Preview of Award 1208732 - Annual Project Report

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Accomplishments

* What are the major goals of the project?

The overarching goals of the Utah RII EPSCoR project were developed in light of 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 by conducting interdisciplinary research of the interactions among water, people, and ecosystems; and by developing 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) 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. Broad goals are presented below, and more specific goals, activities and timelines are provided in Table 1 in the supplemental documents.

1. Enhanced research capacity of the biophysical, social and engineered water environment. This will be accomplished by facilitating cross-campus and interdisciplinary research activities and by building and supporting state-of-the-art multi-user research facilities.

   Research Focus Area 1 (RFA1) – Biophysical System Goals: Improve Utah’s capacity to monitor and understand the ecologic/climatic/hydrologic (hereafter ecohydrologic) system of the Wasatch Range Metropolitan Area (WRMA). This will be achieved by improving watershed-scale measurement capacities via a networked environmental observatory, the Gradients along Mountain to Urban Transitions (GAMUT) Observatory. This instrumentation will support interdisciplinary teams and research projects aimed at gaining a better understanding of the biophysical processes that influence Utah’s water resources.

   Research Focus Area 2 (RFA2) – Social and Engineered System Goals: Improve the capacity of Utah’s science community to gather and analyze social and engineering system data on coupled water systems. This will be accomplished by interdisciplinary research projects aimed at understanding the interactions between urban form, environmental change, built water infrastructure, and decision-making in terms of water use. A Green Infrastructure Research Facility (GIRF) will serve as a hub of research, education, and outreach activities related to how the built environment influences water quantity and quality outcomes.

   Research Focus Area 3 (RFA3) – Coupled Human-Natural System Goals: Improve Utah’s capacity to describe the water system as a whole by defining and including the linkages between biophysical and social dynamics; and by modeling the impact of alternative infrastructure designs and policy options on water use behaviors, the water cycle, water quality, and interconnected social and environmental systems. These goals will be achieved by synthesizing results from RFAs 1 and 2, and augmenting them with additional coupled data collection and coupled modeling. Researchers in this focus area will facilitate interactions with stakeholders and use visualization tools to enhance communication, relevance, and understanding of the complexity of local water issues.

2. Build on Utah’s existing strengths in hydrologic modeling and cyber-infrastructure from the CI-WATER and Cyberinfrastructure (CI) NSF EPSCoR awards. This will be accomplished by developing a hydroinformatics facility, the iUTAH Modeling and Data Federation (MDF); and by supporting interdisciplinary modeling approaches, linking currently disparate models, and developing and supporting data visualization tools.

   The iUTAH CI team will develop hardware and software tools that increase capacity for data collection, organization, management, sharing, and synthesis to higher-level products; and increase capacity for integration of data with models.
3. Build programs to increase participation of underrepresented groups that include women, Hispanics and Native Americans. Training activities and sponsoring programs developed by the Diversity Enhancement (DE) team will accomplish this.

The goal of DE is to increase the individual, disciplinary, institutional, and geographic diversity of the STEM (Science, Technology, Engineering, and Mathematics) enterprise in Utah to address water sustainability issues facing Utah and the Mountain West.

4. Provide educational opportunities for a scientifically literate Utah workforce and citizenry. This will be accomplished using a portfolio of activities developed by the Workforce Development (WFD) team.

The goal of WFD is the enhancement of the STEM 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.

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 other stakeholders.

The iUTAH External Engagement (EE) team will 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.

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

**Major Activities:**

1. **Research**

   If Year 3 of the iUTAH project was a year of transition and transformation, Year 4 was characterized by a major pivot. With iUTAH’s research programs matured; physical research infrastructure—observational, experimental, analytical—installed, operational, and fully integrated with human and cyberinfrastructure into a socio-environmental observatory (Fig. 1); Year 4 saw major advances in directing this infrastructure towards critically important research questions, resulting in substantially increased outputs across teams. Year 4 was also aspirational, as it became clear that the promise of Utah EPSCoR as a catalyst for transforming the research culture of our state has been realized. This has prompted us to seek ways to institutionalize the collaborative, interdisciplinary research capacity we have built.

   With increased integration of research infrastructure comes increased integration of researchers. As each RFA continues monthly/biweekly conference calls to present data and results; interpret findings; update status; and build collaboration; the boundaries between research teams continue to erode, as researchers join calls of other RFAs. In Year 4, iUTAH researchers, staff, and EOD teams conducted over 800 hours of teleconference meetings on GoToMeeting and Zoom that were attended by 1050 participants.

   **RFA1:** Keeping with the increasing integration of research across teams and watersheds, RFA1 conducted multiple synoptic sampling efforts to provide high-resolution spatial data complementing GAMUT’s high-resolution temporal
data. Data collected by RFA1 filled critical gaps in RFA3’s large-scale water balance work, as well as land-use and climate-change scenarios modeling. GAMUT focused on quality assurance/quality control (QA/QC). With significant input from research teams, watershed technicians developed protocols for prioritizing and performing QA/QC on raw GAMUT data that have resulted in tremendous progress in reducing backlog and completion approaching 100% for “Tier 1” (difficult to QA/QC, high demand) data. High-quality rating curves have been finalized for all GAMUT sites. The iUTAH Traineeship Program, instituted in Year 3, greatly contributed to these accomplishments. Year 4 saw the continued expansion of GAMUT into urban water systems, with installation of 4 aquatic stations, 8 storm drain sensors, and 16 mobile sensors that can be quickly deployed in response to shifting research needs and priorities across watersheds. Last, RFA1 saw a substantial increase in outputs, far exceeding its target metrics (Table 2).

RFA2: The engineered system group made great progress in Year 4, with the Biogeochemistry of Urban Green Infrastructure analytical facility fully installed, and GIRF completely rebuilt with greatly enhanced experimental and observational capabilities. Year 4 saw an expansion in the green infrastructure (GI) component of iUTAH’s integrated socio-environmental observatory. The social science team embarked on novel, integrative research with RFA1, including E. coli contamination in urban watersheds, water quality exchanges across urban landscapes, and predicted vs. actual vs. perceived flood risk. Much of the social science group’s remaining work involved engaging with government stakeholders at all levels: presenting relevant data from the Utah’s Water Future household survey to municipalities and regional water organizations; briefing the Governor’s Water Task Force, as well as staff at the Utah Divisions of Water Quality (UDWQ) and Water Resources (UDWR); and continued engagement with public utilities in Salt Lake City and Logan. A signature Year 3 program, the Utah Water Survey (UWS), was expanded statewide and integrated with Education, Outreach, and Diversity (EOD) programs, including the iFellows Summer Research Experience for Undergraduates (REU) and the Research Catalyst Grant (RCG) program. Promising new research, including interviews on water issues targeting audiences from “key informants” to the general public, was instituted. Last, RFA2 saw a substantial increase in outputs, far exceeding its target metrics (Table 3).

RFA3: Year 4 work in RFA3 focused on updating the Year 1 model inventory, using iSAW (Fig. 2A) as a guidepost to identify immediately feasible model couplings (Fig. 2B), establishing the coupled modeling agenda for the remainder of the project. Researchers made substantive progress in interdisciplinary model development, enhancing on interdisciplinary team building conducted in Year 3. This included the continuation of substantive work at the nexus of RFA2-RFA3, using urban typology to inform alternative urban infrastructure scenarios modeling with updated Stormwater Management Models (SWMM) and Soil and Water Assessment Tools. These accomplishments, along with RFA3’s greatly enhanced capacity for innovative data visualization to support research and facilitate understanding, continue to aid in stakeholder engagement, and have resulted in an increase in outputs that exceeded target metrics (Table 4).

2. CI
In Year 4, CI continued data management support by maintaining the CloudShare collaborative file sharing system, MDF website, and other systems. CI also increased and improved virtualization server capacity and storage infrastructure, including separation into production and research clusters, which greatly increased efficiency. CI’s importance for and support of iUTAH research is exemplified by the 10 research proposals that have referenced CI in their data management plans. The Data Policy Committee formed in Year 3, in collaboration with Project Management, invested time and effort into participant training, resulting in greatly increased data policy compliance. Plans have been submitted for every iUTAH-supported data collection effort, with 80% approved. Increased data publication, discovery, and access through iUTAH’s MDF, Consortium of Universities for the Advancement of Hydrologic Science, Inc. (CUAHSI) Hydrologic Information System (HIS) WaterOneFlow, and the CUAHSI Water Data Center, was another major CI accomplishment. CI research in Year 4 focused on continued development and improvement of software to manage sensor data streams and enable model coupling. This has resulted in a substantial increase in outputs far exceeding target metrics (Table 5).

3. EOD

DE: Major Year 4 DE activities included team expansion and diversification; project-wide engagement with participants through a cross-institutional diversity conference focused on Utah’s changing demographics and associated challenges and opportunities, as well as increased diversity training across all EOD activities; and increased focus on outreach activities to under-represented minorities (URM) through new and existing programs and products.

WFD: Based on input from formative assessment, and in coordination with Project Management, WFD greatly increased the reach of our activities by engaging with new partners statewide in a sustained and meaningful way. Recruitment materials were updated to reflect the growing diversity of our state, and to improve the geographical, ethnic, gender, and socio-economic diversity, as well as overall quality, of applicants to WFD programs. This has increased the diversity of both our applicant pool and successful cohorts across all WFD programs.

EE: Our EE team continued its signature programs through existing partnerships with Utah State University (USU) Water Quality Extension’s (WQE) Streamside Science and Natural History Museum of Utah’s (NHMU) Taking Learning Outdoors (TLO) programs. We expanded our museum programming with new partners and programs. The iUTAH Communications team also improved and expanded the iUTAH website and branding, and generated numerous new outreach materials. This was greatly facilitated by hiring a 0.75 FTE Communications Specialist through a national search. iUTAH continued its presence at conferences attended by key audiences at the state, regional, and national level.

Specific Objectives: Year 4 specific objectives closely tracked project milestones from the most current revision of the iUTAH Strategic Plan (Table 6). Additionally, “legacy” milestones not or only partially met from previous project years also informed Year 4 activities (Table 7). Table 8 shows the extent to which future activities highlighted in the Year 2 Annual Report were addressed in Year 4. The implementation of changes proposed in Years 2 and 3, along with future
activities discussed in the Year 3 Annual Report, are reflected in the revised
milestones for Years 3 and 4, and are not discussed separately.

1. Research

RFA1: Year 4 RFA1 research objectives centered on continuation and
expansion of data collection efforts across all 3 watersheds and beyond. A
major focus of this year’s activities was making data from iUTAH’s core facility,
GAMUT, available, useable, and useful to iUTAH and external researchers. This
involved a major push for completion of high-quality rating curves for all
GAMUT stations; a serious effort to reduce the backlog of GAMUT data
QA/QC; and the publication of GAMUT datasets.

With respect to research outputs, RFA1 set out to continue work on water
balance and water quality transport models during Year 4. As part of the larger
iUTAH effort, this research team devoted much time to integrative activities with
RFAs 2 and 3, including using RFA2 research outputs to inform RFA1 data
collection (e.g., E. coli contamination vs. urban typology) and facilitating the
integration of GAMUT data into land-use and climate-change scenarios
modeling.

With many of RFA1’s research efforts maturing in Year 4, an added major
objective was to significantly increase research outputs, as measured by the
number of publications in peer-reviewed journals, as well as presentations to
scientific and lay audiences.

RFA2: RFA2 major objectives for Year 4 centered on successfully incorporating
RFA2 research results into water system planning efforts by demonstrating the
value of iUTAH’s work to stakeholders. Continued collaboration with RFA3,
such as the simulation of impacts of alternative urban growth scenarios on
biophysical outcomes, and incorporation of GI considerations into coupled
modeling exercises; as well as initiation of a stronger RFA1/RFA2 linkage by
allowing advances in RFA2’s understanding of the urban environment, both
from a sociological and engineering perspective, to inform RFA1 data collection
efforts; were another major emphasis of the social science and engineering
research groups of RFA2 in Year 4.

With many of RFA2’s research efforts maturing in Year 4, an added major
objective was to significantly increase research outputs, as measured by the
number of publications in peer-reviewed journals, as well as presentations to
scientific and lay audiences.

RFA3: With GAMUT fully operational in Year 3, one of the major objectives for
RFA3 was the incorporation of GAMUT’s rich data stream into model couplings.
Feasible couplings were identified through an updated model inventory, another
major objective for this project year, replacing the outdated model inventory
conducted in Year 1. As envisioned in the iUTAH Strategic Plan, data collection
took on a decidedly more participatory bent, as did the sharing of iUTAH
research results through stakeholder-targeted products and tools. Stakeholder
engagement in general was a specific objective of RFA3 for Year 4, as was the
application of a fully staffed and operational iUTAH Visualization Laboratory
(iVL) towards the generation of apps and web applications responsive to
stakeholder needs.

Despite the time lag inherent in the nature of RFA3’s research effort, team
members also strived to significantly increase research outputs in the form of presentations and publications.

2. CI

Beyond its vital and necessary “housekeeping” tasks of maintaining and expanding iUTAH CI to support and integrate research across RFAs, iUTAH’s CI team set itself an added objective to continue innovation in the emerging discipline of hydroinformatics during Year 4. This included further refinements to software to manage high-volume data streams of geographically dispersed sensor networks, as well as significant advances in the development of software to facilitate model coupling and execution in a High-Performance Computing (HPC) environment.

In support of GAMUT, and its substantially increased utility to researchers across iUTAH and beyond, CI was tasked with a major push for data publication; data discovery and faceted browsing; data access by a broad audience through widespread publication; and innovative data visualization to support and enhance understanding and accessibility of iUTAH research for stakeholders and the public at large.

3. EOD

DE: Diversity initiatives during Year 4 focused on increasing participation of diverse audiences inside and outside of iUTAH; incorporating feedback received during formative assessment to reevaluate and refine its recruitment and retention practices across EOD programs; culminating in the publication of a best practices handbook. DE was also charged with continuing project-wide diversity training through workshops, small group near-peer mentor trainings, and a project-wide diversity conference.

WFD: With all of iUTAH’s signature EOD programs being well established and highly successful, Year 4 objectives for the WFD team were comparatively modest: to continue and—where feasible—expand these programs, revise SOPs based on formative assessment and other feedback received; and, where possible, increase URM participation across all EOD programs. These programs included iUTAH’s REU (iFellows); iUTAH Summer Institute (SI) including development and publication of associated K-12 curriculum materials; cross-campus course offerings by iUTAH faculty; recruitment and funding of research by faculty at Primarily Undergraduate Institutions (PUI) via RCGs; as well as recruitment and/or retention of trainees, graduate research assistants (GRA), and postdoctoral associates.

EE: iUTAH’s EE team faced a tall order in Year 4. First, to continue existing and funding new programs for K-12 cohorts, recruiting and engaging K-12 students and teachers into these programs, and expanding K-12 programs to GIRF; continuing the Citizen Science program with UWW; and expanding and diversifying iUTAH’s outreach through continued presence at conferences attended by target audiences. iUTAH EE also wanted to greatly increase its capacity to connect with a broad range of audiences and the general public by revising its branding and messaging, completely redesigning the iUTAH website, and substantially enhancing its web presence across the board, utilizing a range of social media platforms. To accomplish these numerous objectives, and to aid with ongoing evaluation of communication strategies based on internal (web site stats, social media following) and external
Significant Results:

1. Research

RFA1: In Year 4, RFA1 saw significant accomplishments in collaborative modeling at the WRMA scale: work by Brooks and collaborators in Colorado indicates a transition between precipitation- and temperature-dominated control on water yield (Fig. 3), while Strong and students have used groundwater data provided by RFA1 to fill important gaps for water balance work begun in Year 1 (Fig. 4). With GAMUT fully built-out and expanded into urban water systems, much of RFA1’s work focused on reaping the fruits of previous years’ labors. This resulted in >10 presentations and 8 peer-reviewed publications. Two successful grant proposals totaling over $500,000 in new funding will support new research endeavors through the end of iUTAH and beyond.

RFA2: In Year 4, RFA2’s social science group continued collaborations with RFA3 begun in Year 3. After extensive discussions about connecting urban typology to the Model Coupling System (MCS), it has become clear that a simplified urban typology will initially be needed for land-use change scenarios modeling. New collaborations with RFA1 enabled the application of urban typology to, e.g., the analysis of E. coli contamination in urban areas; links between objective biophysical flood risk, self-reported flood experiences, and concerns about flooding; and an analysis of water quality changes across urban landscapes (Fig. 5). Results of the household survey “Utah’s Water Future” are beginning to inform policy discussions at all levels of water governance, including the Governor’s Water Task Force, state agencies, as well as municipalities and regional water organizations across the state. In the engineering group, Youcan Feng completed an updated urban landscape SWMM for Red Butte Creek using Green Roof monitoring data (Fig. 6). RFA2 researchers conducted 13 stakeholder meetings; gave 37 presentations, including 9 at undergraduate research conferences; and published 6 peer-reviewed papers, with another 15 submitted.

RFA3: Year 4 saw the continuation of RFA3’s coupled modeling workshop series with 2 workshops: December 2015 at USU and February 2016 at the University of Utah (UU, Fig. 7). Significant results in the area of coupled modeling include Khatri’s meta-model linking climate change, land use/urban form, population change, and hydrology; Strong and Scalzitti’s work using WRMA observational data to validate iUTAH regional climate modeling (Fig. 8); Castronova’s configuration of GAMUT as a data model in MCS; and Strong and Smith’s presentation of a novel stochastic climate simulation framework (Fig. 9). Another focus of Year 4 activities was to broadly and deeply engage with stakeholders across the board. This effort included 8 stakeholder meetings with the Wasatch Front Regional Council, UDWR and UDWQ, Salt Lake City Department of Public Safety/U.S. Department of Homeland Security, Salt Lake City Department of Public Utilities, and Tracy Aviary; and production of 4 stakeholder products (Table 9). RFA3 researchers also gave 9 presentations, published 2 peer-reviewed papers, with an additional 3 papers in press, conditionally accepted, or submitted; and received in excess of $5.75 million in additional funding through 5 grants.

2. CI
Project-wide support by CI during Year 4 saw the completion of discovery and access to external and iUTAH datasets through MDF and CUAHSI HIS; as well as substantial growth in the number of datasets submitted for publication (119, including 27 metadata records). Not surprisingly, we are beginning to see use of our data by a large and geographically diverse audience (Table 10). In coordination with iUTAH Project Management, CI also increased efforts to track and enforce compliance with the iUTAH Research Data Policy, with 66 data collection plans submitted to date, of which 52 (79%) have been approved. CI researchers were able to secure new funding in excess of $750,000 via 2 grants; published 4 peer-reviewed papers, with 1 additional manuscript in revision; and gave 5 presentations.

3. EOD

DE: In Year 4, iUTAH held a project-wide diversity conference that was attended by 72 participants and received an overwhelmingly positive response. A concerted effort by iUTAH EOD and Project Management greatly increased the geographic and institutional diversity of our network, applicants, and successful cohorts for signature programs. iUTAH now has significant and sustained engagement with every post-secondary institution in the state (Table 11). Targets for participation by women were met and/or exceeded for all WFD and EE programs (Table 12). At the same time, participation by URMs is increasing. This is due to a renewed and greatly expanded effort to reach out to Native and Latino communities, including collaboration with 14 EPSCoR jurisdictions to recruit students at the 2015 Society for the Advancement of Chicanos and Native Americans in Science Conference; participation in the USU Eastern Blanding STEM exploration mentorship for Native American students; and extensive outreach to Native American communities in rural southern Utah, and Latino and refugee communities in urban Salt Lake City, with author Nancy Bo Flood and her iUTAH-financed book "Water Runs Through This Book."

WFD: Year 4 saw continuation and growth of all signature WFD programs, including a successful iFellows REU in 2015, with 25% of participants subsequently presenting their research at undergraduate research or professional conferences, and several manuscripts co-authored with faculty and/or near-peer mentors in preparation. Recruitment for the 2016 program had a greater number and diversity of applicants, with 37% women, 15% URM, and 48% PUI applicants and a successful cohort made up of 71% women, 18% URM, and 41% PUI. WFD's retention efforts continue to build out iUTAH's STEM pipeline: 2015 iFellow Natasha Griffin was retained as an iUTAH Trainee; Joydino Beyale, a participant in the STEM exploration mentorship for Native American students, was recruited as a 2016 iFellow; all 4 postdoctoral associates were retained through Year 4 and beyond, and are making great strides in contributing to the vision, direction, and implementation of iUTAH's research agenda through the final years of the project; and several iUTAH Trainees brought on in Year 3 as part of a re-envisioning of the internship program were retained in Year 4 and have been invaluable in advancing critical QA/QC and rating curves work in GAMUT.

EE: In Year 4, iUTAH continued its outreach to a large and diverse audience both via in-house programs and by leveraging existing partnerships with museums, the Utah Education Network (UEN), and USU WQE (Table 13). iUTAH's museum programming saw a significant increase both in the number of
Key outcomes or Other achievements:

Programs and their geographic reach during Year 4. NHMU's TLO, previously held in the WRMA, targeted rural audiences in southern Utah this year, while The Leonardo's “Lego on Wheels” Water Carts program, a mobile version of the ongoing iUTAH-funded “Water: Nature's Driving Force” exhibit, is poised to reach a statewide audience. The Green Roof Agriculture Exhibit and Outreach at the Garth and Jerri Frehner Museum of Natural History (GJFMNH) at Southern Utah University (SUU) is another program targeted to southern Utah. The new digital interactive “The Whole GAMUT,” a collaboration between iUTAH EOD, RFA3’s iVL, and NHMU, is reaching urban audiences in the Greater Salt Lake Area. Outreach activities involving author Nancy Bo Flood are aimed at underserved communities in both rural and urban areas. Despite significant changes in staff, UWQE continued its successful iUTAH-supported citizen science effort, conducting 13 programs that involved 4,915 individuals. As in previous years, iUTAH continued engaging with stakeholders and the public through sponsorship and participation in a large number of STEM- and water-themed conferences (Table 14); as well as through a redesigned and greatly expanded web and social media presence (Table 15).

In Year 4, iUTAH made significant progress in meeting both current-year and “legacy” milestones. Of the 79 milestones across project management, research, and EOD teams, 73 (92%) were accomplished or are on track to being accomplished by the end of Year 4; a further 5 (7%) were partially accomplished or are ongoing, and only 1 was not accomplished (Table 6). At the same time, of the 28 “legacy” milestones carried forward from years 2 and 3, 21 were completed this year, with one additional milestone moving from “red” (not accomplished) to “yellow” (ongoing, Table 7). That, in and of itself, is a key outcome for our project this year.

1. Enhancement of Research Capacity

iUTAH continues to strongly enhance research collaborations across our state as evidenced by co-authored publications and research proposals both within and between institutions. Prior to the EPSCoR track 1 award, there were few cross-disciplinary publications within institutions, and even fewer cross-institutional publications.

iUTAH researchers have submitted 137 research proposals since project inception that leverage iUTAH infrastructure and collaborations. Of these, 55 have been awarded, including proposals funded by the US Geological Survey, local non-profits, the NSF, and state agencies. Total funds requested by these awards exceed $18M.

iUTAH research products have advanced knowledge both within and across disciplines as evidenced by 512 presentations (121 in Year 4) and 134 publications (30 in Year 4).

iUTAH GRAs Philip Stoker and Morey Burnham each accepted faculty appointments at the University of Arizona, and Idaho State University, respectively. We anticipate that these new faculty members will continue their collaborations with iUTAH researchers in the near term as they embark on their academic careers. Former GRA Michael Bunnell, was hired as the Urban Forestry Program Specialist at the Utah Division of Forestry, Fire and State Lands.

Former iUTAH postdoctoral associates Steven Hall and Rebecca Hale both
continued their productive collaboration with our research teams through Year 4, resulting in a number of publications led or co-authored by them. Several former iUTAH GRAs, including Brian Bailey, Youcan Feng, and Alison Chan, are continuing their careers as postdoctoral associates or with private industry. 2013 iFellow Sean Bedingfield received a 2016 NSF Graduate Research Fellowship Program Award to support his graduate studies in biomedical engineering at Vanderbilt University.

2. Enhancing Utah’s STEM Workforce

Renewed efforts at outreach to PUUs across the state brought us great success in Year 4. iUTAH now actively engages with every post-secondary institution in the state of Utah through one or more of its research and training programs (Table 11). Collectively, iUTAH and its many partners continue to build Utah’s STEM workforce of tomorrow as these students “travel” the iUTAH STEM Pipeline. Out of a cohort of 20 iFellows in Year 3, 6 have continued their involvement with iUTAH: 1 as a Trainee (Natasha Griffin—GAMUT), and 5 through independent research with iUTAH faculty (Viviane Baji, Matthew Barnett, Jesse Fieri, Jordan Risley, Darianne Willey). Simone Jackson, a Year 3 iUTAH Trainee, is continuing her iUTAH involvement with the Stable Isotope Ratio Facility for Environmental Research, one of iUTAH’s analytical facilities. Joydino Beyale, a participant in the 2015 STEM exploration mentorship for Native American students, was just accepted into the 2016 iFellows program.

3. EOD Outcomes and Broader Impacts

iUTAH EOD’s redoubled efforts to reach and recruit a diverse population more closely aligned with Utah’s changing demographics to its signature programs is beginning to bear fruit: Participation of women and URM increased dramatically across the board (Table 12), with female participation consistently at or above 50% and as high as 71%, and URM participation, with some exceptions, approaching 20% in many programs, and as high as 100% in areas and programs targeted to the URM population. Several of such targeted programs, having been initiated in Year 3, were found to be effective and tremendously successful, resulting in their continuation in Year 4. Some of them, such as WaterGirls and the Native American Mentorship Program, are on track to becoming signature programs. Several iUTAH undergraduate researchers presented at the Utah Conference on Undergraduate Research (UCUR) and the National Conference on Undergraduate Research (NCUR), the 24th National NSF EPSCoR Conference, as well as professional meetings, including the International Symposium on Society and Resource Management (ISSRM), the Society for Freshwater Science Annual Meeting, and the National NSF EPSCoR Conference (Table 16).

2013 iFellow Brianne Palmer was named the USU S. J. and Jessie E. Quinney College of Natural Resources Scholar of the Year, as well as Outstanding Senior in the Department of Wildland Resources; she was also chosen by her peers to receive the Jardine Juniper Award given to the student who has had the greatest impact on the college through involvement with student organizations. The episode “Recreation: It’s Contentious, It’s Litigious, It’s Fun!” by Utah Public Radio’s The Source, which was funded through an iUTAH EOD Innovation Award in 2015, has won the Associated Press Television and Radio Association Award for Excellence in Broadcast Journalism in the category “Best
Investigative Reporting.” The Source is a monthly 60-minute radio program sharing stories about water in Utah as it relates to research, the environment, recreation, and the economy. The iUTAH-commissioned book “Water Runs Through This Book” by noted author Nancy Bo Flood and photographer Jan Sonnenmair, which discusses water and diverse perspectives surrounding it for young adults, was shortlisted for a Green Earth Book Award, is a finalist in the young adult category for Colorado Author’s League 2016 Awards, and winner of the 2015 Sigurd F. Olson Nature Writing Award for young adult literature.

iUTAH Project Director and Principal Investigator Dr. Michelle Baker was among 10 individuals awarded the 2015 Governor’s Medal for Excellence in Science and Technology for her leadership of iUTAH EPSCoR. Weber State University (WSU) subaward PI Dr. Daniel Bedford was appointed director of the WSU Honors Program, in large part due to his past involvement with the iUTAH project.

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

This award continues to support the professional development of all iUTAH participants, including faculty, staff, postdoctoral associates, graduate students, and undergraduate students at research universities and PUIs; teachers and students at the secondary level; and citizens and stakeholders. As in Year 3, Year 4 activities centered on (1) strengthening and refining research skills by mentoring students at all levels; and (2) engaging teachers and students in research-based educational activities focused on STEM, with particular attention to URMs and women. An added emphasis during Year 4 was a clearly articulated and fully implemented commitment by project leadership to the continued professional development of iUTAH project management staff, including the Assistant Director and Project Administrator, the EOD Coordinator, and the Communications Specialist, who attended numerous conferences and workshops on such diverse topics as NSF’s Broader Impact criterion, the Science of Team Science, research administration, and student mentoring (Table 16). Finally, during Year 4, iUTAH laid the foundation for advanced training in the effective communication of scientific research to diverse audiences by forging a new partnership with the USU Office of Research and Graduate Studies and the UU Office of the Vice President for Research, that will bring the Alan Alda Center for Communicating Science to Utah to engage nearly 100 faculty, postdoctoral associates, and senior graduate students through small-group workshops, as well as a substantially larger audience through interactive plenaries open to their respective campus communities and publics-at-large. As in Year 3, other sources of professional growth and development included the rigorous peer-review process involved in the publication, communication, and presentation of research findings; writing and review of proposals; development of web sites and applications; building of databases and data sharing capacity; and the establishment and maintenance of cross-institutional and multi-disciplinary collaborations.

1. Research

In Year 4, iUTAH made a substantive commitment to providing extensive financial support for its participants to attend conferences and other professional development opportunities. This included supporting conference attendance by (1) undergraduate students to present their research (5 students); (2) faculty to gain important skills in mentoring (1 faculty) and collaboration (2 faculty/postdoctoral associates); and (3) iUTAH participants across the board to interact with important stakeholders (10 participants, Table 16).

RFA1: Postdoctoral associate Dr. Erik Oerter has been retained and will continue work with iUTAH under the mentorship of Dr. Gabriel Bowen at UU. Additionally, 13 graduate students contributed to RFA1 research in Year 4, including 8 Ph.D. and 5 Master’s students. RFA1 also engaged undergraduates through iUTAH EOD programs: 5 undergraduate iFellows, 2 of them women, were hosted in 2015; an additional 6 students will be mentored in 2016. RFA1 faculty and graduate students developed 3 new modules for the 2015 SI in the Middle Provo River watershed after having previously developed 1 module for the 2014 SI.

RFA1 continued to employ 3 M.S.-level research technicians to oversee the installation and daily operations of
GAMUT. Additionally, 6 undergraduate student GAMUT technicians—2 per watershed—hired in Year 3 under the iUTAH Traineeship program were retained in Year 4. These students have been instrumental in the completion of high-quality rating curves for all GAMUT sites across all 3 watersheds, as well as the substantial reduction in QA/QC backlog of GAMUT sensor data.

Several RFA1 alumni were successful in taking the next step in their STEM career: Dr. Brian Bailey accepted a postdoctoral fellowship with the United States Department of Agriculture, while Alison Chan took a position with Los Alamos National Laboratory.

RFA2: Postdoctoral associate Dr. Melissa Haeffner has been retained and continues to work under the mentorship of Dr. Douglas Jackson-Smith at USU. In Year 4, RFA2 also supported 4 doctoral students and 2 Master’s students. In addition, a large cohort of 16 undergraduate students has been actively engaged in RFA2 research through the expansion of UWS (“iPad Project”). RFA2 faculty and graduate students mentored 11 undergraduate iFellows in 2015, and have committed to mentor 9 new iFellows in 2016. With encouragement from RFA2 faculty and financial support from iUTAH, 4 2015 iUTAH iFellows presented their research at NCUR and/or ISSRM.

Both cross-campus and cross-institutional team-taught courses continued to be a hallmark of RFA2 in Year 4: Drs. Davis Rosenberg (USU) and Steven Burian (UU) pooled resources to “team-teach” two different courses, CEE 6490 (Integrated River Basin Watershed Planning and Management, 8 students) and CVEEN 7920 (Water Resources Planning, 10 students), at their respective institutions, allowing them to access a wider range of guest speakers, lecture topics, teaching materials, and geographic coverage. A new cross-campus course on GI was taught for the first time by Drs. Sarah Hinners (UU) and Ryan Dupont (USU) during Year 4. RFA2 faculty also developed a GIRF-themed module for the 2016 SI, after having previously provided 2 modules to the 2014 SI and 1 module to the 2015 SI.

Two former RFA2 Ph.D. students accepted faculty appointments in Year 4: Dr. Philip Stoker at the University of Arizona, and Dr. Morey Burnham at Idaho State University.

RFA3: Postdoctoral associate Dr. Krishna Khatri has been retained and promoted to research assistant professor. He continues his work under the mentorship of Dr. Courtenay Strong (UU). During Year 4, RFA3 also mentored 7 doctoral students and 3 Master’s students, as well as 4 undergraduate students participating in the 2015 iFellows program; an additional 3 undergraduate students will be hosted for the 2016 program. Former graduate student Leah Meeks accepted a position with the Bureau of Reclamation, furthering her involvement with water issues in the Western U.S.

2. CI

CI supported 4 professional staff as programmers/analysts, data managers, or system administrators in Year 4, as well as 7 undergraduate student computer programmers to work with professional programmers and analysts in the development of software and hardware CI that supports MDF. These positions continue to provide opportunities for students to engage in cutting edge CI-related research, develop their programming skills while being mentored by professionals, and gain valuable experience and expertise. CI continues to work with GAMUT technicians and personnel from all RFAs in developing data management best practices and techniques. Year 4 saw an expansion to RFA2 (social science data) and RFA3 (MDF support for models). Tangible outputs that continue to advance the professional development of our participants include new protocols for GAMUT QA/QC prioritization and processes, and are reflected in the iUTAH Data Policy, which has been revised to better address the needs of social scientists (completed) and modelers (ongoing).

iUTAH and CI-WATER collaborators Drs. Jeffery Horsburgh (USU) and Steven Burian (UU) once again teamed with Dr. Dan Ames at Brigham Young University to offer a collaborative course in Hydroinformatics for graduate students during Fall Semester 2015. The course, which uses an innovative multi-institution, team-teaching approach that provides new content and opportunities for interaction among students, was jointly taught and
administered using the UEN Interactive Video Conferencing system, combining synchronous video lectures with asynchronous student discussions, assignments, and grading using a new Learning Management System called Instructure Canvas. Enrollment for the course was 28 students (21% female).

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

In Year 4, iUTAH continued to engage with diverse audiences throughout the state, broadening the reach and impact of iUTAH concepts and research, and increasing interest in and engagement with STEM from K-20 and beyond.

K-12 Students and Teachers

iUTAH TLO, a long-term teacher training program designed to influence K-12 educational practice by helping teachers develop a better understanding of science, its processes, and applications, was brought to southern Utah for the first time in Year 4. The program connected 17 local teachers and faculty members at SUU and 2500 students with NHMU educators to promote a better understanding of the natural world by providing authentic learning experiences through outdoor exploration in their community. Additionally, the program assisted participating teachers with the development and implementation of lesson plans that use outdoor and water-related science as a context for learning.

Another cohort of middle and high school teachers, in addition to high school and undergraduate students, will engage with iUTAH research in the upcoming 2016 SI. This year’s effort targets participants from the Greater Salt Lake City area, and will focus on research conducted by RFA2's engineering group and GIRF. In addition to engaging students and teachers in iUTAH research, participants will once again be encouraged to share their results and experience during the 2016 iUTAH Annual Symposium.

iUTAH WaterGirls, a program first funded in Year 3 under an EOD Innovation Award, was also continued in Year 4. This field experience engages middle school girls and 5-8 college-level mentors to assess the health of streams and watersheds in their communities. The year 4 program has been expanded to include an 8-week after school session at an under-served Middle School in Salt Lake City, in addition to the weekend program developed last year. Students benefit from near-peer mentoring and are encouraged to find creative ways of communicating their findings to audiences of their choosing.

In addition to the continuation of these successful K-12 programs initiated in previous years, a new Year 4 program that has proven highly successful deserves special mention: supported by EOD, author Nancy Bo Flood and photographer Jan Sonnenmair, who produced the iUTAH-commissioned book “Water Runs Through This Book,” are conducting outreach to Native American communities in southern Utah, including at the Indian Wells School (Navajo Nation); and minority neighborhoods, including Hispanic and refugee communities, in Salt Lake City. iUTAH also provided funding for the creation of a companion guide for teachers, which includes games, writing activities, and discussion topics for students, and aligns with Next Generation Science Standards.

Community and Stakeholder Engagement

Community and stakeholder engagement continued to be a focus of iUTAH activities in Year 4. Continuing iUTAH’s involvement with Science Unwrapped, an event organized by USU’s College of Science to share science with Cache Valley families, iUTAH Project Director and Principal Investigator Dr. Michelle Baker was a featured speaker on the topic of “Water and People: Friends or Foes." The exhibit “Water: Nature’s Driving Force” at The Leonardo museum, which challenges people of all backgrounds to explore one of nature’s most fundamental resources, has continued through Year 4 far past its originally scheduled 6-week run, and was expanded to include a traveling exhibit using “Leo on Wheels Water Carts." A new digital interactive developed by NHMU staff under an iUTAH EOD Innovation Award in collaboration with GAMUT and iVL now allows for direct engagement of urban audiences in the WRMA with iUTAH core infrastructure (Fig. 10). Additional museum programming at GJFMNH, focusing on a demonstration green roof agriculture exhibit funded through an iUTAH RCG, continues to
expand the geographic reach of iUTAH key themes to the southern part of the state.

Stakeholder engagement in Year 4 took the form of briefings by iUTAH scientists to the Salt Lake City Department of Public Safety and the U.S. Department of Homeland Security, as well as senior staff at UDWR and UDWQ; participatory modeling exercises of land-use and climate change scenarios involving various state and municipal agencies; and follow-up activities to iUTAH social science research with municipalities and regional water agencies across our 3 watersheds.

*iUTAH Communications*

With so many of iUTAH's research efforts maturing in Year 4, iUTAH Project Management made a strategic decision to completely revamp the way in which we reach out to and communicate with our stakeholders. In the first quarter of Year 4, the Communications team completely revised the iUTAH website by creating new, custom, value-added content targeted to specific audiences. At the same time, we added communications expertise to facilitate connecting this new content with targeted communities of interest. After a competitive, national search, we hired Jeannine Huenemann as a 0.75 FTE Communications Specialist. Jeannine now leads a team that, after having been increased by 2 members in Year 4, has taken on a substantially expanded portfolio of activities and responsibilities. With these additional staffing resources, outputs include near-daily updates of the iUTAH website in the form of news highlights, opportunities, and successes; a consistent engagement with a growing number of stakeholders through social media, particularly Twitter; increased visibility of iUTAH programs and successes through new audience- and program-specific materials; an increased flow of press releases that tell the stories of our successes and are disseminated through regional, state, and national media; as well as a re-engagement with our participants in a sustained and meaningful way through a new, dynamic e-Newsletter that links directly to new content on the iUTAH website each month. The most recent accomplishment of our Communications team, a new, interactive “Successes” page on the iUTAH website, will allow stakeholders and the general public to see and interact with iUTAH successes via infographics as well as traditional text-based formats, and is scheduled for completion by the end of Year 4.

*iUTAH Modeling and Data Federation*

With the substantial progress in data publication, discovery, and access made by MDF in Year 4, a substantive aspect of the dissemination of iUTAH results is beginning to occur through various MDF websites (Table 10). Over the past year, the main MDF website has been visited by 853 unique users from 65 different countries. More importantly, the iUTAH Data Repository, which holds all published datasets, has been accessed 150 times by 72 users from 9 countries since tracking of activity began a little over a month ago. iUTAH's newest MDF site, the Survey Data Viewer, which allows for the innovative visualization of social science survey data, has been accessed 27 times in a little over a month's time.

*Traditional Academic Outlets*

In Year 4, iUTAH researchers submitted 62 manuscripts for publication in scientific, peer-reviewed journals, of which 43 are published or in press. In addition, our participants gave 121 oral or poster presentations at international, national, regional, and state scientific conferences. Much of this activity involved students, with 47 presentations by undergraduate and 28 presentations by graduate students (Table 16).

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

1. Research

With Year 5 being the last year of iUTAH, and our research infrastructure in place and producing results, goals for Year 5 will focus on completion of signature research products that will be the legacy of iUTAH's research efforts. Research teams will place increased emphasis on further development and maintenance of critical stakeholder relationships that can be sustained beyond the life of the iUTAH project.
RFA1: Central Year 5 goals for the iUTAH ecohydrology group include continued data collection by our core infrastructure GAMUT; publication and archival of datasets; continuing its water balance and water quality research across all watersheds; and finishing and publishing land-use and climate change scenarios modeling work for 5, 10, and 15 year futures in close collaboration with RFA3.

RFA2: Most of RFA2’s major research efforts are either complete or nearing completion. Researchers will continue to build out UWS by increasing its geographic and temporal coverage across the state. With GIRF reconstruction finally completed in Year 4, we expect to collect and analyze a wealth of experimental data from this facility in the coming year and beyond. RFA2 researchers will also direct considerable effort to documenting the impacts of their research activities and results on stakeholder knowledge and decision making, with planning for currently underway. RFA2’s substantial GI research should provide ample opportunities for additional stakeholder engagement activities in Year 5.

RFA3: After having made substantial progress on their goals and milestones in Year 4, RFA3 researchers are well-positioned to conclude many of their activities in Year 5, including continued publication and dissemination of results, modeling software, and model products. With a large number of coupled and integrated models expected to be fully operational in Year 5, RFA3 researchers will also be able to direct efforts towards evaluating scenarios of change and adaptation/mitigation strategies. Another goal will be to assess stakeholder relationships by evaluating the use and impact of web-based tools and visualizations, and stakeholder products.

2. CI

With the iUTAH project coming to a close and data publication expected to peak at the end of Year 5, a major objective for CI will be the establishment of a sustainable partnership with a long term data repository for transitioning published iUTAH datasets. Ongoing support for researchers across RFAs in Year 5 will include updating the iUTAH Data Policy and MDF databases to meet the unique needs of modeling and simulation work. Finalizing and releasing all MDF, coupled modeling, and innovative visualization software tools on open source repositories, as well as providing needed documentation for, and demonstrating utility to, potential users will be another emphasis for CI researchers.

3. EOD

In Year 5, iUTAH EOD will continue to develop and diversify membership across all teams, and to engage with partners and stakeholders new and old who have a vested interest in the continuation of pertinent, successful EOD programs. Our team members will work to develop ways to maintain and grow connections made over the course of the iUTAH project to sustain faculty support, STEM workforce development, and outreach to an informed and engaged citizenry, while continuing to promote the inclusiveness and diversity of the STEM enterprise in Utah.

DE: DE will continue to develop relationships with groups statewide, to increase participation of diverse audiences in iUTAH opportunities, and to support the inclusion of diverse groups in Utah’s STEM pipeline. DE expects to complete a handbook of recruitment and retention practices in early Year 5 or sooner. In addition to constituting a lasting legacy of DE beyond the life of the project, this product will inform recruitment efforts for ongoing EOD programs.

WFD: WFD team members plan to make further improvements to the iFellows REU program, soon to be in its fifth year, by expanding on diverse recruitment strategies, faculty engagement, research experiences, and professional development and mentoring opportunities. Other changes under discussion for the last year of this signature program are opening the program to PUI students only; increasing outreach to faculty across the state to enlist their help in advertising and recruitment; reaching out to potential faculty mentors earlier in the year; and incorporating a stronger linkage with stakeholder interests and objectives.
EE: The EE team will continue to engage broadly with diverse audiences across Utah in Year 5. This will occur primarily through the continuation of a diverse array of highly successful museum programs, including TLO (scheduled to be held in San Juan County in the southern part of the state), The Leonardo’s “Water: Nature’s Driving Force” exhibit and “Leo on Wheels” Water Carts, the NHMU digital interactive “The Whole GAMUT, which will be expanded to all 3 iUTAH watersheds in Year 5, as well as the Green Roof Agriculture and Outreach activities at GJFMNH in southern Utah. EE also hopes to expand the highly promising new outreach program with author Nancy Bo Flood using her iUTAH-commissioned book “Water Runs Through This Book,” and continue Citizen Science programs and general water education activities in partnership with UWW and UWQE.

Supporting Files

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Products

Books

Book Chapters

Inventions

Journals or Juried Conference Papers

Armstrong, A., and D. Jackson-Smith (). Connections and collaborations of local water management organizations in Utah. *Society and Natural Resources*. Status = SUBMITTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes


Feng, Y., and S.J. Burian. Improving evapotranspiration mechanisms in the U.S. Environmental Protection Agency’s Storm Water Management Model. *Journal of Hydrologic Engineering*. Status = ACCEPTED; Acknowledgment of Federal Support = Yes; Peer Reviewed = Yes


Feng, Y., S.J. Burian, and E. Pardyjak. Green roof evapotranspiration observation and modeling in Salt Lake City, Utah. *Ecological Engineering*. Status = UNDER_REVIEW; Acknowledgment of Federal Support = Yes; Peer Reviewed = Yes


Flint, C. Vantage Points and Mountain Methods. *Mountain Research and Development*. Status = UNDER_REVIEW; Acknowledgment of Federal Support = Yes; Peer Reviewed = Yes


Li, S., and B. Yang (). Quantifying forest fragmentation patterns and processes during rapid urbanization.. Landscape Ecology. Status = UNDER_REVIEW; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes


Null, S. (). Specializing rivers by water use. Environmental Research Letters. Status = UNDER_REVIEW; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes


Null, S.E., and T. Beach. (). An affordable method for thermal infrared remote sensing of wadeable rivers using a weather balloon. Journal of Undergraduate Research. Status = UNDER_REVIEW; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes


Smith, K., C. Strong, and F. Rassoul-Agha. (). A new method for generating stochastic simulations of air temperature and precipitation. *Journal of Applied Meteorology and Climatology.* Status = SUBMITTED; Acknowledgment of Federal Support = Yes; Peer Reviewed = Yes


Smith, K., C. Strong, F. Rassoul-Agha. (). Improved mathematical formulation of air temperature for stochastic weather generation. *Journal of Applied Meteorology and Climatology.* Status = SUBMITTED; Acknowledgment of Federal Support = Yes; Peer Reviewed = Yes


Stoker, P., S. Hinners, D. Jackson-Smith, M. Buchert, and Z. Levine. (). Neighborhood effects on parcel level water use. *Landscape and Urban Design.* Status = SUBMITTED; Acknowledgment of Federal Support = Yes; Peer Reviewed = Yes

Stoker, P. (). Land Cover, Urban Form, and Water Use in Salt Lake City. *Land Use Policy.* Status = UNDER_REVIEW; Acknowledgment of Federal Support = Yes; Peer Reviewed = Yes


Yang, B., and S. Li (). Design with Nature: Ian McHarg's ecological wisdom as actionable and practical knowledge. *Landscape and Urban Planning.* Status = ACCEPTED; Acknowledgment of Federal Support = Yes


**Participants/Organizations**

What individuals have worked on the project?

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Full details of individuals who have worked on the project:

**Michelle A Baker**
*Email:* michelle.baker@usu.edu  
*Most Senior Project Role:* PD/PI  
*Nearest Person Month Worked:* 6  

**Contribution to the Project:** Responsible for overall project leadership.  
**Funding Support:** Utah State University; Utah Science, Technology, and Research Initiative  
**International Collaboration:** No  
**International Travel:** No

**Zachary T Aanderud**
*Email:* zachary_aanderud@byu.edu  
*Most Senior Project Role:* Co PD/PI  
*Nearest Person Month Worked:* 2  

**Contribution to the Project:** Leadership team, co-lead of RFA1.  
**Funding Support:** Brigham Young University  
**International Collaboration:** No  
**International Travel:** No

**James R Ehleringer**
*Email:* jim.ehleringer@utah.edu  
*Most Senior Project Role:* Co PD/PI  
*Nearest Person Month Worked:* 2  

**Contribution to the Project:** Project leadership focusing on facilities and postdoctoral mentoring.  
**Funding Support:** University of Utah  
**International Collaboration:** No
International Travel: No

Douglas Jackson-Smith
Email: doug.jackson-smith@usu.edu
Most Senior Project Role: Co PD/PI
Nearest Person Month Worked: 2

Contribution to the Project: Leadership team, co-lead of RFA 2.

Funding Support: Utah State University

International Collaboration: No
International Travel: No

Courtenay Strong
Email: court.strong@utah.edu
Most Senior Project Role: Co PD/PI
Nearest Person Month Worked: 2

Contribution to the Project: Leadership team, co-lead of RFA3

Funding Support: University of Utah

International Collaboration: No
International Travel: No

Zanazzi Alessandro
Email: alessandro.zanazzi@uvu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: RCG award

Funding Support: UVU

International Collaboration: No
International Travel: No

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

Contribution to the Project: RFA2

Funding Support: BYU

International Collaboration: No
International Travel: No
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

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 St.
International Collaboration: No
International Travel: No

Frank Black
Email: fblack@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

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

Brenda Bowen
Email: brenda.bowen@utah.edu
Most Senior Project Role: Faculty
Dave Bowling  
Email: david.bowling@utah.edu  
Most Senior Project Role: Faculty  
Nearest Person Month Worked: 2  
Contribution to the Project: RFA1 co-lead  
Funding Support: UU  
International Collaboration: No  
International Travel: No  

Jeff Broadbent  
Email: jeff.broadbent@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  

Paul Brooks  
Email: paul.brooks@utah.edu  
Most Senior Project Role: Faculty  
Nearest Person Month Worked: 2  
Contribution to the Project: iBUGI co-lead and RFA1  
Funding Support: UU  
International Collaboration: No  
International Travel: No  

Mark Brunson  
Email: mark.brunson@usu.edu  
Most Senior Project Role: Faculty  
Nearest Person Month Worked: 2  
Contribution to the Project: EOD Director and RFA3
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**Martin Buchert**  
**Email:** martin.buchert@utah.edu  
**Most Senior Project Role:** Faculty  
**Nearest Person Month Worked:** 3  
**Contribution to the Project:** Faculty at UU participating in research at iUTAH

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**Michael Bunds**  
**Email:** michael.bunds@uvu.edu  
**Most Senior Project Role:** Faculty  
**Nearest Person Month Worked:** 1  
**Contribution to the Project:** RFA1

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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

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**Eddy Cadet**  
**Email:** cadeted@uvu.edu  
**Most Senior Project Role:** Faculty  
**Nearest Person Month Worked:** 1  
**Contribution to the Project:** RCG award

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International Travel: No

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Greg Carling  
**Email:** greg.carling@byu.edu  
**Most Senior Project Role:** Faculty  
**Nearest Person Month Worked:** 2  
**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:** 6  
**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

---

Christy Clay  
**Email:** cclay@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
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  

Jay DeSart  
Email: jdesart@uvu.edu  
Most Senior Project Role: Faculty  
Nearest Person Month Worked: 1  
Contribution to the Project: RCG award  
Funding Support: UVU  
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  

Eric Edwards  
Email: eric.charles.edwards@gmail.com  
Most Senior Project Role: Faculty  
Nearest Person Month Worked: 2  
Contribution to the Project: RFA2  
Funding Support: USU  
International Collaboration: No  
International Travel: No  

Boyd Edwards  
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

Steve Emerman
Email: stevenE@uvu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: RFA1

Funding Support: UVU

International Collaboration: No
International Travel: No

Carla Endres
Email: carla.endres@usu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 0

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
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

Courtney Flint
Email: Courtney.Flint@usu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 2

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

Funding Support: iUTAH
International Collaboration: No
International Travel: No

Joanna Ganning
Email: joanna.ganning@utah.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 2

Contribution to the Project: RFA2 and RFA3

Funding Support: UU
International Collaboration: No
International Travel: No

Shana Geffeney
Email: shana.geffeney@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: 2

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: 0

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

Funding Support: Snow College

International Collaboration: No
International Travel: No

Fred Govedich
Email: govedich@suu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: RCG award

Funding Support: SUU

International Collaboration: No
International Travel: No

Jacqueline Grant
Email: jacqualinegrant@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

Sarah Hinners
Email: sarah.hinners@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: 0
Contribution to the Project: Faculty at UVU participating in research at iUTAH
Funding Support: UVU
International Collaboration: No
International Travel: No

Jeff Horsburgh
Email: jeff.horsburgh@usu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 3
Contribution to the Project: USU Faculty
Funding Support: USU
International Collaboration: No
International Travel: No

Peter Howe
Email: peter.howe@usu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 0
Contribution to the Project: Faculty at USU participating in research at iUTAH
Funding Support: USU
International Collaboration: No
International Travel: No

Hilary Hungerford
Email: hilary.hungerford@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

Laura Hunter
Email: lhunter@uen.org
Most Senior Project Role: Faculty
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<td><a href="mailto:nancy.huntly@usu.edu">nancy.huntly@usu.edu</a></td>
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<td><a href="mailto:ryan.jensen@byu.edu">ryan.jensen@byu.edu</a></td>
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<td><a href="mailto:jiming.jin@usu.edu">jiming.jin@usu.edu</a></td>
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<td>Gary Johnson</td>
<td><a href="mailto:garyjohnson@weber.edu">garyjohnson@weber.edu</a></td>
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Funding Support: Weber St.

International Collaboration: No
International Travel: No

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: 2

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

Funding Support: USU

International Collaboration: No
International Travel: No

Shalini Kesar
Email: kesar@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

Shujuan Li
Email: shujuan.li@usu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 2

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

Funding Support: USU

International Collaboration: 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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<th>David Matty</th>
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<td><strong>Email:</strong> <a href="mailto:dmatty@weber.edu">dmatty@weber.edu</a></td>
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William McDowell
Email: bill.mcdowell@unh.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 0
Contribution to the Project: External Advisory Board
Funding Support: UNH
International Collaboration: No
International Travel: No

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

William Michener
Email: wmichene@unm.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 0
Contribution to the Project: External Advisory Board
Funding Support: UNM
International Collaboration: No
International Travel: No

Becky Monhardt
Email: rebecca.monhardt@loras.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1
Contribution to the Project: Faculty at Loras College participating in research at iUTAH
Funding Support: Loras College
International Collaboration: No
International Travel: No

Christopher Monson
Email: christophermonson1@suu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: RCG award

Funding Support: SUU

International Collaboration: No
International Travel: No

Jeffrey Moore
Email: jeff.moore@utah.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: RCG award

Funding Support: UU

International Collaboration: No
International Travel: No

Lucas Moyer-Horner
Email: lucas.m.horner@utah.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: co-lead iFellows

Funding Support: UU

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

Sarah Null
Email: sarah.null@usu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 2

Contribution to the Project: Faculty at USU participating in research at iUTAH
Funding Support: USU
International Collaboration: No
International Travel: No

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

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

Christine Pomeroy
Email: christine.pomeroy@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

Mitchell Power
Email: mitchell.power@geog.utah.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: RCG award

Funding Support: UU
International Collaboration: No
International Travel: No

David Rosenberg
Email: david.rosenberg@usu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 2

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

International Collaboration: No
International Travel: No

Alexander Simon
Email: alex.simon@uvu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: RCG award
Funding Support: UVU

International Collaboration: No
International Travel: No

Sam St. Clair
Email: stclair@byu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 2

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

International Collaboration: No
International Travel: No

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
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

David Tarboton
Email: david.tarboton@usu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 0

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

Funding Support: USU

International Collaboration: No
International Travel: No

Nathan Toke
Email: nathan.toke@uvu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: RCG award

Funding Support: UVU

International Collaboration: No
International Travel: No

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

Andrew Van Alstyne
Email: andrewvanalstyne@suu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1
Contribution to the Project: RCG award
Funding Support: SUU
International Collaboration: No
International Travel: No

Anne Wairepo
Email: annew@uvu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 0
Contribution to the Project: Faculty at UVU participating in research at iUTAH
Funding Support: UVU
International Collaboration: No
International Travel: No

Simon Wang
Email: simon.wang@usu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1
Contribution to the Project: RFA1 and RFA3
Funding Support: USU
International Collaboration: No
International Travel: No

Kim Weaver
Email: weaver@suu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1
Contribution to the Project: RCG award
Funding Support: SUU
International Collaboration: No
International Travel: No

Matthew Weeg
Email: matthewweeg@suu.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1
Contribution to the Project: RCG award
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<td>Bo Yang</td>
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<td>Sara Yeo</td>
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<td>Maura Hahnenberger</td>
<td><a href="mailto:mhahnenb@bruinmail.slcc.edu">mhahnenb@bruinmail.slcc.edu</a></td>
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<td>Marian Howe-Taylor</td>
<td><a href="mailto:marian.howe-taylor@slcc.edu">marian.howe-taylor@slcc.edu</a></td>
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**Mary Jane Keleher**  
Email: maryjane.keleher@slcc.edu  
**Most Senior Project Role:** Community College 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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**Daniel Poole**  
Email: daniel.poole@slcc.edu  
**Most Senior Project Role:** Community College Faculty  
**Nearest Person Month Worked:** 1  
**Contribution to the Project:** RFA2  
**Funding Support:** SLCC  
**International Collaboration:** No  
**International Travel:** No

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**Kristina Kaly**  
Email: kristina.kaly@slcschools.org  
**Most Senior Project Role:** K-12 Teacher  
**Nearest Person Month Worked:** 1  
**Contribution to the Project:** External Engagement/Outreach, EOD innovation award  
**Funding Support:** Rose Park Elementary  
**International Collaboration:** No  
**International Travel:** No

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**Ken Obrien**  
Email: Ken.Obrien@slcschools.org  
**Most Senior Project Role:** K-12 Teacher  
**Nearest Person Month Worked:** 1  
**Contribution to the Project:** External Engagement/Outreach, EOD innovation award  
**Funding Support:** Rose Park Elementary  
**International Collaboration:** No  
**International Travel:** No
Rachel Gabor
Email: rachel.gabor@utah.edu
Most Senior Project Role: Postdoctoral (scholar, fellow or other postdoctoral position)
Nearest Person Month Worked: 12

Contribution to the Project: RFA1 and RFA2

Funding Support: iUTAH

International Collaboration: No
International Travel: No

Melissa Haeffner
Email: melissahaeffner@gmail.com
Most Senior Project Role: Postdoctoral (scholar, fellow or other postdoctoral position)
Nearest Person Month Worked: 2

Contribution to the Project: RFA2

Funding Support: iUTAH

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: iUTAH

International Collaboration: No
International Travel: No

Krishna Khatri
Email: krishna.khatri@gmail.com
Most Senior Project Role: Postdoctoral (scholar, fellow or other postdoctoral position)
Nearest Person Month Worked: 1

Contribution to the Project: RFA3

Funding Support: iUTAH

International Collaboration: No
International Travel: No

Erik Oerter
Email: erik.oerter@berkeley.edu
Most Senior Project Role: Postdoctoral (scholar, fellow or other postdoctoral position)
Samantha Weintraub
Email: samantha.weintraub@utah.edu
Most Senior Project Role: Postdoctoral (scholar, fellow or other postdoctoral position)
Nearest Person Month Worked: 12
Contribution to the Project: UU postdoc participating in iUTAH research
Funding Support: UU
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

Ellen Bailey
Email: ellen.bailey@usu.edu
Most Senior Project Role: Other Professional
Nearest Person Month Worked: 1
Contribution to the Project: USU Water Quality Extension
Funding Support: USU
International Collaboration: No
International Travel: No

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

---

**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

---

**Kerry Bringhurst**

**Email:** kerry.bringhurst@usu.edu

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 1

**Contribution to the Project:** External Engagement/Outreach, EOD innovation award

**Funding Support:** UPR

**International Collaboration:** No

**International Travel:** No

---

**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

---

**Marcy DeMillion**

**Email:** marcy_demillion@nps.gov

**Most Senior Project Role:** Other Professional

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Education specialist with the National Park Service

**Funding Support:** US NPS

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

Sue Dintelman
Email: sue@pleiades-software.com
Most Senior Project Role: Other Professional
Nearest Person Month Worked: 0

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

Funding Support: Pleiades Software, Inc.

International Collaboration: No
International Travel: No

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

Ellen Eiriksson
Email: ellen.eiriksson@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

Tamara Goetz
Email: tgoetz@utah.gov
Most Senior Project Role: Other Professional
Nearest Person Month Worked: 1

Contribution to the Project: State EPSCoR Committee Member from GOED

Funding Support: Utah GOED

International Collaboration: No
International Travel: No
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

Jeannine Huenemann
Email: jeannine.huenemann@usu.edu
Most Senior Project Role: Other Professional
Nearest Person Month Worked: 7

Contribution to the Project: Communications Specialist

Funding Support: iUTAH
International Collaboration: No
International Travel: No

Terra Huff
Email: terra.huff@usu.edu
Most Senior Project Role: Other Professional
Nearest Person Month Worked: 6

Contribution to the Project: Financial Oficer of IUTAH at USU

Funding Support: USU
International Collaboration: No
International Travel: No

Chris Keleher
Email: ChristopherKeleher@utah.gov
Most Senior Project Role: Other Professional
Nearest Person Month Worked: 0

Contribution to the Project: Member of iUTAH management team

Funding Support: State of Utah
International Collaboration: No
International Travel: No

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

Andreas Leidolf
Email: andreas.leidolf@usu.edu
Most Senior Project Role: Other Professional
Nearest Person Month Worked: 12
Contribution to the Project: Assistant Director/Project Administrator
Funding Support: iUTAH
International Collaboration: No
International Travel: No

Caitlyn Lewis
Email: caitlyn.lewis@usu.edu
Most Senior Project Role: Other Professional
Nearest Person Month Worked: 9
Contribution to the Project: Outreach Assistant
Funding Support: iUTAH
International Collaboration: No
International Travel: No

Cassandra Manuelito-Kerkvliet
Email: manuelitokerkvliet@hotmail.com
Most Senior Project Role: Other Professional
Nearest Person Month Worked: 0
Contribution to the Project: External Advisory Board
Funding Support: CMK Consultancy part of the EAB
International Collaboration: No
International Travel: No

Anna McEntire
Email: anna.mcentre@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

---

**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

---

**Mary-Ann Muffoletto**
**Email:** maryann.muffoletto@usu.edu
**Most Senior Project Role:** Other Professional
**Nearest Person Month Worked:** 0

**Contribution to the Project:** Communications Specialist working with iUTAH

**Funding Support:** USU

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

---

**Adelbert Nelson**
**Email:** mansel.nelson@nau.edu
**Most Senior Project Role:** Other Professional
**Nearest Person Month Worked:** 0

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

**Funding Support:** Northern Arizona U

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

---

**Herm Olsen**
**Email:** herm@hao-law.com
**Most Senior Project Role:** Other Professional
**Nearest Person Month Worked:** 0

**Contribution to the Project:** Lawyer with Logan law firm

**Funding Support:** Hillyard, Anderson and Olsen PC

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

---

**Jennifer Pemberton**  
**Email:** jennifercpemberton@gmail.com  
**Most Senior Project Role:** Other Professional  
**Nearest Person Month Worked:** 1  
**Contribution to the Project:** External Engagement/Outreach, EOD innovation award  
**Funding Support:** UPR  
**International Collaboration:** No  
**International Travel:** No

---

**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

---

**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

---

**Kevin Rhodes**  
**Email:** krhodes@campbellsci.com  
**Most Senior Project Role:** Other Professional  
**Nearest Person Month Worked:** 1  
**Contribution to the Project:** Workforce Development Team Member  
**Funding Support:** Campbell Scientific LLC  
**International Collaboration:** No  
**International Travel:** No
Eli Robinson
Email: eli.robinson@usu.edu
Most Senior Project Role: Other Professional
Nearest Person Month Worked: 1

Contribution to the Project: USU Water Quality Extension
Funding Support: USU
International Collaboration: No
International Travel: No

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

Jessica Seppi
Email: jseppi@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

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

Judy Van Houten
Email: Judith.Vanhouten@uvm.edu
Most Senior Project Role: Other Professional
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<td>Weihong Wang</td>
<td><a href="mailto:weihong.wang@uvu.edu">weihong.wang@uvu.edu</a></td>
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<td>Sarah Young</td>
<td><a href="mailto:sarah.young@schools.utah.gov">sarah.young@schools.utah.gov</a></td>
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<td>Jessica Anderson</td>
<td><a href="mailto:janderson@uen.org">janderson@uen.org</a></td>
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<td>Molly Cannon</td>
<td><a href="mailto:molly.cannon@usu.edu">molly.cannon@usu.edu</a></td>
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</table>
Funding Support: USU
International Collaboration: No
International Travel: No

Jobie Carlisle
Email: jobie@usu.edu
Most Senior Project Role: Technician
Nearest Person Month Worked: 1

Contribution to the Project: Technician at USU

Funding Support: USU
International Collaboration: No
International Travel: No

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

Dylan Dastrup
Email: dylandastrup@comcast.net
Most Senior Project Role: Technician
Nearest Person Month Worked: 12

Contribution to the Project: BYU Technician sponsored by iUTAH

Funding Support: iUTAH
International Collaboration: No
International Travel: No

Dave Eiriksson
Email: dave.eiriksson@utah.edu
Most Senior Project Role: Technician
Nearest Person Month Worked: 12

Contribution to the Project: UU technician sponsored by iUTAH

Funding Support: iUTAH
International Collaboration: No
International Travel: No

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

Amber Jones
Email: amber.jones@usu.edu
Most Senior Project Role: Technician
Nearest Person Month Worked: 12

Contribution to the Project: USU Water Lab Tech sponsored by iUTAH
Funding Support: iUTAH
International Collaboration: No
International Travel: No

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

Matt Lorimer
Email: matt.lorimer@usu.edu
Most Senior Project Role: Technician
Nearest Person Month Worked: 1

Contribution to the Project: CI, systems administrator
Funding Support: USU
International Collaboration: No
International Travel: No
Stephanie Reeder
Email: stephanie.reeder@usu.edu
Most Senior Project Role: Technician
Nearest Person Month Worked: 3
Contribution to the Project: Technician-Programmer at USU Water Lab
Funding Support: USU
International Collaboration: No
International Travel: No

Morgan Grove
Email: mgrove@fs.fed.us
Most Senior Project Role: Staff Scientist (doctoral level)
Nearest Person Month Worked: 0
Contribution to the Project: External Advisory Board
Funding Support: USFS
International Collaboration: No
International Travel: No

Matt Miller
Email: mamiller@usgs.gov
Most Senior Project Role: Staff Scientist (doctoral level)
Nearest Person Month Worked: 0
Contribution to the Project: USGS official, water data and advise provider
Funding Support: USGS
International Collaboration: No
International Travel: No

Brian 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

Michelle Barnes
Email: mlbarnes33@gmail.com
Most Senior Project Role: Graduate Student (research assistant)
**Nearest Person Month Worked:** 4

**Contribution to the Project:** USU graduate student participating in iUTAH research

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

---

**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

---

**Caleb Buahin**

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

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

**Nearest Person Month Worked:** 6

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

**Funding Support:** USU

**International Collaboration:** No

**International Travel:** No

---

**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

---

**Taya Carothers**

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

**Nearest Person Month Worked:** 6

**Contribution to the Project:** USU graduate student participating in iUTAH research
Allison Chan
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Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6
Contribution to the Project: UU graduate student sponsored by iUTAH

Hannah Checketts
Email: hannahncchecketts@gmail.com
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6
Contribution to the Project: BYU graduate student participating in iUTAH research.

Youcan Feng
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Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6
Contribution to the Project: UU graduate student sponsored by iUTAH

Andrew Gelderloos
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Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6
Contribution to the Project: UU graduate student sponsored by iUTAH
International Travel: No

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

Tim Goodsell
Email: timothy.goodsell@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 supervised by Greg Carling

Funding Support: BYU

International Collaboration: No
International Travel: No

Carly Hansen
Email: carlyahansen@gmail.com
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 1

Contribution to the Project: Volunteer on iUTAH WaterGirls program, an iUTAH EOD Innovation Award-sponsored project.

Funding Support: UU

International Collaboration: No
International Travel: No

Yusuf Jameel
Email: yusuf8ysf@gmail.com
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6

Contribution to the Project: UU graduate student participating in iUTAH research

Funding Support: UU

International Collaboration: No
International Travel: No
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<tr>
<td>Ryan James</td>
<td><a href="mailto:ryjamesj@gmail.com">ryjamesj@gmail.com</a></td>
<td>Graduate Student (research assistant)</td>
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<td><a href="mailto:erinfjones3@gmail.com">erinfjones3@gmail.com</a></td>
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<td><a href="mailto:julia.kelso@gmail.com">julia.kelso@gmail.com</a></td>
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<td>Miguel Leonardo</td>
<td><a href="mailto:miguel.leonardo@usu.edu">miguel.leonardo@usu.edu</a></td>
<td>Graduate Student (research assistant)</td>
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Nearest Person Month Worked: 6

Contribution to the Project: USU graduate student participating in iUTAH research

Funding Support: USU

International Collaboration: No
International Travel: No

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

Tylan Magnusson
Email: ty.magnusson@gmail.com
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 1

Contribution to the Project: BYU graduate student participating in iUTAH research

Funding Support: BYU

International Collaboration: No
International Travel: No

Jordan Maxwell
Email: jdmax29@gmail.com
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6

Contribution to the Project: BYU graduate student participating in iUTAH research

Funding Support: BYU

International Collaboration: No
International Travel: No

Anthony Melcher
Email: tmelcher@aggiemail.usu.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6

Contribution to the Project: USU graduate student participating in iUTAH research
Funding Support: USU

International Collaboration: No
International Travel: No

Bryce Mihaevich
Email: bryce.mihal@gmail.com
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6

Contribution to the Project: USU graduate student participating in iUTAH research

Funding Support: USU

International Collaboration: No
International Travel: No

Brett Miller
Email: brett.alan.miller@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

Mallory Millington
Email: malmillington@gmail.com
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6

Contribution to the Project: UU graduate student participating in iUTAH research

Funding Support: UU

International Collaboration: No
International Travel: No

Brianne Nielsen
Email: brnnnielsen@gmail.com
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6

Contribution to the Project: USU graduate student participating in iUTAH research

Funding Support: USU

International Collaboration: No
International Travel: No

Elizabeth Ogata
Email: bethogata@gmail.com
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6
Contribution to the Project: Graduate researcher working on iUTAH
Funding Support: USU Presidential Doctoral Research Fellowship
International Collaboration: No
International Travel: No

Mary Oliver
Email: OliverLeeMary@gmail.com
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6
Contribution to the Project: USU graduate student participating in iUTAH research
Funding Support: USU
International Collaboration: No
International Travel: No

Brian Packer
Email: bnoelpacker@gmail.com
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6
Contribution to the Project: BYU graduate student participating in iUTAH research.
Funding Support: BYU
International Collaboration: No
International Travel: No

Kshitij Parajuli
Email: kshparajuli@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
Alexei Perelet
Email: a.perelet@utah.edu
**Most Senior Project Role:** Graduate Student (research assistant)
**Nearest Person Month Worked:** 6

**Contribution to the Project:** UU graduate student participating in iUTAH research

**Funding Support:** UU

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

Matt Randall
Email: mattrandall3@gmail.com
**Most Senior Project Role:** Graduate Student (research assistant)
**Nearest Person Month Worked:** 6

**Contribution to the Project:** BYU graduate student participating in iUTAH research.

**Funding Support:** BYU

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

Kerri Russel
Email: kerriarussell@gmail.com
**Most Senior Project Role:** Graduate Student (research assistant)
**Nearest Person Month Worked:** 6

**Contribution to the Project:** BYU graduate student participating in iUTAH research

**Funding Support:** BYU

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

Victoria Russell
Email: victoriarussell@gmail.com
**Most Senior Project Role:** Graduate Student (research assistant)
**Nearest Person Month Worked:** 1

**Contribution to the Project:** Volunteer on iUTAH WaterGirls program, an iUTAH EOD Innovation Awards-sponsored project.

**Funding Support:** UU

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

Pratibha Sapkota
Email: pratibha.sapkota@utah.edu
Jason Scalzitti
Email: jason.scalzitti@utah.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6
Contribution to the Project: UU graduate student participating in iUTAH research
Funding Support: UU
International Collaboration: No
International Travel: No

Kimi Smith
Email: kimi.smith@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

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

Trinity Stout
Email: trinity.stout@aggiemail.usu.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6
Contribution to the Project: USU graduate student participating in iUTAH research
Funding Support: USU
International Collaboration: No
International Travel: No

Pratiti Tagore
Email: pratiti.tagore@gmail.com
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6

Contribution to the Project: UU graduate student participating in iUTAH research
Funding Support: UU
International Collaboration: No
International Travel: No

Crystal Tulley-Cordova
Email: tulleycordova@gmail.com
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6

Contribution to the Project: UU graduate student participating in iUTAH research
Funding Support: UU
International Collaboration: No
International Travel: No

Adrian Uzunian
Email: auzunian@gmail.com
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6

Contribution to the Project: USU graduate student participating in iUTAH research
Funding Support: USU
International Collaboration: No
International Travel: No

Joshua Walston
Email: joshwalston@gmail.com
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 4

Contribution to the Project: USU graduate student participating in iUTAH research
Funding Support: USU
Matthew Wheelwright
Email: u0990864@utah.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6

Contribution to the Project: UU graduate student participating in iUTAH research

Funding Support: UU

Trixie Wolf Rife
Email: trixwolf55@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

Sofiya Yuvshanova
Email: sofiya.yuvshanova@aggiemail.usu.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 6

Contribution to the Project: USU graduate student participating in iUTAH research

Funding Support: USU

Mario Harper
Email: mario.harper@usu.edu
Most Senior Project Role: Non-Student Research Assistant
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
Michael Abeln
Email: michaelabeln@mail.weber.edu
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: Weber St.

International Collaboration: No
International Travel: No

Patrick Adams
Email: patrickjnadams@gmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: USU

International Collaboration: No
International Travel: No

Caroline Alsterberg
Email: alsterberg.c@gmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: SLCC

International Collaboration: No
International Travel: No

Dee Anderson
Email: 10581302@uvlink.uvu.edu
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: UVU

International Collaboration: No
International Travel: No

Jeremy Andreini
Email: jeremy.andreini@hotmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: RCG undergrad

Funding Support: UVU

International Collaboration: No
International Travel: No

Francisco Arrieta
Email: francisco.arrieta@aggiemail.usu.edu
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: USU

International Collaboration: No
International Travel: No

Ben Barton
Email: benbarton12@gmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: BYU

International Collaboration: No
International Travel: No

Jonathan Belyue
Email: jrbelyue@gmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 3

Contribution to the Project: iUTAH Trainee

Funding Support: BYU

International Collaboration: No
International Travel: No

Myralynne Benally
Email: myralynnebenally@mail.weber.edu
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research
Funding Support: Weber St.
International Collaboration: No
International Travel: No

Brett Boyer
Email: boyer.brett@yahoo.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 3

Contribution to the Project: iUTAH Trainee

Funding Support: UU
International Collaboration: No
International Travel: No

Jared Brabazon
Email: jbrabazon13@gmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 3

Contribution to the Project: iUTAH Trainee

Funding Support: BYU
International Collaboration: No
International Travel: No

Anthony Bradford
Email: tcb182@hotmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: RCG undergrad

Funding Support: UVU
International Collaboration: No
International Travel: No

Beverly Brewer
Email: beverlybrewer@mail.weber.edu
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: Weber St.
International Collaboration: No
### Dane Brophy
- **Email:** dane.brophy@aggiemail.usu.edu
- **Most Senior Project Role:** Undergraduate Student
- **Nearest Person Month Worked:** 3
- **Contribution to the Project:** iUTAH Trainee
- **Funding Support:** USU
- **International Collaboration:** No
- **International Travel:** No

### Alex Brown
- **Email:** alex.brown7711@aggiemail.usu.edu
- **Most Senior Project Role:** Undergraduate Student
- **Nearest Person Month Worked:** 3
- **Contribution to the Project:** Undergrad student participating in iUTAH research
- **Funding Support:** USU
- **International Collaboration:** No
- **International Travel:** No

### Austin Brown
- **Email:** austin.brown@aggiemail.usu.edu
- **Most Senior Project Role:** Undergraduate Student
- **Nearest Person Month Worked:** 1
- **Contribution to the Project:** Undergrad student participating in iUTAH research
- **Funding Support:** USU
- **International Collaboration:** No
- **International Travel:** No

### Jesse Buchholz
- **Email:** jesserbuchholz@gmail.com
- **Most Senior Project Role:** Undergraduate Student
- **Nearest Person Month Worked:** 1
- **Contribution to the Project:** Undergrad student participating in iUTAH research
- **Funding Support:** UVU
- **International Collaboration:** No
- **International Travel:** No
Amberlee Burrows  
Email: amberleeburrows@yahoo.com  
**Most Senior Project Role:** Undergraduate Student  
**Nearest Person Month Worked:** 1  

**Contribution to the Project:** Undergrad student participating in iUTAH research  
**Funding Support:** USU  
**International Collaboration:** No  
**International Travel:** No

Nicholas Butterfield  
Email: nicholas.butterfield@yahoo.com  
**Most Senior Project Role:** Undergraduate Student  
**Nearest Person Month Worked:** 3  

**Contribution to the Project:** RCG undergrad  
**Funding Support:** UVU  
**International Collaboration:** No  
**International Travel:** No

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

**Contribution to the Project:** Undergrad student participating in iUTAH research  
**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

Andrew Carlson  
Email: ascarlson85@hotmail.com  
**Most Senior Project Role:** Undergraduate Student
Nearest Person Month Worked: 3
Contribution to the Project: RCG undergrad
Funding Support: SUU
International Collaboration: No
International Travel: No

Logan Carter
Email: logan.carter@suusuccess.org
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1
Contribution to the Project: RCG undergrad
Funding Support: SUU
International Collaboration: No
International Travel: No

Taylor Casper
Email: taylorcasper@hotmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1
Contribution to the Project: Undergrad student participating in iUTAH research
Funding Support: UVU
International Collaboration: No
International Travel: No

Neal Christiansen
Email: alexblack30152@gmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 3
Contribution to the Project: RCG undergrad
Funding Support: UVU
International Collaboration: No
International Travel: No

Allison Christopher
Email: callison1@mail.weber.edu
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1
Contribution to the Project: Undergrad student participating in iUTAH research
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<th>Name</th>
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<th>Nearest Person Month Worked</th>
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<th>Funding Support</th>
<th>International Collaboration</th>
<th>International Travel</th>
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<tr>
<td>Scott Collins</td>
<td><a href="mailto:fmg333@gmail.com">fmg333@gmail.com</a></td>
<td>Undergraduate Student</td>
<td>3</td>
<td>iUTAH Trainee</td>
<td>BYU</td>
<td>No</td>
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<td>Cassandra Cornell</td>
<td><a href="mailto:cassandracornell@mail.weber.edu">cassandracornell@mail.weber.edu</a></td>
<td>Undergraduate Student</td>
<td>1</td>
<td>Undergrad student participating in iUTAH research</td>
<td>Weber St.</td>
<td>No</td>
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<tr>
<td>Jacob Crnich</td>
<td><a href="mailto:jacobcrnich@mail.weber.edu">jacobcrnich@mail.weber.edu</a></td>
<td>Undergraduate Student</td>
<td>1</td>
<td>Undergrad student participating in iUTAH research</td>
<td>Weber St.</td>
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<td>Jared Dangerfield</td>
<td><a href="mailto:jared.dangerfield22@gmail.com">jared.dangerfield22@gmail.com</a></td>
<td>Undergraduate Student</td>
<td>1</td>
<td>Undergrad student participating in iUTAH research</td>
<td>USU</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
International Travel: No

Kent Dean
Email: deaner12.td@gmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 3

Contribution to the Project: Undergrad student participating in iUTAH research
Funding Support: USU

International Collaboration: No
International Travel: No

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Email: cynthiaelliott@mail.weber.edu
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research
Funding Support: Weber St.

International Collaboration: No
International Travel: No

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Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research
Funding Support: Weber St.

International Collaboration: No
International Travel: No

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Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 3

Contribution to the Project: Undergrad student participating in iUTAH research
Funding Support: USU

International Collaboration: No
International Travel: No
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Email: 21coral.reef@gmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 2

Contribution to the Project: RCG undergrad
Funding Support: SUU
International Collaboration: No
International Travel: No

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Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research
Funding Support: USU
International Collaboration: No
International Travel: No

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Email: borgny_gerth@hotmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research
Funding Support: SLCC
International Collaboration: No
International Travel: No

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Email: j.elise.gherasim@gmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 3

Contribution to the Project: RCG undergrad
Funding Support: UVU
International Collaboration: No
International Travel: No

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Email: uflm801@gmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: UU

International Collaboration: No
International Travel: No

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Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: Weber St.

International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: Weber St.

International Collaboration: No
International Travel: No

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Email: carlghallows@gmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 2

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: SUU

International Collaboration: No
International Travel: No

Areg Haytayan
Email: areg.haytayan@usu.edu
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 6

Contribution to the Project: iUTAH office assistant
Funding Support: iUTAH
International Collaboration: No
International Travel: No

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Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: USU
International Collaboration: No
International Travel: No

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Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: USU
International Collaboration: No
International Travel: No

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Email: alissa.humes1997@gmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 2

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: USU
International Collaboration: No
International Travel: No

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Email: matzindergard@gmail.com
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Nearest Person Month Worked: 2

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: SUU
International Collaboration: No
## Simone Jackson
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*Most Senior Project Role:* Undergraduate Student  
*Nearest Person Month Worked:* 3  

**Contribution to the Project:** iUTAH Trainee  
**Funding Support:** UU  
**International Collaboration:** No  
**International Travel:** No

---

## Joshua Jackson
*Email:* joshuawilliamjackson1@gmail.com  
*Most Senior Project Role:* Undergraduate Student  
*Nearest Person Month Worked:* 3  

**Contribution to the Project:** Undergrad student participating in iUTAH research  
**Funding Support:** UVU  
**International Collaboration:** No  
**International Travel:** No

---

## Dustin Joe
*Email:* djoe1776@gmail.com  
*Most Senior Project Role:* Undergraduate Student  
*Nearest Person Month Worked:* 2  

**Contribution to the Project:** Undergrad student participating in iUTAH research  
**Funding Support:** UVU  
**International Collaboration:** No  
**International Travel:** No

---

## Christianna Johnson
*Email:* christiannajohnson18@gmail.com  
*Most Senior Project Role:* Undergraduate Student  
*Nearest Person Month Worked:* 1  

**Contribution to the Project:** Undergrad student participating in iUTAH research  
**Funding Support:** UU  
**International Collaboration:** No  
**International Travel:** No
Ryan Johnson  
Email: ryan.z.johnson@outlook.com  
Most Senior Project Role: Undergraduate Student  
Nearest Person Month Worked: 1  

Contribution to the Project: Undergrad student participating in iUTAH research  
Funding Support: USU  
International Collaboration: No  
International Travel: No

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Email: shelstar17@gmail.com  
Most Senior Project Role: Undergraduate Student  
Nearest Person Month Worked: 1  

Contribution to the Project: Undergrad student participating in iUTAH research  
Funding Support: USU  
International Collaboration: No  
International Travel: No

Ian Kesler  
Email: ianmkesler@gmail.com  
Most Senior Project Role: Undergraduate Student  
Nearest Person Month Worked: 1  

Contribution to the Project: RCG undergrad  
Funding Support: SUU  
International Collaboration: No  
International Travel: No

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Most Senior Project Role: Undergraduate Student  
Nearest Person Month Worked: 1  

Contribution to the Project: RCG undergrad  
Funding Support: Weber St.  
International Collaboration: No  
International Travel: No

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Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: UVU

International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 2

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: SUU

International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: UVU

International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 3

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: Weber St.

International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research
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Nearest Person Month Worked: 2

Contribution to the Project: RCG undergrad

Funding Support: SUU

International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: Weber St.

International Collaboration: No
International Travel: No

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Email: leanlyons@mail.weber.edu
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Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: Weber St.

International Collaboration: No
International Travel: No

Belinda Madsen
Email: belindacmadsen@gmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Volunteer on iUTAH WaterGirls program, an iUTAH EOD Innovation Awards-sponsored project.

Funding Support: SLCC
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**Email:** crm0119@westminstercollege.edu  
**Most Senior Project Role:** Undergraduate Student  
**Nearest Person Month Worked:** 1  
**Contribution to the Project:** RCG undergrad  
**Funding Support:** Westminster College

Mackenzie Martin  
**Email:** mackenziemartin@sandiego.edu  
**Most Senior Project Role:** Undergraduate Student  
**Nearest Person Month Worked:** 3  
**Contribution to the Project:** Undergrad student participating in iUTAH research  
**Funding Support:** UU

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**Email:** charles.mascher@gmail.com  
**Most Senior Project Role:** Undergraduate Student  
**Nearest Person Month Worked:** 3  
**Contribution to the Project:** iUTAH Trainee  
**Funding Support:** USU

Mario Matos  
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**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
Josh Matt
Email: joshuampc@aol.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 3

Contribution to the Project: RCG undergrad

Funding Support: SUU

International Collaboration: No
International Travel: No

Devan McLain
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Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 2

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: UVU

International Collaboration: No
International Travel: No

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Email: blaisemendenhall@mail.weber.edu
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: Weber St.

International Collaboration: No
International Travel: No

Lohra Miller
Email: lohramickelle@hotmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 2

Contribution to the Project: RCG undergrad

Funding Support: SUU

International Collaboration: No
International Travel: No

Sara Mitchell
Email: sara.mitchell@utah.edu
Most Senior Project Role: Undergraduate Student
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<td>Jessica Murdock</td>
<td><a href="mailto:jessicamurdock@mail.weber.edu">jessicamurdock@mail.weber.edu</a></td>
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<td>Jarrett Nichols</td>
<td><a href="mailto:jarett.nichols@gmail.com">jarett.nichols@gmail.com</a></td>
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<td>Jenny Nistler</td>
<td><a href="mailto:jennynistler@mail.weber.edu">jennynistler@mail.weber.edu</a></td>
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Funding Support: Weber St.

International Collaboration: No
International Travel: No

Colby Oliverson
Email: colbyoliverson@gmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 3

Contribution to the Project: RCG undergrad

Funding Support: UVU

International Collaboration: No
International Travel: No

James Patton
Email: j.patton@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

Hannah Peterson
Email: Hannah.peterson65@gmail.com
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 3

Contribution to the Project: RCG undergrad

Funding Support: UVU

International Collaboration: No
International Travel: No

Karlee Peterson
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Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: USU

International Collaboration: No
International Travel: No

Brandon Pettersson
Email: brandonpettersson@mail.weber.edu
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: Weber St.

International Collaboration: No
International Travel: No

Jacob Preston
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Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 2

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: SUU

International Collaboration: No
International Travel: No

Henintsoa Rakotoarisaona
Email: hentsrak@yahoo.fr
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Nearest Person Month Worked: 1

Contribution to the Project: RCG undergrad

Funding Support: UVU

International Collaboration: No
International Travel: No

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
Nayla Rhein  
Email: nayla.rhein@gmail.com  
Most Senior Project Role: Undergraduate Student  
Nearest Person Month Worked: 2  
Contribution to the Project: Undergrad student participating in iUTAH research  
Funding Support: SUU  
International Collaboration: No  
International Travel: No

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Contribution to the Project: iUTAH Trainee  
Funding Support: USU  
International Collaboration: No  
International Travel: No

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Email: karenroberson@mail.weber.edu  
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Nearest Person Month Worked: 1  
Contribution to the Project: RCG undergrad  
Funding Support: Weber St.  
International Collaboration: No  
International Travel: No

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Most Senior Project Role: Undergraduate Student  
Nearest Person Month Worked: 1  
Contribution to the Project: RCG undergrad  
Funding Support: Westminster College  
International Collaboration: No  
International Travel: No

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Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: Weber St.

International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: Weber St.

International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: BYU

International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 1

Contribution to the Project: RCG undergrad

Funding Support: UVU

International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 3

Contribution to the Project: iUTAH Trainee
Funding Support: BYU

International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 3

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: USU

International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 3

Contribution to the Project: RCG undergrad

Funding Support: UVU

International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: USU

International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 2

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Funding Support: SUU

International Collaboration: No
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Contribution to the Project: iUTAH Trainee
Funding Support: USU
International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 3
Contribution to the Project: RCG undergrad
Funding Support: UVU
International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 3
Contribution to the Project: RCG undergrad
Funding Support: SUU
International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 2
Contribution to the Project: Undergrad student participating in iUTAH research
Funding Support: SUU
International Collaboration: No
International Travel: No
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Nearest Person Month Worked: 3

Contribution to the Project: iUTAH Trainee
Funding Support: USU
International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research
Funding Support: USU
International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 3

Contribution to the Project: RCG undergrad
Funding Support: UVU
International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research
Funding Support: USU
International Collaboration: No
International Travel: No

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Email: tori.valora@gmail.com
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Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: USU

International Collaboration: No
International Travel: No

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Email: visserphilip@yahoo.com
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Nearest Person Month Worked: 1

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: USU

International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 3

Contribution to the Project: iUTAH Trainee

Funding Support: USU

International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 2

Contribution to the Project: Undergrad student participating in iUTAH research

Funding Support: SUU

International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 2

Contribution to the Project: Undergrad student participating in iUTAH research
 Chelsea Welker  
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**Nearest Person Month Worked:** 1  
**Contribution to the Project:** Undergrad student participating in iUTAH research

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**Contribution to the Project:** iUTAH Trainee

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**Nearest Person Month Worked:** 3  
**Contribution to the Project:** Undergrad student participating in iUTAH research

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Email: Logan@yefimov.onmicrosoft.com  
**Most Senior Project Role:** Undergraduate Student  
**Nearest Person Month Worked:** 2  
**Contribution to the Project:** Undergrad student participating in iUTAH research
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<tr>
<td>Dennis Yu</td>
<td><a href="mailto:dennisyu@mail.weber.edu">dennisyu@mail.weber.edu</a></td>
<td>Undergraduate Student</td>
<td>1</td>
<td>Undergrad student participating in iUTAH research</td>
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<td>Jacqueline Ewing-Taylor</td>
<td><a href="mailto:jacque@unr.edu">jacque@unr.edu</a></td>
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<td>Heather McInnis</td>
<td><a href="mailto:hmcinnis@aaas.org">hmcinnis@aaas.org</a></td>
<td>Consultant</td>
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<td>Program Director with AAAS Research Competitiveness Program</td>
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<td>Mark Milutinovich</td>
<td><a href="mailto:mmilutin@aaas.org">mmilutin@aaas.org</a></td>
<td>Consultant</td>
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Alan Porter
Email: alan.porter@isye.gatech.edu
Most Senior Project Role: Consultant
Nearest Person Month Worked: 0

Contribution to the Project: External Assessment Team

Funding Support: Georgia Tech
International Collaboration: No
International Travel: No

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Nearest Person Month Worked: 1

Contribution to the Project: Consultant working with iUTAH

Funding Support: iUTAH
International Collaboration: No
International Travel: No

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Email: ahn32191@gmail.com
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant
Nearest Person Month Worked: 3

Contribution to the Project: iFellow

Funding Support: SLCC
International Collaboration: No
International Travel: No
Year of schooling completed:
Home Institution:
Government fiscal year(s) was this REU participant supported:

Amanda Araujo
Email: amanda.araujo5214@gmail.com
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant
Nearest Person Month Worked: 3

Contribution to the Project: iFellow

Funding Support: BYU
International Collaboration: No
International Travel: No
Year of schooling completed:
Home Institution:
Government fiscal year(s) was this REU participant supported:

Viviane Baji
Email: Vbaji93@gmail.com
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant
Nearest Person Month Worked: 3
Contribution to the Project: iFellow
Funding Support: USU
International Collaboration: No
International Travel: No
Year of schooling completed: 
Home Institution: 
Government fiscal year(s) was this REU participant supported:

Matthew Barnett
Email: matthew.barnett@aggiemail.usu.edu
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant
Nearest Person Month Worked: 3
Contribution to the Project: iFellow
Funding Support: USU
International Collaboration: No
International Travel: No
Year of schooling completed: 
Home Institution: 
Government fiscal year(s) was this REU participant supported:

Jesse Fleri
Email: jessefleri@gmail.com
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant
Nearest Person Month Worked: 3
Contribution to the Project: iFellow
Funding Support: USU
International Collaboration: No
International Travel: No
Year of schooling completed: 
Home Institution: 
Government fiscal year(s) was this REU participant supported:

Josh Gathro
Email: jdgreply@gmail.com
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant
Nearest Person Month Worked: 3
Contribution to the Project: iFellow
Funding Support: USU
International Collaboration: No
International Travel: No
Year of schooling completed:
Home Institution:
Government fiscal year(s) was this REU participant supported:

Natasha Griffin
Email: natasha.a.griffin@gmail.com
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant
Nearest Person Month Worked: 3
Contribution to the Project: iFellow
Funding Support: BYU
International Collaboration: No
International Travel: No
Year of schooling completed:
Home Institution:
Government fiscal year(s) was this REU participant supported:

Sawyer Hill
Email: sgh0303@westminstercollege.edu
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant
Nearest Person Month Worked: 3
Contribution to the Project: iFellow
Funding Support: Westminster College
International Collaboration: No
International Travel: No
Year of schooling completed:
Home Institution:
Government fiscal year(s) was this REU participant supported:

Joseph Ipson
Email: ahrkelion@gmail.com
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant
Nearest Person Month Worked: 3
Contribution to the Project: iFellow
Funding Support: Snow College
International Collaboration: No
International Travel: No
Year of schooling completed:
Home Institution:
Government fiscal year(s) was this REU participant supported:

Matthew Johnson
Email: mashtomato79@gmail.com
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant
Nearest Person Month Worked: 3

Contribution to the Project: iFellow

Funding Support: Weber St.

International Collaboration: No
International Travel: No
Year of schooling completed:
Home Institution:
Government fiscal year(s) was this REU participant supported:

Heather King
Email: heather.king@utah.edu
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant
Nearest Person Month Worked: 3

Contribution to the Project: iFellow

Funding Support: UU

International Collaboration: No
International Travel: No
Year of schooling completed:
Home Institution:
Government fiscal year(s) was this REU participant supported:

Zack Oldroyd
Email: zack.oldroyd@aggiemail.usu.edu
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant
Nearest Person Month Worked: 3

Contribution to the Project: iFellow

Funding Support: USU

International Collaboration: No
International Travel: No
Year of schooling completed:
Home Institution:
Government fiscal year(s) was this REU participant supported:
Jordan Risley  
Email: jordan.risley@aggiemail.usu.edu  
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant  
Nearest Person Month Worked: 3  
Contribution to the Project: iFellow  
Funding Support: USU  
International Collaboration: No  
International Travel: No  
Year of schooling completed:  
Home Institution:  
Government fiscal year(s) was this REU participant supported:  

Elizabeth Tanner  
Email: etanne19@bruinmail.slcc.edu  
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant  
Nearest Person Month Worked: 3  
Contribution to the Project: iFellow  
Funding Support: SLCC  
International Collaboration: No  
International Travel: No  
Year of schooling completed:  
Home Institution:  
Government fiscal year(s) was this REU participant supported:  

Philip Valle  
Email: philipvalle@mail.weber.edu  
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant  
Nearest Person Month Worked: 3  
Contribution to the Project: iFellow  
Funding Support: Weber St.  
International Collaboration: No  
International Travel: No  
Year of schooling completed:  
Home Institution:  
Government fiscal year(s) was this REU participant supported:  

Jamie Vawdrey  
Email: jamie.vawdrey@aggiemail.usu.edu  
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant  
Nearest Person Month Worked: 3  
Contribution to the Project: iFellow
Funding Support: USU

International Collaboration: No
International Travel: No
Year of schooling completed: 
Home Institution:
Government fiscal year(s) was this REU participant supported:

Darianne Willey
Email: dariannewilley@gmail.com
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant
Nearest Person Month Worked: 3

Contribution to the Project: iFellow

Funding Support: USU

International Collaboration: No
International Travel: No
Year of schooling completed: 
Home Institution:
Government fiscal year(s) was this REU participant supported:

Shannon Williams
Email: shannon.williams027@gmail.com
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant
Nearest Person Month Worked: 3

Contribution to the Project: iFellow

Funding Support: UU

International Collaboration: No
International Travel: No
Year of schooling completed: 
Home Institution:
Government fiscal year(s) was this REU participant supported:

Margaret Wolf
Email: maw0912@westminstercollege.edu
Most Senior Project Role: Research Experience for Undergraduates (REU) Participant
Nearest Person Month Worked: 3

Contribution to the Project: iFellow

Funding Support: Westminster College

International Collaboration: No
International Travel: No
Year of schooling completed: 
Home Institution:
Government fiscal year(s) was this REU participant supported:

What other organizations have been involved as partners?

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<th>Type of Partner Organization</th>
<th>Location</th>
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<td>Academic Institution</td>
<td>Tempe, Arizona</td>
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<td>Consortium of Universities for the Advancement of Hydrologic</td>
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<td>Garth and Jerri Frehner Museum of Natural History</td>
<td>Other Nonprofits</td>
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<td>School or School Systems</td>
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<td>University of Virginia</td>
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<td>Charlottesville, Virginia</td>
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<td>Utah Department of Environmental Quality</td>
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<td>Salt Lake City, Utah</td>
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<td>Name</td>
<td>Type of Partner Organization</td>
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<td>Utah Governor's Office of Economic Development</td>
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<td>Utah Science, Technology, and Research Initiative</td>
<td>State or Local Government</td>
<td>Salt Lake City, Utah</td>
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<td>Utah State Office of Education</td>
<td>State or Local Government</td>
<td>Salt Lake City, Utah</td>
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<td>Utah State University - Eastern</td>
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<td>Blanding, Utah</td>
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<td>Christina River Basin Critical Zone Observatory</td>
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<td>Delaware, Pennsylvania and Maryland</td>
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<td>Vernal, Utah</td>
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<td>Utah State University Water Quality Extension</td>
<td>Academic Institution</td>
<td>Logan, Utah</td>
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<td>Utah Stormwater Advisory Committee (USWAC)</td>
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<td>Utah Valley University</td>
<td>Academic Institution</td>
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<td>Utah Water Research Laboratory (UWRL)</td>
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<td>Washington State University (WaSU)</td>
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<td>Ogden, Utah</td>
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<td>Western Water Assessment (WWA)</td>
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<td>Academic Institution</td>
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<tr>
<td>City of Logan</td>
<td>State or Local Government</td>
<td>Logan, Utah</td>
</tr>
</tbody>
</table>

Full details of organizations that have been involved as partners:

[Link to RPPR Preview Report](https://reporting.research.gov/rppr-web/rppr?execution=e1s4)
Arizona State University

**Organization Type:** Academic Institution  
**Organization Location:** Tempe, Arizona

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

**More Detail on Partner and Contribution:** Researchers from ASU are partnering with iUTAH on a series of projects that investigate urban water use across the west, and the nature of collaboration between public utilities and university researchers.

Arkansas Science and Technology Authority

**Organization Type:** State or Local Government  
**Organization Location:** Little Rock, Arkansas

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

**More Detail on Partner and Contribution:** Along with iUTAH and Utah State University, the Arkansas Science and Technology Authority participates in a consortium that developed and maintains the EPSCoR reporting module ER-Core, using the open source content management platform Drupal.

Bear River Watershed Council

**Organization Type:** Other Nonprofits  
**Organization Location:** Providence, Utah

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

**More Detail on Partner and Contribution:** The Bear River Watershed Council, located in Providence, Utah, is a non-profit organization working to protect Northern Utah's watersheds. It is the recipient of a 2014 iUTAH EOD Innovation Award, with ongoing engagement with the iUTAH project through the organization's disbandment in 2016.

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:** BYU is one of Utah's three major research universities located in Provo, Utah. BYU faculty and students actively engaged with iUTAH represent five academic departments (Biology, Civil and Environmental Engineering, Geography, Geology, and Plant and Wildlife Sciences) and work within and across all three iUTAH Research Focus Areas.
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:** Staff of Campbell Scientific, a scientific instrumentation company headquartered in Logan, Utah, serve on iUTAH education, outreach and diversity teams.

Canyon Concepts LLC

**Organization Type:** Industrial or Commercial Firms  
**Organization Location:** Tucson, Arizona

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

**More Detail on Partner and Contribution:** Staff of Canyon Concepts, LLC, a consulting firm focused on establishing collaborative relationships located in Tucson Arizona, serve on iUTAH education, outreach and diversity teams.

Central Utah Water Conservancy District

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

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

**More Detail on Partner and Contribution:** The CUWCD, headquartered in Orem, Utah, has been an active collaborator in the design and upkeep of the iUTAH GAMUT observation network, providing help with site selection, logistical support and access to facilities and electrical power.

Christina River Basin 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:** Christina River Basin CZO is an NSF-funded environmental observatory partnered with the University of Delaware located in Newark, Delaware. iUTAH is collaborating with personnel from Christina River CZO in the development of functionality for the Python-based software stack used to manage the streaming datasets from the GAMUT network.
Cirrus Ecological Solutions LC

**Organization Type:** Industrial or Commercial Firms  
**Organization Location:** Logan, Utah

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

**More Detail on Partner and Contribution:** iUTAH researchers are collaborating with Cirrus, an environmental consulting firm located in Logan, Utah, on understanding and quantifying the impact of dissolved organic carbon (DOC) on dissolved oxygen impairment to the Lower Jordan River, and on understanding the loading of DOC and other pollutants to the Jordan River in support of the development and revision of the Jordan River total maximum daily loads document.

City of Logan

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

**Partner's Contribution to the Project:** Facilities, Collaborative Research, Personnel Exchanges

**More Detail on Partner and Contribution:** UTAH is partnering with the City of Logan to share datasets, plan for current and potential future monitoring sites and data collection activities, and obtain legal access to monitoring sites within Logan City. This relationship is currently being expanded to include data collection using smart metering devices in residential households. iUTAH researchers are also collaborating with Logan City Public Works to evaluate performance of stormwater collection and treatment systems, to measure flow and monitor water quality from canal/stormwater discharges to the Logan River, and to evaluate the implementation and long-term performance of alternative stormwater management systems.

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:** iUTAH is using and extending cyberinfrastructure software and tools originally developed as part of the CUAHSI Hydrologic Information System for managing data from the GAMUT network. All of iUTAH's software development activities are shared via open-source code repositories, with plans in place to integrate these developments into the software stack supported by the NSF-Supported CUAHSI Water Data Center, a community serving data center for the hydrologic science community. In addition, several iUTAH participants also serve as faculty representatives to CUAHSI.

Dixie State University (DSU)
**Organization Type:** Academic Institution  
**Organization Location:** Southern Utah

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

**More Detail on Partner and Contribution:** Dixie State University is a four-year regional university located in St. George in southern Utah. It primarily serves residents of Utah, southern Nevada, and southern California and, as an open-enrollment school, has a large population of non-traditional students. Faculty at DSU serve on iUTAH education, outreach and diversity teams.

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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:** Envision Utah engages people to create and sustain communities that are beautiful, prosperous, healthy and neighborly for current and future residents. iUTAH personnel served on the technical team that developed the water portions of the comprehensive "Your Utah, Your Future" survey, and assisted with interpretation of survey data.

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**Explore Utah Science**

**Organization Type:** Other Nonprofits  
**Organization Location:** Utah

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

**More Detail on Partner and Contribution:** EUS produces original reporting and multimedia broadcasting of Utah-centric science news and information. It is the recipient of a 2014 EOD Innovation Award.

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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 non-profit organization located in Monticello, Utah, that provides lifelong learning experiences about the Colorado Plateau bioregion for people of all ages and backgrounds through education, service, adventure, and conservation programs. Four Corners School has partnered with iUTAH diversity enhancement by providing diversity training activities for iUTAH participants.
Garth and Jerri Frehner Museum of Natural History

Organization Type: Other Nonprofits
Organization Location: Cedar City, Utah

Partner's Contribution to the Project:
In-Kind Support
Facilities
Collaborative Research
Personnel Exchanges

More Detail on Partner and Contribution: The Garth and Jerri Frehner Museum of Natural History is a museum located on the campus of Southern Utah University in Cedar City, Utah. Museum staff serve on iUTAH education, outreach and diversity teams and have been recipients of iUTAH Research Catalyst Grants and EOD Innovation Awards (2014, 2015).

Global Change and Sustainability Center

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

Partner's Contribution to the Project:
Collaborative Research

More Detail on Partner and Contribution: The GCSC, located at The University of Utah in Salt Lake City, serves as a hub to coordinate, promote and accelerate interdisciplinary research and training on issues related to the environment and sustainability, from local to global scales. It is the recipient of a 2015 EOD Innovation Award.

Hillyard, Anderson, and Olson PC

Organization Type: Industrial or Commercial Firms
Organization Location: Logan Utah

Partner's Contribution to the Project:
Collaborative Research

More Detail on Partner and Contribution: Hillyard, Anderson and Olsen PC is a law firm located in Logan, Utah. Principals from the firm serve on iUTAH education, outreach and diversity teams.

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 online partnership to promote sharing of and better access to data and models in the hydrologic sciences. iUTAH is looking towards HydroShare as a potential partners in the long-term curation and archival of iUTAH datasets. HydroShare is a new and emerging hydrologic information system and collaborative data sharing environment that may be a
viable repository for long term deposition of iUTAH datasets.

Jordan High School

**Organization Type:** School or School Systems  
**Organization Location:** Sandy, Utah

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

**More Detail on Partner and Contribution:** Jordan High School is a public high school located in Sandy Utah. It is the recipient of a 2014 EOD Innovation Award.

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/](http://www.judgememorial.com/)

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:** iUTAH is partnering with the Logan, Hyde Park and Smithfield Canal Company to study the canal water system within the Logan City and Cache County.

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

Loras College

**Organization Type:** Academic Institution  
**Organization Location:** Dubuque, Iowa
**Partner's Contribution to the Project:**
Collaborative Research

**More Detail on Partner and Contribution:** Loras College is a private Catholic liberal arts college located in Dubuque, Iowa. Faculty from Loras College served on iUTAH education, outreach and diversity teams.

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**Loveland Living Planet Aquarium**

*Organization Type:* Other Nonprofits  
*Organization Location:* Draper, Utah

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

**More Detail on Partner and Contribution:** Staff of the Loveland Living Planet Aquarium, an important iUTAH stakeholder located in Draper, Utah, serve on iUTAH education, outreach and diversity teams. It is also the recipient of a 2014 EOD Innovation Award.

**National Park Service**

*Organization Type:* Other Organizations (foreign or domestic)  
*Organization Location:* National

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

**More Detail on Partner and Contribution:** Staff of the National Park Service serve on iUTAH education, outreach and diversity teams.

**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:** NHMU, located on the University of Utah campus in Salt Lake City, is an active participant and partner of iUTAH. In addition to NHMU staff serving on the iUTAH management and education, outreach and diversity teams, NHMU coordinates the Taking Learning Outdoors Program. The iUTAH Visualization Lab (iVL) is currently developing innovative programming and interactive exhibits for NHMU in collaboration with their staff. NHMU is also the recipient of a 2015 EOD Innovation Award.

**Nevada System of Higher Education**

*Organization Type:* State or Local Government  
*Organization Location:* Reno, Nevada

**Partner's Contribution to the Project:**
More Detail on Partner and Contribution: Along with iUTAH and Utah State University, the Nevada System of Higher Education Sponsored Programs Office and EPSCoR participates in a consortium that developed and maintains the EPSCoR reporting module ER-Core, using the open source content management platform Drupal.

Pleiades Software, Inc

Organization Type: Industrial or Commercial Firms
Organization Location: Salt Lake City, Utah

Partner's Contribution to the Project: Collaborative Research

More Detail on Partner and Contribution: Staff of Pleiades Software, Inc., a private software development company located in Salt Lake City, serve on iUTAH education, outreach and diversity teams.

Politecnio di Milano

Organization Type: Academic Institution
Organization Location: Italy

Partner's Contribution to the Project: Collaborative Research

More Detail on Partner and Contribution: Polimi is the largest technical university on Italy, located in Milan. iUTAH is partnering with Polimi on coupled modeling research conducted in Research Focus Area 3.

Portland State University

Organization Type: Academic Institution
Organization Location: Portland, Oregon

Partner's Contribution to the Project: Collaborative Research

More Detail on Partner and Contribution: Researchers from Portland State University are partnering with iUTAH on a series of projects that investigate urban water use across the west, and the nature of collaboration between public utilities and university researchers.

Providence Blacksmith Fork Irrigation Co.

Organization Type: Industrial or Commercial Firms
Organization Location: Providence, Utah

Partner's Contribution to the Project: Collaborative Research

More Detail on Partner and Contribution: iUTAH is partnering with the Providence Blacksmith Fork Irrigation Company to study the canal water system within the City of Logan and Cache County.
Impacts

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

In Year 4, iUTAH research had important impacts on several disciplines related to water science. Contributions in hydrology will enhance this community’s ability to understand hydrologic processes in snow-dominated environments. This includes modeling work that shows a strong influence of climate warming on mountain water balance via changes in the energy balance rather than precipitation changes; as well as development of a new sensor to measure soil infiltration at low cost. iUTAH’s engineered water systems group has published several new papers on stormwater remediation via GI; and secured recent external grant awards to continue this work via 2 EPA-funded projects, one focused on aquifer recharge, and one scaling GI outcomes to watershed models. Our modeling group in RFA3 recently published an application to couple hydrologic models using the OpenMI platform that has been read 61 times in ResearchGate and already has 2 citations.

In general, ascribing disciplinary impact to iUTAH is challenging because our research is inherently interdisciplinary. It is primarily the capacity to engage in this type of research that represents the most significant aspect of our project’s impact, as evidenced by significantly increased productivity over Year 3 in terms of multi-authored outputs like presentations and publications; and the continued submission and awarding of large, collaborative research proposals.

The broader impacts of iUTAH on other disciplines span aquatic ecology, atmospheric science, biogeochemistry, urban ecology, economics, sociology, engineering, urban planning, and water policy. To that end, we have built close-working relationships with colleagues within and outside of iUTAH. In Year 4, we expanded our collaboration network to include groundwater resources, state-level water planners, and municipal partners who are working together to link Utah’s water use data with social science data and water quality/quantity outcomes. We expect the fruits of this work to be fully realized in Year 5 and beyond.

What is the impact on other disciplines?

Nothing to report.

What is the impact on the development of human resources?

The iUTAH project continues to have a direct, substantive impact on the development of human resources at the undergraduate student, graduate student, technician, postdoc, faculty, and staff levels. In Year 4, we trained 42 GRAs, 19 of them female, across 3 campuses. Through our ever-expanding network of training programs, whether primarily executed by iUTAH (iFellows), our participating faculty (UWS), or through one of our many partners (RCGs, SI), we were able to reach 142 undergraduate students from a range of institutional, geographic, and demographic backgrounds. For example, iUTAH’s involvement in the USU Eastern-Blanding STEM exploration mentorship has helped expose 20 Native American students to life at a major research university in a supportive and nurturing way, creating a lasting impact and potentially improving their access to or retention in STEM careers. Undergraduate students were involved in activities spanning the entire spectrum of iUTAH programs, from research (UWS, iFellows, RCGs, SI) to professional training (iUTAH Traineeships) and education and outreach (WaterGirls, SI). Assisted in no small part by the unique research environment we have cultivated in our state, and the opportunities this affords, we were able to retain all of the postdoctoral associates recruited in Year 3 for at least another year. One of them, Dr. Krishna Khatri, was just promoted to research assistant professor at UU, Utah’s premier research university. A number of our former GRAs were able to take the next step in their STEM careers, with at least 5 having accepted full-time employment with industry, federal agencies, or in academic appointments, and several others moving on to their first postdoctoral positions.

Engagement with the iUTAH project through opportunities for innovative research; collaborative teaching; and
mentoring of students, postdoctoral associates, and junior faculty; also contributed to the professional
development of our research faculty, as reflected in several awards and honors. USU professor Dr. David Rosenberg received the Outstanding Service Award—Academic Sector from the Utah Chapter of the American Water Resources Association; Dr. David Bowling received a Guest Professorship at the Leopold-Franzens-University in Innsbruck and Vienna, Austria; CI Co-Lead Dr. Jeff Horsburgh was named 2015-2016 Outstanding Researcher by USU’s Department of Civil and Environmental Engineering; WSU professor and subaward-PI Dr. Daniel Bedford was appointed as Director of the University Honors Program; and iUTAH Project Director and PI Dr. Michelle Baker was honored with the 2015 Governor’s Medal for Excellence in Science and Technology.

iUTAH’s commitment to the professional development of its administrative staff is another major impact, greatly contributing to our state’s capacity for administering large, collaborative and cross-institutional research and training programs now and in the future. iUTAH Project Management staff greatly advanced their skill sets in research administration, team science, mentoring, and broader impacts through participation in a large number of regional and national conferences and workshops.

iUTAH’s Citizen Science and Museum programs continue to reach a tremendous audience made up of teachers, young people, and members of the general public. In Year 4 alone, efforts funded by iUTAH, all or in part, engaged almost 130,000 people.

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

iUTAH’s core infrastructure, the GAMUT observatory, continues to be 100% operational, and saw a substantial expansion into urban water systems during Year 4. A second weighing lysimeter to expand green roof research at SUU was funded in Year 4 under iUTAH’s RCG program. In addition to allowing for measurement of evapotranspiration in urban areas along a latitudinal gradient, this instrumentation has also been a crucial catalyst for education and outreach activities funded by iUTAH EOD Innovation Awards, further strengthening our museum partnership with GJFMNH. Another example of a lasting product built by iUTAH physical infrastructure is the NHMU Digital Interactive co-created by researchers in RFA1/GAMUT, RFA3, and iVL, as well as educators from NHMU. This “kiosque”-style display will continue to undergo modifications in response to visitor feedback and is expected to become a permanent part of the Great Salt Lake ecosystem exhibit at NHMU.

All three of iUTAH’s analytical facilities (SIRFER, BUGI, and the Aquatic Biochemistry Lab) are operational; have greatly expanded analytical capabilities across institutions; and are open to all researchers regardless of their affiliation. Initial results from research conducted at GIRF are beginning to inform planning at the institution level: for example, UU just committed to a $1M investment in the renovation of one of its campus structures that will incorporate and expand on GIRF ideas. iUTAH CI has developed into a powerhouse of cutting-edge hydroinformatics research in particular, and “big data” work in general, and is increasingly being looked towards to guide efforts at, e.g., USU, to train faculty for life in a “big data” world.

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

iUTAH continues to strengthen and improve the institutional resources of all participating institutions, which, for the first time in Year 4, include all 10 institutions of higher education in the state of Utah. From inception through Year 4, iUTAH participants have submitted 137 proposals that collectively generated in excess of $18M in new funding for these institutions. iUTAH continues to strengthen and expand our network of external partners (up from 62 in Year 3 to 72 in Year 4), allowing all of our participating institutions to leverage these additional resources and expertise in the pursuit of their mission and goals. Our facilities, including GAMUT, BUGI, and iVL, will continue to provide important place-based infrastructure for research, education, and stakeholder engagement for the future. To that end, initial commitments of institutional support for many of these facilities has either been secured or is being actively pursued by iUTAH.

Because of its unique positioning as a statewide, interdisciplinary and cross-institutional research and training program with and advanced project management infrastructure, iUTAH has established itself as a trusted partner in the conduct and administration of complex, collaborative, team science-based research. For example, the iUTAH Project Office has been approached by USU’s Office of the Vice President for Research and Dean of the
School of Graduate Studies to aid in the implementation a new institutional policy that expands USU’s safety policy to field research; with the ultimate goal of generating a set of standard operating procedures, resources, and a process for monitoring compliance.

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

The iUTAH CI team has become a critical component that integrates all iUTAH research activities by serving as a clearinghouse for the planning of data collection efforts; monitoring and administration of data compliance; as well as discovery, access, and long-term archival of all iUTAH data products. Because many of the data products generated by iUTAH are novel, this has proven to be a source of substantial innovation, the impact of which will likely be felt within the area of hydroinformatics and beyond for years to come. For that same reason, it is likely that CI researchers will be involved, in a substantive way, in charting potential trajectories for ensuring the permanence of iUTAH data resources beyond the end of the project, continuing the cycle of innovation.

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

Lasting impacts in RFA1 include the substantial contributions of GAMUT technicians to advances in managing and performing QA/QC of datastreams from large, geographically dispersed sensor networks. Through leveraged funds, Dr. Scott Jones and associates of USU have developed a new heat pulse sensor to measure soil water infiltration. This new product has received attention in both print and broadcast media as it could help water managers better track snowmelt processes at a fraction of the cost of current monitoring. RFA2’s social science team has developed a number of novel survey methodologies that began to find their way into the peer-reviewed literature in Year 4. As these methods are encountered by a wider audience, they are likely to be adopted and adapted for a wider range of uses by other researchers in the field. CI continues to develop, modify, and adapt to a greater range of potential uses, software packages made available to the public in Year 3. This includes the web-based graphical user interface that was developed for the iUTAH GAMUT sensor data management database; a software program for managing and performing quality control of streaming sensor data; tools from the CUAHSI Hydrologic Information System (databases, web services, etc.) that have been refined and expanded for managing the streaming sensor data from GAMUT; and an extension to the existing CUAHSI HIS Observations Data Model (ODM) to assist RFA1 researchers in managing the sensor and data collection infrastructure across GAMUT. Work to adapt iUTAH databases to a wider range of data products, including sample-based observations from RFA1, as well as RFA2’s engineering group, is ongoing; and will likely contribute further to these ongoing software refinements.

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

There can be no doubt that a project that has engaged almost 130,000 people over the course of single year—on levels ranging from a fleeting, passive contact on the order of minutes using an informational display in one of our 3 experimental watersheds, to intensive interaction through a rigorous 12-week summer REU, and everything inbetween—will have a lasting impact on the population of our state, and will make a significant contribution to building Utah’s next generation STEM workforce; a research culture that exemplifies the highest ideals of engaged scholarship; and an informed and engaged citizenry whose attitudes and behaviors will ultimately decide the future course of economic and ecological development of the Intermountain West. iUTAH believes that creation of an inclusive environment for STEM participants at all levels of knowledge and desired engagement is the best guarantor of that future. Working actively to open up opportunities to underrepresented groups, including women, Native Americans, and Hispanics, has been a hallmark of iUTAH Year 4 activities, and is beginning to show results. Participation of women now routinely approaches or exceeds 50% across iUTAH research, training, and education programs; and URM participation is significantly increased over previous years, approaching 20% in many programs.

With so much to offer potential partners in industry and government, particularly at the state and municipal level, it is no surprise that Year 4 was also characterized by the establishment of substantive, two-way working relationships with state agency staff and administrators, professionals, and elected office holders. The sharing of relevant results from RFA2’s social science research with municipalities across the state has resulted in new
agreements to share data so we may all develop a better understanding of water use behavior that can inform future policy. Efforts in stormwater monitoring that were expanded in Year 3 have proven beneficial not only to iUTAH researchers, but to municipalities as well. This has raised the profile of iUTAH research and should allow our work to directly influence water management decisions in the future.

Changes/Problems

Changes in approach and reason for change

1. Research

RFA1: The initial goal of building single models to fully represent water yield and water quality across iUTAH watersheds was first abandoned in Year 3 and is reflected in the August 21, 2015 revision of Year 3 milestones in the iUTAH Strategic Plan. However, since this was neither discussed explicitly in the Year 3 Annual Report, nor logically followed through by adjusting subsequent Year 4 and 5 milestones in the revised Strategic Plan, we address this change here now, and will submit revised Strategic Plan milestones to NSF for approval. Many of RFA1’s research objectives center around controls of water balance and water quality as related to biophysical processes, as well the human dimensions that impact both water quantity and quality. In terms of water quantity, the term “water balance” better reflects RFA1 research than “water yield,” since yield (implying surface water runoff) is only one aspect of the water balance studied by RFA1 researchers. The slab model produced by Smith and Strong predicts water yield, and the greatest uncertainty in the water balance is evapotranspiration, which is being studied empirically by Jones, Pardyjak, Stoll, and their students. These results will inform subsequent modeling activities by the RFA3 team. The RFA1 milestone related to water quality was changed in the August 2015 Strategic Plan from modeling to empirical work: “collect surface water chemistry.” This been done in spades (through routine sampling and synoptic sampling) and manuscripts are in preparation that analyze hydrochemical results in the context of the iSAW model.

RFA2: After extensive discussions among RFA2 researchers and in consultation with RFA3, a decision was made to pursue incorporation of the urban typology into coupled systems modeling activities in a stepped-down fashion by (1) using a simplified version of the typology as a first step in land-use change modeling; and (2) expanding on this effort in a manner that reflects the full complexity of the urban typology framework once the initial prototype model is up and running. Year 4 also saw a significant change in the engineering group of RFA2: in response to the needs of researchers, GIRF was completely rebuilt with greatly enhanced experimental and observational capacities. The new facility has an increased capacity for mixing and distribution of synthetic stormwater, monitoring drainage, and measuring soil/atmosphere exchanges.

2. CI

Pursuit of a DataOne member node was officially abandoned by iUTAH CI in Year 4. Alternative options for long-term archival of iUTAH data will be explored in Year 5. Because CI lacks the capacity for assigning digital object identifiers (DOIs), discussion of assigning DOIs to iUTAH data products will be postponed until a decision on long-term archival has been made. Nevertheless, both iUTAH and external datasets are fully discoverable, accessible, and citable through MDF.

3. EOD

DE: The 2015 iUTAH Diversity Conference was a cross-institutional event engaging iUTAH team members and stakeholders. The event featured a keynote presentation by Dr. Pamela Perlich from UU, and Angela Enno from USU. The conference did not focus exclusively on Hispanic Americans, rather, it addressed Utah’s changing demographics and diversity in general, of which Hispanic Americans play a large role. Attendee response to this meeting was overwhelmingly positive.

WFD: Rather than recruit new GRAs, to assure the timely completion of iUTAH research objectives across RFAs, a decision was made to continue funding of productive GRAs already working with iUTAH. Thus, the number of
new GRAs hired in Year 4 is quite small and falls well short of the goal set in the Strategic Plan. For similar reasons, we retained all post-docs hired in Year 3. Another change affected administration of one of WFD’s signature programs, RCGs. Here, iUTAH Project Management assumed an expanded role in Year 4, whereas the program had previously worked much more autonomously. This was done to leverage iUTAH Project Office resources more effectively in support of the RCG program to increase compliance with iUTAH data, safety, and responsible conduct of research policies; improve subaward monitoring; and facilitate student tracking. The iUTAH Traineeship program, which began as a small pilot to supplement iUTAH internship initiatives in Year 3, was found to be highly successful. As a result, a decision was made in Year 4 to permanently replace the internship program with the Traineeship Program. Many of the first cohort of trainees hired in Year 3 were retained in Year 4, which greatly contributed to the substantial progress made in GAMUT’s QA/QC and ratings curves work.

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

1. Project Management

With a number of specific requirements imposed on Project Management by the iUTAH awards Programmatic Terms and Conditions, including Year 4 NSF Reverse Site Visit (RSV) and the American Association for the Advancement of Science (AAAS) Research Competitiveness Program (RCP) Site Visit, this was a busy year for the Project Office. As a result, regular staff meetings were held at a lower frequency than envisioned in the Year 4 milestones. Instead, much of the business normally conducted during these meetings was carried out via e-mail.

2. Research

RFA3: RFA3’s role in integrating RFA1 and RFA2 research may be redundant to some extent, in that much of this integration has been occurring, and continues to occur, organically through ongoing collaborations. However, there is a realization that additional integrative activities need to originate with RFA3, which is a fact pointed out both in the RSV Report and the draft AAAS report. Ultimately, this is a question of resources. Thus, conversations are ongoing on how to redistribute iUTAH’s finite resources to facilitate greater integrative capacity within RFA3. The completion of coupled modeling software, another RFA3 signature product, is behind schedule. This is not to say that there is not tremendous progress: the software already includes a graphical user interface for composing coupled models, as well as specifications for the interfaces that model components must implement to participate in coupled model compositions (largely based on the OpenMI standard). We are now exploring how this system can potentially interact with HPC systems and other systems that enable remote execution of models (e.g., a potential partnership with the HydroShare project) to bring greater computational capabilities to the model coupling work. Here, conversations are also occurring about how to direct additional resources to Tony Castronova’s research group to facilitate timely completion.

3. CI

Full incorporation of modeling data products in the form of inputs, outputs, and simulations has not yet been accomplished. Doing so will requires adapting iUTAH Data Policy and MDF database support to the unique requirements associated with these data products. This will be a topic of discussion by the Data Policy Committee in late Year 4/early Year 5.

4. EOD

DE: A handbook of best practices for recruitment and retention has not been completed. Discussions are ongoing about redirecting resources to this effort in Year 5.

WFD: Despite strong and sustained engagement with 5 of Utah’s PUIs over the first 3 years of the iUTAH project, PUI engagement at the end of Year 3 was incomplete: an existing relationship with Dixie State University (DSU) dating back to Year 1 had not been maintained, and attempts at partnering with Snow College never yielded any lasting success. Early in Year 4, iUTAH Assistant Director and Project Administrator Andreas Leidolf and EOD Coordinator Ellen Eiriksson visited with old and new partners across the state over a 3-day period in October 2015, strengthening existing relationships and forging new ones. This effort has resulted in a re-engagement of
DSU, as well as a new and growing partnership with Snow College (iPad Survey) that is expected to be maintained through the end of the iUTAH project and beyond.

EE: Given the late completion of GIRF almost 2 years behind schedule in the third quarter of Year 4, it is no longer feasible to design a new Citizen Science program for GIRF in the time that remains in the iUTAH project. This milestone will thus be abandoned.

**Changes that have a significant impact on expenditures**
Nothing to report.

**Significant changes in use or care of human subjects**
Nothing to report.

**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.**

The award terms and conditions of the Utah EPSCoR Track-1 award specify two Special Requirements for Year 4: an RSV at NSF headquarters, and a site visit by AAAS RCP.

Pursuant to an invitation by the NSF EPSCoR Office, 10 senior members from iUTAH’s project management, research, and EOD teams visited with NSF EPSCoR staff and an international panel of experts for a comprehensive review and assessment of all project activities and elements. The RSV was conducted on September 10, 2015, at NSF headquarters in Arlington, Virginia. A panel report was submitted to iUTAH via the NSF EPSCoR Program Officer on October 23, 2015. iUTAH’s comprehensive response to the report was submitted on November 23, 2015. A follow-up request for clarification and additional information was received from NSF on December 18, 2015. An addendum to iUTAH’s response addressing this follow-up request was submitted to NSF on January 22, 2016. iUTAH’s response to the panel report as expressed in these two documents was deemed acceptable by NSF on February 4, 2016, thus concluding the RSV process.

In November of 2015, iUTAH began planning its Year 4 AAAS RCP Site Visit in close coordination with the AAAS facilitator, Dr. Heather McInnis. A panel of three experts, all of whom had participated in the Year 2 AAAS RCP Site Visit, and thus were familiar with the iUTAH project, visited with iUTAH leadership, researchers, EOD staff, PUI faculty, student cohorts, as well as the Executive Committee of the State EPSCoR Committee, from March 6-8 at the UU campus in Salt Lake City, Utah. In addition to a summative evaluation of iUTAH project activities and elements, including an assessment of iUTAH’s likely legacy, the panel focused on a forward-looking assessment of productive areas of future research emphasis and promising strategies for the institutionalization of the enhanced statewide research and training capacity facilitated by EPSCoR and built by iUTAH. A comprehensive panel report is expected by the end of April or early May of 2016.

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**Supporting Files**

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