Plankton models – interaction of time-delay and spatial effects

Sue Ann Campbell[1], **Matt Kloosterman**[1], **Francis Poulin**[1]

[1] *Department of Applied Mathematics, University of Waterloo, Canada*
(e-mail: sacampbell@uwaterloo.ca, mkloosterman@uwaterloo.ca, fpoulin@uwaterloo.ca)

We consider a three compartment (nutrient-phytoplankton-zooplankton) model with nutrient recycling. The system is closed, thus the model admits a conservation law for the total amount of biomass. We consider how this conservation law interacts with time delay in the recycling and diffusion. We study the existence and stability of spatially homogeneous equilibria and how this depends on the total nutrient in the system, the type of delay and the strength of the diffusion.