

DBCP-30, 27 Oct. 2014, Weihai, China



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海洋仪器仪表研究所

# MOORING DATA BUOYS OF CHINA TECHNOLOGY & APPLICATIONS

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Instrumentation (SDIOI)



# Outlines

About SDIOI

Introduction

History Awards Network Products

Technical Specification

Applications



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# 1. About SDIOI

- Built in 1965.
- Belong to Shandong Academy of Sciences, China.
- Located in Qingdao, China.
- A pioneer of China in data buoy research and manufacture.



究所

## 2. Introduction of data buoys

### History

#### Step 1: 1965~1985 Young

Types: H23, 2H23, HFB-1, NanFu 1, KeFu 2, ship hull

#### Step 2: 1986~2006 Maturation

Types: FZF2, FZS1-1, FZF3, water quality, Ocean wave

#### Step 3: 2007~now Productions

Types: FZF4, 3m diam. Drifters, 6m diam & Assemble

The History of mooring data buoys of China is also the history of **SDIOI**.



# 2. Introduction of data buoys

## Awards

- National Award for Science and Technology Progress



- National Independent Innovation Production

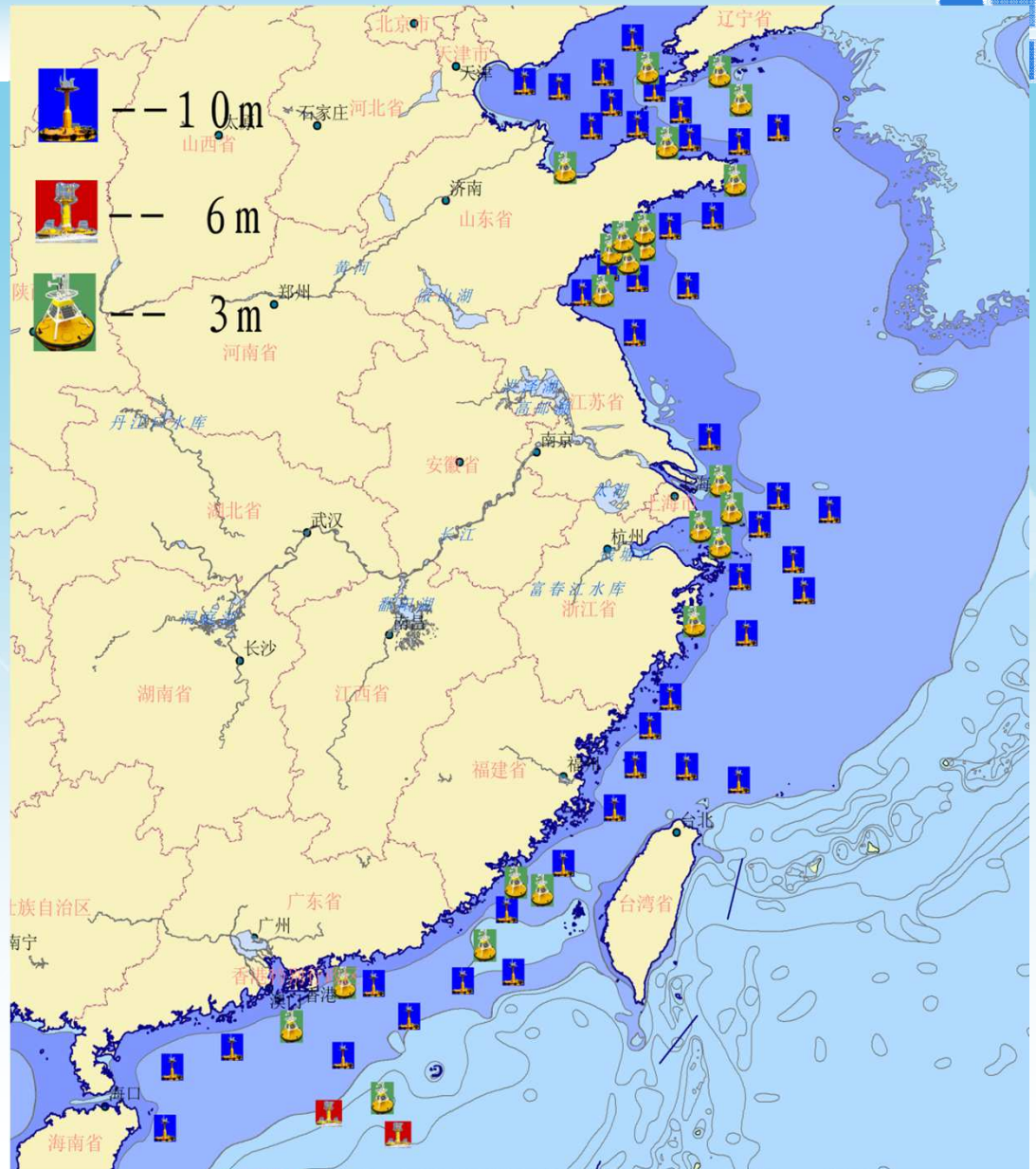


# Network

The network includes about 130 buoys.

More than 90% of these operating buoys are manufactured by SDIOI.

Its applications fields are extending more and more.



**Data buoy network of China**

## 2. Introduction of data buoys

### Products of network

#### ◆ 10 m diam. Discus



#### Specifics:

- Depth: 10 m~300m
- Max. wind: < 80m/s;
- Diameter: 10 m

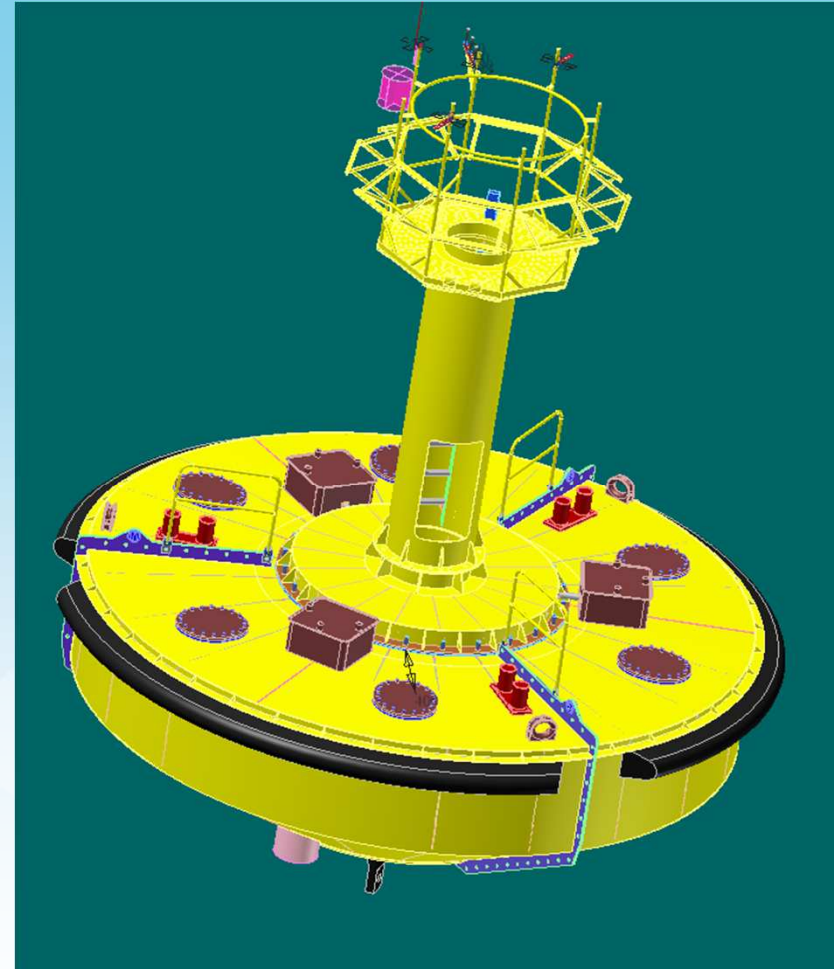


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## ◆ 6 m diam. Discus Assemble

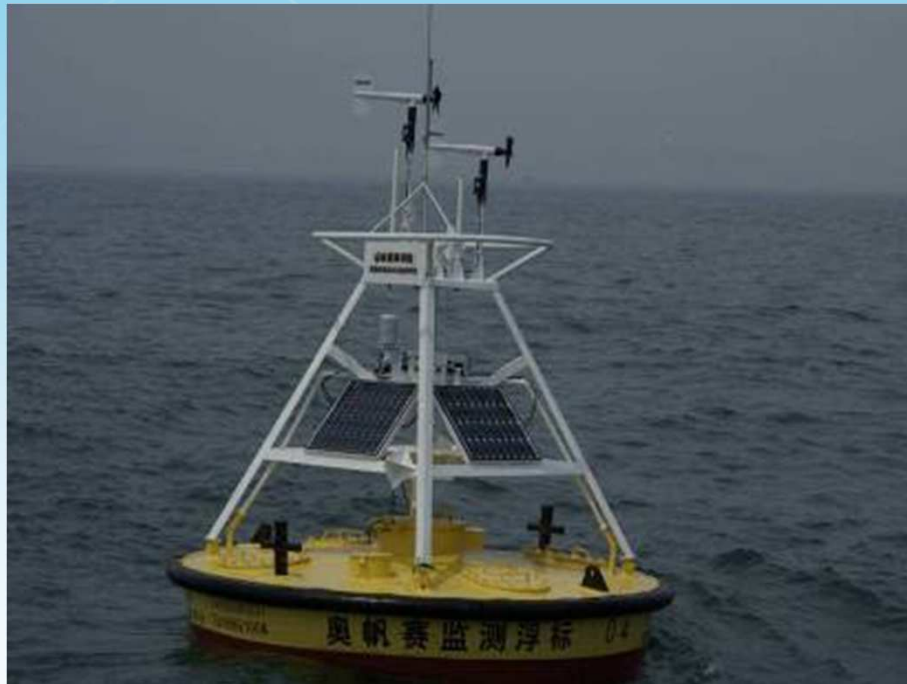


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# ◆ 3 m diam. Discus

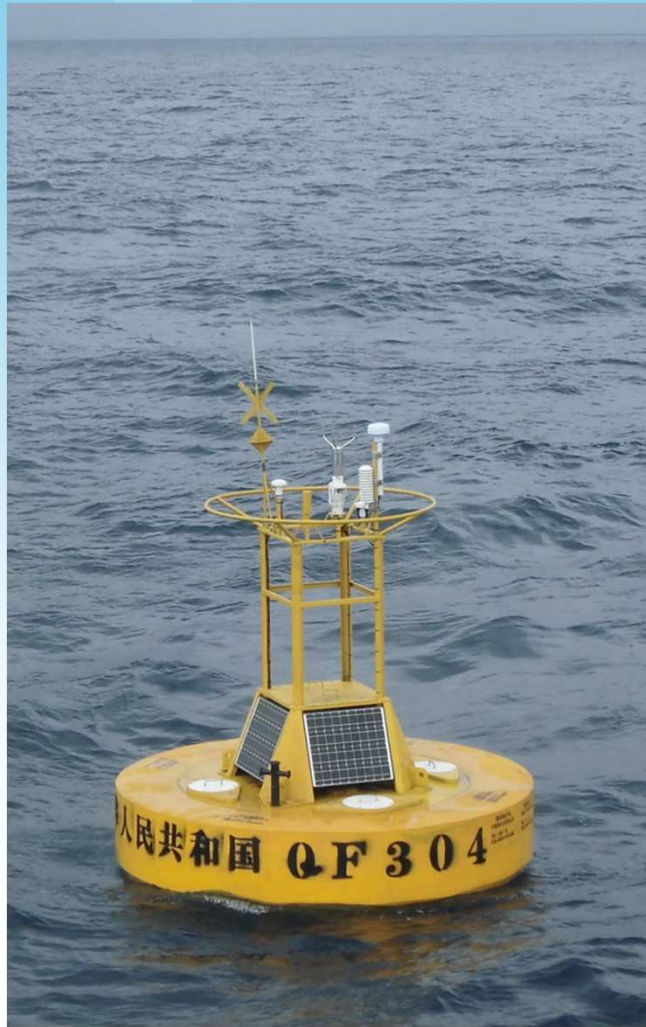


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# ◆ 3 m diam. Composite Material (EVA)

Depth: 5 m ~ 5000 m; Max. wind: < 60 m/s



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## ◆ Wave sensor



### Wave height

- Range: 0.2m~20m;
- Accuracy:  $\pm(0.1+5\%H)$ , H-wave height;

### Periods

- Range: 2s~30s;
- Accuracy:  $\pm 0.25s$  for  $f_s=4Hz$ ;  
 $\pm 0.5s$  for  $f_s=2Hz$

### Wave direction

- Range:  $0^\circ \sim 360^\circ$  ;
- Resolution:  $\pm 2^\circ$  ;

### Water temperature

- Range:  $-5^\circ C \sim +35^\circ C$ ;
- Accuracy:  $\pm 0.1^\circ C$ ;



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## ◆ Ship hull buoy

Length: 6.3 m

Width: 3 m

Depth: 500-4000 m

Tonnage: 10 t



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# 3. Technical Specifications

## ◆ Parameters

Temperature, Pressure, Humidity, Wind, Rain, Visibility, Wave, Current,....

## ◆ Telemetry Options

Satellite VHF/UHF CDMA/GPRS

◆ Depth > 3000m

◆ Wind limitation < 80m/s (**10 m diam.**)

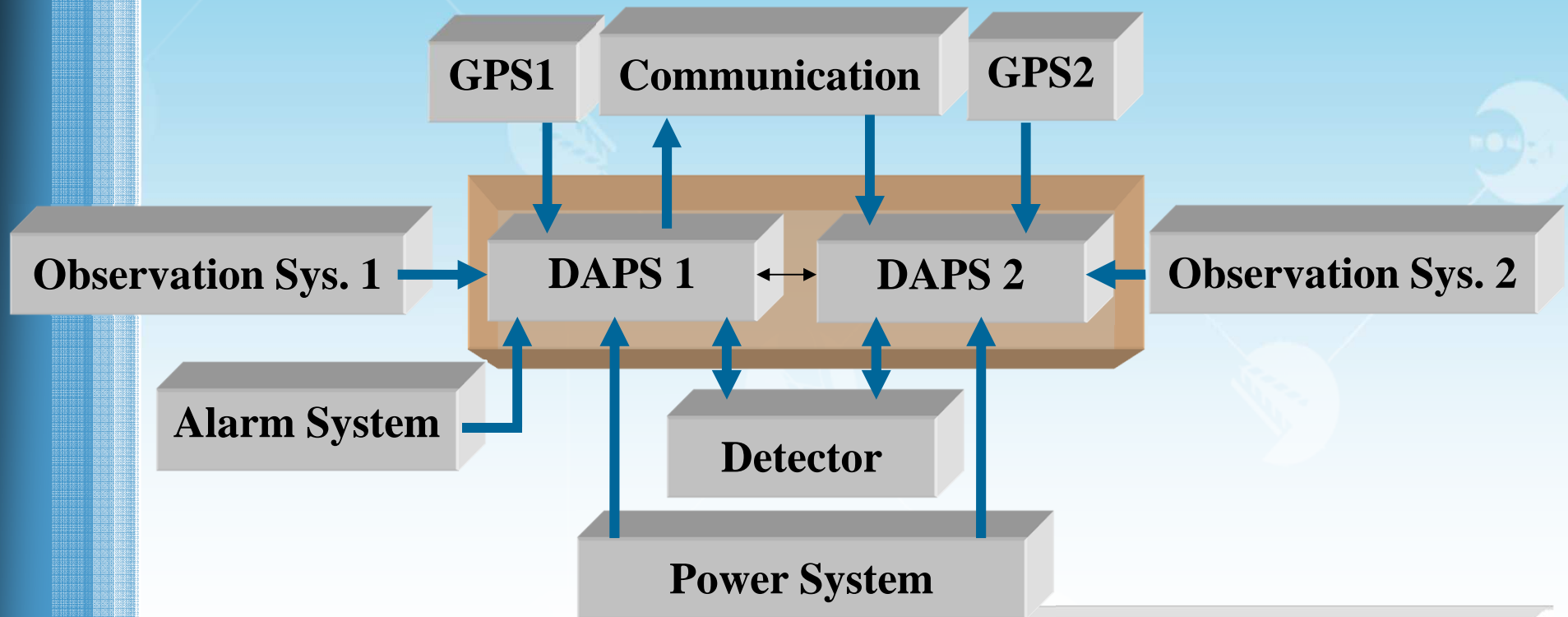


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# ◆ Data Acquisition and Processing System (DAPS)

- Two
- Independent
- Higher reliability



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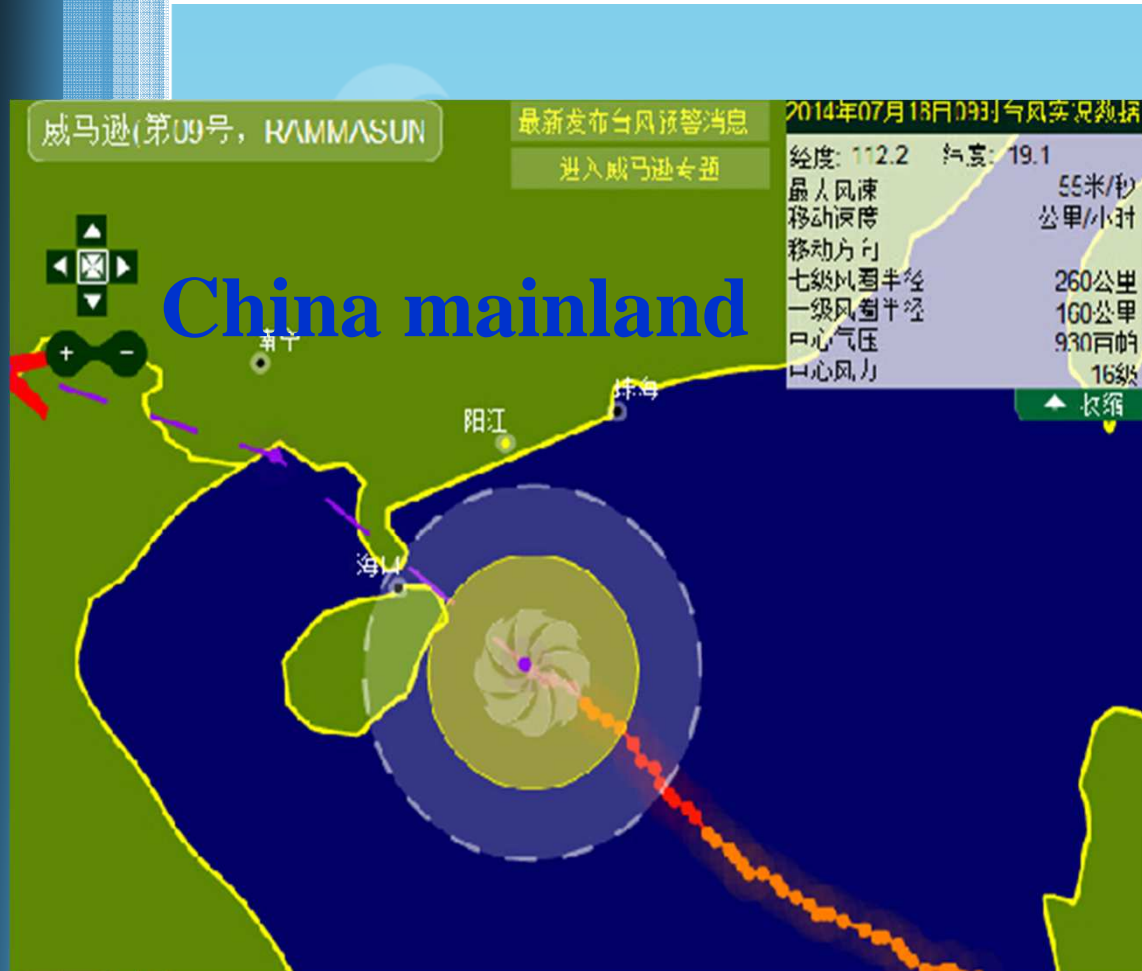


# 4. Applications



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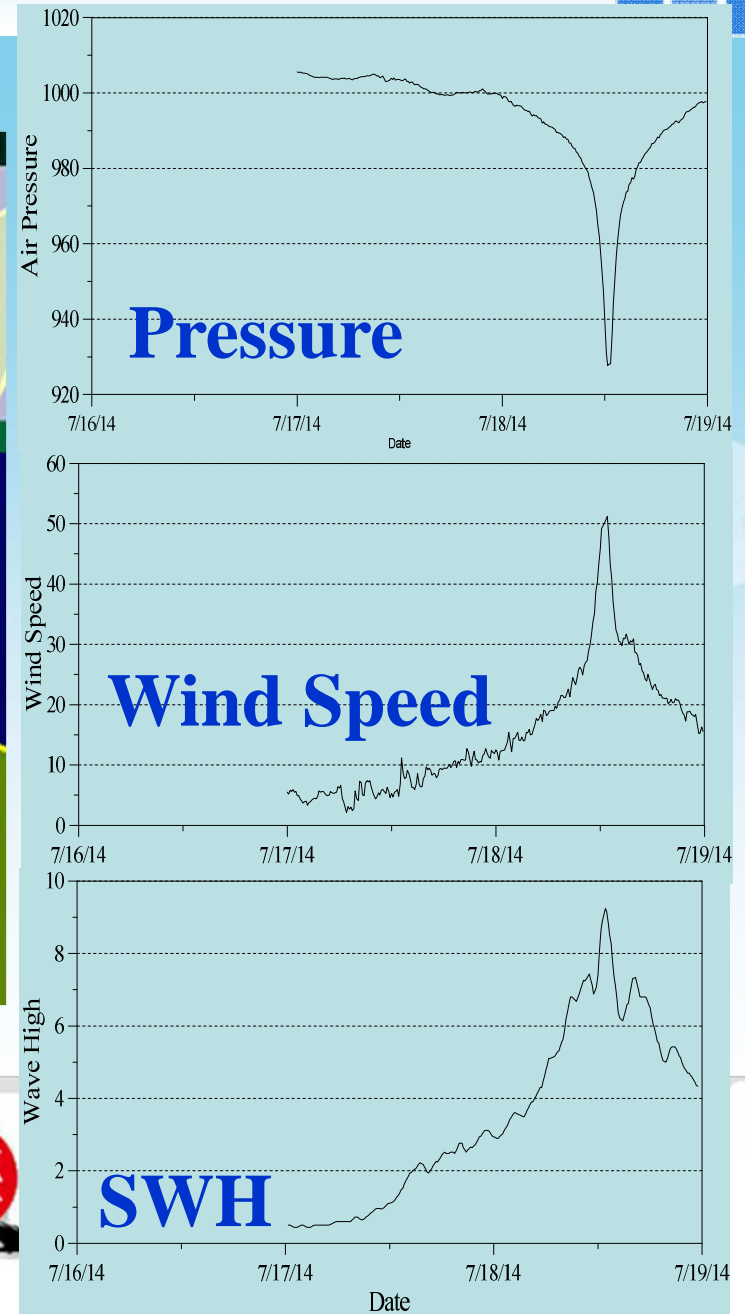
# Applications-Typhoon



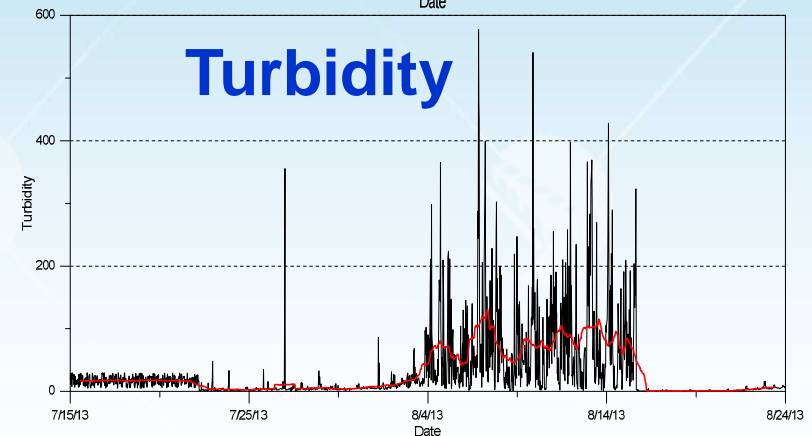
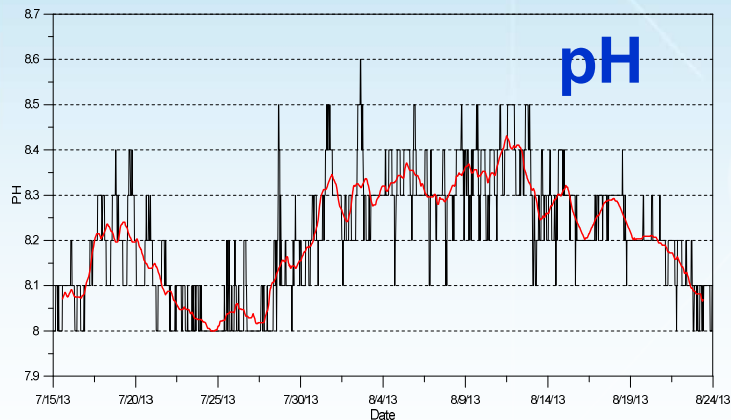
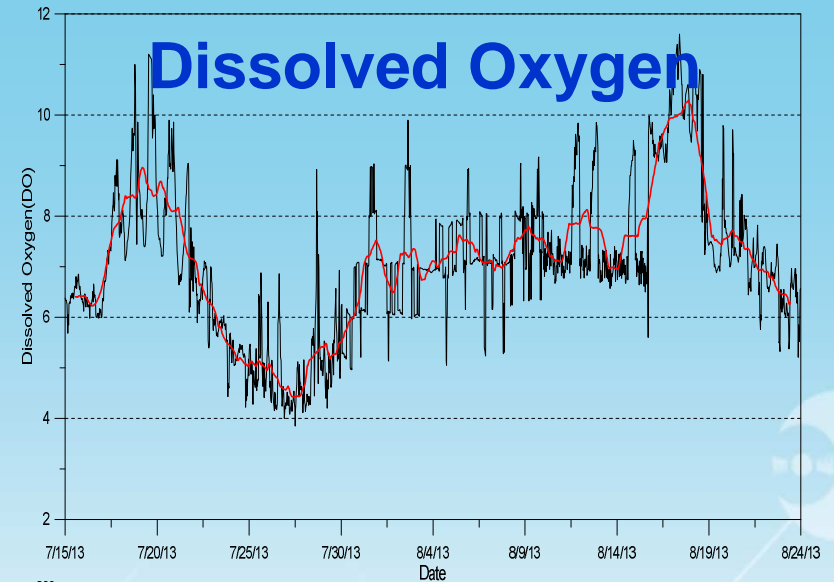
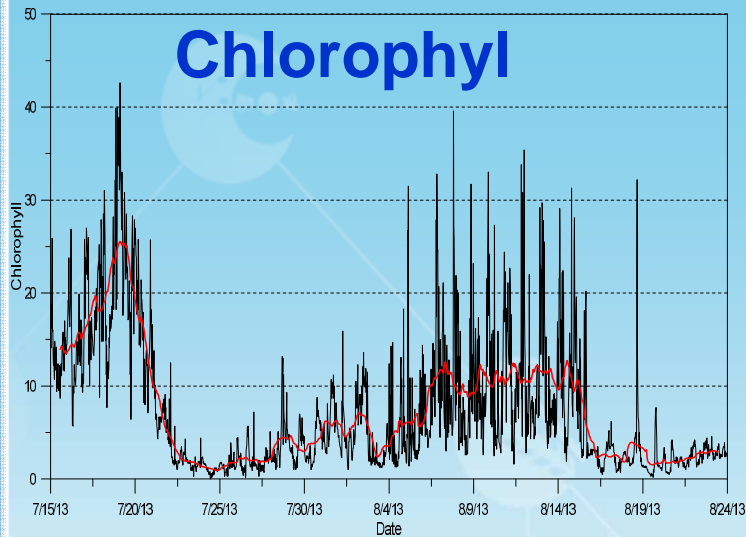
**Moving path of Typhoon Rammasun  
July 18, 2014.**



## Hainan Station



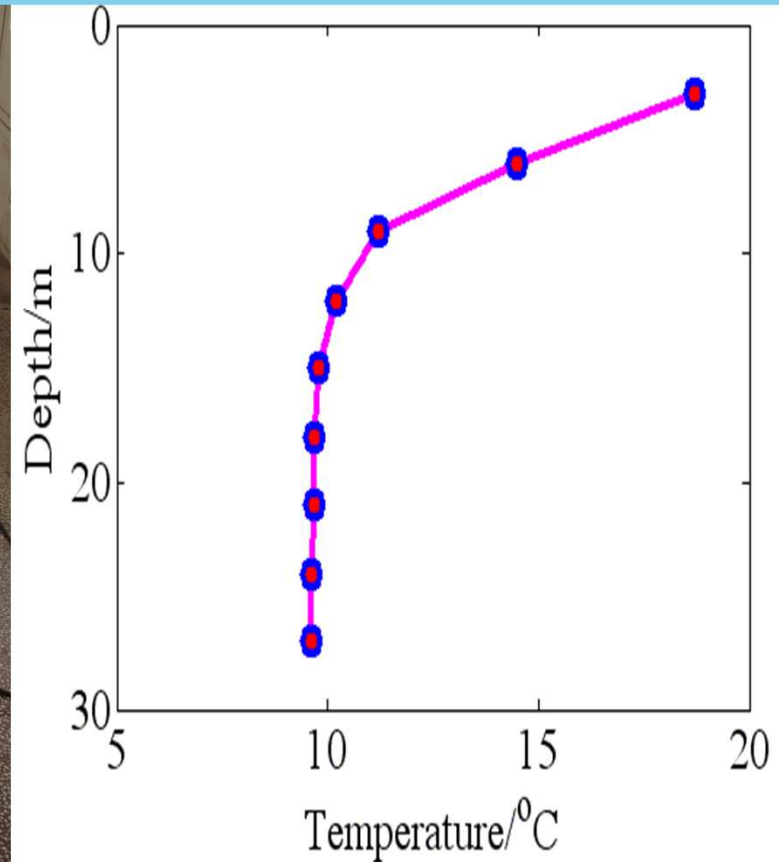
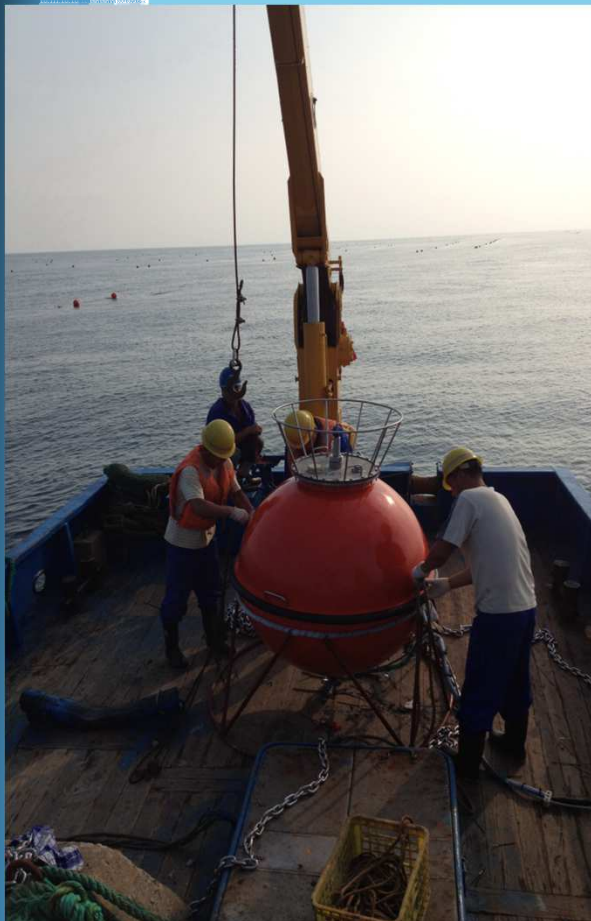
# Applications-Red tide



**Time series of some red tide parameters  
7/15/2013 -8/24/2013, East China Sea**



# Applications-Temperature profile



An example of temperature profile,  
July 1, 2013, Dalian, China

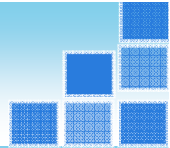
The profile is measured by a temperature sensors chain  
and assisted for mariculture.



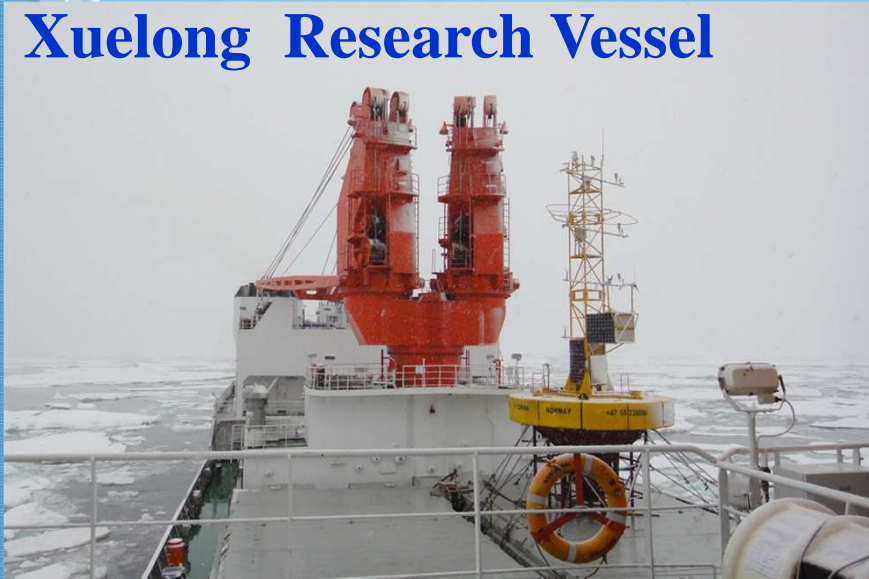
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# Applications-Air-sea Coupling



Xuelong Research Vessel



Observation Buoy



- Research on air-sea coupling
- Deployed in August 4, 2012
- China's First buoy deployment in Arctic region



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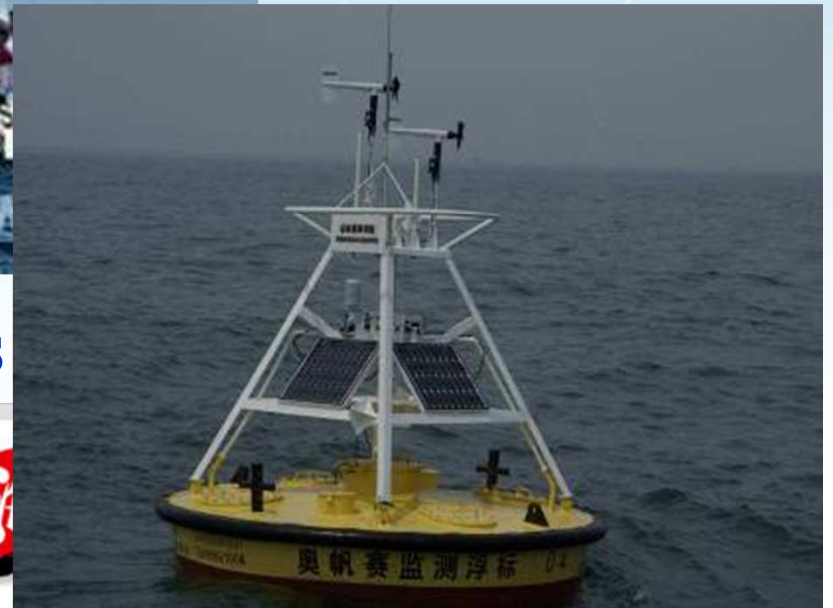
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# Applications-Serving for international Sport Campaign



Successfully Serving for Olympics  
Sailing Events, Qingdao, 2008.





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Think you very much

