Executive Summary

The Institute for Water, Energy, Sustainability and Technology (iWEST) at California State University, Sacramento is a hub for the fusion of science and policy to focus on California and the region’s water, energy and sustainability issues. iWEST channels the power of interdisciplinary science through an integrated research and education platform to inform policy, education, outreach, and behavioral change. iWest is designed to create and foster an environment of inquiry, of action-oriented problem solving, and engaged research that advances public awareness of the complex relationships behind water, energy, and sustainability questions.

Over the last decade, considerable attention has been paid to climate change and its impact on human and environmental ecosystems. iWEST will provide research on the human dimensions of water, energy, sustainability, and technology issues that are important to California. iWEST will educate our students on these topics, and extend this knowledge to our state and federal government agencies and the greater community through a strong collective outreach effort. The initial research agenda will be developed through advancing existing research, pedagogical, or outreach projects to fund, while also broadcasting opportunities for future projects involving each area. This blend of driving current research while expanding aggressively the opportunities for new research themes will aid in the ramp up period of the Institute and help ensure its immediate impact.

There are a number of core research areas to be investigated by iWEST and its associated faculty, including:

- **Examination of the ramifications of FERC (Federal Energy Regulatory Commission) dam re-licensing.** For example in the Yuba River Watershed, specifically looking at irrigation and restoration needs, financial feasibility, water quality, and benefits to humans through preservation of wetlands;

- **Examination of how water impacts social movements.** For example, one of our colleagues has studied politics and social movements around large dams. The same colleague has studied inequality in the Central Valley with respect to groundwater accessibility, water scarcity as a source of conflict and social justice, and social equity impacts of water. Environmental justice and access to water is a key interest of Governor Brown;

- **Examination of the costs and benefits of preserving wetlands.** The state has lost over 90% of its wetland and riparian habitats. The State Water Board is using its existing authority in protecting the beneficial uses of wetlands under both Porter Cologne and 401 certification of the Clean Water Act. The Level 2 committee coordinates the statewide development and management of stream and wetland rapid assessment methods of California, which is part of the water quality monitoring protocols under Porter Cologne. This regulatory/policy effort will also help align regulatory and conservation efforts statewide, and provide a framework for reporting wetland health to the public. Given adverse impacts of climate change on biodiversity, water supply, flood control and ecosystem services, we envision long term involvement of CSUS faculty and students in research, funding and experiential educational/internship opportunities;
• The ongoing work on aquaponics, most notably building upon momentum taking place in the Sustainable Technology Outdoor Research Center (STORC). It's important to note that the largest single use of electricity is to pump water and that 80% of water is used by agriculture. Furthermore, National Geographic magazine estimates that 50 million tons of food waste are generated each year in the USA. The work done in STORC around aquaponics has resulted in a multitrophic sustainable solution to deal with water quality and waste. Furthermore, the work in STORC has had a very significant community outreach and education component. The principals in STORC have been interested in urban agriculture in general, in terms of social justice and how to build resilient communities. Besides basic and applied research in aquaculture, STORC has shown success in going out into the community and schools, as well as working with the Sacramento Food Bank. The work in STORC is helping us understand how we can use aquaponics to make communities more resilient in dealing with challenges;

• Community outreach/education around water issues. As was brought up at the meeting, there is often a fundamental lack of understanding in California about where water comes from and what value it has. There is also an opportunity to include public support biodiversity conservation and ecological restoration in public spaces like the American River Parkway, as well as managing ecosystem functions such as water quality improvement, flood abatement, and low flow augmentation. There could be great opportunities to share knowledge with the public through the proposed Institute. We should leverage our strengths in teaching to educate the public on water, energy, and sustainability opportunities;

• Community outreach in the area of sustainable food. As an example, locally grown food, the “farm to fork” program, community gardens, and other community based outreach programs. The importance of this area has grown to the point where students in our nutrition and food programs can’t complete their degrees without being aware of sustainability issues. There is extremely important education and community outreach work that needs to be done in the areas of food service management and sustainability. This is an area of expertise that should be further developed such that, for example, we can provide supplementary forms of training through the College of Continuing Education;

• Examination of how water scarcity impacts the population. There is a lot that needs to be done to connect the dots between water scarcity and population, e.g. wherever there's water scarcity, there's likely to be more than a proportional impact on the poor, e.g. on migrant workers; Also public recreation, education, happiness, and the relationship between scarcity and gender;

• Examination of how water, energy, and sustainability issues impact politics. The water bill and water plan have the dual goals of water supply and ecosystem restoration. These both offer opportunities for networking with stakeholders in the water community. For example, the Bay Delta Conservation Plan, the massive CA water bond package, the proposed Twin Tunnels Delta water project, and past defeat of the peripheral canal have major political implications.

For more information about iWEST, please contact Academic Affairs or the Office of Research Affairs at 916-278-6402 or research@csus.edu