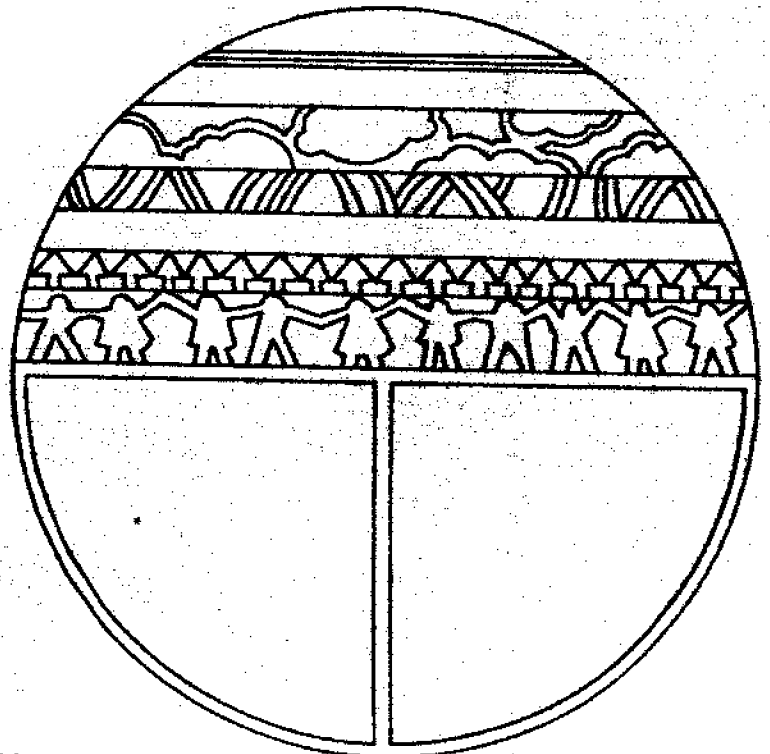


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Informal Survey of K-12 Activities/Publications  
Sponsored by Sea Grant Institutions  
Around the Country



INFORMAL SURVEY OF K-12 ACTIVITIES/PUBLICATIONS  
SPONSORED BY SEA GRANT INSTITUTIONS  
AROUND THE COUNTRY

**CIRCULATING COPY**  
**Sea Grant Depository**

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JULY 1977  
UNIVERSITY OF WISCONSIN  
SEA GRANT COLLEGE PROGRAM  
1800 UNIVERSITY AVENUE  
MADISON, WISCONSIN 53706

In April 1977 an informal request was sent out to Sea Grant Programs all over the country for feedback regarding projects, activities or materials they had developed for K-12 educational use. The responses received from 18 out of the 25 individual programs were equally informal and perhaps did not exhaust the totality of efforts being directed toward this end. There are, however, some exciting activities afloat and curriculum materials developed either for students or educators. Pam Johnson has written this circular, therefore, to spread the good news, encourage some interchange and help prevent reinvention of the wheel.

We are still interested in hearing of materials, activities and/or programs geared toward K-12 marine educational use. Please send such information to:

Pamela Johnson  
Education Specialist

(or)

Linda Weimer  
Assistant Director

U.W. Sea Grant College Program  
1800 University Avenue  
Madison, Wisconsin 53706

## ALASKA --

Fran Sweet--editor, Alaska Sea Grant Program--sent the following curriculum aids developed mainly by Dr. Richard Lee--University of Alaska marine advisory education specialist:

1. Lee, Richard S. Close-Up Photography for the Marine Science Classroom. 1976. 10 pp.  
Written primarily for aquarium photography.
2. Lee, Richard S. Construction and Maintenance of Classroom Aquaria. 1976. 17 pp.  
Concerned only with closed-system temperate marine aquaria.
3. Lee, Richard S. and F. F. Wright. Bibliography of Marine Teaching Materials. 1976. 40 pp.  
An annotated bibliography of oceanographic materials arranged according to form and marked as to education level.
4. A set of five (2x3 foot) posters developed with combined funding from Sea Grant and the state of Alaska. Each deals with a separate species: Pacific Ocean perch, weathervane scallop, king crab, pink shrimp, Pacific halibut. Each poster illustrates the life cycle of the species; features a three or four circle sequence illustrating the different stages of the species--larval, adolescent, adult--accompanied by a short narrative description; and includes a paragraph on the importance of the species to fishing.

## CALIFORNIA --

The following publications were sent:

1. Dewees, Christopher M. and Jon K. Hooper. Identifying Intertidal Plants and Animals. 1974. 10 pp.
2. Dewees, Christopher M. and Jon K. Hooper. Identifying Seashore Birds. 1974. 7 pp.  
Numbers 1 and 2 are booklets that provide line drawings of the different species plus spaces for recording data seen, location seen, habitat and identifying characteristics.
3. Dewees, Christopher M. and Jon K. Hooper. Marine Education Bibliography. 1975. 16 pp.  
An unannotated list of oceanographic materials.

4. Dewees, Christopher and Jon K. Hooper. Pressing Algae. 1975. 2 pp.  
A fact sheet.
5. Wilkie, Donald W. Sharks: An Annotated List of Selected References.  
1976. 7 pp.

Also sent were three sets of Field Trip Information--geared to different grade levels--compiled for teachers bringing groups to the Scripps Aquarium-Museum. Each set included pre-visit exercises, guide sheets and post-visit exercises. The approach is strictly "question and answer."

## DELAWARE --

Since 1968 Delaware Sea Grant has supported the University of Delaware in the development of "learning experience" packages. Several thousand units have been developed and distributed for use by K-12 educators throughout the nation.

The University of Delaware has also been organizing a series of miniworkshops under a special grant from the National Sea Grant Office. Through the mini-workshops, teachers will have the opportunity to contribute to the National Marine Education Project directed by Hal Goodwin at the University of Delaware. Seventeen such teacher workshops are planned for the coming year.

James G. Schaadt--coordinator, National Marine Education Project--wrote:

"I have monitored two workshops and visited one other youth educational program (4H) so far and, in different ways, was impressed with all of them. Leslie Lin at the University of Michigan expects to hold a workshop sometime in October...We are seeking ways of developing flexible, if not universal learning units so they will have broad application."

The following materials were also sent:

1. Geens, Maura and Robert W. Stegner. A Conceptual Scheme for Studies of Aquatic Environments.  
A two-page outline.
2. Goodwin, Harold L. An Introduction to Marine Education. Draft, 1977.  
51 pp.  
Intended as a definitive statement about the importance of marine education.
3. Annotated Inventory of Non-Marine Population-Environment Learning Experiences.  
n.d. 3 pp.  
A supplement to Annotated Inventory of Learning Experiences of Coastal and Oceanic Awareness Studies. Listed are curriculum units grouped by designated grade levels.

## FLORIDA --

Al Volker--associate director for information services--replied that:

"This spring we held the first weekend Marine Science Teachers Workshop on Pigeon Key. This was the pioneer in the miniworkshop series being organized by the University of Delaware Sea Grant Program. We plan to extend the workshop opportunity to science teachers in adjoining counties in one or two additional workshops.

We are assisting in the formation of a Marine Science Teachers Association for Dade County.

We will sponsor a Senior Science Student Seminar this fall at the Rosenstiel School of Marine and Atmospheric Science and the Miami Seaquarium.

We are putting together a slide-cartoon-lecture program for Grades 1-2-3 on Biscayne Bay (history, geography, recreational uses). We plan to produce or cooperate in producing similar audio-visual programs for Grades 4-5-6 (macro and micro biota, bottom communities, shoreline vegetation and the influence of pollution); Grades 7-8-9 (chemical oceanography, sediments, water quality, salt intrusion); Grades 10-11-12 (physical oceanography, beach dynamics, models for predicting dispersion and circulation, turbidity, mapping bottom communities, etc.) We hope to gain Dade County's Board of Education endorsement and possible use on the education television station in South Florida.

We are asking the University of Miami's School of Continuing Education to open an adult education course in Biscayne Bay problems and options.

The Dade County Museum of Science has offered to put a Family Course in Biscayne Bay ecology and its class schedule.

We expect to bolster 4-H environmental education.

Possibly we can get support for seafood cuisine emphasis in home ec. courses in high schools.

Most of this is still in the planning stage..."

## HAWAII --

Makahiki Kai ("Festival of the Sea") is an annual event that has been in existence since 1974. This traveling exhibit features a different theme each year and circulates throughout the state of Hawaii. Rose Pfund--coordinator, Sea Grant College Program--sent copies of the teachers' guide and student workbooks developed for both the 1976 and 1977 exhibits:

1. \_\_\_\_\_ . Makahiki Kai '76: Teacher's Guide Sheet. Neighbor Island edition, 1976. 28 pp.
2. \_\_\_\_\_ . Makahiki Kai-Festival of the Sea '77: Teachers' Guide. 1977. 57 pp.

Both of these booklets provide background information on the theme of the year's exhibit plus a few suggestions for related activities. The 1976 edition, for example, features background information on tuna, baitfish, fishing for aku, etc. to tie in with that year's theme: Hawaiian aku (skipjack) fishing industry.

3. \_\_\_\_\_ . Makahiki Kai '76: Student Workbook. 1976. 31 pp.
4. \_\_\_\_\_ . Makahiki Kai-Festival of the Sea '77: Student Workbook. 1977. 31 pp.

Both workbooks feature word games, illustrations, simple recipes, short informative articles, games, etc. geared for educational enhancement.

5. Curriculum Research and Development Group, University of Hawaii. Reef and Shore: Hawaii Nature Study Program for Elementary School Children. 1976. 265 pp.

A compendium rich in curriculum activities that would be valuable to either the beginning or veteran teacher of "reef and shore" studies.

## MAINE --

During August 1976 the Cooperative Extension Service-Maine Sea Grant Project and The Nature Conservancy joined forces to enable five groups of young people to experience island life on Damariscove. The children spent from one to three days on this island studying various methods of wise resource management. Plans are being made to continue and expand this activity for the summer of '77.

The Maine Sea Grant Program has also developed 10 educational packages for students in high schools or secondary schools. Each "package" consists of three parts: a "unit," questions & answers to accompany the "unit" and a list of classroom experiments for that "unit." The 10 subjects covered are:

1. soft-shelled clam.....2. sea scallop.....3. alewife.....4. sea herring...
5. smelt.....6. commercial marine plants and algae of Maine.....
7. Maine lobster.....8. whiting.....9. ocean perch.....10. northern shrimp.

Phyllis R. Coggins--Maine Sea Grant publications--reports that:

"Several youth education programs have been geared to some of our publications, though most material produced by Maine Sea Grant Program is not specifically youth-oriented.

Among those widely used are: The Uncommon Cookbook--prepared for the general public, this cookbook has been used extensively in young people's workshops on finding and preparing wild food. These are sponsored by the CES-MSG cooperating. Maine's Marine Industries-A Vocational Planning Guide and The Commercial Fisheries of Maine have both been used in high school vocational programs. The 1974 Marine Occupations Conference has been widely distributed among junior high and high school students, often in conjunction with "career day" activities during which Sea Grant personnel have lectured.

As part of our work with The Nature Conservancy, we are publishing a leaflet series. Emphasis in this series is on wise resource use and management. Although these will not all appeal to youthful audiences, the first--guide-book to Geologic and Beach Features of the Salt Pond Area, New Harbor, Maine--outlines a geology field trip and was geared specifically to school groups (junior high - high school).

Our Water Movements in the Atlantic Ocean was written for children of all ages. It has been widely used by grades 2-12, and we hope to continue in this direction with other publications in this "Ocean Problems" series.

The Maine coast has numerous educational facilities (schools, camps, floating classrooms) with which Maine Sea Grant has worked. MSG has supported these programs by lecturing, providing videotape and slide shows, conducting field trips and seminars and, in some cases, by creating summer volunteer work study positions."

## MICHIGAN --

Through telephone conversations with Leslie Lin it was learned that Michigan received the first year's funding for its three year proposal to develop six curriculum kits for Great Lakes Studies. Although each kit will have a different theme, the approach will be multidisciplinary so that material will be included in each kit that could be useful to many different kinds of teachers--social science, history, art, science, etc.

## MINNESOTA --

To carry out Minnesota's program to foster marine-related studies in elementary schools, Susan Hartley has been hired as marine education agent and is scheduled to assume her responsibilities in this capacity around the beginning of August 1977. In the meantime experimental use was made of the Minnesota Marine Advisory Services publication The Edge of the Arrowhead by Ryck Lydecker in a 7th grade social studies class in Twin Cities, Minnesota. Reactions on the part of teacher



and students were quite favorable. In addition, Jim Murray, assisted by graduate student Robert Adams, conducted a series of five sessions devoted to studies of the Great Lakes with two sixth grade classes of a public school. The sessions included history, geology, Great Lakes shipping and shipwrecks, a visit to the Lake Superior Marine Museum and a visit to a fish hatchery.

## NEW HAMPSHIRE --

A reply is pending from Peter Randall, marine education consultant.

## NEW JERSEY --

Nancy Brzezinski--administrative assistant--wrote that:

"Our Institute serves as the environmental education component of the Center, and our primary endeavor is the creation of curriculum materials which address themselves to problems at the interface of science, technology and the social sciences. Our curriculum materials have been created in the form of "modules"--collections of simulation exercises which are centered on a specific problem area. Role playing is utilized as a means of actively involving students in the simulation.

Our first module effort is entitled, "Beacon City--A simulation on Urban Land Use Problems." The urban land area in question has been modeled on Atlantic City. Primary issues discussed relate to the city and its problems, some of which center on its being part of a recreational marine environment. The module has not been field tested as yet."

## NEW YORK --

The executive officer, New York Sea Grant Program--John H. Judd--replied that:

"The New York Sea Grant Institute does not have, at this time, specific projects dealing with K-12 marine education. We have, however, submitted a number of projects to be considered under the K-12 education announcement that came out of National Sea Grant."

Richard B. Raymond--extension associate, Sea Grant Advisory Service--wrote that:

"Your request is difficult to answer because many people have taken it upon themselves to produce materials according to their needs, and for the most part it is frustrating trying to get a handle on all that exists. I have been working with the New York State Marine Education Association (NYSMEA) for several years with the primary goal of facilitating the communication for requests as yours. My other responsibilities have been the coordination and implementation of teacher training in New York City that would develop a greater awareness of marine environment."

There was one sheet describing six workshops offered by the Sea Grant 4-H Youth Development Program in New York City that "can be designed to fit your needs.... K-12." The subjects offered are life in the sea, Japanese fish printing, a New York City waterfront field trip, a seashore field trip, how to set up and maintain a salt water aquarium and the purchase, care and preparation of seafood.

He also included materials collected from various sources, of which the following are cited as most pertinent for K-12:

1. \_\_\_\_\_. Can You Tell a Fresh Fish When You See One? n.d. 1 pp.  
This sheet provides five ways of determining whether a fish is fresh.
2. \_\_\_\_\_. Gifts From the Sea. n.d. 3 pp.  
A unit that includes vocabulary, concept lesson, process lessons, evaluation and activity for further exploration centered on basic marine life from the sea. No grade level given.
3. \_\_\_\_\_. Life Along the Shore. n.d. 3 pp.  
An illustration of "Marine Flora and Fauna" typically found near the seashore to be matched up with a list of names. An answer key accompanies this exercise.
4. \_\_\_\_\_. Marine Life: Where Do We Live? n.d. 2 pp.  
A word game composed of saltwater creatures.
5. \_\_\_\_\_. Marine Science. n.d. 3 pp.  
A bibliography of 10 elementary and 14 secondary sources of marine science information. Each entry supplies title, media, grade level, description price, source. This list is accompanied by a two page unannotated Marine Careers Bibliography listing 29 sources of such information.
6. \_\_\_\_\_. Observing Sea Life in Your Aquarium. n.d. 12 pp.  
Suggestions for marine observations that could be made in the classroom. Includes an argument for the value of free observations; a unit on classification activities; observation worksheets for both hermit crabs and snails.
7. \_\_\_\_\_. Salt Water. n.d. 3 pp.  
This curriculum unit includes vocabulary, concept lesson, process lessons and evaluation for things to do with salt water. No grade level given.
8. \_\_\_\_\_. Sealed World: An Example of Balance in a Natural Community.  
n.d. 10 pp.  
A description of the equipment needed and procedures used to construct an underwater ecosystem.

9. American Littoral Society. Salt Water Reading List. n.d. 5 pp.  
Not claiming to be exhaustive, this partially annotated bibliography lists 37 sources of saltwater reading graded according to "general" or "young readers." Provides title, author, publisher and copyrights ranging from 1948-1973.
10. Dewees, C.M. and J.K. Hooper. Gyotaku--Japanese Fish Printing. 1974. 4 pp.  
A New York Sea Grant Advisory Services reprint of a California Sea Grant publication. Includes description and photos of the procedure.
11. Marine Environmental Curriculum Study, University of Delaware. The Dunes at Play. n.d. 8 pp.  
A unit for teaching students about sand dunes through the use of creative dramatics.
12. N.Y. Aquarium Education Department. Fish. n.d. 6 pp.  
Geared toward elementary/secondary students, this leaflet describes fish printing, dissecting, bibliography, etc. through a combination of narrative and illustration.
13. New York City Planning Commission. New York City Waterfront. 1974 3 pp.  
Provides background history and suggested classroom activities for New York waterfront visits.
14. New York Sea Grant Advisory Service. Suggestions for Undertaking a Successful Trip. n.d. 1 pp.  
Advice to an educator on what to do prior to and during a field trip to make it an optimal educational experience.
15. New York State Marine Education Association. Field Trip Directory. n.d. 10 pp.  
A preliminary list of places to visit on field trips. Provides such information as arrangements, directions, facilities, water facilities, best usage, type of environment, preparation, warnings, etc.
16. Nickelson, Ranzell and Don W. Steinbach. Now That You've Caught That Fish ...What Are You Going To Do With It? Texas Sea Grant Program, 1976. 4 pp.  
This leaflet provides some do's and don'ts of fish handling plus directions on gilling, gutting, filleting, etc.
17. Schuman, Sandy. Environmental Impact In the Coastal Zone: Leader's Guide. n.d. 12 pp.  
A role-simulation game in which teams are faced with the problem of building a marina near a marsh teeming with wildlife. A 1975 edition bears the title The Question of Cobber's Cove.
18. Waters, Barbara S. Ocean in Your Classroom, n.d. 8 pp.  
A report of the experiences of two classes--kindergarten and third--in building and observing a saltwater aquarium.
19. Wolf, Nancy. Eco-News: Environmental Newsletter for Young People. Environmental Action Coalition, Inc., May/June 1976. 8 pp.  
This particular issue is devoted to activities, concerns and information about life along the seacoasts. Free teacher's guides are also available.

## NORTH CAROLINA --

A 20x20 inch glossy poster entitled North Carolina's Underwater Harvest was sent. This poster features simple line drawings of the different species found off the coast of North Carolina plus a few words about each.

## OREGON --

Vicki Osis--marine education specialist--sent 10 issues of Marine Science Education Tips. Usually four pages in length, these tips are produced by the Oregon State University Sea Grant Marine Advisory program and are intended as supplements to classroom materials. The subjects of these eight issues were:

1. Measuring Ocean Depths....
2. Bathymetric Contouring--Astoria Canyon....
3. Bathymetric Contouring....
4. Sediment Plotting and Contouring Cape Blanco to Cape Sebastian....
5. Sediment Contouring--Astoria Canyon....
6. Plankton and the Food Chain....
7. A Drift-Bottle Experiment Using P/V Vagina Data....
8. A Drift-Bottle Experiment You Can Do....
9. Places of Interest to Visit and See on the Oregon Coast 10 pp....
10. Planning a Safe and Productive Field Trip to the Beach.

An interesting note: copies of all Marine Science Education Tips are on file in marine resource files which have been compiled and set up by the Northwest Association of Marine Educators.

## RHODE ISLAND --

Sara S. Callaghan--marine public education specialist--sent the following materials:

1. Callaghan, Sara S. Down Where the Water Is: A Coastal Awareness Activity Book. Illustrated by Henrietta Crandall. 1972. 20 pp.

This booklet features pictures of life and activities of the sea. Two pages in the back provide two to three sentence texts that are to be cut out and pasted below their matching pictures (matched by numbers).

2. A copy of the teacher's activity guide that accompanies the above text. As noted by Sara S. Callaghan "...both the activity book and the teacher's guide are distributed free to Rhode Island schools by the Coastal Resources Management Council, the state agency which is charged with coastal management in Rhode Island. Single copies of the Teacher's Guide and Activity Book are available for out-of-state requests."

3. Stout, Prentice K. and Sara S. Callaghan, ed. Marine Career Series: Marine-Related Occupations - A Primer for High School Studies. 1977. 17 pp.

Provides introductory descriptions of various careers plus suggestions of where to obtain more detailed information.

## TEXAS --

Sarah Meyland--marine education specialist--wrote:

"The Texas A&M Sea Grant Program is currently involved in generating new K-12 marine education materials. We are presently funding four such activities. They are:

1. A Marine Resources Reference Center
2. Future-Oriented Marine Resources Mini-Semester for Secondary Schools
3. Children's Literature and the Sea
4. The Day on the Bay Program

Of these projects only the Day on the Bay is near completion. This program consists of a total package to introduce students to the nature of marine studies through data collection aboard a ship. Several components are involved in the total program package.

1. The Day on the Bay Lab Manual  
(Approx. 120 pp.) sections of the manual include:
  - a. general introduction to marine science and the coastal marine environment
  - b. specifics of Galveston Bay
  - c. specimen collection and identification
  - d. equipment handling
  - e. laboratory procedures
  - f. data analysis
  - g. glossary and bibliography
2. Narrated slide presentation explaining equipment handling and procedures for the cruise.
3. An 8 hour cruise experience.

The publication date for this program is September, 1977."

## VIRGINIA --

Susan Gammisch--coordinator, Marine Education Center--replied that:

"VIMS (Virginia Institute of Marine Science) is actively involved in marine education. We have a staff of four — an educational program director, and three education specialists who work with school groups daily (K-12 plus some college level groups). In addition to presenting educational programs, we are also in the process of completing our VIMS Sea Grant Marine Education Center which in essence is a resource center for teachers to borrow educational materials to add a marine emphasis to the existing curriculum. In order to meet this goal, we have been searching for marine education materials on a nationwide basis."

so sent were two six-page booklets--Visiting VIMS, Field Collecting at VIMS-- and three lists of VIMS-Sea Grant Marine Education Materials System i.e., materials in the system as of a certain date. VIMS offers six one-hour programs for elementary and high school groups, the subjects of which are: collecting marine life at VIMS, ecological problems of Virginia's coastal zone, research at VIMS, introduction to marine science, miniature environments--the Aquarium, Virginia's aquatic animals. Special programs will also be prepared upon request.

## WASHINGTON

Steve Granger--marine field agent--wrote that:

"We're just getting started here as a satellite program of the University of Washington and as such, haven't generated any real education materials. However, we are in the process of putting together some slide presentations of the various commercial fisheries in our area: salmon--purse seining, gillnetting, trolling; Dungeness Crabbing; herring; oysters. Also, we will be encouraging local school districts to use our expertise as speakers during the 1977-78 school year."

Alyn C. Duxbury--assistant director for new programs--sent copies of pending proposals at the K-12 level plus a description of the "Washington and the Sea" program. A \$20,000 (\$16,000 matching) proposal has as its objective: "to provide the Greater Puget Sound area educators and students, kindergarten through 12th grade, with the curriculum resources required for a better understanding of marine processes." The second proposal (\$6,800/15,100 matching) is a plan to integrate a Marine Information Center and related field activities into the Ocean Shores school district's existing scientific curriculum improvements study textbooks (Rand McNally and Co.) for grades one, two and three. A third proposal (\$3,900/5,900 matching) aims "to provide public school teachers with a background in marine sciences and related methodological considerations to the end of upgrading its level and quality in the public schools."

The "Washington and the Sea" program is described as a program that:

"...will be taught during the summer of 1977 to certified teachers who have at least one year of teaching experience. The class will be team-taught by seven Grays Harbor College staff members during an intensive two-week period. Seven of the ten daily meetings will include learning field trips to local marine areas. Twenty-six teachers will be admitted to the class, and concepts developed in the class. Class members will be encouraged to plan future trips with their students to beach areas, using the Ocean Shores Marine Information Center as a resource center."

WISCONSIN --

University of Wisconsin Sea Grant College Program is sponsoring a group of Milwaukee teachers to develop short-term curriculum for use with summer youth groups. Emphasis will be on actual contact with water through field trips, etc. This curriculum is scheduled for use with Milwaukee youth groups during summer, 1977.

Earthbeats, a Sea Grant environmental newspaper, is published on an irregular basis for jr. high education use. Each issue carries a central theme--e.g., energy, Great Lakes--with such variations as word games, role simulations, informative articles, news bits, anecdotes, etc.

An annotated bibliography of Great Lakes materials is being compiled for use by educators at the 6th through 9th grade level. Many Sea Grant public information reports are now used in schools though not produced necessarily for that audience--among them, Our Great Lakes, The Household Energy Game, Fish of Lake Michigan and Fish of Lake Superior.

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