

# 8th International Congress on Environmental Modelling and Software (iEMSs)

## Announcement and call for contributions

### Session

## Complexity, Sensitivity, and Uncertainty Issues in Integrated Environmental Models

San Diego, California, USA

June 15-19, 2014



#### Organization

Colorado State University  
USDA-ARS-NPA, Agricultural Systems Research  
University of Bristol  
University of Palermo



## Introduction to the Session

The purpose of this session is to provide a forum for a set of presentations focusing on **complexity, sensitivity, and uncertainty** issues in **integrated environmental models**.

The session offers an opportunity for:

- 1) investigating what **complexity** and **uncertainty** mean for models and the way we approach modeling, i.e., how do we meet the **challenge** of solving **modeling problems** where time delays, feedback loops, non-linearity, and system interconnectedness increase complexity and make prediction particularly difficult;
- 2) increasing awareness of the significance of various **sensitivity and uncertainty analysis techniques** in the development and application of integrated environmental models;
- 3) discussing and critically evaluating the contribution of these techniques to improved **modeling of environmental systems**.

Objectives include communicating state-of-the-art information on complexity, sensitivity, and uncertainty methodologies, and identifying research directions and potential collaborations for improving these methods in the context of integrated environmental modeling. Suitable complexity, sensitivity, and uncertainty topics for the session include, but are not limited to:

## Introduction to the Session

### Model Complexity

- How to address “problems of scale” for complex models (e.g., how to express, evaluate, and understand the results of complex models).
- Identification of the relationships between model complexity and external factors such as computational performance, simulation software, animation capabilities, modeler expertise, etc.

### Sensitivity Analysis

- The use of sensitivity analysis (SA) to gain insights into key sources of uncertainty in order to provide insights for model calibration and model reduction.
- Practical strategies for local/global SA given models with large parameter sets or high computational requirements.
- Key criteria in selecting SA methods for different modeling structures and problems.
- Visualization techniques for effective communication of SA results.
- Limitations and promising new advances/directions for SA methodologies in environmental models

## Introduction to the Session

### Uncertainty Analysis

- Scale effects in uncertainty analysis (UA) of integrated environmental models.
- Uncertainty propagation in complex, environmental models with large parameter sets or high computational requirements.
- Development and evaluation of UA methods that appropriately consider subjective and qualitative factors.
- Evaluation of uncertainty in model outputs with respect to decision making or risk management objectives.
- Assessing and quantifying information requirements (e.g. theories, data, models) to reduce predictive uncertainty in environmental models.
- Methods for identifying and managing structural uncertainty and bias in integrated environmental models.
- Assessment of uncertainty in socio-economic models.

## Important Information

### **Abstract submission: 6<sup>th</sup> January 2014**

An abstract of a maximum length of 250 words has to be submitted via the electronic conference handling system:

<http://www.iemss.org/sites/iemss2014/Abstract.html>.

In case your abstract is accepted you will be invited to prepare a six-eight pages paper, which has to be submitted until 30th March. Further information about the full paper and the review process are available at

<http://www.iemss.org/sites/iemss2014/index.html>

## Scientific Committee and Contacts

### **Scientific Committee:**

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