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OCS Scientific Committee Meeting
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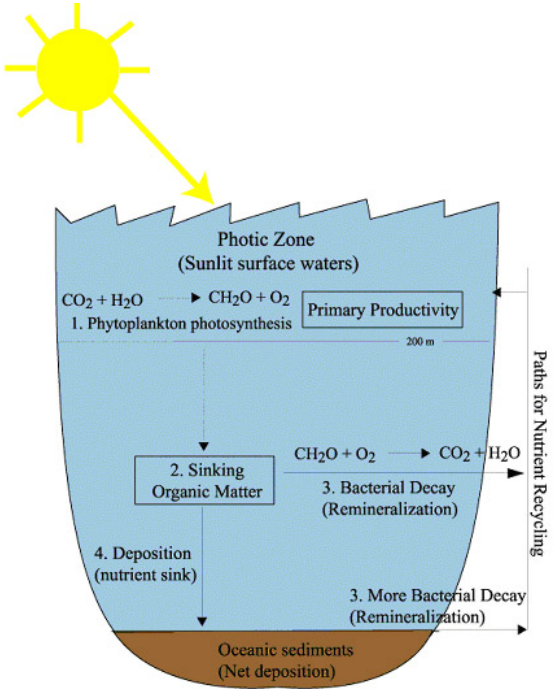
Page #	Break-out	Title	Rank
157	Inter	Gulf Oxygen Deepwater Experiment (GODEX): An Interdisciplinary Field Survey of Rates and Processes Controlling Distributions	FY2015 N/A



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Gulf Oxygen Deepwater Experiment (GODEX): An Interdisciplinary Field Survey of Rates & Processes

BOEM Information Need:

- OCSLA – Assess affected environment and any significant changes in quality.
- NEPA & EFH Consultations – Inform water quality and biological analyses.
- NEPA – Update data trend and cumulative effects analyses (e.g., climate).

Date Information is Required:

- Gulf Multisale EIS 2017-2022
- Timely to follow-up on MMS (2005) study.

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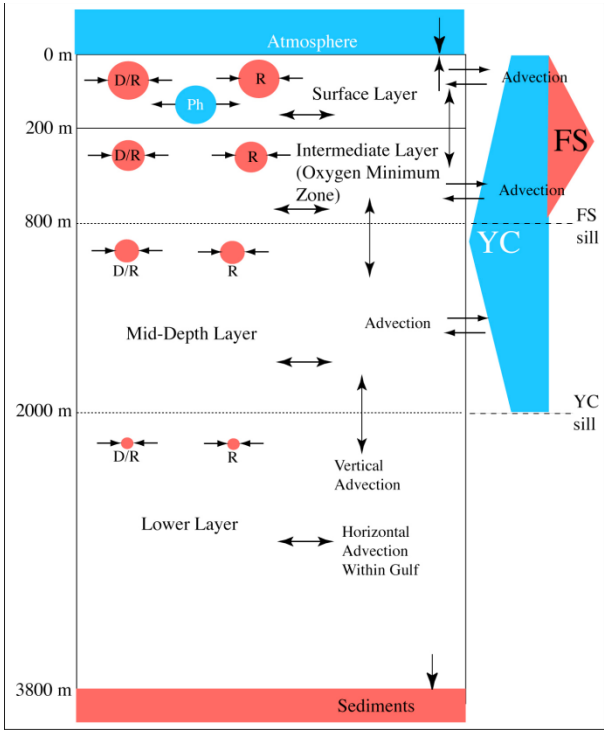
Background:

A) Relationship with Previous Work/Efforts

- Past study showed minimal contribution to shelf hypoxia from produced water.
- MMS 2005 Study: “Understanding the Processes that Maintain Oxygen Levels in the Deep Gulf”.
    1) Data search/synthesis/analysis for 1922-2001
    2) Box model of sources and sinks
    3) Recommendations for filling data gaps



MMS 2005 Report

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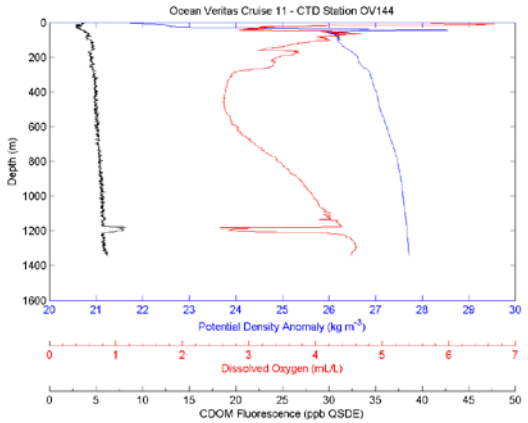
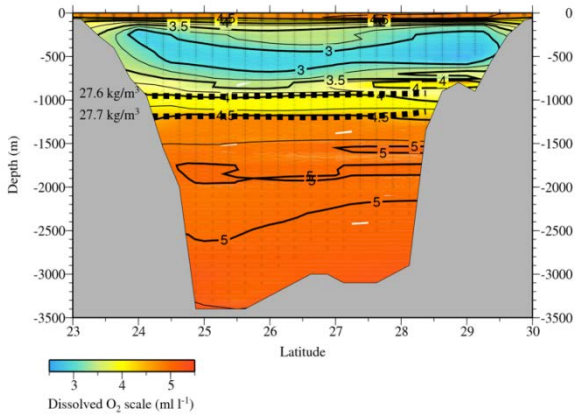
Gulf Oxygen Deepwater Experiment (GODEX): An Interdisciplinary Field Survey of Rates & Processes

Background:

B) Relationship with Concurrent/Future Efforts

- MMS 2005 study provided critical information during *Deepwater Horizon* oil spill.
  - Provided historical datasets & processes.
  - Dissolved oxygen depressions of 0.1-2.6 ml L^{-1}.
- NOAA's World Ocean Atlas 2009 provides GoM regional climatologies.
- Interest amongst multiple parties regarding increased glider use for Gulf environmental sampling.





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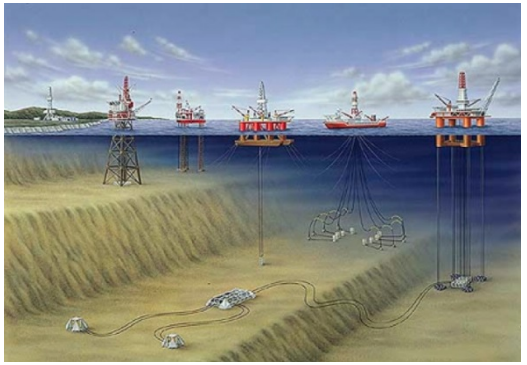
Gulf Oxygen Deepwater Experiment (GODEX):
An Interdisciplinary Field Survey of Rates & Processes

Study's Objectives:

- Overall, to collect and analyze dissolved oxygen and related measurements in Gulf deep waters to fill gaps identified in 2005 MMS study.
- Specific objectives:
  - Identify Gulf-wide horizontal structure of DO distributions and related measurements in OMZ and below 1,500 m.
  - Determine rates of DO consumption and related carbon cycle dynamics throughout water column, particularly below mixed layer.
  - Measure whether anthropogenic activities related to oil and gas operations in the deepwater Gulf affect DO levels locally.



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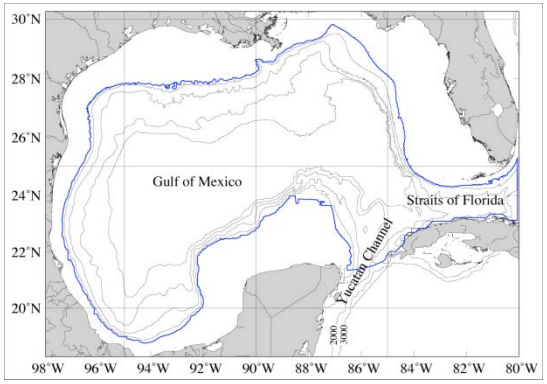
Gulf Oxygen Deepwater Experiment (GODEX):
An Interdisciplinary Field Survey of Rates & Processes

Study's Methods:

- Five-year study with 4 cruises anticipated (2 seasons/yr for 2 years).
- Gulf-wide + site-specific surveys in deep waters (>200-m isobath) using combo of ship-based and glider transects.
- Measurements: Dissolved oxygen, currents, T, S, nutrients, carbon, particulate matter, etc. Subset of stations: DO consumption rates, microbial community structure, trace metals, & hydrocarbons.
- Data analysis/synthesis of oxygen variability, contributing processes, and long-term trends.
- Coordination b/w US & Mexican scientists.



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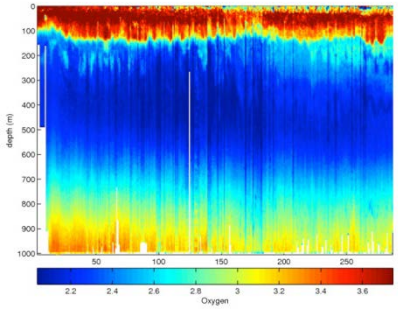
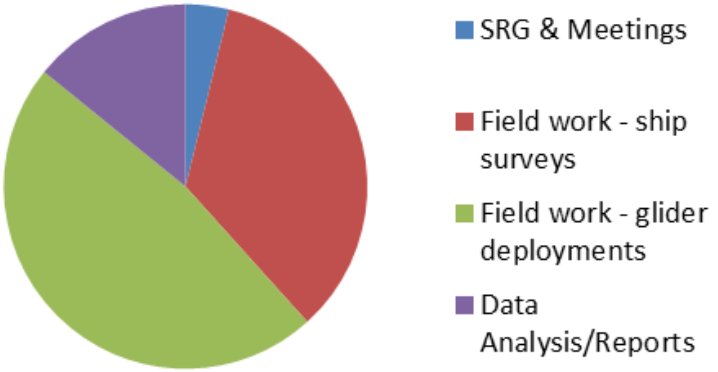
Gulf Oxygen Deepwater Experiment (GODEX): An Interdisciplinary Field Survey of Rates & Processes

Additional *Pertinent* Information

- Measurement resolution will benefit from new technologies.



- ~$5M estimated for study, as follows:



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… Develop partnerships!