Adaptation: a dynamic & emergent process of building social-ecological resilience

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A number of different approaches are available for assessing adaptation to climate change. One of the most recent, adaptation policy or practical adaptation assessment, a type of vulnerability assessment, focuses on implementation processes for adaptation at the community-scale. The aim is to document how a community experiences change and processes of decision-making. Resilience, because of its explicit focus on processes of change in social-ecological systems is though to have much potential to contribute to such climate change adaptation research.

This presentation will describe a conceptual model of adaptation and an associated analytical framework for practical adaptation assessment that explicitly integrates the concepts of vulnerability and resilience into a model of adaptation as a dynamic and emergent process of building social-ecological resilience. Vulnerability is first defined as a dynamic and cumulative property of social-ecological systems shaped over time by exposures to multiple perturbations and the subsequent implementation of adaptive strategies to decrease the exposure/sensitivity and/or increase adaptive capacity. Adaptive capacity is defined as a dynamic process of learning from exposure experiences to reduce the exposure/sensitivity of a social-ecological system through translating adaptive capacity into adaptive strategies. The conceptual model of adaptation is grounded in Holling’s Adaptive Cycle metaphor and integrates concepts of transformation and building social-ecological resilience. A precipitating crisis, or a particular exposure event is theorized to initiate a dynamic process of transformation or re-organization of a social-ecological system. The transformation is theorized to occur in three phases: preparing the system for change, window of opportunity, and transition to adaptive governance. In the final phase of transformation the system is theorized to engage in three specific activities that build social-ecological resilience. The analytical framework developed to apply the conceptual model to describe and explain a past process of adaptation to environmental change as a dynamic and emergent process of building social-ecological resilience and is comprised of nine (9) steps: (1) Vulnerability & resilience of what and to what? or what is the system of interest and disturbance of interest?; (2) Cross-scale social-ecological event history and policy drivers; (3) Adaptive cycle analysis of event history; (4) Vulnerability at time of precipitating crisis; (5) Transformation Phase 1 (Preparing the system for Change), Window of Opportunity, Phase 2 (Transition to Adaptive Governance); (6) Transformation Phase 3 (Building social-ecological resilience); (7) Current resilience; (8) Future of vulnerability & resilience; and, (9) Adaptive co-management. The utility of the model/framework to describe and explain the process of adaptation to environmental change is demonstrated through a case study of the Deerwood Soil and Water Management Association/South Tobacco Creek watershed social-ecological system in southern Manitoba, Canada.