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# Study Fleet Inventory of Data Uses: A Tool for Stakeholder Engagement

by Jason Blackburn

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## Northeast Fisheries Science Center Reference Documents

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## **ABSTRACT**

NOAA Fisheries Northeast Fisheries Science Center's (NEFSC) Research Communications Branch (RCB), in collaboration with the Northeast Cooperative Research Program (NCRP) and the Populations Dynamics Branch, assessed how NEFSC employees used NCRP Study Fleet data. A survey of NEFSC staff was conducted to determine the uses of the study fleet data. The results of the survey are provided as an inventory and bibliography.

## **INTRODUCTION**

The Northeast Cooperative Research Program (NCRP) has been working with fishing industry partners since 2006 to develop the scientific data collection capabilities of the Study Fleet. The Study Fleet are a subset of fishing vessels from which high quality, self-reported data on fishing effort, area fished, gear characteristics, catch, and biological observations are collected. The program now works with a core group of about 37 vessels from Hampton, NH to Wanchese, NC, in the groundfish, small mesh (squid, herring, and mackerel) and scallop dredge fisheries. The data derived from this cooperative arrangement are becoming increasingly useful to scientists examining many aspects of Northeast fish and fisheries.

To determine who is using the study fleet data, and how, NOAA Fisheries Northeast Fisheries Science Center (NEFSC) Research Communications Branch (RCB), in collaboration with the NCRP and the Resource Evaluation and Assessment Division, assessed how NEFSC staff have used NCRP Study Fleet data.

## **METHODS**

The survey utilized Google Forms to solicit feedback from NEFSC staff. The survey included a short series of questions about what type of data was used and how, and a place to provide references and links to products such as stock assessments, scientific articles, and working papers. The questions asked in the survey can be found in Appendix A. Responses to the survey are stored in a Google spreadsheet, and a copy has been saved as an Excel file. A summary of the responses is provided in Appendix B. The survey form, individual responses, and a summary of responses are available from the author.

## **RESULTS**

### **Use of Data**

Study fleet data are being used in a variety of ways by NEFSC scientists. Eight staff members responded to this survey. They are from the Population Dynamics Branch, Population Biology Branch, and Ecosystem Processes Division (the names at the time of the survey) of the NEFSC.

Seven of the eight respondents used catch data, and six used biological samples. Four respondents used environmental data, and three used area fished data. Fishing effort, catch-per-unit effort, landings-per-unit effort, and gear characteristics were all used by one respondent, but not necessarily the same person.

Six respondents used data that were collected with the Fisheries Logbook and Data Recording Software (FLDRS) system. Paper and electronic fishing vessel trip reports (VTRs) were only used by one respondent each. It is likely that some people using study fleet data may not know how the data were collected. There were also other data collection methods highlighted by some respondents. One respondent indicated that data were collected with temperature depth loggers and weather stations, and another's data came from biological samples.

Four respondents compared study fleet data to observer data, and two compared study fleet data to dealer reports or landings data. Five respondents compared it with other forms of

data, such as trawl survey data, other scientific studies, numerical models, ocean observations, ocean model output, and biological samples.

While three respondents used the data as supplemental information for stock assessments, five used the data for scientific articles, and two for tech memos. Study fleet data were also available to the commercial fishermen involved in the study fleet for business and/or personal use.

## Species

Study fleet data were utilized for the following fish species. Many of these species were used for biological sampling.

<u>Common name</u>	<u>Scientific name</u>
Bluefish	<i>Pomatomus saltatrix</i>
Scup	<i>Stenotomus chrysops</i>
Tilefish	<i>Lopholatilus chamaeleonticeps</i>
Blueline tilefish	<i>Caulolatilus microps</i>
Longfin squid	<i>Doryteuthis (Amerigo) pealeii</i>
Butterfish	<i>Peprilus triacanthus</i>
Atlantic herring	<i>Clupea harengus</i>
Yellowtail flounder	<i>Limanda ferruginea</i>
Winter flounder	<i>Pseudopleuronectes americanus</i>
Summer flounder	<i>Paralichthys dentatus</i>
Spiny Dogfish	<i>Squalus acanthias</i>
Cusk	<i>Brosme brosme</i>

## Stock Assessments

Study fleet data were incorporated into the information used for the 2012 Yellowtail flounder stock assessment (NEFSC 2012), the 2014 Butterfish stock assessment (NEFSC 2014), and the 2015 bluefish and scup stock assessments (NEFSC 2015).

## Scientific Articles

Study fleet biological samples have contributed to several scientific articles on reproduction of yellowtail flounder and winter flounder. There were additional articles in development at the time of the survey.

## Other Forms of Communication

Several respondents provided information about white papers, working papers, and presentations that they have produced by using study fleet data. These have been collected in a bibliography that can be found in Appendix C.

## DISCUSSION

One of the best examples of the use of study fleet data is the contribution of environmental data (ocean temperature and depth) utilized in the 2014 butterfish stock

assessment (Press, 2014). The study fleet data showed that butterfish tend to use habitats at certain water temperatures, and this information can be used to avoid their bycatch in the squid fishery.

Another excellent example of the use of the study fleet is in enhanced biological sampling. Biological samples provided by study fleet vessels have contributed to the updating of age keys (proportion of age for a given sized fish) used in stock assessments and other technical documents.

The NCRP produced two NOAA Fisheries Navigator articles entitled “Catching Better Data: The Northeast Cooperative Research Program’s Study Fleet,” (NMFS 2016) and “Collaborative Project to Transmit Real-Time Bottom Temperatures to Enhance Fishing Selectivity and Oceanographic Modeling” (NMFS 2015). These articles highlight the various uses of the study fleet data and are good companion pieces to the inventory. Many of the projects highlighted in the articles are listed in the bibliography in Appendix C.

## **CONCLUSION**

This inventory and the NOAA Navigator articles are useful tools for communicating with external stakeholders about how the study fleet data have been used, and why more involvement in the study fleet should be encouraged.

For now, the survey has been limited to internal NEFSC staff, but NEFSC leadership may wish to expand the pool to include external parties at some point in the future (this would likely have a Paperwork Reduction Act (PRA) requirement). A list of NCRP external partners that may be using study fleet data is provided in Appendix D.

## REFERENCES CITED

- Northeast Fisheries Science Center. 2012. 54th Northeast Regional Stock Assessment Workshop (54th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 12-18; 600 p.
- Northeast Fisheries Science Center. 2014. 58th Northeast Regional Stock Assessment Workshop (58th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 14-04; 784 p.
- Northeast Fisheries Science Center. 2015. 60th Northeast Regional Stock Assessment Workshop (60th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 15-08; 870 p. doi: 10.7289/V5W37T9T.
- NMFS. 2015. Collaborative Project to Transmit Real-Time Bottom Temperatures to Enhance Fishing Selectivity and Oceanographic Modeling. [Internet]. Woods Hole (MA): US Dept Commer, Northeast Fish Sci Ctr. [cited 2015 Sep]. Available from: [http://www.fish-news.com/cfn/wp-content/uploads/2015/09/NOAA\\_Navigator\\_9\\_15.pdf](http://www.fish-news.com/cfn/wp-content/uploads/2015/09/NOAA_Navigator_9_15.pdf)
- NMFS. 2016. Catching Better Data: The Northeast Cooperative Research Program's Study Fleet. [Internet]. Woods Hole (MA): US Dept Commer, Northeast Fish Sci Ctr. [cited 2016 May]. Available from: <http://www.fish-news.com/cfn/wp-content/uploads/2016/04/NOAA-Navigator-5-16.pdf>
- Press R. 2014. Butterfish – Little Fish Big Science. [Internet]. Silver Spring (MD): National Marine Fisheries Service. [cited 2014 Oct 29]. Available from: [http://www.fisheries.noaa.gov/stories/2014/10/butterfish\\_science.html](http://www.fisheries.noaa.gov/stories/2014/10/butterfish_science.html)

# APPENDIX A

## Survey Questions

Title: Study Fleet Inventory of Data Uses

If you have used Study Fleet data, please complete the following form. Your information will be used to compile an inventory of the various uses of the Study Fleet data. This information will be used by NEFSC to communicate with stakeholders about how the data collected by the Study Fleet is being used.

Your Name

Your Phone Number

Your Email Address

Type of organization you work for

- NOAA Fisheries
- Other Federal Agency
- State Agency (MA DMF)
- University
- Fishermen
- Other

Type of data used

- Catch (species, weights, amounts and disposition (landed vs. discarded))
- Fishing Effort (temporal) (duration, timing, season)
- Catch Per Unit Effort (CPUE) (catch per tow)
- Landings Per Unit Effort (LPUE) (landings per tow)
- Area Fished (location (GPS/VMS), statistical area)
- Gear Characteristics (gear type, configuration (mesh size, etc.), depth)
- Biological Sampling (age, length, growth, reproduction)
- Environmental Conditions (water temp, depth (sounder))
- Other

Data was collected using

- Paper Fishing Vessel Trip Reports (VTRs)
- Electronic Fishing Vessel Trip Reports (eVTRs)

- Fishing Logbook & Data Recording System (FLDRS)
- Other

Data was compared to

- Observer Data
- Dealer Reports / Landings Data
- Other

Data was used for

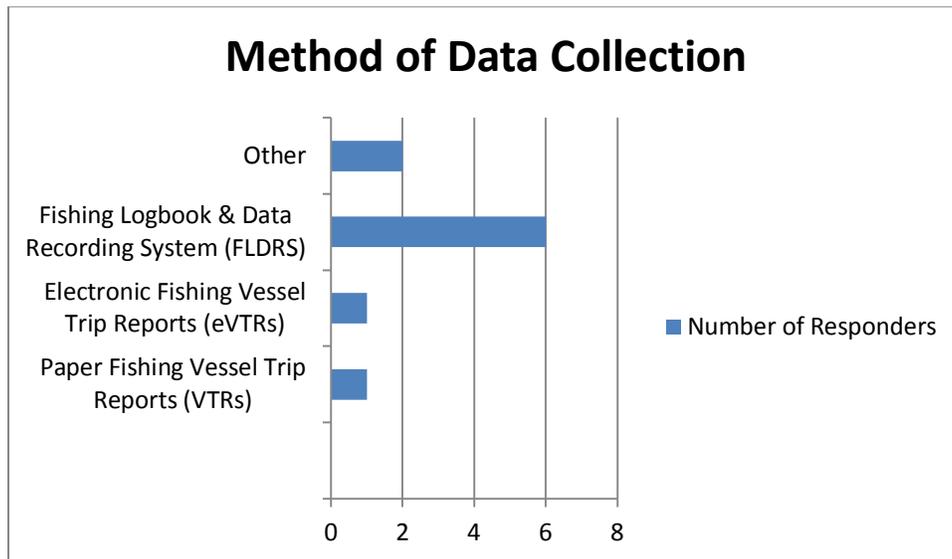
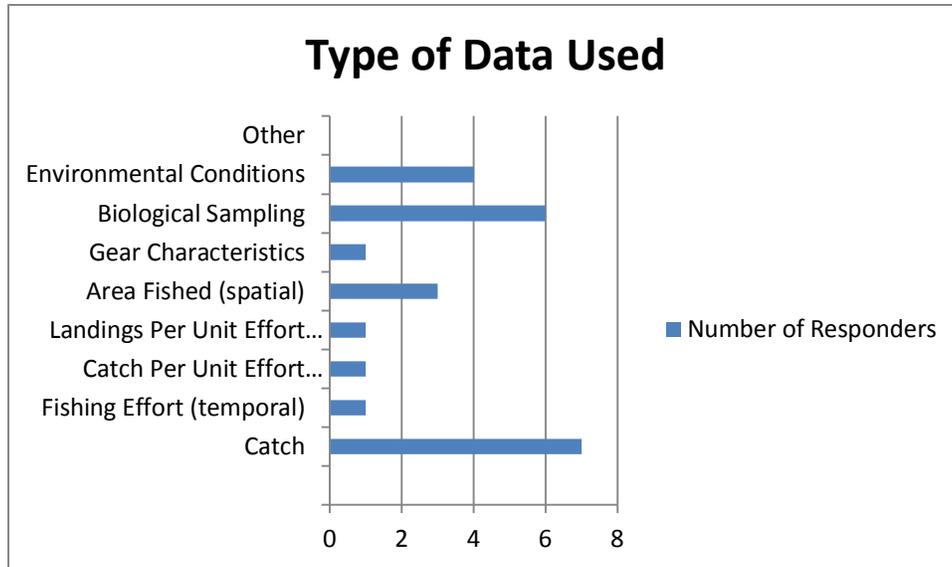
- Stock Assessment
- Tech Memo
- Scientific Article
- Business Use (Fisherman using data to make business decision)
- Personal Use (Fisherman using data to make fishing decision)

References & Citations (for Assessments, Tech Memos, Articles, etc.)

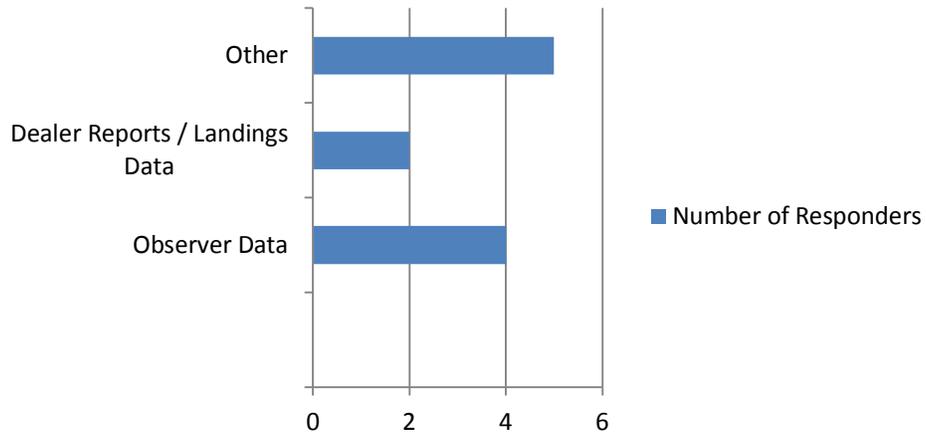
Links (for Assessments, Tech Memos, Articles, etc.)

## APPENDIX B

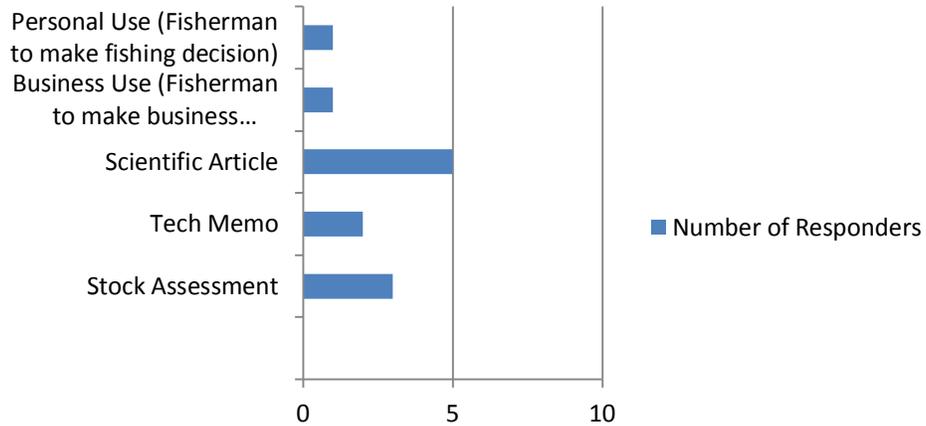
A summary of the responses to the survey.



## Data Comparisons



## Use of Data



## APPENDIX C

### Bibliography: References and Citations of Research Products that Incorporate NCRP Study Fleet Data

#### Stock Assessments

- Northeast Fisheries Science Center. 2012. 54th Northeast Regional Stock Assessment Workshop (54th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 12-18; 600 p. (Yellowtail Flounder Assessment)  
<http://www.nefsc.noaa.gov/publications/crd/crd1218/partb.pdf>
- Northeast Fisheries Science Center. 2014. 58th Northeast Regional Stock Assessment Workshop (58th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 14-04; 784 p. (Butterfish Assessment). <http://nefsc.noaa.gov/publications/crd/crd1404/>
- Northeast Fisheries Science Center. 2015. 60th Northeast Regional Stock Assessment Workshop (60th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 15-08; 870 p. doi: 10.7289/V5W37T9T, (Bluefish & Scup Assessments).  
<https://nft.nefsc.noaa.gov/publications/crd/crd1508/>

#### Peer-reviewed Publications

- McBride RS, Wuenschel MJ, Nitschke P, Thornton G, King JR. 2012. Latitudinal and stock-specific variation in size- and age-at-maturity of female winter flounder, *Pseudopleuronectes americanus*, as determined with gonad histology. *Journal of Sea Research*. 75: 41-51 (<http://dx.doi.org/10.1016/j.seares.2012.04.005>)
- McElroy WD, Wuenschel MJ, Press YK, Towle EK, McBride RS. 2013. Differences in female individual reproductive potential among three stocks of winter flounder, *Pseudopleuronectes americanus*, *J. of Sea Res.* 75:52–61. [doi:10.1016/j.seares.2012.05.018](https://doi.org/10.1016/j.seares.2012.05.018)
- McElroy WD, Wuenschel MJ, Towle EK, McBride RS. 2016. Spatial and annual variation in fecundity and oocyte atresia of yellowtail flounder, *Limanda ferruginea*, in U.S. waters. *J. Sea Res.* 107:76-89. <http://dx.doi.org/10.1016/j.seares.2015.06.015>
- Press YK, McBride RS, Wuenschel MJ. 2014. Time course of oocyte development in winter flounder, *Pseudopleuronectes americanus* and spawning seasonality for the Gulf of Maine, Georges Bank and southern New England stocks, *J. of Fish Biol.* 85:421-445.  
doi: 10.1111/jfb.12431

#### White & Working Papers

- Alade L, McElroy WD, Towle EK. 2014. Re-evaluation of Georges Bank yellowtail flounder natural mortality based on life history approaches. TRAC working paper (2014/06).
- Manderson, Kohut, Palamara, Schmidt. 2015. Working Paper for SARC 60. Tor 3. Characterize oceanographic & habitat data pertaining to Scup distribution & availability. If possible, integrate into assessment
- Manderson, Kohut, Palamara, Schmidt, Hare. 2015. Working Paper for SARC 60. Tor 3. Characterize oceanographic & habitat data pertaining to Bluefish distribution & availability. If possible, integrate into assessment.
- Manderson, Roebuck 2015. *Slouching Towards Bethlehem*<sup>1</sup>: Why place cooperative partnerships at the foundation of applied ecosystem research?: A case study with butterflyfish. Session L:10. ICES ANNUAL SCIENCE MEETING. COPENHAGEN. Talk and white paper
- Manderson, Townsend, Kohut, Palamara, Kang, Churchister, Hoey, Roebuck. 2014. Habitat compression & winter mortality in longfin inshore squid: Theory, data, & possible application for proactive management. 2014 ICES Annual Science Conference. La Caruna Spain. Talk and White paper.
- McBride RS, Press YK, Wuenschel MJ. 2012. Classifying female yellowtail flounder maturity: comparing at-sea, macroscopic maturity classifications with results from a gonad histology method. Working paper #2 for SAW-SARC 54. April; Woods Hole, MA.
- McBride R, Wuenschel M, McElroy D, Rowinski Y, Thornton G, Nitschke P. Classifying female winter flounder maturity during NEFSC resource surveys: comparing at-sea, macroscopic maturity classifications with results from a gonad histology method. SARC 52 Working paper #8.
- McElroy WD, Press YK, Towle EK, McBride RS, Wuenschel MJ. 2011. Reproductive potential of female winter flounder, *Pseudopleuronectes americanus*: Comparison of fecundity and skipped spawning among three stocks. SARC 52 Working paper #12.
- McElroy WD, Press YK, Wuenschel MJ. 2012. Reproductive effort as a predictor of the natural mortality rate for southern New England yellowtail flounder: the Gunderson method. SAW-SARC 54 Working paper.
- McElroy WD, Towle EK, Press YK, McBride RS, Wuenschel MJ. 2012. Comparison of fecundity among stocks of female yellowtail flounder, *Limanda ferruginea*. SAW-SARC 54 Working Paper # 3.
- McElroy WD, Towle EK, Wuenschel MJ, McBride R.S. 2014. Spatial and annual variation in fecundity of yellowtail flounder in U.S. waters. TRAC working paper (2014/33).
- McElroy WD, Wuenschel MJ, McBride RS. 2013. Female summer flounder maturity: recent temporal trends and accuracy of macroscopic classifications. SAW-SARC 57 Working paper #9.

O'Brien L, McElroy WD. 2014. Estimation of the intrinsic rate of increase for Georges Bank Yellowtail flounder. TRAC working paper (2014/30).

OpenOcean 2014. An index of availability ( $\rho_h$ ) of Atlantic Butterfish to surveys using a thermal niche model coupled to debiased hindcasts of bottom temperature from a ROMS model. 2014 Butterfish Stock Assessment Review Meeting. 2014

Wuenschel MJ, McBride RS, Thornton GM, Nitschke P. 2010. The reproductive biology female winter flounder (*Pseudopleuronectes americanus*): validating classification schemes to assess the importance of 'skip spawning'. Available from: <http://hdl.handle.net/10261/24937>

### Presentations

Arruda A, Wuenschel MJ, McElroy WD, McBride RS, Oliveira K. 2010. Evaluation of bioelectrical impedance analysis to predict condition, muscle energy, and liver energy content of three flatfishes: winter, yellowtail and summer Flounder. 12<sup>th</sup> Flatfish Biology Conference, Westbrook, CT, Dec. 1-2, 2010. (Poster).

Axellson D, Lars Axellson, Eleanor Bochenek, Jason Didden, Greg DiDomenico, Kyle Goodwin, Glenn Goodwin, Steven Gray, Jimmy Harris, John Hoey, Olaf Jensen, Josh Kohut, John Manderson, Geir Munson, Matt Oliver, Laura Palamara, Chris Roebuck, Wayne Reichle, Joel Sonnen 2011. "Butterfish Smackdown: Incorporating fisher knowledge into a regional scale "operational" habitat model for a keystone pelagic fish. Mid Atlantic Chapter of American Fisheries Society. Annual Meeting. Drafted abstract & designed & Presented talk

Kohut J, Manderson J. 2012 Can we improve stock assessments by using dynamic habitat models and fishery-dependent surveys as a supplement to current fishery-independent surveys? F18: 2012 ICES Annual Science Conference, Bergen Norway September 17-21, 2012

Manderson JP. 2012 Steps toward an operational seascape ecology in support of the management of sustainable ecosystems. 2nd International Symposium of the American Institute of Fishery Research Biologists on The Relative Importance of Fishing and the Environment in the Regulation of Fish Population Abundance. June 26-28 2012

Manderson JP. 2014. Marine habitat dynamics & climate: an inconvenient truth. Mid Atlantic Fisheries Management Council Workshop on Climate and Fisheries. Virginia Beach VA. 02/11

Manderson JP. 2015. Aspects of habitat of particular concern for fish population dynamics & fisheries management. National Scientific and Statistical Committee Workshop. Honolulu, HI.

Manderson JP. 2015. Physics, Fish & Marine Fisheries: Collaborative research partnerships are required for ecosystem based assessment & management in 21<sup>st</sup> century. Mid Atlantic Bight Physics & Fisheries Meeting. Cape May, New Jersey

- Manderson JP. 2016. Nowcasting seascape dynamics to estimate past and future availabilities offish populations to fisheries & assessment surveys National Ecosystem Forecasting Meeting, College Park Maryland. 04/27
- Manderson JP. 2016. Nowcasting seascape dynamics to better estimate past & future species-habitat distributions. National Essential fish habitat summit. Annapolis Maryland. 05/18
- Manderson JP. 2016. Collaboration & crowd-sourcing applied seascape ecology to support of ecosystem based management. New England Fisheries Management Council Herring Plan Development Team Meeting. Gloucester, Mass, 05/23
- Manderson JP. 2016. Collaboration & crowd-sourcing applied seascape ecology to support of ecosystem based fisheries management. NEFSC Ecosystem Review, Woods Hole Mass. 06/02
- Manderson JP. 2016. Presentation at the World Fisheries Conference. (citation requested on 6/17/16)
- Manderson JP, Kohut J. 2014. Account for habitat dependent species distribution shifts in marine fish population assessments: A case study with Atlantic Butterfish. *Island Institute Predictive Capabilities Workshop: Portland Maine, December 18th, 2014*
- Manderson JP, Kohut J. 2015. Physics, Fish & Marine Fisheries: Collaborative research partnerships are required for ecosystem based assessment & management in 21<sup>st</sup> century. Garden State Seafood Fisheries Science Workshop. Tuckerton New Jersey
- Manderson JP, Kohut J, Hoey J, DiDomenico G. 2012 The butterfish smackdown: Steps towards the development of an operational seascape ecology in support of ecosystem co-management. World Fisheries Congress. Edinburgh, Scotland 7th - 11th May 2012
- Manderson JP, Kohut J, Palamara. 2014. Habitat models can be used in coastal ocean observing systems to guide process based studies informing ecosystem assessments. Ocean Sciences Meeting. Honolulu, HI.
- Manderson, Roebuck 2015. *Slouching Towards Bethlehem<sup>1</sup>*: Why place cooperative partnerships at the foundation of applied ecosystem research?: A case study with butterfish. Session L:10. ICES ANNUAL SCIENCE MEETING. COPENHAGEN. Talk and white paper
- Manderson, Townsend 2016. Data sets supporting the “new paradigm”: “What’s goin on”. Marine Resource Education Program. Longbranch New Jersey
- Manderson, Townsend, Kohut, Churchister, Roebuck 2014. Thermal habitat effects on observation and ecological process for a keystone forage population overwintering along the mid-Atlantic shelfbreak. NOAA Fisheries and the Environment Program Annual Science Meeting. LaJolla, California

- Manderson, Townsend, Kohut, Palamara, Kang, Churchister, Hoey, Roebuck. 2014. Habitat compression & winter mortality in longfin inshore squid: Theory, data, & possible application for proactive management. 2014 ICES Annual Science Conference. La Caruna Spain. Talk and White paper.
- McBride RS, Wuenschel MJ, McElroy WD, Rowinski YK, King JP. 2010. Beyond 'Flatland': a multi-dimensional approach to classify female winter flounder (*Pseudopleuronectes americanus*) maturity and reproductive seasonality. 12<sup>th</sup> Flatfish Biology Conference, Westbrook, CT, Dec. 1-2, 2010. (Poster).
- McElroy WD, Press YK, Towle EK, Wuenschel MJ, McBride RS. 2011. Reproductive potential of female winter flounder, *Pseudopleuronectes americanus*: Comparison of fecundity and skipped spawning among three stocks. 8<sup>th</sup> International Flatfish Symposium, Ijmuiden, Netherlands. Nov. 5-11, 2011.
- McElroy WD, Rowinski YK, Wuenschel MJ, Towle EK, McBride RS. 2010. Application of the auto-diametric method of estimating fecundity to winter flounder, *Pseudopleuronectes americanus*. 12<sup>th</sup> Flatfish Biology Conference, Westbrook, CT, Dec. 1-2, 2010.
- McElroy WD, Terceiro M. 2014. Female summer flounder maturity: a 30 year time-series and accuracy of macroscopic classifications. 14<sup>th</sup> Flatfish Biology Conference, Westbrook, CT, Dec. 3-4, 2014.
- McElroy WD, Towle EK, Press YK, Wuenschel MJ, McBride RS. 2012. Comparison of fecundity and down-regulation among stocks and years for female yellowtail flounder, *Limanda ferruginea*. 13<sup>th</sup> Flatfish Biology Conference, Westbrook, CT, Dec. 4-5, 2012.
- McElroy WD, Wuenschel MJ, Towle EK, McBride RS. Spatial and annual variation in fecundity and oocyte atresia of yellowtail flounder, *Limanda ferruginea*, in US waters. 9<sup>th</sup> International Flatfish Symposium, Cle Elum, WA, Nov. 9-14, 2014.
- OpenOcean 2013. An index of availability ( $\rho_h$ ) of Atlantic Butterfish to surveys using a thermal niche model coupled to debiased hindcasts of bottom temperature from a ROMS model. 2013 Butterfish Stock Assessment Data Meeting. Woods Hole, Massachusetts. August, 2013
- OpenOcean 2013. Integrating habitat dynamics into population & ecosystem assessment using cooperative research within an IOOS framework. Fisheries Working Group. National Research Council. Highlands New Jersey. July 30, 2013
- OpenOcean 2013. Integrating habitat dynamics into population & ecosystem assessment using cooperative research within an IOOS framework. East Coast Fisheries Forum. Annapolis Md. June 27, 2013

- OpenOcean 2013. Climate change, thermal habitat dynamics, habitat coverage bias & population dynamics in offshore forage species (butterfish & longfin squid) central to the MAB food web. MAFMC Squid Summit, Riverhead Long Island January, 16, 2013.
- Rowinski YK, McElroy WD, Wuenschel MJ, McBride RS. 2010. Examination of monthly oocyte development and spawning patterns in the Gulf of Maine winter flounder, *Pseudopleuronectes americanus*, by Macroscopic and Histological Methodologies. 12<sup>th</sup> Flatfish Biology Conference, Westbrook, CT, Dec. 1-2, 2010.
- Tholke EK, McElroy WD. 2016. Preliminary review of cusk, *Brosme brosme*, reproductive biology in U.S. waters. American Fisheries Society, Southern New England Chapter winter meeting, Groton, CT. Jan. 15, 2016. (Poster).
- Towle EK, McBride RS, McElroy WD. Sources of variation in estimates of Summer Flounder, *Paralichthys dentatus*, batch fecundity. 14<sup>th</sup> Flatfish Biology Conference, Westbrook, CT, Dec. 3-4, 2014. (Poster)
- Towle EK, McElroy WD, McBride RS. Seasonal patterns of oogenesis and spawning of female Yellowtail Flounder (*Limanda ferruginea*) in the Gulf of Maine: defining a period to measure potential annual fecundity. American Fisheries Society, Southern New England Chapter winter meeting, Hadley, MA. Jan. 29, 2014.
- Towle EK, McElroy WD, Press YK, McBride RS. 2012. Spermatogenesis, reproductive maturation, and spawning seasonality of male winter flounder, *Pseudopleuronectes americanus*. 13<sup>th</sup> Flatfish Biology Conference, Westbrook, CT, Dec. 4-5, 2012. (Poster).
- Wuenschel MJ, Deroba JJ. The reproductive biology of female Atlantic herring (*Clupea harengus*): validating classification schemes to assess the importance of 'skipped spawning'. American Fisheries Society, Portland OR, Aug. 16-20, 2015.
- Wuenschel MJ, McElroy WD, Oliveira K. 2016. Suitable indicators of fish condition: an evaluation of new and old metrics for three flatfishes with different reproductive strategies. American Fisheries Society, Southern New England Chapter winter meeting, Groton, CT. Jan. 15, 2016.
- Wuenschel MJ, McElroy WD, McBride RS. 2012. Can variation in fecundity of winter flounder (*Pseudopleuronectes americanus*) be explained by measures of condition? 13<sup>th</sup> Flatfish Biology Conference, Westbrook, CT, Dec. 4-5, 2012.
- Wuenschel MJ, McElroy WD, Towle EK, McBride RS. 2010. Seasonal patterns in body condition and proximate composition for three flatfishes: winter, yellowtail and summer flounder. 12<sup>th</sup> Flatfish Biology Conference, Westbrook, CT, Dec. 1-2, 2010.
- Wuenschel MJ, McElroy WD, Towle EK, McBride RS. 2014. Modeling variation in fecundity of winter flounder, *Pseudopleuronectes americanus*, in U.S. waters: does the autodiametric

method mask individual variation? 9th International Flatfish Symposium, Cle Elum, WA, Nov. 9-14, 2014.

Wuenschel MJ, McElroy WD, Towle EK, McBride RS. Modeling variation in fecundity of winter flounder, *Pseudopleuronectes americanus*, in US waters: does the autodiametric method mask individual variation? 14<sup>th</sup> Flatfish Biology Conference, Westbrook, CT, Dec. 3-4, 2014. (Poster)

## **APPENDIX D**

### **NCRP External Partners (Possible External Users of Study Fleet Data)**

Massachusetts Division of Marine Fisheries (MA DMF)

University of Massachusetts School for Marine Science and Technology (SMAST)

Rutgers University

Mid-Atlantic Regional Ocean Observation System

Atlantic Coastal Cooperative Statistical Program

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The CRD series uses the American Fisheries Society's guides to names of fishes, mollusks, and decapod

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## **Publications and Reports of the Northeast Fisheries Science Center**

The mission of NOAA's National Marine Fisheries Service (NMFS) is "stewardship of living marine resources for the benefit of the nation through their science-based conservation and management and promotion of the health of their environment." As the research arm of the NMFS's Northeast Region, the Northeast Fisheries Science Center (NEFSC) supports the NMFS mission by "conducting ecosystem-based research and assessments of living marine resources, with a focus on the Northeast Shelf, to promote the recovery and long-term sustainability of these resources and to generate social and economic opportunities and benefits from their use." Results of NEFSC research are largely reported in primary scientific media (*e.g.*, anonymously-peer-reviewed scientific journals). However, to assist itself in providing data, information, and advice to its constituents, the NEFSC occasionally releases its results in its own media. Currently, there are three such media:

*NOAA Technical Memorandum NMFS-NE* -- This series is issued irregularly. The series typically includes: data reports of long-term field or lab studies of important species or habitats; synthesis reports for important species or habitats; annual reports of overall assessment or monitoring programs; manuals describing program-wide surveying or experimental techniques; literature surveys of important species or habitat topics; proceedings and collected papers of scientific meetings; and indexed and/or annotated bibliographies. All issues receive internal scientific review and most issues receive technical and copy editing.

*Northeast Fisheries Science Center Reference Document* -- This series is issued irregularly. The series typically includes: data reports on field and lab studies; progress reports on experiments, monitoring, and assessments; background papers for, collected abstracts of, and/or summary reports of scientific meetings; and simple bibliographies. Issues receive internal scientific review and most issues receive copy editing.

*Resource Survey Report* (formerly *Fishermen's Report*) -- This information report is a regularly-issued, quick-turnaround report on the distribution and relative abundance of selected living marine resources as derived from each of the NEFSC's periodic research vessel surveys of the Northeast's continental shelf. This report undergoes internal review, but receives no technical or copy editing.

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