Coral Crisis in US Virgin Islands
National Parks

Jeff Miller
William J Miller@nps.gov
Matt Patterson

Dr. Andrea Atkinson
Judd Patterson
Rob Waara

Dr. Kevin R.T. Whelan
Brian Witcher
Alexandra Wright

South Florida/Caribbean Network I&M Program
Tremendous Collaborative Effort

USGS – Dr. Caroline Rogers
- Erinn Muller
- Tony Spitzack
- Bane Schill

SCA and Intern program

Volunteers

South Florida/Caribbean Network I&M Program
Coral Reef Monitoring Protocol

South Florida/Caribbean Network I&M Program
Average Monthly Temperature
(at resource depth)

Degree C

Historical

Jan  Feb  Mar  April  May  June  July  Aug  Sept  Oct  Nov  Dec

23.0  24.0  25.0  26.0  27.0  28.0  29.0  30.0  31.0

South Florida/Caribbean Network I&M Program
Average Monthly Temperature 
(at resource depth)

Historical

2005

Degree C

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

South Florida/Caribbean Network I&M Program
120 permanent transects focused in 6 reef areas

Coral Cover Range
6% - 25%

South Florida/Caribbean Network I&M Program
Episodic Monitoring during - after bleaching event revealed…

90% Coral Cover Bleached
Virgin Islands National Park

Haulover Reef

Coral Cover
Bleached Coral Cover
Disease Mortality
(mean; n=20)

% cover

sq. cm.

Mar-05 Sept. 05 Oct. 05 Nov. 05 Dec. 05 Jan. 06 Feb. 06 Mar. 06

0 5 10 15 20 25 30

300 250 200 150 100 50 0

South Florida/Caribbean Network I&M Program
23% loss
In one Year!

28% loss

48% loss
Teckite - in six months!!

42% loss

South Florida/Caribbean Network I& M Program
South Florida/Caribbean Network I&M Program
Bleaching – Disease connection

August

September

October

November

December

January

South Florida/Caribbean Network I&M Program
Bleaching – Disease connection

2005

2006

Disease

Bleaching
Response of *Acropora palmata* (elkhorn coral) to bleaching in the US Virgin Islands

*Caroline Rogers, Erinn Muller*
*US Geological Survey*
Why is elkhorn coral important?

- Large, complex colonies create the architecture of the reef
- Habitat for high diversity of organisms—fishes, sea turtles
- Proposed for listing as threatened--ESA
Extensive losses from disease and hurricanes—1970s, 1980s
Monthly Monitoring of individual *Acropora palmata* colonies

460+ individual *A. palmata* colonies

4 sites within Virgin Islands National Park

Disease, physical damage, other factors that could limit recovery
First Record of Elkhorn Bleaching--USVI

**Summer/Fall 2005**

- September 8, 2005 - paling of branch tips

- September 28, 2005 - severe bleaching of some colonies
Response of elkhorn coral from St. John study sites
• Diseases have caused more mortality than bleaching at some sites

• Vulnerable to physical damage
Longterm A. palmata monitoring sites
Bleached elkhorn coral, Buck Island Reef National Monument.
Colonies larger than around St. John—Higher mortality
2 Genetically Different Corals

8/29/2005

9/29/2005

11/30/2005
On the Cutting Edge

USGS has developed a new, non-destructive sampling method
Are some genotypes more resistant to bleaching and disease??

Should some reefs have greater protection?
A REGIONAL NOT JUST LOCAL CRISIS

Virgin Islands National Parks and Monuments

Currents, gene flow, connectivity
• Supported by, USGS, NPS, NOAA, UVI, Disney Wildlife Conservation Fund
• Special thanks to Tony Spitzack, Pedro Nieves, Hank Tonnemacher, Ian Lundgren, Barry Devine, Bane Schill, Mark Monaco, Chris Caldow, Iliana Baums, and numerous volunteers