



## Project Instruction

**Date Submitted:** March 7, 2011

**Platform:** NOAA Ship *Okeanos Explorer*

**Cruise Number:** EX-11-01

**Project Title:** Ship Shakedown & Patch Tests

**Cruise Dates:** March 16 – April 1, 2011

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Office of Ocean Exploration & Research

Approved by: \_\_\_\_\_ Dated: \_\_\_\_\_  
Craig W. Russell  
Program Manager  
Office of Ocean Exploration & Research

Approved by: \_\_\_\_\_ Dated: \_\_\_\_\_  
Captain David Score, NOAA  
Commanding Officer  
Marine Operations Center – Atlantic

## I. Overview

### A. Cruise Period

This cruise plan covers *Okeanos Explorer* ship shakedown and the Kongsberg EM302 multibeam system patch test from March 16 – April 1, 2011 (EX-11-01).

### B. Operating Area

The operating area is the Pacific Ocean between San Francisco, CA, and San Diego, CA. A one to two day patch test will take place south of San Francisco, in the vicinity of Monterey Bay, CA over Sur Ridge.

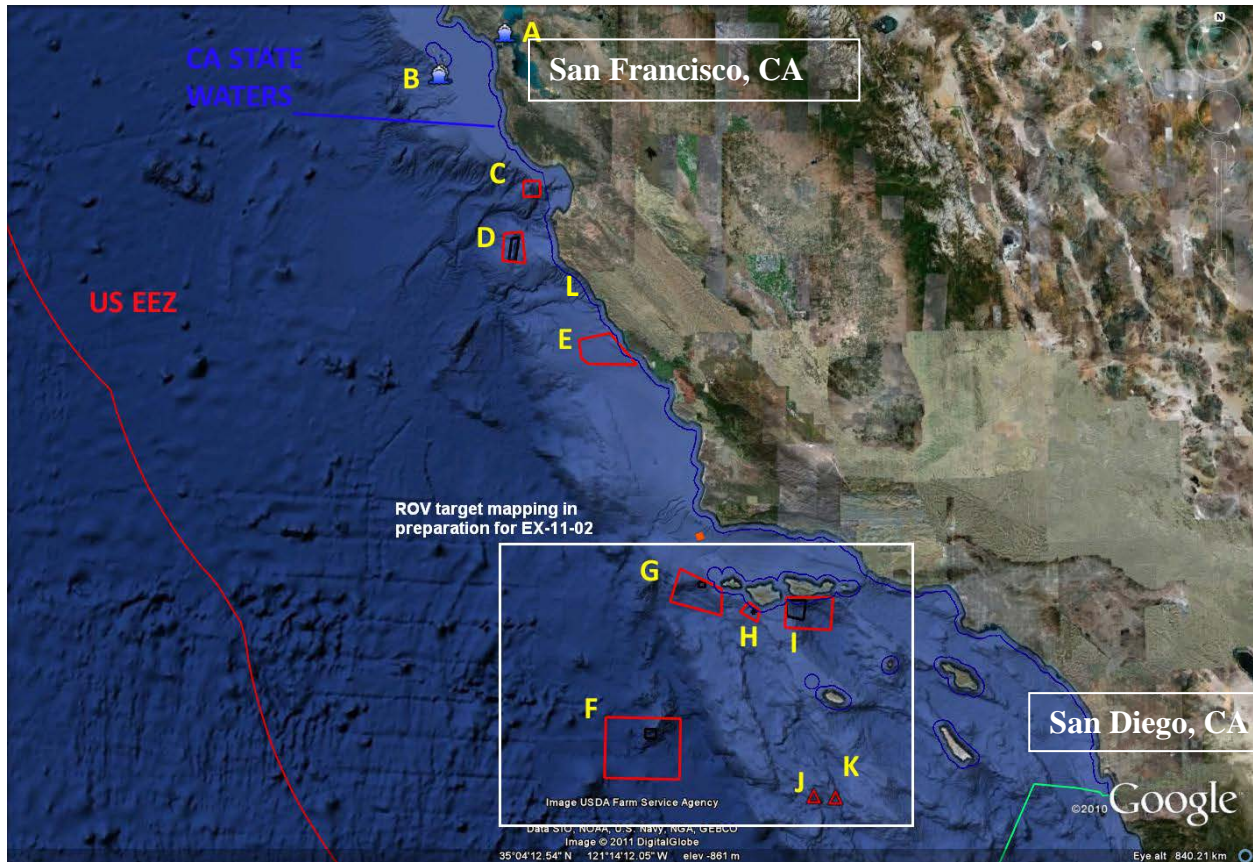


Figure 1. Operating area, from San Francisco, CA to San Diego, CA. Screen grab taken in Google Earth. Not for navigation.

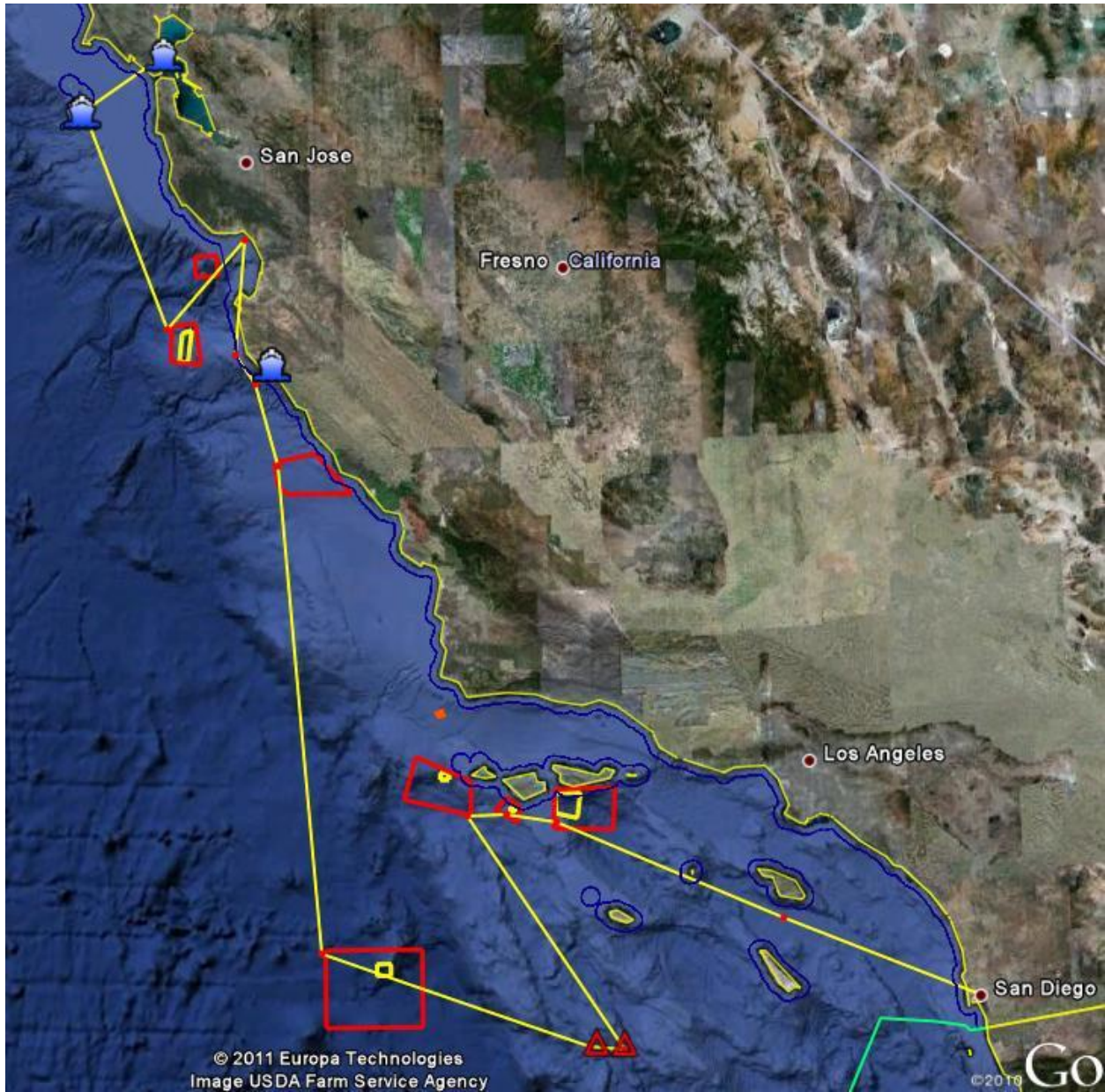


Figure 1a. EX-11-01 possible cruise track, total distance approximately 1400 km, totaling 4 days at 8 kts. Actual cruise track subject to change due to weather and survey conditions.

ID	Name	Category	Survey Type	Longitude (W)	Latitude (N)	Depth(s) in meters (approx)	Survey Estimates (@ 8 kts incl. turns)
A	Fernstrom	Wreck	Single pass (transit)	Position withheld	Position withheld	48 m	n/a
B	Puerto Rican (1) Puerto Rican (2)	Wreck	2-3 passes	Position withheld	Position withheld	350m 515m	1 hr
C	Shallow water test area	Shallow water testing 100-1000m	Flexible	See table below	See table below	100m-1000m	19 hrs
D	Sur Ridge (patch test)	MBNMS Deep water coral habitat	100% coverage	See table below	See table below	800m – 1800m	14 hrs
E	Southern MBNMS	MBNMS deep water coral habitat	100% coverage	See table below	See table below	100m – 1000m	65 hrs
F	San Juan Seamount / Crazy Caldera	CINMS	100% coverage	See table below	See table below	1800m – 3800m	18 hrs
G	Area West of San Miguel Island	CINMS deep water coral habitat	100% coverage	See table below	See table below	300m-2200m	24 hrs
H	“10 Story Building Mystery”	CINMS deep water coral habitat	100% coverage	See table below	See table below	100m-600m	12 hrs
I	Santa Cruz Canyon	CINMS deep water coral habitat	100% coverage	See table below	See table below	130m-1920m	17 hrs
J	Hancock Seamount	Seamount	Single pass or full survey if time	See table below	See table below	300m-1250m	10 hrs
K	109 Seamount	Seamount	Single pass or full survey if time	See table below	See table below	370m-700m	6 hrs
L	USS Macon	Wreck	Two passes, reciprocal direction	Position withheld	Position withheld	450m	1 hr

*Table 1. EX-11-01 Survey Targets*

There are many targets included in this cruise plan. If for some reason it is not possible to cover all targets due to weather or other delays, the following information will be used for **prioritization of targets** while in the field:

1. Seamount 109 is priority over Hancock Seamount if only one of these two can be mapped.
2. For the sanctuaries mapping, in general, the small black box inside red boxes from are the highest priorities.
3. Alphabetical order does not indicate priority order.
4. For ROV target mapping in preparation for EX-11-02, deeper is better (to 4000m) and protected from weather coming in from the NW is better.

Below are tables containing latitude / longitude coordinates for each survey area, including priorities within each larger area.

Point ID	Longitude (W)	Latitude (N)
NE corner	122° 05' 45"	36° 50' 20"
SE corner	122° 05' 08"	36° 43' 31"
SW corner	122° 14' 14"	36° 43' 14"
NW corner	122° 14' 46"	36° 50' 06"

*Table 2: Lat/Longs of Shallow water test site ("C" in figure above)*

Point ID	Longitude (W)	Latitude (N)
NE corner	122° 14' 09" W	36° 28' 24" N
SE corner	122° 12' 02" W	36° 15' 08" N
SW corner	122° 24' 10" W	36° 15' 53" N
NW corner	122° 23' 43" W	36° 27' 30" N

*Table 3: Lat/Longs of Big Sur Deep water patch test site ("D" in figure above)*

Point ID	Longitude (W)	Latitude (N)
NE corner	121° 26' 40"	35° 46' 16"
SE corner	121° 12' 54"	35° 33' 21"
SW corner	121° 41' 05"	35° 32' 44"
NW corner	121° 43' 04"	35° 45' 25"

*Table 4: Lat/Longs of Southern MBNMS survey area ("E" in figure above)*

Point ID	Longitude (W)	Latitude (N)
Large area – San Juan Seamount		
NE corner	120° 46' 40"	33° 06' 06"
SE corner	120° 46' 35"	32° 39' 53"
SW corner	121° 25' 04"	32° 40' 05"
NW corner	121° 25' 10"	33° 06' 19"
Subarea – "Crazy Caldera" – highest priority		

NE corner	120° 59' 23"	33° 01' 31"
SE corner	120° 59' 12"	32° 57' 40"
SW corner	121° 04' 48"	32° 57' 43"
NW corner	121° 04' 46"	33° 01' 39"

*Table 5: Lat/Longs of Southern San Juan Seamount / "Crazy Caldera" survey area ("F" in figure above)*

Point ID	Longitude (W)	Latitude (N)
Large area		
NE corner	120° 27' 39"	34° 00' 09"
SE corner	120° 27' 25"	33° 48' 52"
SW corner	120° 53' 58"	33° 54' 27"
NW corner	120° 48' 49"	34° 08' 14"
Subarea – highest priority		
NE corner	120° 35' 59"	34° 03' 04"
SE corner	120° 36' 00"	34° 00' 53"
SW corner	120° 39' 20"	34° 00' 51"
NW corner	120° 39' 14"	34° 03' 05"

*Table 6: Lat/Longs of Area West of San Miguel Island survey area ("G" in figure above)*

Point ID	Longitude (W)	Latitude (N)
Large area		
NE corner	120° 08' 24"	33° 51' 13"
SE corner	120° 09' 16"	33° 46' 24"
SW corner	120° 18' 05"	33° 50' 33"
NW corner	120° 13' 47"	33° 54' 41"
Subarea – highest priority		
NE corner	120° 10' 31"	33° 51' 20"
SE corner	120° 10' 31"	33° 50' 16"
SW corner	120° 12' 07"	33° 50' 14"
NW corner	120° 12' 08"	33° 51' 20"

*Table 7: Lat/Longs of "10 Story Mystery" survey area ("H" in figure above)*

Point ID	Longitude (W)	Latitude (N)
Large area		
NE corner	119° 31' 15"	33° 57' 01"
SE corner	119° 32' 03"	33° 43' 07"
SW corner	119° 55' 29"	33° 44' 10"
NW corner	119° 54' 44"	33° 56' 55"
Subarea – highest priority		

NE corner	119° 45' 08"	33° 55' 38"
SE corner	119° 46' 23"	33° 47' 22"
SW corner	119° 54' 38"	33° 49' 08"
NW corner	119° 54' 53"	33° 55' 35"

*Table 8: Lat/Longs of Santa Cruz Canyon survey area ("I" in figure above)*

Point ID	Longitude (W)	Latitude (N)
NE corner	119° 27' 20"	32° 35' 28"
SE corner	119° 27' 20"	32° 31' 42"
SW corner	119° 32' 57"	32° 31' 42"
NW corner	119° 32' 57"	32° 35' 28"
Seamount peak – highest priority	119° 29' 31"	32° 33' 20"

*Table 9: Lat/Longs of Hancock Seamount survey area ("K" in figure above)*

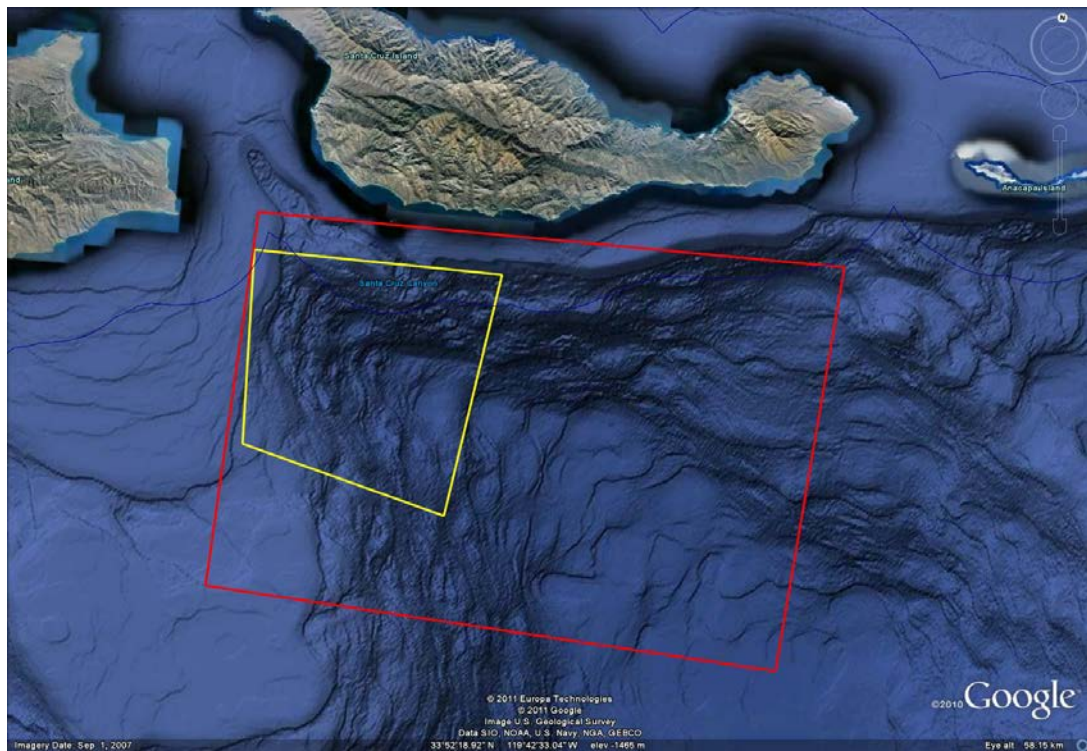
Point ID	Longitude (W)	Latitude (N)
NE corner	119° 35' 19"	32° 35' 11"
SE corner	119° 35' 19"	32° 30' 53"
SW corner	119° 43' 46"	32° 30' 53"
NW corner	119° 43' 46"	32° 35' 11"
Seamount peak – highest priority	119° 40' 20"	32° 33' 55"

*Table 10: Lat/Longs of 109 Seamount survey area ("J" in figure above)*

Below are screen grabs taken in Google Earth showing each survey area within the Channel Islands Marine National Sanctuary (CINMS) and the Monterey Bay National Marine Sanctuary (MBNMS). Overall, survey areas of interest are indicated by a red box and the priority areas are indicated with a yellow box.

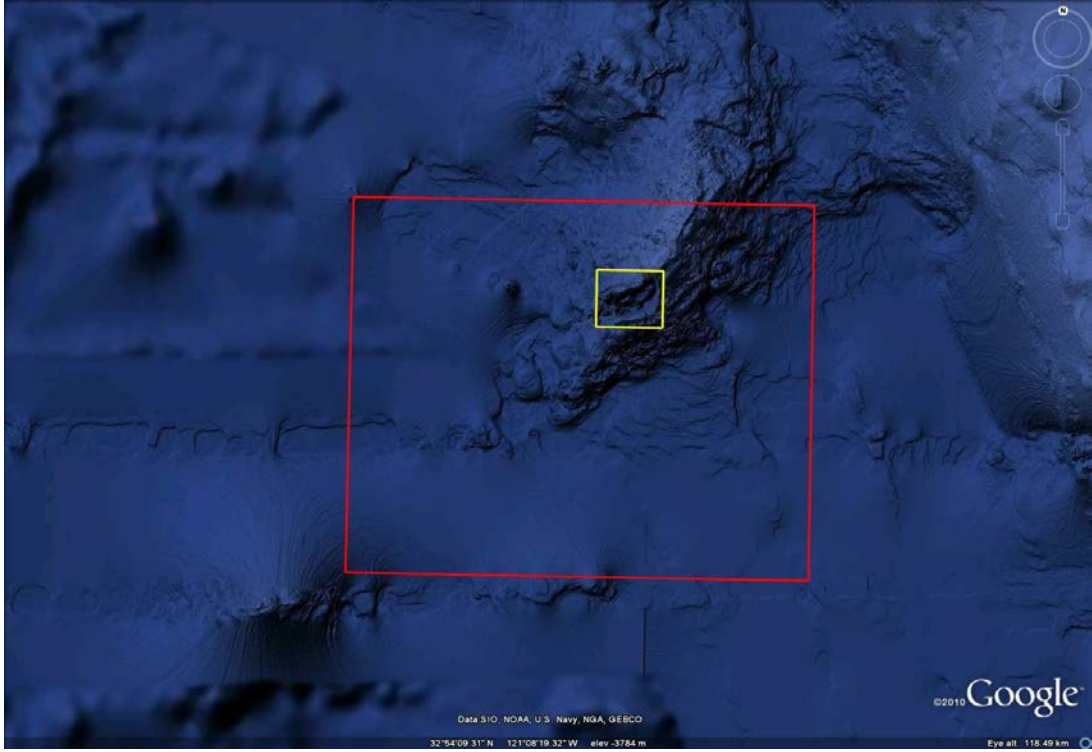


*Figure 2. CINMS survey area west of San Miguel Island.  
Survey area “G” in overall cruise figure.*

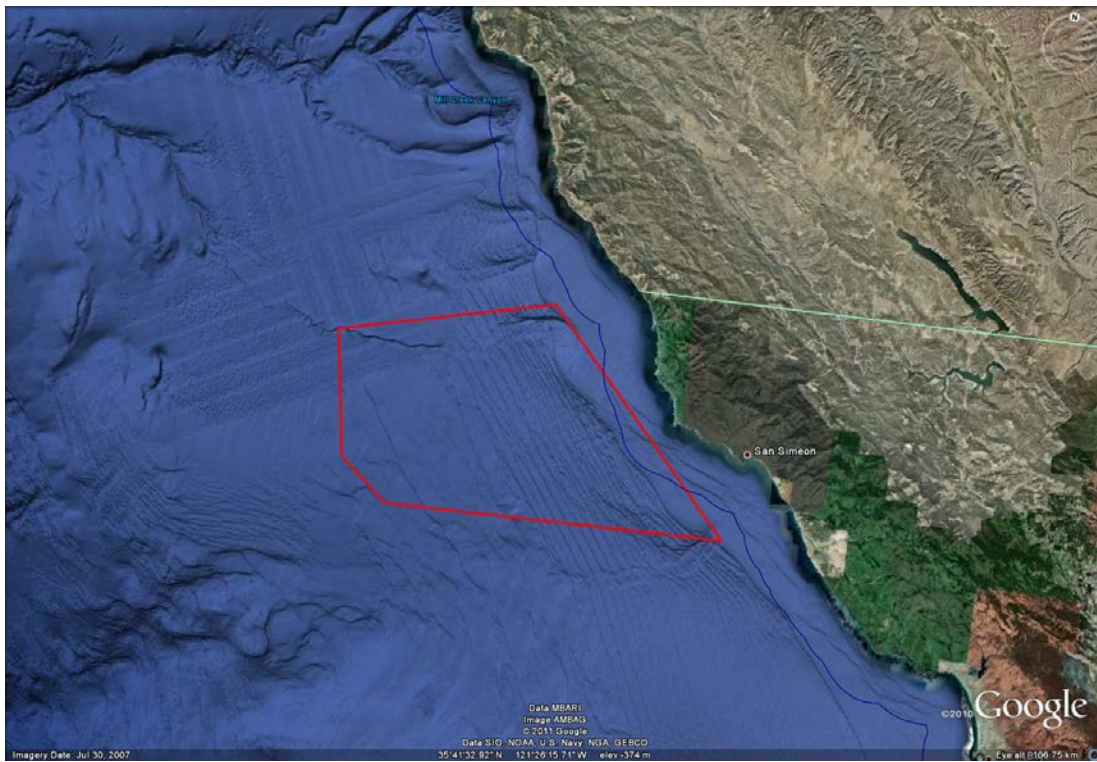


*Figure 3. CINMS Santa Cruz Canyon survey area. Survey area “I” in overall cruise figure.*





*Figure 4. San Juan Seamount, with "Crazy Caldera" in yellow box. Survey area "F" in overall cruise figure.*



*Figure 5. MBNMS southern area. Survey area "E" in overall cruise figure.*

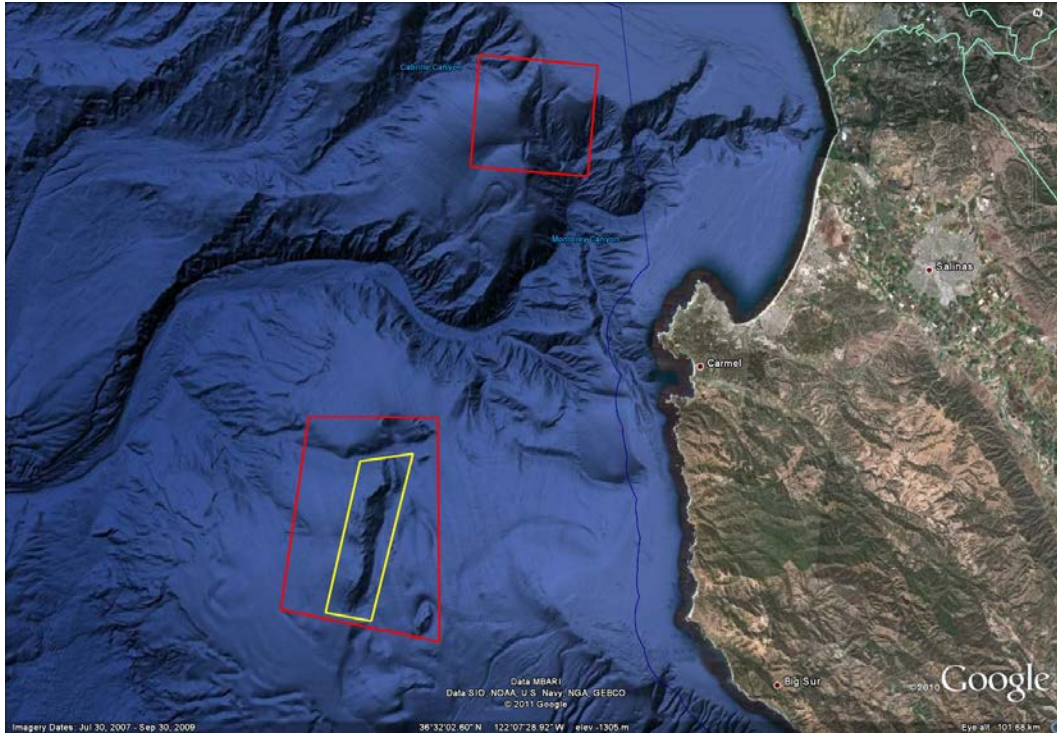


Figure 6. MBNMS surveys areas: Northern box: shallow water test area (Survey area “C” in overall cruise figure). Southern box: patch test over Sur Ridge (Survey area “D” in overall cruise figure).

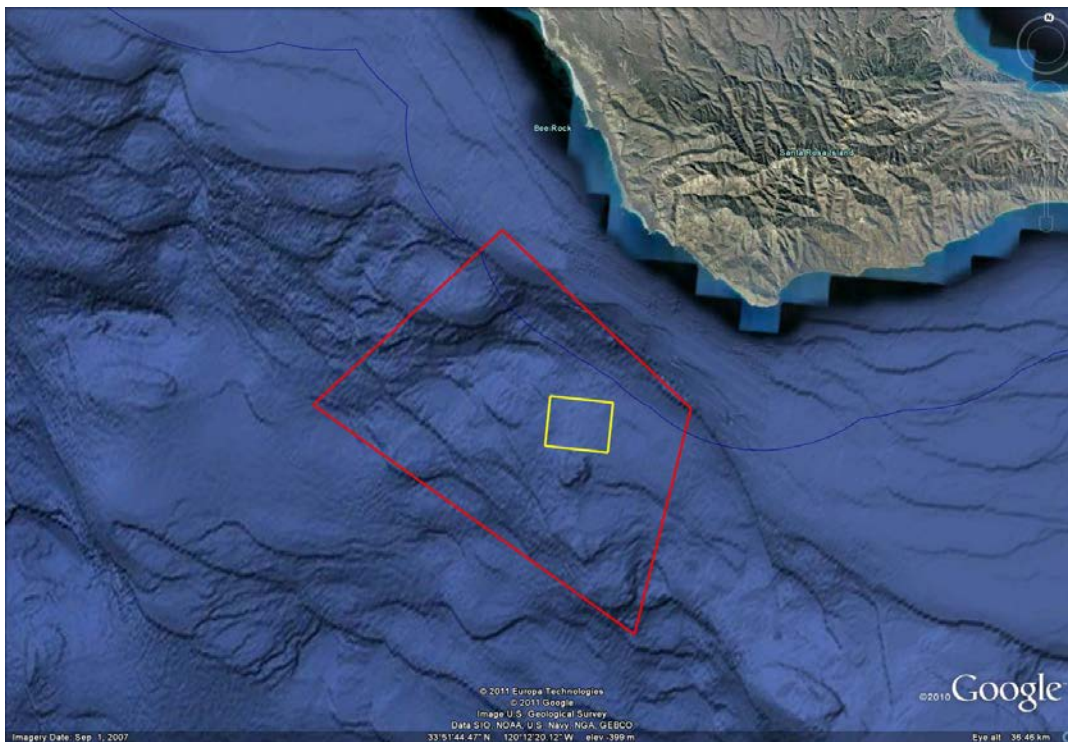


Figure 7. CINMS "10 Story Mystery". Survey area “H” in overall cruise figure.

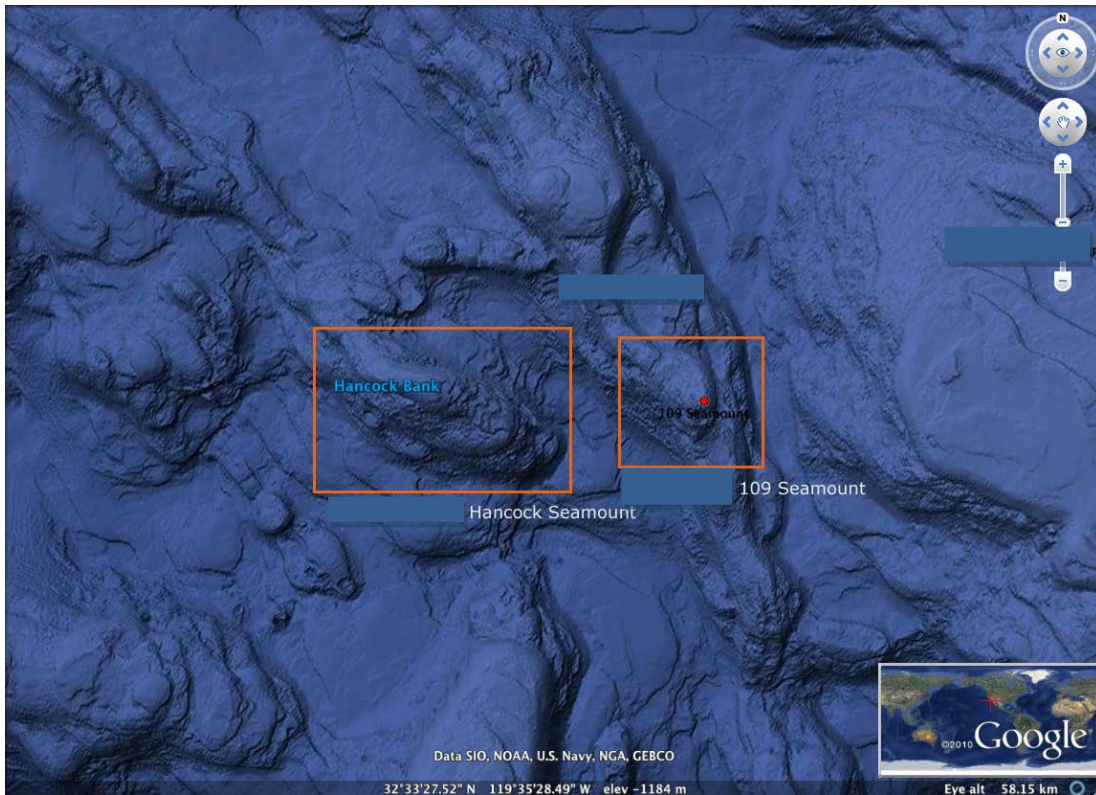


Figure 8. Figure showing Seamounts Hancock and 109 survey areas. Survey areas “J” and “K” in overall cruise figure. See Appendix B for more detail.

## Information on Archaeological Targets (shipwrecks)

### USS Macon

Information from Frank Cantelas, NOAA OER

The Macon site is largely a debris field and, although it was an airship, is typical of nearly all shipwreck sites. Few shipwrecks sink intact and through degradation processes none maintain their integrity for very long. The value of mapping the site area is to acquire a good signature for a debris field of cultural materials and use this as a model in the future to identify submerged cultural resources in multibeam and back scatter data. It will also help refine the use and capabilities of the EM 302 for cultural resource surveys increasing the mapping team's effectiveness in this field.

### Fernstrom

The Fernstrom was carrying diesel when it sank in San Francisco Bay. The position is well known. OER requests the ship pass over it during transit out of the Bay.

### **Puerto Rican**

Information from Kelley Elliott, NOAA OER

Length 162m

Depth 430m

Products of concern: Bunker Fuel (IFO 180 and diesel), lube oil, hydraulic oil

Steel Hull construction

MMS funded a study of this site in 1989

### **Pac Baroness**

On September 21, 1987 at 0600, the Liberian bulk carrier Pac Baroness and the Panamanian freighter Atlantic Wing collided in foggy, high sea conditions, twelve miles southwest of Point Conception, California. The Pac Baroness was carrying 21,000 metric tons of dry bulk copper concentrate consisting of 30% copper, 30% iron, 30% other oxides and approximately 9,200 barrels of bunker fuel (IFO-180 and marine diesel fuel) as well as quantities of lube oil and hydraulic oil. The Atlantic Wing was carrying automobiles and was bound for Long Beach. The Pac Baroness sustained damage to the number 4 and 5 cargo holds and the Atlantic Wing suffered a 25 foot by 10 foot gash in her bow. The Chief Engineer on board the Pac Baroness activated the vessel's bilge pumps and a tug attached a towline to the vessel to prevent the Pac Baroness from drifting toward the shoreline. By 1607, the Pac Baroness was still taking on water and was close to sinking. The Pac Baroness sank at 1618 on September 21, resulting in a release of approximately 9,200 barrels of oil and quantities of copper ore over the next 20 days. The currents at the time of the incident were to the northwest at 3-4 knots; winds in the area were from the N-NW at 10 knots. The seasonal Davidson Current flows north along isobaths at about 0.25 knots. The Clean Seas Co-op was originally conducting cleanup on behalf of the owners of the Pac Baroness. On September 24, Clean Seas notified the U.S. Coast Guard's (USCG) Federal On Scene Coordinator (FOSC) that they would no longer be continuing operations due to disagreements over their contract with the owners. The FOSC declared the incident a Federal response and opened the 311 (k) funds. The USCG began negotiations to contract Clean Seas as part of the Federal response. By September 28, Clean Seas had resumed working for the owners of the Pac Baroness, with the agreement that the owners would finance the Clean Seas response inclusive of the period from September 24 to September 28. USCG district 11. Keyword: International Bird Rescue and Research Center (IBRRC), adverse weather conditions, Elastol, Davidson Current, side looking airborne radar (SLAR), skimmer.

### C. Summary of Objectives

The ship has been in drydock and alongside at Bay Ship & Yacht Co., Alameda, CA, since November 2, 2010. The ship shakedown and patch test cruise is scheduled to provide an opportunity to get underway and ensure all ship and mission equipment is operational and the necessary preparations have been made prior to conducting ROV integration/shakedown.

After the patch tests are completed, the goal is to conduct the objectives outlined below in a safe and timely manner while transiting from the vicinity of Monterey Bay, CA to San Diego, CA, stopping along the way to explore archaeological and seafloor habitat targets of interest selected by the National Marine Sanctuaries program (see Figure 1). It is not expected that all targets shown in Figure 1 will be mapped. It is understood that mapping work is one of a few of the overall objectives of the shakedown cruise. During the transit, multibeam data will be collected 24 hours a day and XBT casts will be conducted every 6 hours. All data will be fully processed according to normal onboard mapping procedures and will be archived with the National Geophysical Data Center.

1. Operation of all ship's basic equipment and routine operating procedures
  - A. Annual review of watchstanding procedures & underway routines
  - B. Annual review of ship's checklists (Getting Underway, Arrival, etc.)
  - C. Fueling and ballasting procedures
  - D. Operation of water makers, Marine Sanitation Device, Oily Water Separator, and all equipment typically not operational while alongside
  - E. Annual review of small boat operational risk management and certification/practice for launch/recovery crews and coxswains.
  
2. Conduct emergency drills
  - A. Fire/Damage Control
  - B. Abandon Ship
  - C. Man-Over-Board
  - D. Steering Casualty
  
4. Operation of ship's equipment necessary to support operations
  - A. Dynamic Positioning System Operator Practice
  - B. Deck Equipment Certification Procedures and Practice
  - C. Rep on board to conduct sound survey
  
5. Run mapping systems (MBES)
  - A. Kongsberg Rep on board for EM302 sub-rack replacement and testing
  - B. Shallow and deep water Patch Test
  - D. Implement new software
  - E. Conduct 24-hr mapping operations during transit, with possible development of exploration targets selected by the National Marine Sanctuaries.
  
6. Test Oceanographic Systems
  - A. Test functionality of CTD sensors and water sampling bottles
  - B. Test newly installed RESON svp
  - C. Conduct an XBT, CTD and RESON svp profile comparison
  
7. Test ship's ROV Support Systems
  - A. Deck equipment testing (A-frame, ROV Crane, and Traction Winch)

8. Test satellite communication systems (VSAT)
  - A. Verify operation of all above-deck and below-deck equipment
  - B. Establish 5Mb/s ship-to-shore, 1.5Mb/s shore-to-ship data link
  - C. Verify transmission of multicast traffic off the ship
  - D. Verify operation of the ship-to-shore intercom link
  
9. Re-establish data pipelines with NODC and NDGC
  - A. Verify data from the ship's systems can be securely transferred to NOAA's shore-based data archival facilities
  - B. Automate data transfer process to allow hourly updates
  
10. Test telepresence system
  - A. Transmit real-time video to shore
  - B. Use the RTS intercom to engage in real-time, two-way voice communication
  - C. Implement new data products into the regular remote exploration data management workflow
  - D. Conduct a remote desktop test through Go to meeting where by the ship sets up a go to meeting on the multibeam data acquisition machine and shore side tests to see if the computer can be controlled remotely. The purpose is to assess the stability and reliability of the connection.
  
11. Complete the Mapping Readiness Report

#### D. Participating Institutions

National Oceanic and Atmospheric Administration - Office of Ocean Exploration and Research (OER) - 1315 East-West Hwy, Silver Spring, Maryland 20910

University of New Hampshire (UNH) - Center for Coastal and Ocean Mapping (CCOM) - Jere A. Chase Ocean Engineering Lab, 24 Colovos Road, Durham, NH 03824 USA

National Oceanic and Atmospheric Administration - Office of National Marine Sanctuaries – 99 Pacific St, Suite 200K, Monterey, CA 93940-2493

#### E. Personnel (Science Party)

A full mapping complement is necessary for this cruise, which requires two qualified watchstanders at all times. One mapping lead is required to facilitate overall mapping operations, including participating in operational meetings, providing guidance for mapping/survey troubleshooting, and communicating status of mapping sensors to personnel on shore.

A technician from Kongsberg will be onboard for the first few days of the cruise to conduct

software upgrades and monitor data quality of the multibeam EM302.

Name	Affiliation		M/F	Status
Meme Lobecker	OER (ERT Inc)	Mapping Lead	F	US Citizen
Adam Argento	NOAA	Mapping Watchstander 1	M	US Citizen
Ash Harris	UCAR	Mapping Watchstander 2	M	US Citizen
Dave Armstrong	UCAR	Mapping Watchstander 3	M	US Citizen
Tony Lukach	NOAA	Mapping Watchstander 4	M	US Citizen
Webb Pinner	OER	Telepresence lead	M	US Citizen
Jared Harris	Kongsberg	EM302 sub-rack replacement and test	M	US Citizen
Roland Brian	OER	Video Engineer	M	US Citizen
Gregg Diffendale	OER	Video Engineer	M	US Citizen

*Table 2: Full list of the science party and their affiliation*

## F. Administrative

### *Key Points of Contact*

#### *Ship Operations*

Marine Operations Center, Atlantic (MOA)  
439 West York Street  
Norfolk, VA 23510-1145  
Telephone: (757) 441-6776  
Fax: (757) 441-6495

Marine Operations Center, Pacific (MOP)  
1801 Fairview Avenue East  
Seattle, WA 98102-3767  
Telephone: (206) 553-4548  
Fax: (206) 553-1109

Chief, Operations Division, Atlantic (MOA1)  
CDR Keith Roberts  
Telephone: (757) 441-6842  
E-mail: ChiefOps.MOA@noaa.gov

Chief, Operations Division, Pacific (MOP1)  
LCDR Demian Bailey  
Telephone: (206) 553-8705  
Email: ChiefOps.MOP@noaa.gov

#### *Mission Operations*

Meme Lobecker, Mapping Lead (onboard)  
NOAA Office of Ocean Exploration  
and Research (ERT, Inc)  
Phone : (301) 938-8460  
E-mail : [elizabeth.lobecker@noaa.gov](mailto:elizabeth.lobecker@noaa.gov)

CDR Robert Kamphaus, NOAA  
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NOAA Ship *Okeanos Explorer*  
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Mashkoor Malik, Mapping Lead (shoreside)  
NOAA Office of Ocean Exploration and Research (ERT,  
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E-mail: [mashkoor.malik@noaa.gov](mailto:mashkoor.malik@noaa.gov)

LT Nicola VerPlanck, Field Operations Officer  
NOAA Ship *Okeanos Explorer*  
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E-mail: [ops\\_explorer@noaa.gov](mailto:ops_explorer@noaa.gov)

### *Other Mission Contacts*

Craig Russell, EX Program Manager  
NOAA Ocean Exploration & Research  
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Catalina Martinez, Regional Manager  
NOAA Office of Ocean Exploration & Research  
Phone: (401) 874-6250 (o) / (401) 330-9662 (c)  
Email: [Catalina.Martinez@noaa.gov](mailto:Catalina.Martinez@noaa.gov)

LTjg Megan Nadeau, Incoming Ops Officer  
NOAA Office of Ocean Exploration & Research  
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Webb Pinner, Telepresence Lead  
NOAA Office of Ocean Exploration & Research  
Phone: (401) 874-6250 (o) / (401) 330-9662 (c)  
Email: [Webb.Pinner@noaa.gov](mailto:Webb.Pinner@noaa.gov)

Dave Lott, West Coast Regional Operations Coordinator  
NOAA's Office of National Marine Sanctuaries  
99 Pacific Street  
Suite 200K  
Monterey, CA 93940-2493  
W: 831-647-1920 x103  
M: 831-241-3097  
F: 831-647-1732

### *Shipments*

Send an email to the *Okeanos Explorer* Operations Officer at [OPS.Explorer@noaa.gov](mailto:OPS.Explorer@noaa.gov) indicating the size and number of items being shipped. All items should arrive in Alameda before March 15, 2011 otherwise they will be forwarded to the ship when it arrives in San Diego, CA.

Shipyard Address  
ATT: Okeanos Explorer; LT VerPlanck  
Bay Ship & Yacht Co.  
2900 Main Street, Suite 2100  
Alameda, CA 94501

#### G. Diplomatic Clearances

***NOT APPLICABLE TO THIS CRUISE***

#### H. Licenses and Permits

Monterey Bay Marine National Sanctuary requires a permit for the discharge of expendable bathythermographs (XBTs) throughout the MBNMS for the multibeam patch test (see permit in appendix C).

## **II. Operations**

### A. Cruise Plan Itinerary



*Tuesday, March 16*

0800	Safety Meeting
0900	ETD San Francisco
0930-1100	Conduct Sound Survey
1100-1130	Small boat transfer for sound survey rep & small boat operations review
1200-1300	Fire Drill: Pre-brief, Drill, and De-brief
1300-1400	Abandon Ship Drill
1415-1515	Man-Over-Board Drill
1600	OPS Brief

*Wednesday, March 16 ~ Friday, March 19/20*

- EM302 testing with Kongsberg Rep
- Implement new SIS software
- Calibrate Multibeam (shallow testing and deep water Patch Test) in vicinity of Monterey Bay, and over Sur Ridge
- Small boat transfer into Moss Landing to drop off Kongsberg rep

*Saturday, March 20 – Wednesday, March 31*

- Conduct CTD, Reson SVP and XBT comparison
- Test Sub-Bottom Profiler and Singlebeam sonar
- Implement new survey software
- Run EM302 continuously to test new transmit boards
- Conduct multibeam surveys over targets selected by NOAA National Marine Sanctuaries, and Peter Etnoyer, as time allows. Targets will be surveyed starting with the northernmost targets and working to the south. See Table 1 for details on each target.
- Dynamic Positioning System testing and Operator Practice
- Deck Equipment Certification Practice - in tandem with DP

*Thursday, April 1*

0800	Safety Meeting
0900	ETA San Diego, CA

B. Staging and destaging

***NOT APPLICABLE TO THIS CRUISE***

C. Operations

*Multibeam Operations*

The following mapping operations are intended for the shakedown cruise.

MBES Patch test: Patch test is conducted to identify any roll, heave, pitch and time offsets between MBES and the motion sensor. The ship is run over small lines (~ 1-4 km) in several configurations to assess these offsets. For detailed description of carrying out patch test refer to the EX SOP for conducting a patch test. Patch test will ensure the ability of the sonar system to collect valid bathymetric data and proper integration with ancillary sensors. See Figures 2 and 3 above for patch test sites.

Preliminary mapping systems testing methodology:

1. With same version / setup as last year, conduct a patch test to verify that all the ancillary systems are properly configured / working.
2. Introduce the hardware updates / software version upgrades and repeat the patch test.
3. Assess the affect of system upgrades (hardware and software). Continue running the system for the duration of cruise in Dynamic Dual Swath mode as appropriate to make sure that transmit boards do not fail.
4. Assess the data compatibility with processing softwares (CARIS, Fledermaus, Geocoder) before and after change of versions / upgrades.
5. Test and evaluate EA 600.
6. Test the operation of all the mapping sensors together (Knudsen, EA600, EM302) to assess synchronization status.

Updating the mapping software (CARIS HIPS, Fledermaus, SIS etc.) The software updates will be conducted after testing all the mapping sensors with 2010 hardware/ software configuration. Tests will be conducted before and after the software upgrades to ensure that changes in any software is detected and understood.

24 hour data multibeam data collection will occur during the transit to San Diego, with XBTs collected every 6 hours.

#### *Other Operations*

Testing and running the Sub Bottom Profiler, the Singlebeam, USBL and SCS system.

#### D. Dive Plan

***NOT APPLICABLE TO THIS CRUISE***

#### E. Applicable Restrictions

***NOT APPLICABLE TO THIS CRUISE***

### **III. Equipment**

#### A. Equipment and capabilities provided by the ship

- Kongsberg Simard EM302 Multibeam Echosounder (MBES)
- Kongsberg Simrad EA600 Deepwater Echosounder
- Knudsen Chirp 3260 Sub-bottom profiler (SBP)
- LHM Sippican XBT (various probes)
- Seabird SBE 911Plus CTD
- Seabird SBE 32 Carousel and 24 2.5 L Niskin Bottles
- CNAV GPS
- POS/MV
- Seabird SBE-45 (Micro TSG)
- Kongsberg Dynamic Positioning-1 System
- NetApps mapping storage system
- CARIS HIPS Software
- IVS Fledermaus Software
- SIS Software
- Hypack Software
- Scientific Computing System (SCS)
- ECDIS
- Met/Wx Sensor Package
- Telepresence System
- VSAT High-Speed link (Comtech 20 Mbps and 10 Mbps ship to shore)
- Cruise Information Management System (CIMS)
- Little Hercules ROV
- Argus 2 Camera Platform
- Labconco Fume Hood

B. Equipment and capabilities provided by the scientists

*NOT APPLICABLE TO THIS CRUISE*

#### **IV. Hazardous Materials**

A. Policy and Compliance

The Expedition Coordinator is responsible for complying with MOCDOC 15, Fleet Environmental Compliance #07, Hazardous Material and Hazardous Waste Management Requirements for Visiting Scientists, released July 2002. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

By Federal regulations and NOAA Marine and Aviation Operations policy, the ship may not sail without a complete inventory of all hazardous materials by name and the anticipated quantity brought aboard, MSDS and appropriate neutralizing agents, buffers, and/or absorbents in amounts adequate to address spills of a size equal to the amount of chemical brought aboard. The

amount of hazardous material arriving and leaving the vessel shall be accounted for by the Expedition Coordinator.

B. Radioactive Isotopes

***NOT APPLICABLE TO THIS CRUISE***

C. Inventory

***NOT APPLICABLE TO THIS CRUISE***

**V. Additional Projects**

A. Supplementary ("Piggyback") Projects

***NONE***

B. NOAA Fleet Ancillary Projects

***NOT APPLICABLE TO THIS CRUISE***

**VI. Disposition of Data and Reports**

A. Data Responsibilities

All data acquired on *Okeanos Explorer* will be provided to the public archives without proprietary rights. All data management activities shall be executed in accordance with NAO 212-15, Management of Environmental and Geospatial Data and Information [[http://www.corporateservices.noaa.gov/ames/NAOs/Chap\\_212/naos\\_212\\_15.html](http://www.corporateservices.noaa.gov/ames/NAOs/Chap_212/naos_212_15.html)].

*Ship Responsibilities*

The Commanding Officer is responsible for all data collected for missions until those data have been transferred to mission party designees. Data transfers will be documented on NOAA Form 61-29. Reporting and sending copies of project data to NESDIS (ROSCOP form) is the responsibility of OER.

*NOAA OER Responsibilities*

The Expedition Coordinator will work with the *Okeanos Explorer* Operations Officer to ensure data pipeline protocols are followed for final archive of all data acquired on the EX without proprietary rights.

*Deliverables*

- a. At sea
- Daily plans of the Day (POD)
  - Daily situation reports (SITREPS)

- b. Post cruise
  - Refined SOPs for all pertinent operational activities
  - Assessments of all activities
- c. Science
  - Multibeam and XBT raw and processed data
  - Mapping data report
  - 2011 System Readiness Report

#### *Archive*

- The Program and ship will work together to ensure documentation and stewardship of acquired data sets in accordance with NAO 212-15. The Cruise Information Management System is the primary tool used to accomplish this activity.

### B. Pre and Post Cruise Meeting

#### *Pre-Cruise Meeting*

Prior to departure, the Operation's Officer will conduct a meeting of the scientific party to inform them of cruise objectives and vessel protocols, e.g., meals, watches, etiquette, etc.

#### *Post-Cruise Meeting*

Upon completion of the cruise, a meeting will be held by the Operation's Officer and attended by the ship's Survey Technicians, the Expedition Coordinator and members of the scientific party to review the cruise. Concerns regarding safety, efficiency, and suggestions for improvements for future cruises should be discussed.

#### *Shipboard Meetings*

Daily Operations Briefing meetings will be held at 1530 in the forward lounge to review the current day, and define operations, associated requirements and staffing needs for the following day. A Plan of the Day (POD) will be posted each evening for the next day in specified locations throughout the ship. A safety brief and overview of POD will occur on the Bridge each morning at 0800. Daily Situation Reports (SITREPS) will be posted as well and shared daily through e-mail and/or the EX PLONE site ( <http://tethys.gso.uri.edu/OkeanosExplorerPortal> ).

### C. Ship Operation Evaluation Report

Within seven days of the completion of the cruise, a Ship Operation Evaluation form is to be completed by the Expedition Coordinator and lead scientist. The preferred method of transmittal of this form is via email to [OMAO.Customer.Satisfaction@noaa.gov](mailto:OMAO.Customer.Satisfaction@noaa.gov). If email is not an option, a hard copy may be forwarded to:

Director, NOAA Marine and Aviation Operations  
NOAA Office of Marine and Aviation Operations  
8403 Colesville Road, Suite 500  
Silver Spring, MD 20910

## VII. Miscellaneous

### A. Meals and Berthing

Meals and berthing are required for up to 19 scientists. Meals will be served 3 times daily beginning one hour before scheduled departure, extending throughout the cruise, and ending two hours after the termination of the cruise. Since the watch schedule is split between day and night, the night watch may often miss daytime meals and will require adequate food and beverages (for example a variety of sandwich items, cheeses, fruit, milk, juices) during what are not typically meal hours. Special dietary requirements for scientific participants will be made available to the ship's command at least twenty-one days prior to the survey (e.g., Expedition Coordinator is allergic to fin fish). Berthing requirements, including number and gender of the scientific party, will be provided to the ship by the Expedition Coordinator. The Expedition Coordinator and Operations Officer will work together on a detailed berthing plan to accommodate the gender mix of the scientific party taking into consideration the current make-up of the ship's complement. The Expedition Coordinator is responsible for ensuring the scientific berthing spaces are left in the condition in which they were received; for stripping bedding and linen return; and for the return of any room keys which were issued. The Expedition Coordinator is also responsible for the cleanliness of the laboratory spaces and the storage areas utilized by the scientific party, both during the cruise and at its conclusion prior to departing the ship.

All NOAA scientists will have proper travel orders when assigned to any NOAA ship. The Expedition Coordinator will ensure that all non NOAA or non Federal scientists aboard also have proper orders. It is the responsibility of the Expedition Coordinator to ensure that the entire scientific party has a mechanism in place to provide lodging and food and to be reimbursed for these costs in the event that the ship becomes uninhabitable and/or the galley is closed during any part of the scheduled project.

All persons boarding NOAA vessels give implied consent to comply with all safety and security policies and regulations which are administered by the Commanding Officer. All spaces and equipment on the vessel are subject to inspection or search at any time. All personnel must comply with OMAO's Drug and Alcohol Policy dated May 7, 1999 which forbids the possession and/or use of illegal drugs and alcohol aboard NOAA Vessels.

### B. Medical Forms and Emergency Contacts

The NOAA Health Services Questionnaire (NHSQ, Revised: 08/08) must be completed in advance by each participating scientist. The NHSQ can be obtained from the Expedition Coordinator or the NOAA website at [NOAA HEALTH SERVICES QUESTIONNAIRE](http://www.oma.noaa.gov/medical/NHSQ_Final_wi_Instructions_fill.pdf) found at [http://www.oma.noaa.gov/medical/NHSQ\\_Final\\_wi\\_Instructions\\_fill.pdf](http://www.oma.noaa.gov/medical/NHSQ_Final_wi_Instructions_fill.pdf). The completed

form should be sent to the Regional Director of Health Services at Marine Operations Center. The participant can mail, fax, or scan the form into an email using the contact information below. The NHSQ should reach the Health Services Office no later than 4 weeks prior to the cruise to allow time for the participant to obtain and submit additional information that health services might require before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of the NHSQ. Be sure to include proof of tuberculosis (TB) testing, sign and date the form, and indicate the ship or ships the participant will be sailing on. Clearances are valid for 2 years for personnel under age 50 and 1 year for age 50 and over. All PPD's expire after one year from the date of administration. The participant will receive an email notice when medically cleared to sail if a legible email address is provided on the NHSQ.

Contact information:

Regional Director of Health Services  
Marine Operations Center – Atlantic  
439 W. York Street  
Norfolk, VA 23510  
Telephone 757.441.6320  
Fax 757.441.3760  
E-mail: [MOA.Health.Services@noaa.gov](mailto:MOA.Health.Services@noaa.gov)

Please make sure the [medicalexplorer@noaa.gov](mailto:medicalexplorer@noaa.gov) email address is cc'd on all medical correspondence.

Prior to departure, the Expedition Coordinator must provide a listing of emergency contacts to the Operations Officer for all members of the scientific party, with the following information: name, address, relationship to member, and telephone number.

Emergency contact form is included as Appendix A.

### C. Shipboard Safety

Wearing open-toed footwear or shoes that do not completely enclose the foot (such as sandals or clogs) outside of private berthing areas is not permitted. Steel-toed shoes are required to participate in any work dealing with suspended loads, including CTD deployments and recovery. The ship does not provide steel-toed boots. Hard hats are also required when working with suspended loads. Work vests are required when working near open railings and during small boat launch and recovery operations. Hard hats and work vests will be provided by the ship when required.

Operational Risk Management: For every operation to be conducted aboard the ship (NOAA-wide initiative), risk management procedures will be followed. For each operation, risks will be identified and assessed for probability and severity. Risk mitigation strategies / measures will be

investigated and implemented where possible. After mitigation, the residual risk will have to be assessed to make Go-No Go decisions for the operations. Particularly with new operations, risk assessment will be ongoing and updated as necessary. This does not only apply to over-the-side operations, but to everyday tasks aboard the vessel that pose risk to personnel and property.

- CTD, ROV (and other pertinent) ORM documents will be followed by all personnel working on board the EX.
- All personnel on board are in the position of calling a halt to operations/activities in the event of a safety concern.

#### D. Communications

A daily situation report (SITREP) on operations prepared by the Expedition Coordinator will be relayed to the program office. Sometimes it is necessary for the Expedition Coordinator to communicate with another vessel, aircraft, or shore facility. Through various modes of communication, the ship is able to maintain contact with the Marine Operations Center on an as needed basis. These methods will be made available to the Expedition Coordinator upon request, in order to conduct official business. The ship's primary means of communication with the Marine Operations Center is via e-mail and the Very Small Aperture Terminal (VSAT) link. Standard VSAT bandwidth at 128kbs is shared by all vessels staff and the science team at no charge. Increased bandwidth in 30 day increments is available on the VSAT systems at increased cost to the scientific party. If increased bandwidth is being considered, program accounting is required it must be arranged at least 30 days in advance.

Specific information on how to contact the NOAA Ship *Okeanos Explorer* and all other fleet vessels can be found at: <http://www.moc.noaa.gov/phone.htm>

#### **Important Telephone and Facsimile Numbers and E-mail Addresses**

Ocean Exploration and Research (OER):

OER Program Administration:

Phone: (301) 734-1010

Fax: (301) 713-4252

E-mail: Firstname.Lastname@noaa.gov

University of New Hampshire, Center for Coastal and Ocean Mapping

Phone: (603) 862-3438

Fax: (603) 862-0839

NOAA Ship *Okeanos Explorer* - Telephone methods listed in order of increasing expense:

EX Cellular:

OOD (401) 378-7414

EX Iridium:



(808) 659-9179

EX INMARSAT B

Line 1: 011-872-764-852-328

Line 2: 011-872-764-852-329

Voice Over IP (VoIP) Phone:

301-713-7772 (expect a delay once picked up by directory)

E-Mail: [Ops.Explorer@noaa.gov](mailto:Ops.Explorer@noaa.gov) - (mention the person's name in SUBJECT field)

[expeditioncoordinator.explorer@noaa.gov](mailto:expeditioncoordinator.explorer@noaa.gov) - For dissemination of all hands emails by Expedition Coordinator while on board. See ET for password.

E. IT Security

Any computer that will be hooked into the ship's network must comply with the NMAO Fleet IT Security Policy prior to establishing a direct connection to the NOAA WAN. Requirements include, but are not limited to:

1. Installation of the latest virus definition (.DAT) file on all systems and performance of a virus scan on each system.
2. Installation of the latest critical operating system security patches.
3. No external public Internet Service Provider (ISP) connections.

Completion of these requirements prior to boarding the ship is required.

Non-NOAA personnel using the ship's computers or connecting their own computers to the ship's network must complete NOAA's IT Security Awareness Course within 3 days of embarking.

F. Foreign National Guests Access to OMAO Facilities and Platforms

***NOT APPLICABLE TO THIS CRUISE***

**Appendix A**

**EMERGENCY DATA SHEET  
NOAA OKEANOS EXPLORER**

PRINT CLEARLY

**NAME:** \_\_\_\_\_  
(Last, First, Middle)

Mailing Address \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
(Other than the ship address)

Phone (Home) \_\_\_\_\_

(Cell) \_\_\_\_\_

Date of Birth \_\_\_\_\_

Emergency Contact: \_\_\_\_\_  
(Name and Relationship)

Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone (Home) \_\_\_\_\_

(Work) \_\_\_\_\_

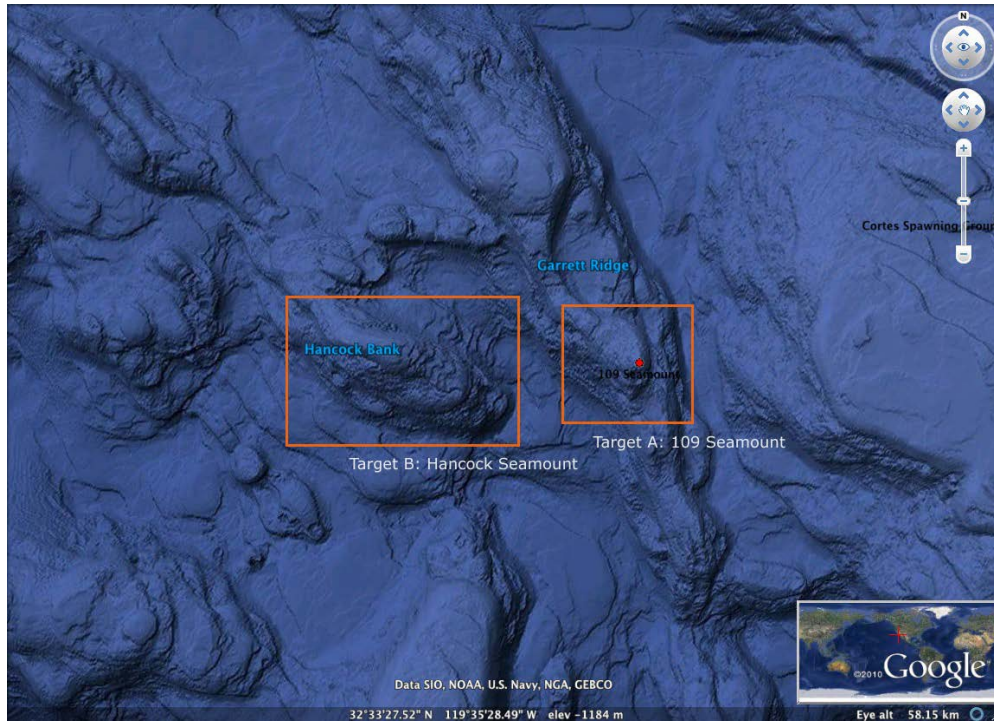
(Cell) \_\_\_\_\_

Email: \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

## **Appendix B – Email from Peter Etnoyer providing background information on Seamounts Hancock and 109**

> From: <Peter.Etnoyer@noaa.gov>  
> To: craig.russell@noaa.gov  
>> Hello Craig Russel,  
>>  
>> Jeremy Potter suggested I contact you in regards to the possibility of  
>> mapping two moderately size (~4 km radius) offshore pinnacles in  
>> Southern California Bight. My colleagues John Butler and Kevin  
>> Stierhoff at NOAA SWFSC have photo and video evidence of a substantial  
>> aggregation of deep-sea coral near 200 m depth from one of these pinnacles.  
>>  
>> The images I have seen show a highly unusual aggregation of  
>> scleractinia (reef building coral) with implications for marine  
>> spatial planning and ocean climate. MSP and ocean climate are two (of  
>> four) priority research areas here at NCCOS, thus my request.  
>>  
>> If at all possible, I would like to ask Okeanos Explorer to survey one  
>> or two of these peaks using your multibeam ecosounder system. SWFSC  
>> and NCCOS would use the data to produce maps of topography and  
>> backscatter to help guide future ROV work.  
>>  
>> The targets are Seamount 109 and Hancock Seamount. The expected depth  
>> range is ~200-1000 meters. I've attached a map with coordinates below  
>> showing bounding boxes for each target. Even one single pass on each  
>> would be helpful. If only one were possible, we would request Seamount  
>> 109.  
>>  
>> Thanks kindly for your consideration,  
>> Peter Etnoyer  
>>  
>> 109 Seamount:  
>> 32 35.461, -119 27.338 Upper Right corner of bounding box  
>> 32 31.701, -119 32.946 Lower Left corner of bounding box  
>> 32 33.339, -119 29.514 Seamount peak, a reference point  
>>  
>> Hancock Seamount:  
>> 32 35.187, -119 35.319 Upper Right corner of bounding box  
>> 32 30.892, -119 43.774 Lower Left corner of bounding box  
>> 32 33.919, -119 40.338 Seamount peak, a reference point



*Appendix B: Email from Dave Lott describing National Marine Sanctuaries priorities. (\*\*Note, "A" below does not correlate to "A" in Figure 2 of this cruise plan, "B" to "B" etc.*

We are mainly after backscatter (looking for hard and soft targets for deep sea coral aggregations). If the evidence is high - after post processing on our end to classify the area for likely DSC - the process will lead to a possible EFH designation/closure. We will likely have to follow up with further video AUV or ROV surveys.

If you happen to have an ROV onboard we are also looking for video ground truthing in that area. Should be some very cool habitat.

On 2/24/2011 2:57 PM, Craig Russell wrote:

> Dave - can you advise why Sur Ridge is a high priority exploration target when there is 1998 EM300 data available?

>

> On Feb 23, 2011, at 3:59 PM, Dave Lott wrote:

>

>> Ok, attached are two KMZ files with our refined priorities:

>>

>> 1) General MBNMS area (Sur Ridge is highest priority) - note the box within a box denoting the critical area for bathy/backscatter and ROV imagery for Sur Ridge.

>>

>> 2) General CINMS areas. Priorities listed A-F. Note the box within a box concept. The smaller box (i.e., "A" is nested within "B"). If you can only hit the smaller box that is always the more critical area. It would be nice to put an ROV down on target "A" to see what the heck is

down there, also "H" only after additional mapping to confirm that there is indeed an caldera of sorts. We are interested in bathy/backscatter and ROV imagery in the 'critical' boxes.

>>

>> We may be able to provide staff to assist with mapping and ROV targeting. And, we may be able to provide vessel support for transfers if interested. If you want to test your water sampling protocols we can help with locations, thinking the areas south of CINMS including Santa Cruz canyon are the most dynamic and unexplored.

>> Dave Lott

>> West Coast Regional Operations Coordinator

>> NOAA's Office of National Marine Sanctuaries

>> 99 Pacific Street

>> Suite 200K

>> Monterey, CA 93940-2493

>> W: 831-647-1920 x103

>> M: 831-241-3097

>> F: 831-647-1732

## **Appendix C - Permits**

Permits were provided to the ship and can be found in the appendices of the EX1101 mapping data report. Permits