



Preserving CNMI's sea turtles

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Currently, an average of 12 nesting female green sea turtle visit the CNMI annually to lay their eggs. Over the past 11 years, 25 sea turtles have been illegally taken from beaches in the CNMI. According to an article found in *frontiers in Marine Science* (January 2018), *Endangered Green Turtles of the Northern Mariana Islands: Nesting Ecology, Poaching, and Climate Concerns*, poaching is currently the greatest threat to resident nesting sea turtles in our islands. Across the Pacific, sea turtles are hunted for various reasons, such as jewelry, money, and food. Because of this, the population of nesting green sea turtles has declined, which puts our coastal resources and coral reefs at risk. Green sea turtles are important because they promote biodiversity in our environment and provide income through the tourism industry. Sea turtles also play a major role in keeping our coral reefs healthy. Green sea turtles, which are the most common turtle species in the CNMI, feed on the algae that grow on corals. This increases productivity and allows coral reefs to thrive.

This summer, I was an intern at DLNR's Sea Turtle Program. My internship project is part of an ongoing effort to protect CNMI's sea turtle population and eliminate illegal poaching by collecting data on current nesting sites and spreading awareness of the threats sea turtles face. During my internship, we conducted outreach at a number of schools, as well as at the Saipan International Fishing Derby, where we displayed stuffed green and hawksbill sea turtles and preserved sea turtle hatchlings in jars. We also handed out educational materials such as hotline stickers and sea turtle coloring books. In addition to outreach, another way we help protect our sea turtles is through nightly beach monitoring. A typical night shift involved walking on the beach looking for turtle nests and tracks, and making sure previous nests haven't been poached. I also assisted with nest inventories, which involved collecting data on the number of hatched and unhatched eggs in each nest.

This internship has increased my interest in sea turtle conservation, and has encouraged me to major in marine science at school. It will take many years to see CNMI's nesting sea turtle population recover, but with the help of the community, I believe it's possible.



I began my summer working as an intern in the Division of Environmental Quality (DEQ) Environmental Surveillance Laboratory. I mainly assisted in the microbiology section where we analyzed marine water for enterococci bacteria and drinking water for total coliforms and E. coli. Total coliforms, E. coli, and enterococci are all bacteria found in fecal matter.

Working in the laboratory, it became my main project to analyze marine water to quantify and monitor the microbial quality of the beaches on Saipan, Managaha, Tinian, and Rota and to assist in testing drinking water to maintain safe drinking standards.

The first step for each water analysis was to collect water samples to bring to the laboratory for testing.

Marine water samples were collected from CNMI beaches by the DEQ Water Quality staff. Once the samples arrived, we diluted them and added enterococci media to each sample to detect enterococci bacteria. Afterwards, the samples were incubated for 24-28 hours. If the sample fluoresced under UV light after incubation, then it was positive for enterococci bacteria.

Drinking water samples were collected by the DEQ Safe Drinking Water staff from clients. In the lab, we added Coli-18 media to each sample to detect total coliforms and/or E. coli. The samples underwent pre-warming for about 7-10 minutes then were incubated for 18 hours. The results were achieved by comparing the samples with a comparator (container of water that contains total coliforms and E. coli for reference).

Here are the possible ways to determine the results:

- Sample is **darker than/equal** in color to the comparator and **is** fluorescent = **positive for total coliforms and E. coli**

To alert the public of the findings of the marine water analysis, a Public Beach Advisory (red flag) is put out on the CNMI DEQ web page if the water quality results exceed the CNMI Water Quality Microbial Standards. Test results are also provided to the U.S. Environmental Protection Agency, Congress, and the media. Results for drinking water samples are reported back to the client.

E. coli in drinking water can harm people if consumed, and significant amounts of fecal bacteria can hurt the economic and recreational value of marine waters. In addition, the presence of total coliforms, E. coli, and enterococcus bacteria "is indicative of the potential presence of other more pathogenic organisms which are a danger to human health" (Price and Wildeboer, 2017). Water analyses are crucial for marine water quality assessments and for maintaining a healthy community.

Prior to this internship position, I had little knowledge of the significance of bacteria in our aquatic resources. It is only through my experience in the laboratory that I learned of the importance of water testing and the effects of these bacteria (enterococci, total coliforms, and E. coli) on our community and environment.

Works Cited:

Robert G. Price and Dirk Wildeboer (July 12th 2017). *E. coli as an Indicator of Contamination and Health Risk in Environmental Waters, Escherichia coli - Recent Advances on Physiology, Pathogenesis and Biotechnological Applications*, Amidou Samie, IntechOpen, DOI: 10.5772/67330. Available from: <https://www.intechopen.com/books/-i-escherichia-coli-i-recent-advances-on-physiology-pathogenesis-and-biotechnological-applications/-i-e-coli-i-as-an-indicator-of-contamination-and-health-risk-in-environmental-waters>

Testing for Bacteria in CNMI Waters

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