Society for Risk Analysis Annual Meeting 2012
San Francisco, CA

What Lawyers and Birds have in Common: Risk and Decisions in Coupled Human-Natural Systems

Proposal for SRA Symposium
Symposium Chairs: Matteo Convertino, PhD, and Igor Linkov, PhD

The analysis of multiple and coupled risks, and the effects of management decisions on complex systems are rarely addressed. The core difficulty is in predicting complex patterns emerging from interdependence between human and natural systems and from complex processes operating within these systems. How would you integrate legal liabilities in making decisions on a new product or technology? How would you integrate stakeholder values in developing restoration alternatives at military installations? How would you use games to extract engineering judgment and use it to enhance products? Approaches to answer these questions will be discussed in this session.

Specifically, the aims of this symposium are to: (i) review and propose theories and methods of human and ecological systems amendable for integration in comprehensive risk analysis; (ii) illustrate application of biophysical models to coupled human and natural systems; (iii) illustrate application of coupled biophysical and social science models and methods to assess the impacts of management alternatives. The lack of integrated analytical and modeling approaches that account for physical processes operating in the environment with societal needs and stakeholder values results in ignoring this complexity. For example, ecological risk assessments are usually focused on one or few species and rarely integrate the whole species richness of ecosystems, spatial, social and legal impacts, and almost never integrate sequential management decisions and cognitive preferences in a quantitative way.

Keywords: Biocomplexity modeling, risk assessment, decision analysis, stakeholder engagement, cognitive science, management
Presentation Format: Oral Presentation
Primary Specialty Group: Ecological risk assessment, decision analysis, cognitive modeling
Significance: Presents new analysis
Description: Theoretical and Applied

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Preliminary Program:

HydroEcological Engineering Advanced Decision Support for Adaptive Real-time Management of Watersheds
Dr. **Nigel T. Quinn** (Earth Sciences Division, Lawrence Berkeley National Lab)

The value of spatial information in marine protected areas: coupling biocomplexity and management
Prof. **Fiorenza Micheli** (Department of Biology, and Hopkins Marine Station, Stanford University)

Spatial portfolio decision model for management of complex human-natural Systems: the case of the Florida coastal ecosystem threatened by sea-level rise
Dr. **Matteo Convertino** (University of Florida, and ERDC USACE)

Dynamic Climate Change Simulator: Decisions from experience reduce misconceptions about climate change
Prof. **Cleotilde Gonzalez** (Dynamic Decision Making Laboratory, Carnegie Mellon University)

Cognitive Mapping Tool for Flood Risk Management
Dr. **Matt Wood** (Psychology, Carnegie Mellon University)

Neuroeconomics to better understand decision-making for a sustainable environment
Mr. **Nik Sawe** (Emmett Interdisciplinary Program in Environment & Resources, School of Earth Sciences, Stanford University)

Integrating Legal Liabilities with Environmental Risks in Nanomanufacturing Risk Management
Mr. **Benjamin Trump** (Risk Science Center, University of Michigan)

An Editorial in *Environment, Systems, and Decisions* (http://www.springer.com/environment/nature+conservation+-+biodiversity/journal/10669) will synthesize the ideas of the symposium. A potential Special Collection of papers from the interested presenters will be included in the journal. Presenters are strongly encouraged to share ideas and to envision collaborative research themes along the directions of the symposium.