An underwater photograph of a coral reef. The scene is dominated by several large, brain-like coral colonies with distinct ridges and grooves. Interspersed among these are smaller, more rounded coral structures, some with a porous, pitted appearance. The background is a dense, textured surface of smaller coral and marine life, with numerous small red spots scattered throughout. A light blue rectangular box is overlaid on the upper portion of the image, containing text.

**Coral settlement and early post-settlement survivorship: Experimental studies of factors that affect recruitment success**

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**19 colonies**  
**8 species**

# The problem

- Caribbean reefs are in decline and have lost significant amounts of coral cover.
- Coral populations do not seem to recover fast enough, WHY??
  - Is reproductive output low?
  - Is settlement of larvae low?
  - Is survivorship of recruits low?

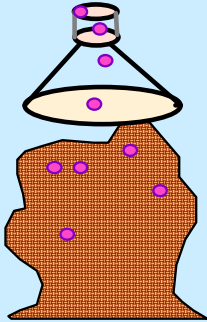
## What we need

- Understand factors that affect larval and recruitment survivorship to be able to understand reef recovery and resilience.
- To develop management tools to help with coral restoration and recovery

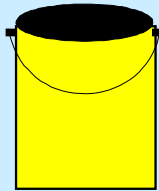


# CORAL CULTURING FROM SPAWN

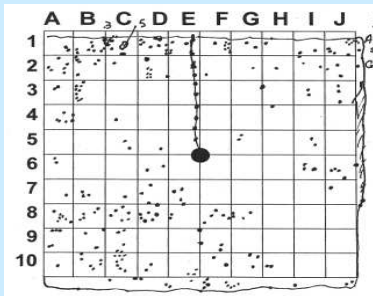
(1) Collect spawned gamete bundles



(2) Fertilize in bucket (on boat or in lab)



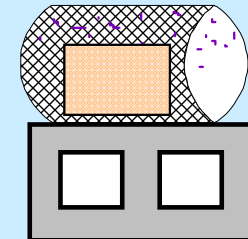
(3) Culture coral larvae in the laboratory until they are mature enough to settle (4 to 8 days depending on species)



(5) Settled spat mapped on plates under a microscope and then plates deployed on reef; plates are retrieved and re-examined to follow survivorship



(4) Place larvae in mesh chambers or aquaria with aged settlement plates until larvae settle



## Methods

- Have been used in the Florida Keys to study survivorship of *Montastraea* spp and *Acropora palmata*
- Similar approach will be used in the pilot project in La Parguera to examine:
  - Natural settlement rates
  - Post-settlement survivorship



# Factors that Affect Settlement

- ★ Substrate characteristics
  - CCA cover
  - CCA species composition
  - macroalgal cover
  - sediment cover & type

## Above Affected by...

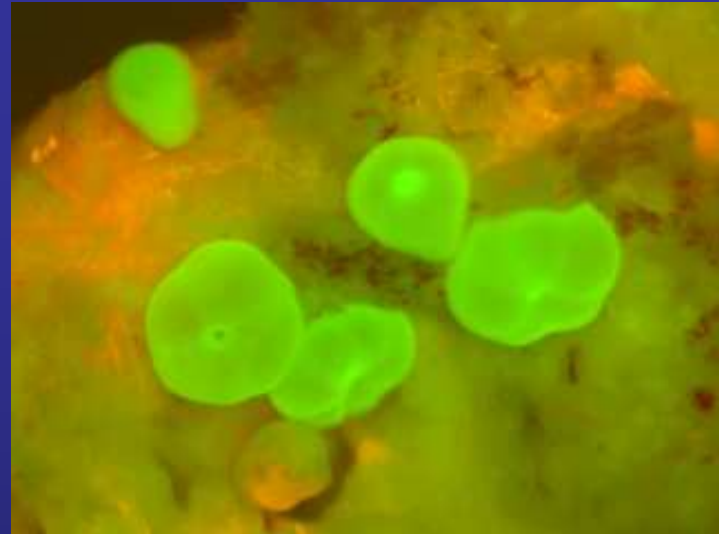
- grazer community composition
- weather, tides, storms
- water quality conditions

# **PROPOSED 'Settlement' RESEARCH:**

- 1. Aged settlement plates examined 2 weeks and 8 weeks after coral spawning for evidence of natural settlement**
- 2. Deploy plates along environmental gradients of interest or concern (sub-set of the reefs presently being monitored for coral recruitment under CRES)**
- 3. Re-deploy plates with spat and follow for survivorship**
- 4. Survey for composition of grazing community since grazers are thought to be important in conditioning substrate to be more favorable for coral settlement**



Coral larvae usually settle next to but not on CCA; often cryptic and difficult to locate



Fluorescent microscope helps quickly find the newly settled corals