

California Water Plan Data Recommendations

The new and improved effort for the California Water Plan Update 2005 includes a higher level of detailed information for current conditions, including much expanded water portfolios. The flow diagram begins with the sources of water, such as precipitation and inflows into the state, and attempts to track all the water as it flows through many different uses until it reaches its ultimate destination. One shortcoming of this expanded process is that there are many regions of the state where some of the water portfolio categories have never been measured or quantified. Thus, the resulting water portfolios show many gaps where there is insufficient data available or accessible. The ability to identify where additional data collection and management activities are needed is an important step in this process.

There are a number of categories in the flow diagram where data is simply not available or very resource intensive to compile. These include:

- total groundwater natural recharge,
- groundwater subsurface inflow and outflow,
- groundwater extractions and recharge,
- evaporation from land surfaces
- evapotranspiration from native vegetation and non-irrigated agriculture,
- total stream flow,
- total direct diversions,
- natural and incidental runoff
- return flows and
- conveyance losses.

There are a number of data items necessary to calculate or estimate these categories. Some of the major data items needed to complete the flow diagram and water balances consist of more detailed and accessible land and water use information including information to separate out applied water use versus consumptive water use. The major data items are:

- water source of supply information,
- outflow data,
- groundwater level data,
- groundwater recharge rates,
- natural riparian water requirements,
- evapotranspiration rates for all types of vegetation,
- detailed return flow information and
- more detailed physical information about all watersheds, water systems and groundwater basins in the state.

Data is currently available for some regions and not for others. For example, methodologies and data to estimate natural runoff is sometimes available for regions where the delta is a control point like the Sacramento River Region, and the San

Francisco Bay Region, but in areas where there is no such control point and substantial groundwater like the South Coast Region, the natural runoff would be close to impossible to estimate. In addition to natural obstacles to close the data gaps, there exists a considerable resource constraint to the extensive data collection and management effort necessary to quantify and track all the water in the state. Existing data is not easily aggregated or disaggregated so that it is conveniently available for all areas of interest.

Detail, digitize, and database are the three D's when it comes to data needs for Update 2003's water balances and flow diagrams. Of course, in a perfect world one would like monitoring stations on every stretch of river and canal reach and in every groundwater basin, all data digitized and put in easily accessible databases and GIS systems right now. But the reality is that the state needs to make choices that are realistic and continue to guide California in the right direction, by expanding data collection and management programs that already exist.

Below is a detailed, itemized list where data is either missing or needs improvement in the water portfolio for current conditions. The information needed for forecasting is very similar because current conditions serve as a basis for future conditions.

Data Gaps wherein data is missing –

1. Surface Water
 - a. Natural runoff
 - b. Incidental runoff
 - c. Runoff flows to salt sink
2. Groundwater
 - a. Total natural recharge
 - b. Subsurface Inflow
 - c. Subsurface Outflow
3. Losses
 - a. Evaporation and Evapotranspiration (E&ET) From Native Vegetation– develop additional plant unit E&ET values
 - b. E & ET From Unirrigated Ag – develop crop coefficients & collect or map acreage
 - c. Wetland ETAW – develop habitat coefficients for various habitat types

Data gaps wherein the data needs improvement –

1. Surface Water
 - a. Local diversions (Agricultural and Managed Wetlands have incomplete information in most basins, additional data and the means to collect that data is required)
 - b. Local Imported deliveries (In most cases we have no real time data, only historical numbers)

- c. CVP base and project deliveries – need actual measurements (Agricultural – Small Riparian Diverters have almost no up to date records, the earliest records are 1976)
 - d. Other federal deliveries
 - e. Return Flow to developed supply – additional measurement points
 - 1. Ag
 - 2. Wetlands
 - 3. Urban – need annual reports of wastewater produced and/or NPDES permits
 - f. Return Flow within service area - additional measurement points
 - g. Return flow for Delta outflow - additional measurement points
 - 1. Ag
 - 2. Wetlands
 - 3. Urban - need annual reports of wastewater produced and/or NPDES permits
 - h. Regional imports/exports – additional data needed
2. Groundwater (Agricultural and Managed Wetlands have incomplete information in most basins, additional data and the means to collect that data is required. Groundwater extractions are often backed into, which tells us there was no means of calculating GW Pumpage)
- a. Extractions - Unadjudicated Basin – fund water source mapping & collection of pumping records
 - b. Extractions – Adjudicated Basin – fund water source mapping & collection of pumping records
 - c. Recharge - Unadjudicated Basin
 - d. Levels – Unadjudicated & Adjudicated Basins
 - e. Transmissivity
 - f. Deep Percolation Rates
 - g. Soil Types
 - h. Water Quality
 - i. Specific yield by GW basin
3. Losses
- a. Conveyance Losses to Mexico
 - b. Ag ETAW –
 - 1. Need more measurements of evap or ETo throughout state
 - 2. Refine crop coefficients
 - 3. Statewide coverage of detailed soil survey data
 - c. Urban ETAW
 - 1. Need more measurements of evap or ETo throughout state
 - 2. Refine estimates of landscape ETAW
 - d. E&ET of Urban wastewater – collect NPDES permits where perc/evap ponds are used for disposal
 - e. Wetland ETAW - Need more measurements of evap or ETo throughout state
 - f. Return Flows to Salt Sink –

1. Ag – additional measurements needed
 2. Urban - need annual reports of wastewater produced, NPDES permits
 3. Wetlands - additional measurements needed
4. Uses
- a. Ag effective precip on irrigated lands – refine soil moisture capacity data and infiltration/runoff relationships by DAU
 - b. Ag use –
 1. Improve frequency of land use surveys
 2. Collect more data on irrigation methods
 3. Collect data on on-farm applied water
 4. Collect data on water sources
 - c. Wetlands Use –
 1. Collect annual acreage by habitat type
 2. Collect flood-up and drawdown dates, flood depths, flow-through rates, and other management practices
 - d. Urban -
 1. All – collect additional data & conduct studies. Municipal data limited
 2. Industrial – collect data. Need water use studies
 3. Energy production - collect data. Need water use studies
5. Data
- a. Economic
 - b. Water Rights – direct diversions