IMPROVING OUR UNDERSTANDING OF AND REQUIREMENTS FOR APPROPRIATE COMPENSATORY MITIGATION:

Where we were, where we are, and where we are heading…

What do we mean by Coral Reef Compensatory Mitigation…

Mitigation - Projects that attempt to offset lost ecosystem services from impacts associated with permitted activities which can not be avoided.

- **Limitations - Although necessary for managing sustainable growth and resource use, and in some cases may offset a portion of lost services, these projects are not sufficient to replace reef ecosystems and should not be viewed as such.**
- **Examples / Opportunities**
  - **Deployment of boulder or artificial structures (SE FL)**
  - **Contributions to conservation projects**
    - **Mooring buoy programs**
    - **Coral nursery programs**

Where we are…

- Many mitigation projects:
  - Are insufficient to replace lost ecological services
  - Do not include criteria which allow success to be defined or determined
  - Do not include appropriate monitoring efforts - data types, sample size, and duration

  (US FWS 2004, Thanner et al. 2006, Moulding 2011, Gilliam et al. in prep)

- Agency recognition that ensuring full compliance with the 2008 USACE/EPA mitigation rule is difficult.

Where we are…

Currently there is limited understanding of ecological services, recovery times, recovery trajectories, and recovery (equilibrium) states which has contributed to:

- **Insufficient effort during project planning to thoroughly evaluate potential lost ecological services**

- **Insufficient budgets (and political will) for appropriate impact avoidance, minimization and mitigation**

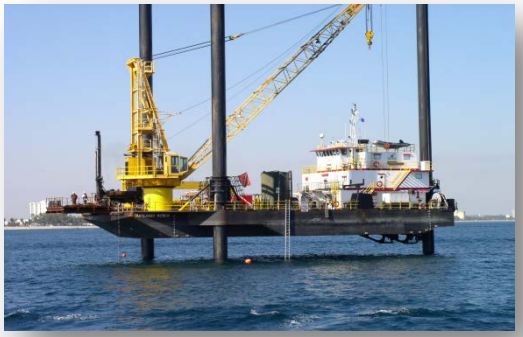
- **Difficulty identifying appropriately scaled mitigation efforts/activities**

Recognition of these issues and the importance of addressing them has led, in part, to the SEFCRI LAS NOAA/FL DEP reef recovery and mitigation project

SE FL Reef Recovery and Mitigation Project

<u>Objective</u>: Evaluate reef resource 'recovery' and potential equilibrium states which maybe used in assisting with determining proper compensatory mitigation for coral reef injury

Permitted Activity



? **Impact**

Recovery **?**

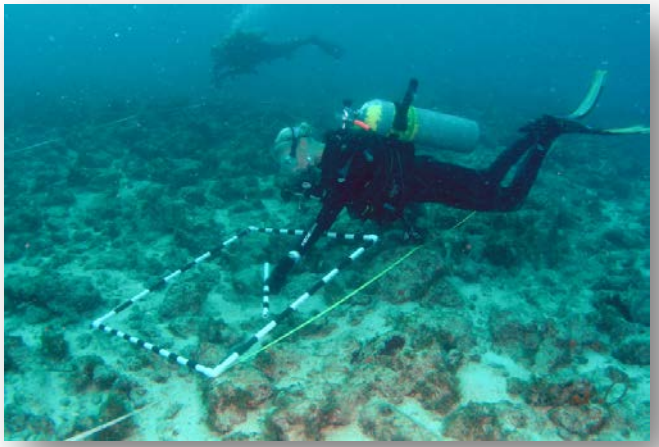
Recovery **?**

? **Mitigation**

SE FL Reef Recovery and Mitigation Project

Conclusions:

1. Very long ‘recovery’ times for impact sites and boulder piles to return lost services
2. Different recovery (equilibrium) states - impact sites and boulders piles may never replace lost stony coral and gorgonian species and size class distributions
3. Physical structure may be a limiting factor for ‘recovery’ - impact sites have greater % cover of rubble and boulders create much different habitat than natural reef



Where we are (hopefully) heading….

1. **Better coral reef protection and recognition of the true costs of losing their ecological services (Executive Order 13089 – Task Force)**

2. **Greater emphasis (time and funds) up front during project planning on impact avoidance, minimization, and mitigation**

3. **Greater commitment to learning more about coral reef resources, their ecological and economic services, and recovery times, trajectories, and equilibrium states**

4. **Greater commitment to proposing and evaluating potential mitigation projects/initiatives which can be appropriately scaled to offset lost services**

Recommendations to USCRTF :

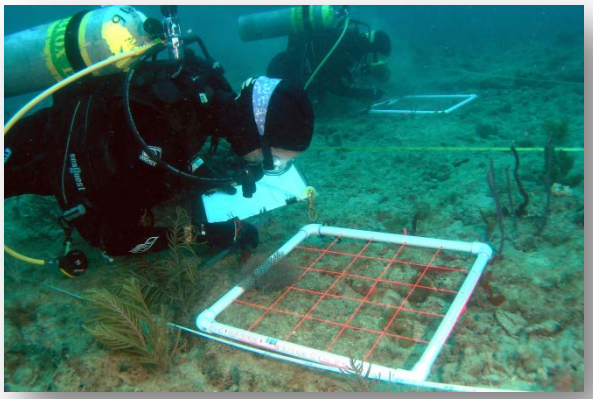
1. Establish communication standards with state and federal resource trustees requiring:

- **Approval of all compensatory mitigation and monitoring plans which appropriately represent the resource, are statistically robust, and include performance / success criteria**
- **Assurance that actual compensatory mitigation and monitoring costs be included in budgets and include contingency mitigation and monitoring.**

Recommendations to USCRTF :

2. Establish national standard conditions for all projects :

- **Define and require impact minimization prior to project initiation**
- **Develop survey and monitoring protocols which actually collect data types at appropriate ecological, geographical and temporal scales**
- **Develop project success criteria or guidance on how to measure mitigation project outcomes**



Recommendations to USCRTF :

3. Create a suite of compensatory mitigations options which include appropriate scaling and associated costs - Compensatory Mitigation Options Guam September 2010 Workshop.

4. Develop guidance for and ensure that cost benefit analyses used by decision makers include accurate and current ecosystem valuations.