

# Impacts of the set-net operation on the seawater and bottom sediment conditions in Rayong, Thailand

**Sukchai Arnupapboon**<sup>1</sup>, Penchan la-ongmanee<sup>2</sup>, Suwannee Chernbamrung<sup>3</sup>, Bandit Yangphonkhan<sup>3</sup> Takashi Yoshikawa and Takafumi Arimoto

1 Training Department, Southeast Asian Fisheries Development Center

2 Marine Technology Faculty, Burapha University

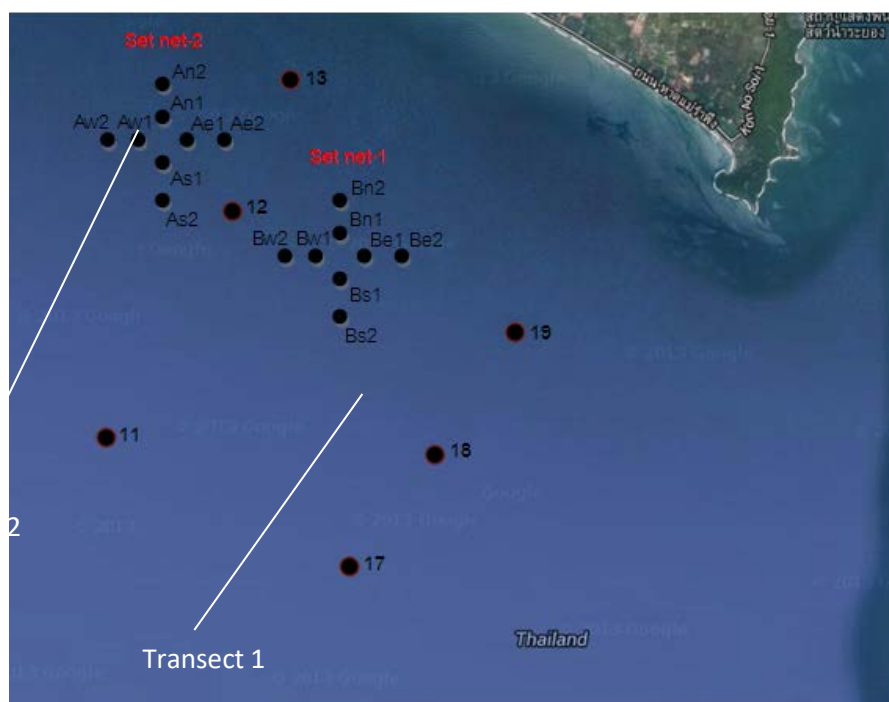
3 Eastern marine Fisheries Research and development center, Department of Fisheries, Thailand

## Introduction

The Research Institute for Human and Nature (RIHN) and Southeast Asian Fisheries Development Center (SEAFDEC) conducted collaborative project aiming to area capability building. Environmental condition survey was one of activities under this project in order to determine impact of set-nets on seawater and bottom sediment condition.

## Materials and Methods

The survey was conducted just beginning of set-nets installation (October, 2013), midterm of installation (January, 2014) and end of set-net installations (April, 2014). The environmental condition surveys were carried out on board M.V. Plalung and Plamong 16. There were 22 survey stations include 8 stations around the set-net number 1, 8 stations around the set-net number 2 and 6 referent stations. Location of the survey stations is shown in **figure 1**.



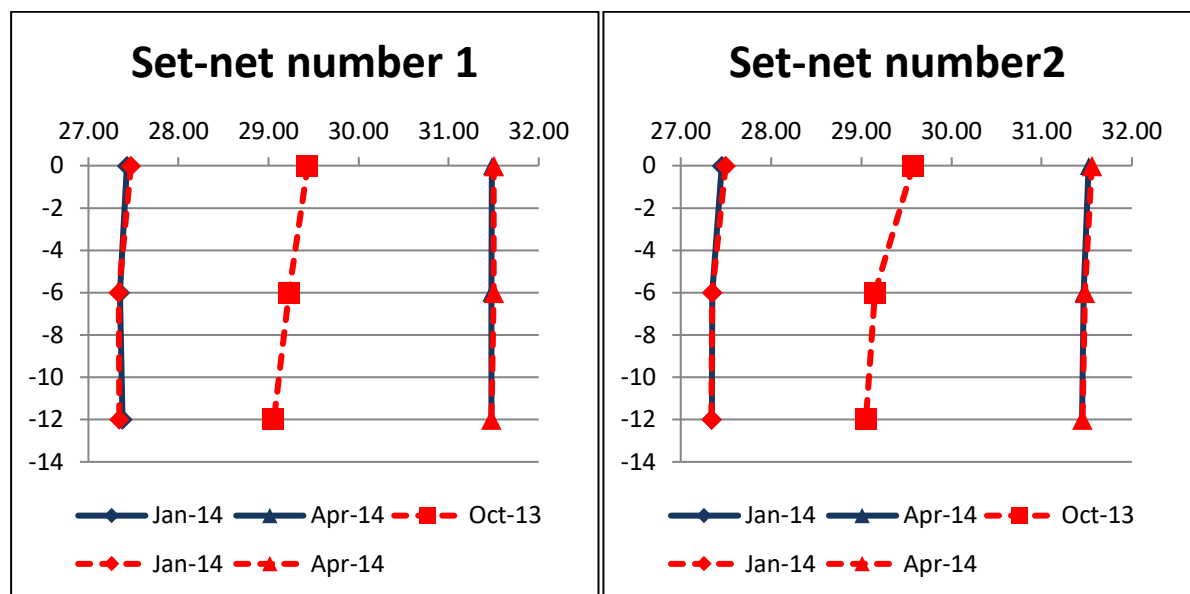
**Figure 1** Sampling stations; An1, Ae1, As1, and Aw1 were at edge of sea-net 2  
An2, Ae2, As2, and Aw2 were 200 m away from edge of sea-net 2  
Bn1, Be1, Bs1, and Bw1 were at edge of sea-net 1  
Bn2, Be2, Bs2, and Bw2 were 200 m away from edge of sea-net 1

## Result and Discussion

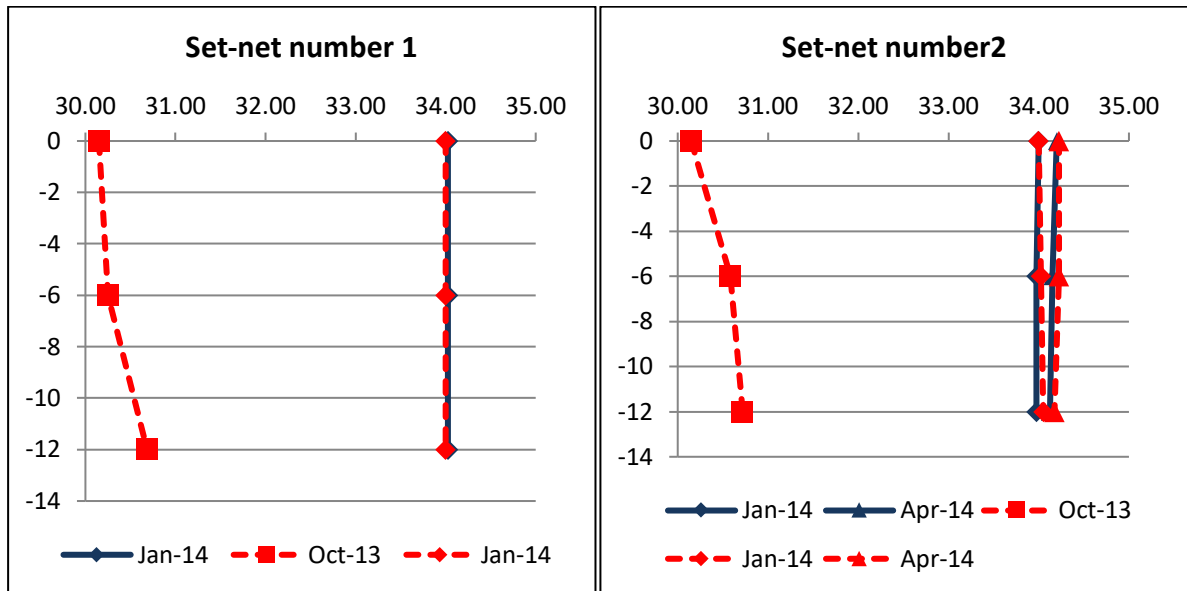
Set-net was constructed in flat area with average depth was 12.5 meter. **Figure 2, 3 and 4** shows average temperature, salinity and pH, respectively, at around each set-net at surface, middle and bottom in the whole period. The results show that the average of water temperature, salinity and pH between edge of set-net and 200 m away from set-net were similar.

During survey period, water was well mix situation in whole water column except in October 2013 when water stratification was weakly developed. **Figure 5** shows that there was low salinity from surface to 5 meter depth. In contrast to insignificant their vertical variations, seasonal pattern can be observed in salinity and water temperature. Water temperatures from surface to bottom of the area was in the range of 30.15-34.23 °C. The highest average water temperature was in April. In January when air temperature was colder than the others, low temperature was also observed. Average salinity at the set-net site was about 33.15 psu. However, in October which is in the rainy season, low salinity water was observed at surface layer (figure 5). This low salinity might be ascribed to out flow from the Rayong River which is west of the set-net site.

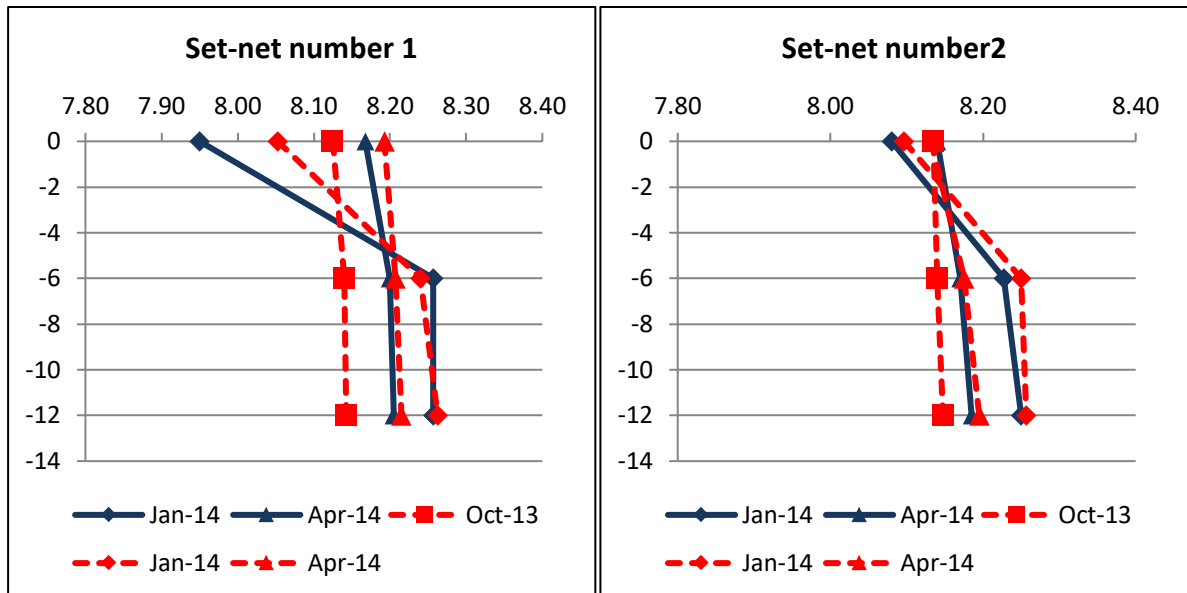
Average pH at edge of set-net and 200 away from set-net ranges from 7.95-8.26. Both the lowest and highest values were found in the same month, January. At this time, ph value at the surface layer was low then suddenly increased at middle layer and slowly increases from middle to bottom layer.



**Figure 2** Temperature profile (°C); Blue line is average temperature at edge of set-net and Red dash is average temperature at 200 m away from edge set-net

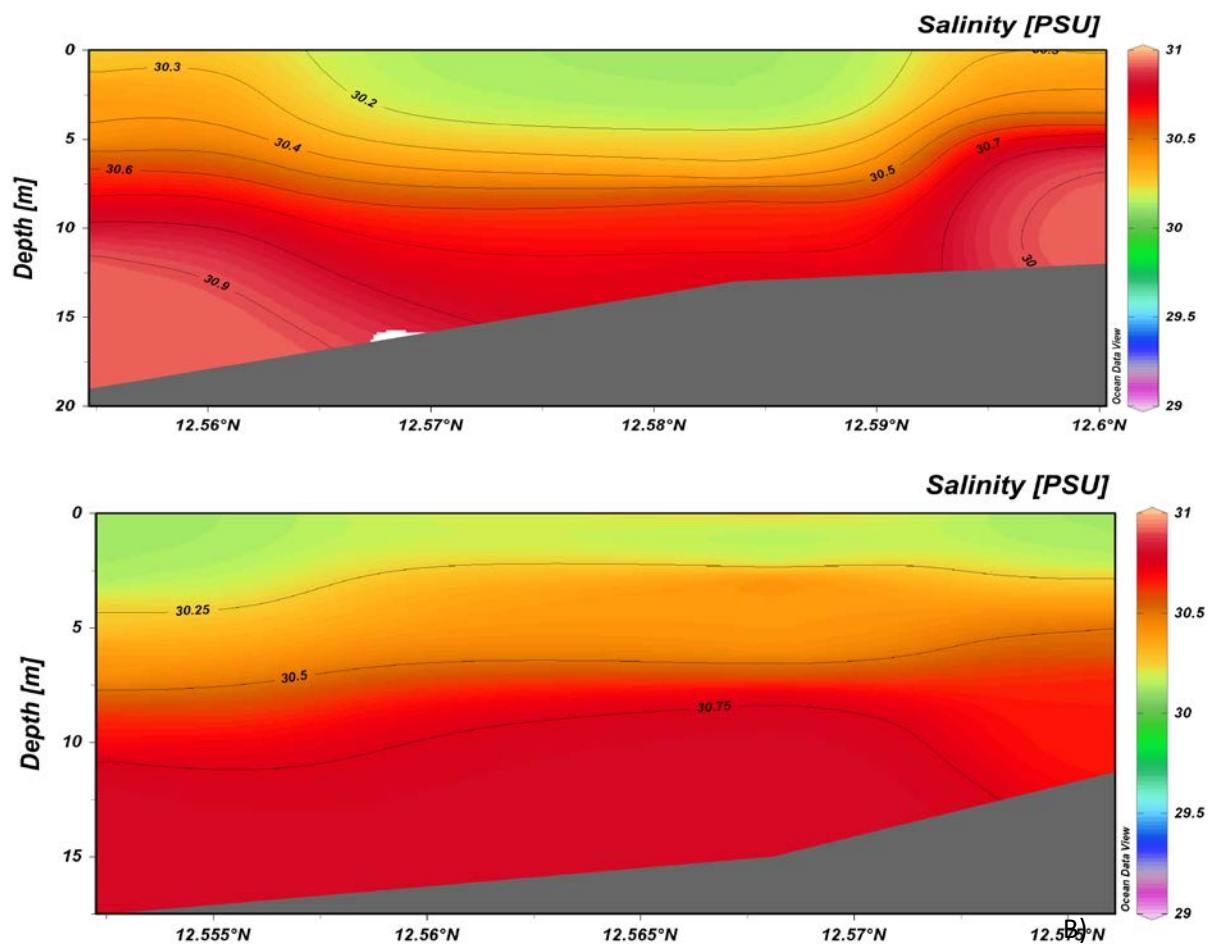


**Figure 3** Salinity profile (PSU); Blue line is average salinity at edge of set-net and Red dash is average salinity at 200 m away from edge set-net

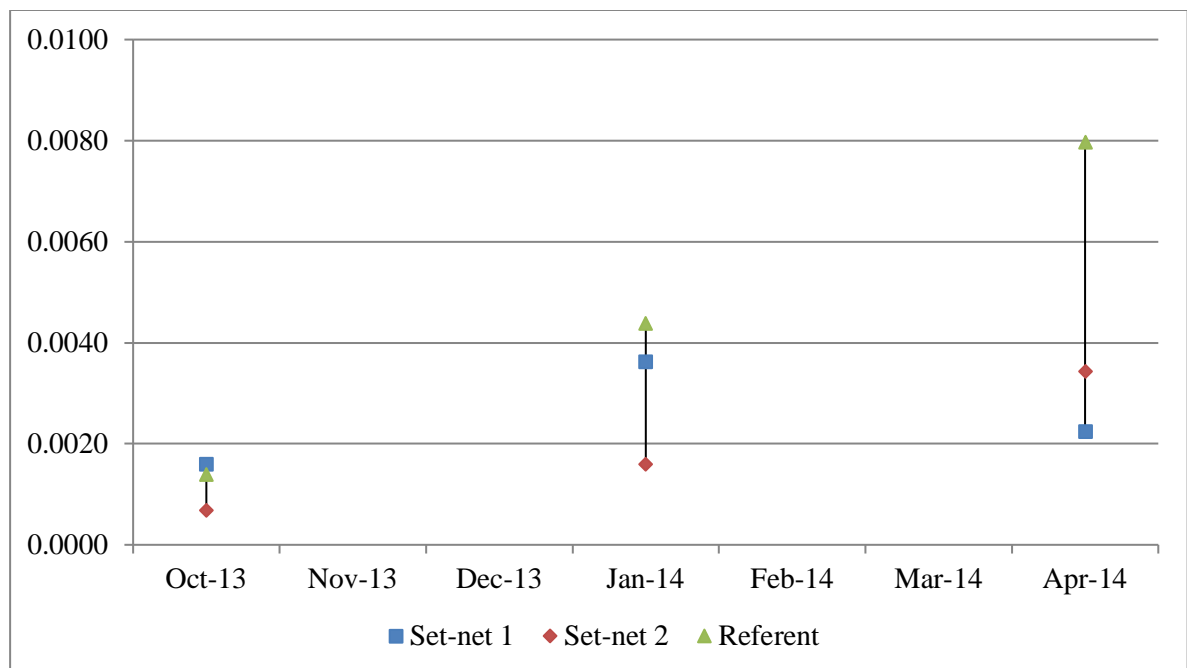


**Figure 4** pH profile (PSU); Blue line is average pH at edge of set-net and Red dash is average pH at 200 m away from edge set-net

**Figure 6** shows the average AVS data of set-net 1, set-net 2 and reference points. All AVS value showed constantly much lower than the criteria for identifying critical farms (2.5 mg/gdry in Yokoyama 2003). AVS in the set-net stations increased with set-net operations (0.0011±0.018 mg/gdry in 13Oct, 0.0016±0.0024 in 14Jan, 0.0034±0.034 in 14Apr), however, the differences were small compared with SD. The results of statistic t-test show that there was no significant difference among 3 month beginning of set-nets installation (October, 2013), midterm of installation (January, 2014) and end of set-net installations (April, 2014). Additionally, non-paired t-test show that no significant difference between set-net station and reference stations.



**Figure 5** A) Salinity transect 1 and B) salinity transect 2 in October 2013



**Figure 6** The average AVS data of set-net No.1, set-net No.2 and reference point

## **Conclusion**

Base on the first year monitoring results, no significant impact of the set-net operation was observed in marine chemical and physical parameter because of 2 reasons. Firstly, results of water quality profile between edge and 200 m away from set-net showed similar value in whole survey period. Secondly, AVS around set-net among 3 month beginning of set-nets installation (October, 2013), midterm of installation (January, 2014) and end of set-net installations (April, 2014) was non-significant different. However, in order to make concluding remarks, it is better to conduct one more year monitoring for checking year to year variation.