

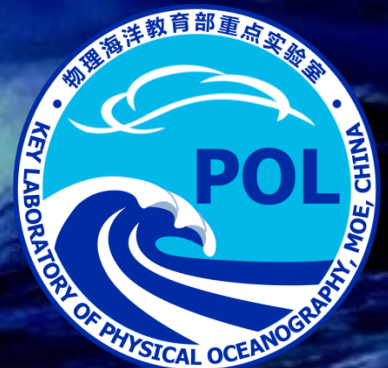
Understanding the Oceans, Sustaining the Future



An overview Physical Oceanography Laboratory Ocean University of China



Yiyong Luo





History

The Physical Oceanography Laboratory (POL) was founded

New era of vigorous development

1950s

1987

1999

2010

traced back to 1950s after the founding of new China

The POL was recognized as the only Key Lab for Physical Oceanography under the China Ministry of Education



Faculty and Staff

57 Research Fellows

3 CAS Members

2 Chang Jiang Scholars (MOE)

2 Distinguished Young Scholars (NSFC)

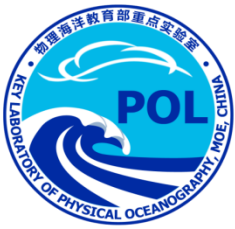
6 New Century Talents

2 Taishan Scholars

2 Zhufeng Talents

3 Youth Talents

6 Executives



Major Research Threads

POL

Ocean Circulation Dynamics

- Coastal circulation and mass transport
- Large-scale ocean circulation
- Polar Ocean Dynamical

Processes

Ocean Wave and Mixing

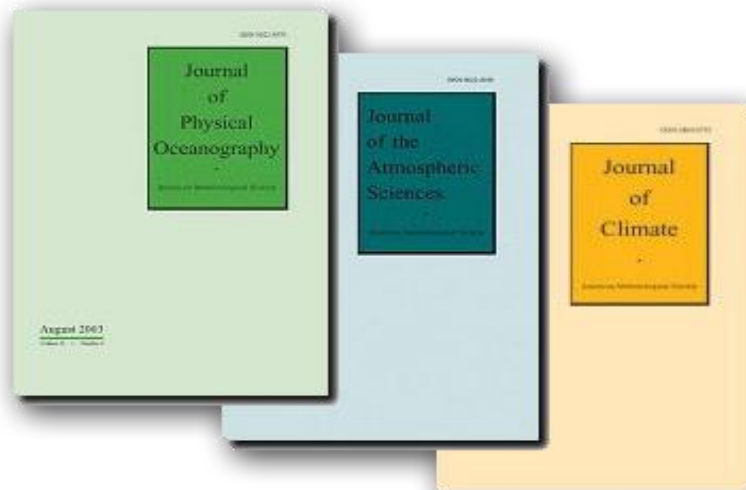
- Wind waves and air-sea interaction
- Ocean Internal Wave and Mixing

Ocean-Atmosphere Interaction and Climate

- Atmospheric circulation dynamics
- Ocean-Atmosphere interaction and climate
- Ocean and climate model development



Research Progresses



2016: **106** papers published.

Nature (1), Nature Geoscience (4), Nature Climate Change (1), PNAS (1)

54 papers: Journal of Climate, Journal of Physical Oceanography, Journal of Geophysical Research, etc.

Research Progresses

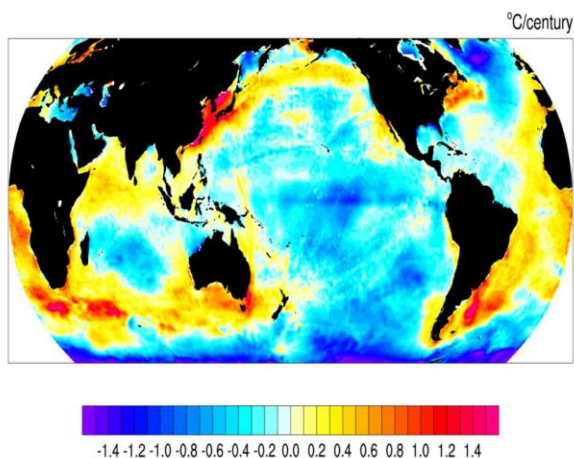
nature
climate change

LETTERS

PUBLISHED ONLINE: 29 JANUARY 2012 | DOI:10.1038/NCLIMATE1933

Enhanced warming over the global subtropical western boundary currents

Lixin Wu^{1*}, Wenju Cai², Liping Zhang¹, Hisashi Nakamura³, Axel Timmermann⁴, Terry Joyce⁵, Michael J. McPhaden⁶, Michael Alexander⁷, Bo Qiu⁴, Martin Visbeck⁸, Ping Chang⁹ and Benjamin Giese⁹



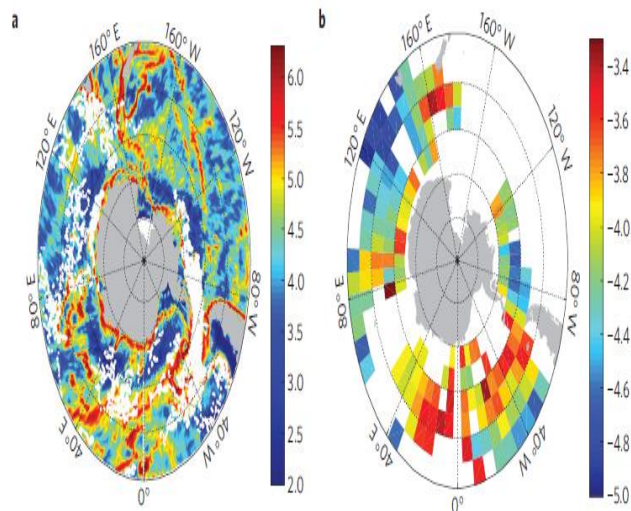
nature
geoscience

LETTERS

PUBLISHED ONLINE: 22 MAY 2011 | DOI:10.1038/NGE01156

Seasonal and spatial variations of Southern Ocean diapycnal mixing from Argo profiling floats

Lixin Wu^{1*}, Zhao Jing¹, Steve Riser² and Martin Visbeck³



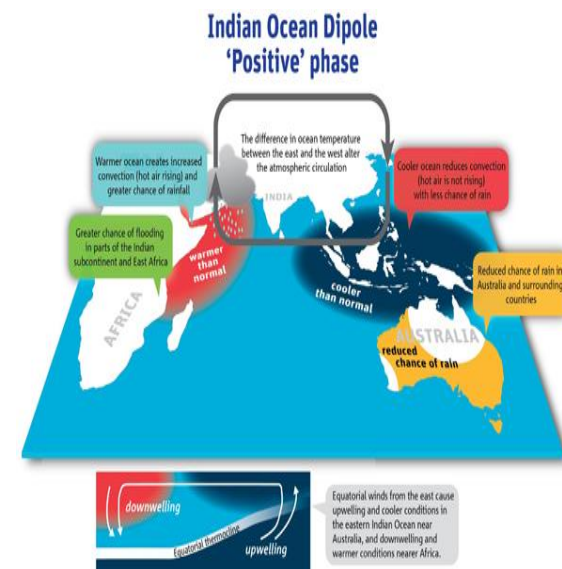
nature
geoscience

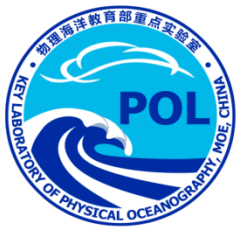
REVIEW ARTICLE

PUBLISHED ONLINE: 28 NOVEMBER 2013 | DOI:10.1038/NGE02009

Projected response of the Indian Ocean Dipole to greenhouse warming

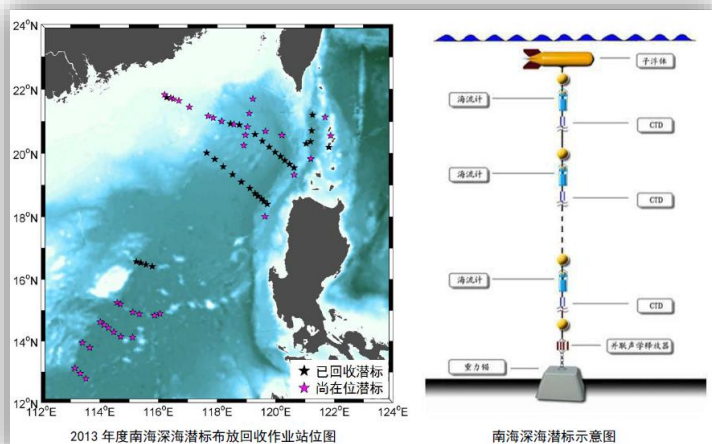
Wenju Cai^{1,2*}, Xiao-Tong Zheng^{2,3}, Evan Weller¹, Mat Collins⁴, Tim Cowan¹, Matthieu Lengaigne⁵, Weidong Yu⁶ and Toshio Yamagata⁷



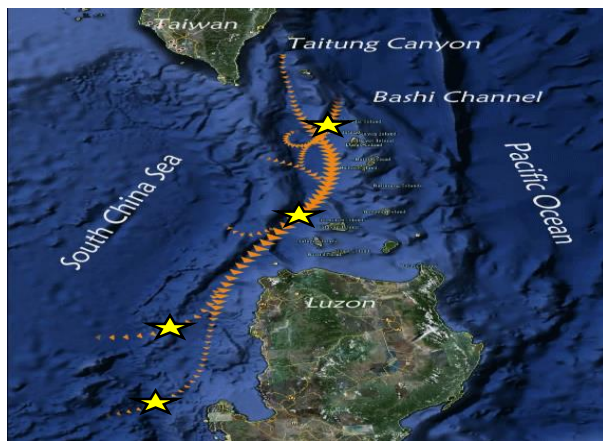
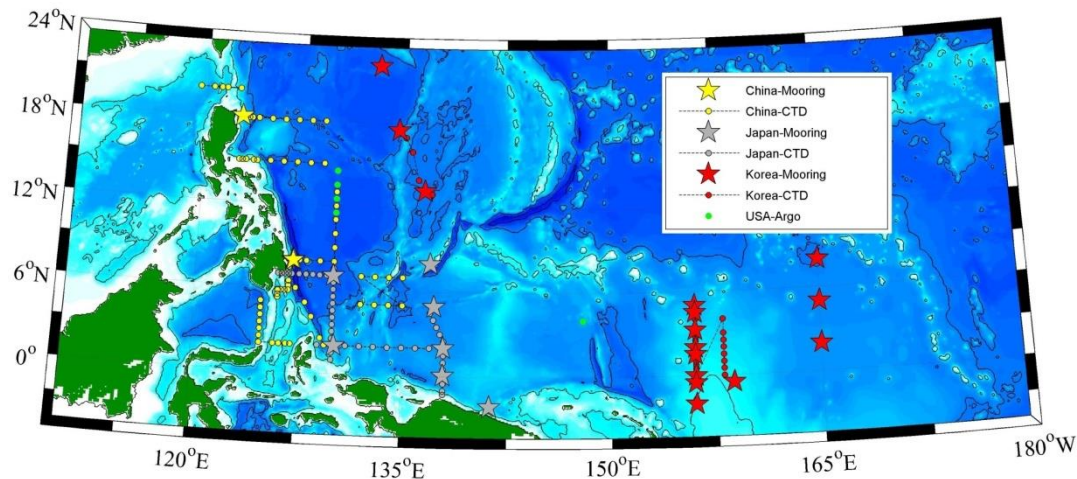


Observations

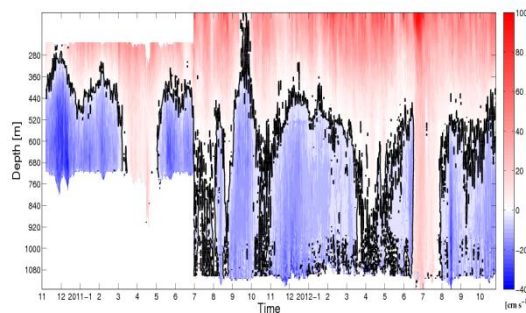
SCS Obs. Network



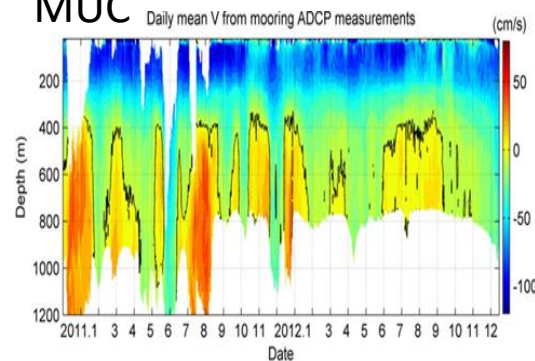
Western P. Obs. System (NPOCE)

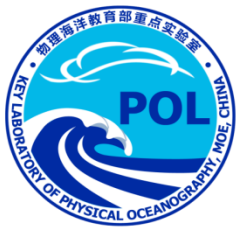


LUC



MUC

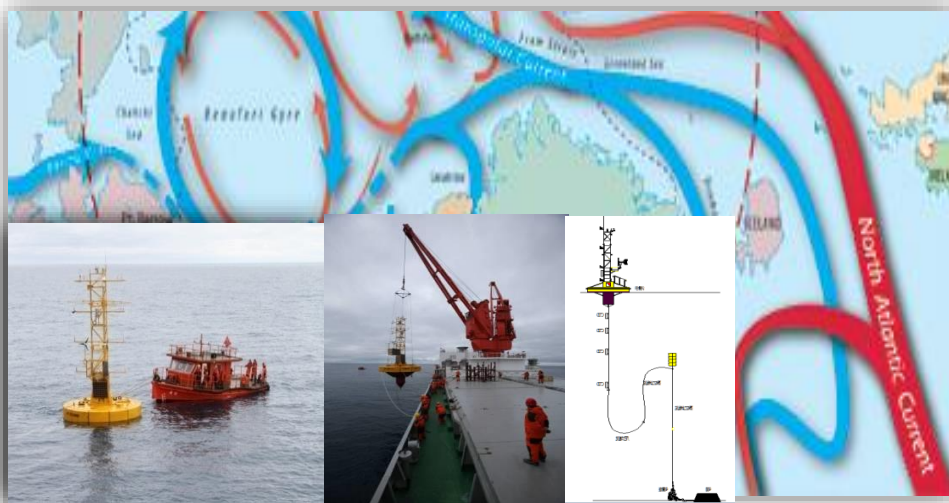




Observations

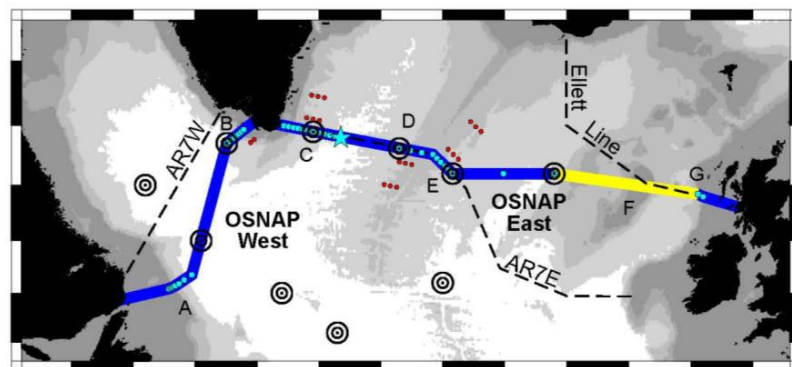
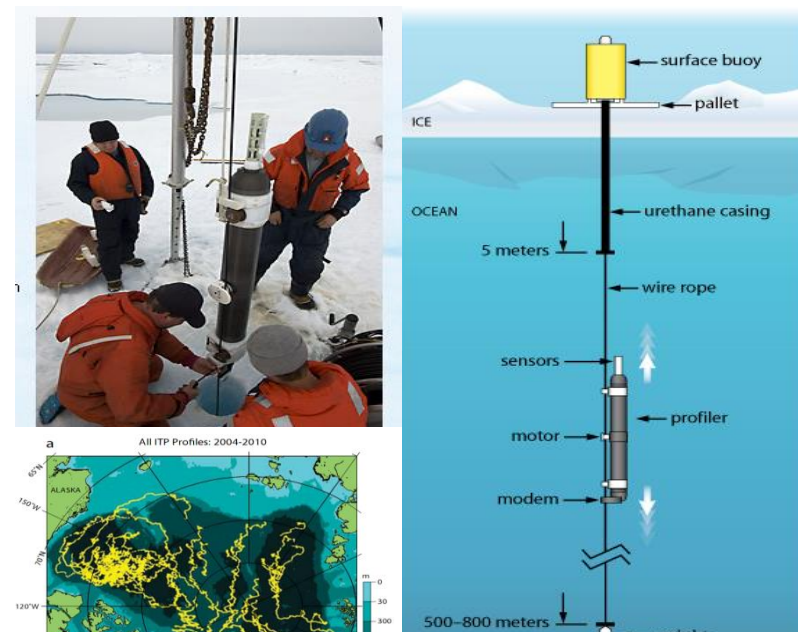
Arctic Ocean Obs.

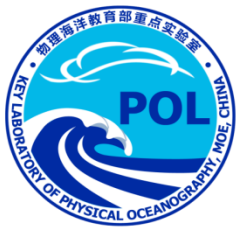
Air-sea flux Buoy at high latitude



Overturning in the Subpolar North Atlantic Program (OSNAP)

Ice-Tethered Profiler (ITP, with WHOI)





Laboratory Experiments

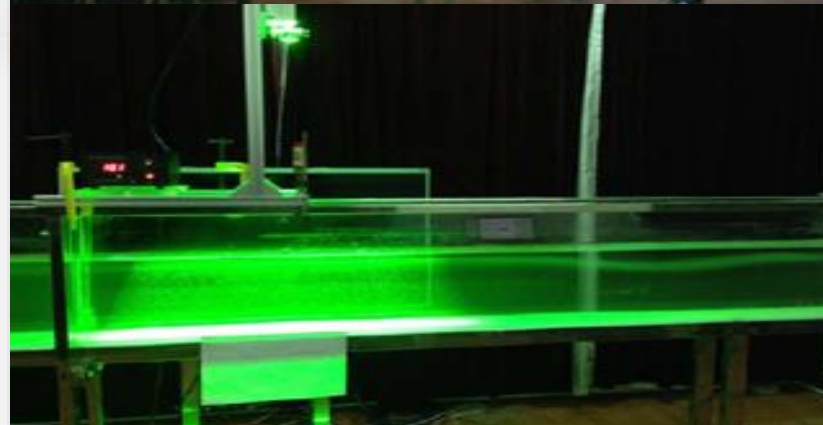
Wind Wave Tank



Internal Waves Platform



Rotating Tank



Numerical Models

China offshore forecasting system

中国近海环流-预报系统

Coastal Circulation Nowcast-Forecast System for China Seas

中国海洋大学物理海洋教育部重点实验室
Key Laboratory of Physical Oceanography, MOE, Ocean University of China



预报系统

Forecast System for China Seas

by, MOE, Ocean University of China



预报系统

Forecast System for China Seas

by, MOE, Ocean University of China



西北太平洋模式

Northwest Pacific

中国近海模式

China Seas

海面高度

Sea Surface Height

温度

Temperature

盐度

Salinity

流场

Current

渤海黄海区域

Bohai & Huanghai

海面高度

Sea Surface Height

温度

Temperature

盐度

Salinity

流场

Current

南海区域

South China Sea

海面高度

Sea Surface Height

温度

Temperature

盐度

Salinity

流场

Current

数据链接

Data Links

CCAR全球MODIS海表温度

CCAR Global MODIS SST Viewer

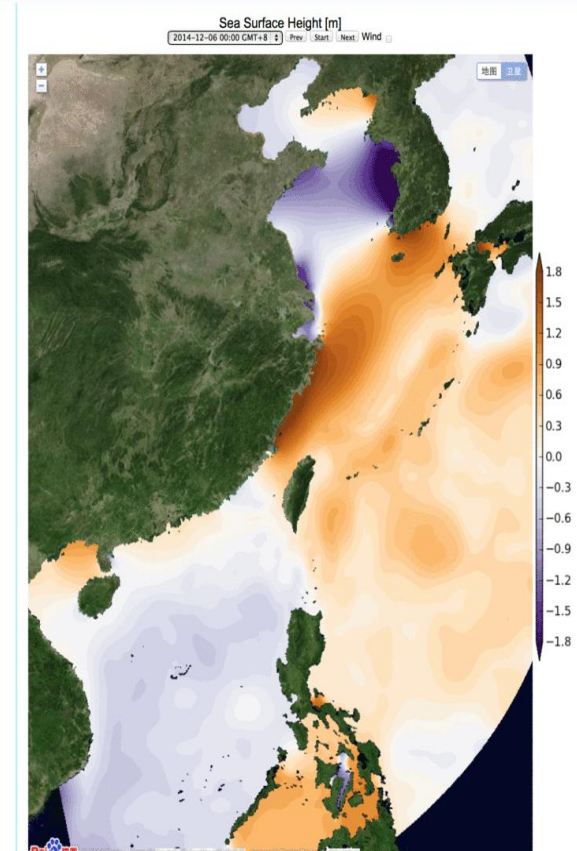
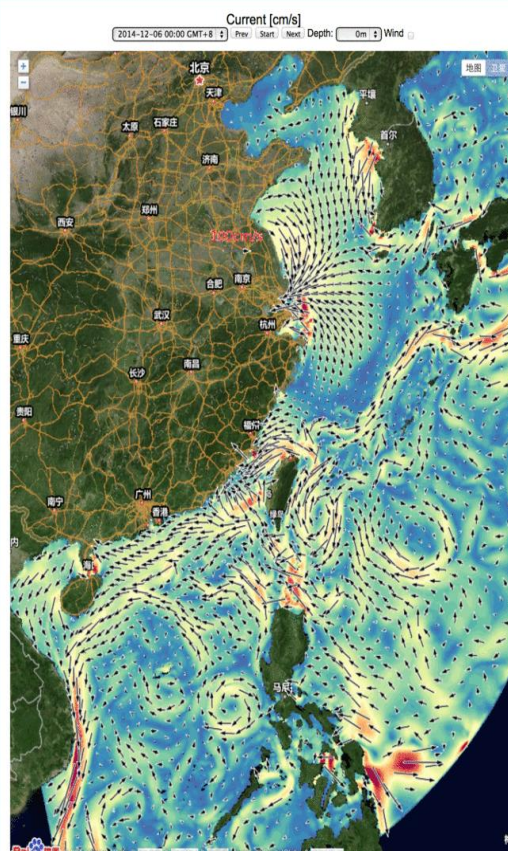
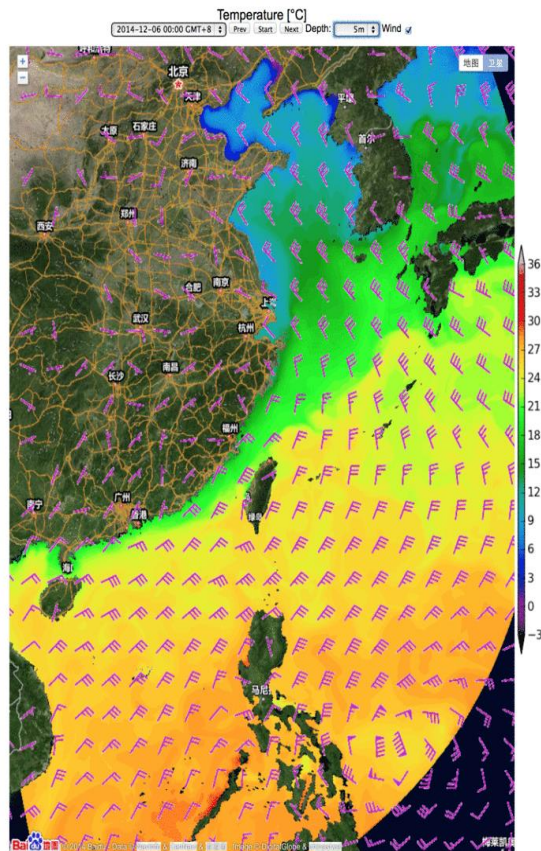
国家海洋环境预报中心

National Marine Environmental

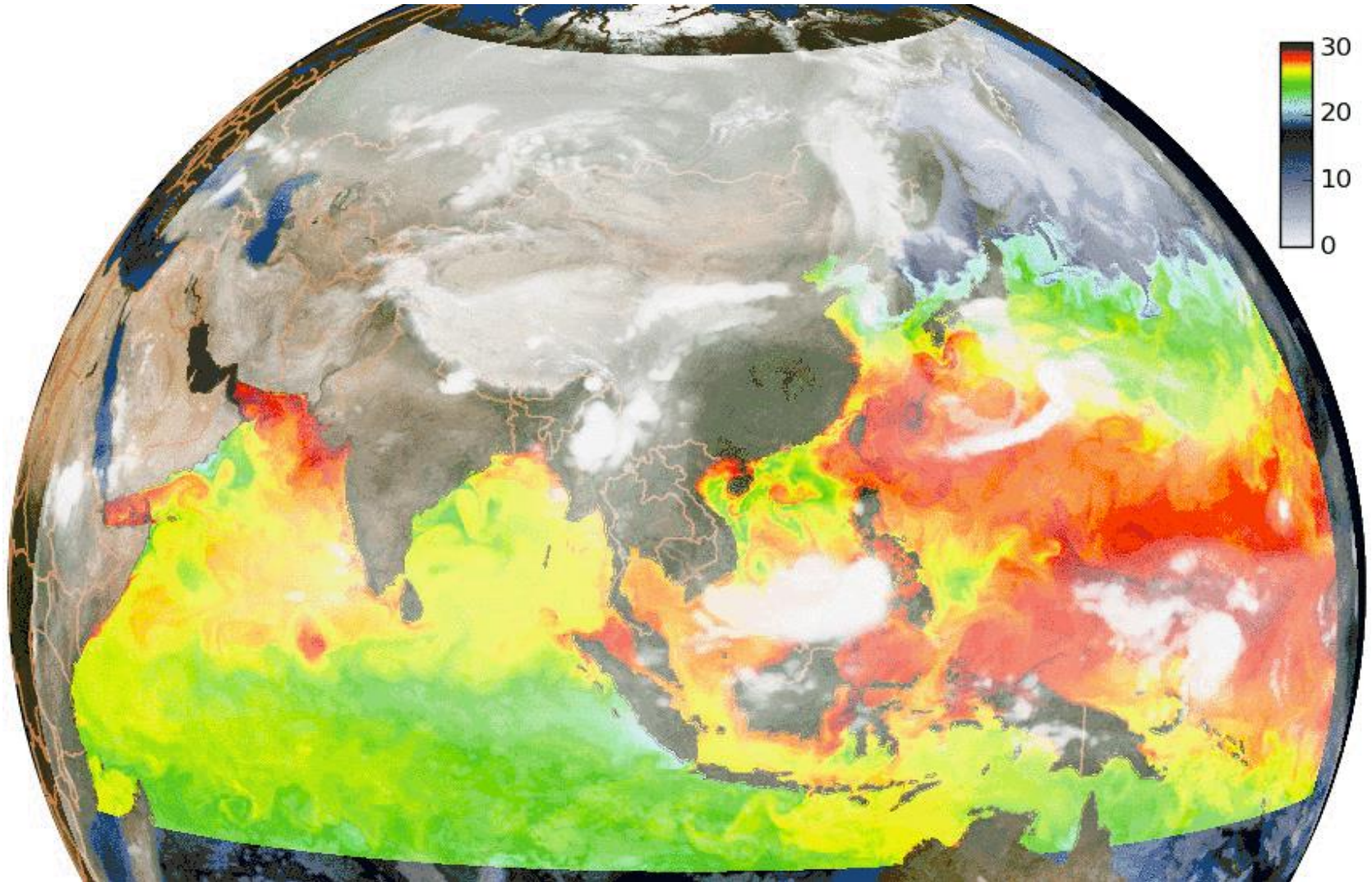
Forecasting Center

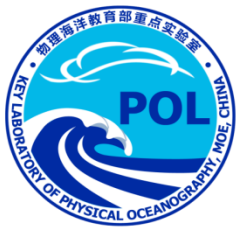
关于

About



Ocean-Atmosphere Coupled Model of The SCS-Western Pacific-India ocean





Meetings

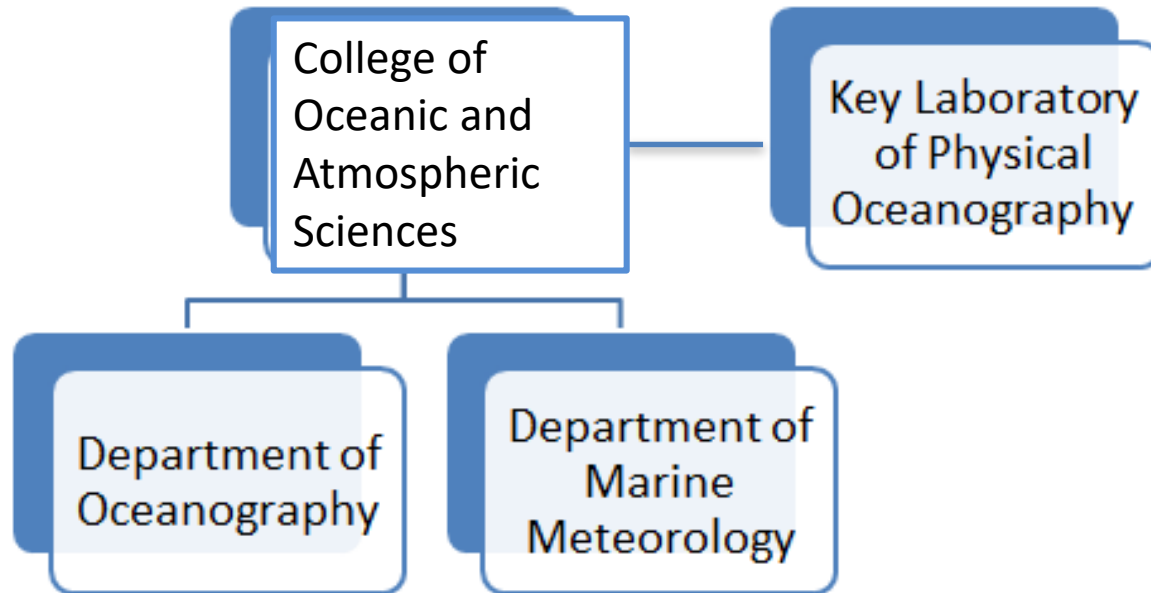
Boundary Current Meetings



Sino-German Symposium



The POL is part of COAS



College of Oceanic and Atmospheric Sciences develops undergraduate, graduate and PhD programs.

Education Programs

■ Undergraduate (833 students)

Ocean science, atmospheric science

■ Master (213 students)

Physical oceanography, applied oceanography, marine management, meteorology, atmospheric physics & environment

■ PhD (182 students)

Physical oceanography, applied oceanography, marine management, meteorology, atmospheric physics & environment

The background of the image is a photograph of a powerful ocean wave. The water is a deep, dark blue, and the wave is cresting, with white foam visible as it breaks. The sky above is filled with dark, heavy clouds, with a sliver of lighter blue visible near the horizon. The overall mood is dramatic and intense.

Thank you!