



**CALIFORNIA STATE SCIENCE FAIR  
2013 PROJECT SUMMARY**

<b>Name(s)</b> <b>Amanda B. Mickelson</b>	<b>Project Number</b> <b>J0806</b>
<b>Project Title</b> <b>Seaside Heritage: Investigating Local Eocene Fossils</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> I have been fascinated with paleontology for as long as I can remember. Several months ago, I visited an area of exposed fossils from the Delmar formation, a middle Eocene layer that is the subject of this report. I was amazed at the density of the fossils in the layer. The fossils are located in the cliffs in an area of Del Mar known as Dog Beach. I decided to describe and document the fossil deposits in this 46 to 48 million year-old layer in its current condition at the base of sandstone cliffs near the mouth of the San Dieguito River Estuary.</p> <p><b>Methods/Materials</b> I gathered a laser rangefinder to measure distances, metric rulers, a calculator and a digital camera to document the fossils. I made visits to the site at low tide, when the layer was most accessible. I gathered loose fossils in the rubble that would be washed away or would be eroded quickly by wave action.</p> <p><b>Results</b> I found numerous <i>Ostrea idriaensis</i> fossils in the green-gray Delmar Formation sandstone. The oyster fossils in the sandstone were permineralized brown or gray calcite. The fossilized oysters ranged from 3 cm to 10 cm in length. The density of the oyster fossils in the exposed rocks was as great as 200 to 300 fossils per square meter of exposed rock surface. I also documented other fossilized mollusks, including the bivalves <i>Venericardia</i> and <i>Pelecypora aequilateralis</i>, and the gastropods <i>Potamides carbonicola</i> and <i>Ampullela Schenckii</i>. <i>Potamides</i> appeared to be deposited in great density in some of the softer mudstone in the formation. I visited the Museum of Natural History to learn more about the layer and to confirm species identification with the help of the museum paleontologists.</p> <p><b>Conclusions/Discussion</b> My findings reveal thousands of fossils from a rich, lagoonal, marine remnant preserved in the sedimentary rock. According to my research, the exposed Eocene layer seems to be strikingly more eroded today than how it had been described 20 years ago. It appears this fossil heritage may now be at risk due to seawall construction and sand loss at the beach where it is located. Perhaps a plan for sand replenishment may help preserve this ancient layer for the future.</p>	
<b>Summary Statement</b> I described and documented Middle Eocene marine fossils in the Delmar Formation in their current condition at the base of sandstone cliffs.	
<b>Help Received</b> Mother and Grandfather supervised me in the field; Dr. Tom Demere and the paleontology department at the San Diego Natural History Museum allowed me to use their collection of fossils to help to identify samples that I had collected.	