



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

Name(s) Alison L. Collins	Project Number S1604
Project Title Rain and Primary Production in Estuaries	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective is to determine if precipitation and water quality effects primary productivity in the small estuaries in northern California.</p> <p>Methods/Materials Water quality and primary productivity parameters were monitored in the Little River and Mad River estuaries, Humboldt County. Two sample sites were chosen in each estuary. On each sampling date weather conditions (raining or not raining) and water temperature were measured at each sample site. Two replicate water samples were collected at each sample site from which salinity, turbidity, pH, coliform level, and primary productivity were measured.</p> <p>Results Water quality and primary productivity were determined from water samples collected on four sampling dates. Precipitation on these dates were: 11/02 and 11/03 = 0 in., 11/12 = 1.08 in., and 11/21 = 0.56 in.. Water temperatures were generally lower when it was raining. Salinity was highest in Little River during moderate rainfall, but lowest during the same period in the Mad River. Turbidity was generally low and pH levels fairly constant among sample dates, except at one location in Little River turbidity increased from 4 to 108 NTUs and pH increased from about 7.5 to 9.0 during moderate rain. Coliform levels were highest in Little River during high rainfall. Primary productivity in the estuaries was about the same during no rain and moderate rainfall events but increased during high rainfall.</p> <p>Conclusions/Discussion Precipitation is an important environmental factor which can effect water quality and thus primary productivity. The observed relationships among rain, water quality and primary production varied somewhat among the two estuaries studied. While turbidity and coliform levels increased with rain in the Little River estuary, little difference was observed in the Mad River estuary when it rained. The increased turbidity observed in Little River probably reflects more unstable conditions in the nearby watershed than exists in the Mad River. The increased coliform levels in the Little River are probably due to the close proximity of cattle grazing, where their waste matter is easily flushed directly into the stream when it rains. Primary productivity in the estuaries appeared to increased with precipitation. This might have been due to higher primary producer abundance resulting from increased nutrients supplied by local runoff or upstream sources.</p>	
Summary Statement The relationship between precipitation, water quality and primary productivity were examined in the Mad River and Little River estuaries, Humboldt County, California.	
Help Received My marine biology teacher, Louis Armin-Hoiland provided instructions in sampling techniques and data analysis. My mother and father drove me to my sampling locations ad proofread my report.	