

Healy Science Support

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Overview

- ◆Multibeam Replacement (separate presentation)
- ◆Incubator water
- ◆Science Communications
- ◆New TSG & pCO₂ location
- ◆Environmentally controlled walk-ins
- ◆Lab Space renovation
- ◆Science Met System (planned changes)
- ◆ADCP
- ◆Gravity Meter
- ◆Equipment for 2009
- ◆Potential science-driven needs for 2009? 2010?
- ◆Plans for 2009/2010 Drydock
- ◆Planning for Healy incremental refits

AICC Ranking (1 is highest)

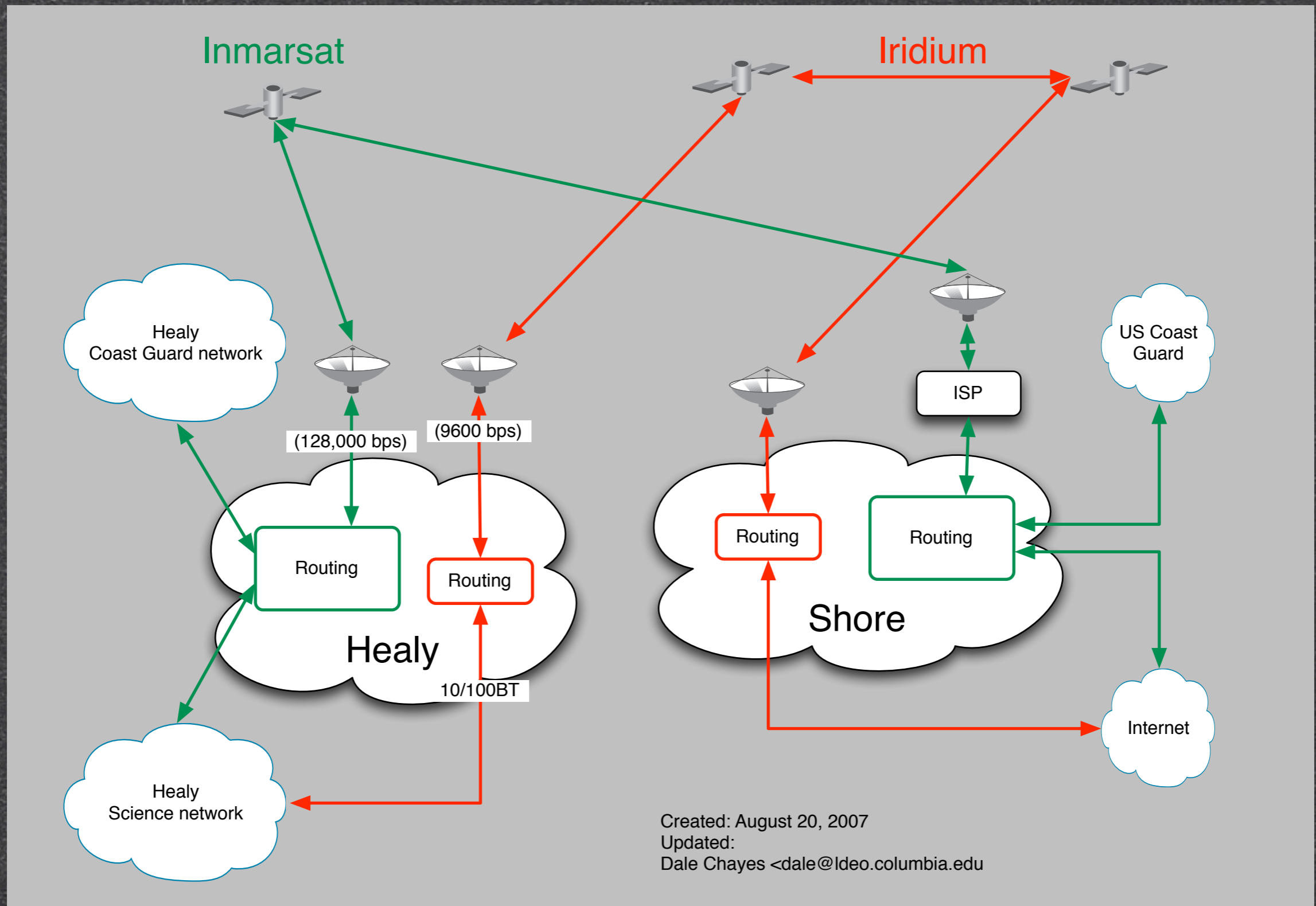
Item	Relative COST	MEAN	StDev	N
New or upgraded Multibeam	\$\$\$\$	1	0	5
Support Existing Multibeam	\$\$	1	0	5
Convert dark room to lab	\$	1	0	3
Seawater: pCO2	\$\$	1.2	0.4	5
Seawater: Definition of water needs	\$	1.3	0.5	4
Broadband Hydrophone	\$	1.3	0.6	3
Seawater: New TSG location	\$\$	1.5	0.5	6
Climate Chambers	\$-\$\$	1.5	1	4
Communications: Science VSAT	\$\$\$	1.6	0.5	6
ADCPs: Re-route cables	\$	1.6	0.9	5
Computer Lab renovation	\$	1.6	0.5	5
Aft Staging complete Unistrut	\$	1.6	0.5	5
Communications: Science Inmarsat	\$\$	1.9	0.7	6
Aft Con renovation	\$- \$\$	1.9	0.9	5
FO 0.68" wire on existing winch	\$\$\$	2	1	5
Terascan: Return to smaller dish?	??	2	1	5
FO 0.68" wire with new winch	\$\$\$\$	2.2	1.1	5
Met Lab renovation	\$	2.2	1	6
02 Copier Room	\$	2.2	0.8	5
Terascan: Replace with something else	\$\$	2.6	0.5	5
Future Lab with darkroom	\$	3	0	3
Future lab w/o dark room	\$	3	0	2

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This is a version of the AICC "ranking" of proposed science upgrades and improvements provided in October 2007 sorted. Items ranked #1 are the AICC's highest priority.

Science Communications



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This one-line diagram shows the two satellite digital data communication systems in use for science on the Healy.

The shared CG Inmarsat is used for real-time Internet connection (web, ftp, etc.) Approximately 1/2 half of the 128,000 bit per second (theoretical) channel is available for science through a secure routing arrangement. In order to provide reasonable performance, we block access to a number of protocols including instant messaging, Voice over IP, etc. and we allow web access only from the public science workstations.

The much slower (9,600 bit per second) is based on using “ganged” (paralleled) Iridium radio systems. This link is normally used for science email and for file transfer at high (about 75 degrees north) file transfer.

Our system allows accommodation of special science-driven access as necessary. We encourage science parties to plan ahead and work with us to accommodate their communication needs.

Add Science VSAT

- Sharing CG bandwidth won't last much longer
- Unplanned loss would be a problem
- 24 x 7 connectivity for science (south of $\sim 80^\circ$)
- 100 - 500 kbps

New TSG & PCO2 Location

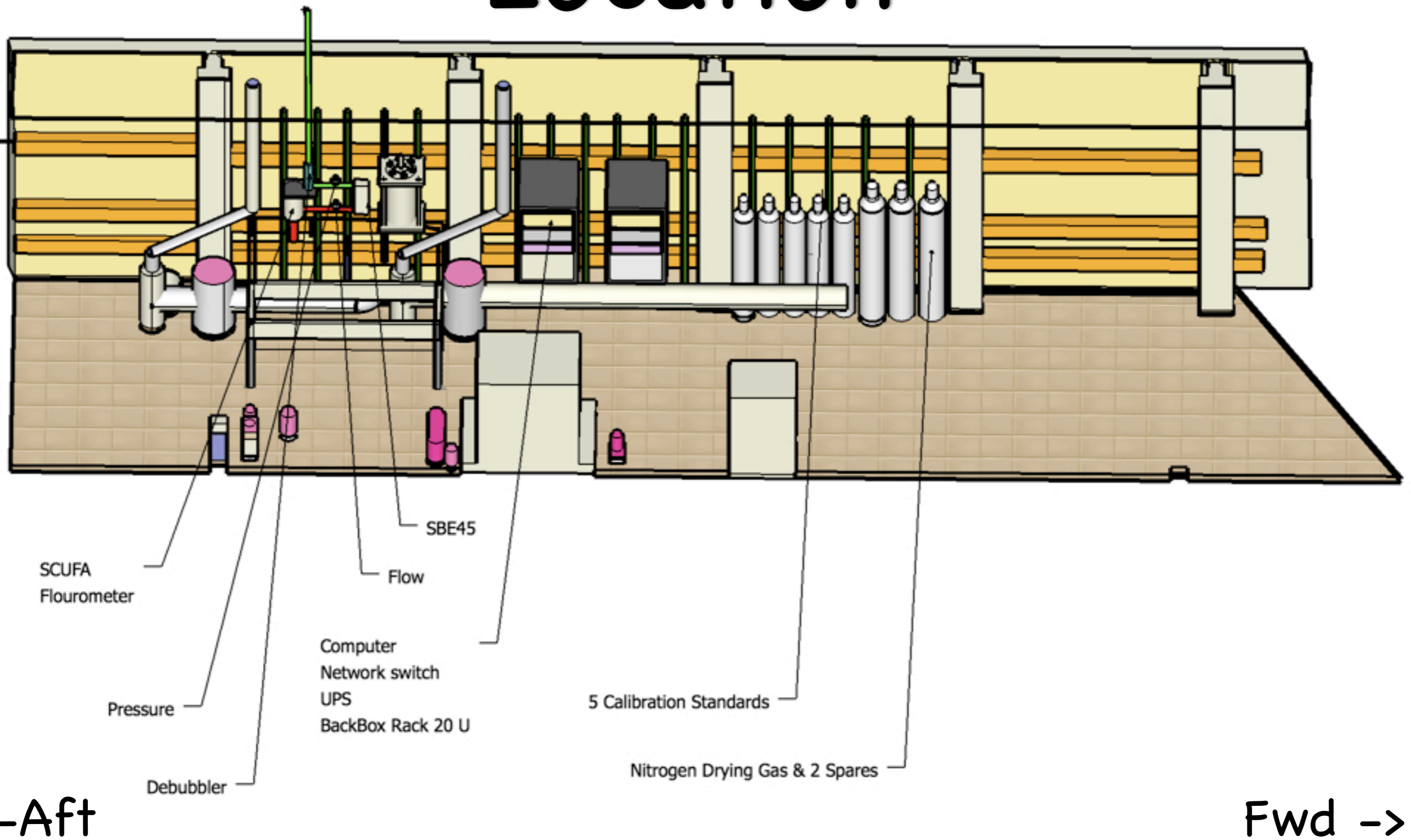
- In Portside main deck passageway
- Proposal in preparation to NSF
- ECR documentation is ready

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We are still trying to get the a new location implemented for the flow-through water system which includes the thermosalinograph, dissolved oxygen sensor, flourometers, etc.

Thermosalinograph Location



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A scale drawing of the TSG and pCO₂ system location in the port side main deck passageway

"Walk-in" Chambers

- They meet the SOR
- Inherently high maintenance, probably need to add labor to ship's force to keep running reliably
- Don't meet the desires of some science parties: Need to define the actual requirements

Lab Renovation

- Following the AICC 2007 ranking
- Proposal in press to NSF for funding
- Computer Lab is primarily a technical support issue

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AICC has ranked the proposed lab renovations based on science needs. The Computer Lab renovation is an infrastructure/technical support need and is judged to be high priority. There is no point in submitting a proposal to fund this work until we have an indication that funding is possible.

Science Met System

- New met system is running on jackstaff
- Relocating all but wind sensors off the jackstaf

Proposed ADCP changes

- Engage the community technical experts (Firing et. al at UH/SOEST)
- Drafting proposal for support, pending cost estimate

Equipment Purchases

- What does science & technical support need?
- What belongs in specific science proposals?
- What should the facility provide?

Equipment for 2008+

- New met system
- Replace the network disk store (ESU)
- Racks for Windows servers and disk store
- Additional disk space for backups
- Aircraft Non-Directional Beacon (NDB)
- Gravity Meter
- Science Inmarsat
- Dredges
- Science AIS
- Science Vsat

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UCSD/SIO/ODF (Scott Hiller) has completed the installation of new met sensors on the bow.

ESU has replaced the network disk system (Snap Servers) with Apple Xraids. Testing remains to be done prior to shakedown.

ESU has purchased (2?) new racks for the Windows servers and Xraid. It is not clear if they will be installed prior to this season

LDEO is planning to add some disk space for backing up our (LDS and Mapserver) computers.

LDEO is working with CG to add a "homing" beacon on Healy so that commercial aircraft (like our contracted helos) can find the Healy in the event of marginal weather and/or GPS problems.

NSF has funded a BGM-3 gravity meter for Healy through a proposal by Dan Fornari and Bernard Coakley to the national gravity meter pool managed through WHOI.

We need to add a Science Inmarsat to provide some fall-back in the event of a CG Inmarsat failure and because sharing the CG Inmarsat will eventually not be an option for science.

Longer term items

- Fiberoptic "0.681" deep tow cable (when there is a funded need)
- Science V-sat: as soon as we can afford it or we are forced of the shared Inmarsat
- Subbottom profiler transducer replacement (2008)

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Need for a 0.68" fiber-optic tow cable has been and will continue to be episodic Healy. Each event so far has been accommodated by temporarily installing a large, complex and heavy traction winch on the fantail. These installations are complicated and expensive and consume much of the working deck. When we anticipate the next need, we propose to purchase a cable, wind off the existing .68 (coper only) tow cable and wind the fiber on for the season. We would remove the fiber at the end of the season to avoid storing it for long periods of time under tension. No such need exists for the 2008 field season.

Science and science technical support on Healy needs 24x7 Internet connectivity. This is provided on all of the large UNOLS vessels using a very small aperture satellite terminal (VSAT.) At present, this capability is provided on Healy by sharing the CG's leased 128kbps Inmarsat connection. In the future this sharing arrangement will be precluded by CG needs for bandwidth and/or security restrictions. We are continuing to plan for the installation of a large (3m) VSAT antenna and routing hardware on Healy. Current cost estimates suggest that purchasing the equipment and leasing "air" time is the most cost effective solution.

The subbottom profiler transducers on Healy have been in service since 2000 and should be overhauled. The traditional method is to purchase a spare set and install them. The used units can then be overhauled and re-installed in the future.

CY 2009/10 Drydock

- Multibeam replacement
- VSAT (or 2008/9?)
- Winch changes?
- Helo hanger access?

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The multibeam replacement is (so far) on track for completion during the next scheduled drydock. The VSAT antenna installation should be done before then, but could be done then. It is probably too late to plan for substantial winch changes in 2010 but we should start thinking about that. There is no way to access the interior of the ship from the hanger. This needs to be addressed.