



# National Report of China

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# 1. Current program status



-----State Oceanic Administration (SOA)

## ○ Number and type of buoys:

(a)	Deployed during the year:	53
	19	surface drifters
	1	3m CO <sub>2</sub> buoy
	1	6m CO <sub>2</sub> buoy
	4	3m moored buoy
	1	Tsunami buoy
	1	Ecosystem monitoring buoy
	1	Large mooring buoy
	22	Argo float
(b)	Operational at 31 July:	42
(c)	Reporting on GTS at 31 July:	24

## ○ Purpose of program:

- ◆ support the operational forecasting and warning service
- ◆ ocean state and climate monitoring
- ◆ Marine environmental monitoring

## ○ Main deployment area:

China Seas and adjacent waters



# 1. Current program status



## ----- China Meteorological Administration (CMA)

- Number and type of buoys:
  - (a) Deployed during the year: 0
  - (b) Operational at 31 July: 22
  - (c) Reporting on GTS at 31 July: 0
- Purpose of program:
  - ◆ support the operational forecasting and warning service
  - ◆ ocean state and climate monitoring
- Main deployment area:  
China Seas



# 2. Future deployment plan



Agency	Number and type of buoys planned for deployment in next 12 months		Deploy location
SOA	19	1 Tsunami buoy	South China Sea
		6 Argo floats	
		10 surface drifters	East China Sea
		1 Optic buoy	
		1 Bailong deep sea mooring buoy	Tropical Indian Ocean



# 3. Technical development



Besides the management of buoy system, State Oceanic Administration of China has also been focusing on the design and manufacture of the buoy.

## Wave sensor

- measure wave direction
- sensor inherent bias
- effort on calibration

Shandong Academy of Science Institute of Oceanographic Instrumentation (SDIOI)



## CO<sub>2</sub> sensor

### Application

Successfully being applied to East China Sea buoys and has been stably operating at sea.

East China Sea Branch of SOA



# 3. Technical development



- **Communication control system** supporting several communication modes is researched and developed on the basis of primary shortwave communication and Inmarsat-C satellite communication, and the North China Sea Buoy Network to guarantee the continuity of data stream. The communication control system works stably in the pasting two years.



CDMA/GPRS

Default setting

Local cost and wide coverage



Inmarsat-C

Backup communication



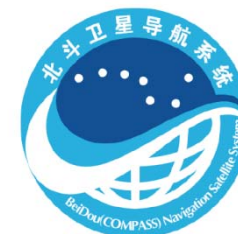
Compass satellite

Backup communication

Satellite system on a trail basis



GSM/GPRS



# 3. Technical development



- All the large buoys are installed with **double data collection control systems**. All the regular sensors have dual backup mode. Two GPS, one location sensor, one temperature and humidity sensor, one air pressure sensor, one Compass transmitter developed by National Ocean Technology Center, door alarm and water inflow alarm are added to each buoy.





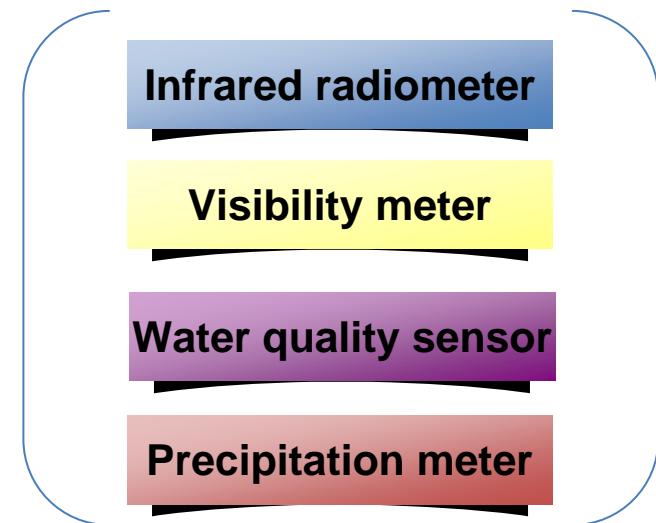
# 3. Technical development



## Reserved device interfaces

- With the growing need of ocean observing, marine monitoring parameters are increasing. In order to meet the requirements of national marine monitoring and the development of marine devices, more interfaces to carry future sensors and instruments are reserved at the buoys of the North China Sea Buoy Network to ensure the sustaining use of buoys.

More and more sensors is being added to the North China Sea Buoy Network, providing environmental data for the North China Sea forecasting service.



# 3. Technical development



## Buoy structure study

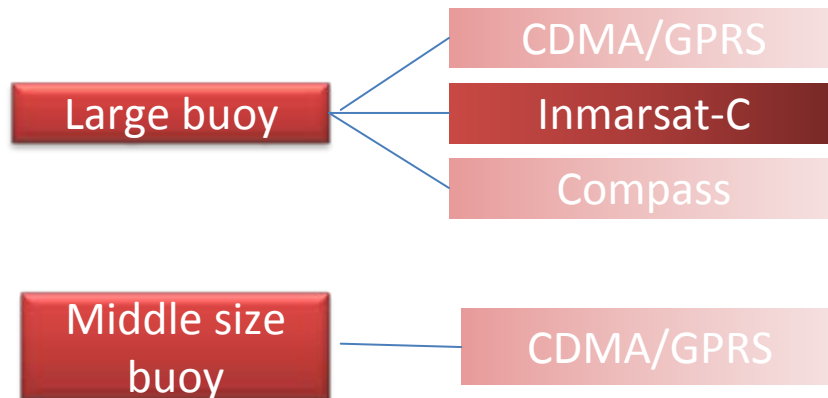
- The East China Sea Branch of SOA develops the splittable 10m buoy. It has the same structure intensity, but easy to transport.
- To solve the frequent vandalism problem of 1m buoy and the jammer of steel structure hull to the performance of current meter, the East China Sea Branch, cooperating with other research institutes in China, develops 3m polyurea buoy that has light weight, well wave-following characteristic and higher data accuracy.



# 3. Technical development



## Data Transmission



Data receiving rates of both are over 99%.

Data are regularly copied from data memory card on the float. It supplements the lost data due to weather or communication failure so as to ensure the continuity of data.



# 3. Technical development

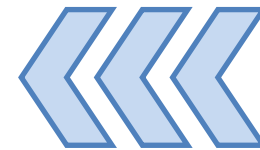


## Data Quality

- The North China Sea Forecasting Center appoints a technician to monitor the buoy data. The technician analyzes the data on the basis of local conditions and weather. If the data abnormal is due to the malfunction of sensor, the sensor will be repaired or replaced as soon as possible. Sensor cleaning and calibration are conducted periodically.

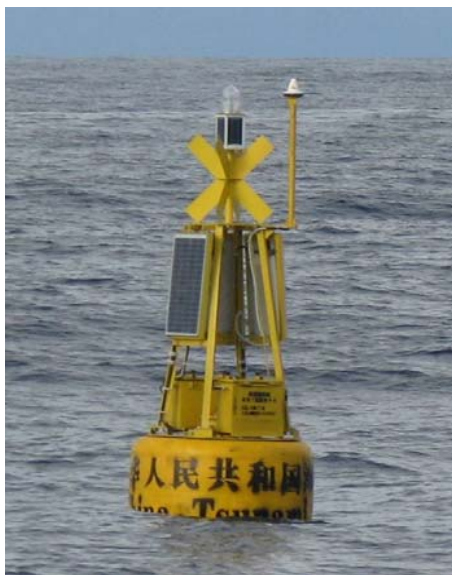


# 4. Vandalism of buoys



Bailong Buoy in RAMA array deployed by First Institute of Oceanography, SOA.

Photo of buoy tower when deployed (left); after recovery, sensors attached to the buoy tower are gone (right).



Tsunami Buoy N1 in South China Sea when deployed (left), and Vandalized Tsunami Buoy N1 (right).



# 4. Vandalism of buoys



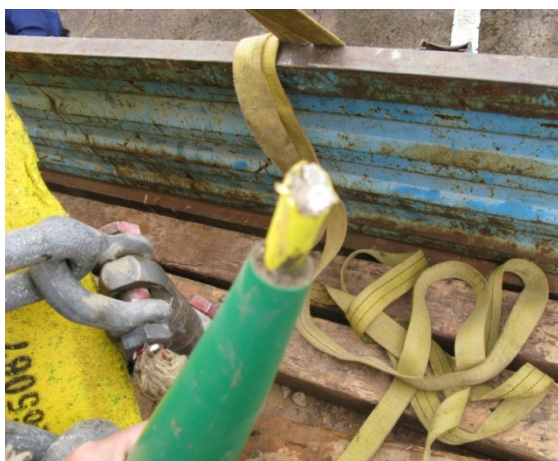
## Tsunami Buoy N2



Fishing lines at the bottom of Tsunami Buoy



The shackle linked anchor chain and steel wire rope was missing



The wire cable was cut deliberately by fisherman.



Photo taken by the buoy was deployed . The shackle was well placed.



# Thank you.

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