

COLLABORATIVE RESEARCH SURVEY ON MARINE FISHERIES RESOURCES AND ENVIRONMENT IN THE GULF OF THAILAND 2018

Sediment texture and organic carbon in surface sediment of the Gulf of Thailand

Penjai Sompongchaiyakul, Chulalongkorn University

Tanakorn Ubonyaem, Sujaree Bureekul, and

Isara Chanrachkij



Supported by Southeast Asian Fisheries Development Center
Training Department, Samut Prakan, Thailand

Contributors

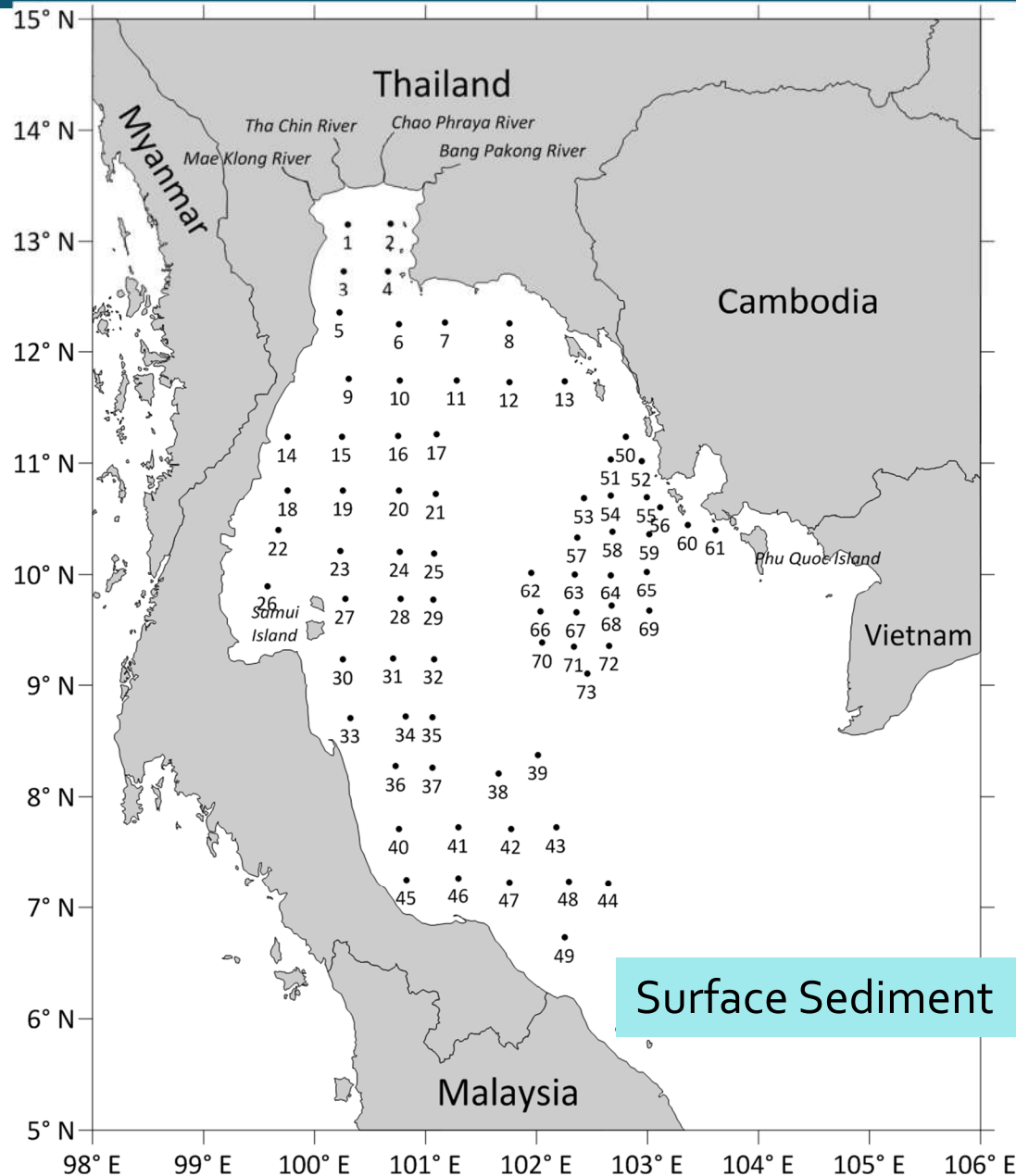
- ¹ Department of Marine Science, Faculty of Science, Chulalongkorn University, Bangkok, Thailand
- ² Center of Excellence on Hazardous Substance Management, Chulalongkorn University, Bangkok, Thailand
 - [Penjai Sompongchaiyakul^{1,2*}](#)
 - [Tanakorn Ubonyaem¹](#)
 - [Sujaree Bureekul^{1,2}](#)
- ³ Southeast Asian Fisheries Development Center/Training Department (SEAFDEC/TD), Thailand
 - [Isara Chanrachkij](#)

Contact: spenjai@hotmail.com

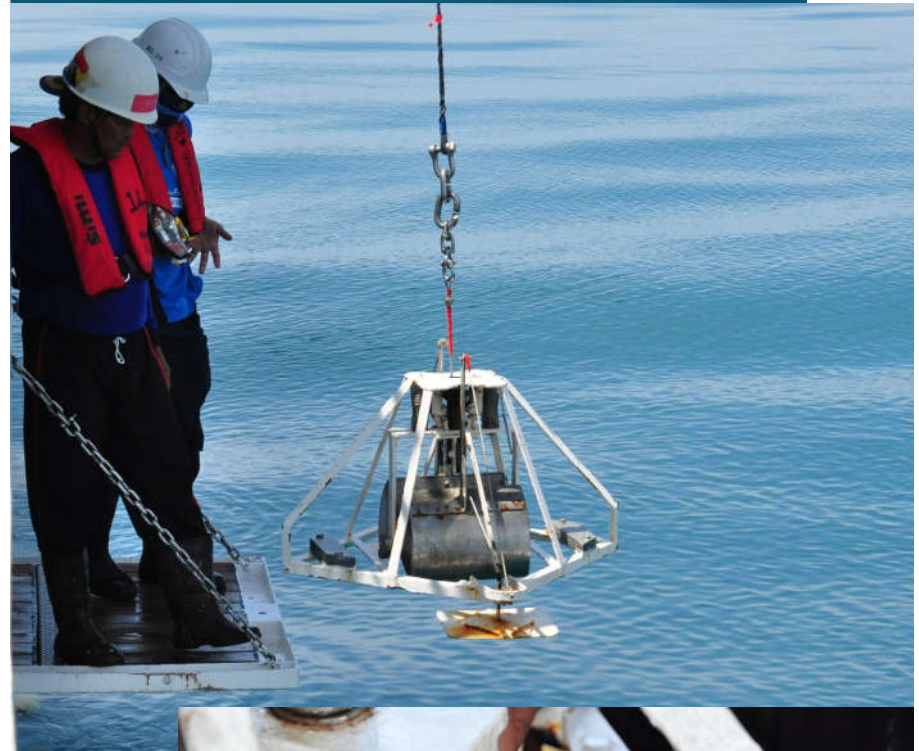
Sediment texture – Surface sediment

- Surface sediments from SEAFDEC-2018
- **Texture (grain size)** → potent contamination from anthropogenic activity in the GOT
- **Organic carbon**
 - Binding with colloids and clay minerals and deposition (**pH, Redox**, O₂ varied toxicity of potent contaminant)
 - Readily oxidizable organic carbon (ROOC) associates with fine grain sediment (90% in GOT)
- **Calcium Carbonate** content (dilution effect on contamination)

Method of Study – Sediment sampling

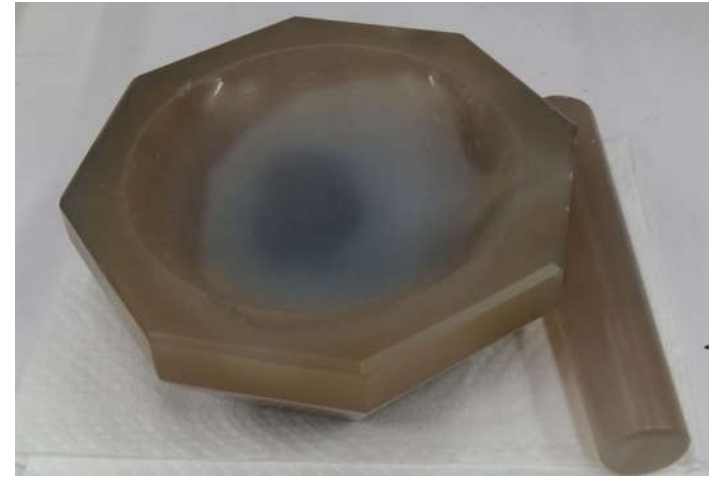


Surface Sediment



Grab Sampling

Method of Study – Sediment Preparation



Freeze dried and Homogenized

Freeze-dry sample

Grain size analysis (wet saving with sedimentation method, U.S. GEOLOGICAL SURVEY OPEN-FILE REPORT 00-358)

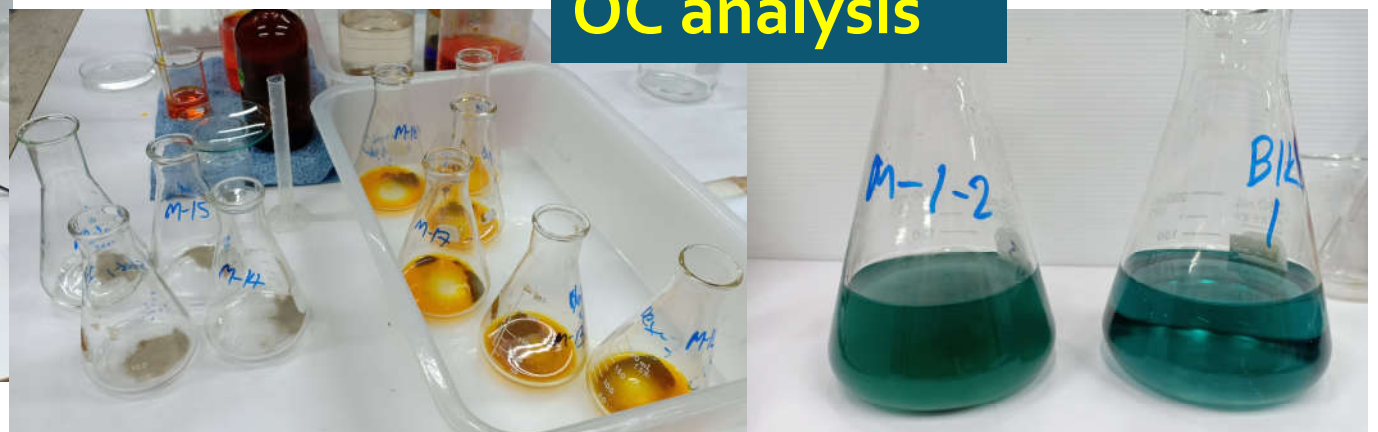
Method of Study – CaCO_3 and %OC

- CaCO_3 - Acid-base back titration of unreacted acid with CaCO_3 with NaOH (Sompongchaiyakul , 1989)
- Readily Oxidizable Organic Carbon in Sediment -- Walky-Black Method (back titration of unreacted strong oxidizing agent), (Loring and Rantala, 1992)

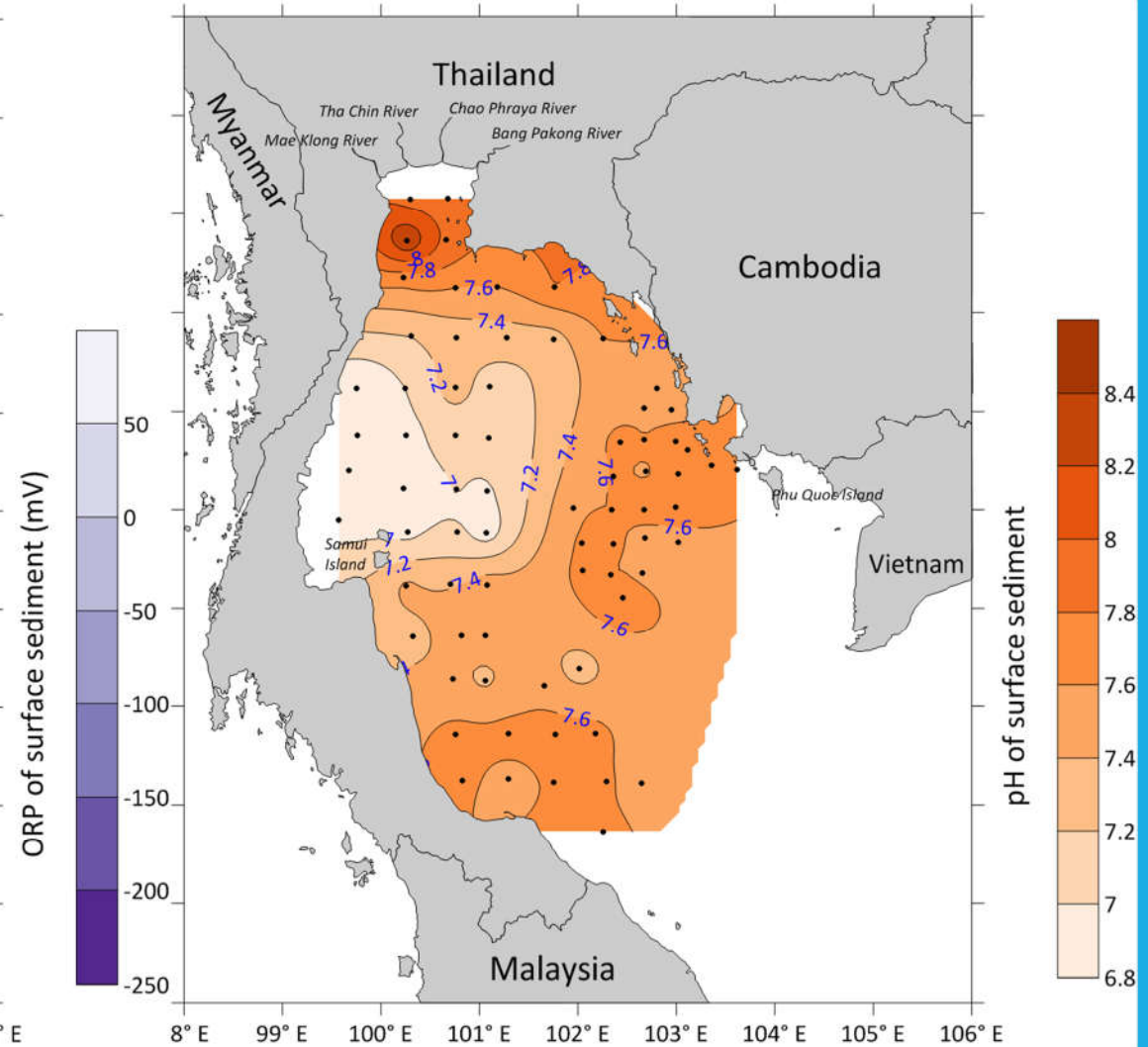
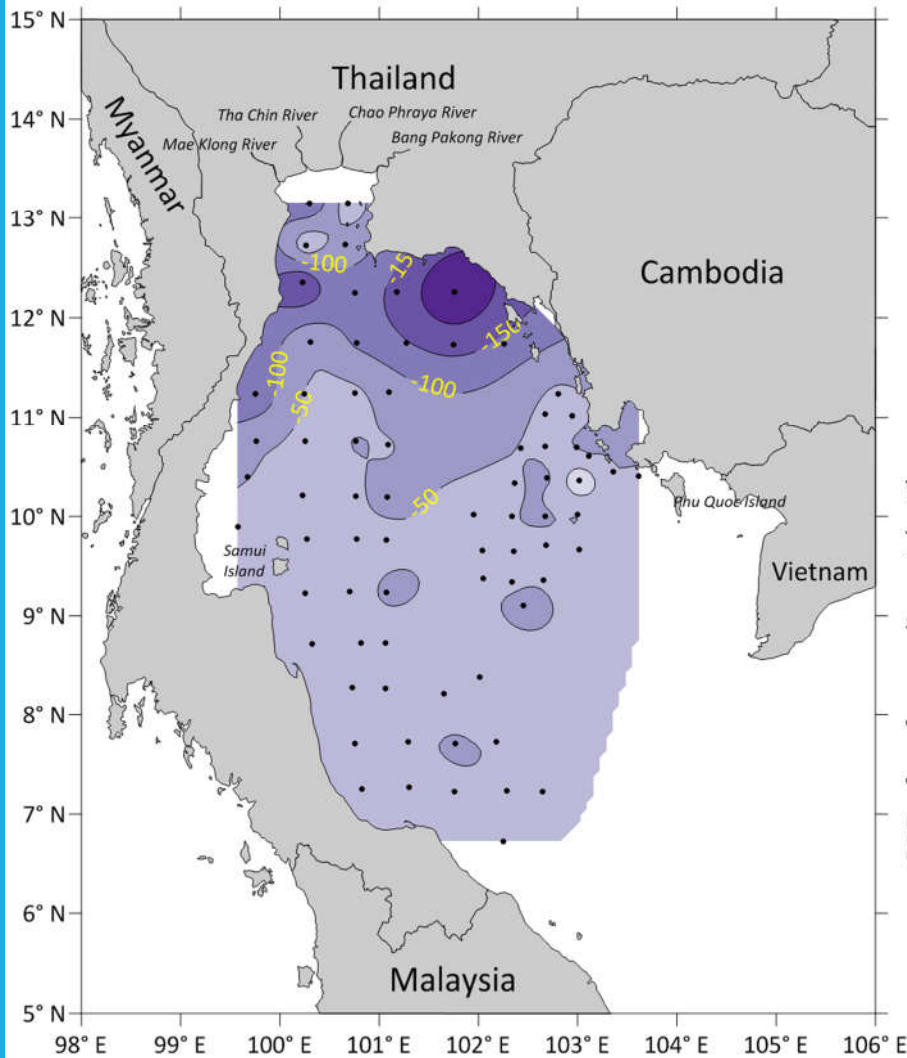
CaCO_3 analysis



OC analysis

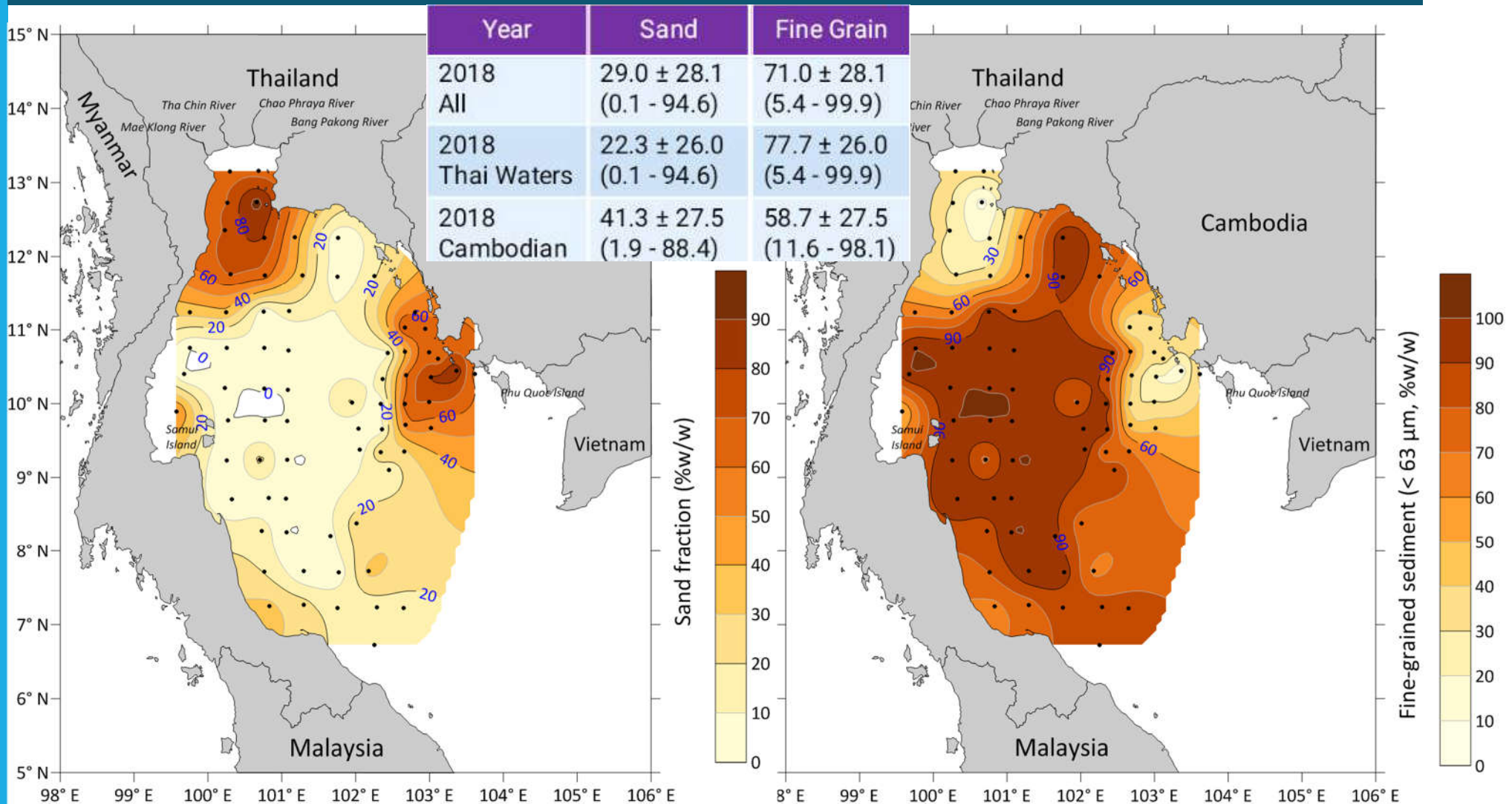


Results – ORP and pH in Sediment



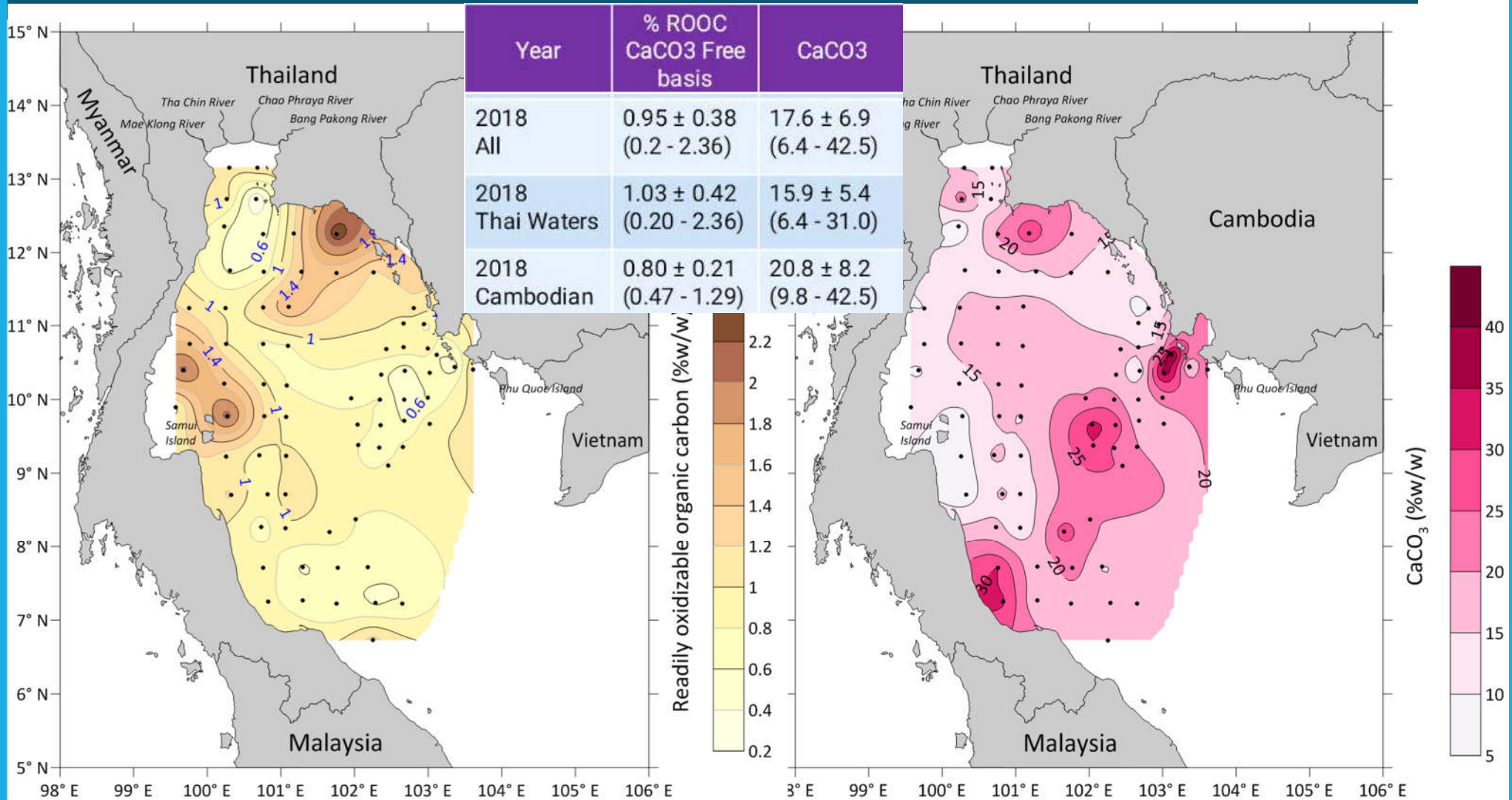
Low ORP in Mid-GOT (East)
Low pH in Mid-GOT (West)

Result – Sediment texture



% sand greater in U-GOT
 % fine grain greater in Mid-GOT (~ 90%)

Result – %OC and Carbonate



% OC in Chanthaburi and Prachuabkirikhun
 % CaCO₃ greater in Mid-GOT

Summary

- Sediment texture
 - Coarse texture sediment found at
 - Area connected between upper and lower GOT,
 - Off coast of Surat-thani , Songkhla and Cambodia
 - Most area in the middle part of the gulf contain more fine grain particles in sediment than the other area

Summary

- Sediment organic carbon
 - Organic Carbon ranged from 0.2 to 2.4%
 - Thai waters $1.03\% \pm 0.42\%$
 - Cambodian waters $0.80\% \pm 0.21\%$
 - High organic carbon in sediment associated with high anthropogenic input and fine particle composition in the sediment

References

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- US EPA. 2001. Appendix to method 163, Total Mercury in tissue, sludge, sediment and soil. A standard operating procedure. Frontier Geosciences, Inc.
- Sompongchaiyakul, P. 1989. Analysis of chemical species for trace metals in nearshore sediment by sequential leaching method. Master's Thesis, Department of Marine Science, Graduate School, Chulalongkorn University
- Loring D.H. and R.T.T. Rantala. 1992. Manual for the geochemical analyses of marine sediments and suspended particulate matter, Earth-Science Reviews. 32(4), 235-283 ISSN 0012-8252. doi.org/10.1016/0012-8252(92)90001-A

Thank you

