

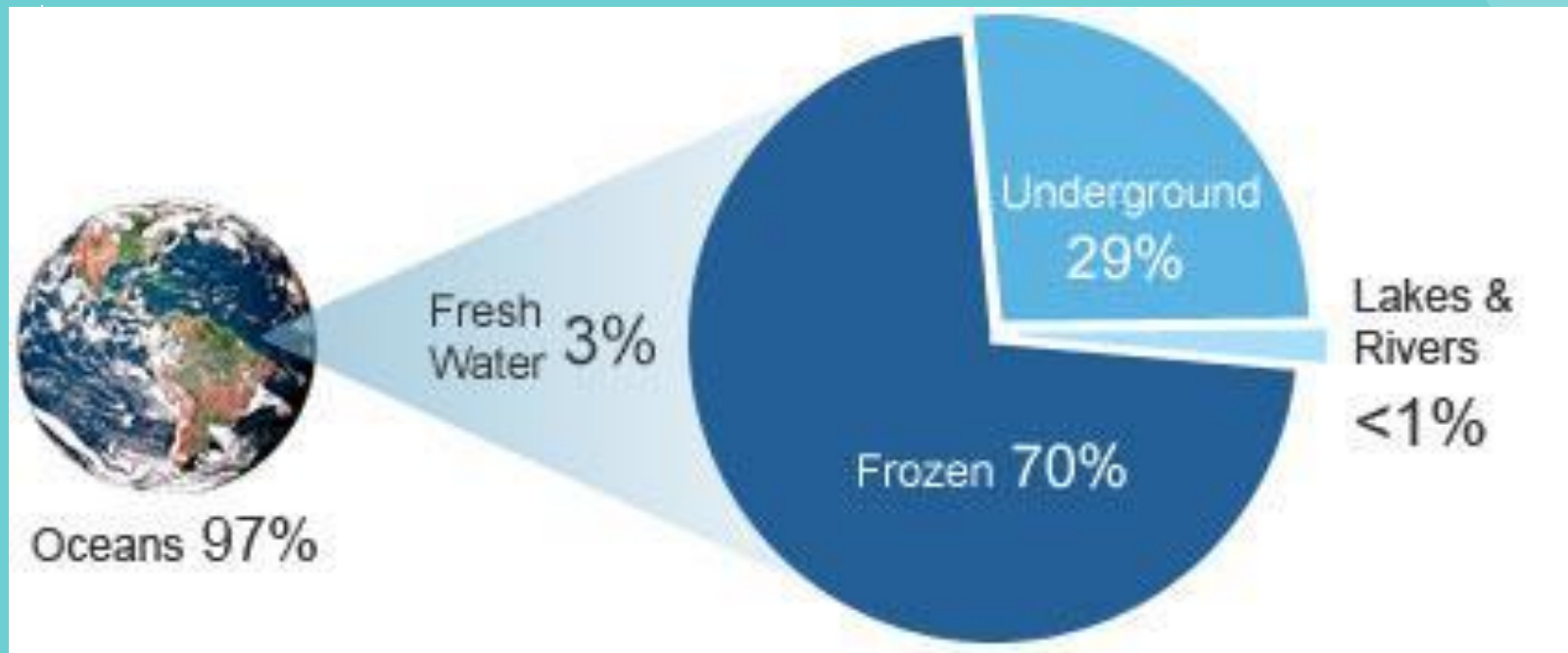
**YOU'RE INVITED TO  
LEARN ABOUT WATER  
RESOURCES IN YOUR  
“BACKYARD”**

**Learn how YOU can evaluate the health of the Waiawa Watershed  
Learn how YOU can become an important part of it's protection and restoration!**



# WATER RESOURCES ARE LIMITED AND WE NEED THEM TO SURVIVE!

LESS THAN 1% OF THE EARTH'S FRESHWATER IS READILY AVAILABLE TO ALL HUMANS AND WILDLIFE!





# HUMANS HAVE NEGATIVELY IMPACTED WATER RESOURCES

## WE ALL PLAY A PART IN CONTRIBUTING TO WATER POLLUTION - AND WATER PROTECTION

### LEPTOSPIROSIS

Animal urine from wild boars, feral cats, rats, mongoose, and other wild animals contain the harmful pathogen leptospirosis that can cause infection and possibly death.

### STORM DRAINS

Trash, oil, sewage, sediment, and toxic chemicals runoff into our streams during storm events. Wastewater from cesspools can also pollute streams.

### AGRICULTURE

Fertilizers and pesticides from agricultural areas, as well as yards and gardens, runoff into our streams and eventually make it into our oceans.



### CESSPOOL DRAINAGE

Cesspools leak sewage into the surrounding environment putting Hawai'i's underground aquifers at risk. Sewage from cesspools has already been found in drinking water in Kea'au on the Big Island and in upcountry Maui.



### SALTWATER INTRUSION

Hawai'i's groundwater systems are permeable. As sea levels rise, saltwater could infiltrate coastal aquifers and threaten drinking water.

### AGRICULTURE INDUSTRY

Pesticides, chemicals, and fertilizers used for farming and industrial uses can threaten our drinking water. A recent study done by the Hawai'i Department of Agriculture tested 32 sites around the State and found pesticides in 31 of the sites sampled. All Pesticide levels were considered safe by EPA drinking water standards.

### MICROPLASTICS

Plastic pollutants degrade into small beads less than 10 nanometers in diameter in the ocean. These small plastic beads have been found in the gut of commonly eaten fish.

### PESTICIDES

nearly a billion pounds of pesticides are used each year. These pesticides can be harul or lethal to aquatic life.



### MERCURY

Mercury waste produced by industrial factories and power plants has led to an increase in mercury levels in the ocean and in predatory fish. Mercury has been shown to have many harmful effects on human health.

### PCBs

PCBs were used heavily in the manufacturing of electric and coolant fluids between 1929 and 1979. PCBs are known to cause cancer in animals, and have been shown to biomagnify up the food chain.

### OVERFISHING

Overfishing has put the future of many of our marine species in danger: the rising demand for certain like blue fin tuna has caused them to become endangered.

### RUN OFF

Runoff from Storm water and irrigation water washes toxic chemicals, oil, trash, and sediment into our ocean. Cesspools can also release raw sewage in to coastal waters.



### GLOBAL WARMING

As the planet warms, the ocean will change forever. Rising sea levels, warmer waters, and acidification are eroding the coral reefs and ecosystems our fish live in.

### PLASTIC WASTE

Every year, 1.4 Billion tons of plastic garbage is released into the ocean. Th epacific garbage patch is a giant collection of plastic debris in the middle of the Pacific Ocean three times the size of France.

# THE AFFECTS



# WATER POLLUTION AFFECTS OUR DRINKING WATER!

## What **Affects** Our Drinking Water?



### Cesspool Drainage

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### Agriculture/Industry

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# WATER POLLUTION AFFECTS OUR FOOD

## What Affects Our Fish?

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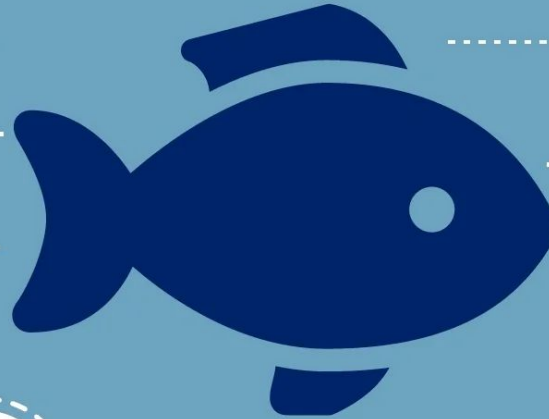


### Polychlorinated Biphenyls(PCBs)

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# WATER POLLUTION AFFECTS OUR FOOD

## What Affects the Ocean?

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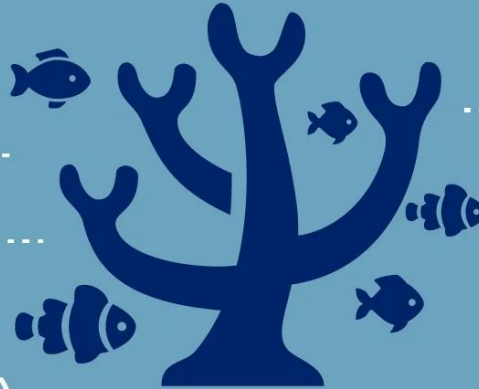
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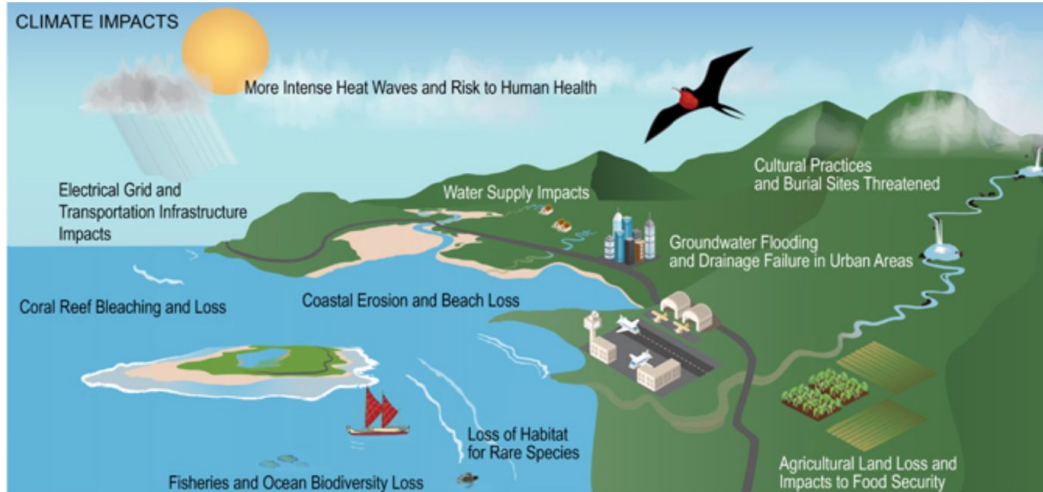


# OUR WATERS ARE THREATENED FURTHER BY CLIMATE CHANGE

## Estimated \$19B damage to Hawai'i by 2100, U.S. National Climate Assessment

[UH News](#) » [Research](#) » Estimated \$19B damage to...

November 28, 2018  [UH News](#)



UNIVERSITY  
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**SO WHAT CAN YOU DO  
ABOUT ALL THIS?**



**HANG IN THERE AND CLICK TO LEARN MORE!**





# LET'S START WITH A LOOK AT THE AREA WHERE YOU LIVE

## THE `EWA MOKU OF O`AHU

“Wai” is the Hawaiian word for water...look at how many place names in `Ewa start with “Wai”



The waters of `Ewa feed into Pu`uloa (Pearl Harbor)



# 140 YEARS AGO `EWA-PU`ULOA WAS `ĀINA MOMONA THRIVING LAND, THRIVING WATERS, THRIVING PEOPLE

Historically a center of sustainable aqua- and agriculture

An abundant, culturally significant, mullet fishery and over 30 fishponds

One of the largest concentrations of freshwater in Hawai`i

The largest aquifer on O`ahu supplying  $\frac{2}{3}$  of the islands drinking water

One of the largest estuaries in Hawai`i

Habitat for endemic, endangered species

**THE HAWAIIAN PEOPLE MANAGED THEIR WATER (AND FOOD) RESOURCES WISELY  
AND SUSTAINED ALMOST 1,000,000 PEOPLE WITHOUT IMPORTS!**



# THE HAWAIIAN PEOPLE MANAGED THEIR WATER (AND FOOD) RESOURCES WISELY AND SUSTAINED ALMOST 1,000,000 PEOPLE WITHOUT IMPORTS!

Forests were kept intact and were considered sacred

Agriculture systems produced healthy food filtered the water (taro lo`i)

Fishponds produced healthy protein and protected reef ecosystems

Resources were managed holistically from ridge to reef in ahupua`a systems

Observations of natural systems were a part of everyday life and used to make decisions about resources

**WE CAN APPLY THIS WISDOM TODAY!**





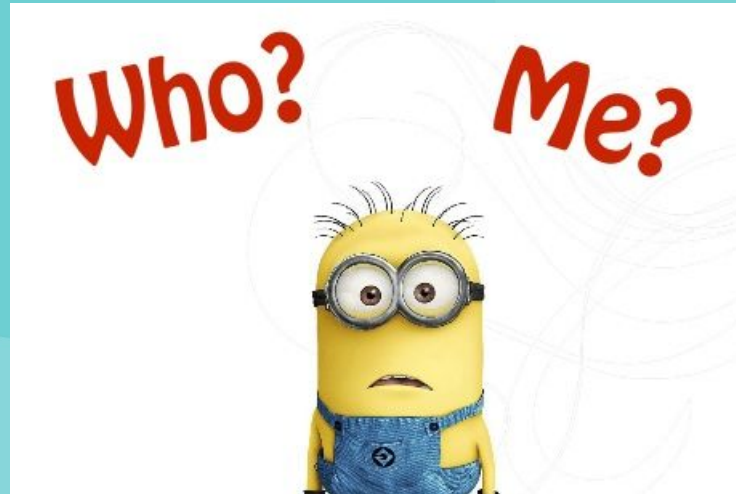
**THIS VIDEO SUMS UP THE RELATIONSHIP OF  
`EWA, HAWAIIAN CULTURE, WATER AND EDUCATION**



**YOU LIVE IN AN AMAZING PLACE!**

YOU HAVE A CHANCE TO LEARN FROM THE WISDOM OF THE HAWAIIAN PEOPLE,  
UNDERSTAND MODERN IMPACTS ON OUR WATER RESOURCES AND....

**MAKE A POSITIVE IMPACT!**

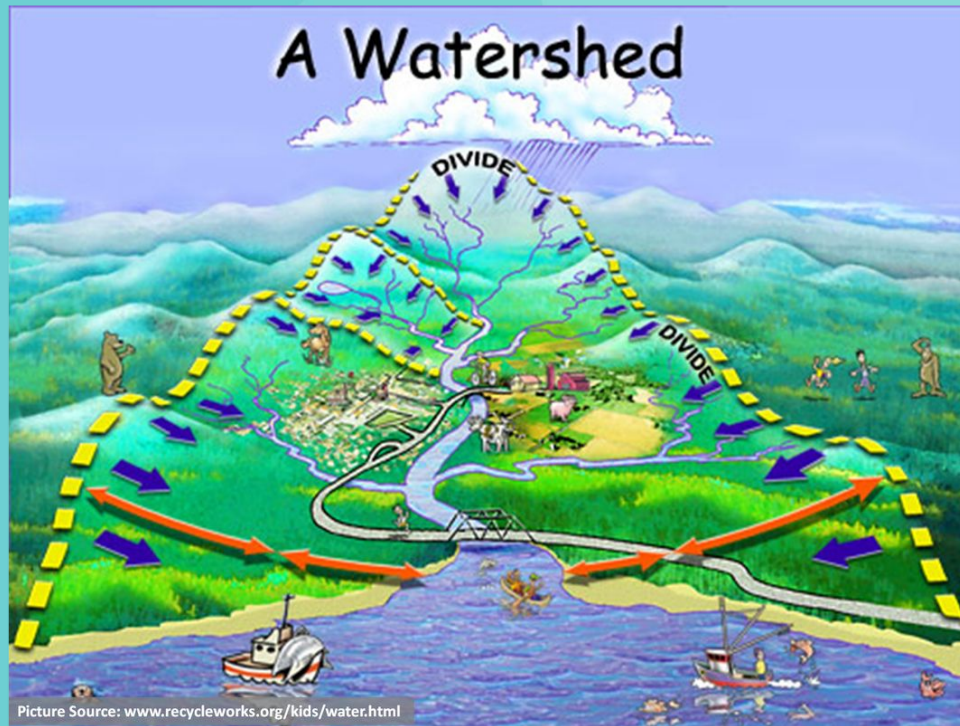




# TODAY WE DO TRY TO MANAGE WATER RESOURCES FROM RIDGE TO REEF IN AREAS CALLED **WATERSHEDS**

Almost the same idea as ahupua`a...

- A watershed is an area of land that drains all of the streams and rainfall to a common outlet
- In Hawai`i watersheds do include impacts to our nearshore reefs
- Working within a single watershed is a good way to start understanding the water resources near you

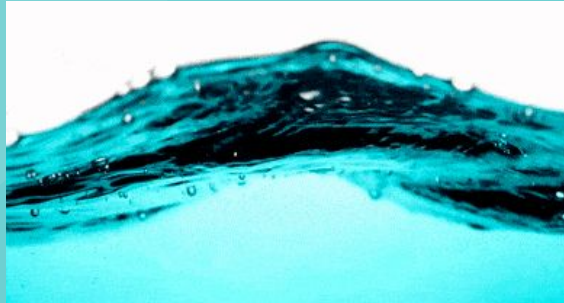


**IF YOU CAN REMEMBER THIS MESSAGE,  
YOU'VE BASICALLY MASTERED THE BIG IDEAS SO FAR!**



# JUST IN CASE: THE BIG IDEAS SO FAR

- Water is a precious resource
- Human actions threaten our water resources from mauka to makai - ridge to reef
- The Hawaiian people managed water resources wisely and understanding HOW they did so has relevance today
- Understanding a water system at the ahupua`a and/or watershed level is a great place to start
- If YOU grow in understanding the watersheds near your home, YOU can make a positive difference

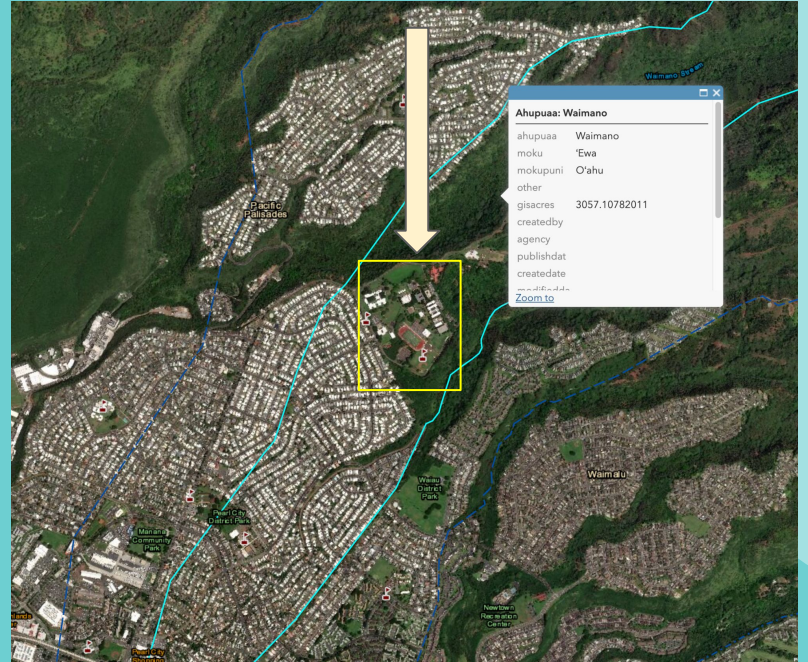


# PEARL CITY HIGH SCHOOL IS IN THE WAIMANO AHUPUA`A AND WATERSHED

## HOMES IN PEARL CITY SPAN MULTIPLE AHUPUA`A AND MULTIPLE WATERSHEDS

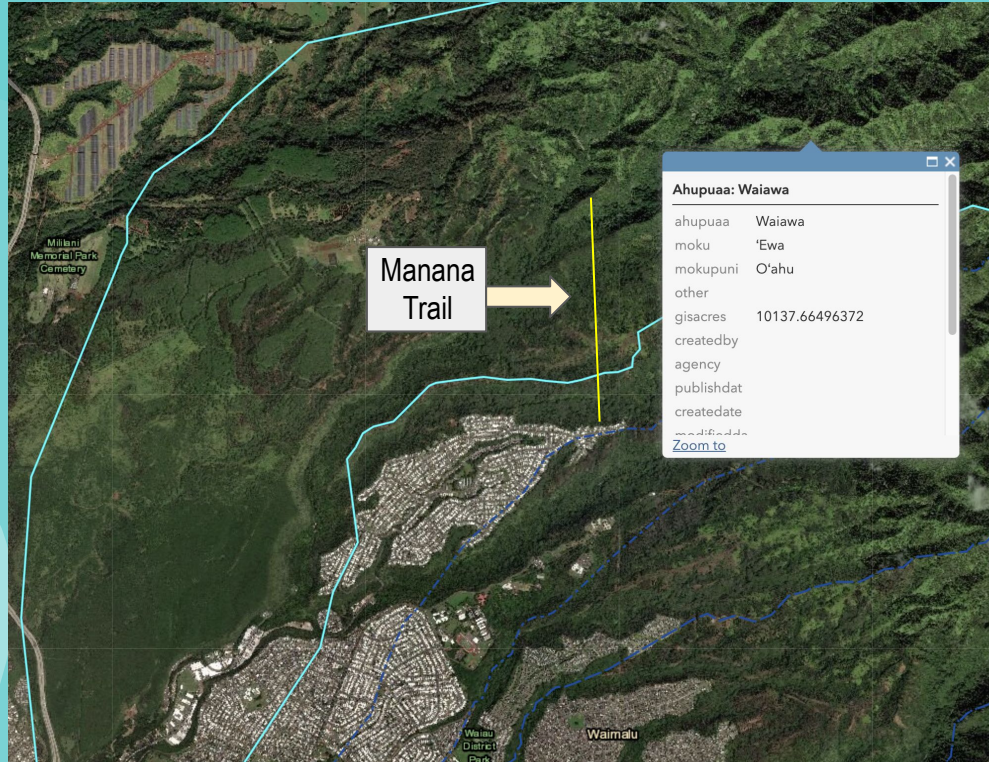


Pearl City HS





# OUR FOREST FIELD TRIP STARTS IN THE MANANA AHUPUA`A AND CLIMBS INTO THE WAIAWA AHUPUA`A AND WATERSHED





# WHY DO WATERSHEDS MATTER?

**WATCH THIS VIDEO FOR A GREAT ANSWER**



# WHY DO WATERSHEDS MATTER?

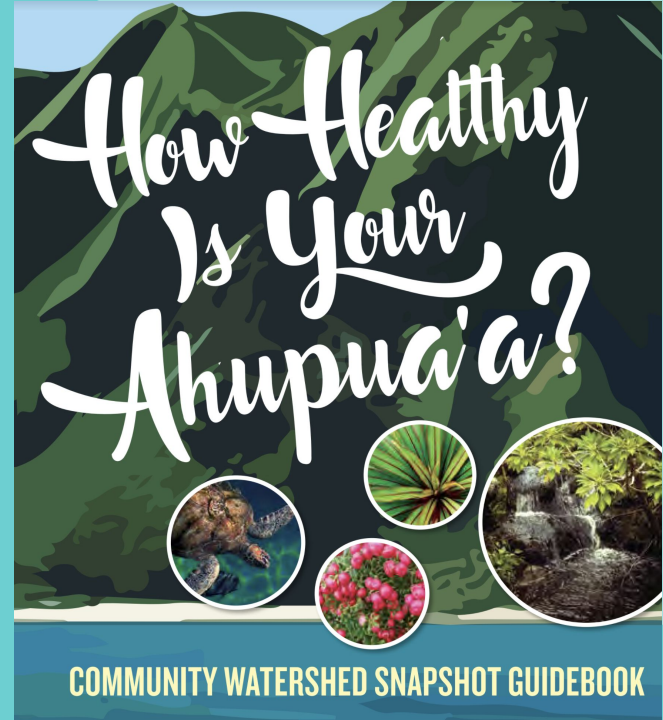
- Provides Drinking Water
- Supports Agriculture
- Mitigates (help protect from) Flooding
- Stops Erosion Into Our Oceans
- Provides Local Jobs
- Supports Local Businesses
- Houses Cultural Needs
- Educates Our Children
- Builds Communities
- Provides Recreation
- Supports Research
- Impacts Climate Change
- Supports Plants and Animals (found nowhere else on Earth)



# YOU'RE GOING TO LEARN SEVERAL WAYS TO ASSESS WATERSHED HEALTH

1. Native vs. non-native plants
2. Areas without vegetation
3. Developed areas with impermeable surfaces (including cement stream channels)
4. Storm drain systems and surroundings
5. Visible pollution
6. Rainfall patterns

**OBSERVATIONS IN THE FOREST**  
**OBSERVATIONS IN YOUR NEIGHBORHOOD**  
**OBSERVATIONS USING GIS - SATELLITE IMAGERY**



**MORE IMPORTANTLY**

**YOU'LL BE COMPLETING A MINI PROJECT  
TO IMPROVE THE HEALTH OF  
YOUR LOCAL WATERSHED!**

# MAHALO NUI LOA

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