

# NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE

We deliver ecosystem science solutions to sustain thriving coastal economies

---

**External Peer Review: Biogeography Branch Portfolio  
July 23-25, 2019**

**NCCOS Response to Review Panel Recommendations  
April 30, 2020**

---

Steven Thur, Ph.D., Director  
NOAA National Centers for Coastal Ocean Science

## TABLE OF CONTENTS | NCCOS Response to Review Panel Recommendations

Introduction -----	Page 3
Evaluation Criteria -----	Pages 3-4
Panel Members -----	Pages 4-5
Summary of Reviewer Findings -----	Page 6
NCCOS Response to Recommendations -----	Pages 7-19

## INTRODUCTION

The external peer review of the National Centers for Coastal Ocean Science (NCCOS) Biogeography Branch portfolio represents an important step in ascertaining quality, performance, and relevance of the body of work. The review was held from July 23-25, 2019, in Silver Spring, MD. It covered Branch science and associated activities from 2015 through 2019 (5 years). The agenda, presentations, briefing book materials, guidance documents, and more are available [here](#). NCCOS appreciates the time and effort that review panel members devoted in advance of, during, and after the review, for conducting their thorough evaluation of NCCOS' science and technologies. The recommendations are well-founded and thoughtful based on the information provided and will be a key factor in developing priorities and future activities under the NCCOS Biogeography portfolio.

## EVALUATION CRITERIA: QUALITY, PERFORMANCE AND RELEVANCE

Following enactment of the Government Performance and Results Act (GPRA) in 1993, the National Academies' Committee on Science, Engineering, and Public Policy produced a report on the unique purpose of federal research programs and inherent challenges in their evaluation. The committee concluded that federal research programs could be evaluated using three criteria: quality, relevance, and leadership, and noted that such evaluations should consider factors beyond peer review of research publications by scholars in the field (National Academy of Sciences, 2001).

In its 2008 Guide to the Program Assessment Rating Tool (PART) and citing the National Academies report, the US Office of Management and Budget (OMB) identified relevance, performance, and quality as criteria that can be used to assess the effectiveness of federal research and development (R&D) programs. This approach was further endorsed in a 2008 NOAA Research Council (NRC) report, which stated that research program efficiency must be evaluated in the context of relevance, effectiveness, and quality. NOAA, through an Administrative Order (NAO 216-115A, dated October 3, 2016, and its previous editions), has adopted Quality, Relevance and Performance as core evaluation criteria. The NAO also calls for a periodic evaluation of research, development and transition activities as well as outreach efforts and stakeholder engagement. In the context of this review, these criteria may be described in the following terms:

**Quality** is a measure of soundness, accuracy, and reproducibility of a specific body of research. It is the most widely and traditionally used criterion evaluated by peer review committees. In general, it refers to the merits of R&D within the scientific community – research publications, awards, innovations, and patents – and implies adherence to values of objectivity, fairness, and accountability. It also requires evidence of established procedures for competitive, merit-based research funding and assuring scientific integrity.

**Relevance** refers to the value and significance of the NCCOS' Biogeography Branch portfolio to NOAA's mission, and the benefits of related products and services to stakeholders and broader society. OMB refers to relevance as "impact" of a program, i.e., measurable analysis of how NCCOS products and services accrued societal benefits, and who uses the products and how. In essence, relevance asks, "What would not have happened if NCCOS did not exist, and how much would society have missed?" During a review, program personnel identify public benefits of the program, including added benefits beyond those of any similar effort that has been made by others. Benefits include increasingly more skillful and reliable program output, technology, or methodology that satisfies legal mandates and user needs, and provides effective expert counsel and technology transfer, as well as new options for the future.

**Performance** refers to an ability to manage in a manner that produces identifiable results effectively (achieving desired results) and efficiently (with maximum productivity and minimum wasted effort or money). This is evaluated by program management structures that produce the desired results, guidance, or framework for tracking progress toward the agency's strategic goals and objectives, flexibility to address events or changing priorities, interaction with stakeholders, and extramural collaboration.

## **PANEL MEMBERS**

### **Dr. Brad Blythe (Chair): Bureau of Ocean Energy Management | Biological & Social Sciences Branch**

Dr. Blythe is an oceanographer by training, and serves as Chief of the Branch of Biological and Social Sciences where he oversees a diverse staff of senior scientists whose expertise include marine ecology and biology, biological oceanography, birds, fisheries, benthic species, marine mammals, sociology, economics and marine archaeology. Together, he helps to oversee and administer BOEM's Environmental Studies Program, which has an annual research budget of ~\$35M. Brad is actively engaged in efforts related to environmental impacts of offshore energy and mineral development and the integration of science and policy for informed decision-making.

### **Captain Rick Brennan: NOAA | Office of Coast Survey**

Captain Brennan has served with the NOAA Corps for over 20 years is currently Chief of the Hydrographic Survey Division. Captain Brennan has also served as chief of Coast Survey Development Lab, Coast Survey's Atlantic Hydrographic Branch and as the mid-Atlantic navigation manager. Earlier, Brennan pursued a Master of Science degree in ocean engineering at the University of New Hampshire's Center for Coastal and Ocean Mapping, specializing in ocean mapping, acoustics, and tidal error models. Brennan led the Hydrographic Systems and Technology Program at NOAA, with a focus on transitioning new technology into fleet operations.

### **Jeff Donze: Environmental Systems Research Institute (ESRI)**

Jeff Donze is the Team Lead for ESRI's National Government Sciences Environment and Atmospheric team, managing ESRI's business with NOAA for the past 12 years as well as overseeing ESRI's relationships with NASA and EPA. ESRI is the global market leader in geographic information system (GIS) software, location intelligence, and mapping. Jeff is currently acting as ESRI's sector lead of the Weather and Climate Community of Interest. Prior to joining ESRI's National Government Organization, Jeff was the Director of Geospatial Services for Technology Planning and Management Corporation (TPMC), leading a consulting division of TPMC that worked on GIS projects with NOAA's Office for Coastal Management (OCM), NCCOS, as well as supporting a range of projects with EPA.

### **Katrina Lassiter: Washington State Department of Natural Resources**

Katrina Lassiter is an Assistant Division Manager in the Aquatic Resources Division at the Washington State Department of Natural Resources. She is responsible for programs that manage ports, land transactions, and the removal of derelict vessels on state-owned aquatic lands. Katrina also serves as the agency's lead planner on state and regional marine planning and ocean policy. Katrina has a Master's Degree in Marine Affairs from the University of Washington and a Bachelor's Degree from the University of Rhode Island. Prior to her work in Washington State, Katrina worked for the United States Congress in Washington, D.C. as a policy advisor on ocean, energy, and general environmental issues.

**Dr. Caroline Rogers: US Geological Survey**

Dr. Caroline Rogers is a Marine Ecologist with the Wetland and Aquatic Research Center based at the USGS Caribbean Field Station in St. John, U.S. Virgin Islands. Previously, she was a research biologist with the National Park Service in Virgin Islands National Park (1984 – 1993). She has over 30 years of experience in research on coral reefs and has published papers on coral diseases, the effects of sedimentation, effects of hurricanes, damage from boat anchors, long-term monitoring, reef productivity, coral recruitment, and the threatened coral *Acropora palmata*, and the coral/mangrove communities within Virgin Islands Coral Reef National Monument.

## REVIEWERS' SUMMARY FINDINGS

A compilation of reviewers' comments was submitted by the chair of the review panel on February 20, 2020. The report contained individual reviewer's observations, comments and recommendations, based on the background material furnished by NCCOS, presentations by NCCOS staff and external partners, private discussion sessions held by panel members, and extra sessions between the panel members and selected NCCOS staff and external presenters. The main observations and salient points from the reviewers' report are noted below:

### Program Quality

- The Biogeography Branch is generally well known for high-quality research;
- Well respected within US Federal and State Government coastal science research community;
- Sought out to perform research and analysis by Federal and state partners which speaks volumes to how the program itself is perceived;
- On the cutting edge of research.

### Program Relevance

- Multiple examples of clients and collaborators presented who were able to highlight specific-use cases and decisions that were made with branch data products and studies;
- Work leads to real, on the ground results;
- Provided clear evidence that the branch helped partners and collaborators meet statutory and regulatory requirements.

### Program Performance

- Clearly work very well with partners and collaborators;
- General procedures are well documented;
- Work is clearly relevant to NOAA and NCCOS missions and goals.

### General Comments

- Strong program, excellent staff;
- Thoughtful consideration of work undertaken;
- Clear that management is thinking about how to improve and help staff perform at higher levels;
- Program and staff's entrepreneurial spirit as a strength is nurtured and valued.

## NCCOS RESPONSE TO PANEL REPORT RECOMMENDATIONS

NCCOS did not solicit consensus statements or recommendations from the review panel, although the reviewers voluntarily provided a summary of their observations and recommendations common across the reviews. As a result, the review report consisted of comments, observations and recommendations from individual members of the panel. Each member offered notes on his/her comments, observations, and recommendations that at a minimum addressed the three core evaluation criteria: quality, relevance, and performance. As expected, individual panel members addressed each subject based on their own knowledge and perspective, yet many of their statements contained salient points, recurring themes, and similar recommendations.

Individual reviewer statements have been preserved along with reference to the page number in the [reviewers' report](#). This is followed by a response narrative from NCCOS staff and an action item or items. In cases where panelist recommendations were similar, NCCOS narratives refer back to the relevant initial response. **Table 1** below provides a summary of the individual recommendations/suggestions grouped by general categories, including: 1) Staffing & Succession Planning, 2) Communications & Outreach, 3) Program Evaluation, 4) Social Sciences, 5) Innovation & Methods Development, 6) Data Management & IT, 7) Distribution of Data & Tools, 8) Program Partnership & Integration, 9) Program Review Logistics, and 10) Suggestions for other NOAA Programs. Not all recommendations were deemed appropriate for identifying an action item (*i.e.*, progress was already being made on the subject of the recommendation). NCCOS did not request “evaluation ratings” for different components of the Biogeography portfolio (*e.g.*, Exceeds Highest Expectations, Exceeds Expectations, *etc.*).

**TABLE 1:** Summary of recommendations. Numbers represent “recommendation #” that follow. Note, some comments are relevant to more than one grouping.

		PANEL MEMBER				
		B. Blythe	J. Donze	R. Brennan	C. Rogers	K. Lassiter
COMMENT GROUPING	Staffing & Succession	1			17	28,29
	Communications & Outreach	2		14		24
	Program Evaluation	3				
	Social Science Integration	4		12	21	25
	Innovation & Methods	5	8	13	18	22
	Data Management & IT		6,7			
	Data & Tools		9	11		
	Partnership & Integration			10,12		27,30
	Program Review Logistics				15,16,20	
	For Other NOAA Programs				19	26
	Project Planning					23,24

The following recommendations are in the order in which NCCOS identified them in the report received from the review panel. The order is not meant to represent a hierarchy or ranking.

## RECOMMENDATION #1 (Brad Blythe)

*“As a manager of another small program, I am always concerned about staff depth, and I think that the Biogeography Branch has some similar concerns to contend with. Small organizations need good succession planning, and while the current hiring climate in the Federal government is limiting, identifying key staff capabilities and planning for turnover early is critical. There are some current vulnerabilities within the branch (GIS Application developer, data management) that should be monitored, and regarding data management, I think it is a major concern that there is no in-house data manager for the Biogeography Branch. I would strongly recommend that this position be developed and filled as quickly as possible” ([Panel Report](#), Page 5).*

### NCCOS RESPONSE & ACTION

As a result of the program review, Biogeography Branch principals and NCCOS leadership have initiated a strategic staffing assessment, which is still ongoing. We are looking at both federal and contract positions throughout the organization, with the intent of supporting a stable foundation of expertise to both lead and execute each of the major components of the program, including: 1) Coastal & Ocean Habitat Mapping, 2) Ecosystem Modeling & Assessment, 3) Ecosystem Monitoring, and 4) Social Science. Thus far, NCCOS has: 1) Initiated recruitment of one additional federal social science FTE, with specific emphasis on statistical expertise and survey development, 2) Authorized hiring a federal “ecosystem modeling team” lead, and 3) Implemented an 18 month “Leadership Competency Development Training Program” (LCDP) for our senior social science team member.

Additionally, the Biogeography Branch’s GIS application developer has been tasked with crafting a statement of need and associated technical requirements to hire a journeyman developer. Together, these steps will ensure that the Branch has the requisite depth to mitigate existing staffing vulnerabilities. Furthermore, NCCOS had identified the risk of not having a dedicated data manager for the organization prior to the program review. A new contract hire was on-boarded in the fall of 2019, and has been principally assigned to address the management needs of the Biogeography Branch. Furthermore, this individual will be tasked with developing a corporate data management strategy for the entirety of NCCOS.

### COMMENT GROUPING

Staffing & Succession Planning

## RECOMMENDATION #2 (Brad Blythe)

*“I would recommend looking into a “mini-symposium” for the rest of NOAA and potential outside collaborators to help get the word out” ([Panel Report](#), Page 5).*

### NCCOS RESPONSE & ACTION

This is an excellent recommendation, to which Branch staff are giving thought on how best to implement. Currently, our staff help lead and coordinate the “[OneNOAA Science Seminar](#)”, a joint effort across NOAA Programs designed to share science and information with the Agency and our constituents. Last fiscal year, we organized and coordinated 107 seminars with over 4,300 attendees. These attendees can join in person or via webinar connections from all over the globe. With this far-reaching platform, and our role in organizing and executing the seminar, we have initiated discussions across the NCCOS Leadership and Management Teams to develop a “Spotlight on NCCOS” concept to present as a feature in the OneNOAA series (*i.e.*, a mini-symposium”). As this is a cross-NOAA forum, we will need to consult with other NOAA Programs to determine when and how such “spotlight” series should be rolled out.



## COMMENT GROUPING

Communications & Outreach

### RECOMMENDATION #3 (Brad Blythe)

*"I would also recommend that some thought be put into how to "value" the support that the Biogeography Branch provides to local, state, and Federal decision-makers" ([Panel Report](#), Page 5).*

#### NCCOS RESPONSE & ACTION

NCCOS will take this recommendation under advisement, and will have the Program Coordination and Communications (PCC) Branch consider options on how best to solicit consistent, quantifiable input from decision-makers across the Nation who use NCCOS data, tools, and assessments.

## COMMENT GROUPING

Program Evaluation

### RECOMMENDATION #4 (Brad Blythe)

*"I think that the Biogeography Branch is also well situated to find ways to truly integrate the social sciences into the work that you do on a regular basis. Because the work ties so closely to real world decision-making, finding ways to think about the sociocultural and economic aspects would continue to add great value to the work that you are doing" ([Panel Report](#), Page 5).*

#### NCCOS RESPONSE & ACTION

NCCOS has a team of six economists and sociologists – who administratively “reside” within the Biogeography Branch – but who work across our marine spatial ecology (MSE), stressor impacts and mitigation (SIM), and coastal change (CC) portfolios to ensure that the human element is considered in the science we conduct, focusing on the study of connections between people and the environment. We prioritize investigations into these connections within three interconnected sub-priorities of research: 1) Ecosystem service valuation, 2) Assessing human use *and* 3) Assessing vulnerability and resilience. Demand for specific data, information, tools, and products delivered by this team is high. This unique and specific demand makes “true integration” across the MSE, SIM and CC scientific portfolios difficult as a matter of logistics (capacity). As noted in our response to recommendation #1 (above), NCCOS has begun recruitment of additional federal social science staff, and has invested in an 18 month “Leadership Competency Development Training Program” (LCDP) for our senior social science scientist within the Branch. These actions are meant to both increase our technical capacity and ensure a basis for additional strategic thought around how best to integrate the social sciences across NCCOS through the leadership of social science staff.

## COMMENT GROUPING

Integrating Social Science

### RECOMMENDATION #5 (Brad Blythe)

*"...there is a lot of great work being done by Biogeography Branch staff in methods and technology development and testing on the margins of projects. This work has led to some excellent improvements, and it may be wise to consider a small dedicated funding line that can be used expressly for this purpose and to encourage staff to utilize some time and resources to keep pushing their innovative ideas" ([Panel Report](#), Page 5).*

## **NCCOS RESPONSE & ACTION**

NCCOS is moving towards funding a suite of research priorities through a programmatic approach (e.g., habitat mapping, social science, ecosystem assessment). This approach will provide funds for a 3-5-year period for a collection of projects within a science priority, as defined by the NCCOS Strategic Plan. Furthermore, NCCOS will maintain an annual call for innovative research concepts from staff and partners to ensure that we remain on the cutting edge of science, and deliver data and information that meet changing demands. The programmatic approach will provide more stability across NCCOS's science portfolio and explicitly build into the process an opportunity to support innovative research. The new approach will consider a small amount of funding (\$100-400K) for NCCOS scientists to develop creative research and technology ideas during development of NCCOS annual research plans. Furthermore, in 2018, NCCOS formally incentivized creativity through two annual innovation prizes: one each for science and support services. The purpose of these awards is to stimulate and reward innovative approaches to our work. Biogeography Branch scientists won the inaugural prize, winning \$50,000 for a project entitled "Efficient Shallow Water Mapping using Novel Unmanned Airborne System Image Processing Techniques". These funds were then used to help finance additional mapping work using unmanned systems.

## **COMMENT GROUPING**

Innovation & Methods Development

### **RECOMMENDATION #6 (Jeff Donze)**

*"While the program has a strong foundation of science, investing in a more highly evolved data management with support from IT to better manage the observation data and geospatial data will be important to keep in step with the increasing data and interests in the data" ([Panel Report](#), Page 6).*

*and*

### **RECOMMENDATION #7 (Jeff Donze)**

*"A review of best practices for data management for the program office given the scale and complexity of data would be recommended" ([Panel Report](#), Page 6).*

## **NCCOS RESPONSE & ACTION**

An early outcome of the strategic staffing assessment noted in our response to recommendation #1 (above), NCCOS had already identified the risk of not having a dedicated data manager for the organization. A new contract hire was brought onboard in the fall of 2019, and has been principally assigned to address the management needs of the Biogeography Branch. Furthermore, this individual will be tasked with developing a corporate data management strategy for the entirety of NCCOS.

## **COMMENT GROUPING**

Data Management & IT

### **RECOMMENDATION #8 (Jeff Donze)**

*"BioGEO staff and management should continue to seek ways to ensure that field surveys that are conducted are as cost effective as possible, and employ spatial analysis and field collection tools that are now available" ([Panel Report](#), Page 7).*

## **NCCOS RESPONSE & ACTION**

Branch staff are continuously exploring new ways to become more efficient and effective in the

execution of our science without compromising quality or integrity. This requirement is particularly conspicuous when performing long-standing programmatic work (e.g., ecosystem monitoring), where financial resourcing rarely keeps pace with inflationary costs. To that end, the program began optimizing our annual shallow water coral reef ecosystem field survey selection ~4 years ago, and we continue to refine that process to this day. We use a suite of off-the-shelf and custom-coded analytical tools to assist with: 1) mission site selection, 2) real-time field logistics logging, 3) daily site visit optimization, and 4) dive safety, among others. This allows the mission team(s) to better manage logistics and safety, and has resulted in marked increases in efficiency since our earliest deployment in 2015-16. Furthermore, we have taken a very deliberate step towards bringing [spatial prioritization and optimization tools](#) to our stakeholders to assist with resourcing, decision-making, and collaborative mapping. The NCCOS-developed Spatial Prioritization Widget is a tool built for ESRI's [Web AppBuilder](#), and is designed to be used in participatory GIS projects by stakeholders who need to evaluate proposed mapping efforts. Using hosted feature services and user accounts on ArcGIS Online, the tool gathers the spatial and temporal requirements of the stakeholders. It can be customized to gather additional information, such as the justifications for the data collections and the type of remote sensing platforms to be used. The tool can be integrated with other widgets in the Web AppBuilder portfolio to create a rich web application to explore other data associated with the project to understand the limitations of existing information, gaps in existing maps, and help identify priority areas for future mapping. The prioritization choices are automatically saved on ArcGIS Online databases, which can be exported and analyzed to identify high priority areas and coordinate the planning, acquisition, and sharing of the mapping data.

#### COMMENT GROUPING

Innovation & Methods Development

#### RECOMMENDATION #9 (Jeff Donze)

*“For the size and scale of the resources for outreach and website management, the program has done extremely well. It may be a consideration to look at other examples of outreach and web portals of NOS offices that also have a wide range of projects, data, tutorials and results to convey to both partners and the public. In some cases, these portals can be used to connect portal to portal collaboration (for example with Digital Coast, or the NOAA Geoplatform). This may offer a more automated means to sharing of applications and information products”* ([Panel Report](#), Page 8).

#### NCCOS RESPONSE & ACTION

The Biogeography Branch often works closely with project partners to develop a communication, outreach, and data dissemination plan. This can include: 1) informational brochure development, 2) project web pages with reciprocal links among partners, 3) data exploration and download tools (often as a map-service), 4) joint press releases, and 5) public education days with our scientists in the field. Currently, we also reach out for regional and national online data compendia and portals to make data and information available to the public using the map-services noted above – which inherently enables portal-to-portal connectivity. Examples of this are the [Mid Atlantic Ocean Data Portal](#) and NOAA's [Digital Coast](#). Additionally, all NOAA data must be stored in a searchable archive at the [National Centers for Environmental Information](#) (NCEI). We recognize that merely posting data and information in these places is not adequate; and that we need to inform stakeholders and other interested public of these services. The Program will explore options to raise awareness of our product availability in these fora. Additionally, since the review, Biogeography staff have increased the frequency in presenting at the "one NOAA" Science seminars in an effort to tell our stories (see response #2 above).

#### COMMENT GROUPING

Data & Tool Distribution

## RECOMMENDATION #10 (Richard Brennan)

*“There are significant synergies that could be realized in the NCCOS Coastal and Ocean Mapping portfolio through a deeper partnership and integration with Coast Survey. There are opportunities for cost sharing of personnel, partnership on base-funded projects, training, hardware and software procurement, as well as research and development” ([Panel Report](#), Page 8).*

### NCCOS RESPONSE & ACTION

The Biogeography Branch has and will continue to work closely with the Office of Coast Survey to identify and collaborate on projects identified as having mutual benefit. These collaborative projects typically include efforts that have joint geographic interest or have an element that includes a benthic habitat mapping application. Through the NCCOS Spatial Prioritization process, we have identified multiple collaborative opportunities of benefit, bringing together OCS ship-based acoustic acquisition with NCCOS product development expertise. Additionally, the Biogeography Branch continues to explore applied research opportunities with OCS. The recently released “Guidelines for UAS to map nearshore coastal bathymetry” is an example of a joint, collaborative research project. The Biogeography Branch routinely provides training and expertise to OCS staff regarding optimum acoustic backscatter processing and acquisition, and likewise, OCS continues to invite NCCOS scientists to participate in their annual Field Procedure Workshop training and presentation forum.

### COMMENT GROUP

Partnership & Integration

## RECOMMENDATION #11 (Richard Brennan)

*“It was exciting to learn about [the Program’s] work on the Remote Sensing Toolbox. This work is of significant interest outside of NCCOS and it would be good to share in more detail the capabilities this toolbox offers to other programs and partners. There is a growing community within NOAA that is providing their software code on GitHub so that it can be used, improved, and vetted within the open source community. If appropriate, NCCOS should consider posting this code on the NOAA GITHUB page” ([Panel Report](#), Page 9).*

### NCCOS RESPONSE & ACTION

NCCOS will take this recommendation under advisement, and will have the Information Technology Team consider options on how best to contribute to the [NOAA GitHub](#). To date, we have used NCEI as our repository for data and attending code, generally identifying source code and contacts in the metadata record. In the referenced case (remote sensing toolbox), our workflows and processing of remotely sensed data is generally geared towards servicing very specific predictive ecological models (e.g., marine bird distributions along the US Atlantic outer continental shelf, etc.). The process and outputs are therefore not “standardized”, and may be of limited value to publicly share in GitHub or other types of repositories. We will look to establish a GitHub link for NCCOS, and post code that is general enough for broad use and/or retrofitting.

### COMMENT GROUPING

Data & Tool Distribution

## RECOMMENDATION #12 (Richard Brennan)

*“There seemed to be a clear driver between much of the work all the Habitat Mapping and Biogeographic Assessment programs perform and the National Coral Reef Monitoring Program (NCRMP). While this work complements local efforts, it was not immediately clear how these efforts were either coordinated or integrated with these local efforts. Establishing a more integrated connection with the local research and conservation communities could significantly strengthen all the work accomplished by this team, particularly in the area of employing social science to crystalize the value of these resources to the communities they support” ([Panel Report](#), Page 10).*

### NCCOS RESPONSE & ACTION

NCCOS will take this recommendation under advisement, and will bring this comment to the attention of our Coral Reef Conservation Program (CRCP) colleagues within the NOAA Office for Coastal Management, the funding office for much of the Biogeography Branch shallow coral mapping, monitoring, and assessment work. While branch staff often work very closely with local, state, and territorial partners to develop research and logistical plans, and to execute the work, we need to engage more closely with CRCP staff to ensure that the program, science, and partner staff are all equally part and aware of activities.

### COMMENT GROUPING

Partnership & Integration, and Social Science Integration

## RECOMMENDATION #13 (Richard Brennan)

*“...there seems to be a significant opportunity to utilize unmanned systems and artificial intelligence (AI) to speed the processing of this work and expand the area of coverage possible per day at sea” ([Panel Report](#), Page 10).*

### NCCOS RESPONSE & ACTION

The Biogeography Branch intends to evaluate the present and future role of unmanned systems towards meeting our program requirements and those we support. The [NOAA Unmanned Systems Strategy](#) is rapidly evolving, and the construct will likely change considerably in the near term as the NOAA’s unmanned programs are reorganized, future investments made, and operational policies are modified. The Biogeography Program Branch recognizes that these systems will continue to be a significant and valuable capability in our mapping portfolio, one which affords greater efficiency, flexibility, responsiveness, and affordability than traditional ship and aircraft programs. We will continue to engage the private and academic sectors, and other agencies with unmanned system (UxS) assets and expertise to investigate new ways to deploy and acquire scientific data and information. The Branch will evaluate whether direct investments in unmanned platform procurement and operation, or extramural contracts for these services is the optimum path to secure the required expertise.

Although we are not currently using AI broadly within the mapping portfolio, we have submitted proposals for funding to integrate AI into future mapping efforts. If funded, we propose to investigate how AI can be used to automatically detect and identify seafloor features and types from “Structure from Motion (SfM)” photomosaics and digital elevation model products. We would deploy an innovative approach to link spatial models derived from SfM cloud-based high performance computing with AI techniques to analyze the SfM products towards a more efficient, robust, and accurate means of understanding the composition, extent, health, and complexity of benthic ecosystems.

### COMMENT GROUPING

Innovation & Methods Development

#### **RECOMMENDATION #14 (Richard Brennan)**

*“Honestly, I think NCCOS does a very good job of telling their story. Perhaps a more robust social media presence could help” ([Panel Report](#), Page 10).*

#### **NCCOS RESPONSE & ACTION**

Since the Program Review in July, NCCOS has contracted for two communications specialists; one to focus on rebranding and redesigning our web-presence, and the other to assist with project-level communications and outreach. Biogeography managers and staff have since worked closely with the new communications specialists to reorganize our web offerings in a way that makes the Biogeography story – and attending data and information – both easier to find and actively “pushed” out in web and social media (both [Twitter](#) and Facebook). While the NCCOS communications strategy is still in its early stages of implementation, we expect a new “look and feel” to be in place by the summer of 2020. Part of the new design will include a “splash page” to tell the story of each major component of the Biogeography Branch, including: 1) Coastal & Ocean Habitat Mapping, 2) Ecosystem Modeling & Assessment, 3) Ecosystem Monitoring, and 4) Social Science.

#### **COMMENT GROUPING**

Communications & Outreach

#### **RECOMMENDATION #15 (Caroline Rogers)**

*“Although Death by PowerPoint is a real phenomenon, the presentations were so varied and professional that this was not a problem. I thought perhaps it would be wasteful to print out the briefing books, but I ended up finding the hard copy very useful” ([Panel Report](#), Page 13).*

#### **NCCOS RESPONSE & ACTION**

While there is no specific action to take, we certainly appreciate the positive feedback on our briefing books. NCCOS Programs will continue to convene reviews over the coming years, and we will be sure to include briefing books with presentation print-outs in these future efforts.

#### **COMMENT GROUPING**

Program Review Logistics

#### **RECOMMENDATION #16 (Caroline Rogers)**

*“One general comment that I have is that I think it would be good to set aside a specific session within the review where the NOAA scientists can present their thoughts on the Biogeography Branch, including obstacles and opportunities, what is working and what is not” ([Panel Report](#), Page 13).*

#### **NCCOS RESPONSE & ACTION**

Again, we truly appreciate hearing what was helpful and useful in hosting the Program review, and how NCCOS can learn from the experience to improve upon future program reviews.

#### **COMMENT GROUPING**

Program Review Logistics

#### **RECOMMENDATION #17 (Caroline Rogers)**

*“It is my opinion that having more base-funded employees and activities would be preferable (another*

example of “easier said than done”). The innovation and new blood that arrives with short-term contract employees can provide flexibility, but these employees will often leave even very fulfilling jobs for the security of a permanent position elsewhere” ([Panel Report](#), Page 13).

#### **NCCOS RESPONSE & ACTION**

Please refer to our response to recommendation #1 above

#### **COMMENT GROUPING**

Staffing & Succession Planning

### **RECOMMENDATION #18 (Caroline Rogers)**

“Ideally, there would be some discretionary funds to support new ideas arising from the employees themselves or from their collaborations with others” ([Panel Report](#), Page 14).

#### **NCCOS RESPONSE & ACTION**

Please refer to our response to recommendation #5 above

#### **COMMENT GROUPING**

Innovation & Methods Development

### **RECOMMENDATION #19 (Caroline Rogers)**

“With regard to the question of whether or not some activities should be modified or scaled back, I think that NCRMP should be carefully examined (Quality, Relevance, and Performance all come into play here) ([Panel Report](#), Page 15).

#### **NCCOS RESPONSE & ACTION**

NCCOS will take this recommendation under advisement, and will bring this comment to the attention of our Coral Reef Conservation Program (CRCP) colleagues within the NOAA Office for Coastal Management, the funding office for the Biogeography Branch’s participation in the CRCP National Coral Reef Monitoring Plan (NCRMP).

#### **COMMENT GROUPING**

Comments to forward to other NOAA Programs

### **RECOMMENDATION #20 (Caroline Rogers)**

“During the review I would have liked to see a little more information on just which [web]sites are available” ([Panel Report](#), Page 15).

#### **NCCOS RESPONSE & ACTION**

We sincerely appreciate hearing what was helpful and useful in hosting the Program review, and how NCCOS can learn from the experience to improve upon future program reviews.

#### **COMMENT GROUPING**

Program Review Logistics



## RECOMMENDATION #21 (Caroline Rogers)

*“I have no expertise in the social sciences and would have liked to have heard more about specific case studies of how social and natural science could be integrated. There might be instances where such studies could enhance each other for a more integrated whole rather than just be simultaneous” ([Panel Report](#), Page 16).*

### NCCOS RESPONSE & ACTION

Please refer to our response to recommendation #4 above

### COMMENT GROUPING

Integrating Social Science

## RECOMMENDATION #22 (Katrina Lassiter)

*“Given how innovative this team is, it would be helpful to build research and development into the job descriptions of key staff working on and with innovative technology and data integration” ([Panel Report](#), Page 18).*

### NCCOS RESPONSE & ACTION

Please refer to our response to recommendation #5 above

### COMMENT GROUPING

Innovation & Methods Development

## RECOMMENDATION #23 (Katrina Lassiter)

*“To enhance the useful life of mapping projects, in the project development phase, the team may consider identifying a return frequency and work that into the project plan” ([Panel Report](#), Page 18).*

### NCCOS RESPONSE & ACTION

Mapping projects are complex, time consuming, and costly. As a matter of course, not all mapping projects require sequential re-mapping (e.g., regional shallow water coral reef ecosystems). However, some of our mapping projects are more tactical in nature – intended to capture the condition of benthic habitats and their occupants before and/or after a disturbance. In the latter case(s), NCCOS will evaluate the feasibility of returning, taking careful consideration of the appropriate timing of return, cost, and availability of resources to execute the mission (e.g., availability of NOAA vessels/platforms, other ongoing missions, personnel capacity). For large-scale (regional) mapping efforts, NCCOS will work with funders to evaluate the feasibility of longer-range re-mapping. For example, it took NCCOS nearly a decade to complete shallow water coral reef ecosystem mapping in all relevant US States, Territories, and Commonwealths (in partnership with NOAA’s Coral Reef Conservation Program). The cost of such a re-mapping effort in 2020 dollars would conservatively be estimated in the tens of millions. This would require substantial programmatic commitments and coordination across NCCOS and partners. NCCOS will initiate early conversations with relevant partners over the next year to determine the need – and if this exists – a pathway and plan to execute. NCCOS’s move to a programmatic approach to fund habitat mapping will aid in sustaining longer term mapping efforts and possibly in defining the return frequency based on the sensitivity of particular habitats (e.g., coral).

### COMMENT GROUPING

Project Planning



#### **RECOMMENDATION #24 (Katrina Lassiter)**

“While each habitat mapping project has an associated project web page, projects may reach a wider audience and be more broadly beneficial with an associated information dissemination plan” ([Panel Report](#), Page 18).

#### **NCCOS RESPONSE & ACTION**

Please refer to our response to recommendation #14 above. Furthermore, the Program will explore how story-maps and other aggregation tools can be incorporated into our new web-presence to provide a launching point for users to reach “thematic” content, rather than individual project data and information. The Program has used story-maps fairly extensively in the past, so are familiar with how to create and publicly serve them. Key to successfully using this capability is using a variety of strategies to raise awareness and access to these communication tools. Again, here we will work with the new NCCOS communications specialists to assist.

#### **COMMENT GROUPING**

Project Planning, and Communications & Outreach

#### **RECOMMENDATION #25 (Katrina Lassiter)**

*“There is potential to better align the scales of biological assessments with those of socioeconomic surveys. Given the growing interest in socioeconomic studies, it may be useful to develop a plan to monitor the useful life and actual application of socioeconomic products ([Panel Report](#), Page 20).*

#### **NCCOS RESPONSE & ACTION**

Please refer to our response to recommendation #4 above

#### **COMMENT GROUPING**

Integrating Social Science

#### **RECOMMENDATION #26 (Katrina Lassiter)**

*“While it is clear that the coral propagation project to restore Gulf coral communities is in its nascent stages, it seemed as if it could benefit from additional sideboards and outside collaboration” ([Panel Report](#), Page 20).*

#### **NCCOS RESPONSE & ACTION**

Indeed this work (Natural Resource Damage Assessment (NRDA) of deep water corals in the Gulf of Mexico) is still in the formative stages. We are currently working closely with the NOAA Restoration Center to determine a clear path forward, including collaboration with the Deepwater Horizon Spill Trustees and others. We expect a DRAFT implementation plan to emerge by early summer 2020. The NCCOS Director, together with NMFS leadership, will discuss this specific recommendation.

#### **COMMENT GROUPING**

Comments to forward to other NOAA Programs

#### **RECOMMENDATION #27 (Katrina Lassiter)**

*“One of the greatest strengths of the Biogeography Branch is their ability to develop collaborative partnerships inside and outside of NOAA. However, it was unclear whether there is deliberate planning at*

the management level for internal partnerships. One recommendation would be to introduce discussion of these types of partnerships at management meetings” ([Panel Report](#), Page 20).

#### **NCCOS RESPONSE & ACTION**

Given NCCOS’s diverse and complex research portfolio, especially in the Biogeography Branch, it is imperative to collaborate with partners and leverage research funds among NOAA programs and external partners. Areas in which NCCOS scientists are actively conducting research and providing science leadership within NOAA include Integrated Ecological Assessments (IEA Program), NOAA Habitat Focus Areas (HFAs), and components of NOAA’s Ecological Forecasting enterprise. NCCOS will continue to move from collaboration to integration among NOAA offices and with external partners by improving long-term research planning consistent with the movement to programmatic funding of research priorities. For example, NCCOS plans to increase its efforts in partnership engagement by holding early-year discussions on leveraging research to support joint research interests. In addition, we plan to engage more actively with the National Ocean Service’s (NOS) “Coastal Roundtable”, led by a consortium of external partners and NGOs. We anticipate the increase in communication and engagement will result in resource-leveraging to advance joint science needs to support the coastal science and management communities.

#### **COMMENT GROUPING**

Partnership & Integration

#### **RECOMMENDATION #28 (Katrina Lassiter)**

*“It was clear from the presentations and conversations with program managers that they are thinking about how to handle data into the future and moving data to the cloud. At this time, however, the program does not have a clear data management strategy nor more than one staff person to manage data. The program should also be thinking about long term stable funding for data management as well as the feasibility of developing a single portal for accessing all of the program’s data”* ([Panel Report](#), Page 20).

#### **NCCOS RESPONSE & ACTION**

Please refer to our response to recommendation #7 above

#### **COMMENT GROUPING**

Staffing & Succession Planning

#### **RECOMMENDATION #29 (Katrina Lassiter)**

*“The Biogeography Branch is comprised of staff who primarily have advanced degrees. However, due to [the Program’s] current structure, these staff are responsible for handling all of the administrative matters related to their work, from travel to contracts. This seems to add significant workload to these staff. An administrative staff person assigned to the Biogeography Branch would streamline administrative duties and remove the burden of those duties from the program staff”* ([Panel Report](#), Page 20).

#### **NCCOS RESPONSE & ACTION**

We appreciate the panel’s recognition of this fact. As noted in our response to recommendation #1 (above), NCCOS has initiated a strategic staffing assessment. If feasible, we will recruit an administrative staff to assist the Biogeography Branch.

## COMMENT GROUPING

Staffing & Succession Planning

### RECOMMENDATION #30 (Katrina Lassiter)

*“It may be beneficial for the program to improve partnerships across line offices in NOAA to find funding efficiencies, avoid duplication, and broaden geographic reach; plan to meet with NOAA program management to engage and integrate; consider a more robust strategy for incorporating social science into projects where appropriate; and develop a strategy for shared goal setting with partner agencies”* ([Panel Report](#), Page 20).

### NCCOS RESPONSE & ACTION

NCCOS continues to advance coordination within NOAA’s National Ocean Service (NOS) by increasing communication with the NOS Science Board that has representatives from each program office. NCCOS communicates its research plan with this group to address their science needs and where applicable leverage funds for specific projects. Across NOAA, NCCOS leadership sits on several coordination teams, including: 1) the NOAA Habitat Conservation Team, 2) Ecological Forecasting Roadmap, and 3) NCCOS chairs the Steering Committee on NOAA Integrated Ecological Assessments, among others. Outside of NOAA, NOS convenes a quarterly roundtable with key partners (*e.g.*, NGOs, foundations) to solicit their ideas on thoughts on existing science and emerging science needs.

## COMMENT GROUPING

Partnership & Integration