

***Using Climate
Change
Information
to Support
Adaptive Coastal
Conservation***

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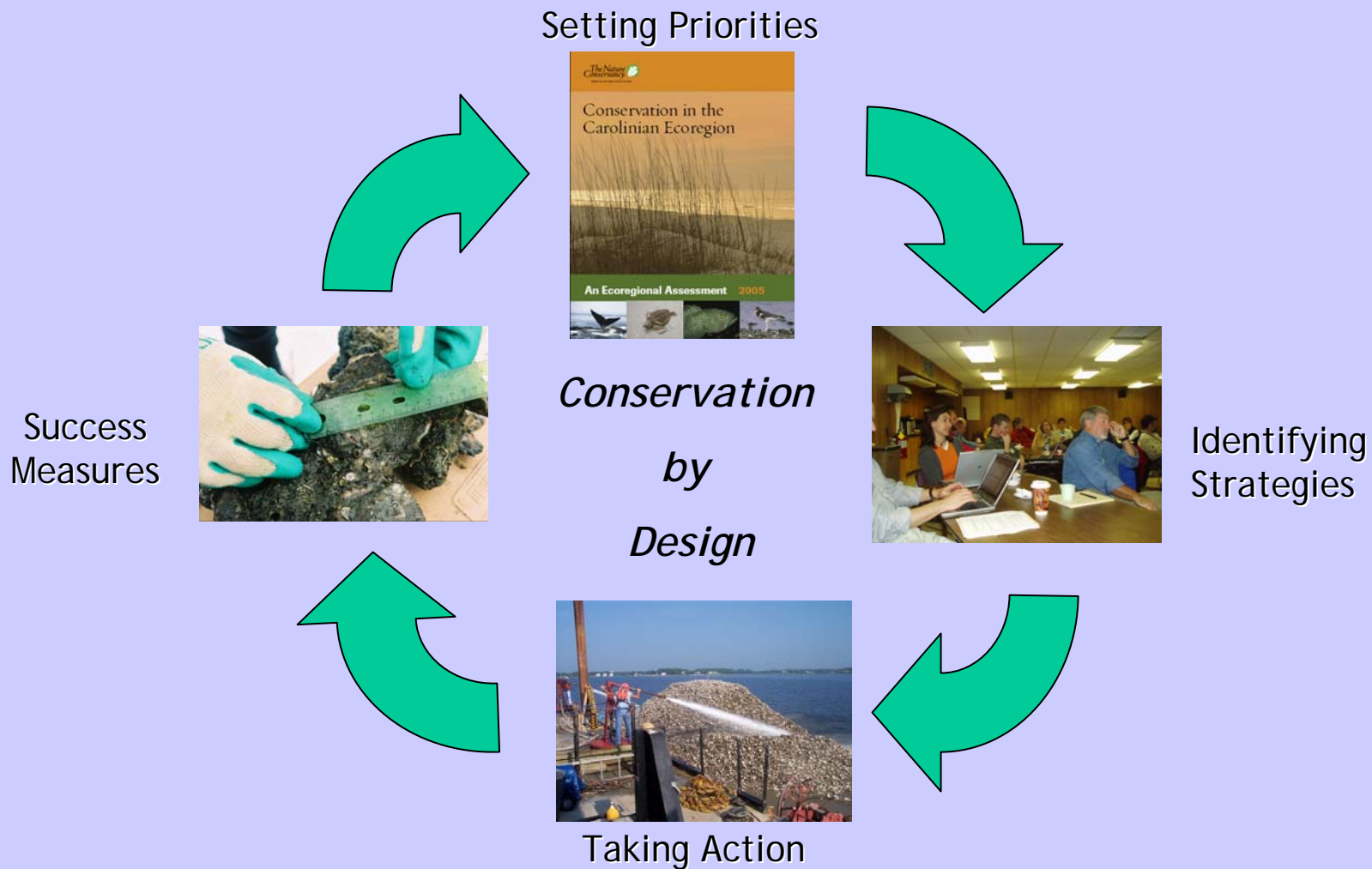
Achieving enduring conservation in a changing world



The mission of The Nature Conservancy is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive.

Our Approach to Conservation

Actions informed by information/results → Adaptive management



Planning and Acting at Multiple Scales

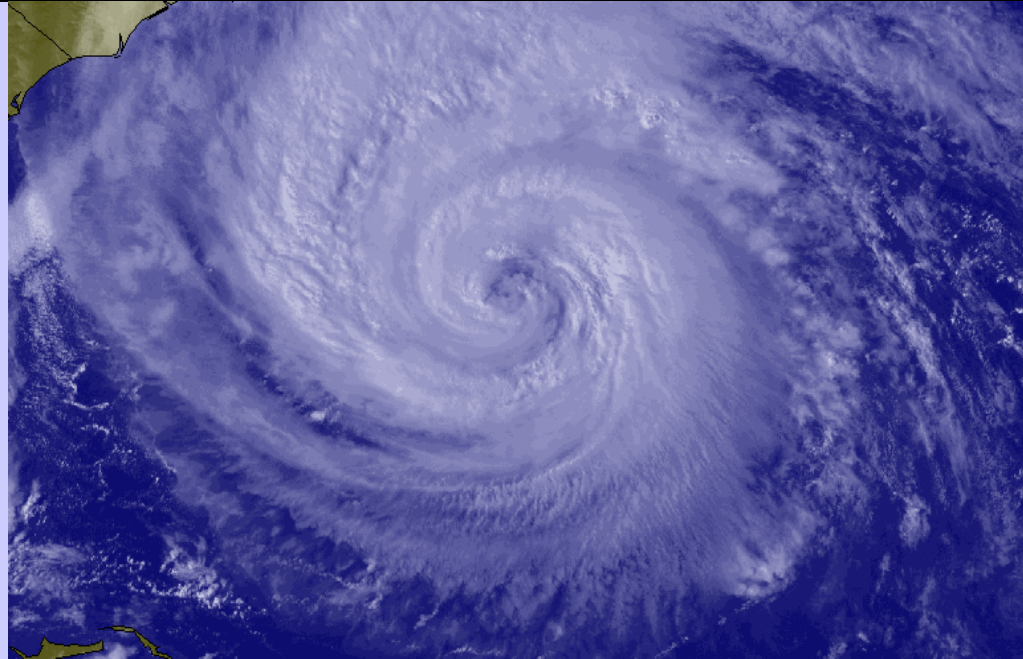


Changing Climate

Adds a new risk factor for

- Conservation Priorities and Portfolio
- Conservation Actions and Strategies

Is not yet incorporated in most of our work



**Rising seas, more storms...
Population shifts & viability...**

There is no steady state in the ocean

Setting Priorities

With partners....

- Identify conservation targets- ecosystems & species
- Collect available information
- Establish conservation goals
- Analyze threats / “costs”
- Use decision-support tool (MARXAN) to set priorities; establish a portfolio of sites

Conservation in the Carolinian Ecoregion

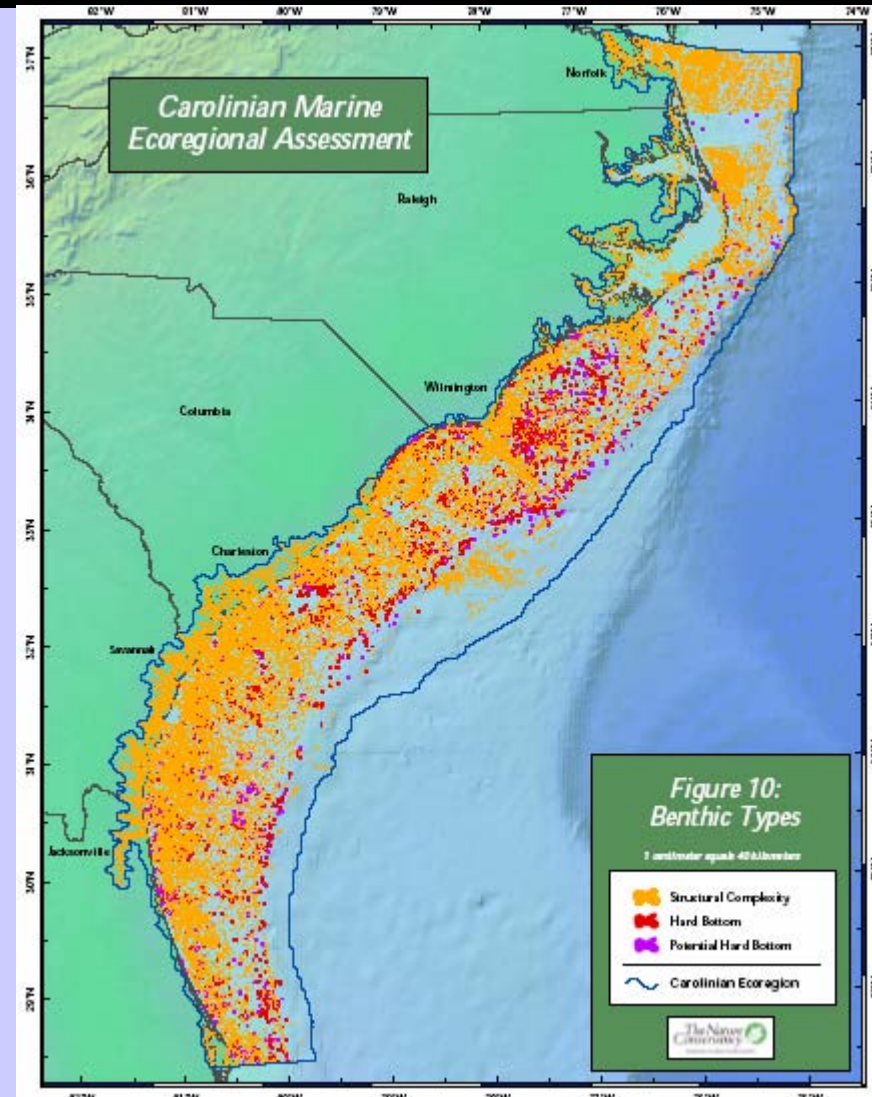
An Ecoregional Assessment 2005



Conservation Targets

36 conservation targets based on today's conditions
examples

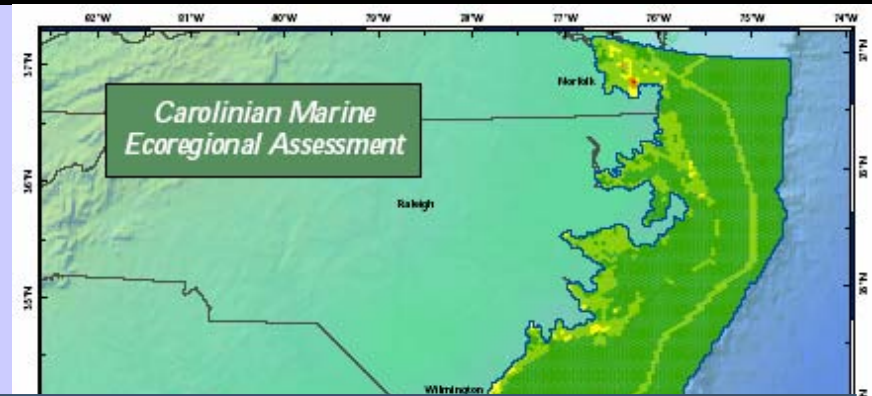
- Salt and brackish marshes
- Oyster reefs
- Seagrasses
- Shoreline types
- Sea turtle nesting beaches
- Shorebird and water bird habitat
- Short-nose sturgeon habitat
- Offshore hard-bottom areas
- Benthic habitat types



Mapped data for 10 “cost factors” to develop a Suitability Index:

- Population growth
- housing density
- road density
- major port facilities
- shipping lanes
- dredged channels
- hardened shorelines
- Superfund sites
- NPDES permits
- dredge disposal sites

No climate related “costs”

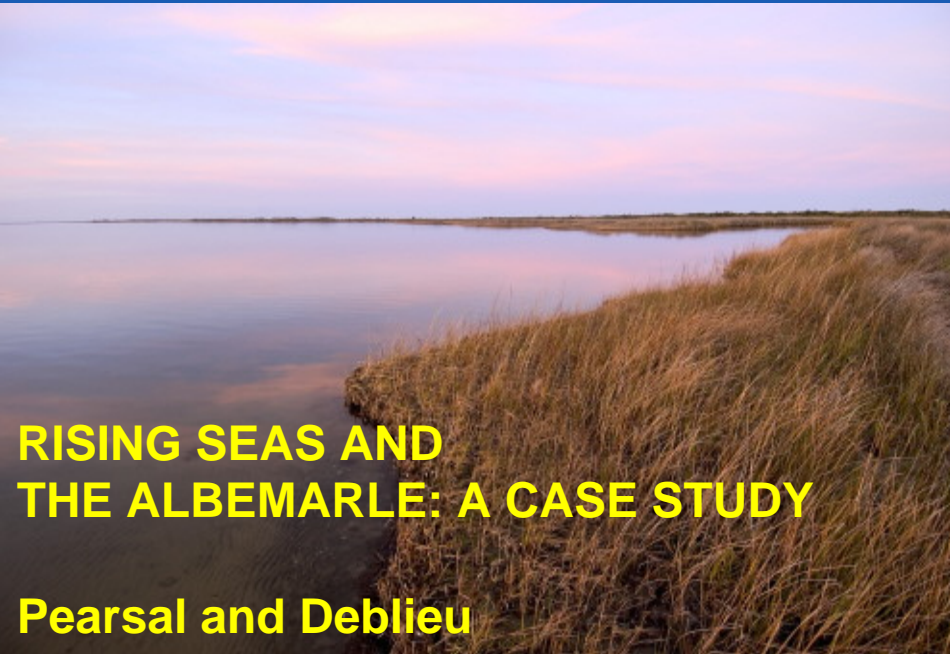


- Spatial **database** of diversity & cost factors
- Objective **decision-support** framework
- **Portfolio** of conservation action areas



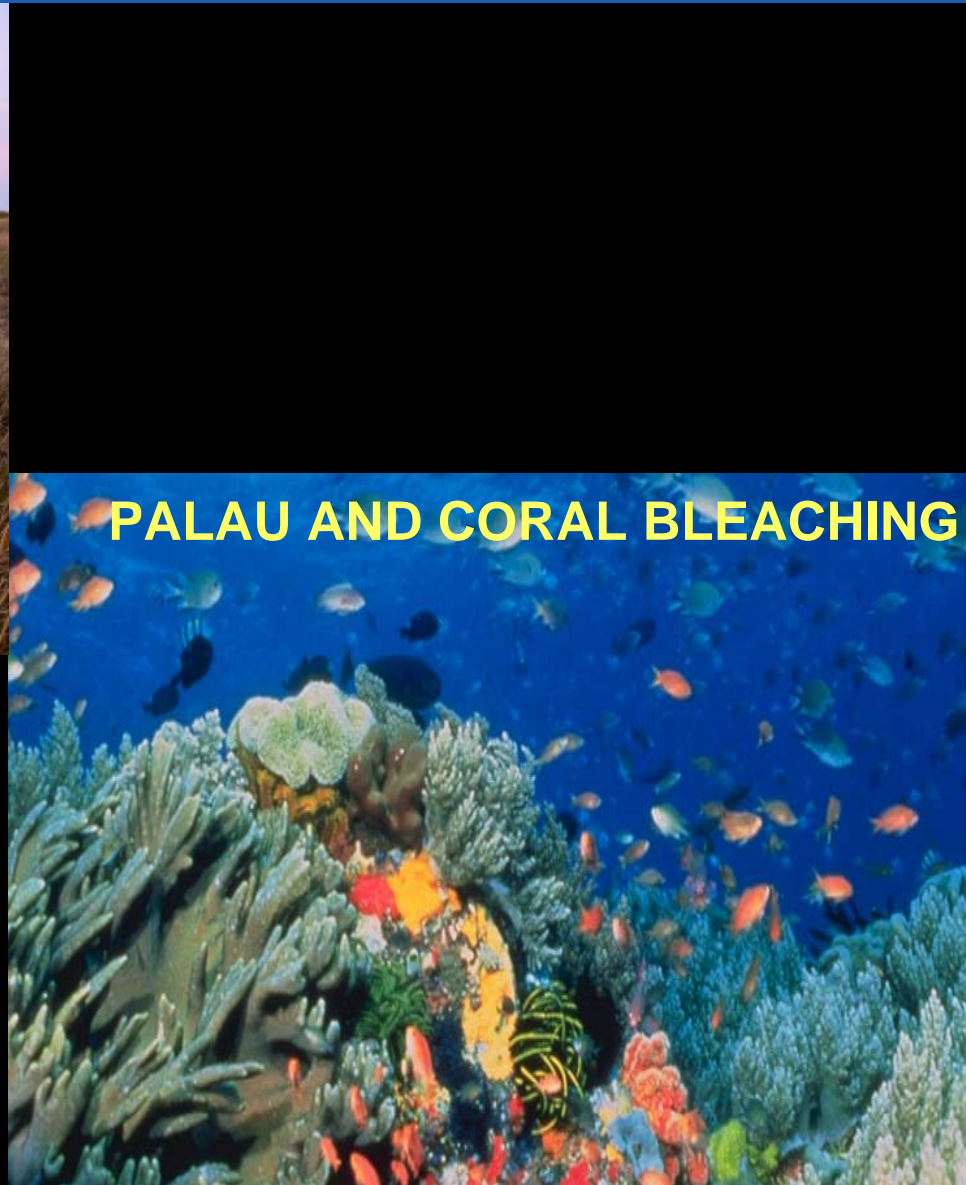
An urgent need to consider potential climate change impacts on the portfolio 10, 20, 50 and 100 years out

Conservation Action



RISING SEAS AND THE ALBEMARLE: A CASE STUDY

Pearsal and Deblieu



PALAU AND CORAL BLEACHING

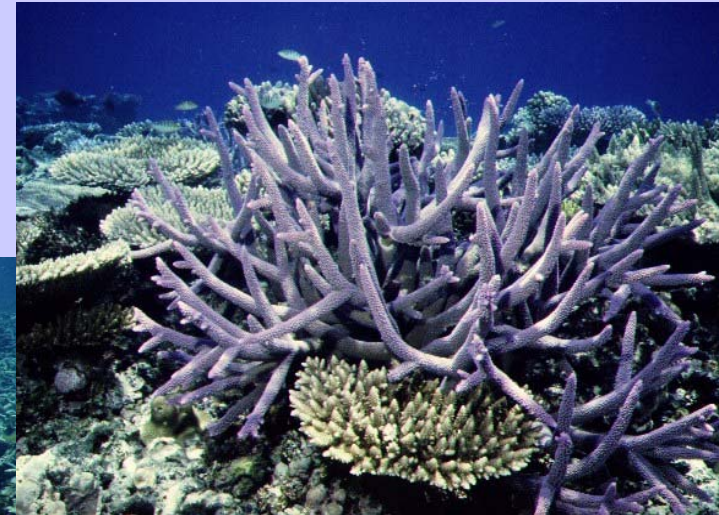
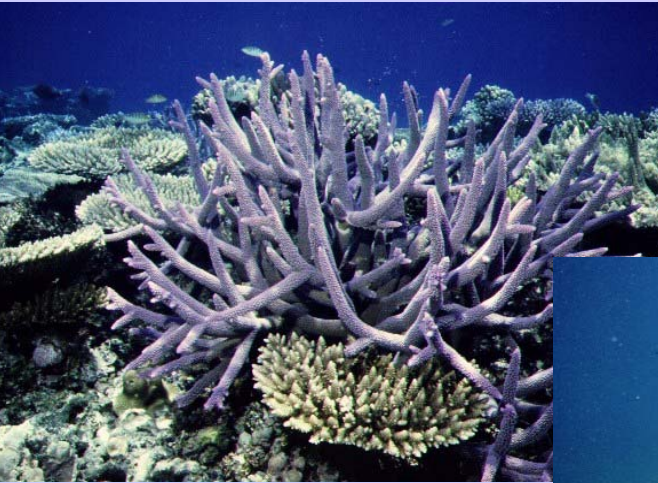
1998 coral bleaching event.  The Nature Conservancy

...a wake-up call



Need to look internationally to address these global threats

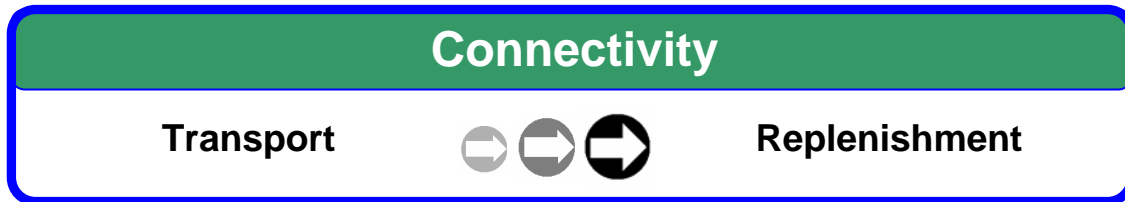
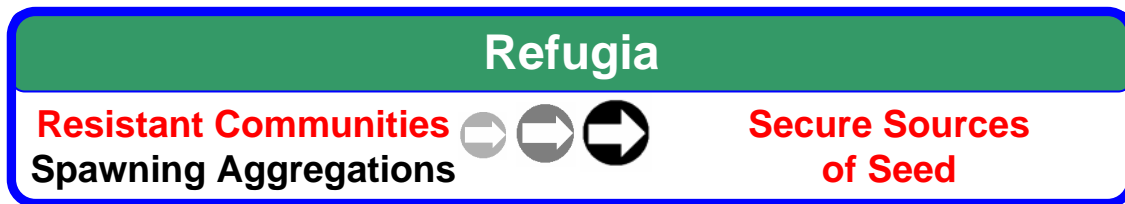
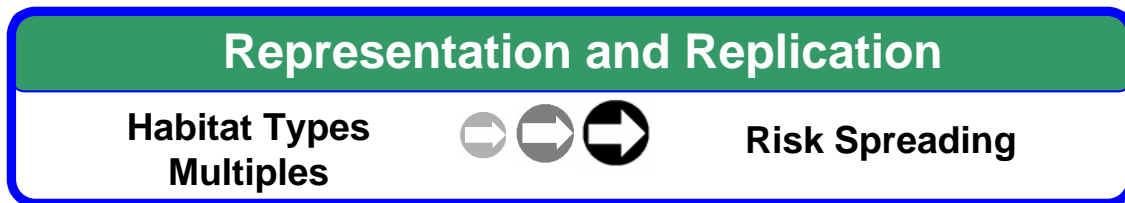
What happens when corals die



Some reefs recover

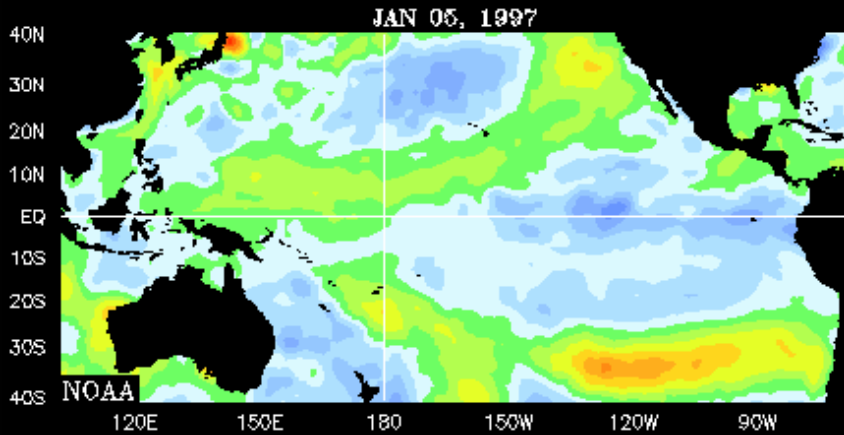
The reef disintegrates: values decrease for shoreline protection, food & livelihoods, recreation & tourism

A Simplified Resilience Model for Coral Reef Ecosystems



RESILIENCE

Factors that help the corals survive a bleaching



Cooling



Screening

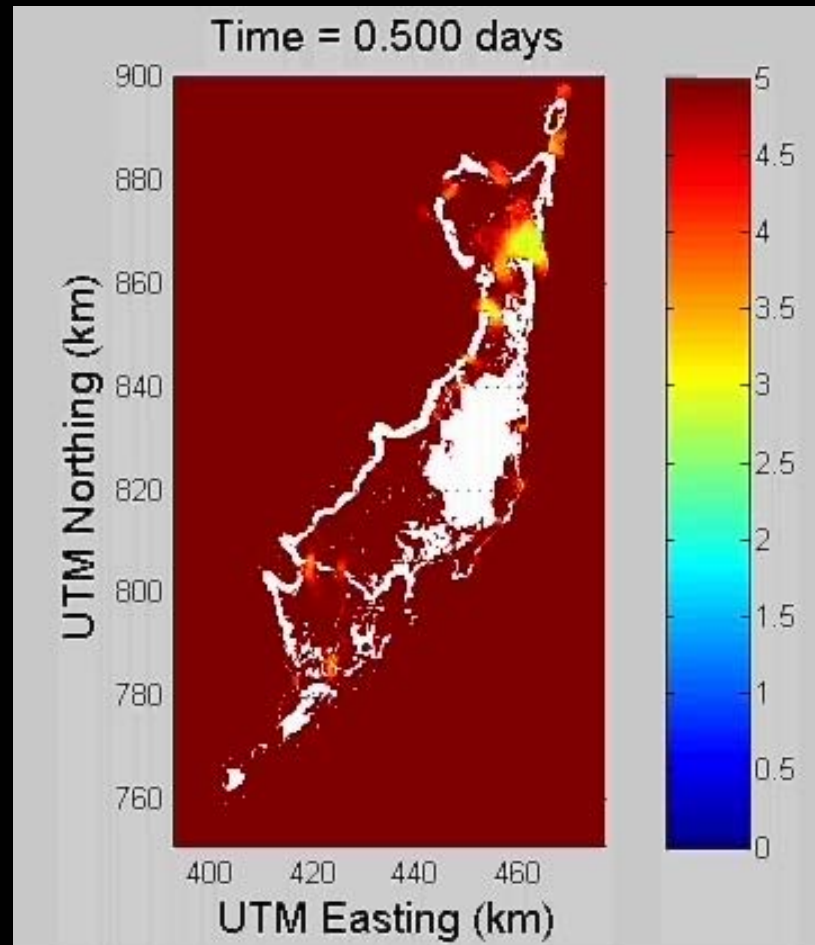


Shading



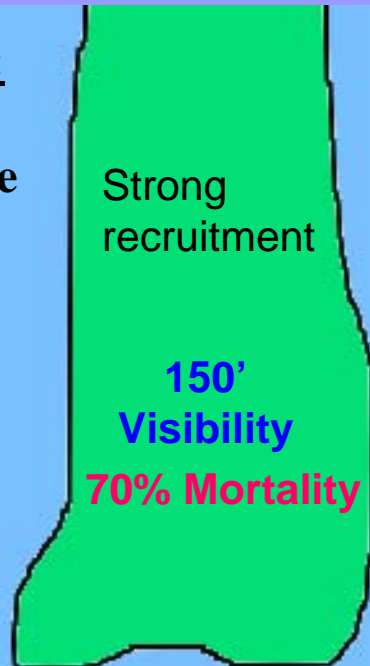
Stress Tolerance

Water temperature modeling



Marine Protected Area design

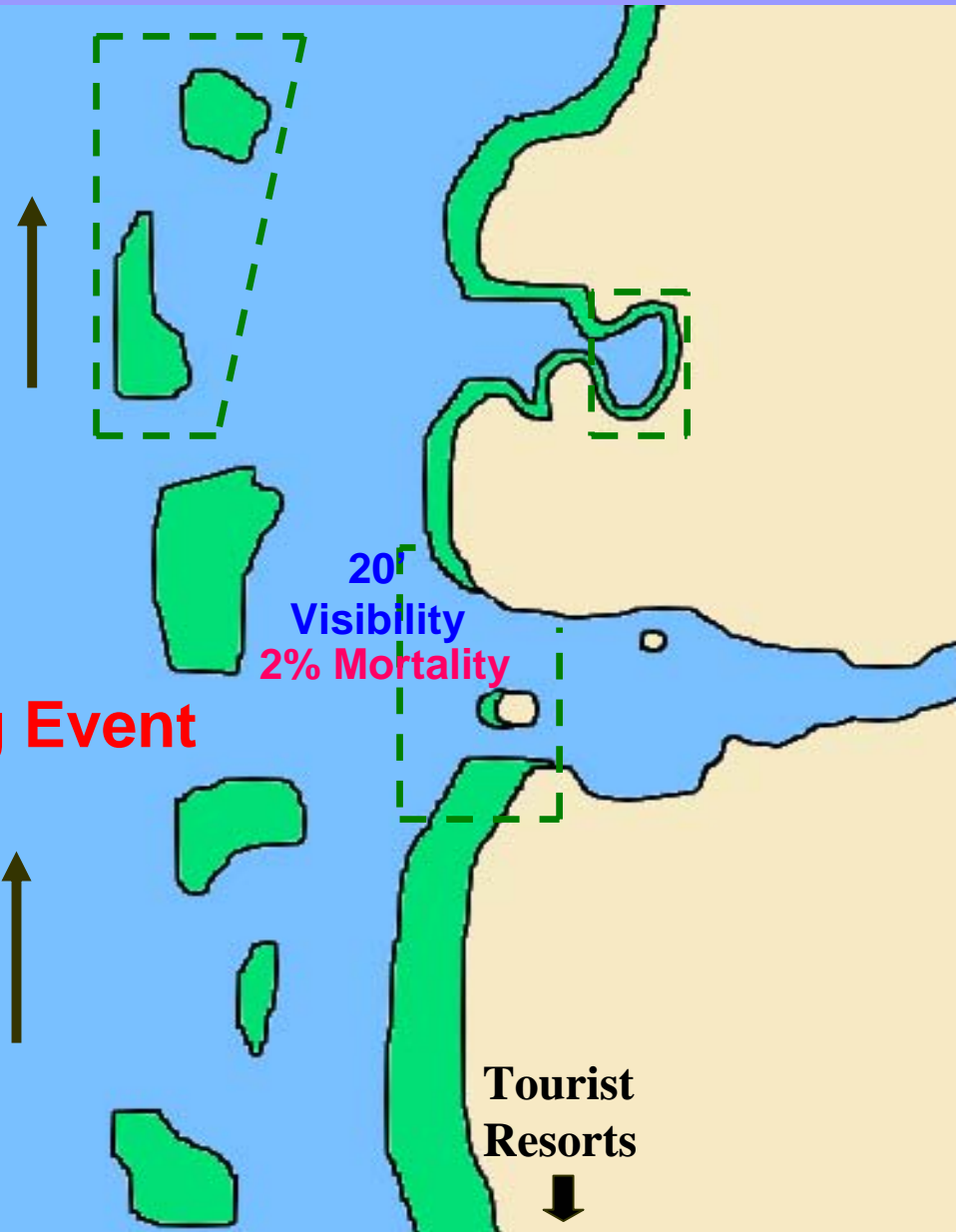
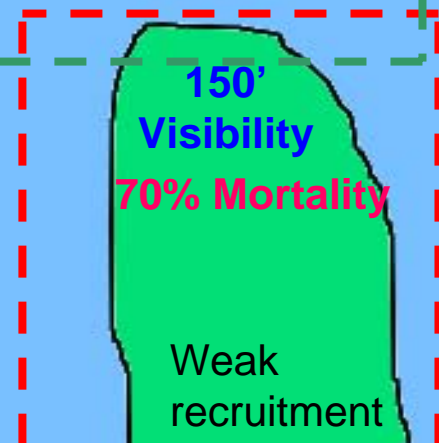
Resilience Criteria:
representation
bleaching resistance
connectivity



1998 Bleaching Event



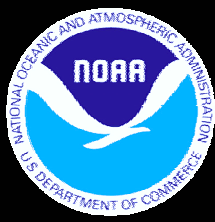
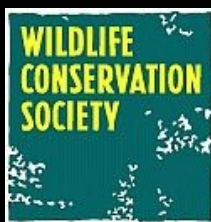
Normal Criteria:
accessible
clear water
scenic
safe
high biodiversity
abundant fishes



Reef Resilience Toolkit



Resilience Partnership



Incorporating Climate Change Information in Marine Conservation

- Increase the climate IQ of conservation practitioners
- Increase focus of climate change science community on conservation implications
- Link climate data collection with biological and physical changes / communicate implications
- Work with practitioners to adapt their tools to incorporate climate change information
- Develop / learn from adaptation demonstration projects in multiple coastal /