

International Arctic Buoy Programme Action Group Report

Thirty Second Session of the Data Buoy Cooperation Panel

17 – 21 October 2016

Scripps Institute of Oceanography, La Jolla, CA, USA

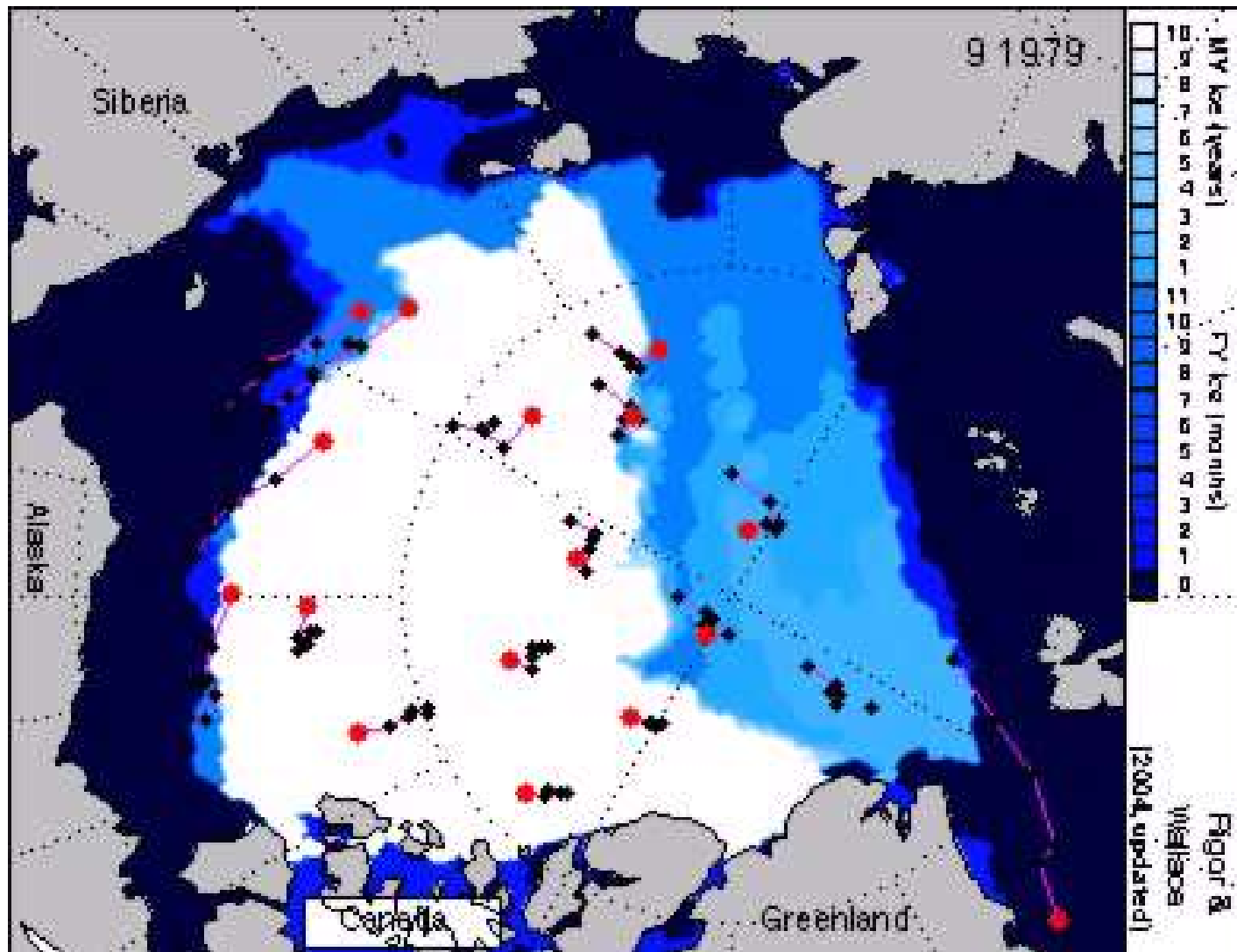


International Arctic Buoy Programme

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

Retreat of Arctic Sea Ice

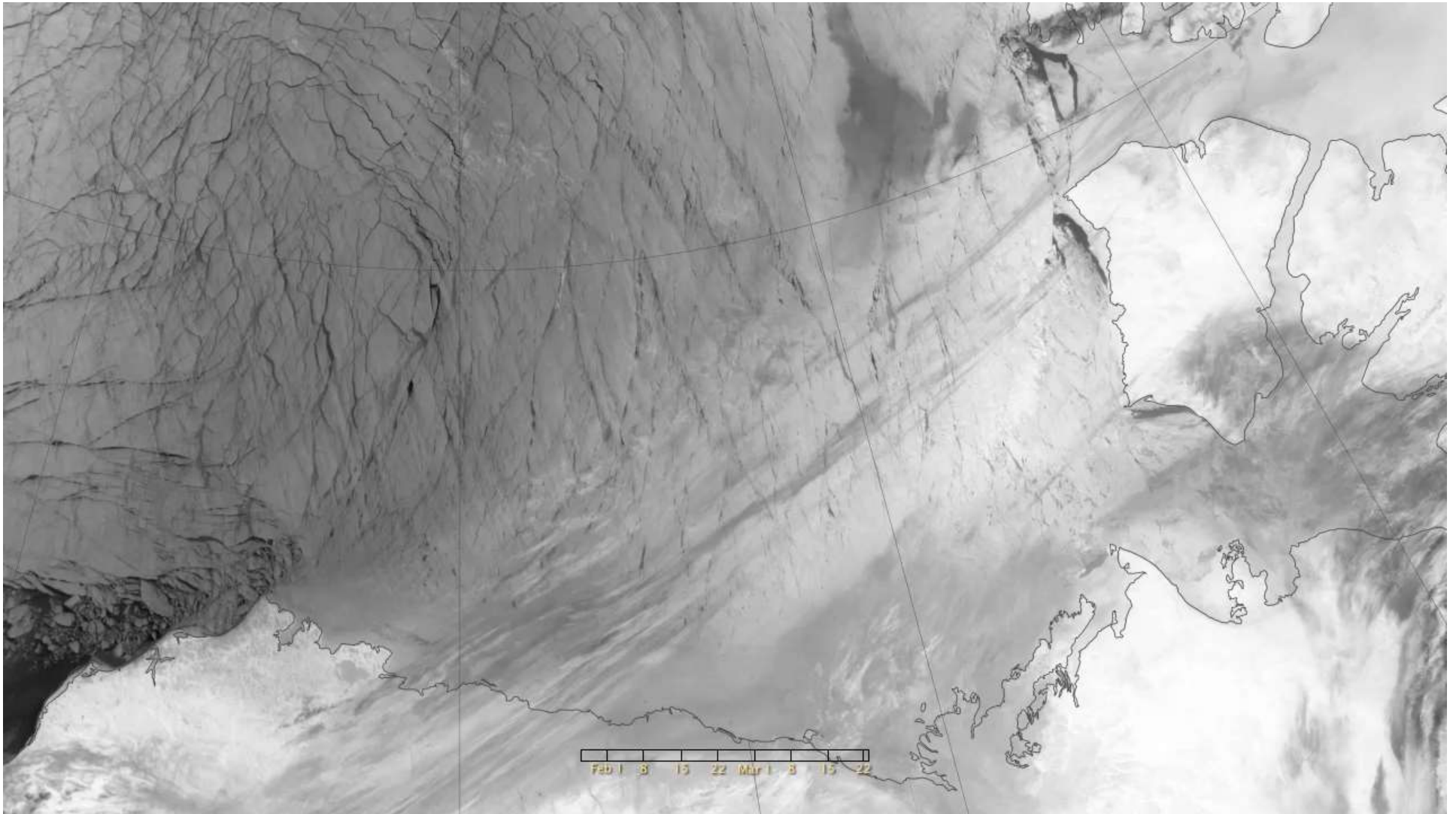


- Sea ice grows thicker with age.
- Prior to 1989, ice over 80% of the Arctic Ocean is at least 10 years old.
- High Arctic Oscillation (AO) winds flushed most of the older thicker sea ice out of the Arctic.
- Younger (thinner) Ice persists through today despite “normal” AO conditions.

(Rigor and Wallace, 2004; updated)

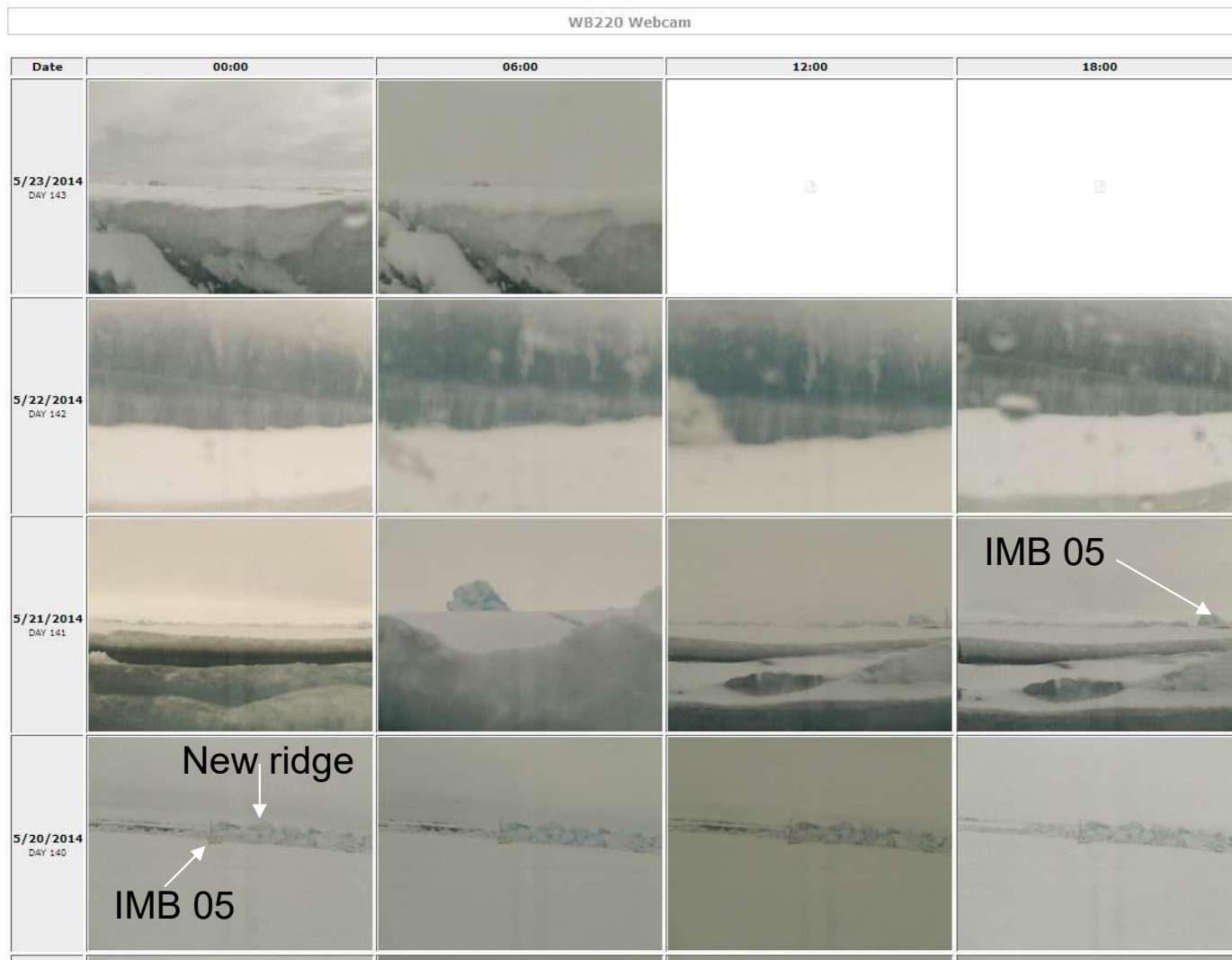
Arctic Sea Ice, February – March 2013

Visible Infrared Imaging Radiometer Suite (VIIRS)



Source: earthobservatory.nasa.gov

Six-hourly webcam images from the wavebuoys tell a dynamic tale



SVP-B Deployments

Chuckhi Sea (northwest of Alaska)



Seasonal Ice Beacon (XIB)



- Developed by USIABP through a NOAA SBIR.
- Capable of surviving in ice, and open water through freeze/thaw cycles.
- Sensors include air and surface temperature, and surface pressure.

Seasonal Ice Beacon (XIB)



145754	9/28/2016	00:00	75.06270	-159.26839	1016.00	-1.19	-3.91
145898	9/28/2016	00:00	82.06984	-143.27162	1009.80	-1.72	-10.64
145951	9/28/2016	00:00	76.38457	-156.91467	1016.50	-1.42	-6.35

Summer Deployments by Air

Airborne Seasonal Ice Beacon (AXIB)



- Capable of surviving in ice, and open water through freeze/thaw cycles.
- Sensors include air and surface temperature, and surface pressure.
- Switched to Pacific Gyre electronics, with 100% success this summer.

International Arctic Buoy Programme

Polar Science Center · Applied Physics Laboratory · University of Washington

- Overview
- Maps
- Data
- Publications
- Research
- News
- Links

Maps

Daily

Table

Map

Ocean/Ice Buoy

Monthly

Table

Bathymetry

NSIDC Ice

Deployment History

Deployment Logistics

Instrumentation

Programme Participant

Buoy Type

Special

Maps · Daily · Table

Daily Table

Please note that this page is still being developed. Date of last report is not 100% accurate, and the data may not be complete back to date of deployment. Missing values are represented by -999, but only the last report is showing, so this value does not mean that the buoy is not reporting that quantity at all. If BP, Ts, or Ta is not available for a buoy, this is indicated with "NA".

Data will pop open in a new window with the following header:
BuoyID, Year, Hour, Min, DOY, POS_DOY, Lat, Lon, (BP),(Ts),(Ta)

DOY = the day of the year to the decimal minute (1.0 to 365.999) of the reported data
POS_DOY = the day of the year to the decimal minute of the reported position
BP = Barometric Pressure, if available
Ts = Surface Temperature if available
Ta = Air Temperature if available

Note that "Surface Temperature (Ts)" is measured from the bottom of the buoy hull. If the buoy is floating, then the reported temperature is of the sea surface. If the buoy is frozen into the ice, or sitting on top of it, then the reported temperature is of the ground or ice. The freezing temperature of sea water is about -1.8C, so temperature readings below this indicate ground or ice temperatures.

Buoys Reporting Over the Last Week

BuoyID	WMO	Description	Date of Last Report	Latitude	Longitude	BP	Ts	Ta	DATA
5300	48731	ICEBUOY	05/24/2014	75.78190	-168.73830	1018.53	-999.00	-4.41	DATA
5313	48732	ICEBUOY	05/24/2014	73.06390	-136.09250	1014.43	-999.00	-2.64	DATA
5315	48507	ICEBUOY	05/24/2014	73.44530	-147.45860	1016.21	-999.00	-8.72	DATA
5318	48508	ICEBUOY	05/24/2014	73.92560	-174.07310	1015.52	-999.00	-5.90	DATA
35094	48733	ICEBUOY	05/24/2014	74.76220	-169.59530	1017.85	-999.00	-6.87	DATA
46517	48520	ICEBUOY	05/24/2014	75.84110	-19.43750	1029.00	18.84	-0.65	DATA
83723	48600	ICEBUOY	05/24/2014	74.53690	169.15940	1014.50	-2.75	-29.60	DATA
83726	48536	ICEBUOY	05/24/2014	75.23470	148.54940	996.50	-999.00	-2.73	DATA
90048	NA	ITP_48	05/22/2014	83.96240	-61.38740	NA	NA	NA	DATA
90054	NA	ITP_54	05/22/2014	80.09330	-178.16240	NA	NA	NA	DATA
90058	NA	ITP_58	05/22/2014	74.00440	-3.69690	NA	NA	NA	DATA
90059	NA	ITP_59	05/22/2014	87.40520	-157.47300	NA	NA	NA	DATA
90061	NA	ITP_61	05/22/2014	56.79770	-46.37530	NA	NA	NA	DATA
90066	NA	ITP_66	05/22/2014	71.95270	-174.63940	NA	NA	NA	DATA
90067	NA	ITP_67	05/22/2014	81.02840	-151.63900	NA	NA	NA	DATA
90068	NA	ITP_68	05/22/2014	77.04000	-151.11030	NA	NA	NA	DATA
90069	NA	ITP_69	05/22/2014	77.07650	-168.34400	NA	NA	NA	DATA
90070	NA	ITP_70	05/22/2014	76.22840	-151.31120	NA	NA	NA	DATA
90071	NA	ITP_71	05/22/2014	76.65800	-140.03270	NA	NA	NA	DATA

Real-Time Observations for Research

Real-Time Observations for Operations

WMO/IOC GTS

osmc.noaa.gov

My Home Page Washington S...h Safety Map Personal Traffic Weather Radar W... 1022 Facebook Va Lake Stevens Pass USIABP RACS IceKid Cam DOE Webcam >>

Western Washington Zone Forecasts JCOMM OSMC In-Situ Metadata +

In Situ Monitoring **Observing System Metrics** **Observing System Monitoring Center Home Page** **Observing System Metric Reports** **GOSIC** **JCOMMOPS** **State of the Ocean** **Contact Us** **Disclaimer** **About OSMC**

Choose a Program: All Programs
Choose a Parameter: All Parameters
Choose a Platform: All Platforms
OR enter a WMO ID:

FROM: 2016 Oct 17
TO: 2016 Oct 19
Choose a Country: All
Color by: Platform
Display: Latest Position only

Map Size: Small (1024x768)
Icon Size: Auto

Map Options:
 Detailed Ocean
 Detailed land
 10x10 graticule
 Political Boundaries
 Preserve 2:1 aspect ratio

Map Domain: Global
90
30 390
-90
Refresh Map

Print Image
Real Time Clock
View on Google Earth
Google Earth Animation
View on Google Maps
Platform Info

Platform Age Country

- Drifting Buoys
- Ships
- Moored Buoys
- Shore and Bottom Station
- Argo Floats and Gliders
- Pinnipeds
- Unknown

Date: 17-Oct-2016 00:00:00 to 19-Oct-2016 23:59:59
Platforms: 4588
Observations: 2368195

Suppressing ship observations for most recent 48 hours

WMO OMM NOAA JCOMM

Observations for Operations and Research WMO/IOC GTS Map – October 19, 2016

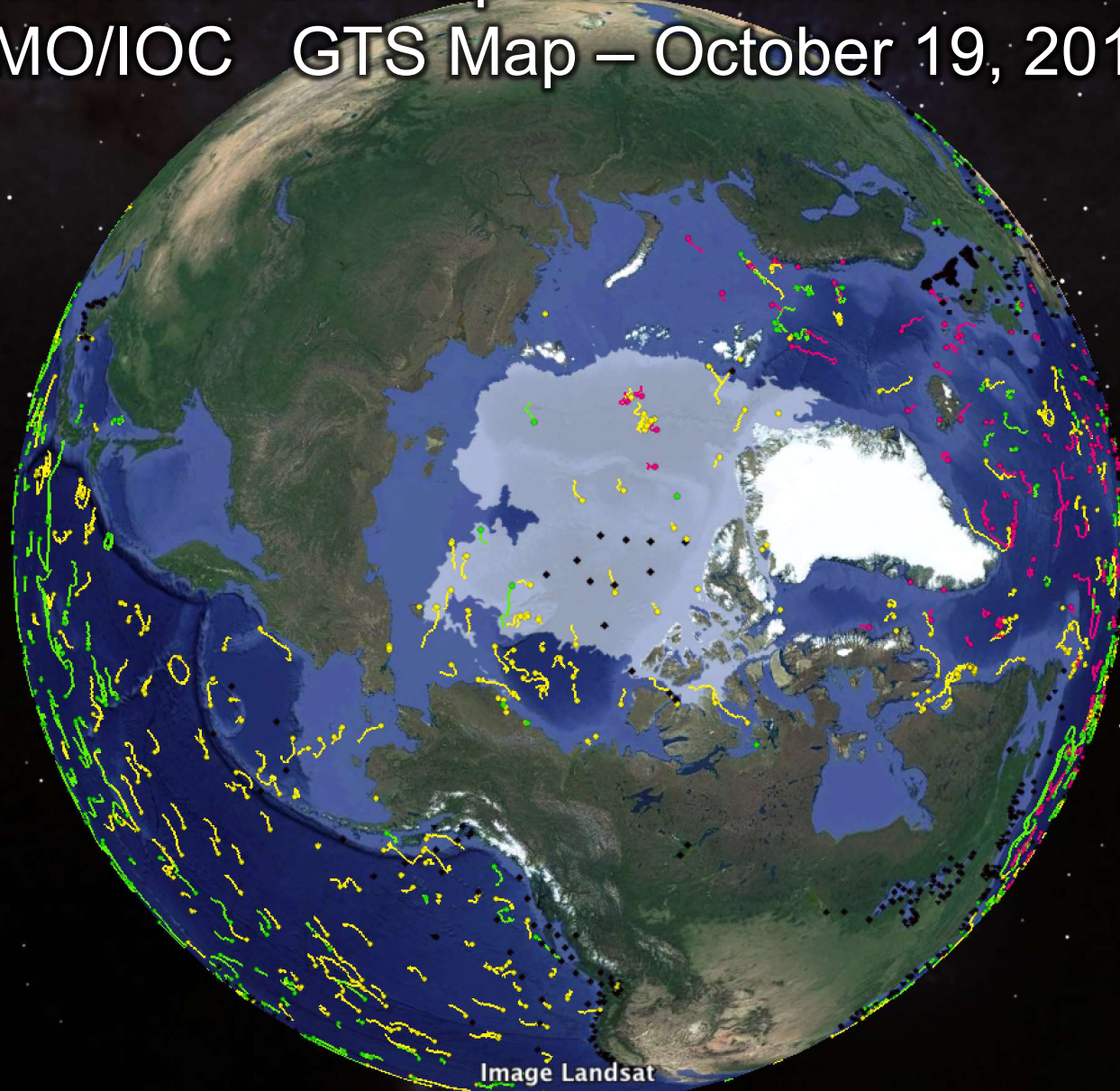


Image Landsat
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image IBCAO
Map U.S. Geological Survey

NIC Multisensor Analyzed Sea Ice Extent

Google

IABP Deployment Plans

Polar Area Weather Station



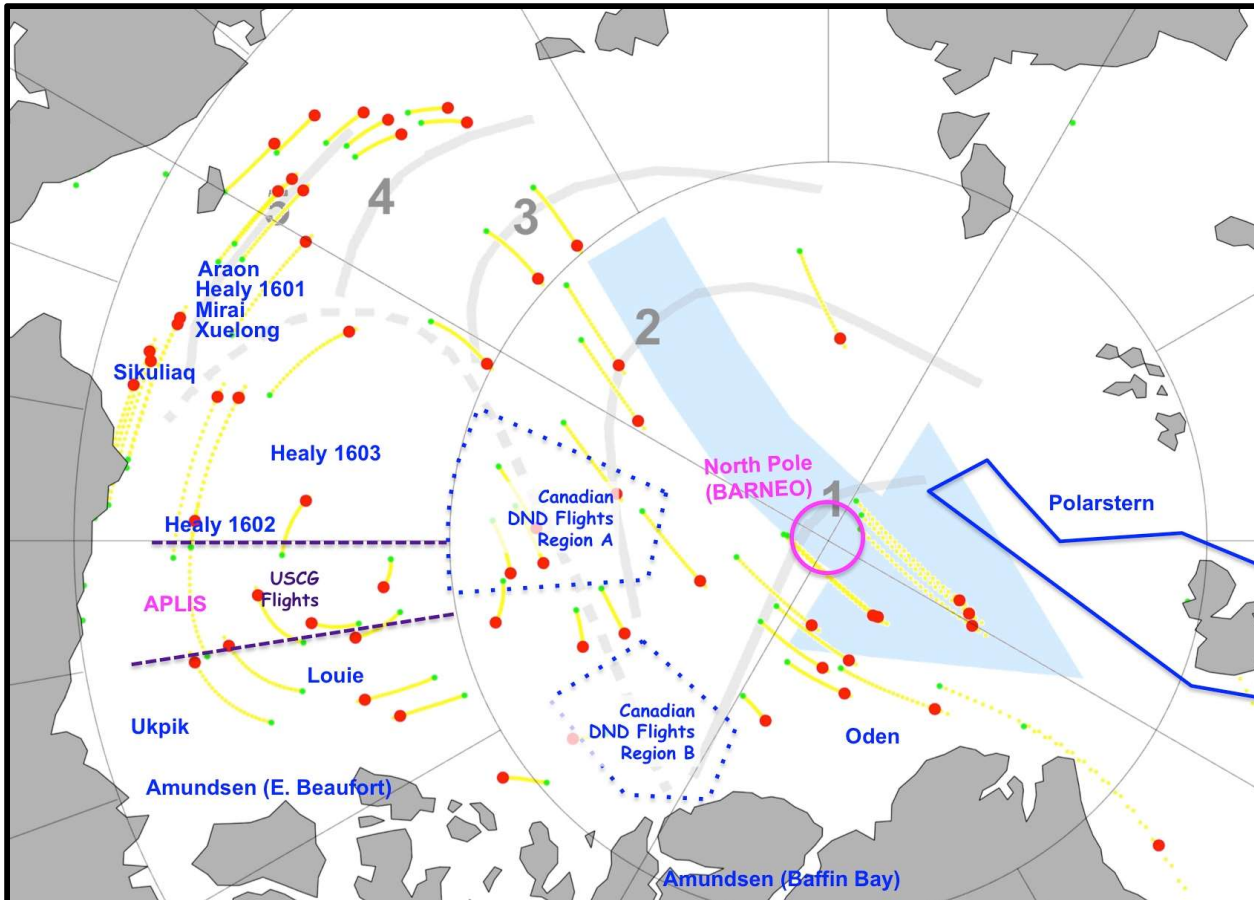
Ice Beacon



Airborne Expendable
Ice Beacon (AXIB)



SVP / WOGE buoy



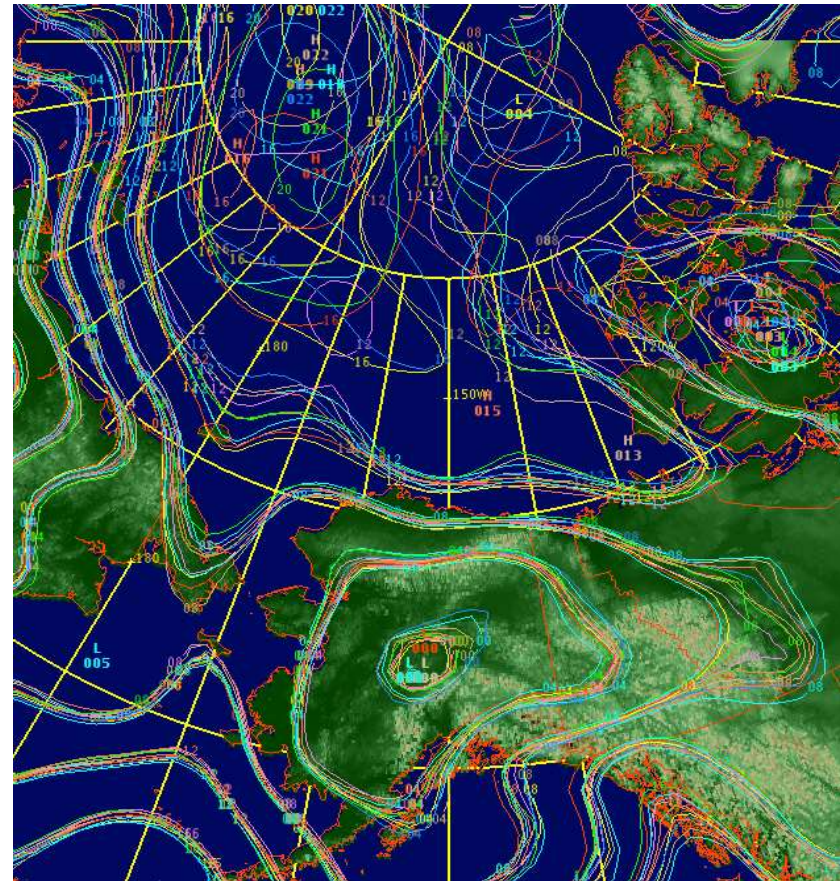
Upper layer Temperature of the
Ocean (UpTempO) buoy



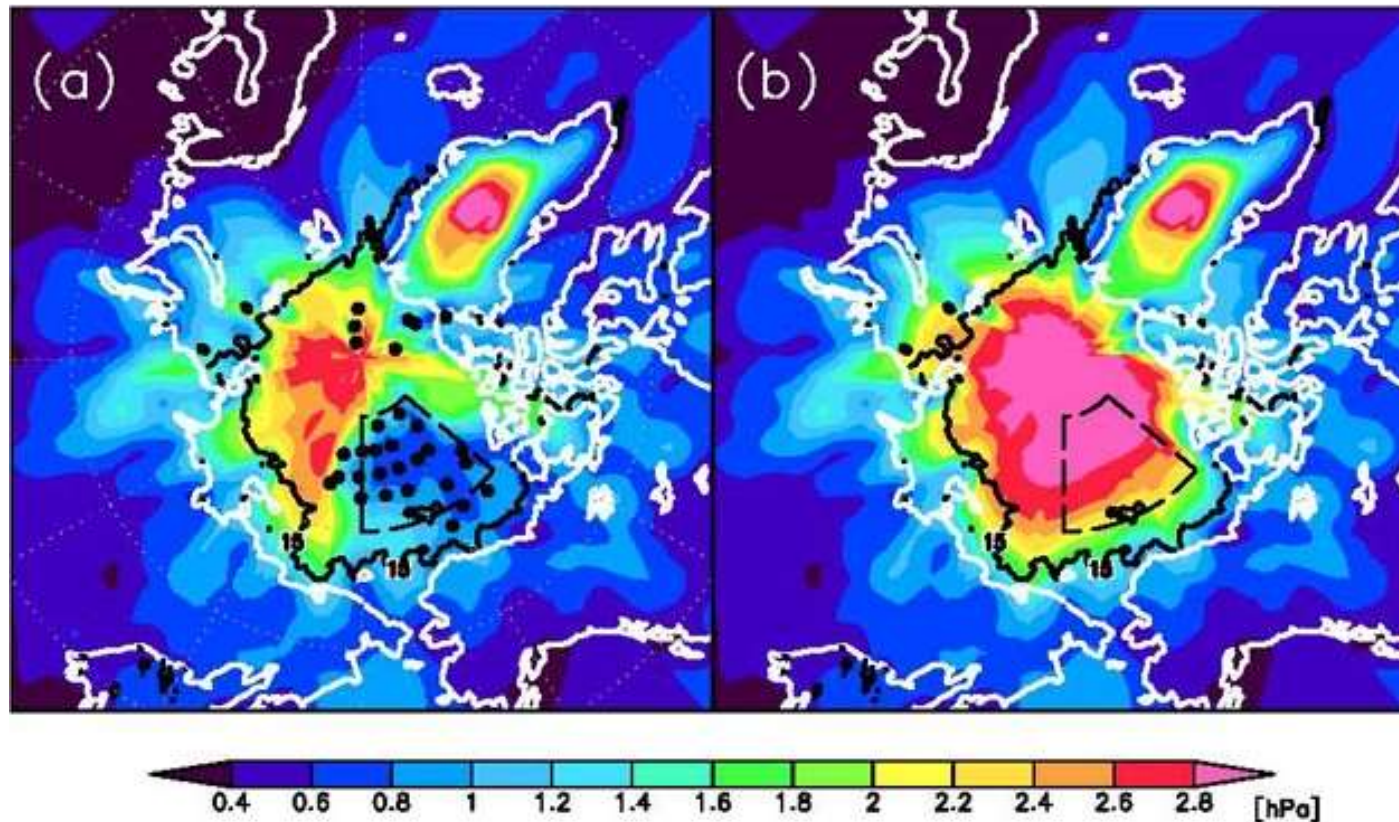
Comparison of Multiple Weather Model Sea Level Pressure Initializations over the Arctic

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



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.

(Inoue et al, 2009)

SUMMARY

- 142 Buoys reporting in May 2016.
- 180 Buoys reporting on Oct 2016.
- Challenge: Maintaining the network in the Eurasian Arctic.

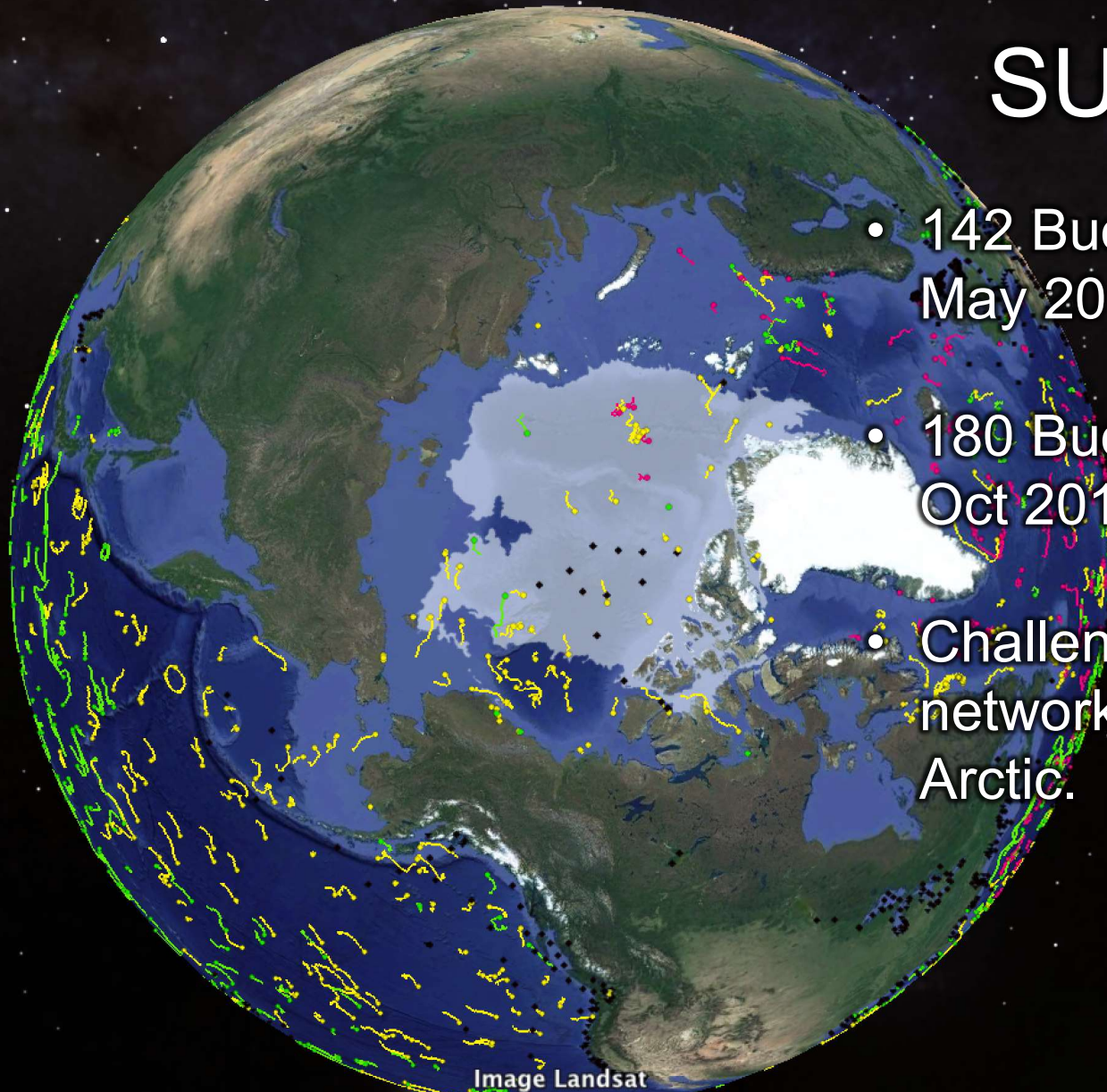


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NIC Multisensor Analyzed Sea Ice Extent

Google