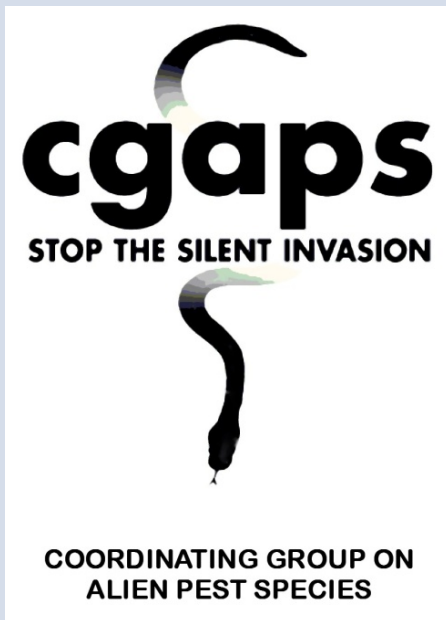


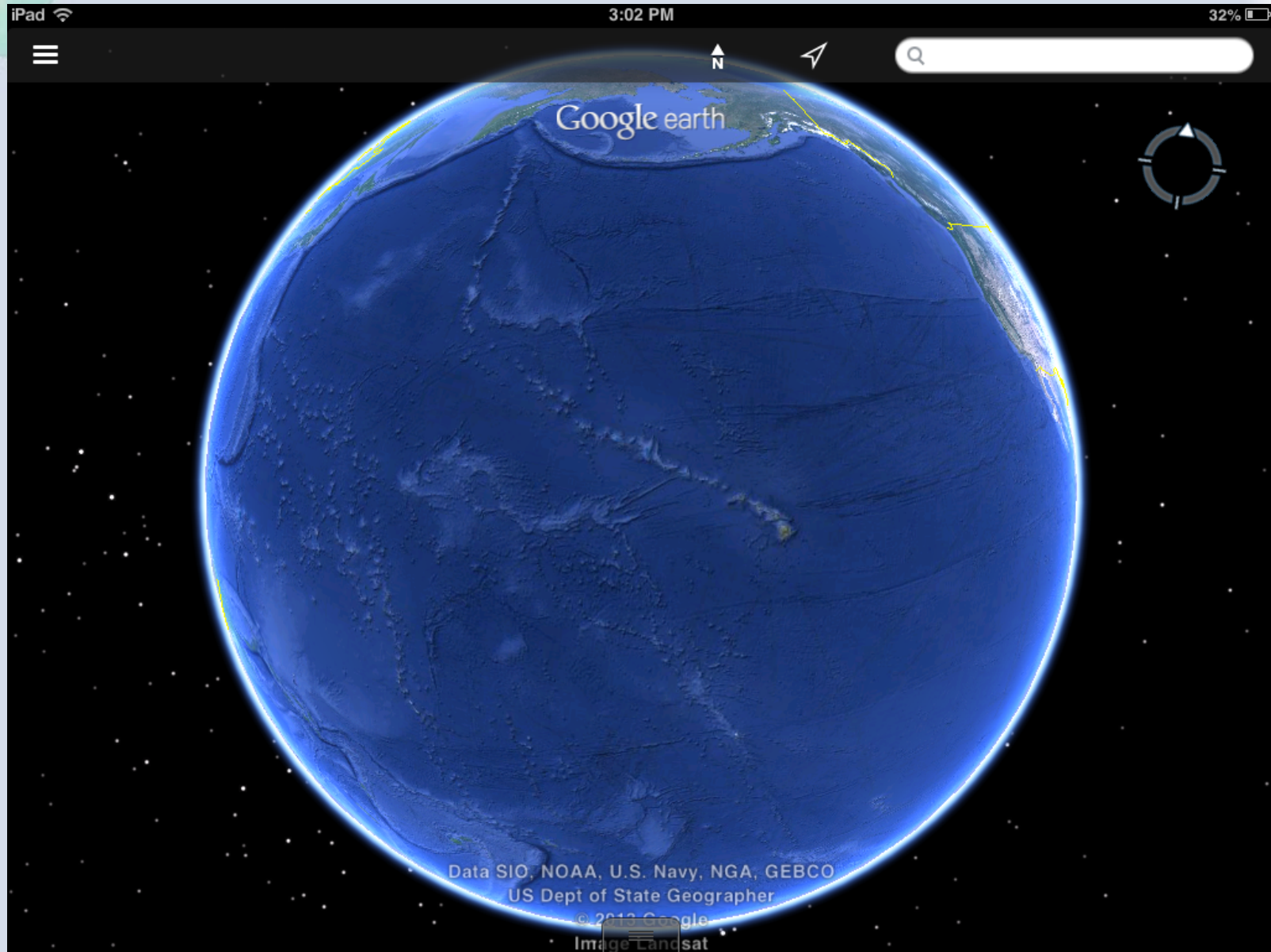
# Overview of Invasive Species Issues

For the  
**Committee on Energy and Environment**  
**Committee on Energy & Environmental Protection**  
Wednesday, January 8, 2014



Presented by:  
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# Isolation



# Hawaii's First Arrivals

Some seeds, spores, insects, and even spiders arrived on the wind.

A few birds flew or were blown off course. In them or stuck to their feathers were more seeds.

Some seeds floated here on ocean currents or waves. Ocean currents also carried eggs or larval fish, invertebrates, algae, and even freshwater stream species.





70 + million years ago through ... 1000 AD?

# Plants and animals arrive & thrive



isolation  
wide variety of habitats  
millions of years  
changes over time

---

20,000 native species

**Native species** =  
plants and animals that  
arrived at a location  
without the help of  
people or our  
conveyances, and all of  
the descendants of  
those colonists

70 million years ago

## First non-native species arrive = 34



...a few, like rats,  
proved to be invasive

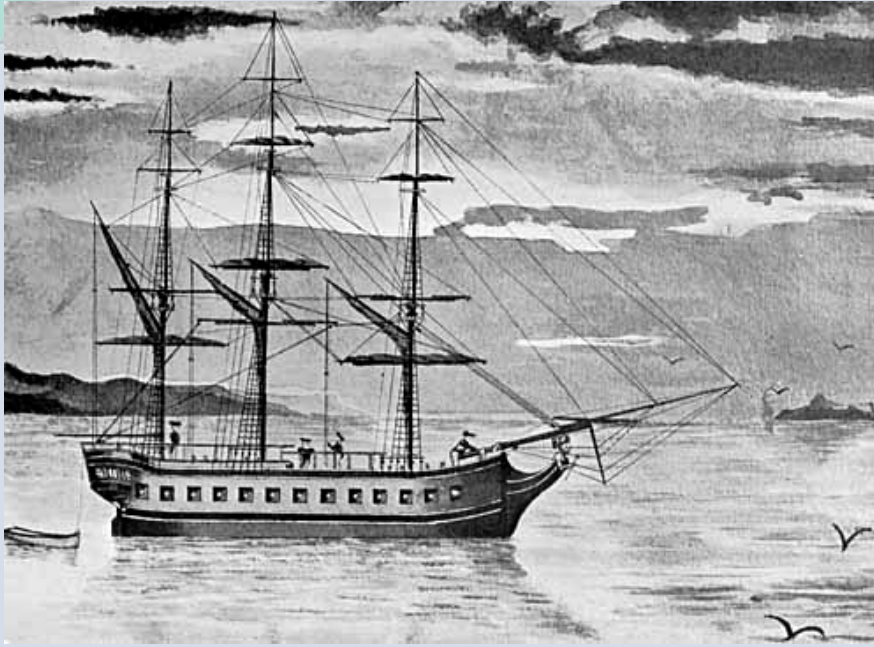
1000 years ago

**Non-native** = plants and animals that arrived at a location carried by people or our conveyances

**Invasive** = Non-native species that cause economic or environmental harm, or harm to human health (E.O. 13112)



# More non-native species = 500?



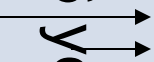
...a few of these proved to be invasive, including goats and mosquitoes

70 million years ago



1000 years ago

236 years ago



# Today: More non-native species arrive faster (and in better condition)



- 343 new marine/brackish water species
- Hawaii went from 0 to 40 land reptiles
- 0 to 6 amphibians (including coqui)
- 20+ insects/year (the Kahului Airport Risk Assessment found an average of one new pest per day!)
- 8,000+ plant species introduced; 200+ damaging ecosystems & natural resources

70 million years ago...



1000 years ago

236 years ago



10 y/a



# Why care about invasive species?

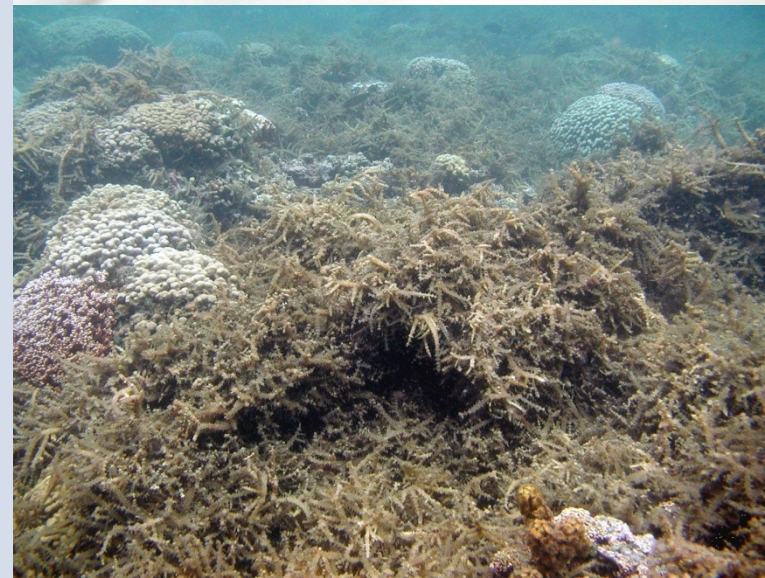
- In the US, \$138 billion is spent/per year on a sample of alien plants and animals<sup>1</sup>
- If introduced to HI, Red Imported Fire Ants = \$211 million/year for HI<sup>2</sup>
- If introduced to HI, brown treesnakes = \$593 million-\$2 billion/year<sup>3</sup>
- Invasive seaweed overgrows and kills nearshore reefs which generate \$800 million annually<sup>4</sup> & protect our shores from storms and the impacts of climate change

<sup>1</sup> Pimentel et al. 2000

<sup>2</sup> Gutrich et al. 2007

<sup>3</sup> Shwiff et al. 2010

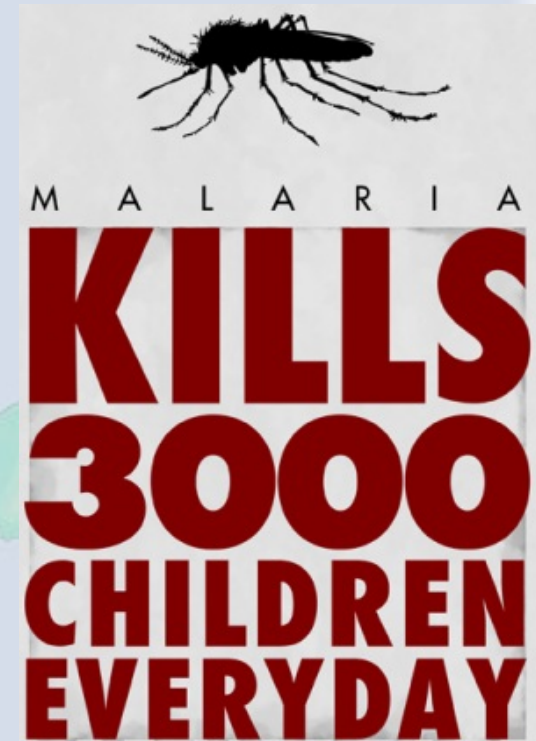
<sup>4</sup> Cesar et al. 2002





# Why care about invasive species?

- The arrival of a single mosquito carrying malaria or West Nile Virus would be devastating. Not yet in Hawai'i!
- Biting sand flies can inflict 10,000 bites per person. Not yet in Hawai'i!
- Little fire ants are invading yards and homes in East Hawai'i, stinging people and pets



Biting flies

ASM MicrobeLibrary.org © Walton and Suchm



[www.littlefireants.com](http://www.littlefireants.com)



# Why care about invasive species?

- Over 80% of endangered plants in Hawaii are threatened by invasive species<sup>1</sup>
- Loss of culture & unique “sense of place”
- Invasive strawberry guava = less water (30-50% less!)<sup>2</sup>
- Reduced volume and reliability of freshwater flow associated with invasive trees<sup>3</sup>; potential for increased erosion and runoff
- Less pollinators = less food



<sup>1</sup> Wilcove et al. 1998

<sup>2</sup> Giambelluca et al. in press

<sup>3</sup> vanWilgen et al. 1996



# Protecting Hawai 'i



## Pre-entry

(laws & agreements)  
International, Fed & State

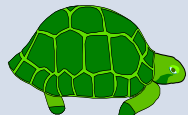
## Port-of-entry

(inspection)  
USDA APHIS & CBP,  
HDOA Plant Quarantine

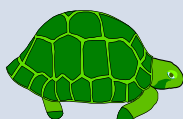
## Rapid-response

(response crews/regional containment)  
Fed, State, County, NGOs

### World's Biota



### Arrivals



### Escapes



#### Options:

- Do nothing
- Eradication
- Regional containment

### Widespread



#### Options:

- Do nothing
- Protect high value areas
- Biocontrol

# Pre-Entry & Port of Entry Needs:

- More pre-entry laws, agreements
- Adequate inspection must be a priority (facilities and staff)
- Preemption and information sharing must be addressed
- Have ballast rules; need hull fouling rules
- Address smuggling via mail and freight forwarders
- Prioritize interisland biosecurity to limit impacts





# Surveillance, Early Detection, and Rapid Response Needs

Things will always get through.

- Some monitoring around ports/high risk areas; need more & for a wider suite of species
- Most early detection and rapid response teams on soft money & without legal teeth—ISCs
- Need periodic cross-agency/NGO rapid response training and practice
- Rebuild HDOH Vector Control





# Control Needs

- Support for programs that reduce the impact of widespread invasive species (support for biocontrol, invasive seaweed control, watershed protection, etc.)
- Political support for agencies to protect public trust resources, even when unpopular (fencing, controlling cats and rodents in natural areas, using pesticides where necessary, etc.)



DAR Aquatic Invasive Species Team photo



Leeward Haleakala Watershed Restoration photo



Mark Rauzon photo



# What else can be done?

- Support for local agriculture to reduce imports (and the unwanted hitchhikers)
- Overhaul nursery certification program to include control of pests of concern or consider other incentives/penalties
- Support outreach by agencies and NGOs to get the public involved





**The good news is that people care and are working to Protect Hawai 'i. Your help and support is important!**

