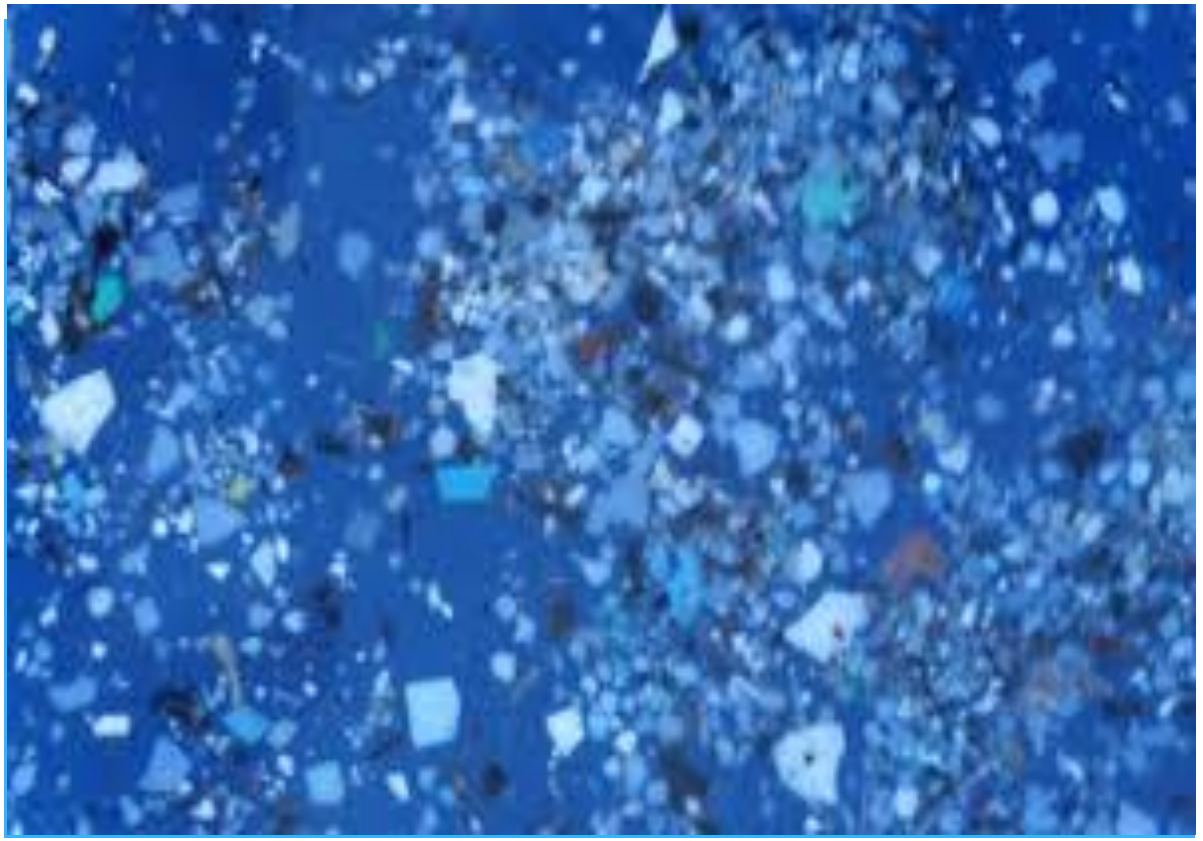


# Micro-plastic Invasion of Kailua Beach

Reid Kim and Brock Kono

# The Problem Of Plastic In The Ocean

- National Academy of Sciences estimated that 14 billion pounds of garbage is being dumped into the ocean every year. The United States could be the source of approximately one third of this ocean pollution.
- Wildlife is not the only area to suffer from the effects of marine debris. Plastic bags are the leading external cause of marine engine damage in Massachusetts

# What Are Micro-Plastics?

- Micro-plastics are small plastic particles in the environment and have become a huge problem in the marine environment.
- Micro-plastics form as a consequence of the breakdown of larger plastic material, especially of marine debris, into smaller and smaller fragments.
- The breakdown is caused by waves and/or by photochemical processes triggered by sunlight.

# Impacts of Micro-Plastics

- The impact on the food chain and marine life is a huge concern for scientists and biologists, but so far researchers have focused on larger plastic items.
- Plastic has caused animals to have indigestion, entanglement, and suffocation, and have all resulted in death.
- It has also been seen that in fish have indigested plastic, and if they keep eating plastic the fish will die

# Micro-Plastics And Persistent Organic Pollutants

- Plastic particles may highly concentrate and transport synthetic organic compounds.
- It still remains unknown if micro-plastics can act as agents for the transfer of POPs from the environment to organisms in this way.
- POPs are Persistent Organic Pollutants

# How Micro-Plastics Effect The Beach

- These particles are potentially dangerous to marine species due to magnification risk over the food chain.
- Scientists worry about micro-plastics for a couple reasons. One of them are because they are pretty much non-biodegradable.

# How We Are We Conducting Our Study On Micro-Plastics

- We first start by making a 10-by-10 plot on the sand and then we measure the distance from the plot to the waterline. We measure our plot to the waterline to get an idea of how much the plastic has moved up on the beach.
- We then start sifting our nets through our sand plot for plastic for about 45 minutes and then we dump the plastic we collected into a bucket. My partner and I collected about 1.5 liters of plastic during our recent visit to the beach.
- Our whole class collected 3.1 liters of plastic from our plots, and right now there is 1544.24 visual gallons of plastic on Kailua Beach on 11/30/12.

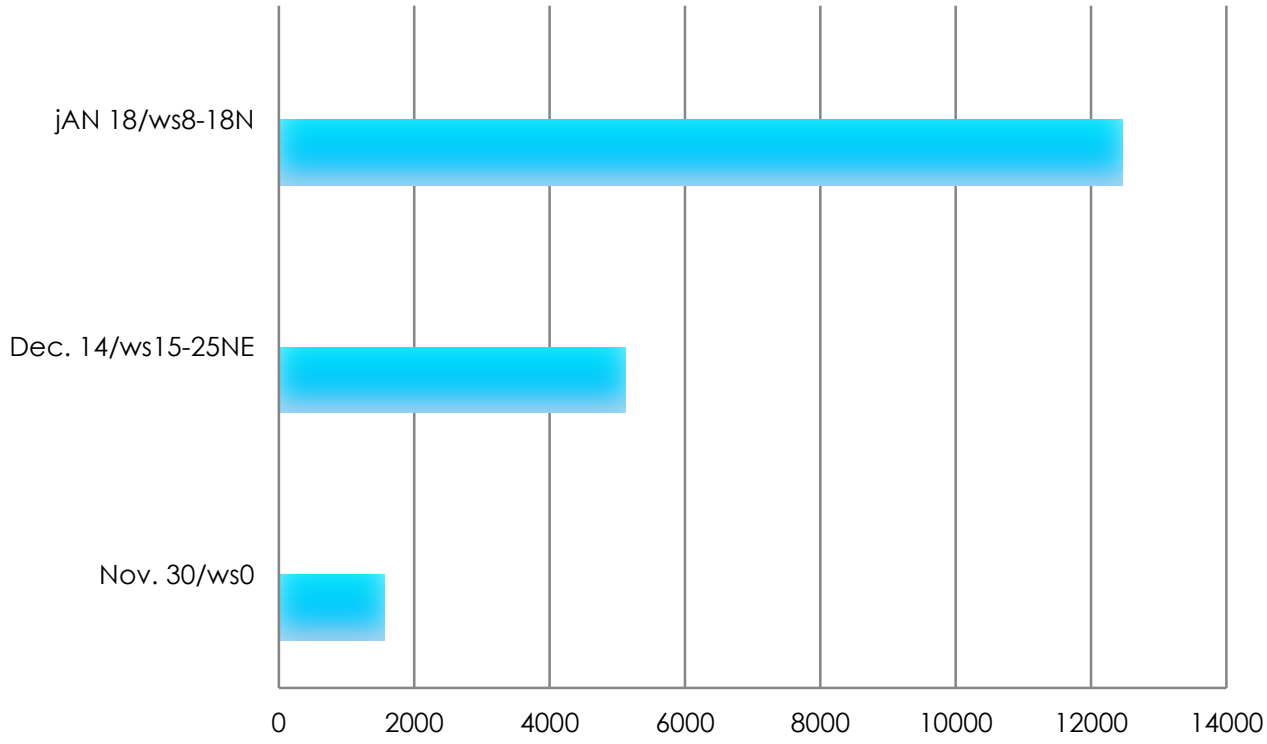
# Possible Solutions To Micro-Plastics

- Some solutions to Micro-plastics are to recycle it, make it into energy, and make a public awareness for it all around Kailua.
- We hope to take this growing problem to the Kailua Chamber of Commerce to make it an actual awareness for Kailua Beach.

# What We Do With The Collected Plastic And How We Can Fund The Clean-Up

- What we want to do with are collected plastic is that we want to make it into energy by selling to a company named HECO.
- We can also fund the clean-up of Kailua Beach by charging a small fee to anyone who lives or rents on that beach.

# Micro-plastic on Kailua Beach




- Estimated liters of plastic on Kalama Beach

# The Possible Long Term Affects Of Micro-Plastics Invading Kailua Beach

- The affects that Micro-plastics could have on the economy of Kailua is that it could stop tourist attraction, stop people from renting the houses on the beach, and could stop the beauty of Kailua Beach, so lets stop it now instead of later.

# Additional Micro-Plastic Survey

- Method: Ten test holes were dug in-between student survey plots to determine the downward migration of micro-plastic below the surface of the sand. The test holes were 12 inches deep by 36 inches long.
- Results: None of the test holes revealed any micro-plastic below the surface of the beach sand more than 3 inches deep, and insignificant amounts were noted at that depth. The vast majority of micro-plastic seems to remain in the top 1-2 inches of the sand.
- Possible Explanation: The density of the micro-plastic prohibits its downward migration, there for beach clean up will be less complicated and less expensive.

# Why We Are Doing The Study

- We are trying to help the environment, the world, and the people on the world to stop littering.
- We are also trying to see how much plastic washes on Kalama Beach.