

PAG Fall Meeting 2016 (27-28 October 2016, Qingdao, China)

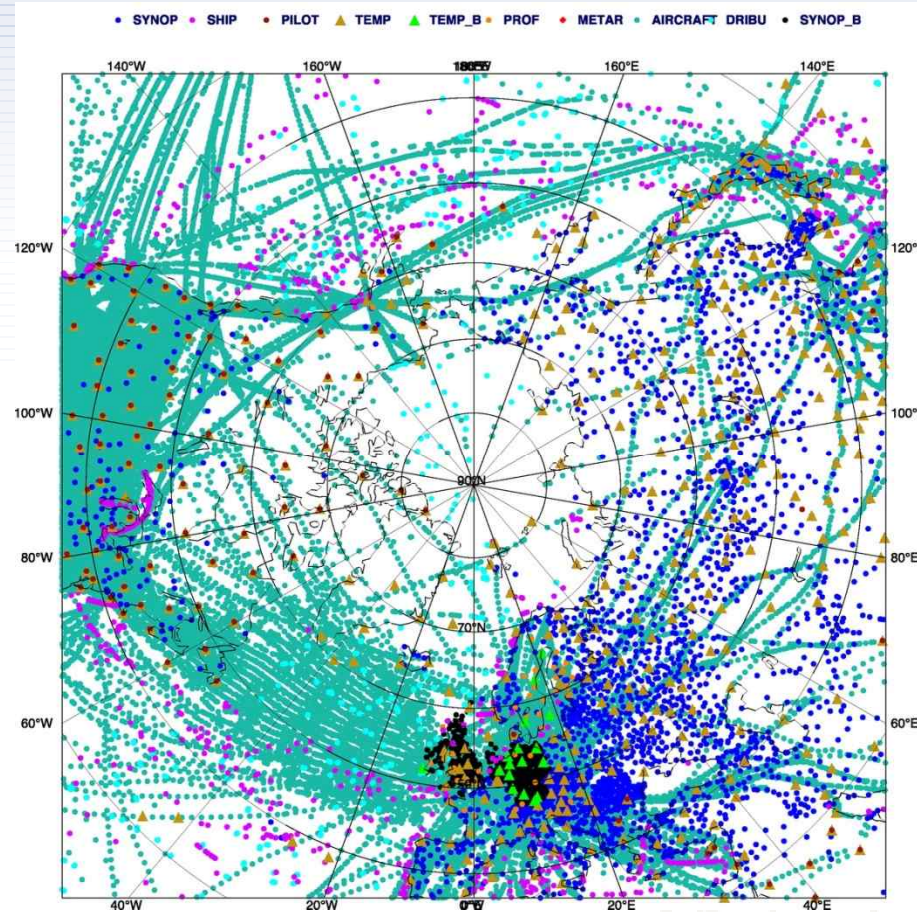
Updates of PAG Joint Field Activities - Atmosphere and Sea Ice -

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Korea Polar Research Institute



Polar observations - fill the gaps

- Conventional observations of different types (assimilated by ECMWF on 15 April 2015)



Jung et al. (2016, BAMS)

“The polar regions are among the most sparsely observed parts of the globe by conventional observing systems.”

Field activities during 2016 ARAON Arctic cruise

- **Leg 1: 5 August to 21 August (17 days)**

- Region: Bering, Chukchi and East Siberian Seas
- Ship-borne meteorological observations
 - Surface: Air temperature, Humidity, Winds, SW/LW Radiations, etc.
 - Upper-atmospheric sounding: Radiosonde launch
- Buoy deployments during sea ice camp

- **Leg 2: 25 August to 9 September (16 days)**

- Region: Chukchi and East Siberian Seas
- Ship-borne meteorological observations
 - Surface measurements and upper-atmospheric sounding

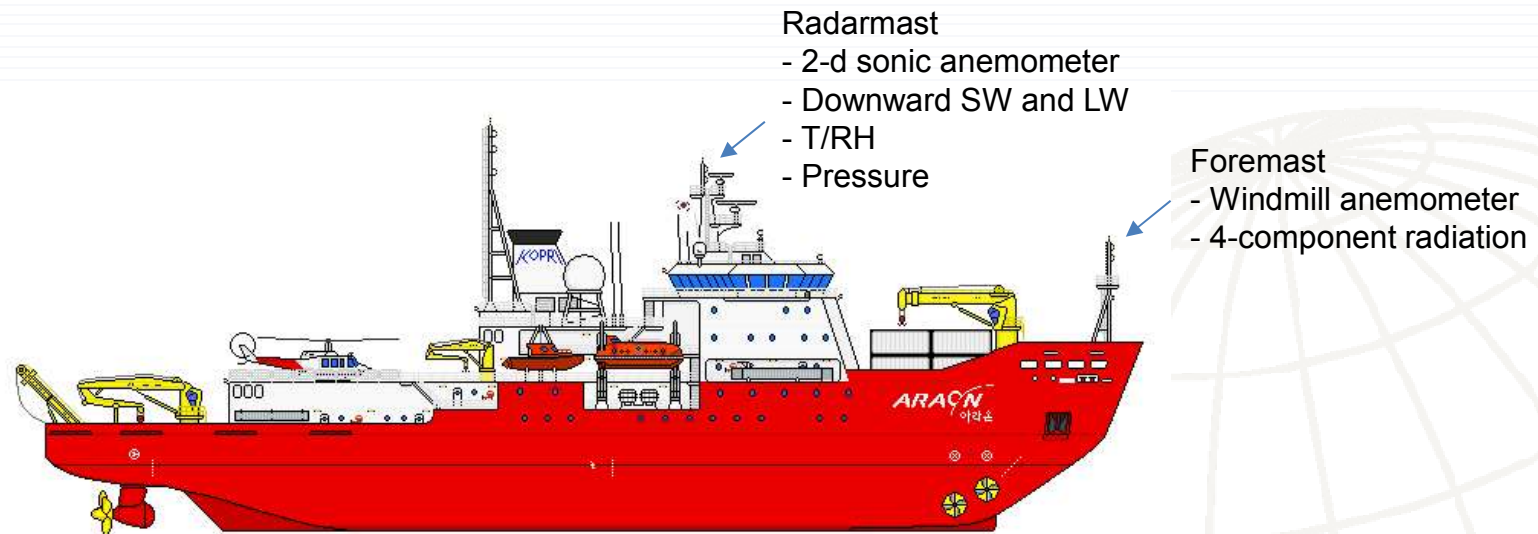
- **Collaborations**

- Radiosonde launch: IARC/UAF (USA), Yonsei Univ. (Korea)
- Buoy deployments: BAS (UK), UPMC/LATMOS/LOCEAN (France), CSIC (Spain), OUC (China), etc.



Ship-borne meteorological observations

- 2014

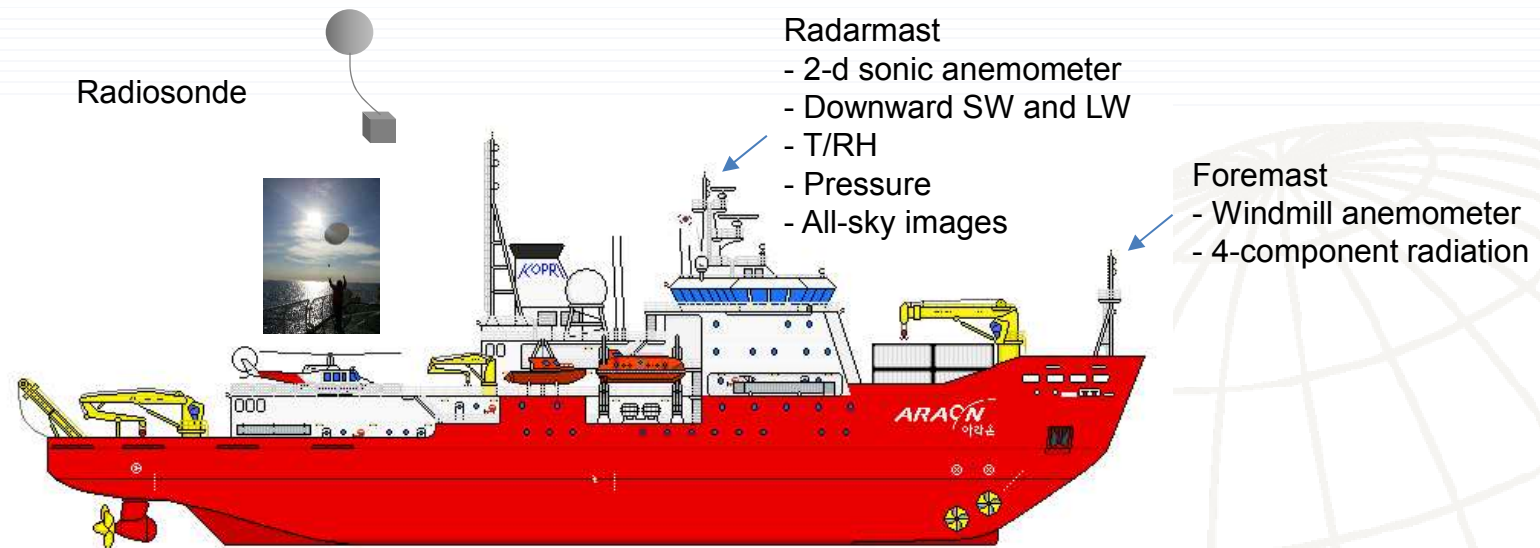


<Objectives>

- Surface basic meteorological variables: physical understanding of weather events, numerical weather prediction, assessment of reanalysis data
- Cloud and radiative fluxes: cloud radiative effect on surface, assessment of reanalysis data, physical understanding of weather events

Ship-borne meteorological observations

- 2015

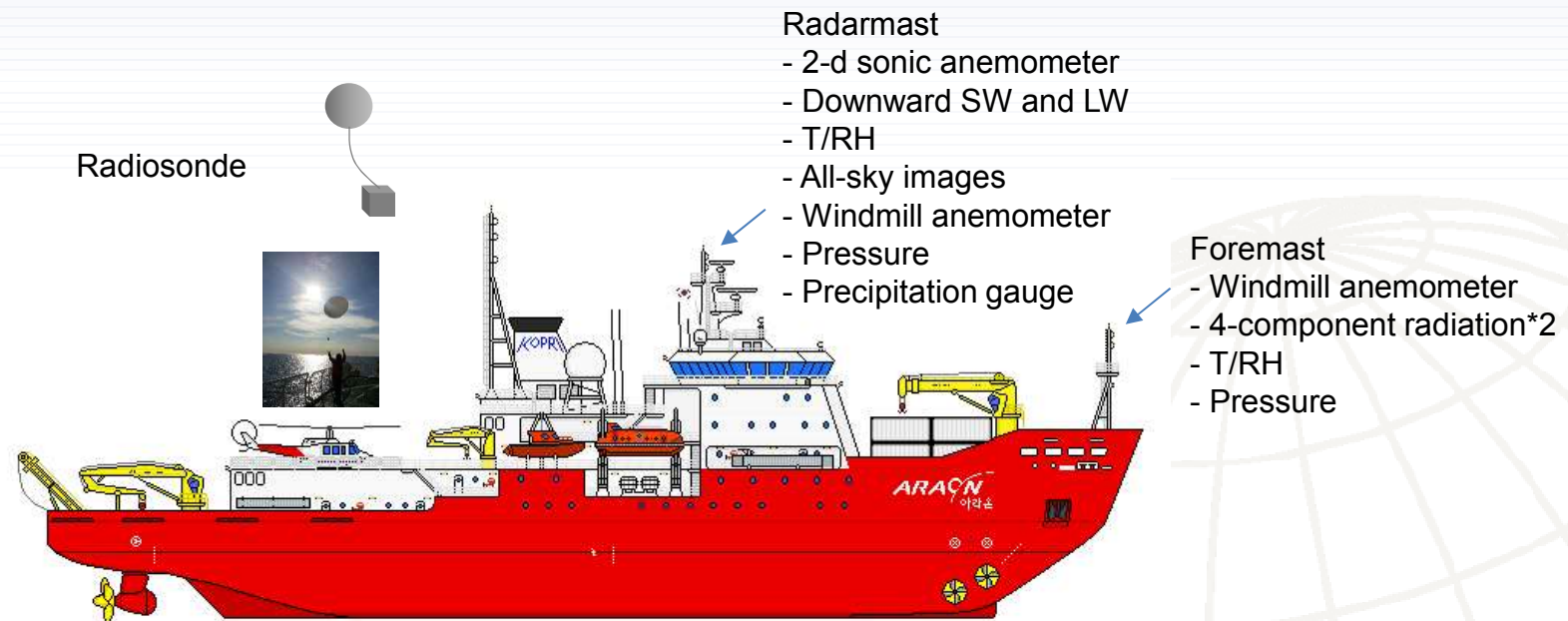


<Objectives>

- Surface basic meteorological variables: physical understanding of weather events, numerical weather prediction, assessment of reanalysis data
- Cloud and radiative fluxes: cloud radiative effect on surface, assessment of reanalysis data, physical understanding of weather events
- Radiosonde launch: physical understanding of weather events, numerical weather prediction, assessment of reanalysis data, cloud and radiation

Ship-borne meteorological observations

- 2016
 - All meteorological instruments have been replaced.



<Objectives>

- Surface basic meteorological variables: physical understanding of weather events, numerical weather prediction, assessment of reanalysis data
- Cloud and radiative fluxes: cloud radiative effect on surface, assessment of reanalysis data, physical understanding of weather events
- Radiosonde launch: physical understanding of weather events, numerical weather prediction, assessment of reanalysis data, cloud and radiation

Radiosonde launches

(2015) August 2 ~ August 20 (Only for the leg-1 period of Arctic cruise)

- Frequency
 - Twice daily (00, 12 UTC)
 - 4-times daily (00, 06, 12, 18 UTC) around the ice camp period (18 UTC 11 Aug. ~ 12 UTC 14 Aug.)
- Total number of launch: 50
 - 43 succeeded, 7 failed
 - Average ascending height: 30 km (mid-stratosphere)
- 00 and 12 UTC observations were transmitted within cut-off time.



(2016) August 5 ~ September 9 (For the entire Arctic cruise (leg-1 and leg-2))

- Frequency
 - Leg 1 (5 Aug ~ 21 Aug): Twice daily (00, 12 UTC) – regular, 4-times daily (00, 06, 12, 18 UTC) around the ice camp period, and 8-times daily during the ice camp period (00 UTC 14 Aug. ~ 06 UTC 15 Aug.)
 - Leg 2 (26 Aug ~ 9 Sep): Twice daily in August, 4-times daily in September with two days of 3-hourly obs (4-5 Sep)
- Total number of launch: 94 (scheduled)
 - Leg 1: 42 (scheduled), 41 launched (Eight didn't reach 100 hPa)
 - Average ascending height: 28 km (mid-stratosphere)
 - Leg 2: 52 (scheduled), 47 launched (Nineteen didn't reach 100 hPa)
- 00 and 12 UTC observations have been transmitted within cut-off



Attempts to make our data on-line



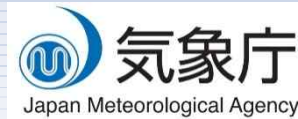
Shipboard observation



INMARSAT satellite



KOPRI server



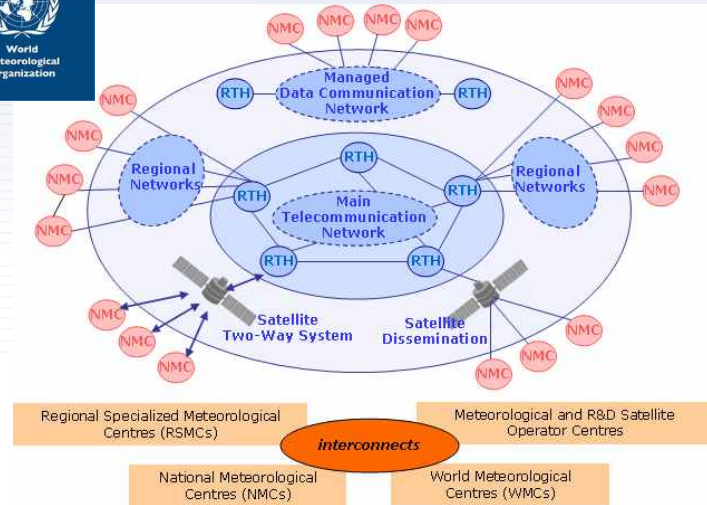
Japan Meteorological Agency



Korea Meteorological Administration



Global Telecommunication System (GTS)



<WMO ftp server>

ftp://ftp.wmo.int/wmo-ddbs/OperationalInfo/VolumeC1/From_WMO/VolumeC1/

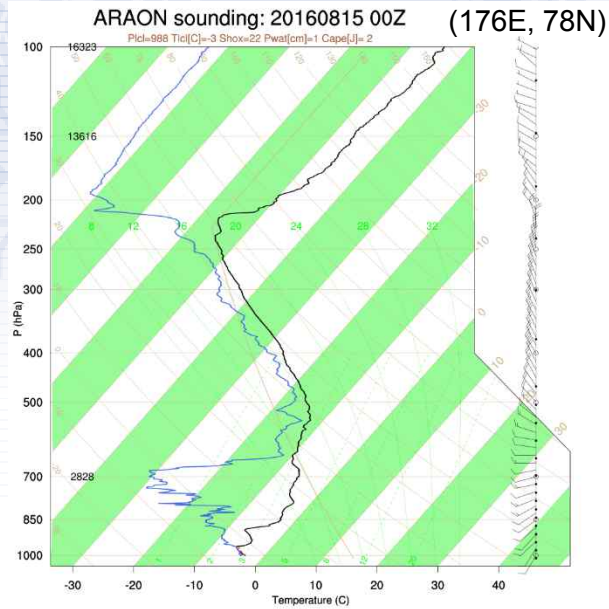
Catalogue of Meteorological Bulletins which gives for each compiling or editing centre of the GTS the list of meteorological bulletins being transmitted for global, inter-regional and regional exchanges

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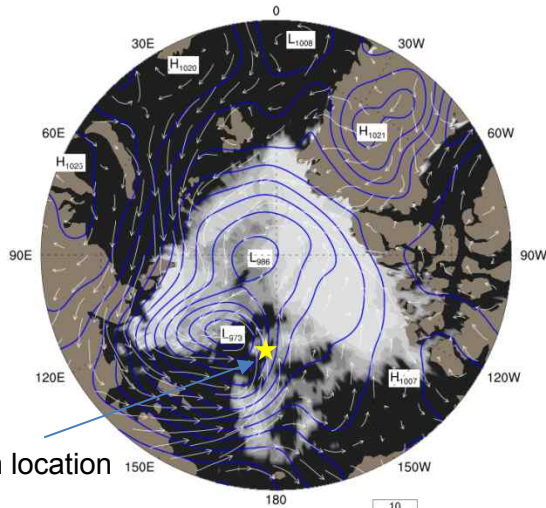
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A great storm in August 2016

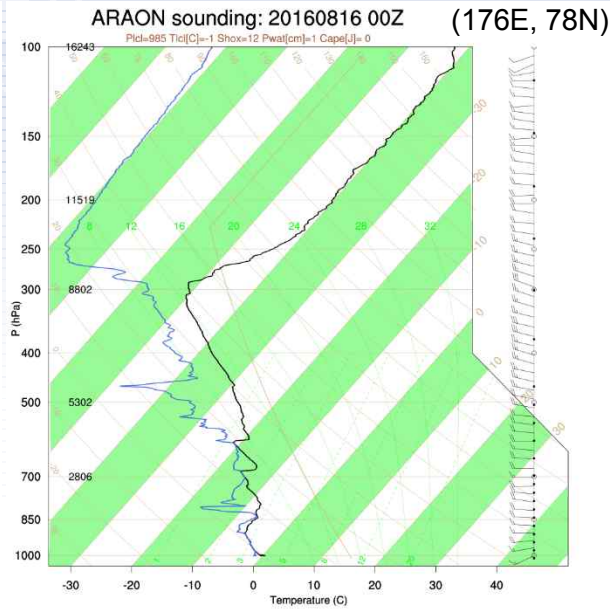
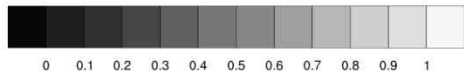


Ice Cover (shading) & MSLP (contour) & UV 10m

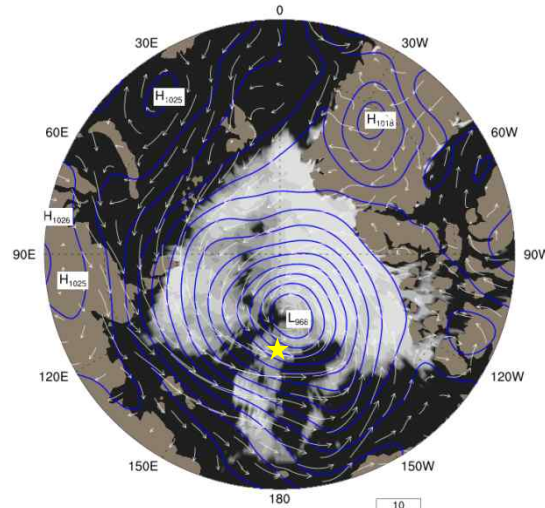


Araon location

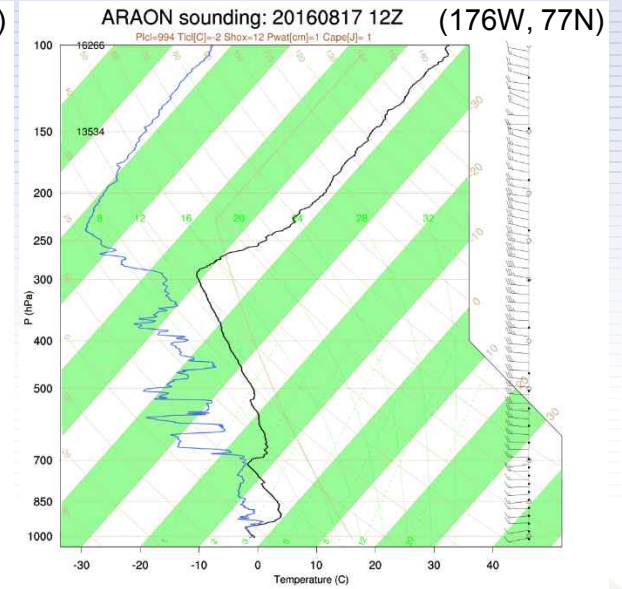
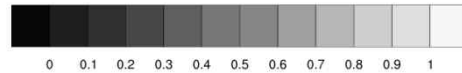
CONTOUR FROM 960 TO 1064 BY 4



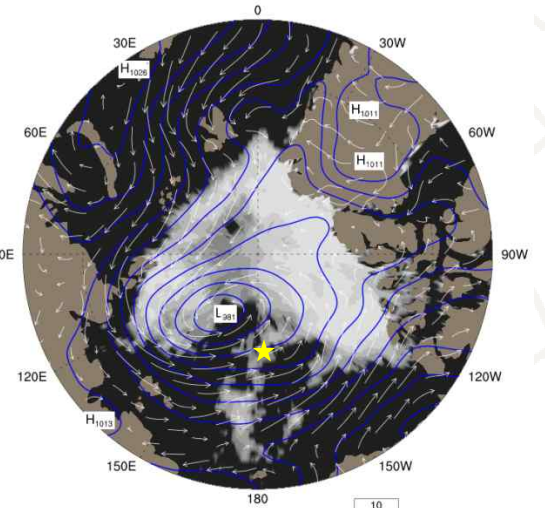
Ice Cover (shading) & MSLP (contour) & UV 10m



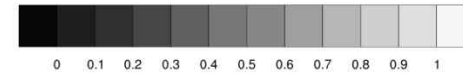
CONTOUR FROM 956 TO 1060 BY 4



Ice Cover (shading) & MSLP (contour) & UV 10m

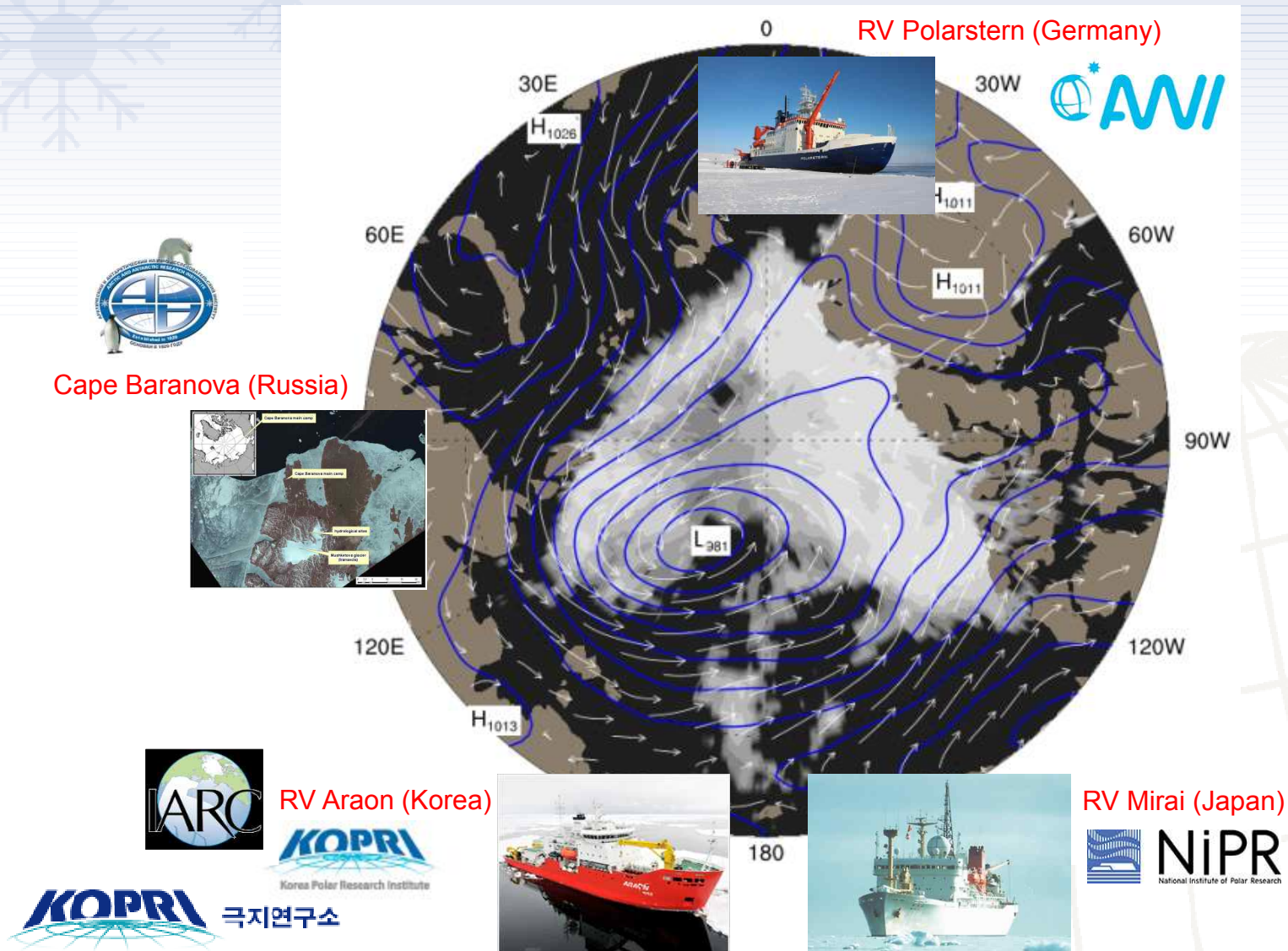


CONTOUR FROM 952 TO 1040 BY 4

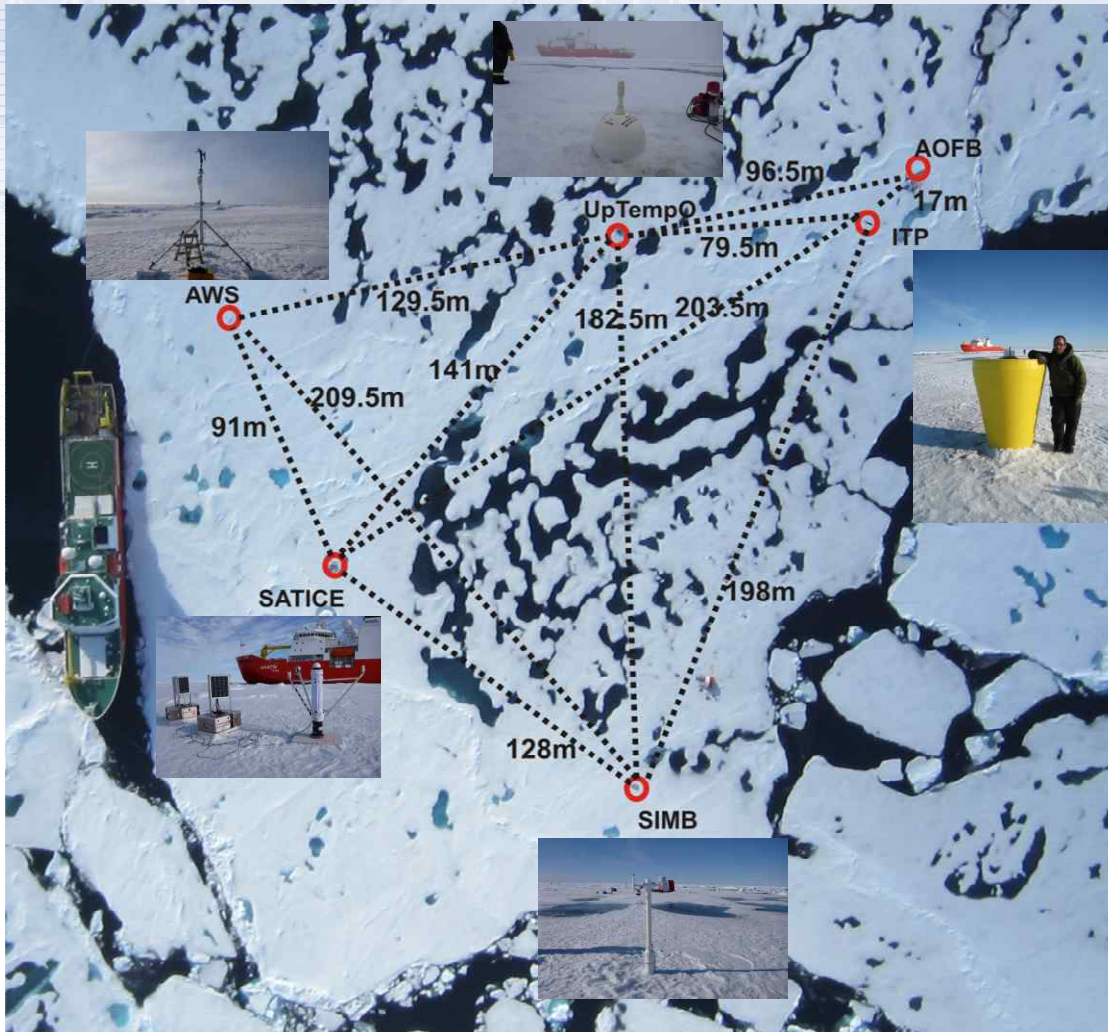


International radiosonde campaign in summer 2016

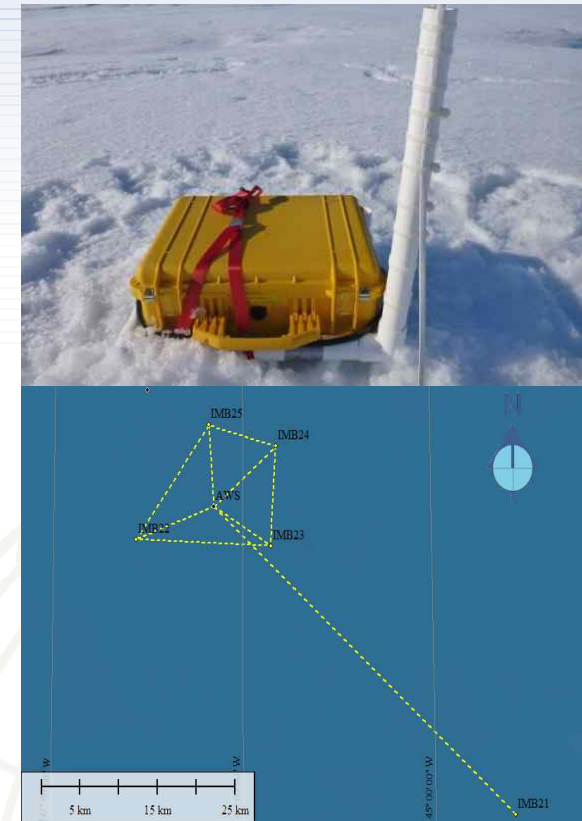
- Summer predictability over Northern sea route (lead by Jun Inoue (NIPR, Japan))



Buoy deployments on sea ice (2014)



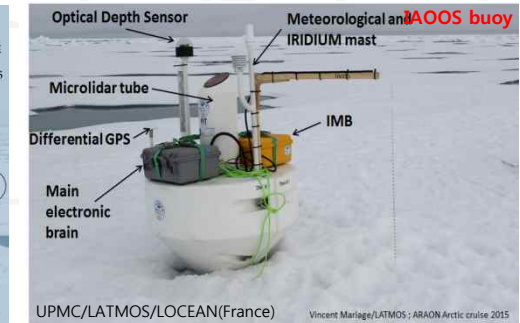
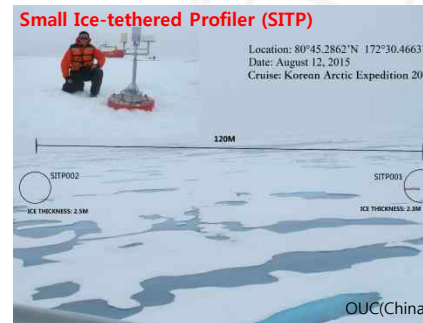
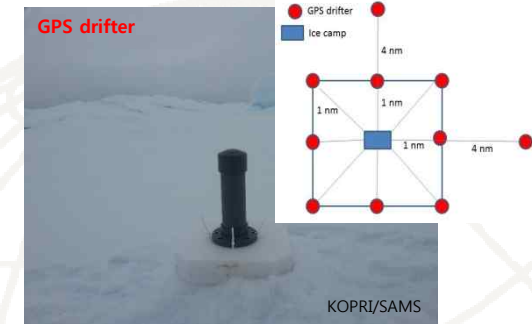
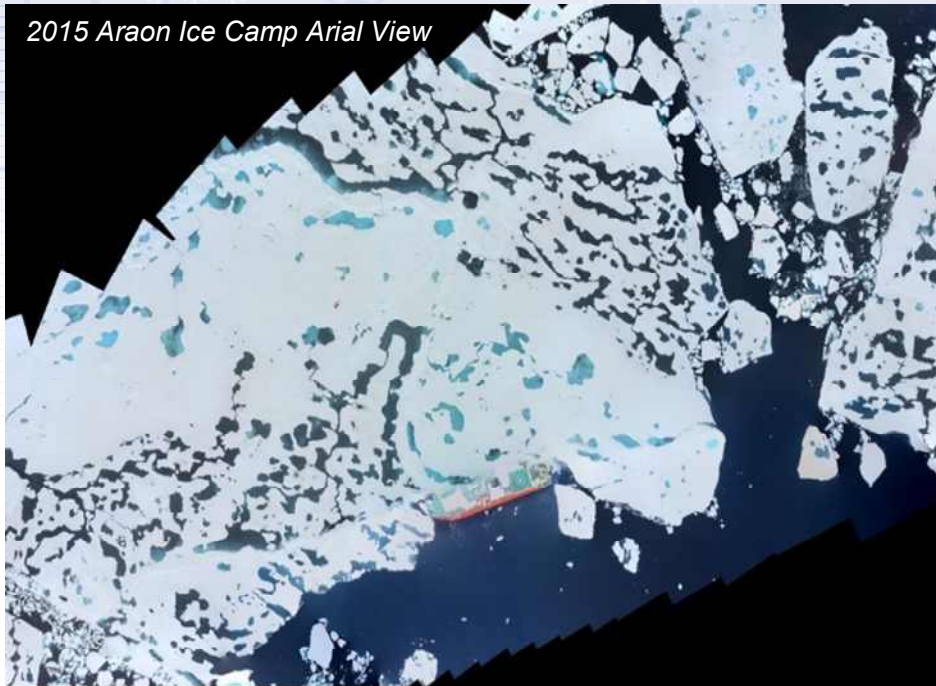
Floe-scale buoy array



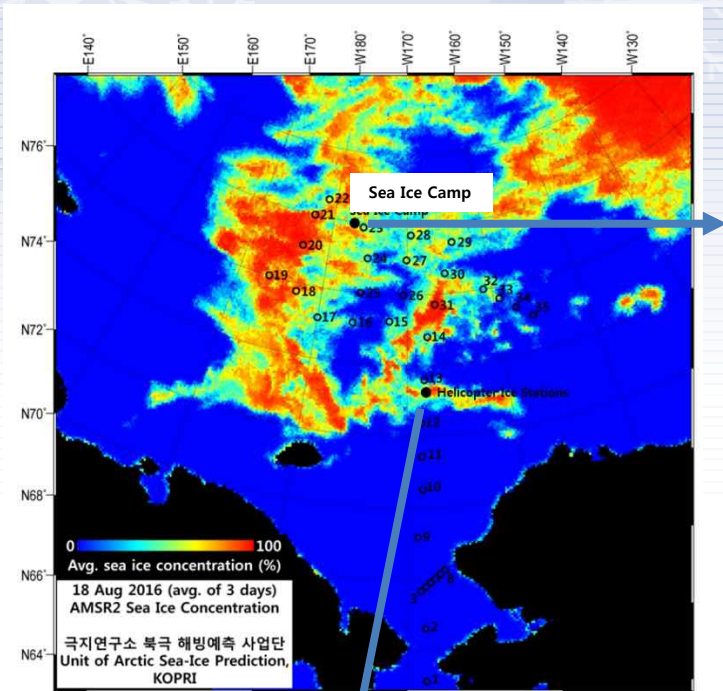
Large-scale IMB array

Provided by Phil Hwang (SAMS)

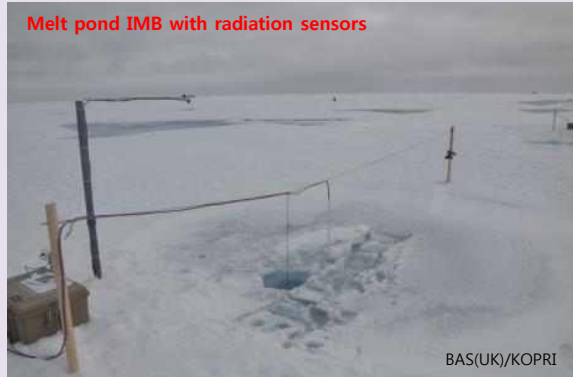
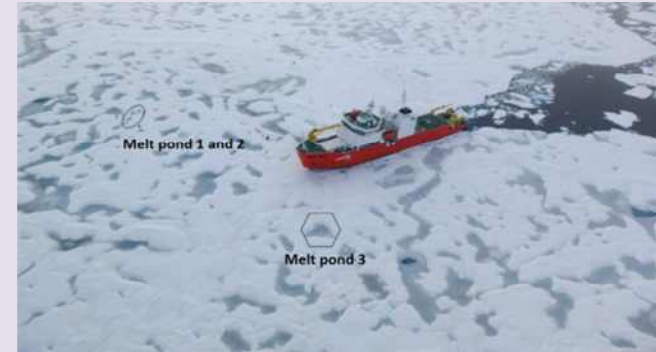
Buoy deployments on sea ice (2015)



Buoy deployments on sea ice (2016)

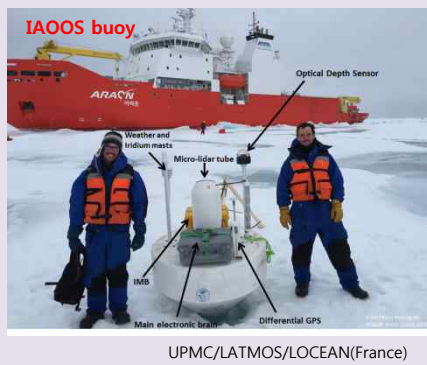


Main Sea Ice Camp (14-15 August)



BAS(UK)

Helo Ice Stations (8 August)



OUC(China)



Thank You

