

Building Tools to Increase Water Productivity: A Joint U.S and Australian Research Funded by NSF's Partnerships for International Research and Education (PIRE)

Ashmita Sengupta, Martha Sutula

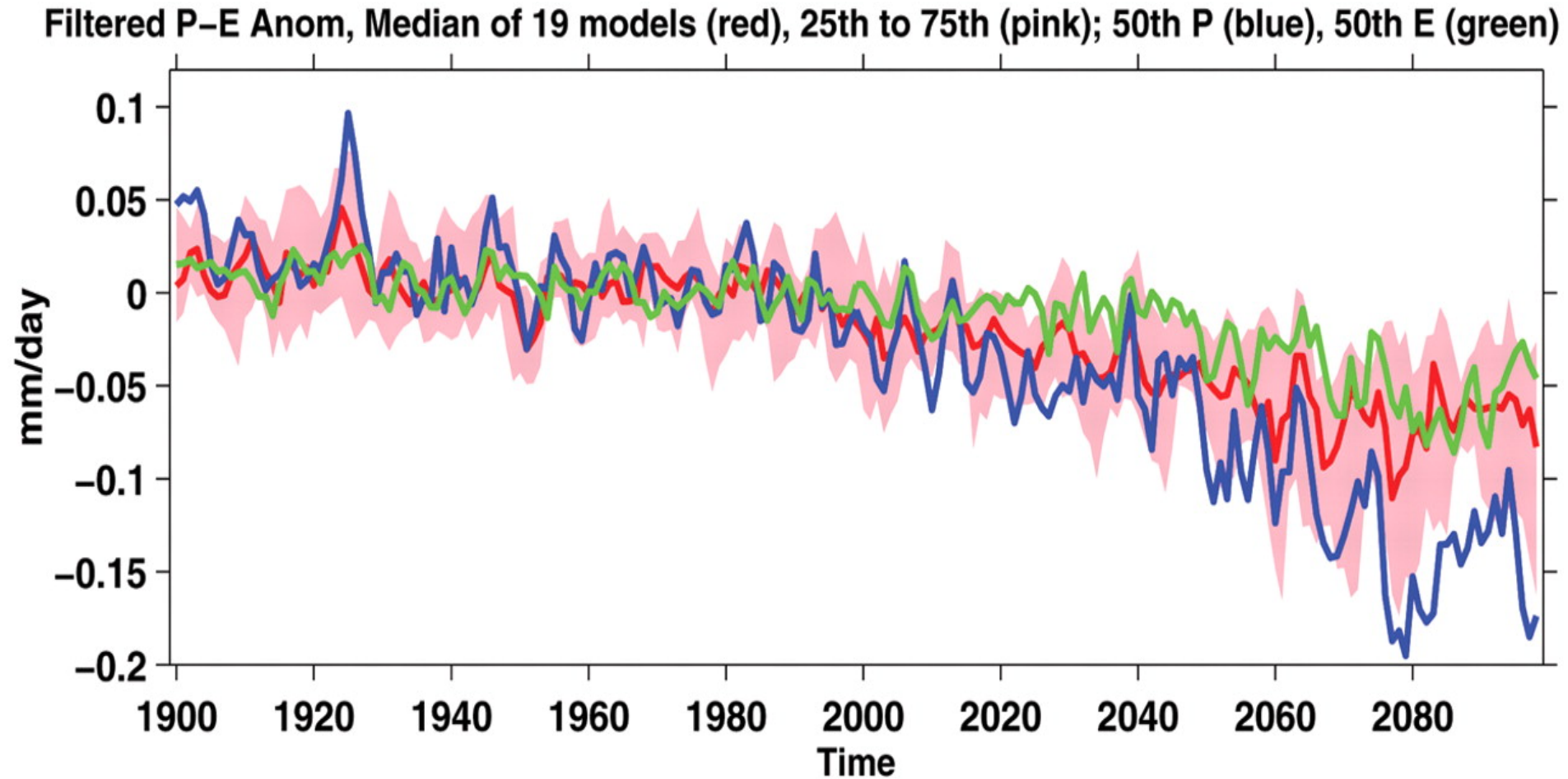
Stanley Grant, Amir AghaKouchak



Overview of talk

- Climate change, Increasing demands : yet another problem for stormwater managers
- Research thrusts of PIRE program
- Why should you pay attention
 - Linkage to CASQA stormwater managers

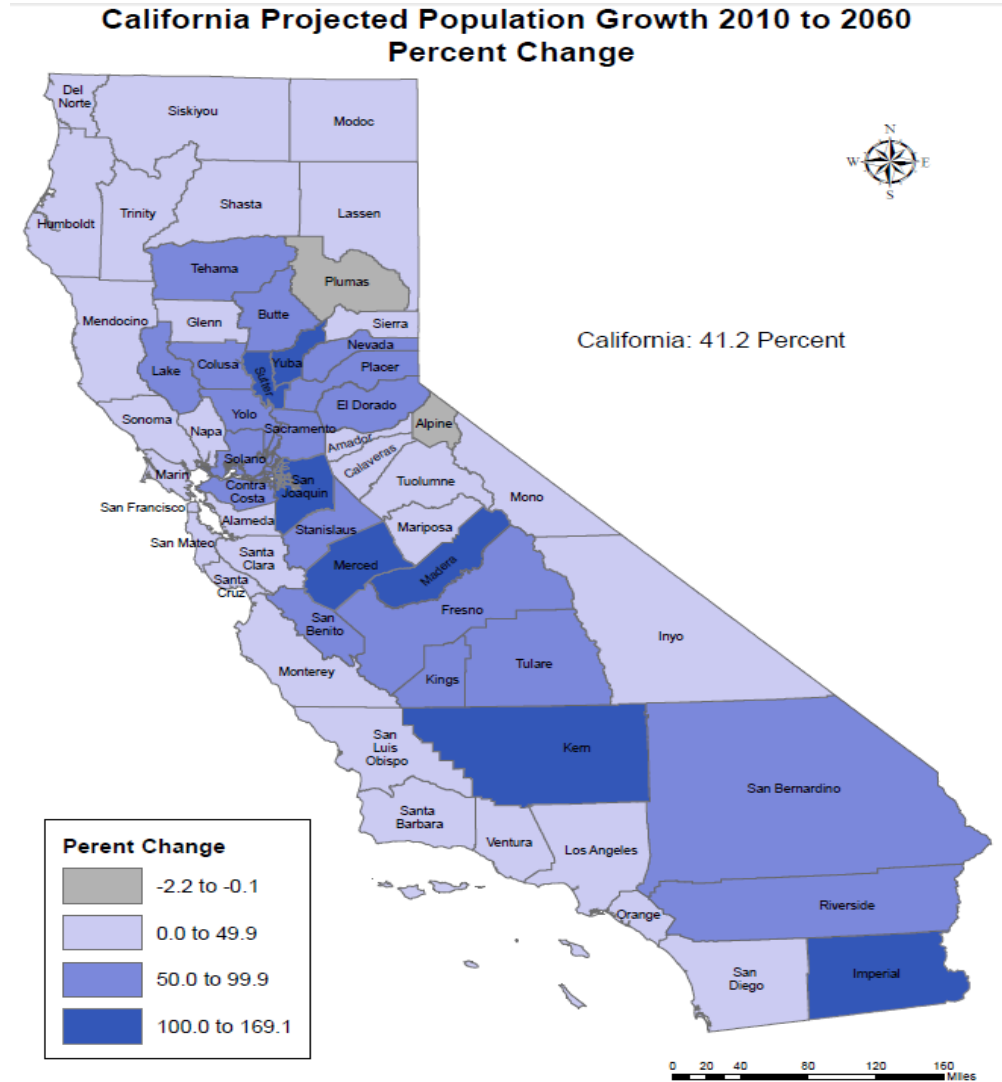
Stormwater Managers Lives Will Become More Complicated with Climate Change



(Seager et al. 2007)

Projected Drought Issues Further Compounded by Increasing Population

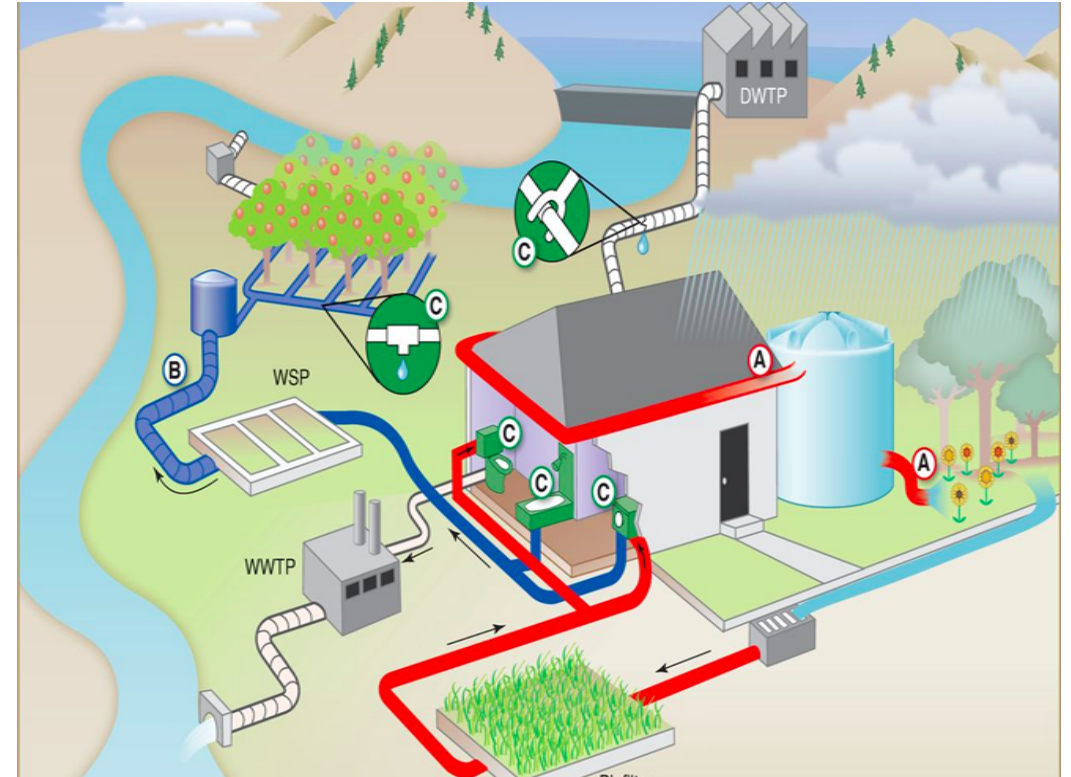
- Already experiencing water shortage
- Climate change will compound problems from population growth
 - Altered hydrology
 - Poor water quality
- Increase in water productivity to meet demand



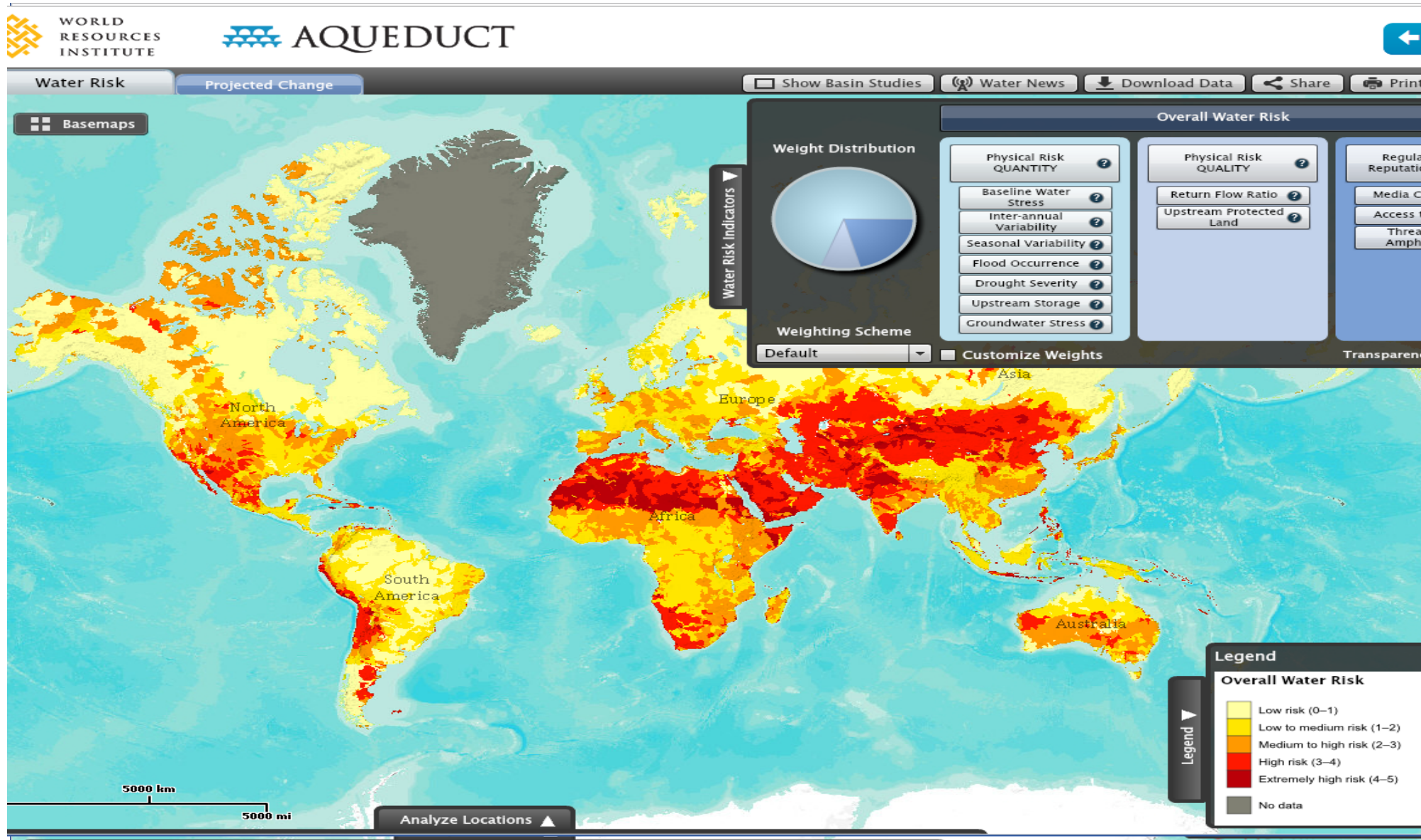
Source: California Department of Finance, Population Projections for California and its Counties, 2010 Baseline Series.
Map prepared by: California Department of Finance, Demographic Research Unit, January 2013.

Need Sustainable ways to Increase Water Productivity

- Reducing non-productive losses of higher-quality water (**conserving**)
- Substituting lower-quality water for higher-quality water where appropriate (**substituting**)
- Regenerating higher-quality water from lower-quality water by treatment (**regenerating**)



California and Parts of Australia Share Similar Issues



Australian Government has been Investing Heavily in Water Sensitive Urban Designs (WSUD)

Recent drought spurred Australian government to invest in sustainable urban water management

- 100 million investment in Cooperative Research Center (CRC) for WSUD
 - Focus on demonstration projects to test and implement new technologies
- Watershed scale experiment
 - Controlled study to test effects of LIDs on hydrology and water quality
- Low energy waste treatment system
 - Largest waste stabilization pond treats 50% of Melbourne's sewage
- Testing technology for accelerated pollutant removal
 - University of Melbourne Flow Visualization Laboratory

Leveraging Australia's WSUD Experience

The PIRE team is a multidisciplinary team that will work closely with the Australian counterparts with the goal to transform water use in the western U.S



THE UNIVERSITY OF
MELBOURNE

Prof. Stanley Grant

Water-PIRE Principal Investigator (PI)
Civil and Environmental Engineering, UCI

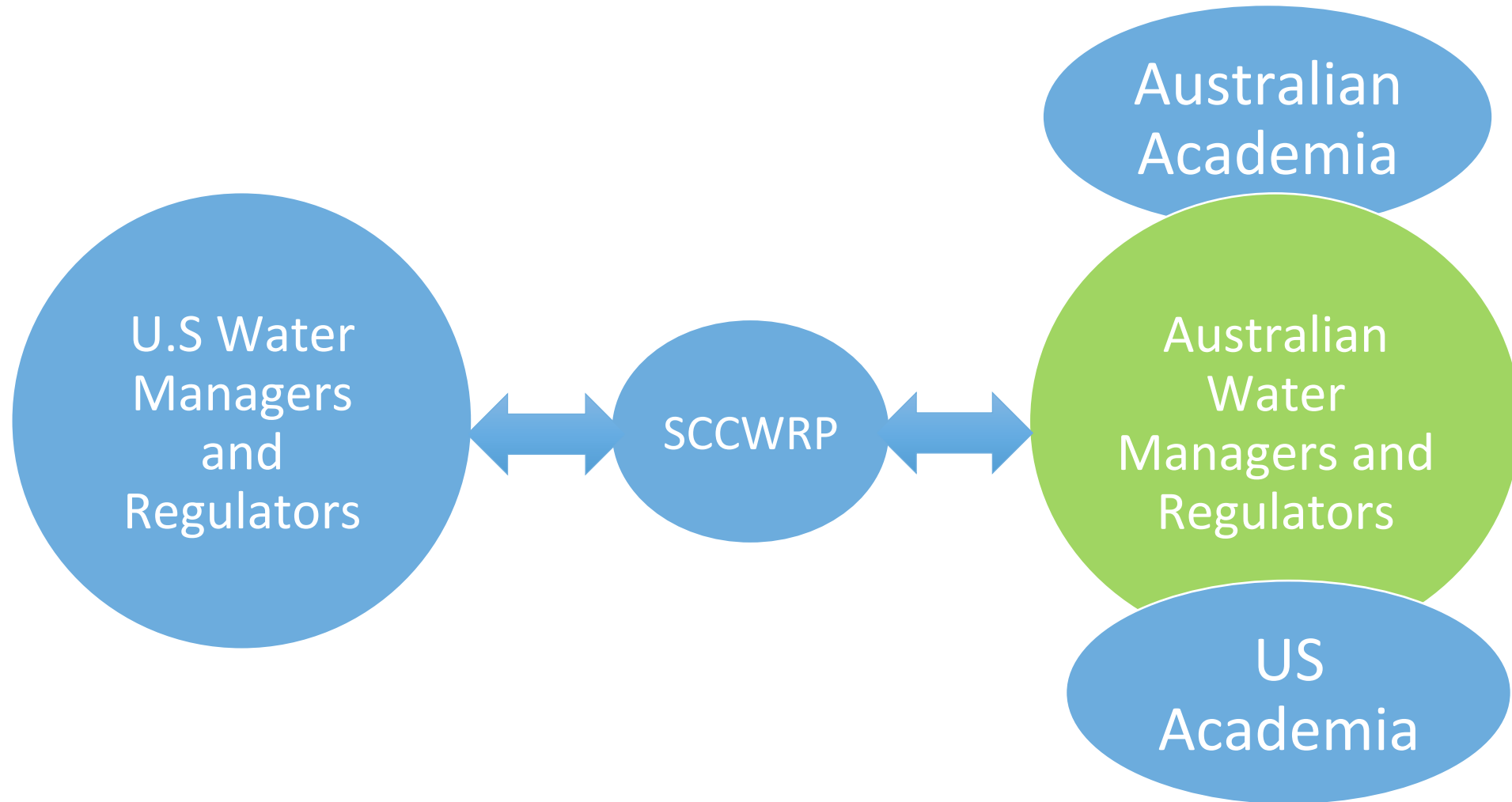


Thrusts of PIRE's Research

There are several components to the PIRE project

- Layer 1: Pollutant removal in biofilters
- Layer 2: Public health risks, energy savings and GHG emissions
- Layer 3: Regulations, Economic Instruments, Equity, and Policy
- Layer 4: Watershed scale processes
- Layer 5. Crosscutting

SCCWRP Provides Linkage to Stormwater Managers



Planned Interactions with Stormwater Managers

- CASQA workshop November 14, 2013
 - Presentations by Australian scientists
 - Interactive panel discussion with CASQA stormwater managers
- 2017 CASQA workshop
 - Presentation of project findings
 - Interactive discussions with stormwater managers
- Website with listserv (<http://water-pire.uci.edu/>)

Next Four Talks from PIRE Research Layers

- Layers (2,5) Kathleen Low: The resiliency of urban water systems
- Layer 1: Dr. Megan Rippey: Optimized Water Sensitive Urban Design; Trade Offs in Pollutant Removal Efficiency
- Layer 4: Asal Askarizadeh: Stormwater Runoff Detection within Urban Watersheds Using Instantaneous Unit Hydrograph Method in Support of Watershed Management
- Layer 1: Morvarid Azizian: Simple Models of Mass Transfer in Natural Streams

The background features a large, light blue circular logo for UCI Water-PIRE. The logo contains the text "UCI Water-PIRE" around the top edge and a central emblem depicting a sailing ship on the water.

Thank You!

QUESTIONS?

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Websites:

<http://water-pire.uci.edu/> (PIRE Website)

www.sccwrp.org (SCCWRP)