



Understanding oceans  
Sustaining future



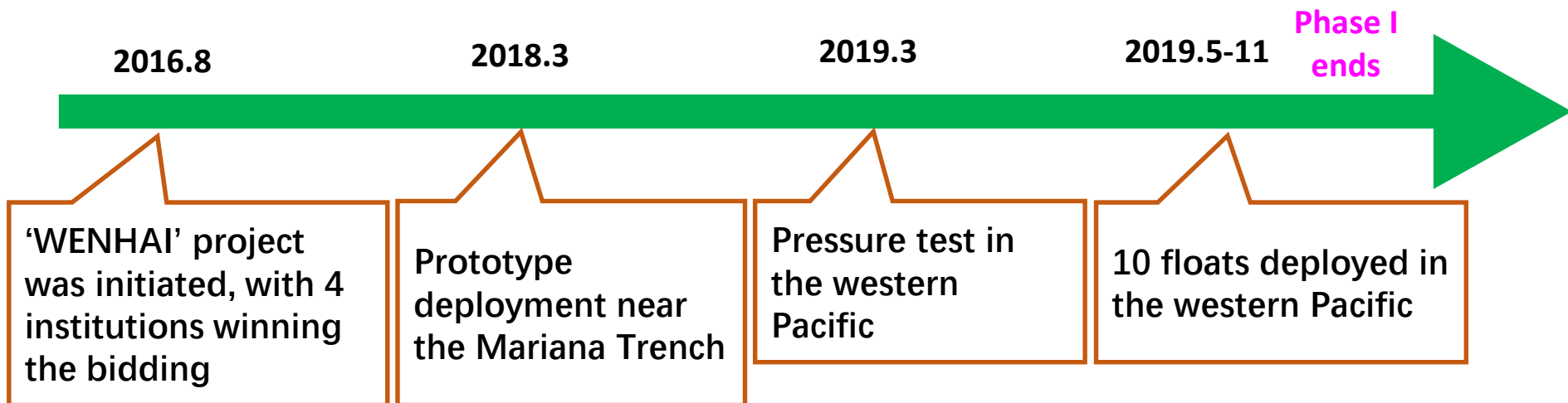
# China Deep Profiling Float

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- 2) Ocean University of China
- 3) State Key Laboratory of Satellite Ocean Environment Dynamics
- 4) The Second Institute of Oceanography, Ministry of Natural Resources

# WENHAI project

- In 2016, 'WENHAI' project was initiated with focus on developing profiling float down to 4000m.
- Both local government and QNLM have funded over 3 million US dollars.
- Additional 1.5 million US dollars after 2020.



# Prototypes of deep profiling float



Ocean University of China



Qingdao HiSun Ocean Equipment Co., LTD



Tianjin University



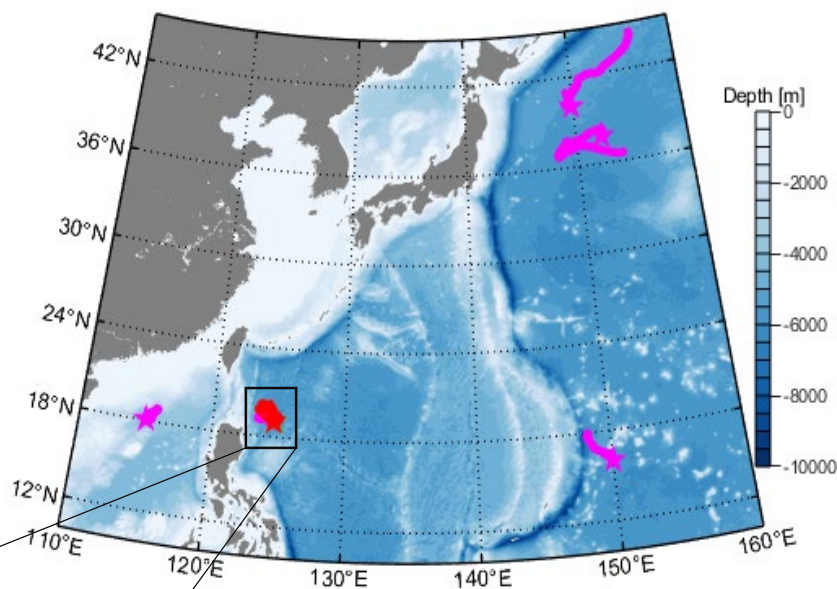
Shandong University

Model	Developer	Profiling depth (m)	CTD
OUC	Ocean University of China	4000	SBE 37 MCAT
HM4000	HSOE	4000	SBE37 MCAT
TJU	Tianjin University	4000	NOTC product
SDU	Shandong University	4000	SBE37 MCAT

**Note: SDU deep float quit the deployment after the field test in 2018**

# Pilot deployment in 2019

10 deep floats (1 cycle/day)



**Duration:**

OUC: 4 months

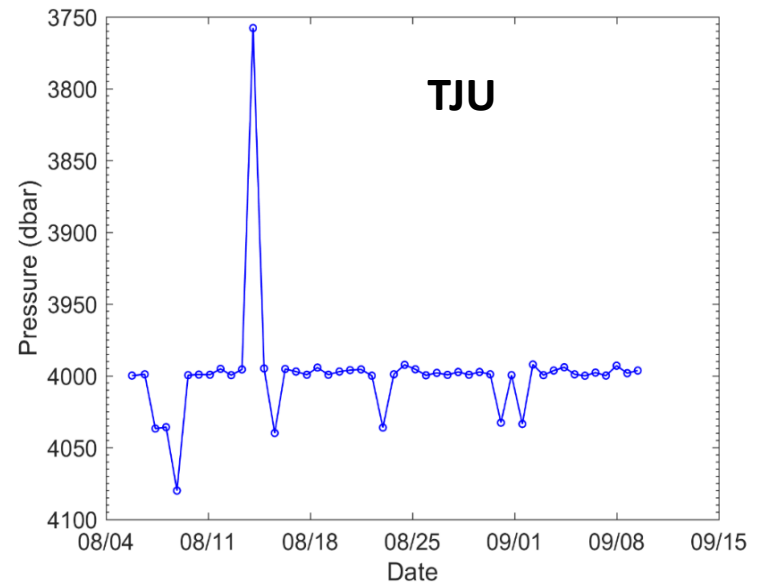
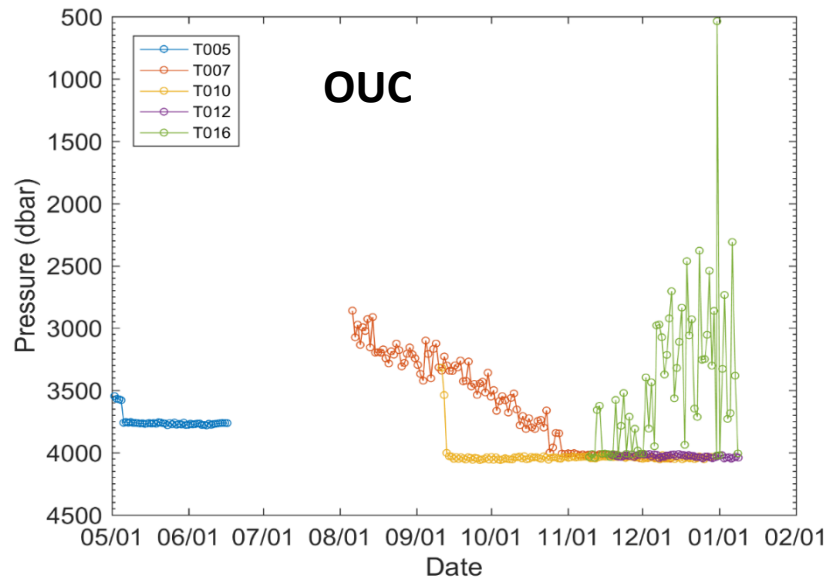
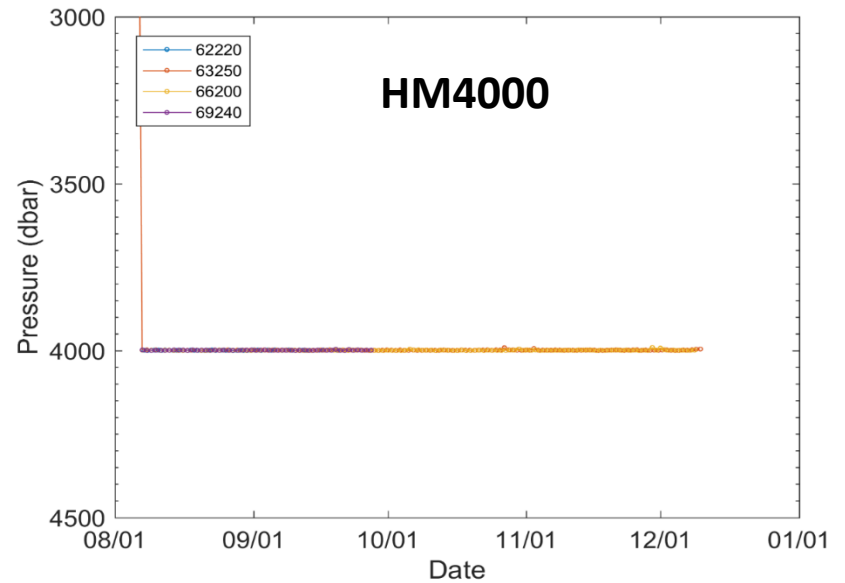
HM4000: 2~4 months

TJU: 1~2 months

Region	No.	Cycle Number
South China Sea	OUC_005	122
Kuroshio Extension	OUC_016	149
	OUC_010	140
Western Pacific	OUC_007	114
	OUC_012	124
	TJU	42
	HM4000_7	130
	HM4000_8	129
	HM4000_9	53
	HM4000_10	55

# Max. profiling depth

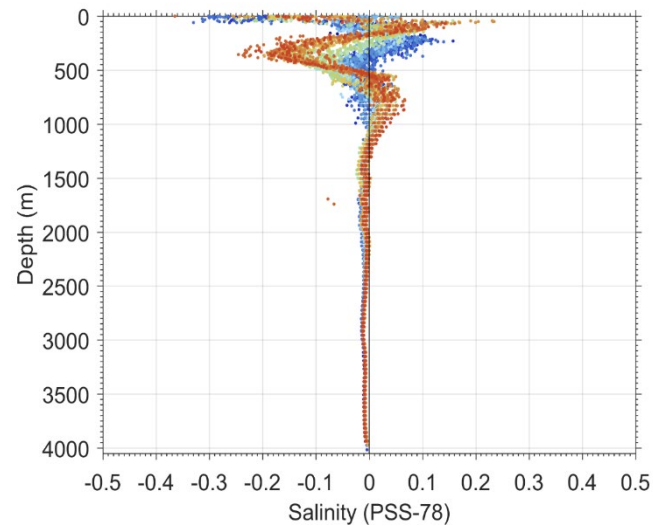
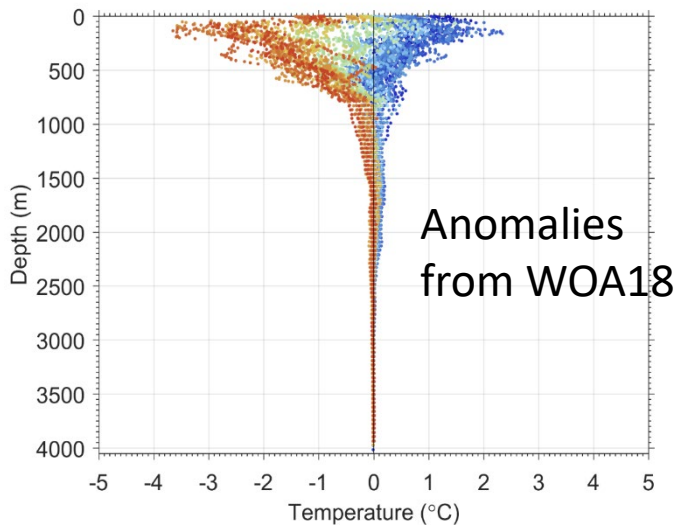
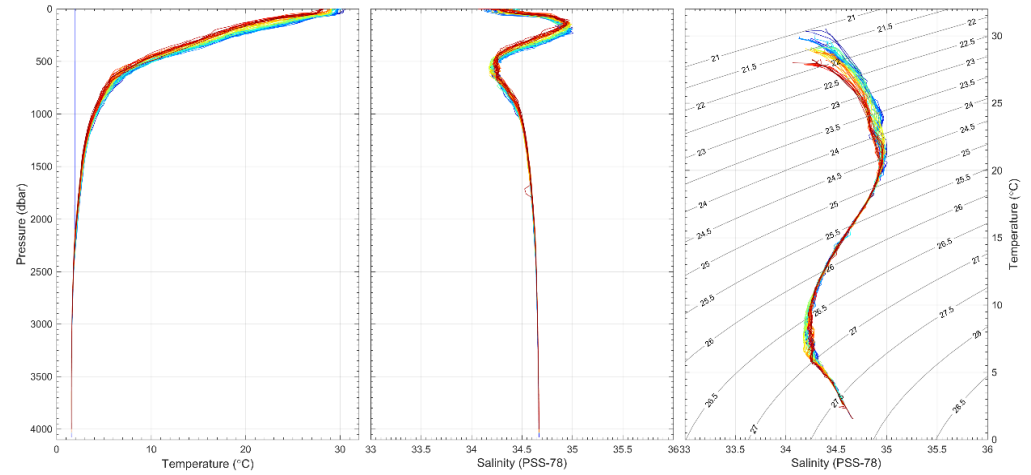
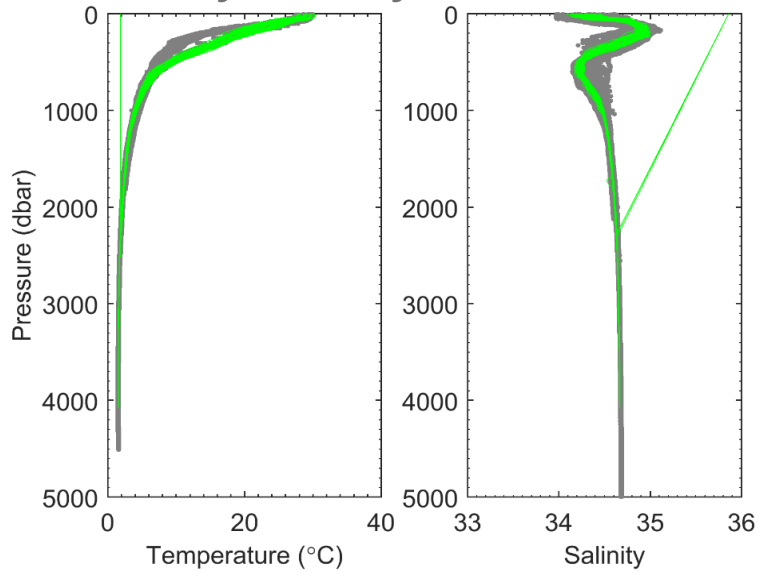
HM4000 shows a best performance of max. profiling depth.



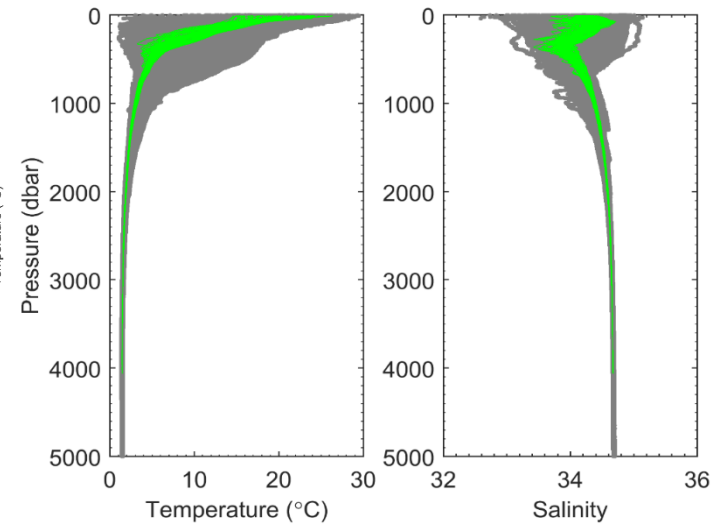
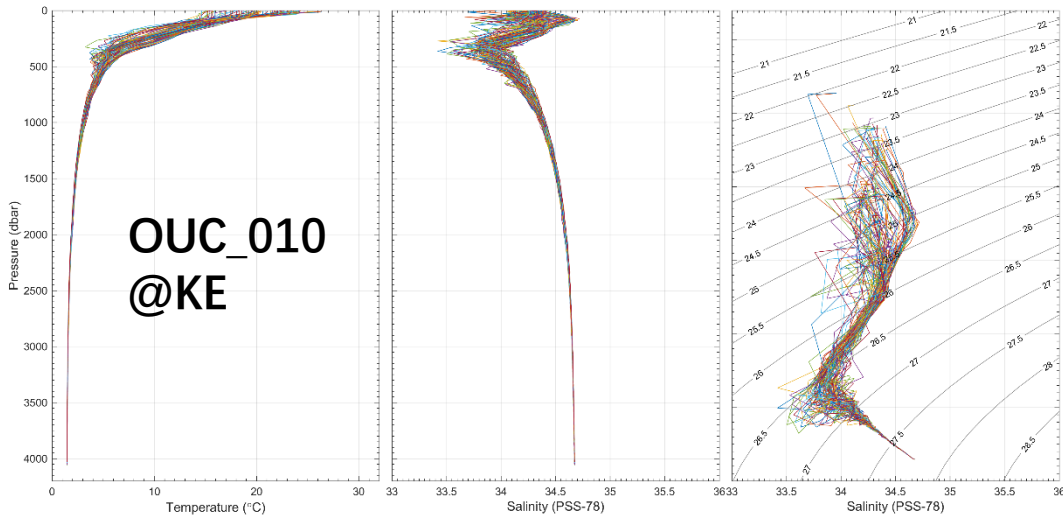
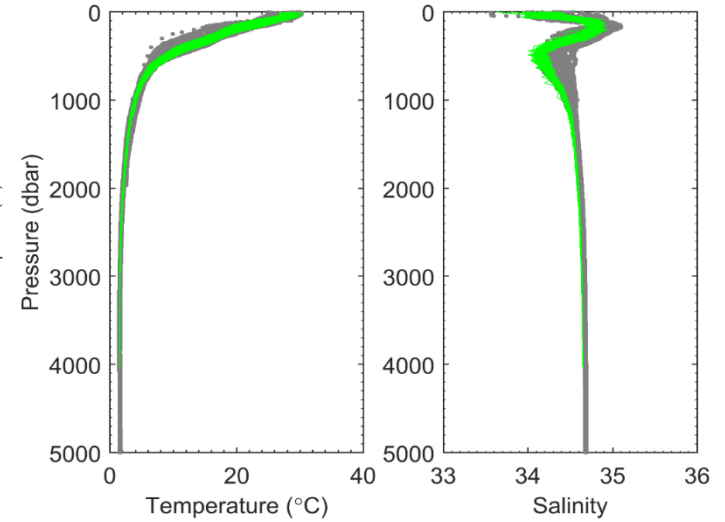
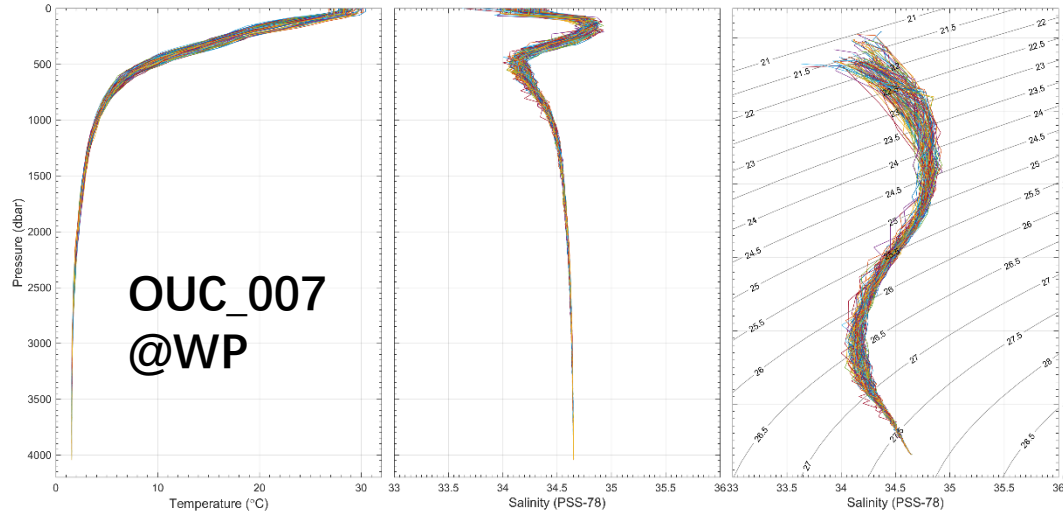
# TJU float (NOTC CTD)

Green: TJU float

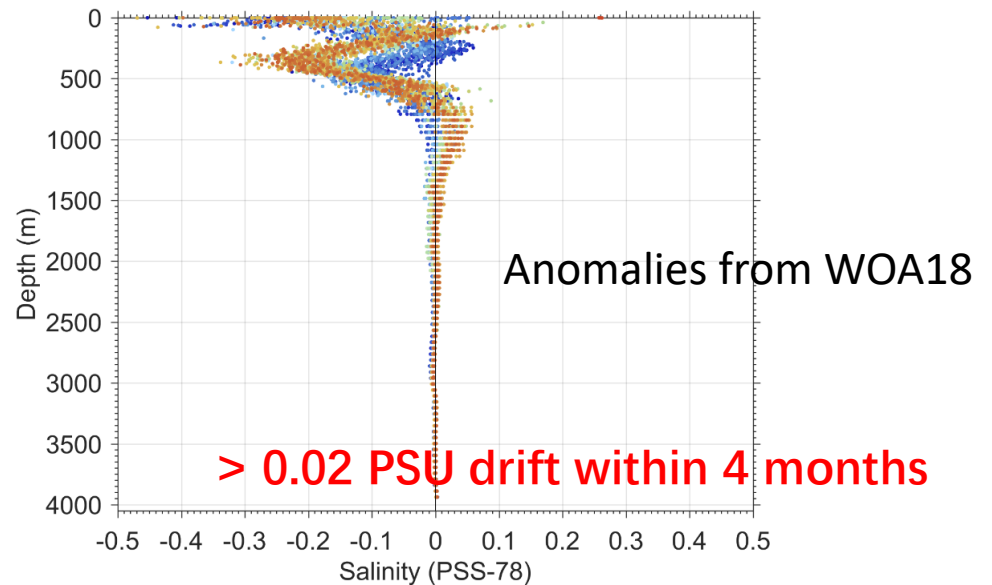
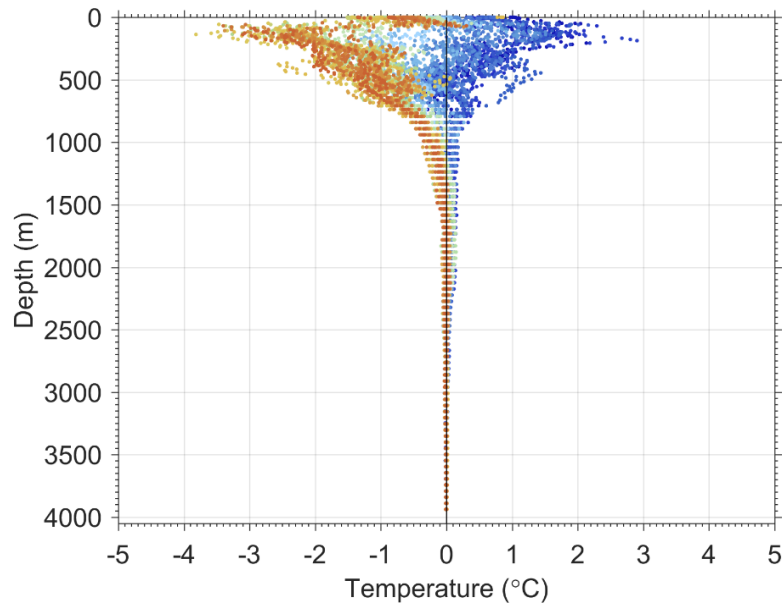
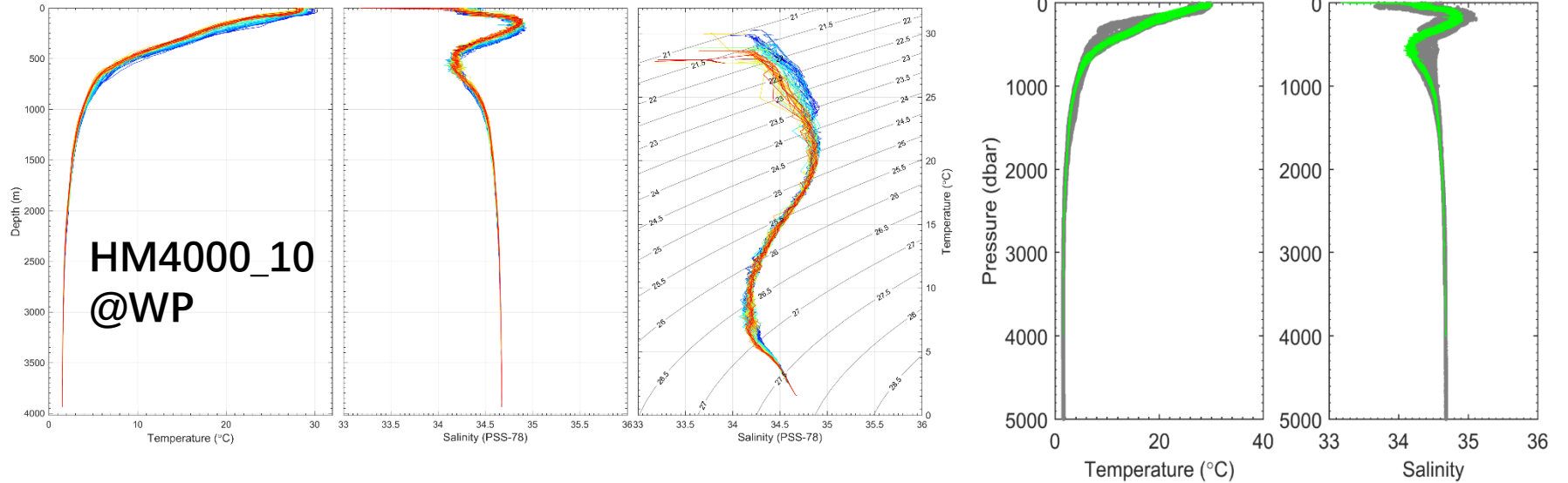
Grey: nearby historical CTD



# OUC floats (SBE37 MCAT)

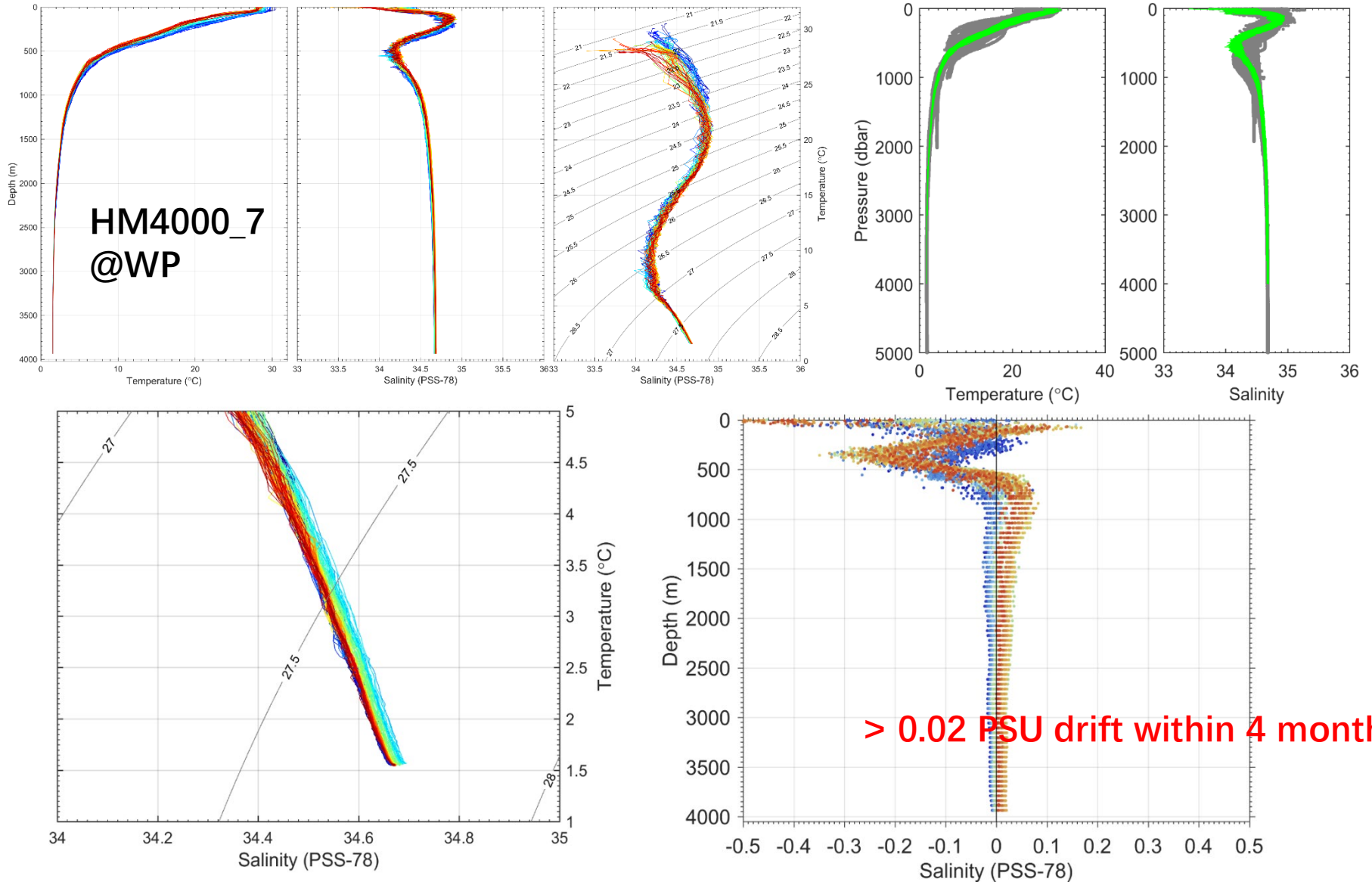


# HM4000 floats (SBE37 MCAT)





# Salinity drift in a HM4000 float

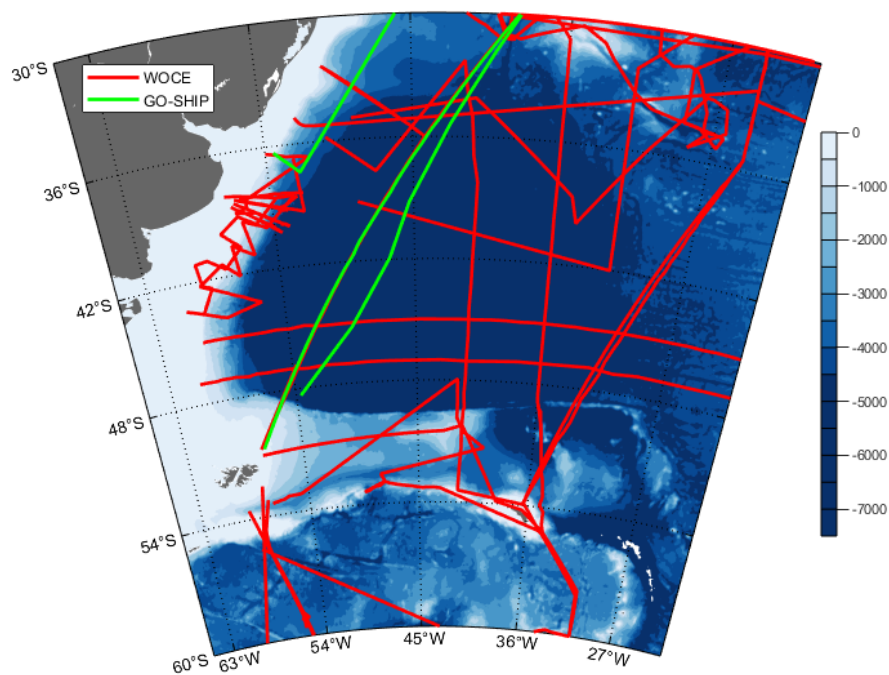


## Technical issues

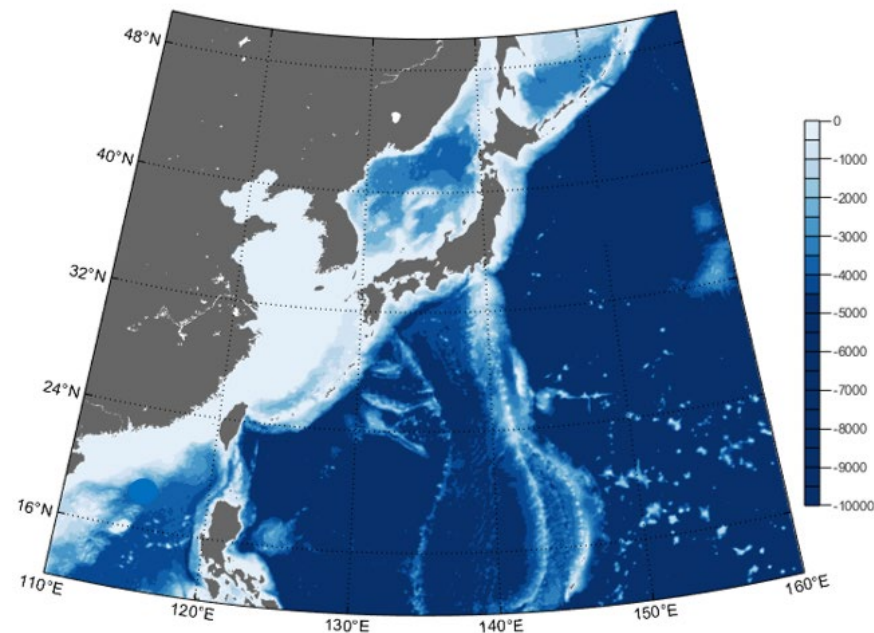
1. SBE 37 MCAT is not designed for profiling system. SBE61 and RBRArgo CTD sensors are recommended.
2. NOTC CTD sensor shows a good performance in a TJU float within 2 months, however a validation in a longer time is needed.
3. The current lifetime of the floats cannot satisfy the goal of long-term monitoring in the deep oceans.



# Plan of Deployment in late 2020



Argentine Basin  
10 HM4000 Deep float



Western Pacific  
10 Deep float, 3-4 6000-m Deep float



# China Deep Argo Plan in this decade

**2020-2021**

**2022-2025**

**2026-2030**

- 20 Deep floats will be deployed at Southern ocean and WP in 2020, and 60 in 2021;
- 6000 m deep floats development.

- Industrialization;
- Data Center (QNLN+CSIO);
- Certified by Argo program.

China will maintain at least 300 deep Argo floats in the North Pacific and the Southern Ocean, providing data down to 6000-m for scientific community.

**Key region**

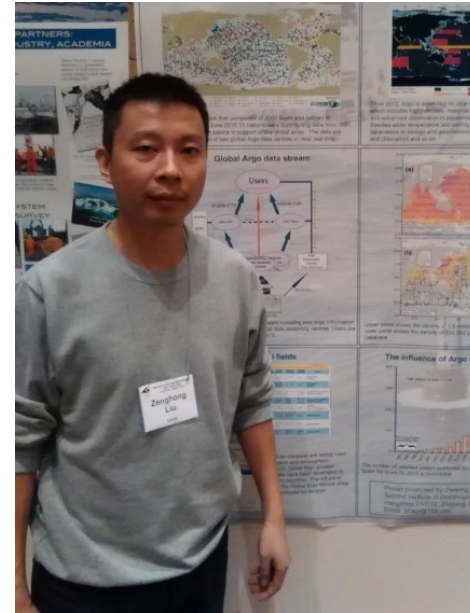
South China Sea  
Northwest Pacific (Kuroshio Extension)  
West Pacific (Mariana Trench area)  
Southern Ocean

**Globally**

# Thank you for your attention



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