



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

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Project Title Human Impacts on Rocky Intertidal Environments: San Nicolas Island vs. the California Coast	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My objective was to determine whether there are more and larger intertidal invertebrates on a remote island far from human impacts compared to coastal areas accessible to humans.</p> <p>Methods/Materials After selecting three intertidal study locations, two along the Santa Barbara County Coast and one remote island (Faria Beach, Coal Oil Point, and San Nicolas Island), five 30-meter transects were placed at each. Transects were two meters apart. The number of four intertidal invertebrate species (sea anemones, Anthopleura sp.; ochre sea stars, Pisaster ochraceus; chitons, Nutalina fluxa; and black turban snails, Chlorostoma funebris) were counted within one meter of either side of each transect. If 50 individuals of any species were encountered, the distance along the transect was noted and counting for that species discontinued. At the completion of each transect, the total number of each species and distance along the transect if 50 were encountered was recorded. Sea stars were also measured from the center of their body disc to the tip of the longest arm, to provide relative size measurements.</p> <p>Results There were greater numbers and densities of all four species at San Nicolas Island. Faria Beach had intermediate densities and Coal Oil Point consistently had the lowest. All sampled species occurred at all three sites, with the exception of sea snails which were not present at Coal Oil Point. Though sea star abundance was far greater at San Nicolas Island, sea stars were largest at Faria Beach and only slightly smaller at Coal Oil Point.</p> <p>Conclusions/Discussion Intertidal invertebrates are subject to a variety of potential human perturbations including oil spills, vessel groundings, water pollution, harvest and over use. Trampling by tidepool visitors has been shown to have a significant impact on species present. San Nicolas Island is owned by the U.S. Navy, remote and has little human access. My other two sites were easily accessible and near to potential pollution sources. My hypothesis was partially supported by the data collected. There were more of all sampled species at San Nicolas Island, likely due to reduced human presence and thus less impact. However, my hypothesis that the size of sea stars would be larger was incorrect. This may be caused by a need for sea stars to be harder to survive in areas of greater impact, but may have also been an artifact of my small sample size.</p>	
Summary Statement I studied the relative densities of intertidal invertebrates at a remote island, far from human impacts, and compared this to densities along the mainland coast to determine if accessibility to humans reduced the number and size of species.	
Help Received My uncle transported me to all three study sites and provided access to the U.S. Navy facility.	