

Guest Editorial, part of a Special Feature on [A Systems Approach for Sustainable Development in Coastal Zones](#)

## A Systems Approach for Sustainable Development in Coastal Zones

Alice Newton<sup>1,2</sup>

---

Key Words: *Coastal zone development*

---

This Special Feature of *Ecology and Society* brings together important outcomes of the EU-funded project: Science-Policy Integration for Coastal System Assessment, SPICOSA. The title of the project revealed its innovative nature from the start. The premise was to bind scientific information to policy decisions and to consider the coastal zone as an integrated ecological-social-economic system. As a result, the SPICOSA project was very broad, ambitious, and required multidisciplinary teams of researchers to work together: natural scientists such as oceanographers and ecologists, social scientists, economists, and modelers. In itself, this was a tour de force. In addition, the project required a participatory role from stakeholders or actors, e.g., institutions, NGOs, economic sectors, etc., as well as from coastal managers and decision makers. SPICOSA is relevant to several facets of environmental policy such as the Water Framework Directive, the Marine Strategy Framework Directive, the Habitat Directive, and NATURA2000, as well as the ICZM-Integrated Coastal Zone Management recommendation. The primary objective of the project was to develop a practical application of the Systems Approach Framework (SAF), which represents an important step forward to enable the appropriate implementation of these policies. The SAF was applied at 18 study sites, representing a wide variety of European coastal systems, including transitional waters such as lagoons, deltas, and estuaries, along the coasts of the European regional seas, from the shores of the Black Sea to the fjords of Norway. The SAF addresses the general problem of assessing complex systems for conversion to sustainable development and thereby makes a valuable contribution to sustainability science. This contribution is not just at an academic level, because it has been demonstrated to be fully operational for European coastal systems, despite the wide range of governance that these systems encompass. Although the SPICOSA sites are European, the widespread applicability of the SAF makes it relevant at the global scale. As such, SPICOSA was recognized by Land-Ocean Interactions in the Coastal Zone as one of the truly integrative projects joining social and ecological aspects of coastal systems and with the SAF representing a major advance in the use of the system approach in coastal zones.

The development of the SAF provided a learning arena for all these different parties to interact in a meaningful and useful

way, which in itself underlined the importance of engaging multidisciplinary teams to conduct research. The SAF is not a strict methodology, it is truly a framework that can be used and adapted to different coastal systems, different issues, different stakeholders, and different countries. As demonstrated by the results, it is also valid for transboundary settings and systems. The SAF is adaptable in the same way that a picture frame can be used for a painting, a photograph, or for a tapestry. The SAF is a space that enables useful Coastal System Assessment and Science-Policy Integration, so that scientific information can better inform decision makers.

In this Special Feature of *Ecology and Society*, you will find a taster of what can be achieved by working together as a multidisciplinary team to solve complex problems in the coastal zone. The insight article, *A Systems Approach Framework for Coastal Zones*, (Hopkins et al. 2011) introduces the research articles that follow by explaining the theoretical basis of the System Approach and how the SAF was applied at the study sites. The research articles demonstrate aspects of value gained in these initial SAF applications. These research articles explain how the SAF allowed researchers to address, through simulations of policy options, a wide range of multi-issue problems that run the gamut from the culture of local fisheries to artificial beaches to freshwater apportionment. It is through this multi-issue quantification that they make an important contribution to understanding the connectivity within coastal zone systems. It is the quantification of these complex interactions that creates a major impediment to effective policy making and that demonstrates the capability of the systems approach as a research tool. The final synthesis article, *Experimental Basis and Potential of the SAF as a Transition Methodology for Sustainable Development*, (Hopkins et al. 2012) summarizes the significance of upgrading the level of information available to policy makers through a participatory process, and it consolidates the lessons learned and perspectives gained through the 18 SAF applications.

*Responses to this article can be read online at:*  
<http://www.ecologyandsociety.org/vol17/iss3/art41/responses/>

---

<sup>1</sup>CIMA, UAIG, Portugal, <sup>2</sup>NILU, Norway

---

**Acknowledgments:**

*The research leading to these results has received funding from the European Community's Sixth Framework Programme grant agreement 036992 (SPICOSA) and from the Seventh Framework Programme under grant agreement n° 226675 (KnowSeas) and grant agreement 282845 (COMET-LA). The SPICOSA and KnowSeas projects are affiliated to LOICZ.*

---

**LITERATURE CITED**

Hopkins, T. S., D. Bailly, and J. G. Støttrup. 2011. A systems approach framework for coastal zones. *Ecology and Society* 16(4):25. <http://dx.doi.org/10.5751/ES-04553-160425>

Hopkins, T. S., D. Bailly, R. Elmgren, G. Glegg, A. Sandberg, and J. G. Støttrup. 2012. A systems approach framework for the transition to sustainable development: potential value based on coastal experiments. *Ecology and Society* 17(3):39. <http://dx.doi.org/10.5751/ES-05266-170339>