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Summary of Conference Presentation

Social, economic, and environmental systems in arid regions are vulnerable to disruptions in water supplies that are likely to accompany future climate changes. With a particular focus on an arid watershed, in New Mexico, I summarize some recent research on climate change impacts and adaptation strategies. The impact research uses a hydro-economic model to integrate plausible changes in climate, hydrologic responses, and water demands within a framework that optimizes water use allocations for the greatest economic benefit. The study uses three climate change scenarios across two distinct future time periods selected to be representative of the range of effects indicated by the outputs from an ensemble of 18 GCMs using the SRES A1B emissions scenario. These six climate change scenarios were then used to model runoff changes using the WATBAL hydrologic model (Yates, 1996), which integrates climate and hydrologic variables, and to change water demand parameters in the hydro-economic model. Primary findings confirm that environmental systems followed by agricultural systems and resources are at greatest risk as water is increasingly transferred to maintain urban and industrial users which have greater economic productivity compared to agriculture. While total economic losses are estimated in the vicinity of \$300 million, under severe climate changes where runoff is reduced by nearly 30%, in actuality, both economic and non-economic losses are likely to be significantly higher.