

WHY DEVELOP STORAGE?

Storage turns low water into high value water.

- Attenuate flood flows.
- Shift diversions to reduce entrainment
- Low impact diversions for increased yields.
- Improve water quality

TYPES OF STORAGE

Sacramento Valley

- Onstream storage -- e.g., enlarged Shasta Dam
 - Easy to fill and empty
 - Could provide environmental water, yield, dry year supplies, flood control, temperature control, and hydropower.
 - Especially note: a larger cold water reservoir for protection of winter run salmon.
- Offstream surface storage -- e.g., Sites Reservoir
 - More limited input and output capacity
 - Fill during periods when salmon entrainment is not a problem.
 - Use reservoir to supply agriculture
 - Result is reduced agricultural diversions off the Sacramento River during periods critical for salmon and increased storage in Shasta.
- Groundwater storage
 - Similar to offstream surface storage, but....
 - Groundwater-surface water interactions cause local problems and reduce benefits

TYPES OF STORAGE

San Joaquin Valley Upstream of the Delta.

- Onstream storage -- e.g., enlarged Friant Reservoir
 - Similar to onstream storage on the Sacramento River.
 - Capture water during periods of surplus flow for other purposes, including greater deliveries to water users and increased environmental flows during critical periods.
- Offstream surface storage -- e.g., Montgomery Reservoir
 - Similar to offstream storage on the Sacramento River, but less benefit for reduced entrainment upstream.
 - Divert water from the San Joaquin tributaries during periods of surplus flow for use during critical periods.
- Groundwater storage -- e.g., Stockton East Water District
 - Many areas with large groundwater storage capacity
 - Treat groundwater like offstream storage
 - However, input and output rates are much lower than surface storage.
 - Therefore, operate groundwater and surface water storage in tandem.

TYPES OF STORAGE

Off Aqueduct Storage

- Off aqueduct surface storage -- e.g., Los Banos Grandes
 - Fill via the state and federal export canals during low impact and high flow periods.
 - Use the stored water for:
 - (1) increased supplies for export agriculture and export urban areas
 - (2) decreased exports during period of high environmental sensitivity
 - (3) San Joaquin Valley wetlands
 - (4) increased San Joaquin River flows (via release at the Mendota Pool)
 - (5) improved water quality in the export areas
 - (6) increased security against major outages in the Delta.
 - Storage is difficult to fill if export constraints are severe
- Groundwater storage -- e.g., Kern Water Bank
 - Many areas in western San Joaquin Valley with major groundwater storage potential.
 - Extensive areas where groundwater percolation rates are high (e.g., the Kern fan).
 - Thus, many opportunities for conjunctive use or direct recharge
 - Constraints are (1) the ability of the export canals to move water to the areas with groundwater storage potential; and (2) limits on the ability of local distribution systems to allow in lieu conjunctive use.
 - Use like off-aqueduct storage.
 - However, lower rates of deposition and withdrawal best used in tandem with surface storage.

TYPES OF STORAGE

Near Delta storage

- Offstream storage -- e.g., enlarge Los Vaqueros Reservoir
 - A form of off-aqueduct storage, but....
 - because near-Delta storage can draw directly from the Delta, easier to fill during high flow and low impact periods.

WHY IS STORAGE IN EVERY CALFED ALTERNATIVE?

The IDT recommended that up to 5 MAF of storage be considered in each of the three alternatives. There are a number of reasons for this conclusion:

- Sometimes there is no acceptable substitute to storage.
 - Major changes in diversion patterns to reduce entrainment are very difficult to achieve without increased local storage.
 - Storage provides operational benefits for environmental flows.
 - Storage provides assurances. More flexibility means less conflict
- Alternatives exist to storage in some cases, but unclear whether they can carry full load.
 - Water transfers and water efficiency measures can sometimes provide similar benefits.
 - The IDT recommended that these measures be maximized to reduce storage needs.
 - However, potential for these measures is unclear.
 - Moreover, unclear whether all needs can be met through markets or efficiency without causing unacceptable local impacts. Largescale land fallowing is not an option.
- The IDT recommendation for storage represented a maximum volume for planning purposes, not a storage target.

PHASING/ SEQUENCING ALTERNATIVES

It may be possible to sequence the development of storage to assure an appropriate amount.

- Acquire easements to all sites that might be needed in the future for storage.
- Develop storage to meet needs that cannot reasonably be met without storage.
- Set reasonable limits on the transferability of water in order to protect local areas.
- If additional water needs remain, pursue acquisition of additional storage, either immediately or in the future.