

# Integrated Assessment Modelling for Environmental Systems

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**Abstract:** Integrated Assessment Modeling (IAM) aims at supporting environmental managers by appraising holistic policies. It is a participative and iterative process in which scientists from different disciplines, policymakers and other stakeholders work together to merge knowledge from multiple domains (engineering, chemistry, physics, social and life sciences, economics, ...) into a single framework, generating structured information useful for policymaking. For this reason, IAM represents a route inversion with respect to a more traditional approach of science, which largely progressed by isolating and studying single domains. IAM integrates models, databases, and tools to assess and, consequently, control the behaviors and the interconnections among environmental, economic, and social systems. Interlinked models of such complex systems are a fertile source of questions for researchers working in the fields of dynamical systems and control theory. Some of these questions are classical, such as: what to measure and how to implement decisions in a chain of dynamical models; but others are very peculiar to IAM: What is the correct level of integration to effectively support decision-making? How can we integrate different sub-models into a whole that is transparent to the users, while preserving their testability and in a way that generates the necessary user confidence? Should we preferably work with a scenario approach or with a receding horizon control? How can we effectively convey the notion of model uncertainty to the users? The open session aims at addressing some of these challenging questions. It will serve as an international forum for interaction among scientists who are interested in defining, testing, and promoting models and methods to support policies for climate change, water resources management, air quality, agriculture, and any other activity that has an impact on human life or the environment itself. The IFAC TC 8.3 organized the first IAMES workshop in May 2018 (<https://iames2018.unibs.it>).

IFAC technical committee: 8.3 Modelling and Control of Environmental Systems

Topics: The open session topics include Integrated Assessment Modelling methods and applications to environmental systems, i.e., air (at the global, regional and local scale), climate change adaptation and mitigation, land (forests, biomasses, etc.) and water resource systems (surface and ground waters, marine and coastal waters).

*Keywords: Integrated assessment modeling; Environmental decision support systems; Modeling and identification of environmental systems; Risk analysis; Impact evaluation.*

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