Our Region. Our Future.
2050 Growth Forecast
February 2011

San Diego Water Authority
Topics

- Purpose of the SANDAG forecast
- Regionwide projections 2008-2050

Purpose of SANDAG Forecast
San Diego region weathered past booms and busts

Today more than half of San Diegans were born outside of California

Source: California Employment Development Department, National Bureau of Economic Research

Source: U.S. Census Bureau, Census 2000
In the future, most growth will be home grown

Regionwide age structure: 2008 and 2050

Source: SANDAG, 2050 Regional Growth Forecast, February 2010
2050 population, jobs, housing

Shift in structure types affects water demand projections

Source: SANDAG, 2050 Regional Growth Forecast, February 2010
Accurate population forecast track record

Regional projections

Historical Economic Trends 1970-2008
National Economic Projections 2008-2050
Peer Review
Regionwide Projection 2008-2050
Demographic Trends 2008-2050
Existing Demographic Characteristics (2008)
Subregional forecast starts with local land use inputs

Forty years in San Diego: Past, Present, and Future
2050 Housing
96% housing growth in County Water Authority area
56% within 10-min. walk of existing high-frequency transit

1995 Job Distribution

Housing Distribution 2050

Job Distribution 1995
2008 Job Distribution

Job Density 2008
Jobs/Acre
- 0.25 - 3
- 3 - 10
- 10 - 25
- 25 - 75
- 75 - 1142

Existing Infrastructure
- Highway/Freeway
- Major Arterials

Job Distribution 2008

2050 Jobs
96% job growth in County Water Authority area
40% within 10-min. walk of existing high-frequency transit
Summary

- Recession affects short term, but long-term growth continues
- Growing and aging population
- More multi-family housing and urban infill

Our Region. Our Future.
2050 Growth Forecast
A Look to the Future:
Draft 2035 Water Demand Forecast

SDCWA Water Planning and SANDAG Regional Planning Committee Joint Meeting
February 11, 2011

Land-Use and Water Supply Coordination San Diego Region

- CITIES/COUNTY GENERAL PLANS
- SANDAG’S REGIONAL GROWTH FORECAST
- PROJECTED WATER DEMANDS
- URBAN WATER MANAGEMENT PLAN & FACILITIES PLANNING (CIP)
- WATER ASSESSMENT (SB 610) WRITTEN VERIFICATION (SB 221)
- WATER SUPPLY ELEMENT SANDAG REGIONAL COMPREHENSIVE PLAN
- CITIES/COUNTY PLANS & POLICIES
Baseline Demand Forecast

- Econometric Model (CWA-MAIN)
- Water Authority forecast = sum of member agency level projections
- Forecast generated by major sector
  - Single-family
  - Multi-family
  - Non-residential
  - Agriculture

Influence of SANDAG Series 12 Projections on Draft Normal Year Baseline Demands

<table>
<thead>
<tr>
<th>Variable</th>
<th>Direction of SANDAG Projections</th>
<th>Influence on Demand Forecast</th>
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<tbody>
<tr>
<td>Occupied Housing Units</td>
<td>🌞</td>
<td>🌞</td>
</tr>
<tr>
<td>Real Household Income</td>
<td>🌞</td>
<td>🌞</td>
</tr>
<tr>
<td>Multi-Family Housing Density</td>
<td>🌞</td>
<td>🐘</td>
</tr>
<tr>
<td>Total Employment</td>
<td>🌞</td>
<td>🌞</td>
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**Forecast Development Process**

- Member Water Use Survey
- Historic SANDAG Demographics
- Historic Price and Weather

Water Use Modeling Database

- Development of Predictive Models
- Testing and Calibration of Predictive Models

SANDAG Forecast

- Retail Water Price Estimates

Baseline Water Demand Forecast

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**Comparison of Forecasted Normal Year and Actual Total Demands** (thousand acre-feet)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Demand (TAF)</th>
<th>Rainfall at Lindbergh Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>600</td>
<td>7.8 in.</td>
</tr>
<tr>
<td>1990</td>
<td>650</td>
<td>17.1 in.</td>
</tr>
<tr>
<td>1995</td>
<td>550</td>
<td>5.8 in.</td>
</tr>
<tr>
<td>2000</td>
<td>500</td>
<td>22.5 in.</td>
</tr>
<tr>
<td>2005</td>
<td>700</td>
<td>10.6 in.</td>
</tr>
<tr>
<td>2010</td>
<td>800</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>750</td>
<td></td>
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</table>

- ● Forecasted Normal Year Demand
- ■ Actual Demand (normalized for weather)
Draft Normal Year Baseline Total Demand (thousand acre-feet)

Comparison of 2005 & Draft 2010 UWMP Total Demand (excluding future conservation)
Demographic and Economic Factors Influencing the Baseline Demand Forecast

- Current economic recession
- Lower number of projected single family units
- Greater proportional share of future housing units designated as multi-family
- Rate of growth in household income
Innovation at Play:
New Technologies and Programs in the Respective Fields

February 11, 2011 Joint Meeting

San Diego Regional Comprehensive Plan

Adopted by SANDAG in 2004

- Urban Form
- Transportation
- Housing
- Health Environment
- Economic Prosperity
- Public Facilities
- Borders
The RCP Approach

- Connect transportation and land use plans
- Guide infrastructure investments
- Provide incentives and collaboration

Smart Growth and Sustainability

Smart Growth Concept Map

Smart Growth Areas
- Existing Planned Potential
  - Metropolitan Center
  - Urban Center
  - Town Center
  - Community Center
  - Rural Village*
    (with some area)
  - Mixed Use Transit Corridor
  - Special Use Center
Visual Simulation
Euclid Ave Trolley Station at Market Street

Euclid Ave Trolley Station at Market Street San Diego, CA
Smart Growth Design Guidelines

Trip Generation and Parking Strategies
Smart Growth Incentive Program

Capital Improvements:
- Sidewalks, plazas
- Streetscape enhancements
- Improvements to transit stations
- Other community initiatives

Planning Grants
- General plan updates
- Specific plans
- Zoning regulations

$280 million

Environmental Mitigation

Regional Habitat Conservation Fund
- $200 million

Local Transportation Project Mitigation
- $450 million

Major Highway & Transit Project Mitigation
- $200 million

$850 million
Healthy Neighborhoods

For More Information

- Muggs Stoll
  mst@sandag.org

- SANDAG Web site
  sandag.org
Innovation at Play: New Technologies and Programs In Water Supply Reliability

SDCWA Water Planning and SANDAG Regional Planning Committee Joint Meeting
February 11, 2011
Drought Headlines from 1990-91

State to Shut Off Water Delivery to Southland
BY VIRGINIA TILS and LORI BURKE

SACRAMENTO — Gov. Pete Wilson on Monday, directed water officials to shut off water deliveries to Southern California from the San Joaquin River because of the threat of low water supplies.

Limits on tap water use urged by staff

San Diego, Feb. 12

The head of the city's water department, Larry Wurtzer, said that the department is considering cutting back on water use to deal with the possibility of a drought.

50% Water-Delivery Cut Will Be Blow to San Diego

Drought: Metropolitan Water District directors also vote a 50% cut in allocation for agricultural users.

Water Dependence Bodes a Dry San Diego Future

Drought: A regional study of climate change says that the city will face a water shortage in the future.

Companies cringe at 50 percent cut in water

Farms offer conservation plans to mayors; some say cuts could cripple growth

L.A. Ready to Battle San Diego Over Water

Conservations weigh legal action as southern neighbor refuses to impose rationing.

State Water Project cuts off water to farms; urban slash expected

Water: Authority to Vote Today on Mandatory Restrictions

Uncertainties and Challenges to Water Supply Reliability

Growth

Regulations

Recurring Drought

Increased Cost of New Supply

Climate Change
Strategies to Improve Reliability

- Conduct Comprehensive Long-Term Supply Planning
- Encourage Water Efficiently and Pursue Innovative New Supplies
- Diversify Supply Sources
- Invest in Regional Infrastructure

Supply Reliability

Proposed 2010 Urban Water Management Plan

Main Elements

- Demand Forecast
  - Econometric Model utilizing SANDAG Regional Growth Forecast
- Water Use Efficiency Target
  - Compliance with SBX7-7: 20% savings by 2020
- Resource Mix and Scenario Planning Process
  - Identify resource mix to meet demands and plan for supply uncertainties
Innovative Supply Development
Water Authority/Local Retail Agencies

Existing:
- Long-Term Transfer of Conserved Supplies
- Recycled and Brackish Groundwater Projects

Proposed:
- Seawater Desalination
- Indirect Potable Reuse

Driving Water Conservation Ethic 1991-2010

- Comprehensive, multi-decade investment in water conservation
- Focusing on sustained water conservation ethic throughout region
- 2007-2009: enhanced, mass communications campaign
  - 20-Gallon Challenge
- 20% Reduction by 2020:
  - behavioral changes and market transformation
Infrastructure Investments in Reliability
$3.8 billion Capital Improvement Program

- $1.5 billion Emergency Storage Project
- New and expanded surface storage
- Regional Water treatment
- Additional Pipelines and system enhancements
- Pump stations
- Clean Energy - hydroelectric generation
- Aqueduct Protection Program
  - Pipeline relining program
- NCCP/HCP mitigation coverage

Project: Olivenhain Dam & Reservoir
Complete: 2003
Cost: $198 million
Benefit: 22,000 AF of storage
Project: Lake Hodges Projects  
Complete: 2011  
Cost: $196 million  
Benefits: 20,000 AF ESP storage; 40MW of power

Project: All American & Coachella Canal Lining Projects  
Complete: 2010 (AAC) and 2006 (CC)  
Cost: $452 million total, including $198 million from Water Authority  
Benefits: 80,000 AF/Y for 110 Years
Project: Twin Oaks Water Treatment Plant
Complete: 2008
Cost: $179 million
Benefit: 100 MGD advanced membrane treated supply for region

Project: Pipeline Relining Program
Complete: Ongoing
Cost: $780 million
Benefit: Extend the life of 82 miles of large-diameter imported water pipeline by 100 years
Project: San Vicente Tunnel & Pipeline System  
Complete: 2011  
Cost: $459 million  
Benefit: Improved Water Delivery

Project: San Vicente Dam Raise  
Complete: 2013  
Cost: $482 million  
Benefit: 152,000 AF of new storage
Diversifying San Diego County’s Water Supply Portfolio

<table>
<thead>
<tr>
<th>1991</th>
<th>2010 (Allocation Year)</th>
<th>2020 Goal (2005 UWMP)</th>
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<tbody>
<tr>
<td>Metropolitan Water District</td>
<td>5%</td>
<td>13%</td>
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<tr>
<td>Imperial Irrigation District Transfer</td>
<td>99%</td>
<td>52%</td>
</tr>
<tr>
<td>All American &amp; Coachella Canal Lining</td>
<td>12%</td>
<td>3%</td>
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<tr>
<td>Conservation</td>
<td>0%</td>
<td>7%</td>
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<tr>
<td>Seawater Desalination</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Local Surface Water</td>
<td>0%</td>
<td>9%</td>
</tr>
<tr>
<td>Groundwater</td>
<td>0%</td>
<td>11%</td>
</tr>
</tbody>
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Conclusion

- Strategies are working
  - Diversified supply sources
    - Reduced reliance on MWD
    - Decreased shortage level during cutbacks
  - Achieved sustained conservation and developed innovative supply sources

- Continued implementation of strategies
  - Long-term comprehensive planning through preparation of Urban Water Management Plans
  - Maintain diversification efforts
  - Pursue further innovative supply sources
Conclusion (cont.)

- Coordination between SANDAG and Water Authority critical to ensuring reliable supply for the region
- Staff will continue to coordinate to ensure adequate supplies for future growth
Development of New Local Supplies

- Several hundred million dollars invested by local agencies since 1991
- Recycled water and groundwater supplies to double by 2020
- Proposed seawater desalination
- Indirect Potable Reuse - City of San Diego Pilot Project

Diversify Imported Supply
Imperial Valley Water Transfers

- Higher priority water than existing imported supplies
- Guaranteed additional water supply for up to 75 to 110 years

IID and Canal Lining Deliveries 2003-2021
Seawater Desalination Efforts

- Regional Carlsbad Project
  - Produce up to 56,000 AF/YR annually
  - Approved term sheet that could lead to water purchase agreement to buy output of plant
- Camp Pendleton Project Studies
  - 56,000 to 168,000 AF/YR
  - Technical studies under way
- Potential Bi-national Project
  - Currently two potential efforts:
    - International Boundary and Water Commission Workgroup Studies (Colorado River Basin States)
    - Otay Water District potential Rosarito Project