

Building the Cooperative Hypoxia Assessment and Monitoring Program (CHAMP) **Workshop Overview**

Alan Lewitus
NOAA National Ocean Service
National Centers for Coastal Ocean Science

7th Annual NOAA/NGI Hypoxia Research Coordination Workshop

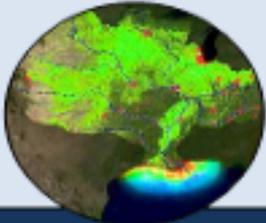
9 January 2018, Stennis Space Center, MS



NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE

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When we last met...



6th Annual NOAA/NGI Hypoxia Research Coordination Workshop

Establishing a Cooperative Hypoxic Zone Monitoring Program

12-13 September, 2016

Mississippi State University Science and Technology, Stennis Space Center, MS

Goal: Identify and coordinate partner interests for establishing a cooperative monitoring program for the Gulf hypoxic zone that achieves management-driven objectives.

Output-1: Workshop report identifying partners and mechanisms necessary to implement and sustain a Cooperative Hypoxic Zone Monitoring Program.

**Building a Cooperative Monitoring Program
Encompassing the Gulf of Mexico Hypoxic Zone**

A proceedings paper by the Steering
Committee of the:

*6th Annual NOAA/NGI Hypoxia Research
Coordination Workshop: Establishing a
Cooperative Hypoxic Zone Monitoring
Program*

Monitoring Workgroups

Workshop Output-2: Establishment of workgroups to advance implementation of key elements of Gulf monitoring identified at the workshop.

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Hypoxia Monitoring Workgroups

Workgroup	Lead(s)
Louisiana	Angelina Freeman (LA CPRA), Dubravko Justić (LSU)
Mississippi/Alabama	Steve Ashby (NGI), Stephan Howden (USM), Brian Dzwonkowski (DISL)
Texas	Steve DiMarco (TAMU)
Autonomous Vehicles	Steve DiMarco (TAMU)
Fisheries	Kevin Craig (NOAA), Chris Brown (NOAA)
Hypoxia Task Force	Katie Flahive (EPA), Danny Wiegand (EPA)
Oil&Gas/Ocean Acidif	Barb Kirkpatrick (GCOOS), Nancy Rabalais (LSU/LUMCON), Steve DiMarco (TAMU)
RESTORE Act	Steve Giordano (NOAA), Becky Allee (NOAA)

CHAMP Workshop Goal and Objectives

Goal: assess progress of workgroups toward building the CHAMP, and further advance strategic planning to meet remaining CHAMP programmatic and financial needs

Agenda steps

Day 1, Morning to afternoon:

-- Workgroup progress

<p>10:00 a.m. to 2:00 p.m.</p>	<p>Workgroup Report Outs:</p> <ul style="list-style-type: none">• Fisheries Monitoring Workgroup• Louisiana Coastal Monitoring Workgroup• States of Mississippi and Alabama Monitoring Workgroup• State of Texas Monitoring Workgroup• Autonomous Vehicles Monitoring Workgroup• Hypoxia Task Force Monitoring Workgroup• Oil and Gas/Ocean Acidification Monitoring Workgroup• RESTORE Act Monitoring Workgroup
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Agenda steps

Day 1, Afternoon:

-- Working Session 1: Data Management

2:00 p.m. to 2:40 p.m.	Working Session – 1: <ul style="list-style-type: none">• Ensure data value is being maximized through availability and usability.
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Agenda steps

Day 1, Afternoon:

-- Working Session 2: Revising the CHAMP Implementation Plan

<p>3:00 p.m. to 4:50 p.m.</p>	<p>Working Session – 2:</p> <ul style="list-style-type: none">• <u>Address Objective 1:</u> Determine the current state of the monitoring program based on requirements met by workgroups – revising matrix for Implementation Plan (Tables 2 and 3 from 2016 workshop report) (55 min)• <u>Address Objective 2:</u> Assess the remaining programmatic gaps and determine priorities in filling these based on management needs (55 min)
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Agenda steps

Day 2, Morning:

-- **Working Session 3: Identifying mechanisms and partners for sustaining monitoring requirements**

9:15 a.m. to 10:15 a.m.	Working Session – 3: <ul style="list-style-type: none">• <u>Address Objective 3</u>: Identify potential partners and leveraging strategies for sustained support for current and future requirements (60 min)
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Agenda steps

Day 2, Morning:

-- Working Session 4: Ways to socialize the CHAMP effort with stakeholders

10:30 a.m. to 11:30 a.m.	Working Session – 4: <ul style="list-style-type: none">• <u>Address Objective 4</u>: Determine pathways for socializing the CHAMP program with stakeholders in order to better leverage and extend participation from multiple groups.
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Workshop Products

1. Workshop Report:

- **Revised CHAMP Tables 2 and 3**
 - **Advances in system requirements from workgroup contributions, and remaining needs**
- **Workgroup descriptions – updated and modified workgroup pages**
- **Data management section**

2. Outreach Plan:

- **Options for outreach documents and target audiences, including partners identified in Session 3**

Can we
build it?



Yes
we can!



Building CHAMP: **Context for Workshop**

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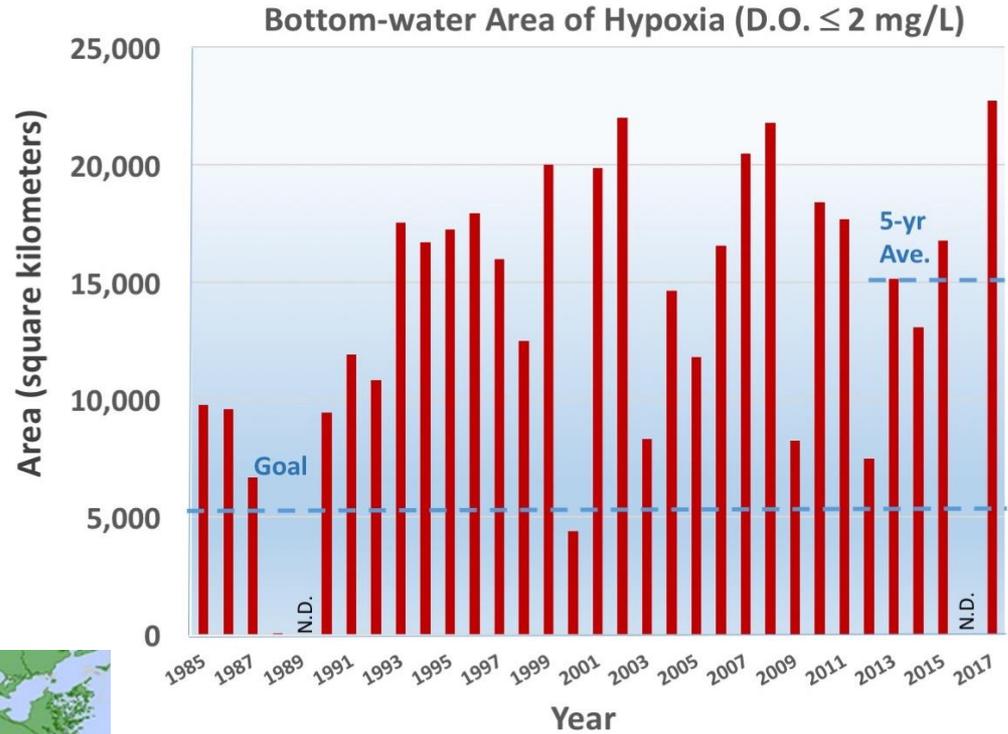
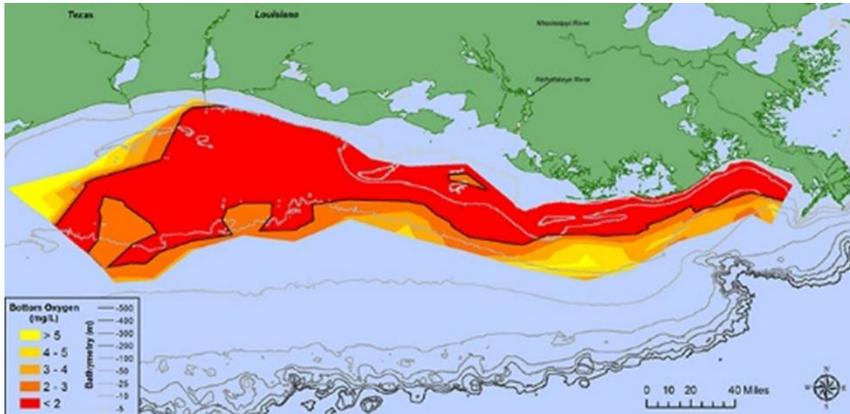


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Long-term Monitoring of Hypoxic Zone Areal Extent

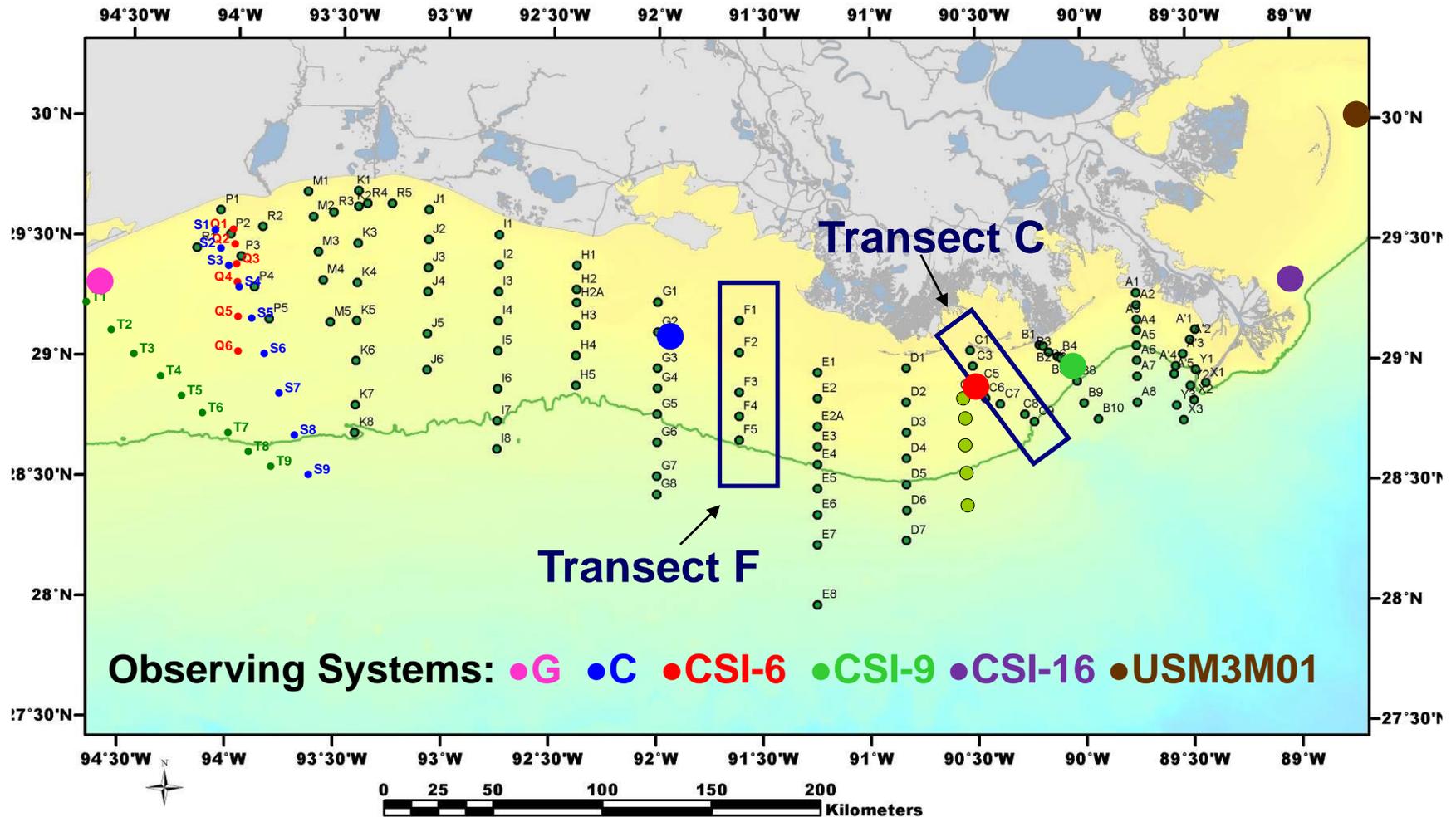
Coastal Goal: Reduce 5-year running average size of the Gulf hypoxic zone to 5,000 km² by 2035



2017 Hypoxic Zone areal extent = 22,720 km²

From Nancy Rabalais (LSU/LUMCON)

Hypoxic Zone Monitoring Activities in Recent Past



6th Annual Hypoxia Research Coordination Workshop: *Establishing a Cooperative Hypoxic Zone Monitoring Program (12-13 Sept 2016, Stennis, Miss)*

Core principles:

- **Management Outcomes** - monitoring requirements are driven by **management needs**;
- **Broad User Community** - the monitoring program will extend beyond the hypoxic zone region, and integrate with monitoring programs that target other **interrelated issues** important to ecosystem conservation and restoration;
- **Cooperative Support Network** – cooperative support from **multiple partners** with diverse interests is critical to sustainability of a comprehensive and robust monitoring program.

Management Products Informing Mitigation of Hypoxia

Product 1

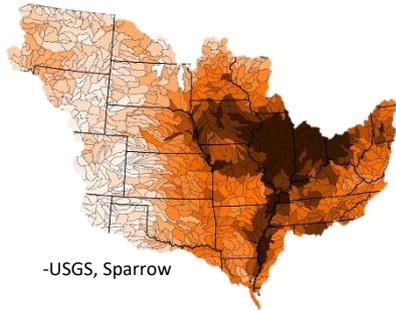
Management Need: Measure progress towards the Coastal Goal of the Hypoxia Task Force Action Plan



Monitoring Requirement: Mid-summer shelfwide ship survey

Product 2

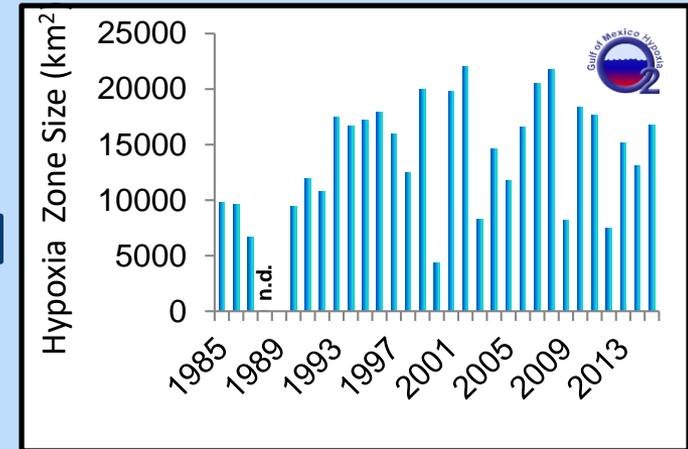
Management Need: Evaluate the overall nutrient reduction required to reduce the hypoxic zone



Monitoring Requirement: Riverine nutrient loading and discharge data

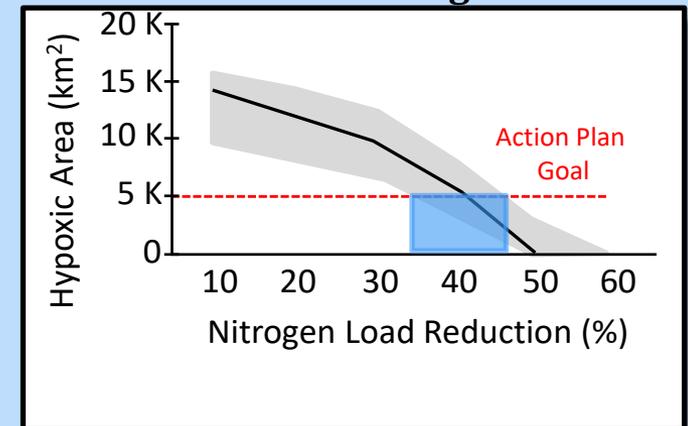
Model Integration / Validation

Hypoxic Zone Areal Extent



-adapted from data from Nancy Rabalais (LUMCON) & Eugene Turner (LSU)

Model Guidance on Nutrient Reduction Targets



Adapted from figure by Don Scavia (U Mich)

Monitoring Requirements for Management Products 1 and 2

Requirement	Collaborators	Support
Mid-summer shelf-wide ship survey west of Mississippi Delta	LSU/LUMCON	NOAA NCCOS
Nutrient monitoring and annual and spring P and N loading estimates from Miss/Atchafalaya River Basin	USGS	USGS
Daily discharge monitoring	USACE	USACE
Maintain Hypoxia Data Portal	NOAA NCEI IOOS GCOOS	NOAA NCEI IOOS GCOOS

Monitoring Requirements are driven by Management Products

Product 3

Management Need: Provide comprehensive space/time characterization of hypoxic zone and controlling factors



- NOAA

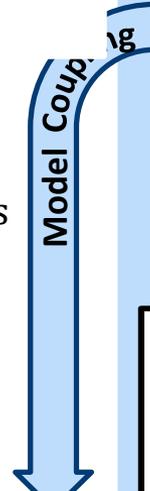
Monitoring Requirement: Cruises, Gliders, Moorings

Product 4

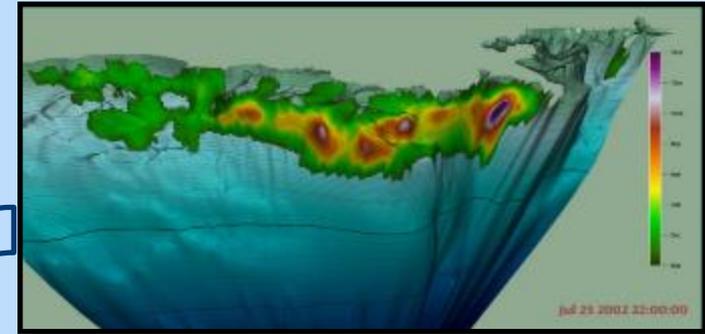
Management Need: Determine impacts of hypoxia on Gulf of Mexico living resources, habitats, fisheries, economies



- NOAA

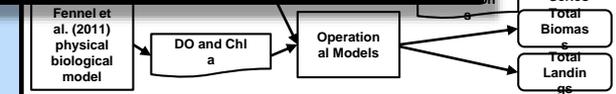
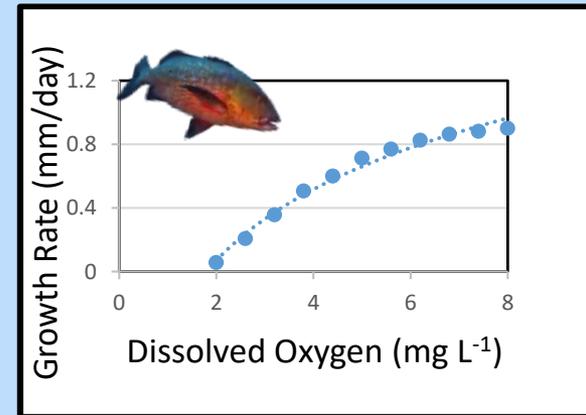


3-D Time Variable Hypoxic Zone Characterization



-Dubravko Justic

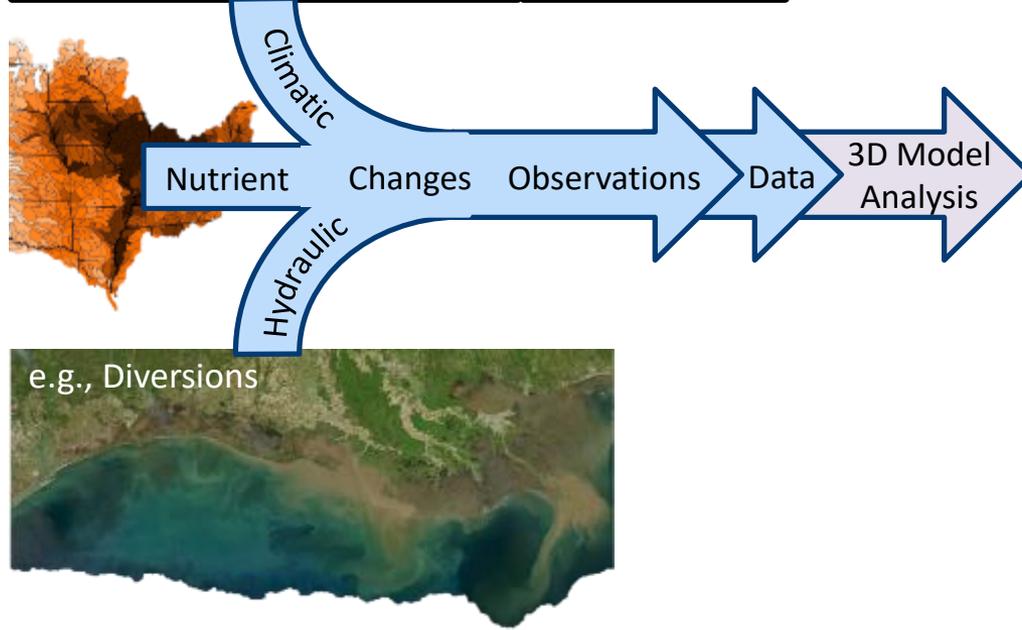
Living Resource and Habitat Impacts



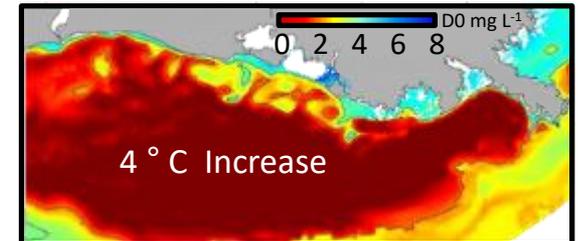
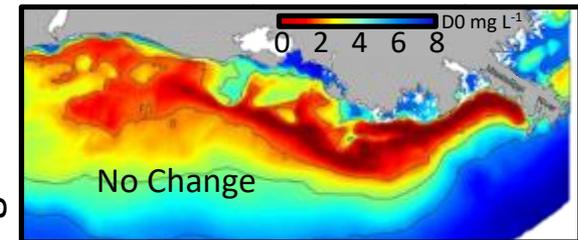
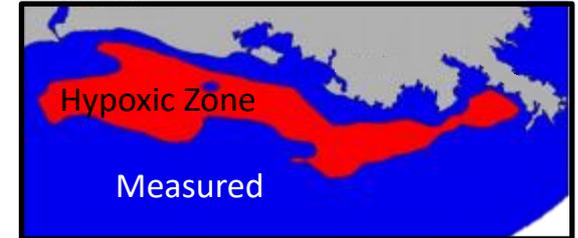
- Kim De. Mutsert et al. (Ecopath/Ecosim)

Monitoring Requirements are driven by Management Products

Management Need: Evaluate strategic management questions related to nutrient reductions including timing, input location, nutrient type, and impacts of climate change



Scenario Forecasts that include interactive ecosystem stressors



Longitude

Latitude

Monitoring Requirements for Management Products 3-5

- **Cross-shelf transects F and C**
- **An additional transect west of F and C for distinguishing hypoxia formation from Miss/Atch vs Texas river discharge**
- **Monitoring east of the Miss Delta for capturing the full extent of influence from Miss River runoff on hypoxia**
- **Continuous data from fixed observing systems**
- **Autonomous surface vehicles and underwater gliders**

