



**CALIFORNIA STATE SCIENCE FAIR  
2002 PROJECT SUMMARY**

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<b>Project Title</b> <b>The Effects of Agricultural Pollutants on the Marine Diatoms, Skeletonema costatum, and Thalassiosira Pseudonana</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The purpose of my project was to determine the effects of various agricultural and other pollutants, such as DCMU, iron, copper and glyphosate on marine diatoms. <b>Methods/Materials</b> Two different species of diatoms, Skeletonema costatum and Thalassiosira pseudonana, were used. Diluted cultures were made of each of these diatoms. Dichlorophenyl dimethyl urea (DCMU), glyphosate, copper and iron found in some pesticides or other marine pollutants were added to separate tubes of each diatom. A control culture was also made for each. Then the maximum fluorescence of each sample was measured using a pulse amplitude modulated fluorometry (PAM fluorometry) on day 0 and day 7. On day 7, cell counts were taken of each sample under a microscope using a hemocytometer. <b>Results</b> DCMU increased the fluorescence and the number of cells for both diatoms. Glyphosate had little effect on either of the diatoms. Iron increased the number of cells per mL of both diatoms, but reduced the fluorescence level. But, copper killed nearly all of the cells by day 7. <b>Conclusions/Discussion</b> Copper used in pesticides and paints has been known to be a potent inhibitor of photosynthesis, which agrees with the results. The DCMU increased the chlorophyll content of both diatoms, possibly because in small amounts it serves as a nutrition source. With the exception of iron, the cell counts and fluorescence have a direct correlation. Since there was a greater number of cells with iron, but a lower fluorescence, it is possible that over an extended period of time, the diatom cell number would decrease as well, due to the inefficiency of the photosynthetic process, when exposed to iron. The concentrations used in my project are much higher than those that are presently being tested as #iron farming# by scientists. The levels of pesticides used in agricultural areas, which flow into runoff, should be reduced to prevent adverse effects on marine organisms, in particular the primary producers.	
<b>Summary Statement</b> My project tested the effects of certain chemicals found in pesticides on two species of diatoms (Skeletonema costatum and Thalassiosira pseudonana).	
<b>Help Received</b> Dr. Jason Smith from Moss Landing Marine Labs provided the lab equipment.	