Production:

Main source of pumping for the model is CalAm.  For this pumping, we had monthly meter reads by well for all wells.  We divided the total water pumped from each well by the days in the month to come up with the daily rate.

For private wells, well owners are required to report pumping annually.  The District reads meters of larger producing wells monthly and in the 1990’s completed a 10 year study of monthly water usage by usage type.  Agriculture, domestic, industrial, rural.  Annual pumping volumes were distributed through the months using the percentages from the monthly meter reads by water use.  Daily pumping was calculated by dividing the monthly values by the days in the month.

For wells outside of the District,  The District has a land use estimation method for non-metered wells (90% of the wells in the model domain are metered.)  GIS and air photography annual water use audits were conducted for each well that is not metered.  Well completion reports were collected from the County and DWR to identify wells outside of the District boundary.  Annual water use volumes were divided into monthly volumes using the monthly percentages by land use.  Daily values were calculated by dividing the monthly values by the days in the month

I did not talk about the consumptive use component of the production, but can go into more detail if you would like.  Each pumping rate was adjusted to leave to component of water in the model that would have recharged through land use, only the consumptive use component was included in the pump file.  Therefore total metered pumping from the database is less than what is in the pump file.

Septic tanks receiving water from CalAm and not an onsite well were simulated as wells injecting water at the average use per connection for Carmel Valley residences.  Consumptive use was removed from the delivered water and the rest was assigned to the pumpfile.

Observations:

MPWMD installed a number of monitor wells in the mid 80’s and began to collect monthly data.  All of these observations were included in the model.  The wells have good spatial distribution through the alluvium.

CalAm collects water level data from their production wells.  MPWMD staff digitized water level records from CalAm, some of the notes indicated the production wells were on when the water levels were takes, these observations were removed from the data used in the model.  Also there were a number of water level observations from this data set where the water level was not listed as taken when the well was running, but was obviously not a static water level.  We built a screening tool in Matlab to flag water levels outside of the static ranges for each well and compared them to neighboring  water levels to determine if they should be included in the model.

Wells were selected based on quality of record including length and frequency of monitoring.  If a well was destroyed, a new well was selected to augment the record from a nearby well.  “Living” wells were selected so that the model can be updated.