Seabirds stimulate social-ecological learning in marine systems

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Seabirds form a small part of marine ecosystems in terms of biomass and ecological function, but provide an important mechanism in linking marine ecosystems to societies. Seabirds provide important ecosystems services (most notably provisioning as well as cultural and spiritual services). They can be used as indicators of change in marine systems and knowledge of seabirds has historically had an impact on how marine resources are managed. The role of seabirds in social-ecological systems has changed over time as the appreciation of services they provide has shifted from mainly provisioning services to regulatory and cultural services. Perceptions of seabirds have changed from an easily accessible food source to charismatic species and symbols of the marine environments. As such, they have become flagship species signaling the need for change in marine governance. Activities resulting in negative impacts on marine system have received much attention when affecting seabirds, such as hazardous substances, oil spills and bycatch in fishing gear. We argue that this has played an important role in shaping how humans relate to the marine environment and has contributed significantly to the establishment of international and national regulations and initiatives that make resource use more sustainable. Meanwhile, an extensive knowledge base regarding these issues has been founded, including how seabirds can be used as indicators of complexity and change. This provides an example of how flagships species can provide incentives and means for social-ecological learning.