Lamont-Doherty Earth Observatory

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MLSOC UPDATE- JULY 2011

MLSOC Meeting July 12, 2011 Teleconference

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OMO Update Outline

- OMO Personnel Changes –January-July 2011
- OMO Strategic Plan and Home Port Updates
- Update on 2011 SSSE and Ocean Instrumentation Awards
- Glosten Winch Study/Long Core Study Update
- Science Update on 2011 Cruises
- Upcoming science cruises and schedules
- Future Maintenance Projects

Key OMO/LDEO Personnel Changes- Jan. to July 2011

1) Dr. Helene Carton will serve as "Chief Scientist" for OMO as of July 1 to take on duties related to Acoustic Source modeling/source signatures and to assist with regulatory questions for protected species mitigation.
2) LDEO Property Manager Hired February, 2011 – Noreen Booth
3) LDEO Deputy Director for Research Management hired July 1- Kathleen Callahan
4) Martin Klein hired full time as Asst. Marine Operations Manager for Ship Operations on May 1.
5) Anthony Johnson, Sr. Science Office for IT resigned in June, 2011.
6) Ryan Eaton promoted to Jr. Science Officer in June, 2011. Currently focusing his training in IT and Navigation.

OMO Strategic Plan Update

Office of Marine Operations (OMO)

- Implementing the new 'working version' of the Office of Marine Operations (OMO) strategic plan was one of the five highest priorities for the Earth Institute over the past six months.
- **Changes and New Priorities added:**
- 1. **Change:** Define an additional objective in the Strategic Plan "Provide robust support to science expeditions".
  Progress: OMO and the Earth Institute restructured the OMO Strategic Plan to highlight operational goals and achievements as an integral part of its long-term mission as a large research facility that meets the needs of the oceanographic community.

OMO Strategic Plan Objectives

1) **Provide robust support for science expeditions**

2) Respond to all issues raised in the Business Systems Review (BSR), achieve administrative improvements, and ensure compliance with federal regulations at all levels

3) Ensure the long-term financial viability of the Marcus G Langseth as a global-class academic research vessel

4) Achieve general purpose oceanographic capacity while maintaining unique seismic capabilities as a leading global-class vessel in the UNOLS Fleet

Objective 1

Provide robust support for science expeditions

- Supporting upcoming science expeditions and bringing *Langseth* successfully through scientific operations over the next 5 years

- Measures of Success
  - Maintaining excellent operational and scientific success for all Langseth cruises.
  - Cruise planning, staffing, marine mammal monitoring, ship and equipment support, scientific outreach activities

1-year

- Continue to improve pre-cruise planning with principal investigators (PIs) based on new NSF-approved Science Support Plan and UNOLS detailed post-cruise assessment forms developed by OMO.
- Meet with principal investigators (PIs) at the American Geophysical Union (AGU) to discuss CY2012 operations.
- Identify staffing requirements to meet goals for scientific research, outreach, and marine mammal observation.
- Continue to realize cost savings from 2011 (approx. $300,000) by completing the protected species observer contract and potentially engaging in other marine mammal protection activities.
- Complete new staffing hires and job description changes within OMO, as part of our Workforce Plan, building on successful recruitment of the new Assistant Operations Manager and LDEO Property Manager hires in 2011.

1-year

- Continue to improve ship conditions such that the *Langseth* receives a "good" or better rating in all inspection categories
- Implement critical 2011 purchases and maintenance items as outlined in the 5-year Major Overhaul and Stabilization Account (MOSA) plan, Shipboard Scientific Support Equipment (SSSE) and Oceanographic Instrumentation proposals, prepared by OMO. This includes phasing in changes outlined in the Glosten Winch Plan to expand on general oceanographic capabilities (see objective #4, below).
- Distribute the new *R/V Langseth* brochure and UNOLS Seismic Research Goals documents via on-line sites, as well as at AGU and other conferences
- Continue updates of *Langseth* and OMO web sites and create devoted web pages for each *Langseth* cruise to assist individual Principal Investigator's with their outreach efforts

NSF Inspection March 2011

- JMS conducted a general condition survey pier side and underway of the R/V Langseth on March 8th and 9th, 2011 in San Diego, CA at the request of the National Science Foundation.

- "The R/V MARCUS LANGSETH is being maintained in a condition which meets or exceeds the standards usually expected of a research vessel of this size and service. The vessel is in a GOOD state of material condition. **Significant improvement has been made since the previous inspection.**"

2011 Completed Shipyard/Maintenance Projects

Painting:

Main, OBS, and Paravane Decks

Flying Bridge, Bridge Visor, Superstructure, Stern Ramp, etc.

Interior spaces…Galley, some accommodations, store rooms, and chain locker

Repairs/Inspections Completed

Rudder Seals

Rolls Royce Pitch Control System

ABS Required Tank Inspections

Steel Work and Hull Piping Decking (Shipyard)

Doors/Hatches

New Incinerator

Extensive Hydraulic Hose Repair

Bilge Cleaning/Preservation (Bow Thruster, Engine, and Compressor Rooms)

Gearbox/Clutch Inspections

Seismic/Gun Winch Inspections and Initial Repairs

Mold Mitigation Projects in Main Lab and All Air Ducts to work/habitation spaces

Accommodation Upgrades – New Flooring/Furniture and Upgrade of Galley, new

Refurbished Anchor Chains

Improve Lighting in lab spaces and common areas (ongoing)

Streamer winches wireless remote controls

New Control System on CAT Engines

Repairs to Ariel Compressors

Technical Services Update

Western-Geco Streamer Acquisition Completed

Completed agreement to obtain all remaining Syntrak seismic equipment from Western-Geco. ~40km of streamer sections along with a lot of other needed equipment were delivered in March 2011 in time for Bangs 3D CRISP Survey.

LDEO Marine Warehouse: All streamers and other OMO equipment will be brought to LDEO for long-term storage.

2010/2011 Maintenance Period Science Projects

- ADCP Installation
- New 3.5khz Transducers for Sub-bottom Profiler for Knudsen 3260
- Wireless Remote Controls for streamer system
- Modifications to A-Frame- including new winch for OBS deployments

Technical Services Update

Other Equipment Recently Acquired from Western-Geco

5 ea	Spare Baro46 Deflector Foils
6 ea	Partnerplast 18” Source Float Nose Pieces
2 Boxes	8pin to 8pin Armored POSNET GPS jumpers (2ea per box) unknown length.
1 Boxes	MISC Sonardyne SIPS1 Acoustic Transponder Parts
3 Boxes	Hardened Transport Boxes with Syntrak Streamer Test Equipment inside.
1 Pallet	DigiCourse 15ea Right Angled (Source/Tailbuoy) Acoustic Transducer.
2 Pallets	DigiCourse 55ea CTX Power/Communication Modules for Source/ Tailbuoy Acoustic Transducer.
1 Pallet	DigiCourse 3ea Haul Mount Acoustic Transducer, 1 ea Straight (Source/Tailbuoy) Acoustic Transducer.
1 Pallet	DigiCourse 6ea Straight (Source/Tailbuoy) Acoustic Transducer.
6 Pallets	DigiCourse 80ea CMX Cable Mounted Acoustic Transponders, 12 ea CTX Power/Communication Modules

Other Equipment Recently Acquired from CGG/Veritas in Houston, TX

- 5 x 1000m Syntrak Light Lead-ins. They are Syntrak optical Light Weight (25mm) Lead-ins, which is much smaller OD then the 33.7mm ones we currently use. This would benefit us in a couple of ways. First being the reduced Diameter would be a big reduction in drag. The Second thing would be the Weight per meter is considerably less and could allow us to go into shallower water with a multi-Streamer array in tow.

ISSUE: Terminations must be checked for compatibility with our optical system. This check is ongoing now.

- 5 spools with 5ea x 18mm x ~120m Synthetic Streamer Separation ropes.

Objective 2

Respond to all issues raised in the Business Systems Review (BSR), achieve administrative improvements, and ensure compliance with federal regulations at all levels

- **New Priority:** Complete BSR implementation plan and successfully renew NSF awards to continue *Langseth* operations in CY2012. **Progress:** With completion of many major components of the BSR implementation plan and the 2011 NSF ship inspections, OMO will focus on achieving success in the BSR review as well as new NSF awards for 2012 *Langseth* activities. Conversion of technical services/mammal awards to cooperative agreement(s) as well as changes in their financial structure to incorporate University-negotiated indirect costs will be pursued with University and agency representatives.

Objective 2: Other Key Deliverable (continued)

- Developing a sustainable workforce plan with key goals:

1. Negotiate a new union contract for licensed deck and engineering officers more, aiming for a reduction in personnel costs to the university
2. The workforce plan will take into close consideration roles and responsibilities and individualized skills to ensure the appropriateness of individuals for their positions
3. OMO will evaluate work requirements within the administrative office of OMO, and will determine what organizational structure and technical and administrative skills will enable OMO to best achieve its mission.

Objective 3

Ensure the long-term financial viability of the Marcus G Langseth as a global-class academic research vessel

- **Objective 3**. Conducting studies of factors that can improve the long-term operational effectiveness of *Langseth*, such as fuel pricing and consider futures contracts if feasible. Initiate study to analyze issue of a home port for the vessel. Consider long-term port options that include leasing wharf space on an as-needed or recurring basis, partnering with other institutions, and locations along the Gulf of Mexico and other US coasts.
- **1-year goal:** Identify and discuss the possibilities of procuring a home port for *Langseth* with potential partner organizations, commercial leasing agents, and ports of opportunity

Objective 3: Other Deliverables

- 1 year
  - Through careful planning and management, pursue clear plans to start the collaboration with USGS with successful cruises in 2011 and beyond.
  - Focus on scheduling overall and begin a process of identifying important schedule footholds over the long-term to allow for better planning for lower budget and operational periods in case of lack of funding
    - Plan around these schedule footholds so that to the extent possible, any interruptions, such as unplanned necessary maintenance, can occur at times that would be minimally disruptive to the overall full-year schedule

Objective 4

Achieve general purpose oceanographic capacity while maintaining unique seismic capabilities as a leading global-class vessel UNOLS Fleet

- Additions being considered for general purpose use:
  - A CTD Winch and handling equipment (including an appropriately-equipped wet lab). Funding for CTD winch is still pending.
  - Mooring handling equipment
  - Gliders and AUVs handling equipment
  - Coring capability (including consideration of Long Coring Facility)
  - Undertaking detailed study Dynamic Positioning system, including consideration of whether this capability should be expanded
  - Towing capability (which the stern was already modified to allow for)

Status 2011 SSSE PROPOSAL ITEMS

Glosten Winch Plan Items: Status of Phase 1: Pending..

- Cost of structural modifications for Phase 1- Main Deck to support other items
- New CTD Winch
- Installation of new winch house

Additional Items:	Status
•Installation of new PAM and Magnetometer winches	Completed
•New Science Workboat	Approved
•2-Halogen Bridge Searchlights	Finishing Installation
•Upgrade of radio equipment for A4 Conditions –	Completed
•New Chemical Locker	Deferred
•Upgraded Tele-Medicine	Under Review
•Portable Shop Van.	Under Construction
•Appendix B Requirements: Maximum Capacity Document for Langseth Winches	Under Review
NEW: Long Core and DP Capability Study	Moving forward

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Status of 2011 Oceanographic Instrumentation Award

Ranking	Item	Status
1	Teledyne RDI 75kHz “Ocean Surveyor” ADCP	Completed
2	Applanix POS/MV V.4 Upgrade & IMU Replacement	Purchase Pending
3	Uninterruptable Power Sources	Deferred
4	Two SBE-45 TSGs	Items just shipped
5	Sonobuoy Electronics Package	Deferred
6	SIPPICAN MK-21 Interface	Purchase Pending
7	GEOMETRICS 882 Magnetometer	Purchase Pending
8	EM-122 Water Column Logging License	Deferred
9	Mammal Mitigation Gun	Purchase Pending

2011 SSSE and Beyond: Glosten Studies for Winch Plan and Long Core

2012 SSSE Proposal: Phase I Glosten Continued

We will propose:

•The installation of a deep sea winch capable of 10,000m of 9/16" 3 x 19 wire;

•Moving stanchions on the main deck near airgun strings and spreading the gun rails to improve deployment and flexibility of the seismic sound source;

•An integrated crane plan that accounts for expected science and operational handling requirements.

Critical issues to be included in the crane plan are maintenance, capacities, reach, and ideal locations to better support all operations

Beyond 2012 – Combining Winch Study and Long Core Study

The focus will be on the issues associated with Phase II of modifications proposed in Glosten report. The first issue is the modifications required to enhance our general purpose capability. This will be evaluated in context of Long Core Design Study.

A second key issue relates to identifying modifications that help mitigate overflow of seawater along the starboard rail. Such steps would improve our ability to protect our shipboard equipment from the maintenance problem this creates on all exposed decks.

Long Core Facility Update

Early 2011, UNOLS Fleet Improvement Committee and NSF reviewed Phase 1 study by Glostens of possible options for moving Long Core Facility from Knorr to another vessel. The results of that study and review were circulated by Sandy Shor to MLSOC.

Last week, NSF (Matt Hawkins) informed OMO that Phase 2 Study for detailed design specifications will continue on R/V Langseth. All other vessel options have been ruled out at this point including new Ocean Class.

OMO will modify its 2011 SSSE proposal to include new Glosten Study of Long Core Facility to include 3 key study points:

1) Detailed design specifications – including trim/stability analysis (i.e. impacts on fuel capacity, OBS deck, tank configuration),
2) Work with Kongsberg on detailed study of DP capabilities – (use opportunities in our current schedule to test existing system.
3) Ensure our existing Glosten Winch Study and new Long Core Study objectives are evaluated together for compatibility.

2011 Science Update (…so far!)

CRISP 3D Survey- Offshore Costa Rica- April-May 2011

This project acquired a 11 x 55 km volume of 3D seismic reflection data to examine the 3D structure of the Costa Rica convergent margin near Osa Peninsula. All objectives were met according to PI's Eli Silver and Nathan Bangs. Mitigation for turtles added a significant complexity for infill/reshooting.

The goal was to examine the structures and rock properties associated with the downdip transition into the seismogenic zone along the plate interface. This project is in support of the IODP CRISP deep riser drilling program and the MARGINS-SEIZE initiative.

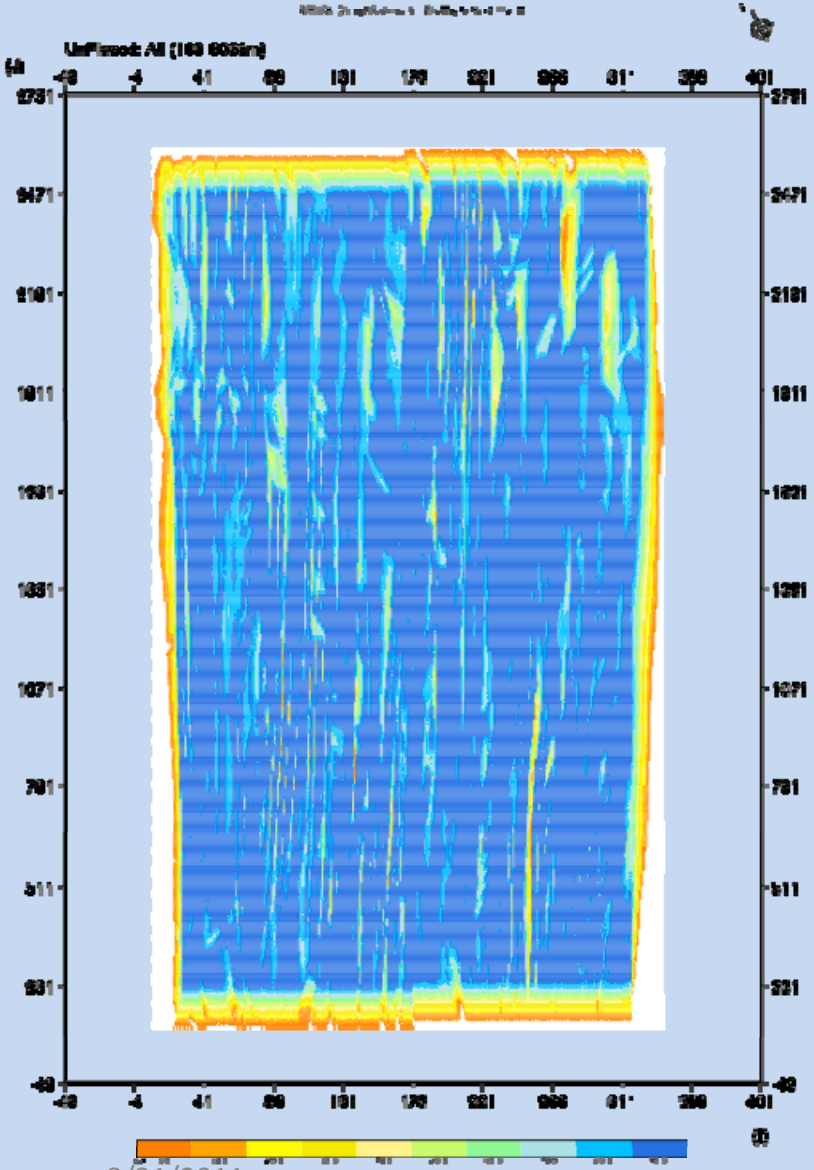

Fig. 1: (left) Final REFLEX Coverage Summary for all near and far hydrophone.

Table 1: (below) Operations Summary

CRISP 3D Survey Operations Summary

	TOTALS(hrs)	PERCENTAGES	
Operations Summary			
Streamer Deployment/Retrieval	74.06	9.50%	
Source Deployment/Retrieval	1.89	0.24%	
Recording	459.07	58.89%	Total Time Data Collection 73.90%
Line Change	104.92	13.46%	
Maneuvering	12.08	1.55%	
Total Operating Time	652.03	83.64	
Sources of Downtime (DT)			
Weather	0.00	0.00%	
Instrument DT	0.38	0.05%	
Hydraulics DT	0.00	0.00%	
Source DT	11.96	1.53%	
Streamer DT	31.47	4.04%	
Seismic Air Compressor DT	28.32	3.63%	
Navigation DT	0.58	0.07%	
Mammal	26.15	3.35%	
Ship Repair	28.70	3.68%	
Total Downtime	127.56	16.36%	
Total Hours	779.58	100.00%	
Total Transit to/from Site	~15 hours		

2011 Science Update (…so far!)

USGS Gulf of Alaska Summary – June 2011

(From Post-Cruise Assessment of Barth, Gulick, and Childs)

"The June 2011 cruise MGL 11-09 to the Gulf of Alaska was a resounding success. The primary cruise objective was to determine the thickness of sediments along the outer portions of the Surveyor and Baranof fans in order to test whether these regions have sufficient sediment thickness to satisfy the criteria for extended continental shelf under Article 76 of the Convention on the Law of the Sea, i.e., "

Additional objectives were to develop:

- information on framework geology for this remote part of the ocean
- to explore the processes control the distribution of sediment in this region
- to understand the interaction of basement topography and sediment transport
- to contribute data to further refine the history of climatic and tectonic influences or the development of these deep-water fans.
- contribute to an IODP drilling proposal in the Gulf of Alaska,
- contribute to the understanding of earthquake and tsunami processes on the Alaska margin.

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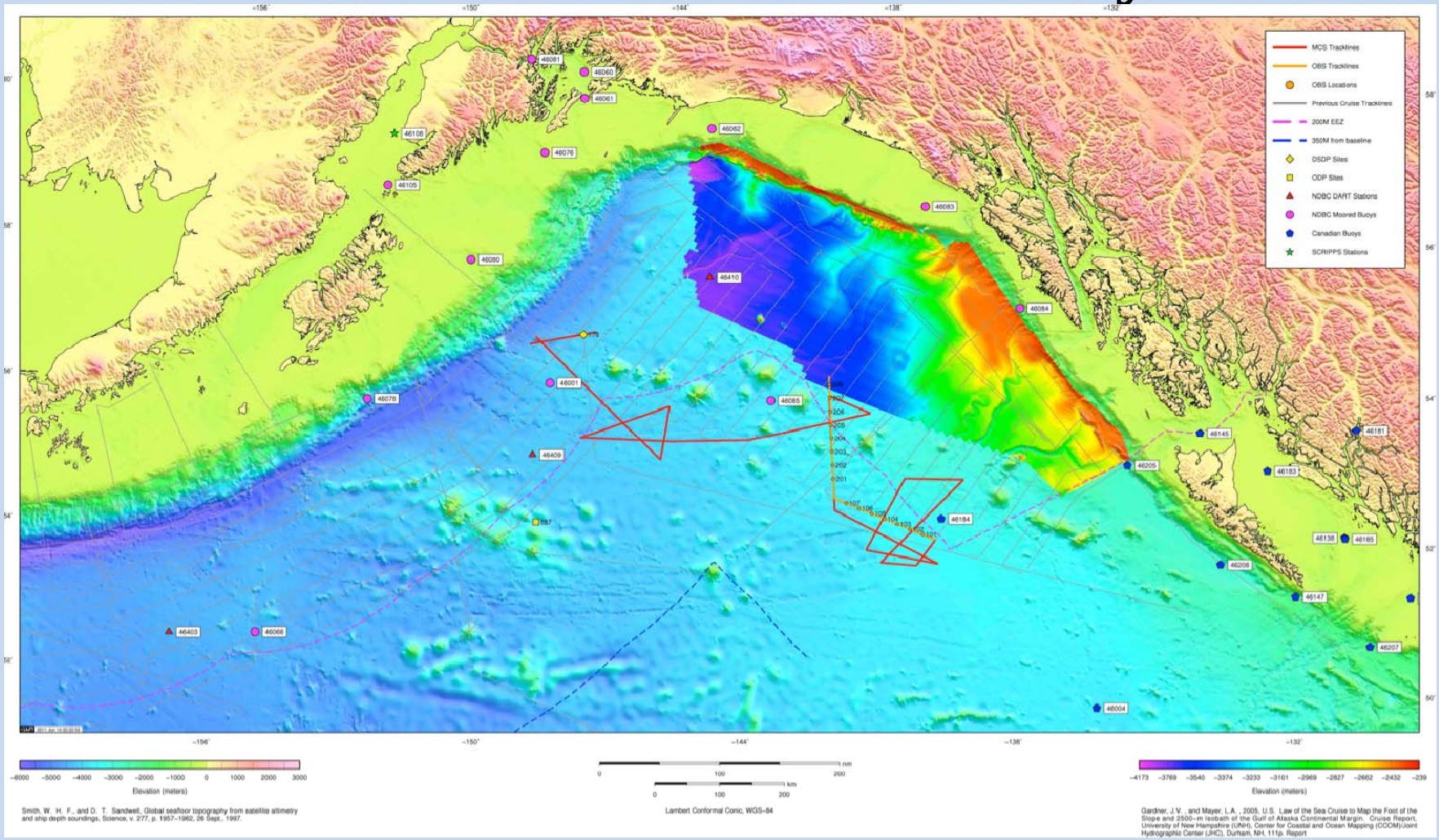
USGS Gulf of Alaska Survey



2011 Science Update

USGS Gulf of Alaska Data Summary

Data collected during the cruise included:

- 3321 km of 6 km- or 8 km-long-offset MCS reflection profiles
- ~3800 km of multibeam bathymetric data
- High-resolution CHIRP sub-bottom profiles
- two OBS refraction profiles each ~200 km long
- 71 XBT profiles
- 6 XCTD profiles
- 6 sonobuoys
- Potential-field gravity and magnetics throughout the cruise.

In addition, seismic arrivals from the M7.2 Fox Islands earthquake of June 23 were serendipitously recorded on our MCS hydrophone array.
Ocean Bottom Seismometers (15 D2-short period OBS from the WHOI-OBSIP) were deployed from a second vessel, R/V Norseman II.

Langseth Schedule Update 2012-2013

2012 Proposed Schedule Options

~140+ Operating Days :

January --	**Maintenance- Hawaii or Guam**
February-March-	**Wiens – Marianas**
(Cancelled)	**USGS- ECS –Marianas**
April-	**Korenaga- Shatsky Rise Completion**
May-June-	**Carbotte- Juan de Fuca**
June-	**Holbrooke – Cascadia 2D**
Nov-Dec.	**Shipyard**

Other Options:

1) Pacific Gas and Electric --- 3D Survey off of Diablo Canyon- (Offshore CA) Sept-November 2012

2) NSF- Candace Major– Possible Gravity/Piston Coring Cruise –Line Islands Possibly following Gaherty in January 2012

Langseth Schedule Update 2012-2013

2013 Proposed Schedule Options

~140+ Operating Days :

USGS- ECS – Atlantic Coast (possible 2 cruises)

Sawyer 3D Survey- Offshore Portugal

Canales 2D Survey –Azores

Other Options:

Canadian Geological Survey --- Hudson Bay 2D-- ~25 day survey

New Jersey Margin 3D Survey– Mountain, et al.

Future 2011/2012 Maintenance Projects

Upcoming 2011 and 2012 Maintenance

Engine Systems:

- Port clutch overhaul
- Bowthruster room fire damper repair with manual remote pull
- Incinerator slops tank stripping drain funnel system to bilge water tank
- Engineering bilges preservation
- UMAS alarm system upgrade
- Service ship's primary circuit breakers
- Pressure vessel and reliefs testing
- Deep cleaning/gleaning/preserving/documenting and organization of spares
- Replace all Caterpillar 3516 foundation fasteners
- Re-torque all associated intermediate shaft removal related fasteners
- Rudder greasing system

Upcoming 2011 and 2012 Maintenance

Deck Systems:

- Anchor windlass overhaul, brakes reline, machine and brake drums bearings
- MMO tower repairs
- Effer crane boom pins and bushings replacement
- All crane two block devices operational
- Deck sockets testing and reinforcement
- ABS required crane base bolts NDT/replacement
- Work boat installation davits refit as required for new boat pending SSSE funding
- All cranes telescopic boom overhaul (internal cylinder reseal slides/guides blast and paint) pins and bushings repair/replacement
- Aft capstan hydraulic controls relocation
- Life rafts and fire system service
- New hydraulic reservoir sight glasses on deck cranes
- Finish chipping and painting frames of the deck gratings on the streamer deck
- Rescue boat jet drive and hull repairs

Upcoming 2011 and 2012 Maintenance

Science Support Systems:

- Portside A-Deck unfinished space- finish overhead and wall sheathing to be used for storage
- Paravane booms sprockets and chain replacement
- Main Lab overhead replacement and lighting system upgrade
- Main Lab underdeck insulation replacement
- EM 122 electronics/wiring protection (wall enclosure) in MD lab
- Install the SS 1 1/2” pipe staples for Spectra line guides
- Install a SS sch 80 half pipe rolled edge at the P&S transom doors for float launching
- Procure and install fall protection system for A-Frame and mast ladders
- Repair Bird lab door handle
- Main Lab climate control system renewal (2012 SSSE or MOSA)
- ER vent fan intake sound deadening system (2012 SSSE or MOSA)

Upcoming 2011 and 2012 Maintenance

Habitation:

- Flooring repairs to cabins, ship's office and hospital
- Mess deck sink installation with new overboard drain line
- Additional fire screen replacement doors for forward stores port and starboard
- PA system CO Monitoring system
- Replace fresh water pressure tank and water heater