



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Edwin Espinoza	Project Number J1014
Project Title Is It Safe to Eat the Fish? Toxic Heavy Metals in Urban Lake Sediment	
Abstract Objectives/Goals My goal for this project was to see whether or not it is healthy for Los Angeles residents to eat Channel Catfish caught from Echo Park Lake. I expected to find high concentrations of Lead, Mercury and Cadmium in the sediment. Methods/Materials The way I conducted my investigation was I went out on two Saturdays, rented a paddleboat, and collected soil samples from six different locations at Echo Park Lake. I used a soil sampler that would work with a lock on top of it. I dropped it into the lake and once it hit the bottom I would tug on it so it would be sure to close. Then I would pull it up onto the paddleboat to fill up sample containers with soil. After all the samples from twelve different sites were collected, I took them to school and put them in Petri dishes and spread them flat. For this I used a small plastic spatula so it wouldn't affect my results. Next, I put all of my samples in an incubator because I only needed the soil, so I dehydrated them. I then took them to the California Institute of Technology (CALTECH), where I smashed each one of them with a mortar and pestel until the soil was very fine. I then measured 4.01 grams of each sample and added .95 grams of paraffin, because I was going to turn them into tablets. To turn the samples into tablets I used a Soil Press. I put a total of 1500 kg of weight on each sample. Finally, I put the samples into an X-ray Spectrometer and this told me how much of each element there is in each of the samples, as a percentage of the total sample. Results My results show that there are potentially toxic levels of Lead in Echo Park Lake sediment. Mercury levels were not high enough to cause concern of toxic exposure. Cadmium levels were high enough for possible toxic exposure depending on how much fish a person ingests. Conclusions/Discussion My results partially confirm my hypothesis because I only found high levels of Lead and Cadmium, but not Mercury. According to a study done by J.M. Czarnecki, if the metals are found at high levels in the sediment, they will be found in the catfish because they are bottom feeders. He tested the tissue of bottom-feeding fish and found that these elements accumulate in fish tissues. The next step in my investigation should be finding the mechanism by which these metals get into Echo Park Lake, and even testing the tissue of real fish that are caught in the lake.	
Summary Statement I tested lake bottom sediment from Echo Park Lake in Los Angeles to see if Lead, Mercury and Cadmium are present at high enough levels to cause concern about eating the Channel Catfish caught there.	
Help Received My science teacher provided the soil sampler. Dr. Dalleska at Cal Tech helped with the spectrometer and provided the soil press.	