Habitat information for the improvement of stock assessments for insular species

Michael Parke, Ph.D.
Director's Office - Pacific Islands Fisheries Science Center

Why Habitat Data/Information

- **National priority as expressed in the Habitat Assessment Improvement Plan (HAIP) and in the Habitat Blueprint**

- **Stock assessment scientists need habitat information at appropriate spatial and temporal scales to improve design and interpretation of stock surveys and to support stock assessment model improvements**

- **Provide fishery managers a more comprehensive understanding of the role of habitat in critical ecosystem processes, enable advancements in the implementation of ecosystem-based fisheries management, and enable decisions that can incorporate the effects of climate change and other anthropogenic events**

Terms of Reference for Habitat Data

- Fish habitats are defined in the HAIP as the places where fishes live, spawn, settle, grow, and reproduce, commonly using multiple habitat types even within a single stage in their life history.

- "Potential" habitat is a more appropriate term for descriptions of physical, geological and topographical bottom features or water column characteristics

- These physical features can be used to infer habitat and can be confirmed by scientific observations of biological associations and dependencies

- Essential habitat should infer more than just fleeting co-occurrence at some life stage

What Habitat Data Do We Need
(Depends on the Question)

- **Potential habitat data include bathymetry, bottom composition, water column characteristics, etc. Current stock assessment models and surveys can use these data, primarily to improve survey designs for stratified sampling (HAIP Tier 1)**

- **Ecological value habitat data include presence/absence data, but habitat-specific biomass or abundance by life stage are needed to improve stock assessments, requiring expanded data collection and new SA models (HAIP Tier 2)**

- **Habitat status or condition data, such as habitat-specific vital rates by life stage are needed for next generation assessments to identify, maintain, and restore both stocks and habitats, and to feed into risk models and IEAs (HAIP Tier 3)**

What Habitat Data Do We Have

- **Good bathymetry from multibeam and LIDAR, derived-depths from satellite imagery, large gaps in the 0-30 meter depths**

- **Relatively good backscatter when calibrated correctly and verified to distinguish hard from soft bottom**

- **Not much information on benthos except in shallow water (0-15 meters) areas surveyed by CRED and certain TOAD data**

- **Oceanographic data at coarse scales other than opportunistic fish tagging and vessel sampling**

- **Presence/absence biological data at scale of fishing or diver surveys**
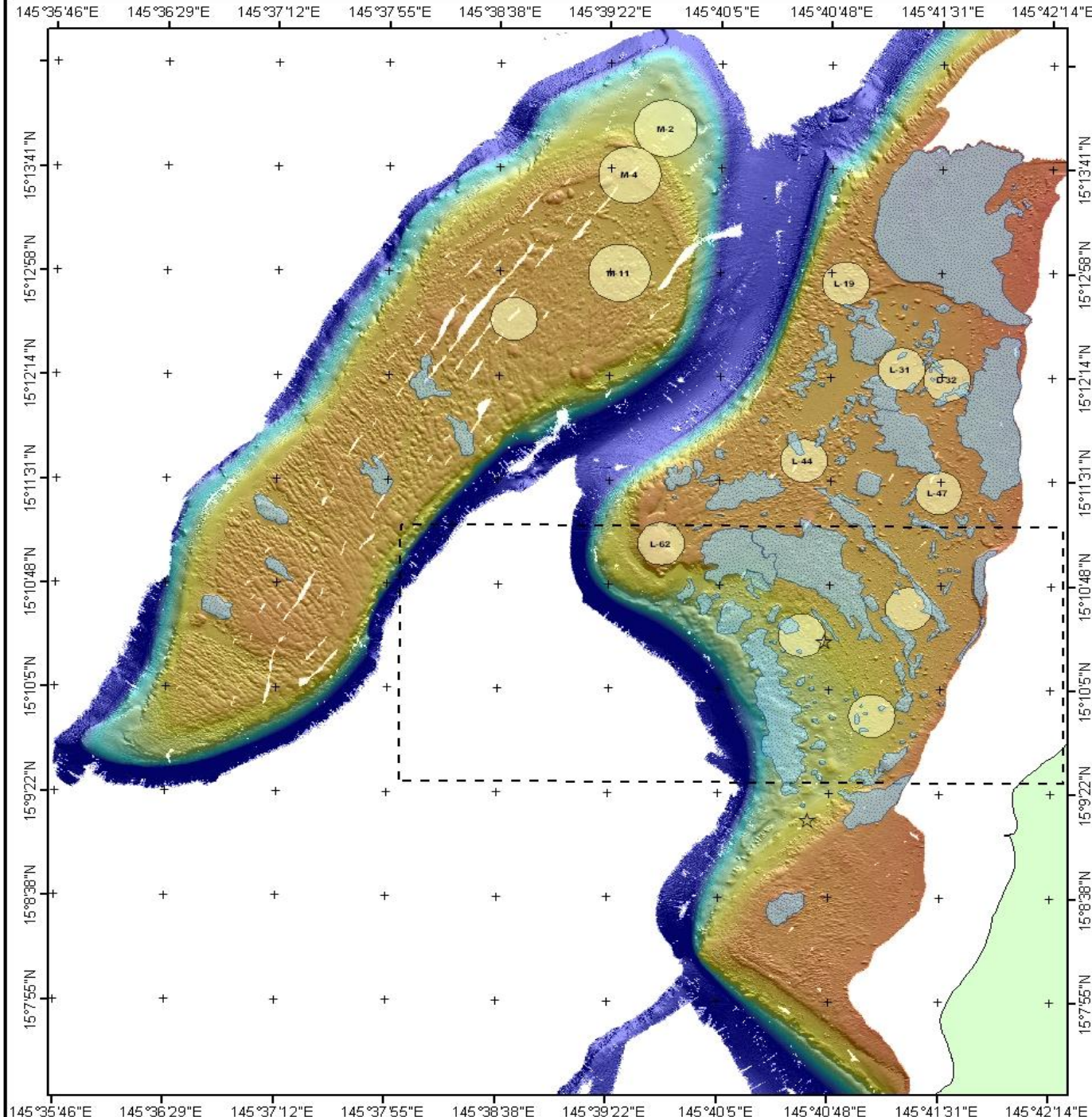
Current Habitat Data Use at PIFSC

- **Potential habitat data (bathymetry, backscatter, benthos, etc.) used to design and analyze fish surveys**

- **Potential habitat data and presence/absence data used to refine and recommend changes to essential fish habitat and habitat areas of particular concern**

- **Potential habitat data and presence/absence data used to evaluate potential effectiveness of restricted fishing areas**

- **Potential habitat (oceanographic regimes) used to constrain certain models**

- **Modeled coral habitat used to evaluate proposed anchorage sites**

Suitable Potential Habitat Areas

Adult Bottomfish Habitat
with Reporting Zones, RFAs, and EFH

State of Hawaii Existing RFA
3 Mile Limit
State of Hawaii Proposed RFA
Suitable Habitat
EFH 100-400 Meters Depth

0   10   20 Miles
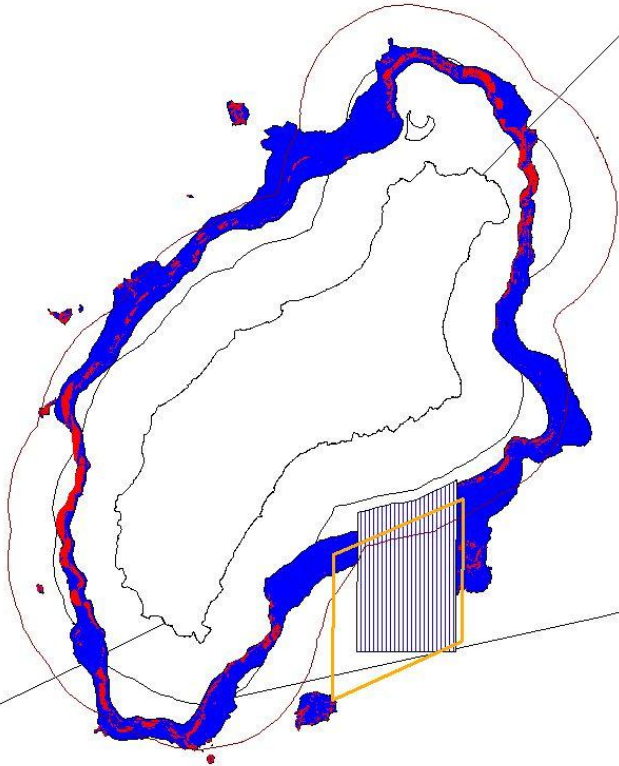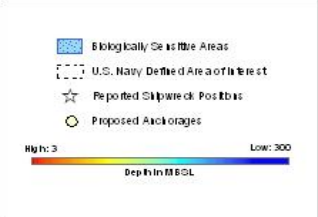
Appendix D

Saipan Anchorage
Biologically Sensitive Areas
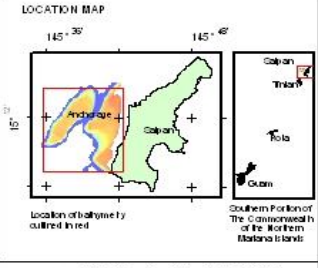
Challenges

- **No dedicated program (other than CRED)**

- **No dedicated funds or staff (other than CRED)**

- **Limited info or research on various life histories**

- **Few stock assessment models that explicitly incorporate habitat data**

- **What habitat data are used are actually potential habitat data, i.e. substrate or water quality data without ancillary ecological/ biological data**

- **Temporal and spatial resolution discrepancies between reported catch data, life history data, and potential habitat data**

Opportunities

- **National Focus on Habitat Issues**
  - **Habitat Blueprint**
  - **Habitat Focus Areas**
  - **Sentinel Sites**
  - **Integrated Ecosystem Assessments**
  - **Regional Habitat Assessment Prioritization Working Group to Improve Stock Assessments**

- **Development of Bottomfish Habitat GIS**
  - **Attempt to incorporate fishing and catch data with life history data and potential habitat data in Hawaii**

- **Formation of Pacific Islands Marine Data Focus Group**
  - **Attempt to bring disparate potential habitat and biological data holdings under one umbrella for management use**

Recommendations of the HAIP Team

- **Develop budget and staffing initiatives to fund habitat science linked to NMFS mandates**

- **Develop criteria to prioritize stocks that would benefit from habitat assessments**

- **Prioritize data inadequacies for stocks and habitats**

- **Initiate demonstration projects using habitat data in stock assessment models**

- **Coordinate the collection and management of habitat data**

- **Improve data accessibility and synthesis**

- **Develop NOAA-wide strategic plan for habitat science and assessments**