Coral Reef Ecosystem Investigation

NOAA Fisheries

Pacific Islands Fisheries Science Center

Ecosystem Approach

- Ecological Assessment & Monitoring
  - ✓ Fish
  - ✓ Corals
  - ➨ Algae
  - ➨ Other Invertebrates
- Benthic Habitat Characterization and Monitoring
  - ✓ Habitat utilization patterns
- Oceanographic Monitoring
  - ✓ Processes influencing ecosystem
- Ecological Interactions
  - ✓ Physical and biological linkages
  - ✓ Trophic linkages
  - ✓ Fishery interactions

Coral Reef Ecosystems Investigation

REVISED 11/18/2002

Rusty Brainard, Ph.D. — Chief

Federal Recruitment — Program Manager (Debris)

Tanya Maiava — Secretary

Scott Ferguson — Engineer/Manager

Rossyn Tasaka — ITS Computer Spec.

Greg Schorr — Marine Debris Group

- Jacob Asher — Marine Debris Spec.
- Kyle Kovanagi — Oliver Danderon — Marine Debris Spec.
- Mark Defley — Karen Geisel — Marine Debris Spec.
- Kelly Curtis — Ashley Greenley — Marine Debris Spec.
- Kyle Hogrefe — Marine Debris Spec.
- Jeremy Jones — Marine Debris Spec.
- Christie Kistner — Marine Debris Spec.
- Megan Moews — Marine Debris Spec.
- Carla Navarro — Marine Debris Spec.
- Karen Shepley — Marine Debris Spec.
- Mario Tolson — (vacant) — Marine Debris Spec.
- Amy Hall — (vacant) — Marine Debris Spec.
- Stephane Charette — (vacant) — Marine Debris Spec.
- Jennifer Stephensen — (vacant) — Marine Debris Spec.
- Elizabeth Keenan — (vacant) — Marine Debris Spec.
- (vacant) — Marine Debris Spec.

Ed DeMartini, Ph.D. — Ecosystems Group

Benthic Ecology Unit

- Jean Kenyon, Ph.D. — Marine Ecologist
- Matt Dunlap — *JIMAR Recruitment* — Coral Reef Habitat Spec.
- Casey Wilkenson — *JIMAR Recruitment* — Coral Reef Habitat Spec.
- Joe Chojnacki — Grad Student

Phycology Unit

- Peter Vroom, Ph.D. — Phycologist
- Kimberly Page — Grad Student
- Elizabeth Keenan — Grad Student
- Marine Debris Spec.

Fishery Ecology Unit

- Ed DeMartini, Ph.D. — Fishery Biologiast
- Brian Greene — Biological Technician
- Stephani Holzwarth, — Marine Ecosystem Spec.
- Bruce Mundy — Fishery Biologist
- Robert Schroeder, Ph.D. — Senior Fishery Researcher
- Brian Zgliczynski — Biological Technician
- Marine Debris Spec.

Joyce Miller — Benthic Habitat Mapping Group

- Robert Moffitt — Fishery Biologist
- Joyce Miller — Oceanographer
- Marine Debris Spec.
- Marine Debris Spec.
- Michael Parke — Computer Specialist

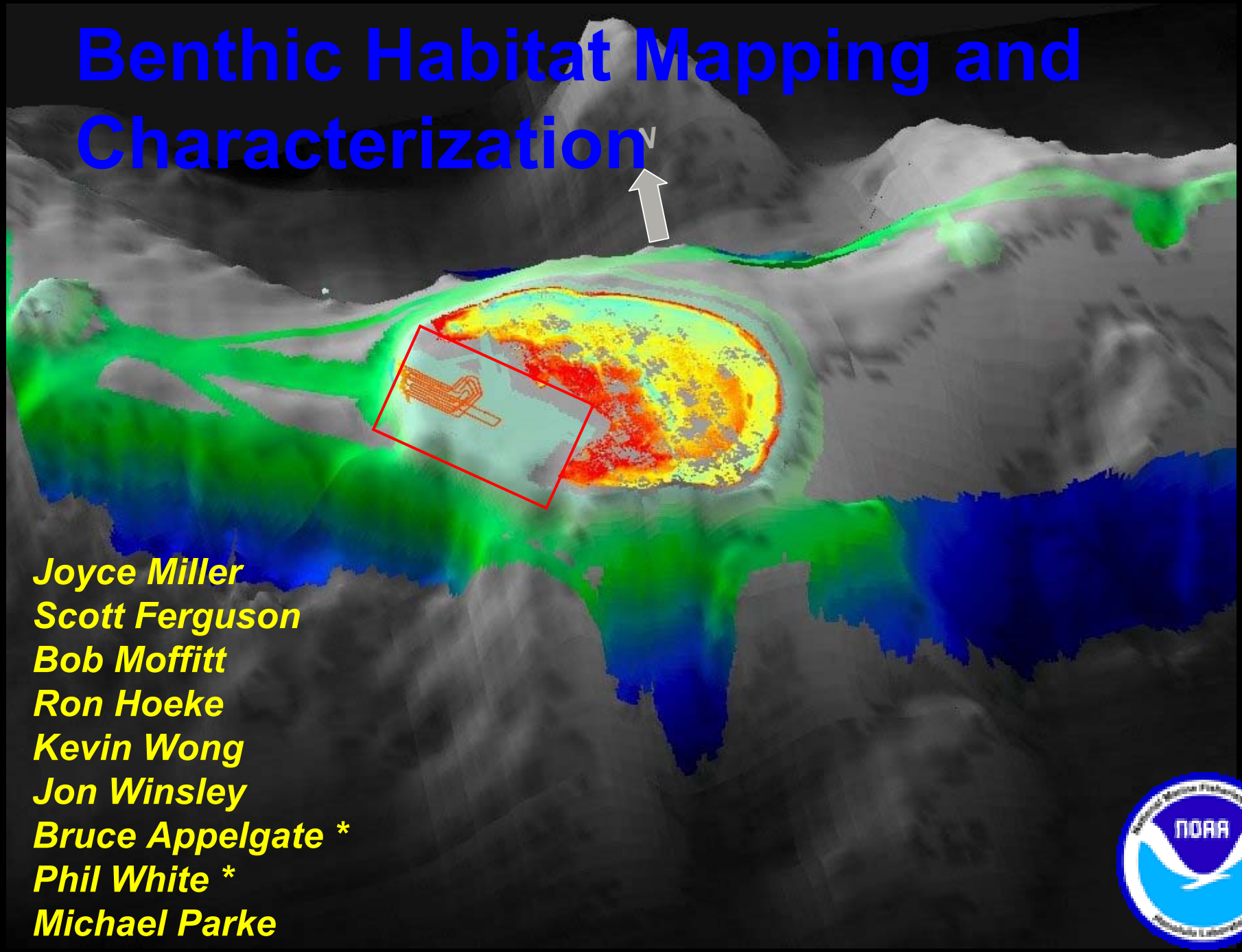
Rusty Brainard, Ph.D. — Oceanography Group

- June Firing — Oceanographer
- Ron Hoeke — Oceanographer
- Patrick Hyder Ph.D. — Oceanographer
- Jamie Gove — Grad Student
- Marine Debris Spec.

Kevin Wong, Ph.D. — Applied Research & Data Management Group

- Nicole Cabana — NOAA Corps
- Marc Lammers — Post Doc
- Molly Timmers — Grad Student
- Kevin Wong, Ph.D. — Industrial Engineer
- Jon Winsley — Grad Student
- Sun He Bak — Data Manager
- Darryl Tagami — Ops Research Analyst
- Thuong Tran — Student
- Marine Debris Spec.
- Marine Debris Spec.
- Karen Sender — Database Administrator

Benthic Habitat Mapping and Characterization



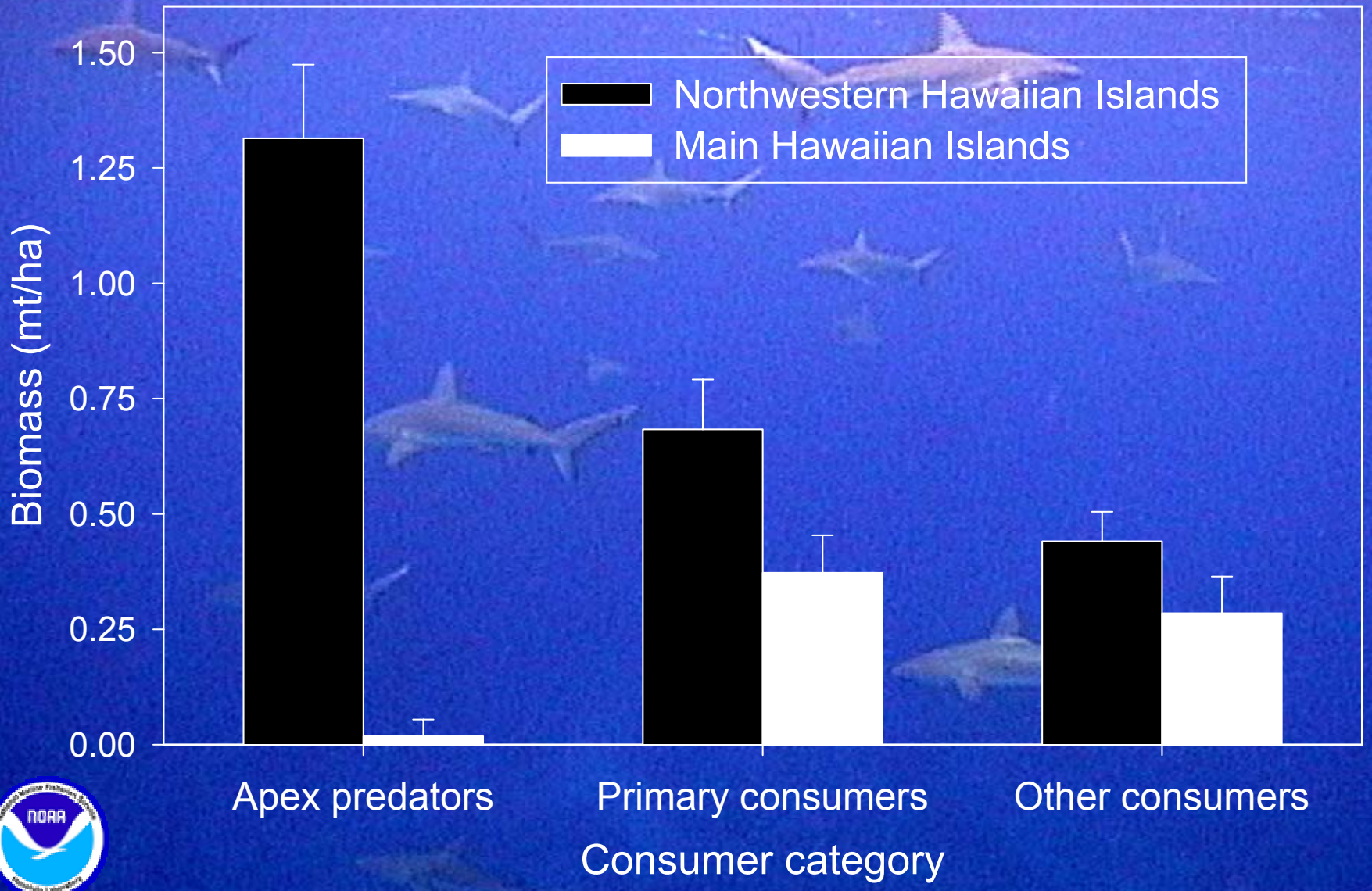
Joyce Miller
Scott Ferguson
Bob Moffitt
Ron Hoeke
Kevin Wong
Jon Winsley
*Bruce Appelgate **
*Phil White **
Michael Parke

In Situ Observations: Rapid Ecological Assessments

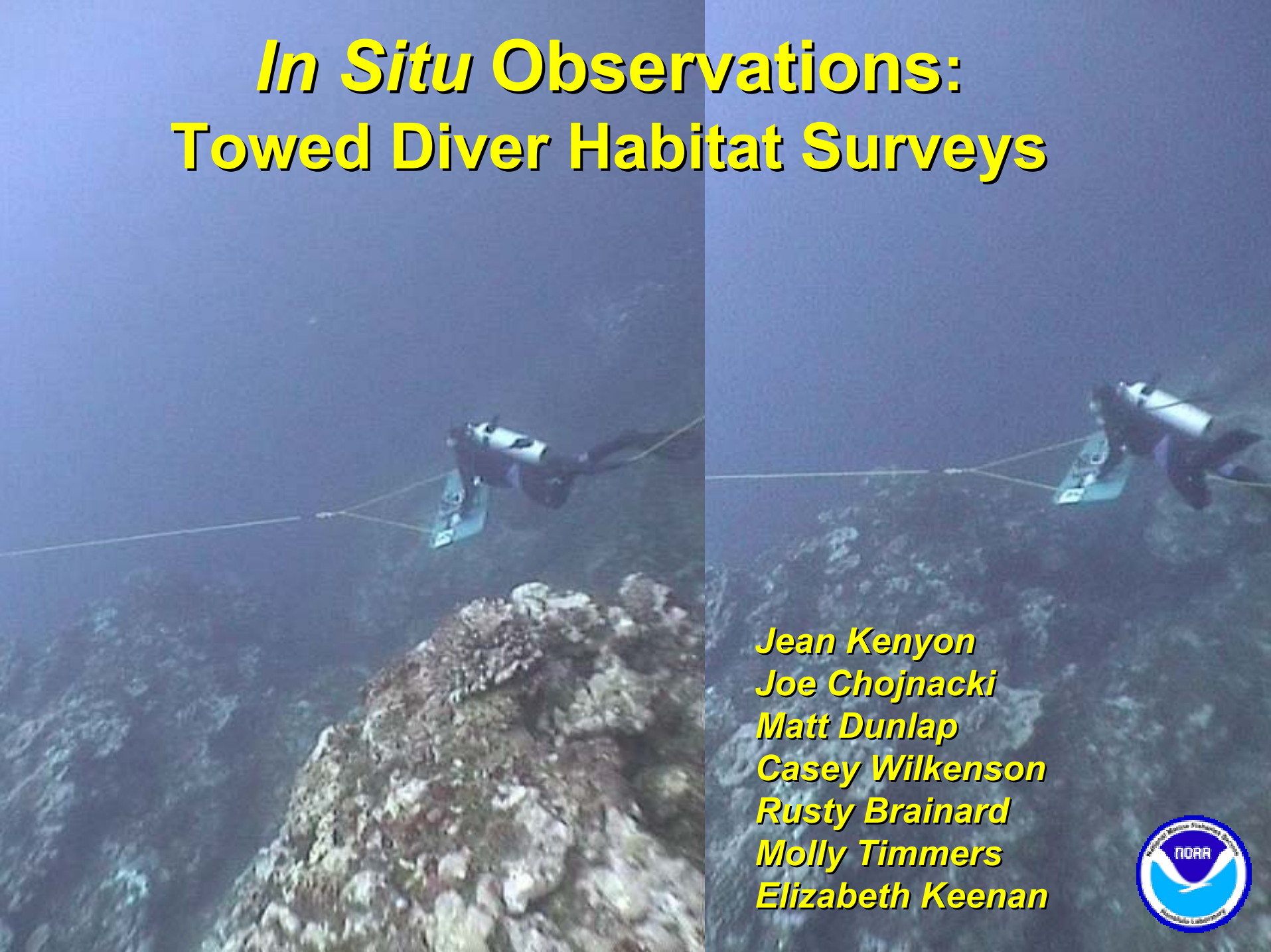
Fish Team
Ed DeMartini
Robert Schroeder
Brian Zglicznski
Bruce Mundy
Brian Greene
Steve Cotton *
Alan Friedlander *
Randy Kosaki *

Benthic Team
Jean Kenyon
Peter Vroom
Kim Page
Scott Godwin
Brian Greene
Jim Maragos *
Greta Aeby *
Linda Preskitt *

Comparison of Fish Biomass Densities between the Northwestern and the Main Hawaiian Islands



In Situ Observations:
Towed Diver Habitat Surveys

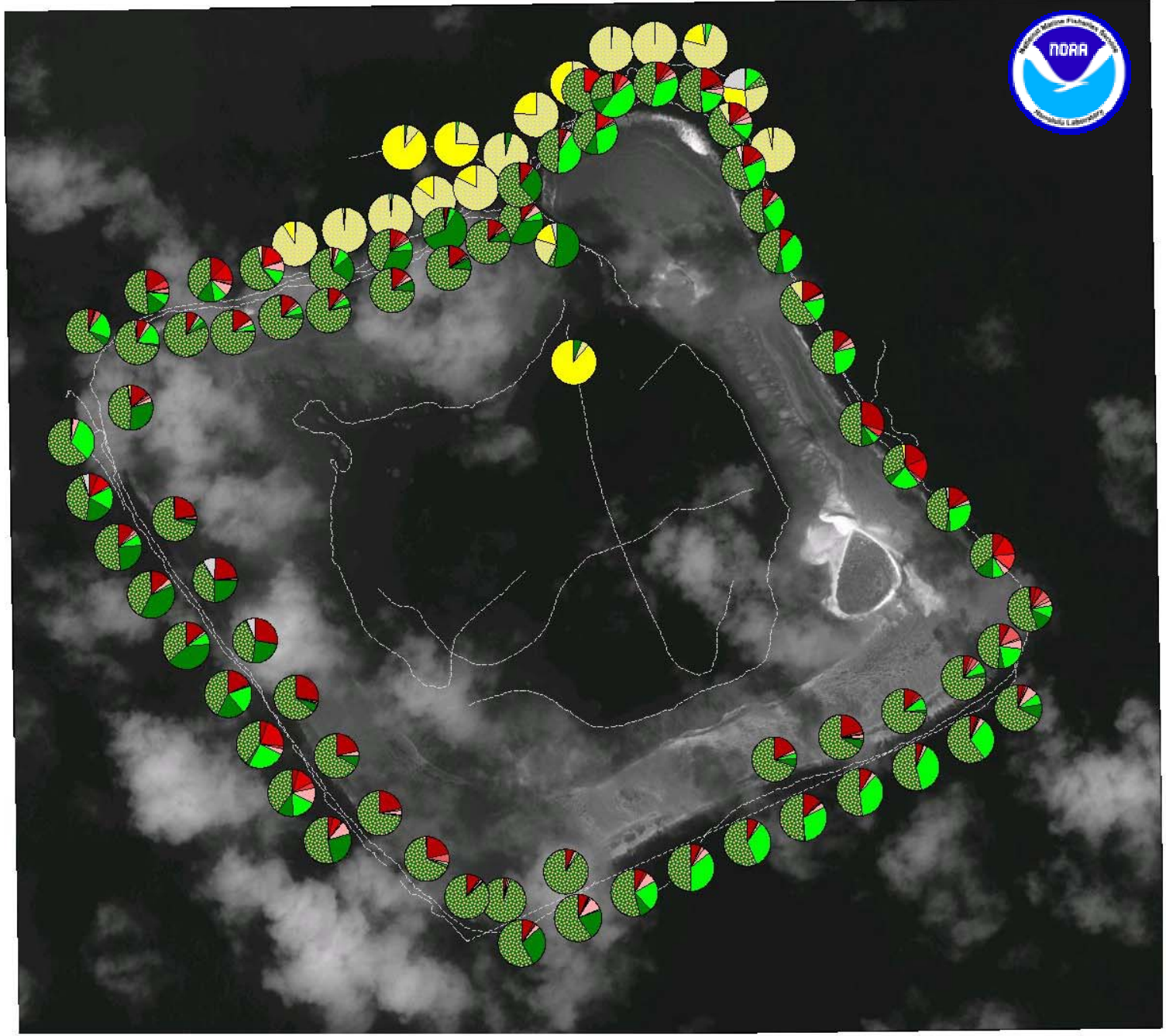


Jean Kenyon
Joe Chojnacki
Matt Dunlap
Casey Wilkenson
Rusty Brainard
Molly Timmers
Elizabeth Keenan

Rose Atoll

Bottom Composition
(% Cover)

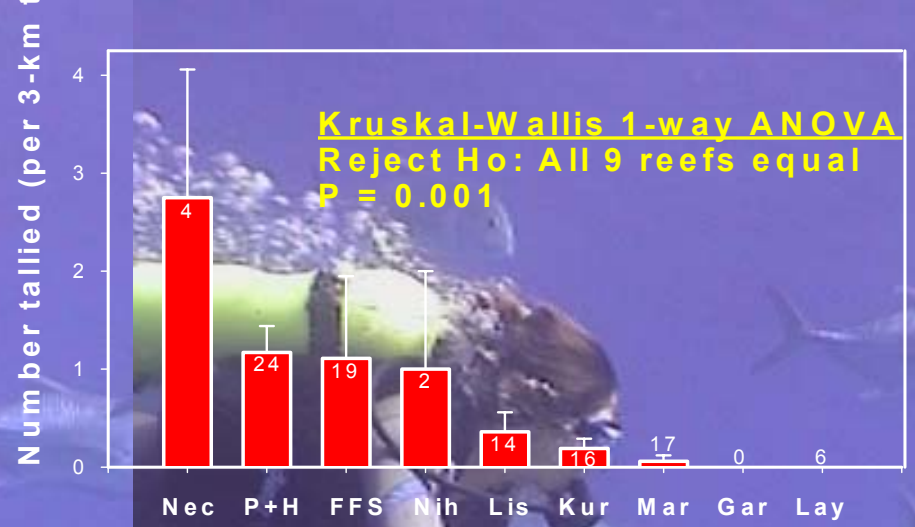
- Pocillopora
- Porites
- Faviids
- Montipora
- Acropora
- Other live coral
- Unencrusted coral
- Macroalgae
- Turf Algae
- Coralline algae
- Fish
- Inverts
- Pavement
- Rubble
- Sand

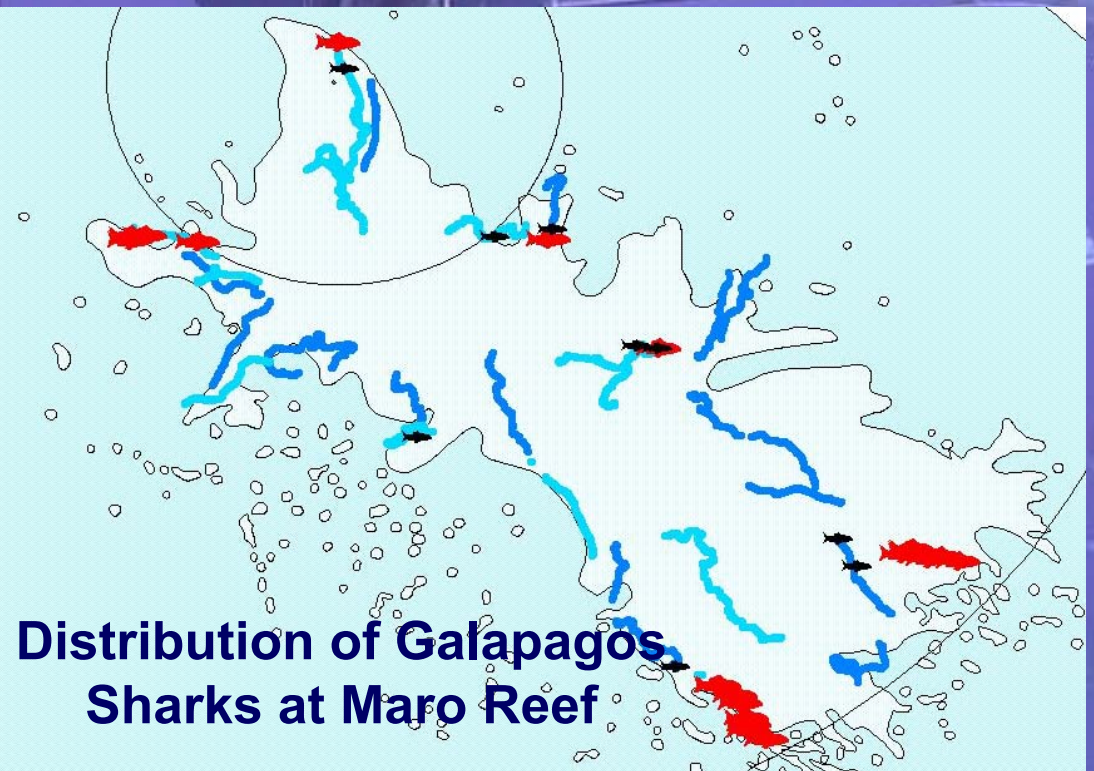


N
W E
S

0.2 0 0.2 0.4 0.6 0.8 Kilometers

Towed Diver Fish Surveys





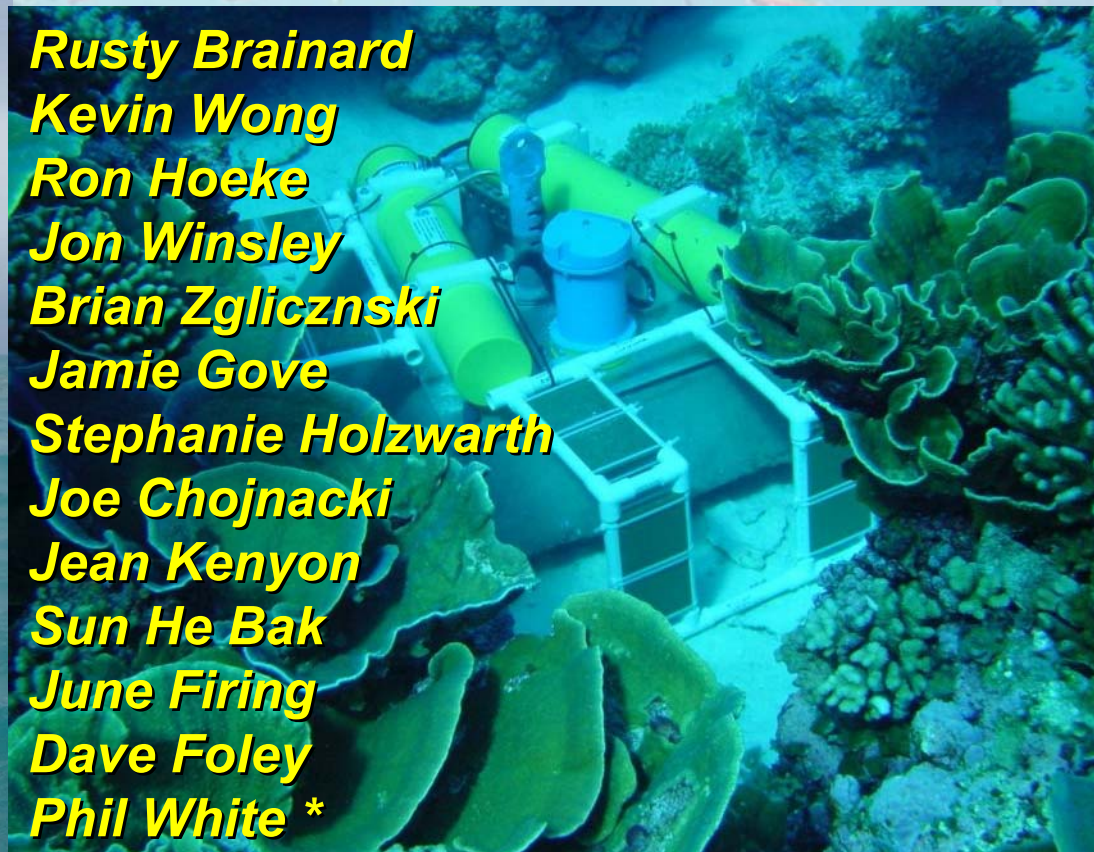
Distribution of Galapagos Sharks at Maro Reef

Brian Zgliczynski
Stephanie Holzwarth
Brian Greene
Robert Schroeder
Ed DeMartini

Oceanographic Moorings
Long-Term Monitoring

CREWS buoys telemeter SST, salinity, wind direction & speed, atm pressure, air temp, PAR and UV-B

Subsurface Ocean Data Platform measures ocean current profiles, waves energy and direction, temperature, salinity and pressure



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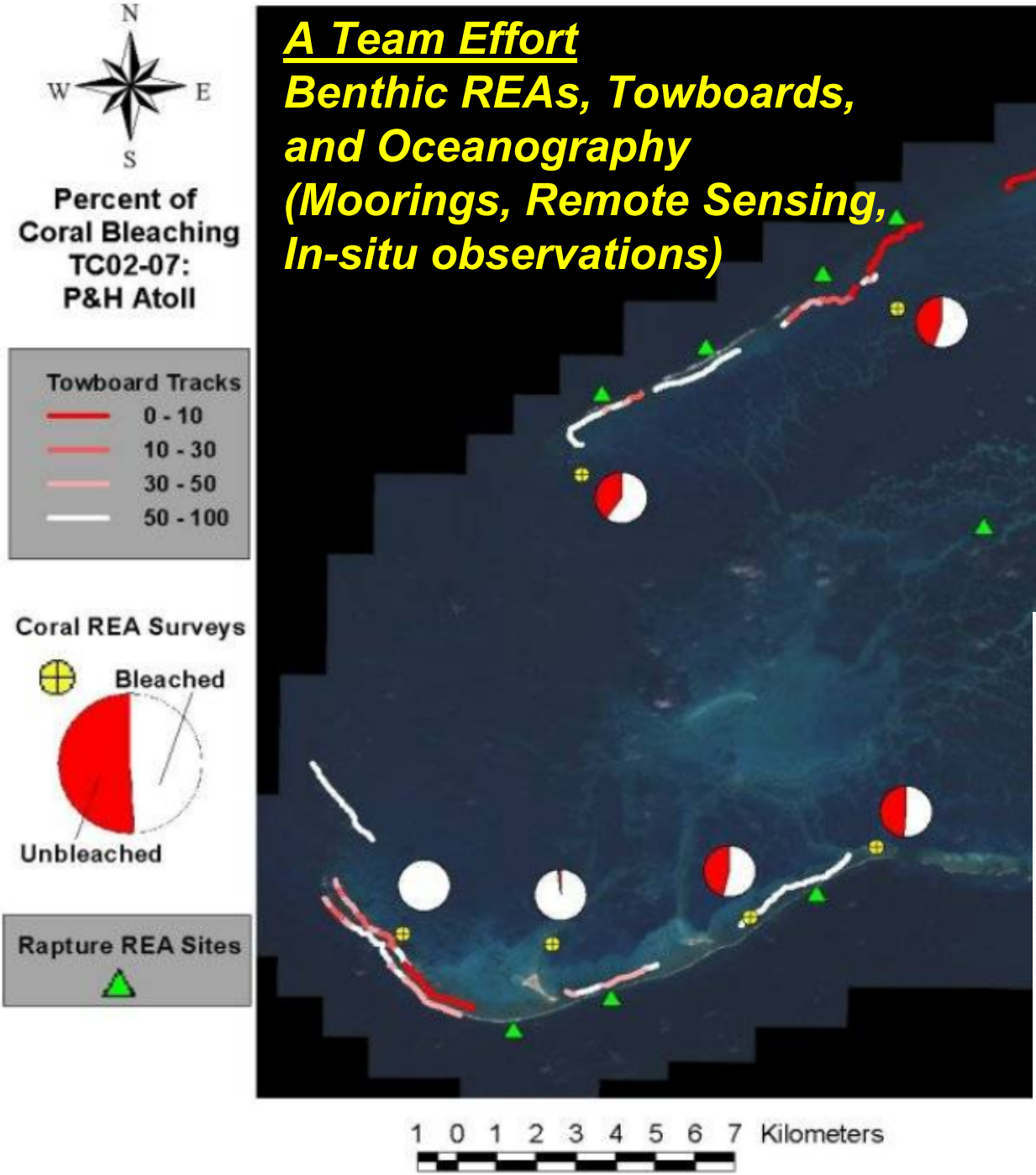
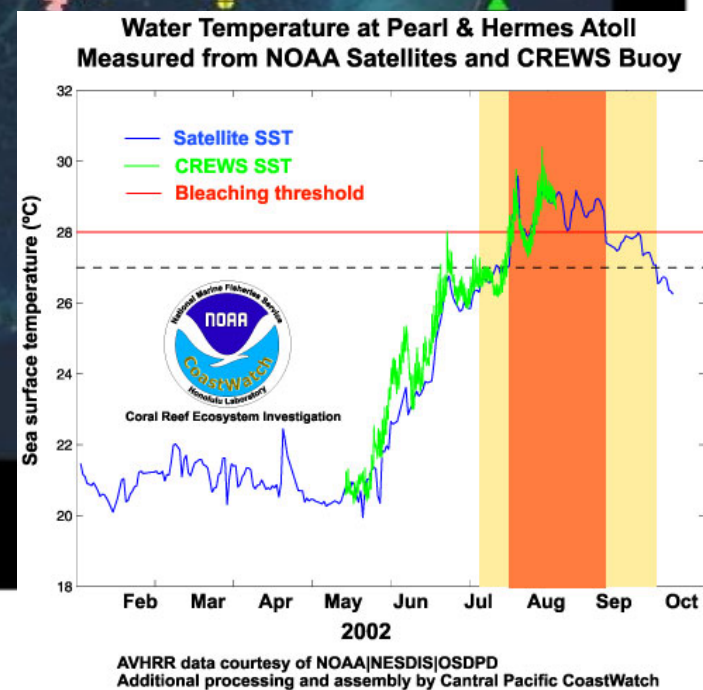
Phil White *

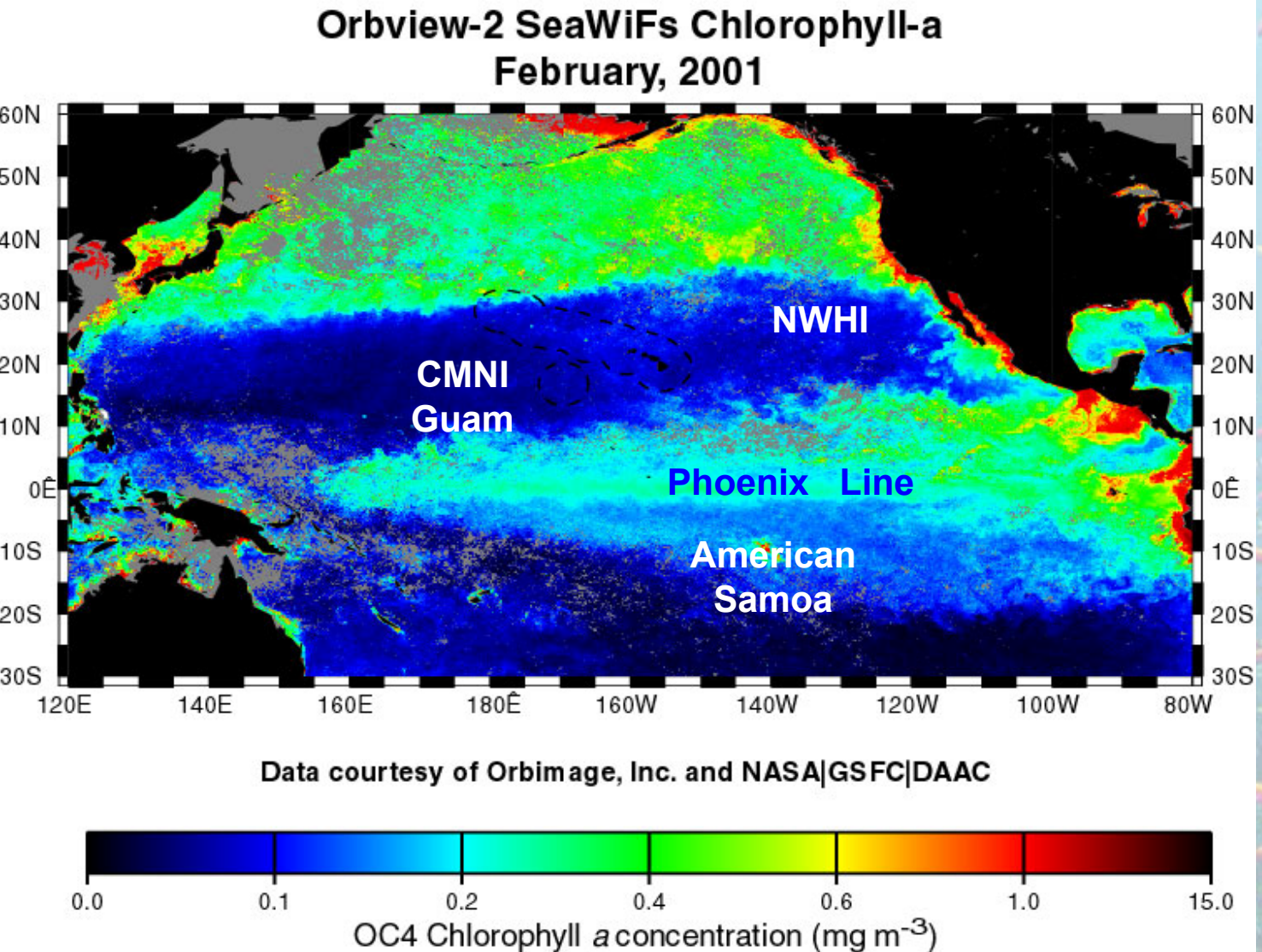
A Team Effort

Benthic REAs, Towboards, and Oceanography (Moorings, Remote Sensing, In-situ observations)



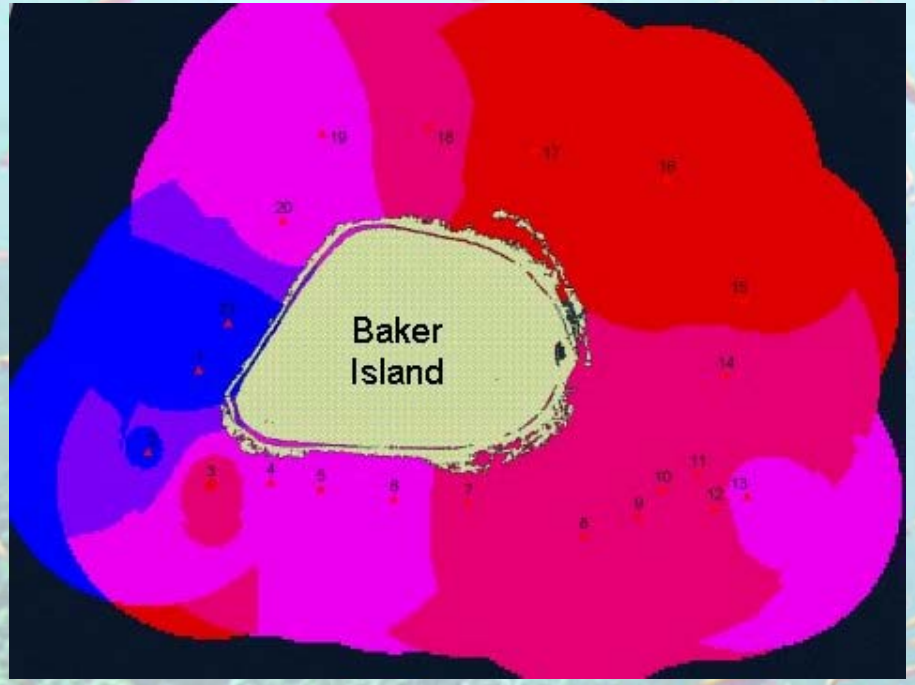


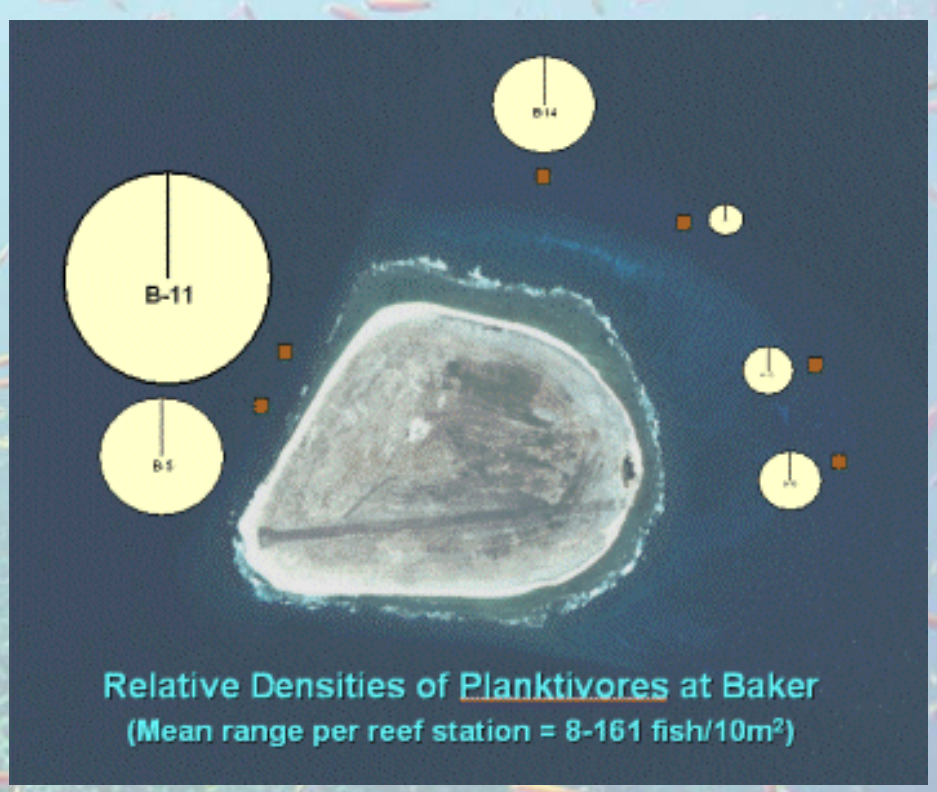
Satellite Remote Sensing
Large Scale Ocean Dynamics



Dave Foley
Ron Hoeke
Rusty Brainard
Lucas Moxey
June Firing
Jamie Gove
Pat Hyder
Kyle Hogrefe

Physical and Biological Linkages





A Team Effort
Fish and Benthic REAs, Towboards, and Oceanography (Moorings, Remote Sensing, In-situ observations)

Links between upwelling processes, including nutrient enrichment, and planktivore abundance

Marine Debris Removal

1996/1997 – NMFS Pilot Effort:	9,610 lbs
1998 – NMFS led Multi-Agency:	16,500 lbs
1999 – NMFS led Multi-Agency:	51,064 lbs
2000 – NMFS led Multi-Agency:	49,350 lbs
2001 – NMFS/NOS led Multi-agency:	138,200 lbs
2002 – NMFS/NOS led Multi-agency:	214,000 lbs
Total debris removed:	478,724 lbs **239.4 T**

Greg Schorr
Brian Zgliczynski
Kyle Koyanagi
Kyle Hogrefe
Karen Shepley
Mario Tolson
Mark Defley

Elizabeth Keenan
Jake Asher
Christi Kistner
Kim Page
Joe Chojnacki
Jamie Gove
Molly Timmers

Megan Moews
Amy Hall
Jennifer Stephensen
Stephane Charette
Carla Navarro
Kelly Curtis
Jeremy Jones