Estimating Bleaching Severity

Why do we need to measure bleaching?

1. To make timely and effective management decisions

2. To communicate/educate

3. To answer questions from stakeholders, media, government, concerned public…..

   "How bad is it?"
   "What are the impacts to the reef?
   "What will it mean for the local stakeholder community?"

Bleaching is Variable

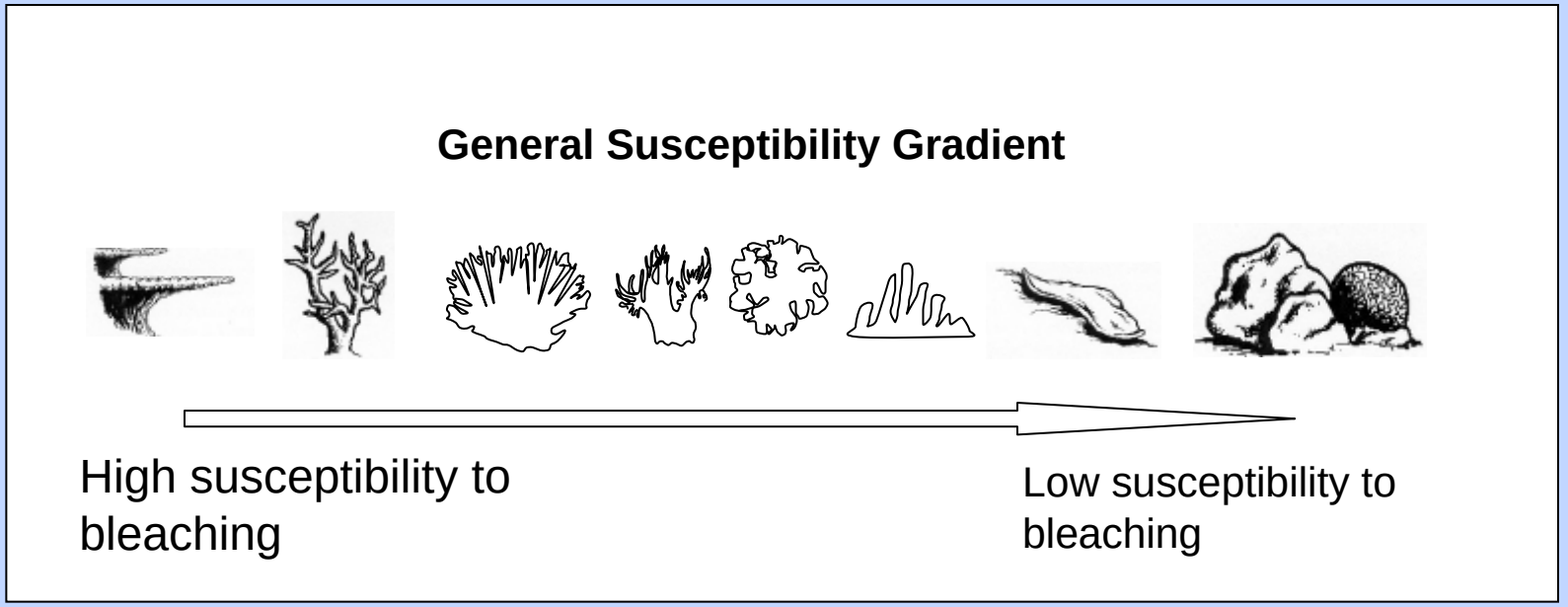
- Bleaching varies at all scales
  (regions, reefs, sites, species, colonies)

- Numerous sources of variation
  (exposure, depth, location, etc.)

- History
  - Acclimatization
  - Shift towards resistant species

M. Johnson

Corals show different susceptibilities



- Species vary in susceptibility
- Broad pattern of resistance
- Taxonomic patterns are diagnostic

Bleached coral: distinguishing characteristics

Porites

L. Benvenuti

<u>Current bleaching</u>

- Coral tissue still present/alive
- Pale, fluorescent or completely white appearance
- Areas of pale/white tissue across exposed parts of whole colony (rather than starting from tips or base)
- Numerous colonies over large reef area

<u>Previous bleaching: harder to distinguish</u>

- May be due to other factors (salinity, freshwater, etc.)

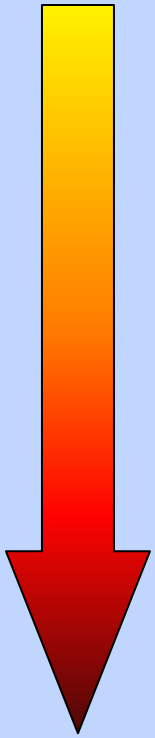
S. Siderea

R. Ginsberg

Recognizing the severity/degree of bleaching

Low

Bleaching Severity

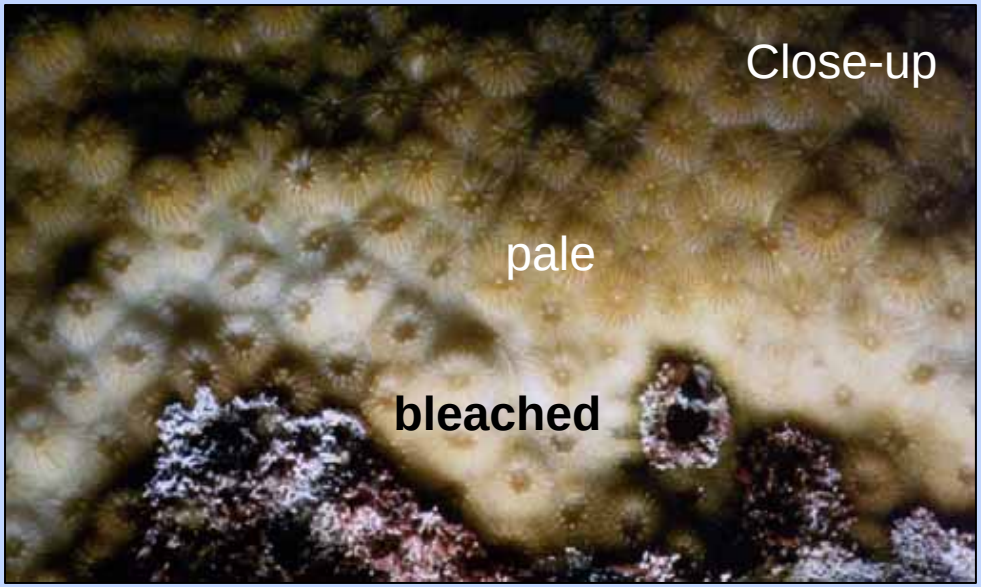


High

- **Pale** (discoloration of coral tissue)
- **Partially Bleached** (patches of fully bleached or white tissue
- **Bleached** (tissue is totally white, no zooxanthellae visible)

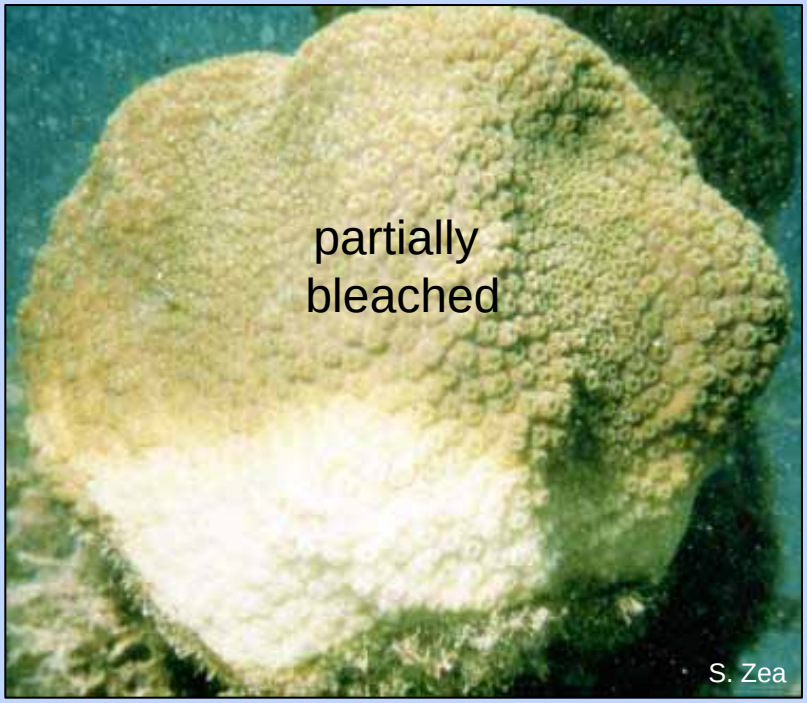
Paling

Polyps that have either just started to bleach or are recovering from bleaching.



Partially bleached

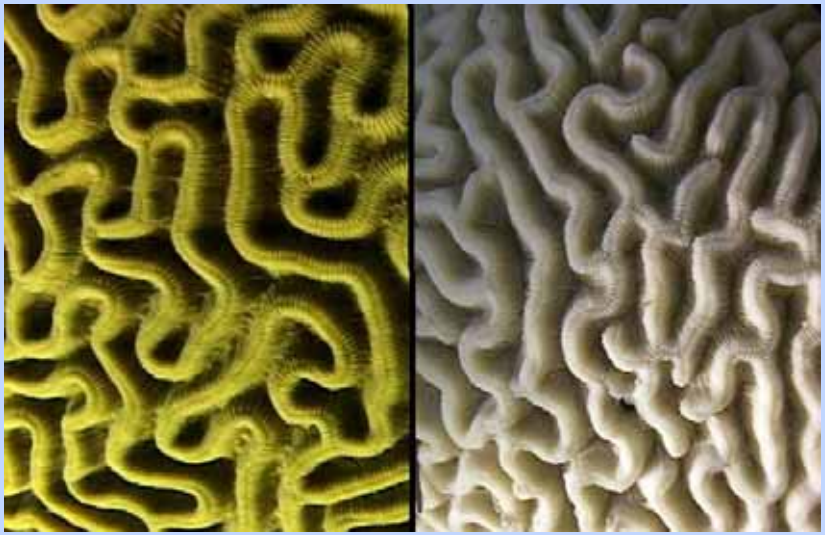
- Patches of fully bleached or white tissue



Partially bleached *Montastraea faveolata*

Fully Bleached

- Tissue is totally white, no zooxanthellae visible



Healthy vs. Bleached

Fully Bleached (Pastel)

- Some bleached corals glow pale, purple, pink,or blue!

Partially Bleached

Fully Bleached

Siderastrea siderea