City of Santa Cruz Water Supply and Conservation

Santa Cruz County
Water Advisory Commission
Commission on the Environment

October 28, 2009

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Water Conservation Manager

Presentation Overview

- Overview of City's Water Supply System and water Supply Problem
- Water Conservation Office: Roles and Responsibilities
- Water Energy Connection in Santa Cruz

Service Area Characteristics

Area served:

- Santa Cruz
- County
- Capitola

Population:

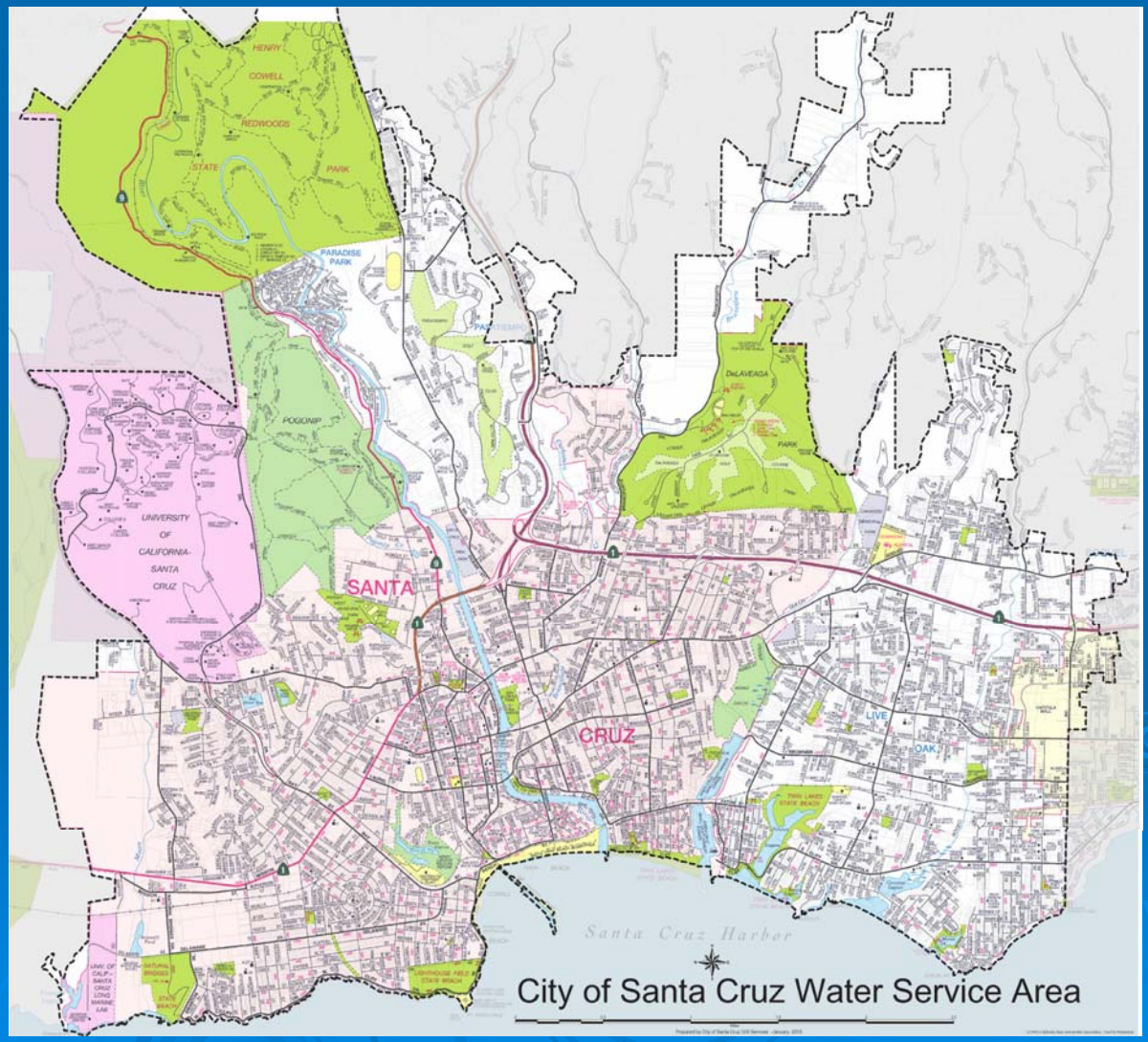
~ 95,000

Employment:

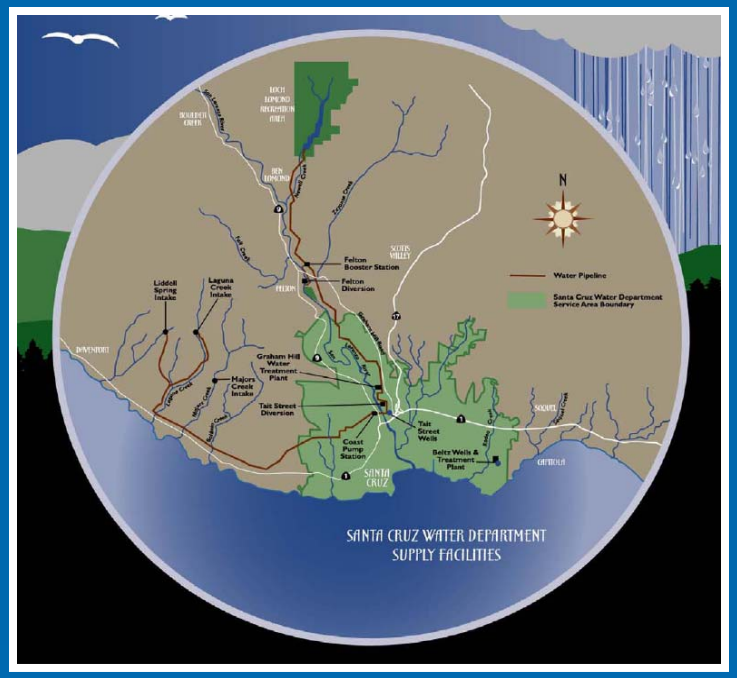
~ 45,000

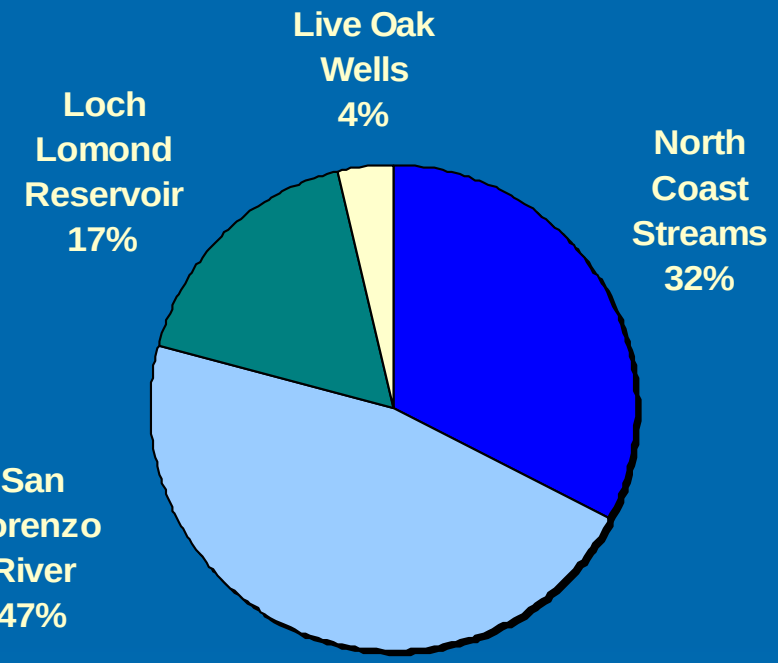
Governing body:

City Council



Water Sources





North Coast Streams

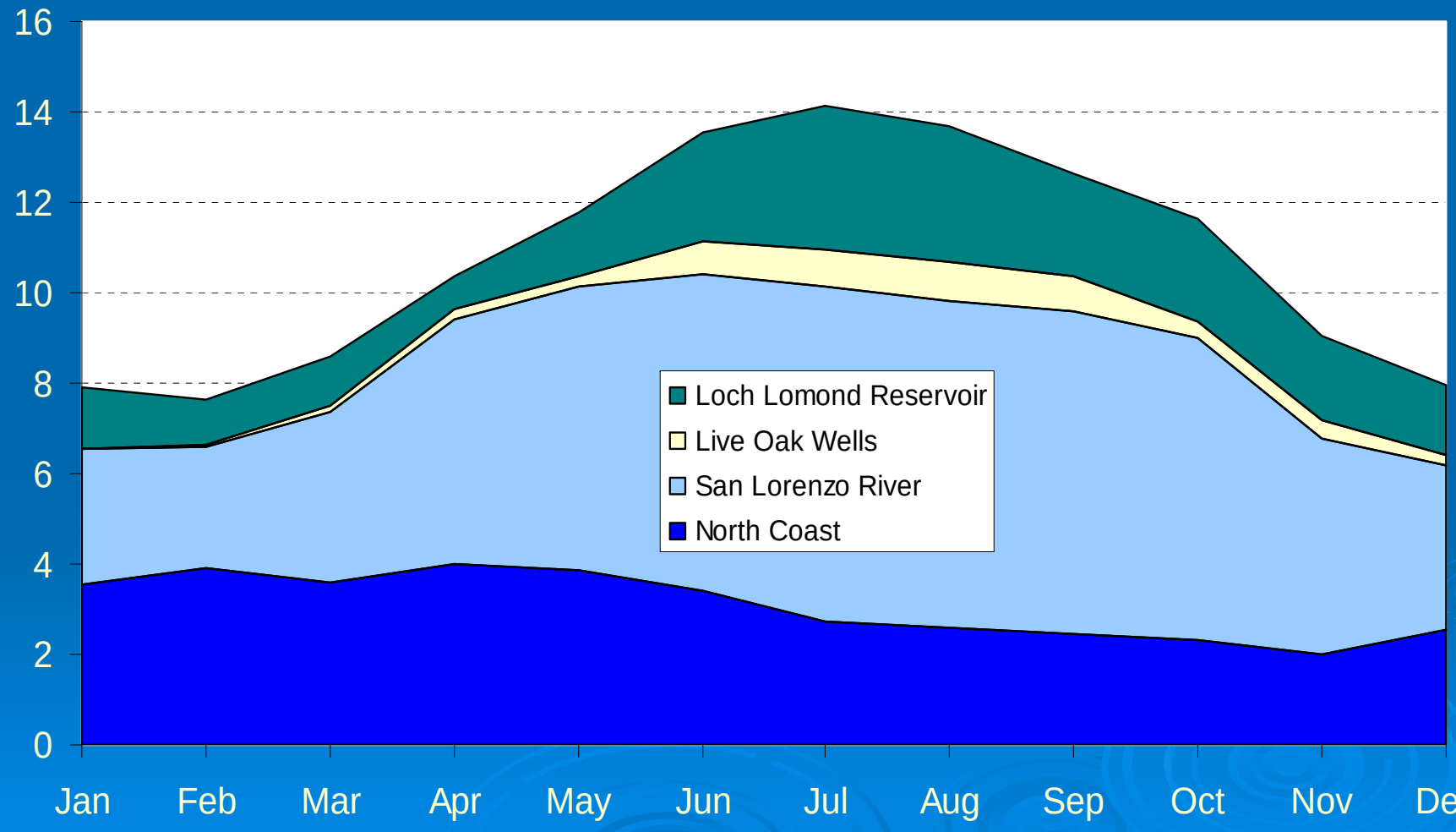
San Lorenzo River

Loch Lomond Reservoir

Live Oak Wells

Monthly Water Production

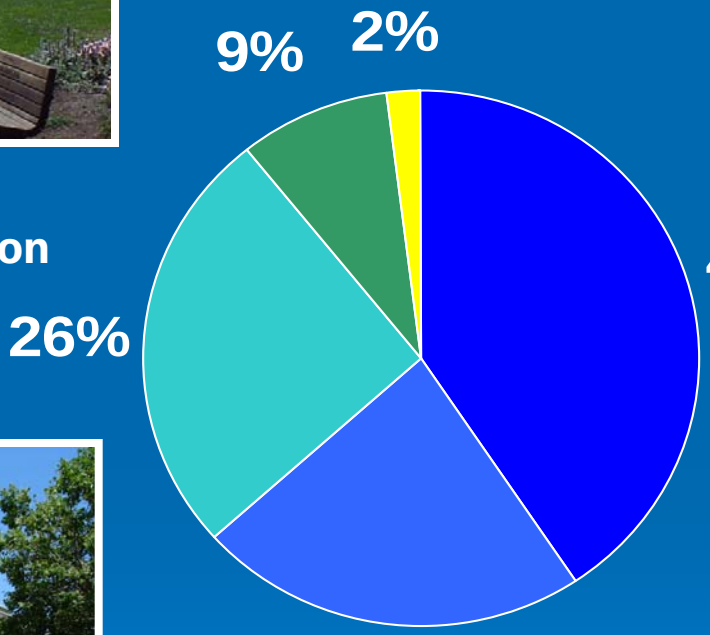
(million gallons per day)



Water Uses

Park and Large Landscape Irrigation

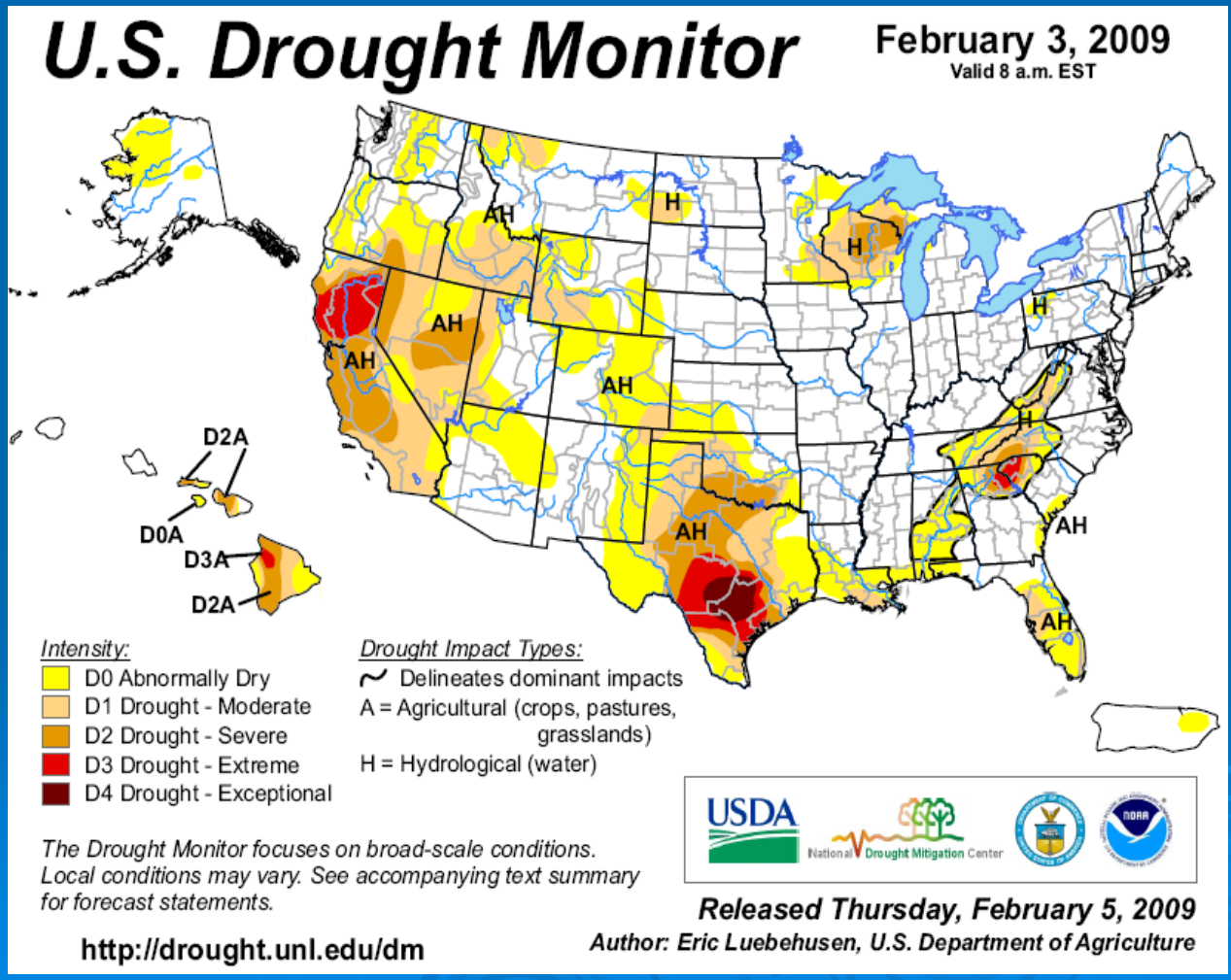
Single Residential



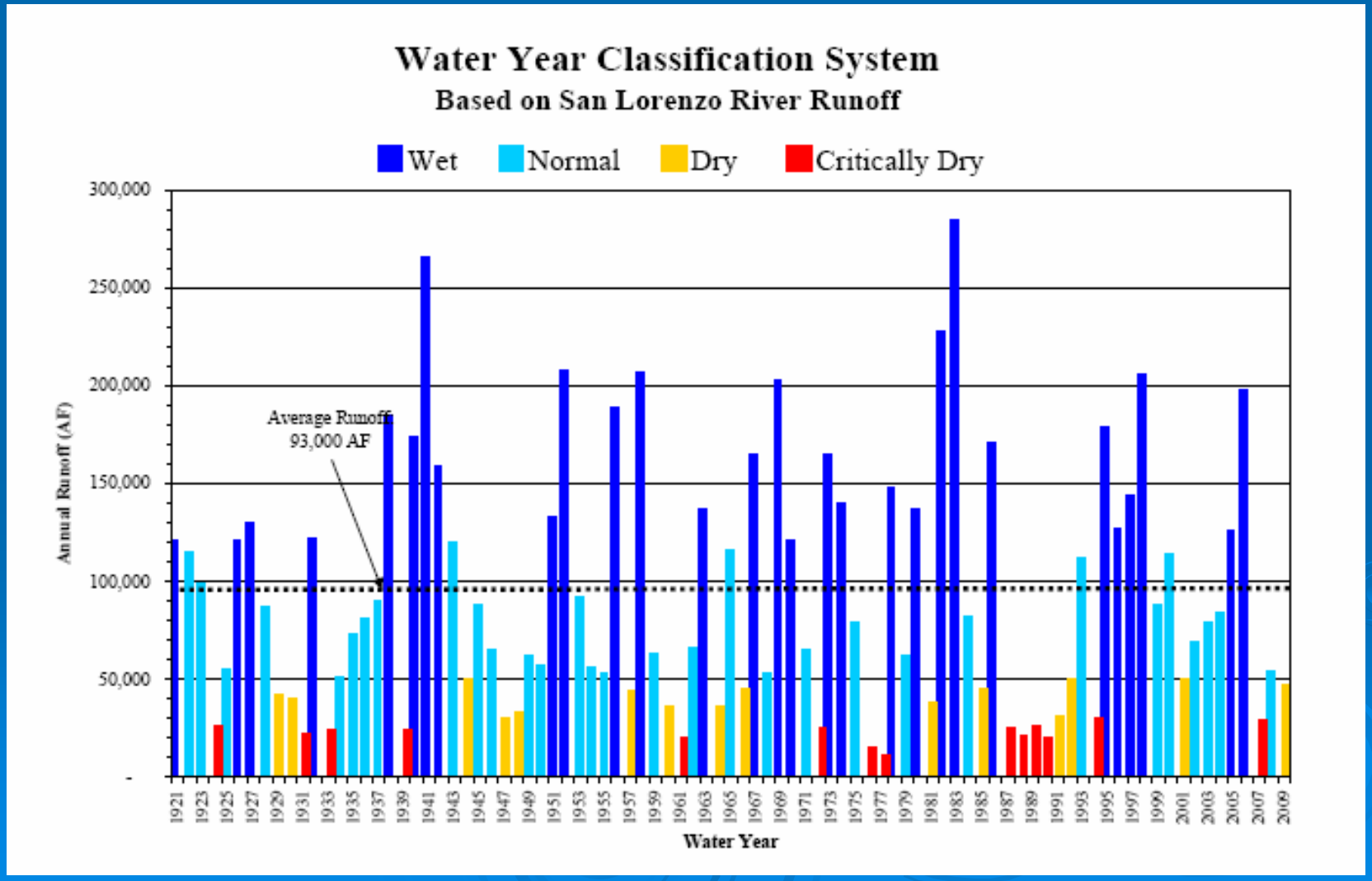
Business, Industry, UCSC

Multiple Residential

Primary Problem: Lack of Adequate Water Supply During Drought



Water Supply Conditions Vary Widely Year to Year



City's Approach to Meet These Challenges

1. Reduce average demand through water conservation in all years
2. Curtail water use through temporary water restrictions in drought years
3. Develop new sources of supply

Integrated Water Plan:

Desalination

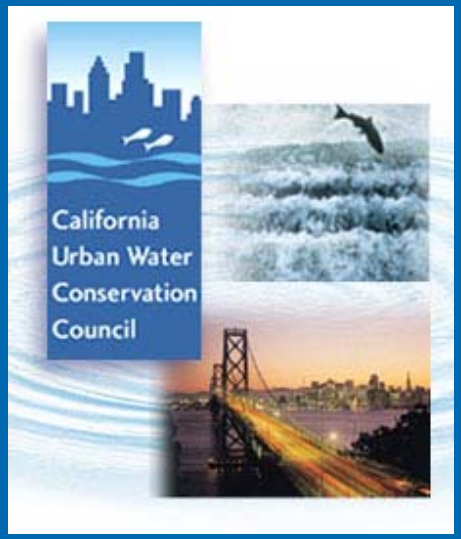
Long-term water conservation

Short-term demand reduction - "use curtailment"

Long-Term Water Conservation

- Emphasis on permanent measures that reduce average daily water use.
- Goals:
  1. Savings of 300 million gallons per year in 2010.
  2. Reduce residential per capita use from 76 to 65 gpcd
- Actual per capita use in 2008 = 68 gpcd
- In 2001, City became a signatory to California Urban Water Conservation MOU

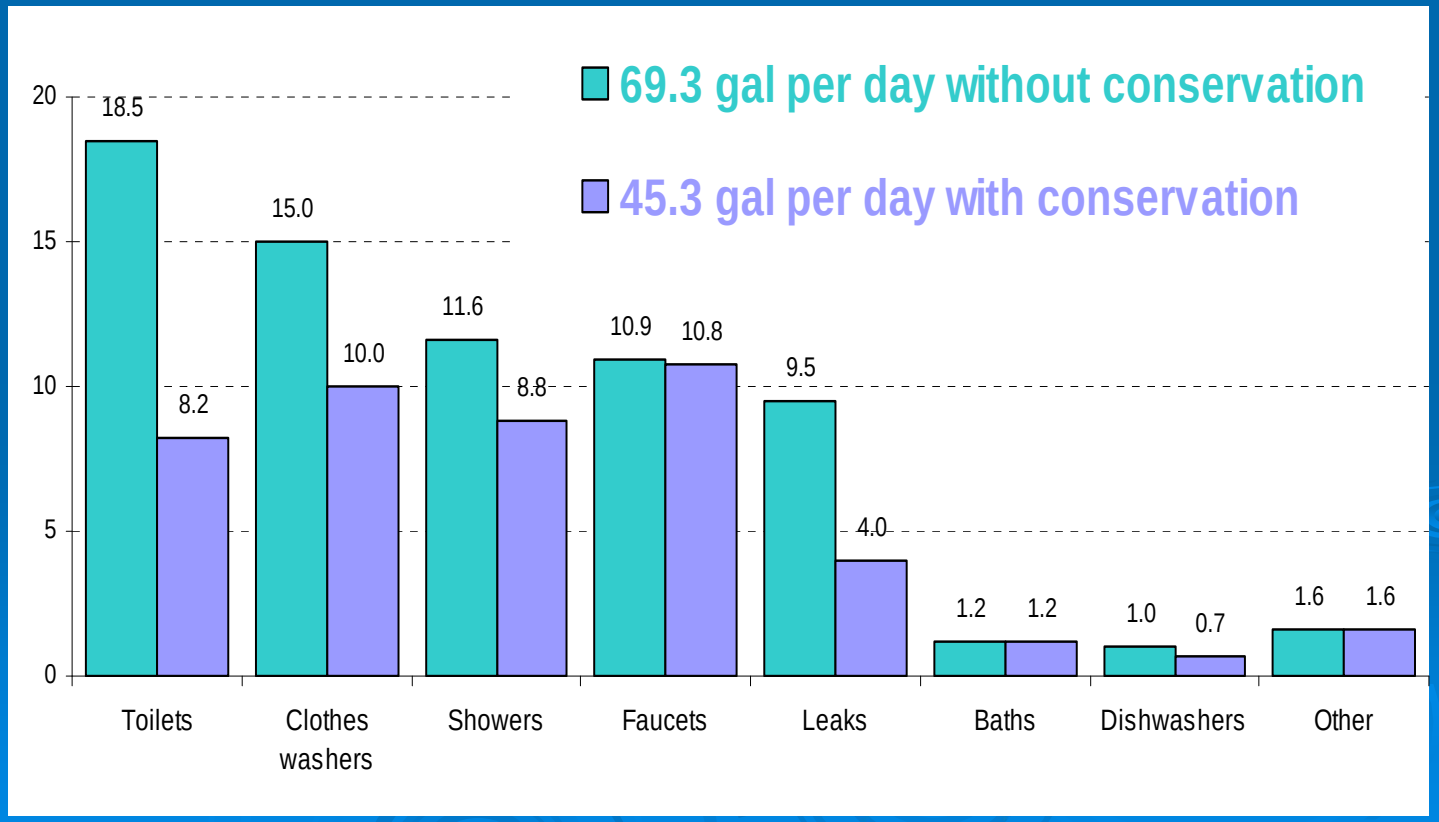
California Urban Water Conservation Council



BMP 1: Residential Survey Programs
BMP 2: Residential Plumbing Retrofit
BMP 3: System Water Audits
BMP 4: Metering with Commodity Rates
BMP 5: Large Landscape Conservation
BMP 6: High Efficiency Clothes Washers
BMP 7: Public Information Programs
BMP 8: School Education Programs
BMP 9: Commercial Industrial Institutional
BMP10: Wholesale Agency Assistance
BMP 11: Conservation Pricing
BMP 12: Conservation Coordinator
BMP 13: Water Waste Prohibition
BMP 14: Residential Toilet Replacement

Long-Term Water Conservation Programs

Residential indoor water use (gallons/person/day):



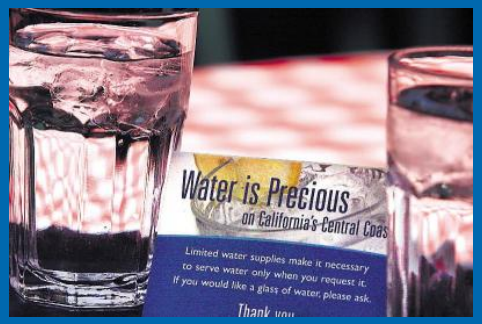
Plumbing Fixture Retrofit Regulations

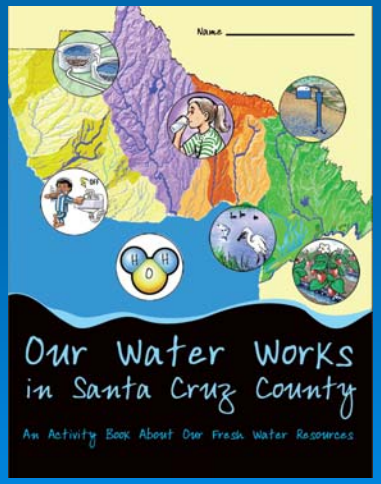
- All buildings must be retrofitted with low consumption plumbing fixtures when real estate is sold
- Regulations apply to all types of buildings served by the City: Residential, Commercial & Industrial

Commercial, Industrial, and Landscape Programs

- Plumbing Fixture Rebates
- Facility audits
- Retrofit regulations
- Smart Rinse, Light Wash, Smart Rebate Programs
- Regulations for New Development

Public Awareness and Education

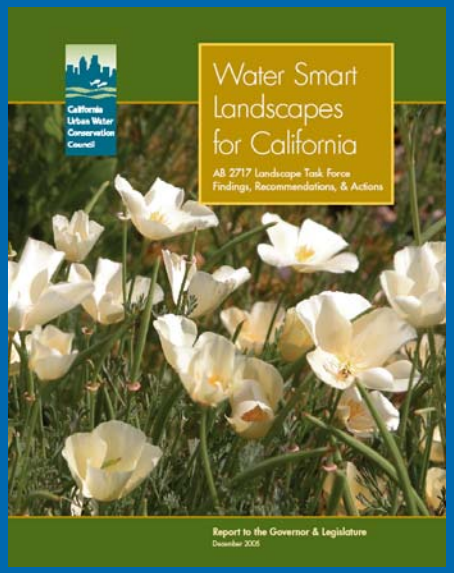




Conservation Oriented Water Rate Structure

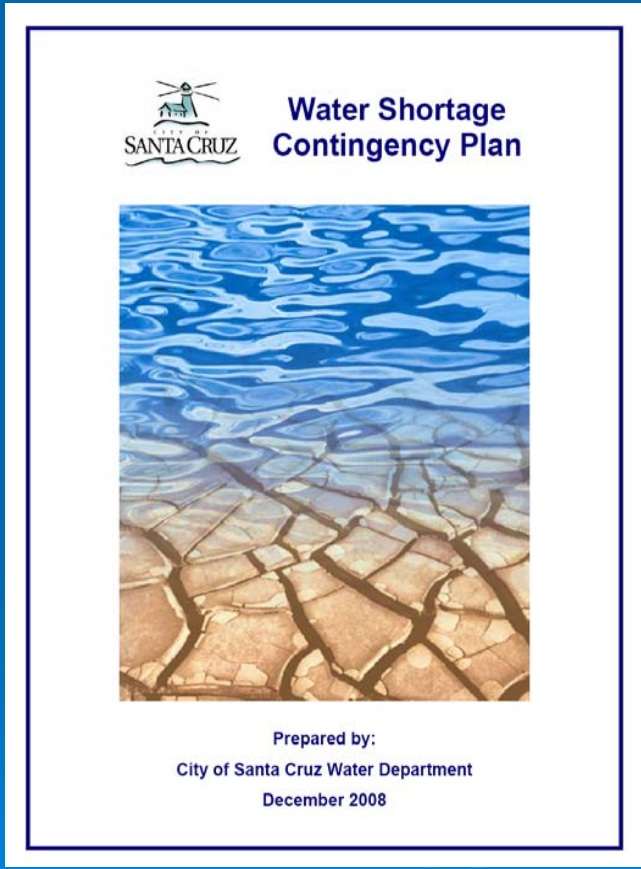
Block	Category	Inside City monthly		Outside City bimonthly	
		Rate	Units	Rate	Units
5	Inefficient or excessive use	$8.37	over 18	$10.68	over 36
4	High use	$6.71	15-18	$8.56	29-36
3	Average outdoor needs	$4.89	10-14	$6.23	19-28
2	Average indoor needs	$3.81	5-9	$4.86	9-18
1	Essential needs	$1.49	1-4	$1.91	1-8

Next Priority: Large Landscapes



- Water budgets
- Pricing
- Water efficient landscape regulations
- Weather-based controllers
- Separate, real-time metering
- Audits

Short-Term Water Conservation "Use Curtailment"



Recently updated City's Water Shortage Contingency Plan

Document that describes how the City will respond to future water shortages ranging from 5 to 50%

Demand Reduction Program: 5 Stage Structure

Stage	Magnitude of Water Shortage	Stage Title
1	0-5%	Water Shortage Alert
2	5-15%	Water Shortage Warning
3	15-25%	Water Shortage Emergency
4	25-35%	Severe Water Shortage Emergency
5	35-50%	Critical Water Shortage Emergency

Difference between percentage figures used to describe the system-wide shortfall and how individual customers are affected

Priority-Based Allocation System

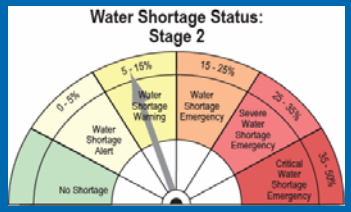
Classified demands into 3 usage priorities:

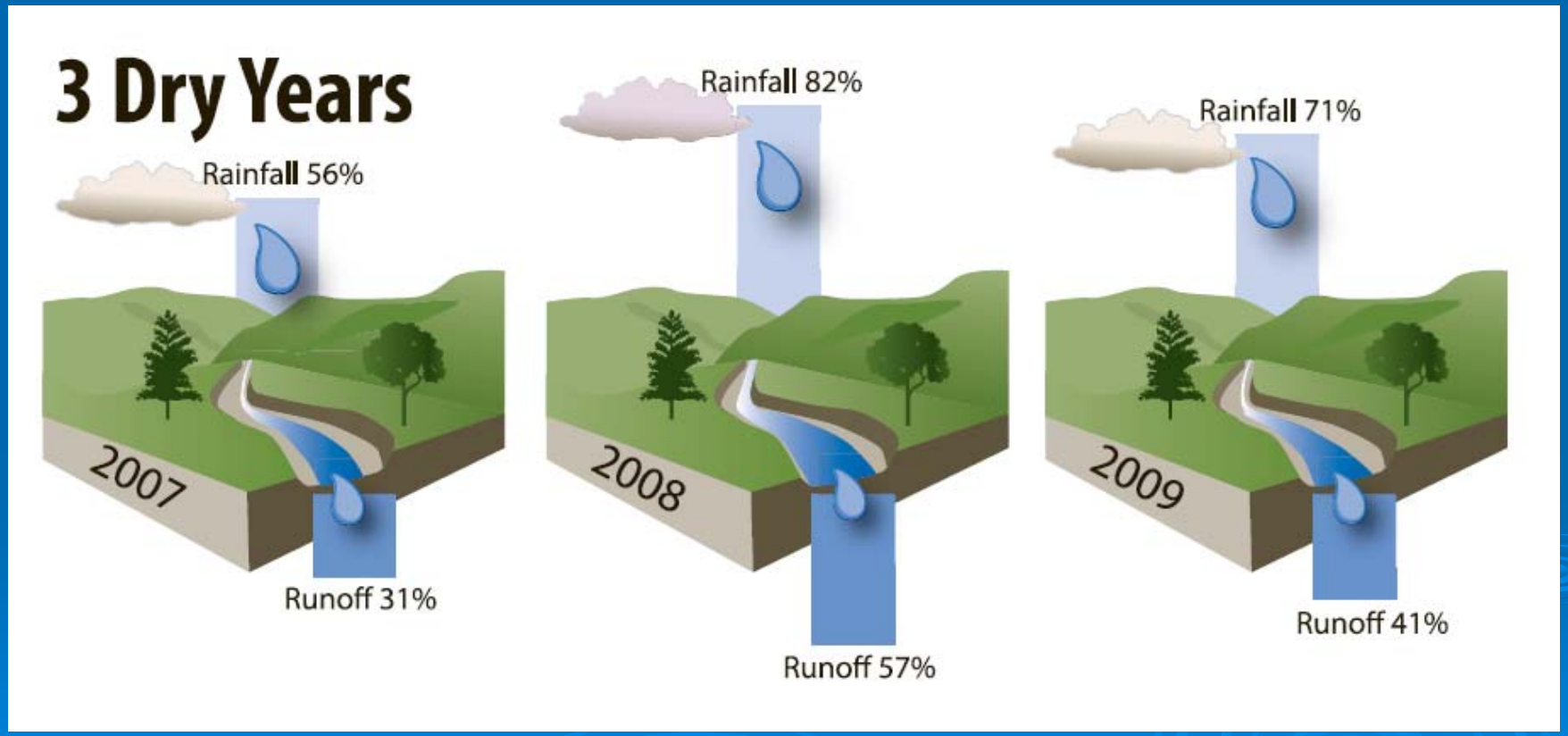
- Health and safety
- Business
- Irrigation/other outdoor usage

Scaled back water delivery by priority:

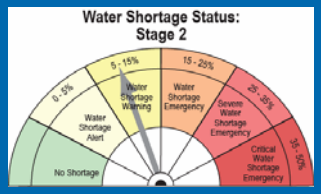
Stage	Overall System Shortfall:	Health/Safety	Business	Irrigation
2	15%	95	95	64
3	25%	95	90	34
4	35%	90	85	12
5	50%	75	67	0

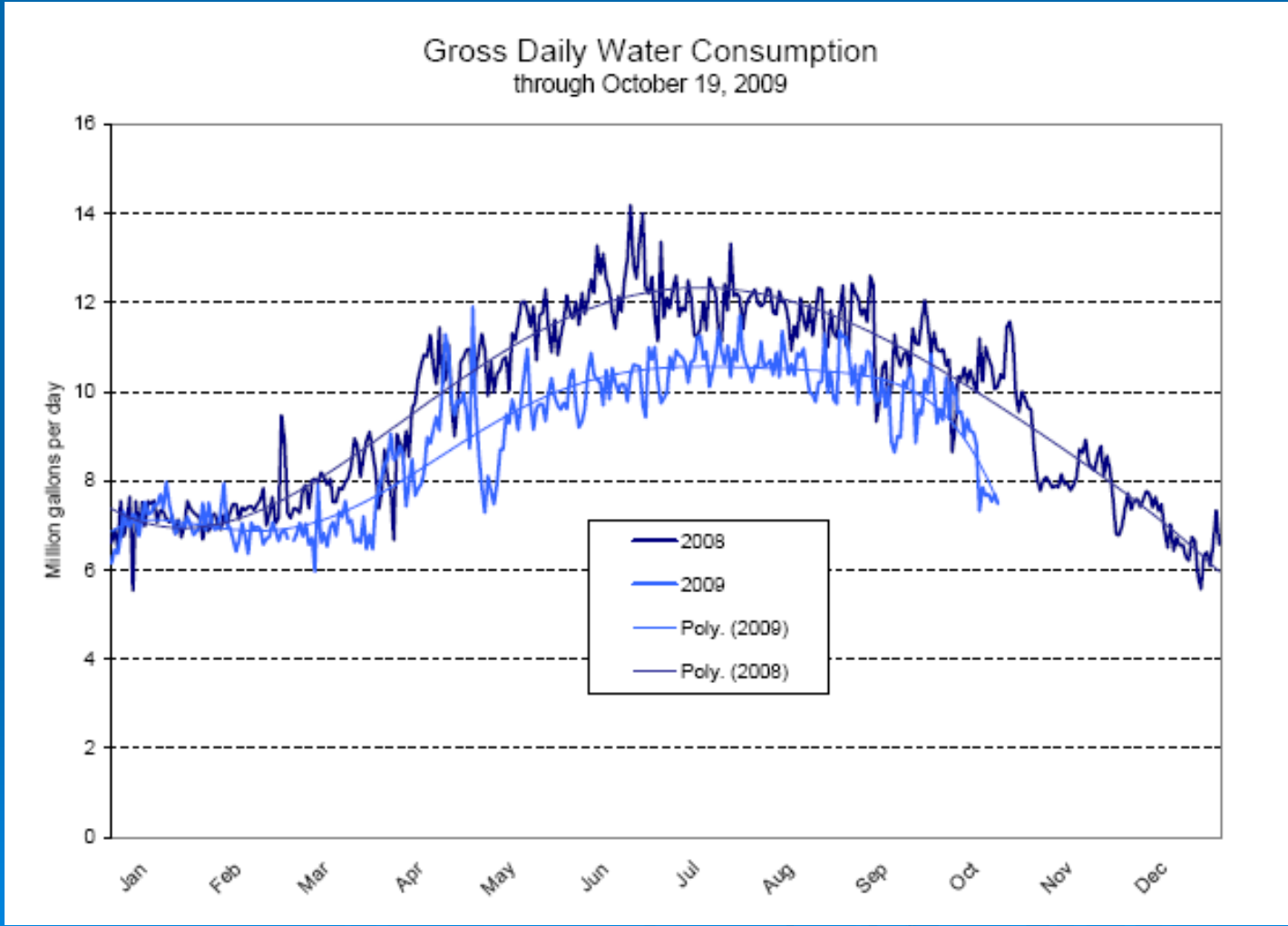
Water Restrictions 2009





Water Restrictions 2009

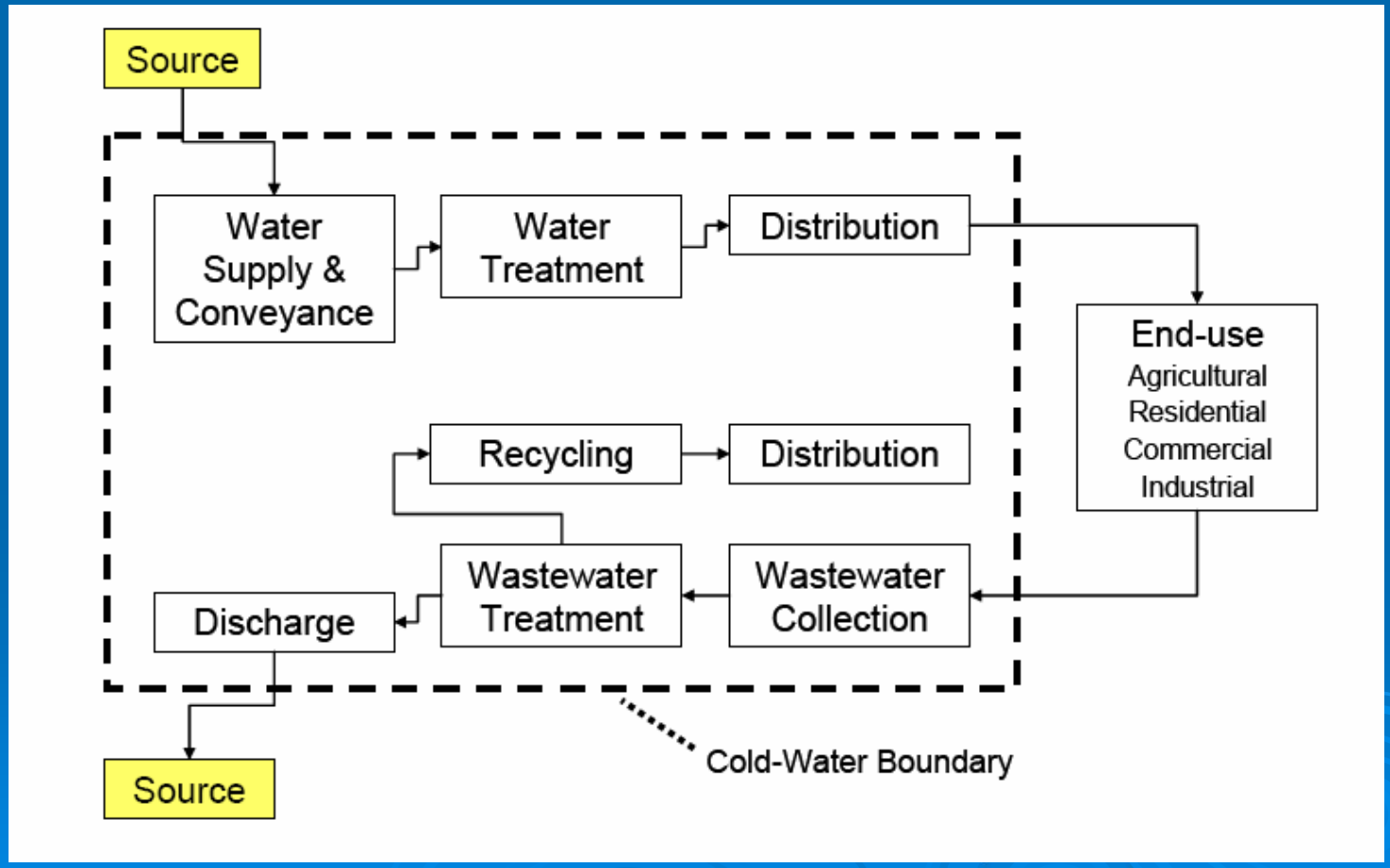




Water-Energy Connection

- Hidden cost of water supply
- Water utilities use large amounts of energy to treat and deliver water
- Electricity used to pump water generates carbon dioxide, contributes to green house gas
- Additional water pumping during peak season for landscape irrigation strains power grid.

Embedded Energy of Water Use Cycle



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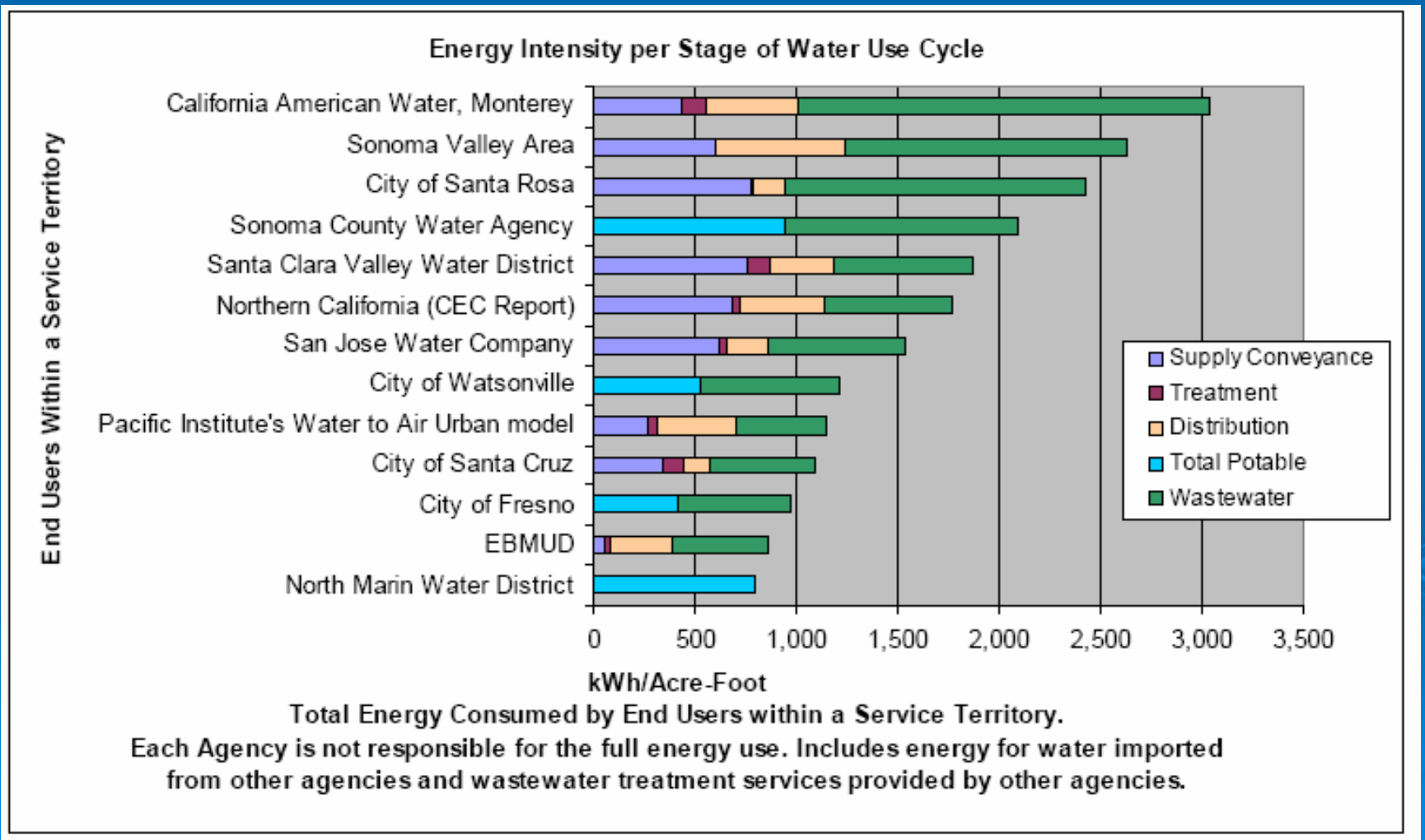

2005 Greenhouse Gas Emissions Inventory

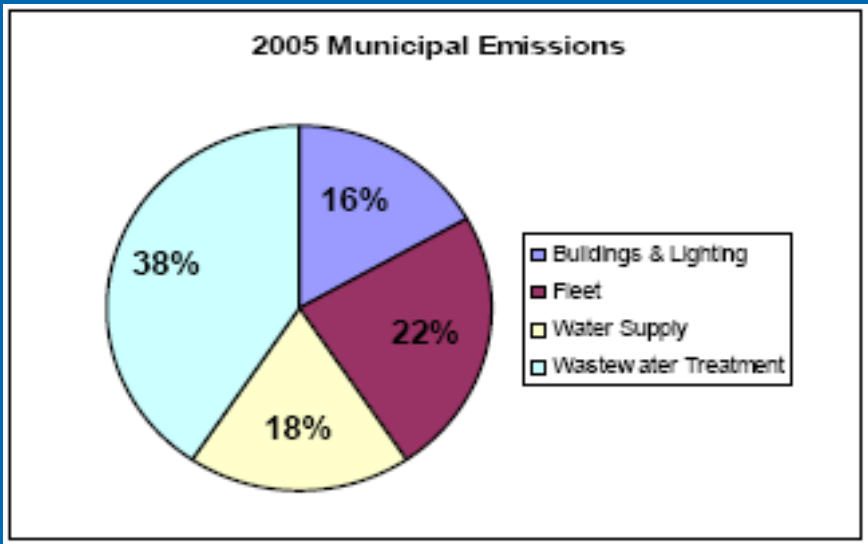

Figure 2. 2005 Municipal Emissions by Sector

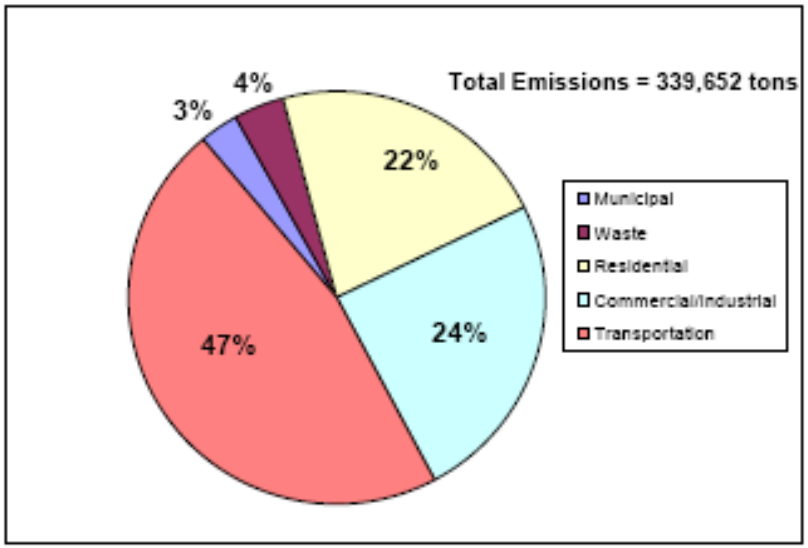

Figure 3. Community-wide Emission by Sector

Questions?

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