

International Arctic Buoy Programme (IABP) Action Group Report

EXECUTIVE COMMITTEE

Chair: Christian Haas, AWI, Germany

Vice-Chair: Takashi Kikuchi, JAMSTEC, Japan

Member: John Woods, ONR, USA

Member: Katrina Tiongson, ECCC, Canada

Coordinator: Ignatius Rigor, PSC, USA

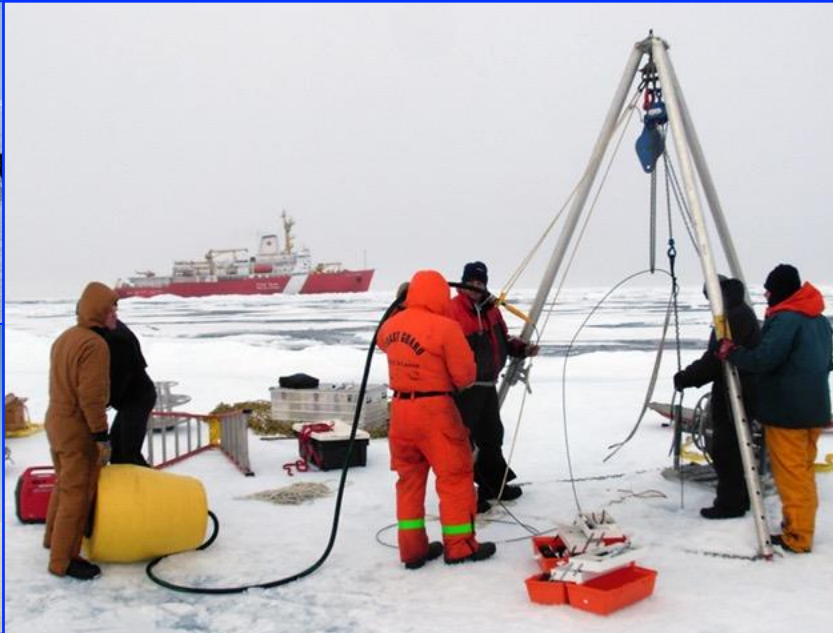
DBCP-38, Geneva, Switzerland

2 November 2022

International Arctic Buoy Programme (IABP)



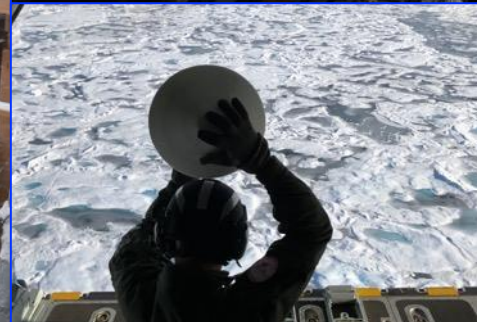
Spring



Summer

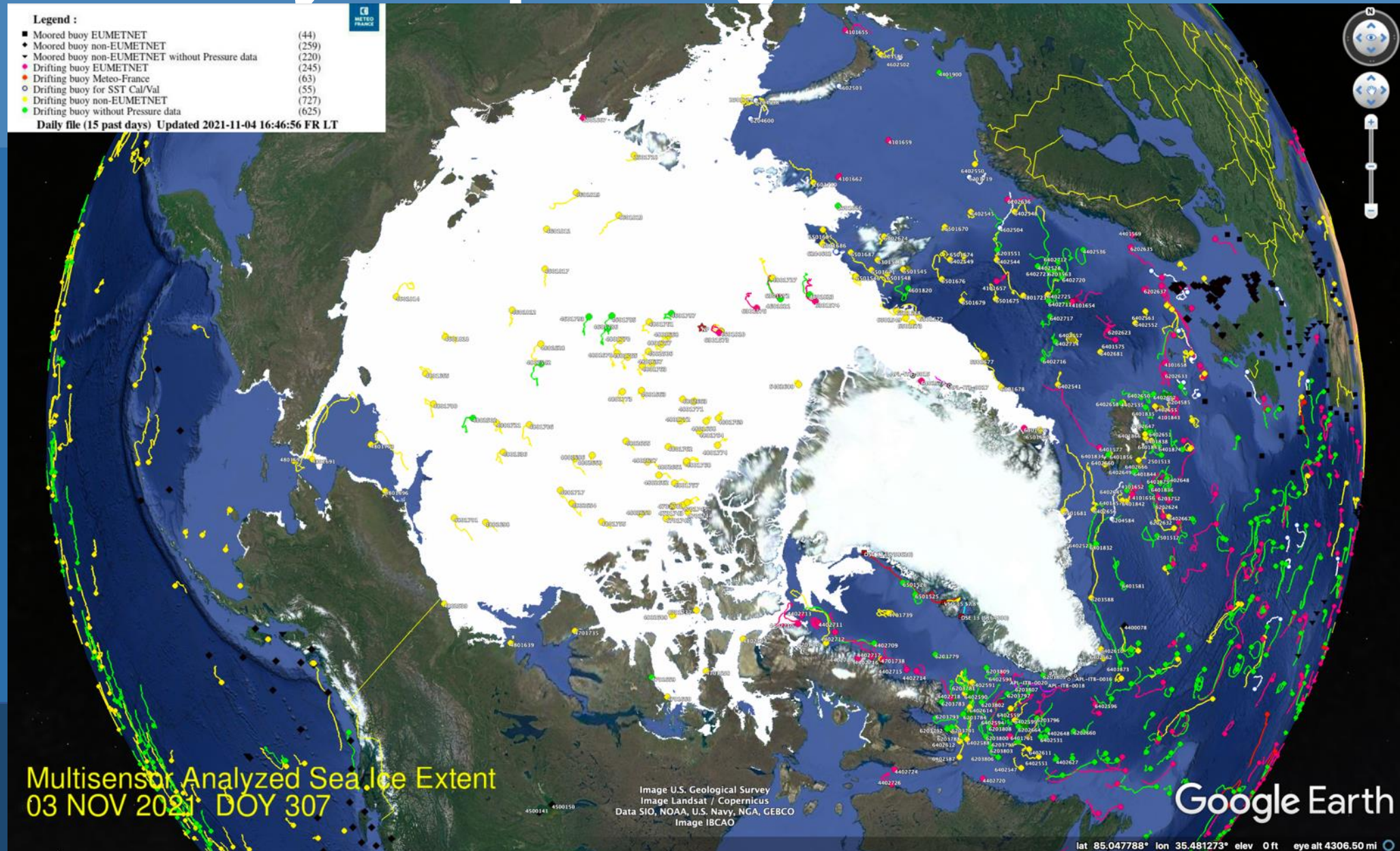


Fall



The IABP maintains the fundamental Arctic Observing Network observing ice/ocean circulation, surface meteorology, and oceanography.

IABP Buoys Reporting in November 2021

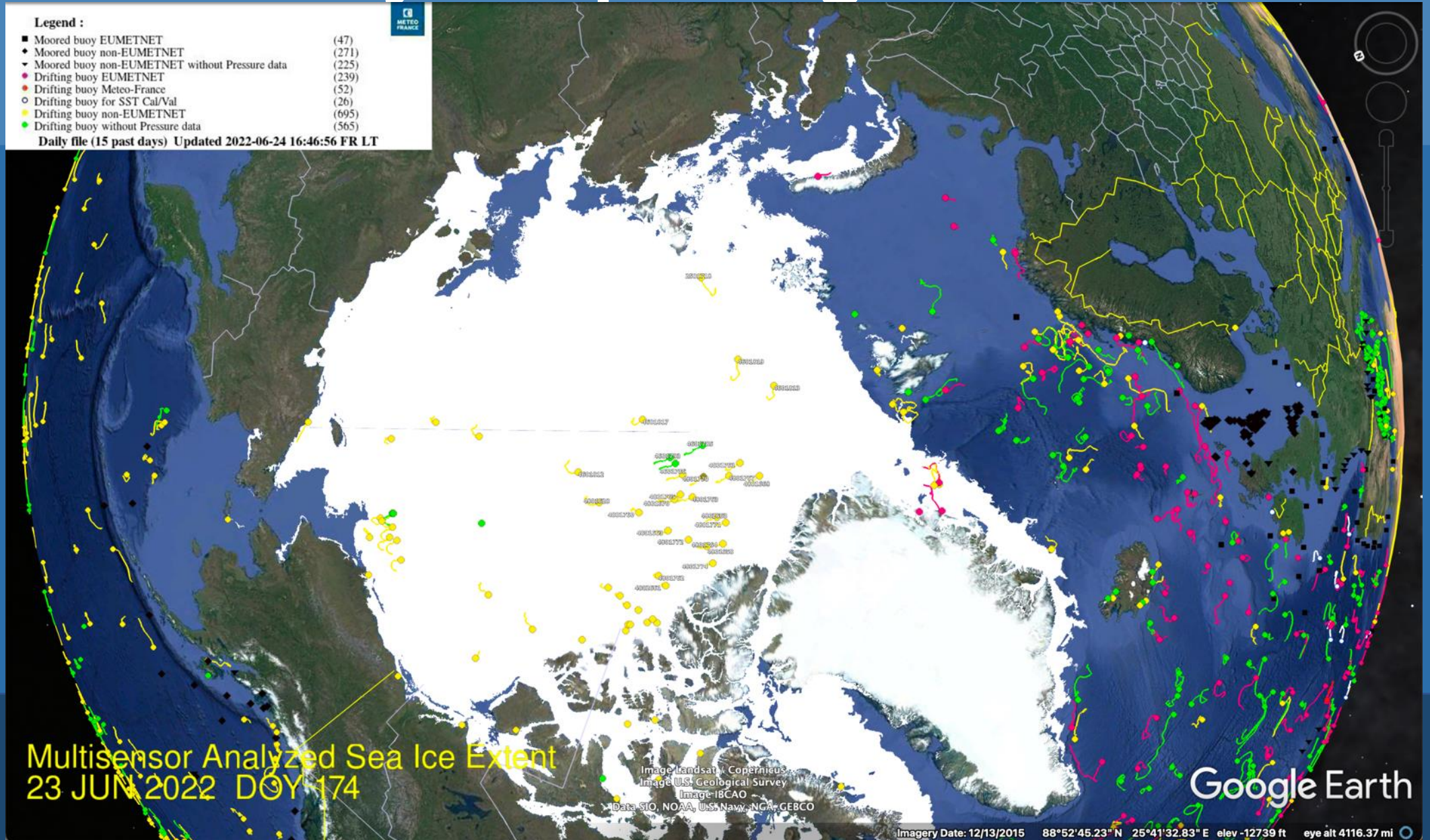


Utqiagvik, Alaska Spring Deployment

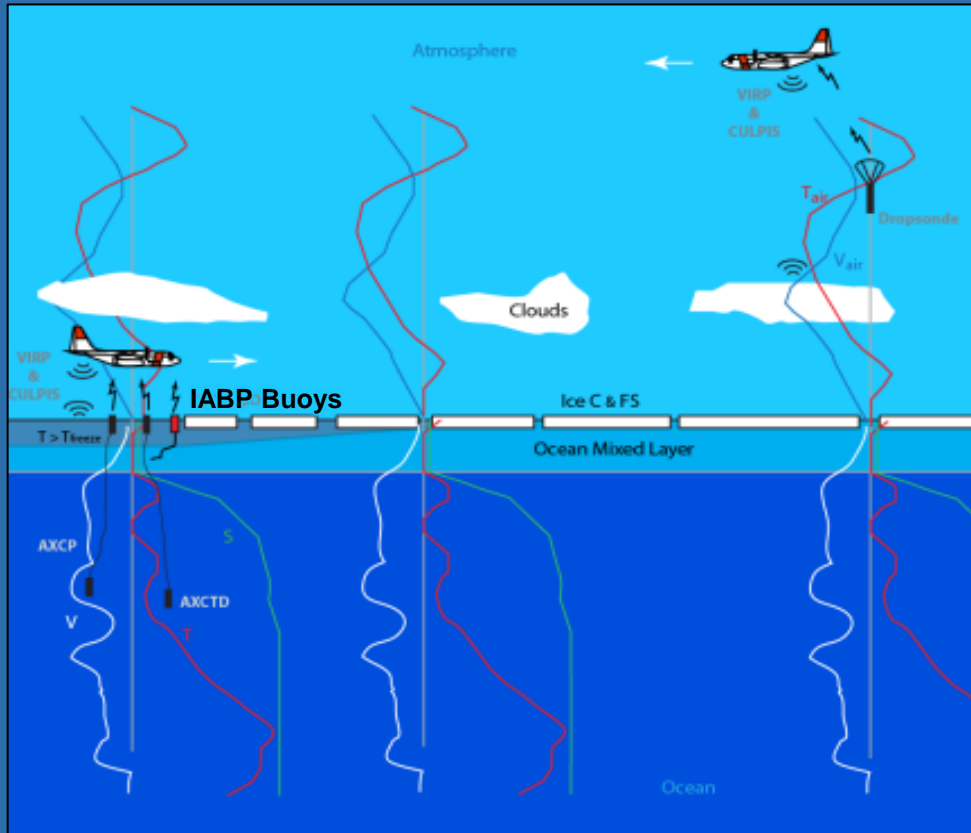


ARCTIC OCEAN

IABP Buoys Reporting in June 2022



Seasonal Ice Zone Reconnaissance Surveys (SIZRS)



Deployments during SIZRS flights with the US Coast Guard. IABP Buoys are typically deployed with AXCTD/AXCPs flying northward, while dropsondes are deployed on the way home.

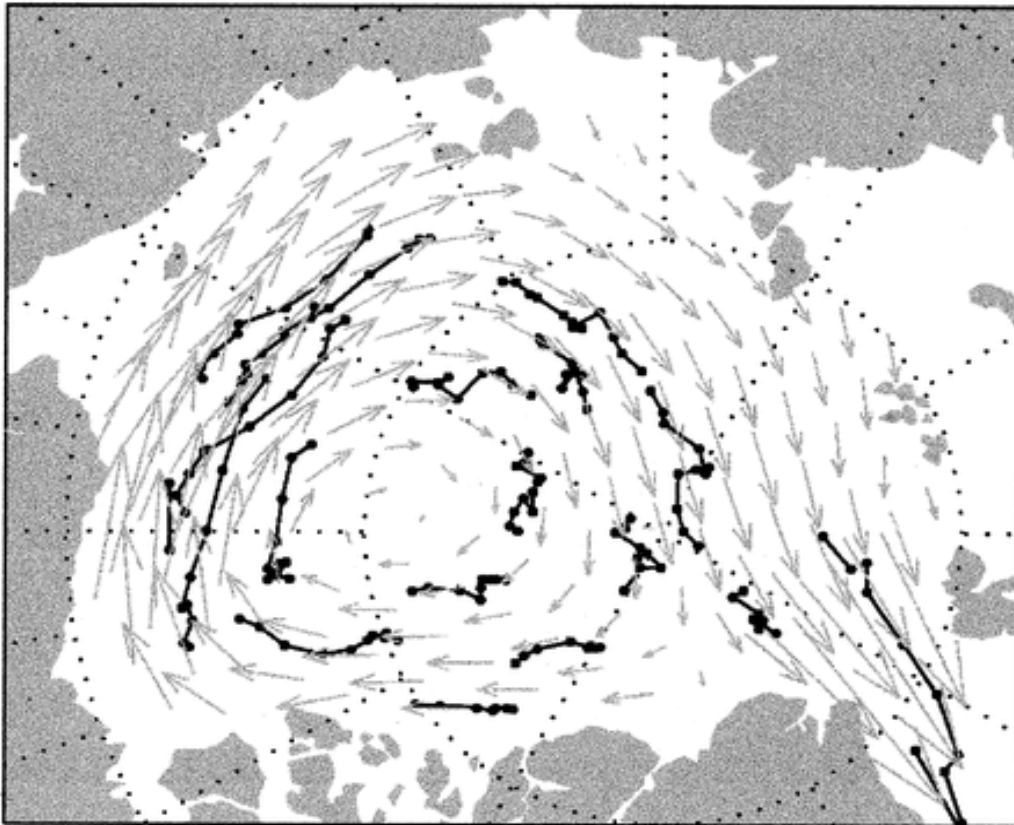
IABP Buoys Reporting in October 2022



Sea Ice Drift

(a)

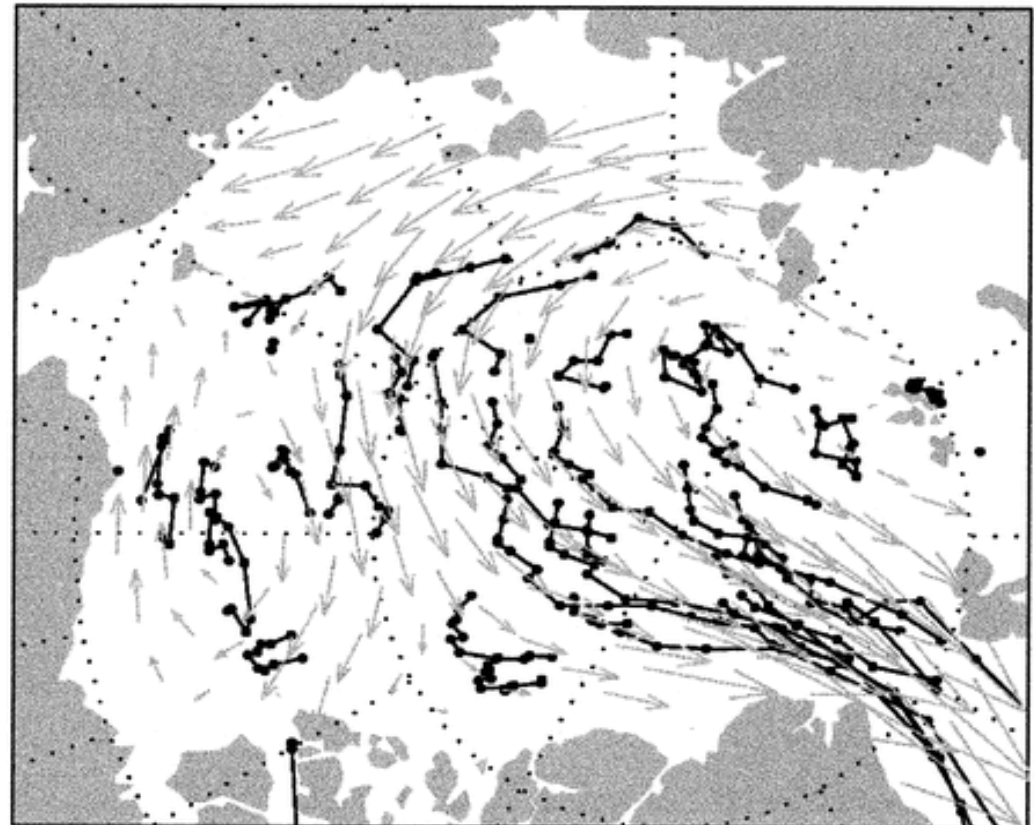
1979



Scale: 2 cm/s = →

(b)

1994

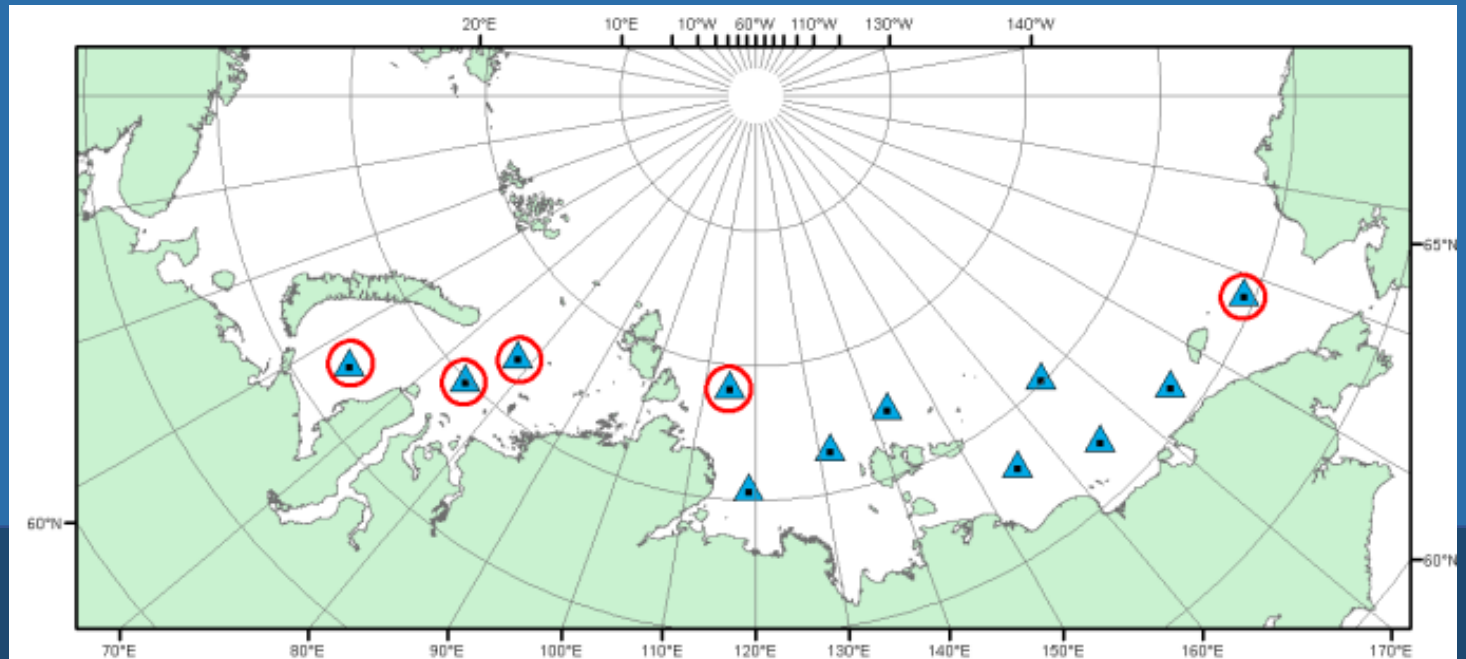


Scale: 2 cm/s = →

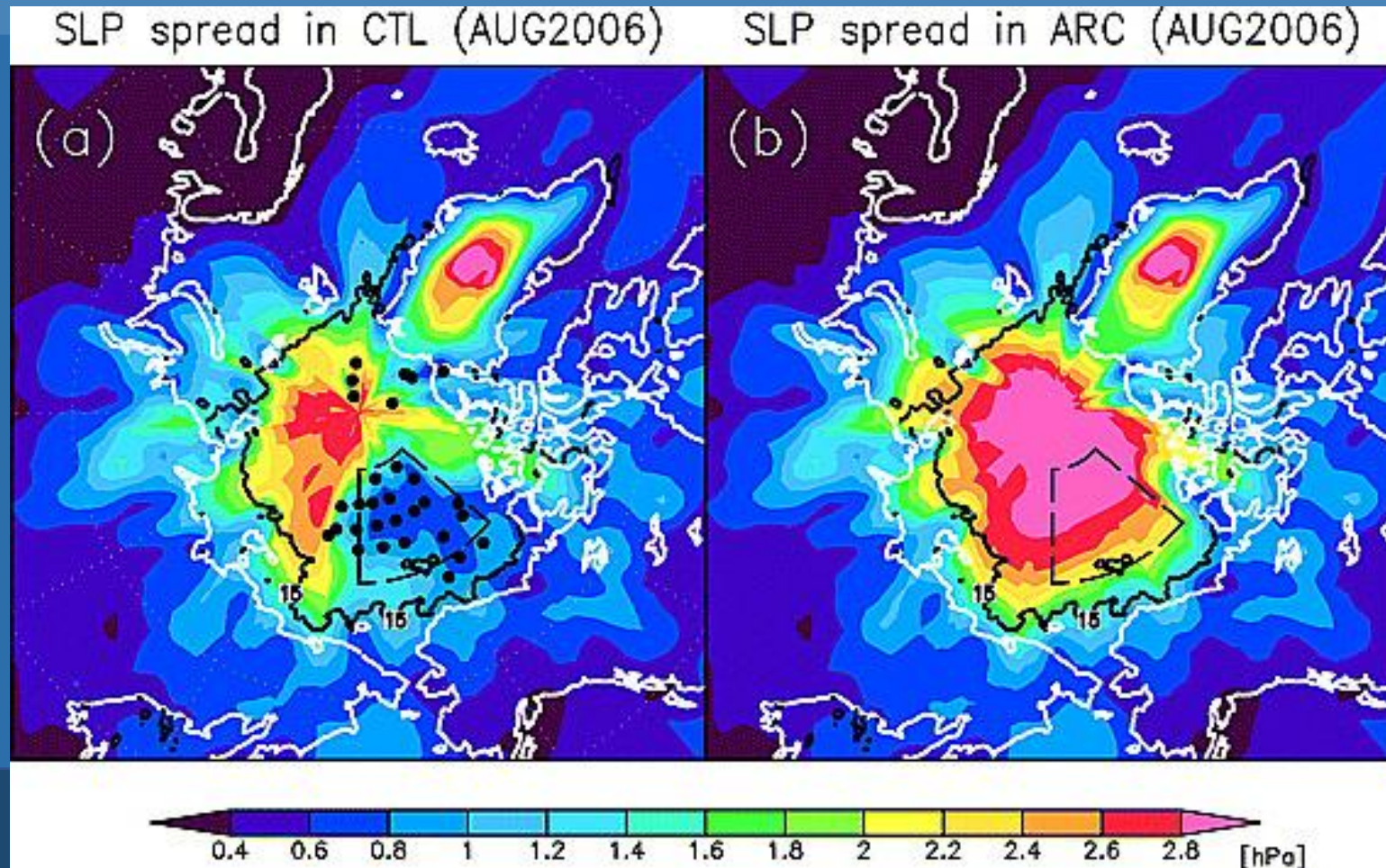
Rigor et al., 2002

US-IABP / AARI Collaboration

- Russian Ice breakers Akademik Fedorov, and Mikhail Somov.
- Deploy Marlin Yug buoys
 - 12 Ice Balls (GPS, SLP, Ts)
 - 8 Ice Balls w/ ice thermistor strings



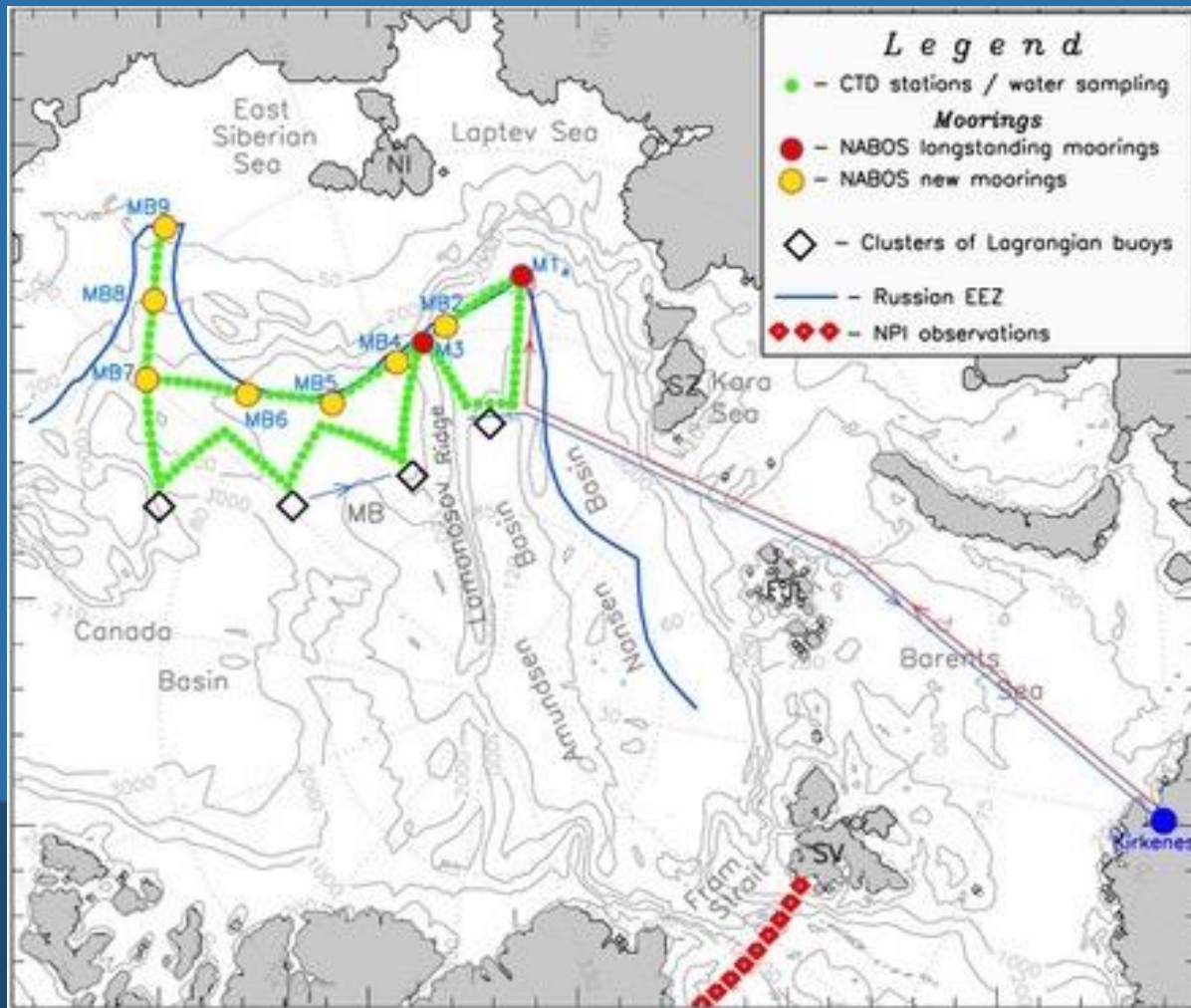
Impact of observations from Arctic drifting buoys on the reanalysis of surface fields



Inoue et al., 2009

Nansen and Amundsen Basin Observing System (NABOS)

RV Akademik Tryoshnikov (?), Sept/Oct. 2023



- Objective: Service moorings, CTD Surveys, and deploy autonomous and ice-based assets.
- Chief Scientist: Igor Polyakov
<ivpolyakov@alaska.edu>
- Buoys:
 - N AXIB
 - N ITP
 - N SIMB3
 - N Ice Balls
 - N Etc.

ICE-PPR Buoy Deployment Plans July 2023

Leads: John Woods, Ignatius Rigor

- ICE-PPR coordinates defense assets from Arctic countries to support research.
- Drop Locations will be determined by
 - a) Current state of buoy array
 - b) Sea Ice and Weather conditions
- METOC/Imagery Support can be coordinated with USA/CAN/DEN Ops Centers
- Science Team interested to be engaged with Flight Crew for coordination



Pri 1 WX



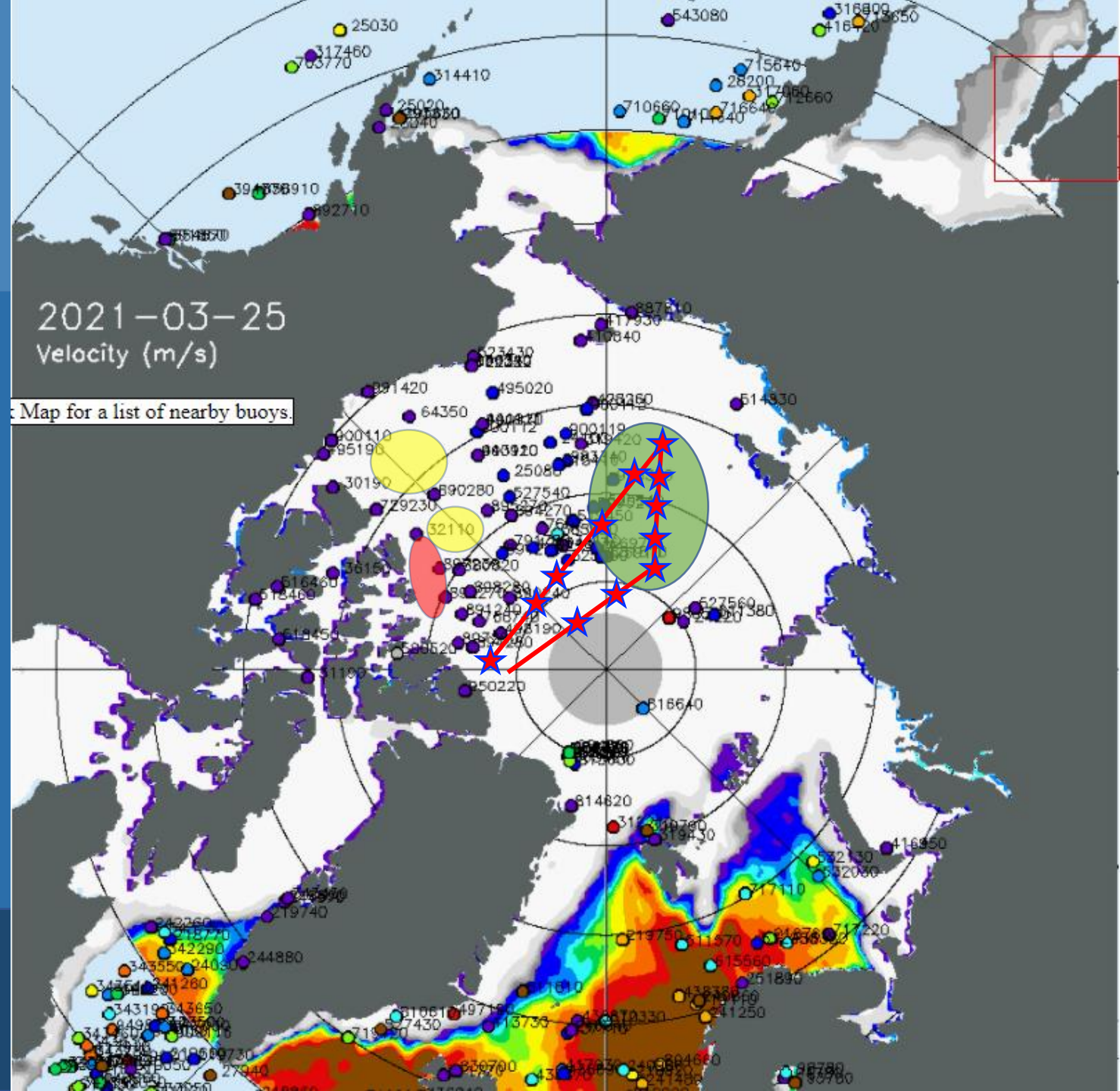
Pri 2 WX



Pri 2 Bergs

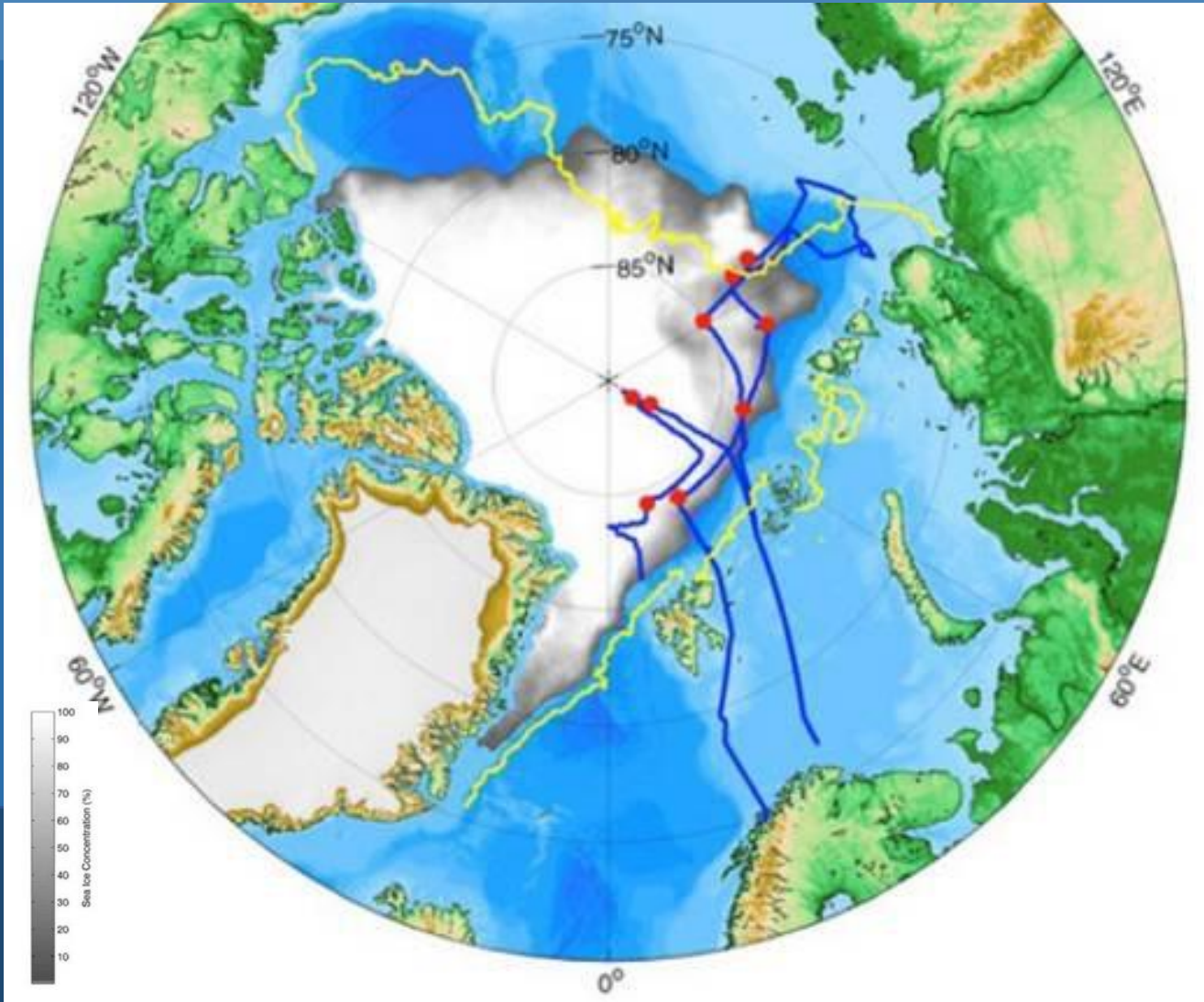


Priority 1 may take multiple flights for proper seeding



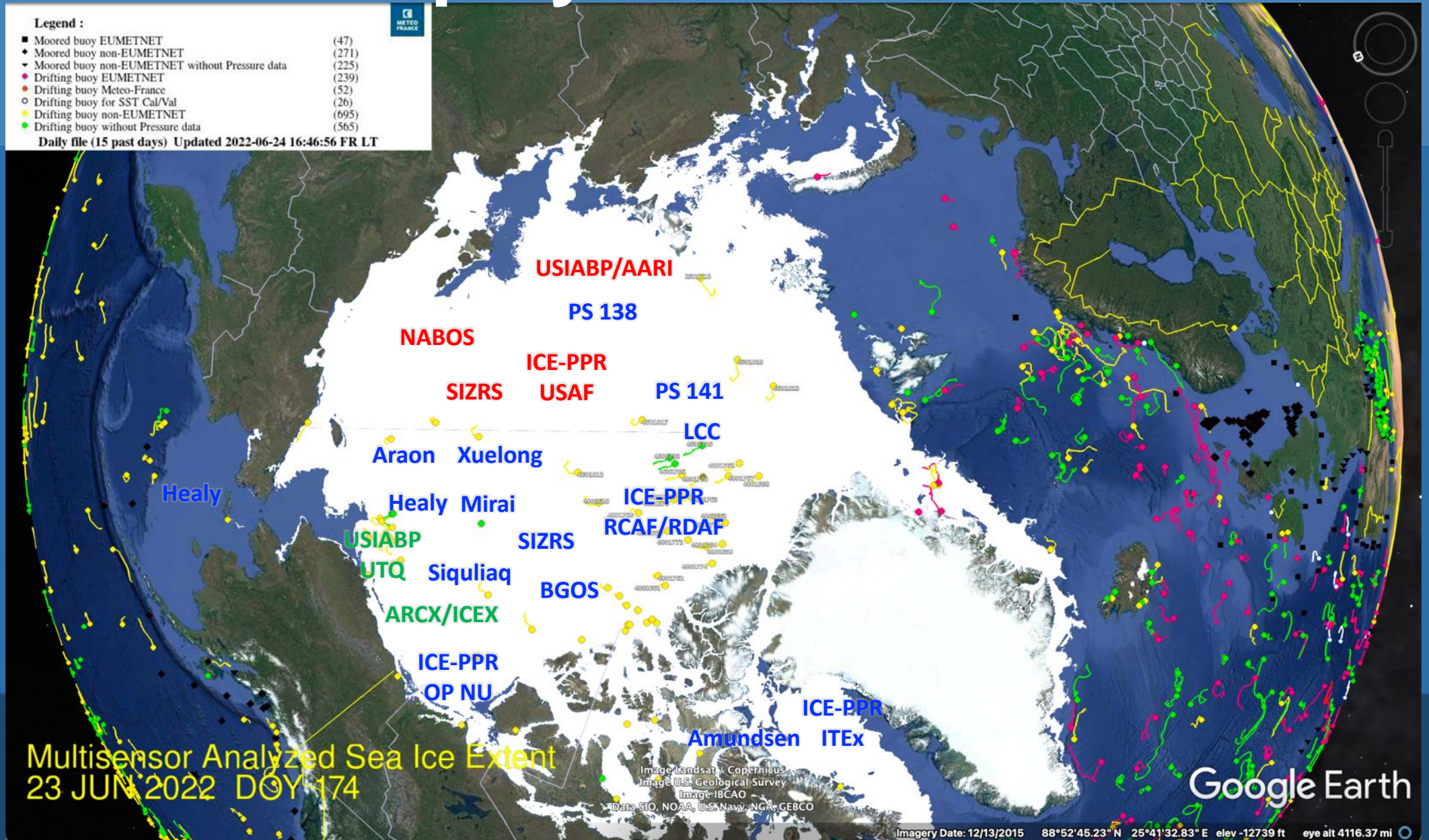
RV Polarstern, Aug-Sep. 2023

PS138; Project: ARCWATCH 1 (GPF 20-1_029)

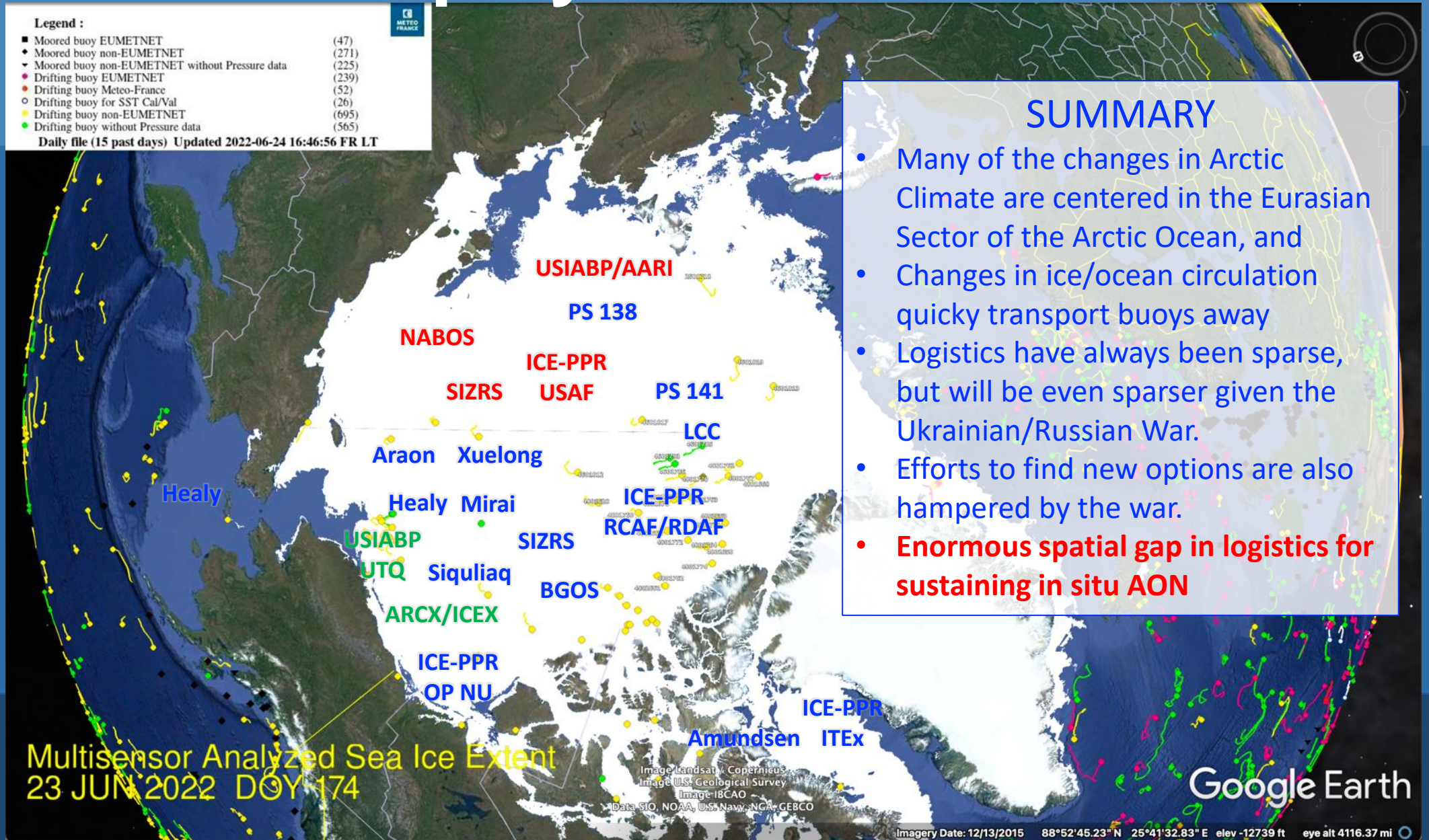


- Disciplines: Sea Ice including physics, cryo-pelagic and cryo-benthic coupling; Chemical and Physical Oceanography; Marine Biology, including Ocean Optics, Planktology, Sedimentology, Biogeochemistry, Microbiology, and Benthology; Marine Technology.
- Chief Scientist Antje Boetius
<Antje.Boetius@awi.de>
- Buoys:
 - N AXIB
 - N ITP
 - N SIMB3
 - N Ice Balls
 - N Etc.

IABP Deployment Plans 2023+



IABP Deployment Plans 2023+



END

International Programme for Antarctic Buoys (IPAB)

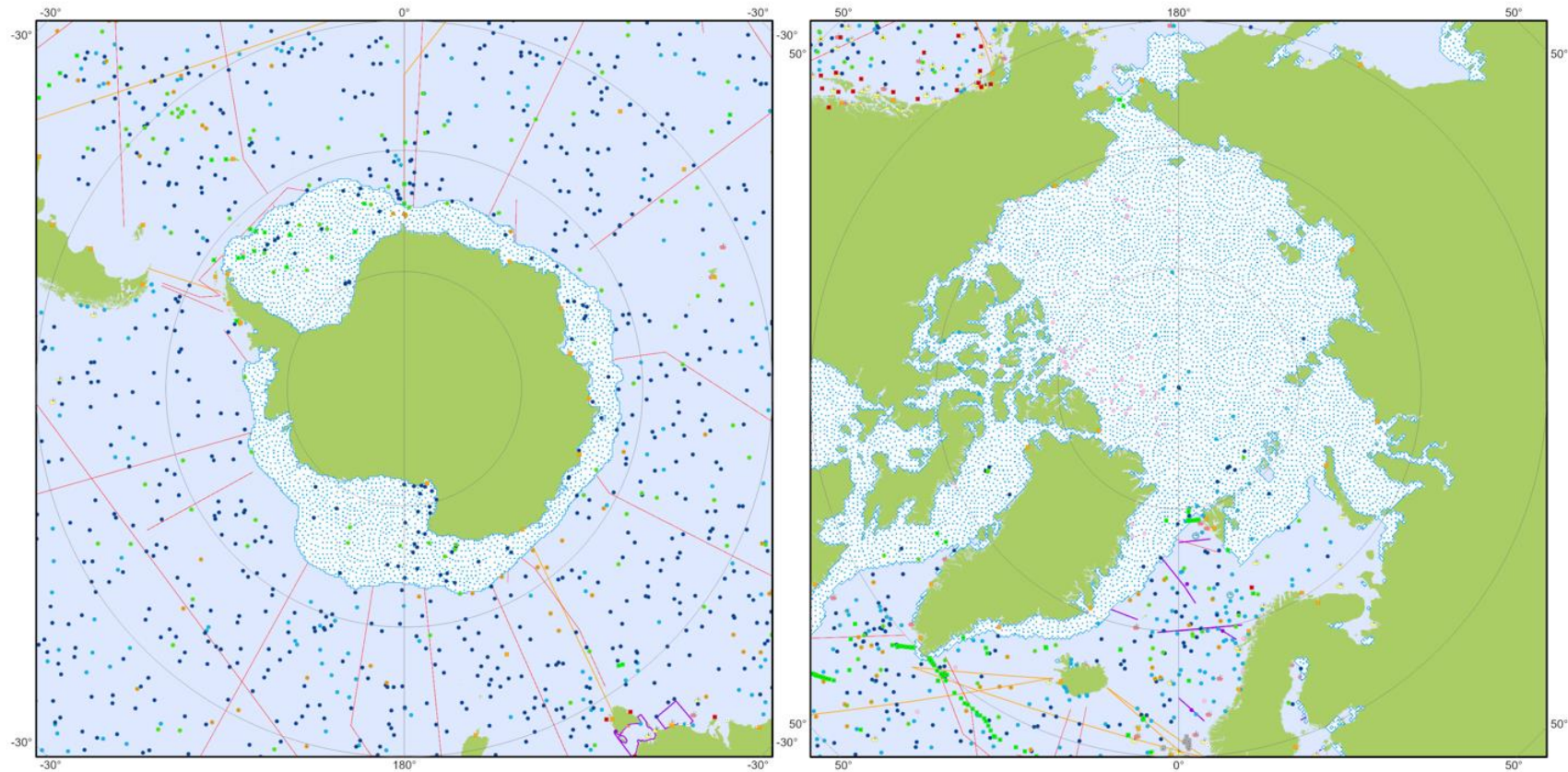
Chair: Petra Heil

Co-Coordination: Christian Haas and Ignatius Rigor

DBCP-38, Geneva, Switzerland

2 November 2022

IPAB Status Map



Polar basins observing system

In situ operational platforms monitored by OceanOPS

June 2022

Mobile systems

- Deep floats - Argo (49)
- Biogeochemistry floats - Argo (111)
- Core floats - Argo (826)
- Underwater gliders - OceanGliders (1)
- Drifting buoys - DBCP (155)
- Polar buoys - DBCP (1)

Fixed systems

- Animal borne sensors (19)
- Moored buoys - DBCP (4)
- Ocean reference stations - OceanSITES (25)
- Sea level gauges -GLOSS (42)
- High Frequency radars (10)

Ship based measurements

- Automated weather stations - SOT/VOS (8)
- Manned weather stations - SOT/VOS (58)
- Repeat hydrography - GO-SHIP (24)
- eXpendable BathyThermographs - SOT/SOOP (4)
- Sampled sites - OceanGliders (2)

Mobile systems

- Deep floats - Argo (27)
- Biogeochemistry floats - Argo (73)
- Core floats - Argo (228)
- Underwater gliders - OceanGliders (4)
- Drifting buoys - DBCP (156)
- Polar buoys - DBCP (59)

Fixed systems

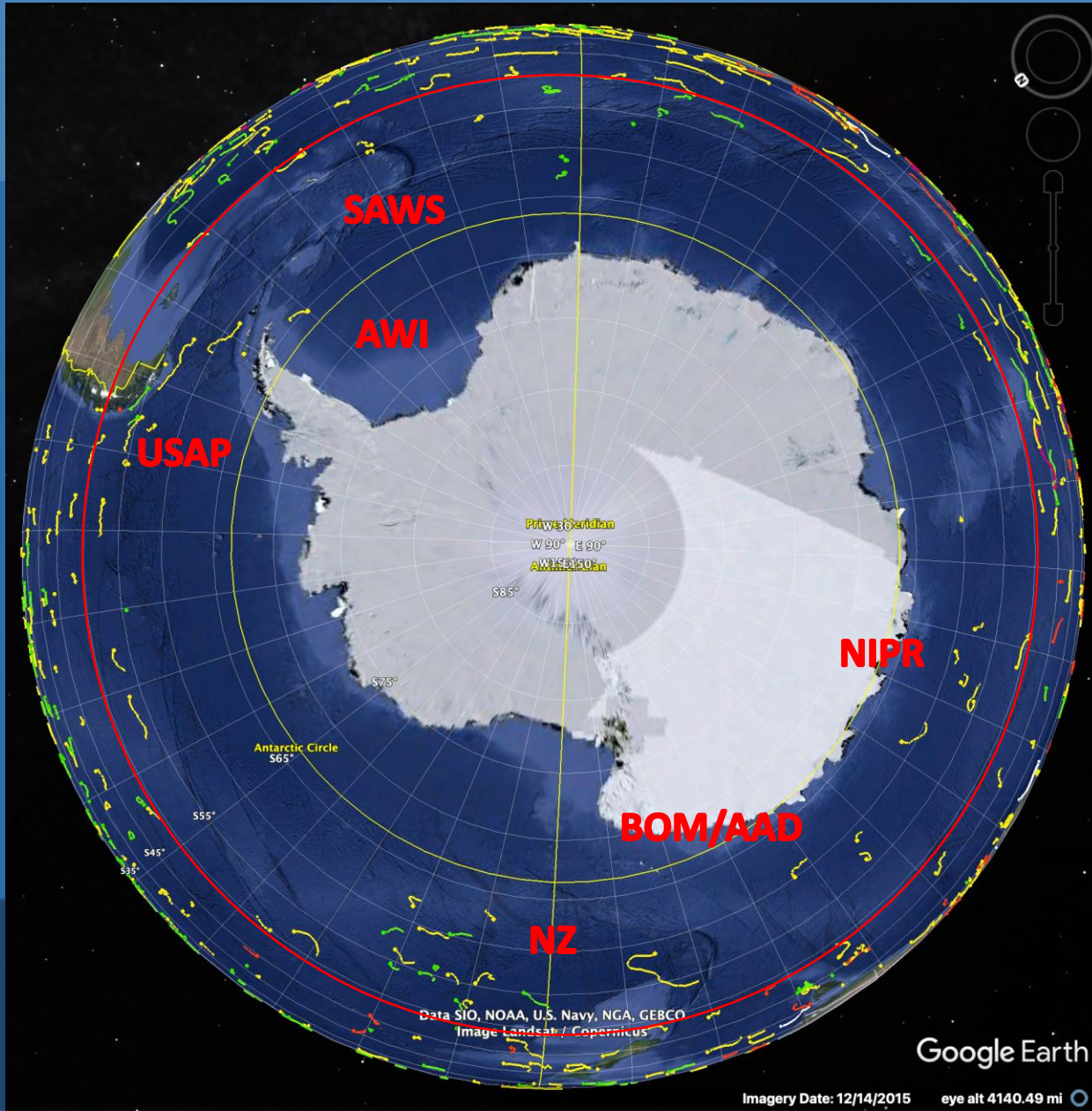
- Tsunameters - DBCP (4)
- Offshore platforms - DBCP (18)
- Moored buoys - DBCP (19)
- Ocean reference stations - OceanSITES (93)
- Sea level gauges -GLOSS (41)
- High Frequency radars (10)

Ship based measurements

- Radiosondes - SOT/ASAP (5)
- Automated weather stations - SOT/VOS (150)
- Manned weather stations - SOT/VOS (235)
- Repeat hydrography - GO-SHIP (13)
- eXpendable BathyThermographs - SOT/SOOP (4)
- Sampled sites - OceanGliders (11)



IPAB Status Map



SUMMARY

- Drifting buoys reporting south of 50S primarily provided by the US GDP, Australian Antarctic Division, and the Alfred Wegener Institute, Germany.
- Logistics provided by
 - Japan's National Institute of Polar Research (NIPR) which has been deploying ~10 drifters/yr, at roughly 60S, 85E-110E.
 - New Zealand Navy has also been deploying SVP buoys north of the ice, they facilitate NZ Met Service activities.
 - AWI RV Polarstern plans to sail to the Weddell Sea in Winter 2022-2023.
 - Other logistics of opportunity provided by BOM, KOPRI, SAWS, USAP.
 - Hoping to leverage New Zealand's involvement in ICE-PPR to deploy buoys on sea ice using C-130s.

END