CHAMP Monitoring Program Overview

Revisiting the Monitoring Matrix

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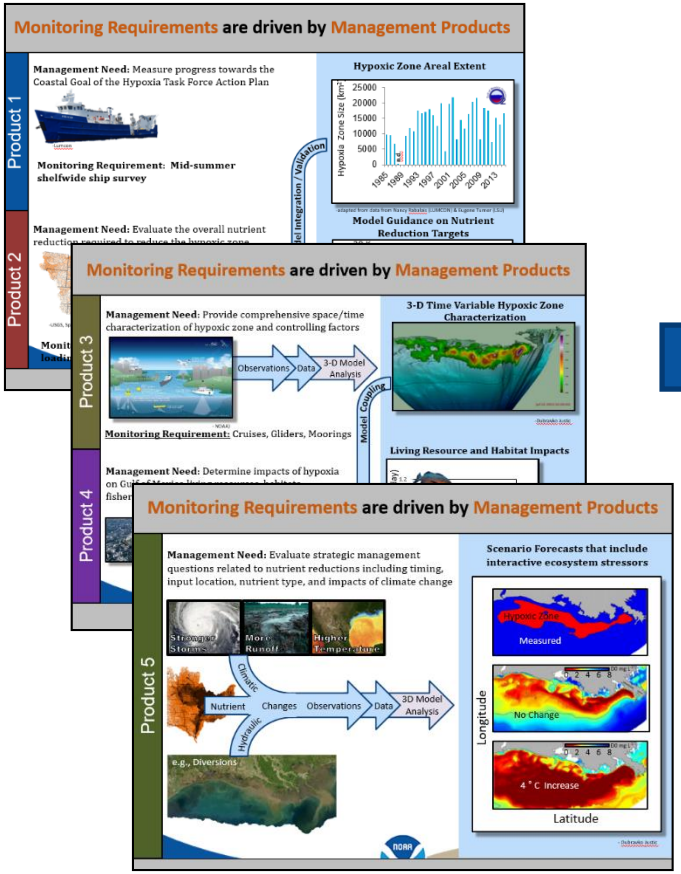
Introducing the Monitoring Matrix

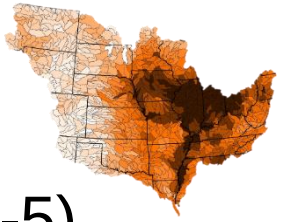
CHAMP Products



Monitoring Matrix

Three Categories shape the Matrix

1. Shelf-Wide Ship Survey (Product 1)



2. Empirical Model Support (Product 2)

3. Deterministic Model Support (Products 3-5)
   a. East of the Delta (MS Sound/ Mobile Bay)
   b. West of the Delta (and South LA)
   c. Texas Coast Measurements
   d. Cross-regional monitoring and natural resource monitoring

The Monitoring Matrix Includes

1. Monitoring Requirement Description
2. Collaborators who complete the monitoring
3. Estimated Cost
4. Funding Status

Shelf Wide Ship Survey (Product 1)

Management Product 1: Hypoxia Task Force annual mid-summer hypoxic zone areal extent

Code	System Requirement	Collaborators	Estimated Annual Cost	Funding Status
S-1	Ship	LUMCON; LSU; NOAA; NGI	$190K using contract (OMAO) vessel	Supported: $110K by NOAA NCCOS for FY17 Needed: $80K for FY17; $190K for FY18 and beyond
D-1	Data Portal	GCOOS; NCEI	$35K for 3 months FTE (GCOOS)	Supported by NOAA IOOS to GCOOS from FY16 to FY20
			$35K for 3 months FTE (NCEI)	Supported: NOAA NCEI ongoing
D-2	Data Communication	LUMCON; LSU; GCOOS	$35K for 3 months FTE for GCOOS	Supported by NOAA IOOS to GCOOS from FY16 to FY20
			$35K for 3 months FTE LSU/LUMCON	Supported by LSU/LUMCON in FY17 Needed: FY18 and beyond

Total Annual Cost: $330K

FY17: Supported: $240K; Needed: $80K

FY18 and beyond: Supported: $105K; Needed: $225K

Empirical Model Support (Product 2)

Management Product 2: Guidance on nutrient reduction requirements to meet the Hypoxia Task Force Coastal Goal

	System Requirement	Collaborators	Estimated Annual Cost	Funding Status
N-1	Annual Nutrient Estimate (MARB)	USGS: Miss R at St. Francisville; Atch R at Melville); LSU: Miss R at Baton Rouge	$20K (USGS)	Supported: USGS ongoing
			$65K (LSU)	Supported: by LSU in FY17 Needed: FY18 and beyond
N-2	Real Time Nutrient Estimate (MARB)	USGS: Discrete sampling - Miss R at St. Francisville; Atch R at Melville; Real-time nitrate – Miss R at Baton Rouge; Atch R at Morgan City	$220K (USGS)	Supported: USGS ongoing
N-3	Daily Discharge	USACE: Discharge for Miss R at Tarbert Landing (01100), and Atch R at Simmesport (03045)	$80K (USACE)	Spported: USACE ongoing

Total Annual Cost: $385K

FY17: Supported: $385K

FY18 and beyond: Supported: $365K; Needed: $20K

Deterministic Model Support (East) (P 3-5)

Characterization of hypoxia east of Mississippi Delta (Mississippi Sound and Mobile Bay				
	System Requirement	Collaborators	Estimated Annual Cost	Funding Status
Mid-summer shelf-wide survey east of Miss Delta	USM; LUMCON; LSU	$50K	Needed	
Monthly shelf-wide ship surveys east of Miss Delta	USM; DISL; LUMCON; LSU	$50/survey X 11 surveys = $550K	Needed	
Maintain observation system east of Miss Delta at end of USM transect: USM 3M01	GCOOS; USM	Year 1: $50K to outfit with DO sensor Year 2 and beyond: $125K to maintain	Needed	

Gaps to discuss at meeting

- Limited sustained funding for most monitoring components
- Limited support for Q&A, archiving, and sharing of data – there is a major need to advertise the data.
- Need a more gulf-wide approach to provide sufficient data for deterministic modeling support

Questions

Deterministic Model Support (West)

Characterization of hypoxia west of Mississippi Delta and south of Louisiana			
Monthly cross-shelf transects C and F	LUMCON; LSU	$80K/survey X 11 surveys = $880K	Needed
Monthly cross-shelf transect from Barataria Pass to hypoxic zone core (CSI-9)	Louisiana CPRA; LSU		
Maintain observation system west of Miss Delta: CSI-9	GCOOS; LUMCON	Year 1: $100K for new probes and sondes (surface and bottom); Year 2 and beyond: $125K/yr to maintain	Needed
Maintain AOP observation system west of Miss Delta: CSI-6	NOAA OAR/OAP	xxx	
Maintain observation system west of Miss Delta: CSI-6	GCOOS; LUMCON	Year 1: $100K for new probes and sondes (surface and bottom); Year 2 and beyond: $125K/yr to maintain	Needed
Maintain observation system south of Atchafalaya: C	GCOOS; TAMU	$125K	Needed

Deterministic Model Support (Texas)

Characterization of hypoxia along Texas coast				
Ship survey(?)				
Maintain observation system west of Miss Delta at western part of shelf-wide grid: G	GCOOS; TAMU	$125K	Needed	
Glider(?)				

Deterministic … (Cross-regional and Impact)

Cross-regional monitoring and natural resource impact monitoring			
SEAMAP groundfish survey mapping hypoxia from June through mid-July	NMFS; LDWF	$190K	Supported: NOAA NMFS ongoing
SEFSC Shark/Snapper/Grouper Bottom Longline Survey	NMFS		
SEAMAP Ichthyoplankton Survey for the fall, spring, and winter	NMFS		
Pelagic Acoustic Survey	NMFS		
U.S. Gulf of Mexico Marine Mammal and Seabird Assessment for the summer and winter	NMFS		
U.S. Atlantic Marine Mammal and Seabird Assessment for the summer and winter	NMFS		

Deterministic … (Cross-regional and Impact)

Continued…

Deploy gliders; "Area" approach of Glider Implementation Plan: **4 cross-shelf areas from June through Aug, with 10-day runs per area (2 underwater autonomous vehicles ["gliders"] & 1 autonomous surface vehicle [ASV] needed per area)**	Ongoing Pilot Study: TAMU	Initial equipment investment = $1.44M based on $960K for 8 gliders ($120K each) + $480K ($120K each) for 4 ASVs Deployment costs: $705K based on $8K/day for ship, $12K/day for personnel, $1K/day/glider, and $2.5K/day/ASV	Supported: NOAA NGOMEX funding of Pilot Study in FY17 Needed: Year 1: $2.145M = $1.44M for equipment + $705K for deployment Year 2 and beyond: $705K for deployment
Maintain a data portal to make data accessible and to facilitate exchange (data management), and disseminate data and findings to research and management communities (communication)	GCOOS; NCEI (including Hypoxia Watch); LSU/LUMCON	$125K for GCOOS FTE	Supported: by IOOS to GCOOS from FY16 to FY20
		$125K for NCEI FTE	Supported: NOAA NCEI ongoing
		$125K for LSU/LUMCON FTE	Supported by LSU/LUMCON in FY17 Needed: FY18 and beyond

Monitoring Requirements are driven by Management Products

Product 1

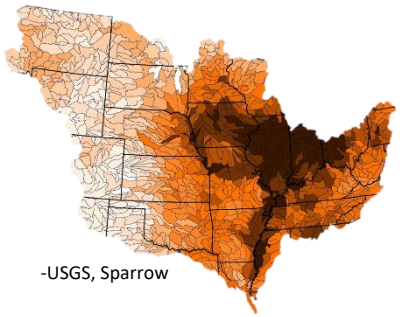
Management Need: Measure progress towards the Coastal Goal of the Hypoxia Task Force Action Plan

-Lumcon

Monitoring Requirement: Mid-summer shelfwide ship survey

Product 2

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

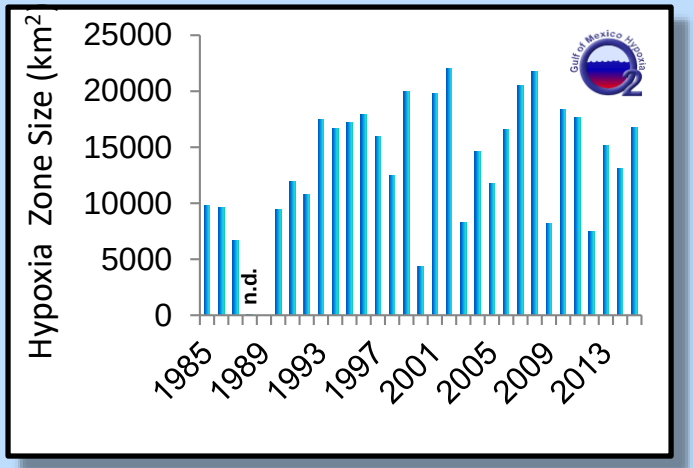


-USGS, Sparrow

Monitoring Requirement: Riverine nutrient loading and discharge data

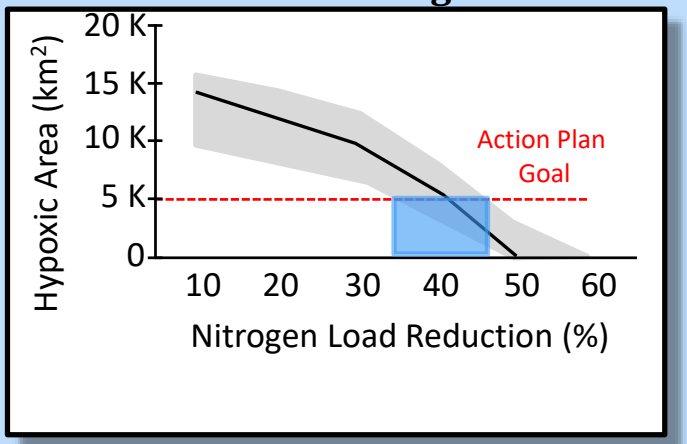
Model Integration / Validation

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 are driven by Management Products

Product 3

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

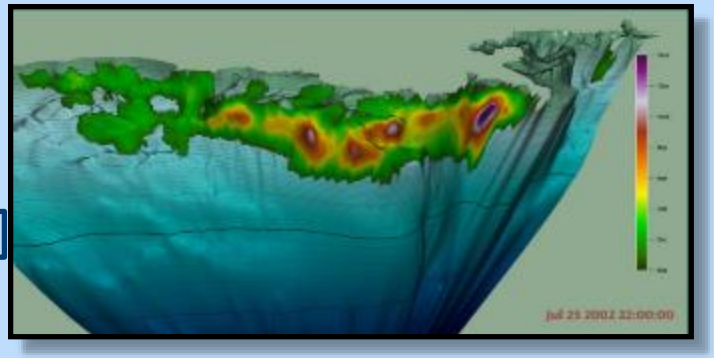
- NOAA)

Observations → Data → 3-D Model Analysis

Monitoring Requirement: Cruises, Gliders, Moorings

Model Coupling

3-D Time Variable Hypoxic Zone Characterization



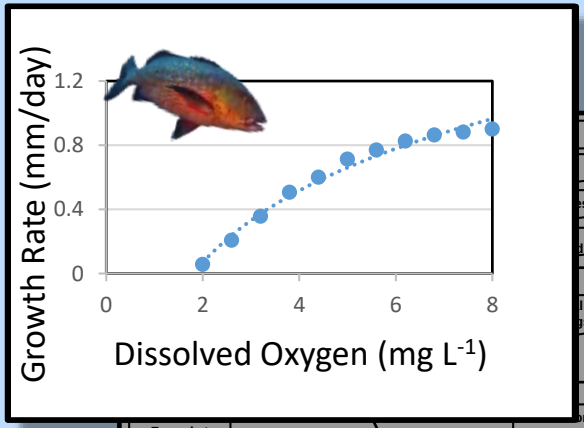
-Dubravko Justic

Product 4

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

- NOAA)

Living Resource and Habitat Impacts

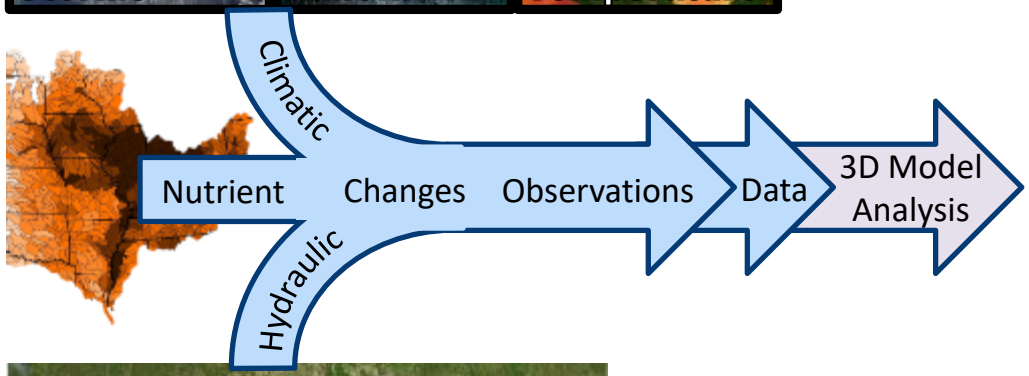


- Kim De. Mutsert et al. (Ecopath/Ecosim)

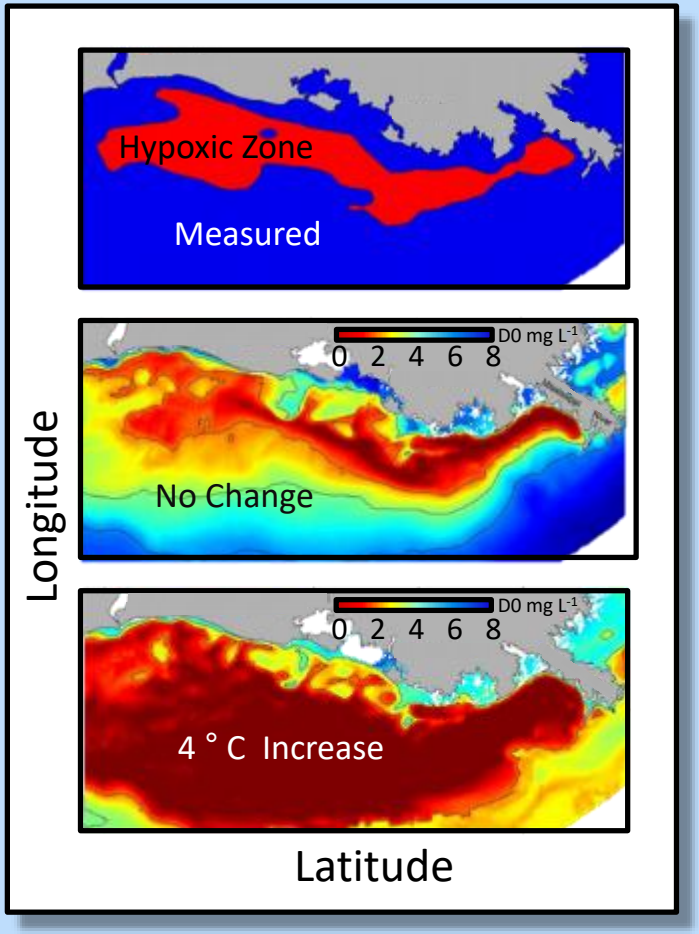
Monitoring Requirements are driven by Management Products

Product 5

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



- Dubravko Justic