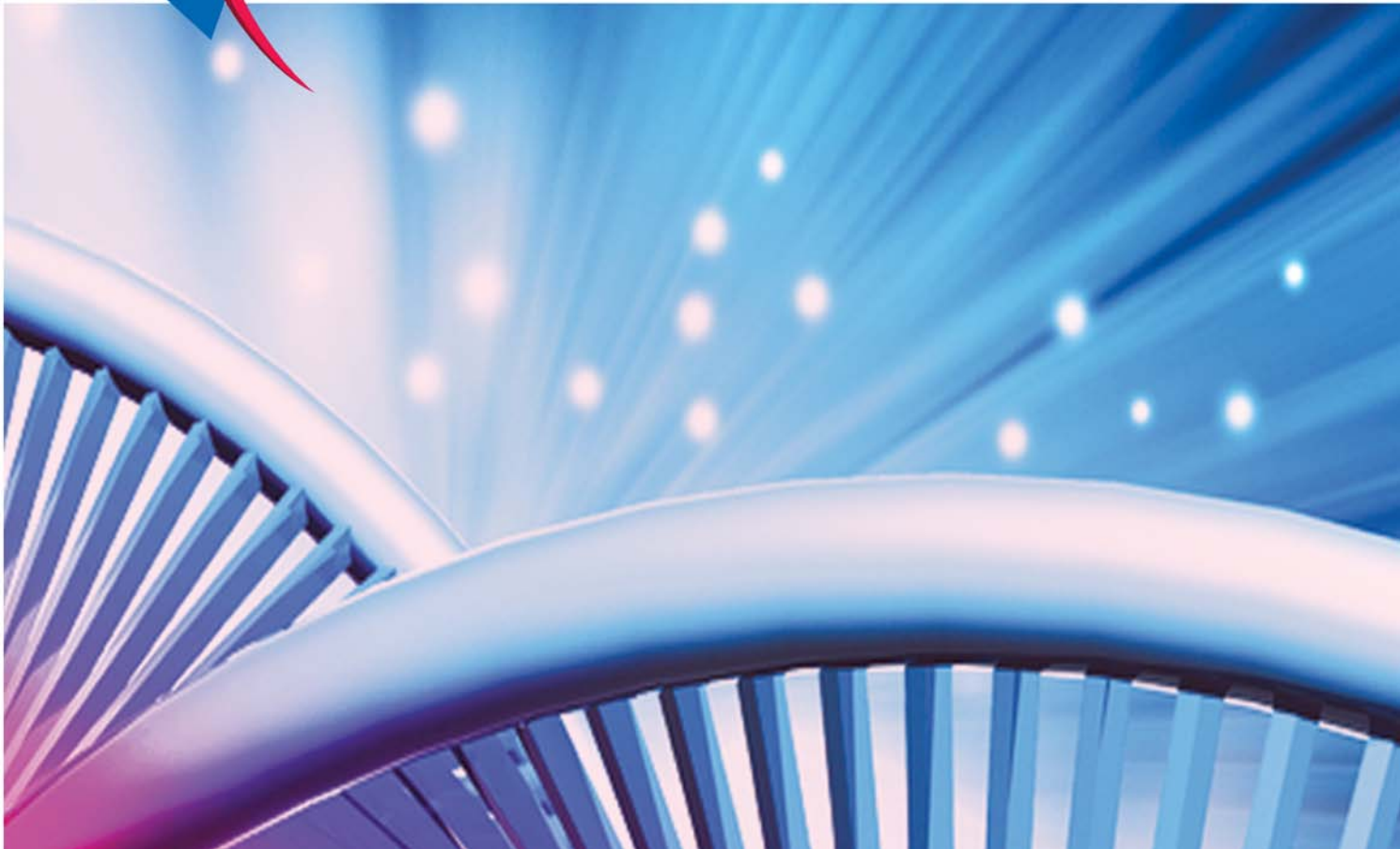
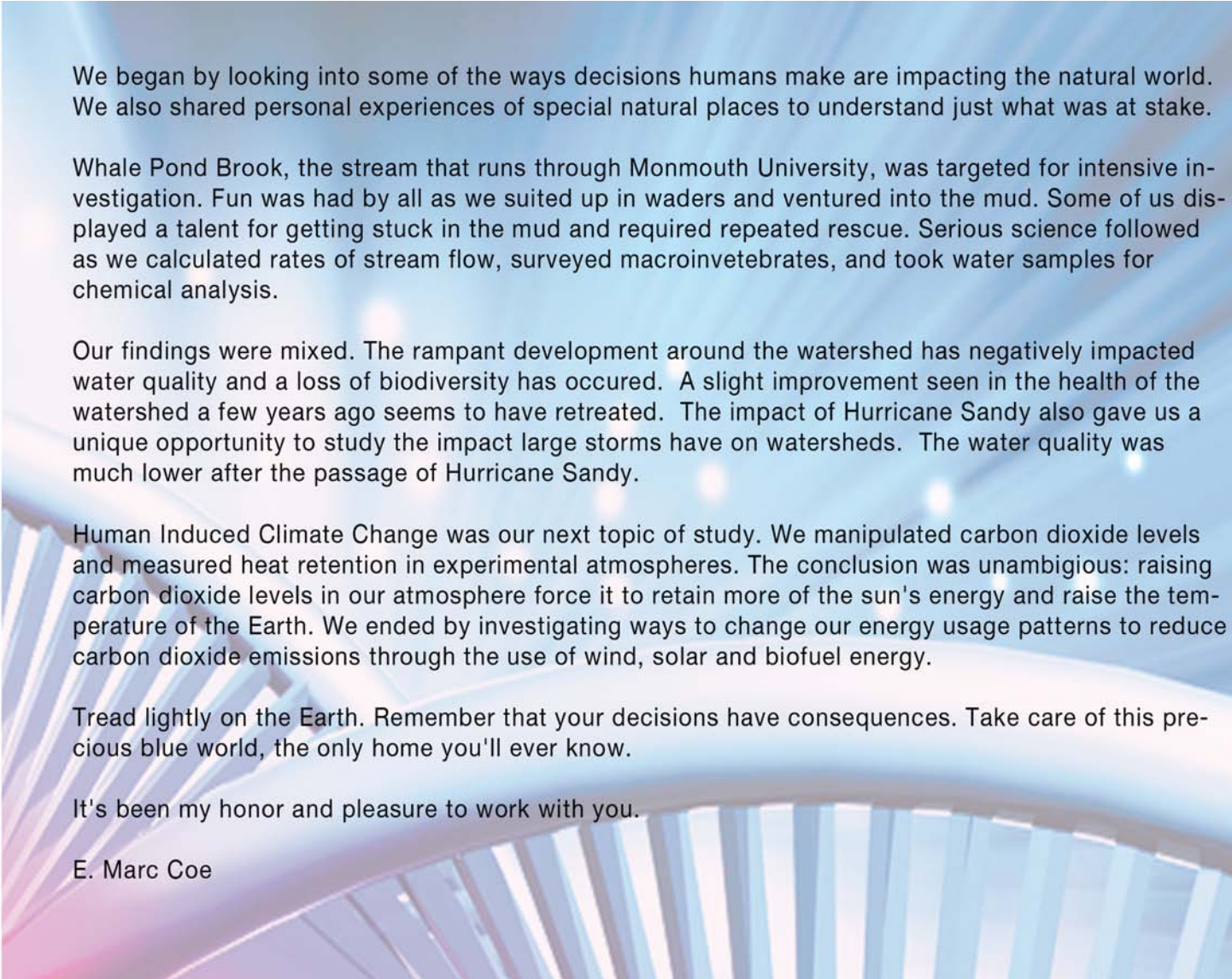




the stars
challenge

**The Environment
and You**
Fall 2012





We began by looking into some of the ways decisions humans make are impacting the natural world. We also shared personal experiences of special natural places to understand just what was at stake.

Whale Pond Brook, the stream that runs through Monmouth University, was targeted for intensive investigation. Fun was had by all as we suited up in waders and ventured into the mud. Some of us displayed a talent for getting stuck in the mud and required repeated rescue. Serious science followed as we calculated rates of stream flow, surveyed macroinvertebrates, and took water samples for chemical analysis.

Our findings were mixed. The rampant development around the watershed has negatively impacted water quality and a loss of biodiversity has occurred. A slight improvement seen in the health of the watershed a few years ago seems to have retreated. The impact of Hurricane Sandy also gave us a unique opportunity to study the impact large storms have on watersheds. The water quality was much lower after the passage of Hurricane Sandy.

Human Induced Climate Change was our next topic of study. We manipulated carbon dioxide levels and measured heat retention in experimental atmospheres. The conclusion was unambiguous: raising carbon dioxide levels in our atmosphere force it to retain more of the sun's energy and raise the temperature of the Earth. We ended by investigating ways to change our energy usage patterns to reduce carbon dioxide emissions through the use of wind, solar and biofuel energy.

Tread lightly on the Earth. Remember that your decisions have consequences. Take care of this precious blue world, the only home you'll ever know.

It's been my honor and pleasure to work with you.

E. Marc Coe



Exploring Whale Pond Brook - the water, the flora, the fauna, the mud.



We were the height of fashion in our waders.



We determined that Whale Pond Brook had two sources: water upstream and local runoff.



After thawing out in the sun we analyzed samples for macro invertebrates.



Teamwork was required to complete the macro invertebrates survey.



A surprising number of living things were thriving in the brook. We were able to determine the health of the ecosystem by categorizing the fauna we found.



Manicures were required to remove the quantities of mud found under our fingernails. This did not deter us in our investigation.



Each of the sites at Whale Pond Brook had a distinctive character.



Biodiversity was lacking in the Whale Pond Brook. This is an indication of poor water quality.



It was determined that our mud-pie making skills from childhood were easily transferrable to the scientific realm.



Moving inside, a chemical analysis of water samples from the brook was completed. Also, Global Warming was modeled using soda bottles and heat lamps. Our discoveries were not reassuring!



We found high levels of nitrates and phosphates in the water samples. It was also discovered that increasing the carbon dioxide content of air increases the heat trapped.



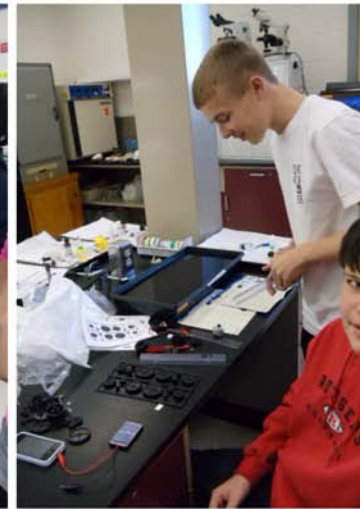
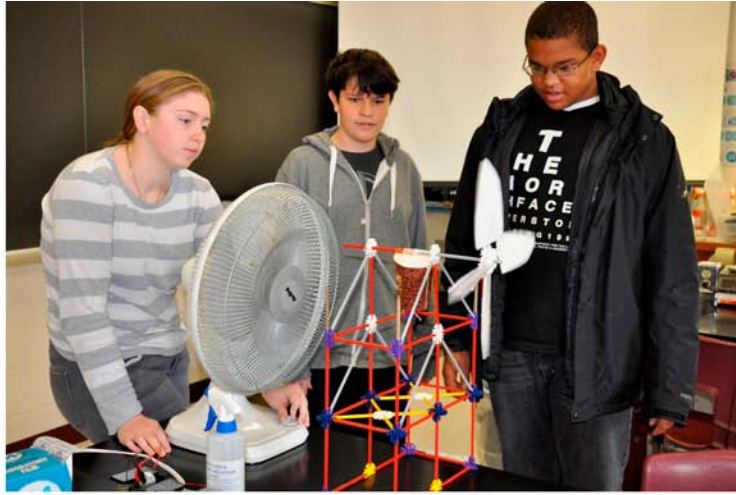
Land use patterns were also investigated. Our experiments indicate that cutting down forests will contribute to climate change.



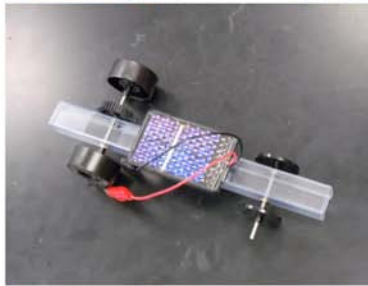
Water samples taken before and after the arrival of Hurricane Sandy were compared.



Renewable energy was investigated through the construction of solar cars, solar powered hot water heaters, and windmills. And to make us look fabulous!



A surprising amount of healthy competition ensued.





The Environment and You
The Stars Challenge at Monmouth University