iVR for Climate Change Visualizations

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We recently started two funded (NSF, ICS) research projects addressing the visualization of climate change using immersive virtual reality (iVR). The first project addresses the question of how iVR can increase the accessibility of climate models and benefit decision making. Combining visual analytics and iVR offers a new path to exploring complex and uncertain environmental planning scenarios, which may lead to improved comprehension, and in turn to more optimal decision making. For example, understanding multidimensional integrated assessment models (IAMs) is particularly challenging for climate change risk management. IAMs are tools that combine information from a wide variety of domains (hence, *integrated*) to help understand tradeoffs for complex and uncertain socioeconomic and biophysical processes. Currently, our prototype system visualizes Dynamic Integrated Climate-Economy (DICE) IAM model output in an interactive virtual environment. This is implemented using a 3D game engine, which in turn enables the use of commercial immersive VR technologies. We are continuing to implement features in our system and are working towards formal evaluations of the system to investigate the added value of iVR.

The second project is addressing the question of how human values and practices impact preferences about natural systems and influence the trade-offs made in decision making about forest resources and sustainability. We will use state-of-the-art visualization and virtual reality experiences about future forest conditions to access a broader range of human values about scenarios of future forest conditions. The investigators will test a set of hypotheses, include the propositions that immersive virtual reality can enhance emotive and cognitive perceptions of environmental changes and that current management activities can be refined through the incorporation of value structures into a robust decision making analysis. These outcomes will be used to model preferences in forest-management activities and determine trade-offs and synergies among economic and other value-based decisions about forest management.

Both project started either late Spring or late Summer and as such raise more questions than provide answers. However, the topics should provide grounds for inspiring conversation at the meeting.