

RESEARCH INFRASTRUCTURE IMPROVEMENT (RII 4)  
PROPOSAL DEVELOPMENT PROCESS

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## EDUCATION & OUTREACH WHITE PAPER

FOR DISCUSSION  
December 16, 2011

TITLE: CREATING A SYSTEMS APPROACH FOR  
SUSTAINABILITY IN BUILDING NEW MEXICO'S  
INFRASTRUCTURE FOR EPSCoR RESEARCH ON THE  
ENERGY-WATER-ENVIRONMENT NEXUS

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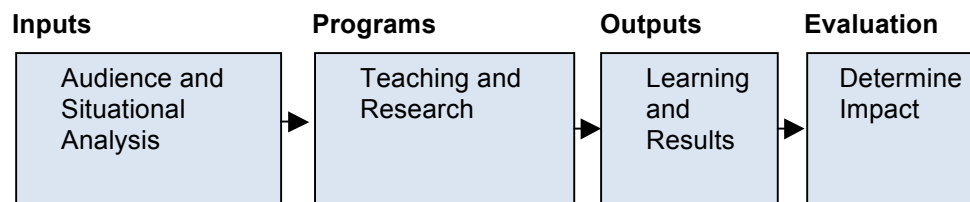
CONTRIBUTING AUTHORS: TBD

**Target Audience:** Coordinators and partners for all EPSCoR education programs

**Description of Activity:** In order to maximize impact and improve utilization of funds, the EPSCoR systems approach will assure that disparate education activities are coordinated and shaped into a coherent and strategic approach. This approach will focus on building a sustainable infrastructure for EPSCoR research on the energy-water-environment nexus.

Utilizing lessons learned from past and current education activities in New Mexico, a systems approach is not only possible, it is necessary. Key benefits of this systems approach will be to enhance the consistency of research quality, eliminate duplication of effort, and strengthen faculty competencies. In general systems theory, a system is any collection of interrelated parts that together constitute a larger whole. The interrelated parts of the EPSCoR education and outreach program include: K-12, undergraduate and graduate students, faculty, community, and teaching materials.

**Figure 1. EPSCoR Systems Model**



Stages of development for the EPSCoR systems model (Figure 1) include:

(1) **Audience and Situational Analysis** - review infrastructure and characteristics; the range of backgrounds, interests, knowledge, attitudes and skills of faculty; research equipment; and information technology capabilities.

(2) **Teaching and Research** - estimate relevant existing skills and knowledge of learners - this may have implications for teaching methods, bridging courses, and support systems.

(3) **Learning and Results** - formulate objectives/learning outcomes and research objectives - may be formulated by students, faculty, and other teaching staff. Select appropriate research topics, methods and educational materials - the process of attempting to match appropriate methods to given objectives and learning outcomes is normally done on the basis of a combination of research and experience.

(4) **Assess and Evaluate** - coordinate education programs and develop articulation strategies to maximize impact.

This systems approach will significantly contribute to meeting the EPSCoR vision: “To enable an environment in which New Mexico scientists and educators are fully competitive in climate change research and education.”

Many colleges and universities in New Mexico have begun to develop systems approaches to building a sustainable research infrastructure – human and technology. This proposal will establish EPSCoR in a lead role across the state.