Introduction to Adaptation Strategies
Jessi Kershner
Adaptation Planning Process

1. Phase 1: Explore, Define, and Initiate
2. Phase 2: Assess Vulnerability
3. Phase 3: Define Adaptation Framework & Strategies
4. Phase 4: Implement, Monitor, Evaluate, & Adjust
Current/same activities
- Educate public on water conservation

Modifications to current activities
- Plant drought-tolerant vegetation around county buildings

New/different activities
- Assess potential climate change-induced population migration within and to the county

Modified from Swanston et al. 2017
Adaptation reflects the **intentional** consideration of climate change... *but* activities are not always different.
Adaptation strategies aim to reduce the negative effects or take advantage of the opportunities provided by climate change.

Adaptation strategies can reduce the vulnerability and/or increase the resilience of human, built, and natural systems to climate change.

General types of adaptation activities:
- Programmatic
- Plans, regulations, policies
- Capital improvement/infrastructure projects
- Knowledge/evaluation
- Coordination/collaboration
Strategies aimed at creating new or expanding existing programs, activities, or initiatives

Examples:

- Integrate climate into health programs and create a website that details health risks exacerbated by climate change and provides information that helps residents prepare for and respond to impacts
- Create Community Emergency Response Team training and offer ongoing training to residents to improve local hazard preparedness, response, and recovery
- Develop low-income energy programs
- Establish a shuttle system to cooling centers
Strategies aimed at developing or revising policies, plans, regulations, or guidelines

Examples:
- Increase parks in underserved areas
- Provide backup power for cooling centers
- Create hazard recovery plans and prioritize restoration of vital facilities and assets
- Take regular inventory of emergency facility needs (e.g., cooling centers, temporary shelters)
Strategies designed to address physical and functional deficiencies or needs in the built and natural environment

**Examples:**

- Construct water storage facilities and install efficient plumbing fixtures and equipment in buildings to conserve water
- Use green infrastructure for stormwater management
- Install heat-reducing roof
- Update emergency services communications equipment
Strategies that aim to gather information about climate changes, impacts, and/or management effectiveness

- May be a precursor to implementing another type of strategy

**Examples:**

- Assess and improve the adaptive capacity of people who are most vulnerable to climate change-exacerbated hazards (e.g., homeless, elderly, those living in high-risk areas or working in high-risk situations)
- Explore feasibility of supply side diversification, resilient electrical distribution infrastructure, and facilitate access to local, decentralized renewable energy
- Assess food security, food systems, and vital services to strengthen and diversify local and regional food systems
Strategies that focus on initiating or expanding partnerships and relationships, communicating and sharing information, expanding awareness, or coordinating across organizational, jurisdictional, or political boundaries

Examples:

- Identify a county building or site that’s safe, accessible, and well-known to serve as a temporary coordination center, and widely publicize its location.

- Encourage neighborhoods to become familiar with residents who have skills and tools to assist others with special needs, should residents need to provide emergency response (e.g., develop maps and inventories of neighborhood assets).

- Work with local medical providers and hospitals to ensure that medical facilities are prepared to meet periods of increased demand.
Using Vulnerability Results in Adaptation Planning

- Likelihood
- Consequence
- Adaptive Capacity

Diagram:
- Likelihood
- Consequence
  - Risk
    - Vulnerability
  - Adaptive Capacity

Using Vulnerability Results in Adaptation Planning
Using Vulnerability Results in Adaptation Planning

**Likelihood (limit change)**

- Increase shading and heat-mitigating materials on pedestrian walkways, transit stops, and around county facilities
- Reduce stormwater runoff within residential neighborhoods that flood frequently
- Increase organic matter content and water retention in soils within urban and agricultural settings (e.g., by planting perennials)
Using Vulnerability Results in Adaptation Planning

**Consequence** (minimize effects)

- Site outside the floodplain and/or require that new or renovated buildings utilize flood-protection measures (e.g., raised finished-floor levels and temporary flood barriers)
- Retrofit or reroute pedestrian/bicycle trails and bridges in areas that are subject to repetitive flooding
- Implement early detection monitoring of invasive species and remove detected species immediately
Using Vulnerability Results in Adaptation Planning

↑ Adaptive Capacity (improve ability to cope w/change)

• Offer professional development opportunities for staff to develop their technical expertise and skills to prepare for and respond to climate change impacts
• Create policies that encourage solar and other renewable energy generation
• Build partnerships between public, private, and nonprofit sectors to provide critical services to vulnerable populations
UP NEXT!
Case Study #1: Trabuco Creek Restoration

Existing restoration project focused on improving stream and riparian habitat quality, sustainability, and function.

Primary project activities included removing barriers to fish passage (e.g., non-functioning fords and dams), adding channel complexity, and removing invasive vegetation.

Purpose was to re-evaluate project goals and activities in light of climate impacts and vulnerabilities to determine if planned activities help reduce impacts and identify additional activities that could also help minimize vulnerabilities.
Case Study #1: Trabuco Creek Restoration

STEP 1. IDENTIFY CLIMATE + NON-CLIMATE IMPACTS

• Flooding, drought, invasive plants, recreation

STEP 2. DETERMINE WHETHER/HOW PLANNED ACTIVITIES REDUCE IMPACTS

• ACTION: Add channel complexity
  ✓ Slows floodwaters to minimize erosion/scour
  ✓ Increases water availability by creating pools

• ACTION: Remove invasive vegetation
  ✓ Increases habitat quality and functioning
  ✓ Reduces erosion risk
STEP 3. IDENTIFY ADDITIONAL ACTIVITIES

- **ACTION:** Manage recreation in sensitive areas
  - ✓ Maintains habitat quality and functioning
  - ✓ Reduces erosion risk

- **ACTION:** Build a system water budget to better manage water and multiple uses
  - ✓ Increases habitat availability and connectivity and maintains water availability
This material is based upon work supported by the National Science Foundation under Grant No. 1811534. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.