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Abstract

- Globally, natural and social ecosystems are changing fast at an accelerating pace.
- Scenario Building is an aid to understand these changes and proactively identify plausible futures.
- Building scenarios of social-ecological systems is a multi-faceted, interdisciplinary and multi-sectorial challenge where scientists need to venture beyond their traditional roles of solution providers and tool builders.
- In June 2015 the EuroMarine workshop “Building scenarios of future marine ecosystems under a global change context: moving forward” was organized with an international scientific team to discuss scenario building challenges (Fig. 1).

Stakeholders

- A key element to successful scenario building is properly timed involvement of stakeholders and fluent communication between all involved parties.
- Scientists play crucial roles in the iterative stages of the scenario building process (Fig. 2): identification of focal issues and driving forces; ranking importance and uncertainty; selecting scenario logic; fleshing out scenarios; selection of indicators; assessing impacts; and evaluation of alternative strategies.
- Different tools and modelling techniques for engaging stakeholders, communicating results, and conflict resolution were identified such as qualitative and quantitative modelling and serious gaming tool to support the scenario building process (Fig. 3).

Case study

A hypothetical case study on how to balance industrial and artisanal fishing in the Mediterranean Sea was developed, where participants contributed with their tools and expertise.

- First, stakeholders and experts would be engaged through expert workshops to build a shared understanding of the social, economic and ecological system and how these systems could conceivably evolve according to an array of possible futures and strategies for intervention. Key aspects to intervention would be an analysis of the social network and governance structures in which these systems are embedded, and inclusion of multiple sectors across multiple scales of organization.
- Next, models and modelling platforms to facilitate identification of critical monitoring variables, and prediction of impacts or change in state across future scenarios would be established.
- Lastly, qualitative mathematical models would be used to provide a rapid and interactive means to merge complex social, economic and ecological systems into a predictive framework that is inclusive of different sources of knowledge, to provide a synthesis across disciplines and quantitative modelling platforms.

Continuation

A future scenario laboratory is planned in Sète, France, to become a central place to organize workshops with stakeholders and experts, and to become a hub of development of qualitative and quantitative modelling activities. As a network of experts delivering components to the scenario building process, the workshop group intends to pursue scenario building funding calls, and to meet soon to further develop ideas that emerged during the 2015 EuroMarine meeting.

References

(1) Syme, G., Dzidic, P., and Dambacher, J.M. (2012). Enhancing science in coastal management through understanding its role in the decision making network. ECU Publications 2012. (2) Mayer, I. S., Zhou, Q., Lo, J., Abspoel, L., Keijser, X., Olsen, E., ... Kannen, A. (2013). Integrated, Ecosystem-based Marine Spatial Planning: Design and Results of a Game-based Quasi-Experiment. Ocean and Coastal Management, 82, 7–26. (3) Steenbeek, J., Buszowski, J., Christensen, V., Akoglu, E., Aydin, K., Ellis, N., Felinto, D., Guitton, J., Lucey, S., Kearney, K., et al. (2015). Ecopath with Ecosim as a model-building toolbox: Source code capabilities, extensions, and variations. Ecological Modelling.



Figure 1. Participants of the workshop in Sète, 2015

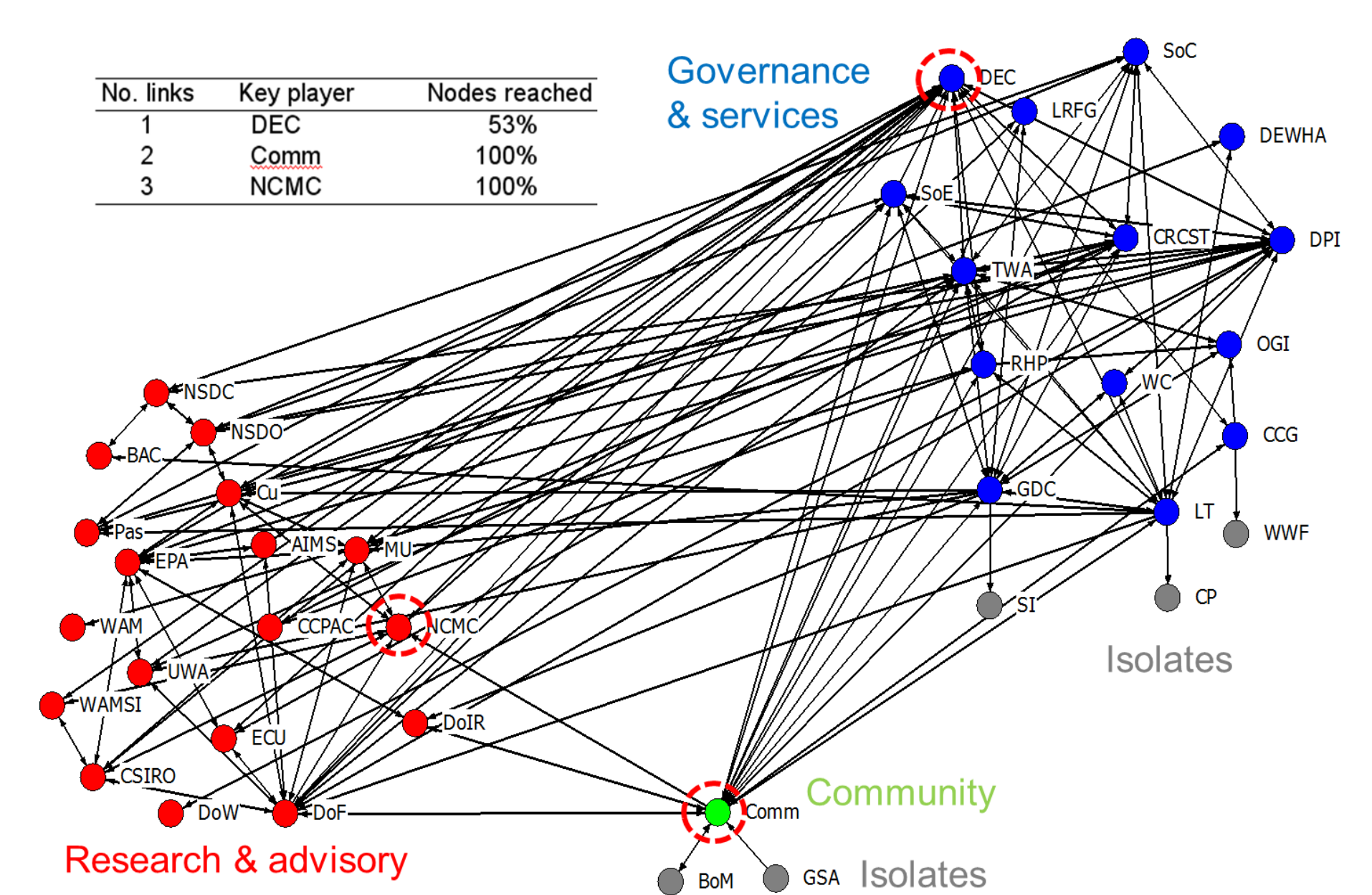


Figure 2. Identifying key players in a stakeholder network (1).

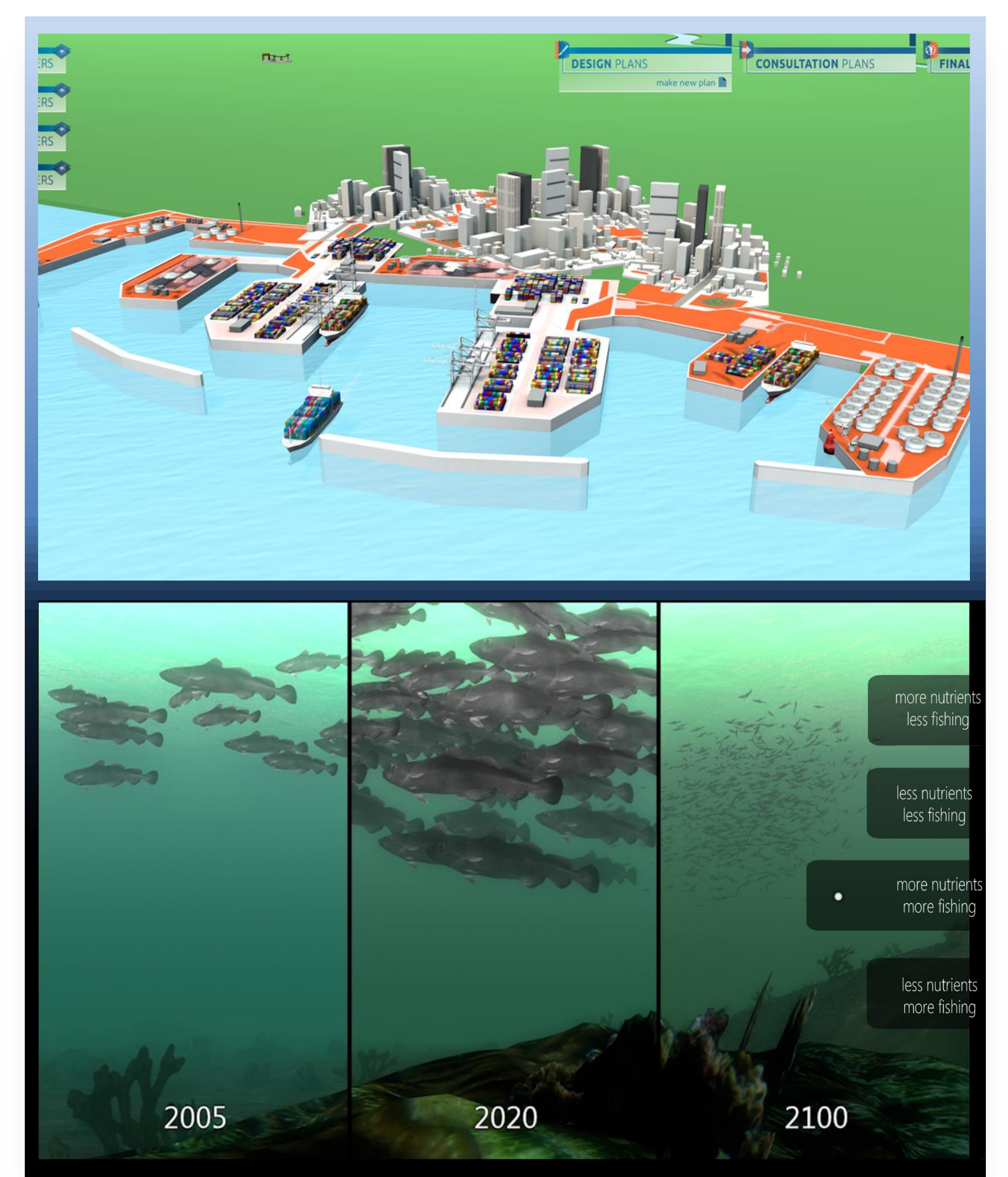


Figure 3. Connections between serious gaming tools and ecological models (2,3) offer unparalleled possibilities to inform the various stages of the scenario building process.