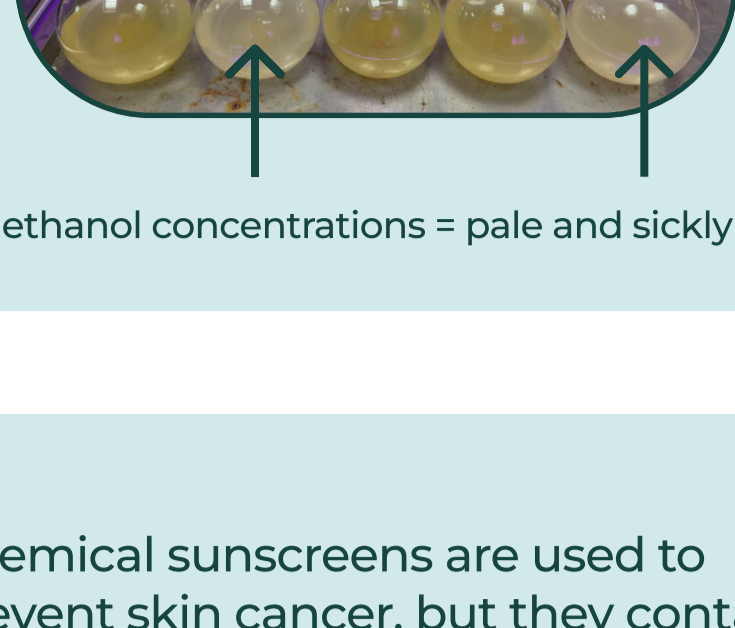
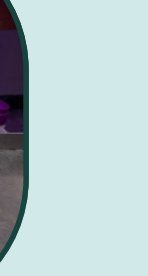
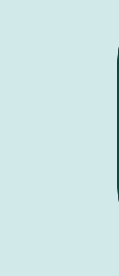
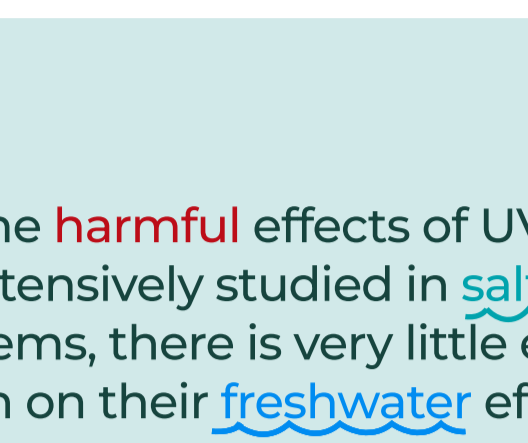


Instead of revealing the effects of octocrylene (a common sunscreen chemical) on microalgae, this study revealed the **lethal** effects of high ethanol concentrations.



high ethanol concentrations = pale and sickly algae

Chemical sunscreens are used to prevent skin cancer, but they contain organic compounds called **ultraviolet filters (UVFs)** that have harmful effects on aquatic ecosystems.

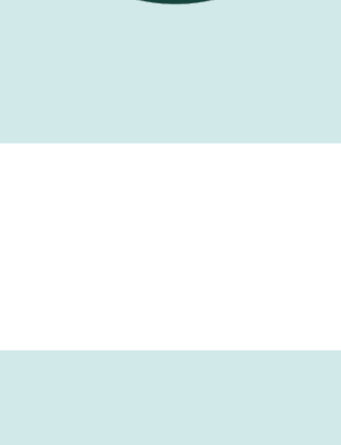


Octocrylene, the **UVF** investigated in this study.

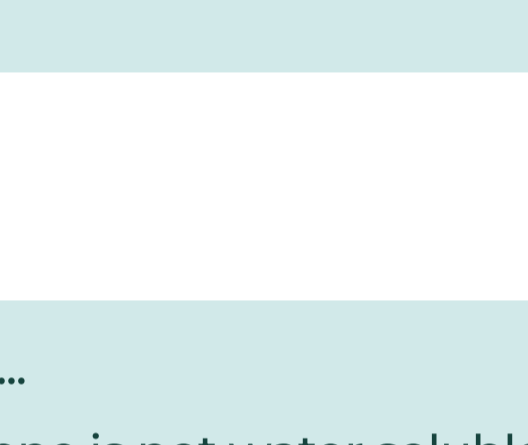
While the **harmful** effects of UVFs have been extensively studied in **saltwater** ecosystems, there is very little existing research on their **freshwater** effects.



In order to examine the ecological impacts of UVFs in **freshwater**, this study focuses on **diatoms**, a type of microalgae that form the base of aquatic food chains.



The diatom *Cyclotella meneghiniana* was used as a test organism. Cultures were exposed to several concentrations of octocrylene over six days



C. meneghiniana under a microscope

However...

Octocrylene is not water soluble, and a solvent was required to get the octocrylene into the cultures. This experiment used ethanol.

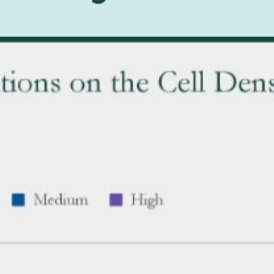
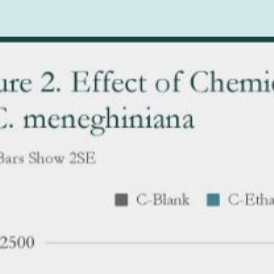
	C-Blank	C-Ethanol	Low	Med	High
Octocrylene concentration (µg/L)	0	0	0.03	0.3	3
Ethanol concentration (µL/L)	0	1000	10	100	1000

Two control groups were used to ensure that all observed effects were from octocrylene and not ethanol

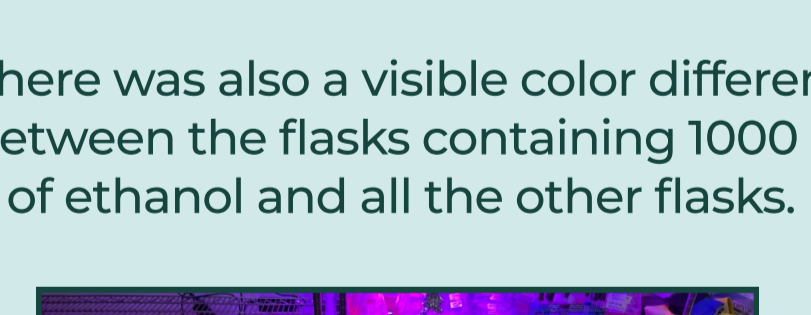
After the six day exposure, the chlorophyll-a levels of the diatoms were measured with a fluorometer...



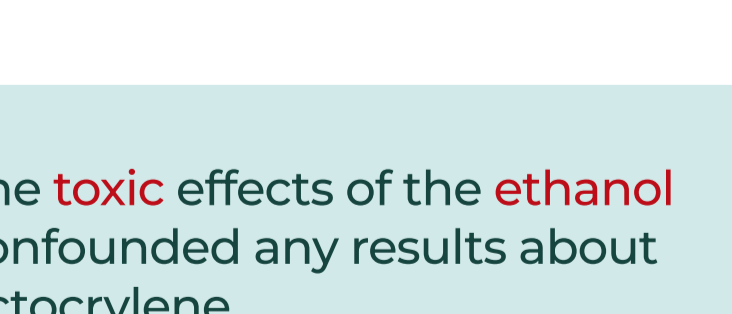
...and the cell densities were measured by counting cells/mL with a Palmer Maloney Cell.



The results showed significant differences in the diatoms' health, but the effects were a result of the ethanol solvent and not the octocrylene.

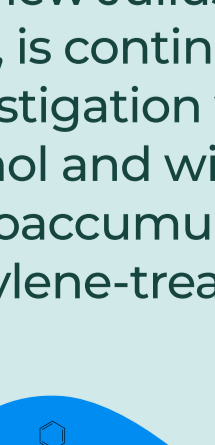
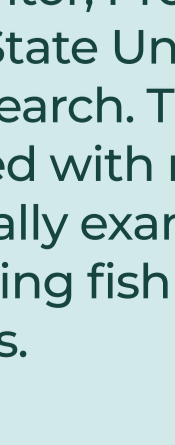


There was also a visible color difference between the flasks containing 1000 µL/L of ethanol and all the other flasks.



Blank control (no ethanol or octocrylene)
 Ethanol control (1000 µL/L of ethanol and no octocrylene)
 Low Conc. (10 µL/L of ethanol and 0.03 µg/L of octocrylene)
 Medium Conc. (100 µL/L of ethanol and 0.3 µg/L of octocrylene)
 High Conc. (1000 µL/L of ethanol and 3 µg/L of octocrylene)

The **toxic** effects of the **ethanol** confounded any results about octocrylene.



However, this experimental model provided clear and well controlled results, showing promise for future adaptation.

My mentor, Prof. Matthew Julius at St. Cloud State University, is continuing this research. The investigation was repeated with methanol and will eventually examine bioaccumulation by feeding fish octocrylene-treated diatoms.

