



Climate Change Adaptation 101

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Adaptation – Why?

- Impacts already happening in both human & natural systems
- Future impacts are inevitable – even if emissions were stopped today.
- Therefore we have to start planning for impacts we see today and those that will be upon us in the future



CC Adaptation – What is it?

- Adaptation is *not* a new concept, but not well understood with respect to climate change
- Rate and magnitude at which the climate is changing has put us up against new challenges that require us to redefine adaptation



CC Adaptation – Definition

- “Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities”

(IPCC, 2007)



CC Adaptation – Definition

- anything that increases a community's ability to remain intact and functional in the face of climate change
 - Mindset Shift –
 - recognize systems are dynamic (spatial & temporal)
 - recognize cross-discipline needs (e.g. human and ecological)



Key Associated Concepts

- Resilience
- Vulnerability



Resilience

- Definition:
 - ability to recover from change (elastic band)
 - not to be confused with resistance – ability to withstand change
- What is the relationship between Adaptation & Resilience?



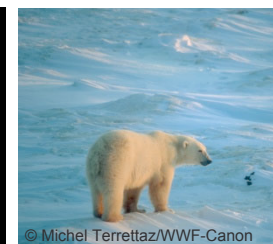
Resilience & Adaptation

- Adaptation is a broad suite of actions to limit vulnerability
- Resilience-based Adaptation
 - Uses actions that reduce vulnerability through building resilience
 - Aimed at enabling the *continued* provision of goods and services
 - Alone may not be enough



Vulnerability

- Definition:
 - Measure of the susceptibility to harm a system in response to a stimulus or stimuli
- Related to exposure & sensitivity to climate risk and the adaptive capacity to deal with that risk
- Helps to identify adaptation needs



Vulnerability

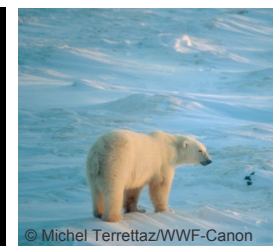
- Adaptive Capacity

- Recognizes the importance of non-climate factors (resource accessibility, cumulative effects, knowledge etc.)
- Recognizes the need for both social, economic, and environmental information
- Can be constrained by forces beyond community level (e.g. political decisions)



Group Activity

From Impacts to Adaptations



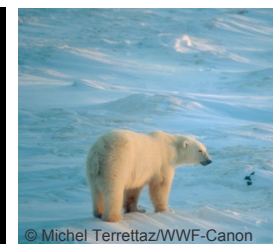
Adaptation Planning Frameworks:

Choosing among adaptations and developing a plan of action



Flip Charts

Adaptive Management
Vulnerability Assessment
Risk Assessment



Value-based Adaptation

Building an adaptation plan to climate change revolves around two key questions:

1. How vulnerable are the “values” (be it food security, ecosystems, species, social structures, etc.) that we care about to climate change? [i.e. a type of *vulnerability assessment*]
2. What can we do to limit or reduce vulnerability? [*adaptation planning*]

Two basic approaches: Top Down and Bottom Up



TOP-DOWN APPROACH TO VULNERABILITY ANALYSIS

IDENTIFY PHYSICAL CHANGES

What changes in climate, currents, sea level, water chemistry, stratification, etc. are predicted for my region?



IDENTIFY IMPACTS

What **ecological** effects are likely to result from these changes (e.g. range changes, timing of seasonal events, species interactions, etc.)?
What **cultural, economic, and subsistence** effects are likely to result from these changes?



PRIORITIZE VULNERABILITIES

What key ecological/social/economic/cultural structures and processes are at



How will ecoregional conservation priorities be affected?

Sample top-down approach

Predicted Change:

Extreme rainfall events become more common

Ecological Effects:

Increased soil erosion

Increased sedimentation of reefs, mangroves, sea turtle nests

River organisms stressed by extreme currents, turbidity

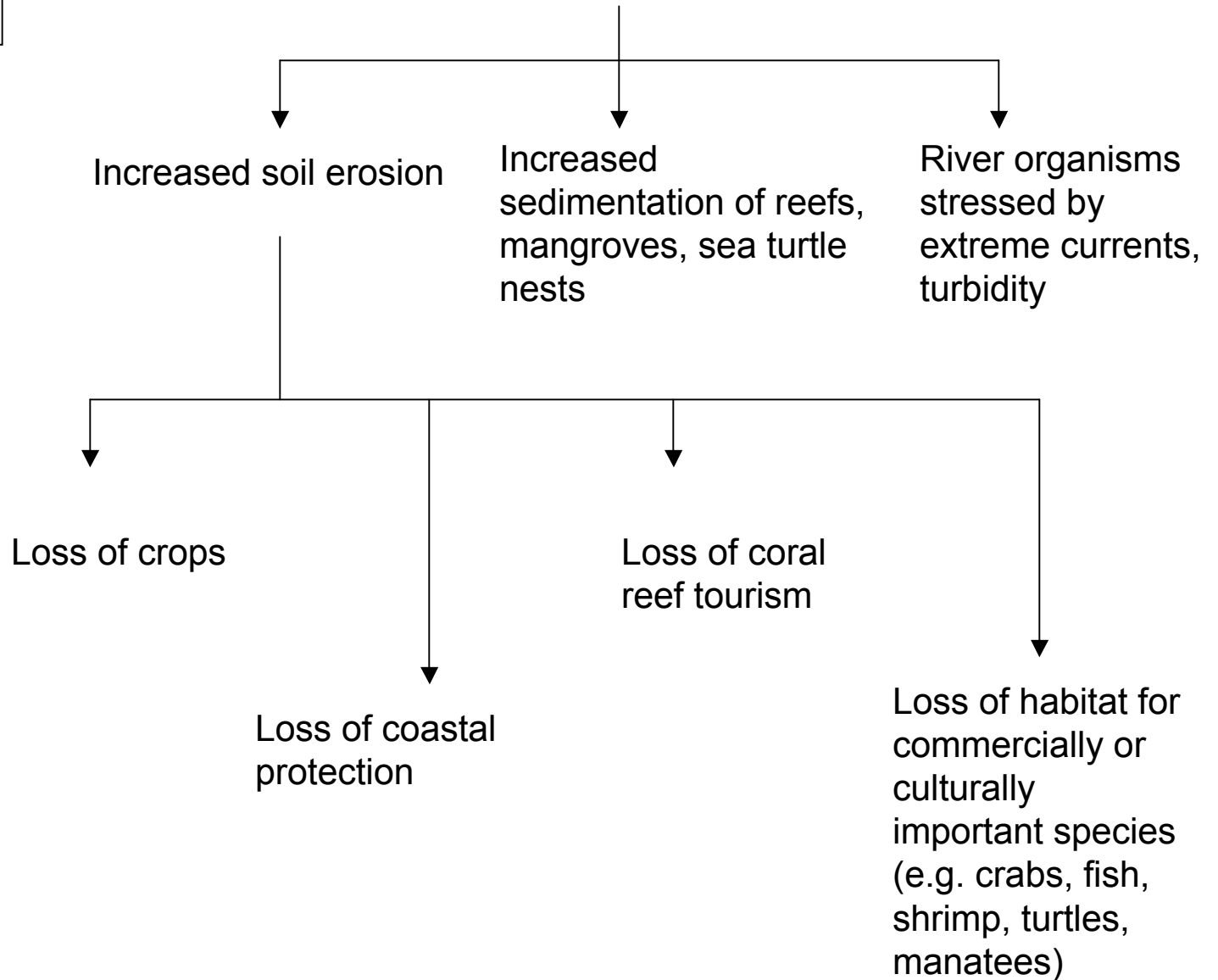
Human Community Effects:

Loss of crops

Loss of coastal protection

Loss of coral reef tourism

Loss of habitat for commercially or culturally important species (e.g. crabs, fish, shrimp, turtles, manatees)



BOTTOM-UP APPROACH TO VULNERABILITY ANALYSIS

IDENTIFY PHYSICAL CHANGES

What climatic changes are predicted for the region in question?
How will these affect the key structures, processes, and priorities?
What will my protected area, farm, etc. look like in 50 years?



IDENTIFY CLIMATIC INFLUENCES

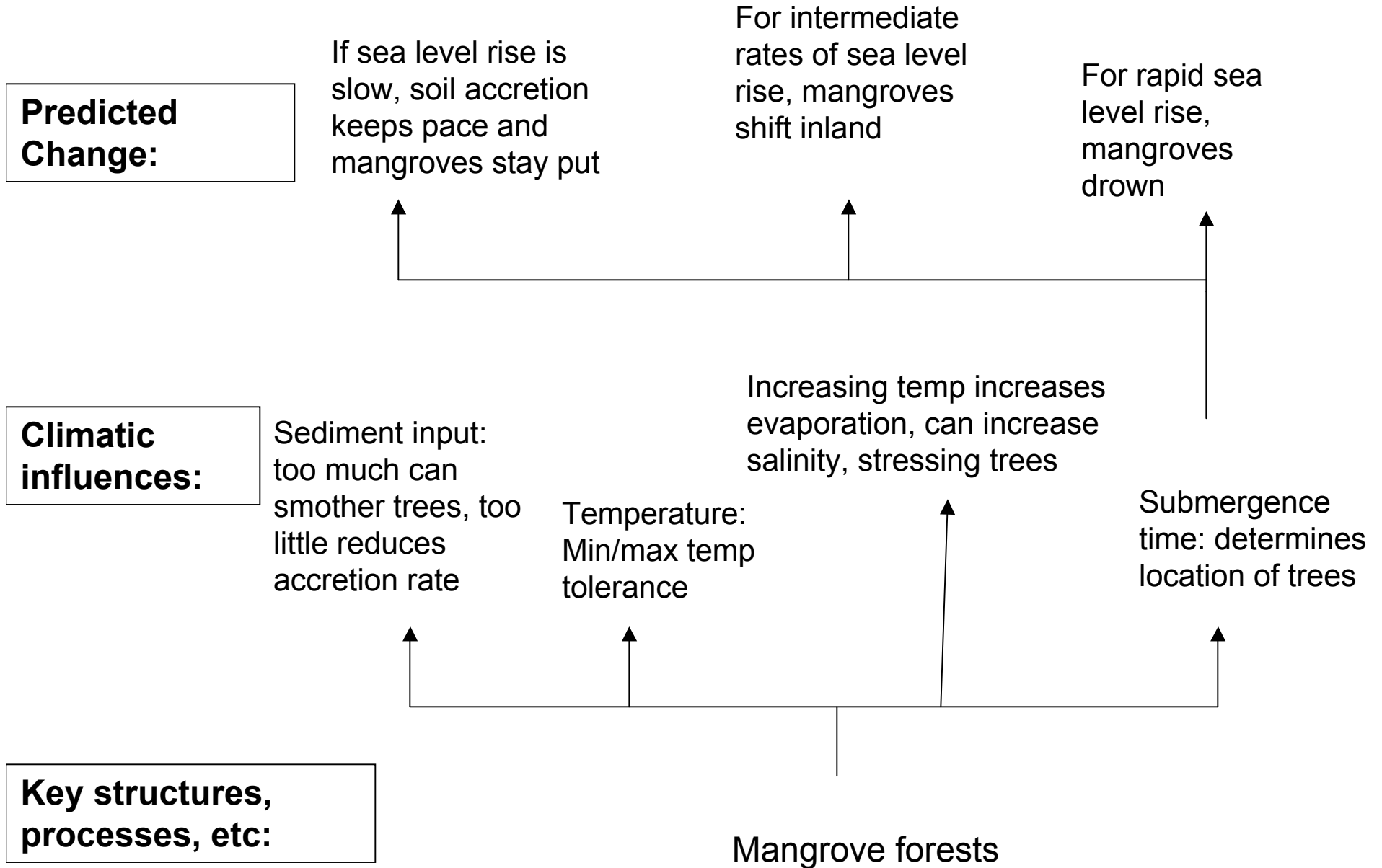
How do climatic forces influence these key species, structures, processes, priorities, etc.?



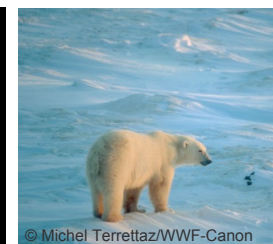
IDENTIFY KEY STRUCTURES AND PROCESSES

What variables (ecological/social/economic/cultural) are critical to ecosystem or community function?
What conservation priorities have been identified for the ecoregion?

Sample bottom-up approach



Adding in a few complicating factors:
Climate change is not happening in a
vacuum



TOP-DOWN APPROACH TO VULNERABILITY ANALYSIS, INCLUDING INTERACTIVE EFFECTS

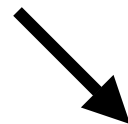
IDENTIFY KEY NON-CLIMATE STRESSORS

What non-climate stressors (e.g. pollution, conflict over water use, war, etc.) will be made worse by climate change? Will make climate change effects worse?



IDENTIFY INTERACTIONS BETWEEN CLIMATE AND NON-CLIMATE STRESSORS

How will predicted changes influence non-climate stressors and vice versa (e.g. increased toxicity of pollutants, increased demand for fresh water)?



IDENTIFY KEY VULNERABILITIES

What structures/processes are most likely to be affected?
What structures/processes are most important for ecological and human communities?

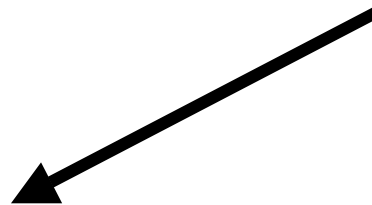
IDENTIFY PHYSICAL CHANGES

What climatic changes are predicted for the region in question?



IDENTIFY IMPACTS

What **ecological** effects are likely to result from these changes?
How will climatic and ecological changes affect **human communities**?



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IDENTIFY PHYSICAL CHANGES

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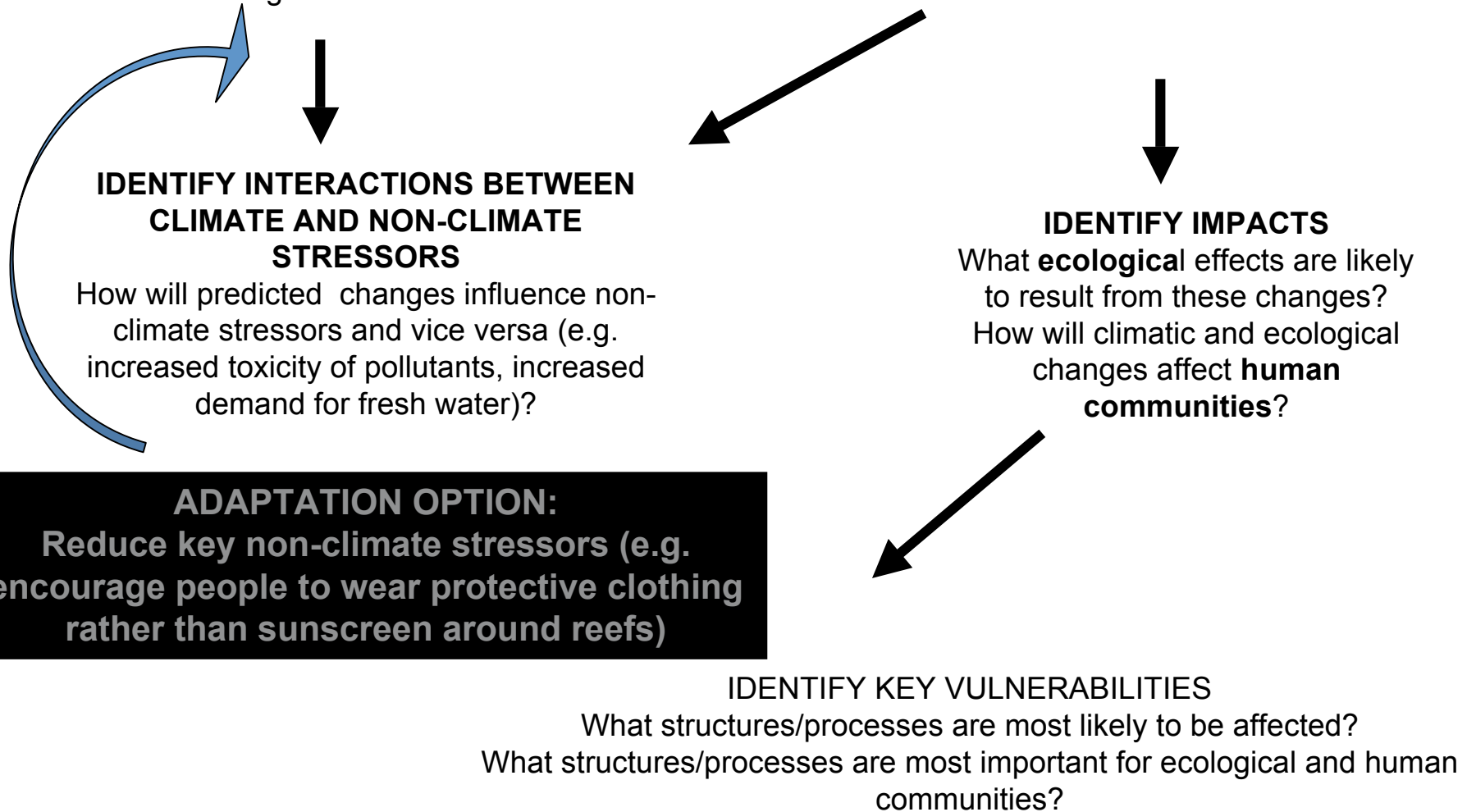
What **ecological** effects are likely to result from these changes? How will climatic and ecological changes affect **human communities**?

ADAPTATION OPTION:

Reduce key non-climate stressors (e.g. encourage people to wear protective clothing rather than sunscreen around reefs)

IDENTIFY KEY VULNERABILITIES

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What structures/processes are most important for ecological and human communities?



Two things to remember about *why* to do adaptation:

- Climate change is happening right now & impacts will continue into the future
- Failing to address climate change means your investments & values are more vulnerable



Three things to remember about *how to do adaptation:*

- Adaptation is not rocket science (but it does require a thoughtful approach, as it can be complex)
- Context matters
 - Ecological, Political, Sociocultural, Organizational
- YOU are an expert on your region
 - Combine available data and models with your understanding of how things work where you are

