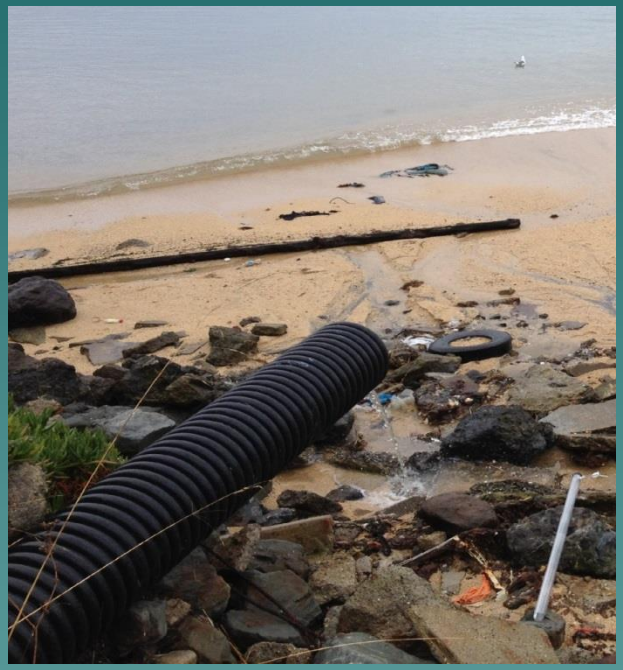
First Flush 2014: Midcoast Storm Drains

RESOURCE
CONSERVATION DISTRICT

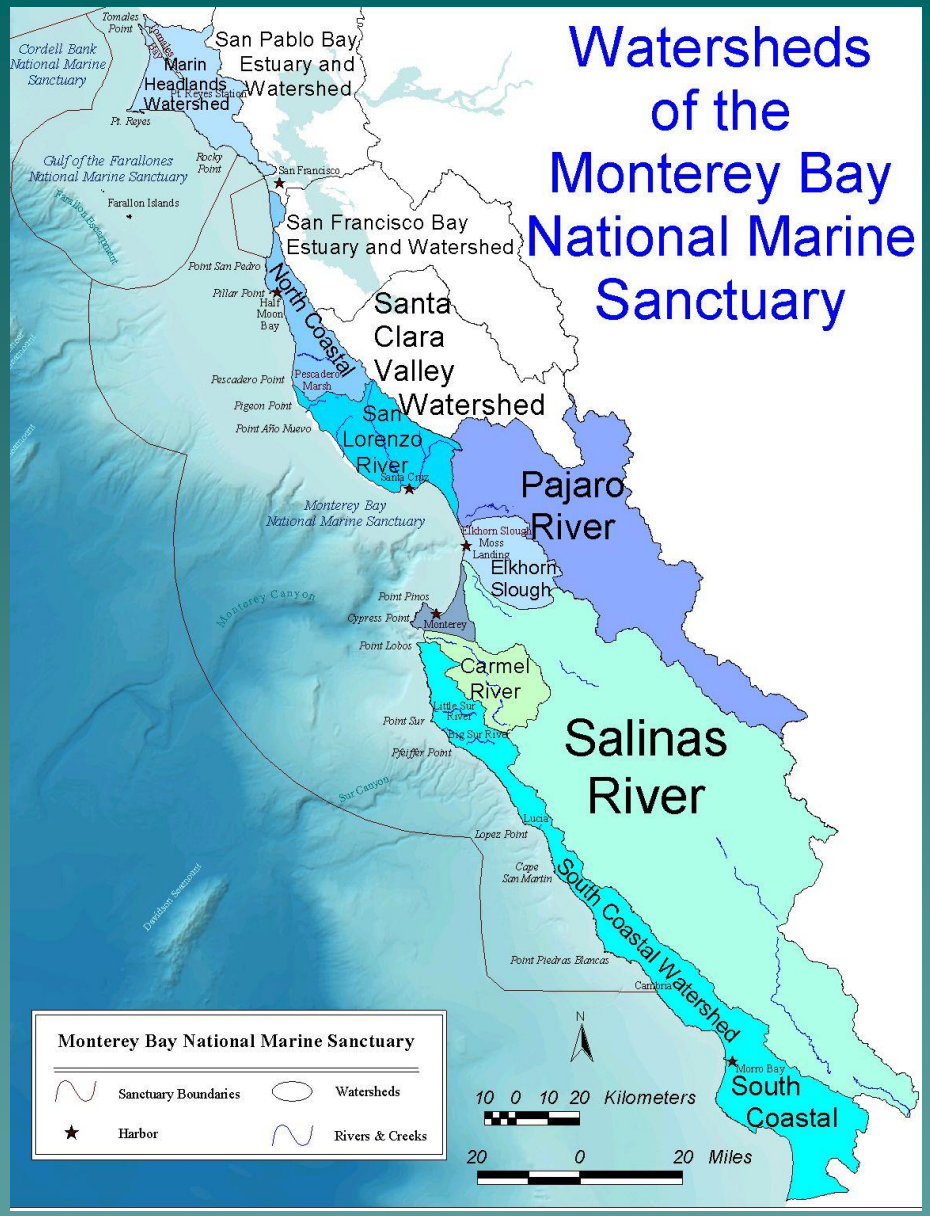
Presentation to:
SMC RCD Board of Directors
March 19th 2015

What is First Flush?

- First big rain of the season
- Freshwater runoff-storm drains
- Most polluted stormwater
- Sampled at outfall before ocean



October 31st 2014



Partners

NATIONAL MARINE SANCTUARIES
MONTEREY BAY

SEWER AUTHORITY MID-COASTSIDE WASTEWATER TREATMENT FACILITY
Sewer Authority Mid-Coastside
SAM

Surfrider Foundation

SAN MATEO COUNTY HARBOR DISTRICT CALIFORNIA

COUNTY OF SAN MATEO FOUNDED 1856
SAN MATEO COUNTY HEALTH SYSTEM

San Mateo County Resource Conservation District

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2014 Sample Sites

*202-MOSD-01: 7th Street
202-MOSD-02: Vallemar Street
202-MBSD-01: Weinke Way
202-MBSD-05: San Vicente Creek Mouth
*202-PPSD-01: Mavericks
202-MBSD-04: West Point
202-EGSD-04: Vassar Street
202-PPSD-02: Columbus Avenue
202-PPSD-03: Denniston Creek
202-EGSD-03: Capistrano Steet
202-PPSD-04: St. Augustine
202-PPSD-05: Inner Harbor parking lot
*202-PPSD-06: Inner Harbor cleaning station
202-PPSD-07: Harbor upland
*202-PPSD-08: Harbor ramp
202-PPSD-09: Deer Creek
202-EGSD-01: El Granada
202-EGSD-02: Surfers Beach
* Outfall not flowing-no data for 2014

What are we testing?

- Bacteria (*E. coli*, Enterococcus, Total Coliforms)
- Nutrients (nitrate, orthophosphate, urea, ammonia)
- Metals (zinc, lead, copper)
- Total Suspended Solids, Hardness

Field Tests

- Transparency-daylight hours only
- pH
- Electrical conductivity
- Water temperature
- Observations: trash, odor, bubbles, scum, oil

Train and Mobilize Volunteers

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Data Analysis

- Dry Run vs. First Flush
- 14 SMC sites in 2014
- 9 were historic sites (2008-2014)
  - Analyzed over time
  - Compared locations
  - Note:
    - No data for 2013 in SMC
    - Other counties have data since 2000
- Water Quality Objectives (WQOs)

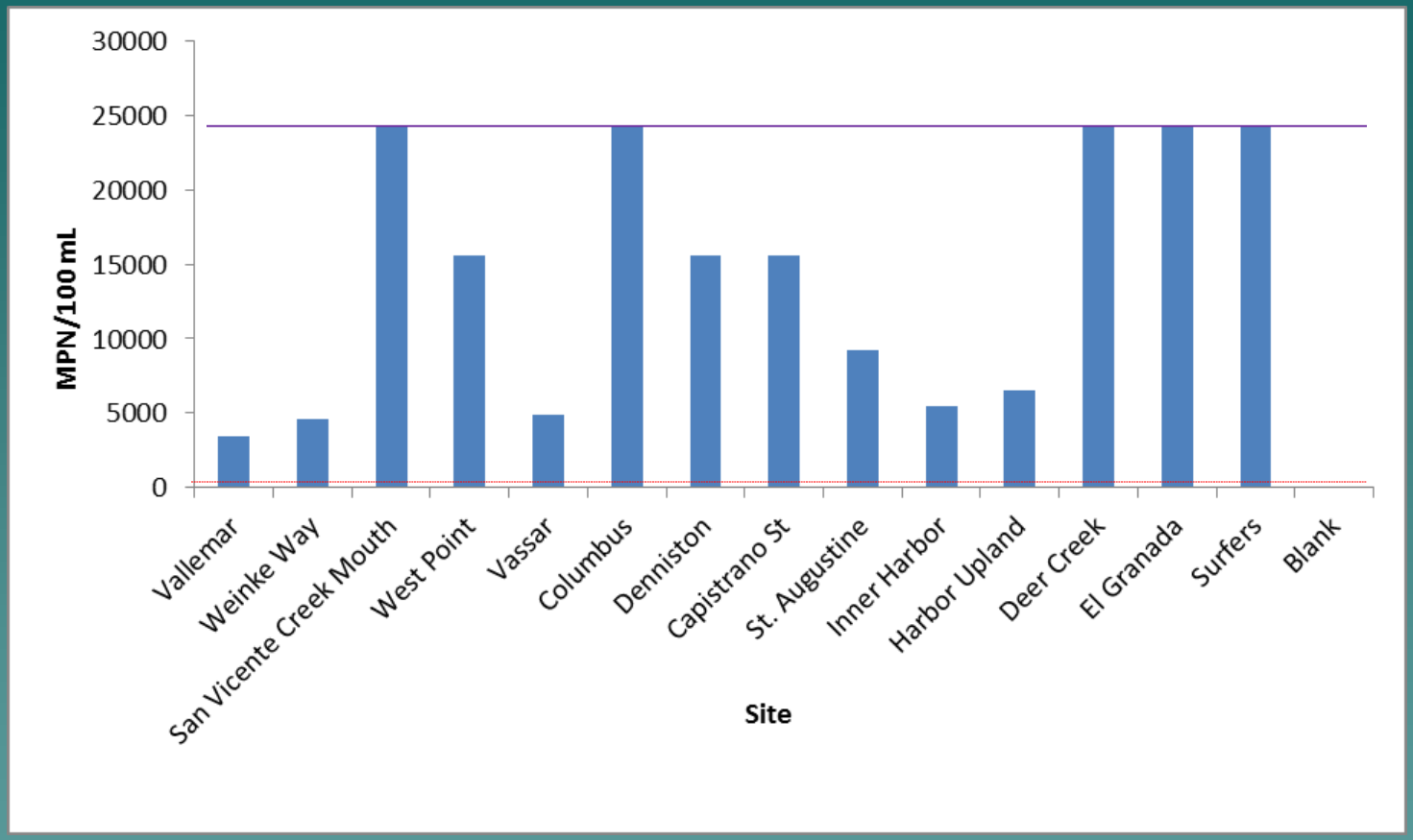
Dry Run vs First Flush

202-MBSD-05: San Vicente Creek Mouth

Parameter	Dry Run	First Flush
E. Coli	6,867	24,196
Entercoccus	4,884	15,531
NO_3-N	1.0	0.3
O-PO_4-P	0	1.69
Urea	10	32
Copper	0.44	11
Lead	0	8
Zinc	14	147
TSS	3	378

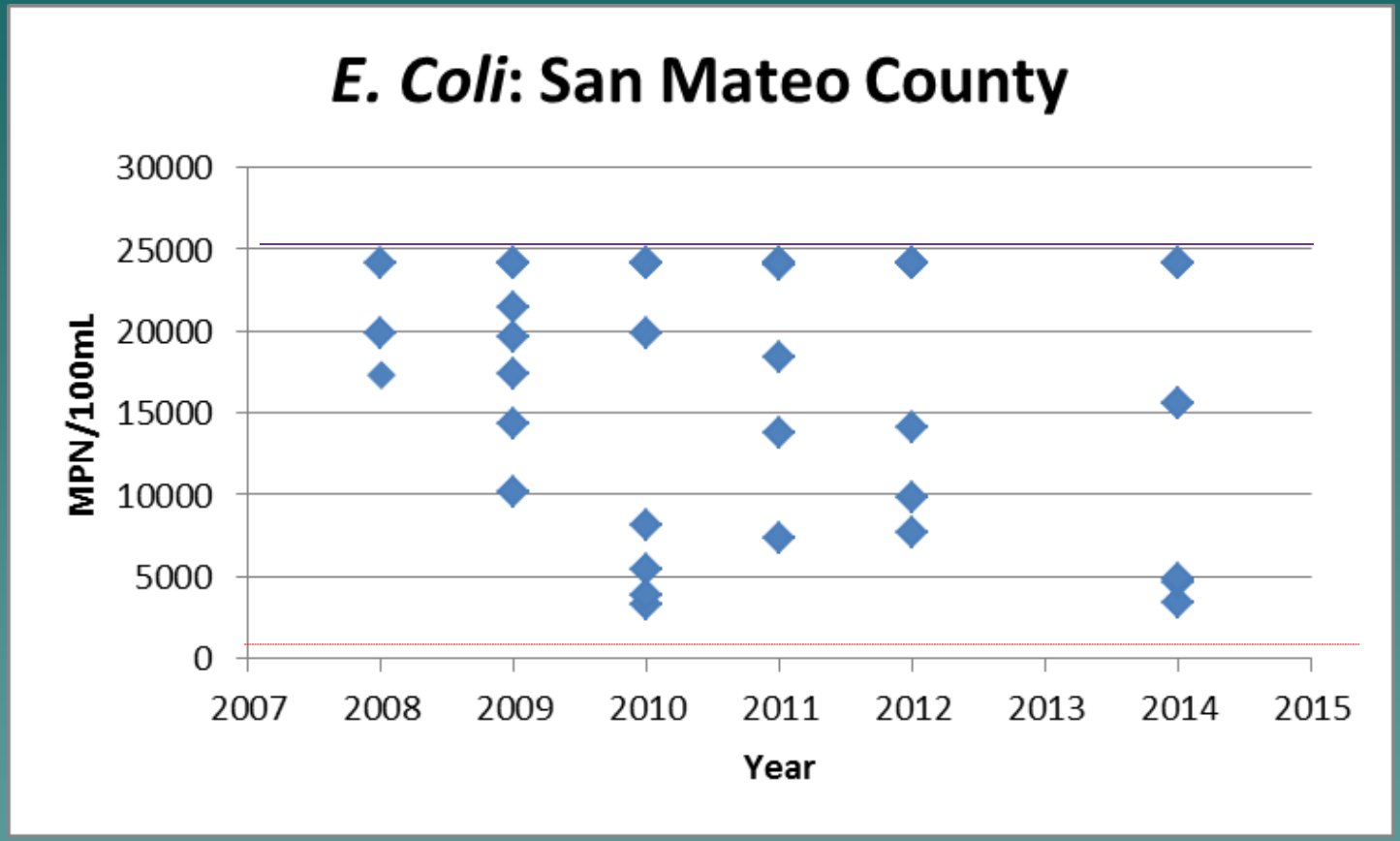
E. Coli: Highest dry run concentration in 2014

E. coli 2014



WQO<235 MPN/100 mL Detection Limit: 24,196 MPN/100 mL

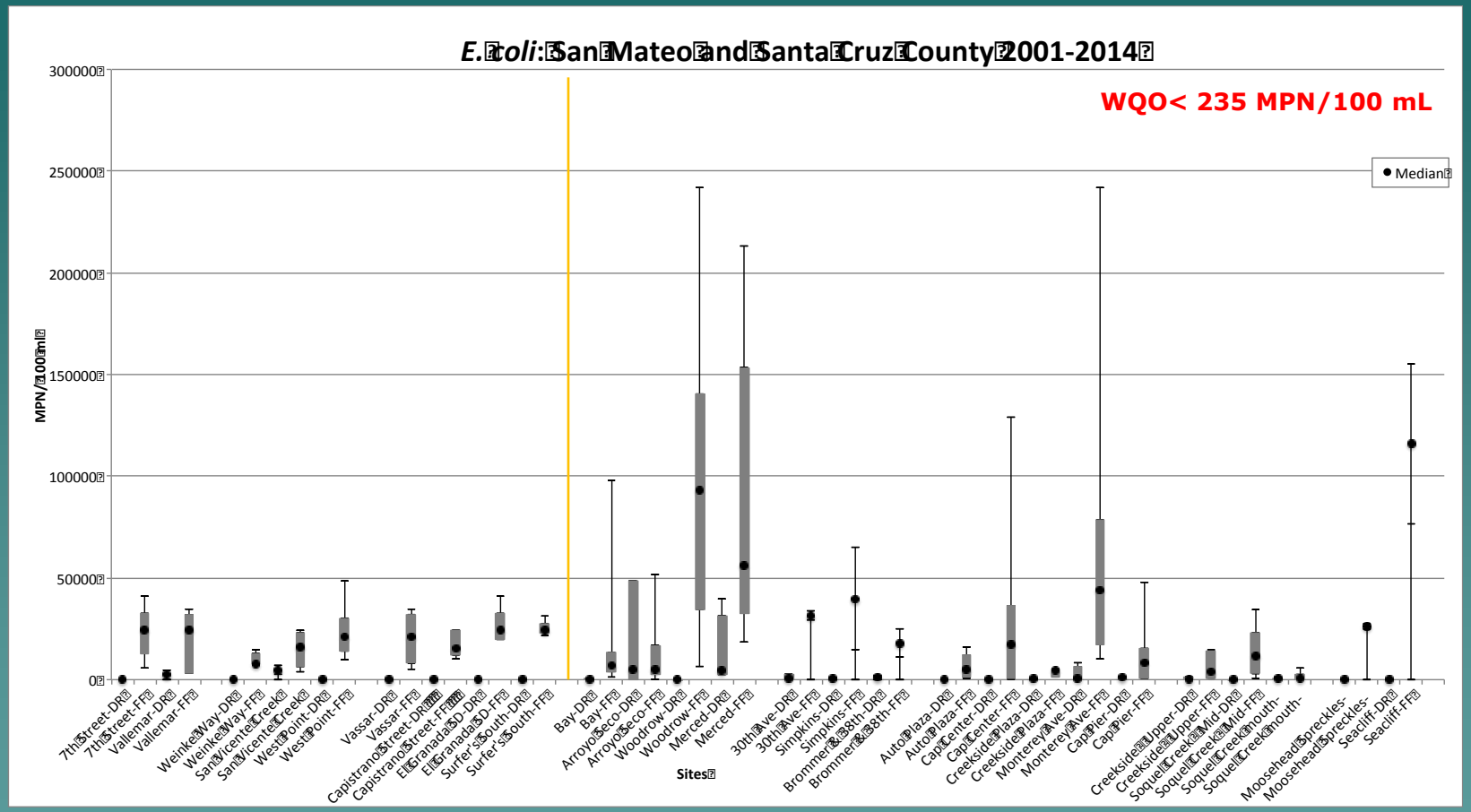
E. Coli over time



WQO<235 MPN/100 mL
Detection Limit: 24,196 MPN/100 mL

*Note data in 2008 and 2009 were adjusted to current Detection Limit

E. Coli Location Comparison



*Note all data in San Mateo County except 2008 and 2009 has a detection limit at 24,196 MPN/100 mL

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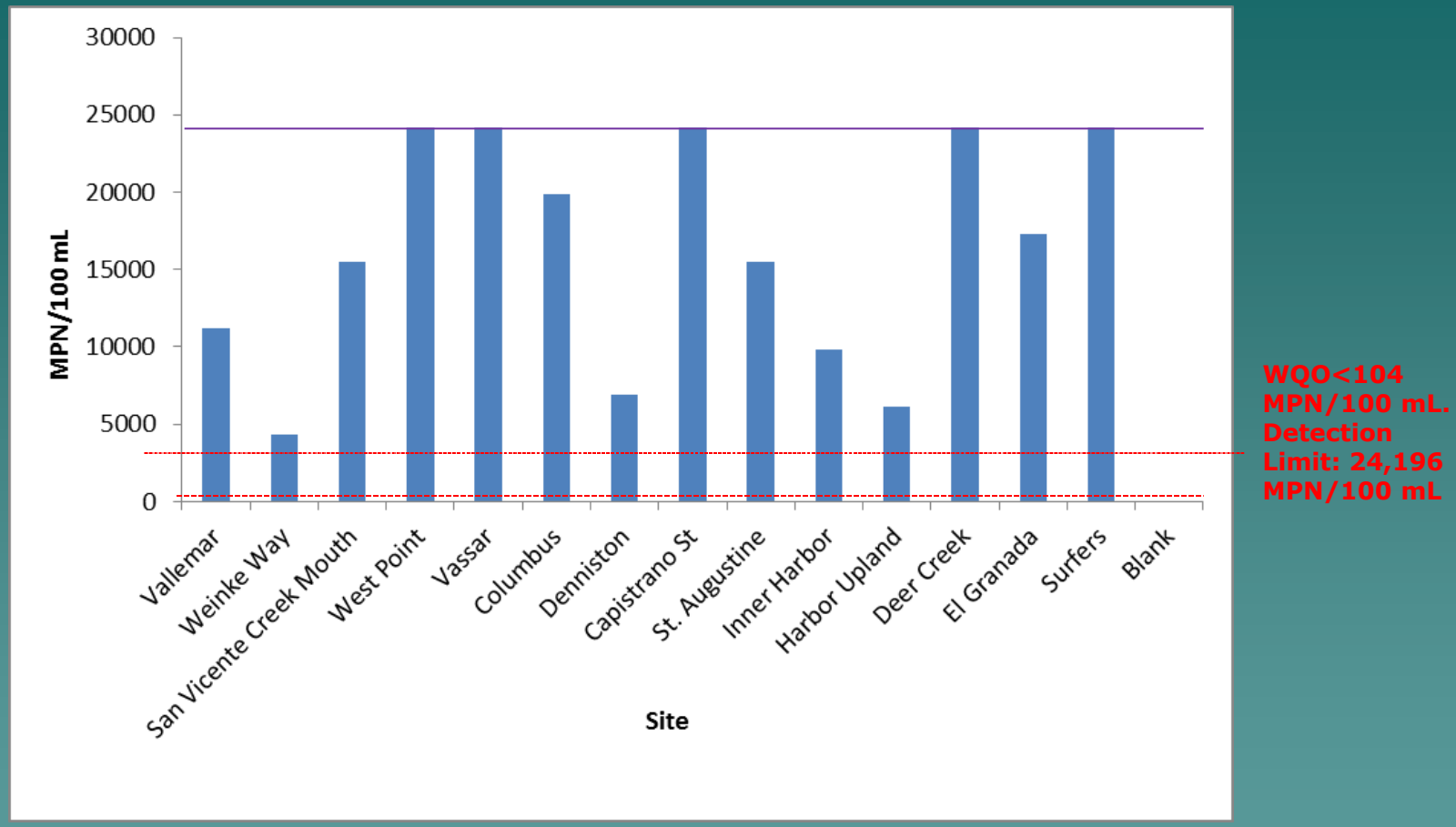
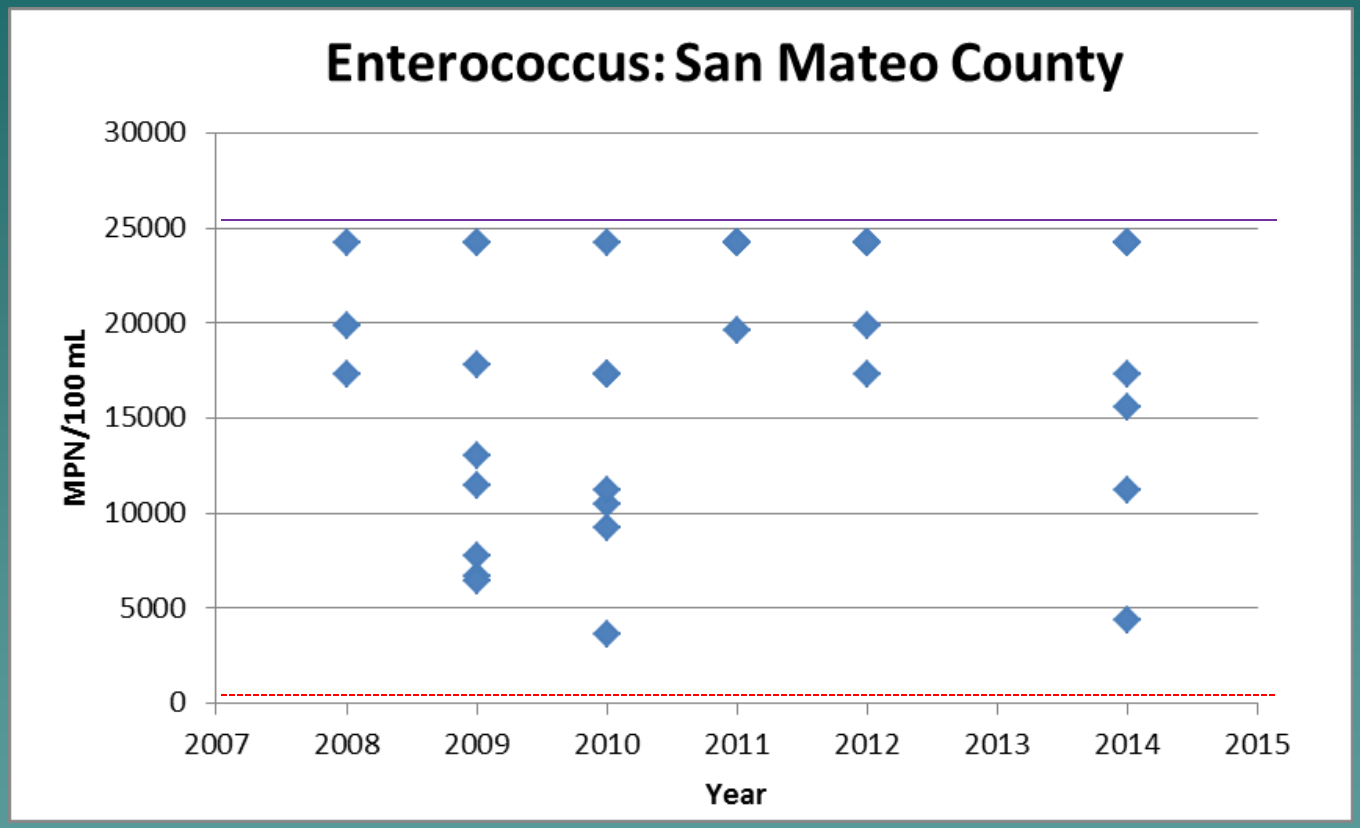
Enterococcus 2014

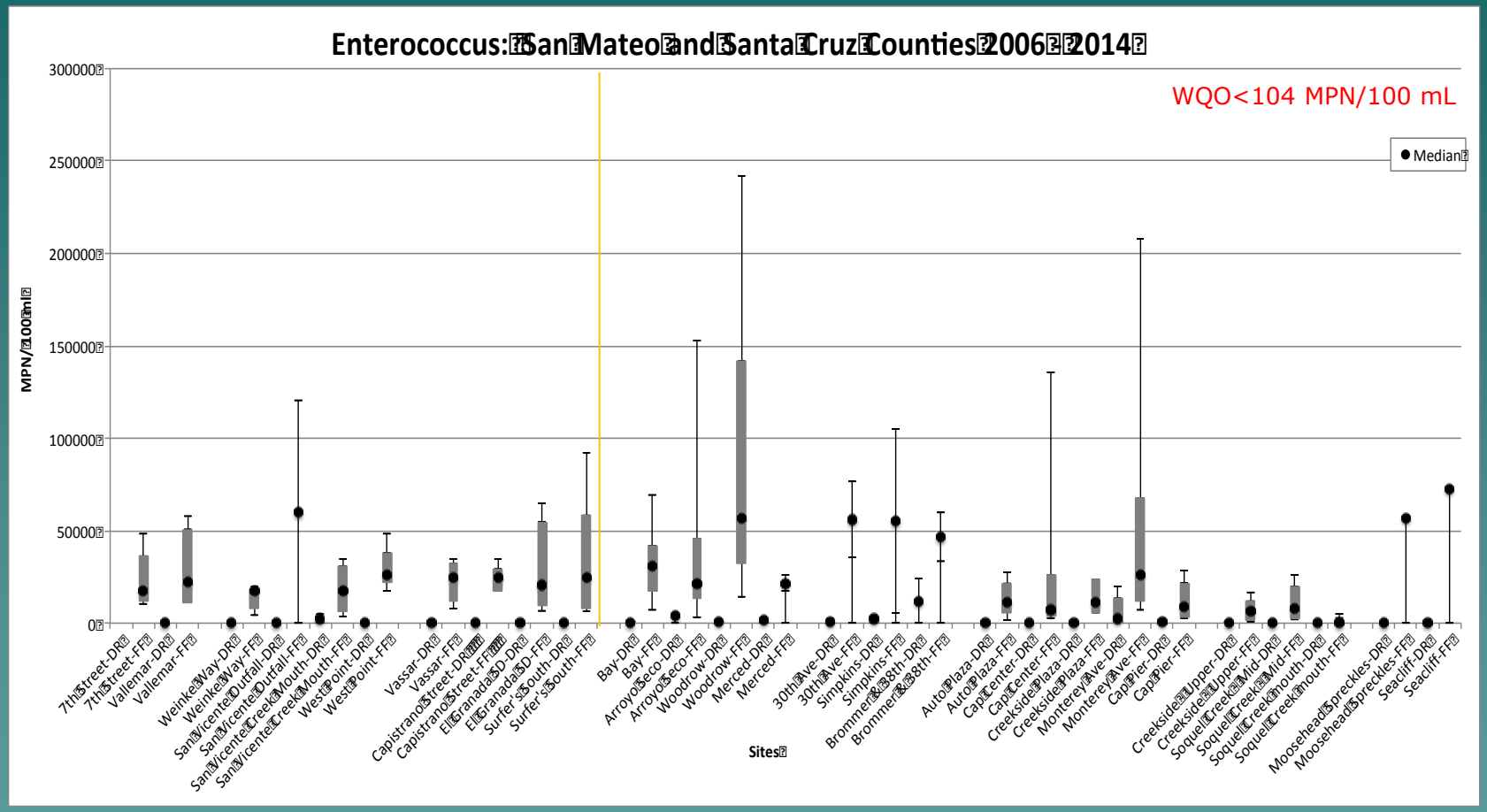


Enterococcus over time



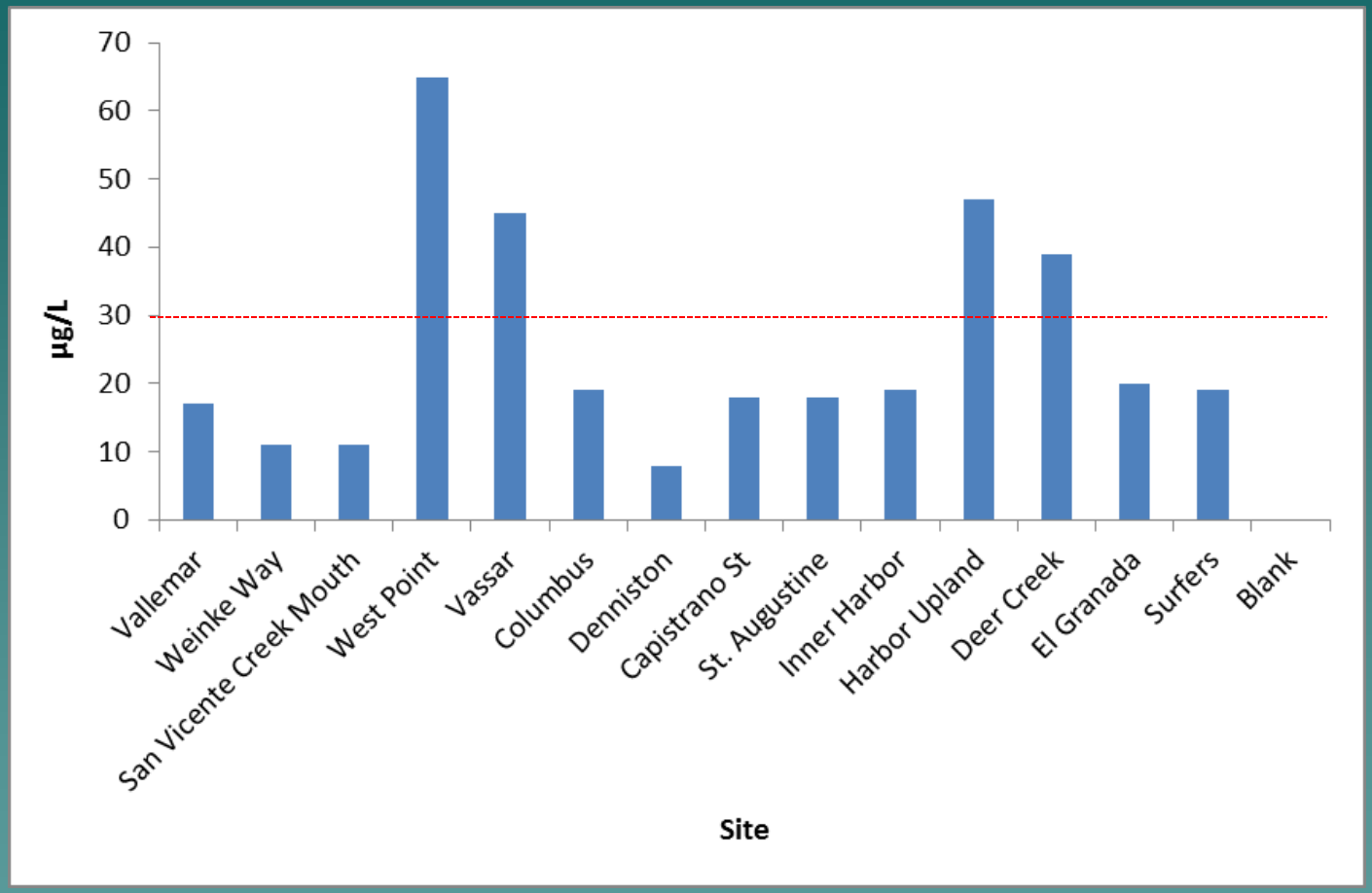
WQO<104 MPN/100 mL. Detection Limit: 24,196 MPN/100 mL

Enterococcus Location Comparison

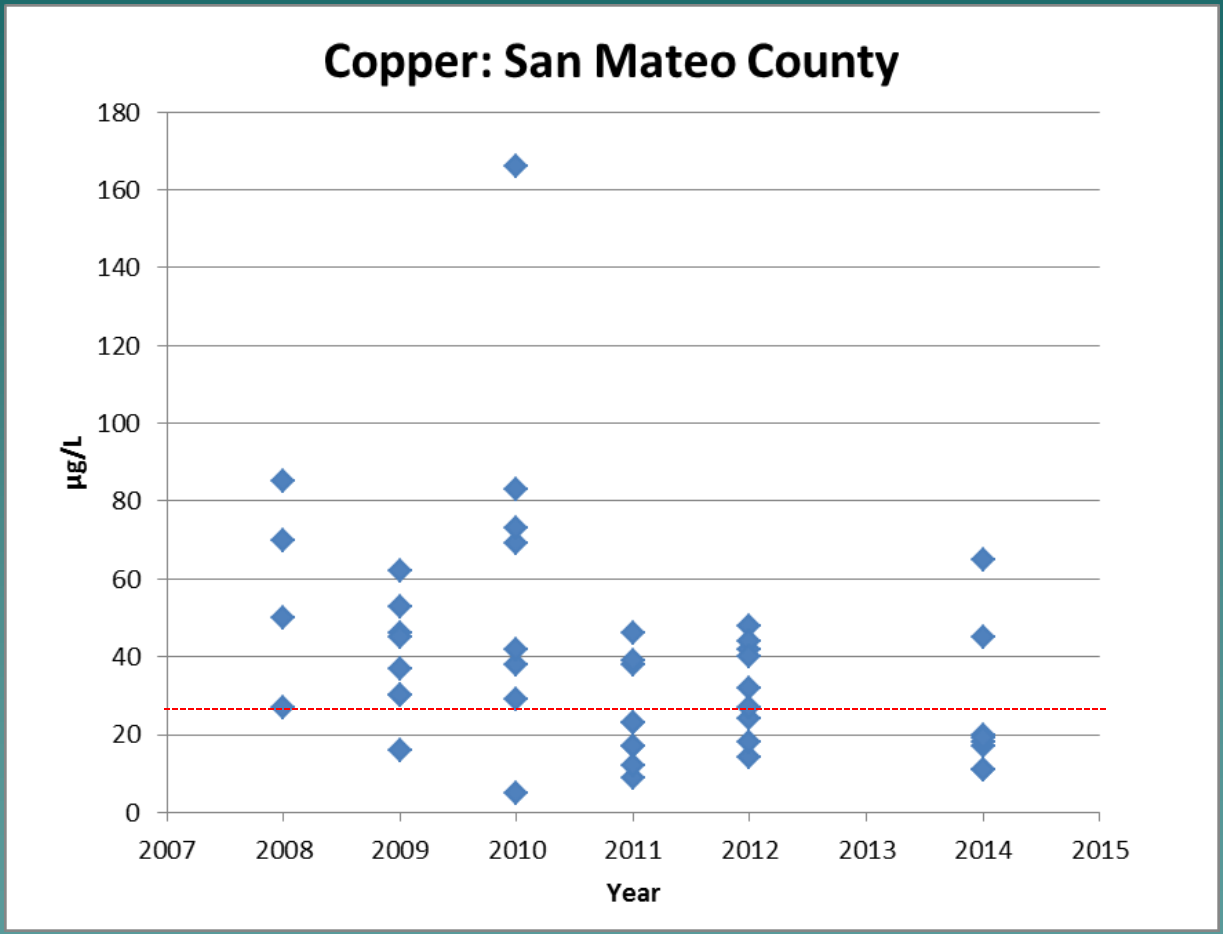


*Note all data in San Mateo County except 2008 and 2009 has a detection limit at 24,196 MPN/100 mL

Copper (Cu) 2014



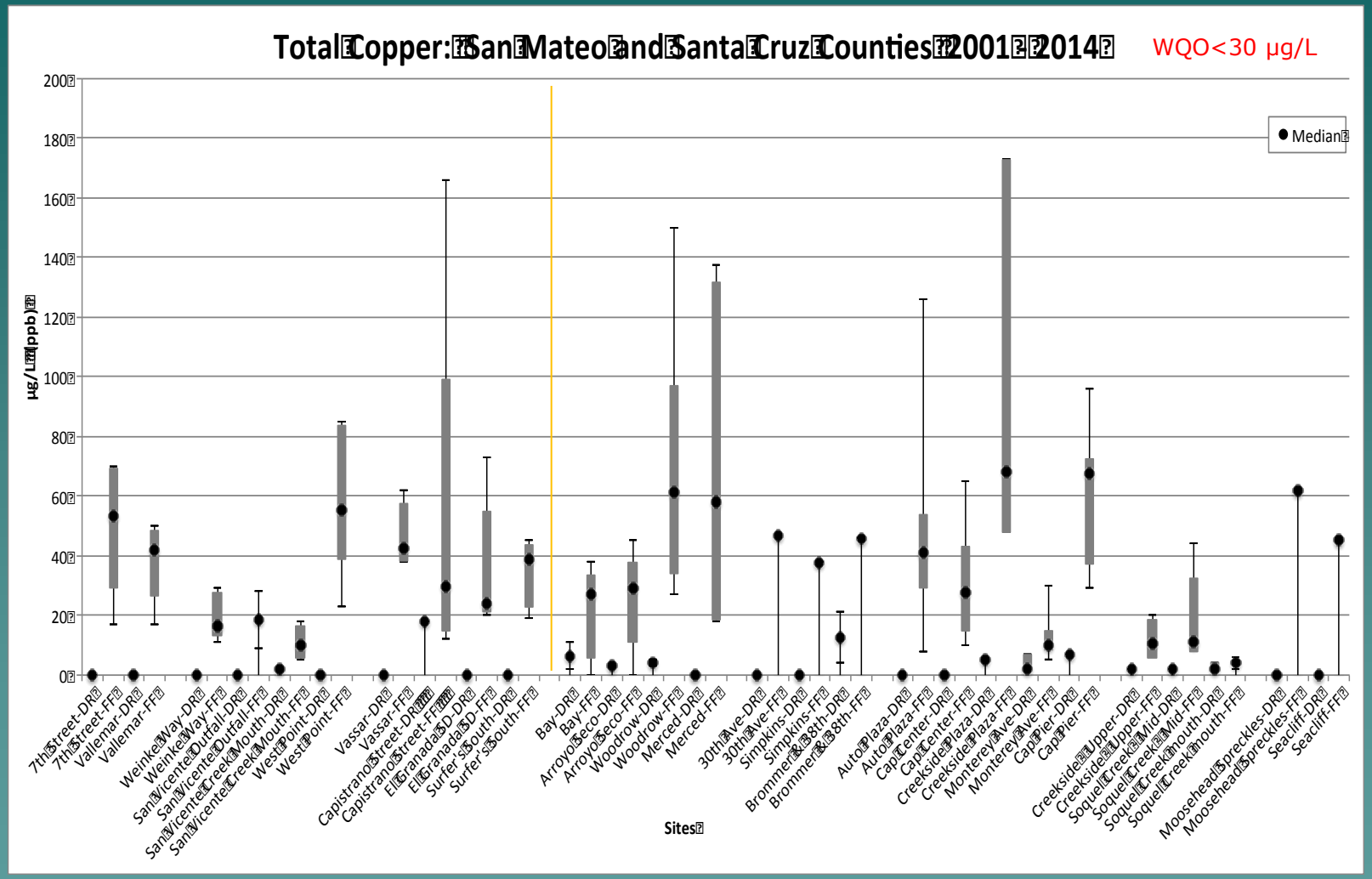
Copper (Cu) over time



50% over WQO

WQO<30 µg/L

Cu Location Comparison



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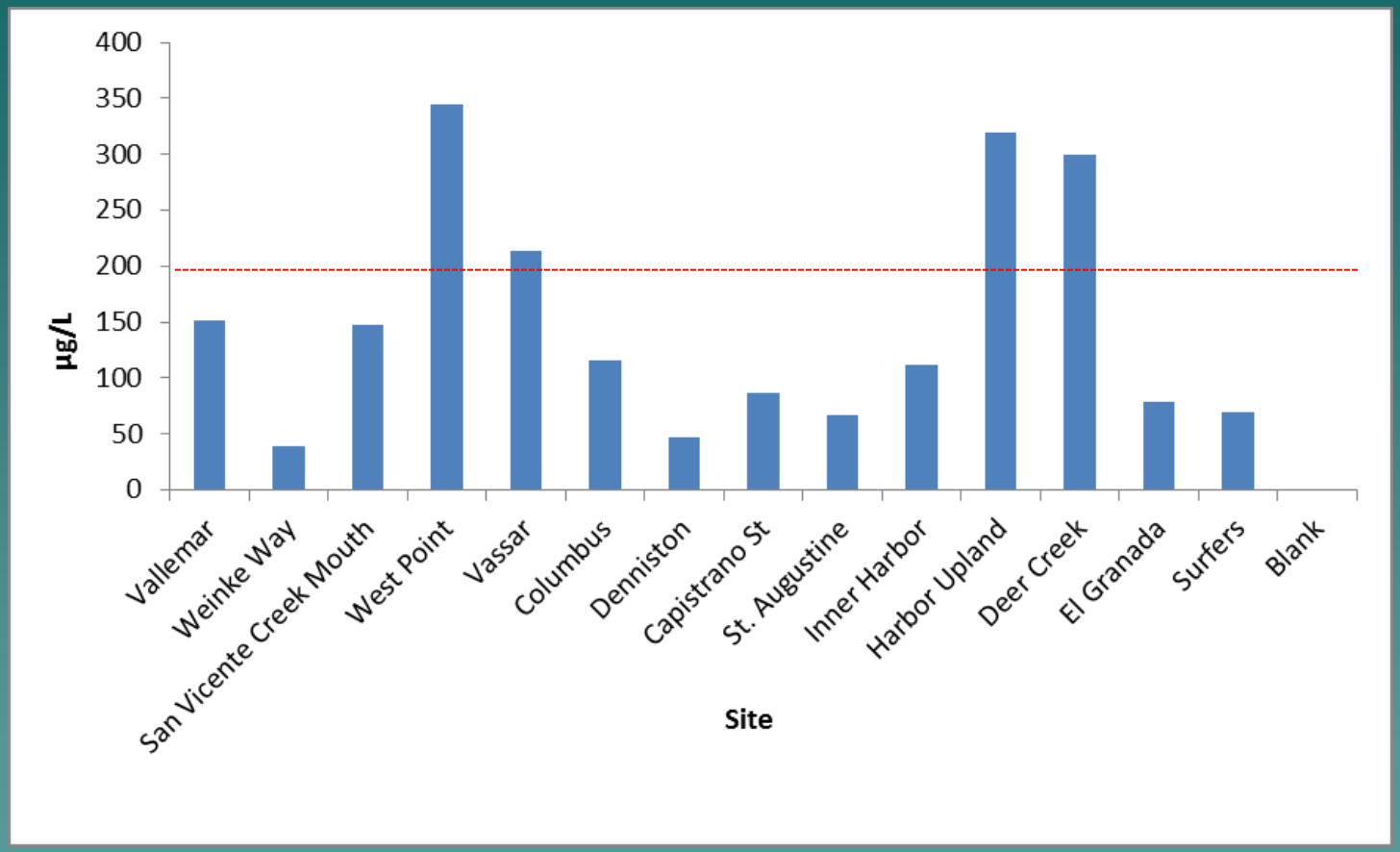
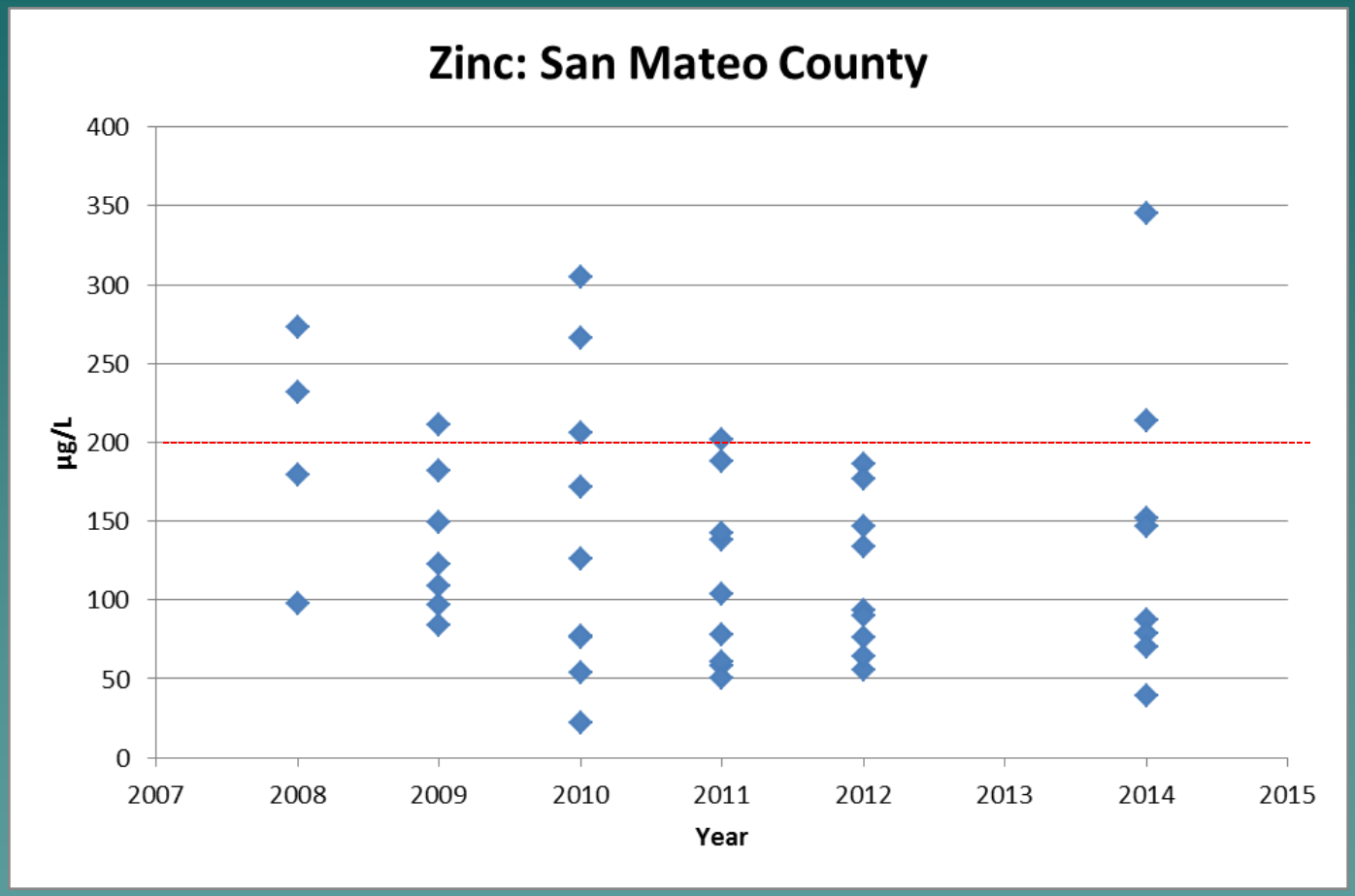
Zinc (Zn) 2014


400
350
300
250
200
150
100
50
0
µg/L
WQO < 200 µg/L
Vallemar
Weinke Way
San Vicente Creek Mouth
West Point
Vassar
Columbus
Denniston
Capistrano St
St. Augustine
Inner Harbor
Harbor Upland
Deer Creek
El Granada
Surfers
Blank
Site

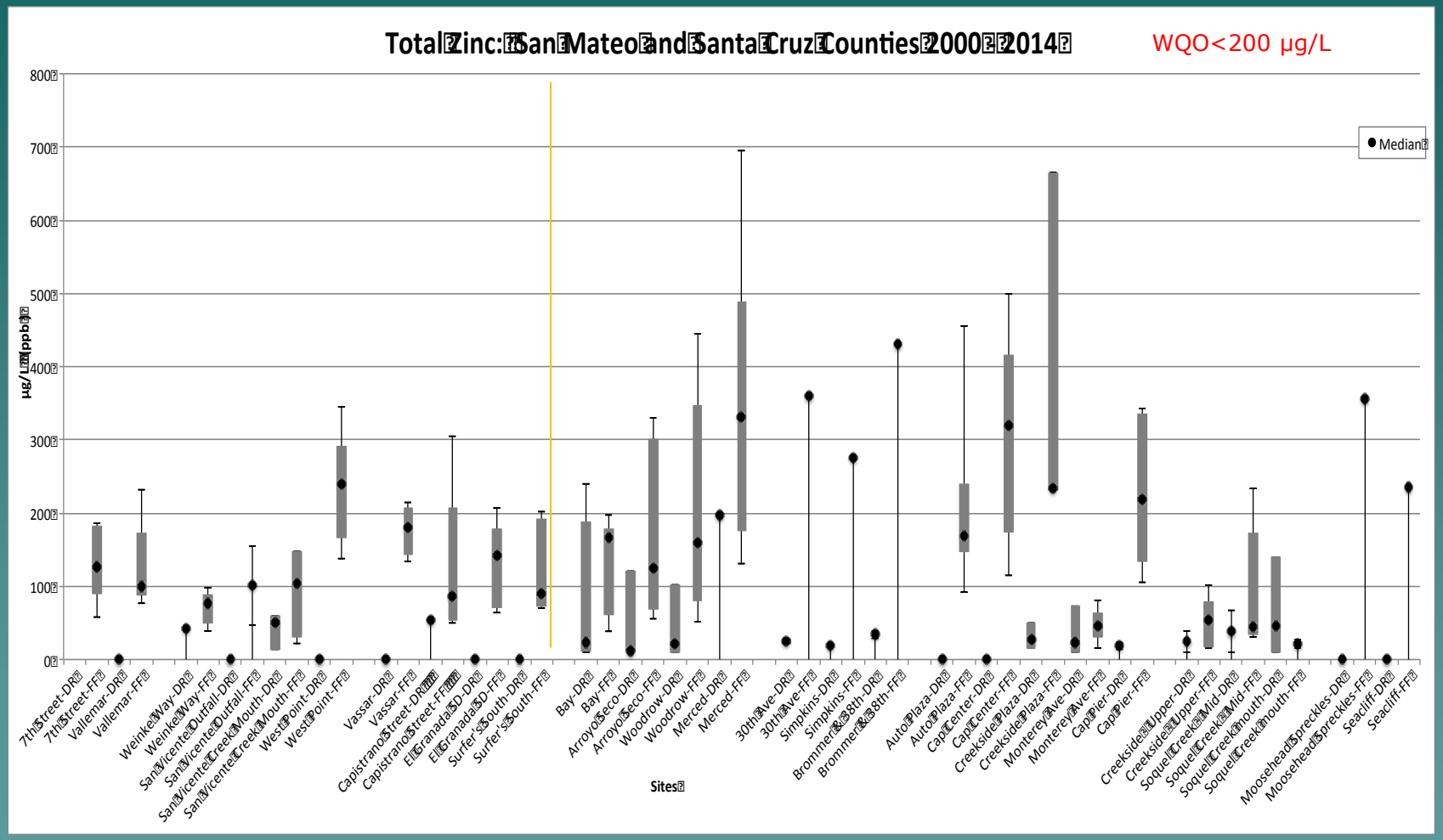
Zinc(Zn) over time



20% over WQO

WQO < 200 µg/L

Zn Location Comparison



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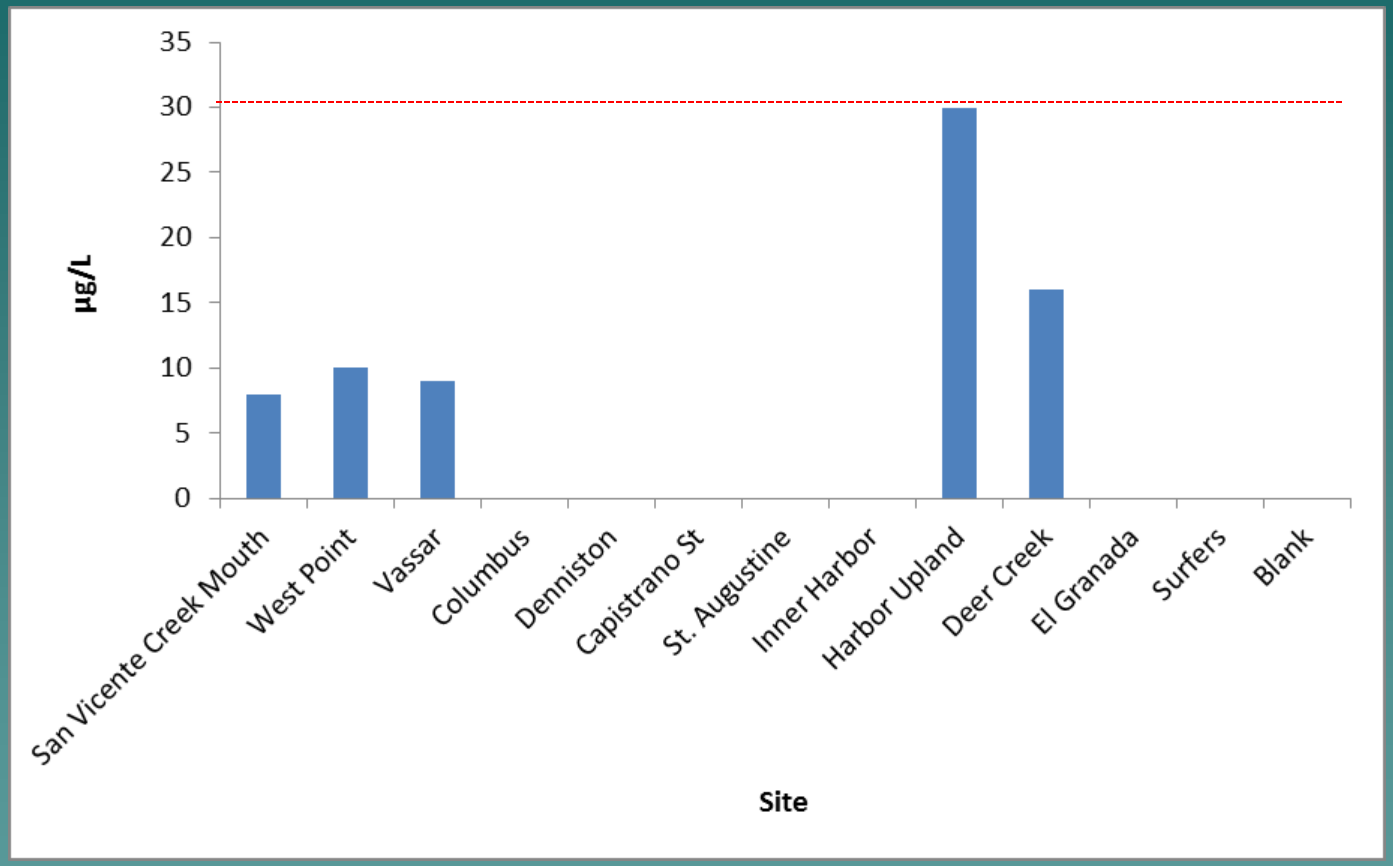
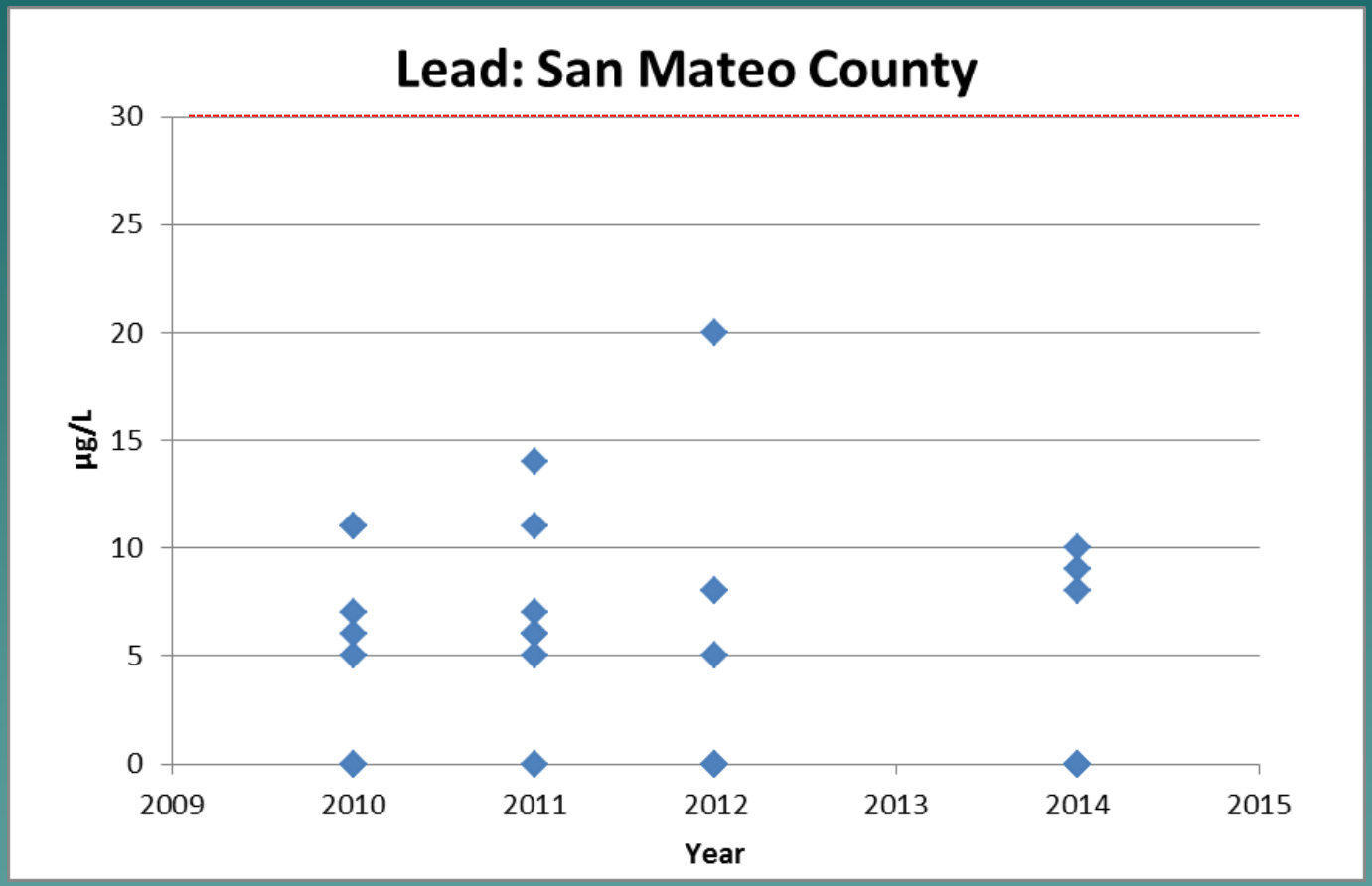
Lead (Pb) 2014

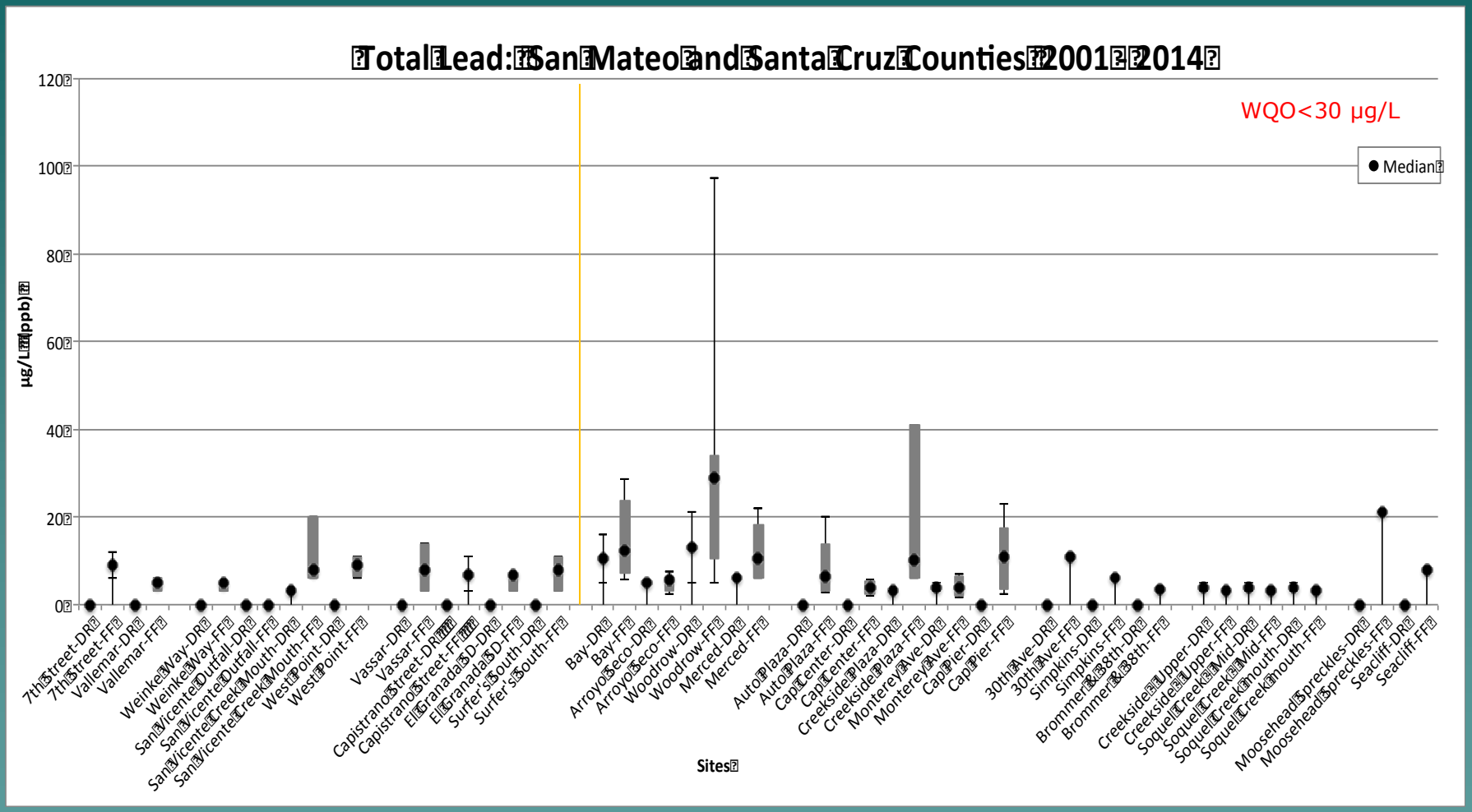

35
30
25
20
15
10
5
0
µg/L
WQO<30 µg/L
San Vicente Creek Mouth
West Point
Vassar
Columbus
Denniston
Capistrano St
St. Augustine
Inner Harbor
Harbor Upland
Deer Creek
El Granada
Surfers
Blank
Site

Lead (Pb) over time

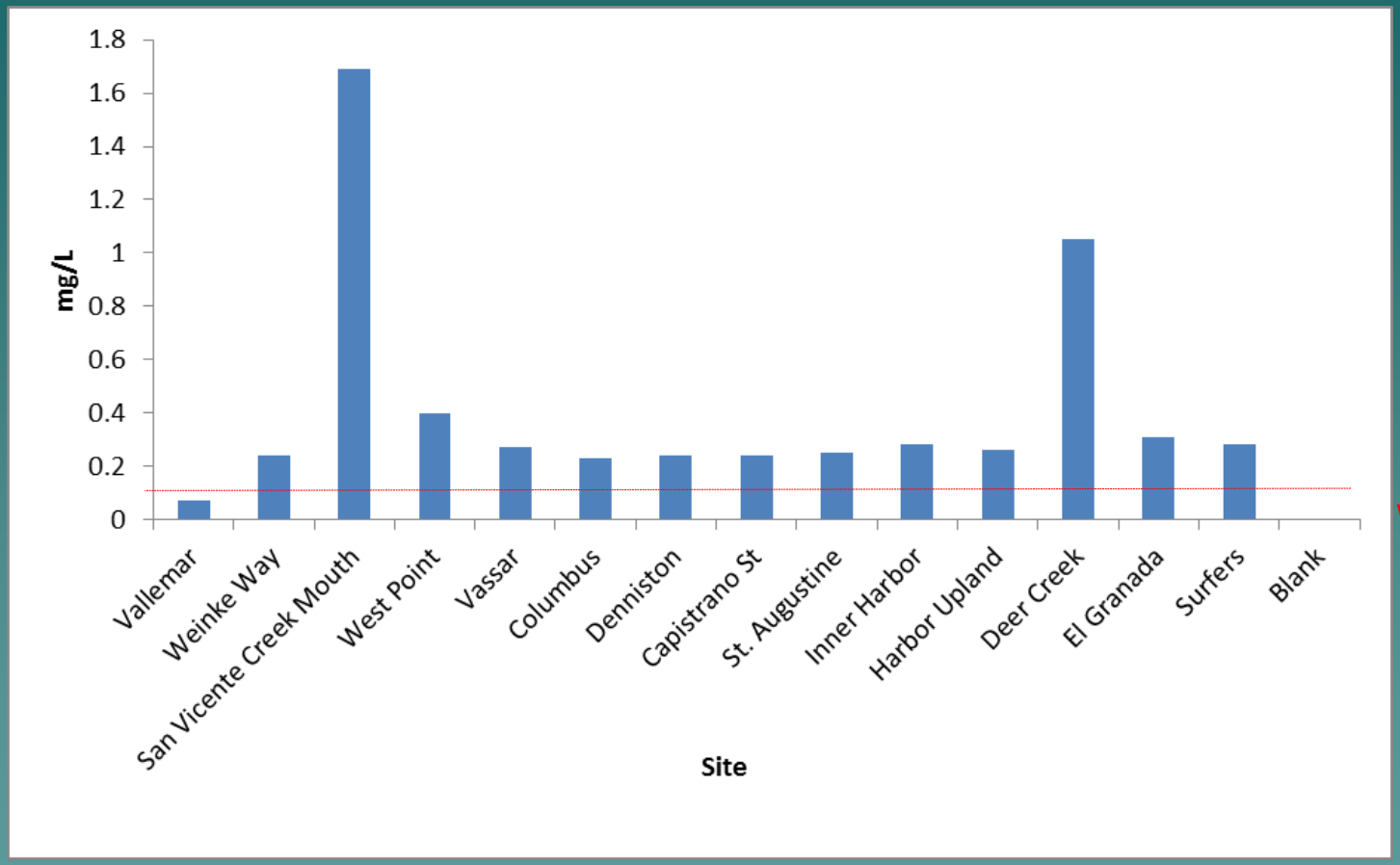


WQO<30 µg/L

Pb Location Comparison

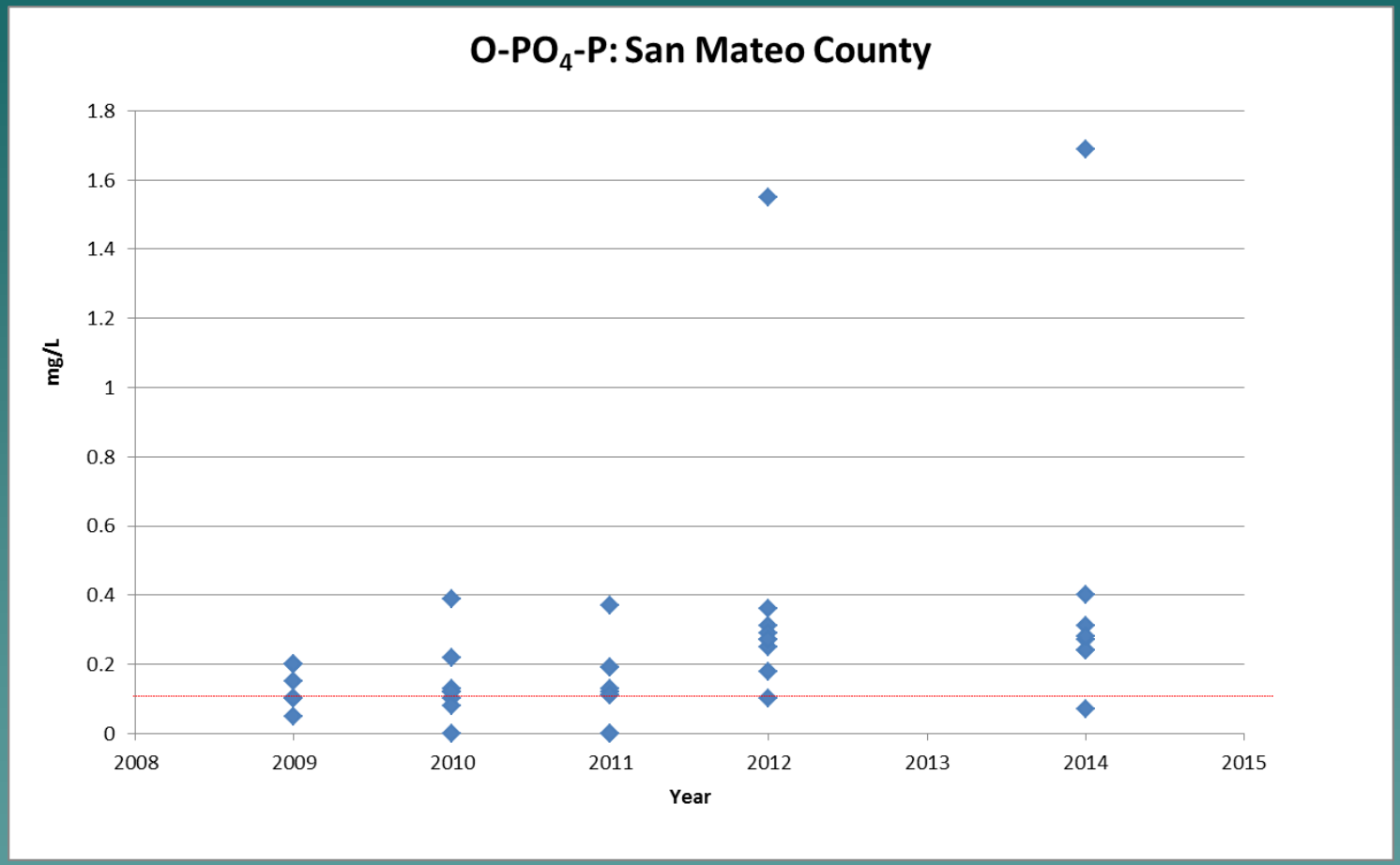


Orthophosphate 2014



WQO=0.12 mg/L

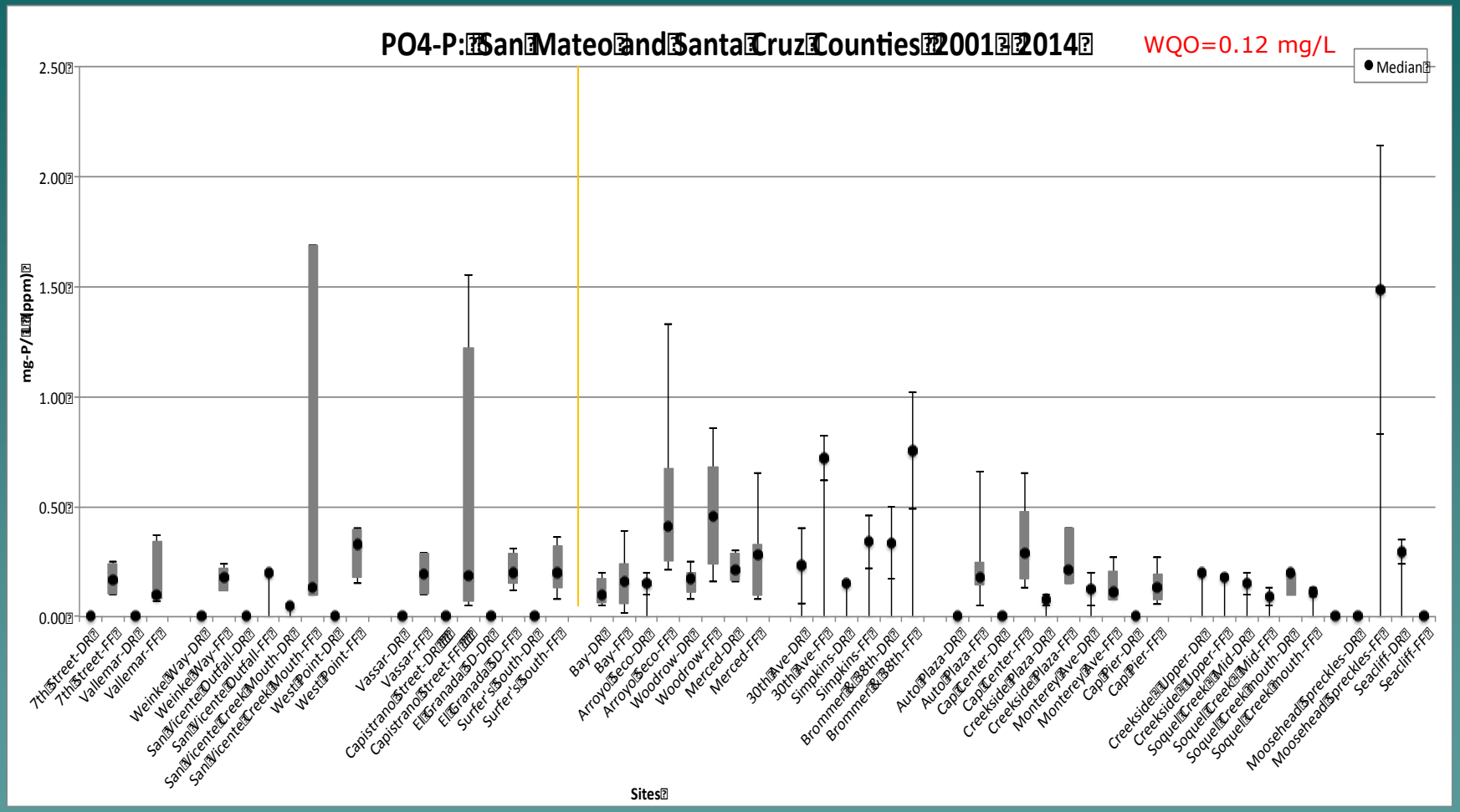
Orthophosphate over time



69% over WQO

WQO=0.12 mg/L

Orthophosphate Location Comparison



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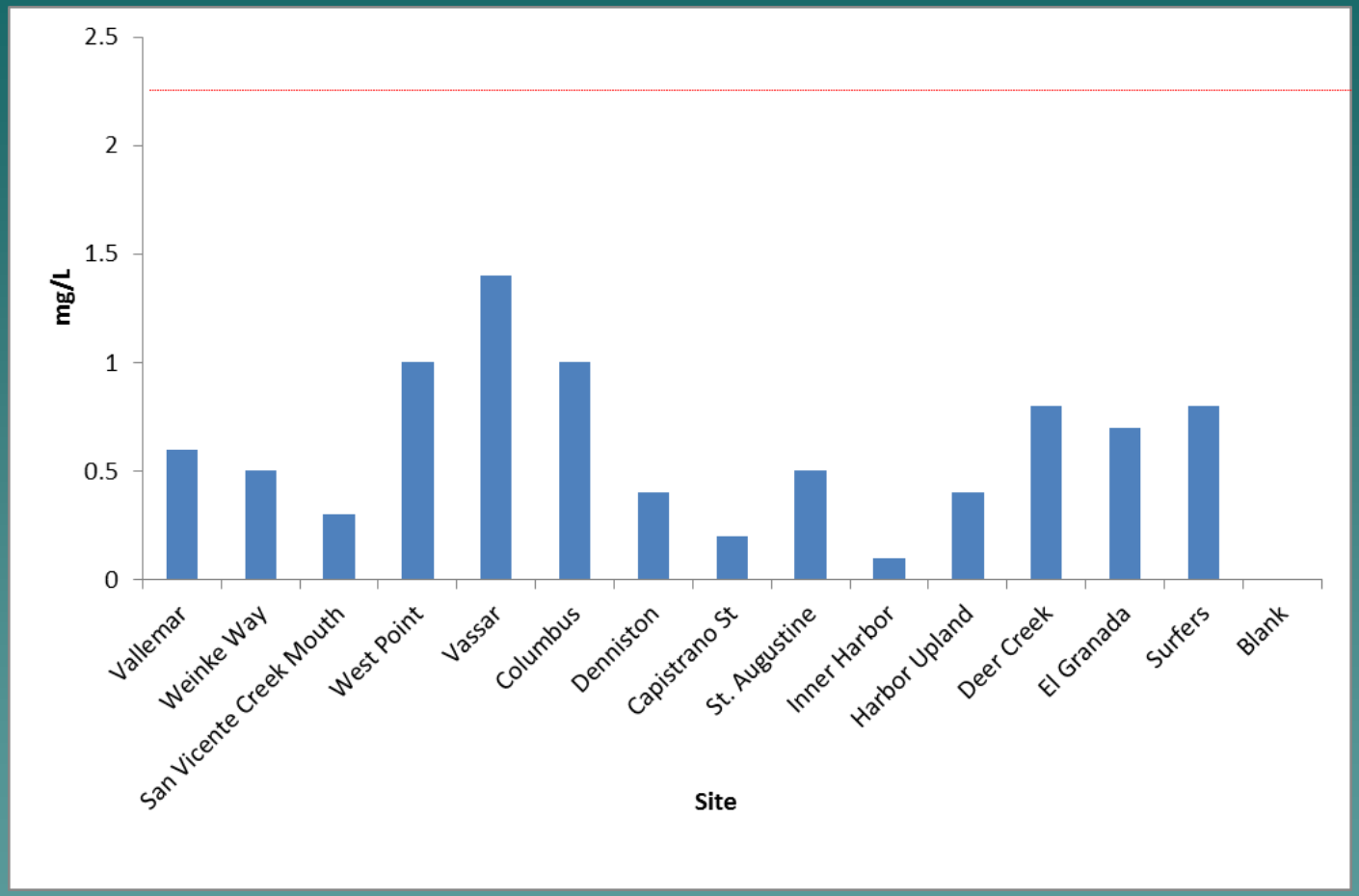
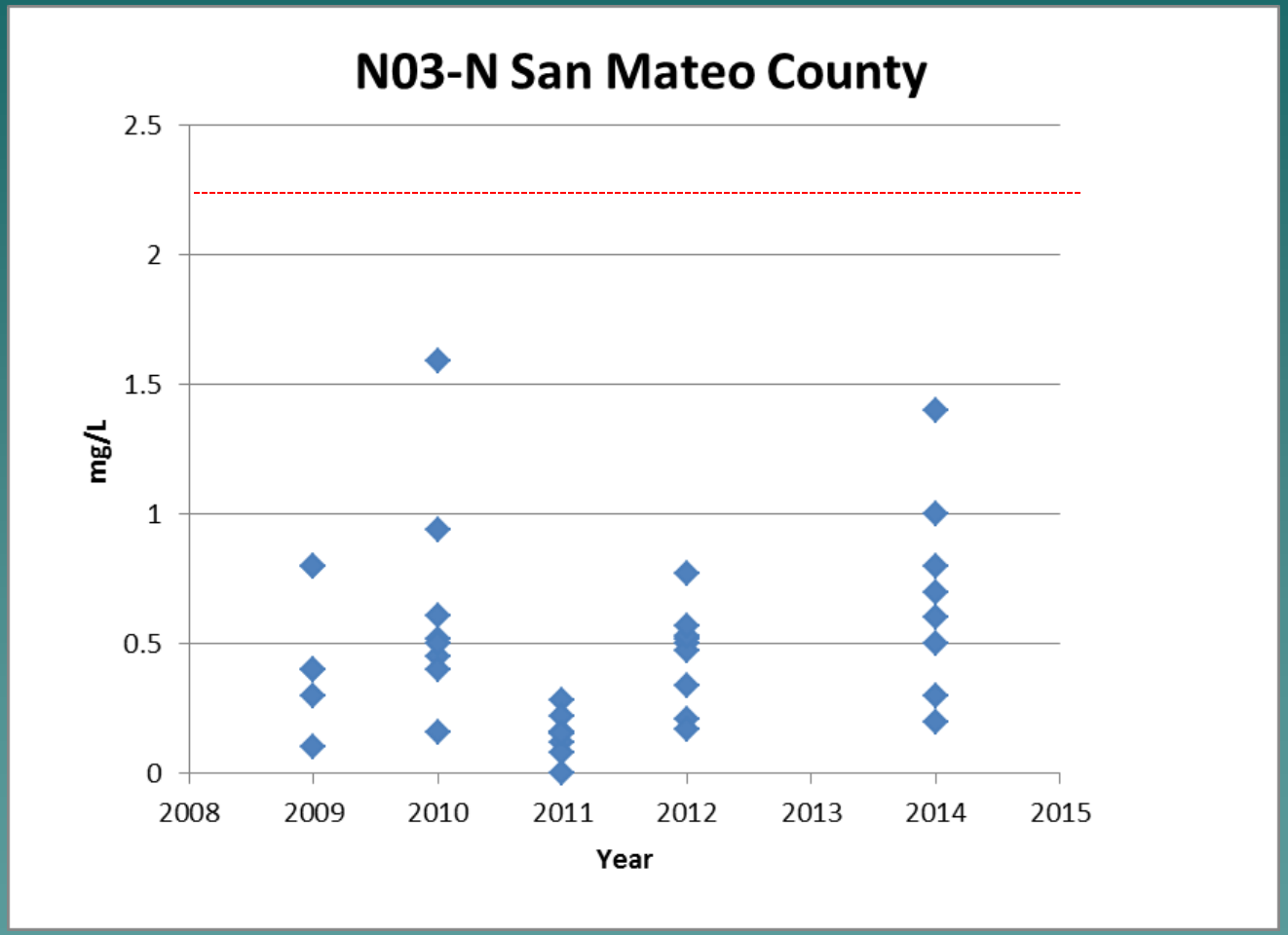
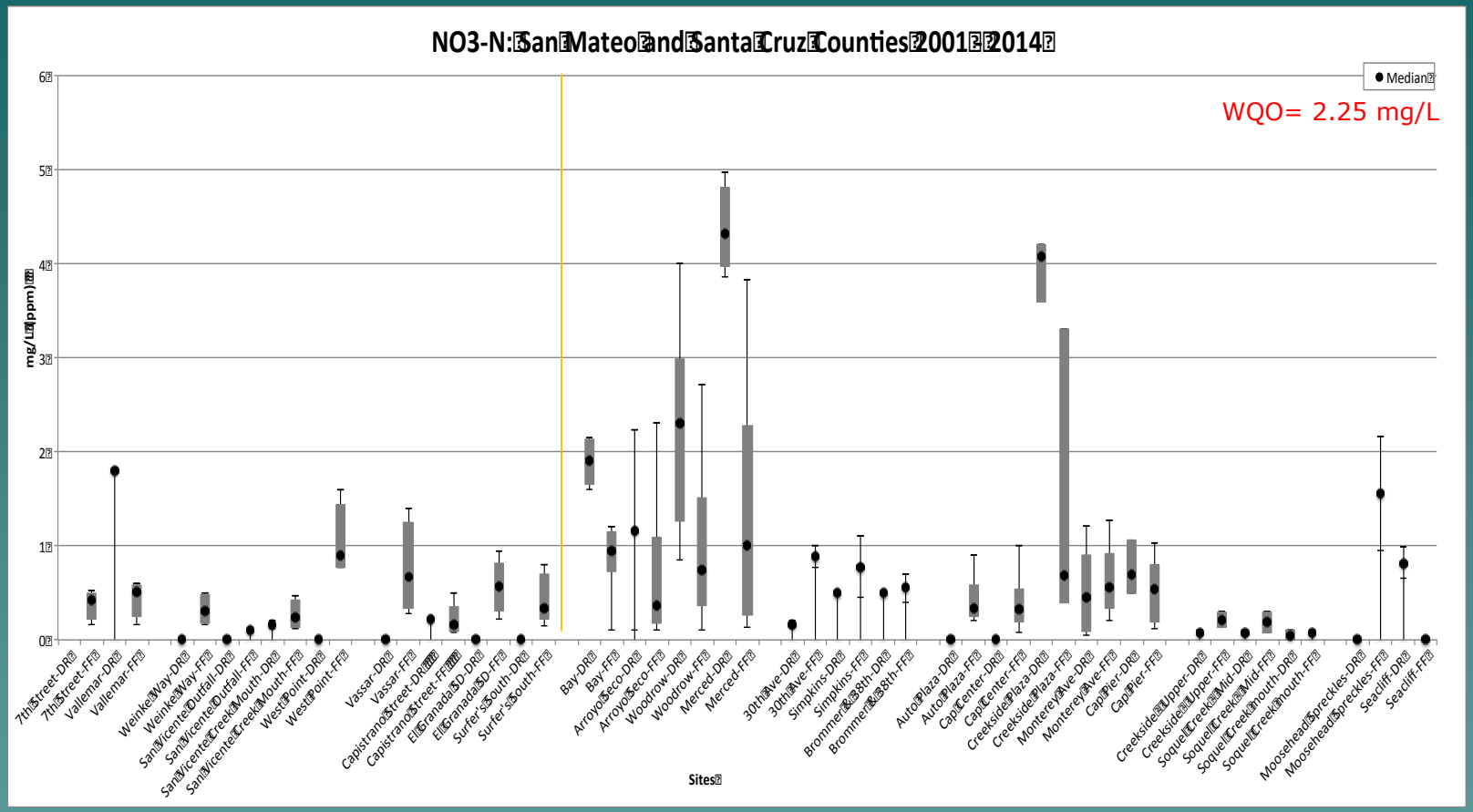
Nitrate 2014



Nitrate over time



Nitrate Location Comparison



Highest sample concentration in 2014: Vassar Ave 1.4 mg/L but still did not exceed WQO

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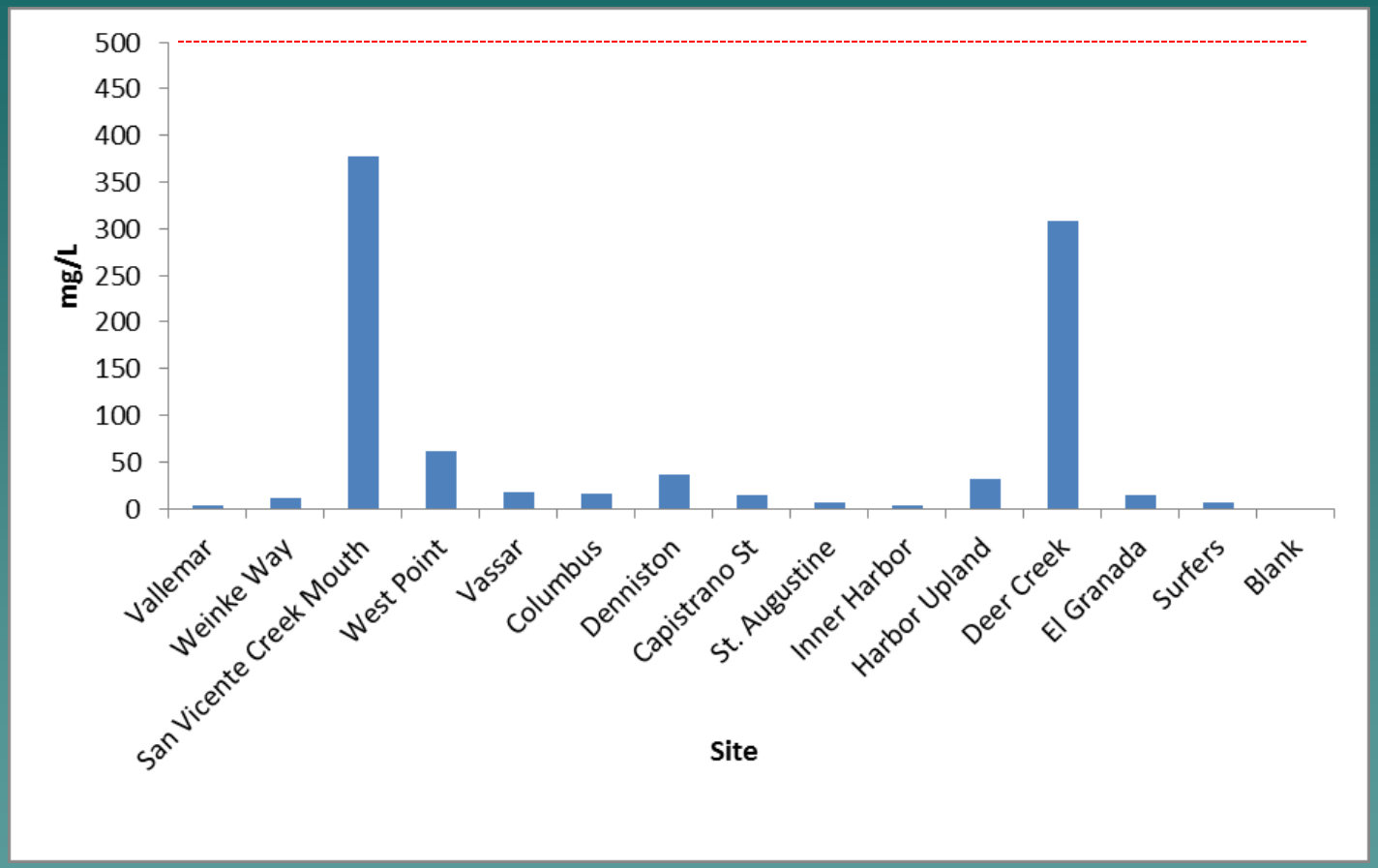
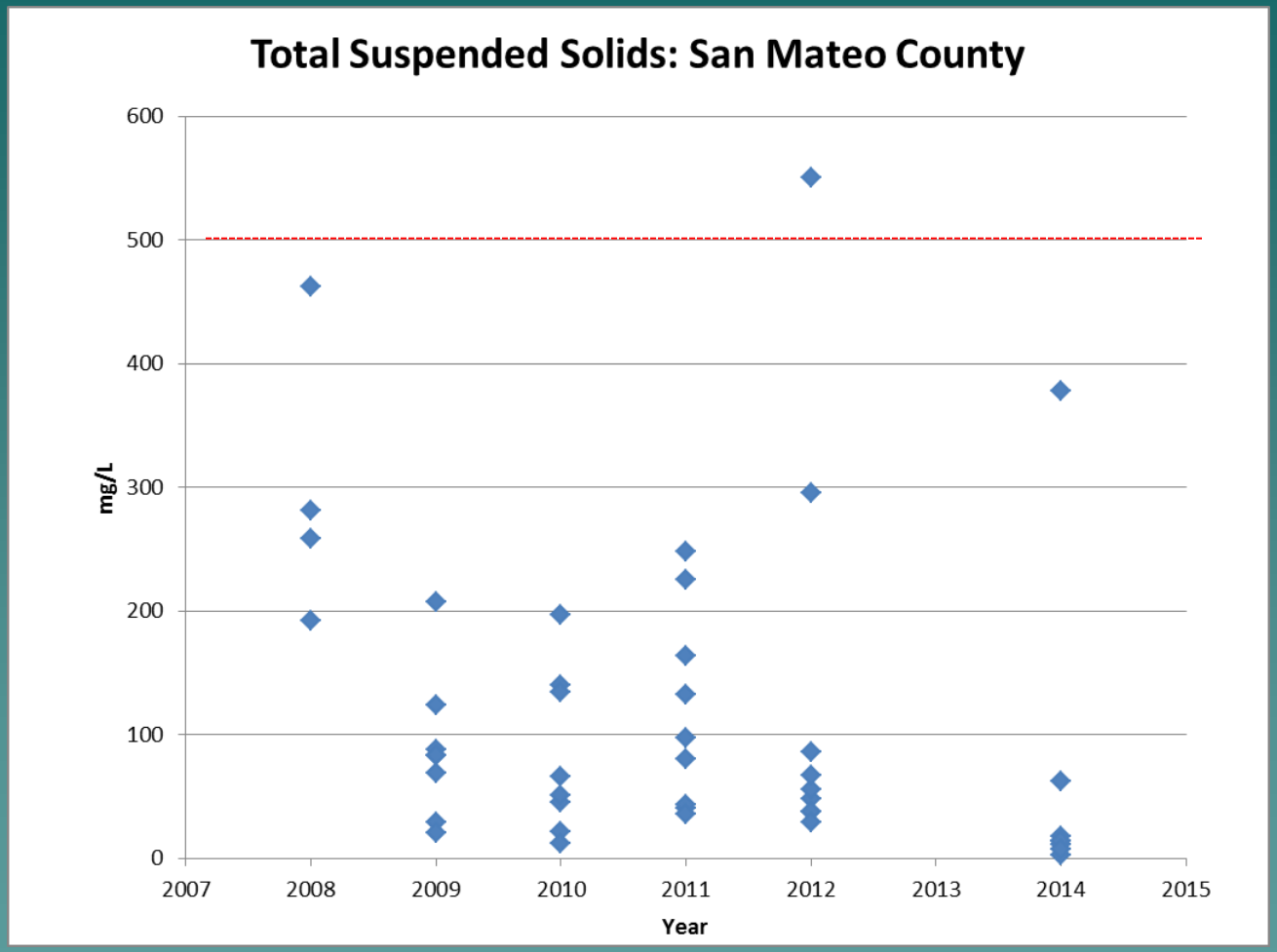
Total Suspended Solids 2014



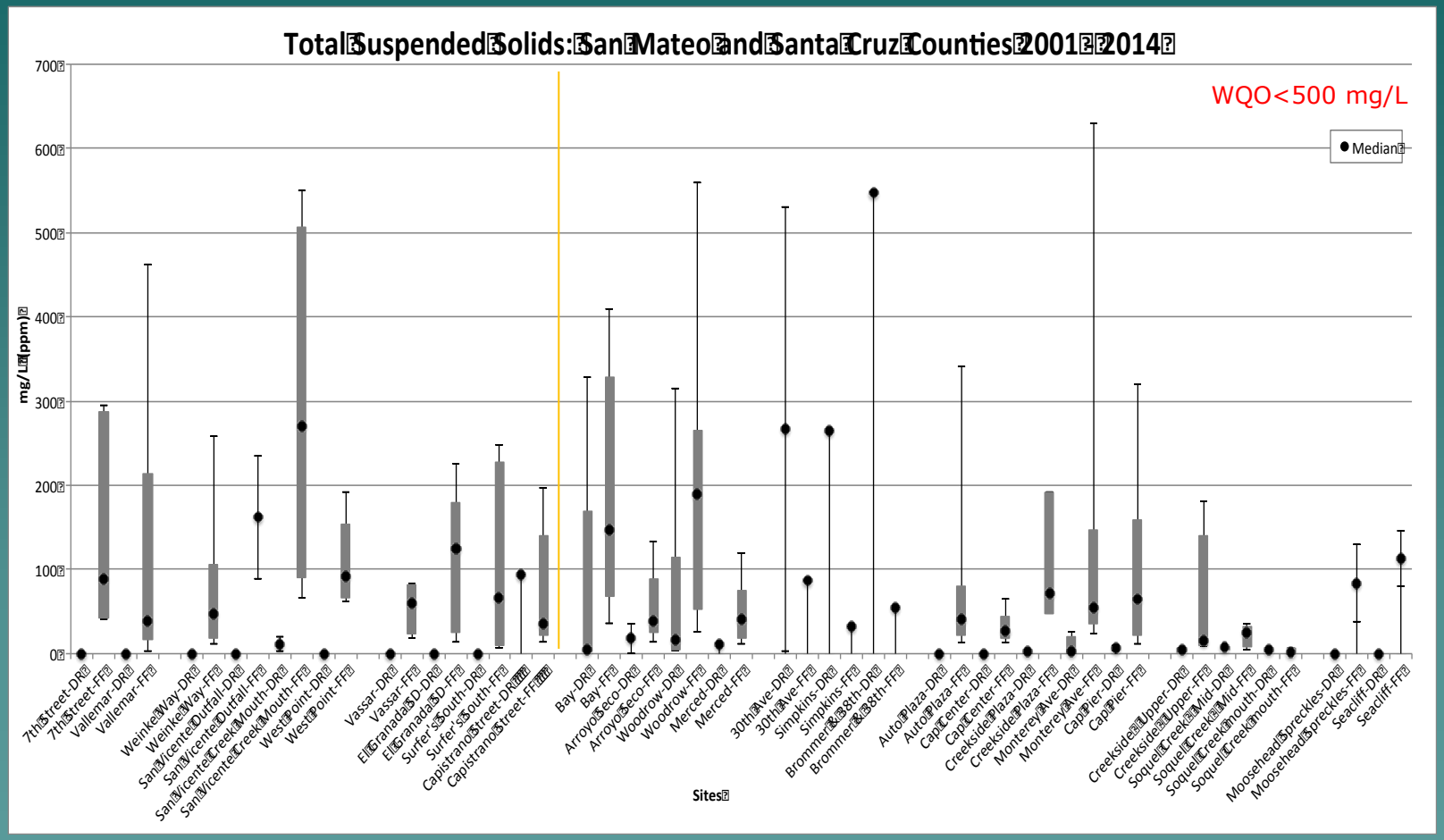
WQO<500 mg/L

TSS over time



WQO<500 mg/L

TSS Location Comparison



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Results Summary

- Identified pollutants with highest concentrations and associated locations
- Bacteria: All *E. Coli* and Enterococcus samples ever measured have exceeded WQ objectives
  - Similar data to Santa Cruz (SC) & Monterey counties but different detection limits - SMC higher?
- WQ objectives have been exceeded 69% of the time (O-PO4), 50% (Cu), 20% (Zn), 0% (Pb), 0% NO3-N at historic sites (2008-2014)
  - Appears Monterey County sites exceed objectives more frequently for metals and nutrients than SC and SMC sites which have similar exceedence rates

Next Steps

- Inform management and target practices
- Continue program
  - 6 years in San Mateo vs 15 years in Santa Cruz and Monterey
  - Make time comparisons at new sites
- Include more sites in SMC
- Multi-year funding to conserve resources
  - Working on SOW/budget

Thank you!

Questions?

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Conservation District

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