Approach to the YOOS through China-Korea Cooperation

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LIAONING
Yalu
Paektu-san 2744 m
(9003 ft)
Beijing
NORTH KOREA
Sea of Japan
(East Sea)
HEBEI
P'yŏngyang
Seoul
Wei He
Huang He
SHANDONG
Yellow Sea
SOUTH KOREA
CHINA
JAPAN
Kuai He
Ishizuchi-
san 1982 m
(6503 ft)
KYŪSHŪ
JIANGSU
ANHUI
East China Sea
Miyanoura-
dake 1935 m
(6348 ft)
ZHEJIANG
PACIFIC OCEAN
JIANGXI
Huangqiang Shan 2158 m (7080 ft)
FUJIAN
NANSEI-SHOTŌ
Philippine Sea
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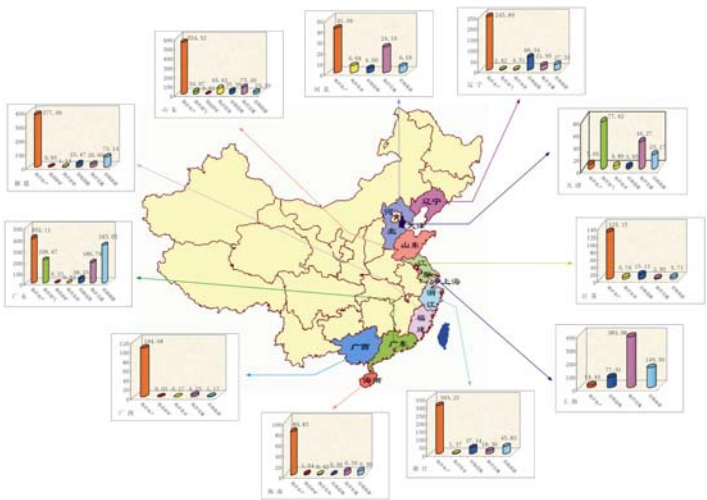
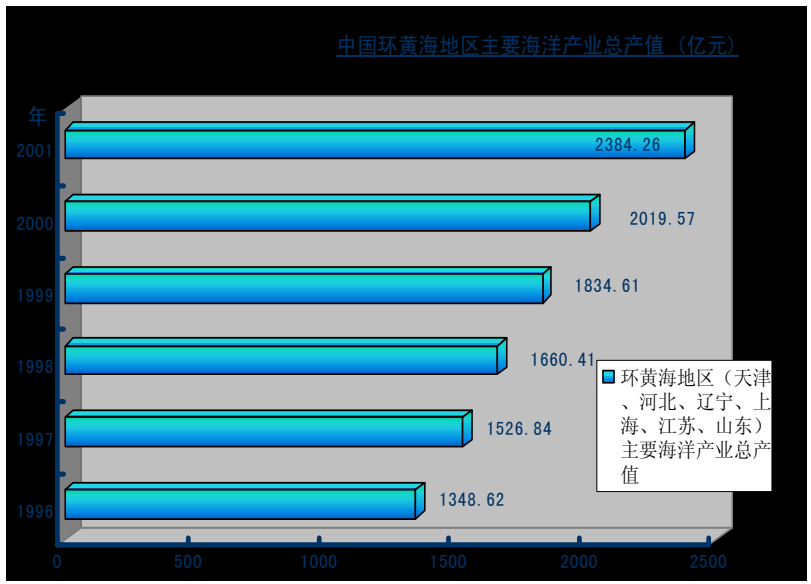
115°
30°

Compression on YS

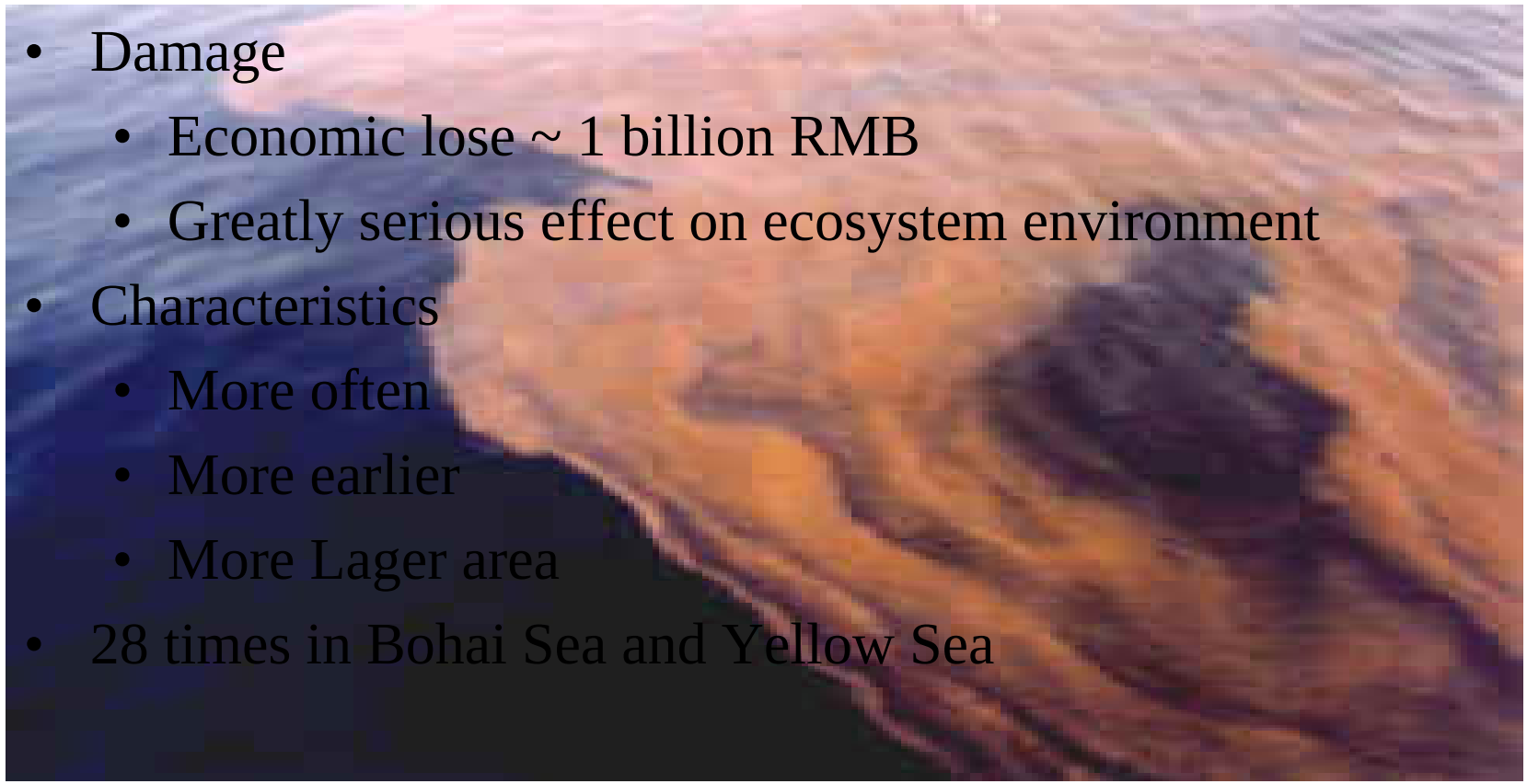
- Development of Economic
- Over-population
- Pollution and Ecosystem degradation

2001年沿海地区海洋产业分布图



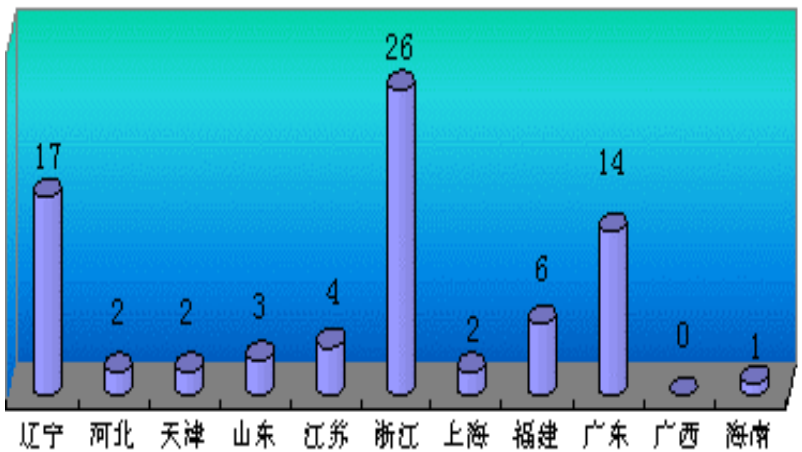


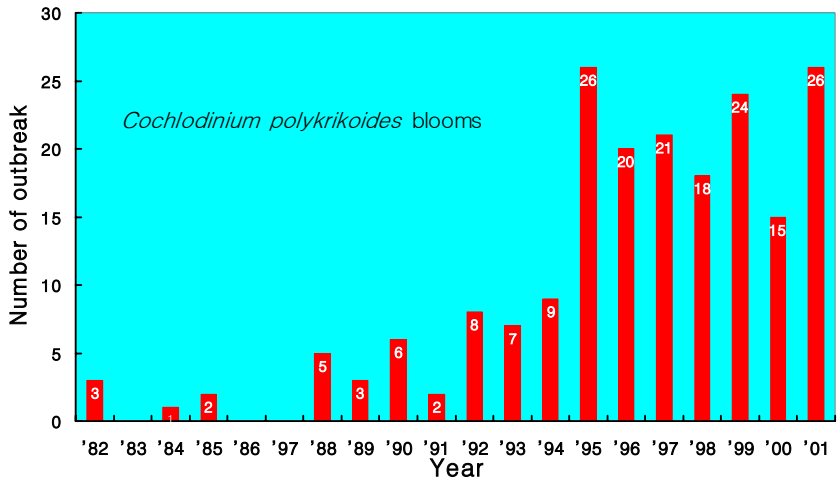
HAB in Chinese waters in 2001



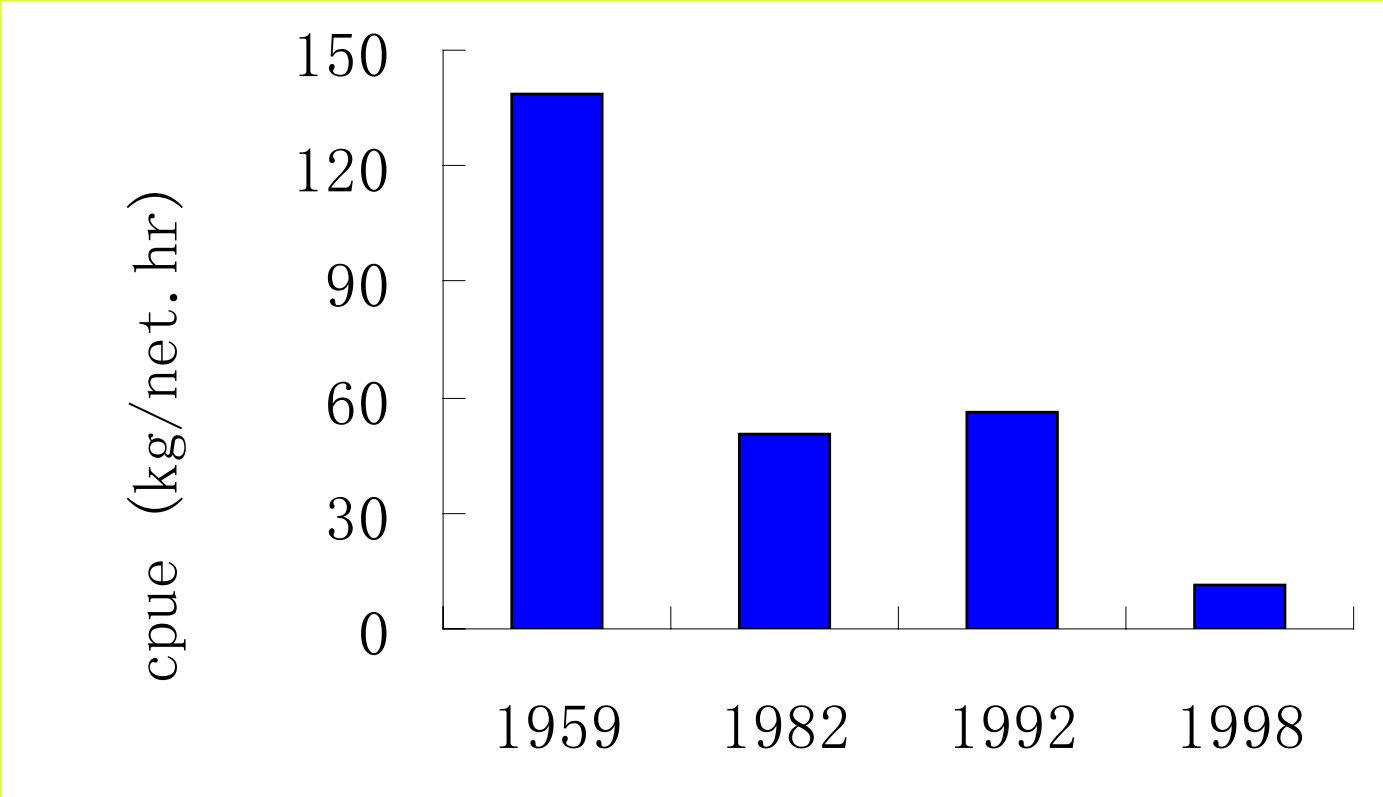
- Damage
  - Economic lose ~ 1 billion RMB
  - Greatly serious effect on ecosystem environment
- Characteristics
  - More often
  - More earlier
  - More Lager area
- 28 times in Bohai Sea and Yellow Sea

Frequency & Areas of HAB in YS





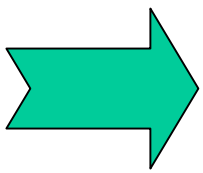
Change of CPUE in YS and BS



YSLME report

What we are aiming at?

- Ocean service
- Disaster prevention and mitigation
- Management of environment and resources



Prediction of Marine Environments

What is essential to do?

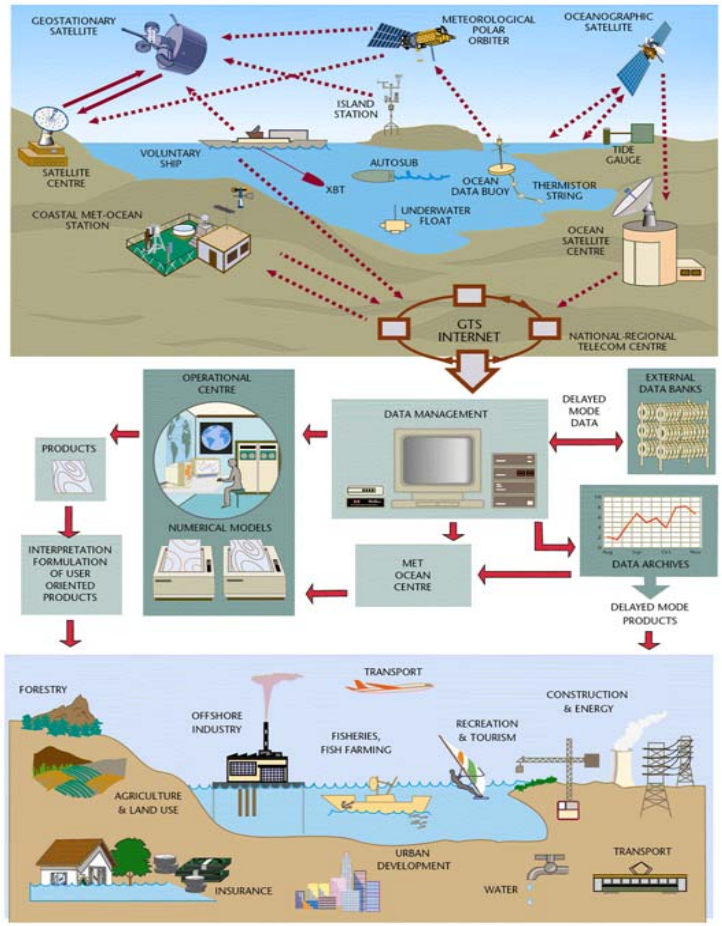
- Real-time or near real-time regional monitoring system
- Collaboration interdisciplinary and regionally

What is YOOS

- Building a Yellow Sea Operational Oceanographic System by implementing the real-time field observe system as well as other complementary tools such as remote sensing and numerical modeling through cooperation between China and Korea to maximize the efficiency of the observing system, and the value of the information products for Ocean Service in the Yellow Sea
  - To develop and implement real-time operational marine data services for the Yellow Sea
  - To provide a reliable description of the marine environmental condition of the Yellow Sea for multiple users and application

Requirements of YOOS

- Relevant to needs
- Long term
- Systematic
- Subject to continue examination
- Cost effective
- Timely
- Routinely



Benefits of YOOS

- Facilitating safe and efficient marine operations
- Ensuring national security
- Managing living resources
- Preserving and restoring healthy marine ecosystems
- Mitigating natural hazards
- Ensuring public health
- Detecting and predicting climate variability

How to Achieve YOOS?

- Commitment of active participation of the agencies and experts
- Proper coordination of the participants
- Capacity building
- Action plan and implementation

Development Strategy of YOOS

- To meet the users' need first and also respond to global issue
  - Input of users group in the region
  - Follow the strategy of GOOS
- Integration of existing observing systems in YS

Development Strategy of YOOS

- Expansion of data coverage
  - Identify and fill gaps in systems and capability and improve them
  - Joint measurement platforms (buoy, ferry boat, drifter)
  - Develop national infrastructure in support of operational oceanography

Development Strategy of YOOS

- Enhance cooperation and coordination mechanism
  - Enhance national coordination mechanism
  - Utilizing existing international cooperation mechanism
  - Regular meeting among participating agencies
  - Form networks for sub-regional to regional and global coordination

Development Strategy of YOOS

- Cooperation with other programs
  - nation program in YS
  - international program for YS
  - other regional GOOS program
  - international Large-scale program

Development Strategy of YOOS

- Promotion of YOOS
  - Publish booklet, homepage, pamphlet and handbook
  - Increase public awareness of YOOS

Development Strategy of YOOS

- Capacity building
  - Share standard and practice
  - Enable all the countries to benefit from and contribute to YOOS through training, technical assistance and technology transfer
  - Cooperative development of new technology

MoU/Agreements between China and Korea Governments

- MOST/MOST
- SOA/MOMAF
- SEPA/MOE
- MOA/MOMAF
- MOC/MOMAF+Japan

Three Organizations focused on YS

- International Association of Yellow Sea Research
- The Health of Yellow Sea
- China-Korea Joint Ocean Research Center

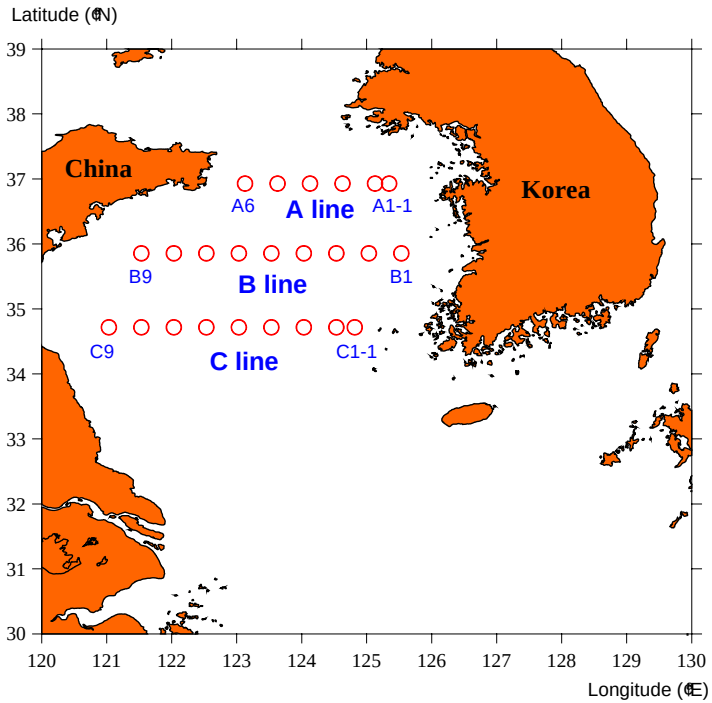
Joint Research and Investigation

- Water Circulation Dynamic
- Sediment Dynamic
- Strategy on Pollution Reducing
- Prediction on Marine Disaster

- YSLME

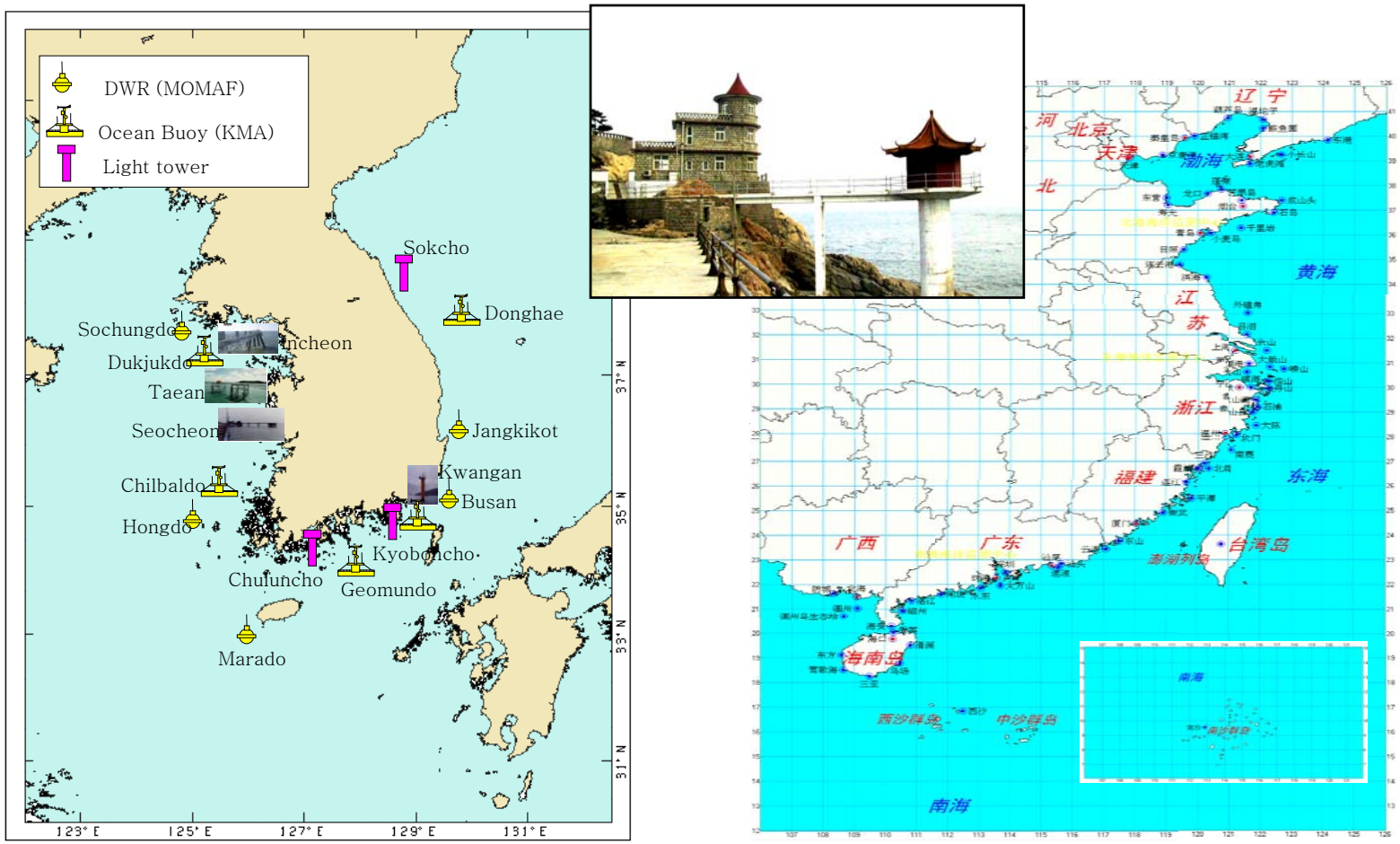
Yellow Sea Environmental Cooperative Research between Korea and China

- once a year since 1997
- agreement between SEPA/MOMAF
- Host Institutions
  Korea: MOMAF-WSFRI/NFRDI
  China: SEPA- OEMNC(Offshore Environmental Monitoring Network Center)
- Sampling Site
  3 lines, 24 stations
- Parameters(33)
  Seawater: Temperature, Salinity, Transparency, pH, SS, DO, COD, Oils and grease, TOC, NO3, NO2, NH4, PO4, Planktons, Chl. *a*, As, Pb, Cd, Zn, Cu, Hg
  Sediment: As, Pb, Cd, Zn, Cu, Hg, PCBs, Grain size, TOC, N, P



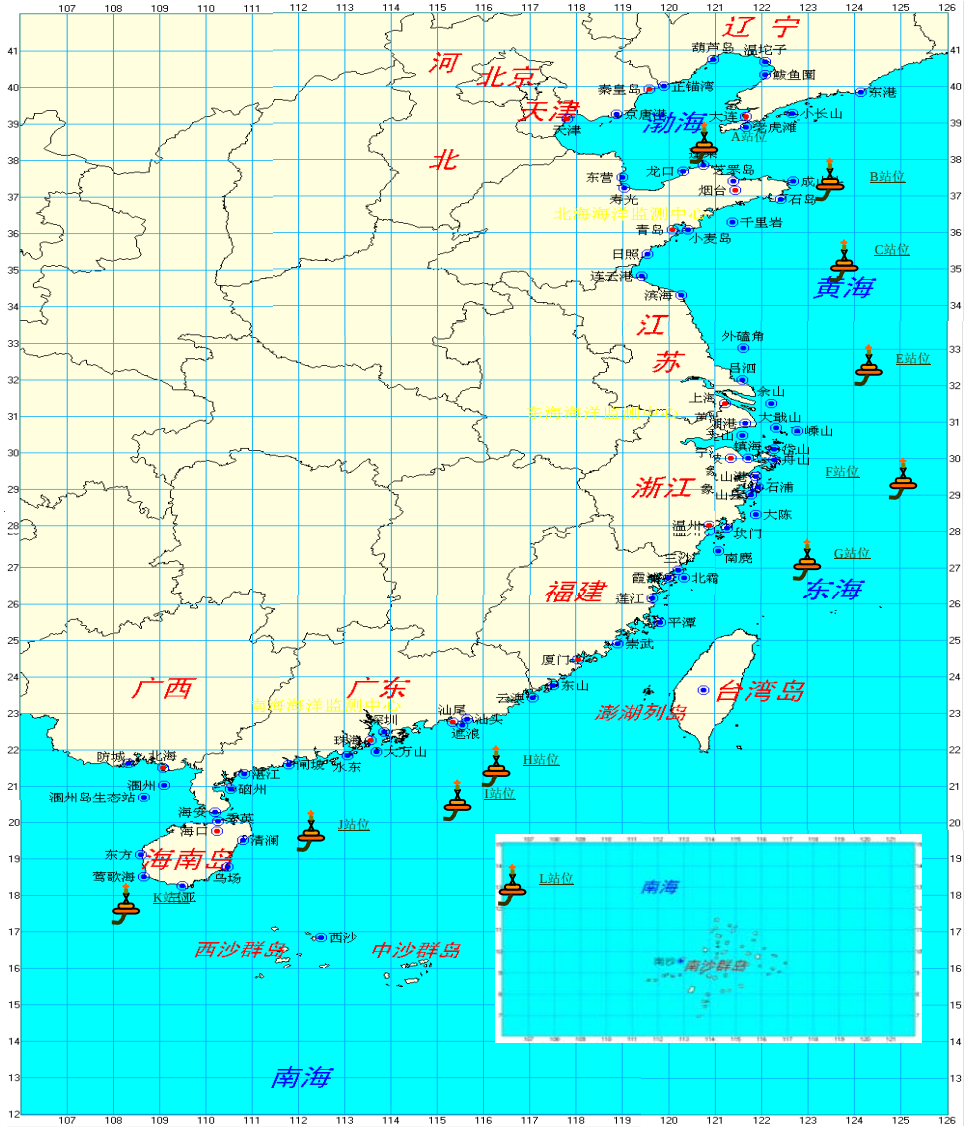
Sampling Site

Coastal Station Network in China

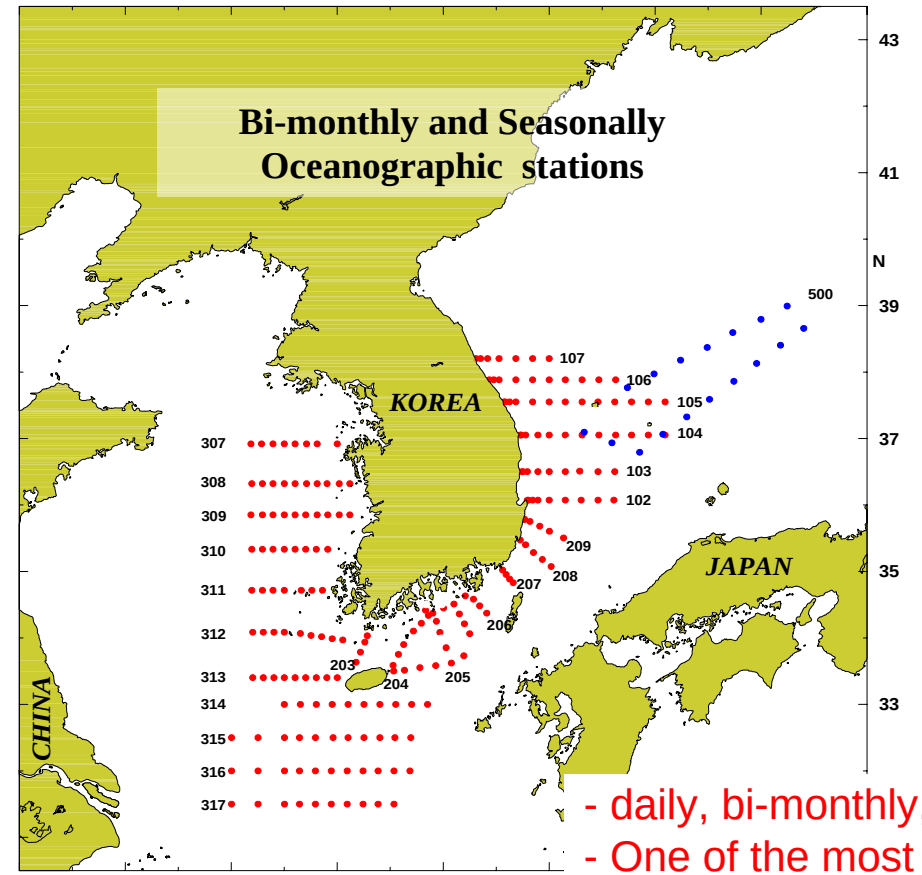


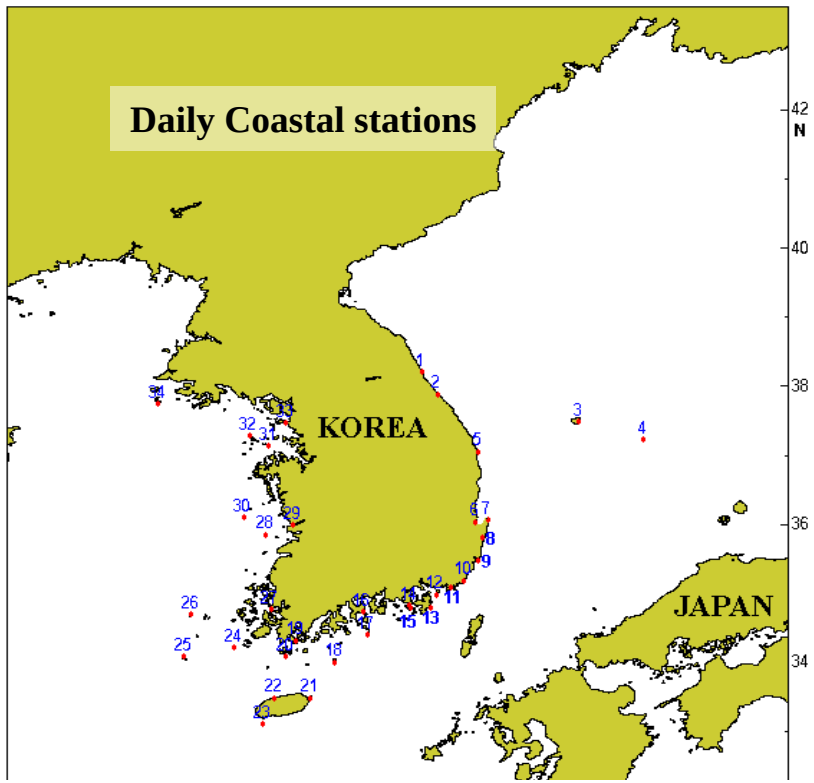
Monitoring Network in Yellow Sea and Bohai Sea

Plan of Data Buoy System in China



Status of Long-term Oceanographic Observations in the Yellow Sea of NFRDI

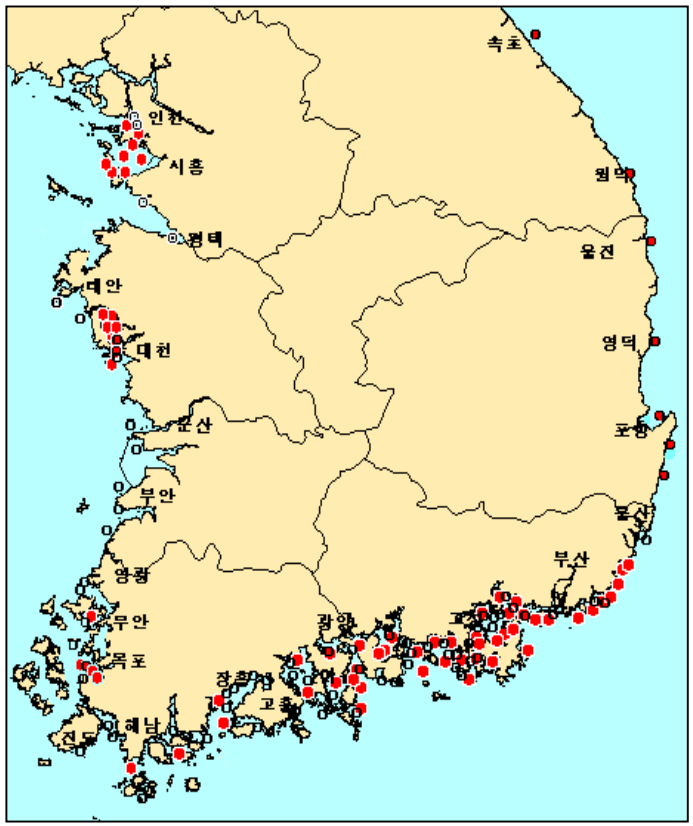




- daily, bi-monthly, seasonally etc.
- One of the most densely and frequently surveyed area in the world

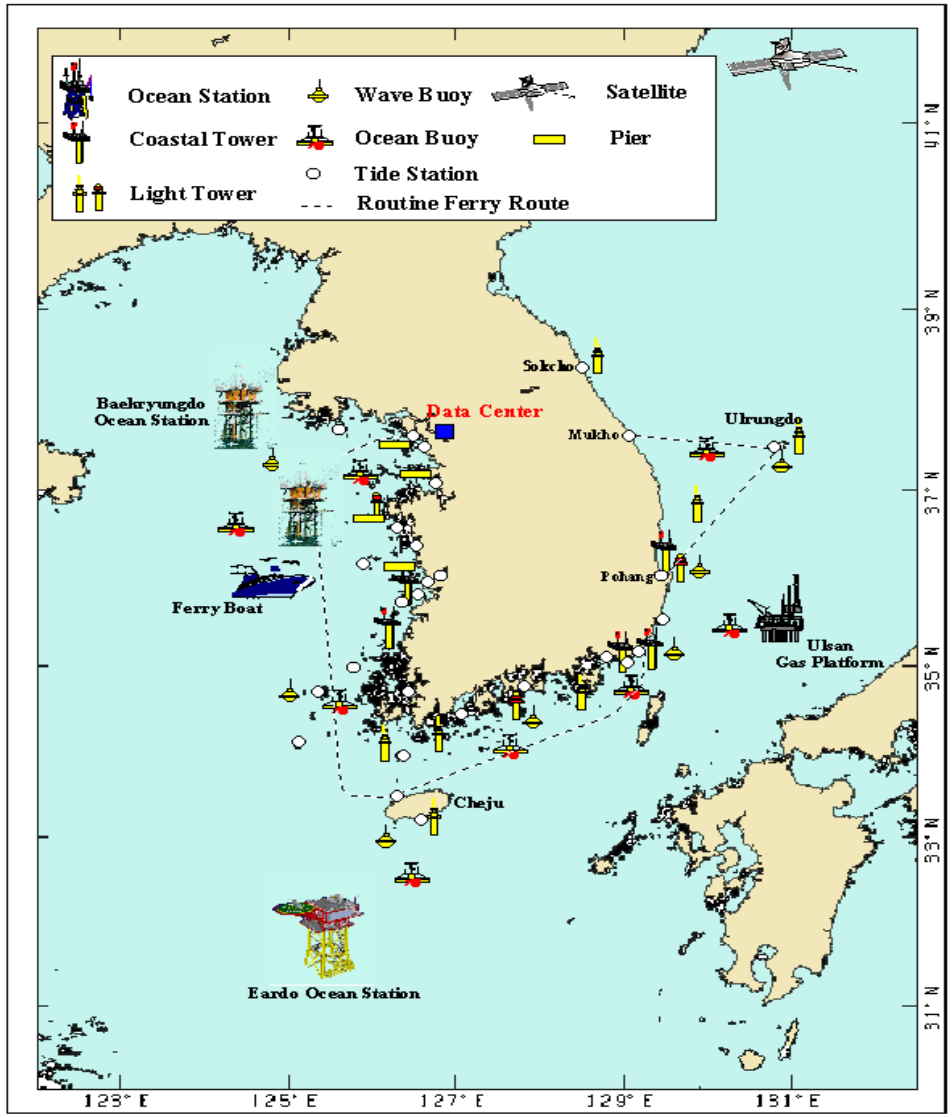
1/15/2004

HAB Monitoring Network in Korea

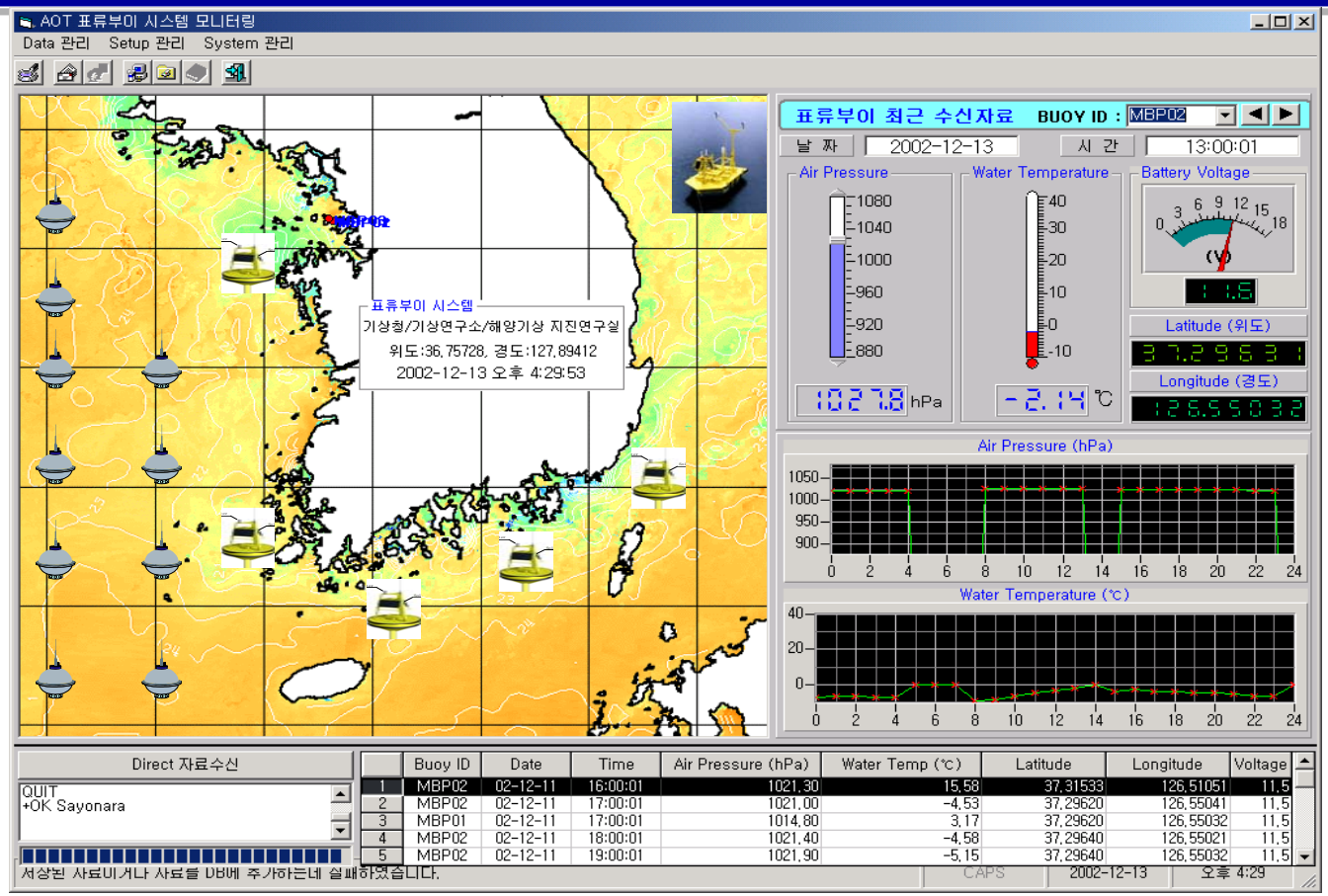


Organization	Methods	Duration	Area
NFRDI	R/V	monthly (Feb.–Nov.) daily (HAB)	all coasts (77 st.)
Local MOMAF	on shore watch and vessels	weekly (Apr.-Oct.)	39 local area (92 st.)
NMPA	helicopter	daily (HAB time)	all coasts

Basic plan for the implementation of real-time coastal and ocean observing system in Korea



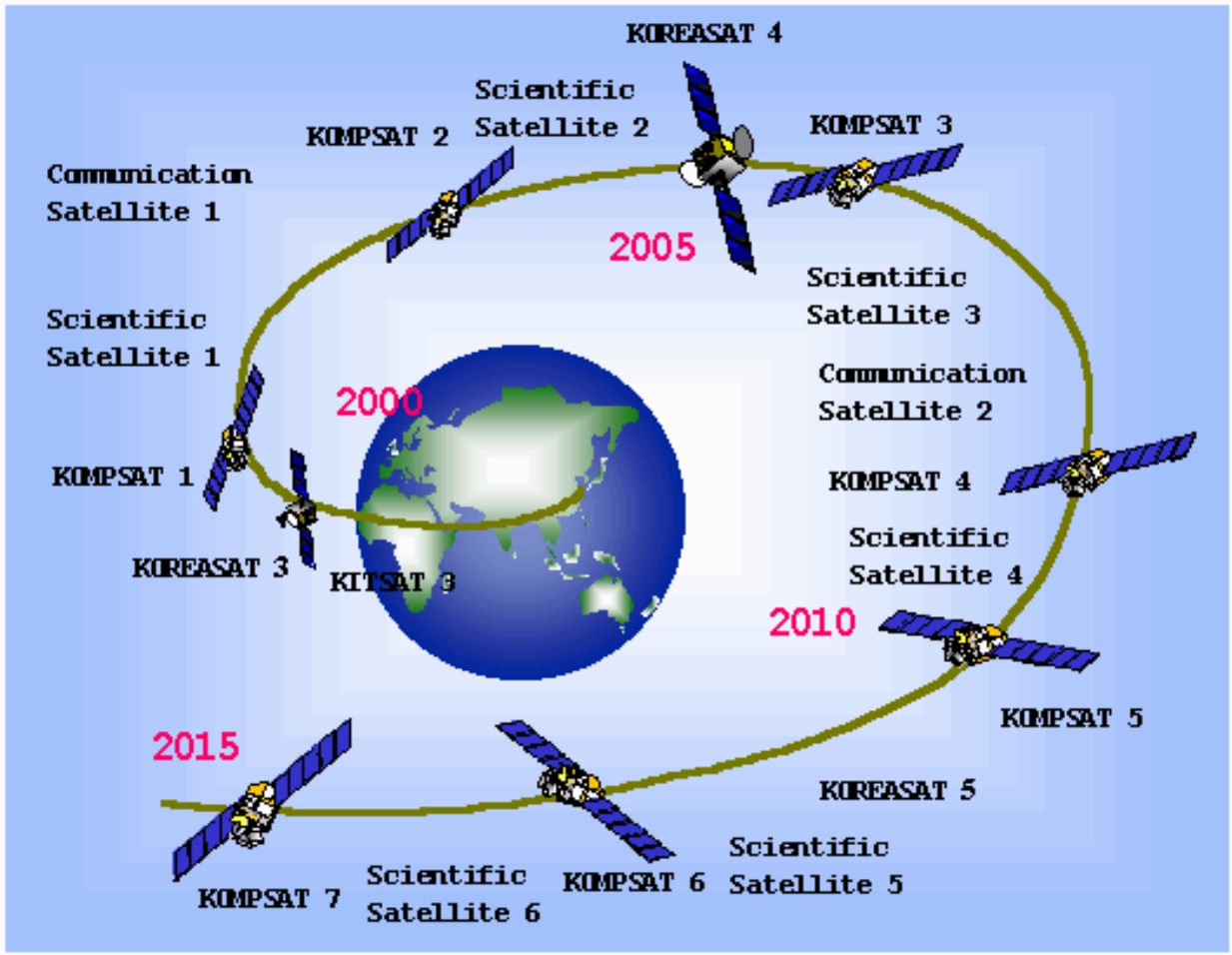
METRI-DRIFTER BUOY PROGRAMM



HY Series Satellites

Series	HY-1	HY-2		HY-3
		HY-2A	HY-2B	
purposes	Environment satellite	dynamic satellite		combine
instruments	• visible light sensors • Infrared sensors	• altimeter • scatttermeter • radiometer	• SAR • altimeter • scattermeter • radiometer	• visible light sensors • infrared sensors • microwave sensor
Lunch time	every 2 years	2004	2009	2010
Observing variables	Ocean color/SST	Wine, wave and current		combine

Satellite Plan of Korea



Conclusion and Discussion

Working in Unity in the Yellow Sea

- An operational oceanographic system needs an enduring collaboration among the neighboring countries and a strong efforts to share resources and knowledge.
- The dialogue, involvement and coordination among the participating partners are essential for its successful implementation.

Data Exchange

- Near-GOOS Data Exchange Frame
- MoU on Cooperation on Marine Science and Technology
- Preliminary Study on Data Exchange
  - Set-up by CKJORC, participated by NMDIS, KODC, KORDI
  - 1999~2000

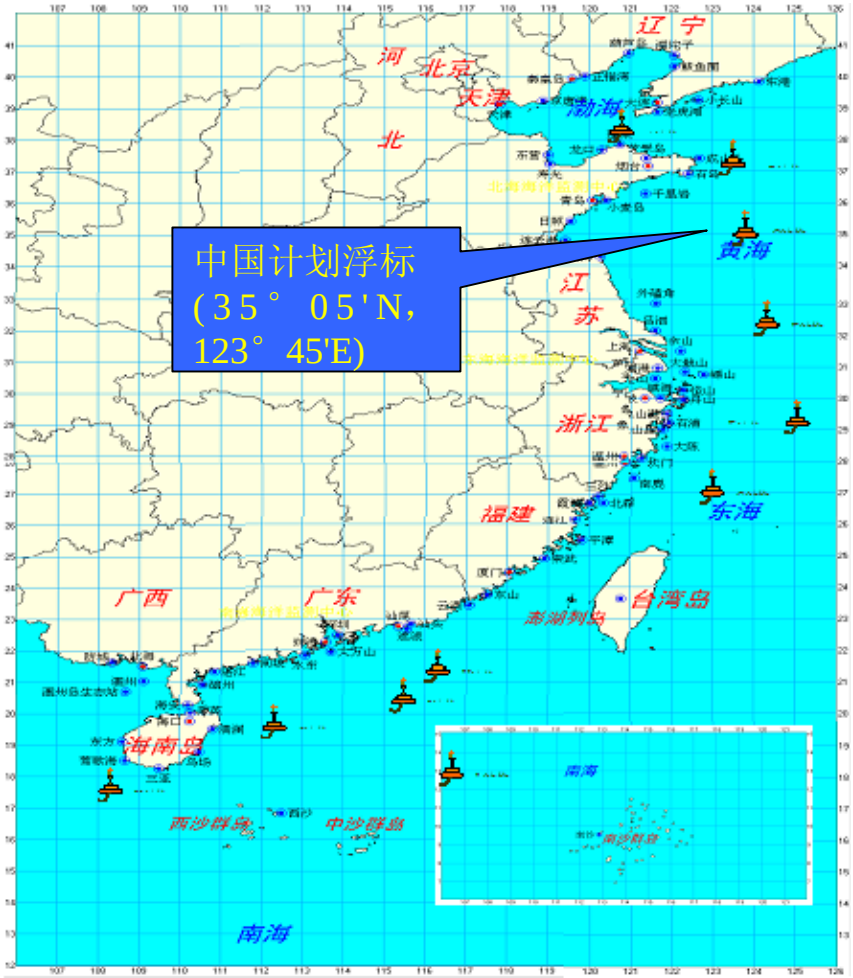
Four Phases of YOOS

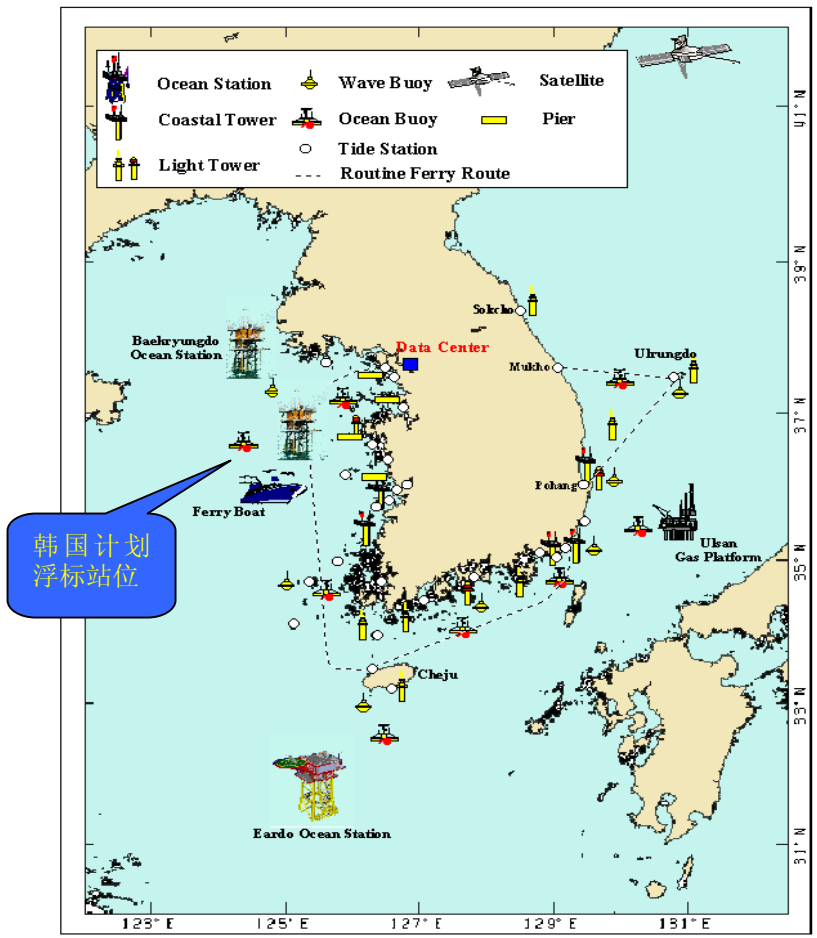
- Development for research purposes;
- testing and pilot projects to demonstration;
- Pre-operational use;
- Incorporation into the observing system with sustained support and sustained use.

Environment Monitoring

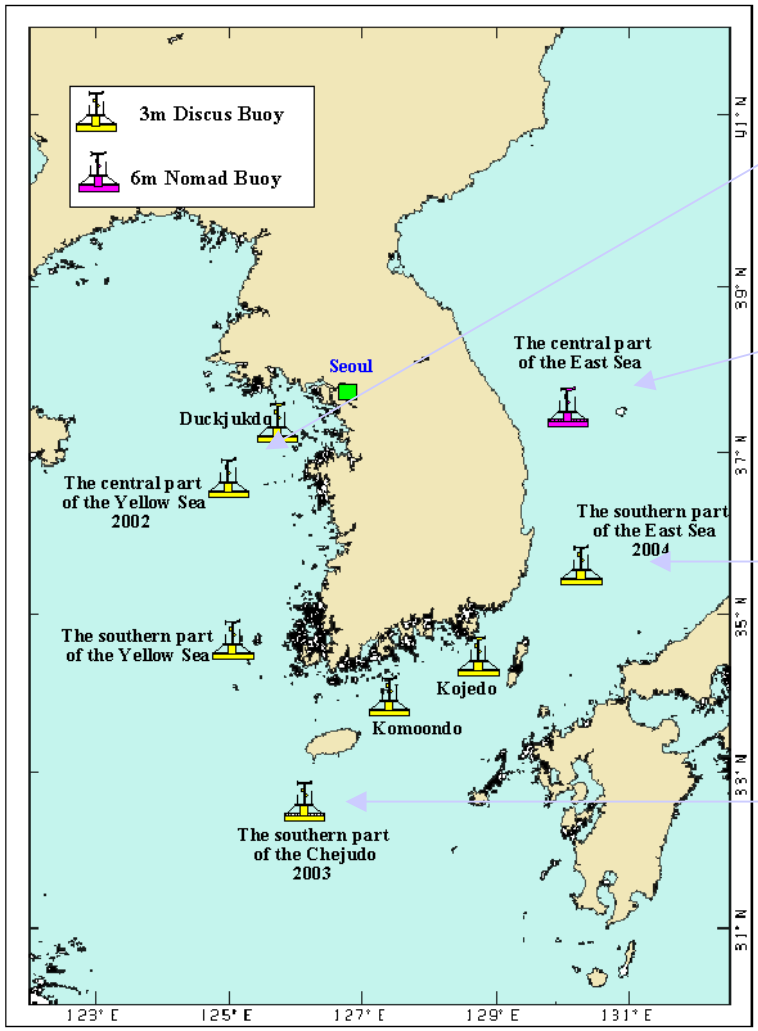
- Costal station, more accurate；
- R/V，less typical and less accurate;
- Remote Sensing，cover more space and continuously, quickly transmission; measuring was affected greatly by variation of mediums, not timely, limited variables
- Buoy: high accuracy, good continues, used for bad environmental conditions.

Basic Plan on Data Buoy in Korea and China





OCEAN BUOY in Korea



2003

2004

2003

5 buoys since 1996

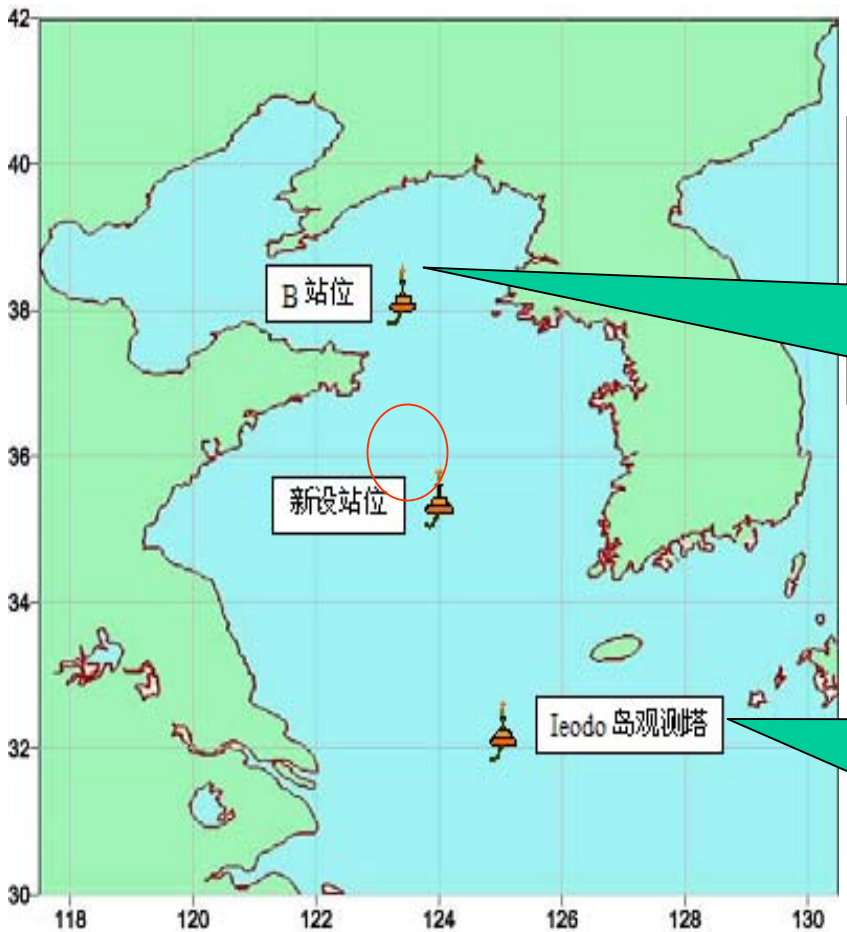
Offshore Platforms in YS

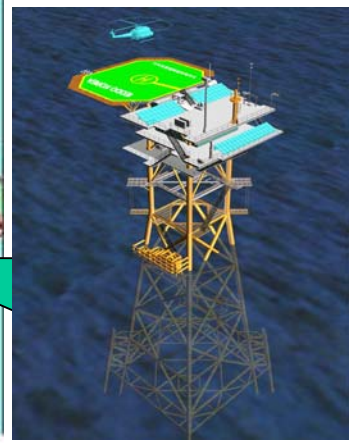
- Station B

38°N, 123.5ºE

- Ieodo Tower: 32 ° 07′ 22.63″ N, 125 °10 ′ 56.81 ″ E

- Proposed Station: 35 ° N, 124 ° E





Concept Design of Field Observing System for YOOS

- How many platform it is essential for YOOS?
- Buoy or tower?
- What type of buoy if buoy?
- Which parameters?
- Construction and deploy
- Invest and maintain
- Data dissemination and management

Benefit of Joint Platform

- Integrated
- Sustainable
- Cooperative
- Cost effective
- Shared risk

Future Development of YOOS

- YOOS was conceived as a sub-regional Near-GOOS program
- YOOS will be a umbrella program
- Two phases: YS→ECS,
- PRC and ROK initiated at first, and DPRK and Japan should be included later.

CKJORC's Role for YOOS

- A cooperative institution, fostered by China and Korea governments
- as a bridge linking Chinese and Korean marine community
- Secretariat service
- two networks
  - data and information exchange network (>40 members)
  - Contactor network (>30 members)