

## Role of the Rapporteur

The rapporteur takes notes for highlight(s) of each presentation and the ensuing discussion.

The rapporteur finalizes the session summary shortly after the session and sent it to the Secretariat (imber@ecnu.edu.cn).

*A suggested template for a written report*

Session Introduction

### **Session 9: Optical remote sensing in the northwest pacific and the central indo-pacific oceans**

Optical remote sensing has become an indispensable tool for studying oceanographic and coastal processes, offering valuable insight into coastal water quality, marine biodiversity and climate-driven changes. The Indo-Pacific and Northwest Pacific Oceans encompass some of the most biologically productive, diverse, and climatically significant regions in the world. With advancements in artificial intelligence (AI) technologies, optical remote sensing is becoming an even more powerful and effective tool for monitoring the marine environment.

Name(s) of Convenor and Rapporteur, number of participants

Convenor : Young-Je Park

Rapporteur : Hee-Jeong Han

number of participants : 12

#### 1. One or two major highlights from each presentation

Oral Presenter 1 (Aida Sartimbul)

- Analyze SST to assess the impact of weather factors, monsoons, and El Niño.
- Conduct long-term data analysis and study the effects of rising SST on fish and biodiversity

Oral Presenter 2 (Fang Shen)

- This study focuses on detecting red tides instead of chlorophyll-a (Chl-a) in turbid waters through the analysis of long-term multi-satellite ocean data.
- By applying 26 years of satellite data and artificial intelligence (AI) techniques, we performed gap-filling and phytoplankton species analysis to calculate species-specific concentrations.

Oral Presenter 3 (Hee-Jeong Han)

- We have developed an optimization algorithm that simultaneously performs atmospheric correction and extracts inherent optical properties (IOP) from geostationary ocean satellites observing the Northeast Asia region on an hourly basis.
- By utilizing GPU-based processing, we achieved performance within 3 minutes per slot and ensured product reliability by comparing it with field data.

Oral Presenter 4 (Young-Je Park)

- Detection of *Sargassum horneri* in coastal areas uses high-resolution satellites, and the cycle uses geostationary ocean color satellite or microsatellite clusters.
- Detection of *Sargassum horneri* using SAR is possible, but optical satellites respond more sensitively.

2. One paragraph of session summary

It was a session rich in valuable insights, where researchers presented numerous groundbreaking studies. The session highlighted many promising areas for future research, particularly in the analysis of SST, ocean color, and SAR in regions critical for biodiversity. The potential for AI integration was also discussed, raising expectations for its application in future studies. This development will make satellite remote sensing data more accessible and user-friendly for researchers who are not familiar with satellite technology.

3. Suggestions for IMBeR 3.0 from this session (one or two bullet points):

- ✓ Satellite remote sensing should be considered an essential research tool for future projects studying marine environments and biodiversity.
- ✓ By integrating remote sensing data with field data, model data, AI technology, and researchers' intuition, we can gain valuable insights, including simultaneous wide-area observation information and time-series trend changes.