NOAA Pacific Islands Fisheries Science Center

Mission Report

***Mission Number*:** FK013L1

Operator-in-Charge: Schmidt Ocean Institute

***Small Boat ID/Type*:** R/V Falkor

***Mission Title*:** Volcanic Platforms, Ancient Reefs, Ridges, and Seamounts: Mapping the Papahanaumokuakea Marine National Monument (PMNM)

***Mission Area*:** Papahanaumokuakea Marine National Monument, Northwestern Hawaiian Islands

***Mission Dates*:** March 5-April 11, 2014

1. Mission Plan

Mission Objectives

The R/V Falkor is owned and operated by the Schmidt Ocean Institute (SOI). The use of this ship for the 36-day cruise, SOI cruise FK013L1, was awarded to the participants following a competitive proposal process. The cruise was led by Dr. Christopher Kelley from the University of Hawaii (UH), with participants from several departments at UH as well as from the Papahanaumokuakea Marine National Monument, the Pacific Islands Fisheries Science Center, and the University of Sydney. The following were the cruise objectives:

Objective 1: Complete bathymetry mapping in water depth of 50-4000m for UTM zone 1, which is located in the northern half of the monument. Also, collect bathymetry data on transit to and from UTM zone 1.

Objective 2: Collect gravity and magnetic-field intensity to answer a variety of questions about the geological history and relative age of the region and locate features of special interest.

Objective 3: Marine mammal behavior observation and avoidance. Record marine mammal behavior simultaneous with active multibeam surveys.

Mission Operations

UH, PMNM, PIFSC and University of Sydney team personnel spent the first couple of days of the mission testing, installing and training on equipment and watch standing and safety procedures. SOI R/V Falkor departed Honolulu Harbor on March 7th, 2014 for a 36days cruise (Fig. 1):

1. To conduct multibeam sonar, gravimetry, magnetic anomaly and marine mammal surveys at various locations throughout the Papahanaumokuakea Marine National Monument in the Northwestern Hawaiian Islands.

2. To conduct CTD casts and XPT deployments at various locations to obtain sound velocity profiles for calibrating the multibeam systems.

2. Schedule

Mar 5-6:	Mobilization and orientation on board the Falkor. Orientation and training for multibeam, gravimeter, magnetometer and marine mammal watch standing and data processing.
Mar 7:	0800 Falkor departs Honolulu Harbor and transits to the first mapping site off Middle Bank.
Mar 8:	Falkor enters the southern end of the PMNM; start multibeam, gravimeter, magnetometer surveys while transiting to UTM zone 1
Mar 9-Apr 10:	Multibeam, magnetometer, gravimeter, and marine mammal observer data collection
Apr 10:	Falkor exits the Monument and transits back to Honolulu Harbor.
Apr 11:	Demobilization of participants and equipment.

3. Field Party

Name	Role	Organization
Christopher Kelley	Chief Scientist, Multibeam watch lead /MB data processor, marine mammal observer	UH-HURL

Name	Role	Organization
John R. Smith	Multibeam watch lead /MB data processor, marine mammal observer	UH-HURL
Jason Lenard	Watch Standing/MB data processing, marine mammal observer	NOAA PMNM
Daniel Wagner	Watch Standing/MB data processing, marine mammal observer	NOAA PMNM
Daniel Luers	Marine mammal observer lead	NOAA
Jeremy Taylor	Watch Lead/MB data processing, marine mammal observer	NOAA CRED/JIMAR
Joyce Miller	Watch Standing/MB data processing	UH-SOEST-HMRG
Frances Lichowski	Watch Standing/MB data processing, marine mammal observer	NOAA CRED/JIMAR
Jonathan Tree	Magnetometer/Gravimeter lead-,watch standing/MB data processing, marine mammal observer	UH-SOEST
Brian Boston	Magnetometer/Gravimeter lead-, watch standing/MB data processing, marine mammal observer	UH-SOEST
Belinda Dechnik	Watch Standing/MB data processing, marine mammal observer	University of Sydney

4. Results

As a result of the first collaborative 2014 SOI Falkor cruise, an additional ~60,000 square kilometers of seafloor (Fig.3)were mapped in water depth between ~50–4,000 m adding to the ~40,000 square kilometers previously mapped in the PMNM. The area mapped included geologic features such as seamounts, rift-zone ridges, and drowned reef terraces. The mapped water depth ranged from ~50–4,000 m. Mapped areas include UTM zone 1: unnamed, Academician Berg, Turnif (Fig.2), Woolwent, Nero, Ladd seamounts, Bank 9, Kure, Midway, Pearl and Hermes Atoll and transits to and from UTM zone 1.

The cruise log and expedition blogs can be found under:

http://www.schmidtocean.org/story/show/2384

5. Attachments

Figure 1. Map of operational area
Figure 2.—High resolution imagery of unnamed, Academician Berg, and Turniff Seamount.
Figure 3.—Map of bathymetry data collection.

6. Approvals

_____ _____
Frances Lichowski Date
PIFSC CRED JIMAR Scientist
Pacific Islands Fisheries Science Center

_____ _____

Chad Yoshinaga Date
Line Office Small Boat Officer
Pacific Islands Fisheries Science Center

_____ _____
Samuel G. Pooley Date
Science Director
Pacific Islands Fisheries Science Center

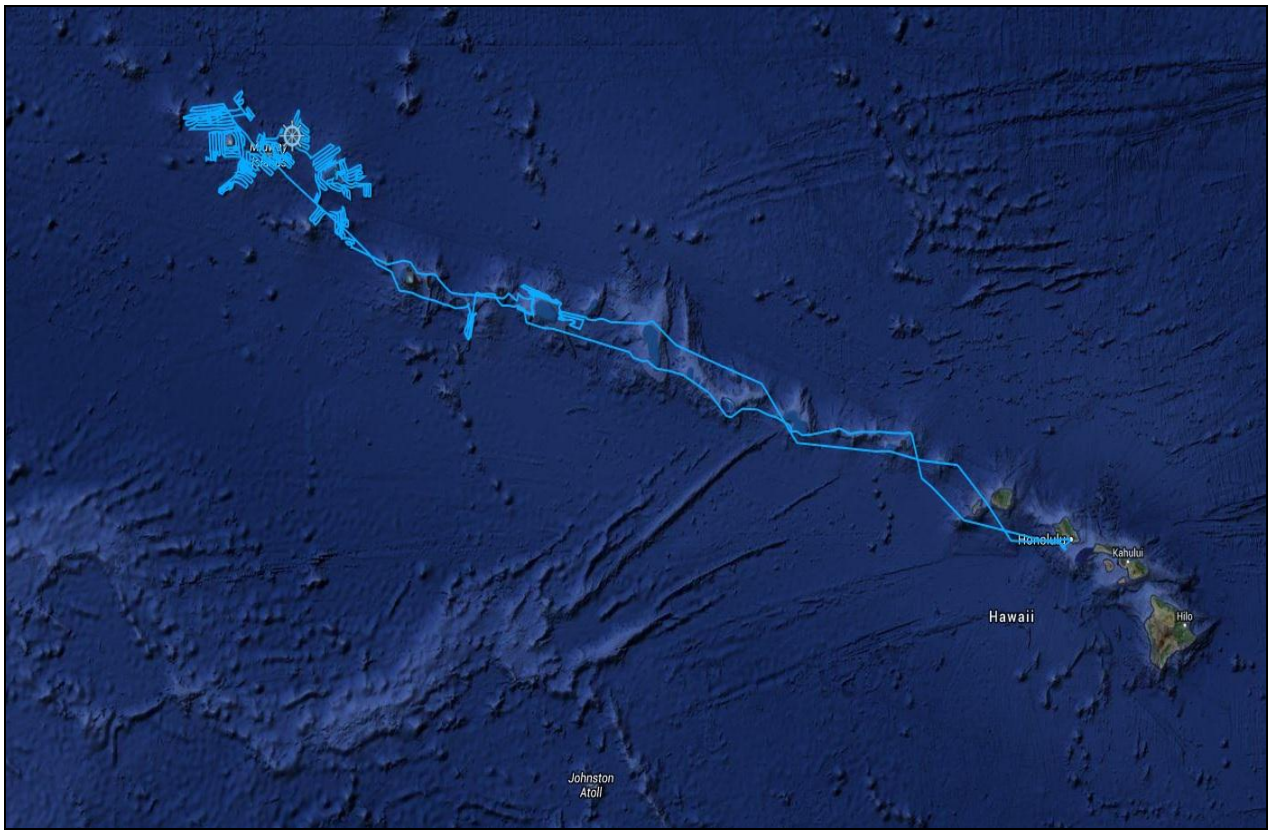

Figure 1.—Map of operational area.

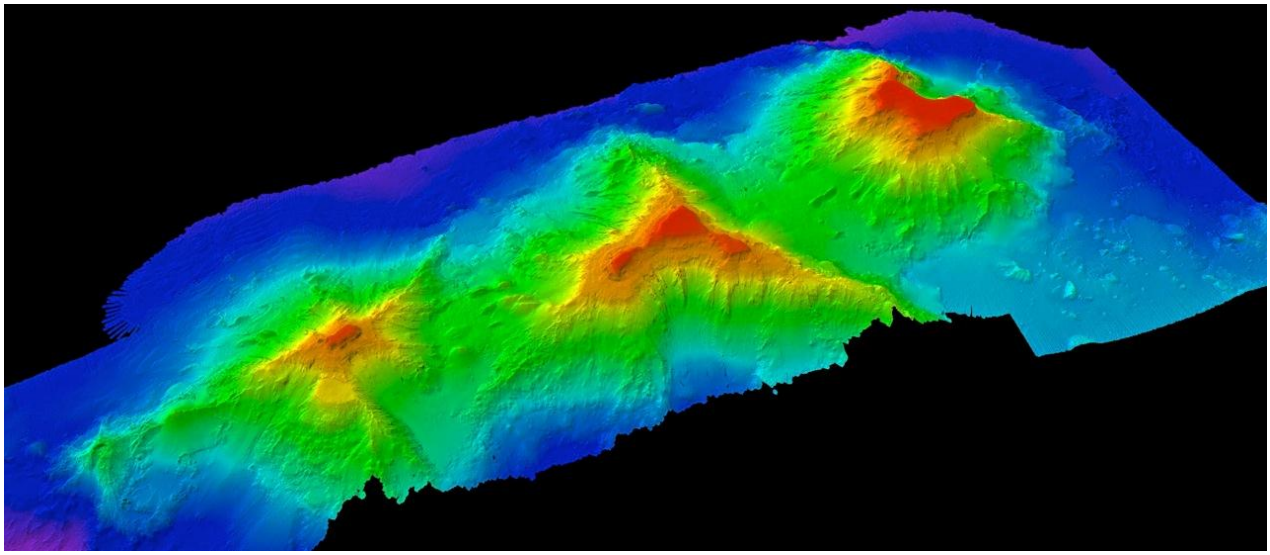

Figure 2.—High resolution imagery of unnamed, Academician Berg, and Turniff Seamounts.

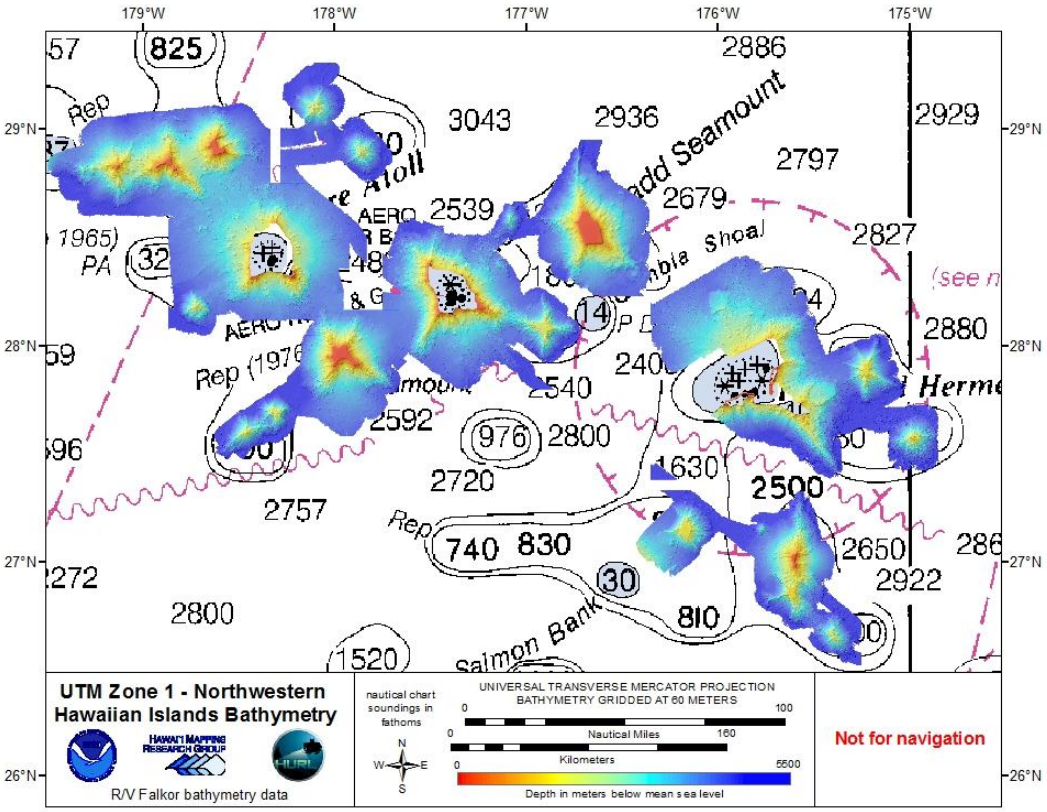

Figure 3.—Map of bathymetry data collection (transits not included).