



Planning for Our Water Future:

City of Santa Cruz & Soquel Creek Water District

Sustainable Water Coalition

September 19, 2011



Overview

- 💧 **Background information on City of Santa Cruz and Soquel Creek Water District**
- 💧 **Our Water Supply Problems**
- 💧 **Our Water Plans**
- 💧 **Progress & Updates to our Water Plans**
- 💧 **scwd² Desalination Program- Timeline**
- 💧 **Frequently Asked Questions**



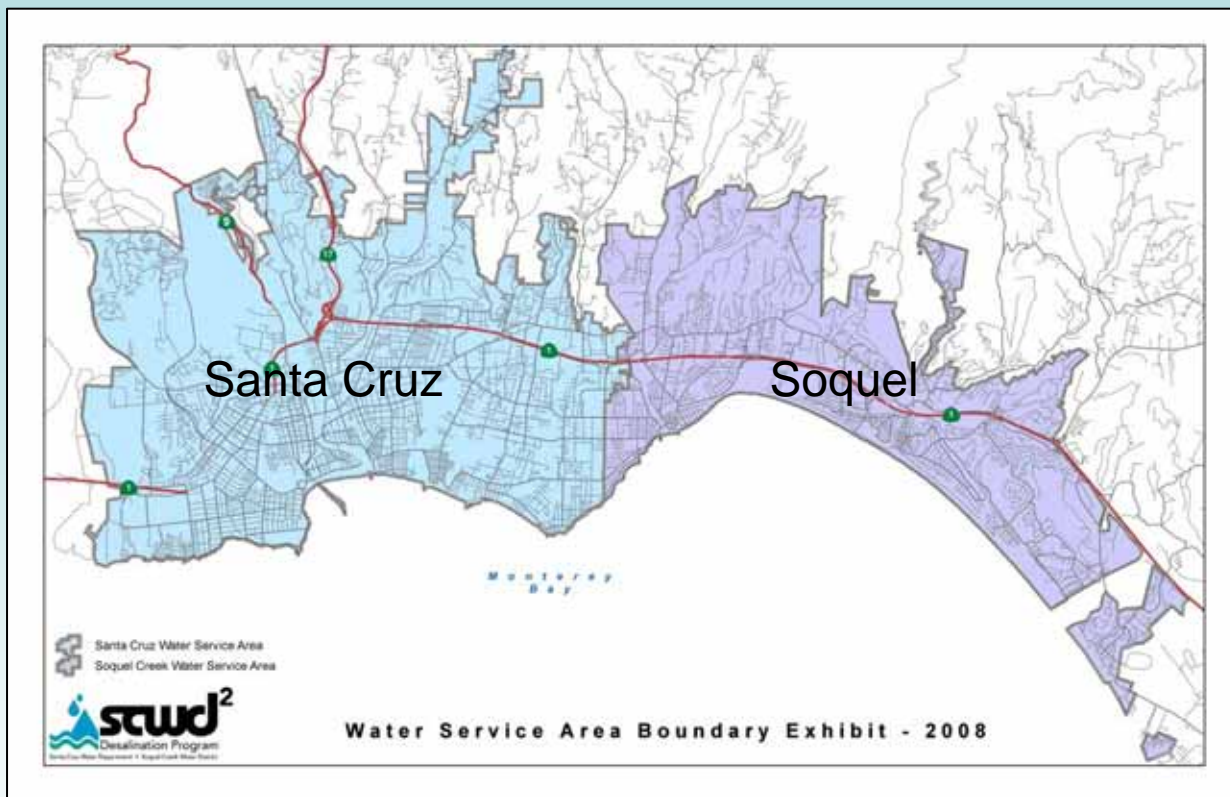
Our Primary Goals Regarding Water Supply:

Safe ● Adequate ● Reliable

The Challenge Every Water Utility Faces:

How to best balance available water supplies with the needs/demands of utility customers, now and into the future.

scwd² is a collaboration between the Santa Cruz Water Dept. & Soquel Creek Water Dist.



- ◆ Together we serve over 135,000 people
- ◆ Similar values and objectives
- ◆ Our different needs led us to a collaborative approach for sustainable water resources

Demographics



- ◆ Population: ~91,000
- ◆ Employment: ~45,000
- ◆ 63% residential , 26% business, industry, UCSC
- ◆ Indoor use 75-80%, Outdoor use 20-25%

- ◆ Population: ~38,000
- ◆ Employment: not available
- ◆ 79% residential, 13% commercial, remainder is irrigation and other
- ◆ Indoor use 75%, Outdoor use 25%

Our Water Supplies: 100% Local Supply- No water is imported



City of Santa Cruz

- Water primarily comes from rainfall into local streams and reservoirs
- Small portion of the system is groundwater

Soquel Creek Water District:

- Local groundwater is the only source
- No water from creeks or rivers





Water Supply Issues

1. Shortage during drought conditions

Approximately 40% shortfall if drought similar to 1976-77 occurs

2. Safe stream flow passage

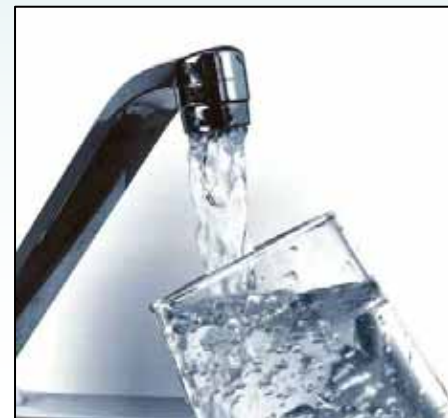
New regulatory requirements to protect endangered fish species (Habitat Conservation Plan)

3. Water rights

Pending applications could affect reservoir operations and reduce water withdrawals

4. Water quality

Groundwater basin is overdrafted





SOQUEL CREEK
WATER DISTRICT

Water Supply Issues

1. Groundwater Overdraft

Sustainable yield could be as much as 40% less than what was previously assumed

2. Seawater Intrusion

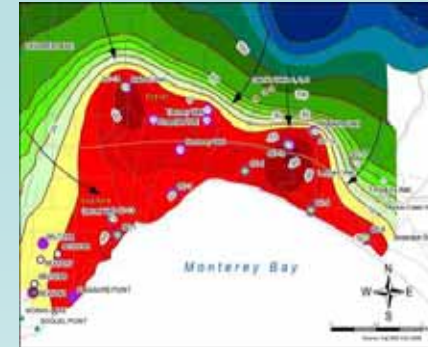
Contamination by seawater into the freshwater aquifers will make the groundwater unusable

3. Water Quality

New drinking water regulations for Cr 6 could impact 1/3 of our groundwater supply

4. Climate Change

Potential for intense storms with greater runoff and less percolation into the aquifers, more frequent droughts, and rising sea levels



No Supplemental Supply? What could happen....

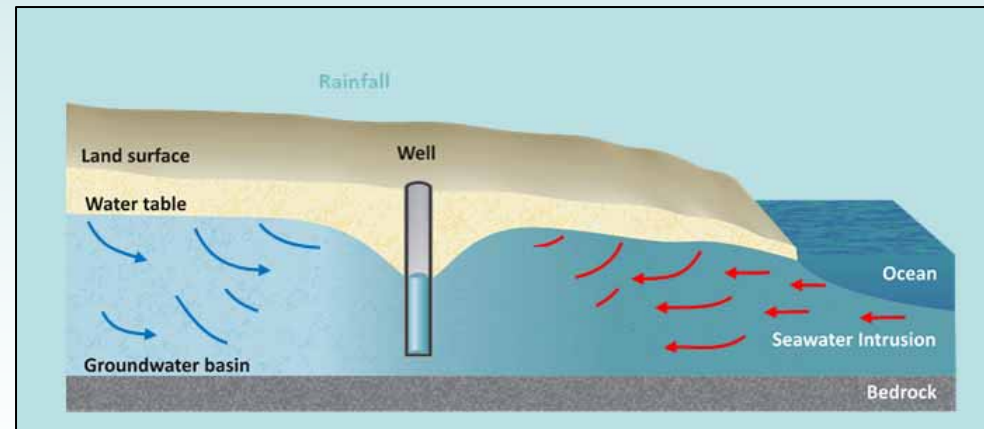


City of Santa Cruz (during drought conditions)

- Severe water rationing
- Extreme limits on outdoor use
- Recreation facilities (parks, pools) reduced or shut down
- Affects residents, businesses, tourism, etc.

Soquel Creek Water District

- Severe water rationing
- Contamination of our only water supply
- Damage can be irreversible
- Affects residents, businesses, tourism, etc.



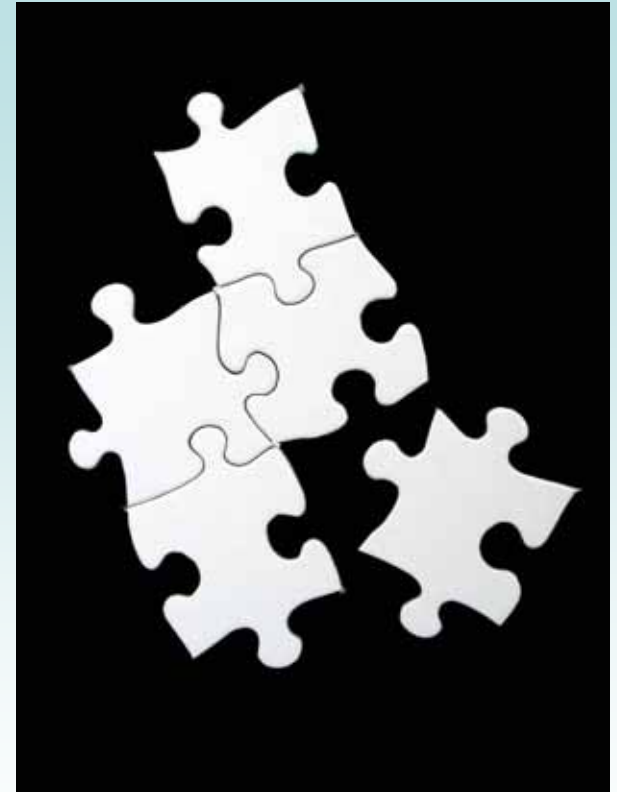
Solution not just a single supply project. In the late 1990's- both agencies pursued Programmatic Approach

Programmatic Approach

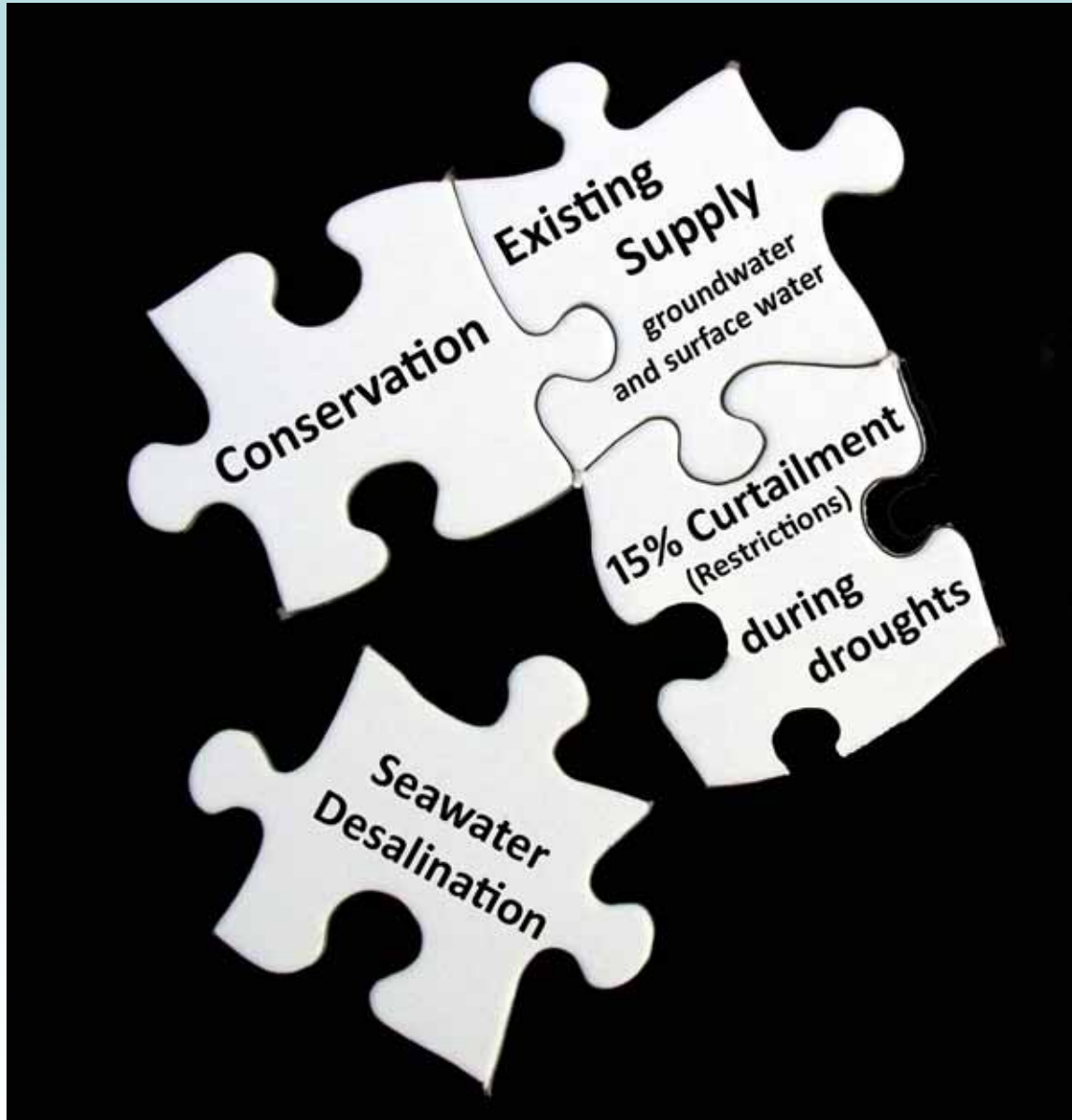
Decrease demand and increase supply

Additional Studies and Reports

- ◆ SqCWD Draft IRP (1997)
- ◆ Water Demand Investigation (1998)
- ◆ Water Conservation Plan (2000)
- ◆ Water Curtailment Study (2001)
- ◆ Alternative Water Supply Study(2000)
- ◆ Evaluation of Regional Water Supply Alternatives (2002)
- ◆ SCWD Integrated Water Plan (2003)
- ◆ 2005- Program IWP EIR (2005)
- ◆ 2006- SqCWD IRP (2006)



Our Water Plan



Santa Cruz and Soquel Creek have active ongoing Conservation Programs to reduce water demand

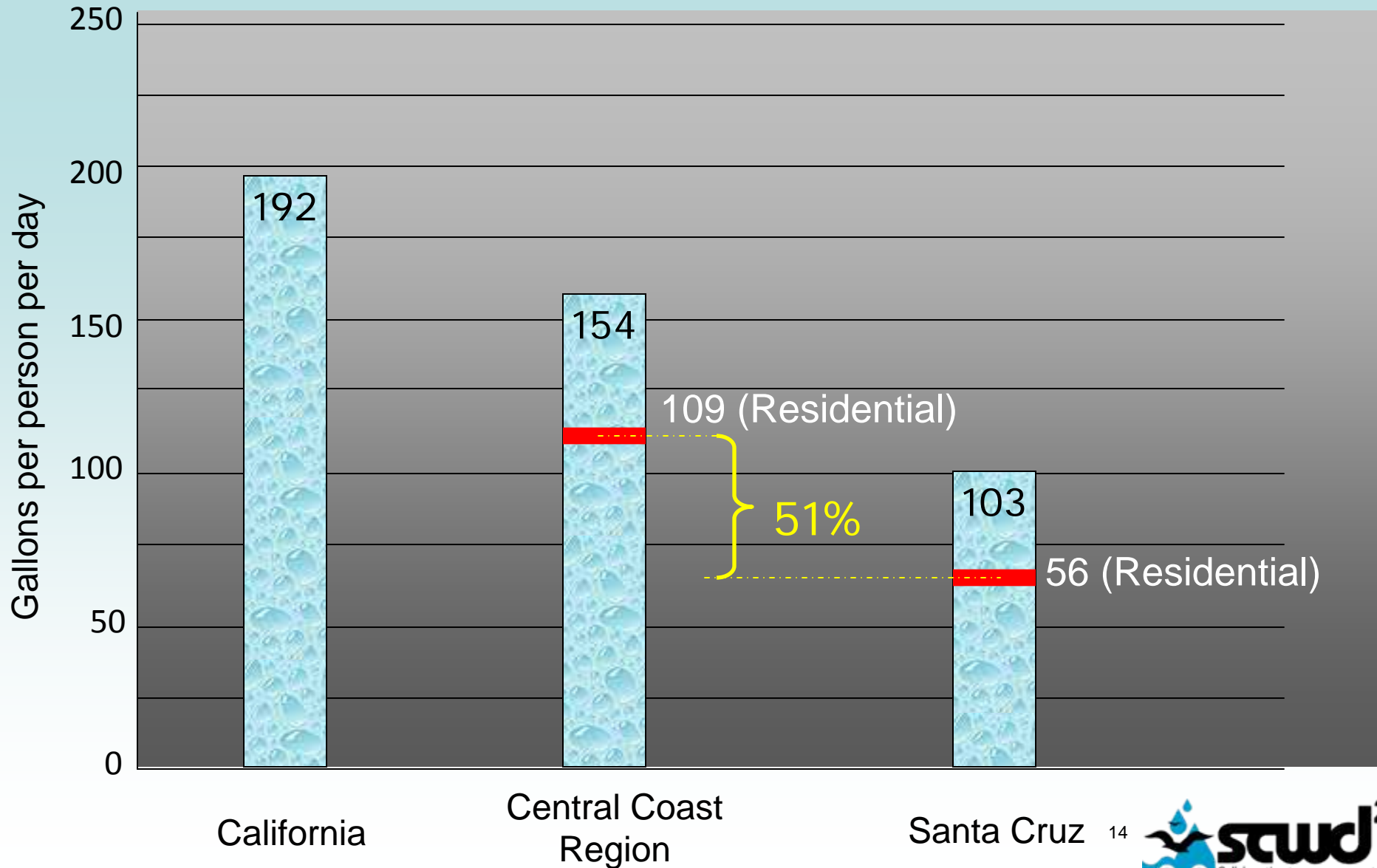


Partial List:

- Home water surveys
- Toilet rebates
- Clothes washer rebates
- Turf replacement
- Rainwater cisterns
- Plumbing fixture retrofit ordinances
- Tiered rate structures

Both agencies have been recognized for award-winning Conservation Programs

Current Water Use Comparisons and Results of Conservation Efforts



In a drought, 15% additional rationing and restrictions are needed



For City, likely drought scenario (Stage 3) includes:

- 💧 Restricted residential water use (27%)
- 💧 Minor cutbacks to businesses (8-10%)
- 💧 Reduced large landscape water budgets (66% reduction)

**Our customers already do a great job conserving -
With rationing, mandatory use restrictions would be in effect.**

Conceptual 2.5 MGD Desalination Facility



* Shared Use

* Shared Costs

Passive wedgewire screens at an open ocean intake are designed to protect marine organisms

Potential intake system under evaluation:



Courtesy of: Alden Research

Slot size of 2 mm

Intake velocity < 0.33 fps

Why Desalination?



- ◆ Technology is safe and used worldwide to provide potable water
- ◆ One desalination facility would meet the needs for both agencies at a shared cost
- ◆ Diversifies our water portfolios
- ◆ The ocean is a viable supplement to surface and groundwater sources that are vulnerable to drought and seawater contamination
- ◆ A desalination facility is a flexible supply project. Can be responsive to growth, but not out ahead of growth.

Sharing 2.5 MGD of Desalinated Water



- Would use up to 2.5 million gallons per day (May-October)
- Operate during droughts, approx. 1 or 2 in 7 years
- Potentially use 3 in 10 years for HCP.



- May use ~1.5 million gallons per day (year round)
- (1) Operate to restore groundwater basin (could take 10+ years) then (2) at a lesser amount to sustain protective groundwater levels

Water Supply Planning: Engineering, Science and Policy



CEQA



Key Changes for SCWD since 2005 IWP



- ◆ Updated Water Demand and Forecast (2010 UWMP)
- ◆ Updated Stream Flow Data
- ◆ Decline of Available Groundwater Supply
- ◆ Development of Habitat Conservation Plan

Conclusion

- ◆ Under a '76-'77 type drought, peak season shortages still look much like they did in the original IWP work (around 40% near term and exceeding 50% long term) with additional HCP Requirements (Tier 2)

Key Changes for SqCWD since 2006 IRP

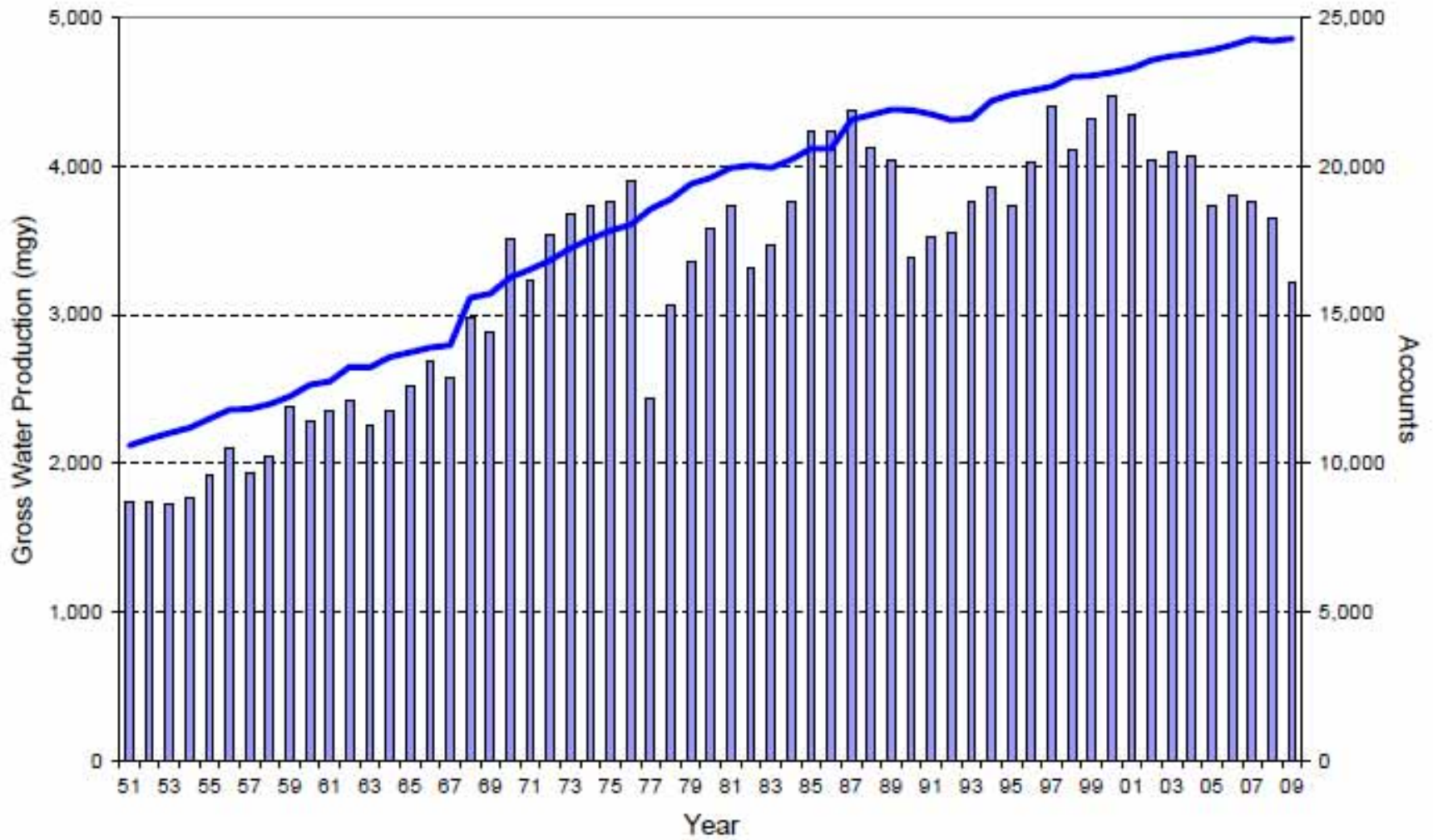


- Updated Water Demand and Forecast (2010 UWMP)
- New information on Groundwater Supply, especially Aromas Red Sands Aquifer
- Drinking water regulations on Cr 6

Conclusion

- Initial restoration of the groundwater basin may require limiting pumping by as much as 40% (from 4,800 afy to 3,000 afy) and could take 10 years to see recovery.
- Even with additional 15% cumulative water conservation projections through 2030, a supplemental supply is still needed to meet customers' needs.

City of Santa Cruz Water Service Accounts And Water Production



Overall scwd² Proposed Project Schedule and Timeline

2005 - 2010 Pilot Plant Testing



2008 - 2012 Additional Studies & Environmental Impact Report



2010 - 2012 Design and Permitting



2013 - 2016 Construction

(Schedule subject to change)

How to stay informed about the project

- ◆ Handouts are available at back table
- ◆ E-mail Updates – sign up to receive monthly email notices and project updates
- ◆ For more info contact: Desalination Program Coordinator at (831) 420-5214

Visit our website:
www.scwd2desal.org

Questions?

Frequently Asked Questions



What studies have been conducted?

Does desalination use a lot of energy?

How are the agencies addressing greenhouse gas emissions?

What about a surface water transfer?




Are there successful desalination plants currently in operation?

How much will the proposed project cost?



What studies have been conducted? What are the preliminary results?

Numerous technical studies are providing the data that substantiates that desalination is plausible

<u>Concern</u>	<u>Study</u>	<u>Study Findings</u>	
Water Quality	Pilot Plant Testing	Desal water is safe	
Marine Impacts with Intake	Open Ocean Effects (Entrainment and screen effectiveness)	No endangered or threatened species found, entrainment impacts considered de minimus	
Marine Impacts with Brine Discharge	Brine Dilution Study	Can effectively blend treated wastewater and brine.	
Energy and GHGs	Energy Minimization & GHG Reduction Plan	<i>Currently underway</i>	

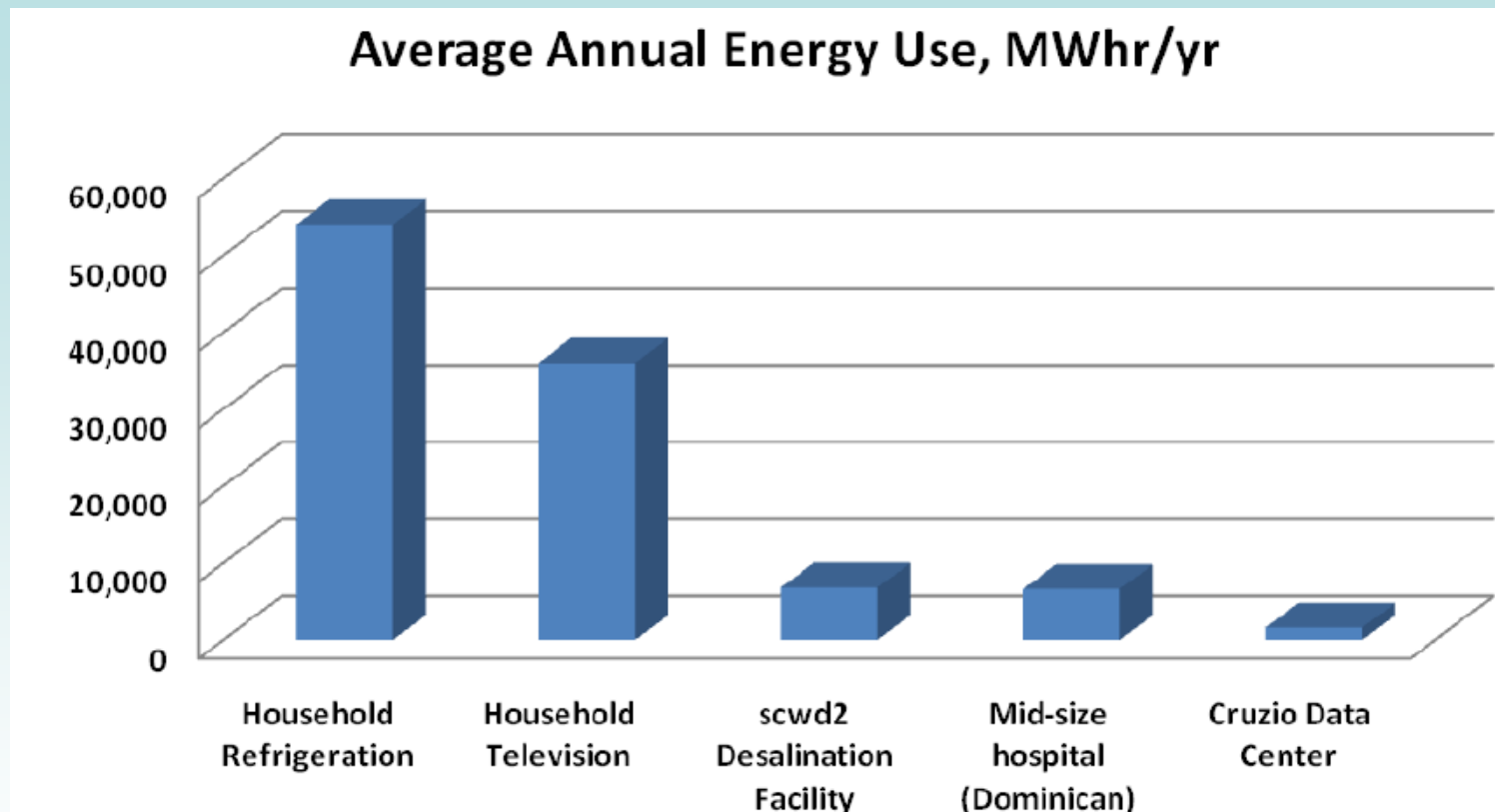
Technical studies will be used to fully inform the environmental impact report (EIR).





Will the proposed desalination project use a lot of energy?

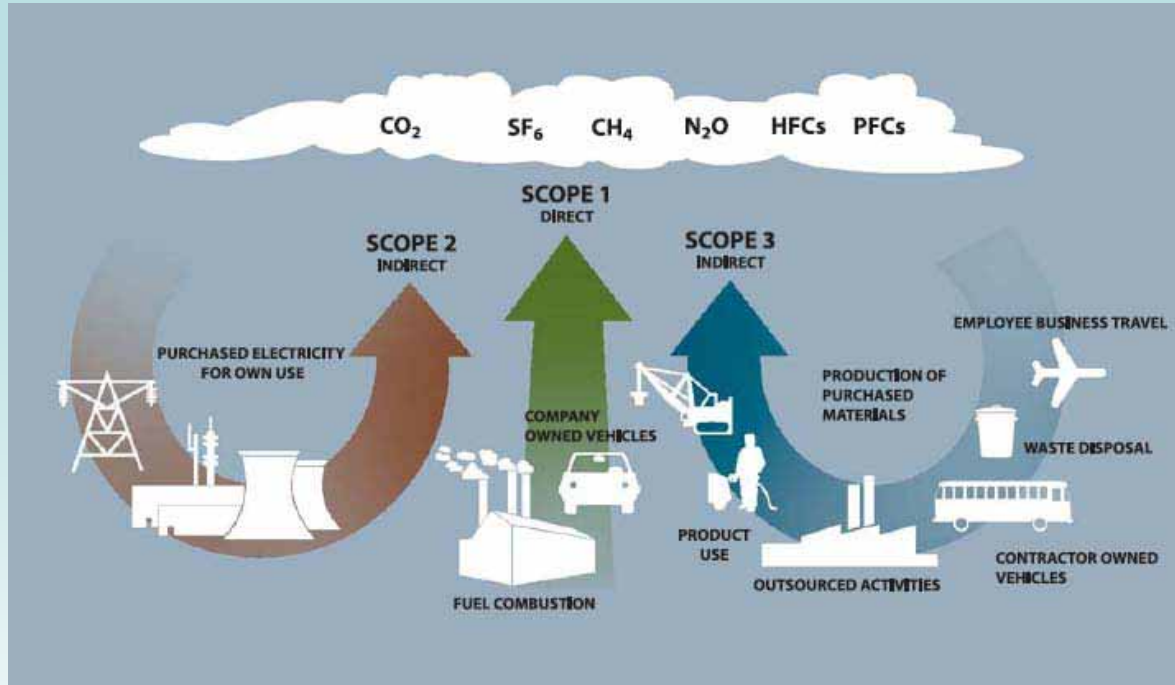
Energy to operate desal plant is less than 20% of energy used for TVs in our service areas



On a household basis, the additional energy for desal is equivalent to leaving a computer on for 1-3 hours a day. ²⁷



How are the agencies addressing greenhouse gas emissions?



An Energy Minimization and GHG Reduction Plan is underway with a Technical Working Group to evaluate ways to reduce the carbon footprint, including net-carbon neutral.

- Desalination uses electricity so it indirectly causes GHG emissions in the same manner as homes and businesses
- The additional indirect GHGs to operate the desal plant is equivalent to approx. 400-700 typical automobiles.



What about the surface water transfer project?



SCWD and SqCWD support the County's continued evaluation of surface water transfers... but project does not meet either agency's near-term needs.

- Estimated ~340 afy available to SqCWD. This is less than 25% of the supplemental supply needed.
- SCWD is not guaranteed any water back from SqCWD or SV because both groundwater basins are overdrafted.
- “..... **not considered an alternative** to developing a new reliable and flexible supplemental supply.”

- John Ricker, Water Resource Division Director
Santa Cruz County Environmental Health Services



Desalination is a proven and successful technology



Sand City's RO units

- 1950s - First major desalination plants built in the Middle East
- 1961 - First U.S. seawater desalination plant built in Freeport, Texas

- Currently – over 15,000 desalination plants in operation worldwide
- 70% of U.S. desalination capacity uses reverse osmosis technology



How much will the proposed project cost?

Conceptual Project Costs

- ◆ Several components continue to be evaluated
- ◆ Costs will be shared equitably between the City and District
- ◆ Conceptual cost estimated at ~\$115 million (includes 30% contingency)

