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R/V Marcus G. Langseth
MLSOC OVERVIEW of 2010 and 2011



MLSOC Committee Meeting October 24-25 2010 San Diego, CA

Overview of 2010 Activities

Shipyard and Maintenance, Jan-April 2010

Vigor Shipyard, Portland, OR:

Important Ship Projects:

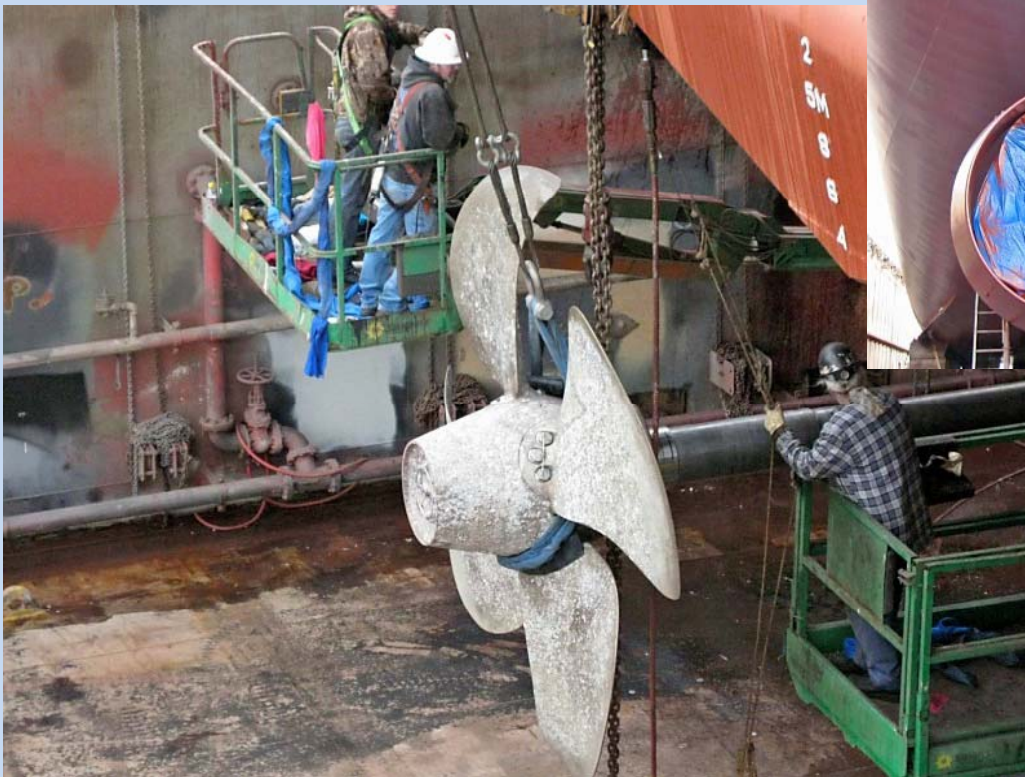
1. Dry-dock for hull painting and required tail shaft repairs.
2. Installation of 18 new transmit array elements on Kongsberg EM122 MB system (warranty repair) and all 16 receive array elements (damaged in shipyard).
3. Major Aft-Peak Tank Repair
4. Ariel Seismic Compressor Overhaul

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SHIPYARD –February 2010

Painting of Hull below waterline (right)
and pulling tail shafts (below).



2010 Maintenance Period Engine Upgrades

Completed Rolls Royce Engine System Upgrades:

- Steering System
- Engine Control
- Engine Overhaul

2010/2011 and Beyond Engine Upgrades/Overhauls :

- UMAS- Engine Alarm System
- HeliconX3- Engine Pitch Control
- Gearbox – Overhaul and Clutch Inspection

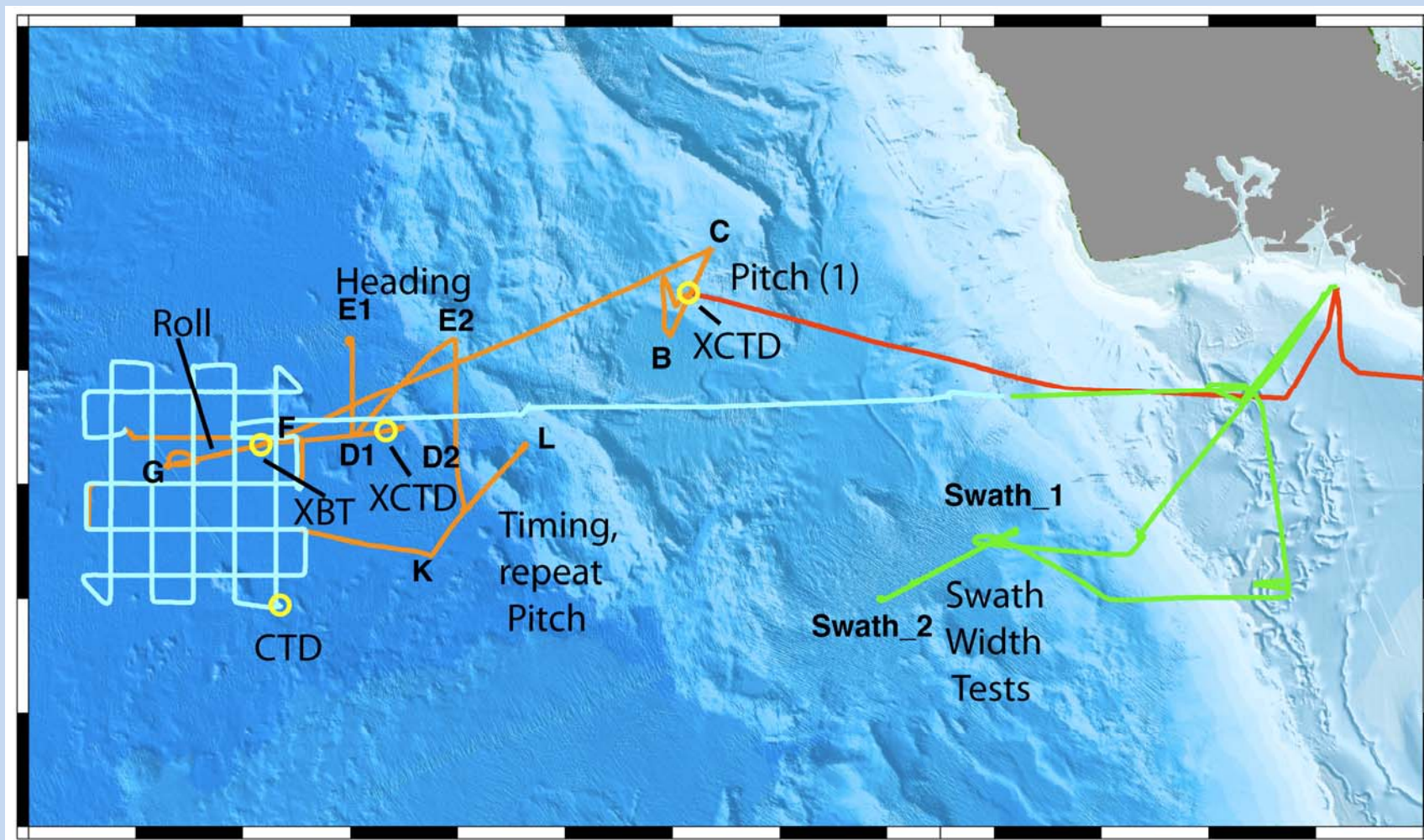
2010 Science Projects

- 1) Refurbishment of Uncontaminated Seawater System Piping**
- 2) Replacement of Knudsen SBP with new 3260 unit**
- 3) Gravimeter repair and calibration**
- 4) Installation of new lab computer racks**
- 5) Successful Sea Trials/Patch Test of Repaired Kongsberg EM 122 MB System off Honolulu**
- 6) The Source Sub-Arrays were completely dismantled and rebuilt from the ground up.**
- 7) A MicroSV and SBE38 Temp Probe were installed in the Sonar Pod**
- 8) SO/IT Office in the Main Lab was renovated.**
- 9) Streamers Cables 1, 2, & 3 were removed from the vessel to allow for re-termination of Armored Tow Leaders (Lead-Ins)**
- 10) DigiCourse 5011 Cable Levelers were upgraded to work with new DigiCourse DMU that were purchased in 2009**
- 11) AG Airlock Control System was installed on the SourceSub-Array for controlling of air leaks on the strings.**

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R/V Langseth EM122 Multibeam System Recalibration And Sea Acceptance Trials Cruise –May 2010(MGL1002)



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Multibeam Sea Trial Cruise (MGL1002) May 2010

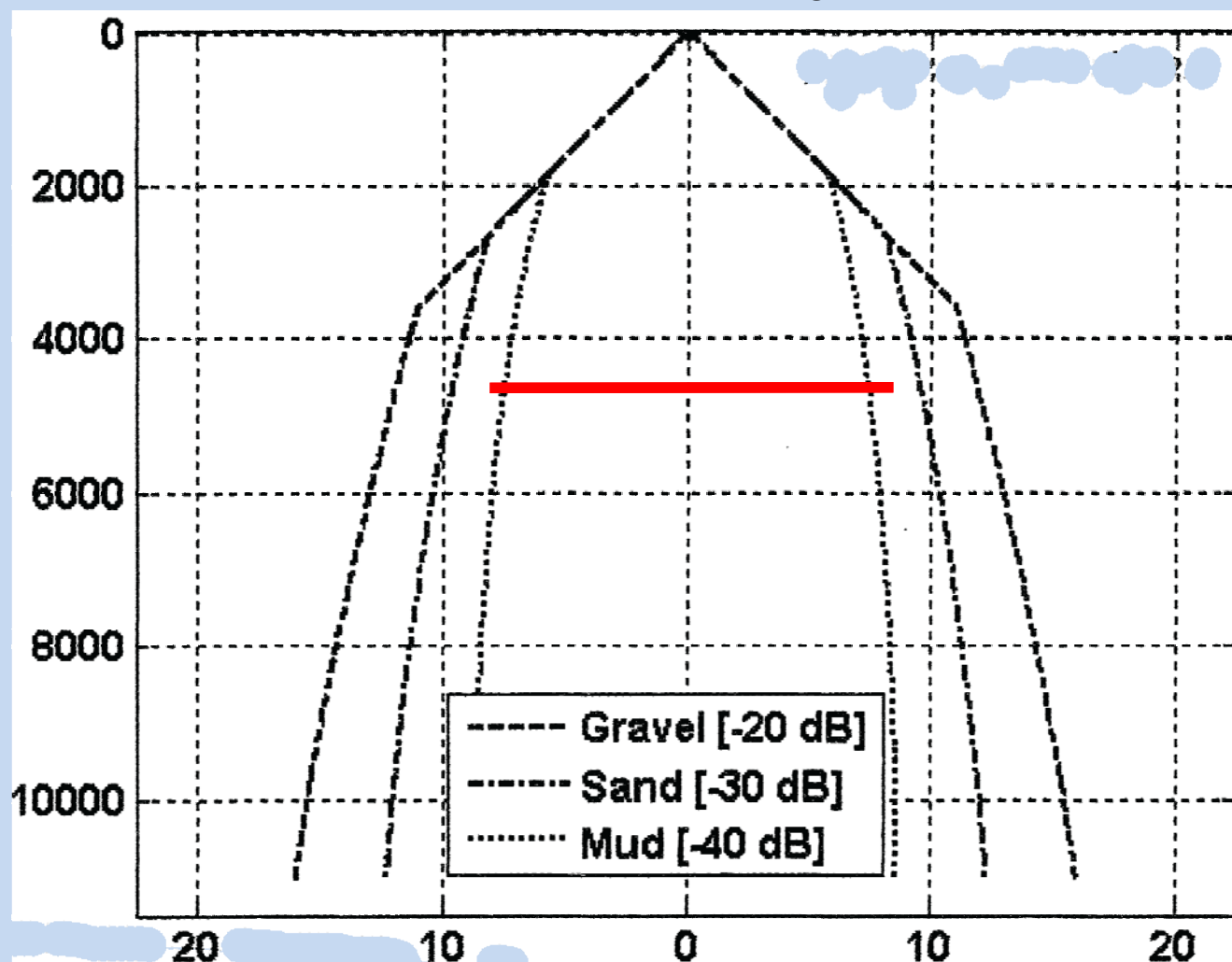
The MB activities included:

- Creation of sound velocity profiles (SVP) using XCTD, XBT and CTD casts
- Determinations of values for pitch bias, roll bias, timing and heading corrections
- A small areal survey over the same ground previously used by U. Hawaii for testing their EM120
- Langseth self-noise tests, via the Simrad built-in self test (BIST) for receiving array noise (RX NOISE LEVEL)
- A series of tests to evaluate two new EM122 features – dual pings, and FM modulation (chirp) for the outer beams
- Tested the use of the Applanix V3 POS MV vessel reference system as a substitute for the Simrad SeaPath system currently in use

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Multibeam Sea Trial Cruise (MGL1002) May 2010

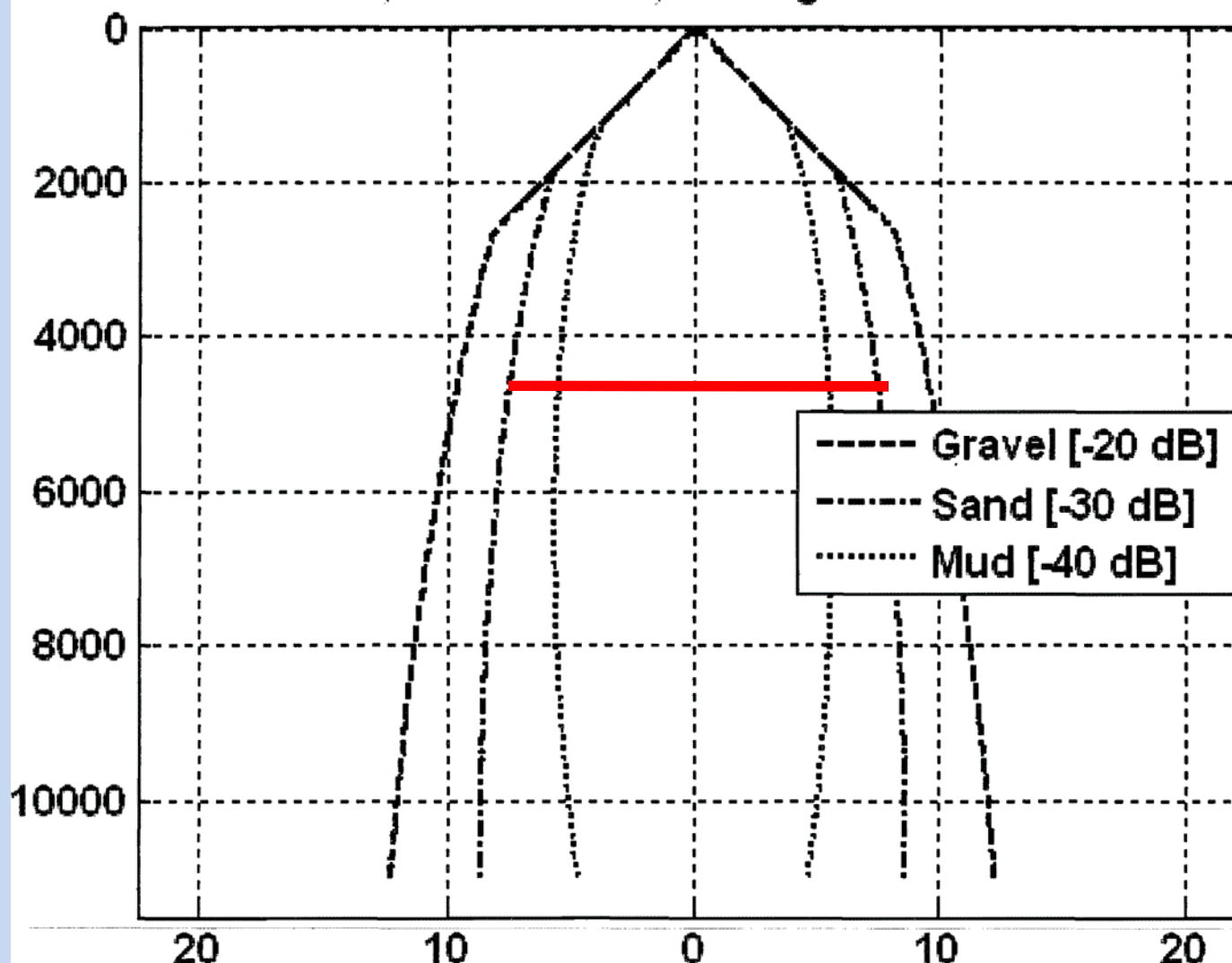
EM122, Warm Ocean, 1x1 degree NL = 55 dB



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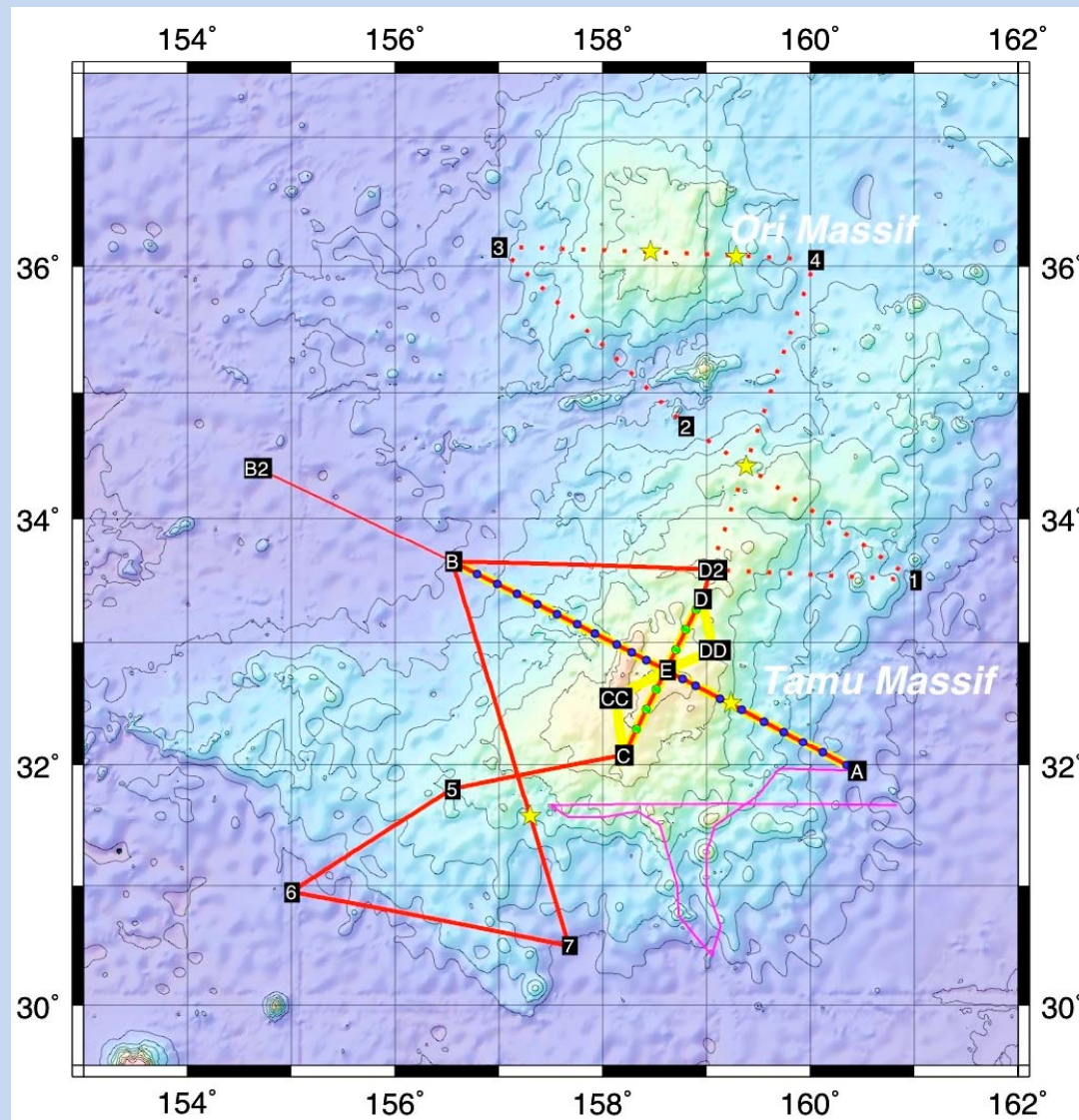
Multibeam Sea Trial Cruise (MGL1002) May 2010

EM 122, Warm Ocean, 1°1' degree NL = 65 dB



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Shatsky Rise Cruise- July-August 2010 (Korenaga and Sager)



Shatsky Rise Cruise Overview- (Korenaga and Sager)

- MCS profiling was conducted with no major issues, yielding high-quality reflection data for TAMU Massif.
- Successful Deployment of all WHOI OBS
- EM 122 MB System performed very well.
- Two Medical Diversions delayed cruise 16 days and cruise was extended by 7 days.
- Approximately 8-10 days of unfinished seismic on northern portion of Shatsky Rise

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SHATSKY SCIENCE SUMMARY from Co-Chief Scientists:

“The Langseth fired over 47,000 shots from its 36-gun tuned airgun source into an array of seismic receivers: the Langseth's 6-km-long multichannel streamer and 28 WHOI OBS. As far as the southern part of the survey is concerned, the operational goals of the experiment were achieved in full. Multichannel seismic (MCS) profiling was also conducted with no major issues, yielding high-quality reflection data. OBS data show spectacular wide-angle refraction and reflection arrivals with the source-receiver distance often exceeding 200 km. The data collected during this experiment are sufficient to accurately determine the entire crustal structure of the Tamu Massif and will provide key information on the early magmatic construction of Shatsky Rise”.

Upcoming Maintenance & Shipyard Activities October 2010 to March 2011

- Arrived in San Diego on October 1 following transit from Honolulu to San Diego
- Langseth was moved to MARFAC on October 11 where it will continue maintenance activity prior to anticipated move to shipyard in mid-December
- ~40-day Shipyard and Drydock Period Planned – Dec.22, 2010 to Jan.31, 2011

Planned Shipyard/Maintenance Projects

Drydock:

Painting of Main Deck, Flying Bridge, Visor, Superstructure, Stern Ramp, etc.
Rudder Seals

ABS Required Tank Inspections (15)

Steel Work

Hull Piping

Decking

Doors/Hatches

New Incinerator

Hydraulic Hose Repair

Gearbox/Clutch Inspection

Seismic/Gun Winch Inspections

Accommodation Upgrades – New Flooring/Furniture

Improve Lighting in lab spaces and common areas

Ongoing General Maintenance/Repairs

Upcoming Shipyard Science Projects

Western-Geco Streamer Acquisition

Currently reviewing draft agreement to obtain all remaining Syntrak seismic equipment from Western-Geco. ~40km of streamer sections along with a lot of other needed equipment and electronics.

Additional Maintenance Period Science Projects

Pending Upgrades :

- ADCP Installation
- New 3.5khz Transducers for Sub-bottom Profiler

POTENTIAL SSSE PROPOSAL ITEMS

Glosten Winch Plan Items:

Cost of structural modifications for Phase 1-Main Deck

New Winch

New Effer Crane for Main Deck

Additional Items:

- New Workboat
- Upgrade of radio equipment for A4 Conditions –Required for Chukchi Sea
- New Chemical Locker
- Portable Shop Van to replace Shop container on paravane deck.
This would be purchased thru East Coast Van Pool.

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**2011 Oceanographic Instrumentation Supplement
Overall Institutional Ranking**

Ranking	Item	Cost
1	Teledyne RDI 75kHz "Ocean Surveyor" ADCP	\$118,094
2a	440 Seapath 300	\$87,330
2b	Pos-MV4 Upgrade	\$32,440
2c	IMU Replacement	\$54,438
3	Uninterruptable Power Sources	\$56,109
4	Two- SBE-45 TSGs	\$12,663

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**2011 Oceanographic Instrumentation Supplement
Overall Institutional Ranking**

Ranking	Item	Cost
5	SIPPICAN MK-21 Interface	\$8,339
6	GEOMETRICS 882 Magnetometer	\$22,500
7	EM-122 Water Column Logging License	\$15,532
8	HP 42" Wide Format Plotter	\$11,251
9	Mammal Mitigation Gun	\$22,230

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2011 Oceanographic Instrumentation Supplement Budget Summary

Total Cost \$440,936

Less funds from other sources:

Balance, Ewing streamer sale	\$ 97,088
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Balance, 2008 Instrumentation	\$163,752
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Total requested from NSF \$180,096

Preview of 2011 Operations

6 Cruises Planned beginning in April:

1. Costa Rica 3-D (Bangs- NSF)
2. Gulf of Alaska (USGS- ECS)
3. Alaska Margin (Shillington- NSF)
4. Bering Sea (USGS-ECS)
5. Chukchi Sea (Coakley- NSF-OPP)
6. Line Islands (Gaherty- NSF)

Operational Day Breakdown

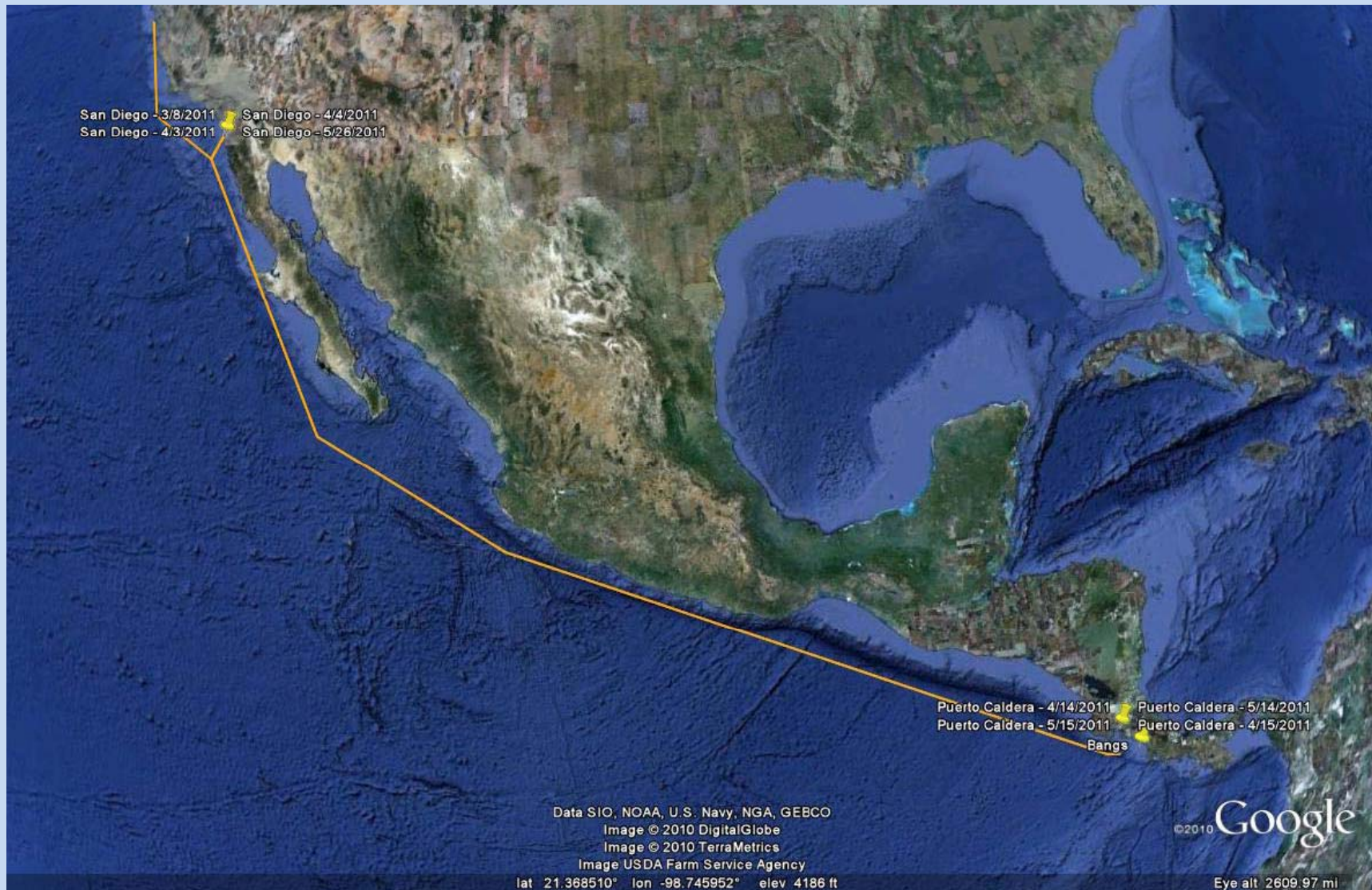
- 246 total funded days
 - 189 NSF
 - 57 USGS
- 6 science missions
- 10 days (requested, pending) for 3-D set-up
- JMS Ship Inspection (08 March – 10 March, San Diego)
- 4 “dead head” transits associated with cruise activity
- 116 maintenance days

Location of 2011 Science Missions



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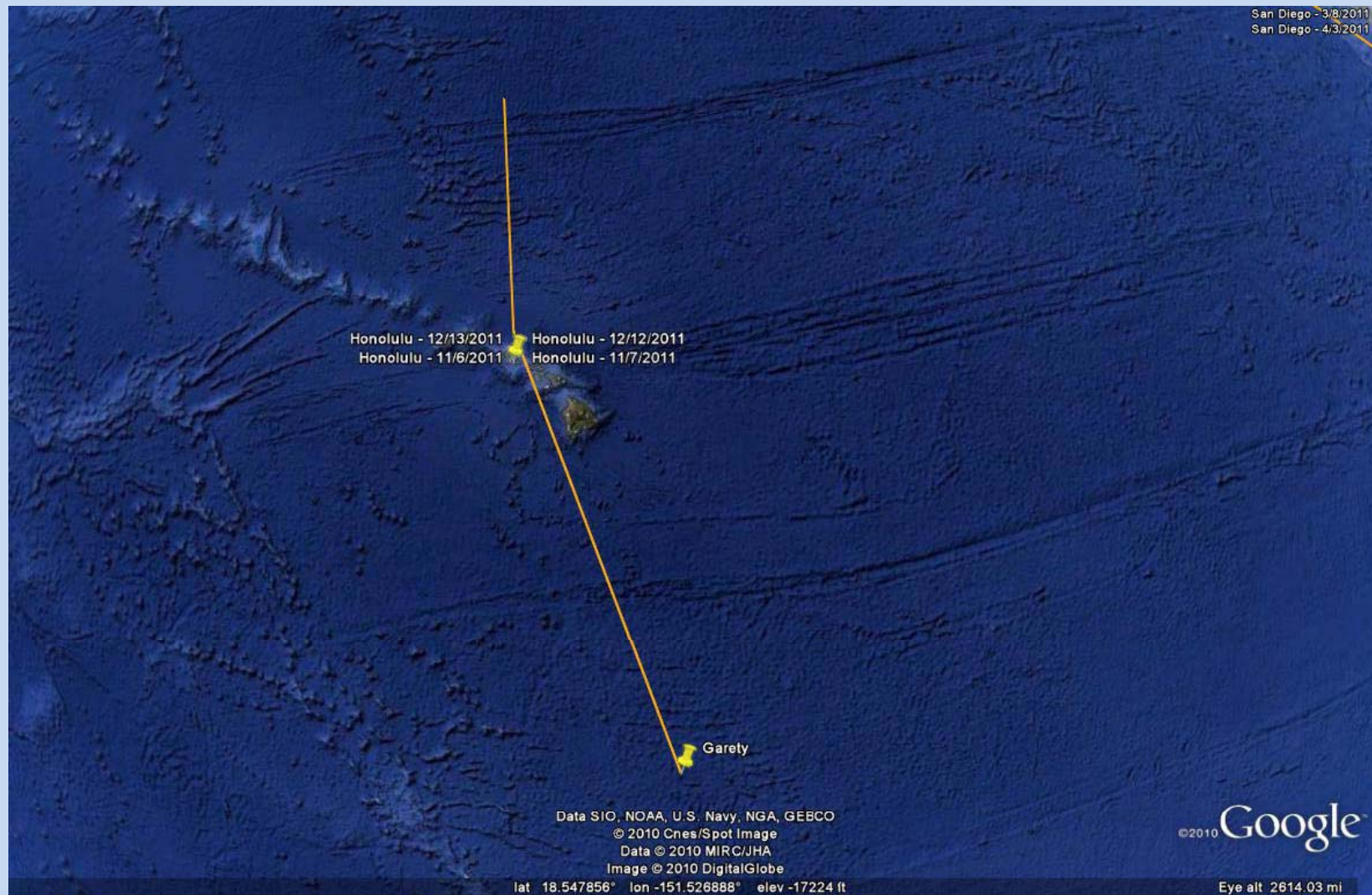
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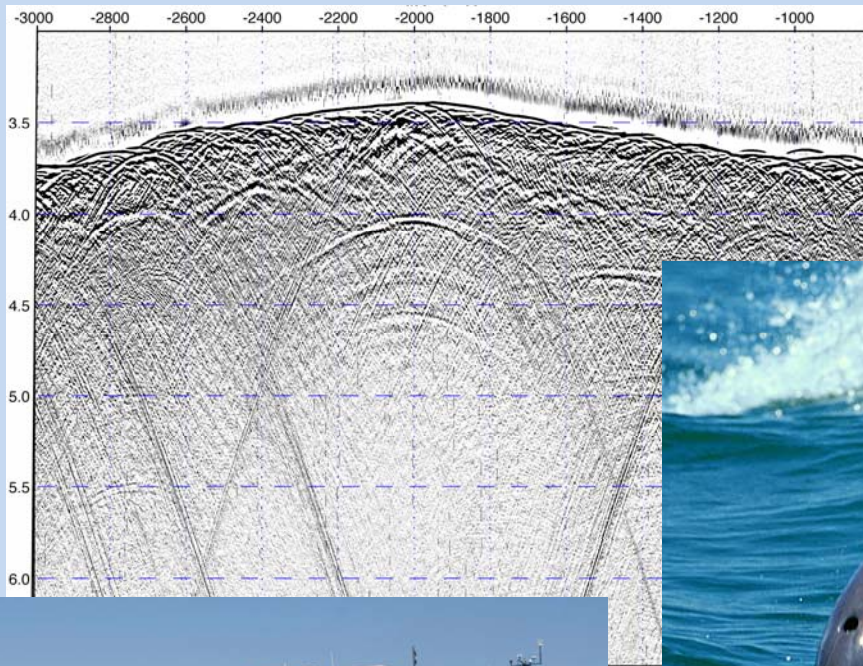


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2011 Marine Geophysical Survey Schedule Review



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Bangs, N/UTIG/ARRA-0851380
NSF-OCE-ODP
CRISP 3d, Costa Rica
15 April – 13 May
Puerto Caldera – Puerto Caldera

This project will acquire 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. The goal is 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.

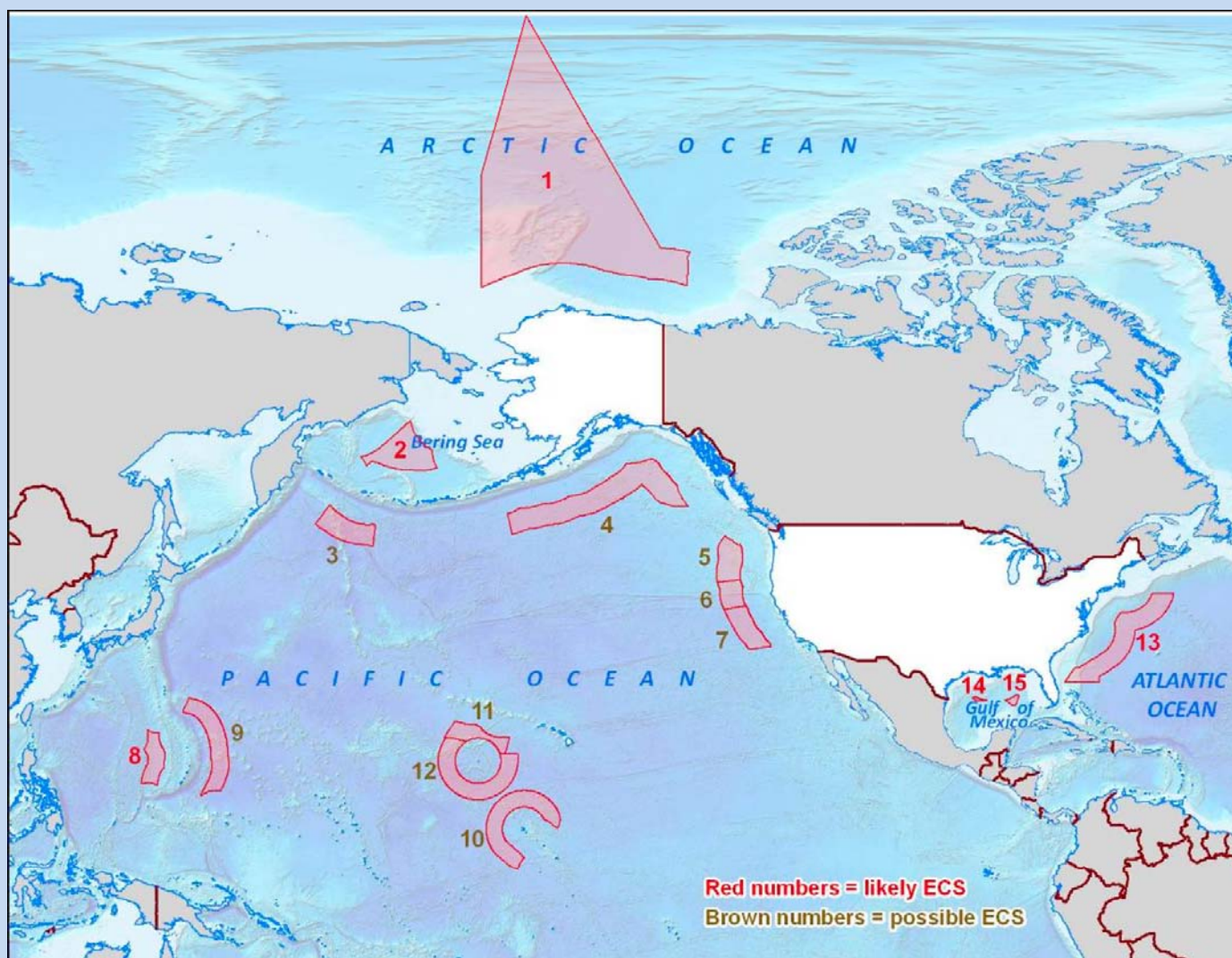
Mammal Issues:

- EA/IHA due to NMFS 18 November
- Draft EA/IHA currently submitted to NSF
- Possible issues with turtles
- Still investigating Costa Rican PSO

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USGS Extended Continental Shelf (ECS)- Areas of Interest



The shaded area on this map illustrates where the U.S. is considering collecting and analyzing data and does not represent the official U.S. Government position on where it has extended continental shelf. This map is without prejudice to boundary depictions and future negotiations.

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Childs, J/USGS (Menlo Park)

USGS

US Extended Continental Shelf Program

Gulf of Alaska

4 June – 26 June

Kodiak - Kodiak

Marine geophysics for the purpose of determining geologic framework, crustal nature and sediment thickness in support of delimiting the US extended continental shelf under provisions contained in Article 76 of the Convention on the Law of the Sea.

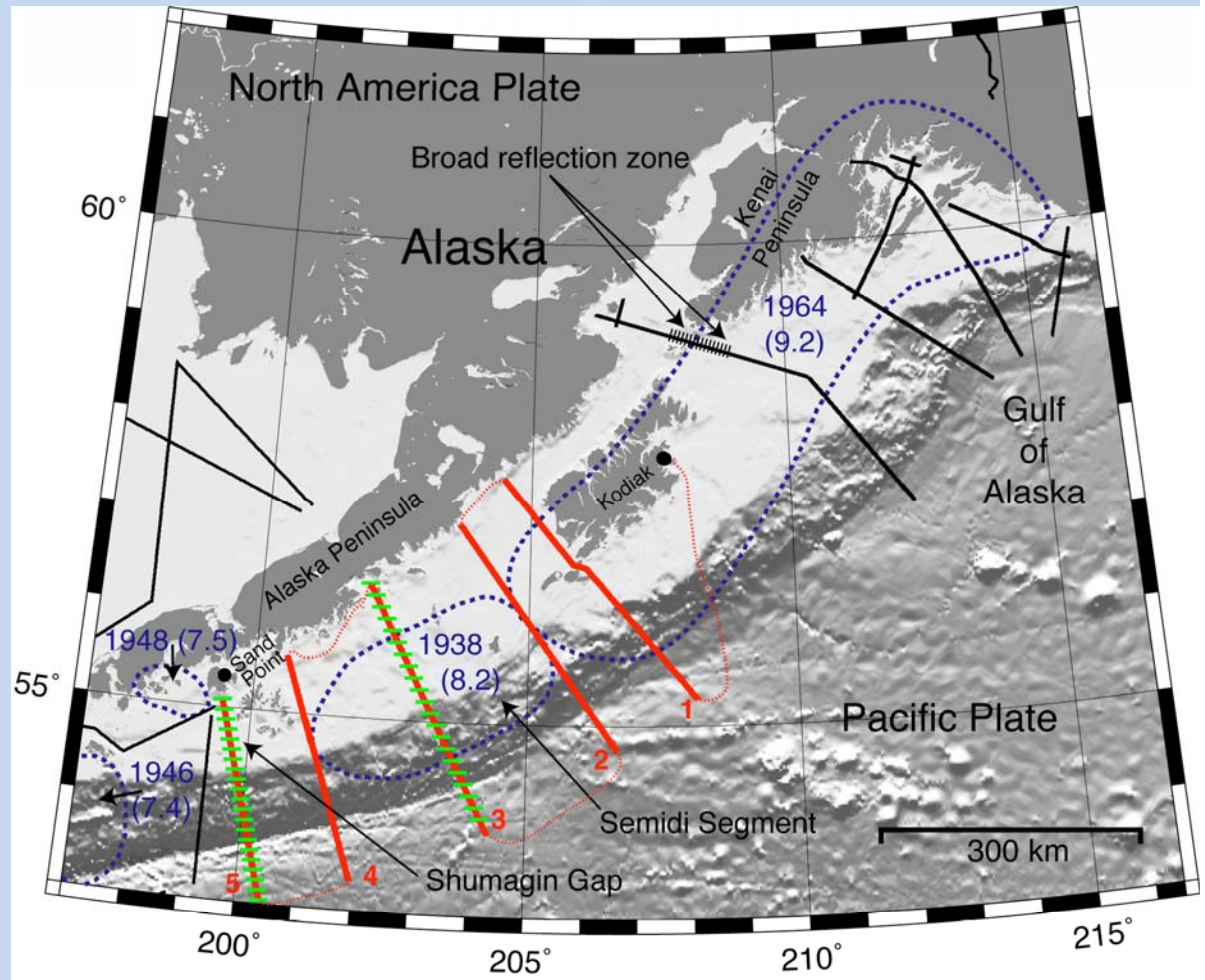
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Shillington, D/LDEO/0926614
NSF-OCE-MGG
Aleutian Megathrust,
Shumagin Islands
29 June – 07 August
Kodiak – Dutch Harbor

The objectives of this experiment are to image the reflection characteristics of the megathrust in the Aleutian/Alaska subduction zone in order to understand downdip changes in processes and physical properties at the slab interface.



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•Preliminary Environmental Impacts:

Mammals:

Mysticetes:

- Potential behavioral disturbance to species, including **ESA** species: **N Pacific right**, East Pacific Gray, Minke, **Humpback**, **Fin** whales
- Effects on **Sei and Blue whales** are not likely based on expected low densities
- Species are anticipated to avoid exposure
- N Pacific Right Whale critical habitat within study area

Odontocetes:

- Potential behavioral disturbance to species, including **ESA** species: **Sperm**, beaked, killer, pacific white-sided dolphins, Dall's porpoises (shallow water)
- Species are anticipated to avoid exposure

Pinnipeds:

- Potential behavioral disturbance to species, including **ESA** species: **Steller Sea Lion**, **Northern Fur Seal**
- Stellar Sea Lion critical habit within study area/rookeries-5.5km no approach
- Greatest abundance April-September (accept Northern Fur Seal is November)
- Species are anticipated to avoid exposure

Sea Otters (Southwestern stock):

- Potential disturbance, but species occurs in shallow, nearshore waters (<35m)

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Preliminary Environmental Impacts (continued):

Turtles:

Potential species: Green, leatherback, loggerhead, olive ridley

Effects highly unlikely as all species considered rare in the project area

Fisheries:

Important fisheries; year round fishing operations; subsistence fishing

Peak fisheries is summer months, therefore November –January is the best time to avoid these activities

EFH/HAPC (potential OBS issue) for numerous species including salmon and groundfish

Other Potential Issues:

Regulatory: CZMA; AK F&G; Consultations with Native Populations, etc

Areas of Special Status

NGOs, other

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Childs, J/USGS (Menlo Park)

USGS

US Extended Continental Shelf Program

Bering Sea

08 August – 05 September

Dutch Harbor - Dutch Harbor

Marine geophysics for the purpose of determining geologic framework, crustal nature and sediment thickness in support of delimiting the US extended continental shelf under provisions contained in Article 76 of the Convention on the Law of the Sea.

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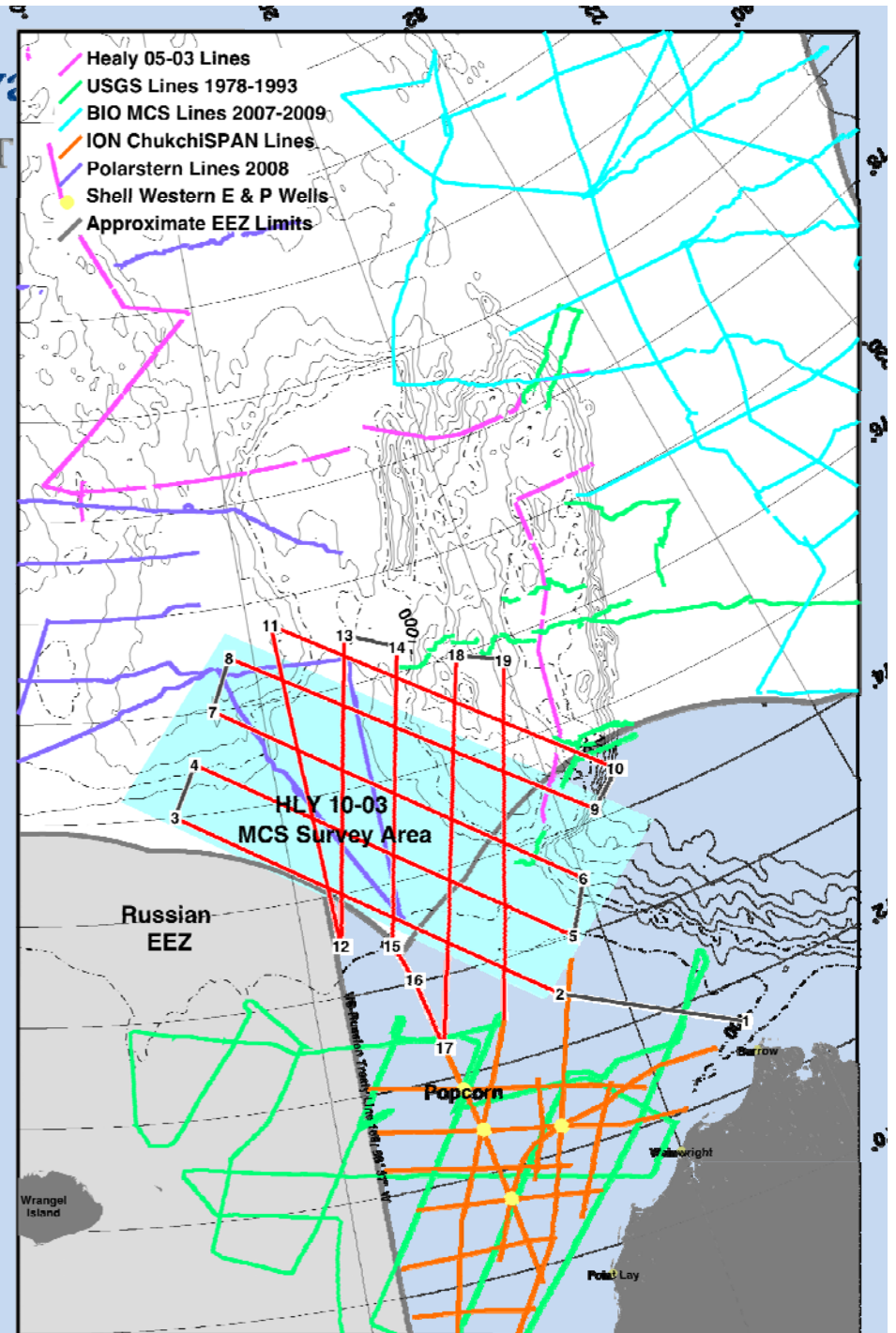
**Coakley, B/UAF, G&G/0909568
NSF-OPP**

**Chukchi Plate, Chukchi Sea
08 September – 12 October
Dutch Harbor – Dutch Harbor**

The Chukchi Borderland is a block of extended continental crust embedded in the oceanic crust of the Canada Basin. As the piece that does not fit the simple “windshield wiper” model for the Mesozoic opening of this basin, it figures prominently in all tectonic models proposed for the opening of the Amerasian Basin.

Mammal Issues:

Mandatory attendance Open Water Meeting (March)
EA/IHA due to NMFS 9 April
Draft EA/IHA Due to NSF 9 March
Possible issues with bowhead hunt and First Nations
Still investigating Alaskan Native PSO



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Gaherty, J/LDEO/0928270
NSF-OCE-MGG
NoMelt
07 November – 12 December
Honolulu – Honolulu

The aim of this project is to use the most up-to-date seismic and electromagnetic methods to address two fundamental questions about the lithosphere that lies beneath the Pacific basin:

- 1) What factors control the seismic structure of the lithosphere? and
- 2) What defines the base of the lithosphere?

Mammal Issues:

EA/IHA due to NMFS 7 June
Draft EA/IHA Due to NSF 7 May
No anticipated issues or problems

MLSOC Meeting October 2010 San Diego CA