

Research issues in Simulation and Modeling for Eco-Informatics

- **Coupling diverse models** that use different assumptions or definitions, or that represent a wide range of spatial and temporal scales
- Addressing **Values in Design**: eco-informatics and modeling both have strong value implications. How can we design, build, and use models in a way that approaches these value/system interactions in a principled way and that makes sense to the diverse set of stakeholders?
- Investigating new or improved **visualizations** for model results, but also model structure, assumptions, processes and influences
- **Representing error and uncertainty**: in particular, how do errors and uncertainty propagate through diverse coupled models, operating at widely different spatial and temporal scales; and how to best communicate this information to decision-makers
- Handling **Large data sets** and related performance challenges
- Developing an **open-source modeling infrastructure**, that is flexible and reusable, along with the social practices that sustain it

Sustaining Research on Ecological Simulations and Models

- Proposal: develop an open-source modeling infrastructure, that is flexible and reusable, along with the social practices that sustain it
 - Supports a community of practice and helps expand it
 - Possible analog: the R statistical system
 - Need good descriptions of the models so that people can evaluate what parts are suitable for their application; useful and up-to-date documentation and tutorials
 - To help sustain this, include contributing to the shared community infrastructure as one of the criteria by which proposals to other NSF programs will be evaluated
- Scenarios of use
 - Allow researchers to conveniently experiment with a new model or change an existing one. Plug into an existing infrastructure (and possibly data)
 - Facilitate comparing alternate models
 - When feasible, other stakeholders (decision-makers, students, ...) should be able to access models via a web interface