Water Eco-Security 2015

Los Angeles Water - More Self-Reliant and Resilient for the Future

Jack Baylis
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December 5th, 2015

a Road Map to Driving and Inspiring Change

- Global Conditions
- Local Community Needs

A Road Map and Approach for a Local Solution

- Policies
- Planning
- Plumbing

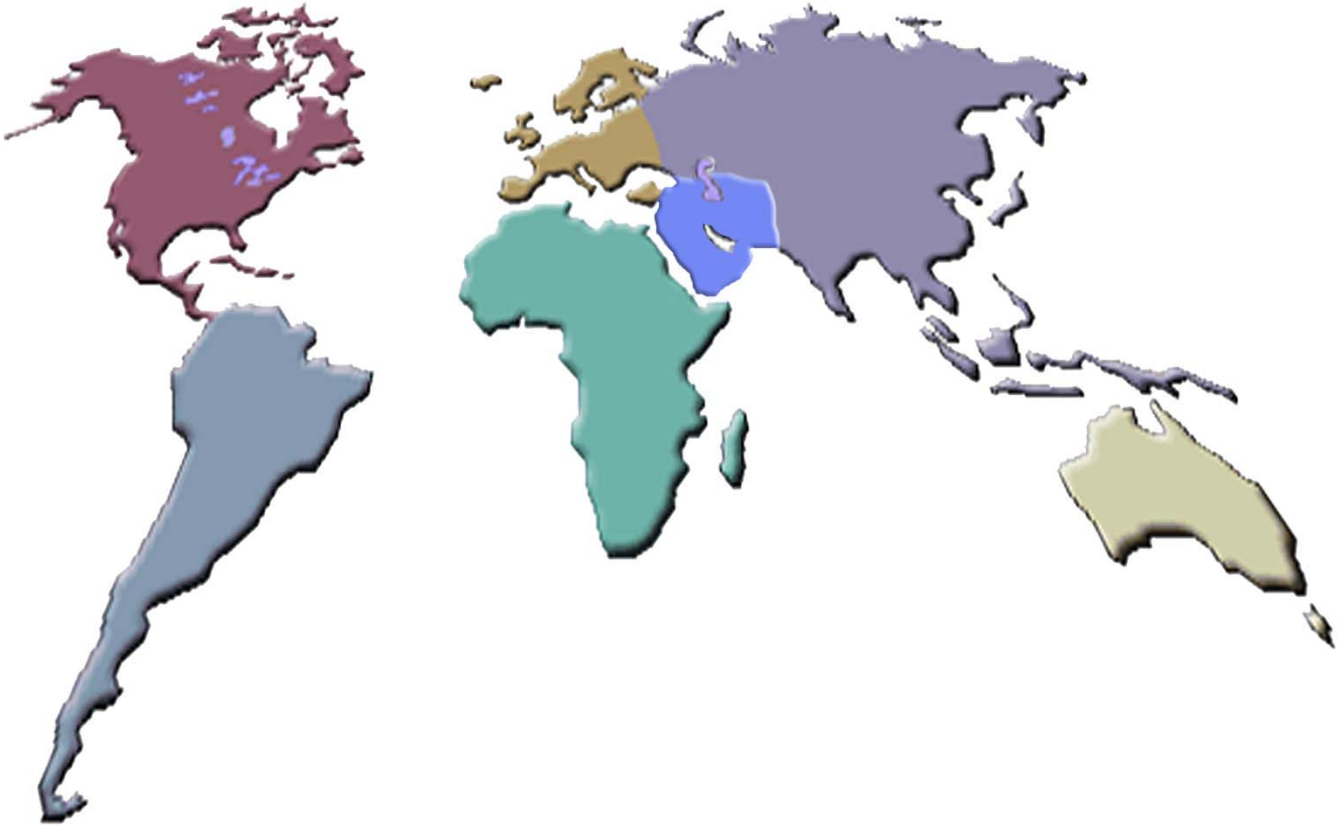
Global Conditions

Population

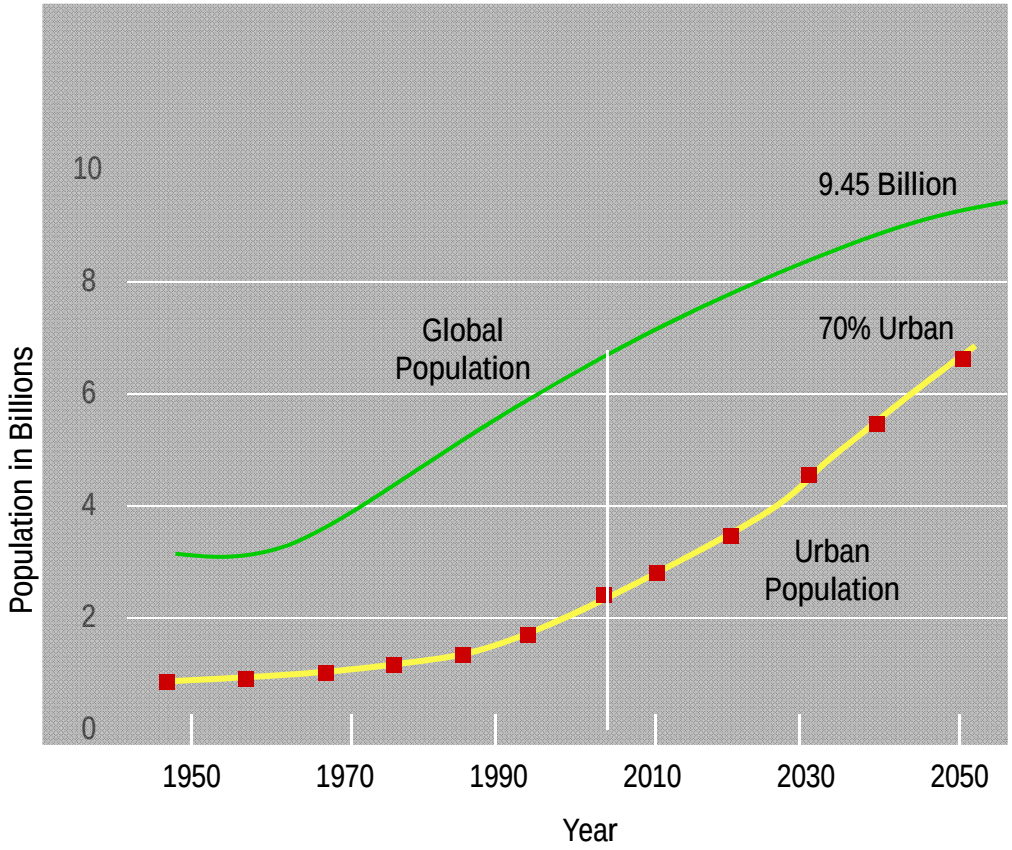
Aging Infrastructure

Climate

New Technologies



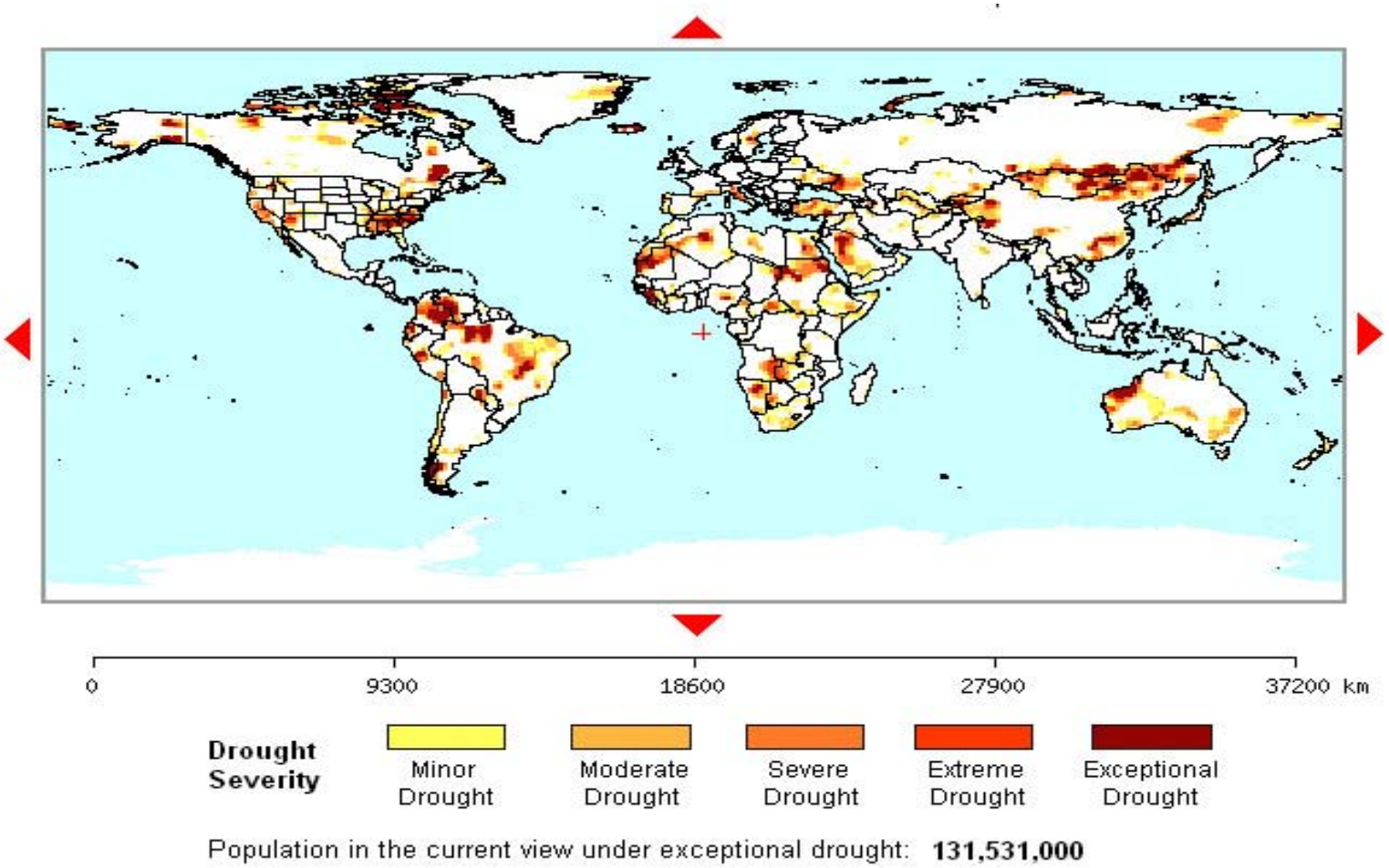
Global Population is Driving Water Resources and Infrastructure Needs



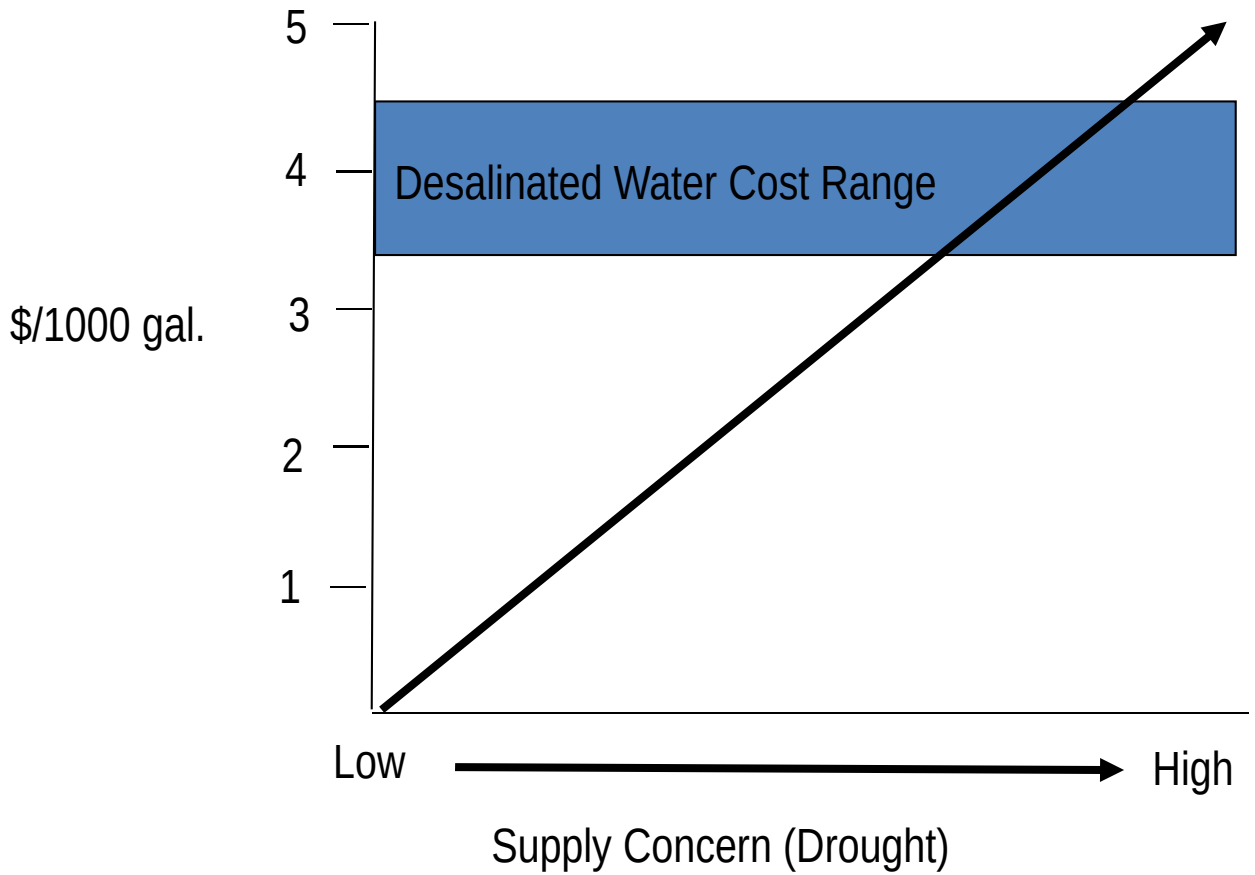
- Significant Population Increase by 2050
- Water Demand Increasing Exponentially

Source: US Census Bureau, International Data Base, 2006
UN Global Forecast, 2004

Global Climate Change is Driving Increased Awareness on Water Resources

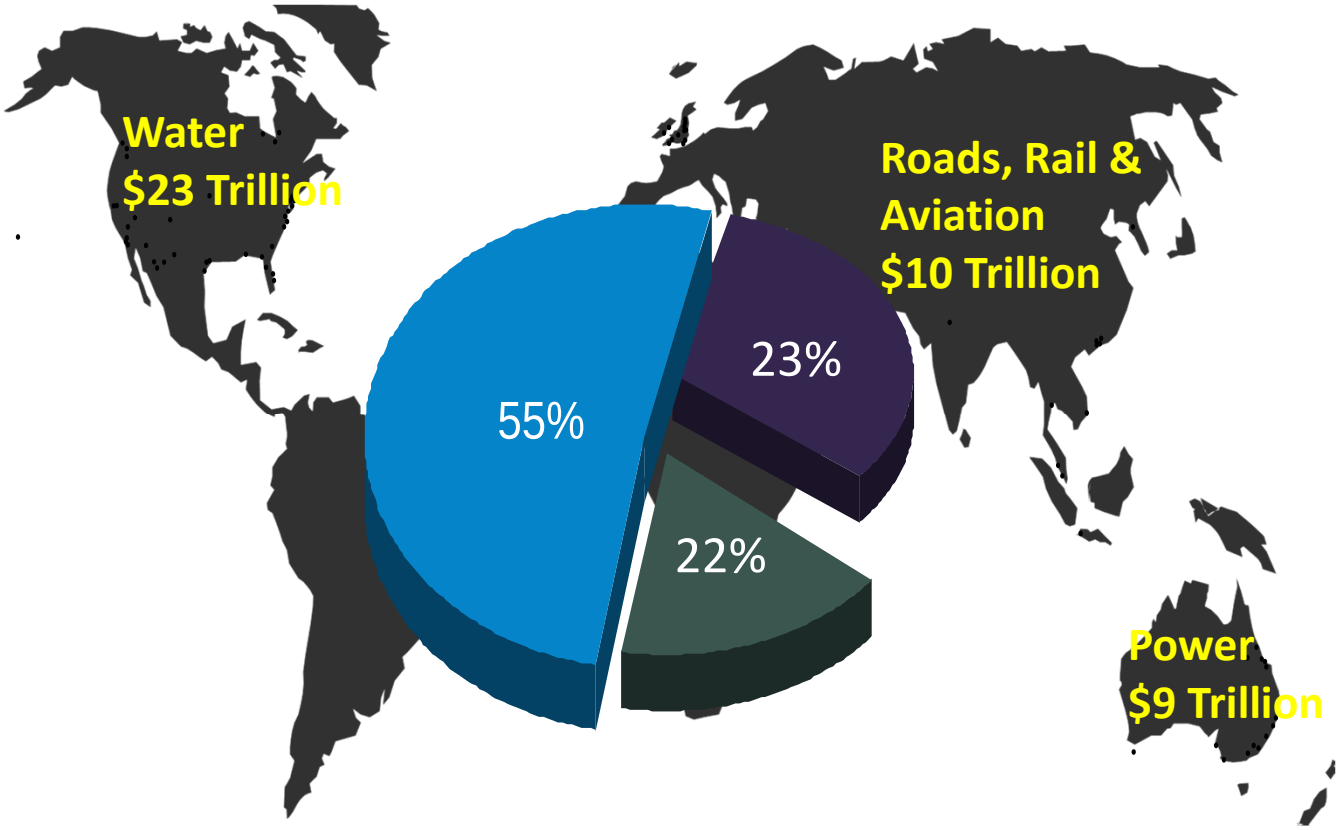


Global Water Supply Concerns are Driving Consumer Willingness to Pay



Global Water Needs are Driving

Resource and Infrastructure Forecasts - Global Infrastructure: next 20-25 years



From the Clean Water Council, August, 2007, "*Infrastructure Needs are Stretching Resources*"

Global Concerns on Greenhouse Gas and Carbon Footprints are Driving

Investments in Alternative Sources of Energy and New Technologies

Wind

Solar

Ethanol

Green Materials

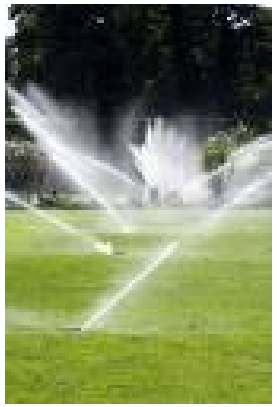
Global Community is Driving Competing Uses of Water

Agriculture

Potable

Minimum Stream Flow

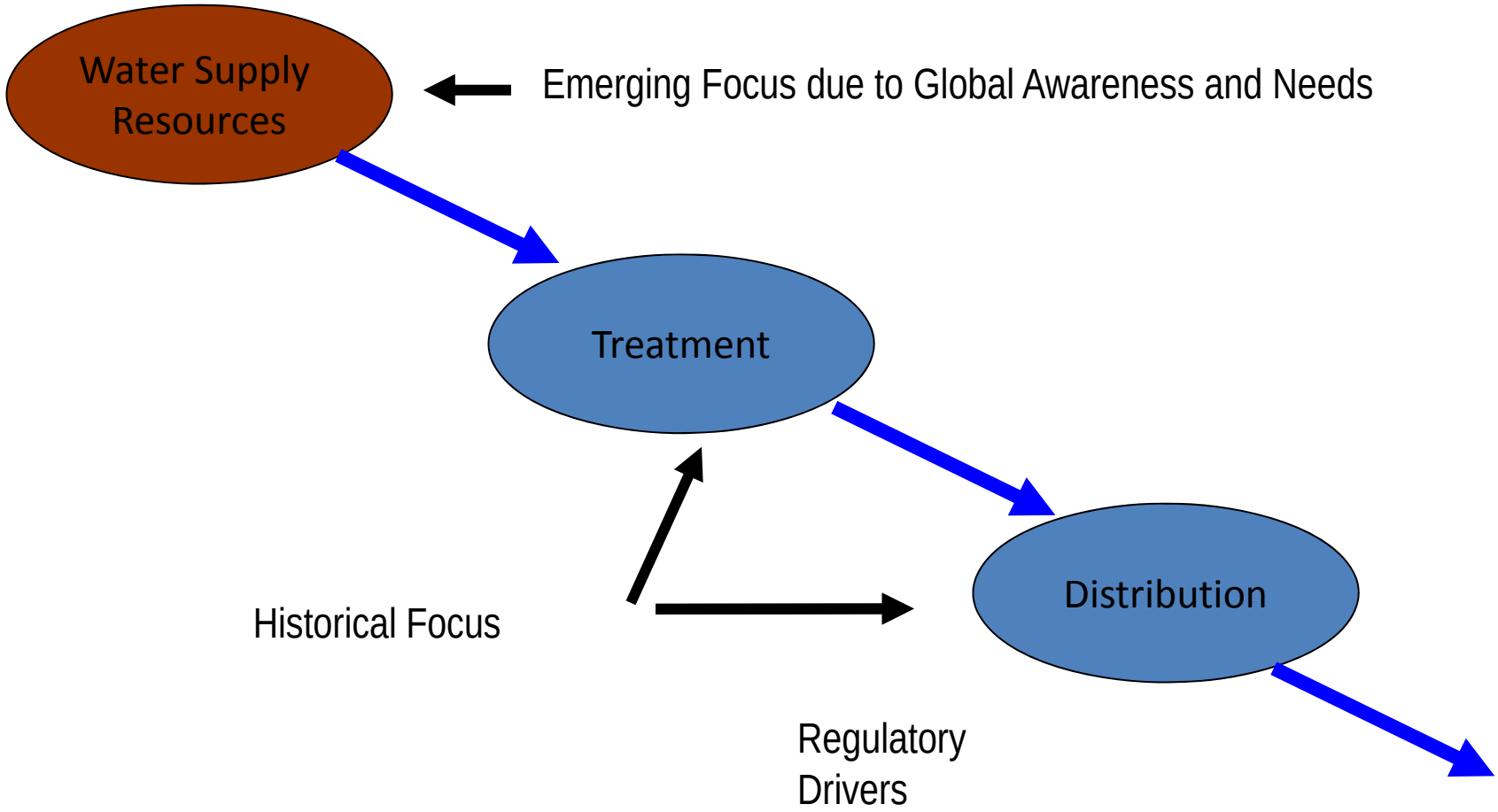
Industrial



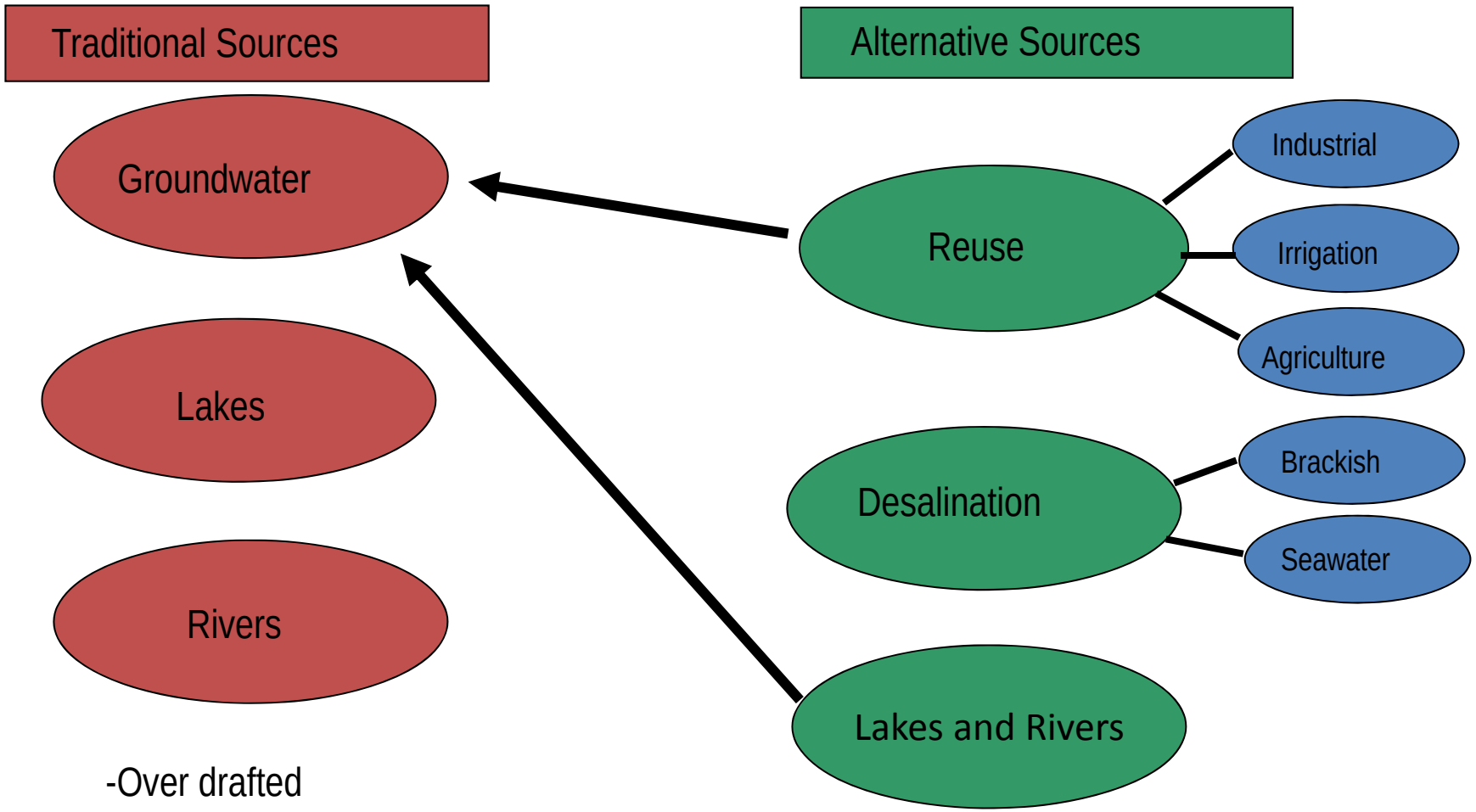
Irrigation

Hydropower

Local Community Awareness is Driving Water Source Paradigm Shift



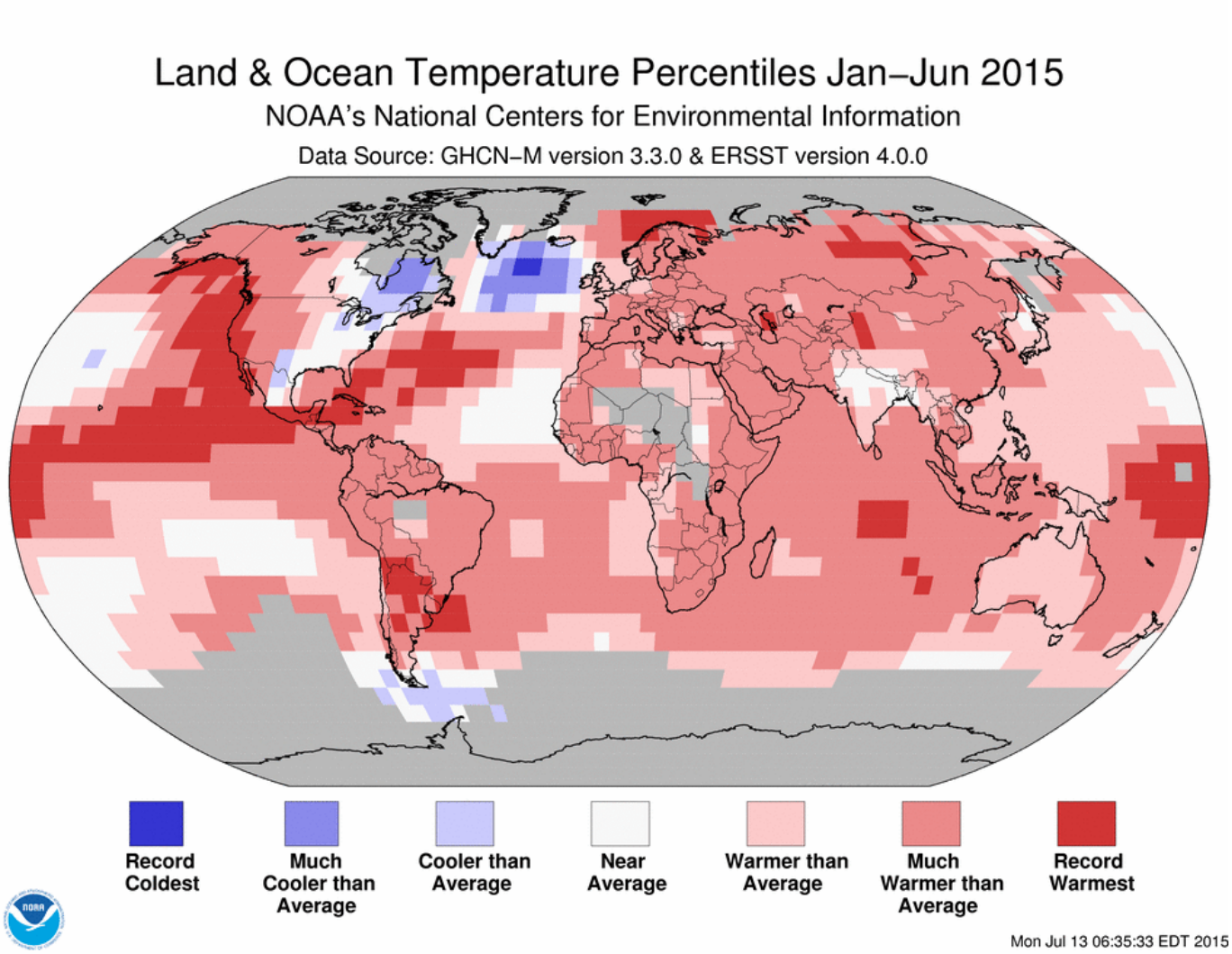
Local Community Needs Require Shift in Water Resources



-Over drafted
-Not recharged

Risks as Climate Changes

- Risks include:
  - Increased temperatures
  - Intense rainfall events
  - Sea water level rise
  - Intense droughts
  - Infrastructure damage

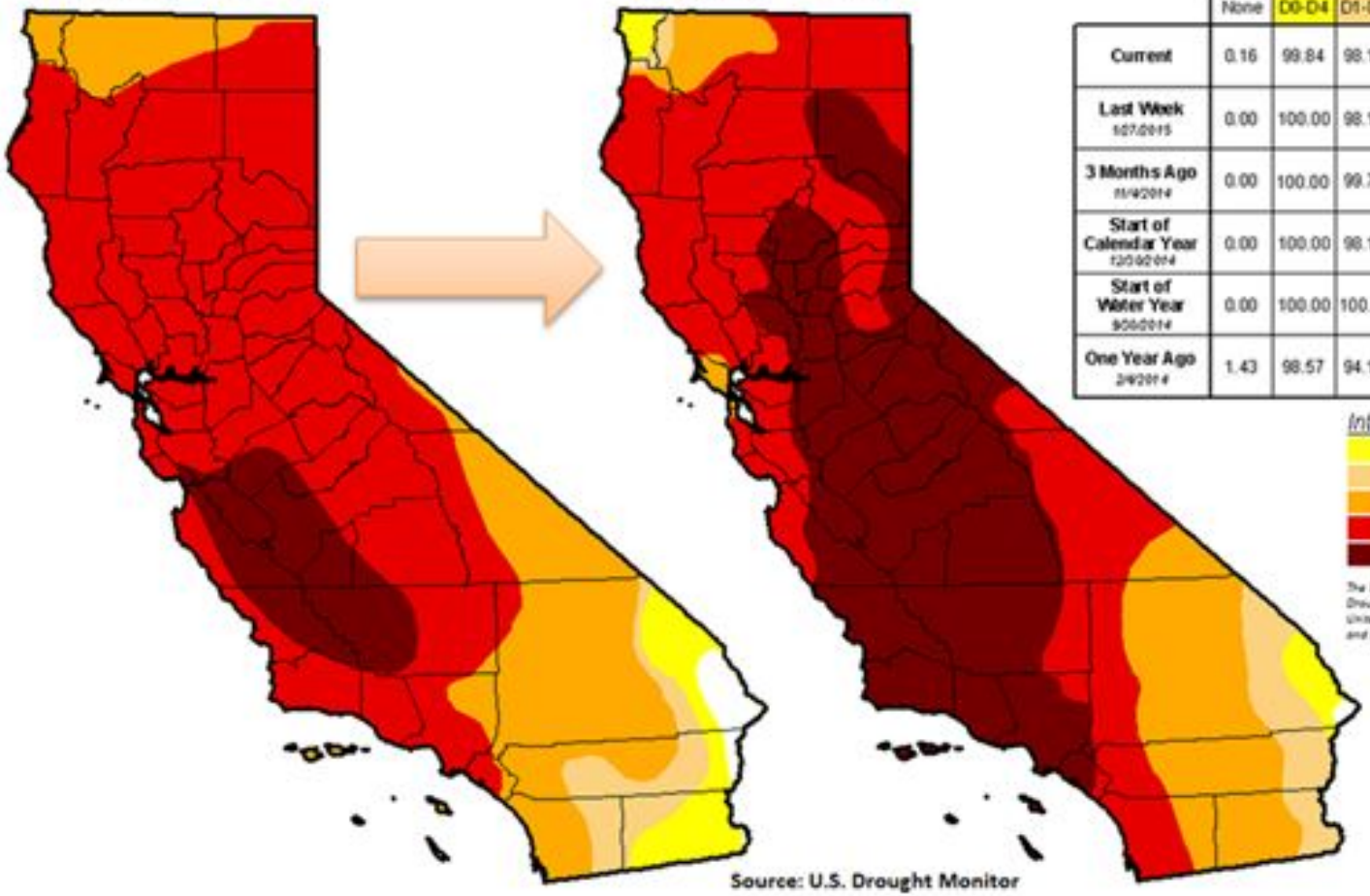


U.S. Drought Monitor

California

Feb '14

Feb '15



Source: U.S. Drought Monitor

February 3, 2015

(Released Thursday, Feb. 5, 2015)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.16	99.84	98.13	93.57	77.46	39.99
Last Week 1/27/2015	0.00	100.00	98.13	94.34	77.52	39.99
3 Months Ago 11/4/2014	0.00	100.00	99.71	94.42	79.69	55.08
Start of Calendar Year 12/30/2014	0.00	100.00	98.12	94.34	77.94	32.21
Start of Water Year 9/30/2014	0.00	100.00	100.00	95.04	81.92	58.41
One Year Ago 2/4/2014	1.43	98.57	94.18	89.91	67.13	9.81

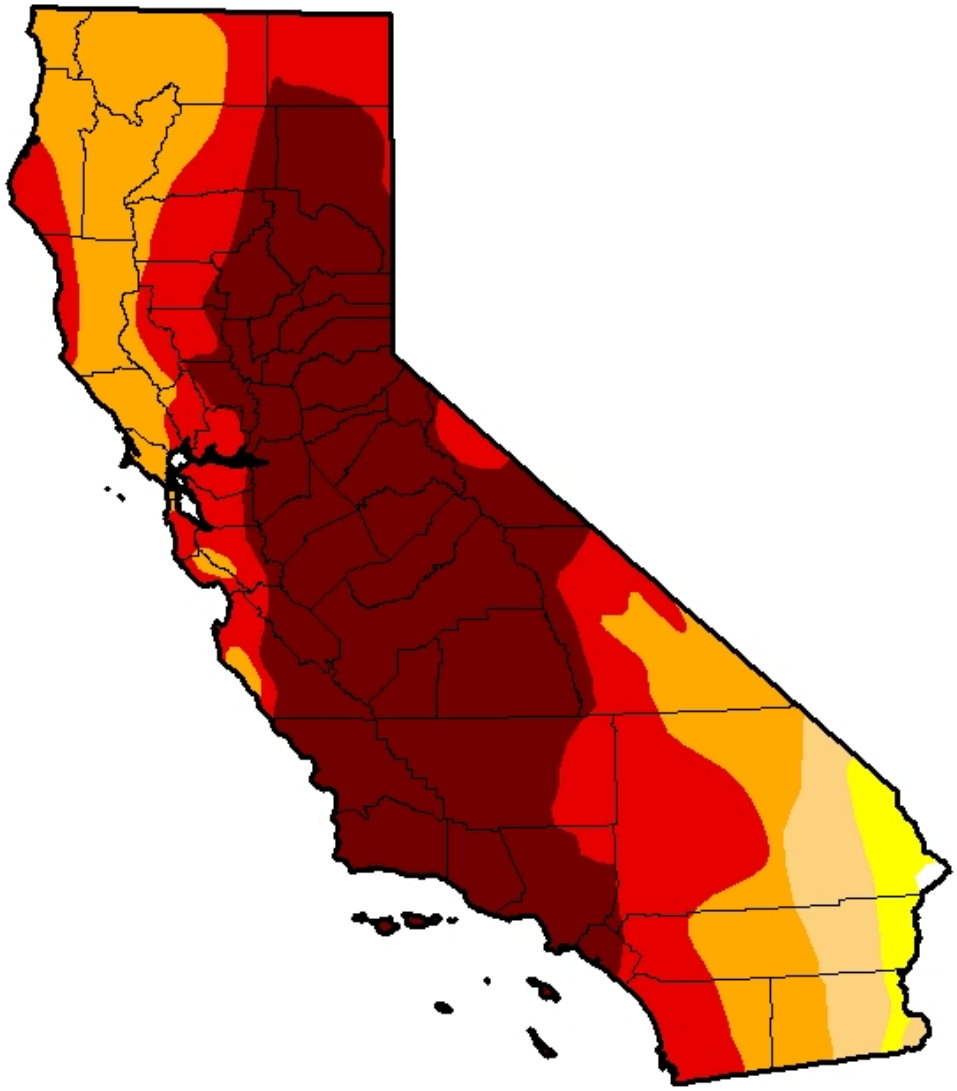
Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The U.S. Drought Monitor is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration. Map courtesy of NDMC-UNL

U.S. Drought Monitor

California



November 24, 2015

(Released Wednesday, Nov. 25, 2015)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.14	99.86	97.33	92.26	70.55	44.84
Last Week 11/17/2015	0.14	99.86	97.33	92.26	70.55	44.84
3 Months Ago 8/25/2015	0.14	99.86	97.35	92.36	71.08	46.00
Start of Calendar Year 12/30/2014	0.00	100.00	98.12	94.34	77.94	32.21
Start of Water Year 9/29/2015	0.14	99.86	97.33	92.36	71.08	46.00
One Year Ago 11/25/2014	0.00	100.00	99.72	94.42	79.69	55.08

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
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- D3 Extreme Drought
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The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Richard Heim
NCEI/NOAA

http://droughtmonitor.unl.edu/

California

Hit hard by Climate Change

- Idea think tank
- Progressive Political Leadership
- Global Economy
- Leading in Climate Change Issues and Policies

Do we understand water?

Gross Domestic Product, 2014 (1)

Ranking	Economy	USD, M$	
1	United States	17,419,000	
2	China	10,360,105	
3	Japan	4,601,461	
4	Germany	3,852,556	
5	United Kingdom	2,941,886	
6	France	2,829,192	
7	Brazil	2,346,118	**California 2.31 Trillion**
8	Italy	2,144,338	↖
9	India	2,066,902	
10	Russian Federation	1,860,598	
11	Canada	1,786,655	
12	Australia	1,453,770	
13	Korea, Rep.	1,410,383	
14	Spain	1,404,307	
15	Mexico	1,282,720	
16	Indonesia	888,538	
17	Netherlands	869,508	**LA Basin 826 Billion**
18	Turkey	799,535	↖
19	Saudi Arabia	746,249	
20	Switzerland	*685,434*	.8Sep15


Lake Shasta
Lake Oroville
Sierra Nevada Mountains
Delta
Los Angeles Aqueduct
L.A. Aqueduct
California Aqueduct
Colorado River Aqueduct
State Water Project
Local Groundwater, Water Recycling, and Conservation

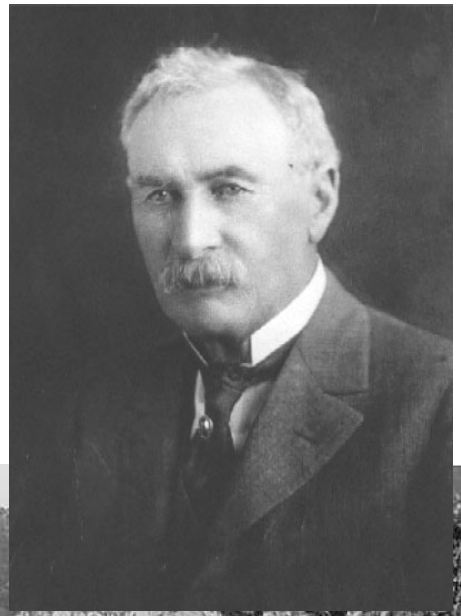
Southern California Imports over 85%

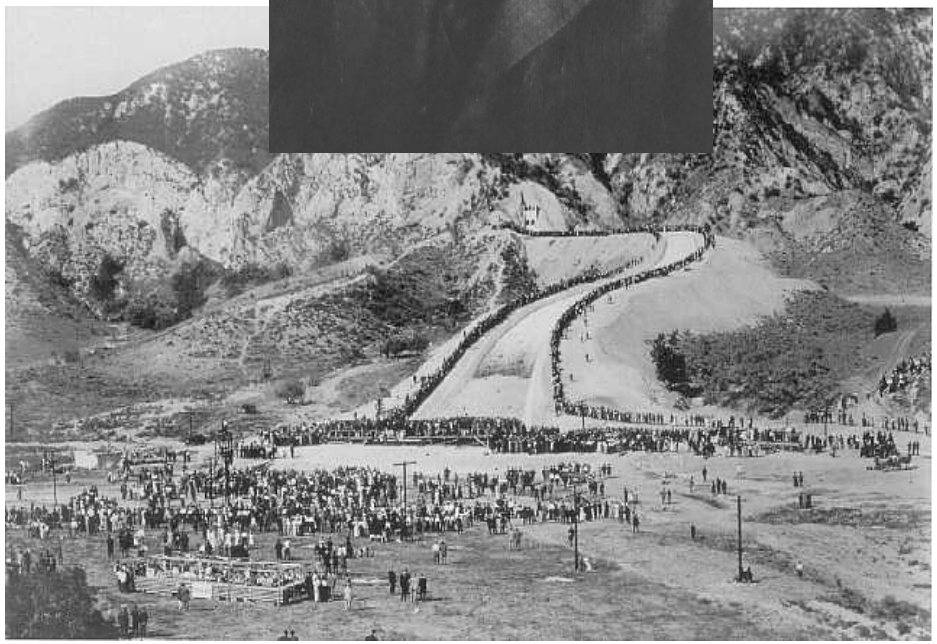
Los Angeles


• Mega City – Urban Area
• Smart Engineers
• Best in Class Political leadership
• Imports over 85% of its water
• Policy, Planning, Plumbing

A Road Map and Approach for a Local Solution

- Policies
- Planning
- Plumbing





“There it is. Take it.”
Nov., 1913

“There it is. Conserve it.”
Nov., 2013

The City of Los Angeles Water Management Challenges

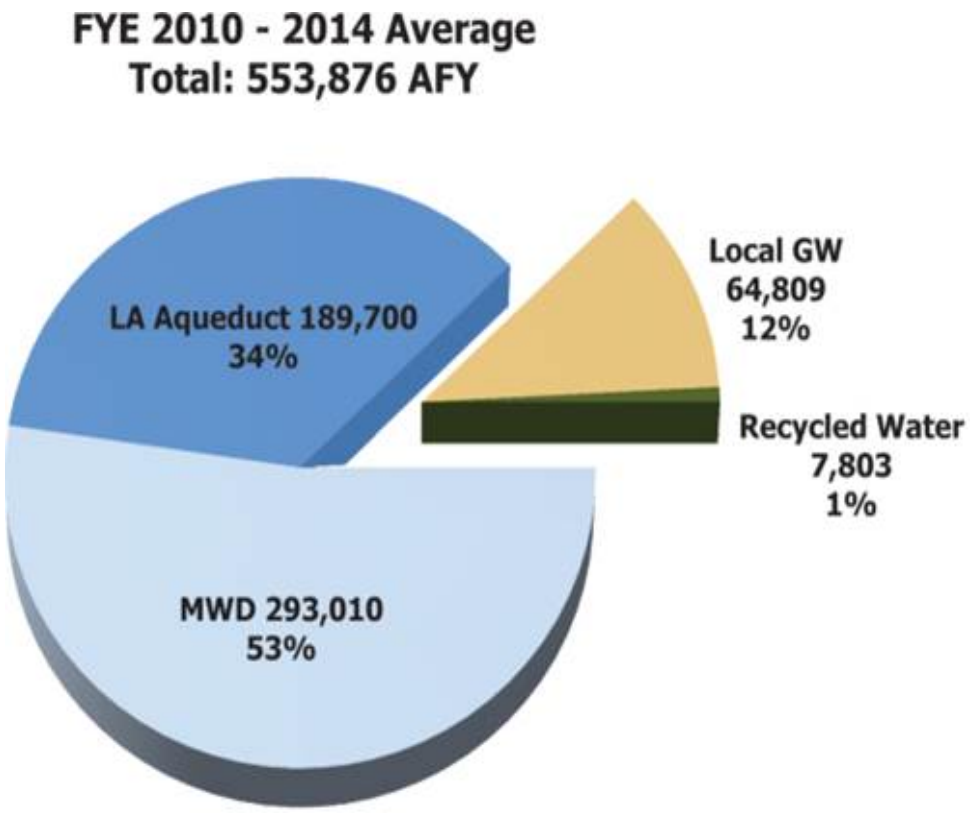
- History of LA linked to water
- importing 85% water supply not sustainable
- Older equipment & infrastructure not as effective
- The City realizes that there is a cost of doing nothing

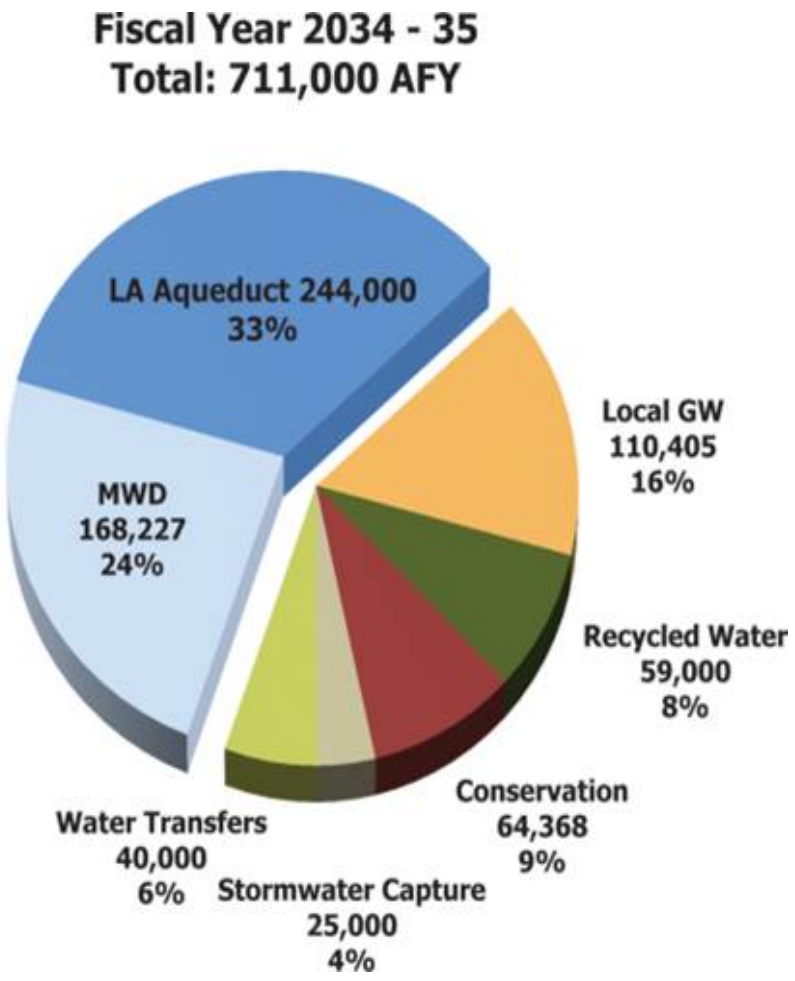
Mayor's Executive Directive # 5
(issued Oct, 2014)

- Reduces Imports by 20% by 2017
- Reduces Purchased Water by 50% by 2024
- Includes an Integrated Local Water Strategy

http://www.lamayor.org/mayor_garcetti_s_executive_directives

Mayor's Executive Directive Goal of 50 % Reduction in Purchased Imports



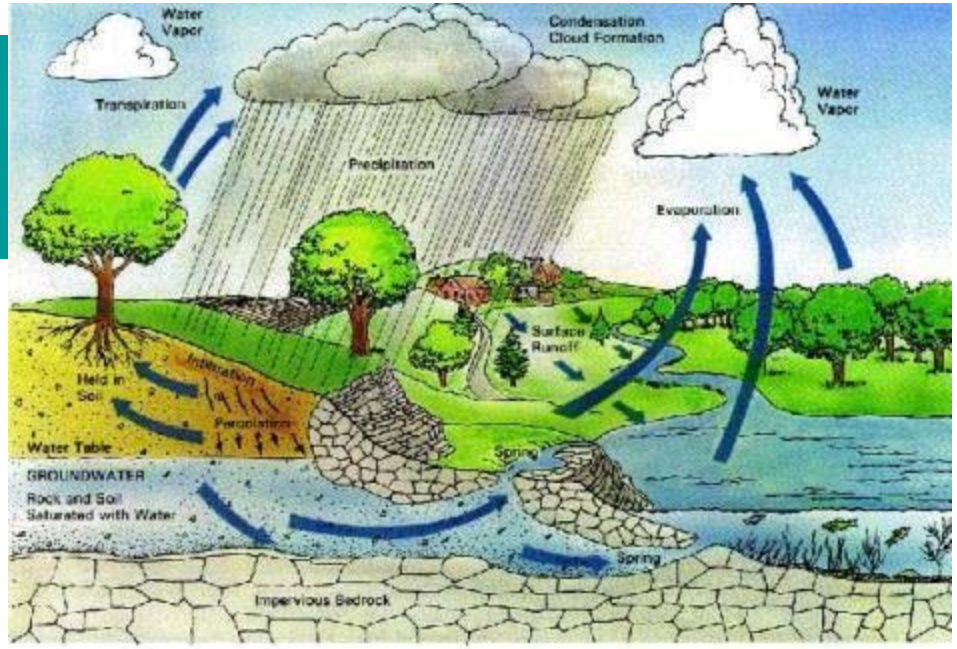


A Road Map and Approach for a Local Solution

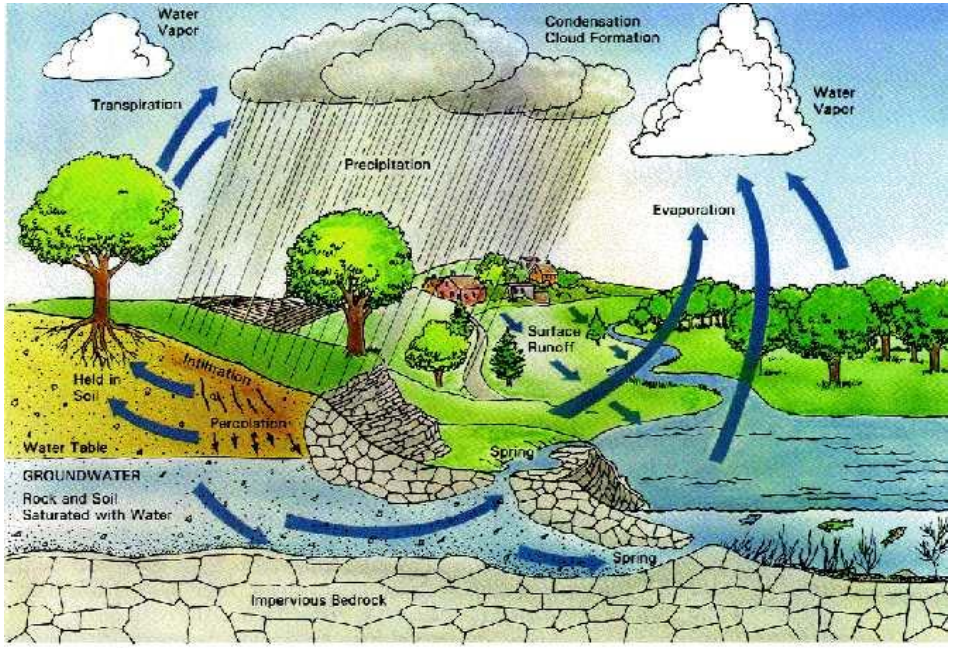
- Policies
- **Planning**
- Plumbing

Planning

LA has been a leader on a sustainable approach:



The Solution



A Sustainable Approach:

Manage all water as <u>One Water</u>:

- Drinking Water
- Rain/Storm Water
- Groundwater
- Recycled Water
- Wastewater

One Water LA Vision

What is it?

One Water LA is a collaborative approach to develop an integrated framework for managing the City's watersheds, water resources, and water facilities in an environmentally, economically and socially beneficial manner

One Water LA will lead to smarter land use practices, healthier watersheds, greater reliability of our water and wastewater systems, increased efficiency and operation of our utilities, enhanced livable communities, resilience against climate change, and protection of public health.

One Water LA Objectives

- Integrate management of water resources and policies
- Balance environmental, economic, and societal goals
- Improve health of local watersheds
- Improve local water supply reliability
- Implement, monitor, and maintain a reliable wastewater system
- Increase climate resilience
- Increase community awareness and advocacy for sustainable water

How Will the City Achieve this Solution?

- Manage all water as **One Water**
- One Water LA facilitates collaboration between ALL City departments and Regional entities
- Water projects are identified and the best opportunities are integrated from the City's "bookshelf"
- Evaluate innovative and creative solutions and technologies
- One Water LA **GOALS:** Determining the highest and best value for water; maximizing water conservation; capturing stormwater; augmenting water supply; reuse water City-wide

One Water LA 2040 builds off the success of the Water IRP

Towards 2020

- **Innovation**
  - Interconnecting water, wastewater and stormwater
- **Integration**
  - Partnerships with LADWP, RAP and other City Orgs
- **Inclusion**
  - Actively sought out stakeholder input and direction

Towards 2040

One Water LA

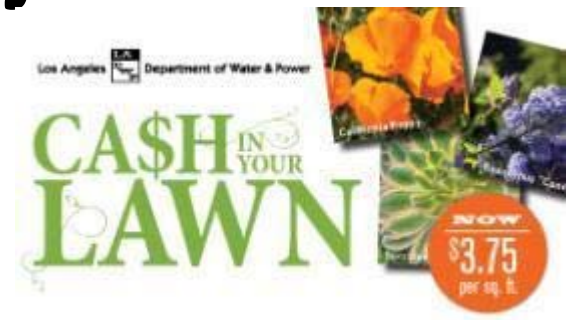
One Water LA

- **Innovation**
  - Address emerging environmental challenges
- **Integration**
  - Build and Expand Citywide Coordination & Partnerships
- **Inclusion**
  - Constant contact and involvement with stakeholders

Managing Water Involves City Projects And Community Projects

Recycled Water

Stormwater Capture



Water Conservation

SF Groundwater Basin Remediation

Local Water Supply Reliability

City of Los Angeles' Clean Water Program

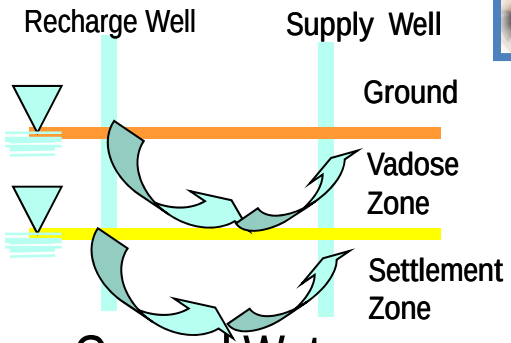
Population served – 4 million
600 sq. mi. service area
29 contract agencies served

Water Reuse

Advanced & Costly Technologies

Real & Perceived Risk

Drinking Water



Ground Water Recharge

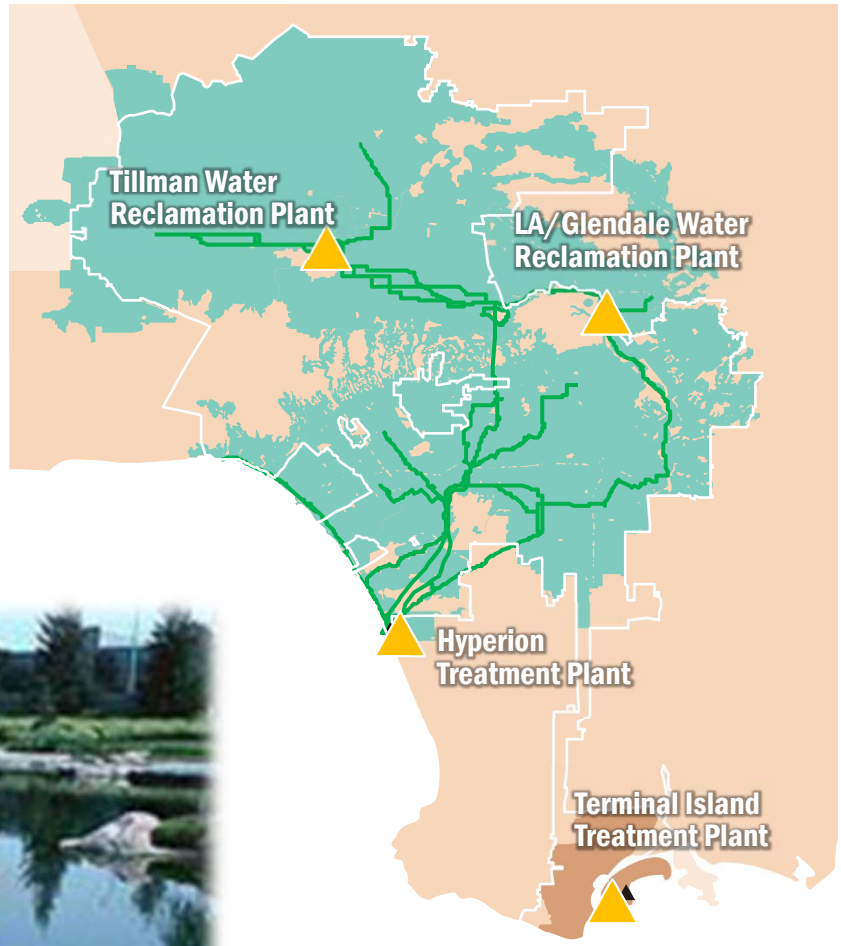
Grey Water

Irrigation

Water Scarcity

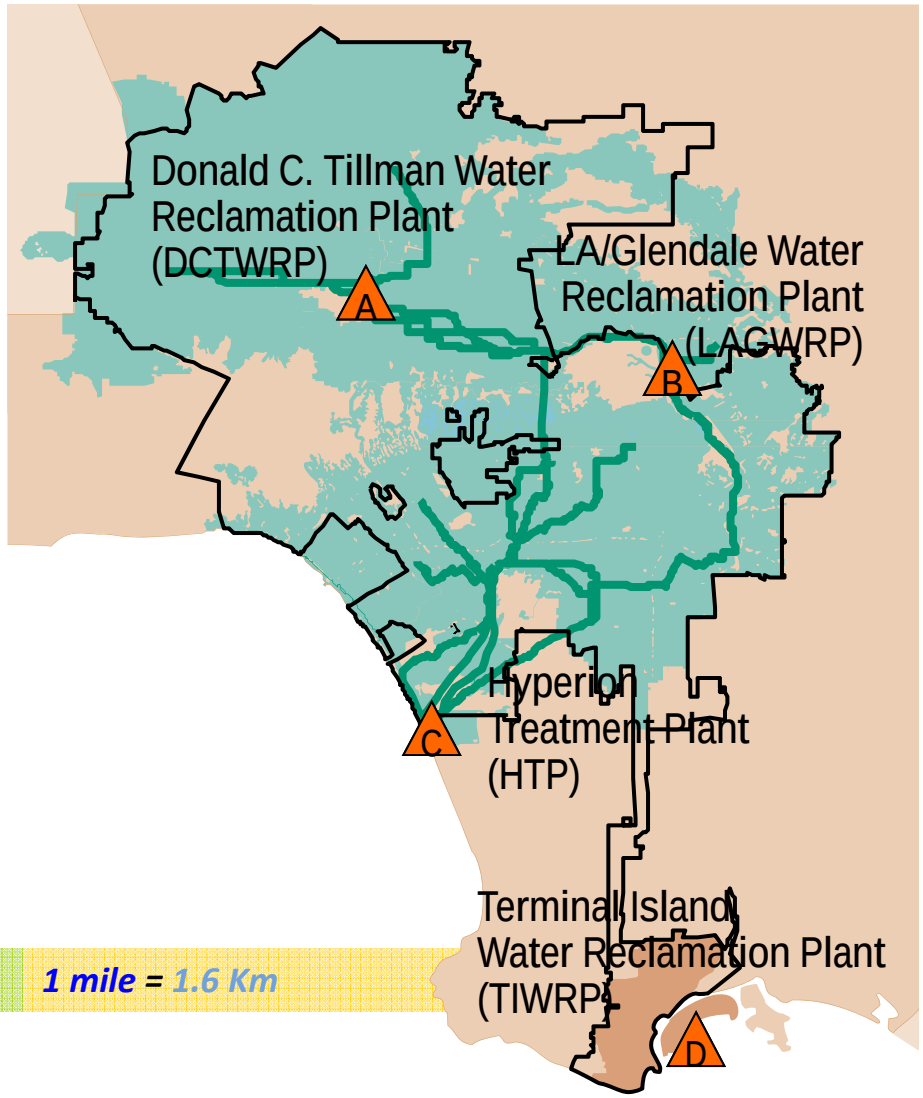
Clean Water Program *(Wastewater Program)*

- 4 Wastewater Treatment Plants
  550 mgd capacity
- 6,700 miles of sewer
- 47 wastewater pumping plant
-
- Invested over $6.3 billion
  over the last 25 years



LA's Wastewater Collection System

- DCTWRP – 80 mgd capacity
- LAGWRP – 20 mgd capacity
- HTP – 450 mgd capacity
- TIWRP – 30 mgd capacity



1 MGD = 3785 m^3/day = 1120 Acre Feet per Year (AFY)

1 mile = 1.6 Km

Plant	Treated Wastewater		Total Recycled		
	MGD	AFY (x1000)	MGD	AFY (x1000)	%
Hyperion	279	313	47	52	17%
D.C. Tillman	35	39	29	32	82%
LAG	15	17	5	6	33%
Terminal Island	15	16	4	4	26%
Total	344	385	84	94	24%

1 MGD = 3785 m^3/day = 1120 Acre Feet per Year (AFY)

Los Angeles

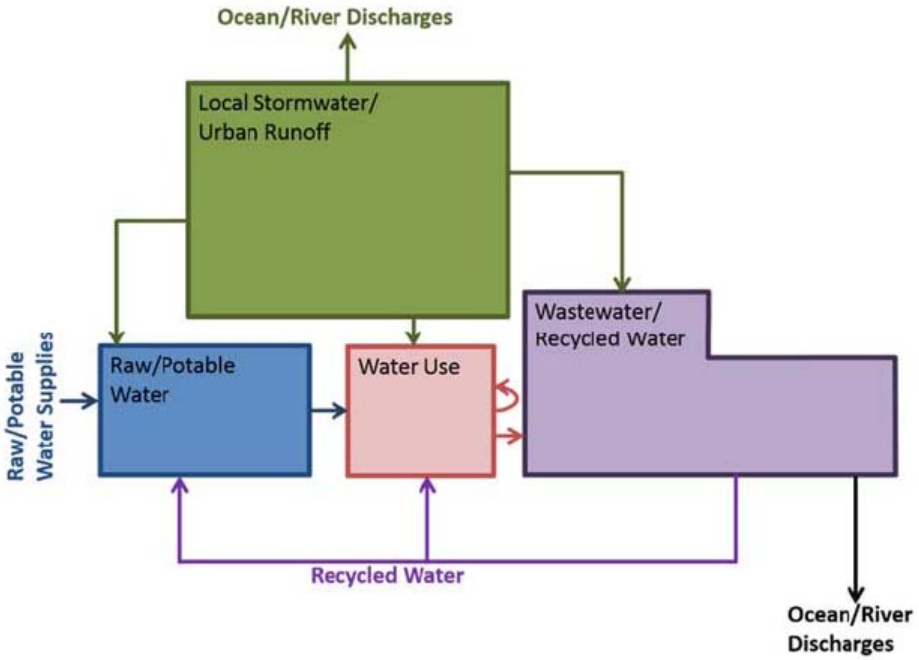
- The Drought Encourages New City-wide Goals And Objectives
- One Water LA Early Successes
- Communicating The One Water LA Strategy
  - One Water LA Moving Forward
  - Interdepartmental & Interagency Collaboration
- One Water LA Key Deliverables
- Climate Change Approach and Efforts

One Water LA Key Deliverables

- Water Balance Tool
- Wastewater Facilities Plan & Capital Improvement Program
- Integrated Water Projects Strategy Plan
- Climate Change Impacts on City Infrastructure
- Stormwater Facilities Plan & Capital Improvement Program
- Marketing & Outreach Strategy Plan

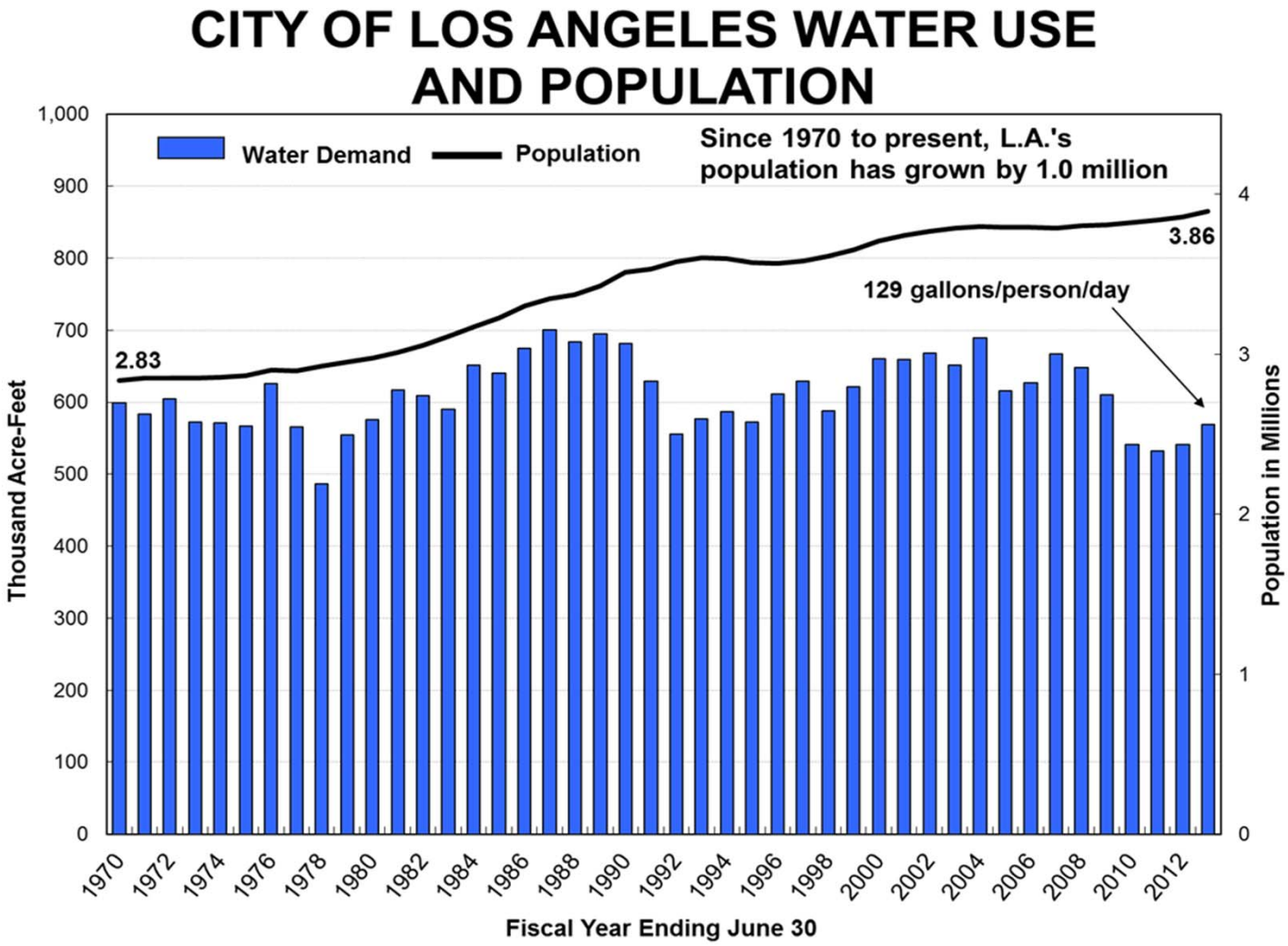
Brief Overview of the City's Water Balance Tool

- Represents the complexity of water sources & sinks in Los Angeles
- Provides snapshot of the magnitude of flows under current & expected conditions
- Tool is meant to develop common understanding of how much water flows into the City, how it is used, and where it goes after use



Overview of Water Balance Flows

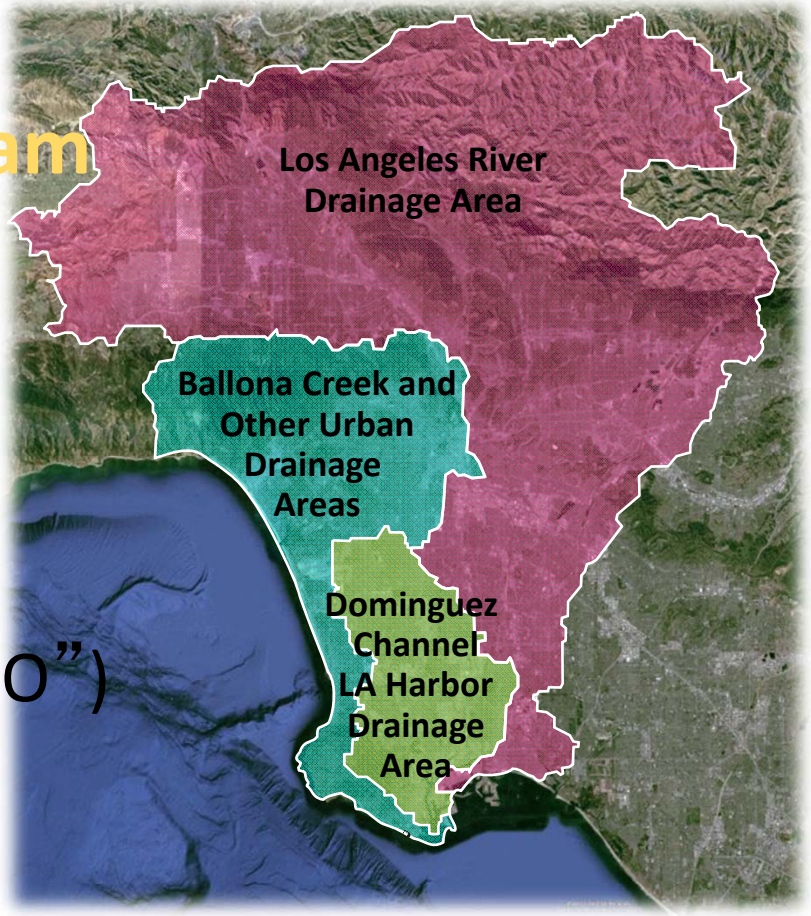
Why a New Planning Baseline?



Look at a Watershed Based Approach

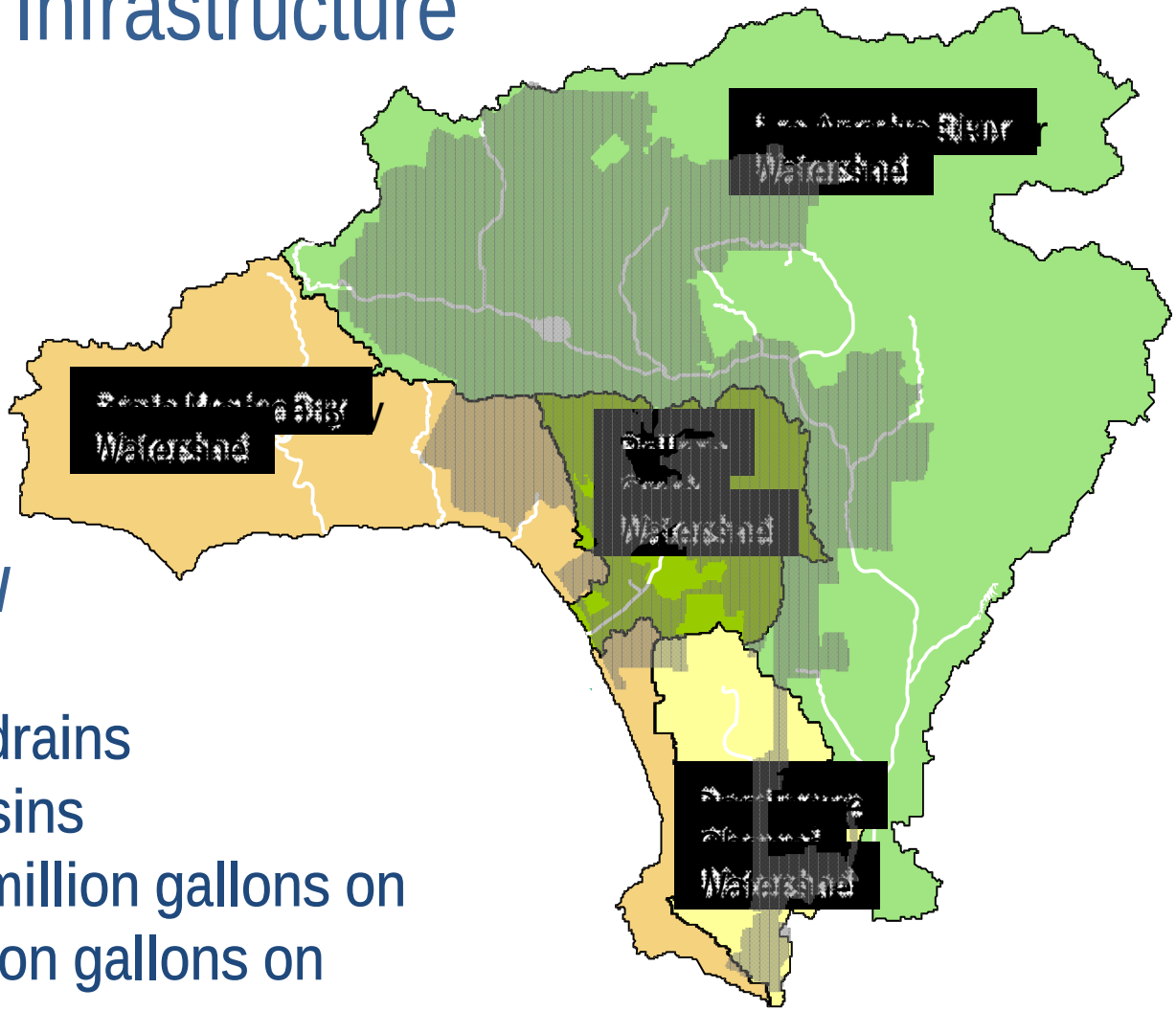
Watershed Protection Program
(Stormwater Program)

- 1,200 miles of pipes
- 100 miles of open channels
- 38,000 catch basins
- Part of 4 watersheds
- $0.5 billion program (Prop "O") since 2004



LA's Stormwater Infrastructure

- Watersheds:
  - *L.A. River*
  - *Ballona Creek*
  - *Santa Monica Bay (North & South)*
  - *Dominguez Channel*



- 1,500 miles of storm drains
- Over 38,000 catch basins
- Stormwater: Tens of million gallons on dry days; over 10 billion gallons on rainy days

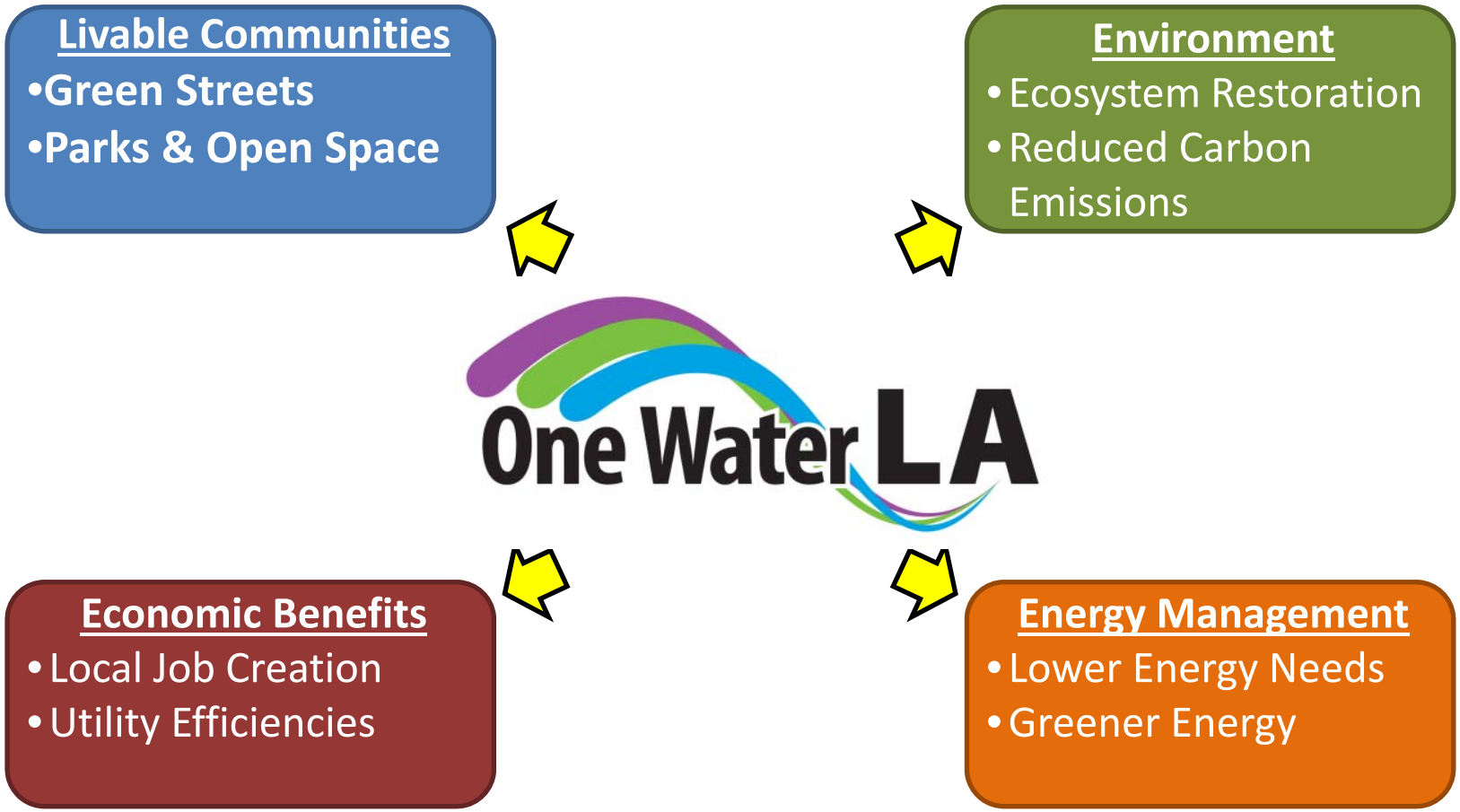
***1 MGD** = 3785 m^3/day = 1120 Acre Feet per Year (AFY)* ***1 mile** = 1.6 Km*

One Water LA Plan Objectives

What will it do?

- Integrate management of water resources and policies
- Balance environmental, economic, and societal goals
- Improve health of local watersheds
- Improve local water supply reliability
- Implement, monitor, and maintain a reliable wastewater system
- Increase climate resilience
- Increase community awareness and advocacy for sustainable water

Additional benefits



A Road Map and Approach for a Local Solution

- Policies
- Planning
- **Plumbing**

Capital Improvement

- The City spent $159 million during Fiscal Year 2013/14 for wastewater capital improvement projects

- Planned $2.6 billion through Fiscal Year 2022/23

Driving Leadership and Inspiration - Solutions

Politics and
Financing

Technologies

Resources – It's
about People

Community Needs Require the Best People

Environmental Engineer of Tomorrow

- Concrete
- Steel
- Hydraulics
- Structures
- Geotechnical

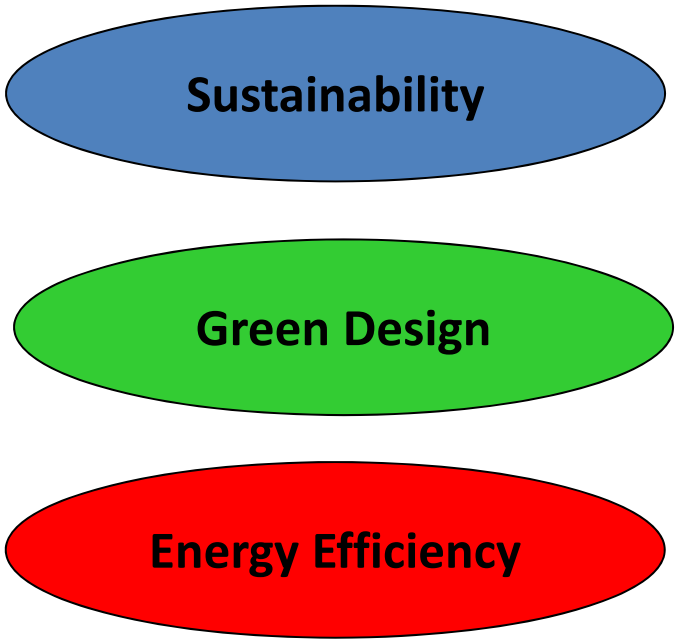
- Public Health Advisor
- Technology Innovator
- Regulatory Leadership
- Integrated Systems Planning; (Water, Wastewater, Energy)
- Social Psychologists / Public Communicators
- Genetic Engineering
- Epidemiology / Toxicology
- Policy Advisor / Politics
- Finance / Legal

Driving Leadership and Inspiration – Resources, People

Driving Leadership and Inspiration – Resources, People

Driving Leadership and Inspiration

- Approach every Project through the Eyes and Mission of our Community
- Think:



"The simple fact is that there is a limited amount of water on the planet, and we cannot afford to be negligent in its use. We can't keep treating it as if it will never run out."

United Nations Water Crisis Analysis