

# **EC DRAGONESS Project**

## **WP5 First Annual Report:**

### **China and Europe**

## **Marine Capacity Building Investigation**

**Bergen, Norway 17-19 Sep. 2008**

# **Introduction**

**The marine institutions (such as universities, institutes or centers are most important capacity building.**

**To know**

**Who is who?**

**Who or which institute is doing what kind work?**

# Chinese part

by

Liqin Shao, Ming-Xia HE, Chuntao Chen, Yan Bai,  
Bo Wang, Lei Guan, Chuanmin Hu

## List for presentation

universities under the Ministry of Education (MOE),  
institutes of Chinese Academy of Sciences (CAS),  
institutes or departments of State Oceanic  
Administration (SOA)

institutes of other Ministries or agencies.

universities or institutes of the coastal  
provincial / municipal administration.

# China map



# **Ocean-related universities under MOE**

# Ocean University of China (OUC)

is a comprehensive university covering all the sub-disciplines of marine sciences, such as Physical Oceanography and Ocean Physics, Marine Chemistry, Marine Biology, Marine Geology and Aquaculture.

OUC has been approved as one of the national key universities. The university is established in 1924. It has 20 colleges, 44 departments. 1298 faculty, 5573 graduated students and 13048 undergraduates.

The University owns the “Dong Fang Hong 2”, a research vessel with a displacement of 3,500 tons. This vessel is used for both teaching and scientific research.

**Seven key laboratories and three engineering research centers under the Ministry of Education housed at OUC.**

in which,

## **LABORATORY FOR OCEAN REMOTE SENSING, MOE**

ORSL was established in 1993. Fundamental and forefront research and development of high technology have been conducted in ocean remote sensing. Staff are 13 professors, 4 lecturers and 5 engineers. Visiting Professors and Ph.D. candidates are 20 and 25 respectively.

### **Research Areas:**

- **Satellite Ocean Remote Sensing**
- **Ocean/Atmosphere Laser Detection**

National Laboratory for Marine Science and Technology (NaLMaST, approved by MOST,) is led by OUC in collaboration with Institute of Oceanology, CAS (IOCAS), First Institute of Oceanography (FIO) / SOA, Yellow Sea Fisheries Research Institute (YSFRI) / Ministry of Agriculture (MOA) and Qingdao Institute of Marine Geology (QIMG) / Ministry of Land and Resources (MLR).



# **Xiamen University**

**is** founded in 1921, It has 22 colleges, including College of Oceanography.

Ocean-related National Key

Discipline:

Marine Chemistry,

Marine Biology.

State Key Laboratory of Marine Environmental Science :  
Founded in 1995. [MEL](#) is currently a primary research institution carrying out marine environmental science at the national level. [MEL](#) has 72 staffs comprising 36 scientists, 31 technicians and 5 administrative staffs. [MEL](#) is dedicated to research at the frontiers of marine environmental science with special attention to biogeochemical processes, mechanisms and their ecological effects. Focal areas include marginal seas such as the Taiwan Strait and the South China Sea. It is the goal of [MEL](#) to be an internationally recognized institution in advancing marine environmental science and a platform for international academic exchange and cooperation.

Key Laboratory of Underwater Acoustic Communication and Ocean Information Technology, MOE concerns the research on underwater acoustic communications, ocean information technology.

**Sun Yat-Sen University:**  
is located in Guangzhou,  
established in 1924. Dr. Sun Yat-  
sen, great leader of the 20th century,  
founded this university. Now It has  
34 colleges, 76 departments. 2630  
faculty, 13000 graduated students  
and 30000 undergraduates.

# Ocean-related Laboratory: National Engineering Research Center for Marine Biological Technology of South China Sea concerns

the research on marine gene engineering medicine development, fermentation technology of marine microorganisms, introduction of new maricultural biological variety and breeding improved varieties technique, marine economic animal breeding and disease control techniques, marine fish nutrition and technique of artificial feedstuff.

# **East China Normal University:**

The university is located in Shanghai, established in 1951. It has 24 colleges, 45 departments, including College of Resources and Environmental Science. 1800 faculty, 7700 graduated students and 13000 undergraduates.

# State Key Laboratory of Estuarine and Coastal Research

concerns the research on estuarine evolution and sediment dynamics, coastal dynamics on geomorphology and sedimentary processes, estuarine and coastal ecology and environment. Currently there are 43 fixed staffs, including 34 researchers, 7 technicians and 2 administrators. The major tasks are to study the sediment dynamics and sedimentary processes with regards to various spatial and temporal scales, as well as the human impacts on the natural environment and natural processes. This will enhance understanding of the interaction among the different physical factors in estuarine and coastal regions. Therefore, it will highlight the construction of harbor and navigation channel, resource exploitation of the coastal zone, ecology and environment protection, and coastal planning and management, etc.

# Tongji University:

The history of Tongji University can be traced back to 1907 when Tongji German Medical School was founded by Erich Paulun, a German doctor in Shanghai. The name Tongji suggests cooperating by riding the same boat. The school was expanded to include engineering in its programs and got its new name as Tongji Medical and Engineering School in 1912.

Located in Shanghai, It has 25 colleges, 50 departments, including College of Ocean and Earth Science. 4200 faculty, 15000 graduated student and 25000 undergraduates.

# State Key Laboratory of Marine Geology

research activities: paleoceanography and paleoenvironment, continental margin evolution and marine sedimentation, submarine resources, deep sea organic geochemistry, and seafloor process and observation.

Aided by several large analytic instruments including stable isotope ratio mass spectrometer, Characterized by deep sea and integrated sea-land research, the Laboratory is becoming a national center for training high-level scientists to embark on international deep sea research frontier and IODP and other basic scientific studies.



# Shanghai Jiao Tong University:

Located in Shanghai, established in 1896. It has 24 colleges, 80 departments, including College of Naval Architecture, Ocean and Civil Engineering. 2978 faculty, 13802 graduated students and 19596 undergraduates.

Ocean-related National Key Discipline:

Design and Construction of Naval Architecture and Ocean Structure,  
Marine Engine Engineering,  
Underwater Acoustics Engineering

# State Key Laboratory of Ocean Engineering

concerns the research on naval architecture digital design, dynamic characteristics for deep sea platform, application of strongly nonlinear water wave dynamics to inshore and offshore engineering, high performance marine vehicles, marine environment simulation and test analysis, remote operated vehicle and engineering under water, novel ocean engineering structure, wave loads and kinetic theory of marine structure.

Key Laboratory of Underwater Technique, MOT concerns the research on manned and unmanned diving technique.

# Nanjing University:

Located in Nanjing, established in 1902. It has 21 colleges, 62 departments, including College of Geographic and Oceanographic Sciences. 4200 faculty, graduated students 15000 and undergraduates 25000.

Ocean-related Laboratory /: Key Laboratory of Coast & Island Development, MOE concerns the research on coastal oceanography and river-ocean interaction, marine sediment dynamics and marine environment dynamics, earth surface process and ecology environment evolution, water and soil resources and evolution, high technology for observation of global change, human beings living of earth system evolution.

# **Hohai University:**

**Located in Nanjing, established in 1915. It has 16 colleges, 30 departments, including College of Traffic and Ocean. 1530 faculty, 9263 graduated students and 18605 undergraduates.**

**Key Laboratory of Hydrology-Water Resources and Hydraulic Engineering MLR, concerns the research on rational allocation and efficient utilization of water resources, flood and drought disaster prevention and mitigation, evolution and protection of water ecology and water environment, integrated management and protection of estuary and coast, water economics and management.**

**Key Laboratory of Estuarine and Coastal Engineering, MWR concerns the research on evolution of muddy coast and sediment movement, integrated development and management of estuary and bay, coastal & estuarine hydrodynamic and simulation, shoaly land and man-made island development.**

# Tianjin University:

Located in Tianjin, established in 1895. It has 18 colleges, 65 departments. 1900 faculty, 10000 graduated students and 29000 undergraduates.

Ocean-related National Key Discipline: Port, Coastal and Inshore Engineering, Marine Resource and Environment

Ocean-related Laboratory: Key Laboratory for Port and Marine Engineering, MOE concerns the research on port, coastal and inshore engineering structure, evolution of coast & estuary and coastal resources monitoring, marine and port engineering geology and ground foundation.

# **Dalian University of Technology:**

Located in Dalian, established in 1949. It has 19 colleges, 33 departments, including College of Civil & Hydraulic Engineering and College of Naval Architecture Engineering. 1802 faculty, 10670 graduated students and 18950 undergraduates.

Ocean-related National Key Discipline: Port, Coastal and Offshore Engineering, Design and Construction of Naval Architecture and Ocean Structure.

# State key Laboratory of Coastal and Offshore Engineering

concerns the research on effect of ocean dynamical environment on coastal architecture and sediment, offshore environmental pollution & disaster dynamic analysis and protection, design of offshore engineering structure and simulation.

The laboratory is equipped with multi-function wave basin that can simultaneously produce multi-directional random wave, current, tide and wind, the large wave-current flume, the wave flume for suspension material test, the ocean environment test flume, the oil spilling flume

# **Dalian Maritime University:**

**DMU is one of the largest and best maritime universities and is the only key maritime institution under the Ministry of Communications. Located in Dalian, established in 1909. It has 13 colleges, 34 departments. 834 faculty, 3460 graduated students and 12238 undergraduates.**

**DMU has a training dock and over 40 laboratories that also include a full mission ship-handling simulator and an engine room simulator. DMU also owns and operates an ocean-going training vessel of over 10,000 deadweight tonnage. DMU as an excellent center of maritime education and training as recognized by the International Maritime Organization (IMO). In 1998, the University was awarded the ISO9001 Certificate of Quality Assurance accredited by the Norwegian Det Norske Veritas (DNV) and the China Maritime Safety Administration (MSA). Ocean-related National Key Discipline: Traffic Information Engineering & Control, Marine Engine Engineering.**



# **Ocean-related institutes of CAS**

# Institute of Oceanology , CAS:

Located in Qingdao, established in 1950. It has 7 laboratories / research centers. 400 researchers.

Main Research Topics: experimental marine biology, marine ecology and environmental sciences, ocean circulation and wave, marine geology and environment.

Key Laboratory of CAS:

**Key Laboratory of Experimental Marine Biology, CAS**, concerns the research on genetic of marine organisms, new technology of biological science, excellent seedling breeding and disease control of mariculture.

**Key Laboratory of Marine Ecology and Environmental Sciences, CAS** concerns the research on biological production process of marine ecosystem, biogeochemistry process of marine ecosystem, evolution of marine environment and its effect on marine ecosystem.

## Key Laboratory of Ocean Circulation and Wave, CAS

concerns the research on dynamics process of ocean circulation and its effect on the climate and environment, ocean wave and its effect on the other ocean process, remote sensing detection and numerical forecast method for marine environment.

## Key Laboratory of Marine Geology and Environment, CAS

concerns the research on geological evolution of continental margin and resource potential, marine process of global change and its sedimentary record, environmental detection of deep sea and life process.

Public Oceanography Research Platform: Kexue-I research vessel, GRT 2748. Kexue-III research vessel, GRT 1224. Jinxing-II research vessel, GRT 1100.

# South China Sea Institute of Oceanology, CAS:

Located in Guangzhou, established in 1959. It has 9 laboratories/departments/ research centers. 400 researchers.

## Main Research Topics:

tropical marine environmental dynamics, marginal sea geology and paleoenvironment, synthetic utilization of marine biological resources and investigation & appraisal of environment for marine engineering.

## Key Laboratory of CAS:

**Key Laboratory of Tropical Marine Environmental Dynamics**, CAS concerns the research on marine circulation dynamic processes of South China Sea and large scale air-sea interaction, ecosystem of South China Sea and its response to climatic variation, offshore waters environment and ecological process in South China.

**Key Laboratory of Marginal Sea Geology**, CAS concerns the research on marginal sea-land-lithosphere geological processes and dynamics, paleoenvironment of marginal sea formation and evolution and paleoceanography, formation and distribution of marginal sea mineral resources.

## **Key Laboratory of Sustainable Tropical Marine Biology**

**Resources** concerns the research on marine bioresources, mariculture biotechnology, marine drugs.

Public Platform For Marine Research: “Shiyan II” research vessels, GRT 1100. “Shiyan III” research vessels, GRT 3300. Hainan Tropic Marine Life Experimental Station, Daya Bay Marine Biology Experimental Station.

# Institute of Acoustics, CAS:

Located in Beijing, established in 1964. It has 18 laboratories/research centers. 530 researchers. It has **3 research divisions located in Qingdao, Shanghai and Hainan.**

Main Research Topics: underwater acoustic physics and underwater acoustic detection, sound and vibration control, environmental acoustics and noise control technique, ultrasonics and acoustical micro-electric mechanical system, communication acoustics and speech signal processing, acoustical navigation and digital system integration, digital audio and video and network technology.

Ocean-related Laboratory : State Key Laboratory of Acoustics concerns the research on acoustic field physics and signal processing technology, numerical simulation and retrieval of **underwater acoustic field**, new methods of passive location, inverse scattering and imaging of ultrasound, speech recognition and synthesis.

# **Yantai Institute of Coastal Zone Research for Sustainable Development, CAS**

**YIC is a new institute which focuses on coastal resource recycling utilizing, environment protection, ecology process, and integrated management under the supervision of the Chinese Academy of Sciences (CAS). The main objectives of the institute will encourage new multidisciplinary research collaborations and to bring together an extended community of researchers and end-users of research.**

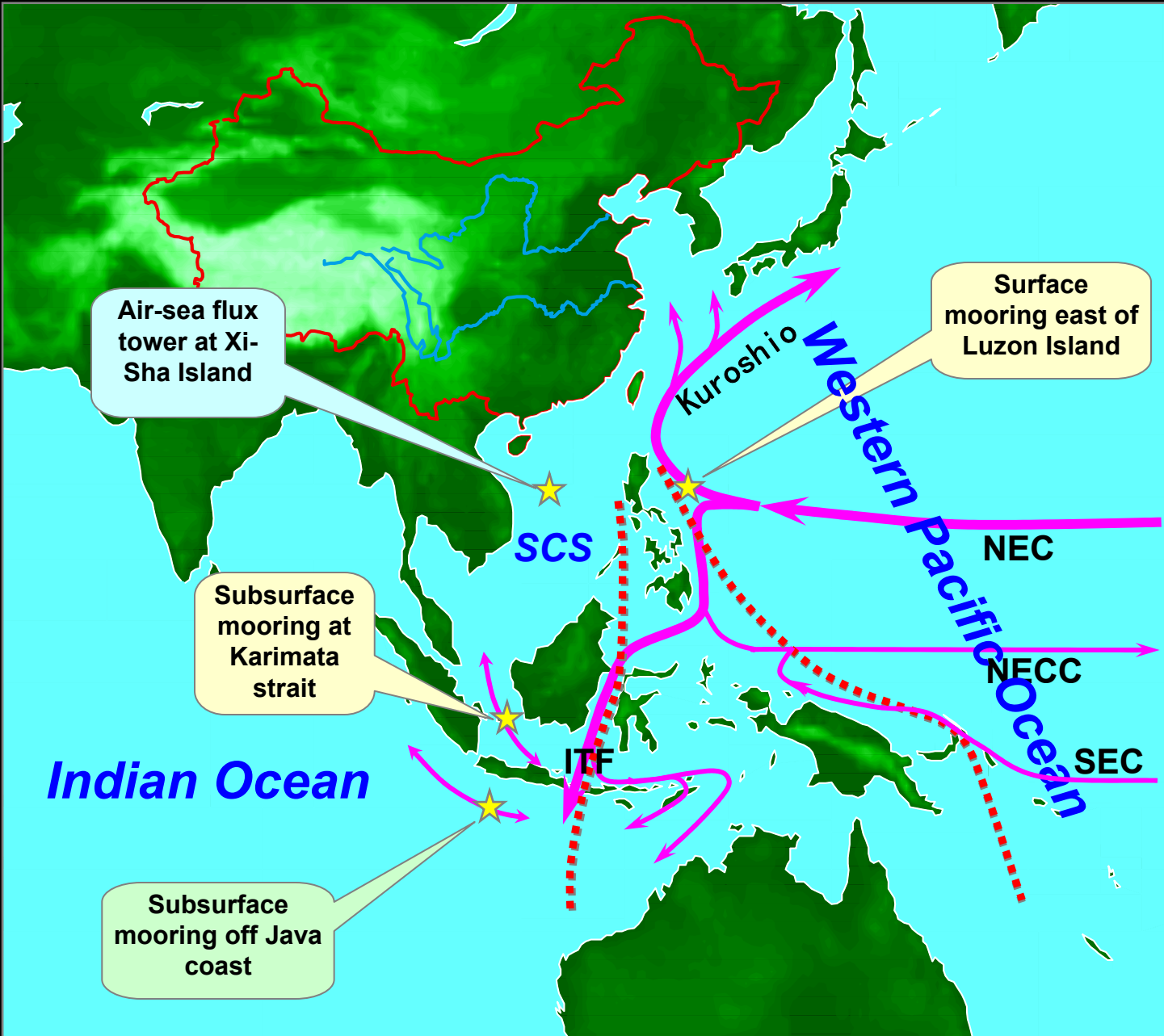
# **Institute of Atmospheric Physics, CAS**

**IAP is also doing marine research, because Asia Monsoon, El Nino, West pacific warm pool, and other impacts of air-ocean and land-ocean interaction.**

**IAP scientists propose and lead some important projects such as MONSOON ASIA INTEGRATED REGIONAL STUDY (MAIRS), Asia-India-Pacific Ocean study (AIPO). IAP has advanced Climate Modeling capacity. Nansen-Zhu center etc.**



# Schematic observation plan of atmosphere-ocean interaction at the Asia-Indo-Pacific Region



# **Institutions directed by State Oceanic Administration (SOA)**

To be presented by Yan Bai

**The Second Institute of Oceanography SIO/SOA**

# SOA and it's subordinates bodies

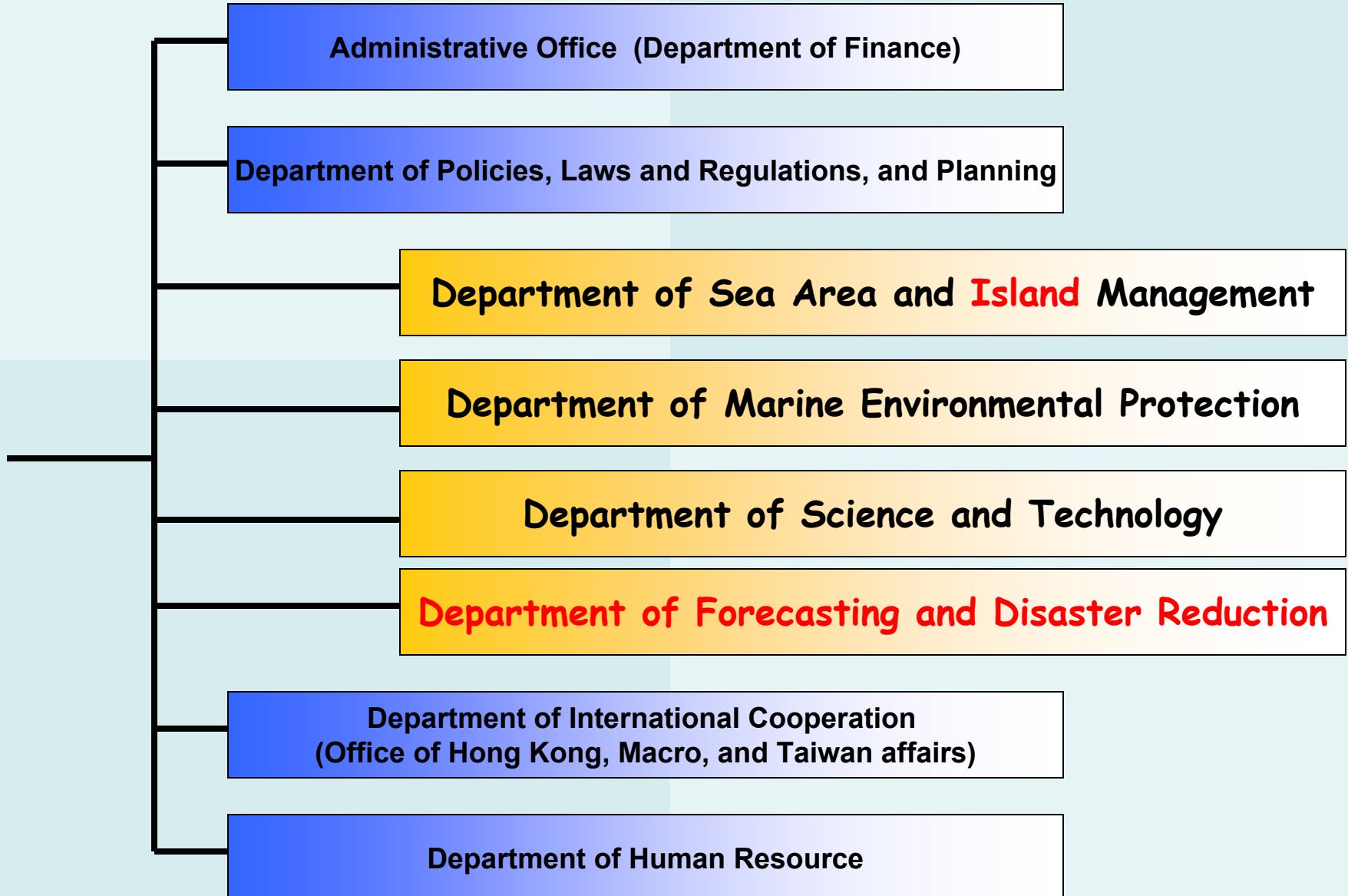


# The State Oceanic Administration (SOA)

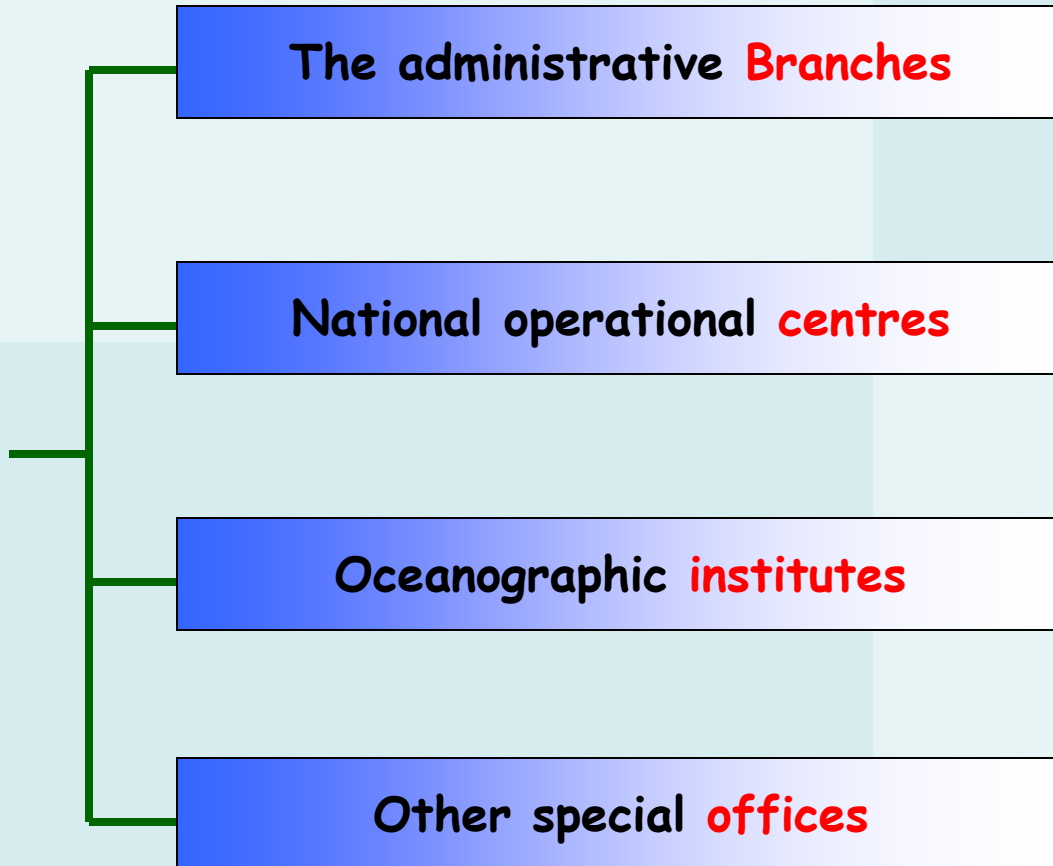
It is an administrative agency responsible for China marine affair

- ✓ supervise and manage the sea area use
- ✓ protect the marine environment
- ✓ safeguard the marine rights and interests
- ✓ organize the marine science and technology research.

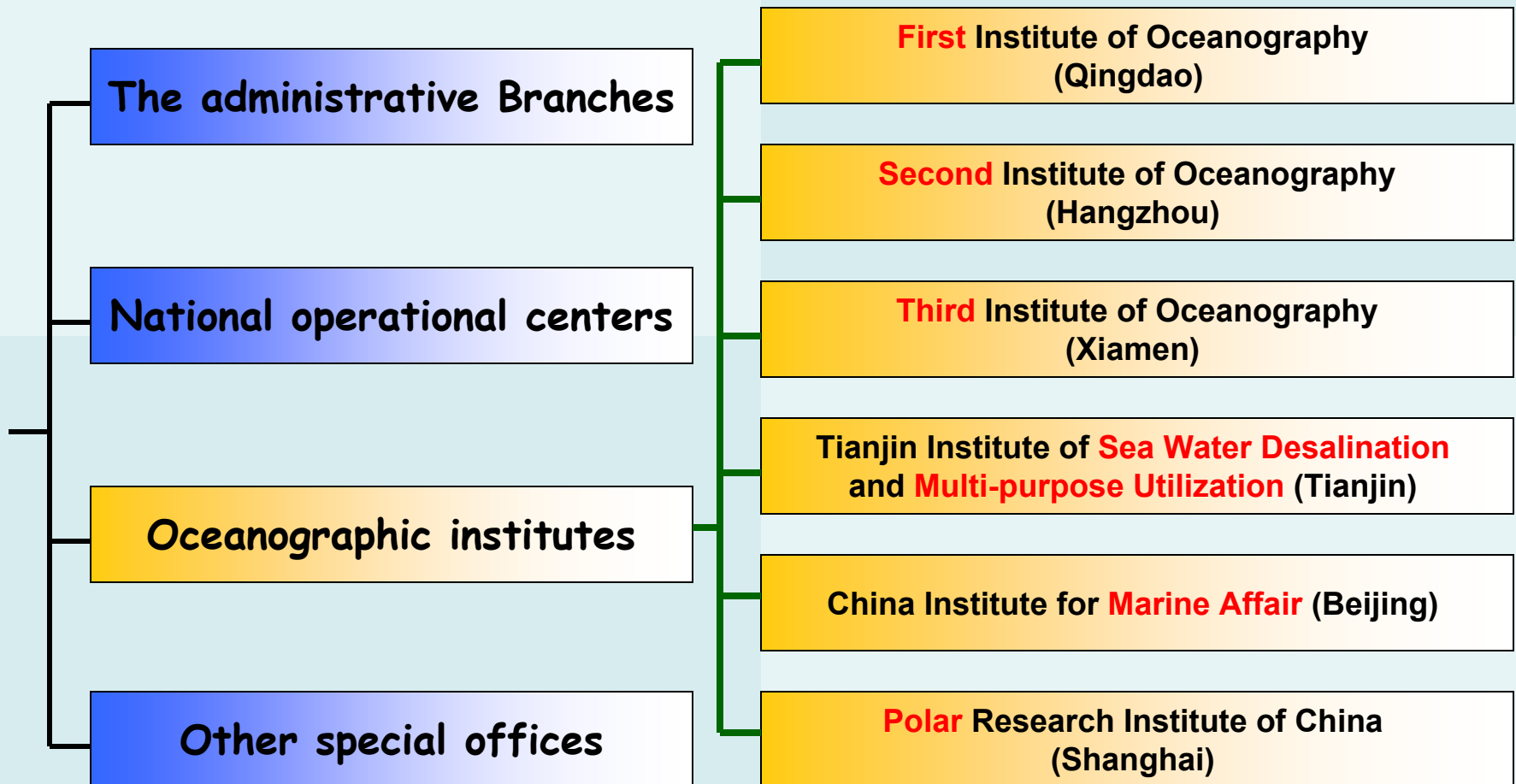
# Organs of the headquarters of the SOA



# Subordinate bodies of SOA



# Subordinate bodies of SOA



# The First Institute of Oceanography

## FIO/ SOA (Qingdao)

- 1) SOA key lab of marine science and **modelling**
- 2) SOA key lab of marine resources and environmental geology
- 3) SOA key lab of science and engineering marine ecology and environment
- 4) SOA key lab of marine bioactive substances
  - 3 Academicians**
  - More than 350 researcher and engineer**
  - 5 Master program**
  - 2 Post-doctoral program**

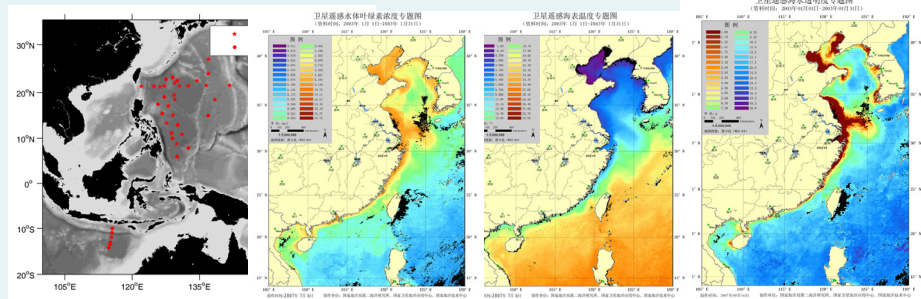
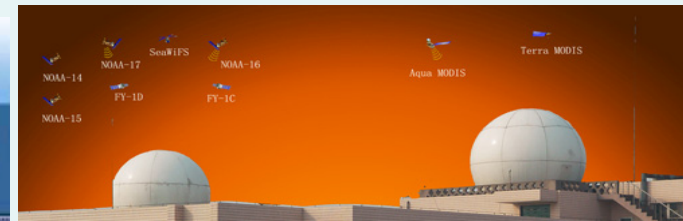


# The Second Institute of Oceanography

## SIO/ SOA

- 1) State key lab of **satellite ocean environment dynamics** (SOED)
- 2) SOA key lab of submarine geosciences (KLSG)
- 3) SOA key lab of marine ecosystem and biogeochemistry (LMEB)

- 3 Academicians
- More than 350 researcher and engineer
- Master program
- Post-doctoral program
- Public platform



# The Third Institute of Oceanography

## TIO/ SOA

1) SOA key lab of **marine biogenetic resources**

(China R & D base of ocean biogenetic engineering) ,

2) SOA key lab of global change and marine-atmospheric chemistry (GCMAC)

- 1 Academicians
- More than 350 researcher and engineer
- Master program
- Post-doctoral program

# The Tianjing Institute of Sea Water Desalination and Multi-purpose Utilization (SOA)

➤ **Distillation desalination**



➤ **Counter-filter desalination**



➤ **water cooling**



**China institute for Marine Affair (CIMA) of SOA**  
**The Institute for Ocean Development Strategy**

**Research the strategic issues in medium and long term in the aspect of national marine polices, laws, economy, environment, resource, right and interests.**



## Polar Research Institute of China (PRIC) in Shanghai

For comprehensive studies of the polar region

## Chinese Arctic and Antarctic Administration (CAA) in Beijing

For the organization of Chinese Arctic and Antarctic Scientific Program, as well as logistic support to the Antarctic expedition.



Ice breaker  
R/V "Xuelong"



1985 Antarctic  
Great Wall Station



1989 Antarctic  
Zhongshan Station

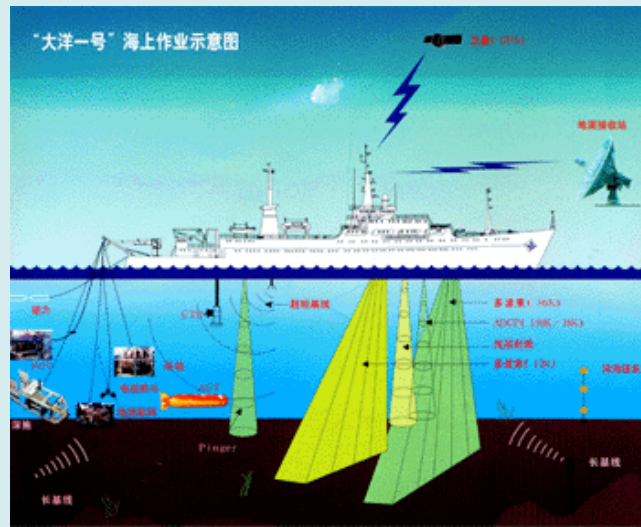


2004 Arctic  
Yellow River Station

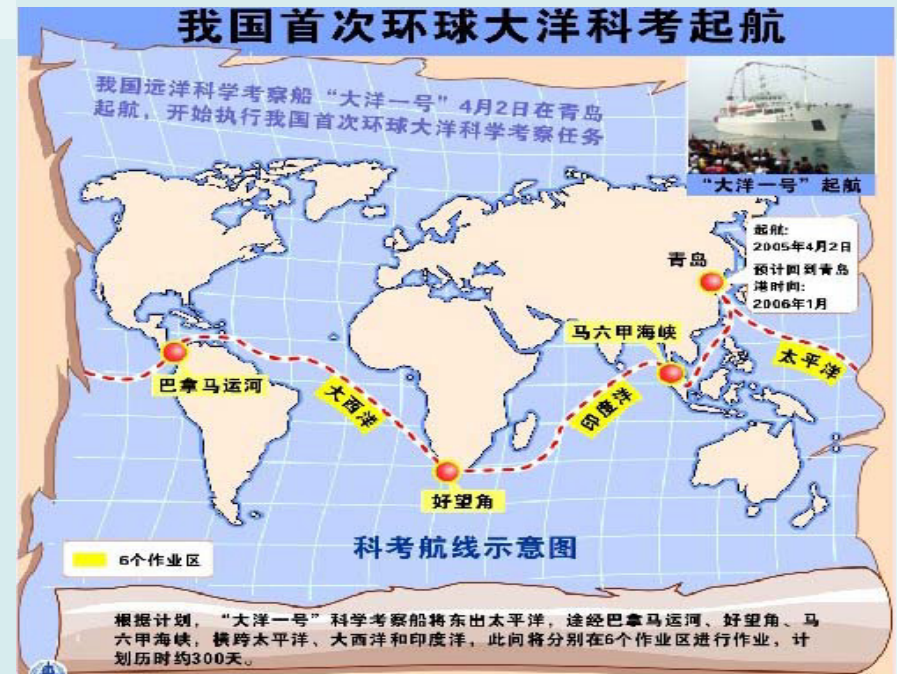
# Office of China Ocean Mineral Resources Research and Development Association (Beijing)



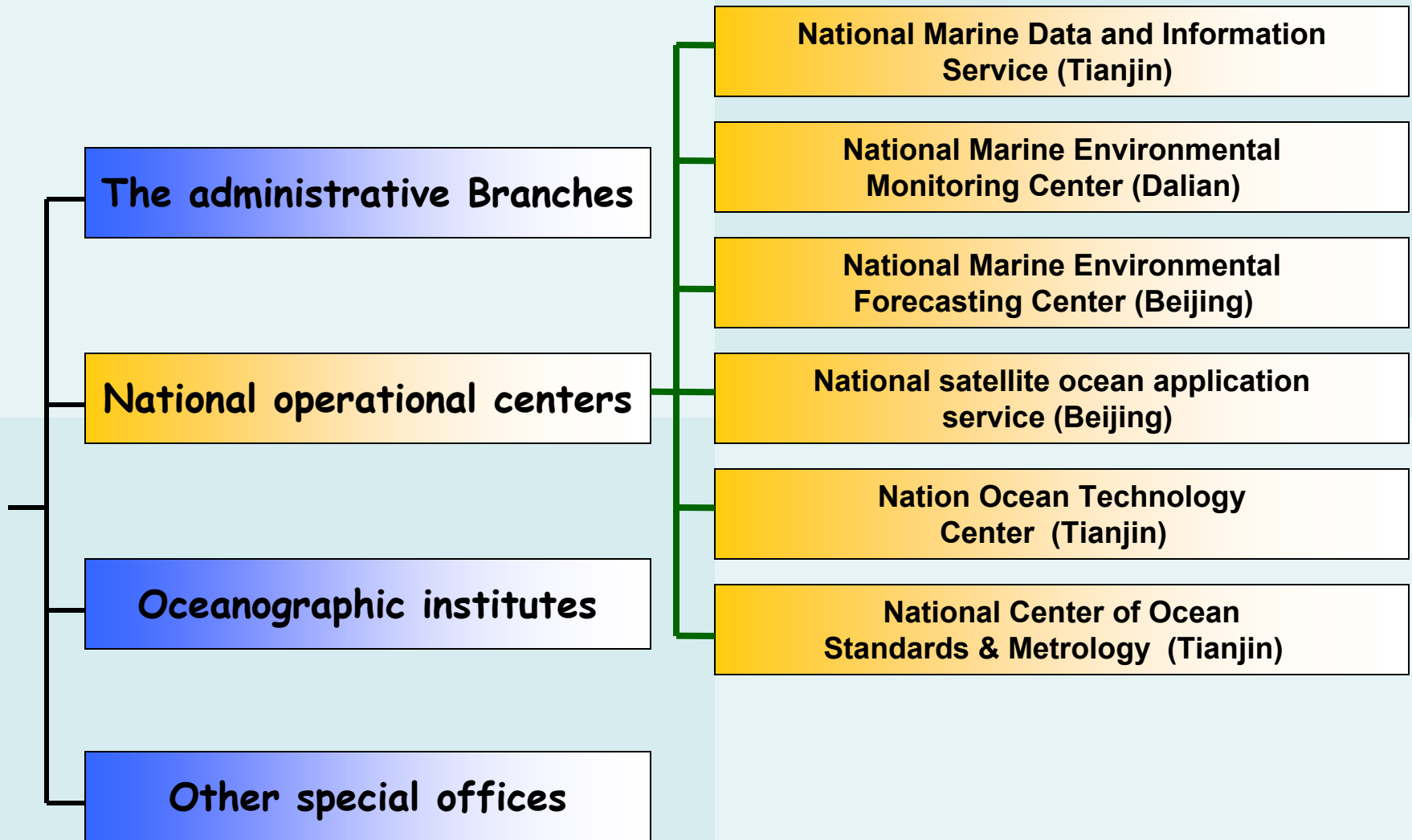
R/V "Dayang-1"  
Displacement of 5600 ton



**COMRA** is an organization of coordinating the activities of deep sea bed exploration and exploitation of its member units.



# Subordinate bodies of SOA



# National operational centres of SOA



# The National Marine Data and Information Service (NMDIS)



**SOA of RPC**  
<http://www.soa.gov.cn>

**China Oceanic Information Network**  
<http://www.coi.gov.cn>

**Oceanic Person with Ability Network**  
<http://www.ohrc.org.cn>

**China ARGO Data Center**  
<http://www.argo-cndc.org>

**Oceanic scientific Data Center**  
<http://mds.coi.gov.cn>

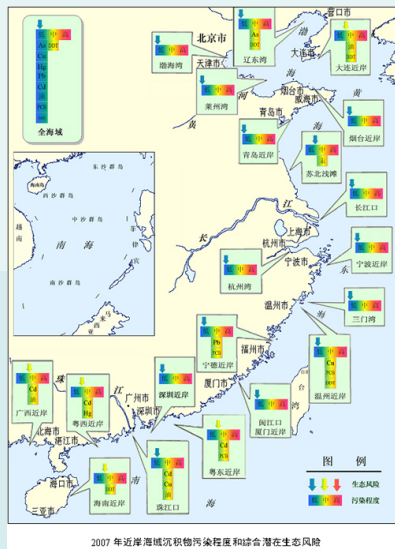
**Sustainable Development in China (marine part)**  
<http://sdinfo.coi.gov.cn>



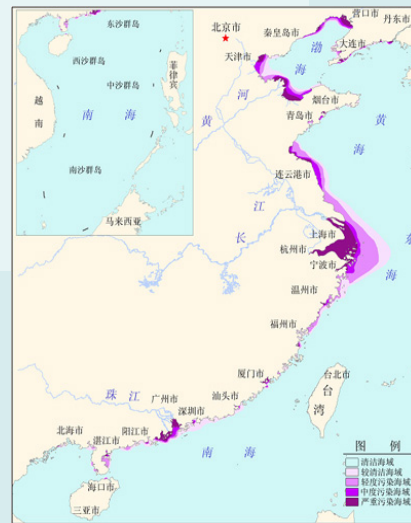
# The National Marine Environmental Monitoring Centre (NMEMC)

## Institute of Marine Environmental Protection

### Annual Report of National Marine Environment



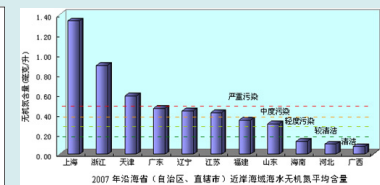
**Sediment pollution and potential biological risk**



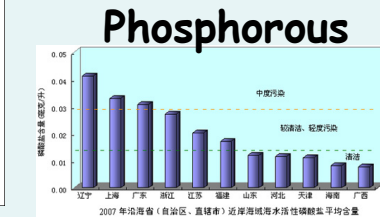
**Water quality classification**



**Distribution of pollutant**



**Nitrogen**

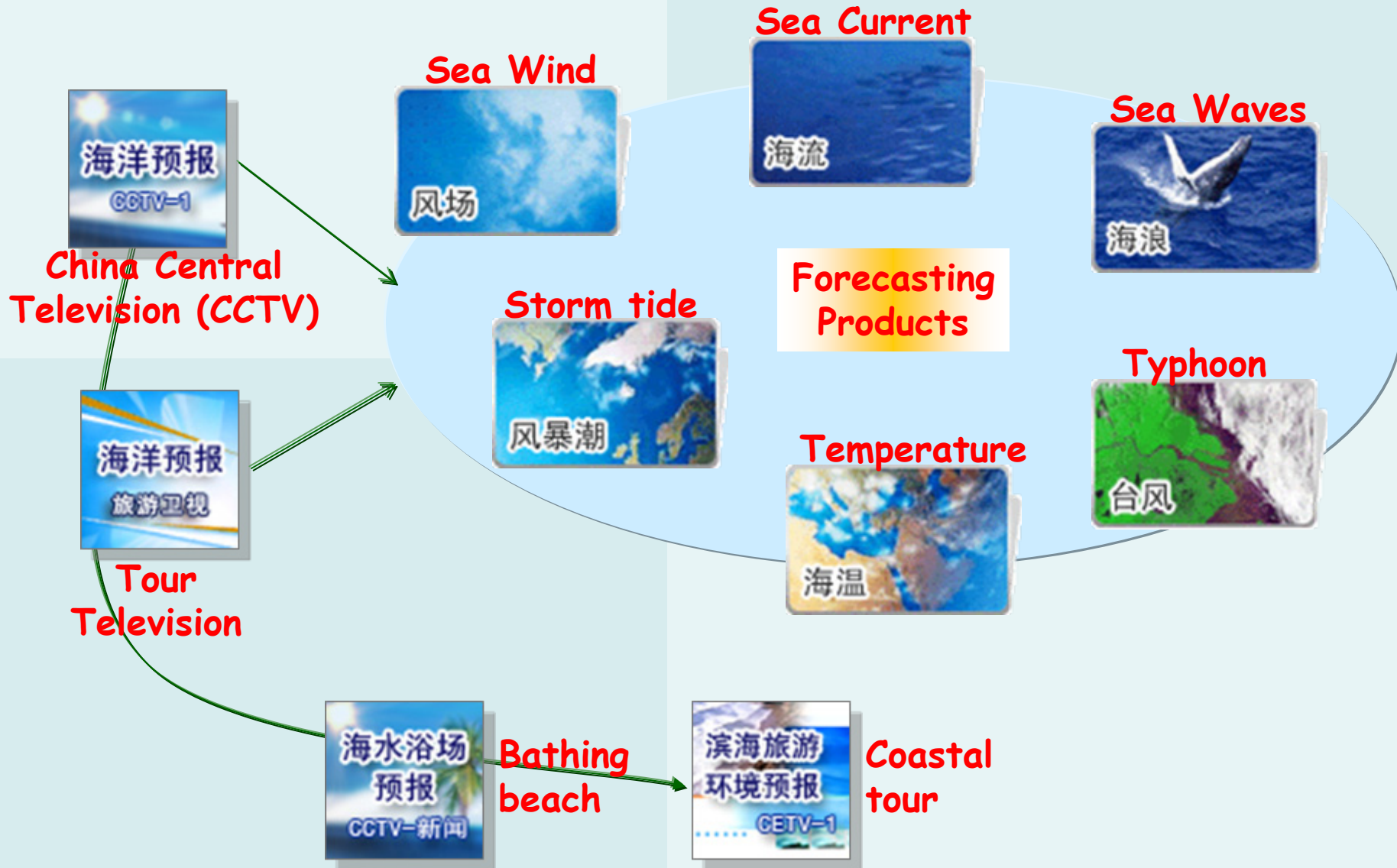


**Phosphorous**

(e.g. 2007)

**organization, technical management and support of the nation-wide marine environmental monitoring**

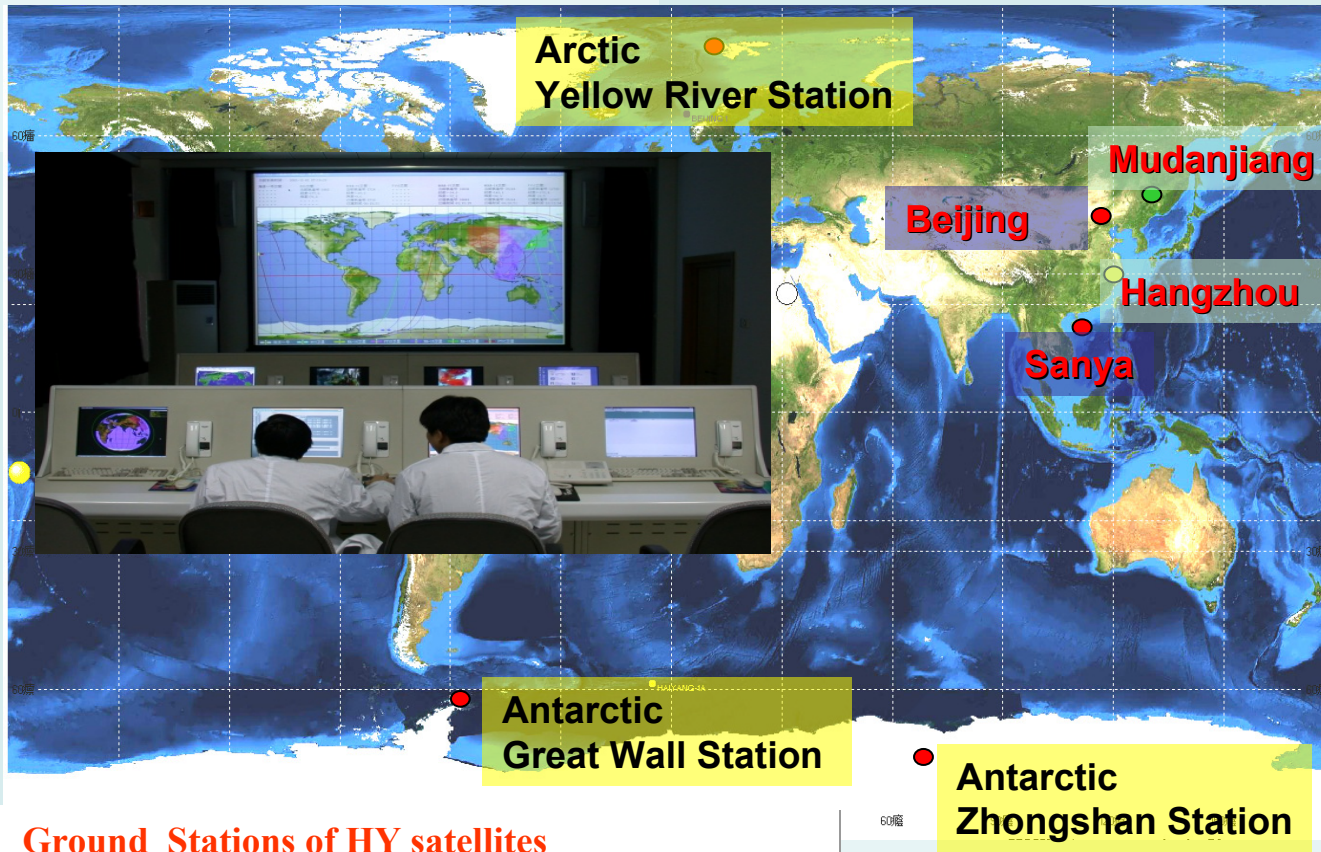
# The National Marine Environmental Forecasting Center (MNEFC)



# The National satellite ocean application service (NSOAS)



Operational running of Chinese ocean satellite series the ocean satellite and its application, and the calibration and validation fields of the ocean satellite.



Ground Stations of HY satellites

# The national ocean technology center (NOTC)

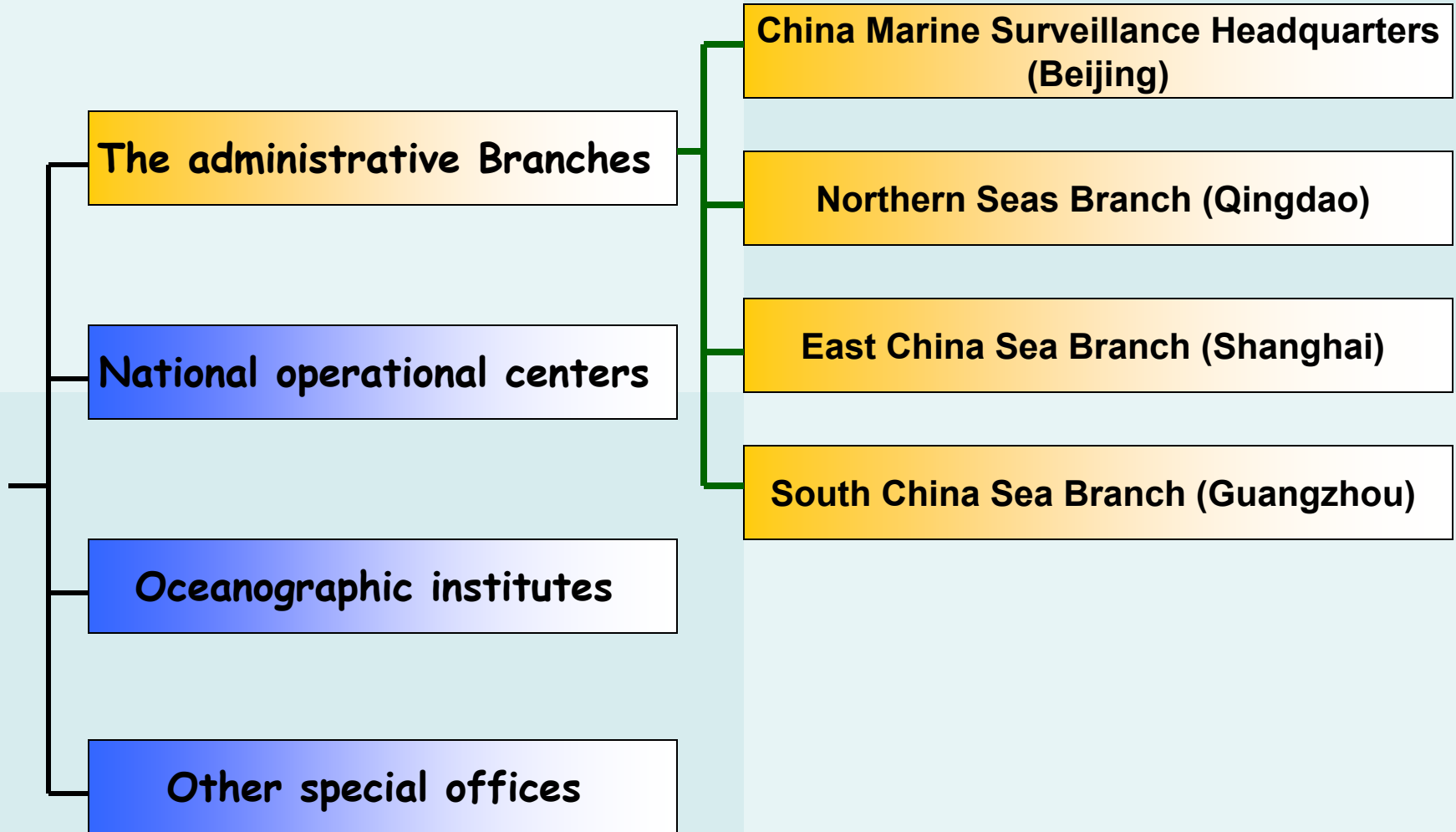
- For the management of national marine technology,
- Draft the development plan,
- Program and standard, research and develop the national high-tech and the production transformation,
- Research of marine monitoring technology and the equipment and system development
- International cooperation and exchange in marine technology.

## National Centre of Ocean Standards & Metrology (NCOSM)



- also guided and supervised by the State Bureau of Quality Technical Supervision professionally.
- For the management and supervision of standardization, metrology, and quality in nationwide marine affair.

# Subordinate bodies of SOA



**China Marine Surveillance Headquarters  
(Beijing)**



**9 sub-brigades of surveillance fleets  
3 airborne brigades**



**Regional Branch  
in Qingdao, Shanghai, and Guangzhou**



# The regional Branches of SOA

Engages in comprehensive oceanic management of coastal sea, continental shelf and exclusive economic zone in its jurisdictional area , and the scientific research support.

巡航监视:



海洋石油勘探开发监视



港口监视



陆源污染监视



海砂采挖监视



疏浚倾废监视



入海河口监视



海域使用监视

赤潮监视:

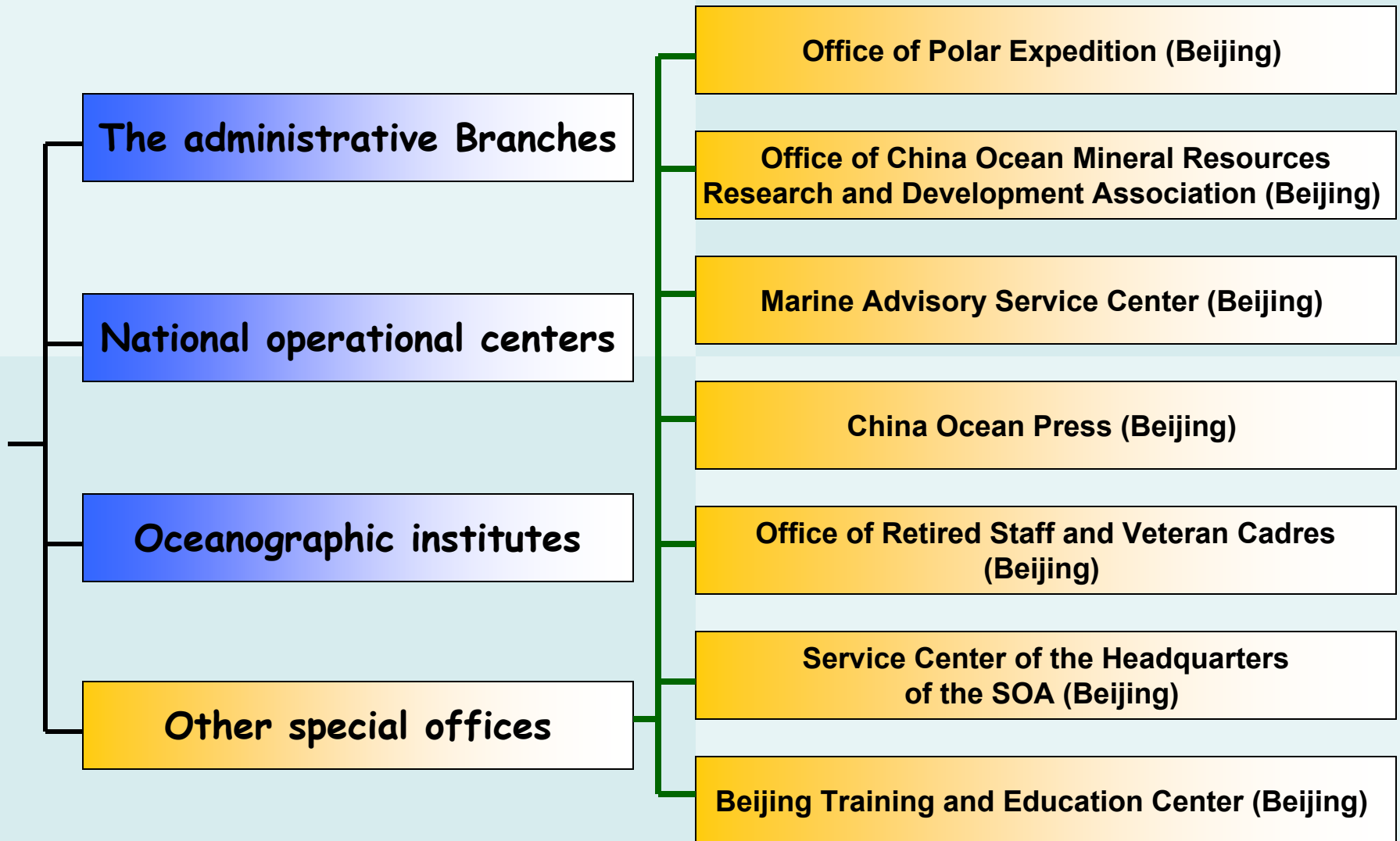


赤潮灾害监视



赤潮红紫外图像

# Subordinate bodies of SOA





## Summary

All of the subordinate bodies of SOA constitute a solid scientific and technological foundation in marine affairs, which have abundant strength of science and technology, advantage technology and equipments, extraordinary scientific research team, and remarkable superiority of subjects, making the significant contribution for the national ocean scientific progress and economic development.

# **Ocean-related institutions of other Ministries or Agencies**

# Shanghai Typhoon Institute of China Meteorological Administration (CMA):

Located in Shanghai, established in 1978. It has 7 laboratories/departments. 50 researchers.

Main Research Topics: techniques to establish database and applied research of typhoon data; parameterized operational numerical forecast model for typhoon and data assimilation into it; generation, development, structure variation and movement dynamics of typhoon and the mechanisms; prediction techniques of track, intensity, distribution of wind and water vapor; policies to mitigate typhoon disasters.

# Guangzhou Institute of Tropical and Marine Meteorology of CMA:

Located in Guangzhou, established in 1976. It has 4 laboratories. 50 researchers.

Main Research Topics: tropical numerical forecast model, South China Sea monsoon, South China rainstorm, South China Sea typhoon, South China droughts and floods.

# **Qingdao Institute of Marine Geology of MLR:**

Located in Qingdao, established in 1964. It has 5 departments. 195 researchers.

Main Research Topics: coastal and marine geology and environment, high resolution detection technology, comprehensive interpretation of geophysical data, quaternary geology and disaster geology, marine geochemistry and regional marine geology, paleo-biostratigraphic and paleo-environment evolution.

# **Yellow Sea Fisheries Research**

## **Institute of MOA:**

**Located in Qingdao, established in 1947. It has 9 laboratories / departments and 4 experimental stations. 336 researchers.**

**Main Research Topics: development and sustainable utilization of marine biological resources, including mariculture, fishery resources and environment, fishery engineering technology.**

**National Laboratory / Key Laboratory of MOA: Key Lab for Sustainable Utilization of Marine Fisheries Resources, MOA concerns the research on sustainable catch of marine fisheries and ecological system management, mariculture carrying capacity and ecological optimum model, mariculture pathogenic ecology and environmental repair, mariculture genetic resources and genetic improvement, marine biological resources and enzyme engineering.**

**Public Ocean Research Platform: BEIDOU research vessel, GRT 1165.**

# **East China Sea Fisheries Research Institute of MOA:**

**Located in Shanghai, established in 1958. It has 8 laboratories and 4 experimental stations. 150 researchers.**

**Main Research Topics: management and evaluation of fishery resources, development of pelagic and polar fishery resources, monitoring and protection of the biological environment for fishery, fishery information technology, aquaculture carrying capacity and health culture ,aquatic biotechnology , aquatic food safety and quality control, fishery resources and organism products, catching technology and fishery engineering, culture biology in special habitat, aquatic standardization.**

# South China Sea Fisheries Research Institute of MOA:

Located in Guangzhou, established in 1953. It has 9 laboratories / departments. 177 researchers.

Main Research Topics: protection and application of fishery resources, biological environments of fishery, healthy culture of aquatic product, biotechnology of genetic breeding, disease control of aquatic product, aquatic product processing and comprehensive utilization, safety and quality control of aquatic product, fishery equipment and Engineering Technology, fishery information.

National Laboratory / Key Laboratory of MOA: Key Laboratory of Fishery Environments, MOA concerns the research on ecological adjustment and control of mariculture and environmental repair technology, highbred propagation and quality control of mariculture, healthy mariculture and facility feeding, quality safety control technology of mariculture products.



# Peal River Fisheries Research

## Institute of MOA:

Located in Guangzhou, established in 1953. It has 4 laboratories / research centers, 3 experimental stations. 110 researchers.

Main Research Topics: genetic resource and genetic breeding, aquiculture and nutrition, disease and immunity of aquiculture, fishery resources and environment, aquiculture biotechnology, aquatic experimental animal and decorative fishery.

National Laboratory / Key Laboratory of MOA: Key Laboratory of Tropical and Semitropical Fish Seed Selection and Culture, MOA concerns the research on propagation technology of tropical and semitropical aquiculture creatural seed, culture technology, genetic improvement and technology of molecules assisted seed selection.

Public Ocean Research Platform: Fishery Biological Environment Field Research Station for Pearl River Estuary, National Key Field Station

**Ocean-related universities or  
institutions  
under the direct administration  
of coastal provinces/  
municipalities**

# Shanghai Ocean University:

Under the direct ministration of Shanghai city government. It is located in Shanghai, established in 1912. It has 12 colleges, 31 departments, including College of Aquaculture and Life Science, College of Marine Sciences. 680 faculty, 1140 graduated students and 12000 undergraduates.

Ocean-related National Key Discipline: Aquaculture Science.

Key Laboratory of MOA: Key Laboratory of Aquatic Genetic Resources and Aquacultural Ecology, MOA concerns the research on aquatic biological genetic resources and seedling project, aquatic biometrical genetics and biological technology, aquatic biological culture ecology and security.

# Shanghai Maritime University:

Under the direct ministration of Shanghai government. Located in Shanghai, established in 1909. It has 13 colleges, 16 departments, including College of Ocean Environmental & Safety Engineering, College of Merchant Marine. 800 faculty, 2000 graduated students and 10000 undergraduates.

Public Oceanography Research Platform:  
Yu-Feng Pelagic Training Ship.

# Guangdong Ocean University:

Under the direct ministration of Guangdong government. Located in Zhanjiang, established in 1935. It has 18 colleges, 45 departments. 1031 faculty, 417 graduated students and 15491 undergraduates.

Ocean-related Laboratory: Guangdong Key Laboratory of Pathogenic Biology and Epidemiology for Aquatic Economic Animals, concerns the research on Aquatic economic animal diseases and its precaution.

# Ningbo University:

Under the direct ministration of Ningbo government. Located in Ningbo, established in 1986. It has 19 colleges, 41 departments, including College of Maritime and College of Life Science and Bioengineering. 1350 faculty, 2000 graduated students and 25000 undergraduates.

Ocean-related Laboratory: Key Laboratory on Application of Marine Biology Technology, MOE concerns the research on marine bioactive substances and high-value aquatic products, gene resources of marine organisms, excellent seedling breeding and genetic conservation of mariculture organisms, marine environmental protection and biological repair.

# Zhejiang Ocean College:

General Introduction: Under the direct administration of Zhejiang government. Located in Zhoushan, established in 1958. It has 12 colleges, 17 departments. 600 faculty, 7000 undergraduates.

# Hangzhou Applied Acoustics Research Institute

**(China Shipbuilding Industry Corporation):**

**Located in Hangzhou, established in 1958. It has 3 laboratories / metering stations / test centers. 357 researchers.**

**Main Research Topics: underwater acoustic electronic engineering, including sonar system technology, underwater acoustic signal processing, underwater acoustic sensors, underwater acoustic measurement technology.**

**Key Laboratory of Province Laboratory of Ocean Acoustics concerns the research on underwater acoustic transducer sonar array new technology, sonar information processing technology**

**Public Ocean Research Platform: low and medium frequency indoor anechoic water tank, national first level underwater acoustic metering station, national underwater acoustic instruments test center.**



# Hangzhou Development Center of Water Treatment Technology (corporation):

Located in Hangzhou, established in 1970. It has 8 research centers / companies. 216 researchers.

Main Research Topics: separation membrane and membrane process, seawater desalination.

# Zhejiang Institute of Hydraulics and Estuary:

General Introduction: Located in Hangzhou, established in 1957. It has 11 institutes / research centers. 389 researchers.

Main Research Topics: hydraulic and hydroelectric engineering, civil engineering, estuarine and coastal engineering, water resources and water environmental science, soil and water conservation science, hydraulics, hydraulic science of farmland, geotechnical engineering, automation information science.

Key Laboratory of Province / Municipality: Test Station for Sediment Model of Tidal Estuary, Zhejiang concerns the research on hydrodynamics, sediment characteristics and its dynamics, water resources and water environment science, estuarine and coastal engineering.

# Shandong Instrument Institute:

**Located in Qingdao, established in 1966. It has 10 laboratories / departments / research centers. 180 researchers.**

**Main Research Topics: monitoring technology for marine dynamic environmental, monitoring technology for marine ecological environmental, underwater acoustic detection technology, automatic control technology, development of marine environmental observation instruments.**

**Key Laboratory of Province / Municipality: Key Laboratory of Marine Environmental Monitoring Technology, Shandong, concerns the research on marine environmental monitoring and marine disaster precaution system, including marine measurement technology and marine instruments, marine environmental field monitoring system, and marine pollution observation device.**

# **Shandong Marine Fisheries Research Institute:**

**Located in Yantai, established in 1957. It has 7 laboratories / research centers. 51 researchers.**

**Main Research Topics: investigation and evaluation of marine fishery resources, demonstration of sea area use, propagation-culture technique and genetic breeding, nutrition and feed of aquatic animals, marine environmental monitoring and protection, fishery product quality detection, aquatic products quality safety, fishing gear and method, fishery engineering.**

# Liaoning Marine Fisheries Science Research Institute:

Located in Dalian, established in 1953. 109 researchers.

Main research Topics: evaluation and management of marine fishery resources, marine economics, plant culture and propagation technique, marine fishery environment management.

# **Jiangsu Institute of Marine Fisheries:**

located in Nantong, established in 1978. It has 5 laboratories / departments / research centers. 47 researchers.

Main Research Topics: fishery resources and its ecological environment monitoring, protection, development and utilization of marine fishery genetic resources, application basis of marine biotechnology, common technology of mariculture, prevention and control of aquatic epidemic diseases.

# Fujian Fisheries Research Institute:

Located in Xiamen, established in 1957.  
It has 14 laboratories / research centers /  
experimental stations. 94 researchers.

Main Research Topics: marine  
biotechnology, mariculture, marine  
fisheries, marine product processing.

# Fujian Spatial Information Research Centre:

Located in Fuzhou, established in 2004. It has 8 laboratories / research centres / departments. 102 researchers.

Main Research Topics: earth information mechanism and

spatial information mapping, environment and natural resources remote sensing, sharing technology of geospace information network, support system of spatial analysis and spatial decision, spatial data mining and visualization technique, virtual geographic environments and digital regional model.

National Key Discipline: Spatial Information and Basic Theory of Computer, Fuzhou University.

Key Laboratory of MOE: Key Laboratory of Spatial Data Mining and Information Sharing, MOE concerns the research on remote sensing information mechanism and geoscience interpretation, geographic information modeling and analytic technique, network information sharing technique and services, theory and method of intelligent information processing, data transmission and information security technology.

Doctoral Program: communication and information systems.



# **Hainan Marine Development Plan and Design Institute(corporation):**

Located in Haikou, established in 1993. It has 5 laboratories / research centers. 16 researchers.

Main Operation: survey and design of marine engineering, planning consultation for port engineering of river and coast, sea area measurement and feasibility demonstrate of sea area use, investigation of marine ecological environment, development of marine information system, model development for estuarine dynamics environmen

# **Ocean-related universities in HONG KONG**

# **The Hong Kong University of Science and Technology:**

Located in Hong Kong, established in 1991. It has 5 colleges, 17 departments. 410 faculty, 3259 graduated students and 5868 undergraduates.

Ocean-related Institutions: Institute for the Environment.

Public Oceanography Research

Platform: Satellite Ground Station, Institute for the Environment.

# Chinese University of Hong Kong:

Located in Hong Kong, established in 1963. It has 8 colleges, 57 departments. 3403 faculty, 3317 graduated students and 10632 undergraduates.

Ocean-related Institutions: The Yuen Yuen Research Centre for Satellite Remote Sensing, Simon F.S. Li Marine Science Laboratory.

Public Oceanography Research Platform:

Satellite Ground Station of CUHK.

# The University of Hong Kong:

Located in Hong Kong, established in 1911. It has 10 colleges, 48 departments. 2559 faculty, 9900 graduated students and 12300 undergraduates.

Ocean-related Institutions: The Swire Institute of Marine Science, Croucher Laboratory of Environmental Hydraulics.

# City University of Hong Kong:

Located in Hong Kong, established in 1984. It has 8 colleges, 23 departments. 1751 faculty, 5613 graduated students and 19347 under- graduates.

Ocean-related Institutions: The Centre for Coastal Pollution and Conservation, Laboratory for Atmospheric Research.

# **Ocean-related universities in Taiwan**

# National Taiwan Ocean University:

Located in Keelung, established in 1953. It has 6 colleges, 15 departments. 332 faculty, 4000 graduated students and 4000 undergraduates.

Institutions: Center for Marine Bioscience and Biotechnology, Institute of Marine Environmental Chemistry and Ecology, Institute of Marine Biology, Ship Maneuvering **and** Control Laboratory, Electronic Chart Research Center, Hydroacoustic Noise Research Center, Laboratory of Marine Pollution Studies and Oil / Water Analysis

Public Oceanography Research Platform: Ocean Researcher II oceanography research vessel, GRT 294; ROCSAT-1 Ocean Color Data Distribution Center. Satellite Ground Station of Center for Marine Science Research, National Science Council of Taiwan.



# **National Taiwan University:**

**Located in Taipei, established in 1928. It has 11 colleges, 59 departments. 2183 faculty, 15111 graduated students and 17690 undergraduates.**

**Ocean-related Institutions: Institute of Oceanography, Institute of Ocean Engineering.**

**Public Oceanography Research Platform:**

**Ocean Researcher I oceanography research vessel, GRT 800. Ocean Database of Center for Marine Science Research, NSC of Taiwan.**

# National Sun Yat-sen University:

Located in Kaohsiung, established in 1980. It has 6 colleges, 19 departments, including College of Marine Sciences. 527 faculty, 3000 graduated student and 5000 undergraduates.

Ocean-related Institutions: Institute of Marine Biology, Institute of Marine Geology and Chemistry, Institute of Applied Marine Physics and Undersea Technology, Asia Pacific Ocean Research Center.

Public Oceanography Research Platform: Ocean Researcher III oceanographic research vessel, GRT 295.

# National Cheng Kung University:

Located in Tainan, established in 1931. It has 9 colleges, 38 departments. 1158 faculty, 10028 graduated students and 10507 undergraduates.

Ocean-related Institutions: Fishing Boat and Marine Engineering Research Center, Tainan Hydraulics Laboratory and Institute of Ocean Technology and Marine Affairs.

Public Oceanography Research Platform: Coastal Ocean Monitoring Center

# National Central University:

Located in Taoyuan County, established in 1915. It has 7 colleges, 20 departments, including College of Earth Sciences. 523 faculty, 5000 graduated students and 10507 undergraduates.

Ocean-related Institutions: [Graduate Institute of Hydrological and Oceanic Sciences](#), Hydrology

Remote Sensing Laboratory of Center for Space and Remote Sensing Research / NSC

Public Oceanography Research Platform: Satellite Ground Station, Center for Space and Remote Sensing Research.

## Comments:

About 60 Chinese marine research institutions form a huge marine research team. They distribute in every coastal province and the coastal cities.

However,

It seems that there's some duplications, lack of scientific infrastructure design and cooperation. From the arrangements of the national key disciplines and national key laboratories, the ocean observation is relatively weak compared to the traditional oceanography.

The operational service of ocean information is weaker than the ocean observation.

# Acknowledgements

This study is supported by EU FP6 DRAGONESS Project (No. SSA5–CT– 2006-030902) and ESA-MOST Dragon Programme Ocean Project (ID2566). Thanks to Zhongwei Xu, Jin Sha, Qian Yang, Shuangyan He and Yili Zhao for participating in the investigation of DRAGONESS WP5 Project.

# **Marine Research Institutions in Europe**



**ICES**

**IOC - IODE**

**EurOcean**



Austria

**Wien / Vienna**

University of Vienna

Institute of Ecology and

Conservation

Department of Marine Biology

# Belgium

**Brussel**

**Royal Belgian Institute of Natural Sciences**

**Marine ecosystem management**

**Unit of Sedimentology**

**Gent**

**University of Ghent**

**Marine Biology Section**

**Renard Centre of Marine Geology**

**ERASMUS - Project "Mercator" in Marine Geosciences**

**Liège**

**Université de Liège**

**Laboratoire d'Océanologie**

**Chemical Oceanography Unit**

**GeoHydrodynamics & Environment Research**

**Oostende**

**Flanders Marine Institute (VLIZ)**

**Sea Fisheries department**

**Other Research Institutions and Marine Resources in Belgium**

**Belgian Scientific Research Programme on the Antarctic**

**Croatia**

**Pula**

**Meeresschule Valsalina**

**Rijeka**

**University of Rijeka**

**Department of Maritime Studies**

**Rijeka College of Maritime Studies**

**Rovinj**

**"Ruder Bošković" Institute Center for Marine**

**Research**

**Split**

**Institute of Oceanography and Fisheries**

**Zagreb**

**Rudjer Boskovic Institute**

**Center for Marine Research**

# Denmark

**Aarhus**

**University of Aarhus**

**Department of Earth Sciences**

**Copenhagen**

**The International Council for the Exploration of the Sea (ICES)**

**Danish Polar Center**

**University of Copenhagen**

**Department of Geophysics**

**Hirtshals**

**North Sea Centre**

**Hørsholm**

**DHI Water and Environment**

**Lyngby**

**Technical University of Denmark**

**Department of Ocean Engineering**

**Danish Institute for Fisheries Research**

**Danish Maritime Institute**

**Roskilde**

**National Environmental Research Institute**

**Department of Marine Ecology**

**Department of Coastal Zone Ecology**

# Estonia

## Tallinn

University of Tartu

Estonian Marine Institute

Marine Physics

Marine Biology

# Faeroe

Faeroese Fishery Laboratory

# Finland

## Helsinki

Finnish Institute of Marine Research

Baltic Marine Environment Protection Commission

# France

**Armees**

**Service hydrographique et océanographique de la Marine**

**Banyuls sur Mer**

**l'Observatoire Océanologique de Banyuls**

**Bordeaux**

**Université Bordeaux 1 - CNRS**

**Oceanic Environments and Paleoenvironments**

**Brest**

**Université de Bretagne Occidentale**

**Institut Universitaire Européen de la Mer**

**Calvis**

**STARESO Station de recherche sous-marine et  
océanographique**

**Concarneau**

**Station de Biologie Marine du Muséum National d'Histoire  
Naturelle et du Collège de France**

**Gif sur Yvette**

**Laboratoire des Sciences du Climat et l'Environnement (LSCE)**

**La Rochelle**

**Université de La Rochelle**

**Laboratoire de Biologie et Environnement Marins**

**Centre de Recherche en Ecologie Marine et Aquaculture de l'Houmeau**

**L'Houmeau**

**Centre de Recherche en Ecologie Marine et Aquaculture de l'Houmeau**

**Lorient**

**Maison de la mer de Lorient**

**Marseille**

**L'Université de la Méditerranée**

**Centre d'Océanologie de Marseille (CNRS)**

**Laboratoire d'Océanographie et de Biogéochimie (L.O.B)**

**Monaco**

**International Hydrographic Bureau**

# Paris

**Université Pierre & Marie Curie**

Institut Pierre Simon Laplace

Laboratoire de Histologie et Cytologie des Invertébrés Marins

Laboratoire de Géosciences Marines

**Muséum National de'Histoire Naturelle**

Laboratoire d'Ichtyologie Générale et Appliquée

Laboratoire d'Océanographie Physique

Institut français de recherche pour l'exploitation de la mer  
(IFREMER)

The Laboratory of Phycotoxins and Harmful Marine Substances

French Marine Science and Technology Society

Institut océanographique

Intergovernmental Oceanographic Commission (IOC) of UNESCO



**Plouzane**

**Institut Francais pour la Recherche et la Technologie Polaires**

**Roscoff**

**University of Paris VI and CNRS**

**Observatoire Oceanologique de Roscoff**

**Sophia Antipolis**

**ACRI Mecanique des Fluides / Observation de la Terre Sciences de l'Environnement**

**Université de Nice**

**Laboratoire Environnement Marine Littoral (LEML)**

**Strasbourg**

**European Science Foundation Marine Board**

**Villefranche-sur-Mer**

**Oceanologic Observatory of Villefranche-sur-Mer**

**Wimereux**

**Station marine de Wimereux**

**Other Research Institutions and Marine Resources in France**

**Réseau National des Stations Marines (RNSM)**

**International Marine Global Change Study (IMAGES)**

# Germany

## Bremen

**University of Bremen**

**Department of Physics**

**Institute for Environmental Physics**

**Oceanography Group**

**Department of Geoscience**

**Marine Technology / Environmental Research**

**General Geology / Marine Geology**

**Marine Geophysics**

**Petrology of the Ocean Crust**

**Marine Technology / Sensors**

**Department of Biology**

**Marine Zoology**

**Marine Botany**

**Center for Tropical Marine Ecology**

**Marum - Centre for Marine Environmental Sciences**

**Senate Commission for Oceanography of the German Research Foundation**

**Max-Planck-Institute for marine Microbiology**

## **Bremerhaven**

**Alfred Wegener Institute for Polar and Marine Research (AWI)**

**German Society for Polar Research**

**German Advisory Council on Global Change (WBGU)**

**Otto Schmidt Laboratory for Polar and Marine Sciences (OSL)**

## **Büsum**

**University of Kiel**

**Research and Technology Centre Westcoast**

## **Corolinensiel**

**University of Münster**

**Marine Biology Wadden Sea Station Carolinensiel**

## **Frankfurt a. M.**

**Senckenberg Centre for Biodiversity Research**

## **Freiberg**

**Technical University Freiberg**

**Institute for Mineralogy**

**Leibniz-Laboratory for Applied Marine Research**

**Geesthacht**

**GKSS Research Center**

**Institute for Coastal Research**

**Baltic Sea Experiment (BALTEX)**

**Environmental Data at GKSS**

**Greifswald**

**Ernst-Moritz-Arndt-University of Greifswald**

**Institut for Ecology Hiddensee**

**Institut for Marine Biotechnology Greifswald**

**Hamburg**

**University of Hamburg**

**Centre for Marine and Climate Research (ZMK)**

**Institute of Oceanography**

**Meteorological Institute**

**Institute for Geophysics**

**Institute for Biogeochemistry and Marine Chemistry (IfBM)**

**Institute of Hydrobiology and Fisheries Science**

**Faculty of Biology**

**German Centre of Marine Biodiversity**

**Technical University of Hamburg-Harburg**

**Mechanics and Ocean Engineering**

**Marine Technology**

**Max-Planck-Institute for Meteorology**

**Federal Maritime and Hydrographic Agency of  
Germany (BSH)**

**German Climate Computing Centre (DKRZ)**

**Federal Waterways Engineering and Research  
Institute - Coastal Division (BAW-AK)**

**Federal Research Centre for Fisheries**

**Deutsche Wissenschaftliche Kommission für  
Meeresforschung (DWK)**

**German Society for Marine Research (DGM)**

**Hannover**

**Bundesanstalt für Geowissenschaften und Rohstoffe**

**Helgoland**

**Biological Institute on Helgoland (BAH)**

**Hiddensee**

**Ernst-Moritz-Arndt-University Greifswald**

**Institute for Ecology**

**Kiel**

**University of Kiel**

**Institute of Marine Research (IfM)**

**Ocean and Climate**

**Marine Biogeochemistry**

**Marine Ecology**

**OZEANE.DE - Marine Mammals Research (*german only*)**

**Institute for Polar Ecology**

**Institute for Geoscience**

**Research Center for Maritime Geoscience (GEOMAR)**

**Federal Armed Forces Underwater Acoustic and and Marine**

**Geophysics Research Institute (FWG)**

**Koblenz**

**German Federal Institute of Hydrology**

**Offenbach**

**German Weather Service / Deutscher Wetterdienst (DWD)**

**Oldenburg**

**University of Oldenburg**

**Institute for Chemistry and Biology of the Marine Environment  
(ICBM)**

**Physical Oceanography**

**Organic Geochemistry**

**Biochemistry**

**Microbiogeochemistry (MBG)**

**Paleomicrobiology**

**Aquatic Microbial Ecology Group**

**Mathematical Modelling**

**Theoretical Physics and Complex Systems**

**Research Group BioGeoChemistry of Tidal Flats**

**Department of Physics**

**Marine Physics Group**

**Potsdam**

**Research Unit Potsdam of the Alfred Wegener Institute  
Institute for Climate Impact Research (PIK)**

**GeoResearch Centre / GeoForschungs Zentrum (GFZ)**

**Rostock**

**University of Rostock**

**Department of Biology**

**Marine Biology**

**Stade**

**German Hydrographic Society (DHG)**

**Sylt**

**Wadden Sea Research Station Sylt**

**Warnemünde**

**University of Rostock**

**Baltic Sea Research Institute**

**Wilhelmshaven**

**TERRAMARE Wilhelmshaven**

**Senckenberg Marine Station**

**Common Wadden Sea Secretariat**



## **Futher Resources**

**[Lower Saxony State Agency for Ecology](#)**

**[Forschungsstelle Norderney](#)**

**[Wadden Sea National Park of Lower Saxony](#)**

**[Wadden Sea National Park Schleswig-Holstein](#)**

**[Wadden Sea National Park Hamburg](#)**

**[National Park Vorpommersche Boddenlandschaft](#)**

**[Society for Maritime Technology \(GMT\)](#)**

**[German Coastal Engineering Research Council](#)**

**[German Museum of Marine Research and](#)**

**[Fisheries](#)**

**[OCEANIS](#)**

# **Greece**

## **Athens**

**National Centre for Marine Research**

## **Iraklion, Crete**

**Institute of Marine Biology**

**Department of Sonar and Marine Information Systems**

**Management of Marine Environment/Technology**

**Department of Marine Ecology and Biodiversity**

**Department of Oceanography**

## **Patras**

**University of Patras**

**Department of Geology**

**Laboratory of Marine Sciences**

# **Iceland**

## **Reykjavik**

**Marine Research Institute**

**Icelandic Fisheries Laboratories**

**University of Iceland**

**Sandgerdi Marine Centre**

# **Ireland**

## **Cork**

**University College Cork**

**Coastal Zone Institute**

## **Dublin**

**Irish Marine Institute**

**Irish Marine Data Centre**

**Abbotstown Laboratory Complex**

## **Galway**

**National University of Ireland**

**The Marine Microbiology Group**

**The Martin Ryan Marine Science Institute**

**Sherkin Island, Co. Cork Sherkin Island Marine Station**

**Israel**

**Haifa**

**Technion - Israel Institute of Technology**  
**Coastal and Marine Engineering Research**  
**Institute Ltd. (CAMERI)**

**Israel Oceanographic & Limnological**  
**Research Ltd. (IOLR)**

**National Institute of Oceanography**  
**The National Center for Mariculture**  
**Yigal Allon Kinneret Limnological**  
**Laboratory**

**Israel Marine Data Center**

# Italy

**Ancona**

**Italian National Research Council**

**[Marine Fisheries Research Institute \(IRPEM\)](#)**

**Bologna**

**[Istituto di Geologia Marina](#)**

**[Institute of Atmospheric and Oceanic Sciences](#)**

**Frascati**

**[The ESA/ESRIN Ionia Global AVHRR Data Set Browser](#)**

**Ispra**

**[Marine Environment Unit, Space Applications Institute at the Joint Research Centre](#)**

**La Spezia**

**[NATO SACLANT Undersea Research Centre](#)**

**[Marine Environment Research Centre](#)**

**Pavia**

**Università degli Studi di Pavia**

**[Centro Interdisciplinare di Bioacustica e Ricerche Ambientali](#)**

**Trieste**

**University of Trieste**

**[Department of Oceanology and Environmental Geophysics](#)**

**Venezia**

**[Tethys Research Institute](#)**

**Other Research Institutions and Marine Resources in Italy**

**[Centre for Earth Observations](#)**

# Malta

**University of Malta**

**Department of Biology**

**Marine Ecotoxicology Laboratory**

**Biodiversity Group**

**Baseline surveys and monitoring in**

**Maltese shallow coastal waters**

# Netherlands

De Bilt

[Royal Netherlands Meteorological Institute](#)

[Oceanographic Research Division](#)

Delft

Delft University of Technology

[Delft Institute for Earth-Oriented Space Research \(DEOS\)](#)

Den Burg, Texel

[Netherlands Institute for Sea Research \(NIOZ\)](#)

[National Oceanographic Data Committee](#)

Den Haag

[RIKZ-Institute for Coast and Sea](#)

Groningen

University of Groningen

[Department of Marine Biology](#)

Maarsse

[Netherlands Institute of Ecology](#)

[NIOO-Nederlands Instituut voor Oecologisch Onderzoek](#)

[Centre for Estuarine and Coastal Ecology](#)

Utrecht

University of Utrecht

[Institute for Marine and Atmospheric Research Utrecht \(IMAU\)](#)

Yerseke

Netherlands Institute of Ecology

[Centre for Estuarine and Coastal Ecology](#)

# Norway

**Bergen**

**University of Bergen**

**Department of Fisheries and Marine Biology**

**Geophysical Institute**

**Bergen Marine Food Chain Research**

**Infrastructure**

**Sars International Centre for Marine Molecular  
Biology**

**Institute of Marine Research**

**Nansen Environmental and Remote Sensing  
Center**

**Longyearbyen**

**Norsk Polarinstitutt**



**Oslo**

**University of Oslo**

**Geophysical fluid dynamics**

**Department of Geophysics**

**Spitzbergen**

**The University Courses on Svalbard**

**Tromsø**

**University of Tromsø**

**Department of Marine and Freshwater Biology**

**Polar Environmental Center**

**The North Atlantic Marine Mammal Commission**

**Trondheim**

**Norwegian University of Science and Technology**

**Faculty of Marine Technology**

**OCEANOR - Oceanographic Company of Norway**

**SINTEF Civil and Environmental Engineering**

**Coastal and Ocean Engineering**

# Poland

Gdansk

University of Gdansk

Institute of Oceanography

Technical University of Gdansk

Faculty of Ocean Engineering and Ship Technology

Gdynia

Sea Fisheries Institute

Sopot

Polish Academy of Sciences

Institute of Oceanology

Szczecin

University of Szczecin

Physical Oceanography Laboratory

Wodnej

Institute of Meteorology and Water Management

Maritime Branch

# Portugal

**Aveiro**

**University of Aveiro**

**Mestrado em Ciências das Zonas Costeiras**

**Coimbra**

**University of Coimbra**

**Institute of Marine Research**

**Faro**

**Universidade do Algarve**

**Faculdade de Ciências do Mar e do Ambiente**

**Unidade de Ciências e Tecnologias dos Recursos Aquáticos**

**Horta**

**University of the Azores**

**Department of Oceanography and Fisheries**

**Lisboa**

**Instituto Hidrográfico**

**Universidade de Lisboa**

**Instituto de Oceanografia**

**Other Research Institutions and Marine Resources in Portugal**

**Institute for Fisheries and Marine Research (IPIMAR)**

**Russia**

**Moscow**

**Russian Academy of Sciences**

Department of Ocean Research,

Atmosphere Physics & Geography

Shirshov Institute of Oceanology

**Obninsk, Kaluga Region**

National Oceanographic Data Centre

**Vladivostok**

**Far Eastern Branch of the Russian**

**Academy of Sciences**

Institute of Marine Biology

Far East Geological Institute

# Spain

**Barcelona**

Institute of Marine Sciences

Institut de Ciències de la Terra Jaume Almera

International Centre for Coastal Resources Research (CIIRC)

**Blanes**

Centro de Estudios Avanzados de Blanes

**Cádiz**

**Universidad de Cádiz**

Facultad de Ciencias del Mar

Instituto de Ciencias Marinas de Andalucía (CSIC)

**Granada**

Instituto Andaluz de Ciencias de la Tierra

**La Coruña**

**Universidad de La Coruña**

Departamento de Química Fundamental

Isolation, elucidation and biological activities of Natural Products

**Las Palmas**

**Universidad de Las Palmas de Gran Canaria**

**Facultad de Ciencias del Mar**

**Instituto Canario De Ciencias Marinas (ICCM)**

**Madrid**

**Universidad Complutense**

**Department of Geophysics and Meteorology**

**AINCO-Interocean**

**Instituto Español de Oceanografía (IEO)**

**Palma de Mallorca**

**Mediterranean Institute for Advanced Studies (IMEDEA)**

**Physical Oceanography Group**

**Biological Oceanography Group**

**Marine Biology - Ichthyology**

**Marine Microbiology Group**

**Sea Birds Group**

**Litoral Ecology Group**

**Santa Cruz de Tenerife**

**Instituto Español de Oceanografía (IEO)**

**Centro Oceanográfico de Canarias (COC)**

**Vigo**

**Univerdad de Vigo**

**Departamento de Geociencias Marinas y Ordenación del Territorio**

**Instituto de Investigaciones Marinas**

**Other Research Institutions and Marine Resources in Spain**

**TIERRA el web de las Ciencias de la Tierra de España**

# Sweden

**Fiskebäckskil**

**Kristineberg Marine Research Station**

**Göteborg**

**Göteborg University**

**Marine Research Centre**

**University of Göteborg and Chalmers University of Technology**

**Analytical and Marine Chemistry**

**Lysekil**

**Institute of marine research (IMR)**

**Stockholm**

**University of Stockholm**

**Stockholm Marine Research Centre**

**Meteorologiska Institutionen (MISU)**

**Department of Systems Ecology, Marine ecosystem modelling and benthic and pelagic ecology**

**International Geosphere-Biosphere Programme (IGBP)**

**Strömstad**

**Tjärnö Marine Biological Laboratory**

**Umeå**

**Umeå University**

**Umeå Marine Sciences Centre**

**Other Research Institutions and Marine Resources in Sweden**

**Swedish Meteorological and Hydrological Institute**

**Swedish Oceanographic Data Centre**



# Turkey

Ankara

Middle East Technical University

METU Institute of Marine Sciences

# Ukraine

National Academy of Sciences of Ukraine

Institute of Biology of the Southern Seas

Marine Hydrophysical Institute

# United Kingdom

**Aberdeen**

**Marine Laboratory**

**University of Aberdeen**

**Lighthouse Field Station**

**Oceanlab**

**Department of Zoology**

**Marine Studies**

**Argyll**

**Scottish Association for Marine Science (SAMS)**

**Centre for Coastal and Marine Sciences -**

**Dunstaffnage Marine Laboratory**

**Bangor**  
**University of Wales**  
**The School of Ocean Sciences**

**Centre For Applied Oceanography**

**Bidston**  
**Bidston Observatory**  
**Centre for Coastal and Marine Sciences - Proudman**  
**Oceanographic Laboratory**  
**British Oceanographic Data Centre (BODC)**  
**GEBCO Digital Atlas (Bathymetrie)**

**Bracknell**  
**The Met. Office**  
**Hadley Centre for Climate Prediction and Research**  
**Ocean Applications**

**Brighton**  
**River Ocean Research and Education**

**Cambridge**  
**British Antarctic Survey**  
**International Whaling Commission**

**Cardiff**  
**Cardiff University**  
**Cardiff Marine Institute**  
**Marine Geoscience Research**

**Edinburgh**  
**Heriot-Watt University**  
**Ocean Systems Laboratory**

**Glasgow**  
**University of Glasgow**  
**Glasgow Marine Technology Centre (GMTC)**  
**Glasgow College of Nautical Studies**  
**Faculty of Maritime Studies**

**Godalming**  
**SOS Satellite Observing System**

**Hull**

**University of Hull**

**Institute of Estuarine and Coastal Studies (IECS)**

**Liverpool**

**University of Liverpool**

**Oceanography Laboratories**

**Physical Oceanography Group**

**Marine Electrochemistry Group**

**Marine Pollution Group**

**Inorganic geochemistry group**

**Organic Biogeochemistry Group**

**Port Erin Marine Laboratory**

**London**

**The Hydrographic Society**

**International Maritim Organization**

**Imperial College Of Science and Technology**

**Oceanography Laboratory**

**Londonderry**

**University of Ulster**

**Coastal Studies Research Group (CSRG)**

**Lowestoft**

**Centre for Environment, Fisheries and Aquaculture Science  
(CEFAS)**

**Newcastle upon Tyne**

**Newcastle University**

**Department of Marine Sciences and Coastal Management**

**Millport, Isle of Cumbrae**

**University Marine Biological Station - Millport**

**Norwich**

**University of East Anglia**

**Physical Oceanography**

**Oxford**

**Oxford University**

**Atmospheric, Oceanic and Planetary Physics**

**Physical Oceanography**

**Marine Group**

**Plymouth**

**University of Plymouth**

**Institute of Marine Studies**

**CCMS Plymouth Marine Laboratory**

**The Marine Biological Association**

**Sir Alister Hardy Foundation for Ocean Science**

**Plymouth Marine Laboratory**

**Port Arthur, Scalloway, Shetland**

**North Atlantic Fisheries College**

**Reading**

**Reading University**

**Oceanography Group, Department of Meteorology**

**Scarborough**

**University of Hull**

**Scarborough Centre for Coastal Studies (SCCS)**

## **Southampton**

**University of Southampton**

**Southampton Oceanography Centre (SOC)**

**Challenger Society For Marine Science**

**National Oceanographic Library**

**George Deacon Division for Ocean Sciences**

**School of Ocean and Earth Science**

**Inter-Agency Committee on Marine Science and  
Technology**

## **St. Andrews**

**St. Andrews University**

**Sea Mammal Research Unit**

## **Stirling**

**University of Stirling**

**Institute of Aquaculture**

**Marine Environmental Research Laboratory**

**Institute of Biological Sciences**

**Marine Bioscience Research**



# **Swindon**

## **Fugro Global Environmental and Ocean Sciences**

### **Other Research Institutions and Marine Resources in UK**

**British Marine Life Study Society (England)**

**British Marine Life Study Society (Scotland)**

**British Antarctic Survey**

**British Geological Survey (BGS)**

**Royal Meteorological Society**

**U.K. Ocean Drilling Program**

**Satellite Observing Systems**

**Tide Gauge Networks and Sea Level Data Sets**

**United Kingdom Hydrographic Office**

About next step of WP5

# **WP 5 – Capacity building in view of gaps and eventual European capabilities**

# ***Description of work***

## **Task 5.1:**

**To identify major gaps by the total assessment of Chinese capacity and European capability.**

## **Task 5.2:**

**Combine the knowledge and expertise gained from the GMES projects in Europe and the P.R. of China Earth observation systems.**

# **What is the difference between WP5 and WP1-4?**

**WP 1 –in-situ observing systems;**

**WP 2 –space-borne observing  
systems;**

**WP 3 –data integration and  
information management;**

**WP 4 –information products and  
services;**

**WP 5 – Capacity building**

## **WP-5 arrangement:**

**How to write 1st, 2nd and final report on the capacity building**

**1st report: China and Europe  
marine capacity building  
investigation.**

**2nd report: To identify major gaps by the total assessment of Chinese capacity and European capability**

**WP5 will depend on the first year outcome and achievements of WPs 1-4 .**



# **We will describe major gaps**

- in-situ observing systems;**
- space-borne observing systems**
- data integration and  
information management;**
- information products and  
services;**
- other Capacity building**

**comparison: quantity, quality, technical level, accuracy, how good the infrastructure, How fast to get information, to resolve problem. 15 pages only**

**Final report: future Chinese and European marine capacity building design**  
in order to develop more harmonized global systems of marine monitoring and forecasting beyond the 2008 time frame. This, in turn, will contribute to a more harmonized implementation of GMES/GEOS.

**In the final report, Wp5 will focus  
cooperation between China & Europe**

**Integration**

**observation integration**

**from space, airborne to bottom of sea  
geographical distribution integration and  
network**

**integration from observation to  
products creation and service**

**rapid response      quality**

**Wp5 will focus data announcement  
mechanism for  
basic daily sea state information  
(physical sea state and  
meteorological condition)**

**most essential data products**

**disaster**

**pollution**

**global change**

**resources (bio-, fishery, oil-gas, etc)**



Thank you!



**Bergen 16/9/2008**

