California Agriculture Water Use:
Setting the Record Straight

AMRITH GUNASEKARA, PHD. AGUNASEKARA@CFBF.COM
DIRECTOR OF SCIENCE AND RESEARCH
CALIFORNIA BOUNTIFUL FOUNDATION
NOVEMBER 2023 (UPDATED FROM MARCH 2023)

PLEASE CITE THIS WORK AS; GUNASEKARA, A. 2023. WATER DISTRIBUTION IN THE STATE OF CALIFORNIA. CALIFORNIA BOUNTIFUL FOUNDATION. CALIFORNIA FARM BUREAU. HTTPS://WWW.CFBF.COM/CALIFORNIA-BOUNTIFUL-FOUNDATION/RESEARCH-STUDIES.
PLEASE DO NOT USE THIS WORK FOR ANY SCIENTIFIC JOURNAL PUBLICATIONS. IT IS IN THE PROCESS OF BEING PUBLISHED IN A PEER-REVIEWED SCIENTIFIC JOURNAL.
Questions;

Slide 3. How much total water does the state get in one year on average?
   - How much water does agriculture need in a given year to feed us?

Slide 4. How much water is captured for use in California?

Slide 5. How much captured water does agriculture get in California?

Slide 6. How much captured water does the urban sector get in California?

Slide 7. How much captured water does the environment get in California?

Slide 8. How is water for California agriculture represented in the media?

Slide 9. How is water for California agriculture portrayed?

Slide 10. Uncaptured water is environmental water!

Slide 11. How much water does agriculture get in California from total water?

Slide 12-14. How should agriculture be portrayed in California agriculture?

Slide 15. California agriculture uses water efficiently

Slide 16. Key Statistics about California Agriculture

Data sources are; the Public Policy Institute of California, DWR, and UC Merced.
How much total water does the state get in one year on average?

On average over many years – 200 Million Acre Feet (MAF). In wet years such as 2023, this number is significantly higher.

How much does agriculture need in a given year to feed us;

Approximately 43 MAF for 9.6 million irrigated acres (less now due to the Sustainable Groundwater Management Act and droughts)
How much water is captured for use in California?

Captured Water - **Wet Year** (2006)
254 MAF

- 59% Water Not Captured (151 MAF)
- 41% Water Captured (103 MAF)

Captured Water - **Dry Year** (2014)
103 MAF

- 60% Water Captured (62 MAF)
- 40% Water Not Captured (41 MAF)
How much **captured** water does agriculture get in California?

**Agriculture Share of Captured Water - Wet Year (2006)**
- 29% (30 MAF) - Agriculture share of captured water (103 MAF)
- 71% (73 MAF) - Captured water used for the environment and urban sectors

**Agriculture Share of Captured Water - Dry Year (2014)**
- 53% (35 MAF) - Agriculture share of captured water (62 MAF)
- 47% (27 MAF) - Captured water used for the environment and urban sectors
How much captured water does the urban sector get in California?

Urban Share of Captured Water - **Wet Year** (2006)
- 103 MAF

- 92% (95 MAF) – Captured water used for the environment and agriculture sectors
- 8% (8 MAF) – Urban share of captured water (103 MAF)

Urban Share of Captured Water - **Dry Year** (2014)
- 62 MAF

- 88% (54 MAF) – Captured water used for the environment and agriculture sectors
- 12% (8 MAF) – Urban share of captured water (62 MAF)
How much captured water does the environment get in California?

Environmental Share of Captured Water - **Wet Year** (2006)  
103 MAF

- 62% (64 MAF) - Environmental share of captured water (103 MAF)
- 38% (39 MAF) - Captured water used for agriculture and the urban sectors

Environmental Share of Captured Water - **Dry Year** (2014)  
62 MAF

- 65% (40 MAF) - Captured water used for agriculture and the urban sectors
- 35% (22 MAF) - Environmental share of captured water (103 MAF)
How is water for California agriculture represented in the media?

Agriculture uses 80% of the water statement. Ag and urban sectors only compared. Environmental water is excluded in water distribution. Incorrect use of data.

22% – Urban Share of (8 MAF) Captured Water without taking into account environmental share of water

78% – Agriculture Share (35 MAF) of Captured Water without taking into account environmental Share of water

Domestic (human) Use only - **Dry Year** (2014).

**Wet Year** – Urban 26% and Agriculture 74%
How is water for California agriculture portrayed? Captured Water only (not accounting for half of water that does not get captured)

Wet Year (2006)
- 29% – Agriculture Share (30 MAF) of Captured Water (103 MAF)
- 64% – Environmental Share (62 MAF) of Captured Water (103 MAF)
- 8% – Urban and Other Share (8 MAF) of Captured Water (103 MAF)

Dry Year (2014)
- 53% – Agriculture Share (33.5 MAF) of Captured Water (62 MAF)
- 35% – Environmental Share (22 MAF) of Captured Water (62 MAF)
- 8% – Urban and Other Share (12 MAF) of Captured Water (62 MAF)

Note: This data supports the citation by academic institutions that agriculture uses 30-50% of “domestic” (human use) water in California.
Uncaptured water is environmental water!
The uncaptured water is environmental water since it is not used by agriculture or the urban sector and flows through the rivers and streams to the ocean.

Captured Water - *Wet Year* (2006)
254 MAF

- 59% Water Not Captured (151 MAF)
- 41% Water Captured (103 MAF)

Captured Water - *Dry Year* (2014)
103 MAF

- 60% Water Not Captured (62 MAF)
- 40% Water Captured (41 MAF)

How much water is captured for use in California?
How much water does agriculture get in California from total water?

Wet Year (2006) 251 MAF

- 88% - Total Water (251 MAF) in 2006 minus Agriculture Share (30 MAF)
- 12% - Agriculture Share (30 MAF) of Total water that State Received in 2006 (251 MAF)

Dry Year (2014) 103 MAF

- 71% - Total Water (103 MAF) in 2014 minus Agriculture Share (30 MAF)
- 29% - Agriculture Share (30 MAF) of Total water that State Received in 2014 (103 MAF)

Note: The amount of water agriculture gets in a wet or dry year does not change (30 MAF).
Note: Agriculture only receives four times the amount of domestic water use (9 MAF).
How should agriculture be portrayed in California agriculture? Environmental Water includes the water that is captured and not captured. Wet year example. Dry year environmental water is 58% or 63 MAF)

- 12% – Agriculture Share (30 MAF) of Water (Captured)
- 3% – Urban Share (8 MAF) of Water (Captured)
- 60% – Environmental Share (151 MAF) of Total Water (not captured). This water is released to the “environment” since it is not captured and therefore should be considered “environmental water”.
- 25% - Environmental Share (64 MAF) of Captured water that is allocated to the environment.
How should agriculture be portrayed in California agriculture? Environmental Water includes the water that is not captured.

- 12% – Agriculture Share (30 MAF) of Water (Captured). Dry year increased to 34%
- 3% – Urban Share (8 MAF) of Water (Captured). Dry Year increases to 8%
- 85% – Environmental Share (215 MAF) of Water (Captured in dark green and Not Captured in light green). Both these fractions are released to the “environment”. In Dry year this value is 58% (63 MAF)

Captured water with blue borders

Uncaptured water with red borders (e.g., releases to the “environment through winter river flows, evaporation)
How should agriculture be portrayed in California? Environmental Water includes the water that is not captured. Agriculture uses 12% of total water.

Note: The fact is that the environment (not agriculture) gets 80% or more of the water.
California agriculture uses water efficiently

**Diagram:**
- **Year Data Collected:** 1991, 2001, 2006, 2010
- **Irrigation Method Percentage (%):**
  - Gravity
  - Sprinkler
  - Low Volume
  - Other

**Graph:**
- **Gravity:** 66.9 in 1991, 49.4 in 2001, 43 in 2006, 30.6 in 2010
- **Sprinkler:** 17.3 in 1991, 15.6 in 2001, 15.4 in 2006, 15.2 in 2010
- **Low Volume:** 3.2 in 1991, 6.8 in 2001, 13.5 in 2006, 17.3 in 2010
- **Other:** 0.6 in 1991, 1.8 in 2001, 4 in 2006, 49.1 in 2010
Key Statistics about California Agriculture

• Number 1 state in the nation for agriculture outputs ($55.9 billion in cash receipts).
• Water use is very efficient – more than half the acres use efficient technologies such as drip irrigation.
• Acres in efficient irrigation technologies have been steadily increasing over time while less efficient methods are declining.
• Total irrigated acres – approximately 9 million acres.
• Only uses just over four times the water used for urban use.
• California is one of five unique Mediterranean regions in the world (with no rain for six to eight months of the year).
• Produces high-value “specialty crops” including fruits, nuts, and lettuces.
• Many specialty crops not grown anywhere else in the country.
• Reputation for providing a safe, affordable, nutritious, diverse, and consistent food supply to California and the nation.

Get more ag stats on California Agriculture from CalPoly.
For questions, please contact Amrith Gunasekara, PhD. agunasekara@cfbf.com