

International Arctic Buoy Programme Report

Data Buoy Cooperation Panel - 29

Paris, France

September 25, 2013

- Introduction
- Some Highlights
 - Increased Russian Collaboration
 - Arctic Observing Experiment
- Summary

International Arctic Buoy Programme Report

Executive Committee:

- Chair:** Christine Best, Environment Canada
- Vice Chair:** Christian Haas, York University, Canada
- Members:** Pablo Clemente-Colón, National/Naval Ice Center, USA
Jean-Claude Gascard, Université Pierre et Marie Curie,
France
Takashi Kikuchi, Japan Agency for Marine-Earth Science
and Technology Center, Japan
- Coordinator:** Ignatius Rigor, University of Washington, USA
- Participants:** 37 Operational and Research Institutions
- Web Page:** IABP.apl.washington.edu

International Arctic Buoy Programme

Polar Science Center · Applied Physics Laboratory · University of Washington

Overview Maps Data Publications Research News Links

Overview

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Executive Committee

Participants, Contact Info

Participant Contributions

Operating Principles

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Overview

Overview

The **participants** of the IABP work together to maintain a network of drifting buoys in the Arctic Ocean to provide meteorological and oceanographic data for real-time operational requirements and research purposes including support to the World Climate Research Programme (WCRP) and the World Weather Watch (WWW) Programme.

Data from the IABP have many uses. For example:

1. Research in Arctic climate and climate change,
2. Forecasting weather and ice conditions,
3. Validation of satellites,
4. Forcing, validation and assimilation into numerical climate models, and
5. Tracking the source and fate of samples taken from the ice.

Over 600 **publications** have benefited from observations from the IABP!

The U.S. contributions to the IABP are coordinated through the U.S. Interagency Buoy Program (USIABP), which is managed by the **U.S. National/Naval Ice Center**, and the **Polar Science Center**, and represent several U.S. agencies, including the **International Arctic Research Center**, the **National Aeronautics and Space Administration**, the **National Oceanic and Atmospheric Administration**, the **National Science Foundation**, the **Naval Oceanographic Office**, the **Office of Naval Research**, and the **U.S. Coast Guard**.

PSC CONTACTS

Ignatius Rigor, Coordinator of the IABP
Mark Ortmeyer, Data Manager of the IABP

NIC CONTACTS

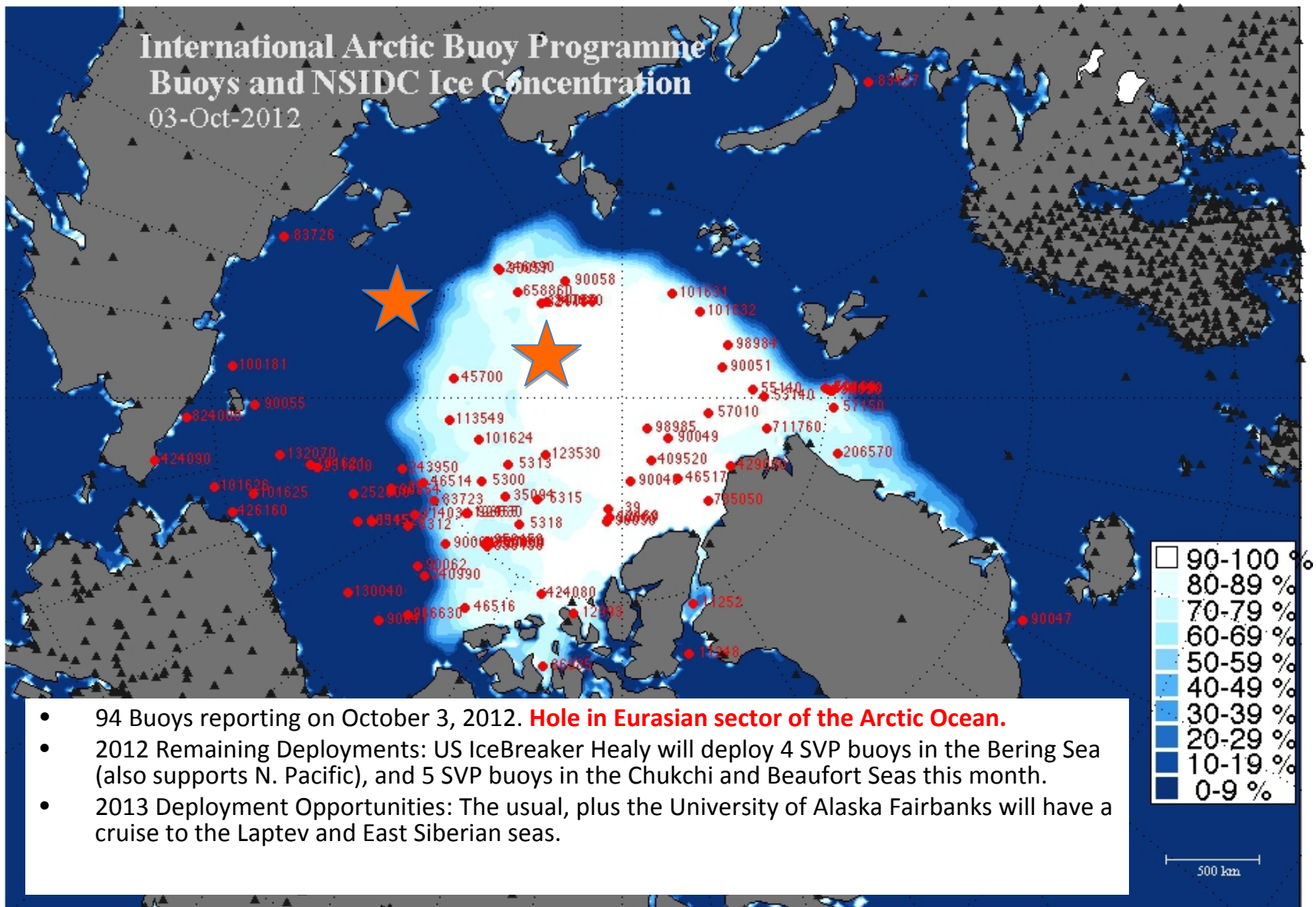
LT Bethany MacDonald, Coordinator of the USIABP



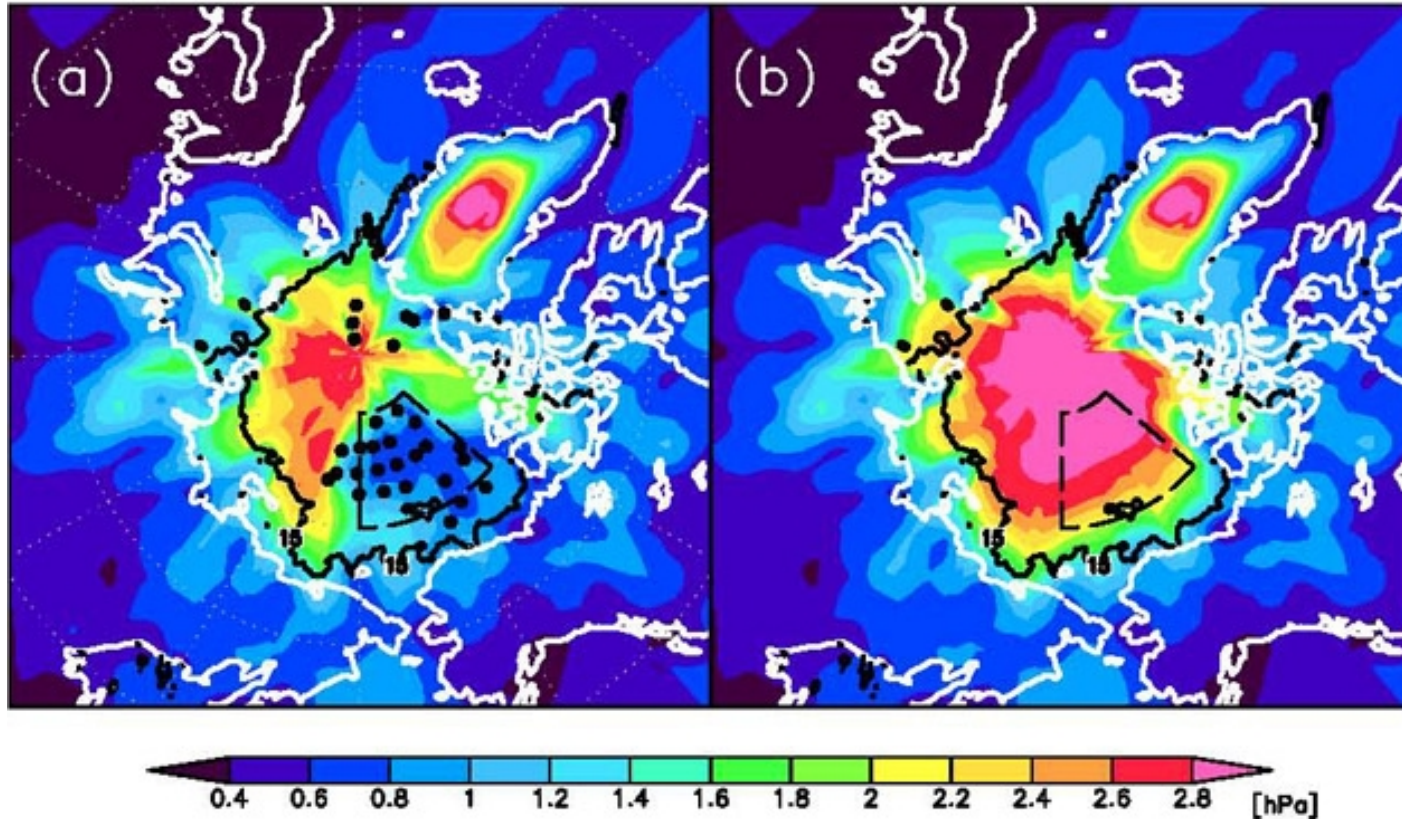
© McKenzie Funk

Crew members and scientists from the US Coast Guard icebreaker Healy haul a buoy across the sea ice during a deployment. In the lead, BM3 Yeckley is on bear watch, followed by SN Hafner the rescue swimmer, Dr. Pablo Clemente-Colón (pulling), and Dr. Dale Chayes steadying the sled..

IABP Summary 2012



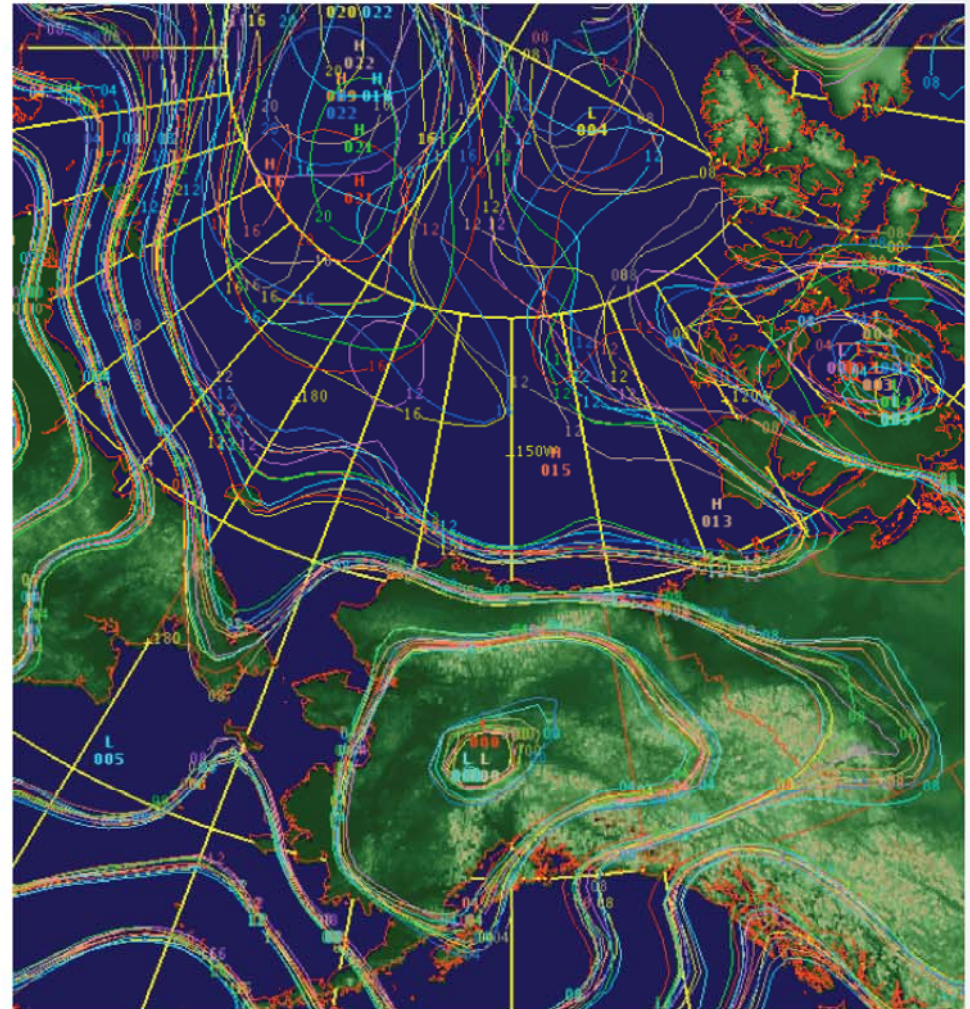
Impact of buoy obs. on SLP fields.



The spread between SLP Reanalyses is low in areas where there are buoy observations (left). The spread increases to cover the whole Arctic when the buoys are removed from the reanalyses (right). The buoy obs. also help constrain estimates of wind and heat.

Why do we need more observations in the Arctic?

- Large Model Differences in Initial Conditions are very common over the Arctic
- Often leads to poor and inconsistent model performance with significant Arctic Weather features.
- Weather is the short term driver of local Sea Ice Changes



Comparison of Multiple Weather Model
Sea Level Pressure Initializations over
the Arctic

Observations for Operations and Research WMO/IOC GTS Map – July 2013



IABP Deployment Plans 2013

Polar Area Weather Station



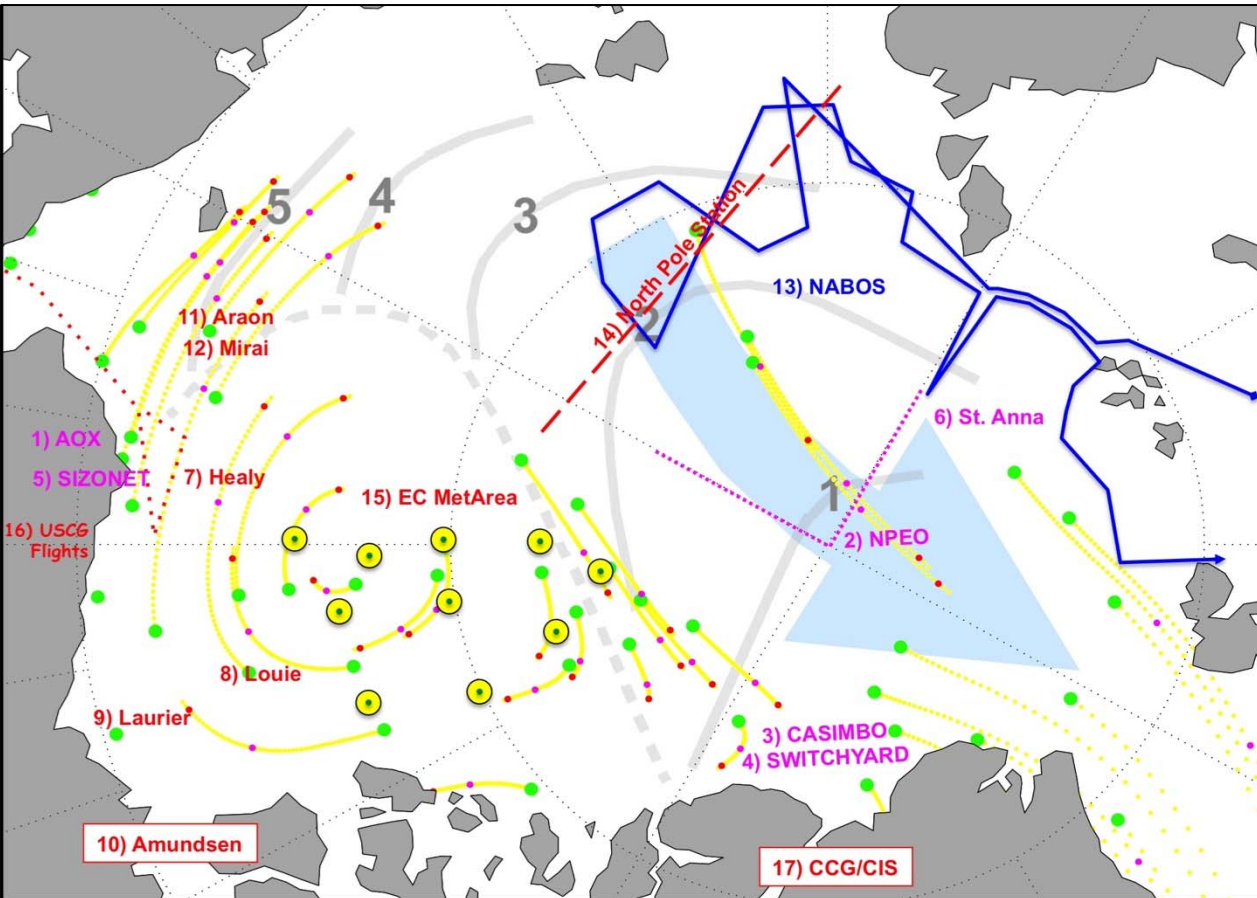
Ice Beacon



Airborne Expendable Ice Beacon (AXIB)



SVP / WOGE buoy

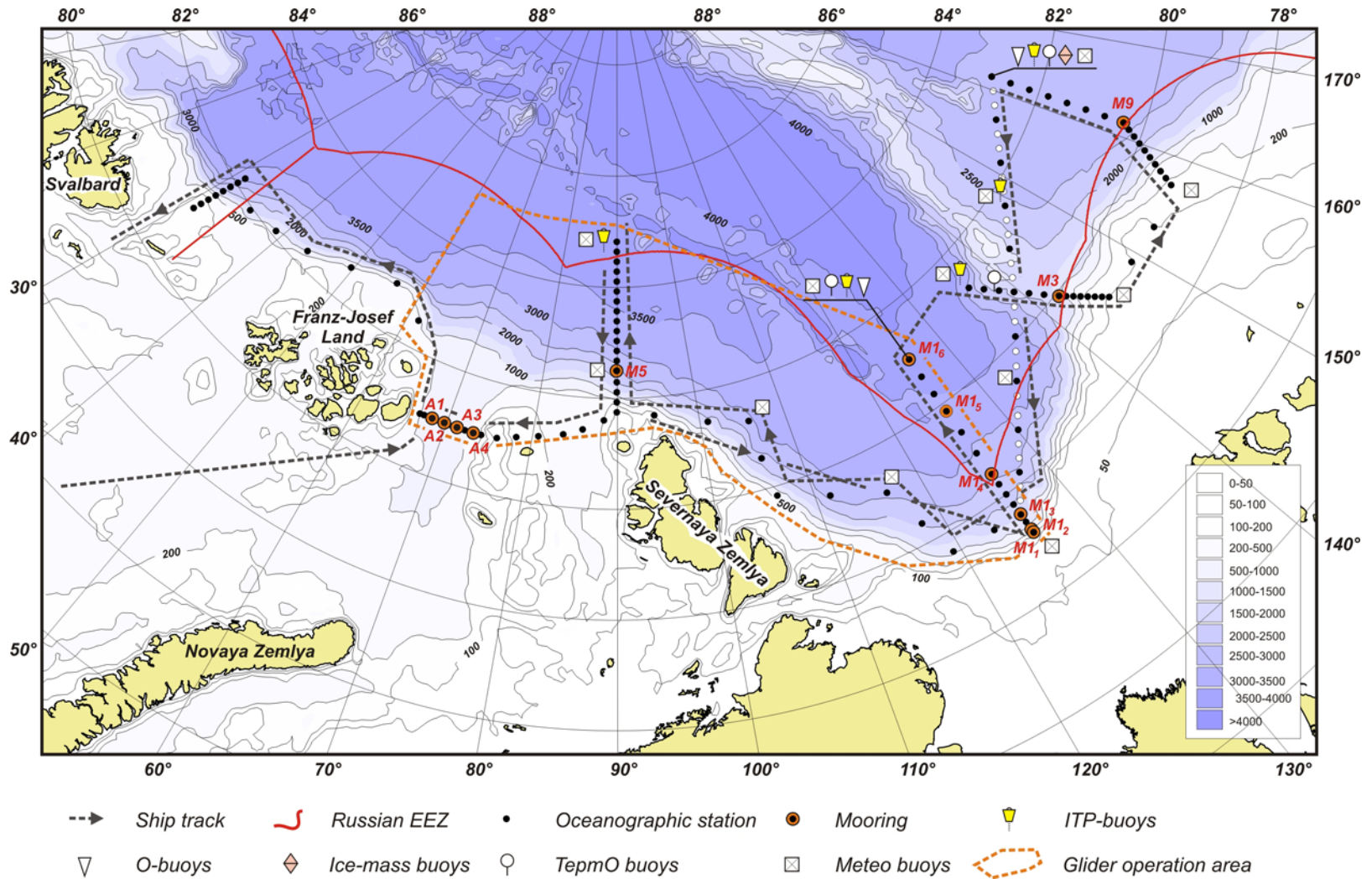


Upper layer Temperature of the Ocean (UpTempO) buoy



IABP Deployment Plans 2013

Nansen and Amundsen Basin Observing System (NABOS) Cruise



US Interagency Arctic Buoy Program Russian St. Anna Collaboration

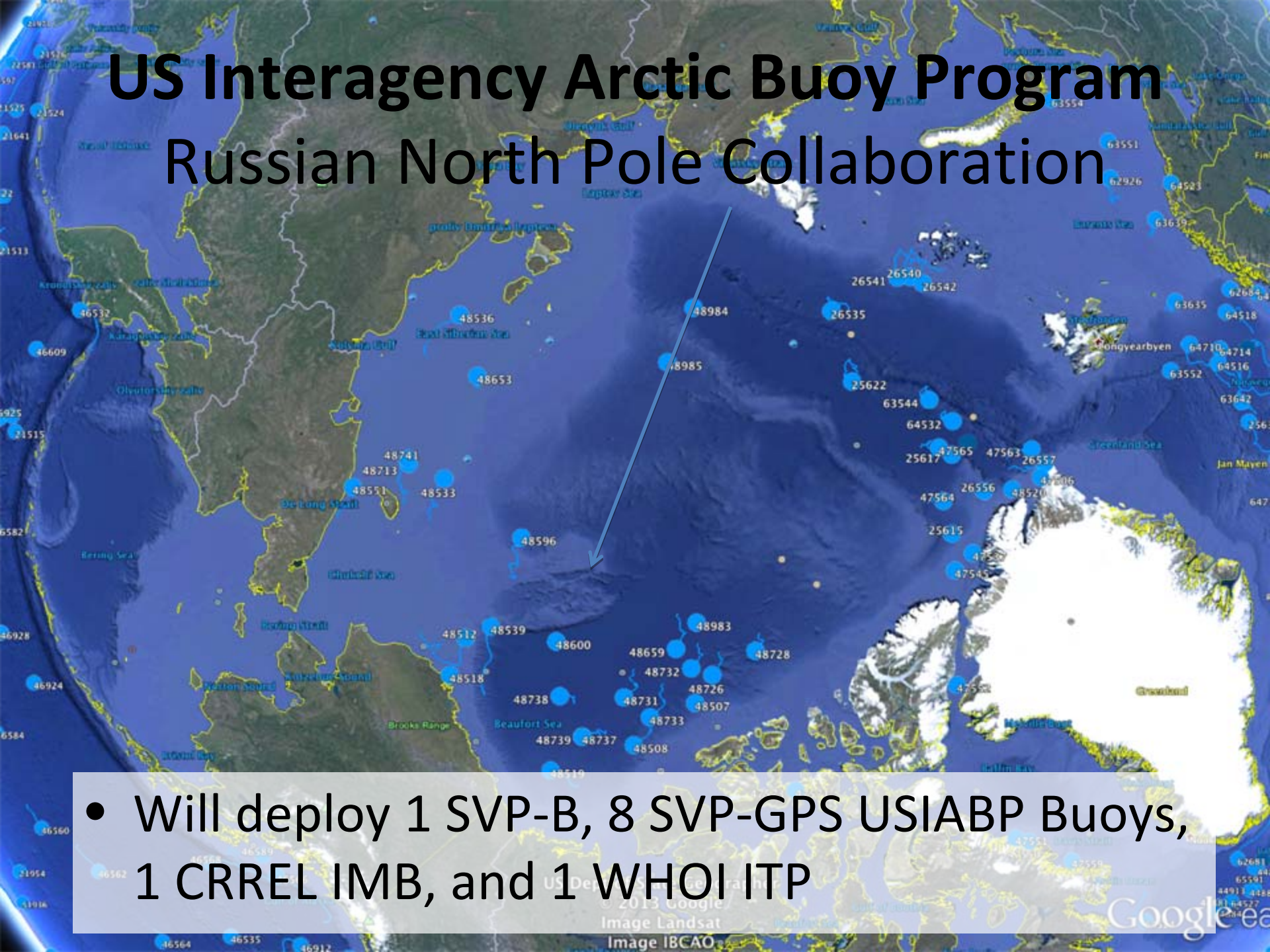
**USIABP: 1 SVP-B, 2 SVP
(all w/ GPS)**



US Interagency Arctic Buoy Program

Russian North Pole Collaboration

- Will deploy 1 SVP-B, 8 SVP-GPS USIABP Buoys, 1 CRREL IMB, and 1 WHOI ITP



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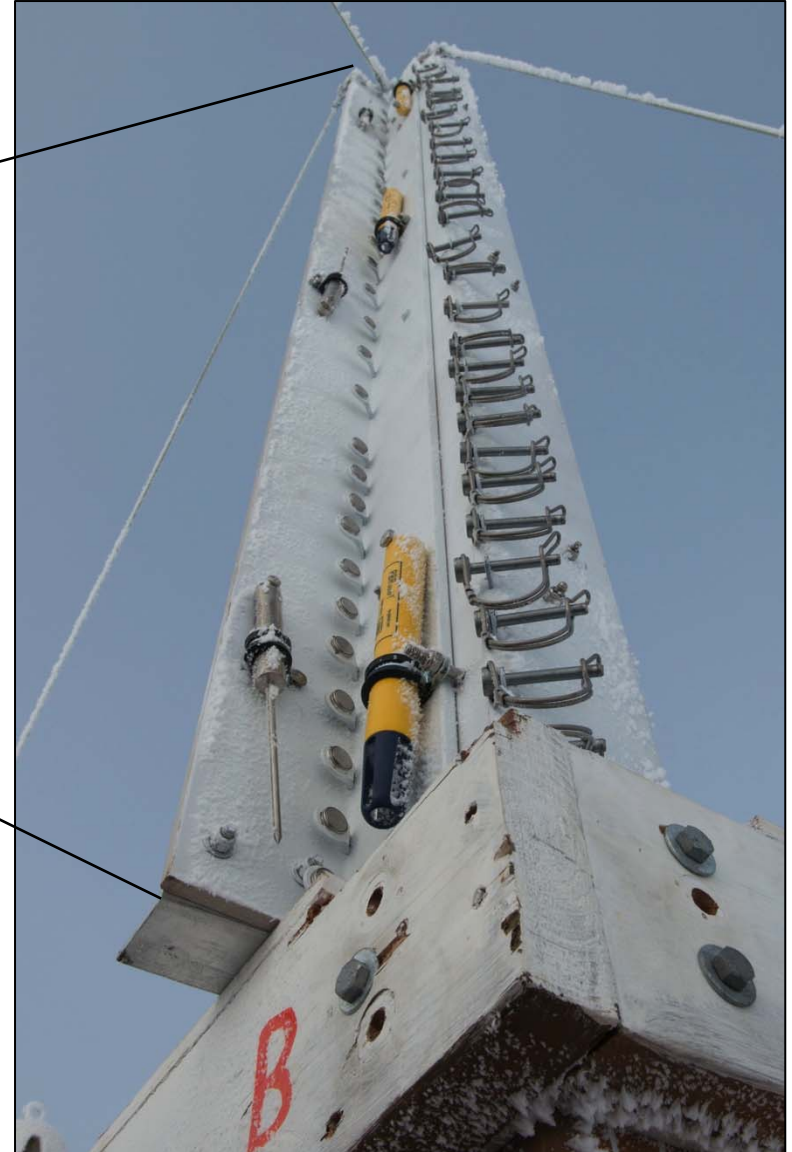
Arctic Observing Experiment: Sensor Assessment



- Buoy sensor assessment at DOE Atmospheric Radiation Measurement and NOAA Climate Reference Network sites.
- Pre/post calibration of instruments.
- Thermochron, RBR and Hobo temperature loggers for profiles.
- Webcams.
- Assess Accuracy of SLP, SST, SAT, wind speed, wind direction, GPS sensors.

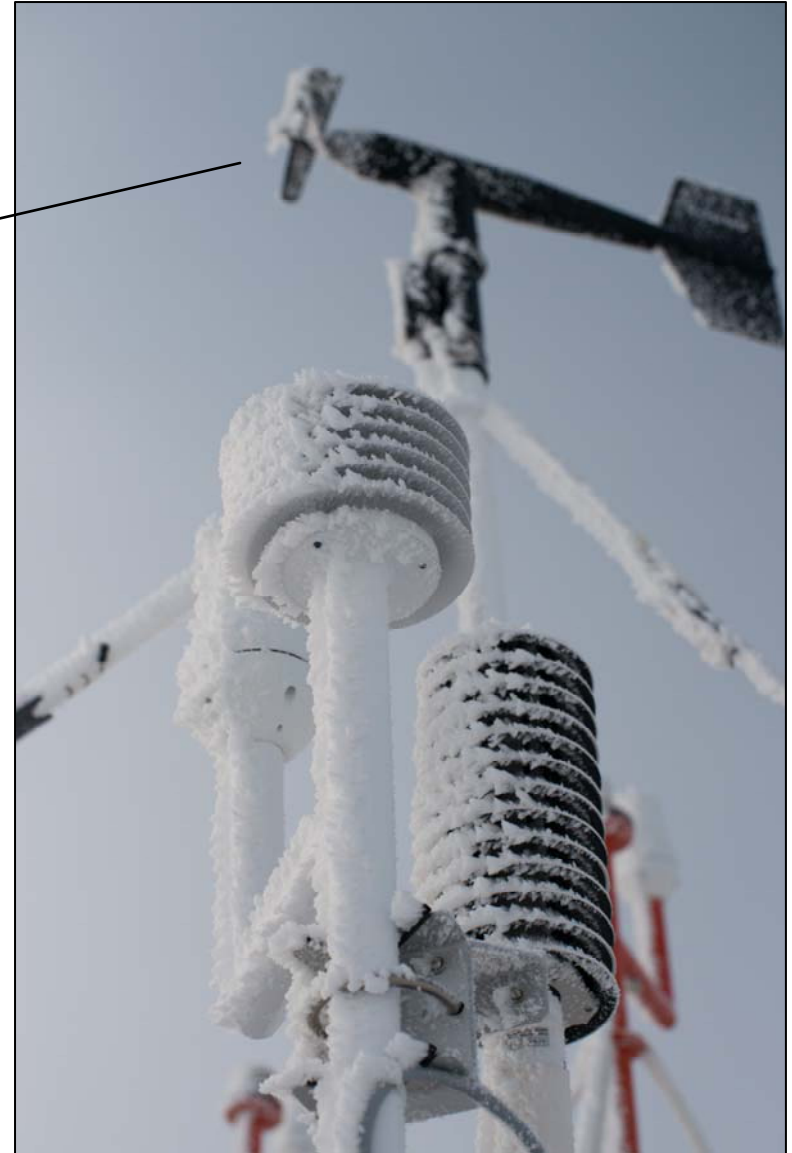
International Arctic Buoy Programme

Arctic Observing Experiment: Sensor Assessment



International Arctic Buoy Programme

Arctic Observing Experiment: Sensor Assessment



Observations for Operations and Research WMO/IOC GTS Map – July 2013

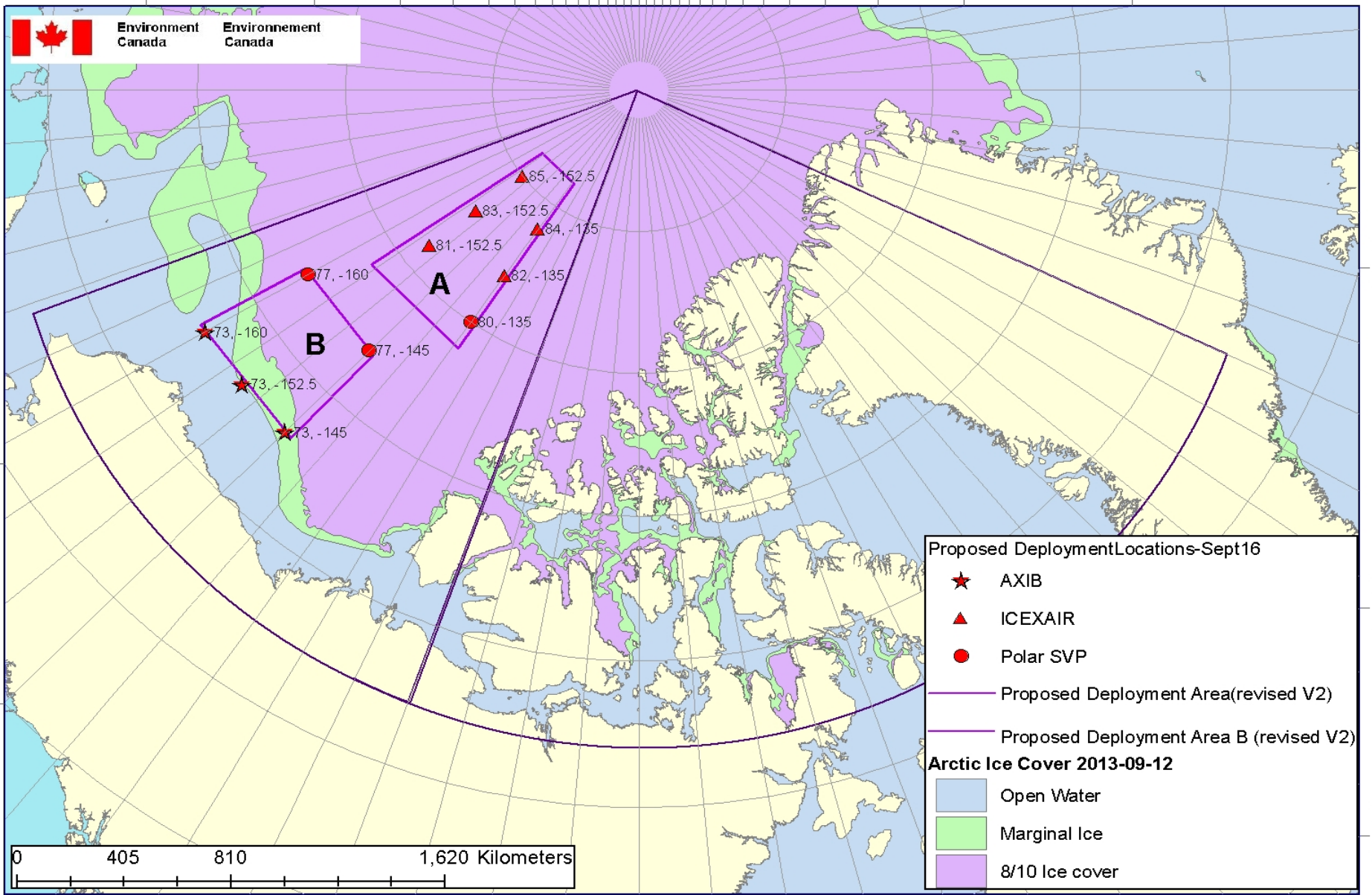


International Arctic Buoy Programme (IABP) WMO/IOC GTS Map – September 2013



Air Deployment Of Drifting Buoys in the Canadian High Arctic - 2013

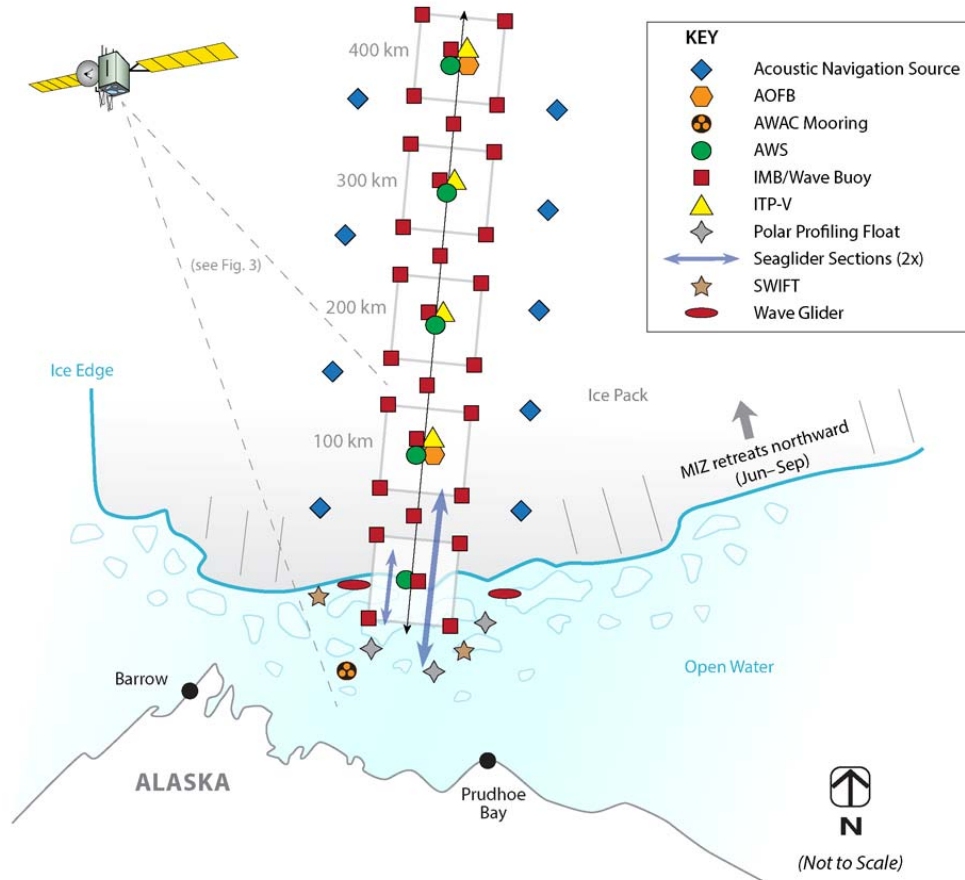
160°0'0"E 155°0'0"E 145°0'0"E 125°0'0"E 85°0'0"E 40°0'0"E 20°0'0"E 10°0'0"E 5°0'0"E 0°0'0"



Data as of Sept 16, 2013

Marginal Ice Zone (MIZ) Program

US Office of Naval Research (ONR) Initiative



- Massive deployment in summer of 2014.
- Collaboration between APL/UW, Cambridge, NPS, NRL, SAMS, VLFR, WHOI, Yale

US CGC Healy

Bering Sea Deployments: July 2013



10 SVP-B (Pacific Gyre Upgrades) on CGC Healy.

- We would like to deploy 5 in the Bering Sea.
- We can deploy other 5 in N. Pacific en route to Seattle?

International Arctic Buoy Programme (IABP) Summary 2013



- Our AOX buoy test site has been deployed and we have begun analyzing the data.
- 80 Buoys are currently reporting, 59 of which have met. sensors (mid-2013).
- We will be deploying another 50+ buoys during the summer.
- We will deploy 13 buoys using Russian assets (excluding NABOS).
- Next year we expect the same logistics assets as this year, with the addition of deployments from large research projects (e.g. ONR MIZ, APL Ice Station).

Extra Slides

International Arctic Buoy Programme

Arctic Observing Experiment: Sensor Assessment



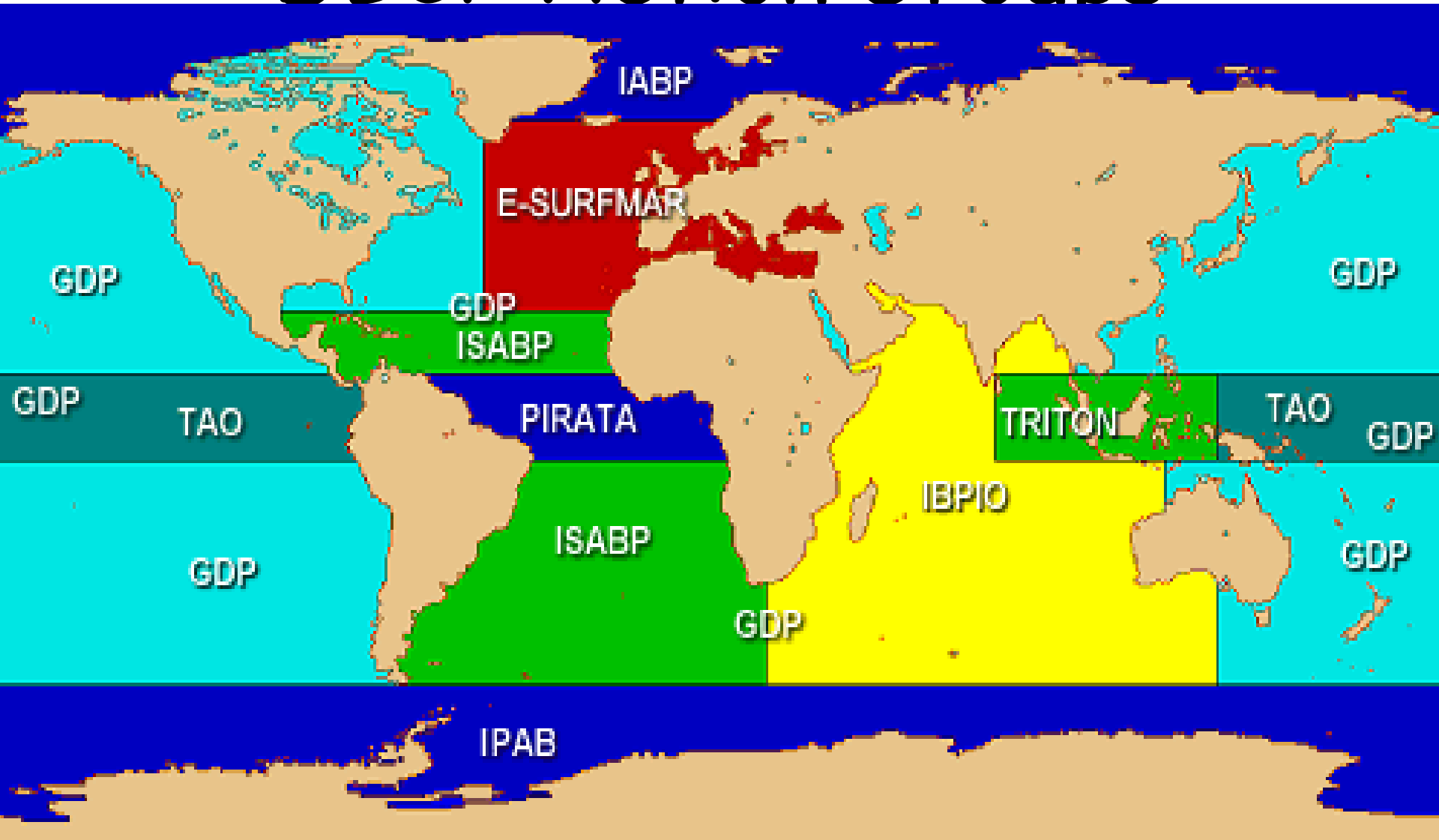
- **SLP:** Vaisala PTB 100s, WTX 520, etc.
- **SAT:** CMR ICEXAIR, MetOcean PAWS, MetOcean Canister with ICEXAIR shield, MetOcean Canister with AXIB shield
- **SST:** SVP buoys and PAWS
- **Winds:** RM Young (MetOcean PAWS), Vaisala WTX 520 (IceKid), Gill (Pacific Gyre Minimet).
- **GPS:** Ice Canisters, IceKid, MY, PAWS

International Arctic Buoy Programme

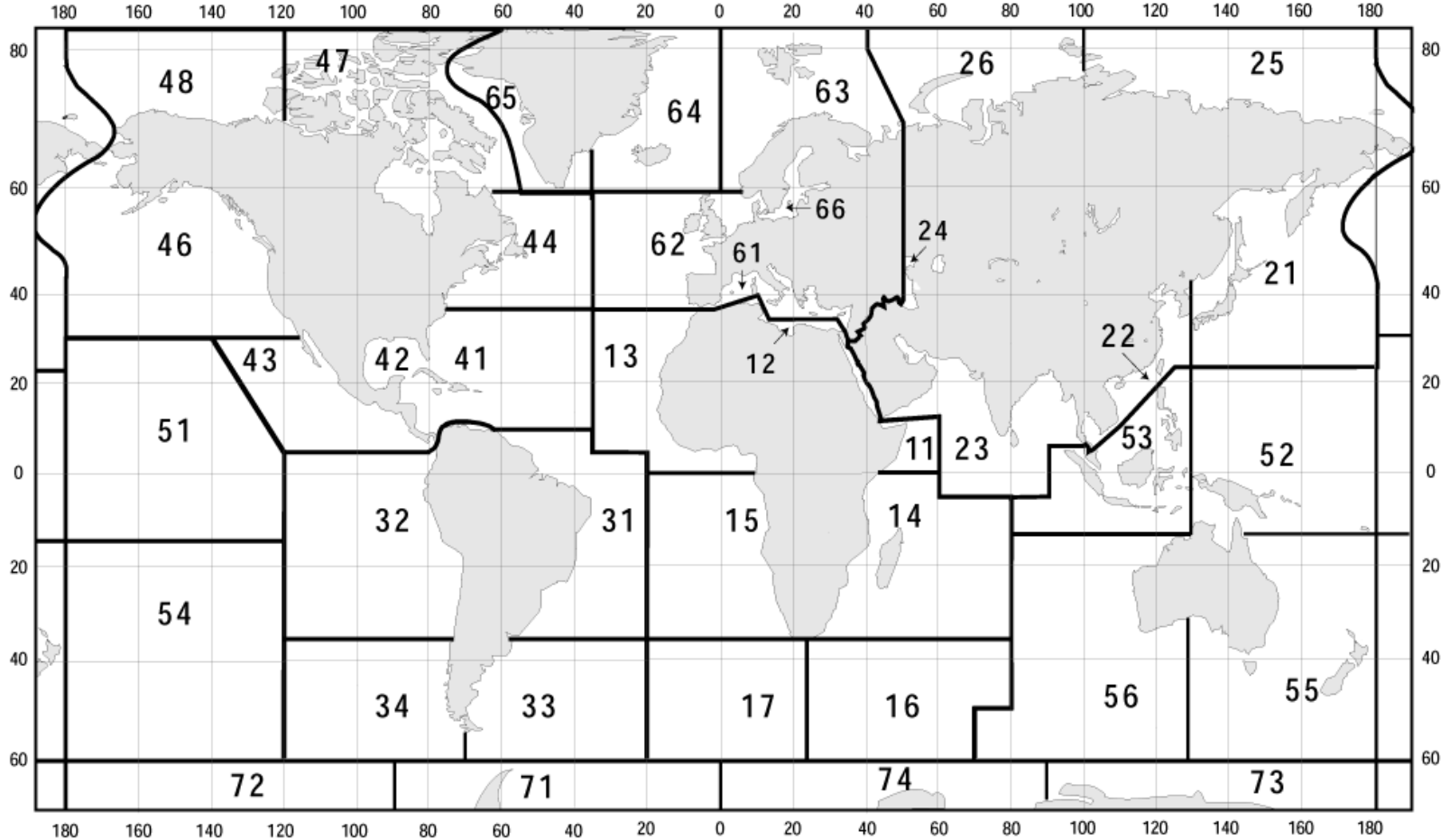
Arctic Observing Experiment: Sensor Assessment



DBCP Action Groups

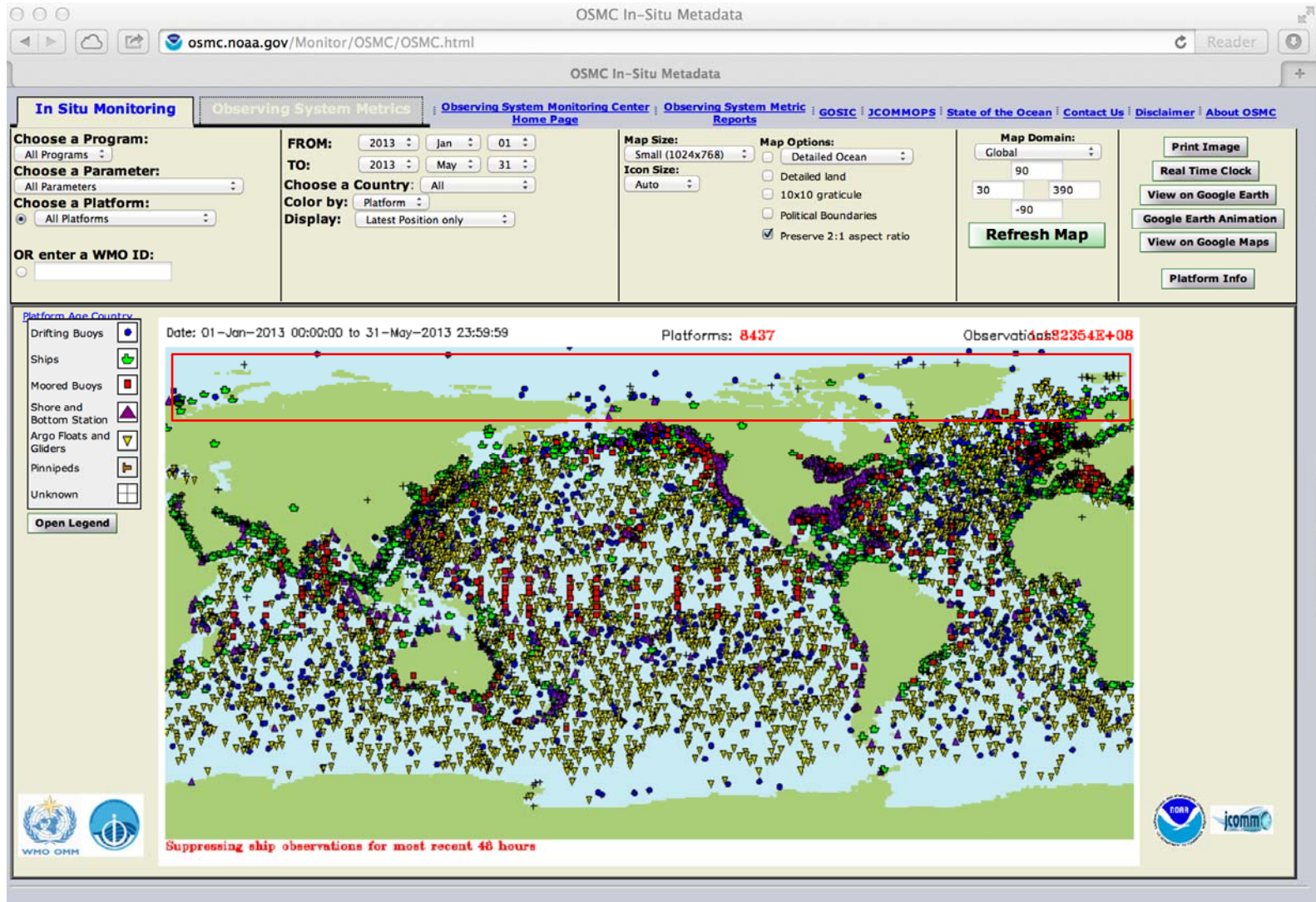


WMO Areas



IABP Buoys are typically deployed in
48, 47, 25, and 26

IABP Observations on WMO/IOC GTS NOAA/OSMC



END