



iUTAH

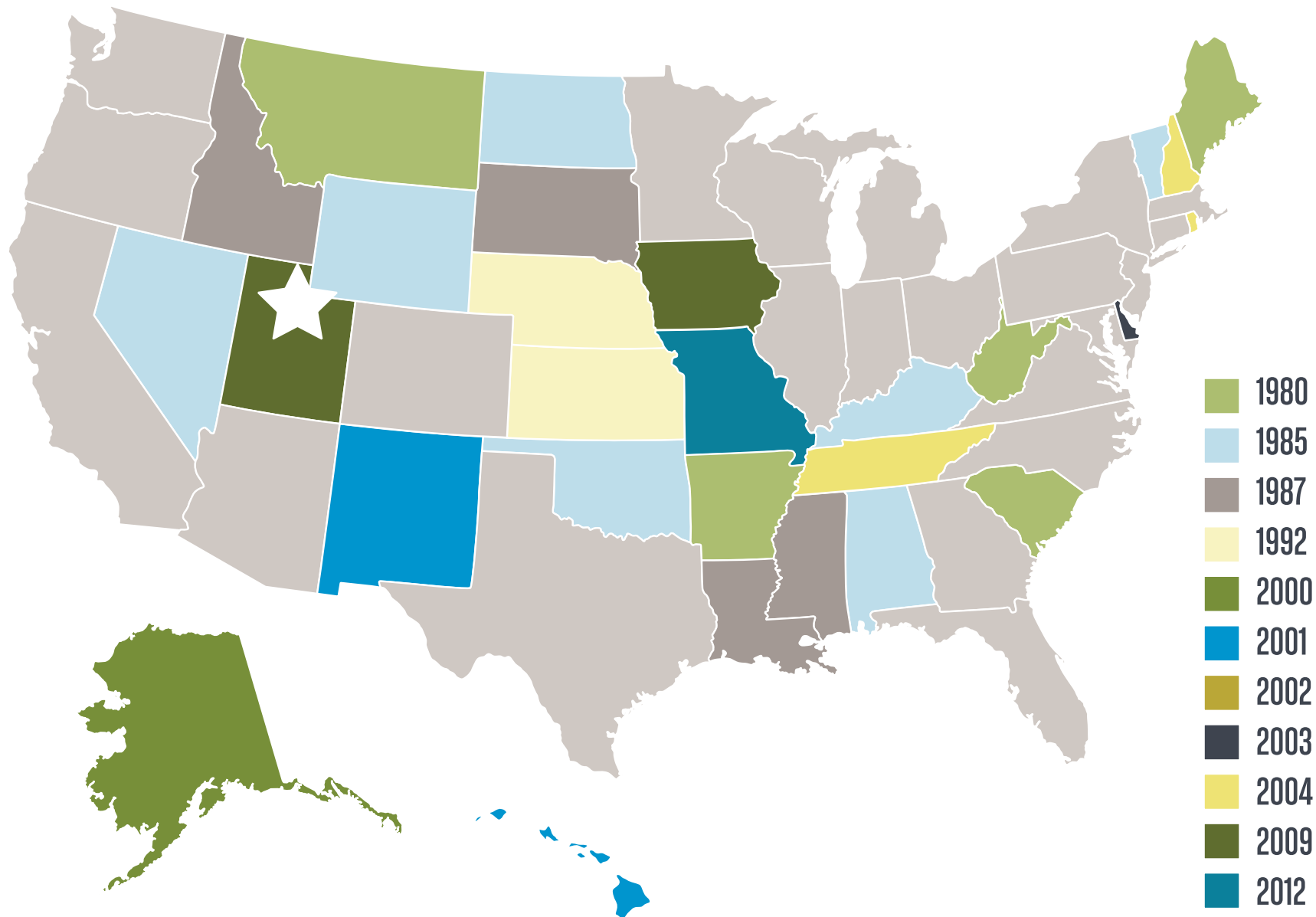
**External Advisory Board
Year 2 Meeting**

Presentation Outline



- State of the State (*Michelle Baker*)
- Research Focus Area 1 (*Zach Aanderud*)
- Research Focus Area 2 (*Doug Jackson-Smith*)
- Research Focus Area 3 (*Diane Pataki*)
- Education Outreach Diversity (*Ellen Burns and Mark Brunson*)
- Facilities (*Jim Ehleringer*)
- Challenges and Opportunities for year 3 (*Michelle Baker*)

Utah eligible for EPSCoR in 2009



EPSCoR's role in Utah



Build statewide
research capacity

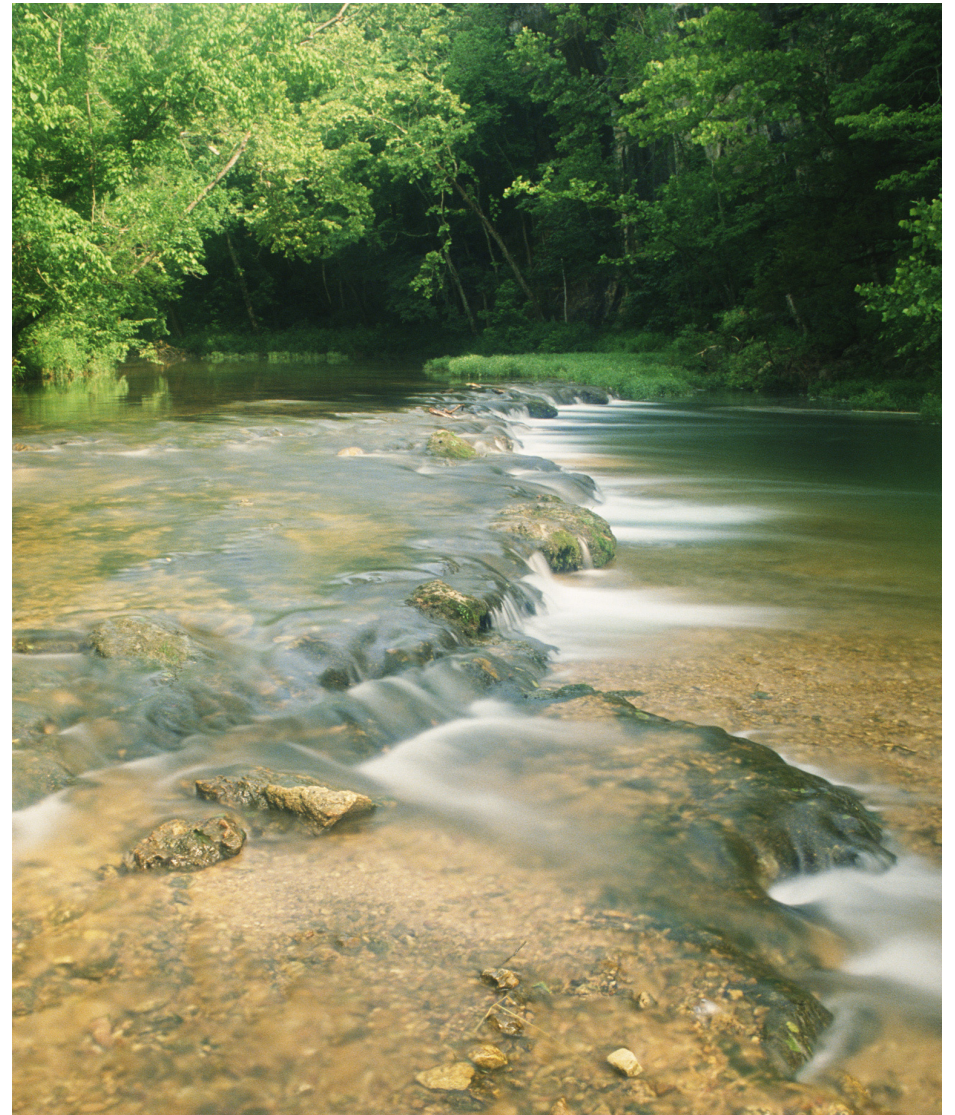
Strengthen STEM
workforce

Enhance economic
competitiveness
and sustainability

Context of Utah's EPSCoR RII



- Utah's population is growing
 - 5 million people by 2040
- Utah has limited water resources
- Utah's climate is changing
 - Average temperatures increasing
 - Alter rain vs. snow mix
- Snowmelt and water quality will decrease
- How achieve future water sustainability?



Research Infrastructure Improvement (RII) award - Track 1



**innovative Urban Transitions
and Aridregion Hydro-
sustainability**

Awarded Aug. 1st, 2012

*\$20M multi-university effort to
boost statewide research
infrastructure to manage and
protect Utah's water resources*

*Exploring how interactions among water, people,
and ecosystems impact Utah*

Transitions in Year 2



Todd Crowl → Michelle Baker

Rita Teutonico → Mark Brunson

Michelle Baker → Dave Bowling

Diane Pataki → Court Strong

National search for Project
Administrator/Assistant Director
underway

iUTAH Leadership and Management Teams

External Advisory Board
Bill Michener, NM EPSCoR
Bill McDowell, NH EPSCoR
Morgan Grove, USFS, Baltimore-LTER
Judy VanHouten, VT EPSCoR
Cassandra Manuelito-Kerkvliet, CMK Consulting

External Assessment Team
AAAS
Education Assessment (J. Ewing-Taylor)
Bibliometric Assessment (A. Porter)



Research Focus Areas

Focus Area 1: Biophysical ecohydrologic system
Co-Leads:
Zach Aanderud, BYU
Dave Bowling, UU

Focus Area 2: Social and engineered ecohydrologic system
Co-Leads:
Doug Jackson-Smith, USU
Christine Pomeroy, UU

Focus Area 3: Coupled human-natural system
Co-Leads:
Diane Pataki, UU (soon to be Court Strong, UU)
Sarah Null, USU

Facilities
GAMUT Environmental Observatory
Modeling and Data Federation
Green Infrastructure Research Facility

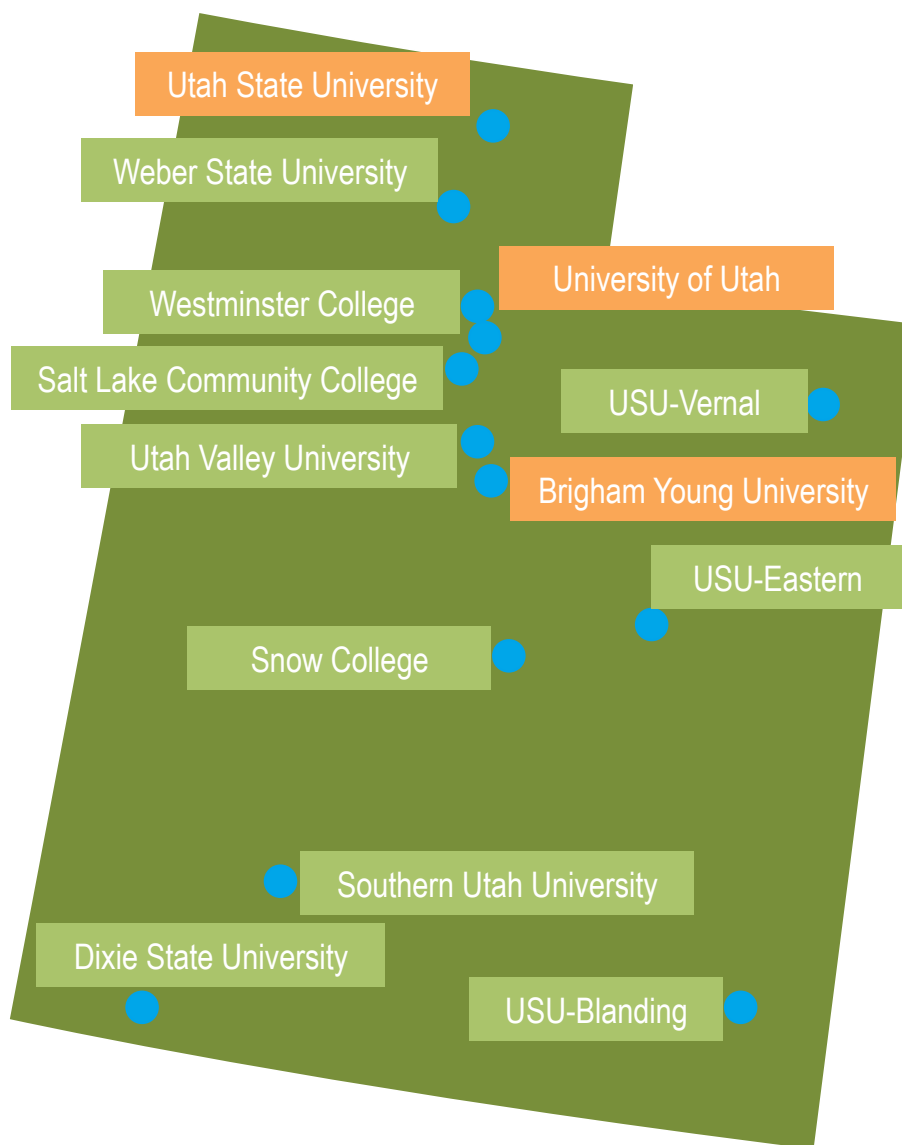


Education, Outreach, Diversity (EOD) Teams

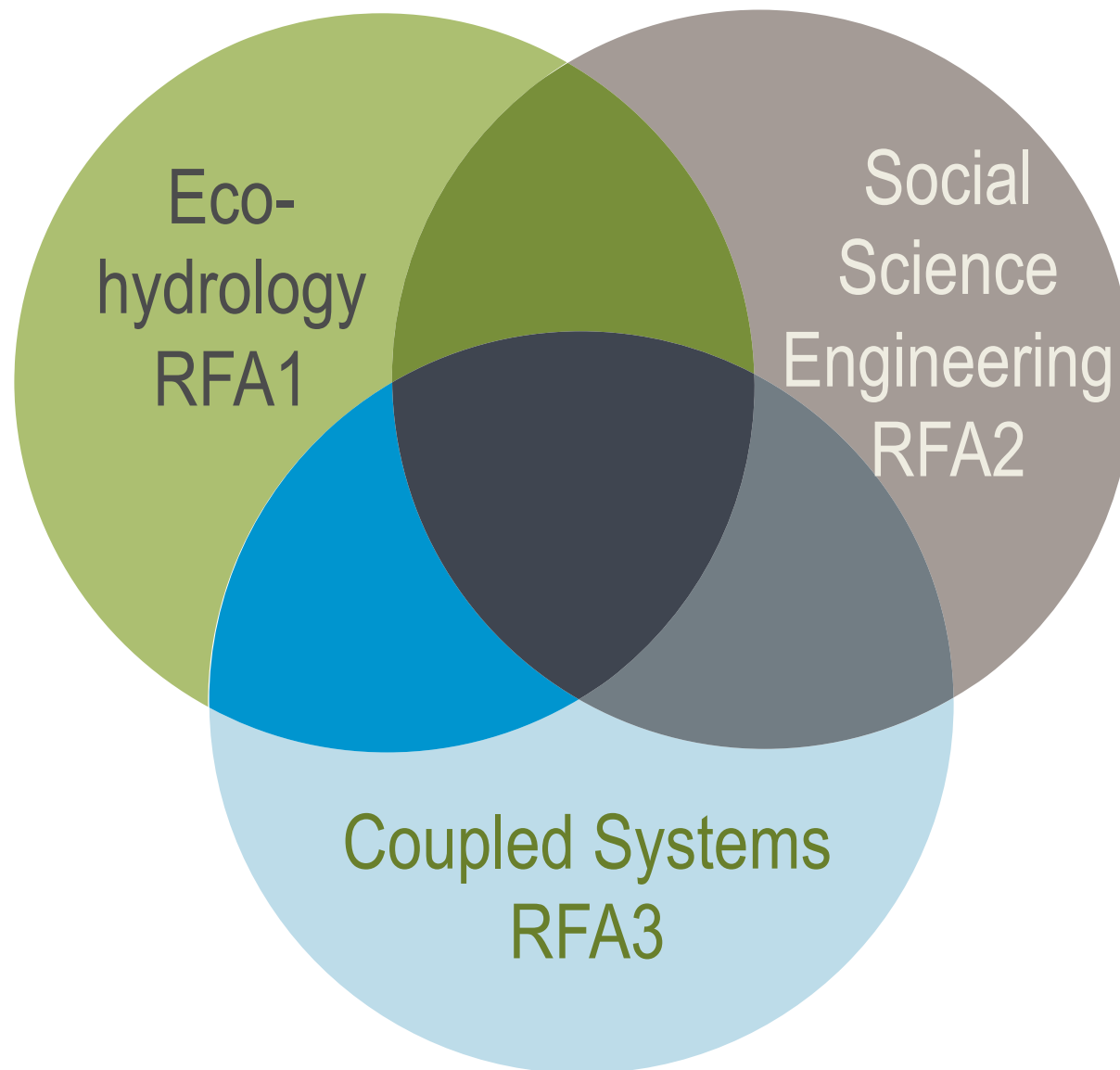
Mark Brunson, EOD Director
Ellen Burns, EOD Coordinator

Workforce Development Team ↔ Diversity Enhancement Team ↔ External Engagement Team

iUTAH's Reach in Higher Ed



Research Activities in iUTAH

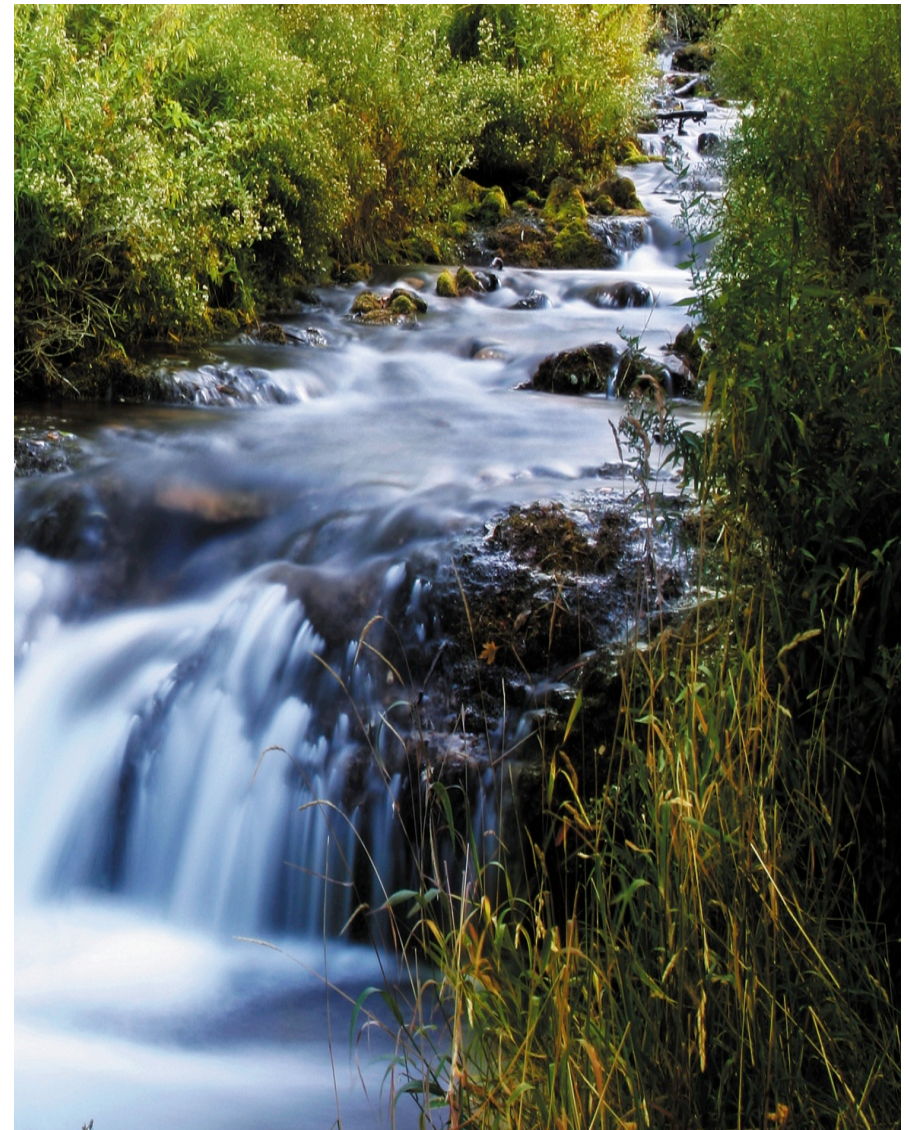


RFA1 Research Questions



What processes control water quantity and quality along mountain-to-urban gradients?

How will the quantity and quality of water change as a result of climate change and land use in forested, urban, exurban, and agricultural environments?



RFA1 - Ecohydrology



Goals

- Improve capacity to monitor WMRA ecohydrologic system on mountain to urban gradient.
- Enhance capacity to understand ecohydrologic processes in the WRMA as they relate to water resource availability now and in the future.

Results of Strategic Priority Targets RFA1



Tasks Completed

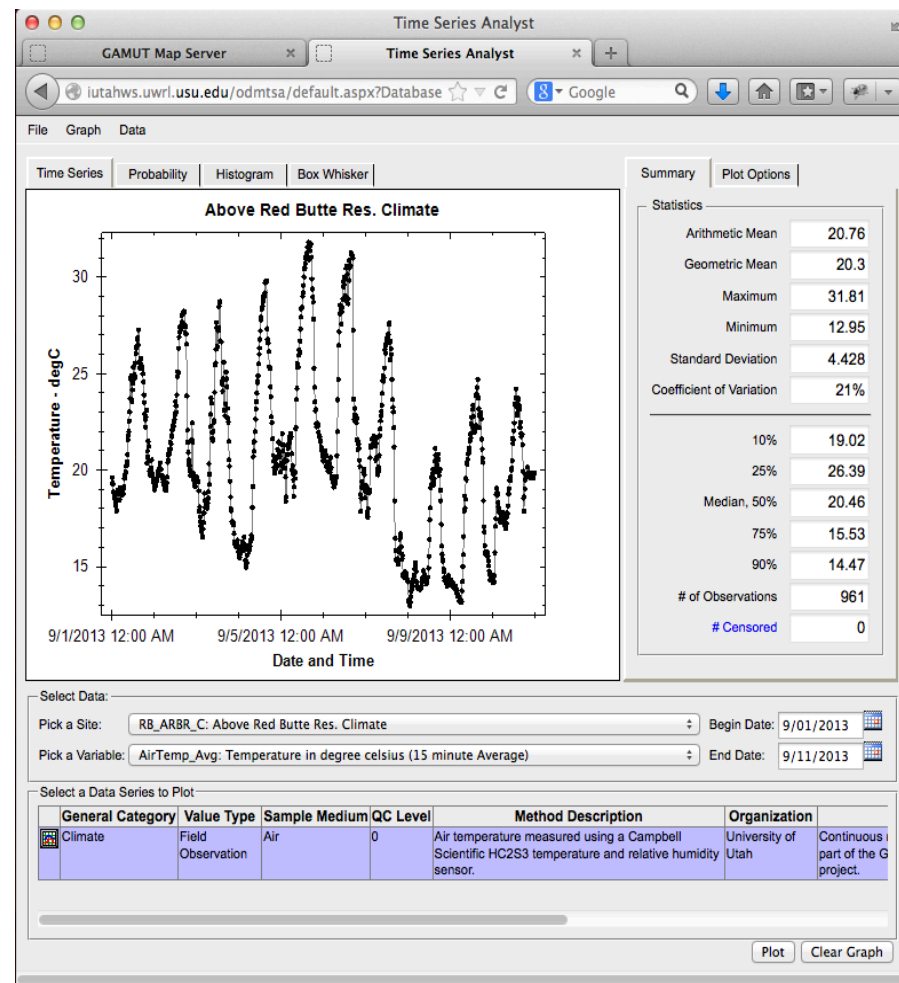
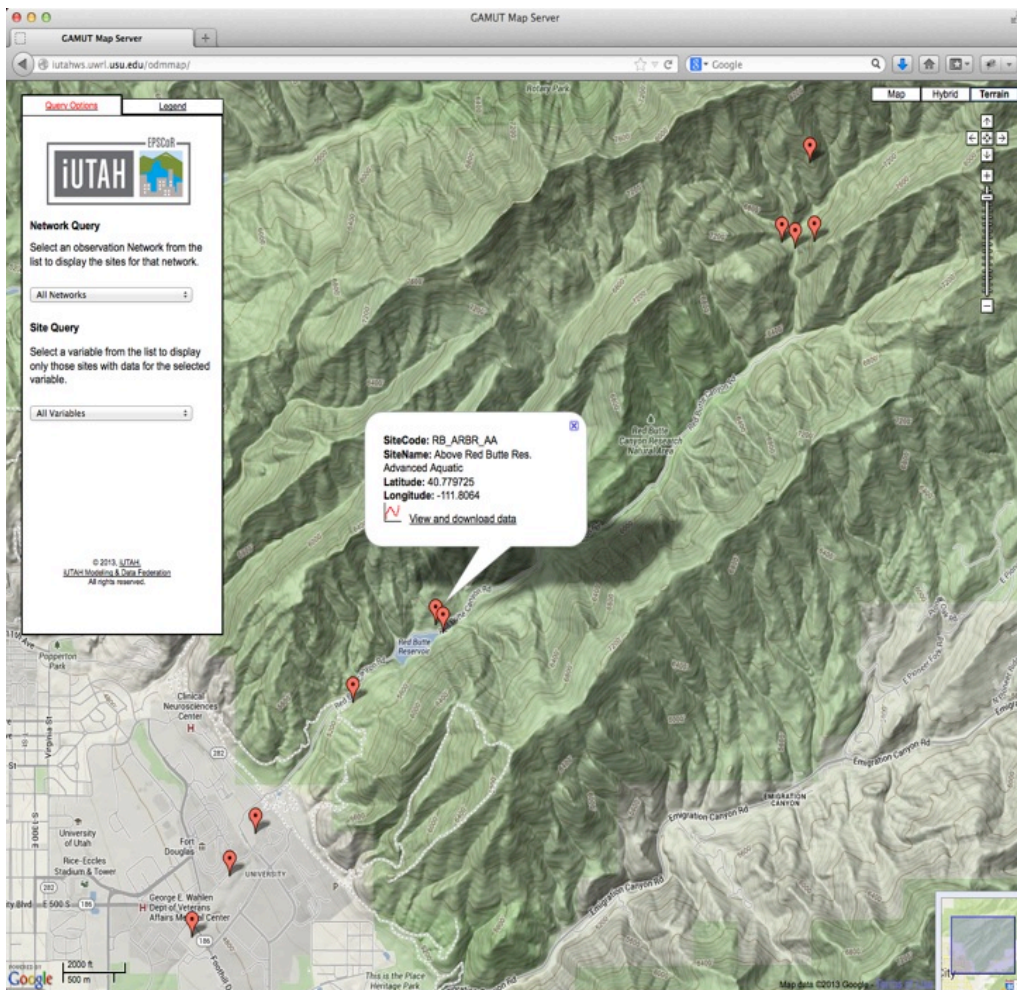
Completed the GAMUT observatory providing needed research infrastructure

Addressing research questions with six graduate students (2013-2014)

Completed monthly synoptic sampling of water quality as baseline data and evaluated snowpack and snow chemistry

Mentored and trained undergraduates during the iUTAH Summer Research Institute and during the academic year

GAMUT is Live!



<http://data.iutahepscor.org/odmmmap/>

RFA1 – Plans for Year 3



Goals

- Collect data for collaborative proposals and publications
 - Submit at least three manuscripts (April 2015)
- Finalize SOPs for water quality
- Continue to create collaborative research network across institutions
 - Monthly RFA1 meeting highlighting graduate student research
- Continue to train and mentor graduate and undergraduates students
 - Summer Research Institute / Spring Runoff and national Conferences

RFA2: People, Places & Pipes



CORE QUESTIONS:

What are the current drivers of water and land use management in the region?

How does urban form interact with water use and the quantity and quality of return flows?

How can we design urban infrastructure to enhance water sustainability?

RFA2 – People, Places, and Pipes



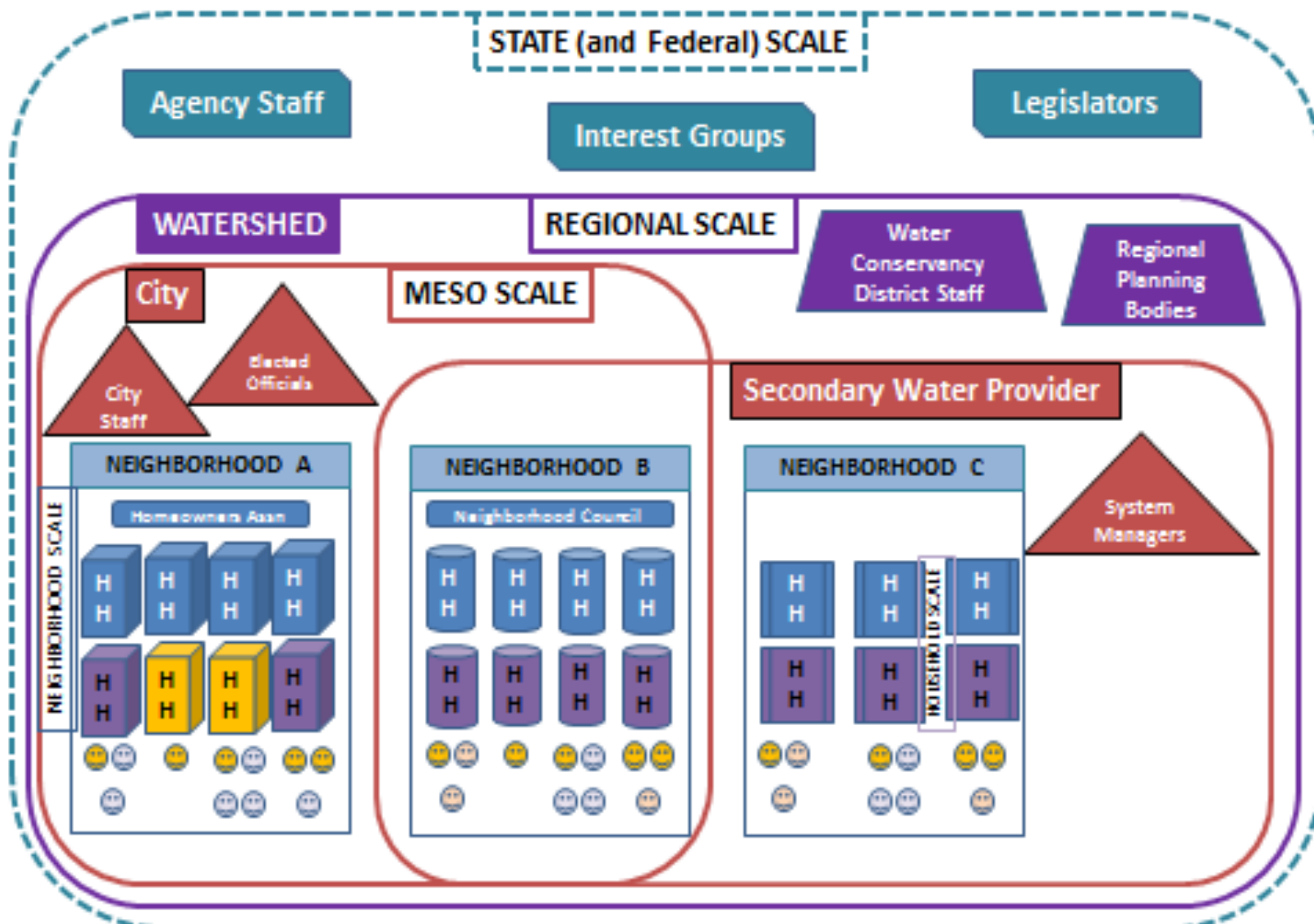
Overall Goals

- *Improve capacity to gather and analyze social and engineering system data on coupled water systems*
- *Improve capacity to collect intensive data on water use, water decision-making, and stormwater runoff*
- *Improve knowledge of and use of information about built infrastructure to model water system outcomes*
- *Build new collaborative relationships*

Working at Multiple Scales



UNITS OF ANALYSIS – SCALES OF ANALYSIS



HOUSEHOLDS & NEIGHBORHOOD SCALE DATA

COLLECTION PLANS

1. Develop “TYPOLOGY” of urban neighborhoods
2. Select neighborhoods
3. Collect multiple types of data in selected neighborhoods
 - Individuals and Households (*surveys & interviews*)
 - Institutions & policies
 - Infrastructure & engineered systems
 - Biophysical monitoring

GAMUT NEIGHBORHOODS

MAJOR CLUSTER GROUPS AND NEIGHBORHOOD TYPES

The Expanding City - 15% pop; 27% area

- Mature homesteaders (n=91)
- Young homesteaders (n=60)
- Green Acres (n=17)

New Suburban - 21% pop; 20% area

- Starter Suburbs (n=124)
- Away-from-it-all Suburbs (n=47)
- Suburban Power Elite (n=47)

Suburban Working Class - 8% pop; 9% area

- Working Class (n=99)

The Moderate Middle - 15% pop; 17% area

- Working poor (n=112)
- Middle-class with a view (n=106)

Traditional Residential Core - 18% pop; 11% area

- Original Residential (n=131)
- Traditional Upper Crust (n=146)

Parkside Residential - 6% pop; 3% area

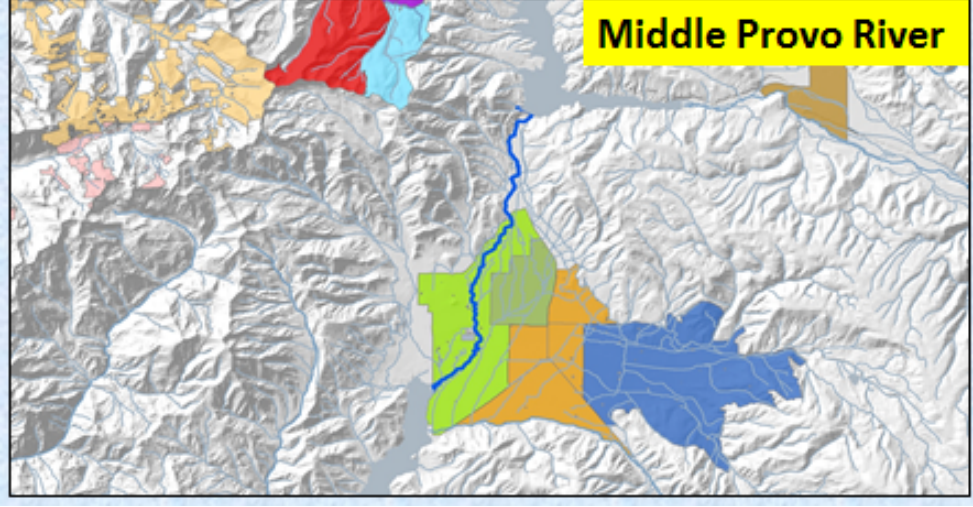
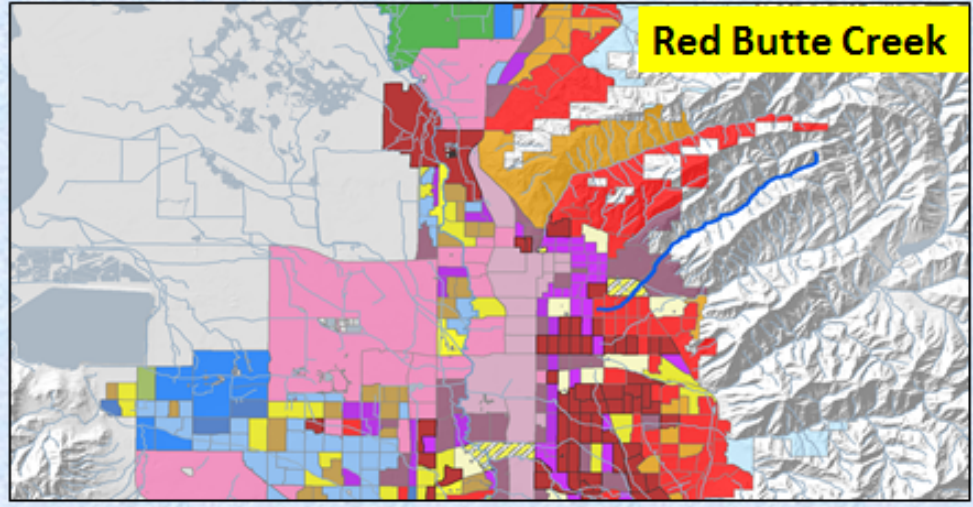
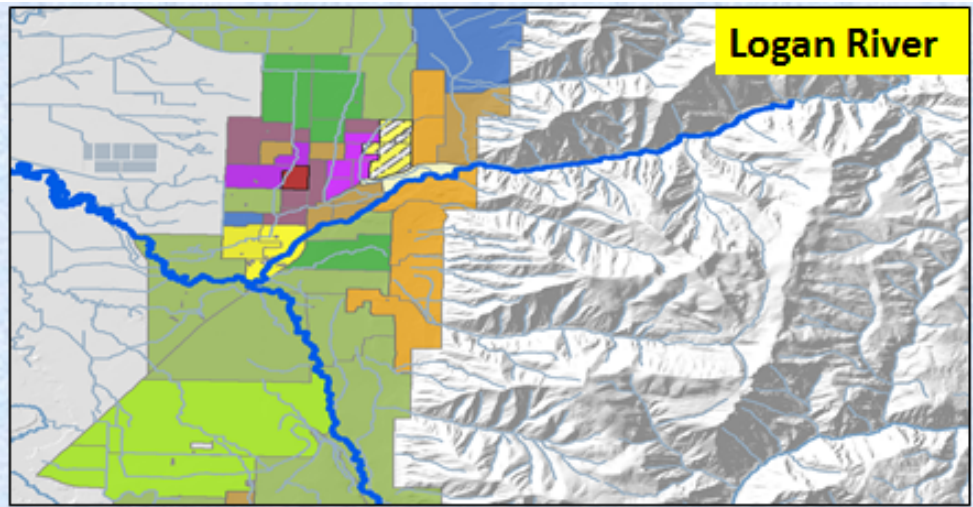
- Neighborhood Parks (n=70)
- City Parks (n=12)

Bohemian Neighborhoods - 9% pop; 2% area

- Wanna-be Bohemians (n=70)
- Wasatch Bohemians (n=62)

The Urban Scene - 9% pop; 7% area

- Downtown Residential (n=75)
- Industrial Poor (n=36)
- Downtown Commercial (n=15)



BROADER SOCIAL SCIENCE RESEARCH PROGRESS



Qualitative & Secondary Data (year 1)

- Semi-structured interviews
- Meeting observations
- Neighborhood-scale data on land use, land cover, etc. to build urban typology

Quantitative Survey and Secondary Data (year 2/3)

- Systematic household survey (water behaviors, attitudes, values, preferences)
- Stormwater manager survey
- Analysis of media coverage of water
- **Municipal data on actual water use**

Coupled Data and Integrated Modeling

(w/RFA3; Year 3-5)

- **Co-located social and biophysical data collection at parcel and neighborhood scales**
- **Use of social research results in development of coupled process & agent-based models**

DATA

Water Use and Landscaping Behaviors

- HH Survey questions
 - Indoor and outdoor water use, landscaping behaviors
 - Decision-making factors
 - Experiences/interactions with local water bodies
- Qualitative follow-up interviews with selected respondents
- Actual water use data (from municipal provider)
- Measured parcel-scale landscaping patterns (remote sensing, on-site measurements)

Perceptions, Attitudes, Values, Preferences

- Interviews & Focus Groups with campus water stakeholders
- Media analysis
- HH survey questions: Values, Concerns, Risk perceptions, Policy preferences
- Qualitative follow-up interviews with selected respondents

Social and Neighborhood Context

- Aggregate neighborhood characteristics (urban typology)
- HH survey response information
- Local water rates and policies
- Documentation of locally-active social groups and networks

Engineering Team Activities



- Developed formal plans for expanded urban instrumentation; initiating purchase/installation
 - GAMUT extension (3 new aquatic stations)
 - Storm drains & canals (flow monitoring)
- Installed new instrumentation
 - Storm drains in Red Butte Creek
 - Green roofs (UU and SUU campuses)
- Began development of parcel & neighborhood urban hydrology models (stormwater; hydrology/water budgets)
- Design of GIRF/GIRN; GI experiments

Results of Strategic Priority Targets RFA2



**Tasks
Completed
(areas 2.1
and 2.2)**

Completed urban typology

Implemented major surveys

Expanded urban instrumentation

Created public datasets

Papers, presentation, grant submissions

RFA2 – Plans for Year 3



Goals

- RESEARCH:
 - Analyze survey datasets; follow-up studies (orgs, policy, coupled data)
 - Urban instrumentation implementation, data analysis & modeling
 - GIRF pilot studies
 - Collaborate with RFA1 & RFA3 on coupled data
- PEOPLE:
 - Hire/integrate new graduate students, RFA2 postdoc; economist (USU)
 - Find new social science collaborators

RFA 3: Coupled Human and Natural System



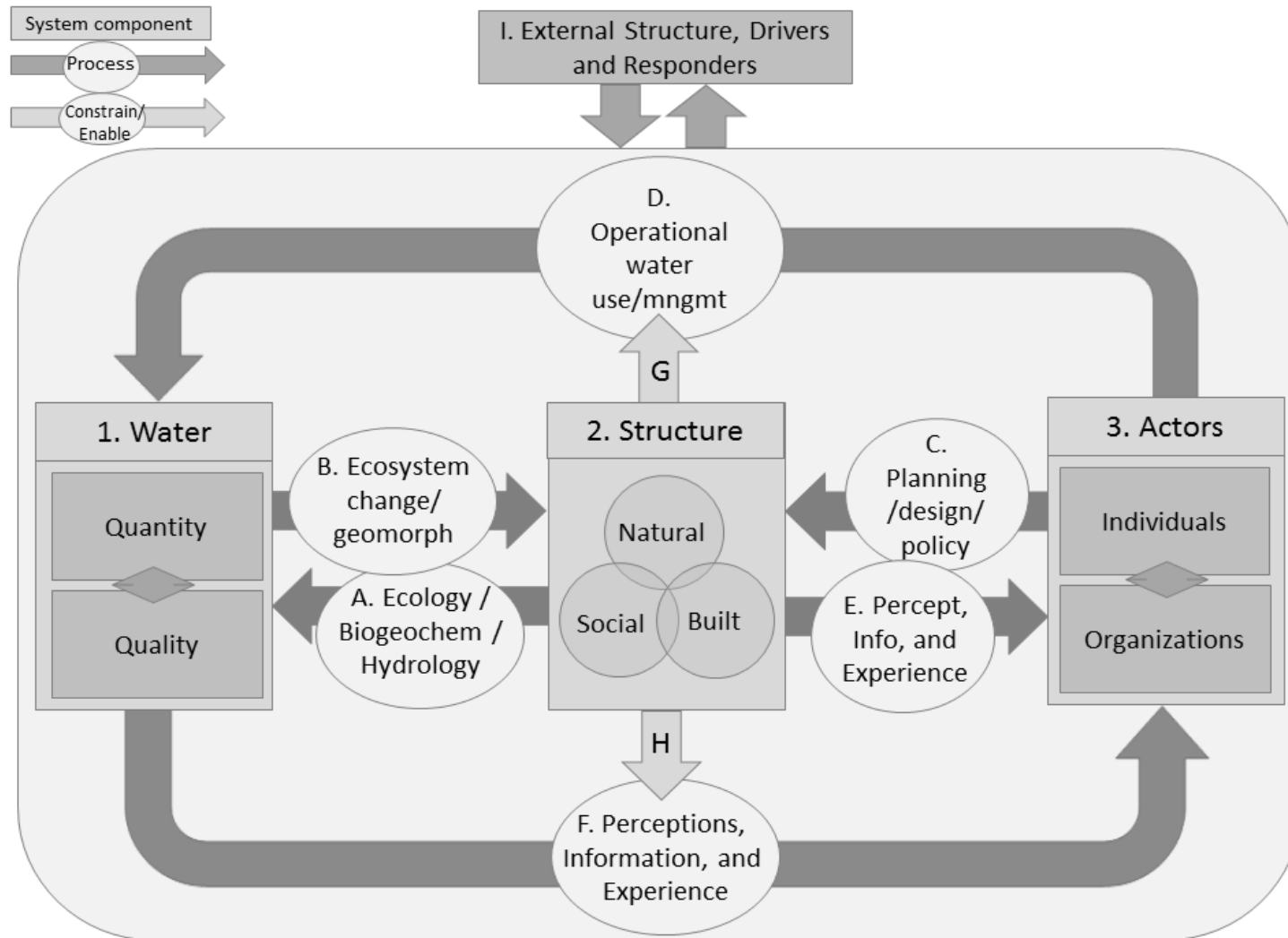
RFA 3: Coupled Human and Natural System



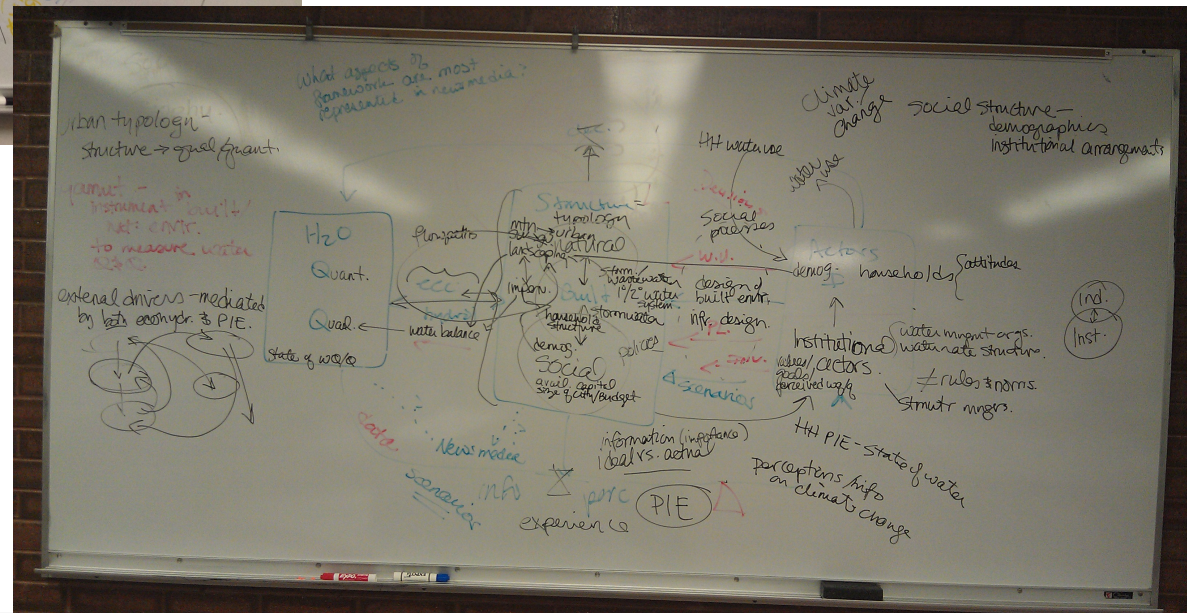
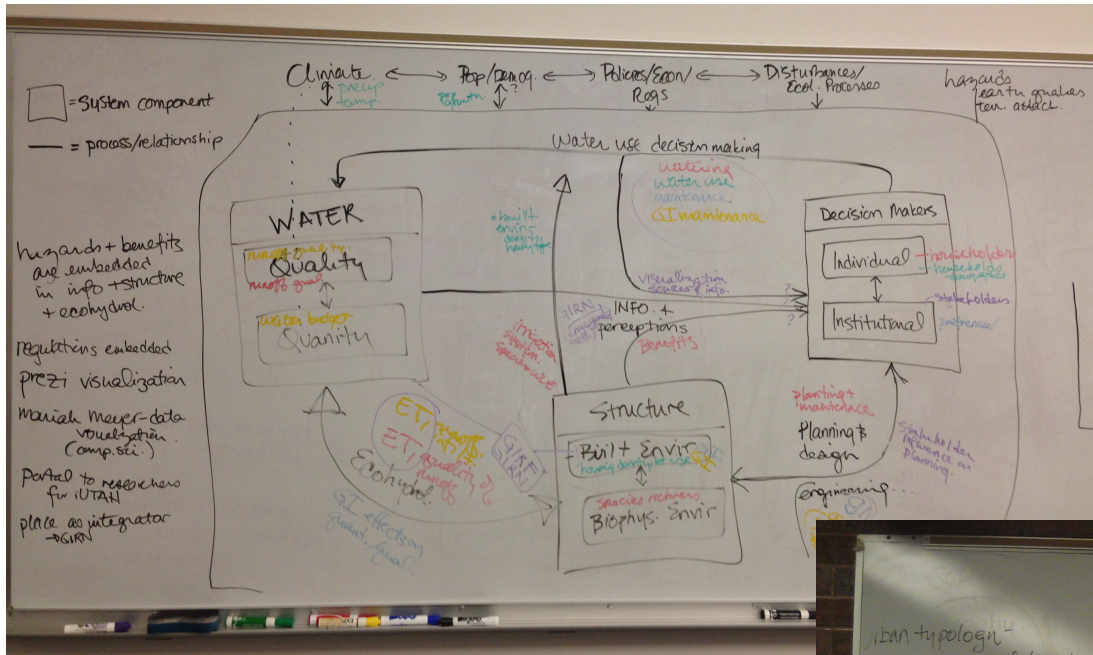
Goals

- Identify, categorize, & centralize relevant data and models
- Link disparate models and datasets
- Integrate results from RFAs 1 and 2
- Enhance capacity for interdisciplinary research and training
- Provide participatory modeling tools
- Enhance data/model visualization capacity

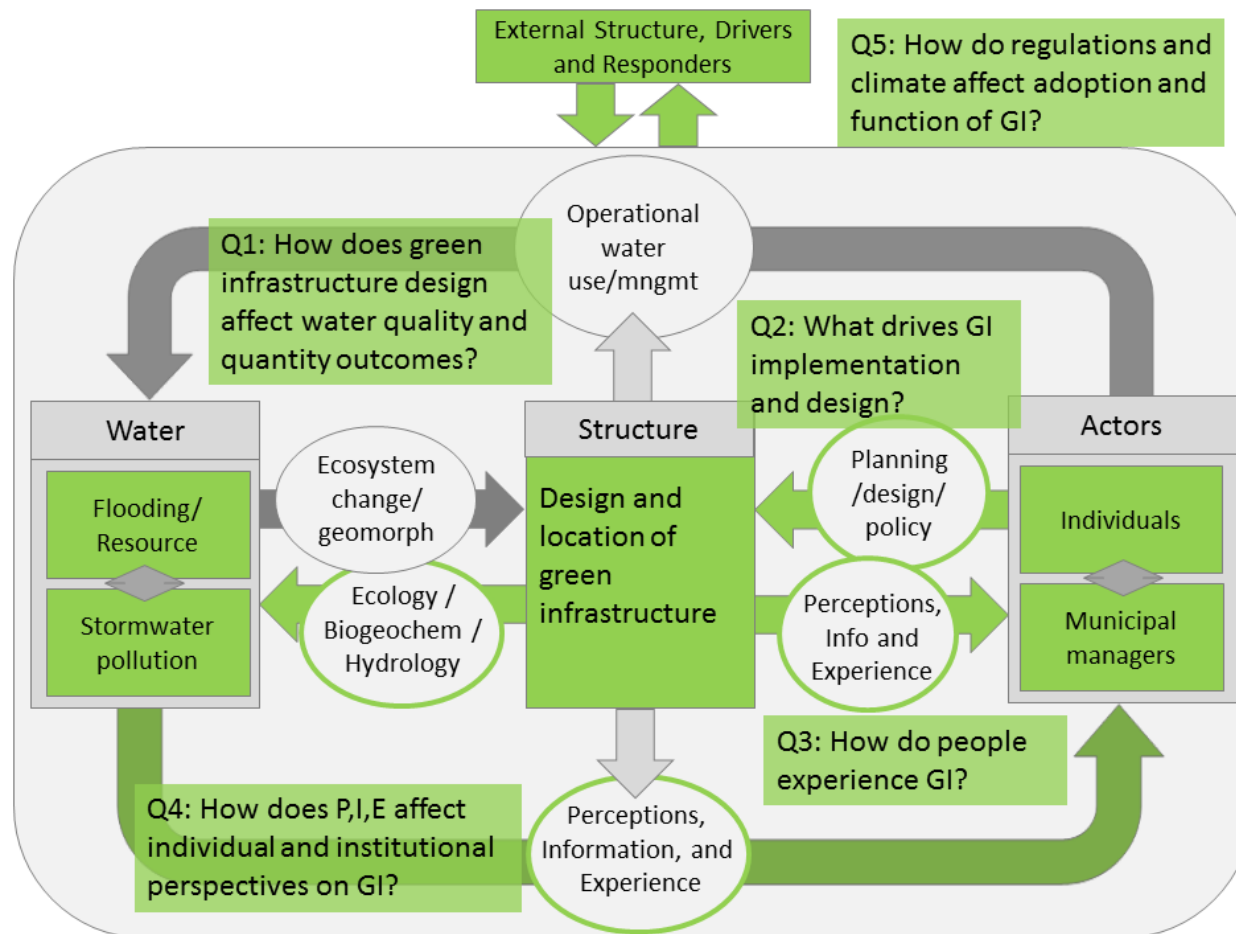
RFA 3 - iUtah Conceptual Model



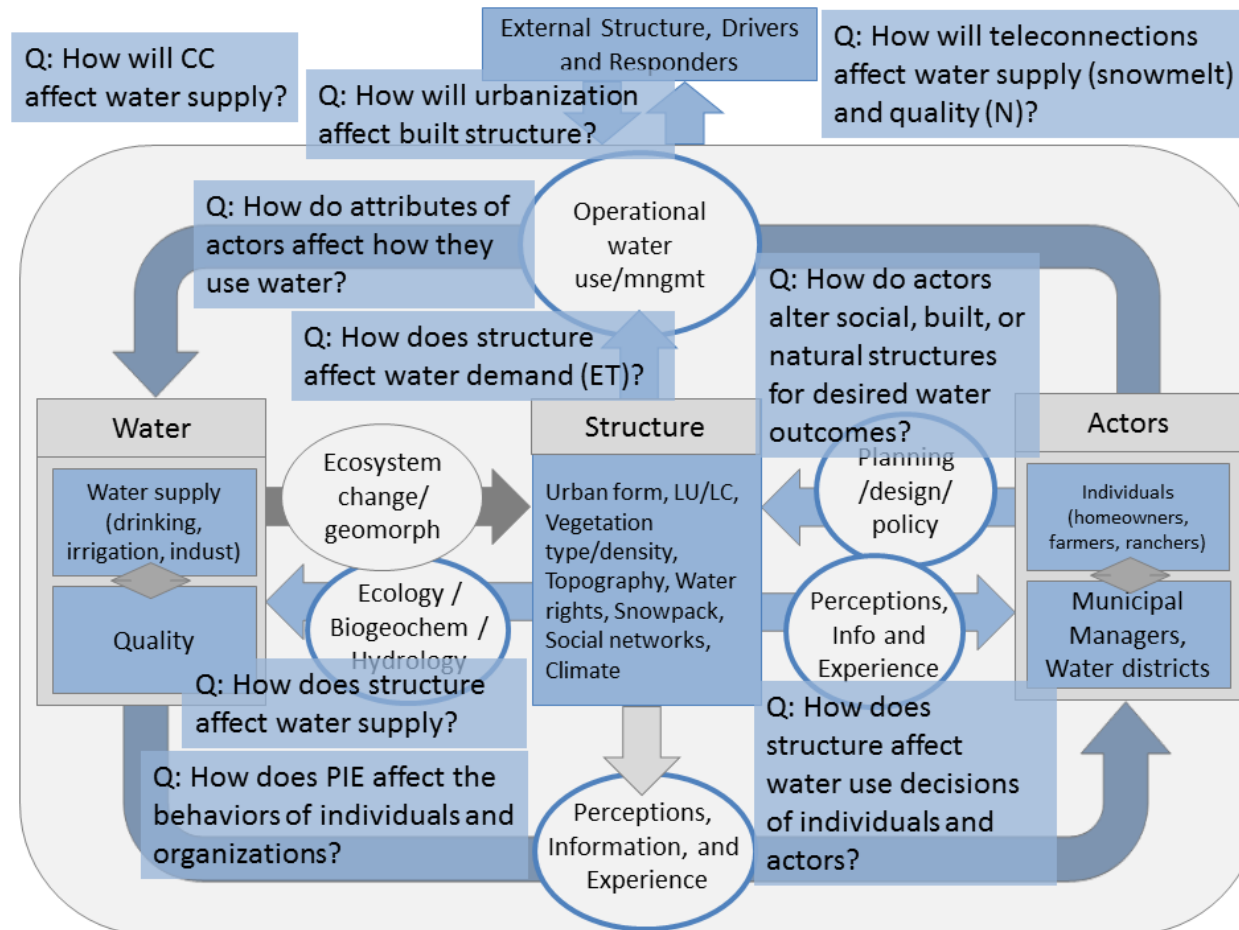
RFA 3 - iUtah Conceptual Model



RFA 3 - iUtah Conceptual Model



RFA 3 - iUtah Conceptual Model



RFA 3 Coupled Modeling



*Management
Decisions affect water
demand
i.e. price changes,
draught restrictions*

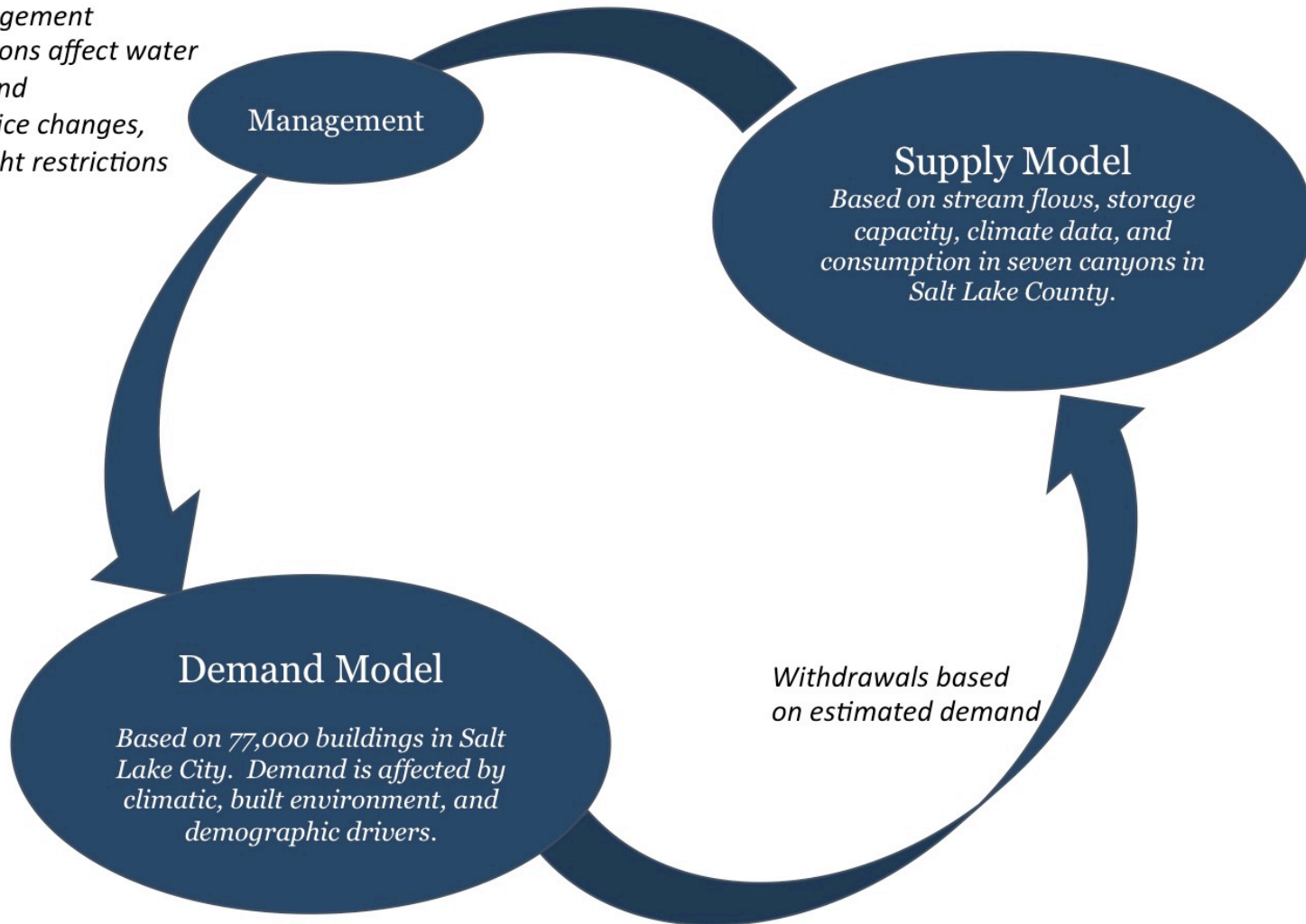
Management

Supply Model
*Based on stream flows, storage
capacity, climate data, and
consumption in seven canyons in
Salt Lake County.*

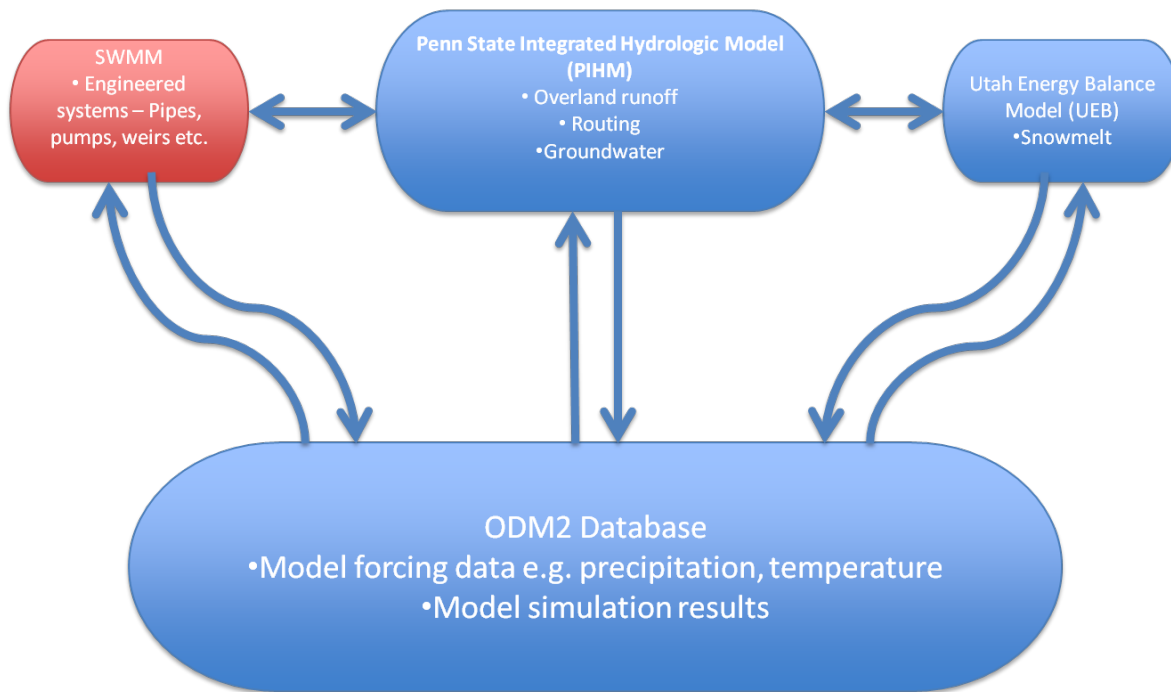
Demand Model

*Based on 77,000 buildings in Salt
Lake City. Demand is affected by
climatic, built environment, and
demographic drivers.*

*Withdrawals based
on estimated demand*



RFA 3 Coupled Modeling



Bi-directional feedbacks
per time step



Bi-directional feedbacks per
entire model time domain



OpenMI
components to
be developed

OpenMI
components
developed

- Evaluation Metrics
 - Simulation time
 - Memory utilization
 - Mass balance errors
- Variables
 - Increasing computational elements
 - Increasing temporal domain
 - Increasing time steps
 - Spatially decomposed coupled models vs. coupled models from decomposing hydrologic processes

Results of Strategic Priority Targets



Tasks Completed

Collaborative team meetings

Model development workshops

Stakeholder engagement working group meetings

Visualization and coupled modeling personnel

RFA 3 postdoctoral fellow

RFA 3 graduate student fellows and ifellows

Collaborative proposals (at least one funded)

iUtah conceptual model and white paper

RFA3 – Plans for Year 3



Goals

- Expand coupled modeling activities
- Develop visualization products
- Publish conceptual model manuscript(s)
- Integrate RFA1 and RFA2 data collection

iUTAH Facilities

... improving statewide infrastructure for today and tomorrow

Natural
sciences

Physical
sciences

Social
sciences

Civil & H₂O
Engineering

Five core facility categories

GAMUT

Gradients Along Montane to
Urban Transitions

characterize watersheds

Cyber Infrastructure

organize, display, deliver,
and archive data

GIRF

Green Infrastructure Research
Facility

experimental water
management

Analytical capacity
environmental chemistry

Visualization
TBD

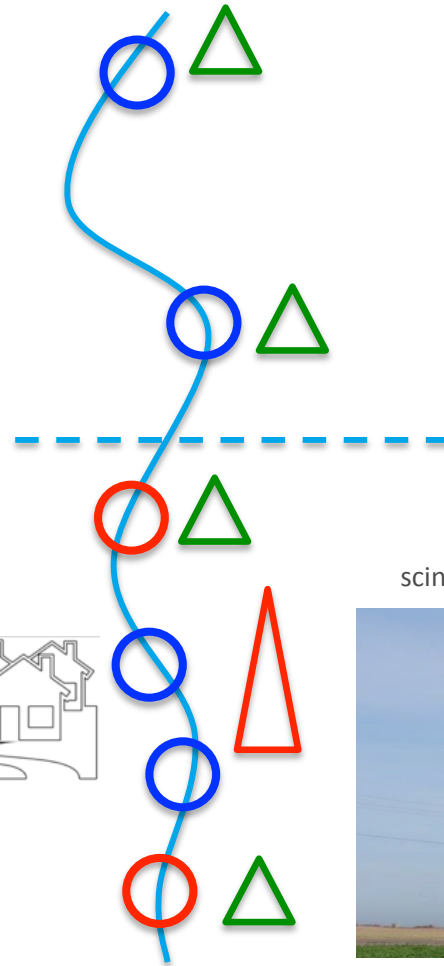
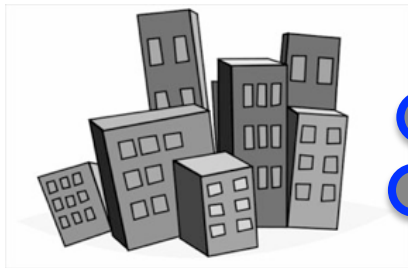
GAMUT

Gradients Along Mountain to Urban Transitions






2500+ m



Mountain-to-Valley transition



scintillometer



-  Fundamental aquatic sensors, *in situ*
-  Fundamental aquatic sensors, relocatable
-  Enhanced aquatic sensors, *in situ*

-  Fundamental terrestrial sensors
-  Urban tower and sensors

This has been another remarkably productive GAMUT year:

Status of GAMUT site installations (installed/planned)

Watershed	Climate stations installed	Aquatic stations installed	Stormwater stations installed	Sapflux stations installed
Logan	4 / 4	5 / 6	0 / 0	1 / 1
Red Butte	4 / 4	5 / 6 *	4 / 4	1 / 1
Middle Provo	4 / 4	4 / 4	0 / 0	0 / 0

* Awaiting final approval of city permit for additional urban station



An aerial photograph of a mountain range. The mountains are covered in snow and have a jagged, rocky appearance. A river flows through a valley between the mountains. The foreground shows a green valley with some buildings and roads.

What does GAMUT provide?

- observatories in three contrasting and urbanizing watersheds
- continuous climate, water quantity-quality chemistry
- data for testing models

An opportunity to understand GI and parking lot impacts



Aquatic sampling station



Aquatic sampling station



Stormwater input



Stormwater input



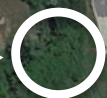
Aquatic sampling station



Stormwater input



Aquatic sampling station



Stormwater input (not in measurement network)



Analytical chemistry

Using ion chromatography wet chemistry as indicators of change in

- **snow chemistry** – changes in watershed inputs
- **stream chemistry** – changes in terrestrial inputs
- **tap water chemistry** – source and history of water

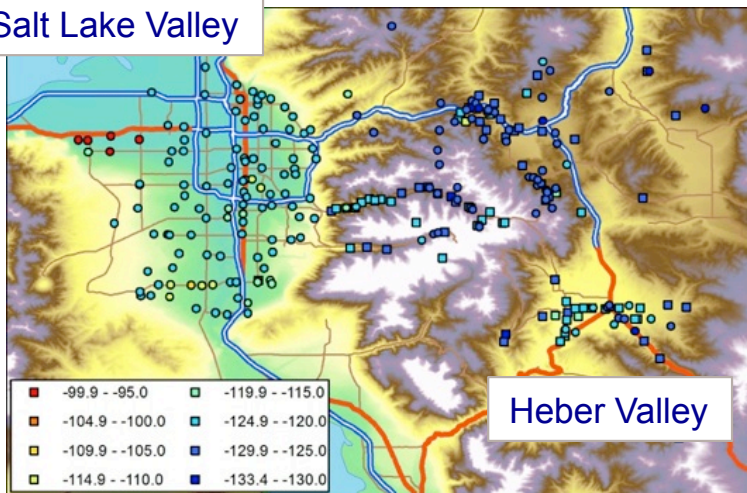
These long-term data will serve as a foundation for current/future studies and as test data to evaluate models exploring terrestrial and aquatic biogeochemistry cycles



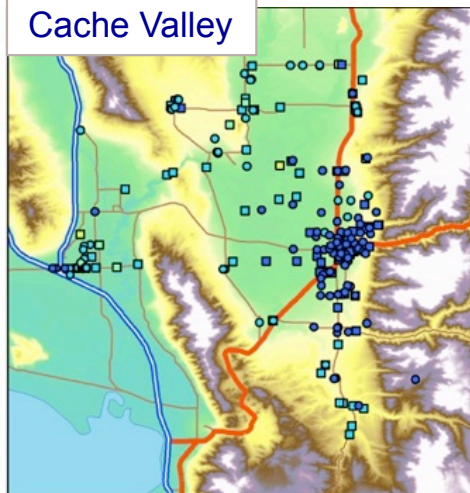
IC

Tap water stable isotope data

Salt Lake Valley



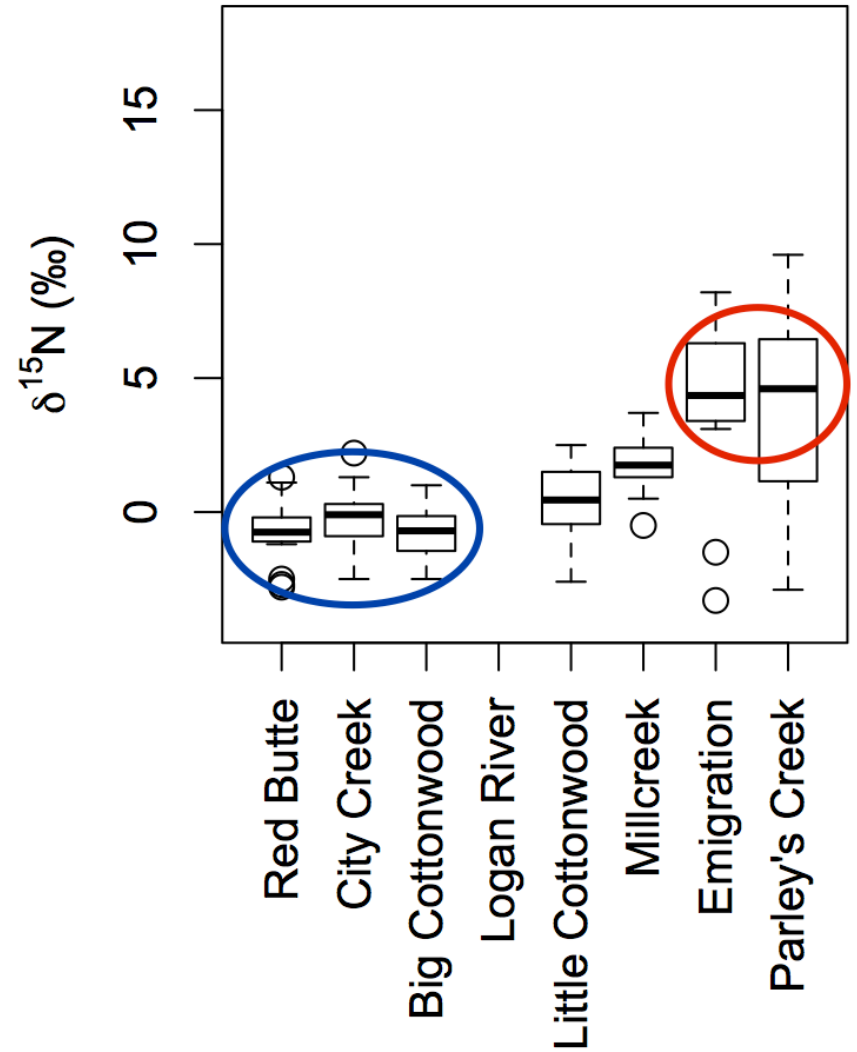
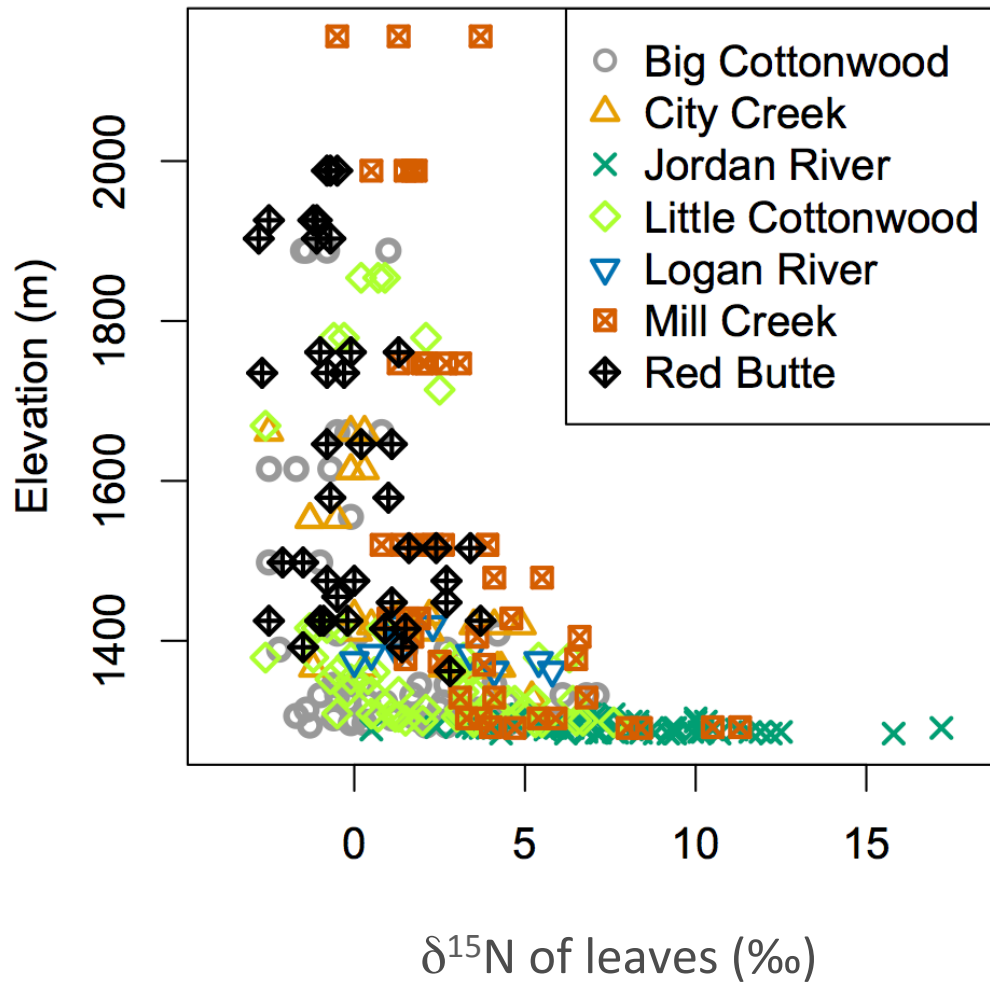
Cache Valley



IRMS

new NSF award

Nitrogen isotope ratios of riparian leaves reveal anthropogenic N inputs



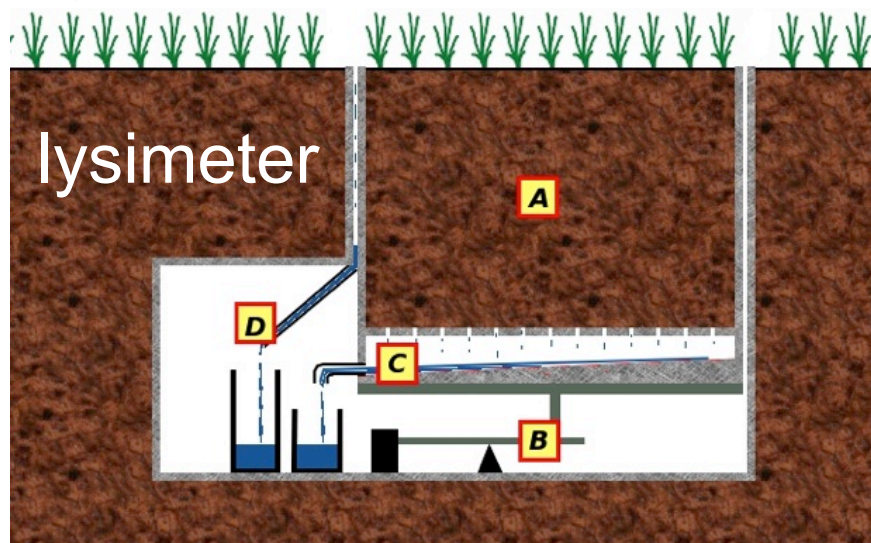
GIRF: Green Infrastructure Research Facility

Onsite management of water and pollutants
pilot project funded

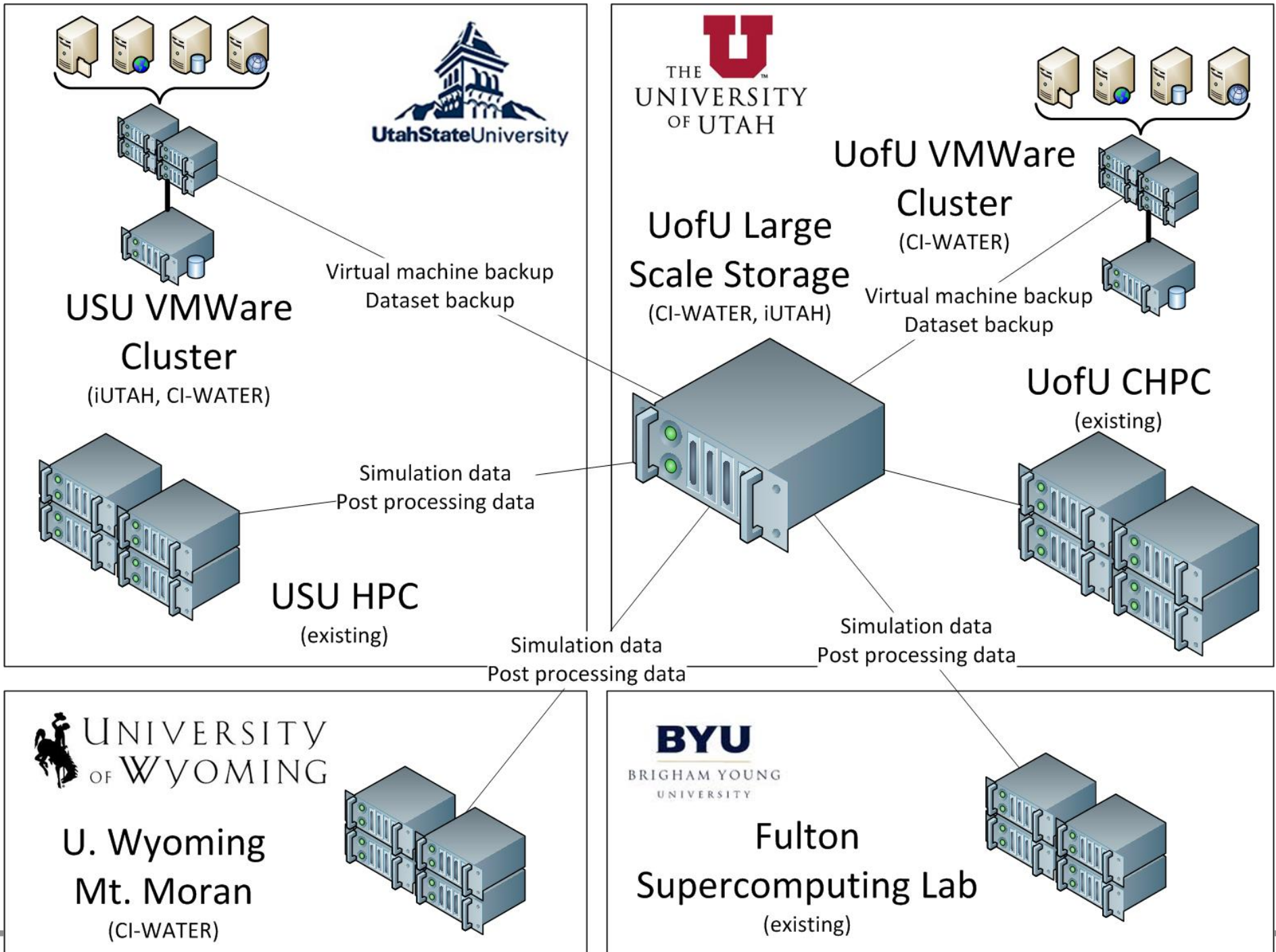
- evaluation of species tolerances
- evaluation of pollutant removal

Design of facility under development

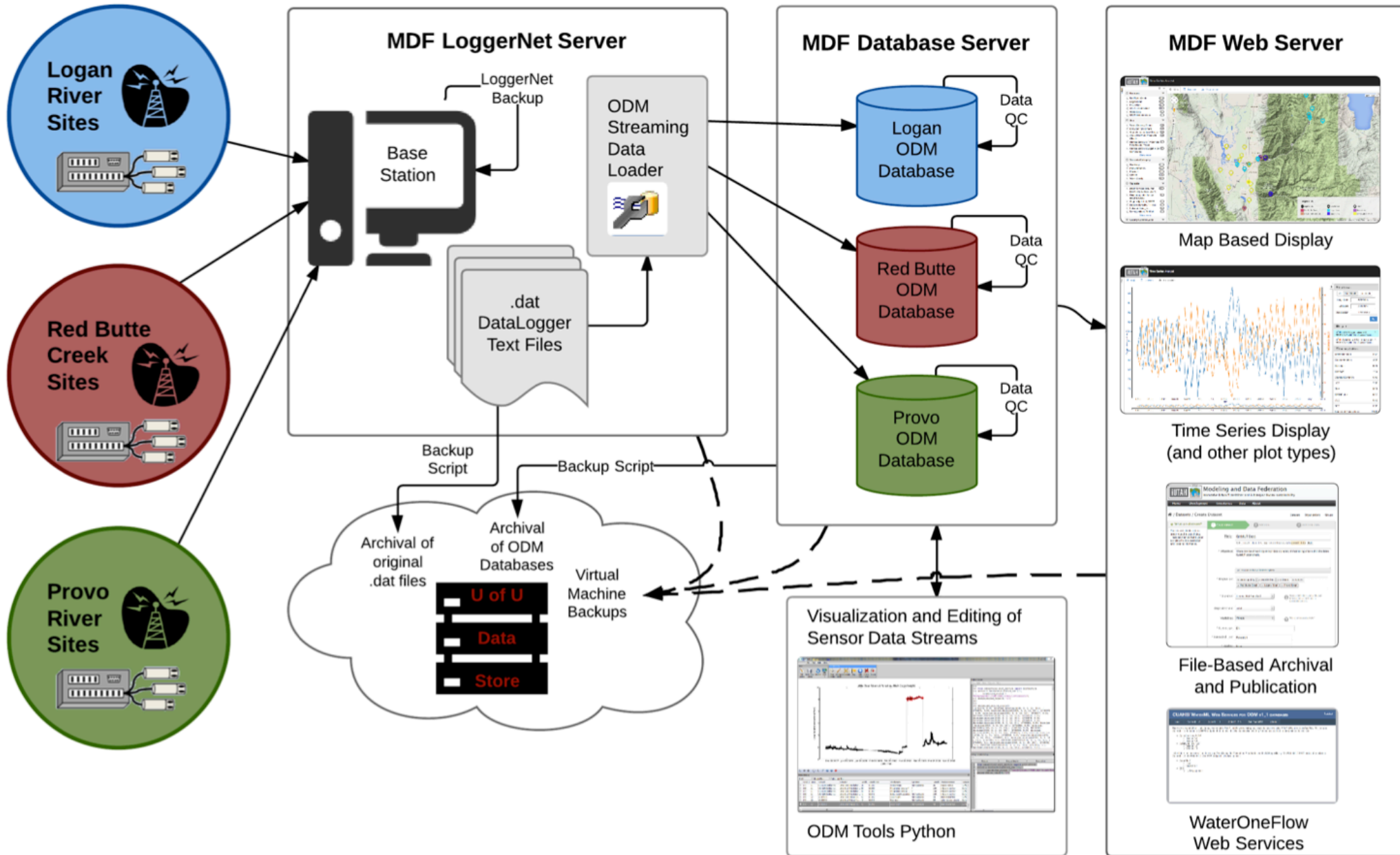
- contained bioretention
- lysimeter
- green roof
- replication requirements



Utah EPSCoR Cyberinfrastructure Hardware



GAMUT Network Cyberinfrastructure




Cyberinfrastructure for Web-Based Data Access and Visualization

Modeling and Data Federation
Innovative Urban Transitions and AridRegion Hydro-sustainability

Home Development Data About

Logan River

The Logan River watershed is located in the heart of the Bear River range with headwaters near the Utah-Idaho border. The river flows southwest through Logan Canyon - a landscape dominated by formerly glaciated peaks, limestone cliffs, and the occasional sinkhole. The underlying bedrock has numerous caves that create natural springs that contribute to the river's year-round discharge. Near the canyon's mouth, the river is dammed in three locations (First, Second, and Third dams) for hydroelectric generation. After exiting the mountains, the river flows west through Cache Valley and is impacted by a mixture of agricultural and urban environments. The Logan River converges with the Little Bear River in central Cache Valley before flowing north to the main stem of the Bear River and Cutler Reservoir.



Multiple instruments are used to collect data.

Visualize Logan River data

Monitoring Sites: Click on a site code to visualize and download data
The data presented here are provisional and subject to revision

Site Code	Site Name	Site Type
LR_Mendon_AA	Logan River at Mendon Road (600 South) Aquatic	Aquatic
LR_WaterLab_AA	Logan River at the USU Water Lab Aquatic	Aquatic
LR_MainStreet_BA	Logan River at the Main Street Bridge Aquatic	Aquatic
LR_GG_C		
LR_TWDF_C		
LR_FL_C		
LR_TG_C		
LR_TC_BA		
LR_Wilkins_S		

Time Series Analyst

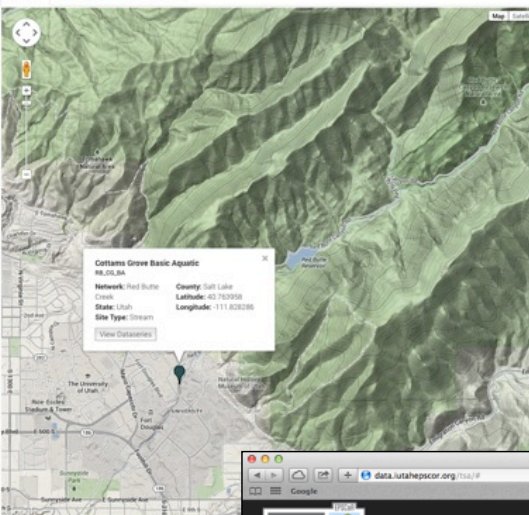
Network: Red Butte Creek

Site: Cottams Grove Basic Aquatic, Todds Meadow Climate, Knowlton Fork Climate, Green Infrastructure Climate, Above Red Butte Reservoir Climate, Climate Station at TW Danvers Experimental Forest

Variable Category: Water Quality, Instrumentation, Hydrology

Variable: Temperature, Water/Temp_PT, Offset, Stage/Offset, Counter, Stage/In/Counter, Gauge Height, Stage, Temperature, Water/Temp_Tur, Temperature, Water/Temp_EXD

Quality Control Level: Raw data



Cottams Grove Basic Aquatic
Network: Red Butte Creek
County: Salt Lake
State: Utah
Latitude: 40.763959
Longitude: -111.828286
Site Type: Stream

Time Series Analyst

Network: Red Butte Creek

Site: Cottams Grove Basic Aquatic, Todds Meadow Climate, Knowlton Fork Climate, Green Infrastructure Climate, Above Red Butte Reservoir Climate, Climate Station at TW Danvers Experimental Forest

Variable Category: Water Quality, Instrumentation, Hydrology

Variable: Temperature, Water/Temp_PT, Offset, Stage/Offset, Counter, Stage/In/Counter, Gauge Height, Stage, Temperature, Water/Temp_Tur, Temperature, Water/Temp_EXD

Quality Control Level: Raw data

Plot	Series	Network	Site Code	Variable Code	Variable Name
<input type="checkbox"/>	99	Red Butte Creek	RB_CO_BA	EXDTime	Time Stamp
<input type="checkbox"/>	100	Red Butte Creek	RB_CO_BA	EXDVol	Electric Power
<input checked="" type="checkbox"/>	101	Red Butte Creek	RB_CO_BA	ODO	Oxygen, dissolved
<input type="checkbox"/>	102	Red Butte Creek	RB_CO_BA	ODO_Local	Oxygen, dissolved, transducer signal
<input type="checkbox"/>	103	Red Butte Creek	RB_CO_BA	ODO_Sat	Oxygen, dissolved percent of saturation
<input type="checkbox"/>	104	Red Butte Creek	RB_CO_BA	pH	pH
<input type="checkbox"/>	105	Red Butte Creek	RB_CO_BA	RH_Lenc	Relative Humidity
<input type="checkbox"/>	106	Red Butte Creek	RB_CO_BA	SpCond	Specific Conductance
<input type="checkbox"/>	107	Red Butte Creek	RB_CO_BA	Stage	Gauge Height
<input type="checkbox"/>	108	Red Butte Creek	RB_CO_BA	Stage/In/Counter	Counter
<input type="checkbox"/>	109	Red Butte Creek	RB_CO_BA	Stage/Offset	Offset
<input type="checkbox"/>	110	Red Butte Creek	RB_CO_BA	TurbAug	Turbidity
<input type="checkbox"/>	111	Red Butte Creek	RB_CO_BA	TurbES	Turbidity
<input type="checkbox"/>	112	Red Butte Creek	RB_CO_BA	TurbMax	Turbidity
<input type="checkbox"/>	113	Red Butte Creek	RB_CO_BA	TurbMed	Turbidity
<input type="checkbox"/>	114	Red Butte Creek	RB_CO_BA	TurbMin	Turbidity
<input type="checkbox"/>	115	Red Butte Creek	RB_CO_BA	TurbVar	Turbidity
<input type="checkbox"/>	116	Red Butte Creek	RB_CO_BA	TurbWipe	Indicator
<input checked="" type="checkbox"/>	117	Red Butte Creek	RB_CO_BA	WaterTemp_EXD	Temperature
<input type="checkbox"/>	118	Red Butte Creek	RB_CO_BA	WaterTemp_PT	Temperature

Modeling and Data Federation
Innovative Urban Transitions and AridRegion Hydro-sustainability

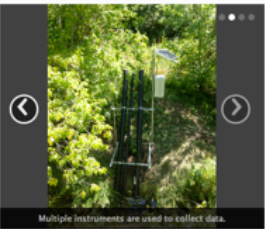
Home Development Data About

Logan River at the Utah Water Research Laboratory west bridge

Site Code: LR_WaterLab_AA

Latitude: 41.739034, Longitude: -111.795742, Lat/Long Datum: WGS84, Elevation: 1414.0, Local X: None, Local Y: None

Local Projection: None, State: Utah, County: Cache, Watershed: Logan, Site Type: Stream



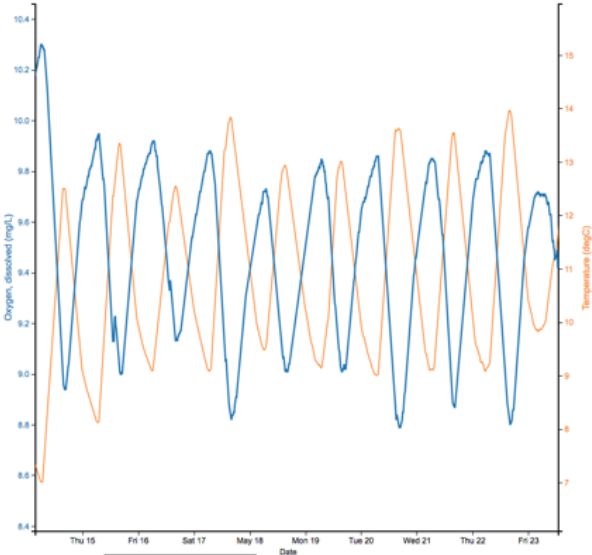
Multiple instruments are used to collect data.

Most Recent Instantaneous Measurements
Data update time: 2014-06-25 11:45:00, past 24 hours shown.

The data presented here are provisional and subject to revision

Temperature WaterTemp_EXD 10.620 degC	Specific Conductance 318.300 uS/cm	pH 8.460 pH
Oxygen, dissolved ODO 9.830 mg/L	Oxygen, dissolved percent of saturation ODO_Sat 88.500 % Sat	Turbidity 1.490 NTU
Blue-green algae (cyanobacterial) precipitation -0.030 RFU	Chlorophyll Fluorescence 0.940 RFU	Colored Dissolved Organic Matter 0.940 QSU
Gage height 55.280 cm		

Time Series Analyst



Plot Options: All, Last Month, Last Week
Begin Date: 5/10/2014, End Date: 6/10/2014
Visualization: Time Series

Legend: ODO: Oxygen, dissolved; RB_CO_BA: Cottams Grove Basic Aquatic; WaterTemp_EXD: Temperature

Summary Statistics:
Arithmetic Mean: 9.35
Geometric Mean: 4.71
Maximum: 10.46
Minimum: 8.38
Standard Deviation: 0.42
10%: 8.57
25%: 8.95
Median, 50%: 9.29
75%: 9.57
90%: 9.74
Number of Observations: 2,977

Software for Data Management and QAQC

Multiple Plot Types

Plot Display Options

Dynamic Zooming and Panning

Date Range Restrictions

Data Editing Tools

Data selection filters

Tabular data view and selection

Filters on Data Series

Export Data Series

Time Series Selection

Dynamic Data Editing Display

Python Script Editor

The screenshot displays the ODM Tools software interface, which is used for data management and quality assurance. The interface includes a main plot area showing time series data for 'Foothill Drive Advanced Aquatic' with variables like 'Gage height' and 'Temperature'. A 'Data Filter' dialog box is open, allowing users to filter data based on 'Value Threshold', 'Data Gaps', and 'Date' (Before/After). A 'Table View' window shows a tabular representation of the data with columns for ValueID, DataValue, ValueAccuracy, and LocalDate. A 'Python Script Editor' window is also visible, showing a script for editing data series. The interface includes a 'Series Selector' on the left, a 'Main' menu with options like 'Edit Functions', 'Filter Points', and 'Reset Selection', and a 'Date Range' selector at the top. The plot area shows data from Dec 23 2013 to Mar 17 2014, with a 'Date Time' selector set to 8/14/2013 and 3/28/2014. The plot shows 'Specific Conductance (microsiemens per centimeter)' on the y-axis and 'Date' on the x-axis. The 'Table View' shows data points with values ranging from 604.4 to 609.8. The 'Python Script Editor' shows a script for editing data series, including commands for filtering, editing, and flagging data points.

ValueID	DataValue	ValueAccuracy	LocalDate
1413863			2013-08-08
1413864	606.7		2013-08-08
1413865	605.1		2013-08-08
1413866	603.7		2013-08-08
1413867	600.6		2013-08-08
1413868	600.2		2013-08-08
1413869	598.5		2013-08-08
1413870	597.3		2013-08-08
1413871	595.0		2013-08-08
1413872	595.4		2013-08-08
1413873	594.7		2013-08-08
1413874	594.7		2013-08-08
1413875	594.6		2013-08-08
1413876	595.5		2013-08-08
1413877	596.3		2013-08-08
1413878	596.2		2013-08-08
1413879	597.9		2013-08-08
1413880	598.3		2013-08-08
1413881	598.7		2013-08-08
1413882	598.3		2013-08-08
1413883	599.5		2013-08-08
1413884	599.2		2013-08-08
1413885	598.8		2013-08-08
1413886	599.2		2013-08-08
1413887	606.1		2013-08-08
1413888	609.0		2013-08-08
1413889	604.4		2013-08-08

```
edit_service = EditService(series_id=261, connection_string='mysql+pyodbc://Amber:xxxxxxxxxx@localhost/iUTAH_RedButte_OD')
series_service = SeriesService(connection_string='mysql+pyodbc://Amber:xxxxxxxxxx@localhost/iUTAH_RedButte_OD')
## To run commands from the python console uncomment and run the following commands ##
#edit_service = Tools
#series_service = Tools.get_series_service()
edit_service.filter_date(datetime.datetime(2014, 1, 31, 0, 0), datetime.datetime(2014, 1, 15, 0, 0))
edit_service.filter_date(datetime.datetime(2014, 1, 15, 0, 0), datetime.datetime(2014, 1, 1, 0, 0))
edit_service.drift_correction(0.5)
edit_service.flag(5)
```


Data Policy and Publication Infrastructure



Research Data Policy

Version 1.3
June 11, 2014

Edited by:
Jeffery S. Horsburgh and Amber S. Jones

- Defines Data Typology
- Defines expectations for data sharing, data and metadata quality, and timeframes
- Requires submission of Data Collection Plan for iUTAH-sponsored efforts
- Includes Data Use Agreement

- Web-based Data Publication System for iUTAH researchers to submit and publish data and models
- Integrated submission and presentation of data and metadata
- Supports discovery and access of datasets to a wide audience

A screenshot of the iUTAH Modeling and Data Federation web interface. The page title is "Modeling and Data Federation" with the subtitle "Innovative Urban Transitions and Aridregion Hydro-sustainability". The user is logged in as Amber Jones. The navigation menu includes Home, Development, Data, and About. The current page is "Datasets / Create Dataset". The interface is divided into three steps: 1. Create dataset (active), 2. Add data, and 3. Additional data. A note states: "NOTE: Your dataset will be private until approved by a system administrator. However, you can see your newly submitted datasets in your Dashboard." The form fields include: Title (eg. Red Butte Creek GAMUT Water Temperature Data.), URL (iutah-ckan-stage.uwrl.usu.edu/dataset/<dataset>), Description (eg. A short description (or abstract) for the dataset.), Keywords (eg. water quality, temperature, Red Butte Creek, time series), Organization (iutah), Visibility (Private), Language (eg., en, es, fr), Access Information (eg., limited to IUTAH participants, limited to IRB researchers), and Type (collection). There is also an "Optional Metadata" section with fields for Purpose (eg., Educational, Research, Regulatory), Required Software (eg., ArcGIS, R, specific model application), and Research.

Infrastructure with a purpose as Utah addresses urban transitions with a need for hydro-sustainability

Year-2 score card

A

GAMUT
designed,
purchased,
installed,
operational

A

Analytical capacity
designed,
purchased,
installed,
operational

A

CI
designed,
purchased,
installed,
operational

INC

GIRF
pilot project approved
facility design in
development

INC

Visualization
TBD



Overall vision: Education, Outreach, and Diversity



Integrate with
research
activities

Increase
diversity of
participants

Support state-
wide
programs and
partnerships

Expand
beyond
original
proposal

Highlights: iUTAH innovation funds



Research Catalyst Grants

Designed to stimulate research at PUIs across Utah

- Over \$100,000 distributed
- Low-cost, high-Impact
- Engages undergraduate students
- 4 new awards given in year 2

EOD Catalyst Grants

Designed to solicit new outreach partners across Utah

- Align with iUTAH milestones
- Integrates research and EOD
- Engaging diverse audiences statewide
- Funded 13 proposals in year 2

Highlights: Summer Institute & REU



iUTAH Summer Research Institute

- Engaging undergraduate students, high school students and teachers
- Targets undergrads from PUIs
- Year 2 is hosting 2 students and 1 teacher from a high school in southern Utah.
- Recently highlighted at an EPSCoR EOD All-Hands meeting, in an EPSCoR STEM Program Catalog.

iFellows Undergraduate Research Experience

- 10 week-research program
- Seeks students from PUI institutions
- Near-peer mentorship
- Year 2 of the program has more PUI students than Year 1
- Added a student track of the 2014 iUTAH Symposium to enhance iFellows' (and other iUTAH students') connection to UTAH STEM workforce

K-12 Engagement



- iUTAH Taking Learning Outdoors
 - Engages K-12 Teachers and Students in iUTAH studied watersheds
- Utah Watersheds Outreach Program
 - Developed for 4th graders in Utah County
- Expanding Your Horizons
 - Supporting K-12 females in STEM
- Natural Resource Field Days
 - Interacting with Logan-area 4th grade students
- Project Youth
 - Engaging K-12 students in a University setting
- National Center for Women in Technology Aspiration Awards, Southern Utah
 - Recognized 11 high school women from Southern Utah for their achievements in computing, one became a national runner-up

Year 3 Plans



- Diversity conference with Hispanic and urban focus
- Leveraging additional statewide partners and programs
- Continued integration of EOD and research
- Broadened inclusion of PUI students in iUTAH programs

Seeking your advice



- K-12 education: How to best leverage Project WET?
- Underserved populations: In addition to SACNAS, are there efforts geared toward urban Hispanics within programs similar to iUTAH?

Research Infrastructure Improvement



Year 2: Research Infrastructure

- Environmental Observatory
- Cyberinfrastructure
- Neighborhood Typology
- Household Survey
- Conceptual Framework

Research Infrastructure Improvement



Year 2: Workforce/Human Infrastructure

- 2 new faculty
- 3 postdocs
- 16 PhD students
- 13 iFellows
- 4 Interns

Research Infrastructure Improvement



Year 1-2: Capacity Building

- **55** joint proposals
- **8** Research Catalyst Grants
- **10** EOD Catalyst Grants
- **5** websites developed
- **55** presentations on iUTAH
- **64** engineering students trained
- **33** graduate assistantships
- **27** joint journal publications
- **1** Environmental Observatory

Actions to Address - Research



- Behind schedule on groundwater workshop
- Stakeholder engagement as a research focus
- Need to increase proposal submissions and success rates
- Need to submit publications from iUTAH data
 - Implement new seed funding and workshop funding stream

Actions to Address - Facilities



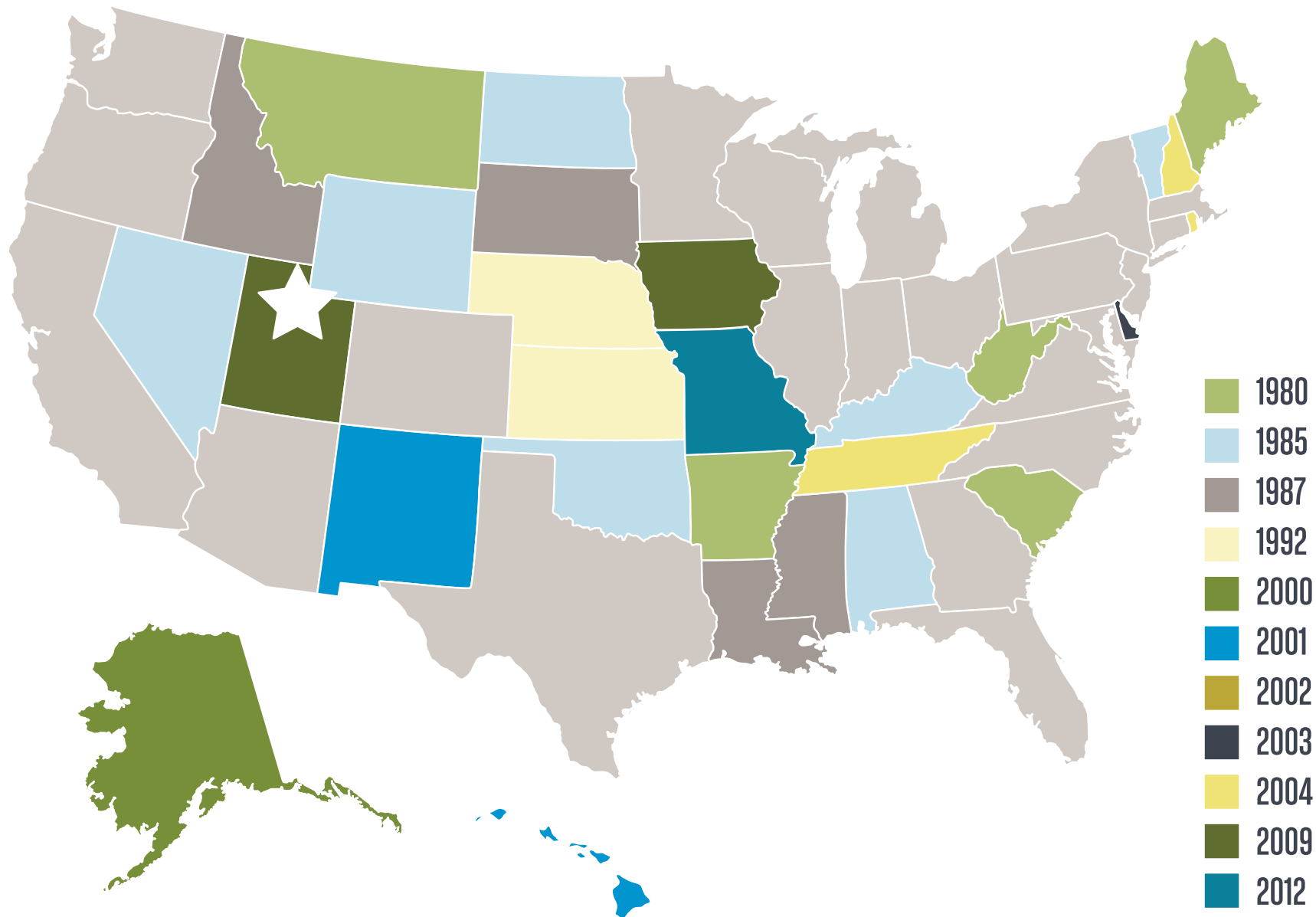
- Behind schedule on GIRF
- Visualization plans not finalized
 - Approved pilot project for GIRF
 - Will hire M. Buchart to guru visualization
 - Seed/workshop funding

Actions to Address - EOD



- Leveraging Project WET?
- Engaging urban Hispanics
- Long-term sustainability of EOD programs

Last-in-First Out!



Sustainability



(The view of the Salt Lake Valley from Little Cottonwood Canyon. Rick Egan, The Salt Lake Tribune)

With no funding, Utah clean-air panel dies as smog lives on

Pollution » Utah Legislature created but didn't secure funding for alternative-energy board.

By Lee Davidson | The Salt Lake Tribune

First Published Jun 13 2014 03:09 pm • Last Updated Jun 13 2014 09:29 pm

As smog smothered Salt Lake City during the 2013 Legislature, protests about air pollution were loud and frequent — and lawmakers responded by passing SB275 to create an interlocal panel to find ways to expand use of cleaner fuels, especially natural gas.

That group — dubbed the Alternative Energy Interlocal Entity Board — was then [ballyhooed as a great hope](#) to improve air quality. Some high-profile city officials and lawmakers were appointed, and the panel [began to meet](#).

- Engage with various air quality groups. UU has a program in Air Quality, Health, and Society
- Engage with DEQ/DAQ/DWQ
- Tie research water to air quality (e.g. post doc Steven Hall's research); seed funds

Sustainability



- Develop partnership with the Utah Climate Center
- Institute for Climate and Water?
- Legislative visit in August
- Seed funds

A screenshot of the Utah Climate Center website. At the top right is the logo for the Utah Climate Center, featuring a sunburst icon above the text "UTAH CLIMATE CENTER". Below the logo is a navigation bar with three links: "Plant Management", "Agweather", and "Resources". The main content area features a large photograph of a man in a blue jacket and cap sitting on a snowmobile in a snowy field. Below the photo are two smaller image thumbnails. The left one is titled "Research" and shows three book covers. The right one is titled "Climate Database Server" and shows a map of Utah with a grid overlay.