Gulf Oil Spill Response

RVTEC 2010

–BERMUDA-

Institute of Ocean Sciences

Technical Community

- From our standpoint, how well did we respond as a technical community?
- Lessons learned?
- What can be improved?


University-National Oceanographic Laboratory System
UNOLS 2010 Annual Meeting
October 14 & 15, 2010
OFFICE OF
ONR
NAVAL RESEARCH
BOEMRE
NOAA
USGS
NSF

UNOLS Vessel Operations in response to the Gulf of Mexico Oil Spill

2010 -GULF OF MEXICO RAPID RESPONSE REQUESTED CRUISES- As of 29 Sept 2010

PI	Funding Agency/Grant#	Status	Ship	Dates	# Day	Ports
Arzayus	NOAA/NURP	Funded	Pelican	4/30-5/16	17	Cocodrie to Cocodrie
Gardener/NOAA cruise with Ostrom/NSF & Liu/NSF	Gardener-NOAA Ostrom-NSF1042887 Lui-NSF1042908	Funded NSF-portion Funded	Pelican	5/21-5/27	7	Cocodrie to Cocodrie
Roman, Boicourt, Brandt, Kimmel,Lavrentyev, Pierson	NSF1043248 NSF1043261 NSF	Funded	Pelican	9/1-9/7	7	Cocodrie to Cocodrie
Felder	NSF1045690	Funded	Pelican	12/2-12/6	5	Cocodrie to Cocodrie
Lutken Singer Rabalais	BOEMRE BOEMRE NOAA					Portion of cruise days on DWH effort
Kessler Transit	NSF	Funded	Cape Hatteras	6/5-6/10	6	Beaufort to Gulfport
Kessler w/ Yvon-Lewis, Bianchi, Raymond, Mills,Valentine	NSF1042650 NSF1042097	Funded	Cape Hatteras	6/11-6/20	10	Gulfport to Gulfport
Chris German	NSF1044289	Funded	Cape Hatteras	6/21-6/25	5	Gulfport to Gulfport
Joe Montoya	NSF-0928495	Funded	Cape Hatteras	8/19-9/17	30	Gulfport to Gulfport

PI	Funding Agency/Grant#	Status	Ship	Dates	# Day	Ports
Yeager Transit	BP/NOAA	Funded	Cape Hatteras	10/7-9 10/22-27	3 6	Key West to Gulfport Gulfport to Beaufort
Kevin Yeager	BP/NOAA	Funded	Cape Hatteras	10/10-10/21	12	Gulfport to Gulfport
Samantha Joye	NSF1043225	Funded	Walton Smith	5/21 to 6/11	22	Miami to Miami
Malinda Sutor	NOAA/NRDA	Funded	Walton Smith	8/30-10/8	40	Miami to Miami
Camilli Transit	NSF	Funded	Endeavor	6/8-6/14	7	Narragansett to St. Pete
Camilli, (Reddy, Valentine,Kessler)	NSF1045025	Funded	Endeavor	6/15-7/2	18	St.Pete to St. Pete
Montoya	NSF0928495	Funded	Oceanus	8/19-9/17	30	Gulfport to Gulfport
Joye Transit	NSF	Funded	Atlantis	10/28-11/5	9	Woods Hole to Galveston
Samantha Joye	NSF0801741 NSF1043225	Funded	Atlantis	11/6-12/4	29	Galveston to Gulfport
Charles Fisher	NSF 1045083	Funded	Atlantis	12/5-12/15	11	Gulfport to Gulfport

Ship Day Totals- 274 days of UNOLS Ship Days/ 277K in instrumentation/Additional Technician Support

LUMCON- R/V Pelican- 36
DUKE- R/V Cape Hatteras- 72
RSMAS- R/V Walton Smith- 62
URI/GSO- R/V Endeavor- 25
WHOI- R/V Oceanus-30 and R/V Atlantis-49

Outlook for the Future in the Gulf Of Mexico

BP and the Gulf of Mexico Alliance Announce Implementation

- BP's $ 500 Million Independent Research Initiative
- Release Date: 29 September 2010- BP America Press Relations
- "BP's $500 million GOM Research Initiative (GRI) to study the effects of the Deepwater Horizon incident and the potential associated impact on the environment and public health over a 10 year program."

Outlook for the Future in the Gulf Of Mexico

- The Gulf of Mexico Alliance will administer the GOM Research Initiative with the ability to execute contracts and provide the required program management support.
- Managed by a board comprised of scientists from academic institutions with peer-recognized credentials.
- Funds will be distributed using the practice of merit review by peer evaluation as described in the 2005 Report of the National Science Board (NSB-05-119)

WET Labs

- Major increase in sensor production in response to the oil spill – order of dozens in the first 3 months
- Sensors are an essential part of the Sea-Bird CTD packages on board the ships active in the Gulf
- Had to amp up their build schedules to accommodate the increased # of requests and quick delivery needs

WET Labs Sensor Package

- WET labs offers a complete package of instrumentation
  - C-Star Transmissometer
  - ECO Backscattering
  - Chlorophyll *a*
  - CDOM – Colored Dissolved Organic Matter
- Addt'l info from the package helps distinguish false positives from the organic matter from phytoplankton
- Chl *a* allows user to see fluorescence & determine if from the response
- NTU (Nephelometric Turbidity Units) allows user to compare total suspended particulates through backscattering
- Combined 3 parameters ensures that the cruise oil signal can be well discerned

WET Labs Reports/Info

- WET Labs says their inquiries have slowed
- Expected a shift into long-term monitoring
  - But this hasn't yet happened
- JAG Reports (current)
  - http://ecowatch.ncddc.noaa.gov/JAG/index.html
- Thomas Jefferson reports include some sensor issues
  - http://www.noaa.gov/sciencemissions/PDFs/tj_deepwaterhorizon_responsemissionreport_june3_11_2010final.pdf
- Maps & Data
  - http://www.noaa.gov/sciencemissiongs/bpoilspill.html

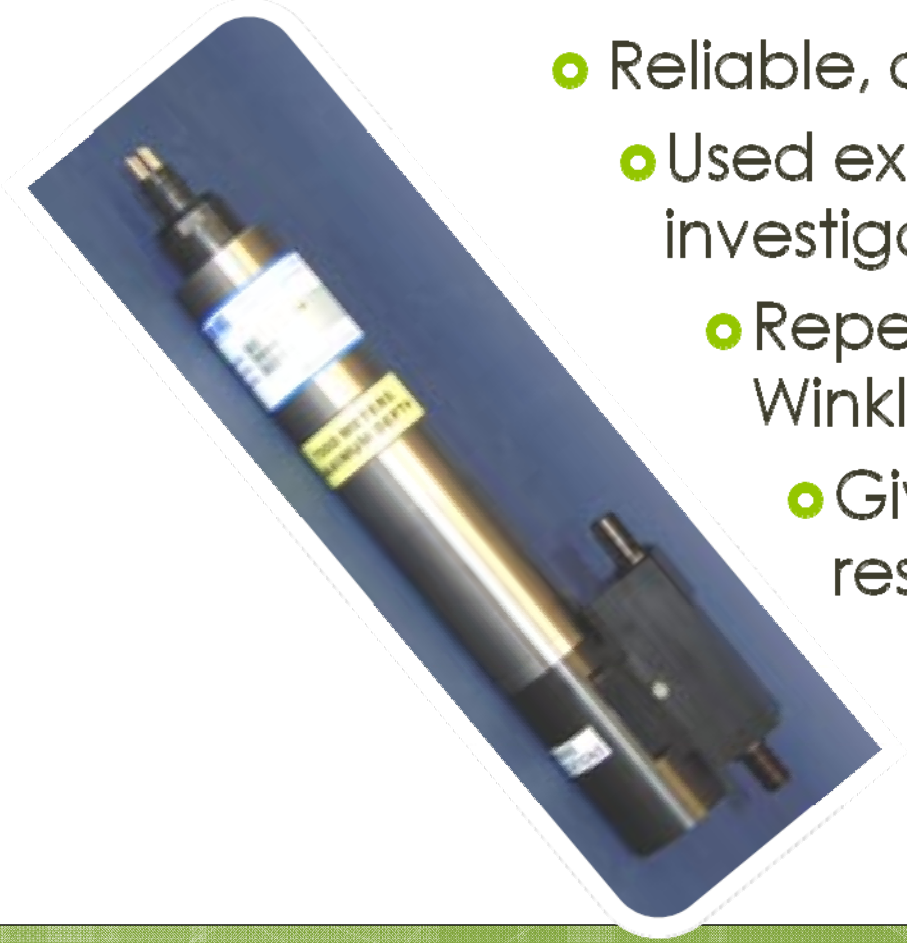
Sea-Bird Electronics (SBE)

- **I asked, SBE answered: with more questions for us!**
  - **Carol Janzen, Physical Oceanographer, PhD**
  - **Research & Development, Scientific Analysis & Oceanography**
  - **SBE wants feedback from the RVTEC Community!**
- **SBE responded to my 7 questions with a very impressive (5 page) email with ample information about sensors, maintenance, response & mitigation factors**

SBE Equipment

- **SBE instrumentation monitored water quality and provided a platform for WET Labs sensors**
  - **CTDs – SBE 9-11*plus***
  - **SBE 19+ SeaCat CTD**
  - **SBE 25 SEALOGGER CTD**
  - **Modular sensors – especially SBE 43 Dissolved oxygen**
- **Many people donated and/or loaned personal equip to the GOM to support the effort**

SBE: What types of sensors? For?



- SBE 43 DO in high demand
  - Reliable, accurate
    - Used extensively for plume investigation
      - Repeatedly validated with Winkler titrations
        - Gives confidence in results, in & out of spill zone

Baseline or Oil Observation?

- ✓ Sensor use reported for both baseline studies and spill response observing
- ✓ Newly acquired sensors were to gather data from the affected spill zones

- ✓ SBE CTDs are on most (if not all) active gliders in the Gulf at the present time (plume observation)
- ✓ Biggest concern for SBE customers was keeping the thicker surface oil off the sensors as the CTDs were deployed

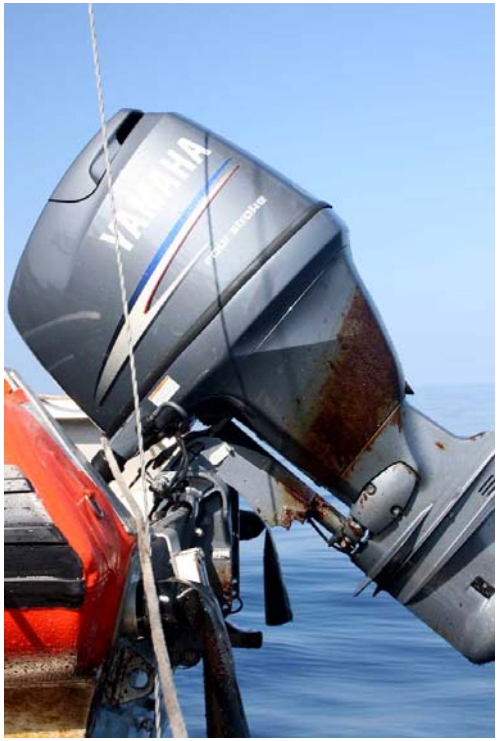
SBE Service/Production increase?

- Production initially was stepped up to meet demand
- Service not so much, yet – for several possible reasons
  - CTDs & sensors worked fine – no known issues
    - no ill effects, damage
    - no poor data quality
  - SBE Cleaning/Sampling protocols worked very well
  - Kept instruments clean, and from getting fouled or damaged
  - SBE dedicated a central contact person to help answer increase in customer concerns
  - Carol Janzen, PhysOc PhD

SBE Tracking Sensors

- Long-term tracking in the event of issues
  - About a dozen have returned for cal from GOM
  - No damage so far
  - Good post cruise cals so far
- Continued evaluation of components for degradation
  - O-rings
  - neoprene cables
  - rubber parts
  - All OK, but long term?
- Input any exposure on SBE Service Request Form
- SBE wants our input & to help in any way

SBE Resources



- http://www.seabird.com/
- Oil Spill Information Center
- Instructions/Application Notes/Recommendations:
  - General Instructions for Avoiding Oil Contamination
  - Cleaning Protocols for SBE CTDs
  - SBE 9*plus* Deployment protocol
  - SBE 19 Deployment protocol
  - SBE 25 Deployment protocol
  - SeaSave V7 Quick Start
- Reference
  - NOAA Science Missions & Data
  - WET Labs cruise Oil Detection Advisory & Lab Results

Lessons Learned?

- Sensors performing to spec
  - Winklers
  - Salinity
  - Post-cals
- No shifts observed
- Following standard protocols has kept the instruments free from long-term exposure, preserving their stability (KUDOS for the good work!)
- Plumes do not appear to affect sensor response
- Corresponding water samples with CTD/DO data agree throughout the water column

What can we, Tech Community do?

COMMON SENSE ANSWERS:

- Keep instrument cals up to date
- Keep a suite on hand just for this purpose – rotate
- Keep an inventory & status
  - Age
  - Dates of service
  - Cal history
- Spare cables & o-ring kits
- Know TATs (3-4 wks, or <)
- When poss, salts/O2s
- Read APP NOTES!
- Tech Training