

Gaseous Elemental Mercury
Measurements at GMD Barrow
and the 2015 Arctic
GEOTRACES Cruise to the
North Pole

GMD Meeting May 18, 2016

Steve Brooks – University of
Tennessee

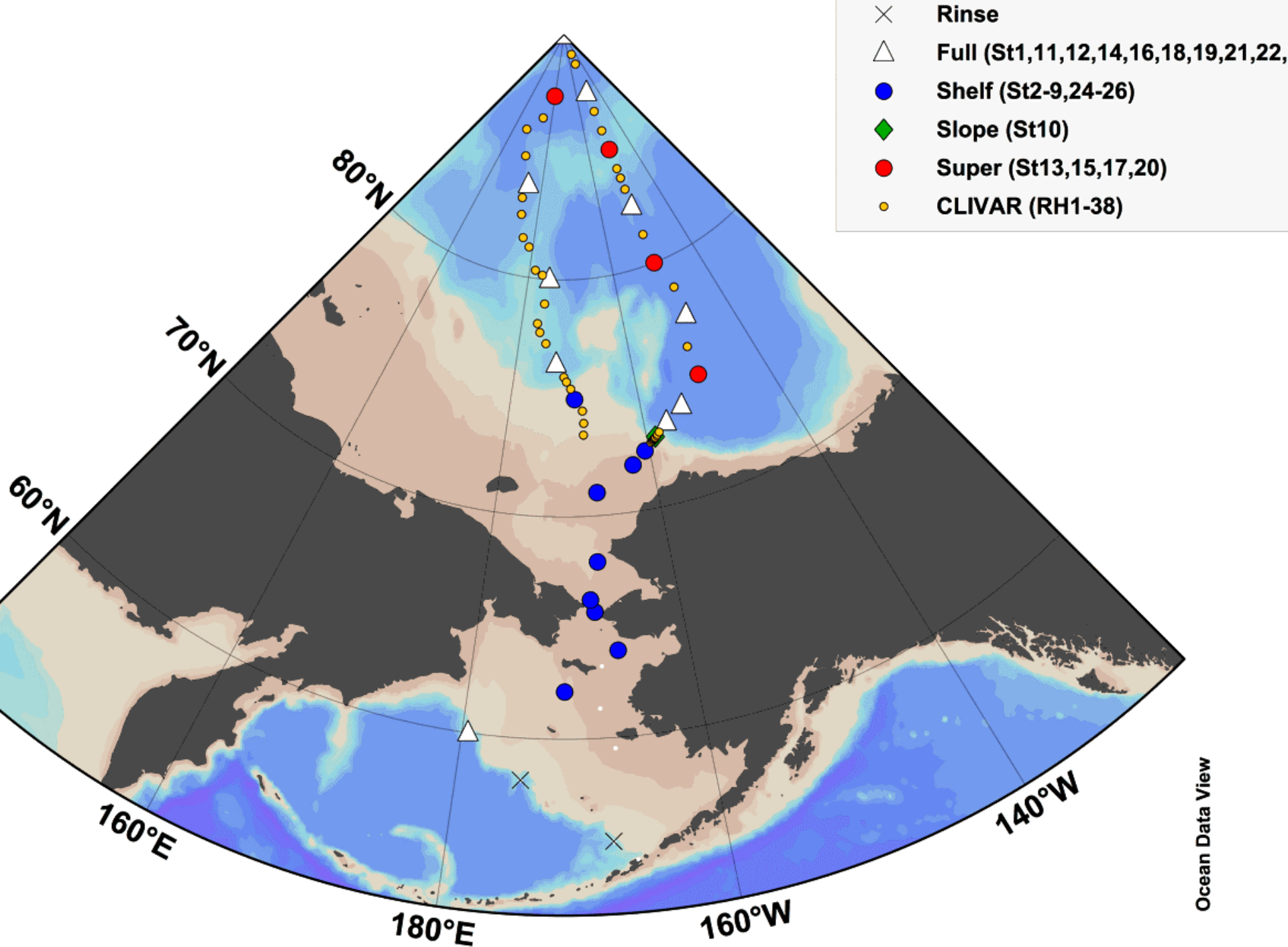
Rob Mason and **Brian DiMento**
– University of Connecticut

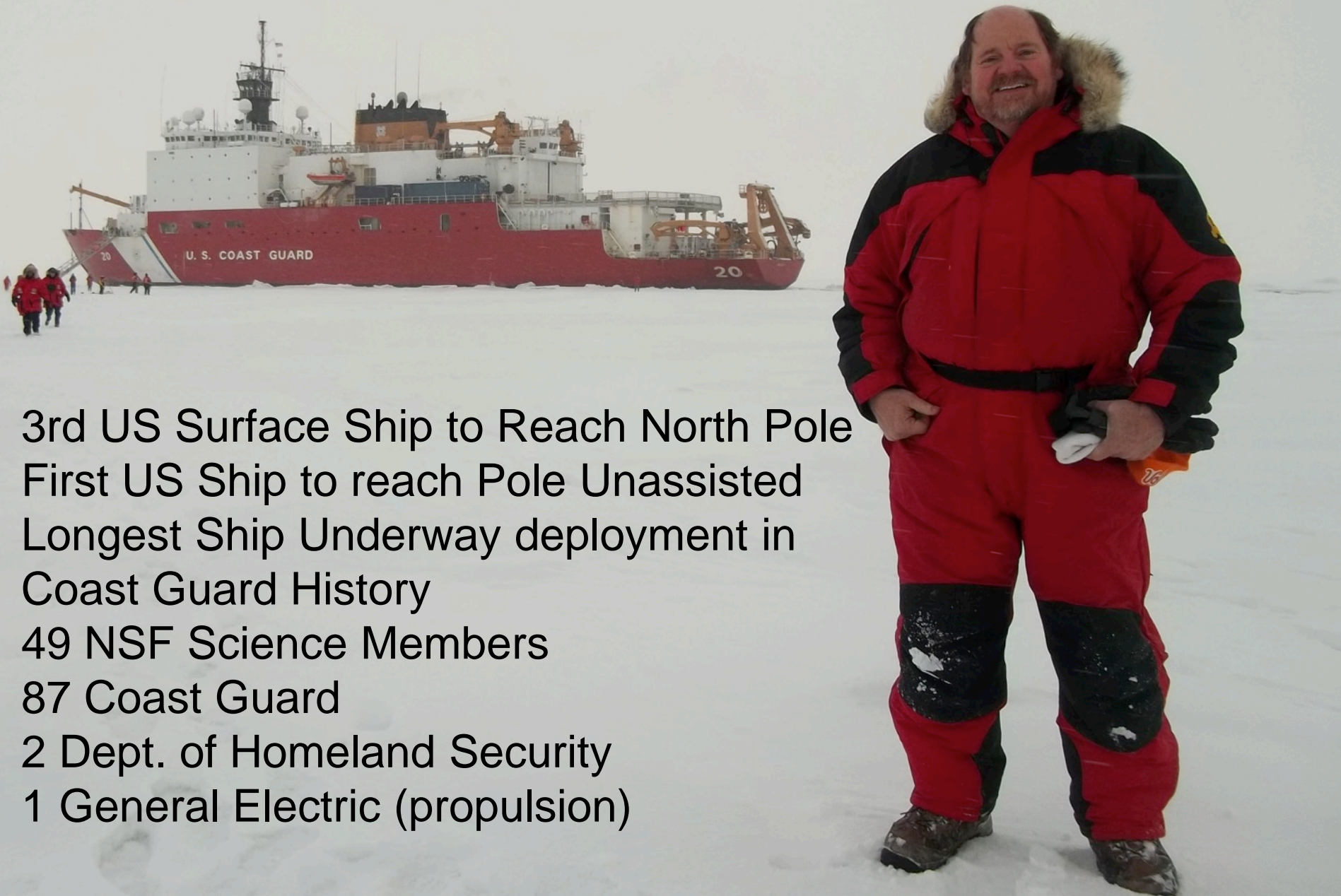
Chris Moore – Gas Technology
Institute

Funding - NSF



North Pole
Sept. 6 2016





3rd US Surface Ship to Reach North Pole
First US Ship to reach Pole Unassisted
Longest Ship Underway deployment in
Coast Guard History
49 NSF Science Members
87 Coast Guard
2 Dept. of Homeland Security
1 General Electric (propulsion)

Sparger

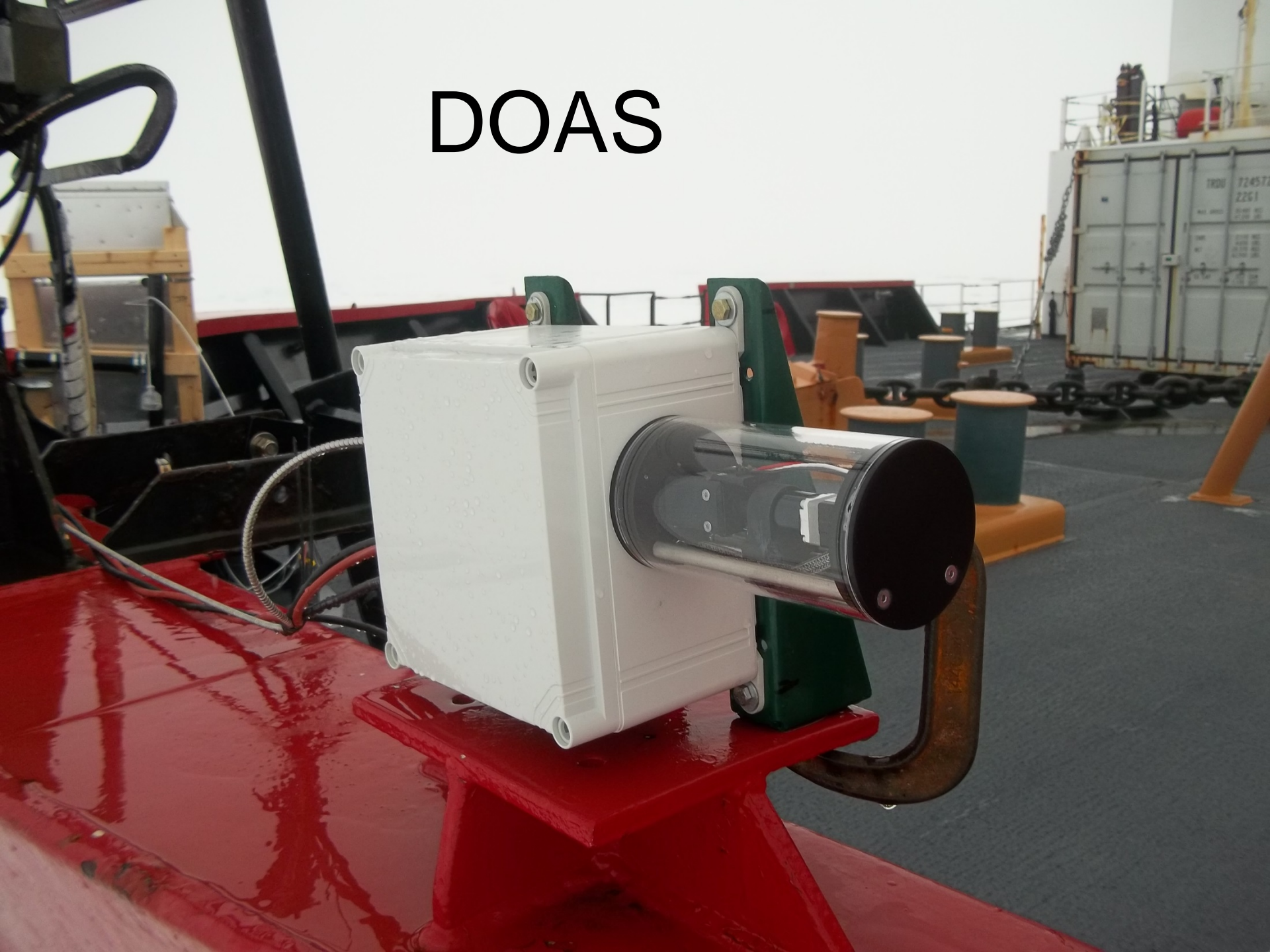


Tekran Hg⁺² in Air

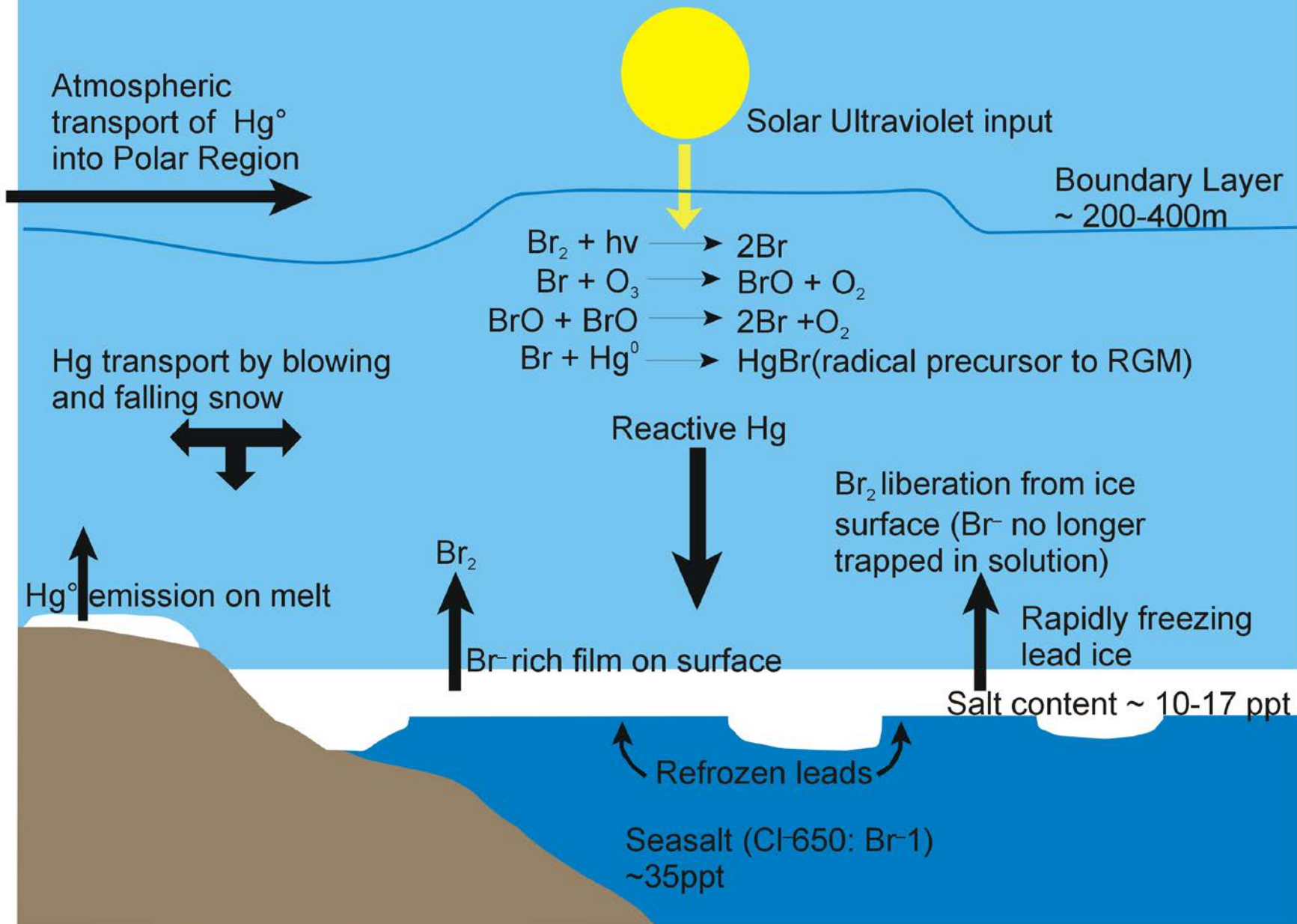


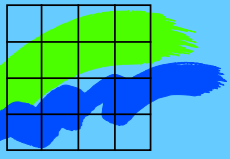


DOAS



The Arctic Mercury Cycle



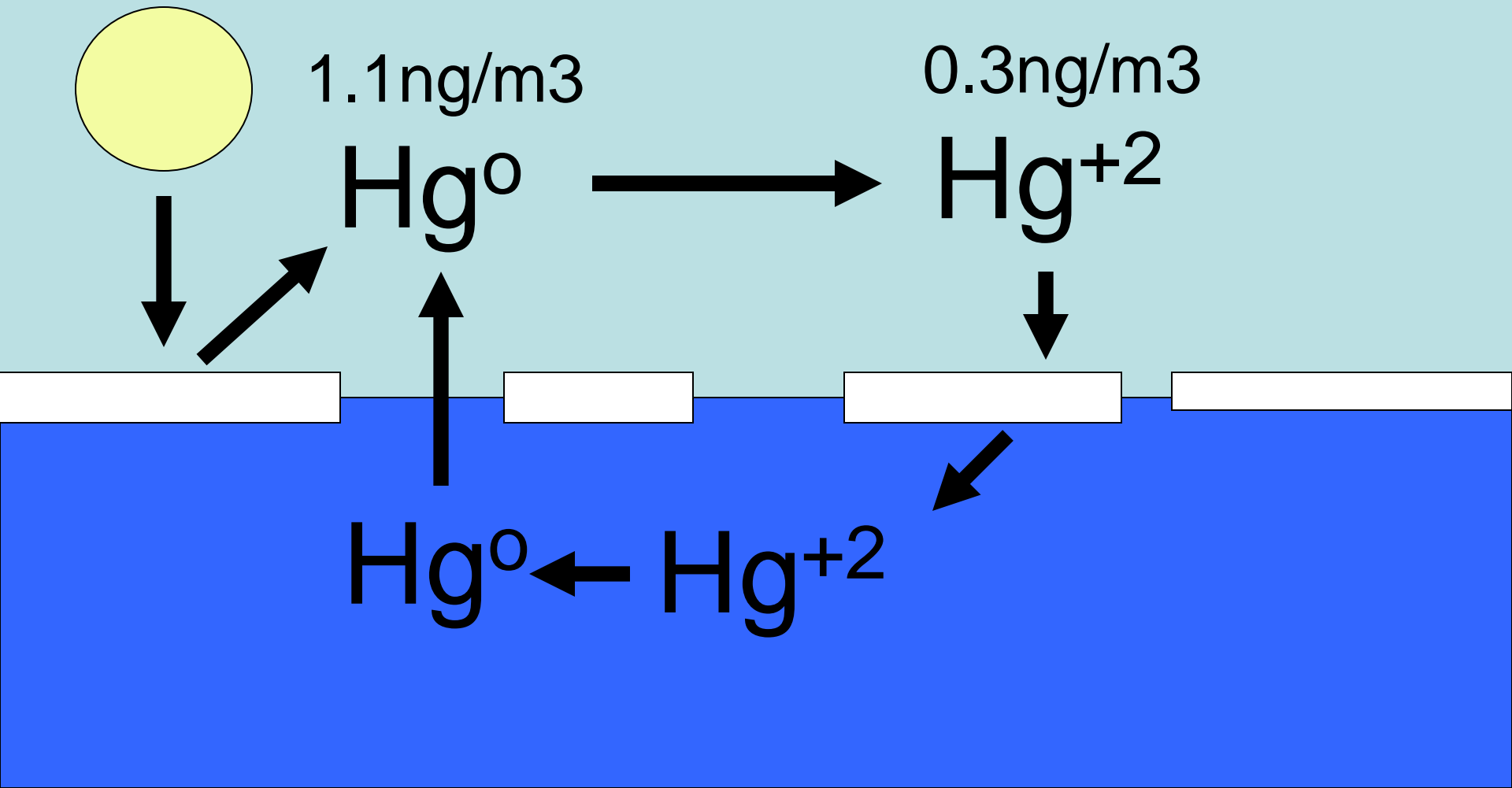


Mercury levels ppm

Greenland Mummies	1500	3.1
Greenland People	2000	9.8
Greenland ringed seal	1500	0.6
Greenland ringed seal	2000	2.6
Average EU citizen	2000	0.6

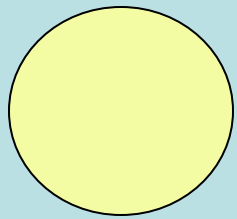
Gert Asmund, 2001

March 2015



September 2015

No Ice



1.4ng/m³

Hg⁰



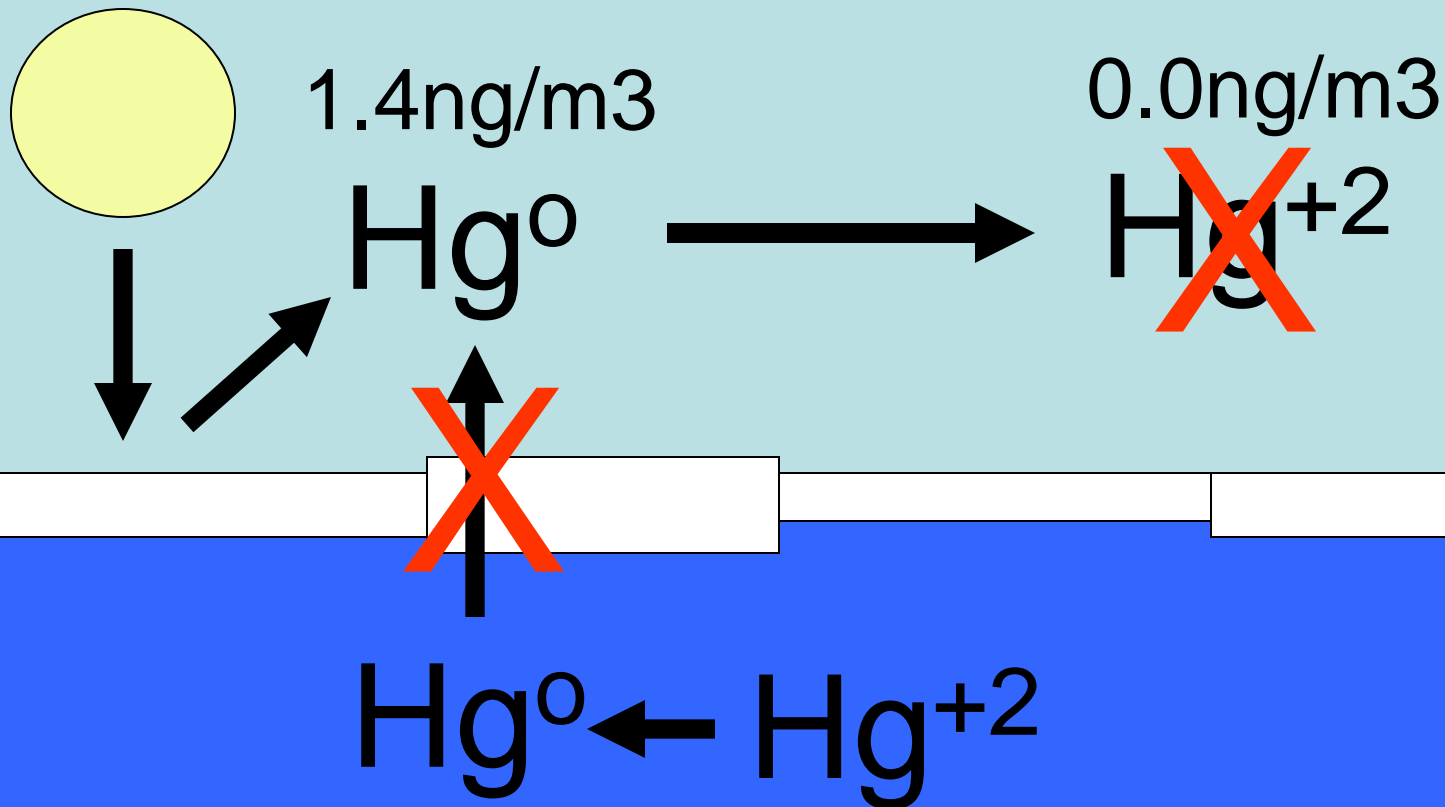
0.0ng/m³

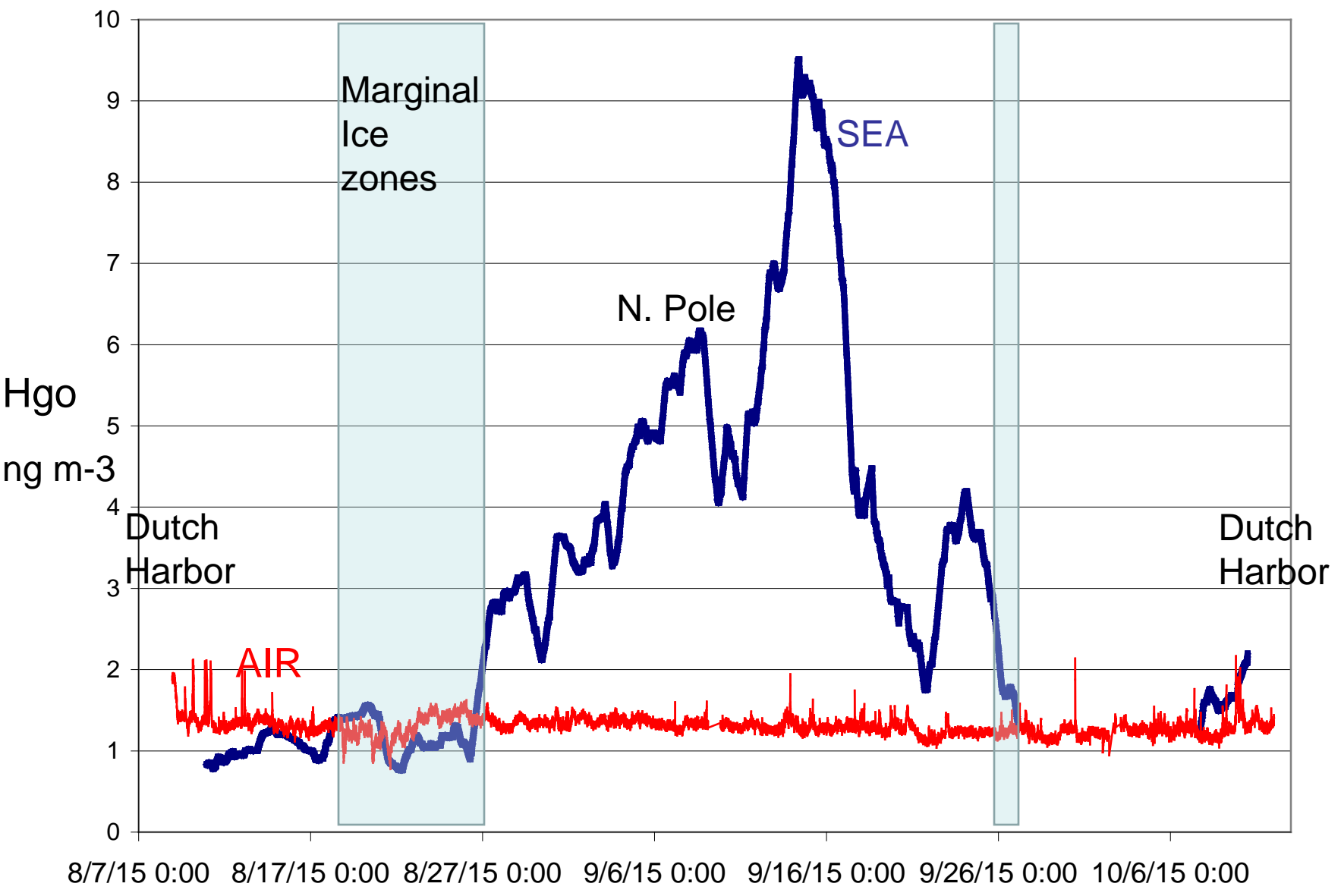
~~Hg⁺²~~



Hg⁰ ← Hg⁺²

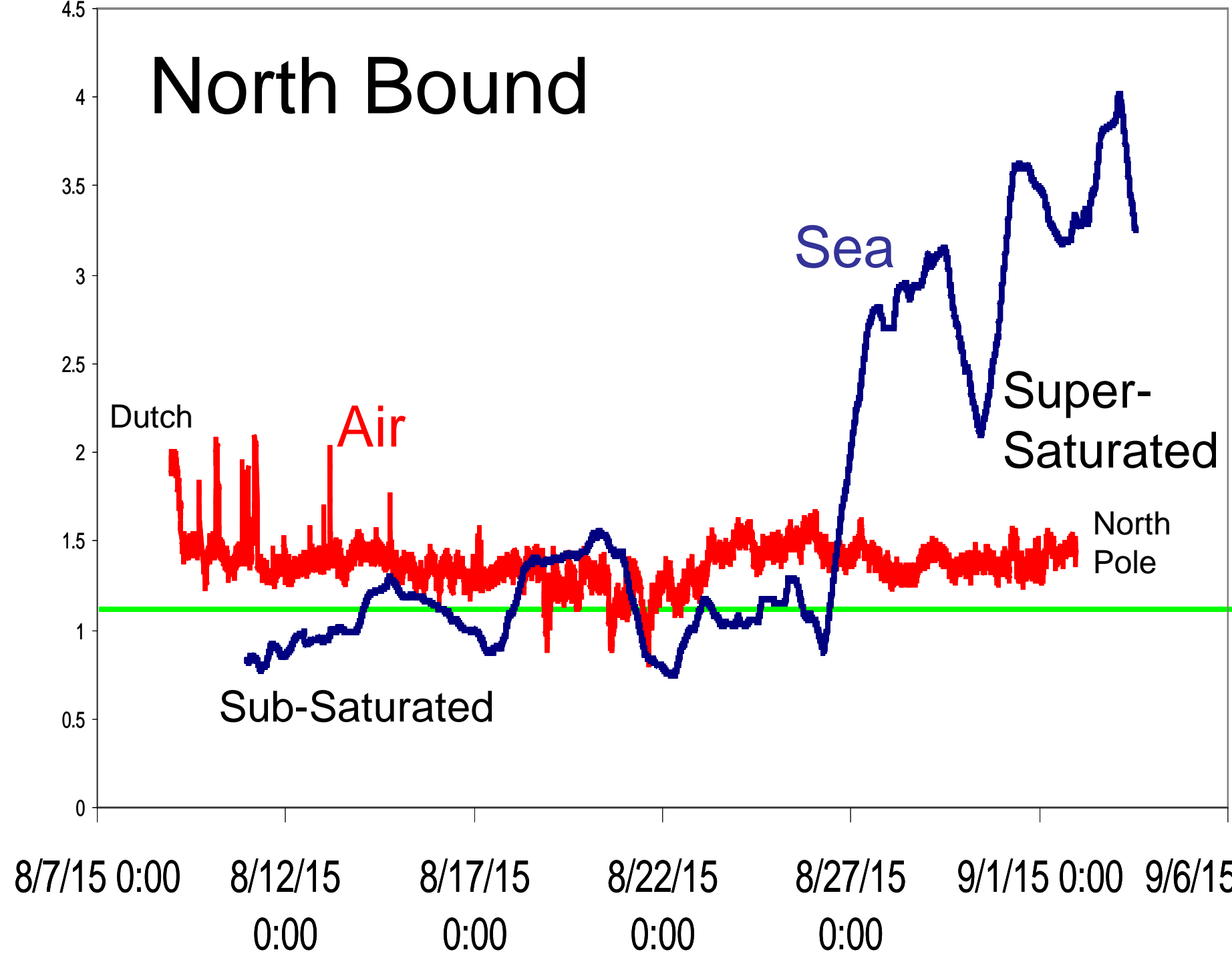
September 2015 Contiguous Ice

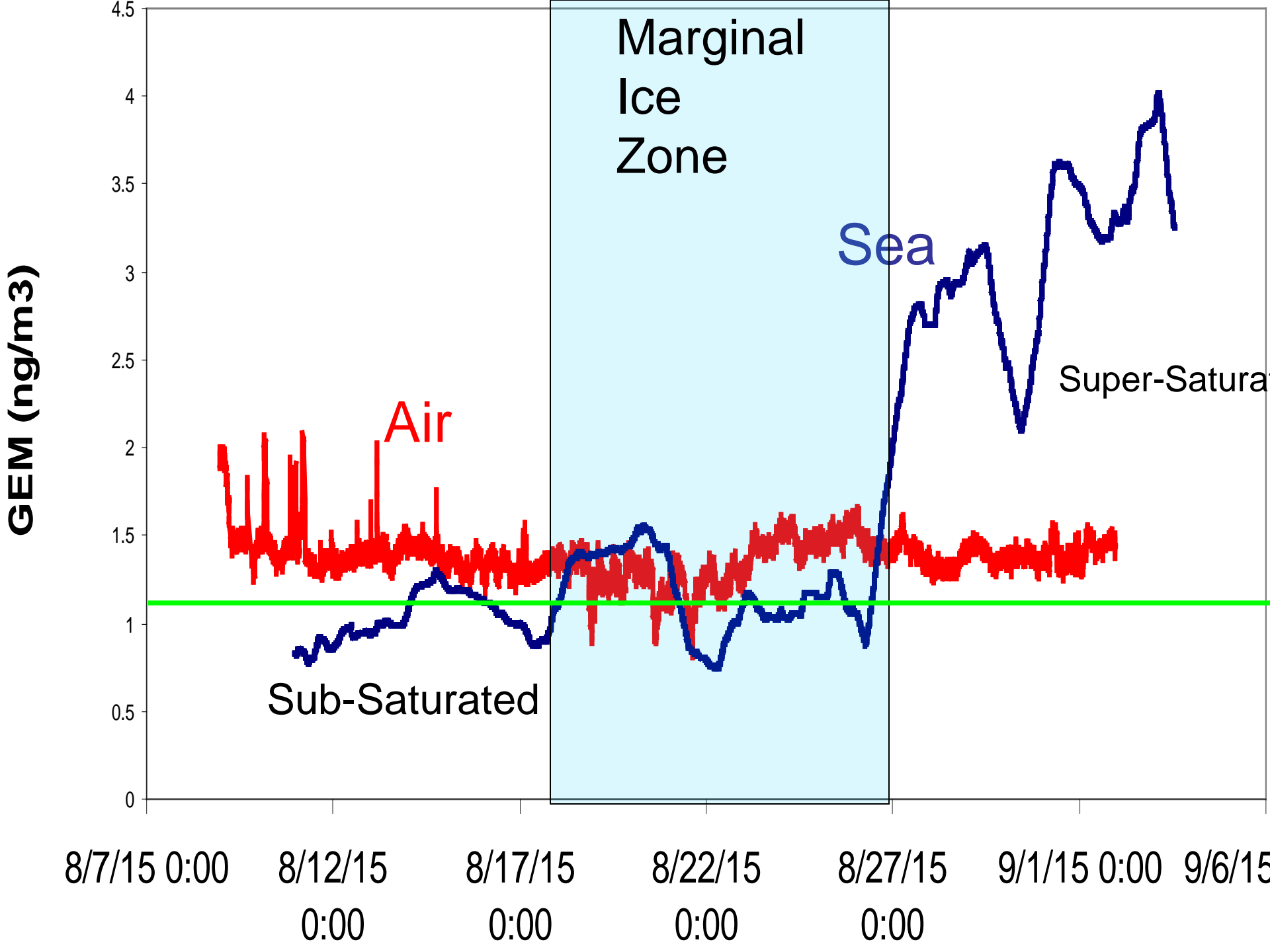


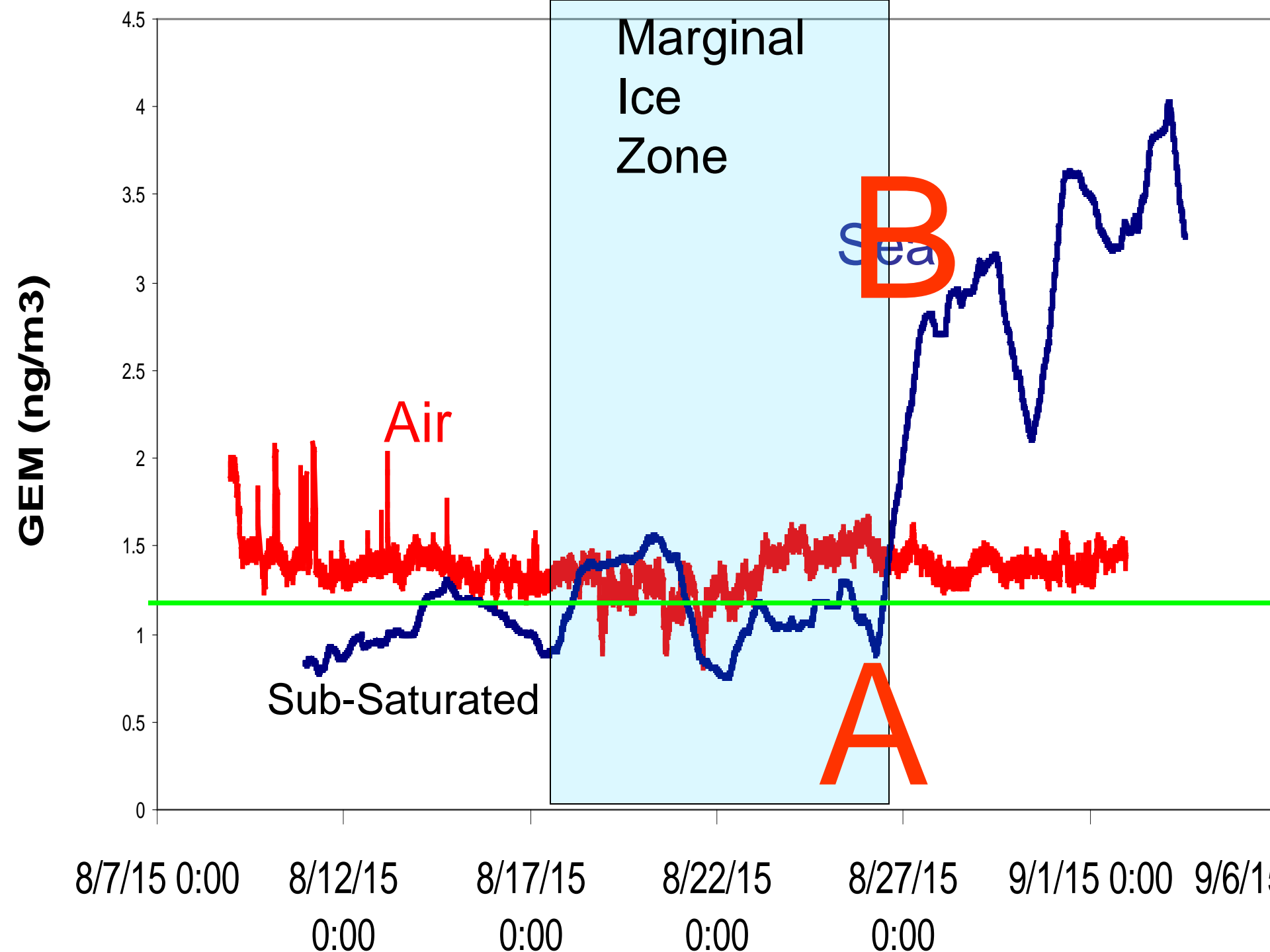


North Bound

GEM (ng/m³)

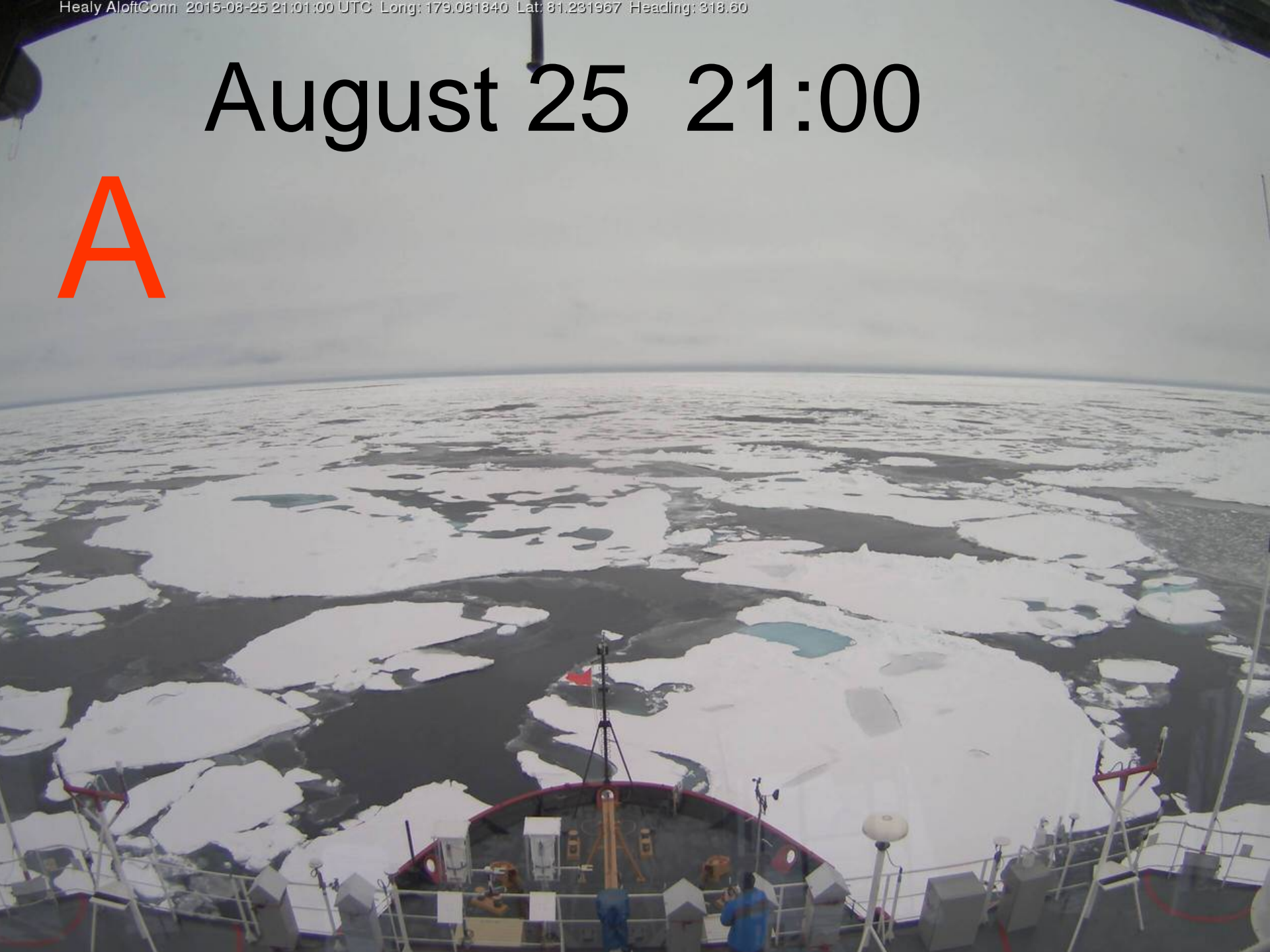






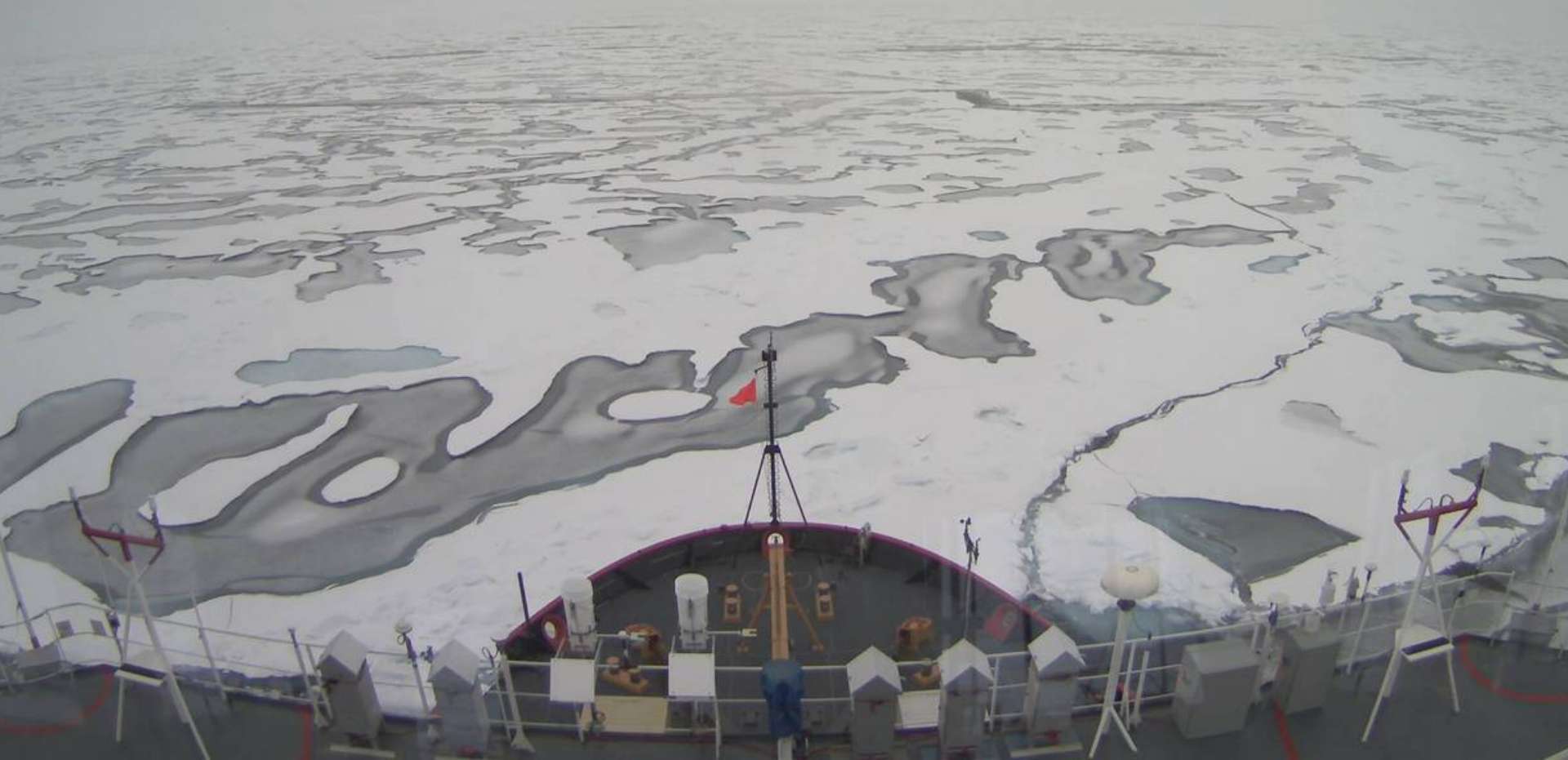
August 25 21:00

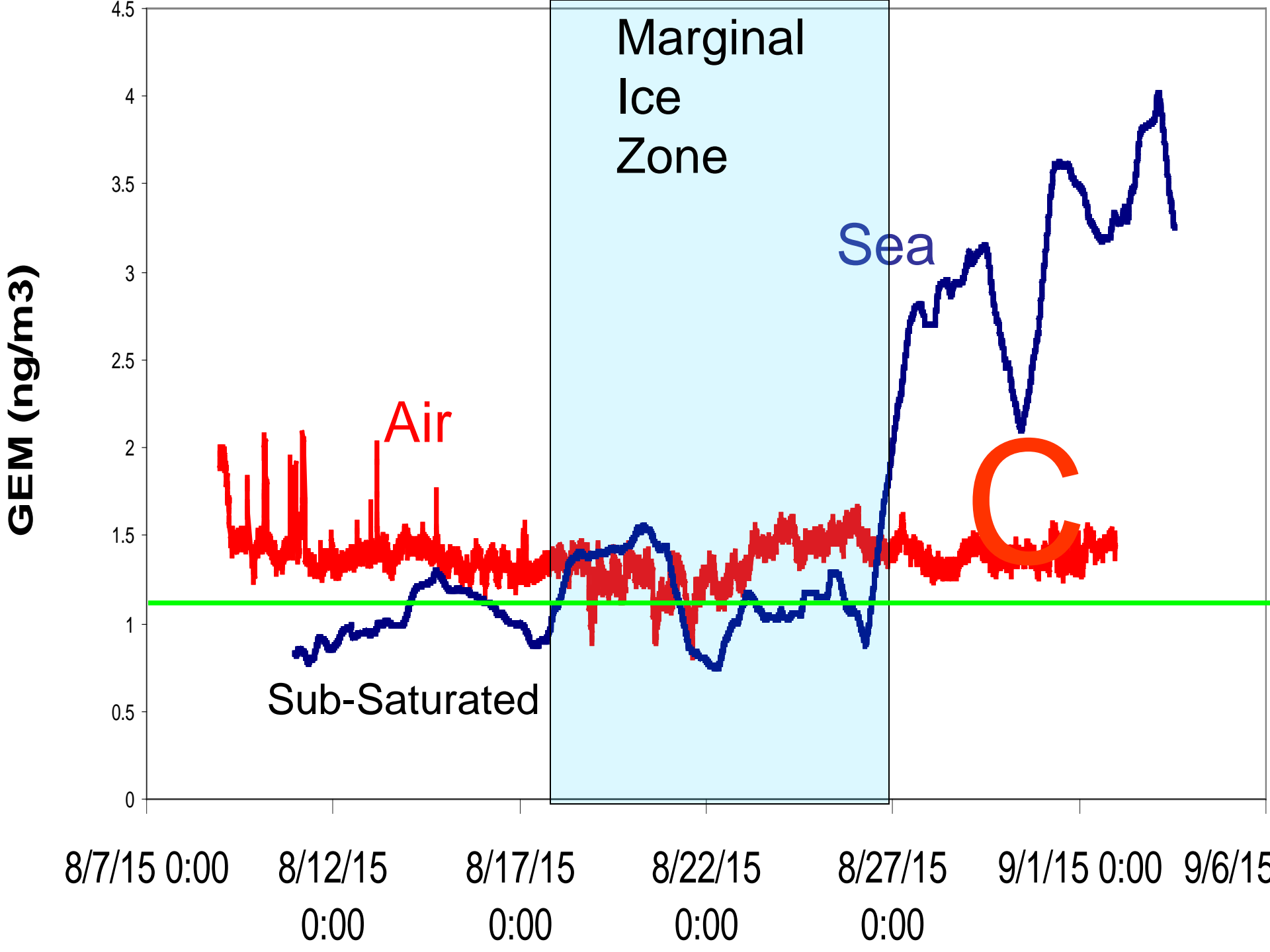
A



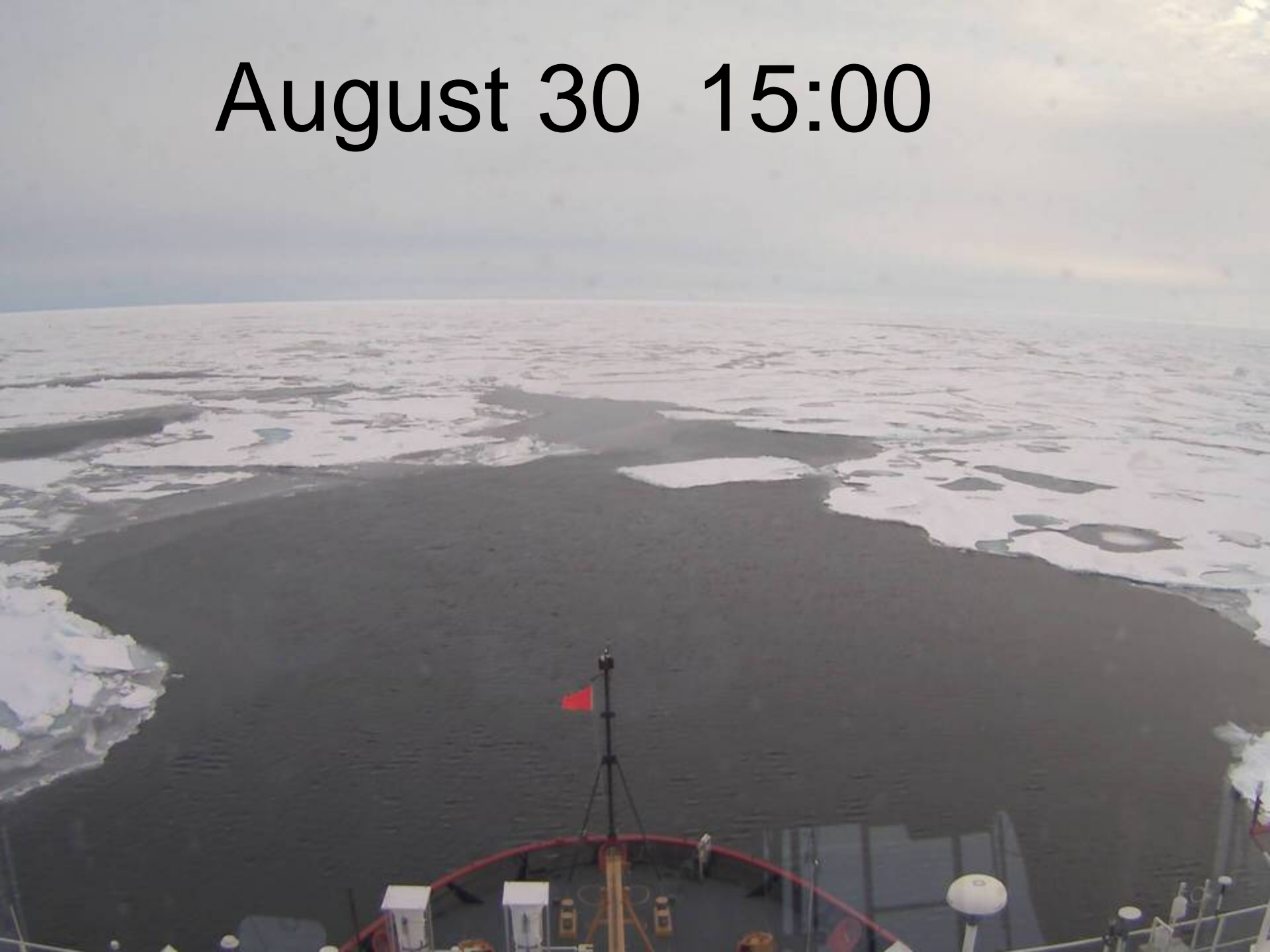
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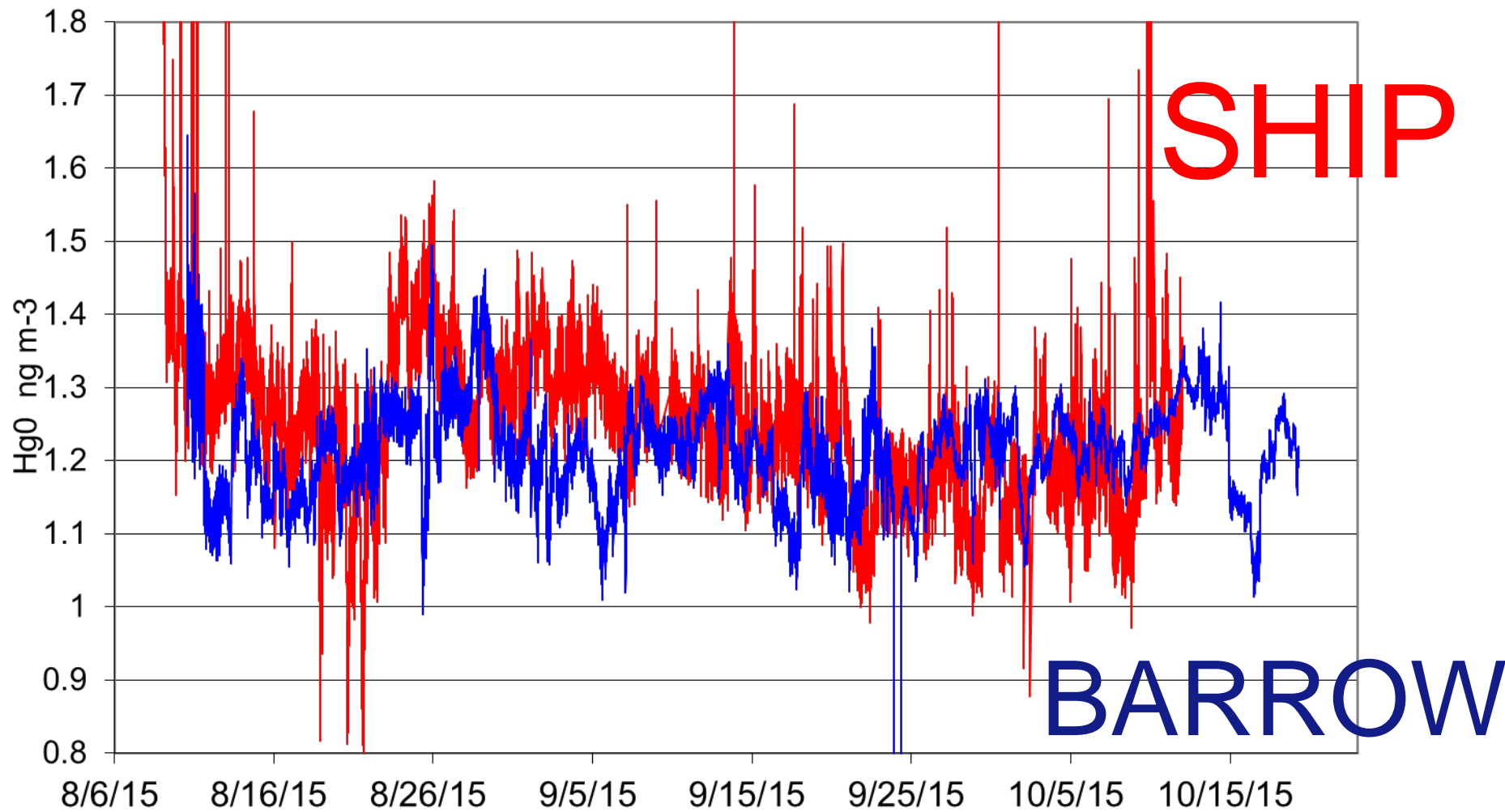
B

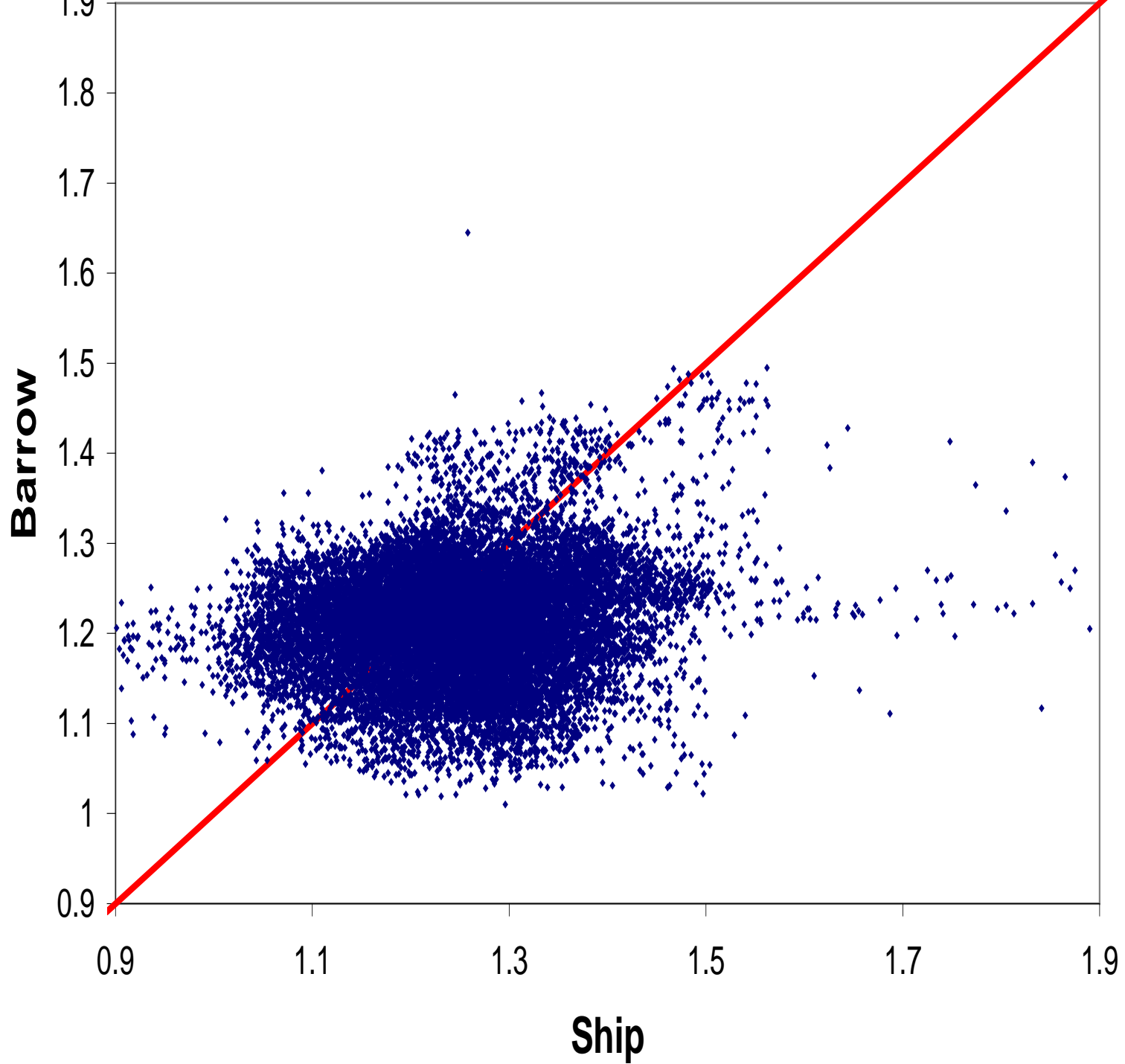


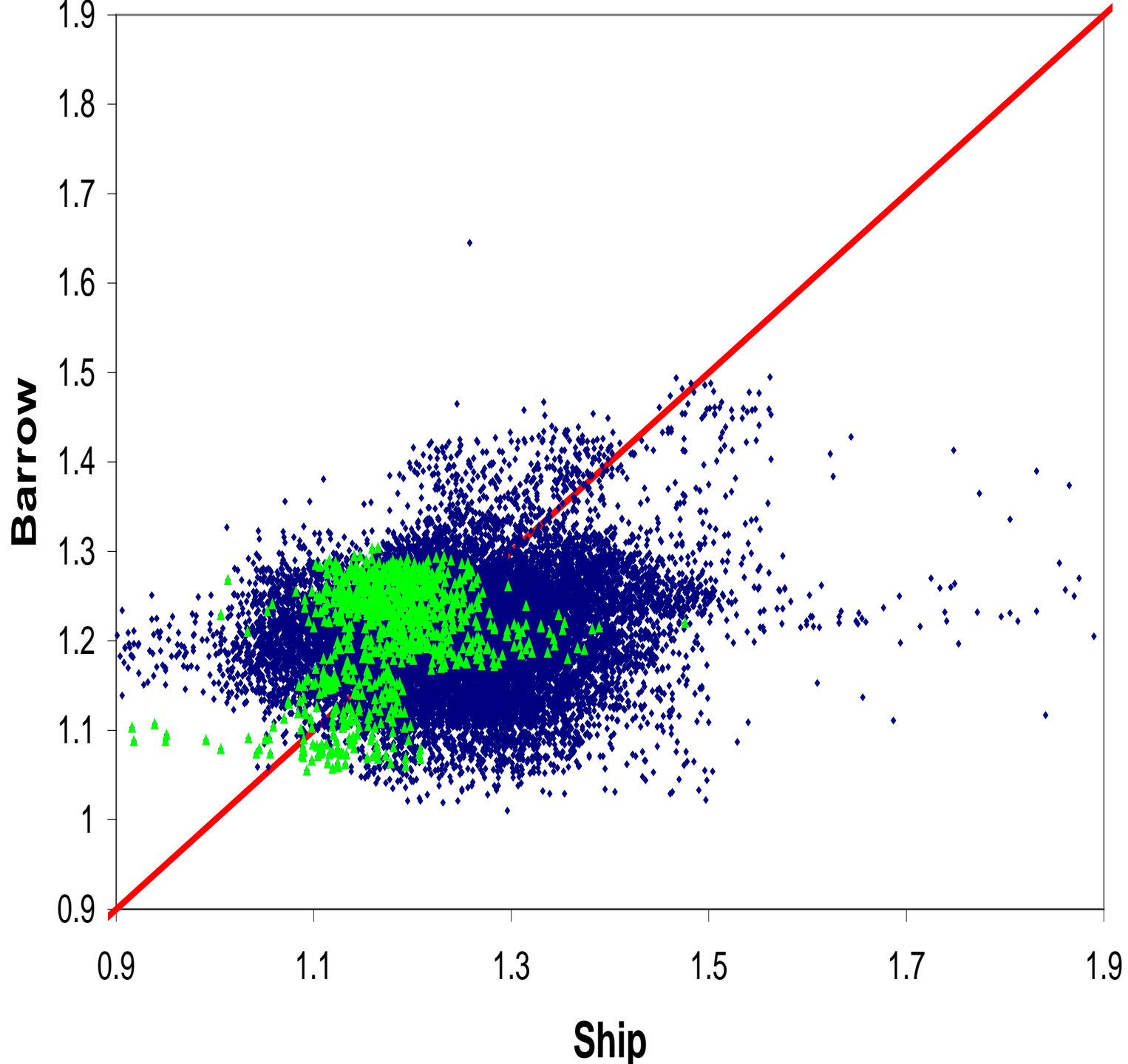


August 30 15:00









FLOAT YOUR BOAT

CONNECTING YOUNG PEOPLE WITH MARINE SCIENCE AND SCIENTISTS WORKING IN THE ARCTIC

THANK YOU FOR YOUR INTEREST IN PARTICIPATING IN THE FLOAT YOUR BOAT PROGRAM.

PLEASE ADHERE TO THE FOLLOWING PROTOCOL WHEN PREPARING YOUR DRIFTERS:

Each drifter will be branded with floatboat.org so please ensure that you do not remove or alter this brand. It is the primary way that people who find these drifters will be able to report finding them.

Before final packaging each drifter will be dipped in wax and packaged together with other drifters for deployment, so **do not attach anything to the drifter.**

Using a permanent marker, label each drifter with:

- The name of the student preparing the drifter
- The participating school
- The date the drifter was prepared
- Any appropriate message in 0.5 inch tall letters



THE ICEBREAKER SHIP USGSS HEALY WILL DEPART FOR ITS ARCTIC EXPEDITION IN JULY 2015.

Float Your Boat is an educational outreach program that provides young people an opportunity to learn about the changing Arctic, marine debris, and maritime careers through participation in a study of Arctic drift patterns by sending their own toy boats to the Arctic.

Step Nine: Boats Make Landfall

www.etsy.com



- Currents and storms deposit some boats on shores
- Other boats continue to float along with currents



U.S. COAST GUARD

WEST
Middle
Tullahoma

- Online Bill Pay
- Large and Small Units
- Open 7 Days
- Well
- Locations

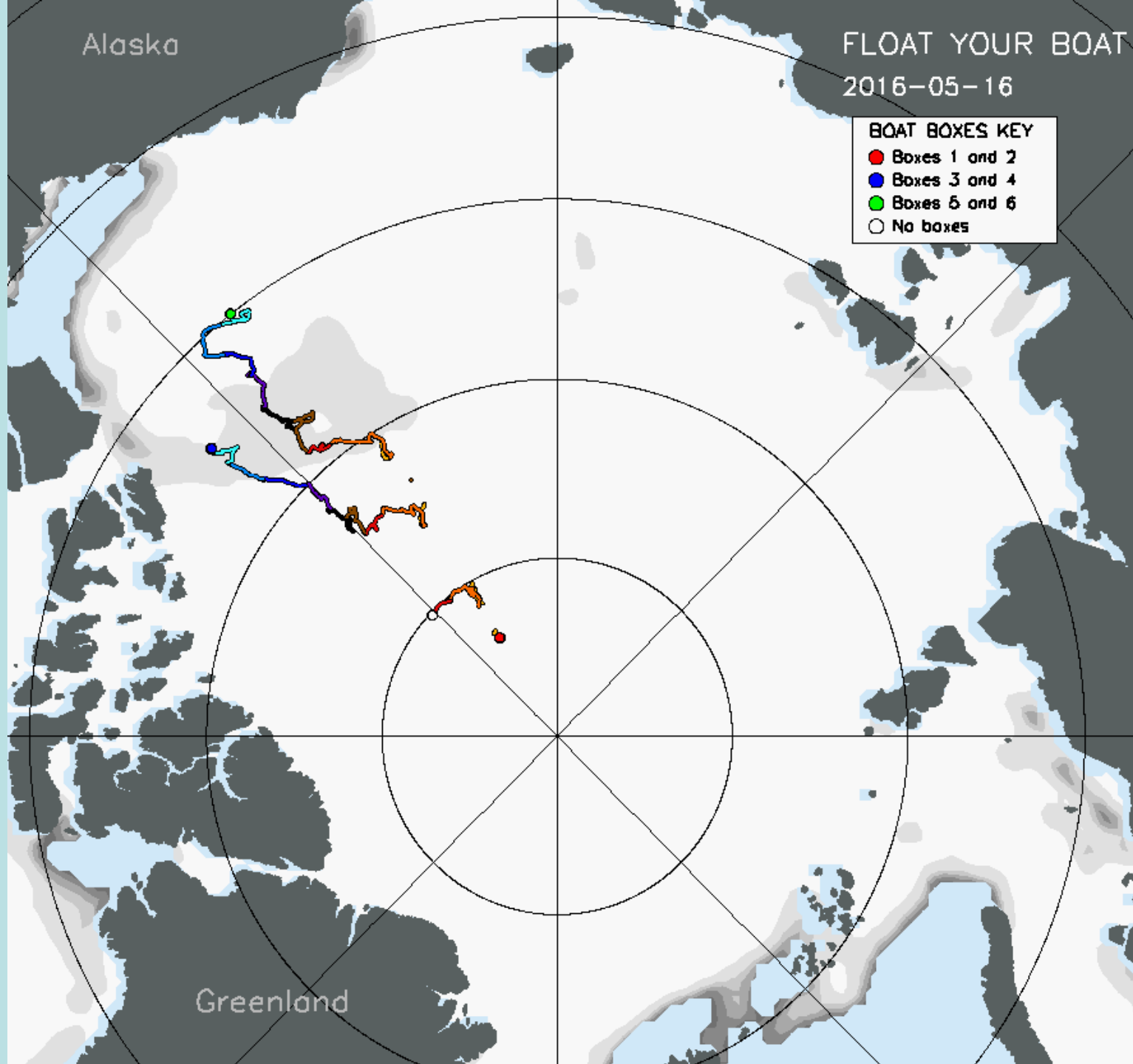
Alaska

FLOAT YOUR BOAT

2016-05-16

BOAT BOXES KEY

- Boxes 1 and 2
- Boxes 3 and 4
- Boxes 5 and 6
- No boxes



Greenland

Conclusions

- In the open seas (Bering and Chukcki) the surface water was on average sub-saturated.
- In the Marginal Ice Zone the surface water on average was slightly super-saturated
- In the contiguous ice zone the surface water was super-saturated
- Ice acts as a barrier to evasion after late winter and spring deposition (Feb-June)
- Barrow is very representative of the Arctic marine environment for Gaseous Elemental Mercury

We would like to thank GMD for
their cooperation, and Barrow
Staffers - Marty Martinsen and
Ross Burgener



Questions???



USCGC HEALY / GEOTRACES
North Pole / Sept. 7, 2015