Current Methods

1. Estimate Public Supply Urban Water Use;
2. Estimate Self Supplied Urban Water Use;
3. Combine (1) and (2) to obtain Total Annual Urban Water Use.

• The reasons for this approach are the types of data available to us and method required.
Smallest Study Area of Urban Water Use Data Set: DAU/County

Detailed Analysis Units (DAU) / County
Lost River (01) / Siskiyou
### Data Sources

<table>
<thead>
<tr>
<th>Node</th>
<th>Box#</th>
<th>Data types</th>
<th>Source</th>
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<td><strong>Public Water System Statistics</strong></td>
<td>Public Supply Urban Water Use by Water Use Sector: Overall - Single Family Residential - Multi-Family Residential - Commercial/Institutional - Industrial - Other</td>
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<td><strong>Public Water System Statistics</strong></td>
<td>Department of Public Health</td>
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<td><strong>Study Area Boundaries</strong></td>
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<td><strong>Population served by Public Water Systems</strong></td>
<td>Department of Public Health</td>
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<td><strong>Industrial Water Use</strong></td>
<td>Industrial Water Use Survey Data</td>
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<td><strong>Employment Data</strong></td>
<td>Commercial and Industrial Employment Data</td>
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<td><strong>Total Population and Population served by Public Water System</strong></td>
<td>Department of Finance, Department of Public Health, and DWR Econ Analysis Section</td>
</tr>
</tbody>
</table>

**Survey data**
- Data from other agencies
- Literature review (previous survey results and studies)
### 1. General Information

**Contact:**
- **Title:**
- **Phone:**
- **Fax:**
- **E-mail:**
- **Website:**
- **County:**
- **Population served:**
- **Names of communities served:**

### 2. Active Service Connections

<table>
<thead>
<tr>
<th>Customer Class</th>
<th>Potable Water</th>
<th>Metered</th>
<th>Unmetered</th>
<th>Recycled Water</th>
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<th>Unmetered</th>
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<td>Multi-family Residential</td>
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<td>Commercial/Institutional</td>
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<td>Industrial</td>
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<td>Other</td>
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<tr>
<td>Agricultural Irrigation</td>
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### 3. Total Water Into the System

**Units of production:**
- [ ] acre-foot
- [ ] million gallons
- [ ] hundred cubic

<table>
<thead>
<tr>
<th></th>
<th>Jan</th>
<th>Feb</th>
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<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
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<td><strong>Total Potable</strong></td>
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<td><strong>Untreated Water</strong></td>
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<td><strong>Recycled 2</strong></td>
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</table>

1/ Potable wholesale supplier(s): ____________  
2/ Recycled wholesale supplier(s): ____________

### 4. Metered Water Deliveries

**Units of delivery:**
- [ ] acre-foot
- [ ] million gallons
- [ ] hundred cubic

<table>
<thead>
<tr>
<th>Customer Class</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
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<td>B. Multi-family Residential</td>
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<td>C.Commercial/Institutional</td>
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<td>E.Landscape Irrigation</td>
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<td>F.Other</td>
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<td><strong>Total Urban Retail (A thru F)</strong></td>
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<td>Agricultural Irrigation</td>
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<td>Wholesale (to other agencies)</td>
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</tbody>
</table>

DWR 38 (Rev. 12/06)  
Page 1 of 2
Estimate Public Supply Urban Water Use by Water Use Sector for Each DAU/County Study Area

Estimate Self-Supplied Urban Water Use by Water Use Sector for Each DAU/County Study Area

Compute Yearly Urban Water Use Overall and by Water Use Sector for Each DAU/County Study Area

Yearly Public Supply Urban Water Use by Water Use Sector for each DAU/County Area

Yearly Self-Supplied Urban Water Use for each DAU/County Area

Yearly Urban Water Use for Each DAU/County Study Area

Data

Water Portfolio

Ag and Urban Workteam

Node: A53
Title: Estimate Urban Water Use
Number:

Page: 42
Estimate Public Supply Urban Water Use by Water Use Sector for Each DAU/County Study Area

Compute Per Capita Public Water System Production for Each PWS (Overall and by Water Use Sector)

Select Representative Water Systems for DAU/County Study Area

List of Selected Water Systems

Compute Per Capita Public Water System Production for each DAU/County Study Area

Compute Public Supply Water Use Overall and by Water Use Sector for each DAU/County Study Area

Yearly Public Supply Urban Water Use by Water Use Sector for each DAU/County Area

Population Served by Public Water Systems

Public Water System Statistics Data

Data

Study Area Boundaries

Public Supply Urban Water Use by Water Use Sector

Population Weighted Average Per Capita Public System Water Production:
- Overall
- Single Family Residential
- Multi-Family Residential
- Commercial/Institutional
- Industrial
- Public
- Other (Fire suppression, street cleaning, line flushing, construction temporary meters).

Select Representative Water Systems for DAU/County Study Area

List of Selected Water Systems

Compute Per Capita Public Water System Production for Each PWS (Overall and by Water Use Sector)

Estimate Public Supply Urban Water Use by Water Use Sector for Each DAU/County Study Area

Compute Per Capita Public Water System Production for each DAU/County Study Area

Compute Yearly Public Supply Urban Water Use by Water Use Sector for each DAU/County Area

Population Weighted Average Per Capita Public System Water Production:
- Overall
- Single Family Residential
- Multi-Family Residential
- Commercial/Institutional
- Industrial
- Public
- Other (Fire suppression, street cleaning, line flushing, construction temporary meters).
Select Representative Water Systems for Rural Self-Supplied Water User for DAU/County Study Area 1

Determine Self-supplied Industrial Water Use and Other Large Water Use for each DAU/County Study Area 2

Estimate Rural Self-Supplied Water Use for each DAU/County Study Area 3

Compute Self-Supplied Water Use for Each DAU/County Study Area 4

Data
- Public Water System data
- Water Use Work Teams
- Total Population and Population Served by Public Water Systems data
- Commercial and Industrial Employment data

Flow Diagram

Node: A532
Title: Estimate Self Supplied Urban Water Use by Water Use Sector for Each DAU/County Study Area
Number: A53

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Analytical tools

- Excel based model
- Database based model
- GIS tools
Example: Overall Water Production

DAU:001 / County: Siskiyou
Year: 2000

- **Rural Self-supplied Water Use**
  - Population: 424
  - GW: 31.21 mg
  - SW: 0.00 mg

- **Industrial and Other Large Water Users**
  - GW: 142.12 mg
  - SW: 0.00 mg

- **Self-supplied Water use**
  - Population: 424
  - GW: 173.33 mg
  - SW: 0.00 mg

- **Public Supply Water Use**
  - Population: 1020
  - GW: 134.39 mg
  - SW: 0.00 mg

- **Total Water Use**
  - Population: 1444
  - GW: 307.72 mg
  - SW: 0.00 mg
## Available Urban Water Use Data

<table>
<thead>
<tr>
<th>Customer Class</th>
<th>Public Supply Water Use</th>
<th>Self-supplied Water Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Family – In/Ex</td>
<td>1998-2005; DAU/County</td>
<td>1998-2005; DAU/County</td>
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<tr>
<td>Multi-Family – In/Ex</td>
<td>1998-2005; DAU/County</td>
<td>1998-2005; DAU/County</td>
</tr>
<tr>
<td>Industrial</td>
<td>1998-2005; DAU/County</td>
<td>1998-2005; DAU/County</td>
</tr>
<tr>
<td>Landscape</td>
<td>1998-2005; DAU/County</td>
<td>1998-2005; DAU/County</td>
</tr>
</tbody>
</table>
What’s new for Update 2009

- MS Access is used as the basis for the model;
- Automate all the computation processes;
- Organizing and storing all type of historical data in one file;

- The model can “grow” when we add more data over time and becomes more useful;
- Query functions allow us to have the flexibility to aggregate water use data the ways as we need it, such as spatially, temporally, or categorically.
Improvements Beyond Update 2009

(1) WaterDemandForecaster™ - GIS based Urban Water Use Model

(2) More Socio-economic Data Collections

- Non-residential Water Use Survey
- Golf Course Survey
Improvements Beyond Update 2009

(3) Remote Sensing of Urban Landscape

Contact Information

http://www.landwateruse.water.ca.gov/

Scott Hayes (916) 651-9658 scotth@water.ca.gov

Dong Chen (916) 651-9659 dchen@water.ca.gov

San Joaquin River

Antioch
Public Water System: anyone who serves drinking water to at least 25 persons for at least 60 days out of the year, or who serves domestic water to 15 or more service connections, is a public water system and must have a domestic water supply permit.