



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Avneesh K. Sharma	Project Number J1216
Project Title Do Wetlands Effectively Remove Nitrates from San Diego Creek Water Before Discharging into the Ocean?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Develop a scientific and practical model that can be used anywhere in the world to effectively reduce nitrates and nutrients from polluted river water before discharge into the ocean.</p> <p>Methods/Materials Materials: 47 milliliter sample bottles, thermometers, 20-micron filters, test sample storage bottles, deionized water, graduated pipettes, distilled water, gloves. Method: Collect seven (7) 47mL water samples from the wetlands ponds at the Inlet from the Creek to the Ponds, at the 5 treatment Ponds, and at the Outlet from Ponds back into the Creek. Take ambient air and water temperatures on day of test. Filter each water sample through a 20-micron filter. Perform Ion Chromatography Testing to determine nitrate concentration levels. Perform Spectrofluorometer Testing to determine dissolved organic material concentrations. Perform Spectrophotometer Testing to determine dissolved organic material concentrations in the invisible part of the light spectrum. Analyze data collected and see if it supports the hypothesis.</p> <p>Results Results from 5 independent tests show that the nitrate levels were reduced in each case. 4 out of 5 tests show nitrate reductions of 72% to 78%. One test showed nitrate reductions of 18%. The dissolved organic matter concentrations were reduced or remained unchanged in 4 out of 5 tests.</p> <p>Conclusions/Discussion The Wetlands can be used as a good model to naturally reduce the high nutrient nitrate levels in river water before environmentally safe discharge into the ocean. The bacteria growth in the 5 treatment ponds naturally reduced the nitrate levels of San Diego Creek water by 72% to 78%. And this was accomplished without increase in the concentration of dissolved organic matter (DOM). This is very significant. This gives society a scientific and practical model to naturally treat river water and prevent the extinction of sensitive marine in our oceans.</p>	
Summary Statement This project is about determining the effectiveness of the Wetlands to remove or reduce nitrates from urban river water before discharging it into the ocean.	
Help Received Dr. Bill Cooper, UCI, provided guidance/permission to use UCI test lab/equipment. Testing supervised by post-doc scholars, Drs. Michael Gonzior and Joon Seon, and post-grad student, Matt Zwartjes. Mom and dad drove me, whenever needed, to Wetland sites and UCI to collect/test samples.	