

# TideBed

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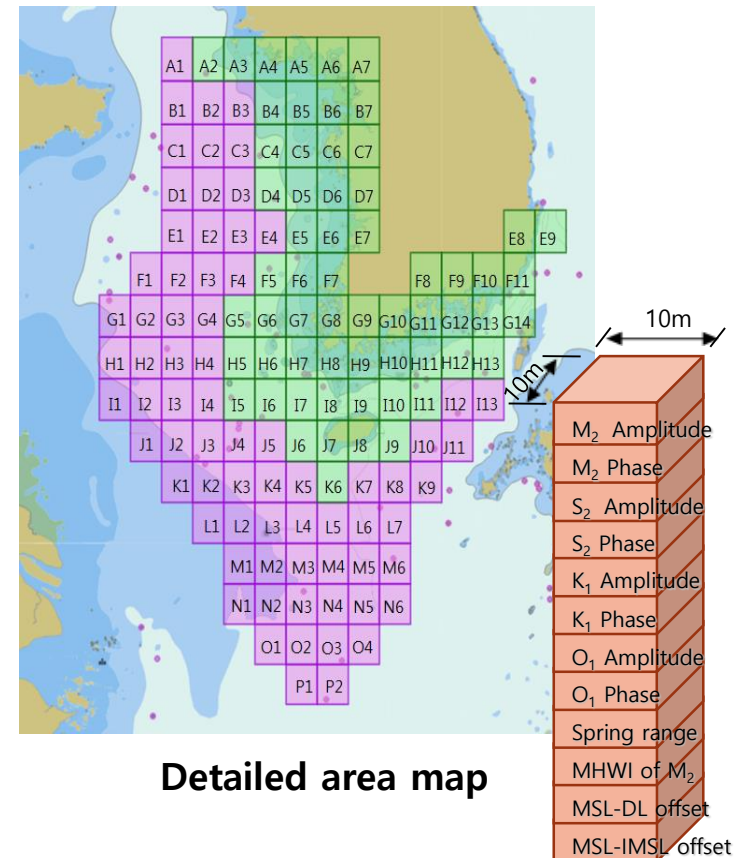


Korea Hydrographic and Oceanographic Agency (KHOA)  
ARAM KIM



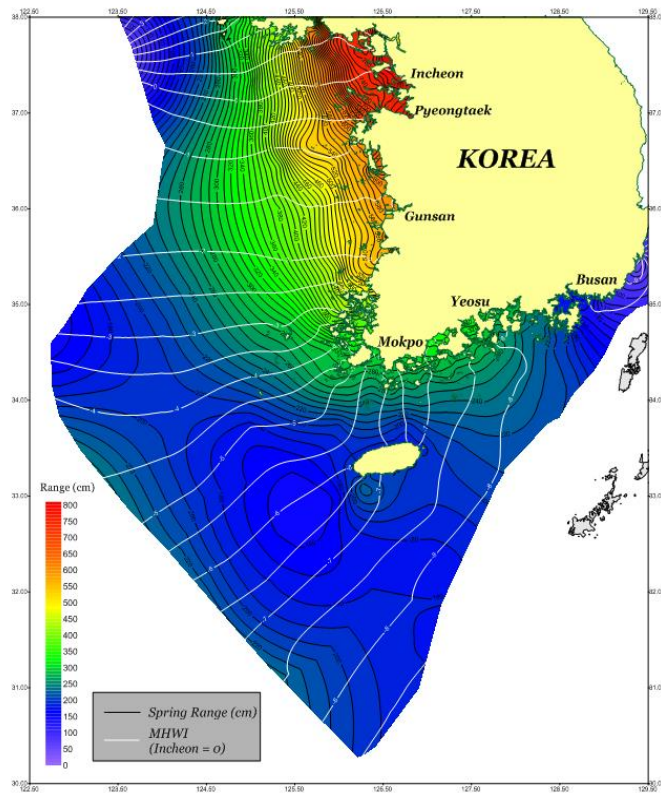
# TideBed

- TideBed is a database of relationships among Mean Sea Level(MSL), Datum Level(DL) and MSL at Incheon port(IMSL) which is vertical datum of Korean geodetic datum.
- Each cell contains
  - Harmonic constants of 4 major constituents (time difference for tide, height ratio for tide)
  - MSL-DL offset
  - IMSL-MSL offset
- TideBed was constructed as fine cell structure.(1/3"  $\approx$  10m mesh in case of territorial sea)
- TideBed is mainly used for correction of tide.

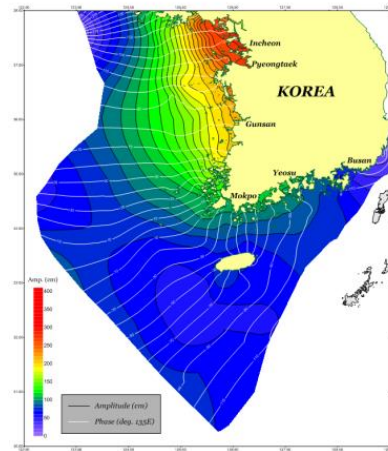


# We obtain co-tidal chart as blow

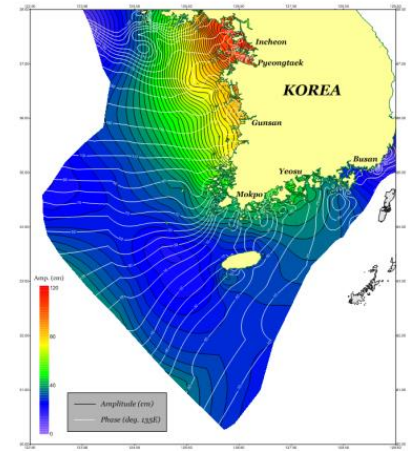
co-Tidal Chart



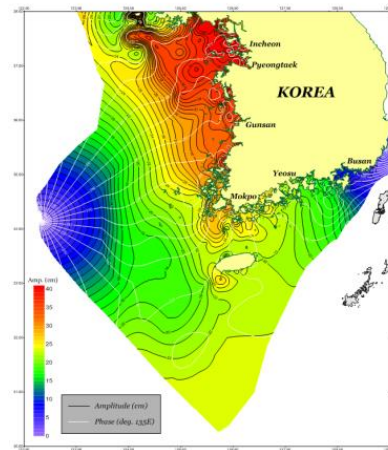
M2 Amplitude and Phase Chart



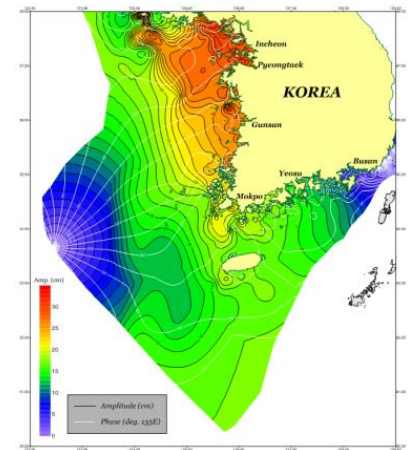
S2 Amplitude and Phase Chart



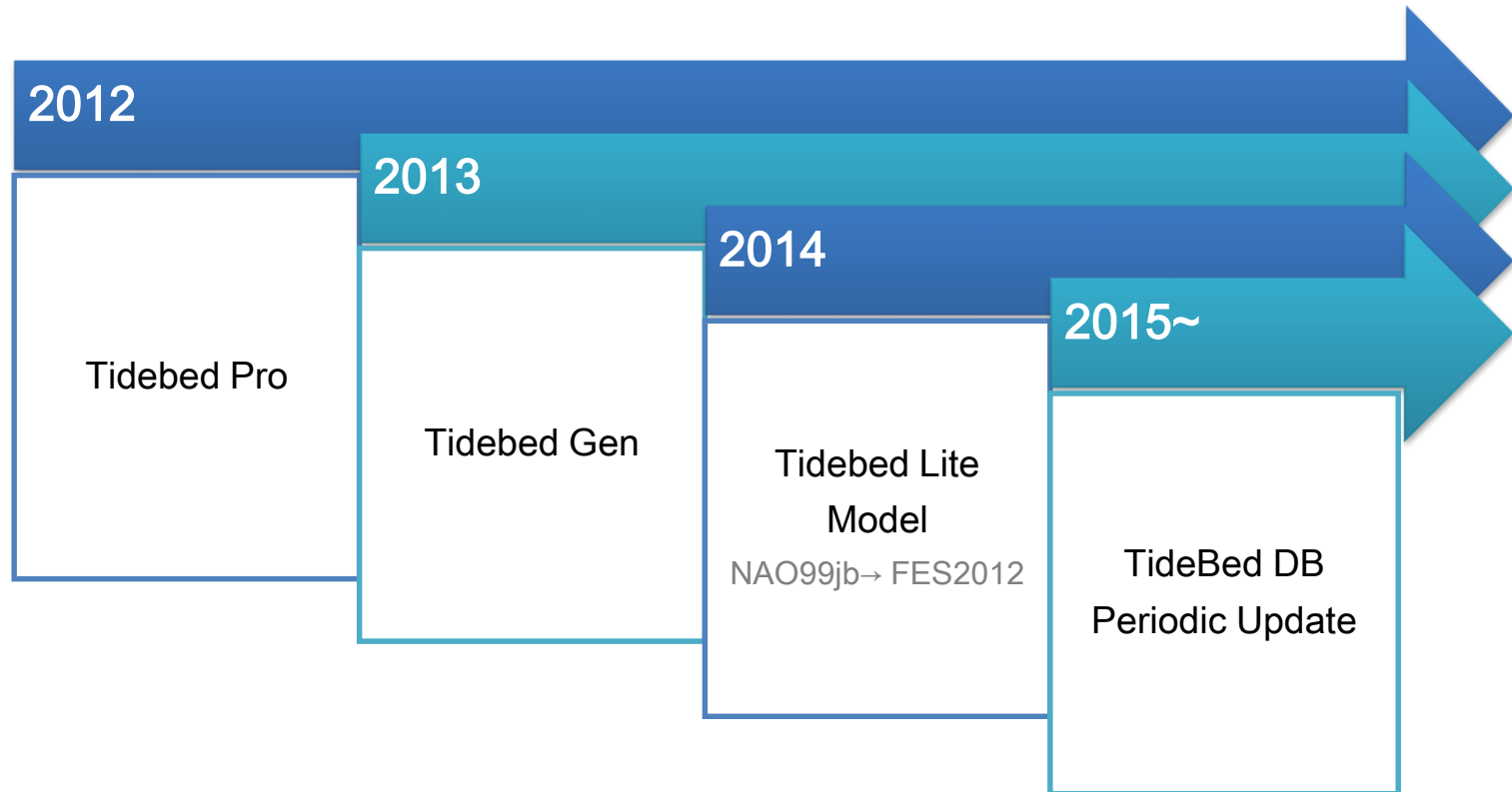
K1 Amplitude and Phase Chart



O1 Amplitude and Phase Chart

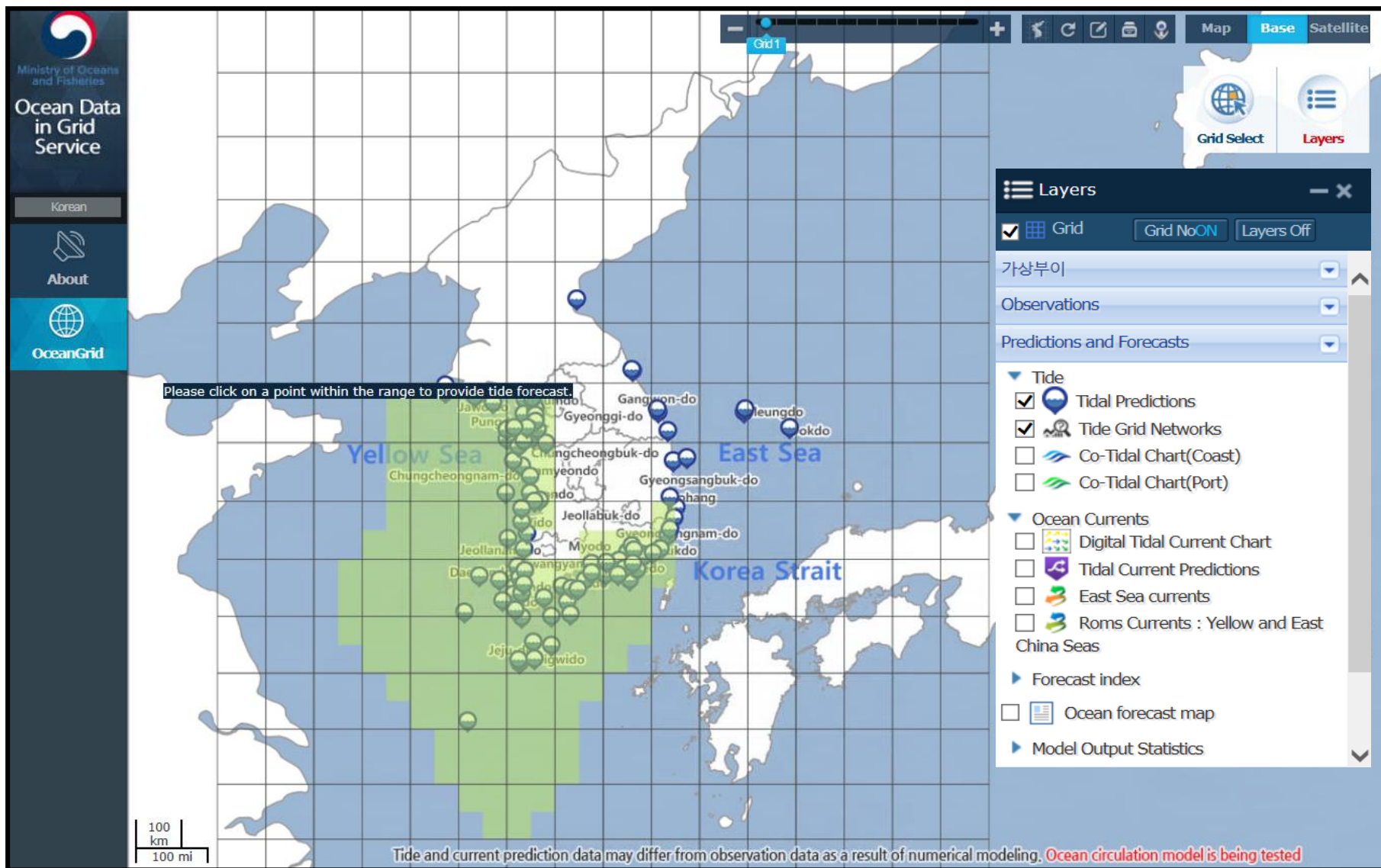


# TideBed Update

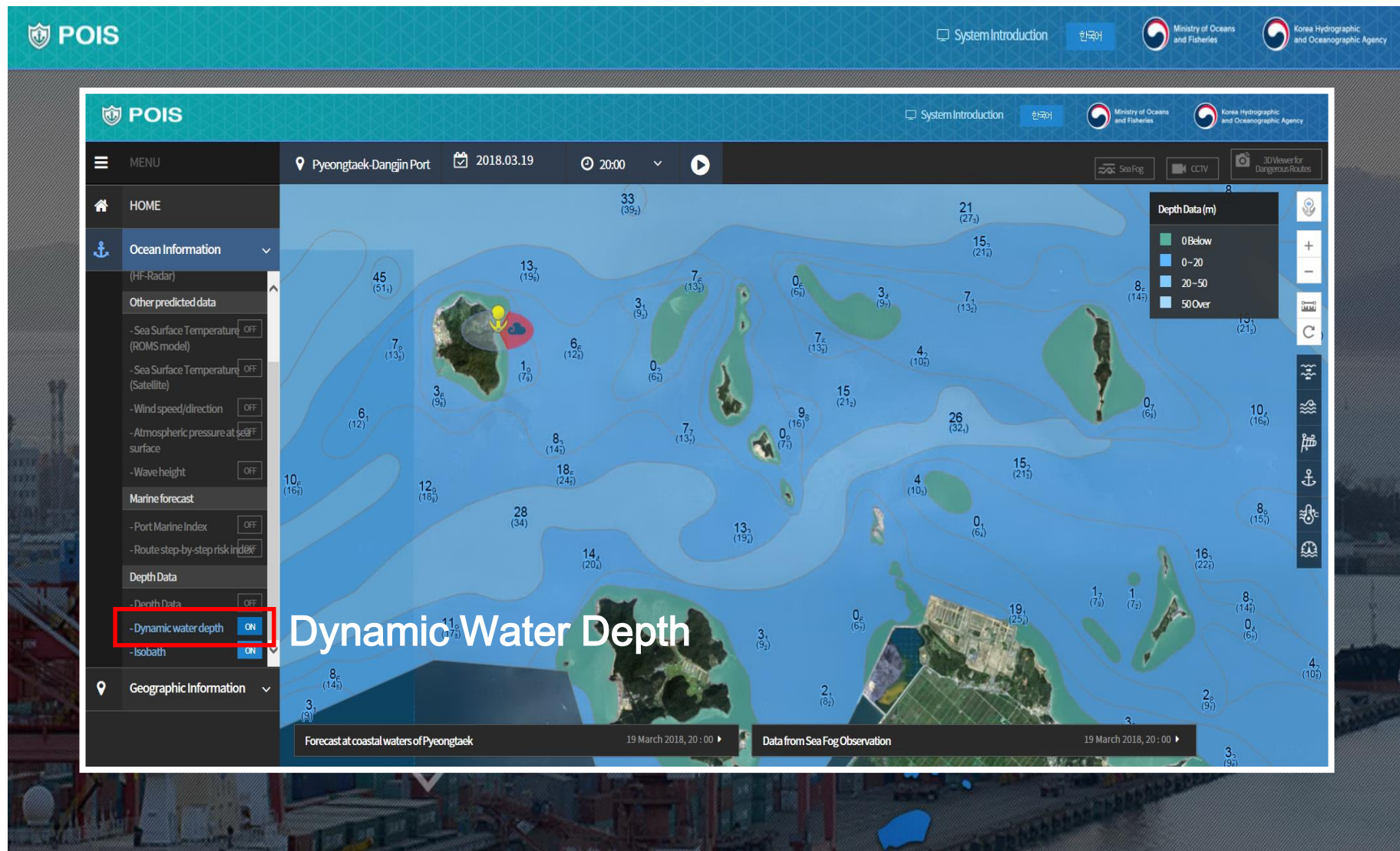




# Ocean Data in Grid Framework

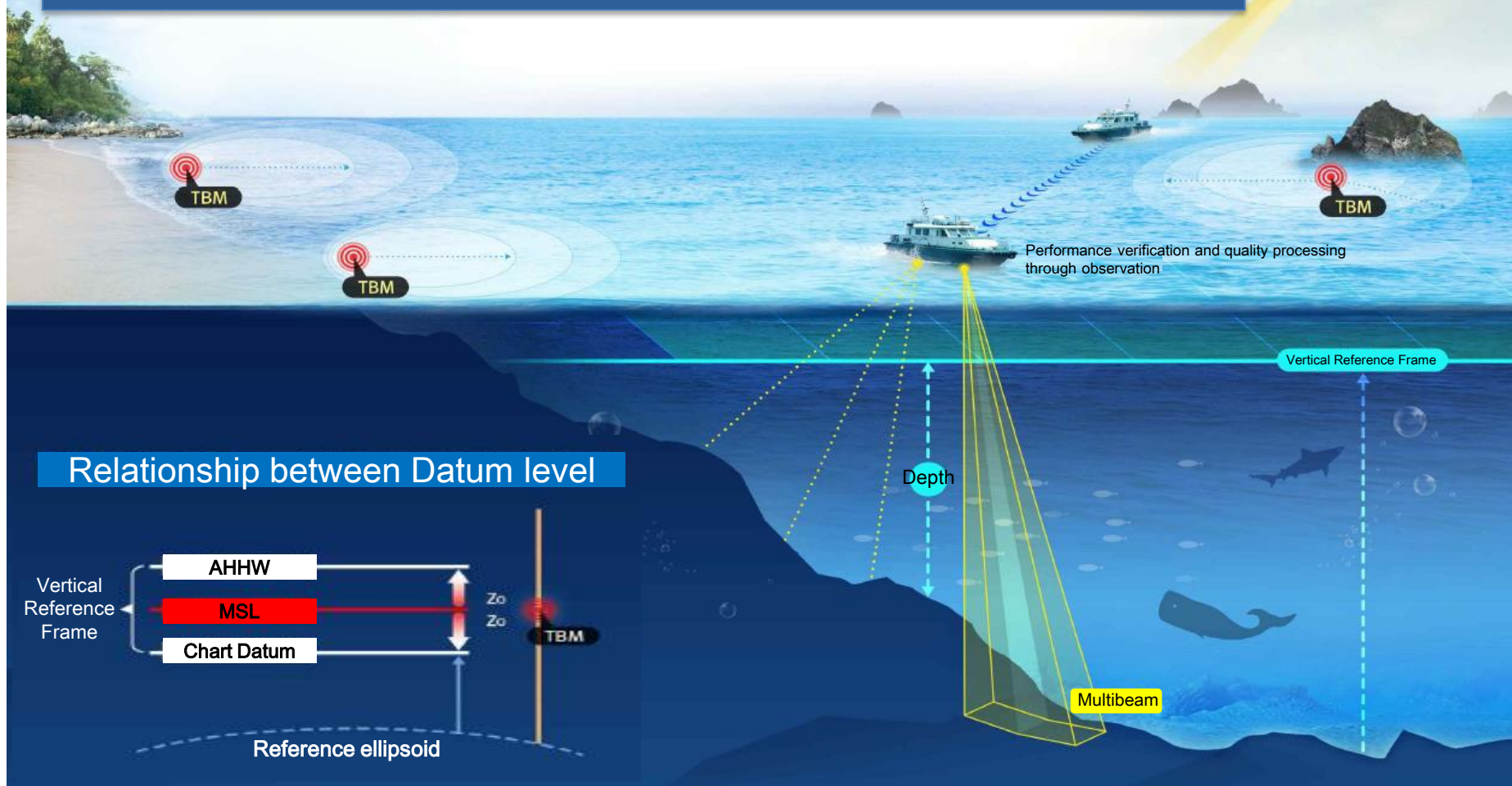


# Port Oceanographic Information System





# In connection with 'Korea Seamless Vertical Reference Frame(unnamed)'



Base study for Seamless Vertical Reference Frame production  
& Pilot production at Southwest Coast of Korea ('17)



Korea Hydrographic  
and Oceanographic Agency

# Approach for Developing of S-111 Surface Current



IHO TWCWG  
16-20 April. 2018 / VIÑA DEL MAR , CHILE

Korea Hydrographic and Oceanographic Agency  
ARAM KIM, GWANGHO SEO



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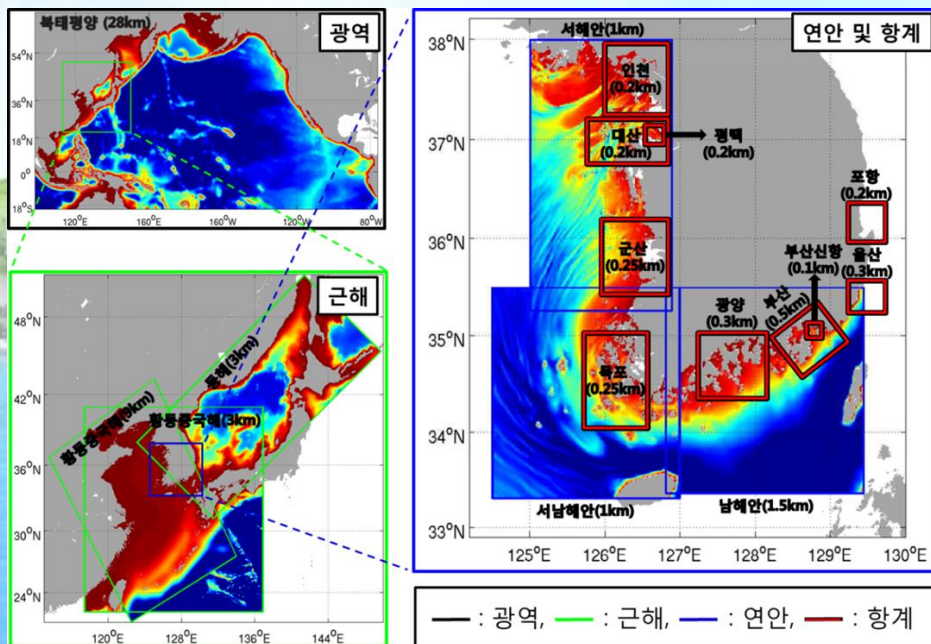
# 1 Introduction

- This presentation introduces the services related to the ocean prediction system and marine forecast chart provided by the Korea Hydrographic and Oceanographic Agency(KHOA)

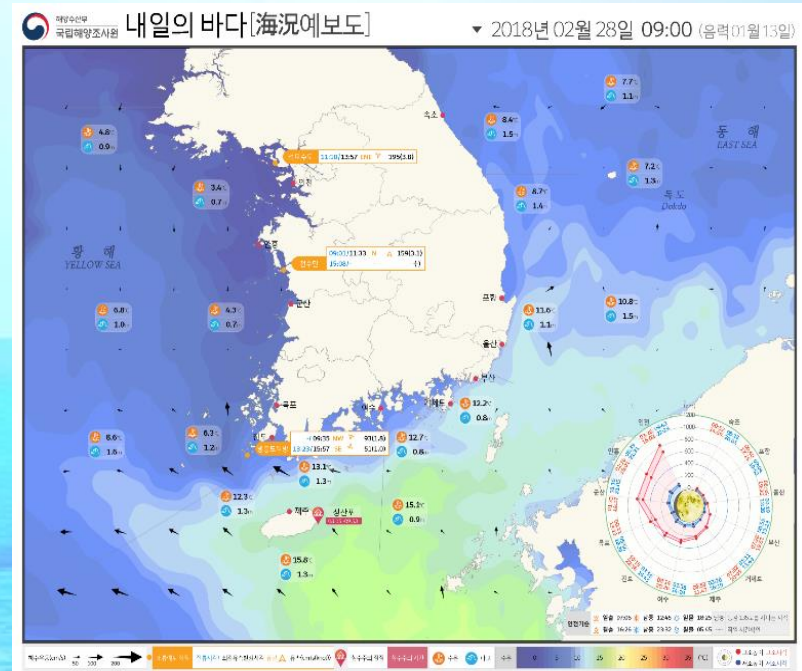
## Marine Forecast Chart from numerical forecasting model for safety navigation

- KHOA is officially operating 22 numerical models for the ocean forecast. After the prediction, we produce marine forecast chart for safety navigation like the weather chart..

### Ocean Forecast System



### Marine Forecast Chart

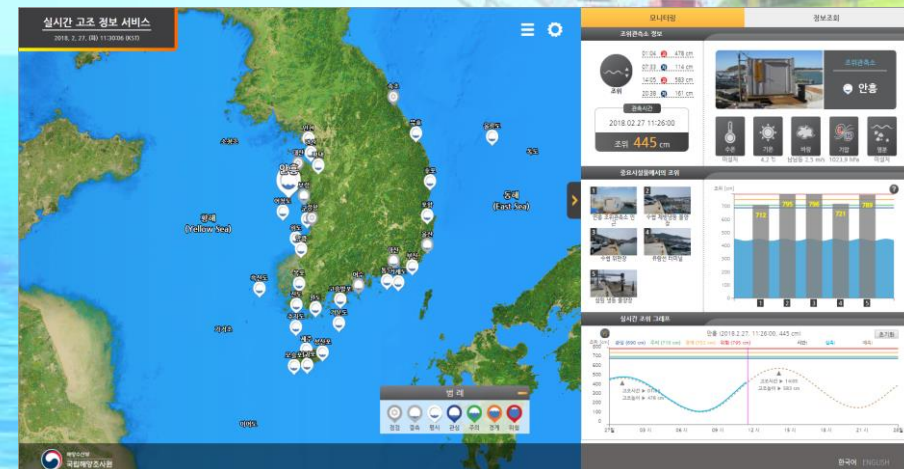
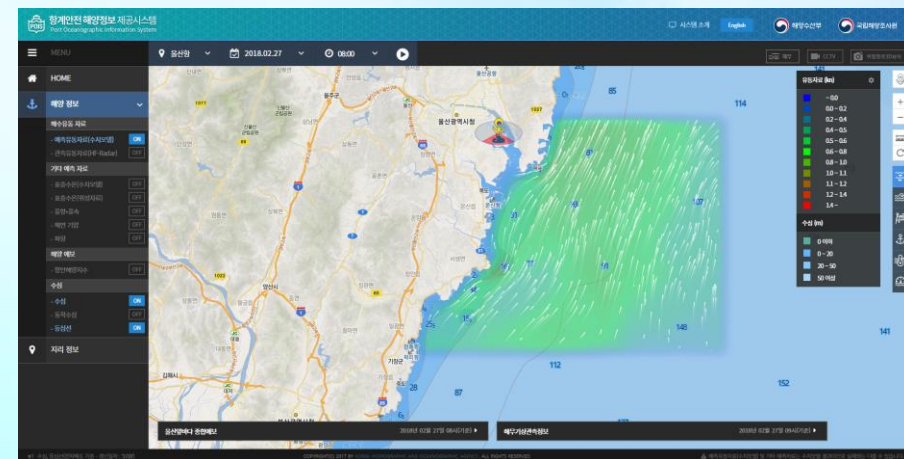
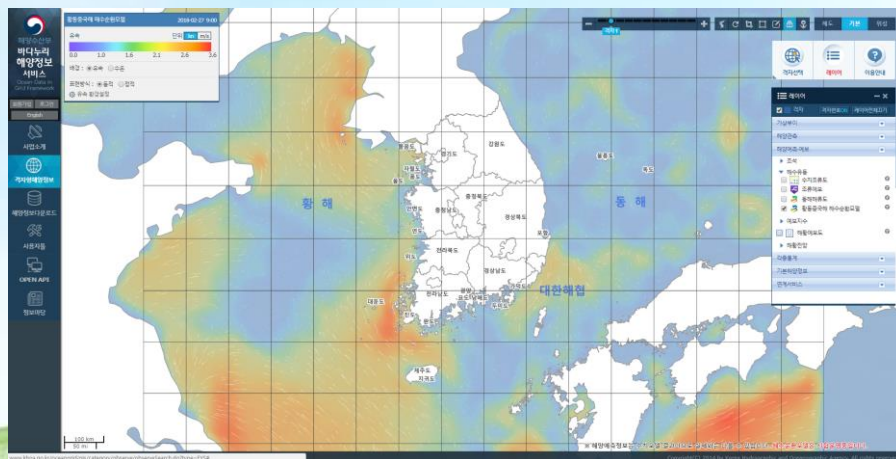




# 1 Introduction

- This presentation introduces the services related to the visualization of predicted data to show effectively for users such as Baroview and Badanuri service which is based on GIS.

## Marine Forecast Visualization

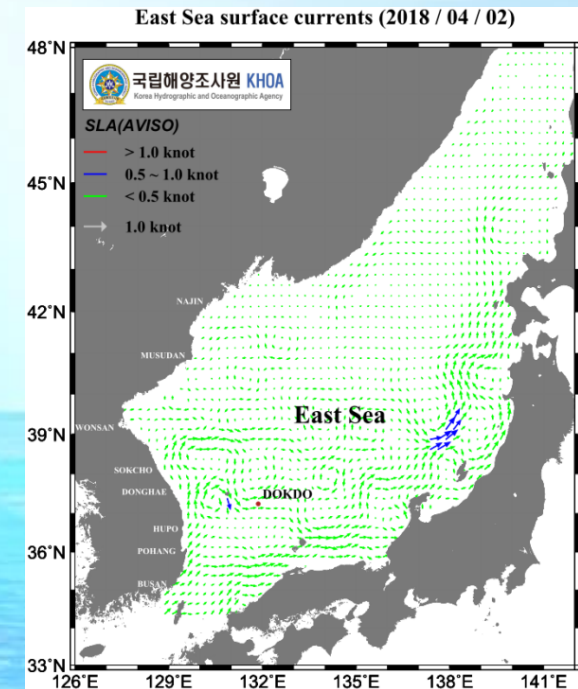
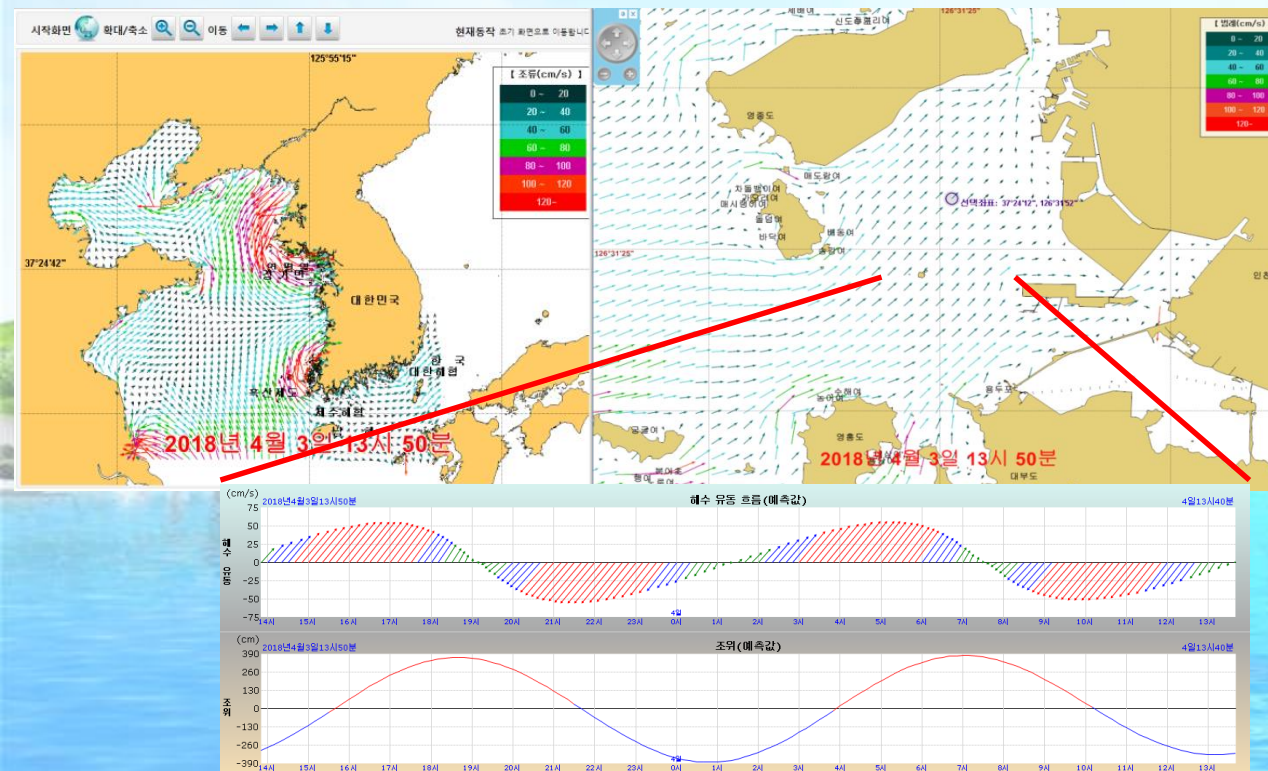




# 1 Introduction

## Tidal current chart and ocean surface current chart around the Korean Peninsula

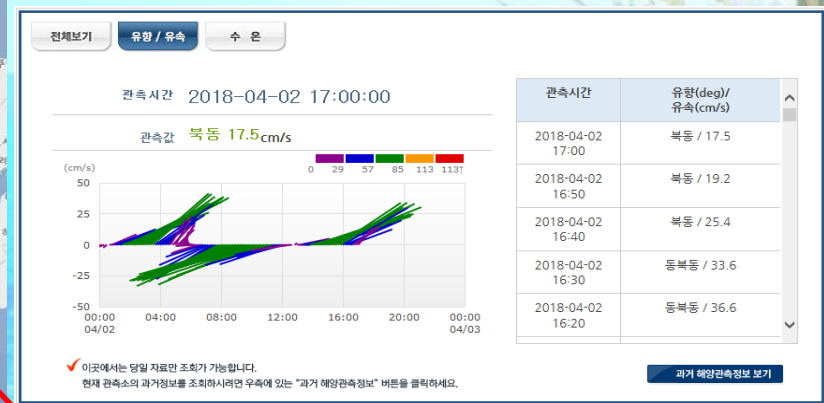
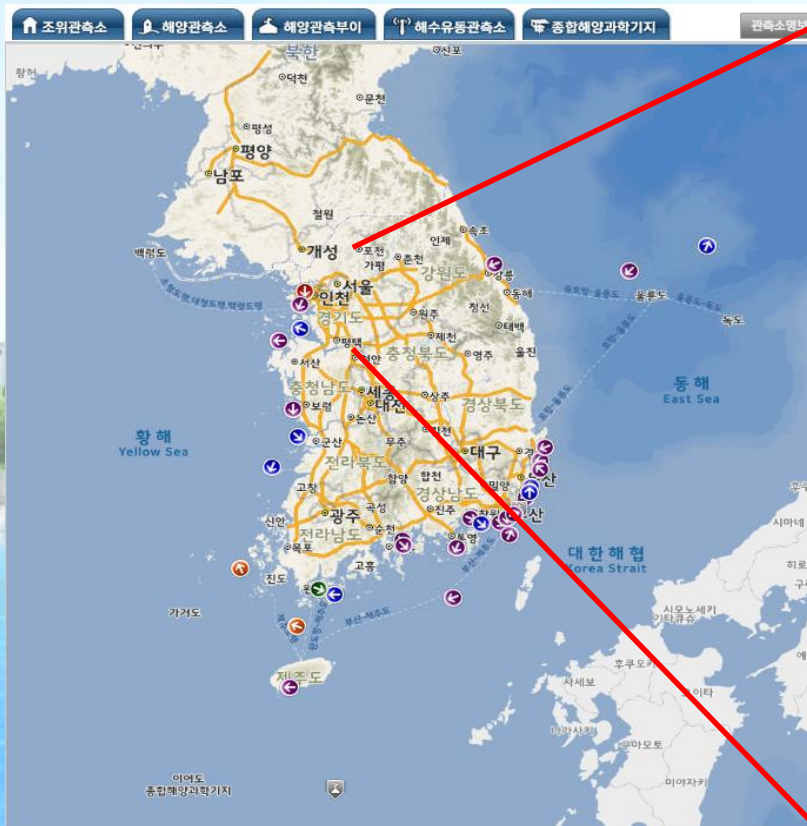
- Tidal current chart provides surface currents information over the Yellow Sea and the Southern Sea using tidal current harmonic constant. These charts are able to show spatial and temporal currents at user chosen area.
- Ocean surface current chart provides ocean surface currents information over the East Sea using satellite altimeter data.



# 1 Introduction

## Korea Ocean Observing and Forecasting System(KOOFs)

- KHOA services surface currents information in real time by receiving data from observation stations on coastal and ocean.
- This system is useful as research data because it is possible to search not only real time data but also past observed data.



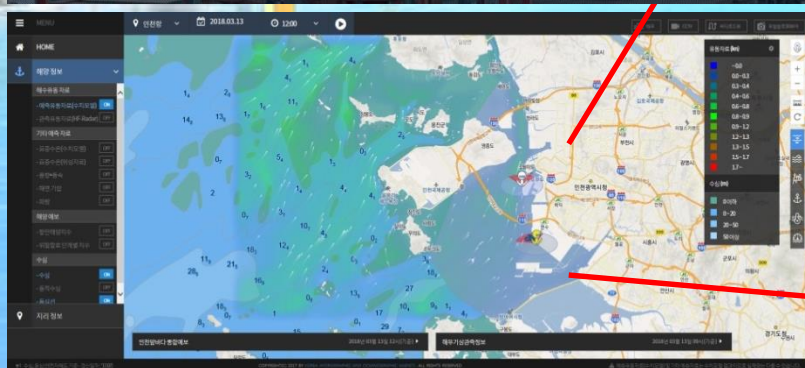


# 1 Introduction

- This presentation introduces the services related to the surface current provided by the Korea Hydrographic and Oceanographic Agency(KHOA) and the background of S-111 specification, results of S-111 application.

## Port Oceanographic Information System

- KHOA provides observed and forecasted surface currents data through the Port Oceanographic Information System(POIS).





## 2 Background

### Display of Current of a single point

- Current speed is represented by the size of the arrow, the color and a numerical value.

- Arrow Size

$$L = L_{ref} \cdot \min(\max(S_{low}, S), S_{high}) / S_{ref}$$

$$\text{where, } L_{ref} = 10\text{mm}, S_{ref} = 5\text{kn}$$

$$S_{low} = 0.01\text{kn}, S_{high} = 13\text{kn}$$

- Display of Regularly Gridded Data(to Calculate n)

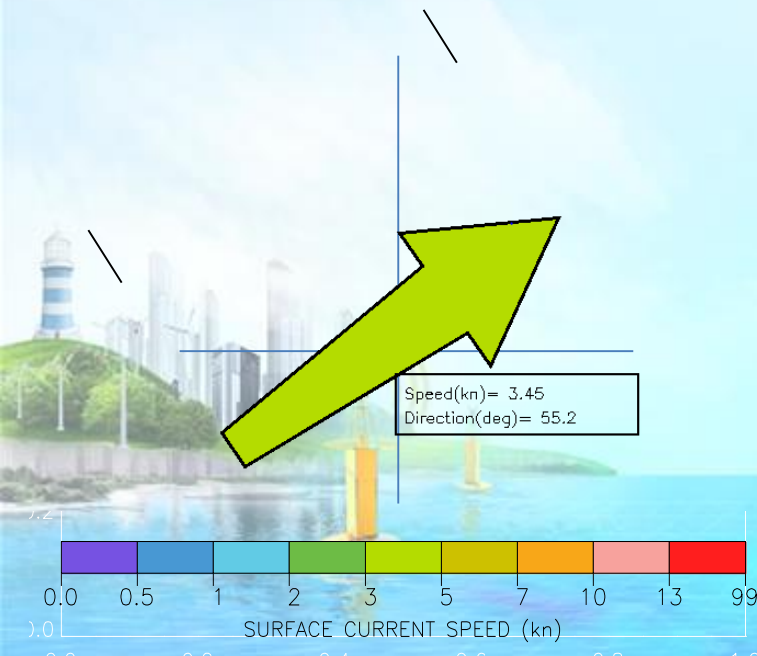
$$R = L_{smax} / (nD) \leq R_{max}$$

$$\text{where, } L_{smax} = \text{maximum speed in the displayed field}$$

$$D = \text{cell's diagonal distance}$$

$$n = \text{cell's diagonal grid numbers}$$

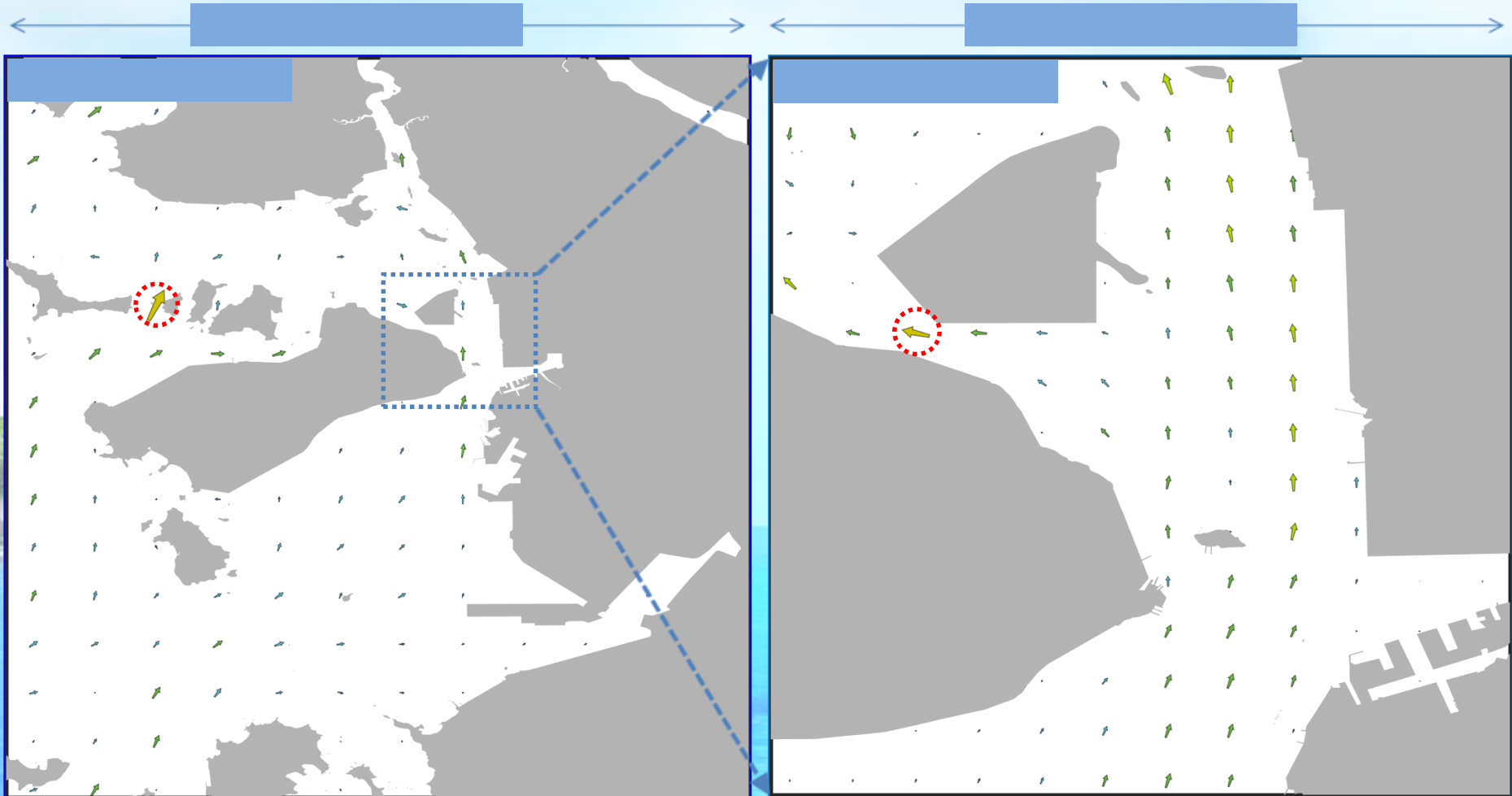
$$R_{max} = \text{prescribed maximum arrow ratio}$$



### 3 Work Status

#### Display of Regularly Gridded Data

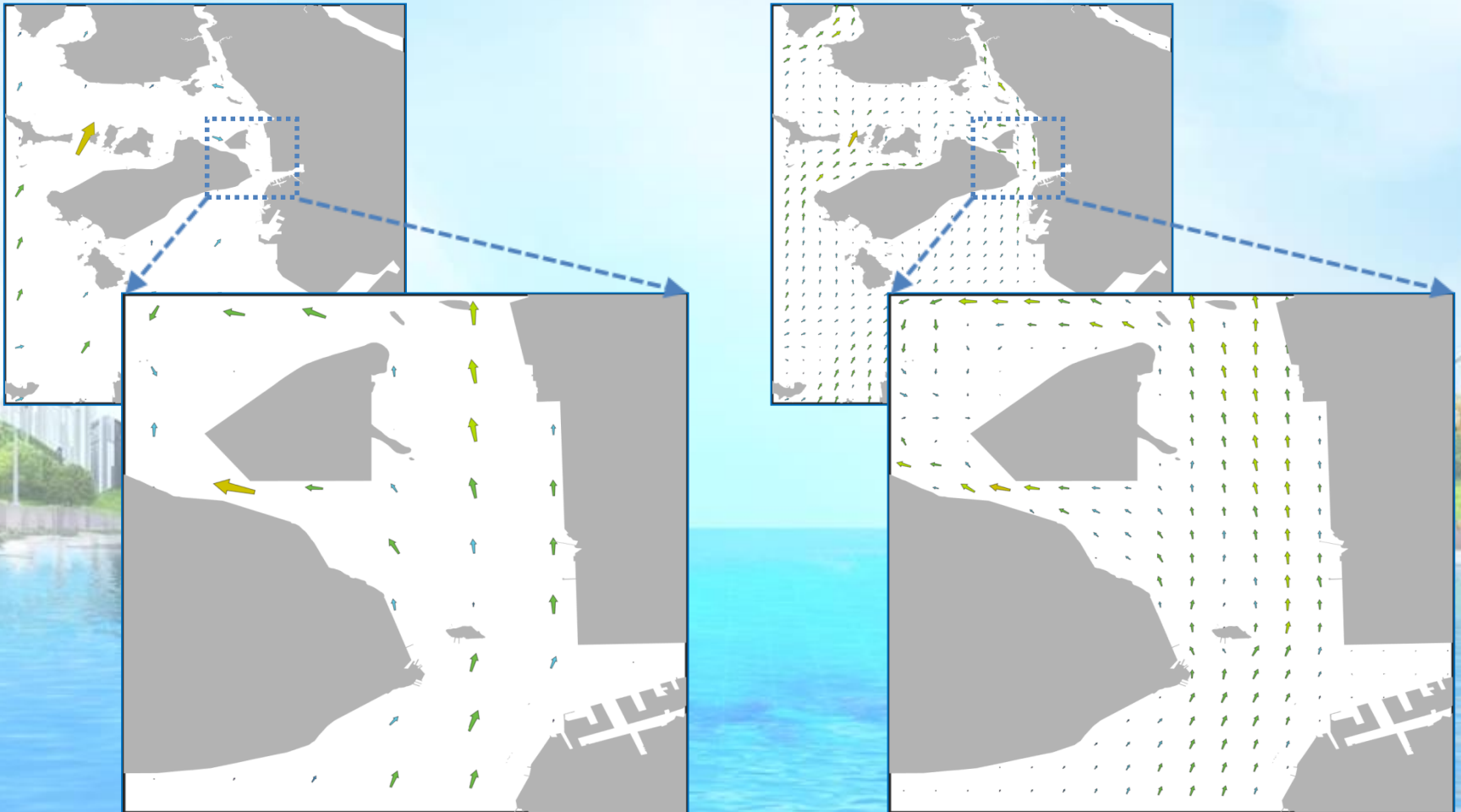
- Performance between Low & High Resolution



### 3 Work Status

#### Display of Regularly Gridded Data

- Can be change  $L_{ref}$ (vector size) &  $R_{max}$ (vector interval)





## 4 Challenge & Plan

### Area and Resolution >

- Provide **various resolution** of data set depending on **user** and **usage purpose**
- Low(inter country), Medium(within the country), High(for major ports) Resolution

### Water, Land and Intertidal zone >

- Add **INDEX value in HDF5** file to distinguish sea, land and intertidal zone
- Apply **distinct vector design on ECDIS** to distinguish sea, land and intertidal zone

### Time and Update Interval >

- **Basically 6-hours** and **Especially under 6-hours** for data set interval
- Likewise, Update Interval is also **6-hours**

### Accuracy and Confidence level >

- Analyze the **statistical value** of each site with **observation data**
- Based on the statistical analysis results, present the **Confidence level**

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if you have any questions about this presentation,  
please email me your questions.

Thank you very much for your attention.