University of Guam Sea Grant Site Review February 3-4, 2015

Sea Grant
University of Guam

Updated

College of Natural & Applied Sciences
University of Guam | Unibetsedåt Guahan

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Agenda - University Sea Grant Program Site Review

February 3-4, 2015
University of Guam (UOG), Mangilao, Guam

Site Review Team (SRT)

Mr. Michael Liffmann, Site Review Team Chair, Federal Program Officer, National Sea Grant College Program

Mr. Rollie Schmitten, Site Review Team Co-Chair, National Sea Grant Advisory Board Member

Dr. Troy Hartley, Director, Virginia Sea Grant

Dr. Paulo Maurin, External Reviewer, NOAA Coral Reef Conservation Program

Site Review Team (SRT) Schedule

Monday, Feb 2, 2015	
5:00p	Site Review Team Meeting/Check-in (Hilton Hotel, Tumon Bay)
6:00	Dinner for Site Review Team (TBD)

Tuesday, Feb 3, 2015 – UOG President's Conference Room (School of Business & Public Administration)	
8:00a	Breakfast meeting with UOG Sea Grant Director and Faculty
8:30	Meet with UOG Administration
9:00	Program Organization and Management
10:15	Break
10:30	Meet with Lieutenant Governor *(confirmed)*
11:30	Lunch and Advisory Board Meeting
1:00p	Break
1:30	Education Panel
3:00	Meet with Sea Grant Research Director
4:00	Sea Grant Fellows Poster Session and Networking Symposium (SBPA Multi-purpose room)
6:00	Dinner (on your own)

Wednesday, Feb 4, 2015 – College of Natural and Applied Sciences – Room 202	
8:30a	Breakfast Meeting with UOGSG Faculty and Administration
9:00	Communications Strategy
9:30	Collaborative Networks Panel (Research)
10:30	Collaborative Networks Meeting Panel (Extension and Education)
11:30	UOGSG Management team and SRT wrap-up (Final Q &A)
12:00p	Working Lunch (closed session SRT)
1:00	Draft Report (closed session SRT)
3:30	Exit Interview with UOG Sea Grant Director
4:00	Exit Interview with UOG Administration
4:30	Wrap up with UOG Sea Grant Management Team
6:00	Dinner (on your own)

Site Review Team (SRT) Members

Michael Liffmann, SRT Chair, Federal Program Officer, National Sea Grant Office

Mr. Mike Liffmann is NOAA National Sea Grant College Program Extension Leader and Program Officer for the Alaska, Georgia, Guam, Hawai'i, Michigan, MIT and Woods Hole Sea Grant Programs.

Liffmann has been with the National Sea Grant Office since 2007. Prior to that, he worked with the Louisiana Sea Grant College Program (LSG) administered by LSU in Baton Rouge. He began working with LSG in 1984 and between 2002 and 2007 served as its Associate Executive Director. In that capacity, he provided leadership and program direction to the program's primary outreach components, i.e., Sea Grant Extension, Marine Education, and Communications and assisted in planning and proposal preparation processes. He holds a M.A. (Regional and Latin American Economics) from LSU in 1971 and a B.S. (Economics) from Lamar University in 1969.

Rollie Schmitten, SRT Co-chair, National Sea Grant Advisory Board Member

Mr. Rolland A. (Rollie) Schmitten was appointed to the Fish and Wildlife Commission of Washington Department of Fish and Wildlife in June 2009 and is also the Chair of the National Sea Grant Advisory Board.

Schmitten has 44 years of experience as a natural resources manager focusing on marine fish, shellfish, and mammals.. He became the Director of the Department of Fisheries in 1980 and in 1984, went to work for the National Marine Fisheries Service as the West Coast Regional Director. In 1993, he became the National Director of Marine Fisheries. In addition, Schmitten has served as the US Department of Commerce Deputy Assistant Secretary for International Affairs in NOAA and the National Director of Marine Habitat Conservation. He has also received Presidential appointments as the US Tuna Commissioner, US Atlantic Salmon Commissioner, and served 12 years as the US International Whaling Commissioner. Schmitten holds a B.S. (Forest Management with Emphasis on Fish and Wildlife) from Washington State University.

Troy Hartley, Director, Virginia Sea Grant College Program

Dr. Troy Hartley assumed the role of Director at the Virginia Sea Grant in 2008 in a few short years, was able to lead Virginia Sea Grant back to Sea Grant College status. Prior to this he was a Research Faculty and Science Administrator at the University of New Hampshire and Northeast Consortium.

Hartley is currently focusing his research in coastal, marine and fisheries policy and management, specifically in the communication networks and stakeholder processes underlying integrated planning and management, adaptive management, collaborative management, ecosystem-based management, and other forms of governance networks. His recent research examined communication network analysis in fisheries and watershed planning, collaboration in coastal communities, and fishermen-scientist partnerships and knowledge integration. Hartley has additionally overseen research in a wide array of land use planning, sustainable community development, water resource management, and environmental pollution control context. Hartley holds a B.S. (Zoology) from the University of Vermont, an M.A.I.S (Environmental Dispute Resolution) from George Mason University, and a Ph.D. (Natural Resource and Environmental Policy) from the University of Michigan.

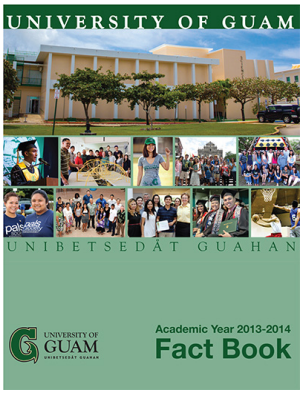
Paulo Maurin, External Reviewer, Education Initiatives Coordinator Coral Reef Conservation Program

Dr. Paulo Maurin is currently the Education Initiatives Coordinator for the Coral Reef Conservation. Maurin's work involves educational and outreach activities, managing the coral fellowship program, and assisting in the planning of marine conservation efforts in the Pacific region.

As a recipient of the Knauss Sea Grant Fellowship, Maurin was able to experience working with the federal government, specifically with the NOAA. From here, he continued to work with the federal government. Maurin has experience working with the US Coral Reef Task Force as a Sea Grant fellow coordinating reporting with member federal agencies. Maurin holds a Masters (Organizational Studies) from the University of Central Florida and a PhD (Marine Resource Management at the Community Level) from the University of Hawai'i at Mānoa.

The University of Guam and its Sea Grant Program

By virtue of its strategic geographic location – University of Guam (UOG) is the only US-accredited four-year institution located within the Western Pacific, a region the size of continental US – UOG plays, a key role in the development of critical knowledge regarding the marine, coastal and environmental resources within the Western Pacific Region. An open admissions four-year land-grant institution, its mission is *Ina, Diskubre, Setbe*: to Enlighten, to Discover, to Serve. To this avail, the University offers 33 baccalaureate degree programs and 11 Master's level programs. Within four hours flying time to most of the major cities of Asia, UOG is the only WASC-accredited institution in the Western Pacific and serves as the primary institution for higher learning for Western Pacific. Of the University's 3,836 students (3488 degree-seeking undergraduates, 304 graduate students with 41% male, 59% female), 73% are enrolled full-time (Fall 2013). Asian and Pacific Islander make up 92% of enrolled students (49.8% Pacific Islander, 41.9% Asian. UOG undergraduate students are on average, 23 years old, while graduate students are 34 year old on average. Enrollment is at its highest since 2000, up 13% from Fall 2009. There are 832 total employees, including 291 faculty dedicated to research and instruction, with 174 full-time faculty, and 34 administrators. The University had $24 million budget in AY13. While local government appropriations make up 17% of consolidated revenue. Other primary revenue sources are research grants, contracts, and scholarships (42%), federal loans (36%) and tuition, and fees.



University of Guam Fact Book contains detailed information on many aspects of the University.

http://www.uog.edu/sites/default/files/AY2013_2014_FactBook_final%20080614.pdf

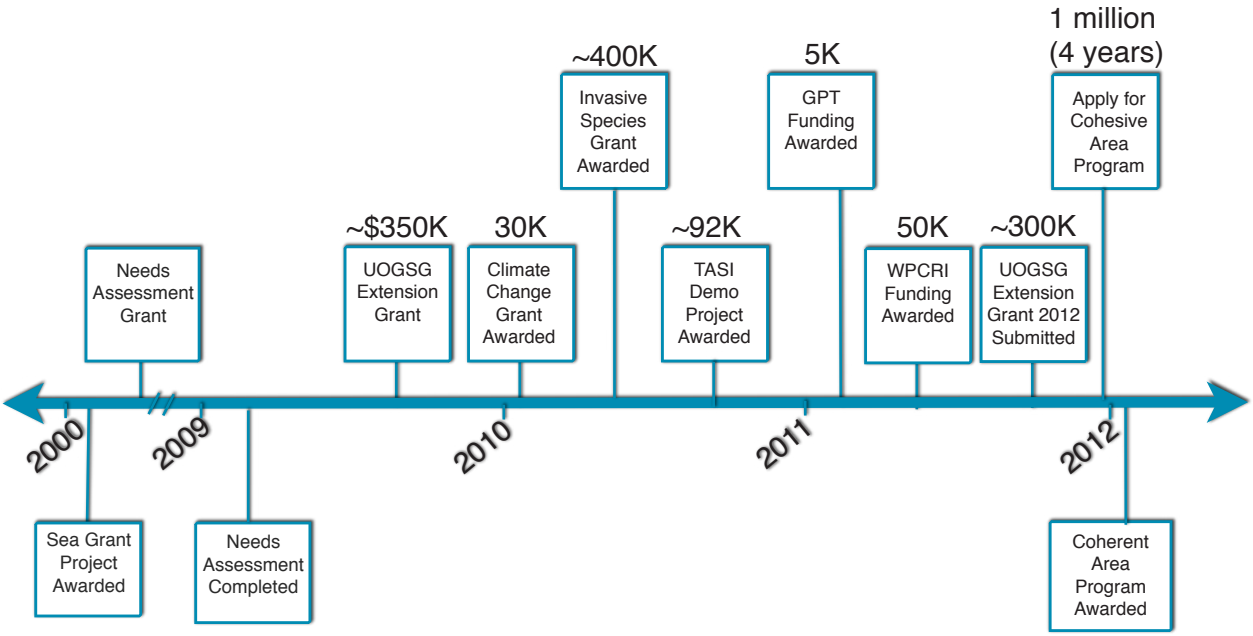
University of Guam Sea Grant (UOGSG) transitioned from 'project' to 'program' status in year nine of operation (2012). Over years ten through fourteen of the program, UOGSG will be targeting STEM and ecosystem based education efforts at the undergraduate and professional level, watershed management and conservation, sustainable fisheries, and climate variability. Our goal is to continue active engagement of stakeholders in their quests for better lives and sustained ecosystems, which will support them. Faculty and staff will continue to develop and implement educational materials, integrate extension activities, and serve as the honest broker of scientific information for the region. UOGSG will begin to develop activities to prepare for a 2015 push for institutional status. Research capacity will gradually increase over the next four years such that the program can support a well-aligned research, extension, and education initiative.

Updated

Brief Time-line of Sea Grant at the University of Guam

The progression of Sea Grant since 2008

The project has engaged in a focused extension and education program from 2008-2012, garnering external funding from various sources. In 2011, the project submitted a Coherent Area Program (CAP) application to the National Sea Grant Office in 2011. The CAP was awarded in 2012 and integrated research proposal funding into the UOG Sea Grant portfolio.



Management Team Composition and Responsibilities

Director Provides overall direction and institutional support.

Associate Director Supervises extension faculty and staff and oversees extension programming.

Research Director Works with external review committee to establish priorities for Sea Grant Fellowship RFP, organizes and implements Fellowship RFP, facilitates review process for Fellowship.

Fiscal Administrator Ensures proper execution of fiscal matters in accordance with granting and Government of Guam requirements.

Assistant Grant Manager Maintains current budgeting and records for all grant funds.

Table 1. UOGSG Staff and Faculty and Funding Source

Employee	Title	SG Omnibus	Leveraged	Total
Program Administration				
Lee Yudin	Director		.10	.10
Jim Hollyer	Associate Director of Extension		.10	.10
Arik Cabatic	Assistant Grant Manager		.25	.25
Education and Extension Faculty				
Laura Biggs	Assistant Professor	.36	.64	1.00
Aaron Parker	Assistant Instructor (vacant as of Jan 2 2015)	1.00		1.00
Joyce Beouch	Education Specialist – Palau Extension Project	0.50		.50
Communications				
Ruzelle Amparo	Communicator		.50	.50
Nick Camacho	Communicator		.50	.50
Pago Watershed Conservation Program (Building a Better Bay Project)				
Maria Cruz	Watershed Liaison/Research Assistant II	.25		.25
Ed Perez	Watershed Liaison/Research Assistant II	.25		.25
Fiscal Administrator (RCUOG)				
Gloria Travis; Noemi Tuazoo	Associate Budget and Administrative Process Officer; Accountant		.10	.10
Total FTE		2.36	2.19	4.55

Updated

Advisory Board Members and Function

The Advisory Board was formed in 2011 and composed of leaders in the community from military, governmental, non-governmental and private sectors. The Board brings a variety of perspectives to its function and has provided critical feedback that has allowed our program to grow over the last 4 years. The Board meets bi-annually (twice a year). The UOG Sea Grant Advisory Board provides input to the Director on the implementation of the approved strategic plan. The plan is approved by the National Sea Grant Program and endorsed by the Board.

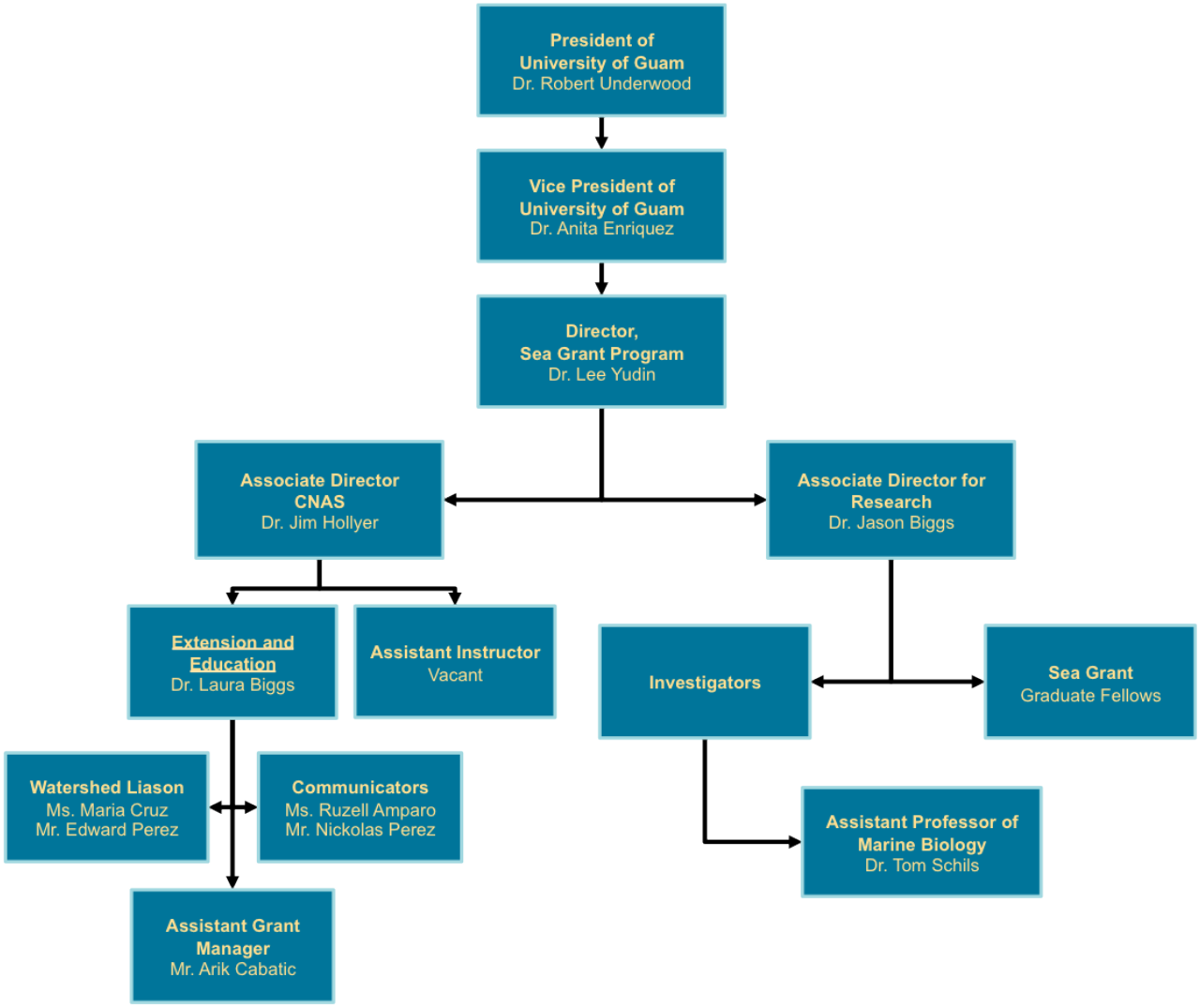
Table 2. UOG Sea Grant Advisory Board Members

	Name	Title	Organization name
1	Gerald S. A. Perez	General Manager	Guam Visitor's Bureau
2	Linda Tatreau	Educator	George Washington High School
3	Len Isotoff	General Manager	Matson, Inc.
4	Hideharu Baba	President	Atlantis Guam, Inc.
5	Mark Cruz	Response Department Head	Joint Region Marianas, J40/REC
6	Thomas McK. Sparks	Captain and Commander	U.S. Coast Guard SECTOR GUAM
7	Roland Quitugua (Advisory Board Chair)	Chairman	Northern Guam Soil & Water Conservation District
8	Hope Cristobal	Chairman	Southern Guam Soil & Water Conservation District
9	Manuel P. Duenas	President	Guam Fishermen's Cooperative Association
10	Michael Gawel	Integrated Resources Program Manager	U.S. National Park Service War in the Pacific National Historical Park
11	Frank Cruz	President	Traditional About Seafaring Islands
12	Tino Aguon	Chief	Department of Agriculture and Wildlife Resources

Updated

University of Guam Sea Grant Organizational Chart

UOG is a diverse campus with five main colleges (or schools). UOG Sea Grant is situated within the College of Natural and Applied Science (CNAS). Full time faculty reside in the Division of Agriculture and Life Sciences (ALS). Extension operations are conducted within the well-established Cooperative Extension Service (CES). Administrative support is principally provided with CNAS, however strategic investments and wider support from UOG President and Vice Presidents are integrated when necessary. Through 2014, UOG Sea Grant financial support was provided directly through the business office via accountants, support staff, and comptroller. In 2015, UOG Sea Grant transitioned to the Research Corporation of University of Guam (RCUOG). RCUOG is a corporation affiliated within the University that allows increased flexibility with hiring and procurement, relative to Government of Guam procedures, while maintaining integrity with federal guidelines and requirements. Strategic planning efforts are conducted within the program between Director, faculty and stakeholders. On the ground efforts are guided by the strategic plan. External federal and cooperative agreements typically bring in short-term limited term hires that fulfill the needs of the funded projects. Reporting is typically handled at the level of Principal Investigator. As the program expands, eProjects will allows for increased ease with reporting requirements and spread this load across PIs and funded students.



Research Priorities and Funding Process

In the fall of 2013, UOGSG Research Director convened a research advisory board to inform the establishment of research priorities for Sea Grant Fellowship request for proposals (RFP). This external review panel is detailed in Table 3. The research priorities are in line with other governmental plans in an effort to support other ongoing management, education, and extension efforts.

Research Topics in Order of Priority

Priority 1 – Climate Change
- Ocean acidification impacts on model species, communities, and ecosystems
- Modeling impacts at local scales for sea level rise and sea surface temperature
- Connectivity within and among Marine Protected Area (MPA) networks
- Management and risk assessment of nuisance and invasive species
- Harmful algal blooms
- Oceanographic data gathering and analyses

Priority 2 – Land Based Sources of Pollution
- Impacts of pollution on reef assemblages
- Reef restoration (research techniques)
- Establishment of monitoring methods
- Testing organisms for pollution
- Improving GIS data availability
- Aquifer sustainability
- Assessment of key ecological processes

Priority 3 – Fisheries
- Local mapping of resources (species and communities)
- Stock assessment of key species
- Anthropogenic links (impacts on habitat)
- Regional connectivity (genetics, larval dispersal oceanography)
- Catch-based data
- Social Economic assessment of fisheries
- Cascading impacts from “unsustainable” resource use
- Assessment of traditional technology (results to guide fisheries regulations and policies)
- Comparing catch rate methods
- Marketing traditionally caught fish

Priority 4 – Watersheds
- Local mapping of resources (species and communities)
- Watershed monitoring-effects of restoration/degradation
- Improved modeling
- Community-based and/or grassroots watershed management projects
- Island and community sustainability leading to improved watershed health

University of Guam External Review Panel Members & Review Process

Table 3. UOG Sea Grant External Review Panel Members				
Member	**Title**	**Affiliation**	**2013-2014**	**2014-2015**
Valerie Paul	Research Director	Smithsonian Institute	X	X
Chris Ostrander	Director	PacIOOS	X	X
Bart Lawrence	Assistant Director Field Operations	Natural Resource Conservation District - Guam	X	X
Bob Richmond	Faculty	University of Hawai'i at Mānoa	X	
Dawn Kotowicz	Social Scientist	NOAA Pacific Science Center	X	
Adrienne Loerzel	NOAA Coral Reef Liaison	NOAA		X
Melany Pulgisi-Weening	Associate Professor	Chicago State University		X
Hendrik Luesch	Associate Professor	University of Florida		X
Marlowe Sabateur	Scientist	Western Pacific Regional Fisheries Management Council		X

Review Process

In conjunction with the elevation to Coherent Area Program status, UOGSG program received a $50,000 annual budget to support the development and implementation of research activities. The advisory board and UOGSG leadership thought it was most impactful to invest these research dollars in student research. Focusing research efforts at the next generation of scientific leaders, would allow for strategic capacity building at UOG. The 2013-2014 Sea Grant Fellowship was released in January 2014. The 2014-2015 Sea Grant Fellowship was released in November 2014. The Fellowship can be expected to be released annually in the Fall of each year from 2014 forward. Applications are received, forwarded to external reviewer panel and evaluated based on seven criteria. For the full RFP refer to UOGSG website (uog.edu/seagrant).

1. Relevance. Importance, relevance, and applicability of proposed project to the program goal and priorities.
2. Outreach Engagement Plan. Each project is required to include an outreach engagement plan.
3. Technical/Scientific merit. Is the approach technically sound or innovative? Are the methods appropriate?
4. Overall qualifications of investigators. Does the applicant possess the necessary education, experience, training, facilities, and administrative resources to accomplish the project?
5. Project costs. Are they appropriate and reasonable?
6. Communication of results. How effectively will results be communicated to the scientific and resource management communities? How will results be shared with the public?
7. Resource Manager Partnering. Does the project propose cost sharing or collaboration with appropriate agencies and how well developed are those relationships

The 2013-2014 RFP for Sea Grant Fellowships received two applicants, after the review process, one project was funded. To encourage an increase in the number of applications received, the 2014-2015 RFP received six (6) applications. Awards will be announced by January 20, 2015.

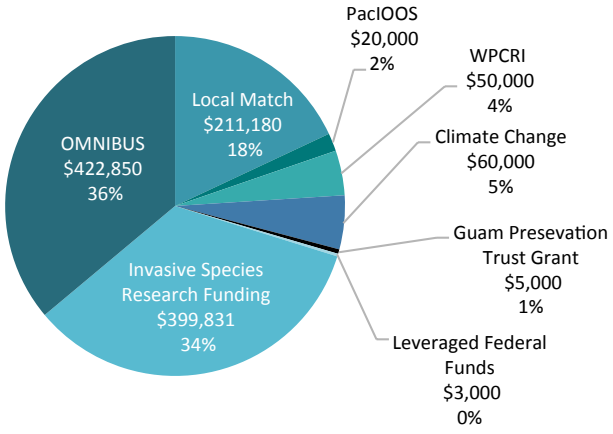
Updated

Funding and Investment Snapshots

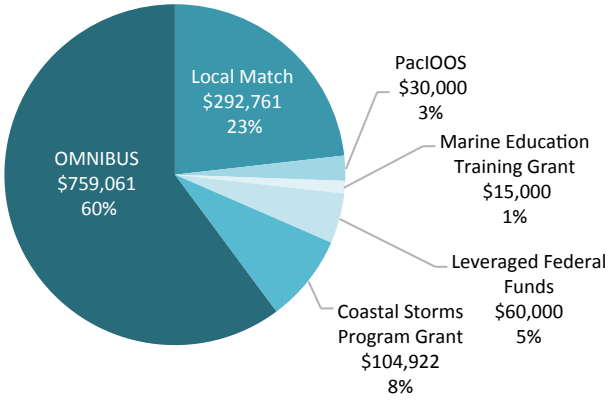
The UOG Sea Grant program can be divided into two distinct funding periods. While these periods cover several grant applications, the program remained focused on education and extension with relatively minimal faculty and administrative structure from 2009-2012. Core Sea Grant funding totaled $422,850. The project was able to garner over $450,000 in national strategic initiative (NSI) funding and $75,000 in federal and local funding through competitive and cooperative agreement mechanisms. The project focus was expanded through the NSI research funds. This regional research project was intended to be a short-term project and allowed UOG Sea Grant to demonstrate research capabilities.

In 2012, the project successfully elevated to program status within the National Sea Grant Network. From 2012 to present, the program has integrated internal research mechanisms to fund graduate student fellowships through increased funding from the National Sea Grant Office (Community Coastal Development funding). The integration of CCD funds provides more consistent sustained research opportunities within UOG Sea Grant. Core funding has totaled 759,061 over a three year period (2012-2015). The program received over $200,000 in federal and local funding through competitive and cooperative agreement mechanisms over the same period.

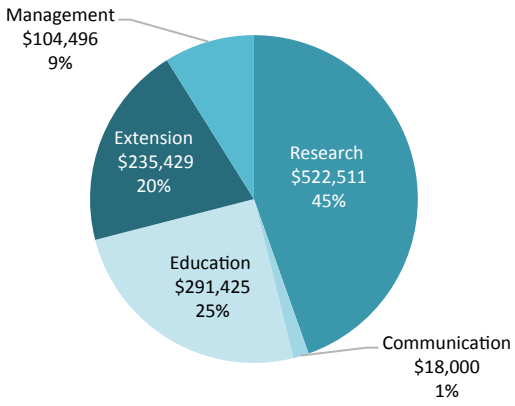
2009-2012



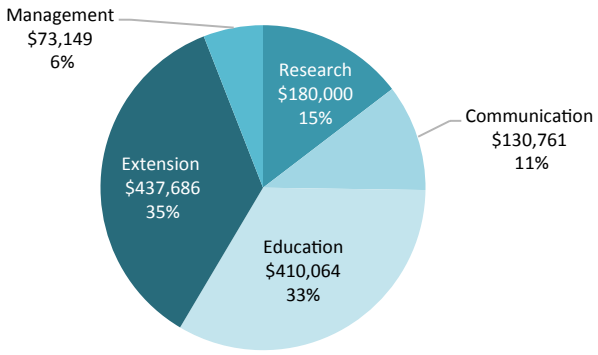
2012-PRESENT



INVESTMENT PORTFOLIO (2009-2012)



INVESTMENT PORTFOLIO (2012-PRESENT)



Legend: R=Research, A=Extension, E=Education, M=management, C=communication.

Stakeholder Engagement

UOGSG engaged in a strategic planning process, which evaluated priorities among stakeholder groups for a Sea Grant program in the Western Pacific. In June 2009, 600 registered households contacted and interviewed during the phone survey portion of this work. From August to September, concentrated focus-group meetings were held for the agriculture, aquaculture, business, shipping, tourism and development sectors. The results of the phone survey and focus group session shaped the strategic plan that carried the program from 2009 to present. The UOGSG Advisory Board held its first meeting in October 2009, and continues to meet on a biannual basis.

Based on the initial strategic plan (see Appendix), UOGSG established a mission statement that guides the program initiatives and stakeholder engagement. University of Guam Sea Grant's mission is:

To integrate and apply research, extension, and education activities that sustain and develop island environments while integrating the knowledge and culture of the island's people.

Major programmatic goals include:

- Enhanced understanding of coastal processes in ways that promote sustainable human activities through extension and education activities;
- Improved conservation, protection, and perpetuation of coastal resources and property;
- Provide scientifically accurate data and methods to inform management and policy;
- Identify and involve stakeholders in community based management efforts;
- Play a leadership role by developing across-sector strategies for addressing major issues affecting delicate coastal marine ecosystems; and
- Empower businesses to make sustainable decisions that are socially, environmentally, and economically profitable.

The next version of the UOGSG strategic plan will be crafted in 2016.

Updated

Partners and Outcomes, 2009-2012, 2013-

UOG Sea Grant has built many partnerships over the last six years. Together these projects address UOGSG strategic planning goals and align with the NSGO strategic plan. Partnerships consist of public, private, federal, and regional in nature.

2013-		
Project/Program	Key Partners	Outcomes
Invasive Species Research Project	UH Hawaii Institute of Marine Biology, University of New Brunswick, Canada; Macroalgal Initiative of the International Barcode of Life, Algaebase, University of Melbourne	Algae samples collected from throughout the Pacific (Okinawa, Majuro,Yap, Hawaii)
		Study suggests the marine flora within Micronesia, Japan, and Hawaii is likely far more diverse than currently recognized.
		Findings of this collaboration have been incorporated into the Micronesian Biosecurity plan, which is the first of its kind and has become the standard for other regional efforts to control the spread and establishment of non-native species that threaten marine environments and the economies that rely upon them.
		Support for one UOG Masters' student, who is expected to defend her thesis by the summer of 2015, and has already accepted a job as Watershed Liaison with Guam Bureau of Statistics and Plans
		Papers: Schils T. 2012. Episodic eruptions of volcanic ash trigger a reversible cascade of nuisance species outbreaks in pristine coral habitats. PLoS ONE 7: e46639. Schils T. & Guiry M.D. Donor-recipient relationships of non-indigenous marine macroalgae between tropical Pacific islands. PLoS ONE: in review. Schils T., Simeon A., Biggs J.S. & Saunders G. Risk assessments of non-indigenous marine algal introductions in the western Pacific: morphospecies vs. genetically identified species. In prep.
		Donor-Recipient Relationships of Non-Indigenous Marine Macroalgae between Tropical Pacific Islands manuscript submitted to PloS One (review pending)
		Through a research project as part of the graduate Marine Botany course (2015), students will investigate and describe a new algal genus that was discovered through the DNA barcoding effort of this Sea Grant project.
		PIs presented research findings at 11 regional, national or global meetings reaching over 600 individuals
Coastal Storms Program	Center for Island Sustainability, NOAA Weather Service, NOAA Pacific Science Center, Guam Homeland Security	Hosted a Coastal Vulnerability workshop for local decision makers to report out survey results and discuss next steps (45 participants).
		Adapted 'Homeowners Handbook for Coastal Hazards Preparedness' to suit Guam, 10,000 copies will be printed in April 2015 and released at Home Depot and outreach events for free
		Published tri-fold pamphlet, fact sheet, and technical report based on survey results.
Conference on Island Sustainability	Center for Island Sustainability	Sponsored the CIS Conference with over 400 regional attendants (2014 & 2015)
Pago Watershed Conservation Project	Islandwide Beautification Taskfoce, Yona Mayors Office, Chalan Pago Mayors Office, NRCS	Hired two student watershed liaisons
		Installed turbidity meter and level logger in Pago river to monitor water quality and inform watershed conservation
		Students developed a 5-lesson watershed curriculum that will be implemented at Pago watershed schools
		Presented at service-learning expo (Jan 2014 & Jan 2015) to 45 teachers to expand curriculum beyond Pago watershed by training teachers to conduct water quality monitoring
		Adopted three bus stops and a section of roadway in Pago watershed to increase positive branding of UOGSG in Pago watershed
Pacific Integrated Ocean Observing System (PacIOOS)	PacIOOS	Cooperative agreement since 2010 ($10,000 annual)
		Dr. Laura Biggs serves as the PacIOOS liaison for Guam
		Installed near-shore water quality monitoring sensor in Pago bay to monitor upland erosion and sedimentation.
		Integrate data into Pago Watershed – Builders of a Better Bay campaign
STEM for Guam	UOG 4H, School of Education, Math Department, Brown & Caldwell	STEM challenge created in partnership with numerous UOG departments.

Project/Program	Key Partners	Outcomes
Sea Grant Fellowship	External Reviewers, Natural Resource Conservation Service, Smithsonian Institute, UH Manoa, PacIOOS	GDOE students will be creating STEM-based solutions utilizing the engineering design concept to respond to sea level rise and food security
		Successfully identified priorities in collaboration with Research Advisory Board
		Released two Request for Proposals (RFP) to support graduate student research
		Funded 6 students to date and awarded in $54,000 in fellowships
		Sea Grant faculty teaching BI503 – Scientific Writing and integrating grant writing into this course to better prepare students to write proposals and budgets
MET	NOAA NMFS, UH Marine Options Program, Guam Community Coral Reef	Hired UOG graduate to coordinate in water training
		Trained 19 Pohnpeian community members to conduct quantitative fish count, transects, and quadrat survey methods
		Students significantly increased their knowledge of survey methodologies by the end of the training
Palau Sea Grant Collaboration	Palau Conservation Society, Belau Watershed Alliance, Palau National Youth Commission, Ngerderar Watershed protected area (UNESCO Biosphere Reserve)	Collaboration initiated in 2010 and ongoing with increased support since 2012.
		Sponsored Youth-For-Conservation initiative
		Hosted youth conference for 21 participants
		Hosted tree planting in Ngaremeduu conservation area
		Hosted coastal cleanup event in Ngaremeduu Bay sponsored by state, Palau National Youth Commission, and Ngatpang leaders.
UOGSG Communications	Guam Soil & Water Conservation Districts (SWCD)	Partnership increased to $10,000 in support towards hiring two UOG communication students to produce video and print media related to shared SWCD initiatives
		Published 15 articles in the Pacific Daily News
		Published over 20 videos on UOG Sea Grant facebook page
		Partnership established in 2011 with $3,000 in support for communications primarily focused on print media.
UOG EPSCoR	Marine Lab, Graduate Studies and Sponsored Program, School of Education	Sea Grant faculty played key roles in two Track 1-RII proposals to NSF EPSCoR program (1st application unsuccessful, 2nd application under review)
		Preliminary data from Sea Grant fellow, Travis Reynolds, provided significant data for this $12.9 million proposal
Climate Stewards	NOAA Climate Stewards Program	Dr. Laura Biggs was successful in an application to participate in the 2014 NOAA Climate Stewards project as a professional development opportunity
Liberation Day	Guam EPA, iRecycle	UOGSG partnered with GuamEPA to facilitate recycling stations set up at the 2013 Liberation Day parade.
Piti Pride Campaign	Guam Department of Agriculture – Division of Aquatic and Wildlife Resources (DAWR), RARE Pride Campaign	UOGSG engaged in a MOU with DAWR to support a RARE Pride Campaign specialist. UOGSG supported 33% of salary to implement a campaign in Piti Bomb Holes. For more information on the RARE Campaign model: www.rare.org/pride
		Campaign specialist, Jane Dia, engaged in a needs assessment process. RARE supported the surveying of a sentinel species that will indicate if upland mitigation and coastal conservation efforts have a positive effect
		Campaign established a call line to report illegal activities in the marine preserve
		Campaign specialist presented at 34 community outreach and educational events, conducted 10 trainings, and contacted over 3700 individuals.
Coral Reef Symposium	NOAA NMFS, NOAA CRCP, Guam Coastal Management Program	UOGSG sponsored the 2013 Coral Reef Symposium
		80 participants attended
		UOG faculty and students presented current, local research
		Conference will be offered in April 2015
Communicating Science Workshop	COSEE, UH Sea Grant, Maui Community College	Worked with regional partners to host the 2014 Communicating Science workshop to increase the effectiveness and integration of 21st century teaching methods in outreach and formal education settings at UOG and with our partners.
		35 participants attended

Project/Program	Key Partners	Outcomes
NOAA Dolphin Education Partnership	NOAA Endangered Species	Presented unique opportunities for partnership and as a results, GDOE, DAWR, and USDA sponsored a 3-credit professional development focused on the eradication of invasive species on Guam.
		Facilitated NOAA dolphin conservationist visit to seven GDOE schools, reaching over 400 students
Guam Science and Technology Plan	Brown and Caldwell, Guam Community College, Guam Power Authority	SG faculty contributed to the authorship of 2014 Guam's Science and Technology Plan
Mission Zero Bags	Payless Supermarkets, Agana Shopping Center, iRecycle, GCC	Community partner for Mission Zero Bag campaign
		Contributed to campaign development and implementation to eliminate use of plastic bags by consumers of Payless markets
Sustainable Science for Teachers	Center for Island Sustainability	Course instructed through UOGSG to 10 GDOE teachers
		Supported by small grant from Center for Island Sustainability (3K)
		Teachers designed and implemented sustainability projects
People. Profit. Planet – A Triple Bottom Line Conference	Brown and Caldwell, Center for Island Sustainability, Guam EPA	UOGSG sponsored meeting to support triple bottom line initiatives implementation in local businesses
		Brown & Caldwell highlighted the 'business case model' that has assisted with implementation of water treatment plant improvements around the US

2009-2012		
Discovering the Mariana Islands	NOAA Papahanoumokuakea Marine National Monument (PMNM) Dr. Larry Cunningham, Traditions About Seafaring Islands (TASI)	Co-sponsored a week-long workshop in collaboration with PMNM to develop localized content for use in GDOE classrooms.
		Local resource management agencies and teachers were present to co-develop content
		Dr. Larry Cunningham, a local and world-renowned, historian, provided accurate and detailed information about the land, sea, and people, of the Mariana Islands that was adapted into the Mariana Island Cards with accompanying lesson plans. Materials were made available on UOGSG website with an interactive tool to tour the islands.
		The island cards were printed and distributed to GDOE teachers and showcased at numerous outreach events (30 as of 1.1.15)
Ancient Chamorro Values and the Environment	Guam Preservation Trust	UOGSG worked with a Chamorro cultural advisory board composed of local historians and stakeholders to identify Chamorro values that inherently promoted environmental stewardship.
Watershed Erosion Model of Guam	Dr. Mohammed Golabi	A video was produced to highlight these values and how respected community individuals feel environmental stewardship is a inherent part of the culture. Videos were shared on uog.edu/seagrant and with GDOE teachers.
		Climate change funding from NSGO was awarded (30K) to build a erosion model of Guam to address ecosystem threats that will worsen with impending climate change impacts
		The model has been showcased with visiting school groups and a UOG Charter Day for the last three years.
Atlantis Submarines Educational Curriculum	Atlantis Submarines	UOGSG worked with Atlantis Submarines to revamp the educational content aboard their submersible operation in Apra Harbor. The submarine has seen the degradation of the ecosystem over more recent years
Island Science for Teachers		UOGSG assisted the implementation of ridge to reef content aboard the submarine and trained staff to conduct the narrative.
		UOGSG faculty taught '*Island Science for Teachers'* as a professional development course for 10 GDOE teachers
Water Quality Monitoring Workshop	NOAA NMFS	Content focused on ridge to reef curriculum and increasing knowledge of local ecosystem threats and how to address them.
		UOGSG collaborated with NOAA NMFS to host a one-day water quality monitoring workshop where teachers learned about Guam ecosystems, how to monitor water quality and how to integrate lessons into the classroom. 35 teachers attended the workshop.
Savor Guam Food Festival	Baldyga Group, Guam Community College Culinary Program	UOGSG collaborated with Baldyga Group and GCC Culinary Program to promote local fish and produce as a means to support a sustainable Guam.
		Local fish and vegetables were caught and/or donated. Local tilapia was donated from the UOG Hatchery.
		GCC Culinary students crafted unique dishes using only local ingredients.
		The dishes were featured at the Savor Guam Food Festival in Tumon which was open and free to the public (2011 & 2012)
		A team of professional chefs declared the competition winner while community members voted on peoples choice award

Collaborative Network Activities

UOGSG has many established networks in the region and is able to provide support for stakeholders' needs in part due to these collaborations. Strategic plan goals are bolstered by collaborative networks.

NOAA Coastal Storms Program
The NOAA Coastal Storms Program was based out of University of Hawaii Sea Grant Program (UHSG). This regional program assists communities by enhancing their community resilience to storm-related hazards and climate change impacts by providing assessment tools, up-to-date information, and outreach. In 2012, UOGSG was successful in a competitive grant announcement and received 109K to conduct a needs assessment of coastal hazards awareness and implement educational campaigns that addressed gaps highlighted in the needs assessment. This will serve as a key point to increase awareness of coastal hazards on island. UOGSG is also working with UHSG to adapt the Homeowner Handbook to Prepare for Coastal Hazards for Guam.

Outcomes: UOGSG completed a comprehensive needs assessment to better understand resident perceptions towards coastal hazards on Guam. A final report, fact sheet, and informational pamphlet will be completed by May 2015 as a result of this collaboration.

Invasive species network - the outcome is already there and the funding has ended.

Key Partners: University of Hawaii Sea Grant Program, NOAA Pacific Science Center, NOAA Weather Service, Guam Homeland Security

National Sea Grant Invasive Species Network
UOGSG has partnered with UHSG faculty Rob Toonen (Hawaii Institute for Marine Biology) to investigate the invasive potential and genetic diversity of algae species in the Western Pacific. With increased transportation in the region due to military relocations and increased maritime traffic, it is likely that non-native algae introductions will increase over the next decade. This study suggests the marine flora within Micronesia, Japan, and Hawaii is likely far more diverse than currently recognized. The findings of this collaboration have been incorporated into the Micronesian Biosecurity plan, which is the first of its kind and has become the standard for other regional efforts to control the spread and establishment of non-native species that threaten marine environments and the economies that rely upon them.

Key Partners: University of Hawaii Sea Grant Program, Hawaii Institute for Marine Biology, Dr. Tom Schils

eProjects 2.0
UHSG has developed eProjects 2.0 to assist the program in project management, alumni, faculty, and student, publications, and outreach tracking. This program management software streamlines reporting, evaluations, and grants management. UHSG is gifting this valuable

program to UOGSG and providing initial technical support to execute within our program. eProjects 2.0 is a paperless, archival software empowering management to access, query, review and manage multiple program portfolios (e.g. research program, extension/outreach program) anywhere an internet connection is available while serving as an electronic, fully searchable program/project archive. UOGSG looks forward to implementing this program while program is small so that it can be increasingly effective as the program grows in the future.

Outcomes: The program will be installed and utilized by the program by March 2015.

Key Partners: UH Sea Grant, UOG Computer Science Department

National Sea Grant Climate Change Network

There is a need for education on the immediate and long-term impacts of climate change (and other coastal hazards) on human safety and property along the nation's coasts, as well as how to prepare for and survive these events. The National Sea Grant Climate Change Network (SGCN) was approved by the Sea Grant Extension Assembly in 2009 to increase the effectiveness of Sea Grant climate programming and outreach nationwide by coordinating Sea Grant climate-related activities, sharing talent and resources, and working with climate agencies and organizations within NOAA and the communities that Sea Grant serves. The network conducted a successful workshop entitled "National Sea Grant Climate Network Workshop," in Santa Monica, California in March 2013. The workshop included updates from Sea Grant programs across the nation on Coastal Community Climate Adaptation Initiative (CCCAI) projects, as well as professional development training on climate change communication. UOGSG receives annual climate change funding to better understand ecosystem and watershed level changes to Guam's environment. Additionally, UOGSG sponsors the Conference on Island Sustainability each year to increase the translation of local research and target its application to stakeholder driven issues. This conference is one of the main foci for climate-based conversations in the Western Pacific.

Outcomes: Through this work, UOGSG has installed a soil erosion model for educational purposes, which over 600 students have experienced. Additionally, UOGSG is able to sponsor the annual Conference on Island Sustainability which brings community members and stakeholders together to discuss sustainability strategies across sectors that will reduce our vulnerability to climate change.

NOAA Pacific Risk Management Ohana (PRiMO)

PRiMO ('ohana is Hawaiian for "extended family") is comprised of local, national, and regional agencies, institutions, organizations, and academia engaged in risk management in the Pacific. PRiMO, which is supported through the NOAA Pacific Services Center, is committed to enhancing regional communication, coordination, and collaboration. PRiMO provides a platform to encourage coordination and collaboration to leverage resources for more effective action. Members are experts in their field and together

bridge the information gaps between science and service providers, decision-makers, and other stakeholders. The UOGSG faculty participate in PRiMO and results from Coastal Storms Program grant will be presented at this regional conference in March 2015.

Outcomes: Abstract was accepted to the PRiMO meeting this year and will present in March 2015.

Key Partners: PRiMO, UH Sea Grant

Regional Palau Sea Grant Extension Project
Watershed degradation issues make many of the islands in the Western Pacific more vulnerable to climatic changes. Erosion and sedimentation issues become more pressing for island communities as development pressures increase. Since 2010, Palau and Guam have been able to partner, to support watershed education and restoration efforts through the Palau Sea Grant Extension Project. UOGSG supports Education Specialist, Joyce Beouch, to implement education initiatives in Palau communities.

Outomes: There are significant pressures on fishing resources by international companies that export sea cucumbers and other fauna from Palau. Through the work we have supported at PCS, one Biib's Kids student urged the Legislature to act on these legal yet highly extractive practices. As a result of this, the Legislature placed a moratorium on the removal of sea cucumbers for sale and export.

Key Partners: Palau Conservation Society, Biib's Kids, Belau Watershed Alliance

Pacific Integrated Ocean Observing System (PACIOOS)
PacIOOS is one of eleven regional observing programs in the U.S. that are supporting the emergence of the U.S. Integrated Ocean Observing System (IOOS®) under the National Oceanographic Partnership Program (NOPP). Dr. Laura Biggs serves as the Guam PacIOOS liaison and coordinates the implementation and maintenance of near shore water quality monitoring station in Pago Bay. The sensor is located strategically to support Pago Bay watershed Conservation Program (Builders of a Better Bay). Upland monitoring stations have been installed to increase data acquisition.

Outcomes: In the summer of 2012, a fish kill incident occurred. UOGSG was able to provide data from the near shore sensor to identify that increased temperature, low tide, decreased salinity from recent large rain event were likely cause of the fish kill event and not chemical contamination.

Key Partners: PacIOOS, Chalan Pago & Yona Mayors' Offices, Natural Resource Conservation Service, Builders of a Better Bay

Guam Soil and Water Conservation District
UOGSG and GSWCD share common ecosystem based goals for addressing environmental issues on Guam. The partnership has evolved over the last two years to support two part-time communications staff. Staff highlights collaborative projects and utilize social media outlets to educate community members about watershed threats, conservation projects and mitigative approaches to watershed management.

Outcomes: UOGSG has been able to increase social media following and expand the marketing of SG messages to populations that would not be reached through print media alone. Our Facebook and Twitter pages is steadily growing, and posts have been reposted by the National Sea Grant Office and other national level organizations.

Key Partners: Guam Soil and Water Conservation Districts, Center for Island Sustainability

Updated

UOG Sea Grant Fellows

The major mechanism for growth at the current structure is graduate student fellowships. The research director and faculty actively recruit students through existing courses, across disciplines through graduate council, and social media marketing YouTube and Facebook) prior to the fellowship process. With improved 'marketing' Fellowship applicants tripled from 2014 to 2015. As of 2015, there are seven (7) Sea Grant fellows currently funded including a graduate student funded through the invasive species research project. In total, Sea Grant has awarded $59,500 in fellowships since 2014.

Fellow and home	Project name	Award Year
Adrian Kense (Alberta, Canada)	Exploring the genetic diversity of endolithic algal communities using environmental DNA sequencing.	2015
Andres Reyes (Guam)	A systems approach to quantifying phenotypes in a tropical Indo-Pacific herbivorous fish in response to diet-derived and synthetic chemical compounds.	2015
Anna Simeon (Pennsylvania)	Unrecognized algal diversity in the Western Pacific: A case study of the genus *Actinotrichia*.	Invasives Project
Devin Resko (Kansas)	Tracking habitat use and movement patterns of inshore species of sharks on Guam's reefs and the relevance to fisheries.	2015
Jacques Idechong (Republic of Belau)	Identifying Gradients of MPA efficacy across Micronesia, and highlighting trophic interactions driven by food fish assemblages.	2015
Travis Reynolds (Tennesee)	Modeling reef recovery following Guam's 2013 coral bleaching event.	2014
Valeri Lapacek (Wisconsin)	Genetic characterization and reproductive timing of Guam's staghorn *Acropora*.	2015

Program Changes Since Previous Site Review

UOGSG underwent a informal site review in February 2012. Suggestions from that review included UOGSG being tasked with increasing meaningful faculty time and effort (FTE) dedicated to the program so that the program can be have more impact and be more efficient. To respond to this recommendation, local funds were identified and utilized to support one FTE. Core funding was thereby shifted to support a new faculty position. Increased funding was directed to support research capacity building. This was done by supporting Sea Grant Fellowships. The Fellowship program will fund 4-7 students in 2014-15. Up to $12,000 has been made available to graduate students to support thesis research.

LATTER TWO ARE NOT INCLUDED IN THIS
JAN 30, 2015, REVISED VERSION

Appendices

University of Guam Marine Options Program

University of Guam Sea Grant Strategic Plan (2013-2016)

University of Guam Sea Grant Strategic Plan for Education (2014-2016)

UNIVERSITY OF GUAM MARINE OPTIONS PROGRAM
(WORKING DRAFT, January 2015)

Program Description
The Marine Options Program (MOP) is designed to assist undergraduate and other students interested in marine studies. Through MOP you can obtain a marine orientation to your own major while earning an official University of Guam Certificate, which is registered on your transcript.

MOP emphasizes experiential, cross-disciplinary education and provides opportunities to apply your traditional coursework to the real world while you obtain practical marine skills through 'hands-on' and 'field-based' coursework. Your MOP coordinator can connect you with a wide variety of existing marine related course opportunities, which can be adapted to your personal learning and career objectives (approved courses can be found on the program website). Each MOP graduate is required to complete a MOP independent research project or complete an internship in a marine-related field. The MOP faculty and staff will assist in identifying potential topics and mentor, prepare your proposal, and carry out your project in a timely fashion. Topics can range from fisheries, marine biology, marine art, and journalism, maritime archaeology, marine education, to marketing surveys for an eco-tourism firm. It is essential to keep in touch with designated MOP Coordinator during the project by submitting periodic progress reports.

MOP's philosophy is that with coursework focused solely on classroom and laboratory learning, you leave College inadequately prepared to enter the workforce or further refine your career goals. Therefore, first-hand experience is central to the Certificate requirements. The course is designed to help you choose a topic and develop a written plan or proposal for your project. By enrolling for credit while carrying out the project, it becomes part of your academic record.

Projects are concluded by a final report, which may be written, an oral presentation at the annual CIS Conference, a performance, an art show, etc. MOP Coordinators assist students in selecting an appropriate format for the final report and guide students in evaluating their learning.

Time-line to Implement MOP at UOG

	2014			2014-5	2015						2016	
Outcome/Objective	Jun-July	Aug-Sept	Oct-Nov	Dec-Jan	Feb-Mar	Apr-May	Jun-July	Aug-Sept	Oct-Nov	Dec-Jan	Feb-Mar	Apr-Aug
Pilot technical skills and new cross-disciplinary courses												
Identify existing courses at UOG												
Partner/write grants to fund new course implementation												
Submit certificate proposal to AAC												
Proposal Approval												
Recruit Students												
Marine Options Certificate Offered at UOG	Target Date: FALL 2016											
Evaluation												

Required Coursework:
- MOP seminar or introductory course
- 9-12 hours of approved marine-related courses
- A MOP Skill Project

MARINE OPTIONS PROGRAM CERTIFICATE CLASS LISTING (10 – 19 CREDITS)
(courses marked with * are potential courses that are potential courses that are not currently offered at UOG)

Electives (9 – 12 credits)

Undergraduate
SOE
**Science in Education*

SBPA
BA251 Guam's Tourism Product
**Environmental Policy & Law*
**Ecotourism*
**Sustainable Business Practices*
**Emergency Management/Public Resilience (online/distance through FEMA)*

CLASS
AN/SO332 Globalization and Human Dynamics
SO411 Social Issues in Micronesia and Guam
GE/SO475 Human Ecology: Problems & Solutions
AN/GE341 Cultural Ecology
GE401 Geography of the Pacific
GE461 Conservation and Resource Management
**Communicating Science (CO494 – Fall 2015)*

CNAS
BI103 Marine Biology
BI380 Oceanography
BI440 Ichthyology
BI474 Marine Botany
BI410 Ecology
BI201 Natural History of Guam
NS230 Meteorology
AG136 Science of Aquaculture

Graduate

CNAS
BI/EV507 Advanced Statistical Methods 4
BI503 Biological Literature and Scientific Writing 2
BI505 Advances in Tropical Ecology 3
BI520 Current Topics in Cellular Biology 3
BI474G Marine Botany
BI440G Ichthyology
BI515 Advances in Biogeography
BI/EV529A Environmental Contamination & Toxicology I: Fundamental Principles & Basic Concepts
BI/EV529B Environmental Contamination & Toxicology II: Fundamental Principles & Basic Concepts
BI/EV545 Fisheries Biology
BI546 Marine Invertebrates
BI/EV550 Biogeochemistry
EV/MI506 Physical Geography of Micronesia
EV510 Environmental Science: Biology/Ecology
EV511 Environmental Science: Geosciences/Engineering
EV512 Environmental Science: Economics-Management-Law
EV/MI517 Cultural Ecology
EV535 Tropical Climate and Climate Variability
EV536 Hurricanes and Typhoons: An Overview of Tropical Cyclones
EV570 Environmental Economics
EV580 Environmental Law
MI/EV506 Physical Geography of Micronesia
MI/EV517 Cultural Ecology

Required Technical Courses (1 – 4 Credits)
The American Council on Education (ACE) through its College Credit Recommendation Service has evaluated and recommended college credit for 18 PADI courses and one Emergency First Response course. ACE is the major coordinating body for all the nation's higher education institutions. Want to learn more? Download an information sheet and Student Transcript Request form (pdf) or contact PADI Americas at training@padi.com.

Physical Education
Snorkel QUEST (Quantitative Underwater Ecological Surveying Techniques) 1 credit
**or Guam Community Coral Reef Monitoring Program/Marine Underwater Techniques (MUT) Completion*
**or Motorboat Operator Certification Course*
Emergency First Responder, PADI (Contract) 1 credit
Open Water Diving, PADI (Contract) 1 credit
Advanced Open Water Diving, PADI (Contract) 1 credit

Capstone Project Course (Optional 3-credit)
**BI/SW401 Community Service Learning*

Technical Course Descriptions
Snorkel QUEST (Quantitative Underwater Ecological Surveying Techniques)
Snorkel QUEST is a 40-hour course aimed at introducing students to marine resource management surveys and near-shore habitat conservation. Snorkel QUEST is offered every summer for credit through UOG. For more information about Snorkel QUEST see the Sea Grant website. This course serves as a swim test and species identification test. Satisfactory completion of the swim test and a score of 80% or better is required for completion of this course.

Charting a Course to Snorkel QUEST
For students interested in participating in Snorkel QUEST, the following requirements must be met:
1. Complete 6 credits of elective courses toward the MOP certificate.
2. Fill out the MOP certificate application and be approved for the program.
3. Apply to QUEST by early February
4. Costs:
   - One (1) credits
   - Lab fee ($150)
   - Snorkel gear

Guam Community Coral Reef Monitoring Program/MUT (Marine Underwater Techniques)
Program in collaboration with NOAA GCCRMP. GCCRMP offers courses in the Fall each semester and trains students to understand underwater techniques used to quantify data in marine science fields, specifically for benthic habitats.

MOCC (Motorboat Operator Certification Course)
The MOCC provides students with training required to operate MOP-owned watercraft. Training includes requirements for safe operation of motorboats, navigation, emergency procedures, rescue, self-rescue, and basic seamanship.

Open Water Diver Course
The PADI Open Water Diver course consists of three main phases:
- Knowledge Development (online, independent study or in a classroom) to understand basic principles of scuba diving
- Confined Water Dives to learn basic scuba skills
- Open Water Dives to use your skills and explore!

Advanced Open Water Diving Course
You'll plan your learning path with your instructor by choosing from a long list of Adventure Dives. There are two required dives – Deep and Underwater Navigation – and you choose the other three, for a total of five dives. During the Deep Adventure Dive, you learn how to plan dives to deal with the physiological effects and challenges of deeper scuba diving. The Underwater Navigation Adventure Dive refines your compass navigation skills and helps you better navigate using kick-cycles, visual landmarks and time. The other knowledge and skills you get vary with your interest and the adventures you have – photography, buoyancy control, fish identification, exploring wrecks and many more.

First Responder Course
- Primary Care (CPR) – This course teaches you the steps and techniques for handling life-threatening emergencies. You'll practice eight skills for aiding patients who aren't breathing, have no heartbeat, may have a spinal injury, may be in shock or who may have serious bleeding. You'll learn to how to perform CPR and continue to monitor the patient, so that you provide every possible chance of survival while waiting for emergency medical services to arrive.
- Secondary Care (First Aid) – Because many medical conditions are not life-threatening and emergency medical services are sometimes delayed or unavailable, this course teaches you how to provide first aid that eases pain and reduces the risk of further harm. You'll learn to assess a variety of injuries and illnesses and practice bandaging and splinting.
- Care for Children – This course allows participants to learn, practice and apply emergency care skills specific to helping infants and children with medical emergencies. It's designed for those who work with children or are likely to have to respond to emergencies involving youngsters. This course is often integrated with Primary Care (CPR) and Secondary Care (First Aid) courses.
- CPR & AED – This course focuses on CPR training and teaching participants how to use an AED (automated external defibrillator). When workplace or governmental requirements specify this training, the CPR & AED course meets the need. This course is often integrated into First Aid at Work programs.

- First Aid at Work – In some areas, such as Great Britain, Australia and Canada, governmental regulations call for enhanced CPR and first aid training for the workplace. First Aid at Work programs designed for these areas include additional topics and skills to meet requirements while following the easy to learn EFR approach to training.
- EFR Refresher – It's a good idea to refresh your CPR and first aid skills every 24 months, and that's what the EFR Refresher course is designed to do. Focusing on key skills, the course allows you to stay up-to-date and ready to lend aid when needed.

Service Learning Project

What is the Service Learning Project?
MOP students are required to complete a MOP Service Learning Project of their choice and design. Student projects may encompass a wide variety of topics including:
- Marine mammal communication
- Summer research cruises
- Artificial reef construction
- Marine photography and videography
- Underwater surveys of marine habitats
- Marine paintings and sculptures

Example projects have run from scientific research to endeavors in the arts. Each year, students from all UOG have the opportunity to present the results of their projects at the annual CIS Conference or Communications Video.

Details of the Service Learning Project
This project is designed to assist students in developing an awareness of the importance of service as a civic responsibility. The project provides upper division students the opportunity to link marine related study in his or her major and community service so that the service makes the study immediate and relevant, and the study relates to and supports the service to the community.

Students contribute a minimum of 50 hours of work to complete an agreed upon project. This service component is complemented by 16 seminar hours where meet with the instructor to discuss and reflect on the project.

MOP's philosophy is that with only classroom and laboratory learning, you leave College incompletely educated about the ocean. Therefore, first-hand experience is central to the Certificate requirements. The MOP Community Service Learning course is designed to help you choose a topic and develop a written plan or proposal for your project. By enrolling for credit while carrying out the project, it becomes part of your academic record.

The MOP faculty and staff will help you survey potential topics, identify an appropriate mentor, prepare your proposal and carry out your project in a timely fashion. You can come into the MOP office with an idea, or the MOP Coordinator may have a ready-made opportunity. Not all projects fit

the academic calendar – this can be accommodated. You may undertake a project alone or with one or more MOP students. The projects can be based on or off campus. Often

Keep in touch with your MOP Coordinator during the project by submitting periodic progress reports. Projects are concluded by a final report, which may be in the form of a written paper, an oral presentation at the annual CIS Conference, a performance, an art show, or in whatever medium best displays your work. MOP Coordinators assist students in selecting an appropriate format for the final report and guide students in evaluating their learning.

Restrictions
Only the Elective Prerequisites can count toward both your major requirements is allowed and the MOP certificate. No more than six (6) credits may be from a non-UOG institution. Three (3) credits should be from a course that shows human impact on the ocean.
An identical project report may not satisfy both the MOP Certificate requirement and the requirement for another UOG certificate or degree. However, the MOP project can be a section or phase of a larger project, such as a senior thesis, or vice versa. This relationship should be clearly stated in the project proposal and discussed with your MOP Coordinator.

Annual CIS Conference
The CIS Conference is held each spring semester. The Symposium provides a professional, scientific venue for MOP students to give oral or poster presentations of their Service Learning Projects, and gives students the opportunity to meet other MOP students, learn about research projects, and practice their presentation skills. MOP students may receive one of the following awards at the Symposium:

- Best Internship Paper
- Best Research Paper
- Best Poster
- Linda Tatreau Guardian of the Sea Award - awarded for the most inspired and inspirational presentation by a MOP “Guardian of the Sea”
- PACON International, Guam Chapter, MOP Symposium Award – awarded for best paper integrating marine science and technology with a Pacific focus

MOP CERTIFICATE COURSE REQUIREMENTS
To receive a MOP certificate, students must complete the following requirements:

9-12 Credits of approved marine-related elective courses
1-4 Credits of technical skills courses
3 Credit Community Service Learning Course (optional)
MOP Service Learning Project
10 – 19 Credits Total

Due to the flexibility of the Marine Option Program, students may choose from a wide variety of ocean-related courses to fulfill their certificate requirements. These courses include topics such as Oceanography, Marine Biology, Natural Resource Management and Conservation, and more.

In addition to specific courses listed, nearly all departments offer “directed reading” with faculty guidance, “directed research”, “field study”, “thesis research”, and similar courses in which each student determines his/her own course content. These will be accepted as fulfilling MOP requirements upon demonstration that an individual’s work for course credit is marine-related. Such offerings are generally available as 399 and/or 499; these will not be repeated for each department in the list. Any student interested in course credit for self-directed study should consult a current University of Guam Course Catalog, his/her advisor, and the MOP staff.

In the event that students find courses which they feel should qualify as marine-related, they are encouraged to consult with the MOP Coordinator. Graduate courses, numbered 500 and above, are occasionally open to undergraduates. Some of these courses are included for completeness of the marine listings.

Not sure what classes are available this semester? Check out the course catalogue, Class Availability section of your Webadvisor account, or contact your campus MOP Coordinator.

FREQUENTLY ASKED QUESTIONS

What is the Marine Option Program (MOP)?
The Marine Option Program is a certificate program open to University of Guam students from any field of study that have an interest in the ocean. Students in the MOP certificate program have the opportunity to take marine-related coursework, and to conduct an independent research project or participate in an internship in a marine-related field. The MOP certificate program provides students with experiential education, research opportunities, networking, job opportunities, field trips, and the opportunity to pursue their passion for marine studies.

What is a Marine Option Program (MOP) Certificate?
The Marine Option Program Certificate is awarded to students who have completed a specialized marine-focused course of study, including required coursework and an independent project. The MOP certificate is similar to a minor, and is awarded to students who successfully complete 9 – 12 credit hours of marine-related courses, 4 credits of required technical courses as well as the capstone Service Learning Project. The MOP certificate is an official University of Guam Certificate that is registered on your transcript.

Interested in the Marine Option Program?
To join the MOP certificate program, complete a MOP Application form and meet with one of the MOP Coordinators soon.