

**AT39-05: Hutchins: Co limited N-fixers**

1400 Wednesday 11 October 2017

SSSG Conference Room, Smith

Call: 508-289-3192 ext. 203811

Synopsis: <http://www.whoi.edu/cruiseplanning/synopsis.do?id=4502>**Mission Objectives:**

We will be using trace metal clean sampling and incubation techniques to investigate iron and phosphorus control of nitrogen fixation in the tropical Atlantic. Our research plan involves both station work to sample mixed layer profiles (~6-8 depths), collect whole water filtered samples using McClain pumps, net tows to obtain Trichodesmium samples. Several sets of deckboard incubations will be running concurrently with the transect sampling. I have uploaded a list of 20 straw-man stations, but we will be looking for Trichodesmium blooms, using both semi-daily net tows and based on ocean color imagery to be periodically sent to the chief scientist. Therefore, stations will necessarily be a bit opportunistic, and may require minor deviations from the cruise track (within reason, of course).

**Science Activities:**

Station sampling will include regular CTD rosette profiles down to ~200m, deployment of a trace metal clean rosette system (coPI Saito), surface seawater trace metal clean pumping system (Saito), McClain pumps (Saito), possibly deployment of an in situ FiRE fluorometer (Hutchins), and frequent net tows to collect Trichodesmium samples (Hutchins/Webb). We also be carrying out simultaneous deckboard incubation work throughout the cruise using 4-5 flow-through deckboard incubators.

**Chief Scientist and PI contact info:**

David Hutchins: Chief Scientist, Principal Investigator

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[dahutch@usc.edu](mailto:dahutch@usc.edu)

Mak Saito: Principle Investigator

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[msaito@whoi.edu](mailto:msaito@whoi.edu)

Eric Webb: Principle Investigator (?)

**Identify operating area:** Latitudinal transect from Cape Verde due S to ~8°S, return NW transect to San Juan, PR

Depth Range: 0 / 200m

**Station Information:** *"stations will necessarily be a bit opportunistic, and may require minor deviations from the cruise track, within reason, of course"*

Approximate Stations (will be adjusted as needed to sample Trichodesmium blooms):

Leg 1	Leg 2
15.5N x 22.0W	5.6S x 26.5W
12.5N x 22.0W	3.0S x 30.8W
9.5N x 22.0W	0.0 x 36.9W
6.5N x 22.0W	2.6N x 40.0W
3.5N x 22.0W	5.0N x 44.3W
0.0 x 22.0W	7.5N x 48.5W
2.0S x 22.0W	10.0N x 52.7W
4.0S x 22.0W	12.8N x 57.0W
6.0S x 22.0W	15.5N x 61.0W
8.0S x 22.0W	17.0N x 65.4W

**Ship's Personnel:**

Captain: Lunt   Chief Mate: Leonard   Chief Eng.: TBD   SSSG: TBD

**Voyage Info:**

Ship transits at Max 11kts

Load: 05 February 2018 – Praia, Cape Verde

Depart: 08 February - Praia

Arrive: 11 March – San Juan, Puerto Rico\*

Unload: 13 March – San Juan\*

\*San Juan port call is contingent on confirmation from agent that all ship & science needs can be met. Alternative port is Bridgetown, Barbados.

**Schedule Notes:**

06 February (pm): Science Personnel can move into their rooms

06 Feb (?): Crane needed to load one 20' container (20k lbs) – Crane costs to science

06 Feb (?): 5T Fork lift needed for winch removal from container –Fork lift costs to winch pool?

Other Forklift needs?

12 March: Science personnel will move out of their rooms day after arrival

**Science Party (size):** 24 Max, plus 2 required berths for SSSG techs

**Pre-cruise and Administrative****1. Financial responsibility:** WHOI Project Number

Institutions outside of WHOI will require a purchase order (PO) to enable incidental costs to be funded. Expenses can include services such as agent charges, shore cranes, forklifts, taxi & hotels, Immigration/Customs entry fees to foreign countries, Hazmat disposal, and freight forwarding to name a few. A link to review potential costs can be found here: <http://www.whoi.edu/page.do?pid=8457>

*\*\*\*WHOI now charges MTDC of 37.5%\*\*\* Therefore, it will be significantly cheaper for you all to make your shipping arrangements independent from WHOI by directly interfacing for purchasing agreements with our agent or any other agent and freight forwarder that you may choose.*

**2. Personnel forms due: 1 month before cruise** to Kim Ray (kray@whoi.edu)

\*Forms should be kept confidential, and sent only to the address specified

**3. Berthing Plan:** Complete and remit to sfuller@whoi.edu

<http://www.whoi.edu/filesserver.do?id=17092&pt=2&p=19713>

**4. Any Special Food Requirements?** (Kosher, Allergy, Vegetarian, etc)

In addition to providing this information on personnel forms we ask that the Chief Scientist request this information from their science party especially information on allergies. This information will be given to the stewards in advance of the cruise

## Scientific Support

### General Duties of Marine Technicians

SSSG Technicians (WHOI SSSG) TBD

**Please Note:** WHOI sssg techs are not watch standers, and are not part of the science party. If specialized/dedicated techs are required to run operations or equipment, they must be added to your science party.

### Shipboard Equipment

Deionized Water System

- 80L/day maximum production onboard, expect 50-75L/day needed for bottle rinsing etc.
- Bring reservoir carboys to make ahead of time
- Filters will have been recently changed, or will be near needing change. We will have 1 additional filter cartridge aboard in case needed after that change.
- Part numbers for extra spares, should you want them:
  - o QGARD00R1 Q-Gard 1 purification pack, Elix RO distilled feed
  - o QTUM000EX Quantum EX (Organex Resin) cartridge filter
  - o ZFA10UV01 UV lamp assembly
  - o MPGL04GK2 Millipak Sterile filter

Fume Hood

Navigation - Position

Science Underway Seawater System

Transducer well for visiting instrumentation

### Shipboard Communication

Basic Internet access via HiSeasNet

Need to receive data ashore – what kind/quantities/frequency?

Other Communication needs? (voice, fax, e-mail, Blog)

Science party is responsible for communication costs.

### CTD/Water Sampling

911+ Rosette 24-position, 10-liter bottle Rosette with dual T/C sensors

Biospherical underwater PAR (1000m depth limit) with reference Surface PAR

SBE43 oxygen sensor

Seapoint STM turbidity sensor

Wet Labs ECO-AFL fluorometer

Wet Labs FLNTURTD Combination Fluorometer and Turbidity Sensor

### MET Sensors

Wind speed and direction

Short Wave Solar Radiation

### Navigation

Needed?

### Sample Storage

Freezer -70°C 25 cu. ft.

Freezer -70°C 3.2 cu. ft. ea.

Refrigerator 8.6 cu. ft.

Liquid Nitrogen Dewars

Approximate amount of sample stowage space needed? (Efforts to accommodate samples from multiple cruises)

### Storage Notes: LN

LN generator is installed and available for use. Consider a backup plan should the generator unexpectedly malfunction.

Do you plan on using ship's dewars, or are you shipping your own? How many, what size?

2 ship's dewars can start full, but note that filling empty & warm dewars may take several days.

Please follow all necessary precautions when handling/transferring LN to avoid spillage on deck.

### Winches

CTD Winch with .322" Electro-mechanical wire

Winch Notes: Clean winch & block request through Brian Guest (Winch Pool). M Saito will deploy his own trace metal rosette system, trace metal surface pumping system, and has requested McClain pumps as well.

Hutchins will occasionally want to do mixed layer profiles with a submersible FiRE fluorometer, which will need to be deployed using the winch.

### Vans

20' Winch van (weight?)

Shipped with science supplies from M Saito

To be located on 01 deck?

Supplied by B. Guest or M Saito?

Cost share?

5T Forklift needed to remove winch from van prior to loading

What are the crane needs?

20' Science Lab Van (20k lbs)

Owned by Hutchins, shipping directly to Praia

Needs: power (440/880), water, telephone?, alarm?, internet?

Crane needed to load

To be located on main deck out of way of winch ops & 4-5 deck incubators

### Special Over the Side Equipment

Details: M Saito has clean rosette system

McLane Pump

**Instrument Deployment / Recovery Procedures:** please submit so can be attached to synopsis

### Special Requirements

Science stowage – supplies & equipment → elaborate size/quantity/type

4-5 deck incubators – need flowing seawater

### Hazardous Material

Hazmats will be confined to lab use.

Hazmats include: HCl, NaOH, acetone, formalin, compressed H<sub>2</sub>, N<sub>2</sub> and acetylene cylinders

Make sure to bring own spill kits, MSDS

Be prepared to remove Hazard Waste and unused chems in San Juan if not possible to carry to WHOI

Please Submit MSDS electronically to R/V Atlantis Chief Mate. [chmate@atlantis.who.edu](mailto:chmate@atlantis.who.edu)

**Radioactive Material:** no

### Additional Information

Anticipated night time work

## Safety

**Deck Safety** – Safety Shoes must be worn at all times on deck and in common areas. Safety Shoes, hard hats and vests must be worn when launching/recovering over the side instruments. Steel toe shoes for movement of heavy equipment. Over the side – safety plan for any over the side work/deployments or recoveries  
On the dock or at sea – hard hats for overhead lifts, fall protection for working on top of vans or for attaching gear on railings or towers.  
Closed toed and back shoes for working in labs or on deck. Open toe/open back only allowed in cabin.

### **Lab Safety – PPE**

Science party is responsible for laboratory PPE including lab goggles, coat, gloves, storage containment and cleanup kits for working with all hazardous materials brought onboard the vessel.

## Shipping & Loading Logistics

*Note: All WHOI contacts should be copied on all communications with Agents. Information regarding the shipment of any equipment, containers or supplies should be communicated to the Agent and to all WHOI contacts.*

**Customs** - You must send me all Bills of Lading or Air Way Bills (BOL's or AWB's) when your gear is shipped so that the captain can have all documents proving that your gear originated in the United States. You can get these forms from your shipper / freight forwarder. We require these documents prior to your mobilization on Atlantis.

**Mobilization in Praia, Cabo Verde** – To clear customs, plan for shipments to arrive no later than 25<sup>th</sup> January, 2 weeks prior to departure. Storage maybe necessary if clearance is efficiently executed, and science will be responsible for storage costs of containers until they can be loaded.

20' Lab Van (~20k lbs) – ship with seal on the doors, or speak with your shipping company about the keys for your container.

### *Agent & Shipping Information*

Ship to:  
Master R/V Atlantis  
Attn: David A. Hutchins / AT39-05  
c/o AGENCIA NACIONAL DE VIAGENS, SA  
Rua Serpa Pinto  
P.O. Box No. 58  
Praia  
REPUBLIC OF CAPE VERDE

Phone: +238 2 603101 / 2603103 / 2603106  
Fax : +238 2 612162  
E-mail [anavpraia@cvtelecom.cv](mailto:anavpraia@cvtelecom.cv)

General Manager: Mr. Euclides Pereira, Mobile +238 9912903  
Primary contacts: Shipping Manager: Mr. José Manuel - Mobile +238 9917641  
Operation Manager: Mr. Bernardino Barbosa - Mobile +238 9916780  
Boarding Agent: Mr. Marileno Soares, Mobile +238 9964277  
Boarding Agent: Mr. Telmo, Mobile +238 5221259

*Needs from Agent & Ship*

Customs processing & storage of 2 containers  
2, 5, or 35T forklifts available – 5T will be needed for Clean Winch  
Shore crane for Lab Van  
What other needs are anticipated?  
Any shipments other than containers?

*Tentative Loading Schedule*

06 February (pm): Science Personnel can move into their rooms  
06 Feb (?): Crane needed to load one 20' container (20k lbs) – Crane costs to science  
06 Feb (?): 5T Fork lift needed for winch removal from container –Fork lift costs to winch pool?  
Other Forklift needs?

**Demob in San Juan, Puerto Rico** – We are still assessing the possibility of ending the cruise in Puerto Rico, dependent on clear outline of anticipated needs while in port. Should San Juan not be able to provide sufficient amenities to accommodate both the demobilization of this cruise and mobilization of the next, the backup is Bridgetown, Barbados.

*Agent & Shipping Information*

TBD

*Needs from Agent & Ship*

Shipment of 2 containers  
Forklift to lift Clean Winch into Container  
Shore crane for Lab Van  
Samples to be shipped directly to PIs from San Juan  
What other needs are anticipated?  
Any shipments other than containers?

*Tentative Unloading Schedule*

11 March (am): Arrival & begin demob  
12 March: Science move off ship  
13 March: Last day of demob

*Can Leave Aboard*

Potential to leave gas cylinders and or chem waste, pending available space. Be prepared to cover these needs in San Juan if necessary.

**Post Cruise Responsibilities**

**Actions departing ship:** Clean rooms, remove items from chemical van)

**UNOLS cruise evaluation:** Chief Scientist & Master

**Reports to foreign government/State Department:** required for work in EEZs; send to Kerry Strom, [kstrom@whoi.edu](mailto:kstrom@whoi.edu)

**Data delivery [shipboard]:** USB Hard drive

**Data archiving policy**

All data on a WHOI Cruise Data Distribution (which includes all underway data) will, by default be considered publicly available once a copy of it has been delivered to the chief scientist at the end of the cruise. Please review the [Cruise Assignment of Data Access Protection](#)

As of January 1, 2011, the default treatment for underway data from Woods Hole Oceanographic Institution (WHOI) research vessels is:

1. Cruise data files are copied by a WHOI SSSG Technician to the distribution media. One copy is delivered to the cruise Chief Scientist, the other is delivered to WHOI's Data Library and Archives. Please note that the distribution of cruise data to other scientist is the responsibility of the Chief Scientist.
2. The **default** access status for the cruise instrument datasets is that they will be immediately accessible by the public. If something other than this default protection is desired, the Chief Scientist must assign alternate protection as indicated below. For cruises funded by the National Science Foundation ,the maximum protection is two years, for non-NFS cruises, other guidelines may apply.
3. WHOI maintains a local copy of the cruise shipboard data distribution at its Data Library and Archives, which also honors access moratorium periods. If the cruise Chief Scientist wishes to modify the data protection assignments made in this pre-cruise document upon cruise completion, they should contact the
4. WHOI Data Library and Archives at [dla@whoi.edu](mailto:dla@whoi.edu), or the SSSG Data Manager at [sssgdatamgr@whoi.edu](mailto:sssgdatamgr@whoi.edu)