

Plankton diversity and community structure based on a cabled observatory data

*Gabriel Ruske Freitas¹, Hidekatsu Yamazaki¹, Takeyoshi Nagai¹, Yoshinari Endo³, Rubens Mendes Lopes², Leandro Tíclia De La Cruz²

1. Tokyo University of Marine Science and Technology, 2. Oceanographic Institute, University of Sao Paulo, 3. Tohoku University

Understanding the planktonic community structure is fundamental for the complete comprehension of the ecological and ecosystemic importance of marine life. Due to their tight coupling with –and non-linear response to –the environment, the planktonic community can be used as indicators for environmental changes, which could potentially lead to ecological and economical implications. In this context, a multi-parameter cabled observatory (CO) covering physical, biological and chemical environment was deployed near Habu harbor at Oshima Island, Japan. This CO also included a plankton imaging system and gathered a data set over the time span of two years. Analyses of plankton community composition and alpha diversity were conducted in order to elucidate the local plankton dynamics. The following conclusions were obtained: a. plankton alpha diversity showed a seasonal pattern and decreased towards winter; b. an inter-annual variability in diversity was correlated to a difference in water mass composition; c. the alpha diversity power spectrum density showed a $1/f$ power law signature (“pink noise”) slope, with peaks at a daily frequency that were correlated with zooplankton diurnal vertical migration; d. marine aggregate dominated with at least 75% of the total particle abundance. These findings are novel in the scientific literature and represent the value of a high-frequency observational approach that covers the planktonic ecosystem.

Keywords: plankton, diversity, coastal , cabled observatory

