

Type of Misfit	Definition and Mechanism	Examples	Solution/s Suggested in the literature
<i>Spatial</i>	<p><i>Governance does not match the spatial scales of ecosystem processes.</i></p> <p>Governance is “too small” i.e. not able to cope with external actors or drivers important for maintaining ecosystem resilience. Governance can also be “too large”, i.e. by providing centrally defined “blue-prints” that ignores existing local ecological and social knowledge (Scott 1998).</p>	<p>I: Hydrological boundaries are match by administrative boundaries which might create collective action problems, misallocation of responsibility and hydrological and ecological degradation (Lundqvist 2004).</p> <p>II: Local institutions for management of sea urchin unable to cope with the development of global markets and highly mobile “roving bandits” (Berkes et. al. 2006).</p> <p>III: Central managers design rules and implement “one size fits all” institutions that are inappropriate to the local social or ecological context (Ostrom 1999).</p>	<p>River basin/integrated water resources management (GWP 2000), bioregionalism (McGinnis et. al. 1999).</p> <p>Multiple scale restraining institutions (Berkes et. al. 2006)</p> <p>Collaborative, decentralized natural resource management (Wondolleck and Yafee 2000).</p> <p>Adaptive co-management (Olsson et. al. 2004)</p>
<i>Temporal</i>	<p><i>Governance does not match the temporal scales of ecosystem processes.</i></p> <p>Institutions and actor interaction result in decisions that assume a shorter or longer time span than those imbedded in ecological processes. Social response too slow or too short-ranged compared to ecosystem behaviour (Holling and Meffe 1996, Scheffer et. al. 2003).</p>	<p>IV. Governments in the West African Sahel promoted in the 1950s and 1960s agricultural and population development in areas with only temporal productivity due to above-average rainfall. As the area returns to its other low-productive state, erosion, migration and livelihood collapse result (Glantz 1976).</p> <p>V. The speed of impacts of invasive species is not matched by the speed of response of institutions with possible severe ecological and health implications (Miller and Gunderson 2004, Meyerson and Reaser 2003).</p>	<p>Early warning systems and national preparedness plans (Wilhite 1996)</p> <p>Adaptive management (Walters 1986)</p> <p>Adaptive co-management (Olsson et. al. 2004)</p> <p>Scenario planning (Peterson et. al. 2003)</p>
<i>Threshold behavior</i>	<p><i>Governance does not recognize, or is unable to avoid, abrupt shifts in social-ecological systems (regime shift).</i></p> <p>Governance reduce variation in social-ecological systems by removing response diversity, removing whole functional groups of species, removing trophic levels, and/or by adding anthropogenic stress such as pollution. The result is that disturbances that could be buffered before, lead to practically irreversible regime shifts (Folke et. al. 2004).</p>	<p>VI: Application of “maximum sustainable yield” triggers fish stock collapse due to overharvesting of key functional species (Pauly et. al. 1998, Worm et. al. 2006).</p> <p>VII. Food production is increased and by promoting monocultures. This happens at the expense of other ecosystem services (Rockström et. al. 1999), and by increasing the risk for biophysical regime shifts and hence rapid yield decline (e.g. Gordon et. al. 2003).</p>	<p>Variable quotas, market based incentives (Roughgarden and Smith 1996).</p> <p>Multiple scale restraining institutions (Berkes et. al. 2006)</p> <p>Adaptive management (Walters 1986)</p> <p>Adaptive co-management (Olsson et. al. 2004)</p> <p>Adaptive governance (Folke et. al. 2005)</p> <p>Scenario planning (Peterson et. al. 2003)</p>
<i>Cascading effects</i>	<p><i>Governance is unable to buffer, or amplifies cascading effects between domains.</i></p>	<p>VIII. El Niño climate anomaly 1972-73 lead to that regions that are usually arid receive excessive rainfall while regions that usually receive abundant rainfall are plagued by drought. Sharp decline in commercial fish landings trigger sharp increase in prices of substitutes, and shifts by US farmers and Brazilian entrepreneurs, to growing soybeans (Glantz 19990).</p>	<p>Adaptive governance (Folke et. al. 2005)</p> <p>Steering of “networks of networks” (this chapter)</p>

Governance response is non-existent, too slow, or ineffective thus propagating the impacts of abrupt ecosystem change through spatial, temporal scales and systems (Kinzig et. al. 2006).

IX. Western Australia: Abrupt shifts from sufficient soil humidity to saline soils, and from freshwater to saline ecosystems, might make agriculture a non-viable activity at a regional scale and trigger migration, unemployment and the weakening of social capital (Kinzing et. al. 2006)