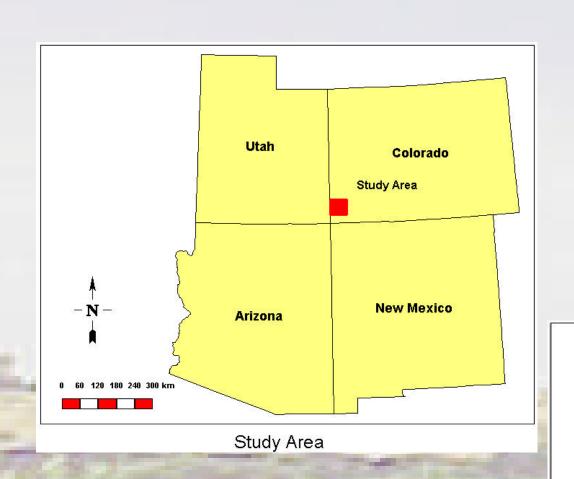
WATERSHED-SCALE HYDROGEOLOGIC ANALYSIS AND PALEOHYDROLOGIC MODELING OF PREHISTORIC SETTLEMENT SYSTEMS IN THE CANYON OF THE ANCIENTS REGION, SOUTHWEST COLORADO

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Purpose & Goals

- Perform analysis of environmental system including watershed-scale hydrogeology and hydrologic system.
- Develop conceptual and mathematical models of the hydrologic system.
- Model lagged response of water resources to climatic changes.
- Develop understanding of impacts to prehistoric settlements by coupling human and hydrologic systems modeling and analysis.







Research Approach

- 1) Conceptualize and characterize the modern hydrologic system, using integrated, multidisciplinary hierarchical systems analysis.
- Develop solid and mathematical models to visualize and quantify the modern hydrogeology and hydrologic system on a watershed-scale.
- Test mathematical models by incorporating known hydrologic system stresses which occurred within historic times.
- Develop scenarios of the paleohydrologic system based on paleoclimate records, using tree ring data, palynology, and paleo-jet stream analysis for identifying the relative roles of climate and humaninduced stresses.
- Compare the dynamics of the paleohydrologic system with the cultural activities, population shifts, and abandonment of cultural centers.

s system characterization

What additional data

What alternative hypothese

could describe system structure and function?





- Continued analysis of surface, geomorphic, geologic and hydrogeologic data on watershed-scale.
- Development of 3-dimensional hydrogeologic solid block model.
- Continued development of modern hydrologic system conceptual model.
- Conceptualization of Pre-historic human settlements placed in landscape based on hydrologic system analysis.





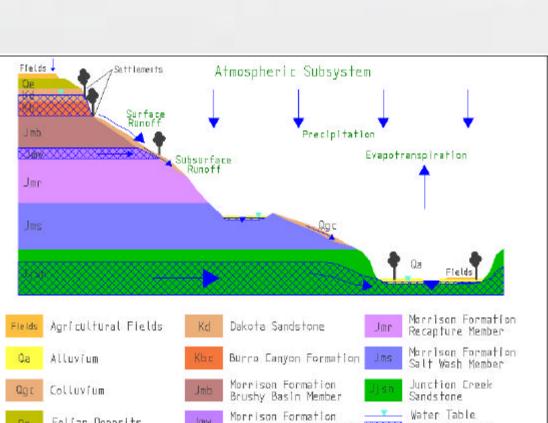












General Conceptual Mode

The Broad Hypothesis

Changing distributions of water sources, including flow quantities, during late pre-Hispanic occupation affected the settlement systems and significantly contributed to depopulation of the Canyon of the Ancients region.







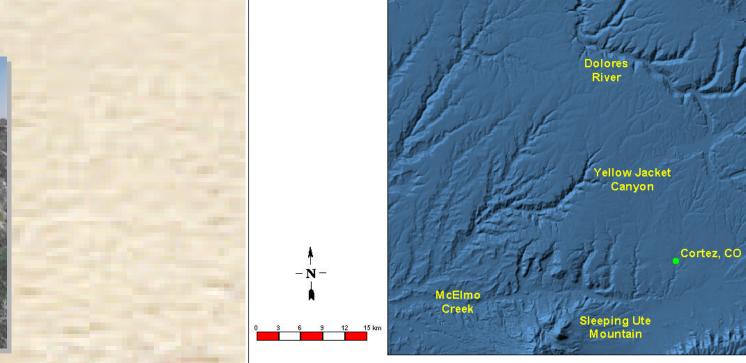
Hierarchical Systems Analysis

Initial Definition and

Characterization of Syste

and Characterization of Groundwater Systems





Topography