Geophysical Research Abstracts
Vol. 20, EGU2018-12141, 2018
EGU General Assembly 2018

Detecting Cochlodinium polykrikoides blooms using artificial neural network algorithms in Korean waters

Sinjae Yoo (1,2), Yeseul Kim (1,2), and Young Baek Son (1)

(1) Korea Institute of Ocean Science and Tech, Jeju Center, Korea, Republic Of (sjyoo@kiost.ac.kr), (2) Ocean Science and Technology School

This study is to develop detection algorithms for the blooms of Cochlodinium polykrikoides, which has caused extensive HABs for more than two decades in Korean waters. Various algorithms have been proposed to detect HABs. However, most of those algorithms are empirical and therefore limited in their applicability in the coastal areas where bio-optical conditions are highly variable spatially and temporally. In a previous study, we have shown that the remote sensing reflectance of Cochlodinium polykrikoides exhibits a distinctive depression in the blue-green wavelength band (Kim et al., Optics Express, 2016) based on a large data set of remote sensing reflectance simulated using HydroLight and IOCCG data. Based on this, we are developing neural network algorithms for in-water and satellite applications. We tested two kinds of neural networks: probabilistic neural network and resilient back-propagation neural network. Resilient back-propagation neural network performs better in terms of accuracy and calculation time, although training is more difficult than the former. The success rate for prediction was 0.95 for the simulated in-water remote sensing reflectance and 0.89 for the MODIS versus HAB sighting match-up data. We compare the HAB distribution from MODIS images processed by neural network algorithm and in-situ sighting information.