

California Ocean Protection Council

Scripps Institute

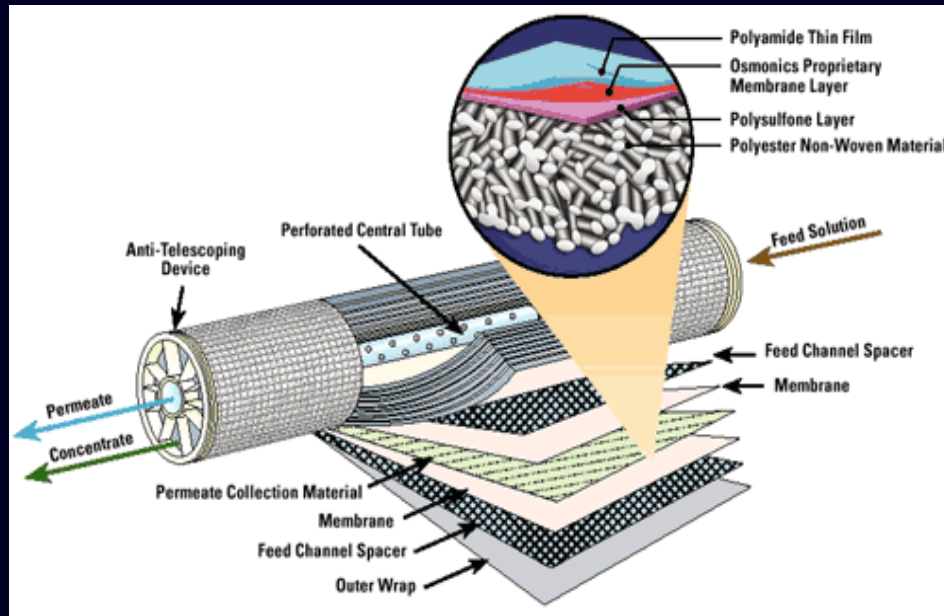
UCSD

November 30, 2009

Desalination in California

- desal works
- almost half century in CA (1960s)
- RO the prevailing technology
- technology improving
(membranes and pressure)
- 26 desalting plants (20 brackish, 6 ocean)

Advanced Water Treatment



Task Force Findings:

“Potentially, desalination can provide significant value and numerous benefits.

- Providing additional water supply to meet existing and projected demands
- Replacing water lost from other sources and relieving drought conditions
- Enhancing water reliability and supplying high quality potable water
- Reducing groundwater overdraft and restoring use of polluted groundwater
- Replacing water that can be used for river and stream ecosystem restoration”

Desalination Task Force, Rec# 2

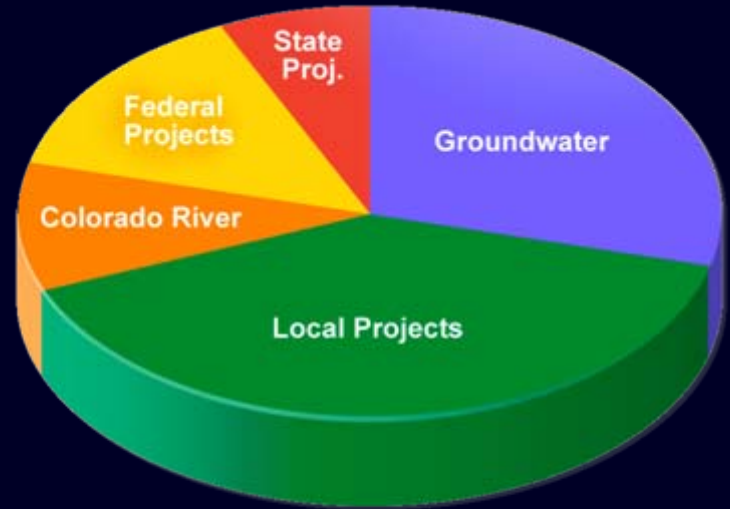
“Include desalination, where economically and environmentally appropriate, as an element of a balanced water supply portfolio, which also includes conservation and water recycling to the maximum extent practicable”.

Water Supply

Every major water supply system in
California (and many other places)
is over-allocated.



State Water Supply Systems



Lester Snow, California
Department of Water Resources

California's Water Portfolio

Sources:

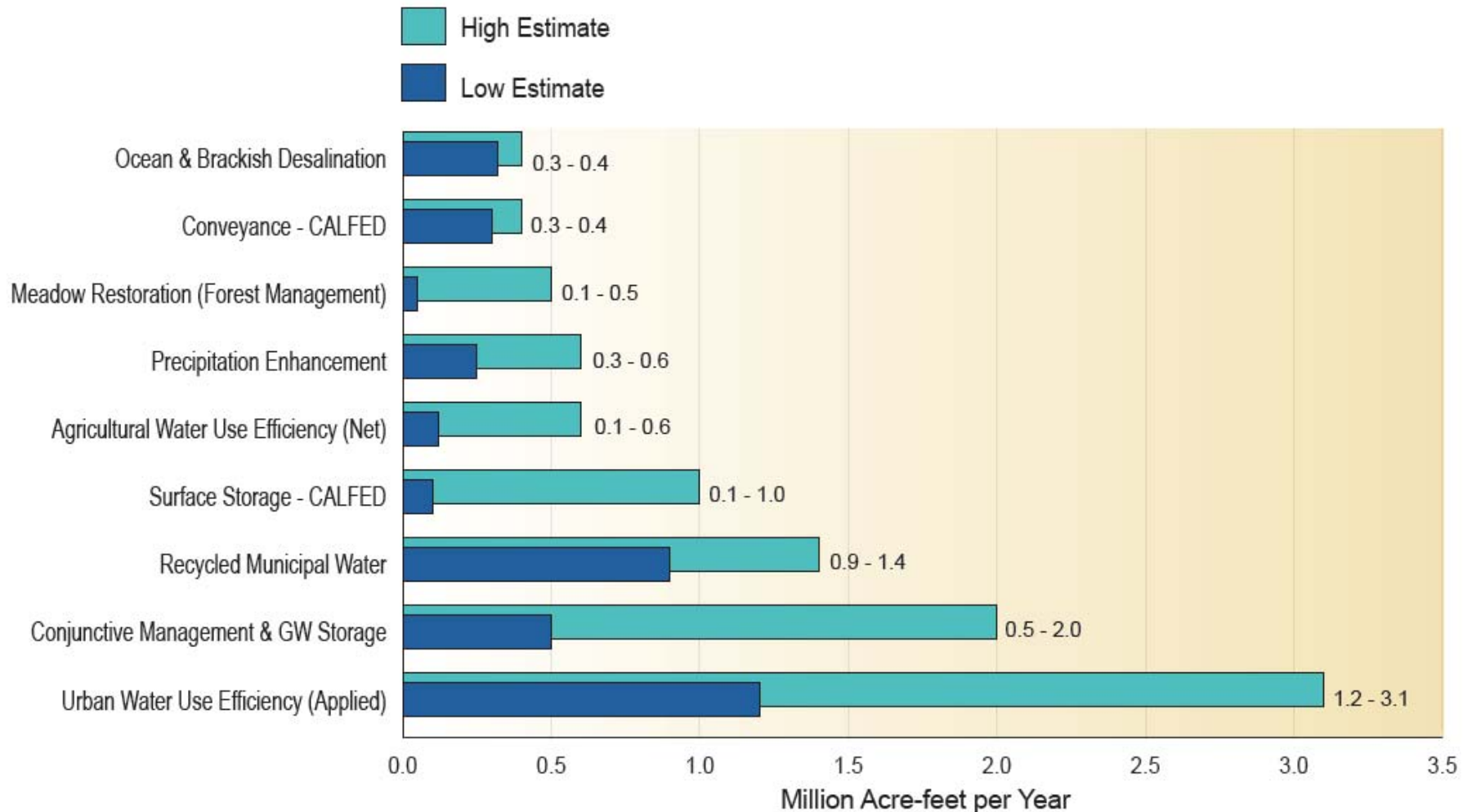
- surface water
- groundwater
- recycling
- seawater desalination

Systems:

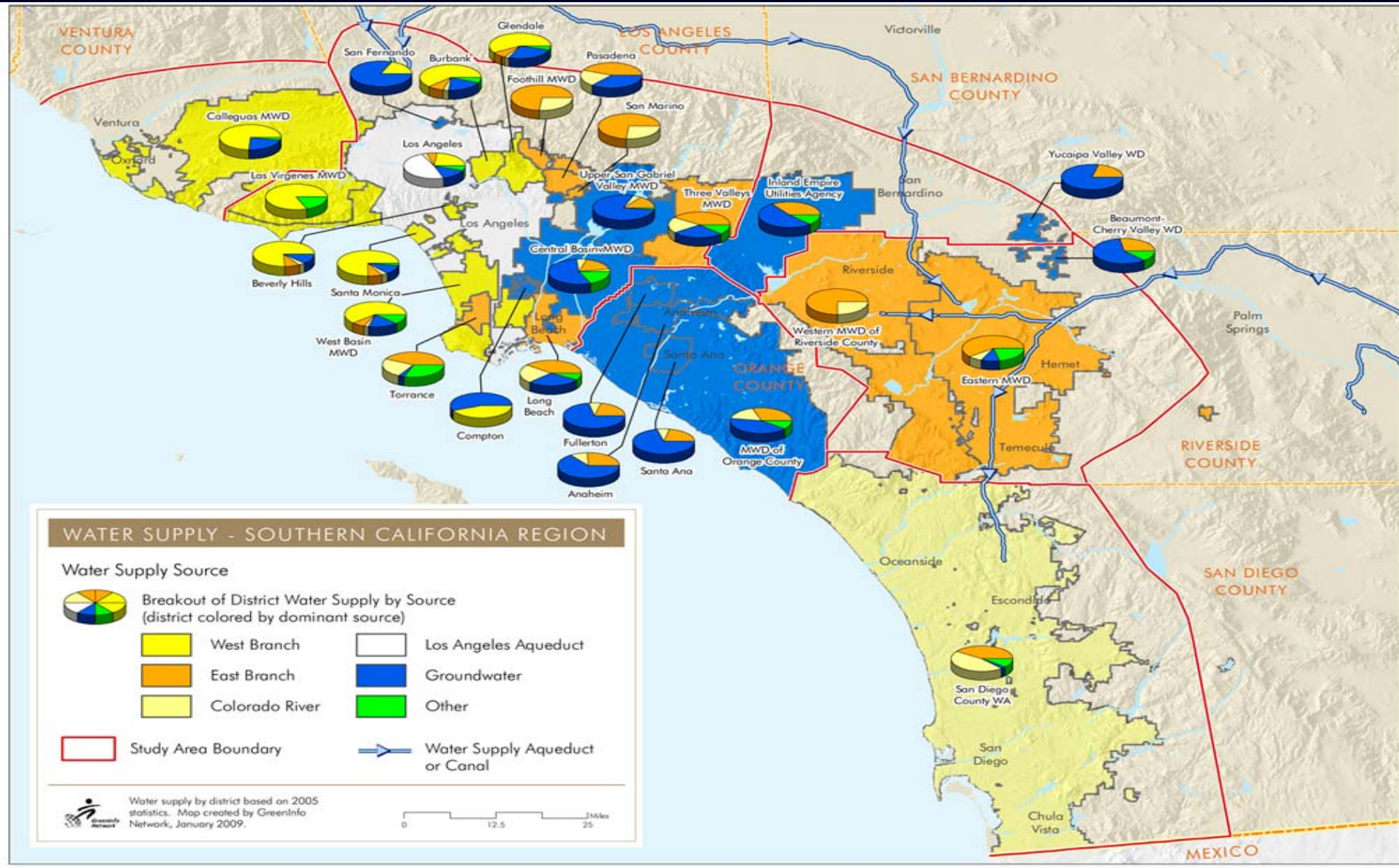
- surface and groundwater management
- interbasin transfers (CRA, SWP, CVP, LA, SF...)
- efficiency improvements / conservation
- rainwater harvesting
- treatment (all sources)

New Water Sources to 2030: DWR B-160 09

Resource Management Strategies



Primary Water Sources in South Coast



Southern California Leadership Council

“Reduced reliance on imported water is key to Southern California’s future.”

Sustainable Water Supplies, 2008 Position Summary

Portfolio Attributes

- Technologies, and prospects for improvements
- Energy intensity of systems
- Treatment requirements and options
- Source and system reliability
- Vulnerability and resilience
- Economics

Waste = Opportunity



Irrigation Efficiency



Efficiency Options



Stormwater Flows



Infiltration Islands



Courtesy of Bruce Ferguson

FINDINGS FOR SOUTHERN CALIFORNIA AND SAN FRANCISCO BAY REGION WATER SAVINGS—2030
(Acre-feet per year, af/yr)

	Southern California	San Francisco Bay	TOTAL
Low	194,500	34,500	229,000
Medium	265,500	49,000	314,500
High	342,000	63,000	405,000

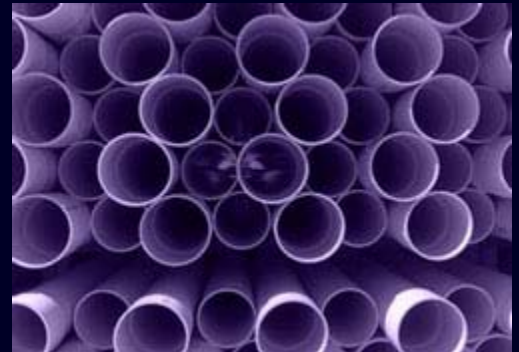
FINDINGS FOR SOUTHERN CALIFORNIA AND SAN FRANCISCO BAY REGION ENERGY SAVINGS—2030
(Megawatt-hours per year, MWh/yr)

	Southern California	San Francisco Bay	TOTAL
Low	443,500	129,500	573,000
Medium	676,500	190,500	867,000
High	974,500	251,000	1,225,500

FINDINGS FOR SOUTHERN CALIFORNIA AND SAN FRANCISCO BAY REGION CO₂ SAVINGS—2030
(Metric tons per year)

	Southern California	San Francisco Bay	TOTAL
Low	194,000	56,500	250,500
Medium	295,500	83,500	379,000
High	426,000	109,500	535,500

Recycled Water



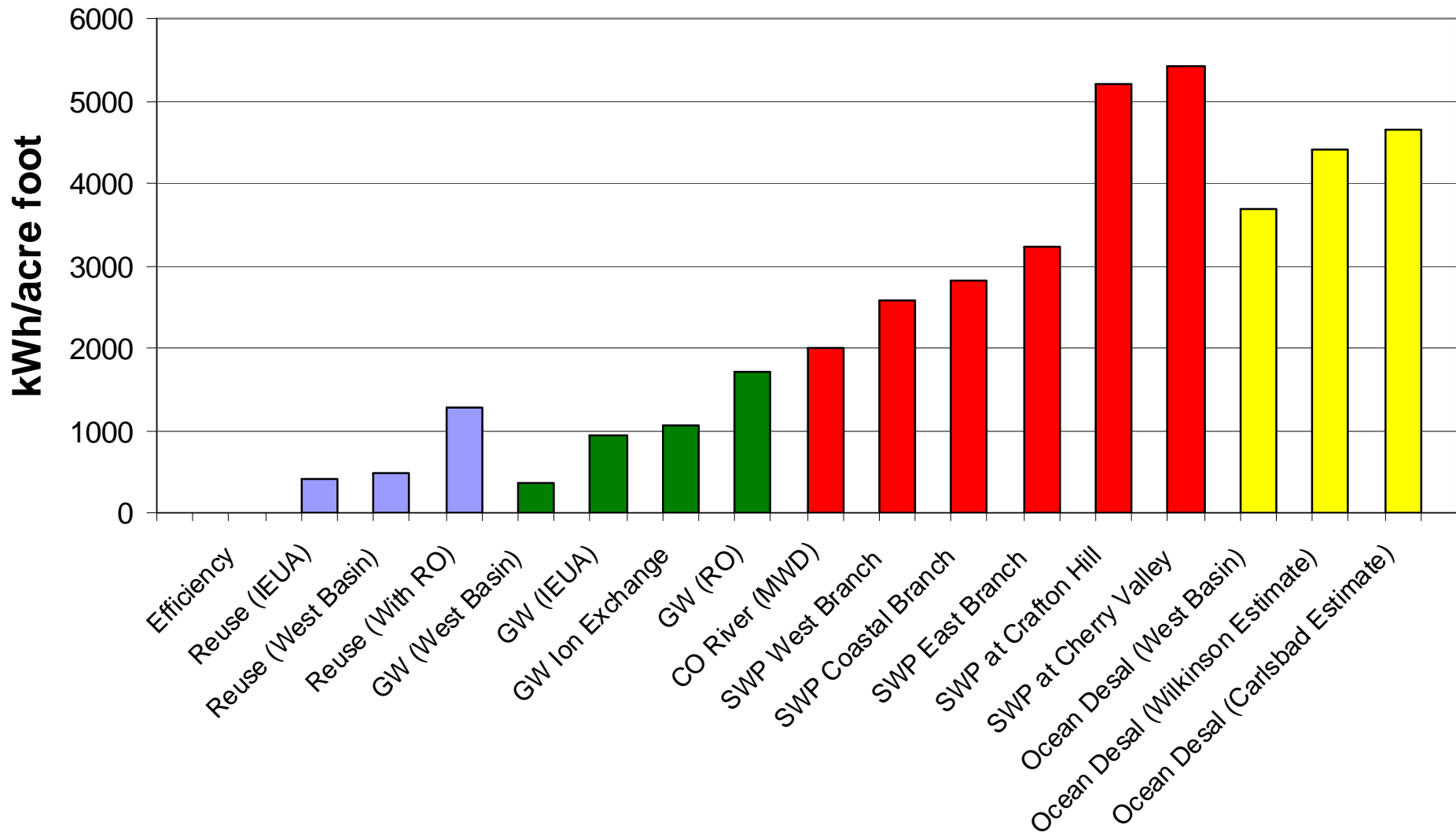
Energy Intensity of Water

California:

19% electricity

33% natural gas (non-power plant)

Energy Intensity of Selected Water Supply Sources in Southern California



Conclusion



Stein's Law

“Things that can't go on forever, don't.”

Herb Stein

Economics Matters



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