Off the *"Water Grid"*: Weathering the Drought on the Central Coast

Michael Cahn, Irrigation and Water Resources Advisor
UC Cooperative Extension, Monterey County
mdcahn@ucdavis.edu

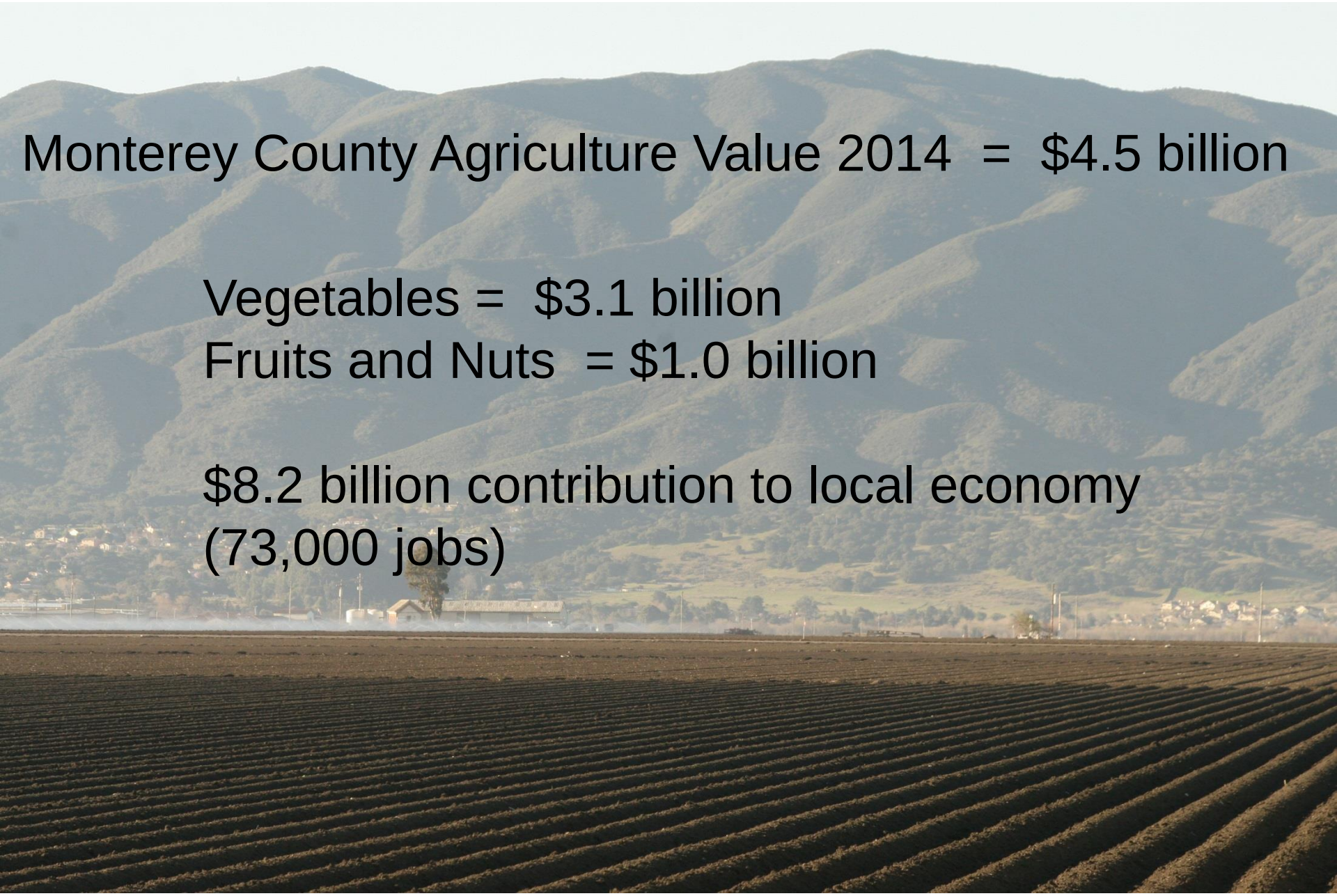
UNIVERSITY of CALIFORNIA

UC CE University of California Cooperative Extension

Central Coast Water Supply

- Where does Central Coast water come from and who are the principal users?
- What are the main concerns with supply and quality?
- What are some of the solutions?

Central Coast

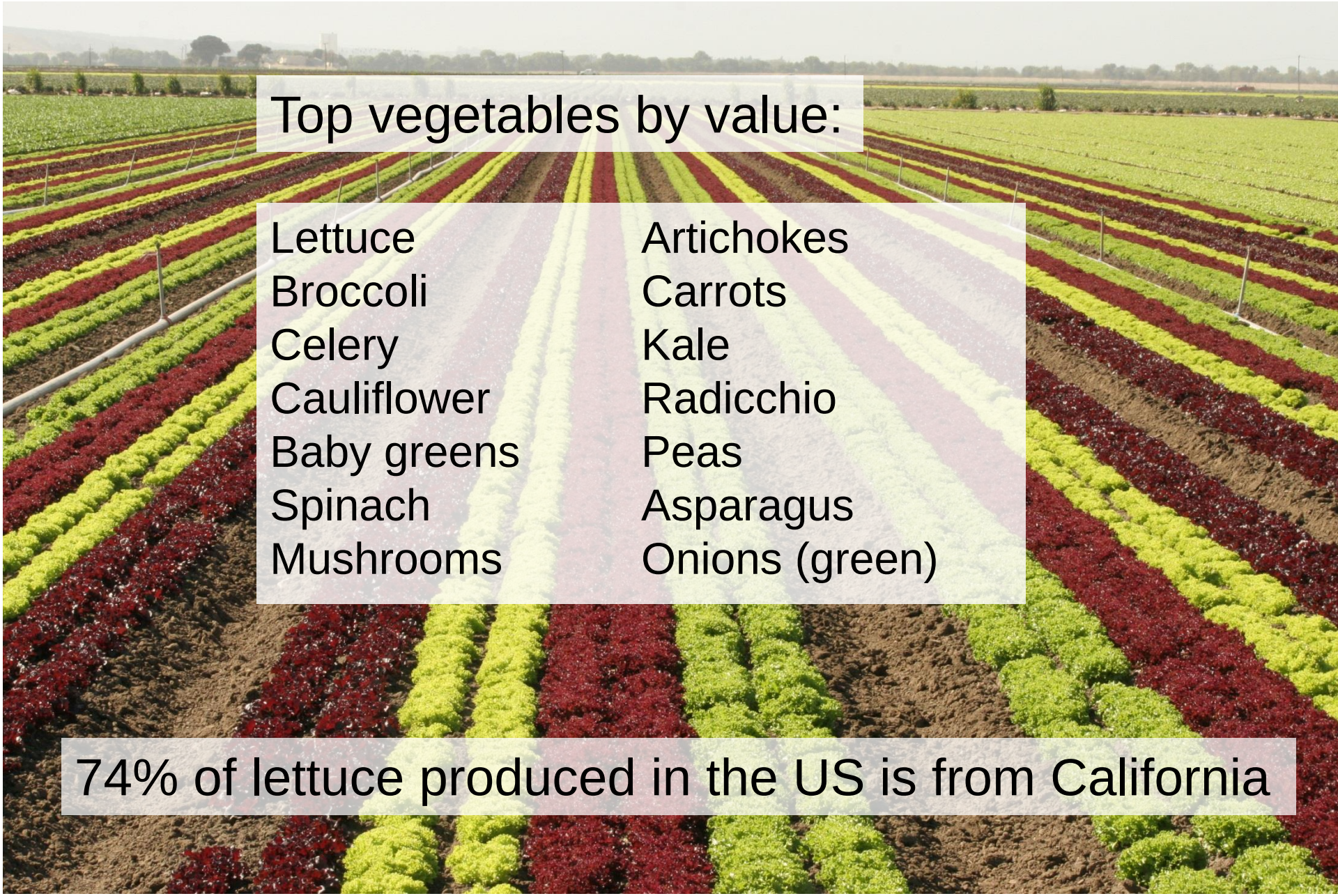


Monterey County Agriculture Value 2014 = $4.5 billion

Vegetables = $3.1 billion
Fruits and Nuts = $1.0 billion

$8.2 billion contribution to local economy
(73,000 jobs)

The Central Coast is the Salad Bowl Capital of the US

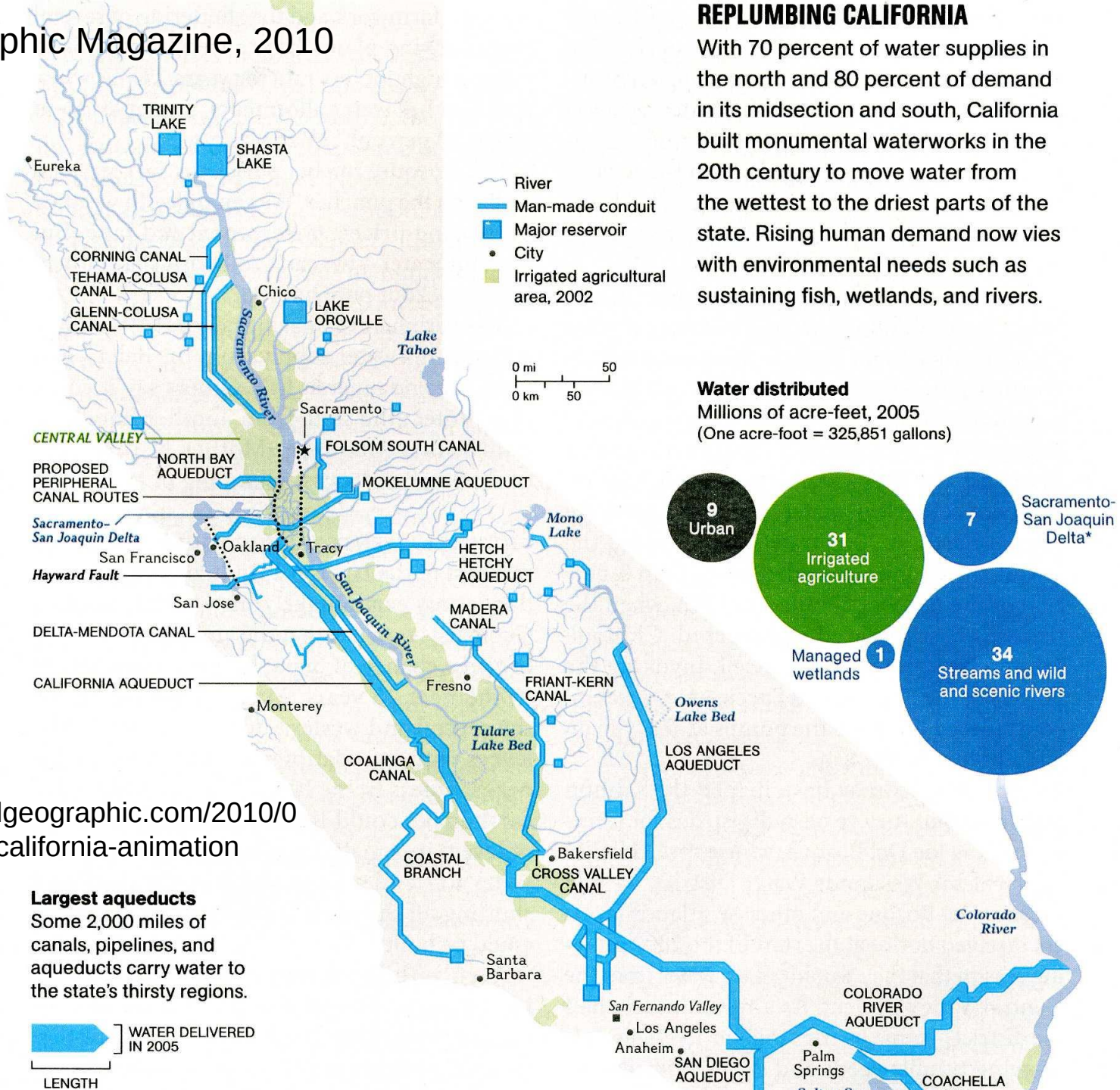


Top vegetables by value:

Lettuce	Artichokes
Broccoli	Carrots
Celery	Kale
Cauliflower	Radicchio
Baby greens	Peas
Spinach	Asparagus
Mushrooms	Onions (green)

74% of lettuce produced in the US is from California

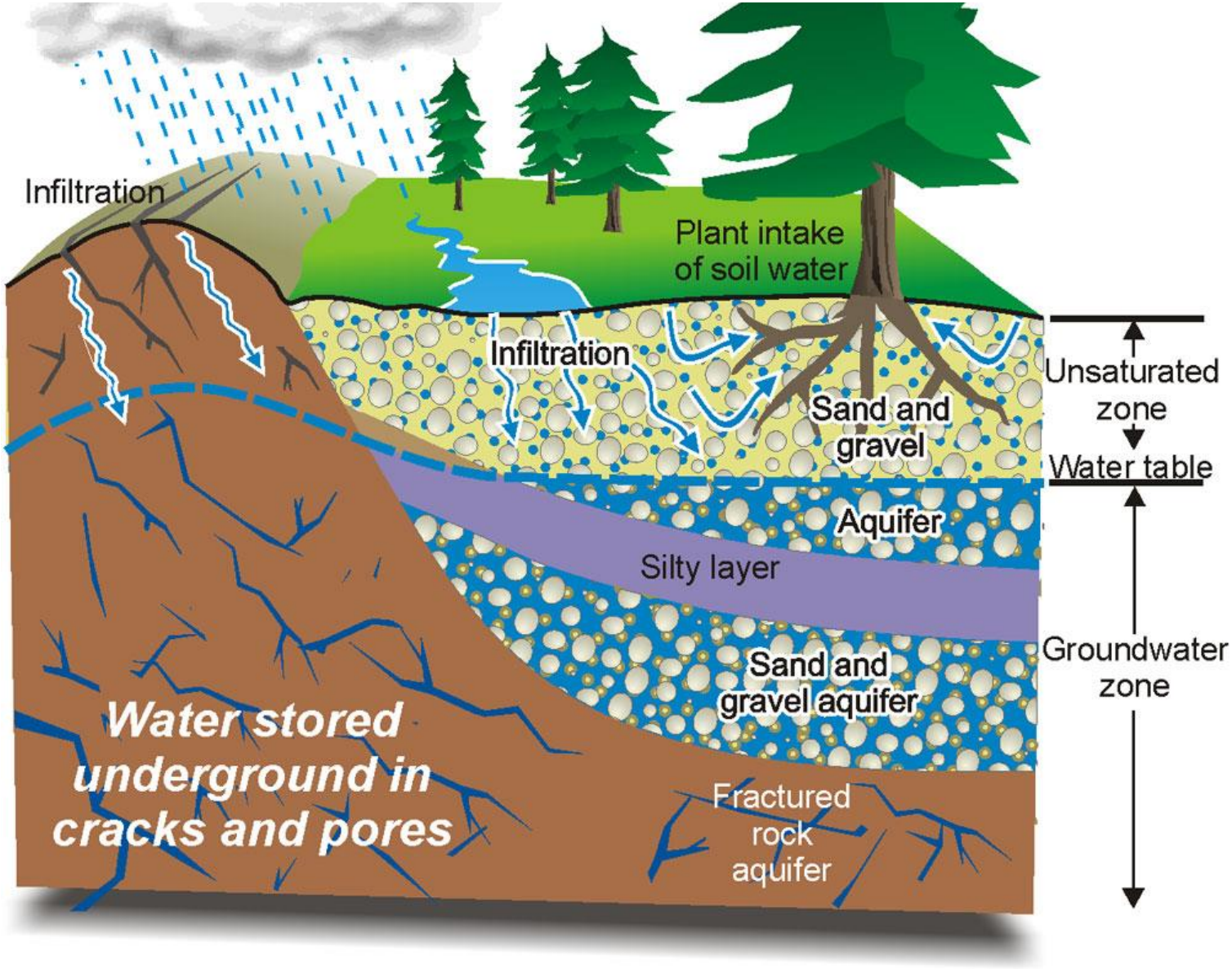
National Geographic Magazine, 2010



http://ngm.nationalgeographic.com/2010/04/water/plumbing-california-animation

Coastal Mountains are Key to Capturing Winter Moisture

Ground Water is the Largest Water Supply on the Central Coast



Water Issues on the Central Coast

- Supply (drought)
- Seawater intrusion into ground water aquifers
- Flooding
- Nitrate contamination of ground water
- Pollution of surface water (rivers, sloughs, lakes)

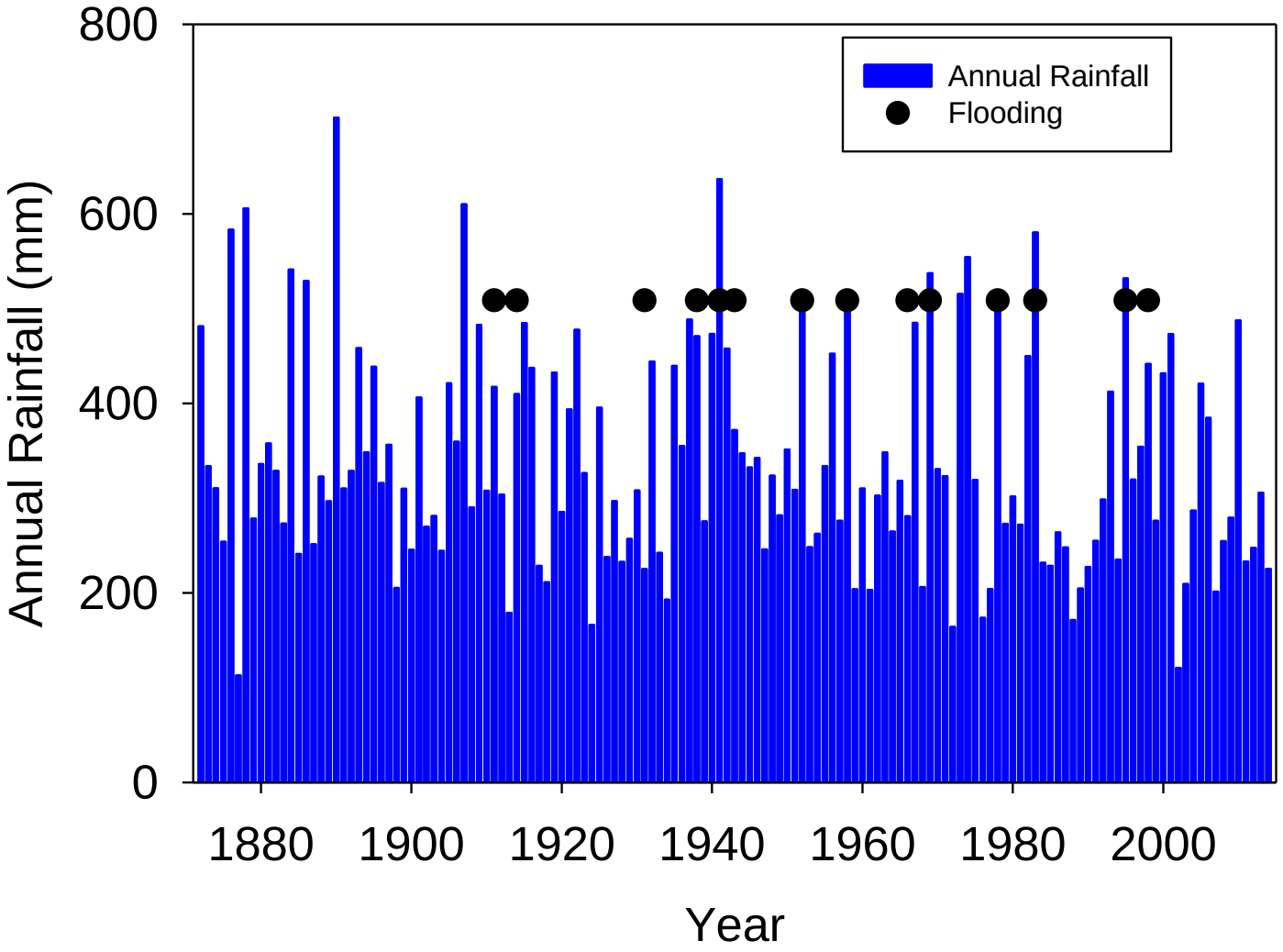

Salinas Valley Basin
128 km

Water Supply for the Salinas Valley (2013)

- ✓ **627 million m^3 pumped during 2013**
- ✓ **1,819 active wells**
- ✓ **91% of water pumped was for agriculture**
- ✓ **No water imports from other regions**

Monterey County Water Resource Agency (MCWRA), 2013 Ground Water Extraction Report

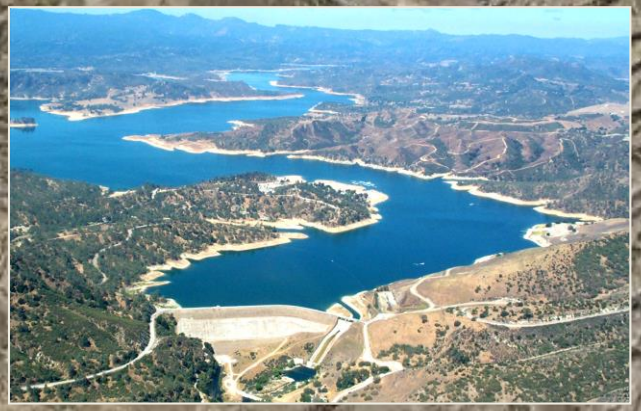
Annual Rainfall and Flooding Events (Salinas)



Lake San Antonio

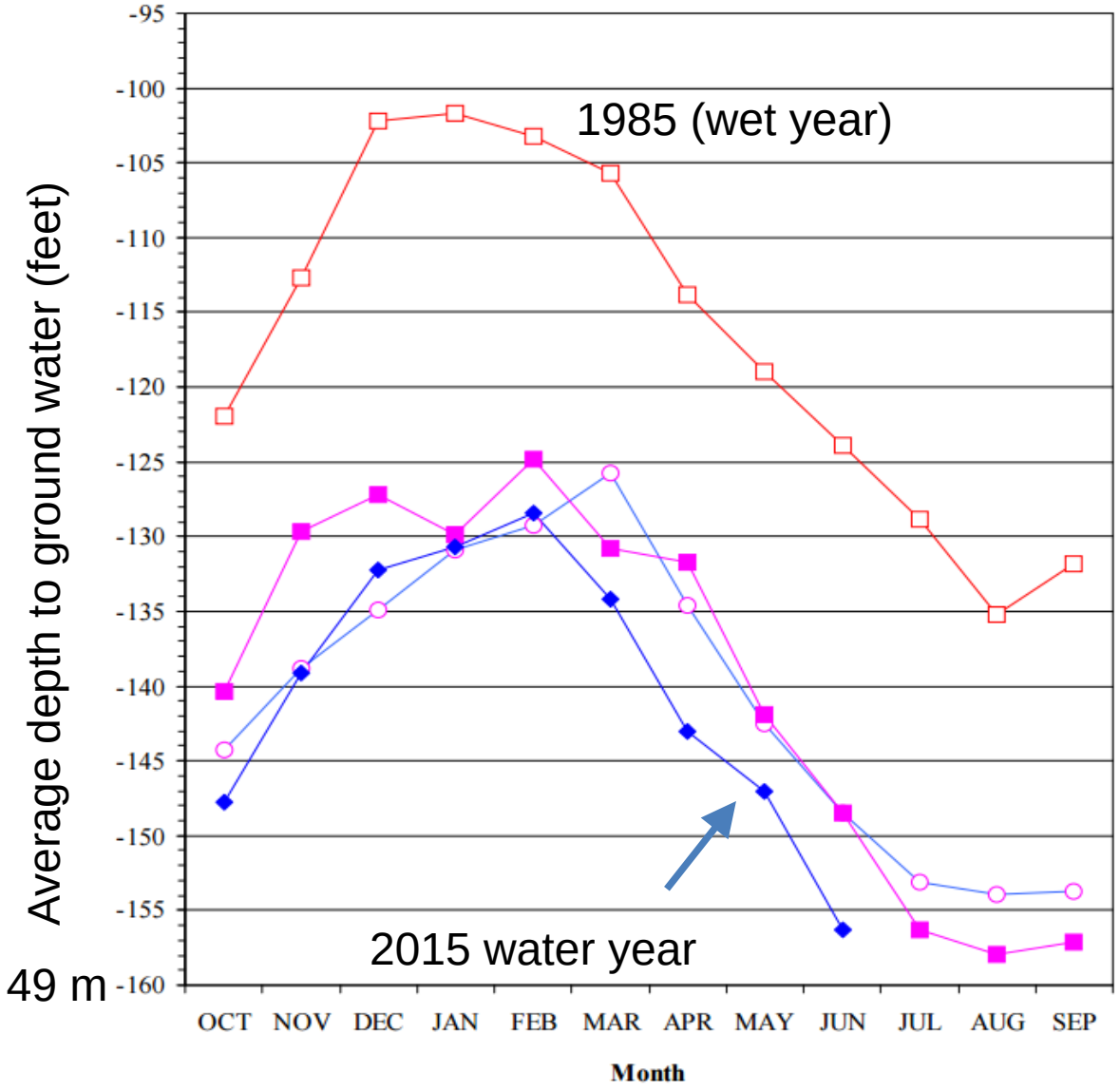
- Completed in 1965
- Capacity 413 Million m^3
  Currently 4% capacity

Lake Nacimiento



- Completed in 1957
- Capacity 466 Million m^3
- Currently 22% capacity

Average Ground Water Depths are Currently at Historically Low Levels*

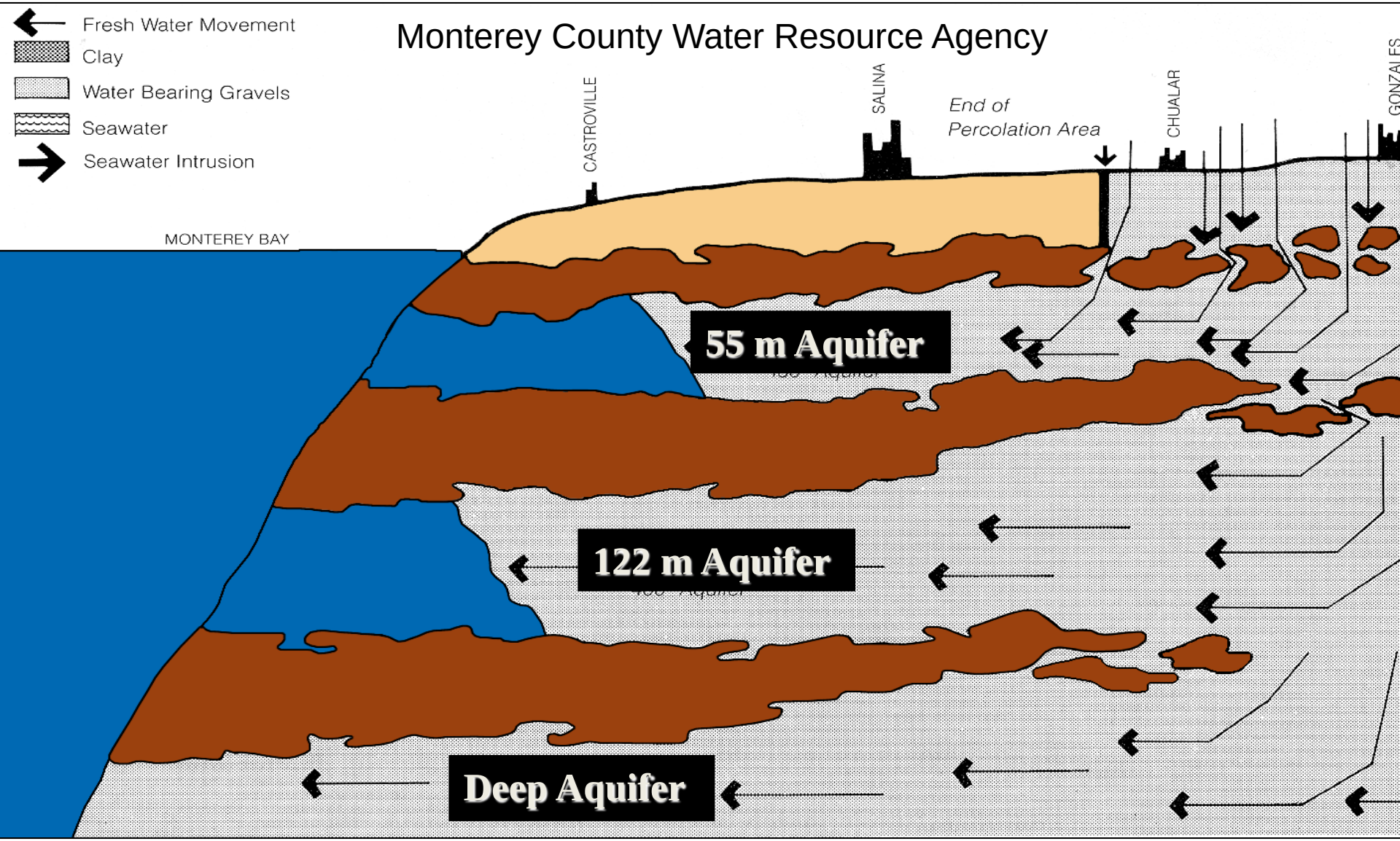


* Monterey County Water Resource Agency, 2015

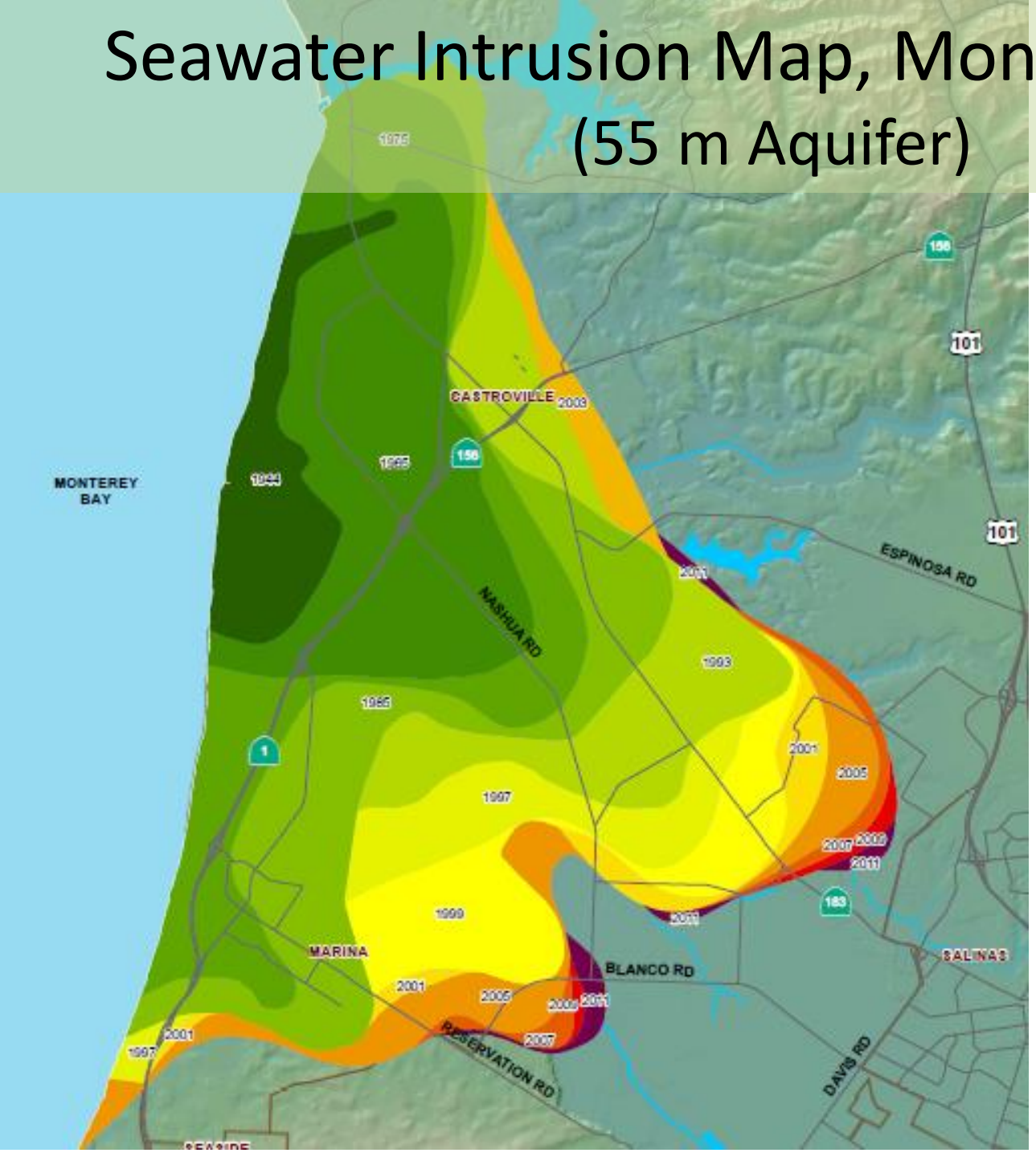
1991 (severe drought)

2014 water year

Salinas Valley Aquifers



Seawater Intrusion Map, Monterey County (55 m Aquifer)



9716 ha in 55 m aquifer

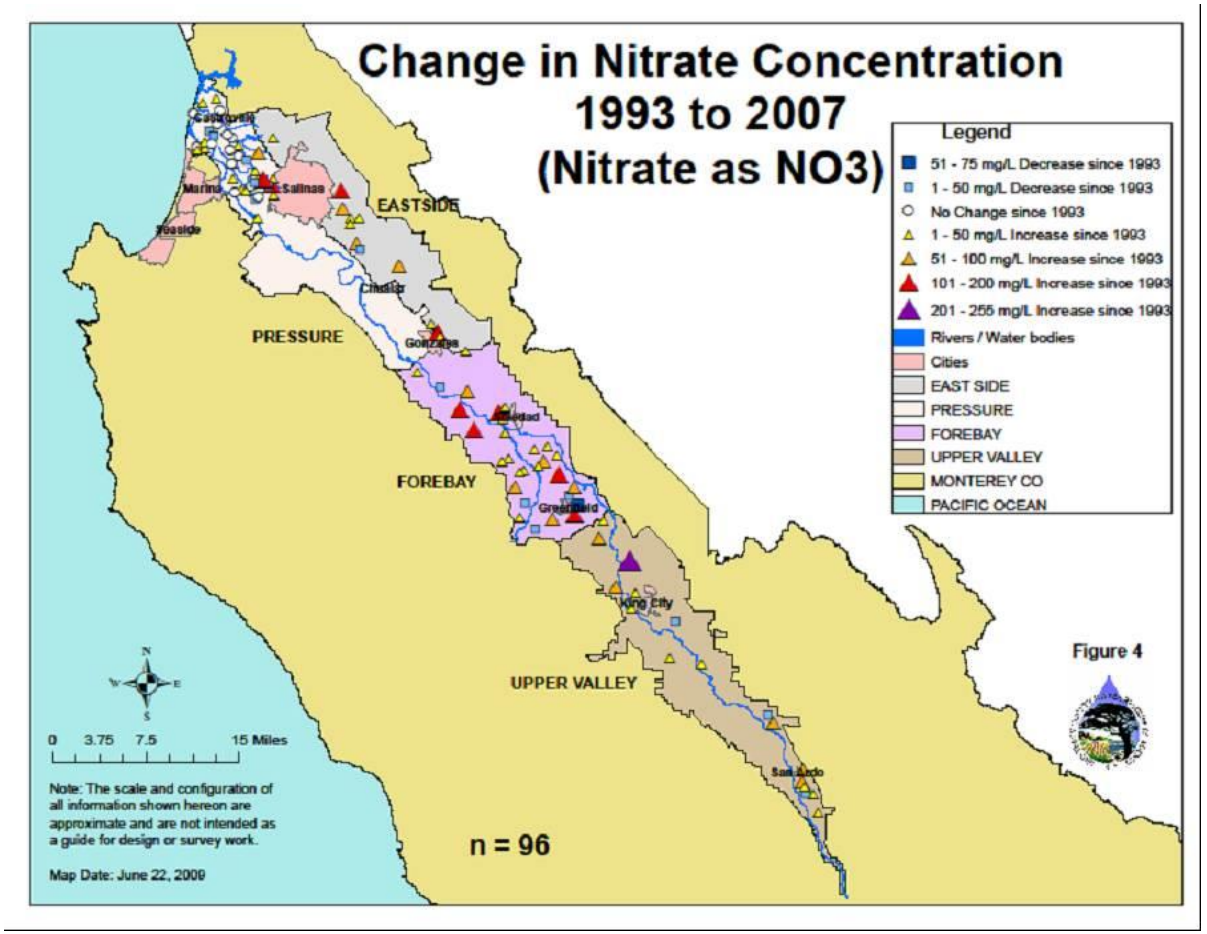
4250 ha in 122 m aquifer

MCWRA

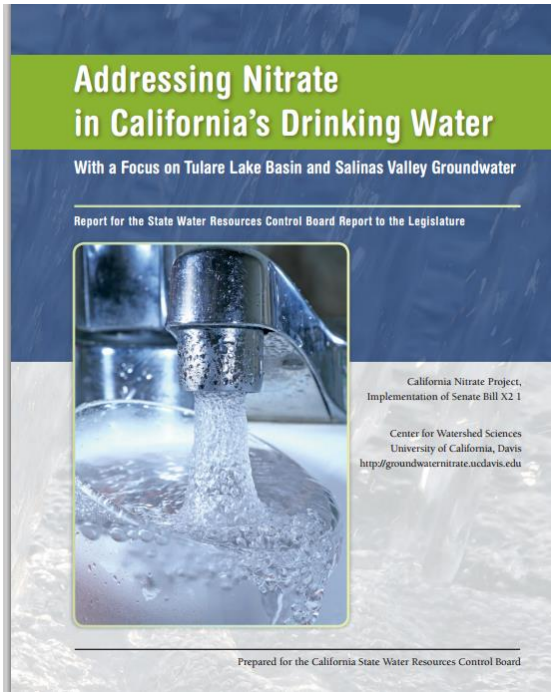
Salt damage symptoms in strawberry

Recycled Water Supplies about 6,822 ha of farmland on the Central Coast

Nitrate contamination of Ground Water



MCWRA



Harter and Lund, 2012

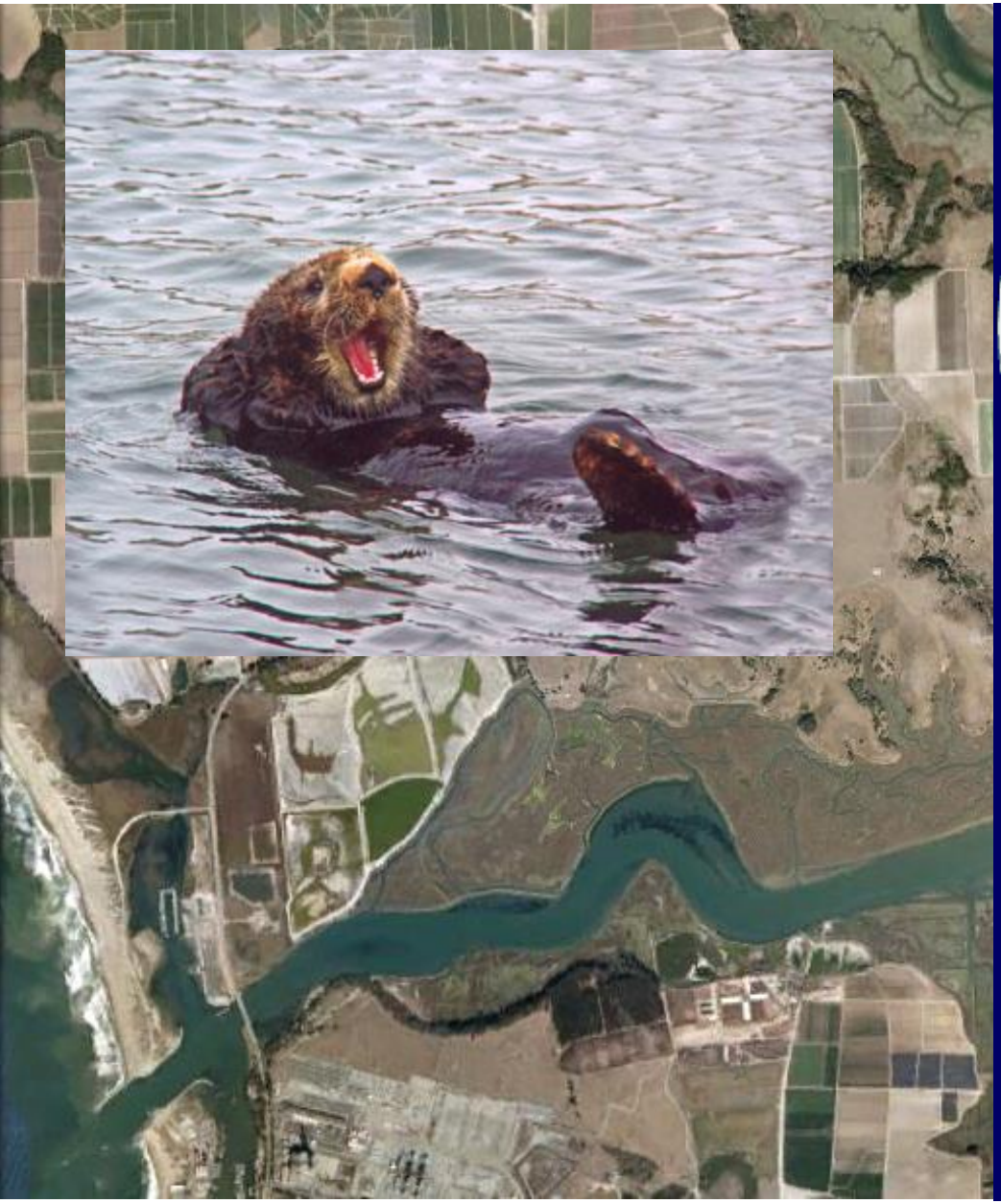
Eutrophication of Surface Water

Regulatory Concentration targets:

P < 0.7 ppm

NO_3-N < 10 ppm

Elkhorn Slough



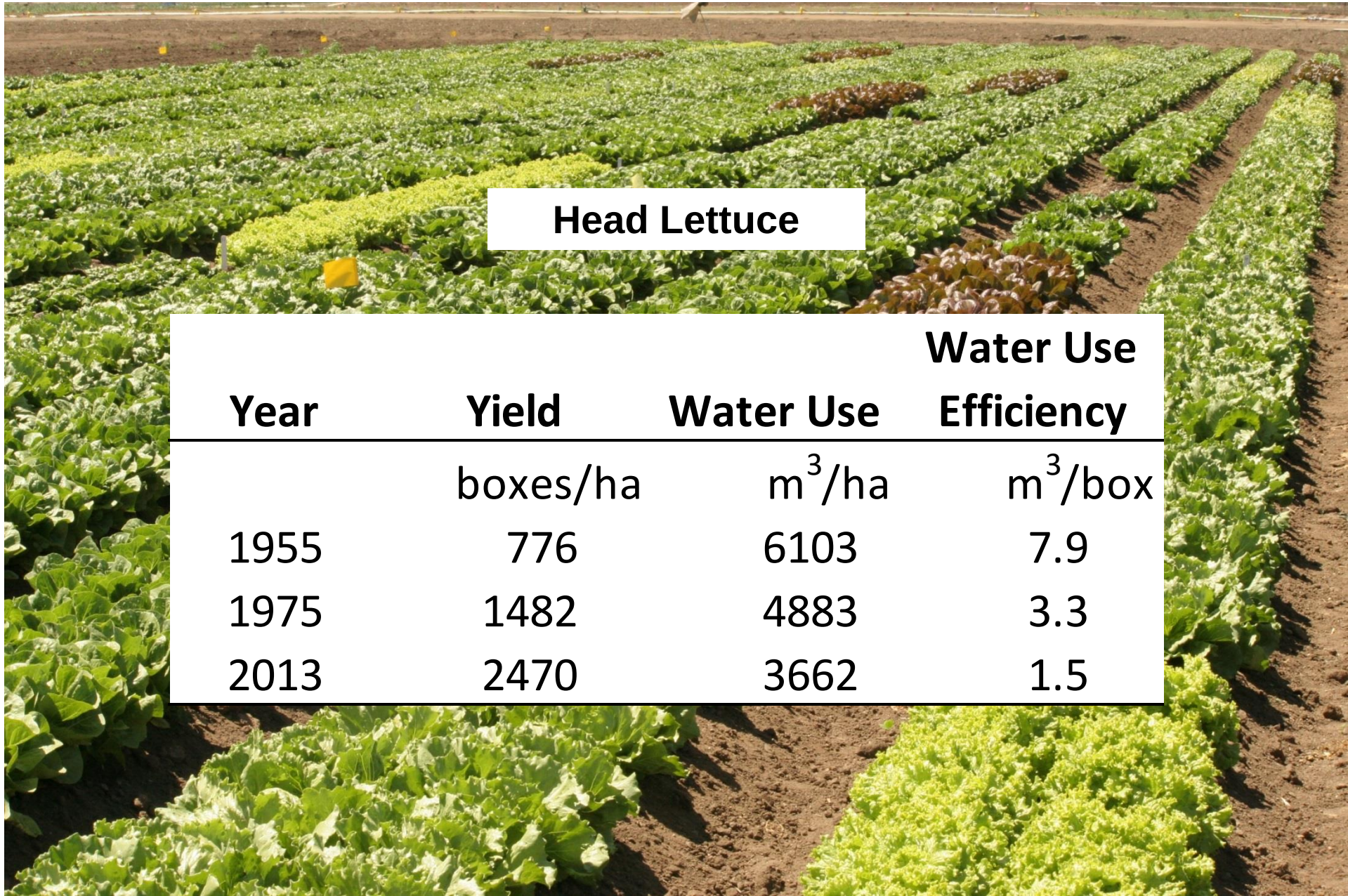
Commodities and irrigated acres have changed in Monterey County

Comodity	Harvested area	
	1955	2013
	hectares	
Vegetables	40,503	122,355
Strawberry	978	4,445
Wine grapes	0	17,403
Grain and dry beans	46,594	4,293
Total	106,424	149,468

Coastal crops: berries and vegetables are water and salt sensitive

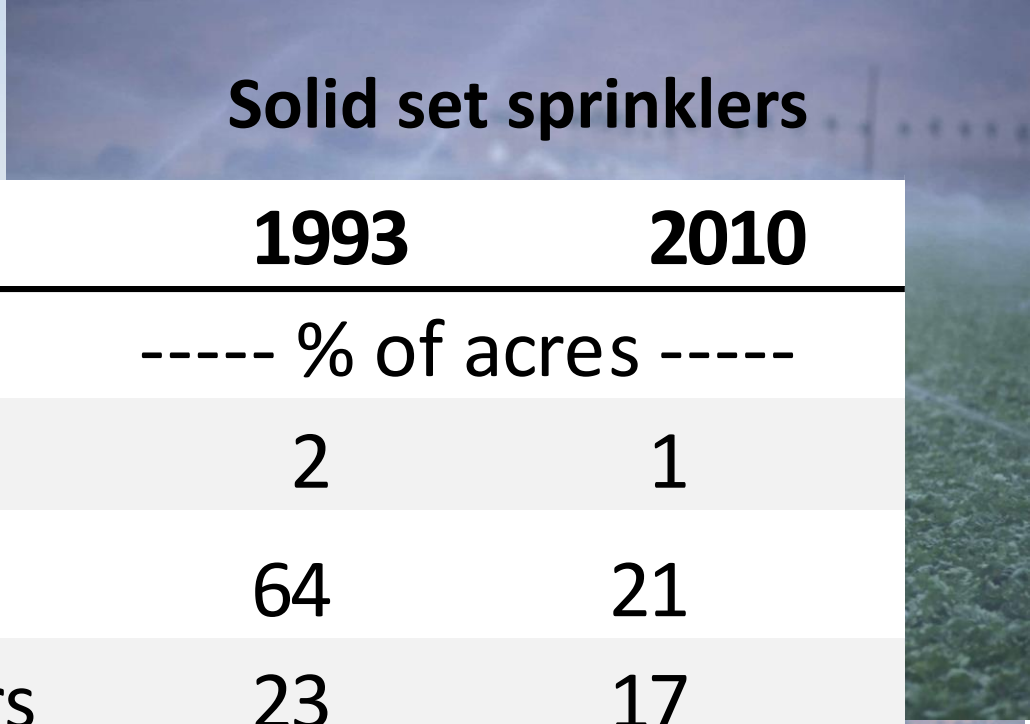
Moderate deficits in moisture can cause yield loss and reduce quality

Water use efficiency of commodities produced in the Salinas Valley has increased during the past 50 years



Head Lettuce

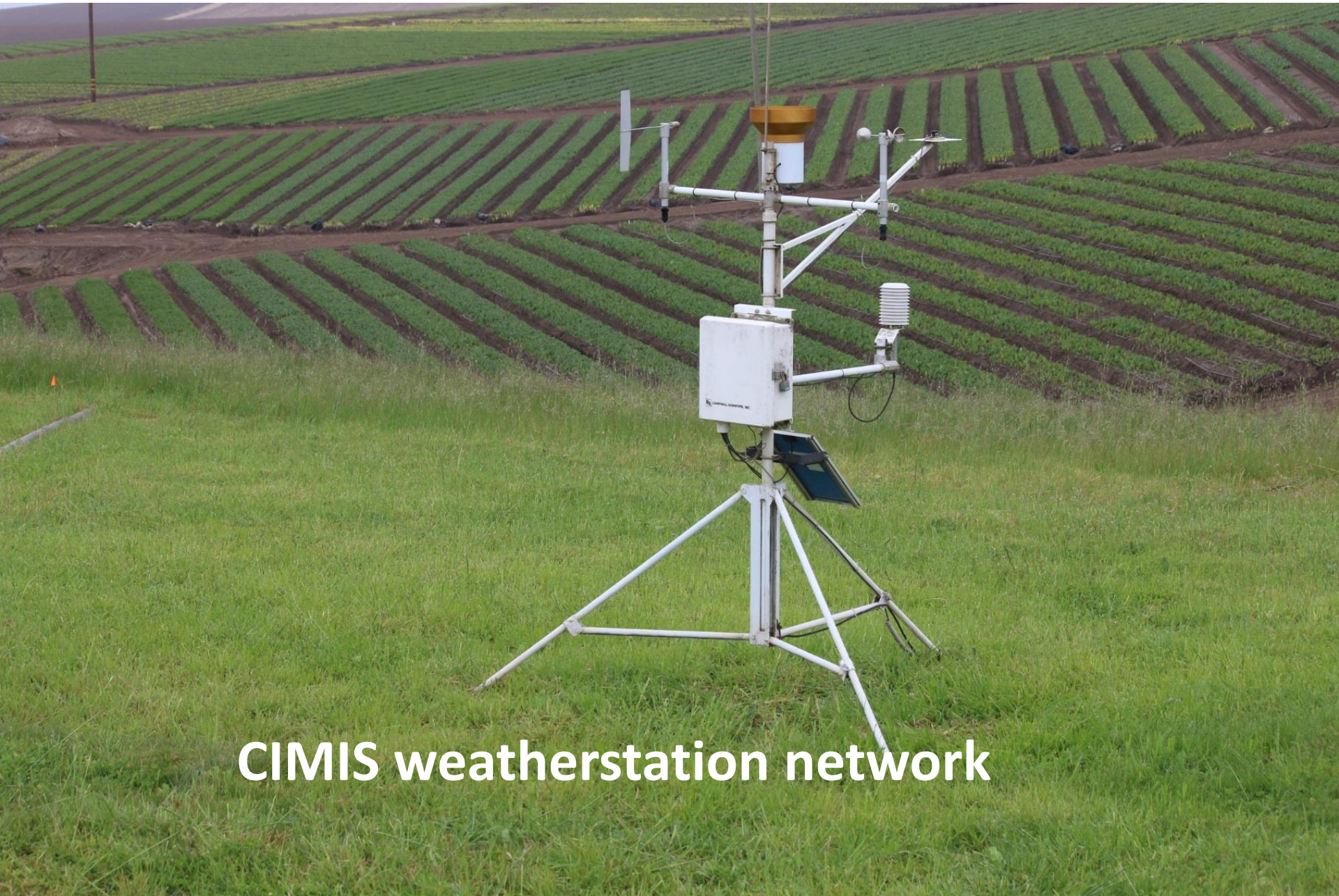
Year	Yield	Water Use	Water Use Efficiency
	boxes/ha	m^3/ha	m^3/box
1955	776	6103	7.9
1975	1482	4883	3.3
2013	2470	3662	1.5



Irrigation method	1993	2010
	----- % of acres -----	
Furrow	2	1
Sprinkler[1]/furrow	64	21
Hand move sprinklers	23	17
Solid set sprinklers	5	6
Linear move sprinklers	3	1
Sprinkler[1]/drip	3	48

[1.] Sprinklers are used for establishing the crop (approximately 0 to 25 days after planting)

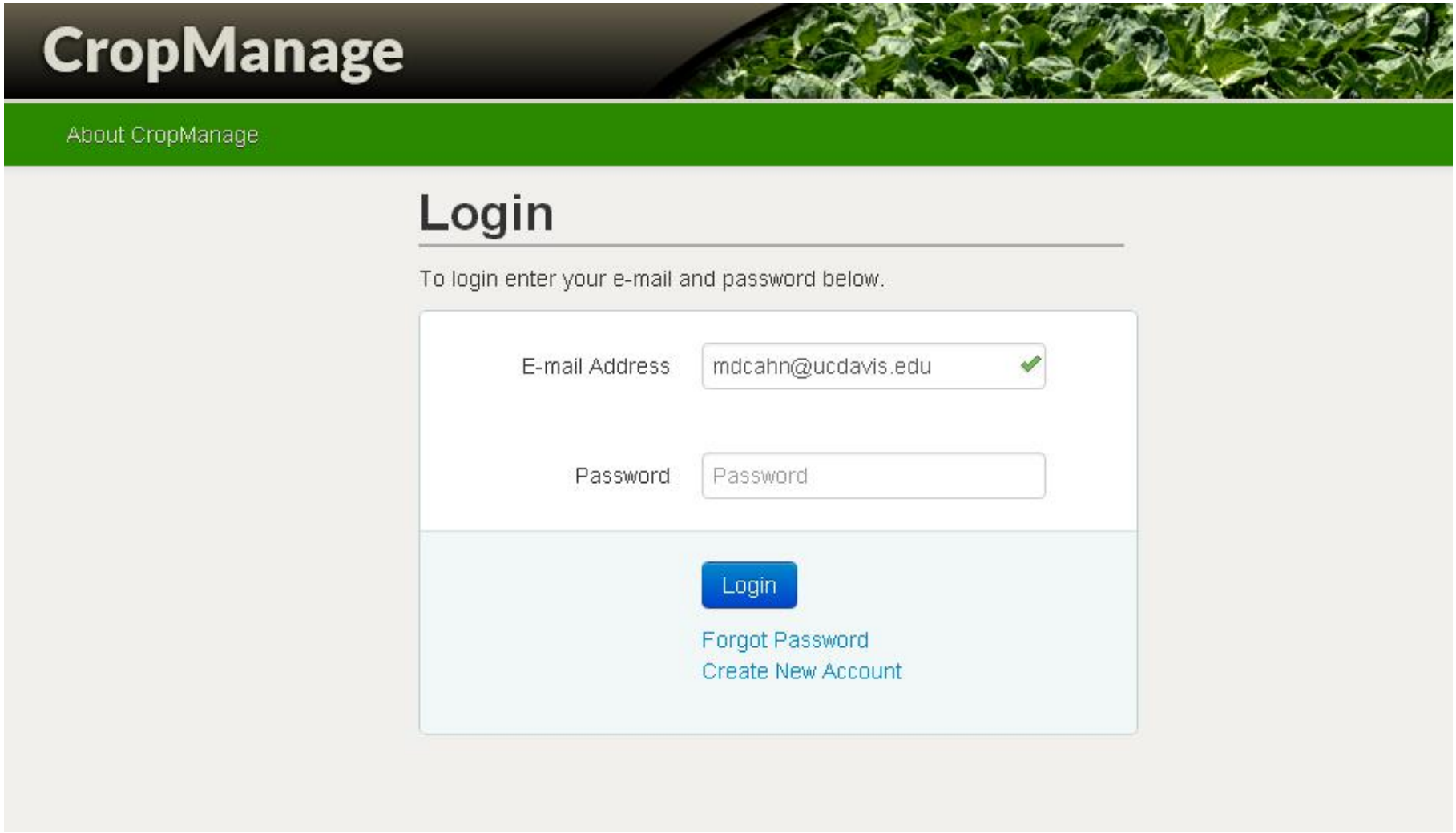
Improving irrigation scheduling using weather information



CIMIS weatherstation network

Web-based Irrigation and N management decision support tool

https://ucanr.edu/cropmanage



Evaluation of irrigation system performance

Hands-on training for irrigators, foremen, and farm managers

Summary

- ✓ The Central Coast is self-reliant for water
- ✓ Agriculture uses a majority of the water resources on the Central Coast
- ✓ The Central Coast community has found creative solutions to manage their water resources

SUPPORT LOCAL GROWERS AND CATTLEMEN

PRAY FOR RAIN

CENTRAL COAST YOUNG FARMERS AND RANCHERS