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*Complex Dynamics of an NPZ Model Induced by Distinct Zooplankton Loss Terms with Applications to Algal Blooms.*

NPZ (Nutrient-Phytoplankton-Zooplankton) models are relatively simple frameworks for the interaction and population dynamics of the eponymous organisms. One of the central questions in plankton ecology is determining what factors drive these dynamics. We investigate this question in the context of ecological disturbances and algal blooms. Algal blooms can be harmful to aquatic ecosystems, and such blooms are increasing in frequency as the effects of anthropogenic climate change become more profound. Using a family of heuristic models, we suggest biological factors which affect qualitative bloom dynamics. These conclusions are based upon both threshold analysis and simulation studies, which we use to explore the rich dynamics of the family of models, including Hopf bifurcation and forward hysteresis. (Received March 02, 2020)