

Report on The Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand onboard M.V. SEAFDEC 2



**Cambodia, Thailand and
Viet Nam Waters**



Outline

- Introduction
- Collaborative agencies
- Objectives
- Survey Activities
- Expected Outputs
- Expected Scientific Information



Introduction

- SEAFDEC in collaboration with Member Countries, fisheries agencies, universities and institutes carried out the **Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand.**



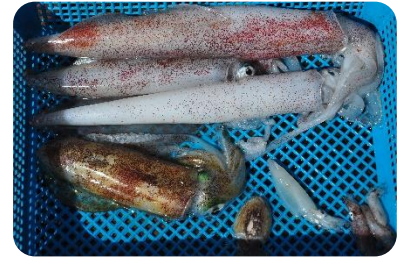
Collaborative agencies

- SEAFDEC Training Department
- Cambodia:
 - *Fisheries Administration (FiA)*
- Viet Nam:
 - *Directorate of Fisheries (D-fish),*
 - *Research Institute for Marine Fisheries (RIMF)*
- Thailand:
 - *Department of Fisheries (DoF-Thailand),*
 - *Burapha University (BUU),*
 - *Chulalongkorn University (CU),*
 - *Kasetsart University (KU),*
 - *Department of Marine and Coastal Resources (DMCR),*
 - *Office of Atoms for Peace (OAP)*



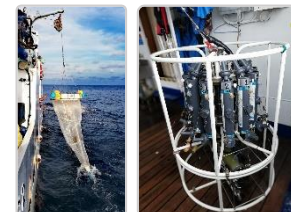
Objectives

- **Update situation** of marine fisheries resources, oceanography and marine environment in the **Gulf of Thailand**
- **Technical supports** on the **human resources capacity building** programs
 - ❖ Collaborative marine research survey among *researchers from difference research agencies*
 - ❖ Capacity building programs for the *junior scientist and university students* to conduct and practices onboard marine research

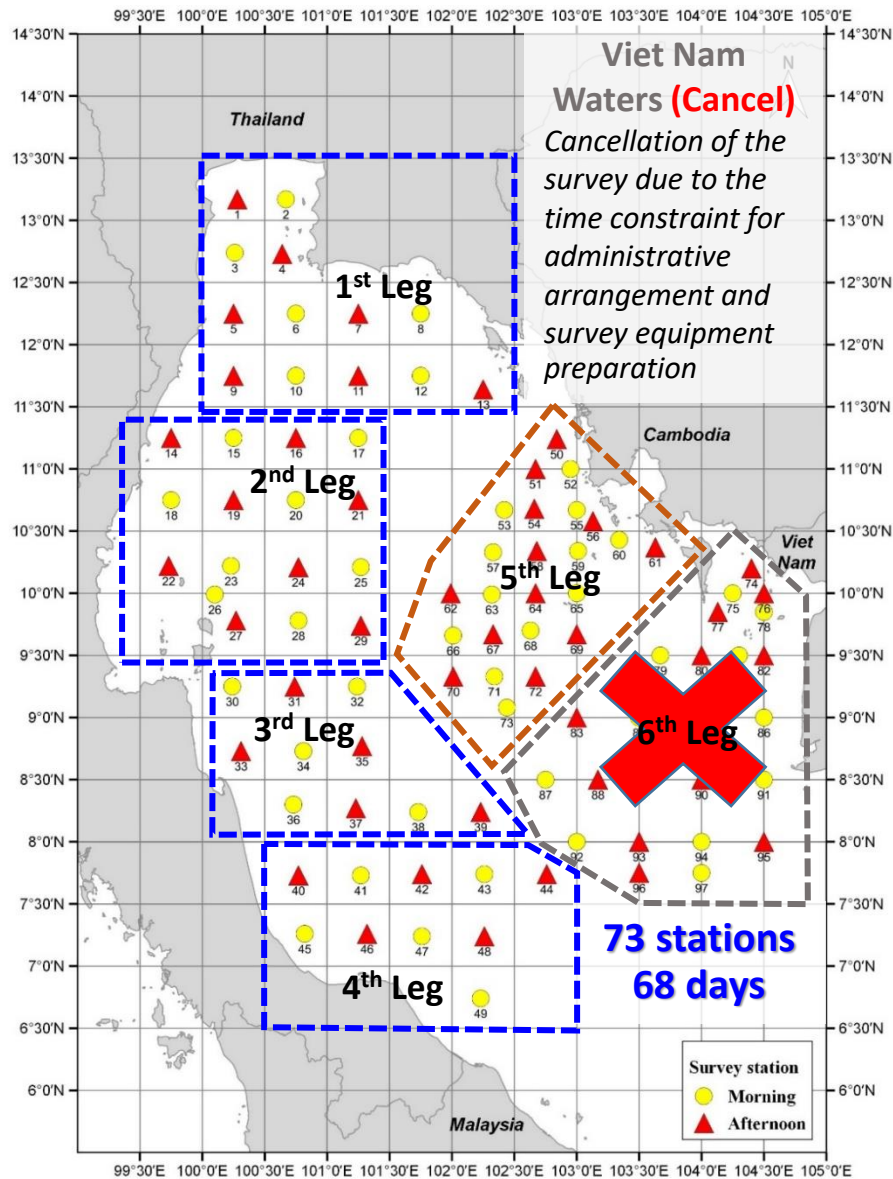


Objectives

- **Strengthen fisheries and oceanography researcher network** in regard to marine fisheries resources and marine environmental in the Gulf of Thailand sub-region
- **Promote on utilization of research equipment and SEAFDEC research vessel** for maximizing it efficiencies and benefit for Southeast Asia region



Survey Activities: Cruise Plan and Survey Area



- **Survey period**
 - 17 August - 11 November 2018 (87 days)
- **Survey area**
 - Gulf of Thailand (**Thailand**, **Cambodia** and **Viet Nam** waters)
- **Survey stations: 97 stations**
 - **Leg 1-4: Thailand Waters**
(17 Aug – 27 Sep 2018)
49 stations (St.1 – St.49)
 - **Leg 5: Cambodia Waters**
(1 – 17 Oct 2018)
24 stations (St.50 – St.73)
 - **Leg 6: Viet Nam Waters**
(24 Oct – 5 Nov 2018)
24 Stations (St.74 – St.97)

Survey Activities: Research Vessels

M.V. SEAFDEC 2



M.V. SEAFDEC 2 Specification

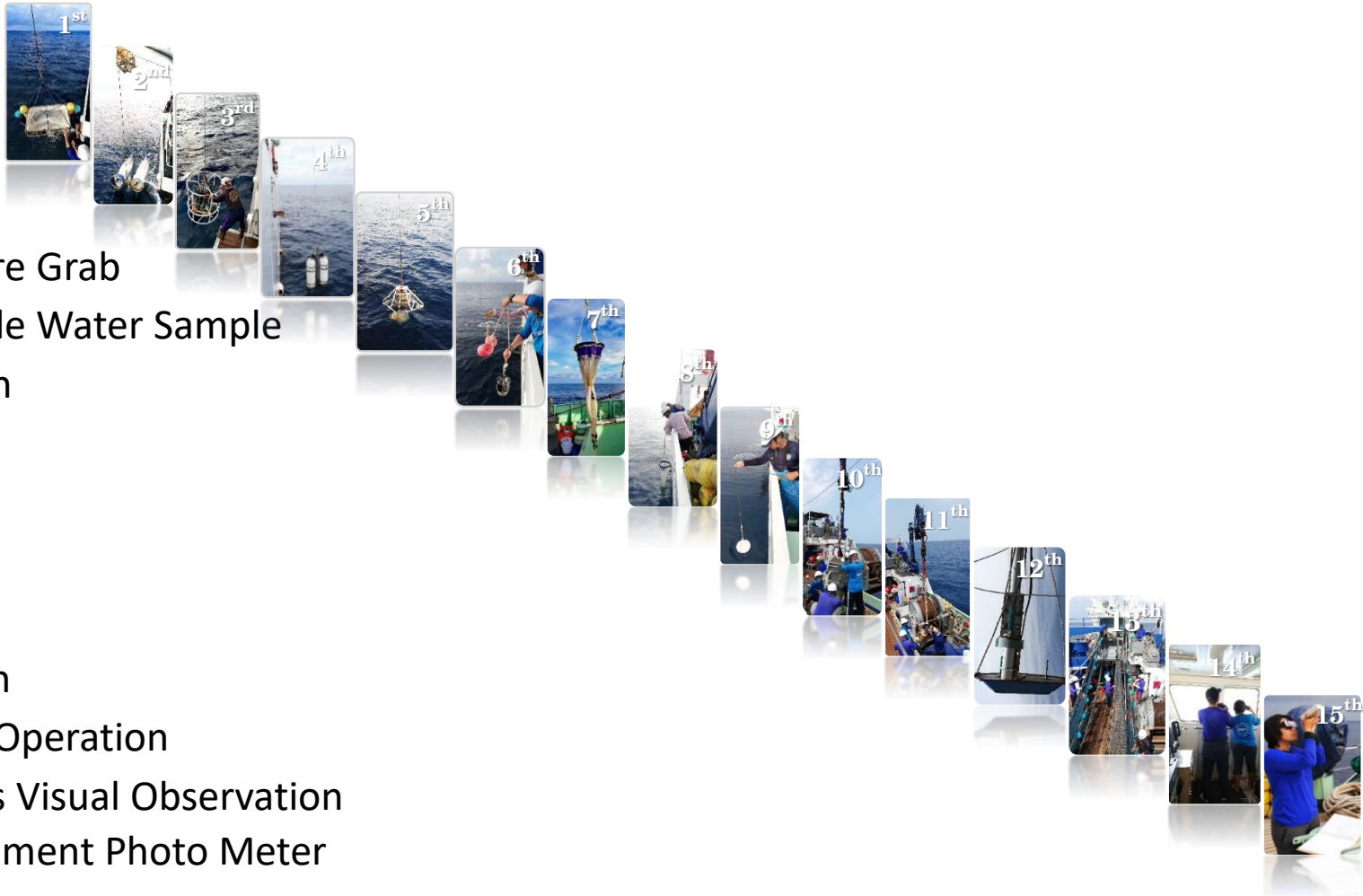


1. *Fishing Research and Training*
2. *Oceanographic Survey*
3. *On-board Navigation and Engine Training*

- **LOA 32.50 m**
- **Breadth 7.20 m**
- **Depth 3.00 m**
- **Gross tonnage 211 tons**
- **Main engine 736 kW**
- **Service speed 12.0 knots**
- **Complement 37 persons**

Survey Activities: Oceanographic and Sampling Gear

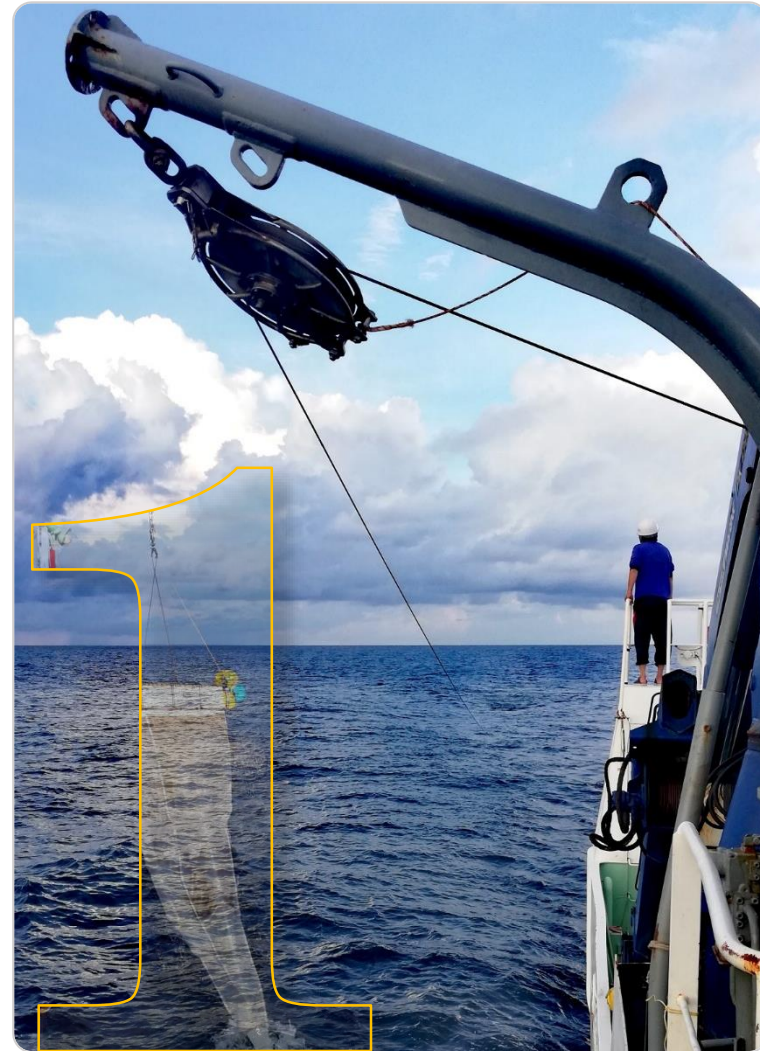
1. Neuston Net
2. Bongo Net
3. CTD
4. Van Dorn
5. Smith McIntyre Grab
6. Dropped Bottle Water Sample
7. Phytoplankton
8. Zooplankton
9. Secchi Disk
10. Box Core
11. Gravity Core
12. Structure Scan
13. Trawl Fishing Operation
14. Marine Debris Visual Observation
15. Dust Measurement Photo Meter



Survey Activities: Working Locations on M.V.SEAFFDEC 2



Neuston Net



Neuston Net for Fish Larvae

- ✓ Surface
- ✓ Speed 2.5 kts.
- ✓ Distance 75 m.



Neuston Net for Micro-plastic

- ✓ Surface
- ✓ Speed 2.5 kts.
- ✓ Distance 40 m.

Neuston Net

1st

SEAFDEC

✓ Fish Larvae

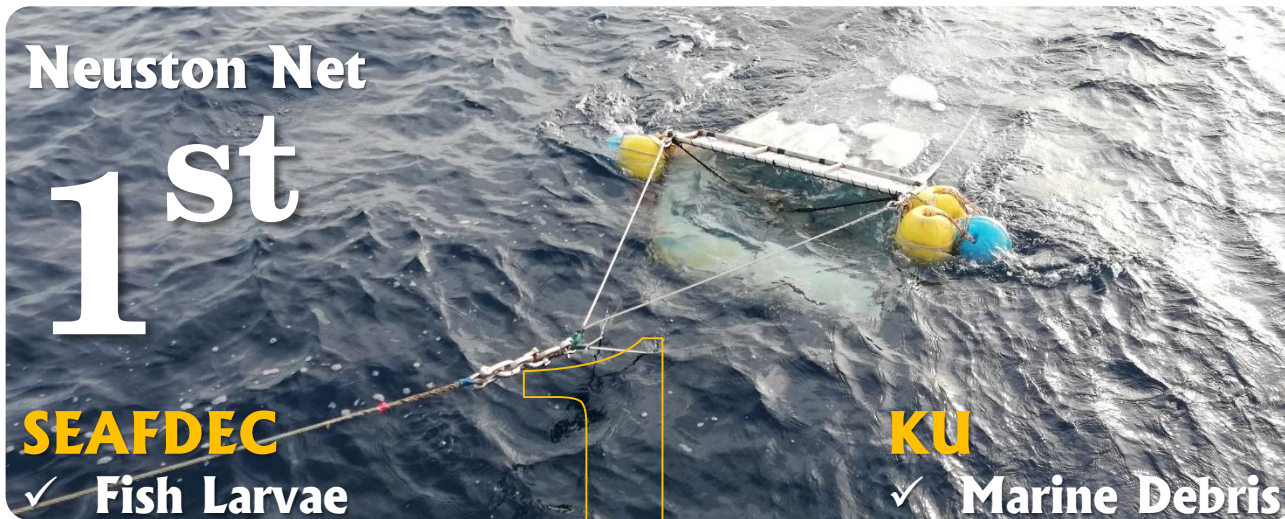
KU

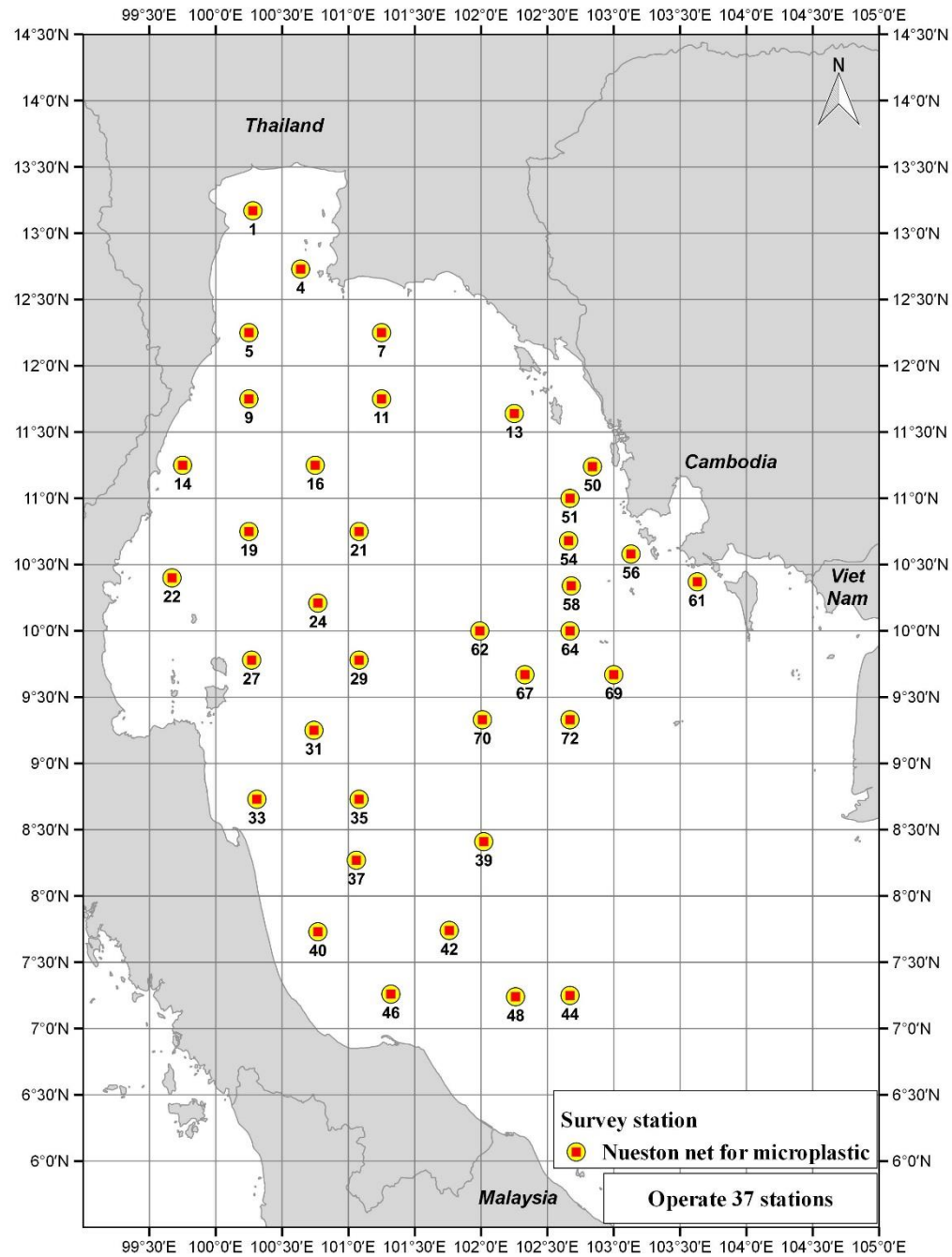
✓ Marine Debris

2nd

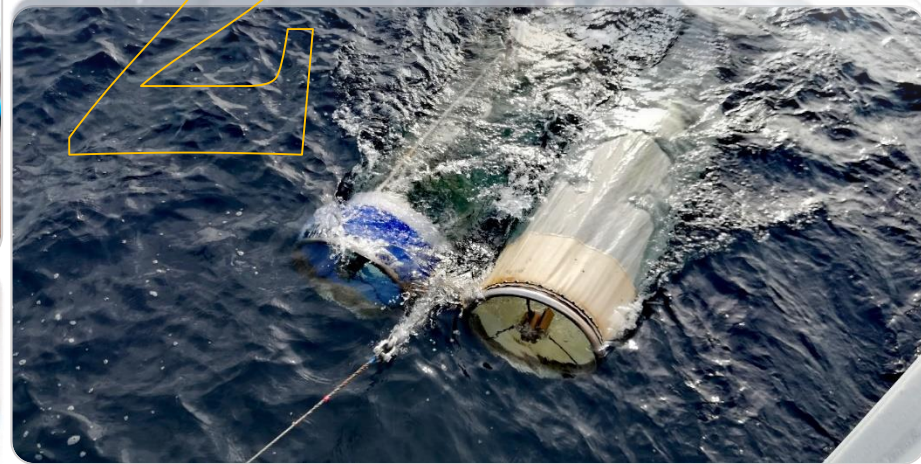
CU

✓ Micro-plastic

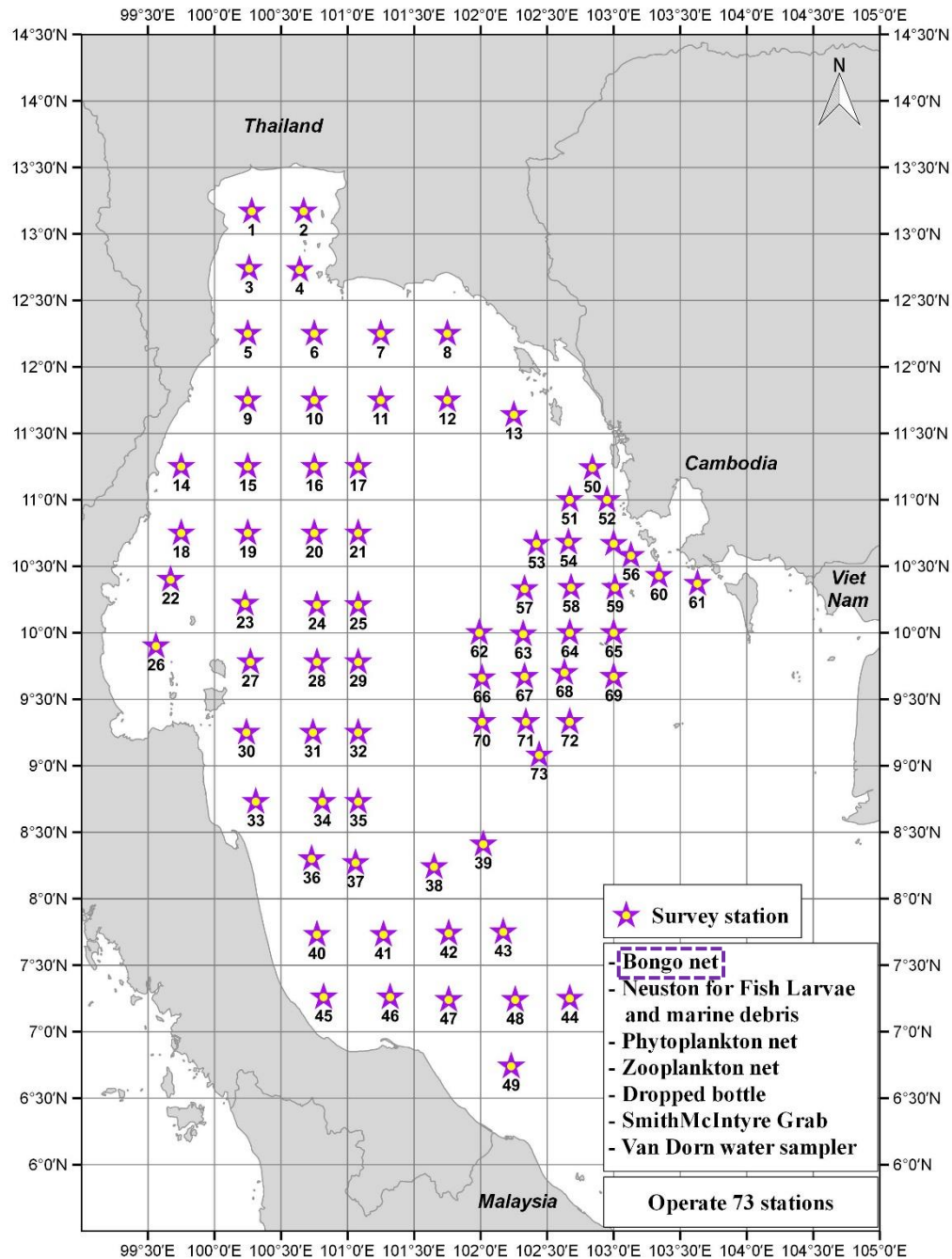




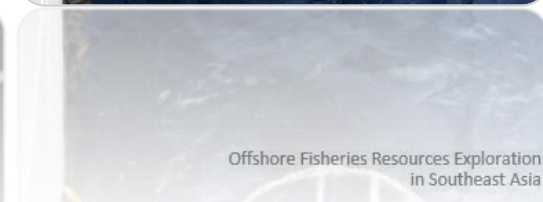
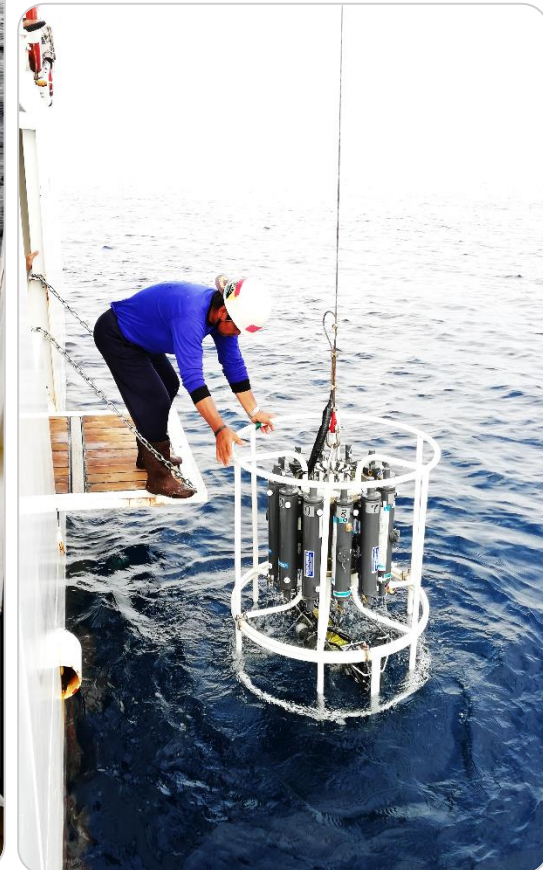
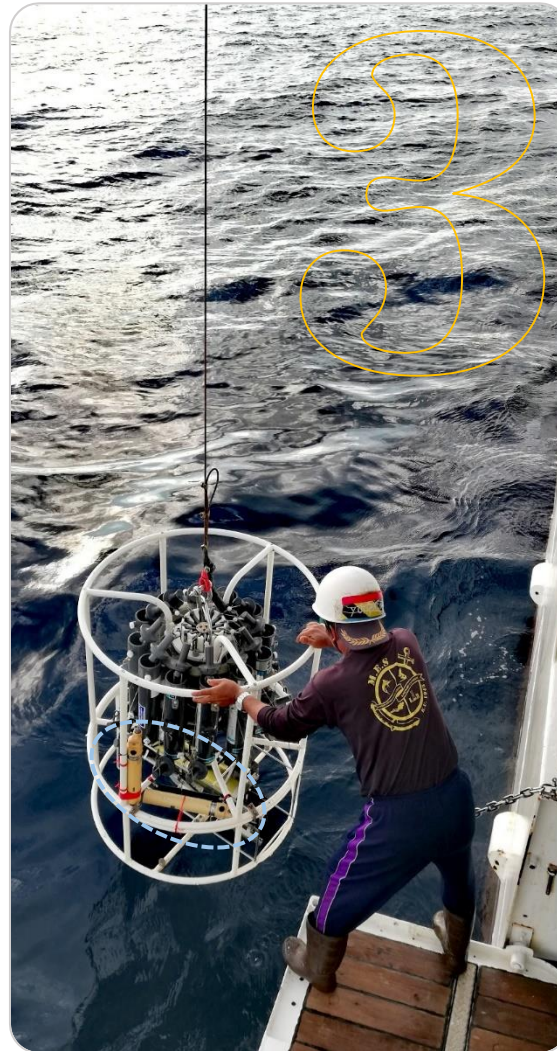
Bongo Net



SEAFDEC



CTD



STD/CTD - model SD204

with multi-parameter & auto range facilities

- Salinity
- Temperature
- Sound velocity
- Turbidity (auto range)
- Conductivity
- Depth
- Oxygen
- Fluorescence (auto range)



SD204



SD204 in transport/carrying case



SD204 with computer monitor

Features:

- Compact & robust design
- Long-term stability sensors
- High memory capacity
- Sonar equipment compatibility
- Year-long battery capacity
- Depth to: 6000 meters
- Windows based software
- Output in physical units
- On-line plotting
- Auto range for turbidity & fluorescence

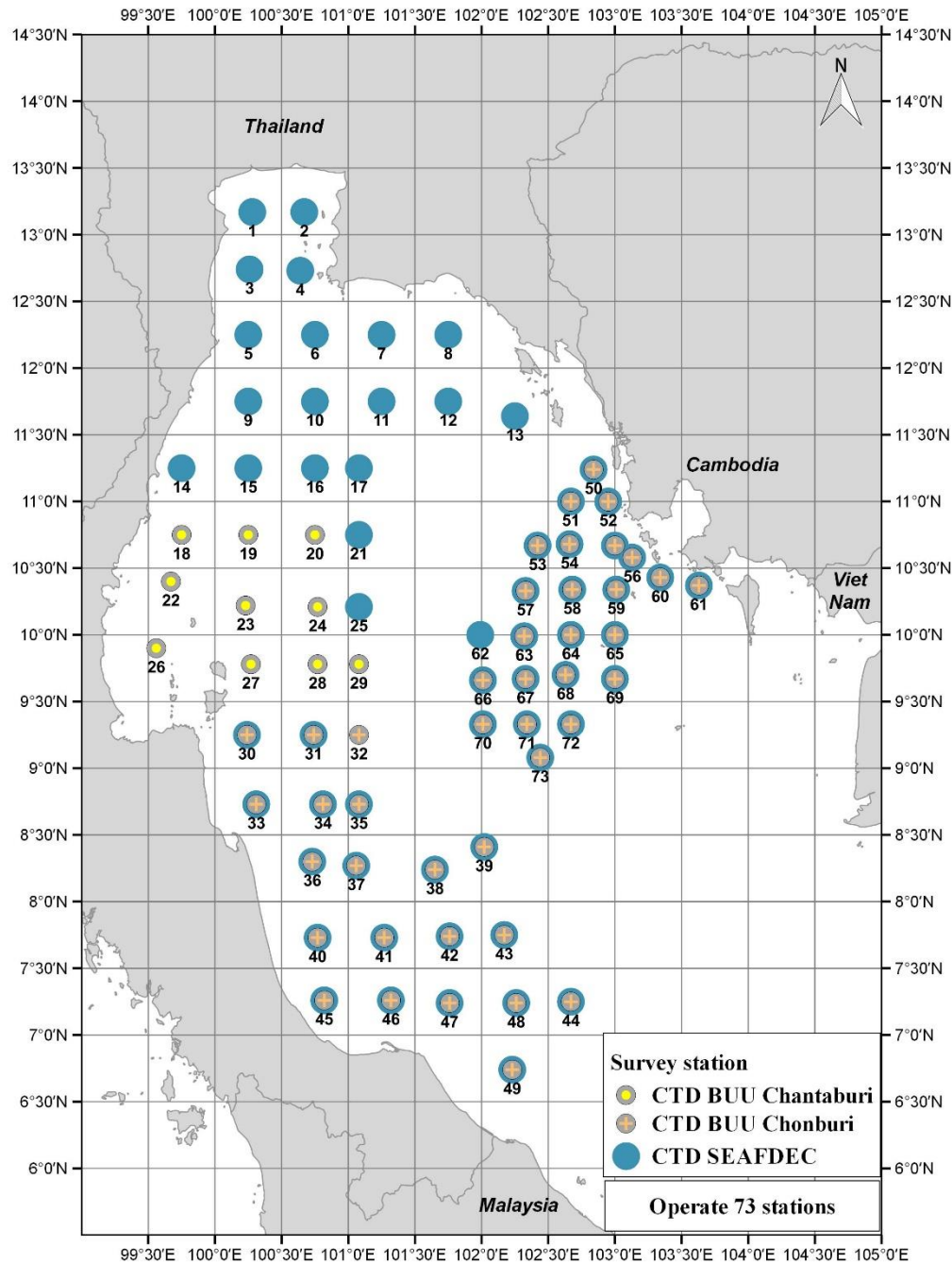


SAIV A/S Environmental Sensors & Systems

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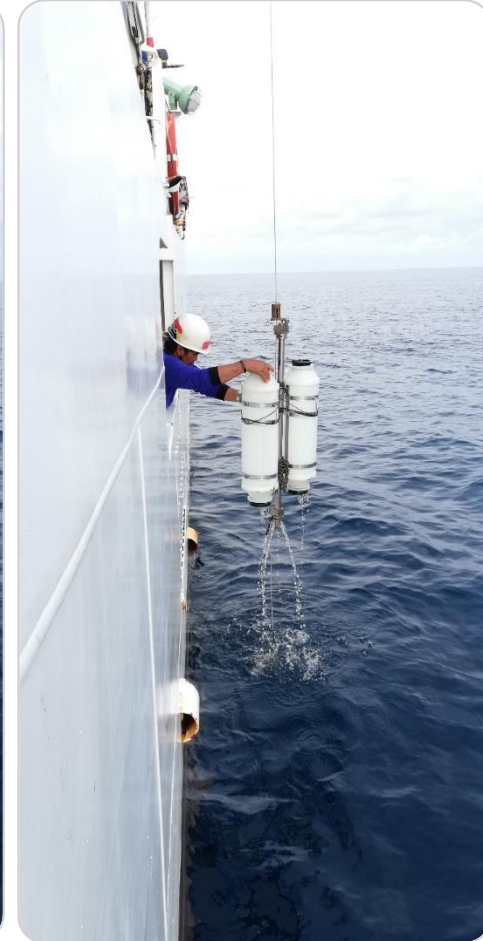
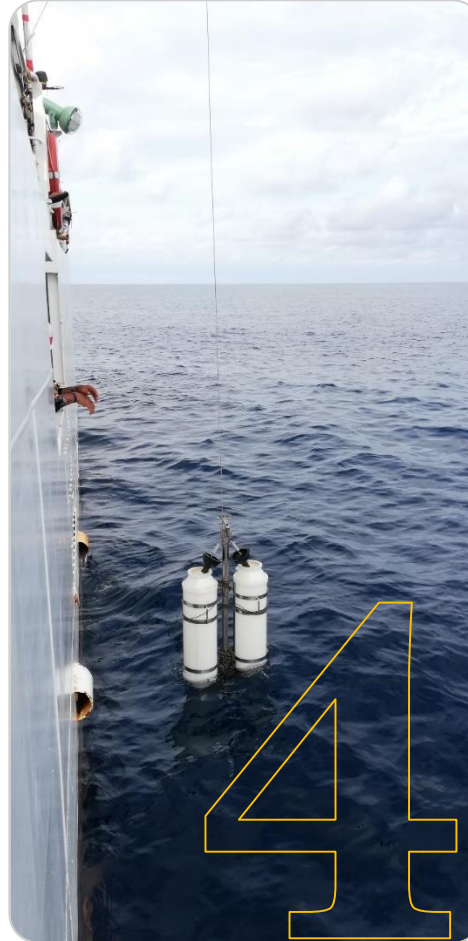
Van Dorn

KU

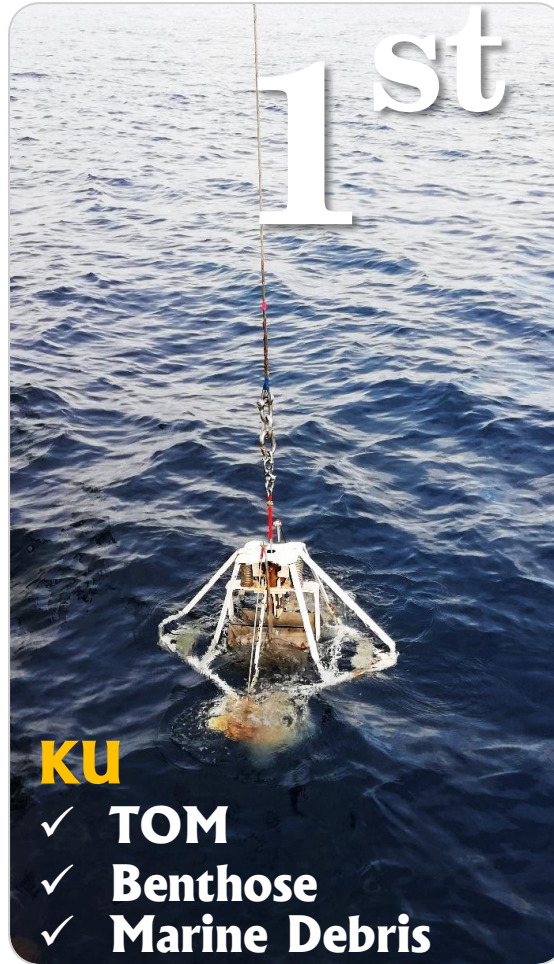
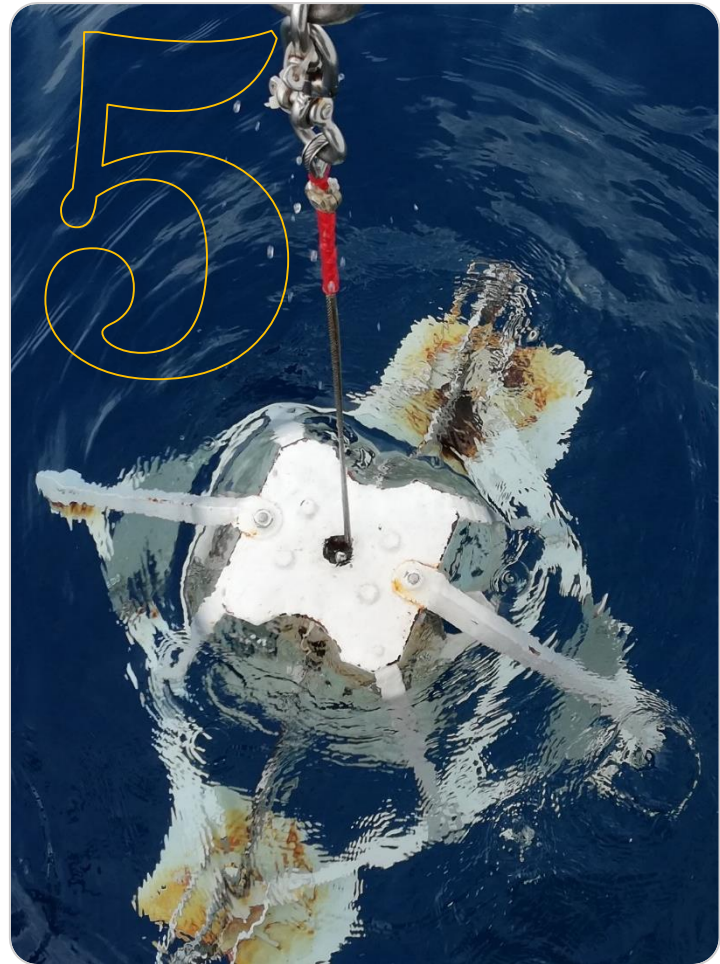
- ✓ Chlorophyll-max Layer
- ✓ CDOM
- ✓ Nutrient



Phytoplankton



Smith McIntyre Grab



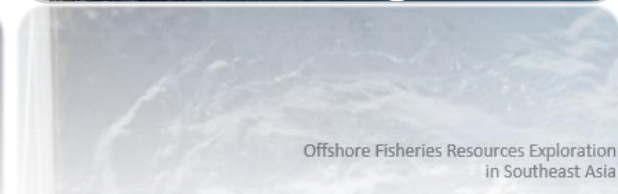
KU

- ✓ TOM
- ✓ Benthose
- ✓ Marine Debris

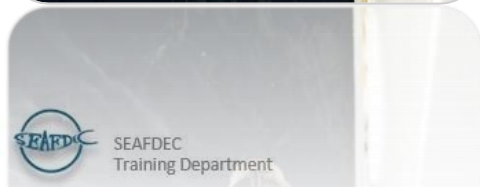
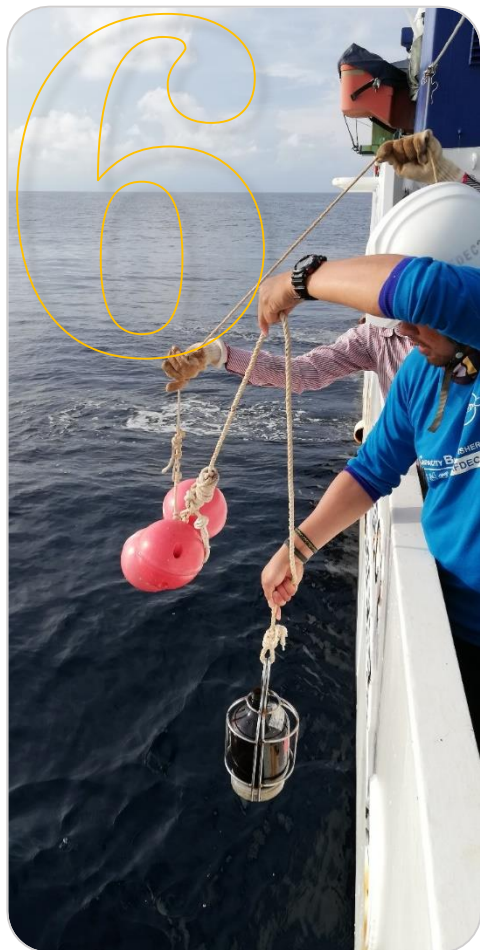


CU

- ✓ Meiofauna
- ✓ Microbiome
- ✓ PAH_s
- ✓ Sediment grain size



Dropped Bottle



Zooplankton and Phytoplankton (Vertical)



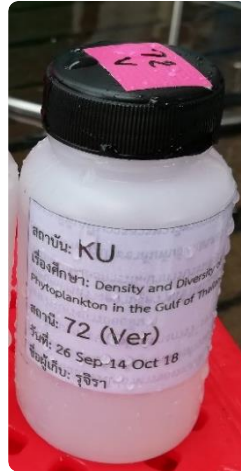
BUU

✓ Zooplankton



KU

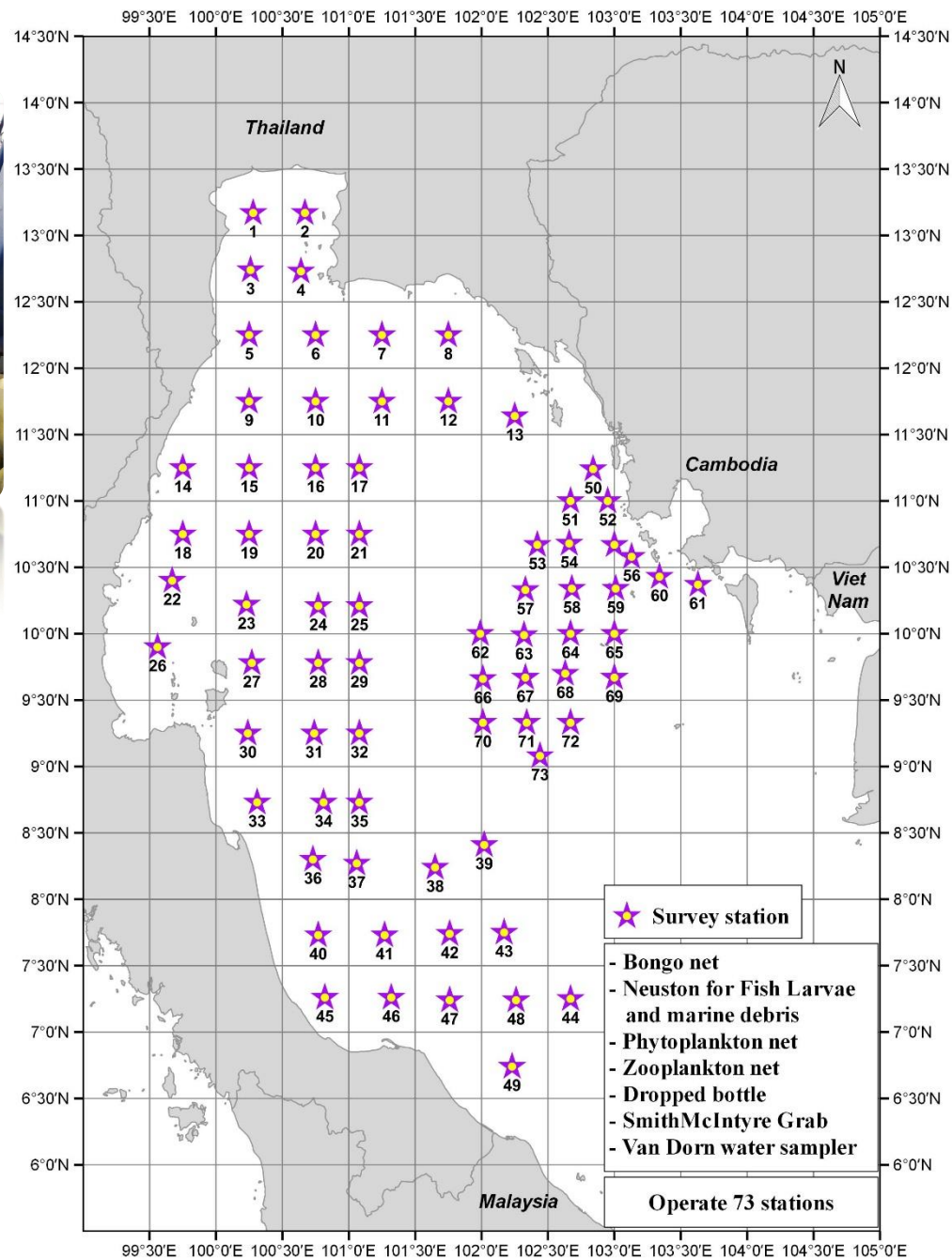
✓ Phytoplankton



9



Secchi disk

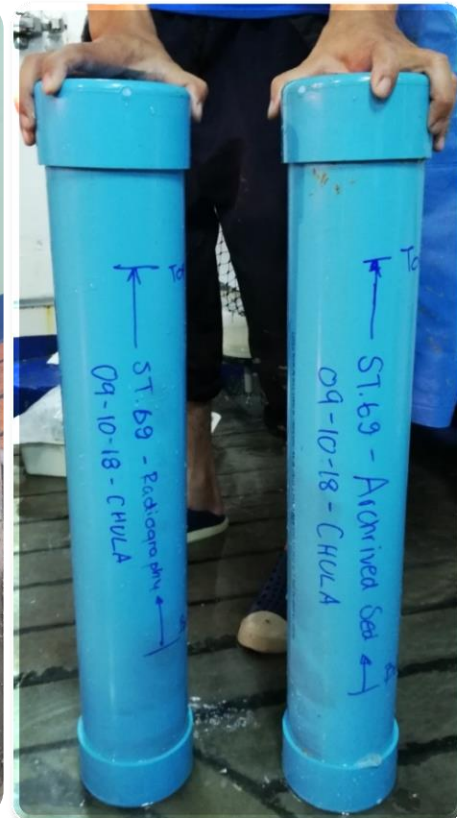


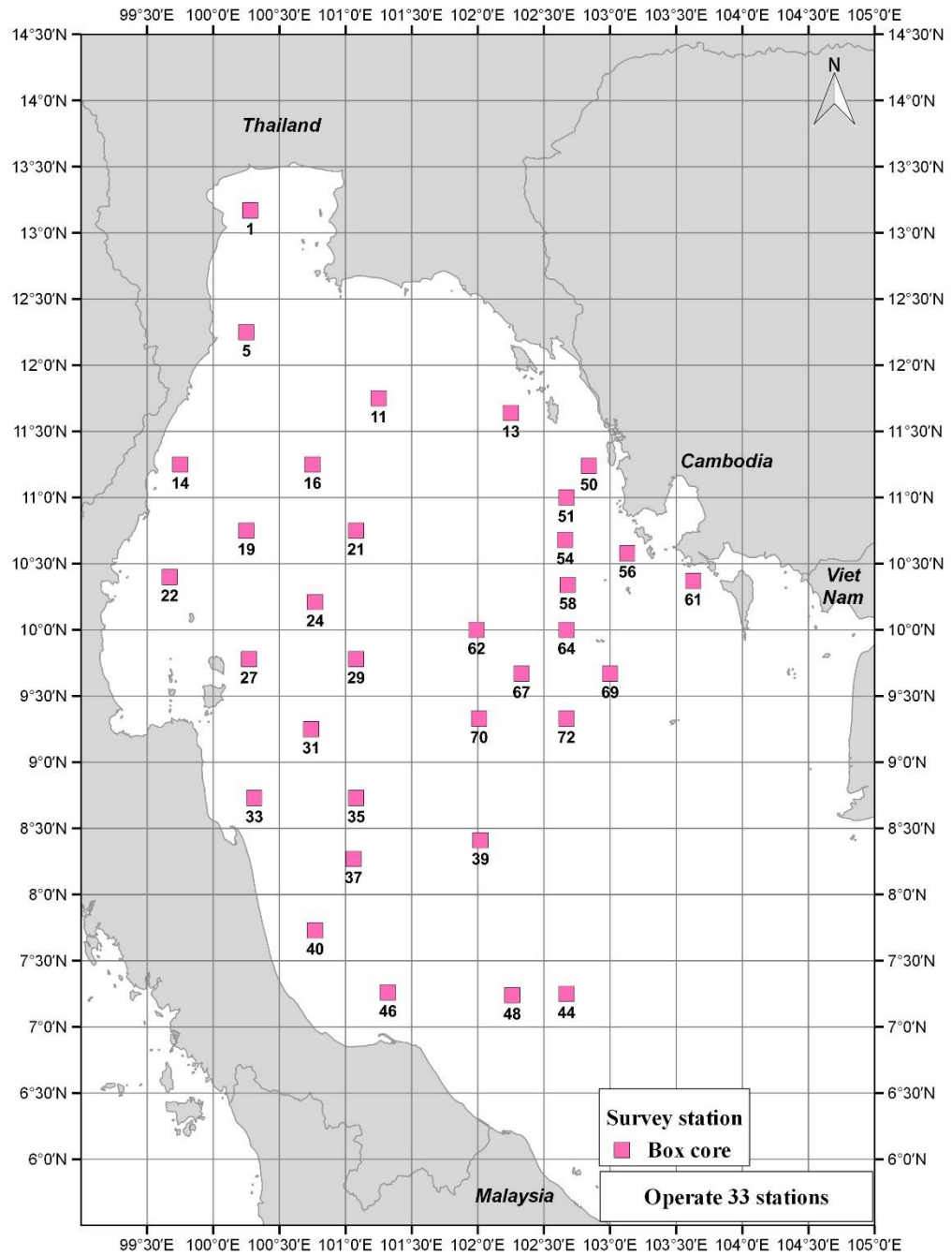
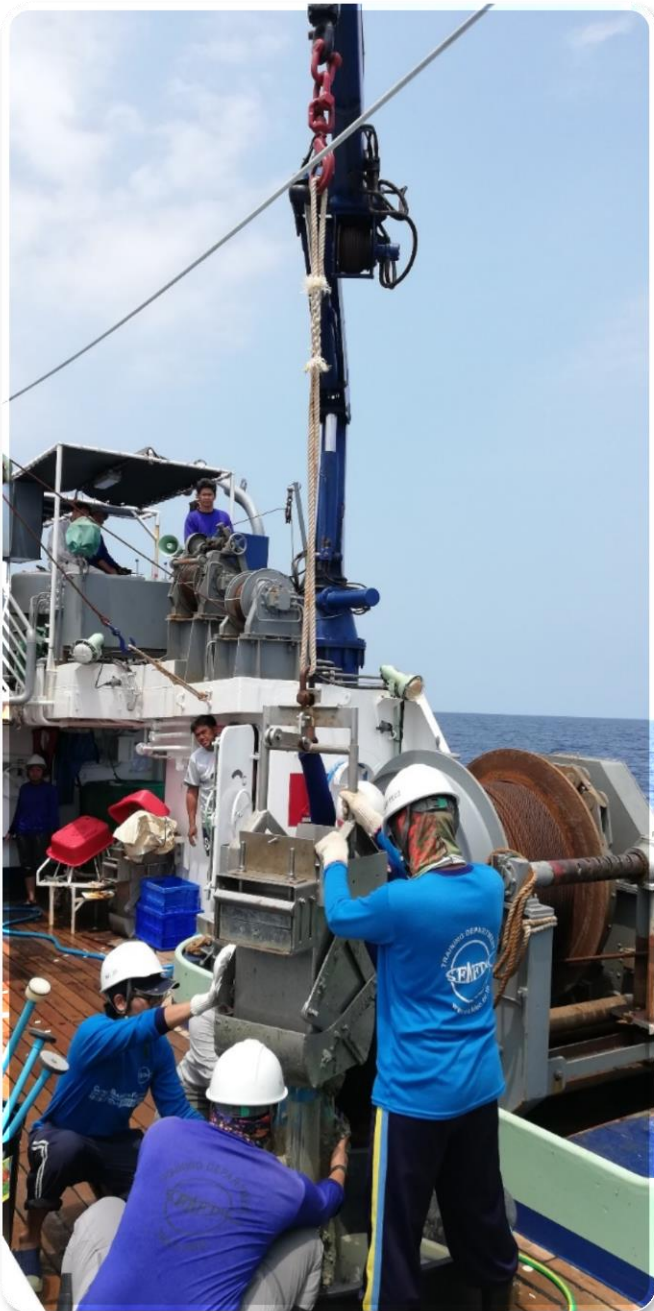
Box Core

10

CU

- ✓ Sediment profile
- ✓ Radiography

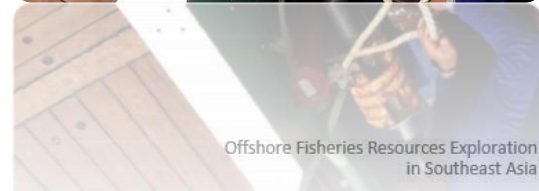
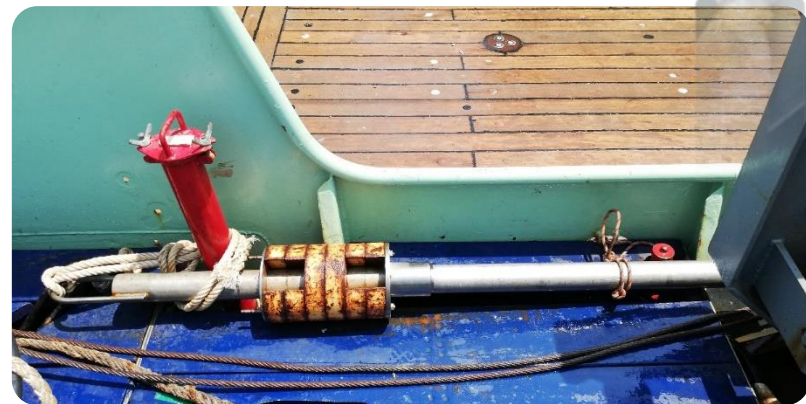
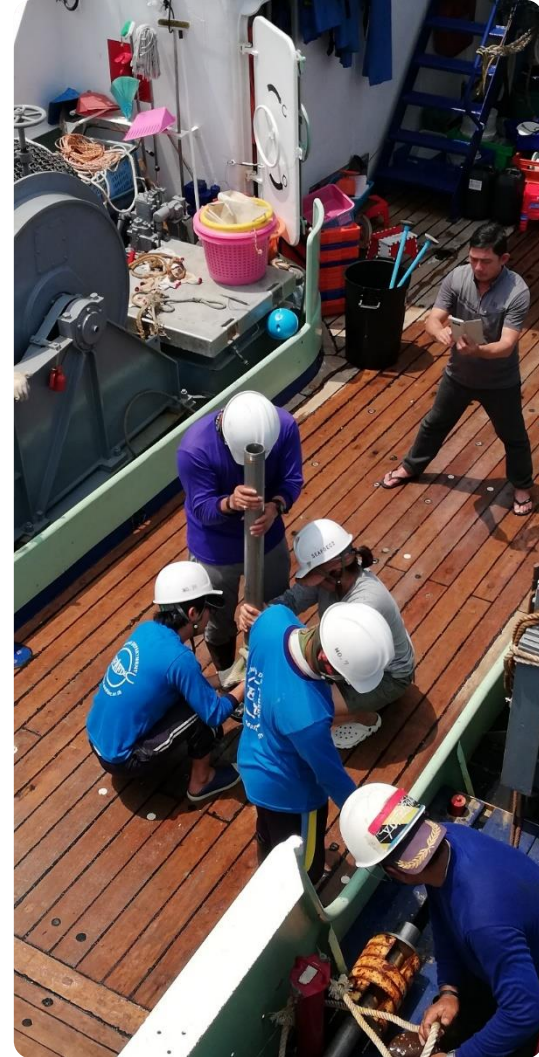


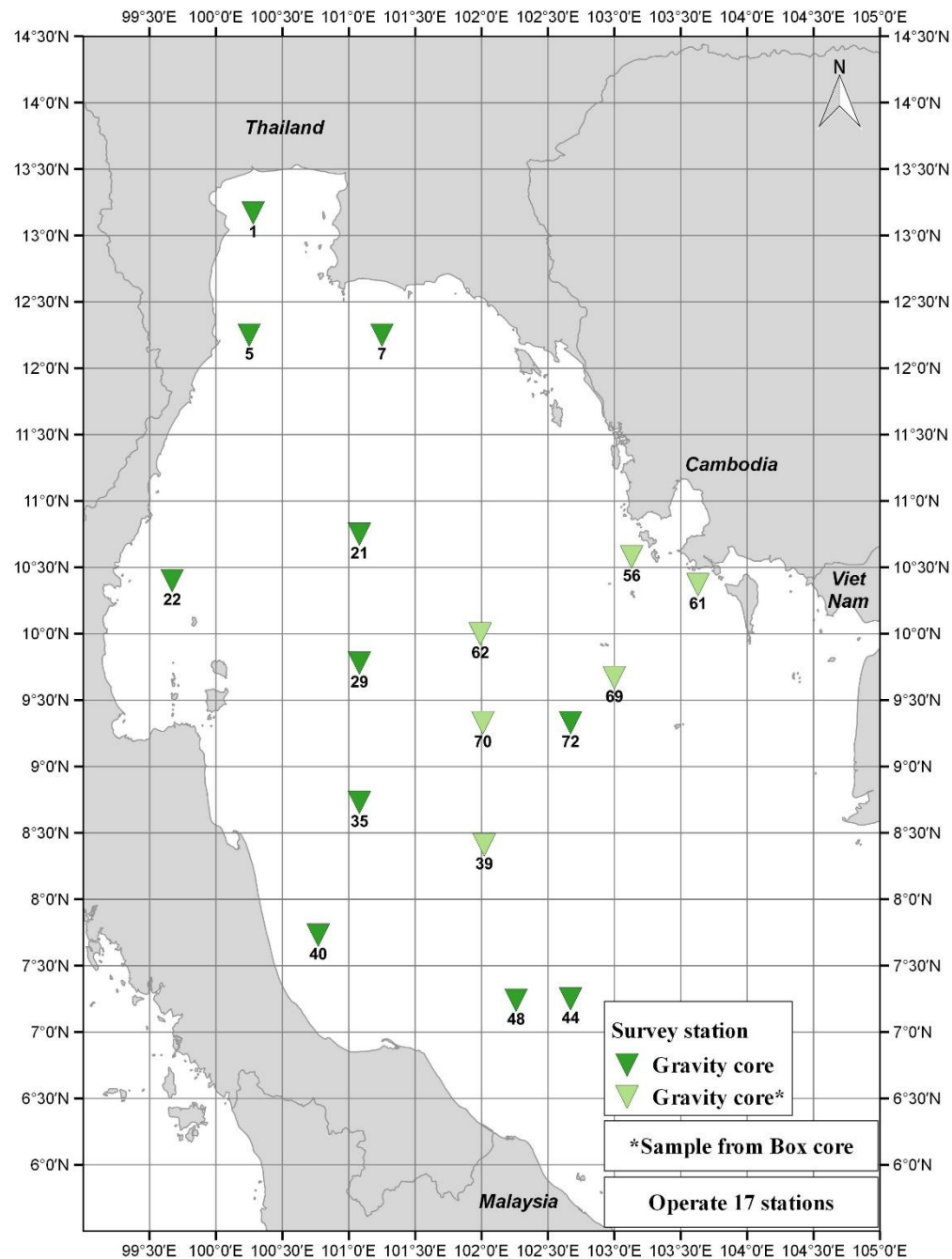


Gravity Core

CU

- ✓ Sediment properties
- ✓ Sedimentation rate
- ✓ Mercury and trace metal study

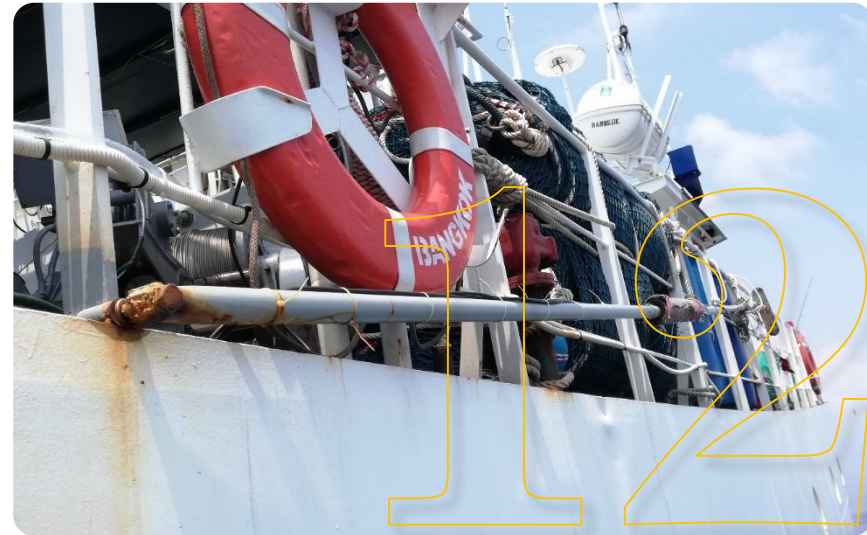
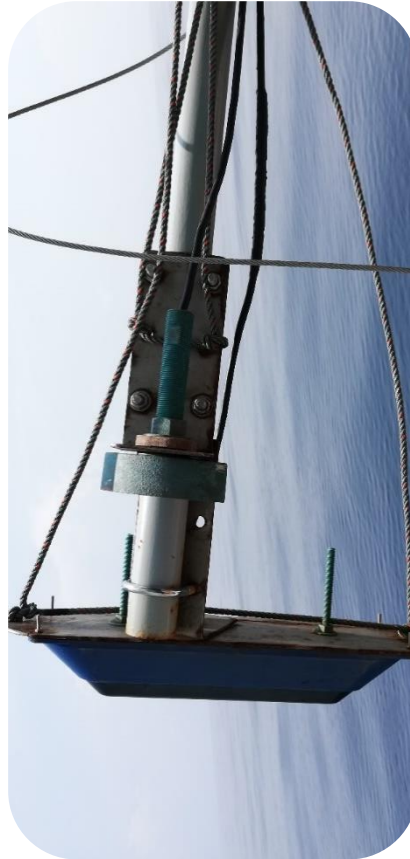


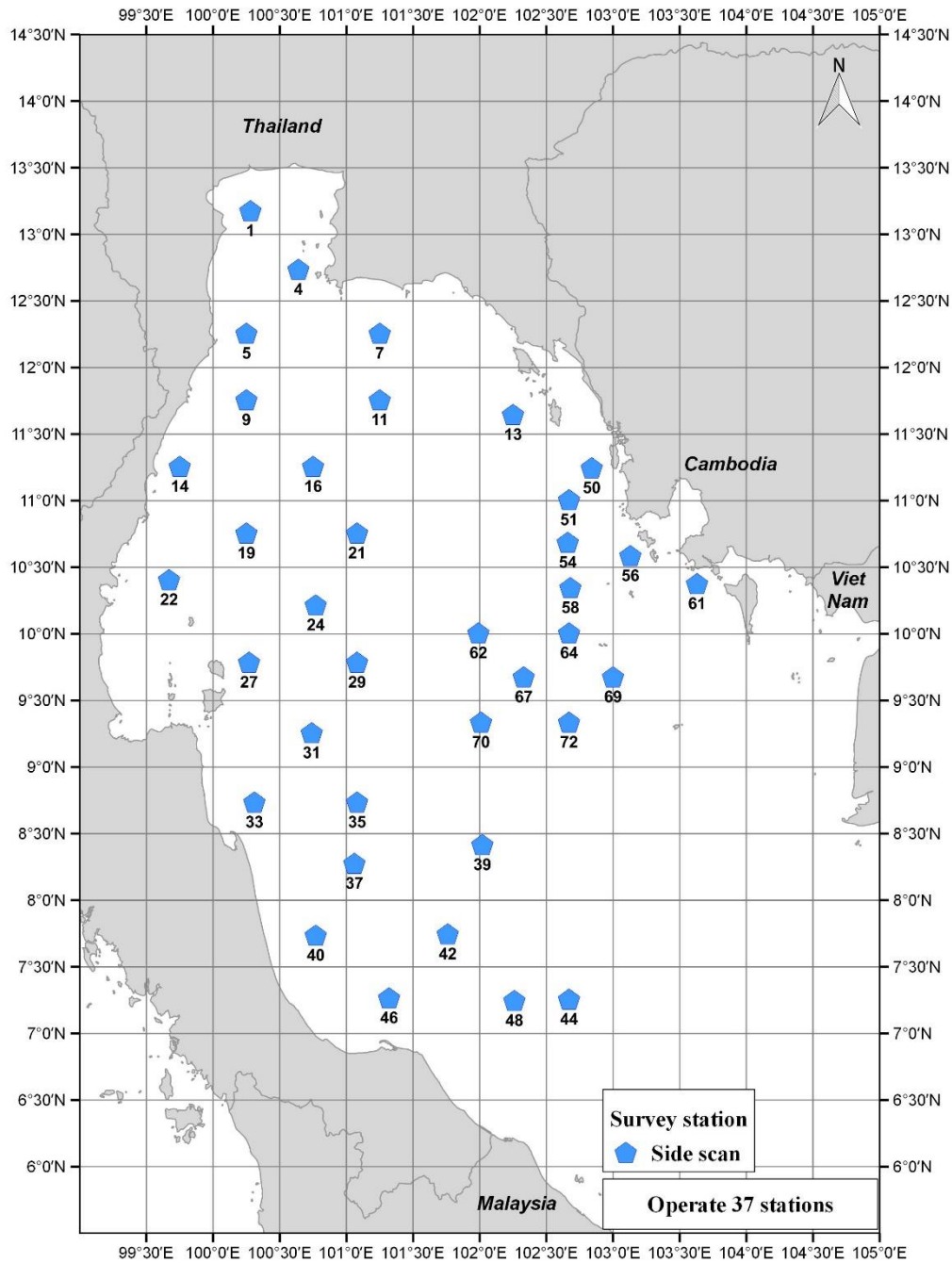


Structure Scan

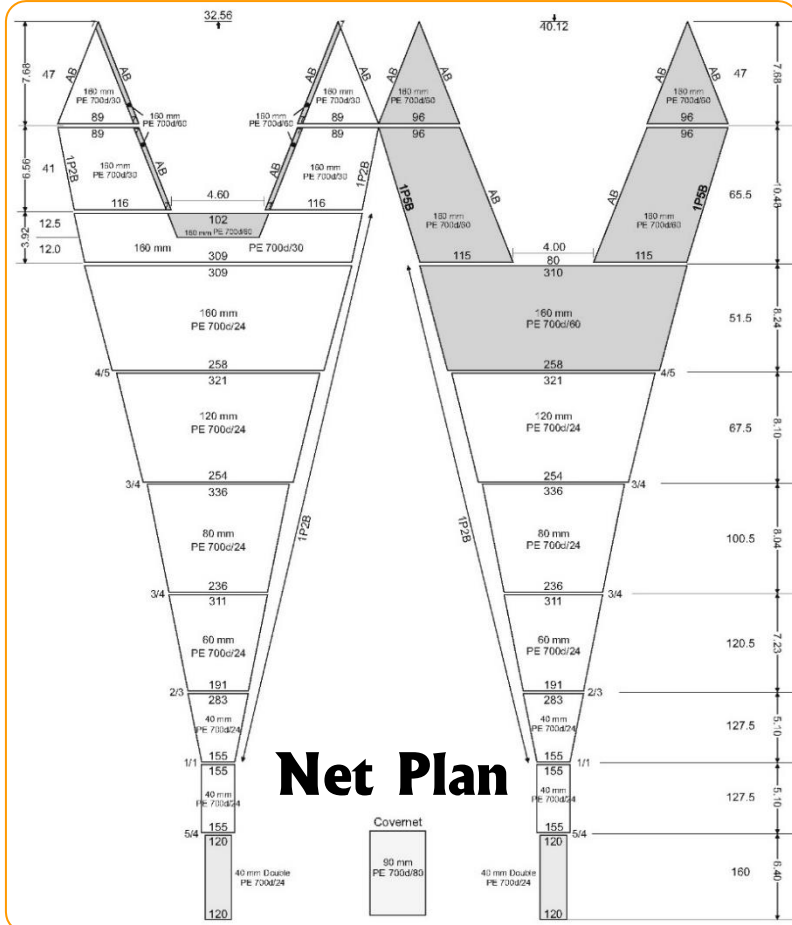
Lowrance Model HDS9 Gen 2 Touch


- ✓ 3-4 knots speed of vessel
- ✓ Zigzag track for 10 minutes

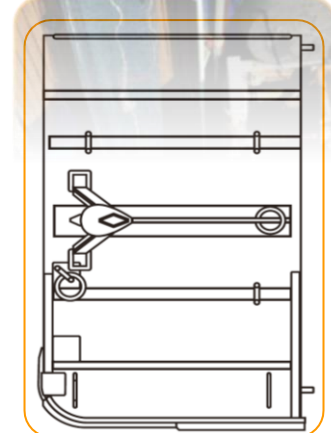




Trawl Fishing Operation



- Otter board trawl
 - Head rope 32.56 m
 - Ground rope 40.12 m
 - Length 66.37 m
 - Codend 40 mm
- 
- Otter board 1400x2200 mm



Trawl Fishing Operation



Checking for the Net Mouth Opening

13



Port side

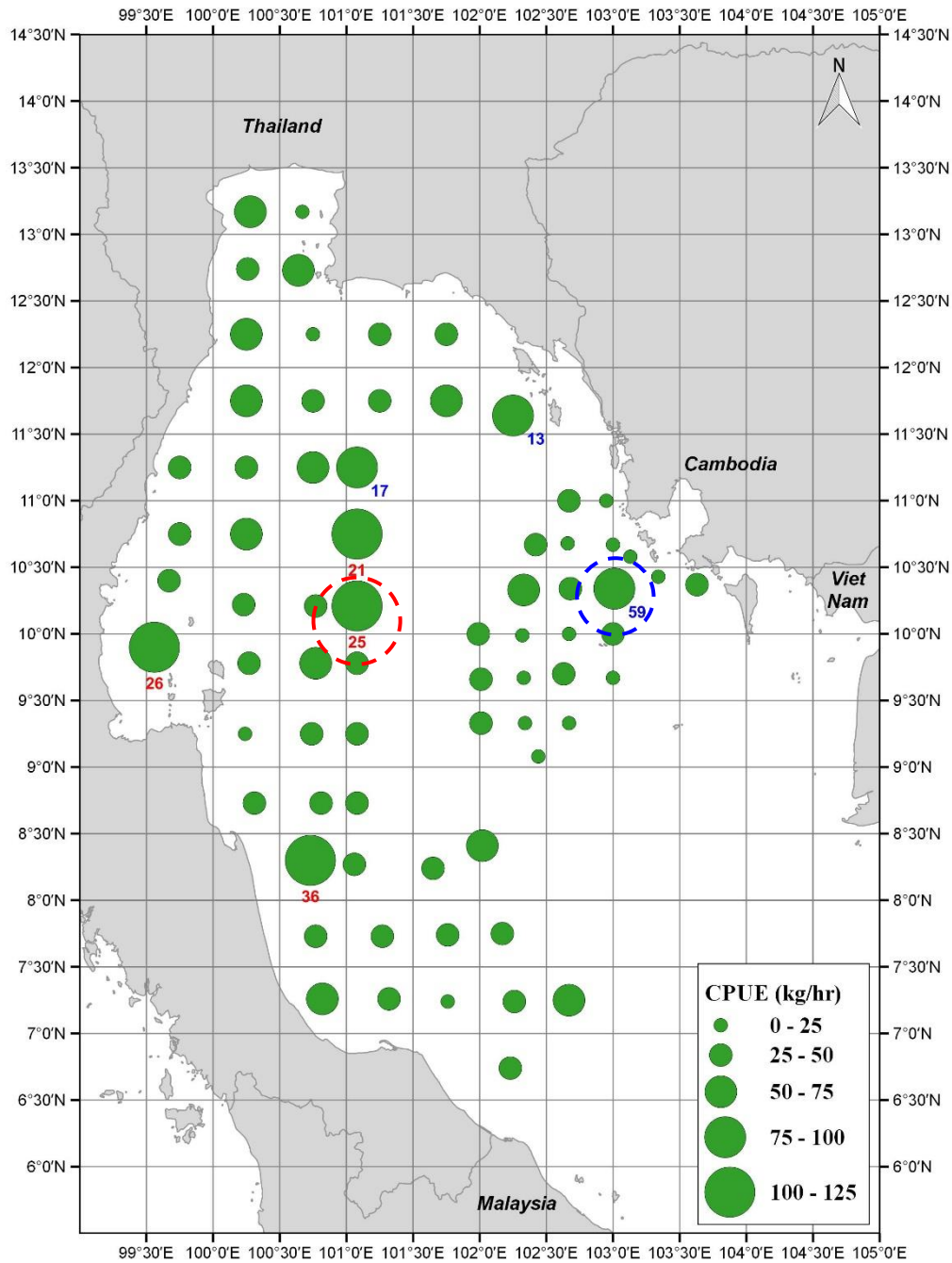
Warp Wire Repairing

Starboard side



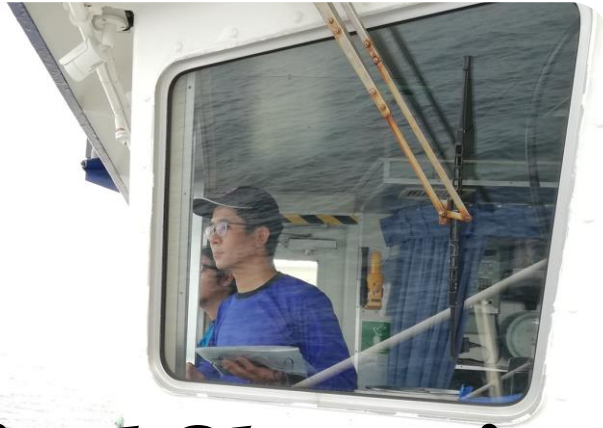
Buoy Replacement





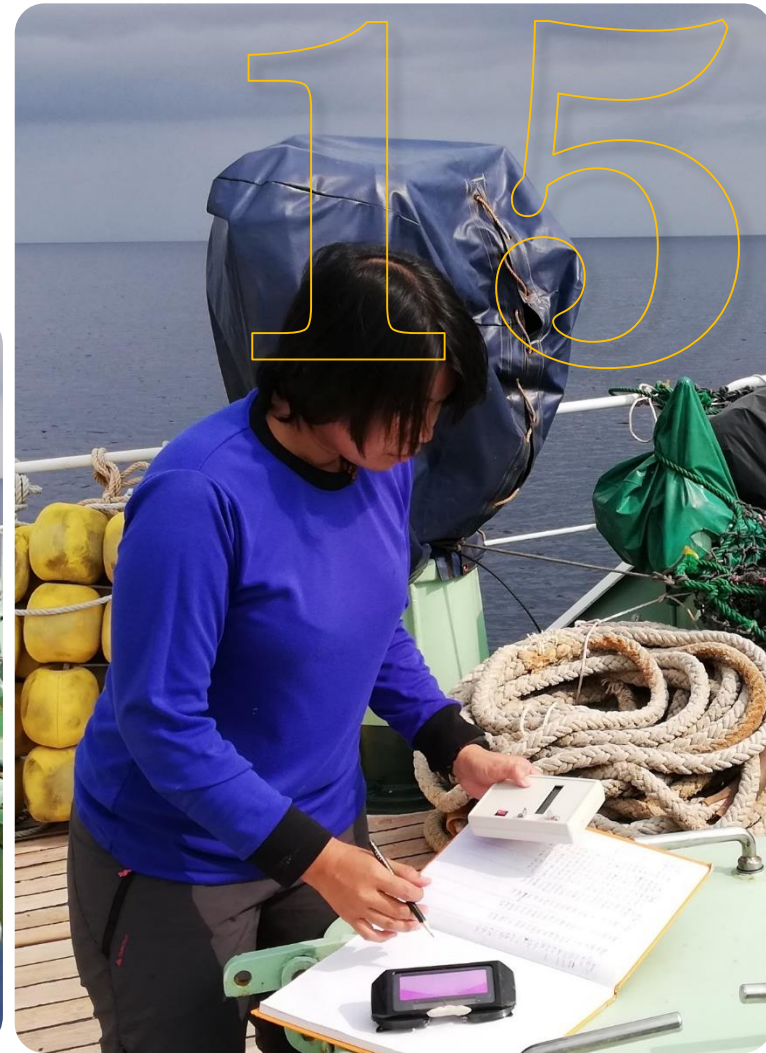
14

Marine Debris Visual Observation



Hand-held Sun Photometer

✓ Dust measurement



Survey Activities: Ship Route

Total survey stations conducted

➤ Thailand waters

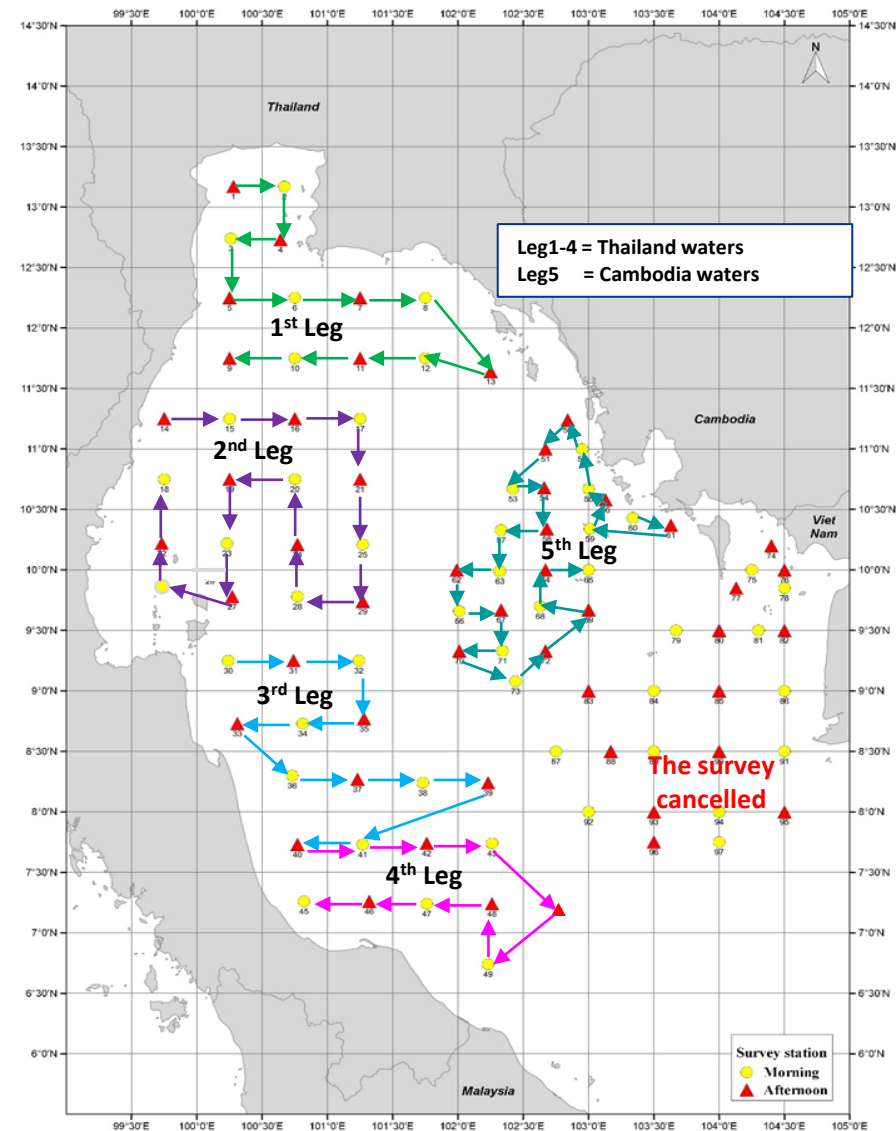
17 August – 27 September 2018

49 stations operated (St.1 – St.49)

➤ Cambodia waters

1 – 10 October 2018

24 Stations operated (St.50 – St.73)



Survey Activities: Summary Activities

Leg survey	Number of survey station	Trawl Fishing	CTD with Rosette	Vandorn	Drop Bottle	Smith McIntyre	Box core	Gravity core	Bongo Net	Neuston Net	Zooplankton net	Structure scan	Bucket surface	Hand-held sun photometer	Marine Debris
1 st	13	13	13	13	13	13	6	3	13	13	13	13	13		
2 nd	16	15	5	16	16	16	8	3	16	16	16	16	16		
3 rd	12	12	11	12	12	12	6	3	12	12	12	12	12		
4 th	8	8	8	8	8	8	3	3	8	8	8	4	8		
5 th	24	23	24	24	24	24	12	1	24	24	24	12	24	★	★

★ ; Operated every one hour during the day time (8:00 a.m. to 5 p.m.)

★ ; The observation conducted when the ship sailing during the day time

Expected Outputs

Description	Responsible Agency
Cruise Report	SEAFDEC
Technical Papers (41 topics)	Researcher in collaborative agencies and SEAFDEC
The Gulf of Thailand Proceeding	SEAFDEC
Regional Symposium	SEAFDEC

Expected Scientific Information

• Fisheries Resources

- ❖ Abundance of the benthic marine resources
- ❖ Biodiversity of the benthic marine resource
- ❖ Influent of environmental factors to distribution fisheries resource
- ❖ Spawning ground and season

Rastrelliger brachysoma (Short Mackerel)

Rasterlliger kanaguta (Indian Mackerel)

Saurida elongate (Lizard fish)

Saurida undosquamis (Lizard fish)

Sardinnella gibbosa (Sardine)

Priacanthus tayenus (Spotted-bigeye fish)

Nemipterus hexodon (Threadfin bream)



Expected Scientific Information

• Physical Oceanography

- ❖ Water characteristic
- ❖ Water stratification
- ❖ Influence of the South China Sea (SCS) on water column condition and near-bottom hypoxic water
- ❖ Exchange of water masses between the GOT and SCS
- ❖ Water current (*Residual surface current, Geostrophic current and 3 D current*)
- ❖ Sedimentary properties and sedimentation rate
- ❖ Underwater habitat mapping in the Gulf of Thailand

Expected Scientific Information

• Chemical Oceanography

- ❖ Total Organic Matter (TOM) of sediment in the Gulf of Thailand
- ❖ Chlorophyll-a concentration distribution in the Gulf of Thailand
- ❖ Nutrient concentration in water and sediment
- ❖ Petroleum hydrocarbon and polycyclic aromatic hydrocarbon in water and sediment
- ❖ Carbon dioxide flux
- ❖ Mercury and trace metals in water, sediment and marine creature

Expected Scientific Information

- **Biological Oceanography**

- ❖ Abundance and biodiversity of fish larvae, paralarvae, phytoplankton, zooplankton, microcrustaceans, micromollusks, meiofauna and microbiome
- ❖ Distribution and diversity of parasite in bony fish and shark
- ❖ Genetic diversity and population genetic structure of three-Banded mantis shrimp

Expected Scientific Information

- Others

- ❖ Microplastics accumulations in fish, sediment, and seawater
- ❖ Distribution of drifting and bottom marine debris
- ❖ Radiation dose and radiological risk assessment in marine biota and seafood consumers

Thank you for your attention

