

NO<sub>3</sub> Data from Geotracker Gamma (CDPH) for Upper Kings Basin

By

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The data set consists of 320 locations (Lat, Long coordinates) and 37,043 individual analyses for NO<sub>3</sub>. Of the 320 locations 67 locations have some analyses of 45 mg/l or better NO<sub>3</sub> (MCL or better). The 67 locations with high NO<sub>3</sub> make up 21% of all locations and the 1857 analyses with NO<sub>3</sub> data at or above the MCL total 5% of all analyses.

The 67 high nitrate locations can be split into three groups. 27 locations are residential/urban locations, 40% of the 67 locations. Fifteen locations (22%) are agricultural/residential, these locations are in close proximity to either a city, an unincorporated disadvantaged community, or a rural residential area with lot sizes of 2.5 acres or less. The final 23 locations (34%) are agricultural locations. Two of the 67 locations account for almost 1200 of the 1800 nitrate analyses at MCL or better; these locations are on Clovis Ave either south of Sunnyside or at the air terminal, eastern Fresno locations.

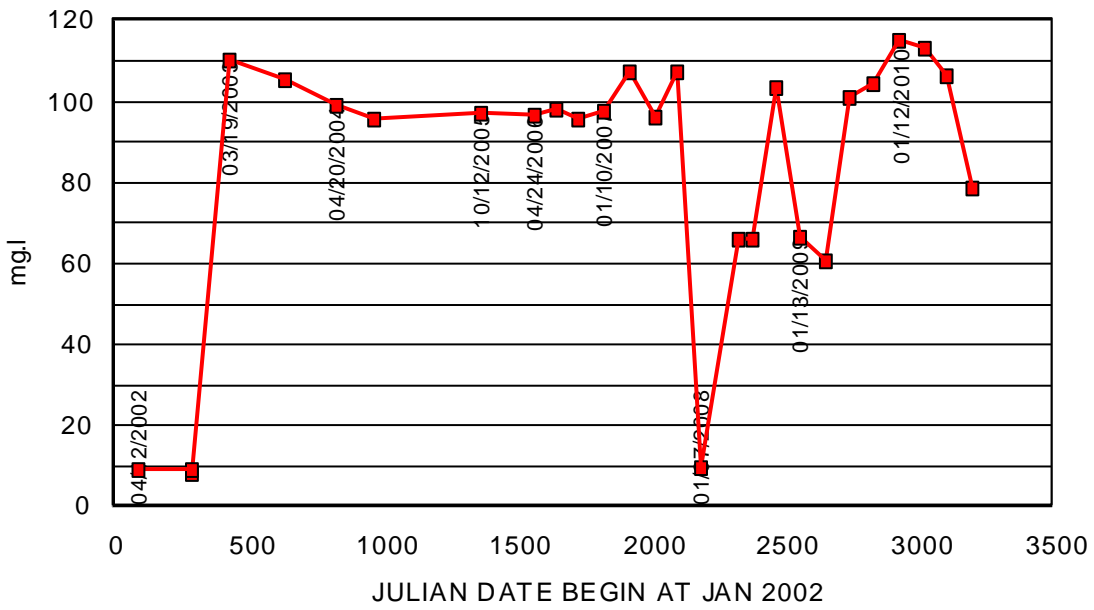
Statistically, locations with analyses above nitrate MCL's, as a percent of total locations, are 7% agricultural, 5% ag/residential, and 8% residential. The number of total nitrate analyses above MCL's are 0.5% ag, 0.7% ag/residential, and 3.8% residential.

When looking at a time series at single location some interesting things are apparent: 1) there can be some spurious (?) or anomalous (?) high values that do not match the rest of the data set, 2) at two of the three single point data sets a case can be made for at least three individual wells making up the single point data set (due to the delocalization of the wells to the nearest ½ mile location), and 3) that when multiple wells are at one delocalized location nitrate values for individual wells can be either above or below the MCL. This last fact indicates how neighboring wells can have much different nitrate levels and must be evaluated on an individual well by well basis (well depth, perforations, pump setting, well construction, geology) and not on a location by location basis.

When looking at the averaged nitrate data spatially (shown on latitude-longitude plots) one hot spot persists through time, the Orange Cove area (36.6 N, 119.3 W). During the 1980's and 1990's a second hot spot is found in SW Fresno (36.7 N, 119.8 W), possibly associated with old septic systems in the area that disappears during the 21 Century data as the area went onto the sewer system? Another hot spot in the 2000 to 2005 average data is bounded by Tulare and Church Aves, north to south, and Temperance to Leonard Aves, west to east (36.7 N, 119.7 W). Curiously, this area is, hydraulically, down gradient of an old super fund site at McKinley and Temperance (36.8 N, 119.7 W), which I believe did some kind of wood treatment/preservation. In the 2006 to 2012 average data, the hot spots are associated with Cutler/Orosi (36.5 N, 119.3 W), Orange Cove, and the Navelencia area (36.7 N, 119.4 W) along the eastern edge of the valley.

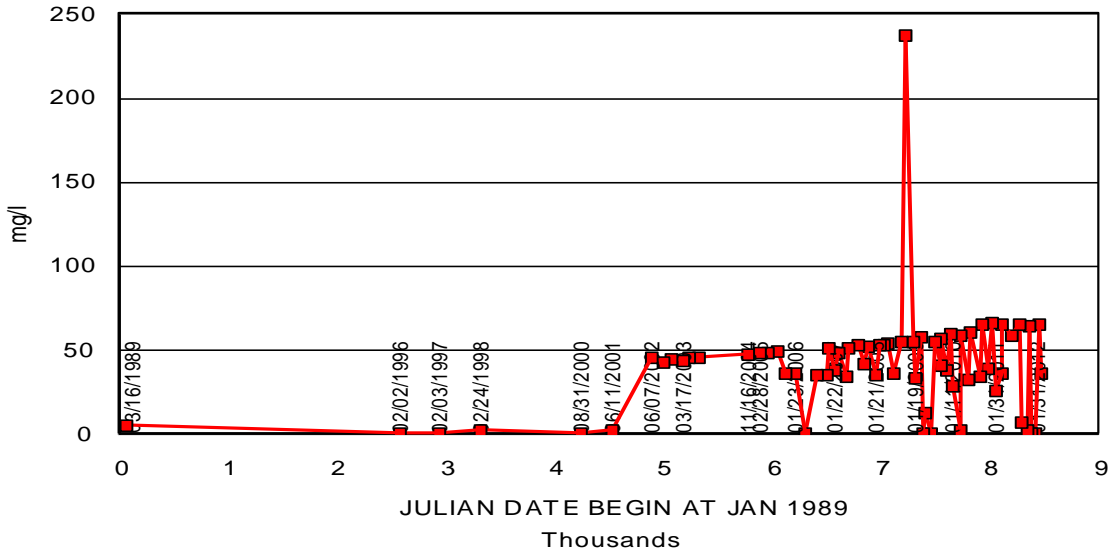
The maximum nitrate data when plotted spatially through time shows an increase in the number of high values and an increase in the maximum value of nitrate found. This is in part due to the increase in the number of analyses through time. The 1980's show 620 analyses while the 1990's had 3,703 analyses. From 2000 to 2005 there were 13,028 analyses and during 2006 to 2012 there are 19,695 analyses.

### NO3 AT 36.568N AND 119.345W



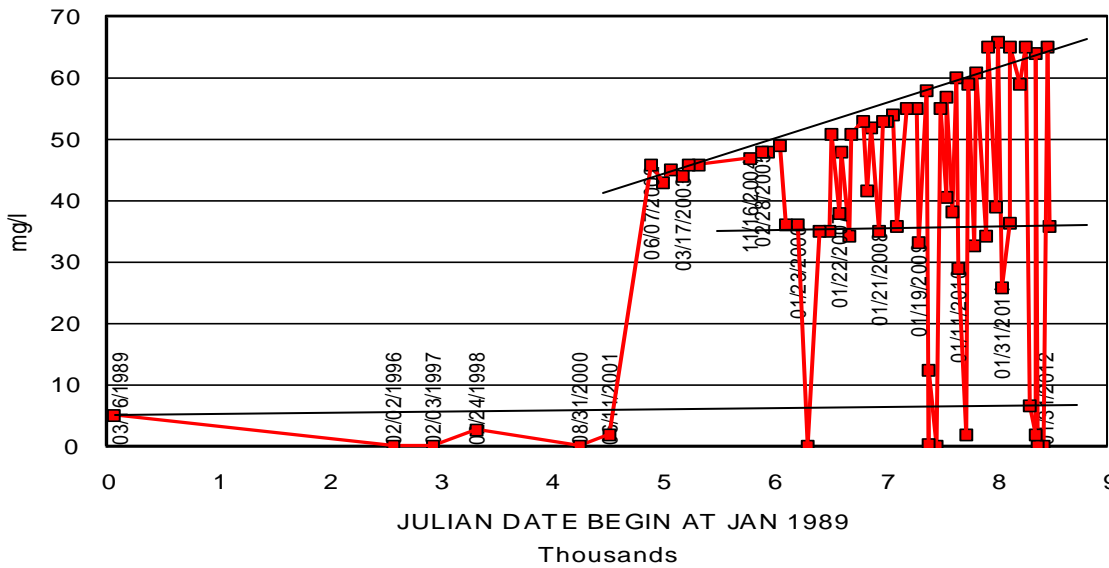
AVG = 82.15, MEDIAN = 97, MODE = 9, STD = 33.79  
JUST E OF SMITH MTN, 2 MINE OF DINUBA

### NO3 AT 36.481N AND 119.503W



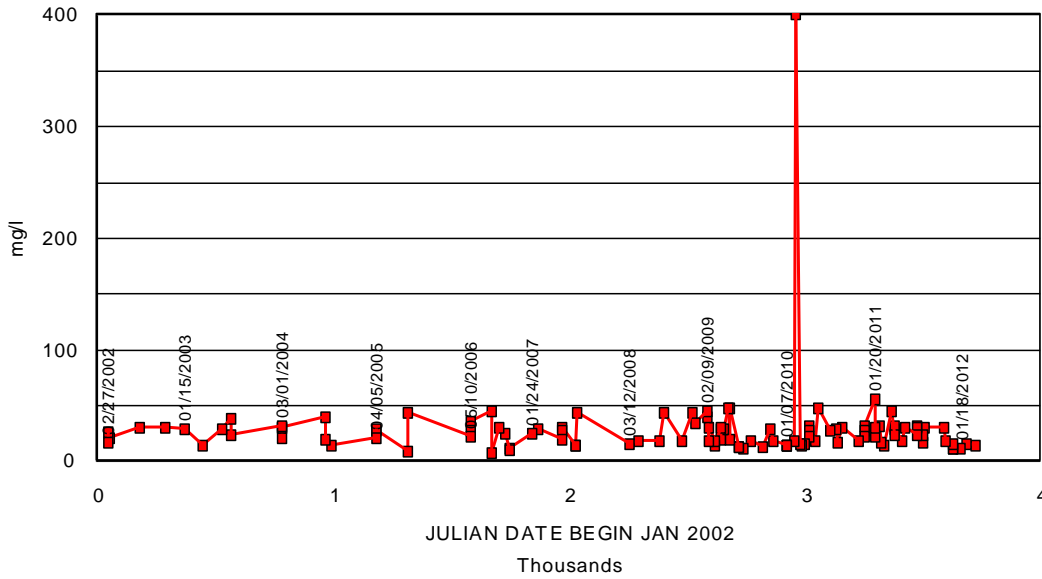
AVG = 40.14, MEDIAN = 42.35, MODE = 0, STD = 31.90  
 WITHOUT SINGLE DATA POINT - AVG = 37.20, MEDIAN = 41.7, MODE = 0, STD = 21.2  
 2 MINNW OF TRAVER

### NO3 AT 36.481N AND 119.503W



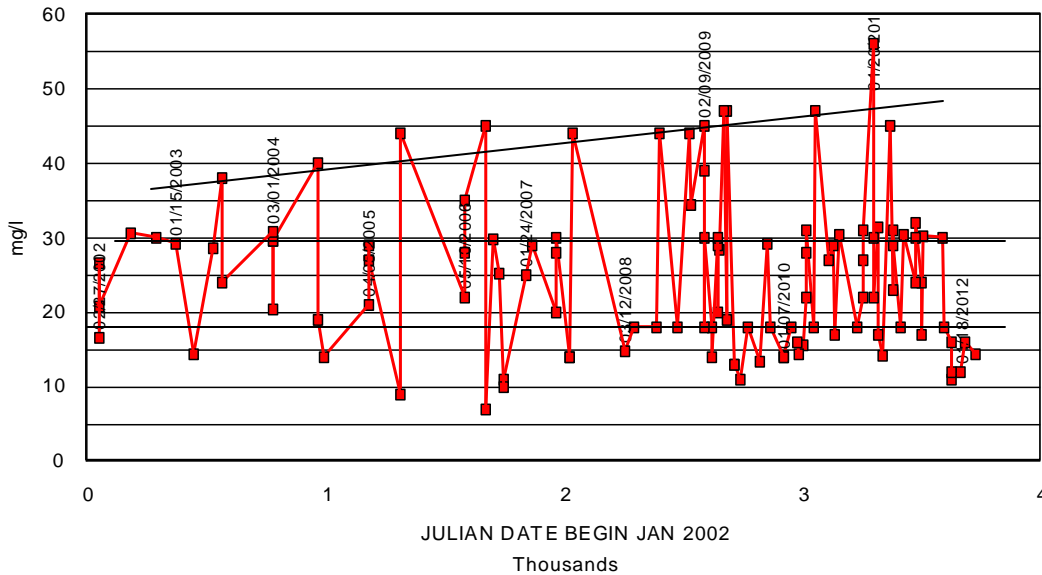
AVG = 40.14, MEDIAN = 42.35, MODE = 0, STD = 31.90  
 WITHOUT SINGLE DATA POINT - AVG = 37.20, MEDIAN = 41.7, MODE = 0, STD = 21.2  
 2 MINNW OF TRAVER

### NO3 AT 36.65N 199.780W



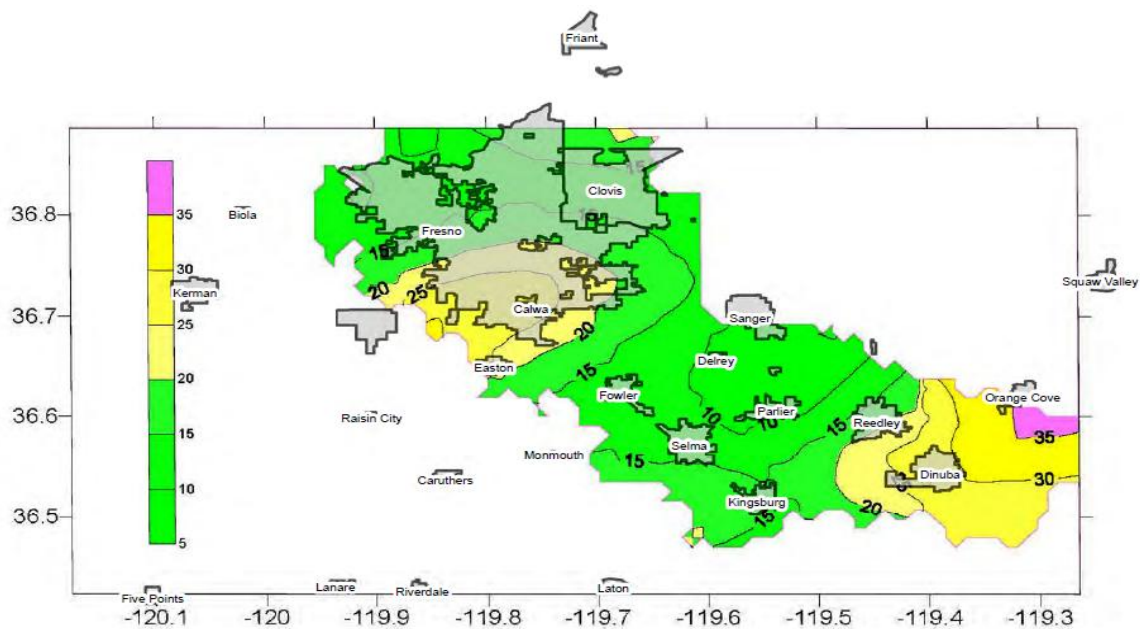
AVG = 28.02, MEDIAN = 24, MODE = 18, STD = 36.58  
 WITHOUT SINGLE HIGH DATA POINT - AVG = 24.70, MEDIAN = 24, MODE = 18, STD = 10.16,  
 NE OF EASTON - JEFFERSON & CHERRY

### NO3 AT 36.65N 199.780W

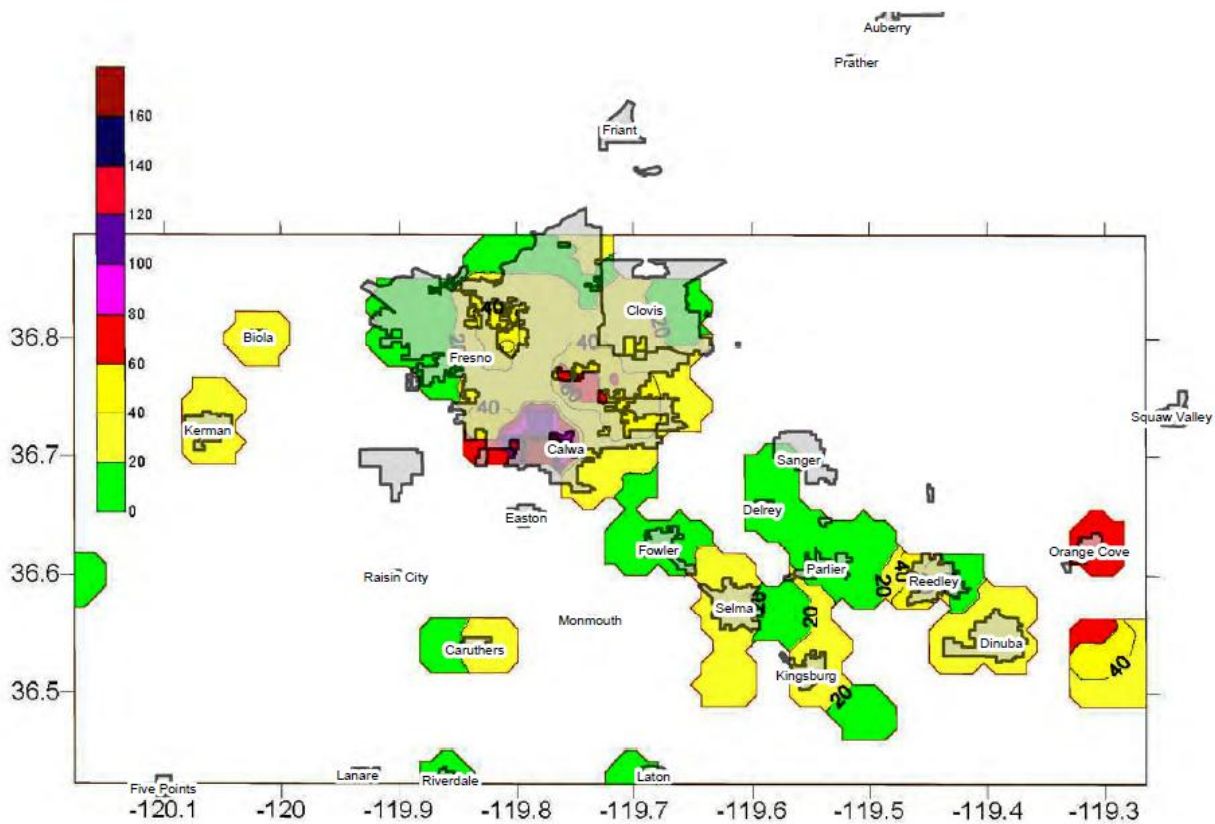


AVG = 28.02, MEDIAN = 24, MODE = 18, STD = 36.58  
 WITHOUT SINGLE HIGH DATA POINT - AVG = 24.70, MEDIAN = 24, MODE = 18, STD = 10.16,  
 NE OF EASTON - JEFFERSON & CHERRY

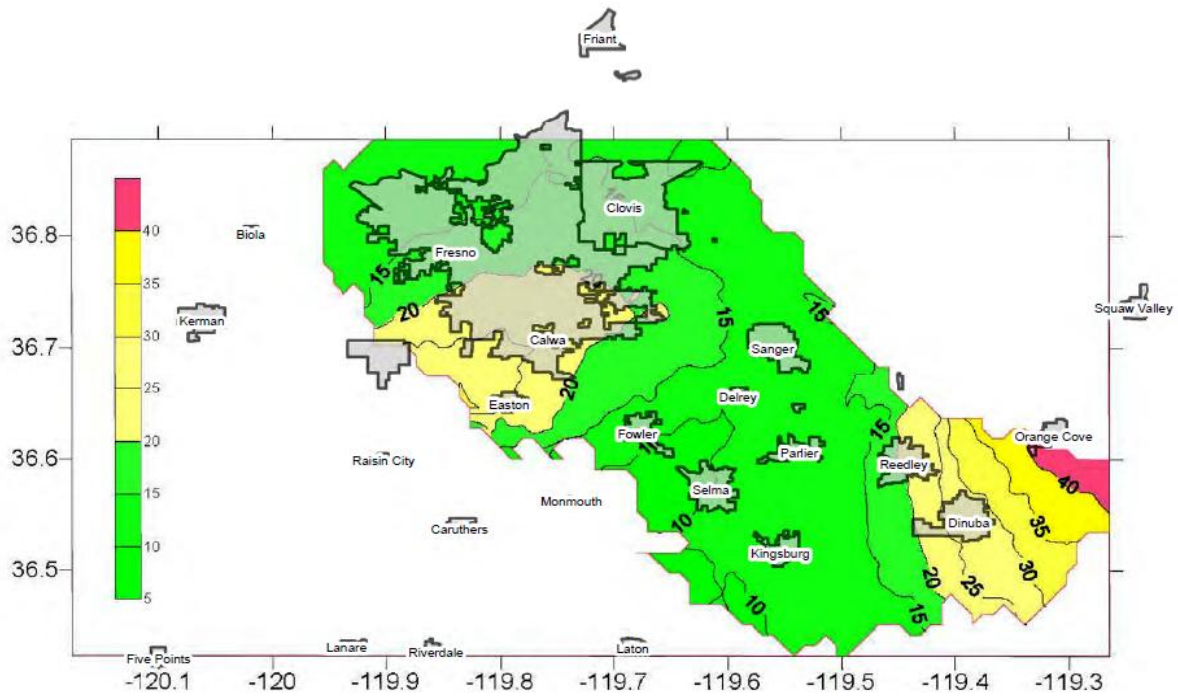
### 1980s Avg NO3



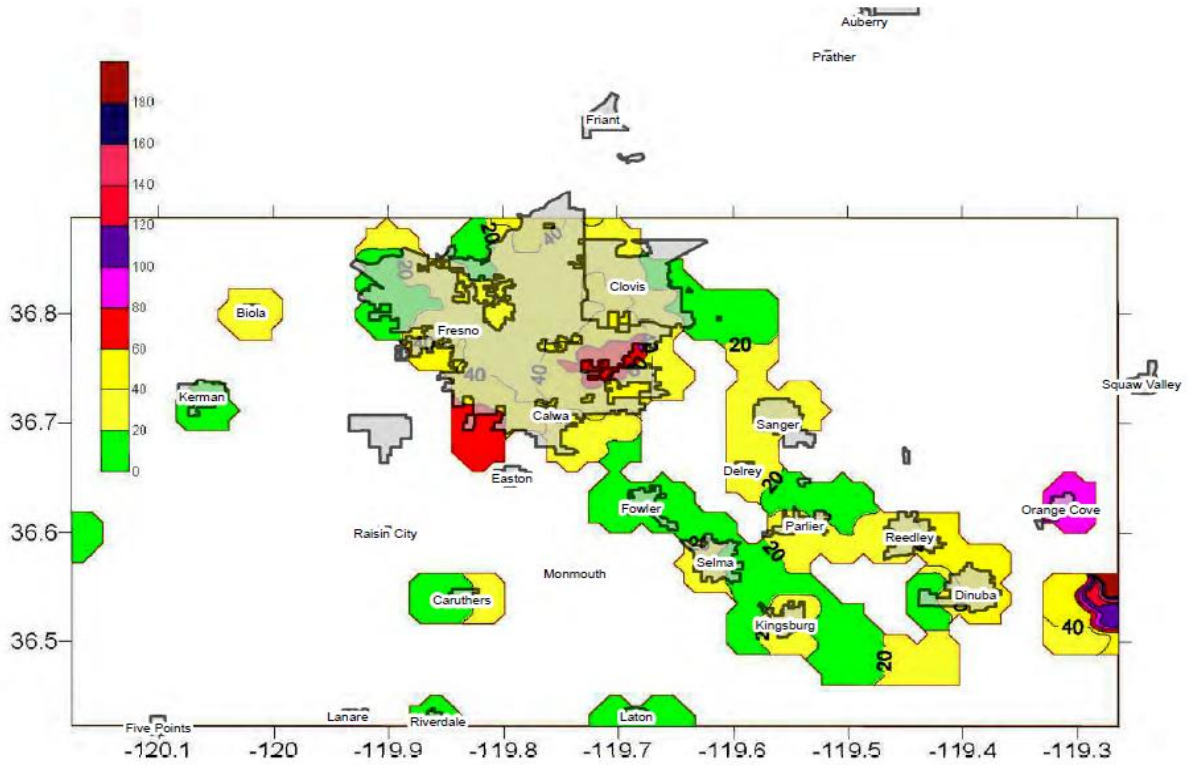
### 1980s Max NO3



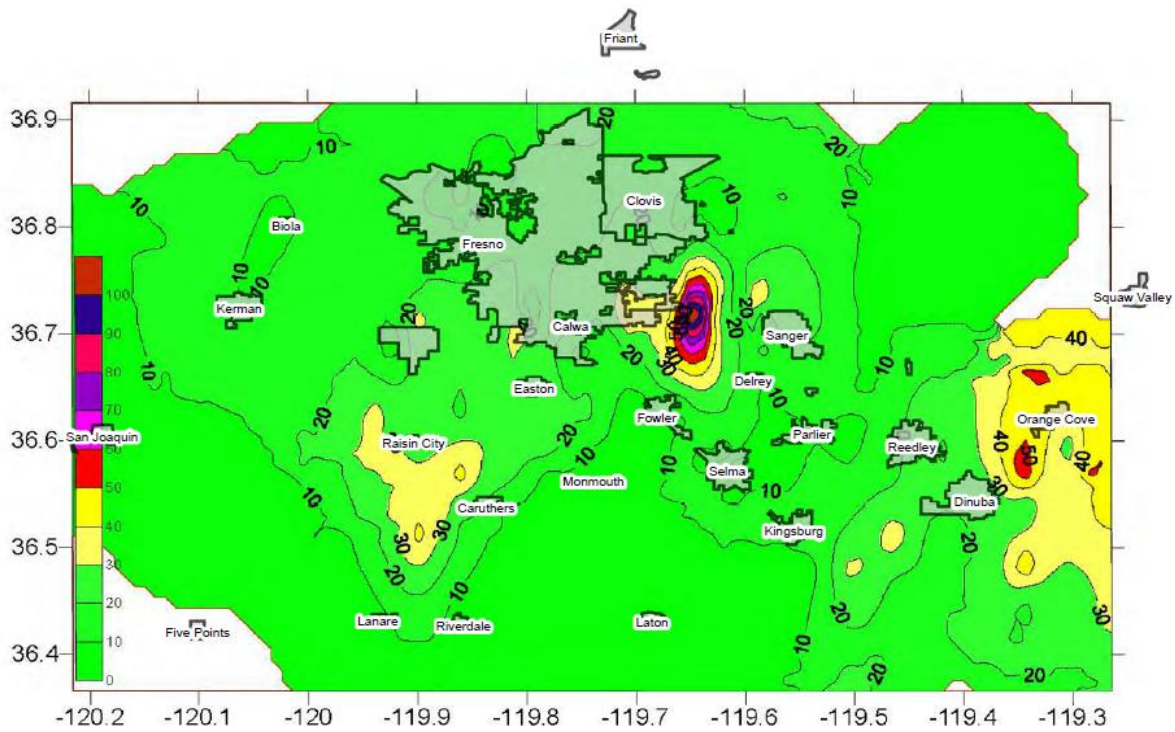
# 1990s Avg NO3



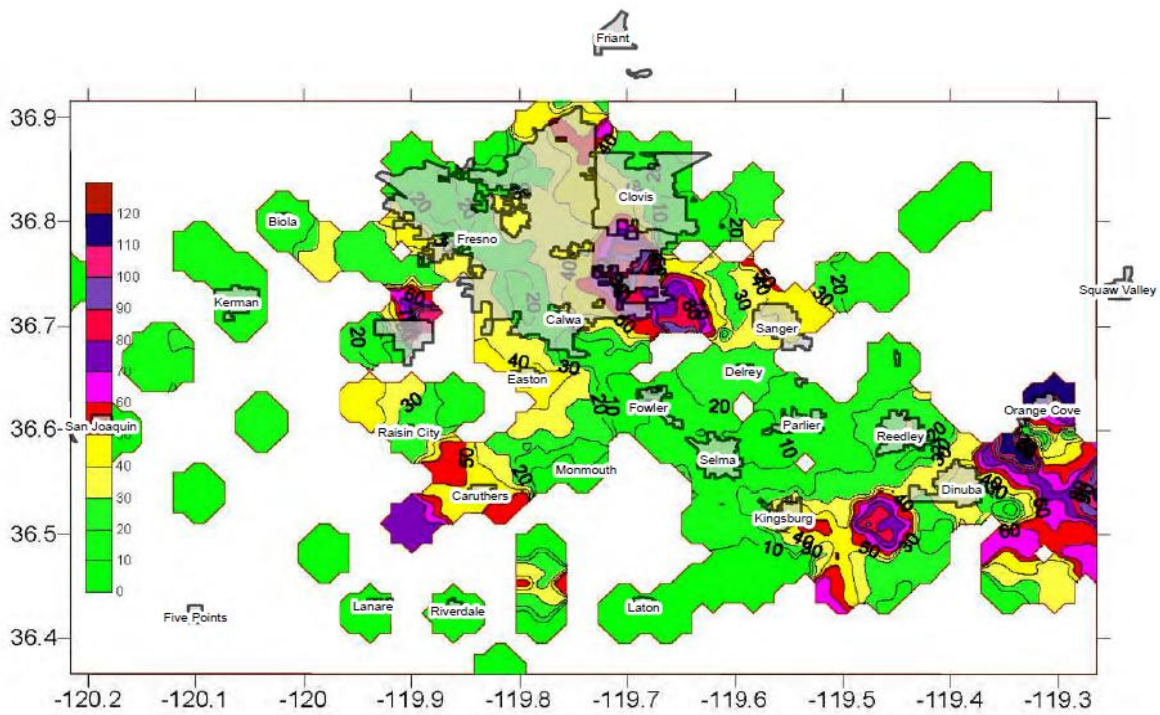
# 1990s Max NO3



## 2000 to 2005 Avg NO3

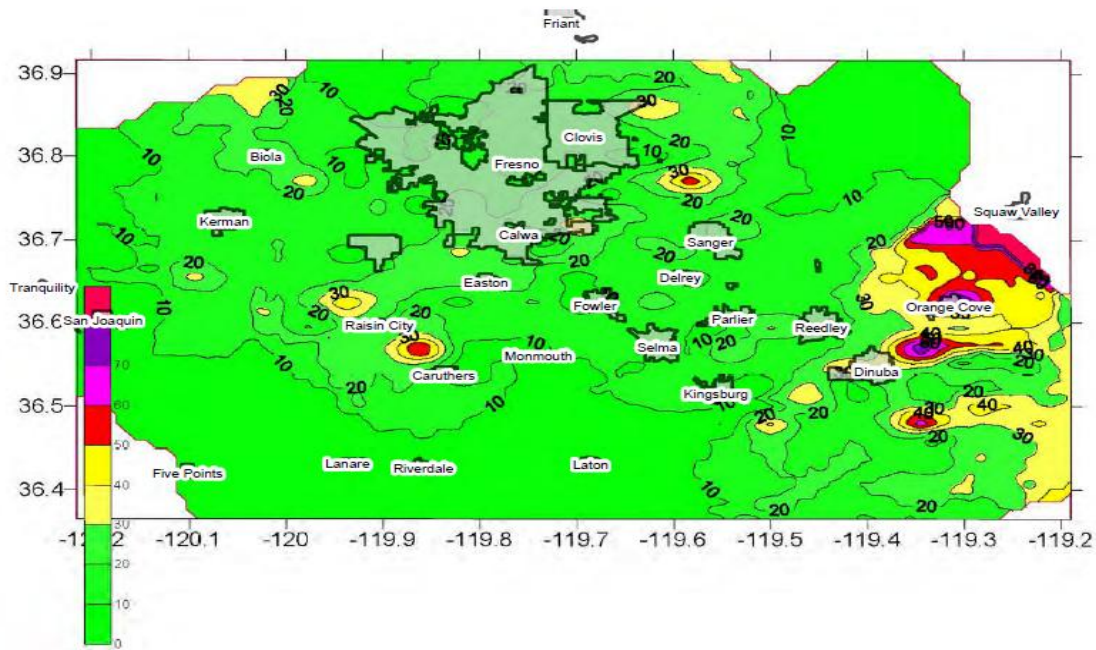


## 2000 to 2005 Max NO3





### 2006 to 2012 Avg NO3



### 2006 to 2012 Max NO3

