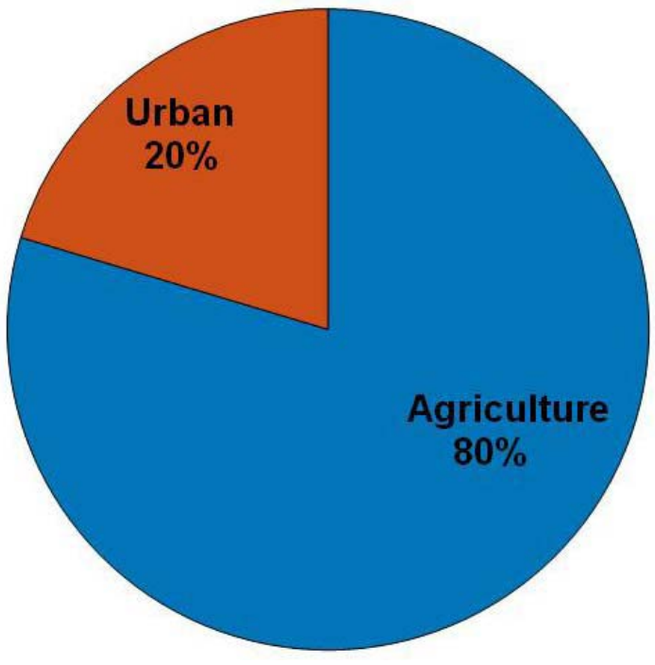
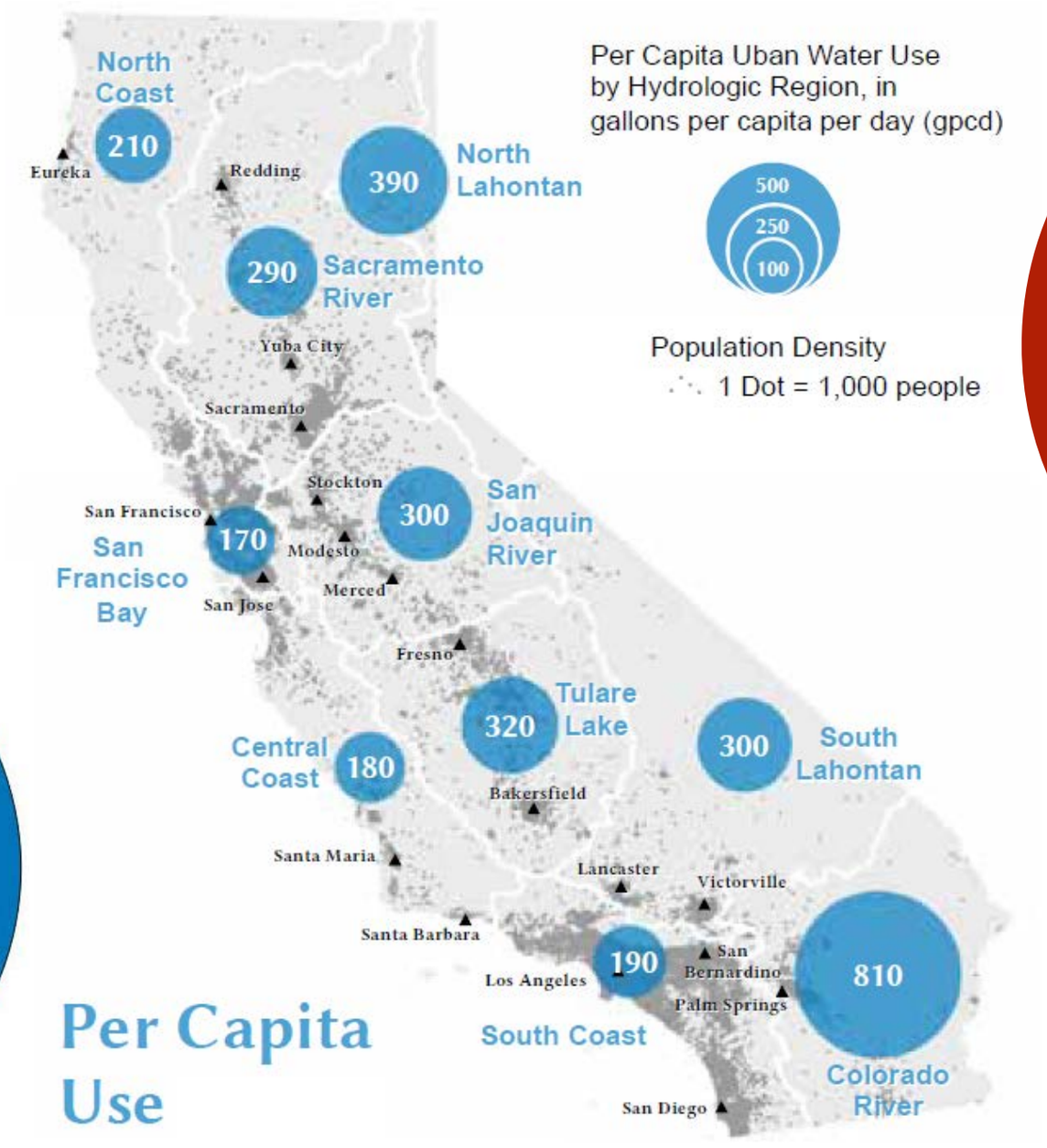
LONG-TERM WATER MANAGEMENT: LIVING WITHIN OUR MEANS

MARCH 25, 2015

Water Use in California

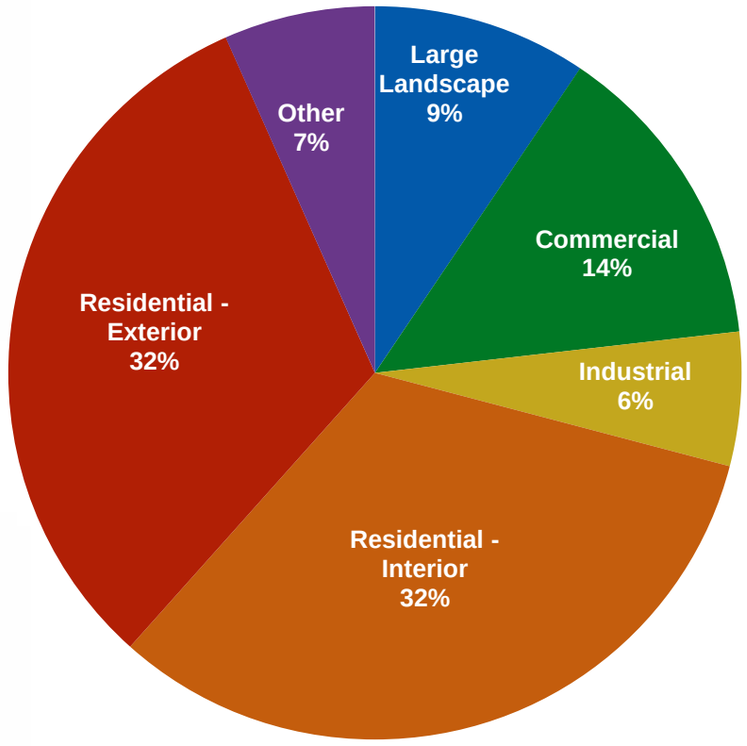
Human Water Use:
44 million acre-feet per year





Per Capita Uban Water Use by Hydrologic Region, in gallons per capita per day (gpcd)

Population Density
1 Dot = 1,000 people



Average from 2001-2010: 230 gpcd

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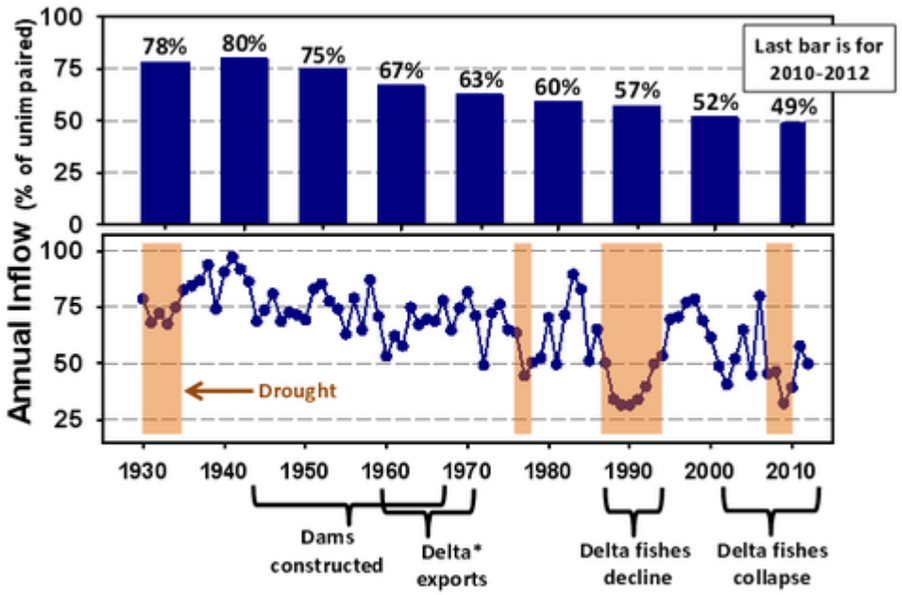
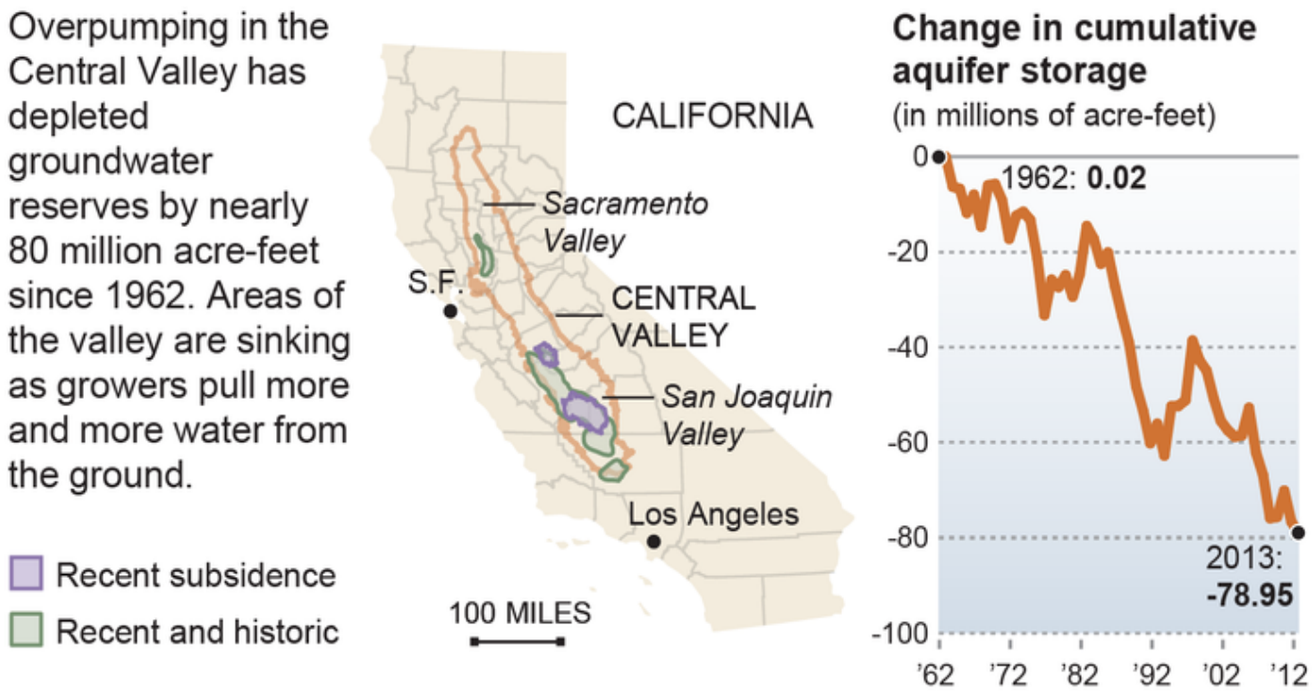
The Current Trajectory

- Rivers Severely Depleted
  - We are diverting more and more freshwater
  - Native fish populations at or near historic lows
    - No San Joaquin River restoration releases in WY2014/2015
    - No water restrictions for delta smelt in WY 2014
    - Salmon/steelhead protections reduced CVP supplies by 2% in WY2014, or 60 TAF

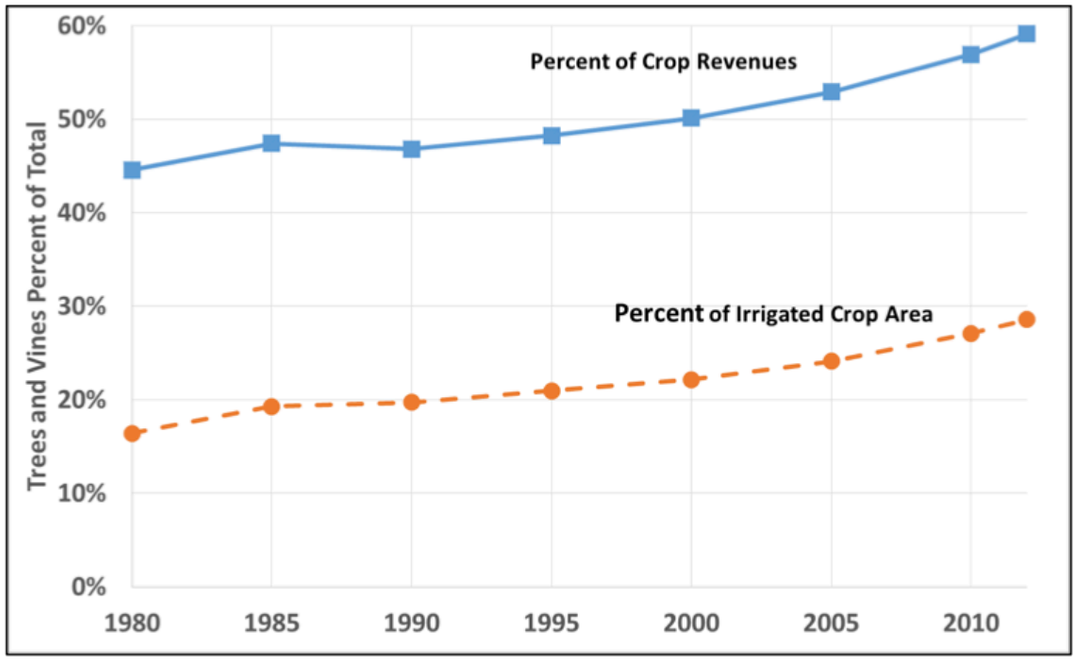


- Groundwater Not Being Replenished



The Current Trajectory

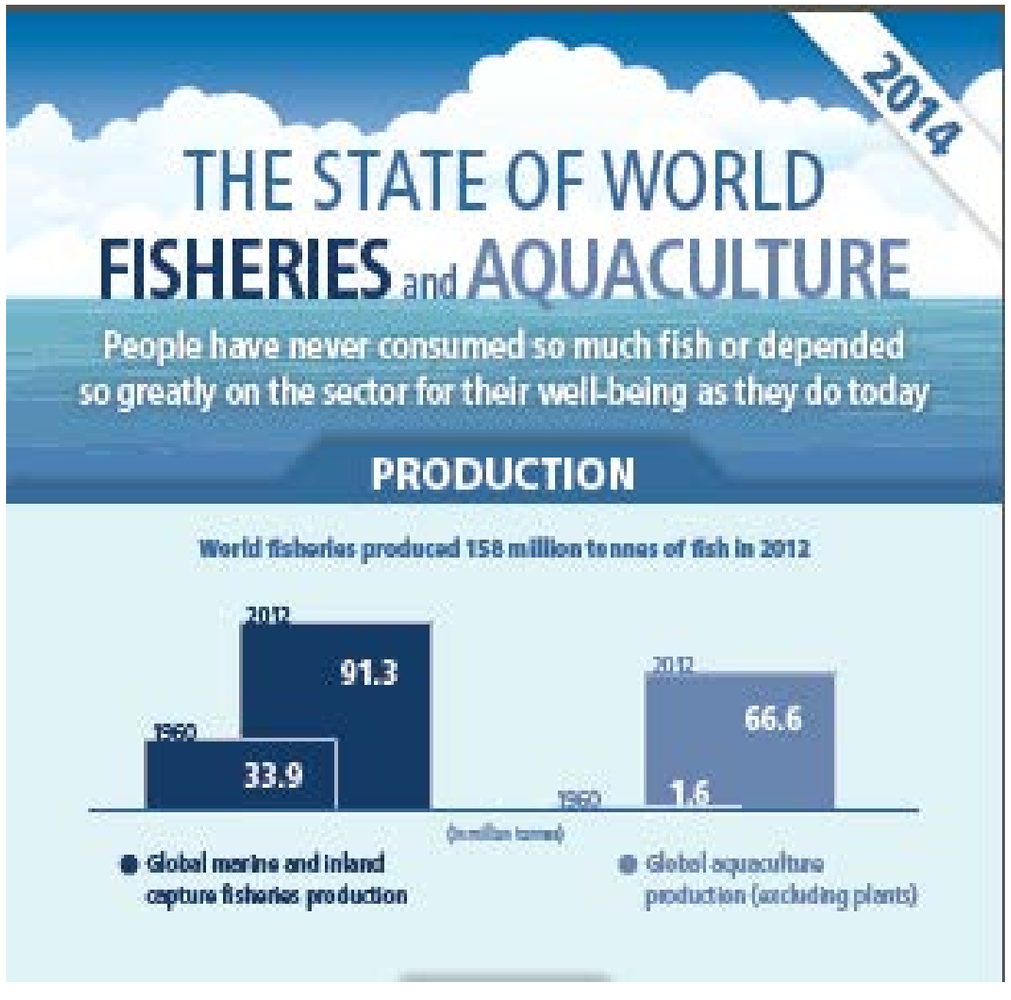
- Agricultural Water Demand Hardening
  - Growth in permanent crops increasing:

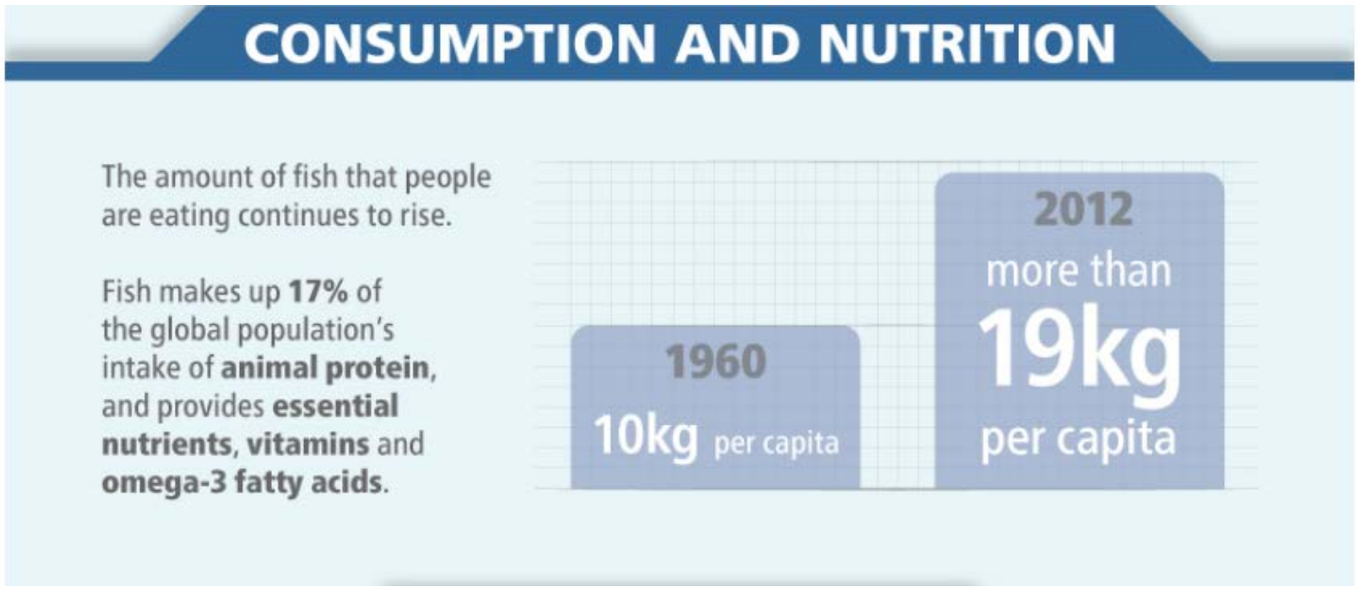


  - Almond acreage doubled between 1995 and 2013, to 940,000 acres. 48,000 new almond acres planted between June 2013 and May 2014, during height of drought
- Population Expanding
  - From about 38 million today to about 50 million by 2050

The Current Trajectory

- Fish are an increasingly important worldwide food source





The Untapped Potential of California's Water Supply

- We need to focus on Better Use and Re-Use of Water
- 2014 report prepared by NRDC, Pacific Institute and UCSB Professor Bob Wilkinson (www.nrdc.org/water/ca-water-supply-solutions.asp)

Key findings:

- We are living beyond our means, taking too much water from rivers, streams, and aquifers.
- The good news:
  - large opportunities exist to reduce urban and agricultural water demand through efficiency improvements; and
  - opportunities to boost local supplies through stormwater capture and water reuse.

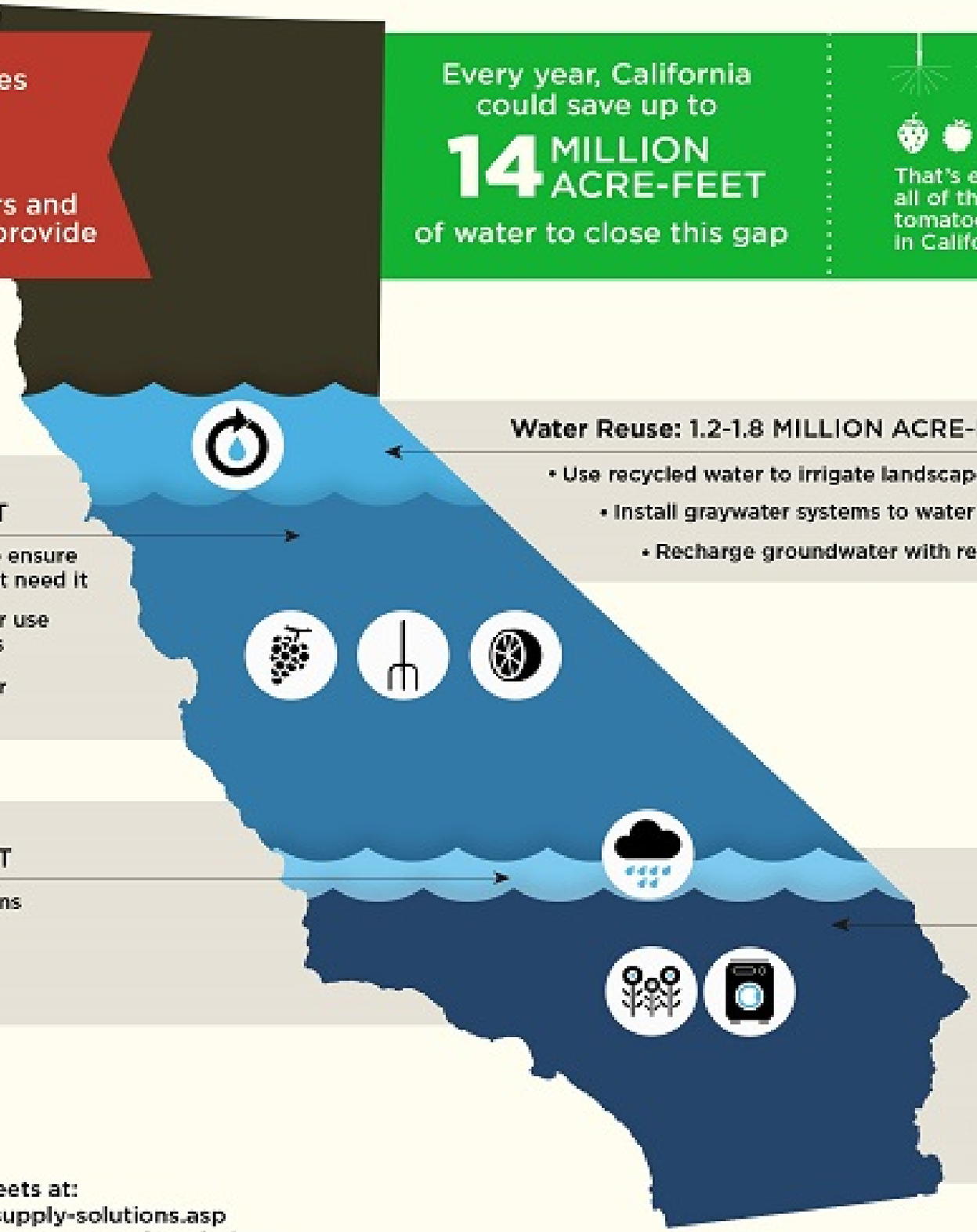
Untapped Savings

21st CENTURY SOLUTIONS FOR A SUSTAINABLE WATER SUPPLY FOR CALIFORNIA

Every year, California uses **6 MILLION ACRE-FEET** more water than our rivers and aquifers can sustainably provide

Every year, California could save up to **14 MILLION ACRE-FEET** of water to close this gap

That's enough water to irrigate all of the orchards, nuts, berries, vineyards, tomatoes, lettuces, rice, and vegetables grown in California, with water left over.



Water Reuse: 1.2-1.8 MILLION ACRE-FEET

- Use recycled water to irrigate landscapes and crops
- Install graywater systems to water lawns and flush toilets in homes and businesses
- Recharge groundwater with recycled water

Agricultural Efficiency: 5.6-6.6 MILLION ACRE-FEET

- Use smart irrigation scheduling to ensure crops are watered when they most need it
- Use deficit irrigation to limit water use at drought-tolerant growth stages
- Expand efficient drip and sprinkler irrigation technology

Stormwater Capture: 0.4-0.6 MILLION ACRE-FEET

- Install rainwater barrels and cisterns at homes and businesses
- Recharge groundwater with stormwater runoff

Urban Efficiency: 2.9-5.2 MILLION ACRE-FEET

- Replace unneeded turf grass with native and drought-tolerant plants
- Accelerate replacement of inefficient plumbing fixtures and appliances
- Find and fix water leakage in buildings and under streets
- Operate cooling towers more efficiently in factories and office buildings

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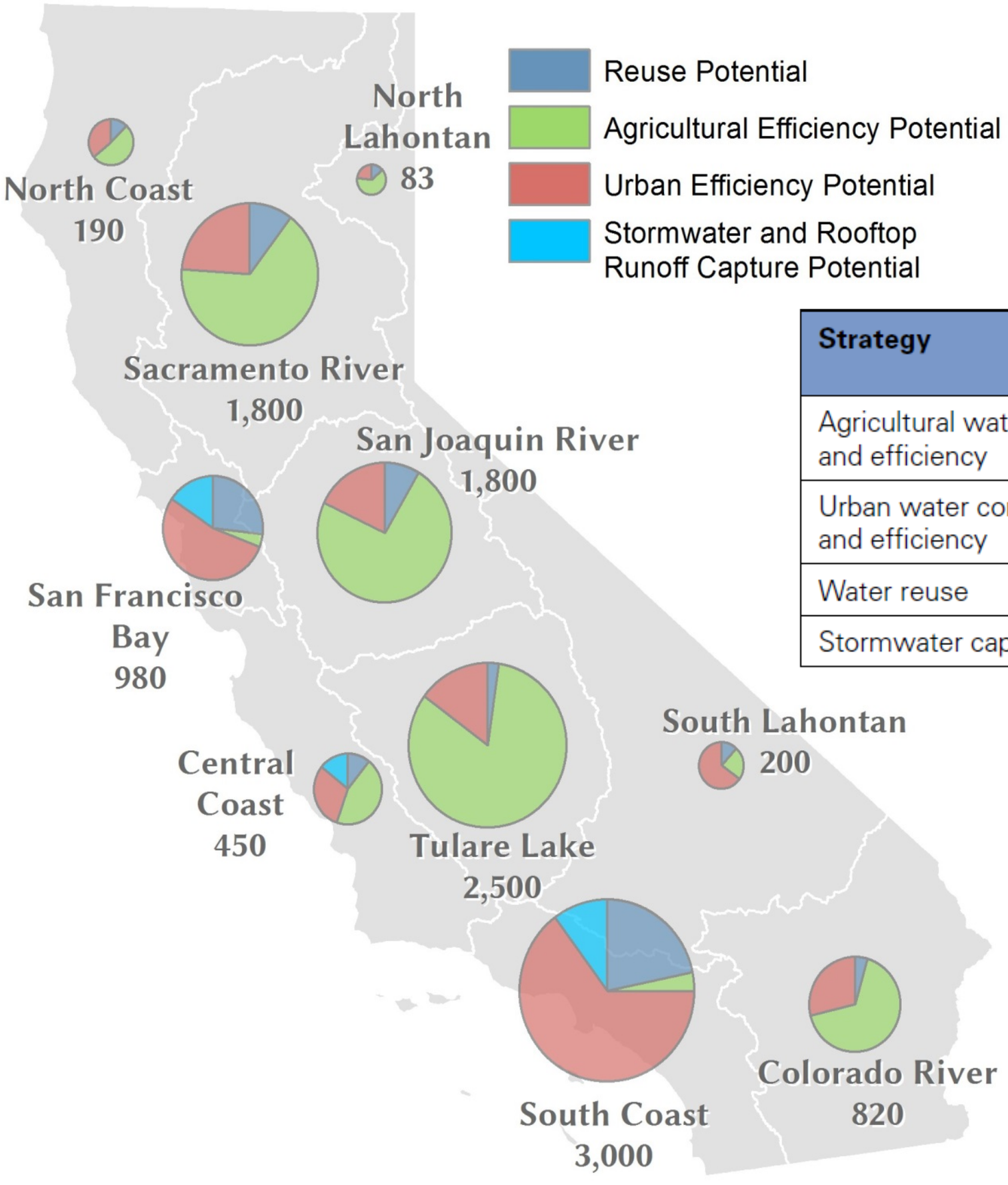
Get the Drought Series Fact Sheets at:
www.nrdc.org/water/ca-water-supply-solutions.asp
www.pacinst.org/publication/ca-water-supply-solutions

* 1 Million Acre-Feet is generally enough to supply 2 million families for 1 year (until we all become more efficient!)



Strategy	Water Savings (million acre-feet per year)
Agricultural water conservation and efficiency	5.6 – 6.6
Urban water conservation and efficiency	2.9 – 5.2
Water reuse	1.2 – 1.8
Stormwater capture	0.4 – 0.6

10.8 million - 13.7 million acre-feet per year

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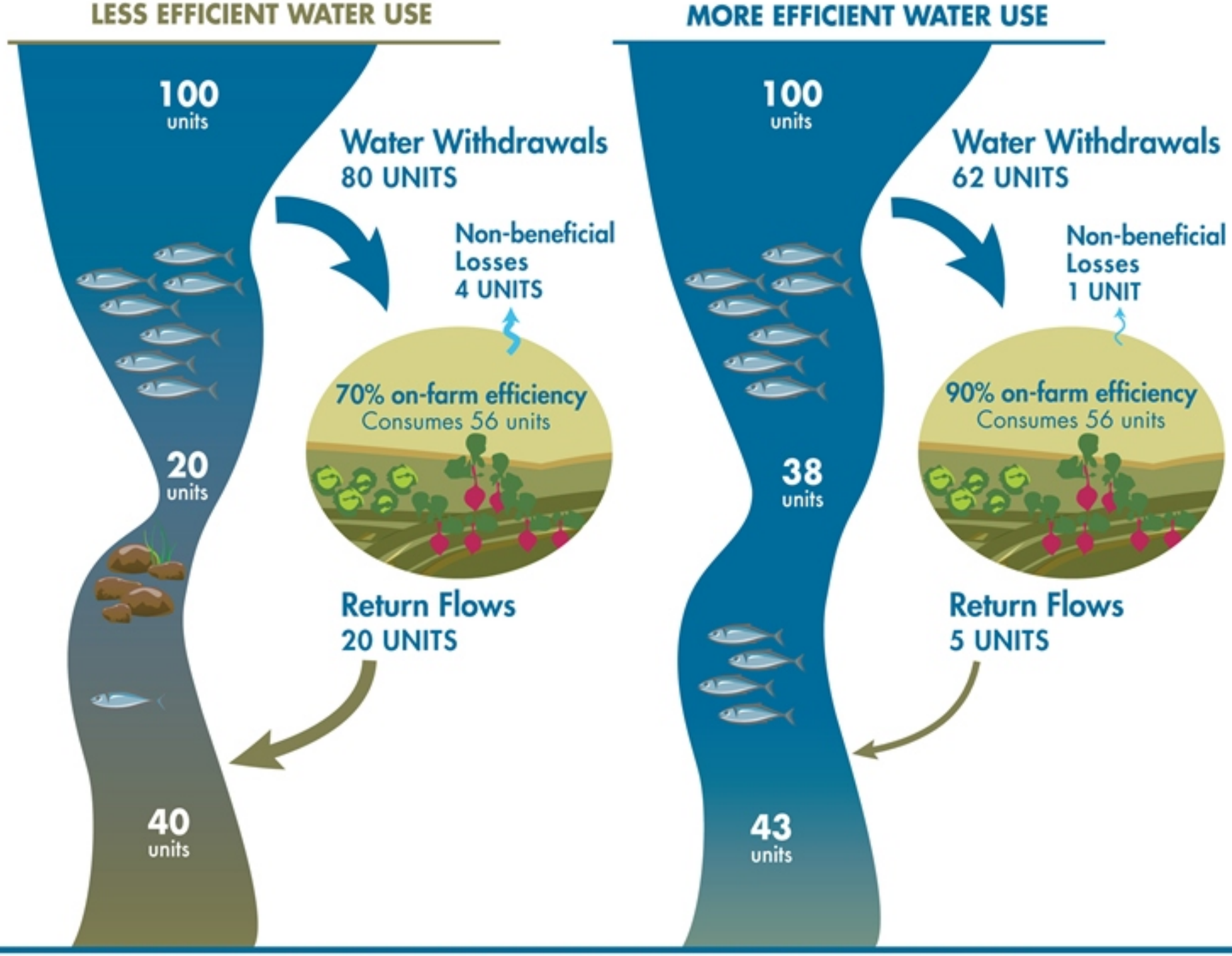
The Multiple Benefits of Water Efficiency



BENEFITS OF EFFICIENCY INCLUDE:

- Maintain agricultural production
- Reduced non-beneficial consumptive losses, creating new supply
- Less polluted runoff into rivers, streams, and groundwater aquifiers
- More water to support in-stream flows
- Less energy for pumping
- Reduce or eliminate need for expensive infrastructure
- Less vulnerability to drought

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*Numbers in this figure are for illustrative purposes. Actual quantities would depend on site-specific conditions.

Take Aways

- Goal must be broader than “new water;” we need to have a resilient system that can provide the right kind of water in the right place at the right time
- Improved efficiency (in urban and ag environments) is *often* the cheapest and quickest way to work toward that resilient system
- We still have tremendous untapped potential to improve water use and reuse to provide enough water for a growing population and economy, and healthy rivers and fisheries

Water Footprint of a Cheeseburger

It takes more water to make one cheeseburger than the average Californian typically uses in three days
(230 gpcd * 3 = 690 gallons)