



CUAHSI

universities allied for water research

CUAHSI Board Meeting Minutes

August 1-2, 2018

Roll Call

- 14 members are present, 10 needed for quorum
- “X” indicates Director is present

Term expires 12/31/2018

Matt Cohen, University of Florida X

David Genereux, North Carolina State University (past Chair) X

Gordon Grant, Oregon State University (Chair) X

Erich Hester, Virginia Tech X

Steve Loheide, University of Wisconsin-Madison X

Jeanne VanBriesen, Carnegie Mellon University (Chair elect) X

Term expires 12/31/2019

Elizabeth Boyer, Penn State University X

Michael Gooseff, University of Colorado X

David Hyndman, Michigan State University X

Holly Michael, University of Delaware X

Al Valocchi, University of Illinois Urbana-Champaign X

Term expires 12/31/2020

John Albertson, Cornell University

Amir AghaKouchak, University of California-Irvine X

Jesus Gomez-Velez, New Mexico Technical University X

R. Edward Beighley, Northeastern University X

Officers & Staff Present: Jerad Bales (CUAHSI), Adam Ward (Secretary)

Guests: Tom Torgersen (NSF 1-Aug only), Holly Barnard (NSF - 1-Aug only)

Minutes prepared by Ward

1-Aug-2018

16:00 EST Call to Order

1. Roll call
 - a. Ward confirmed quorum was established.
2. Discussion with the NSF
 - a. Torgersen shared a summary of investments in CUAHSI from various programs at the NSF. Gooseff confirmed the discussion was such that collaborative proposals were included in the summary, but sub-awards and other involvement were not.
 - b. Torgersen also discussed the general format of the panel review for the renewal proposal that was submitted. Torgersen suggested that the annual report should clearly outline successes, challenges, modifications to tracking funding and outcomes, and similar to provide sufficient information to the panel. Bales and Torgersen discussed the need for Bales and the CUAHSI representatives to articulate successful organizational management and budgeting, and how CUAHSI is expanding its base of partners.
 - c. Grant solicited feedback from the Board on why they serve on CUAHSI's Board. Answers included:
 - i. The importance of CUAHSI in supporting a vibrant community of researchers and their science, and how unique it is to have an organization that exists solely to support its members.
 - ii. Helping advance efforts that were individually of interest to board members, including specific areas of instrumentation, funding, modeling, data management, and education.
 - iii. Learning more about CUAHSI and the services that individuals, their students, and colleagues could leverage in their careers and education.
 - iv. A sense of contribution to a broader community of scientists that is doing meaningful work for society and advancing our fundamental understanding of hydrology.
 - v. CUAHSI as a focusing organization that shapes the direction of the field.
 - vi. A desire to integrate the expertise within one sub-field with other sub-disciplines in hydrology
 - d. Torgersen suggested that the mid-scale infrastructure opportunities at the NSF would be a potentially fruitful direction for CUAHSI, depending upon community needs. He noted that CUAHSI's leadership in creating community and resources that serve future professionals and academics establishes a strong base that could be leveraged to attract additional investments.
3. Reflection on 2018 Biennial Colloquium
 - a. Loheide initiated a discussion of the meeting format, location, and other big-picture reflections on the meeting.
 - i. The "captive audience" of having the group isolated and together on a campus was viewed as a strength, with several noting parallels to the

Gordon Conference series. Several Board members expressed similar opinions, noting the accessibility of more senior colleagues as a strength of the meeting. Welcoming students and early career researchers into the community was viewed as a strength. These ideas were echoed by others. It was also suggested that another venue with similar on-site housing and isolation in another location (e.g., western US) might help to make access easier for different members. Proximity to Washington, DC was noted as a possible benefit of the current site, which might enable added participation by federal agencies. **Action: CUAHSI staff are to investigate**

alternative venues for the Biennial meeting.

- ii. Gooseff reflected on the group of attendees, asking how many non-Board members typically attend, or more generally how trends in the institutions represented and career stages represented varies. **Action: CUAHSI staff are to prepare an analysis of past Biennial attendees.**
- iii. The group discussed the challenge of increasing member institution representatives participation in the meeting and making sure it isn't a "usual crowd" that might not be welcoming to the broader community. The invitation-only talks were viewed as a strength of the program, but also a challenge in attracting at-large members to present posters or attend. It was also noted that some training opportunities are largely geared toward students or early-career members, while targeted session for "teaching an old dog new tricks" may help engage a different demographic of CUAHSI's membership.
- iv. The group noted underrepresentation of the international community - both at-large and our members - in attendance. Grant noted high use cases of CUAHSI hydroinformatics services in Europe.
- v. Grant initiated a discussion motivated by the question "who is CUAHSI serving?" He suggested that CUAHSI's highly engaged users of data and services are not necessarily those who attended this meeting.
- vi. Gomez-Velez suggested expanded discussion periods after the discussions, possibly including additional moderation by conveners or speakers. Hyndman suggested this could be a panel discussion at the end of each set of talks. Several members suggested targeted discussions or workshops as a key part of advancing the meeting, possibly driving toward a white paper or some sort of product.
- vii. Ward suggest differentiation of this meeting from the Gordon Conference model. Suggestions included working groups with regular effort before and after the meeting. Loheide suggested the EGU model of giving "PICO Presentations" that could have small groups rotating through, but might be more than a poster to help engage more people in presenting (similar talks are occurring at GSA and AGU in 2018).

- viii. Torgersen suggested the Gordon Conference model of a student-centric day or two prior to the meeting to enable student-to-student networking and targeted mentoring prior to the larger biennial.
 - ix. Gooseff suggested a town hall or workshop be hosted on a specific theme, providing advising to federal agencies about community directions and needs. This would be an opportunity for CUAHSI to generate products that are relevant to agencies and decision makers.
 - x. Several board members discussed mentoring of students and early-career faculty members as an important area that could be added to the meeting.
 - xi. Boyer suggested cross-institutional challenges around diversity, education, training of specific skills or interdisciplinary efforts to share ideas and experiences. CUAHSI is uniquely positioned to support members.
- b. Additional feedback that was reported by members informally included:
- i. Loheide reported that efforts to facilitate and advance diversity both within CUAHSI and at the meeting was discussed, noting he was told that one person noted this was not explicitly addressed in CUAHSI's Strategic Plan. This was discussed in terms of disciplinary diversity in addition to other aspects of diversity. Bales reported that this is a challenge he is aware of and plans to initiate this discussion on 2-Aug-2018.
 - ii. CUAHSI is continuing to facilitate education in water resources, including discussion of curriculum, core themes, and fundamental requirements in hydrology or water science.
 - iii. Gomez-Velez suggested CUAHSI as a hub of best practices and workshops related to reproducibility of research results.
4. Planning for Summer 2019 CUAHSI meeting
- a. CUAHSI has traditionally alternated a hydroinformatics conference with the biennial meeting. The group discussed plans for a summer 2019 conference.
 - b. The group discussed the potential of a meeting themed on education in hydrologic science.
 - c. Regional meetings were also discussed as a possible alternative to a singular, centralized meeting. Hyndman and Valocchi suggested this was a good community building exercise within regions and is a way to engage representatives and facilitate cross-institutional collaborations. Regional meetings could be themed on regionally relevant issues or topics. Van Briesen suggested existing meetings could have CUAHSI activities added on, such as a CUAHSI member dinner. These could also be optional, with members proposing meetings that CUAHSI could support.
 - d. Boyer suggested the existing momentum for Hydroinformatics might be a "signature" CUAHSI activity worthy of continuing. The group discussed the potential of expanding the scope of that conference to include modeling activities.

18:00 EST Adjourned

2-Aug-2018

08:00 EST Call to Order

5. Standing Committee Reports

a. Education & Outreach (Attachments 05, 06, 07, 08)

i. Pathfinder Awards

1. Loheide reported the committee is managing the Pathfinder grant program. He noted that data management plans are now required, and CUAHSI services are highlighted as part of this effort.
2. The group discussed if there is a definition of what scope is appropriate for the awards, in particular a focus on hydrology vs. water resources more broadly. Cohen noted this parallels discussions that the Let's Talk About Water program had regarding scope of what is fundable. The board discussed including a requirement that applicants articulate how the proposed effort fits within CUAHSI's scope, putting the onus on applicants to clarify their vision. The sense of the board was that this should be included in applications.

ii. Data Driven Education (Attachment 05)

1. Lohide reported that data driven education is a growing area of interest, but there are questions related to quality control, utilization, standardization, best practices for adoption, and additional area. Valocchi suggested CUAHSI's materials should be made more visible via CUAHSI.
2. Gooseff suggested some possible merging of teaching material development and the Virtual University effort. The group emphasized the need to integrate efforts with the Water Data Center.
3. Loheide discussed the need to clarify branding and access to educational materials, which currently include the Carleton College SERC program, storage on HydroShare, HydroVis, HydroLearn, and with multiple access points on CUAHSI's website. Clarifying where educational materials are stored, organized, and accessed in a single portal was articulated. The committee is excited to work on this, but Loheide suggested CUAHSI staff could help with organizing these activities.

4. **Action Item: Bales and CUAHSI staff to work with the Board and E&O committee to define activities and direction for advancing CUAHSI's E&O activities.**
 5. Gooseff suggested using time at 1-2 Board meetings for this discussion.
 6. The group discussed the operational structure of CUAHSI's Board, Committees, and staff. The key point of discussion was to balance the use of CUAHSI resources (and the strategic plan more generally) with the bottom-up emergence of new initiatives from community members who engage via the committees.
- iii. Virtual University
1. Loheide reported that the Virtual University program is on track for this year with 8 participating instructors, with a proposal for the subsequent year planned for the Fall. He noted it required substantive effort to recruit new instructors to the program.
 2. Boyer suggested that there are challenges in making the program accessible to the CUAHSI membership, whereas enrollment currently requires an instructor at each University. She suggested exploring options to expand the pool of participants. Bales concurred that broadening access would be a useful area to consider. Valocchi suggested an audit possibility that would enable viewing the courses instead of participating for course credit/grade.
- iv. Let's Talk About Water
1. Cohen reported that the rubric for evaluation of LTAW events helped streamline and clarify the process. He noted that applications should be encouraged.
 2. Bales reported that he is re-envisioning the event to include a component of professional development for students on science communication integrated with a traditional LTAW event.
- b. Instrumentation
- i. Hester reported that the instrumentation discovery travel grant program has been successful, and is in high demand. He also reported that the committee conducted a study of instrumentation and facilities. He also noted that CTEMPs workshops continue to be strong, with interest in development of additional workshop trainings and topics.
 - ii. Hester reported future directions including: (1) a workgroup on standardization of total suspended solids measurements, (2) instrumentation facilities that exist and how they could be used by the community; (3) what role CUAHSI could play (e.g., the future of WyCHEG and CTEMPs efforts); (4) facilitation of instrument sharing.
 - iii. **Action Item: Bales and Board to discuss an MOU to formalize a collaborative partnership between CUAHSI and CTEMPs.**

- iv. Hyndman suggested that with respect to inventory of instrumentation facilities, articulating the key benefits to hydrologists and critical-path steps to engage with these facilities. Boyer indicated an interest in helping with this, and also noted the improvements in quality and standardization that come from these partnerships. She also suggested helping build a network of instrumentation users who would be willing to share their experience with other hydrologists.
 - v. Grant requested a vision of CUAHSI's role in instrumentation, which has been often discussed but not necessarily been articulated. Cohen suggested that the training and establishment of best practices is potentially more important than access to equipment.
 - vi. Bales suggested that the Board should work with the committee to help collaboratively design the portfolio of activities and their branding / organization to clarify CUAHSI's role. This is well-aligned with the goals articulated for the education and outreach activities.
- c. Hydroinformatics
- i. Beighley reported that he and Gomez-Velez are working to inventory the current activities of the committee. Current areas of effort for the committee include:
 1. building a database of use cases for data storage, analysis, and teaching.
 2. Initiation of hydroinformatics innovation fellowships, which are currently open for application and will be reviewed in Fall 2019.
 - ii. Beighley also noted that the users subcommittee is working to suggest new data types and functionality that CUASHI can support. The group discussed the current structure and function of the user committee. Bales suggested a possible role of advice on HydroShare development from the committee. The group discussed possible roles for the future of this committee in supporting the development team and planning for the sustainability of data services.
6. Board Function and Expectations
- a. Grant initiated a broad discussion of how CUASHI's Board, staff, and committee work together to achieve the goals of the organization.
 - b. The group discussed various roles of committees. Strengths included engagement of broader segment of the community on specialized efforts, consistent review for applications, and providing beta-testing of new initiatives or services. However, Loheide also suggest some task-based issues could be handled by ad-hoc committees with a defined task and timeline that might require a different expertise than is on a standing committee.
 - c. VanBriesen discussed the role of the Board in more actively engaging with the committees, synthesizing their recommendations, and the Board prioritizing activities. This is in contrast to committees potentially using staff time to achieve

some tasks without a clear vision of the portfolio of activities CUAHSI is balancing.

- d. Genereux noted there is a generic charge to the committees that was discussed and endorsed in January 2018, including annual reports to the Board in the Fall that would enable formal feedback and direction for the upcoming year to result from the January Board meeting. VanBriesen also indicated the Board members serving as liaisons to the committees would lead the effort to ensure these reports are generated, reviewed, and feedback and strategic direction are provided to the committees. Cohen noted that this annual cycle has not yet been completed once, suggesting that liaisons should work to ensure this process is met.
- e. VanBriesen suggested that articulation in annual reports of any activities that require CUAHSI staff time and resources, to ensure that the Board can approve or help shape these activities as part of CUAHSI's portfolio. This would enable the grass-roots efforts that have been successful, but balance them with strategic plans.
- f. **Action Item: Board liaisons to establish a deadline for annual reports, and work together to define a structure of key elements that should be included.**
- g. The group discussed the day-to-day function of committees, including who sets the committee agendas and direction. Bales suggested the committee chair should set the agenda for committee meetings and help assign tasks and responsibilities. The liaisons should help frame the committee efforts in the strategic plan, and represent the Board in their meetings and discussions. CUAHSI staff will help facilitate meetings and participate actively in the discussion.
- h. The group discussed the need to formalize communications and assignment of tasks with the committees, as opposed to much of the past effort which has been oral communication where messages and tasks may be forgotten or not clearly defined.
- i. Bales reported that HydroShare would benefit from additional support from a committee, including both strategic planning (top-down) and user experience (bottom-up). This includes sustainability of the program and future directions of the HydroShare program. Valocchi noted the users committee historically served to test beta versions and provide detailed feedback, whereas the standing committee was providing higher-level strategic directions. Bales articulated the need for HydroShare support in the near-term to help.
- j. VanBriesen suggested a HydroShare Strategic Directions committee
- k. **Motion: Establish an ad-hoc committee for Strategic Planning of HydroShare Efforts.**
 - i. Motion: VanBriesen
 - ii. Second: Hyndman
 - iii. Discussion:
 1. Bales suggested a maximum of a 2-year term that would be well-aligned with the timescale of the HydroShare project.

2. Valocchi suggested that a charge to the committee be developed collaboratively by Bales, a Board liaison, and David Tarboton to address the need for setting strategic direction, with the liaison bringing the charge to the Board for approval in the next 1-2 months.
 3. **Action Item: Bales will development a charge to the committee, proposed Board liaison, and proposed short-list of committee members for review by the Board.**
- iv. **Vote:**
1. **Approved: (All present except Gooseff)**
 2. **Opposed: (none)**
 3. **Abstain: Gooseff**
1. Michael suggested that an ad-hoc committee on diversity, equity, and inclusion be established to assess diversity in CUAHSI's portfolio of current activities. The group discussed efforts that might include an inventory of diversity in existing programs as a short-term study as opposed to a longer-term committee to take action in this space. Valocchi and Loheide endorsed a short-term committee that would undertake an initial study to assess diversity in CUAHSI programs. Bales suggested that an assessment of diversity in the community might also be important to provide context for CUAHSI's efforts. Cohen suggested that a long-term standing committee to take on this challenge as a community-wide need is important.
 - m. **Motion: Establish an ad-hoc committee on diversity, equity, and inclusion to assess diversity within existing CUAHSI programs and across the community.**
 - i. Motion: Michael
 - ii. Second: Loheide
 - iii. Discussion:
 1. Valocchi clarified that this should include assessment of existing CUAHSI programs, information already being collected by other communities including AGU's hydrology section, and reporting back to the Board. Cohen noted Board composition is one area of interest, but this should span all of CUAHSI's portfolio.
 2. Michael suggested this should include suggestions for opportunities to increase and support diversity, equity, and inclusion across the CUAHSI portfolio, and possibly across the community.
 3. VanBriesen and other suggested this include dimensions of geographic representation, research area expertise, departmental affiliation in addition to more traditional aspects of diversity.
 4. **Action Item: Bales, Michael, Grant, Cohen, Loheide agreed to serve on the committee and provide at least a preliminary**

**assessment for discussion at the January 2019 Board meeting.
CUAHSI staff will support harvesting of data.**

iv. **Vote:**

1. **Approved (unanimous)**

7. Upcoming Board of Directors election

- a. Grant and VanBriesen initiated a discussion of the future of the Board of Directors. In total, 6 current Board members have terms that will expire with at least 3 planning to run for re-appointment.
- b. VanBriesen emphasized the need to target particular expertise on the Board to complement the existing composition and strategic plan. Gaps on the current Board were discussed including informatics and big data, education, precipitation or atmospheric science, cyberinfrastructure, and expertise with the national water model or distributed hydrologic models.
- c. VanBriesen requested suggestions on potential Board members to help establish her list.
- d. AghaKouchak volunteered to serve on the nominating committee. VanBriesen will also work to identify an external community member for the committee prior to the deadline for its establishment in September 2018.

8. Targeting CUAHSI services to early-career professionals

- a. Genereux initiated a discussion about how CUAHSI markets activities, which include targeted audiences such as “students”, “graduate students”, “early career faculty”, “junior faculty”, and similar. He asked if this might be causing some members to not participate in some activities because they are at a different career stage even though they may benefit from participation. The concern is the appearance or actual occurrence of age discrimination in access to training workshops/classes, if those workshops are open to faculty but the announcements specify that the workshops are targeted toward or intended for only “junior” or “early career” faculty.
- b. The group discussed the potential to consider activities that target participants from different career stages, including opportunities that would be of high interest to mid- and later-career participants.
- c. The Board agreed to remove exclusionary language from advertisements to the degree possible. Examples include removing language that articulates preference to one group over another, excepting those programs specifically targeting students (e.g., Summer Institute).
- d. **Motion: For CUAHSI workshops that are not restricted to students, CUAHSI will include a statement that they are open to all and avoid exclusionary language.**

i. **Motion: Genereux**

ii. **Second: Hyndman**

iii. **Discussion: (none)**

iv. **Vote:**

1. **Approved (all except VanBriesen, Grant)**

2. **Opposed: (none)**

3. **Abstain: VanBriesen, Grant**

9. CUAHSI Branding, Visibility, and Communications Plan (Attachment 02)

- a. Boyer led a discussion of CUAHSI marketing and branding, including the Communications Plan. Boyer suggested a branding exercise that would strategically consider logos, language, website, and communication. Boyer noted the communication plan that the CUAHSI staff developed is useful and commended the effort.
- b. Reporting back on her review of communications and marketing, Boyer notes (1) the logo does not include human impacts, informatics, modeling, or data in any clear way; and (2) the website, while much improved over past version, is still confusing in its organization. Boyer suggested highlighting the key messages on the mission statement should serve as a way to add consistency across programs.
- c. Liz Tran summarized ongoing efforts related to website activities, noting specific challenges in organizing the diverse portfolio of activities.
- d. Boyer discussed a need to make the Water Data Center a key data management office with a single branding - such as “the Hydrology Community’s Data Management Office” - would help clarify the role and provide a single umbrella for the activates.
- e. Valocchi suggested getting an inventory of NSF grants ending each year and reaching out to the PIs to offer support in helping get their data into the Water Data Center.

10. Planning for Membership Meeting

- a. Grant discussed the need to improve the annual membership meeting in its function and engagement of the community. The group discussed struggles across similar organizations to keep the members engaged.
- b. Genereux noted the interactive polling during the meeting and real-time results were one way that could possibly be leveraged to poll the members and make the meeting more interesting and interactive. The group discussed voting on possible community meeting themes. Genereux suggested soliciting poll questions ahead of the meeting to include a select few during the meeting.
- c. Grant encouraged the group to consider the contributions from members to the organization, and to what degree there are unmet interests from the community that CUAHSI should be addressing.

11. Executive Session--Board Annual Performance Review of Executive Director

- a. The Board entered an executive session to discuss the performance of the Executive Director, led by Genereux.

12. Planning Board meetings

- a. January 2019 Face-to-Face Meeting
 - i. The Jan. 2019 Board meeting will be on January 14-15.
 - ii. **Action Item: Bales will confirm if there is a requirement for the meeting to occur in Washington, DC, or suggest an alternate meeting location.**

- b. Monthly meetings: Ward will share a When2Meet poll to plan meeting times. The general schedule will be the first week of each month for ExCom and third week of each month for the full Board.
13. State of CUAHSI—Recent activities, targeted proposal activity other than renewal
- a. Staffing updates
 - i. Bales reported that Hongzhen Zhang is a new hire working on the user interface, and has been performing exceptionally well.
 - ii. Bales also reported that Danielle Tijerina has been hired and will work on the JupyterHub and modeling efforts, and brings added hydrologic expertise to the CUAHSI staff. She will also help with the Summer Institute.
 - b. Data services
 - i. Bales reported focus on integration of HIS and HydroShare is a large ongoing effort, with perhaps 2 years of time anticipated for the integration.
 - ii. The user interface is also a current focal point with Hongzhen and other staff, including considering the assessment completed by the Olin College team who assessed user experience.
 - c. Funding and Renewal Proposal
 - i. Bales made the full proposal available to the Board, noting the evaluation metrics defined for the organization as a supplement to the proposal. He suggested additional feedback prior to the proposal review would be appreciated.
 - ii. Bales reported \$150,000 was awarded as a supplement to base funding to migrate Critical Zone data catalogs to HydroShare and build an interface for the data sets. He noted there are additional funds in the renewal proposal to continue this support into the future.
 - iii. Bales reported that the EPA is now delivering \data from 20,000+ sites via a demonstration site. The EPA requested CUAHSI to host these data moving forward to integrate the information with CUAHSI's services . This project will also result in upgrading the HIS to the OGC standard WML2 data model instead of WML, which CUAHSI currently uses, assimilating EPA's approach into CUAHSI's services.
 - iv. Bales reported that CUASHI is working with the NASA SWOT mission to assimilate data on river discharge across the globe into CUAHSI's data services. .
 - v. Bales reported that sustainability of CUAHSI's data services is a component of the renewal. HydroShare is currently growing by about 100 users per month, including use by the US Army Corps of Engineers behind their firewall and is under consideration by one USGS office. The ability of CUAHSI to grow cyberinfrastructure to support users is an area of consideration by staff, although there are not bottlenecks at this point. HydroShare currently is supported by RENCi, but this may not be the future solution.

- vi. Grant asked about large, instantaneous growth in HydroShare if an agency adopted use in a large way. The group discussed a range of data users and questions related to support of agency application.
- d. Community Services
 - i. The summer institute program remains of interest to the National Weather Service, but Bales reported potential that there could be declining funding levels in the future. He also reported some challenges in the security clearance for students at the National Water Center. Bales has suggested one alternative would be hosting in a different, nearby location to avoid these issues in the future. Bales requested funding in the renewal proposal to support CUAHSI staff expenses for the summer institute. The NWS uses the SI as a recruiting tool for new staff. Gooseff encouraged additional tracking of outcomes and student successes after the program.
 - ii. The Let's Talk About Water program continues to be strong. Liz Tran is hosting an LTAW event in Boston focused on stormwater management, including participation by local and state government representatives and translators to make this a multilingual event.
 - iii. Bales reported possible workshops in partnership with the USGS on soil moisture and indirect measurements of suspended sediment, which would be in 2019 and 2020, respectively. Bales reported on several additional possible workshops that focus on modeling, informatics, and data science applications. These include a range of partners from different projects, agencies, and working groups.
 - iv. CUAHSI has been accepted as a participant in the Science Gateways Community Institute who will help CUAHSI with branding, marketing, service development, and sustainability.
 - v. Bales reported that 101 Member Institution representatives have been personally contacted to update contact information for CUAHSI and to confirm or update representatives.
- e. Business activities
 - i. Bales reported that the employee handbook has been updated. He also noted Jon Pollock continues to establish and update standard operating procedures to ensure continuity of services. He also noted new accounting software has been implemented to more clearly track finances in real time and provide transparency.
 - ii. Bales reported that one of the NSF Cyberinfrastructure for Sustained Scientific Impact projects that includes CUAHSI staff as a co-PI was recommended for funding, and that a second CSSI proposal has potential for funding.
- f. Future Proposals
 - i. Bales identified the possible NSF RCN call that targets CZO networks. He has discussed this opportunity with several potential partners. Bales

indicated that CUAHSI would potentially partner on several proposals here, but not likely lead an independent call.

- ii. VanBriesen asked about proposals in the educational domain. Bales reported acknowledgement of this area, but noted no action has been taken.
- iii. Bales reported there may be a role for CUAHSI in an Internet of Water initiative by the Aspen Institute.
- iv. Hester asked about interest in an NSF Mid-scale Infrastructure proposal. Bales reported an awareness of the space and some preliminary discussions, but he does not have a clear CUAHSI-led proposal in this space.
- v. Grant asked Bales to reflect on possible roles for CUAHSI in new spaces for strategic growth. Bales reported that the JupyterHub efforts which enable the running models on the cloud and linking data services to models directly within the CUAHSI ecosystem has great potential.

14. 2018 Budget to Actual Presentation (Attachment 03)

- a. Bales reviewed the budget and actual expenses to-date for the current fiscal year. The group discussed scenarios involving spending and timing of a renewal proposal decision.

15. Strategic Planning for 2019

- a. Grant initiated a discussion of how the Board can most effectively advance the CUAHSI mission.
- b. Valocchi discussed the need to have a balance between a core suite of services that work without fail and highly polished to achieve ease of use and adoption. Hyndman concurred, noting that active use of services by the Board should be an expectation of the Board.
- c. The group discussed emerging areas of interest to and possible upcoming challenges or risks to CUAHSI, including:
 - i. Internet of Water efforts
 - ii. Municipal water data
 - iii. Leadership succession and development, both within CUAHSI specifically and more broadly in the discipline. Gooseff discussed the unknown of future program managers at the NSF.
 - iv. CUAHSI Business Planning. How do we get from our current position to fulfilling the promise of being the go-to organization for water information. The group discussed the balance of supporting the hydrologic science community and pursuit of other streams of revenue generation. Bales identified the Science Gateways Community Institute as a useful advance in this space.
 - v. Broadening CUAHSI's role in hydrologic modeling, including data and model interoperability standards to ensure future generations of models are compatible with existing efforts. The seamless linkage of data to models and storage or results is a growing area of interest.

- vi. Designing data collection networks to support databases and models, and streamlining these workflows, is broadly of interest in the community.
- vii. Integration of atmospheric data and models is an important element of large-scale simulations, where there may be strategic initiatives to integrate. This might leverage partnerships with the National Weather Service.
- viii. Supporting national-scale modeling of both groundwater and surface water.
- ix. Grant articulated a balance of providing very specific tools vs. the more compelling engagement of members with themes (e.g., ecohydrology) or questions (e.g., who will have water in the future)? The contrast is between the importance of our work as a community vs. the detailed and specific tools that are generated.
- x. Gooseff suggested packaging efforts around big questions or themes that the community could rally behind along with agency partners. Loheide suggested that themes might be used to identify emerging or important areas, using a survey of the members to make these selections and providing targeted goals or areas to advance the community. Cohen discussed CUAHSI as possibly performing the unsung but necessary services the community needs.
- xi. VanBriesen discussed CUAHSI as a catalyst for advancing educational standards, norms, and coordination amongst hydrologists. This parallels many successful activities in CUAHSI's current portfolio. Cohen proposed a CyberSeminar series focused on pedagogy. Several board members noted the engagement of students with CUAHSI as important to seeding a population of hydrologists who are aware of CUAHSI services and will continue to use them. Cohen suggested training in science communication and the role of scientists in the public dialogue and policymaking, as many of our members are interested in this space. Hyndman suggested this as a possible CyberSeminar topic. Several possible organizations were suggested as strategic partners. The group also suggested adding a seminar on to a meeting such as AGU would be possibly useful.
- xii. Gomez-Velez suggested science reproducibility workshops as an important area to advance and ensure the reproducibility of scientific findings including data and codes. He suggested a similar strategy could be helpful, based around CUAHSI's tools.
- xiii. Gooseff emphasized the pathfinder presentations as a compelling part of the biennial. He suggested highlighting success stories based on use cases.
- xiv. Beighley suggested targeted campaigns to get some community subgroups to upload their data in a call. This could be a push to get a significant increase in the number of data points presented from a given type of data (e.g., intermittent flow). Bales suggested NSF RCNs and USGS Powell Center efforts as a way to stimulate small groups to make CUAHSI tools a

standard for groups of researchers. Grant suggested the efforts for the CZO program data management are similar to these efforts.

- xv. Cataloging of other data repositories for remotely sensed and spatial data products.
- xvi. Gomez suggested helping prepare the community to properly collect data including possible drone-based collection.
- xvii. Loheide suggested increased efforts to engage CUAHSI with institutions and stakeholders, including NSF as staff turn-over.
- xviii. Grant suggested a more organized approach is needed to categorize efforts by fundamental services, emerging areas, longer-term potential, and long-range sustainability, or some other view of the different stages of maturity of various CUAHSI efforts.

16. Approval of Bales Travel (Attachment 04)

- a. Bales presented travel and justification for travel on multiple trips, highlighted in Attachment 04 including trips for a Summit to Sea workshop, GSA, AGU, Gateway Computing Environments Conference, and a Mekong River basin data management trip sponsored by the U.S. State Department.
- b. Motion to approve Bales' travel as proposed in Attachment 4 and discussed.**
 - i. Motion: Hyndman**
 - ii. Second: Valocchi**
 - iii. Discussion: (none)**
 - iv. Vote: Approved (unanimous)**

17. Grant opened the floor to other business. Hearing none, the meeting was adjourned.

17:00 EST Adjourned

Attachments provided to the Board in advance of the meeting:

- 1 – NSF Renewal Proposal
- 2 – Communications Plan
- 3 – Budget updates
- 4 – Bales' proposed travel
- 5-8 – Data Driven Education Review, Reports, Plans