

## **A Solution to the Water Conveyance and Storage Problem in California**

**By Robert Pyke**

Although the fact that precipitation in the Sacramento River watershed is running more than 200 percent of average this water year is a bit of a surprise, the fact that we have returned to wetter than average years after a run of drier than average years is not. This has been the pattern in California for over 150 years and this pattern is unlikely to change in the next 150 years. But the State Water Project and the Federal Central Valley Project were not designed to accommodate this climate variability. Rather they were designed primarily to store water during the winter and the spring snow melt, both to attenuate flooding and to provide water for Central Valley irrigation and Southern California urban and industrial consumption in summer and fall. There is some provision for “carryover” storage from year to year but the system is not designed for a six year drought of which we have had two in the last 100 years.

So, what happens in a six year drought, or even a four year drought like we have just witnessed? Urban consumption is limited by a combination of voluntary and mandatory restrictions (and never recovers to pre-drought levels with the result that long-term urban consumption per head is decreasing), and agriculture survives by pumping more and more groundwater. The groundwater basins under the Central Valley recover to some extent when we return to a series of wetter than average years, but never by very much, so that the long-term trend is for the groundwater table to sink lower and lower, possibly all the way to China where it will meet up with the almonds which are grown using the pumped groundwater.

The solution to this problem is pretty obvious – extract more water from the river system during periods of higher river flows and store it primarily as groundwater in the presently depleted aquifers under the San Joaquin Valley. The US Geologic

Survey estimates that there is as much as 50 million acre-feet of water, or ten Shasta Dams, that has been drawn out of these aquifers, space that is just sitting there waiting to be reused. The question then is how to do this? At present the pumps in the South Delta are operating at less than half their full capacity because there is nowhere to put the water!

One possible answer is provided by the Western Delta Intakes Concept (WDIC) which in periods of high river flows would extract water both from the Old River using the existing pumps and at Sherman Island using new pumps. At periods of low river flows, water would only be extracted at Sherman Island so that all available water would flow through the Delta in a natural pattern helping to restore the Bay-Delta ecosystem. See <http://FixCAWater.com> for more details. These details include the provision of additional local storage so that at periods of high flow even more water can be extracted than the existing aqueducts can handle and the use of large diameter shafts to expedite the recharge of selected aquifers.

Twin tunnels from the North Delta to the existing pumps in the South Delta do not solve this problem. Those tunnels only provide better water quality for exporters at the expense of water quality in the Western Delta. It is time for a real solution to the real problem rather than politics as usual.

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