

The Advanced Sampling Technology Working Group's recent efforts in improving NMFS' stock and habitat assessment science

Eric Breuer¹, Dezhang Chu², George R. Cutter, Jr.³, David A. Demer³, Joseph Godlewski⁴, Scott Ferguson⁵, Brad Hanson², Michael Jech⁴, Frank Parrish⁵, Joseph E. Serafy⁶, David Somerton⁷, Charles H. Thompson⁸, and Chris Wilson⁷

¹Office of Science and Technology, Silver Spring, MD; ²NWFSC, Seattle, WA; ³SWFSC, La Jolla, CA; ⁴NEFSC, Woods Hole, MA; ⁵PIFSC, Honolulu, HI; ⁶SEFSC, Miami, FL; ⁷AFSC, Seattle, WA; ⁸SEFSC, Pascagoula, MS

With increasing demands for accurate, precise, and timely information upon which to base assessments of living marine resources (LMRs) and their habitats, the NMFS Science Board established the Advanced Sampling Technology Working Group (ASTWG) to lead the ongoing process of improving the quality of assessments through development, evaluation, and implementation of innovative sampling technology. The ASTWG fosters communication and collaboration among experts in sampling technology at the six Science Centers, facilitating increased technical staff capabilities and expedited development of sampling technologies through synergy in research endeavors. The thrust of the ASTWG mission is to improve the accuracy, precision, and efficiency of living marine resource assessments. The ASTWG principally focuses on acoustics, optics, electronic tagging, and other relevant technologies, recognizing that the agency has other working groups addressing different research areas (e.g. Biotechnology, Bycatch Reduction Engineering). Key to this strategy is the involvement of quantitative scientists involved in LMR stock assessments. The Science Centers will identify and prioritize gaps or constraining levels of uncertainty in stock assessments and habitat inventories for each region and identify candidate technologies to reduce uncertainty and fill the gaps. This information will be used to solicit proposals to address sources of uncertainty and information gaps in population assessments. Recent projects funded by ASTWG include: 1) evaluation of bioelectrical impedance analysis to measure fish energy density and reproductive potential for stock assessment (Northeast and Southeast Fisheries Science Centers); 2) autonomous gliders for real-time passive acoustic remote sensing (Northeast Fisheries Science Center); 3) automated feature detection, shape estimation, and identification using disparity and spectral information in stereo imagery (Southwest Fisheries Science Center); 4) estimating abundance of krill-dependent penguin and seal populations breeding on inaccessible islands in Antarctica using vertical take off and landing craft equipped with cameras (SWFSC); 5) improving visual survey methods for groundfish and reef fish using the Seabed autonomous underwater vehicle (Northwest and Pacific Islands Fisheries Science Centers); 6) advancing remote marine mammal stock assessment with passive acoustic gliders (Pacific Islands Fisheries Science Center); 7) development of an optical sampling trawl for use in groundtruthing species and size composition of acoustic backscatter (Alaska Fisheries Science Center); and 8) modifications to a stereo video camera for improved fish measurements (Alaska Fisheries Science Center).

R MAPS: R Mapping and Plotting Scripts for stock assessment

Elizabeth Brooks and Chris Legault

NEFSC, Woods Hole, MA

Visualization tools such as maps are one way of understanding the spatial-temporal nature of your data. They can highlight data gaps, sparseness of coverage, or important patterns that may provide insight into fish or fishery behavior. The patterns that emerge could reflect a response to environmental features, such as depth or season, or to management actions, such as closed areas or fishing seasons. Understanding these data nuances can be helpful in deciding whether the data are appropriate for inclusion in your stock assessment, and if so, how that data should be treated. We have developed scripts in R that work with existing geographic information system shape files to create maps of typical fisheries data (landings, discards, and observer coverage) and fisheries-independent data (surveys and tagging studies). Mapping in R has several advantages. First, the images can be produced with a very small file size, which reduces the overall file size (and enhances the portability) of assessment documents. Second, the ability to automate the scripts to quickly produce many maps where only the year (or gear or species) is changing makes it simple and fast to create many plots from within a single script. Additionally, the capability to directly import raw data, and to analyze and summarize the data prior to plotting, makes for flexible, 'one stop shopping'. We illustrate some insights gained from recent applications of the mapping scripts, and illustrate the general technique of

PROCEEDINGS

11TH NATIONAL STOCK ASSESSMENT WORKSHOP

Characterization of Scientific Uncertainty in Assessments to Improve Determination of Acceptable Biological Catches (ABCs)

JOINT SESSION OF THE NATIONAL STOCK AND HABITAT ASSESSMENT WORKSHOPS

Incorporating Habitat Information in Stock Assessments

1ST NATIONAL HABITAT ASSESSMENT WORKSHOP

Moving Towards a National Habitat Science Program

Hosted by the Southeast Fisheries Science Center, Southeast Regional Office, and Office of Science and Technology

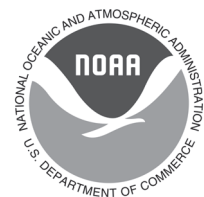
St. Petersburg, FL

May 17–20, 2010

Edited by Kristan Blackhart

November 2010

NOAA Technical Memorandum NMFS-F/SPO-112



**U.S. Department
of Commerce**

Gary Locke
Secretary of Commerce

**National Oceanic and
Atmospheric Administration**

Jane Lubchenco, Ph.D.
Administrator of NOAA

**National Marine
Fisheries Service**

Eric C. Schwaab
Assistant Administrator for Fisheries

Copies of this document may be obtained by contacting:

Office of Science and Technology, F/ST
National Marine Fisheries Service, NOAA
1315 East West Highway
Silver Spring, MD 20910

An online version is available at <http://www.st.nmfs.noaa.gov/>

The mention of trade names or commercial firms does not imply endorsement by the National Marine Fisheries Service, NOAA.

This publication may be cited as:

Blackhart, K. (ed.) 2010. Proceedings. 11th National Stock Assessment Workshop: Characterization of scientific uncertainty in assessments to improve determination of acceptable biological catches (ABCs); Joint Session of the National Stock and Habitat Assessment Workshops: Incorporating habitat information in stock assessments; and 1st National Habitat Assessment Workshop: Moving towards a national habitat science program. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-F/SPO-112, 153 p.