

# The Future Of Agriculture In A Changing World With Less Water And More Regulations

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## AGENDA

**Yesterday: History of California water and agriculture**

**Today: California’s drought and related responses**

**Tomorrow: Forecasting agriculture practices**

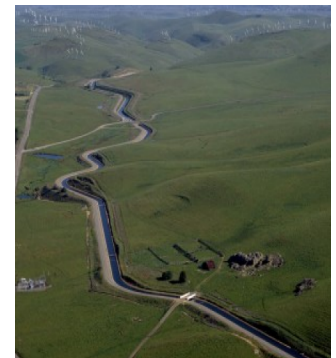
## YESTERDAY

- **Water supplies and use**
- **Water rights...*not* changing**
- **Agriculture and irrigation use**

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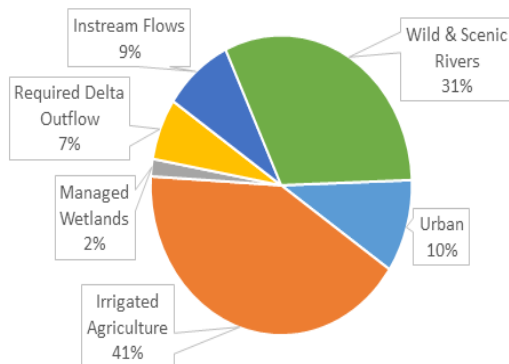
## SOURCES OF WATER

- Surface water
- Groundwater



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## California Water Use



Source: [www.norcalwater.org](http://www.norcalwater.org)

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## WATER RIGHTS

- **California’s “System”:**  
 “Hybrid” system of riparian/overlying and appropriative doctrines  
*Contra contractual rights*
- **Real Property Right of “Bundle of Sticks”:**  
 Water right *usually* part and parcel to land
- **Usufructuary Right:** Right to possess and use, not own, water
- **Reasonable and Beneficial Use**

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## CALIFORNIA AGRICULTURE

- California contributed to 14.3% of the United States' agricultural exports in 2014
- California provides 1/3 of the nation's vegetable supply and 2/3 of its fruits and nuts
- Almonds remain in high demand, yielding strong profit margins and year-round irrigation

Sources:

<https://www.cdfa.ca.gov/statistics/PDFs/AgExports2014-2015.pdf>

<http://www.scpr.org/news/2015/09/15/54182/future-of-water-how-california-farms-will-produce/>

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STOEL RIVES...

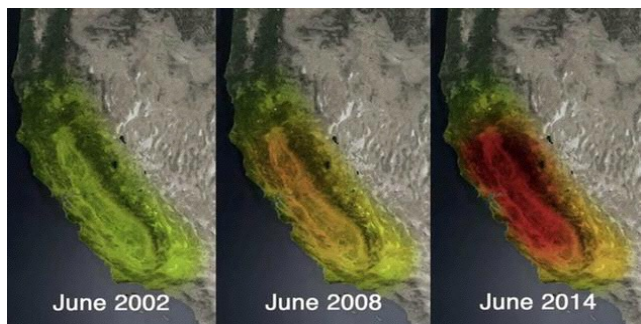
## TODAY

- **Drought**
- **California's responses**
- **Agriculture impacts...so far**

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## DROUGHT



Source:

<http://www.jpl.nasa.gov/news/news.php?feature=4693>

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## CALIFORNIA'S RESPONSES TO DROUGHT

- Governor's Orders
- Surface Water: Curtailment orders dating back to 1858
- *Siskiyou County Farm Bureau v. Dept. of Fish and Wildlife*: Notice to CDFW for all surface diversions
- Groundwater: Enactment of the Sustainable Groundwater Management Act ("SGMA" (sigma))

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## PURPOSE OF SUSTAINABLE GROUNDWATER MANAGEMENT ACT

- To establish and maintain "sustainable" groundwater management
  - Sustainability goal
  - Sustainable yield
- To allow local authority to manage local groundwater
  - State is a backstop



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## AGRICULTURAL IMPACTS

- Increased groundwater reliance
- Reduced land application areas
  - Estimated 540,000 acres fallowed in 2015
- Labor cuts
  - Estimated 10,000 seasonal jobs cut, *but* increased use of H-2A guest worker program

Source for acres and jobs cut:

[https://watershed.ucdavis.edu/files/biblio/Final\\_Drought%20Report\\_08182015\\_Full\\_Report\\_WithAppendices.pdf](https://watershed.ucdavis.edu/files/biblio/Final_Drought%20Report_08182015_Full_Report_WithAppendices.pdf)

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## TOMORROW

- **“Game changers”**
  - Climate change
  - SGMA
- **General implications of game changers**
- **Mitigation and adaptation measures**
  - Alternative water supplies
  - Improving methods and practices
  - Changing businesses (ag to urban)

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## GAME CHANGERS

- Climate change
  - Unpredictability with hydrologic cycles shifting
  - Adaptability necessary for planning and regulatory processes to develop modified “baselines” (e.g., CEQA, State Water Board applications for appropriate permits and licenses)
- SGMA
  - A water right remains a water right! (Water Code §10726.8(b))
  - Where SGMA does not “succeed” among the impacted stakeholders then groundwater adjudications are very likely

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## GENERAL IMPLICATIONS OF GAME CHANGERS

- New world for water resource management
  - Climate Change: Develop new groundwater and surface water models
  - SGMA
    - Data collection and closer scrutiny of water use
    - Paying more for less water
  - Conserve, but recognize efficiency is *not* enough

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## STRATEGIES: ALTERNATIVE SUPPLIES

- Sources
  - Desalination
  - Recycled Water
  - Produced Water
  - Water Transfers / Water Market
    - Key is to be temporary and within the same basin/watershed
- Rationale
  - Increasing population means increased demands
  - Groundwater and surface water supplies are shrinking

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## IMPROVING METHODS AND PRACTICES

- Irrigation efficiency
  - Drip vs. Pivot, where feasible
- Changing crop cycles and types of crops
  - Example: Alfalfa to almonds

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## CHANGING BUSINESSES

- Some growers and food processors of varying sizes are likely to either:
  - Transition land from agriculture to other uses, such as development
  - Relocate operations to other areas

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## QUESTIONS?



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