An aerial photograph of a long, narrow stone breakwater extending into the ocean. The water is a deep blue, and white waves are breaking against the structure. The breakwater is made of dark, irregular stones. The sky is not visible, and the overall scene is a natural coastal environment.

# CWA Compensatory Mitigation

## Challenges and Opportunities

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# Apra Harbor, Guam

Commercial Port

Sasa Bay Preserve

CVN

Inner Apra Harbor



# Kahului Harbor, Maui



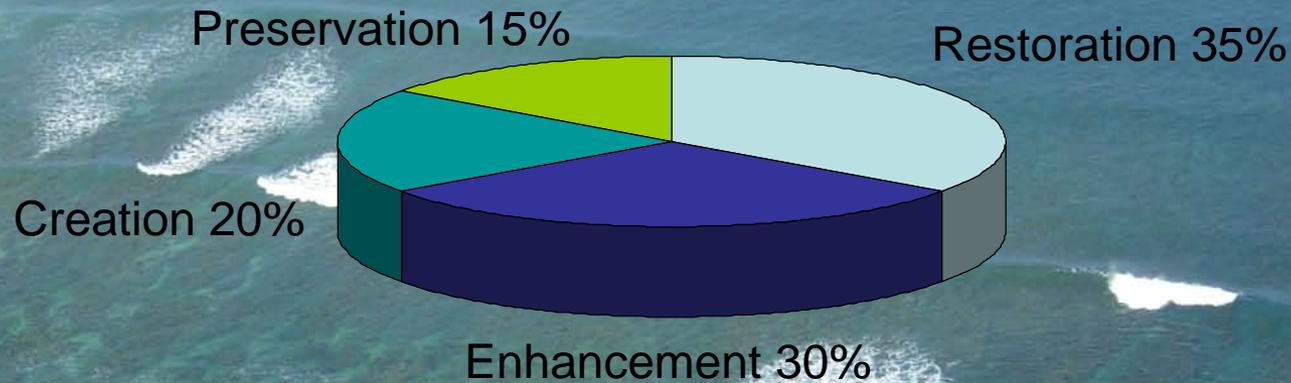
An aerial photograph of a coral reef system. The water is a deep blue, transitioning to a lighter turquoise near the reef. White waves are breaking against the reef. A long, narrow stone breakwater extends from the bottom left towards the center of the frame. The text is overlaid on the top half of the image.

Q: Is Compensatory Mitigation  
Successful?

A: Too often not

- 2001 National Research Council Report
- 2005 FWS-EPA report on coral mitigation
- 2008 COE-EPA Mitigation Rule

# Compensatory Mitigation Approach



Impact site:

Lost  
functions/services  
+ uncertainty  
+ temporal loss

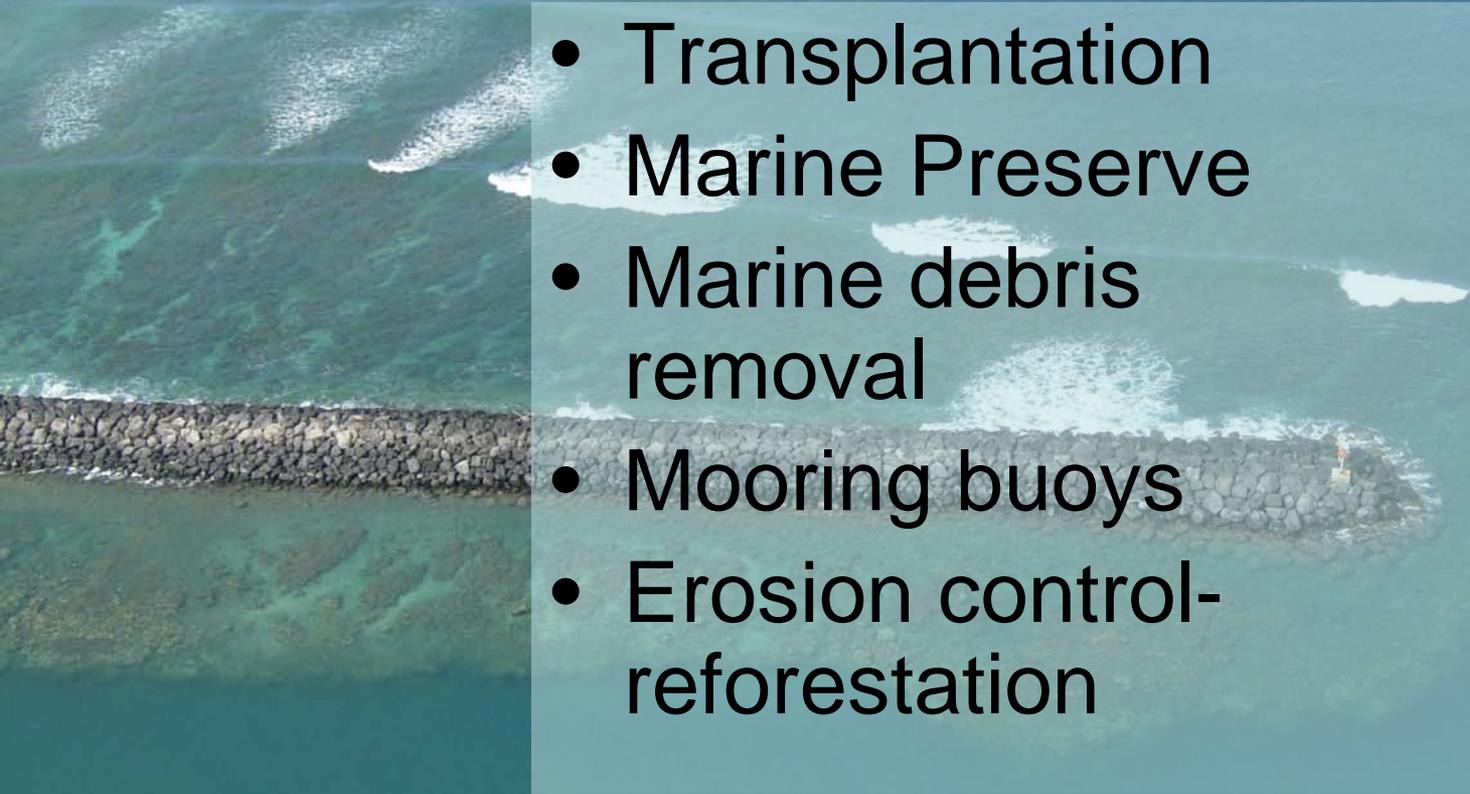
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Mitigation site:

Gained  
functions/services

# Past Coral Mitigation Projects (before 2008 rule)

- Transplantation
- Marine Preserve
- Marine debris removal
- Mooring buoys
- Erosion control-  
reforestation



# Proposed future coral mitigation projects:

- Artificial reefs
- Erosion control-  
reforestation
- Remove nuisance algae
- Wastewater upgrades
- Transplantation
- Mooring buoys
- Marine preserve

# KILO WHARF, APRA HARBOR





## **MITIGATION**

Coral Reef  
Restoration via  
Erosion control –  
Reforestation of  
500 acres in  
Cetti Bay

# Third Party Mitigation

## **Mitigation Banks:**

- Initiated before impacts
- Credits given after project is successful
- Sponsored by entrepreneurs
- >450 banks

## **In-Lieu Fee Programs:**

- Initiated after impacts
- Sponsored by Gov't & Non-profits
- >50 programs