

Applied Dynamical Systems Seminar

Dr. Yuan Yuan,
Memorial University

Monday, November 3, 2014
10:00 - 11:00 a.m., HH-3026

A non-nitrogen-fixing/nitrogen-fixing phytoplankton growth model with nutrient and light

Abstract:

We discuss a mathematical model of growth of two types of phytoplankton: non-nitrogen-fixing and nitrogen-fixing phytoplankton that compete for light and nutrients, where we use general functional responses to represent the nonlinear interactions between the two types of phytoplankton. We have addressed the threshold properties for survival of different combinations of populations, intrinsic oscillatory behavior and chaotic dynamics with constant mixed layer depth theoretically. On the other hand, we have provided numerical investigation to illustrate the possible bifurcations beyond the thresholds with the variation of key parameters. To show the impact of the seasonal change in water depth, we explore the oscillatory behavior numerically when the water depth is not a constant.