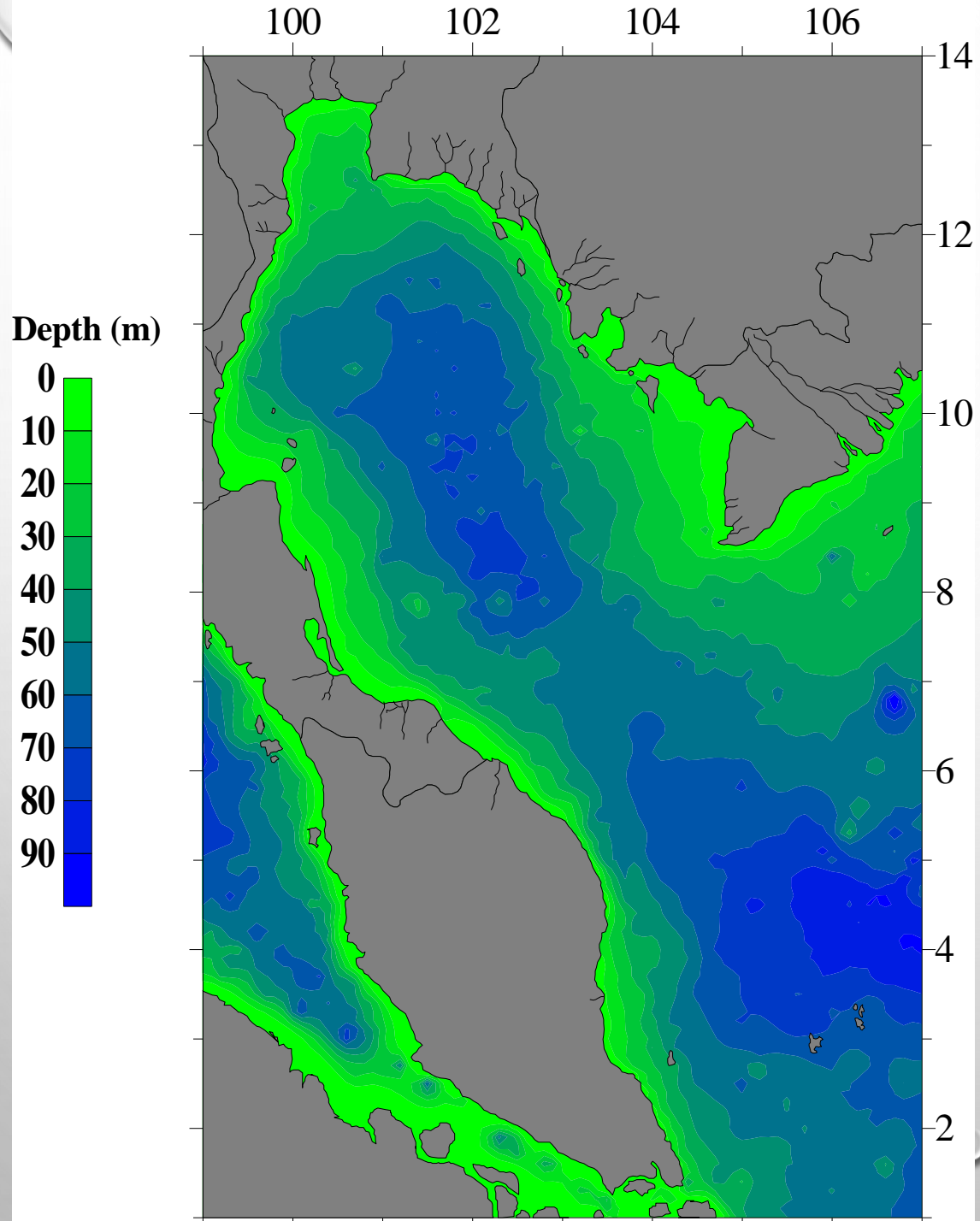


# Oceanographic Conditions and Fishery resources in the Gulf of Thailand

Anukul Buranapratheprat<sup>1</sup> and Praulai Nootmorn<sup>2</sup>

<sup>1</sup>Burapha University

<sup>2</sup>Department of fisheries



# **GULF OF THAILAND**

*Max Depth 80 m*

*Avg. Depth*

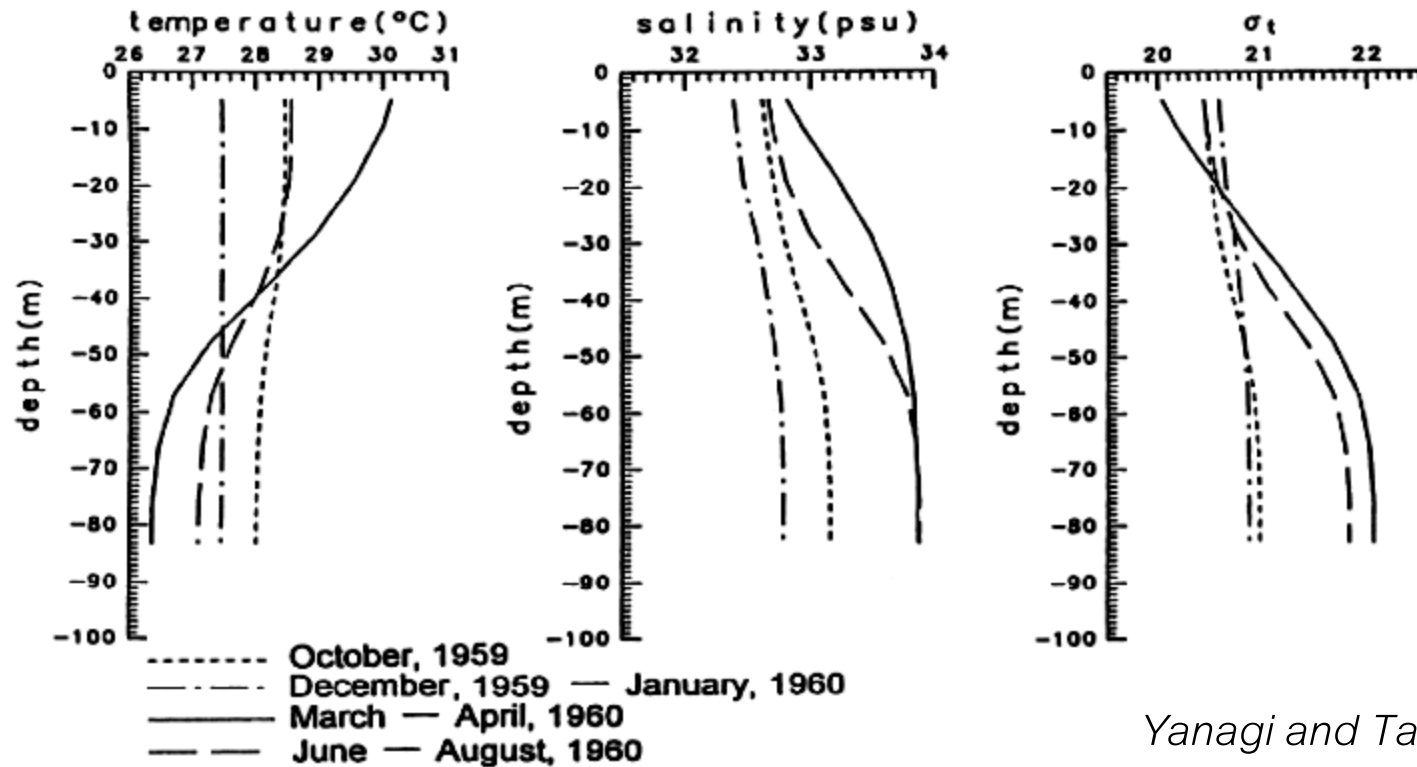
*30 – 40 m*

The background features a light gray gradient with several realistic water droplets of various sizes scattered across the frame. In the center, there are faint, concentric white ripples, suggesting a stone dropped into water. The overall aesthetic is clean and fresh.

# ***WATER COLUMN CONDITIONS IN GOT***

# SEASONAL VARIATIONS IN T, S AND $\sigma_t$ IN GOT

Data from NAGA Expedition: 1959 - 1961



Yanagi and Takao, 1998

# Yanagi et al. (2001)

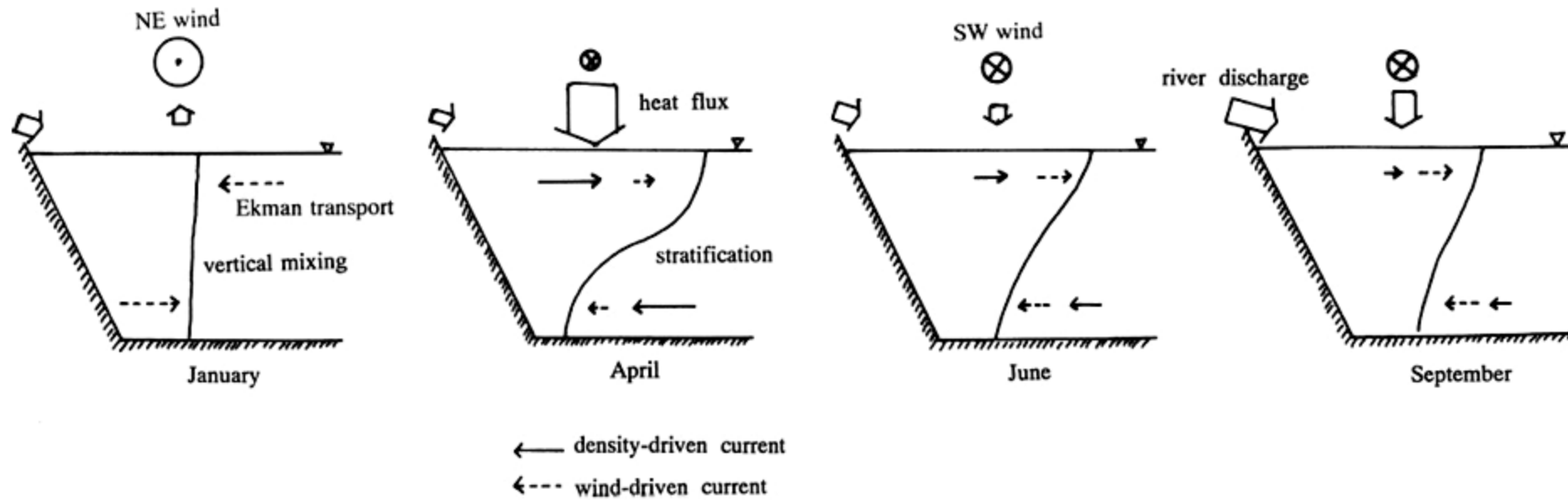
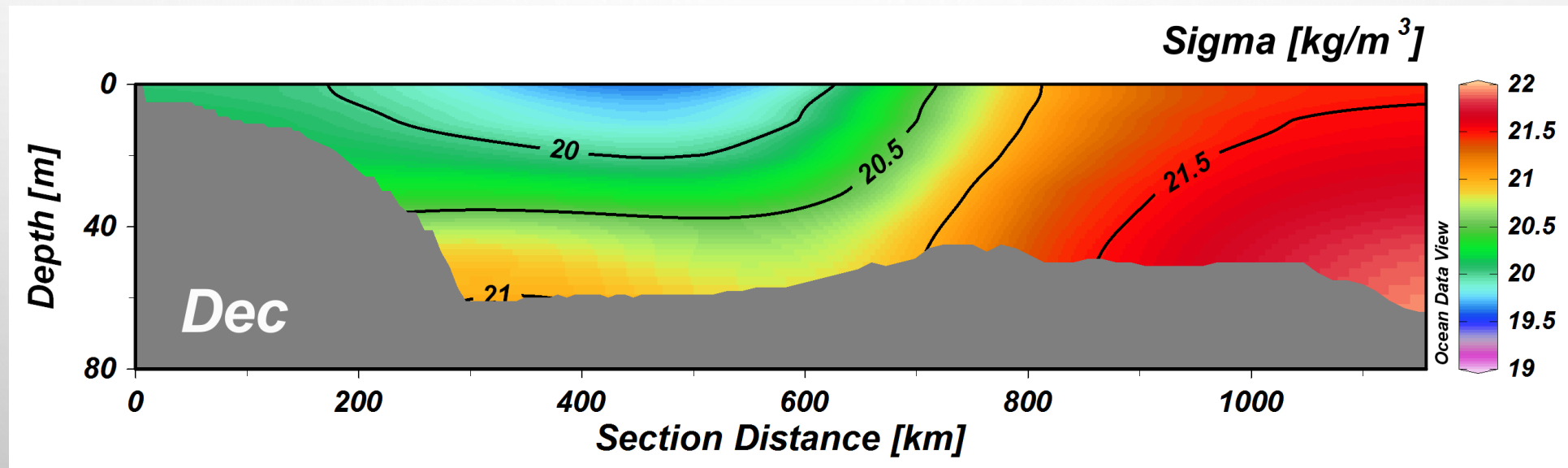


Fig. 12. Schematic representation of seasonal variations in wind, heat flux through the sea surface, river discharge, stratification, density-driven current and wind-driven current in the Gulf of Thailand.



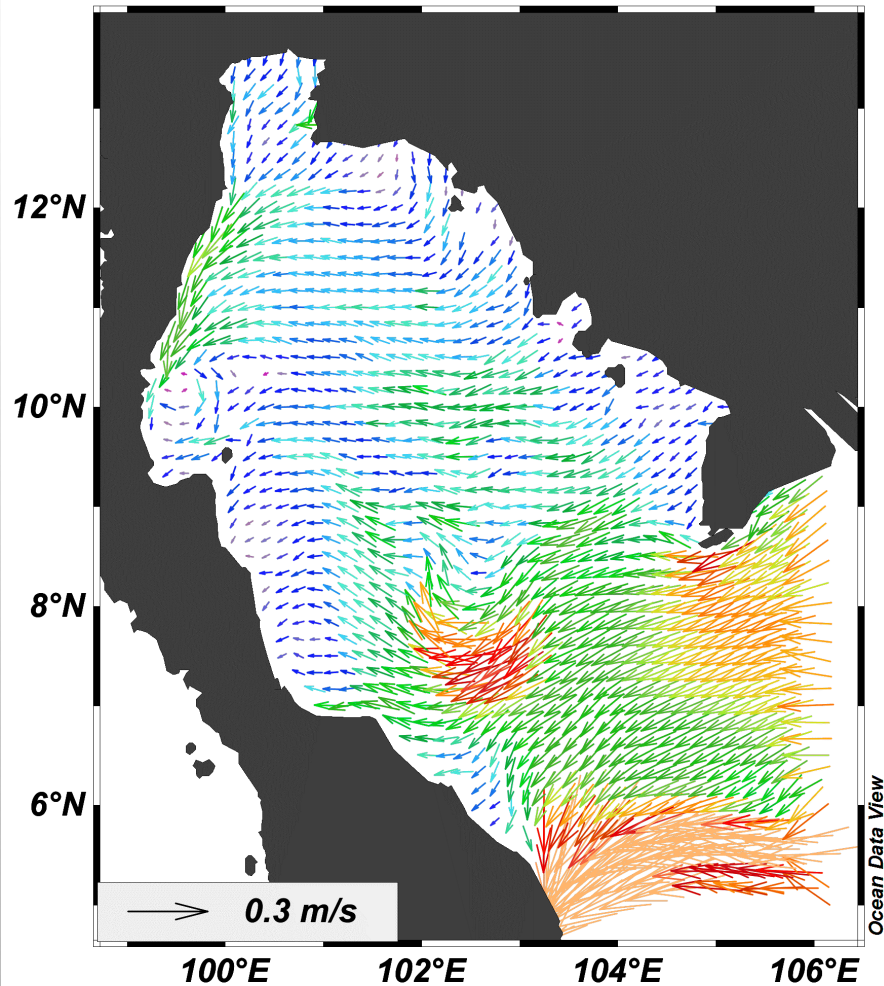
# VARIATIONS IN SCS WATER INTRUSION



# SEASONAL SURFACE CIRCULATIONS

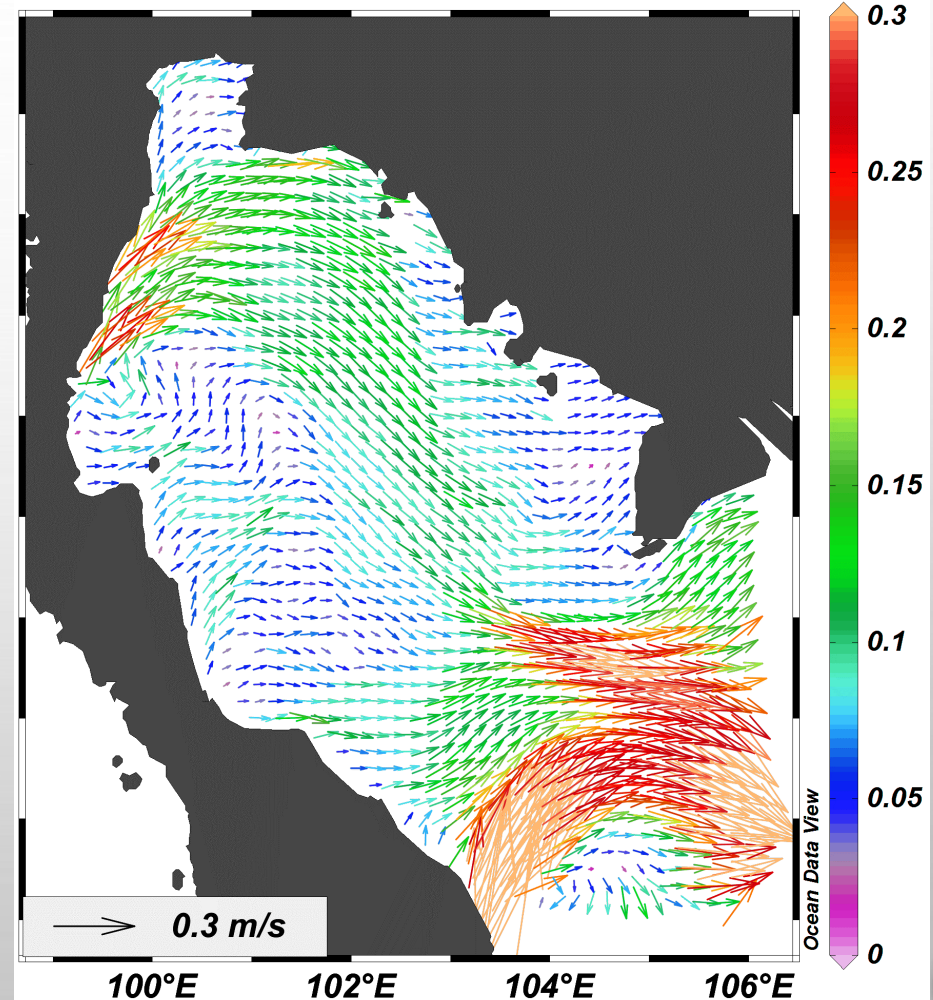
December

Mag [m/s] @ Depth [m]=first



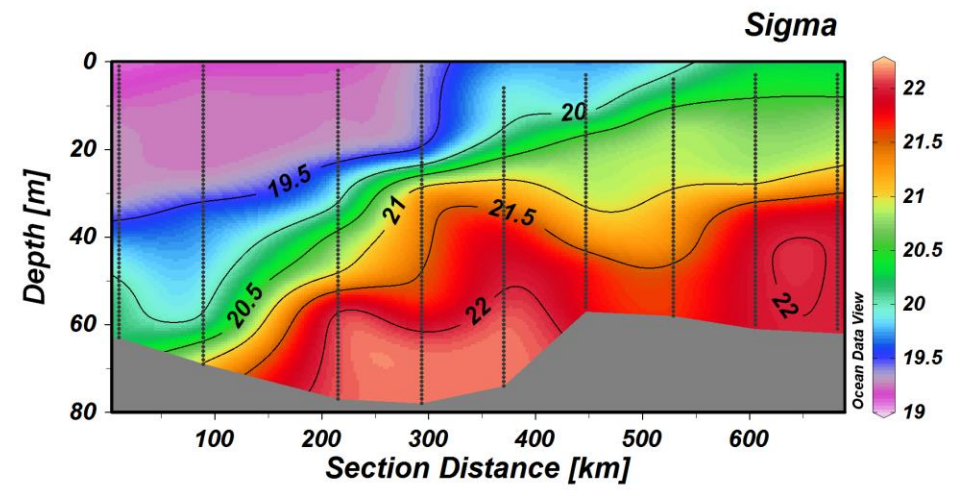
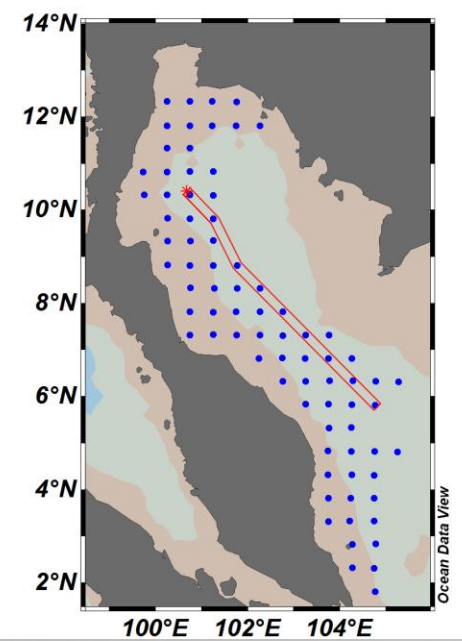
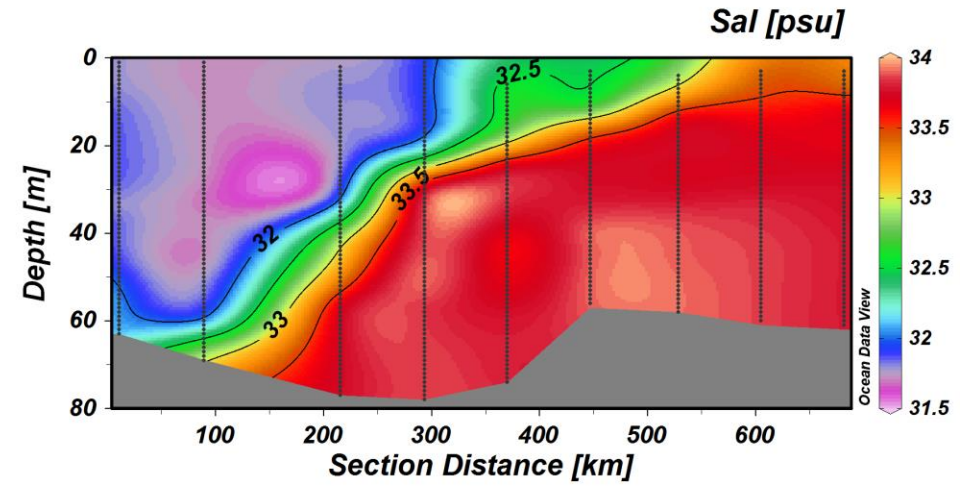
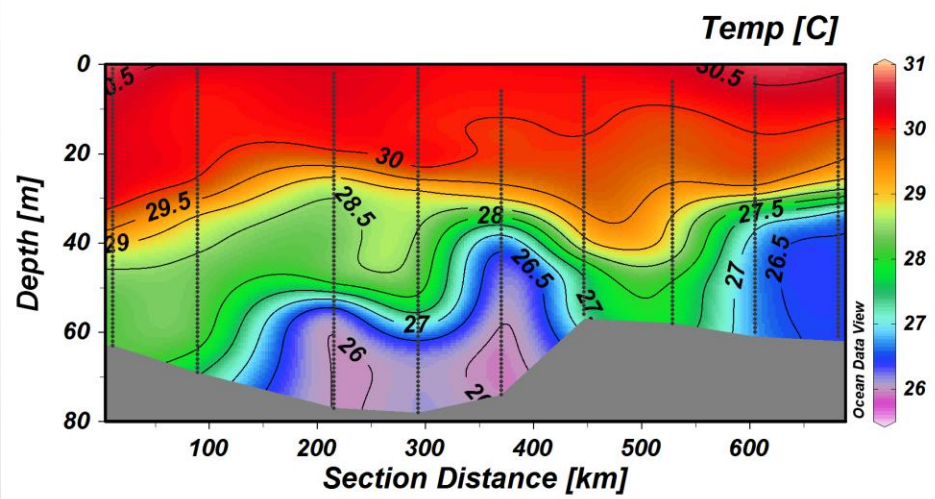
July

Mag [m/s] @ Depth [m]=first





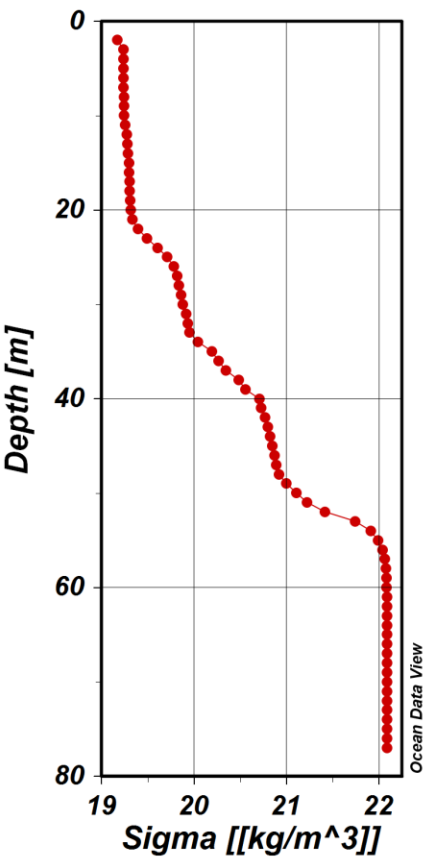
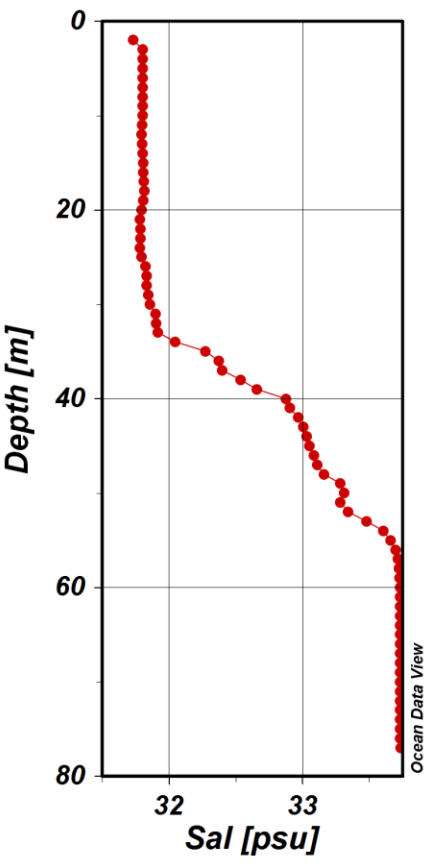
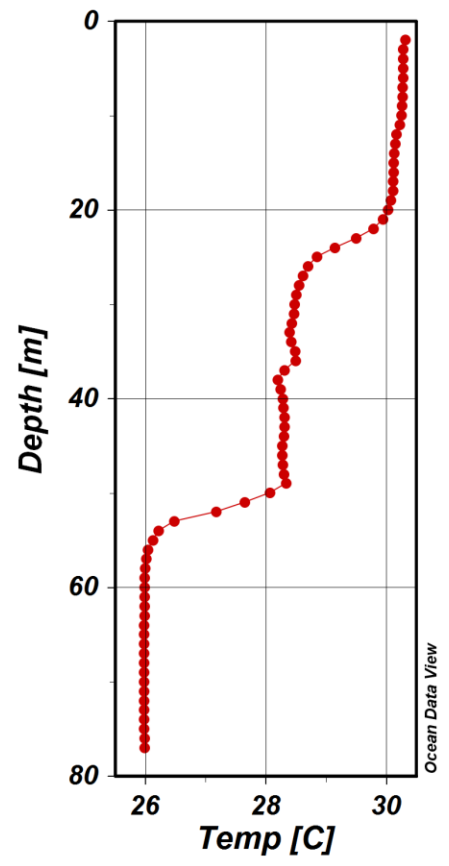
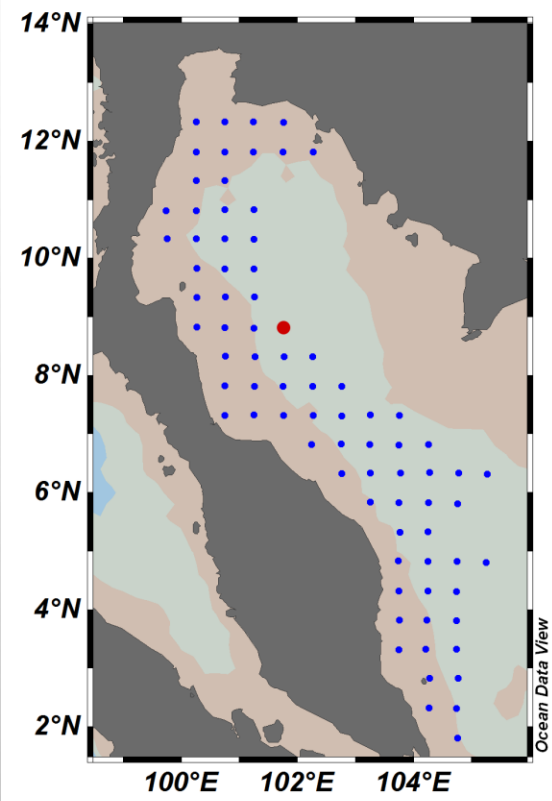
# DOUBLE THERMOCLINE



**SEAFDEC DATA**  
**24 Apr – 17 May 1996**

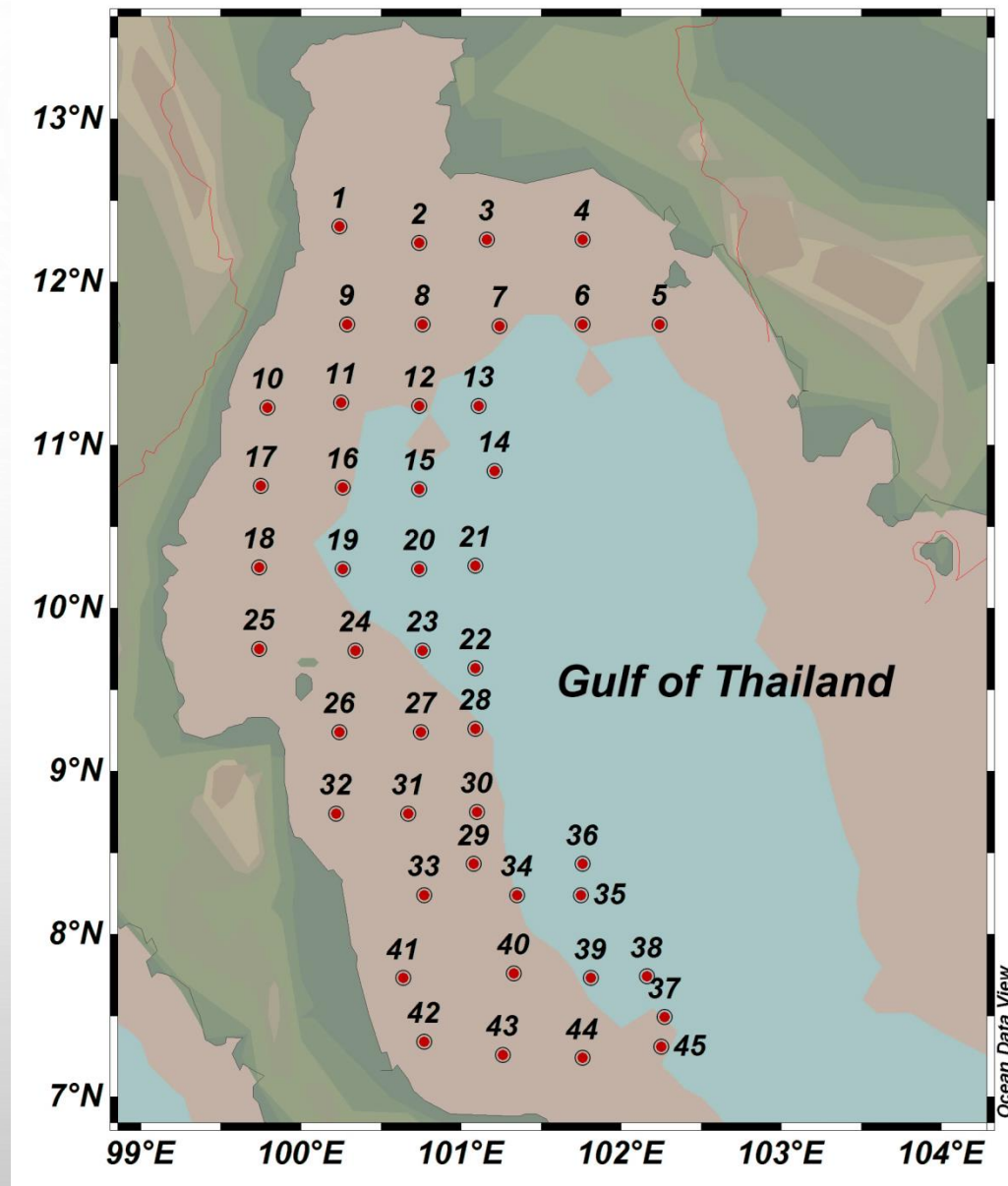


# DOUBLE THERMOCLINE

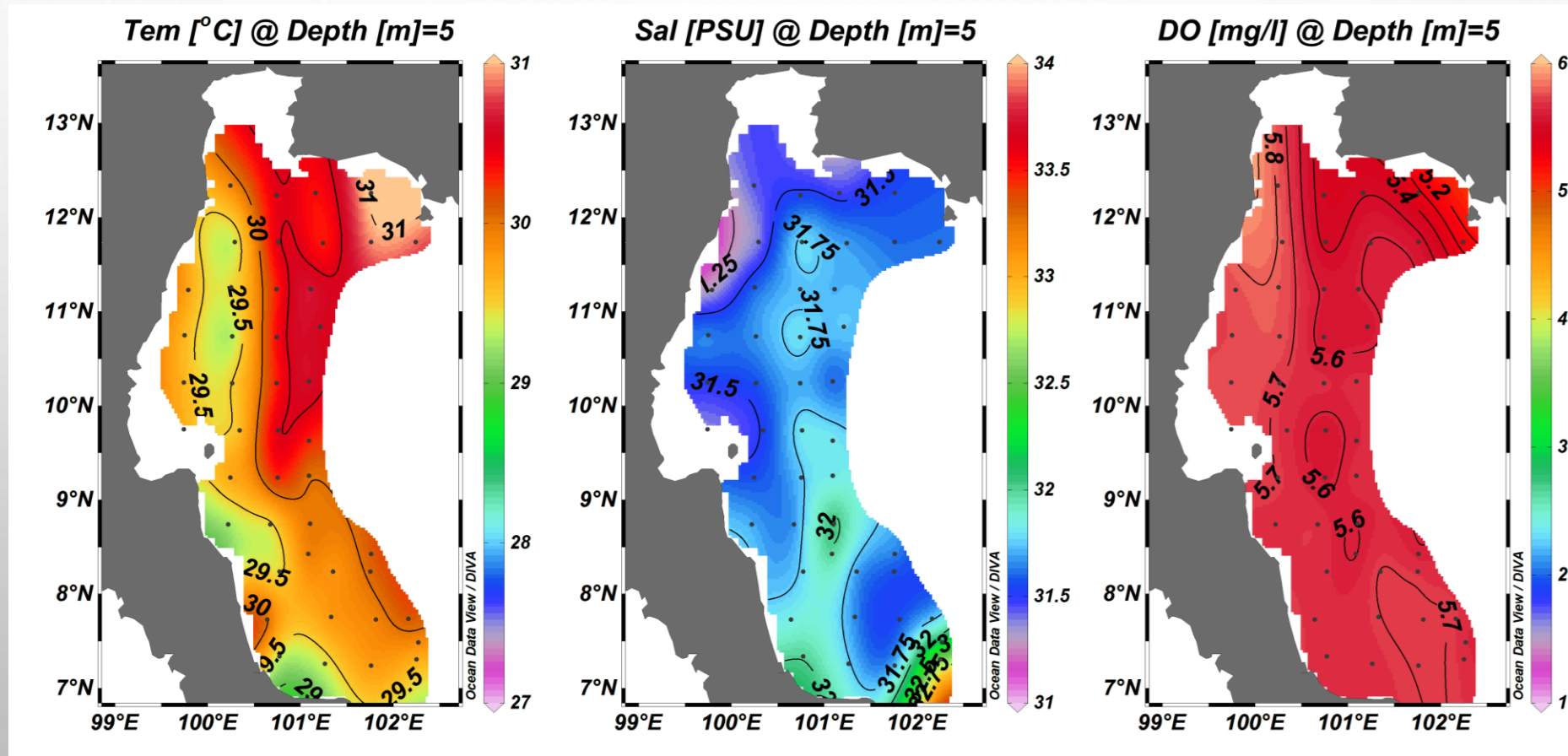


SEAFDEC DATA  
24 Apr - 17 May 1996

# SEAFDEC OBSERVATION 14 MARCH – 12 APRIL 2013

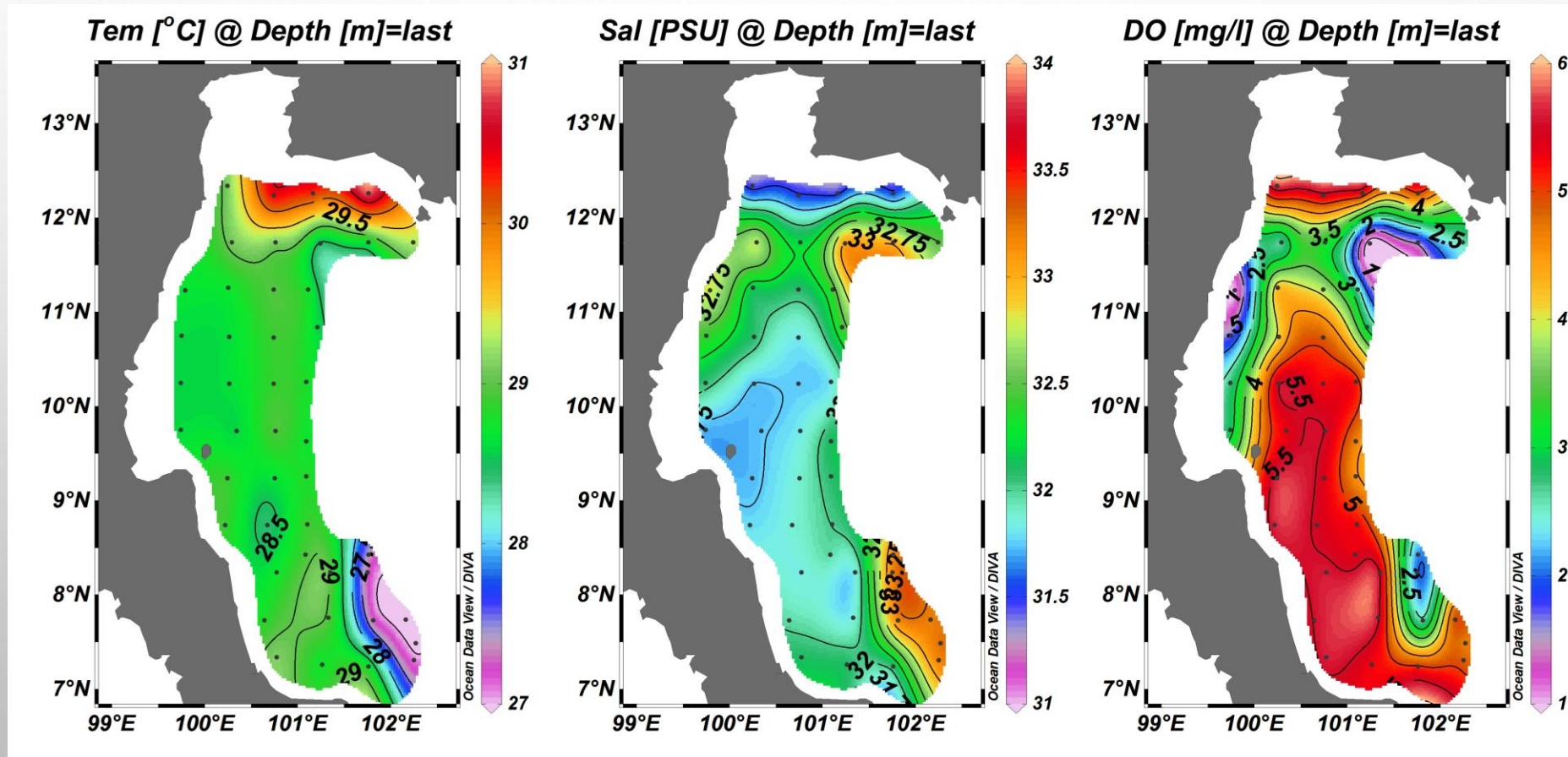


# SEAFDEC OBSERVATION 14 MARCH – 12 APRIL 2013





# SEAFDEC OBSERVATION 14 MARCH – 12 APRIL 2013



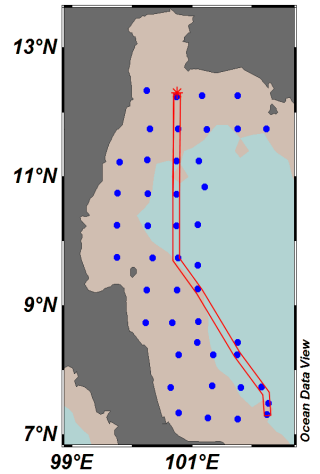
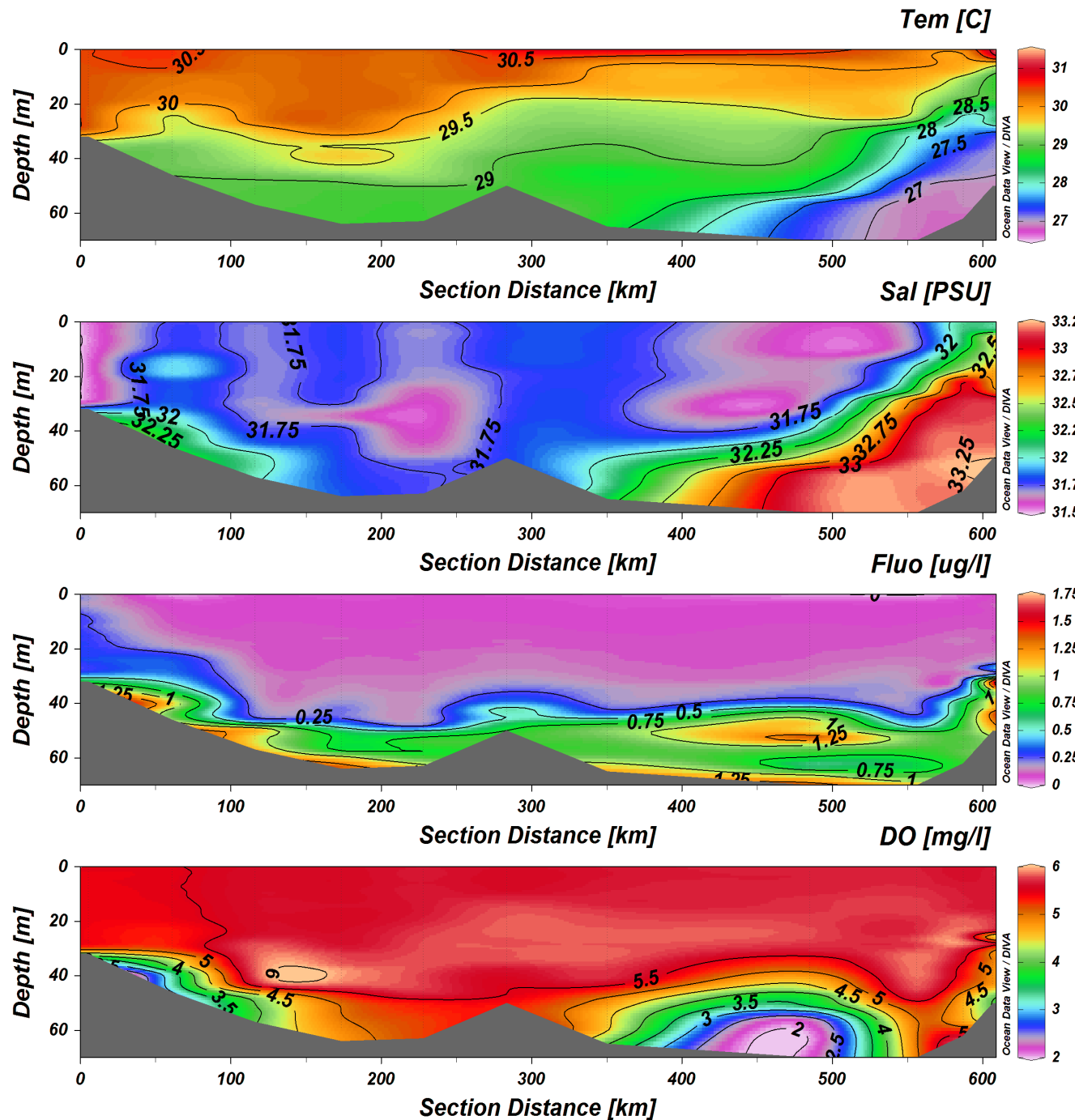


# SEAFDEC OBSERVATION 14 MARCH – 12 APRIL 2013

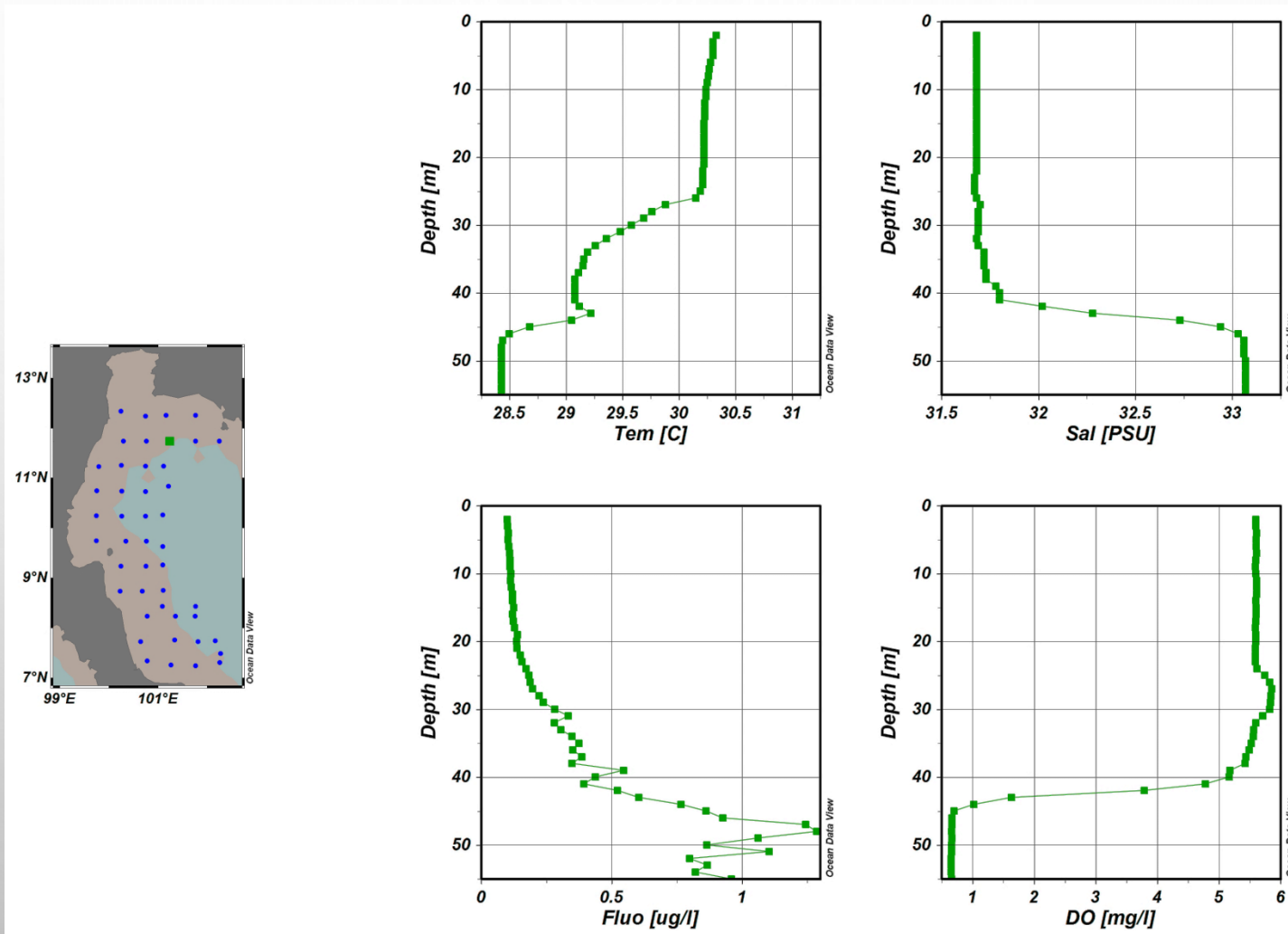
Near-bottom  
water intrusion

Sub-surface  
chlorophyll maxima

Sub-surface  
hypoxic water



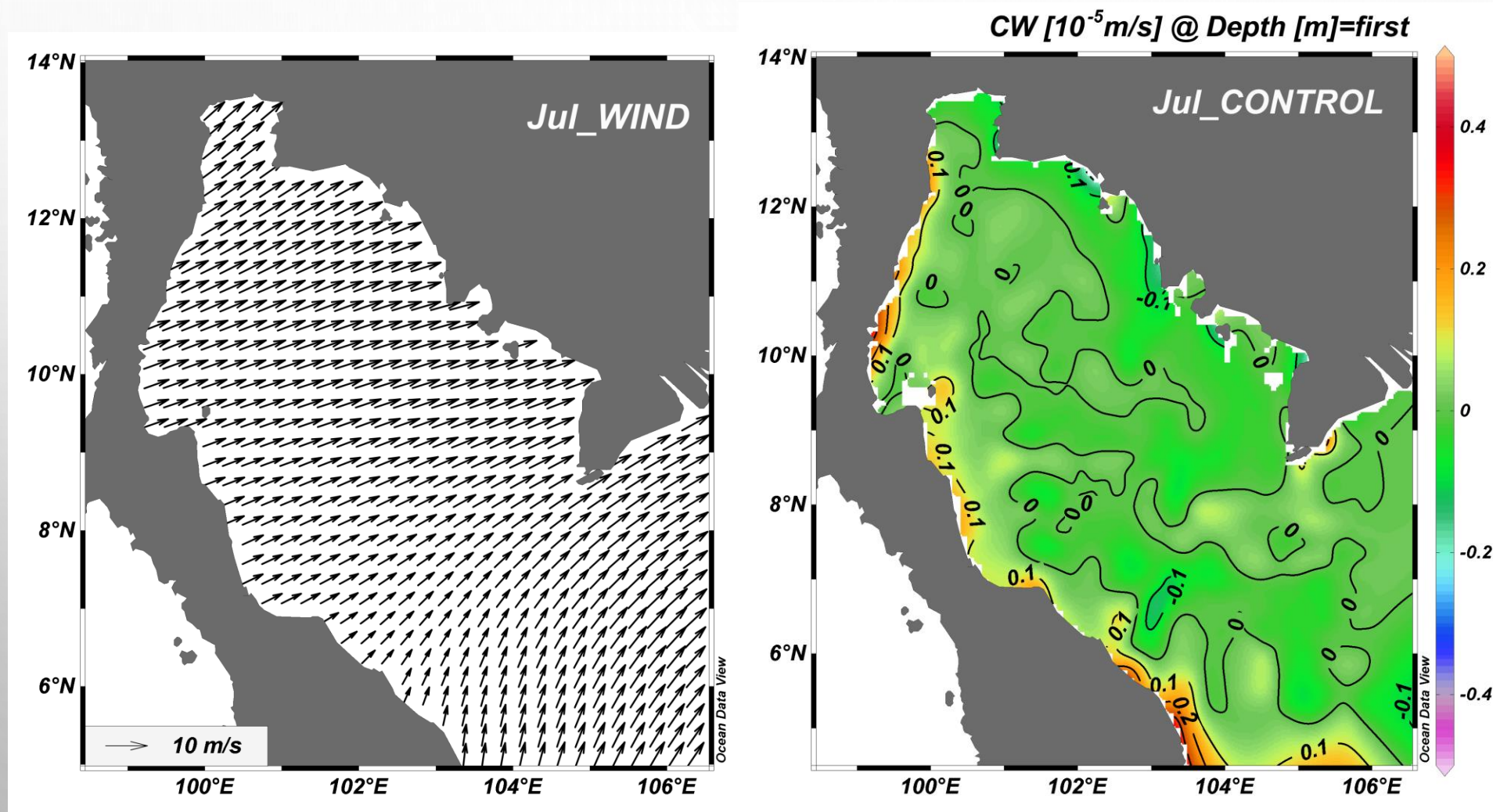
# SEAFDEC OBSERVATION 14 MARCH – 12 APRIL 2013



The background is a light gray gradient with several realistic water droplets of various sizes scattered around the edges. In the center, there is a faint, circular, concentric pattern that resembles a ripple or a stylized logo.

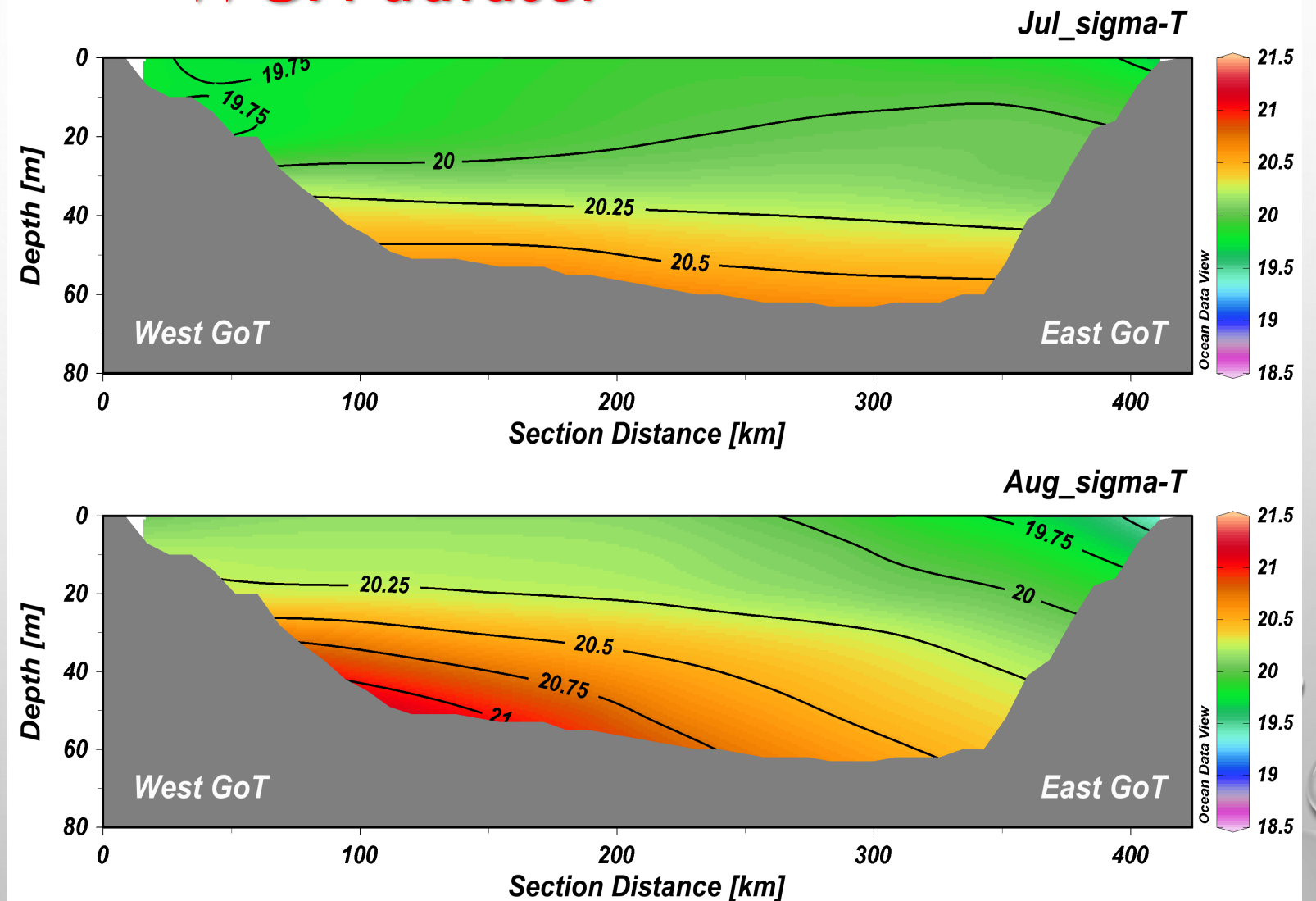
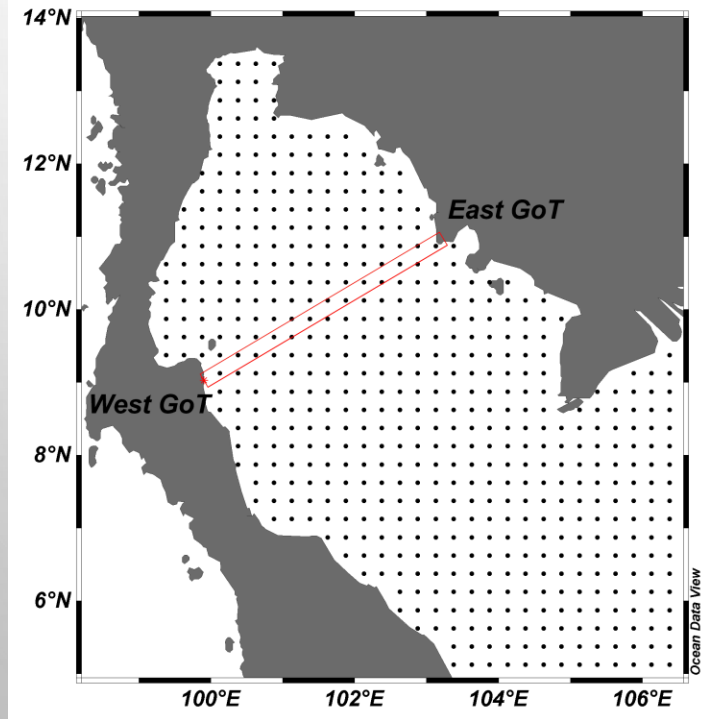
# *Coastal upwelling in GoT*

# Coastal upwelling along the west coast based on POM

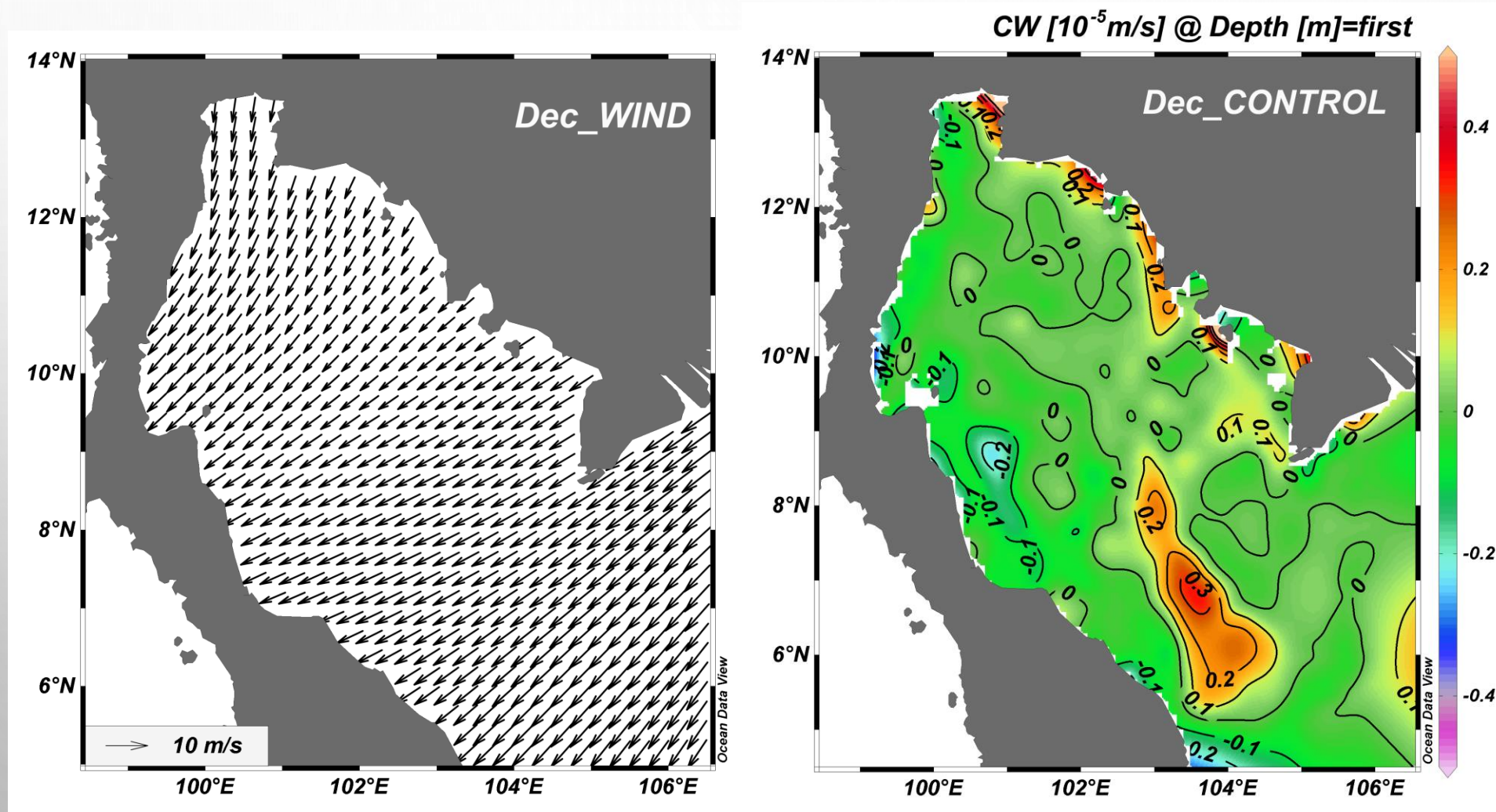




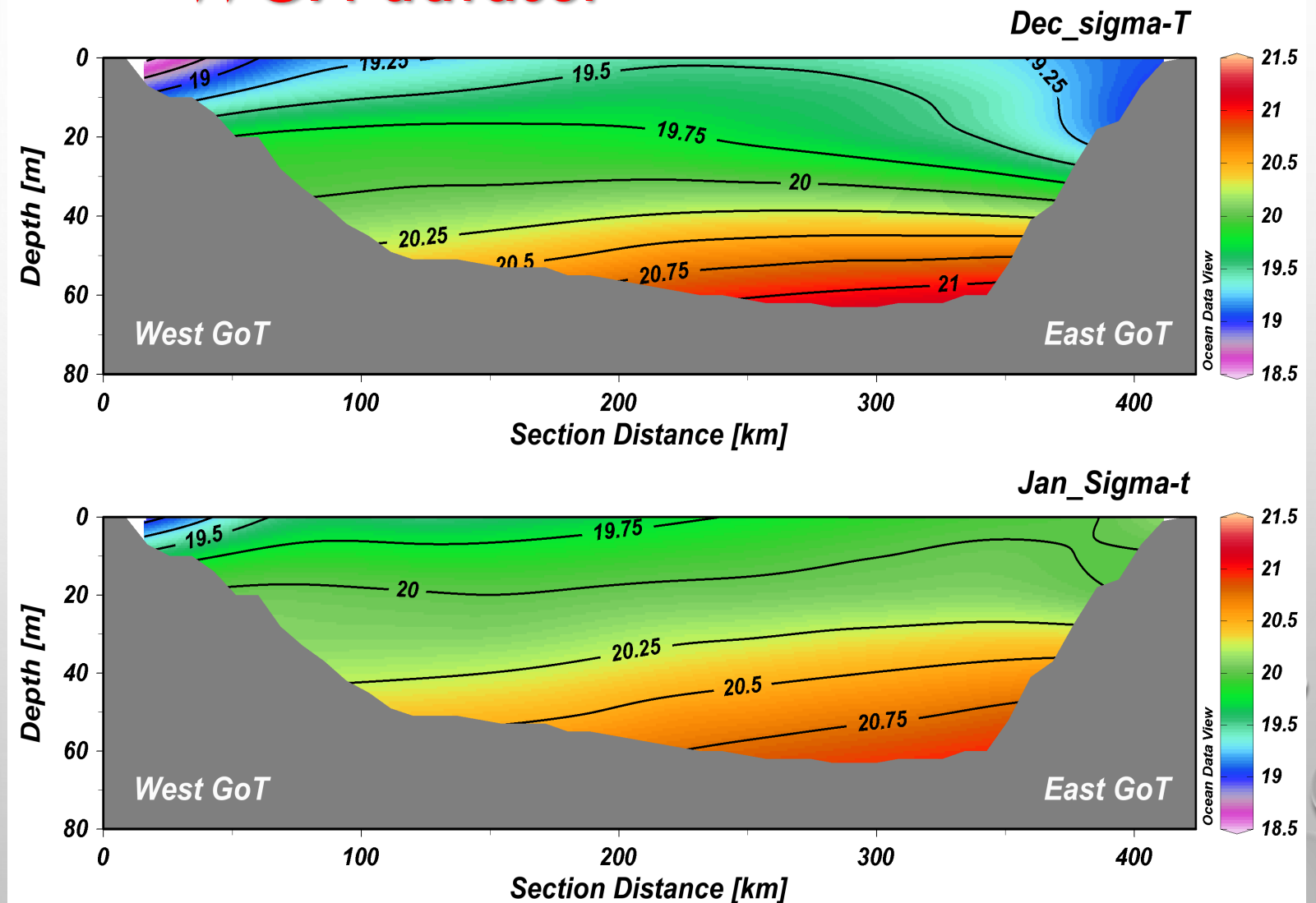
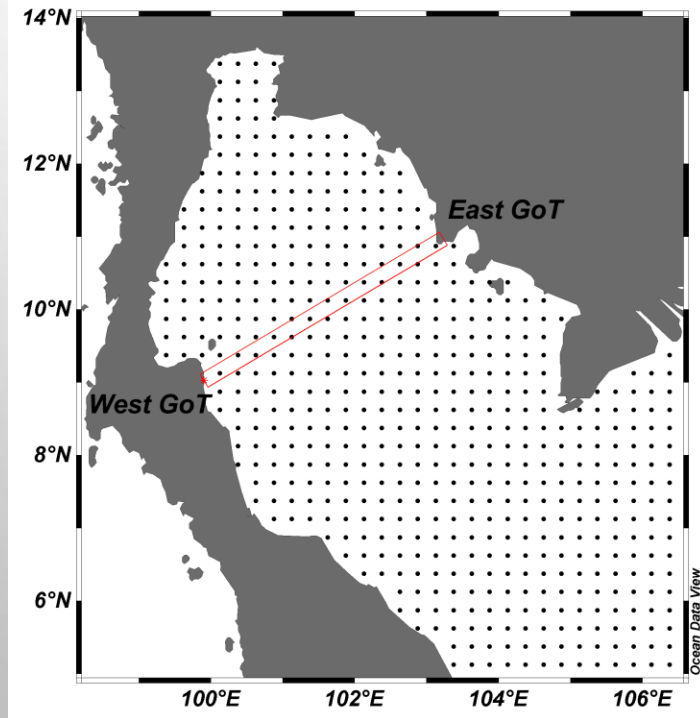
# Coastal upwelling along the west coast WOA dataset



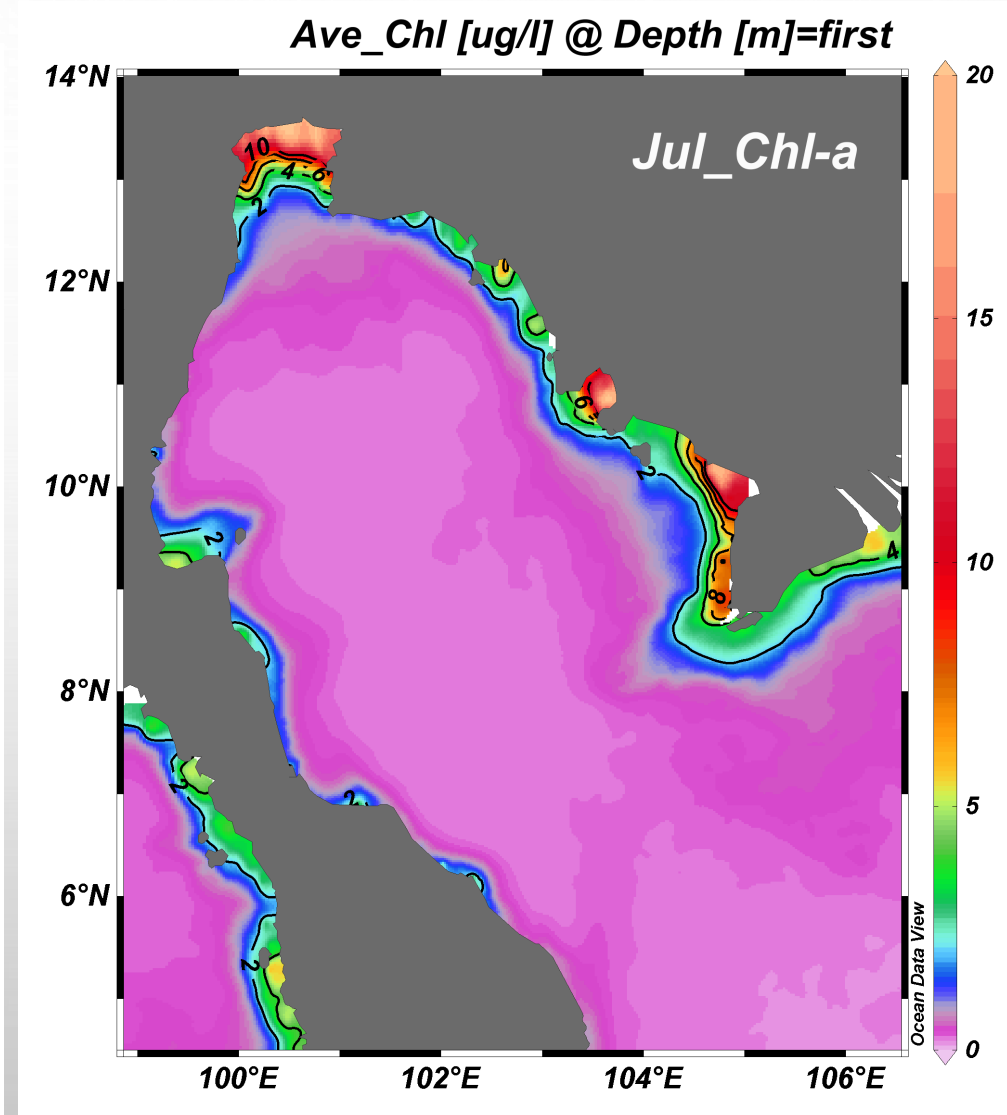
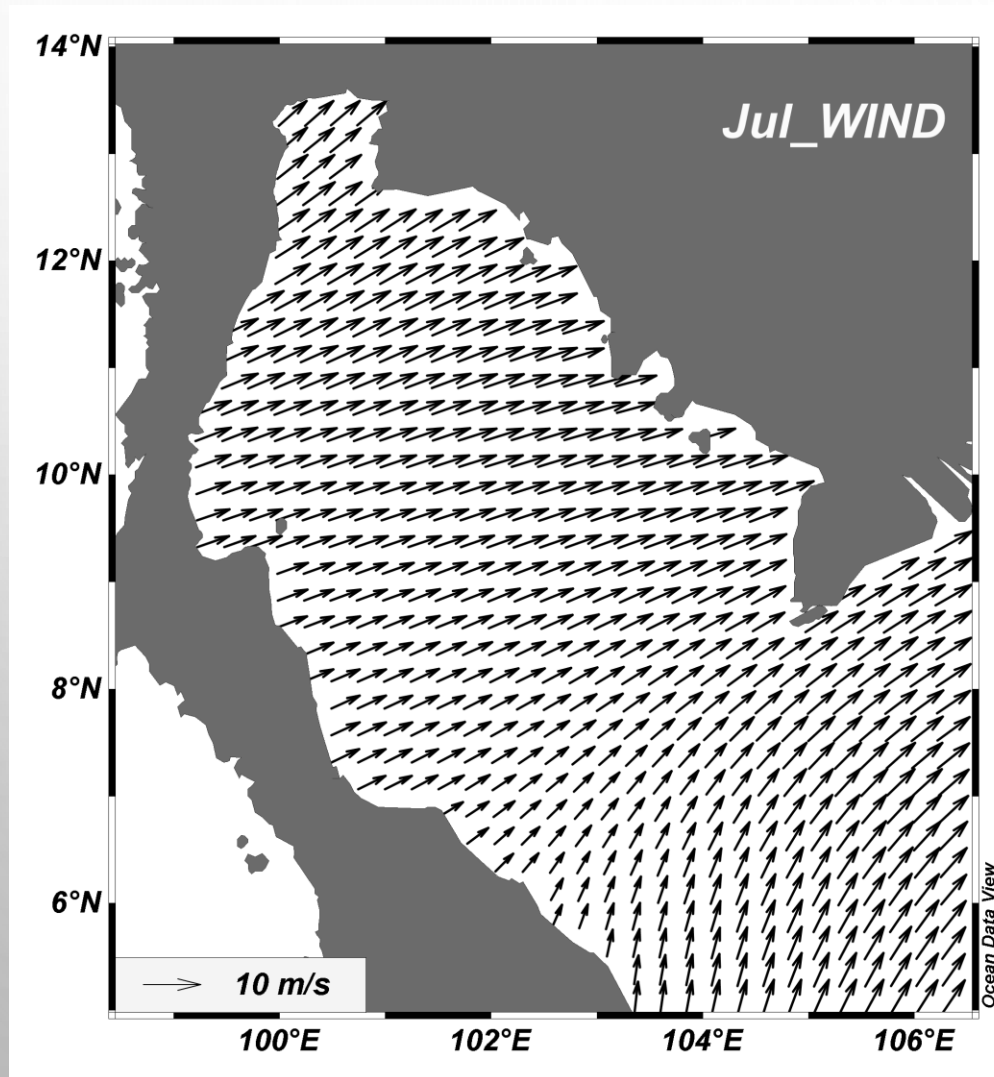
# Coastal upwelling along the east coast based on POM



# Coastal upwelling along the east coast WOA dataset

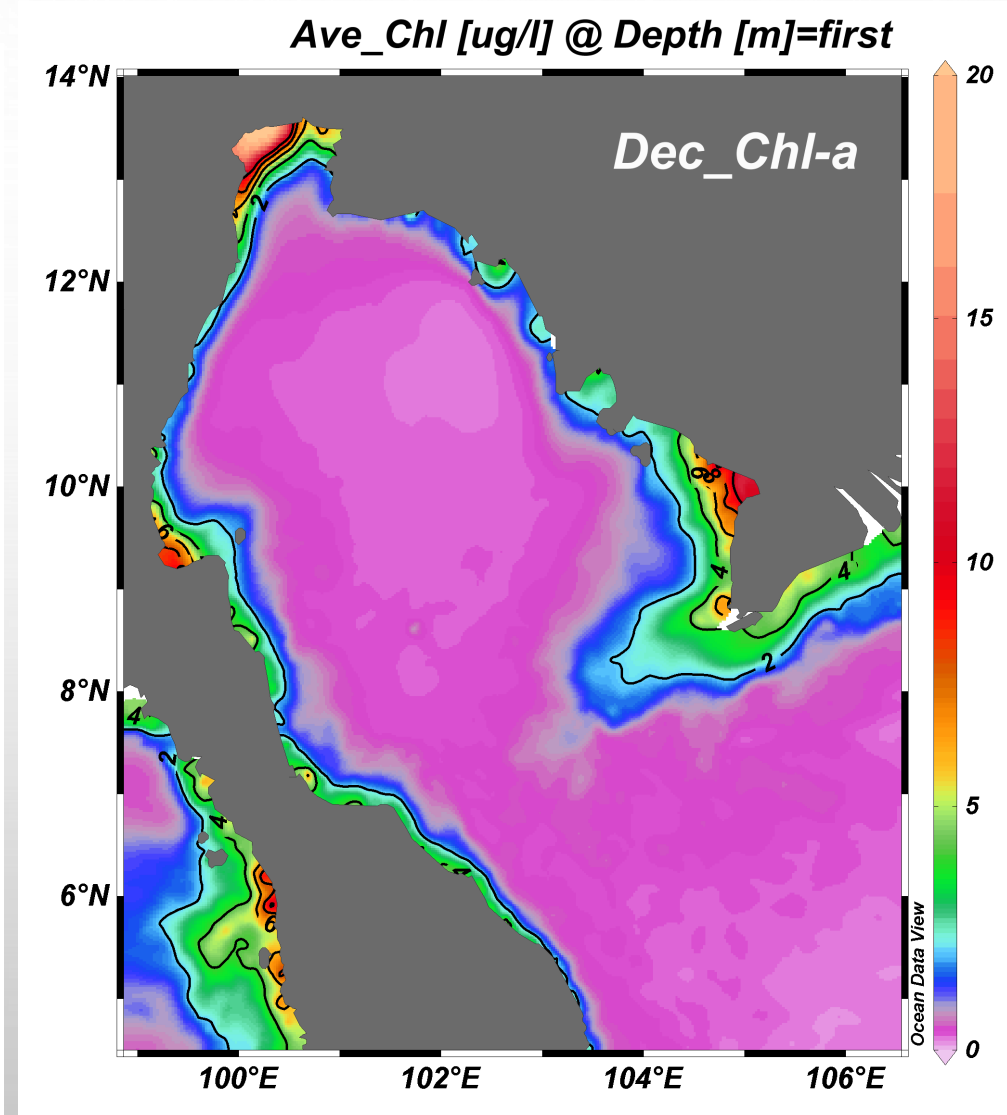
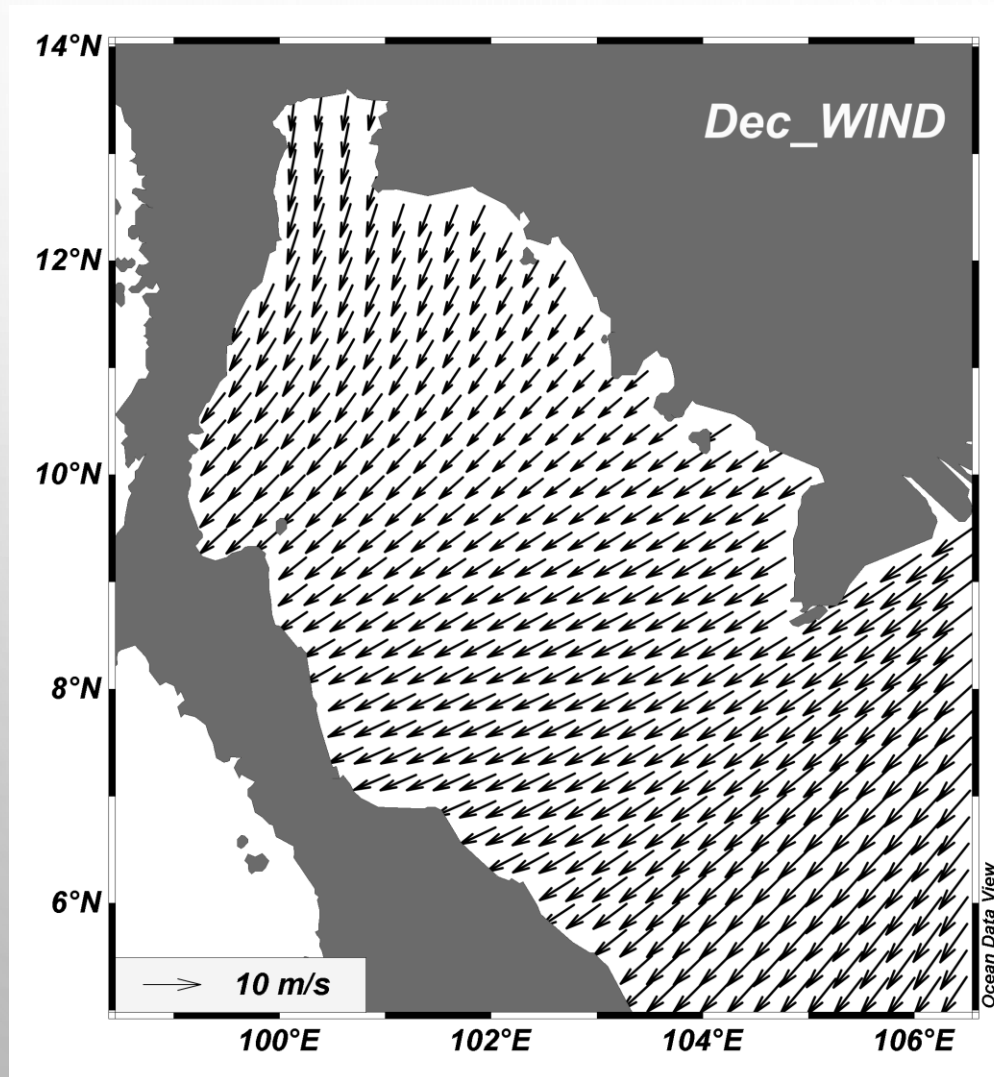


# Wind field and MODIS Chl-a during SW monsoon

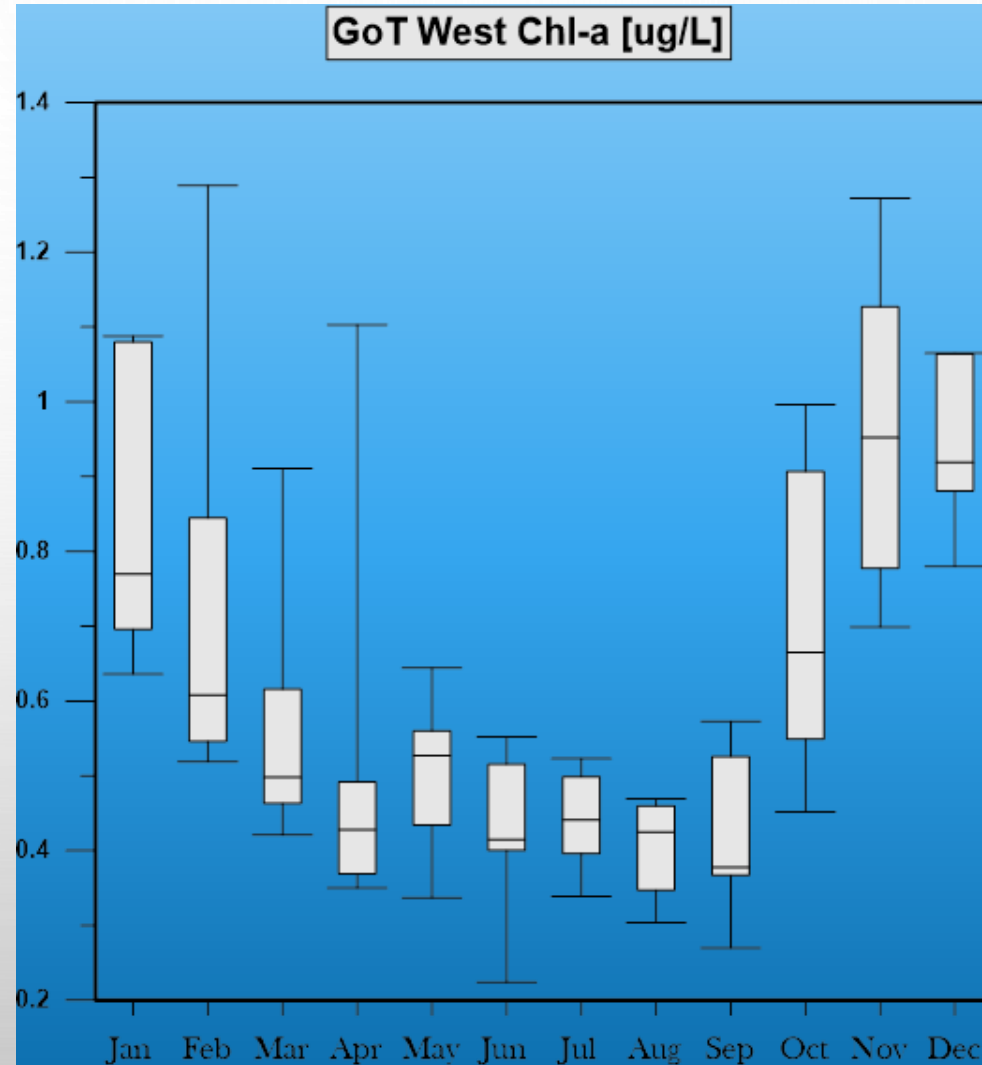
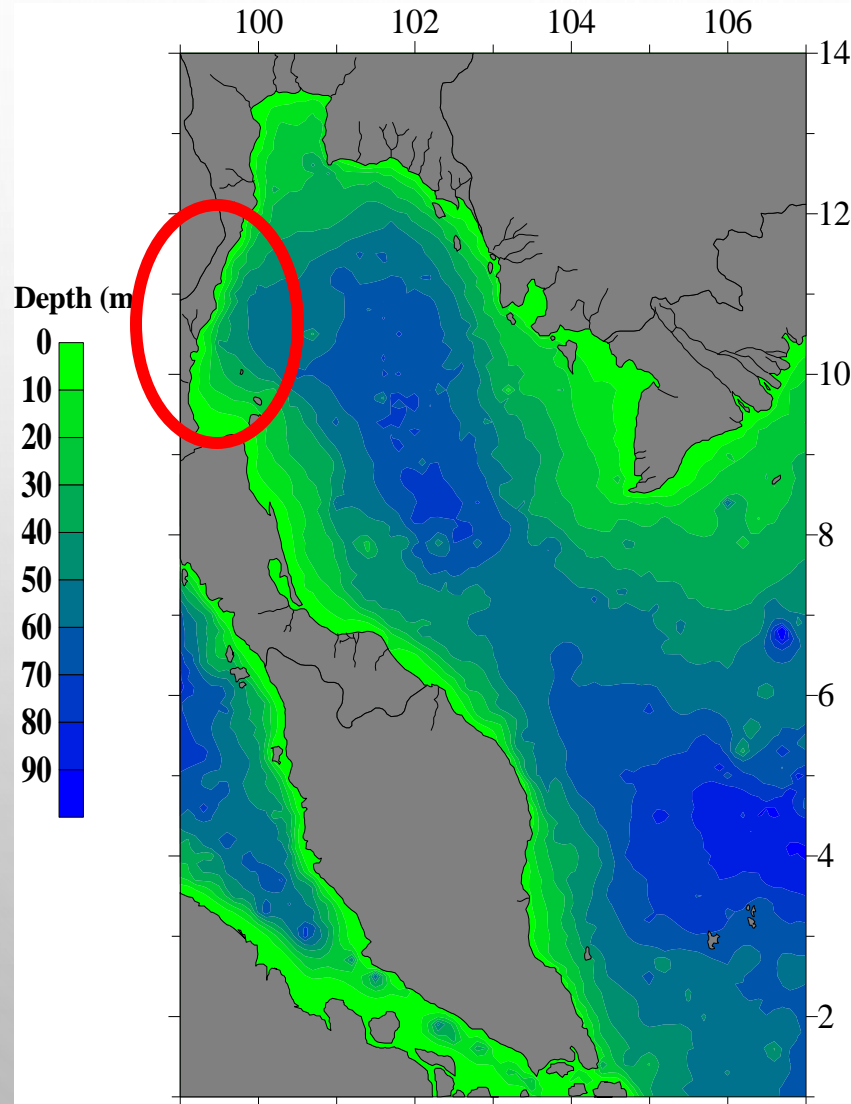




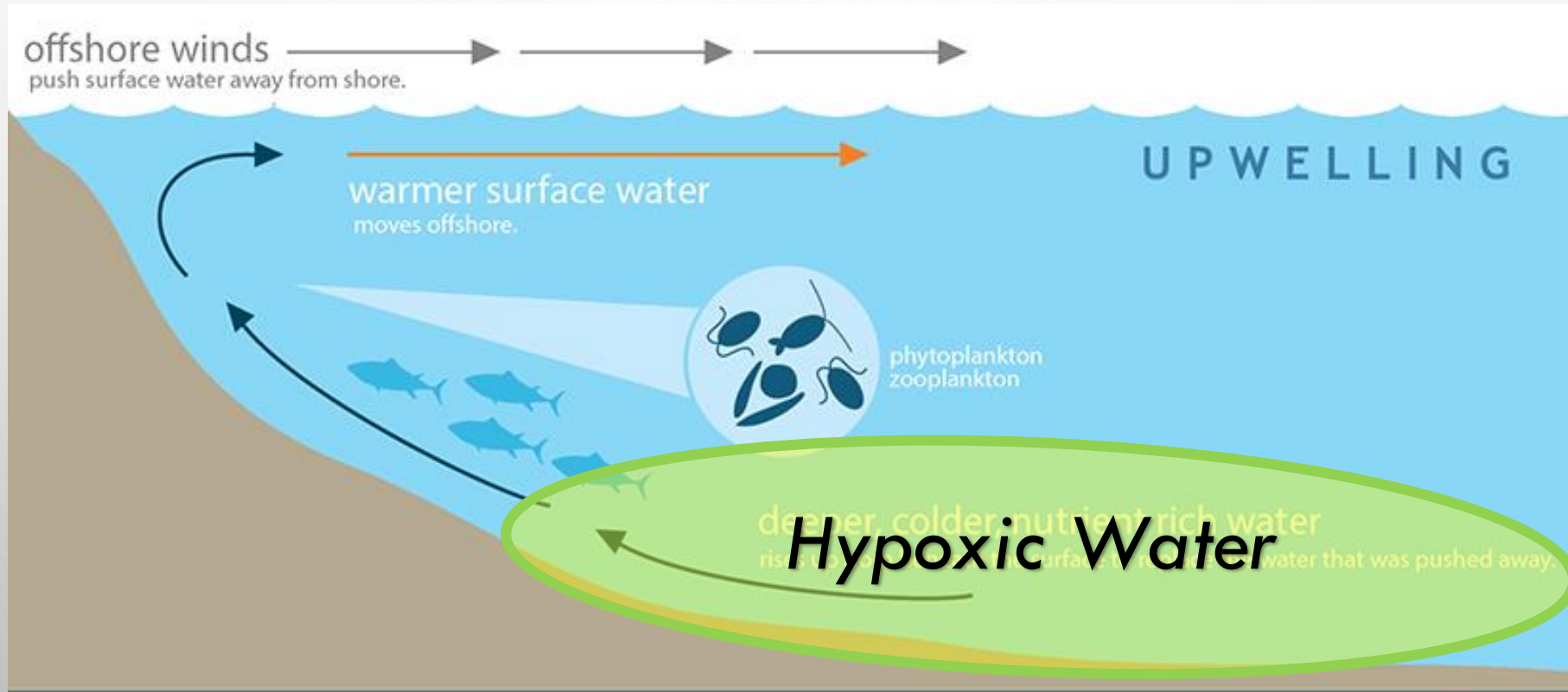
# Wind field and MODIS Chl-a during NE monsoon



# MODIS Chl-a variations in the west coast

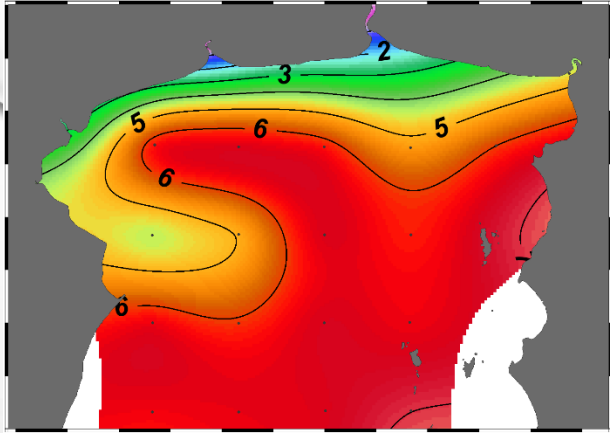


# Nearshore hypoxia induced by coastal upwelling ?



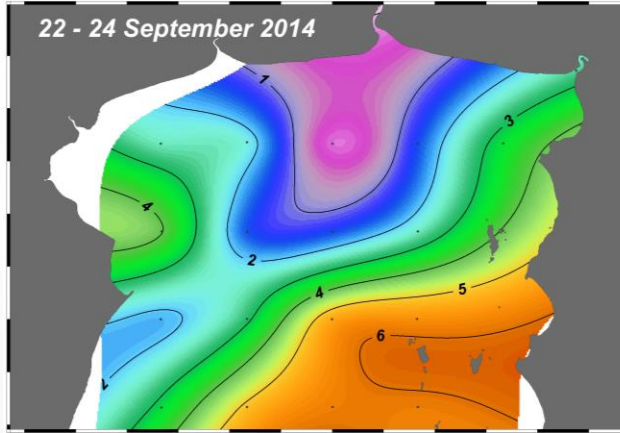


DO [mg/L] @ Depth [m]=last



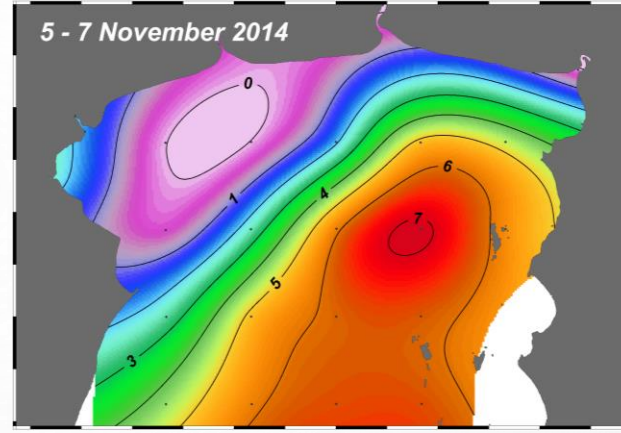
DO [mg/L] @ Depth [m]=last

22 - 24 September 2014

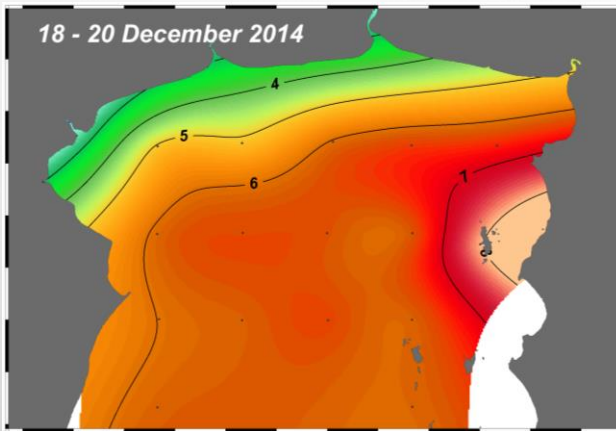


DO [mg/L] @ Depth [m]=last

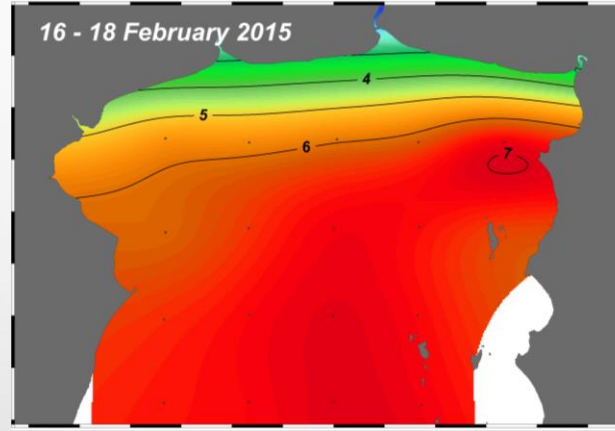
5 - 7 November 2014



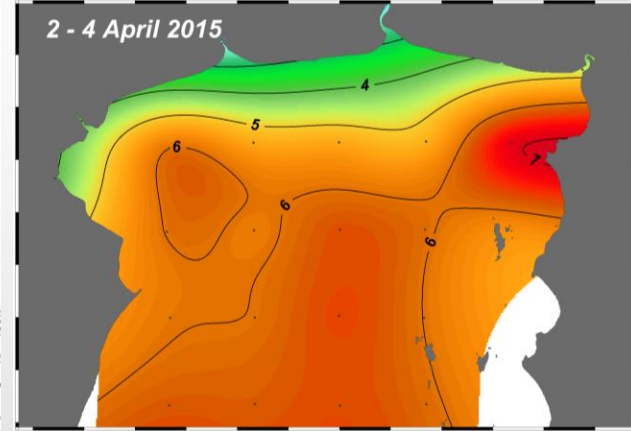
18 - 20 December 2014



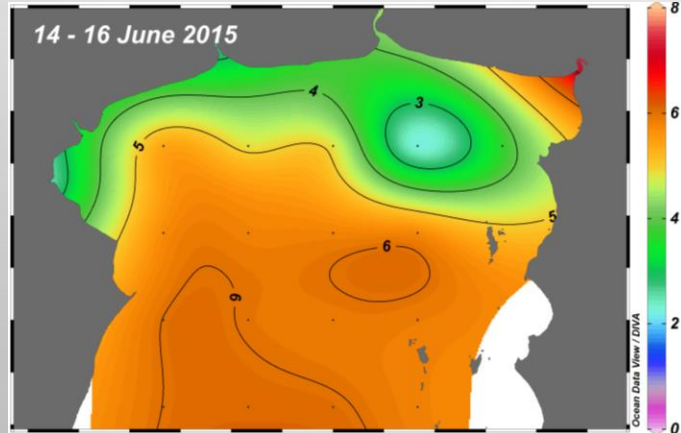
16 - 18 February 2015



2 - 4 April 2015



14 - 16 June 2015

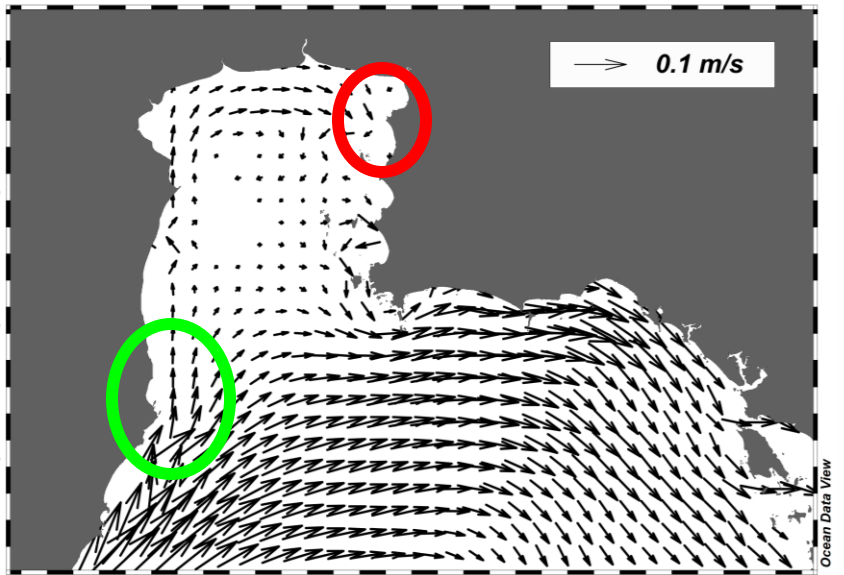


**Near Bottom hypoxia**

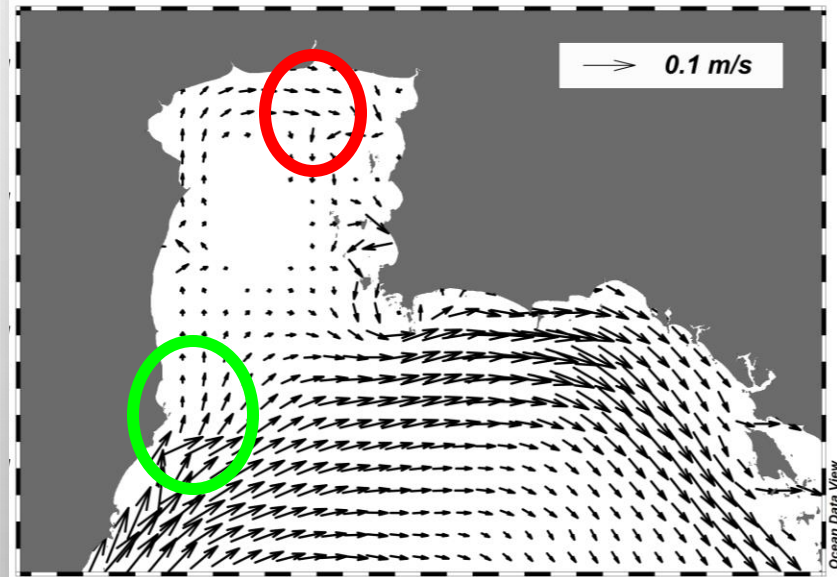


# The movement of hypoxic water mass and upwelling in the west coast

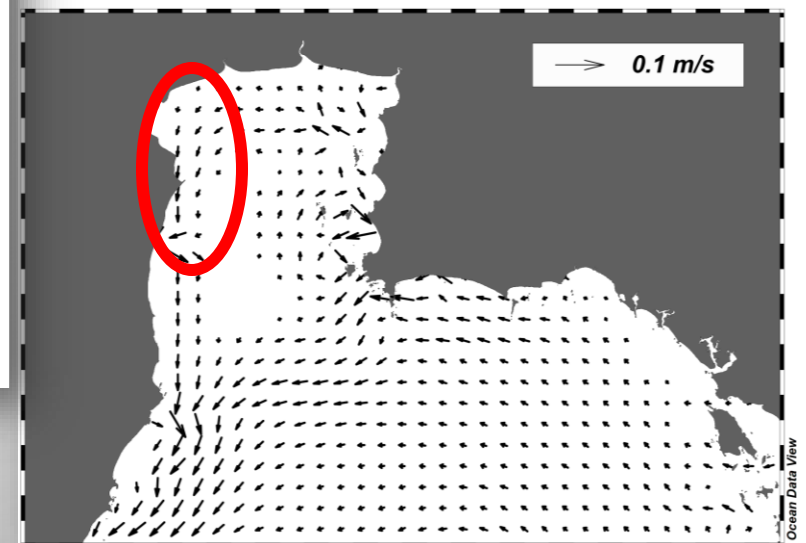
2D Current in August



2D Current in September

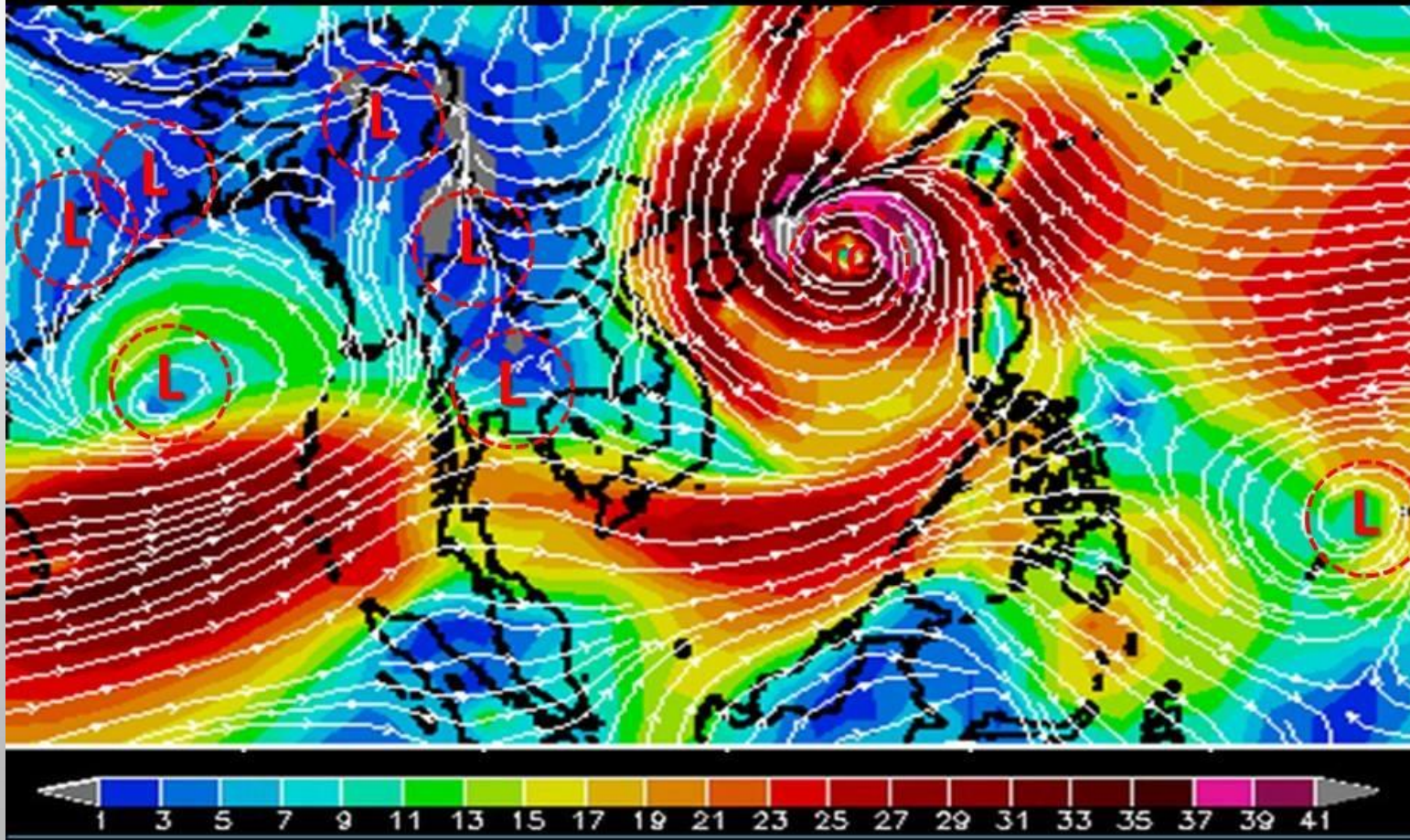


2D Current in October



# Wind streamline 600 m above MSL on Oct 15, 2017

แผนที่ลมระดับ 600 เมตรจากระดับน้ำทะเลปานกลาง  
วันที่ 15 ต.ค. 2560 เวลา 13.00 น.





Coastal Radar Station by MOST/GISTDA

- 0-5
- 5-10
- 10-15
- 15-20
- 20-25
- 25-30
- 30-35
- 35-40
- 40-45
- 45-50
- 50-55
- 55-60
- 60-65
- 65-70
- 70-75
- 75-80
- 80+

*Daily averaged surface  
current on Oct 17, 2017  
from HF Radar  
operated by GISTDA*

Hypoxic water  
moves southward

Upwelling induces  
hypoxic water to surface

zoom 10x  
10 km  
5 mi

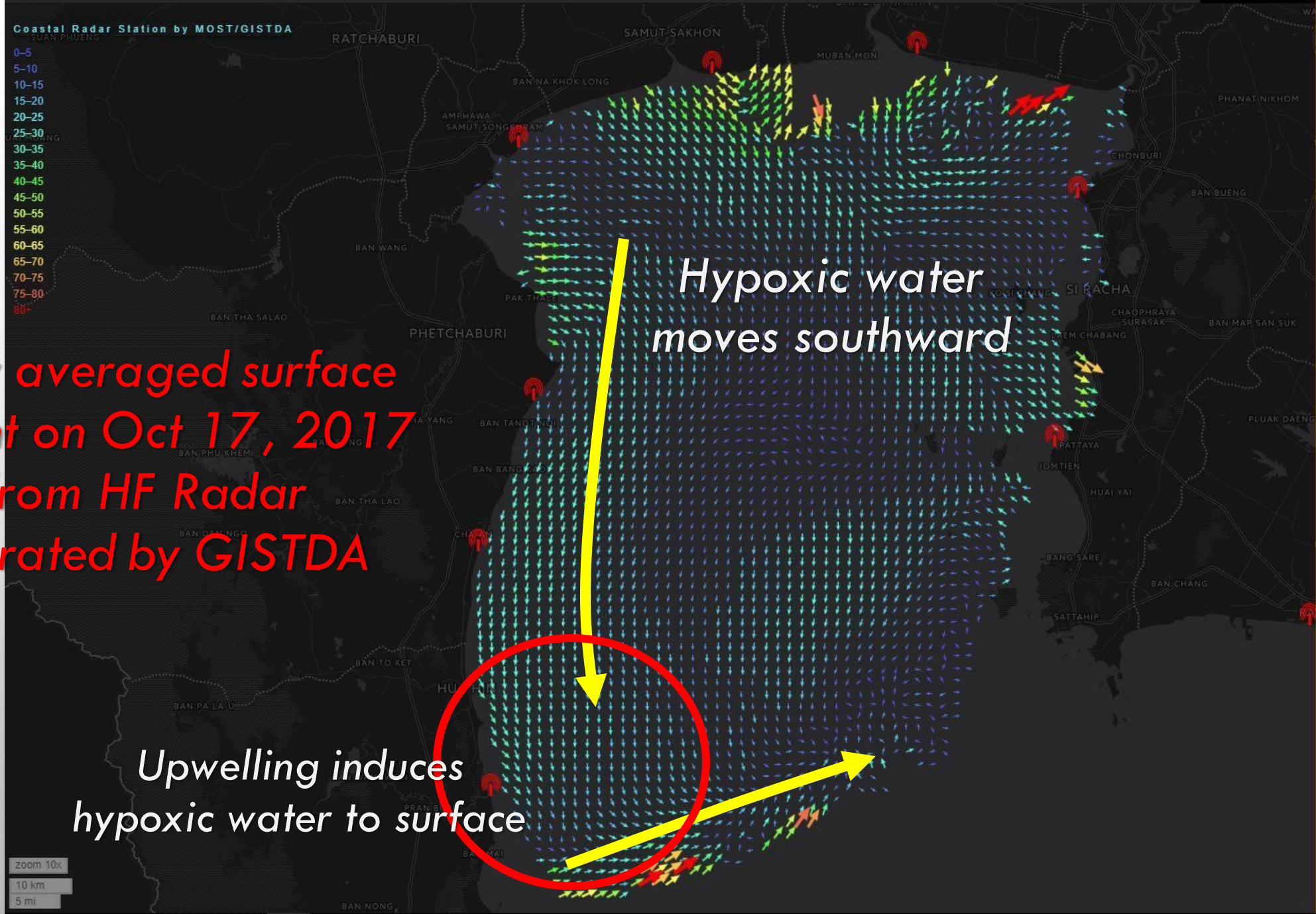






Photo: NEWS and Social media

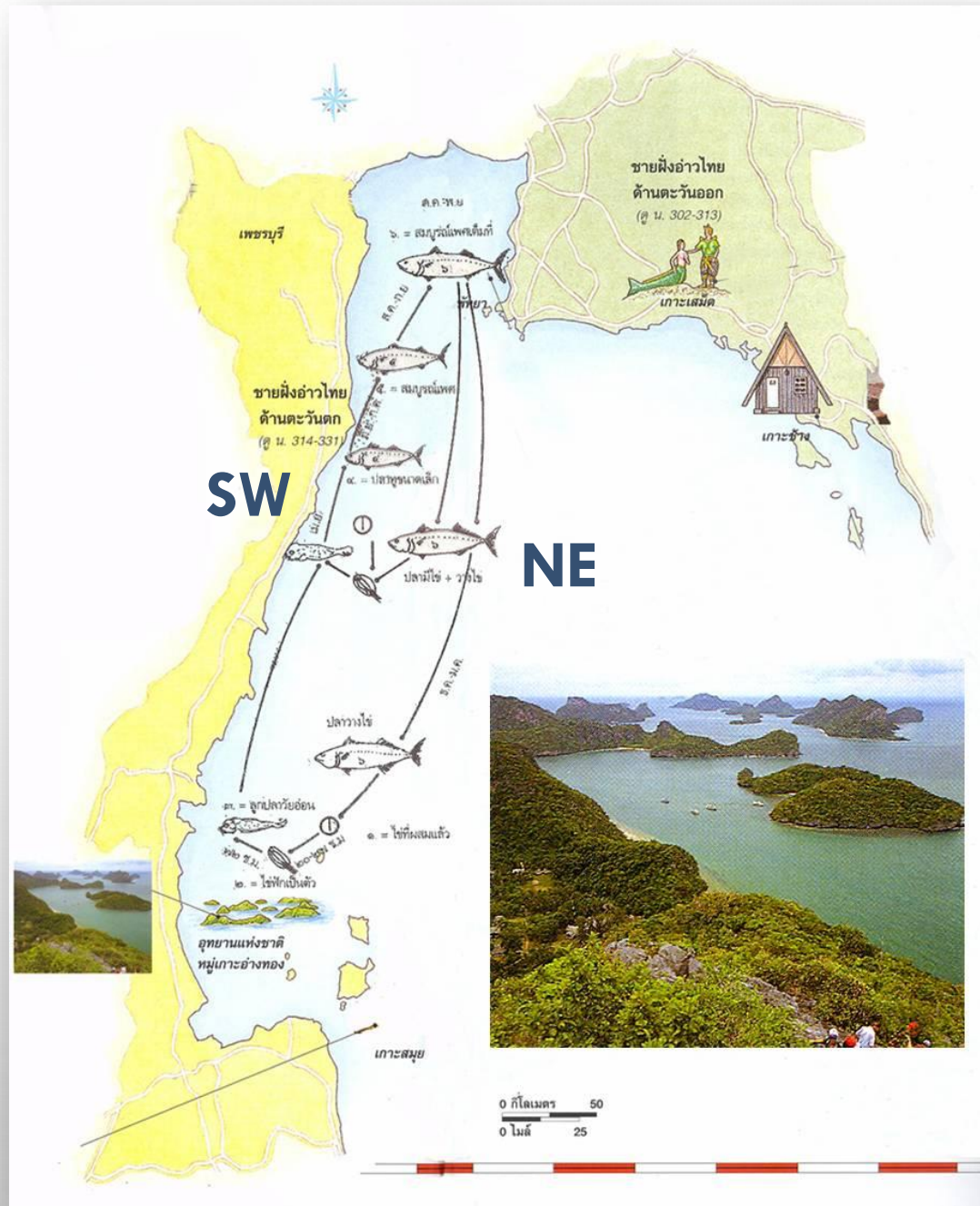


The background of the slide is a light gray gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance.

# CIRCULATION AND SHORT MACKEREL DISTRIBUTION<sup>1</sup>

<sup>1</sup>The survey results from Department of Fisheries

# Life cycle of the short mackerel



# WHAT CONTROL THE DISTRIBUTION OF MACKEREL IN GOT?

- The spawning grounds: More than one? Where?
- Do we understand the life cycle clearly?
- Do they distribute or migrate with water circulation?
- Are oceanographic conditions important? Water column conditions? Upwelling?

The background is a light gray gradient. It features several realistic water droplets of various sizes, some with highlights and shadows, scattered across the frame. In the upper center, there is a faint, circular fingerprint-like pattern. The text 'THANK YOU' is centered in a bold, red, sans-serif font.

**THANK YOU**