

The Ross Sea Connection: Linking broad audiences to an Antarctic Ecosystem

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Chris Parsons
Word Craft

Harold Clark
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Chris Linder
Chris Linder Photography

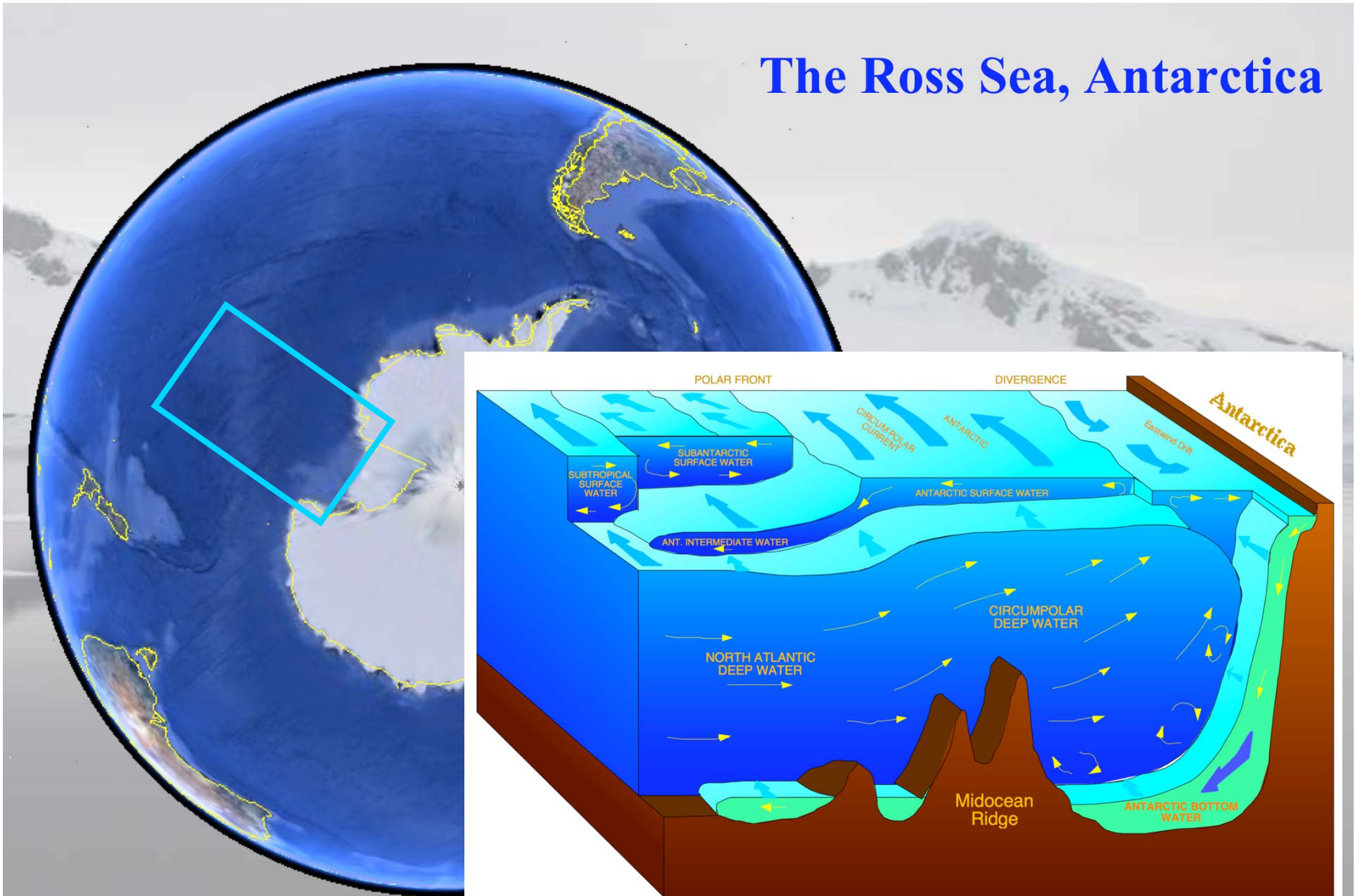


Quick Poll



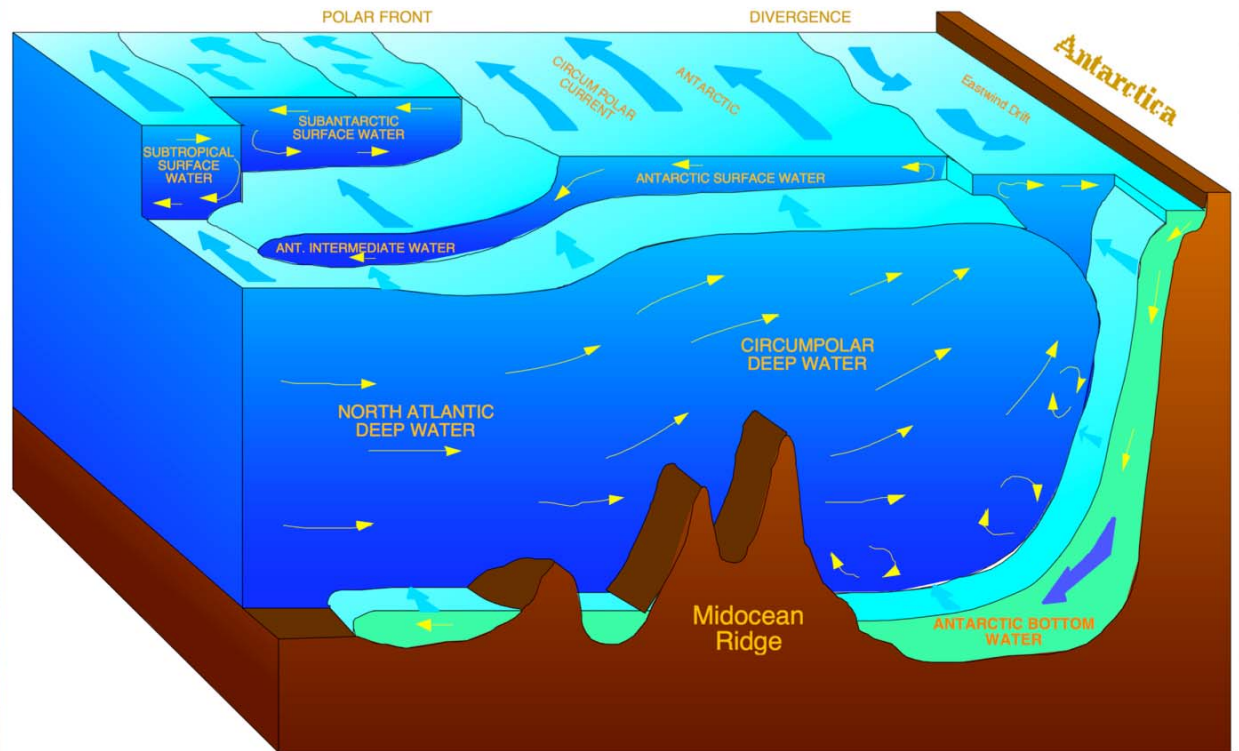
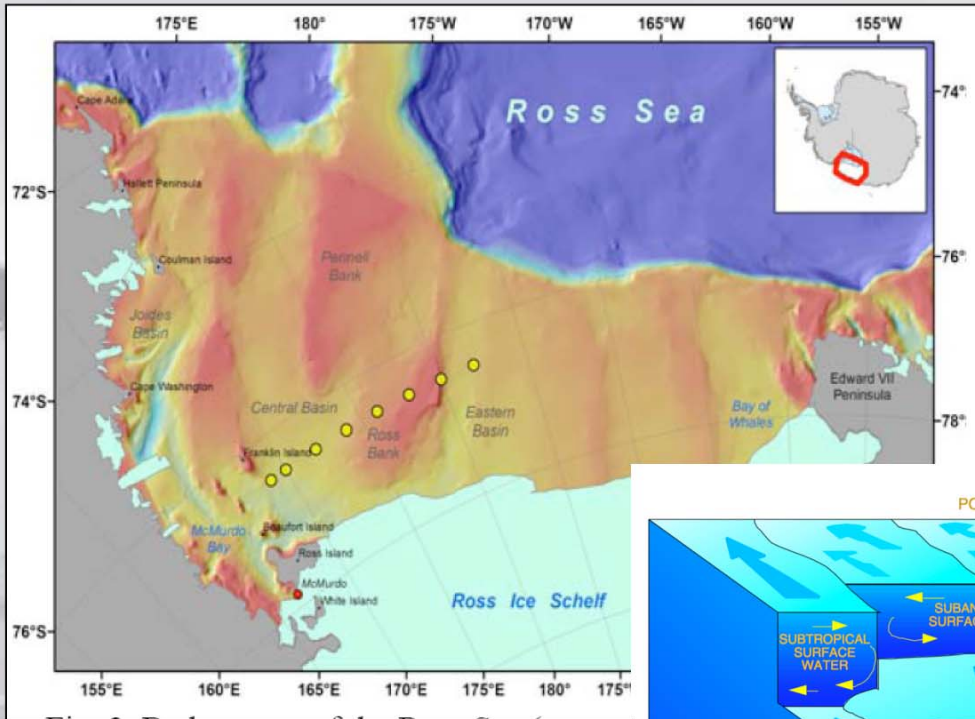
Have you ever been to Antarctica?

The Ross Sea, Antarctica



Hannes Grobe, Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany

The Ross Sea, Antarctica

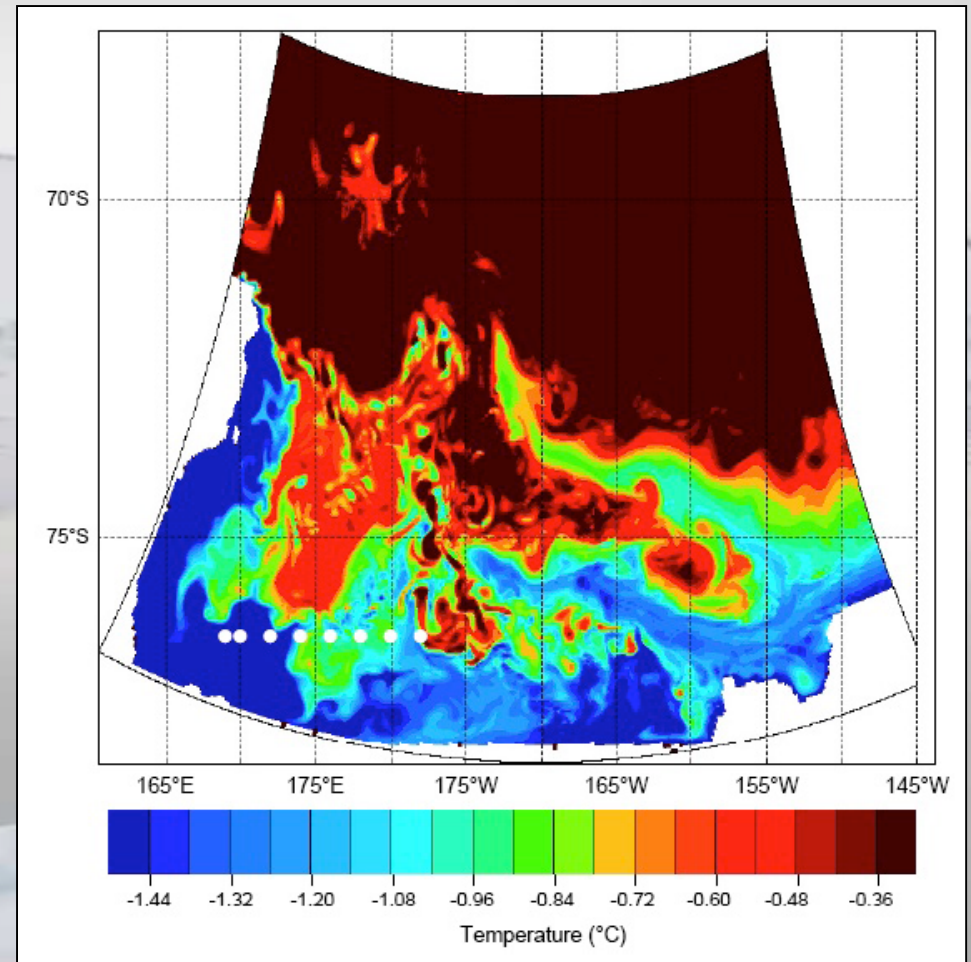


Hannes Grobe, Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany

Our Hypotheses:

*Mike Hiscock, Adam Kustka, Pheobe Lam,
Chris Measures, and Josh Kohut*

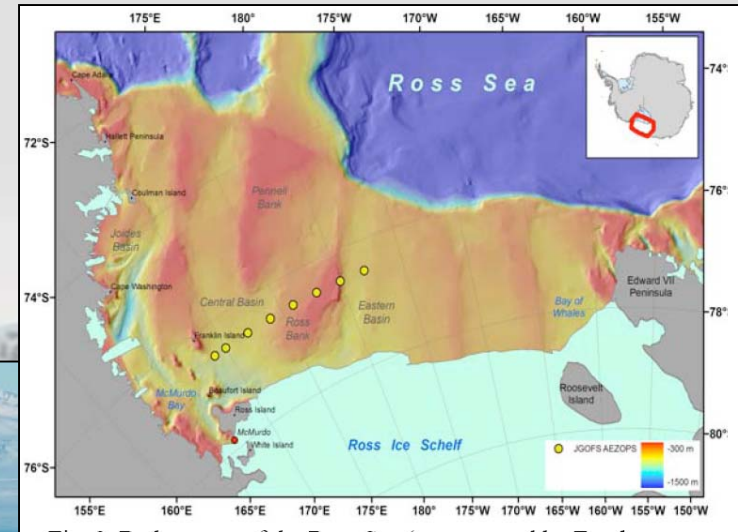
- **Intrusions of Modified Circumpolar Deep Water (MCDW) serve as a source of Fe to surface waters over vast portions of the Ross Sea**
- **MCDW-derived Fe drives ecosystem structure and function by increasing maximum quantum yield, photosynthetic rates and chl, and by promoting blooms of large diatoms.**



Dinninman et al. 2003

Deep Glider (1000m)

Locate and map MCDW intrusion
December 2010



R/V Nathaniel B. Palmer

**Intense sampling of the MCDW intrusion
January 2010**

Underway surface surveys will map

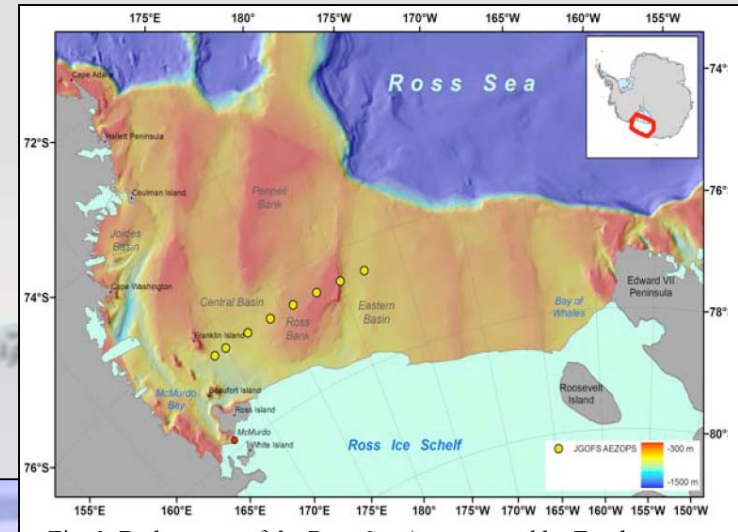
- photosynthetic efficiency (Fv/Fm)
- dissolved Fe

Vertical profiles

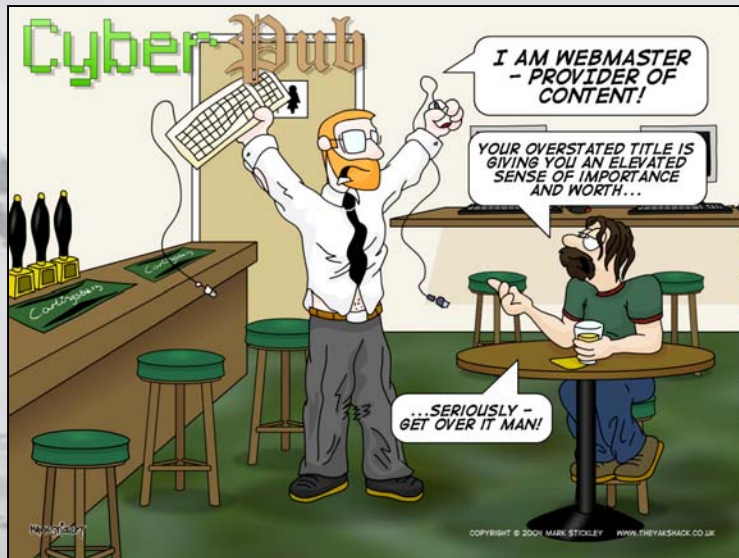
- macro- and micronutrients
- phytoplankton production
- assemblage and physiology
- POC

On-deck

- Trace metal clean incubation experiments



How did we develop our broader impacts?



A: Found the closest webmaster



B: Found colleagues who have done it before



C: Checked admissions for perspective graduate students

COSEE-Networked Ocean World (NOW)

Linking ocean scientists and educators in the virtual world



RUTGERS



liberty science center



MATE
Marine Advanced Technology Center



Broader Impact Objectives

Do you think broader impacts can contribute to funding success?



Increase **awareness** and **understanding** of

- global climate change
- the Antarctic Ross Sea ecosystem
- methods and technologies used by researchers aboard the ship
- careers in ocean science, through interviews with the scientists and ship crew

Broader Impact Objectives

Do you think broader impacts can contribute to funding success?

30% say well crafted BI contributes to our funding success (N 326)

- COSEE-NOW Scientist Survey 2010



Increase **awareness** and **understanding** of

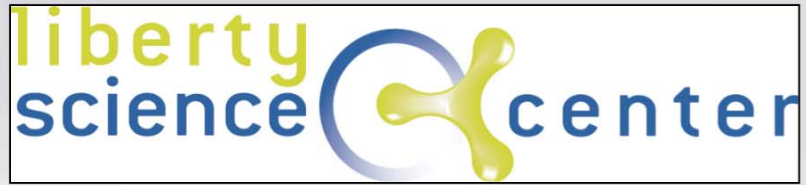
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Audience

- Informal learners
- Grade 6-9 educators

Based on evaluation of similar projects during the International Polar Year programs





Located in Jersey City, NJ, in Liberty State Park

Opened in 1993; Renovated and reopened 2007

**Largest science center in NYC/NJ area:
295,000 sq ft**

**NJ's most visited museum: nearly 1 million
each year, through onsite, offsite, and
online programs.**



CHRIS LINDER PHOTOGRAPHY

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Home

I use photography to educate and inspire people about science and conservation. My specialty is documenting field work in the Arctic and Antarctic.

On this site you will find portfolios of images, information about recent projects and upcoming events, plus excerpts from published stories.

Latest news:

► *Nov 23 - Jan 15* - I am in the field photographing penguins and skuas on Ross Island, Antarctica. Follow my [tweets](#) to see what I'm up to.

Recent site updates:

- [Multimedia: Polaris Project Overview](#)
- [Multimedia: Permafrost](#)
- [Multimedia: Lakes](#)
- [Multimedia: Streams](#)
- [Multimedia: Bugs](#)
- [Multimedia: Rivers](#)

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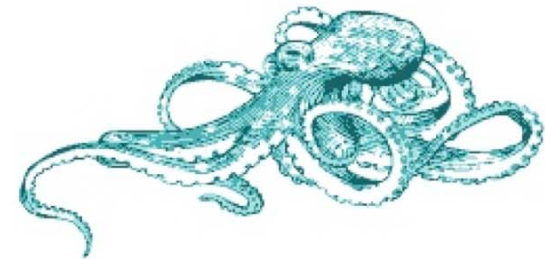
Current Projects

Past Projects

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Word Craft

Science Writers • Science Educators • Program Evaluators



We're writers, educators and evaluators who...

- write about the wonders, workings, beauty and fragility of nature
- teach to engage, enlighten and inspire
- evaluate to inform, improve and innovate
- serve aquariums, zoos, nature centers, museums and other science education places
- work with passion, commitment and hope.

The Ross Sea Connection

August 9-13, 2010

Summer Teacher Institute for 25-30 Earth Science Teachers, Grades 6-9

Hosted at Liberty Science Center

Content

Climate Change Context

Antarctica Mission Overview

Ocean Circulation

Properties of Seawater

Seawater Chemistry

Phytoplankton



Strategy

Storytelling and Photography in Teaching Science

Lessons & Hands-on Activities

Visit to Rutgers

Ocean Observatories

Slocum Gliders

Meeting Mission Staff

Preparing Students for Mission and Live Audio Links



The Ross Sea Connection

January 2011
Field Season

Daily Mission Blog

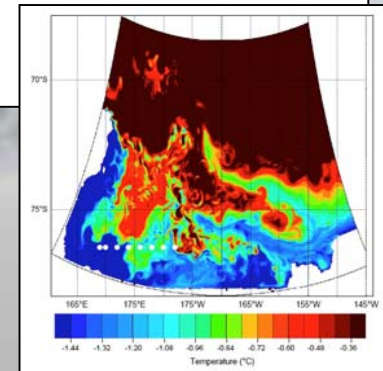
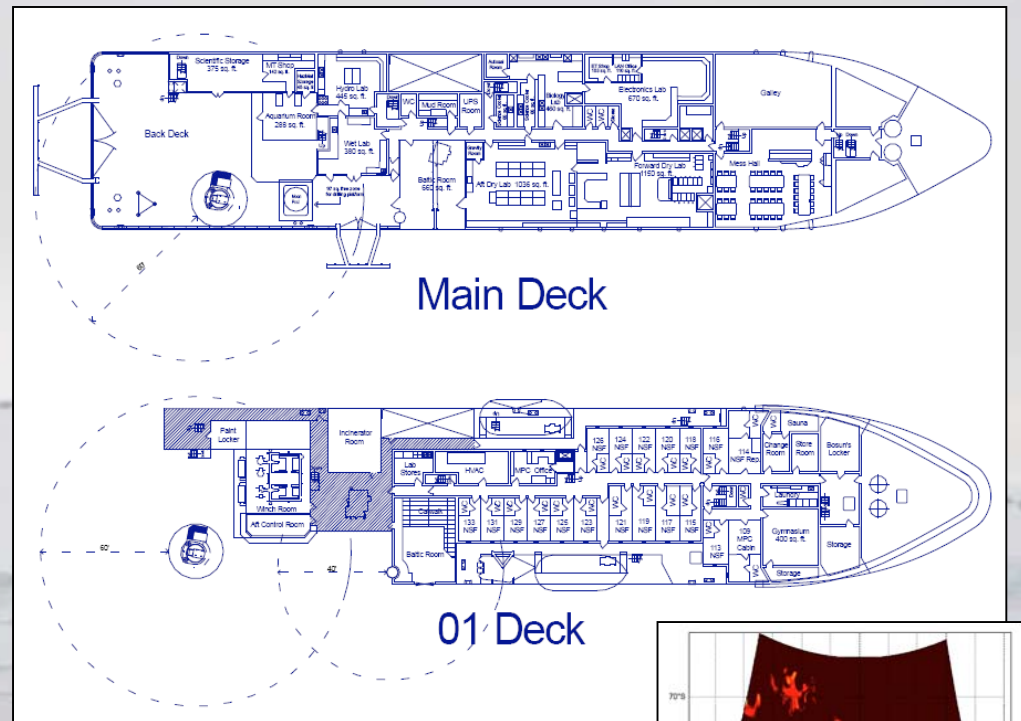
- Written by Chris Linder and accompanying science writer
- Posted on public website

Live Audiocasts from the Ship to LSC and Classrooms (8)

- Hosted by Chris Linder
- Provision of video and data prior to audiocast
- Interviews with researchers and others with Q&A from students
- Utilizing COSEE-NOW resources to connect multiple sites
- Reaching at least 750 students and their teachers

Evaluation

- Guided the design of our approach
- Effectiveness of the program through surveys and interviews



Peer Review: Broader Impacts

“With respect to outreach, this proposal also ranks excellent with three substantial and novel outreach components, including a professional photographer and story teller on the field team, developing public lectures for a science center that includes real time interactions with the ship, and a teacher development component that includes the all important follow up sessions. All round, just an excellent group of activities that will educate a lot of people.”

“In terms of the educational and outreach aspects as defined by NSF, this is one of the best written/planned sets of activities I have read in an NSF proposal. Some of what they have planned is typical of what occurs during normal oceanographic cruises (education of graduate students, opportunities for scientists/postdocs, learning by talking with scientists/ship crew at sea), but the real-time links with the Liberty Science Center (with which I am not familiar, but the stated impact is impressive), teacher professional development (30 teachers from 15 schools for a week pre-cruise and 2-3 half-day post cruise sessions with one teacher going on the cruise), the on-line expedition journal by a professional interacting with Rutgers staff and the teacher, and the independent evaluator of material produced, are all well thought out and planned.”

The Ross Sea Connection: *Summary*

Broader Impacts are an integral part of the entire program

The team has expertise and experience

Our approach is built and measured through evaluation

