

**UF Water Institute  
Faculty Advisory Committee Meeting  
September 13, 2016  
SUMMARY**

**Present:** Arnaldo Valle-Levinson, Jon Martin, Tom Waltzek, Liz Screaton, Matt Cohen, Tatiana Borisova, Sandra Russo, Michael Dukes, Kati Migliaccio, Nancy Denslow, Jamie Gillooly, Peter Frederick (Water Institute: Wendy Graham, Carol Lippincott, Lisette Staal)  
**Not Present:** Mary Jane Angelo, Tom Frazer, David Kaplan

**Introductions**

- Election process was reported on and new members introduced: Borisova, Denslow, Dukes, Gillooly, Martin (all present);
- Members who rotated off were recognized: Annable, Clark, Irani, Jawitz, Boyer
- Results of Chair Elect selection was announced - Kati Migliaccio
- Chair for this year remains Matt Cohen
- Each member briefly introduced themselves

**Water Institute Graduate Fellows Program (WIGF)**

**1. Request for Proposals** - 7 letters of interest were received by the deadline. Noted that the FAC (with no conflict of interest) will be asked to review the proposals. Deadline for submission is September 26. Review will be shortly after that.

One of the submitting groups indicated that they had approached ESSIE (Kirk Hatfield) regarding support and were told that ESSIE is not funding 2017 cohort; this creates a challenge and may keep them from submitting a proposal.

- Suggestion: Would be good to know outlook for future from ESSIE contribution to WIGF; Tom should talk with Kirk Hatfield about 2019 cohort. Graham also suggested that it would be good to approach Urban & Regional Planning Dean for 2019 cohort.
- Tom Waltzek noted that he and Nancy Denslow would like to talk to their Dean about getting \$ from College of Vet Medicine for 2019 cohort; Suggestion: Tom and Nancy consider setting a meeting for discussing the WIGF program 2019.

**2. WIGF Evaluation:** WI Staff reported on refining evaluation and reporting for WIGF. The proposed approach will focus on two different aspects: 1) On-going Assessment (formative) and 2) reporting (summative), and attention to interdisciplinary/integrative efforts. Staff has developed a description of the approach (APPENDIX 1) .

Discussion: FAC member note that developing an evaluation/reporting plan for the WIGF program would provide a unique opportunity to track this type of educational endeavor from its initiation, and an opportunity to follow graduates. Noted some

constraints to evaluation in that the size of the “population” is small and difficult to implement a rigorous control group. In addition, although important, measuring the interdisciplinarity of the program is difficult but any lines of evidence of program success would be useful. Some suggestions for enhancing evaluation of impact included:

- Faculty mentors gather/report info on where graduated students are working, etc.;
- Showcase things that are unique by looking at what happens after they leave
- Track non-funded WIGF students as well as appropriate
- Use social media – (*note: we currently have a linked-in Group but not sure how effectively being used.*)
- Develop a questionnaire with standardized data (*note: we have drafted as part of the description – see appendix 1*).

Action: WI Staff will send revised DRAFT program evaluation description to FAC for their review and comments. FAC will send comments and suggestions to [lstaal@ufl.edu](mailto:lstaal@ufl.edu).

### **Faculty Fellows Award Program**

1. **New Fellows for 2016**: Kati Migliaccio, Arnolde Valle-Levinson. Awards ceremony held together with Florida Climate Institute is scheduled for Monday, October 3, 2016, Keene Faculty Center, Dauer Hall, 4:30 – 6:30 PM. FAC were encouraged to participate.

2. **“Former” Fellows**: The first two Faculty Fellows named in 2013 (Cohen, Munoz-Carpena) are completing their 3 year terms. The Faculty Fellows are a distinguished set of individuals that are an important part of the Water Institute and we need to consider ways to recognize their tenure and encourage their continued relationship as Faculty Fellows and explore retired/alumni/or other designation. Asked what his role has been as a Fellow, Matt indicated he always promoted the WI whenever possible at UF and throughout his networks. Also recognized WI in proposals, gave seminars, helped with seminars and Symposia in particular suggesting sessions, and people.

Discussion: What is appropriate as “closure” or transition to “retired/alumni/former status?” The goal of some “closure” or “report” is to raise profile of Fellows and WI. Some suggestions:

- Recognize the Fellows in some way, but not at the new Faculty Fellow award celebration because that is all about the new Fellows;
- Fellows showcase their achievements at the WI symposium, sharing what happened during tenure of Fellow, linked to theme of symposium;
- Maintain some record capturing the highlights and insights from the Fellows- have communications intern interview retiring/alumni/ Fellows and put on website;
- Designate a space or wall in the Water Institute office of Fellows photos;
- Seminar series could be a good opportunity for Faculty Fellows;

- Suggest/host distinguished and highly recognized speakers to highlight Fellows collaborative work at symposium session or other venues (*note: WI pays for travel*).

### **3. Fellows Selection:**

- WI should try to reach more broadly for nominations;
- There was general agreement to consider early and later career and change criteria so as not to discriminate early career standouts;
- A question remains on whether do every other year or as needed? ....if a year or more is skipped, people tend to forget about awards; or do 1 a year with no bias in criteria against early career pre-tenure); find a better name than later-career

## **Looking Forward and Strategic Plan**

**1. Retreat:** Discussion during the FAC April meeting suggested a retreat in Jan-Feb for ½ to 1 day to include FAC members (including past members) and Faculty Fellows.

Revisiting this idea, discussion points included:

- Want everyone there to be engaged;
- Leave it open to previous FAC members, attend if you want;
- Invite as many people as possible to participate in retreat (not just FAC and Fellows), useful way to demonstrate to new faculty and old faculty that WI is indeed grassroots, motivated by faculty, not just Deans;
- Should find out what do faculty want from WI?

Action: Retreat planning to frame discussion points. In addition to the volunteers from April FAC meeting (Russo, Clark, Angelo, Migliaccio), Tatiana Borisova also volunteered to work with planning group.

**2. Comparative “water institutes:”** Following up on suggestion from the April meeting, WI Staff compiled information on other organizations with similar missions. Brief internet search of comparable institutes (APPENDIX 2); most are interdisciplinary; have affiliations with outside agencies and organizations; many focus on applied solutions; a Water Institute “coordinating water research, education, and outreach across the University, thus stimulating new collaborations” is being established at Penn State. Their Strategic Plan is available at <http://psiee.psu.edu/node/306>.

Discussion: Why are we doing this... looking at ‘comparable’ institutions? Need to be aware that models are very different, some pure research, some pure education; Consider what is working and what we might learn from others about - how we might operate better; innovative ideas that might work within our system, In particular, considering administrative structures and struggles might be helpful.

Action: FAC will consider the documents showing both the comparable institutions (Appendix 2) and the Training/Educational programs (Appendix 3) to consider if we are missing any “water institutes “or organizations that you are aware of with similar missions? (For example, as mentioned, Pacific Institute is NGO but water-

related). Earth Institute at Columbia as mentioned by Wendy in the FAC meeting has been added.

**Next Steps** - FAC suggested to meet once a semester.

## APPENDIX 1

### WIGF EVALUATION APPROACH – (REVISED DRAFT- September 27, 2016)

There are basically two complimentary approaches to the WIGF Program evaluation efforts proposed: 1) On-going Assessment (formative) and, 2) Quantifiable Outcomes (summative). A key element of the program that makes it unique is its interdisciplinary focus and trying to capture this is a challenge and an assessment framework is presented for consideration\*. The potential for comparisons on Reporting could be by comparing to DEPARTMENTAL reporting of similar items.

1) **On-going Assessment (formative)** – Is an integral part of the Cohort’s process and provides feedback to the specific WIGF Cohort team on a) how they are progressing and, and b) what distinguishes this experience as an interdisciplinary program. Assessment tools would be developed with the WIGF PI/Team, and the WI Coordinator would work with the PI as they agree is appropriate.

a) Survey - Administered at least annually the type of information might include – what is working, what could be improved, is the program reaching your expectations, how well is the program reaching its objectives, and is this program providing unique interdisciplinary opportunities. Boix Mansilla [and Duraisingh \(2007\)](#) proposed an assessment framework that highlights three core dimensions of students' interdisciplinary work 1) Disciplinary Grounding, 2) Advancement through Integration, and 3) Critical Awareness that might be considered. The framework description below and some questions are included in the assessment survey (Table 1).

b) Checklist Assessment of Interdisciplinarity – with a goal of 100% sign-off (students and faculty) on a checklist assessing the interdisciplinarity during the dissertation defense. Tom suggested that the new set of “PhD Criteria” from Dr. Glover’s office and this should be considered in developing the checklist. This might also reflect the “assessment framework” as mentioned above (Checklist to be developed).

**2) Quantifiable Outcomes (summative)** – Includes requesting the WIGF PIs to report specific metrics to show that the program has succeeded in achieving its stated goals and reaching overall metrics of success. These metric are based on those identified in the WI strategic plan and annual reporting as well as contributing to Pre-eminence goals at UF (*see reference information In Appendix 2*). It will require collection of specific data from faculty and students in each cohort that could be entered (*or some automatically pulled from UF info*) into a Water Institute database. The specific process of collecting data and filling in the information still to be finalized (*see suggested Metrics below*), but could be asked of the WIGF PIs on an annual basis. In terms of keeping track in a database, since it depends on Mary’s expertise, it is important for her to consider the feasibility and most effective, efficient way to approach any database effort. Table 2 identifies are some of the key metrics and type of data that will be needed.

**3) Framework for Assessing Interdisciplinarity** - Interdisciplinary Research as defined by the [National Academies](#) "... is a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more

disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research practice" (2005, p. 27). [Boix Mansilla and Duraisingh \(2007\)](#) proposed an assessment framework that highlights three core dimensions of students' interdisciplinary work 1) Disciplinary Grounding, 2) Advancement through Integration, and 3) Critical Awareness. In interdisciplinary work, students advance their understanding by moving to a new conceptual model, explanation, insight, or solution. To do so, they employ the unique advantages afforded by bringing together more than one disciplinary lens.

Integration and synthesis activities are widely regarded as the distinguishing traits of interdisciplinary versus discipline-based learning. Sixty eight percent of the faculty addressing epistemic qualities of student work identified “synthesis” or “integration” as an essential feature of interdisciplinary work, often in association with innovation (Mansilla and Duraisingh 2007). Thompson Klein (2007) notes that interdisciplinary education intersects with innovative pedagogies that emphasize exploration and active involvement in the process of making meaning. Teachers use innovative approaches that promote dialogue and community, problem-posing and problem-solving, and critical thinking. The following structures, strategies, and activities are typically reported:

- team-teaching and team planning
- collaborative learning and learning communities
- clustered and linked courses
- core seminars at introductory and capstone levels
- theme or problem focus in courses
- proactive attention to integration and synthesis
- models of interdisciplinary and integrative process
- theories and methods from interdisciplinary fields
- projects and case studies
- inquiry-and discovery-based learning
- experiential-and service-learning, internships, and fieldwork

## REFERENCES

Veronica Boix Mansilla and E. Duraisingh (2007) [Targeted Assessment of Students' Interdisciplinary Work: An Empirically Grounded Framework Proposed](#), the Journal of Higher Education, Volume 78, Number 2, march/April 2007, pp. 215-237 (Article), Published by The Ohio State University Press. DOI: [10.1353/jhe.2007.0008](#)

National Academy of Sciences, National Academy of Engineering, and Institute of Medicine of the National Academies. (2005). [Facilitating interdisciplinary research](#). Washington, DC: The National Academies Press.

Klein, Julie Thompson, (2006) [A Platform for a Shared Discourse of Interdisciplinary Education](#), Journal of Social Science Education, Volume 5, Number 2, September 2006, pp 10-18 ISSN 1618-5293, [www.jsse.org](#) DOI: [10.4119/UNIBI/jsse-v5-i4-1026](#) v

**Table 1. Framework Considerations for Interdisciplinary Assessment**

<p><b>1. Disciplinary Grounding</b></p> <p>The degree to which student work is <i>grounded</i> in carefully selected and adequately employed <u>disciplinary insights</u> — disciplinary theories, findings, examples, methods, validation criteria, genres, and forms of communication.</p> <p>(a) Are the selected disciplines appropriate to inform the issue at hand? Are any key perspectives or disciplinary insights missing?</p> <p>(b) Are the considered disciplinary theories, examples, findings, methods, and forms of communication accurately employed, or does the work exhibit misconceptions?</p>
<p><b>2. Advancement through Integration</b></p> <p>The degree to which disciplinary insights are clearly <i>integrated</i> so as to advance student understanding —using integrative devices such as conceptual frameworks, graphic representations, models, metaphors, complex explanations, or solutions that result in more complex, effective, empirically grounded, or comprehensive accounts or products.</p> <p>(a) Where is there evidence of disciplinary integration (e.g., conceptual framework, graphic representation, model, leading metaphor, complex explanation, or solution to a problem)?</p> <p>(b) Is there evidence that understanding of the issue under study has been enriched by the integration of different disciplinary insights, (e.g., yielding a comprehensive explanation, a more viable solution)?</p> <p>(c) What would be lost if a particular disciplinary insight were missing from the work or if the balance of disciplinary insights were different?</p>
<p><b>3. Critical Awareness</b></p> <p>The degree to which the work exhibits a clear sense of purpose, reflectiveness, and self-critique - framing problems in ways that invite interdisciplinary approaches and exhibiting awareness of distinct disciplinary contributions, how the overall integration "works," and the limitations of the integration.</p> <p>(a) Does a piece of student work show clear goals, framing the issue in ways that invite an interdisciplinary approach?</p> <p>(b) Does the work exhibit reflectiveness about the choices, opportunities, compromises, and limitations that characterize interdisciplinary work and about the limitations of the work as a whole, such as what an account failed to explain or what a solution could not address?</p>

Source: Based on Boix Mansilla [and Duraisingh \(2007\)](#)

**Table 2. Sample Survey Topics for On-Going Assessment by cohort (formative)**

<p><b>COHORT ASSESSMENT</b></p> <ul style="list-style-type: none"> <li>• Why did you choose to enroll in this graduate program?</li> <li>• What are your expectations for the Water Institute Graduate Fellows (WIGF) Program?</li> <li>• So far, has the program met your expectations? Please explain.</li> <li>• What is working well within the team?</li> <li>• List 1 - 3 things you would like the WIGF group to KEEP doing.</li> <li>• List 1 - 3 things you would like the WIGF group to START doing.</li> <li>• List 1 - 3 things you would like the WIGF group to STOP doing.</li> <li>• To date, how satisfied are you with the mentorship/support provided by the WIGF FACULTY cohort?</li> <li>• To date, how satisfied are you with the mentorship/support provided by the WIGF STUDENT cohort?</li> <li>• What other feedback can you offer to help improve the WIGF Program</li> <li>• What was your most significant accomplishment In the WIGF program over the last 12 months?</li> <li>• What was your most significant challenge in the WIGF program over the last 12 months?</li> </ul>
<p><b>INDIVIDUAL ‘INTERDISCIPLINARY” ACCOMPLISHMENTS</b></p> <ul style="list-style-type: none"> <li>• How many presentations did you participate in at conference other than your own discipline?</li> <li>• How many presentations did you author with someone in different discipline?</li> <li>• How many publications have you had in interdisciplinary Journal?</li> <li>• How many publications do you have in a Journal outside of your discipline?</li> <li>• How many proposal with someone from a different discipline?</li> <li>• How many Research projects with someone in a different discipline?</li> </ul>
<p><b>INTEGRATED ACTIVITIES - Rank Activities from most useful to least useful</b></p> <p>(i.e., cohort meetings, field visits, workshops, joint courses..... etc. )</p>
<p><b>INTERDISCIPLINARITY - Based on the description of Interdisciplinary and the Assessment Framework described....</b></p> <ul style="list-style-type: none"> <li>• To what degree do you attribute your participation in the WIGF program with your development of a deep knowledge in your chose discipline?</li> <li>• To what degree do you attribute your participation in the WIGF program with your development of a strong holistic understanding of the biophysical, technological, ecological, social and economic challenges to sustaining water resources?</li> <li>• To what degree do you attribute your participation in the WIGF program with your development of a broad range of interdisciplinary skills?</li> <li>• Please rate the interdisciplinarity of your own research.</li> <li>• How important is interdisciplinarity in your program of study?</li> </ul>



**Table 3. WIGF Reporting Information from PIs for Quantifiable Outcomes Reporting (summative)**

	<b>METRICS</b>	<b>INFORMATION Reported from PI</b>
QUALIFICATIONS	Number, qualifications and diversity of FACULTY and GRADUATE STUDENTS (SPECIFY core funded OR not funded) participating in WIGF	Indicate Faculty or Student(funded cohort or other), age/sex/race, Department, College, and National Awards/recognitions
PRESENTATIONS	Number of national and international conference presentations (poster and oral), refereed publications and scholarly works by graduate students	<ul style="list-style-type: none"> <li>• Presentations at National Conferences</li> <li>• Presentations at International Conferences</li> <li>• How many co-Authors for each</li> </ul>
PUBLICATIONS	Number of national and international refereed publications and scholarly works by graduate students	<ul style="list-style-type: none"> <li>• Refereed publications or publications in-review,</li> <li>• name of Journal and impact factor</li> <li>• Proposals co-developed/submitted</li> </ul>
TEACHING	Number of proposals and teaching activities	Student Co-developed/taught courses
INTERNATIONAL	International experiences of WIGF	<ul style="list-style-type: none"> <li>• Travel with Cohort to another country?</li> <li>• Research in another country?</li> <li>• Research project with someone currently working in another country</li> </ul>
FUNDING	Amount of grant or donor funding obtained <u>to supplement the UF contribution</u>	<ul style="list-style-type: none"> <li>• Number of proposals submitted in the WIGF Cohort (PI Name, names of co-PIS, title, date, funding source, and status)</li> <li>• Number of proposals awarded to the WIGF Cohort (PI Name, names of co-PIS, title, date, funding source)</li> <li>• Funding committed from OTHER projects. (PI, source and amount)</li> </ul>
CAREER	Placement into relevant careers such as positions in government, academia and industry.	<ul style="list-style-type: none"> <li>• Name/date of graduated</li> <li>• Job placement of graduates (<i>followed for 5 years</i>)</li> </ul>

APPENDIX 2 – COMPARABLE ORGANIZATIONS  
 Internet search, Sept 2016

[Columbia Water Center](#) - Columbia University, Earth Institute,

Where it fits in overall Institution	Columbia Water Center - <a href="http://water.columbia.edu/about-us/">http://water.columbia.edu/about-us/</a> was established in January 2008 as a branch of the <a href="#">Earth Institute</a> at <a href="#">Columbia University</a> . (PepsiCo Foundation \$6 million grant) See <a href="#">fact sheet</a> .
Staffing	Director – Upmanu Lall; Core Faculty – 6; Core Researchers – 10; Core Staff – 2 (Director of Operations and Senior Program Manager) ; Affiliates – 60 (includes other universities); Students - 7
Mission	Our mission is to creatively tackle water challenges of a rapidly changing world where water and climate interact with food, energy, ecosystems and urbanization. Combining the rigor of scientific research with the impact of effective policy, we aim to design reliable, sustainable models of water management and development that can be implemented on local, regional and global levels.
Focus	Multidisciplinary approach to water challenges, employing hydrologists, climatologists, environmental engineers and water policy analysts.
RESEARCH	Research Themes (America’s Water, Global Floods Initiative, Data Analytics and multi-scale predictions, Risk and Financial Instruments, Water- Food-Energy Nexus)
PUBLICATION	Searchable System – project related publications and white papers
PARTNERS	Supporters: PepsiCo Foundation, NSF NOAA, IDRC, AIG, India State government Research: India, Brazil, US

[Desert Ranch Institute \(Nevada\)](#)

Where it fits in overall Institution	Environmental research arm of the Nevada System of Higher Education--\$50 million in annual revenue from research grants and contracts, state support and private-sector research and development-- In 1959, the Nevada State Legislature created a division of the University of Nevada specifically devoted to conducting research. DRI is an autonomous division of the University of Nevada System since 1969
Staffing	Acting president, Robert B. Gagosian effective July 1. DRI’s faculty members are nontenured, entrepreneurial and responsible for their own salaries from external grants and contracts; □560 employees; □176 Ph.D. research faculty specializing in more than 40 scientific fields; president's cabinet (20) provides advice and counsel to the president on matters regarding policies, procedures, and strategic planning.
Mission	Basic and applied research and the application of technologies to improve people's lives throughout Nevada and the world.
Focus	Conducts cutting-edge applied research in air, land and life, and water quality across Nevada, global climate change, water quality and availability, air quality, sustainability of desert lands, life in extreme environments
RESEARCH	Since 2000, DRI has attracted \$391 million in external research; 300 research projects around the world; 60 specialized labs; Since 2000, DRI entrepreneurial faculty have leveraged \$110 Million in state appropriation from the Nevada State Legislature to attract more than \$510 Million in external research grants and contracts from federal, local and private sponsors. Providing the State of Nevada with a \$4.6-to-\$1 direct return on its investment.
PUBLICATIONS	<a href="#">Searchable publications database</a>

[UC Davis Center for Watershed Sciences](#)

Where it fits in overall Institution	One of 11 centers/institutes in UC Davis John Muir Institute of the Environment established in 1997
Staffing	Total – 5; Director, Jay R. Lund; Associate Director; Field and lab Director(staff and student); Researcher in Administration; 24-researchers and scholars; 27 students
Mission	he Center for Watershed Sciences is dedicated to the interdisciplinary study of critical water challenges, particularly in California, focusing on environmentally and economically sustainable solutions for managing rivers, lakes and estuaries
Focus	Interdisciplinary research unit help understand and solve California's complex water problems.
RESEARCH	10 identified research programs with projects- •California Drought •California Water Policy •Delta Solutions•Spring-fed Rivers and Streams•Sierra Nevada•Central Valley Floodplains •Watershed Restoration •Modeling and Analysis • International Programs •Water Economics and Management group •Watershed Restoration
PUBLICATION	35 publications in 2015; 5 publications in 2016 ; links to Google Scholar
PARTNERS	•UC Davis • University of California •6 Western university •3 international university • 6 Federal agencies •15 organizations- •2 businesses

[Institute for Water and Watersheds\(Oregon State university\)](#)

Where it fits in overall Institution	Oregon State University-the state water resources research institute for Oregon-- one of 54 state- or territory-based, institutes established by the 1964 Federal Water Resources Research Act. Predecessor organizations- the Center for Water and Environmental Sustainability and the Oregon Water Resources Research Institute
Staffing	Director – hydrogeologist; Assistant Director - manages the business office; International program leader; Manager of Collaboratory; Faculty Research Assistant - project coordinator; 3 students; Principal Investigators Affiliated with the IWW (20) - work directly with the IWW; executive committee consists of faculty members from the OSU water and watersheds community and a student representative; over 125 faculty teach and conduct research in areas related to fresh water supply and quality.
Mission	The Institute for Water and Watersheds (IWW) is Oregon’s federally-designated <u>water resources research institute</u> . Its role is to catalyze water research
Focus	Integrative water research for a changing world.
RESEARCH	<u>Collaboratory</u> - a shared laboratory that provides Oregon State University and Oregon University System affiliates with access to low cost trace level, fresh water analysis instrumentation and procedures. <u>Oregon Hatchery Research Center-</u> Watersheds Research Cooperative- research on the effects of current and expected forest practices on intensively managed commercial forestland on water quality, fisheries and other water-related values- <u>Watersheds Research Cooperative</u> – College of Forestry <u>HJ Andrews Experimental Forest</u> - part of the National Science Foundation Long Term Ecological Research (NSF-LTER) program
PUBLICATION	Publications database - google scholar links The Oregon Explorer - a natural resources digital library and web portal t

[Penn State Water Institute](#) (newly established) 2015 ([link to Task group report- Strategic Plan](#))

Where it fits in overall Institution	The Penn State Water institute is part of the <a href="#">Penn State Institutes of Energy and the Environment (PSIEE)</a> , which is the central coordinating structure for interdisciplinary research at The Pennsylvania State University.
Staffing	Director Hiring is underway- he inaugural Director will be charged with leading the unit in shaping the overall water related research portfolio; in coordination with over 120 exceptional faculty, distributed across eight colleges at University Park and several regional campuses.
Mission	<a href="http://www.psiee.psu.edu/water">http://www.psiee.psu.edu/water</a> The mission of this program would be to coordinate, stimulate, and support integrated water-related research, education and outreach efforts. This will create a sense of community and will provide an intellectual home for water-related faculty, staff, and students in the natural and human sciences across the University. Through leveraging existing strengths and with key targeted investments, it will also bring Penn State to national and international prominence at the forefront of water science.
Focus	targeted hiring of tenure-track faculty, seed funding for new water research, establishing an inter-departmental graduate program, and enhancing the university's connections to internal and external water stakeholders and organizations via a new Web portal and community.
RESEARCH	Current water research activity includes, three major centers supported by NSF and EPA. and over \$40 million per year of external funding for water and closely allied research fields recommendation is to center on four broadly defined but strategically focused scientific areas of excellence, in which Penn State is poised to become a global leader: <ul style="list-style-type: none"> <li><input type="checkbox"/> I: Water Quality, Quantity, and Human Health;</li> <li><input type="checkbox"/> II: Watershed Dynamics: Fluxes from Continent to Ocean</li> <li><input type="checkbox"/> III: Water and Ecosystems</li> <li><input type="checkbox"/> IV: Water and Global Environmental Change</li> </ul>

[Texas Water Resources Institute](#) and Texas A&M Water-Energy-Food Nexus Initiative

Where it fits in overall Institution	Part of Texas A&M University the <a href="#">Texas Water Resources Institute</a> was established 1952 works together with the <a href="#">Texas A&amp;M Institute of Renewable Natural Resources (IRNR)</a> - --- <a href="#">Water Energy food Nexus Initiative</a> was recently established.
Staffing	Director; Deputy Director of Engagement; Business Admin – 7 people; Research and Extension – 10; Geospatial and Information Technology – 6; Communication coordinator and manager – 2; Students - 4
Mission	Foster and communicate research and educational outreach programs focused on water and natural resources science and management issues in Texas and beyond. The Texas A&M University <a href="#">Water-Energy-Food Nexus Initiative</a> - Established in 2015 - Initiative's Goals <ul style="list-style-type: none"> <li>• Facilitate science-based policy</li> <li>• Raise awareness among academe, society, government and industry for holistic approaches to address grand challenges and sustainable development goals</li> <li>• Identify and respond to national and global opportunities in research, education, outreach and policy implementation</li> <li>• Assist in the effective management of primary resources</li> </ul> <a href="#">Factsheet</a>
Focus	Provide science-based, community-supported solutions for the state's pressing water quantity and quality challenges through internal expertise and external collaborations

RESEARCH	Watershed protection; restoration; conservation
PUBLICATION	On line – by topic, technical reports and educational materials

[UNC – The Water Institute](#)

Where it fits in overall Institution	School of Public Health
Staffing	Director, Director of teaching and learning, five affiliate faculty, four postdoctoral researcher and 12 support staff
Mission	Work towards eliminating global disparities and improving access to safe water
Focus	Health and International – Research, Teaching and Learning, Knowledge Management, Networking and Partnership
RESEARCH	See <a href="#">three year review 2010 - 2013</a>
PUBLICATION	Lists publication alphabetically by year highlight Water Institute on google scholar

APPENDIX 3 – WATER ACADEMIC DEGREES (non-Engineering)

Internet search completed by Carol Lippincott, UF Water Institute – Sept 2016

University	Undergrad Degrees	Graduate Degrees	Certificates / Specializations	Online Degrees	Water entity	Notes
Arizona State University (in Tempe)	0	0	0	0	<a href="#">Kyl Center for Water Policy</a> , begun 2014	
California State University - Fresno	0	<a href="#">MS - Water Resource Management</a> in Dept of Earth & Environmental Sciences	0	0	<a href="#">California Water Institute</a>	
California State University – San Bernadino	0	0	0	0	<a href="#">Water Resources Institute</a>	
Colorado State University (in Ft Collins)	<a href="#">BS or Minor - Watershed Science</a> thru College of Natural Resources  Undergrad Minor - <a href="#">Sustainable Water Interdisciplinary Minor</a> thru CSU Water Center with School of Global Environmental Sustainability	<a href="#">MS - Watershed Science</a> thru Dept of Ecosystem Science & Sustainability	PhD – Earth Sciences with <a href="#">Watershed Science Specialization</a>	0	<a href="#">Colorado Water Institute</a>  <a href="#">CSU Water Center</a>	Massive Open Online Course (MOOC), no cost, no credit - <a href="#">Water, Civilization and Nature: Addressing Water Challenges of the 21th Century</a>

University	Undergrad Degrees	Graduate Degrees	Certificates / Specializations	Online Degrees	Water entity	Notes
Columbia University (in City of New York)	0	0	<a href="#">Certificate in Sustainable Water Management</a> thru School of Continuing Education and the Columbia Water Center	Offers online water courses but no online water degree	<a href="#">Columbia Water Center</a> in the Earth Institute	
Duke University (in Durham, NC)	0	<a href="#">MS - Water Resources Management</a> thru School of the Environment	0	0	<a href="#">Water Policy Program</a> in Institute for Environmental Policy Solutions	
Johns Hopkins University (in Baltimore, Maryland)	0	0	0	0	<a href="#">Global Water Program</a> in School of Arts & Sciences	
Oregon State University (in Corvallis)	BS - Environmental Sciences with <a href="#">option in Water Resources</a>	MS & PhD - <ul style="list-style-type: none"> <li><a href="#">Water Resources Science</a></li> <li><a href="#">Water Resources Policy and Management</a></li> <li><a href="#">Concurrent JD/MS Degree Program</a> in <a href="#">Water Resources Graduate Program</a> thru Institute for Water &amp; Watersheds &amp; College of Earth, Ocean and Atmospheric Sciences</li> </ul>	<a href="#">Professional/Graduate Certificate Program in Water Conflict Management and Transformation</a> - also offered as a minor	<a href="#">Online graduate certificate - Water Conflict Management</a>	<a href="#">OSU Institute for Water &amp; Watersheds</a> , a USGS National Institute for Water Resources	

University	Undergrad Degrees	Graduate Degrees	Certificates / Specializations	Online Degrees	Water entity	Notes
Pennsylvania State University (in University Park)	<a href="#">Undergrad minor - Watersheds &amp; Water Resources</a> thru College of Earth and Mineral Sciences	0	0	0	<a href="#">Pennsylvania Water Resources Research Center</a> , a USGS National Institute for Water Resources	May be working on a dual-degree program in water
Stanford University (in Palo Alto, CA)	0	0	0	0	<a href="#">Water in the West Global Freshwater Initiative</a>	
Texas A&M University (in College Station)	0	<a href="#">Master of Water Management</a> (non-thesis), MS & PhD thru <a href="#">Water Management &amp; Hydrological Science program</a> in Geoscience Dept	0	0	<a href="#">Texas Water Resources Institute</a> , a USGS National Institute for Water Resources	
Texas State University (in San Marcos)	0	0	<a href="#">Certificate in Water Resources Policy</a> thru Dept of Geography	0	<a href="#">Meadows Center for Water &amp; the Environment</a> (originally International Institute for Sustainable Water Resources) established 2002, \$10 million endowment in 2012	



University	Undergrad Degrees	Graduate Degrees	Certificates / Specializations	Online Degrees	Water entity	Notes
Tufts University (in Bedford, MA)	0	0	<a href="#">Graduate certificate in Water: Systems, Science, and Society</a> thru <a href="#">Water: Systems, Science &amp; Society</a> interdisciplinary graduate program in the <a href="#">Tufts Institute of the Environment</a>	<a href="#">Integrated Water, Food, and Energy</a> online graduate certificate	0	Got 2010 IGERT for 25 PhD students to focus on water diplomacy
University of Arizona (in Tucson)	<a href="#">BS - Watershed Hydrology &amp; Management</a> thru School of Natural Resources & the Environment	<a href="#">MS - Water, Society &amp; Policy</a> thru School of Natural Resources & the Environment  <a href="#">MS &amp; PhD - Watershed Management &amp; Ecohydrology</a> thru School of Natural Resources & the Environment  <a href="#">MS &amp; PhD - Soil, Water, and Environmental Science Dept</a> thru College of Ag & Life Sciences	Graduate Certificate in Water Policy (certificate only or concurrent with grad degree) thru multiple departments	0	<a href="#">NSF Water Quality Center</a> in the Environmental Research Lab	

University	Undergrad Degrees	Graduate Degrees	Certificates / Specializations	Online Degrees	Water entity	Notes
University of California - Berkeley	0	0	0	0	<a href="#">Berkeley Water Center</a>  <a href="#">Wheeler Water Institute</a> in Berkeley Center for Law, Energy & the Environment	
University of California - Davis	<a href="#">BS - Hydrology</a> thru Dept of Land, Air & Water Resources	MS & PhD in Hydrology, Hydrogeochemistry, or Hydrobiology thru the <a href="#">Hydrologic Sciences Graduate Group</a>	0	0	<a href="#">UC Davis Center for Watershed Sciences</a>  <a href="#">CA Institute for Water Resources</a> – thru UC Division of Ag & Natural Resources	
University of California – Santa Barbara	0	0	Specialization in <a href="#">Water Resources Management</a> thru School of Environmental Science & Management	0		
University of Colorado Boulder	0	0	0	0	<a href="#">Cooperative Institute for Research in Environmental Sciences</a> (CIRES), a partnership of NOAA and University of Colorado Boulder  <a href="#">Colorado Water &amp; Energy Research Center</a>	

University	Undergrad Degrees	Graduate Degrees	Certificates / Specializations	Online Degrees	Water entity	Notes
University of Idaho (in Moscow)	0	<a href="#">MS &amp; PhD - Water Resources</a> thru <a href="#">Water Resources Graduate Program</a> in College of Ag & Life Sciences  Can earn <a href="#">concurrent law &amp; water resources graduate degree (MS or PhD)</a>		0	<a href="#">Idaho Water Resources Research Institute</a> , a USGS National Institute for Water Resources  <a href="#">Univ of Idaho - Community Water Resource Center</a>	Currently has a 5-yr IGERT grant - Adaptation to change in water resources: science to inform decision-making across disciplines, cultures and scales.
University of Michigan (in Ann Arbor)	0	0	0	0	<a href="#">Water Center</a> in the Graham Sustainability Institute	

University	Undergrad Degrees	Graduate Degrees	Certificates / Specializations	Online Degrees	Water entity	Notes
University of Nebraska - Lincoln	<a href="#">BS in Water Science</a> thru College of Agricultural Sciences & Natural Resources	0	<a href="#">Graduate Specialization</a> in Water Resources Planning & Management thru various departments  <a href="#">Graduate Specialization</a> in Advanced Water Management for Food Production, with UNESCO-IHE, Delft, The Netherlands	0	<a href="#">Water for Food Institute</a>  <a href="#">Nebraska Water Center</a>	<a href="#">UNL water website</a>
University of Nevada – Las Vegas	0	<a href="#">MS - Water Resources Management</a> thru College of Sciences	0	0	<a href="#">Desert Research Institute</a> (part of Nevada System of Higher Education)	
University of Nevada - Reno	<a href="#">BS - Ecohydrology</a> thru Dept of Natural Resources & Environmental Science	<a href="#">MS &amp; PhD - Hydrology &amp; Hydrogeology</a> thru <a href="#">Graduate Program in Hydrologic Sciences</a>	Graduate certificate in <a href="#">International Water Resources</a>	0	<a href="#">Desert Research Institute</a> (part of Nevada System of Higher Education)	

University	Undergrad Degrees	Graduate Degrees	Certificates / Specializations	Online Degrees	Water entity	Notes
University of North Carolina – Chapel Hill	0	0	0	0	<a href="#">The Water Institute at UNC</a> in School of Global Public Health, which includes Environmental Sciences & Engineering	<u>WI purpose:</u> sustainable management of water for health and human development; improving access to safe water, sanitation, and hygiene.
University of Virginia (in Charlottesville)	0	0	0	0	0	
Virginia Tech (in Blacksburg)	<a href="#">B.S. in Water: Resources, Policy, and Management</a> <a href="#">Undergrad Minor in Watershed Management</a>	0	<a href="#">Graduate Certificate in Watershed Management</a>	0	<a href="#">Virginia Water Center</a> , a USGS National Institute for Water Resources	
Yale University (in New Haven, CT)			<a href="#">MS Specialization in Water Resource Science and Management</a>	0	0	