Gulf Hypoxia Research Coordination and Advancement Agenda

Where: MSU Science and Technology Center, 1021 Balch Blvd, Stennis Space Center, MS 39529
When: April 17-18, 2013

Purpose

Advance the science underpinning management of the large annual hypoxic zone ("dead zone") in the northern Gulf of Mexico. As described below, the Forum encompassed three separate meetings with intersecting objectives.

4th Annual Hypoxia Research Coordination Workshop
Update scientific understanding of hypoxic zone causes and impacts, coordinate Gulf hypoxic zone research, monitoring and modeling activities in preparation for the 2013 sampling season, and facilitate information exchange between the research and management communities;

- Output: *FY13 Gulf Hypoxic Zone Monitoring Matrix*
- Output: *FY13 Gulf Hypoxic Zone Modeling Matrix*
- Output: *Workshop Report* for Gulf Hypoxia Task Force

Gulf Hypoxia Glider Application Meeting
Develop an implementation plan for use of autonomous underwater vehicles (AUVs) for monitoring the hypoxic zone

- Output: Pre-meeting *Framework for Developing Glider Implementation Plan* by Steering Committee
- Output: White Paper on *Implementation Plan for Glider Application to Hypoxia Monitoring and Modeling* by Glider Implementation Plan Team

Gulf Hypoxia Modeling Technical Review Meeting
Assess the state of scenario forecast models targeting hypoxic zone dynamics in the Northern Gulf of Mexico, and develop recommendations on modeling approaches to most effectively meet the Hypoxia Task Force management directive to mitigate hypoxia;

- Output: Pre-meeting *Terms of Reference* by Steering Committee to provide guidance for the Modeling Technical Review Panel
- Output: Pre-meeting *Guidelines for Gulf Modelers* by Modeling Technical Review Panel to instruct Gulf modelers of informational needs from presentations and working sessions
- Output: White Paper on *Recommended Modeling Approaches for Scenario Forecasts of Gulf Hypoxia* by Modeling Technical Review Panel

4th Annual Hypoxia Research Coordination Workshop

Time	April 17th AM Session Details and Presentation Access
9:00 a.m.	**Status of Gulf Research and Management Collaborative Efforts - The Customer Perspective** **Chair: Steve Ashby - NGI** Objective • Present historical perspective of Annual Coordination Workshops and last year's workshop outputs • Present updates from regional efforts that are users of hypoxia information • Discuss possible connections between on-going hypoxia research and other regional efforts with applications to hypoxia Speakers • Last year's outputs and purpose of this year's meeting (PDF 142 KB) By David Kidwell Nutrient Management/Ecosystem Restoration Efforts i.e RESTORE Act, NRDA restoration, BP Funds, Habitat Blueprint, etc • The Louisiana Nutrient Management Strategy (PDF 1.4 MB) By Chuck Killebrew • Developing partnerships and leveraging points in Mississippi through RESTORE (PDF 1.1 MB) By Monty Graham - Center for Gulf Studies

- RESTORE Update for Centers of Excellence and NOAA RESTORE Science Team (PDF 82 KB) By Russ Beard - NOAA

10:00 a.m.

Updates on Hypoxia Monitoring and Processing Findings and Future Plans

Chair: Dave Scheurer - NOAA

Speakers

- Northern Gulf of Mexico Hypoxia (PDF 1.3 MB) By Nancy Rabalais - LUMCON
- Mechanisms Controlling Hypoxia Project: Update and Plans for 2013 (PDF 755 KB) By Steve DiMarco - TAMU
- FY13 Gulf Atlas Update (Live Demonstration) By Russ Beard - NOAA

10:45 a.m.

Updates on Hypoxia Monitoring and Processing Findings and Future Plans - Continued

Chair: Troy Pierce - EPA

Speakers

- The 2013 Hypoxia Watch Program (PDF 1.2 MB) By Nelson May - NOAA
- Patterns in Plankton and Sediment Respiration on the Louisiana Continental Shelf: Implications for Hypoxia (PDF 4.8 MB) By Mike Murrell - EPA
- Recent NASA Research Related to Hypoxia in the Gulf of Mexico By Duane Armstrong - NASA
- Gulf Alliance Monitoring Network (PDF 697 KB) By Steve Wolfe - FIO
- The Effects of Hypoxia on the Gulf of Mexico Shrimp Fishery By Kevin Purcell - Duke

Gulf Hypoxia Glider Application (Part 1)

Time | **April 17th PM Session Details and Presentation Access**

1:00 pm

Glider Plans, Trials, and Lessons Learned with D.O. - in the Gulf and Elsewhere

Chair: John Harding - NGI

Objective

- Exploring the potential for using gliders in hypoxia monitoring and modeling

Speakers

- Introduction to Glider Session (PDF 390 KB) By David Kidwell - NOAA
- IOOS Glider Plan (PDF 1.4 MB) By Becky Baltes - NOAA
- Spatial and Temporal Monitoring of Dissolved Oxygen in NJ Coastal Waters using AUVs (PDF 1.9 MB) By Josh Kohut - Rutgers
- Spray underwater glider operations off California and in the Gulf of Mexico (PDF 8.7 MB) By Dan Rudnick - Scripps
- GCOOS and Hypoxia Plans By Matt Howard - TAMU
- Glider Plans and Trials in the Gulf By Stephan Howden-USM, Nancy Rabalais-LUMCON and Steve DiMarco-TAMU

2:20 p.m.

Commercial Manufacturers

Chair: Stephan Howden - USM

Objective

- Present state-of-technology for glider application to northern Gulf hypoxia issues (dissolved oxygen detection, monitoring living marine resources, etc.)

Speakers

- Wave Glider: Technology and Gulf of Mexico Mission Applications (PDF 2.2 MB) By Jamie Griffith - Liquid Robotics
- Expanded Capabilities of the Slocum Glider (PDF 1.2 MB) By Clayton Jones - Teledyne Webb Research

- Use of the Exocetus Coastal Glider for Hypoxia Detection in Shallow High Salinity Gradient Environments (PDF 334 KB) By Joe Imlach - Exocetus

Hypoxia Modeling Technical Review

Time	April 18th Session Details and Presentation Access
8:40 a.m.	**Hypoxia Modeling Initiatives** **Chair: John Harding - NGI** Objective ▪ Present background and goals of new initiatives that target Gulf Hypoxia modeling Speakers ▪ COMT Initiative (PDF 224 KB) By Becky Baltes - NOAA ▪ Sensitivity of Hypoxia Predictions to Sediment Oxygen Consumption and Model Nesting: Results from the COMT Shelf Hypoxia Team (PDF 6.1 MB) By Katja Fennel - Dalhousie ▪ Earth System Prediction Capability, Long range forecasts for HABS and hypoxia (PDF 393 KB) By Gregg Jacobs - NRL
9:30 am	**Coupling Scenario Models to Causes and Impacts** **Chair: Dave Kidwell - NOAA** Objective ▪ Present progress in linking hypoxia models to living resource impacts, including potential for models to be used in LMR management Speakers ▪ Linking Hypoxia to Fish Populations: Modeling Across Scales (PDF 1.5 MB) By Kenny Rose - LSU ▪ Hypoxia in Ecospace (PDF 784 KB) By Kim De Mutsert - George Mason University
10:15 a.m.	**Gulf Modelers** **Chair: Steve Ashby - NGI** Objective ▪ Present scenario based modeling systems, focusing on application to key management questions, infrastructure, observational, and remaining research needs, and readiness for transition to operation Speakers ▪ Simple statistical forecast models (PDF 415 KB) By Gene Turner - LSU ▪ S-P Bayesian Scenarios and Forecasts (PDF 247 KB) By Mary Anne Evans - USGS ▪ A parsimonious mechanistic model for assessing multiple drivers of Gulf hypoxia (PDF 275 KB) By Dan Obenour - University Michigan ▪ Hypoxia modeling within NOAA's Northern Gulf of Mexico Operational Forecast System - NGOFS (PDF 8.35 MB) By Jiangtao Xu - NOAA
1:00 pm	**Gulf Modelers - continued** **Chair: Chair: Dave Kidwell - NOAA** Speakers ▪ Development of coupled hydrodynamic-water quality models for the northern Gulf of Mexico hypoxic zone (PDF 6.1 MB) By Dubravko Justic - LSU ▪ The mechanistic model, GoMDOM: Development, calibration and sensitivity analysis (PDF 554 KB) By James Pauer - EPA ▪ GEM3D: A fine resolution 3D model for the Louisiana shelf (PDF 2.9 MB) By Dong Ko - NRL

- GEM3D: A fine resolution 3D model for the Louisiana shelf (PPT 42.4 MB) By Dong Ko - NRL
- GEM3D: Model validation and uncertainties (PDF 1.4 MB) By John Lehrter - EPA
- Lessons from the Trenches, the real-world trials and tribulations of operational ocean prediction (PDF 784 KB) By Frank Bub - NAVO

Gulf Hypoxia Glider Application (Part 2)

Time	April 18th Concurrent Session Details and Presentation Access
8:40 a.m.	**Glider Writing Team** **Chair: Jan Kurtz - EPA** Objective ▪ Present additional details on context and review requirements for the application of glider hypoxia monitoring Speakers ▪ Gulf Hypoxia Monitoring Implementation Plan (PDF 390 KB) By David Kidwell - NOAA ▪ Review of modeling requirements and overview of working sessions By Stephan Howden - USM ▪ Review of glider requirements By Stephan Howden - USM
9:20 a.m.	**Glider Implementation Plan** **Chair: Stephan Howden - USM, Becky Baltes - NOAA and Lael Butler - EPA** Objective ▪ Five working sessions for developing a framework for a Glider Implementation Plan

Also see the 2011, 2012 and the 2014 workshop proceedings.