

NATIONAL SEA GRANT ADVISORY BOARD

NOVEMBER 3-4, 2015

FALL 2015 MEETING

BRIEFING BOOK

NAME

HILTON HAWAIIAN VILLAGE

HONOLULU, HI



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Agenda



National Sea Grant Advisory Board (NSGAB) Fall Meeting
November 3-4, 2015
AGENDA
Honolulu, HI

Tuesday, November 3, 2015

Location: Honolulu Suite 1

OPEN TO THE PUBLIC 8:00 am – 5:00 pm HST

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| 7:30 | Breakfast (Honolulu Suite 2) |
| 8:00 – 8:15 | Welcome, introduction of new members, review of agenda, approval of minutes (Rollie Schmitt, Chair, NSGAB) |
| 8:15–8:45 | NOAA Research Update & Discussion (Craig McLean, Deputy Assistant Administrator, NOAA Research) |
| 8:45 – 9:00 | Chair’s update (R. Schmitt, NSGAB) |
| 9:00 - 10:30 | National Sea Grant College Program, Director’s Update (Nikola Garber, Acting Director, NSGCP) |
| 10:30—11:00 | Break (Honolulu Suite 2) |
| 11:00—12:00 | Sea Grant Association Update (Sylvain DeGise, President, Sea Grant Association) |
| 12:00—1:15 | Break for Lunch (Honolulu Suite 2) |
| 1:15—2:00 | Set the stage for afternoon discussion/Reauthorization/Biennial Report to Congress (N. Garber, NSGCP; R. Schmitt, NSGAB; S. DeGise, SGA) |
| 2:00—3:00 | Sea Grant Visioning/Sea Grant Roadmap (N. Garber, NSGCP; R. Schmitt, NSGAB; S. DeGise, SGA) |
| 3:00—3:30 | Break (Honolulu Suite 2) |
| 3:30—4:00 | Program Implementation & Evaluation (PIE) (N. Garber, NSGCP) |
| 4:00—4:15 | Strategic Planning 2018-2021 (N. Garber, NSGCP) |
| 4:15—4:30 | Chair, Vice Chair, Member-at-large Slate & Vote (R. Schmitt, NSGAB) |

- 4:30—4:45 National Ocean Sciences Bowl Discussion (R.West, NSGAB)
- 4:45—5:00 Discussion of days topics and wrap-up (R. Schmitt, NSGAB)
- 5:00 Public Meeting recessed until 8:30 am Wednesday, November 4, 2015
- 5:00 – 6:00 Advisory Board Business Meeting (Board Only)**

Wednesday, November 4, 2015

Location: Iolani Suite 1

OPEN TO THE PUBLIC 8:00 am – 12:00 pm HST

- 7:30 Breakfast (Iolani Suite 3-4)
- 8:00 – 8:15 Call to Order and follow up from previous days meeting
- 8:15 – 8:30 Public Comment Period
- 8:30 – 9:30 Charge to the Board- Review of the Sea Grant Extension-NOAA Liaison positions (D. Baker, NSGAB)
- 9:30 – 10:00 Break (Iolani Suite 3-4)
- 10:00 – 10:45 Globalization of the Sea Grant Model (R. Vortmann, NSGAB)
- 10:45 – 11:30 Member Updates
- 11:30 – 12:00 Discussion of meeting topics and wrap-up (R. Schmitt, NSGAB)
- 12:00 Meeting Adjourned**
Lunch (Tapa 3 Ballroom)

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March 2015 Draft Minutes



National Sea Grant Advisory Board (NSGAB) Spring Meeting
March 2-3, 2015
Meeting Minutes

Washington Plaza Hotel
10 Thomas Circle NW
Washington, DC 20005

Monday, May 2, 2015

OPEN TO THE PUBLIC 8:30am-4:00pm EST

Introductions, review agenda, approval of minutes, etc. (R. Schmitten, Chair, NSGAB)

Roll Call:

Rosanne Fortner, Richard West, Dale Baker, Amber Mace, Paulinus Chigbu, Harry Simmons
William Stubblefield, Rolland Schmitten, Richard Vortmann, Frank Beal, Nancy Rabalais,
Sylvain DeGuise (*ex-officio*), Leon Cammen (*ex-officio*)

National Sea Grant Office (NSGO) attendees: Jonathan Eigen (Designated Federal Officer),
Nikola Garber, Dorn Carlson, Genene Fisher, Joshua Brown, Sami Grimes

Other attendees:

Jennifer Hinden-National Sea Grant Office, Contractor, Acentia
Julia Galkiewicz-National Sea Grant Office, Contractor, Acentia
Sarah Bowman-National Sea Grant Office, Knauss Fellow
Helen Cheng-National Sea Grant Office, Knauss Fellow

Welcome, introductions, review of agenda, approval of minutes (R. Schmitten, Chair, NSGAB)

Mr. Schmitten suggested moving the Focus Area Updates and the discussion on Focus Teams to earlier in the agenda. He also suggested two additional topics: discuss the Sea Grant Association (SGA) 2015 budget proposal and the future of Sea Grant.

September 2014 Draft Minutes

Questions/Comments/Changes

- Add Dr. Mace to roll call on both meeting days.
- Mr. Baker's name is included in roll call twice on day two.
- Replace "Florida Sea Grant has" to "have" on page 8 of the minutes, 2nd paragraph, 2nd sentence.

Motion by Mayor Simmons to approve the September 2014 draft minutes with recommended changes.

Dr. Stubblefield 2nd, unanimous approval.

Motion approved.

Mr. Schmitten announced Dr. Cammen will be retiring from the National Sea Grant Office and Dr. Stubblefield's term will be expiring with the NSGAB. Mr. Jonathan Eigen has been appointed the NSGAB's Designated Federal Officer, and Dr. Nikola Garber will move into the Acting Director position once Dr. Cammen retires. Mr. Schmitten welcomed Dr. Sylvain DeGuise to his first NSGAB meeting as the new SGA President.

Chair's Update (R. Schmitten, NSGAB)

Topic: Sea Grant Heroes; Sea Grant 50th Anniversary

Mr. Schmitten summarized what is currently being discussed with the Executive Committee on Sea Grant's 50th Anniversary. He noted the Executive Committee would like to get a small group of Knauss Fellows to participate, and include, presidential proclamations, a Congressional resolution honoring Sea Grant, brochures, a 50th Anniversary Sea Grant logo (turn the eagle gold), t-shirts, highlight the different Sea Grant success stories, and highlight Knauss alumni. Mr. Schmitten will try to send out a summary to everyone on what the Executive Committee is doing for the 50th Anniversary.

Dr. DeGuise noted the plan for the 50th Anniversary is to have a year ending with Sea Grant Week in Rhode Island. Admiral West suggested getting Whitehouse & Reed, Congressmen to participate. Dr. DeGuise noted the Pell family is in the plans for Sea Grant Week in fall of 2016.

Topic: 114th Congress

Mr. Schmitten has been impressed about procedurally moving through the system, and that it all started back in October with his and Dr. Fortner's meeting with Dr. Kathryn Sullivan on Sea Grant's Reauthorization. A letter of appreciation to Dr. Sullivan followed a few days later. He and Dr. Fortner indicated Sea Grant itself could use the \$80M to do its job appropriately.

Mr. Schmitten referenced the letter to Dr. Kathryn Sullivan from the SGA, and feels the SGA has done a great job in preparing for this including visits to Sea Grant state's. The SGA asked if this was something the NSGAB can support. Mr. Schmitten asked for any comments. He feels that for the good of Sea Grant it's a good initiative and would like to say the NSGAB can support.

Dr. Cammen noted, Sea Grant has been working more closely with the National Ocean Service (NOS) over the past 8 months, which is more than we ever have since he's been with NOAA. This is because there is finally recognition from leadership, and the change in leadership with NOS.

They know what Sea Grant can do, and there are a lot of tools they can work with and Sea Grant's one of them.

Dr. Cammen noted the proposed FY16 Resilience activities funded through NOS are grants and Sea Grant will have the ability to receive some of those grants. The idea is to take advantage of everything NOAA has to offer and help the coastal communities out. Dr. Cammen noted there is \$2M for coastal conservation resiliency type work that specifically is assigned to Sea Grant and the National Estuaries Research Reserve System (NEERS), but the money will go somewhere in NOS and will get transferred. If it did come through Sea Grant, the \$45M or \$50M FY 16 President's request would require \$25M match. If it comes through NOS and then Sea Grant, there is no match requirement. People are saying it's hard to find match, but others find it a good thing.

Dr. Stubblefield feels this is a marketing issue for Sea Grant, because they are not mentioned. He feels the marketing aspect has a greater impact than just the work getting done. Mr. Schmitt noted this should be brought to Dr. Holly Bamford's attention. Dr. DeGuise mentioned Dr. Bamford, Mr. Craig McLean and Dr. W. Russell Callender are aware of this issue.

Dr. Cammen noted Dr. Callender will work directly with this topic. What Dr. Bamford established before she left NOS was a coastal roundtable that includes Coastal Zone Management (CZM), NEERS, and other external members. Everyone meets via phone once a month, and it's an open conversation. Dr. Bamford invited Sea Grant to join. Dr. Callender has continued the conversation, and it has made a big difference. The conversation last meeting revolved around the proposed FY 16 \$45M, and other groups are uncomfortable as well. Dr. Callender assured all it's a NOAA project.

Topic: The Future of Sea Grant, Are we prepared?

Mr. Schmitt noted Sea Grant is about to embark on another 4-year Strategic Plan and they do look briefly at Sea Grant's future, but there's a need to conform with the NSGO and NOAA's strategic plan, but what they don't do is look at Sea Grant as a whole. His view is that the current Strategic Plan becomes less visionary. While important, he feels Sea Grant should be asking NOAA, how we prepare for the long term.

Mr. Schmitt noted there are many reasons Sea Grant should be proactive and long term, we are in competition. The Administration is looking to modify education, the outlook for Federal and state funding is not optimistic, other programs are copying the Sea Grant model rather than embracing Sea Grant, and we should be preparing for the social and economic changes. Businesses and people are beginning to move away from coastal areas and more towards higher grounds. Certainly, Sea Grant has changed the beginning, but in an ad hoc fashion and not a holistic approach.

Mr. Schmitt would like to form a small group made up of the NSGO, SGA and NSGAB to attempt to predict challenges and formulate options to better attempt the forever changing

environment. There is a need for more money to do more and the need to do better. The big question is what Sea Grant would look like if we were to start over today.

Admiral West absolutely agrees, and feels it should be coordinated with Dr. Bamford. They also need to take a look at where we are going in the future. NOAA needs to be invited and participate. Mr. Schmitten noted he would like to wait and see what the SGA has to say about forming a small working to discuss the future of Sea Grant.

National Sea Grant College Program, Director's Update (L. Cammen, Director)

Topic: Staff Introductions

Dr. Cammen introduced Ms. Helen Cheng and Mrs. Sarah Bowman, the 2015 Sea Grant Knauss Fellows; with the National Sea Grant Office and, Dr. Julia Galkiewicz, Knauss Fellowship Manager/Education Lead. Dr. Cammen also introduced NOAA Leadership Competencies Development Program (LCDP) details to the NSGO, Dr. Gene Fisher; Acting Assistant Director for Operations and Mr. Devin Brakob; Acting Lead for Planning and Evaluation. The LCDP is where senior people work in other offices to build leadership capacities. There may be more LCDP details within Sea Grant in the next year. Mrs. Sami Grimes is currently on LCDP detail to NOAA's Office for Coastal Management.

Topic: FY 2015/2016 Budget

Dr. Cammen noted Sea Grant's FY15 appropriation is about as high as it's ever been and the FY16 request from the Administration nominally reduces the base, increases aquaculture and again tries to eliminate STEM education, but funding would stay in Sea Grant. The important part for this year is resilience research was singled out and is now part of the base. The grand challenge, which is the prize competition, was proposed in FY14 for \$10M and ended up being \$1M in FY15. The NSGO has been working with the XPrize foundation. They have a larger challenge that Sea Grant would like to contribute to. The prize challenge was proposed for termination in FY15 and FY16.

Admiral West asked where the STEM education money goes. Dr. Cammen noted it would go to other Sea Grant activities. Mr. Schmitten asked how much money it is. Dr. Cammen replied it's on the order of taking the Knauss Fellows out of it and graduate students out. We would make the argument that graduate students are research. It would probably be around \$1M. Admiral West asked if there's been a reaction from the Hill. Dr. Cammen replied, no, he hasn't heard anything. He's assuming the reaction would be the same as last year.

Mr. Eigen noted from a legal standpoint, as he interprets the law, Sea Grant at the moment, assuming education passes in Reauthorization, it really does come down to how NOAA guides the NSGO. The NSGO hasn't been given any guidance. Dr. Cammen noted the NOAA budget process is changing and will be pushing more collaboration.

When ideas are being put forth now, they need to show collaboration. Resilience is a good example. When Sea Grant goes to talk about the \$80M we are asking for, they are going to want to know how it's relating to what other parts of NOAA are doing. As we move forward, we will see a lot of larger topical areas, but you won't see 50-60 individual projects for different offices.

Topic: FY 15/16, Office of Management and Budget (OMB) View Point

Dr. Cammen noted when the budget was put together for this year's request; Sea Grant did not have the appropriation. When OMB is getting the budget together for FY16, they are using the FY15 budget as a starting point. They held Sea Grant's base funding, aquaculture increased by \$5M because the Office of Science and Technology Policy (OSTP) has been working on aquaculture and recognizes the importance of the big increase overall.

Topic: FY15 Budget Handout

Sea Grant is in their 2nd-year of a 4-year program. The FY 15 budget shows no STEM reduction or grand challenge. New this year, Sea Grant has the Sea Grant/National Marine Fisheries Service (NMFS) exchange initiative. Sea Grant personnel professions, extension, or communicators go on detail for one-month to one-year to work on a Sea Grant project. NMFS employees are able to go out and work with a Sea Grant program.

The idea is to get them better connected. Sea Grant is providing \$200K to pay for Sea Grant personnel and NMFS is providing the same to NMFS Personnel. This is the first year Sea Grant and NMFS are doing this, and it is an experiment. We both want to see what comes out of it and if this is a way to get Sea Grant better connected with NMFS.

The NSGO expects to have \$1.5M if we get the President's budget for social science or a new National Strategic Investment (NSI), but not both. When we talk about NSI's Resilience and water resources, you have to realize social science is also on the same table. This will be the second year of the social science NSI. Each program will receive \$30K for the Climate Change Core Capacity Building NSI.

Topic: Sea Grant Network Development

Dr. Cammen reported the Guam Sea Grant Site Visit team not only conducted the review, they also visited the Northern Mariana's College. Folks from the college met with the NSGO last fall and were interested in working together. Mr. Schmitten, Dr. Hartley and Mr. Liffmann all participated in the meeting. As a result of that meeting it was concluded that the college has capabilities in the area of aquaculture. They are a very small institution, but the NSGO can give them funding as a Sea Grant project, if it is warranted.

Dr. Cammen noted the next step would be to get a proposal from them and he is sure the NSGO would work with them to see if it's something worth doing. Mr. Vortmann asked if they are independent or working through Guam Sea Grant. Mr. Schmitten noted the group would rather

they have some connection with Guam Sea Grant, but we aren't sure it's reasonable. Mr. Schmitten noted they are almost 4 hours away from anywhere in Asia and are collaborating with Japan, China, etc.

Sea Grant Association Update (S. DeGuise, President, Sea Grant Association)

Topics: Past SGA Leadership; Changes in membership; Directors Years of Experience;

Dr. DeGuise noted to Dr. Cammen it was a pleasure and honor to serve with him. He also commemorated Dr. Stubblefield on their professional relationship during the time they've known each other.

Topic: Recent Past

Dr. DeGuise noted Dr. Swann set up the growth committee with the idea to grow Sea Grant to \$80M without distraction. One of them was to hire an outside communications firm, West End, to assess the network. We have not had huge success in media placement as one of the parts they were envisioning, but they have helped Sea Grant create their message before it was presented to the NOAA Administrator and members of Congress. The SGA tends to be very precise and use big words; however, West End reviewed our idea and to our surprise a two sided document with lots of pictures and semantics was better communicated. It was a good lesson learned that we don't need twelve pages of information to get our point across.

The Sea Grant programs had a budget increase in FY 2014. There's been a lot of conversation about allocation committees and a lot of hard work from the NSGAB and SGA on working to rebalance the programs. Hat's off to Dr. Cammen on his wisdom and moving it in a different direction without alienating the programs.

Topic: Priorities for 2014-2018; and NOAA Priorities

The SGA met with NOAA Leadership and were made very aware of the top 4 priorities: community and economic resilience; National Weather Service evolution; observational infrastructure; and organizational excellence. Since then everything has a consistent message of these priorities. Priorities one and four fall exactly within Sea Grant's purview.

Topic: Near Future

Dr. DeGuise noted Randy Nelson was Dean at Pixar University. The video is 12 minutes and talks about collaboration.

Topic: Where is Sea Grant on Resilience?

Dr. DeGuise reported part of the collaboration is to accept every offer that makes your partners look good. If you find someone that is rare and accomplished and are the best at something, then you can be the best at something else. Sea Grant has been able to do neat and original stuff with

resilience. He feels Sea Grant's nationwide extension network is not only giving but listening. We have a great network of communicators that are not only good at crafting the message, but the people on the ground transferring that message.

Topic: Strategic Roles for SGA; A Vision for SGA Efforts

Dr. DeGuise feels the SGA has been very effective in communicating with OAR, NOAA, and Congress. A great reflection of that is Sea Grant's budget.

Topic: Strategy: enhance communication; Some specific examples; Some difficult questions

Dr. DeGuise noted the SGA has several meetings where the committees and networks are represented, and then there's the SGA membership that interacts with current and past members. The SGA is hoping the NSGAB can reach out to membership and talk about it more than twice a year. Dr. DeGuise feels Sea Grant needs to continue to integrate a national and local communication strategy. The contract with West End is one-year, and he feels they should discuss what went right and what didn't.

Dr. DeGuise feels the SGA should participate in trying to reach out to different line offices of NOAA and to access the role of Sea Grant and how it can be improved. Dr. DeGuise mentioned the Intergovernmental Personnel Act (IPA) positions that will be implemented within Sea Grant. If it's a year, it may be a problem, but a few weeks here and there will be easier for a lot of people.

Topic: What it will take?

Dr. Stubblefield thanked Dr. DeGuise and noted he's appreciated the vision of his predecessors. Each one had very good ideas: Dr. Swann selling Sea Grant to Congress and Dr. Pennock on partnerships. What he hasn't heard is the President actually building upon the objectives and goals of its predecessor. There's a continuity message that would be persuasive, but never represented. Dr. DeGuise replied he fully intends to work on growth and feels if the SGA changes their message every two years, they will fail. The growth principal he wants to continue to pursue is the same, resilience. Mayor Simmons reported on a new Congressional Coastal Communities Caucus that started two weeks ago. He would like to try and make the connection between the SGA and the committee.

Reauthorization (L. Cammen, NSGO; R. Schmitten, NSGAB)

Dr. Cammen reported the NSGO is still in process of Sea Grant's Reauthorization that has been discussed by the Senate Commerce Committee (SCC). where several issues were reviewed. The SCC staff was interested in the language dealing with the Knauss Fellowship placement and in looking at ways to balance the program.

At this point, no bills have been introduced this Congress. The only thing that needs to be clarified is the direct hire authority for Knauss Fellows. The proposed language would give

Executive offices, one a fellowship is complete, the ability to hire them as a federal employee. A lot of our fellows are recruited as contracts.

Mr. Schmitten noted he was told the Bill was going to be re-introduced by Senator Brian Schatz and Senator Roger Wicker. Two committees in the House; Science and Natural Resources have jurisdiction. The Science Committee is very keen on being involved. That's where the problem is right now, that committee doesn't exist. They are currently being rebuilt.

Mr. Schmitten noted the proposed legislation raises the administrative cap (CAP) .5%. The NSGAB position is still the same. Dr. Cammen noted besides the increase, the legislation gives the NSGO the authority to hire IPAs from the universities outside the CAP. IPAs are temp positions to the NSGO, and the NSGO may or may not pay their salary. According to the current legislation, administrative IPA's fall within the CAP. If the IPA is programmatic, they do not fall under the CAP. There is an issue, they are still not free.

The way the law is written is, we can pay nothing or everything. In the SGA briefing book, there is a comment that the universities would be paying for the IPA's, that's not my understanding of how it works. Dr. DeGuise noted it could be directly or indirectly. The SGA feels they are in the same situation, and they are under pressure to cap those expenses because they have to maintain their programs at a certain level. Our principal is to focus on increasing the overall funding which would be more of a permanent solution than increasing the CAP.

Our office had our education coordinator in a part time IPA position and they subsidized part of the cost, and so did the program, but it wasn't worth it. It was a common goal effort and it might be difficult to get a lot of people to commit, but if we approach it at a focus topical effort, it may be a lot more mutually productive and that might be where the university language came from. He feels the SGA is willing to contribute to the value added that the NSGO provides, however, the SGA doesn't agree that lifting the CAP is sufficient in order to do that because our expenses increase as well.

Dr. Mace replied yes, overall the pie doesn't stay the same. She thinks from the staffing prospective, the programs are limited and will have temporary staff. She feels there are constraints for the NSGO to staff itself appropriately.

Dr. Cammen noted, in the past, IPA's were in a sense competitive, but not formally. The NSGO put out a note to the network announcing an IPA position. They review the resumes and make a decision from there. It is not a NOAA formal recruitment process. There is nothing that says an IPA has to be a resident of Silver Spring, but there are things that can be gained by working on site.

The only problem he has with the concept is regardless whether it's in or out of the cap, the NSGO is still paying it and anything the NSGO pays will be cut from funding. The way the SGA ought to be looking at IPAs is as a return on investment. The network gets more resources. Rising tide floats all boats. You don't wait to see what's happened to decide if the investment is good. You make the investment first to see if it was a good decision.

Dr. Cammen noted the other implication of having a CAP tied to an annual appropriation is you have an annual budget. During the history of the budget, half the budget went down and the other half it went up. The Sea Grant programs don't see this fluctuation because the NSGO makes sure it dampens that effect. If the Sea Grant programs don't have a budget that goes up and down, up and down, you can't manage to the peak or to the average. Some years there's some additional money, but you can't hire under the circumstances to the peak amount. He feels Sea Grant has reached a plateau and now we will be more aggressive with hiring, but that is the result of an unpredictable cap.

National Sea Grant Office Staffing and Responsibilities (L. Cammen, NSGO)

Topic: Functions of the National Sea Grant Office; What is changing?

Dr. Cammen noted the four major function of the NSGO include (1) management and assessment of individual programs; (2) network leadership and coordination; (3) optimization of Sea Grant's role within NOAA; and (4) national leadership and program development. Due to inadequate staffing of the NSGO, we do not have time to accomplish the duties 3 & 4. The NSGO is realigning because we need to place more emphasis on these major functions. There are too many assignments for staff members.

Topic: NSGO Realignment Handout

Dr. Cammen referenced the NSGO organizational chart and noted some of the numbers are the same, which means the position will be shared by the same person. Circles are all personnel actions and changes. The numbers circled in green are not new positions we have to pay for, they are details. Positions 14 and 15 were filled by Mrs. Chelsea Berg and Dr. Gene Kim and do not require any additional money. There is no one currently in those positions because they've left. The positions circled in purple are IPA positions, which will be full or half time.

The focus area coordination lead and line office liaison are the same person. Two positions are planned to be NMFS detail (seafood) and NOS. The NSGO should have a name this month on who will be the NMFS liaison. The NOS person will be in charge of ecosystems and making connections with NOS. If the NSGO can negotiate that position, it will be a hire.

Mrs. Elizabeth Rohring is now the Director of Communication and will continue as such, minus the DFO responsibilities. She will only do communication and will have an assistant. Mr. Jonathan Eigen is now the Chief Financial Officer, as well as the DFO. He will have two people under him. Right now one of those positions is being filled by Dr. Joshua Brown when he's not being a program officer, and climate and hazards lead. Someone will also be supervising information technology (IT), which includes web functions and the Planning, Implementation, and Evaluation Reporting Database (PIER).

The realignment funding can be handled for up to 3 years, but what's going to happen in the 3rd and 4th year is we are going to have legislation passed for additional money. Over time salaries

go up and we are confident we can last 3 years. Beyond that, if the legislation doesn't pass we are going to have to make cuts. The thing is we've lived long enough managing the trough and at some point you can't do that and need to take a more optimistic point of view. At the end of the day we've brought in more people in the office and split up duties so people can be more specialized. We are in the midst of getting approval for the whole flock of actions.

Mr. Vortmann noted he fully supports the organizational chart and it depicts exactly what Dr. Cammen is trying to achieve. Mr. Vortmann asked Dr. Cammen to explain the split between the organizational chart. Dr. Cammen replied what we are trying to do is split things in half. Left half is all dealing with Sea Grant programs one way or another. The right side represents Sea Grant as a national program with external partners. This is external of the Sea Grant network.

Dr. DeGuise noted there are no new positions at the senior level towards the top. Is that because of budget constraints, done purposefully or we have enough growing experience. Dr. Cammen replied he tried to create a career for people to grow into senior level positions. Right now people have to leave to get advancement. It's more important to get the people at the bottom than one senior person at the top.

Dr. Mace asked about a NWS detail position. Dr. Cammen noted it's not built into the plan, but it's a possibility. The one person we have in place in the middle box is 12, Dr. Brown. He will stop doing contracts and program officer details, and concentrate on tasks of climate, weather, and hazards. If we can get a detail person from the NWS that will be terrific, and we will have those conversations.

Dr. Garber noted Dr. Gene Fisher's position is to have those conversations and see what we can do. The NMFS Sea Grant position is advertised as permanent. Just like the IPAs, there are other models that could have rotation. We want to keep some institutional knowledge, as well as rotation through the NSGO.

Mr. Baker asked Dr. Cammen if he has rationale to who he wants in the DFO position. Dr. Cammen replied traditionally that position has been filled by the Deputy Director. When Dr. James Murray retired, he made the decision that there was enough work for a Deputy Director to do without being DFO. Mrs. Rohring had the most ability at the time to change her assignment. The down side of that is that she spent most of her time as DFO and not communicating.

By putting Mr. Eigen in that position, we've elevated it back to being senior level. With that we are getting Mr. Eigen two people to work for him on the budget task. His job as CFO will give up some time to work more on the NSGAB. Also, Mrs. Jennifer Hinden will take on a larger role in helping the NSGAB. Admiral West noted someone from the NSGAB can take the DFO training to help Mr. Eigen and do a lot of the leg work.

Dr. DeGuise asked if decisions have been made or are they still in progress. Dr. Cammen noted other than the details from NMFS and NOS; every other position has to be competitive. There are a few senior level positions that are re-competing. Dr. DeGuise asked who would fill the positions for 7, 8 & 9. Dr. Cammen replied, Mr. Dorn Carlson is 7, 8 will be Mr. Chris Hayes;

and 9 is Mr. Michael Liffmann. Mr. Liffmann is retiring at the end of the year so he will have to be replaced by then.

Dr. Garber noted if anyone would like to make recommendations on who should fill the positions, please let her know and she will be sure to send out the information as it becomes available. Dr. Cammen noted the Director position will be recruited. He has no idea how quickly it will advertise, but when it gets out, it will be a national search in Science magazine and different journals. It is a really competitive position. It could go to someone in NOAA or a Sea Grant office.

Dr. Stubblefield asked if Dr. Cammen has talked with Mr. Craig McLean or Dr. Kathryn Sullivan on the mechanics of the position and their role in the NSGAB. Dr. Cammen noted there are two hiring boards that look at the applications. The first one looks at everyone and cuts down the list, the second conducts interviews. The NSGAB is not permitted to serve on the first hiring board and you can't be an official part of the group, but you can offer advice and be a part of the selection choice. Dr. Stubblefield asked if it requires Senate confirmation. Dr. Cammen replied no.

Pennsylvania Sea Grant (PA SG) Program Status (L. Cammen, NSGO)

Dr. Cammen noted Pennsylvania Sea Grant was brought into existence in early 2000 and they have made steady progress in moving through the stages to becoming a College Program. The NSGO sent a review team out in October to decide if PA SG met the standards to becoming a College Program. The review team has conducted the review and letter of recommendation. That report will come to the NSGAB for review.

The NSGAB will take action on the report, action being either to agree with the recommendation to become a Sea Grant College or reject. Once the NSGAB makes their decision, the recommendation goes to him and he makes the recommendation to NOAA for PA SG to become a designated College Program. Virginia Sea Grant went through the same process. At this point, he will defer to Admiral West for comments.

Admiral West noted the committee did a combined evaluation of the program and site review. The committee consisted of Dr. Fortner, Mr. Baker, Dr. Pennock and Mr. Eigen. The report is in the briefing book. The committee is very happy with the review and we recommend that VA SG become a College Program.

Mr. Schmitten asked if there are any comments. Dr. Cammen noted with the new allocation scheme, PA SG received a substantial bump in funding. Mayor Simmons asked if they get another bump by becoming a College Program. Dr. Cammen replied no, there is no money associated in advancing from stage to stage. The NSGO has been treating Institutional Programs equivalent to the way we treat College Programs. When Guam and Lake Champlain Sea Grant became Coherent Area Programs, they got a bump, but it's nothing formal.

Admiral West noted PA SG is really engaged with state agencies and have a lot of support from the governor. Penn State is probably one of the largest federally funded research centers. They have given PA SG a lot of support.

Motion by Mayor Simmons to recommend to Dr. Cammen that PA SG be approved as a College status program.

Dr. Mace 2nd, unanimous vote.

Motion approved.

Selection of nominating committee for 2016-2018 slate (R. Schmitten, NSGAB)

Mr. Schmitten noted the nominations committee consists of the Chair and two members of the NSGAB that are chosen by the NSGAB. He has asked Mr. Beal, Dr. Rabalais as past president, and Admiral West as the third.

Motion by Mayor Simmons to approve the proposed Nominating Committee.

Dr. Mace 2nd, unanimous vote.

Motion approved.

National Strategic Investments (NSI) (L. Cammen, NSGO)

Dr. Cammen noted the NSI's that are being discussed will start next fiscal year. This year, the NSGO is booked with social science, capacity building, and aquaculture. Two are discretionary. If Sea Grant gets the President's request for next year, as requested, we would get \$1M. If Congress were to look at the budget and say we would rather put that into the base of Sea Grant, then we would have more money available for NSI's. We won't really know until we get the final appropriation.

His goal is to try and get ahead of the game so we are ready going into the next fiscal year. Also, he is trying to get the SGA and NSGAB more involved in the decision making process. You have two documents in front of you that were sent out on Friday. The process consisted of short proposals on fifteen different topics. Topics were discussed last were discussed during the 2014 fall meeting. Everyone selected preferences on resilience and water resources.

Those things were described very broadly. We are only talking about \$1.5M. What we need to do is discuss which one of these might be the third one to go forward and we will spend the next 6 months or so defining that down. These are written in the form of a request for proposal (RFP) and eventually will turn into an RFP. It has alarmed some people that there may be an RFP coming out. It's a description of the topic and the attempt to focus it down a little.

My advice is for everyone to think about three things. One, the impact the activity will have on stakeholders and two, will we be able to claim credit for doing this. If we are going to do something a lot of other people are working on, with more money than us, maybe it isn't the place we should be spending money. Lastly, does it help provide an identity or visibility for Sea

Grant. Further, narrowing it down to one of these two topics and having people working on crafting language.

Mayor Simmons asked what it means for social science. Dr. Cammen replied social science is providing an initiative. We are paying for half of the projects. The idea was to fund things, but get the social science out there as well.

Dr. Mace noted almost every aspect of water can be put into resilience. The description is very broad and not really targeting impact. She would like to discuss how many topics can be paired with resilience. She wouldn't pick something too offshore and if there is a big off shore component, you would have something more coastal.

Dr. Cammen noted his impression is that NOS is looking at giving money to regional communities to implement things. That's not really what Sea Grant does. He's been trying to partition Sea Grant out. Sea Grant tells people how to do resilience. That's got to be made clear to people.

Mr. Schmitten noted he likes the idea of tying the two together. He asked what Dr. Cammen needs from the NSGAB. Dr. Cammen replied he would like the NSGAB to go as far as they think they can go. Mr. Vortmann asked if Dr. Cammen is still looking at three potential NSI's with a maximum of 2 or 1 if they were combined. Dr. Cammen replied right now social science is done away with. This is the 2nd year of the 2 year initiative.

Dr. Mace noted Sea Grant's niche needs to be identified with resilience. She feels it would be helpful if Sea Grant played the role of narrowing the list and how the other amount will be invested. For example, you can combine the two: loss of freshwater supply, capabilities of climate change impacts affecting freshwater storage; and merging and strengthen the resilience piece.

Mayor Simmons noted the resilience piece really strikes him as something that will need a lot of legal involvement. He wants to make sure that whatever comes from this, that law components are covered. Mr. Baker noted one area Sea Grant can be unique is if they focus on an outreach initiative. Dr. Cammen noted he'll carry this advice forward to tomorrow and see what the SGA has to offer. A small committee will be put together to finalize one NSI and we'll wait to see what the budget looks like.

Discussion and wrap up of all topics (R. Schmitten, NSGAB)

Mr. Simmons brought up marketing of Sea Grant and how it can be easily done with stakeholders during site visits. Mrs. Grimes noted during site visits, we have stakeholders that come in and say great things about Sea Grant. They are speaking from the heart and it's true they are speaking on behalf of Sea Grant. It would be great if we could capture visually what the stakeholders are saying.

Dr. Cammen noted this is something that ought to be offered to the program. His concern on the program end is that it's an intense, difficult period of time and unless they think of it themselves to layer it on top, it is really throwing something in at the last moment. When we are setting up the site visit, we bring it up as something that was mentioned and if they like it fine, but they may not. Dr. DeGuise noted he will bring it up during the SGA meeting. Dr. Mace suggested the program inviting back the stakeholders to have a more thought out video.

Mr. Schmitten reiterated that the SGA initiative for the FY15 budget is to move under the guidelines of resilience and increase Sea Grant's budget to \$80M. The SGA has worked diligently with the NOAA Administration.

Mr. Schmitten noted the SGA/NSGAB Fall Meeting will be in Hawaii. The topic is resilience. Other topics could include collaboration with NOS and sharing funds, projects, qualifying for grants, etc. Dr. Mace noted another topic could be thinking about expanding partnerships in the Pacific and international partnerships. Dr. Cammen noted Sea Grant did have an international program that was repealed and taken out of legislation; and what was left in was the State programs can still have international projects. Maybe the NSGAB would like to consider having it put back in. We do have an extension agent in the Marshall Islands, and we have the Guam Coherent Area Program that is conversing with the Northern Mariana Islands.

Dr. Mace asked if there were any follow-up items with the Mariana Islands that would warrant conversation. Mr. Schmitten replied they have interest in aquaculture, that's their forte. Mr. Vortmann noted we aren't looking for tax payer money to directly fund, but maybe use it as a seed for Sea Grant to go abroad to make them aware of the model and the benefits of the model. There may be interest of other countries using the model and setting up their own programs.

Dr. Garber noted a number of the Sea Grant programs work internationally. Sea Grant has been able to move some money into the office. The NOAA OAR International Office works on Sea Grant International trips. Since we don't do it in the NSGO, and we don't have staff, it is something we want to discuss. Dr. Mace noted she would be interested in exploring and discussing that topic and inviting Korea Sea Grant.

Mr. Simmons reported another component of Hawaii Sea Grant is their coastal hazard activities, and home owner's handbook. Since costal hazards can be a big part of coastal resilience, it's just another piece to tie into it. Dr. DeGuise noted they can discuss on going efforts to sell resilience to the Sea Grant Network. Dr. Brown noted Hawaii is a good place to do that because Hawaii Sea Grant has been very successful in a range of NOAA partnerships around resilience issues. Dr. Garber gave the task to Dr. Brown.

Dr. Garber asked if there are any folks on the NSGAB with international topics who can pull together concepts. Mr. Vortmann, Mr. Beal, Dr. Mace, and Dr. Fortner volunteered to take on the effort. Dr. Garber asked Dr. Fortner to pull together educational topics. Dr. Mace asked if there is a particular Sea Grant Director who is engaged in international work that may be a good addition. Dr. DeGuise replied Hawaii Sea Grant; and Dr. Cammen noted California, Florida and Washington Sea Grant Programs. Mr. Schmitten tasked Mr. Vortmann in chairing the

subcommittee and to come up with terms of reference, title and scope and to be prepared to give feedback at the next meeting.

Mr. Hayes gave a brief update on the Program Implementation and Evaluation (PIE) information he recently sent out. Mr. Hayes thanked everyone for the time they put into the site visits. The NSGO has an administrative calendar on our website, and the next Performance Review Panel will take place in October. The NSGAB will be invited to be a part of a brief look at the previous report. Mr. Schmitt noted the NSGAB has participated in 15 site visits, and asked Mr. Hayes if he is getting any feedback regarding any take home messages, what went right, what went wrong. Mr. Hayes replied only that positive interactions with the stakeholders should be better captured and utilized.

Mr. Vortmann asked if there were any recommendations. Mr. Eigen noted he's done a couple of site visits and based on the ones he's done and comments from the team, is that there are too many presentations. Dr. Rabalais brought up the topic of talking about stakeholders and formal interactions; and based on her experience, there were too many stakeholders. Dr. DeGuise commented the site visits have been positive and the directors have more knowledge about what's expected.

Public meeting recessed until 9:00 am Tuesday, March 3, 2015.

Tuesday, March 3, 2015

Roll Call:

Rosanne Fortner, Richard West, Dale Baker, Amber Mace, Paulinus Chigbu, Harry Simmons William Stubblefield, Rolland Schmitt, Richard Vortmann, Frank Beal, Nancy Rabalais, Leon Cammen (*ex-officio*)

National Sea Grant Office (NSGO) attendees: Jonathan Eigen (Designated Federal Officer), Nikola Garber, Dorn Carlson, Genene Fisher, Joshua Brown, Sami Grimes, Michael Liffmann, Chris Hayes, Devin Brakob

Other attendees:

Jennifer Hinden-National Sea Grant Office, Contractor, Acentia
Julia Galkiewicz-National Sea Grant Office, Contractor, Acentia
Sarah Bowman-National Sea Grant Office, Knauss Fellow
Helen Cheng-National Sea Grant Office, Knauss Fellow

Public Comment Period

No Public Comments

Focus Area Updates (NSGO Knauss Fellows: S. Bowman, H. Cheng)

Topic: Happy 50th Anniversary

Ms. Bowman reported on significant impacts Sea Grant has accomplished in the last 50 years. These include implementing ways and methods to reduce bycatch and introducing extensive research in aquatic invasive species especially within the Great Lakes regions. Sea Grant has also played a large role in the Hazard Analysis and Critical Control Points alliance ensuring that the delivery of seafood was safe to eat. In addition, there have been 36 generations of Sea Grant Knauss fellows. Providing this unique and valuable experience to graduate students sets Sea Grant apart from the rest. She and Ms. Cheng plan to work with the 50th Anniversary Committee to prepare a complete list of highlights for the 2015 Fall SGA Meeting.

Topic: Updates Since Fall 2014

Mrs. Bowman reported there have been changes to the new Strategic Plan. Healthy Coastal Ecosystems stayed the same; Sustainable Coastal Development and Hazard Resilience in Coastal Communities became Resilient Communities and Economies; and Safe and Sustainable Seafood Supply became Sustainable Fisheries and Aquaculture. The new Strategic Plan includes one new focus area, although it's not new to sea grant, Environmental Literacy and Workforce Development. This new focus area overlaps all other focus areas.

Topic: Healthy Coastal Ecosystems Examples, and Opportunities for Growth

Mrs. Bowman reviewed highlights of the Healthy Coastal Ecosystems Focus Area over the past 2 years. A primary pathway for Aquatic Invasive Species (AIS) is movement of trailed watercraft. There are political boundaries, but these don't make sense ecologically and human behavior-wise. In the West, states have different regulations on the inspection and decontamination of trailed watercraft. The National Sea Grant Law Center partnered with 19 Western States (including some non-Sea Grant states), Regional AIS Coordinators, law enforcement, and natural resources attorneys to host a workshop on AIS and varying regulatory frameworks. The workshop resulted in calls, meetings, etc. to build a regional consensus around the issue. Over the past few years this has resulted in a model law (May 2014) and resulted in Oregon and Utah making regulatory changes.

A second issue in coastal waters is new contaminants such as pharmaceuticals and personal care products. The Sea Grant Pharmaceuticals and Personal Care Products (PPCPs) working group is in the process of renewing partnerships with the American Veterinary Medical Association (AVMA) to produce joint outreach materials for animal caregivers. They are also reaching out to the Public Health Sector to educate people about the proper disposal of pharmaceuticals. Many states have organized pharmaceutical product collection programs.

While Sea Grant has been strong in healthy coastal ecosystems over the years, there are still opportunities for growth. Some of these include: the need to continue ecosystem-based management approaches; implement restoration and conservation, especially with growing concerns over freshwater availability; incorporate natural infrastructure and/or hybrid infrastructure into coastal ecological communities for the benefit of ecological communities, as

well as, to provide ecosystem services natural infrastructure to coastal communities and to continue to detect, analyze, and prevent aquatic invasive species.

Topic: Sustainable Fisheries and Aquaculture Examples, and Opportunities for Growth

Mrs. Bowman noted a good example of this focus area is bycatch reduction. It is sometimes costly and reduces catch per unit, but it reduces bycatch of non-targeted species. In Pacific Northwest states, entanglement of albatross species in long-line fishing rigs is a significant concern, especially for endangered species. Washington Sea Grant worked with industry to develop research projects to determine Best Management Practices (BMPs) for streamer lines in Washington.

Alaska Sea Grant previously worked with Alaska fisherman that used streamer lines to keep birds out of the zone where they could become entangled. The research was effective at reducing bycatch by 73%. Now Washington Sea Grant is involved in outreach to industry and local fisherman on the proper use of streamer lines, which became a requirement for certain vessels.

Mrs. Bowman also noted Georgia Sea Grant funded research to determine the oyster age at maturation. Oysters grow quickly in Georgia and perhaps there was a way to reduce the minimum size, while still operating a sustainable fishery. This resulted in a regulatory change at the Georgia Department of Natural Resources where minimum size requirements were reduced. In turn, this opened up a whole new market for Georgia oysters, especially the cocktail oyster market and the overall production of oysters.

Mrs. Bowman reported in order for this focus area to be more successful, Sea Grant needs to continue to have informed regulation because it is sometimes closely tied with community economies. Traditionally, Sea Grant has focused on commercial fisheries, but in the Great Lakes, recreational fishing is a large part of the regional economy. Sea Grant needs to understand how recreational fishing fits into traditional fisheries management. The fisheries extension network has increased communication among the Sea Grant programs, however, there is still occasional disconnect. The goal is to be able to share information, BMPs, etc., across the network so that each Sea Grant program can benefit from lessons learned and success stories in each program.

Topic: Resilient Communities and Economies Examples, and Opportunities for Growth

Ms. Cheng reported there have been a wide variety of plans that state Sea Grant programs have been implementing in achieving this focus area. Many states have implemented economic preparation and strategies, one example being Lake Champlain Sea Grant, which provided water resources training courses for real estate professionals. Realtors are an important group to focus educational efforts on as they regularly interact with the public and other professionals on issues of land use. Working with realtors provides improved awareness of mitigation strategies towards changes in water resources, to reduce development impact on water quality, and proficiency with the use of existing tools to identify sensitive areas.

There are also efforts from Sea Grant for coastal community adaptation. In particular, Georgia Sea Grant developed a Sea Level rise adaptation plan leading the City of Tybee Island to make changes to city infrastructure. This included raising the pump station for city wells, retro-fitting storm tide gates, and opening discussions with the Department of Transportation and surrounding counties to include sea level rise projections in plans. In addition to these positive actions, a recent decision to forego a proposed sea wall on the island was made after an analysis by the Georgia Sea Grant project deemed it to not be cost effective.

Ms. Cheng noted Sea Grant needs to continue to communicate with town councils, and coastal managers to create and implement these adaptation strategies. Based on recent conference calls and meetings, there is a need from the Sea Grant network to place more troops on the ground, as well as, provide ways to handle economic and legal issues to communities. Sea Grant needs to adopt mitigation measures, and create new tools and technologies to be resilient.

Topic: Environmental Literacy and Workforce Development (ELWD) Examples, and Opportunities for growth.

Ms. Cheng noted that since the creation of the ELWD focus area there have been several success stories. There has been a push to provide technical assistance and extension to the workforce, once example being to workers on the water. Many Sea Grant programs have provided training on sustainability to fishermen and vessel operators to fish and harvest in a conducive way and to be more fuel-efficient.

There has also been an effort to increase awareness in science, technology, engineering, and mathematics (STEM) to groups, such as, influencing the next generation of students, to get them excited about sciences, and to bring the classroom into the field. One example being, the National Ocean Sciences Bowls (NOSB) that addresses a national gap in environmental and earth sciences at locations where students are not meeting mathematics and science standards. A participants survey done in Texas found that 75% agreed or strongly agreed that preparing for and participating in NOSB increased their interest in science, 70% agreed or strongly agreed that after participating they were much more aware of science career options, and 60% agreed or strongly agreed that they were more likely to consider a career in a scientific field.

Ms. Cheng noted Sea Grant should continue to reach out to underrepresented groups at other locations, and develop coastal marine and Great Lakes curriculums in schools, colleges, and universities. It would also benefit to keep track of the students who remain in the STEM field and how many of those students would contribute to workforce and/or the sciences. Sea Grant also needs to bridge the gap between research scientists who are conducting the sciences in the field, resources managers who are making assessments and management, and the community who are living within these areas.

Topic: Cross-Cutting Opportunities

Mrs. Bowman reported there are many examples of cross-cutting opportunities and a few include continuing climate adaptation work in focus areas, social science work in focus areas, exploring coastal communities' resilience, and exploring changing coastal water resources.

Topic: Cross Cutting Approaches

Mrs. Bowman noted that she and Ms. Cheng recommend that Sea Grant continue to communicate closely with targeted local groups. Expanding interaction with the native groups, as well as, specific science groups, can help us accomplish more in each focus area. Many Sea Grant Programs have Memorandums of Understanding with their Land Grant counterparts. Sea Grant Programs should continue these collaborations since land and sea are interconnected.

Mrs. Bowman also noted collaboration within NOAA and other agencies has been strong. Sea Grant should focus on how we can pool money from joint RFPs. We should think about strategic partnerships that cross-cut multiple focus areas. This will increase Sea Grant's visibility.

Ms. Cheng noted there are a variety of groups that fall under the category of education, extension, and research. One of which are students and families in impoverished and/or urban areas that may have no knowledge of natural sciences. As we continue to live in an ever-growing technological age, many students and their families, especially from urban areas are losing touch with their natural surroundings. And as our climate changes, these individuals need to be aware of this in order to adapt to changes.

Another group is native groups. These native groups may have a better knowledge of the natural areas than scientists and managers. They have a plethora of knowledge passed down from generations and have developed special bonds with land and sea. We need to appreciate this, as well as, continue to work with them in preserving the natural areas that hold traditions and spiritually among these groups. Finally, there needs to be an overall increase in stewardship from varying groups of people. We want the the community to partake in the decision making, to see more people learning and getting involved with the actions of their communities, and help contribute in impactful decisions.

Topic: Cross-Cutting Tools

Mrs. Bowman noted Sea Grant is a great network, and it gets even bigger when we encourage collaboration. She and Ms. Cheng recommend that Sea Grant continue to expand communication, collaborate with Land Grant Institutions, and within NOAA and other agencies. Sea Grant should also incorporate new technologies into education, research, and extension.

Ms. Cheng noted citizen science is extremely valuable to scientists and to resource managers. Citizen science can provide more troops on the ground and increase the help in data collection and other tasks. It is also a way to engage non-scientists, in turn creating an appreciation for their community and the activities of their community on a passionate level. Sea Grant can also be successful in continuing social science work in the focus areas. Learning how societies interact with issues associated with the environment is valuable in our decision-making. Describing,

explaining, and predicting human behavior enables Sea Grant to make a difference in coastal and Great Lakes communities.

Topic: A Look Into the Future

Mrs. Bowman noted in the year 2065, when the 86th generation of Knauss Fellows stands before the NSGAB, they will look back on the last 50 years, and what will they see. Ms. Cheng reported, she and Mrs. Bowman hopes that when the 2065 Knauss Fellows create this slide, they will look back and see that communities are better prepared to cope with emerging threats economically, socially, and ecologically. We also hope our successors will present on work that communities are utilizing technologies for science and management.

Discussion

Mr. Rolland feels that Ms. Cheng and Mrs. Bowman did an outstanding job, and feels the NSGAB benefited from the presentation. He really enjoyed the cross cutting suggestions. Mr. Vortmann questions the ELWD focus area and the risk of education being removed from the budget. He would like to know what impact there would be on that particular focus area. Ms. Cheng replied, with the proposed budget in FY2016, it would be drastic. Sea Grant would not be able to reach out to schools, especially in urban areas that may have no idea of what's going on. Mr. Vortmann asked if this bad news materialized, do we need to revise some of it. It's one thing if we do it behind the scenes and another if it's advertised.

Mr. Cammen noted, what may come to pass, the NSGAB shouldn't shy away, if your advice is to continue, you should be loud and clear. Some of the Sea Grant Programs have flexibility and they will find ways to use another pot of money to do this. If this actually happened it would be the termination of a lot of the programs. Our legislation doesn't say we have to, but to make it more mandatory, we changed the word for fellowships to we must have Knauss Fellows. It may be time to put a clause in there to establish it.

Dr. Fortner noted there are several things going on. We can't say at any point STEM is going away. She would like to work with the fellows to pull out EWLD as a separate slide, and in some way establish the importance of this area, and cross-cut it with the rest of the focus areas. She would like to review the reauthorization and find the cross-cutting areas and report on the big picture. Dr. Fortner noted in the Biennial report, they put programs under categories instead of reporting on the individual program alone.

Resiliency Update and Toolkit Demonstration (J. Brown, NSGO)

Dr. Brown noted it's amazing what a \$50 Billion disaster does to a discussion. Dr. Brown referenced the items in the briefing book: Council on Environmental Quality (CEQ) White House Resilience Fact sheet, NOAA Press Release on Sea Grant Resilience, 2012 National Research Council (NRC) Resilience Summary, Sea Grant \$15.9 Resilience Press Release and the SGA Fact Sheet. He remembers being in the middle of a PRP meeting while the storm was going on and at the time, we didn't necessarily realize the impact it was going to have. Not so much in

terms of damage, but in terms of policy conversation. Since then NOAA and the federal government have made a lot of investments. The NRC did provide a framework vision for 5 components for a resilient America. These topics included: support creation and maintenance, work cooperatively with public and private, incorporate resilience and promote coordinate resilience.

At the national level, Sea Grant has definitely showed the last two topics and has been doing resilience from the get go. Sea Grant has been working on resilience for 40 years plus. At the same time NOAA has made resilience one of their top requirements. Dr. Sullivan has made it one of her 4 priorities and she's narrowed it down to where she wants to focus her political capital.

Dr. Brown mentioned the NSGO is actively participating in NOAA's climate adaptation policy team and strategic climate goal in planning how to spend money. We have stepped up our partnerships with the NWS while Dr. Genene Fisher is here with Sea Grant, we will do more. In April, we will hold a meeting in Norfolk on rip current and wave run off, which is paid for by the NOAA Coastal Storms Program. This is aimed at researchers, forecasters, and emergency managers. The planning is underway but VASG, DESG, and NCSG are all key players in the planning.

Also under the Coastal Storms Program, we have had success in connecting Sea Grant in the larger effort in all the regions it has been playing. Ms. Tracy Sempier who deals with the Gulf of Mexico has become the new paradigm in the Pacific. We are now moving the program into a new region, the Mid-Atlantic, which somewhat overlaps. They wanted to be involved in the storms that were impacted by Sea Grant, but they have a small budget and have decided to focus on DE, MD and VA Sea Grant Programs. We work very closely with NOAA's Climate Program Office, the National Ocean Service, and the National Marine Fisheries Service to work on grants to target resilience. The NSGO was able to review the initial drafts of the RFP and make suggestions and comments to encourage it to be more meaningful to our stakeholders.

With regards to the coastal resilience grants that NOS has now, we are talking to the manager of the competition to see how we can help and encourage our programs to apply and make sure our work compliments instead of duplicates. They are looking for research that already has information which is good. Sea Grant doesn't have the capacity to do the planning in the past, so there are still some gaps. We secured \$1.8M for social science at risk communication from the Sandy Supplemental that involved NY, NJ and CT Sea Grant Programs. Our individual programs have done a lot more. That was just from the national level.

Dr. Brown hoped the NSGAB has seen the resilience toolkit. It represents everything the Sea Grant Programs have submitted and is useful for resilience. We currently only have information from 18 programs. One of the concerns is it needs to be updated. We are updating it annually and trying to schedule the update into the annual reporting cycle.

We decided not to organize it by state because we want it to be a national tool kit. The other thing we did was highlight featured tools that are being used by many programs, or that our team

of experts feels are particularly useful and if you were brand new person coming to Sea grant and use stuff Sea Grant has developed. We want it to be small and tight so you can show up day one and see the 4-6 things that will help someone do resilience the way Sea Grant does resilience. We have pulled together demonstration projects on how people have used multiple tools to become resilient.

All the projects were funded by Sea Grant and many of them have come out of the \$5M we used on demonstration projects or larger investments. The federal climate resilience tool kit which the climate office is hosting, lists many of our tools. We held a Climate Adaptation Knowledge Exchange Program and they featured many of our tools, and we are talking about how we can share knowledge. We are doing our best at this point to share a coherent picture of how Sea Grant is in the resilience area. It is challenging because each region does resilience differently. We are moving towards having the programs themselves to define what resilience means in their area and then weaving that together.

In some states Sea Grant is really big into water resources management and other states don't do it at all. The challenge to the NSGAB is how we convert this into something that is coherent and to help us address how Sea Grant is a unique partner in resilience.

Mr. Schmitten commended Dr. Brown on his presentation. Mr. Schmitten noted resilience is a topic dear to our hearts, NOAA, and Congress. We are the founding fathers of resiliency. Mr. Baker asked if there is an estimate of how many Sea Grant Extension Specialists are in the field doing resilience work. Dr. Brown noted he would say almost all extension folks are doing resilience work under the NRC Resilience because they are helping the communities address and plan for changes.

Dr. Brown noted the NRC is looking to do a National Adaptation Forum, biennial meeting in May. He managed to convince the planning committee to give Sea Grant a room for any Sea Grant folks that would like to get together and share some tools and some experiences; and have a professional development day. One of the challenges we have is how do we shape this vision for resilience across the program. Someone may think they do not qualify. Mr. Vortmann asked if Dr. Brown briefed Dr. Holly Bamford. Dr. Brown replied NOS is aware of it, not sure about Dr. Bamford, but she chairs several working groups he has briefed.

Dr. Mace asked Dr. Brown if he would share his thoughts on what makes Sea Grant unique and if he's talking about collaborating with other entities within NOAA and what do they think. Dr. Brown replied his feeling in many cases; Sea Grant is the person who does bring lots of groups together. There's also a growing understanding of the strength of our integrated research and outreach model; and Sea Grant has the resources to effectively target research. We can do it in a quick and coherent fashion, and bring people to the table and fill information gaps. They don't tend to think of us on broader geographies, they come to us on a state level. We've pushed through some regional mini grants. We are building the sense we can collaborate on a regional scale. Some of our partners that know us well see how strong we are in regional collaboration.

Admiral West noted he feels Dr. Bamford's challenge is to bring everyone together for coastal resiliency, and she needs to know about this and that it's not duplicated somewhere else. Dr. Garber noted Mr. McLean wants all the Assistant Administrators to know about the tool and his newsletter highlighted it.

Focus Teams (L. Cammen, NSGO)

Dr. Cammen noted this discussion began during Sea Grant Week and what it amounts to in redesigning theme teams and theme team concepts, also known as focus teams. 10 years ago, we had 10 theme teams. Sea Grant topic areas were divided up into a team for just about everything. They were functioning along the titles of think tanks and were supposed to develop plans for their area.

Some developed white papers of Sea Grant activities and some didn't do much at all. The idea was they were going to be the way of telling the big story of Sea Grant. We then developed the concept of focus teams. The focus teams were intended to provide oversight guidance and forward thinking for each of the four strategic plan focus areas. It didn't really work well. They did good things but they got overtaken by their duties and in reviewing all the impacts once a year. It all makes sense in order to know what Sea Grant is doing, yet in order to do that, it's a tremendous job. That really overwhelmed everything else.

For this round of strategic planning, teams will concentrate on planning and ideas; and will still look over what we are doing and provide advice and guidance to the network. What makes sense is to get the NSGAB more involved in that and making the teams formal subcommittees of the NSGAB. This gets us around the legal uncertainty where we are using these teams to get guidance and advice which is really supposed to be the job of a Federal Advisory Committee Act (FACA) committee. It also gives the NSGAB an opportunity to think about the different areas we are focusing on, looking ahead and providing advice. We will have a few people in the new office alignment to help work on these committees. They will help staff the team, and help run the committee unless someone on the NSGAB has the expertise.

When this subject was brought up in the fall, there was a lot of concern on the amount of work from the NSGAB. These teams will not function the same way as before. Alternatively, we put the teams together. The function will change, but organizationally we put them together the same way as the last few years and put one or two NSGAB members, but they would be formal subcommittees of the NSGAB. Dr. Cammen asked for any feedback.

Dr. Rabalais asked how many subcommittees there will be. Dr. Cammen replied he envisions four standing committees. If there is interest in building a real aquaculture plan, another group may form and cease when the work is complete. Mr. Schmitten noted he supports the focus team concepts. He asked Dr. Cammen what the reporting requirement is. Dr. Cammen replied the subcommittees would not be reporting to the NSGO, but to the NSGAB. The NSGAB could have two subcommittees per meeting and focus on two sets of topics and another meeting focus on the rest.

Dr. Rabalais asked if the NSGO would ask people to be a part of the focus teams as before, because she was the only one from the NSGAB and is concerned she'd be doing all the work. Dr. Cammen noted he sees the team composition more or less the same as before. It will be composed of the Sea Grant Directors, NSGAB and other members as appropriate. He doesn't think it really matters, but it does not have to be chaired by a NSGAB member.

Dr. Mace asked if Dr. Cammen could explain how this model is more effective than the last time. Dr. Cammen replied what teams were involved in last time is sort of the same idea. They provided guidance and made suggestions about initiatives and looking forward. There was the feeling that you needed to know what's going on and in order to do that you have to look at 200 plus accomplishments. They ended up with a few day meeting each fall to do nothing but go over accomplishments and there wasn't enough energy to carry on the forward thinking part.

It turned into a task rather than an opportunity. What we are trying to do here is get the task part out of it. Once the NSGO is realigned, we will be able to take part in it and it will give more time for forward thinking. I think there will be more volunteers from the network. Dr. Garber noted she can see the forward thinking feeding into the next strategic plan, which will start in 2015. From not only the Sea Grant resources, but what partnerships should we be pursuing and why we should be going after it.

Dr. Rabalais feels it's a good way to go, but if these teams came up with recommendations that went through the NSGAB and to the Sea Grant Director for the next 5 years, are all the Sea Grant Directors going to complain that they don't have a part of it. Dr. Cammen replied it's up to the Directors to join the groups. Dr. Rabalais asked how the focus area groups would interact in a unified way. There may be something that could slip between the cracks that should be included in a strategic plan. Dr. Cammen replied as the subcommittees of the NSGAB you are reporting to the NSGAB as a whole and getting them to engage with each other in a discussion. If you think something fell through the cracks, you still have the NSGAB to discuss, as well as, the Strategic Planning Committee.

Dr. Rabalais noted this seems more of an opportunity for the NSGAB to look at important issues for Sea Grant rather than just taking care of business. Dr. Brown noted they were very powerful groups before. The Social Science NSI was recommended by a group as well as the Small Business Innovation Research (SBIR) investment in ocean renewable energy and the whole conversation of adaptation of climate. Mr. Baker asked Dr. Cammen if he foresees having a budget in the NSGO for helping manage projects, meetings, etc. Dr. Cammen replied yes, it's part of the budget.

Dr. Rabalais sees the HCE group deciding they want to start focusing on Healthy Coastal Economies and ecosystems which would be outside of the box, but it would be something that could possibly go into the next Strategic Plan. Dr. Garber noted she can see these teams as in the next 5 years, or 20. Dr. Brown noted if they are give the opportunity and time, these teams would have historically gone out of their boundaries.

The following NSGAB members volunteered to take part in each focus area team:

Healthy Coastal Ecosystems- Dr. Rabalais as Co-Chair
Sustainable Fisheries and Aquaculture- Mr. Schmitt as Co-Chair
Resilient Communities and Economies- Mayor Simmons as Co-Chair, and Dr. Mace
Environmental Literacy and Workforce Development-Dr. Fortner as Co-Chair

Motion by Dr. Rabalais that the NSGAB create subcommittees that contribute to the focus area development into the future, and that those subcommittees report back to the NSGAB to maintain FACA authority. The NSGAB would then take those recommendations to the NSGO. There should be at least one NSGAB member on each of the focus area teams, and the NSGAB should strive to have one member co-chair the committee with someone from the NSGO.

Mr. Baker 2nd, unanimous approval.

Motion approved.

Discussion of Meeting topics and wrap-up (R. Schmitt, NSGAB)

Current NSGCP Reauthorization Bill

HR1900



114TH CONGRESS
1ST SESSION

H. R. 1900

To reauthorize and amend the National Sea Grant College Program Act,
and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

APRIL 21, 2015

Mrs. LAWRENCE (for herself and Mr. CONYERS) introduced the following bill;
which was referred to the Committee on Natural Resources

A BILL

To reauthorize and amend the National Sea Grant College
Program Act, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “National Sea Grant
5 College Program Amendments Act of 2015”.

6 **SEC. 2. REFERENCES TO THE NATIONAL SEA GRANT COL-**
7 **LEGE PROGRAM ACT.**

8 Except as otherwise expressly provided, wherever in
9 this Act an amendment or repeal is expressed in terms
10 of an amendment to, or repeal of, a section or other provi-

1 sion, the reference shall be considered to be made to a
2 section or other provision of the National Sea Grant Col-
3 lege Program Act (33 U.S.C. 1121 et seq.).

4 **SEC. 3. MODIFICATION OF DEAN JOHN A. KNAUSS MARINE**
5 **POLICY FELLOWSHIP.**

6 (a) IN GENERAL.—Section 208(b) (33 U.S.C.
7 1127(b)) is amended by striking “may” and inserting
8 “shall”.

9 (b) PLACEMENTS IN CONGRESS.—Such section is
10 further amended—

11 (1) in the first sentence, by striking “The Sec-
12 retary” and inserting the following:

13 “(1) IN GENERAL.—The Secretary”; and

14 (2) in paragraph (1), as designated by para-
15 graph (1), in the second sentence, by striking “A fel-
16 lowship” and inserting the following:

17 “(2) PLACEMENT PRIORITIES.—

18 “(A) IN GENERAL.—In each year in which
19 the Secretary awards a legislative fellowship
20 under this subsection, when considering the
21 placement of fellows, the Secretary shall
22 prioritize placement of fellows in the following:

23 “(i) Positions in offices of, or with
24 members on, committees of Congress that

1 have jurisdiction over the National Oceanic
2 and Atmospheric Administration.

3 “(ii) Positions in offices of members
4 of Congress that have a demonstrated in-
5 terest in ocean, coastal, or Great Lakes re-
6 sources.

7 “(B) EQUITABLE DISTRIBUTION.—In plac-
8 ing fellows in offices described in subparagraph
9 (A), the Secretary shall ensure, to the max-
10 imum degree practicable, that placements are
11 equitably distributed among the political par-
12 ties.

13 “(3) DURATION.—A fellowship”.

14 (c) EFFECTIVE DATE.—The amendments made by
15 subsection (b) shall apply with respect to the first calendar
16 year beginning after the date of enactment of this Act.

17 (d) SENSE OF CONGRESS CONCERNING FEDERAL
18 HIRING OF FORMER FELLOWS.—It is the sense of Con-
19 gress that in recognition of the competitive nature of the
20 fellowship under section 208(b) of the National Sea Grant
21 College Program Act (33 U.S.C. 1127(b)), and of the ex-
22 ceptional qualifications of fellowship awardees, the Sec-
23 retary of Commerce, acting through the Under Secretary
24 of Commerce for Oceans and Atmosphere, should encour-
25 age participating Federal agencies to consider opportuni-

1 ties for fellowship awardees at the conclusion of their fel-
2 lowship for workforce positions appropriate for their edu-
3 cation and experience.

4 **SEC. 4. MODIFICATION OF AUTHORITY OF SECRETARY OF**
5 **COMMERCE TO ACCEPT DONATIONS FOR NA-**
6 **TIONAL SEA GRANT COLLEGE PROGRAM.**

7 (a) IN GENERAL.—Section 204(c)(4)(E) (33 U.S.C.
8 1123(c)(4)(E)) is amended to read as follows:

9 “(E) accept donations of money and, not-
10 withstanding section 1342 of title 31, United
11 States Code, of voluntary and uncompensated
12 services;”.

13 (b) PRIORITIES.—The Secretary of Commerce, acting
14 through the Under Secretary of Commerce for Oceans and
15 Atmosphere, shall establish priorities for the use of dona-
16 tions accepted under section 204(c)(4)(E) of the National
17 Sea Grant College Program Act (33 U.S.C.
18 1123(c)(4)(E)), and shall consider among those priorities
19 the possibility of expanding the Dean John A. Knauss Ma-
20 rine Policy Fellowship’s placement of additional fellows in
21 relevant legislative offices under section 208(b) of that Act
22 (33 U.S.C. 1127(b)), in accordance with the recommenda-
23 tions under subsection (c) of this section.

24 (c) REPORT.—Not later than 180 days after the date
25 of the enactment of this Act, the Director of the National

1 Sea Grant College Program, in consultation with the Na-
2 tional Sea Grant Advisory Board and the Sea Grant Asso-
3 ciation, shall—

4 (1) develop recommendations for the optimal
5 use of any donations accepted under section
6 204(c)(4)(E) of the National Sea Grant College Pro-
7 gram Act (33 U.S.C. 1123(c)(4)(E)); and

8 (2) submit to Congress a report on the rec-
9 ommendations developed under paragraph (1).

10 (d) CONSTRUCTION.—Nothing in this section shall be
11 construed to limit or otherwise affect any other amounts
12 available for marine policy fellowships under section
13 208(b) of the National Sea Grant College Program Act
14 (33 U.S.C. 1127(b)), including amounts—

15 (1) accepted under section 204(c)(4)(F) of that
16 Act (33 U.S.C. 1123(c)(4)(F)); or

17 (2) appropriated under section 212 of that Act
18 (33 U.S.C. 1131).

19 **SEC. 5. REPEAL OF REQUIREMENT FOR REPORT ON CO-**
20 **ORDINATION OF OCEANS AND COASTAL RE-**
21 **SEARCH ACTIVITIES.**

22 Section 9 of the National Sea Grant College Program
23 Act Amendments of 2002 (33 U.S.C. 857–20) is repealed.

1 **SEC. 6. REDUCTION IN FREQUENCY REQUIRED FOR NA-**
2 **TIONAL SEA GRANT ADVISORY BOARD RE-**
3 **PORT.**

4 Section 209(b)(2) (33 U.S.C. 1128(b)(2)) is amend-
5 ed—

6 (1) in the heading, by striking “BIENNIAL” and
7 inserting “PERIODIC”; and

8 (2) in the first sentence, by striking “The
9 Board shall report to the Congress every two years”
10 and inserting “Not less frequently than once every
11 3 years, the Board shall submit to Congress a re-
12 port”.

13 **SEC. 7. MODIFICATION OF ELEMENTS OF NATIONAL SEA**
14 **GRANT COLLEGE PROGRAM.**

15 Section 204(b) (33 U.S.C. 1123(b)) is amended, in
16 the matter before paragraph (1), by inserting “for re-
17 search, education, extension, training, technology transfer,
18 and public service” after “financial assistance”.

19 **SEC. 8. AUTHORIZATION OF APPROPRIATIONS FOR NA-**
20 **TIONAL SEA GRANT COLLEGE PROGRAM.**

21 (a) IN GENERAL.—Section 212(a) (33 U.S.C.
22 1131(a)) is amended—

23 (1) in paragraph (1)—

24 (A) in subparagraph (E), by striking
25 “and” at the end;

1 (B) in subparagraph (F), by striking the
2 period at the end and inserting “;”;

3 (C) by adding at the end the following:

4 “(G) \$72,000,000 for fiscal year 2015;

5 “(H) \$75,600,000 for fiscal year 2016;

6 “(I) \$79,380,000 for fiscal year 2017;

7 “(J) \$83,350,000 for fiscal year 2018;

8 “(K) \$87,520,000 for fiscal year 2019;

9 “(L) \$91,900,000 for fiscal year 2020; and

10 “(M) \$96,500,000 for fiscal year 2021.”;

11 (2) in the heading for paragraph (2), by insert-
12 ing “FOR FISCAL YEARS 2009 THROUGH 2014” after
13 “PRIORITY ACTIVITIES”; and

14 (3) by adding at the end the following:

15 “(3) PRIORITY ACTIVITIES FOR FISCAL YEARS
16 2015 THROUGH 2020.—In addition to the amounts
17 authorized under paragraph (1), there is authorized
18 to be appropriated \$6,000,000 for each of fiscal
19 years 2015 through 2020 for competitive grants for
20 the following:

21 “(A) University research on the biology,
22 prevention, and control of aquatic nonnative
23 species.

1 “(B) University research on oyster dis-
2 eases, oyster restoration, and oyster-related
3 human health risks.

4 “(C) University research on the biology,
5 prevention, and forecasting of harmful algal
6 blooms.

7 “(D) University research, education, train-
8 ing, and extension services and activities fo-
9 cused on coastal resilience and U.S. working
10 waterfronts and other regional or national pri-
11 ority issues identified in the strategic plan
12 under section 204(c)(1).

13 “(E) University research on sustainable
14 aquaculture techniques and technologies.

15 “(F) Fishery extension activities conducted
16 by sea grant colleges or sea grant institutes to
17 enhance, and not supplant, existing core pro-
18 gram funding.”.

19 (b) MODIFICATION OF LIMITATIONS ON AMOUNTS
20 FOR ADMINISTRATION.—Paragraph (1) of section 212(b)
21 (33 U.S.C. 1131(b)) is amended to read as follows:

22 “(1) ADMINISTRATION.—

23 “(A) IN GENERAL.—There may not be
24 used for administration of programs under this

1 title in a fiscal year more than 5.5 percent of
2 the lesser of—

3 “(i) the amount authorized to be ap-
4 propriated under this title for the fiscal
5 year; or

6 “(ii) the amount appropriated under
7 this title for the fiscal year.

8 “(B) CRITICAL STAFFING REQUIRE-
9 MENTS.—

10 “(i) IN GENERAL.—The Director shall
11 use the authority under subchapter VI of
12 chapter 33 of title 5, United States Code,
13 to meet any critical staffing requirement
14 while carrying out the activities authorized
15 in this title.

16 “(ii) EXCEPTION FROM CAP.—For
17 purposes of subparagraph (A), any costs
18 incurred as a result of an exercise of au-
19 thority as described in clause (i) shall not
20 be considered an amount used for adminis-
21 tration of programs under this title in a
22 fiscal year.”.

23 (c) ALLOCATION OF FUNDING.—

24 (1) IN GENERAL.—Section 204(d)(3) (33
25 U.S.C. 1123(d)(3)) is amended—

1 (A) in the matter before subparagraph (A),
2 by striking “With respect to sea grant colleges
3 and sea grant institutes” and inserting “With
4 respect to sea grant colleges, sea grant insti-
5 tutes, sea grant programs, and sea grant
6 projects”; and

7 (B) in subparagraph (B), in the matter be-
8 fore clause (i), by striking “funding among sea
9 grant colleges and sea grant institutes” and in-
10 sserting “funding among sea grant colleges, sea
11 grant institutes, sea grant programs, and sea
12 grant projects”.

13 (2) REPEAL OF REQUIREMENTS CONCERNING
14 DISTRIBUTION OF EXCESS AMOUNTS.—Section 212
15 (33 U.S.C. 1131) is amended—

16 (A) by striking subsection (c); and

17 (B) by redesignating subsections (d) and
18 (e) as subsections (c) and (d), respectively.

19 **SEC. 9. TECHNICAL CORRECTIONS.**

20 The National Sea Grant College Program Act (33
21 U.S.C. 1121 et seq.) is amended—

22 (1) in section 204(d)(3)(B) (33 U.S.C.
23 1123(d)(3)(B)), by moving clause (vi) two ems to
24 the right; and

1 (2) in section 209(b)(2) (33 U.S.C.
2 1128(b)(2)), as amended by section 6, in the third
3 sentence, by striking “The Secretary shall” and in-
4 serting the following:

5 “(3) AVAILABILITY OF RESOURCES OF DEPART-
6 MENT OF COMMERCE.—The Secretary shall”.

○

The State of Sea Grant 2015

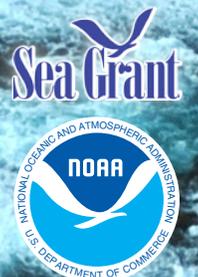




The State of Sea Grant 2014

Impacts, Challenges and Opportunities

Biennial Report to Congress by the National Sea Grant Advisory Board, November 2014



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Photo: NOAA Sea Grant

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Cover Photo: Oliver Bencosme, Puerto Rico Sea Grant





National Sea Grant Advisory Board

A Federal Advisory Committee



Dear Members of the Congress of the United States of America,

On behalf of the National Sea Grant Advisory Board (the Board), I am proud to transmit this Biennial Report to Congress, The State of Sea Grant 2014, as directed by the 2008 Sea Grant Act (PL 110-394). The State of Sea Grant 2014 follows the format of previous reports and provides an update on the National Sea Grant College Program (Sea Grant) over the past two years.

The Board finds that Sea Grant continues to be effective in responding to the needs of our coastal and Great Lakes communities. Sea Grant provides the National Oceanic and Atmospheric Administration (NOAA) with the capability to address these needs in collaboration with research universities located in every coastal and Great Lakes state, and every U.S. Territory. It is a solid investment of public monies, leveraging federal dollars with a 2:1 federal: non-federal matching requirement.

Sea Grant has made great strides in addressing the allocation needs of our state programs through a rebalancing of funding based on Board and state Program recommendations. After several years of level funding and declining purchasing power, the FY2014 budget brought an increase in minimum level of base funding for several underfunded programs, while retaining existing funding for others. The Board is confident that continued increases will return Sea Grant to a level that strengthens its ability to meet the needs of our coastal communities.

Sea Grant completed a full cycle of the Planning, Implementation and Evaluation (PIE) process, including the first four-year comprehensive panel review of the state Sea Grant programs. All programs are found to meet or exceed expectations, and are undergoing their second round of Site Reviews during the FY14-15 years.

Sea Grant appreciates the Senate Committee on Commerce, Science, and Transportation, and Senators Schatz and Wicker, the prime sponsors, for passing the Sea Grant Reauthorization (S. 2030) out of Committee. The National Sea Grant Office (NSGO), the Board, and the Sea Grant Association have collaborated with Congressional staff and committees to ensure that the needs of Sea Grant are met. Key elements of the legislation that Sea Grant strongly supports are the authority of the Secretary of Commerce to conduct a Knauss Fellowship Program, the authorization of regional initiatives, and the authorization to detail personnel from Sea Grant colleges to the NSGO. While appreciative of the 0.5% increase in the administrative cap, the Board continues to support the removal of the cap.

For nearly 50 years, the National Sea Grant College Program has been a trusted source for coastal science and a valuable asset to the Nation. The Board looks forward to working with Congress, NOAA, the state Sea Grant programs, and the Sea Grant Association for the continued success of the exemplary research, education and outreach that characterize the Program.

A handwritten signature in blue ink that reads 'Rollie Schmitt'. The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Rollie Schmitt
Chair, National Sea Grant Advisory Board

INTRODUCTION

Two-thirds of the Earth's surface is covered by ocean. The United States boasts 95,500 miles of coastline, and over 50% of our population lives within 50 miles of it. Forty-eight years ago, Congress established the National Sea Grant College Program (PL 89-688) to recognize the importance of the oceans, coasts and Great Lakes to the world's environment, the Nation's economy, and human wellbeing. These resources are threatened by the immediate impacts of natural hazards such as Hurricane Sandy, and longer term concerns such as climate change and the needs of resource users. States and communities that depend on these resources require research, education and communication designed to address current needs and to ensure health and vitality for future generations.

Sea Grant's network focuses the academic and research power of 33 university-based state programs. Sea Grant partners with public and private sector groups to capture and sustain the economic and social benefits of our ocean, coastal and Great Lakes resources. By marshaling these resources and providing outreach and education to public and stakeholder groups, Sea Grant consistently meets the needs of the communities that depend on our Nation's water resources.

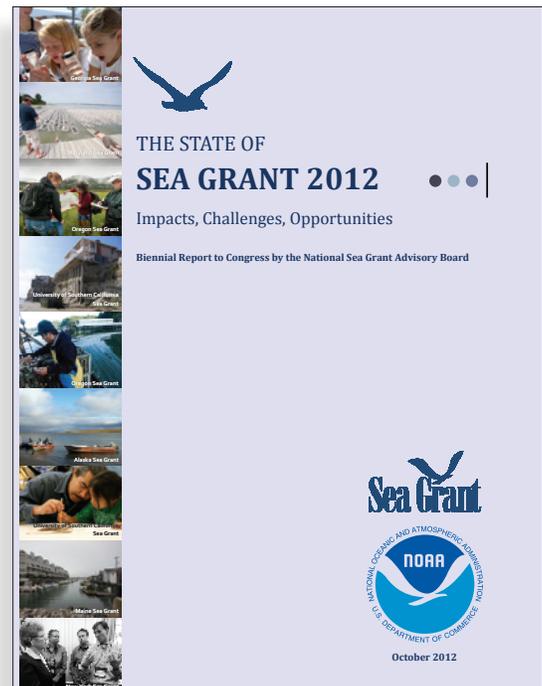
Reauthorization of Sea Grant in 2008 (PL 110-394) included a mandate for the National Sea Grant Advisory Board to prepare a Biennial Report to Congress. The 15-member Board provides advice to NOAA and Sea Grant to address the Nation's highest priorities regarding the understanding, assessment, development, management, utilization and conservation of ocean, coastal and Great Lakes resources. The State of Sea Grant 2014 reviews Sea Grant's progress over the past two years, including its response to recommendations made in the 2012 report, and suggests ways to maximize program effectiveness and impact. The report concludes with recommendations for actions that will enhance Sea Grant's capacity to achieve national goals. Web links to all reports cited in the document are provided in Appendix B.

The 2014 Biennial Report is organized into the following sections:

- Executive Summary
- The Sea Grant Model
- Response to State of Sea Grant 2012 Recommendations
- National Focus Areas
- Sea Grant in Action
- State of the Sea Grant Network
- Emerging Opportunities
- Recommendations for 2014

Sea Grant's mission is to "enhance the practical use and conservation of coastal, marine and Great Lakes resources in order to create a sustainable economy and environment."

Environmental stewardship, long-term economic development and responsible use of America's coastal, ocean and Great Lakes resources are at the heart of Sea Grant's mission.



EXECUTIVE SUMMARY

THE STATE OF SEA GRANT 2014 A BIENNIAL REPORT TO CONGRESS FROM THE NATIONAL SEA GRANT ADVISORY BOARD

The purpose of this report is to fulfill reporting responsibilities established in 2008 by the National Sea Grant Act, PL110-394. The National Sea Grant Advisory Board is charged with reporting to Congress every two years on the state of the National Sea Grant College Program. This report responds to Recommendations offered in The State of Sea Grant 2012, highlights program accomplishments and challenges, and provides updates on activities over the past two years. Finally, the report makes recommendations for the coming years.

Sea Grant Mission and Methods

Sea Grant has a mission to “enhance the practical use and conservation of coastal, marine and Great Lakes resources to create a sustainable economy and environment.” Sea Grant advances this mission through research, education and advisory services to inform public and private decision-making. Its priorities are established on a national level based on citizens’ needs, and implemented on state, regional and national levels. University-based Sea Grant programs draw from the best personnel and support resources in the nation, and attract multiple partners with expertise, networks and innovative ideas. Interactions with its parent agency, NOAA, expand the range of what Sea Grant can accomplish. The interchange of services and information from national to regional to state to local enables Sea Grant researchers, educators and outreach personnel to access the most up-to-date technologies and methods, and combine their influence to meet demonstrated needs, support businesses, enhance environmental literacy and help policy makers make well-informed science-based decisions.

Response to 2012 Recommendations

Sea Grant has performed admirably on meeting the recommendations of the 2012 Biennial Report. Positive and effective attention has been paid to retaining local sensitivity while focusing on national and regional priorities, and to integrating coastal programs and improving cross-agency collaboration. The National Sea Grant Office has continued to refine the Planning, Implementation and Evaluation Resource (PIER) database to provide the Sea Grant network with support and guidance on effective impacts; searchable components make reports of Sea Grant research, outreach and education partners and projects accessible to the public. Federal budget increases for FY14 provide welcome opportunities to focus on rebalancing the fiscal portfolio to assure state and regional programs a minimum level of base funding.

National Focus Areas

National Strategic Plans developed every four years establish a framework for priority projects and a set of cross-cutting goals that are the basis for activities within those projects. Programs submit impacts and accomplishments annually to demonstrate progress toward goals.



Photo: Woods Hole Sea Grant



Photo: Susan Ferris Hill, South Carolina Sea Grant



Photo: Delaware Sea Grant

EXECUTIVE SUMMARY

Cross-cutting goals (These goals underpin each of Sea Grant's four focus areas.):

- Sound scientific research
- An informed, scientifically-literate public
- Inclusive decision-making involving a wide variety of stakeholders
- Relevant and timely information on climate change adaptation

Focus areas:

- Hazard Resilience in Coastal Communities
- Healthy Coastal Ecosystems
- Safe and Sustainable Seafood Supply
- Sustainable Coastal Development

At the end of 2013, Sea Grant transitioned to its new Strategic Plan for 2014-2017. Thus the last full year of reports from the field was calendar year 2013, reflected in this report.



Photo: Oliver Bencomse, Puerto Rico Sea Grant

Sea Grant in Action

With 140 deaths and over \$62 billion in damages, Hurricane Sandy shook the very foundation of the coastal communities in affected areas. Sea Grant programs in seven states responded quickly with coordinated information for community and individual preparedness. Since the storm, the Sea Grant network has been engaged in the assessment and recovery effort along the East Coast. Sea Grant is also helping local communities develop long-term solutions for climate change adaptation.

Sea Grant is responsive to a growing demand for efforts to increase community resilience, awareness and preparation in the face of a changing climate. Sea Grant increases community resilience to hazards by facilitating solutions to challenging issues, developing tools and techniques, and increasing awareness of climate driven challenges including extreme weather events, coastal storms, sea level rise, ocean acidification, and integration of green infrastructure. To mitigate future climate impacts and increase community resilience, Sea Grant works with communities in development and permitting of local renewable energy sources.

Education for environmental literacy is at the heart of Sea Grant's pipeline for the workforce and its fostering of science understanding and respect in future decision makers. Federal and agency budget cuts to Science, Technology, Engineering and Mathematics education (STEM) programs threaten the unique education contributions Sea Grant makes to such programs, and the Network has responded with support for enhanced education.

This year the John A. Knauss Marine Policy Fellowship program reached a milestone – the 1000th fellow was accepted into the program. The Sea Grant Knauss Fellowship trains the best and brightest graduates in marine science, conservation and policy, and is the starting point for many of the country's leaders in marine, coastal and Great Lakes-related fields.

Social Science initiatives in Sea Grant programs are providing valuable information on the human interface with resource questions. In 2012-13, 28 programs funded 67 social science projects, allowing Sea Grant to increase its efforts in economics, communication, sociology, anthropology, market research and program evaluation. Economic development impacts are featured in all of Sea Grant's Focus Areas.

Partnerships are key to leveraging resources for effective action, and Sea Grant applies partner support and expertise at local, state and national levels, as well as within NOAA. Recognition from the Department of Interior for Rhode Island and Michigan Sea Grant programs is evidence of the valuable interface provided by partnering for conservation.

State of the Sea Grant Network

Allocation of funds within Sea Grant has been evaluated by the Advisory Board. To retain vitality and bring the Sea Grant network to a consistent level of excellence nationwide, an adjustment of policy was needed to balance stakeholder needs, represented by shoreline and population, and provide a minimum level of base funding for all programs. Based on input from the Advisory Board, state programs and National Office, an allocation balancing plan is being implemented to allow for movement toward a more equitable distribution of funding as the overall pool of base funding increases. No program will lose funding to increase another's base. The plan provides an equitable, rational, transparent and flexible allocation that promotes performance, healthy competition and partnerships.

Sea Grant continually works to reach and extend its potential through legislative support, fiscal balance and strategic planning. Legislation introduced to Congress in 2014 seeks to reauthorize the National Sea Grant College Program Act through support for the Knauss Marine Policy Fellowships, an increased funding base and an annual fund for research on priority topics. The amendments also change the frequency of the Advisory Board's reporting to Congress to every three years rather than biennially and increase the administrative funding cap by 0.5%. The Board continues to support removal of the cap.

Emerging Opportunities

Looking toward the future, Sea Grant transitioned to a new Strategic Plan in FY2014. The program did so with a network strengthened by a rebalancing of budget allocations, continued refining of program evaluation efforts, enhanced public visibility for Sea Grant impacts and partnerships, greater integration with other NOAA programs and anticipation of reauthorization. Development of this Biennial Review has also identified opportunities emerging from current research, resource management issues, economic development and outreach/education strategies that will lay groundwork for continuing Sea Grant's productivity and service to the nation.



Photo: Maryland Sea Grant

2014 Recommendations

The Board finds Sea Grant to be responsive to recommendations made through Biennial Reports. To continue the progress made toward addressing the challenges and opportunities of our oceans, coasts and Great Lakes, the Board recommends the following:

1. Sea Grant should continue to focus on advancing national priorities while solving problems on a local and regional basis. This national focus must continue to emphasize partnerships and collaborative efforts within the Sea Grant network and with other federal, regional, state and local agencies and organizations, without loss of sensitivity to community stakeholders' needs.
2. Sea Grant should continue to support tracking and reporting of the cumulative, measurable impacts of Sea Grant activities toward the achievement of national goals.
3. The continued viability of Sea Grant relies on adjustment of equity in funding among programs, while maintaining program review and merit considerations. The Sea Grant network should embrace steps toward balancing the federal allocation for programs, with a goal of assuring all programs a minimum level of base funding.
4. Sea Grant should strengthen the focus area in Environmental Literacy and Workforce Development by demonstrating how Sea Grant K-12 and informal STEM education programs and targeted graduate Fellowships are mission critical, respond to national priorities, and result in evidence-based accomplishments and impacts.

The Sea Grant Model

Sea Grant was created by the U.S. Congress in 1966 as a federal and state partnership to harness the academic power of the nation's universities to solve ocean, coastal and Great Lakes problems. Sea Grant engages public and private partners and outreach groups to sustain and enhance the vitality, value and wise use of the nation's coastal resources. Administered and supported by NOAA and implemented through leading research universities, Sea Grant provides unique access to scientific expertise and new discoveries, and delivers information and solutions for complex issues.

Sea Grant is a national network that includes the National Sea Grant Office, 33 university-based state programs, the National Sea Grant Advisory Board, the National Sea Grant Law Center, the National Sea Grant Library and hundreds of participating institutions. The Sea Grant network enables NOAA to combine science and expertise to address both human and environmental needs in coastal communities. Sea Grant's university alliances help develop future scientists and resource managers who will conduct research and guide responsible use of our nation's coastal resources. Sea Grant's partnerships, research capabilities and local workforce bring unmatched ability to identify and capitalize on opportunities and to generate timely, practical solutions to issues facing coastal communities.

Research, outreach and education for present and future coastal needs.

The core of Sea Grant's mission is "science serving America's coasts." Every coastal and Great Lakes state, including Puerto Rico and Guam, uses scientific information to create tools, products and services that benefit coastal communities. Sea Grant transforms this knowledge into coastal and marine literacy at the public and policy levels by applying expertise in research, outreach, communication and education. This flow of services and information to citizens and government agencies enables Sea Grant and NOAA to help individuals and organizations make well-informed decisions.

The cornerstones of Sea Grant's community-empowering efforts are:

Finding Solutions to Critical Questions

Sea Grant invests in applied scientific research through a multi-disciplinary network of more than 3,000 researchers from over 300 institutions. Sea Grant-funded research explores complex marine and coastal issues while accounting for today's rapidly changing economic landscape. Researchers discover new information and apply new technology, resulting in solutions to improve coastal environments and associated economies.

Connecting Science to People and Policy

Sea Grant's network of over 400 extension agents and 100 communication specialists provides the connection between Sea Grant-funded research and the people and regions that benefit from it. The critical role of Sea Grant outreach is to bring the latest scientific information to community leaders and professionals who can apply it to benefit their livelihoods and the environment and use it to solve problems facing our coastal and marine landscapes.

Building Knowledge for the Future

Sea Grant works with teachers and students from kindergarten to high school to develop environmental literacy and stewardship practices. The goal of Sea Grant's engagement with K-12 is to teach about our marine and coastal environments and the interaction of society with these ecosystems, and to raise awareness of marine careers. As students prepare in college to become the new generation in research, resource management and protection, Sea Grant's educational focus shifts to critical thinking, career preparation and annual support for over 900 graduate students.

After university graduation, students may join one of Sea Grant's fellowship programs (Sea Grant Knauss Marine Policy Fellowship, NOAA Fisheries/Sea Grant Population and Ecosystem Dynamics and Resource Economics Fellowship). Both fellowships provide graduate students and recent grads with applied science or policy experience within the federal government. Sea Grant also provides education for professionals on current scientific findings and management tools.



Photo: Oliver Bencosme, Puerto Rico Sea Grant

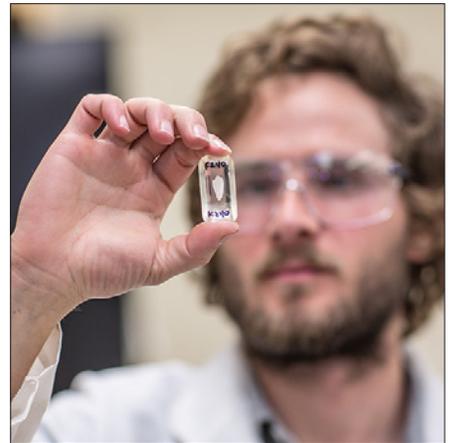


Photo: Todd Paris, University of Alaska Fairbanks



Photo: Pat Kight, Oregon Sea Grant

Photo: Mike Sullivan, Skidaway Institute of Oceanography (SIO)

2012 Recommendations

2012 Recommendations

1. Sea Grant should continue to focus on advancing national priorities and solving problems on a local and regional basis, while remaining sensitive to the needs of local communities.
2. Sea Grant should continue to support tracking and reporting of the cumulative, measurable impacts of Sea Grant activities toward the achievement of national goals.
3. Sea Grant should continue to emphasize partnerships and collaborative efforts within the Sea Grant network and with other federal, regional, state and local agencies and organizations.
4. The federal budget should allocate additional resources for Sea Grant to reverse the erosion of buying power and maintain a dynamic program.
5. The National Sea Grant Office should review the funding structure of Sea Grant, including the allocation and distribution of funds to state programs, following recommendations made in a 2011 Advisory Board report.
6. NOAA should continue the integration of its coastal programs to maximize its capability to address the nation's growing coastal challenges.

Sea Grant Response

Sea Grant Response

The National Sea Grant College Program Strategic Plan for 2014-2017 outlines national priorities developed through local and regional stakeholder input with state Sea Grant programs. The Strategic Plan process, with the sharing of feedback on research outcomes, economic impacts and environmental changes in state programs, demonstrates positive and effective Sea Grant attention to this recommendation.

Sea Grant is committed to careful planning and evaluation at the state and national levels. The National Sea Grant Office (NSGO) has continued to refine the Planning, Implementation and Evaluation Resource (PIER) database to provide the Sea Grant network with support and guidance on effective impacts. The NSGO has added a PIER public search capability for Sea Grant projects as well as an impacts and accomplishment search <http://seagrants.noaa.gov/News/SeaGrantAnnouncements/TabId/275/ArtMID/731/ArticleID/252/NOAA-Sea-Grant-Launches-Public-Search-to-Highlight-Program-Impacts.aspx>. This should increase the ease of use of PIER and its value for both researchers and the public. The 2014-2017 program measures and metrics have been refined to incorporate more fully the work of the network.

Partnerships are growing in number and impact. For example, Sea Grant partners with other NOAA line offices and programs to leverage existing knowledge and resources. Types of partnerships are explained in the PIER database. Within individual Sea Grant programs, partnerships with business, agencies, academia and other sponsors increase Sea Grant's scope of influence and leverage support for wider efforts.

The federal budget is moving toward greater support for Sea Grant efforts. In FY 2014 Sea Grant received an increase of nearly \$5M in the Conference Appropriations Report. While these additional revenues do not yet recoup losses to inflation, they are certainly welcome recognition of the value of the services rendered by Sea Grant.

A third Allocation Committee was assigned to review funding distribution among the national office, individual programs, and the essential elements of research, education and outreach. Committee representatives from the Board, Sea Grant Association, and NSGO challenged many long-held traditions of Sea Grant funding. They provided balanced and specific recommendations for future allocations and a timeline for implementation. After considering comments from the SGA, the NSGO decided to use FY14 budget increments to begin re-balancing programs to achieve a minimum funding level of \$1M in all programs.

NOAA has made progress in integrating coastal programs and improving cross-agency collaboration. For example, NOAA has realigned the National Ocean Service budget structure and is merging the Coastal Services Center and the Office of Ocean and Coastal Resource Management. The agency also realigned and refocused the National Centers for Coastal and Ocean Service to better target research on agency coastal missions and priorities. These changes are enabling NOAA to make progress on NOS priorities (coastal resiliency, coastal intelligence and place-based conservation), which align well with Sea Grant and other NOAA coastal interests. These changes are improving delivery of services to NOAA partners and customers and creating opportunities for further coordination and collaboration across NOAA. Such integration should result in increased cooperation between Sea Grant and NOS coastal programs.

National Focus Areas

Sea Grant activities concentrate effort in a set of Focus Areas, which are established through the national and state program strategic plans. These interrelated Focus Areas are of critical importance to the health and vitality of the Nation's coastal resources and communities, respond to issues of major importance to NOAA, and are topical areas in which Sea Grant is making significant contributions.

Focus Area Impact: Hazard Resilience in Coastal Communities

Sea Grant combines research and communication efforts with stakeholder education opportunities to inform the public about the risks of living and working in coastal communities, and to help those communities respond effectively to environmental needs and hazardous events. (See multiple examples from Hurricane Sandy in Sea Grant in Action p. 16.)

- Texas and Virginia Sea Grant programs reduce insurance costs through the National Flood Insurance Program's Community Rating System.
- Oregon Sea Grant's wave prediction tool aids assessment of local conditions to improve safety for commercial and recreational boaters and may show how local waves affect coastal vulnerability. The tool is also used in creating global and regional weather models. The Eastern North Pacific forecast system is used by the National Weather Service (NWS).
- Maryland Sea Grant researchers developed the Nutrient Loading Model that shows nitrogen amounts in coastal lagoons in the Delmarva Peninsula, and predicts changes and environmental response from land use, population size and agricultural activity.
- Lake Champlain Sea Grant has focused work on research and public education about storm water management, sedimentation and erosion control, including homeowner rain barrel projects, phosphorus educational campaigns and studies on bioretention systems at the University of Vermont.
- Puerto Rico Sea Grant has been collecting and analyzing drowning incident statistics at the beaches of Puerto Rico to inform the resource managers and decision makers of the need for improved aquatic safety services on the island.

Photo: Mississippi-Alabama Sea Grant



Mississippi-Alabama Sea Grant developed and Texas Sea Grant implemented the Coastal Resilience Index. The self-assessment tool, deployed in six coastal TX counties, allows communities to address vulnerabilities.



MIT Sea Grant supported use of Vulnerability and Consequences Adaptation Planning Scenarios (VCAPS) modeling, which was used by the City of Boston to draft a new hazard mitigation plan. The program also helped create a compelling use case for Google's Project Ara modular phone by incorporating unique sensors to collect and transmit environmental data.

Photo: Keoki Stender, Marine Life Photography



Hawaii Sea Grant educates and prepares for climate change impacts: Provided a coastal protection education program in the Marshall Islands, and endorsed 2013 Landowner's Guide publication as guidance to adapt to and prepare for climate change impacts.

Focus Area Impact: Healthy Coastal Ecosystems

Sea Grant professionals are leaders in understanding and maintaining healthy ecosystems. Sea Grant works to support ecosystem-based approaches to managing the coastal environment, including restoring the function and productivity of degraded ecosystems and promoting stewardship of healthy ones through research, education and innovation.

- University of Southern California Sea Grant improves methods for detecting and removing neurotoxins from harmful algal blooms in intake waters of desalination systems used by municipal water systems.
- Sea Grant assesses invasive species impacts and control methods:
 - Wisconsin Sea Grant led a multi-state survey of Lake Michigan food web structure as impacted by invasive species.
 - New York Sea Grant helped develop and patent a safe, effective method for biocontrol of zebra and quagga mussels.
 - Mississippi-Alabama Sea Grant developed a testing method to identify and raise awareness of invasive jellyfish.
 - Florida Sea Grant's Cooperative Invasive Species Management Area program treated 5,000 acres distressed with non-native vegetation.
 - Alaska Sea Grant helped tourism companies incorporate invasive species monitoring into their offerings, providing significant gains in knowledge about these species.
 - Guam Sea Grant has identified native algae species to inform the Micronesian Biosecurity Plan and help respond to invasive algae species in the Western Pacific.
- Sea Grant is working to help communities properly dispose of used pharmaceutical products which, if not handled properly, could become a significant environmental crisis. Pennsylvania and New York Sea Grant coordinated education and collection events, and Illinois-Indiana Sea Grant supported 17 permanent pharmaceutical product collection programs and six events that collected 12,000 pounds of material.



Photo: Chris J. Benson, Minnesota Sea Grant

Sea Grant programs are working to provide safe and effective methods to reuse dredge material, a byproduct of the need to create clear navigation channels and ports. Ohio Sea Grant designed a program for beneficial reuse of Toledo Harbor dredge material to create blended soil products that are used by the City of Toledo. Minnesota Sea Grant supported development of a project to use 20 years of dredge material to create 74 acres of new wetland and public recreation space. Wisconsin Sea Grant's coastal engineer contributed to projects in two states that found new uses for 2.4 million cubic yards of dredged material.



Photo: Deborah Mercy, Alaska Sea Grant

Alaska Sea Grant Marine Advisory Agent identifies a marine invasive.



Photo: Stephanie Showalter Otis, National Sea Grant Law Center

Quagga mussels on boat propeller. The National Sea Grant Law Center provides wide-reaching education and research. They helped reform regulations for the movement of trailered watercraft in Oregon and Utah and conducted research leading to the change of septic system financing in Virginia.

National Focus Areas

Focus Area Impact: Safe and Sustainable Seafood Supply

Sea Grant works to support seafood sustainability and supply, as well as the health of the U.S. domestic seafood industry. Sea Grant's research, development and education provide significant local impact for the domestic aquaculture industry and wild fisheries, and can be used to launch far-reaching programs that will benefit seafood safety and quality, keeping the domestic seafood industry financially competitive and environmentally responsible.

- Georgia Sea Grant research on oyster age at maturation allows Georgia Department of Natural Resources to reduce the minimum size for commercial oyster harvest, enabling a significant increase in production.
- Wisconsin and New York Sea Grant programs developed new procedures for nonlethal Viral Hemorrhagic Septicemia Virus (VHSV) testing and pathogen removal. VHSV can cause serious fish mortalities that may result in significant economic losses.
- Maryland Sea Grant developed an oyster spatfall model to predict which locations have the greatest likelihood of receiving above-average settling of larvae, potentially maximizing restoration efforts and benefitting commercial aquaculture operations. To date, application of the model has led to production of 900 million oyster "spat on shell" that helped seed new oyster beds and restore sanctuary reefs around the Chesapeake Bay.
- Woods Hole Sea Grant and Barnstable County MA administer a Municipal Shellfish Propagation Program benefitting 17,000+ recreational and 1,000 commercial fishermen in the county.

Photo: Courtesy N.C. Seafood Festival



North Carolina Sea Grant provided expertise for "North Carolina's Local Catch" documentary to heighten awareness of locally caught seafood.

- Sea Grant investigates, develops and refines aquaculture products and procedures:
 - New Hampshire Sea Grant developed multi-trophic aquaculture technologies (shellfish with finfish).
 - Connecticut and New Hampshire Sea Grant produced a written technical manual and training video for the culture of four species of seaweed for human consumption.
 - California Sea Grant research on Pacific oysters led to a new oyster hybrid that has the potential to increase the value of West Coast oyster farms by millions of dollars annually.
- Sea Grant creates significant local impacts with research, development and education:
 - Louisiana Sea Grant assisted with researcher personnel, data compilation and cleanup efforts leading to the Louisiana blue crab fishery being recognized with the seal of sustainability by the Marine Stewardship Council.
 - Washington Sea Grant organized and taught commercial vessel safety procedures which are credited with saving the lives of Makah fisherman during a night time boating accident.
 - Mississippi-Alabama Sea Grant organized and implemented 12-hour Commercial Fishing Vessel Drill Conductor courses for Vietnamese-American fisherman in their native language.

Photo: Catherine Schmitt, Maine Sea Grant



Maine Sea Grant adapted sea vegetable species for commercial production.



Virginia Sea Grant facilitated discussions between the state's shellfish hatchery members to discuss ocean acidification and water quality.

Photo: Janet Kream, Virginia Sea Grant

Focus Area Impact: Sustainable Coastal Development

Coastal communities in the U.S. provide vital economic, social and recreational opportunities for millions of Americans, but decades of population migration have transformed our coastal landscapes and intensified demand on finite resources. Sea Grant uses its technology and resources to educate and engage the public on important issues such as water conservation, land use and habitat protection.

- North Carolina Sea Grant researchers used novel fish tagging techniques to provide data for protecting saltmarsh habitats that are strategic to fish production. Since responses to development are most discernible among the assemblages of smaller fish that use the marsh for foraging and refuge, tagging these fish can provide insights for managers about the impacts of development.
- Water availability and quality is becoming an increasing concern for officials in many parts of the country. Sea Grant provides education and programs with a direct impact on the improvement of water quality:
 - South Carolina Sea Grant organized and conducted workshops to educate residents about water quality impacts in the home, including replacement or repair of septic systems. As a result the state reported water quality improvements to the USEPA and re-opened 883 acres of shellfish beds to harvest.
 - Illinois-Indiana Sea Grant led a Lawn to Lake program to reduce water use in lawn and landscape care that resulted in over 88 million gallons of water saved.
 - Maryland Sea Grant supported a program that provided nearly 800,000 feet of “rainscaping,” green design projects that helped restore local water quality.
- Sea Grant develops and uses technology to enhance public participation and education on coastal development issues (See images at right).
- North Carolina Sea Grant assisted in forming Saltwater Connections, a regional initiative aimed at sustaining livelihoods, cultural heritage and natural resources along the state’s coast through economic development and leadership programs.



Photo: Peg Van Patten, Connecticut Sea Grant

Connecticut Sea Grant and CT NEMO rain garden installations result in diversion of over 600,000 gallons of stormwater annually, increasing water quality.



Photo: Texas Sea Grant

Texas Sea Grant Coastal Planning Specialist leads state officials through a resilience workshop using the weTable. Pictured are Aransas County Road and Bridge Engineer, Director of Building and Development for the City of Rockport, and Rockport Mayor.



Photo: Narayan Mahon

Wisconsin Sea Grant provides access to coastal spatial data through the Wisconsin Coastal Atlas, which is being used to facilitate better understanding of coastal issues and inform decision making about sustainable use of the Great Lakes. Pictured above is Ozaukee County, WI which is featured in the Wisconsin Coastal Atlas as an example of bluff erosion. Sea Grant has helped this community come to terms with the beauty, and risks, associated with fickle topography.

Sea Grant in Action

Sea Grant's Response to Hurricane Sandy

With 140 deaths and over \$62 billion in damages, Hurricane Sandy shook the very foundation of the coastal communities in the areas it hit.

Even before the storm made landfall on October 29, 2012, NOAA's Sea Grant network, with more than 400 extension agents nationwide, was working to get coastal residents information they needed to prepare for Sandy. With strong community relationships, Sea Grant extension agents can reach isolated populations, such as rural fishing communities, even in the aftermath of a disaster. Their community trust allows agents to serve as effective liaisons between communities, local and state governments and federal agencies.

Since the storm, the Sea Grant network has been engaged in the assessment and recovery effort along the East Coast. Sea Grant is also helping local communities develop long-term solutions for climate change adaptation.

Coordination

Connecticut Sea Grant, with the University of Connecticut, sponsored a meeting for coastal entities with state and federal agencies, to address concerns about impacts to beaches and dunes.

Rhode Island Sea Grant coordinated creation of the Rhode Island Shoreline Change Special Area Management Plan, known as the Beach SAMP. Rhode Island sea levels are expected to rise 3 to 5 feet within 100 years. The plan helps communities prepare for and rebound from coastal hazards of erosion and flooding.



Photo: National Park Service

Assessment

Connecticut Sea Grant helped the U.S. Fish and Wildlife Service assess severe dune and shoreline erosion and evaluate new potential piping plover habitats created by the storm.

Delaware Sea Grant supported a satellite and remote-sensing monitoring system used to follow the storm's progress. After the storm, University of Delaware scientists identified raw sewage entering the ocean from damaged treatment plants. Such rapid assessments help keep the public safe.

New Jersey Sea Grant worked with tourism officials to renew public interest and confidence in the New Jersey Shore as a desirable destination for vacations and day trips. With the New Jersey Division of Travel and Tourism, Sea Grant produced a special Making More Shore Memories calendar highlighting shore area events and attractions beyond conventional summer fare.

Coastal erosion after Hurricane Sandy.

Post-Sandy rebuilding efforts in the Rockaways.



Photo: Rhode Island Sea Grant



Photo: Jay Tanski, New York Sea Grant

New York Sea Grant provided real-time information on the track, intensity and aftermath of Hurricane Sandy via social media, when other outlets lost power. New York Sea Grant researchers have provided information and analysis to The New York Times, The Wall Street Journal, NBC News, ABC News, the Associated Press and Newsday, among others.

New York Sea Grant researchers measured the rate of Long Island estuaries' recovery after Sandy's storm surge caused a Wastewater Treatment Plant to release raw sewage from 1/2 million homes into the waterways. This research will provide emergency managers and municipalities with needed scientific data about seasonal nitrogen levels near the plant while upgrades to the facility are underway.



Photo: New Jersey Sea Grant

Destruction from Sandy in Mantoloking.

Technical Assistance & Outreach

Delaware Sea Grant is developing a “Natural Hazards and Climate Adaptation Tool Kit for Delaware Communities” to assist municipal planning efforts. The Delaware Homeowners Handbook to Prepare for Natural Hazards helps Delaware residents brace for the next big storm.

Delaware Sea Grant extension staff captured footage of the storm tide flooding over three days and created a time-lapse video, illustrating the importance of homeowners being prepared, especially with regard to flood risk, as well as evacuation planning and procedures.

Maryland Sea Grant is conducting research and offers planning assistance to help coastal communities prepare for sea level rise and coastal flooding.

New Jersey Sea Grant's data from beach surveys after the storm showed that communities with wide beaches or a mature dune system suffered less damage than those with narrow beaches or no dune system. The information led to county workshops with community representatives, one-on-one meetings with coastal communities and the development of a manual to assist communities in their beach and dune nourishment planning.

New York Sea Grant's expert on barrier beaches helped the National Park Service (NPS) save \$6 million by providing information that led to the NPS deciding it was not wise to undertake a major beach restoration effort immediately after the storm.

New Research

The National Sea Grant Office delivered rapid-response research funds to New York, New Jersey and Connecticut Sea Grant programs. To address more long-term issues, a collaborative partnership between FEMA Recovery Directorate and Sea Grant is underway to facilitate a connection between FEMA regional recovery coordinators and respective Sea Grant Extension agents and specialists.

To improve public understanding and awareness of natural hazards and associated risks, NOAA Sea Grant awarded a \$1.8 million grant to Sea Grant programs in Connecticut, New Jersey and New York to support the Coastal Storm Awareness Program. The funding is part of the Disaster Relief Appropriations of 2013, commonly referred to as the Sandy Supplemental. The research will enhance the Nation's ability to respond to disasters.

Sea Grant in Action

Climate Adaptation and Renewable Energy

Improving our ability to understand, plan for and respond to climate-driven challenges is one of Sea Grant's main priorities. Sea Grant is responsive to a growing demand for efforts to increase community resilience, awareness and preparation in the face of a changing climate. Sea Grant's continued support of Community Climate Adaptation Initiatives helps communities access the most current climate adaptation science and prepare for the long-term consequences of climate variability and change, demonstrating practical examples for other communities to follow.

Sea Grant increases community resilience to hazards by finding new solutions to challenging issues, developing tools and techniques, and increasing awareness of climate driven challenges, including extreme weather events, coastal storms, sea level rise, ocean acidification and integration of green infrastructure. Sea Grant specialists connect local stakeholders to the best science available and assist decision-makers in leading their communities through informed choices.

Sea Grant works to mitigate future climate impacts and increase community resilience using local renewable energy sources. Sea Grant's trusted reputation allows specialists to bring local community and stakeholder interest together, and to educate the public on the technology, opportunities and challenges of renewable energy research and deployment. Sea Grant's extensive legal network has clarified permit issues surrounding renewable energy projects.

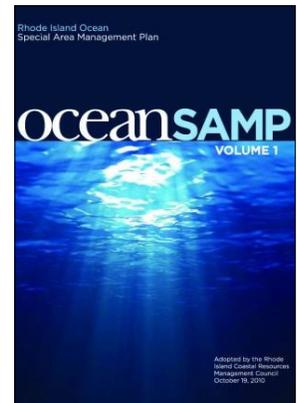
- Ocean acidification is detrimental to shellfish and zooplankton, with both food web and economic implications. Based on a Washington Sea Grant research symposium, the governor established the Nation's first Blue Ribbon Panel on Ocean Acidification. Sea Grant staff coordinated working groups on science, adaptation and remediation, and education and outreach, spurring state agency action and addition of \$3.3M for acidification research in the state.
- Florida Sea Grant supported development of a new science-based prediction tool that can help the insurance industry more accurately assess hurricane damage risk. The research resulted in significant enhancements to the Florida Public Hurricane Loss Model, and also led Miami to establish new building codes to strengthen the exterior of residential structures.

Oregon Sea Grant assists development of renewable energy from the ocean waves and wind, while minimizing conflicts with other ocean uses. A partnership with Oregon State University researchers is working to enhance understanding of the social and environmental ramifications of wave energy. Oregon Sea Grant has also partnered with the Northwest National Marine Renewable Energy Center. Sea Grant outreach and extension activities aim to help the public understand the technology and issues surrounding marine renewable energy, focusing on the complex issues involved in wave energy siting and production.



Photo: Joe Cone, Oregon Sea Grant

Rhode Island Sea Grant, with the National Oceanographic Partnership Program (NOPP) has developed the Ocean Special Area Management Plan (Ocean SAMP) project. A team of University of Rhode Island researchers collects data and establishes standards for use with existing and newly developed tools to evaluate the impacts of potential projects on the ocean environment. Ocean SAMP is a means of assessing the impacts of a broad range of offshore renewable energy resources projects on marine ecosystems and human activities.



STEM consolidation response

Science, Technology, Engineering and Mathematics (STEM) education is a national goal which Sea Grant fosters at multiple levels, including the prestigious Sea Grant John A. Knauss Fellowships in marine policy, the NOAA Fisheries/Sea Grant Fellowships, graduate and undergraduate research support on Sea Grant projects, K-12 education programs and informal education for the public.

When the federal Committee on STEM education (CoSTEM) proposed its national strategy for all levels of education (NSTC 2013), the federal administration's budgets responded in both FY14 and FY15 with consolidation strategies (and

accompanying budgets) that would have effectively removed Sea Grant from its legislated role in education. In FY14, all education funds in Sea Grant were proposed for reassignment to the National Science Foundation (graduate and undergraduate education), the Department of Education (K-12 education) or the Smithsonian Institution (informal education). Resounding support from the Sea Grant network, Knauss Fellows and alumni, the education community and other stakeholders, and finally Congress, rescued STEM education in Sea Grant for the year. The FY15 federal budget did not remove education funding (Office of Science and Technology Policy, 2014), but NOAA's agency plan states that K-12 education and the NOAA Fisheries/Sea Grant Fellowships in Sea Grant will not be supported.

The Sea Grant model of integrating research, education and outreach excels in bringing ocean, coastal and Great Lakes science to the U.S. population. The “three-legged stool” on which Sea Grant is founded would topple without education. Sea Grant recognizes that in the 21st century environmental literacy is a fundamental component of an informed public, and STEM education enables people to understand scientific evidence and make knowledgeable decisions about environmental and resource issues.

Sea Grant continues to support programs in K-12 education. Sea Grant Educators work in coastal communities across the United States promoting ocean, coastal and Great Lakes science to children and lifelong learners through K-12 and informal education.

These professionals are uniquely qualified to facilitate the translation of science to all citizens, with expertise in both science (natural and/or social) and education (formal and/or informal). As Sea Grant invests resources in K-12 STEM education, Sea Grant Education professionals leverage additional resources through partnerships at local, state and national levels. Sea Grant's goal is to engage and excite young people, their families and teachers to learn more about the ocean, coasts and Great Lakes. These students will become the next generation of experts committed to the wise use of our Nation's coastal resources, and well-informed decision making citizens in their community.

Sea Grant will continue to build evidence of success and strengthen evaluation methods to provide significant indicators of K-12 and informal education impact. Sea Grant STEM impacts include these examples, showing the scope of audiences and methods for Sea Grant education:

- In 2012, Florida Sea Grant instructed 519 people in Master Naturalist Program courses. Graduates of this program included 52 business owners, 132 teachers, 15 resource managers and 4 local elected officials. A statewide survey of program graduates revealed the program helped 7% acquire jobs, 13% obtain volunteer positions, and 3% obtain pay raises.
- The University of Southern California Sea Grant's Parent Child Education Program (PCEP) was developed to address parents' concerns that they had very little understanding of the connection inland communities have through the watershed to the coastal ocean. In 2012 the PCEP served 15 families who all reported increased knowledge about their connection to the ocean and made commitments to reduce their impact (validated through post-program surveys).
- The Oregon Coast Aquatic and Marine Partnership (OCAMP) delivers high-quality, current ocean sciences content to teachers. In 2011 this Oregon Sea Grant partnership connected teachers with 44 working ocean scientists to deliver classroom- and field-based science education to almost 1,000 K- through 10th-grade students. Students of OCAMP teachers are benefiting: 81 percent of them meet or exceed state test scores in science and math, compared to 64 percent of students

Photo: Florida Sea Grant



Students analyze water quality using math and chemistry principles learned in the aquaculture curriculum from Florida Sea Grant.



Students from Murray La Saine Elementary School participate in South Carolina Sea Grant's *Seeds To Shoreline* program.

Photo: Susan Ferris Hill, South Carolina Sea Grant

Sea Grant in Action

in the same district whose teachers are not in the program. Meanwhile, 15 OCAMP teachers have submitted portfolios for National Board Certification--half of them reporting that they would not have done so without their OCAMP experience. All 32 teachers showed improved abilities to design appropriate science lessons, to create conditions for communicating science content and concepts, and to make explicit connections across content areas.

- Illinois-Indiana Sea Grant helped foster a grant that educated people from 40 states, as well as Egypt, Greece, Brazil and Canada about proper disposal of unwanted medications. This education effort has resulted in 1 million people educated on the topic of unwanted medicine disposal and over 2.2 million pills collected.
- South Carolina Sea Grant's From Seeds to Shoreline (S2S) program engages students in growing salt marsh plants to vegetate areas along the coastline. Classroom lessons, field trips and presentations about the salt marsh ecosystem supplement the restoration process. The program has expanded to three inland and seven coastal schools. Participating teachers indicated that their knowledge increased, and schools were empowered to seek additional funds to support the effort.

Sea Grant's Social Science Initiative

Sea Grant's Social Science Initiative aims to improve the interactions among social, economic and environmental systems in U.S. coastal areas. Social science research is the process of describing, explaining and predicting human behavior. With ties to over 300 U.S. universities, Sea Grant is able to bring social science research to coastal communities. To help foster informed decisions, Sea Grant provides information on the value of coastlines and coastal amenities and cash flow through communities. Sea Grant's social science research shows how people perceive and value coastal amenities, and how to help existing coastal businesses, increase community resilience, and encourage sustainable coastal development.

The number of Sea Grant social science research projects increased by nearly 50% between 2010 and 2012. This initiative allowed Sea Grant to increase its efforts in coastal economics, public perceptions, planning, sociology, administration, anthropology,



Photo: Connecticut Sea Grant

Connecticut Sea Grant research on kelp culture techniques, support for product testing, and extension assistance with permitting resulted in the first permitted kelp farm and harvest in Long Island Sound, with over 120 pounds of kelp sold to restaurants in New York City.

market research, program evaluation, geography, law and leadership development.

Economic Impacts

Michigan Catch & Cook promotes Great Lakes sport fishing and dining through partnerships between charter boat operators and restaurants, where fishers can have their catch prepared by professional chefs. A website (www.micatchandcook.com) lists local partners so charter fishing clients can enjoy a unique dining experience that supports the local coastal community.

Florida Sea Grant worked with a private company to create a coupled fish aquaculture-wetland plant production system. Over 100,000 plants were produced by the system and used to restore six acres of coastal wetlands. In just the first year the system was also effective in producing more than 2,500 Florida Pompano, a recreationally important fish.

Education and training are important to economic development:

- Hawaii Sea Grant helped provide job training in marine resource science to retain local workforces.
- Florida Sea Grant worked with state government and local fishing clubs to train anglers how to minimize barotrauma mortality among bycatch.
- Minnesota and Wisconsin Sea Grants used science, history and handheld game apps in an interactive program to communicate the value of healthy estuaries, focusing on the newest National Estuarine Research Reserve on Lake Superior.

Partnerships

Partnerships at all levels are important for NOAA and Sea Grant’s mission within academia, government, non-profit and private sectors.

In 2014, two NOAA Sea Grant Programs were awarded prestigious Department of Interior Partners in Conservation awards for their work. Rhode Island Sea Grant helped develop national environmental monitoring tools for offshore renewable energy development. These tools were delivered to the U.S.

Bureau of Ocean Energy Management in 2012, and help inform national standards development for the industry. Michigan Sea Grant led a multi-partner project to construct fish spawning habitat in the Detroit River, leading to the creation of the Huron-Erie Corridor Initiative. The initiative used research suggesting that water flow, depth and temperature are important in the placement of spawning reefs. The plan increased habitat for lake whitefish, lake sturgeon, walleye and more than 14 other native fish populations. By collaborating across institutional and geographic boundaries, Sea Grant is able to leverage its talents, capabilities and resources and expand the scope of their efforts.

Sea Grant partners with other NOAA line offices and programs to leverage existing knowledge and resources:

- NMFS: NOAA Fisheries/Sea Grant Fellowships, Aquaculture National Strategic Initiative, and Fisheries Training
- NOS: Sea Grant contributes to Coastal Storms Program
- NWS: Weather-Ready Nation (WRN): Sea Grant multimedia preparedness messages

Photo: Michigan Sea Grant



Huron-Erie Corridor Initiative.



Photo: Laura Oremland, NMFS

A Washington Sea Grant coastal hazard specialist, in collaboration with the Natural Resources Department for the Lower Elwah Klallam Tribe and the U.S. National Park Service, leads a tour of Elwah Dam removal and restoration sites for the NOAA NMFS /Sea Grant Graduate Fellowship Program in Population and Ecosystem Dynamics.

State of the Sea Grant Network

The Board supports rebalancing of budget allocations, Sea Grant reauthorization, the Planning, Implementation and Evaluation process (PIE) and the new 2014-2017 Strategic plan focus areas.

Rebalancing the National Sea Grant College Program

In 2010 the Board was asked to take a fresh look at Sea Grant's budget allocation policy with the objective "To develop policies and criteria for allocating Sea Grant funding resources that will be consistent with Sea Grant's legislative authority and will maximize the effectiveness, efficiency, and impact of the National Sea Grant College Program." Two joint subcommittees, including members from the Board, the SGA, and the NSGO, addressed this issue. The first subcommittee reported back to the Board in September 2011 with a framework for allocation, and the second subcommittee developed that framework into recommendations for implementation in 2013.

The most significant recommended policy change was to shift the primary determinant of base funding to coastal shoreline and population. The concept of a minimum level of base funding was reaffirmed and it was also recommended that 75% of the Sea Grant appropriation should be dedicated to base, merit and regional funding with the remainder to be set aside to support national activities. The report was transmitted to the Sea Grant Network and followed by an extensive dialogue on whether and how to implement the recommendations. Based on that discussion, the implementation plan was modified to ensure that no Program would lose base funding in order to increase another Program's base. Instead, movement toward coastal shoreline- and population-based funding would only occur as the overall pool of base funding increased. The significant increase in the FY 2014 appropriation for Sea Grant provided just that opportunity, and the process of rebalancing the allocation of funds across the Sea Grant Network was initiated.

Thus, the goals and objectives for the distribution of funds in the National Sea Grant College Program for FY 2014 and beyond are as follows:

Goals

- Bring the Sea Grant network to a consistent level of excellence nationwide.
- Foster a high level of innovation, educational and scientific quality, and program impact.
- Support Sea Grant's legislative mandate to promote the wise use and conservation of coastal and marine resources.
- Support NOAA's mission priorities.

Objectives

- Provide an equitable, rational, transparent and flexible allocation plan that promotes performance, healthy competition and partnerships.
- Provide a stable national infrastructure of university-based programs that accomplish Sea Grant's mission effectively and efficiently.



Photo: Woods Hole Sea Grant

Students from the 'Fundamentals of Shellfish Farming' class hike out to the tidal flats to tour a shellfish aquaculture operation at Crowe's Pasture in Dennis, Cape Cod, Massachusetts.

Reauthorization

The National Sea Grant College Program Act was passed by Congress in 1966 and was last reauthorized in 2008. Legislation was introduced in the 113th Congress to strengthen and amend the program. Significantly, the recommended authorization of appropriations includes exactly the same five-year amounts from 2015-2020 as were recommended in 2008 for the years 2009-2014. Appropriated Program funds have lagged behind projected sustainable levels of support, with nearly level funding until FY14's roughly \$5 million increment. In addition to base support, the proposed legislation establishes an annual fund of \$6 million for priority topics: research on aquatic invasive species, oyster diseases and human health risks, harmful algal blooms, aquaculture, fishery extension activities and activities focused on coastal resilience and U.S. working waterfronts.

To manage the Program, the reauthorization bill recommends an increase in support for the National Sea Grant Office, to 5.5% of the appropriation; plus authorization for the NSGO to use the Inter-government Personnel Act to take on short-term appointees from the Sea Grant Colleges. Despite the efforts of the small National Sea Grant Office, the current 5% cap has limited the staff's ability to effectively administer and represent the Program. No other NOAA division has an administrative cap mandated by Congress. The Advisory Board maintains that removal of the administrative cap would facilitate the greater range of support services needed at the national level.

The reauthorizing legislation seeks to solidify the John A. Knauss Marine Policy Fellowship. The amendments also change the frequency of the Advisory Board's reporting to Congress to every three years rather than biennially. Additionally, the language requires the Board to indicate progress made towards meeting the priorities identified in the strategic plan currently in effect. At this writing Sea Grant Reauthorization S 2030 has been passed out of Committee for full Senate consideration, with several steps remaining to be accomplished before passage.

New Focus Areas, Strategic Plan and Site Reviews

Implementation of the 2014-2017 Sea Grant Strategic Plan has begun through state Sea Grant Program projects. The Sea Grant network plan aligns with the Department of Commerce, NOAA Next Generation, and the NOAA Office of Oceanic and Atmospheric Research Strategic Plans. The 2014-2017 Sea Grant focus areas are: Healthy Coastal Ecosystems, Sustainable Fisheries and Aquaculture, Resilient Communities and Economies, and Environmental Literacy and Workforce Development.

In 2014-2015 Sea Grant programs will again be evaluated during Program Site Reviews and Performance Review Panels. During the site reviews in 2010-2011, all Sea Grant Programs were found to be "Successful" with all recommendations formally addressed.

Sea Grant John A. Knauss Fellowship

In 2014 the Sea Grant John A. Knauss Fellowship hit an important milestone selecting its 1000th Fellow. The fellowship seeks qualified candidates from all U.S. accredited institutions of higher education in the U.S. and U.S. Territories including students from minority serving institutions and those that are economically disadvantaged. The fellowship, established in 1979, matches highly qualified graduate students with "hosts" in the legislative and executive branch of government located in the Washington, D.C. area, for a one year paid fellowship. Learn more about the current fellows and alumni at: <http://seagrants.noaa.gov/FundingFellowships/KnaussFellowship.aspx>



2013 Sea Grant Knauss Class with NOAA Administrator, Kathy Sullivan

Photo: Derek Parks

Emerging Opportunities for Sea Grant

Sea Grant has identified emerging needs in research, education and outreach for the 2014-2017 Focus Areas, with accompanying opportunities to increase knowledge and understanding of these areas.

Healthy Coastal Ecosystems

Emerging Contaminants: Pharmaceuticals and personal care products (PPCPs) help people and animals live healthier lives, but their use comes with consequences for aquatic systems. There is growing evidence that PPCPs act as endocrine disruptors or human carcinogens, and contribute to antibiotic resistance.

Aquatic Invasive Species: Aquatic invasive species are among the most pervasive problems in the marine and Great Lakes environments. Since it is practically impossible to eradicate a species once it has become established, efforts are ongoing to reduce numbers, develop early detection tools and educate the public on control measures and practices.

Restoration of Coastal Ecosystems: Evidence is mounting that intact ecosystems help increase long term resilience of coastal environments and provide a buffer to the impacts of coastal storms. Restoration of ecosystems such as wetlands not only buffers communities from destructive coastal storms, but also contributes to the overall reduction of greenhouse gases.

Water Resources: Rapid development, climate change and other human activities are leading to water quality degradation, increased demands on water supplies, changes to fisheries stocks, wetlands loss, proliferation of invasive species and other impacts. It is essential for decision-makers to understand the interconnectedness of these systems to maintain vital habitats and restore ecosystems.

Resilient Communities and Economies

Climate Change Adaptation and Coastal Resiliency: Resiliency applies to many topics within Sea Grant's portfolio, including resilient coastal economies and community resilience to hazards such as coastal storms, coastal inundation and erosion. Sea Grant can determine areas of vulnerability and need, develop adaptation plans, conduct climate change monitoring and provide legal advice on sea level adaptation policies. Sea Grant can also help build the capacity of small, rural communities to deal with climate change.

Tourism: Tourism brings income, tax revenues and jobs. It is important to guide the industry towards providing a benefit to the environment as well. Tourism can provide financial return for those in commercial fishing and aquaculture, and can also play a role in connecting seafood consumers with producers, resulting in an economic engine that also pays benefits in educating citizens about the important environmental issues.

Coastal Development: Coastal population growth has led to increasing development, recreation, business activities and use of waterfronts along with increased pressure on coastal environments to retain the functions to support these communities. Sea Grant supports diverse and vibrant economies, while maintaining ecosystems resilient to coastal hazards and climate change.

Sustainable Fisheries and Aquaculture

Seafood Traceability: In the U.S., food-borne diseases are estimated to cause 76 million illnesses, 325,000 hospitalizations and 5,000 deaths each year. Developing effective traceability tools will help ensure a safe seafood supply and promote the development of profitable local markets by helping consumers connect to their food sources.

Environmental Literacy and Workforce Development

Education Research: Developing the most effective means of delivering ocean literacy content in marine education and outreach requires expanding and utilizing the educational research base. Educational research can illuminate effective instructional techniques, student and public misconceptions and gaps in knowledge. Research adds to what is known about a field, helps to improve education practice, and can influence policy.

Environmental Literacy Impacts: K-12 STEM education in Sea Grant is strong and diverse, with a national scope and elements addressing all levels of CoSTEM education fostered by the Administration. Evidence-based support documenting impacts of existing program components is needed, and long-term tracking of program participants can demonstrate how Sea Grant education opportunities are used to achieve workforce development and larger Sea Grant program goals.

Cross-Cutting Opportunities

Social Science: Sea Grant's social science initiative improves our understanding of integrated social, economic and environmental systems in our coastal areas. Describing, explaining and predicting human behavior enables Sea Grant to make a difference in coastal communities.



Photo: Amanda Cording, Lake Champlain Sea Grant

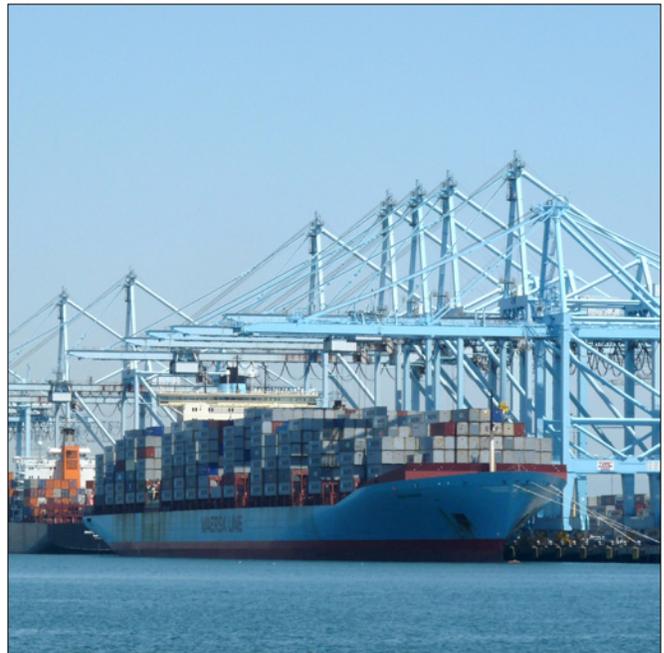


Photo: Phyllis Grifman, USC Sea Grant



Photo: Ohio Sea Grant



Photo: Louisiana Sea Grant

2014 Recommendations

To continue the progress made toward addressing the challenges and opportunities of our oceans, coasts and Great Lakes, the Board recommends the following.

Recommendation	Rationale
<p>1. Sea Grant should continue to focus on advancing national priorities while solving problems on a local and regional basis. This national focus must continue to emphasize partnerships and collaborative efforts within the Sea Grant network and with other federal, regional, state and local agencies and organizations, without loss of sensitivity to community stakeholders' needs.</p>	<p>There is ample evidence of how state initiatives contribute to the development and enhancement of national priorities and progress.</p> <ul style="list-style-type: none"> • The Clean Marinas program is a well-known example of a national priority implemented locally. It provides marinas and boaters the opportunity to protect natural resources, and is currently active in 16 states. • Connecticut, New Jersey and New York programs support social science research to improve community understanding and response to coastal storm hazard information as part of Sea Grant's Coastal Storm Awareness Program. • The Ocean Special Area Management Plan (Ocean SAMP), developed by Rhode Island Sea Grant along with the State and the University of Rhode Island, proactively plans for the wise use of Rhode Island's offshore waters. The planning process developed and analyzed scientific data, mapped ocean uses, and incorporated oral histories from the Narragansett Indian tribe to ensure a beneficial plan for all stakeholders. <p>These and other efforts demonstrate the value of continuing state-national projects for meeting Sea Grant goals.</p>
<p>2. Sea Grant should continue to support tracking and reporting of the cumulative, measurable impacts of Sea Grant activities toward the achievement of national goals.</p>	<p>Sea Grant is based on a federal legislative mandate for research, education and outreach, all of which require ongoing demonstrations of effectiveness, responsiveness to local, state, regional and national needs, and awareness of additional opportunity for growth. The Planning, Implementation and Evaluation (PIE) process documents program impacts and is the public's view of Sea Grant functionality (See Appendix C). Accountability demands continued work toward enhancing impacts and then adequately measuring and reporting them. Modifications in the external evaluation process and its components will be tested in the next biennium.</p>
<p>3. The continued viability of Sea Grant relies on adjustment of budget equity among programs, while maintaining program review and merit considerations. The Sea Grant network should embrace steps toward balancing the federal funding among programs, with a goal of assuring all programs a minimum level of base funding.</p>	<p>Sea Grant has received level funding in the past but increments in funding in 2014 will allow the program to make adjustments in internal allocation of funds. This is necessary for collective success of the national network and state partnerships, and allows for enhanced merit funding. Increments in Sea Grant funding in the future will support further adjustments for program preservation. Balancing funding toward equity within the program is based on strengthening research funding to allocate ~40% of federal funds for research, instituting a more equitable distribution of federal dollars, and enabling the NSGO to effectively administer the program.</p>
<p>4. Sea Grant should strengthen the focus area in Environmental Literacy and Workforce Development by demonstrating how Sea Grant K-12 and informal STEM education programs and targeted graduate Fellowships are mission critical, respond to national priorities, and result in evidence-based accomplishments and impacts.</p>	<p>The Sea Grant model of integrating research, education and outreach excels in bringing ocean, coastal and Great Lakes science literacy to the U.S. population. The administration's proposed budget for FY2015 recommends eliminating K-12 STEM education efforts, including teacher professional development, from Sea Grant. This recommendation does not recognize either the critical links between the development of environmental literacy from a young age and a robustly educated workforce and informed citizen decision makers or the past success of the program. With a new Focus Area in Environmental Literacy and Workforce Development, Sea Grant should strategically strengthen its role in education, with special emphasis on the impact of Sea Grant K-12 and informal STEM education.</p>

Appendix A: Sea Grant Programs

Sea Grant College Programs

Alaska Sea Grant
California Sea Grant
Connecticut Sea Grant
Delaware Sea Grant
Florida Sea Grant
Georgia Sea Grant
Hawai'i Sea Grant
Illinois-Indiana Sea Grant
Louisiana Sea Grant
Maryland Sea Grant
Maine Sea Grant
Michigan Sea Grant
MIT Sea Grant
Minnesota Sea Grant
Mississippi-Alabama Sea Grant Consortium
North Carolina Sea Grant
New Hampshire Sea Grant
New Jersey Sea Grant Consortium
New York Sea Grant
Ohio Sea Grant

Oregon Sea Grant
Puerto Rico Sea Grant
Rhode Island Sea Grant
South Carolina Sea Grant Consortium
Texas Sea Grant
Virginia Sea Grant
Washington Sea Grant
Wisconsin Sea Grant

Sea Grant Institutional Programs

University of Southern California Sea Grant
Woods Hole Sea Grant
Pennsylvania Sea Grant

Sea Grant Coherent Area Programs

Guam Sea Grant
Lake Champlain Sea Grant

Sea Grant Projects

National Sea Grant Law Center
National Sea Grant Library



- We are pleased to report that Virginia Sea Grant has met the requirements for formal designation as a Sea Grant College Program, the highest level obtainable.

Appendix B: References and Reports

National Sea Grant Allocation Committee #3

http://seagrant.noaa.gov/Portals/0/Documents/who_we_are/leadership/board/reports/2013/Allocation%20Committee%203%20Recommendations.pdf

National Science and Technology Council. (2013). Federal STEM Education 5-year strategic plan.

http://www.whitehouse.gov/sites/default/files/microsites/ostp/stem_stratplan_2013.pdf

NOAA Budget Estimates Fiscal Year 2015. STEM proposal on page 569 (OAR 147)

http://www.corporateservices.noaa.gov/~nbo/docs/NOAA_FY15_CJ_508%20compliant.pdf

NOAA Sea Grant Planning, Implementation and Evaluation Process Documents

http://seagrant.noaa.gov/Portals/0/Documents/network_resources/reporting_evaluation/Sea%20Grant%20Planning,%20Implementation,%20and%20Evaluation%20System%20-%20April%202014%20Revision.pdf

Office of Science and Technology Policy (2014). Preparing Americans with 21st Century Skills Science, Technology, Engineering, and Mathematics: (STEM) Education in the 2015 Budget.

http://www.whitehouse.gov/sites/default/files/microsites/ostp/STEM-ED_FY15_Final.pdf

Rebalancing Sea Grant's Base Funding Resources – FY2014 and Beyond

http://seagrant.noaa.gov/Portals/0/Documents/who_we_are/legislation/SeaGrantAllocationPolicyFY2014andBeyond_9_23_14.pdf

Sea Grant Laws, Regulations and Policies

<http://seagrant.noaa.gov/WhoWeAre/Laws,RegulationsandPolicies>



Photo: Michael Chambers, N.H. Sea Grant/UNH Cooperative Extension

Photo: Washington Sea Grant



Photo: April Turner, South Carolina Sea Grant

APPENDIX C: SEA GRANT PROGRAM IMPACTS

The Sea Grant network enables NOAA and the Nation to tap the best science, technology and expertise to balance human and environmental needs in coastal communities. The NOAA Sea Grant website includes a searchable database of Sea Grant impacts and accomplishment to learn more about our work.

<http://seagrant.noaa.gov/WhatWeDo/ImpactsandAccomplishments.aspx>

The screenshot shows a web browser window displaying the NOAA Sea Grant website. The browser's address bar shows the URL <http://seagrant.noaa.gov/whatwedo/impactsandaccomplishments.aspx>. The website header includes the NOAA logo and the text "NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION UNITED STATES DEPARTMENT OF COMMERCE". The "Sea Grant" logo is also visible. A navigation menu contains links for Home, Who We Are, What We Do (highlighted), Where We Work, How We Work, Funding & Fellowships, News, and Network Resources. Below the navigation menu, there is a search bar labeled "SEARCH SEA GRANT WEBSITE" and a breadcrumb trail: "What We Do > Impacts and Accomplishments".

Sea Grant Impacts and Accomplishments

The Sea Grant network enables NOAA and the nation to tap the best science, technology and expertise to balance human and environmental needs in coastal communities. Here you can search Sea Grant impacts and accomplishment to learn more about our work.

Need help or more information about this search? Please see our [Impacts and Accomplishment Search Instructions](#).

Search Sea Grant Impacts & Accomplishments

Region / State: Year: Focus Area / Cross Cutting Goal: Impact/Accomplishment:

Search for OR

We are continually working to improve our search. If you have any questions or suggestions please fill out this [form](#).

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Appendix D – 2014 Performance Measures and Metrics

**National Sea Grant College Program
FY2014 Performance Measures and Metrics
As a result of Sea Grant activities, the Nation achieved...**

Economic Impacts		Research	
\$450M	In economic impact	576	Peer-reviewed publications
6,500	Businesses created or sustained	Safe and Sustainable Seafood Supply	
17,500	Jobs created or sustained	23,000	Fishers adopt responsible harvesting techniques
5	Patents	53,000	Stakeholders modify practices based on increased knowledge of safety, sustainability, and health.
Healthy Coastal Ecosystems		1,750	Hazard analysis & critical control points (HACCP) certifications
460	Ecosystem-based management (EBM) tools, technologies, and information services	Sustainable Coastal Development	
521	EBM tools used by Sea Grant customers	220	Communities implemented sustainable development practices/policies
4,000	Resource managers use EBM	Education, Outreach and Extension	
21,700	Acres of degraded ecosystems restored	290,000	Volunteer hours
Hazard Resilience in Coastal Communities		760	Undergraduate students supported
1,050	Trainings to improve resilience	910	Graduate students supported
300	Communities improved resilience	8,200	Workshops, trainings, and presentations

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Photo: Rebecca Zerber, N.H. Sea Grant



Photo: Louisiana Sea Grant



Photo: Anna McCarmey, Pennsylvania Sea Grant



Photo: Delaware Sea Grant



Photo: Cindie Powell, Texas Sea Grant

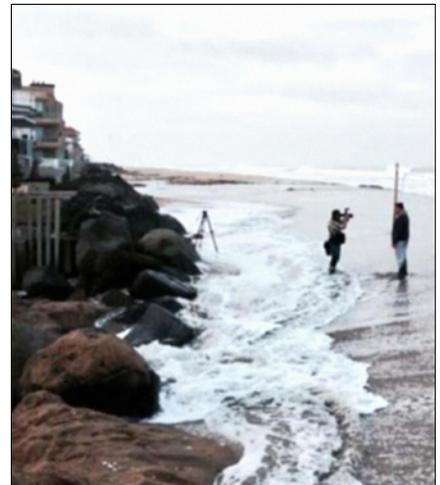


Photo: California Sea Grant

The State of Sea Grant 2014: Impacts, Challenges, Opportunities
Biennial Report to Congress by the National Sea Grant Advisory Board

November 2014



Photo: Illinois-Indiana Sea Grant

Sea Grant



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2014-2017 NSGCP Strategic Plan



NOAA National Sea Grant College Program

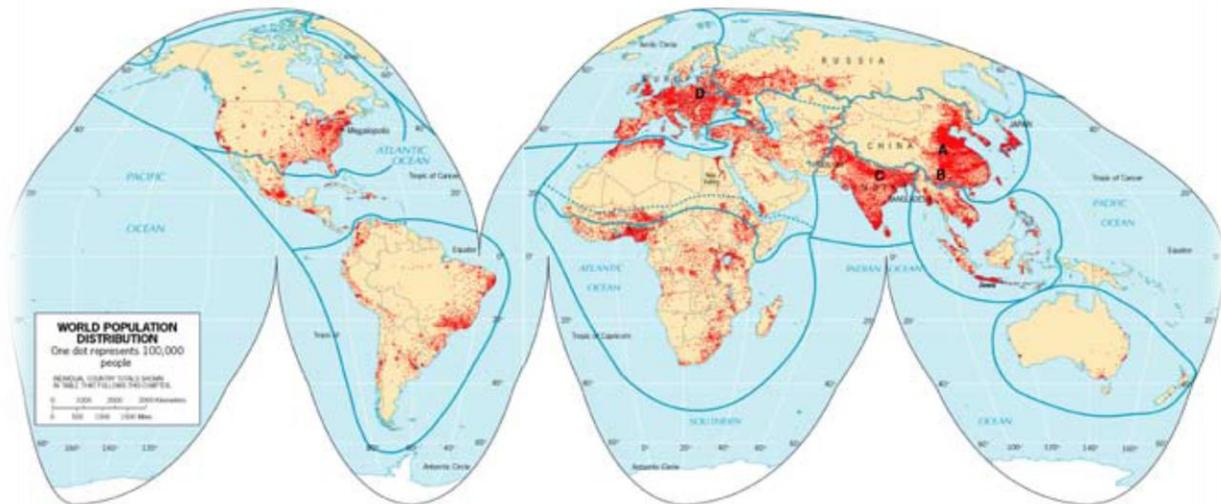


Strategic Plan 2014-2017

Sustaining our nation's ocean, coastal and Great Lakes resources through university-based research, communications, education, extension and legal programs.


Sea Grant

World Population Density



Around the world hundreds of thousands move to the coast every year, making it increasingly important that we find adequate ways to balance human social and economic activities. Along with other coastal nations, America must use its coastal land, water, energy, and other natural resources in ways that preserve the health and productivity of coastal ecosystems.

Introduction

Serious challenges present the greatest opportunities for change, and Sea Grant is prepared not only to respond, but to help coastal communities prepare to meet these challenges. One of Sea Grant's demonstrated strengths is its ability to quickly mobilize universities and other partners to address challenges across the country and around the world. The national Sea Grant network of university scientists and communication, education, extension and legal professionals has the ability, through the organization's coordinated state and regional infrastructure, to address local and state priorities of national importance.

At this time of great risk to the sustainability¹ of our ocean, coastal and Great Lakes resources, there is an even greater opportunity for the Sea Grant network to play a significant role, through innovation and creativity, in addressing the goals set forth in this plan. The Sea Grant programs will strive to achieve these national goals in a manner that reflects the particular needs of individual states and communities and the nation as a whole. This four-year strategic plan establishes a prioritized national direction to guide the Sea Grant network in addressing critical national needs at local, state and regional scales in ocean, coastal and Great Lakes environments. The plan capitalizes on Sea Grant's unique capacities and strengths, allows state Sea Grant programs to be flexible, and supports the Next Generation Strategic Plan of the National Oceanic and Atmospheric Administration (NOAA).

SEA GRANT VISION AND MISSION

The National Sea Grant College Program envisions a future where people live, work and play along our coasts in harmony with the natural resources that attract and sustain them. This is a vision of coastal America where we use our natural resources in ways that capture the economic, environmental and cultural benefits they offer, while preserving their quality and abundance for future generations.

This vision complements the vision articulated in NOAA's Strategic Plan: "Healthy ecosystems, communities and economies that are resilient in the face of change."

Sea Grant's mission is to provide integrated research, communication, education, extension and legal programs to coastal communities that lead to the responsible use of the nation's ocean, coastal and Great Lakes resources through informed personal, policy and management decisions.

¹ Sustainability is defined as meeting the needs of the present generation without compromising the ability of future generations to meet their own needs. Sustainability has three equally weighted components: economic, social and environmental.



SEA GRANT MODEL

Sea Grant was created by the U.S. Congress in 1966 to be a highly leveraged federal and state partnership to harness the intellectual capacity of the nation's universities to solve ocean, coastal, Great Lakes and island (hereby referred to as coastal) problems. The National Sea Grant College Program engages citizens, communities, scientists, organizations and governments to sustain and enhance the vitality, value and wise use of the nation's coastal resources. Administered and supported by NOAA, and implemented through leading research universities, Sea Grant provides unique access to scientific expertise and to new discoveries. Through its scientists and communications, education, extension and legal specialists (hereby referred to as engagement professionals), Sea Grant generates, translates and delivers cutting-edge, unbiased, science-based information to address complex issues.

Sea Grant is a national network. This network includes the National Sea Grant Office, 33 university-based state programs, the National Sea Grant Advisory Board, the National Sea Grant Law Center, the National Sea Grant Library and hundreds of participating institutions. The Sea Grant network enables NOAA and the nation to tap the best science, technology and expertise to balance human and environmental needs in coastal communities. Sea Grant's alliance with major research universities around the country provides access to thousands of scientists, students and engagement professionals. Sea Grant's university-based programs are fundamental to the development of the future scientists and resource managers needed to conduct research and to guide the responsible use and conservation of our nation's coastal resources. With its strong research capabilities, local knowledge and on-the-ground workforce, Sea Grant provides an effective national network of unmatched ability to rapidly identify and capitalize on opportunities and to generate timely, practical solutions to real problems in real places.

SEA GRANT CORE VALUES

Since its inception, a strong set of core values has provided the foundation for Sea Grant's work. Sea Grant is founded on a belief in the critical importance of university-based research and constituent engagement². Sea Grant invests significantly in merit-reviewed research each year. Research discoveries are then distributed to Sea Grant's constituents through sustained engagement programs. Meaningful and sustained engagement has allowed Sea Grant to form strong partnerships with leading coastal state research universities, with other NOAA programs, and with a wide range of public and private partners at federal, state and local levels. This has proven to be a highly effective way to identify and solve the most relevant problems facing coastal communities.

² A Mandate to Engage Coastal Users: A Review of the National Sea Grant Extension Program and a Call for Greater National Commitment to Engagement (November 2000) and NOAA's Science Advisory Board's report on Engaging NOAA Constituents. Each report defined constituent engagement as being responsive, accessible, respecting partners, maintaining scientific neutrality, integrating diverse expertise, coordination of efforts and building resource partnerships.



Sea Grant’s unique integration of research with constituent engagement is at the heart of its mission. As a pioneer in translational research (from discovery to application), Sea Grant ensures that unbiased, science-based information is accessible to all. The diverse capabilities of Sea Grant’s personnel and partners enable the organization to be creative and responsive in generating policy-relevant research and disseminating scientific and technological discoveries to a wide range of audiences. Sea Grant’s science-based, non-regulatory approach and its long-term history of engagement with local communities have made Sea Grant a trusted source of information. Sea Grant serves as a catalyst for decision support by increasing knowledge among decision-makers and the public as a whole. Sea Grant’s commitment to these core values is vital to achieving the goals set forth in this plan.

PLANNING PROCESS AND STRATEGIC APPROACH

The collective Sea Grant network brought its wealth of expertise and experience to the task of creating this plan. The planning process began with identification of priorities by the Sea Grant state programs (and their stakeholders and advisory committees) followed by a review of existing plans and reports that set national, regional, state and local priorities. To elicit additional input and guidance, the Sea Grant network, national stakeholder groups, representatives from NOAA programs, other federal agencies and environmental non-profit organizations were asked to provide input on three drafts of the 2014-2017 National Sea Grant Program Strategic Plan

A strategic approach to managing coastal resources in ways that balance human use with environmental health requires:

- Better science-based information about how coastal ecosystems function and how human activities affect coastal habitats and living resources;
- Citizens who understand the complexities of coastal environments and the interactions between human use and coastal ecosystem health;
- Management and decision-making processes that are based on sound information, involve citizens who have a stake in America’s coastal resources and include mechanisms to evaluate trade-offs between human and environmental needs; and,
- Incorporation of social science, including quality of life and sustainable economic development, into ecosystem-based management decisions.



FOCUS AREAS



Image Credit: Oliver Bencosme/ SeaGrantPR.org

To help the nation understand, manage and use its coastal resources wisely, Sea Grant identified four focus areas central to what Sea Grant does. The focus areas are:

- 1. Healthy Coastal Ecosystems**
- 2. Sustainable Fisheries and Aquaculture**
- 3. Resilient Communities and Economies**
- 4. Environmental Literacy and Workforce Development**

These focus areas evolved from Sea Grant’s 2009-2013 Strategic Plan and reflect America’s most urgent needs along our coasts, as well as NOAA goals and Sea Grant’s strengths and core values. The focus areas also reflect the integration of Sea Grant’s research and engagement programs. These functional areas provide the foundation for implementing a successful four-year plan.

Each focus area has goals, outcomes and performance measures. The goals describe the desired long-term direction for each focus area. The outcomes are benchmarks from which Sea Grant can track progress toward achieving each goal. Performance measures are quantitative ways of measuring outcomes with targets developed by each Sea Grant program.

Outcomes are commonly categorized as short-, medium- and long-term. In this plan, learning, action and consequence outcomes are synonymous to short-, medium- and long-term outcomes and have been chosen to more easily identify the transition across outcome categories. For example, progress toward a goal starts with an achievable and measurable learning outcome and is followed by a series of “what happens next” (action and consequence) questions until the goal is met. Using this approach, it is easier to demonstrate in a more or less linear process how goals are achieved.

- Learning (short-term) outcomes lead to increased awareness, knowledge, skills, and changes in attitudes, opinions, aspirations or motivations through research and/or constituent engagement.



- Action (medium-term) outcomes lead to behavior change, social action, and adoption of information, changes in practices, improved decision-making or changes in policies.
- Consequence (long-term) outcomes are long-term, and in most cases, require focused efforts over multiple strategic planning cycles. Consequence outcomes in a four-year strategic plan serve as reference points toward reaching focus area goals between the current and future strategic plans.

The outcomes identified in the 2014-2017 National Sea Grant Strategic Plan can only be realized through full utilization of Sea Grant’s research and engagement programs. For example, many of the learning outcomes identified require a substantial investment in needs-based and merit-reviewed research before any actionable outcomes. Simply stated, Sea Grant-sponsored research is the “engine” that leads to new products, tools or other discoveries used by Sea Grant’s engagement programs to effect change.

There are two types of performance measures identified in this plan. Performance measures that are most closely linked to a single focus area are listed at the end of each focus area section. Cross-cutting performance measures - broad measures of progress toward goals for all focus areas - are listed following the Education and Workforce Development Focus area.

Collectively, the four focus areas include 11 goals, 91 outcomes and 10 performance measures. This plan directly aligns to NOAA’s goals and objectives as articulated in NOAA’s Next Generation Strategic Plan: climate adaptation and mitigation, weather-ready nation, healthy oceans, and resilient coastal communities and economies. The 2014-2017 National Sea Grant Strategic Plan capitalizes on Sea Grant’s unique capacities and strengths and provides state programs with the flexibility and creativity required to adapt to emerging needs.



HEALTHY COASTAL ECOSYSTEMS

The United States manages millions of square miles of coastal territories that contain diverse and productive ecosystems. These ecosystems span from the tropics to the Arctic and support a variety of recreational, commercial and subsistence activities. More than four million acres of coral reefs serve as vital economic and biodiversity hotspots in the Atlantic, Caribbean, Gulf of Mexico and Pacific³. More than 88,569 square miles of coastal wetlands provide nurseries for more than half of our commercially harvested fish species and refuges for 75 percent of all our migratory birds and waterfowl⁴. In addition, there are the countless miles of beaches and bluffs, sea grass beds, oyster reefs and tidal flats, which have long made our coasts popular places to live and visit. Therefore, healthy coastal ecosystems, sustained by their surrounding watersheds, are the foundation of life along the coast.



Image credit: Acropora Cervicornis; Otter- Alaska Sea Grant; Algal Bloom- Ohio Sea Grant

Keeping coastal ecosystems healthy is a challenge because of the diversity of stressors each system faces. This is further complicated because ecosystems do not adhere to traditional political boundaries. Responsible management of these systems requires new kinds of thinking and actions, often termed ecosystem-based management⁵. Ecosystem-based approaches require unprecedented levels of coordination among federal, state and local jurisdictions and the active engagement of the people who live, work and play along our coasts. They also require

³ USGS 2002, <http://pubs.usgs.gov/fs/2002/fs025-02/>.

⁴ NOAA 2012, <http://stateofthecoast.noaa.gov/>.

⁵ Ecosystem-based management is an integrated approach to management that considers the entire ecosystem, including humans. The goal of ecosystem-based management is to maintain an ecosystem in a healthy, productive and resilient condition so that it can provide the services humans want and need. Ecosystem-based management differs from current approaches that usually focus on a single species, sector, activity or concern; it considers the cumulative impacts of different sectors.

understanding of the characteristics of species, landscapes and their interactions within each ecosystem.

In general, increasingly rapid coastal development, greater demands on fisheries resources, climate change and other human activities are leading to water quality degradation, increased demands on water supplies, changes to fisheries stocks, wetlands loss, proliferation of invasive species and a host of other environmental impacts. It is essential for decision-makers to understand the interconnectedness and interactions of these systems in order to maintain vital habitats and inform restoration efforts within ecosystems and watersheds.

Sea Grant is a leader in regional approaches to understanding and maintaining healthy ecosystems, with planning efforts across the country to identify information gaps, implement research priorities and coordinate information and technology transfer to people who need it. Sea Grant recognizes the need to determine the value of the myriad services ecosystems⁶ provide that maintain the conditions for life on Earth. Sea Grant's regional consortia, nationwide networks and international contacts are particularly well-suited to helping the nation address ecosystem health at the appropriate local, state, regional, national and global levels.

⁶ Ecosystem services include provisioning (food and water), regulating (flood and disease control), cultural (spiritual, recreational and cultural benefits) and supporting (nutrient cycling).

HEALTHY COASTAL ECOSYSTEMS

GOAL 1

Ecosystem services are improved by enhanced health, diversity and abundance of fish, wildlife and plants.

Learning Outcomes

- Develop and calibrate new standards, measures and indicators of ecosystem sustainability.
- Identify critical uncertainties that impede progress toward achieving sustainability of ecosystems and the goods and services they provide.

Action Outcomes

- Resource managers, policy- and decision-makers use standards and indicators to support ecosystem-based management.

Consequence Outcomes

- Dynamic ecological systems provide a wide range of ecological, economic and societal services and are more resilient to change.
- Greater public stewardship leads to participatory decision-making and collaborative ecosystem-based management decisions.

HEALTHY COASTAL ECOSYSTEMS

GOAL 2

Ecosystem-based approaches are used to manage land, water and living resources.

Learning Outcomes

- Stakeholders have access to data, models, policy information and training that support ecosystem-based planning, decision-making and management approaches.
- Baseline data, standards, methodologies and indicators are developed to assess the health of ecosystems and watersheds.
- Residents, resource managers, businesses and industries understand the effects of human activities and environmental changes on coastal resources.
- Resource managers have an understanding of the policies that apply to coastal protected species.

Action Outcomes

- Methodologies are used to evaluate a range of practical ecosystem-based management approaches for planning and adapt to future management needs.
- Resource managers apply ecosystem-based management principles when making decisions.
- Resource managers incorporate laws and policies to facilitate and implement ecosystem-based management.
- Residents, resource managers and businesses integrate social, natural and physical science when managing resources and work with all sectors in the decision-making process.

Consequence Outcomes

- Land, water and living resources are managed using ecosystem-based approaches.

HEALTHY COASTAL ECOSYSTEMS

GOAL 3

Ecosystems and their habitats are protected⁷, enhanced or restored.

Learning Outcomes

- Residents, resource managers and businesses understand the importance of the benefits provided by preserving non-degraded ecosystems.
- Residents, resource managers and businesses understand the threats to ecosystems and the consequences of degraded ecosystems.
- Scientists develop technologies and approaches to restore degraded ecosystems.

Action Outcomes

- Resource managers set realistic and prioritized goals to protect, enhance and restore habitats by incorporating scientific information and public input.
- Resource managers, businesses and residents adopt innovative approaches and technologies to maintain or improve the function of ecosystems.

Consequence Outcomes

- Habitats are protected, enhanced or restored.
- Degraded ecosystem function and productivity are restored

HEALTHY ECOSYSTEMS PERFORMANCE MEASURES

1. Number of resource managers who use ecosystem-based approaches in the management of land, water, and living resources as a result of Sea Grant activities.
2. Number of acres of coastal habitat protected, enhanced or restored as a result of Sea Grant activities.

⁷ In the context of this goal, protected areas are those places in some form of conservation management program.

Sustainable Fisheries and Aquaculture⁸



Image Credit: Alaska & Oregon Sea Grant

The nation has witnessed the decline of many of its major fisheries while seafood consumption has increased and continues to be encouraged because of its health benefits. To fill the gap between seafood demand and domestic harvests, the United States imports 86 percent⁹ of what is consumed leading to a seafood trade deficit of over \$10 billion¹⁰ per year. With global wild fisheries harvests at a plateau of around 185 metric tons¹¹, some 50 seafood species are now produced from aquaculture. There are no projected increases in wild capture fisheries, but global aquaculture is predicted to increase by 33 percent over the next decade. These projections create opportunities for an expanded U.S. aquaculture industry and for innovative marketing strategies and value-added products for the nation’s wild fisheries industry.

The overall economic impact of the commercial, recreational, for-hire fisheries and aquaculture industries in the United States is over \$276 billion. The commercial fishing industry supports

⁸ We use a working definition of “seafood sustainability” that is based on the NOAA Fish watch concept. Sustainability involves “meeting today’s needs without compromising the ability of future generations to meet their needs. In terms of seafood, this means catching or farming seafood responsibly, with consideration for the long-term health of the environment and the livelihoods of the people who depend upon the environment.

⁹ Food and Agriculture Organization of the United Nations.

¹⁰ U.S. Department of Agriculture Foreign Agricultural Service statistics.

¹¹ Food and Agriculture Organization of the United Nations.

approximately 1 million full- and part-time jobs and generates \$116 billion in sales¹². The recreational and for-hire fishing industry generates significant tourism revenue with \$73 billion in total economic impact for saltwater fishing and an additional \$6 billion annually for Great Lakes recreational and for-hire fisheries. The U.S. aquaculture industry generates an economic impact of \$1 billion, provides additional opportunities for job creation, and contributes to meeting the nation's demand for finfish and shellfish.

Sea Grant continues to play a leadership role in developing innovative technologies for all sectors of the seafood industry, including fishing, aquaculture, seafood processing and consumer safety, to ensure a safe and sustainable supply of seafood products now and for future generations. Seafood safety will continue to be a concern for consumers as foreign imports, some of which are associated with seafood contamination, continue to increase. Sea Grant's partnership with NOAA Fisheries, state fisheries managers, seafood processors, fishing associations and consumer groups will ensure safe, secure and sustainable supplies of domestic seafood and decrease our reliance on seafood imports.



Image Credit: Alaska Sea Grant; Oregon Sea Grant

¹² NOAA Fisheries, 2009 . Fisheries Economics, Sociocultural Status and Trends Series:
<http://www.st.nmfs.noaa.gov/st5/publication/>.

Sustainable Fisheries and Aquaculture

GOAL 4

A safe, secure and sustainable supply of seafood to meet public demand

Learning Outcomes

- Fishery managers and fishermen understand the dynamics of wild fish populations.
- The seafood industry¹³ is knowledgeable about innovative technologies, approaches and policies.
- Commercial and recreational fishermen are knowledgeable about efficient and responsible fishing techniques.
- The commercial fishing industry is aware of innovative marketing strategies to add value to its product.
- The seafood processing industry learns and understands economically viable techniques and processes to ensure the production and delivery of safe and healthy seafood.

Action Outcomes

- Fishermen employ efficient fishing techniques, including by catch reduction.
- Fishermen apply techniques to reduce negative impacts on depleted, threatened or endangered species.
- The seafood industry adopts innovative technologies and approaches to supply safe and sustainable seafood.
- The commercial fishing and aquaculture industries adopt innovative marketing strategies to add value to their products.
- The seafood industry adopts techniques and approaches to minimize the environmental impact of their sectors.
- Resource managers establish policies and regulations that achieve a better balance between economic benefit and conservation goals.
- The seafood processing industry implements innovative techniques and processes to create new product forms and ensure the delivery of safe and healthy seafood.

Consequence Outcomes

- The U.S. seafood¹⁴ supply is sustainable and safe.
- There is an expansion of the sustainable domestic fishing and aquaculture industries.

¹³ The seafood industry includes all sectors of the industry, including aqua culturists, fishermen, processors, wholesalers, retailers and supporting businesses.

¹⁴ Seafood includes product originating from all sectors of the fishing and aquaculture industries.

Sustainable Fisheries and Aquaculture

GOAL 5

Informed consumers who understand the health benefits of seafood consumption and how to evaluate the safety and sustainability of the seafood they buy.

Learning Outcomes

- The seafood industry is aware of the standards for safe seafood.
- The seafood industry is knowledgeable about consumer trends regarding seafood sustainability and safety and how to adjust operations to meet emerging demands.
- U.S. seafood consumers have the knowledge to evaluate sustainable seafood choices.
- U.S. seafood consumers have an increased knowledge of the nutritional benefits of seafood products and know how to judge seafood safety and quality.

Action Outcomes

- The seafood industry adopts standards for safe seafood.
- The seafood industry adopts technologies and techniques to ensure seafood safety.
- U.S. seafood consumers preferentially purchase sustainable seafood products.

Consequence Outcomes

- Consumers improve their health through increased consumption of safe and sustainable seafood products.
- The U.S. seafood industry operates sustainably and is economically viable.

SUSTAINABLE FISHERIES AND AQUACULTURE PERFORMANCE MEASURE

3. Number of fishermen, seafood processors and aquaculture industry personnel who modify their practices using knowledge gained in fisheries sustainability and seafood safety as a result of Sea Grant activities.

Resilient Communities and Economies¹⁵



Photo Credit: Resilience- North Caroline Sea Grant; PRGS

Coastal communities in the United States provide vital economic, social and recreational opportunities for millions of Americans. For example, in 2010 over 13.5 million people were employed in the tourism industry in coastal communities in over 750,000 business establishments, earning combined wages of \$266 billion. The total economic value generated by the U.S. coastal tourism industry in 2010 was estimated at \$531 billion. However, decades of population migration have transformed many natural coastal habitats into urban landscapes and intensified the use of finite coastal resources. Between 1970 and 2010, the population of U.S. coastal watersheds has increased by 45 percent to a total of 164 million, or 52 percent of the nation's population¹⁶. This population increase has resulted in greater vulnerability of coastal communities and environments to natural¹⁷ and technological¹⁸ hazards. To accommodate more people and activity while balancing demands on coastal resources, our nation must develop innovative policies, institutional capacities and management approaches to increase community resilience.

Sea Grant will continue to support cutting-edge research in the areas of marine-related energy sources, climate change, coastal processes, energy efficiency, hazards, storm water management and tourism. Sea Grant programs will engage our diverse and growing coastal populations in applying the best-available scientific knowledge to address increased resource demands and

¹⁵ Resilience is determined by the degree to which a community is capable of organizing itself to increase its capacity for learning from past economic, natural or technological disasters.

¹⁶ NOAA Economic Value of Resilient Coastal Communities, Revised 3/9/2012.

¹⁷ Natural hazards include hurricanes, Northeasters, tropical storms, extreme rainfall events, flooding, wildfires, tornadoes, droughts, tsunamis, blizzards and heat waves.

¹⁸ Technological hazards include chemical and oil spills and nuclear reactor accidents.

vulnerability. Ultimately, Sea Grant will bring its unique research and engagement capabilities to support the development of resilient coastal communities that sustain diverse and vibrant economies, effectively respond to and mitigate natural and technological hazards and function within the limits of their ecosystem.



Resilient Communities and Economies

GOAL 6

Development of vibrant and resilient coastal economies

Learning Outcomes

- 6.1. Communities¹⁹ are aware of the interdependence between the health of the economy and the health of the natural and cultural systems.
- 6.2. Communities have access to information needed to understand the value of waterfront- and tourism-related economic activities.
- 6.3. Communities understand the strengths and weaknesses of alternative development scenarios on resource consumption and local economies.
- 6.4. Communities are aware of regulatory regimes affecting economic sustainability.
- 6.5. Communities are knowledgeable about economic savings from energy planning and conservation.

Action Outcomes

- 6.6. Citizens are actively engaged in management and regulatory decisions.
- 6.7. Communities engage in economic development initiatives that capitalize on the value of their natural and cultural resources while balancing resource conservation and economic growth.

Consequence Outcomes

- 6.8. Communities have diverse, healthy economies and industries without displacing traditional working waterfronts²⁰.

¹⁹ Communities are defined broadly to include governments, businesses, residents, visitors and non-governmental organizations.

²⁰ Working waterfront is a term broadly used in this plan to include water-dependent and water-related industries, such as energy production, tourism, ports and harbors, marine transportation, shipyards, marinas, commercial fishing, recreational fishing, aquaculture, fishing piers and public access.

Resilient Communities and Economies

GOAL 7

Communities use comprehensive planning to make informed strategic decisions.

Learning Outcomes

- 6.9. Communities understand the connection between planning and natural resource management issues and make management decisions that minimize conflicts, improve resource conservation efforts and identify potential opportunities.

Action Outcomes

- 6.10. Communities make use of tools and information to explore the different patterns of coastal development, including community visioning exercises, resource inventories and coastal planning.
- 6.11. Communities adopt coastal plans.
- 6.12. The public, leaders and businesses work together to implement plans for the future and to balance multiple uses of coastal areas.

Consequence Outcomes

- 6.13. Quality of life in communities, as measured by economic and social well-being, improves without adversely affecting environmental conditions.

Resilient Communities and Economies

GOAL 8

Improvements in coastal water resources sustain human health and ecosystem services.

Learning Outcomes

- 6.14. Communities are aware of the impact of human activities on water quality and supply.
- 6.15. Communities understand the value of clean water, adequate supplies and healthy watersheds.
- 6.16. Communities understand water laws and policies affecting the use and allocation of water resources.

Action Outcomes

- 6.17. Communities engage in planning efforts to protect water supplies and improve water quality.
- 6.18. Communities adopt mitigation measures, best management practices and improved site designs in local policies and ordinances to address water supplies and water quality.

Consequence Outcomes

- 6.19. Water supplies are sustained.
- 6.20. Water quality improves.

Resilient Communities and Economies

GOAL 9

Resilient coastal communities adapt to the impacts of hazards and climate change.

Learning Outcomes

- 6.21. Residents and decision-makers are aware of and understand the processes that produce hazards and climate change and the implications of those processes for them and their communities.
- 6.22. Decision-makers are aware of existing and available hazard- and climate-related data and resources and have access to information and skills to assess local risk vulnerability.
- 6.23. Communities have access to data and innovative and adaptive tools and techniques to minimize the potential negative impact from hazards.
- 6.24. Decision-makers understand the legal and regulatory regimes affecting adaptation to climate change, including coastal and riparian property rights, disaster relief and insurance issues.

Action Outcomes

- 6.25. Communities apply best available hazards and climate change information, tools and technologies in the planning process.
- 6.26. Decision-makers apply data, guidance, policies and regulations to hazard planning and recovery efforts.
- 6.27. Communities develop and adopt comprehensive hazard mitigation and adaptation strategies suited to local needs.
- 6.28. Residents take action to reduce the impact of coastal hazards on their life and property.
- 6.29. Communities adopt a comprehensive risk communications strategy for hazardous events.

Consequence Outcomes

- 6.30. Communities effectively prepare hazardous events and climate change.
- 6.31. Communities are resilient and experience minimum disruption to life and economy following hazard events.

RESILIENT COMMUNITIES AND ECONOMIES PERFORMANCE MEASURES

- 4. Number of communities that implemented sustainable economic and environmental development practices and policies as a result of Sea Grant activities.
- 5. Number of communities that implemented hazard resiliency practices to prepare for, respond to or minimize coastal hazardous events as a result of Sea Grant activities.

Environmental Literacy and Workforce Development



Image Credit: MIT Summer Interns Sampling; Water Sampling

The scientific, technical and communication skills needed to address the daunting environmental challenges confronting our nation are critical to developing a national workforce capacity. The Congressional report, *Rising Above the Gathering Storm*²¹, states that building a workforce literate in science, technology, engineering and mathematics is crucial to maintaining America's competitiveness in a rapidly changing global economy. These skills are also necessary to advance cutting-edge research and to promote enhanced resource management. In recognition of these needs, the America COMPETES Act²² mandates that NOAA build on its historic role in stimulating excellence in the advancement of ocean and atmospheric science and engineering disciplines. The Act also mandates that NOAA provide opportunities and incentives for the pursuit of academic studies in science, technology, engineering and mathematics. Workforce needs are reflected in the broader science and technology communities of both the private and public sectors with whom Sea Grant works to fulfill its mission.

²¹ National Academy of Sciences, 2010: http://www.nap.edu/catalog.php?record_id=12999

²² America COMPETES, 2010: <http://www.commerce.gov/americancompetes>

An environmentally literate person is someone who has a fundamental understanding of the systems of the natural world, the relationships and interactions between the living and non-living environment and the ability to understand and utilize scientific evidence to make informed decisions regarding environmental issues²³. These issues involve uncertainty and require the consideration of economic, aesthetic, cultural and ethical values.

²³ 2009-2029 NOAA Education Strategic Plan



Environmental Literacy and Workforce Development

GOAL 10

An environmentally literate public supported and informed by a continuum of lifelong formal and informal engagement opportunities.

Learning Outcomes

- Formal and informal educators are knowledgeable of the best available science on the effectiveness of environmental science education.
- Formal and informal educators understand environmental literacy principles.
- Lifelong learners are able to engage in informal science education opportunities focused on coastal topics.

Action Outcomes

- Engagement professionals use environmental literacy principles in their programs.
- Engagement programs are developed and refined using the best available research on the effectiveness of environmental and science education.
- Formal and informal education programs incorporate environmental literacy components.
- Formal and informal education programs take advantage of the knowledge of Sea Grant-supported scientists and engagement professionals.
- Formal and informal educators, students and/or the public collect and use coastal weather data in inquiry and evidence-based activities.
- Lifelong learners make choices and decisions based on information they learned through informal science education opportunities.
- Educators work cooperatively to leverage federal, state and local investments in coastal environmental education.

Consequence Outcomes

- Members of the public incorporate broad understandings of their actions on the environment into personal decisions.

Environmental Literacy and Workforce Development

GOAL 11

A future workforce reflecting the diversity of Sea Grant programs, skilled in science, technology, engineering, mathematics and other disciplines critical to local, regional and national needs.

Learning Outcomes

- Students and teachers are aware of opportunities to participate in science, technology, engineering, mathematics and active stewardship programs.

Action Outcomes

- A diverse and qualified pool of applicants pursues professional opportunities for career development in natural, physical and social sciences and engineering.
- Graduate students are trained in research and engagement methodologies.
- Research projects support undergraduate and graduate training in fields related to understanding and managing our coastal resources.

Consequence Outcomes

- A diverse workforce trained in science, technology, engineering, mathematics, law, policy or other job related fields is employed and have high job satisfaction.

Environmental Literacy and Workforce Development Performance Measures

6. Number of Sea Grant products that are used to advance environmental literacy and workforce development.
7. Number of people engaged in Sea Grant-supported informal education programs.
8. Number of Sea Grant-supported graduates who become employed in a career related to their degree within two years of graduation.

CROSS-CUTTING PERFORMANCE MEASURES

9. Number of Sea Grant tools, technologies and information services that are used by our partners/customers to improve ecosystem-based management.
10. Economic (market and non-market; jobs and businesses created or retained) impacts derived from Sea Grant activities.

IMPLEMENTATION STRATEGY

This plan provides a national framework for the work of the 33 Sea Grant programs. The state strategic plans align with the National Sea Grant Strategic Plan with particular focus on the specific needs and priorities of each respective state and region. The 2014-2017 National Sea Grant Strategic Plan will be implemented through each of the programs' portfolios of merit-reviewed research, communications, education, extension and legal projects. This implementation strategy utilizes Sea Grant's unique combination of research and engagement capabilities and capitalizes on its strong federal-university-state-private sector partnerships.

Progress toward meeting state programs' strategic plans will be used to assess each individual Sea Grant program's contribution toward meeting the national goals outlined in this plan. The National Sea Grant Office will track state-level performance measures, other numerical metrics and impacts to highlight Sea Grant's contributions in achieving the goals identified in the National Sea Grant Strategic Plan. The National Sea Grant Office will track and disseminate best practices applied by individual Sea Grant programs and facilitate their adoption by the entire Sea Grant network. The National Sea Grant Advisory Board will continue in its role of developing strategies to foster wider use of the National Sea Grant College Program to address the highest priorities regarding the wise utilization of the nation's coastal resources. Sea Grant will revisit this plan yearly to ensure that the organization is accomplishing its four-year goals while staying alert to new trends and opportunities.

National Ocean Sciences Bowl



BRIEF OVERVIEW OF THE NOSB

HISTORY

The National Ocean Sciences Bowl was established in 1998 in honor of the International Year of the Ocean. Over the past 17 years, the NOSB has provided a forum for high school students, an age group that, broadly, does not have access to formal coursework in the subject area, to gain exposure to and learn ocean and climate science. The program also aims to increase the number of students pursuing careers in the ocean sciences and STEM-related fields and enhance public understanding and stewardship of the ocean. The long term goals of the NOSB are to:

- Create knowledgeable ocean citizens that understand the ocean's impact on daily life and the importance of scientific research;
- Foster the use of the ocean to teach STEM and encourage the inclusion of the ocean sciences in curricula;
- Encourage diversity in ocean science education and broaden interest among geographically diverse communities; and
- Provide students interactive education that develops critical thinking and skills for the workforce and exposes them to ocean science professionals and career opportunities.

QUICK STATS ON THE NOSB

- Nearly 2,000 students from 325 high schools in 34 states plus the District of Columbia participate in the NOSB each year
- 1,200+ scientists and ocean enthusiasts volunteer each year
- 25 regional competitions are held across the U.S. each year
- 1 National Finals Competition is held each year (location changes)

FOCUS

Why is the NOSB's focus on the ocean important?

- Humans are reliant on a healthy ocean for oxygen, food, jobs, health and well-being;
- The global ocean is facing numerous current and emerging issues such as climate change, ocean acidification, loss of biodiversity and resource depletion;
- Most high schools do not teach ocean science (or even environmental) (source: 2012 National Survey of Science and Mathematics Education);
- Geoscience (including ocean science) as an industry is expected to grow faster than the average for all occupations over the next 10 years (U.S. Bureau of Labor Statistics Employment Projections program);
- Ocean science is interdisciplinary, provides real world examples for applying scientific principles, and can appeal to students interested in biology, chemistry, physics, geology and more.

Why is the NOSB a solution?

- The NOSB generates in students excitement about the ocean and understanding of the role of the ocean and ocean science in the environmental and societal challenges we face;

- NOSB students learn basic scientific principles and how to apply them to more complex problems;
- NOSB coaches learn ocean science concepts and infuse them into their regular classes;
- NOSB students are exposed to the wide variety of career options in and related to ocean science;
- Teens are the most effective target audience for engaging the public in ocean stewardship (source: The Ocean Project);
- NOSB students are the nation's future critical thinkers and problem solvers.

FORMAT

The basic model for the NOSB is a timed competition in which two teams compete to answer questions in categories related to the ocean (biology, chemistry, geology physics, social science, geography, marine policy and technology). Students must answer buzzer questions (multiple-choice and short answer) as well as Team Challenge Questions (more challenging, critical thinking and team-oriented questions that involve solving equations, interpreting graphs and applying scientific concepts). Each year, up to 25% of the questions cover the competition theme. Competition questions are written by graduate students and ocean science and education professionals and undergo peer review each fall by additional marine scientists and educators during the NOSB's Technical Advisory Panels. After all the questions are edited for scientific accuracy, the NOSB staff sorted them by level of difficulty (Easy, Moderate and Difficult) and separate them into rounds for each of the three competitions (two regionals and one National Finals). Once the competitions are compiled, the questions are then sent to NOSB's regional sites for their approval. Each site has its own scientists and experts review the questions once more for scientific accuracy and to conduct a final edit. The final versions of the questions are released using the NOSB question software called the Electronic Ocean Science Bowl (eOSB). The eOSB has completely replaced the traditional printed, paper notebooks and it is now used in 100% of the competition rooms.

Each February and March, participating high schools compete in one of twenty-five regional competitions taking place around the country. The 25 NOSB regional bowls are located across the country at an array of universities, non-profit research institutions, federal laboratories, aquaria and science centers. At least one staff member at each site is designated as the bowl's Regional Coordinator (RC) and is responsible for communicating with the national NOSB office, handling all aspects of the regional competition, and securing any additional funds necessary to run the program. Competing teams consist of a coach and a team of four students (five, with an alternate). Each team consists of four individuals, with many teams involving a fifth student as an alternate. In 2014, 329 teams (approximately 1,645 students) from 34 states and the District of Columbia participated in the regional competitions. Also, roughly 1,200 volunteers from the ocean science community participate each year.

NOSB culminates each year with a Finals Competition, typically in late April, where the top teams from each region compete for nation-wide recognition. Students and coaches view participation in the Finals Competition as a distinct honor. Students are able to meet peers with similar interests from across the nation, talk with a wide range of scientific role models, and learn about a broad range of ocean careers and related university programs. The students are also immersed in experiential field trips that highlight the local marine environment as well as the regional history, culture, recreation and scientific research. Additionally, students who attend the Finals Competition participate in the NOSB's mock congressional briefing and science communication training activity known as the Science Expert Briefing.

The top 12-13 teams are awarded various prizes (ranging from books and trophies to netbooks or cameras), with the top two placing teams receiving experiential award trips to marine science institutions across the U.S. All competing teams receive a participation plaque.

However, the NOSB is more than just a buzzer competition. The NOSB national office provides additional enhancements to the competitions to encourage year-round engagement, including:

- Scholarships for NOSB participants;
- A Professional Development Webinar Series for NOSB coaches (and other educators);
- A video contest tied to the Ocean Literacy Principals;
- An online game, the Ocean Science Quiz;
- Career mentoring events;
- Experiential, interactive field and award trips;
- A career resource guide, *An Ocean of Possibilities: Careers Related to the Ocean and Aquatic Sciences*;
- Enhanced communication, through the use of social media, of other marine and freshwater opportunities available to high school students and teachers;
- A general online resource guide for students, covering all topics (biology, chemistry, etc.);
- A yearly online list of study resources, specifically highlighting the year's theme;
- Program evaluation – Longitudinal study of NOSB alumni (conducted since 2002).

National Ocean Sciences Bowl Advisory Council Members

In 2014, the National Ocean Sciences Bowl is establishing its first Advisory Council. The NOSB Advisory Council shares responsibility, with the Consortium for Ocean Leadership, for the strategic direction and long-term sustainability of the NOSB program.

Members (As of August 2015):

Chair:

RADM Dick West (U.S. Navy, Retired), former President/CEO of the Consortium for Oceanographic Research and Education

Bio: <http://www.nauticalcharts.noaa.gov/ocs/hsrp/bios/west.htm>

Members:

Hon. Brian Baird, former U.S. Congressman (D-WA)

Bio: https://en.wikipedia.org/wiki/Brian_Baird

Ms. Elizabeth Creed, Principal Systems Engineer at Kongsberg Underwater Technology

Bio: <http://bit.ly/1W6e3RA>

Dr. Rosanne W. Fortner, Professor Emeritus, The Ohio State University

Bio: <http://seagrant.noaa.gov/whoweare/leadership/nationalseagrantadvisoryboard/members.aspx>

Mr. Matthew Huelsenbeck, Manager, Team Relations, Wendy Schmidt Ocean Health XPRIZE

Bio: <http://www.xprize.org/about/our-team>

Dr. Nancy Knowlton, Sant Chair for Marine Science, Smithsonian National Museum of Natural History

Bio: <http://invertebrates.si.edu/knowlton.htm>

VADM Conrad Lautenbacher (U.S. Navy, Retired), CEO, GeoOptics and former Administrator of the National Oceanic & Atmospheric Administration

Bio: <http://www.noaa.gov/lautenbacher.html>

Dr. Ellen Prager, Marine Scientist and Author, Earth to Ocean

Bio: <http://www.earth2ocean.net/bio.html>

Dr. Ralph Rayner, Sector Director of Energy, BMT Group Limited, and Professorial Research Fellow, London School of Economics and Political Science

Bio: <http://www.lse.ac.uk/CATS/Whos%20Who/People/RalphPage.aspx>

Dr. Nancy Targett, Dean of the College of Earth, Ocean, and Environment, University of Delaware

Bio: <http://www.ceoe.udel.edu/our-people/profiles/ntargett>

Trout Bowl					NOAA	NOAA								NOAA Env Research Labs, NOAA Boulder
Tsunami Bowl		NOAA			Alaska Sea Grant, NOAA, Kachemak Bay National Estuarine Research Reserve	Alaska Sea Grant			Alaska Sea Grant			Alaska Sea Grant		



WHY THE OCEAN FOCUS?



- **Humans are reliant on a healthy ocean for oxygen, food, and overall health and well-being**
- **Global ocean facing numerous current and emerging issues:**
 - Climate change
 - Ocean acidification
 - Loss of biodiversity
 - Resource depletion
- **Most high schools do not teach ocean science** (or even environmental science)
- **Ocean science is interdisciplinary and can appeal to students** interested in biology, chemistry, physics, geology and more



A Program of



WHY THE NOSB?

- The Ocean Project indicates that **teens are the most effective target audience** for engaging the public in ocean stewardship
- The **NOSB generates excitement in students** about the ocean and understanding of societal issues
- NOSB participants learn basic scientific principles and **how to apply them to more complex problems**
- NOSB students are the **nation's next critical thinkers and problem solvers**



A Program of



WHAT IS THE NOSB?

- **Academic STEM competition**
 - 25 regional bowls / 1 National Finals Competition
- **Primary Outcome**
 - Increase the number of students pursuing careers in the ocean sciences and STEM-related fields
- **Annual Audience**
 - 2,000 high school students compete / ~ 300 high schools
 - 1,200+ scientists & ocean enthusiasts volunteer



A Program of



NOSB GOALS

- **Create knowledgeable ocean citizens** that understand the ocean's impact on daily life and the importance of scientific research;
- **Foster the use of the ocean to teach STEM** and encourage the inclusion of the ocean sciences in curricula;
- **Encourage diversity in ocean science education** and broaden interest among geographically diverse communities; and
- **Provide students interactive education** that develops critical thinking and skills for the workforce and exposes them to ocean science professionals and career opportunities.



A Program of



Charge to the NSGAB

Review of the Sea Grant Extension-NOAA Liaison Positions





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL SEA GRANT COLLEGE PROGRAM
1315 East-West Highway, Silver Spring, MD 20910

June 22, 2015

Mr. Rolland Schmitten
Chair, National Sea Grant Advisory Board
1315 East West Highway
Silver Spring, MD 20910

Dear Mr. Schmitten,

Since 1965, the National Oceanic and Atmospheric Administration (NOAA) National Sea Grant College Program (Sea Grant) has demonstrated its effectiveness in extending science-based ocean and coastal research to its coastal stakeholders. Hundreds of thousands of coastal constituents have benefited from an outreach infrastructure that consists of Sea Grant Extension (SGE) agents and specialists, communications professionals, and educators. Much of the information they've shared has been obtained from Sea Grant funded applied research activities that are highly valued by resource managers, public officials, the private sector, and the public at-large.

In 2001, it was determined that closer communication and cooperation with other Oceanic and Atmospheric Research (OAR) elements would be highly desirable and add value to Sea Grant's outreach services. Thus, the first Sea Grant-OAR extension liaison position was established at the Great Lakes Environmental Research Laboratory (GLERL) in Ann Arbor, MI. In 2005, a similar arrangement was made with the National Severe Storms Laboratory (NSSL) in Norman, OK followed by agreements with the Atlantic Oceanographic Meteorological Laboratory (AOML) in Miami, FL and Pacific Marine Environmental Laboratory in Seattle, WA.

The benefits are that Sea Grant would gain wider access to OAR's expertise and products; Sea Grant's constituents would be better served with additional scientific and technological information; the extension liaison specialists would obtain different insight into the needs of constituents; and NOAA would be responding to the challenge made in the National Sea Grant Advisory Board's 2000 report, "A Mandate to Engage Coastal Users: to better respond to

constituent needs and important issues.” Since the original arrangement with OAR Labs, Sea Grant Extension liaison positions have been opportunistically created with OAR’s Climate Program Office (CPO), National Marine Fisheries Service (NMFS) and the National Ocean Service (NOS).

I am asking the National Sea Grant Advisory Board to review the progress of, and suggest improvements for Sea Grant Extension-NOAA Liaison positions by exploring the successes of various models/arrangements, highlighting best practices, and recommending opportunities for improvement, and perhaps, expansion or contraction.

With best regards,



Nikola M. Garber, Ph.D.
Acting Director
National Sea Grant College Program

Attachment:

cc: J. Eigen
M. Liffmann

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Globalization of the Sea Grant Model



GLOBALIZATION OF THE SEA GRANT MODEL

Draft Proposed Action Plan to Move Forward

Questions to address:

1. Is S/G currently “prohibited from” (as distinct from “not explicitly authorize to”) pursue international initiatives by the current Congressional authorization language
 - a. my reading of the 2008 (?) act is replete with the word “ocean” in addition to and as distinct from “coastal”, and speaks explicitly to “including international projects conducted within such (Sea Grant College) programs”
2. if this S/G globalization idea is to be pursued, at what priority in SG and at what level commitment, remembering our original premise that any such effort/success should not be at the expense of existing S/G funding (other than some NSGO and/or SGAB personnel time)
3. Can S/G pursue this initiative on its own or does it need explicit OAR and NOAA blessing?
4. Can we build a compelling case of the benefits of implementing a global S/G program:
 - a. To the host country?
 - b. To the USA S/G?

5. Can we develop a plan with a series of budget scenarios for how this initiative would be implemented, at what pace, etc?
6. Points 4 & 5 will be the resultant “sales pitch” for the overall concept. It needs to answer: Why should the US devote taxpayer’s money to this initiative?
7. Do we have any ability/ data base to ascertain if there have been any S/G “beneficiaries” (e.g. scholarships, internships, Knauss Fellowships, etc) to foreign students who have returned home and now are active in Govt. offices or Universities who might be potential “champions” for a S/G program in their country?
 - a. Can we query the state programs for any people they might know?
8. Can we develop a list of current and past international initiatives undertaken individually by the state programs
 - a. collect “success stories”, to document:
 - i. benefits to counterparty country
 - ii. benefits to the US program
 - b. contact names of potential “champions” or institutions in those countries that were involved with those projects
9. Flesh out the idea of inviting Korea and Indonesia to S/G Week for a splinter session on the idea of globalizing the S/G model (I understand this used to be a norm)
 - a. Solicit Rene Eppi’s assist (OAR’s International Division guy, and big supporter in past years)
10. Ascertain Korean and Indonesian opinion as to the feasibility of a S/G globalization effort
 - a. How they feel it might work
 - i. Benefits to their program

ii. Benefits to the region

11. Discuss their concept of Targets of opportunity

- a. Their interest in a leadership role (with funding) particularly if the target is the SE Asian region
- b. I believe Korea S/G currently has a larger budget from their govt. than does US S/G

12. Preliminary thoughts on proposed initial targets

A. Cuba

- i. Get S/G on NOAA's shovel ready project priority list (this should be done regardless of this over all initiative)
 - i. With current initiative of US govt. to "open up" Cuba, the creation of a S/G model program could well be a relevant early action effort to lend assistance to Cuba and their coastal issues (e.g. how to develop the coming coastal tourism boom in an eco friendly manner)
 - ii. The funding requirement should not be big in govt. terms
 - iii. The proximity of Florida and Puerto Rico and the language ability are huge pluses
 - iv. An early success could be the impetus for greater traction for S/G globalization within NOAA

B. Thailand, Malaysia, Singapore, Cambodia, Vietnam, Taiwan, Philippines, (Possibly India)

- i. The proximity to the existing Korean and Indonesian programs is a plus
- ii. The ability for those SE Asian countries to see successful "Asian" programs operating without influence/interference from the USA a possible plus

Might well fit in USA's current "swing to the Pacific" political thrust to offset the growing influence/threat from China

iii. This list could include China if the previous point does not carry any weight with USA policy

1. possibly China could take a leadership role, with funding for the other countries

13. Investigate and contact USAID's new coastal programs to conserve oceans and food sources in developing countries

a. Launched by Sec John Kerry at the June 2014 "Our Oceans" Conference

b. It would seem that the S/G model could well be very relevant here

c. This would represent the needed independent source of incremental funding to kick start the S/G Globalization initiative

14. Investigate the United Nations' "Post – 2015 Development Agenda", focusing on Goal 17, "Strengthening the means of Implementation and revitalize the global partnership for sustainable development, recognize multi-stakeholder partnerships as important vehicles for sharing knowledge and expertise....particularly in developing countries". The S/G model might well be very relevant here.

15. Investigate "Coastal Zone Asia –Pacific Association" to test check concept of the S/G model

16. Investigate the annual International Conference on Coastal Zone Management

17. Investigate the United Nations Environmental Programs' International Strategy for Disaster Reduction (UNISDR) in

the Asia – Pacific (implemented 2009) aimed at coastal zone management

18. Review the original pitch made to USAID on behalf of Indonesia to create a S/G program
 - a. see what “sold” back then

THE GLOBALIZATION OF THE SEA GRANT MODEL

SHOULD WE TRY?

THE GLOBALIZATION OF THE SEA GRANT MODEL

SHOULD BE TRY?

AGAIN?

THE IDEA

- GIVEN THE PROVEN SUCCESS OF THE S/G MODEL,
- COULD THIS MODEL ADD VALUE ELSEWHERE AROUND THE WORLD?
- DOES AUTHORIZATION LANGUAGE PROHIBIT?

TO RECIPIENT COUNTRY?

- TAKE PROVEN IMPLEMENTATION MODEL AND SCIENCE BASE TO LESSER DEVELOPED COUNTRIES
- PRESSING NEEDS:
 - ECONOMIC DEVELOPMENT ACCELERATING; INADEQUATE ENVIRONMENTAL & SUSTAINABILITY CONSIDERATION
 - FISHERY DEPLETION
 - SEA LEVEL RISE IMPACT ON INFRASTRUCTURE

TO US GOVT. (AND US TAXPAYER)

- IT IS “ONE OCEAN”
 - Everybody benefits
- SUPPORT EVOLVING GEO POLITICAL CHANGES
 - “Swing Toward the Pacific”
 - Counter Growing Influence of China
 - New Relations with Cuba

TO S/G PROGRAMS

- EXTENSIVE HISTORY OF INDIVIDUAL STATE PROGRAMS WORKING INTERNATIONALLY ON INDIVIDUAL PROGRAMS
 - Typically scientific research, not the outreach model
- NEW, EXPANDED OPPORTUNITIES
- SHARE KNOWLEDGE ALREADY GAINED
- SYNERGISTIC POTENTIAL FOR JOINT RESEARCH

GLOBALIZATION OF S/G MODEL

THE FOREGOING ARE THE QUESTIONS
TO BE ANSWERED

- WOULD THIS BE A WORTH WHILE
ENDEAVOR FOR S/G?

HISTORY OF S/G GLOBALIZATION

- EFFORT MADE IN LATE 90's
 - Honduras & Nicaragua
 - Created in response to a one time USA hurricane relief effort
 - Domestic programs created but died due to cessation of local funding
- KOREA | SUCESSFUL
- INDONESIA | PROGRAMS
CONTINUE TODAY

»

HISTORY OF S/G GLOBALIZATION

- OTHER COUNTRIES WITH PAST INTEREST:
 - Australia
 - Canada
 - Japan
 - Thailand
 - To lesser degree: Viet Nam, Taiwan, China
 - (Europe believed they already had adequate programs)

HISTORY OF S/G GLOBALIZATION

- GLOBALIZATION EFFORT AGGRESSIVELY CHAMPIONED BY NSGO DIRECTOR (Ron Baird)
- EFFORT DIED
 - Generated some interest, but never critical mass, in NOAA
 - S/G State Programs Rebelled
 - Several States were supportive
 - But with Fed. Budget squeeze, concern over dilution of already reduced funding
 - Initiated lobbying effort to reword 2004 Reauthorization Bill; eliminated “international” mandate
 - New S/G Director after Baird’s retirement

LESSONS LEARNED

- CONCEPT REQUIRED STRONG LEADERSHIP & TIME COMMITTMENT
 - Came From NSGO Director and OAR International
 - Personal interest; no explicit mandate for such
 - “One Man Show” Is Insufficient; necessitates small dedicated team to kick start
 - US Champion needs good access to agencies in D.C.

LESSONS LEARNED

- THE TWO SUCCESSES:
 - Both had:
 - Local Champion in high govt. level position
 - Champion had prior personal experience in US S/G
 - Initial in-country work done largely by State programs, with modest support from NSGO
 - Supported by OAR International Division

LESSONS LEARNED

- MANY ASIAN / LESS DEVELOPED COUNTRIES:
 - Govts do not have strong ties with Universities
 - Govts leery of Bottom-Up efforts from society (i.e. “outreach”)
 - These challenges need to be overcome

LESSONS LEARNED

- NEED DEVELOP NON - S/G SOURCES OF FUNDING
 - State Dept – environmental section
 - USAID
 - World Bank
 - International Development Bank
 - UN Marine environmental agencies
- NEED GAIN SUPPORT OF STATE PROGRAMS
 - Demonstrate new, incremental projects

THE KEY QUESTION

- SHOULD A RE-INITIATION OF GLOBALIZING THE S/G MODEL BE A PRIORITY FOR NSGO

????

THE KEY QUESTION

- IF YES, SEE PRELIMINARY DRAFT ACTION PLAN (HANDOUT)
 - Validate Authorization Latitude
 - Preliminary investigative work within S/G, OAR and NOAA
 - Engage Korean & Indonesian S/G programs for joint effort on initiative
 - Possibly with Korea in the lead

THE KEY QUESTION

- IF “NO”,
- REVISIT ISSUE AS PART OF THE BROADER S/G’s 20 YEAR VISION

THE KEY QUESTION

IF NO:

NOW, AT LEAST CONSIDER TWO “ONE OFF” EFFORTS:

- Re-opening of CUBA!!
- A priority for administration
- Excellent opportunity to:
 - Prove the concept
 - Generate awareness of value of exporting S/G model
- Get S/G on NOAA's Cuba shovel ready priority list

CUBA INITIATIVE CONT.

- With coming massive tourist beach front development:
 - Need for enviro sensitive, sustainable development is NOW!
- Proximity to Florida and Puerto Rico S/G programs with Spanish language ability is a natural
- New Hampshire S/G agent already on Cuba visit team

2nd TIME CRITICAL INITIATIVE

- INVESTIGATE SEC. KERRY'S 6/2014 NEW INITIATIVE ANNOUNCED AT MULTI-NATIONAL "OUR OCEAN CONFERENCE"
- DEVELOP PITCH FOR ROLE FOR S/G MODEL

Biographies



Biographies

Advisory Board Members



Dale Baker (Vice Chair)
Ithaca, NY

Dale Baker worked with Sea Grant for over 36 years and served as a Sea Grant Extension Program Leader for 34 years. His major programmatic responsibilities were in the areas of commercial fisheries, ports and harbors, aquaculture and coastal climate change. Mr. Baker retired from Cornell University in January of 2009, but continues to do work for Sea Grant and the Cayuga Lake Watershed Network.



Patricia Birkholz
Saugatuck, MI

Senator Patty Birkholz is director of the Michigan Office of the Great Lakes. Previously, she served as a member of the Michigan State Senate from 2002 to 2010. In the Senate, she represented the 24th District comprising of Allegan, Barry and Eaton Counties. Prior to her terms in the Senate, she represented the 88th District in the Michigan House of Representatives from 1996 to 2002. She was the Allegan County Treasurer from 1992 to 1996. Birkholz began her career in politics as a trustee for Saugatuck Township.



Paulinus Chigbu, PhD
Fruitland, MD

Dr. Paulinus Chigbu is the Director of the NOAA Living Marine Resources Cooperative Science Center, Director of the National Science Foundation Center for Research Excellence in Science and Technology: Center for the Study of Coastal Ecosystem Processes and Dynamics in the Mid-Atlantic Region and a professor of marine environmental science at the University of Maryland. Chigbu has been involved in many programs to bring diversity to marine science including projects and partnerships with NOAA, Jackson State,

University of Mississippi, Office of Naval Research and the Louis Stokes Alliance for Minority Participation. Dr. Chigbu has been the recipient of a Fulbright scholarship, an Excellence Fellowship from the University of Washington and served as Chair of the Mississippi Academy of Sciences.



Rosanne Fortner, PhD
Oak Island, NC

Dr. Rosanne Fortner is a retired professor of environmental science education from The Ohio State University and a former middle school science teacher. In her 27 years at OSU she taught environmental communications and education to undergraduates and graduate students on campus, and Great Lakes interdisciplinary sciences for educators at F.T. Stone Laboratory on Lake Erie. From a position as a project investigator, she coordinated the Ohio Sea Grant Education Program until 2005. Her research was directed at identifying needs for science education programs and training, comparing effectiveness of methods for Earth system science education, and assessing the impact of environmental education programs in field and classroom settings. Curriculum development and assessment were also an important part of her responsibilities as an educator, and her 12 books of curriculum activities were funded by Ohio Sea Grant, the National Science Foundation, Great Lakes Protection Fund and other sponsors.

She works with current Ohio Sea Grant investigators to bring the curricula into modern technological forms, and to match Great Lakes with marine science learning through online teaching. Dr. Fortner was the Director of the Center for Ocean Science Education Excellence [COSEE] Great Lakes, a collaboration of the seven Sea Grant Education programs in the region, with NSF and Sea Grant support from 2006-2010. With her assistance the scientists and educators of that program developed the Great Lakes Literacy Principles. Fortner is the author of over 80 research and education-based publications, has advised 15 PhDs and 50 MS programs to completion, and served as a Fulbright Senior Scholar in Cyprus. She is currently Co-Chair of the Oak Island Beach Preservation Society at her retirement home in North Carolina.



Judith Gray
Block Island, RI

Judith (Judy) Gray retired in 2011 after a 33-year career as a meteorologist with the National Oceanic and Atmospheric Administration (NOAA). She is currently a member of the Senior Advisory Council for the Rhode Island Sea Grant Program. A meteorologist trained at Penn State and the University of Washington (M.S., Atmospheric Sciences, 1984), she started as a commissioned officer with the NOAA Corps in the 1970s. Her civilian career began at

the Pacific Marine Environmental Laboratory in Seattle, where she studied winds along the mountainous coastlines of Alaska on NOAA ships and aircraft in support of the Fisheries Oceanography Coordinated Investigations.

She moved to NOAA headquarters in 1990 to be an advocate for oceanic and atmospheric research and served as the Acting Deputy Director of NOAA's then twelve Environmental Research Laboratories, and was the NOAA Program Manager for the Coastal Forecast System and GLOBEC (Global Ocean Ecosystems Dynamics).

For 15 years, she was the Deputy Director of the Atlantic Oceanographic and Meteorological Laboratory, in Miami FL, supporting climate, hurricane, and ecosystems research, deep sea and coastal oceanography. Her last position with NOAA was Acting Deputy Assistant Administrator for Oceanic and Atmospheric Research Programs and Administration, one of two deputies to the head of NOAA Research. She was responsible for the daily operations and administration of NOAA's research enterprise, and the execution of programs including the National Sea Grant Program, NOAA's Climate Program, and Ocean Exploration and Research.

Judy's scientific interests are in air-sea interaction and winds along mountainous coastlines, with an emphasis on observing systems and improving coastal forecasts. Her life-long goals have been to provide the Nation with outstanding research to improve weather, ocean, and climate forecasting and a policy-neutral scientific basis for making environmental decisions. One path to this goal, throughout her career and today, has been in helping people to fulfill their potential. At NOAA, that meant working to create an organization that best supports scientists and acting as a mentor to staff across NOAA both unofficially and officially, as part of several Federal leadership development programs.

In retirement, Judy continues her mentoring of NOAA scientists, as well as a senior-high student at the Block Island School in R.I., where she lives. She is the Vice President of the Block Island Maritime Institute, whose mission is to provide educational programs and maritime activities including aquaculture, marine science, and maritime heritage for residents and visitors on Block Island. Judy and three other retired scientists on the island conduct monthly profiles at eight beach locations to monitor changes of beach contours. For the RI Sea Grant Advisory Council, she represents Block Island's interests and concerns, as well as thinking about the best ways to be responsive to emerging and chronic regional and National challenges.



Brian Helmuth, PhD
Marblehead, MA

Dr. Brian Helmuth is a Professor at the Marine Science Center at Northeastern University in Boston, Massachusetts, with a joint appointment in the Department of Marine and Environmental Sciences and the School of Public Policy and Urban Affairs. Helmuth's research and teaching focus on predicting the likely ecological impacts of climate change on coastal ecosystems, and on the development of products that are scientifically accurate,

understandable, and useful by a diverse array of stakeholders. He has authored or co-authored over 70 peer-reviewed journal articles in the areas of climate change and marine ecology. Helmuth is a Fellow of the Aldo Leopold Leadership program, which trains select scientists to interact with policy makers, journalists and the public and in 2011 was named a Google Science Communication Fellow in the area of climate change. He also served as a lead author on the Technical input document for the inaugural Oceans chapter of the US National Climate Assessment.



**Amber Mace, PhD
Sacramento, CA**

Dr. Amber Mace is the Deputy Director of the California Council on Science and Technology (CCST). In addition to providing strategic advice to the executive director and advancing CCST organizational goals, Mace leads the California Science, Technology and Policy Fellows program. Concurrently with her position at CCST, Mace maintains her affiliation with the UC Davis Policy Institute for Energy, Environment and the Economy as a Policy Fellow advancing a regional climate adaptation initiative. Prior to this position she served as the Executive Director of the California Ocean Protection Council (OPC) and Assistant Secretary for Coastal Matters at the California Natural Resources Agency from 2009 to 2012 and in dual roles as the Executive Director of the California Ocean Science Trust and the Science Advisor to the OPC from 2006 to 2009. Mace worked as a National Sea Grant John A. Knauss marine policy fellow for the U.S. Senate's Committee on Commerce, Science, and Transportation in 2006, and as a California Sea Grant state fellow at the Ocean Resources Management Program in the California Natural Resources Agency in 2005. Mace is dedicated to ensuring policy development and resource management decisions are outcome driven, cost-effective, and informed with sound science.



**Michael Orbach, PhD
North Carolina**

Dr. Michael Orbach is a Professor of the Practice of Marine Affairs and Policy in the Division of Marine Science Conservation at the Nicholas School of the Environment at Duke University. He has performed research and has been involved in coastal and marine policy on all coasts of the U.S. and in Mexico, Central America, the Caribbean, Alaska and the Pacific, and has published widely on social science and policy in coastal and marine environments. He has worked as a Cultural Anthropologist with the National Oceanic and Atmospheric Administration, and has held several Governor's appointments to environmental Boards and Commissions as well as appointments to National

Academy of Sciences Boards and Committees. He has been the President of The Coastal Society, and Chairman of the Board of Directors of the Surfrider Foundation.



**Nancy Rabalais (Past Chair), PhD
Cocodrie, Louisiana**

Dr. Nancy Rabalais is a Professor at the Louisiana Universities Marine Consortium where she is also Executive Director. Dr. Rabalais' research interests include the dynamics of hypoxic environments, interactions of large rivers with the coastal ocean, benthic ecology, and science policy. Dr. Rabalais is an AAAS Fellow, an Aldo Leopold Leadership Program Fellow, a Past President of the Estuarine Research Federation, and a National Associate of the National Academies of Science and has served as Chair of the Ocean Studies Board. She currently serves on two National Research Council committees, the Council for the University-National Oceanographic Laboratories, the Executive Board for the Consortium on Ocean Leadership, and Board of Directors of the Gulf of Mexico Coastal Ocean Observing System, and is President Elect of the Southern Association of Marine Labs and the National Association of Marine Labs. She received the 2002 Bostwick H. Ketchum Award for coastal research from the Woods Hole Oceanographic Institution, the Blasker award shared with R.E. Turner, the Clarke Prize from the National Water Resources Institute, the Ruth Patrick Award from the Association for the Sciences of Limnology and Oceanography, a Rachel Carson Lectureship for the American Geophysical Union, and a Heinz Award. She earned a Ph.D. in Zoology from the University of Texas at Austin in 1983.



**Rollie Schmitten (Chair)
Leavenworth, Washington**

Rolland A. (Rollie) Schmitten has been a natural resources manager for 44 years; focusing on marine fish, shellfish, and mammals for the past 31 years. He has served as the Washington State Director of Fisheries and the National Marine Fisheries Service West Coast Regional Director for 6 western states. Upon moving to Washington, D.C. he became the Assistant Administrator/Director for the National Marine Fisheries Service; later the U.S. Department of Commerce Deputy Assistant Secretary for International Affairs in NOAA, and the National Director for NOAA Fisheries Office of Habitat Conservation. During his career he served 4 presidents with Presidential appointments as the U.S. Tuna Commissioner, U.S. Atlantic Salmon Commissioner, the Pacific and Alaska Fisheries Management Councils, and 12 years as the U.S. International Whaling Commissioner. His many awards and recognitions include: Presidential Merit Award, Trout Unlimited Washington Sportsman of the Year, Presidential award for outstanding

achievement of a Vietnam veteran, and the Department of Transportation (USCG) Commandant's Award for Meritorious Public Service. In 2005, Mr. Schmitt retired and moved back to Sockeye Point Lodge in Washington State where he continues to work on marine and fresh water resource issues. He is currently serving his 6th year as a Fish and Wildlife Commissioner in Washington State.



Dick Vortmann
La Jolla, California

Richard H. Vortmann retired after a 30-year career with National Steel and Shipbuilding Company (NASSCO) based in San Diego, California where he served as President for 22 years. He also retired after six years as Vice President of General Dynamics Corporation. He most recently completed an assignment as Interim President and CEO of the San Diego Regional Chamber of Commerce. Vortmann recently completed a 7-year term on the Board (including 2 years as Chairman) of Scripps Health; Vortmann is a

Member of Council, American Bureau of Shipping. He is a Trustee on the San Diego County Employees Retirement System. Previously Vortmann served as Chairman of both the American Shipbuilders Association and the Shipbuilders Council of America, and Vice Chairman of the National Academies of Science Marine Board.

For 14 years he was the Chairman of the American delegation to the Japanese, European, Chinese, Korean, and United States Annual Shipbuilding Conference. He also served as a Director of the San Diego Chamber of Commerce and the San Diego Economic Development Corporation. He was a member of the San Diego Mayor's Blue Ribbon Finance Committee, and Vice Chair of the San Diego Pension Reform Committee. Vortmann was born in San Francisco, California. He earned a Bachelor's degree in finance in 1966 and an MBA in 1967 from the University of California, Berkeley, for whom he also played basketball. He taught on the Business School faculty of his alma mater from 1967 to 1969 while doing postgraduate work before entering private industry.



Dick West
Coventry, Rhode Island

Admiral West (U.S. Navy, Retired) served as President/CEO of the Consortium for Oceanographic Research and Education (CORE) from August 2002 until December 2007. As President of this DC-based non-profit organization, he led efforts to promote ocean research and education within the U.S. federal government on behalf of the academic and private ocean research community. Admiral West

significantly expanded the membership of CORE and was instrumental in promoting several ocean initiatives and the establishment of a U.S. integrated ocean observing program. He has testified before the U.S. Congress on several marine related policy issues and has addressed the United Nations on 5 Safety of Life at Sea. Admiral West serves on two marine related U.S. Federal Advisory Committees and continues as a consultant on national and international maritime issues.

Admiral West served as Oceanographer and Navigator of the Navy where he managed a \$400 million program providing oceanographic, meteorological, geospatial and navigation support to the U.S. Navy from 1999 to 2002. As the first Navigator of the Navy, he led the Navy's transition to electronic navigation. As Oceanographer of the Navy, he was the Department of Defense representative to the U.S. Ocean Commission. Admiral West was a career Surface Warfare Officer serving on several ships. Admiral West served in Vietnam with the riverine forces and commanded three ships, two during hostilities in the Arabian Gulf.

Ex-officio Members



Nikola Garber, PhD
Acting Director,
National Sea Grant College Program

In her role as the acting Director of the National Sea Grant College Program, Kola administers funding to the 33 Sea Grant colleges throughout the nation and oversees several national funding competitions, facilitates both the Department of Commerce designation of Sea Grant College Programs, and the Sea Grant program assessment process. On a daily basis, this includes strategic, fiscal, evaluative, and management responsibilities of an annual budget exceeding \$100 million composed of the Sea Grant Federal appropriation, matching non-federal funds, and other NOAA and Federal Agency funding that is passed through the office. Kola joined NOAA Sea Grant in 2000 as the Sea Grant

Knauss fellowship manager and has since held positions as the Assistant Director for Administration and most currently as the Deputy Director. She holds a Bachelor of Science in biology from Bowling Green State University, a Master of Science degree in marine science/molecular biology and a Ph.D. in International Development from the University of Southern Mississippi. Her dissertation researched NOAA's response to Hurricane Mitch and formulated a plan for Reconstruction Planning in NOAA. In 1999, Dr. Garber was a recipient of the Dean John A. Knauss Marine Policy Fellowship working as a legislative fellow for Senator Ron Wyden.



**Sylvain De Guise, DMV, PhD
President, Sea Grant Association**

Sylvain De Guise is director of the Connecticut Sea Grant College Program, Professor of Pathobiology and Veterinary Science at the University of Connecticut, and President of the Sea Grant Association. He currently serves as the Sea Grant representative on the NOAA North Atlantic Regional Team, is past-chair of the Northeast Sea Grant Consortium, an entity consisting of the Sea Grant programs from Maine to New York, and is a member of both the Management and Science and Technical Advisory Committees of the EPA-funded Long Island Sound Study, one of the National Estuary Programs. He is one of three Science Directors of the Connecticut Institute for Resilience and Climate Adaptation. He has a degree in veterinary medicine (1988) and a residency in veterinary pathology (1993) at the Université de Montréal, as well as a Ph.D. in immunotoxicology at the Université du Québec à Montréal (1996).

As the president of the Sea Grant Association, Dr. De Guise is an ex-officio member of the National Sea Grant Advisory Board. Dr. De Guise's personal research interest is the influences of man-made and natural toxicants on the health of aquatic organisms (from marine mammals to fish, lobsters and oysters), with focus on the immune system. He and his wife Jean live in Coventry, Connecticut.

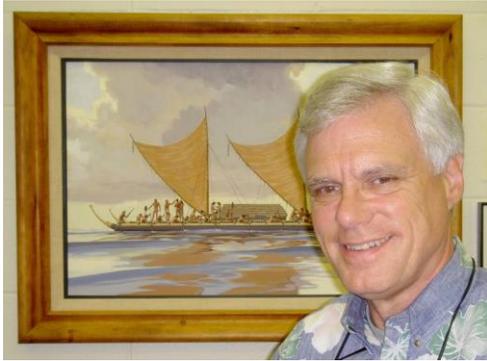
Designated Federal Officer



**Jonathan Eigen
CFO, DFO, Program Officer,
National Sea Grant Office**

Jonathan Eigen is the Chief Financial Officer for the National Sea Grant College Program, Designated Federal Officer for the National Sea Grant Advisory Board, and the Program Officer for the Illinois-Indiana, Minnesota, New York, and Pennsylvania Sea Grant programs. Jon graduated from the University of Maryland in 1988 with a BS in Marketing and Finance. He completed his Masters of Business Administration with an emphasis of Business Economics and Public Policy from The George Washington University. His duties with the National Sea Grant College Program include all aspects of the Budget and Grants administration as well as serving as Program Officer for the Great Lakes Region. Prior to joining NOAA in 1991 he worked in television sports for the now defunct Mizlou Sports News Network. His hobbies include basketball, reading science fiction/fantasy and board games.

Consultants to the National Sea Grant Advisory Board



E. Gordon Grau, PhD Kaneohe, Hawaii

Dr. Grau is a Professor of Zoology at the Hawai'i Institute of Marine Biology, University of Hawaii. Although a Maryland native, Professor E. Gordon Grau has lived in Hawai'i for 33 years. For 15 years, he served as the director of the University of Hawai'i Sea Grant College Program (UH Sea Grant), a partnership program among the State of Hawai'i, University of

Hawai'i at Mānoa, federal government, private industry, and other stakeholders. He was also appointed the interim director of the Water Resources Research Center at the University of Hawai'i at Mānoa, which focuses on addressing the unique water and wastewater management practices facing people in the Pacific. Previously, he served as Interim Director of the Hawaii Institute of Marine Biology and as Commissioner on the Honolulu Charter Commission, in the government of the City and County of Honolulu. He also served as President of the Sea Grant Association as well as President of the Center for a Sustainable Future, a 501(c) (3) nonprofit organization.

During his tenure as director, Professor Grau positioned UH Sea Grant at the forefront of the 33 Sea Grant Programs nationwide by organizing his program around the theme of coastal communities and economies. Through Sea Grant, both locally and nationally, Professor Grau worked to advance coastal communities to become more prosperous, more economically, socially and culturally inclusive, and to have the smallest environmental footprint.

Professor Grau holds a bachelor of science from Loyola University in Maryland, a master of science from Morgan State University, and a PhD from the University of Delaware. He also completed postdoctoral studies at the University of California, Berkeley. Currently, he is a professor and a member of the faculty of the Hawai'i Institute of Marine Biology where he maintains a laboratory. He is the author of nearly 200 papers in peer-refereed journals. He has mentored, and supported through peer-refereed Federal grants, 16 Postdoctorals, 13 Ph.D. Students, and 22 M.S. students. Professor Grau continues to conduct research, and to mentor graduate and undergraduate students and postdoctoral associates.



Jim Murray, PhD
Naples, Florida

Dr. James D. Murray retired in 2011 as Deputy Director of the NOAA National Sea Grant College Program. He spent his entire 37-year career in various Sea Grant positions including Sea Grant Scholar at SUNY College of Environmental Science and Forestry, Regional Extension Specialist at Minnesota Sea Grant, Extension Leader for both the New Jersey and North Carolina Sea Grant Programs, National Sea Grant Extension Leader and finally Deputy Director of the National Sea Grant College Program. His professional interests are in marine resource and fisheries management where he was the Principal Investigator on over 40 grants which led to 58 professional publications. Murray was the recipient of the President's Award, Sea Grant Association in 2010, and the William Q. Wick Award for Visionary Career Leadership in Administration by the Assembly of Sea Grant Extension Leaders in 2011. Currently he serves as a member of the Florida Sea Grant Extension Program's Advisory Committee (Collier County) and volunteers as an Interpretive Ranger at Everglades National Park and as a research assistant at NOAA's Rookery Bay Estuarine Research Reserve.

Non-member Presenters



Craig N. McLean
Deputy Assistant Administrator for NOAA
Research

Craig McLean is the deputy for NOAA's Oceanic and Atmospheric Research programs and administration. He is responsible for daily operations and administration of NOAA's research enterprise, and the execution of NOAA programs including the Climate program, the National Sea Grant Program, Ocean Exploration and Research, and Weather and Air Quality research.

McLean served NOAA in uniform for nearly 25 years, retiring from NOAA's Commissioned Corps in the grade of Captain after service at sea, underwater, and in operational, legal, and marine resource management positions. McLean served aboard hydrographic, oceanographic, and fisheries research ships and was the first commanding officer of NOAA's largest fisheries research vessel, the 224-foot *Gordon Gunter*. He led NOAA's innovation and planning for the Smithsonian Institution's Ocean Hall, and achieved a National Ocean Action Plan goal of securing a permanent, dedicated ship for the national ocean exploration program, the NOAA Ship *Okeanos Explorer*. He has previously served in NOAA as Executive Officer of the

National Ocean Service, and was the founding Director of NOAA's Office of Ocean Exploration. He is the head of the U.S. Delegation to the Intergovernmental Oceanographic Commission, and is Co-Chair of the National Ocean Partnership Program.

A lifelong diver, he began exploring deep shipwrecks through decompression diving while in junior high school. These experiences have taken him to the Amazon River searching for freshwater dolphins, and to the USS MONITOR and *RMS TITANIC* searching for solutions in historic shipwreck management.

Craig McLean is also an attorney and has practiced marine resource law for NOAA. He has been awarded the Departmental Silver and Bronze Medals, and the NOAA Corps Commendation Medal. He is a frequent speaker on ocean related subjects, rooted in his diverse NOAA career experience. He is a Fellow of the Explorers Club, and of the Marine Technology Society, and a Past-President and Chairman of the Sea-Space Symposium.