



**CALIFORNIA STATE SCIENCE FAIR  
2015 PROJECT SUMMARY**

<b>Name(s)</b> <b>Paul C. Lauermann</b>	<b>Project Number</b> <b>J0807</b>
<b>Project Title</b> <b>Monitoring the Decline of Sea Fan Populations Near Anacapa Island Using a Remotely Operated Vehicle</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Gorgonians, commonly referred to as sea fans, are a type of octocoral that are slow growing and sensitive to environmental fluctuations. Studies have shown that in areas with dense gorgonian populations, thermal stress can lead to widespread disease and eventually death. The objective of my project was to determine if there was a gorgonian die off near Anacapa Island from 2009 to 2014 and if so, was it caused by an increase in seawater temperature.</p> <p><b>Methods/Materials</b> Using Remotely Operated Vehicle (ROV) video imagery collected on the same four 0.5 km long transect lines in both 2009 and 2014 were compared. Gorgonian data extracted from the video included health and total coverage by transect line and year. NOAA monthly sea surface data and satellite thermal imagery were used to track monthly seawater temperatures near Anacapa Island from 2009 to 2014.</p> <p><b>Results</b> My data showed that there was in fact significant decrease in the population health of gorgonians from 2009 to 2014 and that during this time there were periods of significant sea surface temperature increase. Data collected in 2009 showed that living gorgonians covered between 6.9% and 44.4% of a transect line and there was no noticeable dead gorgonians. Data collected in 2014 showed that living gorgonians covered between 1.0% and 4.8% of a transect line and dead gorgonians covered between 12.2% and 28.0% of a transect line. NOAA sea surface temperature data showed an unusual spike in temperature during the summer of 2012 and 2014, with winter temperatures not cooling down to normal between 2013 and 2014.</p> <p><b>Conclusions/Discussion</b> My conclusion is that seawater temperature does affect gorgonian population health, but may not have been the only factor involved in this die-off. Because I did not have a control site with gorgonians that did not receive the thermal stress, seawater temperature can not be scientifically determined to be the direct cause for the die-off of gorgonians.</p>	
<b>Summary Statement</b> The effects of climate change on sensitive marine populations.	
<b>Help Received</b> My dad helped set up data collection; Dr. Peter Etnoyer provided access to NOAA sea surface temperature.	