



***Maud Menten Institute /
Mathematical and Statistical Biology Seminar***

Monday, October 19, 2026

2:00pm CT

University of Manitoba – 225 St. Paul's College

-or-

[Join Zoom meeting](#)

Meeting ID: 699 6049 3994

Passcode: 900153

Sue Ann Campbell

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Turing Instability of a Closed Nutrient-Phytoplankton-Zooplankton Model with Diffusion and Time Delay

We study a diffusive nutrient-phytoplankton-zooplankton-detritus (NPZ) model with delayed nutrient recycling. We consider both the case of a general spatio-temporal delay and a specific delay kernel where the model is equivalent to a non-delayed system with an additional compartment. If the diffusion rates for all species are identical, we show that Turing instability is not possible; however, if sufficient biomass is present, complex spatio-temporal dynamics, both transient and long lasting, may occur. If the diffusion rates are different, we show that Turing instability is possible. We study the effect of the diffusion rates and the total biomass of the system on the development of the instability. This is joint work with Francis Poulin, Yiwen Tao, and Xiangye Xu.

In Victoria: Attend the **UVic watch party (12pm PT)** Clearihue A-313

In Edmonton: Attend the **UofA watch party (1pm ABT)** UComm 2-180