



自然资源部第二海洋研究所  
SECOND INSTITUTE OF OCEANOGRAPHY, MNR

# The renovation of R/V Xiangyanghong 10 in 2023

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Oct.18,2023



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**Overview of SIOSOA**

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**Overview of R/V “Xiang Yanghong 10”**

03

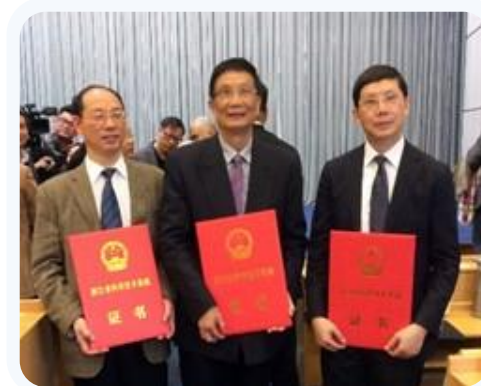
**The renovation  
of R/V Xiangyanghong 10 in 2023**



## 01 Location and Position



Directly affiliated to the **Ministry of Natural Resources** (MNR), the Second Institute of Oceanography (SIO) was established in **1966** and has developed into a non-profit oceanographic research institute with comprehensive disciplines, strong scientific and technological capabilities and advanced equipment support. It is mainly engaged in marine scientific researches on **China seas, oceans and polar regions** as well as the **R & D and application of high technology for marine environmental protection and resources exploration.**





# General Introduction

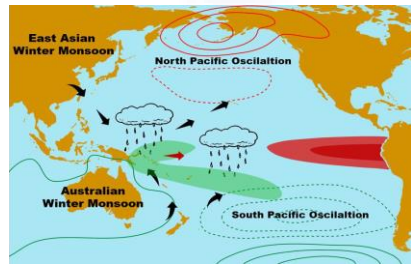
The research areas of SIO cover **5 research fields** and have derived into more than 19 research directions, which have basically formed our own scientific innovation system and scientific research group that can meet our country's great demands and help us gain a foothold in the world marine scientific and technological development.

1



submarine  
geosciences and  
deep-sea exploration  
technique

2



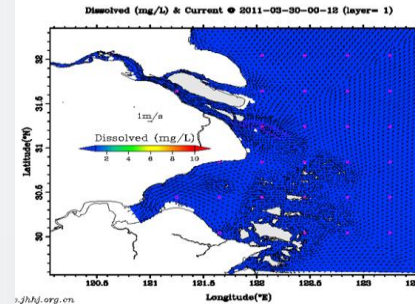
ocean dynamic  
processes and  
numerical  
simulation

3



satellite  
oceanography  
and marine  
remote sensing

4



marine  
ecosystem and  
biogeochemistry

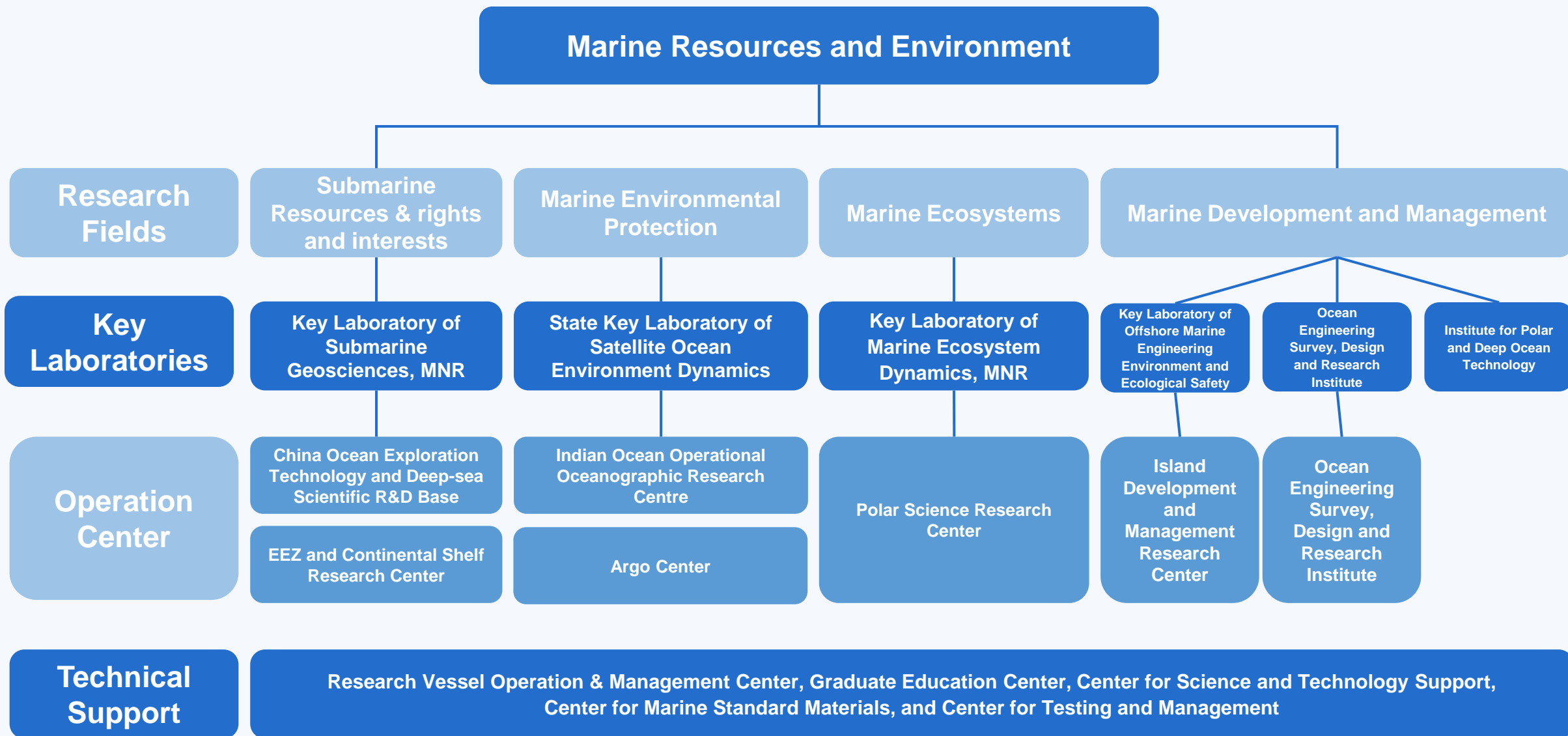
5



engineering  
oceanography



## 03 Organizational Structure





## 04 Faculty and Education

SIO was given permission to confer **Master Degrees** of Science by Academic Degree Commission of the State Council in 1981. Right now, SIO has **35** doctor supervisors and **109** master supervisors. From 2012, SIO has been working with Zhejiang University, Xiamen University, and other universities to recruit and cultivate overseas students supported by **Marine Scholarship of China**. SIO also has **postdoctoral workstation** that is qualified to recruit postdoctoral researchers and a platform for visiting scholars for cooperation and joint research.

**Total enrollment**

562

**Master's students**

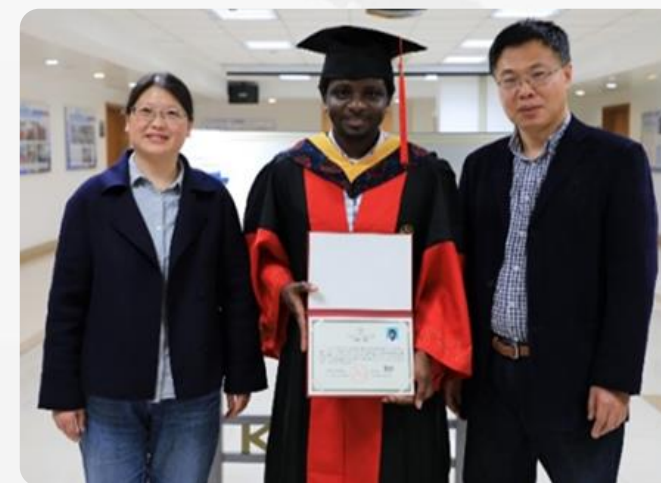
532 (including students recruited by SIO and co-educated students)

**Postdoctoral**

30 (Data as of December 31, 2022)

**Overseas students**

supported by Marine Scholarship of China : 31 (from 2012)





## 05 Capacity Building



**The "Dayang" Integrated Research Vessel**



**The "Xiangyanghong 10" Integrated Research Vessel**





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**Overview of R/V “Xiang Yanghong 10”**

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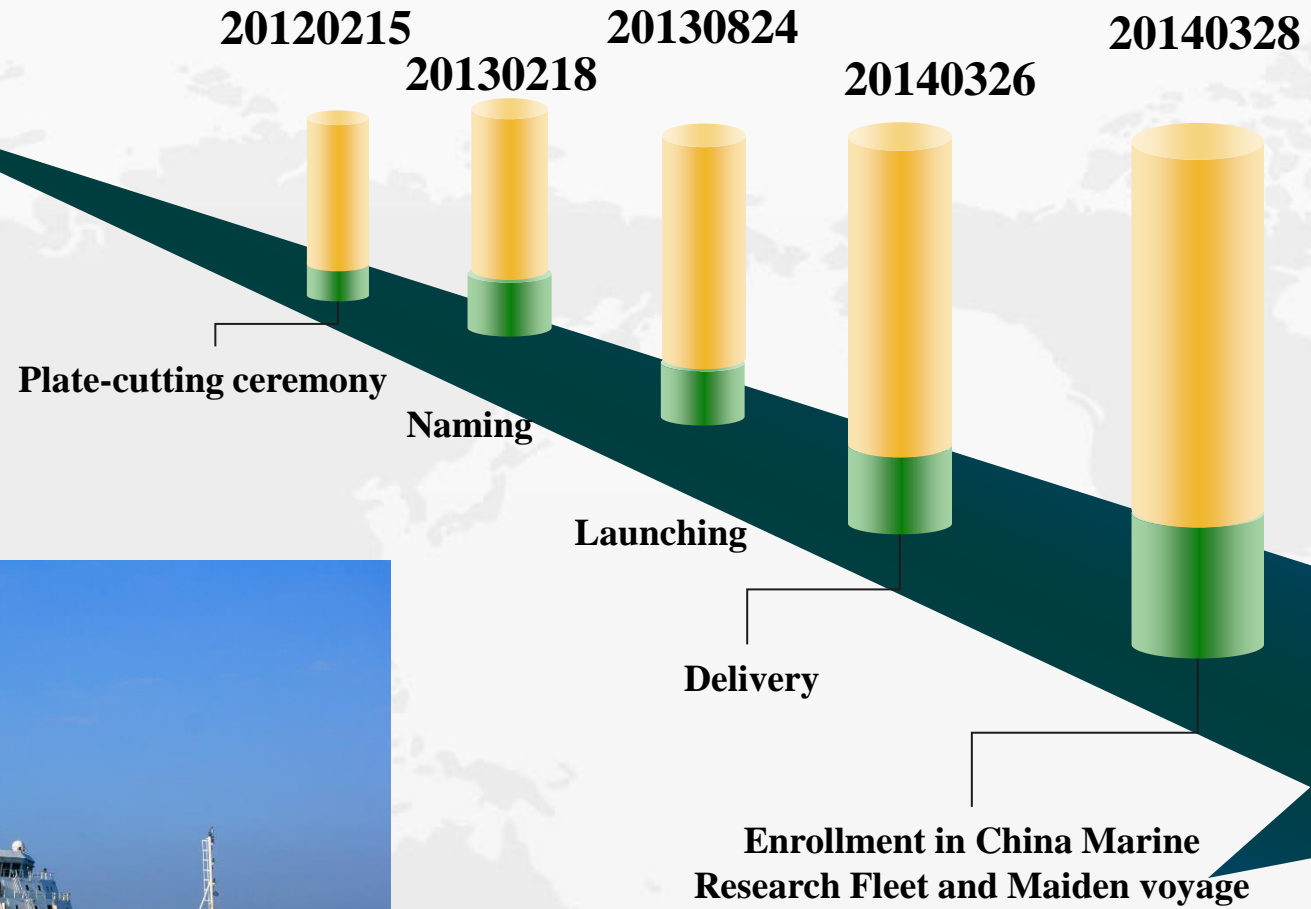


## ➤ Overview of R/V “Xiang Yanghong 10”

The R/V “Xiangyanghong10” was co-built by the SIO,SOA and Zhejiang Taihe Shipping CO.,LTD.The SIO,SOA is responsible for scientific investigations and scientific equipments maintenance, and Zhejiang Taihe Shipping CO.,LTD is responsible for ship managements.



# Memorabilia



# Main specifications

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- Length: 93 m
- Beam: 17.4 m
- Draft: 6.9 m  
(draft 5.5m + GONDOLA 1.4m)
- Tonnage: 4474 t
- Capacity: 65 persons (24crews+41scientists)
- Speed(max): 14.7 kn
- Cruise speed: 11 kn
- Range: 12000 nm
- Endurance: 60 days
- Working deck: 430 m<sup>2</sup>
- Lab space: 515 m<sup>2</sup>



**“ Xiang Yanghong 10” Comprehensive  
Marine Scientific Research Vessel**



Since its operation in March 2014, it has successfully conducted more than over 40 survey voyages. The peak time is almost 300 working days in one year.



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**The renovation of R/V Xiangyanghong 10 in  
2023**



Why we need R/V Xiangyanghong10 renovation?

- 1) The requirements for 10-year special inspection of R/V Xiangyanghong10;
- 2) No Sustainable financial to support the R/V Xiangyanghong10 operation;
- 3) R/V Xiangyanghong10 economic speed is almost 9 knot;
- 4) The Habitability, the deck, the lab. area: aging of decorative panels, worn floors, damaged furniture, and partial loss of functionality;
- 5) Obsolete information system;
- 6) the hull severe paint aging , large area shedding, Partial component corrosion.

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The New Owner:

1) FUJIAN Earthquake Agency;

2)SIO,SOA;

3) Zhejiang Taihe Shipping CO.,LTD.

FUJIAN Earthquake agency provide the funds, the SIO,SOA is responsible for scientific investigations and scientific equipments maintenance, and Zhejiang Taihe Shipping CO.,LTD is responsible for ship managements.

The shipyard: NINGBO Huanhai heavy INDUSTRIES

# Renovation CONTENTS

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Underwater acoustic equipment renovation

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Shock absorption and noise reduction renovation

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Deck renovation

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Lab., Cabin, Chief Scientist , living quarters upgrade

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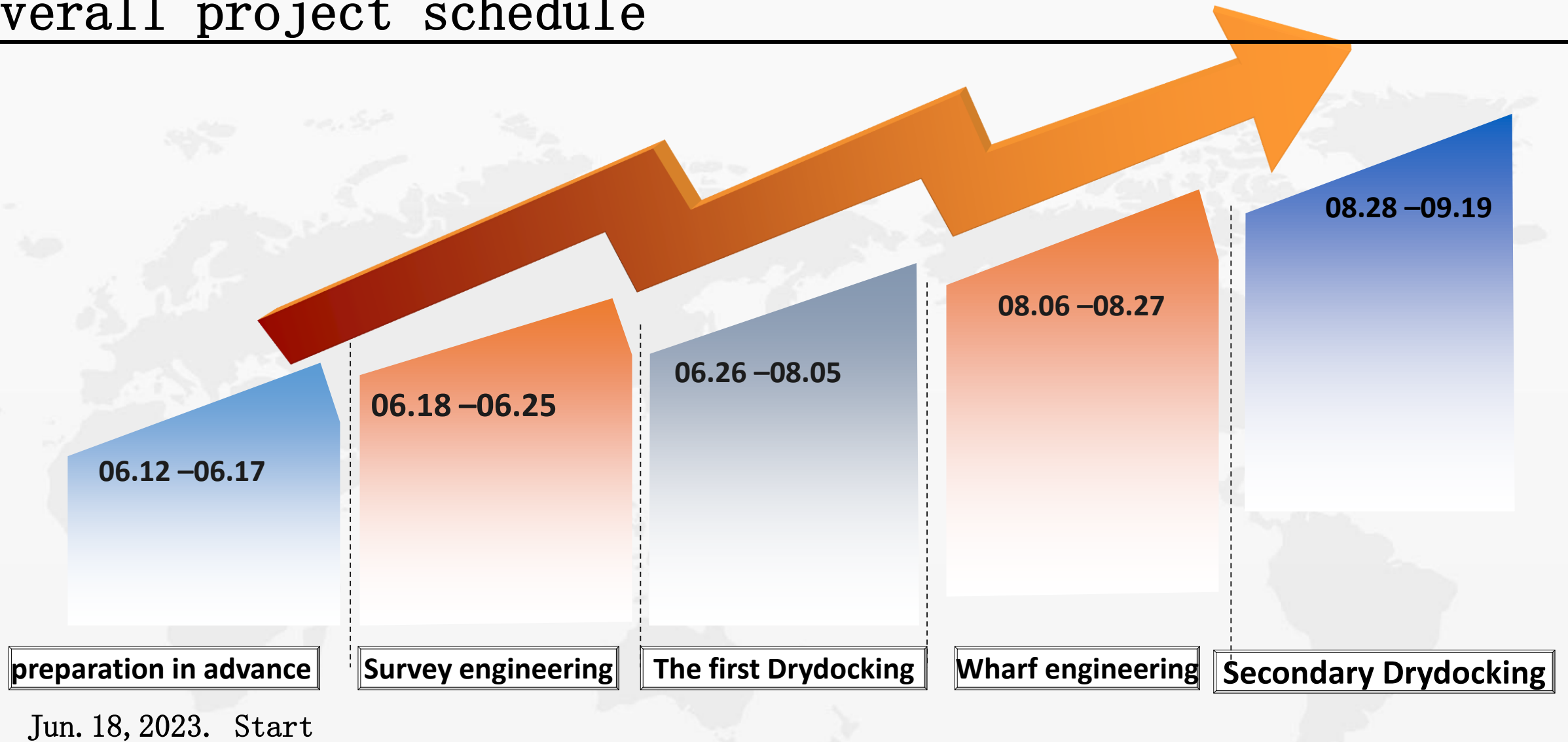
Information system renovation

06

Hull painting



# Overall project schedule



The duration is expected 75 days, due to the impact of typhoons and additional concealed works, the total period extended by 95 days.

# Typhoons affection



# 1. underwater acoustic equipment renovation

Before



Dismantle the old GONDOLA

After



Install the new GONDOLA

# 1. Underwater acoustic equipment renovation

Before



**Dismantle the underwater acoustic equipment**

**Such as Multibeam,**

**Single beam, ADCP, Sub-bottom profiles**

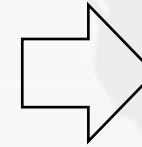
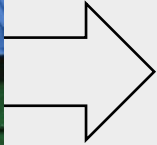
After



**Kongsberg engineers measure equipment installation accuracy**

## 2、 Shock absorption and noise reduction renovation

### Before



### After

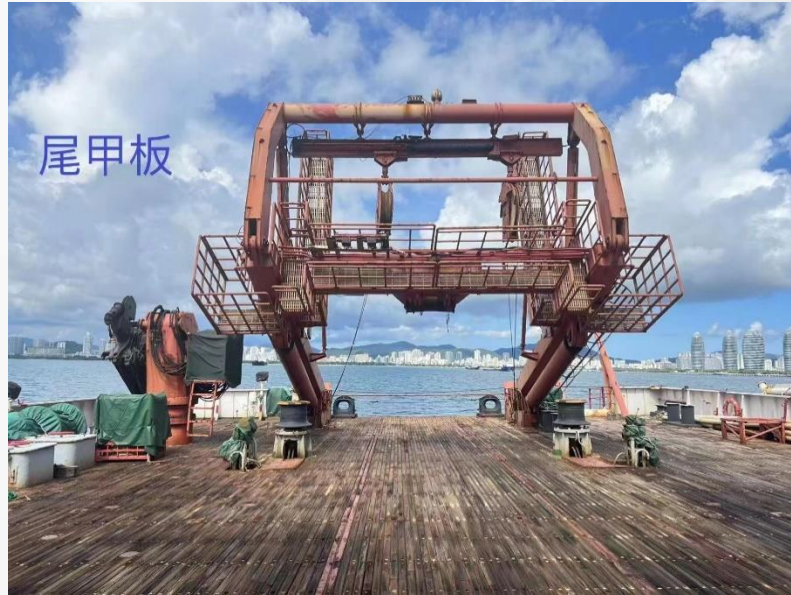


- Vibration measurement before repair
- Maintenance of vibration isolation equipment for main generators, pump sets, and other equipment;
- Maintenance of engine compartment partition soundproof panel

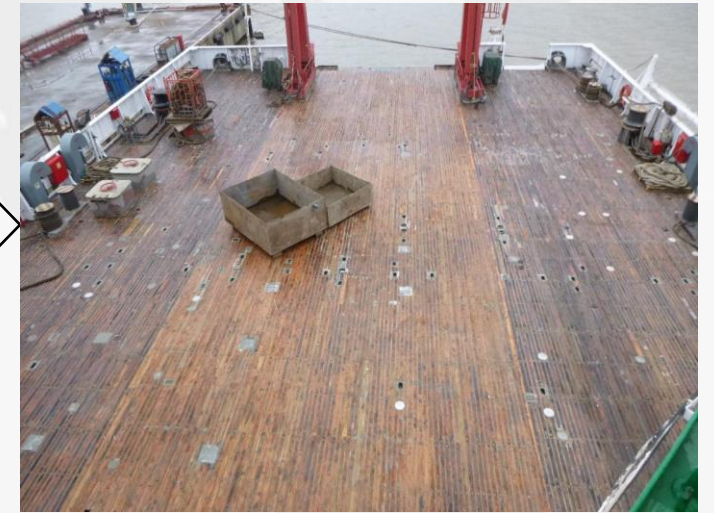
**Vibration measurement after repair**

### 3. Deck renovation

Before



After

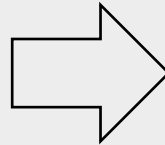


- Capstan/ bitt and so on removal
- Derusting and maintenance of A Frame
- Structural strengthening
- Refurbishment of stern deck planks

'modular' science container

#### 4. Lab., Cabin, Chief Scientist , living quarters upgrade and renovation

Before

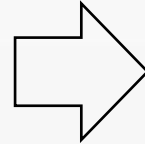


After

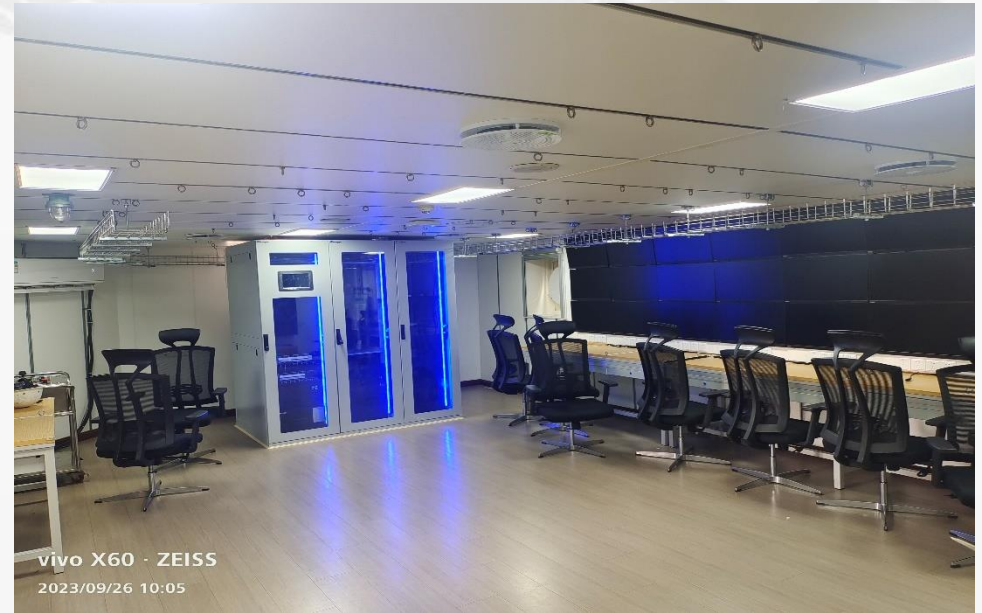
- Demolition and redecoration.
- Multifunctional hall renovation;
- Chief Scientist renovation;
- Upgrade and renovation of living quarters

# Lab. upgrade and renovation

Before



After



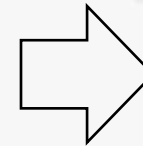
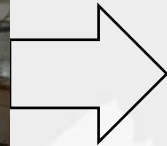
The ceiling is made of aluminum plate, the bulkhead is made of composite rock wool plate, and the PVC floor is renewed.



# 5、 Information system renovation

Before

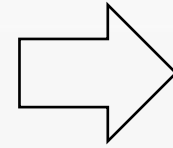
After



- A dedicated cable rack is installed to fully cover the laboratory platform;
- Upgrade and replace cameras and computers;
- Full ship wireless AP replacement.

# 6. Hull painting

Before



After



- Using Sand blasting Sa2.0 grade for the entire ship's exterior panels, and re-spraying of external coatings;
- Replace all anti-corrosion zinc blocks



To be  
continued...

Sea trial not finished yet



**Thank you for your attention**