The policy landscape of California and its impact on agriculture

Nick Brozović, PhD

Director of Policy
Robert B. Daugherty Water for Food Global Institute
University of Nebraska

SIWI Swedish Water House
Stockholm / 19 December 2016

Main goals

1. An overview of water rights and values in California
2. Key water issues now and in the future
3. Current and potential responses to water risk in California

Summary

- California water issues are complex and heterogeneous
- There are opportunities as well as challenges

California overview

- Mismatch between water supply and demand
- Federal, state, local, and private infrastructure
- >3 million hectares in agriculture, both low and high value
- Endangered species, large urban areas, complex water rights. . .

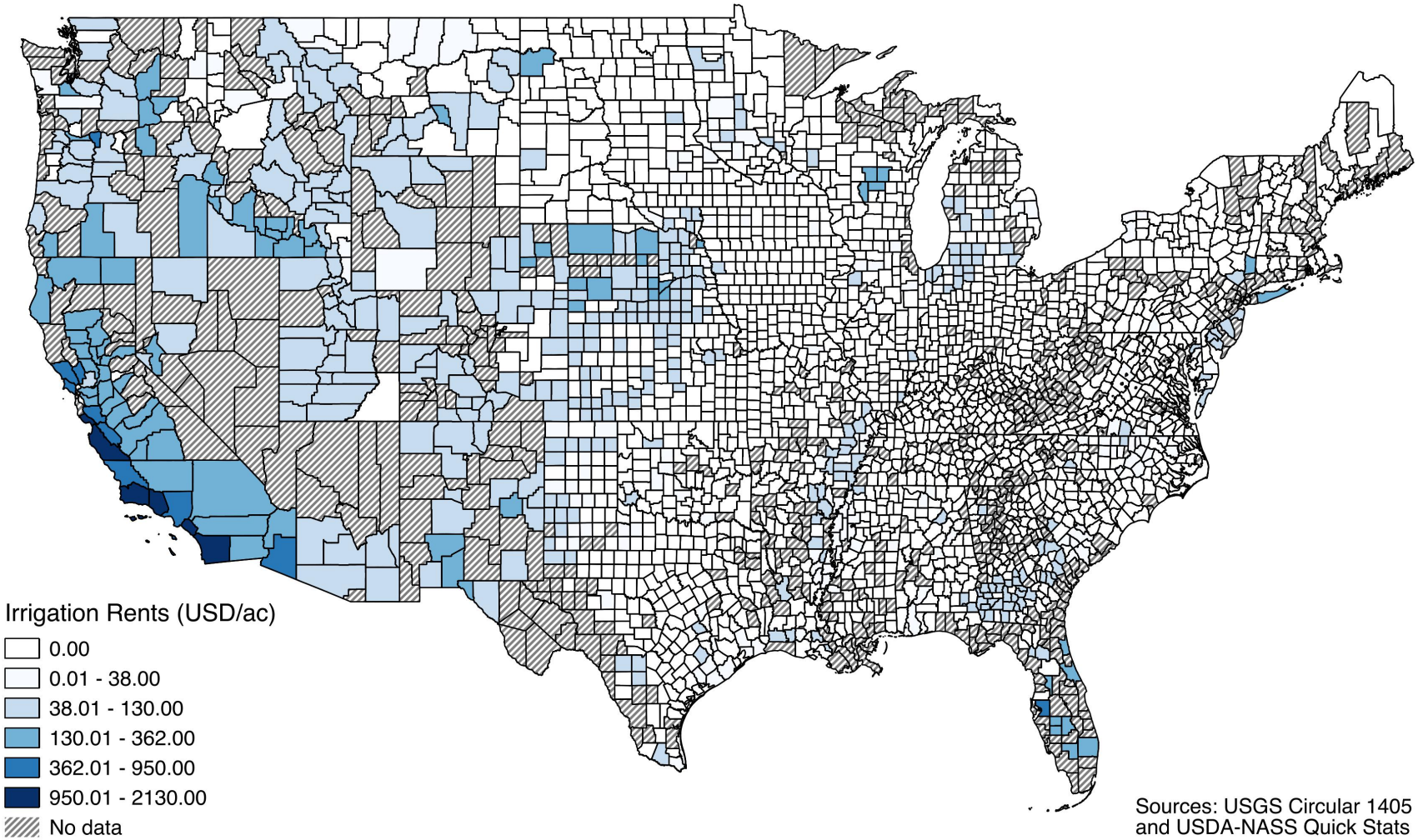
California water rights

- In the US, States generally own water and use rights are granted to individuals for beneficial uses
- In California, surface water rights include appropriative, riparian, adjudicated, and tribal
- Groundwater rights include correlative and adjudicated
- In general, surface water rights are quantified and reported; groundwater rights are not

How do we value water?

- The value added or profits produced by using water?
- The jobs supported by water? Contribution to the local or national economy?
- The value of water as a lifeline?
- What it would cost to replace water with water from other sources?
- Cultural, existence, or environmental values, or the value of a way of life?

County-Level Irrigation Rents



Sources: USGS Circular 1405
and USDA-NASS Quick Stats

Water for Food
DAUGHERTY GLOBAL INSTITUTE
at the University of Nebraska

Context – Physical water risk

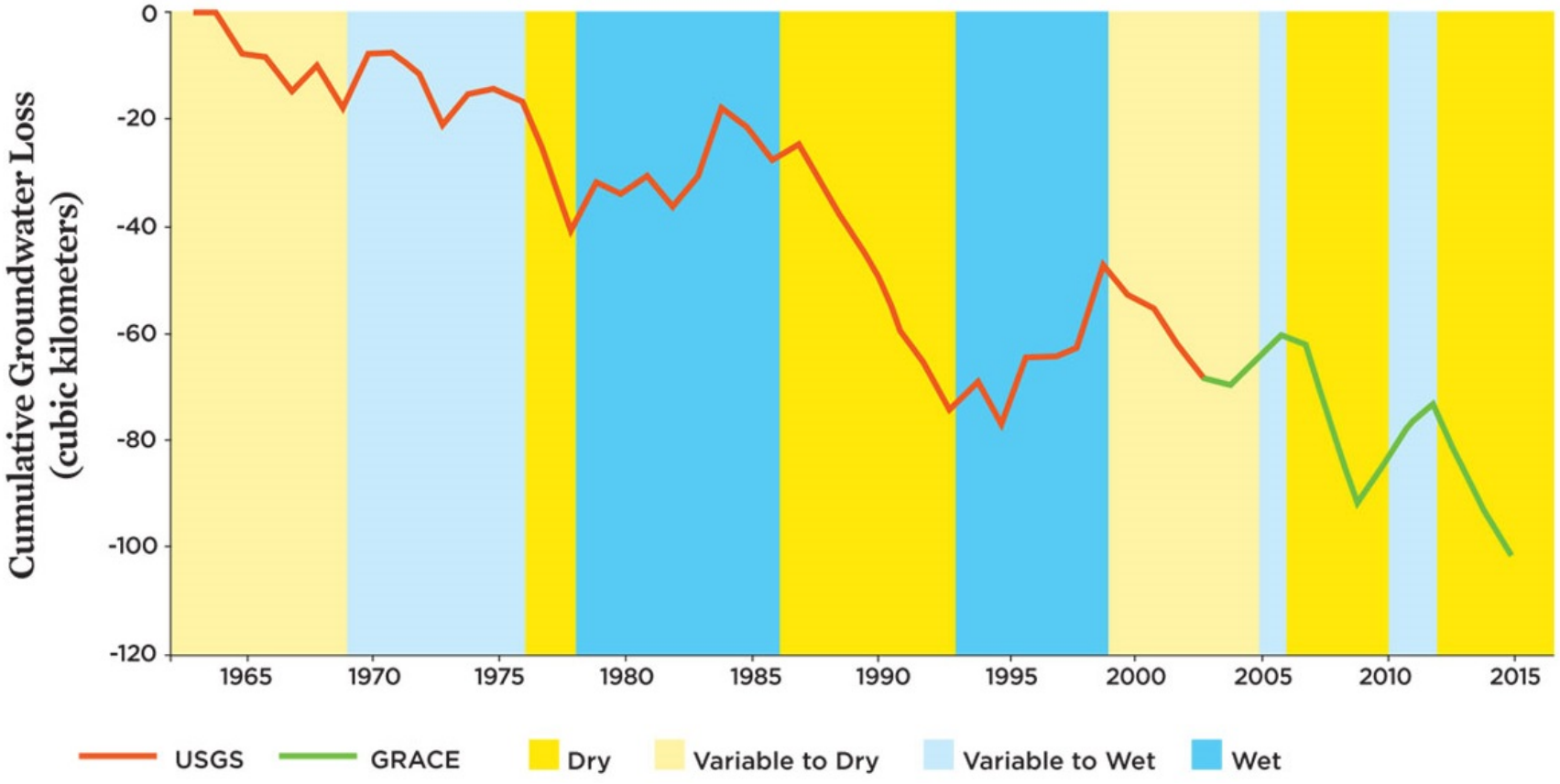
- Snowpack is a key component of surface water supply
- California's climate has multiyear dry and wet periods
- Water needs are highest when there is least water
- The impacts of recent droughts vary with seniority of water rights and physical availability of groundwater
- Much of agriculture's current resilience is attributable to (i) groundwater pumping and (ii) reallocation mechanisms

What have drought impacts been?

R. Howitt, estimates for 2015

Description	Impact	Percent
Surface water shortage	8.7 million AF	-48%
Groundwater replacement	6.0 million AF	72%
Cost of added pumping	$590 million	75.5%
Farm seasonal jobs lost	10,100	5.1%
Crop revenue lost	$900 million	2.6%

Groundwater and drought resilience



Water for Food
DAUGHERTY GLOBAL INSTITUTE
at the University of Nebraska

Context – Regulatory water risk

Issues

- In general, surface water rights are quantified and reported; groundwater rights are not
- The degree of monitoring and enforcement of rights, both in law and in implementation, is very variable

Policy

- California water bond (2014)
- Water Infrastructure Improvements for the Nation Act (2016)
- Sustainable Groundwater Management Act (2014)

Sustainable Groundwater Management Act (2014)

Overview

- A statewide mandate to move towards sustainable water management
- Specifically targets undesirable impacts such as aquifer depletion, degraded water quality, and land subsidence
- Management process intended to bring relevant stakeholders together

Sustainable Groundwater Management Act (2014)

Regulatory risks

- SGMA is *not* intended to provide immediate mitigation of current impacts
- It's not clear how SGMA will be implemented or enforced, and there will be much local variation
- Effective groundwater governance is very hard, and California is starting from a low level with high stakes

Context – Reputational water risk

- Agriculture is the largest consumptive user of water
- Agricultural water values are the highest in the world, and can exceed urban values on the margin
- Locally, groundwater pumping has the potential to create reputational risk for agriculture
- Though overall land area in agriculture *decreased* during the drought, high value crop acreage is *increasing*

Current and potential responses to water risk

- Can increase available **supply**
  - Infrastructure construction, well deepening, managed aquifer recharge, wastewater reuse
- . . . or decrease or reallocate **demand**
  - Incentive-based, regulatory, and voluntary approaches
  - Relocation is also a response
- Significant amounts of money are being allocated for both supply side and demand side projects
- Involved stakeholders include public-private partnerships, nonprofits, and for profits

Innovation to reduce water risk

Driscoll's water swap

Driscoll's has large berry operations in coastal California, where saline groundwater creates problems

- In March 2016, Driscoll's started a water swap
- Growers receive treated wastewater from Oxnard
- Oxnard receives groundwater rights for drinking supply
- Both parties benefit

Summary

Physical risk

- Groundwater provides enormous buffer value but drawdown creates long-term sustainability issue
- Cropping changes are currently reducing system resilience

Regulatory risk

- Regulatory uncertainty, particularly with groundwater
- Unresolved monitoring and enforcement issues

Reputational risk

- Multiple dimensions, often because water and water cycle are poorly understood
- Private sector opportunities are present

Thank you!

Nick Brozović, *nbrozovic@nebraska.edu*

Water for Food
DAUGHERTY GLOBAL INSTITUTE
at the University of Nebraska