



Strengths/Assets and Vulnerabilities

INTRODUCTION

This document provides an overview of how campuses can identify their strengths and vulnerabilities in the context of climate change. Visit Second Nature's guidance *How to Conduct*

a Campus-Community Resilience Assessment for more details on the process of completing a resilience assessment, and on reporting for the Climate or Resilience Commitment.

Second Nature's
Definition of Climate
Resilience:

Resilience is the ability of a system or community to survive disruption and to anticipate, adapt, and flourish in the face of change.

STRENGTHS AND ASSETS

Leading with Strengths

Second Nature recommends that campuses begin the resilience assessment and planning process by identifying current strengths, capacities, and existing resilience activities. While many planning efforts for resilience begin with a vulnerability assessment, Second Nature recommends leading with strengths for a few reasons:

- Starting with vulnerabilities means decisions tend to focus on reducing negatives. This can limit the opportunity to create comprehensive, long-term, and multi-faceted resilience efforts across the campus and community.
- Most campuses have existing initiatives and resources that are already contributing to resilience, or that can support the resilience planning efforts. Campuses will benefit from having a full understanding of these existing initiatives and resources, especially if they are not widely known and not considered “resilience activities.” Completing a resilience assessment can provide an opportunity to build bridges and relationships across campus silos.
- When campuses address vulnerabilities before considering where the campus and community want to be in the future, they tend to assess future vulnerability based on current systems and infrastructure. For example, planning for the level of heat waves expected in 20 years should be in the context of the civic and campus systems expected in 20 years.

In other words, focusing on building a resilient *system* can be more beneficial than reducing individual vulnerabilities. However, if campuses have already begun or completed a vulnerability assessment, it is perfectly fine to begin by identifying vulnerabilities.

What are Strengths and Assets?

Strengths and assets are existing features, capacities, characteristics, and resources that will help a campus and its community cope with climate change. The strengths and assets that the campus and community identify during the assessment are characteristics that should be continually reinforced and improved upon going forward. These strengths and assets will help the campus and community adapt and thrive in the face of climate impacts.

Campuses should consider strengths and assets that correspond to each of the Five Dimensions of Resilience identified by Second Nature: Ecosystem Services, Infrastructure, Social Equity & Governance, Health & Wellness, and Economic.

Sample Questions to ask when identifying Strengths and Assets:

- What existing campus programs or initiatives could help the institution adapt to the changing climate?
- What does the institution do well?
- What does the city/town/community do well?
- Which student or community civic groups are most engaged?
- What natural features or green infrastructure is present on campus or in the community?
- What areas of expertise does the institution have?
- What areas of expertise does the city/town/community have?
- What policies or structures has the campus or city/town/community created to overcome past crises?
- What areas do the campus and city/town/community work closely together on?
- Do the campus and the community have emergency plans in place?
- Does the campus have emergency funds, and are they designated for a certain purpose?

Examples of Strengths and Assets:

These example strengths and assets are from colleges and universities that have completed a Resilience Assessment.

Social Equity & Governance



- Active and engaged non-profit community (From [Resilience Assessment for Ball State University](#))
- High concentration of educated, actively engaged members of the community (From [Resilience Assessment for Humboldt State University](#))
- Small community with many networks (including faith communities, service organizations, and school groups and clubs) (From [Resilience Assessment for Oberlin College](#))

Health & Wellness



- Agriculture and food production (From [Resilience Assessment for Clarkson University](#))
- 20% of campus food purchases sourced from within 100 miles (From [Resilience Assessment for Colby-Sawyer College](#))
- Operation of drinking water plant for the college and the neighboring village of Aurora (From [Resilience Assessment for Wells College](#))

Ecosystems Services



- Trees for extreme heat and air pollution mitigation (From [Resilience Assessment for California State University-Long Beach](#))
- Tree canopy and health (From [Resilience Assessment for University of Illinois at Urbana-Champaign](#))
- Diverse topography reducing areas of flooding and increasing biodiversity (From [Resilience Assessment for University of Arkansas Main Campus](#))

Infrastructure



- Free campus shuttles between campuses (From [Resilience Assessment for Arizona State University](#))
- Connections to multi-modal transit (From [Resilience Assessment for American University](#))
- Seismically safe buildings (From [Resilience Assessment for California State University-Northridge](#))

Economic



- North Philadelphia's strong housing market, which can provide alternative, temporary housing (From [Resilience Assessment for Temple University](#))
- Strong focus on economic development with an interest in diversifying (From [Resilience Assessment for Lamar Community College](#))

VULNERABILITIES

Campuses should also identify current and future vulnerabilities to climate change as part of their resilience assessment. This includes vulnerabilities on campus, in the community, and across both.

What are Vulnerabilities?

Vulnerabilities may result from direct hazards from the changing climate (such as drought, heat waves, and severe storms), and impacts from climate change or related events (such as infrastructure failure and disease outbreak). Vulnerabilities may also include existing conditions that are exacerbated by the effects of climate change, or that reduce a campus and community's ability to cope and respond positively (e.g., residents in floodplains, lack of weatherization of community housing, and poor air quality days).

A Note on Terminology:

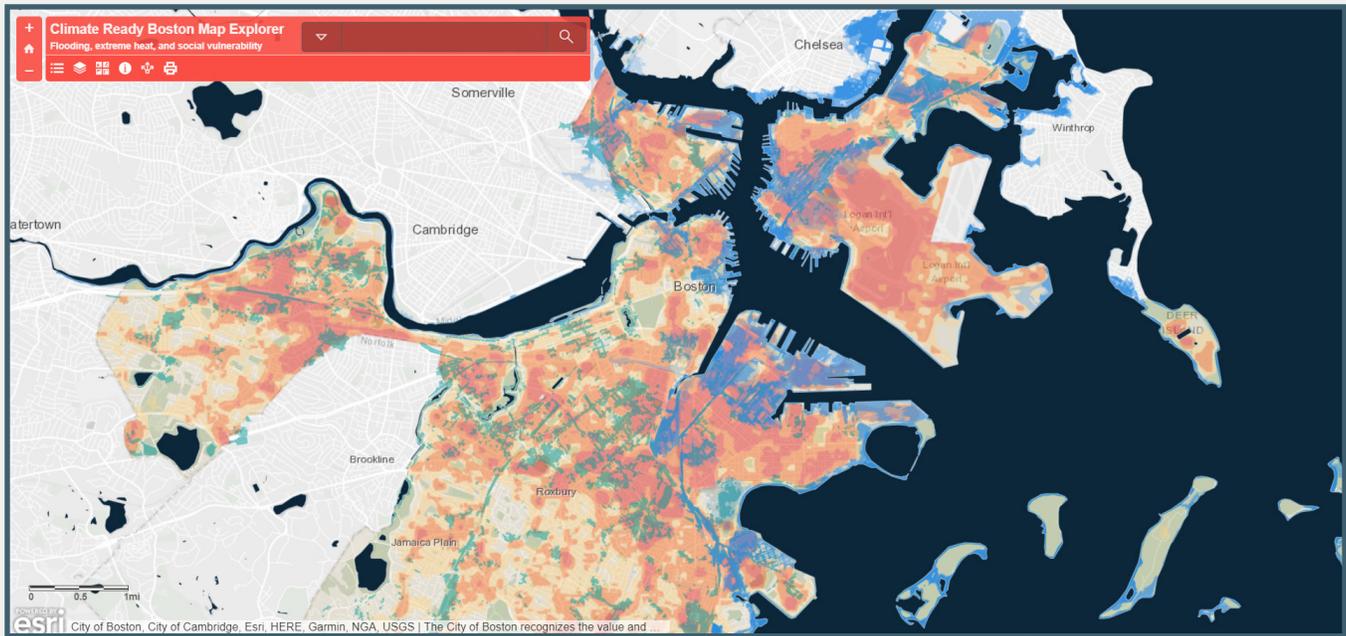
There are many definitions of vulnerability. Most definitions include the interaction between exposure to a hazard, the sensitivity of a system, resource or population (i.e., the potential magnitude of impact), and adaptive capacity (i.e., the ability of the system, resource or population to adjust and cope with change). Second Nature's resilience planning framework uses the term vulnerability to identify the ways in which climate change may interfere with a campus and community's ability to create a thriving, just, and sustainable future.

Assessing Current and Future Vulnerabilities

Campuses should consider how their operations, infrastructure, and populations may be at risk from and threatened by climate change. Campuses may choose to focus on a high-level understanding of vulnerabilities from the experience of various stakeholders, they may complete a comprehensive data-driven vulnerability analysis incorporating climate projections, or they may follow a process that includes both. Both strategies, including stakeholder input and completing a technical data-driven analysis, are important. Campus and community stakeholders will understand vulnerabilities from their own perspectives and experiences, which helps ensure the needs of all community members are included. At the same time it may be necessary to complement this with a data-driven approach to further capture vulnerabilities and local climate impacts. The extent of the vulnerability assessment will depend on campus capacity.

Colleges and universities should enlist as much help as possible from across the campus and community, drawing on existing data sets and input from experts. Schools can create a preliminary analysis of impacts by observing past weather and climate events, along with other stressors the community has experienced. Most communities can draw upon events from recent decades – from snow emergencies to flooding, storms, and heat waves. Non-climate events such as widespread power outages or transportation failures can also be instructive. Campuses likely have faculty who study local events and their impacts, who can assist in providing data and projections. This analysis is also a great opportunity for student projects and engagement. Campuses should look for climate-related work completed by their city or state as well; if the city has already released a vulnerability assessment, campuses can use the existing data and analysis.

Example City Resource:



The City of Boston created an interactive Climate Ready Boston Explorer that illustrates the areas of the city projected to be at risk from flooding and extreme heat. The climate data is mapped over population demographic data. This helps users understand the social factors that may intersect with climate impacts and contribute to vulnerability. The Climate Ready Boston Explorer is an example of a resource, developed by the city, that campuses within the city can use to identify their own strengths and vulnerabilities.

Image Citation: Climate Ready Boston Explorer, available at boston.maps.arcgis.com, accessed June 2019. [Boston Climate Map \(2050\)](#)

Sample questions to ask when assessing vulnerabilities:

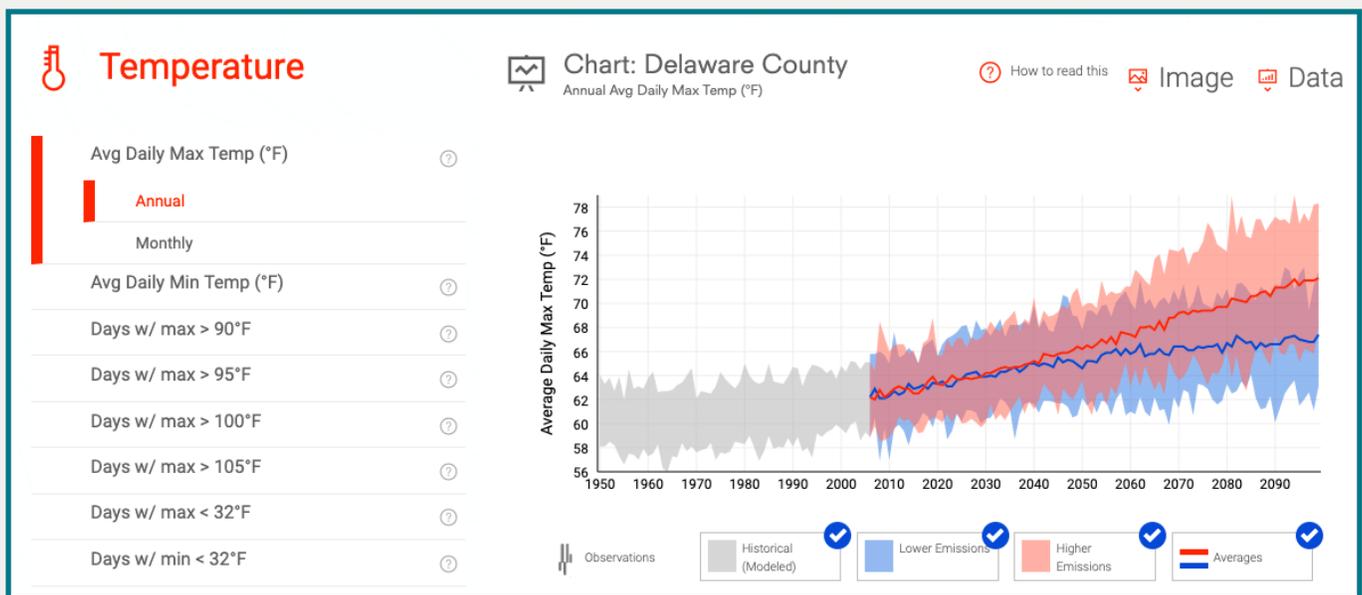
- What previous disasters or crises has the university faced, and what was the response? (e.g., If there have been heatwaves: are there particularly affected neighborhoods? Was there associated loss of power or public transportation? Was there damage to roads or transmission lines? Was there habitat impact? Are there policy changes as a result?)
- Do the campus and the community have emergency plans in place?
- Where does the campus' food and water come from?
- What social issues affect the campus and local community? What could cause these issues to worsen?
- How close is the campus to the ocean? Is the campus below sea level?
- What areas of the campus typically flood during heavy rain events?
- Does the campus frequently experience natural disasters (e.g., hurricanes, tornadoes, or earthquakes)? What could happen to local infrastructure if these disasters worsen?
- Is the campus near unstable geological formations (e.g., volcanoes or landslide areas)?
- What is the local population density? Is it expected to fall or rise?
- What is the state of public transportation and what might threaten it?
- Does the campus have emergency funds, and are they designated for a certain purpose?
- Does the campus have investments? If so, in what? What could threaten future returns?
- What are the most prominent local industries? What do they need to succeed?

Anticipating Climate Changes

There are many resources that project climate changes in the United States. Federal and state-level resources are a good place to start. Second Nature provides [projected climate changes by region](#) from the [U.S. National Climate Assessment \(NCA\)](#). This includes climate information from observed (recent) trends, near-term projections, and future projections out to 2100. It also provides information for several different emissions scenarios.

The information in the NCA and other government sources is unlikely to be as granular as the city or neighborhood scale. Schools may feel that this data is not detailed enough and seek out projections that are higher resolution and include a specific number instead of a range. A word of caution on this: High resolution future climate projections are not always supported by the science. Specific future values imply accuracy in prediction, which the scientific community does not currently have. Campus vulnerability assessments will need to incorporate some degree of uncertainty in projections. Framing the process as building overall resilience capacity (instead of responding to a specific expected climate change) can help reduce vulnerability to a range of possible impacts.

The Climate Explorer



The Climate Explorer is an online tool that can be used to create graphs and maps of climate projections by county in the United States. The Climate Explorer is part of the U.S. Climate Resilience Toolkit. This is an example of a resource campuses can use to understand how climate change may impact their location under different emissions scenarios.

Image citation: Image generated by The Climate Explorer, available at <https://crt-climate-explorer.nemac.org/>, accessed June 2019