Project 1: Energy Profile for California’s Water System

- Objective:
  - Gain a better understanding of CA's energy use in relation to the movement of their water
    - Affects future decisions targeting energy and cost savings
  - Do this by illustrating the amount of energy it takes to supply/convey, treat, and distribute water in CA based on the source of the water supply
    - Supply sources: Federal, State, Local, Imported, Groundwater, Recycled, Desalinated
- Project Breakdown:
  - State of California has 10 Hydrologic Regions
  - Summarize the total distribution of water supply sources for each region by gathering data about a handful of utilities in each region
  - Create an energy profile for each of the utilities chosen
### Project 1 (continued)

Table 1: Energy profile for the San Francisco Bay Region

<table>
<thead>
<tr>
<th>Water Source</th>
<th>Supply (kWh/AF)</th>
<th>Treatment (kWh/AF)</th>
<th>Distribution (kWh/AF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal</td>
<td>870.0</td>
<td>87.0</td>
<td>390.0</td>
</tr>
<tr>
<td>State</td>
<td>1128.0</td>
<td>83.3</td>
<td>390.7</td>
</tr>
<tr>
<td>Local</td>
<td>0.0</td>
<td>64.2</td>
<td>390.9</td>
</tr>
<tr>
<td>Local Imports</td>
<td>92.4</td>
<td>64.2</td>
<td>394.6</td>
</tr>
<tr>
<td>Groundwater</td>
<td>86.6</td>
<td>3.0</td>
<td>396.1</td>
</tr>
<tr>
<td>Desalinated</td>
<td>1643.0</td>
<td>0.0</td>
<td>390.9</td>
</tr>
<tr>
<td>Recycled</td>
<td>0.0</td>
<td>1129.0</td>
<td>684.1</td>
</tr>
</tbody>
</table>

- Table 1 shows the variation of energy intensity for each water source in the Bay Region
- Energy associated with supplying GW varies with depth
- Conveyance of water is dependent on geography
  - Gravity fed systems vs. pumping
- For Bay Region, GW is least energy intensive source
- Desalination is most energy intensive source

### Project 2: Update of WWEST

- WWEST is a LCA tool that evaluates the environmental impacts of WWTPs
- Create Excel spreadsheet to house data collected from peer reviewed journal articles
- Seeking data related to WWTP operations, emissions, and energy use/consumption
- Organize data based on
  - Liquid and sludge treatment processes
  - Influent and effluent
  - System inputs and outputs

![Image of W wastewater-energy sustainability tool](image-url)