



**NOAA
FISHERIES**

RFPs and Work Groups

Office of Science & Technology
Stock Assessment Science Program Review
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Stephen K. Brown, Ph.D.
Chief, Assessment and Monitoring Division (ST4)
Office of Science and Technology

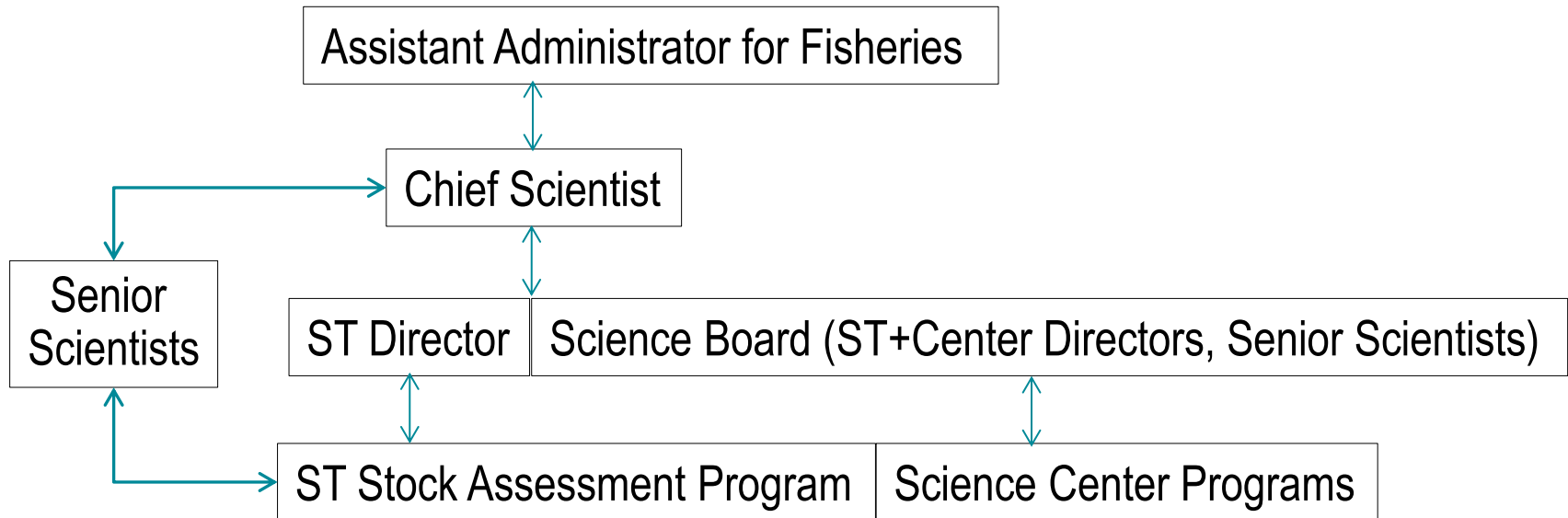
Outline

- **Rationale**
- **How We Operate**
- **Questionnaire: Feedback From Center Directors**
- **Recap of RFPs**
 - **Portfolio**
 - **Operations**
- **Stock Assessment Related RFPs**
 - **Background info (objectives, history, # projects)**
 - **Highlighted projects**
- **Strategic Initiatives for Advanced Sampling Technology**

Rationale for Work Groups and RFPs

- Address topics identified as priorities by Science Board
- Support applied science most directly relevant to NMFS' mission
- Encourage communication and collaboration among experts within and among science centers
- Provide center scientists opportunities to engage in research
 - Generally fund 1-2 year projects up to \$100K/year
 - External scientists can be included

How We Operate

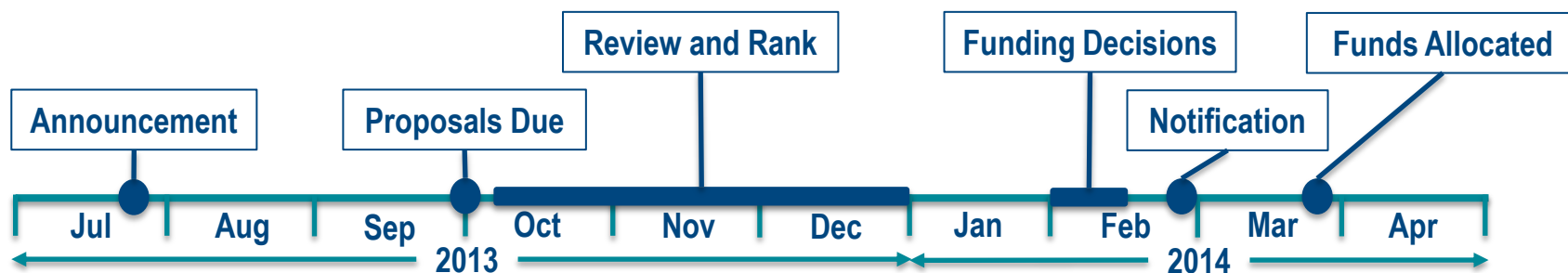


- Science Board commissions a work group
 - Members & chair from ST and science centers
 - ST coordinates and funds the work group
 - ST coordinator/work group chair report back to Science Board
- Senior scientists oversee and advise programs and work groups
 - Senior scientist for stock assessments most active for stock assessment program

Typical RFP Process Coordinated by ST

- RFP: developed/updated annually by WG
- RFP Announcement: Released by ST Director; some coordination among RFPs
- Proposals: emailed to ST; coordinators can redirect errant proposals
- Reviews: organized by ST; ST summarizes results
- Proposal Ranking: teleconference among WG, completed by 31 December
- Funding Decisions: discussion between ST and WG once budget is confirmed
- Reporting: annual progress reports, final report and identified products, presentation via webinar (variable implementation)

Details of Typical RFP Process (FY2014)



Review

- Panel: scientists from each center (max of 2 sequential years); # reviewers/proposal varies
- Conflicts: recuse when co-PI or 'closely related' (Program Manager substitutes)
- Rank: mean total score or rank, standardization method varies (reviewer comments and project region also considered)

Scoring Criteria

| Category | Weight |
|--------------------------------------|--------|
| Scientific/Technical Merit | 40 |
| Importance, Relevance, Applicability | 35 |
| Project Costs | 10 |
| Project Management, Qualifications | 15 |

Questionnaire: Feedback on RFP's From Center Directors

- The suite of stock assessment-related RFPs administered by ST contributes to the overall advancement of NMFS stock assessment science.

| Strongly Agree | Agree | Neither Agree nor Disagree | Disagree | Strongly Disagree | Not Familiar |
|----------------|-------|----------------------------|----------|-------------------|--------------|
| 2 | 2 | 2 | | | |

Questionnaire: Center Director Comments

- Strongly Agree: My center has benefitted from the various RFP products. .New RFP to Improve a SA will also greatly help fill some critical gaps. Funding for Cooperative Research, which should also support SA, has been unbalanced across the regions, and needs to be rebalanced.
- Agree: Overall the RFP process has led to improvements & enhancements of SA. Consider a national 'Internal Grants' program to improve individual scientific competency, promote innovation, and improve staff morale. The RFP would not be topic focused and would encourage innovative projects in the range of 50K per year for up to 2 years.
- Neither Agree Nor Disagree: We have concerns about the large number of RFPs and the coordination of RFP programs. It would be useful to coordinate scheduling of the RFPs and then distribute the schedule a year in advance. We would also like to preserve the ability to fund more focused and longer term initiatives.

Working Group/RFP Overview

| Name | \$K/year | # Funded projects/year |
|---|----------|------------------------|
| Stock Assessment Analytical Methods | \$532 | 7 |
| Improve a Stock Assessment | \$526 | 10 |
| Fisheries And The Environment | \$1,359 | 10 |
| Habitat Assessment | \$707 | 6 |
| Cooperative Research | \$1,500 | 7 |
| International Science | \$250 | 10+1 partial |
| Advanced Sampling Technologies | \$841 | 9 |
| Electronic Monitoring - National Observer Program | \$900 | 5 |
| Fisheries Information System | \$2,000 | 13 |
| Marine Recreational Information Program | \$2,600 | 14 |
| Sea Turtle Assessment | \$500 | 7 |
| National Standard 8 | \$390 | 7+2 partial |
| Recreational Fisheries Economics | \$500 | 4+2 partial |
| Economics | \$1,100 | 21+9 partial |
| Ocean Acoustics | \$300 | 7+2 partial |
| Totals: | \$13,905 | 138+16 partial |

Stock Assessment Analytical Methods: Background

Objectives

- Advance stock assessment methodology by supporting research, development, testing, standardization, and documentation of analytical methods

History

- Initiated in 2009: 3 projects funded (\$110,000)
- FY2014: 13 proposals submitted and reviewed; 7 funded (\$532,472)

Assessment Methods Working Group

- Composition: Program Manager (ST), chair and rep (each science center), Senior Scientist for Stock Assessment

Other workgroup activities

- NOAA Fisheries Stock Assessment Toolbox, AD Model Builder support

Stock Assessment Analytical Methods

Highlighted Projects

| Fiscal Year | Center(s) | Title | Product(s) |
|-------------|-----------|--|---|
| 2009 | All | Estimating Natural Mortality in Stock Assessment Applications | Workshop; Tech Memo |
| 2010 | SW & NW | Adding Trend Data to Depletion-Based Stock Reduction Analysis | Bayesian DB-SRA Model with applications |
| 2010 | NE & SE | Beyond a Constant Value: An Evaluation of Stock Assessment Methods that Incorporate Age and Time Varying Natural Mortality | Publication Fish. Res. (2013) |
| 2010 | PI & SE | Comparisons of Total and Natural Mortality Rates of Reef Species in the Hawaiian Archipelago and the Caribbean Region | 2 Tech Memos |
| 2012 | SW | Workshop on selectivity in stock assessments | Publication Fish. Res. (October 2014) |

Improve a Stock Assessment: Background

Objectives

- Improve the accuracy and precision of specific stock assessments by supporting projects addressing data inputs, data flow, and modeling

History

- Initiated in FY2014: 46 proposals submitted; 10 funded (\$525,705)
- FY2015: request maximum of 4 proposals per science center

Management

- Program Manager (ST4 Stock Assessment Coordinator), in consultation with ST4 Division Chief, Senior Scientist for Stock Assessments, other ST4 staff
- Work Group under development from assessment and survey managers

Improve a Stock Assessment

Highlighted Projects

| Fiscal Year | Center(s) | Title | Product(s) |
|-------------|-----------|---|------------|
| 2014 | AK | Estimating the survey catchability of rock sole in the Gulf of Alaska | NA |
| 2014 | NE | Using high resolution optical surveys to assess hake and skate stocks in the Northeast U.S. | NA |
| 2014 | NW | Using genetic analysis to reduce uncertainty in the assessment of morphologically-similar west coast rockfish | NA |
| 2014 | SE | Factorial sensitivity analyses to assess the impact of data collection activities in the Southeastern United States | NA |

Fisheries And The Environment: Background

Objectives

- FATE (Fisheries And The Environment) supports fisheries oceanography research to provide scientific advice on the sustainable use of U.S. fisheries resources under changing environmental conditions.
- FATE develops climate-sensitive ecological indicators, maintains the time series, examines them for climate trends, and facilitates their incorporation into models for fisheries and ecosystem management.

History

- Initiated in 2002
- FY2014: 58 proposals submitted; 9 funded (\$1,359K)

FATE Scientific Steering Committee – develop research priorities

- Composition: Chair and 2 reps per center, Program Manager (ST7)

Other Activities

- 7 federal employees funded by FATE Program in NMFS science centers work on ecosystem-related reports

Fisheries And The Environment

Highlighted Projects

| Fiscal Year | Center | Title | Product(s) |
|-------------|--------|--|--|
| 2012 | NE | Stratification index to detect early ecosystem change pre-phytoplankton, pre-zooplankton | New operational index for ecosystem condition report, NEFSC |
| 2010 | AK | Reducing recruitment uncertainty through the use of large scale climate indices for Alaska sablefish | New index |
| 2010 | SE | Incorporation of Harmful Algal Bloom (HAB) factors in grouper assessment | Revised stock assessment |
| 2013 | NE | Thermal habitat dynamics for NE butterflyfish | Incorporation of environmental information in butterflyfish stock assessment |

Habitat Information in Stock Assessments: Background

Objectives

- Improve the availability and utility of habitat information in support of the stock assessment process for stocks managed under Federal FMPs

History

- Initiated in FY2010: 5 proposals submitted; 3 funded (\$252,000)
- FY2014: 22 proposals submitted; 6 funded (\$707,000)

Habitat Assessment Improvement Plan Team

- Composition: ST lead/support, representatives from each science center

Other Workgroup Activities

- NOAA Habitat Conservation Team, NOAA Habitat Blueprint, Habitat Assessment Prioritization

Habitat Information in Stock Assessments

Highlighted Projects

| Fiscal Year | Center(s) | Title | Product(s) |
|-------------|-----------|---|---|
| 2010 | SE | Habitat modeling of Atlantic blue marlin with SEAPODYM and satellite tags | Publication – Nature Climate Change (2012); presentations to ICCAT |
| 2011 | SE | Brown shrimp habitat and environmental characteristics | Publication – Fisheries Research (2014); several presentations |
| 2012 | NE & SE | Accounting for habitat-dependent observation error in bottom trawl survey indices for pelagic stocks using butterfly (<i>Peprilus triacanthus</i>) as a model | Level 5 stock assessment for butterfly (2014); publications in prep |
| 2013 | NW | Integrating spatial habitat and fisheries effort data to improve abundance estimates of West Coast groundfish | Publication - CJFAS (in press); inputs to upcoming stock asmts |

Cooperative Research: Background

Objectives

- Enhance the data upon which fishery management decisions are made *and* foster greater coordination, communication, and mutual respect between agency scientists and stakeholders.

History

- Initiated in 2012: 29 proposals submitted; 7 funded (\$1.5M)
- FY2014: 18 proposals submitted; 10 funded (\$1.5M)

Cooperative Research Working Group

- Composition: Chair and reps from each science center and regional office, National Coordinator (ST4)

Other workgroup activities

- Allocate funding to augment regional cooperative research programs
- Coordinate policy development
- Coordinate regional programs, communication and outreach

Cooperative Research

Highlighted Projects

| Fiscal Year | Center | Title | Contributions |
|-------------|--------|--|--|
| FY12 & FY13 | AFSC | AFSC Longline Survey and Sablefish Logbook Program | <p>Primary fishery independent index for Alaska sablefish stock assessment</p> <p>Logbook Program provides fishery dependent index for the Alaska sablefish stock assessment</p> |
| FY12 & FY13 | NWFSC | Southern California Hook and Line Survey in Cooperation with Sportfishing Industry | 2 assessments have used this survey's data |
| FY12 & FY13 | SWFSC | SWFSC Cooperative Tuna Research Program | 1 assessment has used this program's data |

International Science: Background

Objectives

- Strengthen international science collaborations, increase data for migratory species, advance NMFS' international science priorities, and improve fisheries science capabilities both domestically and in partner countries

History

- Initiated in 2012: 18 proposals submitted; 11 funded (\$235,000; including \$35K from F/IA)
- FY2014: 24 proposals submitted; 12 funded (\$250,000)

International Science Team

- Composition: Representatives from each science center and program manager (ST7)

Other Team Activities

- NMFS International Science Strategy and outreach activities

International Science

Highlighted Projects

| Fiscal Year | Center | Title | Product(s) |
|-------------|---------|---|---|
| 2012-14 | SEFSC | US-Mexico Range-Wide Assessments of Tuna, Billfish, and Sharks | Joint cruises, tagging, and data exchange |
| 2013 | NWFSC | US-China Alternative Aquaculture Feeds Research | Scientist exchange and research studies |
| 2013-14 | NW & SW | US-India Research on Coastal Pelagics and Hazardous Algal Blooms (HABs) | Workshops for sharing data & models |
| 2013 | NWFSC | Stock Synthesis Training in Argentina and Chile | Training workshops in both countries |
| 2014 | NEFSC | US-Canada Deep Sea Coral Research | Joint cruise and data exchange |

Advanced Sampling Technologies (AST): Overview

Mission: Improve the accuracy and precision of living marine resource assessments by:

- Identifying information needs to reduce uncertainty in stock and other assessments;
- Identifying new technologies and innovative uses of existing technologies to address these information needs;
- Facilitating and conducting research to develop these sampling technologies;
- Developing advanced sampling capabilities that can be deployed operationally in surveys that contribute data to stock assessments.
- Science Board coordination through Senior Scientist for Stock Assessments
- Advanced Sampling Technology Working Group
 - Administer RFP for R&D projects
 - Supports staff at centers
 - Provide technical advice to leadership
- Strategic Initiatives
 - Temporary (3-5 years) work groups to bring specific technologies to operational capability

Workshops to Identify Survey Priorities for AST

- Workshops conducted within science centers to identify:
 - Assessment data gaps
 - Needed surveys or survey improvements
 - Survey needs where AST could help
 - Topics for AST RFP and new strategic initiatives
- ST synthesizes summary for Science Board to identify national AST priorities
- First round conducted Fall 2011
 - Led to current strategic initiatives
 - Results could be applied elsewhere (e.g., budget initiatives, annual planning)
 - Lessons learned could improve the process
- Subsequent workshops only held by AK and PI
- Planning workshops for all centers in FY15
 - Implement Next Gen SAIP (not just AST)
 - Identify potential new strategic initiatives

AST Working Group: Background

Objectives: Evaluate, develop, implement AST R&D projects to improve surveys

- Characterization of benthic/demersal habitat
- Remote species identification and enumeration
- Near-boundary assessments
- Broad-scale movements of living marine resources
- Efficient Ecosystem Surveys

History

- Initiated in 2004: 6 projects funded (\$398K)
- FY2014: 27 planning letters reviewed; 14 full proposals invited; 8 funded (\$841K)

Advanced Sampling Technology Working Group

- 2 members/center with rotating chair, ST4 coordinator, OAR representative

Other Work Group Activities

- Advise NMFS leadership on technology issues
- Participate in strategic initiatives
- Participate in center workshops on survey priorities

AST Working Group – Highlighted Projects

| Fiscal Year | Center(s) | Title | Product(s) |
|------------------------------------|------------------------|--|--|
| 2011-2012 | PI, NW | AUV operations in untrawlable habitats | PIFSC bottomfish surveys, NWFSC rockfish surveys |
| 2006 | NE | Automated image analysis sea scallops | NEFSC scallop survey - HABCAM |
| 2009, 2010, 2012, 2013 | AK, NW | Optic trawl cod-end, automated image analysis | AFSC pollock survey, NWFSC hake survey |
| 2012 | NW | Waveglider acoustic survey | NWFSC pilot study |
| 2006, 2007, 2010, 2011, 2012, 2013 | NE, NW, SW | Multifrequency and broadband acoustic classification | Improved classification for NEFSC, NWFSC, NEFSC acoustic surveys |
| 2007, 2009, 2011 | SW, NE, SE, AK, PI, NW | ME70 acoustic operations | Improved ME70 operational protocol for all centers |

Advanced Sampling Technologies Strategic Initiatives

- Initiated at direction of Science Board in 2012
- Concept: provide 3-5 year support to focus on technologies ready to transition from the ASTWG's R&D to operational capability
- Builds on and complements the R&D focus of the ASTWG's RFP
- SI work groups include NOAA and external experts
 - Include some ASTWG members
 - Sunset at end of the 3-5 year project
- Two current SI's
 - Untrawlable habitat/calibration
 - FY14 funding: \$695K
 - Automated image analysis
 - FY14 funding: \$615K

Untrawlable Habitat/Calibration SI

- **Goal**: Operationalize new technologies to estimate total biomass in key NMFS regions where survey information is not currently available; incorporate resulting data in routine stock assessments
- **Objectives**:
 - Develop generally applicable sample design to obtain total biomass estimates using advanced technologies
 - Determine catchability of key technologies to estimate total biomass from surveys
 - Implement total biomass surveys to produce data useful for assessments within the same year they are collected
- **Membership**: NMFS - 7 (3 ASTWG), External - 4

Untrawlable Habitat/Calibration SI – FY14 Project

- Objective: Estimate the sampling efficiency of moving camera systems by comparing methods for estimating undisturbed density and detecting fish movement
- Cruise dates: August 2014
- Study Area: Gulf of Mexico
 - Relatively shallow, clear water
 - Cameras can use natural light
- Testing ROV, AUV, towed system; compared to fixed cameras

Untrawlable Habitat/Calibration SI – FY15

- Workshop on initial analysis of FY14 data
- Planning to conduct studies in other regions:
 - West coast, where the water is deeper and less clear than in the Gulf of Mexico;
 - Pacific Islands, where comparisons with ongoing reef fish long-line survey can be conducted.

Automated Image Analysis SI

- **Goal**: Develop guidelines, set priorities, and fund projects to develop broad-scale, standardized, and efficient automated tools for the analysis of optical data for use in stock assessment
- **Objective**: Create an end-to-end open source software toolkit allowing for the automated analysis of optical data streams to provide fishery-independent abundance estimates for use in stock assessment
- **Membership**: NMFS - 7 (5 ASTWG), External - 5

Automated Image Analysis SI – FY14 Activities

- Sponsored workshop of the Committee on Applied and Theoretical Statistics of the Mathematics Board of the National Academies of Science: “Robust Methods for the Analysis of Images and Videos for Fisheries Stock Assessment”
 - The technology exists
 - Limited underwater visibility and color are impediments
 - Training data sets needed
- Established web site serving training data sets
(http://marineresearchpartners.com/nmfs_aiasi/DataSets.html)
 - Benthic habitat, fish, invertebrates
 - Fish in natural environment, in trawl, or on deck
 - Seals on ice floes
- Funding six projects addressing aspects of these challenges

Automated Image Analysis SI – FY15

- Workshop to be hosted at IEEE Winter Conference on Application of Computer Vision in (January 2015 in Hawaii)
 - Invited speakers, contributed papers
 - Challenge prize for automated analysis of NMFS test data set
- SI members preparing FY15 proposals
- Focus on integration and end products

Program Strengths

- Dedicated and hard-working staff
- Wide interest across science centers
- Addresses NMFS priority science needs
- Provides NMFS scientists opportunities to continue conducting research
- Increased collaboration, team building within and among NMFS science centers
- Relatively well resourced

Program Challenges

- Modest scope of individual projects
 - Programmatic tradeoff between depth and breadth
- Minimal collaboration between RFPs
- Proposal and review processes not standardized
 - Tradeoff between rigor and resources required
 - Inconsistency in 2-year term limits for reviewers
- Variable tracking of projects
- Lack metrics of success
- Administratively hard to move money and involve external scientists

Solutions

- Support some more comprehensive, inter-disciplinary, better-funded, and longer-term projects with operational deliverables (e.g., SI's)
- Improve collaboration and cross-fertilization among work groups and RFPs (e.g., combined RFPs)
- Systematically develop and track performance metrics (e.g., specific improvements to stock assessments, publications)
- Work with existing entities (e.g., cooperative institutes, Sea Grant, CSCOR) to handle grants and access external scientists



Thank You!

