

WELCOME!

Our Project In Hawai'i's Intertidal (OPIHI)



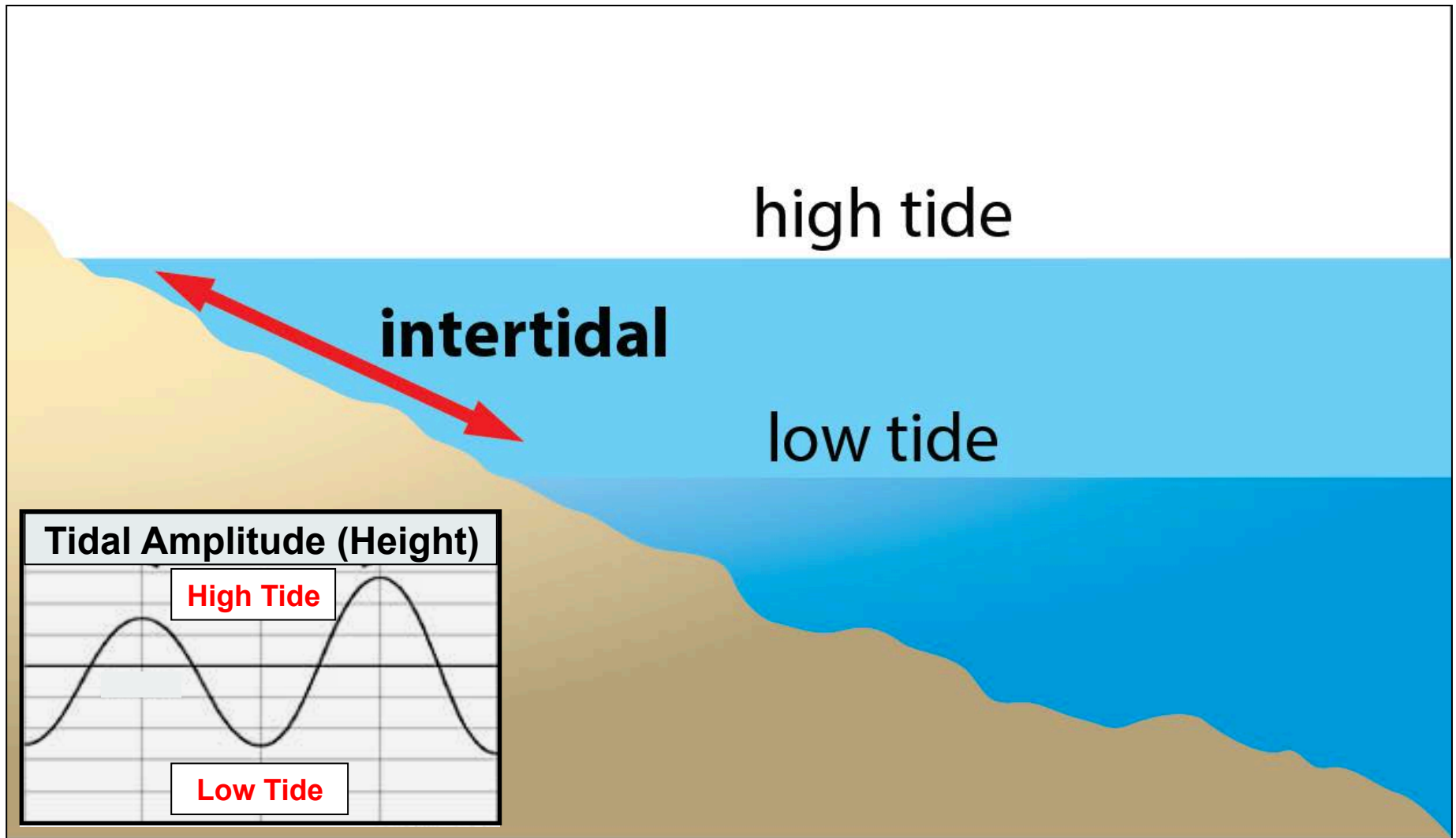
'Ewa Beach





‘Opihi vs. OPIHI

Intertidal = Ecological Zone



High Tide



Low Tide



Bay of Fundy, Canada

Images courtesy of Dylan Kerejuk, Wikimedia Commons



**Shell Beach
Sonoma, California**

<http://www.theseareanchlife.com/tag/california-king-tide-project/>

Tidal Range in Hawai'i ~ 1 m (3 ft)



High Tide



Low Tide

Ma'ili Point, O'ahu

Tidal Range in Hawai'i ~ 1 m (3 ft)



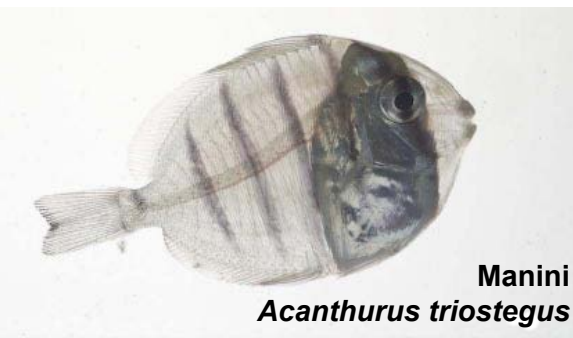
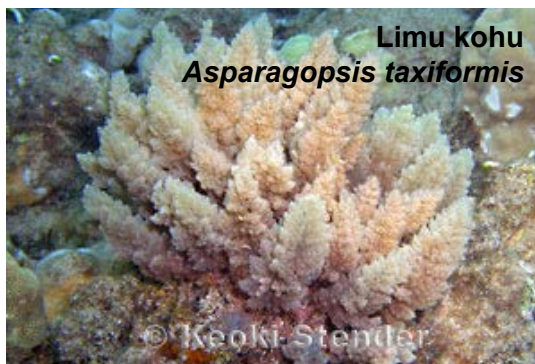
Low Tide at 'Ewa Beach, O'ahu



Unique Ecosystem = Unique Organisms



Importance of Intertidal



Hawaiian
Cultural,
Medicinal,
Culinary, &
Religious
Practices

Nursery

marinelifephotography.com

Human Threats

Impact of Development



Trampling & Overharvesting



Species Invasions



Wikipedia Commons
Wikipedia Commons

© Keoki Stender

Climate Change



Dr. Fletcher uses a yardstick to show what could be the approximate sea level at the Ala Wai Canal in 100 years.

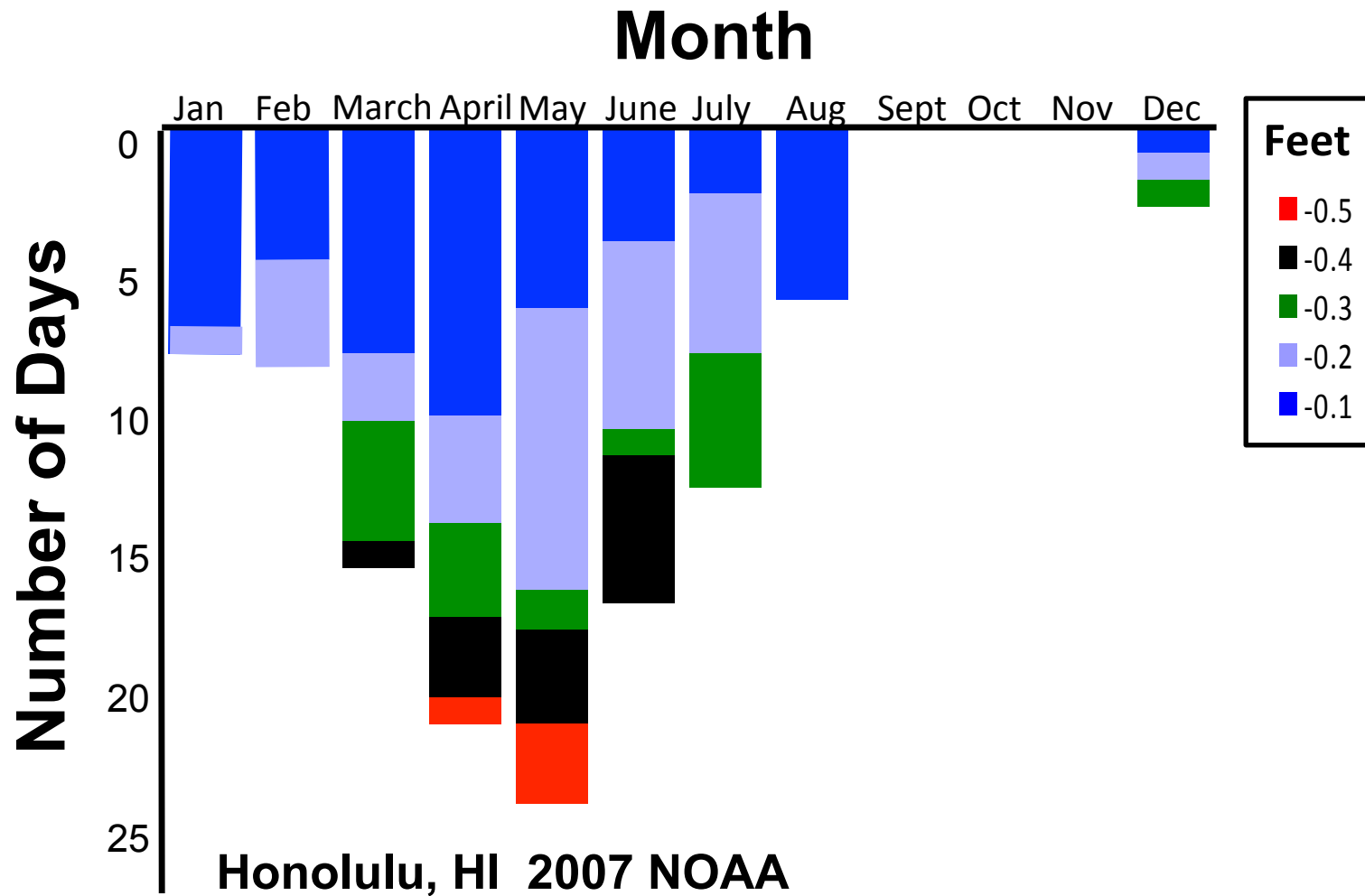
Summary: Hawai'i's Intertidal

- Intertidal zone in Hawai'i small
- Cultural, economic, & ecological importance
- Impacted by both land & sea issues
 - Nutrient inputs
 - Invasive species
 - Climate change



→ Has not been well-studied

Number of Negative Low Tides (Daylight Hours)



Citizen Science

Scientific and Educational Goals

- The public has the opportunity to engage in scientific research
- Scientists are able to collect a large amount of data



Accessible Marine Environment



Sand Island

Our Project In Hawai'i's Intertidal (OPIHI)

Goals (2003):

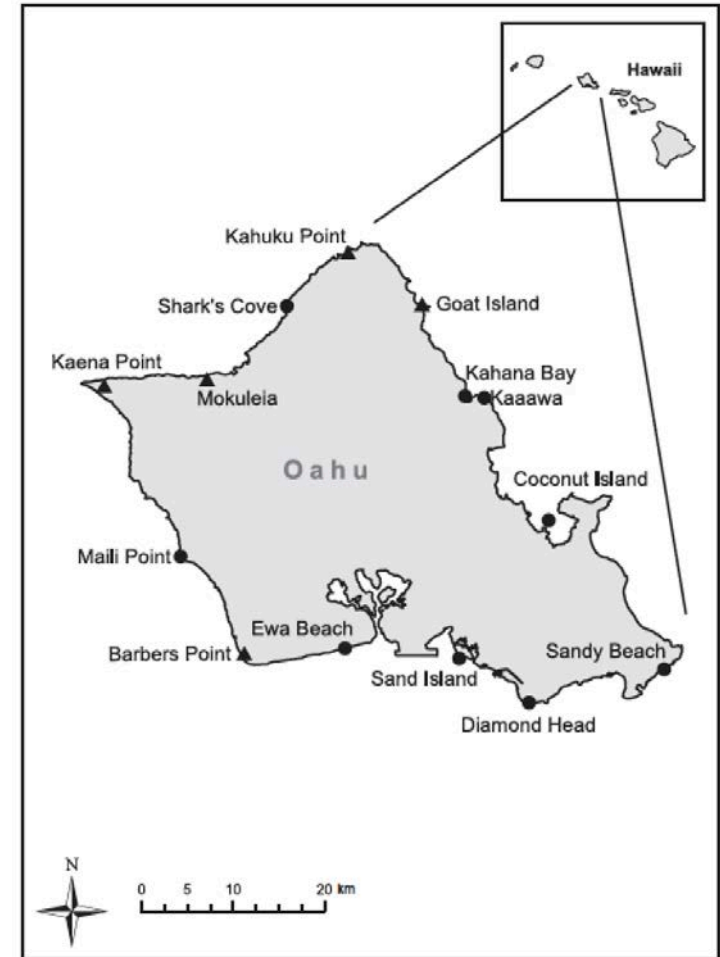
1. Describe the intertidal
2. Engage students in authentic scientific research
3. Collect baseline data to inform conservation efforts



2003 & 2004: “Bioblitzes”



- 516 species identified
- High number of invasive & endemic species
- Similar diversity to temperate regions

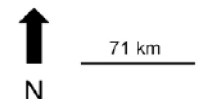
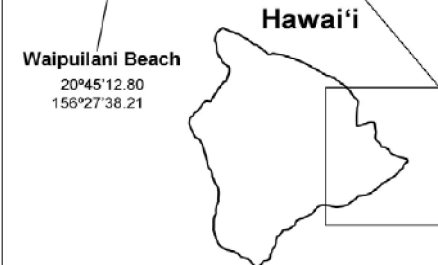
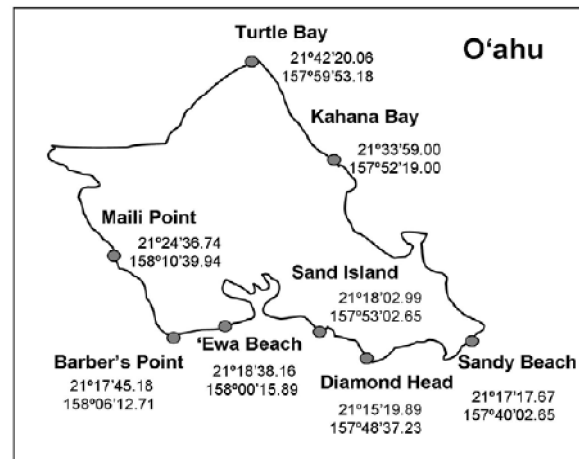
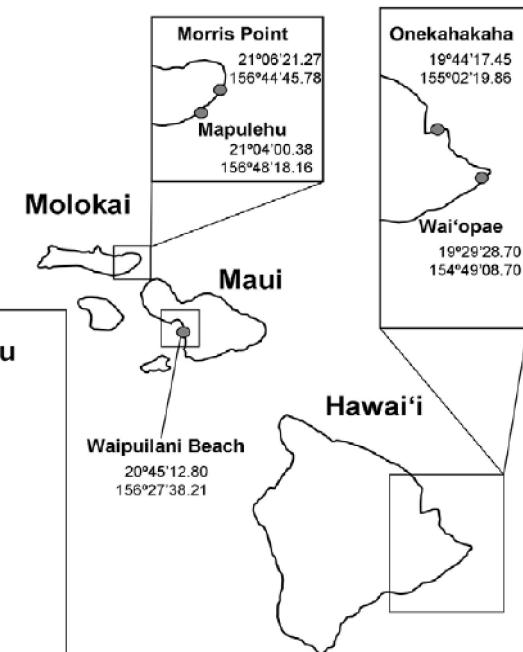


(Zabin, C. et al., 2012)

2004–2007: Abundance



Sand Island



(Cox. et al., 2013)

In the Field



Classroom Preparation



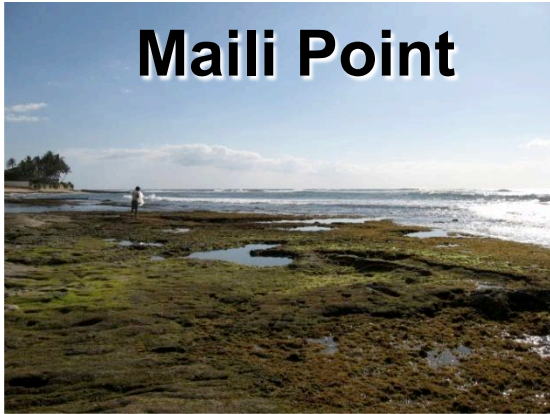
What we knew in 2007:

Science Findings



- Hawai'i has a rich intertidal community (richness = number of species) (Zabin et al., 2012)
- Some evidence that sites group by environmental factors—but patterns not consistent (Cox et al., 2012)

Mali Point



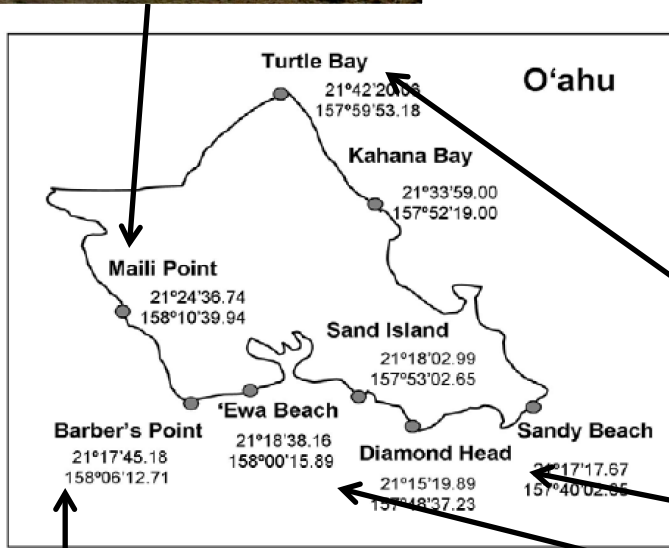
Bench Sites

Onekahakaha



Onekahakaha
 19°44'17.45
 155°02'19.86

Wai'opae
 19°29'28.70
 154°49'08.70



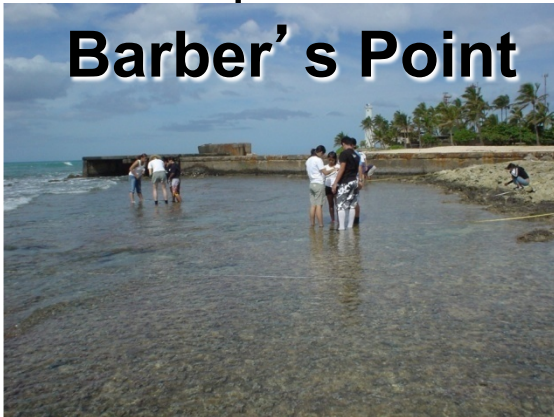
Turtle Bay



Hawai'i



Barber's Point



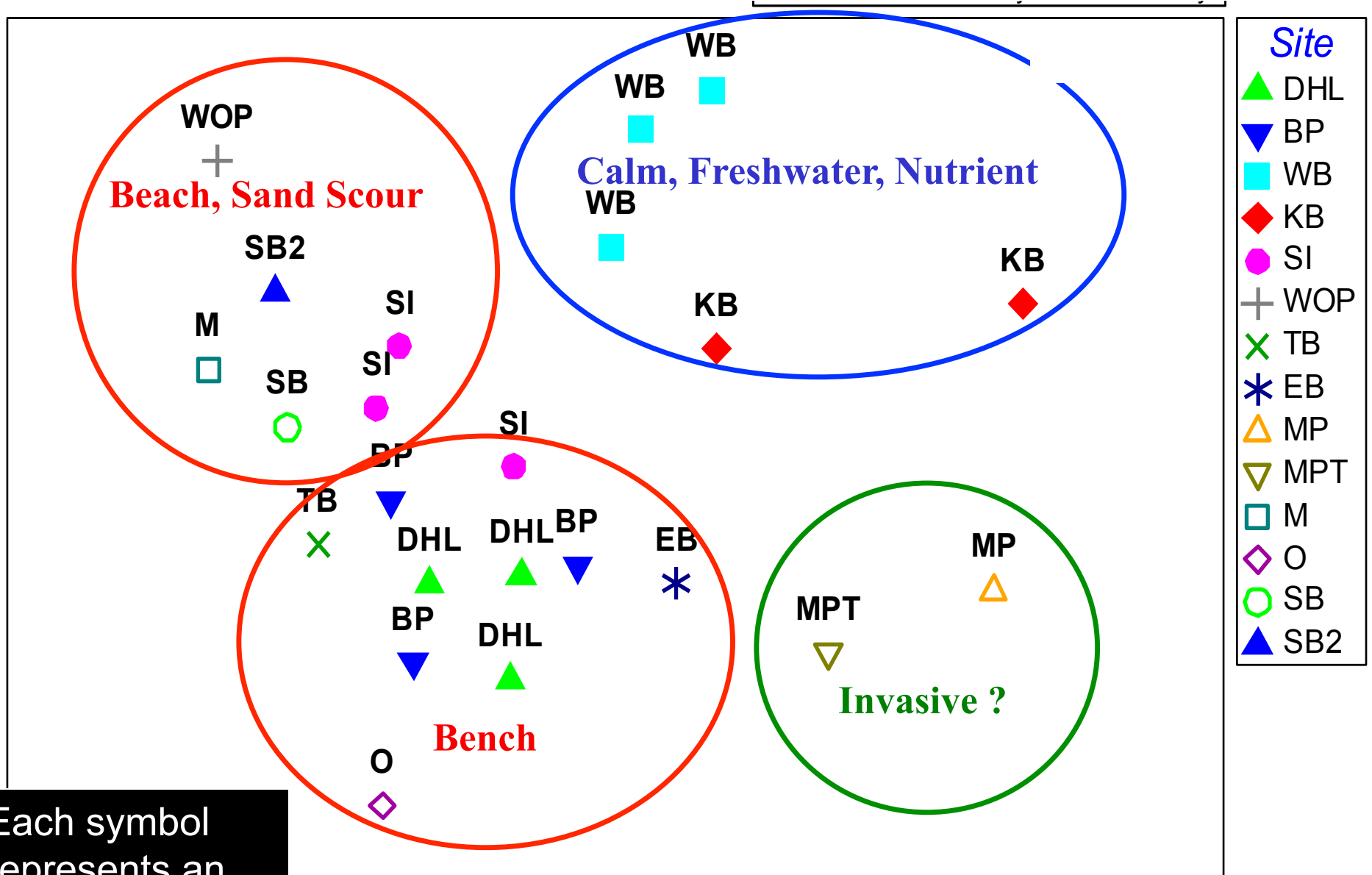
Ewa Beach



Diamond Head



Patterns in OPIHI



Each symbol represents an average by year

No clear clustering of sites

What we knew in 2007:

Education Findings

- Student gains in content knowledge & skills knowledge
- Trained students collect data comparable to professional researchers (at level of detail sampled) (Cox et al., 2012)

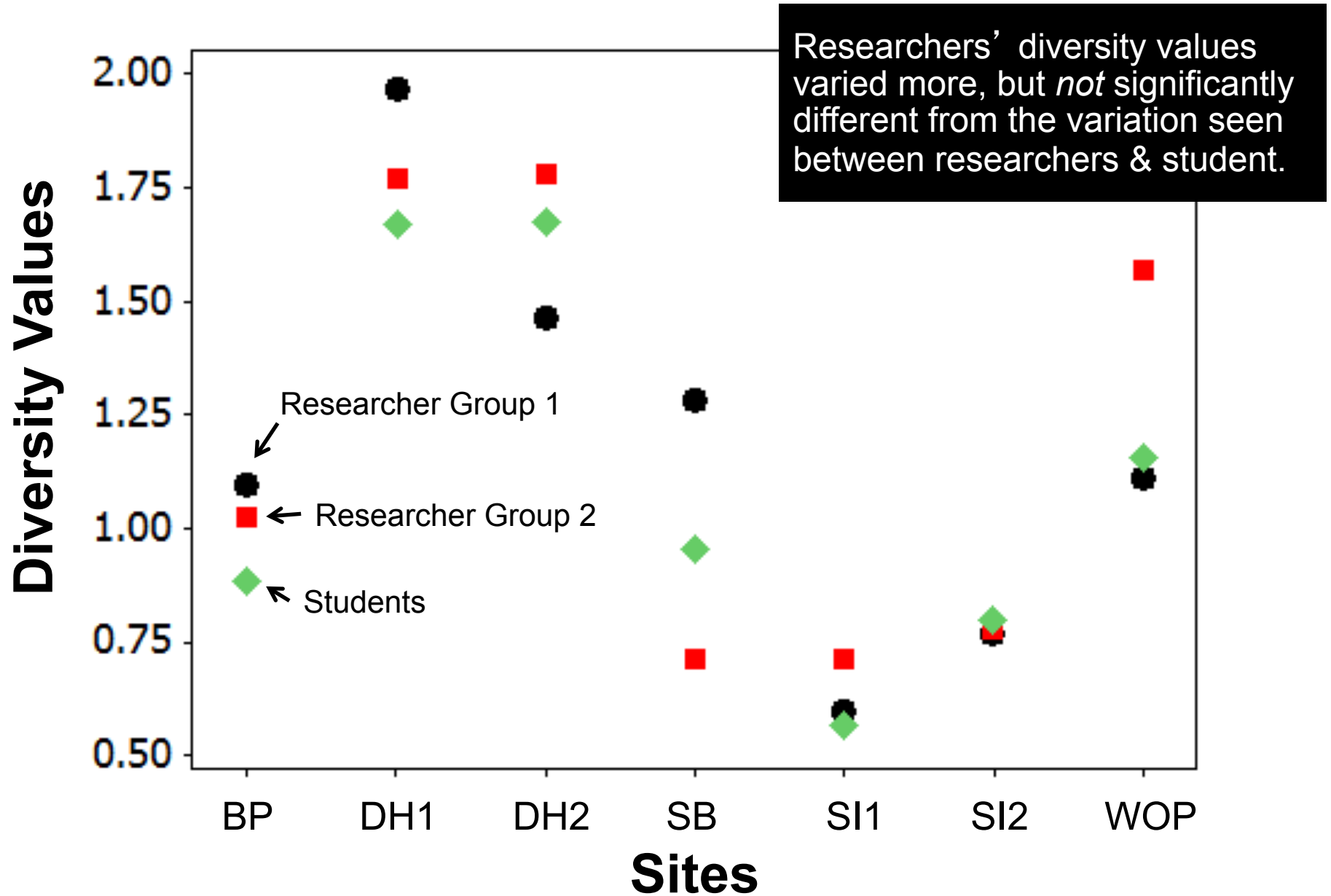


Validity of Student Data

- Concerns over scientific quality of student (citizen science) data = underutilized data
 - Detrimental to scientific & educational goals.
- OPIHI data validated in 2007.



Diversity values at each site



REVIVED! OPIHI Goals

- 1. Educational goal:** Improve content & scientific process knowledge of participants by engaging in authentic citizen-science research
- 2. Scientific goal:** Rigorously survey original sites (see if any changes) & expand to new intertidal sites; data used by scientists
- 3. Grow Community:** Train next generation of OPIHI teachers and student community ecologists
 - PD vs. science-teacher partnerships
 - Internship & skills project
- 4. Increase Knowledge:** Understand more about how the intertidal can serve as a indicator of overall watershed health

Characteristics of Intertidal: Slope, Substrate, Wave Action Temperature, pH, Salinity, Nutrients



<http://manoa.hawaii.edu/news/article.php?ald=6039>

<http://www.alohafrom808.com/2011/06/makapuu-tidepools-and-waimanalo-may-30-2011/>