

# CONNECTICUT SCIENCE & ENGINEERING FAIR

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## Intel International Science Fair Competitor

### 2012 Connecticut Science Fair

( Student information as of April 2012 )

**Katherine Fennell, Grade 7**

**The Montessori Middle School, Norwalk, CT**

*Could a Small Aquatic Plant Have Reversed Global Warming 49 Million Years Ago?*

#### Connecticut Science Fair Awards

- Pfizer Life Sciences Awards --- 1st Place- Life Sciences 7th grade- \$200 & trophy and Invitation to Compete Broadcom MASTERS

#### Abstract

The Eocene began fifty-five million years ago as the hottest time since the dinosaurs died out. The mean annual temperature of the High Arctic was as high as 18-20°C. But by the middle of the Eocene, the Earth began to cool, so that by thirty-four million years ago glaciers covered Antarctica. A recent explanation for the cooling involves the fresh water fern, *Azolla*, which grew in a fresh water layer in the Arctic Ocean. The landlocked ocean became very saline, and toxic to decomposers. *Azolla* absorbed large amounts of carbon dioxide, but did not release it in death. Instead dead plants became the oil and gas deposits. Here I test this theory by observing *Azolla* in tanks to recreate Arctic conditions. First, I tested whether *Azolla* could survive the extended Arctic darkness. Second, I measured the nutrients *Azolla* required in the water, to see what conditions would have been necessary to support *Azolla*. Third, I compared how *Azolla* decomposed in very salty sea water compared with how it decomposed in ordinary sea water. The experiments showed that *Azolla* was very sensitive to darkness. *Azolla* also required very high concentrations of nutrients in the water to grow rapidly. And finally it appeared that high salt concentration in fact prevented decomposition. The results of my various tests combined, demonstrate that my hypothesis stating that *Azolla* caused a significant decline in the carbon dioxide fifty-five million years ago is plausible.

#### Biography

