

The logo for IOCAS RV KEXUE. It features the letters 'IOCAS' in a bold, blue, sans-serif font. The 'I' and 'O' are connected, with a stylized blue wave or globe graphic integrated into the 'O'. To the right of 'IOCAS' is the text 'RV KEXUE' in a blue, italicized, sans-serif font.

**IOCAS RV KEXUE**

# Management Outline and Typical Operation Cases in Recent Years

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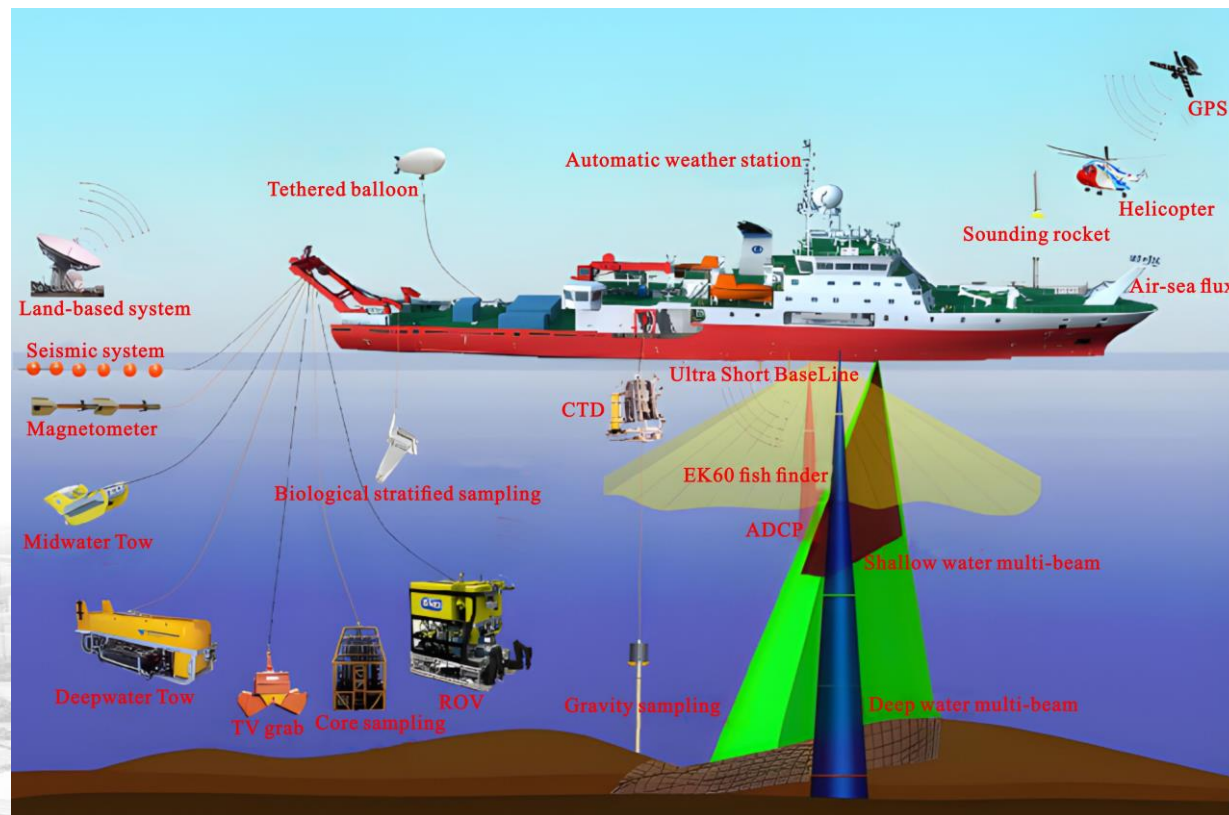


# Global class oceanographic research vessel

<b>Main Dimensions</b>	(1) LOA: 99.8 m (2) Moulded Breadth: 17.8 m (3) Moulded Depth: 8.9 m (4) Draught: 5.88 m
<b>Gross Tonnage</b>	4711
<b>Range</b>	15,000 n miles @ 12 knots
<b>Endurance</b>	60 days
<b>Speed</b>	Service Speed: 12.0 knots Maximum Speed: 15.8 knots Speed Range: 0-maximum variable speed
<b>Complement</b>	80 persons (Crew 30, Scientists 50)

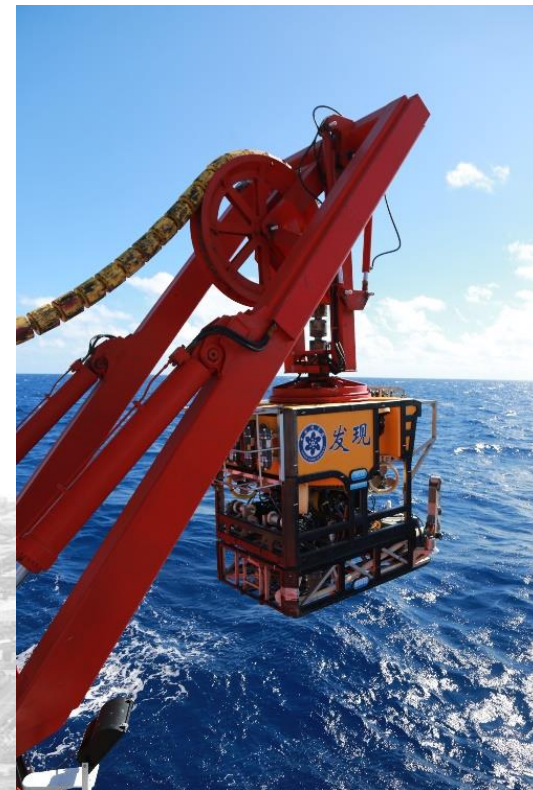
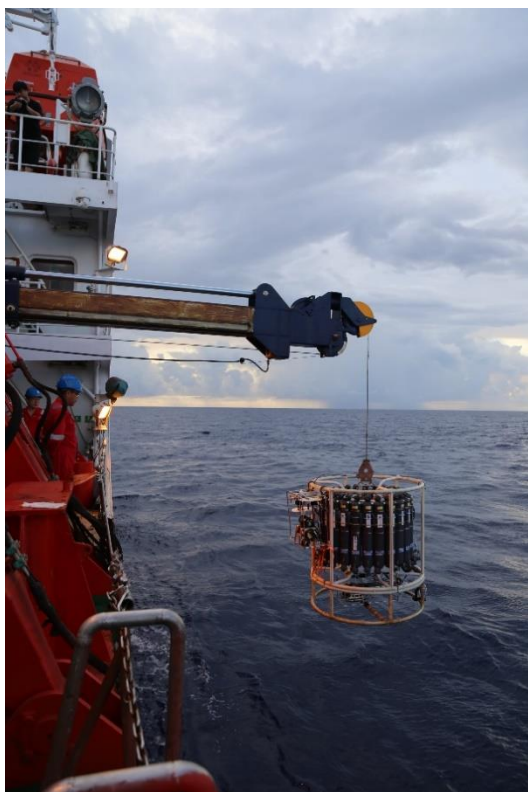


- ✧ Ocean circulation and climate change
- ✧ Marine dynamic process and natural hazards
- ✧ Deep-sea biological/gene resources and biodiversity
- ✧ Ocean ecosystem and carbon cycle
- ✧ Hydrothermal system in mid-ocean ridge and continental margins and deep earth processes
- ✧ Formation mechanism of deep-sea oil and gas resources





# Cruises in the last 3 years



RV *KEXUE* has fulfilled **13** cruise tasks and sailed **536** days with **84726** nautical miles in the last 3 years.



# Implementation of international conventions

RV *KEXUE* Strictly implements international conventions such as SOLAS, MARPOL, MLC, and so on within the framework of IMO and completed. Intermediate and special inspections for ship dock repair were completed in 2020 and 2022.



We took **strict measures** to ensure the safety of the crew and the normal operations of RV *KEXUE* during the COVID-19 pandemic including the 7-14 days isolation and swab tests. **No cases** of COVID-19 appeared aboard the vessel.



# Daily maintenance and professional exchanges



We conduct **daily maintenance** to meet ISM's requirements, and irregularly organize **study and interaction with peers** to enhance operation skills of crews with the goal of vessel's safe voyages.



# Enhancement of emergency skills



National Large Research Infrastructure  
Multi-purpose Oceanographic Research Vessel

*RV KEXUE*  
Ship's Handbook



2023 Edition

**Safety** is the basic guarantee for conducting scientific investigations. We have developed **a handbook for scientists** so that they can acquaint with the life aboard as early as possible.

At the same time, we will also conduct relevant exercises and training at sea to enable not only **crew members**, but also **scientists** to master emergency skills.



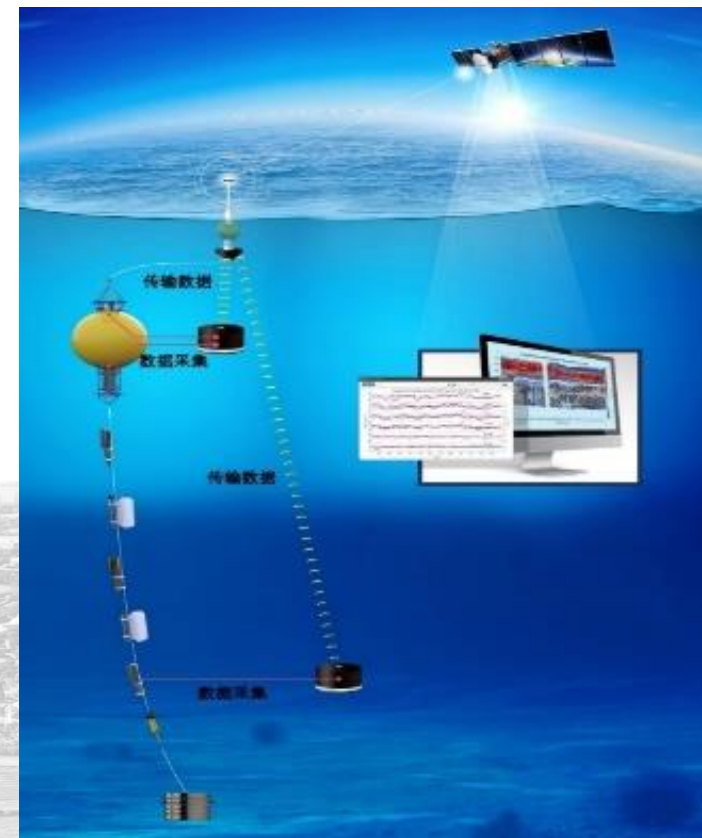
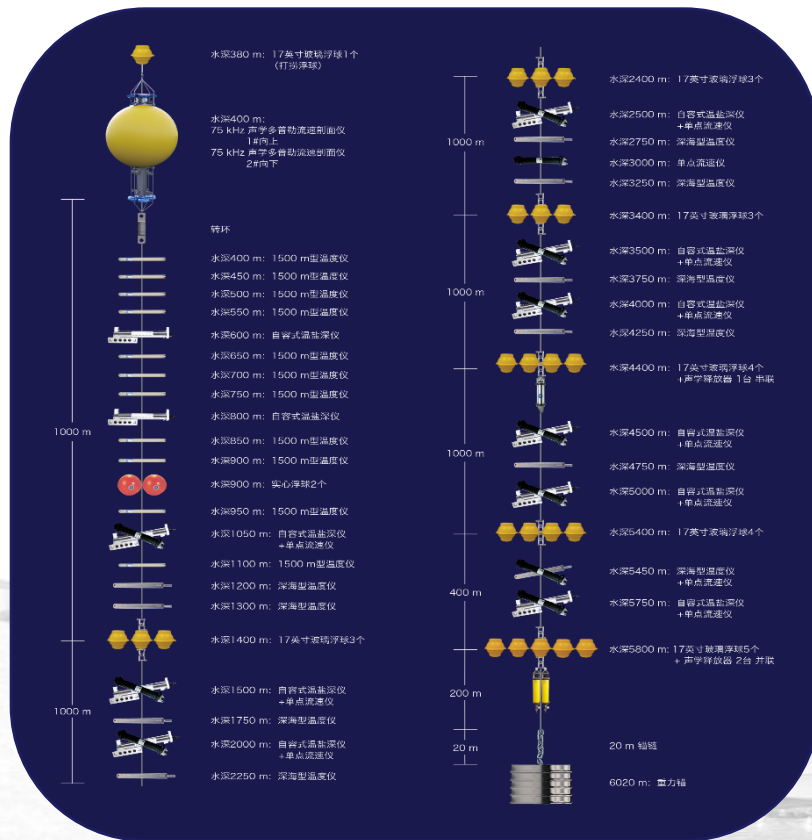
# Three representative aspects of considerations for cruises

- 01.** Understanding and deconstructing the investigation tasks during the cruise preparation stage (taking the cruises of Scientific Observing Networks in western Pacific as examples).
- 02.** Cooperation at sea (taking the cruises of high-precision seabed exploration and sample collection as examples).
- 03.** Ship control for multi platform operations.



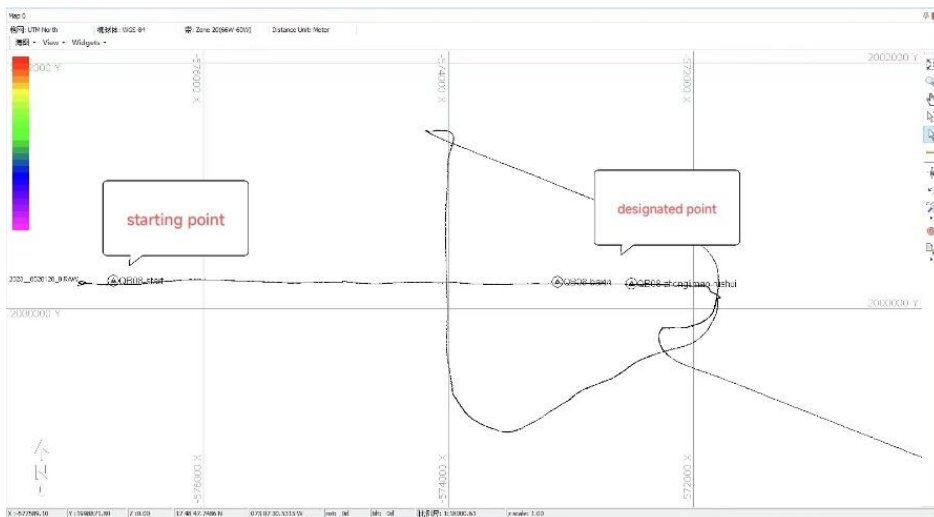
# Cruise preparation--Understanding and deconstructing the investigation tasks

Acquaint with the structure of subsurface mooring system and make decisions on deployment and recovery methods.





# Cruise preparation--understanding and deconstructing the investigation tasks



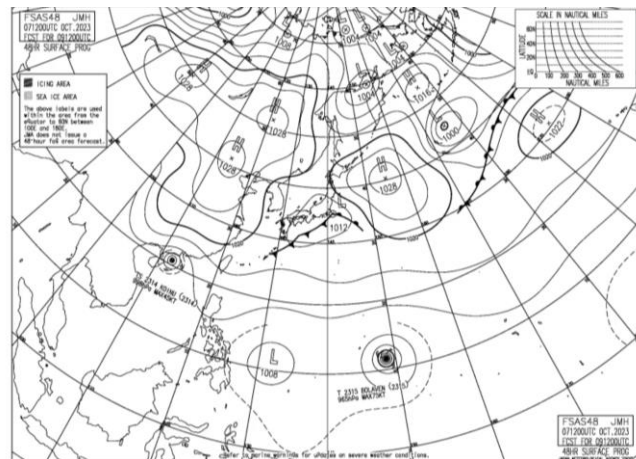
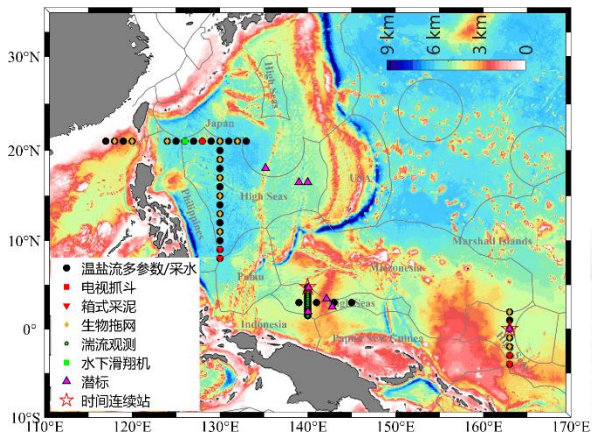
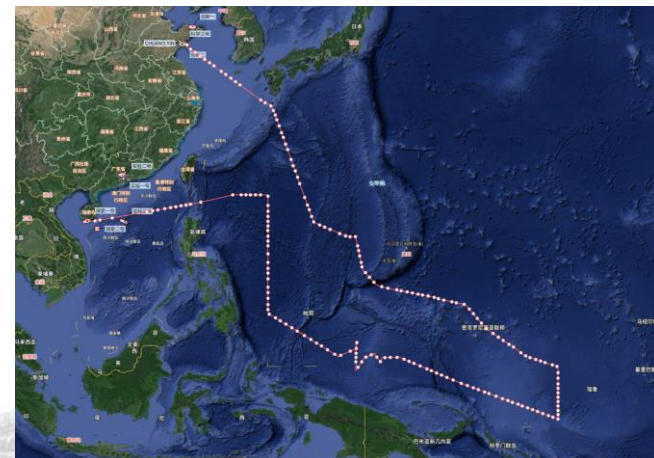
Select the starting point for deployment in advance based on wind flow and the length of submersible buoys

In complex terrain, deploy the subsurface moorings accurately in designated positions

# Cruise preparation--adjustment of routes



Fully consider the impacts of weather and international regulatory requirements



Efficiently and economically design routes in advance

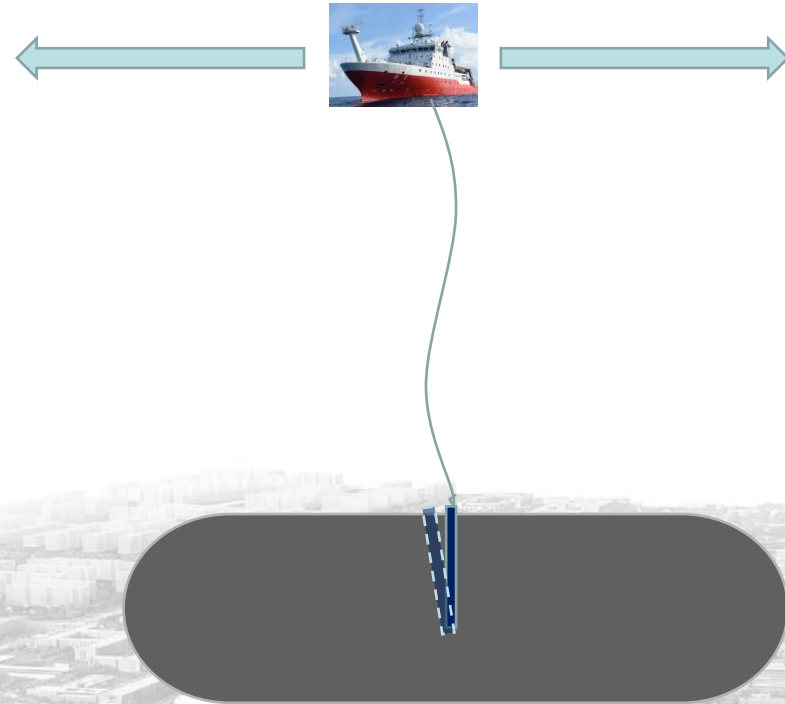
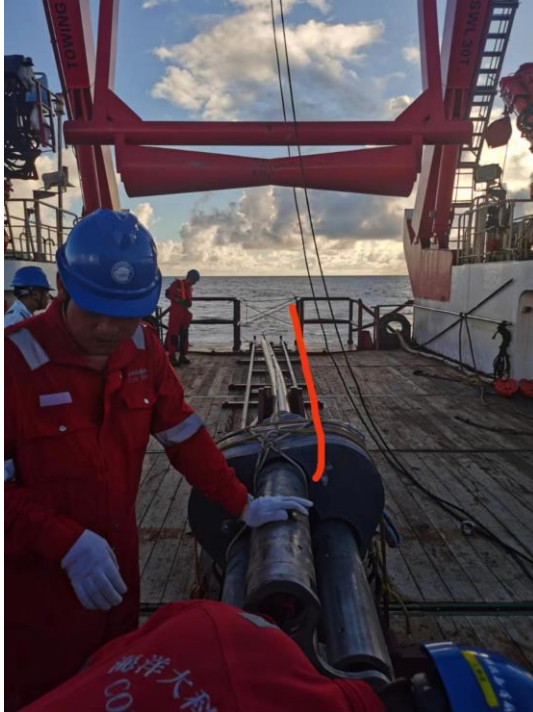
Dynamically adjust the routes based on factors such as weather and diplomatic clearance



Technicians of the shipboard laboratory, marine engineers and electrical engineers work together for maintenance and repair.

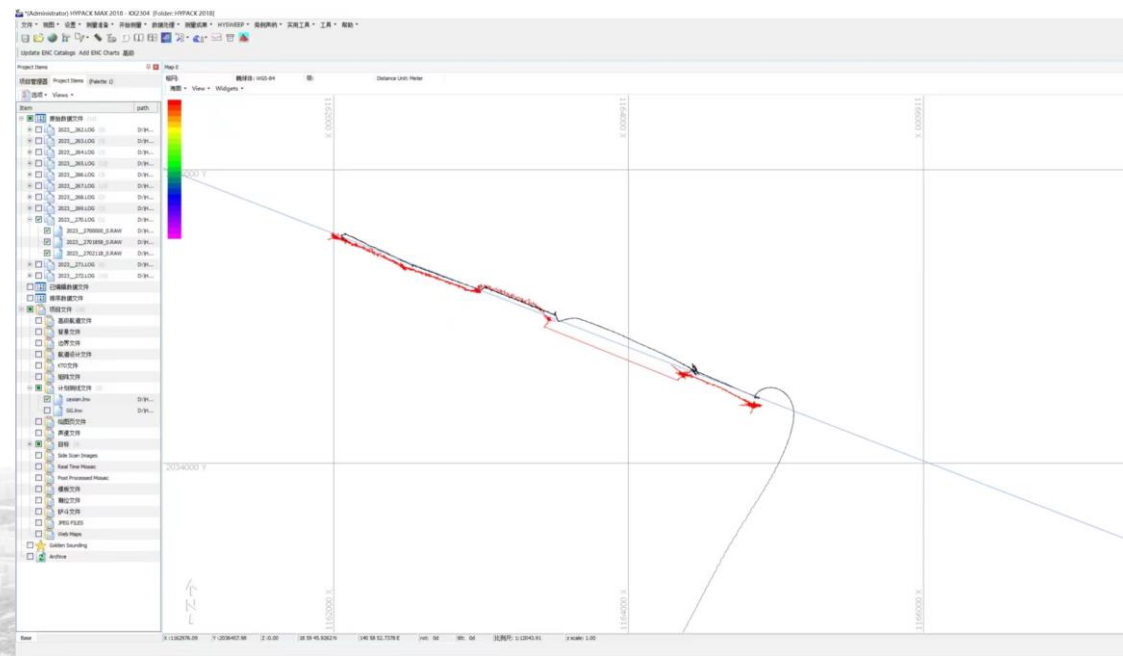
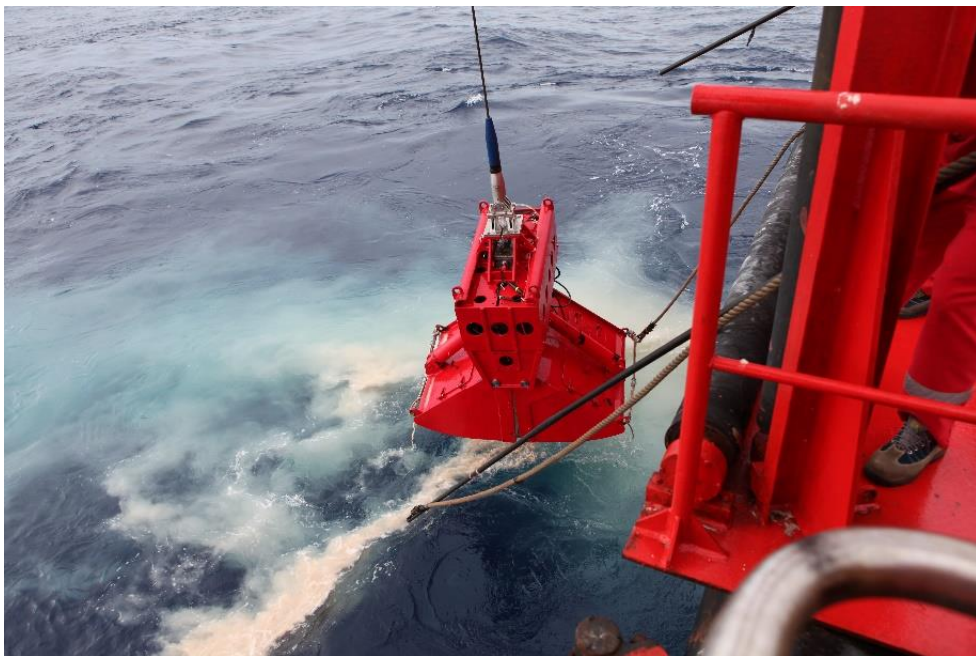


A.B. and OLR participate in joint assignments with research team and technicians aboard together.



- ✧ Personnel of the two departments, bridge and laboratory, work together.
- ✧ Adjust the ship's position to the cable length.

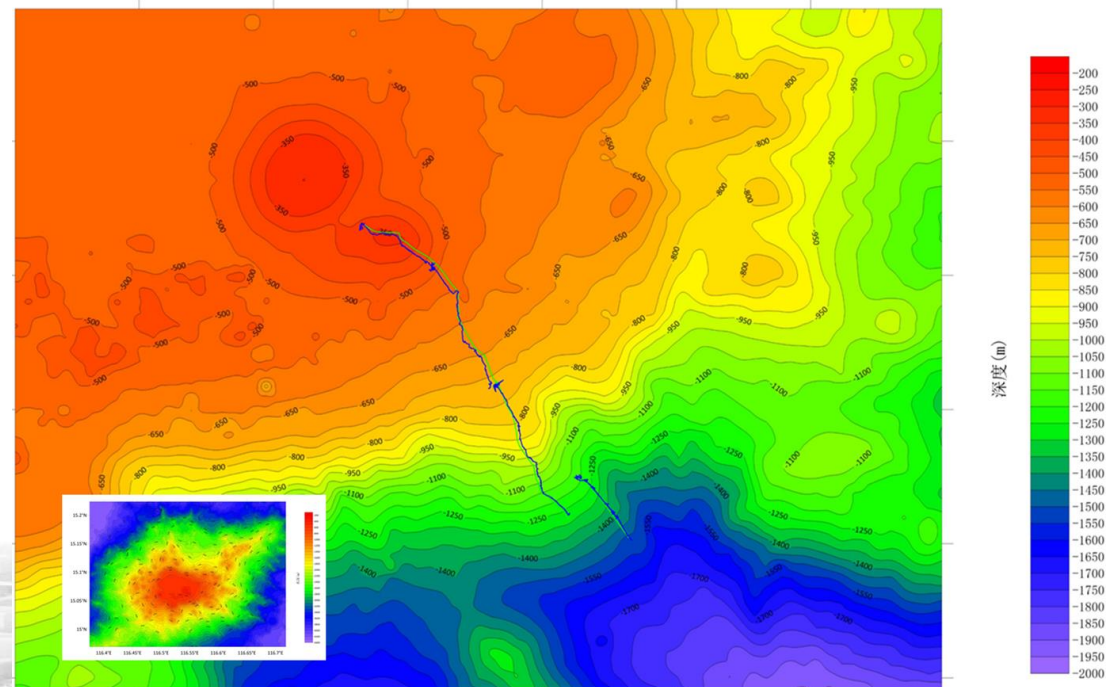
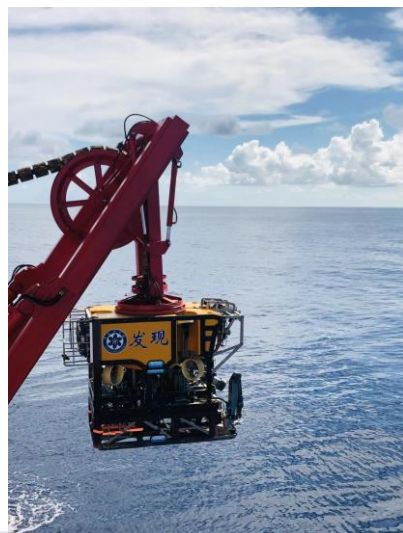
Drive the ship left and right to adjust the cable within a safe load to shake the heat flow probe and free it from the constraints of the seabed.



The vessel tows the TV grab at low speed to accurately grab samples.

# Ship control for multi platform operations

1. ROV equips with thermometers, biological collectors, bottom sampler, etc.
2. ROV's designed diving depth is 4500 m, equipped with underwater positioning system and deep water ultra high definition camera system.
3. ROV equips with Titan4 and Atlas robotic arms which can directly grasp organisms and rocks weighing over 300 kg.



Track of RV KEXUE

Track of ROV

The vessel maintains dynamic positioning and cooperates with ROV's seamount investigation.



# Ship control for multi platform operations

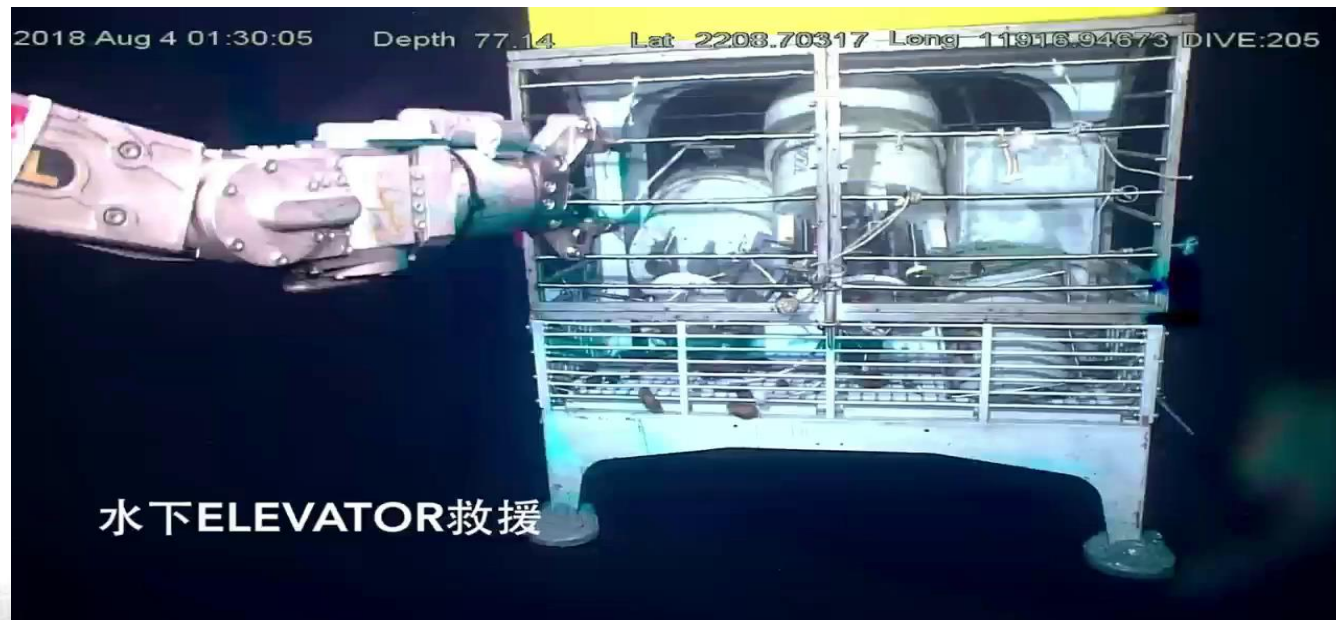
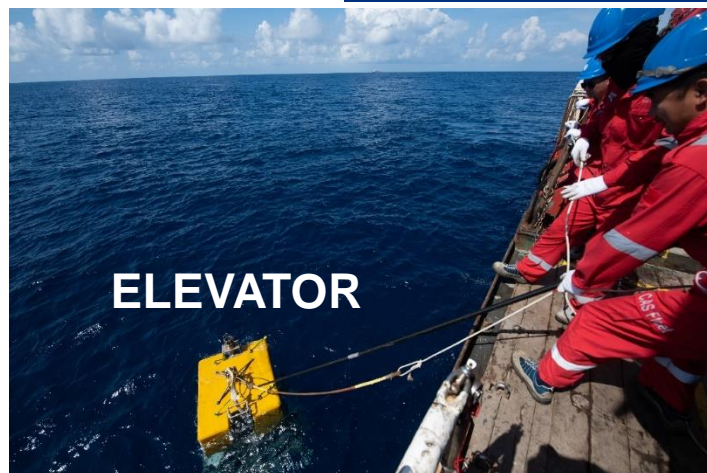


ROV and Lander's teamwork

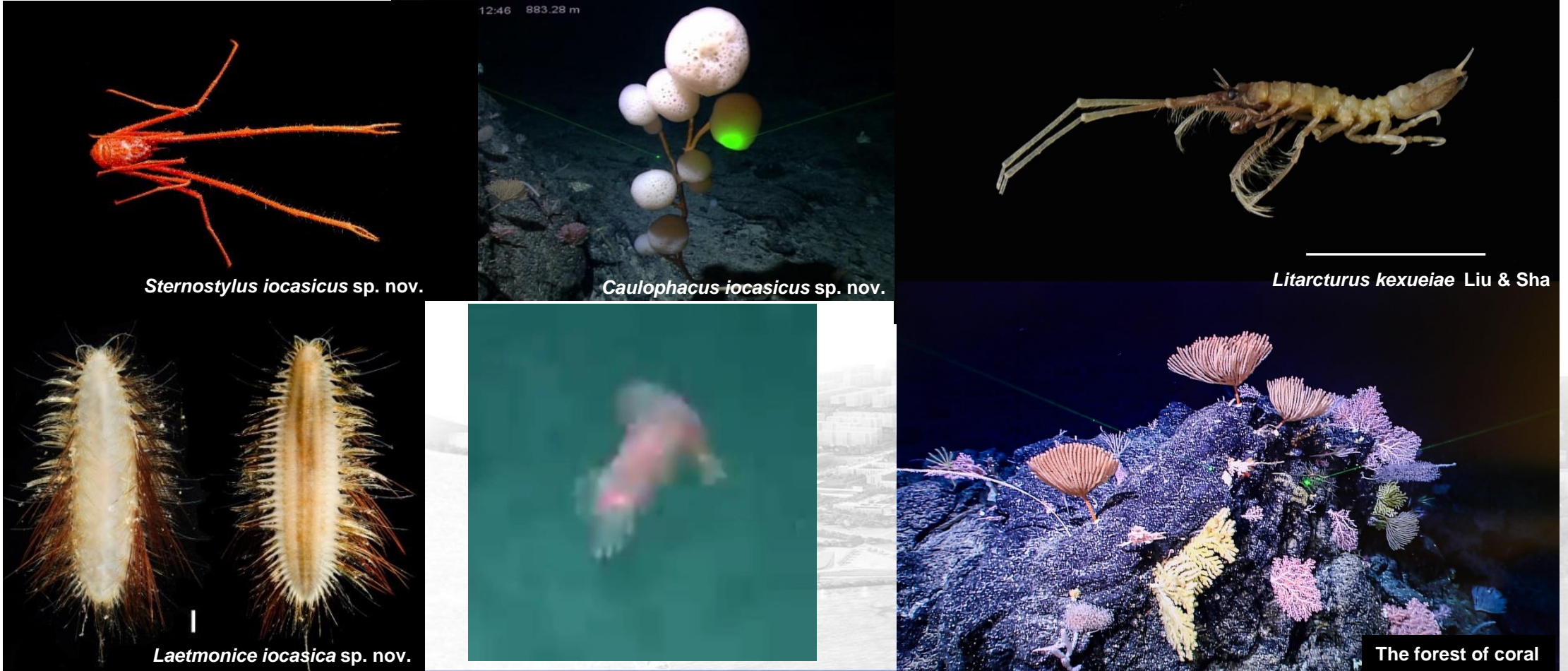




# Ship control for multi platform operations



ROV searched and rescued in the sea when ELEVATOR malfunctioned.



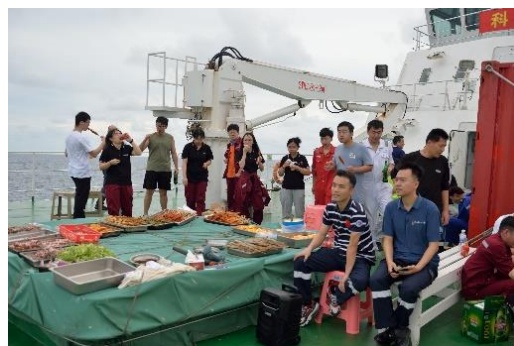


# Comfortable Life: various activities



Certificate of Crossing the Equator

Games



Parties

Our principle is to serve scientific research and provide excellent logistical support. We organized a variety of cultural and sport activities to bring joy, unity and inspiration to all crew members, which inspires everyone to devote themselves to the scientific research work with enthusiasm.



# Comfortable life: delicious food



Dumplings and other delicious food

Working meal



# Thank you for your patience



Thanks to the colleagues at IOCAS:

LI Leixi, CHEN Xiufeng, LIU Heyi:  
suggestions;

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Shichen, GONG Xudong: material collection;

FENG Jing, JIANG Qiufu: management  
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