Fisheries Monitoring Workgroup Workshop

May 15-17, 2018

Meeting Location
Mississippi State University Science & Technology Center
1021 Balch Blvd
NASA Stennis Space Flight Center
Stennis, MS 39529

FMW Workshop Background and Purpose

Two recent collaborative efforts have been launched to advance understanding of the effects of hypoxia on fisheries in the Gulf of Mexico:

- A FY16 FFO of NOAA's Northern Gulf of Mexico Ecosystems and Hypoxia Assessment Program (NGOMEX) was focused on quantifying the ecological impacts of hypoxia, including an evaluation of the effects of alternative management strategies on ecosystem function and living resource populations. The competition resulted in three awards, which included both a "Scientific PI" to coordinate research activities and an "Application PI" responsible for activities related to transitioning the research information and tools toward management application. The projects also established management committees to evaluate progress and suitability of the research to management goals. The NGOMEX projects are:
  - ***Synthesis of long-term datasets and modeling of data to support fisheries and hypoxia management in the NGOM*** **(Link);**
    - **Scientific PI: Dan Obenour (NCSU)**
    - **Application PI: Kevin Craig (NOAA NMFS)**
    - **Management Committee: Fisheries Monitoring Workgroup – see below**
  - ***Linking models to connect nutrient pollution and impacts of diversions on hypoxia and the subsequent impacts on living resources*** **(Link)**
    - **Scientific PI: Kenny Rose (UMCES), Dubravko Justic (LSU)**

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        - **Application PI: Kevin Craig (NOAA NMFS)**
        - **Management Committee: Fisheries Monitoring Workgroup – see below**

    - ***User-Driven Tools to Predict and Assess Effects of Reduced Nutrients and Hypoxia on Living Resources in the Gulf of Mexico*** **(Link)**
        - **Scientific PI: Kim de Mutsert (George Mason U)**
        - **Application PI: Matt Campbell (NOAA NMFS)**
        - **Management Committee: Advisory Panel – described in Matt Campbell presentation**

- The 6th Annual NOAA/NGI Hypoxia Research Coordination Workshop, "Establishing a Cooperative Hypoxic Zone Monitoring Program" and the follow-up workshop proceedings paper led to the establishment of eight workgroups to develop the Cooperative Hypoxia Assessment and Monitoring Program (CHAMP). The workgroups encompass regional, topical, and management focuses that intersect with, and would benefit from a multi-partner, sustainable Gulf of Mexico hypoxia monitoring program. One of these, the Fisheries Monitoring Workgroup (FMW), has two goals that together aim to broaden understanding of the effects of hypoxia on key fisheries, for the purpose of quantifiably predicting hypoxia impacts and managing fisheries accordingly. The goals are to:
    - integrate fisheries surveys into the CHAMP by leveraging and expanding upon current monitoring activities and compiling available data; and
    - serve as a management advisory group (Management Committee) for two NGOMEX projects (Obenour and Craig, Rose et al.), to help ensure the effectiveness of project tools and outputs towards fisheries management applications.

The purpose of the FMW Workshop is to bring together the NGOMEX PIs and Management Committees (1) to share information on project objectives and progress toward achieving intended management outcomes; (2) facilitate dialog between PIs and Management Committees to ensure project research is informed by management guidance; and (3) advance monitoring capacity in the Gulf to enable scientists to better understand the impacts that hypoxia has on fish biology/physiology and fisheries stocks.

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Workshop Objectives:

- Provide summary of CHAMP Workshop and address requests for strengthening FMW contribution;
- Assess progress in incorporating fisheries surveys into the CHAMP.
- Learn of NGOMEX project updates;
- Identify initial / preliminary management needs;
- Evaluate NGOMEX research progress in terms of management goals and provide feedback on management needs;
- Determine how NGOMEX PIs can best interact with management on their development and use of modeling tool(s);
- Identify gaps in observational needs and propose solutions; and,
- Day 3: NGOMEX PI Meeting - Develop plans for a NGOMEX cross-project collaborative effort to compare modeling results and develop strategy for integrative modeling approach for validation.

Meeting Outputs/Deliverables:

1. Workshop Proceedings Paper that:
    a. Addresses the value of FMW fisheries surveys to achieving the CHAMP program and NGOMEX project goals, and identifies and provides rationale for the fisheries surveys selected to integrate into the CHAMP (Session 4);
    b. Describes the current protocol for SEAMAP Groundfish Survey data management through NCEI, and the plans for incorporating data input from additional surveys added to CHAMP (Session 5); and,
    c. Summarizes management needs and feedback on NGOMEX projects – strengths, weaknesses, advised changes – and maps out strategy for informing fisheries management (e.g. SEDAR or other fisheries data or assessment workshops) (Session 7 and 8).

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FMW Workshop Agenda

Day 1 - Tuesday, May 15, 2018	
Time	**Discussion Item**
1:00 -- 1:30 pm	**Registration & soda/coffee**
1:30 – 2:00 pm	**Session 1: Welcome, Introductions, Agenda Overview and Meeting Objectives** ● Welcome, Around the Room Introductions - *Steve Ashby* (NGI) (10 min) ● Workshop Overview and Objectives – *Chris Brown* (NOAA) (10 min)
2:00 – 2:30 pm	**Session 2: CHAMP Workshop Report Out** Presentation on refinements in CHAMP developed from workgroup contributions; present successes and future plans - *Alan Lewitus (NOAA)*
2:30 – 2:45 pm	**Session 3: FMW Updates** Presentation on FMW progress, including feedback from CHAMP workshop - *Chris Brown (NOAA)*
2:45 – 3:00 pm	**Break (15 minutes)**
3:00 – 3:45 pm	**Session 4: Observations: Existing and Potential Additions** Discussion on value of FMW surveys for hypoxia monitoring program and NGOMEX modeling efforts; other issues brought up at CHAMP workshop - *Chair: Chris Gledhill (NOAA)*

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	See Session 4 guidance below
3:45 – 4:45 pm	**Session 5: Data Coordination and Dissemination of Results from CHAMP Ship Surveys** Discussion of current processing of ship survey data and potential dissemination of DO vs. fish relationships - *Kirsten Larsen (NOAA)* *See Session 5 guidance below*
5:00 - 6:30 pm	**Optional Social Event at Cypress House; Dinner on your own**

Day 2 - Wednesday, May 16, 2018	
Time	**Discussion Item**
8:30 – 9:00 am	**Pastries/coffee**
9:00 – 9:15 am	**Review of Day 1** - *Chris Brown*
9:15 – 10:30 am	**Session 6: Research Project Updates & Next Steps (Chair: Trevor Meckley, NOAA)** ● Using Linked Models to Predict the Impacts of Hypoxia on Gulf Coast Fisheries -- *Kenny Rose* (UMCES): Project Overview and Fisheries Modeling (30 min) -- *Dubravko Justić* (LSU): Model Coupling and Scenarios (12 min) -- *Kevin Craig* (NOAA): Management Issues (12 min) -- *Kenny Rose* (UMCES): Synergistic Activities (6 min) -- Q&A (15 min)
10:30 – 10:45 am	**BREAK (15 minutes)**

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10:45 am – noon	**Session 6: Research Project Updates & Next Steps (Continued)** ● Synthesis and Integrated Modeling of Long-term Data Sets to Support Fisheries and Hypoxia Management -- *Dan Obenour* (NCSU): Project Overview and Modeling (30 min) -- *Kevin Craig* (NOAA): Fisheries Effects (30 min) -- Q&A (15 min)
noon - 1:00 pm	**Lunch (provided)**
1:00 – 2:15 pm	**Session 6: Research Project Updates & Next Steps (Continued)** ● User-driven Tools to Predict and Assess Effects of Reduced Nutrients and Hypoxia on Living Resources -- *Kim de Mutsert* (George Mason); Project Overview and Ecosystem Modeling (30 min) -- *Steve Brandt* (OSU); Growth Rate Potential Modeling (30 min) -- Q&A (15 min)
2:15 - 3:15 pm	**Session 7: Break Out Groups to Discuss NGOMEX Project Presentations** ● Break Out Group A: Discussion / Comparison of Research Outputs (Project Research PIs) - *Dave Hilmer (NOAA)* ● Break Out Group B: Define Management Needs and Application of Research Outputs to Management (Application PIs and Management Committees) - *Kevin Craig & Matt Campbell (NOAA)* *See Session 7 guidance below*
3:15 – 3:30 pm	**Break (15 minutes)**
3:30 -- 5:00 pm	**Session 8: Progress and Suitability of Research to Management Goals** Provide feedback on management needs, evaluate NGOMEX research in terms of management goals, and map out strategy for informing fisheries management (e.g. SEDAR or other fisheries data or

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	assessment workshops). - Report out from Break Out Group A (Research PIs) (10 min) - Report out from Break Out Group B (Application PIs) (10 min) - Discussion of project refinements and future plans (70 min) - *Leads: Kevin Craig and Matt Campbell* *See Session 8 guidance below*
4:30 -- 4:45 pm	**Closeout of Main Meeting.**
	End of Meeting for non-NGOMEX PIs
Day 3 - Thursday, May 17, 2018	
8:30 – 9:00 am	**Pastries/coffee**
9:00 am -- noon	**NGOMEX PI Collaboration Workshop**

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Guidance for Working Sessions

Session 4: Observations: Existing and Potential Additions

Discussion on value of FMW surveys for hypoxia monitoring program and NGOMEX modeling efforts; other issues brought up at CHAMP workshop.

In addition to the SEAMAP Groundfish Survey, that was already an operational component of the CHAMP, the following surveys collect DO and can be integrated as part of the Program (from May 2017 summary compilation report, NOAA Fisheries Independent Surveys on NOAA Ships, that was prepared for the SEFSC Survey Assessment Workshop on 20-23 June 2017). The reference to DO collection methodology is included in quotes.

- SEFSC Shark/Snapper/Grouper Bottom Longline – "Conduct Conductivity, Temperature, Depth (CTD) casts to profile water column temperature, conductivity (salinity), transmissivity, dissolved oxygen concentrations and fluorometry."

- SEAMAP Ichthyoplankton Survey for the fall, spring, and winter – "Conductivity, temperature and depth profilers (CTDs) optionally equipped with a dissolved oxygen sensor, transmissometer (turbidity) and fluorometer are used to gather environmental data throughout the water column."

- Pelagic Acoustic Survey – "Conduct Conductivity, Temperature, Depth (CTD) casts to profile water column temperature, conductivity (salinity), transmissivity, dissolved oxygen concentrations and fluorometry."

- U.S. Gulf of Mexico Marine Mammal and Seabird Assessment for the summer (p. 31) and winter – "Collect vertical profiles of hydrographic parameters (e.g., temperature, salinity, oxygen concentration) using CTD and XBTs"

- U.S. Atlantic Marine Mammal and Seabird Assessment for the summer (p. 35) and winter – "Collect vertical profiles of hydrographic parameters (e.g., temperature, salinity, oxygen concentration) using CTD and XBTs"

Other topics:

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- Are there other fish surveys (e.g. Louisiana Department of Wildlife and Fisheries) that should be added to CHAMP?
- Explore the possibility of adding DO to key fisheries surveys.
- Examine non-traditional platforms for retrieving environmental data coincident with fisheries surveys (e.g. satellite information, gliders with echosounders, etc.) Should modeling output be included in this or just measurements?

Session 5: Data Coordination and Dissemination of Results from CHAMP Ship Surveys

Discussion of current processing of ship survey data and potential dissemination of DO vs. fish relationships. Kirsten Larsen (NCEI) will present an overview of data flow for SEAMAP Groundfish Survey DO collection that are posted in near real-time on the NCEI Hypoxia Watch website.

Topics:

- How are data from other fisheries surveys managed (added, archived, disseminated)?
- When are the fish distribution data added and relationships between DO and fish available?
- Should the results from other surveys added to the CHAMP by the FMW be disseminated? If so, how – near real-time DO, post-processing relationships of selected species vs. DO?

Session 7: Break Out Groups to Discuss NGOMEX Project Presentations (60 min)

- Break Out Group A: Discussion / Comparison of Research Outputs (Project Research PIs)

The following questions will be projected and discussed:

- What are the model inputs and outputs?
- Are there overlaps in model outputs and can comparisons of findings lead to improved interpretation/validation?
- There is comparative value in standardizing nutrient reductions scenarios for model runs – what should these be?
- What long-term forecast parameters are planned? Should these be consistent between projects?

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- Can bioenergetics parameters from Rose's croaker model be used to develop a new Atlantic Croaker production potential model?
- What are the baseline years for model parameterization?
- What patterns of fisheries responses to hypoxia are consistent and inconsistent between projects/models?
- Do lab experiments need to be performed to estimate model parameters, e.g. mortality of larvae by species and [DO]

- Break Out Group B: Application of Research Outputs to Management (Application PIs and Management Committees)

The following questions will be projected and discussed:

- What do you need as managers?
- What did you learn about fisheries responses from the presentations?
- What modeling tools/outputs are amenable to incorporation into stock assessments?
- Are there suggestions for improvements in research approach or outputs that would improve chances of management use?
- For what species is there potential for hypoxia effects to be used in stock assessments? Likelihood for success?
- For species with higher likelihood, what is the timeframe for stock assessment workshops, and can project outputs meet these schedules?
- Can project results influence fisheries management in ways other than stock assessment regulation? e.g. EBFM?

Session 8: Progress and Suitability of Research to Management Goals (60 min)

Provide feedback on management needs, evaluate NGOMEX research in terms of management goals, and map out strategy for informing fisheries management (e.g. SEDAR or other fisheries data or assessment workshops).

- Report out from Research PIs (10 min)
- Report out from Application PIs (10 min)
- Discussion of project refinements and future plans (40 min)

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The discussion will include potential engagement in fisheries stock assessment workshops/processes to propose incorporating hypoxia into management strategies. It will also address mechanisms for applying the projects results and tools to EBFM.

Matt Campbell developed the figure below as guidance for the de Mutsert et al. project's Advisory Council. We should update and add other workshops to this timeline for selected species (e.g. red snapper, menhaden, brown shrimp, other?).

Title	Assessment species	Assessment track	Terminal year	Organizing entity	Data workshop	Assessment workshop	Contact
51	Gulf of Mexico Gray Snapper	Benchmark (new data sets)	2015	SEDAR	April 24-28, 2017	February 13-15, 2018	julie.neer@safmc.ne
52	Gulf of Mexico Red Snapper	Standard (update from benchmar	2016	SEDAR	Undecided	Undecided	julie.neer@safmc.ne
54	Sandbar Shark (HMS)	Standard (update from benchmar	2015	SEDAR	May-Aug, 2017	Late 2017	julie.neer@safmc.ne
	White shrimp			SEFSC Galveston			Rick.Hart@noaa.gov
	Brown shrimp			SEFSC Galveston			Rick.Hart@noaa.gov
	Pink shrimp			SEFSC Galveston			Rick.Hart@noaa.gov
	Royal Red?			SEFSC Galveston			Rick.Hart@noaa.gov
For further information on assessment scheduling etc visit:							
http://sedarweb.org/							
http://sedarweb.org/docs/page/SEDAR_PlanSchedule_Nov2016_FINAL.pdf							
http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#safe							

Links to obtain SEDAR workshop schedules:

SEDAR Project List, August 2017:
http://sedarweb.org/docs/page/SEDAR_PlanSchedule_August2017_0.pdf

SEDAR Upcoming Events:
http://sedarweb.org/upcoming-events

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