Monitoring Ocean Microscopic Organic Material: Assessing Large-Scale Ecological Disruption on Annual ChI-a, POC, and PIC Fluctuation Equilibrium

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According to the biodiversity theory, the decrease in piscivore population will result in direct, shrot-term increase in planktivore biomass, reductions in crustacean herbivore biomass, and increase in chlorophyll a concentration and phytoplankton biomass. Put into perspective, when environmental systems are introduced to large-scale disruptions, we can expect a shift of biomass from secondary consumers to primary consumers and producers. This study focuses on the environmental impacts of the Fukushima Earthquake on the lower trophic levels of the Pacific Ocean ecosystem. Through satellite remote sensory (MODIS Aqua-9km), the resulting shifts of chlorophyll a (Chla) concentration and particulate organic (POC) and inorganic carbons (PIC) will be monitored monthly for 2 years prior and after the earthquake. Chla, POC, and PIC concentrations will be converted into average annual mass/biomass. The two data groups will be compared and analyzed with respect to modeled seasonal trends. Annual Chla data shows an overall biomass increase after the earthquake while annual POC and PIC mass decreased. 2-tailed t-tests on datasets from before and after the incident reveals no statistical significance in the numerical difference. Furthermore, only the overall amplitude of the total mass/biomass peaks were noticeably changed. Seasonal distribution and concentration trends were largely unaffected. Given that POC and PIC are most commonly created through fixation of inorganic carbons by organisms of lower trophic levels, the results of this investigation show that the earthquake incident served to slightly increase Chla while lowering overall biological productivity of microscopic organisms in the affected marine ecosystem.

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