



Final Project Instructions

Date Submitted: January 12, 2015
Platform: NOAA Ship *Oscar Dyson*
Project Number: DY-15-01
Project Title: *CO2 Surface and FOCI Subsurface Mooring Recover/Deploy*
Project Dates: **25 January - 2 February, 2015**

Prepared by: _____ Dated: _____
Commander Thomas Peltzer, NOAA
NOAA-PMEL

Approved by: _____ Dated: _____
Dr. Jeremy Mathis
Chief Scientist
NOAA-PMEL

Approved by: _____ Dated: _____
Dr. Christopher L. Sabine
Director
NOAA-PMEL

Approved by: _____ Dated: _____
Captain Douglas D. Baird, Jr., NOAA
Commanding Officer
Marine Operations Center – Pacific

I. Overview

- A. NOAA Ship *Oscar Dyson* will participate in the recovery and deployment of two CO₂ surface buoy moorings and one FOCI subsurface mooring.
- B. Days at Sea (DAS)
Of the 3 DAS for this project, 0 DAS are funded by the program and 3 DAS is funded by OMAO. This project is estimated to exhibit a High Operational Tempo.
- C. Operating Area (include optional map/figure showing op area)

Southeastern Gulf of Alaska (Chatham Strait near Port Conclusion) and Chiniak Bay near Kodiak.
- D. Summary of Objectives:

Cruise Overview: PMEL will load three moorings and equipment when the *Dyson* is in Seattle between the dates of January 17-21. Primary load day will be January 20. Two scientific staff members will embark the vessel in Seattle WA on January 24/25. The ship departs Seattle on January 25. As the *Dyson* steams north they will stop at the Port Conclusion CO₂ mooring site for a buoy deployment and recovery. A small NOS tidal mooring will also be deployed in Chatham Strait after the CO₂ mooring ops. Please see the appendix for a description of the mooring and proposed deployment area. From the Port Conclusion site the *Dyson* will steam to Kodiak and the Chiniak Bay CO₂ mooring site with an expected arrival date of 2 February. There will be a deployment and recovery of the CO₂ surface mooring and the FOCI subsurface mooring. There will be CTD casts with water samples at all three mooring sites. We request the underway seawater sampling system with measurements of temperature and salinity is operational for the cruise. The moorings are approximately 2-3 miles from each other in Chiniak Bay. With the moorings aboard the ship is scheduled to tie up in Kodiak 2 February.

Final decisions on station locations will be determined by the chief scientist in consultation with the Commanding Officer and officers of the *Dyson* as weather and shipboard circumstances permit.

In support of NOAA's Ocean Acidification Program, NOAA will recover and deploy two surface instrumentation buoys to:

- 1) Characterize ocean acidification (OA) conditions on the U. S. in Southeast Alaska and northern Gulf of Alaska.
- 2) Conduct inter-calibration measurements near the OA observing assets in the study area, allowing inter-calibration of these autonomous assets with high-quality, ship-based measurements;
- 3) Provide calibration data needed to develop predictive models for aragonite saturation state, pH, and other important OA indicators in the California Current System, based on widely measured parameters such as salinity, temperature, and oxygen concentration;
- 4) Provide quantitative assessment of phytoplankton, zooplankton, and harmful algal bloom activity in conjunction with OA measurements; and
- 5) Provide scientific information on OA conditions and trends for resource management and decision support.

E. Participating Institutions:

- NOAA Pacific Marine Environmental Laboratory (PMEL)
7600 Sand Point Way N.E., Seattle, Washington 98115-6439
- University of Alaska Fairbanks (UAF)
- NOAA Ocean Acidification Program
- NOAA National Ocean Data Center (NODC)

F. Personnel/Science Party:

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Naber, Daniel	scientist	24/25 Jan	2/3 Feb	male	UAF	USA
Lebon, Geoff	scientist	24/25 Jan	2/3 Feb	male	PMEL	USA

G. Administrative

1. Points of Contacts

Chief Scientists:
 Dr. Jeremy Mathis
 NOAA PMEL
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 Seattle, WA 98115
 206-526-4809 jeremy.Mathis@noaa.gov
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Seattle, WA 98115
(206) 526-4485, pmel.dir.ops@noaa.gov

2. Diplomatic Clearances

None Required.

3. Licenses and Permits

None Required.

II. Operations

The Chief Scientist is responsible for ensuring the scientific staff are trained in planned operations and are knowledgeable of project objectives and priorities. The Commanding Officer is responsible for ensuring all operations conform to the ship's accepted practices and procedures.

A. Project Itinerary:

20-21 Jan 2015 - Load 2 surface and 1 subsurface moorings aboard vessel.

24/25 Jan - Embark 2 science party members in Seattle, WA.

25 Jan - 2 Feb - transit north stopping at the Port Conclusion mooring site for mooring recovery and deployment and NOS tidal mooring deployment in Chatham Strait at location TBD. Proceed to Chiniak Bay location for 2 mooring recoveries and deployments. Transit to Kodiak to tie up.

B. Staging and De-staging

Staging/De-staging: NOAA Ship *Oscar Dyson* is scheduled to arrive in Seattle January 16/17 at the conclusion of gear trials and remain alongside until January 21/22. During this time the two surface (18' x 10' x 11' fully assembled) and one subsurface moorings will be loaded aboard the vessel. The anchors for the surface moorings are 5000lbs apiece, chain boxes 4000lbs, and buoys are 2500lbs each. The anchor for the subsurface mooring is 1600lbs, chain box 150lbs, 2 metal floats 150lbs each, release 150lbs, and instruments 100lbs. Additionally, there will be 3-4 standard size pallets of storage boxes, instruments, and

miscellaneous gear. A description of the NOS mooring can be found in the appendix.

C. Operations to be Conducted:

After departing Seattle, WA on January 25, 2015, the ship will steam for the mooring site in Chatham Strait near Port Conclusion. The ship will deploy a replacement mooring and recover the existing mooring. A small NOS tidal mooring will be deployed in Chatham Strait after the OA mooring ops. The ship will then transit to Kodiak, with a scheduled arrival of February 2, 2015. On the way to the pier, the ship will recover and deploy a surface and subsurface mooring in Chiniak Bay.

D. Dive Plan

All dives are to be conducted in accordance with the requirements and regulations of the NOAA Diving Program (<http://www.ndc.noaa.gov/dr.html>) and require the approval of the ship's Commanding Officer. (This statement must remain in all project instructions)

Dives are not planned for this project.

E. Applicable Restrictions

Conditions which preclude normal operations: poor weather and equipment failures will be the most likely conditions that would preclude normal operations. Mitigation strategies should be worked out between the Commanding Officer and Chief Scientist.

III. Equipment

A. Equipment and Capabilities provided by the ship

- Navigational systems including high-resolution GPS.
- Underway seawater sampling system for measurements of temperature and salinity.

- CTD with following sensors: dual conductivity and temperature, flurometer, PAR, dual Oxygen sensors and 10 functioning Niskin bottles volume 5 liters or greater.
 - Refrigerator space (10 cubic feet) for seawater samples (no chemicals).
 - Freezer space (10 cubic feet) for seawater samples (no chemicals).
 - Minimum of 2 computers with internet and e-mail access
 - Ship's crane for loading and/or deploying
- B. Equipment and Capabilities provided by the scientists
- Surface/subsurface moorings (descriptions and diagrams can be found in the appendix)

IV. Hazardous Materials

A. Policy and Compliance

The Chief Scientist is responsible for complying with FEC 07 Hazardous Materials and Hazardous Waste Management Requirements for Visiting Scientific Parties (or the OMAO procedure that supersedes it). 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 quantity, MSDS, appropriate spill cleanup materials (neutralizing agents, buffers, or absorbents) in amounts adequate to address spills of a size equal to the amount of chemical brought aboard, and chemical safety and spill response procedures. . Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

Per OMAO procedure, the scientific party will include with their project instructions and provide to the CO of the respective ship 30 days before departure:

- List of chemicals by name with anticipated quantity
- List of spill response materials, including neutralizing agents, buffers, and absorbents
- Chemical safety and spill response procedures, such as excerpts of the program's Chemical Hygiene Plan or SOPs relevant for shipboard laboratories
- For bulk quantities of chemicals in excess of 50 gallons total or in containers larger than 10 gallons each, notify ship's Operations Officer regarding quantity, packaging and chemical to verify safe stowage is available as soon as chemical quantities are known.

Upon embarkation and prior to loading hazardous materials aboard the vessel, the scientific party will provide to the CO or their designee:

- An inventory list showing actual amount of hazardous material brought aboard
- An MSDS for each material
- Confirmation that neutralizing agents and spill equipment were brought aboard sufficient to contain and cleanup all of the hazardous material brought aboard by the program
- Confirmation that chemical safety and spill response procedures were brought aboard

Upon departure from the ship, scientific parties will provide the CO or their designee an inventory showing that all chemicals were removed from the vessel. The CO's designee will maintain a log to track scientific party hazardous materials. MSDS will be made available to the ship's complement, in compliance with Hazard Communication Laws.

Scientific parties are expected to manage and respond to spills of scientific hazardous materials. Overboard discharge of hazardous materials is not permitted aboard NOAA ships.

B. Inventory

Common Name of Material	Qty	Notes	Trained Individual	Spill control
Compressed Air	2 tanks (roughly the size of dive tanks)	Calibration gas used in the CO2 system on the buoy	Dan Naber	N/A
Sodium Hydroxide	1L	Neutralize with available acid or alternative	Dan Naber	A
Mercuric Chloride	0.25L	See 'M' below	Dan Naber	M
Lithium D Cell Batteries	18	In seacat instrument packages on the moorings	Dan Naber	N/A

C. Chemical safety and spill response procedures

A: Base

- Use proper PPE.
- Ventilate area.
- Neutralize with dilute acid such as HCl if possible – Kolosafe Base in the spill kit is the neutralizing agent.
- Absorb with cat litter or vermiculite.
- Vacuum or sweep up material and place into suitable disposal container.

- Do not breathe dust.
- Do not get water on spilled substances.

M: Mercury

- Spills: Pick up and place in a suitable container for reclamation or disposal in a method that does not generate dust. Sprinkle area with sulfur or calcium polysulfide to suppress mercury. Use Mercury Spill Kit if need be.

Inventory of Spill Kit supplies:

Product Name	Amount	Chemicals it is useful against	Amount it can clean up
Mercury eater	1.8kg	mercuric Chloride/Mercury	.5L
Goggles	1 pair	All	N/A
Plastic Bags	5	All – for used absorbents	Varies
Final Wipes	50	mercuric Chloride/Mercury	N/A
Kolorsafe Base	2.5 lbs	Bases	1L
Latex Gloves	2 pair	All	N/A
Broom	1 ea	All	N/A
Baking soda	2.5lbs	Acids	1L

C. Radioactive Materials

No radioactive isotopes are planned for this project.

V. Additional Projects

A. Supplementary (“Piggyback”) Projects

No supplementary projects are planned.

B. NOAA Fleet Ancillary Projects

No NOAA fleet ancillary projects are planned.

VI. Disposition of Data and Reports

Disposition of data gathered aboard NOAA ships will conform to NAO 216-101 *Ocean Data Acquisitions* and NAO 212-15 *Management of Environmental Data and Information*. To guide the implementation of these NAOs, NOAA’s Environmental Data Management Committee (EDMC) provides the *NOAA Data Documentation Procedural Directive* (data documentation) and *NOAA Data Management Planning Procedural Directive* (preparation of Data Management Plans). OMAO is developing procedures and

allocating resources to manage OMAO data and Programs are encouraged to do the same for their Project data.

A. Data Classifications: *Under Development*

a. OMAO Data

- b. Program Data - At the end of the cruise, the Chief Survey Technician will provide the Chief Scientist with copies of data from the ship's SCS system, barometer measurements, log sheets, TSG data, rain sensor data, wind speed and direction data, ship's navigation log data, speed logs, winch system, ADCP, Fluorometer data, ADCP data, and any other logged scientific data. The number of copies of each data set will be worked out between the Chief Scientist and Chief Survey Technician.

B. Responsibilities: *Under Development*

VII. Meetings, Vessel Familiarization, and Project Evaluations

- A. Pre-Project Meeting: The Chief Scientist and Commanding Officer will conduct a meeting of pertinent members of the scientific party and ship's crew to discuss required equipment, planned operations, concerns, and establish mitigation strategies for all concerns. This meeting shall be conducted before the beginning of the project with sufficient time to allow for preparation of the ship and project personnel. The ship's Operations Officer usually is delegated to assist the Chief Scientist in arranging this meeting.
- B. Vessel Familiarization Meeting: The Commanding Officer is responsible for ensuring scientific personnel are familiarized with applicable sections of the standing orders and vessel protocols, e.g., meals, watches, etiquette, drills, etc. A vessel familiarization meeting shall be conducted in the first 24 hours of the project's start and is normally presented by the ship's Operations Officer.
- C. Post-Project Meeting: The Commanding Officer is responsible for conducted a meeting no earlier than 24 hrs before or 7 days after the completion of a project to discuss the overall success and short comings of the project. Concerns regarding safety, efficiency, and suggestions for future improvements shall be discussed and mitigations for future projects will be documented for future use. This meeting shall be attended by the ship's officers, applicable crew, the Chief Scientist, and

members of the scientific party and is normally arranged by the Operations Officer and Chief Scientist.

- D. Project Evaluation Report: Within seven days of the completion of the project, a Customer Satisfaction Survey is to be completed by the Chief Scientist. The form is available at <http://www.oma.noaa.gov/fleeteval.html> and provides a “Submit” button at the end of the form. Submitted form data is deposited into a spreadsheet used by OMAO management to analyze the information. Though the complete form is not shared with the ships’, specific concerns and praises are followed up on while not divulging the identity of the evaluator.

VIII. Miscellaneous

A. Meals and Berthing

The ship will provide meals for the scientists listed above. Meals will be served three times daily beginning one hour before scheduled departure, extending throughout the project, and ending two hours after the termination of the project. 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 seven days prior to the project.

Berthing requirements, including number and gender of the scientific party, will be provided to the ship by the Chief Scientist. The Chief Scientist and Commanding 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 Chief Scientist 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 that were issued. The Chief Scientist is also responsible for the cleanliness of the laboratory spaces and the storage areas utilized by the scientific party, both during the project and at its conclusion prior to departing the ship.

All NOAA scientists will have proper travel orders when assigned to any NOAA ship. The Chief Scientist will ensure that all non-NOAA or non-Federal scientists aboard also have proper orders. It is the responsibility of the Chief Scientist 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 17, 2000, 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, NF 57-10-01 (3-14)) must be completed in advance by each participating scientist. The NHSQ can be obtained from the Chief Scientist or the NOAA website <http://www.corporateservices.noaa.gov/noaaforms/eforms/nf57-10-01.pdf>.

All NHSQs submitted after March 1, 2014 must be accompanied by [NOAA Form \(NF\) 57-10-02](#) - Tuberculosis Screening Document in compliance with [OMAO Policy 1008](#) (Tuberculosis Protection Program).

The completed forms should be sent to the Regional Director of Health Services at the applicable Marine Operations Center. The NHSQ and Tuberculosis Screening Document should reach the Health Services Office no later than 4 weeks prior to the start of the project to allow time for the participant to obtain and submit additional information should health services require it, before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of either form. Ensure to fully complete each form and indicate the ship or ships the participant will be sailing on. The participant will receive an email notice when medically cleared to sail if a legible email address is provided on the NHSQ.

The participant can mail, fax, or email the forms to the contact information below. Participants should take precautions to protect their Personally Identifiable Information (PII) and medical information and ensure all correspondence adheres to DOC guidance (http://ocio.os.doc.gov/ITPolicyandPrograms/IT_Privacy/PROD01_008240).

The only secure email process approved by NOAA is [Accellion Secure File Transfer](#) which requires the sender to setup an account. [Accellion's Web Users Guide](#) is a valuable aid in using this service, however to reduce cost the DOC contract doesn't provide for automatically issuing full functioning accounts. To receive access to a "Send Tab", after your Accellion account has been established send an email from the associated email account to accellionAlerts@doc.gov requesting access to the "Send Tab" function. They will notify you via email usually within 1 business day of your approval. The "Send Tab" function will be accessible for 30 days.

Contact information: Include only the Pacific OR Atlantic Office as applicable.

Regional Director of Health Services
Marine Operations Center – Pacific
2002 SE Marine Science Dr.
Newport, OR 97365
Telephone 541-867-8822
Fax 541-867-8856
Email MOP.Health-Services@noaa.gov

Prior to departure, the Chief Scientist must provide an electronic listing of emergency contacts to the Executive Officer for all members of the scientific party, with the following information: contact name, address, relationship to member, and telephone number.

C. Shipboard Safety

Hard hats are 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.

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. At the discretion of the ship CO, safety shoes (i.e. steel or composite toe protection) may be required to participate in any work dealing with suspended loads, including CTD deployment and recovery. The ship does not provide safety-toed shoes/boots. The ship's Operations Officer should be consulted by the Chief Scientist to ensure members of the scientific party report aboard with the proper attire.

D. Communications

A progress report on operations prepared by the Chief Scientist may be relayed to the program office. Sometimes it is necessary for the Chief Scientist to communicate with another vessel, aircraft, or shore facility. Through various means of communications, the ship can usually accommodate the Chief Scientist. Special radio voice communications requirements should be listed in the project instructions. 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, and it must be arranged at least 30 days in advance.

E. IT Security

Any computer that will be hooked into the ship's network must comply with the *OMAO Fleet IT Security Policy* 1.1 (November 4, 2005) 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 three days of embarking.

F. Foreign National Guests Access to OMAO Facilities and Platforms

Foreign National access to the NOAA Ship or Federal Facilities is not required for this project.

VIII. Appendices

Appendix A:

Port Conclusion Currently Deployed Mooring Site:

56.2688 N 134.6585 W; approximate depth is 115 meters. The replacement Port Conclusion mooring will be deployed as close as possible to the location of the currently deployed mooring. This buoy can be found on NOAA Chart 17331 and is unlabeled with color "Y bl"

The Chiniak Bay Currently Deployed Surface Mooring Site:

57.6967N 152.3133W; approximate depth is 143 meters. This buoy can be found on NOAA Chart 16595 and is labeled "NOAA-UAF"

The Chiniak Bay replacement mooring will be deployed as close as possible to the location of the currently deployed mooring.

The Chiniak Bay Currently Deployed Subsurface Mooring Site:

57.7223N 152.29395W; approximate depth is 199 meters. This buoy can be found on NOAA Chart 16595 and is labeled "Subm buoy".

Appendix B:

Hydrolevel System Description

Hydrolevel Buoy Diameter: 0.6m (25.5") Weight: 156 lbs.

Telemetry: Iridium (WiFi available)

Amber Light, 5 flash every 20 sec

Charging Requirements:

- Two 60 Ah LiFePO4 rechargeable batteries (included)
- Standard 120V AC outlet
- 12 hours charge time
- 60 "D-Cell" Lithium non- rechargeable batteries (supplied by

HSTP)

Assembly/Hardware

- 11mm torque wrench
- 12 bolts around equator
-



Mooring Depths 10-25m



