

**Terms of Reference (TOR) for NMFS Science Program Reviews**  
**2016 Ecosystem Science**

**Purpose of the Review**

The National Marine Fisheries Service (NMFS) mission includes the stewardship of living marine resources through science-based conservation and management, and the protection and restoration of healthy ecosystems. To ensure NMFS achieves this mission, it is appropriate to conduct periodic reviews of the ecosystem-related (including habitat, oceanographic, climate and ecological) science programs.

Reviews of science programs at the NMFS Regional Science Centers (including associated laboratories) and, when appropriate, the Office of Science & Technology (ST), are conducted annually to:

- Evaluate the quality, relevance, and performance of science and research conducted in NMFS Regional Science Centers (Centers) and associated laboratories
- Strategically position the Centers and ST in planning future science and research.

**Objective**

The objective for these reviews is to evaluate the current scientific programs of the Centers/ST that are directed to provide information relative to the management, protection and restoration of resilient and productive ecosystems. Here we define ecosystem-related science programs as those elucidating ecological, oceanographic, climate and habitat-related processes as they are linked to living marine resource (LMR) species. In addition, these reviews will assess the extent to which current science programs are focused on the priority information needs required to complete the NMFS mission. Ecosystem-related science programs addressed in these reviews may include science programs that support ecosystem-based management of fisheries and protected species; conservation and restoration of habitats; dynamics of ecosystem and LMR productivity; ecosystem-level responses to pressures; understanding the effects of pressures on food webs and the effects of food webs on LMRs; oceanographic effects on LMRs; and understanding of climate-related forcing and impacts on the LMRs.

It is recognized that there are other habitat and climate-related programs within NMFS (e.g., Habitat Conservation) and NOAA (e.g. OAR's Climate Program Office, NOS's ecological forecasting) but the focus of this review exercise will be for reviewers to provide advice on the direction and quality of the science programs that are conducted specifically in the NMFS Centers/ST.

## **Overarching Questions for Reviewers**

Staff of the Centers will provide information that describes their relevant programs in a regional context. ST will present information relevant to national programs. The reviewers will use this information (and any ensuing discussion) to provide advice on the direction of the research programs conducted to meet management needs in the region. In doing this, the reviewers should consider these overarching questions:

1. Do the Centers/ST have clear goals and objectives for an ecosystem-related science program? Is ecosystem-related science integrated with the other science activities across Divisions within the Center/ST? Are the Center's/ST's ecosystem science and research activities appropriately prioritized and evaluated as part of an overall strategic plan?
2. Do the Center's/ST's ecosystem-related science programs focus on information to address the priority needs of the Regional Offices, other NOAA managers, Fishery Management Councils and Commissions, and other partners that require ecosystem-related information to achieve their mission?
3. Has the Center/ST appropriately established a Regional Action Plan to identify the major climate threats to the ecosystem, identify major vulnerabilities of living marine resources with respect to climate, address the core science needs to address impacts from a changing climate, and integrate this information into management advice, congruent with the NOAA Fisheries Climate Science Strategy<sup>1</sup>?
4. What is the status of oceanographic, habitat, climate and ecological data required to fulfill ecosystem-related science needs? Has the Center developed strategies to obtain and manage such data?
5. Is the Center appropriately analyzing and modeling ecosystem-level processes? Are cumulative and integrative ecosystem-level analyses being conducted? If not, is there a plan in place to initiate or contribute to the science needed to address cumulative impacts?
6. Is the Center's oceanographic, habitat, climate and ecological advice sufficiently included into living marine resource management advice? Are there suitable mechanisms to determine when such inclusion is warranted?

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<sup>1</sup> [http://www.st.nmfs.noaa.gov/Assets/ecosystems/climate/documents/NCSS\\_Final.pdf](http://www.st.nmfs.noaa.gov/Assets/ecosystems/climate/documents/NCSS_Final.pdf)

7. Are the Centers'/ST's ecosystem-related science programs and products adequately peer-reviewed relative to their purpose and use? If not, has the Center/ST developed a strategy for peer-review?
8. Does the Center/ST appropriately communicate research results and resource needs to conduct ecosystem-related science to various managers, partners, stakeholders and the public?

In all cases, the reviewers should provide recommendations for areas that need improvement.

### **Format**

The meetings will last 3-5 days depending on the complexity of individual Center's programs. The venue will allow public access to open sessions and have wireless internet access, audio visual capability (e.g., overhead projector, microphone amplification). The Centers and ST will endeavor to provide access to open sessions of the review for the public and remotely located staff who are unable to attend in person. Prior to the review, a teleconference between Center leadership and the review panel will be held to discuss and clarify the charge to reviewers, the scope of the review, focus questions provided in the scope, background documents provided, and products of the review.

A typical review is structured with presentations that address topics related to the review overarching questions but may be organized differently e.g. by mandate, thematic or taxonomic group. These presentations will draw upon background material as described in the material to be provided by the Center:

- Day 1
  - Presentations about the Center by Center leadership
  - Theme 1: Ecosystem-related science activities and regional management needs including strategic planning and prioritization (Q1, Q2, Q3)
  - Public comment (variable)
  - Panel deliberation (closed session, 1+ hr)
- Day 2
  - Theme 2: Collection of and access to ecosystem - related data (Q4)
  - Theme 3: Advances in ecosystem level analyses and modeling (Q5)
  - Public comment (variable)
  - Panel deliberation (closed session, 1+ hr)
- Day 3
  - Theme 4: Integration of ecosystem - related information into management (Q3, Q6)
  - Theme 5: Communication of research results and resource needs, peer review (Q7, Q8)

- Public comment (variable)
- Preparation of the panelists' recommendations (closed session, 1+ hr)
- Day 4
  - Preparation of panelists' recommendations (closed session, as needed)
- Day 5
  - Report preparation
  - Panel and Center leadership discuss the results of the review (i.e., debrief, closed session)

Panelists will be provided, at minimum, a 1 hour closed working session at the end of each day.

Stakeholders will be invited to participate as observers and to comment during the daily public comment sessions. Stakeholders providing comment during the review public comment sessions may also submit written public comments to the point of contact listed on the Center's program review website. These comments will be provided to the review panel. Public comments are for the reviewers' edification and will not necessarily be specifically responded to by the agency or the review panel.

At the close of the review, the panel and Center/ST leadership will discuss the results of the review in closed session. Additional personnel (e.g. Chief Scientist, Senior Ecosystem Advisor, ST Director, Center and ST staff, and program review coordinator) are expected to attend the closed session and this will be communicated to the panel prior to the start of the review.

### **Briefing and Background materials**

All background materials prepared by the Center/ST will be provided to the panel electronically through the Center/ST website no later than 2 weeks prior to the review. All presentations will be provided to the panel, through the website, at the beginning of the review. Briefing books may be provided at the request of the panel chair.

### **Products**

Each panelist will produce a succinct report detailing his or her observations of and recommendations for the themes provided within the TOR for the program review. (See Appendix 1 for template.) The chair may submit an individual report, but this is not a requirement. Individual reports are required for NMFS to comply with the Federal Advisory Committee Act (FACA, 1972). Draft reports will be submitted to the Center/ST Director at the close of the review. Final versions will be submitted by the panelists 1 week after the review concludes.

The panel chair will summarize the program review proceedings (e.g. what happened, salient issues, and recurring themes) in a report submitted to the Center/ST Director at the close of the review. The report will not represent a consensus of panelists' observations and recommendations (FACA).

### **Review Team Resources**

NMFS will pay for the travel cost and per diem for all review panelists external to NMFS and a set fee for the services of non-governmental panelists. Each Center/ST will assist review panel members in making travel arrangements.

During the review the Center/ST will provide the review panel with wireless broadband services and space to convene closed working sessions. If requested in advance, the Center will, within reason, provide other items (e.g. desktop computers, printers, copiers) to assist the review panel with report preparation.

The review panel will, if needed, be provided 1 full day to write draft review reports at the conclusion of presentations by Center staff.

### **Review Panel**

The scientific review panel will include 4-7 independent PhD-level or equivalent scientists with demonstrated familiarity with the topic. Panels should include:

- 1 scientist from NOAA Fisheries
- 1 scientist from another NOAA line or staff office (optional).
- 3- 5 (the majority) scientists external to NOAA.
- 1 Science Center Director (optional)

NMFS requires the chair not be a NMFS employee and encourages that the chair of the panel be a federal scientist external to NOAA. The NMFS program review coordinator will attend and provide guidance to the panel on complying with FACA. To ensure a majority of independent reviewers, reviewers who are members of committees that are involved in NMFS science (e.g. science and statistical committees, science review groups) will be from a different region than the Center being reviewed, and use of recently retired and former NMFS employees will be limited. The NMFS Assistant Administrator or their designee shall approve the Panel selections.

### **Agency Response**

The Center/ST Director will send the chair's summary report and the panel members' individual reports to the NMFS Chief Science Advisor when the reports are received. The Center/ST Director will also prepare a brief response, including agency actions, to the chair's summary report within 10 weeks of receipt of the chair's review report package by the NMFS Chief Science Advisor. The response can include clarifying information and respond to controversial points within individual reports even if not mentioned in the chair's summary.

The NMFS Chief Science Advisor will send the package to the NMFS Assistant Administrator for clearance.

At end of 90 days after the review, all documents (chair's summary report, director's response, individual reviewers' reports) will be posted on the Center/ST websites. Authorship of the individual review reports will remain anonymous to the public.

### **Material to be Provided by the Center**

The Centers will provide presentations made by staff and background materials in order to facilitate the independent review. All materials (e.g. power point presentation, word files, pdfs) will be named such that the file names indicate the main topic the material covers. Materials will be provided in an interactive agenda format (i.e. materials will be linked to the talks listed on the agenda) and will be marked as required primary references (must read) and secondary references (optional for further detailed information).

Appendix 1. Program Reviewer Report Templates

**Chair's Summary<sup>2</sup> of Program Review of Ecosystem Science  
Science Center  
Address  
Dates**

**Review Panel Members**

- Name, Affiliation, Chair
- Name, Affiliation, Reviewer (as many as needed)

**Background and Overview of Meeting**

**General Observations and Recommendations**

**Panel Member's Major Recurrent Observations and Recommendations**

- **Theme 1 – Management Context and Strategic Planning**
  - Observations
  - Recommendations to address issue
- **Theme 2 – Ecosystem Data**
  - Observations
  - Recommendations to address issue
- **Theme 3 – Ecosystem modeling and analysis**
  - Observations
  - Recommendations to address issue
- **Theme 4 – Incorporation into Management**
  - Observations
  - Recommendations to address issue
- **Theme 5 – Communication and Peer Review**
  - Observations
  - Recommendations to address issue
- **Other**
  - Observations
  - Recommendations to address issue

**Conclusions**

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<sup>2</sup> Notes: This report is a summary by the chair NOT consensus. Summarized findings and recommendations should be reported as "Panel members said" NOT "Panel concluded".

## **Reviewer Report on Program Review of Ecosystem Science**

**Science Center**

**Address**

**Dates**

**Background**

**General Observations and Recommendation**

**Key (Specific) Findings and Recommendations (as reviewer has comments on)**

- **Theme 1 – Management Context and Strategic Planning**
  - Observations
  - Recommendations to address issue
- **Theme 2 – Ecosystem Data**
  - Observations
  - Recommendations to address issue
- **Theme 3 – Ecosystem modeling and analysis**
  - Observations
  - Recommendations to address issue
- **Theme 4 – Incorporation into Management**
  - Observations
  - Recommendations to address issue
- **Theme 5 – Communication and Peer Review**
  - Observations
  - Recommendations to address issue
- **Other**
  - Observations
  - Recommendations to address issue

**Conclusions**



**NOT IN TOR FOR REVIEWERS BUT DIRECTION TO THE CENTERS and ST:**

**Defining ecosystem science at each Center**

Ecosystem science can be a broad term that will need to be defined by Center leadership very early on in the planning for these reviews. There are multiple considerations when establishing the remit for the ecosystem review. It is recognized that this topic is broad in scope and could be daunting, so some level of selection is warranted. That selection needs to be cognizant of at least four dimensions. First, is the flow of information. The way the TORs and specific information section below are generally structured is from strategic plan/goals, to data collection, to analyses/models, to use in management, to communication and review. The second is the thematic elements. Currently we have climate, habitat, ecology, and oceanography highlighted. Climate and cumulative, ecosystem-level elements are highlighted directly and it would be wise to include some form of those, but obviously each Center will want to emphasize those programs and efforts that are most germane for their region. The third dimension is taxonomic scope. Certainly we have our fisheries and protected species emphases, but which ones to showcase at the review in this ecosystem context are regionally specific. The final element is one of scale. The time scale of hindcasts and forecasts are as need be (e.g. 3-5 years for regional action plans, 20-30 years for key commercial species), but spatial scale needs to be considered. Again, this is structured to be at the pseudo-LME and FMC ecosystem scale, but other scales may be appropriate.

The salient point is to not cover in detail each and every facet of ecosystem-related assessments, science, research, and consideration that a Center executes. Rather, it will be to touch on the main aspects of these programs and highlight those examples, cognizant of the dimensions just noted, that are most germane for each region. These challenges will have to be very clearly laid out for the Review Panels.

**Specific information to be provided by each Center to the review committee:**

Provide an overview of information needs for ecosystem-related science and research at the Center. Then identify the two to three important and typical research programs run by the Center and explain why they are a) important and b) typical. Identify the types of research that are atypical for the Center.

Centers should provide reviewers material that:

1. Describes the programmatic structure and composition of overall ecosystem efforts at the Center; note strengths, challenges, solutions, and areas for growth

2. Describes the ecological, habitat, and oceanographic science—data collection, databases, data analyses, modeling, and syntheses—at the Center
3. Describes the climate science—data collection, databases, data analyses, modeling, and syntheses—at the Center
4. Describes the cumulative and integrated ecosystem science—data collection, databases, data analyses, modeling, and syntheses—at the Center
5. Describes the ecosystem-related management advice needed in the region/s the Center supports
6. Describes how well this information is included in trust species management-supporting advice at the LME level
7. Describes how well systematic, ecosystem-level integrative analyses are being used.
8. Describes the partnerships used by the Center in its ecosystem science enterprise and where there is significant leveraging of outside resources.

**List of generic information to be provided by each Center to the review committee:**

During the review, the Center should address the following questions as related to the thematic areas under review:

- What does the Center do? What does the RO do? To what extent does the RO inform Center science priorities? What is the nature of the relationship with ST and OHC, OPR, SF?
- How does the Center work to assure common objectives are being effectively and efficiently addressed across multiple NMFS and NOAA organizations?
- What's the societal significance of the Center's research?
- What are the linkages to NOAA Strategic and Research Plans, NMFS Strategic Plan for Fisheries Research, NMFS AGM and the Center's science plan?
- What are the key scientific questions being addressed?
- How are they linked to regulatory or management needs?
- What are the key 5-Year Strategic Plan milestones and what is the Center's progress in achieving them?
- Who are the Center's customers and partners and how does the Center work with them?
- What are the products of the Center's research?
- What is the Center's approach for increasing the use of ecosystem information into the Center's informational products, starting with species assessments and other existing products used to inform management decisions?
- What innovative or transformational research is being conducted?
- What science and applications will be transitioned to operations?
- What are the future directions of the Center?
- How does the Center set priorities? What are the core research priorities of the Center?
- What research activities have been dropped in recent years due to budget limitations or as a result of prioritization efforts?