

First (1st) Quarterly Report (November 2008)

for

Deepwater Program: Exploration and Research of Northern Gulf of Mexico Deepwater Natural and Artificial Hard Bottom Habitats with Emphasis on Coral Communities: Reef, Rigs and Wrecks “Lophelia II”

The primary work accomplished and results achieved during the first quarter of this project are described below. Planned actions for the succeeding quarter and a summary of the expenditures for this period are also included.

The main activities since August on this project were:

- Draft Action Plan/Post-Award Conference Summary
- NOAA Data Archiving Agreement
- Cruise Plans
- Cruise 1 on NOAA Ship *Nancy Foster* (Legs 1 and 2)
- Cruise 1 Cruise Reports
- Planned Actions for the next quarter

Details of project activities are detailed below.

Draft Action Plan/Post-Award Conference Summary

A Draft Action Plan was submitted to MMS in August 2008. It provided a summary of the oral presentation and answers to the pre-award questions and concerns of the Technical Proposal Evaluation Committee (TPEC).

TDI-Brooks held a Post Award Meeting with MMS in New Orleans at Minerals Management Service Gulf of Mexico Regional Office, Visualization Room 860. The meeting was held on August 13, 2008 from 8:00 AM-3:00PM. Minutes of the meeting are attached as **Appendix A**.

NOAA Data Archiving Agreement

NOAA Data Archiving Agreement draft was sent to Susan Gottfried, NOAA, on 19 August 2008 and to Steven Rutz, NOAA on 25 August 2008. The agreement is still in review by NOAA but should be finalized by the first week of November 2008.

Cruise Plans

Cruise plans were sent to MMS for COR approval in mid-August 2008. The cruise plan detailed the proposed logistics, purpose, and scope for both Leg 1 and Leg 2 of the first cruise of this project.

Cruise 1

The Lophelia II Cruise was conducted on the NOAA Ship research vessel *Nancy Foster* from September 2, 2008 to October 17, 2008, and was the first cruise conducted for this contract. The cruise mobilized and embarked from Galveston, Texas and returned to Gulfport, Mississippi for the second leg. The second leg began 20 September 2008 and concluded on 2 October 2008.

Leg 2 demobilized in Pascagoula, Mississippi (**Figure 1**).

Leg 1 – 2 September – 17 September

Objectives

The main objective of the first shipwreck cruise was to conduct a reconnaissance of eight shipwreck sites and assess the archaeological and biological potential of the wrecks for inclusion in project. The planned site for the reconnaissance include the “Ewing Banks Wreck” site, the *Gulfpenn* site, the tentatively identified *Gulfoil* site, the “Green Lantern” site, the tentatively identified *Holly Ann Viesser* site, the “Oval Shape” site, the “Steel Hull” site, and the “Viosca Knoll Wreck” site. Several secondary objectives were planned pending the findings at each site. The secondary objectives were planned to accomplish as many tasks as possible toward meeting the overall project requirements of the four-year study. The secondary objectives included photo mosaics of each site, visual area survey around the sites to determine the extent of artifact scatter, detailed imaging of coral colonies at each site, collecting coral samples, collecting four sediment cores at each site, setting temperature loggers at select coral sites on the wrecks, reexamining a microbiology experiment placed at *Gulfpenn* in 2004, and setting microbiology experiments at two additional wreck sites.

Summary

Five days were lost to weather and more than 28 additional hours were lost because of ROV and vessel down-time. Only thirteen hours of total bottom time were achieved on the wreck sites over the course of thirteen days (the ROV was in the water for a total of only 29.5 hours). Only four of the eight planned wreck sites were dove on during the cruise because of the considerable down-time and adverse conditions encountered on the seafloor. Useful data was collected at three of the four sites investigated. The Ewing Banks Wreck site was confirmed to be a historic shipwreck site, which likely dates to the nineteenth century. More *Lophelia* was discovered growing on that site than any other nineteenth century wooden wreck known in the Gulf of Mexico. Many of the wreck’s attributes, such as the lack of cargo, rigging, or machinery, make it an intriguing mystery. The identity of *Gulfoil* was confirmed on a brief dive at the site and substantial coral colonies were documented. The preliminary examination suggests the *Lophelia* coverage at *Gulfoil* may be more substantial than that documented at *Gulfpenn* in 2004. The dive on *Gulfpenn* allowed the identification of the stern section of the tanker, the microbial experiment placed on the site in 2004 was reexamined, and a temperature logger was placed on *Gulfpenn*’s bow. Over all only 10 to 15 percent of the cruise objectives were accomplished.

Leg 2 – September 20 – October 2, 2008**Summary**

During the 12 working days at sea, multibeam data were collected at 13 sites and 10 lowerings of the ROV were completed over 8 different sites (**Table 1**). There were two (2) ROV operations days lost to weather conditions, one (1) dive never reached the bottom, and three (3) other dives were ended with under two hours of bottom time due to technical problems with the ROV (see **Table 1**). During almost every dive the manipulator failed, and this severely limited the capacity to collect physical samples for future genetics work. On most of the latter dives, only one attempt was made to collect samples in areas of high coral diversity and density due to the anticipation of manipulator failure and the extremely long amount of time required to sample (1-5 samples obtained in 1-3 hours).

Table 1. Summary of submersible operations during the second leg of the NOAA Ship Nancy Foster / SeaVision ROV reconnaissance cruise.

Date	Dive	Site	Launch	Recovery	On bottom	Issues
9/21	SV1	MC539	11:45	13:00	0:15	loss of telemetry, tether caught in propeller
9/22	SV2	GC140	9:30	20:00	9:30	delayed launch due to video malfunction, failure of tilt mechanism
9/23	SV3	GB201	8:30	18:30	9:30	garage on side - lost temperature probe, frozen manipulator
9/24						weather
9/25						weather
9/26	SV4	GC246	8:30	9:30	0:00	loss of telemetry due to depth (>600m)
9/26	SV5	GC234	12:30	19:15	5:15	frozen manipulator
9/27	SV6	GC140	8:15	16:30	7:20	frozen manipulator, garage hung up - damaged bioboxes
9/28	SV7	EW1009	17:30	19:00	0:30	flooded USBL, loss of depth and heading, ground in LED array, restricted tether length
9/29	SV8	MC751	10:00	19:00	8:00	poorly functioning USBL, frozen manipulator, malfunctioning thruster
10/1	SV9	VK906	8:00	10:00	1:30	poorly functioning USBL, ground fault in LED array
10/1	SV10	VK906	12:00	21:45	9:00	poorly functioning USBL
				Total	50:50	

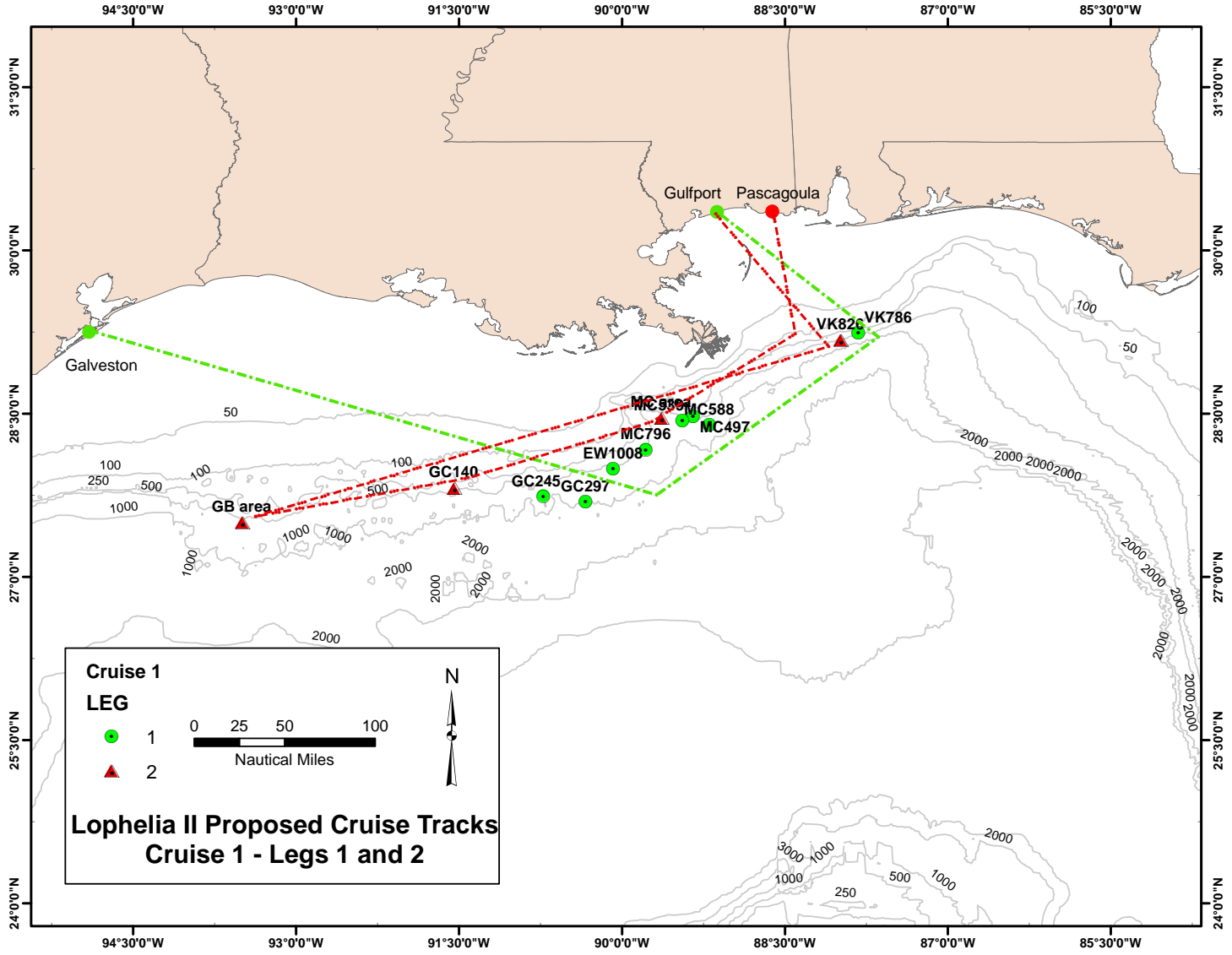


Figure 1. Site locations of Cruise 1, Legs 1 and 2

Cruise Reports for Cruise 1

TDI-Brooks submitted a cruise/field operations report on 3 November 2008 to MMS. The report outlined how time was used, the progress made, problems encountered, and a description of the activities undertaken.

Planned Actions for the Next Quarter

Much of the next quarter will be spent reviewing the data collected from Cruise 1. Data Management received one hard drive at the conclusion of Leg 1 and two hard drives at the conclusion of Leg 2. Each hard drive contained Cruise data, video and imagery. Further design and content will be added to the Lophelia-II project website which was launched on the TDI-Brooks server in September 2008. One of the primary purposes of the website will be to provide data access and communication among the project's Principal Investigators.

Expenditures

All contracts have been executed with our University (Penn State, LSU, Temple and TAMU-CC) and company (C&C Technology) subcontractors. The project is being conducted on a fixed price basis. No funds have been received yet from MMS as the first billing is scheduled for 31 October 2008. Expenditures are as budgeted for the 1st quarter of the project.

Appendix A**Minutes from Post-Award/Pre-Cruise Meeting****MMS/NOAA OER Lophelia-II Project:****Exploration and Research of Northern Gulf of Mexico Deepwater Natural and Artificial Hard Bottom Habitats with Emphasis on Coral Communities: Reefs, Rigs and Wrecks**

Date: August 13, 2008
Location: Minerals Management Service Gulf of Mexico Regional Office
 Visualization Room 860
 8:00 AM-3:00PM

Introductions/sign-in sheet**Attendees**

Greg Boland	MMS
Jim Brooks	TDI-BI
Bernie Bernard	TDI-BI
Chuck Fisher	Penn State
Erik Cordes	Temple U
Tom Ahlfeld	MMS
Will Schroeder	TDI-BI
Dan Warren	C&C
Robert Church	C&C
Harry Roberts	LSU
Lance Horn	NURC/UNCW
Steve Ross	UNCW/USGS
Felipe Arzayus	NOAA
Bill Shedd	MMS
Jesse Hunt	MMS
Jack Irion	MMS
Jeff Snyder	Sea Vision Marine
Gary Brenner	USGS

Project award review

Award of ROV contract
 Plans for 09-10: Jason II “or equivalent”

Immediate Needs

2008 cruise legs
 Confirm dates and ports

- Leg 1: Sept 5 depart Galveston, Sept 17 arrive Gulfport

- Leg 2: Sept 20 depart Gulfport, Oct 2 arrive Pascagoula
- Checking on moving 1-2 days to from 1st to 2nd cruise
 - 15-18 or 16-19 in Gulfport
- Ship's agent in Gulfport, Pascagoula from NOAA

Steve Ross contributions for ship logistics

- Leave at 10AM, get in around noon
- DP w/2 Z-drives
- EM1002, SimRad – bathymetry and backscatter
 - NOAA tech Missy is out for part of Sept
 - Dates from NOAA – which leg?
 - Question about other tech Melanie's training status
- NF bunking plan form from Steve Ross
- Medical, chem forms
- 2 foreign nat'l ROV crew
- Freezer space on board
 - 30 ft³ freezer space
 - refrigerator space?

OE signature expedition for Leg 2

- Female web coordinator

Sea Vision rep presentation on SeaEye Falcon ROV

- Jeff Snyder (owner)
 - Seaview systems – subcontractor for ROV (Matt Cook)
 - Applied Acoustics Easytrak USBL – 1% slant range
 - Kongsberg MST 342 transponders
 - heading and GPS from Nancy Foster
 - Optional - LinkQuest USBL
 - integrated with ship's nav to 2800'
 - 1500LC at MMS?
 - Previously worked with NF – good DP holding tracklines
 -
- ROV setup –
 - Control van
 - Communication with ship w/ active nav feed
 - USBL on both ROV and cage
 - Underlay for ROV positioning – multibeam if available
 - Working in NAD27 feet for consistency w/ GoM database
 - Sea state – no heave compensation, 6-7 ft seas
 - CTD on cage – send data up wire on RS232
 - SeaBird 19+ on garage
 - tech for 1st leg – depends on NOAA tech
 - Buoyant 50m tether – syntactic foam on midpoint
 - 1.5 kt thrust

- 3 video, 4 RS-232, 2 485 (sonar, telemetry) channels
- 48V DC to add-ons
- Scanning sonar still forward – Imagenex 881a
- Cameras
 - Insite Atlas 3 CCD color zoom – 850 lines
 - On pan and tilt
 - Can tilt to downlooking – but not w/ manip
 - Westec SDS3030 – still w/ strobe 1600x1200
 - Downlooking fixed inside body
 - Strokes cycle time?
 - Size of memory card in camera?
 - SeaEye low-light camera – 480 lines, 0.2 lux
 - SIT cam
 - Kongsberg OE 14-367 color zoom backup
 - Recorded to Viperfish DVR (AVI format)
 - with event marking real time
 - other unit for 3CCD – mp4 format
 - ROV will provide TeraByte drive with data
 - Lighting to 4m
 - 2x75 watt tracking 3-chip, 2x100 watt fixed
 - LED SeaBox lights possible additions
 - HD camera – not going to be available
 - KnudCo? out of Vancouver
 - down sampling at fibreoptic multiplexer
 - software time crunch – late August
- Sampling
 - 5 func manip – SeaEye HydroLek
 - 3+2 fingers, cutting tool
 - coral and sponge collections previously
 - Bioboxes on garage?
 - Subdivided or pacman sampler
 - Weight limit of cage

Cruise Plan to *Nancy Foster* ASAP

- Leg 1
 - Rob Church (C&C)
 - Dan Warren (C&C)
 - C&C
 - C&C
 - Oscar Garcia (TAMUCC)
 - Stephanie Lessard-Pilon (PSU)
 - Arunima (PSU)
 - ? Cheryl tech (USGS)
 - ? CTD tech (USGS?)

- ?Amanda Demopolous (USGS) or tech if cores operational
- OE male
- MMS male
- 3 ROV males
-
- Leg 2
 - Erik Cordes (Temple)
 - Andrea Quatrini (USGS)
 - Jay Lunden (Temple)
 - Leslie Wickes (Temple)
 - Matt Porter (PSU)
 - Maria Pia Miglietta (PSU)
 - Morgan Kilgore (TAMUCC)
 - Doug Weaver (TAMUCC)
 - ?
 - TDI-Brooks?
 - Emily Crum (OER)
 - Bill Shedd (MMS)
 - 3 ROV males

Medical requirements for participants

- TB test required
- Physical suggested
- Clinical depression – note from doctor
- Sedatives – not allowed and note from doctor to ok non-use

Leg 1 shipwrecks; Other objectives needed for backup and ROV off-hours

- Overview of shipwreck plan/priorities from Rob Church
- MC539 target for 1st leg if “oval shape” strikes out
- 1000m limit, 8 sites, 12 working days

Multibeam mapping

- at new sites near wrecks, VK826 if time
- MC929 multibeam grid

Leg 2 Hardbottom Sites

- Possibility of drift camera loaded as a backup
- Biobox on work sled
- 5-10 temp probes for site markers
 - Known and new exploration sites
- Known
 - VK826
 - relocate areas worked in 2005
 - genetics collections
 - multibeam
 - collect live corals on last days of cruise

- large site to west that Harry says has Lophelia on it
- transect over cable scar – locations? - Will
- others - GC140, DeSoto canyon (Steve)
- Exploration
- Potential sites
- small pinnacle near Gulfpen
- MC588 (near steel hull)
- other parts of MC885
- MC929 for multibeam
- GC39 good anomalies
- GC208?
- Pick 3-4 Geo targets
- Navigate among them, chase sonar near each
- Stop for photography, collections if anything found
- If it's a "good site"
- large site marker on CRP
- transect pattern centered on CRP
- Station selection process/timing
- Need for proprietary data on cruise/+MMS representative
- yes – Bill Shedd will participate
- Data transmission limits for daily reports
- Bandwidth for Signature Expedition

Collaboration with USGS

- USGS people on September legs?
 - Cheryl tech?, Amanda Demopolous on Leg 1,
 - Andrea Quattrini leg 2
 - cores, CTD, winch

Other non-NOAA vessel field work for 2008/2009

- AUV sites – Vk826, others?
- Brooks McCall* spring09 with TAMU ROV
 - deep-water reconnaissance
- Platform work
 - mostly ROV off the platform
- Status and future plans for the TAMU ROV after last attempted field use
 - need new tether – used in drift camera mode
 - should have new garage soon

Draft Action Plan and Post-Award report

- Cruise plans will suffice for MMS
- Minutes from this meeting as Post-Award report

Scanned Sign In Sheet

Sign In Sheet / Lophelia II Post-award Meeting

NAME	Organization	Phone	Email
LANCE HORN	NURC/UNCW	910 982-2443	hornl@uncw.edu
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