OHIO SEA GRANT COLLEGE PROGRAM (1978)

AT THE OHIO STATE UNIVERSITY

including

F.T. STONE LABORATORY (1895)
CENTER FOR LAKE ERIE AREA RESEARCH (CLEAR) (1970),
AND
GREAT LAKES AQUATIC ECOSYSTEM RESEARCH CONSORTIUM (GLAERC) (1992)

"A Summary of National Reviews of Ohio Sea Grant by the NOAA Sea Grant College Program between 2000-2013"

JULY 2014
JEFFREY M. REUTTER, PH.D., DIRECTOR

Sea Grant
Ohio Sea Grant College Program

THE OHIO STATE UNIVERSITY

NOAA

OHSU-TB-1

OHIO SEA GRANT COLLEGE PROGRAM

Historical Summary of National Reviews

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INTRODUCTION

In 2000, 2005, 2010, and 2012, national teams of experts led by the National Sea Grant College Program reviewed the Ohio Sea Grant College Program, which includes Stone Laboratory, the Center for Lake Erie Area Research (CLEAR), and the Great Lakes Aquatic Ecosystem Research Consortium (GLAERC). These teams were charged with reviewing all aspects of each Sea Grant program including each program's research, education, and outreach programs; effectiveness of the leadership and the ability to administer the program well; position within, and support from, The Ohio State University (OSU); partnerships with government, academia, and the private sector; leadership of local, state, and regional initiatives; ability to generate and leverage funds; numbers of students supported, publications, presentations, etc.; strategic plan quality; and overall accomplishments and impact. The first two reviews were called Program Assessment Team (PAT) reviews and were approximately four-day events including visits to the Lake Erie shoreline, Stone Laboratory, and the Columbus campus. PATs were designed to review, evaluate, and rank the 33 Sea Grant programs.

The review in 2010 was entirely on the Columbus campus, two days in duration, and the format was standardized to allow better comparisons across the 33 Sea Grant Programs. These standardized reviews are called "Site Visits" and are designed to review and evaluate programs and make recommendations for improvements. They do not rank the 33 programs. Our next Site Visit is scheduled for 13-14 November 2014 on the Columbus Campus.

The PAT process was leading to competition among Sea Grant Programs nationally to see who could develop the most thorough, attractive, and most exciting review documents and agenda for the review team. While incredibly thorough, the time and energy being spent by Sea Grant Programs to develop the review materials and agendas were increasing exponentially. Furthermore, while the reviews of each program were excellent, the teams leading each of the reviews differed from program to program, which made comparisons across programs very difficult.

From 2000 to the present, the National Sea Grant College Program has required individual state programs to develop very thorough, multi-year, strategic plans. In recent years, the major focus areas of these strategic plans were standardized to allow each state program to fit easily into the major focus areas of the National Program, which are broad enough that it is

Renovations continue annually at Stone Lab. Most recently, 40 solar panels were added to the laboratory roof (above) and exterior enhancements to the Research Building were completed in 2013.

INTRODUCTION

easy for each state program to fit into them and still address the critical needs and opportunities in that state. Furthermore, the emphasis placed by each state on each of the four focus areas varies. Each program is also required to submit electronic, and very thorough, annual reports.

To take advantage of the inherent value of the Site Visits and eliminate the weaknesses of the PATs, a new review process was implemented in 2012—Program Review Panels (PRP). For the PRP process the National Sea Grant College Program developed a national panel of experts for each of the four focus areas in the National Strategic Plan and a fifth panel for education. Each focus area panel was given the portion of each state program's annual report for that focus area for each of the past four years and the program's strategic plan for those years. Each state program was also allowed to submit a summary report (up to 20 pages in length) summarizing the accomplishments of the past four years. Finally, each team was given the final report of the most recent PAT and Site Visit for each program. The PRP then evaluated and ranked all 33 programs for that focus area, while factoring in the level of federal funding each program received. The National Sea Grant College Program used the results from each focus team and developed a final ranking for each of the 33 state Sea Grant Programs.

This report briefly summarizes the results of the 2000 and 2005 PATs, the 2010 Site Visit, and the PRP conducted from 2012-13 (the final report of the 2012 PRP was completed in 2013). The report includes a number of appendices that contain actual documents from each of the reviews, the 20-page summary report prepared for the 2012 PRP, and a chronological inventory of important events in the history of the program dating back to the formation of Stone Laboratory in 1895 (Appendix E). The complete set of materials provided to each of the review teams is available from the Ohio Sea Grant College Program Office on the OSU main campus.

A student learns to operate a ROV.

Overall Ohio Sea Grant, including Stone Lab, CLEAR, and GLAERC, has gone through four national reviews since 2000 with a fifth scheduled for 13-14 November 2014. Every review team has been extremely favorable in their evaluation of the program, and the reviews have also noted the growth and positive trajectory of the program. Clearly the Ohio Sea Grant College Program has grown substantially since 2000, has moved up steadily in national rankings since OSU was designated this country's 24th Sea Grant College by the Secretary of Commerce in 1988, and is currently headed in a very positive direction.

Students use a seine to collect organisms.

2000 PROGRAM ASSESSMENT TEAM VISIT

John Toll, Chancellor Emeritus, University of Maryland, chaired the 6-member team for the 2000 PAT on 25-29 September. This review included meetings in Columbus and extensive visits along the Lake Erie shoreline from Port Clinton to Mentor and an overnight at Stone Lab. The PAT met with over 100 people during their visit, including research scientists, extension agents, elected officials, coastal businesses, state agency personnel, and university officials including President Brit Kirwan and Vice Presidents Bobby Moser and Bradley Moore. Documents from this review are contained in Appendix A, including, the names of the team members, the agenda for the review, the final report from the PAT, the final National Sea Grant College Program Evaluation, and Dr. Reutter's official response. The following excerpt from the Final PAT Report summarizes their assessment of the program.

"The procedures of the National Sea Grant College program require the PAT to rate the OSGCP in four broad categories. Rankings for the four categories are presented in this section, followed by a section consisting of the principal recommendations. A detailed discussion follows for each of the four categories and further specific recommendations are outlined.

The PAT believes that the Ohio Sea Grant College Program is so outstanding that it deserves the highest possible overall rating of ***EXCELLENT****.*

The ratings of the four broad categories are as follows:

Effective & Aggressive Long Range Planning (10%): ***VERY GOOD***

Organizing & Managing for Success (20%): ***VERY GOOD***

Connecting Sea Grant with Users (20%): ***EXCELLENT***

Producing Significant Results (50%): ***EXCELLENT****"*

2005 PROGRAM ASSESSMENT TEAM VISIT

Dr. Jerry R. Schubel, President and CEO of the Aquarium of the Pacific, and Dr. Frank L. Kudrna, Jr., CEO of Kudrna and Associates, Ltd., co-chaired the eight-member team that visited the program from 21-25 August 2005. The visit took place on the OSU main campus, at Stone Laboratory, at Cedar Point Amusement Park, at the Old Woman Creek NERR, at Bowling Green State University Firelands Campus, and at the Lake Erie Nature and Science Center in Bay Village. It included meetings with members of Ohio Sea Grant's nine advisory committees, elected officials, research scientists, agency officials, extension agents, the Friends of Stone Lab, and President Karen Holbrook and Vice Presidents Bobby Moser and Robert McGrath. Documents from this review are contained in Appendix B, including the names of the team members, the agenda for the review, the final report from the PAT, the final National Sea Grant College Program Evaluation, and Dr. Reutter's official response.

The PAT followed the guidelines of the National Program Assessment Team Manual and evaluated the program in four key focus areas: 1) organizing and managing the program, 2) connecting Sea Grant with users, 3) effective and aggressive long-range planning, and 4) producing significant results. The program was further evaluated in 2-5 subcategories within these four major focus areas, 14 subcategories in total. The PAT assigned one of four possible ratings to each of the 14 subcategories: "needs improvement," "meets benchmark," "exceeds benchmark," or "highest performance." **Ohio Sea Grant received the rating of "highest performance" in 12 of the 14 categories and "exceeds benchmark" in the remaining two categories.** The team was particularly pleased to see the clear lines of reporting with Stone Lab, the Center for Lake Erie Area Research, and the Great Lakes Aquatic Ecosystem Research Consortium being part of Ohio Sea Grant. They also thought the reporting lines to two vice presidents were a strength of the program.

2010 SITE VISIT

The 2010 Site Visit took place on 26-27 May entirely on the OSU main campus. The 6-member Site Visit Team (SRT), lead by Jonathan Eigen, Program Officer, National Sea Grant College Program, and Harry Simmons, member of the National Sea Grant Advisory Board and Mayor of Caswell Beach, North Carolina, met with Sea Grant staff members, principal investigators, advisory committee members, elected officials, directors of state agencies and division leaders, President E. Gordon Gee, Vice Presidents Carol Whitacre and Bobby Moser, Senior Associate Vice President Jan Weisenberger, and the Friends of Stone Lab. Documents from this review are contained in Appendix C, including the names of the team members, the agenda for the review, the final report from the SRT, and Dr. Reutter's official response.

The SRT followed the guidelines of the National Site Review Team Manual and reviewed the program in three major categories: organization and management of the program, stakeholder engagement, and collaborative network activities. Their report presented findings, recommendations, and suggestions in each category and was extremely positive in its review of the program. Within the section on "organization and management of the program," the SRT was very pleased with Ohio Sea Grant's leadership, communications, organization, programmed team approach, and support. Within the section on "stakeholder engagement," the SRT report was extremely positive and made a number of very strong comments including:

> *"It was apparent to the team that the Ohio Sea Grant Program is a trusted and immediate point of contact for all issues regarding Lake Erie,"*

and

> *"through systematic partnering with entities, communications programs, and coordination between researcher and administrator, the program has burgeoned into a regional leader."*

Within the section on "collaborative network activities," the SRT report recognized Ohio Sea Grant's national and regional leadership, its success in developing state and regional partnerships, and in developing partnerships with NOAA and other federal agencies.

2012 PROGRAM REVIEW PANEL RESULTS

The 2012 PRP process was complex and involved a very large group of external reviewers. Five panels of experts met in Washington DC in October 2012 to review each of the 33 Sea Grant programs in four major focus areas: healthy coastal ecosystems, hazard resilient coastal communities, sustainable coastal development, and safe and sustainable seafood supply. Each team reviewed the accomplishments and activities of the program over the previous four years as well as the most recent Site Visit Report (2010). This was the first time all Sea Grant Programs were evaluated concurrently by the same group of reviewers. Within each of the four focus areas, Sea Grant programs could be rated as unsuccessful, below expectations, successful, exceeds expectations, or highest performance. No panel rated Ohio Sea Grant below "successful" and the overall rating for Ohio Sea Grant placed the program between "highest performance" and "exceeds expectations." The final rating for Ohio Sea Grant likely places the program in the top 5 in the country.

Documents from this review are contained in Appendix D, including Ohio Sea Grant's 20-page summary of the past four years, the cover letter from Dr. Leon Cammen explaining the process, the final report from the PRP, the national evaluation and ranking, and Dr. Reutter's official response.

OHIO SEA GRANT COLLEGE PROGRAM

Historical Summary of National Reviews

APPENDIX A

2000 PROGRAM ASSESSMENT TEAM VISIT 25-29 SEPTEMBER 2000

- AGENDA FOR PAT
- REVIEW TEAM MEMBERS
  - John Toll, Chair, Chancellor Emeritus, Univ. Maryland
  - Judy Weis, Professor, Rutgers, Toxicology
  - Steve Brandt, Director, NOAA's Great Lakes Environmental Research Lab, Ann Arbor
  - Nancy Bull, Director, Connecticut Cooperative Extension Service
  - Leon Cammen, Program Officer, National Sea Grant College Program
  - Ron Dearborn, Director, Alaska Sea Grant
- FINAL PAT REPORT
- DIRECTOR'S RESPONSE TO FINAL PAT REPORT
- NATIONAL SEA GRANT EVALUATION SUMMARY AND FINAL RECOMMENDATION
- FINAL RATING AND FUNDING ALLOCATION FROM THE NATIONAL SEA GRANT PROGRAM

APPENDIX A

2000 AGENDA FOR PAT

OHIO SEA GRANT COLLEGE PROGRAM

PROGRAM ASSESSMENT TEAM VISIT

AGENDA: 25-29 September 2000

Monday, 25 September

AM Arrive Port Columbus International Airport and check in at Fawcett Center

12:00 Buffet Lunch with Ohio Sea Grant Staff—Presidential Suite, Fawcett Cen.

1:00 Program Review—Sea Grant Office

- Jeff Reutter—Program Description and Staff Introductions
- Karen Ricker/Cindy Hayter/Jill Jentes—Newsletter, publications, web site
- Nancy Cruickshank—Publication Distribution/Databases
- Chris Stanton/In-Young Yeo—Research Reporting
- Lisa Griffin—Software/Program Development
- Arleen Pineda—Stone Lab Curriculum, Databases, and Promotion

3:00 Meeting with Bobby D. Moser, Vice President and Dean, College of Food, Agricultural and Environmental Sciences, Ohio State University

4:00 **3 Meetings**

- Meeting with k-12 teachers—Kottman Hall
- Meeting with engineering researchers—Dr. Bedford's Dept. Office
- Meeting with biological researchers—Dr. Stein's Office, Kinnear Rd.

5:00 Fawcett Center—Reception and Research Poster Session—PI's and Graduate Students Invited

7:00 Fawcett Center—Buffet Dinner

Team free after 8:30—Presidential Suite Available for work

Tuesday, 26 September

7:00	Review Team on own for breakfast in private (complimentary continental breakfast available in Lobby)
8:00	Depart for Fountain Square
8:30-10:00	Meet with state agencies
10:00	Depart for Port Clinton/Sandusky—Continue discussion in 15-passenger van including discussion about Stone Laboratory
1:00-3:00	Lunch at Cedar Point—Meet users and local officials—Discuss Fred Snyder's work in Northwest Ohio
3:00	Depart for Ferry
4:00	Jet Express Ferry to Put-in-Bay
4:30-5:15	Tour Research Building and South Bass Island facilities
5:15	Transport to Gibraltar and check into rooms
5:45	Dinner and discussion in Dining Hall
6:30	Lecture Hall—Continue discussion with users and Laboratory personnel
7:15	Transport teachers and users to Jet Express Ferry; Review Team tour Island

Team free after 8:00

Wednesday, 27 September

7:00	Breakfast
8:30	Miller Ferry to mainland
10:00	Old Woman Creek NERR, Huron, Ohio—Meeting with OWC staff, local users, elected officials, and researchers
12:00	Depart Old Woman Creek—Boxed lunch in van

1:00 Lake Erie Nature and Science Center (LENSC), Bay Village—Meeting with LENSC staff, local users, and researchers; discuss Dave Kelch's work

3:30 Depart LENSC

4:15 Reception and Dinner Hosted by Great Cleveland Growth Association—Discuss Walt William's work and view Lake Erie Marine Trades Association Video

6:30 Depart for Lake County Hotel—La Malfa Hotel and Suites

Team free in evening.

Thursday, 28 September

8:00 Mentor Lagoons—Continental breakfast followed by meetings with elected officials, extension staff, users, and researchers; discuss Frank Lichtkoppler's activities in Northeast Ohio

10:00 Depart for Columbus—Continue discussion in van

12:45 Check in Fawcett Center

1:00 Lunch Buffet, Presidential Suite, Fawcett Center—Team eat in private

1:45 Depart for Bricker Hall

2:00 Meet with William "Brit" Kirwan, President, Bricker Hall

3:00 Meet with C. Bradley Moore, Vice President for Research, Keith E. Alley, Senior Associate Vice President for Research, and their staff, Bricker Hall

4:00 Final meetings with staff, researchers, and elected officials as appropriate

Team free for dinner and evening work. Presidential Suite available for work.

Friday, 29 September

AM **Presidential Suite. Team finishes work, reports to Director and others, as appropriate, and departs. Depending on timing, lunch will be available.**

APPENDIX A

2000 REVIEW TEAM MEMBERS

Dr. John S. Toll, PAT Chair
Washington College and University of Maryland
National Sea Grant Review Panel

Dr. Stephen B. Brandt, Director
Great Lakes Environmental Research Laboratory, NOAA

Dr. Nancy H. Bull, Associate Dean for Outreach and Public Service
University of Connecticut

Dr. Ronald K. Dearborn, Director
Alaska Sea Grant College Program

Dr. Judith S. Weis, Professor
Rutgers University

Dr. Leon M. Cammen, *Ex Officio*
National Sea Grant Office, NOAA

APPENDIX A

2000 FINAL PAT REPORT

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Sea Grant College Program
1315 East-West Highway
Silver Spring, Maryland 20910

December 6, 2000

Dr. Jeffrey M. Reutter, Director
Ohio Sea Grant College Program
Ohio State University
1541 Research Center
Columbus, OH 43212

Dear Dr. Reutter:

On behalf of Dr. John S. Toll, Chair of the Program Assessment Team, I am transmitting the report of the Program Assessment Team (PAT) that reviewed the Ohio Sea Grant College Program, September 25-29, 2000.

The Ohio Sea Grant College Program received an overall rating of "Excellent." By way of explanation, the Sea Grant Program Assessment Team Manual outlines the rating standards as follows:

> Programs should be evaluated on all criteria and be given an overall rating in one of four categories: Excellent, Very Good, Good, or Needs Improvement. A program which generally meets the benchmarks of "Expected Performance" should be given a rating of Good. A program which does not reach the benchmarks should be given a rating of Needs Improvement and informed where improvement is needed. If the benchmarks of "Expected Performance" are generally exceeded, the program will be rated as Very Good. If benchmarks of "Expected Performance" are substantially exceeded, the program will be rated as Excellent. An excellent program does the things expected of it exceptionally well. To be rated an excellent program overall, a program must at a minimum:
>
> 1) Be ranked excellent in the category "Producing Significant Results";
> 2) Normally be rated excellent in the category "Connecting Sea Grant with Users";
> 3) Normally have no "Needs Improvement" ratings.

Our policy states that the Sea Grant Program Director will prepare a response to the PAT report. Both the PAT report and the Program's response will become part of the Program file in the National Sea Grant Office. In February 2001, the National Sea Grant Office will review the PAT reports and Program responses from the seven program reviews that were carried out this year and issue a final evaluation and recommendation report. This final evaluation will be used to determine merit funding for the next four years.

I wanted also to offer my thanks and to express the gratitude of the PAT for the effort you and your staff put forth to make this review productive and most enjoyable. And also our thanks to all participants who took the time to meet with the PAT.

Sincerely,

Leon M. Cammen

Leon M. Cammen
Program Officer

Enclosure

cc: Dr. William E. Kirwan, President
Dr. C. Bradley Moore, Vice President for Research
Dr. Bobby D. Moser, Vice President and Dean, College of Food, Agriculture and Environmental Sciences
PAT Members
NSGO File for Ohio Sea Grant College Program

REPORT OF THE PROGRAM ASSESSMENT TEAM'S
REVIEW OF THE
OHIO SEA GRANT COLLEGE PROGRAM

September 25-29, 2000

Dr. John S. Toll, Chair
Program Assessment Team

November 27, 2000
Date

Program Assessment Team Members

Dr. John S. Toll, PAT Chair
Washington College and University of Maryland
National Sea Grant Review Panel

Dr. Ronald K. Dearborn, Director
Alaska Sea Grant College Program

Dr. Stephen B. Brandt, Director
Great Lakes Environmental Research Laboratory, NOAA

Dr. Judith S. Weis, Professor
Rutgers University

Dr. Nancy H. Bull, Associate Dean for Outreach and Public Service
University of Connecticut

Dr. Leon M. Cammen, *Ex Officio*
National Sea Grant Office, NOAA

REPORT OF THE PROGRAM ASSESSMENT TEAM'S REVIEW OF THE OHIO SEA GRANT COLLEGE PROGRAM

INTRODUCTION

This report summarizes the conclusions of the Program Assessment Team (PAT) that reviewed the Ohio Sea Grant College Program on September 25-29, 2000. The PAT wishes to express its gratitude to the many persons involved in all aspects of the Program for the tremendous cooperation, courtesy, openness, and support that was shown by the many different groups with which we met. Particular thanks are due to the Ohio Sea Grant College Director, Dr. Jeffrey M. Reutter, and the members of his staff. They responded with remarkable promptness to many requests for extensive materials in advance and for special arrangements and information during the visit. They were superb hosts who made the PAT's task especially pleasant.

The PAT enjoyed an intensive series of meetings and interviews with over 100 persons from the various constituencies of the Ohio Sea Grant College Program (OSGCP). On the first day, Monday, September 25, the meetings were held in Columbus. These included first an orientation by the Sea Grant Director Jeff Reutter and other members of the OSGCP leadership. This was followed by a meeting with Dr. Bob Moser, Vice President and Dean of the College of Food, Agricultural and Environmental Sciences, and Dr. Keith Smith, Director of Ohio State University (OSU) Extension. Then a series of simultaneous meetings were held so that the PAT members could meet with individuals and small groups of scientists – engineers, biologists, and educators. This was followed by a reception, poster session and buffet dinner with graduate students and principal investigators who had collected theses, dissertations, and reprints based on Sea Grant projects; in this approach each PAT member could pursue information about those research projects and education and outreach efforts that matched most closely the PAT member's field of expertise.

The second day, Tuesday, September 26, began with a meeting with officials of the Ohio Department of Natural Resources' Division of Wildlife and Division of Watercraft, along with OSU faculty who, with Sea Grant support, made the economic studies on which the State planners depend. The PAT continued on to the Lake Erie shore to Cedar Point where there were discussions with local officials, and then to Stone Laboratory for Tuesday evening and Wednesday morning to review the programs and facilities. On Wednesday and Thursday the PAT traveled to the Old Woman Creek National Estuarine Research Reserve, the Lake Erie Nature and Science Center, the Greater Cleveland Growth Association , and Mentor Lagoons. At each stop the PAT members received enthusiastic presentations from persons deeply involved with OSGCP programs. Again and again it was made clear how important the role of Sea Grant was in leading the efforts that had been major factors in identifying problems and then working to improve the quality of Lake Erie and in dealing with other challenges.

The PAT returned to Columbus on Thursday afternoon to meet with OSU President William Kirwan and then Bradley Moore, OSU Vice President for Research, and his staff, after which it spent the final day of work compiling this report.

OVERALL EVALUATION OF OHIO SEA GRANT COLLEGE PROGRAM

The procedures of the National Sea Grant College program require the PAT to rate the OSGCP in four broad categories. Rankings for the four categories are presented in this section, followed by a section consisting of the principal recommendations. A detailed discussion follows for each of the four categories and further specific recommendations are outlined.

The PAT believes that the Ohio Sea Grant College Program is so outstanding that it deserves the highest possible overall rating of **EXCELLENT**.

The ratings of the four broad categories are as follows:

Effective & Aggressive Long Range Planning (10%): **VERY GOOD**

Organizing & Managing for Success (20%): **VERY GOOD**

Connecting Sea Grant with Users (20%): **EXCELLENT**

Producing Significant Results (50%): **EXCELLENT**

PRINCIPAL RECOMMENDATIONS

1. Ohio has an extraordinarily fine Sea Grant College Program but it is one of the small Sea Grant programs in the USA. Yet the challenges facing the aquatic environment in Ohio are much clearer than in many other coastal states. As recently as 30 years ago, Lake Erie was gravely damaged and, although it is improved, it remains the most polluted of the Great Lakes. The situation is very dynamic and may easily deteriorate in the future, or improve, with great consequences to the economy and quality of life in Ohio and other states and provinces bordering the lake. Sea Grant programs are of critical importance in preserving and improving the quality of Lake Erie. Hence it is recommended that Ohio seek to strengthen the funding of its Sea Grant College until it is clearly one of the strongest Sea Grant Colleges on the Great Lakes. In particular, OSU officials have already endorsed a request to increase the annual State budget line for Sea Grant to $1,200,000, and vigorous efforts should be made to receive approval for this request.

2. OSU is commended for the current construction to provide much needed new OSGCP headquarters and for the efforts to restore the historic Cooke Castle. The next urgent project is to provide much needed modern research space on South Bass Island. The long-term goal should be to make that location the "Woods Hole of the Great Lakes," providing the highest quality research where it is most needed.

3. The extraordinarily able director of the OSGCP, Dr. Jeff Reutter, is the longest serving Sea Grant director in the region and is now serving as the leader of Sea Grant directors in the Great Lakes. OSU should attempt to take advantage of this situation to increase cooperation among Sea Grant programs and other regional agencies in the Great Lakes and to share expertise so as to increase the effectiveness of the research and outreach programs.

4. As the funding for OSGCP increases both at the state and national levels, efforts should be made to accommodate some larger projects with greater scope than possible at the $50,000 funding level that is the normal maximum at present This will permit OSGCP to attract more of the best researchers to its programs and to foster more interdisciplinary programs.

I. EFFECTIVE AND AGGRESSIVE LONG-RANGE PLANNING

The recent completion of the five-year strategic plan is a significant step forward for the Ohio Sea Grant Program. The plan is based on regional needs targeted to the National Sea Grant Strategic Plan. The Ohio strategic plan is rather unique because it also includes a number of 'actions' that form an implementation plan. The process for developing this plan was comprehensive and included widespread input from all user and stakeholder groups, including coastal communities and businesses. All potential investigators were allowed to review the plan. The overall goals are comprehensive and cover a wide range of topics that allow for program flexibility and new ideas from investigators. The incorporation of the implementation plan directly into the Strategic plan will require clear guidance to potential principal investigators so that they may submit proposals in

conformance with the objectives of the strategic plan even when not included in the action items. There were a large number of goals with no indication of relative priorities.

Recommendations

During the proposal process, the differences between the Strategic Plan (goals and objectives) and the Implementation Plan (action items) should be clarified to ensure that investigators will be able to respond to new issues and opportunities as they arise; in the future, the Implementation plan might better be separated from the Strategic Plan. Some priorities should be set within the strategic plan or over shorter time periods, for example during the RFP process.

Rating: VERY GOOD

II. ORGANIZING AND MANAGING FOR SUCCESS

Managing the Program and Institutional Setting

The Ohio Sea Grant Program is housed at the Ohio State University, the largest university within the state. The Sea Grant Director and the Sea Grant Program are closely affiliated with three other entities with Great Lakes activities: the F. T. Stone Laboratory, The Center for Lake Erie Area Research (CLEAR), and the Great Lakes Aquatic Ecosystem Research Consortium (GLAERC). The Sea Grant Director reports to the Vice President for Research at the University. The operations of Stone Laboratory report through the Vice President for Agriculture. The cooperation of the offices of the two vice presidents appears to be excellent. The Director has an Advisory Council as well as a forum of investigators to receive counsel.

The Ohio State University is clearly the best place to house the Sea Grant Program. It is the largest university and research entity in the state. The high level of reporting and strong support from the university administration is excellent. The close and tightly integrated relationship between the four programs allows for diversification and flexibility in funding and allocation of resources. The success of this arrangement depends, to a great extent, on having an excellent Director like Dr. Reutter. The Director's leadership abilities are impressive as is his intense commitment to the Sea Grant College. His leadership has resulted in major gains at Ohio Sea Grant in the past twelve years. The simultaneous service of the Sea Grant Director as the Director of the Stone Laboratory has been a key to this progress.

The Advisory Council as well as the Forum of Investigators provides the Director with a rich source of stakeholder input and scientific advice. The Director has an excellent management philosophy that actively seeks partnerships and collaborations of all kinds. This leveraging effort has made the program extremely productive given the available direct resources.

The newly instituted tracking system for projects and publications is an excellent resource for the management of the program as well as for the investigators and users. We were impressed with the competence of the Ohio Sea Grant Office staff and their obvious ability to work as a team.

Meritorious Project Selection

The proposal process for the competitive selection of research projects follows National Sea Grant Office guidelines. Preproposals are reviewed by a panel. Full proposals are requested for about twice as many as are expected to be funded by Sea Grant funds. Each full proposal is reviewed by at least three mail reviews. The mail reviews are sent to the investigator for rebuttal and the final packages are reviewed by a second panel. The composition of the panels often includes users. The Director makes the final decision on projects. There is also a similar and faster process for the developmental program, whereby small grants (less than $7.5k) are given for

developmental or pilot projects. The development projects have proven to be an exceptional use of resources; they have often led to new programs or collaborations. This selection procedure for research proposals is a rigorous review process. The investigator's rebuttal process is worthwhile.

However, the external mail reviews are sometimes comprised of only those people suggested by the project principal investigators; this may lead to an impression of possible bias in the reviews. Review panels are often made up predominantly of individuals who have served on many OSGCP panels or who are residents of Ohio or who may not be active researchers in the specific areas of research being evaluated.

Recruiting and Focusing the Best Talent Available

The call for proposals is distributed to all investigators who have ever submitted a proposal for funding as well as to all university presidents and research entities within the state. The program has a combination of well established and more junior investigators often encouraged with program development funds. Some investigators have been successful at obtaining relatively long-term funding from Sea Grant. The distribution of information across the state is excellent, and the Director has done a commendable job of identifying and involving faculty from other institutions outside of Ohio State University. However, one problem is that it may be especially difficult within the proposal process or the strategic plan to encourage fully interdisciplinary research.

Meritorious Institutional Program Components

There seem to be mechanisms and strong encouragement in place for the education, outreach and management components to use the most appropriate methods and technology. The web site and the project database are clear examples where the Ohio program can lead the way in the region and in the nation. The newsletter has been awarded a prize from the National Sea Grant Association. Some of funded research projects (e.g. welding, DNA sequencing, and biotechnology research on *Chlamydomonas*) and the strategic plan goal of Advanced Technology provide for national leadership to advance disciplines. The team works well together, especially given the large distances involved. The Ohio Lake Erie Commission has chosen Ohio Sea Grant to receive its organizational Lake Erie Award for 2000.

Recommendations

Evaluate whether project reports should be encouraged every six months for the project tracking system. This may prove to be a burden on the investigators.

Consider whether the relationship of the three entities affiliated with Sea Grant (Stone Laboratory, GLAERC and CLEAR) can be clarified and their public identity thereby strengthened.

The review process would be improved by increasing the diversity of reviewers. At least one individual mail reviewer (and preferably more) should be someone not on the P.I.'s suggested list. The research panelists should be selected primarily on their ability to interpret and to contribute to scientific peer review rather than their understanding of programmatic issues. Increasing the number of panel members who are from outside of the State and/or who have not served on the panel before would encourage an influx of ideas. For example, we suggest working with other Sea Grant programs to try to identify reviewers.

The size of some projects may need to be increased to allow for interdisciplinary research, to ensure substantial scientific input, or to attract the best talent in the state. As additional resources become available, it would be advantageous to promote some interdisciplinary projects that take advantage of the biological and physical strengths in the area as well as to provide a mechanism for special ad hoc panels to review multidisciplinary proposals. The Program should work with faculty and resource managers to outline a conceptual framework for understanding Lake Erie and Great Lakes processes to which incremental Sea Grant investments will contribute.

Sea Grant should continue to encourage promlsing investigators in initial stages of research and then encourage them to seek support from other sources, thereby leveraging the impact of Sea Grant's limited funds. A general recommendation for all Sea Grant programs is to try to develop a process to get a package of material to newly hired junior faculty in aquatic sciences within the state.

The research emphasizes applied programs. Although this type of research is a major focus of Sea Grant, there should also be an opportunity for an investigator to develop the theory and data to help basic understanding of processes that have potential for later Sea Grant Objectives. Investigators need to be continually reminded of the need to publish in peer-reviewed journals of high quality.

Rating: VERY GOOD

III. CONNECTING SEA GRANT WITH USERS

The Ohio State Program has a communications office located at Ohio State and five extension agents located in key communities throughout the Lake Erie region. The Ohio Sea Grant Program has excellent rapport with users and stakeholders throughout the region. The program has reached out through extension specialists and through publications to all segments of the community, including educators, business, politicians and the general public. This is the strongest component of the Ohio program. The extension advisory committees are active, and stakeholders are routinely involved in direct advice to the Director and in research proposal development and evaluation. The outreach and information made available to the stakeholders is obtained from Sea Grant sponsored research as well as from research sponsored by others. The program produces a bimonthly publication that is well-done, highly valued and distributed widely. Investigators are required to produce an article targeted towards users or the general public. There seems to be reasonable collaboration with other Sea Grant programs. This effort is of tremendous value to Ohio Sea Grant and the State of Ohio.

Sea Grant Extension has strived to be integrated into the total Extension system. This has occurred in the areas of water quality, agriculture, and 4-H youth development. A 4-H Sea Camp on Kelley's Island developed by Sea Grant has been conducted for a number of years. Sea Grant has excellent involvement of volunteers in the data collection on research projects. Priorities for the last round of research grants came from the extension efforts for assessment of needs. Future opportunities exist in working toward reducing nonpoint source pollutants in the Lake Erie watershed.

Some specific highlights that were noted by the PAT:

- Stone Laboratory Outreach - In addition to providing a unique research resource on Lake Erie, Stone Laboratory also provides an effective effort for outreach education. School children, college students, and educators from across the state spend a day, a week, or more at Stone Laboratory learning about the ecology of Lake Erie. Highly effective efforts have led to curriculum integration of the Stone Laboratory experience into the classroom back home. Teacher education has included educational research to measure the impact of the Stone Laboratory experience and follow through as compared to a control group. Results indicate an increase in scores on state proficiency tests. Staff from the Laboratory also travel to schools to integrate the learning experience prior to students arriving at Stone Laboratory.

- Boat Show Project - The Ohio Sea Grant program has a rich history of exhibiting at three boat shows. With hundreds of thousands of participants, Sea Grant's presence at the shows is critical to expose citizens to the program. However, these types of shows can sometimes be tedious with questionable educational value of time and resources. An innovative approach is Ohio Sea Grant's focus on adding to an ongoing data base of the values and priorities held by Lake Erie resource users. Data collected have been used in a variety of ways, such as allowing the Lake Erie Marine Trade Association to implement a successful campaign to have a greater percentage of the boating fuel tax allocated to access development. Opinions and values expressed in the survey help Sea Grant to focus priorities. Show managers have used the data to improve their events.

• Lake Erie Nature and Science Center - This non-profit educational center is supported by donations, grants, and memberships. Sea Grant developed and provided educational and display recommendations as part of an extensive 1998 renovation. A permanent Sea Grant display is housed at the Center with a revolving series of themes. In addition, a permanent display area is dedicated to Sea Grant fact sheets for the public. This is a highly effective means by which to reach thousands of children and adults.

• Community Involvement - The local Sea Grant Extension agents, Stone Laboratory personnel and local University researchers are committed to effective outreach education in the Lake region. This is exhibited by the extensive involvement of faculty and staff in numerous public and private boards related to the Lake Erie ecosystem. Examples of such boards include county visitor boards, Lake Erie Nature and Science Center, and the Toledo Brownfield Working Group.

• Making Connections - Volunteers, public officials and employees, and private partners repeatedly expressed vocal support for the skill and expertise of Sea Grant Extension employees to make connections. These connections are between and among interested parties in current problems, people who do not know or have not worked together, or people who have resources needed by others.

• Twine Line - This bi-monthly publication has been recognized by National Sea Grant for its outstanding contribution. About 6000 copies are distributed to media, friends, scientists, government officials, and interested parties. Local media who receive Twine Line repeatedly pick up a story idea or reprint an article. Researchers present their findings for the lay audience. Twine Line also includes information from the Ohio Lake Erie Commission, another example of the partnership in action. In 1999, 294 print media articles from 139 sources cited Sea Grant's efforts.

• Web Site – Extensive work over the last two or three years has resulted in an updated and improved web site. This site allows the browser to search for Sea Grant, Stone Lab, GLAERC, or CLEAR as well as related links. Promotion for the course work offered includes photos of students from previous classes engaged in hands-on learning and reflecting the diversity of the student body. All Sea Grant research projects can be searched on the site.

• Ohio Sea Grant has been a leader in the Great Lakes Sea Grant Network. There have been extensive efforts to foster communications among the partners working in the Lake Erie watershed and across the Great Lakes. Ohio Sea Grant has developed and distributed a well-regarded series of fact sheets which are used by private partners and by the Ohio Department of Natural Resources. They contributed to the National 30th Anniversary celebration by co-chairing the 30th Anniversary Committee and preparing and printing the 30th Anniversary Brochure, posters, and the new National Brochure. In addition, the communications staff has worked to train others on how to communicate science to the media. Ohio Sea Grant was recognized by the National program for its outstanding efforts in development of brochures and fact sheets.

Recommendations

The Ohio Sea Grant College Program should serve as a model to be considered by other Sea Grant programs in trying to strengthen their connections with users.

The overall success of the extension program depends greatly on the network established by the extension agents that have worked in the communities for many years; there could be difficulties when this able staff begins to retire. Plans should be made to assure continuity of the excellent extension activities.

Rating: Excellent

IV. PRODUCING SIGNIFICANT RESULTS

Research

A number of Ohio Sea Grant investigators spoke to the PAT about their research, much of which, in addition to being intrinsically interesting research, is also useful to management agencies. Much of the biological research was focused on studies of the impacts of invasive species, a major problem in Lake Erie. There is excellent collaboration and cooperation between OSGCP and the Ohio Department of Natural Resources (ODNR) on research and outreach efforts. The PAT was impressed that the emphasis was on accomplishments, not so much on who received the credit.

Some of the significant achievements of the Program include:

- Research on aquaculture has established the appropriate ratios of N and P in fertilizers used in fish culture ponds to increase the yield of walleye. This appropriate ratio has been adopted by the Ohio Division of Wildlife in their culture systems. In addition, earlier Sea Grant research on the use of potassium to kill zebra mussels has been adapted to kill larval zebra mussel without harming fish in transport trucks in order to prevent walleye aquaculture shipments from inadvertently spreading zebra mussels.

- Research on the impact of bioaccumulation and trophic transfer of toxicants (chiefly polychlorinated biphenyls or PCBs) up the food chain has shown that the transfer of toxic chemicals through Great Lakes food webs has been altered by the arrival of invasive species. Zebra mussels are very efficient in concentrating toxic chemicals from algae they consume; since few organisms consumed zebra mussels themselves, there was not much concern about potential food chain effects or potential health risks to humans. However, now that zebra mussels have acquired a direct consumer (the round goby, a newer invader), there is a direct pathway from zebra mussels to round goby to smallmouth bass or yellow perch to humans. Smallmouth bass are now near the FDA action level for PCBs as a result of food chain biomagnification of PCBs. This research has significant management implications, and the relevant agencies are following it with great interest.

- Research on population genetics also has great importance for both understanding invasions and for managing fisheries for walleye and perch. The molecular genetics work indicates that there are a number of different stocks of walleye in Lake Erie that tend to spawn at the same sites from which they were derived. This finding means that the state management agency could develop stock-specific management plans, rather than regarding and managing all the fish in the lake as a single population. Based on a combination of nuclear and mitochondrial DNA studies, population genetics research on invasive species (including zebra and quagga mussels, ruffe, and round gobies) has identified the Eurasian sites from which these invasive species were derived. Populations of the round goby have been shown to have high genetic variability, and are about as diverse as those in their European/Asian native areas.

- Research on the ecology of invasive species in Lake Erie and their interactions with native species has documented that one recent invader, the round goby, consumes large numbers of another invader, the zebra mussel, and may help to control the zebra mussel populations. This in turn may help to decrease filtration of the water column and zooplankton populations may increase. This research is important in understanding how the ecology of the ecosystem is being altered by the various invasive species.

- Biotechnology research has enormous potential for cleaning up metal-contaminated sites and removing metals from waste streams. The initial work engineered the alga *Chlamydomonas* to incorporate the gene for metallothionein, a metal-binding protein, and thus be able to accumulate high levels of certain metals without being adversely affected. Subsequently work has been done to engineer the cells to have metal-binding sites on their surface rather than in the interior, to bind specific metals, and to make higher than normal amounts of proline and thus be able to tolerate the increased stress that would result from binding even greater amounts of

metals. These cells release the metals when exposed to low pH, and thus can be re-used to bind more metals. Because these cells are able to grow in very toxic environments, they have great potential for cleaning up highly contaminated sites, and there is a patent pending. This work has justifiably received considerable attention from the media and seems to have enormous potential for benefitting contaminated environments, not just in the Great Lakes, but in any metal-contaminated freshwater system in which this species can grow. A spin-off of this research is using the alga to carry essential nutrients in cattle feed and in the aquaculture industry to administer antibiotics.

- Ohio Sea Grant made initial investments in recruiting engineering faculty to address Lake Erie and Great Lakes issues. Sound research was accomplished with Sea Grant support, but the greater long-term benefit may have been the established interest of the Department of Civil and Environmental Engineering and Geodetic Science, which resulted in the recruitment of new faculty with the talents to further pursue environmental and watershed challenges. Clearly Ohio Sea Grant's attention and investment has contributed to the expansion of engineering faculty interest in and ability to address Great Lakes issues.

- Ohio Sea Grant also made an investment unique to the National Sea Grant College network in underwater welding technology and techniques. Through the efforts of the principal investigator, the technology and techniques were extended both nationally and internationally to industry through underwater welding competitions, an innovative and effective method of extension education.

Education

From teacher workshops, to introducing curriculum, to developing credit courses for teacher education, the Sea Grant education efforts have evolved. Funding from multiple sources including NASA, NSF, and the Eisenhower Math and Science Fund have been leveraged with Sea Grant dollars to multiply the impact. Education has been viewed from a total perspective. For grades K-12, the Lake Erie based science curriculum for K-12 teachers has been developed for classroom use, and Stone Laboratory provides the opportunity for a hands-on environmental education. For university undergraduate students, the Stone Laboratory experience offers introductory and upper level courses in biology, geology, and natural resources. For graduate students, the opportunity is available to work as teaching or research assistants and to take course work at Stone Laboratory.

Curriculum development represents some of the most significant accomplishments related to Ohio Sea Grant's education programs. Teachers have requested new and better methods of teaching science. Using the Earth Systems approach, an extensive program of teacher education has been implemented. Ohio Sea Grant educators developed curriculum teaching packets that have been tested and are being used by K-12 teachers integrating Lake Erie concepts into their curriculum. In addition, Ohio has a fourth grade proficiency test system, and demonstration schools were selected by Sea Grant to serve as models for the infusion of interdisciplinary science education materials focused on the Lake Erie ecosystem. Students receiving this integrated approach have shown significant improvements in content area proficiency test scores especially in the process of science and life in the Great Lakes sections. Demonstrating cooperative learning techniques showed that a trained teacher can educate peer teachers. Hands-on group activities and questioning excite middle school students about science. The Great Lake Erie reference text is a shared resource providing expert summaries of important lake-related topics.

In summary, Ohio Sea Grant K-12 teaching materials are based on emerging issues and research on assessment of needs. The materials are peer reviewed and field tested. Concept maps provide a logic to the interrelationship of teaching topics. Materials foster best teaching practices through the integration of science, inquiry learning, group explorations and use of instructional technology. Internet linked instructional materials improve the accessibility of K-12 teachers to environmental information. An excellent job has been done of seeking outside funding and of infusing materials into local curricula.

Extension and Outreach

The PAT was impressed with the scope and success of the many Extension activities, including:

- Beaver Creek Bridge Project - Recreational marinas are located on the south side of a low clearance bridge across Rt. 6. These marinas provide dockage for over 1200 recreational vessels. A few years ago when Lake Erie was unusually high, the vessels were unable to navigate under the bridge for most of the spring and summer. Ohio Sea Grant proposed a plan to raise the bridge, providing economic and tourism data to support this project. The bridge was successfully completed. A few years later when low water levels were anticipated, Sea Grant provided updates and sufficient data for marina owners to decide to dredge the river. This forward thinking approach prevented marina owners from another financial disaster.

- Artificial Reef Project - Artificial reefs have been shown to attract fish, thus providing an increased opportunity for fishermen and scuba divers. Using both private and public dollars and the donation of materials, the first reefs were constructed in the Lake off the Lakewood shore. Two reefs offshore from Lorain were added using more than 12,000 tons of clean rock, concrete, and brick rubble. The reefs have successfully improved the quality of the fishing experience at locations closer to the shore. An economic and biological impact study of the Lorain and Lakewood reefs indicated the structures pay for themselves 2.75 times each year and attract 20-60 times as many fish as the surrounding non-reef areas. Ohio Sea Grant's artificial reef project was the first one planned, constructed, and evaluated within the Great Lakes. As a result of this success, Sea Grant volunteers negotiated with the City of Cleveland to salvage 20,000 cubic yards of uncontaminated concrete from the demolished Cleveland Stadium to build artificial reefs. The City of Chicago has now used Ohio Sea Grant's results to justify and carry out a similar artificial reef project.

- Brownfield Project - This is a case of turning abandoned industrial properties in or around urban centers into viable economic enterprises. To turn abandoned sites into investment grade properties requires local, state, and federal interactions targeted to environmental and economic objectives. One example was the incorporation of retention and expansion study results to find room for the expansion of the Cleveland Gear Company. While all the pieces seemed to be in place, the last sticking point was a waiver requested by the company to ensure they would not be sued for environmental infractions committed by previous site owners. This was successfully negotiated and the business was able to expand. Brownfields were avoided.

- Mentor Lagoons Project - This unique natural resource was threatened by development when the Town of Mentor decided to step to the plate. Using the expertise of Sea Grant in building private/public partnerships, the town acquired the lagoons for public benefit. Over a period of years, Sea Grant helped gather community input, facilitated the public education process, and organized and empowered diverse interest groups. Mentor Lagoons has been recognized by other states as a model for land use planning and Sea Grant has been identified as a successful catalyst for this project.

- Sea Grant has effectively brought together several state agencies to reduce redundancy and to ensure that one survey will be useful for the measurement of multiple goals. Sea Grant Extension has done an excellent job of connecting state agencies such as ODNR to local tourism bureaus. Sea Grant Extension is recognized as a strategic partner making local organizations look better and effectively utilizing the multiplier effect.

- Ohio Sea Grant's State Legislature/Congressional Day on Lake Erie – With 12 programs in 18 years, this day invites state and federal legislators and their families to learn about and to enjoy Lake Erie. The event communicates the benefits and problems of the Lake. These events have played a key role in the establishment of a line item in the State of Ohio's budget for program support, funding for capital improvements at Stone Laboratory, and the passage of the Ohio ban on phosphates in detergents.

In summary, the Ohio Sea Grant program has effectively developed and utilized a wide variety of methods for extending information to the public. These include highly effective extension personnel, well-integrated into the

communities they serve, award-winning newsletters and fact sheets and highly effective displays at local science centers and trade shows. Staff and faculty repeatedly extend their efforts through volunteer involvement and local presentations. Local decision-makers recognize the value of Sea Grant's multiplier efforts and strategic partnerships.

Recommendations

In view of the great importance of Sea Grant research to the future of Lake Erie and the State of Ohio, an increased effort should be made to encourage more of the best marine scientists in Ohio to participate in the Sea Grant program. It is recognized that the small level of past funding has limited the size of grants and the number of research grants that could be made; as increased funding becomes available, an intensive effort should be made to identify additional research leaders.

The PAT encourages Ohio Sea Grant to involve the engineering and environmental faculty, watershed managers, and other user groups in a needs assessment for Lake Erie environmental studies in order to provide a set of priorities for research and technology development.

A more effective link should be developed between K-12 curriculum development and 4-H programming. Additional funding may be needed to advance the critical area of teacher education research.

Ohio Sea Grant should take the lead in seeking ways to coordinate data sets across the Sea Grant network to survey recreational issues with a consistent methodology to facilitate better comparisons.

Given the extensive involvement of volunteers with the Sea Grant Extension Program, it may be time to consider the creation of a volunteer management/program assistant position in each county office on the Lake.

Rating: Excellent

V. CONCLUSION

The PAT is ready to answer any questions there may be concerning our ratings and recommendations.

Dr. John S. Toll, PAT Chair
Washington College and University of Maryland
National Sea Grant Review Panel

Dr. Ronald K. Dearborn, Director
Alaska Sea Grant College Program

Dr. Stephen B. Brandt, Director
Great Lakes Environmental Research Laboratory, NOAA

Dr. Judith S. Weis, Professor
Rutgers University
National Sea Grant Review Panel

Dr. Nancy H. Bull, Associate Dean for Outreach and Public Service
University of Connecticut

Dr. Leon M. Cammen, *Ex Officio*
National Sea Grant Office, NOAA

APPENDIX A

2000 DIRECTOR'S RESPONSE TO FINAL PAT REPORT

5 January 2001

Dr. Ronald C. Baird, Director
National Sea Grant College Program
National Oceanic and Atmospheric Administration
1315 East-West Highway, Room 11716
Silver Spring, Maryland 20910-3282

Dear Dr. Baird,

This is my official response to the "Report of the Program Assessment Team's Review of the Ohio Sea Grant College Program, 25-29 September 2000." This report was signed by Dr. John S. Toll, Chair of the Program Assessment Team (PAT), on 27 November 2000, and transmitted to us with a cover letter from Dr. Leon Cammen dated 6 December. In addition to Dr. Toll, President of Washington College, Chancellor Emeritus of the University of Maryland, and a member of the National Sea Grant Review Panel, the PAT consisted of Dr. Stephen B. Brandt, Director of NOAA's Great Lakes Environmental Research Laboratory, Dr. Nancy H. Bull, Associate Dean for Outreach and Public Service at the University of Connecticut, Dr. Ronald K. Dearborn, Director of the Alaska Sea Grant College Program, Dr. Judith S. Weis, a Professor at Rutgers University and a member of the National Sea Grant Review Panel, and Dr. Leon M. Cammen, an *Ex Officio* team member representing the National Sea Grant College Program.

Let me begin by thanking the National Sea Grant College Program for putting together such a talented, enthusiastic and dedicated team. They were excellent representatives of the National Sea Grant College Program and a group that I was very proud to introduce to our university administrators and our partners in government, academia and the private sector. I must also thank the PAT members for their hard work and determination in preparing a very thorough review and evaluation of our program. While there may be one or two points where we disagree with their evaluation (we worked very hard to achieve an "Excellent" rating in every category), we are completely satisfied that we received a very thorough, honest and fair review, by a team that desired to both evaluate and improve our program. Furthermore, we could not be happier with the conclusion on page one of their report, *"The PAT believes that the Ohio Sea Grant College Program is so outstanding that it deserves the highest possible overall rating of **EXCELLENT**."* In the paragraphs that follow I will comment on each of the major sections of the PAT report.

PRINCIPAL RECOMMENDATIONS

We were pleased by the PAT's endorsement of our effort to raise our state line item to $1.2 million/year and their encouragement of our university administration to strongly support the request. However, I should add that everyone involved with our program hopes this very strong review also allows the National Sea Grant College Program to increase our federal funding very significantly. An increase in federal support as a result of this review could also provide leverage for our request to increase our state support.

We were pleased to read their approval of the efforts of The Ohio State University and our state legislature to improve our office space on main campus and restore the historic Jay Cooke's Castle for our outreach program. We should move into the new office in April 2001 and exterior renovations of the Castle were completed in November 2000. We are also in complete agreement with their recommendation that the next major construction project should improve our research space to allow us to become the *"Woods Hole of the Great Lakes."*

I appreciated the PAT's evaluations of my capabilities and assure you that we will endeavor to provide leadership and enhance collaboration between Great Lakes groups.

Their final recommendation in this section was to increase the average size of our grants above our current $50,000 level when our funding from the state and national program increases. This is currently part of our rationale for requesting an increase in our state line item. We recognize the limitations of $50,000 projects, but with a very limited federal budget and a large number of important issues to address, we believe the $50,000 limit is the best strategy until our budgets increase.

I. EFFECTIVE AND AGGRESSIVE LONG-RANGE PLANNING

Our rating of "Very Good" in this category was disappointing, because we had worked very hard and honestly felt we deserved a rating of "Excellent" as I will explain below. First, we believe the thoroughness of our planning process is unparalleled. In addition to numerous focus group meetings with our advisory committees and the Friends of Stone Laboratory, our strategic planning process included surveys of 1000 individuals annually at boat and sport shows and leadership of several regional research organizations. Leadership of these organizations allowed us to develop a strategic plan that clearly had a regional flavor and was of value to the entire region. These organizations included the Council of Great Lakes Research Managers of the International Joint Commission (IJC) between the US and Canada (US State Department) of which I am a member and which I co-chaired from 1996-1999, the Lake Erie Task Force for IJC that I co-chaired until its completion in 1997, and the Lake Erie at the Millennium Project where Ohio Sea Grant is one of the four host organizations—the others are US EPA, the University of Windsor, and the National Water Research Institute of Canada. For the IJC Council I developed their strategy of scoping research issues for the region as part of (and to assist) our

strategic planning process, and led their effort to overhaul and rejuvenate their regional research reporting system. It is possible that the PAT underestimated the significance of these regional leadership efforts as an important part of our planning process.

We believe the PAT may not have appreciated our strategy and the effort we took to modify our early strategic plans and mold our Ohio plan into the national framework. We think all programs should be encouraged/required to use the national framework for it clearly allows individual programs to demonstrate how our local priorities fit into national needs.

We felt the addition of "actions" to our plan was a major strength, yet I am not sure the PAT agreed. As we met with our partners to develop objectives to meet our local needs under the national goals, the enthusiasm of the groups grew to the point that they wanted to specifically state some of the actions they wanted to take to accomplish the objectives. I encouraged them to do so, as long as they were indeed committed to accomplishing the action. We think this is a strength of our process because it clearly shows how the implementation plan is tied to the strategic plan. Furthermore, our future reports will be able to show our goals, followed by objectives to achieve the goals, followed by actions to achieve the objectives, and finally followed by the results of the actions.

I believe the PAT was concerned that our action statements would confuse investigators when developing proposals. We are pleased the PAT pointed this out and feel we can address this concern very easily in future calls for proposals, and we will. However, potential investigators are only one of the audiences for the strategic plan and we believe many of our other audiences—elected officials, state agencies, the private sector, and others—will benefit and better understand our program by seeing the action statements.

Finally, the PAT was concerned that we had not prioritized goals and objectives within the strategic plan. On the contrary, we feel our strategic plan is a tremendous stretch for the program, for while we have included all of the national goals, we have added, deleted and modified objectives to fit Lake Erie and Ohio, and we have only included actions that we will indeed take. As a result, we intend to do everything within our strategic plan and those things that are not priorities for us were not included.

II. ORGANIZING AND MANAGING FOR SUCCESS

Managing the Program and Institutional Setting

We were extremely pleased by the comments of the PAT in this section of their report. They recognized and appreciated:

- the strong support we receive from the highest levels of university administration;
- the value of reporting to two vice presidents;
- the appropriateness of the program being located at Ohio State University;
- the importance of our Forum of Investigators, the Friends of Stone Laboratory, and our Advisory Committees;

- the value of the linkages between our four programs (Ohio Sea Grant College Program, Stone Laboratory, CLEAR, and GLAERC) and Sea Grant's role as the umbrella organization;
- the many improvements we have made in the past 12 years;
- the value of our newly developed electronic reporting system for projects (labeled as the best in the country by the PAT);
- the value and importance of our efforts to establish partnerships; and
- the competence of my staff.

Consequently, we were very surprised to be rated "Very Good" rather than "Excellent" in this category.

Meritorious Project Selection

With so much to absorb in only a few days the PAT may have missed an important point in this summary. Before we send out proposals for review we send the proposed reviewers a note asking them if they are willing to review the proposal and asking them if they have any conflicts of interest that would prevent them from giving us a fair review. We also ask investigators not to propose reviewers who would have any conflicts of interest. Finally, our panels have always included 2-4 people from outside Ohio.

Recruiting and Focusing the Best Talent Available

We were very pleased with the comments of the PAT in this area and pleased that they recognized the importance of our Development Fund in identifying and encouraging new investigators. They expressed concern about our ability to encourage interdisciplinary research. While we are convinced that our overall program is truly an interdisciplinary program, we agree that larger budgets would allow individual projects to be more interdisciplinary. If we are successful in our efforts to obtain additional funding from the National Sea Grant College Program and our state sources, we will certainly increase the size of our individual project awards. Without the additional support, increasing the size of individual projects would significantly reduce the number of awards we can make and the number of issues and problems we can address. Our Forum of Investigators and Advisory Committees have encouraged me not to do this without additional funding.

Meritorious Institutional Program Components

We were very pleased that the team recognized the awards we have received and our opportunities for leadership in several strategic research areas. In the last few years we have made great strides in developing an electronic reporting system for all projects and improving our website. This required a great deal of effort and planning, and as a result we were most pleased to read the following comment from the PAT, *"The web site and the project database are clear examples where the Ohio program can lead the way in the region and in the nation."*

Recommendations

We really appreciated the PAT's recommendations as they will clearly improve our program. I will comment on several of their recommendations that have not been discussed above.

- The PAT encouraged us to evaluate our requirement for reports every six months to be sure it was not too burdensome to investigators. We agree entirely. Our goal was to develop a reporting process that is so simple, that reporting every six months is not a problem. We also wanted a system that would allow us to better manage and track projects and report exciting findings in news releases or newsletters.
- We will certainly try to clarify the relationship between Sea Grant, CLEAR, Stone Laboratory and GLAERC.
- They recommended that at least one peer reviewer for every proposal not come from a list suggested by the principal investigator. We agree completely.

III. CONNECTING SEA GRANT WITH USERS

We were extremely pleased to receive a rating of "Excellent" in this category, and the comments of the PAT were gratifying—in particular in their recommendations, *"The Ohio Sea Grant College Program should serve as a model to be considered by other Sea Grant programs in trying to strengthen their connections with users."*

I want to thank the PAT for the effort they took in providing details within their highlights in this section. This report has already been read and reviewed by members of our advisory committees and participants in the September 2000 review, and they were particularly pleased to see so many of the programs in which they were involved mentioned specifically within this section. That recognition and the enthusiasm it has created will be invaluable as we move forward in developing new partnerships to address the critical issues of the next century.

IV. PRODUCING SIGNIFICANT RESULTS

We were very pleased to receive a rating of "Excellent" in the category given the most weight in the review process. Again I want to thank the PAT for their effort to provide so many details and highlights in their evaluation. This is clear evidence that they were paying close attention during discussions with our investigators and partners throughout the review process. We were also very pleased that the PAT chose almost an equal weighting of highlights in research, education and outreach, as we feel they are all important elements within our program. We agree with all five recommendations in this area and will pursue each of them if funding allows.

Thank you for the opportunity to comment on the PAT report. We believe our programs benefited from the process. While we are disappointed that we did not achieve our goal of an "Excellent" rating in every review category of the PAT report, we are pleased with our overall evaluation, and remain hopeful to achieve our goal when the National Sea Grant College Program meets in February to review all PAT reports from 2000. Please don't hesitate to call if you have any questions.

Sincerely,

Jeffrey M. Reutter, Ph.D.
Director

C: Dr. Leon Cammen

APPENDIX A

2000 NATIONAL SEA GRANT EVALUATION SUMMARY AND FINAL RECOMMENDATION

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Sea Grant College Program
1315 East-West Highway
Silver Spring, Maryland 20910

MAY 2 2001

Dr. Jeffrey M. Reutter, Director
Ohio Sea Grant College Program
Ohio State University
1541 Research Center
Columbus, OH 43212

Dear Dr. Reutter:

The National Sea Grant College Program Act of 1998 requires NOAA to evaluate individual Sea Grant College Programs using priorities, guidelines and qualifications established by the Secretary of Commerce. Those guidelines are set forth in the policy document of April 20, 1998, from the National Sea Grant Office (NSGO) entitled "Implementation of Program Evaluation Procedures in the National Sea Grant College Program." The stated objective of the evaluation process is to review program performance with the intent of providing specific recommendations for overall improvement in each of the 30 individual Sea Grant Programs.

The performance review for the Ohio Sea Grant College Program (OSGCP) was recently completed, and I am pleased to provide the enclosed NSGO Final Evaluation and Recommendation Report for your consideration and review. Also, enclosed is the report of the outside Program Assessment Team (PAT) which reviewed the program on September 25-29, 2000. This report provided a major input to the NSGO evaluation process. In arriving at a final evaluation, the NSGO also considered OSGCP's response to and actions taken since the PAT report as well as the responsiveness of the program to national needs and priorities. Most importantly, we tried to normalize program ratings across both PAT and NSGO evaluations.

The NSGO's Final Report considers, as did the PAT report, four evaluation criteria and performance benchmarks as specified in the document "Performance Benchmarks for Evaluations," dated April 20, 1998, and modified in 1999. NSGO criteria include: utilizing effective long-range planning, organizing and managing for success, connecting Sea Grant with users, and producing significant results. The enclosed report provides our findings with respect to each of these criteria, including recommendations to improve performance and maintain existing areas of excellence. Both the Final Evaluation and the PAT reports then provide Ohio State University with both an overview of OSGCP program performance and specific recommendations that are intended to enhance future performance.

I want to commend you and your management team for the job you have done in making Ohio Sea Grant an effective resource. The contributions of the OSGCP in the areas of fisheries management, coastal recreation, underwater reefs, pollution impacts and remediation, economic development, underwater welding, invasive species, and educational curriculum development, have been effective and will benefit not only the citizens of Ohio, but also of the Great Lakes region. The development of the Stone Laboratory as both an educational and a research facility is particularly noteworthy as it expands Sea Grant's impact to constituencies not traditionally involved in the Program. Two Best Management Practices were identified within the Ohio Sea Grant College Program: the newly instituted system for tracking projects and their results; and the State Legislature/Congressional Day on Lake Erie.

I would also like to call your attention to two of the recommendations that are treated in some detail in the enclosed reports and summarized below. Management attention to these issues, I believe, will enhance the overall effectiveness and impact of the program as well as its image and stature statewide:

a. Ohio Sea Grant is a stellar program, but it is among the smaller programs in the Sea Grant network, and the challenges facing the aquatic environment in Ohio are clear and substantial. Both the PAT and the NSGO agree that Ohio should seek to strengthen the state and private funding of its Sea Grant College in order to enhance its ability to address the critical coastal issues of the state and the Great Lakes region.

b. The issues facing the Great Lakes are complex and frequently require multi-disciplinary approaches. We encourage Ohio Sea Grant to look for opportunities to broaden the scope and size of its environmental research projects as program funding increases.

Finally, while not required, you may provide to the NSGO a response to this report for the record. In addition, your NSGO Program Officer will provide, by separate letter, a merit fund rating category which we will use to allocate merit funding. This rating will remain in effect for funding purposes for the duration of the four-year evaluation period beginning with federal fiscal year 2002 (i.e., FY2002 to FY2005). The merit funding is explained in a policy memo "NSGO Final Evaluation and Merit Funding," issued in April 1999.

These reports are considered proprietary to Ohio State University and will not normally be made available by the NSGO to other parties outside of the U. S. Department of Commerce. The university may use or make public any information contained herein for whatever purposes it so chooses. We plan to issue a general report on program evaluation that will be distributed to

Sea Grant Directors, the Sea Grant Review panel, and senior NOAA/DOC officials, summarizing our experience with performance-based reviews. I would welcome your ideas or those of your organization on how we might generally improve the evaluation process.

Sincerely,

Ronald C. Baird
Director

cc: Dr. William E. Kirwan, President
Dr. C. Bradley Moore, Vice President for Research
Dr. Bobby D. Moser, Vice President and Dean, College of Food, Agriculture and Environmental Sciences

FINAL EVALUATION AND RECOMMENDATION REPORT FOR THE OHIO SEA GRANT COLLEGE PROGRAM

NATIONAL SEA GRANT OFFICE
APRIL 30, 2001

INTRODUCTION

In accordance with the Sea Grant Act of 1998 and guidelines set forth in the policy document of April 20, 1998, from the National Sea Grant Office (NSGO) entitled "Implementation of Program Evaluation Procedures in the National Sea Grant College Program," this report is submitted to the Ohio Sea Grant College Program (OSGCP) in fulfillment of those requirements. As such, it constitutes the final report from the NSGO on the evaluation of program performance for the OSGCP for this four-year evaluation cycle. For planning purposes, the next Program Assessment Team (PAT) visit can be expected to occur in calendar year 2004.

The report is organized in four sections in conformance with NSGO evaluation criteria and benchmarks for performance as cited above. The final report draws heavily on the comments, recommendations and merit rankings, made by the PAT in their site visit of September 25-29, 2000. The information in this report is considered proprietary to the OSGCP and will not be released to the general public.

I. Effective and Aggressive Long-Range Planning

The recently completed strategic planning process carried out by the OSGCP was inclusive in nature with widespread input from user and stakeholder groups, including coastal communities and businesses, and the research community. The breadth of input was greatly enhanced by the many regional planning groups included and by the extensive use of surveys of individuals attending boat shows. The OSGCP made the decision to integrate the strategic plan with a number of 'actions' that constitute an implementation plan. The result was a well-written, highly usable document, but one that may require some explanation to potential investigators to emphasize the available opportunities. The plan is ambitious for a smaller program, but it is clear that choices have been made. Overall, the NSGO viewed the result as a valuable guide for the program and its constituents.

II. Organizing and Managing for Success

Both the PAT and the NSGO were impressed with the quality of the management team and their ability to work together. All facets of Program operations appear to be involved in the decision-making process. The various modes of self-evaluation have provided valuable input to the program. Dr. Reutter has provided effective leadership both for regional efforts in the Great Lakes and for the national Sea Grant Network.

The institutional setting for the OSGCP is somewhat complex, but the dual reporting at a high

level in the university administration appears to be working well and does increase the opportunities for highlighting the program's efforts. The tightly-integrated relationship between Sea Grant, the Stone Laboratory, the Great Lakes Aquatic Ecosystem Research Consortium (GLAERC), and the Center for Lake Erie Area Research (CLEAR), allows for diversification and flexibility in funding and allocation of resources. The simultaneous service of the Sea Grant Director as Director of the Stone Laboratory has benefitted both programs and has resulted in one of the strongest education programs in the entire Sea Grant network. However, as the PAT observed, the success of this arrangement depends, to a great extent, on having as skilled a Director as Dr. Reutter, and some thought should be given as to the future of this interlocking administrative structure.

Ohio Sea Grant has revised its peer review system to eliminate the appearance of conflict of interest. However, we concur with the PAT's recommendation to further enhance the diversity of the mail reviewers and the panelists. The new system for tracking projects should be of great value to the program both as a management tool and as an outreach vehicle for transmitting the results; it is recognized as a Best Management Practice.

III. Connecting Sea Grant with Users

The PAT commented favorably on the high degree of connection of OSGCP with users and stakeholders throughout the region, and saw this as the strongest component of the OSGCP. The extension advisory committees are active, and stakeholders are routinely involved in offering advice to the Director and in research proposal development and evaluation. The PAT commented on many of the highlights in this area including the use of boat shows as both outreach and advisory opportunities, the level of community involvement of the extension agents, and the quality of the communications products and the enhanced web site.

Ohio Sea Grant's State Legislature/Congressional Day on Lake Erie – a day where state and federal legislators and their families are given the opportunity to learn about and to enjoy Lake Erie – is a highly effective way of communicating the benefits and problems of the Lake; it is recognized as a Best Management Practice.

IV. Producing Significant Results

Ohio Sea Grant has a solid list of accomplishments, appropriate to the level of resources available to the Program, in all three areas that Sea Grant emphasizes – research, education, and extension. Several of these accomplishments were seen as highlights by the PAT and the National Office:

1) The Ohio Division of Wildlife Research has used Sea Grant research results to design their aquaculture systems for walleye. In addition, earlier Sea Grant research has been instrumental in helping prevent walleye aquaculture shipments from inadvertently spreading zebra mussels. Research on walleye population genetics has shown that there

are a number of distinct stocks of walleye in Lake Erie. This finding means that the state management agency can develop stock-specific management plans, rather than regarding and managing all the fish in the lake as a single population.

2) Ohio Sea Grant has led the way for the development of a Great Lakes environmental curriculum. Teachers have requested new and better methods of teaching science, and using the Earth Systems approach, an extensive program of teacher education has been implemented to help K-12 teachers integrate Lake Erie concepts into their curriculum. Students receiving this integrated approach have shown significant improvements in content area proficiency test scores related to science and the Great Lakes. The Great Lake Erie reference text is an outstanding shared resource providing expert summaries of important lake-related topics.

3) Ohio Sea Grant's artificial reef project – a series of biological, ecological, and economic studies over several years – was the first to be planned, constructed, and evaluated within the Great Lakes. The result has been the establishment of several major artificial reefs along the Ohio coast. These artificial reefs have been shown to attract fish, thus providing an increased opportunity for fishermen and scuba divers at locations closer to the shore. An economic and biological impact study of the Lorain and Lakewood reefs indicated the structures pay for themselves 2.75 times each year and attract 20-60 times as many fish as the surrounding non-reef areas. As a result of this success, Sea Grant volunteers were able to convince the City of Cleveland to salvage 20,000 cubic yards of uncontaminated concrete from the demolished Cleveland Stadium to build artificial reefs. The City of Chicago has now used Ohio Sea Grant's results to justify and carry out a similar artificial reef project.

APPENDIX A

2000 FINAL RATING AND FUNDING ALLOCATION FROM THE NATIONAL SEA GRANT PROGRAM

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Sea Grant College Program
1315 East-West Highway
Silver Spring, Maryland 20910

May 10, 2001

Dr. Jeffrey M. Reutter, Director
Ohio Sea Grant
Ohio State University
1541 Research Center
1314 Kinnear Road
Columbus, OH 43212

Dear Dr. Reutter :

The National Sea Grant Office (NSGO) has completed the final review of the Ohio Sea Grant College Program (OSGCP). On May 2, 2001 Dr. Ronald Baird sent to you the NSGO's "Final Evaluation and Recommendation Report." This letter follows from that report and provides the merit fund rating category and the level of your merit funding allocation.

Based upon the NSGO final evaluation, the Ohio Sea Grant College Program is accorded a "Category One" rating, reserved for the highest performing programs . This rating will remain in effect for the purpose of allocating merit funding for the duration of the four-year evaluation period beginning in federal fiscal year 2002.

For the omnibus proposal you will be submitting in federal fiscal year 2002, the OSGCP's minimum merit funding allocation will be $100,000. You can expect to receive this amount each of the next four years, assuming no significant changes in Sea Grant appropriations or budget strategy. A program with a "Category One" rating is also eligible to receive an additional variable allocation from the residual component of the merit pool each year. For fiscal year 2002, based on the size of the merit pool and Sea Grant's current national funding, this is expected to amount to $25,000. Consequently, for planning purposes, the federal fiscal year 2002 total merit funding for the OSGCP will be $125,000.

Merit fund allocations are considered part of a program's core funding level and are subject only to the normal terms and conditions that apply to all funds used in supporting a program's core activities. Your fiscal year 2002 merit funding level of $125,000 should be included in your February/March, 2002 omnibus proposal which will be submitted to NSGO in November, 2001. As with all funding plans, please consider these numbers as tentative until next year's Sea Grant appropriation is final.

Details of the NSGO policy on merit funding allocations are outlined in Dr. Baird's memo of April 22, 1999, "Policy Memorandum on NSGO Final Evaluation and Merit Funding." If you have any questions regarding this document or the calculation of the merit funding allocation, please call me.

Sincerely,

Leon M. Cammen

Leon Cammen
Program Officer

OHIO SEA GRANT COLLEGE PROGRAM

Historical Summary of National Reviews

APPENDIX B

2005 PROGRAM ASSESSMENT TEAM VISIT
21-25 AUGUST 2005

- AGENDA FOR PAT
- REVIEW TEAM MEMBERS

  Jerry R. Schubel, President and CEO, Aquarium of the Pacific, Chair
  Frank L. Kudrna, Jr., CEO Kudrna & Assoc. Ltd., Co-Chair
  Jonathan Eigen, Program Monitor, National Sea Grant College Program
  Robert R. Stickney, Director, Texas Sea Grant College Program, Texas A&M
  William L. Stubblefield, Rear Admiral, NOAA (Ret.)
  Keith R. Criddle, Professor/Head, Dept. of Economics, Utah State Univ.
  William E. Frost, Program Leader, Natural Resources, Univ. of California
  Jamie Krauk, Director for Communications, National Sea Grant College Program

- FINAL PAT REPORT
- FINAL PAT REPORT RATING SHEET
- DIRECTOR'S RESPONSE TO FINAL PAT REPORT
- FINAL RATING AND FUNDING ALLOCATION FROM THE NATIONAL SEA GRANT PROGRAM

APPENDIX B

2005 AGENDA FOR PAT

Sunday, 21 August

AM — Arrive Port Columbus International Airport and check in at Blackwell Inn, 2110 Tuttle Park Place, The Ohio State University, Columbus, Ohio 43201 (614-247-4000; or toll free at 866-247-4003). *Some PAT members may arrive Saturday.*

12:00 Noon — Depart for buffet lunch at Sea Grant Office (614-292-8949) with Jeff Reutter and staff

1:00 — Program Review and Overview—Sea Grant Office—Jeff Reutter

- Review Team and Staff Introductions
- Review Agenda and Logistics
- Review Briefing Materials
- Organizing and Managing the Program
  - o Program Description and History
  - o Leadership of the Program
  - o Institutional Setting
  - o Project Selection
  - o Recruiting Talent
  - o Integrated Program Components
  - o Electronic Reporting System
- Response to last PAT
- Connecting with Users
  - o Leadership Activities
  - o Advisory Committees
  - o Partnerships and Collaborations
- Effective and Aggressive Long-Range Planning
- Director's Vision for the Program
- Producing Significant Results

4:30 — **Team time alone**

5:00 — Depart for Blackwell and Reception and Poster Session

6:30 — Dinner and discussions with investigators, staff, Friends of Stone Laboratory, and Dr. Bobby D. Moser, Vice President for Agriculture and University Outreach

8:00 — **Team time**—Dr. Kudrna will have a small conference room attached to his hotel room throughout your stay in the Blackwell.

Monday, 22 August

7:00 — Breakfast at Blackwell

7:45 — Check out of Hotel and depart for Sea Grant Office (Casual attire is appropriate while we are traveling on Monday and Tuesday. You can leave unneeded bags at the hotel front desk, as we will be checking back in on Tuesday evening.)

8:00 — Outreach Accomplishments—Sea Grant Office
Dr. Keith Smith—Director, OSU Extension
Jill Jentes—Communications Program
Frank Lichtkoppler and Fred Snyder—Sea Grant Extension Program

9:00 — Interdisciplinary and Large Grant Research Development—Sea Grant Office
Dr. Robert McGrath, Senior Vice President for Research
Yo Chin and Linda Weavers—NSF Wetlands/contaminants
Elena Irwin—NSF Biocomplexity Project
Richard Sayre—Biotechnology

10:00 — Depart for Cedar Point on 23-passenger bus—We will use the speaker system on the bus for presentations on partnerships and significant results during half of the trip

1:00 — Lunch at Cedar Point Conference Center with investigators, collaborators, partners, advisory committee members, local officials, etc.

3:30 — Depart for Ferry

4:30 — Jet Express Ferry to Put-in-Bay

5:00-5:30 — Transport to Stone Laboratory (614-247-6500) on Gibraltar Island and check into rooms

5:30 — Tour Gibraltar Island

6:00 — Dinner and discussion in Dining Hall with teachers and research scientists

6:45 — Lecture Hall—Continue discussion with users and Laboratory personnel

7:45 — Transport teachers and users to Jet Express Ferry. Review Team tour Research Building.

8:30 — **Team Time** in Lecture Hall and Computer Lab (12 computers linked to Internet)

Tuesday, 23 August

7:00	Breakfast in Dining Hall
8:00	Depart Stone Lab
8:30	Jet Express to mainland
10:00	Bowling Green State University, Firelands Campus—Meeting with Coastal Training Program and NOAA Partners
11:00	Old Woman Creek NERR—Meeting with investigators, collaborators, partners, advisory committee members, local officials, etc.
12:00	Buffet Lunch at Old Woman Creek.
1:30	Depart OWC
2:30	Lake Erie Nature and Science Center (LENSC), Bay Village—Meeting with LENSC staff, partners, local officials/leaders, and researchers.
5:00	Buffet Dinner at LENSC—**Team time alone**
6:30	Depart for Columbus—We will use the speaker system on the bus for presentations on partnerships and significant results during half of the trip.
9:00	Check in at Blackwell Inn

Wednesday, 24 August

7:30	Breakfast at Blackwell
8:30	**Team time** to discuss observations and begin writing.
10:30	Closing comments and Q & A—Jeff Reutter, Jill Jentes, Frank Lichtkoppler, Fred Snyder, Eugene Braig and others, as needed
12:00	Lunch
2:15	Team departs Blackwell for Bricker Hall
2:30	PAT preliminary reporting to, and discussion with, President Karen Holbrook (available until 3:30), Senior Vice President Robert McGrath, Vice President Bobby Moser, and Extension Director Keith Smith—Bricker Hall Conference Room
5:00	**Team free for dinner and evening work**

Thursday, 25 August

AM	Team finishes evaluation and writing assignments and reports to Director. Transportation to airport will be provided whenever the Team is ready to depart.

APPENDIX B

2005 REVIEW TEAM MEMBERS

Jerry R. Schubel, President and CEO,
Aquarium of the Pacific, Chair

Frank L. Kudrna, Jr., CEO Kudrna & Assoc. Ltd., Co-Chair

Jonathan Eigen, Program Monitor,
National Sea Grant College Program

Robert R. Stickney, Director,
Texas Sea Grant College Program, Texas A&M

William L. Stubblefield, Rear Admiral, NOAA (Ret.)

Keith R. Criddle, Professor/Head, Dept. of Economics,
Utah State Univ.

William E. Frost, Program Leader, Natural Resources,
Univ. of California

Jamie Krauk, Director for Communications,
National Sea Grant College Program

Ohio Sea Grant College
Program Assessment Team 2005

Jonathan Eigen, Ex-officio
Program Monitor
National Sea Grant College Program
1315 East-West Highway
SSMC-3, R/SG, Room 11828
Silver Spring, Maryland 20910
Tel.: 301.713.2438 ext: 188
Fax: 301.713.1031
e-mail: jonathan.eigen@noaa.gov

Jamie Krauk, Ex-Officio
Program Director for Communications
National Sea Grant College Program
1315 East-West Highway
SSMC-3, R/SG, Room 11853
Silver Spring, Maryland 20910
Tel.: 301.713.2431 ext. 129
Fax: 301.713.0799
e-mail: Jamie.krauk@noaa.gov

Dr. Robert R. Stickney, Director
Texas Sea Grant
Texas A&M University
2700 Earl Rudder Freeway, South
Suite 1800
College Station, Texas 77845
Tel.: 979.845.3854
Fax: 979.845.7525
e-mail: Stickney@tamu.edu

Dr. Jerry R. Schubel, Chair
Sea Grant Review Panel
National Sea Grant College Program
President and CEO
Aquarium of the Pacific
320 Golden Shore, Suite 100
Long Beach, California 90802
Tel.: 562.951.1608
Fax: 562.951.1689
e-mail: jschubel@lbaop.org

Frank L. Kudrna, Jr.
Member, Sea Grant Review Panel
CEO, Kudrna & Associates. Ltd.
203 North Cass Avenue
Westmont, Illinois 60559
Tel.: 630.969.3060
Fax: 603.969.3122
e-mail: f_kudrna@kudrna.com

Dr. William L. Stubblefield
Rear Admiral, NOAA (Ret.)
291 Carlyle Road
Martinsburg, West Virginia 25401
Tel.: 304.274.2350
e-mail: bill_bon@earthlink.net

Dr. Keith R. Criddle
Professor/Head, Department of Economics
Utah State University
3530 Old Main Hill
Business Building, Room B615
Logan, Utah 84322-3530
Tel.: 435.797.2300
Fax: 435.797.2701
e-mail: kcriddle@econ.usu.edu

Dr. William E. Frost
Program Leader, Natural Resources
UC Division of Agriculture and Natural Resources
311 Fair Lane
Placerville, California 95667
Tel.: 530.621.5509
Fax: 530.642.0803
e-mail: wefrost@ucdavis.edu

APPENDIX B

2005 FINAL PAT REPORT

Report of the National Sea Grant Program Assessment Team's Review of the Ohio Sea Grant College Program

August 21 – 25, 2005

Jerry Schubel _____

Frank Kudrna _____

Co-Chairs, Program Assessment Team **08/24/05**

NOAA National Sea Grant College Program

Report of the National Sea Grant Program Assessment Team's Review of the Ohio Sea Grant College Program

Table of Contents

INTRODUCTION

The Program Assessment Team (PAT) review of the Ohio Sea Grant (OSG) Program took place from August 21, 2005 through August 25, 2005.

The PAT members included:

Jerry Schubel (co-chair) Chair, National Sea Grant Review Panel Aquarium of the Pacific Long Beach, CA	Frank Kudrna (co-chair) Member, National Sea Grant Review Panel Kudrna & Associates Westmont, IL
William Stubblefield Member, National Sea Grant Review Panel Martinsburg, WV	William Frost Program Leader, Natural Resources UC Division of Agriculture Placerville, CA
Robert Stickney Texas Sea Grant Director College Station, TX	Keith Criddle (*ex-oficio*) Member, National research Council Utah State University Logan, UT
Jonathan Eigen (*ex-oficio*) CFO and Ohio Sea Grant Program Officer NOAA Sea Grant Silver Spring, MD	Jamie Krauk (*ex-oficio*) Communications Director NOAA Sea Grant Silver Spring, MD
Jennifer Greenamoyer (observer) Sea Grant Association Washington, DC	

Prior to the beginning of the PAT visit, and in conformance with National Sea Grant guidelines, the Ohio Sea Grant issued a public notice of the upcoming PAT visit by inviting interested parties to send written comments to the PAT Chair. The public notice was distributed by means of Federal register notice, email, personal communication, and web posting. The PAT Chair received 30 letters in response to the public notice, all of which were highly supportive of the program. Most letters were focused on Sea Grant efforts in areas that the PAT was not able to visit.

The PAT review took place on The Ohio State University Campus, at the Stone Laboratory, Cedar Point Amusement Park, Bowling Green State University Firelands campus, Old Woman Creek NERR, and the Lake Erie Nature and Science Center. During the review, the PAT met with members from Ohio Sea Grant's nine Advisory Committees as well as other members of Ohio Sea Grant's extensive network of constituents, state and local legislators, industry representatives, Principal Investigators, students, University Administration, and Friends of Stone Lab. The PAT also benefited from poster sessions describing numerous research and outreach projects funded by the Ohio Sea Grant program.

The report of the PAT follows the guidelines of the Program Assessment Team Manual

(National Sea Grant College Program, April 2004). The Program Assessment Team focused on how well the Ohio Sea Grant Program met the four Sea Grant evaluation criteria and performance benchmarks in the areas of: 1) Organizing and Managing the Program; 2) Connecting Sea Grant with Users; 3) Effective and Aggressive Long-Range Planning; and 4) Producing Significant Results. Each of these four evaluation criteria has between two and five sub-elements, 14 sub-elements in total. Within each of these areas, the PAT report discusses Ohio Sea Grant's research, education, outreach, and management efforts; presents the findings and recommendations of the PAT for each sub-element, and assigns one of four possible ratings to each of the 14 sub-elements: "Needs Improvement," "Meets Benchmark," "Exceeds Benchmark," or "Highest Performance." A summary of the ratings can be found in the "Program Assessment Team Rating Sheet" attached to this report (p. 17).

The 2005 PAT was impressed with the leadership and accomplishments of the Ohio Sea Grant College Program. It is a compelling example of how a small Sea Grant program can, through focus and an active network of partnerships, leverage its resources to have a disproportionately large impact.

The program has done an excellent job of developing a set of priorities consistent with NOAA, the National Sea Grant Office, the Council of Great Lakes Governors, and Ohio State University priorities, but tuned to the specific needs and opportunities of the state of Ohio and the Great Lakes region. The integrated research, education and outreach projects form a coherent program that is quintessential Sea Grant.

The impact of Sea Grant in the state of Ohio in relation to its resources is enormous. The public and governmental use and recognition of Sea Grant research and advice is a significant and major factor in State and local decision-making.

ORGANIZING AND MANAGING THE PROGRAM

Leadership of the Program

Dr. Jeffrey Reutter provides strong leadership to the Ohio Sea Grant program. He has over 30 years of experience at OSU, Stone Lab, and Sea Grant. The panel was impressed with his strong management team and diverse new hires. Dr. Reutter has a clear and strong vision for the future of Ohio Sea Grant. His management team is strong with open and broad lines of communication between Director and staff.

The Ohio Sea Grant program has a number of broad advisory committees (e.g., Director, Stone Lab, and individual extension agents.) Dr. Reutter is directly involved in these committees and personally met with them to seek their input into the Strategic Plan.

The Ohio Sea Grant program was extremely responsive to the previous PAT's recommendations.

Rating: Highest Performance

Institutional Setting and Support

We were extremely pleased to see the clear delineation of Stone Lab, CLEAR, and GLAERC reporting to Sea Grant. We view this, coupled with Sea Grant's dual reporting responsibility to Dr. Robert McGrath, Senior Vice President for Research, and Dr. Bobby Moser, Vice President for Agriculture and University Outreach, as extremely positive. It was clear from Dr. Moser's presentation to the team Sunday evening, Dr. McGrath's presentation Monday morning, and the final debriefing Wednesday afternoon with President Karen Holbrook, Vice Presidents McGrath and Moser, and Extension Director Keith Smith, that the program is respected and supported at the highest levels with the University. Additionally, Ohio State University should be commended on the relocation and renovation of Sea Grant's Columbus office and the preservation efforts at Cooke Castle.

Sea Grant's fundraising efforts have been excellent. The endowment effort and the Lake Erie license plate deserve special recognition. Ohio State University deserves recognition for its support and the freedom it gives the Sea Grant director in seeking outside donations and establishing endowments to support the program's research, education, and outreach mission.

Rating: Highest Performance

Project Selection

The Panel felt that the review process was very strong. It was fair and open to other institutions within the state. In interviews with representatives of other institutions within the state it was apparent that they were satisfied with the process. The Panel believes that sending the Strategic Plan out with the RFP was innovative. The Panel also found that it was innovative to have reviewer comments sent to the PI for comment before the final funding decisions are made.

Rating: Highest Performance

Recruiting Talent

The Panel concluded that the program seeks and forms new research partnerships on a regular basis. Turnover of PI's has been steady with new PI's receiving funding from the program on a regular basis. The program has numerous multi-investigator projects and continually competes successfully for funding under the National Strategic Initiatives. The Panel believes that increasing the research project funding level to $60,000 and allowing 3-year projects where appropriate were positive elements of the program. Ohio Sea Grant does an excellent job in leveraging funding from sources other than the Sea Grant appropriation.

The Panel felt that, both in PIs and Sea Grant staff, the program recruited strong individuals and teams. The Panel compliments the Ohio Sea Grant programs on their talented, diverse new hires.

Evidence of the quality of the Ohio Sea Grant was demonstrated by their success in being the only Sea Grant Program in the Great Lakes Region to be awarded funds to hire a new Extension Specialist in the Fisheries Extension competition.
Rating: Highest Performance

Effective and Integrated Program Components
The Panel found that all components of Sea Grant worked together well and excelled individually. Ohio Sea Grant provides strong national (i.e. IOOS, AIS theme team co-chair, NAML President) and regional leadership (i.e. Great Lakes regional communications chair and program leaders' chair).

The Panel found that although competitive projects constituted slightly less than 45% of core funding. Based on the strength and need of the extension component, this was not viewed as a problem. Ohio Sea Grant is committed to awarding as much new money as possible on a competitive basis.

The Panel was pleased to see that all education components of the program are competed.

Recommendation:
1) It is critical to replace the education position with a tenured faculty member.
2) It is recommended that the Ohio State University provide infrastructure capital funds for the Stone Lab South Bass Island Research Laboratory and continuous Cooke Castle rehabilitation.
3) It is recommended that Ohio Sea Grant add new funding to the competitive research pool.
Rating: Highest Performance

CONNECTING SEA GRANT WITH USERS

Engagement with Appropriate User Communities and Partnerships

A major strength of the Ohio Sea Grant Program is its broad partnerships with diverse groups and its ability to engage with the user community. Partnerships include: federal and state agencies, city and county government, industries and businesses, educational consortia, trade associations, the research community, and local commissions, associations, and councils. Each of these partnerships is approached with the realization that all parties must mutually benefit. This has resulted in long-term and significant benefits to the state and region. Some examples of the success of this effective partnership include:

- Developing Governors' Priorities for Great Lakes
- Clean Marinas Program
- Clean Boater Program
- Coastal Training Program
- Coastal Research Advisory Group
- Lake Erie Millennium Network

Development of the Ohio Sea Grant College Program Strategic Plan and associated Implementation Plans involved a process in which a wide array of user and interest groups had substantive input. These plans have identified critical issues and approaches to creating solutions. These efforts have continued the excellent relationship among the Program, stakeholders and user communities. The continued meaningful engagement of a number of advisory committees in both programmatic planning and evaluation is a strength of the Program.

The network of extension personnel, in collaboration with their communications unit, Program director, and other Ohio Sea Grant personnel, have provided science-based information and assistance to user communities through a variety of methods and approaches that have empowered user communities to effectively address critical issues. Some selected programmatic highlights demonstrating successful efforts that have benefited user communities are:

<u>Sport Fishing</u>

Ohio Charter Captains Conference – now in its 25th year, an average of 225 people attend annually. Over 80% of those attending have modified their operating practices based on information received at these conferences. Two-thirds of the attendees have reported increased business profitability as a result of this conference.

Educational program for sports fishing with new target audiences of women, youth and underserved clientele – An innovative new program initiated by the Ohio Sea Grant Program, this program is demonstrating the potential for increasing fishing activity, while recruiting underserved clientele groups.

<u>Marinas and Boaters</u>

Clean Marina Program – Ohio Sea Grant has provided leadership to this program, developed a manual containing best management practices for marinas, and implemented

a process of certifying marinas. Currently 27 marinas have pledged to adopt the Ohio Clean Marinas best management practices. This program demonstrates the ability of the program to form effective partnerships that involve the private sector and regulatory agencies.

Clean Boater Program – a parallel program to the Clean Marina Program, Ohio Sea Grant has provided leadership in developing this program that targets boat owners.

Local Communities

Economic development efforts (including business retention and expansion) – Efforts of Sea Grant Extension personnel have resulted in the creation of hundreds of new jobs and new investments of millions of dollars annually. The ability to develop an effective partnership among the private sector, local and state governmental entities, and the Ohio Sea Grant Program has been a significant factor in the success of these efforts.

Mayfly Composting – The Ohio Sea Grant Program extension specialist was integral to developing the concept and grant application, and providing a creative approach to disposal of mayflies in Port Clinton. This partnership of private sector, local government and the Ohio Sea Grant Program resulted in significant reductions in the amount of material being disposed of in local landfills while creating a useful compost product utilized by Port Clinton.

Mentor Marsh Special Area Management Plan – An Ohio Sea Grant Program extension specialist was a significant contributor to the leadership and content in the development of a Special Area Management Plan that has been utilized by the City of Mentor to secure almost $3,000,000 to purchase 97 acres adjacent to the Mentor Marsh State Nature Preserve. This area will provide a buffer to protect a nature preserve from development as well as providing wildlife habitat and recreational opportunities.

Government Agencies and Local Government

Research and outreach on smallmouth bass resulted in improvements to fishing regulations – Research demonstrating effect of predation on smallmouth bass eggs by gobies and resulting outreach were the basis for changes in fishing regulations that have benefited smallmouth bass populations.

Local Government Leadership Academies – Ohio Sea Grant extension personnel developed an effective leadership development program for local governments. Successful implementation is demonstrated through the increase in knowledge and skills by 85% of program participants.

Coastal Training Program – This partnership of Ohio Sea Grant, the Old Woman Creek National Estuarine Research Reserve and the Ohio Coastal Management Program is beginning to conduct programs to increase the knowledge of coastal decision makers to enable them to make informed decisions on a wide array of coastal issues.

Public Education

Lake Erie discussion board – The development of this web-based discussion board has greatly enhanced the public's ability to ask questions and receive science-based information to enable them to make informed decisions.

Public workshops and educational events – The Program conducts a substantial number of educational events, and takes advantage of opportunities like the Cleveland Boat Show, to effectively extend research-based information developed by the Ohio Sea Grant Program and other relevant sources.

Twineline - This newsletter is an effective, and widely read publication that is utilized to extend information relevant to issues addressed by the Ohio Sea Grant Program as well as providing information on funded research projects in a way that the general public can readily understand.

Youth and teacher education programs at Stone Lab - At the Stone Laboratory, workshops/field trip/conference programs are provided to students at the 4th grade level and above, and one-week courses are conducted for teachers. These programs have provided effective hands-on, experiential learning experiences for students and teachers from a variety of areas within Ohio, Pennsylvania, and Michigan.

Recommendation:

1) Continue effective/meaningful interaction with advisory committees. Ohio Sea Grant has been extremely effective in working with advisory committees to identify critical issues, explore approaches to addressing issues, and in generating support for Sea Grant Programs.

Rating – Connecting with Users: Highest Performance

Rating – Partnerships: Highest Performance

EFFECTIVE AND AGGRESSIVE LONG-RANGE PLANNING

Strategic Planning Process

The PAT was impressed with the open and transparent planning process. There was opportunity for all stakeholder groups to provide advice at critical points in the process.

Stakeholders included: community leaders, business leaders, charter fishermen, activists, elected officials, representatives of state and federal agencies, researchers, and representatives of various consortiums. Stakeholders' input was provided through nine advisory groups. Stakeholders felt their voice was heard and appreciated by the Ohio Sea Grant leadership team. The team was impressed that the Director personally met with each advisory group to facilitate a discussion of the plan. Ohio Sea Grant conducted extensive consultation meetings with local, regional, state, and federal agencies with mandates for Lake Erie or for activities that affect Lake Erie. The team was impressed both with the level and range of consultation by the Sea Grant leadership team with stakeholder groups, and with their recognition of their responsibility for making the final decisions. The balancing was done adroitly.

The Program was responsive to the recommendation of the previous PAT to separate the Planning and Implementation documents. We found the separation helpful.
Rating: Highest Performance

Strategic Plan Quality

In developing the Ohio Sea Grant Strategic Plan, particular attention was paid to the NOAA Strategic Plan and the National Sea Grant Plan. Ohio priorities that were identified through a broad consultative process were mapped against these and were sorted into three categories: high, medium, and low. The Great Lakes Governors' and the Ohio State University priorities also became part of the calculus in developing the final priorities. These are clearly articulated. The Strategic Plan and the Implementation Plan were endorsed by the various advisory committees. Broad consultation led to buy-in to the plans. There is an unusually high-level of shared ownership of the Strategic Plan.

The Strategic Plan and the Implementation Plan were circulated not only to staff and to advisory committees, but also to principal investigators so they could see how their individual research, education, and extension activities fit within the broader goals and objectives of the Ohio Sea Grant Program.

Ohio Sea Grant has clearly articulated vision and mission statements, and the Strategic Plan and Implementation Plan both have clearly articulated goals and objectives.
All elements of the Program are integrated into the plans—research, education, communications and extension.

The Ohio Sea Grant Strategic Plan provides a strong roadmap for formulating the program over the planning period. The Plan is coherent and comprehensive, while still allowing for flexibility. It is appropriately ambitious while ensuring a necessary threshold of success if followed.

The only major concern of the team in the area of the Strategic and the Implementation Plans was the deficiency of metrics for the stated objectives. We found that relatively few of the numerous objectives had clearly stated and measurable metrics to determine whether the objectives had been fully met. We believe that the plans could have been more closely tied to the US Commission on Ocean Policy report and this could have provided leverage for the Ohio Sea Grant Program within the University, and at the national level.

Recommendation:
1) Include clearly articulated, quantifiable benchmarks in the Strategic Plan (and the Implementation Plan) to provide metrics to measure the impacts of the Ohio Sea Grant Program and its outcomes.
Rating: Exceeds Benchmark

Implementation Plan
The Implementation Plan was coupled to the Strategic Plan although the times covered were not coincident. All of the core components are integrated into the Plan—policy, planning, outreach, research, education, and management. The Plan provides a nice roadmap of goals, objectives, actions, and a listing of the various funded projects that support each of the goals. The strategies and tactics were expressed clearly.

In summary, the Strategic Plan articulates very well the direction of the Sea Grant Program and ensures broad support among its diverse user groups. It is visionary, inclusive, and provides clear paths for implementation.
Rating: Exceeds Benchmark

PRODUCING SIGNIFICANT RESULTS

Contributions to Science and Technology

The Ohio Sea Grant College Program is commended on the quality of the supporting material provided to the PAT. The material in support of this category (Appendix D in the PAT briefing material) was well organized, complete, professionally prepared and, as indicated by the director, developed with the idea that it can be utilized as resource information not only for the PAT, but also for the broader community of stakeholders.

Ohio Sea Grant provided the PAT with a list of publications stemming from research supported by the program that appeared each year from 2000 through the present. Many of the 95 publications produced during that period were associated with projects completed prior to 2000, with some going back to the early 1990s. The annual publications were numerous (teens to mid-twenties in number, including published abstracts, with the exception of 2005 which is to be expected because the annual data are incomplete). A large percentage were published in distinguished journals.

Researchers supported by Ohio Sea Grant made numerous presentations during the five years covered by this review. Presentations numbered 52, 70, 86, 98, and 71 in 2000, 2001, 2002, 2003, and 2004, respectively. By the time the material for the PAT briefing book was prepared, some 35 presentations had been made in 2005. Those numbers reflect very positively on the quantity of Sea Grant-funded science that is being disseminated within the broader scientific community.

In addition to scientific publications, director Reutter indicated that at least one patent application is under review from work supported by Ohio Sea Grant. The team was delighted to learn that under recently revised University policy, Ohio Sea Grant will receive a share of the royalties that accrue from patents issued to investigators that developed a patentable product with support from Ohio Sea Grant. The team suggests that the director pursue this benefit.

Rating: Highest Performance

Contributions to Extension, Communications, and Education

The contributions made by Sea Grant extension during the past five years are exemplary, particularly given the relatively small staff of extension agents associated with the program. There is a good mix of seasoned as well as new personnel in extension. New programs, such as the Clean Marina and Clean Boater initiatives are beginning to show positive results. The new Fisheries Extension agent position has, within a short period of time, begun to show significant results in conjunction with increasing interest in angling by inner city minorities and women.

Extension agents who have been in place for in some cases well over two decades provided evidence of a good balance between ongoing programs that may span nearly the length of their tenure, as well as new programs. Clearly, the partnerships that have been established between the extension agents and various public and private entities provide the agents with the information they need to pursue new outreach opportunities as well as maintaining activities that constituents have come to expect. Some instances where other

Of particular note is the number of times results of work supported or conducted by Ohio Sea Grant is picked up by the media. Over 1,000 instances over the past five years were cited by the program.
Rating: Highest Performance

Impacts on Society, the Economy, and the Environment
Many of the research projects that have been funded over the past five years and described to the PAT appear to hold significant potential in terms of impacts. Examples are the development of vaccines for fish that can be transmitted via incorporation into algae (Dr. Sayre), the finding that sonication can be used to remove heavy metals from sediment particles (Dr. Weavers), research employing light to remove agricultural chemicals in wetlands (Dr. Chin), and the finding that the presence of labile dissolved organic carbon is involved in the control of phosphorus removal by phytoplankton through a relationship with the microbial community (Dr. Heath). All of these and other Ohio Sea Grant funded research hold out potential for development of applications and technologies aimed at improving the health of the Lake Erie ecosystem, though those applications and technologies are currently in the development stage.

A number of examples of Sea Grant work that has yielded significant impacts to society and the environment were provided by Dr. Reutter. Mayfly composting, changes in the smallmouth bass fishing season, assisting communities to obtain funds and create new jobs are a few such examples. The list of impacts provided by the program is impressive, but the PAT is convinced that many additional examples could have been provided.
Rating: Highest Performance

Success in Achieving Planned Program Outcomes
The Strategic and Implementation Plans produced by Ohio Sea Grant provide an excellent basis for determining whether the goals and objectives of the program are being met. Having a five year strategic plan with two year implementation plans is an unusual approach but provides opportunities every two years as new implementation plans are developed to assess how the goals and objectives are being met; i.e., mid-course corrections can be made in a timely manner. Whether that approach is being actively employed was not very clear in the materials provided and was not mentioned in the presentations to the PAT. However, as the strategic plan in effect during the period of this review was prepared before the requirement to include a process by which evaluation of whether goals were met was imposed, it was considered unreasonable to require that information at this time. The PAT strongly recommends that a report on how the goals of the new strategic plan (2005-2010) were achieved be included as part of the briefing package for the next scheduled PAT.

Testimonials about the program's importance to user groups were numerous and passionate during the presentations to the PAT. How those relate to the strategic goals was not clearly articulated. Thus, while not specifically treated in the current PAT briefing materials or discussed in detail by Ohio Sea Grant administration, this committee is of the opinion that the program could have easily documented how their programmatic

entities have assumed responsibility for programs initiated by Sea Grant extension were provided. Those types of transitions follow the Sea Grant model appropriately and provide the agents with opportunities to spend more time on new initiatives.

Sea Grant extension has developed a web presence that provides a forum for the public to ask questions that range from topics such as the so-called "dead zone" in Lake Erie to where the best surfing might be along the shoreline of the lake. The website has become very popular and questions are responded to in a timely fashion. The approach is one that might be considered for adoption by other Sea Grant programs.

The manner in which Ohio Sea Grant approaches education is somewhat different than that used in other programs. Ohio Sea Grant has provided summer salary to an educator (Dr. Rosanne Fortner) who has provided service to the program -for instance through involvement with courses taught at Stone Laboratory - but who also has competed (effectively) for Sea Grant funding by submitting research proposals. Dr. Fortner recently retired, and while she will be retained on a part-time basis for the near future, the program is seeking an OSU tenured faculty member to take her place so the unique approach to Sea Grant Education can be retained.

A primary product from Ohio Sea Grant's educational program has been through curriculum development. For example, Dr. Fortner has been involved with development of a series of manuals that are used to teach students in the K-12 schools about the Great Lakes. Each topic is geared to the state's performance goals for students at the appropriate grade level.

Through the Stone Laboratory scholarships, the REU (research experience for undergraduates) program and research grants, Ohio Sea Grant has supported a large number of undergraduate and graduate students. Thousands of K-12 students and even Elderhostel groups annually benefit from workshops conducted at the Stone Laboratory. The number of students who are directly impacted by Ohio Sea Grant must be the highest or among the highest that can be claimed by any program within the Sea Grant network.

Communications products produced by Ohio Sea Grant are numerous. They include a large number of annual news releases and *Twine Line*, the quarterly newsletter of the program. Research and extension results are highlighted in *Twine Line* and keep Ohio Sea Grant front and center before the various individuals and constituent groups and organizations that the program serves. Ohio Sea Grant also maintains a web presence that provides additional information on the program and its products.

Newsletters and other types of publications that are produced by Sea Grant staff are reviewed by the director and quality control of publications such as those submitted by extension personnel is assured by the communications arm of the program. News releases are sent to the researchers involved to ensure scientific accuracy. The staff has been recognized for various awards for the products produced by the program.

goals have been achieved, or if they have not been achieved, the reasons for that outcome.

Recommendation:

1) The contributions to science and environment made by Ohio Sea Grant are significant. The program can do a better job in highlighting them, not only to future PATs but to other interested entities. It is recommended that the program better highlight its accomplishments with concise statements and take the credit the program richly deserves.

2) Ohio Sea Grant should strive to more clearly articulate to future program assessment teams the extent to which strategic goals were being or had been met and if those are not being met, why that was the case.

Rating: Highest Performance

BEST MANAGEMENT PRACTICES

Overall, the Panel was impressed with the strength of the Ohio Sea Grant program. It demonstrated exemplary leadership and connection to the state of Ohio as well as to the region and the nation. During the review period, the Panel identified two Best Management Practices of the Ohio Sea Grant program, both of which would be fine additions to any Sea Grant program's process.

1) The Panel believes that sending the Strategic Plan out with the RFP was innovative.
2) The Panel also found that it was innovative to have reviewer comments sent to the PI for comment before final decisions are made regarding grants.

APPENDIX B

2005 FINAL PAT REPORT RATING SHEET

PROGRAM ASSESSMENT TEAM RATING SHEET

ORGANIZING AND MANAGING THE PROGRAM

SUB-ELEMENTS

	Needs Improvement	Meets Benchmark	Exceeds Benchmark	Highest Performance
• Leadership of the Program				✓
• Institutional Setting and Support				✓
• Project Selection				✓
• Recruiting Talent				✓
• Effective and Integrated Program Components				✓

CONNECTING WITH USERS

SUB-ELEMENTS

	Needs Improvement	Meets Benchmark	Exceeds Benchmark	Highest Performance
• Engagement with Appropriate User Communities				✓
• Partnerships				✓

EFFECTIVE AND AGGRESSIVE LONG-RANGE PLANNING

SUB-ELEMENTS

	Needs Improvement	Meets Benchmark	Exceeds Benchmark	Highest Performance
• Strategic Planning Process				✓
• Strategic Plan Quality			✓	
• Implementation Plan			✓	

PRODUCING SIGNIFICANT RESULTS

SUB-ELEMENTS

	Needs Improvement	Meets Benchmark	Exceeds Benchmark	Highest Performance
• Contributions to Science and Technology				✓
• Contributions to Extension, Communications and Education				✓
• Impact on Society, the Economy, and the Environment				✓
• Success in Achieving Planned Program Outcomes				✓

Sea Grant Program: Ohio

PAT Chair Signature

8/25/2005

Date

APPENDIX B

2005 DIRECTOR'S RESPONSE TO FINAL PAT REPORT

THE OHIO STATE UNIVERSITY

Ohio Sea Grant College Program

Franz Theodore Stone Laboratory
Great Lakes Aquatic Ecosystem Research Consortium (GLAERC)
Center for Lake Erie Area Reserach (CLEAR)
Area 100 Research Center
1314 Kinnear Road
Columbus, OH 43212-1194

Phone (614) 292-8949
Fax (614) 292-4364
www.sg.ohio-state.edu

21 November 2005

Dr. Ronald C. Baird, Director
National Sea Grant College Program
National Oceanic and Atmospheric Administration
1315 East-West Highway, Room 11716
Silver Spring, Maryland 20910-3282

Dear Dr. Baird,

This is my official response to the "Report of the National Sea Grant Program Assessment Team's Review of the Ohio Sea Grant College Program, 21-25 August 2005." This report, dated 24 August 2005, was signed by Drs. Jerry Schubel and Frank Kudrna, Co-Chairs of the Program Assessment Team (PAT), and received in this office on 24 October 2005. In addition to Dr. Schubel, Chair of the National Sea Grant Review Panel and President of the Aquarium of the Pacific, and Dr. Kudrna, Member of the National Sea Grant Review Panel and President of Kudrna and Associates, the PAT consisted of: Dr. William Frost, Program Leader, Natural Resources, University of California; Dr. Robert Stickney, Director of the Texas Sea Grant College Program; Dr. William Stubblefield, Retired Admiral of NOAA Corp; Dr. Keith Criddle, a member of the National Research Council and an observer on the PAT; Jonathan Eigen, an ex-officio member of the PAT and the Ohio Sea Grant Program Officer within the National Sea Grant College Program; Jennifer Greenamoyer, an observer and Executive Director of the Sea Grant Association; and Jamie Krauk, Communications Director of the National Sea Grant College Program and an ex-officio member of the PAT.

Let me begin by thanking the National Sea Grant College Program for putting together such a talented, enthusiastic and dedicated team. They were excellent representatives of the National Sea Grant College Program and a group that I was very proud to introduce to our university administrators and our partners in government, academia and the private sector. I must also thank the PAT members for their hard work and determination in preparing a very thorough review and evaluation of our program.

While there may be one or two points where we disagree with their evaluation (we worked very hard to achieve a "Highest Performance" rating in every category), we are completely satisfied that we received a very thorough, honest and fair review, by a team that desired to both evaluate and improve our program. Furthermore, we are very pleased with the ratings ("Highest Performance" in 12 of 14 categories representing over 93% of the total "grade" and "Exceeds Benchmark" in the other two) and with the overall

conclusions and observations expressed throughout the report, and particularly two on page four, *"It is a compelling example of how a small Sea Grant program can, through focus and an active network of partnerships, leverage its resources to have a disproportionately large impact,"* and, *"The impact of Sea Grant in the State of Ohio in relation to its resources is enormous."*

In the paragraphs that follow I will comment on each of the major sections of the PAT report.

ORGANIZING AND MANAGING THE PROGRAM

Leadership of the Program. The PAT rating for this category was "highest performance," and we are very pleased that they liked our management team, our new hires, our open lines of communication, and our advisory committee structure. We are also pleased that they recognized our efforts to respond to the recommendations of the previous PAT. However, that response was quite easy for us because we received such great recommendations from the previous PAT. We believe that is also the case with the recommendations from this PAT.

Institutional Setting and Support. The PAT rating for this category was "highest performance," and we are very pleased that they recognized the exceptional support we receive from President Karen Holbrook, Senior Vice President for Research Robert McGrath, and Vice President for Agriculture and University Outreach Bobby Moser. Our new office space in Columbus and our new reporting structure with Stone Laboratory, CLEAR, and GLAERC reporting to Ohio Sea Grant, have been very positive changes for us and we are very pleased that the PAT recognized them.

We have been recognized as one of Sea Grant's best programs, but we remain one of the smallest based on the amount of federal support we receive. We are very pleased that the PAT recognized our fundraising efforts with the creation of endowments (totaling over $1 million) and the new Lake Erie license plate. We believe these are superlatives for the entire Sea Grant network and should be considered as possible "Best Management Practices" to encourage other universities and programs to follow our lead in this area.

Project Selection. The PAT rating for this category was "highest performance," and we are pleased that they liked our strategy of allowing Principal Investigators to comment on reviews. This has been very helpful in our evaluation or research proposals.

Recruiting Talent. The PAT rating for this category was "highest performance," and we are very pleased with all of their comments in this area.

Effective and Integrated Program Components. The PAT rating for this category was "highest performance," and we are pleased that they recognized the many leadership positions held by our staff.

We agree with their overall recommendations for this section, e.g. replacing our education coordinator with a tenured faculty position, renovating the Stone Laboratory Research Building and Cooke Castle, and emphasizing competitive research grants with any new funding the program might receive. We should add that the newly approved Great Lakes COSEE, led by our education coordinator, Dr. Rosanne Fortner, may give us a reprieve on replacing her for a few years.

CONNECTING SEA GRANT WITH USERS

Engagement with Appropriate User Communities and Partnerships. The PAT rating for these two categories was "highest performance," and we are very please with all of their comments in this section. In particular we thank the team for recognizing that creating good partnerships takes a lot of work. Their recognition of our newly developed Clean Marina and Clean Boater Programs, and the Coastal Training Program and the Coastal Research Advisory Group is very gratifying to us as we expect big things from these programs. Over the years we have been recognized many times for our partnerships and private sector advisory committees. Our outside supporters are truly extraordinary and we feel very blessed to have such wonderful support.

EFFECTIVE AND AGGRESSIVE LONG-RANGE PLANNING

Strategic Planning Process. The PAT rating for this category was "highest performance," and we are extremely pleased that they recognized the tremendous amount of effort we put into making it a very thorough, open, and inclusive process.

Strategic Plan Quality and Implementation Plan. The PAT rating for these categories was "exceeds benchmark." We are very pleased that they recognized our efforts to pattern our plans after the NOAA Strategic Plan and the National Sea Grant Plan while incorporating the priorities of the Council of Great Lakes Governors and The Ohio State University. We are also very pleased that they liked our strategy of prioritizing the eleven Sea Grant Thematic Areas. These strategies strengthened our plan and enhanced our partnerships, as noted by the PAT comment, "There is an unusually high level of shared ownership of the Strategic Plan."

The PAT had three documents to review: our new Strategic Plan for 2005-10, our new Implementation Plan for 2005-07, and the last Implementation Plan developed under our old Strategic Plan covering the period 2004-06. Based on guidance from the National Sea Grant College Program, we update our implementation plans every two years. In the process we develop a running tally of all of the projects we supported during the period of the strategic plan. As the last implementation plan from our 2000-05 Strategic Plan, the 20004-06 implementation plan listed almost 90 projects and served as a great record of our work during the period.

In developing these plans, our goals were to improve on our previous Strategic and Implementation Plans, create plans that would be real assets and tools for the program, and create the best Strategic and Implementation Plans in the entire Sea Grant network. We believe we definitely succeeded on the first two goals and felt we had the best, or one of the best, sets of plans nationally. However, we do not disagree with the PAT recommendation to include more quantifiable metrics in the plans. A careful read of the plans shows that there are indeed many quantifiable metrics, but it also shows that many of the objectives do not have quantifiable metrics. The PAT also recommends that we try to tie our plans more closely to the Ocean Commission Report. While this was not part of the guidance, or part of the NOAA or National Sea Grant Strategic Plans, it is a great idea, and something the entire Sea Grant Network and NOAA should consider as new plans are developed in the coming years. We remain committed to following the format of the NOAA and National Sea Grant plans to clearly show how we are addressing national priorities and the local level. Please note that in developing our plans, we worked very hard to provide leadership in the Great Lakes Region to make constructive comments on the draft of the Ocean Commission Report to improve it and assure that it addressed priorities and issues identified by our constituents.

PRODUCING SIGNIFICANT RESULTS

Contributions to Science and Technology. The PAT rating for this category was "highest performance," and we are very pleased that they appreciated the effort that we put into organizing and presenting the material in this appendix. We are also pleased that the PAT recognized the efforts of our investigators to produce scientific publications and presentations and believe that based on the amount of federal funding we receive, our 95 scientific publications (19/yr) and 377 presentations (75/yr) are among the best in the entire Sea Grant network.

Contributions to Extension, Communications, and Education. The PAT rating for this category was "highest performance," and we are very pleased that they recognized our efforts to develop the Clean Marina and Boater Programs and our efforts with women and minorities. We have an exceptional staff and the PAT recognized that. We are also very proud of our efforts to get our work into the media and pleased that the PAT recognized the 1,001 times that occurred from 2000-05. We believe extension, communication, and education are areas of strength within our program.

Impacts on Society, the Economy, and the Environment. The PAT rating for this category was "highest performance." We are very pleased that the PAT recognized the value and importance of the work being done by Drs. Sayre, Weavers, Chin, and Heath, among others. Furthermore, the team is very accurate in their assessment that many more success stories could have been told.

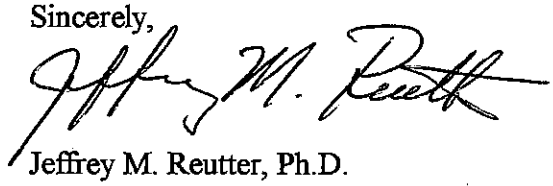
Success in Achieving Planned Program Outcomes. The PAT rating for this category was "highest performance." The team was correct in their belief that we update our implementation plan every two years. For this review, we only showed them the last

update (2004-06), and, as our last update for the previous Strategic Plan (2000-05), it was published in a more expensive format that the previous update (2002-04). We will certainly follow the recommendation of the PAT and show how the goals of the 2005-10 Strategic Plan were achieved when we host our next PAT.

Having served on a number of PAT's myself, I know how difficult it can be for a program to present the appropriate material in a concise and understandable way. We chose a new presentation format that I would have wanted if I were on this PAT. Clearly the team liked it, but we believe there is still much opportunity for improvement, for the PAT report encourages us to do a better job of highlighting our accomplishments and essentially blowing our own horn. For some of us, that will be hard, but we will certainly work at it.

Thank you for the opportunity to comment on the PAT report. We believe our program benefited from the process. While we are disappointed that we did not achieve our goal of a rating of "Highest Performance" in every review category, we are very pleased with our overall evaluation and the process. Please don't hesitate to call if you have any questions and please extend my thanks to the members of our PAT for all their hard work and a job well done.

Sincerely,



Jeffrey M. Reutter, Ph.D.
Director

C: Jonathan Eigen

APPENDIX B

2005 FINAL RATING AND FUNDING ALLOCATION FROM THE NATIONAL SEA GRANT PROGRAM

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Sea Grant College Program
1315 East-West Highway
Silver Spring, Maryland 20910

APR 10 2006

Dr. Jeffrey M. Reutter
Ohio Sea Grant
Ohio State University
1314 Kinnear Road, Room 100
Columbus, OH 43212-1194

Dear Dr. Reutter:

On behalf of the NSGO staff, let me first offer my sincere thanks for your dedicated leadership, for the enthusiastic service of your staff, and for the innumerable contributions Ohio Sea Grant is making to the Sea Grant enterprise.

As you are aware, the National Sea Grant College Program Act (33 U.S.C 1123) requires the National Sea Grant Office Director to evaluate the performance of the Sea Grant programs. Pursuant to NSGO guidelines, we have completed our review of your program, and I am pleased to provide our Final Evaluation Report.

As stated in the "Revised Policy Memorandum on NSGO Final Evaluation and Merit Funding (2004)," the primary objective of this evaluation is to provide local management with an assessment of performance and specific recommendations directed toward the improvement and maintenance of existing program strengths. The second objective is to assign programs to a rating category that can be used in the allocation of Sea Grant funds.

The NSGO final evaluation process relies primarily on the information provided by the program to the PAT, the PAT Report and ratings, and the institutional response to the PAT report. The enclosed Final Evaluation Report summarizes the findings of the NSGO performance review for your program over the last four-year review cycle. If there are any differences in ratings between the PAT review and the NSGO Final Evaluation Review, the report details why such changes were made. In addition, the NSGO provides a performance rating to each Sea Grant program as part of the evaluation. The rating is used to allocate merit and bonus funding in accordance with provisions of Sea Grant's authorizing legislation.

While not required, you may provide a response to our Final Evaluation Report for the record. The Final Evaluation Report is considered proprietary and will not generally be made available by the NSGO to other parties outside of the U.S. Department of Commerce. The enclosed report is sent to only you and the members of the NSGRP who participated in the PAT review.

If you have any additional questions, please do not hesitate to contact me. Again, thank you for your service to Ohio and to the Sea Grant enterprise.

Sincerely,

James O. Murray
For

Leon M. Cammen
Acting Director

Enclosure

cc: J. Eigen, Program Officer
J. Schubel, PAT Chair
F. Kudrna, PAT Vice-Chair

Sea Grant

National Sea Grant Office

Final Evaluation Report
Ohio Sea Grant College Program

Leon M. Cammen

Leon M. Cammen, Acting Director

4/7/06

Date

Final Evaluation Report
Ohio Sea Grant College Program

To increase the overall performance and effectiveness of the Sea Grant Colleges and Institutional Programs, the National Sea Grant College Program Act (33 U.S.C. 1123) requires the Director, National Sea Grant Office (NSGO), to evaluate the performance of the Sea Grant programs. Pursuant to NSGO guidelines (*Revised Policy Memorandum on NSGO Final Evaluation and Merit Funding*, 2005), we have completed our review of the Ohio Sea Grant College Program (OHSG), and I am pleased to provide our Final Evaluation Report. The formal on-site evaluation by an outside Program Assessment Team (PAT), which preceded the NSGO review, took place August 21-25, 2005, and provided a major input to our final evaluation; the PAT report is attached. The NSGO report, in addition to summarizing the findings of the NSGO performance review, also indicates the program's merit funding rating category for the next four years. The rating is given at the end of the report along with a brief description of how the rating is used to allocate merit funding.

NSGO Rating Decisions

An objective of the NSGO final evaluation process is to provide a consistent approach to rating Sea Grant programs. The intensive weeklong PAT evaluation by a team of experts, who interact with university officials, constituents, and government officials, provides credible information from which to judge a program's performance. In addition, in order to supplement information provided during the PAT process, the NSGO utilizes the following resources during its final review process:

- The institution's formal response to the PAT's findings and recommendations is explicitly considered. This additional input is a critical informational component of the NSGO review that can often provide clarifying information on program performance or identify actual and planned changes by the program. However, changes instituted since the Program Assessment took place are not considered when assigning the rating for the previous four-year period; those changes will be considered during the next Program Assessment.

- The NSGO review provides a broad perspective across seven to eight programs each year, and across all Sea Grant programs over a four-year cycle. While the NSGO evaluates programs individually, by considering a group of programs at the same time and with the same reviewers, more consistency for assigning ratings can be achieved.

- Performance-relevant information available to the NSGO results not only from the PAT process, but also from a continuous process of evaluation and dialogue between the NSGO and the Sea Grant program over the full four-year cycle.

Final NSGO ratings are used to assign each program to a merit-funding category and are also interleaved with the last rating of all other Sea Grant programs to determine eligibility for bonus-funding categories.

The NSGO Final Evaluation Report considers the same four categories of evaluation criteria and performance benchmarks as the PAT review, which are specified in our guidelines:

I. Organizing and Managing the Program
II. Connecting Sea Grant with Users
III. Effective and Aggressive Long Range Planning
IV. Producing Significant Results

Our findings, with respect to each of the criteria, along with recommendations to improve performance and maintain existing levels of excellence, are detailed below. The numbers in parentheses refer to the weighting of that criterion in determining a final rating category.

EVALUATION CRITERIA AND BENCHMARKS FOR PERFORMANCE

I. Organizing and Managing the Program (20%)

Program Strengths: The Ohio Sea Grant Program's strong and effective leadership is evident in all aspects of the program, from the planning process to the scientific achievements to the diverse new hires and the positive relationships with residents and legislators in the State of Ohio. The NSGO is impressed with the Director's vision and entrepreneurial talents which have garnered new and creative means of enhancing support for the program. We encourage OHSG and the Director to continue to foster that vision throughout the program as consideration is given to succession planning. The NSGO agrees with the PAT that the institution of the Lake Erie license plate and the program's endowments deserve special commendation. Ohio Sea Grant (OHSG) staff work well together, creating a synergy that enables the program to address day-to-day tasks while embracing broader challenges.

Areas for Improvement: None in addition to the PAT recommendations.

Rating Differences: There were no NSGO rating differences compared to the PAT Report.

Recommendations for Improvement: In particular, the NSGO endorses the PAT's recommendation that OHSG remain committed to adding new funding to the competitive research pool.

II. Connecting Sea Grant with Users (20%)

Program Strengths: OHSG has done an excellent job of connecting with a broad array of users, including trade associations, NGOs, industry and government, at local, state, county and regional levels. Notable examples include developing the Governors'

Priorities for the Great Lakes, working with the National Estuarine Research Reserve and other partners to conduct the Coastal Training Program, and establishing the Lake Erie discussion board—a highly creative and effective format for engaging and informing the public of the program's extension activities and providing information about issues critical to the Great Lakes. The program also engages constituents by effectively utilizing nine advisory committees which include over 125 people who are actively involved with the program in a variety of capacities.

Areas for Improvement: The NSGO supports the PAT in encouraging Ohio Sea Grant to continue its meaningful interaction with advisory committees. This will continue to aid OHSG in its ability to connect with a cross-section of users and stakeholders, and will assist the Program in its strategic planning process as well as in tracking feedback from its programming and outreach efforts.

Rating Differences: There were no NSGO rating differences compared to the PAT Report.

Recommendations for Improvement: None.

III. Effective and Aggressive Long-Range Planning (10%)

Program Strengths: The OHSG planning process clearly demonstrates the involvement and endorsement of constituents and advisory groups at every level. The plans not only link to both the NSGO and NOAA strategic plans, but also reflect local, state and regional needs. Both plans have clearly articulated goals and objectives, and integrate research, education, communications and extension.

Areas for Improvement: As a means of reporting and program evaluation, the NSGO suggests using the plans to measure and track program results.

Rating Differences: There were no NSGO rating differences compared to the PAT Report.

Recommendations for Improvement: The NSGO endorses the PAT recommendation to include quantifiable benchmarks and to provide metrics to measure program impacts.

IV. Producing Significant Results (50%)

Program Strengths: OHSG is making significant contributions to science. In particular, the NSGO was impressed by the number of publications produced during the PAT cycle and with the patent application currently under review. We are delighted that OHSG will receive a share of the royalties accrued from patents. OHSG is also to be commended for its strong and effective extension program, especially given the relatively small staff. The program has supported a large number of

undergraduate and graduate students through scholarship programs and research grants, and reaches thousands of K-12 students each year. Finally, OHSG is to be lauded for leading (and collaborating on) several regional efforts, including the Great Lakes COSEE, IOOS and others.

Areas for Improvement: The PAT report offered several suggestions for highlighting and enhancing program impacts.

Rating Differences: There were no NSGO rating differences compared to the PAT Report.

Recommendations for Improvement: The NSGO strongly agrees that OHSG needs to highlight its accomplishments and impacts in a concise manner in order to better promote (and help the NSGO promote at the national level) its excellent work. The NSGO encourages OHSG to capitalize on the unique capabilities of Community Economic Development Coordinator, Walter Williams by sharing his wealth of expertise and information with other Sea Grant Programs.

NSGO Rating

Sea Grant programs that have reached Sea Grant institutional or college status and whose performance over the past five years meets the NSGO performance benchmarks or better are assigned to one of three merit funding categories. Programs assigned a rating of Category 1 (highest level of performance), 2, or 3, based on the NSGO final evaluations, will receive an allocation of merit funds over the next four years. Programs with significant deficiencies, Category 4, will not be eligible to receive merit funds over the next four-year cycle.

The Ohio Sea Grant College program has been rated in Category 1, indicating a high level of overall performance. A separate funding letter will indicate the dollar level of the merit funding allocation your program will receive in the following fiscal year. Programs in Category 1 may be eligible for bonus funds in addition to merit funds. In compliance with Sea Grant's allocation policy (*Revised Policy Memorandum on NSGO Final Evaluation and Merit Funding*, 2005), bonus funds, if any, will be restricted to no more than half of all Sea Grant programs. The funding letter will also indicate whether your program's rating, vis-à-vis the rating of all other Sea Grant programs in a given year, qualifies the Ohio Sea Grant College Program for bonus funds, and at which of two possible levels. Since bonus funding depends on the appropriation, the actual dollar amount of bonus funding, if any, will not be known until after the Sea Grant appropriation for the fiscal year is known.

Conclusion

Thank you for your participation in the review process. The NSGO hopes this process will help each Sea Grant Program continue to improve and excel.

Again, congratulations to you for your outstanding work in areas including fund raising, partnerships, research in fisheries, biotechnology and ecosystem health, and outreach. The

unique capabilities and core competencies of each Sea Grant program strengthen the foundation of our enterprise and ensure that community by community, state by state, and region by region, we serve the needs of our Nation.

OHIO SEA GRANT COLLEGE PROGRAM

Historical Summary of National Reviews

APPENDIX C

2010 SITE VISIT
26-27 MAY 2010

- AGENDA FOR SITE VISIT
- SITE VISIT TEAM MEMBERS
  - Dale Baker, Program Leader & Assoc. Dir. (Ret.), NY Sea Grant Institute
  - Lori Boughton, Chief, PA Department of Environmental Protection
  - Chryssostomos Chryssostomidis, Director, MIT Sea Grant College Program
  - Jonathan Eigen, Chief Financial Officer, National Sea Grant College Program, NOAA
  - Sami Grimes, Program Analyst, National Sea Grant College Program, NOAA
  - Harry Simmons, Mayor, Caswell Beach, NC & National Sea Grant Advisory Board
- FINAL SITE VISIT REPORT
- DIRECTOR'S RESPONSE TO FINAL SITE VISIT REPORT

APPENDIX C

2010 AGENDA FOR SITE VISIT

OHIO SEA GRANT COLLEGE PROGRAM

NOAA Sea Grant Site Visit Agenda, May 26-27, 2010

Tuesday, May 25

Team arrives in afternoon and evening

Wednesday, May 26

7:00 **Breakfast at Blackwell with Jeff Reutter, Jill Jentes Banicki, and Eugene Braig**

7:45 **Depart for 4-H Center**

8:00 **Introductions at the 4-H Center—Jeff Reutter**

- Program Description and History
- Reporting Structure
- Funding
- Setting
- Great Lakes and Lake Erie Issues
- 8 states and 2 countries
- Leadership and Partnerships
- Accomplishments, Goals, Strategies, and Concerns for Future

9:15 **Proposal Development and Reporting—Eugene Braig**

9:45 **Communications Program Overview—Jill Jentes Banicki**

10:15 **Break**

10:30 **Strategic Planning—Melinda Huntley**

11:00 **Key Partners/Stakeholders**

- Ken Alvey, President, Lake Erie Marine Trades Association
- Ed Hammett, Executive Director, Lake Erie Commission
- Frank Lopez, Manager, Old Woman Creek NERR
- John Watkins, Chief, Ohio Coastal Management Program
- Heather Elmer, Coastal Training Program Coordinator, Old Woman Creek NERR

12:00 **Lunch with Partners/Stakeholders and Research Scientists at the 4-H Center**

- John Conglose, OSU Extension
- George Bullerjahn and Michael McKay, Bowling Green State University
- Carol Stepien, University of Toledo
- Linda Weavers, Ohio State University

1:00 **Discussion with Research Scientists**

1:30 **Education—Jeff Reutter**

- GRA, fellows, COSEE
- Stone Lab
- Courses, workshops, and conferences
- Scholarships and Research Experience for Undergraduates (REU) Program
- FOSL, Endowments, Volunteers
- Program Management and Concerns

1:55 **Ohio Sea Grant Extension Program Overview—Frank Lichtkoppler**

OSU Extension Overview—John Conglose, Keith Smith

2:15 **Break**

2:30 **Agent Programs and Accomplishments**

- Frank Lichtkoppler—Ashtabula River Clean-Up
- Dave Kelch—Shipwrecks Web Site & Brochure
- Joe Lucente—Local Government Leadership Academy
- Matt Thomas—REU Program & research support at Stone Lab
- John Hageman—Stone Lab Science Field Trip Program & experiential learning at Stone Lab
- Colleen Wellington—Ohio Clean Marinas & Shrink Wrap Recycling Programs
- Tory Gabriel—Aquatic Visitors Center & CSI: Lake Erie Tours
- Melinda Huntley—Sustainable Tourism Development

Wednesday, May 26 *(continued)*

4:45 **Private Team Discussion**
5:00 **Depart for Faculty Club**
5:15 **Reception at Faculty Club**
6:00 **Dinner**

Gloria Earley, OSU Office of Sponsored Programs
Amir Eylon, Tourism Director, Ohio Dept. of Development
Laura Finch, OSU Office of Sponsored Programs
Mike Heniken, Friends of Stone Lab
Sean Logan, Director, Ohio Department of Natural Resources
Jim Lynch, OSU Director of Media Relations
Ann and Denny Moore, Toledo and NW Ohio Sea Grant Adv. Com.
Amy McKenzie, Ohio State University Foundation
Kristin Lane Smith, OSU Director of Sponsorship and Stewardship, Rec. Sports
Kristin Strobel, Legislative Aide, Senator Mark Wagoner
Mary Yerina, Ohio State University Foundation
Senator Mark Wagoner, Ohio State Senate
Carol Whitacre, OSU Vice President for Research

7:30 **Team depart for evening session at Blackwell**

Thursday, May 27

7:15 **Depart Hotel for Sea Grant Office**
7:30 **Breakfast in Sea Grant Office**
8:10 **Depart for Bricker Hall**
8:30 **108 Bricker Hall**

Bobby Moser, OSU Vice President for Agriculture
Carol Whitacre, OSU Vice President for Research
Jan Weisenberger, OSU Senior Associate Vice President for Research

10:15 **Meet with OSU President E. Gordon Gee**
11:00 **Open Discussion and Closing Comments**
12:00 **Review Team Lunch at Blackwell with Jeff, Eugene, Jill, and Frank**
1:00 **Team Discussion and Writing in Blackwell**
4:30 **Review Team Debriefing (time approximate)—Meeting Room in Blackwell**

Friday, May 28

Team members depart for airport

APPENDIX C

2010 SITE VISIT TEAM MEMBERS

Dale Baker, Program Leader & Assoc. Dir. (Ret.),
NY Sea Grant Institute

Lori Boughton, Chief, PA Department of Environmental Protection

Chryssostomos Chryssostomidis, Director,
MIT Sea Grant College Program

Jonathan Eigen, Chief Financial Officer,
National Sea Grant College Program, NOAA

Sami Grimes, Program Analyst,
National Sea Grant College Program, NOAA

Harry Simmons, Mayor, Caswell Beach, NC
& National Sea Grant Advisory Board

APPENDIX C

2010 FINAL SITE VISIT REPORT

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Sea Grant College Program
1315 East-West Highway
Silver Spring, Maryland 20910

10/14/2010

Dr. Jeffery Reutter
1314 Kinner Road, Area 100
Columbus, OH 43212-1156

Dear Dr. Reutter:

On behalf of the Site Review Team (SRT) for the Ohio Sea Grant Program, I am pleased to transmit to you the enclosed SRT report. The report documents the SRT's findings and recommendations on program management and organization, stakeholder engagement, and collaborative network activities from the site visit on May 26-27, 2010.

A *recommendation* is a formally prescribed course of action for which the Sea Grant Program is accountable. The Sea Grant Program is expected to respond to each recommendation, explaining how it has implemented, how it plans to implement, or why it chooses not to implement each course of action. A *suggestion* is an idea that is presented for consideration. The Sea Grant Program is not accountable for responding to suggestions, but is encouraged to consider implementing those deemed useful and appropriate by program leadership. In accordance with our site review policy, this report does not assign a grade or score to your program.

Our policy states that as the program director, you have the opportunity to prepare a response to the SRT report. Both the SRT report and your response will become part of the Program File in the National Sea Grant Office. I encourage you to keep our office informed of any activities that are undertaken to strengthen your program.

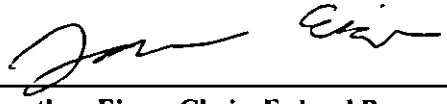
I wanted also to offer my thanks and to express the articulation of the Site Review Team for the effort you and your staff put forth to make this review productive and most informative. In addition, we also want to express our thanks to the university officials, administrators, staff, researchers and the program's stakeholders who ensured that our review was comprehensive and enjoyable.

Sincerely,

Jonathan Eigen
Federal Program Officer
National Sea Grant Office

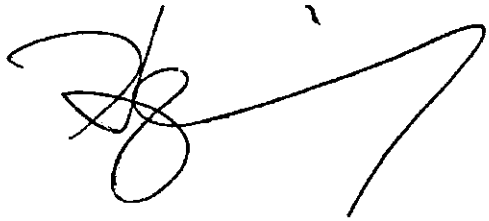
Enclosure
Printed on Recycled Paper

Site review team's
Review of the
Ohio Sea Grant College Program
May 26, 2010 – May 27, 2010



10/8/2010

Jonathan Eigen, Chair, Federal Program Officer — **Date**



October 8, 2010

Harry Simmons, Co-Chair, National Sea Grant Advisory Board Member — **Date**

Sea Grant
National Sea Grant College Program

INTRODUCTION

The Site review team (SRT) review of the Ohio Sea Grant (OHSG) Program took place from May 26, 2010 – May 27, 2010.

The SRT members included:

Jonathan Eigen (Chair, NSGO Program Officer) National Sea Grant Office Silver Spring, MD	Mayor Harry Simmons (Co-Chair, Advisory Board Member) Caswell Beach, NC
Chryssostomos Chryssostomidis MIT Sea Grant College Program Director Cambridge, MA	Lori Boughton Great Lakes Program Director, Pennsylvania DEP Erie, PA
Dale Baker Program Leader & Associate Director of NY SG (retired) Ithaca, NY	Sami Grimes, Observer National Sea Grant Office Silver Spring, MD

Prior to the beginning of the SRT visit, and in conformance with National Sea Grant College Program guidelines, the OHSG issued a public notice of the upcoming SRT visit by inviting interested parties to send written comments to the SRT Chair. The public notice was posted on the Ohio Sea Grant's website. The SRT Chair did not receive any letters in response to the public notice.

The SRT review took place on The Ohio State University campus in Columbus, Ohio.

During the review, the SRT met with stakeholders and partners, including Ken Alvey, President, Lake Eire Marine Trades Association, Ed Hammett, Executive Director, Lake Erie Commission, Frank Lopez, Manager, Old Woman Creek NERR, John Watkins, Chief, Ohio Coastal Management Program, Heather Elmer, Coastal Training Program Coordinator, Old Woman Creek NERR, John Conglose, OSU extension and many more. From the university, the SRT had the opportunity to talk to Bobby Moser,.OSU Vice President for Agriculture, Carol Whitacre, OSU Vice President for Research, Jan Weisenburger, OSU Senior Associate Vice President for Research and OSU President E. Gordon Gee.

The report of the SRT follows the guidelines of the Site Review Team Procedures Manual. The SRT reviewed and discussed broad issues related to the OHSG Program's: 1) Organization and Management of the Program; 2) Stakeholder Engagement; and 3) Collaborative Network Activities. Within each of these areas, the SRT report presents the findings, recommendations and suggestions of the SRT.

I. ORGANIZING AND MANAGING THE PROGRAM

Based on the criteria descriptions and considered questions, in this section, the Program addresses each of the following areas: leadership, organization, programmed team approach, and support. Each area is covered separately.

Leadership

The OHSG program has benefited from outstanding leadership over many years under the director Dr. Jeffery Reutter. Dr. Reutter has also been very influential in promoting the National Sea Grant College Program agenda in regional collaborations to the benefit of the Great Lakes states and Nationally. It is evident that he is a great catalyst in forming collaborations among the key players within the region. A couple of examples include the Great lakes Regional Research Network (GLRRIN) and the Great Lakes Collaborative Science Monitoring Initiative, where all Great Lakes Sea Grant Directors and University Officials can receive funding from any source and distribute the funds among each of the Great Lakes Sea Grant Programs while minimizing administrative costs. This mechanism can serve as a model of cooperation in enhancing regional collaboration for the Sea Grant Network.

With Dr. Reutter's retirement from the University, he has restructured the management organization to accommodate a 25 percent reduction in his work schedule. In preparation for further personnel changes in the future senior leadership has demonstrated forethought with regard to the future of the program. The staff has been given more leadership and decision-making responsibilities and the delegation of responsibilities has added to the overall effectiveness of the program.

The program has been instrumental in receiving funding for Centers for Ocean Sciences Education Excellence (COSEE) program for the Great Lakes region. Further, the prestige and recognized leadership enjoyed externally is echoed within the university. A high regard for this program exists within the administration, as evidenced by university support received by the program.

OHSG is a leader in the Great Lakes basin starting with the Great Lakes Research Initiative Other Great Lakes programs and organizations look to Ohio Sea Grant as the critical link in coordinating the varied programs and interest groups involved in Lake Erie and other Great Lakes issues. This coordination has been very effective in limiting duplication of effort and as helped the programs develop a feeling of cooperation amongst each other. It is critical to the future of both OHSG and other ~~the~~ Great Lake programs that the vision and contacts that have made the program such a leader are maintained in order to efficiently carry out program goals at a state and regional level.

Finally, the program responded positively to the recommendations made in the 2005 program assessment seamlessly incorporating those recommendations into the program.

Communications

The response of the SRT was overwhelmingly positive with regard to the communications area. The program exceeded all expectations, as set forth in the previous PAT, with regard to quality of materials and quantity of outreach.

Vast improvement was noted in the quality of communication materials. The SRT was impressed, collectively, by this effort. It was further noted that the OHSG had responded so proactively and forcefully to the 2005 PAT recommendation for improvement in communications area.

Further, the Communications Department had exceeded expectations in areas of innovation and imagination. The creativity shown in promoting the mission of Sea Grant among all constituents from K-12 students to University officials, students and faculty to the general public was received favorably. The program is making use of innovative communications vehicles of superior quality that are well suited to the targeted audience. In fact, on campus, OHSG has had a presence at the OSU football stadium, the recreational center, the new student union center, and the OSU library. A number of new products have been very favorably received by the users of the materials. These materials included but were not limited to: reports, publications, posters, displays, database, and website.

Organization

The program is structured within a multi-disciplinary department, reporting directly to the Vice-President of Research and the Vice-President for Agriculture. The management of Stone Laboratory under Sea Grant has been an effective step to help with the name recognition for Sea Grant, which in turn allows the program to raise research funding, education funding and endowment to the benefit of OHSG's mission. Stone Laboratory has also been a great marketing tool for Sea Grant to use to create name recognition.

Within this structure, the panel was struck by the breadth of issues the program covered. These ranged from the development of the leadership academy to coastal tourism to clean marinas. Although the panel found the range of activity areas commendable, the site review team encouraged that care be exercised so that the program does not spread itself too thin.

Programmed team approach

The program is to be commended for the high quality of advisory services and the clearly identifiable results. However, the review panel was unable to identify a clear path of transferring results from the more academic research to the applied research needs. Strengthening this link would yield a much stronger program.

The team suggests that the program consider developing a defined process in which the fruits of the academic research are translated to the applied needs of the extension/education service.

Support

The program is acknowledged for their innovation in attracting funding. Some of these should serve as a model for other programs. The program is noted for its success in developing new sources of revenue, specifically innovation in bringing in endowments to support the program.

The decision to emphasize areas of joint interest to other state agencies within the RFP has resulted in additional collaborations as well as encouraging jointly funded projects further increasing the resources to the program as well as minimizing duplication of effort within the region.

II. STAKEHOLDER ENGAGEMENT

Based on the criteria descriptions and the considered questions, in this section, the Program addresses each of the following areas: extension/advisory service, relevance, and relationships. The areas will be considered collectively.

The program has a strong involvement in the regional networks that have been developed by the OHSG program. The program is clearly well connected within the region at the university state and local level. The program has developed valuable relationships with a broad variety of groups ranging from academia, state and local government.

Further, the program does an excellent job tying its research results to its communications. However, there could have been stronger interaction and program development between the extensions agents with the researchers. A possible solution is to involve a Sea Grant staff member/Extension at the beginning of each research project to help guide the extension component. This may help facilitate the link between the academic to the application of the research to the general public, as suggested in the previous section.

The OHSG Program is extremely active in all levels of coordination in the great lakes region their efforts in taking the lead with the Lake Erie phosphorus, clean marina and leadership development program. Dr. Reutter has been the leader in developing many Great Lakes projects. With this, encouragement is offered for efforts to reestablish an extension presence in Cleveland.

The Sea Grant Program has done a fine job of taking advantage of partnership opportunities as they have been identified. The program has done an excellent job of developing its ties with relevant agencies within the state and region. The close relationships that have been developed have certainly proved to be a boon to the state. However the review team is concerned that the program may be approaching a level of interdependency in its partnerships that could harm the perception of program as neutral party.

The communications program has developed an outstanding media campaign to disseminate Sea Grant and other research results to the community. Twine Line is a first rate newsletter and the OHSG Investment information technology.

Support for the program from its users has been tremendous. The number of letters of Congressional support generated by supporters of OHSG is testament to how highly regarded the

OHSG Program is in the community. The constituents that came out to speak with the team were knowledgeable and enthusiastic in their support of the program. From members of the State Senate to local fishing boat captains, the review team heard passionate stories about the impact the program has had on the community. It was apparent to the team that OHSG is a trusted and immediate point of contact for all issues regarding Lake Erie.

Through systematic partnering with entities, communications programs, and coordination between researcher and administrator, the program has burgeoned into a regional leader. Its leadership has cultivated these relationships, facilitating the research and its dissemination to the critical decision makers in the state.

III. COLLABORATIVE NETWORK/NOAA ACTIVITIES

OHSG continues to provide leadership in Great Lakes activities. This includes coordinated planning and cooperative work with local, state, regional and Federal agencies, as well as other Sea Grant Programs and non-Sea Grant universities.

Sea Grant Network – National and Regional Leadership

The members of the leadership team participate and lead activities that support the overall Sea Grant Network. Dr. Jeffery Reutter is currently Co-Chair of the Great Lakes Regional Research Information Network (GLRRIN). Dr. Eugene Bragg is Research Coordinator Chair Elect of the Sea Grant Network, and Jill Jentes was chair of the Chair Great Lakes Sea Grant Network Communicators (2004-2006). Finally, Tory Gabriel was a member of the planning committee for the Great Lakes Sea Grant Network Conference (2009). OHSG's education coordinator, Rosanne Fortner, has been the principal investigator on the Centers for Ocean Sciences Education Excellence (COSEE) project since its inception. OHSG is now collaborating with COSEE to finalize Great Lakes Literacy Principles.

State and Regional Partners

The Great Lakes Regional Research and Information Network (GLRRIN) created under the leadership of Dr. Reutter has been a critical component in improving and identifying and coordinating research and extension needs throughout the Great Lakes. The program was instrumental in putting together the key players in each of the Great Lakes and has aided in better identifying the major issues and needs of each Great Lake.

NOAA and other Federal Agency Cooperative Efforts

OHSG maintains a strong partnership with Old Woman Creek NERR, the Ohio Coastal Management Program, and the Lake Erie Commission. In 2008 and 2009, OHSG collaborated with these partners on developing education and outreach plans and co-fund research projects. These partners serve on each other's review panels to evaluate and prioritize proposals in order to eliminate any possibilities of duplication and in order to enhance linkages between management and research. All four organizations make up Ohio's Coastal Training Program, which is intended to bring scientists, practitioners, and local decision-makers together to share challenges, innovative science and technologies, and success stories.

OHSG's work with Clean Marinas and the recent work collaborating with Mondo Polymer, Inc. in Marietta, Ohio, to recycle shrink-wrap from boats into plastic spacers on highway guardrails is another example of Sea Grant effective collaboration efforts.

IV. FINDINGS, RECOMMENDATIONS and SUGGESTIONS

The recommendations are defined as those that the program must consider. The suggestions are defined as those that the program may wish to consider. The panel did not offer any elements under the findings rubric.

The panel recommended two actions for consideration:

1. When discussing the economic impact of tourism on the state and region, federal tax revenue should be included along with the state and local tax receipts.

2. The effective communication of the strategic agenda of the program would be strengthened with the development of an executive summary version of the strategic plan.

The panel made four suggestions for consideration of the program:

1. Stone Lab merchandise should include OHSG branding.

2. In order to further enhance institutional leadership capability, the director should qualitatively involve the leadership team in cultivating existing and future relationships, in support of continued success in the program.

3. OHSG program should consider develop a stronger system of involvement between the extension agents and the researchers.

4. OHSG should consider expanding their technical review panel to include more panelists who are independent of existing partnerships.

V. BEST MANAGEMENT PRACTICES

A possible Best Management Practice would be Ohio Sea Grant's capability in seeking outside donations and establishing endowments to support the program's research, education, and outreach mission. This practice, if allowed to assist other Sea Grant Programs.

Another possible Best Management Practice would be OHSG's concept of the leadership academy that instructs incoming state and local officials on the issues facing the great lakes. This can be expanded nationwide.

APPENDIX C

2010 DIRECTOR'S RESPONSE TO FINAL SITE VISIT REPORT

THE OHIO STATE UNIVERSITY

Ohio Sea Grant College Program

Franz Theodore Stone Laboratory
Great Lakes Aquatic Ecosystem Research Consortium (GLAERC)
Center for Lake Erie Area Research (CLEAR)
Area 100 Research Center
1314 Kinnear Road
Columbus, OH 43212-1156
Phone (614) 292-8949
Fax (614) 292-4364
www.ohioseagrant.osu.edu

1 December 2010

Dr. Leon Cammen, Director
National Sea Grant College Program
National Oceanic and Atmospheric Administration
1315 East-West Highway, Room 11716
Silver Spring, Maryland 20910-3282

Dear Dr. Cammen,

This is my official response to the "Site Review Team's Review of the Ohio Sea Grant College Program, May 26, 2010 – May 27, 2010." This report, dated 8 October 2010, was signed by Jonathan Eigen and Harry Simmons, Co-Chairs of the Site Review Team (SRT), and received in this office on 20 October 2010. In addition to Mr. Eigen, our Program Officer, and Mr. Simmons, Mayor of Caswell Beach, NC, the SRT included: Dale Baker, retired Program Leader and Associate Director of New York Sea Grant; Lori Boughton, Great Lakes Program Director, Pennsylvania Department of Environmental Protection; Chryssostomos Chryssostomidis, Director of MIT Sea Grant; and Sami Grimes, an ex-officio member of the SRT from the National Sea Grant College Program.

Let me begin by thanking the National Sea Grant College Program for putting together such a talented, enthusiastic, and dedicated team. They were excellent representatives of the National Sea Grant College Program and a group that I was very proud to introduce to our university administrators and our partners in government, academia, and the private sector. I must also thank the SRT members for their hard work and determination in preparing a very thorough review and evaluation of our program.

I. Organizing and Managing the Program

Leadership

I want to thank the SRT for the many personal compliments. I feel very fortunate to have been able to serve in this position for so many years. I was also very pleased that the Team recognized the overall strength of the Ohio Sea Grant Management Team and the leadership role we play within the region. We do have a very strong, talented, and dedicated leadership team, including Jill Jentes Banicki, Eugene Braig, and Frank Lichtkoppler, and they are each supported by an equally talented staff. Finally, while I hope my retirement date is still well in the future, I do appreciate the Team's approval and support of the actions we have taken to prepare for that date.

Communications
I was particularly pleased with the comments of the team regarding our Communications Program.

- "The program exceeded all expectations, as set forth in the previous PAT (2005), with regard to quality of materials and quantity of outreach."
- "The SRT was impressed, collectively, by this effort."
- "Further, the Communications Department had exceeded expectations in areas of innovation and imagination."

What makes this even more satisfying is that our Communications Program was also rated very highly during our last review in 2005. It is good to see strong elements recognized for getting even stronger.

Organization
We are pleased that the SRT recognized the breadth of issues that we cover and appreciate the caution expressed by the SRT that we not spread ourselves too thin.

Programmed Team Approach
During the Site Visit, Team members suggested assigning specific Sea Grant agents to each of our Research Projects to expedite and improve our outreach capabilities, especially on the more academic projects. We really liked this recommendation and it is being implemented.

Support
We were pleased that the SRT recognized and appreciated our efforts to enhance donations, develop endowments, diversify support streams, and collaborate with other funding agencies. We agree that this is an area of real strength for our program and an area we will seek to enhance even further in the future.

II. Stakeholder Engagement

We were very pleased that the SRT recognized and appreciated our efforts and accomplishments in involving stakeholders, leading regional programs and efforts ("the program has burgeoned into a regional leader"), and creating partnerships with agencies and the private sector. We were also pleased that the SRT appreciated the support we get from agencies, the private sector, and elected officials. We believe these are critically important audiences, but appreciated the SRT's urging us to be cautious to maintain our unbiased reputation as we continue to improve and enhance these relationships in the future.

III. Collaborative Network/NOAA Activities

Sea Grant Network—National and Regional Leadership
We were pleased that the SRT appreciated our leadership role in the Great Lakes Regional Research Information Network (GLRRIN), the National Sea Grant Research Coordinators, the Great Lakes Communicators, the Great Lakes COSEE, and more. They

went on to recognize our work to develop individual nodes for GLRRIN on each of the lakes and our efforts to identify and disseminate research and outreach information in the region.

NOAA and Other Federal Agency Cooperative Efforts
We have spent a great deal of time and effort since our last review in 2005 to develop the Lake Erie Partnership between Ohio Sea Grant, Old Woman Creek NERR, the Ohio Coastal Management Program, and the Lake Erie Commission. Our collaborations with these groups have resulted in some very significant impacts and accomplishments, e.g., Lake Erie and Great Lakes Literacy Principles to match the Ocean Literacy Principles. We were pleased the SRT recognized and appreciated the value of these collaborations.

IV. Findings, Recommendations, and Suggestions

The SRT had two recommendations and four suggestions. These will be addressed individually, below.

Recommendations

1. When discussing the economic impact of tourism on the state and region, federal tax revenue should be included along with the state and local tax receipts. **Ohio Sea Grant Response:** Will do! We already have the information but have not been including it because almost all tourism related funding comes from state and local sources.
2. The effective communication of the strategic agenda of the program would be strengthened with the development of an executive summary version of the strategic plan. **Ohio Sea Grant Response:** We agree! A 4-page executive summary of the "Ohio Sea Grant 2010-14 Strategic and Implementation Plan" is being prepared and will be completed in time to be included with our new call for preproposals in March 2011.

Suggestions

1. Stone Lab merchandise should include OHSG branding. **Ohio Sea Grant Response:** This is a good suggestion and one that is easy to implement because almost everything that we produce already recognizes Sea Grant, Stone Lab, OSU, NOAA, etc. In fact, our newest Stone Lab t-shirt and hoodie both recognize the Ohio Sea Grant College Program.
2. In order to further enhance institutional leadership capability, the director should qualitatively involve the leadership team in cultivating existing and future relationships, in support of continued success in the program. **Ohio Sea Grant Response:** Good suggestion. The director already tries to do this, but will enhance his efforts in this area in the future.
3. OHSG program should consider developing a stronger system of involvement between the extension agents and the researchers. **Ohio Sea Grant Response:** A Sea Grant agent is being assigned to each new project beginning with our call for preproposals in March 2011.

4. OHSG should consider expanding their technical review panel to include more panelists who are independent of existing partnerships. **Ohio Sea Grant Response:** Will do!

V. Best Management Practices

The SRT identified two best management practices: 1) our success in developing a donor base and endowments, and 2) our leadership academy for elected officials and decision makers. We wholeheartedly agree, but would also include our new leadership academy for tourism officials. Our belief is that all Sea Grant programs could develop, and would benefit from the development of, a funding stream from donors and endowments and the above mentioned leadership academies. The tourism leadership development effort is a result of an industry identified need to learn the skills necessary to have more involvement in policy decisions impacting the industry and we believe it could be a model for other Sea Grant programs.

Thank you for the opportunity to comment on the SRT report. We believe our program benefited from the process, and we are very pleased with our overall evaluation in the report. Please don't hesitate to call if you have any questions and please extend my thanks to the members of our SRT for all their hard work and a job well done.

Sincerely,

Jeffrey M. Reutter, Ph.D.
Director

C: Jonathan Eigen
Sami Grimes

OHIO SEA GRANT COLLEGE PROGRAM

Historical Summary of National Reviews

APPENDIX D

2012 PROGRAM REVIEW PANEL RESULTS OCTOBER 2012

- 20-PAGE SUMMARY REPORT FROM OHIO SEA GRANT
- COVER EMAIL FROM NATIONAL DIRECTOR ACCOMPANYING FINAL EVALUATION
- FINAL PRP REPORT AND NATIONAL RANKING FOR OHIO
- DIRECTOR'S EMAIL RESPONSE TO NATIONAL SEA GRANT REPORT AND RANKING

APPENDIX D

2012 20-PAGE SUMMARY REPORT FROM OHIO SEA GRANT

2008-2011 Ohio Sea Grant College Program Performance Review Panel Report

Program Summary

For more than 30 years, Ohio Sea Grant has worked to help restore Lake Erie and rejuvenate its regional economy. With the unique combination of research, education, and outreach efforts, Ohio Sea Grant has become a program of action, working progressively with its stakeholders and partners to solve Lake Erie's most pressing environmental and economic issues. The program itself began in 1978 and was designated this country's 24th Sea Grant College in 1988. Over its 34 years, Ohio Sea Grant has led research and outreach efforts to help decrease the frequency of Lake Erie's harmful algal blooms, track and respond to the spread of the invasive species, and evaluate and respond to the reoccurrence of the Dead Zone and continued sediment/nutrient loading.

Through its educational arm, Stone Laboratory field station, Ohio Sea Grant has offered since 1978 approximately 25 college courses annually to 6,000 advanced high school students, teachers, and college students from over 110 colleges and 360 high schools and has provided nearly 1,150 students with $450,000 in scholarships from private sector donations. As a cutting-edge way to introduce STEM education to youths every year, Stone Laboratory's unique field trip has provided 170,000 students of all ages with a hands-on opportunity to be Lake Erie scientists for a day. Thanks to three of Sea Grant's 18 endowments, Stone Lab's Research Experience for Undergraduates Scholarship Program can annually provide 10 students with one-on-one supervised research projects led by key Great Lakes researchers.

Investment Per Focus Area

Focus Area	Percentage	Federal (+ Match + pass thru)	Leveraged
Healthy Ecosystems	39%	$1.40 Million	$1.75 Million
Sustainable Coastal Development	23%	$1.04 Million	$828,000
Hazard Resilience	24%	$919,000	$1.01 Million
Safe and Sustainable Seafood	14%	$365,000	$783,000

Addressing Lake Erie issues is most effective when coordination of efforts throughout the Great Lakes is achieved. In 2006, Ohio Sea Grant led the creation of the Great Lakes Research and Outreach Consortium (GLROC), a consortium of the seven programs in the Great Lakes Sea Grant Network that allows anyone of the programs to accept a grant for the region and subcontract projects to the other programs without charging indirect costs. Ohio Sea Grant created and continues to lead the Great Lakes Regional Research Information Network (GLRRIN), which started with regional funding to Ohio Sea Grant through GLROC from the National Sea Grant College Program in 2006. Ohio Sea Grant is an active leader and participant in several regional projects for the Great Lakes Sea Grant Network and hosted Sea Grant Extension Program Leaders and Sea Grant Communicators for three days at Put-in-Bay for their biannual conference and in-service training in 2011.

Ohio Sea Grant has funded more than 420 researchers from 20 different colleges and universities. The program's researchers work on cutting-edge projects such as: assessing the impact of birding on Lake Erie tourism, determining if amenity led growth is driving economies in the Great Lakes region, modeling sediment movements in the lake and the erosion of shoreline, and the development of techniques to track sportfish movements, increase the growth of important aquaculture species, and track the presence of a potentially devastating fish virus (VHS). Ohio Sea Grant also facilitates collaboration among scientists and has led the way in addressing excessive nutrient loading problems, harmful algal blooms, and Dead Zones in Lake Erie. This leadership has resulted in the funding of more than 40 projects valued at more than $10 million in the past four years and research synthesis reports that are being used by three leading state agencies.

Because engagement with the public is equally as important as its research and education programs, Ohio Sea Grant's communications program has continued to find innovative ways to inform its stakeholders. The program's award-winning magazine, *Twine Line*, reaches more than 25,000 people every issue, while its website, with its hundreds of online publications, reaches more than 250,000 unique visitors every year. Partnerships within one of the largest universities in the country have helped Ohio Sea Grant expand its campus outreach to influence more students by educating through unique venues such as ticker boards at OSU's football stadium and outreach displays at key student venues.

To ensure Lake Erie messages are consistent through K-12, as well as through place-based settings and regional communications strategies, Ohio Sea Grant with four state and regional partners developed the Lake Erie Literacy Principles. In 2011, Lake Erie Literacy Principles were finalized and are consistent with NOAA Ocean Literacy Principles. Aligned to Ohio education standards, these principles motivated development of, and were used as a model for COSEE's Great Lakes Literacy Principles which resulted in teacher education courses at more than 10 Great Lakes universities and used as a foundation for exhibit and program development at multiple regional museums.

What has made Ohio Sea Grant unique over the years is its ability to find ways to broaden its reach and educate more of Ohio's citizens about Lake Erie issues. Through its tourism initiatives like the Tourism Leadership Academy, Ohio Sea Grant has armed tourism industry leaders with the necessary tools, contacts, and knowledge about the industry to become more informed advocates of the lake. Ohio Sea Grant's on-site educational programs at the Aquatic Visitors Center, South Bass Island Lighthouse, and Stone Laboratory convey the complexities of the Great Lakes ecosystem and the importance of this aquatic resource. Ultimately, the goal of these programs is to instill an appreciation and desire to become better stewards of our Great Lakes. Since 2008 the three facilities have educated more than 100,000. Further, partners like the Lake Erie Nature and Science Center have continued to help relay Ohio Sea Grant's messages through its educational displays and programming to nearly 100,000 annually. Ohio Sea Grant was named the top outreach program within Ohio State University in 2009.

OHSU–TB-110-2012

Healthy Coastal Ecosystems

Ohio Sea Grant Healthy Coastal Ecosystems Goals

- Restored function and productivity of Lake Erie degraded ecosystems.
- Sound scientific information to support ecosystem-based approaches to managing the Lake Erie coastal environment.
- Widespread use of ecosystem-based approaches to managing land, water, and living resources in the Lake Erie coastal area.

Healthy Coastal Ecosystems represents 39% of Ohio Sea Grant's efforts. Actual accomplishments far exceed expectations due to several new partnership opportunities to reach additional stakeholders. The partnership with Ohio Department of Natural Resources to manage the Aquatic Visitors Center expands our reach by more than 12,000 per year. Through a partnership with multiple agencies, the Ohio Coastal Training Program targets planners and water resource managers. In addition, increased saliency of coastal issues, such as harmful algal blooms and Asian carp, have increased overall demand for Ohio Sea Grant expertise.

Addressing Seven Critical Issues

Lake Erie has been called the most important lake in the world. It provides shelter and nourishment to countless living things, including 11 million people who rely on it for drinking water. It is the southernmost, shallowest, warmest, and most biologically productive of the Great Lakes, often producing more fish for human consumption than the other four lakes combined. But Lake Erie also faces a number of challenges that Ohio Sea Grant and its partners are working to address. Ohio Sea Grant has identified seven critical issues whose resolutions form the basis for ensuring a healthy Lake Erie ecosystem. These include sedimentation and dredging, nutrient loading and phosphorus, harmful algal blooms, the Dead Zone, aquatic invasive species, climate change, and sustainable coastal community and economic development. These issues are interdependent and related, so we have combined some issues below for better understanding. Solving these issues through effective decision making is also interdisplinary, and Ohio Sea Grant takes such an approach in funding and supporting research for the lake's most pressing issues. Beyond Sea Grant's efforts to address the 7 critical issues, we will also highlight other Sea Grant accomplishments that fall into the following categories (1) Developing Decision-making Tools and Research Ecosystem-Based Approaches, (2) Restoring Critical Habitat, (3) Reaching Stormwater Management Decision Makers, (4) Creating an Educated Workforce, Now and in the Future, and (5) Lifelong Learning about the Lake Erie Ecosystem and Importance of Stewardship. These sections will also highlight the numerous research endeavors Ohio Sea Grant has supported, partnerships that Ohio Sea Grant has been associated with, and outreach opportunities Ohio Sea Grant has initiated.

Due to report constraints, Ohio Sea Grant accomplishments and impacts related to aquatic invasive species are presented in the PRP report for Safe and Sustainable Seafood, those most associated with climate change are included in the PRP report for Hazard Resilient Communities, and those targeting sustainable coastal development are included in the PRP report for Sustainable Coastal Communities.

Sedimentation and Dredging

An Ohio Sea Grant researcher from OSU has developed a wastewater treatment method that uses ultrasound waves to break down pharmaceuticals and personal care products (PPCPs) that are otherwise not removed during wastewater treatment. These PPCPs, which include substances like anti-inflammatories, birth control hormones, and antibiotics, can have profound effects on aquatic ecosystems, and their impact on human health is still unknown. While the ultrasound treatment is not ready for commercial use, engineers are using the findings to develop larger-scale models for continued testing.

Nanosilver is a byproduct of many everyday consumer goods, such as shoes, health and beauty products, and clothing. By understanding how these tiny particles behave

as sediment within a freshwater system, Ohio Sea Grant researchers are now evaluating their toxicology and potential contamination consequences in drinking water for 33 million Great Lakes residents.

Natural processes in wetland sediments can break down harmful chemicals like PCNB, an antifungal agent now banned for its carcinogenic properties, through a reaction with iron. Ohio Sea Grant researchers have discovered that while wetlands do not break down this contaminant as quickly as previously thought, wetlands are still an essential part of environmental protection. These research findings are providing leverage to encourage planners to maintain and restore wetland areas.

Removal and upland disposal of all contaminated sediments in the U.S. would cost trillions of dollars. The translocation of contaminants from one medium to another is not sustainable. Furthermore, reliance on one technology alone is not cost-effective. The aforementioned facts encouraged Ohio Sea Grant to support research that emphasizes *in situ* sediment management to provide a viable alternative for areas where sediment removal technologies are cost prohibitive yet remediation is warranted. The specific project was focused on active capping technology. This research was conducted to analyze the sorption performance of active materials amended to clay minerals for the sequestration of contaminants within sediments. The results indicate that the amendments enhance the performance of a sediment cap. Ongoing experiments are investigating whether or not these amendments are still effective when sediments contain both heavy metals and PAHs.

Healthy Coastal Ecosystem Performance Measures
Number of acres of degraded ecosystems have been restored with significant Ohio Sea Grant facilitation, research or other support

Most Lake Erie ports require regular dredging to stay operational, but disposal of the removed sediment can present a problem, especially in large ports like Toledo, where more than 850,000 cubic yards of sediment need to be dredged each year. Ohio Sea Grant researchers are working with Ohio soil blenders to develop "recipes" for beneficial reuse of this sediment, and are analyzing the economic feasibility of reuse compared to on-land impoundment, which takes up valuable space on port property, or open lake dumping, which can worsen algal blooms by adding nutrients back into the water column.

Nutrient Loading and Phosphorus that Leads to Harmful Algal Blooms (HABs) and the Dead Zone

Nutrients provide the foundation of Lake Erie's food web and the right balance of nutrients is essential in ensuring a healthy Lake Erie. When nutrient levels become too high, harmful algal blooms emerge and can contribute to an expanded Dead Zone. This results in public health risks, tainted drinking water, and economic losses. Phosphorus, a key ingredient in many fertilizers and weed killers, has been targeted as a leading contributor to HABs. Ohio Sea Grant has been a leader in identifying causes and solutions for the nutrient loading problem. Its director, Dr. Jeff Reutter, led a team of 25 investigators from 14 institutions to find funding and coordinate seven research projects dealing with excessive nutrient loading, HABs, and the Dead Zone. Through this effort, Ohio Sea Grant is providing knowledge and technical expertise to policymakers and community officials. Major findings include 30% of farmland already has too much phosphorus, fertilizer should be incorporated into soil, winter application should end, and other key science-based facts to guide decision making.

Ohio Sea Grant researchers determined that algae growing on the underside of lake ice contribute to the development of the Dead Zone in the summer and early fall. Keeping track of this algal growth could help natural resource managers better predict and prepare for the extent of the year's Dead Zone.

A four-year interdisciplinary project by researchers from Ohio State University and Case Western Reserve University is developing models to illustrate the decision-making processes in the Maumee River watershed, which flows into western Lake Erie and is often the starting point of harmful algal blooms in the lake. The models will include climate change scenarios along with hydrological data and decision-making consequences, allowing ecosystem managers to develop better strategies for mitigating nutrient runoff into Lake Erie in the face of more severe precipitation, one of the climate change impacts predicted for the Great Lakes region.

Another Case Western Reserve University researcher has developed a computer model that combines chemical profiles of Lake Erie sediment to determine reactions involved in internal nutrient loading, the process in which natural reactions at the lake bottom (algal decomposition, for example) add nutrients to the lake that can fuel harmful algal blooms. Funded in part by Ohio Sea Grant, the model is anticipated to predict when ecosystem managers can expect to see an improvement in the lake ecosystem based on changes in external nutrient management. Currently, the impact of such changes is difficult to determine, as internal loading can contribute nutrients even after external changes take effect.

The finding by various researchers that phosphonates can be readily utilized by the Lake Erie microbial community warrants attention because phosphonates are being added to the Lake Erie watershed in increasing amounts due to the planting of herbicide-resistant Roundup-Ready crops. Whereas this is a productive agricultural practice, the contribution of these compounds to P loadings has not been widely considered. To address this question, Ohio Sea Grant funded research to assess the phosphonate vs. phosphate concentration

in lake water. This work showed that phosphonate herbicides can be readily assimilated by bacteria and cyanobacteria in the Lake Erie watershed, and that diverse microbes have the genetic capability to use phosphonates as a P source. Once assimilated, phosphonates are converted to phosphates that can be utilized by all aquatic taxa and therefore should be taken into consideration when calculating P budgets for Lake Erie.

Using NOAA Ship Time Support for vessels and donations from the Friends of Stone Laboratory, Ohio Sea Grant assists the Lake Erie Commission and USEPA's Great Lakes National Program Office to link research efforts on the Dead Zone with our endowment-funded education program of Research Experiences for Undergraduates (REU) and outreach efforts on the causes of the Dead Zone (including HABs). From 2008-11 OSG made over 35 trips into the Sandusky Sub-Basin and beyond and over 100 trips into the Western Basin to support research, education, and outreach efforts related to the Dead Zone, its causes, and solutions. Through collaborations with Ohio State University, NOAA, Defiance College, Kent State University, and Kutztown University, Ohio Sea Grant is also linking the REU program to other water quality issues. Their results are shared annually with elected officials and decision makers during our special events for congressional delegations, the state legislature, coastal county commissioners, and mayors, among others.

Monitoring and Identifying Future Threats

Focusing only on emergent threats may diminish our ability to address new threats early, so part of Ohio Sea Grant's focus continues to target research to prevent future issues.

Monitoring and preventing infectious diseases impacting the lake's wildlife improves the health of the lake, and Ohio Sea Grant researchers have developed a test for viral hemorrhagic septicemia (VHS) that provides results in a matter of hours instead of weeks, at a fraction of the cost. The new test also determines the viral strain, how much virus is present, and whether it is actively replicating, an important determinant of infectiousness. Other Ohio Sea Grant researchers are protecting human health at the same time they are studying wildlife ailments. By assessing survival rates of avian influenza in coastal wetlands, important stopovers for migratory birds, researchers help public health officials, resource managers and animal caretakers better prepare for (and prevent) such an event.

Healthy Coastal Ecosystem Performance Measures
Number of stakeholders that have used ecosystem-based approaches in resource management of Lake Erie as a result of Ohio Sea Grant and partnership activities

Target	**25**
Actual	**681**

Aquatic Invasive Species (AIS) threaten our nation's inland lakes, rivers, wetlands, estuaries, and oceans. To address AIS within the Lake Erie watershed involves a multi-pronged approach with various audiences to stop the transport of AIS. Working with the Ohio Division of Wildlife, Ohio Sea Grant

updated and rewrote the Ohio AIS Management and Rapid Response Plan to direct action.

In addition to our involvement with the Ohio AIS Management and Rapid Response Plan, we have also collaborated with the University of Minnesota to educate professional tournament anglers about AIS. This education includes Ohio Sea Grant teaching "Best Management Practices" devised to prevent the spread of AIS. Evaluation results from this educational event have led to additional education and outreach strategies that will be included in our Ohio Clean Marinas and Ohio Clean Boater programs, as well as programs for launch ramp users and others who can use best practices to reduce fishery risks.

Developing Decision-Making Tools and Researching Ecosystem-Based Approaches

An Ohio Sea Grant researcher at Kent State University found that public outreach is an important part of protecting an ecosystem through Ecosystem-Based Management. Engaging residents in protecting their surroundings increases the emotional connection people have to the environment, which in turn makes them more likely to want to protect it. A survey covering ecosystems in a variety of geographic locations in the U.S. underscored the need for (1) more public outreach around Lake Erie, which has been struggling with environmental problems for the past decade, and (2) a management model that provides suggestions on how to improve collaboration between public officials and residents to better protect the lake's future.

Erosion along the Ohio shore of Lake Erie is a serious problem; approximately 95 percent of the Ohio lakeshore is affected. Each year, nearly 1.6 million tons of material are eroded along Ohio's lakeshore, threatening public safety, health, and welfare. Further, the Ohio Department of Natural Resources (ODNR) identifies coastal erosion and flooding as one of several priority coastal management issues. To

minimize damage from coastal erosion, ODNR was directed to identify areas of coastal erosion along the Lake Erie shore, and is currently updating maps of the Lake Erie Coastal Erosion Areas using 2004 orthoimagery. Accurate shoreline positions and variation information are crucial to the identification of eroded areas as well as to many other coastal applications, including coastal development, coastal environmental protection, and coastal resource management and decision making. A project funded by Ohio Sea Grant has investigated an algorithm and procedure to map the Lake Erie shorelines by integrating airborne LiDAR data with the newly available 0.4-m-resolution World View 2 satellite images. This technique will improve cost effectiveness, accuracy, and efficiency of shoreline mapping. Due to the rapidity of the procedure's generation process, it can directly benefit ODNR in achieving its goal for designation of Lake Erie Coastal Erosion Areas (CEA) in a timely and cost-effective manner. The developed shoreline mapping techniques will also provide useful information for monitoring and research programs at the Old Woman Creek National Estuarine Research Reserve. The mapping results of this project will support the Lake County Planning Commission and its GIS department in their regulatory coastal management activities.

Improving the predictive capability of existing forecasting models for Lake Erie, especially in the near-shore zone, in order to provide more accurate water level and current forecasts to user communities of the Lake, e.g., recreational, commercial, and emergency response, is critical. For this reason, Ohio Sea Grant supported research to develop a high-resolution computational model of Lake Erie using the latest shoreline and bathymetric data available. This provides unprecedented levels of resolution and accuracy. Simulations are currently being performed in order to validate the models versus historical records of water levels.

The Great Lakes Observing System (GLOS) must work with limited resources to achieve its mission to increase the availability of environmental data to resource managers, researchers, policy makers and educators. Understanding the needs of key GLOS user groups is essential if appropriate products and services are to be efficiently provided. In 2010, GLOS contracted with Ohio Sea Grant to lead the Great Lakes Sea Grant Network (GLSGN) in a needs assessment of Great Lakes Lakewide Management Plan/Area of Concern (LaMP/AOC), public health and fishery managers. GLOS now has a better idea of the needs of key potential clientele and is better situated to focus scarce resources on developing tools and products for use by Great Lakes LaMP/AOC, public health and fishery managers.

Restoring Critical Habitat

Ohio Sea Grant creates clean and healthy watersheds through participation on Areas of Concern projects, as well as with watershed committees and universities throughout the region. Collaboration reduces duplication and leverages resources and expertise. Great Lakes collaboration includes GLISA, GLOS, SARP, and the Great Lakes Sea Grant Network, to name just a few.

Following extensive phosphorus reduction efforts initiated in the 1970s, algal blooms in Lake Erie have been largely absent. However, blue-green algae (cyanobacteria) blooms in Lake Erie's Western Basin and dead zones in the Central Basin began to reappear in the mid-1990s. The return of the symptoms of anthropogenic eutrophication of Lake Erie continuously proves to be among the lake's most pressing problems and threatens a multi-billion dollar regional economy. Based on the success of past synthesis and summary efforts for Lake Erie and Ohio, Ohio Sea Grant is serving on Ohio's Phosphorus Task Force II and the Agriculture Nutrient Task Force. Based on our success in helping Ohio receive over $11 million dollars from USEPA to support more than 30 projects to restore Lake Erie, we were also asked to co-lead Ohio's Synthesis Team to summarize the results of these projects.

The Black River Area of Concern (AOC) is restoring wetlands, building fish shelves, and reclaiming floodplain areas thanks to Ohio Sea Grant expertise and assistance. As a partner in the project and master plan, Ohio Sea Grant has helped secure funding and provided recommendations for restoring this important area. Great Lakes AOCs are severely degraded water systems, and the Black River is the only river system in Ohio where the entire watershed has been designated as an Area of Concern. In addition to providing drinking water for two communities, the river is home to four state-listed endangered, threatened or special concern aquatic animal species, including the recently sighted river otter, and more than 12 state-threatened and/or protected plant species. The City of Lorain is now building underwater rocky fish habitat shelves, totaling more than 1,600 feet of new prime vegetated fish habitat for walleye, smallmouth bass, northern pike and longnose gar. This project, once implemented, will also restore up to seven acres of riparian habitat from a former industrial area back to its original natural forested state.

Ohio Sea Grant has contributed toward the potential delisting of the Ashtabula River AOC through involvement as a leader in the community effort. Ohio Sea Grant research, information transfer, and staff have supported community and governmental efforts to identify the contaminated

sediments, seek financial resources, design the remediation and implement remedial actions to restore the local ecosystem. A $75 million dredging effort removed over 600,000 cubic yards of contaminated material from the lower two miles of the Ashtabula River and placed it in a specifically designed landfill that was capped in 2009. This significantly reduced the contamination threat to the Lake Erie ecosystem and resulted in the construction of over 1,000 feet of fish habitat and about two acres of wetlands on the lower Ashtabula River. An additional $1.5 million was received by the OEPA in 2011 for additional habitat restoration work in the Ashtabula AOC. These Ohio Sea Grant efforts helped one local community significantly reduce the risk of a serious environmental threat to the Lake Erie ecosystem and restore two acres of wetlands. Restoration of an additional 8 acres of habitat is ongoing.

After an intensive 10-year effort, the Lake Erie Watersnake has been removed from the list of federally threatened species. It is found only on and around the Western Basin islands of Lake Erie, and human and snake interactions too often resulted in the demise of the rare reptile. The US Fish and Wildlife Service (USFWS) listed the Lake Erie Watersnake as a federally threatened species as the population dropped to about 2,000 animals. Using Ohio State's Stone Lab as home base for three summers, Ohio Sea Grant supported researchers studied the habits of the rare snake. During this time, these researchers also developed an intensive outreach campaign to educate local residents and transient boaters about the need to protect the snake. The nation learned about the snake in 2006 as the research was featured on the Discovery Channel's "Dirty Jobs with Mike Rowe" program. In 2011, the snake rebounded to almost 12,000 individuals. Surveys say public opinion about the snake is friendlier toward the reptile and human-caused deaths are decreasing. Working with private landowners and the Lake Erie chapter of the Black Swamp Conservancy helped to permanently protect almost 11 miles of shoreline and 300 acres of snake habitat.

Reaching Stormwater Management Decision Makers

By collaborating with other state and federal agencies, Ohio Sea Grant trains coastal officials and planners on balanced growth, best land use practices, and geospatial tools to evaluate watershed land use options for impacts on water quality.

The Ohio Coastal Training Program is a partnership of Ohio Sea Grant, the ODNR Office of Coastal Management, Old Woman Creek National Estuarine Research Reserve, and the Ohio Lake Erie Commission and is aligned with NOAA's national education and outreach strategic plan. Ohio Sea Grant contributed funding or in-kind support to four workshops reaching 1,132 individuals to increase their understanding of land use impacts on the lake and to build capacity of local planners. Quarterly workshops engage stormwater professionals and offer incentives for innovative stormwater management. Fourteen additional courses have been offered by the Ohio Coastal Training Program, as well as a climate adaptation resource webpage and curriculum for natural resource managers and coastal community officials. Case studies and expertise have been shared throughout the Great Lakes region and throughout NOAA.

Recognizing the importance of collaboration in achieving ecosystem goals, a workshop entitled "Working Together to Get Things Done" builds capacity to work with people who have different priorities, viewpoints, and knowledge in order to achieve resource management goals for Lake Erie watershed coordinators and conservation professionals. Following a needs assessment, the Ohio Coastal Training Program also offered Green Grants, a workshop providing skill-building and networking opportunities for nearly100 participants from communities and nonprofit organizations.

The Ohio Coastal Training Program Coordinator at Old Woman Creek NERR is Co-Investigator and Collaboration Lead on a NERRS Science Collaborative grant awarded in November 2011. The project team was awarded $821,000 to conduct collaborative research focused on performance of stormwater systems and produce technical guidance, tools, and training for stormwater professionals in Ohio's Lake Erie basin. The program coordinator also planned and co-facilitated a collaborative research work session for Ohio Division of Wildlife staff and other conservation professionals to provide input on priorities for a regional climate vulnerability assessment funded by the U.S. Fish and Wildlife Service.

Creating an Educated Workforce

The mission of the Franz Theodore Stone Laboratory is to serve Ohio State University, the Ohio Sea Grant College Program, the State of Ohio, and the people of Ohio as their research, education, and outreach facility on Lake Erie. Its programming addresses the needs of students grades 4-12, college undergraduate and graduate students, K-12 teachers, research scientists, decision makers and elected officials, technical staff in state and federal agencies, and the general public.

Since 2008, Ohio Sea Grant's Stone Laboratory has offered 91 courses for college credit available to high school, college, and graduate students and professionals. In addition, we offered 18 workshops for college students and aquatic science professionals. These efforts reached 839 students: 400 college-level students from numerous universities/colleges, 256 advanced high school students from across the country, 183 in non-credit workshops, and 48 taking regular courses as a non-credit workshop option.

With Ohio Sea Grant funding and support, more than 1,200 teachers carry knowledge about the Great Lakes back to the classroom. COSEE Great Lakes was able to introduce lesson materials specific to the Great Lakes to teachers, who often are not provided with adequate materials to teach students about the lakes and their importance to the region. Working with Ohio Sea Grant and Stone Laboratory, this program also connects schoolteachers with working Great Lakes scientists, allowing them to experience the Great Lakes ecosystem first-hand.

The Research Experience for Undergraduates (REU) Scholarship Program was developed to provide educational and training opportunities for undergraduate students to assist in the work of scientists and address real-world problems. Immersion in a research project allows students to apply science, technology, engineering and math (STEM) skills to a current Lake Erie issue. Since 2008, a total of 126 REU credits were earned by 40 undergraduate students studying at Stone Laboratory.

Lifelong Learning About the Lake Erie Ecosystem and Importance of Stewardship

In 2009, Ohio Sea Grant and the ODNR - Division of Wildlife (ODNR-DOW) worked to reopen the old state fish hatchery/museum at Put-in-Bay. In a relatively short time Ohio Sea Grant turned the hatchery/museum into an environmental science museum (Aquatic Visitors Center; AVC). More than 12,000 people every year learn about the lake and their role in protecting the ecosystem during visits. In addition to reaching people at the AVC, Ohio Sea Grant also introduces them to Lake Erie while they are visiting the South Bass Island Lighthouse. Since 2008, nearly 30,059 have visited this Ohio Sea Grant landmark overlooking the lake.

Stone Lab offers youth the chance to be a scientist for a day, participate in a science cruise, get wet seining for fish, view Lake Erie water samples under a microscope, and much more. Living on an island offers a unique perspective for students. Since 2008, over 28,000 youth through adult students participated in 800 organized workshops, conferences, tours and educational programs at OSU's Stone Laboratory.

Ohio Sea Grant is also involved in awareness campaigns. For example, traces of chemicals from pharmaceutical and personal care products (PPCPs) have been found in many waters tested in the United States. Proper disposal of these chemical-laden products will avoid harm to fish and other aquatic wildlife, as well as drug misuse or accidental poisoning in humans. Displays developed by Ohio Sea Grant have been used by other Great Lakes Sea Grant Network team members, Southwest General Hospital in Cleveland, and are on permanent display at the aforementioned Aquatic Visitors Center. Ohio Sea Grant has also worked with the Lorain County Sheriff's Department Drug Enforcement Task Force on a county-wide unwanted pharmaceuticals collection event. Although still in its early stages, the entire Great Lakes project team has collected 2,473,154 pills and contacted approximately 795,932 people. A Great Lakes wide website has been developed at ***www.unwantedmeds.org***.

Ohio Sea Grant created social media opportunities before these platforms became routine and readily accessible. Since July 2009, 1,374,375 posts have been read on the Lake Erie Discussion Board and there are 407 registered users. Most of these posts are related to fishery regulations, practices, and issues. With the explosion of social media usage and platforms, a comprehensive social media strategy has been developed to continue to provide a forum for questions and answers; however, the Lake Erie Discussion Board provides a valuable way to monitor concerns and to participate in in-depth conversations related to Lake Erie fishery issues.

Healthy Coastal Ecosystem Performance Measures
Ohio Sea Grant will solicit applied ecosystem research and seek to support at least one research project to assist ecosystem managers
Target 4
Actual 5

Harmful algal blooms (HABs) occur all too frequently in Lake Erie and other freshwater ecosystems. These HABs may produce toxins that have the potential to harm people, pets and wild animals. HABs have caused taste and odor problems in drinking water, reduced recreational beach use, and adversely impacted tourism. Ohio Sea Grant partnered with Ohio State University Extension, the Ohio Department of Health, Ohio Department of Natural Resources and the Ohio EPA to develop an informational fact sheet on HABs. Thoroughly researched and documented, the fact sheet discusses key questions citizens need to know about HABs. Citizens now have accurate, easy to understand information on HABs and are better prepared to address this growing issue and protect their families and pets.

Aquatic Invasive Species (AIS) threaten our nation's inland lakes, rivers, wetlands, estuaries and oceans. The Great Lakes Sea Grant Network, led by Minnesota, developed a two-year, comprehensive AIS public outreach initiative as one strategy to help stop new AIS introductions. An estimated 26,554 individuals, including professional tournament anglers, have been reached with information on AIS, Asian carp, AIS impacts and methods to stop the transport of AIS.

Ohio Sea Grant's Clean Marinas Program is providing an opportunity for Ohio marinas to voluntarily implement best management practices that reduce their nonpoint source pollution. A total of 37 Ohio Marinas are verified Clean Marinas and another 32 have pledged to become Clean Marinas. One of the primary benefits of the Clean Marina program for marinas is an enhanced image. Nationwide 30% of Clean Marina operators attribute an increase in dock sales to their participation in the program.

Sustainable Coastal Development

Ohio Sea Grant Sustainable Coastal Development Goals

- Coastal communities that make efficient use of land, energy, and water resources and protect the resources needed to sustain coastal ecosystems and quality of life.
- Healthy coastal economies that include working waterfronts, an abundance of recreation and tourism opportunities, and coastal access for all citizens.
- Lake Erie coastal citizens, community leaders, and industries that recognize the complex inter-relationships between social, economic, and environmental values in coastal areas and who work together to balance multiple uses and optimize environmental sustainability.

Sustainable Coastal Development represents 23% of Ohio Sea Grant's efforts. This focus area has increased in importance since the Ohio Sea Grant Strategic Plan was developed due to the increased saliency of overall sustainability related to land use decisions.

Building sustainable coastal communities means increasing awareness of the resources upon which these communities' economies are built, as well as sharing the importance of ecosystem health to long-term economic vibrancy. Ohio Sea Grant does this through (1) research evaluating the resources and resource-based industries and by (2) providing assistance to communities seeking to retain, expand, or develop businesses and markets. Ohio Sea Grant sustainability activities also involve leveraging smart decisions for energy and recycling, as well as making sure policy leaders at all levels make balanced decisions.

Given the $11 billion impact of Lake Erie tourism within Ohio's eight coastal counties, the Ohio Sea Grant Program recognizes the importance of developing strategies to boost local economies while protecting those intrinsic qualities which attract visitors and their dollars. This means working with local communities and the tourism industry to develop new products, as well as assisting in reaching markets and generate higher returns on investment. In 2011, the Ohio Sea Grant Extension Tourism Program Director was awarded the top tourism industry award in the State of Ohio. Efforts transcend all four focus areas as defined by the National Sea Grant Program, with strategic tourism actions serving as both the ends and the means for achieving outcomes. The following sections will highlight our efforts to promote and support sustainable Coastal Development: (1) Assessing the Value of Our Resources, (2) Creating Economic Development Opportunities and Awareness of Coastal Resources, (3) Increasing Capacity of Local Communities to Live and Work Sustainably, (4) Creating Strong Leaders, and (5) Living and Working Sustainably Through Green Energy and Recycling. These sections will also highlight the numerous research endeavors Ohio Sea Grant has supported, outreach opportunities Ohio Sea Grant has initiated, and partnerships that Ohio Sea Grant has been associated with to help us reach our sustainable coastal development goals.

Assessing the Value of our Resources

Sea Grant supported research at Bowling Green State University (BGSU) found that bird watching contributes $30 million and 283 jobs to northern Ohio's economy each year. By surveying 1,100 birders at six of Ohio's most popular birding sites, BGSU was able to determine that about 2.4 million visitors come to Ohio for birding opportunities, paying for food, gas and lodging along the way. Through continued Ohio Sea Grant collaboration, BGSU is now working with local communities to educate government leaders and businesses about the value of birding, and about how attracting more birders to an area—through advertising campaigns as well as through establishing and maintaining birding sites—can improve the region's economy.

Another Sea Grant project associated with assessing

resource value is investigating the evidence for amenity-led growth in the Great Lakes and Lake Erie regions. To date, regional analysis verifies that there are some differences in growth and economic structure in the eastern and western Great Lakes. Descriptive analysis points to higher rates of employment, population, and wage growth in the western Great Lakes, compared to the eastern Great Lakes, between 1990 and 2008. Sea Grant researchers also found some initial evidence that industrial disamenities appear to be hindering economic vitality and that some natural amenities may be helping. Specifically, they found a positive relationship between population growth, forest cover and being closer to one of the Great Lakes, and a negative association with air emissions.

Creating Economic Development Opportunities and Awareness of Coastal Resources

Ohio Sea Grant and the Ohio Department of Natural Resources created the Lake Erie Ohio Birding Trail, which connects some of the state's most popular birding sites, and an accompanying website (***lakeerieohiobirding.info***). This project involved facilitating planning sessions for natural site managers. Ohio Sea Grant has also worked with site managers and county planners on managing visitation to prevent habitat impairment, as well as ways to improve the guest experience. In Conneaut, Sea Grant worked with the port authority to raise their awareness of birders who were visiting a mudflat for shorebird sightings. Once the port authority recognized that the mudflat was indeed attracting additional spending, they constructed a viewing platform and boardwalk.

As natural areas become more important to a community's ability to attract visitors, local businesses and decision makers begin to better understand their economic value, in addition to their ecological significance. More people are also seeking ways to experience the outdoors while on vacation, resulting in increased local spending. Because of this, Ohio Sea Grant produced *Explore the Lake Erie Islands: A Guide to Nature and History Along the Lake Erie Coastal Ohio Trail*, an award-winning guidebook highlighting parks, preserves, stories, and historical sites on U.S. and Canadian Lake Erie islands. The guide involved bi-national collaboration with more than 30 partners.

Ohio Sea Grant partnered with six historical, recreational diving, and research organizations to develop the website 'Shipwrecks and Maritime Tales of the Lake Erie Coastal Ohio Trail' (***ohioshipwrecks.org***) and created an accompanying publication to encourage visitor spending and increase awareness of the region's rich maritime heritage.

Ohio has the largest charter fishing fleet on the Great Lakes. But for most Ohio charter captains, the charter business is a secondary source of income, and information relating to the business of charter fishing is needed. For more than 30 years, Ohio Sea Grant has organized the annual Ohio Charter Captains Conference to strengthen the charter industry through education in business management, updates on rules, and the latest information on Lake Erie environmental issues. Attendance at the Ohio Charter Captains Conference runs from 135 to over 220 annually. More than two-thirds of the attending captains report an increase in their bottom line as a result of information learned at one or more of the annual conferences.

Sustainable Coastal Development Performance Measures
Number of coastal communities have adopted sustainable development practices as a result of Ohio Sea Grant activities

Target	**3**
Actual	**16**

Sustainable Coastal Development Performance Measures
Statewide tourism leaders have participated in Sea Grant training to create understanding of relationship between resource health and economic potential

Target	**50**
Actual	**239**

Increasing Capacity of Local Communities to Live and Work Sustainably

Ohio Sea Grant is involved in facilitating plan developments in many different areas of the coastal region. One example includes efforts through the Ohio Coastal Training Program to help the City of Sandusky and Erie County conduct 80 stakeholder interviews over a three-day period. As a result, Sandusky will be better able to lessen the impact of development along its coastline by including the opinions of both citizens and elected officials in its planning process.

Ohio Sea Grant was sought out by the National Park Service to facilitate civic engagement after a Congressional mandate requested a feasibility assessment for a 14-county Western Reserve Heritage Area. These communities had historically not worked regionally in linking stewardship, economic development efforts, and resource assessments. More than 3,800 individuals participated in town hall gatherings or through social media discussions. An advisory board was established, consisting of more than 20 regional community leaders, and this board still meets to advance strategies.

Building the capacity of local communities to help themselves is also important. Ohio Sea Grant trained 36 statewide economic

development professionals to conduct business surveys, assemble effective local task forces, conduct business survey analyses, and finance programs focused on business retention and expansion.

Ohio Sea Grant educated 36 water professionals and college students about ways to facilitate the continued health, well-being and prosperity of Ohio communities faced with increased cyanobacteria in the water. These photosynthesizing bacteria, commonly called blue-green algae, are capable of producing toxins that affect the liver, nervous system, and/or skin. They can also cause water quality deterioration associated with excessive production. Providing tools to water professionals and municipal water supplies to deal with cyanobacteria is essential to protecting the health of Ohio's public.

Since 2007, Ohio Sea Grant has been a leader in the designation and continued management of the Lake Erie Coastal Ohio Trail, a 200-plus mile national scenic byway. This project involves programs, speakers, and activities that have reached more than 12,000 residents and business owners. The project has been able to increase the recognition of the importance of balanced growth. Further, nearly $5 million has been leveraged for public access and other projects through Ohio Sea Grant grant-writing assistance, technical expertise, and facilitation.

The Ohio Sea Grant Program played a role in launching the Ohio portion of the Great Lakes Small Harbor Coalition to maintain small harbor infrastructure on Lake Erie. The Ohio boating industry employs almost 19,500 people and is responsible for more than $1 billion in annual economic impact. Until 2009, Ohio communities were not organized to work for the maintenance of Ohio's small recreational harbors. Ohio Sea Grant worked with the Michigan Small Harbor Coalition, the Lake Erie Marine Trades Association and coastal marine interests to organize and form the Ohio Chapter of the Great Lakes Small Harbor Coalition, as well as its website, to keep Ohioans informed of small harbor dredging and maintenance issues. Ohio Sea Grant data and technical information has informed ongoing discussions on maintaining small recreational harbors and updating US Army Corps of Engineers fact sheets.

From 2010-11, Ohio Sea Grant partnered with the Ohio State University Extension's Sustainable Development Initiative, the Village of Edgerton and its business community in Williams County to plan and organize ten community-wide sustainable visioning trainings and information gathering sessions based on

what citizens currently value and what their hopes for the future are. 225 participants provided the overall vision and developed a planning document complete with goals, objectives and strategies on how to achieve them. This document will guide the Village of Edgerton in future growth and conservation.

Nature-based tourism is emerging as a key market for the state's tourism industry; however, few natural resource managers or tourism industry professionals understand the market's complexities and needs. Understanding the nature tourist's needs is critical to creating and promoting a nature-based experience that will increase a local community's economy while not damaging its resources. In 2011, Ohio Sea Grant worked on five different projects related to building sustainable resource-based tourism strategies, including those led by municipalities, a county metropark, a visitors bureau, and a local grassroots preservation organization. Ohio Sea Grant helped resource managers and tourism professionals identify the market characteristics of recreational users best suited for their local resources and products. Ohio Sea Grant helps these users understand the information and infrastructure needs of these travelers. Ohio Sea Grant accomplished these tasks through one-on-one consultations, presentations, development of educational materials, and workshops.

Sustainable Coastal Development Performance Measures
New research projects focus on socio-economic research/outreach cost-benefits for local communities

Target 2
Actual 4

Sustainable Coastal Development Performance Measures
Ohio Sea Grant has assisted 5 public access projects along Lake Erie, resulting in 20 additional acres for recreational use

Target 5
Actual 8

To encourage further coastal development, Ohio Sea Grant has recognized the need to restore ecologically degraded sites so that they can attract development and recreation in the future. One such example is the Lower Black River. The Black River is the only river system in Ohio where the entire watershed has been designated as an Area of Concern. The Black River watershed AOC river system provides a source of drinking water for two communities (Oberlin and Wellington). It is estimated that approximately 180,000 citizens reside in the watershed. To help restore and then develop this region for tourism and recreation, Ohio Sea Grant helped the Black River RAP committee and the Lower Black River Restoration Sub-Committee to develop the necessary studies of and assisted in developing recommendations for improvements.

Creating Strong Leaders

Ohio Sea Grant provides information and resources to develop the leadership capacity of elected and appointed leaders, while increasing their understanding of how their decisions affect the Lake Erie watershed and coastal communities. At the local level, more than 60 mayors and county commissioners, as well as their planners, managers, and others who work directly in implementing policy, have sampled water quality from research vessels, viewed microorganisms under a Stone Lab microscope, and learned about the lake directly from scientists during Ohio Sea Grant's annual Mayors and County Commissioners Day.

Since 2009, more than 200 elected and appointed officials have participated in a ten-week local government leadership academy with a curriculum focused on public officials and public service, leadership skills and styles, building sustainable communities, team building, technology in local government, intergovernmental relations, ethics, communicating and working with citizens and the media, and conflict management and dispute resolution. Ohio Sea Grant worked with Ohio State University Extension, the Toledo Area Chamber of Commerce, the Ohio County Commissioners Association, the Ohio Township Trustees Association, and the John Glenn Institute for Public Policy at Ohio State University to develop a core curriculum for local government leadership training for elected and appointed officials.

With term limits reducing the institutional memory of the Ohio State House and Senate, it is more important than ever to provide Lake Erie educational opportunities to key legislative and administrative decision makers. Ohio Sea Grant partners with local agencies, private industry, non-governmental organizations and key state legislators to plan, develop and conduct legislative events at Stone Laboratory that include field trips, tours, educational exhibits, and a science discovery trip on a university research vessel. Since 2009, more than 200 key decision makers (state & federal legislators and their legislative aides, agency officials and Ohio State University administrators) have participated in at least one of these Ohio Sea Grant events, and nearly 100% said they intend to use the learned information in future decision making.

The health of Lake Erie's tourism industry is vital for Ohio, as it represents nearly one-third of total tourism economic impact. Policy decisions made by state tourism industry leaders contribute to the health of the industry, yet these leaders are often not prepared to take on the task. Recognizing the powerful role tourism industry leaders could play if they were armed with the necessary tools, contacts, and knowledge to make informed decisions, Ohio Sea Grant helped the Ohio Travel Association launch the Ohio Tourism Leadership Academy (OTLA) in 2008. Fifty-two tourism industry members have completed the year-long curriculum, the first of its kind in the nation. Nearly 80% of graduates have gone on to leadership positions in state or regional organizations.

Living and Working Sustainably Through Green Energy and Recycling

Making Stone Laboratory an example of sustainability creates a living laboratory for Ohio Sea Grant. Through grant funding provided by Ohio State University, the Friends of Stone Lab, the Royal Bank of Canada, and the Joyce Foundation, Ohio Sea Grant replaced approximately 40 toilets and shower heads with low-flow units. Solar thermal was added to the dining

hall roof to supply all kitchen needs, and 50 (12-Kilowatt) solar panels mounted on a pavilion create an outdoor classroom and lecture site. All 50 solar panels have individual readouts on a website, allowing the program to compare monocrystalline panels to polycrystalline panels and assess various angles to the sun's rays. The panels on top of the pavilion are viewable by more than 800,000 tourists annually and will be used within sustainable energy courses offered by Ohio Sea Grant at Stone Lab. All power is diverted through a mechanical room to allow future research on battery storage.

Sustainable Coastal Development Performance Measures
Coastal communities and citizens have adopted hazard resiliency practices to prepare for and minimize coastal hazardous events

Target	**200**
Actual	**2,290**

Every winter, boats kept in cooler climates are wrapped with a protective plastic shrink wrap cover. In the spring, the shrink wrap is removed and discarded. Historically, most of this material ended up in landfills. Since 2006, Ohio Sea Grant has helped coordinate a shrink wrap recycling collection with a plastics company located in the Appalachian region of Ohio. Since 2009, more than 1,225,000 pounds of boat shrink wrap has been recycled, saving each participating marina an average of $700 per year in waste disposal costs. The recycled plastic was made into more than 177,000 highway guardrail spacer blocks (over 220 miles worth) that cost taxpayers less than the traditional wooden spacer blocks.

Ohio Sea Grant, in partnership with the Ohio Lake Erie Commission, Ohio Coastal Training Program and Cleveland State University, conducted three workshops in Columbus, Cleveland and Toledo entitled "Planning for Renewable Energy in Your Community." Nearly 200 planners, economic development officials and elected and appointed officials learned about current renewable energy options and their impact on Lake Erie coastal communities.

A team of state-wide renewable energy and land use experts was gathered by Ohio Sea Grant to conduct a roundtable about how Ohio needs to respond to its communities about potential land use planning problems related to the future of renewable energy. As a result, the analysis and data was shared at three state-wide land use conferences. These annual conferences average over 100 attendees each and focus on the cornerstones of sustainability: community, economy and environment. Ohio Sea Grant also partnered with the Ohio Lake Erie Commission to promote the Ohio Balanced Growth Program that incorporates regional cooperation on growth and development in Ohio's communities.

Marinas are not substantial pollution generators, but because of their on-the-water location, their activities impact Lake Erie. Ohio Sea Grant's Clean Marinas Program provides an opportunity for marinas to voluntarily adopt EPA-approved pollution control practices that help minimize the potential for water pollution. Workshops, certifications and site reviews, and incentives are used to increase the sustainability of coastal marinas. A total of 37 Ohio Marinas are certified Clean Marinas and another 32 have pledged to become Clean Marinas.

Expanding upon the success of the Clean Marinas Program, Ohio joined forces with Michigan and Wisconsin Sea Grant through a Green Marinas Education and Outreach project supported by USEPA's Great Lakes Restoration Initiative. By working together, these programs are developing regional and consistent best management practices and bolstering educational offerings to marinas.

Safe and Sustainable Seafood Supply

Ohio Sea Grant Safe and Sustainable Seafood Goals

- Healthy Lake Erie fisheries that harvest, produce, process, and/or market fish products responsibly and efficiently.
- Informed consumers who understand the importance of ecosystem health and sustainable harvesting practices to the future of our Lake Erie fisheries, who appreciate the health benefits of fish consumption, and who understand how to evaluate the safety of the fish they catch.
- Sustainable fisheries to meet public demand.

Safe and Sustainable Seafood represents 14% of Ohio Sea Grant's efforts. Most seafood activity within the Ohio portion of Lake Erie is generated by the lake's fishery, including its abundant sportfishing and limited commercial activity. Aquaculture within Ohio is not a huge business and is limited in scope and size. In recent years, emerging threats and issues to the lake's overall vitality, which also impact the fishery, have increased in saliency and importance. Despite the diminished focal effort, however, Ohio Sea Grant has made substantial impacts to create an enhanced and healthy fishery, generating leaders aware of fishery issues, increasing productivity and profitability of the fishery, mitigating aquatic invasive species, reaching the public about fishery issues, and increasing productivity and profitability of aquaculture efforts.

Lake Erie's fishery is part of the fabric of Ohio's coastal communities. It contributes to community economics, cultural traditions, and pride. In particular, sport fishing is a major component of Lake Erie tourism, contributing more than $850 million annually to local businesses. Generations of residents have earned a living through the fishery, and Friday Night Fish Fries are a common venue for bringing communities together. Protecting this cultural tradition and economic force is important for preserving jobs, income, and tax revenues at the federal, state, and local levels.

The last few years have introduced new Lake Erie threats that endanger a healthy fishery, as well as increased media and public awareness of these emerging issues and long-term pressures to a healthy fishery and ecosystem. Perhaps the greatest example is the threat of Asian carp and other aquatic invasive species that alter ecosystems. The increased saliency of Lake Erie issues has created greater demand for Ohio Sea Grant research, education programming, and information. Combined with the 2009 opening of the Aquatic Visitors Center (a former fish hatchery at the popular Put-in-Bay tourism destination), Ohio Sea Grant has far exceeded projections for reaching the public with information about the fishery. The following sections will highlight our efforts to promote and support safe and sustainable seafood: (1) enhanced, healthy wild fishery, (2) leadership for Lake Erie's fishery, (3) improved productivity and profitability, (4) mitigation of aquatic invasive species, (5) new ways to reach visitors with fishery information, and (6) improved productivity and enhancement of aquaculture. These sections will also highlight the numerous research endeavors Ohio Sea Grant has supported, outreach opportunities Ohio Sea Grant has initiated, and partnerships Ohio Sea Grant has been associated with to help us reach our safe and sustainable seafood goals.

Due to report constraints, Ohio Sea Grant accomplishments and impacts related to aquatic invasive species are presented in this section, those most associated with climate change are included in the PRP report for Hazard Resilient Communities, and those targeting sustainable coastal development are included in the PRP report for Sustainable Coastal Communities.

Enhanced, Healthy Wild Fishery

Walleye and yellow perch are the two most economically important fish species in the lower Great Lakes. To successfully conserve these species, the Great Lakes Fishery Commission prioritized the identification of impediments to population growth and options for rehabilitating these fish stocks. Ohio Sea Grant funded research from 2007 through 2012 that explored (1) genetic differences between the two species, particularly related to their tendencies to return to spawning grounds and (2) travel patterns so that fisheries managers can direct conservation efforts to the most important areas. Walleye spawning groups, in particular, return to their sites of origins, such as the Maumee River, Sandusky River, and Van Buren reefs. Using the results of these studies, Ohio Sea Grant is now working on an online database to provide data and an interactive resource for academics and agency fisheries managers. Greater understanding of the behaviors of these important fish has led to improved regional management and better-informed researchers and fisheries management professionals.

Lake Erie tributary steelhead fishing has grown in popularity and economic importance, and the state's $600,000 stocking program produces $12 to $14 million annually in gains related to increased angler participation and spending. At 300,000 hours per year of participation, steelhead fishing has expanded tremendously and now steelhead are the third most popular fish species in Lake Erie behind Lake Erie open water walleye and yellow perch (2.0 and 1.5 million angler hours, respectively). There has also been a considerable increase in the number of guided fishing trips for steelhead in Ohio streams. Ohio and Pennsylvania hatchery managers and state fish biologists have begun modifying their stocking strategies due to Ohio Sea Grant-funded research. Research has helped to develop a natural tag using fish otoliths to track steelhead returns to their spawning sites. Using these data, biologists have now started to stock further upstream to maximize time for steelhead to imprint on their native tributaries, thereby increasing the probability that these fish will return.

New threats to the Great Lakes fishery have occurred over the current reporting period. For example, Viral Hemorrhagic Septicemia (VHSv), which causes massive fish die-offs in the Great Lakes, threatens our fishery and economy. A monitoring program using electro-shocking equipment was conducted by Ohio Sea Grant in collaboration with the Ohio Department of Agriculture and the US Fish and Wildlife Service to help refine the regulatory proclamation on intrastate fish movement and to prevent the spread of the disease inland from Lake Erie. Ohio Sea Grant research led to greater understanding of the timing and ecological impacts of VHSv, essential for developing management controls. In addition, Ohio Sea Grant is leading the way in VHSv detection. Existing VHSv testing is labor intensive, time consuming, less sensitive, and less accurate. Working with several state and federal partners, Ohio Sea Grant researchers have developed a new rapid StaRT-PCR test that is VHSv specific and can detect a single VHSv molecule in hours at a fraction of the cost.

Another step toward a healthy wild fishery is Ohio Sea Grant's support of research related to hormones. Hormones used in agriculture, particularly growth promoters used in concentrated animal feed operations (CAFOs), find their way into our waters and impact the development of the fishery. Ohio Sea Grant funded research has helped determine the soil types that can benefit from manure application and has helped develop guidelines for timing manure application to cropland to reduce the negative impacts of CAFO hormones on the fishery. This research resulted in a National Science Foundation grant to continue developing agricultural guidelines for ensuring healthy watersheds across the nation.

Safe and Sustainable Seafood Supply Performance Measures
Ohio Sea Grant will have reached 5,000 with education and outreach related to the Lake Erie fishery

Target	**5,000**
Actual	**56,931**

Leadership for Lake Erie's Fishery

A Great Lakes Fisheries Leadership Institute has helped emerging leaders understand and consider research-based fisheries management. By providing these community and organization leaders with fishing experiences, information on its impact, and discussions regarding challenges, graduates developed a greater understanding of how their future decisions may impact the vitality of the fishery. A total of 40

new leaders have graduated from this program and are sharing what they learned with others interested in protecting and improving Lake Erie sport fishing. For many of these leaders, this institute is their first opportunity to visit Stone Lab. When this experience is coupled with in-class discussions addressing the issues and challenges, a powerful and long-lasting impression is made that contributes to making smarter and better balanced decisions.

Improved Productivity and Profitability

Ohio has the largest charter fleet in the Great Lakes, yet its vibrancy and value is at risk due to socioeconomic and environmental changes. Helping charter captains adapt to a constantly changing environment, Ohio Sea Grant works directly with captains and their networks to educate and inform. An annual Ohio Sea Grant Charter Boat Conference reaches up to 25% of the licensed captains in the state with updates on fishery resource management, business management, laws and regulations, and marine technology. Two-thirds of those who take part annually report increased profitability due to information learned at the conference, and 89% of respondents in 2011 reported improving their operation based on information presented at the conference. Ohio Sea Grant also consistently takes the pulse of this important industry through surveys. Lake Erie charter captains conducted over 21,000 paid charter trips in 2010 with 73% of the trips focusing on walleye fishing. Estimated charter industry revenues for 2010 were almost $9.7 million. For most captains fuel costs were by far the most expensive operating cost of running their business.

Budget cuts at the state level have reduced and impaired the ability of both the Ohio Environmental Protection Agency and the Ohio Division of Wildlife fisheries managers to monitor the Lake Erie fishery. Further, budget cuts also reduce the ability of these agencies to train new staff in management techniques. Rather than counting on these agencies to train new employees when they are hired, Ohio Sea Grant, since 2007, assists in training. Ohio Sea Grant and Stone Laboratory have offered fish sampling workshops to increase the competitive advantages of entry-level applicants and to ensure a better-trained workforce. Seven workshop participants have been hired by the state thanks to skills obtained in our sessions.

Mitigation of Aquatic Invasive Species

Aquatic Invasive Species (AIS) threaten our nation's inland lakes, rivers, wetlands, estuaries, and oceans. Addressing AIS within the Lake Erie watershed involves a multi-pronged approach with various audiences to stop the transport of AIS. Working with the Ohio Division of Wildlife, Ohio Sea Grant updated and rewrote the Ohio AIS Management and Rapid Response Plan to direct action.

In addition to our involvement with the Ohio AIS Management and Rapid Response Plan, we have also collaborated with the University of Minnesota to educate professional tournament anglers about AIS. This education includes Ohio Sea Grant teaching "Best Management Practices" devised to prevent the spread of AIS. Evaluation results from these education events have led to additional information strategies. Additional education and outreach strategies are being developed to reach participants in the Ohio Clean Marina and Ohio Clean Boater programs, as well as launch ramp users and others who can use best practices to reduce fishery risks.

New Ways to Reach Visitors with Fishery Information

When people experience fishing and learn about Lake Erie, they gain a deeper understanding of the importance of stewardship. In 2007, state budget cuts necessitated the closing of a former Put-in-Bay fish hatchery that had been operated by the Ohio Division of Wildlife as a museum. This facility is next to the Ohio State University research facility at Stone Laboratory. In 2009, Ohio Sea Grant entered into a management agreement with the Division to reopen and improve the site. Staffed by Ohio Sea Grant, Stone Lab student workers, and volunteers, the Aquatic Visitors Center provides an on-the-dock fishing experience for youth under 16 years old. The center allows youth and adults to view Lake Erie under a microscope, as well as to participate in hands-on activities to learn about Lake Erie, food webs, sustainable sport and commercial

Safe and Sustainable Seafood Supply Performance Measures
Ohio Sea Grant will work with Ohio Department of Natural Resources and other partners to update statewide Ohio AIS Management Plan
Target 1
Actual 1

Safe and Sustainable Seafood Supply Performance Measures
Ohio Sea Grant will investigate the feasibility of developing at least two new Lake Erie or aquaculture fish products
Target 2
Actual 3

fisheries, and aquatic science. Since 2009, more than 56,930 people have visited the center and report being more likely to pay attention to Lake Erie issues in the future. New exhibits and program development follow current issues and include aquatic invasive species, Asian carp, unwanted medications in our waters, and harmful algal blooms.

Ohio Sea Grant has developed a fishery-oriented curriculum through its Stone Lab educational program, offering more than 10 fishery-focused courses and research programs to an average of 150 high school students, college students, and teachers each summer during the 2008-2011 reporting period. The courses and research curriculum continue to emphasize how the fishery is an intricate part of a sustainable Lake Erie ecosystem.

Ohio Sea Grant created social media opportunities before these platforms became routine and readily accessible. Since July 2009, 1,374,375 posts have been read on the Lake Erie Discussion Board and there are 407 registered users. Most of these posts are related to fishery regulations, practices, and issues. With the explosion of social media usage and platforms, a comprehensive social media strategy has been developed to continue to provide a forum for questions and answers; however, the Lake Erie Discussion Board provides a valuable way to monitor concerns and to participate in in-depth conversations related to Lake Erie fishery issues.

Ohio's youth experience fishing first-hand during several Ohio Sea Grant programs, including a 4-H Sea Camp on Kelley's Island each year. This 5-day event is designed to instill a sense of stewardship to the Lake Erie resource and intertwines science and popular recreational activities. Programs on lure making, aquatic biology, and fishing techniques are led by Ohio Sea Grant. Since 2008, 72 adolescents and counselors/staff learned about casting, trawling, knot-tying, and filleting and preparing a catch, as well as field sampling techniques and identification skills.

Improved Productivity and Enhancement of Aquaculture

Ohio Sea Grant has helped the Ohio aquaculture industry work on developing golden shiner baitfish production technology. Two growers successfully cultured golden shiners from hatching to market. In addition, Ohio Sea Grant worked with the Center for Innovative Food Technology to evaluate market feasibility and uses of two underutilized fish, the freshwater drum and white perch.

Demand for yellow perch is high, as this is the traditional fish used in local restaurants and by consumers in many Great Lakes states. Ohio ranks first in pounds of yellow perch sold in the nation. Despite this economic opportunity, expansion of the yellow perch aquaculture industry has not occurred. One reason is the relatively slow growth of cultured fish populations. Ohio Sea Grant research indicated that only 60% of the fish cultured in aquaculture operations reach market size. Ohio Sea Grant researchers used genetic selection techniques and selective breeding to improve growth rates 28% to 54%, and these genetically-improved perch have been distributed to fish farmers statewide for field-testing, creating added revenues and markets.

The new test for VHSv developed by Ohio Sea Grant researchers also protects the aquaculture industry and the bait fish trade, as fish can now be tested quickly and economically before being sent to fish farms throughout and beyond the state.

Hazard Resilience in Coastal Communities

Ohio Sea Grant Hazard Resilient Communities Goals

- Community capacity to prepare for and respond to hazardous events.
- Effective response to coastal catastrophes.
- Widespread understanding of the risks associated with living, working, and doing business along the Lake Erie coast.

Hazard Resilient Coastal Communities represents 24% of Ohio Sea Grant's efforts. This focus area has increased in importance since the Ohio Sea Grant Strategic Plan was developed due to the emergence of highly visible issues, such as harmful algal blooms. This has increased local demand for Ohio Sea Grant research, education, and outreach.

In defining hazards along Lake Erie, Ohio Sea Grant considers those forces that disrupt the ecosystem or produce personal, economic, or property risk. These risks may be associated with public safety, health, property loss, and diminished revenue or increased costs. Examples of Lake Erie hazards include erosion, flooding, severe water level fluctuations, rip tides, and harmful algal blooms. Ohio Sea Grant considers climate change as a hazard as well, as a changing climate accelerates and intensifies many of the hazards identified above. For the Great Lakes, the most serious symptoms of a changing climate include more frequent and intense storm events, low water levels, and increased water temperatures. Each potential change has its own short-term risks, such as property damage, impact on access, and health risks. Each also fosters an environment for long-term hazards, such as costly infrastructure repairs, revised storm water management strategies, increased run-off of nonpoint pollution, and higher water temperatures contributing to increased harmful algal growth.

Lake Erie is the southernmost, shallowest, and warmest of the Great Lakes. Due to the lake's physical characteristics, impacts of emerging issues often appear here first and at greater intensity. Lake Erie's watershed is also the most populated, meaning not only is there a greater dependency on the lake for local communities and economies, but increased media exposure and public awareness when things go wrong. Although this creates a greater demand for Ohio Sea Grant research, education, and outreach, the increased saliency creates additional opportunities to engage stakeholders in discussions about Lake Erie, its value, and stewardship. The following sections will highlight our efforts to promote and support a hazard resilient ecosystem: (1) research to assess risk, (2) safety education, (3) forecasts for the future, and (4) response to hazards. These sections will also highlight the numerous research endeavors Ohio Sea Grant has supported, outreach opportunities Ohio Sea Grant has initiated, and partnerships that Ohio Sea Grant has been associated with to help us reach our hazard resilient goals.

Due to report constraints, Ohio Sea Grant accomplishments and impacts related to aquatic invasive species are presented in the PRP report for Safe and Sustainable Seafood, those most associated with climate change are included in this section, and those targeting sustainable coastal development are included in the PRP report for Sustainable Coastal Communities.

Hazard Resilience in Coastal Communities Performance Measures
Decision makers have received information and training regarding coastal hazard risk planning

Target 100
Actual 5,134

Research to Assess Risks

Research to assess hazard risks includes both research related to mitigating hazards and research of stakeholder needs for adapting to new conditions and mitigating damage.

Biofilm, including microorganisms that grow on boat hulls, can cause major problems for Great Lakes freighters by corroding ships' hulls and increasing drag in the water. Preventative measures are estimated at more than $5.7 billion each year. Ohio Sea Grant researchers discovered an environmentally-friendly alternative to the heavy-metal based paint used to prevent biofilm build-up: a natural chemical called *rhamnolipid*, which "signals" certain biofilm organisms not to attach. A new instrument developed to test the *rhamnolipid's* properties is already being requested for use by biofilm researchers across the country.

When storms rage across Lake Erie in the spring and summer, sediment is washed from the landscape, and sediment already found at the bottom of the lake and its tributaries is stirred up and redistributed. Over time, the build-up of sediment reduces the depth of harbors, making it necessary to dredge to restore safe passage. With dredging comes an additional risk of spreading pollutants like mercury and PCBs, which often rest at the bottom of these harbors attached to sediment particles. To assist communities in determining whether managing contaminated sediment via capping or dredging is the safest way to remove sediments, Ohio Sea Grant researchers created a computer model. This model is used as a risk assessment tool to help communities deal with sediment contamination in the best possible way to minimize distribution of small sediment particles (and the attached contaminants) into the water column or into the materials used to cap contaminated sediments.

Ohio Sea Grant researchers have combined ultrasound waves and engineered algae to develop a treatment system for mercury removal in Lake Erie sediment. The ultrasound separates the mercury from the sediment particles to which it is attached, and the now patented alga binds the contaminant so it can be removed. Lab tests showed that the system can remove 30% of mercury contamination in about 30 minutes, with in-field prototype testing pending.

Ohio Sea Grant researchers are studying how well different types of avian influenza can survive in Ohio's coastal marshes. Despite the lack of recent outbreaks, avian influenza—"bird flu"—is still found in bird populations across the globe, and migrating birds could carry the virus to Ohio, where coastal marshes represent an important stopover on many major flyways. Understanding the risk of an avian flu outbreak helps public health officials, resource managers and animal caretakers better prepare for (and prevent) future events.

Much of the Lake Erie port and harbor infrastructure needed to support commercial transportation is 50 to 100 years old and needs to be repaired or replaced in the next decade. To help communities make smart future port infrastructure decisions in the face of global changing climate, Ohio Sea Grant helped lead the Great Lakes Sea Grant Network in a NOAA Sectorial Applications Research Program (SARP) project in Toledo and Duluth. Focus groups in Toledo, one of the busiest Great Lakes ports, indicated that even a few inches of lake level change

makes a big difference to commercial transportation on the Great Lakes. Port managers and planners want to learn more about the potential impacts of climate change on their work, but most respondents were not looking ahead more than one to five years. Ohio Sea Grant is working to help identify user needs and bring global climate change information to the local and regional level. Over a dozen technical products, tools and webinars have been developed since the initial focus groups, including a regional modeling effort, new data visualizations, Great Lakes Sea Grant Network fact sheets, and a harbor infrastructure economic matrix.

Following extensive phosphorus reduction efforts initiated in the 1970s, algal blooms in Lake Erie had been largely absent. However, blue-green algae (cyanobacteria) blooms in Lake Erie's Western Basin and Dead Zones in the Central Basin began to reappear in the mid-1990s and have increased in the past two years. These blue-green algal blooms and the Dead Zone warrant attention in this hazard resilient focus area because research has shown that the algal blooms plaguing the Western Basin of Lake Erie are closely tied to the nutrients released from sediments during spring runoff. Spring runoff, unfortunately, has been linked to both an increased frequency of storms and an increased volume of water associated with each storm. Together, the frequency of rain events and the volume of water discharged per event, are being linked to global climate change, clearly a hazard to community resilience. Beginning in 2009, Ohio Sea Grant led a team of 15 scientists, representing two countries and 11 institutions, agencies, and companies, in developing and conducting seven collaborative research projects, and explored strategies to reduce nutrient loading to Lake Erie and eliminate harmful algal blooms. Three state agencies are now attempting to implement the strategies, and Ohio Sea Grant has been asked to assist in that process. Ohio Sea Grant also serves on Ohio's Phosphorus Task Force II and the Agriculture Nutrient Task Force. Based on our success in helping Ohio receive over $11 million dollars from USEPA to support over 30 projects to restore Lake Erie, we were also asked to co-lead Ohio's Synthesis Team to summarize results of these projects. As a member of these teams, Ohio Sea Grant is currently developing recommendations to decrease nutrient inputs, assisting with research to understand the movement of sediments and nutrients through Lake Erie, and involved in discussions on how to effectively manage the resources of Lake Erie.

Policymakers making decisions to address the hazard-causing impact of a changing climate need viable options and a better understanding of the consequences of their actions and inactions. To identify existing policymaker priorities and needs, nearly 100 local, state and federal policymakers were surveyed by Ohio Sea Grant in 2010. Water quality, habitat, species movements, lower lake levels, droughts, and health issues topped their list of concerns. Barriers to adaptation include lack of funding, lack of staff time, lack of knowledge, and lack of public support. Resources most needed include education about impacts, financial assistance, strategies for communicating, and technical expertise and tools. Policymakers need local and real-time data, institutional coordination, technical assistance, and training in order to decrease environmental impacts and to protect quality of life for citizens. This survey has been used regionally to build tools and structure communications with policy officials.

Hazard Resilience in Coastal Communities Performance Measures
Needs assessments are conducted with at least three stakeholder groups on their needs for climate change information and tools
Target 2
Actual 3

The NOAA Great Lakes Regional Collaboration Team, Great Lakes Sea Grant Network, and Old Woman Creek National Estuarine Research Reserve worked with the Great Lakes and Saint Lawrence Cities Initiative to develop specialized training for Great Lakes coastal communities targeting adaptation to the impacts of climate change. To ensure that training met priority needs and provided accessible and applicable tools and resources, these organizations conducted a needs analysis of adaptation training and information needs of Great Lakes communities. Results are being used throughout the region to structure tool and training development, particularly for planners and storm water managers.

Ongoing studies related to risk assessment include (1) the public health impacts of harmful algal blooms and (2) collaboration with University of Michigan and Michigan State University on the Great Lakes Integrated Science and Assessment Center (GLISA). The GLISA project is assessing stakeholder needs related to climate change in three primary target groups – agriculture, water management, and outdoor recreation. This project is unique in that it is evaluating the role of boundary organizations in building trust and communicating information.

Safety Education

Ohio Sea Grant collaborated with other organizations to offer Stone Lab workshops on harmful algal blooms to 36 water management professionals and students. These workshops are critically important because Lake Erie provides drinking water for 13 million people. Enrolled professionals received contact hours toward state certification and learned how to protect the quality and safety of municipal water supplies.

Ohio Sea Grant, through Stone Laboratory, provides safety training for more than 15 divers each year and was instrumental in developing safe diving protocols for Ohio State University. Ohio Sea Grant's Diving Safety Officer has supervised university research dives throughout the world,

including Hawaii, Saipan, and the Caribbean. Safe ice fishing on Lake Erie involves knowing basic rules and being aware of dangerous conditions. Since 2008, more than 12 weekly ice fishing safety updates were provided by Ohio Sea Grant for use by the Ohio Department of Natural Resources and potential ice fishing anglers.

Working with the Cuyahoga County Health Department, Ohio Sea Grant presented at annual beach manager gatherings for all public beach managers, addressing many of these managers' information needs related to beach nuisances and issues, such as fish-kills, mayflies, and harmful algal blooms. Ohio Sea Grant also co-authored a climate change presentation in collaboration with University of Michigan and Michigan State that was presented to approximately 30 Great Lakes beach mangers at an annual conference in 2011. Ohio Sea Grant provided rip current information in both English and Spanish to better address the City of Lorain's large Hispanic community. Rip tide safety instruction was also provided at two Cleveland-area beaches.

Forecasts for the Future

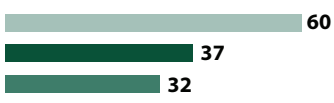
Beginning in 2010 we began forecasting an almost immediate recovery from HABs if we could reduce the loading of phosphorus by two-thirds. The drought of 2012 is providing a perfect natural experiment and test of our forecast. On 5 July we joined NOAA and hosted a press conference at Stone Lab to release our prediction for the severity of blooms for the remainder on 2012.

Response to Hazards

In response to harmful algal bloom outbreaks, Ohio Sea Grant has been at the forefront of research, education, and outreach. As described in previous sections, Ohio Sea Grant is a leader in integrating and directing research from 11 universities to identify feasible solutions, and has delivered the results of this research to water managers, policymakers, and others involved in developing a strategy. As the tourism industry is on the front-line of many coastal environmental issues, Ohio Sea Grant developed a taskforce to identify communications strategies and efforts that will minimize economic losses and increase worker and guest safety. Due to Ohio Sea Grant's discussions with the industry and Ohio EPA, rapid-response and monitoring kits are being developed to detect unsafe E. coli levels in order to provide beach managers with faster results. Ohio Sea Grant is also establishing a water quality lab at Stone Laboratory to minimize the time needed to get results, again reducing economic losses and increasing safety. Working with state and federal agencies, Ohio Sea Grant also developed HABs materials that answer key questions citizens have about HABs. Through collaboration with several state agencies, informational material for display at public events, and presentations for the public, nearly 5 million citizens have information on HABs and are better prepared to address this growing issue and protect their families and pets.

To strategically plan climate outreach for the state and help localize the climate change issue, Ohio Sea Grant created the OSU Climate Change Outreach Team. The team, representing nine departments within Ohio State University, works with six other state and federal agencies, as well as local health departments and planning agencies, to coordinate climate education and outreach initiatives within the Great Lakes region. Content is based on stakeholder needs assessments, as well as monthly surveys following webinars. More than 3,300 participants representing 350 organizations from around the country have attended the monthly webinars since 2011, with 90% acknowledging they learned new information and would share it. The webinars have been used in 10 secondary

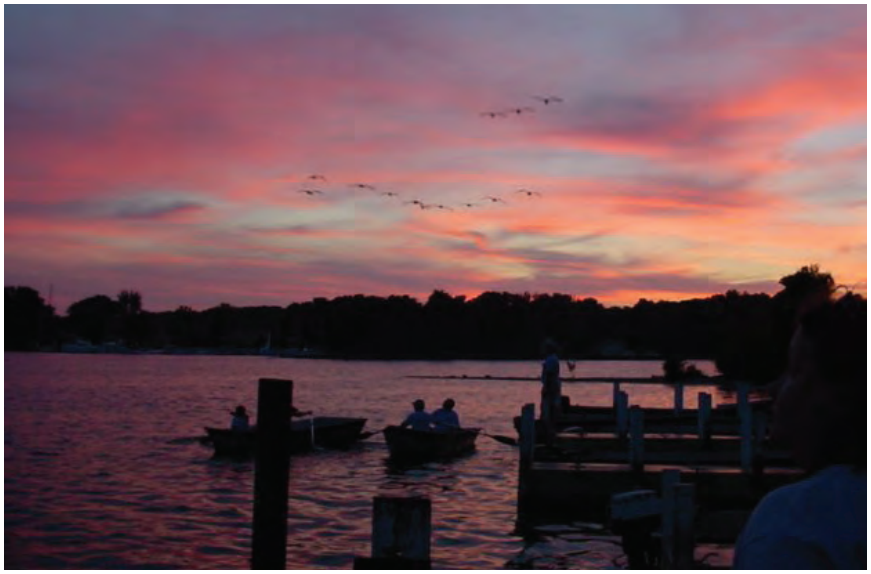
Hazard Resilience in Coastal Communities Performance Measures
Marinas within the coastal Ohio area are certified as Clean Marinas



and college courses as teaching tools, and the website is used as a regional resource for natural resources professionals with nearly 8,000 unique visitors. The partnership sparked the creation of a multi-disciplinary group of OSU researchers to tackle regional climate-related issues.

To leverage Ohio Sea Grant's ability to reach thousands with climate-related information each year, Extension agents have incorporated information about climate change into most of their programs. In addition, changes in curriculum, lectures, tours, and displays at both the Aquatic Visitors Center (which reaches 12,000 per year) and Stone Laboratory (which provides instruction for 5,673 per year) have integrated information about climate change.

A partnership with the Ohio Coastal Training Program helped introduce nearly 450 environmental professionals from around the state to climate adaptation planning at adaptation planning workshops since 2009. Four publications on climate impacts and adaptation have been developed and delivered to nearly 10,000 stakeholders through the program's magazine and e-newsletter.



Climate-related information has also reached more than 40 coastal communities through an Ohio Coastal Training Program climate module, as well as specific and targeted training provided on a consultation basis. Communities in which some of these trainings have occurred include Toledo, Cleveland, Painesville, Fairport Harbor, Ashtabula, Geneva, Geneva-on-the-Lake, North Perry, Sylvania, Oak Harbor, Columbus, Jefferson, Put-in-Bay, Lorain, Sandusky, Huron, Madison, Austinburg, Conneaut, Andover, North Kingsville, and Unionville. This is probably a conservative measure, as many trainings are held in one community, but are attended by decision makers and citizens from nearby communities.

Creating teachers who understand climate change and can introduce the topic in the classroom, Ohio Sea Grant provided support of the Great Lakes Climate Curriculum, which has taught 12 formal and informal educators from the Great Lakes region. The program also provided funding to update the curriculum and its 15 lesson plans. In addition, Ohio Sea Grant has provided at least 11 guests lectures surrounding hazard issues, reaching more than 300 individuals attending these events at Stone Laboratory.

Finally, Ohio Sea Grant has worked to restore critical habitats around Lake Erie. This clearly represents Ohio Sea Grant's commitment to return Lake Erie to a resilient ecosystem. Ohio Sea Grant creates clean, healthy, and resilient watersheds through participation on Areas of Concern (AOC) projects, as well as with watershed committees and universities throughout the region. Collaboration reduces duplication and leverages resources and expertise. Great Lakes collaboration includes GLISA, GLOS, SARP, and the Great Lakes Sea Grant Network, to name just a few. The Black River Area of Concern (AOC) is restoring wetlands, building fish shelves, and reclaiming floodplain areas thanks to Ohio Sea Grant expertise and assistance. As a partner in the project and master plan, Ohio Sea Grant has helped secure funding and provided recommendations for restoring this important area. Ohio Sea Grant has also contributed toward the potential delisting of the Ashtabula River AOC through involvement as a leader in the community effort. Ohio Sea Grant research, information transfer, and staff have supported community and governmental efforts to identify the contaminated sediments, seek financial resources, design the remediation and implement remedial actions to restore the local ecosystem. A $75 million dredging effort removed over 600,000 cubic yards of contaminated material from the lower two miles of the Ashtabula River and placed it in a specifically designed landfill that was capped in 2009. This significantly reduced the contamination threat to the Lake Erie ecosystem and resulted in the construction of over 1,000 feet of fish habitat and about two acres of wetlands on the lower Ashtabula River. An additional $1.5 million was received by the OEPA in 2011 for additional habitat restoration work in the Ashtabula AOC. These Ohio Sea Grant efforts helped one local community significantly reduce the risk of a serious environmental threat to the Lake Erie ecosystem and restore two acres of wetlands. Restoration of an additional 8 acres of habitat is ongoing.

APPENDIX D

2012 COVER EMAIL FROM NATIONAL DIRECTOR ACCOMPANYING FINAL EVALUATION

January 18, 2013 email cover letter from Leon Cammen, Director of the National Sea Grant College Program to Jeff Reutter accompanying the final report and evaluation of the 2012 PRP review process of the Ohio Sea Grant College Program.

Dear Jeff:

Program evaluation plays a central role in maintaining the credibility of the Sea Grant Program by highlighting the impact the Program has on our coasts and coastal communities and by helping find ways to provide even more effective service to our stakeholders. Sea Grant's evaluation process is comprehensive, involving site visits and panel reviews as outlined in the 2009 policy document "National Sea Grant College Program Evaluation" (http://seagrant.noaa.gov/other/admininfo/ppe/index.html). During 2010 and 2011, a series of site visits to each Sea Grant Program demonstrated that without exception, Program management is effective and the users of Sea Grant information are well-engaged in planning and implementing Sea Grant's diverse suite of activities.

To round out the evaluation process, in October 2012, the first set of Performance Review Panels (PRPs) were held here in Silver Spring to assess each Sea Grant program's progress toward achieving its strategic plan and its impact relative to federal investment between 2008 and 2011. Five panels of focus area experts met for three to five days to review program performance in Healthy Coastal Ecosystems, Hazard Resilient Coastal Communities, Sustainable Coastal Development, Safe and Sustainable Seafood Supply, and the Marine/Coastal Literacy cross-cutting area. The reports that each of the panels reviewed and the Program Summaries that you provided are available in PDF format on the PIER homepage (https://pier.seagrant.noaa.gov/User/UserHome.aspx) in the section entitled "Upload PRP Documents." Once all the panels completed their reviews, the ratings were weighted by the percentage of Program resources that you reported for each focus area and combined to give an overall rating for your Program.

The PRP reviews for your Program are attached. Please review the panel comments and your ratings, and if you have any questions, you can contact your Program Officer. As outlined in the attached memo,

if the PRP has made a factual error in reviewing your program materials, you can submit a memorandum to your Program Officer by February 20. During the next NSGO Annual Review in May, we will share the highlights of the PRP evaluations and any responses to help all Program Officers become more familiar with all the Programs, and we will complete the performance evaluation for each of the Programs as outlined in the evaluation policy document.

Since this was the first time for this type of review, we are looking to make improvements where needed. We will continue engaging with you, the advisory board, and the panelists to make the evaluation process even more effective in the future.

In closing, this has been a very rich experience for everyone who has been involved and certainly served to emphasize the strength of the Sea Grant Program. Every one of the panelists came away extremely impressed with the depth and breadth of Sea Grant's impact on the stakeholders you serve. I thank you and your staff for the hard work and dedication you provide each and every day.

Regards,
Leon

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Leon M. Cammen
Director, NOAA Sea Grant
1315 East-West Highway
Silver Spring, MD 20910
Phone: 301-734-1088
Fax: 301-713-1031
Email: leon.cammen@noaa.gov

APPENDIX D

2012 FINAL PRP REPORT AND NATIONAL RANKING FOR OHIO

OHIO SEA GRANT
2012 Performance Review Panel
Comments by Focus Area

Sea Grant
National Sea Grant Office

NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

Performance Review Panel Evaluation Summary

In October 2012, the first Performance Review Panel (PRP) evaluation was held in Silver Spring, MD to assess each Sea Grant program's progress towards achieving its strategic plan and its impact relative to federal investment between 2008 and 2011. Five panels of focus area experts met to review program performance in Healthy Coastal Ecosystems, Hazard Resilient Coastal Communities, Sustainable Coastal Development, Safe and Sustainable Seafood Supply, and the Marine/Coastal Literacy cross-cutting area. The Sea Grant Program is approximately halfway through the first four-year cycle, making this a transitional PRP. In the future, PRPs will occur about two years after the completion of the programs' four-year plans.

As the first time all Sea Grant programs were evaluated concurrently by the same group of individuals, this transitional PRP represents a major step for the National Sea Grant College Program and is a key evaluation component of the Planning, Implementation and Evaluation (PIE) process.

Ohio Sea Grant's performance ratings for the individual Focus Areas are:

Focus Area	Progress towards Plan	Overall Program Impact	Focus Area Rating	Estimated Level of Effort (%)
HCE	3.1	4.0	3.6	39%
HRCC	2.8	2.0	2.4	24%
LIT				
SCD	3.4	4.0	3.7	23%
SSSS	3.2	2.0	2.6	14%

Based on the Focus Area ratings weighted by the level of effort, Ohio Sea Grant's Overall Performance Rating is **3.2**.

Overall Program Performance Rating

Each PRP working group rated two areas – Progress towards Plan and Overall Program Impact – and averaged the ratings to generate a Focus Area Rating. The Focus Area ratings were

combined using a weighted average – the proportion of funding resources allocated to each of the national focus areas – to produce the Overall Program Performance Rating.

Panelists were asked to use a baseline rating of 2 for both progress towards the plan and overall impact, which could change based on the materials presented. The ratings criteria for each section were as follows:

Progress Towards Program Plan

Highest Performance (4) – exceeds expectations by an exceptional margin in most areas/aspects
Exceeds Expectations (3) – by a substantial margin in some areas/aspects
Successful (2)
Below Expectations (1)
Unsuccessful (0)

Overall Program Impact

Highest Performance (4) – particularly outstanding scientific or societal contributions on the local, regional or national level relative to their level of Sea Grant federal investment
Successful (2) – an acceptable, but not unusual, level of performance relative to their level of Sea Grant federal investment
Below Expectations (0) – a level of performance substantially less what would be expected relative to their level of Sea Grant federal investment

Next Steps

The National Sea Grant Office (NSGO) Annual Review that follows this PRP evaluation will be expanded to include a performance assessment based upon the PRP ratings. If a program believes the PRP has made a factual error in reviewing the program materials, the Sea Grant Program Director has the opportunity to submit a memorandum to the Program Officer by February 20, 2013 for consideration during the NSGO Annual Review. This NSGO Annual Review finalizes Program ratings and will be used to allocate merit funds. A final evaluation package, which includes the Site Visit Report, the PRP reports and the outcome of the NSGO Annual Review, will be sent to the Sea Grant Program.

Future Evaluation

To ensure the Sea Grant programs were adequately evaluated and improve this process in the future, at the end of the PRP review we asked the Panelists for their comments and recommendations on the process. We are also planning to solicit feedback from the Sea Grant Association and National Sea Grant Advisory Board. We will use those comments and recommendations to streamline and improve the PRP process for 2015.

Conclusion

If you have any questions about this process or about your ratings, please contact your Program Officer.

Healthy Coastal Ecosystems

Progress Towards Plan - Is the Program making significant progress towards their previously approved Program Goals, Program Performance Measures, and/or Program Objectives in this focus area?

Rating: 3.1

Explanation for the rating:
The Ohio Sea Grant Program (OH SG) is exceeding expectations with regard to performance towards their healthy coastal ecosystem goals.

The write-up is detailed, well-formatted and easy to read except for annoying redundancies in the "Impacts and Accomplishments" section and overly long comments in the Performance Measures and Program Objectives.

There is a good balance of effort in scientific research, outreach and education that is highly relevant to the issues facing Lake Erie and its coastline, including sedimentation and dredging, nutrient loading and phosphorus, harmful algal blooms, hypoxia, invasive species, climate change and sustainable coastal communities and economic development. The Summary Report also addresses accomplishments in creating an educated workforce, lifelong learning about Lake Erie and the importance of stewardship, educating stormwater managers, restoring critical habitats and developing decision-making tools and ecosystem-based approaches.

Performance measures are mostly met or exceeded. This is impressive progress for a plan that is essentially midway in execution.

For the Healthy Coastal Ecosystems focus area, OH SG has three program goals: (1) restored function and productivity of Lake Erie degraded ecosystems; (2) sound scientific information to support ecosystem-based approaches to managing the Lake Erie coastal environment and (3) widespread use of ecosystem-based approaches to managing land, water, and living resources in the Lake Erie coastal area.

For the first goal, OH SG supported research that helped populations of the Lake Erie water snake recover and conducted outreach programs on the ecological benefits the snakes provide. The Program assisted in the development of a master plan for the ecological restoration of the lower Black River with support leveraged from the USEPA. An outreach program targeted the safe deposal of pharmaceutical and personal care items in cooperation with Pennsylvania Sea Grant. Ohio Sea Grant also worked with local communities to dredge contaminated sediments from the Ashtabula River.

For the goal of sound scientific information to support ecosystem-based approaches to managing the Lake Erie coastal environment, OH SG developed a comprehensive outreach campaign on invasive aquatic species that affect the aquatic ecosystems. Place-based educational venues supported Lake Erie literacy and were used to support Great Lakes literacy

efforts across the upper Midwest. Environmental drivers associated with the pathogenicity of avian influenza virus were examined in marshes along the upper Midwest waterfowl flyway. The use of ultrasound for remediating contaminated sediments was investigated.

A high resolution hydrodynamic shoreline model was developed to help communities better plan shoreline uses. Visioning training and information gathering sessions were conducted with coastal Lake Erie communities to assist with development plans. A fact sheet was produced to help citizens understand the potential impact of harmful algal blooms and conducted workshops for water professionals on HABs, particularly cyanobacteria.

The Stone Lab was used by several thousand students and teachers for immersion training in the environmental sciences. Eight undergraduate students participated in REU experiences at the Stone Lab. Curricular material for high school teachers was developed through climate change courses supported by OH SG.

The Program partnered with the US Coast Guard to take advantage of winter collecting opportunities on Coast Guard assets while providing for Coast Guard personnel interactions with students and scientists that might help them in post-career endeavors. Ohio Sea Grant sponsored researchers used LiDAR data to develop detailed analyses of Great Lakes shorelines to help predict patterns of erosion. Outreach programs targeted the general public as well as the academic community. Support for a Knauss Fellow resulted in several high quality scientific publications and presentations.

For the third goal, widespread use of ecosystem-based approaches to managing land, water, and living resources in the Lake Erie coastal area, the Stone Lab helped train agency biologists and technicians in fisheries management methodologies. The Program worked with other agencies to reduce nutrient loading that leads to harmful algal blooms and with local marinas to be environmentally responsible. Considering the size of the federal investment, OH SG has exceeded expectations in HCE research, outreach and education.

<u>Overall Program Impact-</u> Considering the level of Sea Grant federal investment, is the Program making a significant contribution to science and technology in this focus area? Considering the level of Sea Grant federal investment, is the Program making a significant contribution to society beyond the contribution to science and technology in this focus area?

Rating: 4.0

Explanation for the rating:
The OH SG Program is making an outstanding contribution in the Healthy Coastal Ecosystems area.

Particularly related to the size of the federal investment, the contributions to science, engineering and technology are meritorious.

The Program has also done an excellent job of leveraging their federal funding by successfully competing for Great Lakes Restoration Initiative (GLRI) grants and partnering with other organizations on research, education and outreach activities.

Most activities have had regional impacts and accomplishments in the Lake Erie coastal communities serviced by OH SG. Of Great Lakes basin wide significance is OH SG's leadership role in developing the Great Lakes Regional Research and Information Network (GLRRIN), a research coordination for the Great Lakes region. The research that led to the recent removal of the Lake Erie water snake from the Federal threatened species list has national significance in support of the Endangered Species Act.

Of regional significance, OH SG far exceeded its target for number of acres of degraded ecosystems restored. This is because of a combination of research, education, outreach and partnering with other agencies working to restore internationally designated Areas of Concern (AOC's). The Program partially funded (and leveraged) research collaboration on the resurgence of algal blooms in Lake Erie and hypoxia in the so-called "Dead Zone" in the bottom waters of Lake Erie's central basin. The research included the finding that phosphonates in Roundup-Ready crops need to be included in phosphorus loading budgets to Lake Erie.

The number of scientific publications is often not the best measure of impact or contributions, but the number of publications, many in prestigious journals, combined with technology transfer and closely linked partnerships and communications with resource managers and the user community has made the scientific and societal contributions particularly outstanding. Impacts have benefitted the entire coastline serviced by OH SG and the State of Ohio, but also many of the activities have had regional influence throughout the Great Lakes region, including internationally with Canada.

The OH SG extension, outreach and communications staff often works on the same issues as the research scientists and engineers. This strengthens the potential for science information to be used by resource managers and to inform citizens and constituent groups. The number of stakeholders reached concerning ecosystem-based management approaches to resource management in Lake Erie far exceeded the targets in their strategic plan.

The OH SG Director is also Director of the Ohio State University Stone Laboratory, where education programs about the Lake Erie ecosystem reach hundreds of school-age children in addition to undergraduate and graduate students taught in summer field and laboratory classes. The Ohio State University and Stone Lab were leaders in the COSEE "teach the teacher" program. This emphasis on education is continuing and expanding to build an educated workforce and support for Lake Erie sustainability issues.

Little attention seemed to be given to the economic impacts of programs supported or conducted by OH SG, but social benefits were exemplary. Focus was given to informing the citizenry on, in particular, harmful algal blooms, coastal hydrodynamic change and safe disposal of pharmaceuticals as well as environmental and Great Lakes literacy for students and teachers.

Hazard Resilient Coastal Communities

Progress Towards Plan - Is the Program making significant progress towards their previously approved Program Goals, Program Performance Measures, and/or Program Objectives in this focus area?

Rating: 2.8

Explanation for the rating:
Ohio Sea Grant (OH SG) is a successful program with a unique take on hazard resilience. The Program is making good progress towards achieving the HRCC portion of its plan, and has exceeded three of its five performance measure targets. The documentation provided clearly articulates how OH SG achieved HRCC success. Evidence of progress on the "1000 citizens provided with information and/or trained in local hazard resiliency and hazard mitigation tools, techniques, and best practices" can be found in OH SG's monthly Global Change, Local Impact climate webinar series and regional climate change curriculum (PIER 15999). The Performance Review Panel database report does not support progress on the "number of public beach managers report using OH SG-provided communication tools and information regarding rip currents to train lifeguard and beach personnel". But, in the Summary Report, OH SG claims to have provided rip current information in both English and Spanish to better address the City of Lorain's large Hispanic community. Rip current safety instruction was also provided at two Cleveland-area beaches (Summary Report; p4).

Similarly, five of six performance objectives have already been achieved. The remaining objective, to develop a tool for decision makers to assess risk vulnerability, is being addressed through the Ohio Coastal Training Program, where "evaluations are conducted for hazard-related workshops and trainings." Pilot versions of evaluations will be used to develop a final tool before 2013 (Program Objectives Table; Comment).

Note: OH SG accomplishments and impacts related to aquatic invasive species for Safe and Sustainable Seafood are listed in the Program Performance Review Panel database report. But, "due to report constraints", accomplishments associated with climate change are not included in the Report. Instead, climate change-related accomplishments are included in the Summary (Summary Report; p1).

<u>Overall Program Impact-</u> Considering the level of Sea Grant federal investment, is the Program making a significant contribution to science and technology in this focus area? Considering the level of Sea Grant federal investment, is the Program making a significant contribution to society beyond the contribution to science and technology in this focus area?

Rating: 2.0

Explanation for the rating:

Ohio Sea Grant is successfully having an impact on HRCC science and technology relative to federal investment. Ohio Sea Grant has led research efforts to help decrease the "frequency of Lake Erie's harmful algal blooms, track and respond to the spread of the invasive species, and evaluate and respond to the reoccurrence of the Dead Zone and continued sediment/nutrient loading" (Summary Report Introduction; p1). The Program is making significant contributions to science and technology in these areas. For example, OH SG researchers have created a computer model as a risk assessment tool "to help communities deal with sediment contamination in the best possible way to minimize distribution of small sediment particles into the water column" (Summary Report; p2). Similarly, OH SG researchers have "combined ultrasound waves and engineered algae to develop a treatment system for mercury removal in Lake Erie sediment" (15025; 15405) (Summary Report; p2). Furthermore, the linkage between nutrients released from sediments during spring runoff and climate change has been explored through seven collaborative research projects aimed at exploring strategies to reduce nutrient loading to Lake Erie and eliminate harmful algal blooms. As a result, three state agencies are now attempting to implement the strategies (Summary Report; p3).

The Program is also conducting groundbreaking research in the following areas: improving and developing robust algorithms to monitor water properties using satellite data (PIER 14903); executing a laboratory model to simulate water and sediment quality parameters to study the influenza A virus (PIER 15126); determining how the movement of microcystins in Lake Erie is affected by sediment particles (PIER 15403); and running critical experiments to assess the efficacy for soils and plants to take up and possibly transform two commonly used hormones in order to use as a guide for agricultural practices in the future in watersheds that drain into Lake Erie and nationally (PIER 15402).

Ohio Sea Grant is successfully having an impact on society. The Program has had a positive environmental impact, namely in its efforts to dredge contaminated sediments from the Ashtabula River and restore its beneficial uses. In 2009, the Ashtabula River Partnership, founded partially by OH SG, removed over 600,000 cubic yards of contaminated material from the lower two miles of the river and placed it in a specifically designed landfill that was capped. This significantly reduced the contamination threat to the Lake Erie ecosystem and resulted in "construction of over 1,000 feet of fish habitat and about two acres of wetlands on the lower Ashtabula River" (PIER 14380).

The Program is also influencing marinas to adopt best practices to reduce pollution and partnered with others to form the Ohio Clean Marinas Program, which is responsible for setting standards and implementing processes to certify marinas as Clean Marinas. The Program hosted three workshops in 2010 and affords ongoing opportunities for marinas to participate in site reviews "designed to evaluate the current status of a marina in terms of its implementation of the recommended best management practices." There are 42 Certified Ohio Clean Marinas and 30 have pledged to become certified. Nationally, 30% of Clean Marina operators attribute an increase in dock sales to their participation in the program (PIER 14378).

Sustainable Coastal Development

Progress Towards Plan - Is the Program making significant progress towards their previously approved Program Goals, Program Performance Measures, and/or Program Objectives in this focus area?

Rating: 3.4

Explanation for the rating:
The score for progress of Ohio Sea Grant's (OH SG) SCD goals, objectives and measures reflects the reviewers' assessment that the Program is operating at a very high level, between exceeds expectations and highest performance. The Program set clear objectives and good outcomes and all are well-articulated. While many of the objectives appear to be controlled by OH SG, there a few that are not, making them more challenging and more impactful to ultimately achieve. The Program's SCD activities are diverse and range from leisure-tourism, water quality, and planning. Ohio Sea Grant set three performance measures of which two were achieved and one is ongoing. Twenty program objectives were listed with all being on target and several unmet. It appears that one will not be met. Tool development is in progress, but many other objectives set for needs assessments, trainings and information-provided were completed. Ohio Sea Grant was thoughtful in how it presented its SCD reporting information. The panelists appreciated the inclusion of publications, presentations, and other outcomes along with each project.

Activities include promoting tourism, assessing resource values, creating economic opportunities, facilitation conducting community visioning sessions, managing a national scenic byway, supporting nature based tourism, developing leadership programs, and promoting unique recycling and renewable energy efforts. The Program's tourism projects are strengths. There seems to be a strong connection to local communities and active and direct support of their tourism activities. This is done through economic research, convening of stakeholders, and providing leadership training.

<u>Overall Program Impact-</u> Considering the level of Sea Grant federal investment, is the Program making a significant contribution to science and technology in this focus area? Considering the level of Sea Grant federal investment, is the Program making a significant contribution to society beyond the contribution to science and technology in this focus area?

Rating: 4.0

Explanation for the rating:
Ohio Sea Grant, in the opinion of the SCD panelists, has a very successful, hands-on, communities' approach and as a result has a significant. Over $682,000 were available for SCD programming in

2010-11, and this represented approximately one-fourth of OH SG core federal funding effort. The focus area has been increasing in relative importance.

The participation of so many small towns is testimony to OH SG's trust and recognition. The Program has stepped up, filled in some of the gaps in training and leadership, and with that, "floated more boats." There have been many contributions in science, technology and societal benefits as well. Researchers worked on a variety of issues, including ecosystem effects, water quality, and human health issues. They also worked on economic issues of importance to state and local policy and decision-makers. This included developing new tools and methodologies that others can utilize. The Program's research is very application driven and used for outreach efforts. One study found that birding contributes $30 million and 283 jobs to northern Ohio's economy each year and that about 2.4 million persons visit the state for such purposes each year. Tourism-related research also analyzed growth and economic structure in the eastern and western Great Lakes to support further tourism and recreation opportunities. Other OH SG SCD-related research involved mapping techniques for the Great Lakes shoreline that reduced costs while increasing available information, and findings that ultrasound offers potential advantages over technologies proposed to address Pharmaceuticals and Personal Care Products (PPCPs) in water supplies and municipal wastewater treatment plant effluents.

From guidebooks to research, conferences to helping to set community visions, OH SG program earned the highest performance in the area of impact.

Safe and Sustainable Seafood Supply

Progress Towards Plan - Is the Program making significant progress towards their previously approved Program Goals, Program Performance Measures, and/or Program Objectives in this focus area?

Rating: 3.2

Explanation for the rating:
Ohio Sea Grant (OH SG) has three program goals in the SSSS Focus Area:

(1) Healthy Lake Erie fisheries that harvest, produce, process, and/or market fish products responsibly and efficiently.
(2) Informed consumers who understand the importance of ecosystem health and sustainable harvesting practices to the future of our Lake Erie fisheries, who appreciate the health benefits of fish consumption, and who understand how to evaluate the safety of the fish they catch
(3) Sustainable fisheries to meet public demand.

Overall, reviewers felt that OH SG met and/or exceeded review requirements and that "Progress towards Plan" exceeded expectations by a substantial margin in some aspects. It was positively noted that the performance measures and program objectives were on target and achieved with supportable comments. In general, OH SG has good research and outreach geared towards program goals (1) and (3) and good outreach geared towards program goal (2).

There is room, however, for improvement. By most measures, the Program exceeded expectations by a substantial margin, likely resulting from effective management that set and executed the plan. As the entire Sea Grant network plans for the next version of the strategic plans, performance measures, and targets, maintain this, but also consider longer-term, challenging objectives. There was a concern among some reviewers that the Program Goals were not robust enough and there were a lack of data to support and validate impacts.

<u>Overall Program Impact-</u> Considering the level of Sea Grant federal investment, is the Program making a significant contribution to science and technology in this focus area? Considering the level of Sea Grant federal investment, is the Program making a significant contribution to society beyond the contribution to science and technology in this focus area?

Rating: 2.0

Explanation for the rating:
In terms of overall impact, OH SG is successful. They have achieved an acceptable, but not unusual, level of performance relative to their level of Sea Grant federal investment.

Reviewers felt that OH SG was successful in supporting significant contributions to science and technology. Some examples that were noted among impacts/accomplishments including:

- Development of an accurate VHS indicator [PIER 15006]
- The creation of regional "Green Marinas" within the Great Lakes [15991]
- Development of a tag for mixed stock identification of hatchery steelhead [15414].
- Temporal and spatial analysis of walleye, yellow perch genetic stock structure [14909]

In terms of overall impact, reviewers recommended that additional attention be given to quantifying and authenticating the data used to support the impact analysis. Doing so would have given reviewers more robust information to fully determine the Program's overall impact. Although assessing impacts (economic or otherwise) requires time, expertise, and networking with colleagues in the Sea Grant network, attention to this would result in greater confidence in the ultimate impact of OH SG on stakeholders and interested parties.

The OH SG Program has contributed to society and its SSSS activities have resulted in economic benefits and a more informed public. This includes communications activities that include two Stone Lab events: an OSU Communicators Conference with other university communicators to generate awareness and partnerships for the Program and a legislative relations outreach effort to cultivate partnerships and educate decision-makers.

Ohio Sea Grant supports the valuable recreational and commercial fisheries of Lake Erie, including work that spans wild fisheries, stock enhancement, aquaculture, as well as research and outreach to prevent invasive species and disease expansion. The following projects/activities could translate directly (especially with additional information to quantify and authenticate program impacts) to better management of economically important resources:

- Temporal and spatial analysis of walleye and yellow perch genetic stock structure [PIER 14909];
- The development of a natural tag for stock identification informs fisheries managers on the impact and contribution of hatchery produced steelhead [15414]; and
- Reviewers hope potential impacts of accomplishment 6484 are realized and communicated in the future on how a selective yellow perch breeding program yields benefits for an emerging aquaculture sector.

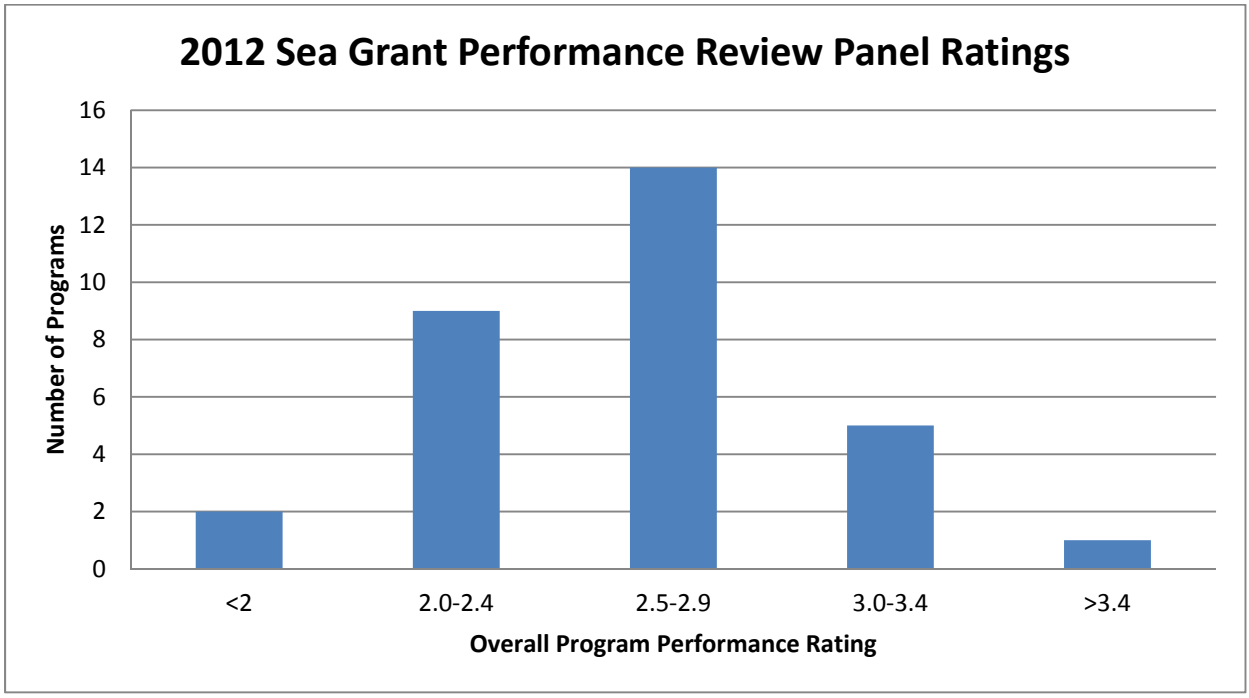
Impacts geared towards a more informed public include:

- A Comprehensive Regional Public Outreach Campaign, including professional anglers, on Aquatic Invasive Species to prevent new introductions [15151] and
- In partnership with the Division of Wildlife, Aquatic Visitors Center teaches the next generation (>12,000 youth and adults) about fishing and Lake Erie issues [14370].

OH SG has demonstrated clear significant impacts and excellent prospects for future impacts. There have been solid returns on modest federal investments and the efforts have been well-

leveraged program. One key issue, however, is that when evaluating the Program, the attribution/authentication of data for impacts is not well developed, thus, difficult to quantify.

Appendix I –


2012 Sea Grant Performance Review Panel Ratings
Number of Programs
16
14
12
10
8
6
4
2
0
<2
2.0-2.4
2.5-2.9
3.0-3.4
>3.4
Overall Program Performance Rating

APPENDIX D

2012 DIRECTOR'S EMAIL RESPONSE TO NATIONAL SEA GRANT REPORT AND RANKING

January 23, 2013 email response from Reutter to PRP report and ranking.

Leon and Jon,

We are very pleased with our rating and quite relieved as we were very uncertain as to our target and no history to provide perspective and confidence! After reading the review, I am also pleased and quite frankly amazed at the thoroughness of the review and the comments. Clearly they read and took notes to allow them to be quite specific with some of their statements and references to our reports. I am also pleased in that in addition to providing a very positive quote or comment on the work of each member of our team, it also suggests some steps for each of us to improve in the future. We are also eager to help in finding ways to greatly simplify both reporting and planning processes and this is taking far too much time.

I will be sharing this report and our rating with our staff, advisory committees, and university officials. From the ranking we received, we can infer that we were ranked somewhere between number 2 and 6. I know I will be asked, so can you tell us our exact ranking?

Again, thank you! We are all breathing a huge sigh of relief!

Jeff

Jeffrey M. Reutter, Ph.D., Director
Ohio Sea Grant College Program
F.T. Stone Laboratory
Center for Lake Erie Area Research (CLEAR) and the
Great Lakes Aquatic Ecosystem Research Consortium (GLAERC)

The Ohio State University
Area 100 Research Center
1314 Kinnear Rd., Columbus, Ohio 43212
t: (614) 292-8949 | f: (614) 292-4364 | e: reutter.1@osu.edu
ohioseagrant.osu.edu | stonelab.osu.edu

OHIO SEA GRANT COLLEGE PROGRAM

Historical Summary of National Reviews

APPENDIX E

PROGRAM HISTORY

PROGRAM HISTORY

- Stone Lab (1895) and Center for Lake Erie Area Research (CLEAR—3rd Interdisciplinary Research Center formed by OSU, 1971) are part of College of Biological Sciences until 1990. CLEAR is formed in response to burning of Cuyahoga River in 1969 and national uproar about water pollution and Dr. Charles E. Herdendorf is named the Director. Approximately 12 upper level undergrad and graduate courses per year are offered by Biological Sciences' departments at Stone Lab. Enrollment is 35 to 70 students per year. All faculty are hired directly by departments and the Stone Lab Director must convince the department chair to offer courses.

- 1966—The National Sea Grant College Program is created within the NSF and awards its first grants in 1968. National Sea Grant moves to NOAA when NOAA is created in 1970.

- 1971—Jeff Reutter is s graduate student at Stone Lab and is hired by CLEAR to lead a fisheries research project at Stone Lab in 1972.

- 1973—Dr. Lauren Putnam retires as Director of Stone Lab and Dr. Herdendorf is named Director. This brings CLEAR and Stone Lab together.

- 1974—Governor Gilligan's Lake Erie Task Force recommends that Ohio establish a Sea Grant Program and that CLEAR be its home.

- 1976—Jeff Reutter becomes Assistant Director of CLEAR.

- 1977—After a failed proposal to get a Sea Grant Program at Ohio State, the Provost asks Dr. Reutter to lead a second effort. That proposal is successful and funded and the program is formed on 28 August 1978. It consists of one research project (Dr. Reutter is PI and Russ Scholl, Ohio Division of Wildlife, is the Co-PI), one education project (Dr. Rosanne Fortner is PI), and one extension agent, Fred Snyder, is hired (Dr. Reutter leads the extension program until 1990). Dr. Charles Herdendorf is Director and Jeff Reutter is the Assistant Director and Program Leader for the Extension Program (at that time called the Sea Grant Advisory Service). Fred Snyder is hired as the first advisory service agent and housed in ODNR Division of Wildlife Offices in Sandusky.

- 1979—A 50th Anniversary Celebration recognizing the 1929 dedication ceremony, is held at Gibraltar Island.

- 1980—Collaborative arrangement developed allowing Sea Grant Advisory Service to become part of Ohio Cooperative Extension Service (later OSU Extension). Fred Snyder becomes a tenure-track area extension specialist in Fremont, Ohio. Dave Kelch is hired as the second, tenure-track, area specialist and housed in the Lorain County Extension Office.

- 1981—Frank Lichtkoppler is hired as the third, tenure-track area specialist and housed in the Lake County Extension Office. Fred, Dave, and Frank all get tenure and Frank goes on to become a full professor. Karen Jennings led a group of volunteers (former students and faculty) in the development of a support group for Stone Lab.

PROGRAM HISTORY

Participants gather for the first Congressional Day on Lake Erie in 1982.

- 1982—Dr. Reutter and Jack Waldock, Chair of the Northwest Ohio Sea Grant Advisory Committee, arrange the first Congressional Day on Lake Erie in June. An official support and alumni group, the Friends of Stone Laboratory (FOSL), is formed with Karen Jennings as the first president and Jeff Reutter as Vice President.

- 1983—The Second Annual Congressional Day is planned and several State Legislators ask to come and attend. Ohio Sea Grant and Stone Lab receive a line item in the state budget. Ohio Sea Grant is elevated to "Institutional Program" status by the National Sea Grant College Program. The first endowment (student scholarships) is created. All endowments are part of the College of Biological Sciences and the College supports development activities.

- 1984—The first combined Ohio Sea Grant State Legislature/Congressional Day on Lake Erie is a huge success. In December, Dr. Herdendorf goes on a sabbatical and Dr. Reutter is named Acting Director. The Office of Residence and Dining Halls begins to manage the Laboratory's housing and dining operation.

- 1985—Ohio Sea Grant and Stone Lab receive $1 million for renovations at Stone Lab from the State Legislature. The Dining Hall is renovated and a porch added, Harborview Dorm is built, and Cooke Castle is used for men's housing for the final time.

- 1987—Dr. Herdendorf resigns as director on 31 October. Dr. Reutter is named Interim Director and prepares the application to make OSU a "Sea Grant College."

- 1988—Ohio State University is designated this country's 24th Sea Grant College by Malcolm Baldridge, US Secretary of Commerce, in October. Dr. Reutter is named Sea Grant Director on 1 November. OSU's national plaque of recognition hangs in Bricker Hall.
- 1990—Ohio Sea Grant, Stone Lab, and

National plaque of recognition in Bricker Hall.

PROGRAM HISTORY

CLEAR move out of the College of Biological Sciences and into the Provost's Office (Academic Affairs). The Director is given a separate budget to develop a more creative curriculum and hire faculty. Dr. Reutter develops and teaches the first one-week, introductory course at Stone Lab, and superior high school students are able to enroll and get college credit while in high school. Enrollment jumps from less than 50 per year to 169 the first year. Additional one-week, introductory courses, and one-week, educator courses are added in subsequent years. Target enrollment is a minimum of 175 students per year and has always been met and frequently exceeds 200.

- 1992—Dr. Reutter leads a group of five universities submitting a proposal in response to a call for collaborative university proposals, from the Ohio Board of Regents. This group becomes the Great Lakes Aquatic Ecosystem Research Consortium (GLAERC). It is a finalist in the competition, but does not receive funding. However, the collaboration proves very beneficial and a number of joint projects are funded from other sources. The group quickly grows to 12 colleges and universities. It serves primarily as a communication network and uses Stone Laboratory as its shared research site.

Ichthyology students gaining hands-on experience

- 1994—The programs move out of the Office of Academic Affairs. CLEAR, Ohio Sea Grant, and GLAERC move to the Office of Research. Stone Lab moves to the College of Food, Agricultural, and Environmental Sciences (CFAES). All endowment funds move from the College of Biological Sciences to CFAES. The Ohio Sea Grant Extension Specialists continue to be part of OSU Extension. The Director reports directly to the Vice President for Research and the Vice President for Agriculture.

- 1996—FOSL begins awarding Stone Lab scholarships to high school students with outstanding science projects at the Ohio Academy of Science's State Science Day. Stone Lab hosts a centennial celebration with the signing of a resolution by all participants and others from important leadership groups (Ohio Board of Regents, Governor, and State Legislature). Lake View Pavilion and Waldock Gazebo are built on Gibraltar Island. The foundation of Waldock Gazebo contains a time capsule containing mayflies, zebra mussels, various letters and resolutions, and President Gee's bowtie.

- 1997—Jill Jentes is hired in our communications program.

- 2000—The first comprehensive strategic

PROGRAM HISTORY

plan for the entire program, Ohio Sea Grant, Stone Laboratory, CLEAR, and GLAERC, is completed and designed around the strategic plan for the National Sea Grant College Program and the Academic Plan for The Ohio State University. The entire program goes through an extensive review by a Program Assessment Team from the National Sea Grant College Program and receives the highest possible rating: Excellent.

- 2002—The Friends of Stone Laboratory partner with the Young Buckeyes Club and the College of Biological Sciences Alumni Society to host the first "Buckeye Island Hop" at Stone Laboratory. Groups work at Stone Lab, the South Bass Island State Park, and the Island Historical Society. The John L. Crites Research Endowment at Stone Laboratory is created with gifts from the sale of John Crites numbered prints of Stone Laboratory, the Research Building, and Cooke Castle. The Franz T. Stone Research Endowment at Stone Laboratory is created with proceeds from the donation of two farms in the will of Kate Stone.

- 2005—OSU recognizes the Ohio Sea Grant College Program as the official umbrella organization, and Stone Lab, CLEAR, and GLAERC are components of Ohio Sea Grant. Jill Jentes is elevated to Assistant Director. Stone Lab launches an endowment-funded Research Experience for Undergraduates (REU) program, supporting 14 students in its first year. The value of REU awards is $46,192. On 22-23 August 2005, a Program Assessment Team (PAT) from the National Sea Grant College Program, a team of nine national

Introductory Aquatic Biology students in the field

The 2014 FOSL Buckeye Island Hop volunteer project team

experts, reviews the entire program. The PAT was very impressed with Ohio Sea Grant, Stone Laboratory (a component of Ohio Sea Grant), and all of the education, outreach, and research programs. As a result of this review, Ohio Sea Grant receives the highest possible rating and ranking by the National Sea Grant College Program and is considered one of the top Sea Grant Programs in the country.

- 2008—A new management model is

PROGRAM HISTORY

Jeff Reutter explains the mechanics of the solar array and panels (top), some of which double as a well-shaded study area (bottom).

developed for Stone Lab effective 1 April. The Director of the Lab continues to report to the Vice Presidents for Research and Agriculture. Facilities Operation and Development (FOD) and Student Life discontinue direct involvement in the program and move to an advisory role. All personnel report directly to the Director and the Director is responsible for all aspects of the operation (research, education, outreach, utilities, facilities maintenance, etc.).

- 2009—In December 2008 Dr. Reutter hosted a 7-site videoconference around Lake Erie with 75 scientists. They agreed to collaborate under Ohio Sea Grant leadership in developing seven research proposals. All seven were funded ($750,000) by USEPA and the Lake Erie Protection Fund in 2009. A total of 14 agencies and universities are participating. Implementation of a new management structure for Stone Lab begins and costs are transferred from FOD and Student Life. Fred Snyder, the first Ohio Sea Grant Extension Agent, retires.

- 2010—The Ohio Sea Grant Extension Office at Camp Perry is closed and Tory Gabriel moves into the Oak Harbor Extension Office. Put-in-Bay State Fish Hatchery is leased from the Ohio Division of Wildlife and converted into an Aquatic Visitors Center. A patio is constructed at the Stone Dining Hall entrance. The entire program is reviewed by a Site Visit Team of 6 experts from the National Sea Grant College Program on 25-27 May. The team report states that they were absolutely "thrilled with the program." The lease of the Port Clinton Lab at 1854 State Road is terminated and equipment and supplies are moved into a simple storage facility resulting in a savings of approximately $20,000/year. June 30, 2010 marks the end of the first full fiscal year under the new management structure. The $350,000 annual operating deficit reported by CFAES and FOD is gone and the program is operating in the black, growing and improving.

- 2011—Eight roofs are replaced at Stone

PROGRAM HISTORY

Lab, the exterior of Cooke Castle is painted, the attic of Bayview Office and the Lighthouse are insulated, the chimney of the Research Building is repaired, and new freezers, refrigerators, and ice machines are purchased. A grant from OEPA allows the purchase of an atmospheric mercury monitor for the Research Building. Twelve trees are removed on Gibraltar Island. Dr. Christopher Winslow is hired as the Assistant Director for Administration and Research in December.

- 2012—Quarter to semester transition is completed and all courses are offered for semester credit. First floor renovations are completed in the Research Building and Stone Lab and used by students during the summer session, roofs on four buildings are replaced, the Gibraltar dock area is dredged, a drainage trench at the Research Building is repaired, new attic windows and air-conditioning are installed at the Lighthouse, and sidewalks are repaired on Gibraltar Island. Stone Laboratory's greening initiative gets a major boost as solar thermal is applied to the roof of the Dining Hall (March), 12 KW of solar panels (50 panels) are added to a new pavilion built where the sand filters for sewage treatment had been (June),

The Lake Erie programs are well represented at public events such as the Cleveland Mid-America Boat Show.

all toilets and shower heads are replaced with low-flow units, and all outboard motors are replaced with 4-cycle engines. Dr. Kristin Stanford is hired as the fulltime Education and Outreach Coordinator and Research Scientist at Stone Lab and Dr. Justin Chaffin is hired as the fulltime Research Coordinator. Grants from OEPA and the Office of Research allow the purchase of equipment to renovate the water quality lab.

- 2013—The Ohio Sea Grant College Program including CLEAR and Stone Lab, go through an extensive review by the National Sea Grant College Program, NOAA, during 2012. The review covered the period 2008-11. The process included preparation and review of annual reports, a 2010 Site Visit to Columbus by a team of national experts, multiple powerpoint summaries, and culminated in 5 external Program Review Panels (PRP) meeting in October 2012 in Washington to review every Sea Grant program in the country (33). Our final ranking from the PRP, received in January 2013, placed Ohio Sea Grant either 2 or 3 in the country. Renovation of the water quality lab is completed and a grant from OEPA supports a monitoring program for nutrients and harmful algal blooms. Sewer lines and sidewalks are replaced for Harborview Dorm. New WiFi equipment and a new provider increase speed and band width over 10-fold. Live video feeds from the Lighthouse, Cooke Castle, Stone Lab, and the Research Building, are visible on our website. Forty solar panels are added to the roof of Stone Lab. Exterior renovations of the Research Building and shop are completed.

THE OHIO STATE UNIVERSITY