GCOOS and the Oil and Gas Business

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Topics

- Industry’s role in the development of an ocean observing system
- The need for ocean observations in the oil and gas Industry
- The application of ocean observations in the oil and gas Industry
- Currently available observations
- Potential benefits to the energy industry of GCOOS
- Findings of the GCOOS Energy Workshop
- Conclusions
Industry’s role in the development of an ocean observing system

The role of industry in the building, operation and maintenance of the system should be clearly defined. Industry should not be viewed solely as a provider of technology or a user of the system, but as a full partner in the planning, implementation and operation of the system. This will require developing joint strategies with industry, for things as diverse as long-term sensor and platform technology, protection of intellectual property rights, and identification of possible ventures to create value-added products."

Admiral James Watkins on the IOOS
Industries role in the development of an ocean observing system

U.S. Ocean Action Plan
The Bush Administration's Response to the U.S. Commission on Ocean Policy

Monitor and Share Data on Ocean Currents in the Gulf of Mexico through New MMS Program.
In November 2004, the Minerals Management Service (MMS) issued a Notice to Lessees and Operators (NTL) to establish and implement an ocean current monitoring and data-sharing program in the Gulf of Mexico. Under the NTL, deepwater oil and gas platform operators will collect ocean current data from deepwater drilling and production sites, and publish it on the Internet. Initial feedback indicates that more than forty operating sites will collect data on a daily basis. MMS is also engaging industry in discussions on how this information may best be integrated into the IOOS currently under development.

President George W. Bush, July 31, 2001, Statement on Earth Observation Summit
The need for ocean observations in the oil and gas industry
The need for ocean observations in the oil and gas industry
The need for ocean observations in the oil and gas industry
The need for ocean observations in the oil and gas industry

• Prime Parameters of interest:
  - Waves
  - Winds
  - Currents
  - Air Pressure
  - Air temperature
  - Sea temperature

• Required data:
  - Accurate climatic statistics and hindcasts
  - Accurate nowcasts
  - Accurate forecasts
The application of ocean observations in the oil and gas industry

- Seismic exploration
  - Planning
  - Optimisation
  - Minimising environmental impact

- Exploration drilling
  - Design
  - Operations
  - Environmental assessments

- Transport of structures
  - Routing
The application of ocean observations in the oil and gas industry

- **Production**
  - Design
  - Operation
  - Abandonment

- **Pipelines**
  - Design
  - Installation

- **Shore installations**
  - Design
  - Operations
Currently available observations
Currently available observations
Currently available observations
Currently available observations
Currently available observations
Potential Benefits to Oil and Gas Industry of GCOOS

IOOS Stands to Improve:

- Storm and loop forecasts
- Oil spill response
- Design and operational efficiency
- Reduction in loss of life
- Reduction in spill impacts
- Reduction in capital costs
- Competitive position of U.S. offshore oil production
Potential Benefits to Oil and Gas Industry of GCOOS

Potential magnitude of economic benefits for the Gulf of Mexico with the implementation of IOOS.

<table>
<thead>
<tr>
<th>User Sector Users Estimated Economic Effects</th>
<th>($M/Y)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recreational Activities</strong></td>
<td></td>
</tr>
<tr>
<td>Recreational Fishing</td>
<td>$6.7-34.0</td>
</tr>
<tr>
<td>Recreational Boating</td>
<td>$4.0</td>
</tr>
<tr>
<td>Beaches</td>
<td>$105.6</td>
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<tr>
<td><strong>Transportation</strong></td>
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<td>Freight</td>
<td>$30.7</td>
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<tr>
<td><strong>Health and Safety</strong></td>
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<td>Search and Rescue</td>
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<td>Oil Spills</td>
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<tr>
<td>Tropical Storm Prediction</td>
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<tr>
<td><strong>Energy Oil and Gas Development</strong></td>
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<tr>
<td>Commercial Fisheries</td>
<td>$14.1-26.3</td>
</tr>
<tr>
<td>Commercial Fisheries</td>
<td>$2.1</td>
</tr>
</tbody>
</table>

Table 3-1. Order of magnitude estimates of potential economic benefits of the GCOOS to eleven sectors in the Gulf of Mexico as estimated by Charles Colgan and Hauke Kite-Powell (2004). Estimates do not include the west coast of Florida.
Findings of GCOOS Energy Workshop

**PRODUCTS**
- Hurricane severity forecasts
- Surface current forecast maps
- Measurement & product archive
- Operational maps of SST
- Forecast maps of 3-D deepwater currents
- Forecast maps of winds and waves (& crests)
- 3-D current forecasts on shelf
- Probability maps of bottom hazards
- Marine mammal & turtle maps
- Legacy measurement & product archive
- Improved storm surge probability maps (not real-time)
- Severe weather monitoring
- Maps of water quality (DO, PH, etc.)
- Maps of hydrocarbon seeps
- Maps of chemosynthetics & arch. Sites
- Maps of SSH, Color Imagery
- Bathymetry, topography, soil maps
- Temperature/Salinity profiles

**MEASUREMENTS**
- Hurricane severity model improvement
- Operational satellite altimeters, near real-time
- Operational satellite radiometers, near real-time
- Operational satellite wind (QuikSat), near real-time 2 Hz wave data
- Measurements to improve hurricane severity forecasting, real-time offshore meteorology
- measurements (V, P, T, H), real-time
- Upper-column current & temperature/salinity profiles, real-time
- 3-D Ocean current model forecasts, real-time
- Marine mammals and sea turtle sightings
- High resolution coastal bathymetry, topography, & subsidence rates
- Turbidity current, not real-time
- Water quality parameters Offshore HF radar, real-time
- Caribbean inflow (Yucatán or Florida Straits), real-time
- Identification of hydrocarbon seeps
- Identification of chemosynthetics & arch. sites
Findings of GCOOS Energy Workshop – Pilot Projects

• Project to develop proven forecasts of three-dimensional surface currents for the Gulf of Mexico (H)
• Development of a measurement and products archive for the deepwater Gulf of Mexico (H)
• Produce maps of marine mammals and endangered turtles in the Gulf of Mexico based on legacy information from the NMFS and MMS projects and real-time observations from the oil and gas industry (M)
• Produce probability maps of bottom hazards (H-) and maps of hydrocarbon seeps (L)
• Improving forecasts of hurricane severity (H)
Conclusions

• Accurate ocean data is crucial to safe and cost effective design and operation of offshore drilling facilities
• Ocean Observing systems represent a valuable method for obtaining data
• Offshore operators must be involved OOS as partners to ensure their data requirement are addressed
• Valued added products will be required and these may be produced from the underlynig data from the observing systems providing opportunities for contractors and consultants
• Pilot projects and there subsequent evolution into operational systems can "plug" holes in the system and promote the advancement of Observing Systems
• The requirements of oil and gas operators have many synergies with other user groups and ocean Observing systems provide an excellent method to making data publically available
Invitation to Pemex

• Become a signatory to the Resolution to help develop GCOOS

• To consider sharing with GCOOS non-proprietary, non-commercial data or products of mutual interest.

• To consider offering members to the GCOOS Councils and Committees.
Thank You