



# DEPARTMENT OF WATER RESOURCES

## Water Demand and Use in California

Water Education Foundation  
*Water 101- The Basics and Beyond*

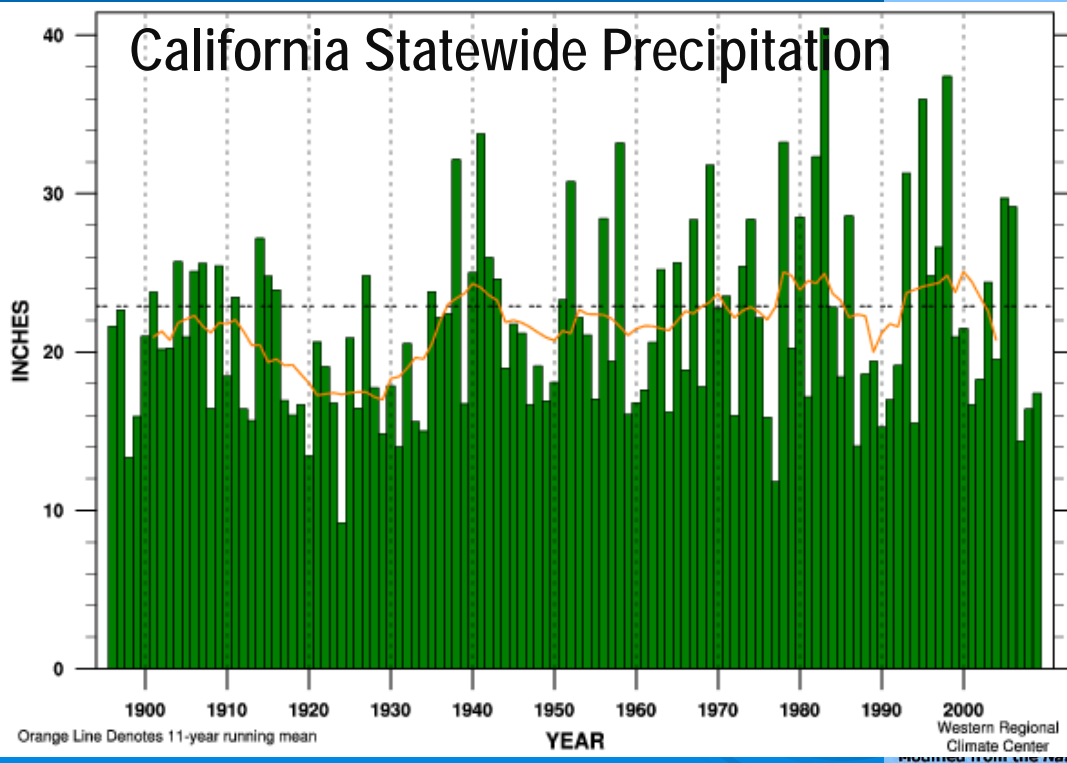
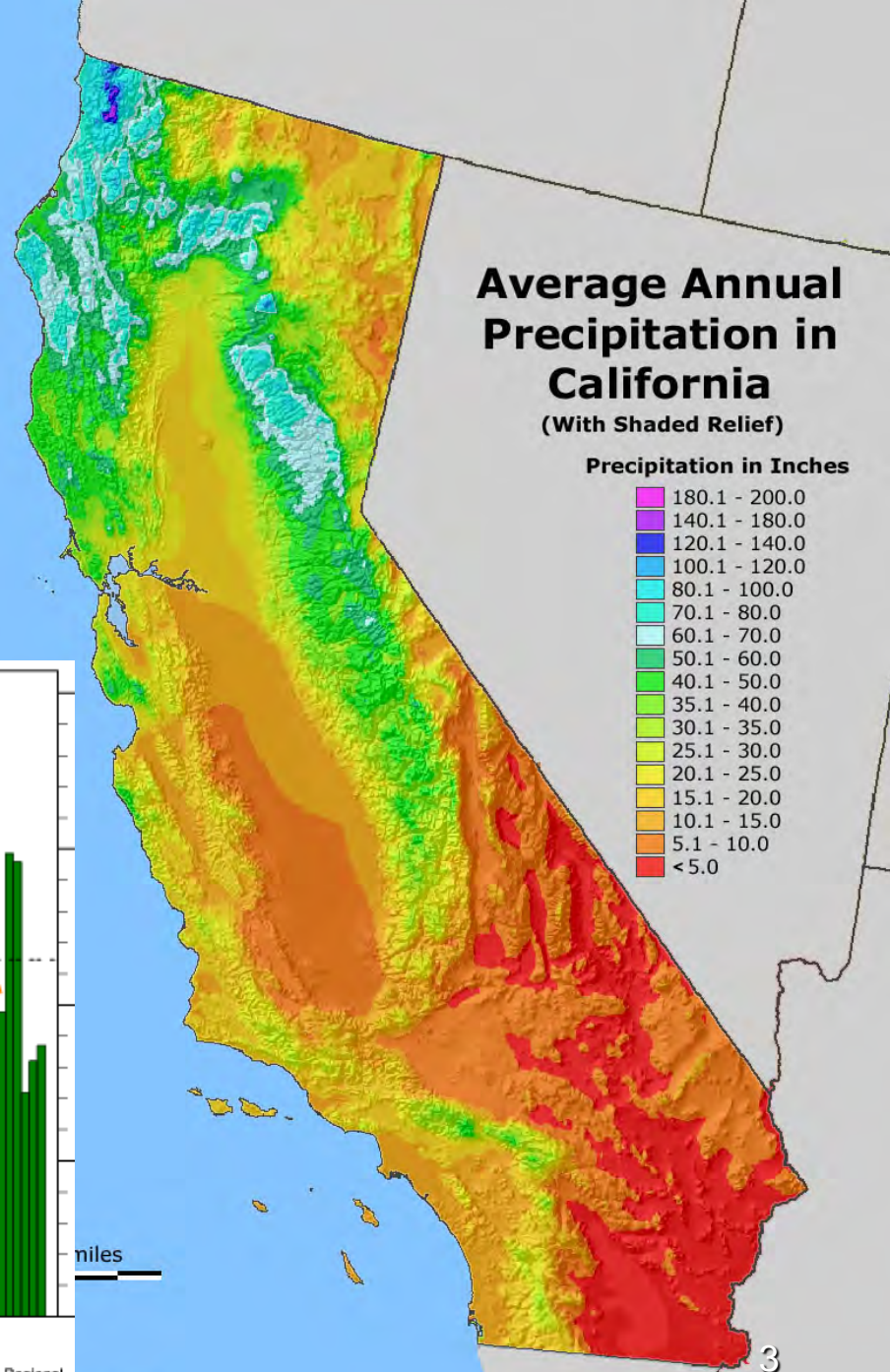
*February 23, 2012*

# California's Water Resources & Systems

# California Precipitation

Variable & Extreme  
Over Time & Location

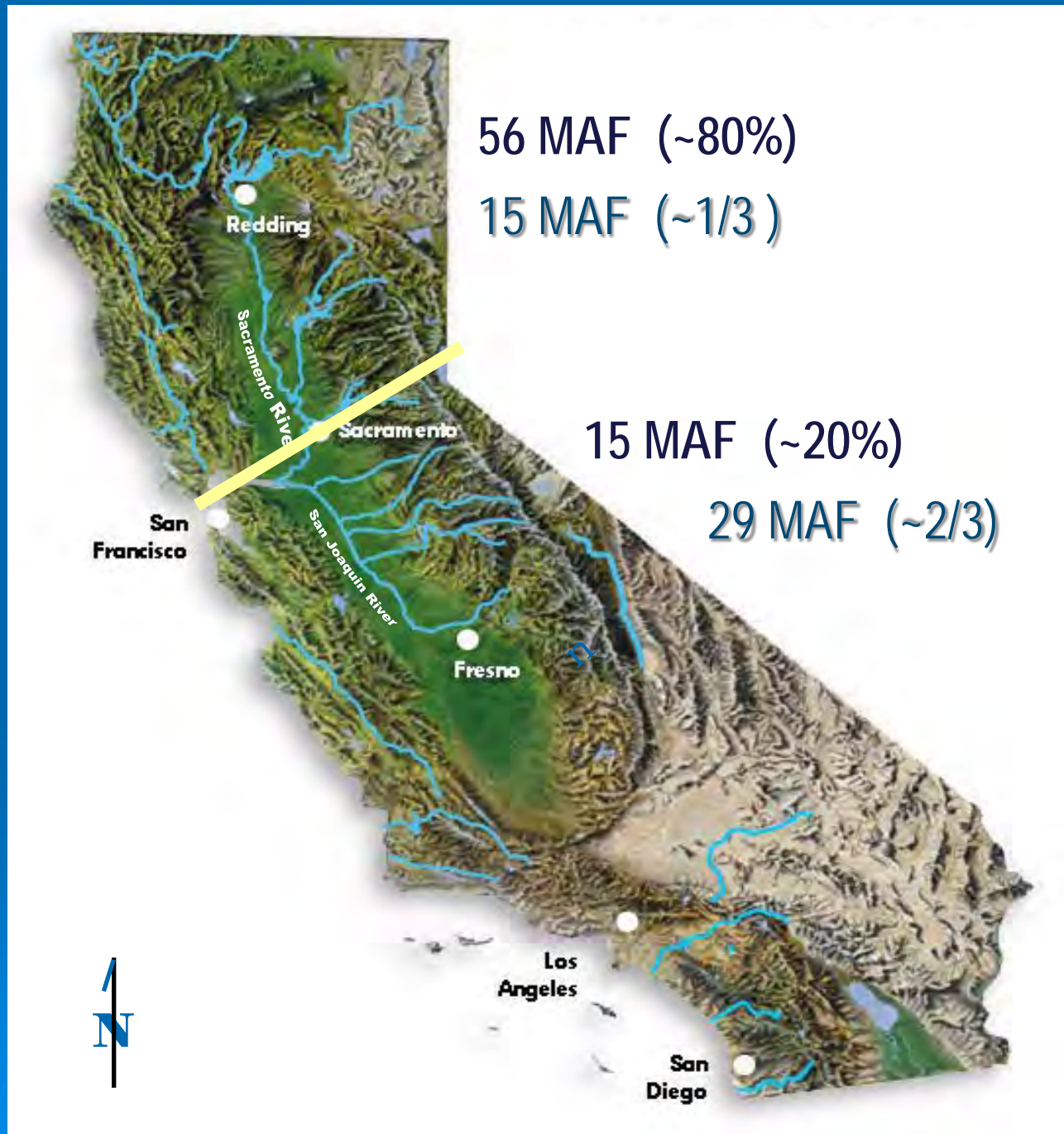
Most precipitation occurs  
November - March



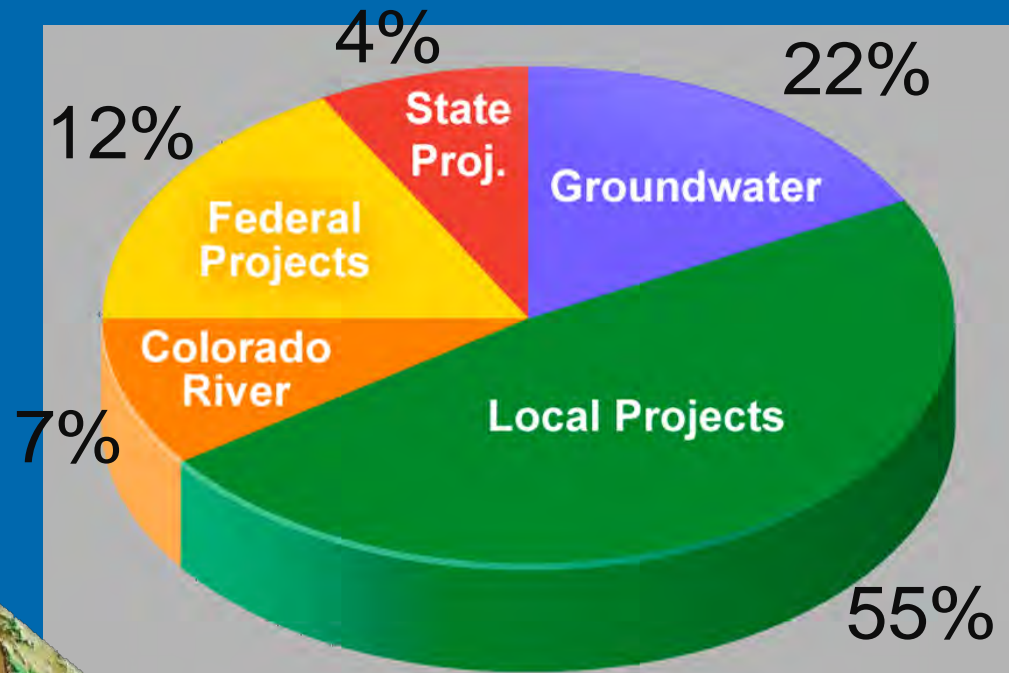
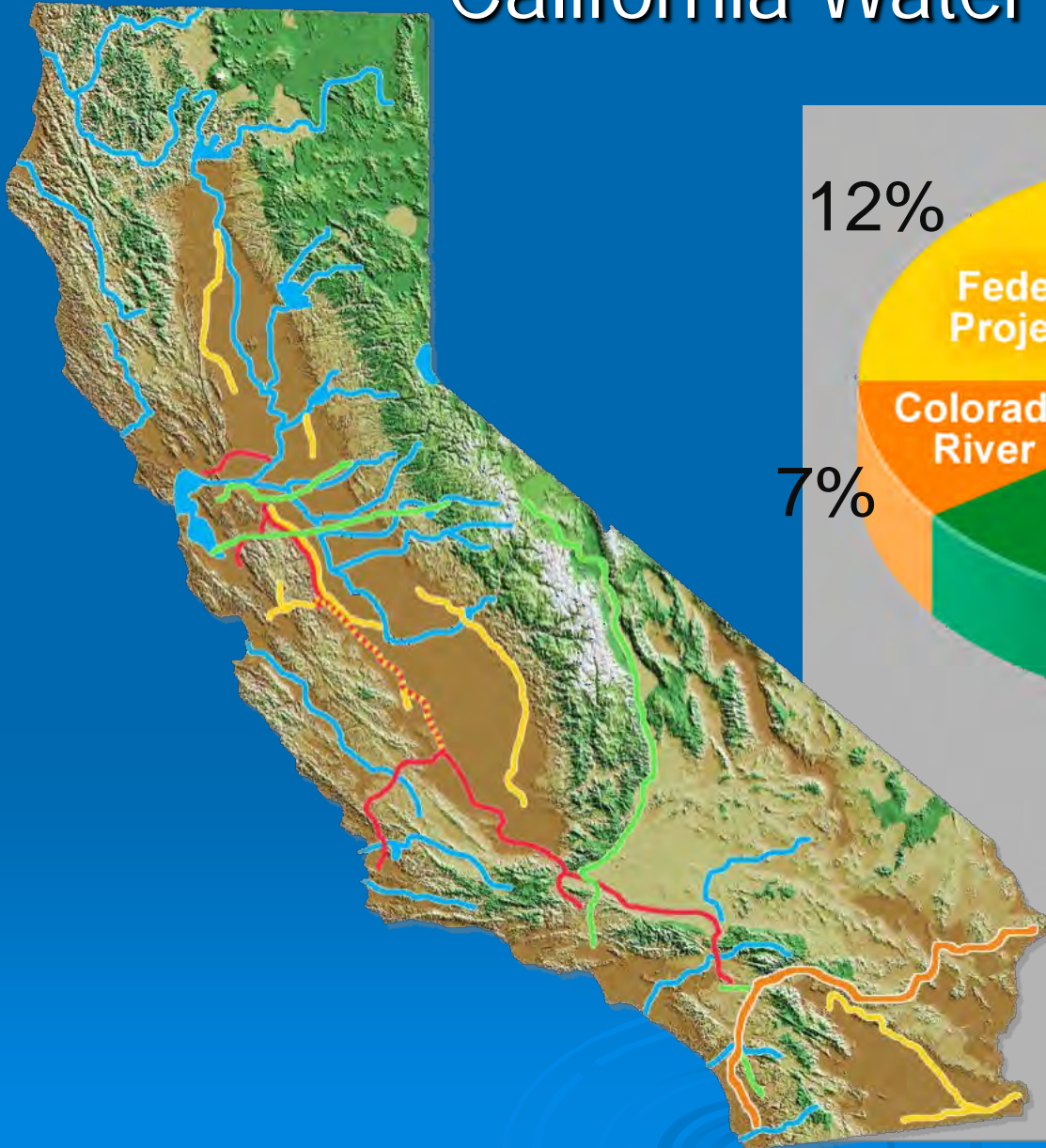
# California's Major River Systems

Distribution of Average Runoff

Distribution of Water Use

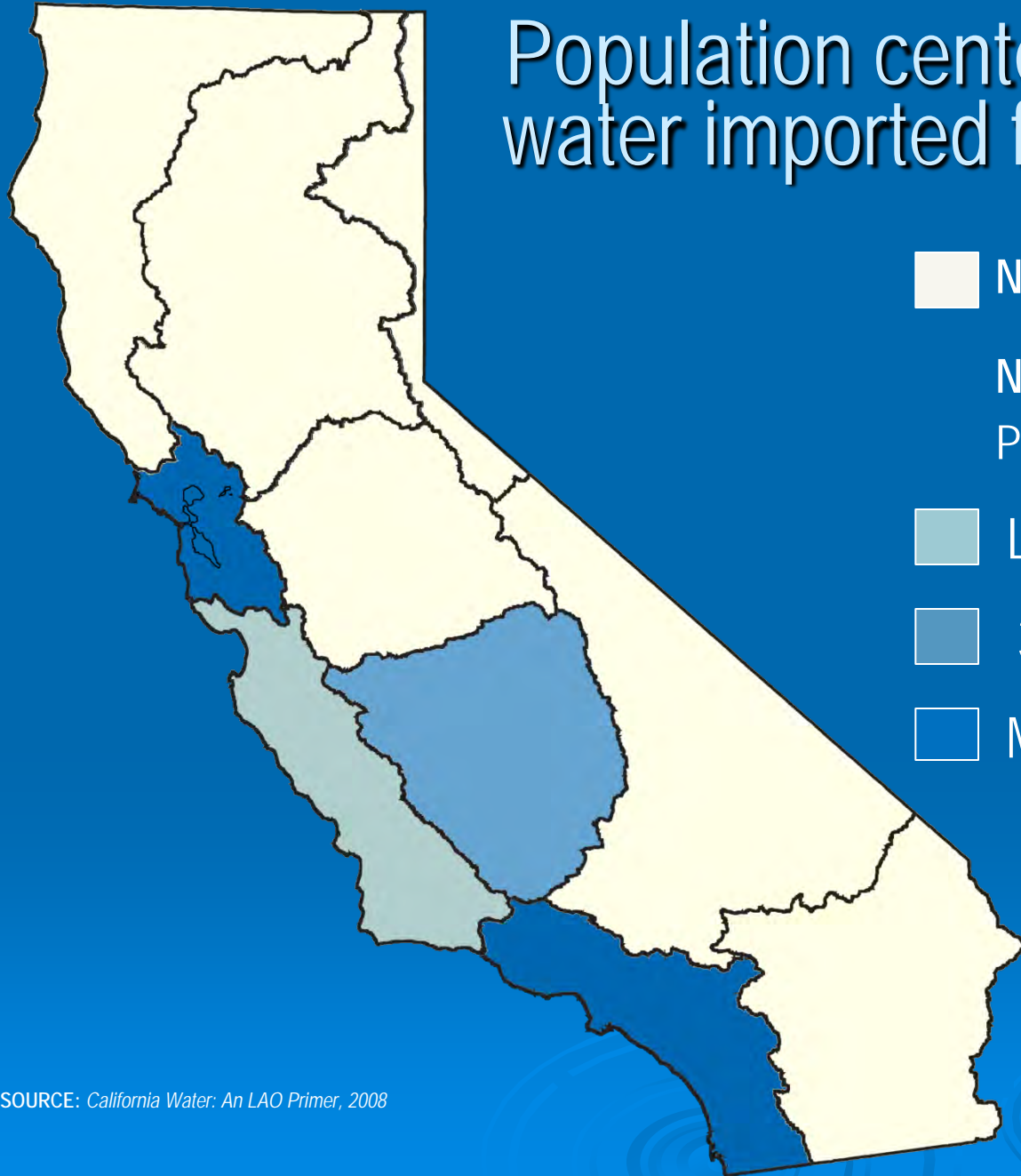


# California Water Supply Systems



	Local	--	38.3 maf
	Colorado	--	4.8 maf
	Federal	--	8.1 maf
	State	--	2.9 maf
	Groundwater	--	15.0 maf

# Population centers rely heavily on water imported from other regions



Net Exporters\*

Net Importers

Percent urban & agricultural water use from Imports

Less than 30%

30 to 60%

More than 60%

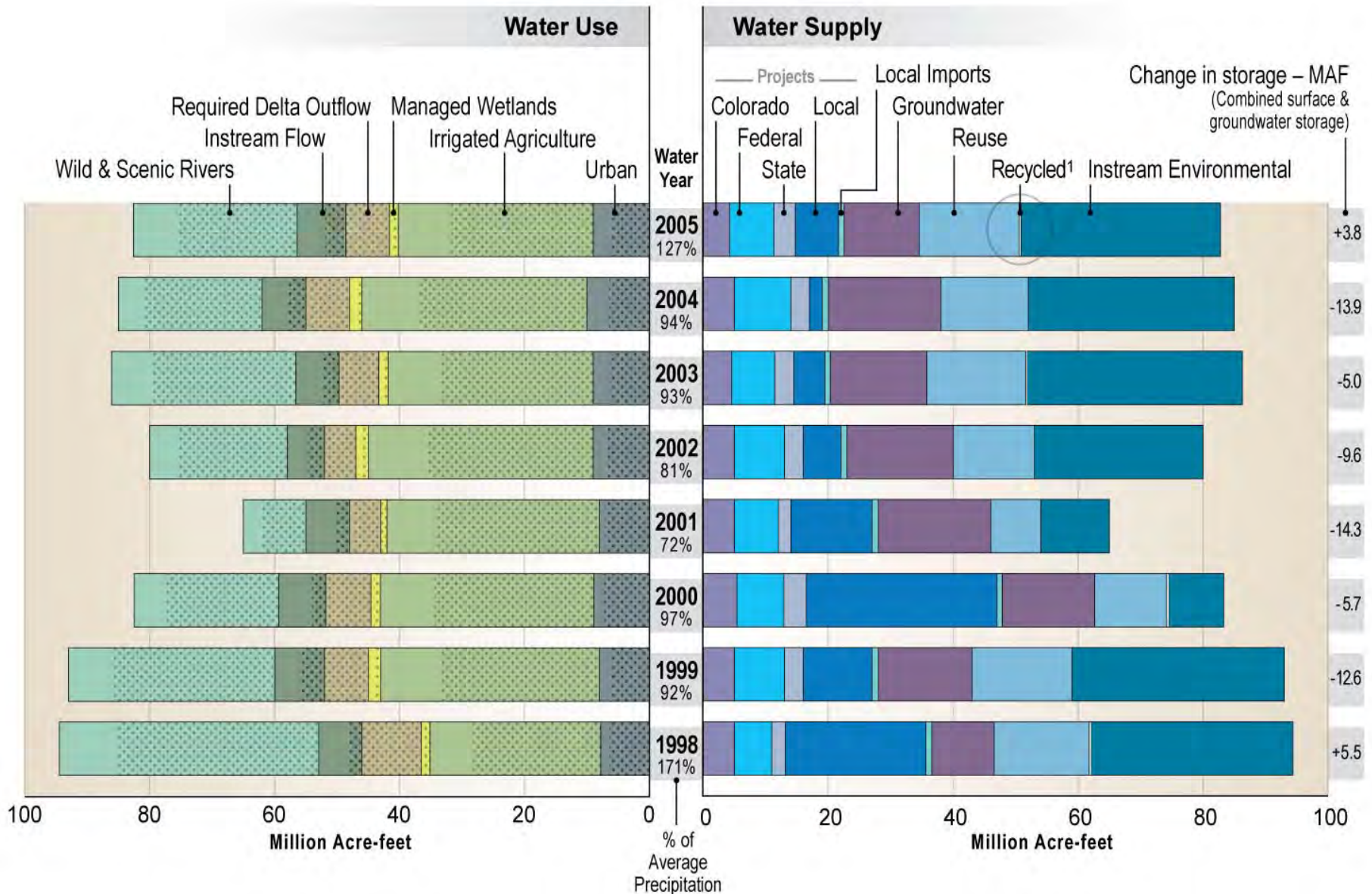
\* While the Colorado River is a net exporter of water within California, its main source of water is imported from the Upper Colorado Basin

# Water Demand



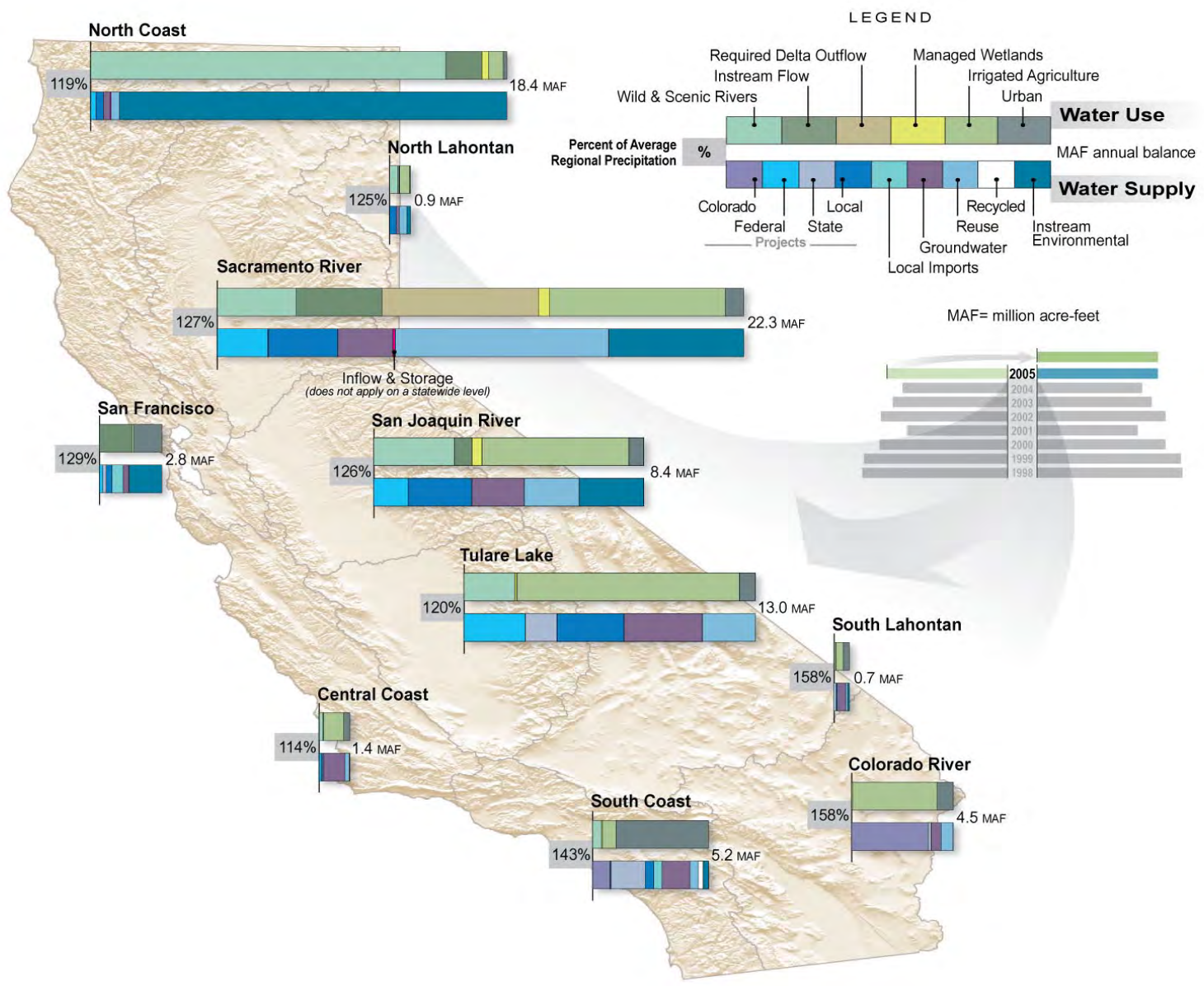
# California's Water Resources: Variable & Extreme

## Butterfly Chart for WY 1998 - 2005





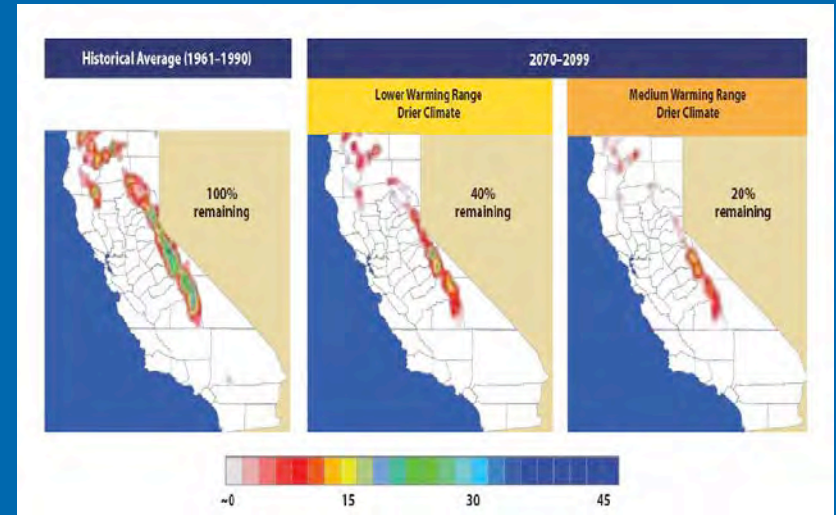
# Understanding Regional Diversity (2005)



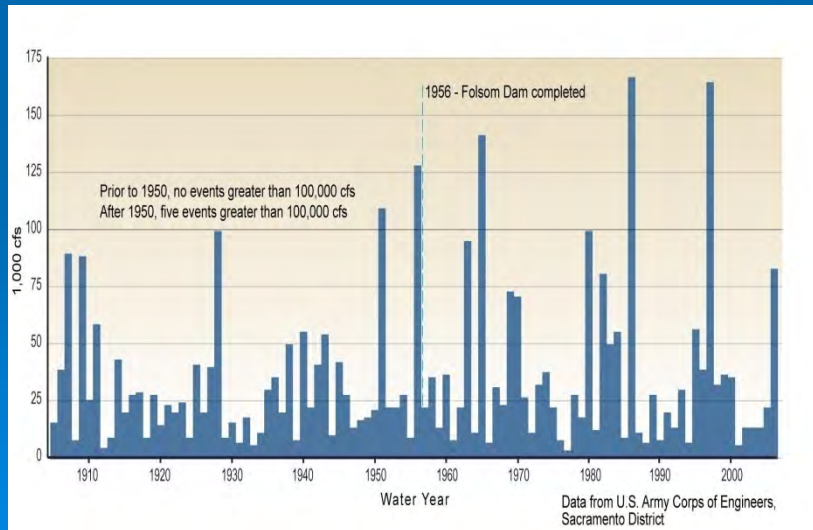
# Climate Change: Future Hydrology Unlike the Past



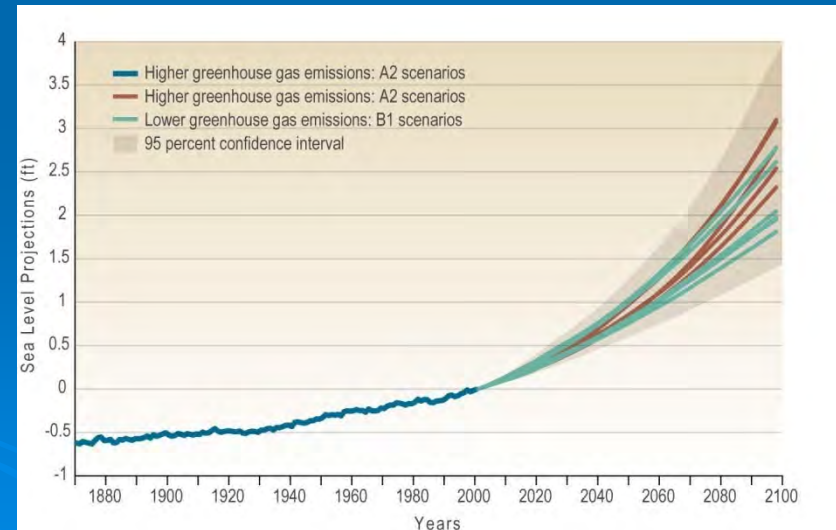
Higher air & water temperature



Early snowmelt & less snowpack

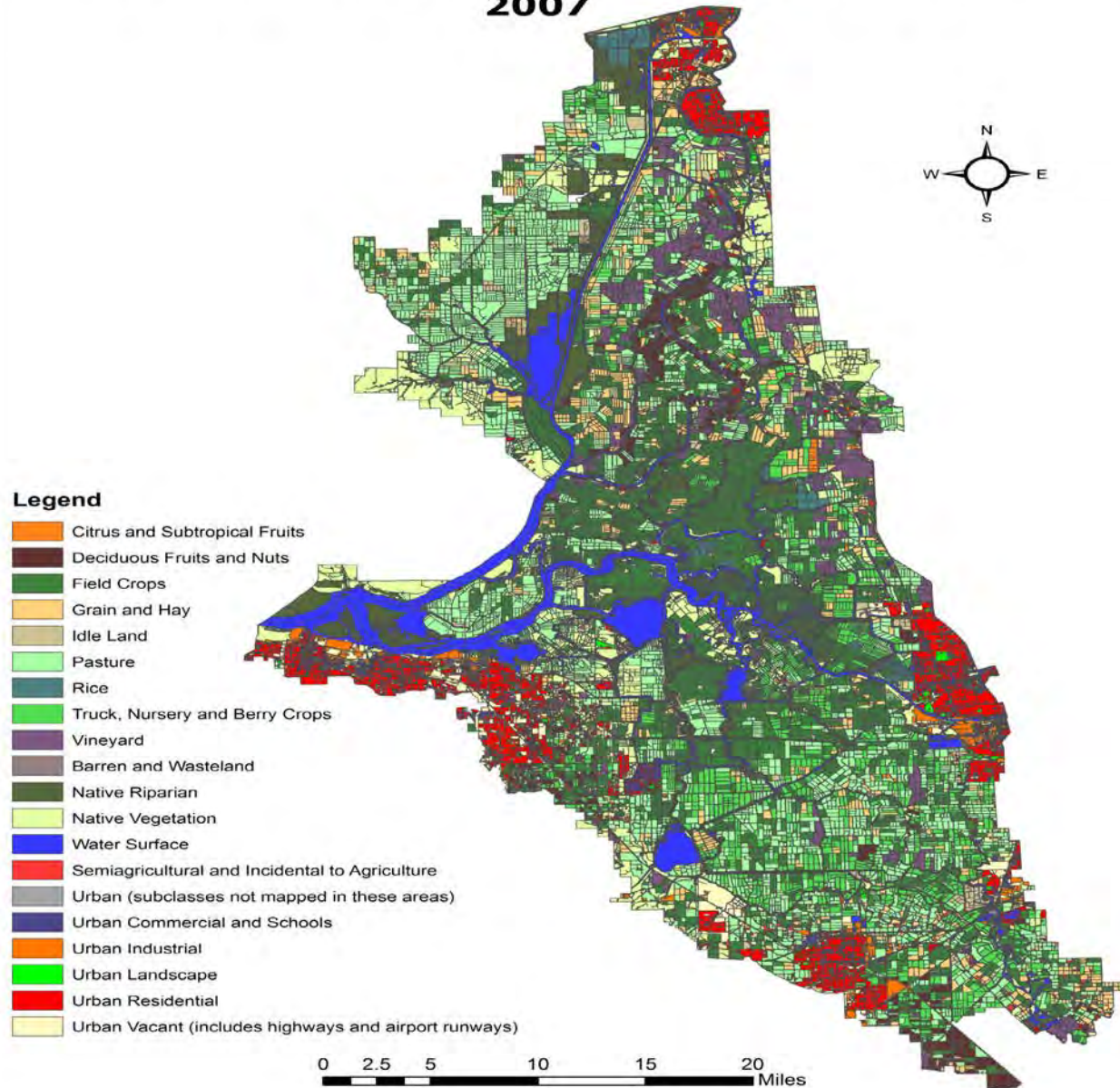


Changing runoff pattern

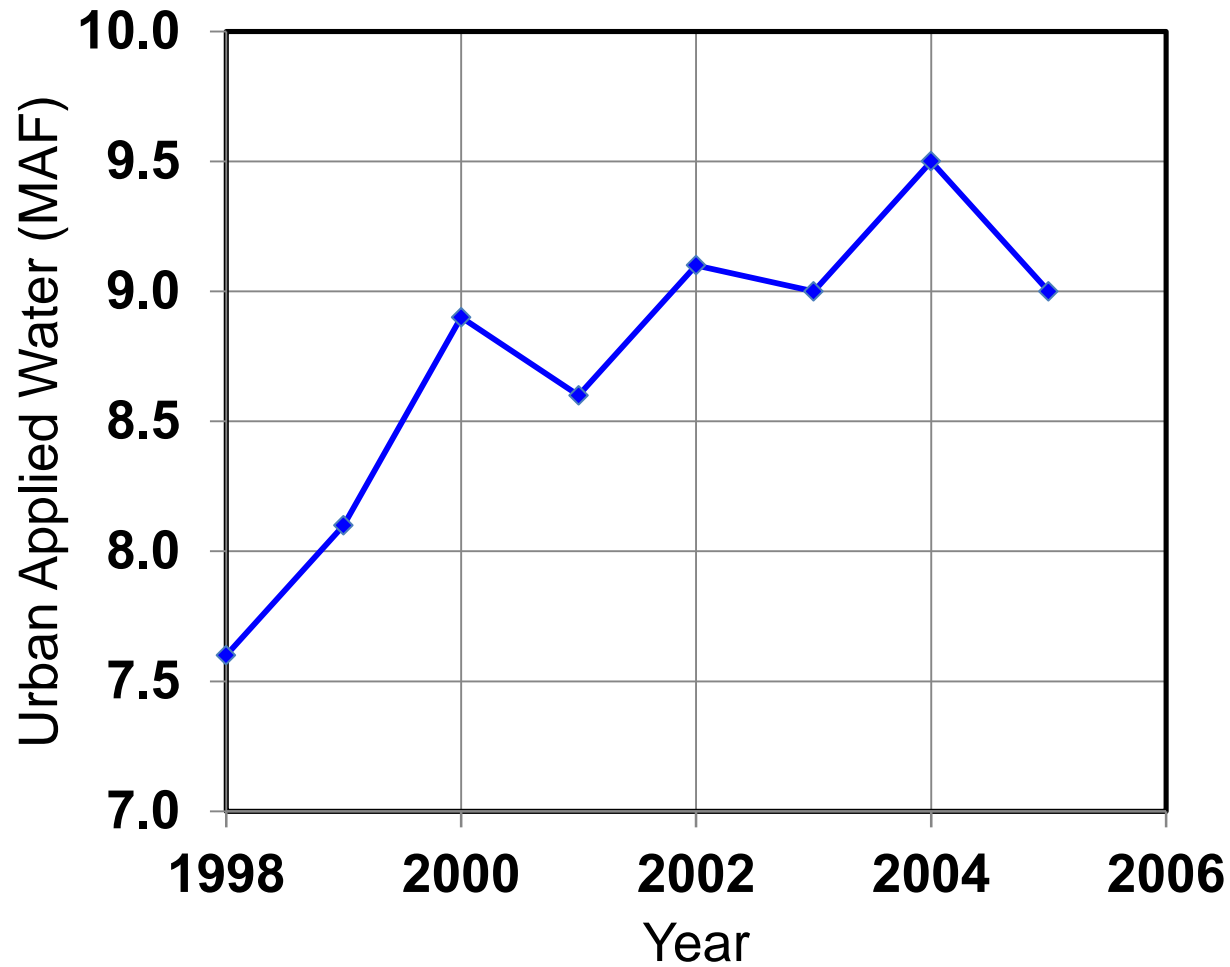


Rising sea level

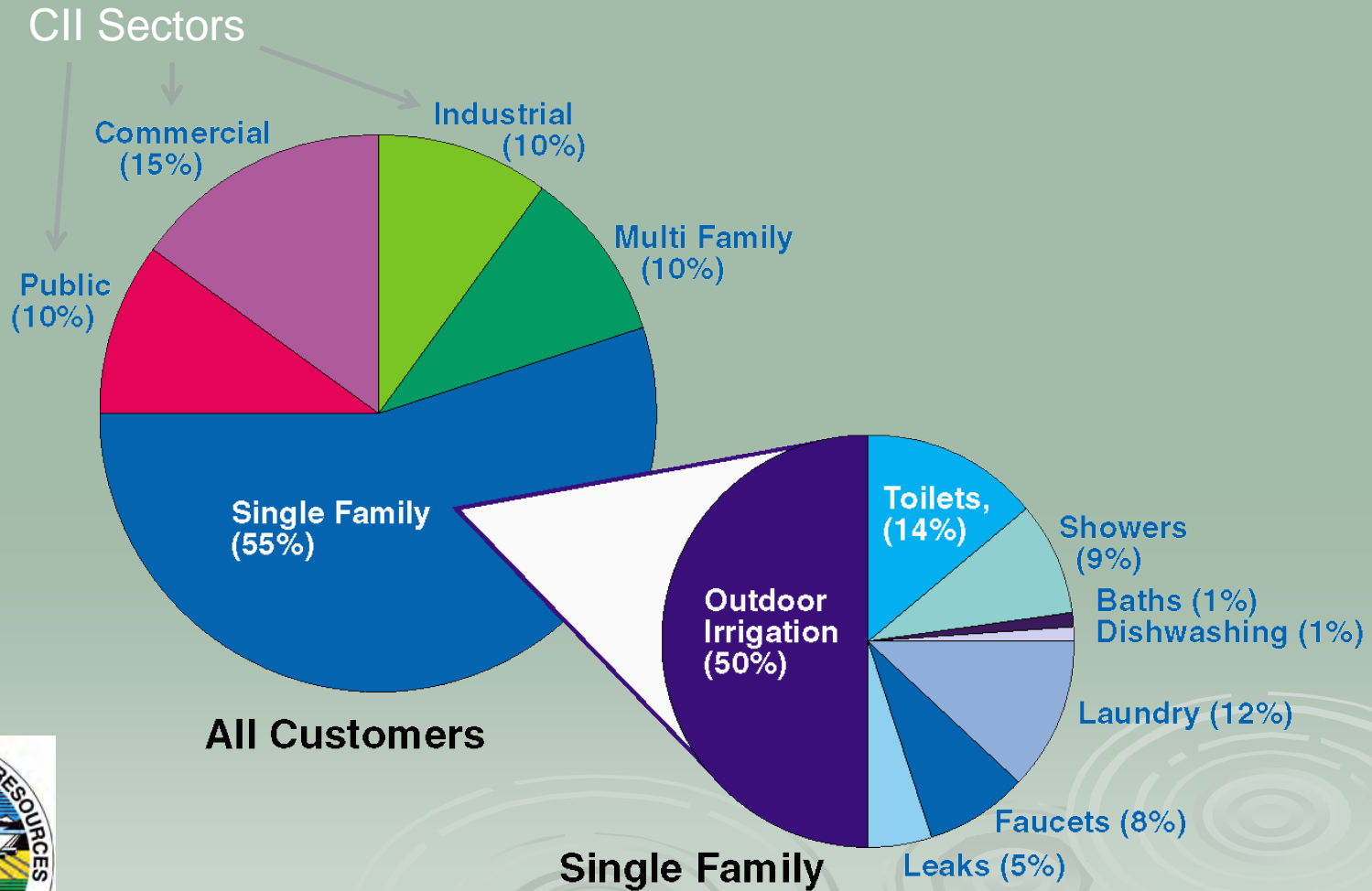
# Sacramento-San Joaquin Delta Land Use 2007



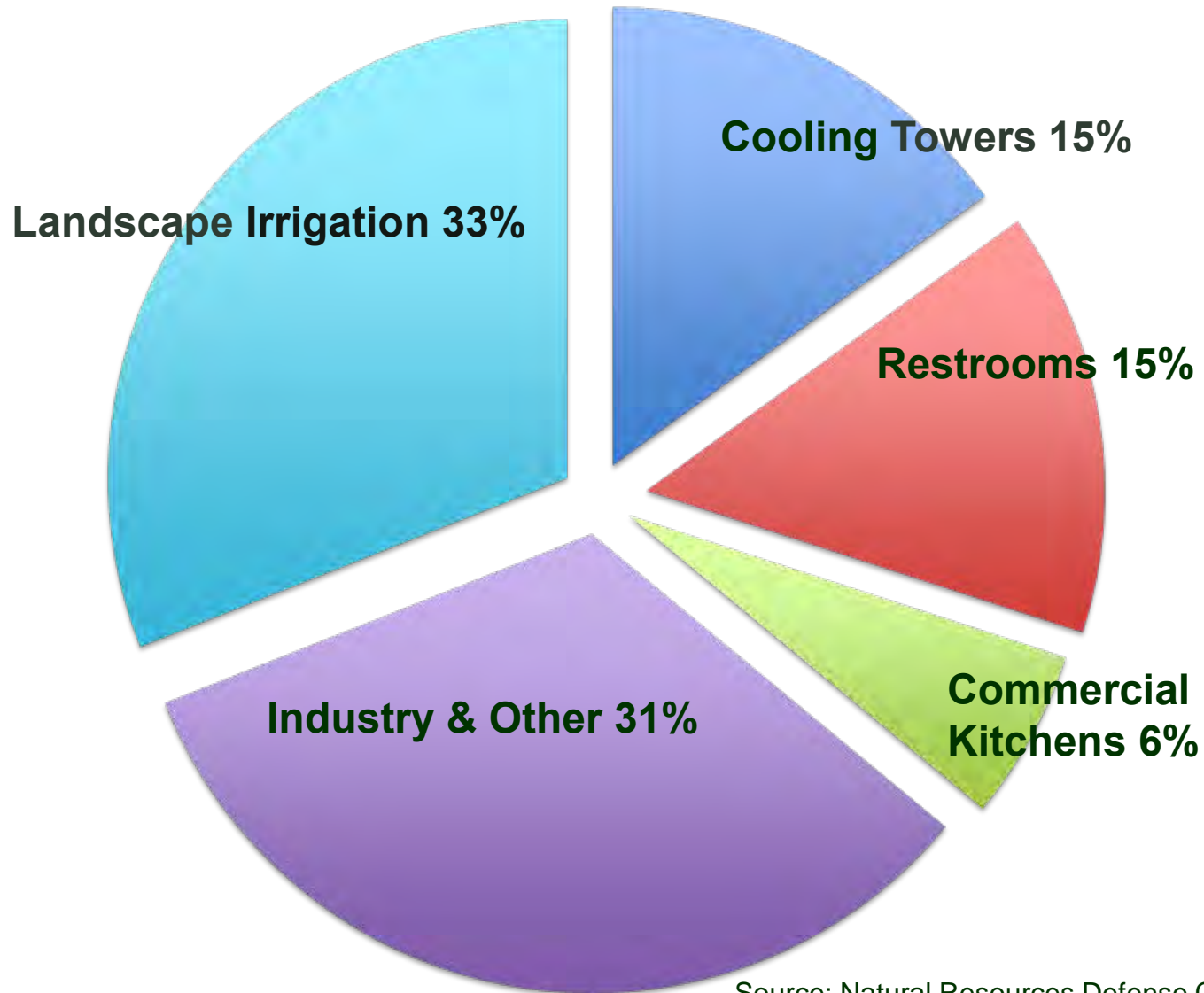
# Estimated Urban Applied Water MAF (million acre feet)



# Urban Water Uses (California)



# CA CII Water Use by Application



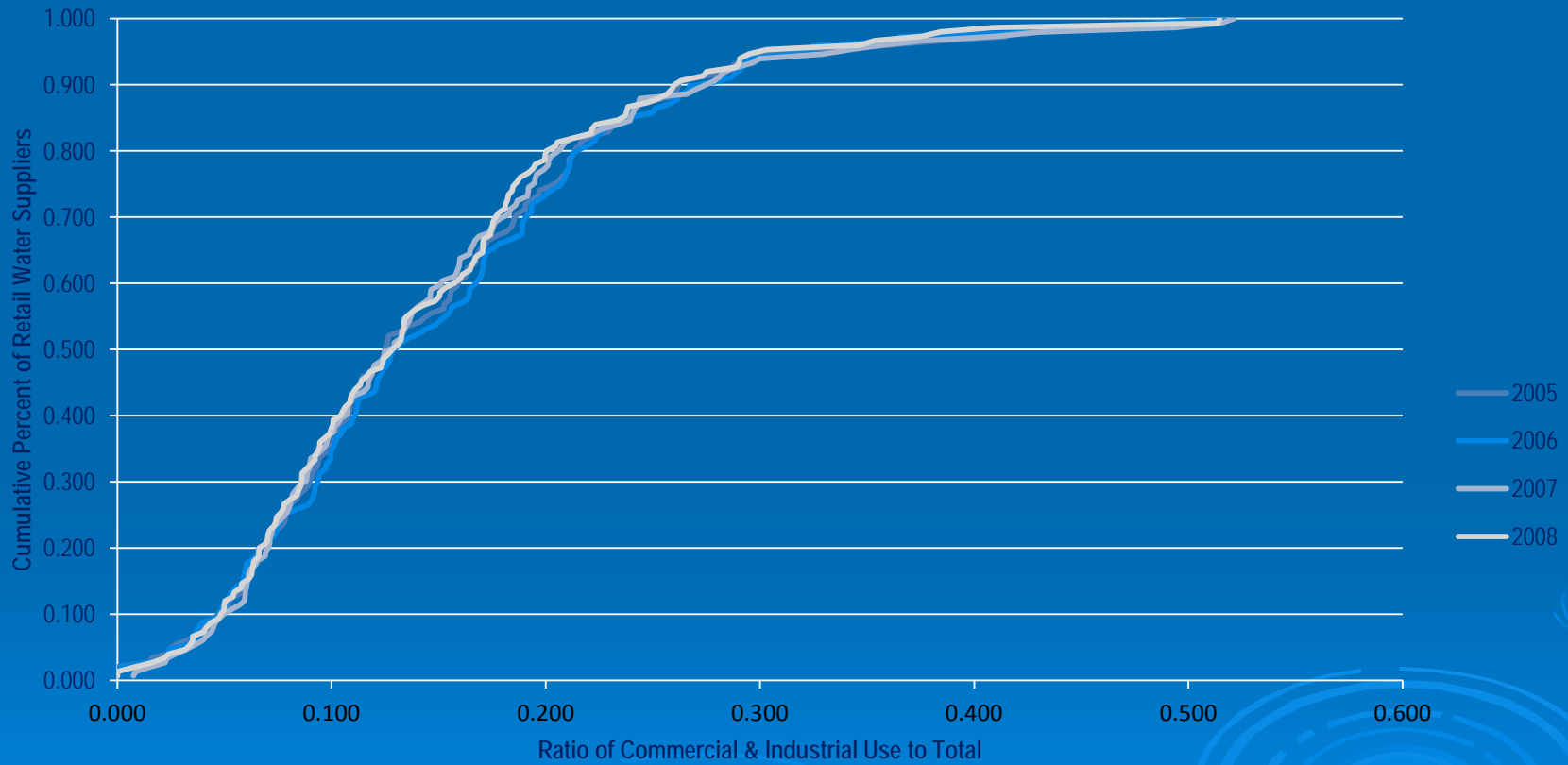
Source: Natural Resources Defense Council



# Industrial Process Water Use

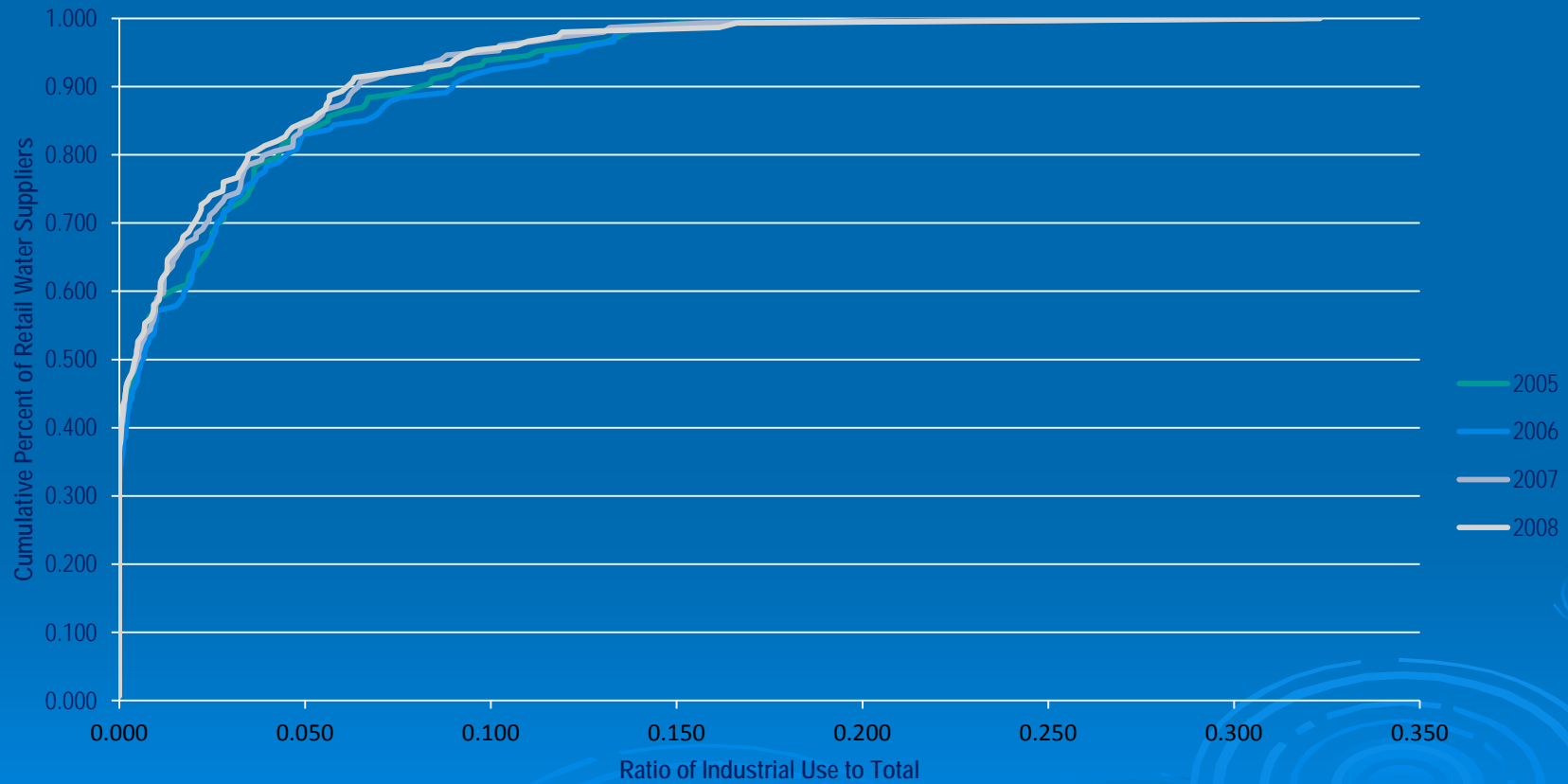


# Cumulative Distribution of Retail Urban Water Suppliers

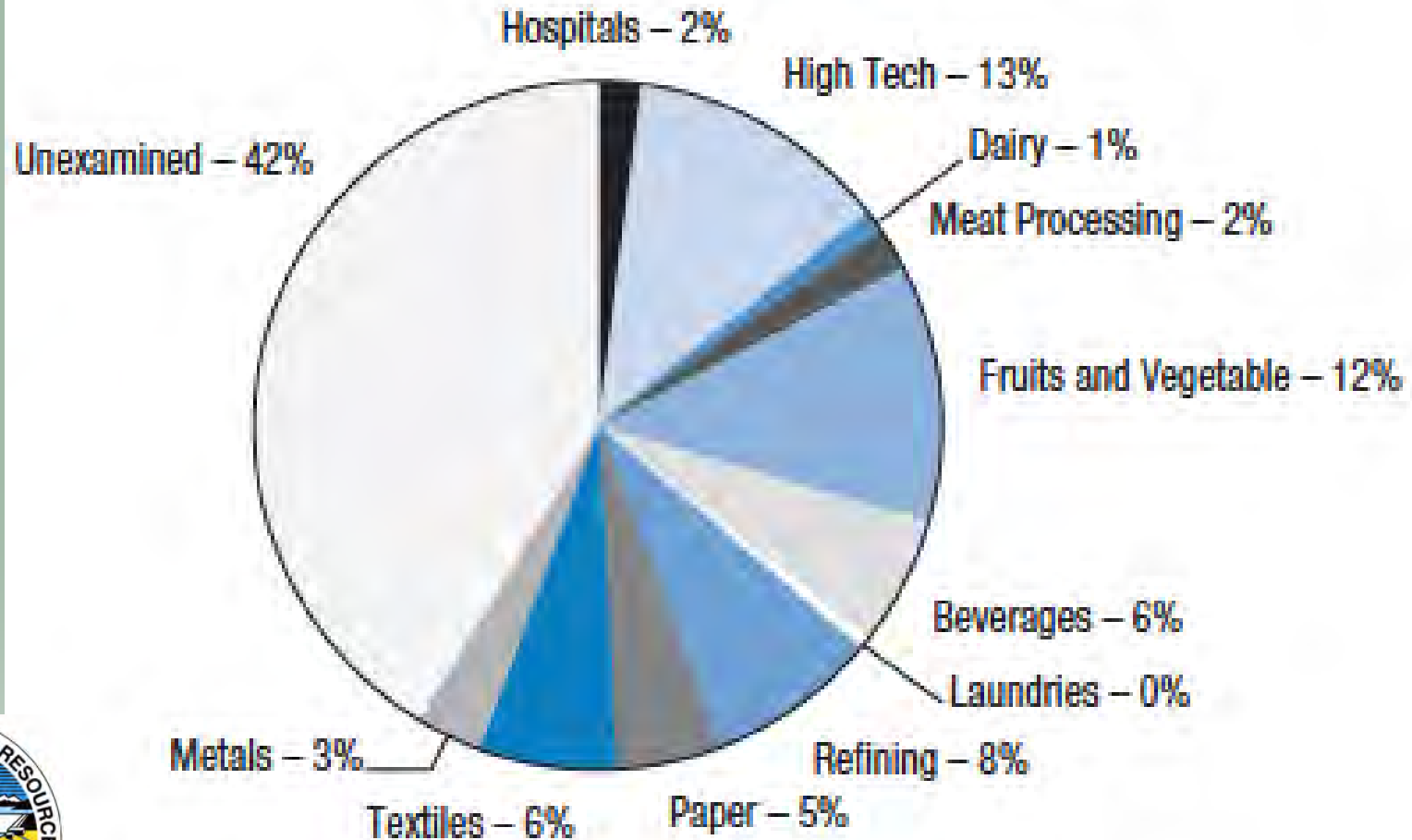




# Cumulative Distribution of Retail Urban Water Suppliers

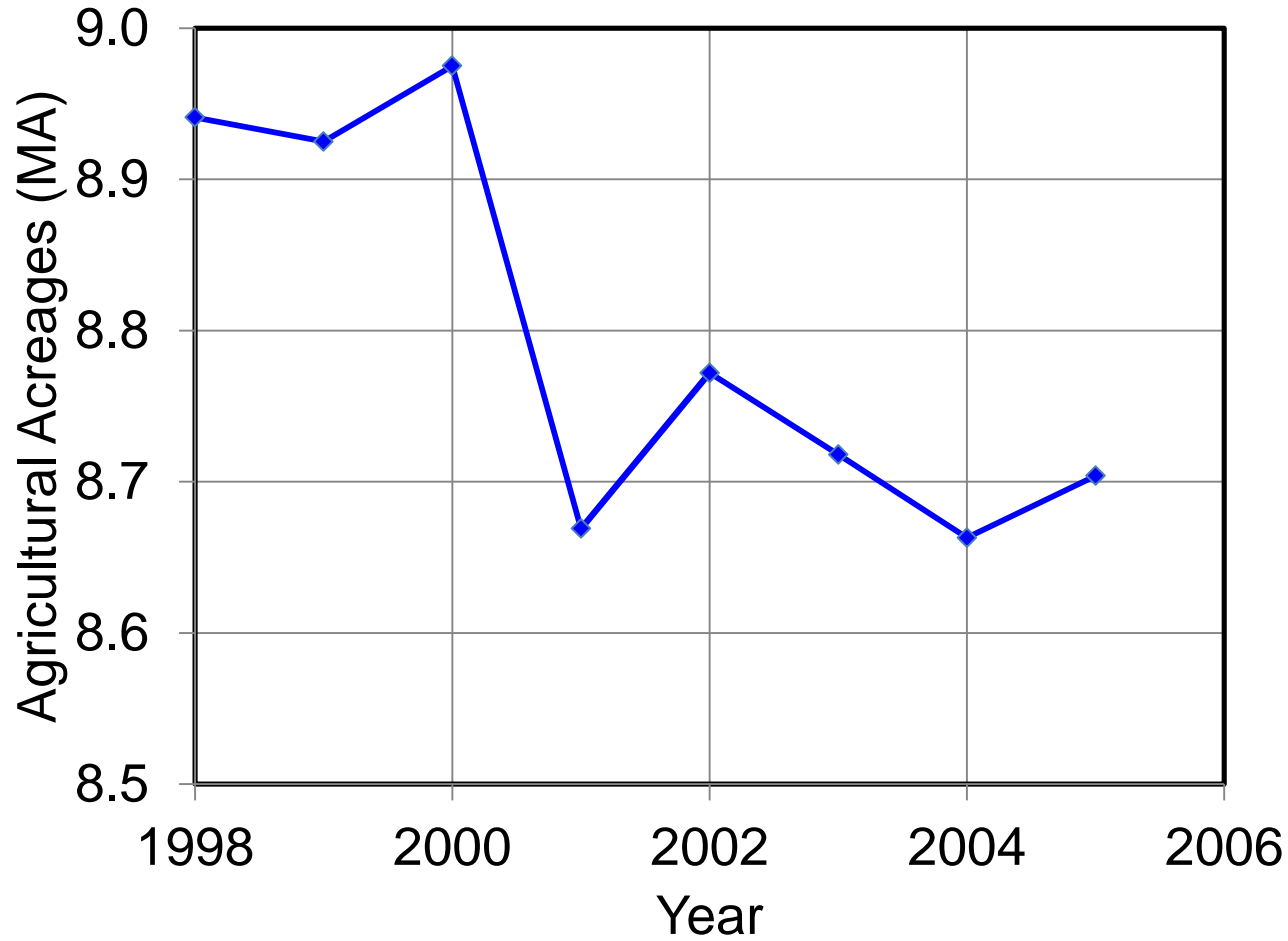


# Process Water Use by Industry - California



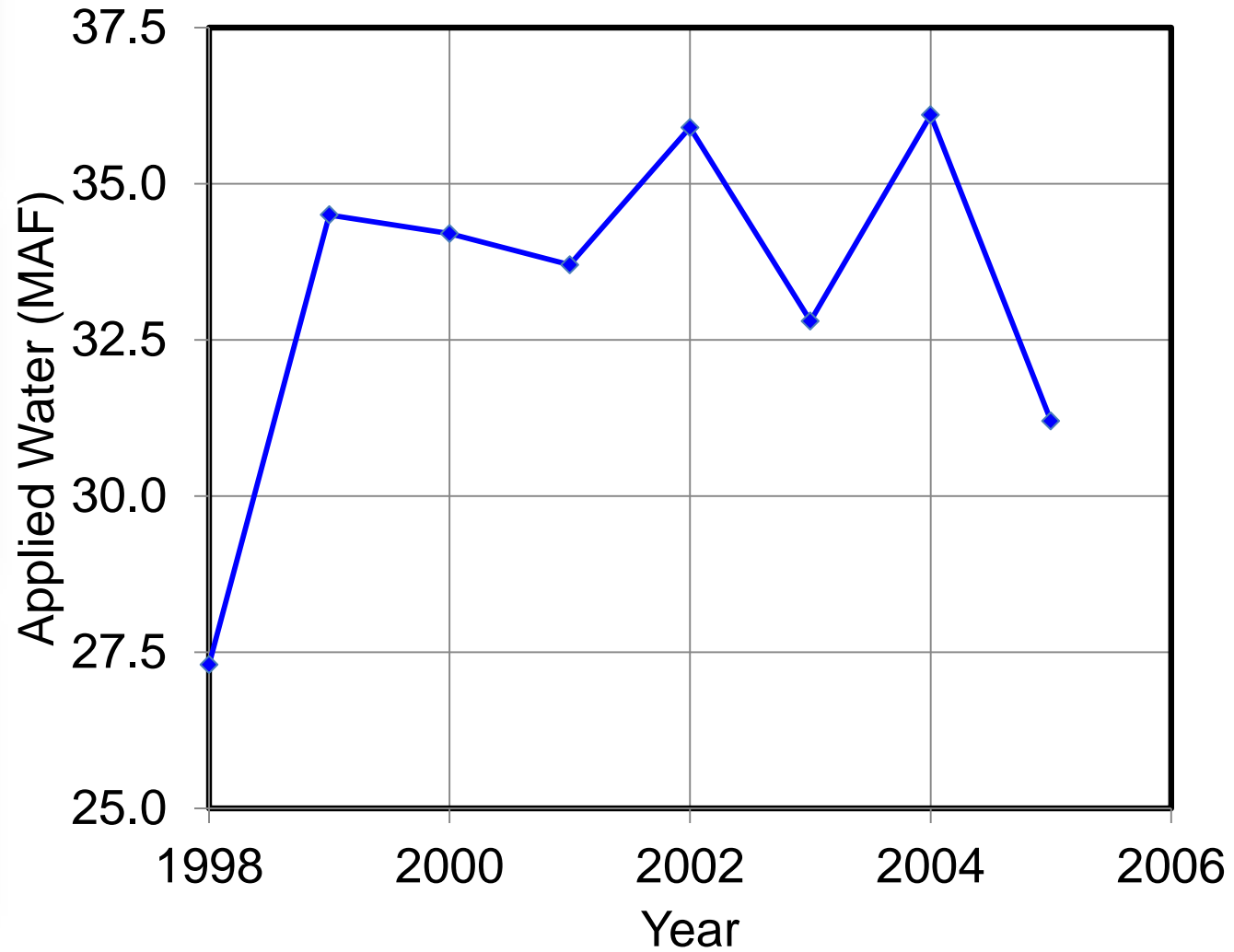
Source: Pacific Institute, 2003, "Waste Not, Want Not"

# Estimated Irrigated Agricultural Acreages MA (million acres)

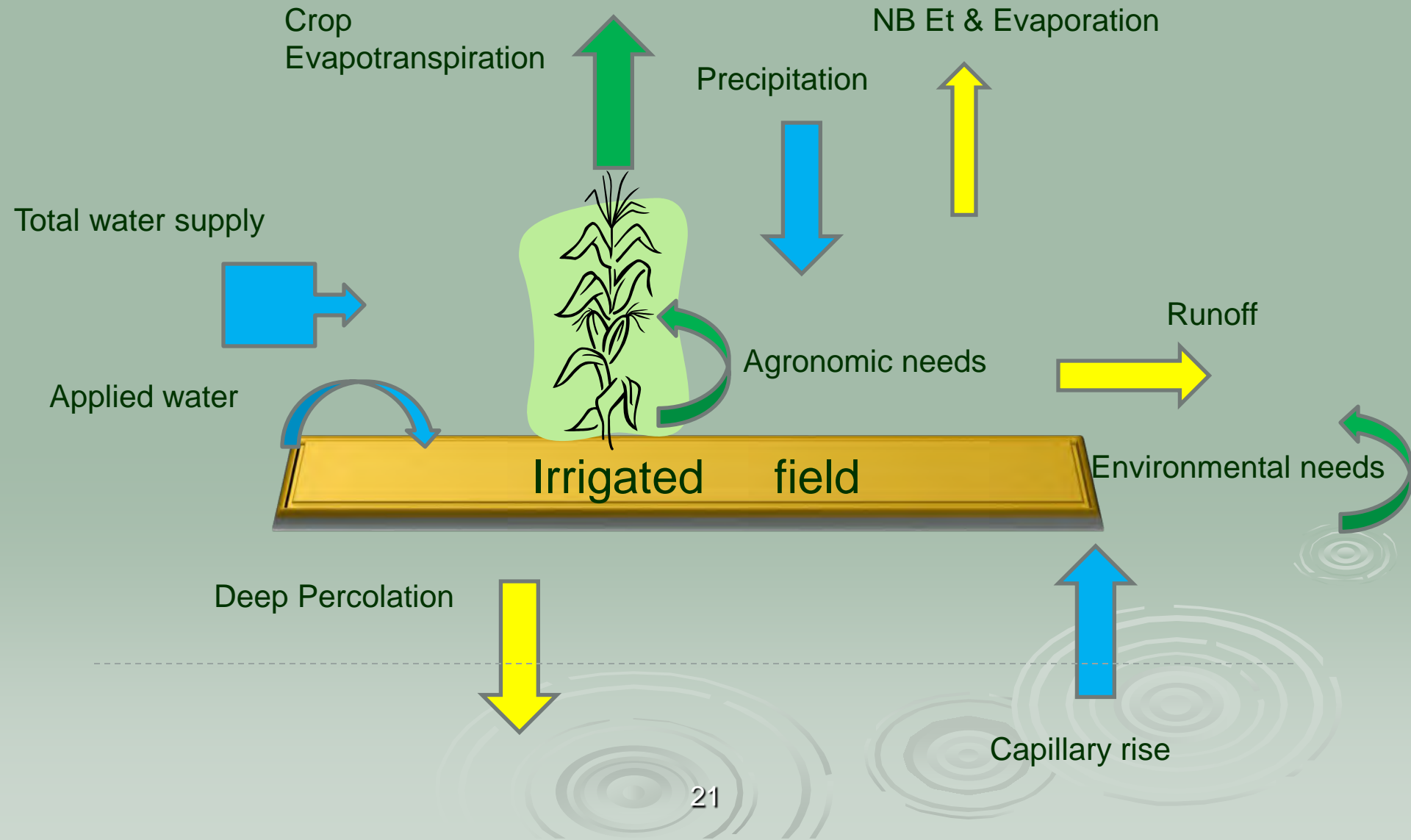




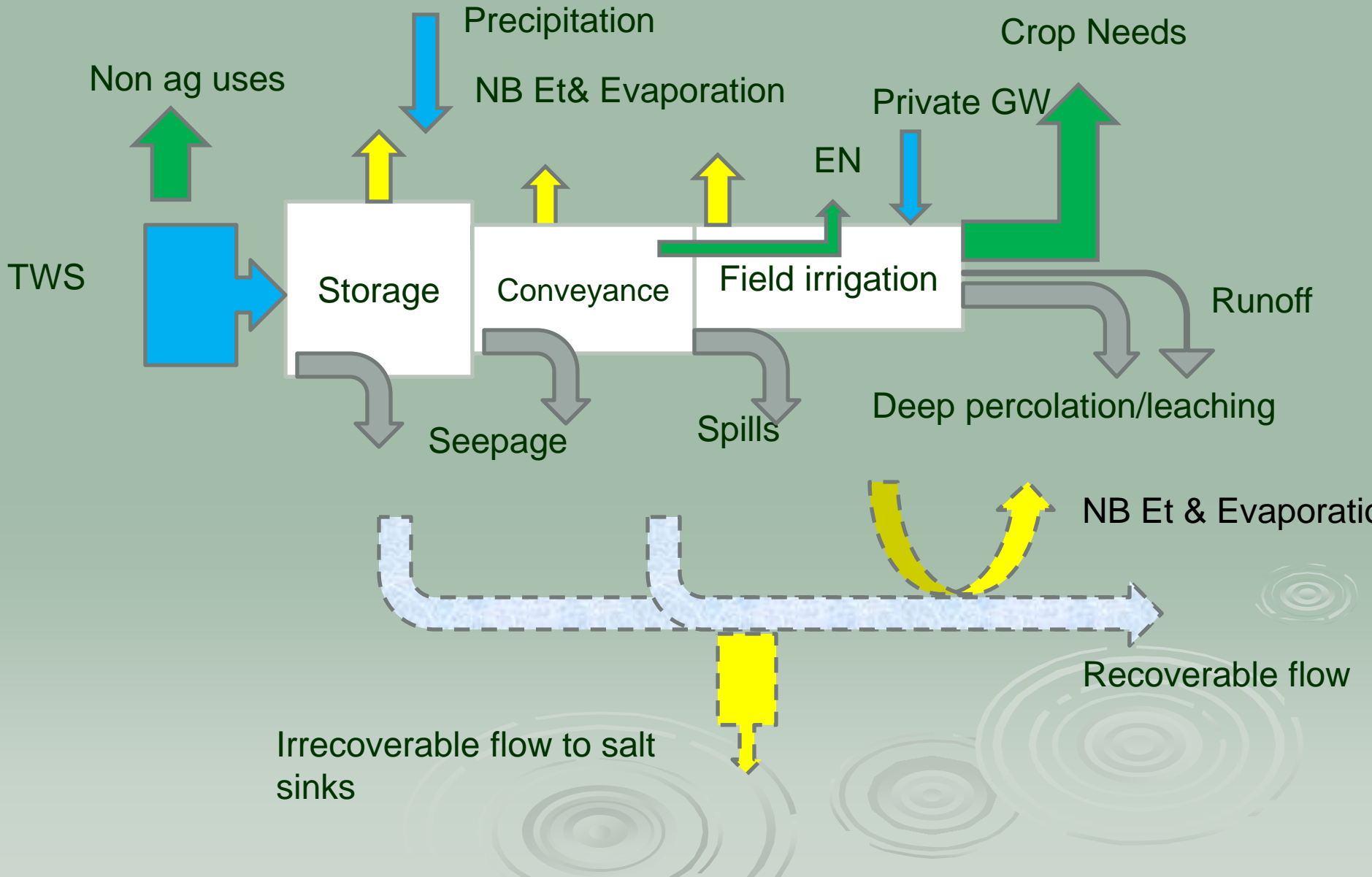
## Estimated Agricultural Applied Water MAF (million acre feet)



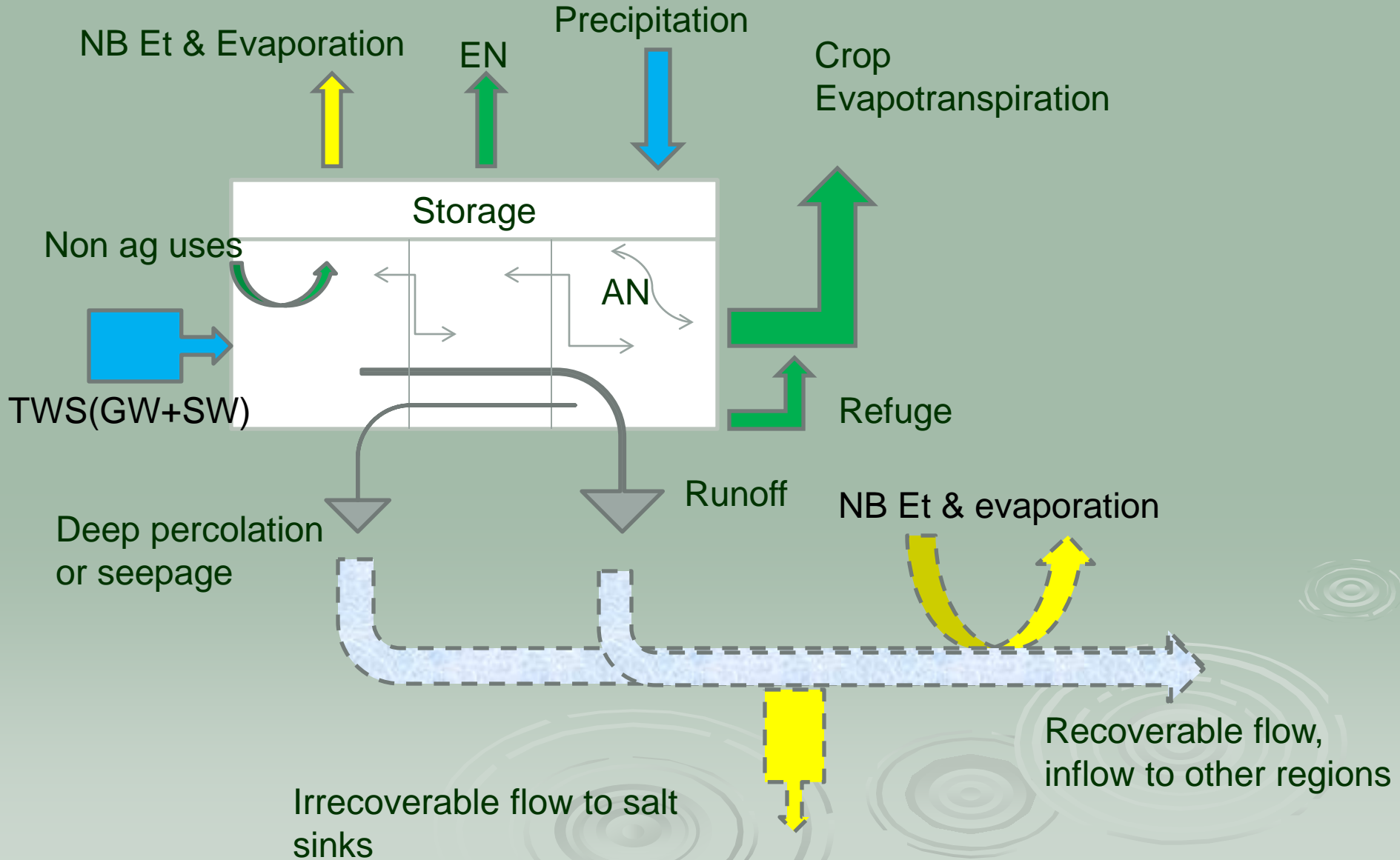
# Components of Water Balance, Field Scale



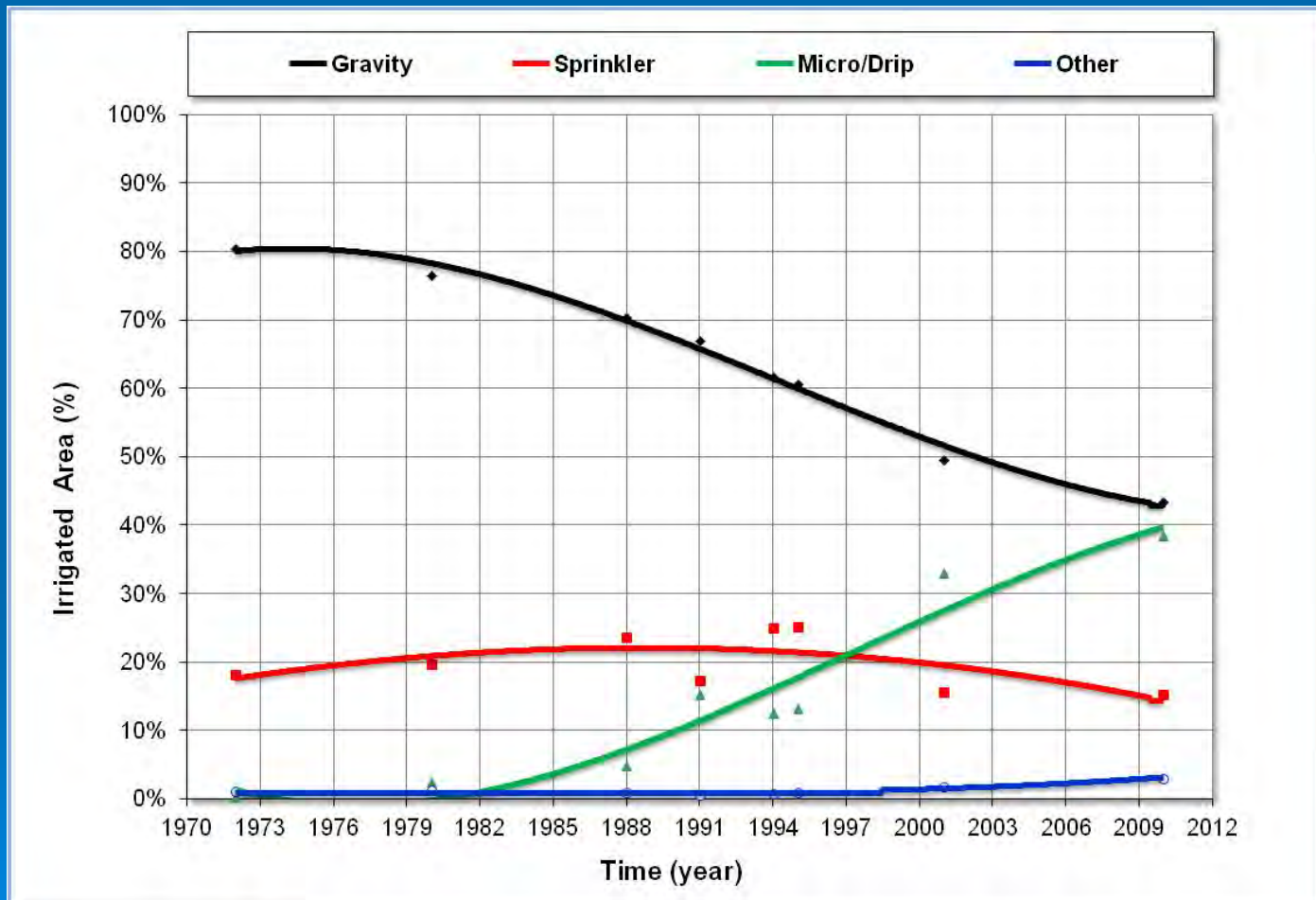
# Components of Water Balance, Supplier Scale



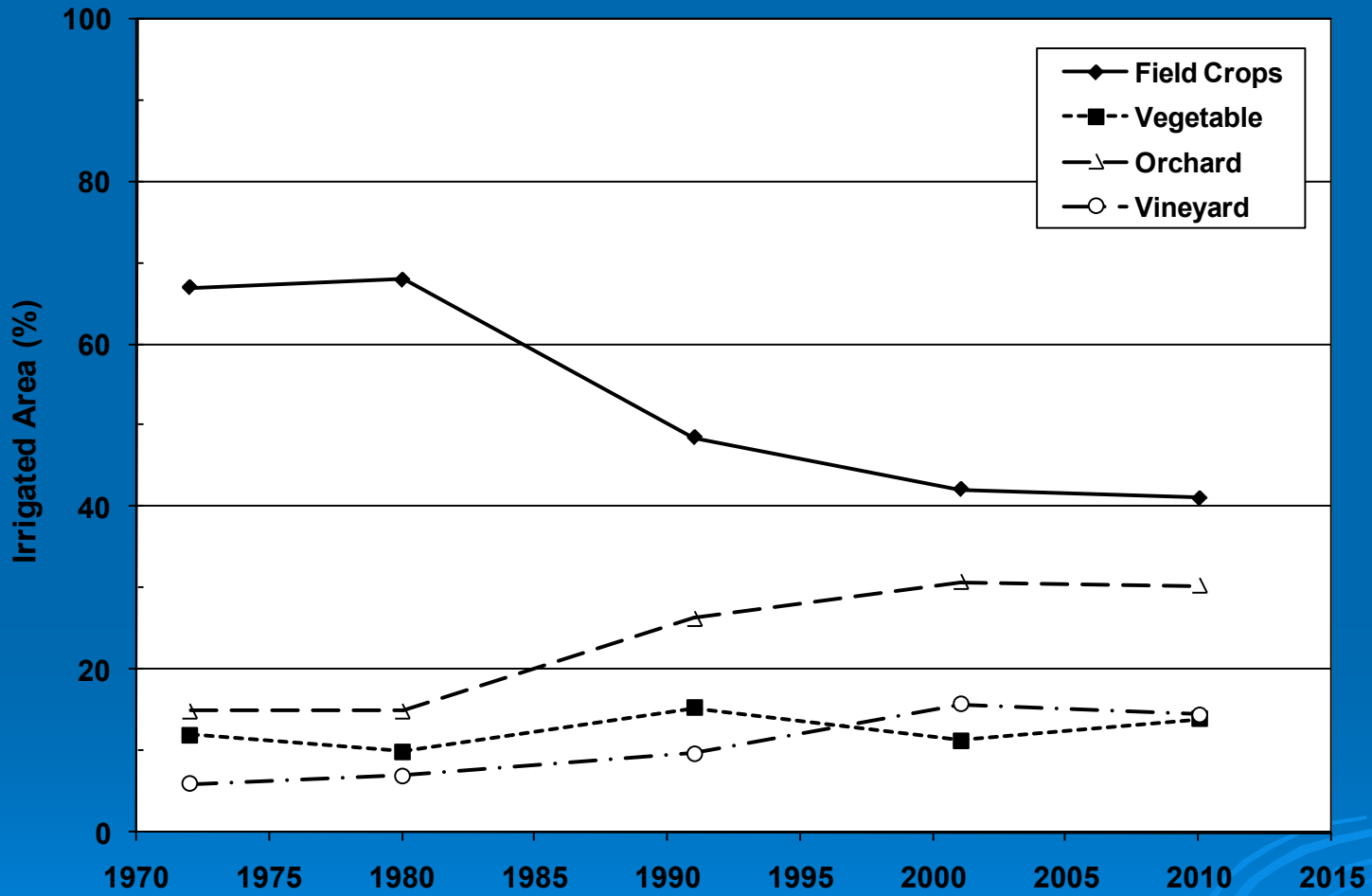
# Components of Water Balance, Regional Scale



# Surveys of irrigation methods quantify the change in irrigation methods over time.



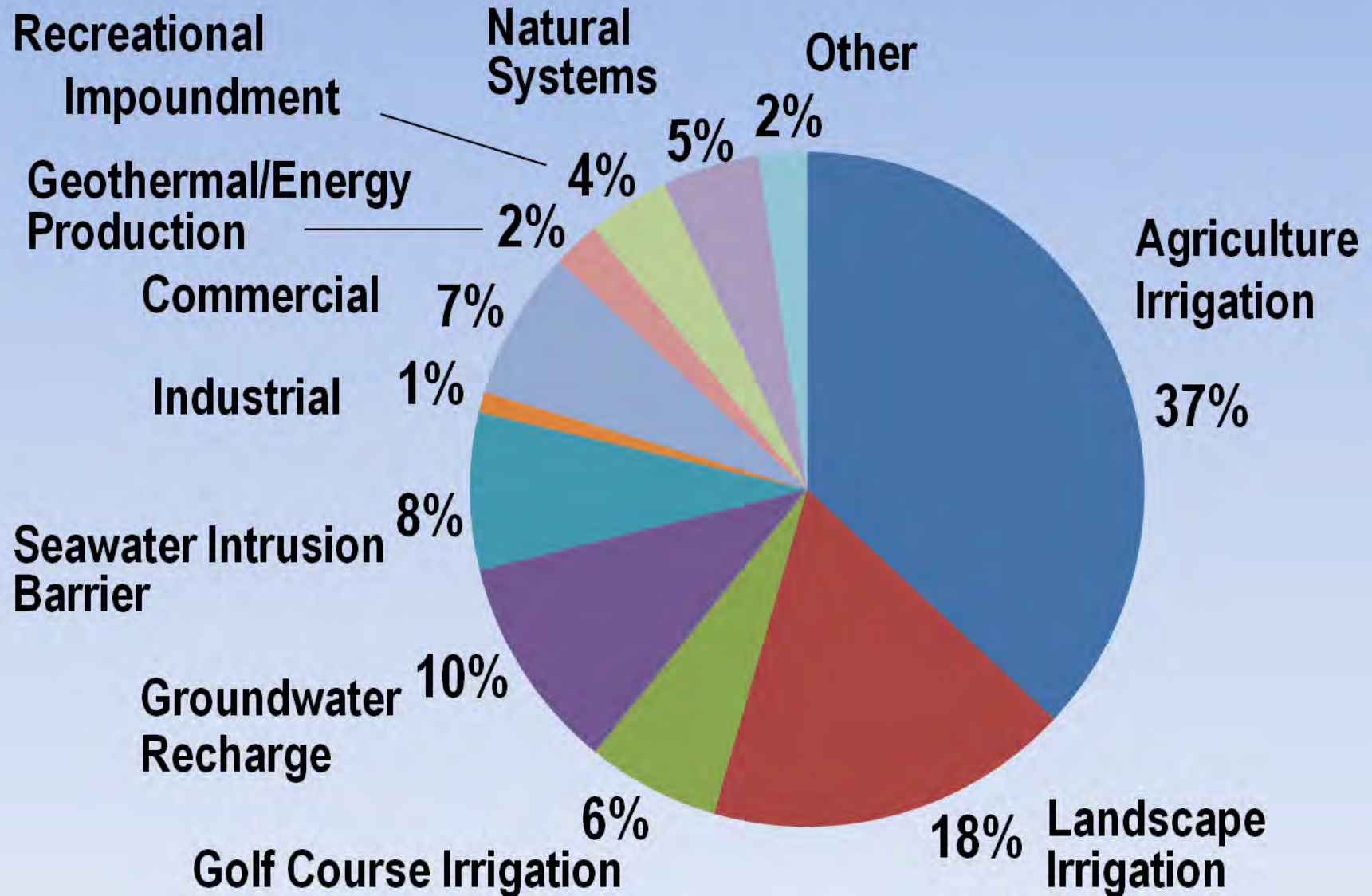




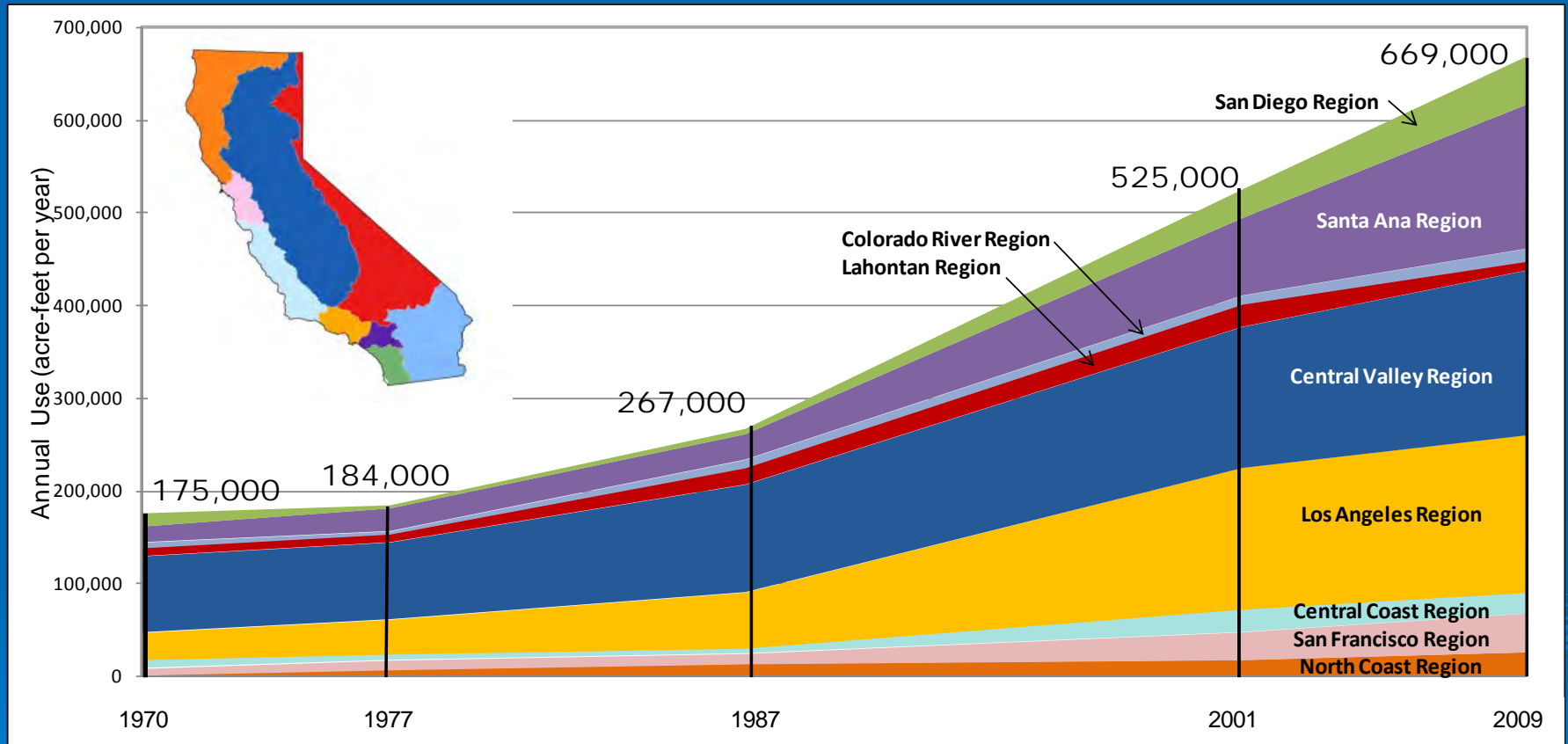
# Percentage of irrigated land area by crop and irrigation category reported for 2010

<b>Crop</b>	<b>Gravity</b>	<b>Sprinkler</b>	<b>Drip/Micro</b>	<b>Subsurface</b>
Corn	78	1	7	14
Cotton	73	7	15	4
Dry beans	66	21	12	0
Grains	79	13	3	5
Safflower	54	44	0	1
Sugar beet	85	3	12	0
Other Field crops	69	15	14	2
Alfalfa	77	18	2	3
Pasture	69	26	5	1
Cucurbit	50	11	39	0
Onion-Garlic	19	39	42	0
Potato	2	81	17	0
Tomato (fresh)	44	11	45	0
Tomato (process)	33	4	63	0
Other Truck Crops	24	40	35	0
Almond-Pistachio	13	14	71	1
Other Deciduous	31	27	40	1
Subtropical Trees	6	15	76	4
Turfgrass-Landscape	1	79	20	0
Vineyard	20	2	75	2
<b>average</b>	<b>43</b>	<b>15</b>	<b>39</b>	<b>3</b>

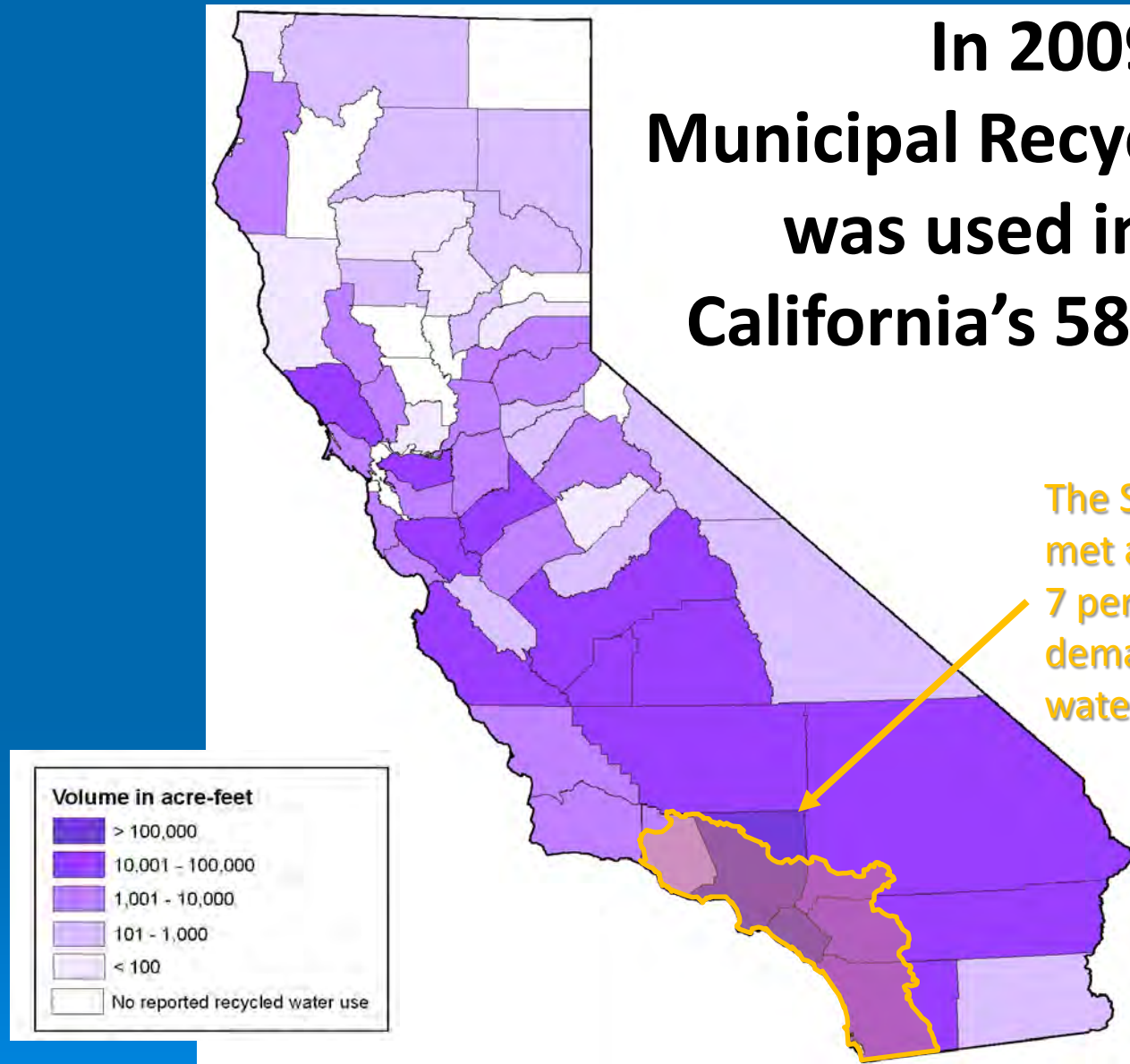
# Types of Recycled Water Use in California, 2009



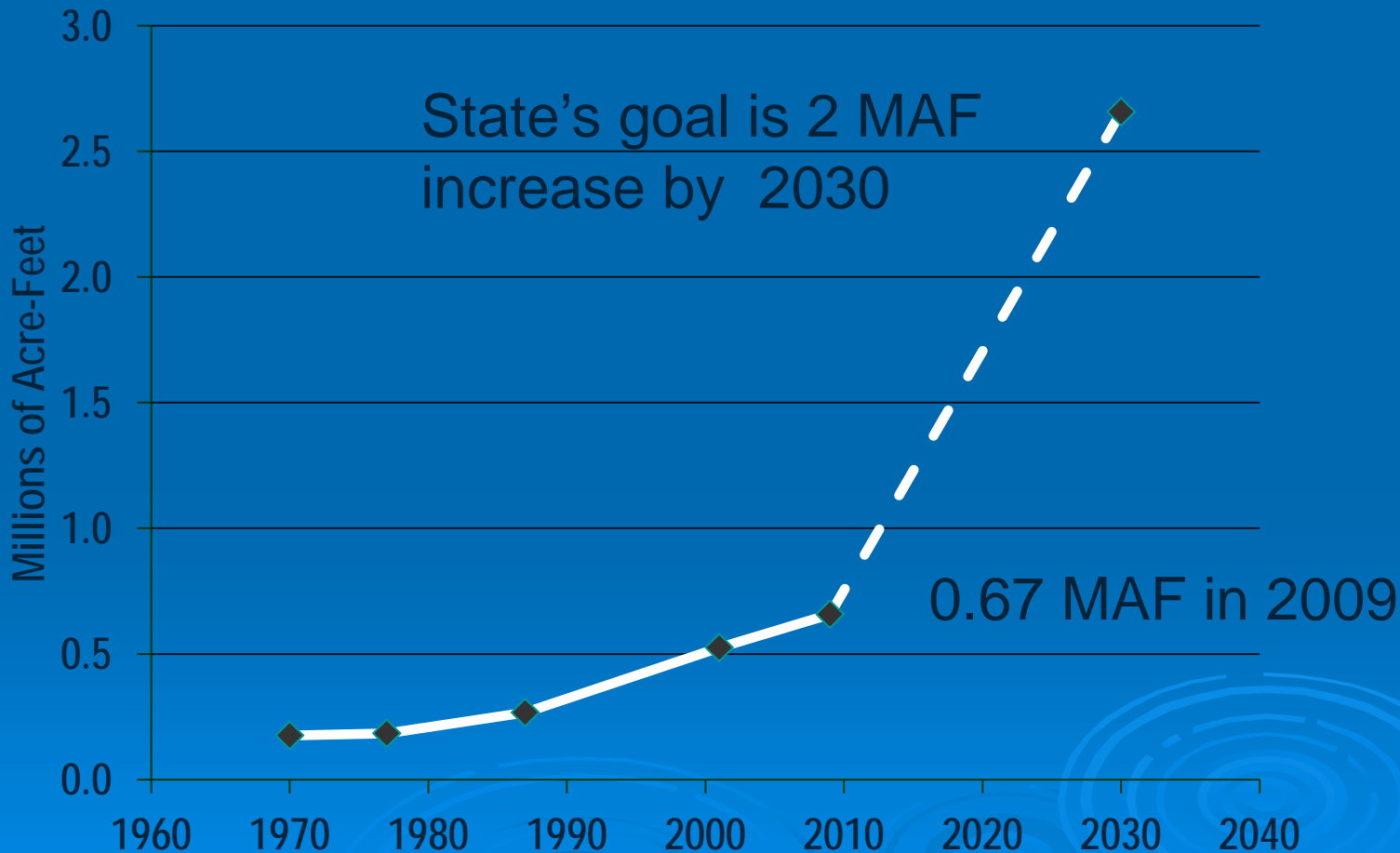
# In 2009, 669,000 AF of recycled water was beneficially reused.



# In 2009, Municipal Recycled Water was used in 51 of California's 58 Counties



# Recycled Water Use Trend In California



# SBX7-7: Part of Comprehensive Water Legislation in California



# Urban Water Use Efficiency

## ➤ Urban Water Suppliers- 455

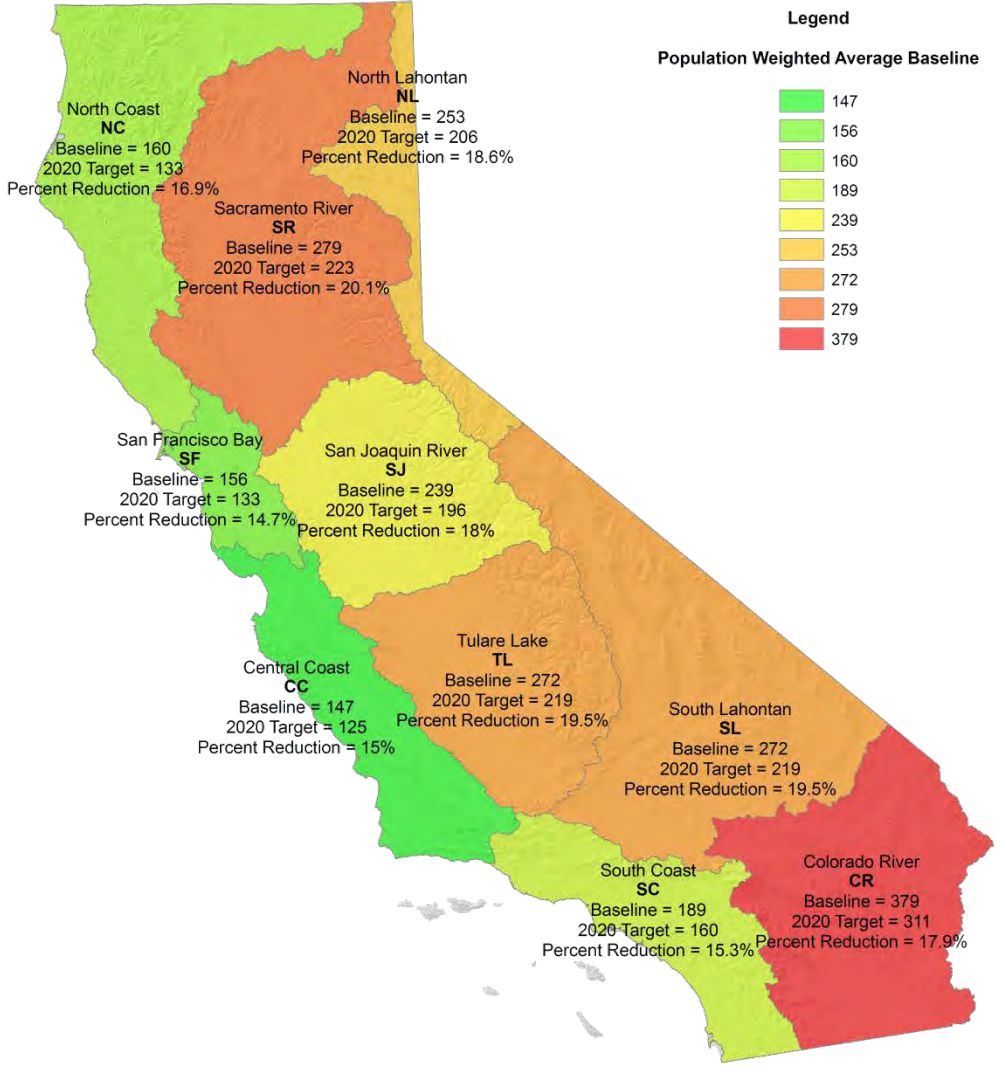
- Prepare Urban Water Management Plans
- Reduce water use
- Develop 2015 and 2020 targets
- State to achieve 20% per capita use reduction by 2020

## ➤ DWR

- Develop a Target Method
- Develop Methodology for consistent application
- Review UWMP (380)
- Loans and grants subject to compliance with SBX7-7

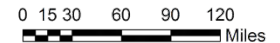


# Baseline Water Use by Hydrologic Region

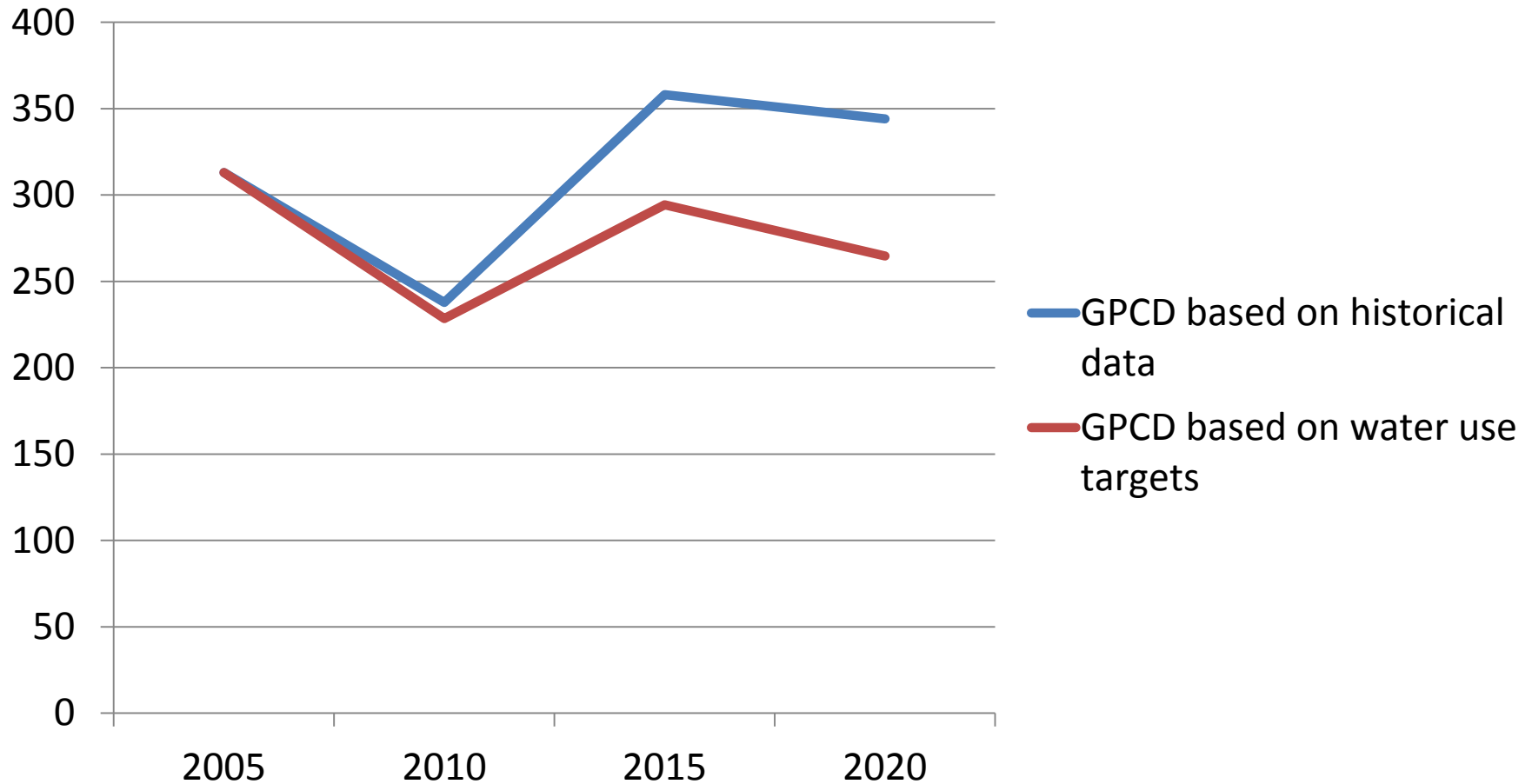


Target Method	# of Suppliers Selecting	Percent
1	187	57%
2	4	1%
3	121	37%
4	15	5%
<b>Total</b>	<b>327</b>	<b>100%</b>

All Data Presented is the Population Weighted Average

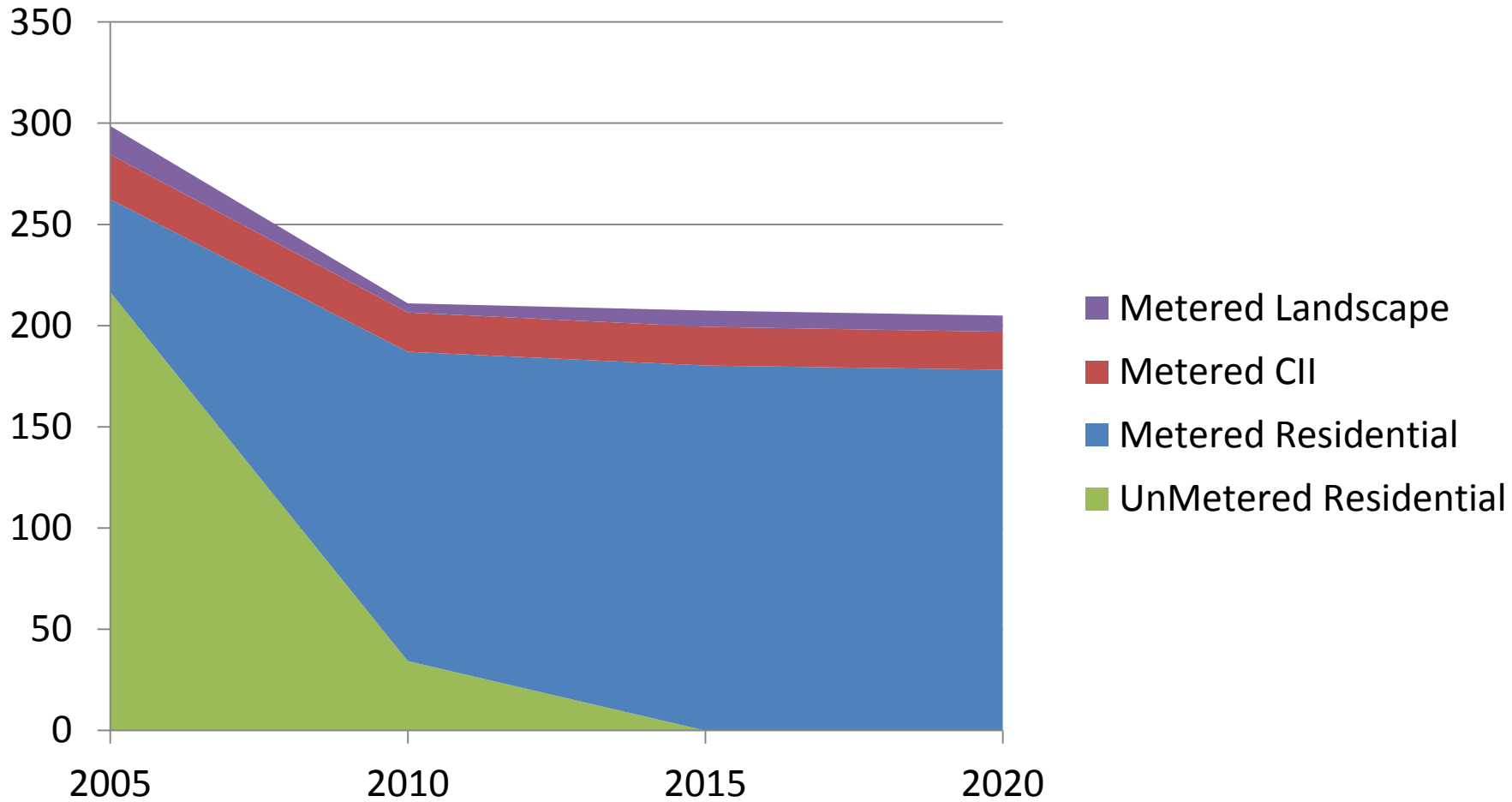


# City of Roseville-GPCD comparison



# Carmichael Water District-GPCD

## Target 244



# Agricultural Water Use Efficiency

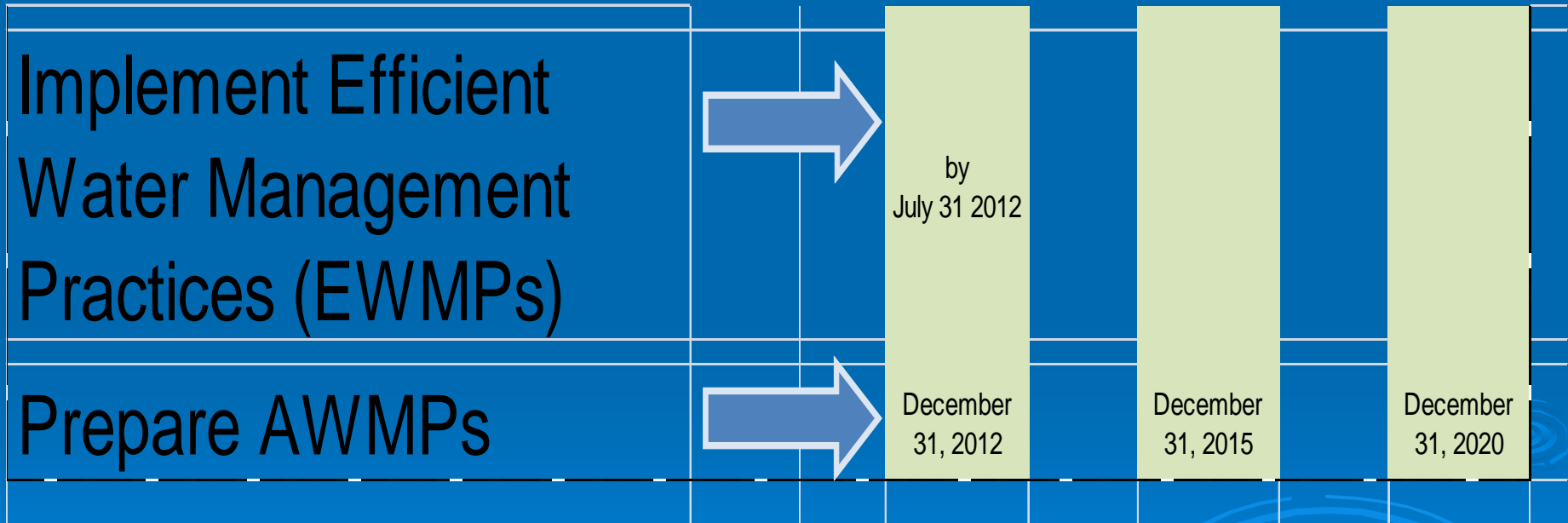
## ➤ Ag Water Suppliers

- Prepare Ag Water Management Plans
- Implement Efficient Water Management Practices
- Report efficiency improvements

## ➤ DWR

- Adopt a regulation for ag water measurement
- Develop methodology for quantifying efficiency
- Update EWMPs
- Review AWMPs
- Loans and grants subject to AWMPs
- Develop standardized reporting form

# Agricultural Water Supplier's SBX7-7 Requirements and Deadlines



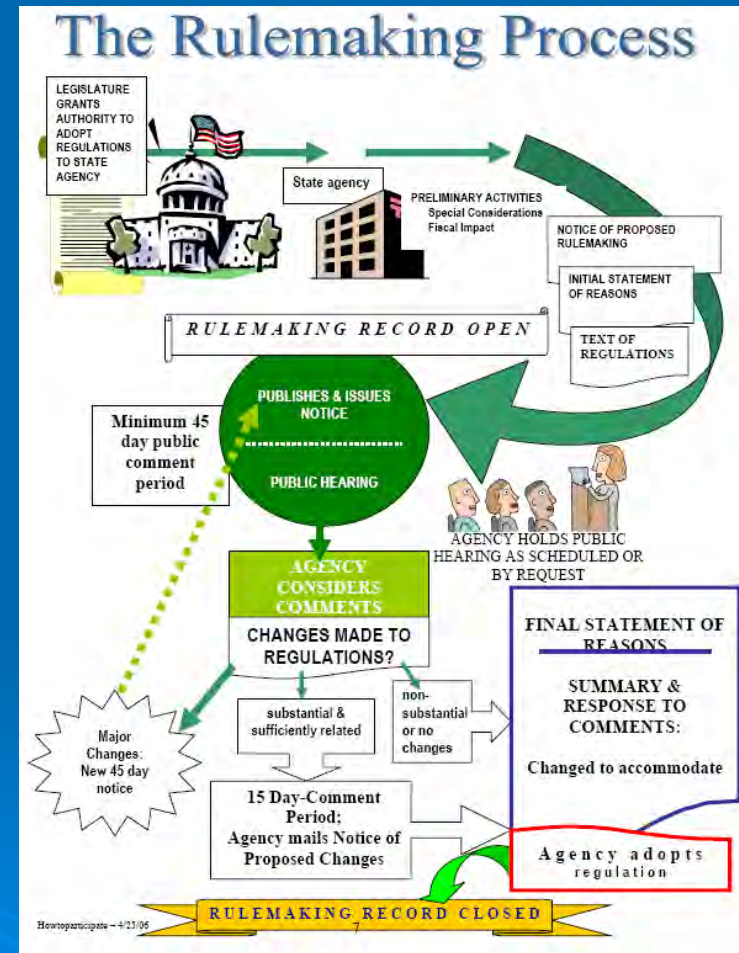
# Agricultural Water Suppliers

Size Categories, Acres	Number of Suppliers	Acreage
<b>Area &lt; 2,000</b>	<b>50</b>	<b>49,000</b>
<b>2,000 ≤ Area &lt; 10,000</b>	<b>91</b>	<b>486,000</b>
<b>10,000 ≤ Area &lt; 25,000</b>	<b>46</b>	<b>680,000</b>
<b>Area ≥ 25,000</b>	<b>72</b>	<b>5,694,000</b>
<b>Total</b>	<b>259</b>	<b>6,909,000</b>

# Ag water measurement regulation

## ➤ The Regulation

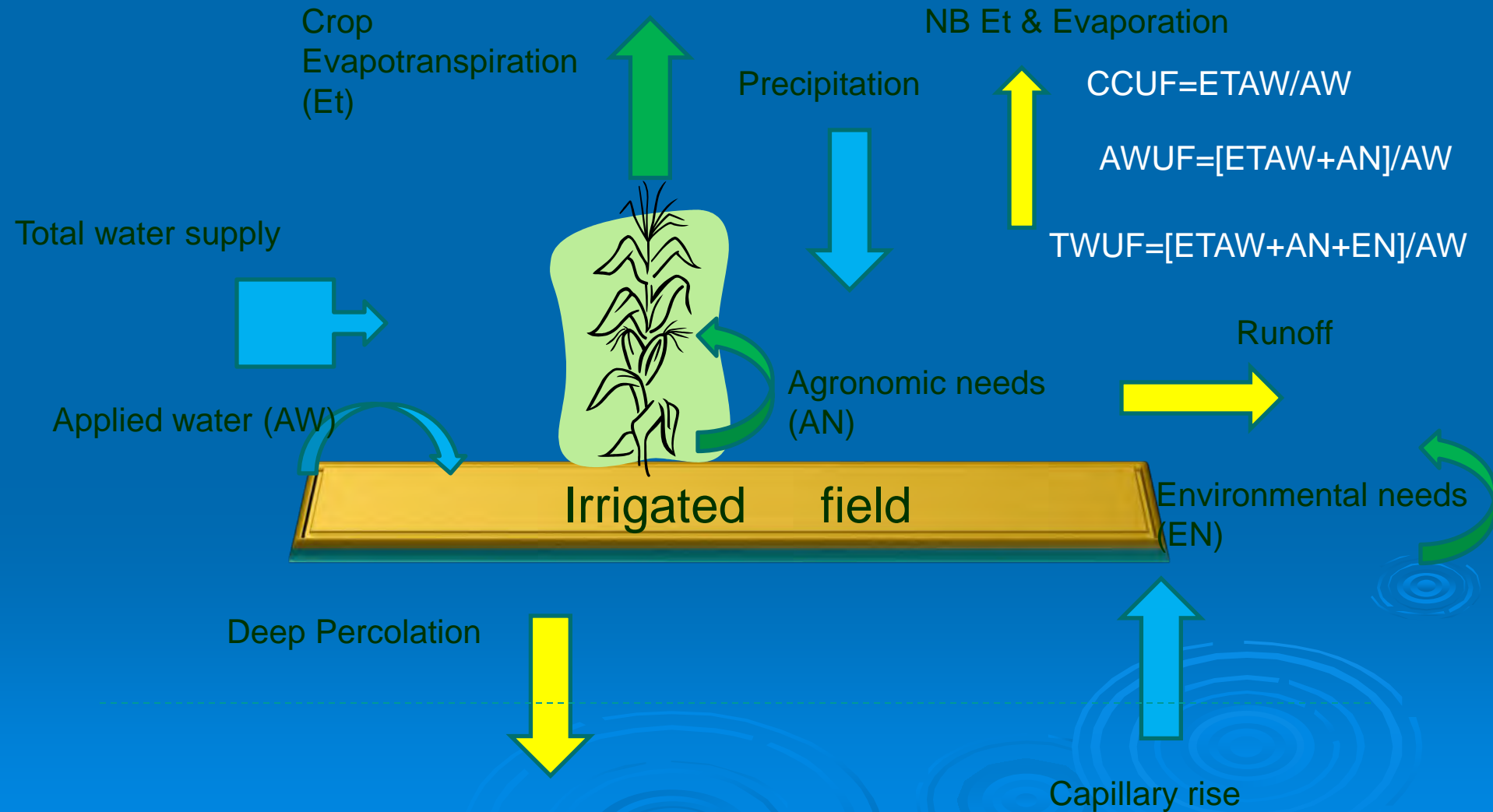
- Accuracy standards
- Certification
- Performance
- Compliance Reports
- Record Retention



# Methodology to Quantify Efficiency of Ag Water Use



# Components of Water Balance, Field Scale



# Draft Methodology for Quantifying Efficiency

## ➤ Methods

- Crop Consumptive Use Fraction
- Agronomic Water Use Fraction
- Total Water Use Fraction
- Water Management Fraction

## ➤ Indicators

- Distribution Uniformity
- Delivery Fraction
- Crop Productivity
- Crop Value

# DWR Assistance (ag and urban)

- Grants
- Supports studies
- CIMIS
- Guidebooks for Plan Preparation
- Water Management Plan Review
- Data Management
- Model Water Efficient Landscape Ordinance
- Process Water Regulation
- Ag Water Measurement Regulation
- Target Calculation Method

# Questions & Comments

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