Life-cycle Assessment of Urban Water Infrastructures

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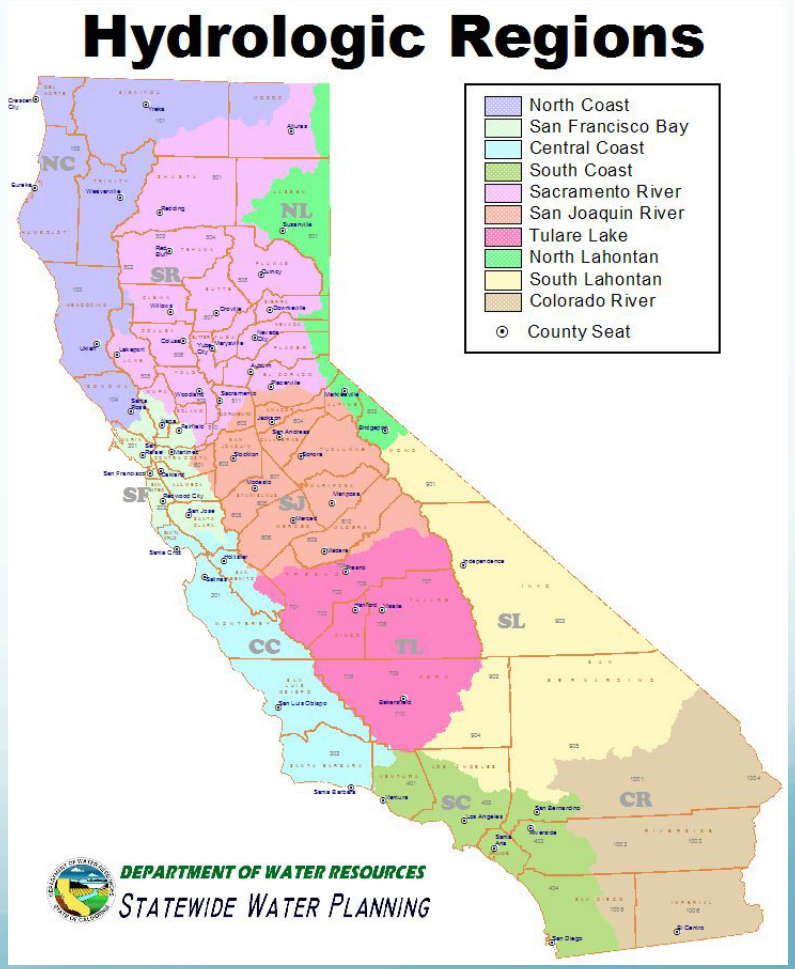
Project 1: Energy Profile for California's Water System

- 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

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

- 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