BASELINE
“Why do we Need to Establish a Baseline?”

• Serves as a frame of reference for the 20x2020 Program
• Allows the measurement of progress over time
What is GPCD?

• GPCD – Gallons per Capita per Day

Annual Water use (converted to gallons)
Population x 365

– Water Use = from point of diversion
  • (although realize that some of data is probably point of use).
– Includes all commercial, industrial, and residential uses
  • Including these is standard practice in GPCD calculations
Scope of Study

- Urban only
- Sectors within total
  - Single-Family Residential
  - Multi-Family Residential
  - Commercial
  - Industrial
  - Other, not reported
- Regional level rather than agency level
- Agricultural use needs to be addressed, but not here
- Recycled water is not included in the baseline calculation
  - Accounted for small proportion in database (<1% of total)
  - This will be one of the possible measures for reducing overall water used in the state
Statewide Approach

• Governor set a statewide goal of reducing water use by 20% by 2020
• So initially needed to look on a statewide level
• Agency team recognized there are regional variations
  – Evapotranspiration
  – Rainfall
  – Temperature
  – Other variations
• Mechanism for reviewing this already exists – these are the hydrologic regions
Hydrologic Regions

North Coast
North Lahontan
Sacramento River
San Francisco Bay
San Joaquin River
Tulare Lake
Central Coast
South Lahontan
South Coast
Colorado River
ET Zones

EvapoTranspiration (ETo) Zones:
1. Coastal Plains Heavy Fog Belt (33.2 in/yr)
2. Coastal Mixed Fog Area (29.0 in/yr)
3. Coastal Valleys and Plains and North Coast Mountains (46.3 in/yr)
4. South Coast Inland Plains and Mountains North of San Francisco (46.5 in/yr)
5. Northern Inland Valleys (43.0 in/yr)
6. Upland Central Coast and Los Angeles Basin (46.7 in/yr)
7. Northeastern Plains (43.4 in/yr)
8. Inland San Francisco Bay Area (46.4 in/yr)
9. South Coast Marine to Desert Transition (55.1 in/yr)
10. North Central Plateau & Central Coast Range (45.2 in/yr)
11. Central Sierra Nevada (33.1 in/yr)
12. East Side Sacramento-San Joaquin Valley (43.4 in/yr)
13. Northern Sierra Nevada (44.3 in/yr)
14. Midi-Central Valley, Southern Sierra Nevada, Tulare-Bakersfield (57.0 in/yr)
15. Northern & Southern San Joaquin Valley (57.9 in/yr)
16. Westside San Joaquin Valley & Mountains East & West of Imperial Valley (52.5 in/yr)
17. High Desert Valleys (46.5 in/yr)
18. Imperial Valley, Death Valley and Palo Verde (71.6 in/yr)
Limitations and Qualifications

- This is the first time that the State has compared datasets from DWR, CPUC, CUWCC, SWRCB and DPH
- The data needed significant review.
- Improvements needed for future analysis:
  - More data for Regions 8 and 9
  - Standard structure of data collection across the state
  - Data from all utilities to be provided
  - Measurement units standardized both at state and individual utility levels
- These data and analyses reported are the “best-available” analyses and need to be improved upon in future years.
- Water Suppliers may provide more rigorous data sets to revise/update those presented
Baseline Development Process

1. Baseline Development
2. Raw Data Collection
3. Data Review and Preparation
4. Calculation
5. Results
6. Data Audit and Removal of Bad Data
7. Validation Process
8. Reporting

(Data Issues)
Methods

• Review of PWSS Database
  – This includes water supplier data

• Removal of obviously bad data
  – Very high and very low values where GPCD below 10 or above 2000
    • World Health Organization suggests a minimum of 40 litres per person per day (10 GPCD).
    • Upper boundary beyond limits of normal use
  – Where measurement units incorrect or incompatible
  – Where no data on population available

• Validated data used for calculations
Result - Base Year  
(Composite of 1995 to 2005)

Base developed using data from Department of Water Resources (DWR) from 1995 through 2005.

• Initially reviewed 2000 only as this was reported to be a good average precipitation year. However, not enough data for certain regions. 2005 also reviewed, but decision taken to include larger dataset.
• Average GPCD from 1995 to 2005 from the DWR PWSS data showed no recognizable trend (i.e. GPCD has been level in this period with no trend either up or down).
• Therefore the GPCD weighted average value from all the data from 1995 to 2005 is assumed as being representative of an average year.
  – The gallons per capita weighted average is derived by adding all the water used by all the entities reporting in the validated database, and dividing this number by the sum of all the populations from the same entities.
  – Consistent so we are suggesting this is the best data.
Results – Base Use

• Results developed at the state level and by region.
• Overall Statewide Baseline value

192 GPCD
Baseline Datasets – Average Values
Hydrologic Region Weighted GPCD Averages and Range

<table>
<thead>
<tr>
<th>REGION</th>
<th>Weighted 1995-2005</th>
<th>Range</th>
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<tr>
<td>1</td>
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<td>141-170</td>
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<tr>
<td>2</td>
<td>157</td>
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<td>141-177</td>
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<td>171-198</td>
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<td>237-272</td>
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<td>236-250</td>
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<td>221-286</td>
</tr>
<tr>
<td>10</td>
<td>346</td>
<td>272-387</td>
</tr>
</tbody>
</table>
Baseline Data by Hydrologic Regions

Legend
DWR_Hydrologic Regions
GPCD
- 154 - 165
- 166 - 180
- 181 - 253
- 254 - 285
- 286 - 346

North Coast
North Lahontan
Sacramento River
San Francisco Bay
San Joaquin River
Tulare Lake
Central Coast
South Lahontan
South Coast
Colorado River
Final thoughts before Questions

• As the dataset improves, the calculations should be revisited using the same methodology.

• Further analysis will improve the baseline and the targets and are necessary and welcome.