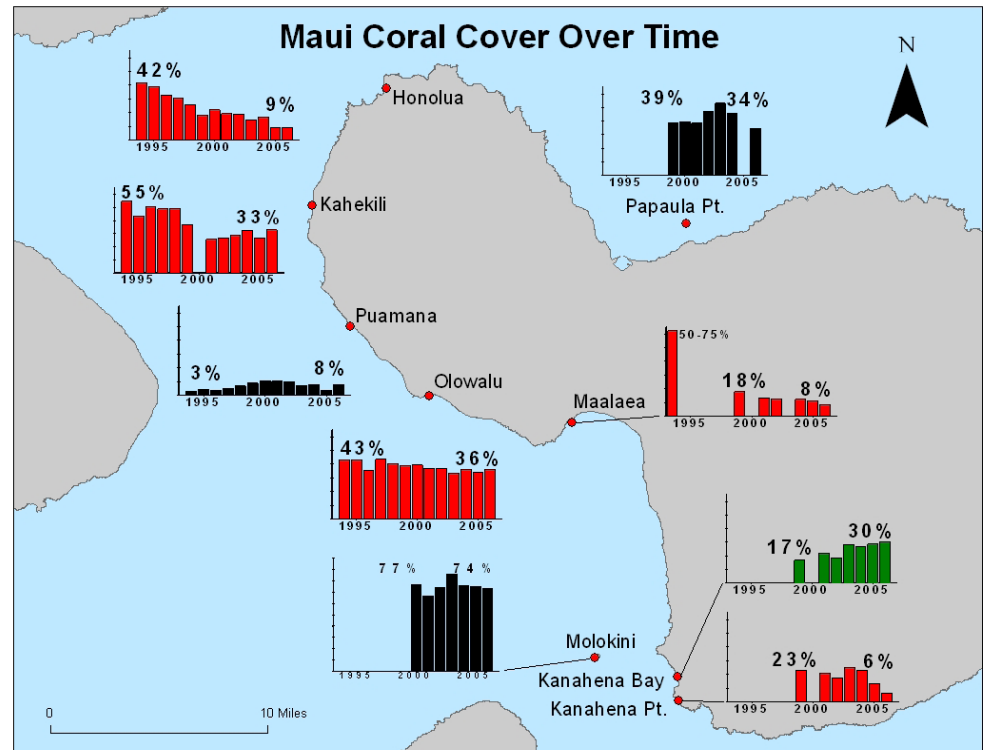


“Characterization of dead zones and
population demography of *Porites compressa*
along a gradient of anthropogenic nutrient
input at Kahekili Beach Park”

Principal Investigators:
Paul Jokiel Ph.D HIMB
Darla White M.S. DAR
Graduate Student Assistant:
Megan Ross

Coral Reef Assessment and Monitoring Program

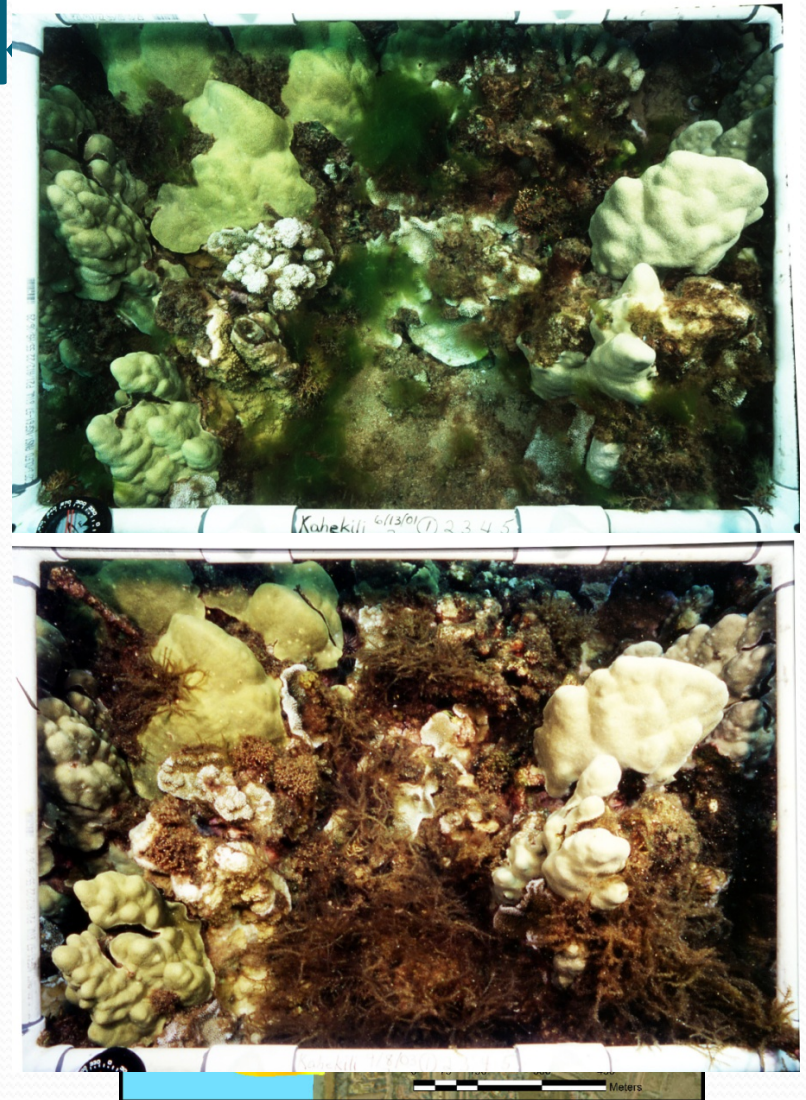
- Nine sites on Maui currently monitored by Division of Aquatic Resources
- 10-15 year record of coral cover shows decreases in percentage coral cover of up to 50% at some sites with an overall loss of ~25% coral cover island wide (Williams et al. 2008)



Credit: Ivor Williams, <http://hawaii.gov/dlnr/dar/pubs/MauiReefDeclines.pdf>

Kahekili Beach Park

- Turf Algal Competition
- Blooms of *Cladophora* sp. and *Acanthophora spicifera* in 2001 and 2003
- Nutrient input (Dailer et al. 2010)
- Herbivore Enhancement Area



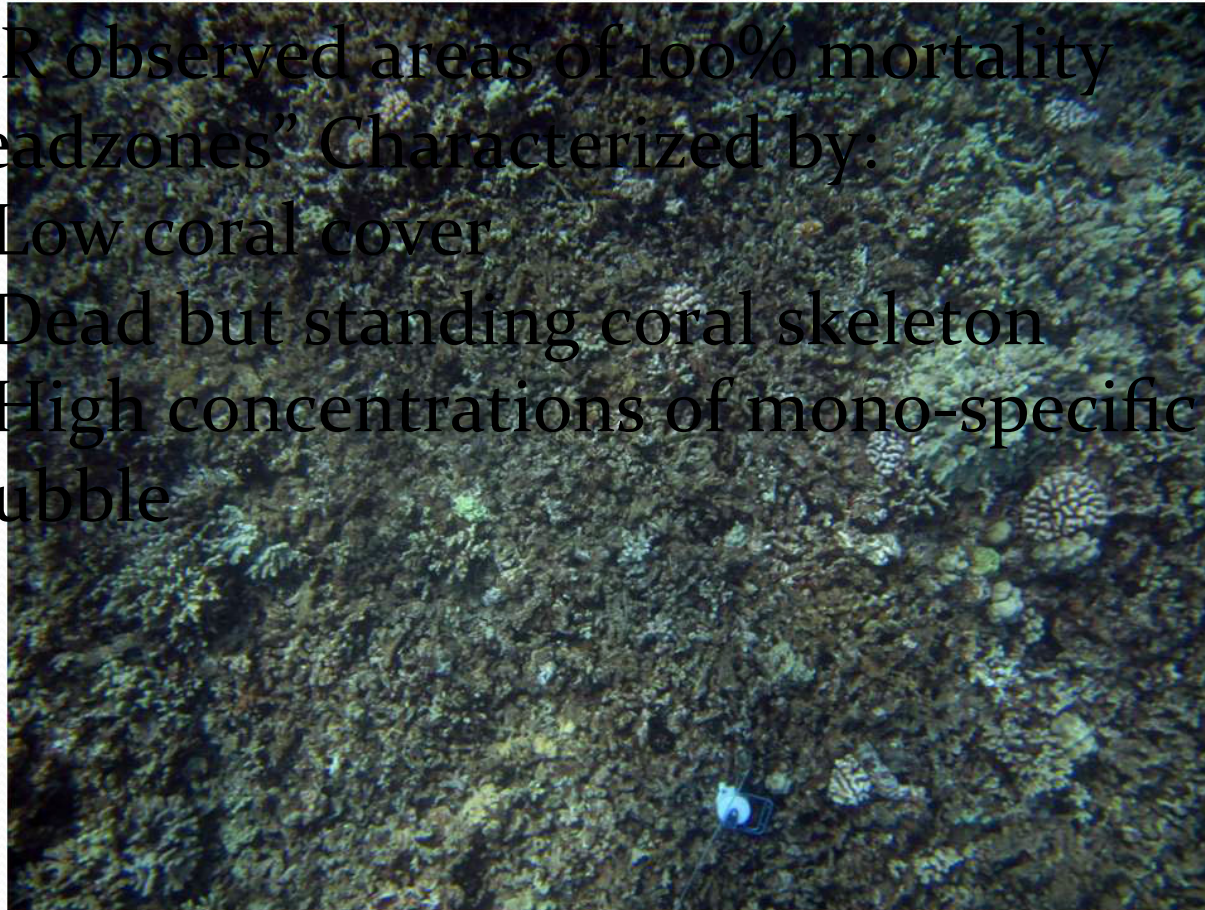


Objectives

- Determine processes of mortality around dead zones (i.e. chronic vs. catastrophic mortality and ongoing vs. historical)
- Describe and compare population and community size structures
- Collect data on environmental variables including temperature, salinity, pH, wave action, sediment composition
- Determine rates of mortality via monitoring of individual colonies and digital analysis of permanent photo quadrats maintained and monitored by Maui DAR

Historical Mortality Events

- DAK observed areas of 100% mortality
- “Deadzones” Characterized by:
 - Low coral cover
 - Dead but standing coral skeleton
 - High concentrations of mono-specific rubble

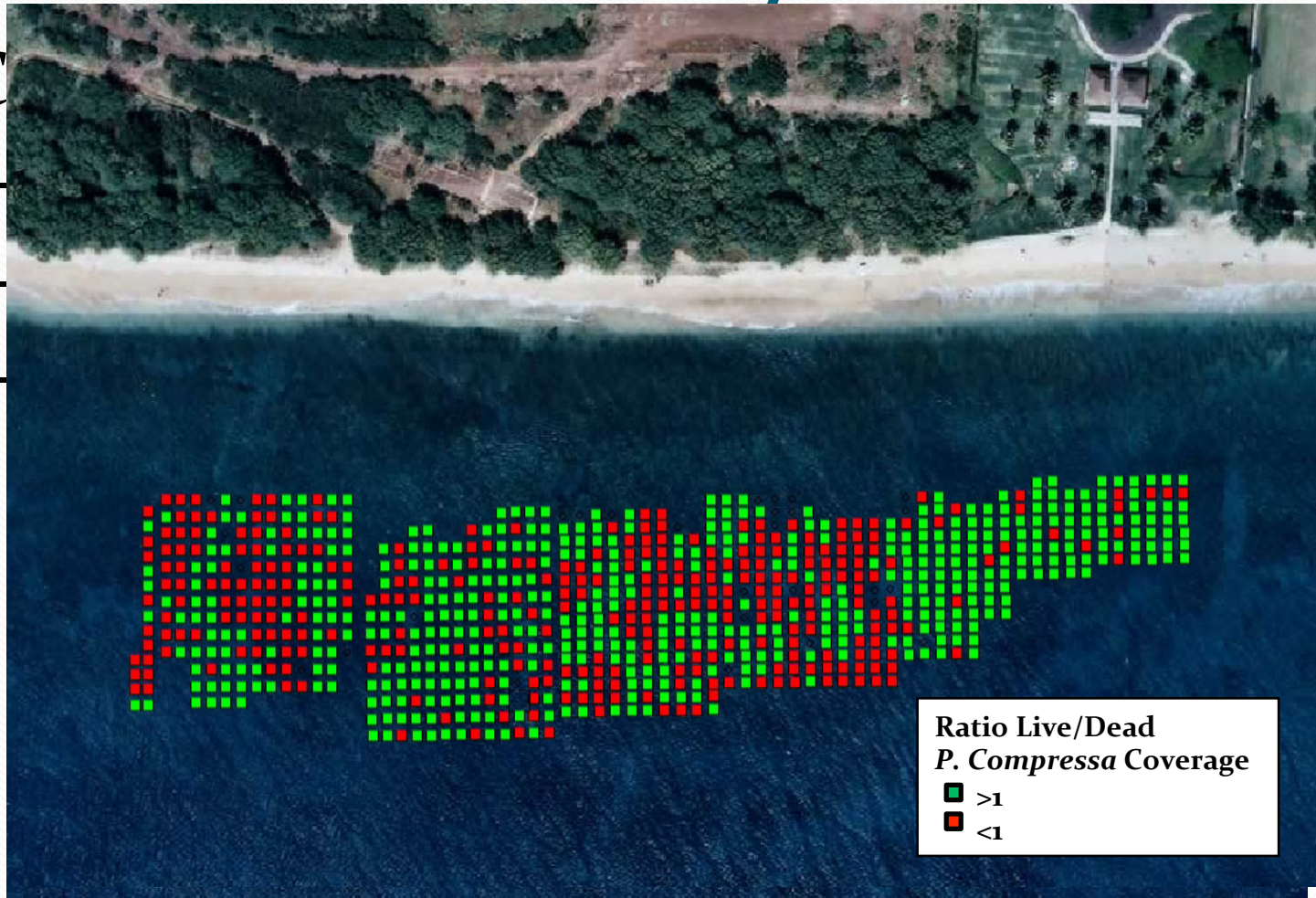


Historical Mortality Events



Historical Mortality Events

- C



on



Objectives

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Population Demography

- 20 Transects selected in areas of good, intermediate, and poor condition
- Maximum diameter and species recorded for all colonies within 1x10m belt transect



Population Demography

- Mean colony size of *P. compressa* is larger in areas of good condition than areas of poor or intermediate condition
- Density of *P. compressa* recruits (<5cm max diameter) does not vary with condition
- Loose *P. compressa* rubble may limit ability of recruits to grow



Objectives

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Environmental Variables

- Relative water motion measured with clod cards at each transect
- Handheld YSI used to measure pH, salinity, temperature every meter along transects
- Temperature measurements using *in situ* Onset loggers
- Bulk sediment collected from each transect for composition and grain size analysis



Objectives

- Determination of processes of mortality around dead zones (i.e. chronic vs. catastrophic mortality and ongoing vs. historical)
- Describe and compare population and community size structures
- Collect data on environmental variables including temperature, salinity, pH, wave action, sediment composition
- Determination of rates of mortality via monitoring of individual colonies and digital analysis of permanent photo quadrats maintained and monitored by Maui DAR



Rates of Mortality

- One colony each of *P. lobata* and *P. compressa* selected every meter along transects
- Colonies were observed and photographed every 1.5 months from June 2011 –January 2012
- Incidence: percentage of colonies to show signs of mortality
- Percentage of colony affected by incidents of mortality



Rates of Mortality

- Mean incidence of mortality combined or by species does not vary significantly with condition
- May be non-linear relationship between incidence of mortality and location along coast
- Higher overall percentage of colony surface area affected in poor areas vs. areas of good and intermediate condition
- Higher incidence is positively correlated with higher percentages of colony affected



Further Analysis

- Multivariate spatial analysis
- Completion of sediment composition and temperature logger analysis
- Final Report
- Information Sheet



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- Darla White
- Maui DAR
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Questions?



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