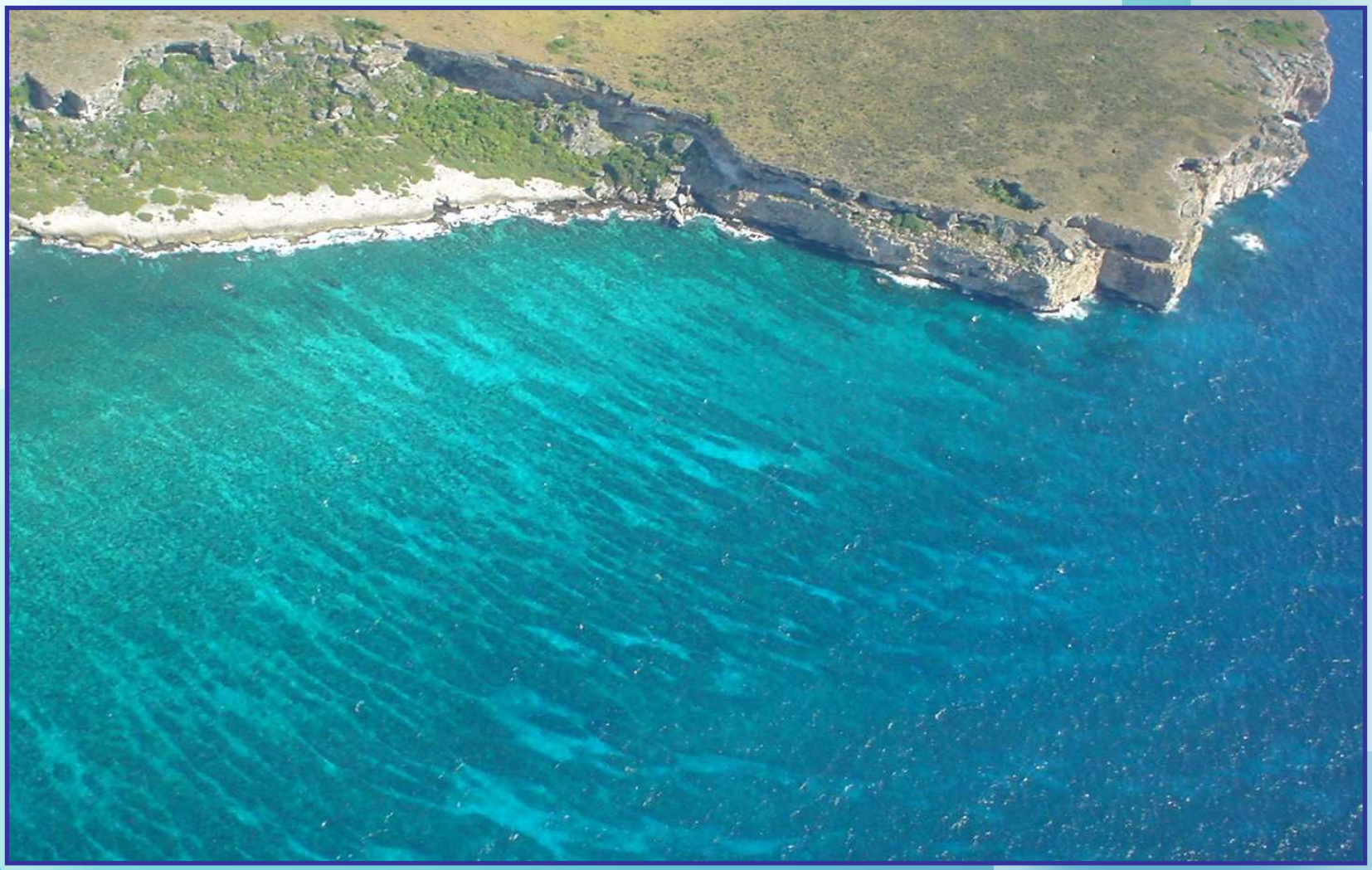
FISH ASSEMBLAGES AND HABITAT CONNECTIVITY FOR MPA DESIGN



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NEED

- MPA USE INCREASING
  - DESIGN BASED ON:
    - GOVERNANCE
    - COMPLIANCE
    - HABITATS
    - COMPROMISES
    - EDUCATED GUESSWORK
- CRITERIA FOR DESIGNING ZONES WITHIN MPAS
- MEETING PROPOSED OBJECTIVES
- IMPORTANCE OF MPAS AS A CONTROL AREA FOR UNDERSTANDING ECOLOGICAL PROCESSES

PREVIOUS STUDIES

- MPA LITERATURE
  - FEW EMPIRICAL OR EXPERIMENTAL
  - FEW BACIP STUDIES
  - LITTLE REPLICATION
- HABITAT INFLUENCE ON FISH ABUNDANCES
- CONNECTIVITY BETWEEN HABITATS
- ONTOGENETIC MOVEMENTS
- JUVENILE HABITAT DEPENDENCE

AIM

- **To better understand the underlying ecological processes that link habitats and coral reef fish species.**
  - **What alternate habitats used by 'nursery' species in the lack of submerged mangroves?**
  - **How does the distribution of these habitats influence the distribution of fish around Mona Island?**
  - **How does this distribution affect the effectiveness of the proposed zoning scheme and MPA objectives?**

OBJECTIVES

- Determine the abundance of specific reef fish species in relation to habitat types.
- Assess the distribution of size classes for specific reef fish species.
- Identify recruitment habitats and quantify their distribution.

METHODS

- BENTHIC HABITAT MAP ANALYSIS
  - DETERMINE RANDOM SAMPLING SITES
  - A POSTERIORI GROUNDTRUTHING
- U/W FISH SURVEYS STRATIFIED BY HABITAT
  - ABUNDANCE & DENSITY
  - ESTIMATE OF LENGTH & BIOMASS
  - 25 x 4 m (100 m^2)
- BENTHIC HABITAT CHARACTERIZATION
  - LINE INTERCEPT
  - LARGE SCALE RUGOSITY
  - DEPTH
  - DISTANCE FROM JUVENILE HABITAT

HABITAT

- **BACKREEF**
  - **Seagrass**
    - ***Thalassia & Syringodium***
  - **Linear Emergent Reef**
    - ***Acropora palmata, Porites & Montastraea***
- **FOREREEF**
  - **Patch and Spur & Groove**
    - ***Acropora palmata, Diploria & Montastraea***
    - **Octocorals & Sponges**
- **SLOPE**
  - **Pavement**
    - **Octocorals & Sponges**
  - **Linear and Spur & Groove Reefs**
    - ***Montastraea, Agaricia & others…***
- **CLIFF WALL**
  - **Bedrock**
    - **Octocorals & Sponges**

EXPECTED OUTCOMES

- Spatial distribution of coral reef fish species
- Quantification of habitat available and the connection between them for fish species
- Detect most probable pathways for fish movement inferred from spatial distributions
- Baseline for the evaluation of the effectiveness of the proposed no-take area before implementation

Proposed No-take Zone