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### **Integrated Water Resources Planning for South Florida**

The South Florida region is expected to experience increasing stress on its fresh water supplies. Continued population growth, land-use changes, and development are expected to increase water demands in the future. Federal and state statutes have recently been passed, requiring major improvements in water quality for the region's natural environments, while at the same calling for continued economic growth for the region. The pressures of meeting increasing regional demand while ensuring flood control, and maintaining regional economic growth while providing improved water quality exist within the setting of climate and environmental uncertainty. This has created a complex decision environment that challenges traditional water planning processes and management institutions. As decision makers plan for the future, they seek to manage future risks by incorporating available scientific knowledge regarding climate, environmental, and human uncertainties. System Dynamics modeling, decision support exercises, participatory model development, and policy exercises have all been proposed as tools to connect decision makers to available science. In this study we apply these tools in a participatory approach and examine the impact of our work upon policy outcomes using the South Florida Water Management District as our study group. Mixed method research techniques including surveys, interviews, scenario building, and stakeholder science workshops are used to integrate a system dynamics water balance model in this project. The findings from this research develop our understanding of user needs for scientific input into water resource planning on short and long time scales, allow us to explore the potential impacts of alternative water policy options in various future scenarios, reveal regional constraints to adaptive management policies on multiple time scales, and allow us to identify the people and economic sectors that are most vulnerable to water shortages and surpluses resulting from future climate, environmental, and human changes.