

Reef Flat Recovery Following Large-scale Removal of Invasive Algae



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The Nature Conservancy

Main Hawaiian Islands



Maunaloa Bay



Maunalua Bay Was Once a Productive Reef Ecosystem



Circa 1930



Halophila hawaiiiana



Dr. Kim Peyton, University of Hawai'i

No regrowth over several years



Avrainvillea amadelpa (leather mudweed)
First recorded in Hawai'i in 1981

Community “huki”

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MĀLAMA MALINALIA



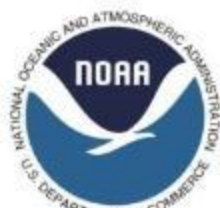
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MĀLAMA MAUI



Maunalua Bay Reef Restoration Project

Goals:

1. Create jobs
2. Build community management capacity in the Bay
3. Remove the densest growth *A. amadelpha*

Manual Removal







27 acres
cleared



Over
3,000,000 lbs
removed

Maunalua Bay Reef Restoration Project

Goals:

1. Create jobs
2. Build community management capacity in the Bay
3. Remove the densest growth *A. amadelpha*
 - a. Response of algal community to removal
 - b. Recovery of reef flat community
 - c. Fate of sediment trapped by algal mats

Paiko Before Removal



Photo: Sean Macduff

40% Native Algae



40% Native Algae

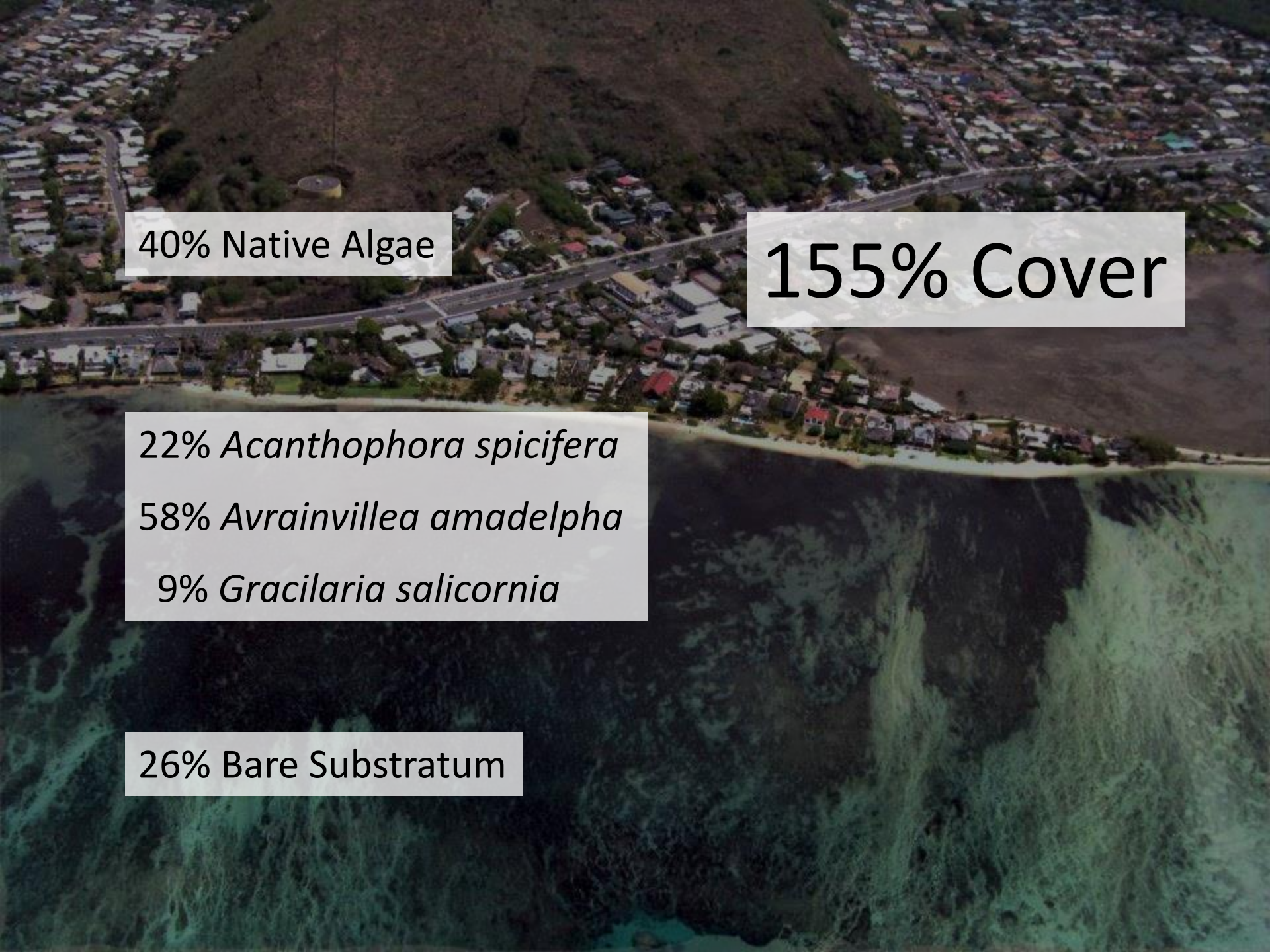


22% *Acanthophora spicifera*

58% *Avrainvillea amadelpha*

9% *Gracilaria salicornia*





40% Native Algae

155% Cover

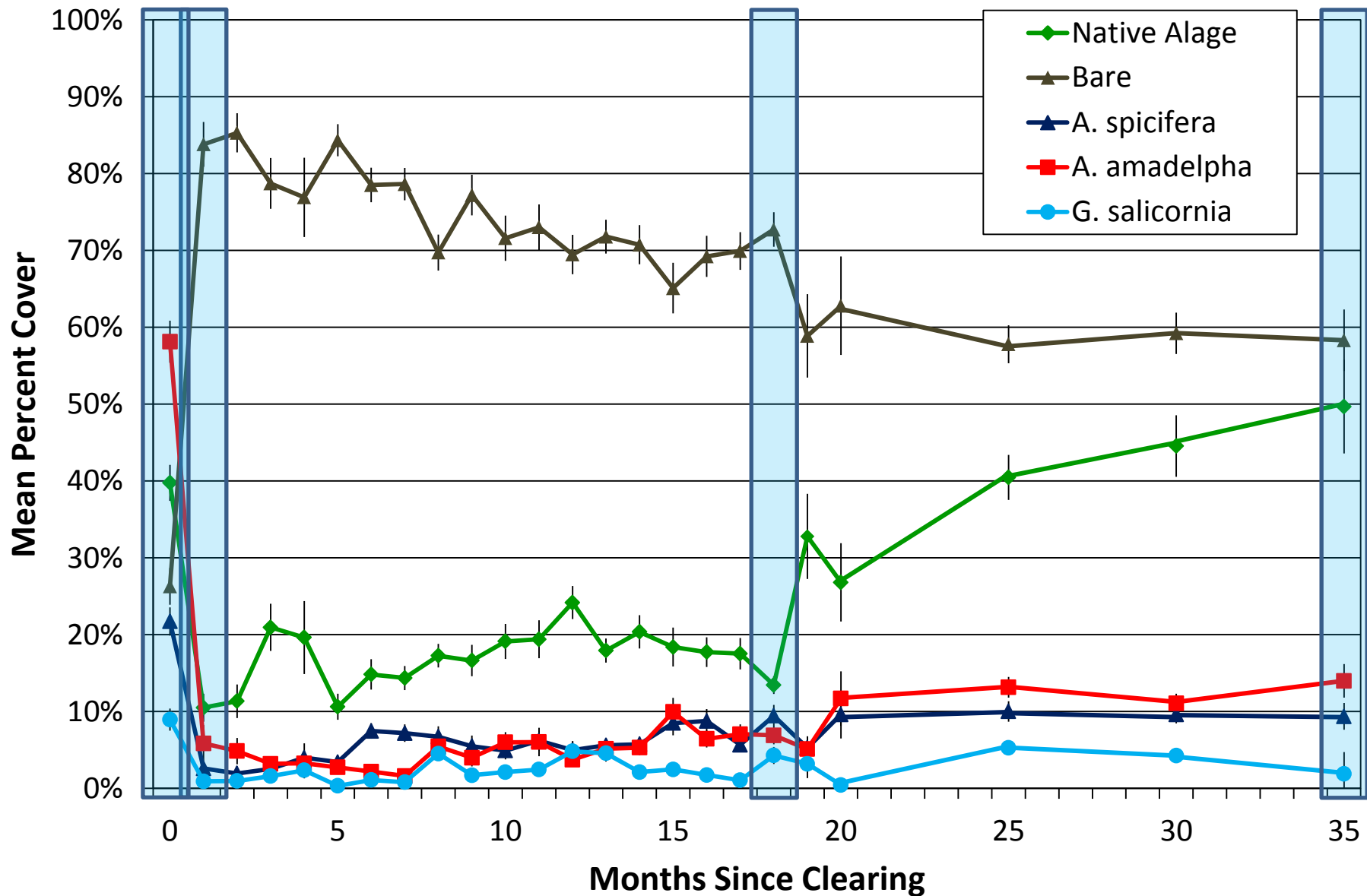
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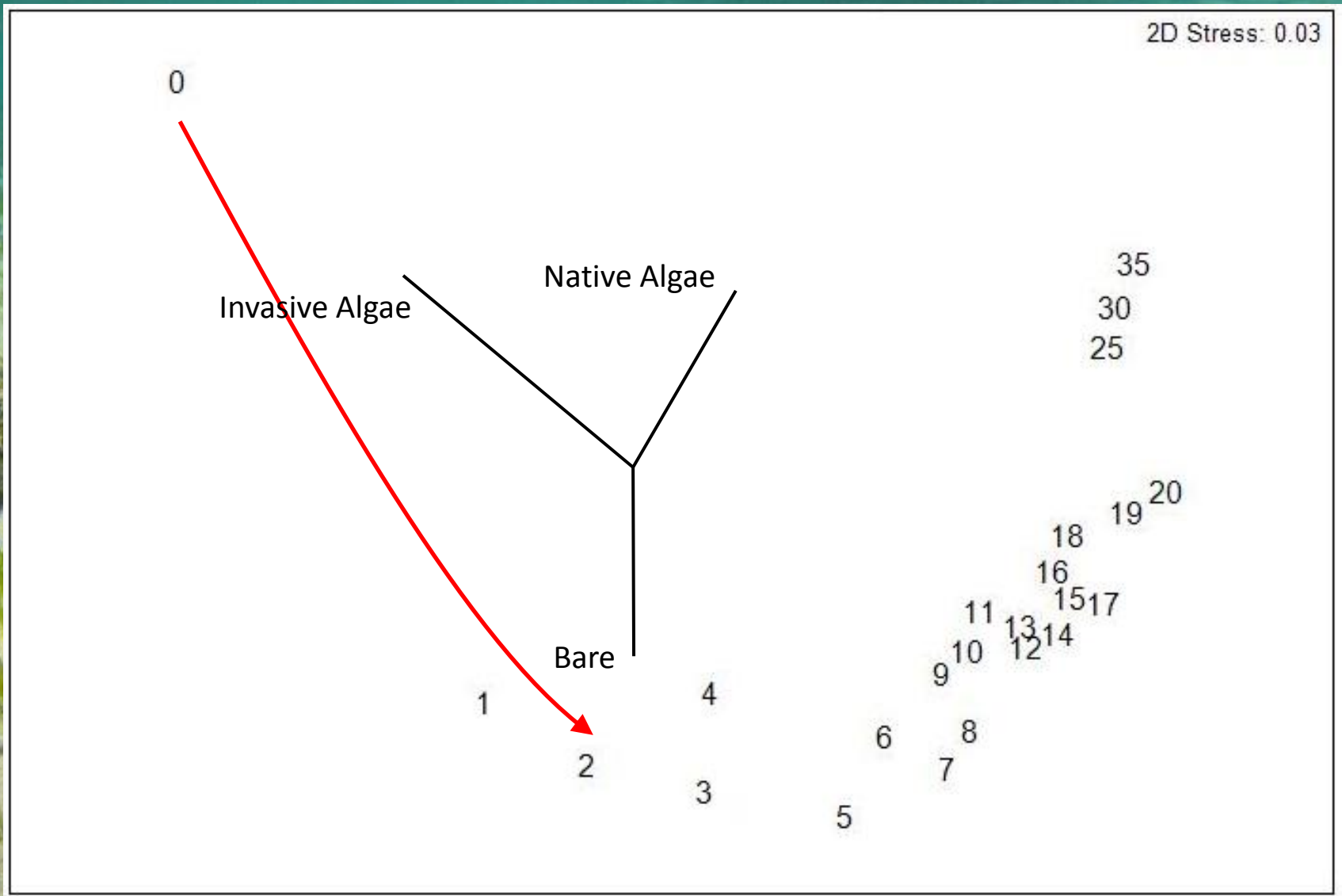
9% *Gracilaria salicornia*

26% Bare Substratum

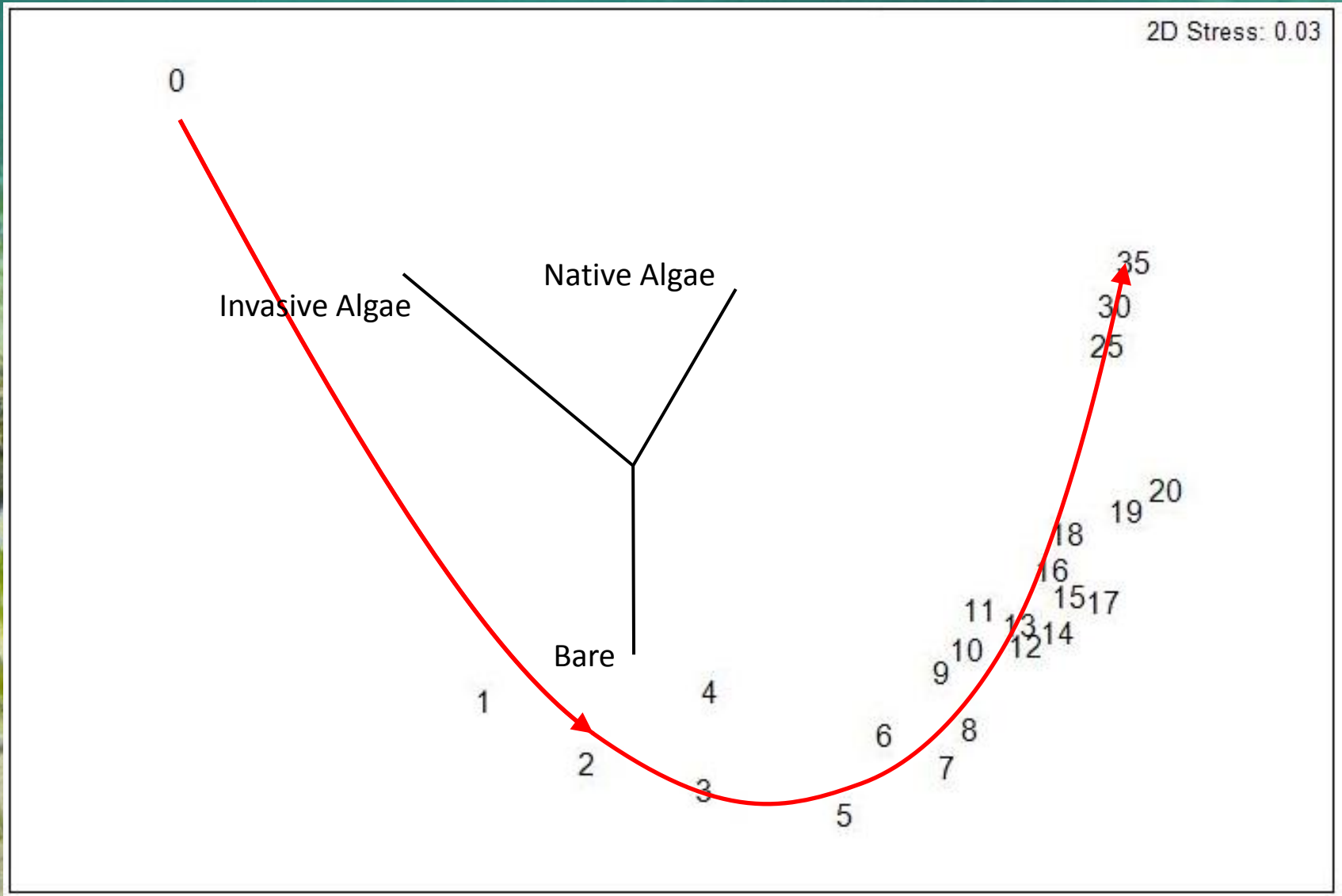
Changes in Benthic Cover



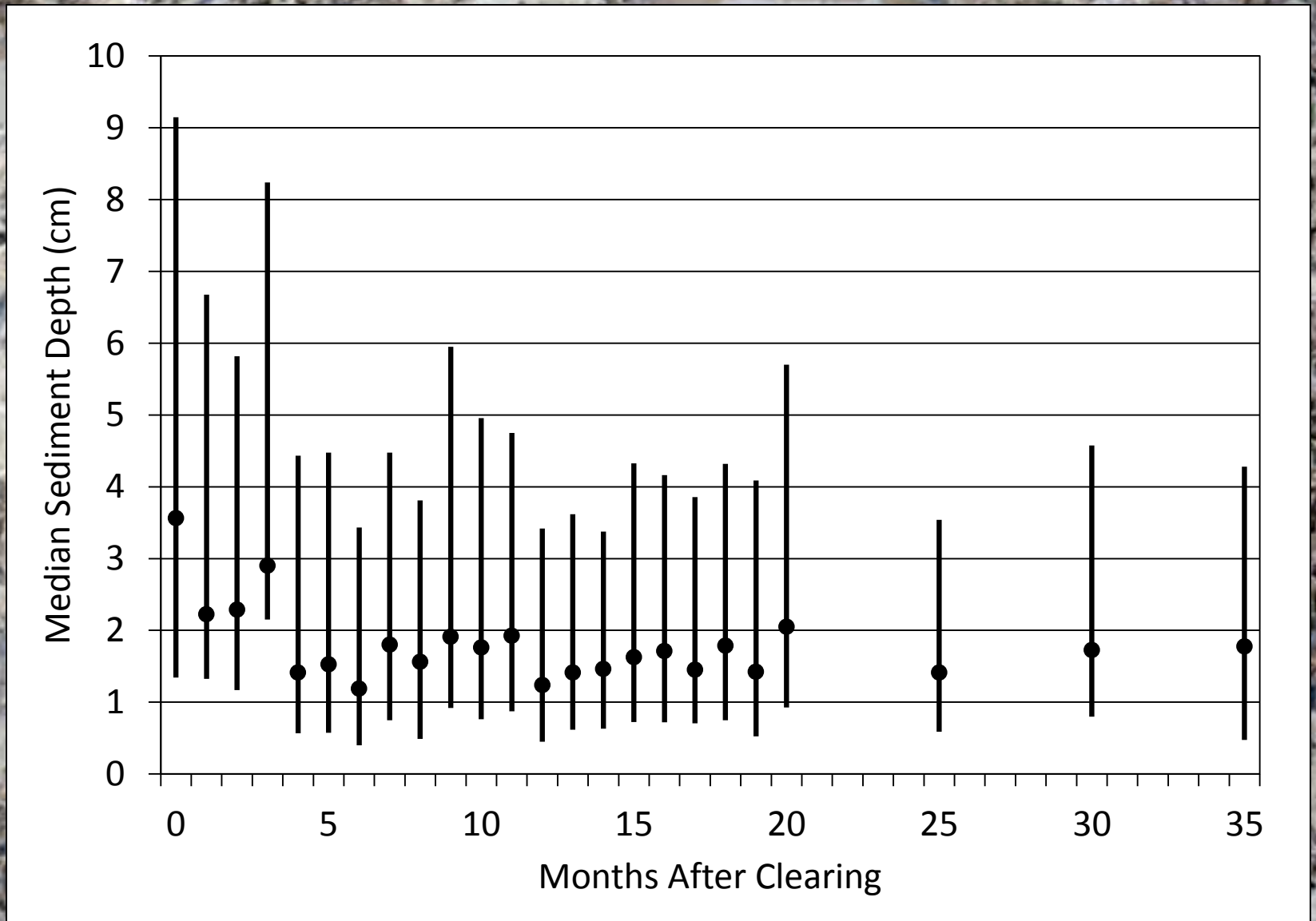
Shifts in Community Structure



Shifts in Community Structure



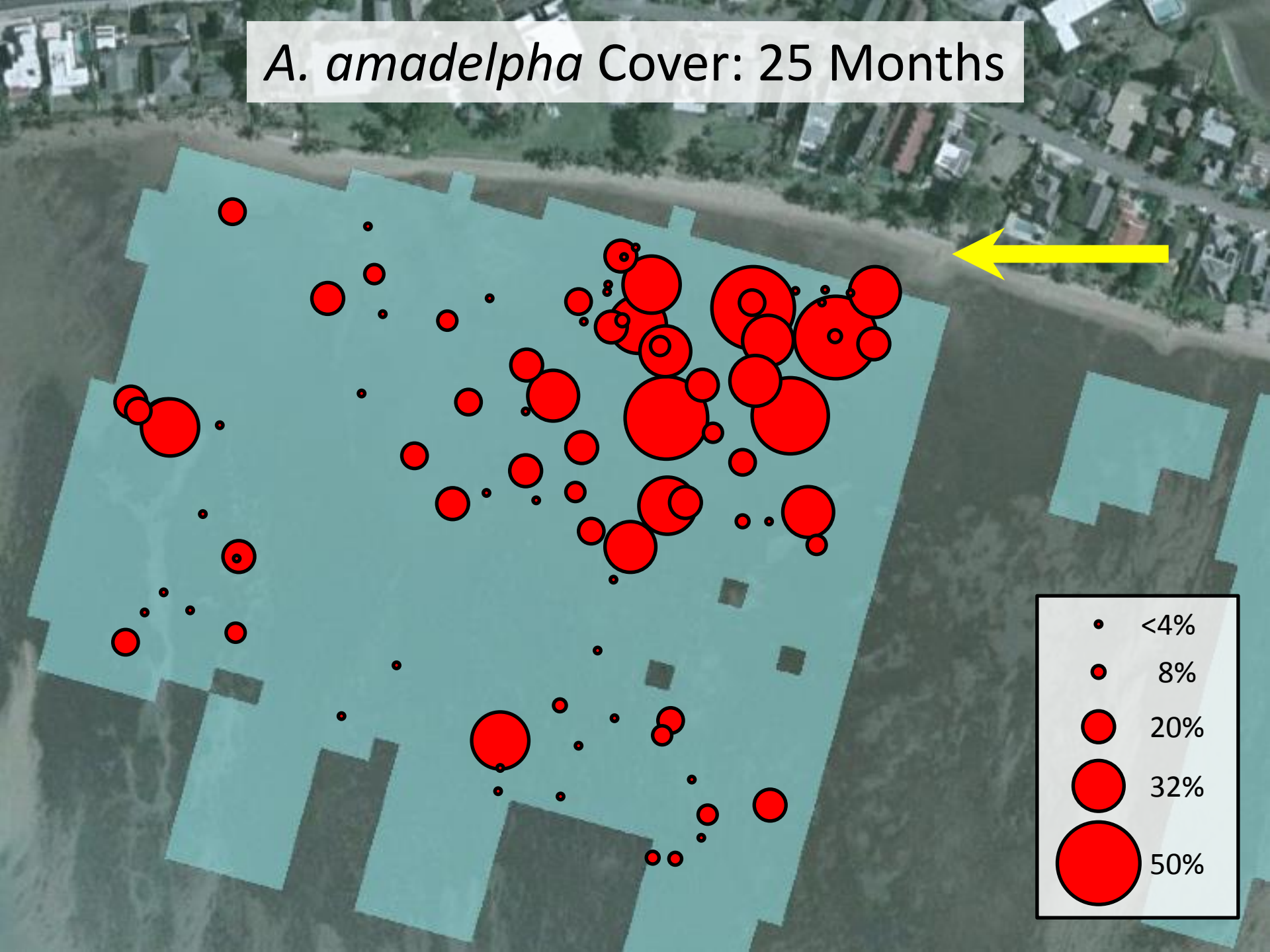
Change in Sediment Depth







A. amadelpa Cover: 25 Months



What Does It All Mean?

- **Clearing was effective, reducing invasive algae cover below 10% (<5% for mudweed)**
- **Invasive algal cover remains low after 3 years**
- **Native algal cover and species diversity has exceeded pre-clearing levels**
 - **Silt has been replaced by marine sand**
 - **Incidence of endemic seagrass has increased**

What Does It All Mean?

- **Mudweed regrowth is patchy**
- **Community has undertaken “spot” treatment of mudweed patches**



Beyond the Project

- Proof of concept for large-scale marine restoration in Hawai‘i
- Increased community involvement
- Expanded green business
- Re-invigoration of “Ike”





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