# Assessment of the Water Quality Health of Martin Slough and Jacoby Creek in Humboldt County for Habitat Suitability for Salmonids

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## Background

Eight water quality parameters (pH, temperature, total dissolved solids (TDS), conductivity, nitrate, nitrite, alkalinity, and hardness) were measured in two watersheds in Humboldt County: Martin Slough and Jacoby Creek (Figure 1). Both waterways have been previously listed as impaired water bodies for high sedimentation levels (California State Water Resources Control Board 2021 and Natural Resources Services 2021), and have been periodically monitored by the Humboldt Baykeeper's Citizen Water Monitoring Program (Kalt 2021). The sites have not been monitored by Humboldt Baykeepers since 2012, and the parameters measured provide updated insight on water health, and habitat suitability for salmonids.

## Objective

To assess the water quality health of Martin Slough and Jacoby Creek in Humboldt County for habitat suitability for salmonids as compared to previous data.

## Methodology

The eight parameters were analyzed at the five sampling locations with triplicate measurements. Martin Slough was analyzed for four weeks across a five week period and Jacoby Creek was analyzed for four weeks across four weeks. Two locations were sampled along Martin Slough and three locations along Jacoby Creek. Three instruments were used for data collection including a pH meter, total dissolved solids meter, and insta-test strips (see website).

## Additional Results

Scan the QR code or follow the provided link for additional project results and information:

https://tinyurl.com/yj6bnr7f

## Location

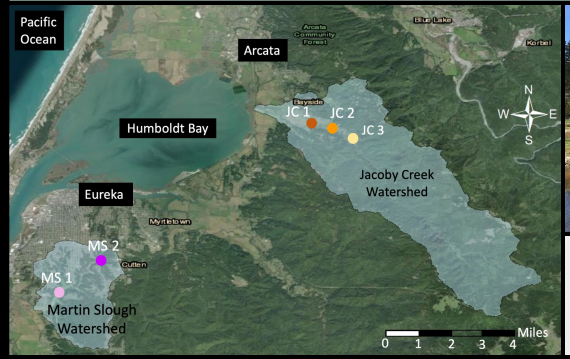


Figure 1: a) (Left) A map of the two watersheds: Martin Slough and its two testing sites (MS 1 and MS 2), and Jacoby Creek and its three testing sites (JC 1, JC 2, and JC 3). b) (Above Left): Image taken at Martin Slough's site MS 1. c) (Above Right): Image taken at Jacoby Creek's site JC 3.

## Results

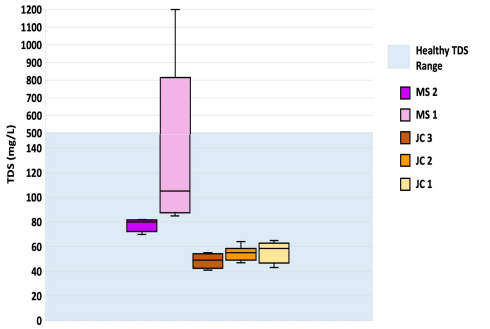


Figure 2: A box and whisker plot of TDS at each of the five sites in Jacoby Creek and Martin Slough (n=12). The healthy range of TDS for salmonids is 0-500 mg/L (Carter 2008).

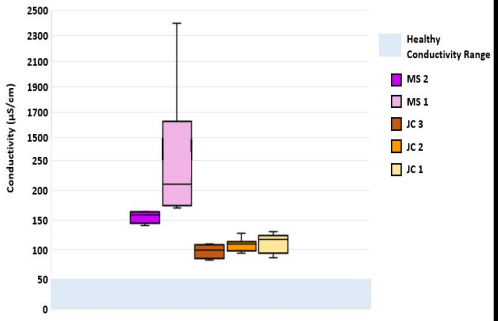


Figure 3: A box and whisker plot of conductivity at each of the five sites in Jacoby Creek and Martin Slough (n=12) . The healthy range of conductivity is 0-50 µS/cm (Hanson et al. 1998).

## Discussion

All values for pH, temperature, alkalinity, and hardness were within the healthy ranges for salmonids (6.5-8.5, 3.3-13.3℃, > 20 mg/L as $CaCO_3$, 25-520 mg/L $CaCO_3$, respectively) (Kidd 2011, Carter 2008, EPA 1976, EPA 1976). The median TDS at MS 1 was within the 0-500 mg/L healthy range for salmonids (Carter 2008), but the conductivity at all five sites in both watersheds was outside the <50 µS/cm healthy range for salmonids (Hanson et al. 1998). The nitrate concentration was outside the healthy range at the most downstream sites, JC 1 and MS 1. The data suggests that Martin Slough and Jacoby Creek were not suitable habitats for salmonids because they exceeded healthy requirements for four of the eight parameters analyzed. There was no clear indication of water quality changes compared to the previous data collected by the Humboldt Baykeepers across any of the parameters.

## Future Consideration

Recommended future work includes monitoring the turbidity of the two watersheds and comparing it to previous data. Turbidity has been identified as the leading pollutant for these two watersheds, therefore, an analysis on the current turbidity levels of the streams would provide valuable insight. Additional work could also focus on assessing the increase observed at Martin Slough for TDS, conductivity, alkalinity, and hardness. Understanding the cause of the increase in parameter values would allow better recommendations to be made for maintaining Martin Slough as a habitat for salmonids.

## Acknowledgements

The data from 2012 used in this project was provided by the Humboldt Baykeeper's Citizen Water Monitoring Program.

## References

See website for complete list of references.