



Colloquium

Wednesday April 24, 2007

1pm Room 08-2130

**“DESIGN AND EVALUATION OF AQUATIC
ECOSYSTEMS VIA DISCRETE EVENT SIMULATION”**

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Environmental issues will continue to be of great importance in the XXI Century. For they affect health, drive production costs up (short and long term) and are felt across borders, making them a global problem. In addition, ecological problems are fairly complex, involving many physical, human and socioeconomic factors that often interact with each other. Therefore, building tractable mathematical models for ecological problems is difficult and often leads to oversimplification of model assumptions. As a result, these mathematical models bear little resemblance with the real problem entities being modeled. In this paper we present an alternative analysis tool for environmental modeling. We propose the use of discrete event simulation, via specialized languages such as GPSS (General Purpose Simulation System). This approach presents several important advantages over purely mathematical ones, for environmental studies. For example, the modeler can now use broader distribution assumptions, in addition to Exponential or Normal. The modeler can now also consider all problem factors and their interactions. There is no longer need to keep the model formulation simple, in order to obtain a closed form solution. These two gains, by themselves, more than justify pursuing a simulation modeling approach.

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