

**Estero Americano Watershed Sediment Reduction Project, Phase II, Sonoma and Marin
Counties, CA**

**Draft Quarterly Monitoring Report
Item B.4.2**

This quarterly report summarizes data collected from September to December 2010 under the SWRCB 319(h) funded Estero Americano Watershed Sediment Reduction Project, Phase II. The data period included the fall, pre-rainfall sampling (September 15), the post first rainfall sampling (October 28), monthly sampling (December 6) and the first storm sampling event (December 8).

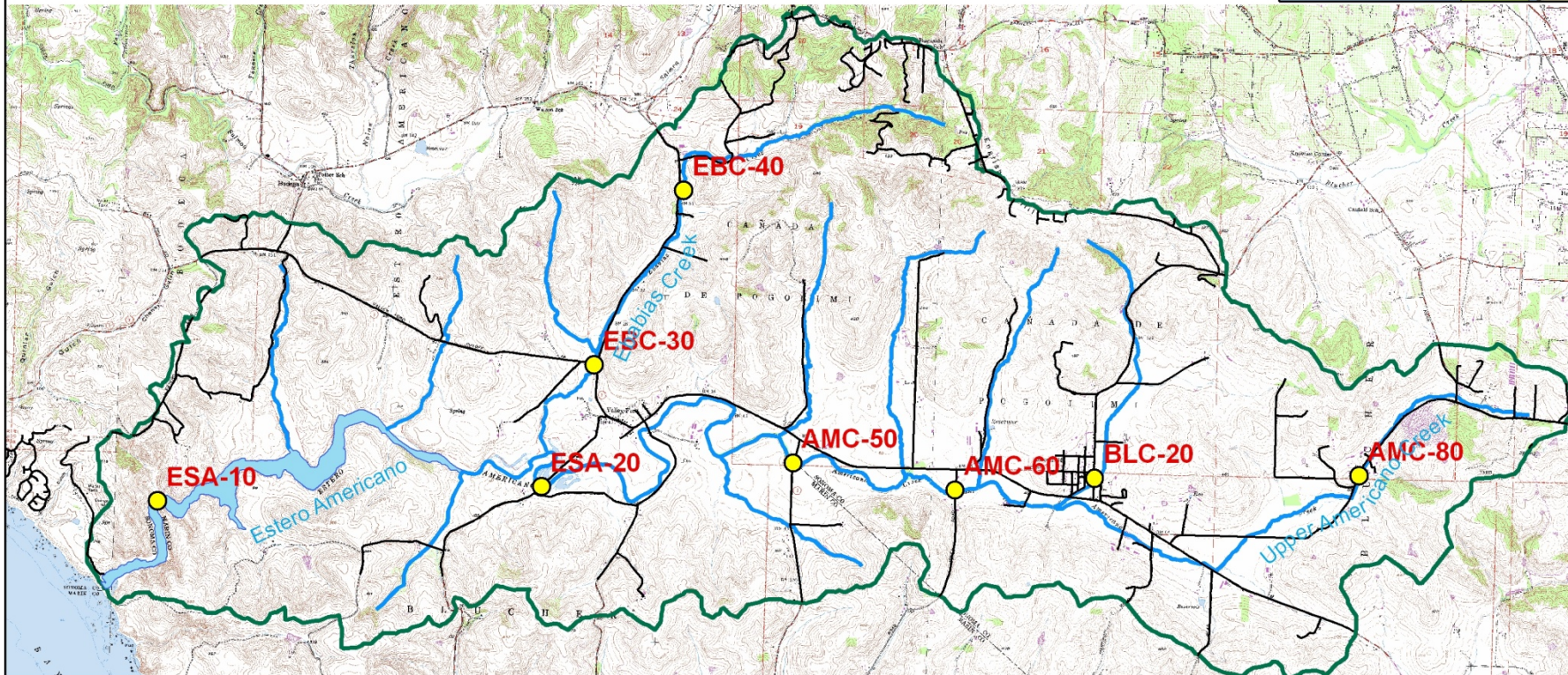
The first significant rainfall event of water year 2011 occurred on October 23-24, 2010 and delivered between 5-8 inches of rainfall in the Estero Americano watershed. Before that, only the Ebabias Creek (EBC-30 and EBC-40) and the upstream-most (AMC-80) and downstream-most (ESA-20) stations had sufficient surface flow to sample. After the first storm, all stations have remained wetted.

The sampling locations have been renamed to comply with SWRCB naming convention. See the table below and the associated attached map.





Table 1: Revised monitoring station IDs

New Station ID	Past Station ID	Description
ESA-10	EA1	Estero Americano off of Estero Lane on private property
ESA-20	EA2	Estero Americano at Marsh Road bridge
EBC-30	EA3	Ebabias Creek at Hwy. 1 bridge
EBC-40	EA4	Ebabias Creek off of Valley Ford Freestone Road
AMC-50	EA5	Americano Creek at Hwy. 1 bridge
AMC-60	EA6	Americano Creek at Gehrke Road bridge
BLC-20	EA7	Bloomfield Creek at Bloomfield Road bridge
AMC-80	EA8	Americano Creek at Roblar Road bridge

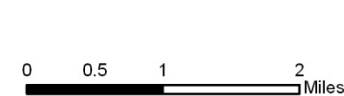
Water Quality Monitoring Sites Estero Americano Watershed Marin and Sonoma Counties, California



Legend

-  water quality monitoring sites
-  roads
-  streams
-  watershed boundaries

 Gold Ridge RCD
December 2010



Water Quality Objectives/Targets

As with previous GRRCD evaluations of water quality in the Estero Americano watershed, the Water Quality Objectives or comparative thresholds are listed in the table below. The North Coast Regional Water Quality Control Board (NCRWQCB) has not set numeric standard water quality objectives for the Estero Americano watershed, which falls into the “Bodega Bay” water body description (NCRWQCB, 1994). Statewide criteria set by the US Environmental Protection Agency (EPA), Region 9(US Environmental Protection Agency, 2000) and/or the objectives for the nearby Russian River water body by the North Coast Regional Water Quality Control Board (NCRWQCB, 1994) have been used as targets and are outlined in Table 2 below.

Table 2. Water Quality Objectives.

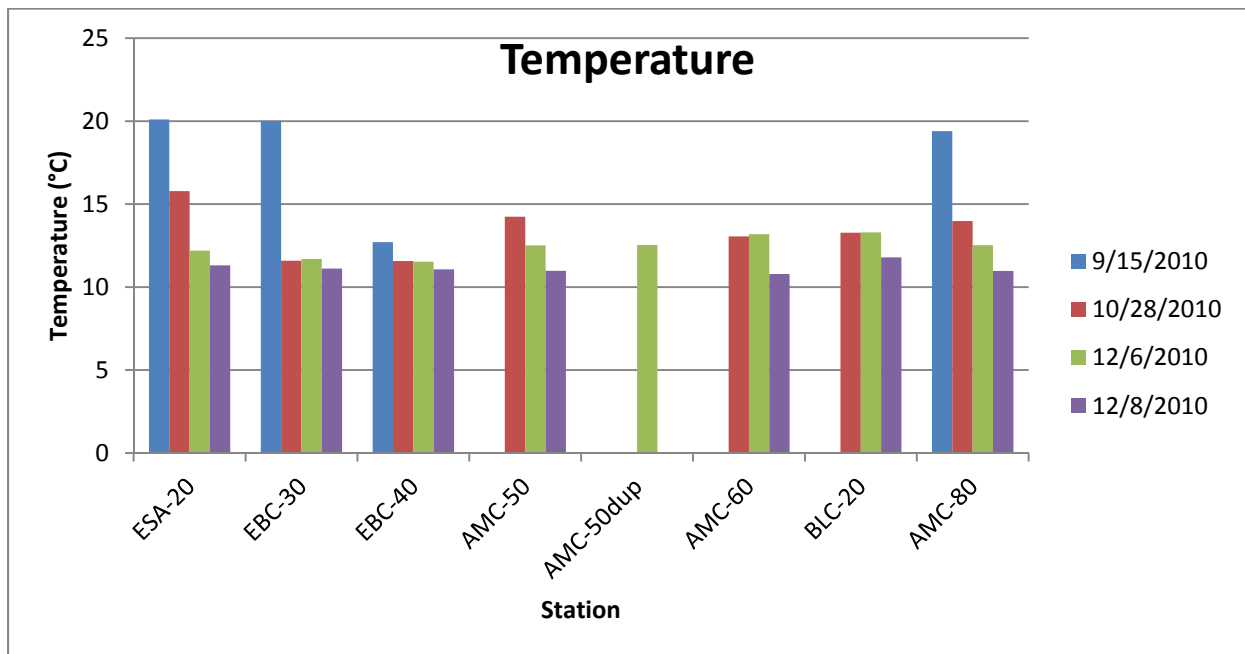
Parameter (reporting units)	Water Quality Objectives	Source of Objective
Dissolved Oxygen (mg/l or ppm)	Not lower than 7	North Coast Region Basin Plan Objective for Cold Water Fish
pH (pH units)	Not less than 6.5 or more than 8.5	General Basin Plan objective
Water Temperature (°C)	Not to exceed 21.1	USEPA (1999) 20-22 range, supported by Sullivan (2000)
Conductivity (uS)	None established	N/A
Nitrate as N (mg/l)	Not to exceed 0.3	Cline (1973)
Ammonia-Nitrogen (mg N/l)	Not to exceed 0.26*	USEPA (2009)
Total Phosphorus (mg/l)	Not to exceed 0.10	USEPA(2000)
Turbidity	Not to exceed 25 NTU	GRRCD selected threshold, supported by Sigler (1984)

* Draft Ammonia Criteria (at pH 8 and 25°C where mussels are present) (US Environmental Protection Agency, 2009)

Results and Discussion

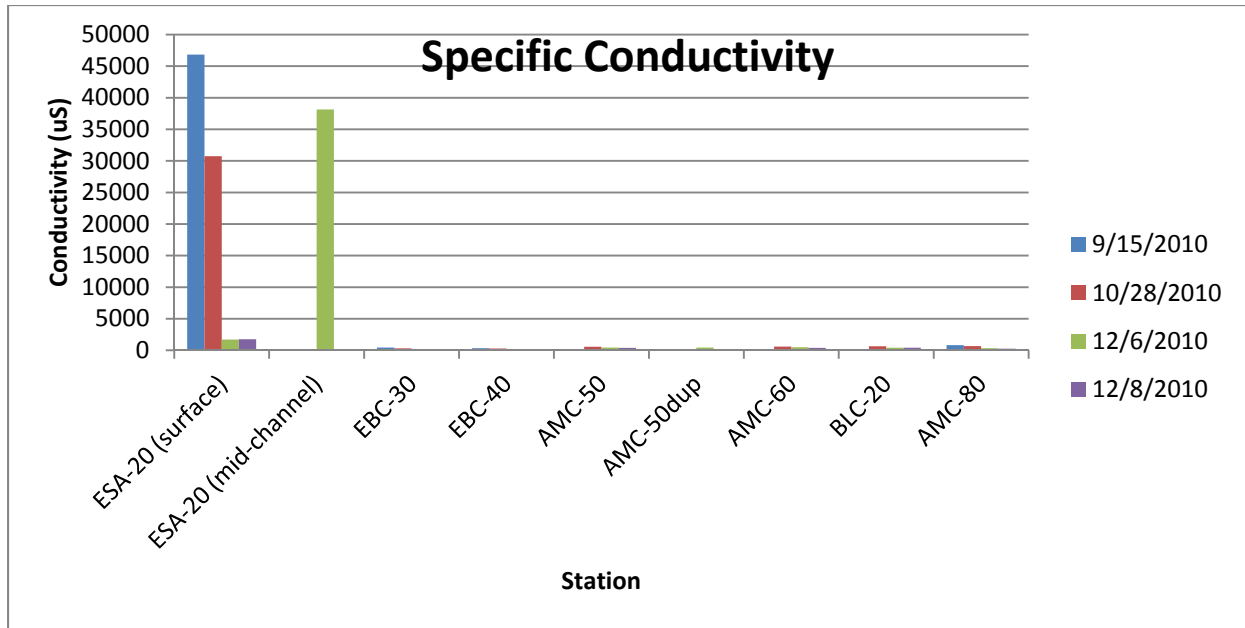
Temperature

Over the data period, temperature measurements varied from 10.79 to 20.10 °C, none of which exceeded the threshold of 24 °C. Since the collected measurements were grab samples, this information is not conclusive that the stream conditions never exceeded the maximum temperature threshold. As was expected, the highest temperatures were observed during lowest flow conditions at the September sampling.



Conductivity

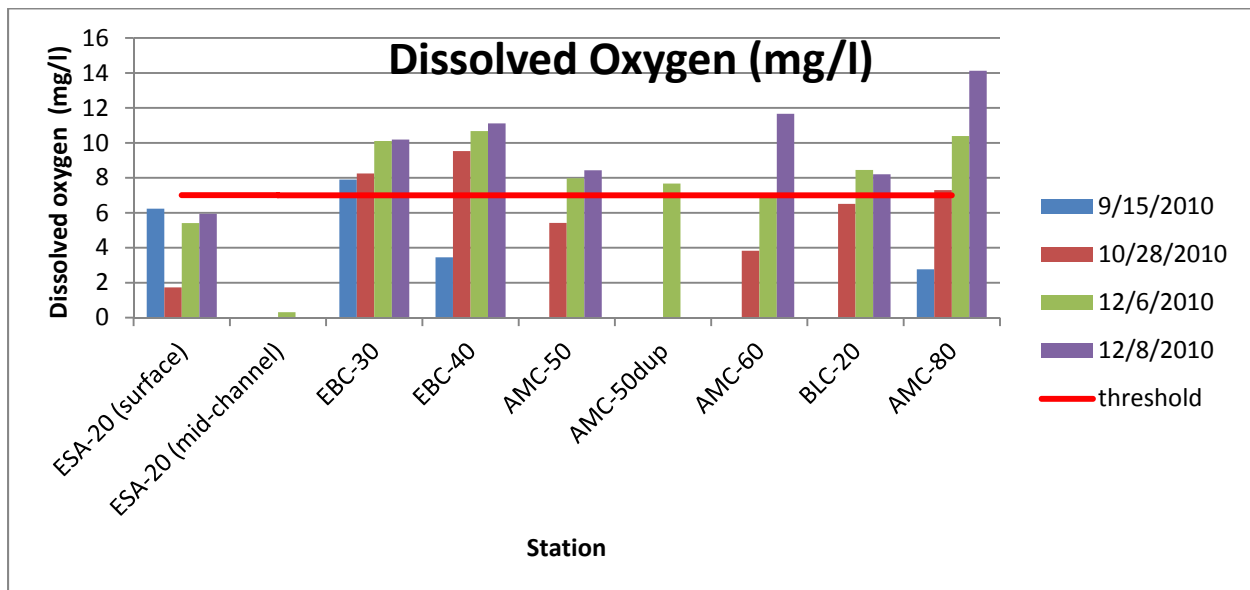
Conductivity was highest at the downstream-most site ESA-20, which is the only currently monitored station in the Estero Americano (as opposed to Americano Creek). At ESA-20, it was noted during the 12/6/10 sampling event that when the Datasonde probe was moved throughout the water column, the conductivity varied widely. It is assumed that tidal effect (tidal conditions were an ebb tide near low tide) in the Estero combined with the high freshwater in-flows were creating a freshwater lens near the surface and a saline condition from mid to lower channel depths. These varied conditions were also demonstrated in the dissolved oxygen concentrations at the varying sampling depths (see DO graph).



Dissolved oxygen

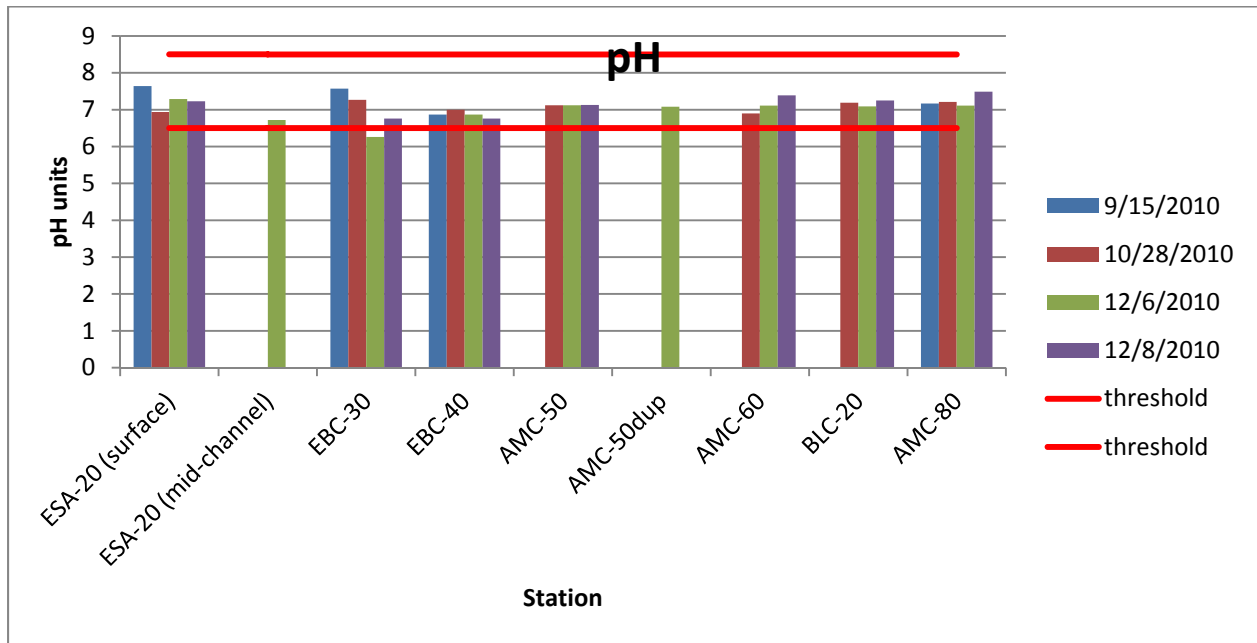
With the exception of EBC-30 which had excessive algal growth conditions, all stations with measureable surface water on 9/15/10 failed to meet the Water Quality Objective of <7.0 mg/l.

As noted above in the Conductivity results discussion, during the 12/6/10 sampling it was noted that when the Datasonde probe was moved throughout the water column, the dissolved oxygen concentration varied widely from 5.41 mg/l near the surface to 0.31mg/l towards the bottom of the channel.



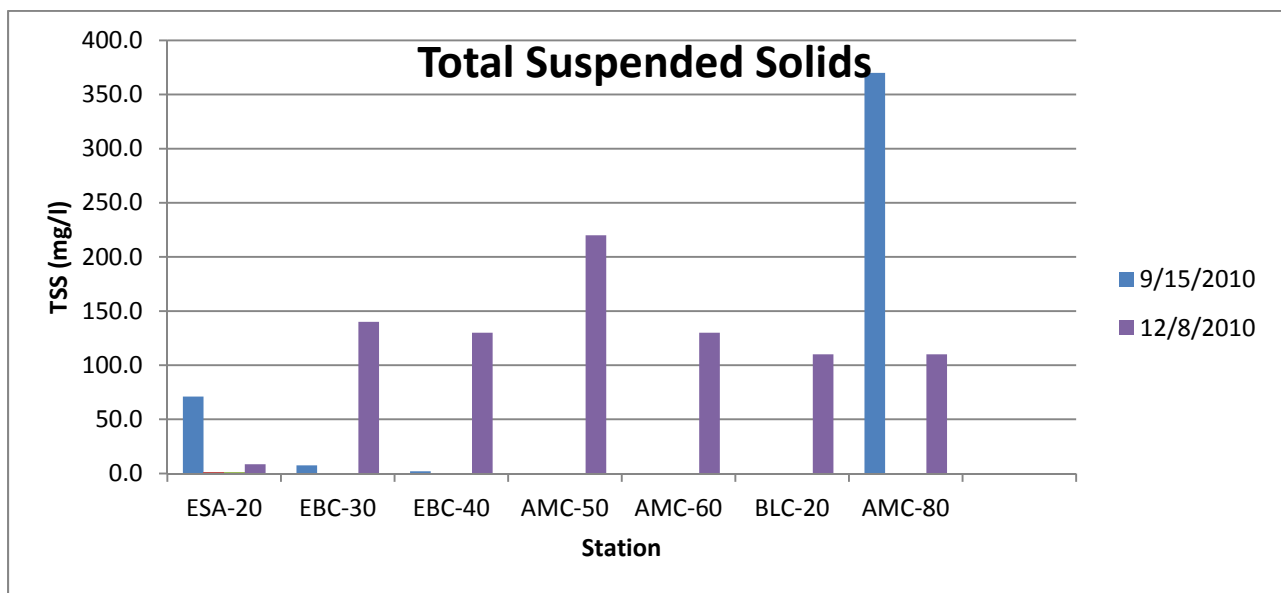
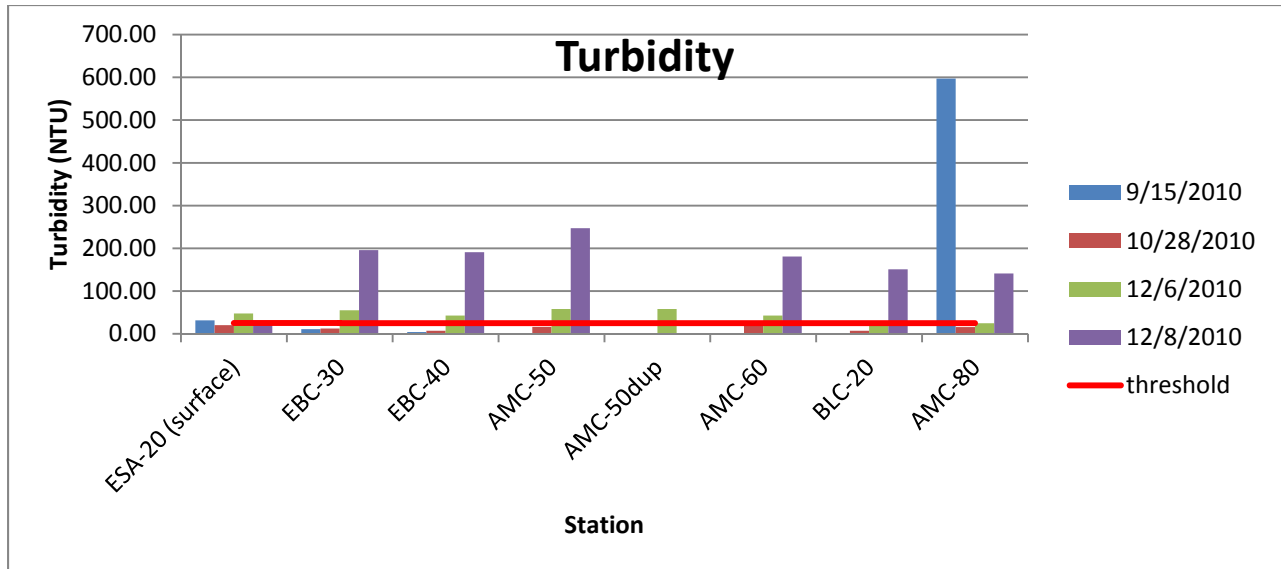
pH

pH conditions generally fell within the Water Quality Objectives with the exception of an acidic result of 6.26 at EBC-30 on 12/6. Two days later, during the storm sampling event, conditions at the site had improved. This is a parameter to continue to watch for compliance with Water Quality Objectives since it leads to the critical habitat in upper Ebabias Creek, which sustains both steelhead trout and freshwater shrimp populations.



Turbidity and Total Suspended Solids

Turbidity conditions exceeded WQOs at a number of locations during wet weather conditions (12/6 and 12/8/10). One condition to note is the highest Turbidity result of 597 NTUs and TSS result of 370 mg/l at AMC-80 during the low flow conditions. This is likely due to excessive algal growth conditions and recent bank disturbance coupled with low streamflow volumes. Considering that the storm flow conditions on 12/8/10, were not excessively high by watershed standards, this condition should be watched in the future, but may not be indicative of a chronic problem.



List of Works Cited

North Coast Regional Water Quality Control Board. (1994). *Water Quality Control Plan North Coast Region 1*. Santa Rosa, California: North Coast Regional Water Quality Control Board.

US Environmental Protection Agency. (2000). *Ambient Water Quality Criteria Recommendations*. Washington, DC: USEPA Office of Water.

US Environmental Protection Agency. (2009). *Draft 2009 Update of Aquatic Life Ambient Water Quality for Ammonia - Freshwater*. Washington, DC: USEPA.