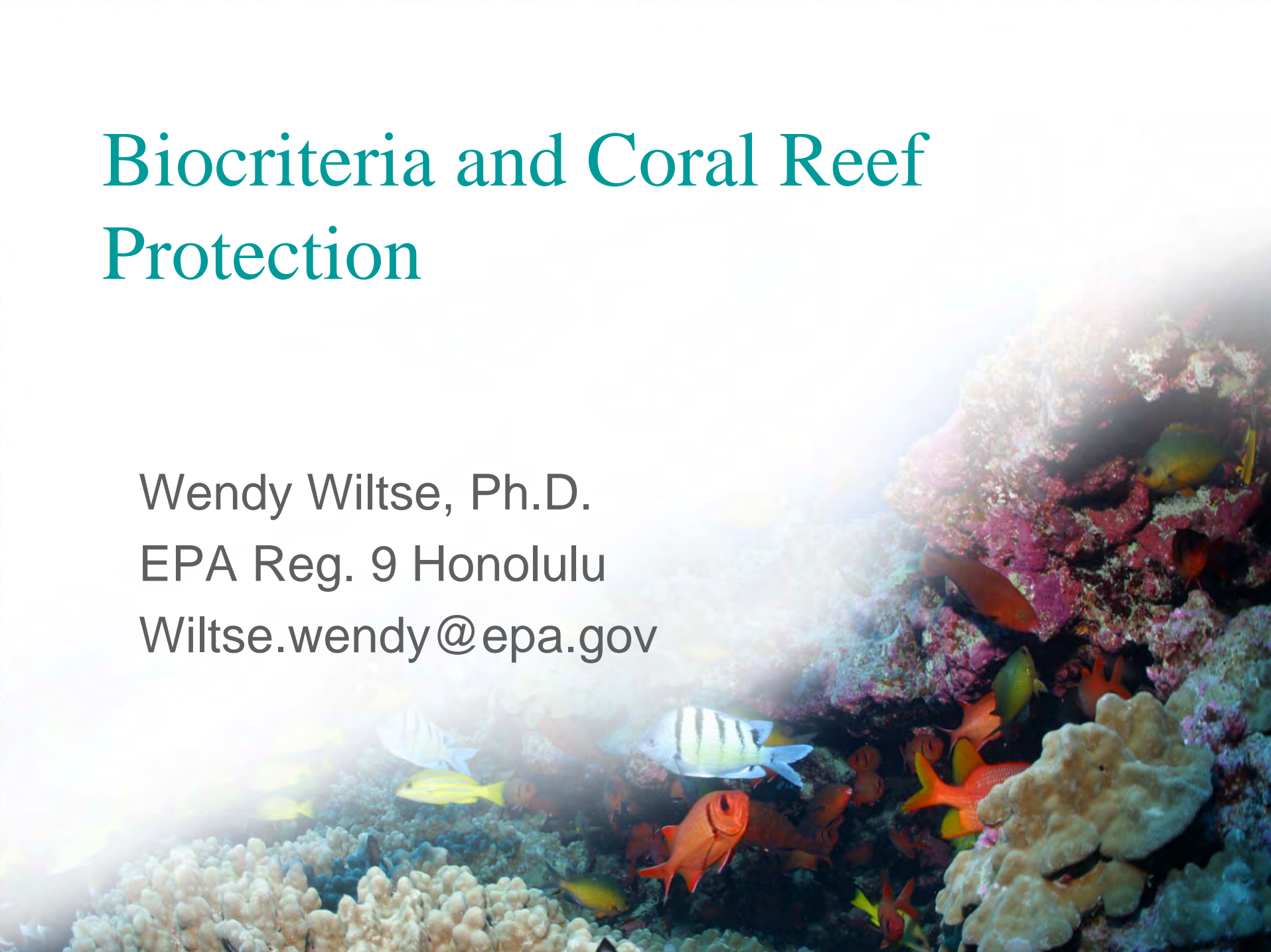
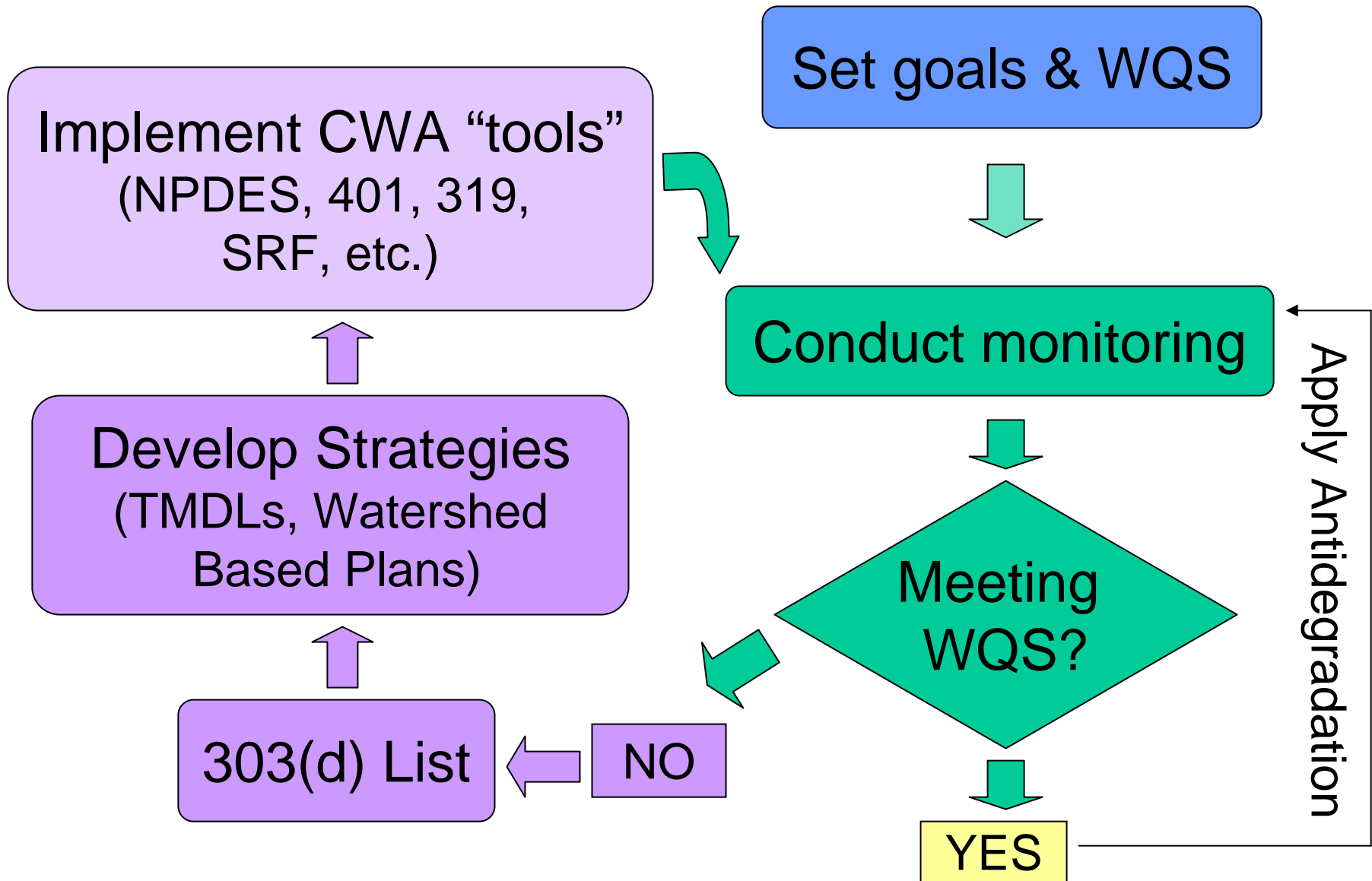


# Biocriteria and Coral Reef Protection

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# Clean Water Act



# WQS are not directly enforceable

If WQS exceeded, state is obligated to:

- List water on 303(d)
- Develop TMDL
- Write wq based permit limits

NPDES permittee not liable if meeting limits

NPS only enforceable with CZARA



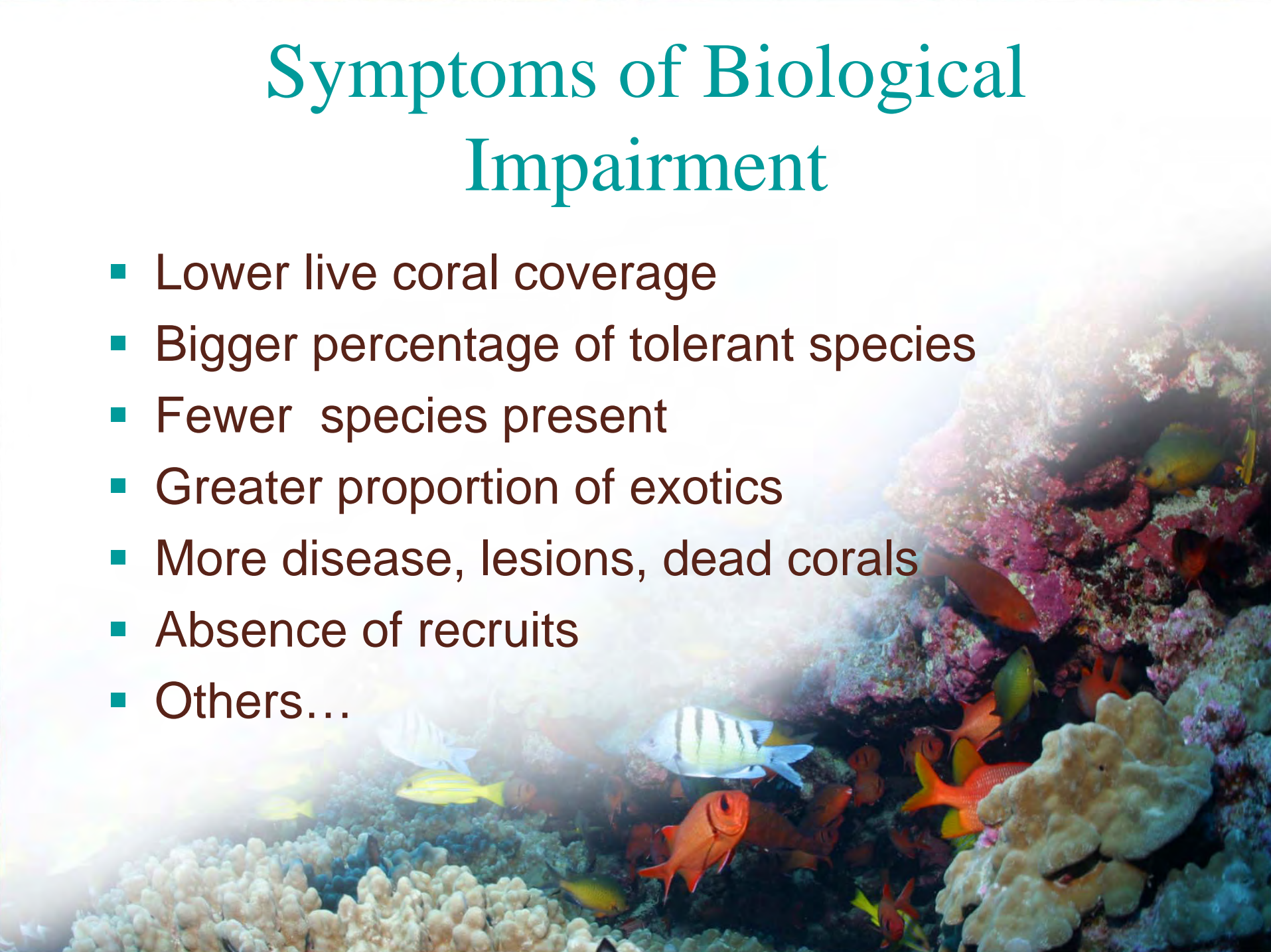
# Can require bioassessments & determination of compliance with biocriteria in...

- NPDES permits (E)
- 404 permits & mitigation plans (E)
- 401 certifications (E)
- Dredging and ocean dumping permits (E)
- Permits for coastal development (?)
- EISs
- Monitoring plans for 319 projects



# Symptoms of Biological Impairment

- Lower live coral coverage
- Bigger percentage of tolerant species
- Fewer species present
- Greater proportion of exotics
- More disease, lesions, dead corals
- Absence of recruits
- Others...



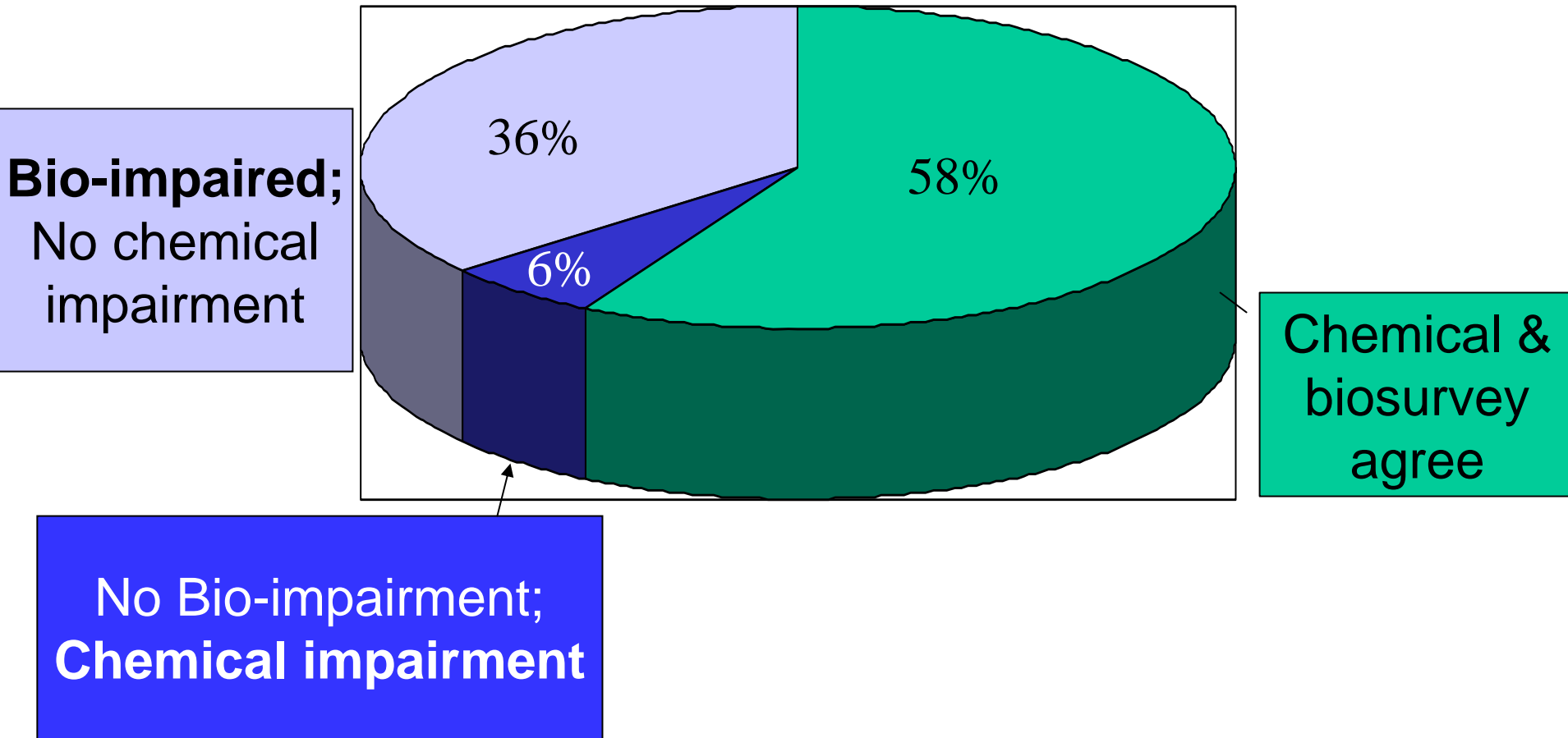
# Uses of biocriteria & bioassessment data

- Identify impaired waters/ecosystems
- Identify stressors
- Impact assessment
- Watershed and ecosystem management
- Mitigation and restoration
- Support enforcement



# Identify impaired waters/ecosystems

Ohio biosurvey results for streams & lakes



# Identify stressors & events

- **Species respond differently to stressors**
- **Metrics reflect gradients of response**
- **Size class distribution reflects timing**



# Impact assessment

Consistent & objective method for measuring extent & severity of impacts

- Spills and vessel groundings
- Dredging
- NPDES discharges
- New development
- Fill and habitat alteration

Uses of biocriteria and bioassessment data

## Mitigation & Restoration

- Prioritize areas for protection
- Characterize the quality and quantity of a resource impacted or lost
- Set performance standards for restoration & mitigation
- Objective measures of recovery

# Watershed & ecosystem management

- Link coral biocriteria with bioassessments/ biocriteria for streams and wetlands
- Distinguish habitat quality and water quality
- Set priorities

Uses of biocriteria and bioassessment data



# Support enforcement

- Measure biological response to spills, runoff events, etc. using accepted protocols
- Determine extent & severity of impact
- Measure rate of recovery
- Compare with broad database and regulatory guidelines

# Biological Criteria for Coral Reefs

- Bioassessment methods
- Definition of coral reef
- Beneficial uses of coral reefs in WQS
  - Fishable/swimmable, marine preserve, etc.
- Narrative criteria
  - Free-from..
- Numeric biocriteria

A Living Reef Gives  
Our Islands Life

