Operationalising the concept of Adaptation Services

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Abstract

Ecosystem services are often valued for their immediate material or cultural benefits to human well-being, although in the medium- to long-term ecosystem services that sustain such benefits (referred to as regulating and supporting services in the Millennium Ecosystem Assessment terminology) must be considered. In the context of climate change and its expected dramatic and likely abrupt impacts on ecosystems and on societies, an additional role for ecosystems towards human well-being has been considered, and referred to as Ecosystem-based Adaptation. In this context, a broader framework can be proposed for the identification, understanding and management of so-called adaptation services. This framework identifies adaptation services as the the benefits to people that ecosystems provide in the context of climate variability and climate change. Such climate adaptation services encompass indirect services that help manage risks (e.g., crop diversity to buffer productivity against climate variability), and those that provide direct benefits such as new income sources.

Beyond such a conceptual definition, and possible story lines for examples of varying complexity, the uptake of the concept by scientists, managers and policy makers requires proof the concept and identification of key underpinning mechanisms. In this presentation we will demonstrate such a proof of concept by means of a common methodological framework applied to four Australian ecosystems from a range of latitudes and with key roles in ecosystem-based adaptation to climate change: grassy eucalypt woodlands of southeastern Australia, fire prone mountain forests, floodplains of the Murray Darling Basin, and tropical littoral forests.

This framework facilitates implementation of an adaptation services approach and enables synthesis across case studies. In particular, using such a comparative approach we propose hypotheses on functional mechanisms underpinning adaptation services required to support transition and transformation of socio-ecological systems, such as the role of keystone species and keystone functional groups or the role of different types of response diversity. Landscape connectivity already does, and is expected to play a key role for transition and/or transformation of fragmented systems.

We then identify initial principles for the management of adaptation services that range from the management of pre-existing adaptation services that will support autonomous adaptation, to planned adaptation through the steering of new adaptation services, and to the restoration of adaptation services in degraded ecosystems. Uptake of the framework should facilitate synthesis across similar ecosystems world wide, and across different ecosystems across a given region.

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