

Biomath Seminar:

Dr. Olga Vasilyeva

Christopher Newport University

Thursday, April 10

2:30 pm

Harris 2118

***Note the special day, time and place!**

Population dynamics in streams and rivers

I will give a brief overview of several classical models describing spatial and non-spatial population dynamics. Then we will discuss a model describing population dynamics of aquatic organisms subject to advection. The model offers possible explanations of the “drift paradox” (persistence despite the downstream flow). It is based on a generalization of Fisher’s diffusion-reaction equation involving an extra advection term, and is applicable to a wide variety of organisms. Next, we will discuss models describing the population dynamics of two or more competing species in stream ecosystems. We show that alterations of flow speed can influence the outcome of competition and thereby change community composition. Our analysis shows that at relatively high flow speed, each species’ intrinsic growth rate is the crucial factor that determines the outcome of competition. At low flow speeds, in contrast, the strength of interspecific competition determines community composition. This is joint work with Frithjof Lutscher (University of Ottawa, Canada).