EPSCoR Overview
Collaborative Opportunities
July 26th, 2012

Rita Teutonico
iUTAH Associate Director
State EPSCoR Director
What is EPSCoR

Experimental Program to Stimulate Competitive Research

State-based *capacity-building* program
- State committee oversight
- Alignment with State S&T plan
- Research driven: *Science First!*
- State co-investment
- Economic development

Multidisciplinary and Multi-institutional

*Multi-faceted State-wide program!*
Established by NSB Resolution in 1978
Target states receiving lesser amount of NSF research support funding
Build sustainable capacity of educational institutions in those states to compete more successfully in NSF and other research programs
Build both human and physical infrastructure
Close interaction between NSF and EPSCoR community

Strengthen Jurisdiction’s Capacity for Competitiveness
Announcements

**iUTAH RII Track 1 awarded by NSF**
The National Science Foundation has awarded a group of Utah higher educational institutions and...

**NSF Workshop**
The National Science Foundation (NSF) will be holding a workshop, “Science: Becoming the...

Events

**Water Symposium**
CI-WATER is hosting a Water Symposium
September 5-6, 2012.

**SC12 Super Computing Conference**
The SC12 Super Computing conference will be held in Salt Lake City on November 10-16, 2012.

Opportunities

- **iUTAH Graduate Student Opportunities**
- **SC12 Super Computing Conference**
  - Student Opportunities
  - Science: Becoming the Messenger Workshop Aug. 22
UTAH EPSCoR Structure

**USTAR**

**State Committee**

- State EPSCoR Director
  - R. Teutonico

- **NSF Director**
  - *Crowl, Track I PI*

- **NASA Director**
  - *Westenskow, RID PI*

- **DOE Director**
  - *Ex officio State Committee members*

**Education, Outreach, Diversity (EOD) Teams**

*Ex officio State Committee members*
EPSCoR Funding

Research Infrastructure Improvement Awards (RII)

Support physical, human, and cyber infrastructure within academic institutions at the state level

Co-Funding with NSF Directorates and Offices

Supports individual investigators and groups from EPSCoR jurisdictions by co-investment with disciplinary research programs in their meritorious proposals

Outreach Activities and Workshops

Brings EPSCoR jurisdiction investigators together with NSF program staff; builds mutual awareness and transparency
Research Infrastructure Improvement, Track 1

RII Track-1 awards provide up to $4 million per year for up to 5 years to support physical, human, and cyber infrastructure improvements in research areas selected by the jurisdiction's EPSCoR governing committee as having the best potential to improve future R&D competitiveness of the jurisdiction.

- Expand University expertise and facilities in areas critical to future issues
- Develop faculty and facilities to more successfully compete for federal support
- Develop inter-university cooperation
- Expand State science education capacity
NSF Awards Utah $20M to Boost Statewide Research Infrastructure Multi-university effort aims to manage and protect state’s water resources

Salt Lake City - The National Science Foundation has awarded a group of Utah higher educational institutions and related organizations a five-year, $20 million competitive grant to help manage and protect one of the state’s most valuable and scarce resources: water.

The grant funds a statewide effort to assist in building the human and research infrastructure needed to sustainably manage Utah’s waters. The award, which went into effect July 1, creates iUTAH, which stands for innovative Urban Transitions and Aridregion Hydro-Sustainability.

iUTAH is an interdisciplinary effort among researchers from Utah State University, the University of Utah, Brigham Young University, and two dozen other Utah institutions of higher education, government agencies and industry and non-profit partners. EPSCoR partners in Alaska and Wyoming are also collaborating. The Utah EPSCoR (Experimental Program to Stimulate Competitive Research) Office coordinated the multi-partner effort, with the support of USTAR.

"Utah is faring better than most states due in part to unprecedented partnerships in all aspects of our economy," said Governor Gary R. Herbert. "This public-private collaboration among so many educational, industry and government partners in tackling a key factor in long-term economic growth and quality of life is another example of our state's can-do approach."

The state's largest EPSCoR award to date, the grant provides $4 million per year for five years to fund the program. iUTAH will explore how population growth, changing climate and land use affect the state's water sustainability.

iUTAH will strategically invest in projects aimed at monitoring and improving state water usage, while informing Utah residents of sustainable practices, and educating future water scientists and managers. The program also will promote long-term collaboration among Utah institutions and provide interdisciplinary research opportunities to students from kindergarten through postgraduate school. Todd Crowl, professor in USU's Ecology Center and Department of Watershed Sciences, is the principal investigator on the project and NSF EPSCoR director for Utah.

"Utah State University is excited to be leading this initiative to strengthen the research infrastructure across the State," said Stan Albrecht, president of USU. "The results from iUTAH will have a dramatic impact on how we understand and respond to changing water resource availability in Utah."

Most of Utah's precipitation occurs as snowfall, and the project will focus on how changing mountain snowpacks affect water supplies for the state's growing communities. Specifically, iUTAH focuses on three main areas related to water usage: watershed, infrastructure and technology. Utah's natural watersheds will serve as "living labs," with on-site observatories developed along the Wasatch Front. Statewide iUTAH partners will collect data from sites for evaluation.

Planned project facilities include a green-infrastructure research facility featuring controlled experimental gardens to test engineering innovations to improve Utah's water infrastructure, runoff and water quality in an urban environment. The research facility will also include a centralized computing facility for data integration, storage and sharing.

iUTAH will develop "Environmental Situation Roomes," designed to explore, visualize and analyze data and model simulation from all focus areas, at the U of U's Natural History Museum of Utah in Salt Lake City and the Logan USTAR campus at USU. Central aims of iUTAH are to build a statewide community of water scholars and foster education and outreach programs on water quality and usage.

"Education, outreach and diversity enhancement are key components of the EPSCoR program," said Rita Teutonico, state EPSCoR director and iUTAH associate director. "iUTAH has representatives from across the State as members of the EPSCoR teams who will ensure we integrate our research and education efforts, as well as expand the diversity of the science and technology education in Utah."
innovative Urban Transitions and Aridregion Hydro-sustainability

Exploring how population growth, changing climate, and land use affect water sustainability
This is **not** the kind of grant we are all used to!

It is a **cooperative agreement** - NSF, external advisory board, assessment team all have input into annual goals, objectives, plans.

We are being asked to come together to build a better, more capable state-wide NSF(and other federal agencies) program.

Everything we do must be transparent and open to everyone, including all facilities, models and data supported through iUTAH.

Oversight is intense and very thorough, so reporting will be

All decisions are program decisions; there are no individual projects here; **we are all in this together!**
Keys to iUTAH success

Communication

Group thinking

Detailed scopes of work

Compliance with reporting dates and format

Reevaluating overarching goals and priorities

Engaging with faculty and students in different departments and across different universities
Utah in a Nutshell:

• Utah is growing.
  – 5 million people by 2040.
• Utah has limited water.
  – 2\textsuperscript{nd} driest state in the nation.
• Utah’s climate is changing.
• Particles affect snowmelt and water quality.
Water Resources

Most of our precipitation currently occurs as snow.

We use 30-35% of the renewable water supply.
Water Resources

- Changing Climate
- Alter rain vs. snow mix.
- Snowmelt already starting earlier than average.
Utah’s Sustainable Future
Focus Area 1: The biophysical ecohydrologic system

Environmental Monitoring Network

Builds on: CZO, NEON, CUP

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Focus Area 2: The Social and engineered ecohydrologic system

- Integrated environmental-social monitoring network (from mountain top to city center)
- Green infrastructure facility
Focus Area 3: The coupled human-natural system

Interdisciplinary modeling
Scenarios modeling
Participatory modeling
iUTAH “Environmental Situation Rooms”

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Primary Data Storage
Backup Data Storage

CUAHSI HIS
DataONE

National Science Data Networks

• USGS NWIS
• NRCS SNOTEL
• Utah DWQ
• Etc.

• Primary data organization and storage
• Data sharing, publication, and archival
• Data integration and synthesis
• Integrated modeling and CI Support
• HPC support

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• Redundant data storage
• HPC support
• Modeling and simulation
• Collaboration technologies

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• HPC support
• Modeling and simulation
• Collaboration technologies

• LiZle Bear River
• Red BuZe Creek
• Provo River

Fulton Supercomputing Lab

UVU

BYU

Utah Field Station Network

North Region Decision Theater
(USTAR Logan)

SLC Decision Theater
(NHMU)

UEN and K-12 Sites

Intermountain Network Node

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iUTAH Research Teams

**Focus Area 1:** Biophysical ecohydrologic system
Lead: **Michelle Baker, USU**
Zach Aanderud, BYU
Dave Bowling, UU
Richard Gill, BYU
Jiming Jin, USU
Scott Jones, USU
Bethany Neilson, USU
Diane Pataki, UU
Sam St. Clair, BYU
Court Strong, UU
Dave Tarboton, USU
Suzanne Walter, UVU

**Focus Area 2:** Social and engineered ecohydrologic system
Lead: **Doug Jackson-Smith, USU**
Daniel Bedford, WSU
Steve Burian, UU
Joanna Endter-Wada, USU
Carlos Licon, USU
Christine Pomeroy, UU
Charles Sims, USU
Carla Trentelman, WSU
Bo Yang, USU

**Focus Area 3:** Coupled human-natural system
Lead: **Diane Pataki, UU**
Reid Ewing, UU
Jeff Horsburgh, USU
Ryan Jensen, BYU
Chris Nelson, UU
Sara Null, USU
David Rosenberg, USU
Bo Yang, USU

**Facility 1**
Environmental Network

**Facility 2**
Green Infrastructure

**Facility 3**
Environmental Situation Rooms

**Cyberinfrastructure**
**Steve Corbato, UU**
Jeff Horsburgh, USU
James Stewart, UEN
Dave Tarboton, USU

**Facilities:** Jim Ehleringer, UU
iUTAH Management Team\textsuperscript{MT}

PI: Todd Crowl, USU  
Co-PI: Diane Pataki, UU  
Co-PI: Jim Ehleringer, UU  
Co-PI: Doug Jackson Smith, USU  
Co-PI: Michelle Baker, USU  
Assoc. Director: R. Teutonico, USU

Zach Aanderud, BYU  
Brian Avery, Westminster  
Dan Bedford, Weber St  
Tami Goetz, UVU  
Chris Keleher, UDNR

James Morales, USU  
Paul Spruell, SUU  
Janet Ross, Four Corners School  
Madlyn Runburg, NHMU

Research Focus Areas

Focus Area 1: Biophysical ecohydrologic system  
Lead: \textit{Michelle Baker, USU}

Focus Area 2: Social and engineered ecohydrologic system  
Lead: \textit{Doug Jackson-Smith, USU}

Focus Area 3: Coupled human-natural system  
Lead: \textit{Diane Pataki, UU}

Education, Outreach, Diversity (EOD) Teams

NSF EPSCoR Associate Director  
EOD Director

Workforce Development Team  
External Engagement Team  
Diversity Enhancement Team
iUTAH Education, Outreach, Diversity (EOD) Teams

Workforce Development Team

Zach AanderudMT, BYU
Brian AveryMT, Westminster
Scott Bates, USU
Todd Crowl, USU
Boyd Edwards, USU-Uinta Basin
James Ehleringer, UU
Holly Godsey, UU
Tami GoetzMT, UVU
Daniel Horns, UVU
Nancy Huntly, USU
Doug Jackson-Smith, USU
Chris KeleherMT, DNR
Mary Jane Keleher, SLCC
Linda L’Ai, Edith Bowen School
David Matty, Weber State U
Nancy Mesner, USU
Diane Pataki, UU
Bob Ramsey, Canyon Concepts LLC
Jacob Davis, Campbell Scientific, Inc.
Madlyn Runburg, NHMU
Sam Rushforth, UVU
Paul SpruellMT, SUU
Louisa Stark, GRLC

Associate Director: R. TeutonicoMT
EOD Director: tbd

External Engagement Team

Laura Hunter, UEN
Paul Husselbee, SUU
Carlos Licon, USU
Becky Menlove, NHMU
Nancy Mesner, USU
Lorie Millward, NHMU
Nalini Nadkarni, UU
Madlyn RunburgMT, NHMU
Louisa Stark, GRLC

Diversity Enhancement Team

Sue Dintelman, Pleiades, Inc.
Carla Enders, USU-Eastern
Nancy Huntly, USU
Kathleen Hurd, SLCC
Susan Madsen, UVU
James MoralesMT, USU
Herm Olsen, J.D.
Janet RossMT, Four Corners School
Hugo Rossi, UU
Madlyn Runburg, NHMU

Note: MT indicates Management Team member

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Education

• iUTAH Summer Institutes:
  K12 thru faculty research experiences

• Collaborative Research Experiences for Undergraduates (REU)

• Water Sustainability Graduate Research Fellows

• Internship Program - Corporate, state agencies

• Postdoctoral Fellowships:
  Interdisciplinary

• Faculty Research Fellowships:
  2yr and 4yr

• Annual iUTAH Symposium:
  all participants
Outreach

• Museum Partnerships
  – Taking Learning Outdoors
  – Traveling Treasures
  – other

• Urban Futures
  – Participatory Modeling
  – ‘Environmental Situation Rooms’

• Citizens’ Science

• Communications Technology
  – iUTAH web site
  – UEN backbone
  – NSF CI awards
Diversity Plan

- Diversity Enhancement Team
- State-wide representatives
- Diversity experts at UT institutions
- Four Corners School partner
- Recruitment for all iUTAH activities
- *Integral to research and education*
Timeline
Big Picture Priorities

Year 1 - Develop iUTAH and state EPSCoR Office and Staff

Watershed Observatories - design, install monitoring instruments, data flow and storage

Establish EOD teams, objectives and timelines

Internships, REUs, Museum Partnerships

*Satisfy NSF requirements*

Year 2 - Watershed Observatories – must be fully integrated and functioning, including urban and social components

Begin scoping Green Infrastructure

Summer Institute

all EOD activities

*NSF and assessment meetings*
Big Picture Priorities

Year 3 - Watershed Observatories - Data & Modeling capabilities fully operational

EOD activities fully engaged

Summer Institute

Green Infrastructure Facility completed and integrated with EOD and other research

Environmental Situation Rooms Scoped

*NSF reverse site visit*
Big Picture Priorities

Year 4 - Watershed Observatories - fully integrated

Green Infrastructure - fully integrated

Summer Institute

all EOD activities

Environmental Situation Rooms - functional

*NSF site visit; Assessment team evaluation*

*EPSCoR II planning begins*
### iUTAH EPSCoR 2012-2013 Timeline

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
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<tbody>
<tr>
<td>Sept. 1, 2012</td>
<td>Individual participants (from all institutions) submit finalized scopes of work and deliverables for 2012-2013 to Crowl</td>
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<tr>
<td>Sept. 10, 2012</td>
<td>PIs and team leads meet with External Advisory Board</td>
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<tr>
<td>No later than</td>
<td>Assessment/NSF strategic planning meeting - All required to attend (including a revised education plan)</td>
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<tr>
<td>Sept. 30, 2012</td>
<td>Final watershed designs</td>
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<tr>
<td>Nov. 15, 2012</td>
<td>Final watershed designs</td>
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<tr>
<td>No later than</td>
<td>Strategic Plan, State S&amp;T Plan and State EPSCoR bylaws due to NSF</td>
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<tr>
<td>Nov. 30, 2012</td>
<td>including individual Scopes of Work with roles, responsibilities and deliverables</td>
</tr>
<tr>
<td>Jan. 1, 2013</td>
<td>First semi-annual reporting due</td>
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<tr>
<td>March 1, 2013</td>
<td>Second semi-annual reporting due</td>
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<td>Final individual reports due with estimates for 4th quarter</td>
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<tr>
<td>April 1, 2013</td>
<td>80% of budget must be obligated;</td>
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Collaborative Opportunities
Current Collaborators:

Each institution has someone on at least 1 research or EOD team

Seed funds targeted to non-PhD institutions
iUTAH Partners (so far)

- Brigham Young University
- Central Utah Project
- Dixie State College
- Envision Utah
- Governor’s Office Economic Development
- Governor’s Office Planning & Budget
- KUEN Public Television

- Salt Lake City School District
- Salt Lake Community College
- Salt Lake County Planning and Development
- Southern Utah University
- University of Utah
- USDA NRCS
- USTAR
- Utah Center for Science and Math Education
- Utah Department of Environmental Quality
- Utah Educational Network

- Utah Field Station Network
- Utah Museum of Natural History
- Utah Rural Schools Association
- Utah Society for Environ. Sci. Education
- Utah State Office of Education
- Utah State University
- Utah Valley University
- Wasatch Front Regional Council
- Westminster College
- Women’s Tech Council

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• Expand partnerships across Utah
• Workshops and team building
• Research Experience for Undergraduates Site (NSF 12-569)
• Science, Technology, Engineering, and Mathematics Talent Expansion Program (NSF 11-550)
• Integrated Graduate Education and Research Traineeships (NSF 11-533)
• Research Coordination Network (NSF 11-531)
• Sustainability Research Network (NSF 11-574)
• Expeditions in Computing (NSF 10-564)
• Others?
Discussion

rita.teutonico@usu.edu