



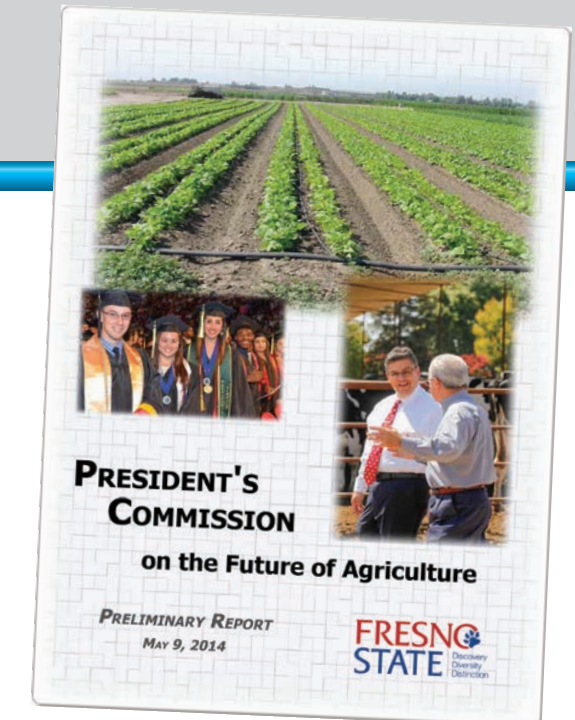
PRESIDENT'S
Water TASK FORCE

REPORT TO THE PRESIDENT

BACKGROUND

In May 2014, the President's Commission on the Future of Agriculture issued a preliminary report on how Fresno State should plan for, address and implement its future agricultural and natural resources programs. Point 8 of their recommendations began *"Ample surface and groundwater supplies are essential for agricultural productivity."* The report then notes that *"President Castro will create a campus/industry task force to coordinate existing water-related programs and to redefine Fresno State as a recognized leader in the area of water technology, water resource management and policy. The Commission supports this action, which will add value to existing programs."*

- *Promote findings of the task force as full-service to industry, academic and government.*
- *Create water-related majors/minors that train future water managers and related positions. Such courses would include water systems operations and management, irrigation technology, agricultural engineering, agricultural and environmental biology, water policy, and water resource management.*
- *Promote the Water and Energy Technology (WET) Incubator as an internship and career development center for students and faculty interested in water and energy related issues. Establish partnerships with other Colleges, Universities, Government and NGO researchers to enhance the visibility and utility of the WET Incubator.*
- *Improve alignment between water cohort faculty to better connect them to water centers and institutes, research, agricultural programs, science and engineering."*



THE CHARGE FROM THE PRESIDENT

The President's appointment letter to members of the task force early in Fall 2014 indicated they were to review Fresno State's water related programs and the commission recommendations above, and make recommendations to him on how campus programs could be coordinated and strengthened to redefine Fresno State as a recognized leader in the area of water education, water technology, water resource management and water/environmental policy. At its first meeting the President charged the task force to:

1. Consider how the search for a new Dean of the Jordan College of Agricultural Science and Technology fits into the picture. While not a central focus of this committee, input on the job description would be appreciated.
2. Look at the programs that Fresno State has and identify the strengths that exist and build on those strengths and perhaps focus on those efforts more strategically.
3. Make sure University programs are as coherent and effective as possible.
4. Envision where we can be together in the next 5, 10, 20, 50, 100 years.
5. Figure out how faculty, staff, and students fit into the broader water community as seen by leaders outside the University.
6. Identify how the University can effectively be a leader in the CSU system, the state, nation, and world relative to water. Fresno State fits into a larger CSU infrastructure and the task force should consider how the University can leverage that strength.

In terms of the timeline, a report by March 1st was suggested. This would provide a chance to help determine priorities for the 2015-2016 budget and provide input to the University's new strategic plan.



THE RECOMMENDATIONS

The task force met four times in 2014 (Oct 2, Oct 24 (virtual), November 14, and December 12), and three times in 2015 (January 9, 30, Feb 20). Additionally, four subcommittees were formed around the elements of the President's charge (program analysis, future vision, community engagement, and leadership) and met at other times. The rest of the report provides the Task Forces' response to each item in the charge.

1. Recommendation regarding the Jordan College of Agricultural Science and Technology Dean search.

A. The dean should:

- I. Understand agriculture in the Central Valley, including crops and the institutional structure.
- II. Know how the graduates of Fresno State relate to what Central Valley farmers grow as well as why and how they produce it.
- III. Understand the importance of water including local, state, and federal policy issues; the interconnectedness of groundwater, water quality, environmental uses, and sustainability.
- IV. Have an appreciation of and experience in working with other disciplines including business, social science, science and engineering.
- V. Be able to relate to various constituencies- including producers, input providers, processors, manufacturers, and other agricultural support industries and establish working relationships with them

The Task Force has additional comments relative to this element that are covered in the recommendations on "leadership" (3)

2. Recommendations regarding water programs at Fresno State

The Task Force inventoried water related programs at Fresno State (see Appendix I). Qualities desired in an interdisciplinary water management degree were identified. These qualities were deemed useful to agriculture, public agencies and natural resources-oriented nonprofits and include regulatory and political aspects.

A. The University should consolidate all water related centers and institutes under the California Water Institute (see Schematic Structure of the California Water Institute in Appendix II).

Movement in this direction has started as there is already some sustainable funding that wraps both University programs and the WET together.

B. The University should develop strong undergraduate and graduate programs in water resource management, with options for emphasis in public policy/management, civil engineering, or earth science (aquatic and terrestrial biology, environmental science, geology, or soil science). Given that the modern water resources manager will need to have solid training in all of these areas, we emphasize that undergraduate degree programs must be inter-disciplinary, and not strictly the provinces of particular colleges or academic departments. Courses must emphasize not just knowledge about water, but also the skills to effectively utilize that knowledge as a water resource manager. The programs should be responsive to community and regional needs, effectively supported (labs, faculty, scholarships, assistantships), and include internships (see below).

C. The University should develop a single, interdisciplinary graduate program emphasizing science, public policy and engineering.

Suggestions for implementation of both undergraduate and graduate programs are found in Appendix III.

3. Recommendations on making sure University programs are as coherent and effective as possible.

- A. **The University should establish a new senior level position for water in Academic Affairs (see Appendix II).** The person in this position would be Associate Vice President for Water Programs and Executive Director of the California Water Institute. The person would take responsibility for bringing coherence to University efforts related to water and would be of sufficient rank to make things happen at the University, be responsive to the community, and have the president's ear. The position would be charged with achieving objectives established by this task force, oversight of Fresno State's existing water-related programs, and defining Fresno State as a recognized leader in the area of water. The rationale, desired qualifications, and potential responsibilities of this position are in Appendix IV.
- B. **The President should establish a Water Advisory Board (see Appendix II)** consisting of well-known regional leaders willing to assist the campus in achieving the recommendations in this report and setting the direction in the future.
- C. **A campus Executive Committee for Water Programs should be formed.** This committee would include the deans of the colleges involved, faculty, and others as determined by the President.

4. Recommendations regarding envisioning where we can be together in the next 5, 10, 20, 50, 100 years.

- A. This requires effective strategic planning and clearly communicating and interacting with the larger water community. The strategic planning element is included in recommendation 6 below. The vision of the California Water Institute will be to foster economic development through education, research, and technology development and improve the quality of life in California and throughout the world.
- B. **One person should lead and be responsible for advancement/development and grant/contract efforts for water related programs.** The Vice President of Advancement presented a plan to hire a business development officer to represent all centers and institutes. This may be a starting point but eventually, water should have a dedicated development/grants and contracts officer.
- C. **A communications specialist should be employed** to effectively develop the Fresno State water brand, market Fresno State expertise, and work with campus communications specialists to share the Fresno State water story. This effort should include a strong social media presence. The task force also saw a need for a governmental affairs role that might be part of either the advancement, communications specialist, or associate vice president portfolio or a completely different position.
- D. **Provide service "on demand" for community partners.** Those accessing parts of the University could be given access to other parts as well. For example, a company using the test facility at the WET or CIT could also have access to research services elsewhere on campus. This might be facilitated through a subscription or retainer program.

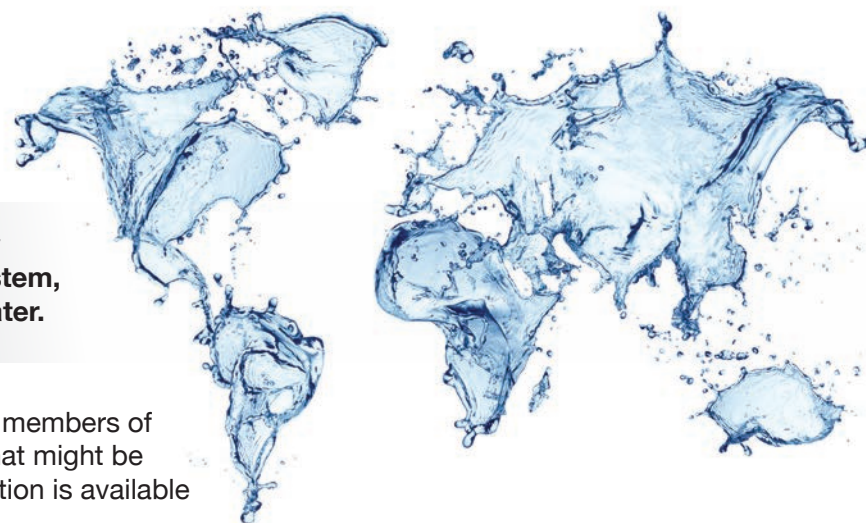
Fresno State will become the recognized leader on water issues affecting the San Joaquin Valley and be actively engaged in state, national and worldwide water research and education.

5. Recommendations on how faculty, staff, and students fit into the broader water community.

- A. **Foster communication and increased collaboration among colleges/schools, departments, and the community.** The committee recognized the need for a "front door" to the University and clearer definition of involvement of industry partners. The California Water Institute would provide the entry point to the University; a clearinghouse for incoming and outgoing water related products, information, and services; and a rallying point for campus activities.
- B. **The University Farm should be a laboratory that showcases technology optimizing water and energy use.** It should be the place people go to see the application of the latest developments in the field. Innovative aspects of the Farm water system could be visually presented to campus visitors via the new computer-based water system modeling software and display monitors that are planned to be housed near the lobby of the new Jordan Research Center.
- C. **Internship and career awareness programs should be integrated into all water curricula.** Alternatives to internships might include projects such as the former Clinic Project program in which faculty worked with a group of students on industry sponsored projects.
- D. **Faculty researchers and center staff should take advantage of opportunities provided by state and federal research grants.** The 2014 water bond and the California Water Action Plan present significant opportunities for engagement.
- E. **Faculty, staff and students should work as appropriate in areas such as disadvantaged communities that have been identified as priorities in California.** Students might assume the role of "water ambassadors."
- F. **Build on established educational outreach efforts to train agricultural and urban water users on utilizing water efficient technologies and practices.** Provide ongoing public forums on water issues that educate the general public based on science based facts.



The Water, Energy and Technology (WET) Center at the corner of Barstow and Chestnut at Fresno State.



6. Recommendations on how the University can effectively be a leader in the CSU system, the state, nation, and world relative to water.

- A. **Develop a strategic plan for water.** Several members of the task force brainstormed examples of what might be included in a strategic plan and this information is available to those who are interested.
- B. **The University should create a University centered culture focused on water.** The faculty water cohort is a starting point and their efforts to have a common reading program in Spring 2015 is indicative of the types of activities that can be used to accomplish this. Environmentally sound and sustainable campus water features might also be developed. All students should be exposed to the ethical dimensions of 21st century water management practices and have an opportunity to visit water-related entities and facilities on campus to increase awareness and expose them to the challenges and opportunities associated with global water issues.
- C. **Position Fresno State as a credible resource.** Hosting workshops, conferences and water-related seminars, and increasing the number of articles published in refereed journals and in the general press will be required. Establishing relationships in Sacramento and Washington D.C. to provide input to policy formation and develop policy analysis capability would promote this as well.
- D. **Improve both virtual (web) and physical access to University Faculty/Staff and programs and showcase water.** The university could become the repository of local and regional water data not generally available to the public (i.e. not collected and published by DWR, USGS, etc...) and could develop an information sharing conduit that allows for the free flow of water data between stakeholders in our region. Perhaps the Waterways program would facilitate this. The need for other data analytics tools is recognized. Water related displays (hydraulic modeling, computer modeling), exhibits, cultural events, etc should become a hallmark of campus.
- E. **Pursue partnerships with other campuses,** especially CSU Stanislaus and Bakersfield, but also UC Merced. Fresno State should seek out complementary expertise and resources in support of grant applications.
- F. **To facilitate campus participation in state funded projects, align the Fresno State focus with California's Water Action Plan.**
- In particular:**
1. Make conservation a California way of life,
 2. Invest in integrated water management and increased regional self-reliance,
 3. Manage and prepare for dry periods,
 4. Expand water storage capacity, and
 5. Provide safe drinking water and secure wastewater systems to all communities.
- G. **Pursue or strengthen partnerships with governmental and nongovernmental organization researchers,** especially those located in our region, e.g., USDA and the cities of Fresno and Clovis.

The task force recognizes that implementing these recommendations will require an investment of money, time, and effort. The University and the water community will need to come together to make this happen.

**APPENDIX I
WATER PROGRAMS AT FRESNO STATE**

The University currently offers an interdisciplinary professional water management degree at the graduate level through continuing and global education and a Water Resources and Environmental Engineering option within the Civil Engineering graduate program.

The University offers the following undergraduate courses

- Water Resources Engineering
- Hydrogeology
- Environmental Engineering
- Design of Water Quality Control Processes
- Urban Stormwater Management
- Design of Wastewater Management Systems
- Water quality and health
- Water Politics and Policy
- Agricultural Water
- Natural Resource Economics
- Soil and Water Management.

The University offers the following courses at the graduate level

- Engineering Hydrology
- Contaminants Fate and Transport Engineering
- Urban & Industrial Water Systems
- Advanced Water Quality
- Topics in Hydrogeology and Environmental Geology
- Interdisciplinary Hydrogeology: The social political and scientific theories of water
- Groundwater Hydrology
- Contaminant Transport
- Water Resource Management Internship
- Climatology
- Hydrological System
- Natural and Agricultural Uses of Water
- Urban and Industrialized Water Use
- Water and Politics
- Environmental Policy for Water Management
- Water Economics
- Water Resource Management Project.
- Soil Plant Water Relations.
- Environmental Politics and Policy

The University has several other water related programs:

The Faculty Water Cohort. Faculty from several disciplines are working together around water issues. They have formed a faculty learning community (more information available at www.fresnostate.edu/academics/water-cohort/index.html) and had students in 36 courses read "The Big Thirst" in spring 2015. The author made a presentation on campus. The Task Force suggests that the Water Cohort should be expanded to include all campus faculty with water-related expertise. Bringing together all water faculty is necessary to attain the vision and goals identified in the Task Force Report.

Waterways. The library is using water as a jumping off point in the development of an information portal dynamically linking many types of information. A short video explaining this effort can be found at <https://vimeo.com/66362946> (enter the Password: madden2013 in the dialogue box).

The University also is home to several water related centers and institutes:

The Center for Irrigation Technology (CIT) Established as partnerships with manufacturers in 1980, CIT works with a couple hundred companies in the valley on pumps, filters, sprinklers, pipes, control systems etc. The center specializes in testing and evaluating irrigation equipment and plays a leading role in the development of national and international standards for irrigation equipment and testing procedures.

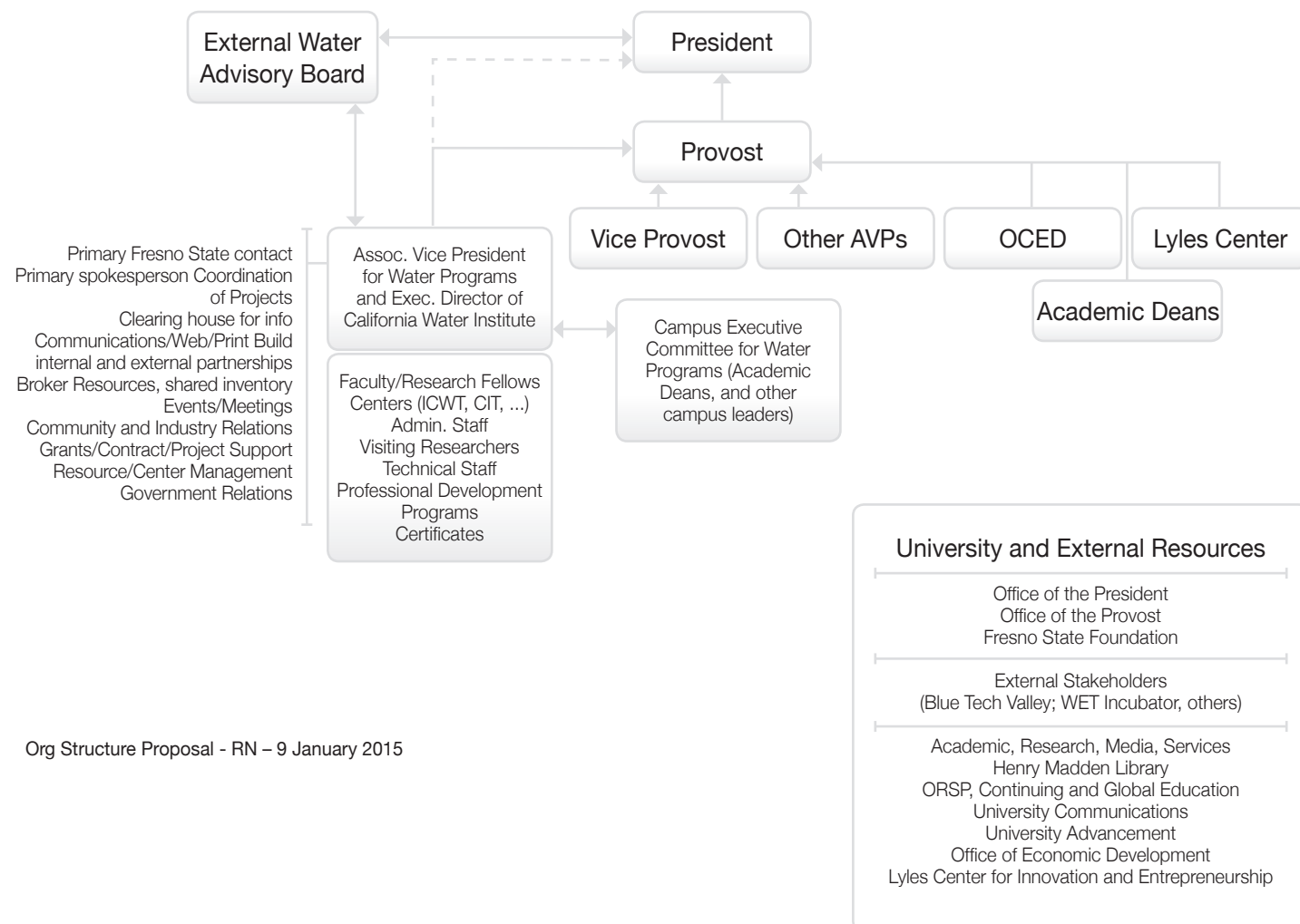
The International Center for Water Technology (ICWT) was established in 2001 when industry approached CIT to certify non-irrigation use products in a fashion similar to what the Center for Irrigation Technology was doing for agricultural products. The Center provides education and research to assist in developing and adopting innovative solutions and technologies that improve water use efficiency.

The Water, Energy, and Technology Center (WET) was formed when ICWT partnered with other entities in the valley to create Blue Tech Valley – a hub of water research and development that provides an entryway for entrepreneurs, innovators as well as established businesses to accelerate product development and business launch of new water and energy technologies. The WET Center, houses and provides support to startup companies. Some industry leaders see a need to expand this effort.

The California Water Institute (CWI) grew out of the 2001 water bond. It focuses on research, education and policy analysis of issues involving water resources, including water quality and integrated regional water management planning. It has worked on policy issues such county ground water use rules, disadvantaged community water quality, access to drinking water, and studies on environmental quality issues.

APPENDIX II SCHEMATIC STRUCTURE OF THE CALIFORNIA WATER INSTITUTE

CALIFORNIA WATER INSTITUTE



Org Structure Proposal - RN – 9 January 2015

APPENDIX III SUGGESTIONS FOR IMPLEMENTATION UNDERGRADUATE AND GRADUATE PROGRAM

Fresno State should develop and offer strong, inter-disciplinary undergraduate programs in water resource management, with options for students to specialize in public policy or public management, civil engineering, or earth or biological science (aquatic and terrestrial biology, environmental science, geology, or soil science). Given that the modern water resources manager will need to have solid training in many of these areas, these degree programs must be truly inter-disciplinary. In addition Fresno State should develop and offer a strong graduate program in water. We offer the following suggestions for implementation of our recommendation:

Suggestion 1: Conduct a detailed survey of water industry employers (agriculture, farm operators, water districts, municipalities, manufacturing industries, natural resource-oriented nonprofits, governmental agencies and other large scale water users) to assess the expertise needed by the workforce and projected near term and long term employment projections.

Suggestion 2: Conduct a detailed inventory of courses that are currently offered at Fresno State to determine if there are adequate courses from across the University that can be packaged to create inter-disciplinary undergraduate, graduate and certificate programs in the broad areas of water resource management, water policy, water science, and water engineering. New courses should be designed and developed as needed.

Suggestion 3: Conduct a detailed inventory of laboratory infrastructure that could support teaching, learning, and research in water related courses and programs. Such laboratories may currently be distributed across the University in academic departments in the various schools and colleges and research centers. Explore ways to effectively use the available infrastructure for teaching, learning, and research, identify and remove barriers to such usage.

Suggestion 4: Effectively market existing degree programs to potential students and remove “service area” barriers for admission to such programs. Provide incentives such as graduate research assistantships to graduate students pursuing water related degree programs.

Suggestion 5: Require all students enrolled in water related programs to have hands-on design, research, and/or internship experiences as appropriate to the disciplines. Business organization and management, written and oral communications, critical thinking and public relations management should also be incorporated into the programs.

Suggestion 6: Explore offering graduate and professional degrees and programs online. Participants in an online program should be prequalified to ensure they are ready for such a program. If they already have a degree and are trying to advance in their current career, there may be less need for face to face interaction.

Suggestion 7: Develop continuing education programs to include workshops, seminars, short courses, and certificates to provide inservice support to those in the field.

Suggestion 8: Hire faculty to support the design and offering of new courses and programs as needed.

Suggestion 9: Graduate program design may best be done by strengthening existing programs that offer specializations in water (e.g., Water Resources and Environmental Engineering option in the Civil Engineering Graduate Program) and by modifying the University’s M.S. in water resource management. The University may want to consider moving the M.S. in water resource management degree program from Continuing and Global Education to a stateside offering and to evaluate housing it in a way that it is not strictly the province of a particular department or college.

APPENDIX IV ASSOCIATE VICE PRESIDENT FOR WATER PROGRAMS AND EXECUTIVE DIRECTOR OF THE CALIFORNIA WATER INSTITUTE

Rationale

Fresno State is located at what is truly Ground Zero for California's most important water issues. Meeting the water demands of irrigated agriculture, environmental needs (water quality) and amenities (recreational), and the requirements of the valley's rapid population growth requires designing, developing, financing, and managing complex water systems. These include the federal Central Valley Project, California's State Water Project, locally-operated projects, and ground water systems. Changes in water rights, water usage, water quality and environmental priorities are constant.

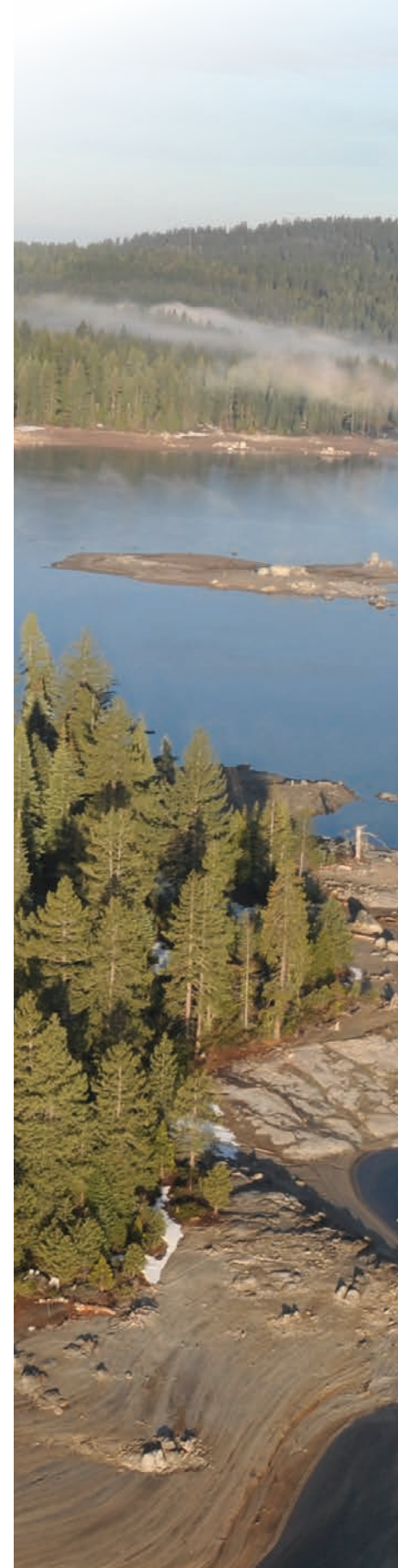
While the University is strategically located to address these issues, it simply does not command widespread recognition as a center of significance in providing meaningful academic, policy or practical input on water-related matters. This is paradoxical given Fresno State's water related institutions: International Center for Water Technology, California Water Institute, Center for Irrigation Technology, Maddy Institute, Jordan College of Agricultural Sciences and Technology, and Lyles College of Engineering; and its role in providing leadership in establishing the CSU-wide Water Resources and Policy Initiatives (WRPI) program.

Public perception is that Fresno State suffers from a lack of focus and coordination of activities. The relationship between the University; federal, state and public water resources agencies; municipal and industrial water providers; and technology companies needs to be improved. The University needs to become adept at publicizing results of water-related studies and providing opinion pieces on water and environmental issues authored by faculty members.

Fresno State needs to build its brand through increased faculty research and publications and far greater interaction with the community and its agricultural, municipal and industrial bases.

Obviously, more effort is needed to elevate Fresno State to the prominence envisioned by this task force. The University should utilize its regional leadership and leverage its capabilities and resources to provide academic preparation, applied research, and policy development which address critical aspects of water use—particularly those found in the San Joaquin Valley. In order to effectively meet the challenges, a senior level academic leader is needed to push the agenda. Thus, the task force recommends creating a new position: Associate Vice President and Executive Director of the California Water Institute. A detailed list of responsibilities follows but the key areas are academic program development and community relations.

Reporting directly to the University President, this program's leader will have the authority to carry out the vision and goals of the strategic plan, including recruiting the necessary talent both inside and outside the University to implement the program.



Qualifications

The proposed Associate Vice President will be expected to have expansive knowledge and experience working in multiple aspects of water, and a keen understanding of the water challenges facing California and, in particular, the San Joaquin Valley. The successful candidate must also have strong relationships with agriculture, water related industries and public agencies in order to foster a solid and direct relationship with agriculture and the University's agricultural programs.

The ideal leader would have a broad understanding of:

- The Valley's agricultural economy (such as costs of production, crop growth projections and commodity trends).
- San Joaquin Valley hydrology.
- Water policy, water law, water rights, water transfers, water markets, the history of California water, and the California Water Plan.
- Municipal, industrial, and urban uses of water and wastewater; water and wastewater treatment technologies.
- Water quality issues and environmental demands for water.
- How other universities have established reputations for leadership in agricultural and water related fields.

The ideal leader would also be able to:

- Work effectively across disciplines.
- Communicate effectively with academics, the water community, and the public.
- Raise funds through grants and philanthropic efforts.

Responsibilities

The person holding this position would:

- Organize and unify all non-curricular water activities and initiatives on campus, ensuring that University programs are as coherent, linked and effective as possible.
- Establish a "front door" to University water programs and develop the California Water Institute brand
- Establish relationships in Sacramento and Washington D.C to raise the visibility of the program and lead efforts to acquire external funding to grow University water programs.
- Lead the effort to establish partnerships with leading science and technology companies to advance applied research in key areas.
- Develop relationships with water agencies, production agriculture and other businesses and industries relying upon water.
- Work with the water advancement/development officer to create an endowed funding base to support and sustain the program.
- Develop a Fresno State water strategic plan.
- Work with colleges/schools, industry, potential employers and career services to develop multidisciplinary internship opportunities.
- Work with centers and the University Farm Laboratory to develop a campus based Agricultural Water/Energy educational and demonstration facility showcasing water/energy/input sustainability in partnership with community/industry interests.
- Work with CSU and UC campuses, water agencies, and industry to strengthen Fresno State's role in water related activities.

APPENDIX V TASK FORCE MEMBERSHIP

Chair Carol Chandler-Chandler Farms

Vice Chair .. Dennis Nef-Vice Provost, Fresno State

Name	Affiliation
Chris Acree	Revive the San Joaquin
Antonio Avalos	Department of Economics – Fresno State
Penny Carlo	Carollo Engineers
Sarge Green	California Water Institute – Fresno State
Tom Holyoke	Department of Political Science – Fresno State
Dave Krietemeyer	USDA Natural Resources Conservation (NRCS)
Claude Laval	Lakos Separators
Marvin Meyers	Meyers Farming
Ram Nunna	Lyles College of Engineering – Fresno State
Aric Olson	Jain Irrigation
Martin Querin	City of Fresno
Mario Santoyo	Friant Water Authority
Gary Serrato	Fresno Irrigation District
Bill Smittcamp	Wawona Frozen Food
Beth Weinman	Department of Earth and Environmental Science – Fresno State
Bill Wright	Department of Civil and Geomatics Engineering – Fresno State
David Zoldoske	Center for Irrigation Technology– Fresno State





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