Biological Aspects of the Hydrologic Cycle: Regional Vulnerability Issues

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Abstract. In order to understand the hydrologic cycle the role of vegetation and soils must be included. Vegetation and soil dynamics provides additional nonlinear feedbacks to the hydrologic cycle which are absent with sterile Earth surfaces. In my talk, I present results from coupled atmospheric-land surface models, which demonstrate these linkages, and how they feedback across the land surface interface. The predictability of the hydrologic cycle is more difficult as a result of these interactions. As an alternative, a vulnerability approach is suggested as a procedure to assess risks to the hydrologic cycle. A major conclusion in our work is that human disturbance to the land surface represents an alteration of the hydrologic cycle that exceeds that which might occur due to the radiative effect of the doubling of carbon dioxide in the atmosphere.