Genetic connectivity in the sea cucumber *Holothuria atra* indicates that Johnston Atoll is a biodiversity bridge to Hawai`i

Derek Skillings, Christopher E. Bird, Robert Toonen

*Hawaii Institute of Marine Biology, Kāne`ohe, HI*
Introduction

• Hawaii is one of the most isolated archipelagos in the world
• High proportion of endemics
• Low connectivity?
• Sources of biodiversity replenishment?
Holothuria atra

Lollyfish; loli okuhi kuhi
Holothuria atra
Teatfish; loli
Holothuria whitmaei
Hawai`i – Central Pacific Connectivity Hypotheses

1) Johnston Atoll as a stepping stone into Hawai`i
   - based on faunal comparisons and computer simulation

2) Input from Japan into the NW Hawaiian Islands
   - based on faunal comparisons

3) Isolation by distance
   - connectivity negatively correlated with distance from Hawai`i
Results
Conclusions

• Population structure between and within archipelagos
• Johnson Atoll is part of the same population as the NW Hawaiian Islands
• Hawaii is a source and not a sink in the central Pacific
• Hawaii and Kingman appear ancestral to the rest of the central Pacific
Acknowledgements

- NSF DEB#99-75287, OCE#04-54873, OCE#06-23678
- National Marine Sanctuaries/ NWHI Marine National Monument (MOA-2005-008/6882)
- Brian Bowen
- ToBo Lab
- The crew of the NOAA ship Hi`ialakai
- Scott Godwin, Matt Iacchei, Greg Concepcion, Jon Puritz, Melissa Skillings, Nina Yasuda, Jeremy Claisse, Kelly Boyle, Derek Smith, Frederique Kandel