# CALIFORNIA STATE SCIENCE FAIR
# 2013 PROJECT SUMMARY

**Name(s)**
Isabel Torres

**Project Number**
**S1520**

**Project Title**
## Effects of Ocean Acidification on Marine Calcifying Invertebrates

**Abstract**

**Objectives/Goals**
My objective is to determine how ocean acidification will affect Foraminifera, some of the world's most common marine microorganisms which make their shells out of calcium carbonate, by studying springs with high carbon dioxide content in the oceans of Yucatan, Mexico. My hypothesis is that there will be a higher abundance of foraminiferans per gram away from the springs than near the springs.

**Methods/Materials**
Sediment samples were collected in the center of and far from the carbon dioxide springs off the Yucatan Peninsula in Mexico. I weighed about 1-5 g of each sample and separated the sample by size fraction, using sieves with different sizes of holes. Using a compound microscope, I separated foraminiferans into the 6 most common species on a glass slide and counted the number of each species. I then calculated the number of foraminiferans per gram and percentage of each taxonomic group in each sample.

**Results**
There are statistically significantly fewer foraminiferans in the sediment near the springs than away from the springs. Some species, such as Discorbis rosea, are less common near the springs than away from the springs. Other species, such as Amphistegina gibbosa, are more common near the springs than away from the springs.

**Conclusions/Discussion**
As I hypothesized, foraminiferans are less abundant near the springs than away from the springs, most likely due to the high carbon dioxide levels and low pH levels at the springs. Thus, as carbon dioxide levels in the ocean rise and ocean pH decreases, due to ocean acidification, foraminiferans will become less abundant. Ocean acidification will affect calcifying organisms, such as forams, directly by requiring more energy for them to build their shells and skeletons and other organisms indirectly via food webs and other mechanisms.

**Summary Statement**
I show that forams are less abundant near high-carbon dioxide springs off Mexico, which suggests that forams will become less abundant as carbon dioxide continues to rise and ocean pH decreases, which is known as "ocean acidification."

**Help Received**
I used lab equipment at UC Santa Cruz under supervision of Dr. Adina Paytan. Graduate student Ana Martinez Fernandez collected sediment samples. Graduate student Kristin McCully helped me analyze my data and make my poster.