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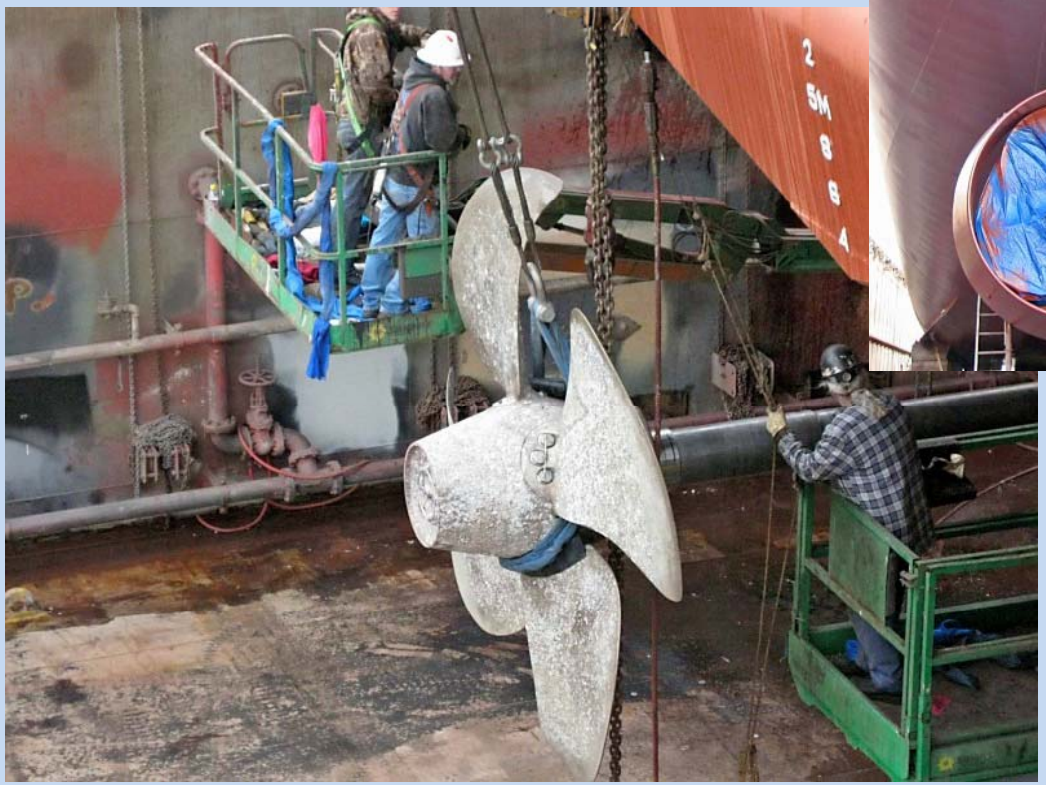
R/V Marcus G. Langseth

MLSOC OVERVIEW of 2010 and 2011

MLSOC AGU Town Hall Meeting December 12, 2010 San Francisco, CA

SHIPYARD –February 2010

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



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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 and Clutch Inspection

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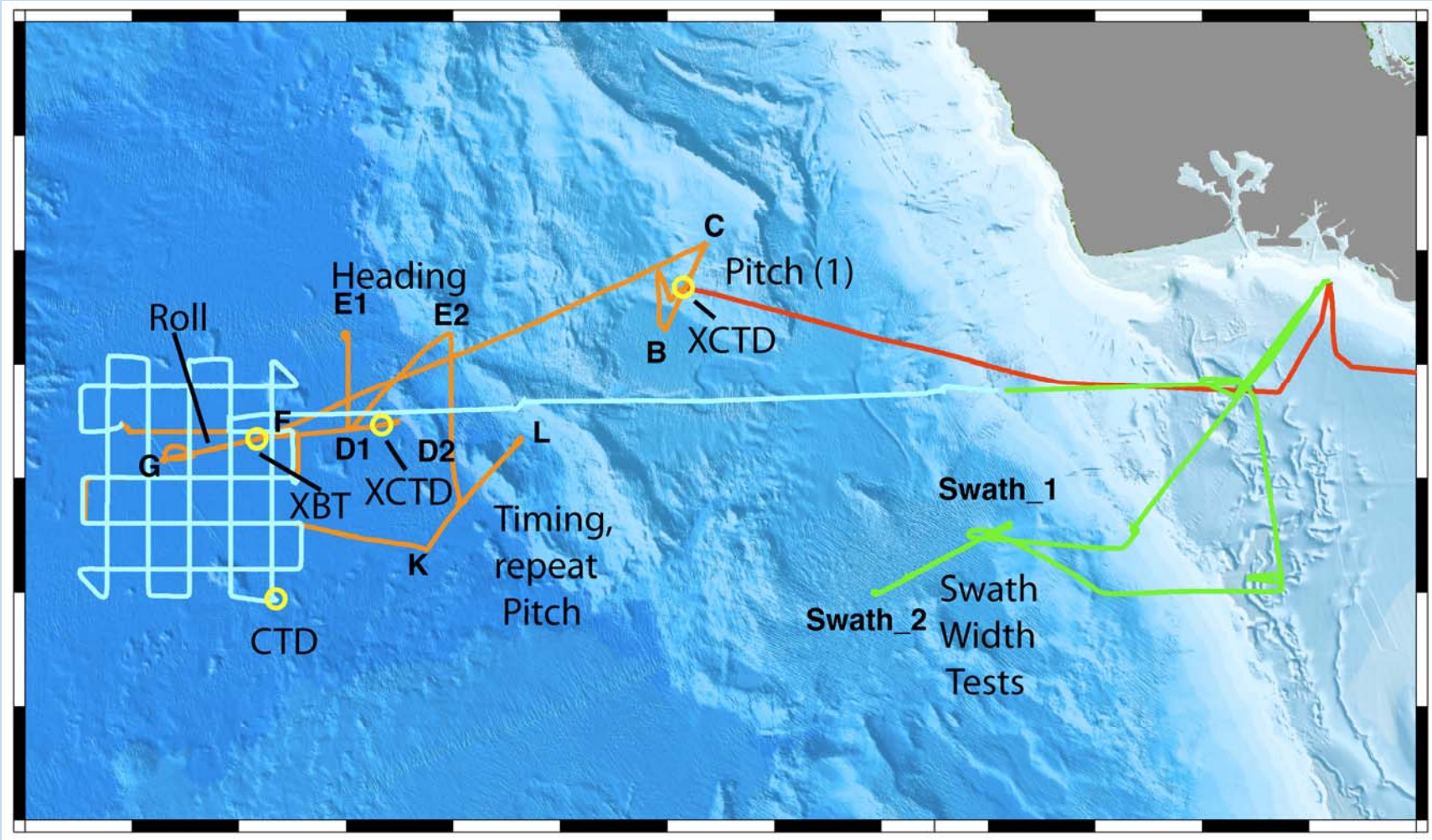
R/V Langseth EM122 Multibeam System Recalibration And Sea Acceptance Trials Cruise –May 2010(MGL1002)



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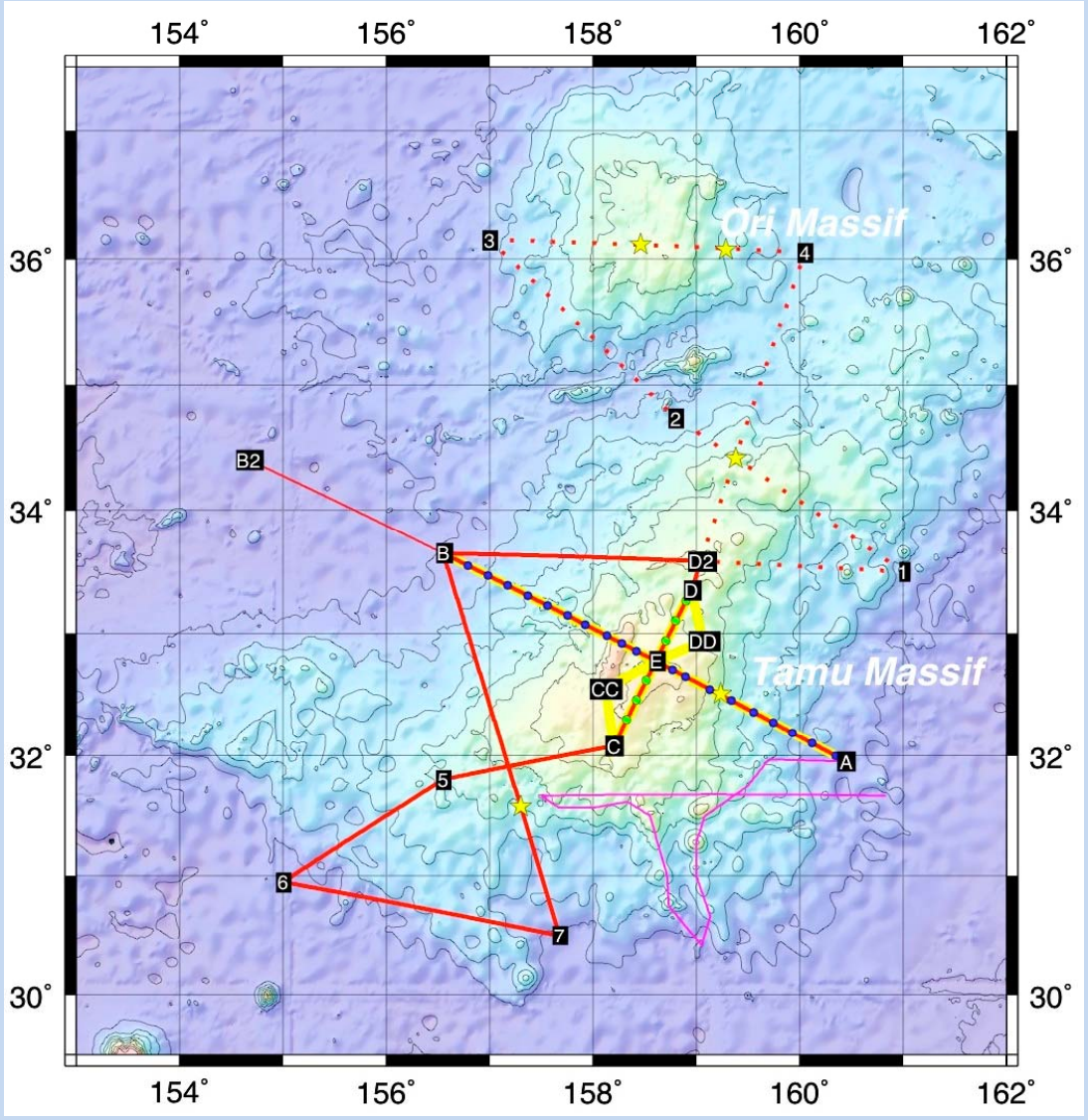
Shatsky Rise Cruise- July-August 2010 (Korenaga and Sager)



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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".*

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Upcoming Maintenance & Shipyard Activities October 2010 to March 2011

- Langseth was moved to MARFAC on October 11

- Recommended Shipyard Selected on Dec.1. BAE, San Francisco was chosen based on evaluation of 2 bids.

- Contract and Schedule under final negotiation

- ~30- 40-day Shipyard and Drydock Period Planned – Estimated "Start of work" –Jan.4.

Planned Shipyard/Maintenance Projects

Drydock:

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

Other Repairs/Inspections Planned

Rolls Royce Pitch Control System (Commissioning Underway)
ABS Required Tank Inspections (15) (Shipyard)
Steel Work (Some underway)
Hull Piping (Shipyard)
Decking (Shipyard)
Doors/Hatches (Shipyard)
New Incinerator (Shipyard)
Hydraulic Hose Repair (Underway)
Bilge Cleaning/Preservation
Gearbox/Clutch Inspection
Seismic/Gun Winch Inspections
Mold Mitigation (Underway)
Accommodation Upgrades – New Flooring/Furniture
Improve Lighting in lab spaces and common areas (underway)
Ongoing General Maintenance/Repairs (Painting of aft under decks)
Streamer winches wireless remote controls
Caterpillar Controls

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

Glosten Winch Study Phase I (2011)

2011 Maintenance Period –

We plan to upgrade the capability of the starboard A-frame with the addition of a winch(s) mounted on the A-frame to facilitate over the side handling of equipment such as Ocean Bottom Seismometers (OBS). The existing P-Flow vertical lift will be removed as part of our planned maintenance period activity.

2011 SSSE Proposal: Implementation of Phase I

We are requesting funds for the acquisition of a CTD winch, installation of a new winch control station underneath Mammal Observation tower, and the associated structural modifications that will include:

- modification of the Marine Mammal Observation Tower Steps
- relocation of stanchions on paravane deck to allow for new CTD winch placement modifications to paravane deck, streamer deck, and OBS deck to support the installation of a winch suite due to P-Flow lift removal
- removal of existing winch house from OBS deck
- installation of PAM and Maggie Winch

2012 SSSE and Beyond

2012 SSSE Proposal: Phase I Continued

We would 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 – Phase II Issues

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 by being able to deploy instruments and support science operations from the stern.

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.

Glosten Report : Phase 2 Stern/Hydroboom Modifications

The *Langseth* has a telescoping boom for deployment of instrumentation off the stern of the vessel. Presently, this boom has severe limitations since any effort to deploy instruments is in conflict with the existing seismic equipment located on the stern. The following modifications will improve the ability to use the stern boom as part of Phase 2.

- Provide the ship with a removable deck for installation in stern ramp as required
- To allow access to the main deck a section of the streamer deck must be made removable
- A new flag block will be required to fairlead oceanographic cable to the telescoping boom
- A new turning block will also be required in order to properly lead the wire to the telescoping boom
- The current goosenecks, for deployment of the seismic sound source, must be made removable as to not interfere with stern deployments of scientific instrumentation
- A new remote-control station for Hydroboom operations.
- Crane and tow winch support needed?

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2011 SSSE PROPOSAL ITEMS

Glosten Winch Plan Items: Total Estimate Phase 1: Pending..

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

Additional Items:	Est. Cost:
•New Science Workboat	$124,000
•2-Halogen Bridge Searchlights	$ 12,846
•Upgrade of radio equipment for A4 Conditions –	$ 16,215
•New Chemical Locker	$ 8,500
•Upgraded Tele-Medicine	$ 46,700
•Portable Shop Van.	$ 0
This would be purchased thru East Coast Van Pool.	
•Appendix B Requirements:	$ 20,000
Maximum Capacity Document for Langseth Winches	

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2011 Oceanographic Instrumentation Supplement
Overall Institutional Ranking

Ranking	Item	Cost
1	Teledyne RDI 75kHz “Ocean Surveyor” ADCP	$119,053
2	Applanix POS/MV V.4 Upgrade & IMU Replacement	$ 92,174
3	Uninterruptable Power Sources	$ 56,109
4	Two SBE-45 TSGs	$ 12,623
5	Sonobuoy Electronics Package	$ 51,806
6	SIPPICAN MK-21 Interface	$ 8,339
7	GEOMETRICS 882 Magnetometer	$ 22,550
8	EM-122 Water Column Logging License	$ 15,532
9	Mammal Mitigation Gun	$ 22,230

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2011 Oceanographic Instrumentation Supplement
Budget Summary

Total Cost **$400,416**

Less funds from other sources:

Balance, Ewing streamer sale	$ 97,088
Balance, 2008 Instrumentation	$163,752

Total requested from NSF $142,460

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Preview of 2011 Operations

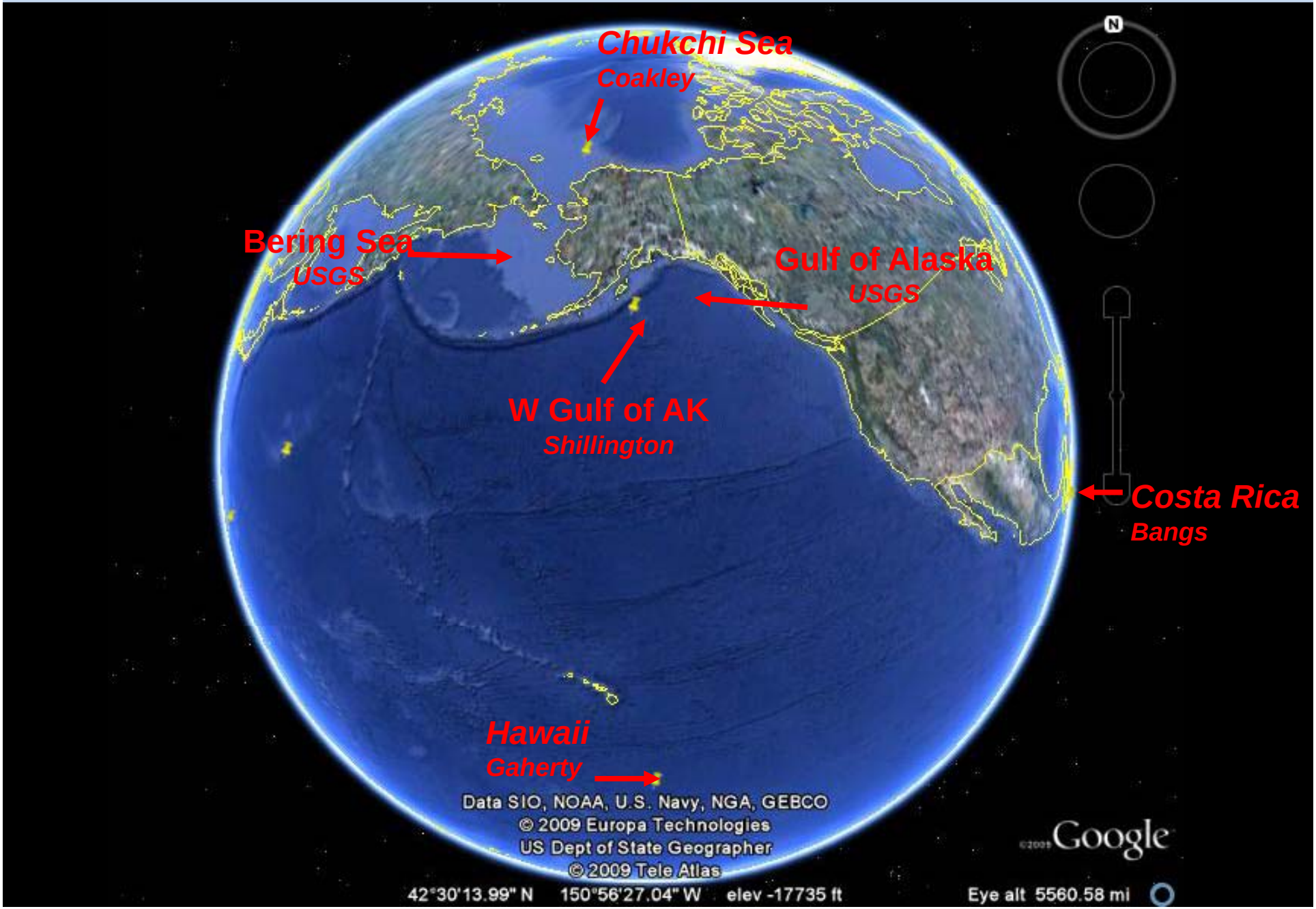
6 Cruises Planned beginning in April:

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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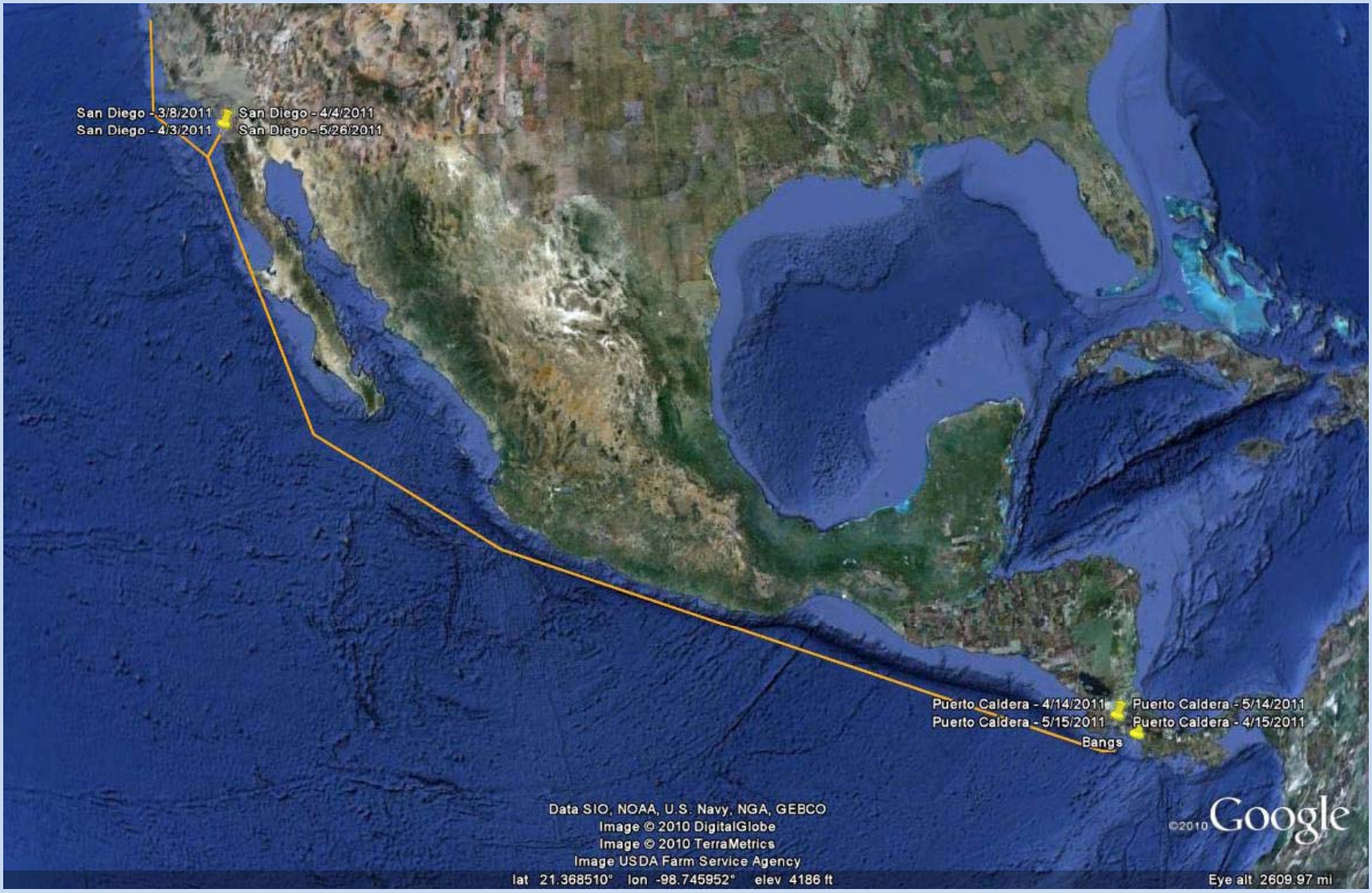

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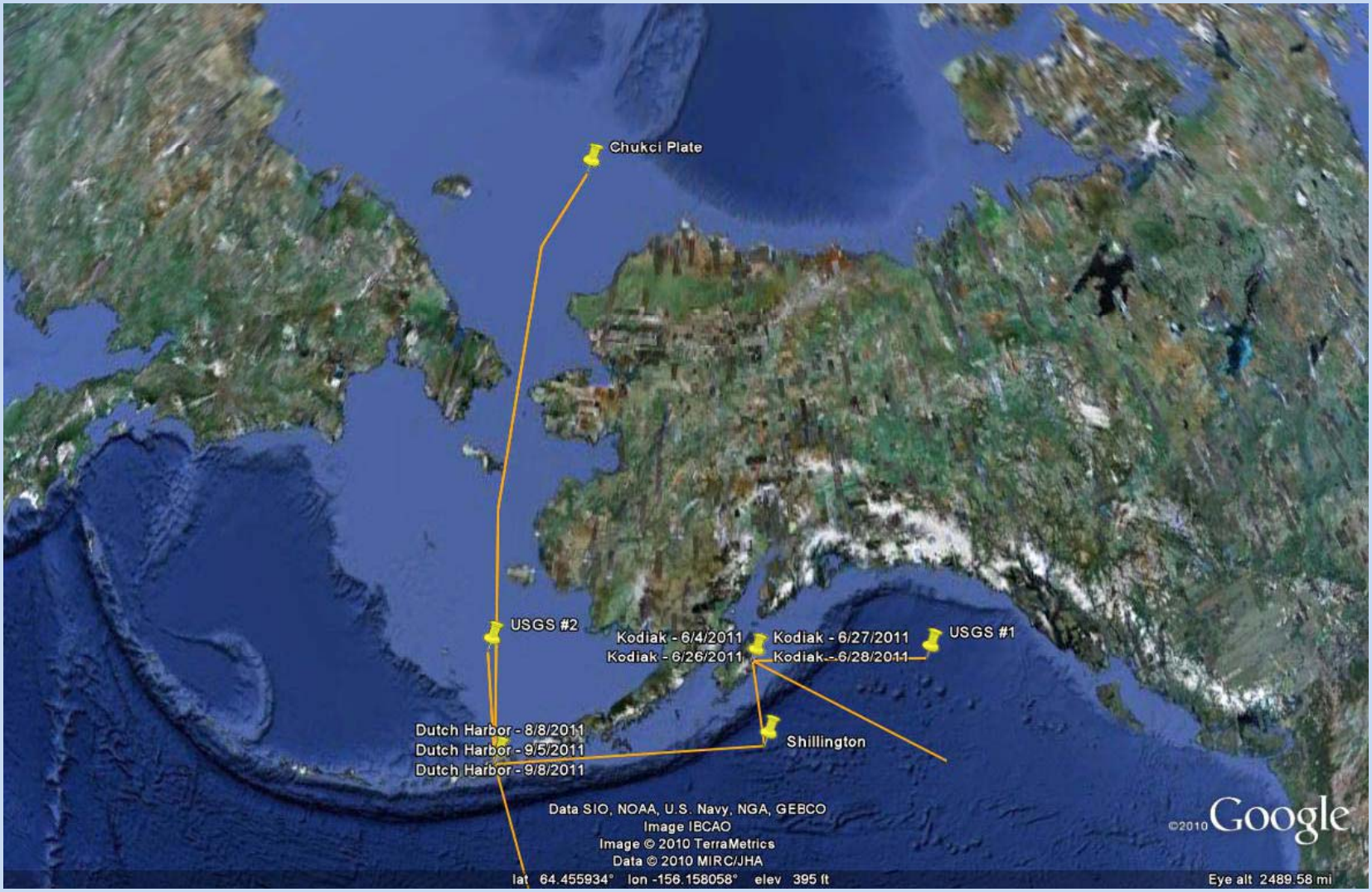

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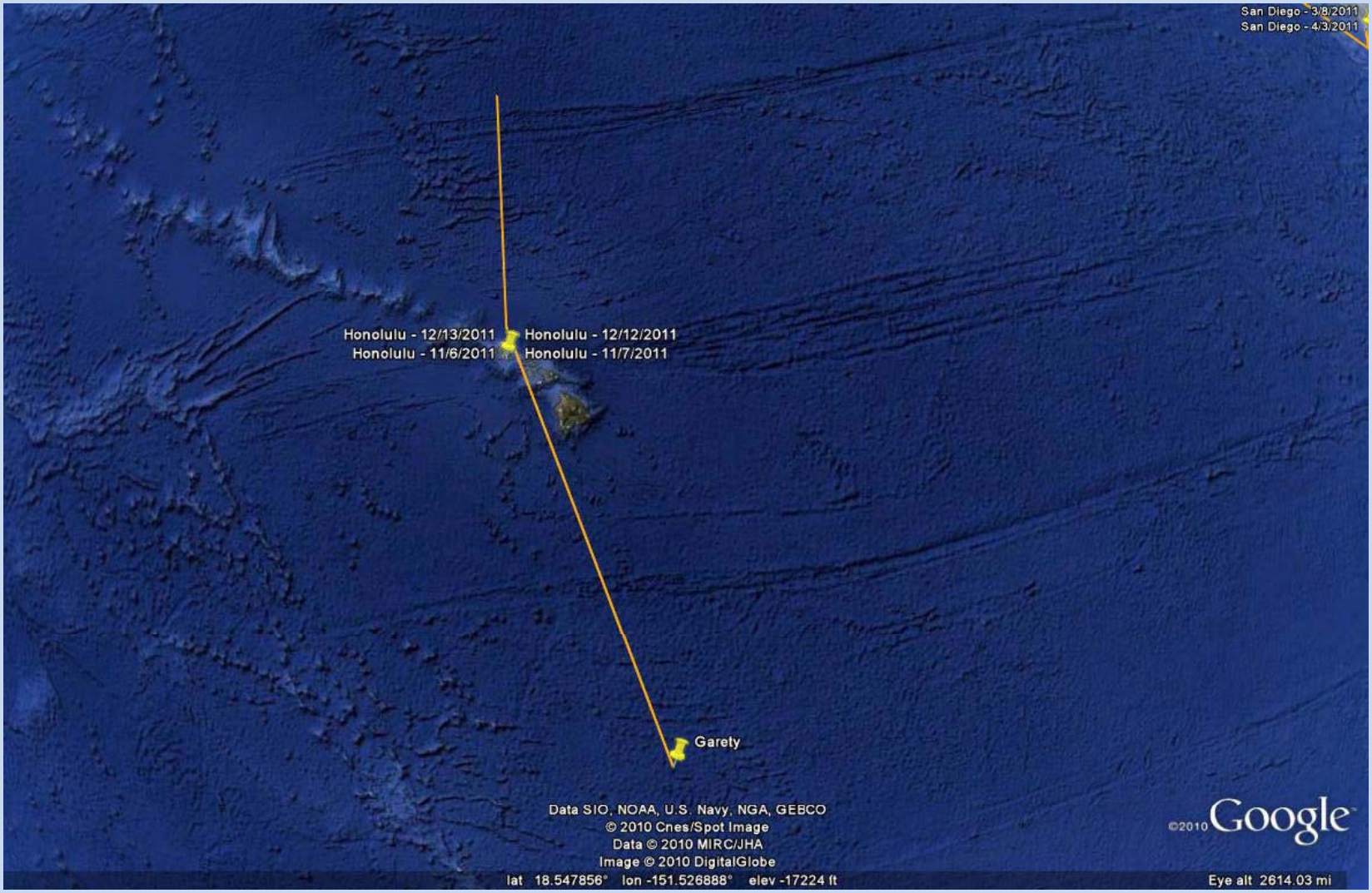
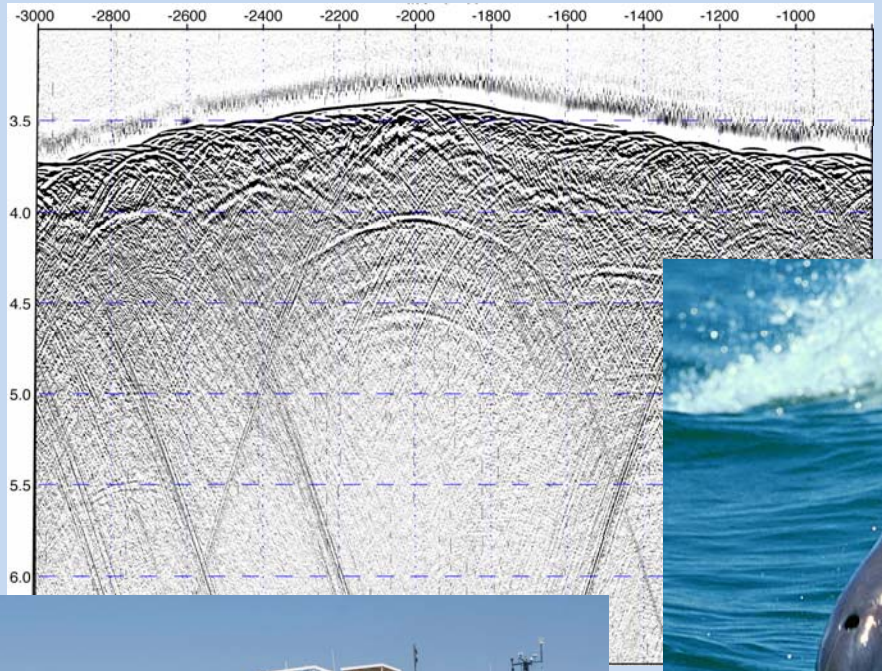
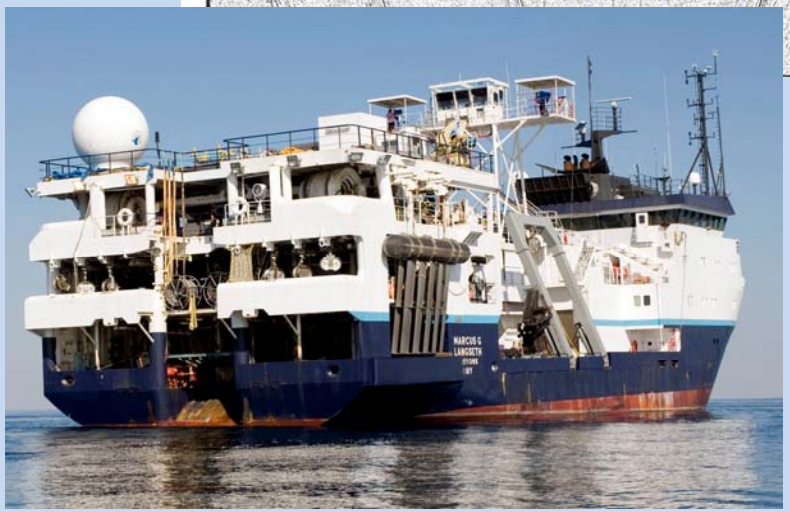


2011 Marine Geophysical Survey Schedule Review





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Bangs, N/UTIG/ARRA-0851380
NSF-OCE-ODP
CRISP 3d, Costa Rica
7 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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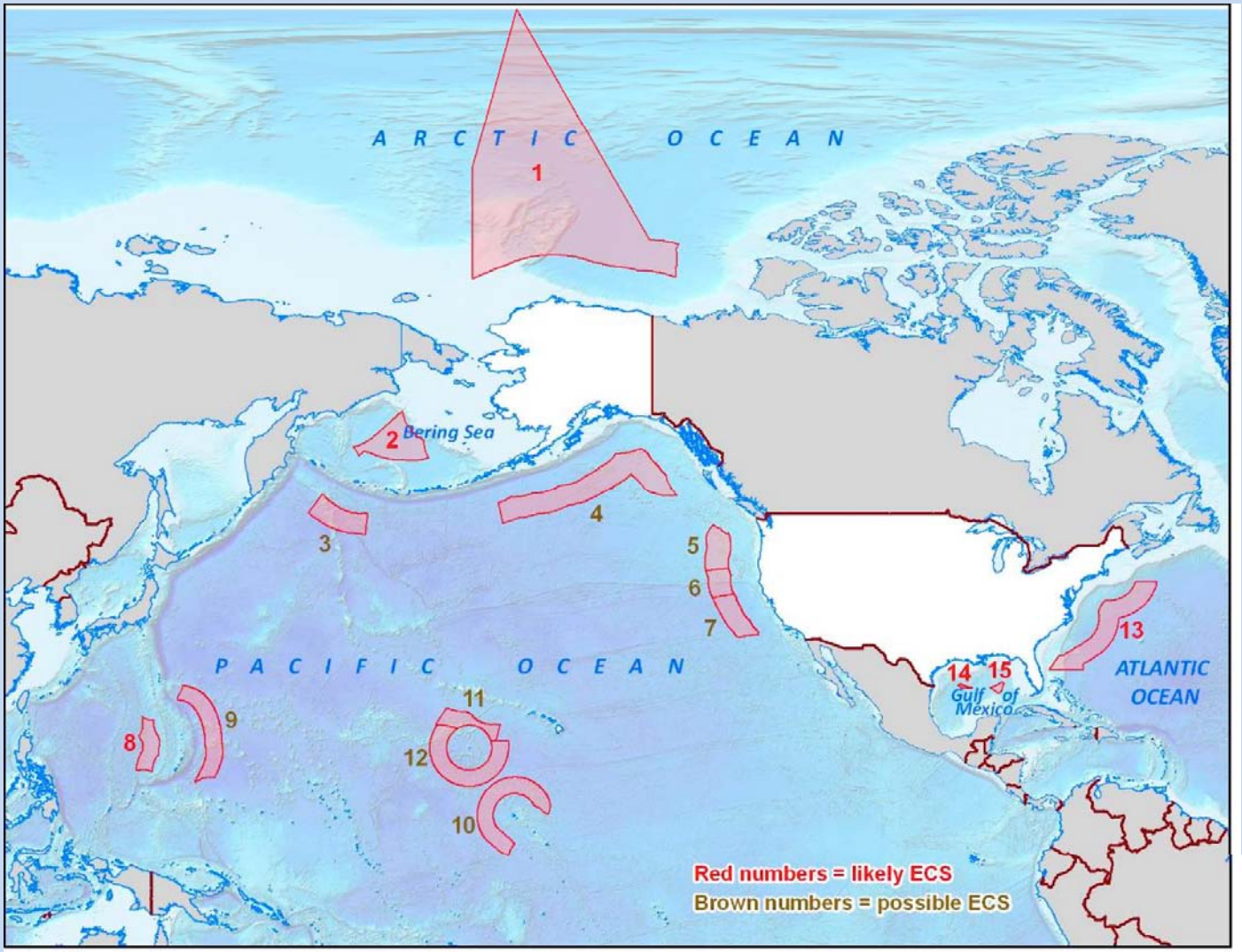
USGS Extended Continental Shelf (ECS)- Areas of Interest



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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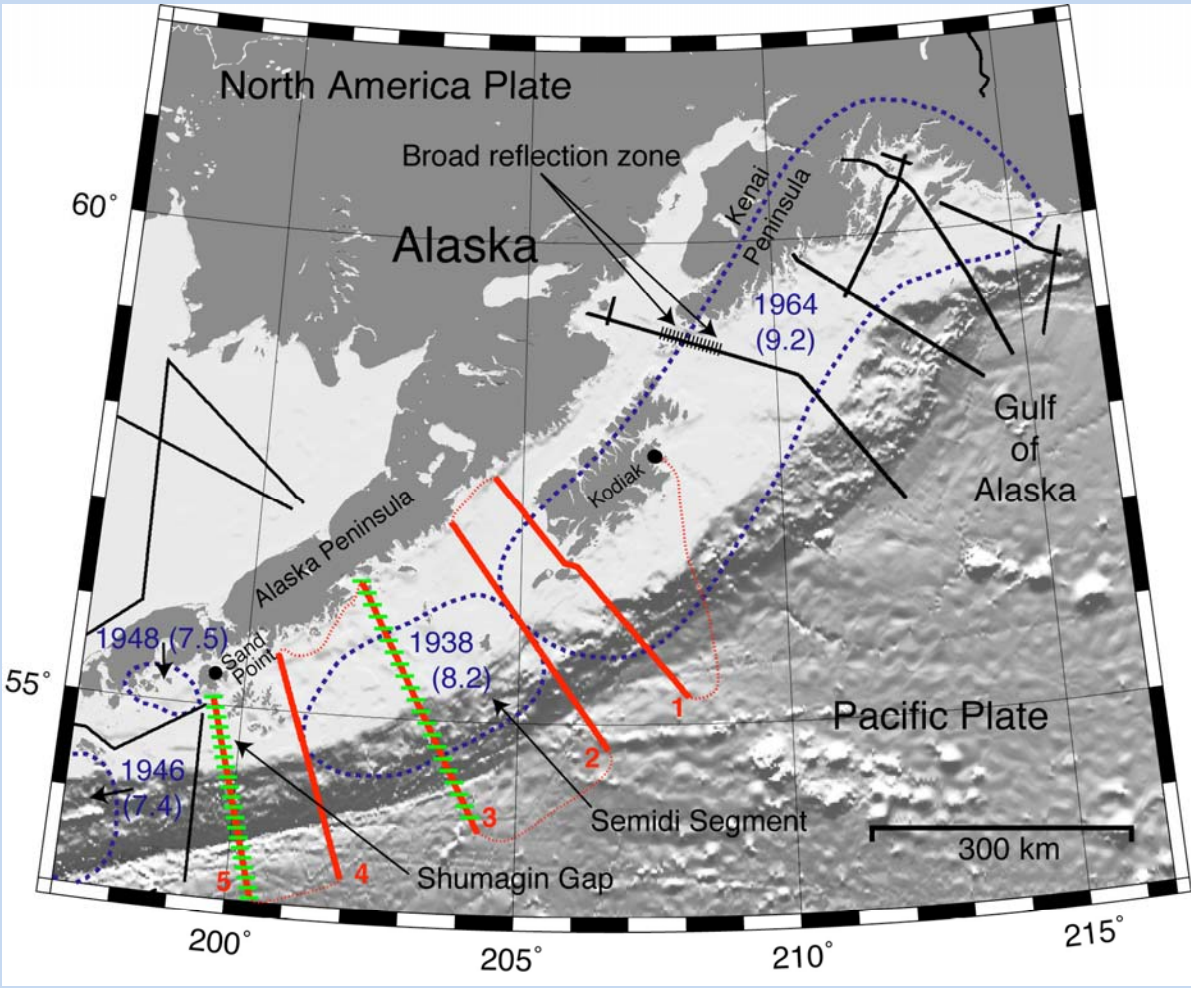
Shillington, D/LDEO/0926614
NSF-OCE-MGG
Aleutian Megathrust,
Shumagin Islands
28 June – 04 August
Kodiak – Dutch Harbor

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.



•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)

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
07 August – 01 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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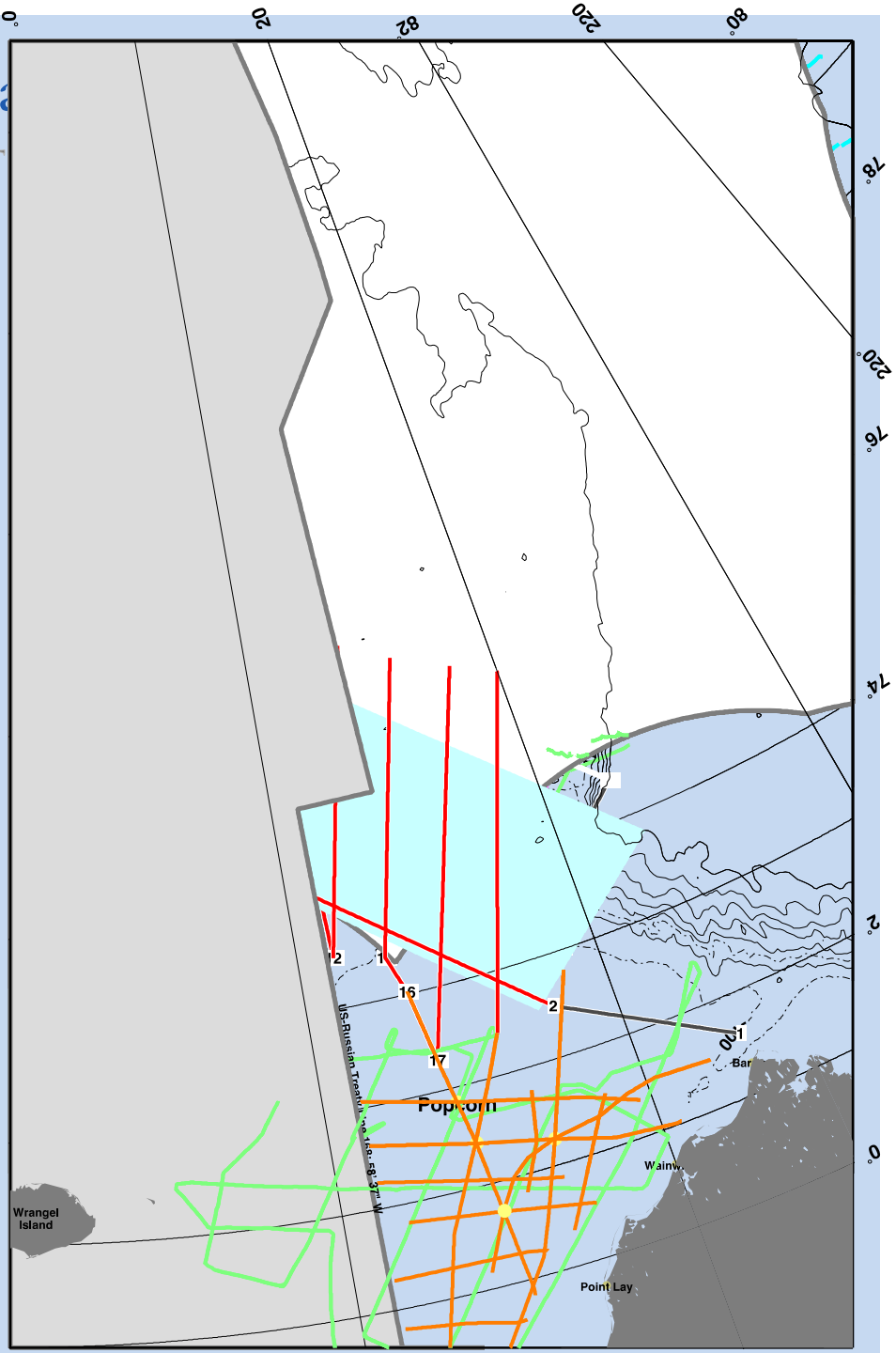
Coakley, B/UAF, G&G/0909568
NSF-OPP
Chukchi Plate, Chukchi Sea
5 September – 9 October
Dutch Harbor – Dutch Harbor

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
26 November – 29 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

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Possible 2011 Scheduled Modified to include Abers' 5-day OBS Deployment

Schedule Impact:

1)Shillington becomes 5 days longer
2)Childs and Coakley move back a net 4 days as we reduced Mob/Demob interval by 1 day.
3)Gaherty moves back a net 3 days by reducing maintenance period by 1 day.
4)Net effect on schedule is increase # of operating days by two days to 248 days as part of Gaherty will fall into January 2011.

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Tentative 2012 Schedule

January 1- 30 –Maintenance period in Hononlulu
January 31– February14 --- Transit to Guam

February 18-March 15 – Wiens– Marianas (Guam to Guam)

March 18 – April 21 – USGS– (Childs) Marianas ECS (Guam to Guam)

April 24- May 14- Korenaga – (Completion of Shatsky Rise)
Guam- Dutch Harbor

May 17 – 23 – Transit from Dutch Harbor to Astoria

May 26 –June 19 Carbotte– Juan de Fuca –

Transit to Atlantic ???

Possible Atlantic Science:

Sawyer 3-D
Canales
2 –USGS ECS Projects Possible on Atlantic Coast.
Hayman – Cayman Seismic

Elsewhere:
Gurnis– Puysegur --Otago Harbor
USGS –Line Islands (Pacific)