**AT42-08: Drazen / MBCal / Alvin Eng. Cruise on R/V Atlantis *w/ Alvin***

Precruise Meeting: Thursday 6 December 2018, 1500 EDT

3rd Floor Smith Conference Room

Join by phone: +1-508-289-3192 ext 203777

**General Information**

**\****There are 3 sections to this cruise with different Chief Scis. Each will be addressed separately below.*

**Ship’s Personnel**

Captain: Al Lunt Chief Mate: Jennifer Hickey Chief Eng.: Chris Morgan Bosun: Edward Popowitz

SSSG: Catie Graver & Joe McCabe

*Note:* WHOI SSSG techs do not stand watches, but are available 24/7 to provide support for integrating science party equipment with ship systems, and aiding science party in the use of ship-based instrumentation to meet project objectives. If specialized/dedicated techs are required to run operations or equipment, they must be added to your science party. SSSG techs are not part of the science party.

**Science Party**

24 Max science to be shared + 10 Alvin berths

Participant list & [berthing diagram](http://www.whoi.edu/fileserver.do?id=17092&pt=2&p=19713) send to Sarah Fuller ([sfuller@whoi.edu](mailto:sfuller@whoi.edu)) 1 month before

Personnel Forms due to Dan Meiggs ([dmeiggs@whoi.edu](mailto:kray@whoi.edu)) 1 month before departure

Highlight any food allergies/restrictions as soon as possible

**Voyage Info**

Ship transit speed: Max 11 kts.

*Mare Island Mobilization (exact location TBD)*

Mobilization Starts: 9 March 2019

Move in cabins: Noon, 9 March

Departure: 11 March

Agent: TBD

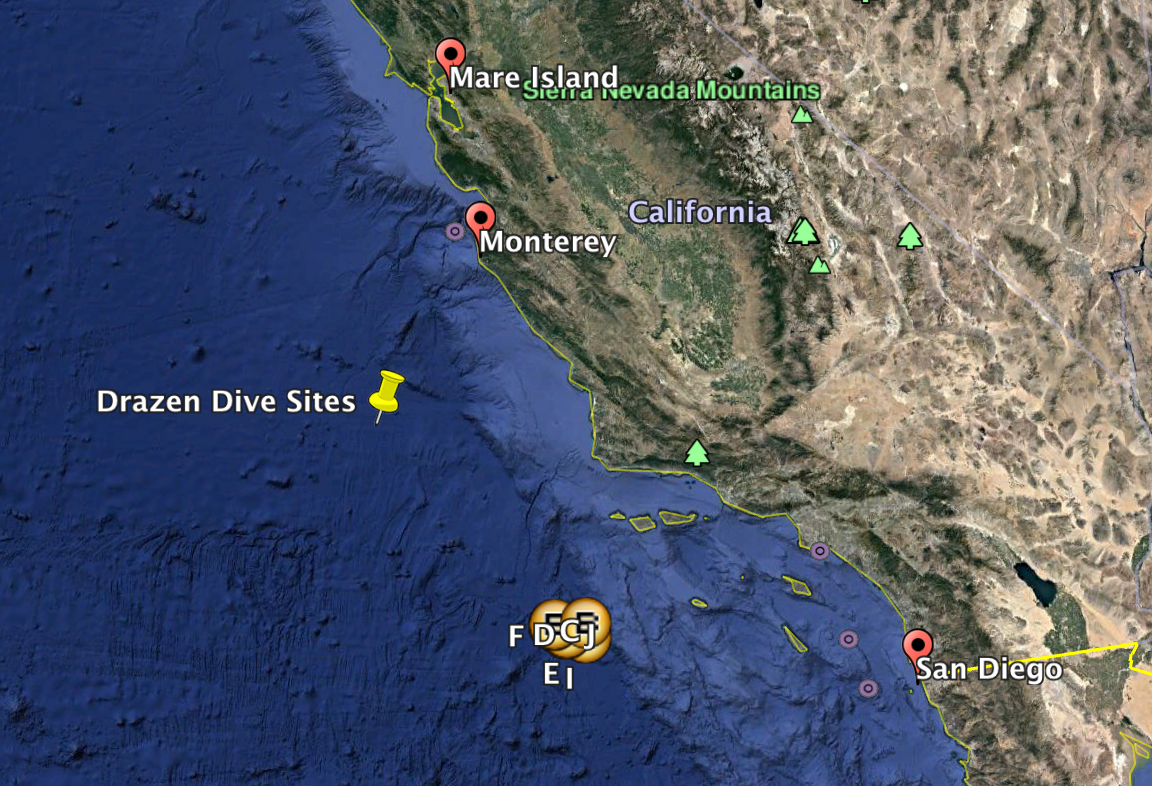
*San Diego Demobilization (exact location TBD)*

Arrival and Unload: 22 March

Unload day and Science moves off ship: 23 March

Agent: Tom Jenkins - <http://www.whoi.edu/page.do?pid=8230&tid=7342&cid=20252>

**General Station Locations**

****

**Vans & Topside Equipment**

*Deck plan required w/ weights*

Alvin:

* OV – Main Deck port side, aft of hangar
* Basket of Alvin line – 01 by Electrical shop
* tracks

Drazen:

* TSE Mooring Spooler (Possibly. See below.)
* Small Benthic landers

Stolp:

* None requested

Also Aboard:

* SSSG & Alvin stores – Fwd 02
* Carpenter Van – Fwd 02
* WHOI Rad Van – Fwd 02

**Ship Power Requirements:**

Alvin OV power needs

**Mission # 1: “Abyssal Food Webs”**

Chief Sci - Jeff Drazen, UH

Location - Station "M" - 200km off Pt Conception, CA

Science operation days - 4 with 2 days for transit and 2 mob/demob

Berths – 13 requested

**Mission Objectives**

The overarching goal of this project is to evaluate the relative importance of different food materials (very small slowly

sinking/suspended particles vs larger rapidly sinking particles) to the abyssal food web. To achieve this goal we will

characterize the isotopic composition of water column particles and sediments and compare them to the composition of

benthic animals (macrofauna and megafauna).

Part of a timeseries with MBARI

Main sampling outlined below

**Science Activities**

Sampling will include

1. CTD casts with in situ particle filtration using **McLane pumps.** See notes below Sampling will occur at night and from near the surface to near the seafloor (~4100m depth).
2. CTD casts collecting water in available Niskin bottles. Sampling will occur at night and from near the surface to ~500m depth. These will occur at night
3. Alvin sampling - sediment push cores, larger (~20x20cm) Ekman cores, and megafaunal collections, we will also perform video/photo transects to quantify animal abundances
4. Benthic trap lander - to capture fishes and large crustaceans, (2) ~24 hour deployments. We would like to conduct deployments and recoveries during the day while Alvin is at the seafloor to maximize use of ship time
5. Box coring for sediment macrofaunal

**Chief Scientist and PIs**

Claudia Benitez-Nelson: Principal Investigator

University of South Carolina USA

+1 803 777 0018

[cbnelson@geol.sc.edu](mailto:cbnelson@geol.sc.edu)

Jeffrey Drazen: Chief Scientist, Principal Investigator

1000 Pope Rd Honolulu, HI USA 96822

+1 808 956 6567

[jdrazen@hawaii.edu](mailto:jdrazen@hawaii.edu)

Brian Popp: Principal Investigator

1680 East-West Road Honolulu, Hawaii USA 96822

+1 808 956 6206

[popp@hawaii.edu](mailto:popp@hawaii.edu)

Craig Smith: Principal Investigator

1000 Pope Road Honolulu, HI USA 96822

+1 808 956 7776

[craigsmi@hawaii.edu](mailto:craigsmi@hawaii.edu)

**Operating area**

NP09 220km west of Pt Conception, California

Lat/Lon: 34° 50.0 N 123° 0.0 W

Depth Range: 4000 / 4200

**Station Locations**

*Please provide sampling & dive locations – tentative plan required 1 month prior to departure*

*Waypoint template to complete will be provided*

**Scientific Support**

**Shipboard Equipment**

12 kHz Pinger for Wire Use (2 pingers needed – 1 is a ready spare)

Bathymetry System 12 kHz

Deionized Water System (80L/day maximum production)

Fume Hood (how many need to be accessible, all 3?)

Multibeam

*The following were NOT requested as of 12/5:*

LN generator - Able to produce 3-4L/day for transfer to science personnel dewars

EK80

ADCPs

Bathymetry System 3.5 kHz

Gravimeter (ITAR documentation)

Sippican XBT System (Mark 21)

– SSSG provides 1 per day, additional will need to be provided by PIs  
Navigation – Heading & Position

Science Underway Seawater System (standard sensors: t, s, chla; anything to be added into the system?) Transponder Navigation - Sonardyne USBL

**MET Senors (not requested as of 12/5)**

*The following were NOT requested as of 12/5:*

Barometric Pressure

Air temperature

Precipitation

Relative Humidity

Wind speed and direction

Short Wave Solar Radiation

Long Wave Solar Radiation

**CTD/Water Sampling**

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

Wet Labs C\*Star transmissometer (660nm wavelength)

SBE43 oxygen sensor

Wet Labs FLNTURTD Combination Flourometer and Turbidity Sensor

Frequency of CTD/McLane cast = 1 a night

\*\*Will want to attach McLane pumps to .322 wire for in situ deployments\*\*

* **Have own wire clamps – brass inserts to adjust for multiple wire sizes; mostly be within last 100m of the termination, but on 1 cast will need up to 200m – will need outlines of all the mclane pump clamping points; will be using exactly mclane’s pumps; clamps are integreated into the frame, also use a bottom clamp separate from the mclane pump, upper clamp is integrate; have used these on geotraces, on exports, etc so are pretty standard; clamp them without too much extra pressure; CTD will be 50m off the bottom, someone will need to be on watch at the station for 4-6 hrs; someone will need to man that station the whole time; science party will need to be driving the winch for all of them. Wherever CTD is in the water someone needs**
* Deployments can be up to 8 hrs
* Max depth is 4200m (pinger required for near bottom deployments)
* Want to attach many as 6 pumps to the wire at various depths. Each weighs ~51kg in air and ~34kg in water.

*The following were NOT requested as of 12/5:*

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

Wet Labs ECO-AFL fluorometer & Seapoint STM turbidity sensor\* (our standard is to provide the FLNTURD combo sensor in lieu of 2 separate sensors)

**Rock/Sediment Sampling**

Box Corer on 9/16ths

Would you like to use ours or bring your own? Not currently aboard, will need to be shipped

Chris Griner – 1/2m on the side, ocean instruments? – get the specs on our box core to Craig

Pinger required

Contingency – prefer to collect with Alvin if possible

One or the other with CTD/McLane – not them together

Box core swap 681 and trawl wire requires about 30 minutes

Box core off the stbd side

**Specialized Science Deck & Over-the-Side Equipment**

Small benthic landers

Diagram attached to synopsis and precruise email

24hr deployments on seafloor

Largest component weighs 150lb in air (w/o 225lb anchor)

Like a giant lobster pot – 6x3x3 and connect by mooring line of 50-60ft that has syntachtic foam that ends at a spar bouy, vhf beason and strobe; can do this with the stbd crane, can add some rings for pull points; will cleat on rail and take bites with the crane

**Winches, Wire, & Deck Equipment**

CTD winch with .322” Electro-mechanical wire – also to be used for McLane pumps (see above)

Trawl winch with 9/16th trawl wire

For box coring, anything else?

TSE Mooring Spooler – not needed

For deployment/recovery of small trap lander

Team is open to other methods than Mooring Spooler – such as with stbd or prt side cranes

No slip rings requested

No additional winch requested

Recovery and deployments needs – Alvin has a benthos deck box (NOT AVAILABLE AS OF DEC 2018)

Use the benthos 865A release at 12kHz for release spanning 9-15kHz; functional ducer would be preferred if aboard; usually use DS7000; Bruce maybe able to test what is aboard; jeff is sending the codes to me to distribute; still recommend to bring a portable deck box; always want a back up on board

Quick releases for dropping package from crane? Grappling hooks – all available on the ship

Bridge equipped with RDF – send frequency to verify

**Shipboard Communication**

Basic Internet access via HiSeasNet

Please review “Internet-at-Sea” document provided with Precruise Agenda

**Navigation**

GPS

USBL – required for Alvin

**Sample Storage**

Walk-ins – 1 or 2 & at what temperature? 4’C? will have sediment and animal processing 1 per walkin

Freezer -70°C 25 cu. Ft.

Freezer -70°C 3.2 cu. Ft.

Refrigerator 8.6 cu. Ft.

**Hazardous Material**

Hazmats include:

38% Formaldehyde solution

95% Ethanol

liquid nitrogen

Nitric Acid

Ammonium Hydroxide

230Th in 0.1N HNO3 solution

Manganese chloride (MnCl2·4H20) solution

Potassium permanganate (KmnO4) solution

Please fill out hazmat inventory <http://www.whoi.edu/sbl/liteSite.do?litesiteid=7092>

Send copy of hazmat manifest to [sfuller@whoi.edu](mailto:sfuller@whoi.edu)

All Hazmats must be redundantly labelled **(minimum of 2 places)** with Cruise #, PI’s responsible, concentration & contents prior to loading on ship (label provided)

Make sure to bring own spill kits, MSDS

Bring 1 printed copy of all MSDS sheets for binders & submit electronic copies (1 pdf per chem)

Be prepared to remove all Hazard Waste and unused chems during demob

**Other Special Requirements**

Night ops will include CTD and in situ pump casts & box coring (pinger required)

Rads – Claudia and Dan Lopes – Claudia has received rads approval – early Jan 2019

**ALVIN Scientific Instrumentation**

**Objectives**

Dives will consist of collections (sediment cores, Ekman cores, megafaunal collections) after landing. Then line transects will be run (500-1000m) using Alvin video and stills cameras (prefer downward looking camera).

**Site Survey**

No charts will be provided

No generation of work area maps needed

No need for post-dive work area maps

**Navigation**

No LBL

No nets or transponders

**Vehicle Equipment**

Bio box: 12x12x12

Bio box: 12x12x14

CTD – calibrated prior to cruise

Large capacity slurps: single chamber

12-pack rack of Push Cores

Scoop Nets – what mesh size do you want for holothurians, brittle stars, etc, 1cm sized mesh should be good

Tube cores: 12 core array (12”x18” milk crate base)

Alvin can take 45 cores at once with bio boxes

Send image of Eckmann cores

Slurp is single chamber for animals

5 chamber as well and gives more capacity – definitely will want

Want niskins at the bottom? (can have a wand for targeted sampling places)

Bruce send diagram of baskets and show the geometry for where everything can go

Dives are 4100m

4 days = 4 dives; possible for recovery of trap when Alvin in the water? (NO deployments with Alvin in the water) Can launch right before the dive, just not when the sub is in the water (launch takes 30 minutes)

Recover following day after sub is down

Recovery – can dive w/I 1km of trap location and then release when Alvin is on the bottom

Can keep pinging on it to get a range, Bruce will provide beacon for navigational purposes

**Elevators**

None

**Science Supplied Equipment**

Ekman grabs:

Supplied by science

For collecting sediment macrofaunal samples using Alvin’s manipulator

Cores are 30cmx30cmx 35cm – 25x 25cm boxes per core – prefer their boxes over milk crates

Actuated by rotating a T handle (1/2 inch rod)

Each corer (without sample) weights about 25 lbs in air and 20 in water

They each collect about 8 liters of mud.

They need to be mounted & then replaced with samples in open topped boxes (e.g., milk crates or plywood boxes) in Alvin’s basket.

Will equipment disconnect and be left in situ? – No

Will previously deployed equipment be recovered? – No

Will there be Hazmats? – No

Any other equipment added to Alvin?

Any surprise sensors to add to Alvin must have pressure certifications (implodable volumes) – have nothing, only bringing Eckmann cores

Want downward facing camera on lightbar – interval stills on one of these cameras; purpose is for animal counts (image every 15 seconds during transect) SubC-Alpha camera in down looking camera; numerous pan and tilt

Also have a GoPro camera on sub (MISO); scaling lasers are on the pan and tilt cameras, but possible to move them to subC for down facing

Bruce to send specs on SubC

Can goPro be positioned downward? Yes, definite option

SubC-1Alpha takes until after dinner/late evening

GoPro (5 seconds) – has to be manually downloaded and made available by 1830 – want it to be useful for planning, but not for analysis; might not be as useful if it is looking straight down

Most data will be available by the next day

Log into Alvin dive log on the website

Flammability & toxicity testing

* Any laptops, ipads, etc fundamentally required to go in Alvin (no phones/cameras), must be tested (incl. spare batteries)
* Items must be delivered to Rick Chandler ([rchandler@whoi.edu](mailto:rchandler@whoi.edu)) by communicated date
* If they can borrow an Alvin supplied Samsung with office etc that should be enough for their needs; same with cameras etc; contact lens stuff is alright

**Mission #2 – Multibeam Calibration and USBL Calibration**

Chief Sci – Laura Stolp, WHOI

Location – West coast seamounts for MB cal and deep water for USBL cal

Science operation days – 3 with 1 day for transit

Berths – 8

**Mission Objectives:**

The estimated time is ~11 hours on site for calibration, plus another ~11 hours for verification – about a day, assuming sea state cooperates and all goes well. That would be using one attitude/positioning system, so double the time if a Seapath gets installed. In theory, we can log both the PHINS and Seapath feeds in the .all files, and not have to re-run all the lines with the secondary system, but that may depend on the ship’s network – something to bring up with Kongsberg, for sure.

We would then add accuracy crosslines (waypoints C-D over the RR1301 reference surface, same as the roll calibration line) as time allows, and collect swath extinction data during all transits.

**Science Activities:**

Patch test for EM122

**Chief Scientist and Pis**

Laura Stolp: Chief Scientist, Principal Investigator

WHOI

[lstolp@whoi.edu](mailto:cbnelson@geol.sc.edu)

Hopefully have Mac folks out there

Trying different IMU systems

**Operating area/Station Location**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Waypoint | Decimal Degrees | |
|  | Lat. | Lon. |
| Pitch | A | 32.98737 | -120.92086 |
| B | 33.06319 | -121.05380 |
| Roll | C | 32.95000 | -120.71667 |
| D | 33.08333 | -120.71667 |
| Heading 1 | E | 32.99484 | -120.91485 |
| F | 33.07066 | -121.04780 |
| Heading 2 | G | 32.97991 | -120.92686 |
| H | 33.05572 | -121.05980 |
| RR1301  Accuracy | I | 32.95000 | -120.71667 |
| J | 33.08333 | -120.71667 |

*Waypoint template to complete will be provided so waypoints can be incorporated into bridge system*

**Scientific Support**

**Shipboard Equipment**

EM122

XBT T7

**Specialized Science Equipment**

Possible rental of SeaPath from Kongsberg – Laura is taking care of this

Will be dominating the computer lab

**Mission #3 – Alvin Engineering Dives**

Chief Sci - Bruce Strickrott, WHOI

Location - TBD

Science operation days – 1

Berths – All 10 DSOG Berths (non-science cabins)

Usually the first dive, around the area of Drazen dives and do a shake down prior to the Drazen operations.

Location is dependent on Navy clearances and possibly in shallower waters

Possible to get some science collections too – last minute

**Mission Objectives (edited from previous Alvin Eng. cruises)**

Principal objectives for the Alvin dive program are as follows:

1) perform vehicle testing and trials of DSV Alvin and associated support systems (LARS, USBL, Communications, science gear, etc)

2) perform directed training of existing and new personnel to advance technical and operational readiness and advancement toward DSV pilot certification

3) perform on-going new systems integration and engineering tests (thrusters, acoustic modem, video improvements, in-hull computer upgrades and other systems)

4) perform in-water tests of the Operations Vehicle?

5) as possible obtain footage and media for use in the on going vehicle outreach efforts

**Science Activities**

No official science objectives are associated with the Alvin efforts.

No sampling or equipment placements planned.

**Chief Scientist and PIs**

Bruce Strickrott – Lead Alvin

**Station Locations**

Opportunistic or planned?

**Scientific Support**

**Winches, Wire, & Deck Equipment**

Trawl Winch with .681 fiber optic

Winch Notes: OV will use 0.681" winch for testing and trials

**Other Special Requirements**

Possible use of an Alvin elevator for OV testing?

**Potential STEM-seas Undergraduate Students**

There is a request from UNOLS to accommodate some STEM-seas undergraduate students.

<http://mlp.ldeo.columbia.edu/stemseas/>

The request is for 8 berths (7 students, 1 instructor) -or- **3**-4 program alumnae who have been to sea previously

Example program outlines for POD are attached in precruise meeting email – one from Sikuliak, one from RV Endeavor

**Safety**

**Deck Safety**

Closed toe/heel shoes must be worn at all times on deck, and in labs/common areas.

Steel toe shoes required for movement of heavy equipment.

Open toe/heel only allowed in personal cabins.

Launch & Recovery: Safety Shoes, hard hats and vests must be worn; safety plan required

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.

We will have some hard hats, but bring one if you have one.

**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**

\*If you choose to work with the ship’s agents, [ebenway@whoi.edu](mailto:ebenway@whoi.edu) & [sfuller@whoi.edu](mailto:sfuller@whoi.edu) must be copied on all correspondence. Should you choose to ship anything to these agents, Sarah Fuller ([sfuller@whoi.edu)](mailto:sfuller@whoi.edu)) must receive all manifests, BOLs, shipping information prior to shipments departing your home institution.

**Mobilization in Mare Island**

Ship’s Agent Information in Mare Island, CA is TBD

**Demobilization in San Diego**

The Ship’s Agent Information in San Diego is:

Master R/V Atlantis

Attn: Scientist's Name – AT42-06

c/o Paxton, Shreve & Hays Inc.

453 54th Street Suite 101

San Diego, CA 92114

Contact: Tom Jenkins

Phone: (619) 232-8941

Fax: (619) 232-3006

Telex: 6731029 SHREVE SDG

Email: [marineops@pshinc.net](mailto:marineops@pshinc.net)

Note the above address is for the ship’s agent, not the pier where the ship will be located.

\*If you choose to work with the ship’s agents, [ebenway@whoi.edu](mailto:ebenway@whoi.edu) & [sfuller@whoi.edu](mailto:sfuller@whoi.edu) must be copied on all correspondence.\*

**Financial responsibility:** Please supply a WHOI Project Number for any anticipated mobilization/demobilization costs.

New WHOI policy encourages PIs to make all shipping arrangements independent of the institution. Starting 2018, WHOI will cover certain fees when they occur at/on the ship, including immigration, cranes, forklifts, and stevedores for loading/offloading containers/heavy equipment.

The science party will be responsible for all other costs associated with their science gear, including but not limited to: customs clearance of science equipment, visas, equipment storage, shipping and handling, purchase of science supplies (gases, chemicals, etc), personnel transportation costs to/from the ship, unexpected travel or medical needs, etc.

WHOI charges an MTDC rate of ~42% for non-WHOI PIs. For WHOI PIs, research rates apply.

You may work with Sarah to estimate a budget for your anticipated science needs and supply a WHOI Project Number and/or create a Purchase Order. Otherwise, science personnel are expected to secure their own agent independent of the ship.

If you have any questions, please contact Sarah Fuller ([sfuller@whoi.edu](mailto:sfuller@whoi.edu)).

**Post Cruise Responsibilities**

**Actions departing ship**

All scientists are responsible for cleaning their cabins & heads.

Remove all scientific samples, chemicals, waste, gases, and cylinders, unless specific permission has been given to leave them aboard. If items are left aboard, plan on sending a representative from your group to remove these items from the ship at the designated time & port. WHOI is not responsible for items left aboard outside of your designated cruise time.

Any materials staying aboard must be *redundantly* labelled with owner’s name, contact information, and cruise Id.

**UNOLS cruise evaluation**

To be completed by both Chief Scientist & Master[**Post Cruise Report Link**](http://strs.unols.org/Public/diu_pre_pcar.aspx)

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

**Reports to R2R:** <https://www.unols.org/document/cruise-personnel-manifest>

Chief Scientist should fill this out and send to dropbox@rvdata.us at some point during the cruise

**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](http://www.sssg.whoi.edu/sssg/pdf/cruiseData_v3.pdf)

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, or the SSSG Data Manager at [sssgdatamgr@whoi.edu](mailto:sssgdatamgr@whoi.edu)