Experimental Studies of Factors Affecting Coral Recruitment in La Parguera, Puerto Rico:

Update No. 3, Aug. 4 2006

Alina Szmant (UNCW) and
Ernesto Weil (RUM)

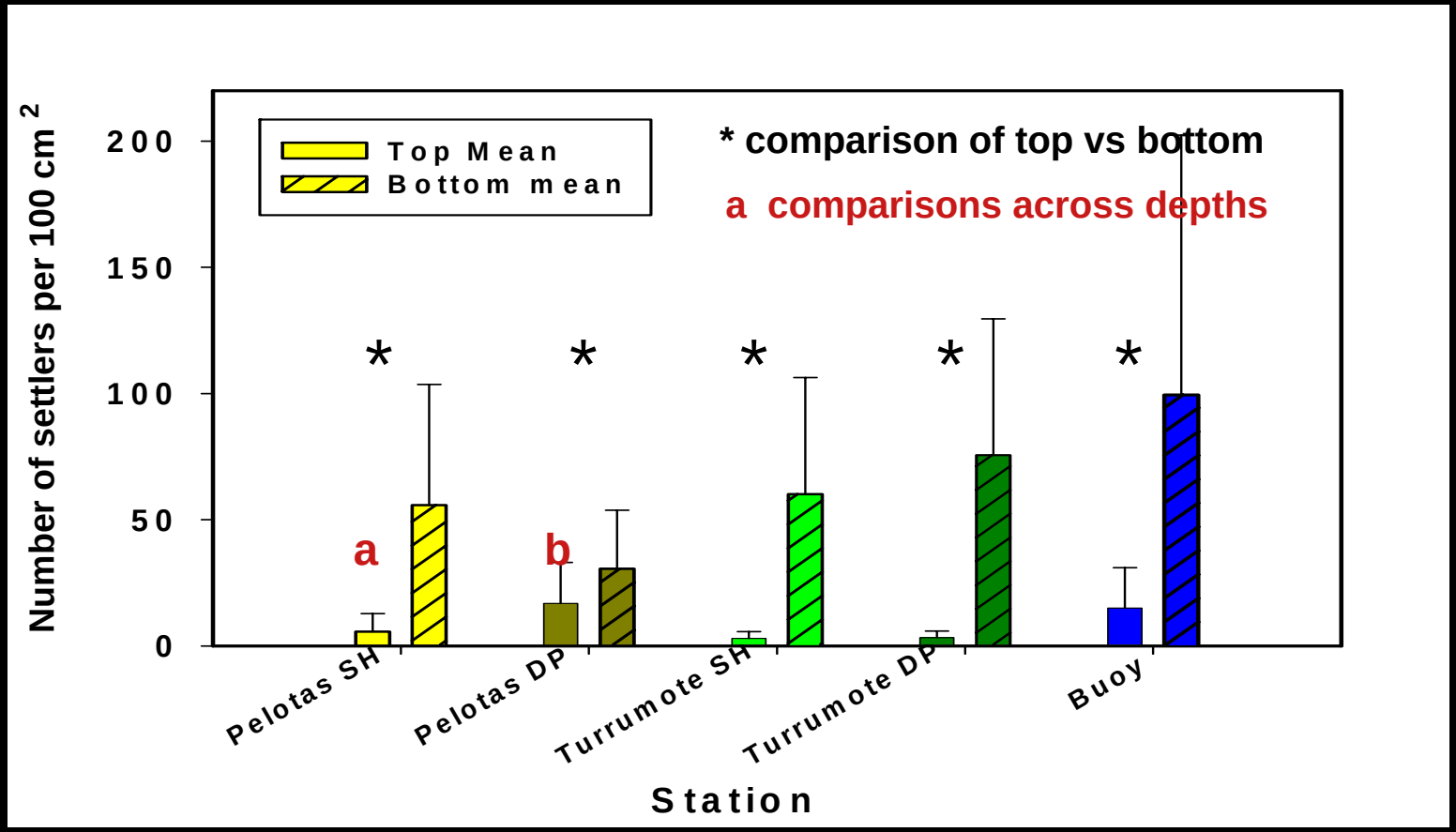
SUMMER 2006 MAJOR OBJECTIVES

- NO. 1: Experiment to investigate factors affecting substrate community structure that supports greater coral settlement: Multifactorial experiment in which we vary light and grazing under which settlement plates are exposed during aging period
- NO 2: Introduce new technologies to improve mariculture of coral larvae; goal to raise 10^6 larvae of each of several species, especially *A. palmata*
- NO 3: Continue research on early larval behavior, development of competency and duration of competency

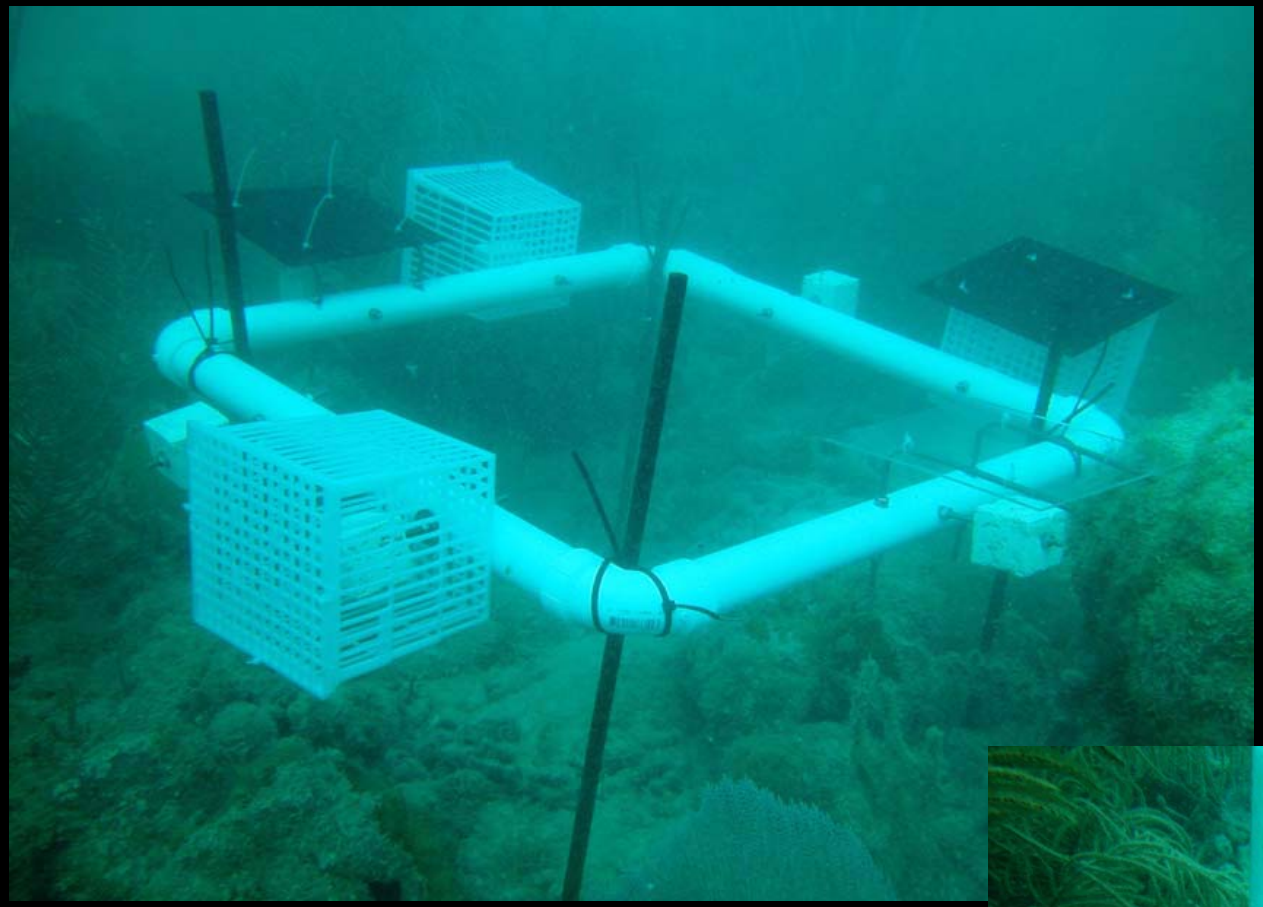
SUMMER 2006 MAJOR OBJECTIVES (continued)

- NO. 4: Initiate work (funded by World Bank; thesis of Ainhoa L. Zubillaga) to use antibody assays to detect post-spawn larval distribution patterns
- NO. 5: Experiment to investigate the effects of elevated seawater temperature [28 to 34 oC] on coral larval development of competency, and heat stress protein production (Dr. Seab Griffin)
- NO 6: Begin new work on early survivorship and polyp feeding
- NO 7: Continue work on the effects of Diadema grazing on survivorship of newly settled coral polyps.

OBJECTIVE 1 based on previous findings: Undersides of experimental plates attract more larval settlement than do the tops



- Hypothesis: Light and amount of grazing are the two factors that differ most between conditions affecting "tops" vs "bottoms



Underwater around the ICON station

OBJECTIVE 2: Introduce new technologies to improve mariculture of coral larvae; goal to raise 10^6 larvae of each of several species, especially A. palmata; Large number of larvae needed for restoration, genomics, behavioral and ecological studies

New flow through system to reduce handling stress, and improve water quality during high-density rearing: Jake Adams, Nathan Kwiatek, Chris Jury

OBJECTIVE 3: Continue research on early larval behavior, development of competency and duration of competency

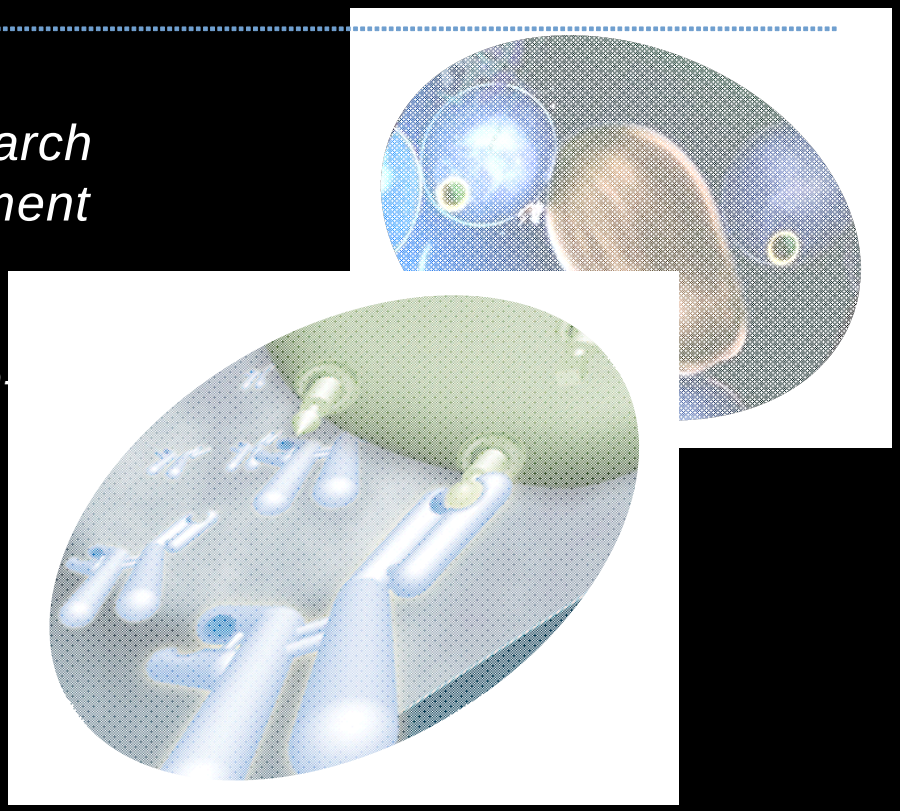
- Time series of bouyancy, vertical swimming abilities, how long it takes each spp to become competent, and how long they can remain competent:
- Information important to estimation of larval dispersal abilities: Ainhoa L. Zubillaga (A. palmata) and Chris Jury (D. strigosa and M. cavernosa)

OBJECTIVE 4: Initiate work (funded by World Bank; thesis of Ainhoa L. Zubillaga) to use antibody assays to detect post-spawn larval distribution patterns

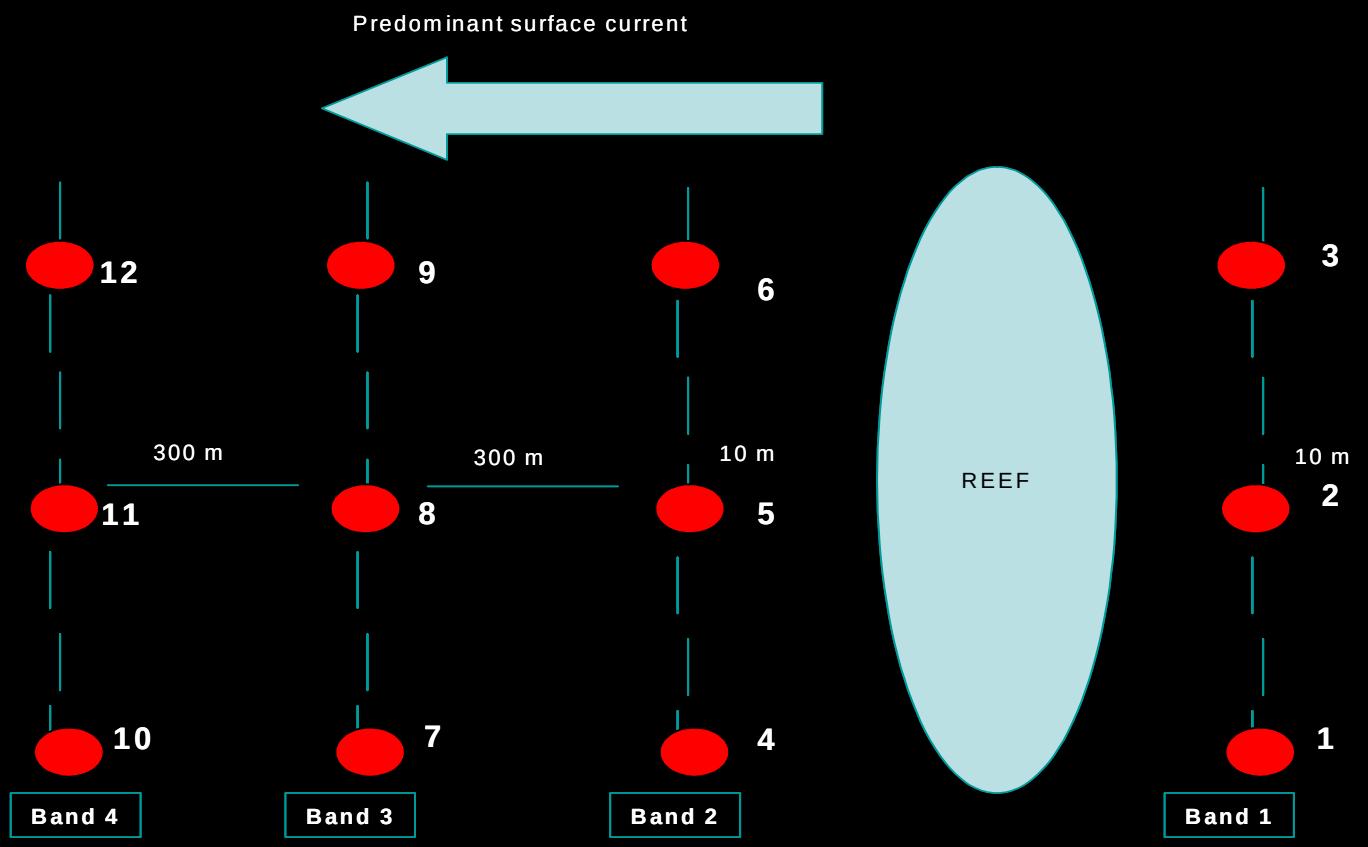
Use of specific polyclonal antibodies for the detection of *Acropora palmata* larvae in water samples

Project: Coral Reef Targeted Research and Capacity Building for Management

M.Sc. Ainhoa L. Zubillaga-. Dr. Brian Dixon-
Dr. Carolina Bastidas



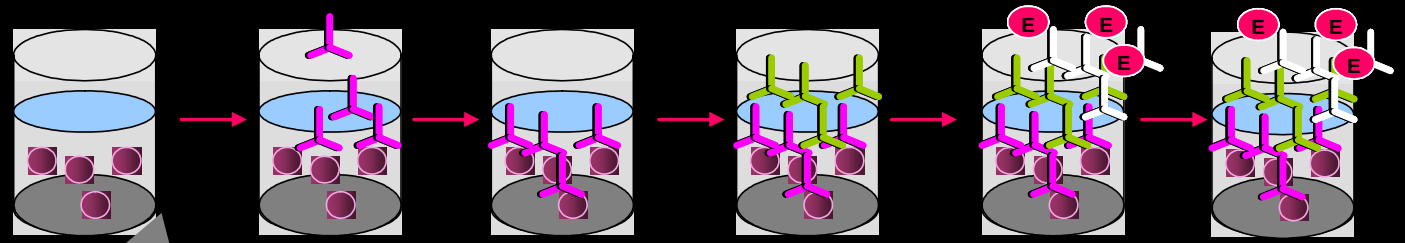
Example of sampling program



- **Larvae of *A. palmata* are not fully competent until minimum of days after spawning**
- **Sampling begun 2 days before spawing, continued for ca. 8 days**

Assay Method

Enzyme-Linked Immunosorbent Assay (ELISA)



Coat well with water samples (with potential larvae)

Add Antibody 1

Specific for *Acropora palmata* larvae (antigen)

Add Antibody 1

+

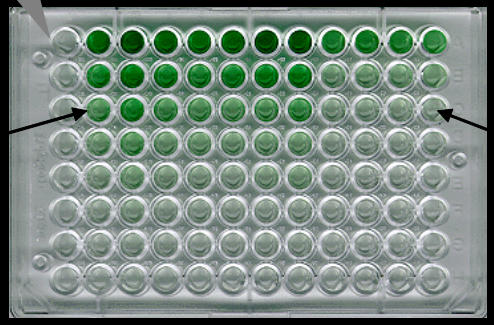
A. palmata Larvae

Add Antibody 2 (detection)

Enzyme labeled

Add substrate

Measure Color Change



Positive response

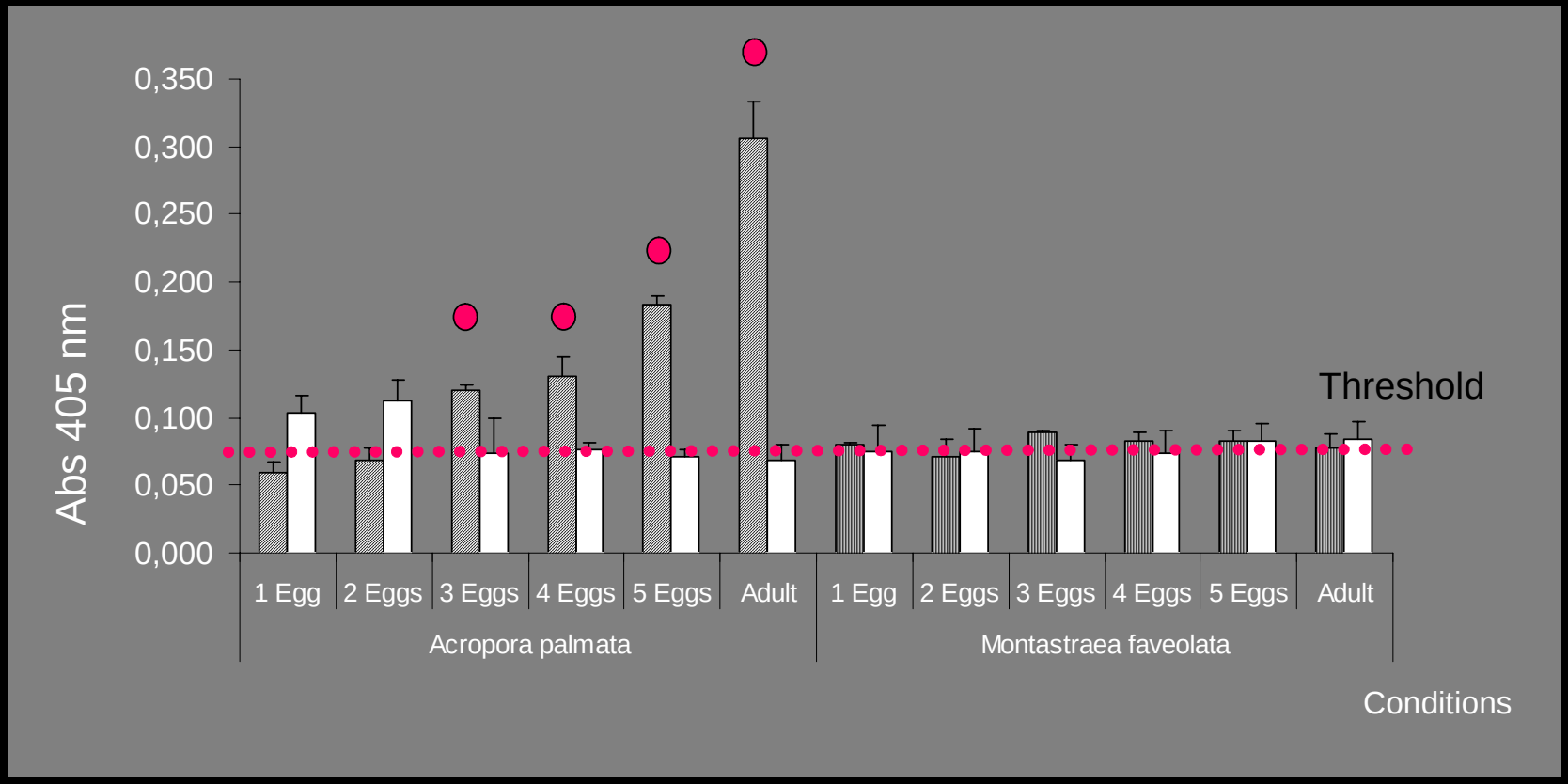
Presence of *A. Palmata* Larvae

Negative response

Absence *A. Palmata* Larvae

Assay Method

Test of accuracy and specificity



Acropora palmata Larvae (antigen)

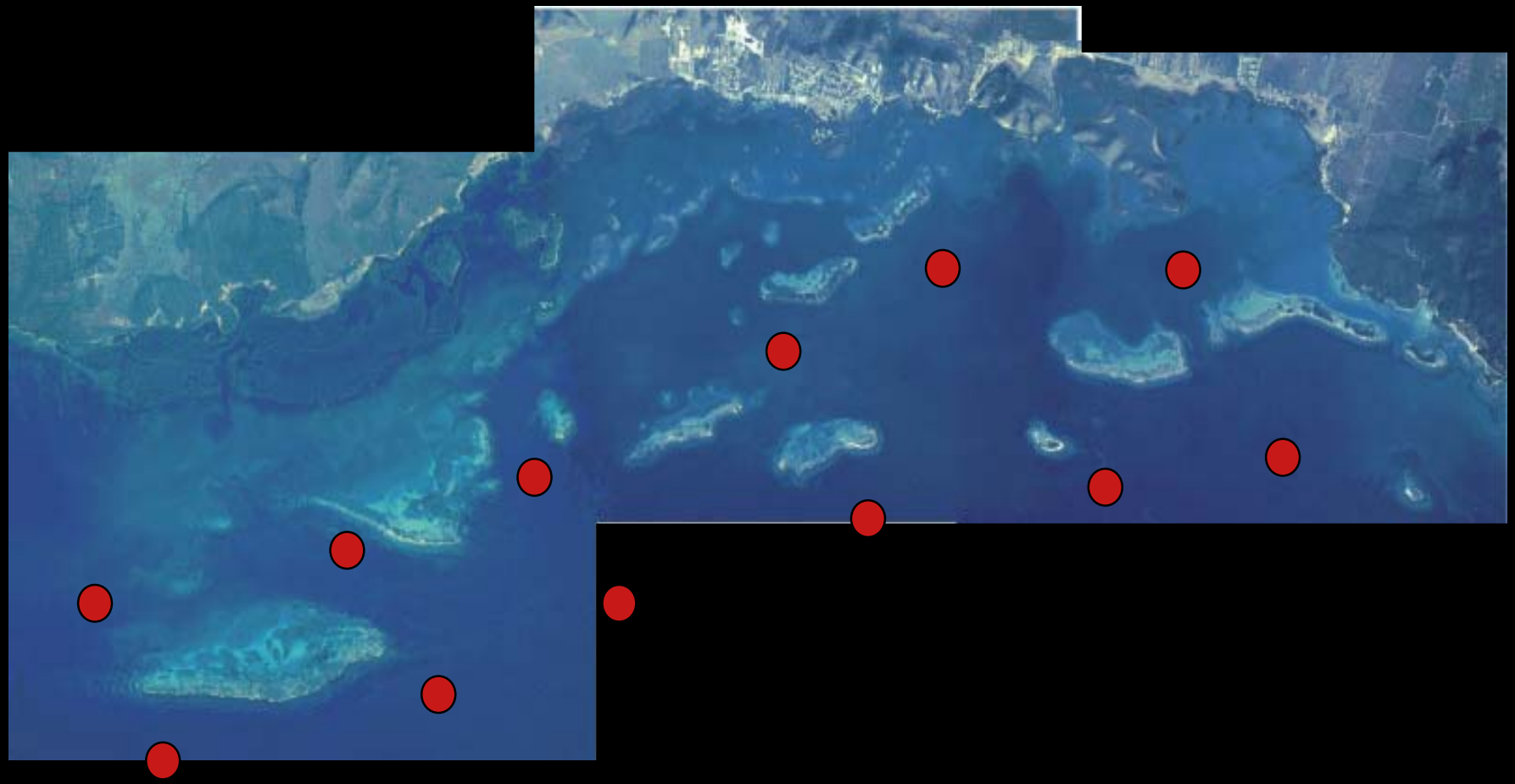
Negative (no larvae)

Montastraea faveolata larvae (other antigen)

Response +

Response -

We'd appreciate help from local oceanographers with background information on small scale hydrographics patterns



ACKNOWLEDGEMENTS

- Work funded by NOAA CCRI to RUM, by World Bank Targeted Research Program, and by NSF Bio-GenEn grant
- Summer 2006 Resrach Team:

  Emmanuel Irizzarry, Ainhoa Zubillaga, Sean Griffin, Chris Jury, Jake Adams, Nathan Kwiatek