Examining Patterns of Brachyuran Crab Diversity across US Pacific Coral Reefs using Autonomous Reef Monitoring Structures (ARMS)

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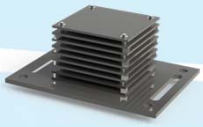
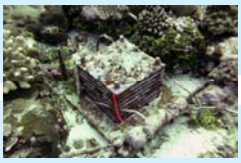
Introduction

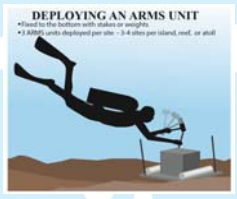
- Coral reefs are the most biologically diverse marine ecosystems. The majority of reef diversity is found within the cryptofauna and not the fish or coral taxa.
- ARMS were developed as a standardized method to assess biodiversity of coral reef cryptofauna.
- Brachyuran crabs are one of the most diverse groups of organisms and they are the best studied of all Crustacea.
- Brachyurans have many contributions in ecosystem function and fulfill a variety of trophic niches.





- 2163 ARMS were deployed at 25 islands, reefs, and atolls across the Pacific.

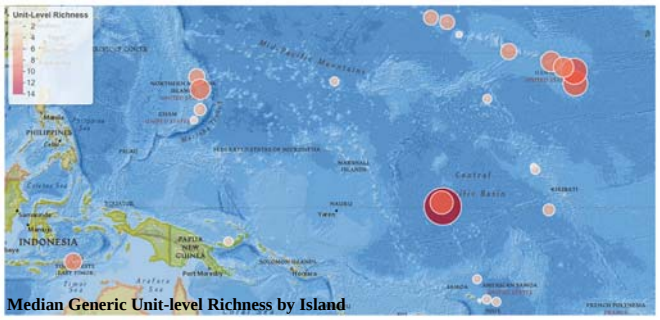
Methods



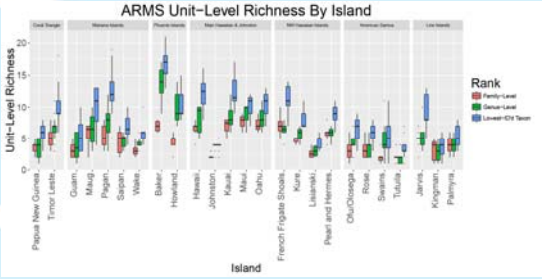
Disassemble | Photograph Plates | Scrape & Homogenize

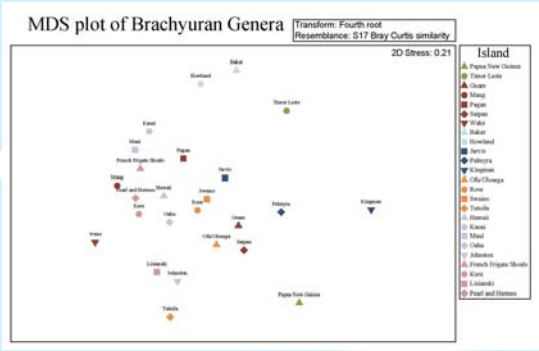
Sieve | Sort, Identify & Count | Photograph

Results

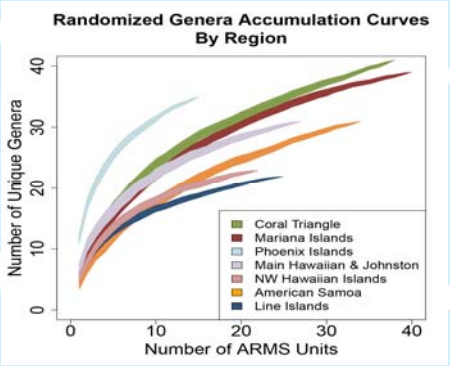


Median Generic Unit-level Richness by Island



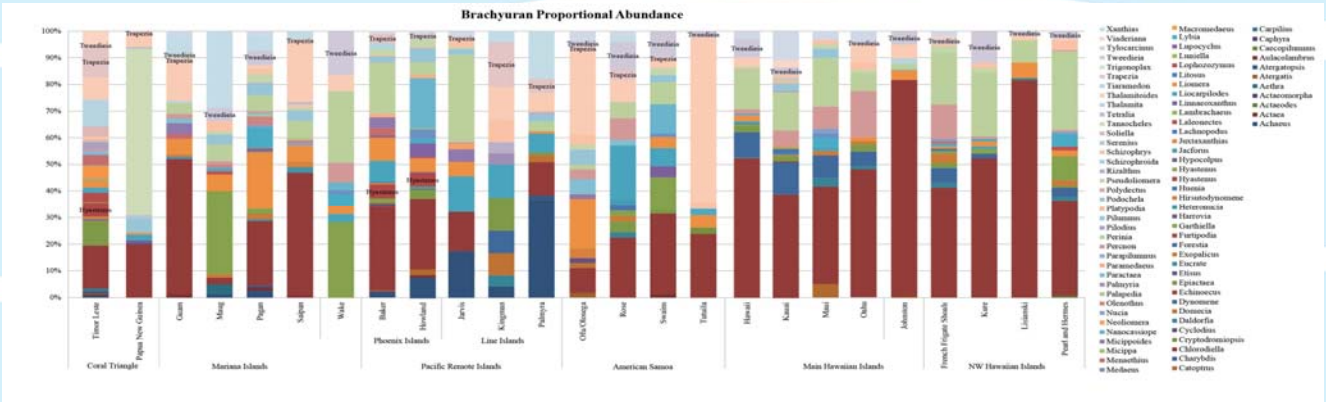


Results



Conclusions

- 4777 Brachyuran crabs were sorted to morphospecies and abundances documented.
- 24 families, 85 genera, and 98 unique species were recorded
- Most abundant families:
  Xanthidae (49%)
  Epialtidae (13%)
  Portunidae (11%)
  Pilumnidae (7%)
- Most abundant genera :
  Chlorodiella (35%)
  Perinia (12%)
  Liomera (5%)
  Thalamitoides (5%)
- The Pacific Remote Island Areas have the greatest Brachyuran diversity while the Northwestern Hawaiian Islands were the least diverse and had the lowest Brachyuran abundances.
- Tweedieia, Hyastenus, and Trapezia have the greatest influence on the spatial patterns of diversity.
- Tweedieia was found in Timor Leste, Johnston, Wake, Guam, Maug and Pagan. Also found at all of the islands of American Samoa, the Main and Northwestern Hawaiian Islands.
- Hyastenus was only recorded in the Timor Leste, Baker and Howland Islands.
- Trapezia was recorded in all locations in the Coral Triangle, Guam, Saipan, and 5 of the 7 Pacific Remote Islands.



For more on ARMS see:

Timmers, M. et al. Wed. 06/22 /2016 09:30 Rm: 311 and Ransome, E. et al. Wed. 06/22/2016 10:00 Rm: 311

https://pifsc-www.irc.noaa.gov/cred/survey_methods/arms/index.php

PAPAHĀNAUMOKUĀKEA Marine National Monument

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