EcoAdapt's Climate Vulnerability Assessment Cheat Sheet

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$$V = E + S - AC$$

Vulnerability (V) to climate change reflects:

> *Exposure (E)*: how much change occurs, including changes outside the project area that affect the target (e.g. loss of glaciers→loss of water supply)

> *Sensitivity (S)*: how much the target is affected by a given amount of change

> *Adaptive capacity (AC)*: ability to adapt to change; reflects intrinsic traits (e.g. phenotypic plasticity of individuals, species diversity of communities) or extrinsic factors (e.g. degree of habitat fragmentation)

From Glick and Stein 2011
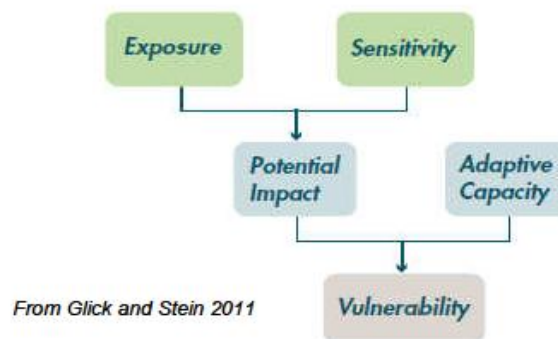
Your vulnerability assessment goal affects how you do the assessment (e.g. audience, target, spatial and temporal scale, products). Some possible targets/objectives of a vulnerability assessment include:

1. Informing whether or not to <u>list a species</u> under Endangered Species Act

2. Setting <u>acquisition priorities</u> for agency, land trust, etc.

3. Developing <u>management plan</u> for a park, reserve, or other management unit

4. Deciding which management measures to use for a <u>restoration</u> project

OPTIONS FOR DECREASING VULNERABILITY OF A SPECIES OR A SYSTEM

1. Decreasing EXPOSURE
2. Decreasing SENSITIVITY
3. Increasing ADAPTIVE CAPACITY

1. **Examples of decreasing EXPOSURE**
   - **Reducing greenhouse gas emission to reduce rate and extent of global change**
   - **Restoring wetlands to limit increases in drought and flooding**
   - **Replanting riparian vegetation to limit in-stream water temperature increases**
   - **Increasing use of permeable pavements and other low-impact approaches to decrease runoff/increase groundwater recharge, which limits increases in drought and flooding**

2. **Examples of decreasing SENSITIVITY**
   - **Reducing or limiting levels of pollutants that increase temperature sensitivity**
   - **In restoration projects, replanting with a mix of species that can cope with a range of climatic conditions**
   - **Breeding or supporting the evolution of tolerance for likely future conditions in key populations of plants and animals**
   - **Anticipating and preventing (e.g. through programs to increase efficiency of water use by farms or municipalities) increased demands on resources by people as a result of climate change**

3. **Examples of increasing ADAPTIVE CAPACITY:**
   - **Making sure populations of plants and animals are healthy enough and genetically diverse enough that they can adapt evolutionary to changing conditions**
   - **Supporting connections across the landscape and between different populations to support recovery from adverse events in part of a species' range**
   - **Focusing protection efforts on areas with many climatic microhabitats**
   - **Increasing land- or seascape connectivity to support species range shifts**