

Integrative ecoABSYSs & landscape modelling

Integrative modelling for landscape-scale understanding and management of ecosystems under human influence

ABSTRACT

Context

There is definitely a great need for scientific-based, user-friendly, game-like platforms for integrative landscape modelling, enabling either scientists or multiple stakeholders to test their landscape design and management ideas in the light of economical, ecological and environmental constraints. The development of such platforms needs to integrate knowledge from different disciplines in order to provide effective solutions for real-world problems. For this purpose, two projects were set up within the advanced thematic research network "Montpellier Agricultural Sciences and Sustainable Development", funded by Agropolis Foundation. The projects are entitled "Integrative landscape modelling" and "Towards a federative research on modelling and simulation platforms".

Their objective was to put together various teams, each of them having developed, with a specific scientific focus, its own model or platform for simulating landscape structure and functioning. The challenge is to manage to link these models and platforms in a general conceptual and modelling framework, enabling to consider the main biological, physical, geographical and socio-economical interactions impacting ecosystems and landscape functioning and management. These projects constituted a first step for all partners to share their background experience in their own discipline (ecology, agronomy, hydrology, socio-economy) and further try to define a roadmap for building an integrative modelling platform.

These two projects have been carried-out in very close cooperation, the first one focusing on thematic issues and the second one being its methodological counterpart. In consequence, the results of the two projects are presented together.

Results

The projects started in February 2009 and ended in December 2010. During the time-course of the projects, three thematic workshops have been organized, implying a total of around 50 members of the participating research units. An international conference on integrative landscape modeling was also set up, with a worldwide-recognized scientific committee. The event attracted more than one hundred participants from all over the world. Fifty-two researchers presented their ongoing work and three round-table allowed discussions about hot topics of landscape modeling and simulation. In total, sixteen scientists were invited to present their work and feed the discussions.

As a result, the proceedings of the international conference were published, gathering thirty-seven scientific communications (www.symposcience.org). A website was built-up to capitalize information and discussions generated by the projects (<http://www.umn-lisah.fr/rtra-projects/>). A state of the art of integrative landscape modeling was written, from bibliographic data and exchanges within the scientific community (see annex 8).

The projects allowed to reinforce the links both within the Montpellier-based research community and with the national and international scientific community (METISSE Network, Réseau National des Systèmes Complexes, Global Land Project, etc.). In addition, the outputs of the projects have been highlighted through various publications and communications towards the local, national and international communities around landscape modeling (see annex 12). Finally, the projects gave rise to several concrete research collaborations at various levels (see annex 10).

Year : 2008

Project number : 0803-021

Type of funding : AAP INRIA

Project type : AAP

Research units in the network : SENS CEE-M ABSYS

Start date : 2008-11-01

End date : 2011-04-07

Flagship project : no

Project leader : Xavier Louchart Marc Jaeger

Project leader's institution : INRA-INRAE

Project leader's RU : AMAP LISAH

Budget allocated : 43890.8996 €

Total budget allocated (including co-financing) : 60124.52 €

Funding : RTRA

PERSPECTIVES

The various teams that were implied in the current project will continue to share their development and experience on the integrative modelling approaches (concepts, tools and methods). They will try to work together in order to submit a concept note or a challenging projet to a futur proposal (e.g ANR)