

iUtah External Advisory Board Meeting

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The External Advisory Board (EAB) met separately with the Project Director and other key iUtah leaders on 14 July 2016 to review project and component progress, and with the broader project team on 15 July 2016. This report consists of two sections. First, we provide our observations on progress made by various project components. Second, we offer a small number of recommendations to iUtah leadership as the project moves into its final phase. We conclude with a final observation for the future.

I. General Observations

(a) Project Management. The Project Director (Michelle Baker) and Associate Director and Project Administrator (Andreas Leidolf) continue to provide sound and visionary project leadership for iUtah. As would be expected, there has been some turnover in personnel, but this turnover has had little or no adverse impact on progress. The team appears to be running like a well-oiled machine. The EAB noted that kudos are in order for Jim Ehleringer who was recently inducted into the National Academy of Sciences. Over the past year, iUtah underwent reviews by NSF and AAAS, and has responded proactively to their respective recommendations. We were particularly impressed with the logical progression of iUtah activities and their extraordinarily high degree of achievement and integration in all areas, often exceeding objectives by a significant margin. We were also impressed by the extent to which iUtah responded positively to prior EAB recommendations.

(b) Facilities. Jim Ehleringer and other team members have implemented all facilities, and the core analytic facilities are largely self-sustaining via recharge fees and University support. Construction of the Green Infrastructure Core (Williams' Field) will provide a relatively novel test bed to examine the effectiveness of watershed and stormwater management in a way that will be visible and accessible to the local community.

(c) RFA1. Great progress has been made in understanding the processes that control water quality and quantity. Moreover, 40 data sets are publicly available and the team produced 11 peer-reviewed publications in year 4. The plan for Year 5 seems reasonable.

(d) RFA2. Likewise, this research component is developing new understanding of attitudes and perceptions; generating data, publications and proposals, and training an excellent cadre of students. Future plans are on track and new streams of funding from EPA, NSF and USDA will allow continuation/expansion of research.

(e) RFA3. This component has been quite successful, exceeding all objectives. The team has produced coupled models, publications, and developing partnerships with state engineers and ecologists. The EAB encourages further planning for sustainability in this area as the component has significant potential for engaging new partnerships.

(f) Cyberinfrastructure. Good progress is being made in publishing data and in transitioning the data repository to HydroShare—a move that will facilitate sustainability, preservation and discovery. The CI team leads have trained a large number of students in hydroinformatics. The year 5 plans seem reasonable.

(g) Education, outreach and diversity (EOD). EOD activities are on track and there are new efforts focused on museum partnerships and tracking participant demographics. It would be useful to see some more in-depth success stories presented along with standard output information.

(h) Significant outputs. iUtah has been an exceptionally productive project with 442 presentations, 137 publications, 138 proposals and 64 awards, dozens of external engagements, 227 undergrads, 42 graduate students, many faculty hires, etc. Importantly, a large number of new collaborations among faculty across Utah have been engendered, reflecting a change in the overall scientific culture of the state.

(i) Year 5 and sustainability. iUtah has identified priority programs and activities to attempt to sustain, as well as strategies for doing so. Establishing core analytical facilities as cost centers is a significant, positive step. The EAB expects that it may be more challenging to maintain some of the educational programs, field sensors and CI. Nevertheless, Baker and Brooks articulated several worthwhile strategies they are pursuing. Particularly notable achievements included MOUs with the VPRS for supporting cross-campus collaborations, co-teaching activities, the move to HydroShare, and the identification of partnership opportunities and action items that may likely contribute to sustainability. The WASATCH – CACHE effort and associated activities seem especially promising, but will require significant effort to bring to fruition. The coupling of atmospheric and hydrological data, research, and applications is a strategic approach.

We do note, however, the WASATCH-CACHE project as briefly described, does not include any explicit social science components. We suggest that WASATCH-CACHE may want to revisit this because the social sciences are essential for understanding drivers and variation in atmospheric and hydrologic dynamics, risk and vulnerabilities to human well-being, particularly in terms of social equity, and possible points and means of intervention for improving atmospheric and hydrologic conditions and human well-being over the long term.

(j) Communications and outreach/PR. Communication activities such as the re-designed website have been demonstrably effective. The EAB was impressed with the number of press releases in year 4 (i.e., 35) as this activity is non-trivial.

(k) Stakeholder engagement. There has been lots of engagement with state and local agencies, museums, etc. The outcomes of these engagement activities were not especially clear to the EAB.

II. Recommendations

(A) Identify and develop stories around iUtah's most significant outcomes and impacts—that is, those accomplishments that will be notable years after the project concludes. The EAB commends iUtah for its exceptional productivity as demonstrated by research and education outputs (e.g., publications, students graduated, proposals submitted and funded, collaborating institutions). Now is the time to identify the most important outcomes and impacts as these stories will be critical to long-term sustainability. Examples include: significant scientific findings that altered current understanding or upended existing paradigms; new scientific and technical methods that can or have been adopted by others; new, innovative and sustainable infrastructure that will be used for years to expand knowledge; data and/or knowledge that have affected decision-making--policies, plans, or projects--in the public or private sectors; education programs that are demonstrably changing lives; diversity programs that are leading to higher retention and graduation of under-represented students, etc.

1. We strongly encourage the iUTAH team to think broadly about which signature outputs and outcomes of the project have been most successful, and have made the most impact among the full range of stakeholders. From those signature accomplishments, a subset should be chosen that has high impact and high likelihood of sustainability. These projects should be a particular focus in year 5, to ensure the highest probability of sustaining the most important and effective aspects of the iUTAH project.
2. Two associated activities would be to:
 - a. convene a meeting of iUTAH leadership to consider the key impacts of iUTAH and prioritize essential programs that iUTAH seeks to sustain.
 - b. develop a marketing and communications plan for iUTAH associated with these key programs.

(B) Develop a business model for iUTAH 2.0 that does not depend primarily upon National Science Foundation support. Following on Recommendation (A), iUTAH should identify the connections among key components of iUTAH 1.0 and local partners and explore opportunities for support, or working together to jointly seek support. For instance, a key feature and exciting aspect of iUTAH 1.0 is the coupled system of an embedded biophysical sensor network and social survey program. This coupled system could be an asset for local jurisdictions and their MS4 compliance. MS4 permits involve required data collection and interventions for stormwater mitigation. Interventions include both structural changes and behavioral changes. iUTAH's

coupled system could be used to monitor and assess the impacts of MS4 interventions. The mutual benefit of the system could be the basis for shared support or seeking “innovative” support from the EPA. Other examples of potential partnerships include Utah Climate Action Network, <http://www.utahclimateactionnetwork.com>, the Mountain Accord, <http://mountainaccord.com>.

Another feature of the business model might be to consider novel ways to leverage iUTAH investments by attracting new partners. We recognize that iUTAH 2.0 will always require some core funding from the University Consortium, but rather than paying for the entire program, the business model might be to think in terms of how can iUTAH spend \$2 to leverage \$5 through investments from other partners. Thus, the business mindset might be to think about the best ways to spend \$2 in order to leverage \$5?

(c) Develop, formalize, and implement systematic strategies and practices for actionable science. A key feature of iUTAH is its desire to improve the sustainability, economic prosperity and well-being of the state. Thus, iUTAH needs to enhance their capacity for actionable science. This will also be crucial for developing interest and investment to support iUTAH 2.0 from stakeholders. Some features of this effort will include systematic network mapping of stakeholders; cross-walk with local partners of mandates, programs, and plans; and practices for documenting outcomes in addition to outputs.

III. Final thoughts:

iUTAH 2.0 may not be able to nor may it be desirable to sustain all the parts of iUTAH 1.0. That's ok. Maintaining the embedded, coupled long term sensor and social survey program may be the most difficult to accomplish, yet may provide the most powerful and innovative outcomes.

Ultimately, iUTAH has been very successful and we are excited to see it prosper in its next phase. iUTAH is a potential model and success story for the national EPSCOR program. The ability and pathways for iUTAH to become sustainable over the long term could be a model for EPSCOR and its programs and to be of immense value to Utah.

We are grateful for the opportunity to advise iUTAH and be a part of its development.