

# Introduction of KHOA

**5<sup>th</sup> April, 2011**

Korea Hydrographic and Oceanographic Administration  
Ministry of Land, Transport and Maritime Affairs

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**II . Hydrographic survey**

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# History and Organization

## History

Instituted Hydrographic Division, Navy

[1949]

Hydrographic Office  
Ministry of Transportation

[1963]

National Oceanographic Research  
Institute, Ministry of Maritime  
Affairs and Fisheries

[1996]

National Oceanographic Research  
Institute, Ministry of Land,  
Transport, and Maritime Affairs

[2008]

**In 2009, Recognized as Korea Hydrographic and Oceanographic Administration (KHOA)**

## Organization



**4 Divisions, 1 Laboratory, 1 Office, 3 Regional Offices (219 employees)**

# Research Vessels

## Haeyang 2000

- Gross Tonnage : 2,533 tons
- Cruising range : 14,000 miles
- Commissioned : Mar. 1996
- Equipment : Multi-beam, Magneto meter, Gravity meter , ADCP, CTD, HRPT, MVP, ROV etc.



**KHOA operates 7 ocean research vessels (22~2,500 tons).**



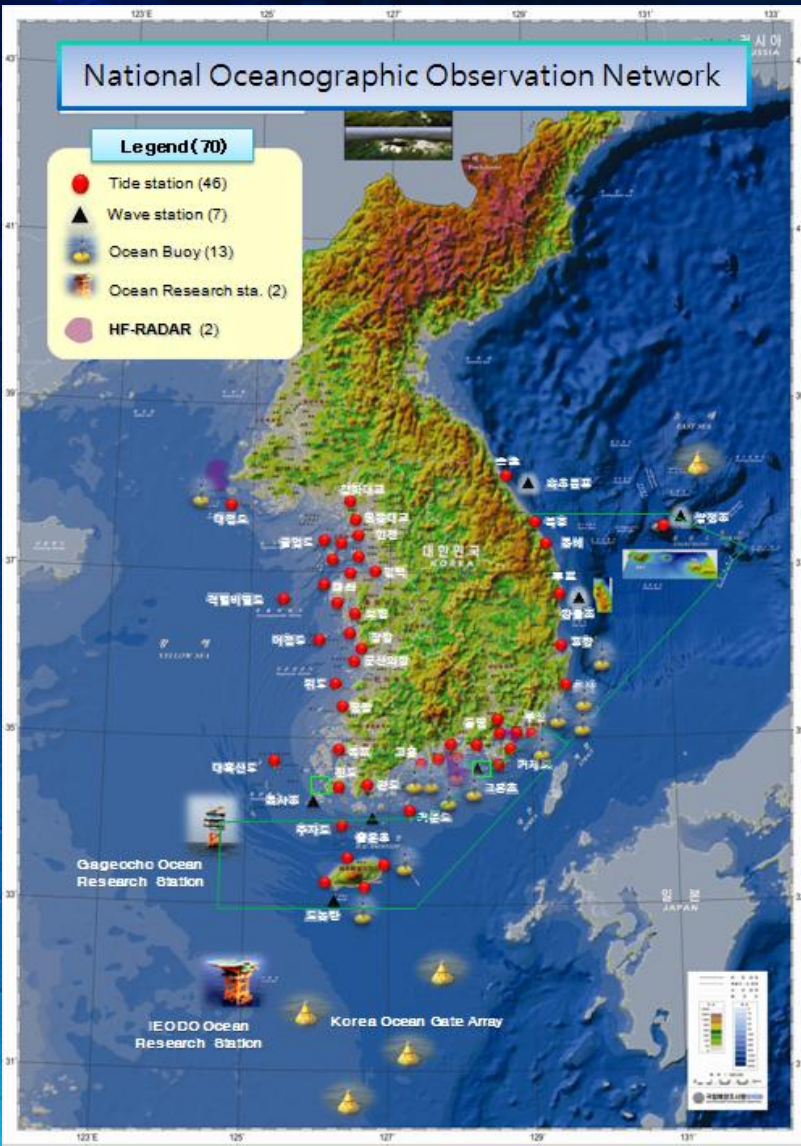
# Oceanographic Observation

## 2010 NOOS

### National Oceanographic Observation Network

#### Legend (70)

- Tide station (46)
- ▲ Wave station (7)
- Ocean Buoy (13)
- Ocean Research sta. (2)
- HF-RADAR (2)



○ KHOA' has **70** Real-time stations (2010)

- Tide Station : 46

- Ocean Station : 7

- Ocean Buoy : 13

- Tidal current (HF-Radar) Station : 2

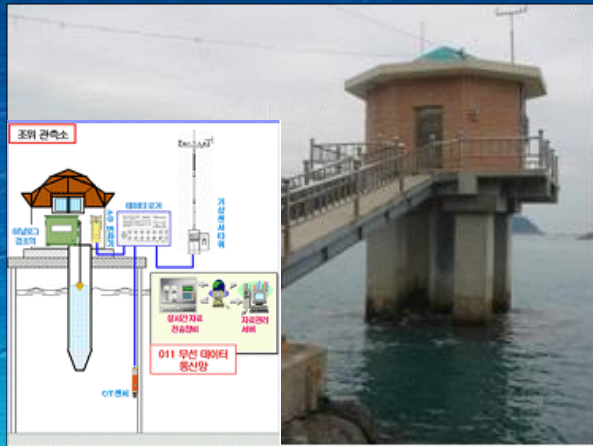
- Ocean Research Station : 2

✓ It will be 161 stations in 2013

# Tide observation

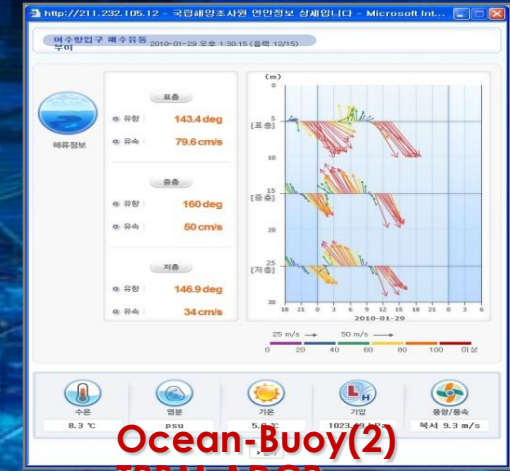
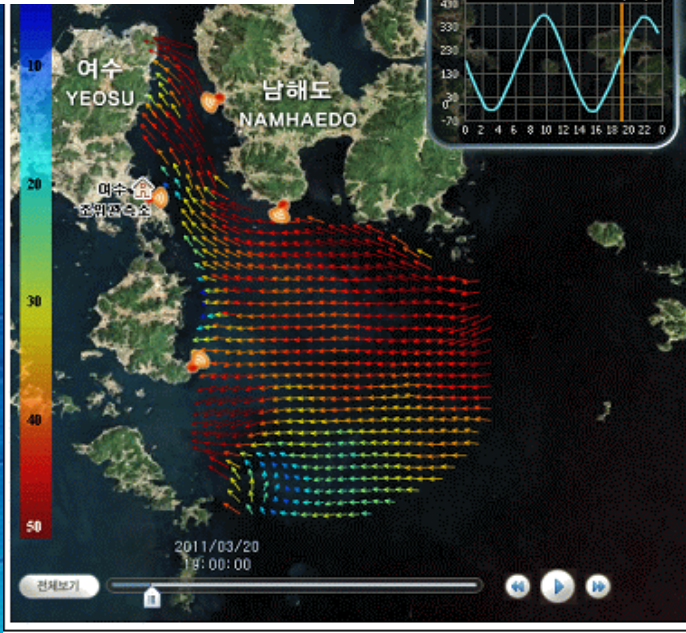
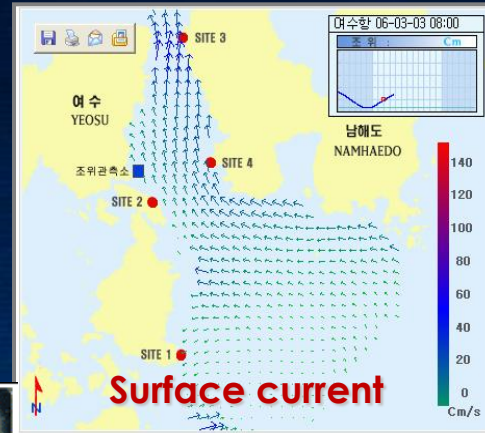
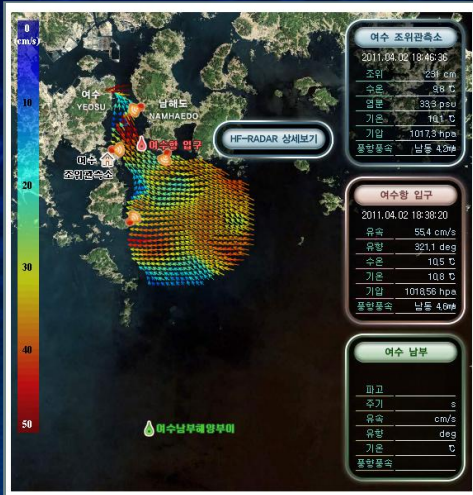
## Observing items

- Tide gauge
  - OTT type stilling well gauge
  - Microwave gauge
- Sea temperature, Salinity
- Ocean weather
  - Air temperature, pressure, wind direction, wind speed, etc
- ※ real-time data service through internet
  - <http://www.khoa.go.kr> (korean)
  - <http://www.khoa.go.kr/koofs/ENG/> (English)



# Ocean current observation

## High Frequency Radar (Codar) System at Yeosu, Busan New Port



**Ocean-Buoy(1)  
Wave, temp, Met.**



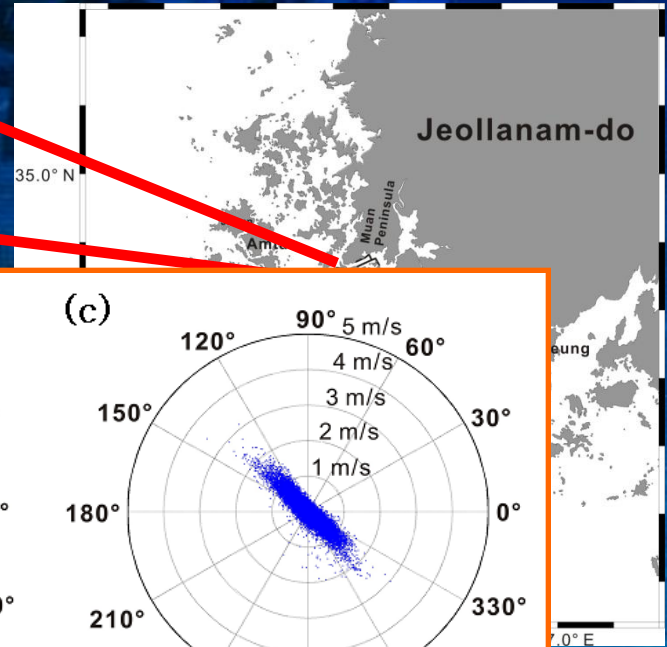
**Ocean-Buoy(2)  
TRBM ADCP**



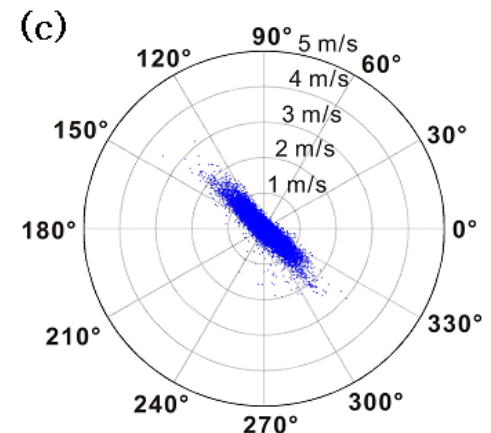
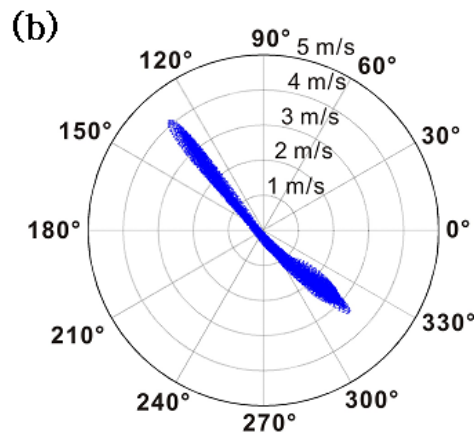
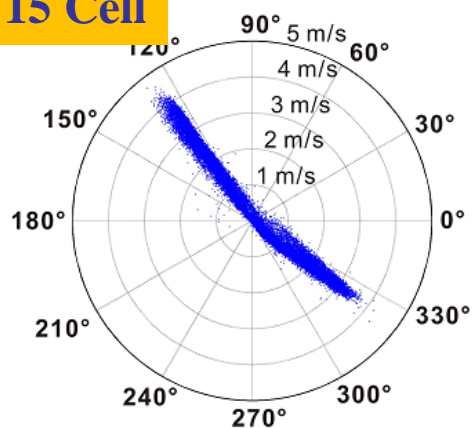
# H-ADCP on Jindo channel



- Operation : 2009.11 ~ Now
- Frequency : 300 kHz
- Bin length : 5 m
- Bin number : 45



15 Cell



H-A

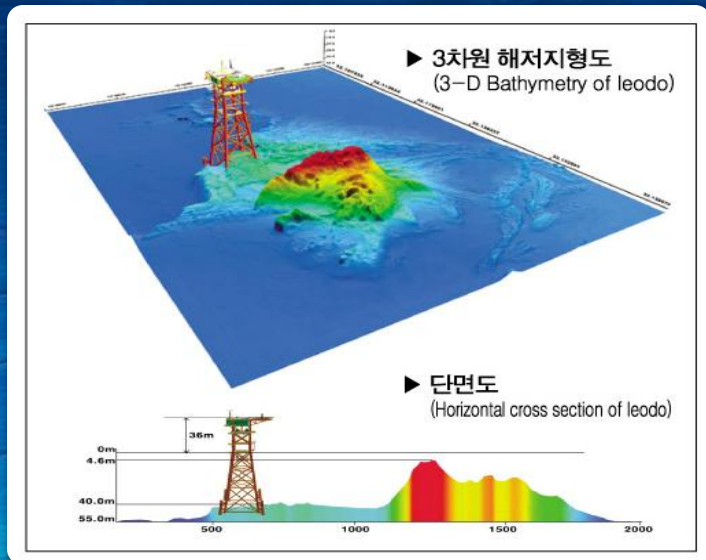


# leodo ocean research station



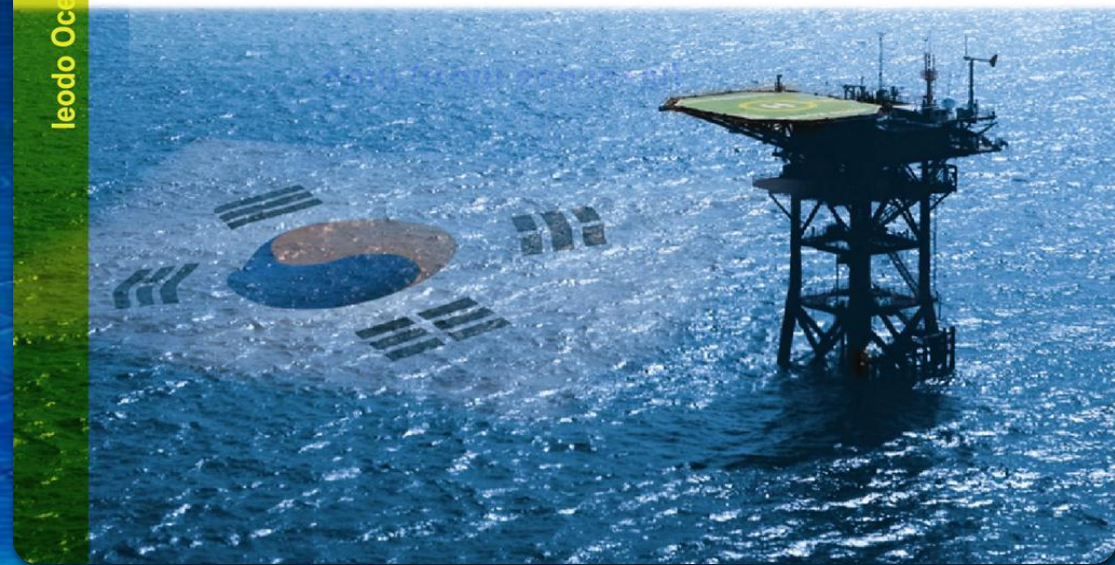
## ○ Location

- leodo underwater rock located 149 km southwest of Marado
- Peak of leodo is at 4.6 m depth, 700 m away from station



leodo Ocean Research Station

- leodo.nori.go.kr
- Installed : 2003 yr
  - Structure
    - Height : 77m (from sea bottom)  
36m (from sea level)



# Observation Equipment of leodo station



01

**가속도계**  
Accelerometer  
가속도, 속도, 변위



02

**경사계**  
Inclinometer  
구조물경사도



03

**풍향·풍속계**  
Wind Monitor  
풍향, 풍속



04

**온도·습도계**  
Humidity & Temperature Gauge  
기온, 습도



05

**기압계**  
Digital barometric sensor  
기압



06

**일사계**  
Pyronometer  
일사량



07

**일조계**  
Sunshine Duration Meter  
일조시간



08

**자외일사계**  
UV-B Radiometer  
자외선



09

**강우량계**  
Rain Gauge  
강우량



10

**정밀증발계**  
Vaporimeter  
증발량



11

**시정계**  
Present Weather Detector  
가시거리, 강우강도



12

**스펙트럼라디오미터**  
Ocean Colour Radiometer System  
대기 및 해양 분광량



13

**IR온도계**  
IR Thermometer  
원격 해표면온도



14

**WAVE RADAR**  
Directional Wave & Surface Current  
Radar System  
파고, 주기, 파향, 스펙트럼, 표층유속



15

**운고계**  
Cellometer  
구름높이, 구름량



16

**Sea Level Monitor**  
Wave & Sea Level Sensor  
조위, 파고



17

**ARGOS**  
Drifter Buoy  
표층수온, 기압, 해류



18

**ROSSET SAMPLER&CTD**  
Water sampler & Conductivity  
Temperature Depth  
채수, 수온, 염분



19

**AEROSOL 채취기**  
PM2.5 Sequential filter  
sampler system  
무기미온, 금속, 유기산



20

**CO<sub>2</sub>측정계**  
CO<sub>2</sub> Gas Analyzer brochure  
대기중 CO<sub>2</sub>량



21

**FLUX측정계**  
3D Sonic Anemometer  
3차원풍향, 풍속



22

**RDCP**  
Recording Doppler Current Profiler  
층별 유속, 유량



23

**SMART Release**  
Acoustic Release &  
Underwater Modem  
수중통신, 장비회수



24

**CTR7**  
Conductivity & Temperature Sensor  
층별 수온, 염분



25

**차세대조위계**  
High Quality  
Sea Level Monitor  
조위



26

**태양력발전기**  
Solar Power Generator  
전원공급



27

**풍력발전기**  
Wind Power Generator  
전원공급



28

**디젤발전기**  
Diesel Generator  
보조전원공급



29

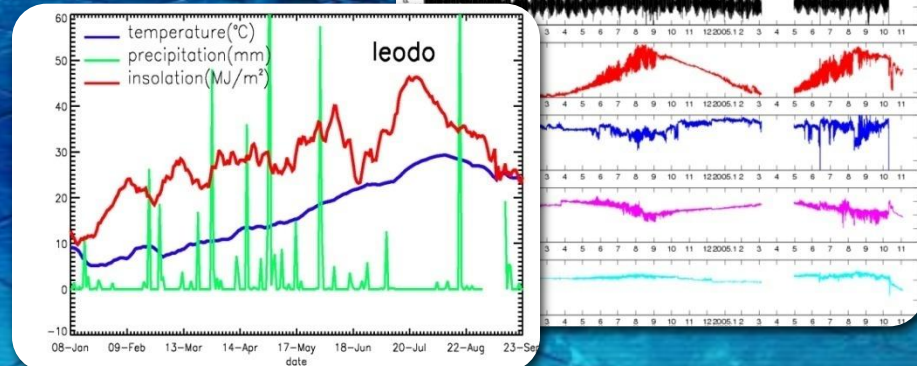
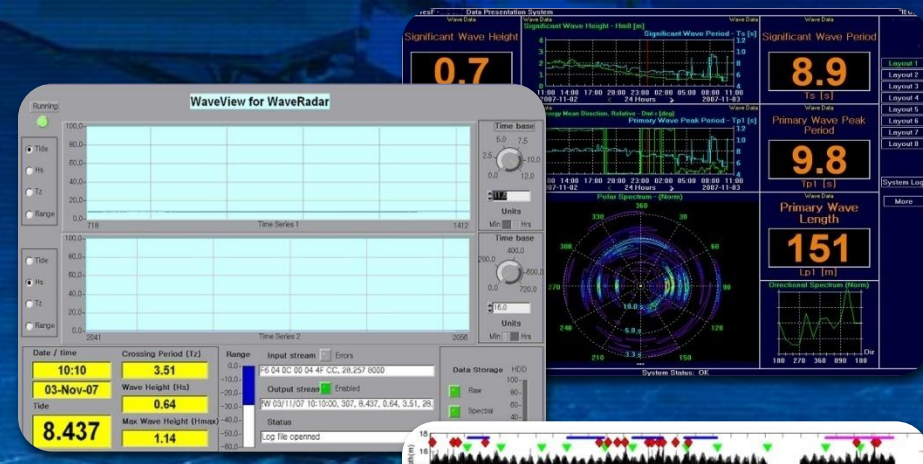
**자동사다리**  
Auto Ladder  
탐방방지



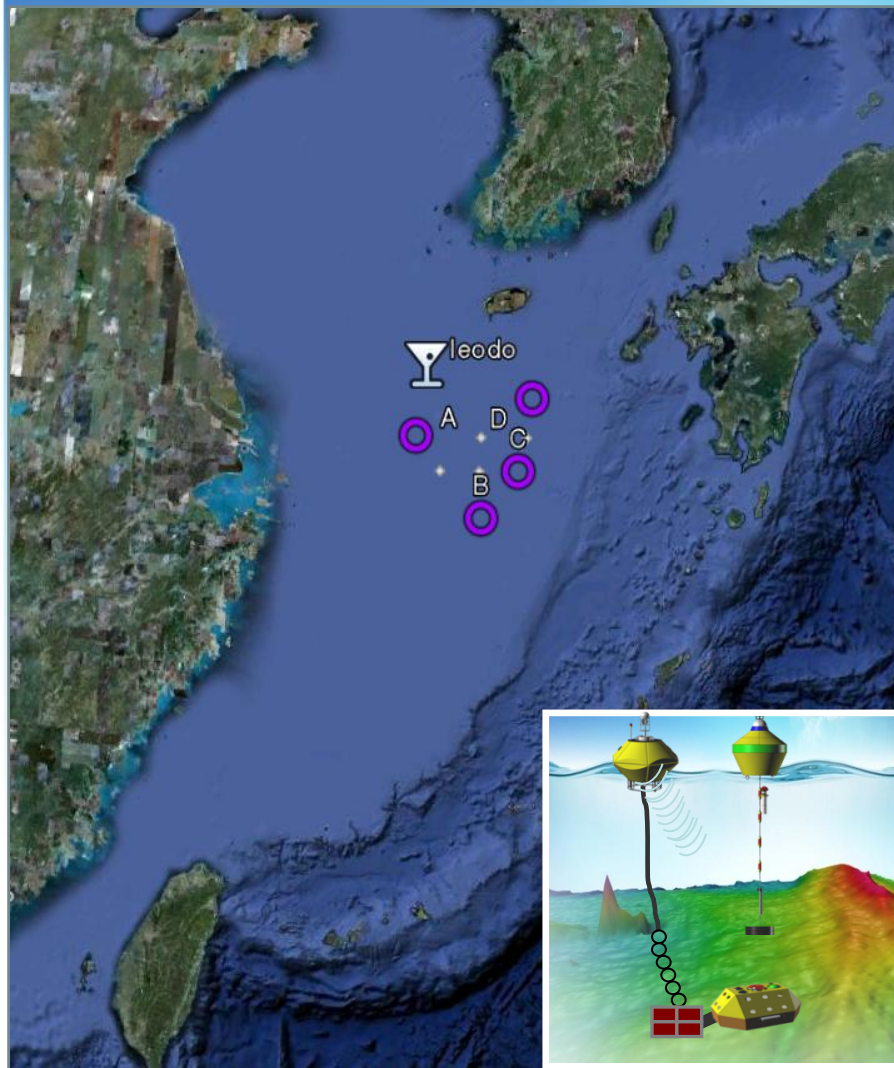
30

**등대**  
Light House  
항해안전

- Equipment : 68 (36 types)
- Atmos. obs. : 20 (13 types)
- Ocean obs. : 30 (14 types)
- Structure safety obs. : 10 (3 types)
- Environment obs. : 8 (6 types)



# KOGA (Kore Ocean Gate Array) project



- Main path of the typhoon affecting Korea
- The branching area of the Tsushima Current from Kuroshio Current
- Sea of detectable Earthquake occurred along Ryukyu Trench
- Boundary Condition area of oceanography and meteorology Numerical Modeling



# Observing network and data management

## Real time Obs.



## Data storage center



Raw DB



First QC DB

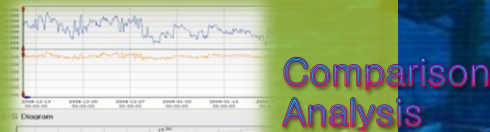


Second QC DB

First QC

**AUTO PROCESS**  
**HARD check**  
**SOFT check**

Second QC



T-S Diagram

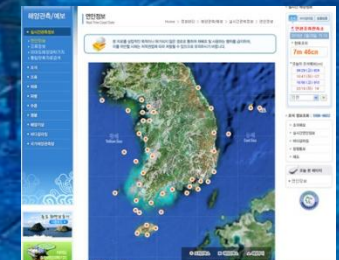
Annual and monthly report

## Services

Relevant institutions



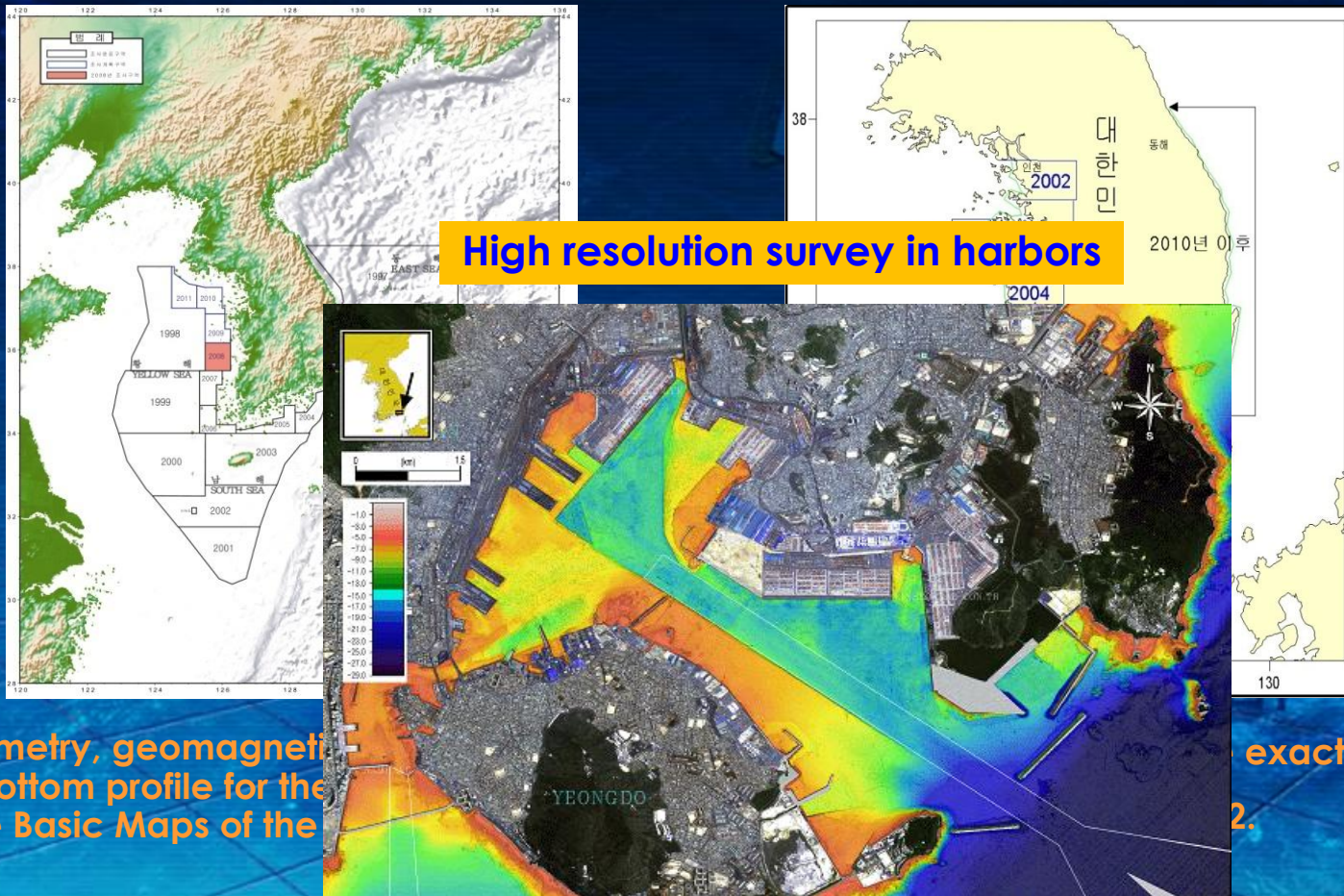
Public services



Real time Obs. Info.

# Hydrographic survey

KHOA carries out harbor, passage and coastal surveys in order to obtain depths, identify danger zones and coastlines, retrieve bottom samples and identify navigational targets, etc. for the safety of navigation



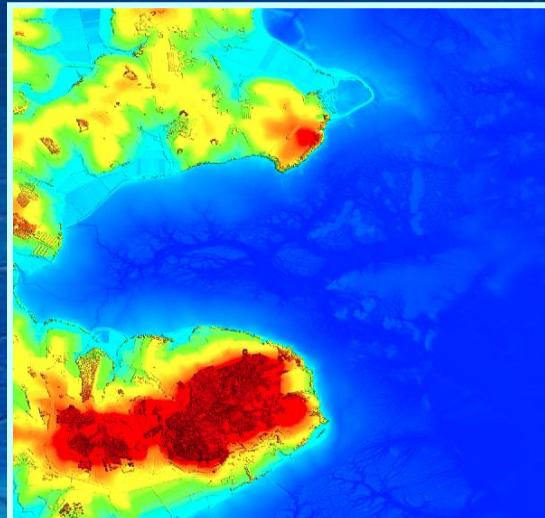
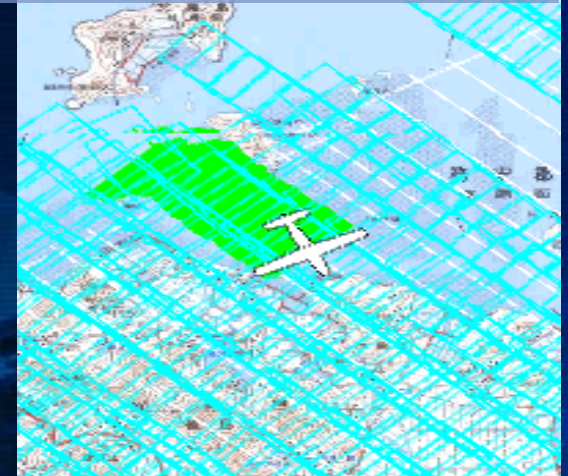
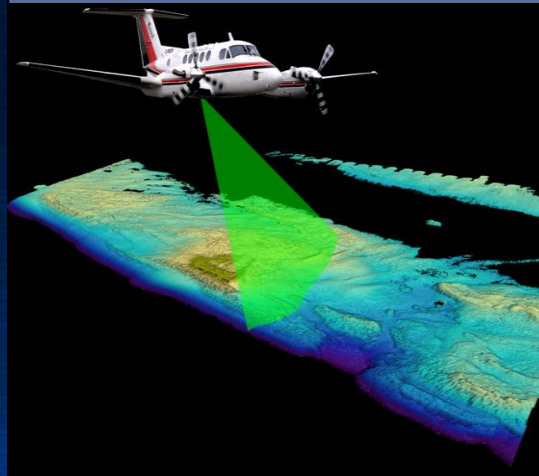
Bathymetry, geomagnetic sub-bottom profile for the of the Basic Maps of the

exact coastline since 2.

# Airborne Laser Survey (LiDAR)

KHOA started airborne Laser surveying from 2005 to survey areas where are difficult to survey by vessels.

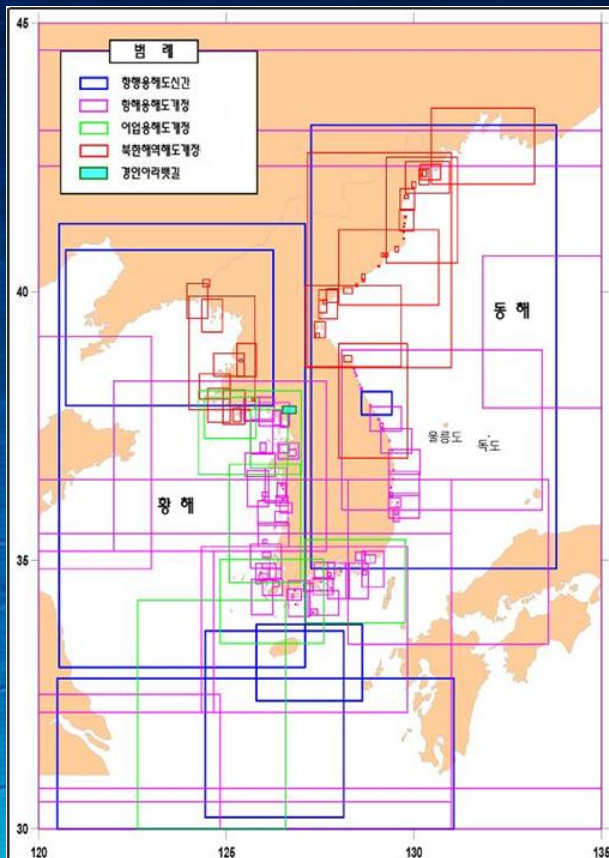
## Airborne Laser Surveying



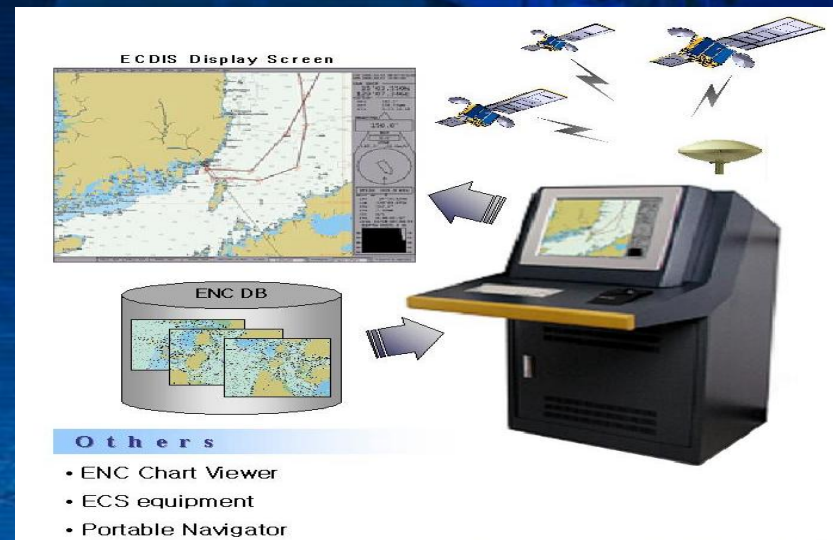
# Nautical charts & ENC

KHOA produces 213 chart-based and 334 grid-based ENCs upon IHO standard S-57 for use with ECDIS which is a great aid to mariners and has distributed ENCs since 2000.

## ■ National paper charts



## ■ ENC and ECDIS



## Advantages of ENC

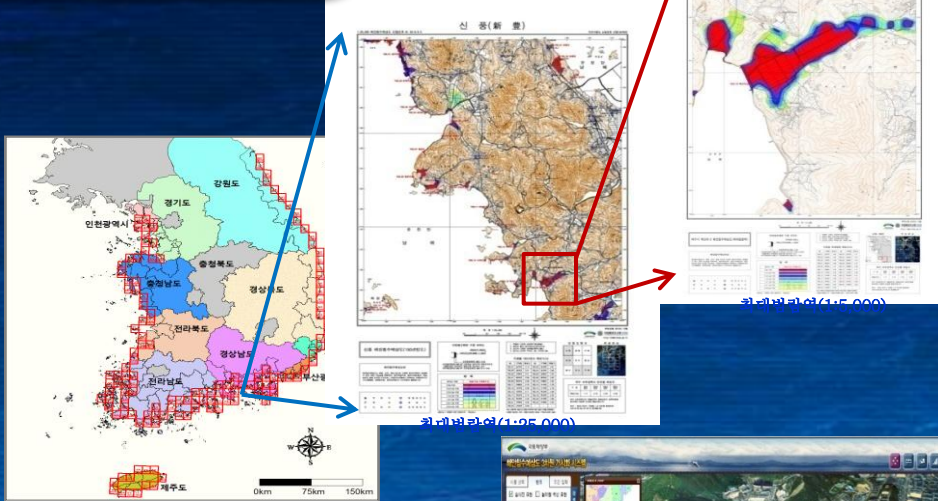
- Display correct and real time position of the ship with the use of a navigation system such as GPS
- Navigate automatically according to planned course
- Alarm sounds upon impending danger in route

# Coastal Inundation Map

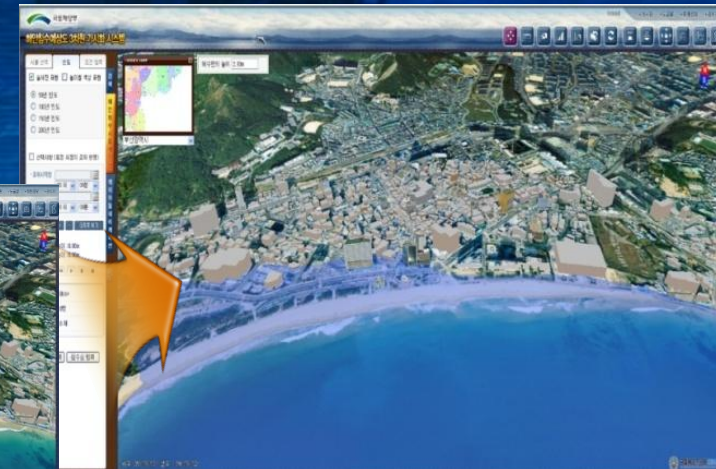
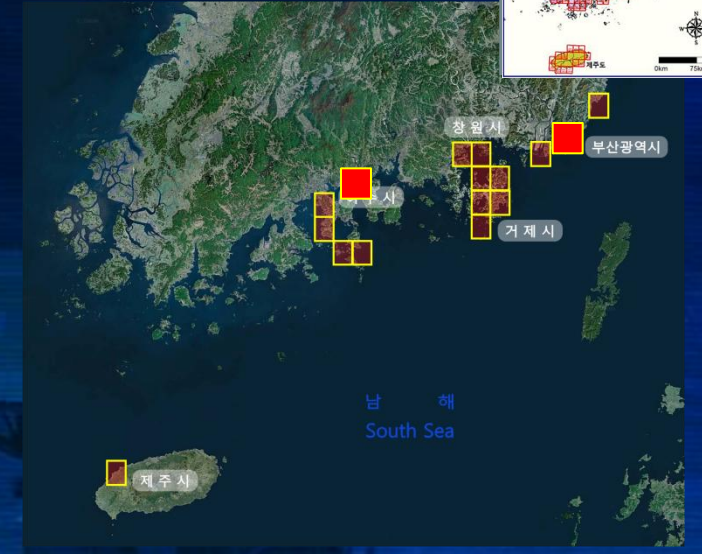
Creating CIMs for New 17 Sites

17 Areas completed during 2009-2010

Inundation map



3D-VR system



Establishing integrated system to encourage local government to use the system



***Thank you for your attention.***

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[peterhak@korea.kr](mailto:peterhak@korea.kr)

