

# The Status and future plan on the Argo observation in the East Sea (Sea of Japan)

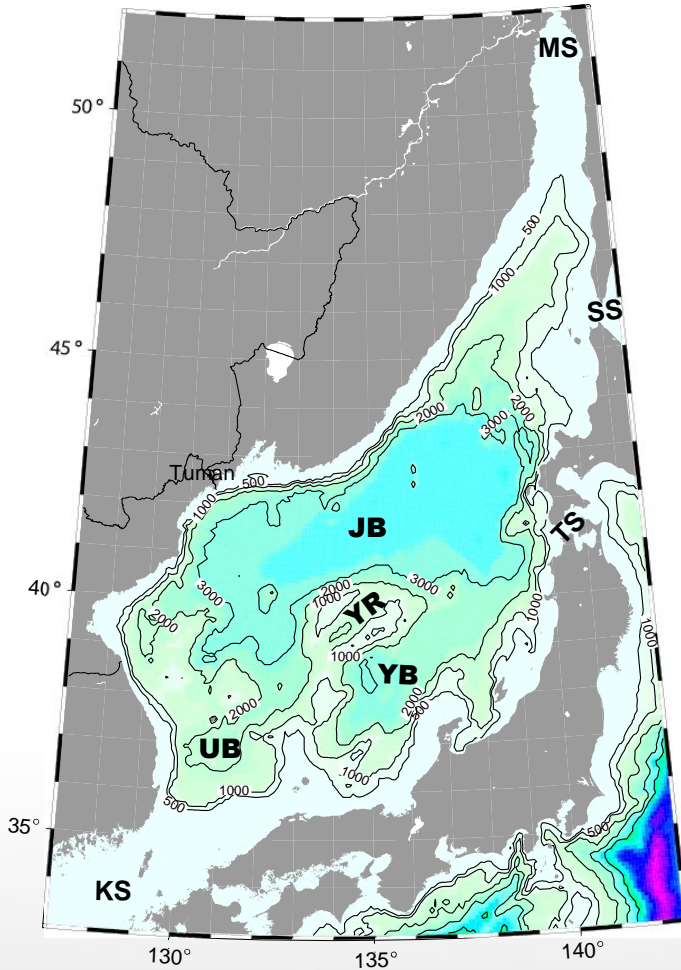
National Institute of Meteorological Research, KMA

Sang-Boom Ryoo



- Deployment and observation status
  - Domain, Location and number, active and profile number,
- Monitoring & Research
  - long-term variation of temperature profile
  - Argo data application to ocean modeling
- KMA plan 2012

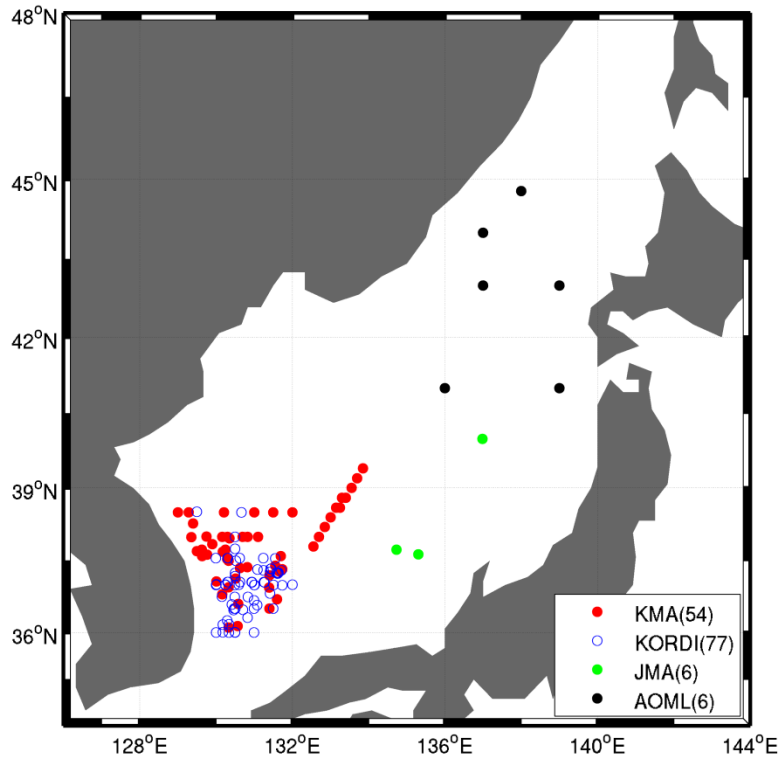
# Domain



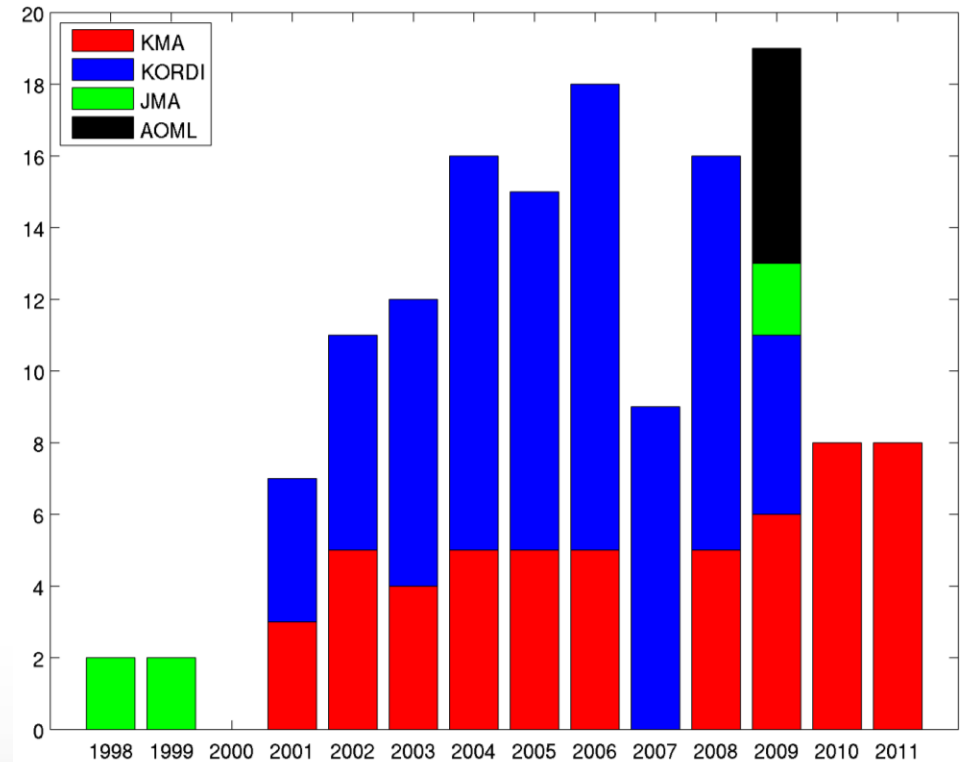
- The East Sea is a marginal sea of the western Pacific Ocean
- It is semi-closed sea and consists of three large basins
  - maximum depth reaches 4000m in Japan Basin
- The East Sea is connected to open sea through four shallow (~200m) straits.
  - Warm current flows into the sea via Korea str. (2-3sv)
- Below about 500m, a cold and nearly homogeneous water mass exists.
- The East Sea has a similar water characteristics and current system with open ocean  
→ **“Miniature of Ocean”**

# Deployment Location and Float Number

## ◆ Location



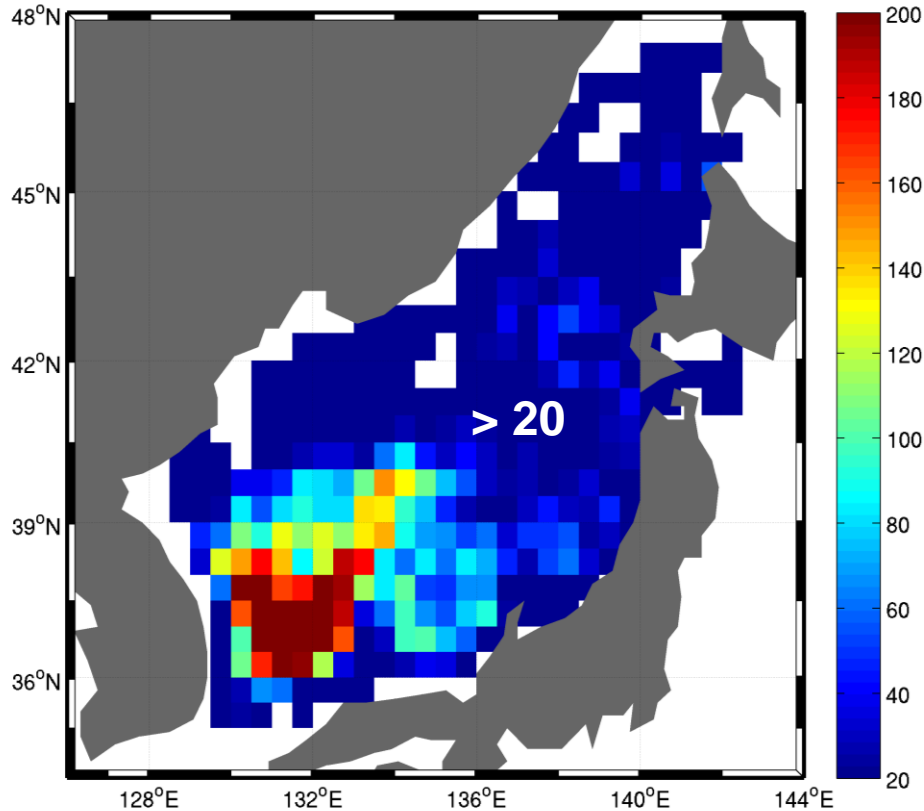
## ◆ Number of floats since 1998



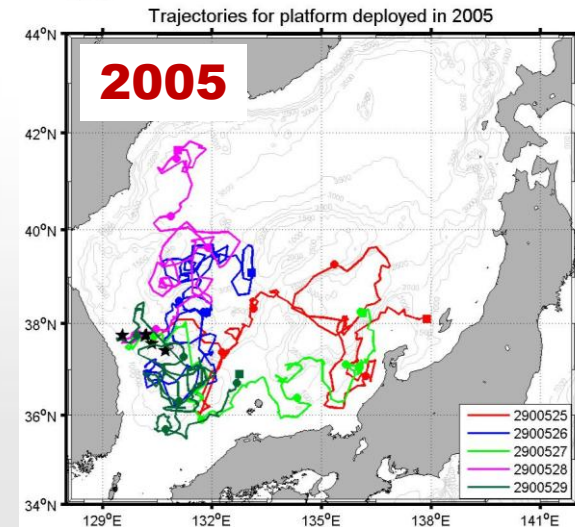
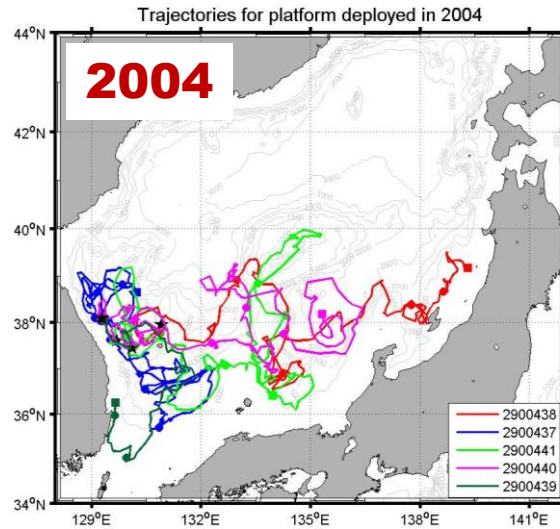
Total 143 of Argo floats were deployed by KMA, KORDI, JMA, and AOML

# Density of Argo Obs.

- ◆ Number of profile data within 0.5 x 0.5 deg. grid (1998-2011)



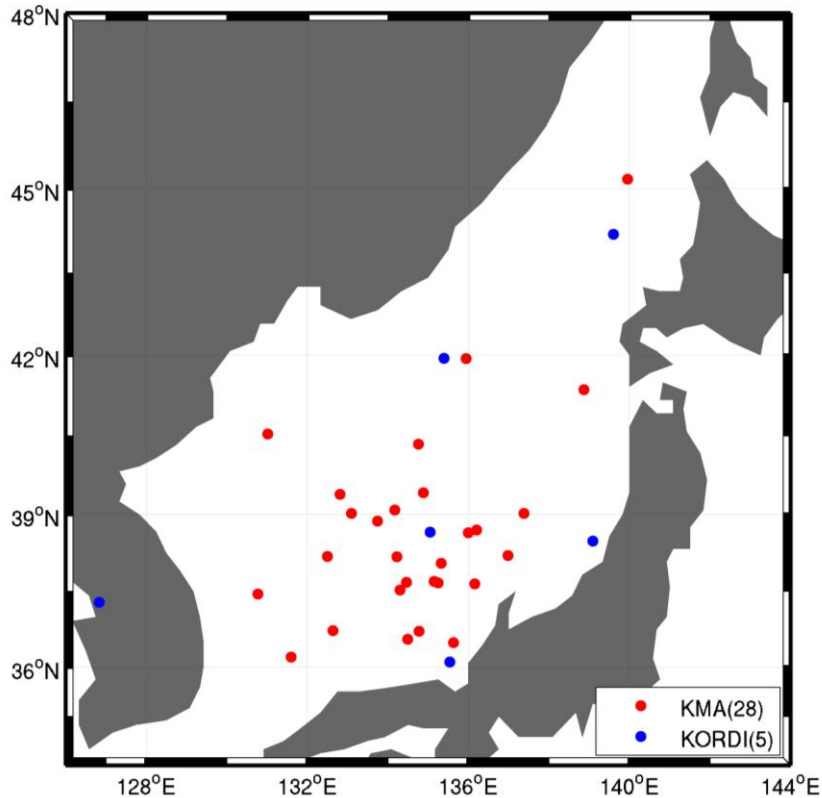
- ◆ Trajectories of KMA floats deployed in 2004 and 2005



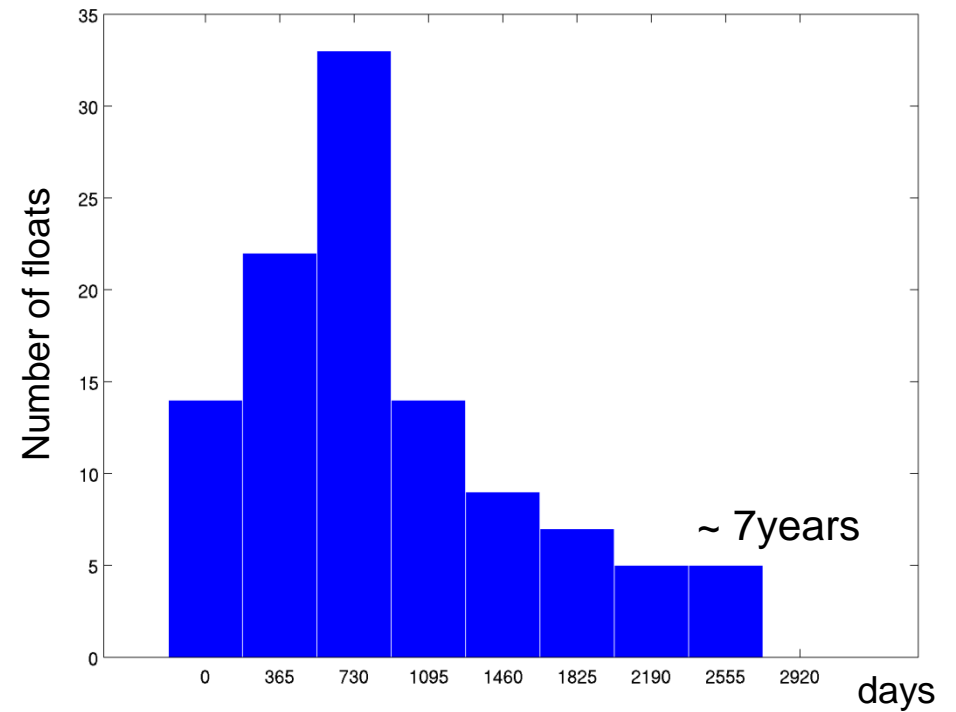


# Active Floats & Life-time

## ◆ Active floats : 33 (2012.3.14)



## ◆ Life-time of floats (without active floats)



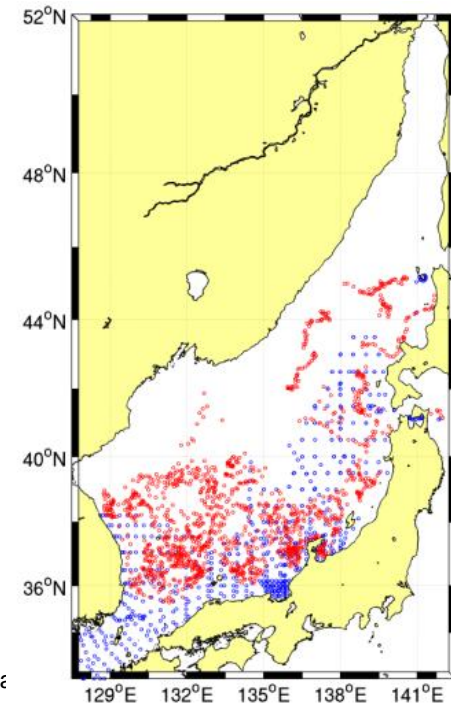
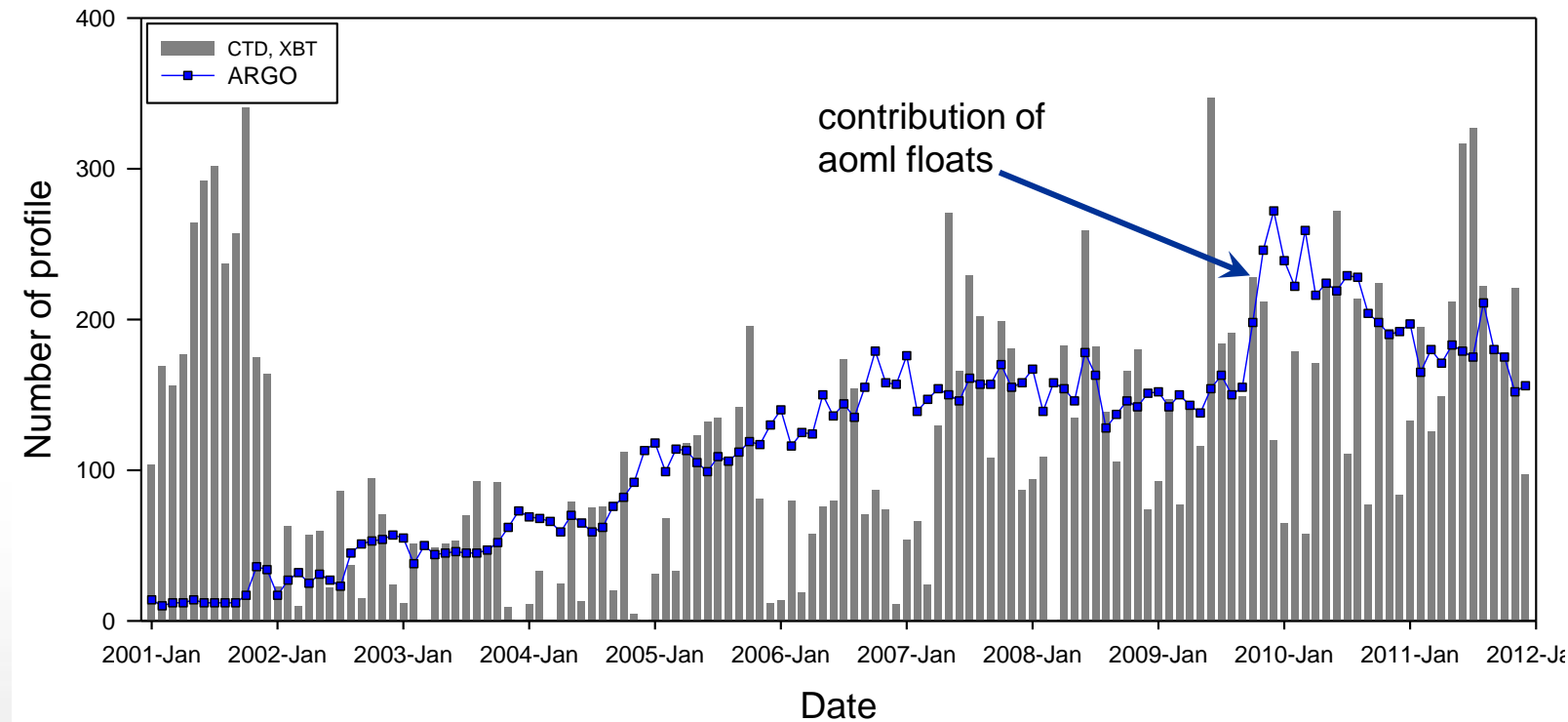
# Number of Profiles

## ◆ Number of monthly temperature profiles

- Argo data gradually increase from 2001
- Temporal distribution is more dense.

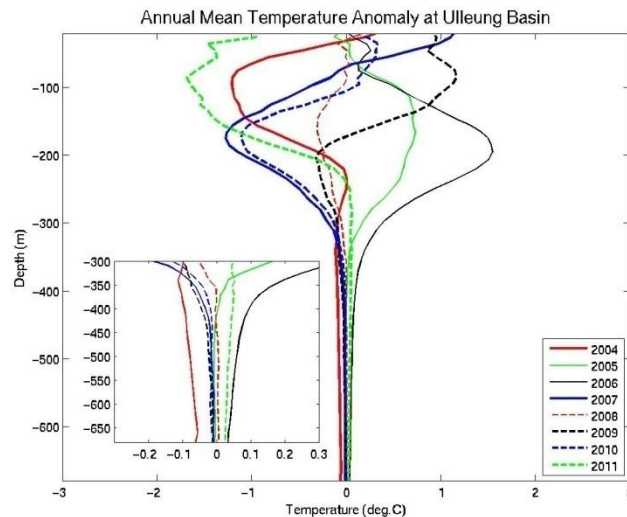
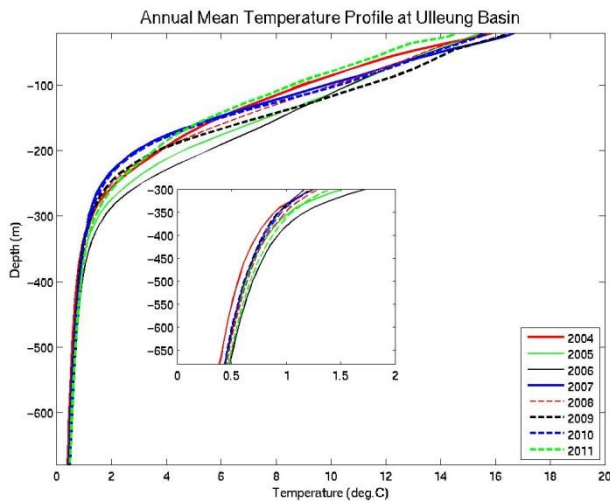
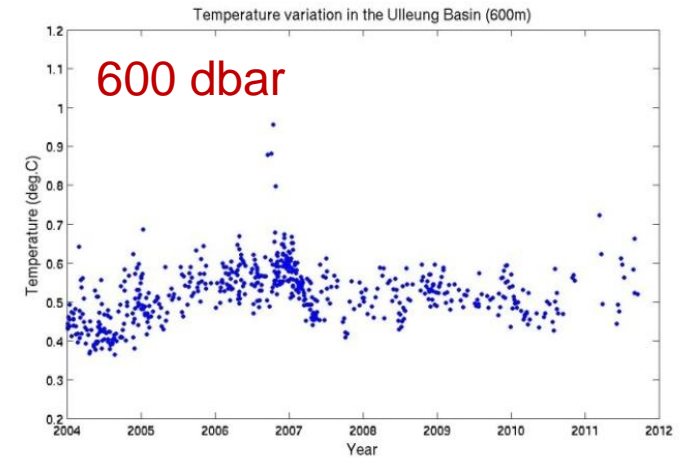
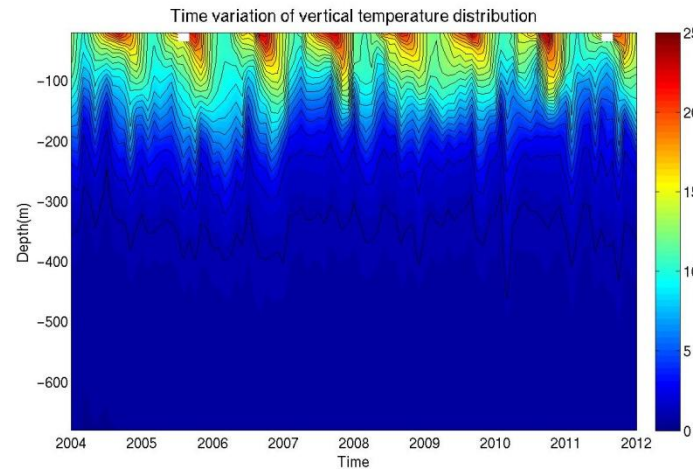
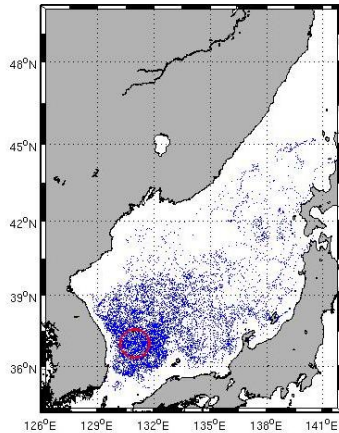
## ◆ Profile data in 2009

- Argo
- CTD & XBT



# Monitoring of Temperature in Ulleung Basin

- KMA conducts monitoring of temperature in the East/Japan Sea from 2004, using Argo data
- Results are displayed in the NIMR-Argo web site with R- and/or D-files  
(<http://argo.nimr.go.kr>)





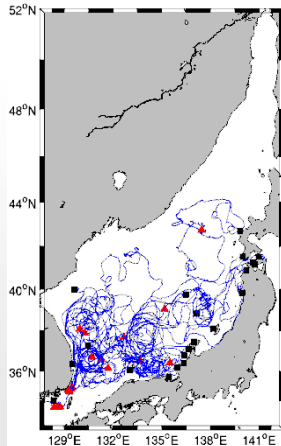
# Impacts of Argo Data in the Ocean Circulation Model

## ◆ Ocean Model & Exps.

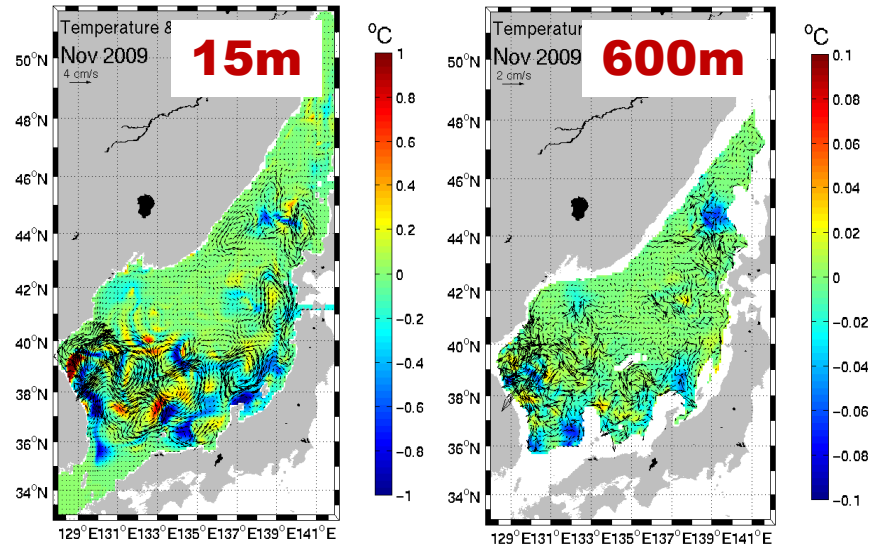
- Ocean model: GFDL MOM 3
- Resolution:  $0.1^\circ \times 0.1^\circ$ ; 42 vertical levels
- DA: 3D VAR
  - T profiles (including Argo)
  - SST
  - SSH
- Experiments (2009 hindcast):
  - All data assimilated ([Exp\\_all](#))
  - without Argo assimilation ([Exp\\_NoArgo](#))

## ◆ Surface drifters (2009)

- 18 surface drifters from AOML
- Drogue depth: 15 m

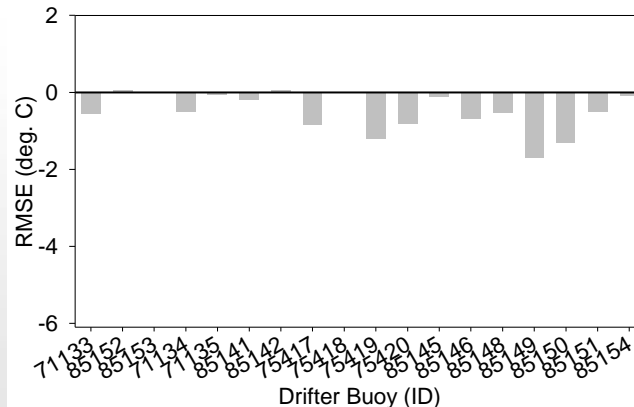


## ◆ Temp. & Vel. Diff. (Exp\_all – Exp\_NoArgo)

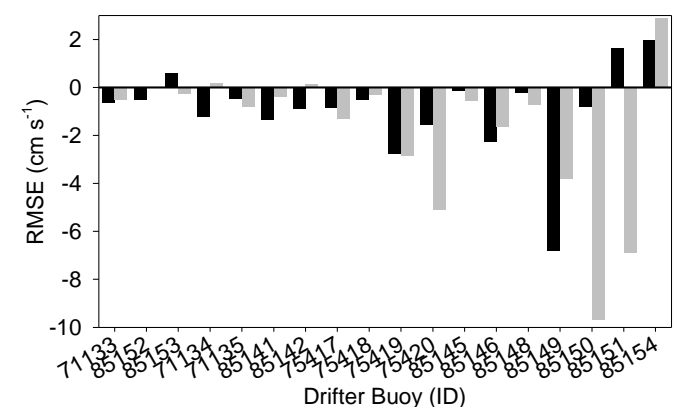


## ◆ RMSE Diff. (Exp\_all – Exp\_NoArgo)

### SST (1<sup>st</sup> layer)

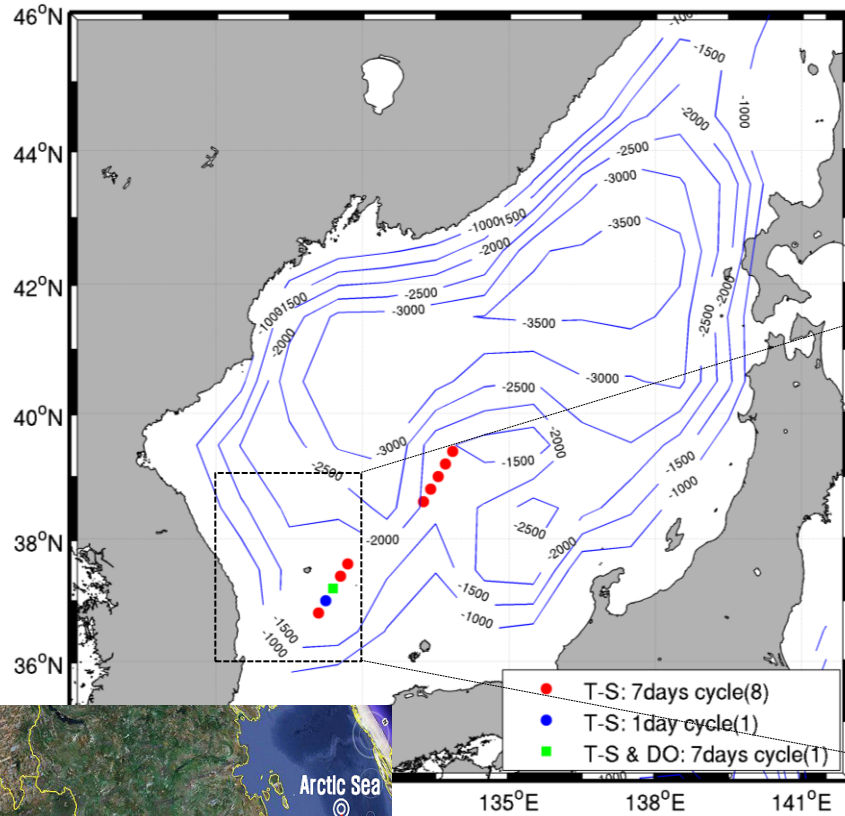


### U, V comp. (15m dep.)



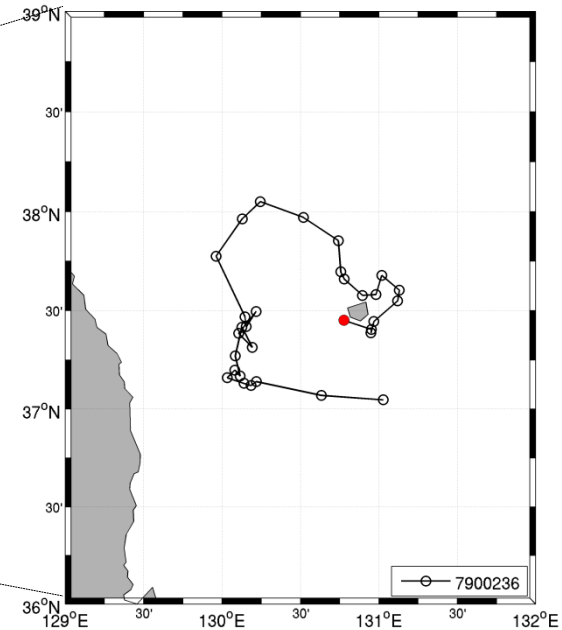
# KMA Plan 2012

## ◆ Deployment Plan: 10 floats in July 2012



## ◆ CTD observation in April 2012

- to examine the feasibility of East Sea Argo data DMQC
- location: near float of '7900236'



# Summary

- Current status of Argo deployment in the East Sea
  - Total 143 floats released from 1998
  - 33 floats are active
  - Floats mostly measured data in the southern region
  - Argo becomes the most effective data in this region
- Monitoring the oceanographic environment change
  - long-term variation of temperature profile
- KMA's plan for this year:
  - to deploy 10 floats in the East Sea  
(including 1 day cycle float to study about short-term variability)
  - to evaluate the feasibility of East Sea Argo data DMQC