

# Preview of Award 1208732 - Annual Project Report

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## Cover

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## Accomplishments

### \* What are the major goals of the project?

The overarching goals of the Utah RII EPSCoR were developed in light our Vision and Mission:

**Vision:** The vision for iUTAH EPSCoR is to lead the nation in scientific, educational, and innovative solutions for water management and sustainability through innovative interdisciplinary research and systems-level knowledge of the interactions among water, people, and ecosystems and development of a state-of-the-art hydroinformatics program that incorporates large data with interdisciplinary modeling and visualization

**Mission:** The mission of iUTAH is to enhance collaborative partnerships to better understand how to sustain Utah's water resources by (1) developing novel approaches to integrated research and training, and (2) by expanding the state's economic, educational, and research competitiveness.

**Overarching Goals:** The overarching goals of the Utah RII Track-1 are to create sustainable infrastructure improvements to benefit water –related science and technology throughout the state, increase national research and development competitiveness, and expand our workforce of researchers, educators and practitioners to ensure a vital economy and sustainable future. Infrastructure improvements include:

- 1. Enhanced research capacity of the biophysical, social and engineered water environment. This will be accomplished by building state-of-the-art water quality- and quantity- monitoring networks in three focal watersheds that encompass a range of urbanization and future development. In addition, a green infrastructure research facility will be constructed, allowing for new research activities, as well as providing an important educational and outreach facility. To accomplish this goal, three research focal areas have been identified with more specific goals.*
- 2. Build on Utah’s existing strengths in hydrologic modeling and cyber-infrastructure from the CI-WATER and Cyber-infrastructure (CI) NSF EPSCoR awards. This will be accomplished through interdisciplinary modeling approaches that will create new models; link currently disparate models, data and computing approaches; and provide greatly enhanced forecasting capabilities for water managers and stakeholders.*
- 3. Build programs to increase participation of underrepresented groups that include women, Hispanics and Native Americans by increasing the individual, disciplinary, institutional, and geographic diversity of the STEM enterprise in Utah to address the water sustainability issues facing Utah and the Mountain West.*
- 4. Provide educational opportunities for a scientifically literate Utah workforce citizenry. We will enhance the STEM (Science, Technology, Engineering, and Mathematics) workforce in Utah by developing programs for a diverse range of learners that inspire students to choose STEM (Science, Technology, Engineering, and Mathematics) careers by promoting the retention of students in STEM degrees and enhancing the success of faculty in STEM disciplines. A strong STEM workforce is critical to building and sustaining research capacity and economic growth.*
- 5. Provide societally relevant science and education regarding current and future water resources. iUTAH has a rigorous external engagement plan in place that will include state, regional, county and local water management agencies and stakeholders. Our participatory modeling activities will provide first-hand knowledge of our enhanced sensor networks, data flows and scenarios modeling capabilities. In turn, our research questions and modeling activities will be directly informed by the needs expressed by our water resource managers and policy makers.*

**Project Component Goals:** These overarching goals will be accomplished through activities in our three Research Focal Areas (goal 1) Cyberinfrastructure (goal 2), Diversity Enhancement (goal 3), Workforce Development (goal 4) and External Engagement (goal 5). The research component-specific goals are provided below under the overarching goal below.

*Overarching Goal 1. Enhanced research capacity of the biophysical, social and engineered water environment.*

Research Focus Area 1 – Biophysical Ecohydrologic System Goal: to improve Utah’s capacity to monitor and understand the ecologic/climatic/hydrologic (hereafter ecohydrologic) system of the Wasatch Range Metropolitan Area (WRMA). This goal will be achieved by improving watershed-scale measurement capacities. This instrumentation will be used to conduct research aimed at gaining a better understanding of the biophysical processes that influence Utah’s water resources.

Research Focus Area 2 – Social and Engineered Systems Goals: improve the capacity of Utah’s science community to gather and analyze social and engineering system data associated with the water system; Understand the interactions between urban form, environmental change, built water infrastructure, and decision-making in terms of water use ; Model the impact of alternative infrastructure designs and policy options on water use behaviors, the water cycle, water quality, and interconnected social and environmental systems.

Research Focus Area 3 – Coupled Human-Natural Systems Goals: describe the water system as a whole, by defining and including the linkages between biophysical and social dynamics, using results from RFAs 1 and 2 and to facilitate interactions with stakeholders and linkages among disparate datasets and models to improve capacity to study the complexity of local

water issues.

*Overarching Goal 2. Build on Utah’s existing strengths in hydrologic modeling and cyber-infrastructure from the CI-WATER and Cyber-infrastructure NSF EPSCoR awards.*

Cyberinfrastructure Goals: increase capacity for data collection, organization, management, sharing, and synthesis to higher-level products and Increase capacity for integration of data and models.

*Overarching Goal 3. Build programs to increase participation of underrepresented groups that include women, Hispanics and Native Americans.*

Diversity Enhancement Goal: The goal of Diversity Enhancement (DE) is to increase the individual, disciplinary, institutional, and geographic diversity of the STEM enterprise in Utah to address the water sustainability issues facing Utah and the Mountain West.

*Overarching Goal 4. Provide educational opportunities for a scientifically literate Utah workforce citizenry.*

Workforce Development Goals: Enhance the STEM (Science, Technology, Engineering, and Mathematics) workforce in Utah by developing programs for a diverse range of learners that inspire students to choose STEM careers by promoting the retention of students in STEM degrees and enhancing the success of faculty in STEM disciplines. A strong STEM workforce is critical to building and sustaining research capacity and economic growth.

*Overarching Goal 5. Provide societally relevant science and education regarding current and future water resources.*

External Engagement Goals: design and implement programs to enhance the development of a diverse, well-prepared STEM workforce and a more scientifically literate public in the state of Utah. iUTAH will use data and results from the RFAs to engage the public in discussions about water sustainability issues throughout the western United States.

The Goals, Activities and Timelines are provided in Table 1 in the supplemental documents.

**\* What was accomplished under these goals (you must provide information for at least one of the 4 categories below)?**

Major Activities:

Goal 1: Enhanced research capacity of the biophysical, social and engineered water environment.

Research Focus Area 1 – Biophysical Ecohydrologic System:

- Installed instrumentation in an environmental observatory (the GAMUT: gradients along mountain to urban transitions) in three watersheds (Fig 1)
- Created and coordinated water balance, climate modeling, and water quality working groups to organize research activities
- Collected real-time data using installed instrumentation (Fig 2)
- Collected 500+ tap water and irrigation water samples for analysis of water isotopes and identification of drinking and irrigation water sources
- Collected synoptic water quality data at ~60 locations across the iUTAH domain each month (Fig 3)
- Developed and populated an instrumentation data base to track installation, calibration, and repair records of each sensor (in collaboration with CI team)

- Mentored 4 iFellows, 2 of which presented their research at the National Conferences on Undergraduate Research
- Mentored 11 graduate students at BYU, USU, and UU, including 3 students with assistantships leveraged from other sources (Table 2)
- Mentored the RFA 1 postdoctoral fellow
- Submitted collaborative research proposals to NSF and other agencies
- Presented research results at regional and national conferences
- Submitted manuscripts

#### Research Focus Area 2 – Social and Engineered Systems:

- Completed of a formal statistical typology of urban neighborhoods
- Implemented a major survey of municipal stormwater managers
- Implemented a major household survey across neighborhoods (Fig 4)
- Collected survey data from selected households in 21 neighborhoods (Fig 5)
- Initiated formal analysis of media coverage across WRMA region
- Expanded stakeholder partnerships in Heber Valley
- Carried out multivariate analysis of drivers of water use
- Submitted collaborative research grants to USEPA and NSF
- Published data sources and final products on urban neighborhood typology
- Developed social science module for 2014 Summer Institute
- Cooperated with RFA1 to co-locate data collection activities in 2014
- Presented research results to multiple professional meetings
- Submitted and published first papers manuscripts
- Developed formal research design for GIRF (Green Infrastructure Research Facility) and GIRN (GI research network) (Fig 8)
- Incorporated data from RFA1 and RFA2 field observations into neighborhood and landscape scale hydrologic models
- Mentored first class of undergraduate iFellows
- Continued to facilitate cross-disciplinary and cross-campus collaborations
- Continued to train graduate and undergraduate students
- Used this typology to select locations for further collection of social, engineering and biophysical data in summer of 2014

- Developed and implemented household survey instrument
- Gathered systematic qualitative data from key informants
- Continued development of a simple agent-based model to link water management decisions of individual households, farms, cities, and irrigation companies (Fig 9)
- Expanded our archive of existing data for the entire WRMA region
- Worked with CI team to develop a web-interface to share data
- Maintained and expanded our partnerships with local water managers
- Mentored RFA2 postdoctoral fellow

#### Research Focus Area 3 – Coupled Human-Natural System:

- Supported doctoral students at UU and USU
- Mentored undergraduates in the iFellows program
- Mentored the RFA3 post-doctoral fellow
- Held multiple meetings across campuses to develop a new conceptual framework for interdisciplinary research in iUtah, led by the RFA3 post-doctoral fellow
- Held quarterly meetings to share individual research results and develop a collaborative strategy for the future
- Held joint meetings between the coupled modeling group and the iUtah Modeling and Data Federation
- Continued to work with the Modeling and Data Federation to inventory water related modeling activities at iUtah institutions
- Discussed linkages in data gathering activities across RFAs 1 and 2
- Developed a working group to coordinate stakeholder engagement activities and develop a stakeholder engagement protocol
- Continued to link models that individually represent specific aspects of the system, particularly hydrology, climate, and urbanization (Fig 9)

Goal 2: Build on Utah's existing strengths in hydrologic modeling and cyber-infrastructure from the CI-WATER and Cyber-infrastructure (CI) NSF EPSCoR awards.

- Deployed and linked to the iUTAH/CI-WATER Petabyte storage resource at the UU (Fig 10)
- Made available online, in standardized formats, data from all online GAMUT sites streaming into operational databases
- Deployed of an initial version of an equipment management database and web

application for managing GAMUT physical infrastructure

- Made operational new informational pages and landing pages for each GAMUT watershed
- Created new Google Map application presenting site locations from each GAMUT watershed - <http://data.iutahepscor.org/odmmmap/>
- Created simple time series visualization tool for the GAMUT data that is linked to the Google Map - <http://data.iutahepscor.org/odmtsa/>
- Made first release of ODM Tools Python software for sensor data management and quality control (Fig 11)
- Published first release of an advanced, web-based time series visualization tool
- Made available first release of a data publication system for iUTAH research datasets
- Taught course in Hydroinformatics across 3 campuses to 33 grad students
- Established iUTAH Data Policy Committee and drafted iUTAH Data Policy
- Developed a GAMUT QA/QC Plan
- Maintained the physical hardware the software applications
- Developed linkages to the iUTAH/CI-WATER large storage array
- Implemented automated backups of all iUTAH systems
- Support the iUTAH CloudShare website

Goal 3: Build programs to increase participation of underrepresented groups that include women, Hispanics and Native Americans.

- Conducted Diversity Training for iUTAH Team
- Recruited Diversity Specialists from partner institutions from 3 main universities and the other 10 campuses (Fig 12)
- Funded EOD Catalyst grant supporting rural women in technology
- Supported “Expanding Your Horizons” event engaging young women in STEM
- Held Miss America event engaging young women in STEM

Goal 4: Provide educational opportunities for a scientifically literate Utah workforce citizenry.

- Created competitive research assistantships for graduate students
- Held first summer research experience for undergraduates (iFellows) (Fig 13)

- Implemented the Research Catalyst Grant Program for PUI faculty
- Developed and implemented EOD Catalyst Grant Program for new EOD collaborators
- Continued internship program with private sector partners
- Initiated second Summer research experience for undergraduates
- Initiated second Summer Institute for middle/high school teachers, high school students, and undergraduates (Fig 14)
- Hired two iUTAH supported faculty in hydroinformatics and social sciences

Goal 5: Provide societally relevant science and education regarding current and future water resources.

- Further developed museum partnerships across Utah to provide interactive experiences for K-12 students and teachers
- Engaged K12 students and their teachers in the Natural History Museum of Utah's Taking Learning Outdoors (TLO) program
- Aligned Utah Water Watch's Citizen Science and Streamside Science programs to support relevant aspects of iUTAH research areas (Fig 15)
- Enhanced iUTAH communications strategy for a diverse set of iUTAH audiences
- Enhanced iUTAH website, complimentary social media presence, and printed publications for a diverse set of audiences on and outside of the project
- Held Neighborhood Information Meetings with land-owners, managers and the general community about the climate, aquatic and sap-flow stations that will be installed on their neighborhoods
- Integrated iUTAH research into existing museum programs

Engaged relevant Utah stakeholders in shaping research directions

#### Specific Objectives:

Goal 1: Enhance research capacity of the biophysical, social and engineered water environment.

Research Focus Area 1 – Biophysical Ecohydrologic System:

- Improve capacity to monitor the Wasatch Range Metropolitan Area (WRMA) ecohydrologic system on mountain-to-urban gradients
- Enhance capacity to understand ecohydrologic processes in the WRMA as they relate to water resource availability now and in the future

Research Focus Area 2 – Social and Engineered Systems:

- Ensure that research activities are relevant to decision-makers

- Improve capacity to study human dimensions of water systems
- Improve capacity to study impacts of gray and green water infrastructure systems
- Improve capacity to collect intensive data about water use, water decision-making, and stormwater runoff
- Improve iUTAH's knowledge of the built water infrastructure across the WRMA
- Improve iUTAH's capacity to use information about built infrastructure

#### Research Focus Area 3 – Coupled Human-Natural System:

- Identified, categorized, and centralized relevant datasets and models
- Linked disparate models and datasets
- Enhanced capacity for interdisciplinary research and training
- Linked researchers, teachers, students, and stakeholders interested in water sustainability

Goal 2: Build on Utah's existing strengths in hydrologic modeling and cyber-infrastructure from the CI-WATER and Cyber-infrastructure NSF EPSCoR awards.

- Develop infrastructure to support data collection and management activities of iUTAH facilities and researchers
- Identify, prioritize, and facilitate access to external datasets needed by iUTAH researchers
- Enable iUTAH researchers to share and access data using standard formats, protocols, and services
- Support iUTAH researchers in identifying and prioritizing modeling needs, models to be used, and access to computational resources
- Provide online resources for citizens, K-12, undergraduate, and graduate students throughout Utah

Goal 3: Build programs to increase participation of underrepresented groups that include women, Hispanics and Native Americans.

- Enhanced the diversity of iUTAH team members among our Utah's higher education partners (Fig 12)
- Continued training iUTAH team members in the best practices for implementing culturally aware educational activities
- Followed up of recruiting and retaining groups underrepresented in STEM for all iUTAH activities

Goal 4: Provide educational opportunities for a scientifically literate Utah workforce

citizenry.

- Promote and maintain a STEM workforce focused on water sustainability
- Enhanced and consolidated develop public-private partnerships
- Pursued formative assessment of programs and modify future activities

Goal 5: Provide societally relevant science and education regarding current and future water resources.

- Improved participatory iUTAH-related research experiences for K-12 students and teachers
- Engaged public audiences and stakeholders in face-to-face activities designed to build connections with iUTAH researchers
- Stronger dissemination strategy on iUTAH project information, research outcomes, educational materials, and participation opportunities through a dynamic communications strategy

Incorporate assessment outcomes into our programming efforts

#### Significant Results:

Goal 1: Enhance research capacity of the biophysical, social and engineered water environment.

#### RFA 1 – Biophysical Ecohydrologic System

RFA1 has accomplished our year 2 milestones outlined in the strategic plan. As of April 2014, we have installed all instrumentation at 11 of 14 aquatic locations and 10 of 12 terrestrial locations in our three study watersheds. Telemetry is working at 100% of Red Butte stations, 66% of Provo stations, and 50% of Logan stations with data streaming through the iUTAH Data and Modeling Federation website. Establishment of rating curves at aquatic stations is underway. Our team is in the process of developing QA/QC documents for instrument operations and a sample and analysis plan for water quality; these will be published to the iUTAH website in the coming months. In addition to GAMUT network, we created and coordinated water quantity, climate modeling, and water quality working groups. Our water balance group has been using GAMUT data to measure aspects of the water balance and commenced sap flux measurements in Red Butte. Interestingly they observed for the first time that conifer trees began to transpire in late winter while there was still 1m of snow on the ground. Our water quality group has documented increases in total nutrients and E. coli in all three urban areas from the monthly synoptic water quality data that has been collected across the iUTAH domain. This group also performed a detailed snow sampling effort wherein snow samples were collected at 10 mountain and urban locations this winter in a multiple-institution effort with snow samples from the same snow pits being analyzed for metal, nutrient, and isotopic chemistry. Our initial findings suggest that large inputs of nitrogen in urban locations are associated with atmospheric inversions (see research highlight). Our climate modeling group has completed a simple downscaled model that shows urban evapotranspiration is an important component of the water balance that is poorly documented with empirical data.

#### Other Results

- We anticipate that installation and telemetry of the initial equipment investment will be completed this summer, before the end of year 2
- We will complete purchase of urban instruments to support RFA2 urban research, with installation to commence in late summer

#### RFA 2 – Social and Engineered Systems

- Continued to facilitate cross-disciplinary and cross-campus collaborations
- Continued to train graduate and undergraduate students (supported 4 PhD students directly; helped support 2 other PhD, 1 MS, and 1 undergraduate student)
- Implemented a major online survey of municipal and private sector stormwater managers
- Completed development of a formal statistical typology of urban neighborhoods
- Carried out multivariate analysis of drivers of monthly water use in Salt Lake City (Fig 4)
- Collaboratively developed research design and survey instrument for major household survey in selected urban neighborhoods; sites selected based on urban typology (Fig 5)
- Used qualitative data to inform survey development; developed plan to collect primary and secondary in survey neighborhoods to inform development of coupled models (Figs 5 and 6)
- Continued development of a simple agent-based model to link water management decisions of individual households, farms, cities, and irrigation companies (Fig 6)
- Initiated formal analysis of media coverage of water issues across WRMA region
- Expanded and maintained stakeholder partnerships in Heber Valley, Salt Lake City, and Cache Valley
- Developed design of social science module for 2014 Summer Institute
- Cooperated with RFA1 to develop plan to expand aquatic and terrestrial observatory into urban environment (Fig 7)
- Continued development of formal research design for GIRF (Green Infrastructure Research Facility) and GIRN (GI Research Network) – (Fig 8)
- Worked with CI team to develop a web-interface to share social data

#### Other results

- Generated dataset of responses from municipal stormwater manager survey (currently being analyzed; report expected in May)
- Generated systematic qualitative dataset based on key informant interviews with local water system managers
- Produced geospatial database at census block group scale to characterize land use,

land cover, sociodemographic attributes of WRMA region (submitted to CI team)

- Produced geospatial map of neighborhoods in WRMA based on formal urban typology (Fig 4)
- Submitted collaborative research grants to USEPA and NSF
- Received 2 externally funded grants (from USGS and local non-profit) to expand iUTAH planned social research
- Presented research results in 13 oral presentations and 6 posters at multiple professional meetings
- Submitted 4 collaborative research paper manuscripts to professional journals
- Published first peer-reviewed iUTAH-based journal article (and 4 other i-UTAH related manuscripts)
- Mentored first class of 5 undergraduate iFellows

### RFA 3 – Coupled Human-Natural System

A major objective of iUTAH and RFA3 is to identify the linkages between social and biophysical components of the water system. This is visualized in a conceptual model (Fig 9). We have continued developing a simple agent-based model (also reported in RFA2) to link water management decisions of individual households, farms, cities, and irrigation companies. This conceptual model takes a systems approach, focusing on how system components are organized and how they interact, rather than on parts themselves. One benefit of this approach is that it can then be translated into an integrated systems model. The proposed framework is generalized so that it can be easily adapted to the many domains and scales of water being studied within iUTAH. This will also allow us to compare the nature of linkages across domains, scales, and the three study watersheds. A major goal for the framework is that it can be used to generate hypotheses. The framework is intended to encourage a critical evaluation of linkages and their dynamics and to enable the development and testing of hypotheses about system dynamics. Finally, this framework is expected to evolve as iUTAH research identifies new linkages and different linkages.

### Other Results

- Began the inventory of existing data and models
- Continued PhD & post-doctoral program at UU and USU
- Built collaborations with CI, stakeholders & EOD Team
- Discussed linkages across RFA1 and RFA2

Goal 2: Build on Utah's existing strengths in hydrologic modeling and cyber-infrastructure from the CI-WATER and CI NSF EPSCoR awards.

In year 2, we have developed (first release late in Year 2 or early Year 3) enables iUTAH partners to publish data using a standardized metadata schema.

The data publication system we have developed provides faceted browsing of published datasets and search across the data that are within the system (Fig 10). The first release of this system will happen late in Year 2 or early Year 3 and will provide access to datasets published by iUTAH researchers.

The graduate level course on Hydroinformatics was offered across the 3 major research campuses, and materials from the course are available online. GAMUT data are online via a variety of mechanisms. Additional work related to this objective has begun and will continue through subsequent years of the project.

#### Other Results

- Designed, purchased and deployed virtual server and storage hardware deployed
- Deployment of databases, software, and web services to support streaming sensor data from GAMUT sites
- Hired and trained 2 student programmers, 1 technician, 1 data manager, 1 programmer/analyst, and 1 system administrator
- Designed and deployed web-based inventories of existing and planned datasets and models in support of RFA1, RFA2, and RFA3
- Established open source code repositories for ongoing software development
- Developed new software tools for managing streaming data from GAMUT sites (Fig 11) and led development and delivery of a graduate level course in Hydroinformatics

#### Key outcomes or Other achievements:

##### EOD Results

Goal 3: Build programs to increase participation of underrepresented groups that include women, Hispanics and Native Americans.

##### Diversity Training

iUTAH partner and Special Assistant to the President of Diversity at Weber State University, Adrienne Andrews, was recruited to conduct diversity training for the entire iUTAH team during the spring All-Hands Meeting.

##### Diversity Specialist Meeting

iUTAH brought together Diversity Specialists from 5 Primarily Undergraduate institutions in Utah (Fig 12) to discuss their own diversity practices and how iUTAH can assist these efforts. Additionally, these Diversity Specialists are assisting iUTAH with the creation of a Recruitment and Retention plan for iUTAH's diverse target audiences in in all iUTAH programs.

##### Other Results:

iUTAH provided support of the first National Center for Women & Information Technology (NCWIT) Aspiration Awards, held at Southern Utah University, recognizing aspiring high school women in computing and IT. Eight rural counties and 29 females were represented as applicants for the awards.

iUTAH supported the 2014 Expanding Your Horizons Conference, supporting girls in STEM.

iUTAH staffed booths at five major national conferences to recruit underrepresented graduate students and postdocs.

Goal 4: Provide educational opportunities for a scientifically literate Utah workforce citizenry.

Undergraduate research fellows (iFellows):

iUTAH conducted its first iFellows program in the summer of 2013. Twelve undergraduate students were selected to be iFellows, from five different Utah colleges or universities. Students were paired with both faculty and graduate student mentors from the 3 major research universities in Utah. In conjunction with an expected 40 hours per week working on their assigned research project, each iFellow participated in six cohort-building sessions throughout the summer where they learned professional skills, practiced poster and oral presentations, and engaged with panels of STEM professionals from a number of different careers (Fig 13).

Research Catalyst Grants (RCGs):

RCGs provide opportunities for faculty and students from Primarily Undergraduate Institutions to develop partnerships with Utah's research universities and advance the research objectives of iUTAH. This opportunity was again offered in Year 2.

Summer Institute:

The inaugural iUTAH Summer Institute was held in the Red Butte Creek Watershed July, 2013. During this week-long program, teams of graduate students, undergraduate students, high school students and teachers (totaling 34 participants) conducted three research projects. Participants examined various aspects of iUTAH research occurring in Red Butte Creek, collected data, created posters, and developed curriculum for their classrooms. Participants presented their results at the iUTAH Symposium, and interacted with the iUTAH team (Fig 14).

Internship program:

iUTAH partnered with Utah agencies and private companies to provide internships for undergraduate students. Internship opportunities were posted on iUtahEPSCoR.org as well as on iUTAH's Facebook and twitter feeds. Students applied directly to the internship sponsor and will be hired as interns for 12 weeks during the summer. For 2013, two interns were hired by Campbell Scientific, Inc., one by Utah Division of Water Quality, one by Utah Geologic Survey, one by USU Water Quality Extension, and one by Salem City Public Works.

Other Results:

iUTAH has hired new staff, students and technicians, with a total of 178 participants since August, 2013. A participants table is provided in the Product's section with the accompanying position descriptions. iUTAH has also listed 58 collaborating institutions.

Goal 5: Provide societally relevant science and education regarding current and future water resources.

#### K-12 Museum Programs:

iUTAH continued its partnership with the Natural History Museum of Utah's (NHMU) Taking Learning Outdoors Program, engaging K-12 Teachers and students in iUTAH studied watersheds. Additionally, iUTAH brought on four new Museum partners in Utah to provide outreach to audiences along the Wasatch Front and Southern Utah.

#### EOD Catalyst Grants

In year 2, iUTAH sought applications from potential new EOD partners throughout Utah. Ten EOD Catalyst Grants were awarded to new or existing partners who submitted proposals that aligned with iUTAH goals, and enhanced iUTAH outreach capabilities.

#### Citizen Science:

iUTAH continued its partnership with Utah Water Quality Extension, engaging citizen scientists in data collection across Utah, developing new outreach signs in the three iUTAH studied watersheds to engage citizen scientists, school groups, and the public, and the development of iUTAH specific curriculum that incorporates iUTAH GAMUT data (Fig 15).

#### Other Results:

iUTAH Partnered with Utah Water Quality Extension's annual Natural Resource Field Days, engaging over 1,800 students from Northern Utah in the natural sciences.

iUTAH partnered with Jordan High School to sponsor field trips and provide equipment for the inaugural year of the school's AP Environmental Science program.

Furthering Utah Water Quality Extension's Rain Barrel program, iUTAH Postdoc Dasch Houdeshel is partnering with an 11th grade class to grow radishes from the storm water collected by the iUTAH rain barrel provided to them last year. Students will plant, water, and study the radishes alongside Dr. Housedhel.

Explore Utah Science (EUS) has partnered with iUTAH to produce a 5-part radio series for Utah public radio entitled "Follow the Flow."

Creation of Stakeholder Engagement Committee, in order to engage relevant stakeholders in the community

#### Communications:

The communications team has maintained and updated the 4 websites associated with the grant- the Utah State EPSCoR site, the iUTAH Track RII Track 1 site, the iUTAH Modeling and Data Federation's data sharing site, and the EPSCoR Drupal reporting data entry site (Fig 16). From August 2013-March 2014, the iUTAH Track RII Track 1 site has received 7,347 visits.

iUTAH has several social media outlets. The communications team has grown our Facebook followers to 128, and Twitter followers to 156 as of April 2014.

The iUTAH Newsletter has been sent out 8 times from May 2013-April 2014, engaging and informing 178 team members, EPSCoR State Committee members, university administrators, and other interested parties (Fig 17). The newsletters are posted at <http://iutahepsco.org/resources/newsletters.html>

All 95 External Engagements events are described in Table 3.

**\* What opportunities for training and professional development has the project provided?**

This award continues supporting the development of new opportunities for all iUTAH participants, including faculty, graduate students, undergraduate students, post-doctoral fellows, and teachers and students at the secondary level. It also has provided opportunities for citizens and stakeholders. A special focus has been given to STEM education, especially that oriented to promote formal education with research-based approaches to minorities, underrepresented groups and gender education. Thus, the most important activities in year 2 included: the deepening and refining of research skills through mentoring students from all levels and engaging teachers and students in research activities, the peer-review process of publications, communication and presentation of research findings, proposal writing and reviews, developing of web sites and applications, database building and sharing, and collaborating with other scientists within social, ecological and hydrological disciplines and among disciplines.

In RFA1, the project recruited a postdoc, Dr. Steven Hall, who began at the start of year 2. Dr. Hall has initiated a few projects with iUTAH collaborators, including isotopic analysis of riparian vegetation, atmospheric deposition in urban areas, and understanding biogeochemical N transformations along mountain and urban flowpaths. We expect that these activities to help Dr. Hall secure a position as an Assistant Professor. We also had eleven graduate researchers who during year two worked on RFA1 research. Of these students 36% of them we funded from leveraged funds (Utah State research fellowship and matching funds at Brigham young University). Almost all of the graduate students presented posters one of the all-hands meeting held during 2013-2014. Also in RFA1, we had four undergraduate iFellows. Of these 50% were women and 50% were supported with leveraged funds from an internal research competition at Utah State University (summer undergraduate research/creative opportunity) and another from external research funds from the Utah Division of Water Quality. Two of these students represented iUTAH at the National Council on Undergraduate Research conference in Lexington, KY. Last, two of these students are completing a senior thesis based on their research. RFA1 faculty and graduate students developed two modules at the 2013 Summer Institute, and two new ones are planned for 2014. We continue to employ three MS-level research technicians who oversee the installation and daily operations of our environmental observatory, GAMUT. Several hourly student technicians have been engaged in GAMUT installation when needed, and this has allowed them to develop important field experience.

In RFA2, we hired our first postdoctoral fellow, Dasch Houdeshel, who has been designing and implementing research projects related to documenting the impact of urban areas on water flows and water quality outcomes. We fully supported four doctoral students (2 at the University of Utah, 2 at Utah State) who worked on iUTAH-related social and engineering science research. In addition, two additional doctoral students (1 at UU and 1 at USU) were engaged in iUTAH research projects, though their funding was largely or fully coming from other institutional sources. RFA2 faculty and graduate students also mentored five undergraduate summer iFellows in summer 2013; and have committed to mentor seven new iFellows in summer 2014. Separately, one masters student and one undergraduate at Utah State were employed part-time to assist in iUTAH research activities. Finally, RFA2 faculty and graduate students participated in developing and implementing a module at the 2013 Summer Institute, and will be leading a social science module at the 2014 Summer Institute.

In RFA3, the project has hired one post-doctoral researcher, Rebecca Hale, and mentored 4 Ph.D. students. RFA3 also mentored several undergraduate students with the iFellows program.

The iUTAH Leadership Team engaged in important programmatic leadership and prepared an Authorship Guidance document outlining the consideration of who to include as authors on iUTAH products. This document, along with the

Research Data Policy document spearheaded by the iUTAH CI team, explicitly details the treatment of graduate student generated data and manuscripts. The reporting will help graduate students and all iUTAH researchers to be more aware of overlapping research efforts and will facilitate collaboration and clear expectations for coauthorship. These documents in particular will help students and postdocs meet the iUTAH goal of having data publically available in a timely fashion, while still protecting their right to be the first to publish their data.

The iUTAH CI-Team employs several undergraduate student computer programmers who are working with our professional programmer/analysts to develop the software and hardware cyberinfrastructure that supports the iUTAH Modeling & Data Federation. These student positions provide opportunities for student programmers to engage in cutting edge CI related research, develop their programming skills with supervision from professional programmers, and develop valuable experience and expertise. To date, five undergraduate researchers have been supported in this capacity by the CI Team. In addition to undergrad programmers, the CI Team has supported two post undergrad data technicians who have worked closely with CI Team members to advance their data management skills. One of these data technicians has now moved on to work on a graduate degree in Watershed Science at USU.

We continue to work with the iUTAH watershed technicians and others in developing data management best practices and techniques. The CI Team has prepared and delivered multiple one-day training sessions for the iUTAH watershed technicians in data management and using the iUTAH CI software and systems. The CI Team may expand these trainings in later years and offer them more broadly to additional iUTAH participants.

Finally, iUTAH and CI-WATER (Utah EPSCoR Track 2) collaborators Dr. Jeffery Horsburgh (USU) and Dr. Steven Burian (UofU) teamed with Dr. Dan Ames (BYU) to offer a collaborative course on Hydroinformatics (<https://usu.instructure.com/courses/235322/>) offered for graduate students during Fall Semester 2013. The course was jointly taught by the three faculty members. This course uses an innovative multi-institution, team-teaching approach that provides new content and opportunities for interaction among students at all three institutions. The course is offered using the UEN Interactive Video Conferencing (IVC) system. The course combines synchronous video lectures with asynchronous student discussions, assignments, and grading using a new Learning Management System called Instructure Canvas. Enrollment for the course was as follows, with a total of 33 students spread across the 3 campuses:

USU – CEE 6110: Hydroinformatics – 5 students

BYU – CEEEn 594R: Hydroinformatics – 11 students

UU – CVEEN 7970: Hydroinformatics – 17 students

#### **\* How have the results been disseminated to communities of interest?**

iUTAH participants have aggressively engaged schools, universities, local, state and federal resource agencies, stakeholders as well as a myriad of professional societies.

During the second year of the project, RFA1-3 faculty and students have made numerous presentations to professional meetings and several formal presentations have been made to stakeholder audiences in Utah. Moreover, informal meetings with key local water managers and stakeholders have provided opportunities to disseminate our initial findings with local decision-makers.

Thus far, the initiative has been focused on making both researchers and stakeholders aware of the iUTAH project through lectures, presentations, and stakeholder meetings.

The iUTAH CI-TEAM has established a public facing website at <http://data.iutahepscor.org>, which is the home of the iUTAH Modeling & Data Federation. On this website, we have posted materials describing our software and CI development activities, and we are now building out the tools for presenting iUTAH data to iUTAH partners and the public. All of these tools are or will be linked to the [data.iutahepscor.org](http://data.iutahepscor.org) website. Additionally, we have described our research and development

activities in a number of formal presentations as detailed in the Products section below.

We have also established and are maintaining a series of open-source code repositories on the popular social programming website GitHub.

<https://github.com/UCHIC/WEBTSA>

<https://github.com/UCHIC/CKANDev>

<https://github.com/UCHIC/ODMToolsPython>

<https://github.com/UCHIC/ODM2Sensor>

<https://github.com/UCHIC/iUTAHData>

Managing our development in public repositories within a social programming website like GitHub ensures that our developments are discoverable and accessible to others who may be interested in using our code or techniques.

Finally, we have made the materials and results of the graduate level course in Hydroinformatics available online at <https://usu.instructure.com/courses/235322/> under a Creative Commons License. We have linked to these materials from the iUTAH and CI-WATER websites.

We have 27 peer-reviewed publications that are either in press, submitted or will be submitted prior to April 30, 2014. We also submitted 56 joint proposals to different funding sources (see products).

We are associated with 58 collaborating institutions based locally, state-wide, national and internationally.

Table 3 in the supporting documents section shows the complete list of 95 'External Engagement Activities.'

Main dissemination activities besides research presentations and outreach activities have been accomplished through the 4 websites that were created to engage participants and the general public:

[UtahEPSCoR.org](http://UtahEPSCoR.org) – State EPSCoR site

[iUtahEPSCoR.org](http://iUtahEPSCoR.org) – RII Track 1 site

[data.iUtahEPSCoR.org](http://data.iUtahEPSCoR.org) – the iUTAH Modeling and Data Federation's online system for sharing data, models, and other digital resources

[report.utepscor.org](http://report.utepscor.org) – Drupal reporting data entry system

From August 2013-March 2014, the iUTAH Track RII Track 1 site has received 7,347 visits. The communications team has grown our Facebook followers to 128, and Twitter followers to 156 as of April 2014.

The iUTAH Newsletter has been sent out 8 times from May 2013-April 2014, engaging and informing 178 team members, EPSCoR State Committee members, university administrators, and other interested parties. The newsletters are posted at <http://iutahepscor.org/resources/newsletters.html>

The Communications Team has maintained and updated the 4 websites associated with the grant- the Utah State EPSCoR site, the iUTAH Track RII Track 1 site, the iUTAH Modeling and Data Federation's data sharing site, and the EPSCoR Drupal reporting data entry site.

#### **\* What do you plan to do during the next reporting period to accomplish the goals?**

iUTAH has immediate plans to follow up with second year activities. Across the RFA's and CI components, we will continue

support and mentorship to undergraduate students, graduate students, and post-doctoral scholars. Under RFA 1's specific objectives, we will install urban instrumentation in support of RFA2's stormwater group in late year 2/ early year 3 so that it can become part of the GAMUT network. We aim to install a scintillometer at a fixed location and begin measurements of urban evapotranspiration in Salt Lake City before moving to the other watersheds. We expect to complete the process of downscaling the snow accumulation model and its parameters. RFA1 plans to outline potential water balance scenarios for use by other RFA teams. In RFA 3, we will meet at least quarterly as a larger group to share results, identify remaining research gaps, invite feedback, and build capacity between universities and stakeholders in Utah. We will continue to build the stakeholder database and model coupling activities. We hope to complete the manuscript about the iUtah coupled conceptual framework and finalize a data visualization plan in the absence of a centralized decision theater facility.

In the next year, the CI Team plans to continue supporting the infrastructure we have already built, along with developing new capabilities. Specifically, we will prioritize the following new activities: We will work with the RFA2 team to develop effective visualization and presentation techniques for social science datasets collected as part of their survey efforts. And also with the RFA3 team to identify and develop new capabilities and data services to support the coupled and integrated modeling activities of this group. We expect to fully deploy and support the data publication system we have been developing for iUTAH research data products and the new and more advanced data visualization and access tool for the GAMUT data that also presents data from USGS NWIS, NRCS SNOTEL and other networks available via the CUAHSI HIS. We will continue offering the graduate level course in Hydroinformatics across USU, UofU, and BYU campuses. And we will provide support for green infrastructure data.

A strong STEM workforce is critical for building and sustaining research capacity and economic growth. In the third year, we will focus our attention on the implementation of recruitment, selection, placement and evaluation processes and begin to create the K-12 curriculum materials from Summer Institutes. Summer Institute #3 will be implemented following the feedback and recommendations of Year 2. We will recruit more iFellows for the undergraduate research program and place students in iUTAH internships. In summary, we will continue implementing our successful workforce development programs, based on feedback from years 1 and 2.

As the main External Engagement (EE) activity for Year 2 we plan on expanding our EE team statewide so that we can integrate our EE activities with RFAs. As the main External Engagement activity for Year 3, planning will begin for Taking Learning Outdoors programs that engage rural audiences in Utah. We will continue to recruit and engage new EOD partners statewide to engage target iUTAH audiences.

As the main purpose of our Diversity Enhancement activities, we will continue to partner with Workforce and Engagement Teams to incorporate diverse populations in all iUTAH programming, and increase the diversity of iUTAH teams. We plan and implement the second diversity-training workshop connecting with Hispanic populations in Utah. We will continue to design engagement and museum programs for target populations.

### Supporting Files

Filename	Description	Uploaded By	Uploaded On
1_Supporting_Tables_Figures_1d.pdf	Supporting Document 1	Todd Cowl	05/01/2014
2_Supporting_Tables_Figures_2d.pdf	Supporting Document 2	Todd Cowl	05/01/2014
3_Supporting_Tables_Figures_3d.pdf	Supporting Document 3	Todd Cowl	05/01/2014

## Products

### Books

## Book Chapters

### Conference Papers and Presentations

Horsburgh, J.S., Spackman Jones, A., Reeder, S (2014). *Automating data management and sharing within a large-scale, heterogeneous sensor network*. Proceedings 7th International Congress on Environmental Modelling & Software. San Diego, CA. Status = AWAITING\_PUBLICATION; Acknowledgement of Federal Support = Yes

Spackman Jones, A., Horsburgh, J.S., Reeder, S. (2014). *Cyberinfrastructure for Data Management and Sharing within a Large-Scale, Heterogeneous Sensor Network*. Mountain Observatories a Global Fair and Workshop. Reno, NV. Status = AWAITING\_PUBLICATION; Acknowledgement of Federal Support = Yes

Spackman Jones, A., Horsburgh, J.S., Reeder, S. (2014). *Implementation of a workflow for streaming sensor data for a large-scale hydrologic monitoring network*. 2014 Utah State University Spring Runoff Conference,. Logan, UT. Status = AWAITING\_PUBLICATION; Acknowledgement of Federal Support = Yes

Spackman Jones, A., Horsburgh, J.S., Ramirez, M., Caraballo, J. (2014). *Managing monitoring equipment: A sensor extension for the CUAHSI Observations Data Model*. National Water Quality Monitoring Council 9th National Monitoring Conference. Cincinnati, OH. Status = AWAITING\_PUBLICATION; Acknowledgement of Federal Support = Yes

Horsburgh, J.S., Reeder, S., Patton, J., Spackman Jones, A. (2014). *ODM Tools Python: Open source software for managing hydrologic and water quality time series data*. National Water Quality Monitoring Council 9th National Monitoring Conference. Cincinnati, OH. Status = AWAITING\_PUBLICATION; Acknowledgement of Federal Support = Yes

Steve Burian, Jeff Horsburgh, David Rosenberg, Laura Hunter, Courtenay Strong (2013). *Using interactive video conferencing for multi-institution, team-teaching*. American Society for Engineering Education (ASEE) Annual Conference Proceedings. Atlanta, Georgia. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

## Inventions

### Journals

Andrea Armstrong, Douglas Jackson-Smith (2013). Forms and Levels of Integration: Evaluation of an Interdisciplinary Team-Building Project. *Journal of Research Practice*. 9 (1), . Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes ; OTHER: <http://www.jrp.icaap.org/index.php/jrp/article/view/335/297>

Beth Neilson (2013). Deducing the spatial variability of exchange within a longitudinal channel water balance. *Hydrological Processes*. . Status = SUBMITTED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Beth Neilson, David Rosenberg (). Simple Optimization Method to Determine Best Management Practices to Reduce Phosphorus Loading in Echo Reservoir, Utah.. *Journal of Water Resources Planning and Management*. . Status = SUBMITTED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Beth Neilson (). Two-zone transient storage: Analytical solutions to solute transport and central temporal moments. *Water Resources Research*. . Status = SUBMITTED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Carlos Licon (). Sustainability Assessment of Utah Counties. *The International Journal of Environmental, Cultural, Economic, and Social Sustainability*. . Status = SUBMITTED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Dasch Houdeshel, Christine Pomeroy (). Can Green Stormwater Infrastructure Coexist In The Western Legal Landscape Of Prior Appropriation Law?. *Water Resources Management*. . Status = SUBMITTED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Dasch Houdeshel (). Stormwater Green Infrastructure as no-irrigation landscaping alternative in a semi-arid climate. *Journal of Irrigation and Drainage*. . Status = SUBMITTED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Houdeshel, C.D., Hultine, K.R., Pomeroy, C.A. (2014). Evaluation of three vegetation treatments in bioretention gardens in a semi-arid climate.. *Landscape and Urban Planning*. . Status = SUBMITTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Jon Meyer, Jiming Jin (2012). Systematic Patterns of the Inconsistency between Snow Water Equivalent and Accumulated Precipitation as Reported by the Snowpack Telemetry Network. *Journal of Hydrometeorology*. 13 1970–1976. Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Li, E., S. Li, and J. Endter-Wada. (2014). “Coupling water and land use planning in megacities: a review of conceptual, political, and technical integration needs.”. *Journal of American Water Resources*. . Status = SUBMITTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Licón, C. V. (2014). La Integración de Indicadores de Sustentabilidad a Través de un Modelo Gráfico de Evaluación. Cuadernos de Arquitectura y Nuevo Urbanismo. [Integrating sustainability indicators through a graphic assessment model. *Journal of Architecture and New Urbanism (2014)*. . Status = SUBMITTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Philip Stoker, Martin Buchert (). Comparing the Utility of LiDAR data vs. Multi-spectral imagery for household-level water demand modeling.. *ACSE Journal of Water Resources and Management*. . Status = SUBMITTED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Philip Stoker (). Drivers of Urban Water Use. *Journal of Sustainable Cities and Society*. . Status = SUBMITTED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Samuel Rivera, Kevin Landom, Todd Crowl (2013). Monitoring Macrophytes Cover and Taxa in Utah Lake by Using 2009-2011 Landsat Digital Imagery. *Revista de Teledetección*. (39), 1133. Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes ; ISSN: 1988-8740

Sandoval, K., Houdeshel, C.D., Burian, S.J., and Porter, R.J. (2014). Precipitation chemistry may drive nitrogen concentrations in stormwater runoff.. *Expected submission May 1, 2014*. . Status = OTHER; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Steve Burian, Christine Pomeroy (2012). Water supply and stormwater management benefits of residential rainwater harvesting in U.S. cities. *Journal of the American Water Resources Association*. 49 810. Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Steve Burian, Tim Bardsley (2013). Planning for an uncertain future: Climate change sensitivity assessment towards adaptation planning for public water supply. *Earth Interactions*. 23 . Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Steven Hall, Gregory Maurer, Sebastian W Hoch, Raili Taylor, David R Bowling (). Urban atmospheric pollution increases deposition of major ions to the "Greatest Snow on Earth". *Atmospheric Environment*. . Status = SUBMITTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Stoker, P. & Rothfeder, R. (2014). “Drivers of Urban Water Use.”. *Journal of Sustainable Cities and Society (2014)*. (2014). <http://dx.d>. Status = SUBMITTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Thomas Walsh, Christine Pomeroy, Steve Burian (). Hydrologic Analysis of a Watershed-Scale Rainwater Harvesting Program. *Journal of Hydrology*. . Status = SUBMITTED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Yang, B. & R.R. Dupont. (2014). “Form-based variables for stormwater quality performance: comparing three BMP types in five U.S. states.”. *Urban Planning and Design Research (2014)*. . Status = SUBMITTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

## Licenses

### Other Products

*Audio or Video Products.*

Video: Utah Economic, Water and iUTAH. Published on Nov 12, 2013

Utah's residents and economy rely heavily on Utah's limited water supply. iUTAH is establishing a statewide group of researchers, teachers and decision makers to find ways preserve Utah's water resources for the future.

[https://www.youtube.com/watch?v=UxF4Mk\\_zSI8](https://www.youtube.com/watch?v=UxF4Mk_zSI8)

Duration: 3:03 minutes.

In addition, we developed a Spanish version to reach the Spanish growing community.

*Software or Netware.*

**The iUTAH Team has developed several innovative software applications. Open source code repositories are maintained on the popular social programming website GitHub:**

<https://github.com/UCHIC/WEBTSA> - Advanced, web-based time series visualization tool.

<https://github.com/UCHIC/CKANDev> - iUTAH data publication system.

<https://github.com/UCHIC/ODMToolsPython> - ODM Tools Python for managing and quality controlling sensor data.

<https://github.com/UCHIC/ODM2Sensor> - Equipment management database and website.

<https://github.com/UCHIC/iUTAHData> - Main iUTAH Modeling & Data Federation website.

*Open source code repositories - Websites.*

**We have established and are maintaining a series of open source code repositories on the popular social programming website GitHub.**

<https://github.com/UCHIC/WEBTSA>

<https://github.com/UCHIC/CKANDev>

<https://github.com/UCHIC/ODMToolsPython>

<https://github.com/UCHIC/ODM2Sensor>

<https://github.com/UCHIC/iUTAHData>

**Managing our development in public repositories within a social programming website like GitHub ensures that our developments are accessible to others who may be interested in using our code or techniques.**

### Other Publications

Omar Reyes-Perez, Samuel Rivera and Todd Crawl (2014). *Physical and Chemical Properties of Water: A Curriculum for K-12 students*. This is a manual of hands-on practices to be used by The Leonardo Museum to promote rational use of water among K-12 students. Status = UNDER\_REVIEW; Acknowledgement of Federal Support = Yes

## Patents

### Technologies or Techniques

The iUTAH Team has developed several innovative techniques for management of the streaming sensor data being collected within the GAMUT network:

- We have integrated components of the CUAHSI Hydrologic Information System into a larger workflow for managing the GAMUT sensor data

- We have developed a technique for collaboratively managing program updates to sites within the GAMUT network to minimize data loss due to program changes.
- We have developed innovative techniques for creating real-time alerts of potentially problematic conditions within the GAMUT data streams.
- We have developed a unique approach to sensor data quality control that couples a graphical user interface with automated scripting of quality control edits to preserve the provenance of changes made to move data from raw to quality controlled versions.

## Thesis/Dissertations

### Websites

Main iUTAH Modeling & Data Federation website

<http://data.iutahepscor.org>

Landing pages for each GAMUT watershed are operational.

<http://data.iutahepscor.org/mdf/logan-river>

<http://data.iutahepscor.org/mdf/provo-river>

<http://data.iutahepscor.org/mdf/red-butte-creek>

<http://data.iutahepscor.org/odmmmap/> - Google Map application for accessing GAMUT sites and data

<http://data.iutahepscor.org/odmtsa/> - Time series visualization tool for GAMUT data

<https://usu.instructure.com/courses/235322/> - Hydroinformatics graduate course materials

<http://cloudshare.iutahepscor.org> - Collaborative file sharing for iUTAH researchers

<http://data.iutahepscor.org/gamutmanagement/> - Equipment management website for iUTAH watershed technicians.

### Supporting Files

Filename	Description	Uploaded By	Uploaded On
PROPOSAL SUBMITTED_Table.pdf	Proposal list Table: Contains the list of 56 proposal submitted during this reporting period	Todd Crawl	04/29/2014

## Participants/Organizations

### What individuals have worked on the project?

Name	Most Senior Project Role	Nearest Person Month Worked
Crawl, Todd	PD/PI	2
Baker, Michelle	Co PD/PI	2
Ehleringer, James	Co PD/PI	1
Jackson-Smith, Douglas	Co PD/PI	1

Pataki, Diane	Co PD/PI	1
Teutonico, Rita	Co-Investigator	6
Aanderud, Zachary	Faculty	1
Avery, Brianne	Faculty	1
Balling, Richard	Faculty	1
Bates, Scott	Faculty	1
Bedford, Daniel	Faculty	1
Bowen, Gabriel	Faculty	1
Buchert, Martin	Faculty	1
Burian, Steve	Faculty	1
Carling, Greg	Faculty	1
Castronova, Tony	Faculty	1
Ciaccio, Jen	Faculty	1
Corbato, Steve	Faculty	1
Denton, Guy	Faculty	1
Dupont, Ryan	Faculty	1
Edward, Boyd	Faculty	1
Endres, Carla	Faculty	1
Endter-Wada, Joanna	Faculty	1
Ewing-Taylor, Reid	Faculty	1
Feng, Youcan	Faculty	6
Flint, Courtney	Faculty	9
Geffeney, Shana	Faculty	1

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Gill, Richard	Faculty	1
Gordillo, Luis	Faculty	1
Grant, Jacqueline	Faculty	1
Hinners, Sarah	Faculty	2
Homs, Daniel	Faculty	1
Horsburgh, Jeff	Faculty	2
Howe-taylor, Peter	Faculty	1
Hunter, Laura	Faculty	1
Huntly, Nancy	Faculty	1
Hurd, Kathleen	Faculty	1
Jensen, Ryan	Faculty	1
Jin, Jiming	Faculty	1
Jones, Norm	Faculty	1
Jones, Scott	Faculty	1
Keleher, Mary Jane	Faculty	1
Li, Shujuan	Faculty	1
Licon, Carlos	Faculty	1
Malone, Molly	Faculty	1
Matty, David	Faculty	1
McDowell, William	Faculty	1
Mesner, Nancy	Faculty	1
Michener, William	Faculty	1

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Neilson, Bethany	Faculty	1
Nelson, Arthur C.	Faculty	1
Null, Sarah	Faculty	1
O'Neill, Bill	Faculty	1
Pardjak, Eric	Faculty	1
Pomeroy, Christine	Faculty	1
Rosenberg, David	Faculty	1
Spruell, Paul	Faculty	1
St. Clair, Sam	Faculty	1
Stark, Louisa	Faculty	1
Stoll, Rob	Faculty	1
Strong, Courtney	Faculty	1
Tarboton, David	Faculty	1
Trentelman, Carla	Faculty	1
Vouvalis, Nicole	Faculty	1
Wairepo, Anne	Faculty	1
Walther, Suzanne	Faculty	1
Yang, Bo	Faculty	1
Hale, Rebecca	Postdoctoral (scholar, fellow or other postdoctoral position)	12
Hall, Steven	Postdoctoral (scholar, fellow or other postdoctoral position)	12
Houdeshel, Dasch	Postdoctoral (scholar, fellow or other postdoctoral position)	12

Andrews, Adrienne	Other Professional	1
Baker, Barry	Other Professional	1
Bancroft, Betsy	Other Professional	1
Bardsley, Tim	Other Professional	1
Bo Flood, Nancy	Other Professional	1
Bowen, Brenda	Other Professional	1
Burns, Ellen	Other Professional	12
Clay, Christy	Other Professional	1
Dash, Pabitra	Other Professional	1
Dintelman, Sue	Other Professional	1
DuRoss, Erika	Other Professional	1
George, Carol	Other Professional	1
Gooch, Heather	Other Professional	1
Hildebrand, Terri	Other Professional	1
Howe-taylor, Marian	Other Professional	1
Huff, Terra	Other Professional	6
Keleher, Chris	Other Professional	1
Kesar, Shalini	Other Professional	1
Kiefer, Julie	Other Professional	1
Manuelito-Kerkvliet, Cassandra	Other Professional	1
McEntire, Anna	Other Professional	1
Menlove, Rebecca	Other Professional	1

Miller, Dan	Other Professional	1
Milutinovich, Mark	Other Professional	1
Monhardt, Becky	Other Professional	1
Nelson, Adelbert	Other Professional	1
Obendorfer, Reed	Other Professional	1
Olsen, Herm	Other Professional	1
Paulsen, Heather	Other Professional	1
Pendleton, Jackie	Other Professional	1
Petty, Lauren	Other Professional	9
Porter, Alan	Other Professional	3
Ramsey, Robert	Other Professional	1
Rhodes, Kevin	Other Professional	1
Rivera, Samuel	Other Professional	12
Runburg, Madlyn	Other Professional	2
Sansom, Rebecca	Other Professional	1
Schuske, Kim	Other Professional	1
Seppi, Jessica	Other Professional	1
Smith, Katie	Other Professional	1
Van Houten, Judy	Other Professional	1
Wang, Weihong	Other Professional	1
Yajima, Reiko	Other Professional	1
Young, Sarah	Other Professional	1

Anderson, Jessica	Technician	3
Cannon, Molly	Technician	1
Carlisle, Jobie	Technician	5
Cox, Chris	Technician	12
Crawford, Joe	Technician	12
Eiriksson, Dave	Technician	12
Greene, Brian	Technician	6
Jones, Amber	Technician	6
Keele, Rusty	Technician	1
Lorimer, Matt	Technician	2
Mouzon, Nate	Technician	1
Reeder, Stephanie	Technician	6
Grove, Morgan	Staff Scientist (doctoral level)	1
Miller, Matt	Staff Scientist (doctoral level)	1
Amstrong, Andrea	Graduate Student (research assistant)	6
Bahr, Jason	Graduate Student (research assistant)	6
Bailey, Brianne	Graduate Student (research assistant)	6
Betts, Dave	Graduate Student (research assistant)	6
Blaiser, Mark	Graduate Student (research assistant)	6
Buahin, Caleb	Graduate Student (research assistant)	8
Bunnell, Michael	Graduate Student (research assistant)	6
Burnham, Morey	Graduate Student (research assistant)	8

Chan, Allison	Graduate Student (research assistant)	6
Christensen, Scott	Graduate Student (research assistant)	1
Gomez-Navarro, Carolina	Graduate Student (research assistant)	6
Goodsell, Tim	Graduate Student (research assistant)	12
Jones, Erin	Graduate Student (research assistant)	6
Kelso, Julia	Graduate Student (research assistant)	6
Kumarasamy, Karthik	Graduate Student (research assistant)	6
Levine, Zacharia	Graduate Student (research assistant)	6
li, Enjie	Graduate Student (research assistant)	6
Mallory, Mallory	Graduate Student (research assistant)	1
Meyer, Jon	Graduate Student (research assistant)	6
Odame, Augustina	Graduate Student (research assistant)	6
Perez-Reyes, Omar	Graduate Student (research assistant)	6
Richardson, Jake	Graduate Student (research assistant)	1
Smith, Kimi	Graduate Student (research assistant)	6
Stoker, Philip	Graduate Student (research assistant)	6
Stwertka, Carolyn	Graduate Student (research assistant)	1
Walsh, Thomas	Graduate Student (research assistant)	1
Bedingfield, Sean	Undergraduate Student	3
Bell, Luke	Undergraduate Student	3
Bjerregaard, Zackary	Undergraduate Student	3
Campbell, Hayden	Undergraduate Student	3
Caraballo, Juan	Undergraduate Student	3

Cook, Brant	Undergraduate Student	3
Frandsen, Jeff	Undergraduate Student	3
Hagedorn, Andrew	Undergraduate Student	3
Locquiao, Jem	Undergraduate Student	3
Matos, Mario	Undergraduate Student	1
Meline, Jacob	Undergraduate Student	1
Mitts, Stephanie	Undergraduate Student	3
Norman, Kari	Undergraduate Student	3
Palmer, Brianne	Undergraduate Student	3
Patton, James	Undergraduate Student	4
Pilkington, Dusty	Undergraduate Student	3
Ramirez, Maurier	Undergraduate Student	3
Thatcher, Natalie	Undergraduate Student	4
Wheeler, Staton	Undergraduate Student	1
Ewing-Taylor, Jacqueline	Consultant	2

#### Full details of individuals who have worked on the project:

##### **Todd A Crowl**

**Email:** todd.crowl@usu.edu

**Most Senior Project Role:** PD/PI

**Nearest Person Month Worked:** 2

**Contribution to the Project:** PD/PI and USU faculty

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

##### **Michelle A Baker**

**Email:** michelle.baker@usu.edu  
**Most Senior Project Role:** Co PD/PI  
**Nearest Person Month Worked:** 2

**Contribution to the Project:** Co PD/PI and USU faculty

**Funding Support:** USU

**International Collaboration:** No  
**International Travel:** No

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**James R Ehleringer**

**Email:** jim.ehleringer@utah.edu  
**Most Senior Project Role:** Co PD/PI  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Co PD/PI and UU faculty

**Funding Support:** UU

**International Collaboration:** No  
**International Travel:** No

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**Douglas Jackson-Smith**

**Email:** doug.jackson-smith@usu.edu  
**Most Senior Project Role:** Co PD/PI  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Co PD/PI and USU faculty

**Funding Support:** USU

**International Collaboration:** No  
**International Travel:** No

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**Diane E Pataki**

**Email:** diane.pataki@utah.edu  
**Most Senior Project Role:** Co PD/PI  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Co PD/PI and UU faculty

**Funding Support:** UU

**International Collaboration:** No  
**International Travel:** No

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**Rita Teutonico**

**Email:** rita.teutonico@usu.edu  
**Most Senior Project Role:** Co-Investigator  
**Nearest Person Month Worked:** 6

**Contribution to the Project:** Co PD/PI of iUTAH

**Funding Support:** USU

**International Collaboration:** No  
**International Travel:** No

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**Zachary Aanderud**

**Email:** zachary\_aanderud@byu.edu  
**Most Senior Project Role:** Faculty  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Co PD/PI and BYU faculty

**Funding Support:** BYU

**International Collaboration:** No  
**International Travel:** No

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**Brianne Avery**

**Email:** bavery@westminstercollege.edu  
**Most Senior Project Role:** Faculty  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at Westminster College participating in research at iUTAH

**Funding Support:** Westminster College

**International Collaboration:** No  
**International Travel:** No

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**Richard Balling**

**Email:** balling@byu.edu  
**Most Senior Project Role:** Faculty  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at BYU participating in research at iUTAH

**Funding Support:** BYU

**International Collaboration:** No  
**International Travel:** No

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**Scott Bates**

**Email:** scott.bates@usu.edu

**Most Senior Project Role:** Faculty  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at USU participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No  
**International Travel:** No

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**Daniel Bedford**

**Email:** dbedford@weber.edu

**Most Senior Project Role:** Faculty  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at Weber St. participating in research at iUTAH

**Funding Support:** Weber State

**International Collaboration:** No  
**International Travel:** No

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**Gabriel Bowen**

**Email:** gabe.bowen@utah.edu

**Most Senior Project Role:** Faculty  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at UU participating in research at iUTAH

**Funding Support:** UU

**International Collaboration:** No  
**International Travel:** No

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**Martin Buchert**

**Email:** martin.buchert@utah.edu

**Most Senior Project Role:** Faculty  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at UU participating in research at iUTAH

**Funding Support:** UU

**International Collaboration:** No  
**International Travel:** No

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**Steve Burian**

**Email:** burian@eng.utah.edu

**Most Senior Project Role:** Faculty  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at UU participating in research at iUTAH

**Funding Support:** UU

**International Collaboration:** No  
**International Travel:** No

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**Greg Carling**

**Email:** greg.carling@byu.edu

**Most Senior Project Role:** Faculty  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at BYU participating in research at iUTAH

**Funding Support:** BYU

**International Collaboration:** No  
**International Travel:** No

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**Tony Castronova**

**Email:** tony.castronova@usu.edu

**Most Senior Project Role:** Faculty  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at USU Water Lab participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No  
**International Travel:** No

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**Jen Ciaccio**

**Email:** ciaccio@dixie.edu

**Most Senior Project Role:** Faculty  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at Dixie participating in research at iUTAH

**Funding Support:** Dixie

**International Collaboration:** No  
**International Travel:** No

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**Steve Corbato**

**Email:** steve.corbato@utah.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at UU participating in research at iUTAH

**Funding Support:** UU

**International Collaboration:** No

**International Travel:** No

---

**Guy Denton**

**Email:** Guy.Denton@usu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at USU participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

---

**Ryan Dupont**

**Email:** ryan.dupont@usu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at USU participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Boyd Edward**

**Email:** boyd.edwards@usu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at USU participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Carla Endres**

**Email:** carla.endres@usu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at USU participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

---

**Joanna Endter-Wada**

**Email:** joanna.endter-wada@usu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at USU participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

---

**Reid Ewing-Taylor**

**Email:** ewing@arch.utah.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at UU participating in research at iUTAH

**Funding Support:** UU

**International Collaboration:** No

**International Travel:** No

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**Youcan Feng**

**Email:** youcan.feng@utah.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 6

**Contribution to the Project:** UU graduate student sponsored by iUTAH

**Funding Support:** UU

**International Collaboration:** No

**International Travel:** No

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**Courtney Flint**

**Email:** Courtney.Flint@usu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 9

**Contribution to the Project:** Faculty at USU participating in research at iUTAH

**Funding Support:** iUTAH

**International Collaboration:** No

**International Travel:** No

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**Shana Geffeny**

**Email:** shana.geffeny@usu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at USU participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

---

**Richard Gill**

**Email:** rgill@byu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at BYU participating in research at iUTAH

**Funding Support:** BYU

**International Collaboration:** No

**International Travel:** No

---

**Luis Gordillo**

**Email:** luis.gordillo@snow.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at Snow College participating in research at iUTAH

**Funding Support:** Snow College

**International Collaboration:** No

**International Travel:** No

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**Jacqueline Grant**

**Email:** jacquelinegrant@suu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at SUU participating in research at iUTAH

**Funding Support:** SUU

**International Collaboration:** No

**International Travel:** No

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**Sarah Hanners**

**Email:** sarah.hanners@utah.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 2

**Contribution to the Project:** Faculty at UU participating in research at iUTAH

**Funding Support:** UU

**International Collaboration:** No

**International Travel:** No

---

**Daniel Homs**

**Email:** hornsda@uvu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at UVU participating in research at iUTAH

**Funding Support:** UVU

**International Collaboration:** No

**International Travel:** No

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**Jeff Horsburgh**

**Email:** jeff.horsburgh@usu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 2

**Contribution to the Project:** USU Faculty

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Peter Howe-taylor**

**Email:** peter.howe@usu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at USU participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Laura Hunter**

**Email:** lhunter@uen.org

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at UEN participating in research at iUTAH

**Funding Support:** UEN

**International Collaboration:** No

**International Travel:** No

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**Nancy Huntly**

**Email:** nancy.huntly@usu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at USU participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Kathleen Hurd**

**Email:** Kathleen.hurd@slcc.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** faculty at SLCC

**Funding Support:** SLCC

**International Collaboration:** No

**International Travel:** No

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**Ryan Jensen**

**Email:** ryan.jensen@byu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at BYU participating in research at iUTAH

**Funding Support:** BYU

**International Collaboration:** No

**International Travel:** No

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**Jiming Jin**

**Email:** jiming.jin@usu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at USU participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Norm Jones**

**Email:** njones@byu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at BYU participating in research at iUTAH

**Funding Support:** BYU

**International Collaboration:** No

**International Travel:** No

---

**Scott Jones**

**Email:** scott.jones@usu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at USU participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Mary Jane Keleher**

**Email:** maryjane.keleher@slcc.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at SLCC participating in research at iUTAH

**Funding Support:** SLCC

**International Collaboration:** No  
**International Travel:** No

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**Shujuan Li**

**Email:** shujuan.li@usu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at USU participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Carlos Licon**

**Email:** carlos.licon@usu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at USU participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Molly Malone**

**Email:** molly.malone@utah.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at UU participating in research at iUTAH

**Funding Support:** UU

**International Collaboration:** No

**International Travel:** No

---

**David Matty**

**Email:** dmatty@weber.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at Weber St. participating in research at iUTAH

**Funding Support:** Weber St.

**International Collaboration:** No  
**International Travel:** No

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**William McDowell**

**Email:** bill.mcdowell@unh.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** External Advisory Board

**Funding Support:** UNH

**International Collaboration:** No

**International Travel:** No

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**Nancy Mesner**

**Email:** nancy.mesner@usu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at USU participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**William Michener**

**Email:** wmichene@unm.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** External Advisory Board

**Funding Support:** UNH

**International Collaboration:** No

**International Travel:** No

---

**Bethany Neilson**

**Email:** bethany.neilson@usu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at USU Water Lab participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Arthur C. Nelson**

**Email:** acnelson@utah.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at UU participating in research at iUTAH

**Funding Support:** UU

**International Collaboration:** No

**International Travel:** No

---

**Sarah Null**

**Email:** sarah.null@usu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at USU participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Bill O'Neill**

**Email:** oneillb@dixie.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at Dixie participating in research at iUTAH

**Funding Support:** Dixie

**International Collaboration:** No

**International Travel:** No

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**Eric Pardyjak**

**Email:** pardyjak@gmail.com

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at UU participating in research at iUTAH

**Funding Support:** UU

**International Collaboration:** No

**International Travel:** No

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**Christine Pomeroy**

**Email:** christine.pomeroy@utah.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at UU participating in research at iUTAH

**Funding Support:** UU

**International Collaboration:** No

**International Travel:** No

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**David Rosenberg**

**Email:** david.rosenberg@usu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at USU participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Paul Spruell**

**Email:** spruell@suu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at SUU participating in research at iUTAH

**Funding Support:** SUU

**International Collaboration:** No

**International Travel:** No

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**Sam St. Clair**

**Email:** stclair@byu.edu

**Most Senior Project Role:** Faculty

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at BYU participating in research at iUTAH

**Funding Support:** BYU

**International Collaboration:** No

**International Travel:** No

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**Louisa Stark****Email:** louisa.stark@utah.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 1**Contribution to the Project:** Faculty at UU participating in research at iUTAH. Director of iUTAH's Summer Institute**Funding Support:** UU**International Collaboration:** No**International Travel:** No

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**Rob Stoll****Email:** rstoll@eng.utah.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 1**Contribution to the Project:** Faculty at UU participating in research at iUTAH**Funding Support:** UU**International Collaboration:** No**International Travel:** No

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**Courtney Strong****Email:** court.strong@utah.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 1**Contribution to the Project:** Faculty at UU participating in research at iUTAH**Funding Support:** UU**International Collaboration:** No**International Travel:** No

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**David Tarboton****Email:** david.tarboton@usu.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 1**Contribution to the Project:** Faculty at USU participating in research at iUTAH**Funding Support:** USU**International Collaboration:** No**International Travel:** No

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**Carla Trentelman****Email:** carlatrentelman@weber.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 1**Contribution to the Project:** Faculty at Weber St. participating in research at iUTAH**Funding Support:** Weber St.**International Collaboration:** No**International Travel:** No

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**Nicole Vouvalis****Email:** nicole.vouvalis@usu.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 1**Contribution to the Project:** Faculty at USU participating in research at iUTAH**Funding Support:** USU**International Collaboration:** No**International Travel:** No

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**Anne Wairepo****Email:** annew@uvu.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 1**Contribution to the Project:** Faculty at UVU participating in research at iUTAH**Funding Support:** UVU**International Collaboration:** No**International Travel:** No

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**Suzanne Walther****Email:** SWalther@uvu.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 1**Contribution to the Project:** Faculty at UVU participating in research at iUTAH**Funding Support:** UVU**International Collaboration:** No**International Travel:** No

**Bo Yang****Email:** bo.yang@usu.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 1**Contribution to the Project:** Faculty at USU participating in research at iUTAH**Funding Support:** USU**International Collaboration:** No**International Travel:** No**Rebecca Hale****Email:** rebecca.hale@utah.edu**Most Senior Project Role:** Postdoctoral (scholar, fellow or other postdoctoral position)**Nearest Person Month Worked:** 12**Contribution to the Project:** UU PosDoc by iUTAH**Funding Support:** UU**International Collaboration:** No**International Travel:** No**Steven Hall****Email:** steven.j.hall@utah.edu**Most Senior Project Role:** Postdoctoral (scholar, fellow or other postdoctoral position)**Nearest Person Month Worked:** 12**Contribution to the Project:** UU PosDoc by iUTAH**Funding Support:** UU**International Collaboration:** No**International Travel:** No**Dasch Houdeshel****Email:** d.houdeshel@utah.edu**Most Senior Project Role:** Postdoctoral (scholar, fellow or other postdoctoral position)**Nearest Person Month Worked:** 12**Contribution to the Project:** USU PosDoc sponsored by iUTAH**Funding Support:** iUTAH**International Collaboration:** No**International Travel:** No

**Adrienne Andrews****Email:** adrienneandrews@weber.edu**Most Senior Project Role:** Other Professional**Nearest Person Month Worked:** 1**Contribution to the Project:** Diversity specialist at Weber St**Funding Support:** Weber St**International Collaboration:** No**International Travel:** No

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**Barry Baker****Email:** bbaker@tnc.org**Most Senior Project Role:** Other Professional**Nearest Person Month Worked:** 1**Contribution to the Project:** Nature Conservancy representative**Funding Support:** Nature Conservancy**International Collaboration:** No**International Travel:** No

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**Betsy Bancroft****Email:** betsybancroft@suu.edu**Most Senior Project Role:** Other Professional**Nearest Person Month Worked:** 1**Contribution to the Project:** iUTAH grant recipient from SUU**Funding Support:** SUU**International Collaboration:** No**International Travel:** No

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**Tim Bardsley****Email:** wwa.bardsley@gmail.com**Most Senior Project Role:** Other Professional**Nearest Person Month Worked:** 1**Contribution to the Project:** Western Water Assessment team**Funding Support:** Western Water Assessment**International Collaboration:** No**International Travel:** No

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**Nancy Bo Flood**

**Email:** wflood@hotmail.com

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Navajo Nation representative, diversity specialist

**Funding Support:** Navajo Nation

**International Collaboration:** No

**International Travel:** No

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**Brenda Bowen**

**Email:** brenda.bowen@utah.edu

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Professional at iUTAH

**Funding Support:** UU

**International Collaboration:** No

**International Travel:** No

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**Ellen Burns**

**Email:** ellen.burns@usu.edu

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 12

**Contribution to the Project:** iUTAH EOD coordinator

**Funding Support:** iUTAH

**International Collaboration:** No

**International Travel:** No

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**Christy Clay**

**Email:** cclay@westminstercollege.edu

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 1

**Contribution to the Project:** RCG recipient at Westminster College

**Funding Support:** Westminster College

**International Collaboration:** No

**International Travel:** No

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**Pabitra Dash**

**Email:** pabitra.dash@usu.edu  
**Most Senior Project Role:** Other Professional  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Programmer at USU Water Lab participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No  
**International Travel:** No

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**Sue Dintelman**

**Email:** sue@pleiades-software.com  
**Most Senior Project Role:** Other Professional  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Pleiades Software, Inc. - private enterprise representative

**Funding Support:** Pleiades Software, Inc.

**International Collaboration:** No  
**International Travel:** No

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**Erika DuRoss**

**Email:** EDuRoss@theleonardo.org  
**Most Senior Project Role:** Other Professional  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Education specialist from The Leonardo

**Funding Support:** The Leonardo

**International Collaboration:** No  
**International Travel:** No

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**Carol George**

**Email:** cgeorge@utah.gov  
**Most Senior Project Role:** Other Professional  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** State EPSCoR Committee

**Funding Support:** GOED

**International Collaboration:** No  
**International Travel:** No

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**Heather Gooch**

**Email:** heathergooch@comcast.net

**Most Senior Project Role:** Other Professional  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Jordan High School teacher, EOD support

**Funding Support:** Jordan High School

**International Collaboration:** No  
**International Travel:** No

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**Terri Hildebrand**

**Email:** hildebrand@suu.edu

**Most Senior Project Role:** Other Professional  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** iUTAH grant recipient from SUU

**Funding Support:** SUU

**International Collaboration:** No  
**International Travel:** No

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**Marian Howe-taylor**

**Email:** marian.howe-taylor@slcc.edu

**Most Senior Project Role:** Other Professional  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Faculty at SLCC participating in research at iUTAH

**Funding Support:** SLCC

**International Collaboration:** No  
**International Travel:** No

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**Terra Huff**

**Email:** terra.huff@usu.edu

**Most Senior Project Role:** Other Professional  
**Nearest Person Month Worked:** 6

**Contribution to the Project:** Financial Officer of IUTAH at USU

**Funding Support:** USU

**International Collaboration:** No  
**International Travel:** No

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**Chris Keleher**

**Email:** ChristopherKeleher@utah.gov

**Most Senior Project Role:** Other Professional  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Member of iUTAH management team

**Funding Support:** State of Utah

**International Collaboration:** No  
**International Travel:** No

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**Shalini Kesar**

**Email:** kesar@suu.edu

**Most Senior Project Role:** Other Professional  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** SUU

**Funding Support:** SUU

**International Collaboration:** No  
**International Travel:** No

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**Julie Kiefer**

**Email:** exploreutahscience@gmail.com

**Most Senior Project Role:** Other Professional  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Member of EUS

**Funding Support:** EUS

**International Collaboration:** No  
**International Travel:** No

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**Cassandra Manuelito-Kerkvliet**

**Email:** manuelitokerkvliet@hotmail.com

**Most Senior Project Role:** Other Professional  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** External Advisory Board

**Funding Support:** CMK Consultancy part of the EAB

**International Collaboration:** No  
**International Travel:** No

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**Anna McEntire**

**Email:** anna.mcentire@usu.edu

**Most Senior Project Role:** Other Professional  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** USU

**Funding Support:** USU

**International Collaboration:** No  
**International Travel:** No

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**Rebecca Menlove**

**Email:** bmenlove@nhmu.utah.edu

**Most Senior Project Role:** Other Professional  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** NHMU, educational specialist

**Funding Support:** NHMU

**International Collaboration:** No  
**International Travel:** No

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**Dan Miller**

**Email:** dmiller@brwcouncil.org

**Most Senior Project Role:** Other Professional  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Bear River Watershed Council collaborating with iUTAH EOD team

**Funding Support:** Bear River Watershed Council

**International Collaboration:** No  
**International Travel:** No

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**Mark Milutinovich**

**Email:** mmilutin@aaas.org

**Most Senior Project Role:** Other Professional  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** AAAS member of the External Assessment Team

**Funding Support:** AAAS

**International Collaboration:** No  
**International Travel:** No

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**Becky Monhardt**

**Email:** rebecca.monhardt@loras.edu

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Diversity specialist at Loras College

**Funding Support:** Loras College

**International Collaboration:** No

**International Travel:** No

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**Adelbert Nelson**

**Email:** mansel.nelson@nau.edu

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Diversity specialist of Northern Arizona U

**Funding Support:** Northern Arizona U

**International Collaboration:** No

**International Travel:** No

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**Reed Obendorfer**

**Email:** reed@cuwcd.com

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 1

**Contribution to the Project:** CUWCD user

**Funding Support:** CUWCD

**International Collaboration:** No

**International Travel:** No

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**Herm Olsen**

**Email:** herm@hao-law.com

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 1

**Contribution to the Project:** HAO, private enterprise representative.

**Funding Support:** HAO

**International Collaboration:** No

**International Travel:** No

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**Heather Paulsen**

**Email:** hpaulsen@thanksgivingpoint.org

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 1

**Contribution to the Project:** EOD supplement from Thanksgiving Pt.

**Funding Support:** Thanksgiving Pt.

**International Collaboration:** No

**International Travel:** No

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**Jackie Pendleton**

**Email:** outreach@thelivingplanet.com

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 1

**Contribution to the Project:** EOD supplement from The Living Plant Aquarium

**Funding Support:** The Living Plant Aquarium

**International Collaboration:** No

**International Travel:** No

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**Lauren Petty**

**Email:** lauren.petty@usu.edu

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 9

**Contribution to the Project:** iUTAH Communications/Logistics Administrator at USU

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Alan Porter**

**Email:** alan.porter@isye.gatech.edu

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 3

**Contribution to the Project:** Consultant - GA Tech, establishing iUTAH baseline for research publications

**Funding Support:** GA Tech

**International Collaboration:** No

**International Travel:** No

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**Robert Ramsey**

**Email:** bob.ramsey@crsengineers.com

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Consultant at Canyon Concepts LLC

**Funding Support:** Canyon Concepts LLC

**International Collaboration:** No

**International Travel:** No

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**Kevin Rhodes**

**Email:** krhodes@campbellsci.com

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Campbell Scientific, Inc. tech

**Funding Support:** Campbell Scientific, Inc.

**International Collaboration:** No

**International Travel:** No

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**Samuel Rivera**

**Email:** samuel.rivera@aggiemail.usu.edu

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 12

**Contribution to the Project:** Science Coordinator of IUTAH at USU

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Madlyn Runburg**

**Email:** mrunburg@nhmu.utah.edu

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 2

**Contribution to the Project:** NHMU, educational specialist

**Funding Support:** NHMU

**International Collaboration:** No

**International Travel:** No

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**Rebecca Sansom**

**Email:** sansom.becca@gmail.com

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Einsten Fellow of NSF

**Funding Support:** NSF**International Collaboration:** No**International Travel:** No

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**Kim Schuske****Email:** exploreutahscience@gmail.com(2)**Most Senior Project Role:** Other Professional**Nearest Person Month Worked:** 1**Contribution to the Project:** Member of EUS EOD supplement**Funding Support:** EUS**International Collaboration:** No**International Travel:** No

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**Jessica Seppi****Email:** jseppi@nhmu.utah.edu**Most Senior Project Role:** Other Professional**Nearest Person Month Worked:** 1**Contribution to the Project:** NHMU, educational specialist**Funding Support:** NHMU**International Collaboration:** No**International Travel:** No

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**Katie Smith****Email:** ksmith@theleonardo.org**Most Senior Project Role:** Other Professional**Nearest Person Month Worked:** 1**Contribution to the Project:** Education specialist from The Leonardo**Funding Support:** The Leonardo**International Collaboration:** No**International Travel:** No

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**Judy Van Houten****Email:** Judith.Vanhouten@uvm.edu**Most Senior Project Role:** Other Professional**Nearest Person Month Worked:** 1**Contribution to the Project:** Member of External Advisory Board

**Funding Support:** UVM

**International Collaboration:** No

**International Travel:** No

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**Weihong Wang**

**Email:** weihong.wang@uvu.edu

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 1

**Contribution to the Project:** UVU recipient of RCG grants

**Funding Support:** UVU

**International Collaboration:** No

**International Travel:** No

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**Reiko Yajima**

**Email:** ryajima@aaas.org

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 1

**Contribution to the Project:** AAAS member of the External Assessment Team

**Funding Support:** AAAS

**International Collaboration:** No

**International Travel:** No

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**Sarah Young**

**Email:** sarah.young@schools.utah.gov

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 1

**Contribution to the Project:** State of Utah

**Funding Support:** State of Utah

**International Collaboration:** No

**International Travel:** No

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**Jessica Anderson**

**Email:** janderson@uen.org

**Most Senior Project Role:** Technician

**Nearest Person Month Worked:** 3

**Contribution to the Project:** Technician from UEN

**Funding Support:** UEN

**International Collaboration:** No

**International Travel:** No

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**Molly Cannon**

**Email:** molly.cannon@usu.edu

**Most Senior Project Role:** Technician

**Nearest Person Month Worked:** 1

**Contribution to the Project:** USU tech sponsored by iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Jobie Carlisle**

**Email:** jobie@usu.edu

**Most Senior Project Role:** Technician

**Nearest Person Month Worked:** 5

**Contribution to the Project:** Technician at USU

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Chris Cox**

**Email:** chrisrycx@gmail.com

**Most Senior Project Role:** Technician

**Nearest Person Month Worked:** 12

**Contribution to the Project:** Technician at USU

**Funding Support:** iUTAH

**International Collaboration:** No

**International Travel:** No

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**Joe Crawford**

**Email:** joe\_crawford@byu.edu

**Most Senior Project Role:** Technician

**Nearest Person Month Worked:** 12

**Contribution to the Project:** BYU technician sponsored by iUTAH

**Funding Support:** BYU

**International Collaboration:** No

**International Travel:** No

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**Dave Eiriksson**

**Email:** dave.eiriksson@utah.edu

**Most Senior Project Role:** Technician

**Nearest Person Month Worked:** 12

**Contribution to the Project:** USU tech participating in reasearch at iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Brian Greene**

**Email:** brian.greene@usu.edu

**Most Senior Project Role:** Technician

**Nearest Person Month Worked:** 6

**Contribution to the Project:** USU Technician sponsored by iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Amber Jones**

**Email:** amber.jones@usu.edu

**Most Senior Project Role:** Technician

**Nearest Person Month Worked:** 6

**Contribution to the Project:** USU Water Lab Tech sponsored by iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Rusty Keele**

**Email:** rkeele@uen.org

**Most Senior Project Role:** Technician

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Technician from UEN

**Funding Support:** UEN

**International Collaboration:** No

**International Travel:** No

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**Matt Lorimer**

**Email:** matt.lorimer@usu.edu

**Most Senior Project Role:** Technician

**Nearest Person Month Worked:** 2

**Contribution to the Project:** Tech at USU

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Nate Mouzon**

**Email:** nmouzon@gmail.com

**Most Senior Project Role:** Technician

**Nearest Person Month Worked:** 1

**Contribution to the Project:** USU Water Lab tech sponsored by iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Stephanie Reeder**

**Email:** stephanie.reeder@usu.edu

**Most Senior Project Role:** Technician

**Nearest Person Month Worked:** 6

**Contribution to the Project:** Technician-Programmer at USU Water Lab

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Morgan Grove**

**Email:** mgrove@fs.fed.us

**Most Senior Project Role:** Staff Scientist (doctoral level)

**Nearest Person Month Worked:** 1

**Contribution to the Project:** External Advisory Board

**Funding Support:** USFS

**International Collaboration:** No

**International Travel:** No

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**Matt Miller**

**Email:** mamiller@usgs.gov

**Most Senior Project Role:** Staff Scientist (doctoral level)

**Nearest Person Month Worked:** 1

**Contribution to the Project:** USGS official, water data and advise provider

**Funding Support:** USGS

**International Collaboration:** No

**International Travel:** No

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**Andrea Armstrong**

**Email:** armstrong.usu@gmail.com

**Most Senior Project Role:** Graduate Student (research assistant)

**Nearest Person Month Worked:** 6

**Contribution to the Project:** USU graduate student sponsored by iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Jason Bahr**

**Email:** jrbahr@gmail.com

**Most Senior Project Role:** Graduate Student (research assistant)

**Nearest Person Month Worked:** 6

**Contribution to the Project:** USU graduate student sponsored by iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Brianne Bailey**

**Email:** bri.bailey@utah.edu

**Most Senior Project Role:** Graduate Student (research assistant)

**Nearest Person Month Worked:** 6

**Contribution to the Project:** UU graduate student sponsored by iUTAH

**Funding Support:** UU

**International Collaboration:** No

**International Travel:** No

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**Dave Betts**

**Email:** davebetts@gmail.com

**Most Senior Project Role:** Graduate Student (research assistant)

**Nearest Person Month Worked:** 6

**Contribution to the Project:** USU graduate student sponsored by iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Mark Blaiser**

**Email:** mblaiser@gmail.com

**Most Senior Project Role:** Graduate Student (research assistant)

**Nearest Person Month Worked:** 6

**Contribution to the Project:** USU graduate student sponsored by iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Caleb Buahin**

**Email:** caleb.buahin@aggiemail.usu.edu

**Most Senior Project Role:** Graduate Student (research assistant)

**Nearest Person Month Worked:** 8

**Contribution to the Project:** USU Water Lab graduate student sponsored by iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Michael Bunnell**

**Email:** michaelcbunnell@gmail.com

**Most Senior Project Role:** Graduate Student (research assistant)

**Nearest Person Month Worked:** 6

**Contribution to the Project:** BYU graduate student sponsored by iUTAH

**Funding Support:** BYU

**International Collaboration:** No

**International Travel:** No

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**Morey Burnham**

**Email:** moreyburnham@gmail.com

**Most Senior Project Role:** Graduate Student (research assistant)

**Nearest Person Month Worked:** 8

**Contribution to the Project:** USU Water Lab graduate student sponsored by iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

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**Allison Chan**

**Email:** amchan118@gmail.com

**Most Senior Project Role:** Graduate Student (research assistant)

**Nearest Person Month Worked:** 6

**Contribution to the Project:** UU graduate student sponsored by iUTAH

**Funding Support:** UU

**International Collaboration:** No

**International Travel:** No

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**Scott Christensen**

**Email:** scottychristensen@gmail.com

**Most Senior Project Role:** Graduate Student (research assistant)

**Nearest Person Month Worked:** 1

**Contribution to the Project:** BYU graduate student sponsored by iUTAH

**Funding Support:** BYU

**International Collaboration:** No

**International Travel:** No

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**Carolina Gomez-Navarro**

**Email:** cgomeznavarro@gmail.com

**Most Senior Project Role:** Graduate Student (research assistant)

**Nearest Person Month Worked:** 6

**Contribution to the Project:** UU graduate student sponsored by iUTAH

**Funding Support:** UU

**International Collaboration:** No

**International Travel:** No

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**Tim Goodsell****Email:** timothy.goodsell@gmail.com**Most Senior Project Role:** Graduate Student (research assistant)**Nearest Person Month Worked:** 12**Contribution to the Project:** BYU graduate student sponsored by iUTAH supervised by Greg Carling**Funding Support:** BYU**International Collaboration:** No**International Travel:** No

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**Erin Jones****Email:** erinfjones3@gmail.com**Most Senior Project Role:** Graduate Student (research assistant)**Nearest Person Month Worked:** 6**Contribution to the Project:** BYU graduate student sponsored by iUTAH**Funding Support:** BYU**International Collaboration:** No**International Travel:** No

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**Julia Kelso****Email:** julia.kelso@gmail.com**Most Senior Project Role:** Graduate Student (research assistant)**Nearest Person Month Worked:** 6**Contribution to the Project:** USU graduate student sponsored by iUTAH**Funding Support:** USU**International Collaboration:** No**International Travel:** No

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**Karthik Kumarasamy****Email:** karthik.k@aggiemail.usu.edu**Most Senior Project Role:** Graduate Student (research assistant)**Nearest Person Month Worked:** 6**Contribution to the Project:** USU graduate student sponsored by iUTAH**Funding Support:** USU**International Collaboration:** No**International Travel:** No

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**Zacharia Levine****Email:** z.levine@utah.edu**Most Senior Project Role:** Graduate Student (research assistant)**Nearest Person Month Worked:** 6**Contribution to the Project:** UU graduate student sponsored by iUTAH**Funding Support:** UU**International Collaboration:** No**International Travel:** No

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**Enjie li****Email:** enjie.li@aggiemail.usu.edu**Most Senior Project Role:** Graduate Student (research assistant)**Nearest Person Month Worked:** 6**Contribution to the Project:** USU graduate student sponsored by iUTAH**Funding Support:** USU**International Collaboration:** No**International Travel:** No

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**Mallory Mallory****Email:** mallory.dolan@usu.edu**Most Senior Project Role:** Graduate Student (research assistant)**Nearest Person Month Worked:** 1**Contribution to the Project:** USU graduate student sponsored by iUTAH**Funding Support:** USU**International Collaboration:** No**International Travel:** No

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**Jon Meyer****Email:** jonathan.meyer@aggiemail.usu.edu**Most Senior Project Role:** Graduate Student (research assistant)**Nearest Person Month Worked:** 6**Contribution to the Project:** USU graduate student sponsored by iUTAH**Funding Support:** USU**International Collaboration:** No**International Travel:** No

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**Augustina Odame****Email:** yaa\_oye@yahoo.com**Most Senior Project Role:** Graduate Student (research assistant)**Nearest Person Month Worked:** 6**Contribution to the Project:** USU graduate student sponsored by iUTAH**Funding Support:** USU**International Collaboration:** No**International Travel:** No

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**Omar Perez-Reyes****Email:** macrobrachium@gmail.com**Most Senior Project Role:** Graduate Student (research assistant)**Nearest Person Month Worked:** 6**Contribution to the Project:** USU graduate student sponsored by iUTAH**Funding Support:** USU**International Collaboration:** No**International Travel:** No

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**Jake Richardson****Email:** jrjch1724@gmail.com**Most Senior Project Role:** Graduate Student (research assistant)**Nearest Person Month Worked:** 1**Contribution to the Project:** USU Water Lab graduate student sponsored by iUTAH**Funding Support:** USU**International Collaboration:** No**International Travel:** No

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**Kimi Smith****Email:** kimi.smith@utah.edu**Most Senior Project Role:** Graduate Student (research assistant)**Nearest Person Month Worked:** 6**Contribution to the Project:** Graduate students in UU working on RFA1 in Regional Modeling**Funding Support:** UU**International Collaboration:** No**International Travel:** No

**Philip Stoker****Email:** philip.a.stoker@gmail.com**Most Senior Project Role:** Graduate Student (research assistant)**Nearest Person Month Worked:** 6**Contribution to the Project:** UU graduate student sponsored by iUTAH**Funding Support:** UU**International Collaboration:** No**International Travel:** No

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**Carolyn Stwertka****Email:** carolyn.stwertka@gmail.com**Most Senior Project Role:** Graduate Student (research assistant)**Nearest Person Month Worked:** 1**Contribution to the Project:** UU graduate student sponsored by iUTAH**Funding Support:** UU**International Collaboration:** No**International Travel:** No

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**Thomas Walsh****Email:** u0655790@utah.edu**Most Senior Project Role:** Graduate Student (research assistant)**Nearest Person Month Worked:** 1**Contribution to the Project:** UU graduate student sponsored by iUTAH**Funding Support:** UU**International Collaboration:** No**International Travel:** No

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**Sean Bedingfield****Email:** sean.bedingfield@gmail.com**Most Senior Project Role:** Undergraduate Student**Nearest Person Month Worked:** 3**Contribution to the Project:** USU Undergraduate student sponsored by iUTAH**Funding Support:** USU**International Collaboration:** No**International Travel:** No

**Luke Bell****Email:** ldbell16@gmail.com**Most Senior Project Role:** Undergraduate Student**Nearest Person Month Worked:** 3**Contribution to the Project:** Undergrad/ iFellow**Funding Support:** BYU**International Collaboration:** No**International Travel:** No**Zackary Bjerregaard****Email:** zackarybjerregaard@mail.weber.edu**Most Senior Project Role:** Undergraduate Student**Nearest Person Month Worked:** 3**Contribution to the Project:** Weber St. undergraduate student sponsored by iUTAH**Funding Support:** Weber St.**International Collaboration:** No**International Travel:** No**Hayden Campbell****Email:** alexandria.hayden.campbell@aggiemail.usu.edu**Most Senior Project Role:** Undergraduate Student**Nearest Person Month Worked:** 3**Contribution to the Project:** USU graduate student sponsored by iUTAH**Funding Support:** USU**International Collaboration:** No**International Travel:** No**Juan Caraballo****Email:** juan.caraballo17@gmail.com**Most Senior Project Role:** Undergraduate Student**Nearest Person Month Worked:** 3**Contribution to the Project:** USU Water Lab undergraduate student sponsored by iUTAH**Funding Support:** USU**International Collaboration:** No**International Travel:** No**Brant Cook**

**Email:** raizinbrant@gmail.com  
**Most Senior Project Role:** Undergraduate Student  
**Nearest Person Month Worked:** 3

**Contribution to the Project:** USU Undergraduate student sponsored by iUTAH

**Funding Support:** USU

**International Collaboration:** No  
**International Travel:** No

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**Jeff Frandsen**

**Email:** frandsen.jeff@gmail.com  
**Most Senior Project Role:** Undergraduate Student  
**Nearest Person Month Worked:** 3

**Contribution to the Project:** USU undergraduate student

**Funding Support:** USU

**International Collaboration:** No  
**International Travel:** No

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**Andrew Hagedorn**

**Email:** awh0128@westminstercollege.edu  
**Most Senior Project Role:** Undergraduate Student  
**Nearest Person Month Worked:** 3

**Contribution to the Project:** iFellow at Westminster

**Funding Support:** Westminster

**International Collaboration:** No  
**International Travel:** No

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**Jem Locquiao**

**Email:** jem.locquiao@utah.edu  
**Most Senior Project Role:** Undergraduate Student  
**Nearest Person Month Worked:** 3

**Contribution to the Project:** UU undergraduate student sponsored by iUTAH

**Funding Support:** UU

**International Collaboration:** No  
**International Travel:** No

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**Mario Matos**

**Email:** mario.matos@usu.edu  
**Most Senior Project Role:** Undergraduate Student  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Undergrad student at USU Water Lab participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No  
**International Travel:** No

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**Jacob Meline**  
**Email:** jacob.meline@gmail.com  
**Most Senior Project Role:** Undergraduate Student  
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Undergrad student at USU Water Lab participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No  
**International Travel:** No

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**Stephanie Mitts**  
**Email:** stephmitts93@hotmail.com  
**Most Senior Project Role:** Undergraduate Student  
**Nearest Person Month Worked:** 3

**Contribution to the Project:** Weber St. undergraduate student sponsored by iUTAH

**Funding Support:** Weber st.

**International Collaboration:** No  
**International Travel:** No

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**Kari Norman**  
**Email:** kari@normanfamily.org  
**Most Senior Project Role:** Undergraduate Student  
**Nearest Person Month Worked:** 3

**Contribution to the Project:** USU undergraduate student sponsored by iUTAH

**Funding Support:** USU

**International Collaboration:** No  
**International Travel:** No

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**Brianne Palmer**

**Email:** brianne.palmer@aggiemail.usu.edu  
**Most Senior Project Role:** Undergraduate Student  
**Nearest Person Month Worked:** 3

**Contribution to the Project:** USU undergraduate student sponsored by iUTAH

**Funding Support:** USU

**International Collaboration:** No  
**International Travel:** No

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**James Patton**

**Email:** j.patton@aggiemail.usu.edu  
**Most Senior Project Role:** Undergraduate Student  
**Nearest Person Month Worked:** 4

**Contribution to the Project:** USU undergraduate student sponsored by iUTAH

**Funding Support:** USU

**International Collaboration:** No  
**International Travel:** No

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**Dusty Pilkington**

**Email:** dustypilkington@mail.weber.edu  
**Most Senior Project Role:** Undergraduate Student  
**Nearest Person Month Worked:** 3

**Contribution to the Project:** Weber St. undergraduate student sponsored by iUTAH

**Funding Support:** Weber St.

**International Collaboration:** No  
**International Travel:** No

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**Maurier Ramirez**

**Email:** mauriel.ramirez@gmail.com  
**Most Senior Project Role:** Undergraduate Student  
**Nearest Person Month Worked:** 3

**Contribution to the Project:** Undergrad student at USU Water Lab participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No  
**International Travel:** No

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**Natalie Thatcher**

**Email:** natalie.thatcher@usu.edu

**Most Senior Project Role:** Undergraduate Student

**Nearest Person Month Worked:** 4

**Contribution to the Project:** Communication - USU undergraduate student sponsored by iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

**Staton Wheeler**

**Email:** slatonwheeler@yahoo.com

**Most Senior Project Role:** Undergraduate Student

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Technician at USU Water Lab participating in research at iUTAH

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

**Jacqueline Ewing-Taylor**

**Email:** jacque@unr.edu

**Most Senior Project Role:** Consultant

**Nearest Person Month Worked:** 2

**Contribution to the Project:** U Nevada Reno

**Funding Support:** U Nevada Reno

**International Collaboration:** No

**International Travel:** No

#### What other organizations have been involved as partners?

Name	Type of Partner Organization	Location
Brigham Young University	Academic Institution	Provo, Utah
Campbell Scientific, Inc.	Industrial or Commercial Firms	Logan, Utah
Judge Memorial High school (Judge)	Academic Institution	Salt Lake City, Utah
Logan City	State or Local Government	Logan, Utah
Logan Northwest Field Irrigation Company	Industrial or Commercial Firms	Logan, Utah

Logan, Hyde Park and Smithfield Canal Company	Industrial or Commercial Firms	Logan, Utah
Montana State University Billings	Academic Institution	Billings, Montana
Natural History Museum of Utah	Other Nonprofits	Salt Lake City, Utah
Northern Arizona University (NAU)	Academic Institution	Northern Arizona
Providence Blacksmith Fork Irrigation Co.	Industrial or Commercial Firms	Providence, Utah
Purdue University	Academic Institution	Indiana
Renaissance Computing Institute (RENCI)	Academic Institution	North Carolina
Christina River Critical Zone Observatory	Other Nonprofits	Delaware, Pennsylvania and Maryland
STEM Evaluation Associates	Other Nonprofits	Western US
Salt Lake City	State or Local Government	Salt Lake City, Utah
Salt Lake Community College	Academic Institution	Salt Lake City, Utah
Salt Lake County	State or Local Government	Salt Lake City, Utah
Salt Lake Department of Public Utilities	State or Local Government	Salt Lake City, Utah
Southern Utah University	Academic Institution	Cedar city, Utah
Stroud Water Research Center	Other Nonprofits	Avondale, PA
The Leonardo	Other Nonprofits	Salt Lake City, Utah
Triangle Coalition for STEM Education (Triangle)	Other Nonprofits	Washington D.C.
Tufts University	Academic Institution	Massachusetts
Consortium of Universities for the Advancement of Hydrologic	Academic Institution	National
US Forest Service Rocky Mountain Research Station (RMRS)	Other Organizations (foreign or domestic)	Logan, Utah
United States Bureau of Reclamation (BLM)	Other Organizations (foreign or domestic)	Salt Lake City, Utah

United States Geological Survey	Other Organizations (foreign or domestic)	Salt Lake City, Utah
University of Alaska Anchorage	Academic Institution	Anchorage, Alaska
University of Hawaii	Academic Institution	Hawaii
University of Idaho	Academic Institution	Moscow, Idaho
University of Illinois at Urbana-Champaign (UIUC)	Academic Institution	Illinois
University of Life Sciences & Natural Resources (BOKU)	Academic Institution	Vienna, Austria
University of New Hampshire	Academic Institution	New Hampshire
University of New Mexico	Academic Institution	Las Cruces, New Mexico
Dixie State University (DSU)	Academic Institution	Southern Utah
University of North Carolina Chapel Hill	Academic Institution	North Carolina
University of South Carolina	Academic Institution	South Carolina
University of Texas at Austin	Academic Institution	Texas
University of Toledo	Academic Institution	Toledo, Ohio
University of Utah	Academic Institution	Salt Lake City, Utah
University of Wyoming	Academic Institution	Wyoming
Utah Automated Geographic Resource Center	State or Local Government	Salt Lake City, Utah
Utah Department of Agriculture (UDA)	State or Local Government	Salt Lake City, Utah
Utah Education Network	Academic Institution	Salt Lake City, Utah
Utah State University - Eastern	Academic Institution	Eastern Utah
Envision Utah	Other Nonprofits	Utah
Utah State University - Eastern	Academic Institution	Logan, Utah

Utah Stormwater Advisory Committee (USWAC)	State or Local Government	Utah
Utah Valley University	Academic Institution	Orem, Utah
Utah Water Research Laboratory (UWRL)	Academic Institution	Logan, Utah
Washington State University (WaSU)	Academic Institution	Washington state
Western Water Assessment (WWA)	Other Nonprofits	Colorado, Western US
Westminster College	Academic Institution	Salt Lake City, Utah
Explore Utah Science (Explore)	Other Nonprofits	Utah
Four Corners School	Academic Institution	Monticello, Utah
HydroShare	Academic Institution	National
JUB Engineering	Industrial or Commercial Firms	Utah

#### Full details of organizations that have been involved as partners:

##### Brigham Young University

**Organization Type:** Academic Institution

**Organization Location:** Provo, Utah

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:**

##### Campbell Scientific, Inc.

**Organization Type:** Industrial or Commercial Firms

**Organization Location:** Logan, Utah

**Partner's Contribution to the Project:**

Collaborative Research

Personnel Exchanges

**More Detail on Partner and Contribution:** Campbell Sci. as been the host of iUTAH students in internships.

<http://www.campbellsci.com>

##### Christina River Critical Zone Observatory

**Organization Type:** Other Nonprofits

**Organization Location:** Delaware, Pennsylvania and Maryland

**Partner's Contribution to the Project:**

Collaborative Research  
Personnel Exchanges

**More Detail on Partner and Contribution:** Whole watershed integration. We integrate knowledge of water, mineral and carbon cycles to quantify human impact on Critical Zone Carbon sequestration - from soils to sea.

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**Consortium of Universities for the Advancement of Hydrologic**

**Organization Type:** Academic Institution

**Organization Location:** National

**Partner's Contribution to the Project:**

Facilities  
Collaborative Research  
Personnel Exchanges

**More Detail on Partner and Contribution:**

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**Dixie State University (DSU)**

**Organization Type:** Academic Institution

**Organization Location:** Southern Utah

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** Dixie State is a four-year regional university in southern Utah that primarily serves Utah state residents, southern Nevada, and southern California. It is an open-enrollment school and has a large population of non-traditional students. As of spring 2013: We offer 67 degree programs, emphasis areas and certificates. 87% of students are on financial aid. 215 full-time faculty (23:1 student to faculty ratio). <http://new.dixie.edu/>

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**Envision Utah**

**Organization Type:** Other Nonprofits

**Organization Location:** Utah

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** Exchange ideas, projects

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**Explore Utah Science (Explore)**

**Organization Type:** Other Nonprofits

**Organization Location:** Utah

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** Original reporting and multimedia broadcasting of Utah-centric science news and information. <http://www.exploreutahscience.org>

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**Four Corners School**

**Organization Type:** Academic Institution

**Organization Location:** Monticello, Utah

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** Four Corners School of Outdoor Education is a nonprofit organization founded in 1984. Based in Monticello, Utah, Four Corners School provides place-based outdoor education on and about the Colorado Plateau (Northern Arizona, Southwestern Colorado, Northwestern New Mexico, Southern Utah). The mission of Four Corners School of Outdoor Education is to create lifelong learning experiences about the Colorado Plateau bioregion for people of all ages and backgrounds through education, service, adventure, and conservation programs. The vision of Four Corners School of Outdoor Education is to build a diverse community of people who are committed to conserving the natural and cultural treasures of the Colorado Plateau.

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**HydroShare**

**Organization Type:** Academic Institution

**Organization Location:** National

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** HydroShare is a collaborative website being developed by a collaborative team for better access to data and models in the hydrologic sciences. HydroShare is aimed at providing the sustainable technology infrastructure needed to address critical issues related to water quantity, quality, accessibility, and management. <http://www.cuahsi.org/HydroShare.aspx>

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**JUB Engineering**

**Organization Type:** Industrial or Commercial Firms

**Organization Location:** Utah

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** Non-participating Institution

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**Judge Memorial High school (Judge)**

**Organization Type:** Academic Institution

**Organization Location:** Salt Lake City, Utah

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** Judge Memorial is a diverse, co-educational, college preparatory school centrally located in Salt Lake City, Utah <http://www.judgememorial.com/>

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### Logan City

**Organization Type:** State or Local Government

**Organization Location:** Logan, Utah

**Partner's Contribution to the Project:**

Facilities

Collaborative Research

**More Detail on Partner and Contribution:** Public work at Logan city, UT.

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### Logan Northwest Field Irrigation Company

**Organization Type:** Industrial or Commercial Firms

**Organization Location:** Logan, Utah

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** Water users

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### Logan, Hyde Park and Smithfield Canal Company

**Organization Type:** Industrial or Commercial Firms

**Organization Location:** Logan, Utah

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** Canal company in Cache Valley

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### Montana State University Billings

**Organization Type:** Academic Institution

**Organization Location:** Billings, Montana

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** DRUPAL collaboration

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**Natural History Museum of Utah****Organization Type:** Other Nonprofits**Organization Location:** Salt Lake City, Utah**Partner's Contribution to the Project:**

Facilities

Collaborative Research

**More Detail on Partner and Contribution:**

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**Northern Arizona University (NAU)****Organization Type:** Academic Institution**Organization Location:** Northern Arizona**Partner's Contribution to the Project:**

Collaborative Research

Personnel Exchanges

**More Detail on Partner and Contribution:** Northern Arizona University's main campus is located in Flagstaff, AZ. There are 34 additional campuses, many which are located in underrepresented communities. <http://nau.edu>

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**Providence Blacksmith Fork Irrigation Co.****Organization Type:** Industrial or Commercial Firms**Organization Location:** Providence, Utah**Partner's Contribution to the Project:**

Collaborative Research

Personnel Exchanges

**More Detail on Partner and Contribution:** Water users

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**Purdue University****Organization Type:** Academic Institution**Organization Location:** Indiana**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** <http://www.purdue.edu/>

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**Renaissance Computing Institute (RENCI)****Organization Type:** Academic Institution**Organization Location:** North Carolina

**Partner's Contribution to the Project:**

In-Kind Support

**More Detail on Partner and Contribution:** RENCI (Renaissance Computing Institute) develops and deploys advanced technologies to enable research discoveries and practical innovations. RENCI partners with researchers, policy makers, and technology leaders to engage and solve the challenging problems that affect North Carolina, our nation and the world. An institute of the University of North Carolina at Chapel Hill, RENCI was launched in 2004 as a collaborative effort involving UNC Chapel Hill, Duke University and North Carolina State University. <http://www.renci.org/>

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**STEM Evaluation Associates**

**Organization Type:** Other Nonprofits

**Organization Location:** Western US

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** We provide external evaluations for STEM projects to universities and school districts across the west.

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**Salt Lake City**

**Organization Type:** State or Local Government

**Organization Location:** Salt Lake City, Utah

**Partner's Contribution to the Project:**

Facilities

Personnel Exchanges

**More Detail on Partner and Contribution:** Salt Lake City government

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**Salt Lake Community College**

**Organization Type:** Academic Institution

**Organization Location:** Salt Lake City, Utah

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:**

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**Salt Lake County**

**Organization Type:** State or Local Government

**Organization Location:** Salt Lake City, Utah

**Partner's Contribution to the Project:**

Collaborative Research

## Personnel Exchanges

**More Detail on Partner and Contribution:** Salt Lake County government

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### Salt Lake Department of Public Utilities

**Organization Type:** State or Local Government

**Organization Location:** Salt Lake City, Utah

**Partner's Contribution to the Project:**

Facilities

**More Detail on Partner and Contribution:** Salt Lake City Department of Public Utilities is committed to serving our customers and protecting our environment by delivering high-quality drinking water, managing flood control and storm water, and collecting and treating wastewater to standards that exceed EPA regulations. We actively protect our source waters and promote its efficient use. Established in 1876, the Utility is the oldest retail water provider in the West, and as a municipal agency is funded by water sales and new connection fees, not taxes. <http://www.slcgov.com/utilities>

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### Southern Utah University

**Organization Type:** Academic Institution

**Organization Location:** Cedar city, Utah

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:**

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### Stroud Water Research Center

**Organization Type:** Other Nonprofits

**Organization Location:** Avondale, PA

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** <http://www.stroudcenter.org>

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### The Leonardo

**Organization Type:** Other Nonprofits

**Organization Location:** Salt Lake City, Utah

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** Museum. educational purposes

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**Triangle Coalition for STEM Education (Triangle)****Organization Type:** Other Nonprofits**Organization Location:** Washington D.C.**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** Agency responsible for administering the Albert Einstein Distinguished Educator Fellowship Program.

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**Tufts University****Organization Type:** Academic Institution**Organization Location:** Massachusetts**Partner's Contribution to the Project:**

Collaborative Research

Personnel Exchanges

**More Detail on Partner and Contribution:** <http://www.tufts.edu/>

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**US Forest Service Rocky Mountain Research Station (RMRS)****Organization Type:** Other Organizations (foreign or domestic)**Organization Location:** Logan, Utah**Partner's Contribution to the Project:**

Collaborative Research

Personnel Exchanges

**More Detail on Partner and Contribution:** Research unit of the US Forest Service

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**United States Bureau of Reclamation (BLM)****Organization Type:** Other Organizations (foreign or domestic)**Organization Location:** Salt Lake City, Utah**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** The BLM is a United States Department of the Interior.

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**United States Geological Survey****Organization Type:** Other Organizations (foreign or domestic)**Organization Location:** Salt Lake City, Utah

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:**

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**University of Alaska Anchorage**

**Organization Type:** Academic Institution

**Organization Location:** Anchorage, Alaska

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** This is part of DRUPAL collaboration

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**University of Hawaii**

**Organization Type:** Academic Institution

**Organization Location:** Hawaii

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** This is part of DRUPAL collaboration

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**University of Idaho**

**Organization Type:** Academic Institution

**Organization Location:** Moscow, Idaho

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:**

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**University of Illinois at Urbana-Champaign (UIUC)**

**Organization Type:** Academic Institution

**Organization Location:** Illinois

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** Collaborative research

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**University of Life Sciences & Natural Resources (BOKU)**

**Organization Type:** Academic Institution

**Organization Location:** Vienna, Austria

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** The Institute of Landscape Development, Recreation and Conservation Planning (ILEN) at BOKU conducts research for sustainable landscape development with expertise across many disciplines.

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### **University of New Hampshire**

**Organization Type:** Academic Institution

**Organization Location:** New Hampshire

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** This is part of DRUPAL collaboration

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### **University of New Mexico**

**Organization Type:** Academic Institution

**Organization Location:** Las Cruces, New Mexico

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** Part of DRUPAL collaboration

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### **University of North Carolina Chapel Hill**

**Organization Type:** Academic Institution

**Organization Location:** North Carolina

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** RENCI (Renaissance Computing Institute) develops and deploys advanced technologies to enable research discoveries and practical innovations. RENCI partners with researchers, policy makers, and technology leaders to engage and solve the challenging problems that affect North Carolina, our nation and the world. An institute of the University of North Carolina at Chapel Hill, RENCI was launched in 2004 as a collaborative effort involving UNC Chapel Hill, Duke University and North Carolina State University. <http://unc.edu/>

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### **University of South Carolina**

**Organization Type:** Academic Institution

**Organization Location:** South Carolina

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** <http://www.sc.edu/>

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**University of Texas at Austin****Organization Type:** Academic Institution**Organization Location:** Texas**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** <https://www.utexas.edu/>

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**University of Toledo****Organization Type:** Academic Institution**Organization Location:** Toledo, Ohio**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:**

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**University of Utah****Organization Type:** Academic Institution**Organization Location:** Salt Lake City, Utah**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** University of Utah - Salt Lake City Campus

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**University of Wyoming****Organization Type:** Academic Institution**Organization Location:** Wyoming**Partner's Contribution to the Project:**

Collaborative Research

Personnel Exchanges

**More Detail on Partner and Contribution:** EPSCoR collaboration

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**Utah Automated Geographic Resource Center**

**Organization Type:** State or Local Government

**Organization Location:** Salt Lake City, Utah

**Partner's Contribution to the Project:**

Facilities

Collaborative Research

Personnel Exchanges

**More Detail on Partner and Contribution:** The Utah AGRC maintains a central clearinghouse for spatial data and digital mapping services in the state of Utah.

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### Utah Department of Agriculture (UDA)

**Organization Type:** State or Local Government

**Organization Location:** Salt Lake City, Utah

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:**

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### Utah Education Network

**Organization Type:** Academic Institution

**Organization Location:** Salt Lake City, Utah

**Partner's Contribution to the Project:**

Collaborative Research

Personnel Exchanges

**More Detail on Partner and Contribution:** DRUPAL collaboration & web support

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### Utah State University - Eastern

**Organization Type:** Academic Institution

**Organization Location:** Eastern Utah

**Partner's Contribution to the Project:**

Collaborative Research

**More Detail on Partner and Contribution:** Utah State University is an academic research institution serving the needs of students throughout Utah.

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### Utah State University - Eastern

**Organization Type:** Academic Institution

**Organization Location:** Logan, Utah

**Partner's Contribution to the Project:**

Financial support  
Facilities  
Collaborative Research  
Personnel Exchanges

**More Detail on Partner and Contribution:** Utah State - Logan campus.

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### **Utah Stormwater Advisory Committee (USWAC)**

**Organization Type:** State or Local Government  
**Organization Location:** Utah

**Partner's Contribution to the Project:**  
Personnel Exchanges

**More Detail on Partner and Contribution:** The Utah Storm Water Advisory Committee (USWAC) will coordinate efforts to reduce storm water pollution and provide adequate flood control. The committee will jointly review governing regulations, disseminate information to enhance compliance with those regulated, promote effective storm water management training, and assist local municipalities and other interested parties to implement best management practices, consistent with their individual needs and resources. This committee will also review any proposed storm water regulations to assess potential impacts on the regulated community. <http://www.uswac.utah.gov>

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### **Utah Valley University**

**Organization Type:** Academic Institution  
**Organization Location:** Orem, Utah

**Partner's Contribution to the Project:**  
Collaborative Research

**More Detail on Partner and Contribution:**

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### **Utah Water Research Laboratory (UWRL)**

**Organization Type:** Academic Institution  
**Organization Location:** Logan, Utah

**Partner's Contribution to the Project:**  
Collaborative Research

**More Detail on Partner and Contribution:** The Utah Water Research Laboratory (UWRL) is part of Utah State University. The Utah Water Research Laboratory (UWRL) is a stand-alone facility located at Utah State University (USU) on the Logan River, Logan, Utah. The UWRL operates within an academic environment and collaborates with government and private sectors to address technical and societal aspects of water-related issues, including quality, quantity, distribution, and conjunctive use. This is accomplished through providing more than 100,000 square feet of state-of-the-art laboratory, computer, and office space. <http://uwrl.usu.edu>

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### **Washington State University (WaSU)**

**Organization Type:** Academic Institution  
**Organization Location:** Washington state

**Partner's Contribution to the Project:**  
Collaborative Research

**More Detail on Partner and Contribution:** The School of Communications at Washington State University has expertise in risk and environmental communication.

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### **Western Water Assessment (WWA)**

**Organization Type:** Other Nonprofits  
**Organization Location:** Colorado, Western US

**Partner's Contribution to the Project:**  
Personnel Exchanges

**More Detail on Partner and Contribution:** On of the NOAA funded Regionally Integrated Sciences and Assessments <http://wwa.colorado.edu/>

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### **Westminster College**

**Organization Type:** Academic Institution  
**Organization Location:** Salt Lake City, Utah

**Partner's Contribution to the Project:**  
Collaborative Research

**More Detail on Partner and Contribution:**

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**Have other collaborators or contacts been involved? No**

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## **Impacts**

### **What is the impact on the development of the principal discipline(s) of the project?**

During the second year of this project, the research teams have made progress on different fronts. First, they have started to gather data and make it available to multiple users via web streaming channels. Second, research outcomes such as detecting an increase in coliforms and nutrients along all three mountain-to-urban transitions, and atmospheric deposition in urban areas provided a research breakthrough of interest to Utah. The first provide insights about the water contamination of surface water, providing data about safer water to the population. The other uncovers the air pollution and inversion related problems that affect most of the Utah's population that inhabits the intermountain valleys. We also have made data available to engaged scientists, citizens, and students for the purposes of ecosystem modeling and public involvement. Through these initial models we have a better understanding of water interactions and biochemical transformations along the landscape of this intermountain landscape. The most significant contribution of iUTAH has been in enhancing the human capacity to engage in interdisciplinary research. iUTAH has continued to develop research groups that span across multiple campuses and disciplines. These are close-working teams capable of working within and across disciplines to identify knowledge gaps

and gather needed data about our study areas in a collaborative way. The productivity of these teams is strong as evidenced by the growing number of jointly authored conference presentations, research proposals, and publications.

Developing new software tools for managing streaming sensor data is also having an impact on the main discipline of this project. Developing our public repositories within a social programming website like GitHub ensures that our developments are discoverable and accessible to others who may be interested in using our code or techniques.

### **What is the impact on other disciplines?**

The broader impacts of this project on other disciplines span aquatic ecology, atmospheric science, biogeochemistry, urban ecology, and urban planning. We have built close-working relationships with colleagues within and outside of iUTAH who represent other disciplines and have participated in cross-disciplinary collaborative meetings to plan the full research infrastructure for iUTAH. We also have presented our social and engineering science work to natural science audiences. Thus we have established an ongoing and productive dialogue across disciplines in iUTAH. We anticipate this will bear much fruit in the coming years as we synthesize our disciplinary research to understand complex coupled human-natural dynamics. We have maintained and expanded our partnerships with local water system managers in each GAMUT watershed to coordinate social and engineering data collection plans and to get their input into social science survey content.

### **What is the impact on the development of human resources?**

For this reporting year, iUTAH has had a direct impact on the development of human resources at the undergraduate student, graduate student, postdoc and technician levels.

In RFA 1, we trained 11 graduate students (6 female, 5 male) across 3 campuses (note 3 of these students are not paid by iUTAH but are leveraging other resources) (Table 2). We engaged 4 undergraduates as iFellows (50% female), and retained 2 of these as hourly employees for part of the school year. A postdoctoral fellow was incorporated into the team.

In RFA 2, we trained 6 graduate students (3 female, 3 male) and 2 undergraduate students (2 male). We also recruited and trained 1 female technician. We conducted a national search that resulted in the hiring of a new faculty member in sociology (iUTAH-sponsored hire; Utah State) and a postdoctoral fellow in social/engineering sciences both of whom began in August 2013.

In RFA 3, we trained four graduate students (2 female, 2 male, one Hispanic). A female postdoctoral fellow was hired and she began in August 2013.

The cyberinfrastructure component of this project has trained 2 undergraduate students (2 male) and recruited and trained one technician (male). We have trained several undergraduate students as programmers and software developers. The cyberinfrastructure group has contributed to the professional training of 2 females and 1 male. We conducted a national search and we hired a new assistant professor in Hydro-informatics. We offered a multi-campus Hydroinformatics course, in which there was participation by 33 across 3 universities.

Involving citizen scientists in the use of monitoring devices to collect data for the academic researchers has also had an impact on human resource development in the communities of Utah.

A table showing the 178 iUTAH EPSCoR participants are provided in Participants/Organizations section.

### **What is the impact on physical resources that form infrastructure?**

The physical research infrastructure of iUTAH during year 2 has been almost 100% operational, and constitutes the first climate-hydrologic observatory across mountain-to-urban gradients in three watersheds. It is a network of climate and aquatic monitoring stations referred to as GAMUT (Gradients Along Mountain to Urban Transitions). Data is being downloaded and available to the public: managers, water users and researchers through user-friendly web interfaces.

A virtual server and storage infrastructure has also been designed and deployed with the USU enterprise data center to host the iUTAH Modeling and Data Federation (MDF) which is in operation this year at a capacity of pentabyte of storage, located at the University of Utah. All other components of iUTAH have provided contribution of data to the iUTAH Modeling and Data Federation. Data inventories are available at <http://data.iutahepscor.org>.

To complement the GAMUT network and provide stronger coupling among RFA1, RFA2, and RFA3, we are finalizing a plan to purchase and install multiple storm drain monitoring equipment so that we can monitor water runoff from different urban drainages (representing contrasting urban forms) in the urbanized Red Butte Creek watershed, and plan to install parallel instrumentation in Heber Valley (Provo River GAMUT) and Logan City (Logan River GAMUT).

### **What is the impact on institutional resources that form infrastructure?**

iUTAH strengthens and improves the institutional resources of all participating institutions. As a result, 27 journal articles have been published, 51 presentations have been made, and most importantly, 56 proposals were submitted. Five websites were developed; 9 databases were developed and went live for the public to use. We built ties with 58 collaborating institutions.

We have created opportunities for and supported new relationships and collaborations across disciplines and nation-wide institutions. These have led to joint publications and grant proposal submissions.

We have generated new datasets that characterize social and engineered aspects of the water systems in the WRMA. We are embarking on significant social science data collection this summer, and resulting datasets will provide a rich resource for integrated analyses by multiple investigators in the coming year.

The GAMUT and GIRF facilities will provide important place-based infrastructure for research and education for the foreseeable future.

### **What is the impact on information resources that form infrastructure?**

The Cyberinfrastructure component of the iUTAH project has begun developing the hardware and software systems that will not only support management of the data collected under the iUTAH project, but will also facilitate a greater degree of collaboration among iUTAH students and scientists. One major impact of the iUTAH Cyberinfrastructure is the recognition among iUTAH researchers that it is no longer sufficient to work and collect data independently within disciplines or subgroups. The iUTAH Cyberinfrastructure is seen as an integral component of the overall project and necessary to promote data and model sharing and collaboration among the iUTAH research teams.

The server hardware that we have deployed provides us with a flexible platform to implement the systems needed by iUTAH researchers. For example, we have deployed an interim data sharing web application at <http://cloudshare.iutahepscor.org> and are now supporting a website at <http://data.iutahepscor.org>, where we are hosting online data and model inventories to assist iUTAH researchers in cataloging and prioritizing existing datasets and models. We are now working on deploying the databases, web services, and software required to manage the continuous, streaming datasets from the GAMUT network. The major impact of this infrastructure will be to enable management of the data across the participating institutions and broad access to these data across iUTAH project participants and partners.

Another major impact is in training the next generation of engineers and scientists. The iUTAH Cyberinfrastructure Team has collaborated with the Utah EPSCoR CI-WATER project in the development and delivery of a graduate level course in Hydroinformatics across the three major Utah research universities. In this course we trained 33 engineering students in data management, modeling, and Hydroinformatics concepts to better prepare them to work in a data and computationally intense work and research environment. The Cyberinfrastructure team has also integrally involved three computer science undergraduate students in development of the iUTAH data management-related software.

In less than one year, we have developed 5 websites and 2 web applications that can be used as repositories and sources of

information for all iUTAH participants and the public. These sites are:

1. <http://iutahepscor.org>, our main public and researcher website was developed and deployed.
2. <http://report.utepscor.org>, our Drupal site where all reporting information is uploaded and displayed was designed in concert with our other Drupal Collaborators and functioned as our primary source of information for this report
3. <http://data.iutahepscor.org>, a site for online model and data inventories were developed and deployed
4. <http://cloudshare.iutahepscor.org>, a site for interim collaborative data and file sharing
5. <https://usu.instructure.com/courses/127332>, a site for materials from the Hydroinformatics course
6. New Google Map application presenting site locations from each GAMUT watershed with links to data at each site operational - <http://data.iutahepscor.org/odmmmap/>
7. Time series visualization tool for the GAMUT data that is linked to the Google Map application operational - <http://data.iutahepscor.org/odmtsa/>

This information is now available to other researchers and the public.

### **What is the impact on technology transfer?**

During the course of this award, four software packages have been made available to the public as a part of the technology transfer objectives of this year's activities.

1. A release of a web-based graphical user interface has been developed for the iUTAH GAMUT (Gradients Along Mountain to Urban Transitions) sensor data management database.
2. A release of a software program for managing and performing quality control of streaming sensor data was developed and released.
3. Existing tools from the CUAHSI HIS (The Consortium of Universities for the Advancement of Hydrologic Science, Inc-Hydrological Information System) have been deployed in anticipation of managing the streaming sensor data from GAMUT.
4. An extension to the existing CUAHSI HIS Observations Data Model (ODM) has been developed to assist RFA1 researchers in managing the sensor and data collection infrastructure across the GAMUT site.
5. Created new Google Map application presenting site locations from each GAMUT watershed with links to data at each site operational - <http://data.iutahepscor.org/odmmmap/>
6. Created simple time series visualization tool for the GAMUT data that is linked to the Google Map application operational - <http://data.iutahepscor.org/odmtsa/>

In addition, we also developed the following web applications:

Developed the first version of a data publication system for posting and curating research data products that facilitates metadata creation according to an accepted standard, supports a curation and moderation workflow, provides simple online visualizations for known data types, and provides a metadata catalog and faceted browsing and search.

Deployed an equipment management database and web application in support of the iUTAH GAMUT watershed technicians and recording information about sensor deployment and maintenance.

### **What is the impact on society beyond science and technology?**

This award has two broader impacts that reach beyond science and technology:

- The workforce development and enhancement of graduate and undergraduate training in Science, Technology, Engineering, and Mathematics (STEM)
- A growing collaboration with local water resource managers (cities, county, irrigation/canal companies).

Workforce development and the expansion of the STEM opportunities are critically important to sustain the growth of the state of Utah's high technology sector. Guiding principles for iUTAH's workforce development plan have included integrating research and education, providing near-peer mentoring, encouraging diversity, and creating public-private partnerships. Research and education activities are planned for: K-6 students, middle school and high school students and teachers, undergraduates at community colleges, Primarily Undergraduate Institutions (PUIs), and the major research universities (Fig 12), graduate students, postdoctoral fellows, and early career faculty and established faculty. These experiences are directly related to iUTAH's research questions, so the focus will be on the watershed observatories and modeling activities in the three RFAs.

Collaborations with local water resource managers and the public include outreach, communication, and dissemination activities to translate iUTAH efforts to diverse audiences in order to engage key stakeholders. We aim to engage stakeholders now as research is just beginning, to make sure that results and outputs from iUTAH are relevant to their needs while at the same time advancing basic research. These partnerships are bringing together researchers, educators, students, stakeholders, and policy makers to design and develop decision-making exercises. Mixed models of social and hard sciences are being used for both collaboration and evaluation as a novelty in the iUTAH process. Workforce Development and Diversity Enhancement goals are also incorporated into this work.

Relationships with state, municipal and local irrigation company partners have raised the profile of iUTAH research and should allow our work to directly influence water management decisions.

## Changes/Problems

### Changes in approach and reason for change

Year 2 of iUTAH saw a significant change in that both the PI (Todd Crowl) and Associate Director/State EPSCoR Director (Rita Teutonico) announced in February their intended move to Florida International University. Shortly after this announcement, co-PI Diane Pataki accepted a temporary rotator position with the NSF beginning in August. Following these announcements, iUTAH implemented a transition plan, placing co-PI Michelle Baker into the PI/PD role, and recruiting Court Strong to serve in Diane Pataki's place as co-PI and co-lead of RFA3. To relieve Michelle Baker of her role as co-lead of RFA1, we have asked Dave Bowling (University of Utah) to join Zach Aanderud (BYU) as co-lead. Zach Aanderud will also occupy the NSF cover sheet as a co-PI. Through these transitions we have not lost project momentum. Although Todd Crowl left USU officially on April 15, we are fortunate that Rita Teutonico will not leave until May 30, and will be retained 5-78 hours/week as a USU employee to see the successful implementation of the 2014 iFellow program, and our annual symposium in July. While no one can truly fill Rita's shoes, we are recruiting for a new Project Administrator (to be nationally advertised soon). The USU Office of Research and Graduate Studies is in negotiation with a likely new State Director.

On the research front we had hoped to secure additional funding through NEON or similar sources to build a mobile scintillometer to measure evapotranspiration in urban areas. Such funds were not available, yet through internal funds from the University of Utah in addition to the urban tower budgeted in the UU iUTAH sub award; we will purchase equipment to build a re-locatable scintillometer. This instrument will be built and tested in Salt Lake City first, and then moved to Logan and Heber in years 3-4 of the project. We are excited at this unparalleled opportunity to estimate evapotranspiration in urban areas. We have removed the plan for the "environmental situation room" – a decision theater-type facility that was in our original proposal. Our external advisors recommended eliminating this RFA3 facility as it was under-staffed and budgeted. As an alternative, we have sought feedback on an alternative strategy for data visualization and communication from all of

our external panels, advisors, and assessors. We are currently synthesizing these recommendations into a new plan that will be completed in the next project period.

### **Actual or Anticipated problems or delays and actions or plans to resolve them**

In RFA1, initial delays in permitting on Federal lands have been overcome and permits are now in place, as are most of the instruments. In year 2 we purchased equipment to add 3 additional stations on Red Butte and Logan GAMUTs. As these will be on private property, negotiations are underway for access to desired locations for instrumentation.

In RFA2, we have delayed the start date for initial construction of the GIRF facility until summer 2014 to allow more time for discussions among iUTAH team members and local stakeholders to reach consensus on an experimental research design. Our current expectation is to break ground and initiate construction in summer 2014.

In RFA3, since we removed the RFA3 facility from our plans, we need to work in a new plan for a replacement facility. We are developing a data visualization plan for next year.

### **Changes that have a significant impact on expenditures**

Nothing to report.

### **Significant changes in use or care of human subjects**

All iUTAH sanctioned and supported human subjects research has been reviewed and approved by appropriate institutional review boards. No changes have been required to protocols that were previously approved.

### **Significant changes in use or care of vertebrate animals**

Nothing to report.

### **Significant changes in use or care of biohazards**

Nothing to report.

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## **Special Requirements**

### **Responses to any special reporting requirements specified in the award terms and conditions, as well as any award specific reporting requirements.**

A reverse site visit was conducted in September of 2013. All recommendations made by NSF assessment panel of experts were made to correct the course of the iUTAH project. To summarize:

- iUTAH has invested a great deal of effort in debating and narrowing down specific research questions, data needs and analytical tools, as recommended by the RSV panel.
- Special attention has been given to the development of the conceptual model of coupled human-water system. Several events have been held to discuss the model and its main drivers across the social and science disciplines. We have a finished a well-debated model, and a publication manuscript is ready to be submitted.
- We have directed resources to support early career faculties, an essential component of infrastructure enhancement across the participating universities. Early career faculties now have a more prominent role at iUTAH decisions.
- We have continued and improved our capacity to facilitate cross-disciplinary and cross-campus collaborations and networking among social scientists, planners, and engineers.
- In this second year, we have developed and implemented better social science protocols to capture resident, water managers and water users perspectives on water issues across diverse neighborhoods in each of three-iUTAH watersheds. The RFA2 surveys started to conduct about 3000 households across the study region.

- We have enhanced the diversity of iUTAH team members and continued training iUTAH team members in the best practices for implementing culturally aware educational activities.
- We have better included groundwater and other subsurface flowpaths in research aimed at understanding linkages between terrestrial and aquatic systems through surface and groundwater flows. This is an important segment of the water cycle and relevant to the water sources for water consumption in the state of Utah.
- We have established an iUTAH Data Policy Committee and developed and documented a Data Policy for the iUTAH project. This is a set of requirements for contributing data and models, so we can regulate its access and display on the iUTAH web portals. We are doing the same for the water quality data collected by the RFA1.
- In the Cyberinfrastructure component, we have improved and refined the tools for displaying and retrieving geospatial datasets, online basemaps, and online mapping tools. Usability tests have been conducting to ensure a more friendly and readily use.

Another assessment session was conducted in February of 2014 by AAAS. Their recommendations were recieved on March 26, and currently are being discussed by the iUTAH teams so their recommendations can be incorporated into management directives of iUTAH. We will submit their report and our response with a revision to this annual report.

### Supporting Files

Filename	Description	Uploaded By	Uploaded On
RSVletter2013_UT.pdf	Cover letter from NSF's RSV report	Michelle Baker	04/30/2014
UT_1208732_RSVReport_final2013.pdf	RSV report	Michelle Baker	04/30/2014
iUTAH_RSV_secondresponse.pdf	iUTAH's response to RSV that was accepted by NSF	Michelle Baker	04/30/2014