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Participatory Modelling to Assess Climate Impacts on Water Resources in the Big Wood Basin, Idaho

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Abstract: Many of the natural resource issues we face today cannot be fully understood using normal scientific methods or theories. When uncertainties or decision stakes are high, participation by an “extended peer community” can be critical to studying and managing complex systems since local expertise on land use and ecosystem processes may not otherwise be captured. We conducted a case study of participatory modelling to support natural resource management under a changing climate. Over a two-year period, we convened a Knowledge to Action Network (KTAN) of scientists and stakeholders interested in exploring the impacts of climate change in Idaho’s Big Wood Basin. Through a series of workshops and webinars, participants worked together to (1) pose relevant research questions collaboratively and iteratively, (2) create models of the future landscape under a changing climate regime to explore their questions, and (3) increase knowledge about how scientific information is both used and generated within those models in order to interpret the results. We began by developing a conceptual model of the river basin and progressed to two quantitative models – a system dynamics model and a spatially-explicit integrated model – in order to explore research questions generated by the KTAN. Alternative scenarios were developed and simulated in the final quantitative model to assess the range of impacts that external drivers and management decisions could have on the system.

Keywords: Participatory Modelling; Climate Impacts; Watershed Management; Knowledge-to-Action-Networks; Alternative Scenarios