UNIVERSITY OF CALIFORNIA Carbon Neutrality Initiative

Framework for J.E.D.I.-Centered Climate Resilience Planning

Guidance for University of California

Campuses and Medical Centers

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INTEGRAL

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Introduction: Quick Guide

The University of California (UC) is a leader in higher education climate action, as evidenced by its commitment to achieving carbon neutrality by 2025. But as climate change wreaks havoc in communities across California and the world, planning for resilience in the face of climate impacts has become just as important as climate mitigation action. Furthermore, because **climate change disproportionately affects vulnerable communities, including communities of color**, climate resilience planning must work to address inequities so that all communities have an opportunity to survive and thrive.

The UC Office of the President solicited consultant support in designing and facilitating climate resilience planning workshops for each UC campus and medical center. This climate resilience planning effort centers the need for Justice, Equity, Diversity, and Inclusion (J.E.D.I.)[1] in order to address existing inequities that make some communities more vulnerable to the impacts of climate change. The framework also helps to align climate adaptation efforts with the broader definition of resilience in emergency management planning.

The consultant team of Integral Group, Thrive Consulting, and Environmental Justice Solutions has developed this **Framework for J.E.D.I.-Centered Climate Resilience Planning (Framework)** to guide each campus and medical center in understanding the key concepts and steps involved in J.E.D.I.-centered climate resilience planning. The Framework is intended to be accessible to each location regardless of current planning status and includes tools and resources that can be leveraged for future efforts.

The Framework

The following UC Framework outlines the key elements needed for campus-specific[2] climate resilience planning. Centering J.E.D.I. entails a deliberate focus on the most marginalized and at-risk groups, which in turn shapes every step of the climate resilience planning **process and outcomes.** At its core, the lens provided by use of these terms is extremely helpful for climate resilience planning: a prerequisite for achieving sustainability and resilience is the need to address the underlying causes of vulnerability, including the structural inequalities that create and sustain poverty and constrain access to resources. As such, actions resulting from this process focus on and prioritize the communities who face increased exposure and sensitivity to climate impacts while having **the least capacity to adapt, resist, or recover**.

Justice	**E**quity	**D**iversity	**I**nclusion
A practice of both **acknowledging and redressing the root causes of historic and present-day disparities**, through collaborative efforts that avoid causing additional harm, repair previous harms, and heal communities.	Focusing on, prioritizing, and **allocating significant resources to vulnerable communities** that have experienced injustices and disproportionate harm in ways that eliminate barriers to meeting their needs.	Including a broad range of voices in the planning process to integrate a comprehensive range of experiences, barriers, needs, and strengths, **enabling the creation of robust solutions that solve intersectional issues.**	Adopting practices, policies, and programs that **create the conditions of belonging** and mutual respect for historically excluded groups or individuals to join in participatory decision making.

Table 1: Definition of J.E.D.I. in Climate Resilience Planning

[1] See the Glossary of Terms for working definitions of this and other terms used in this Framework.

[2] Note that the use of "campus" in this document refers to medical centers as well.

A Different Kind of Planning Process

A J.E.D.I.-centered planning process requires collaborating with members of underserved communities from the beginning of the process to understand their **specific** vulnerabilities to climate impacts, their barriers and needs, and to **co-design innovative and effective resilience solutions**.

Centering J.E.D.I. means prioritizing resilience strategies that enable the campus community to survive and thrive **before, during and after disruptive events**. J.E.D.I.-centered resilience strategies have meaningful and transformational direct benefits and co-benefits that reduce disparities, help dismantle structural barriers to resources, and ensure that campus facilities, infrastructure, and services better serve the entire campus community. Without a J.E.D.I. lens, well-intentioned climate resilience planning efforts can nonetheless overlook certain communities, inadvertently placing them in harm's way and undermining the integrity of the campus community. With a J.E.D.I. lens, equitable climate resilience solutions go far beyond just managing and responding to catastrophic events to consider ways to **maximize everyday resilience**, which requires "eliminating chronic stressors and maximizing the dynamic potential" of community leadership, local economic opportunities, and natural resources.[3] As Second Nature states, "Inclusivity is important to resilience not only because it allows the institution and community to articulate multiple viewpoints, but also to brainstorm many potential solutions that a less diverse approach might not identify."

The **UC Framework for J.E.D.I.-Centered Climate Resilience Planning** provides a roadmap and set of resources for UC locations to draw on as they chart their own climate resilience journey for ongoing equitable action. Following this Framework should ensure that the voices of marginalized, overburdened and vulnerable campus community members meaningfully shape each UC location's climate resilience solutions. The steps in this planning process are iterative by nature; each should be thought of as a starting point to be refined and updated over time as new resources, stakeholders, or information become available. The table on the following pages summarizes the eight-step planning process proposed in this Framework.

Other Helpful Resources

The material in this guide represents a combination of insights from a variety of sources. Some of the helpful resources and frameworks we utilized that can support the climate resilience planning process include:

- Climate Vulnerability: An Initial Assessment for the University of California, Berkeley[4]
- Alliance of Regional Collaboratives for Climate Adaptation
- How to Conduct a Campus-Community Resilience Assessment[5]
- Making Equity Real in Climate Adaptation and Resilience Policies and Programs[6]
- Adaptation Capability Advancement Toolkit (Adapt-CA)
- The Climate Justice Playbook for Business: How to Centre Climate Action in Climate Justice[7]

[3] Second Nature, "Resilience Series: Climate Resilience Background," p.4, https://secondnature.org/wp-content/uploads/Climate-Resilience-Background-Final.pdf
[4] Anne DeBoer, Lisa McNeilly, Bruce Riordan, "Climate Vulnerability: An Initial Assessment for the University of California, Berkeley," Spring 2017, https://sustainability.berkeley.edu/sites/default/files/climate_vulnerability_initial_assessment_for_uc_berkeley_deboer.pdf
[5] Second Nature, "Resilience Series: How to Conduct a Campus-Community Resilience Assessment," https://secondnature.org/publications/conduct-campus-community-resilience-assessment/
[6] Sona Mohnot, Jordyn Bishop, Alvaro Sanchez, "Making Equity Real in Climate Adaptation and Community Resilience Policies and Programs: A Guidebook," The Greenlining Institute, August 2019, https://secondnature.org/publications/conduct-campus-community-resilience-assessment/
[7] B Lab et al., "The Climate Justice Playbook for Business: How to centre climate action in Climate Justice," 2021, https://pardot.bcorporation.net/climate-justice-playbook-for-business-2021

STEP	KEY OBJECTIVES	TASKS
1) Establish the team, scope, and baseline	**Set the groundwork for a diverse planning team and a successful project.**	a) Establish a **Core Team** to lead the planning process and develop a **project charter** by which the team will operate. b) Determine the project **scope** (campus boundary and planning horizon). c) Review what work has already been done that the planning process can **build on** and determine the best kind of planning process for the campus given past efforts.
2) Identify vulnerable on-campus populations	**Identify the most vulnerable[8] on-campus populations by gathering both quantitative and qualitative data and keep these groups at the forefront of consideration at each step of the planning process.**	a) Meet with campus departments such as **student support services,** to move beyond the initial textbook list of potential vulnerable populations toward a detailed understanding of the quantity of those individuals on campus, university-specific needs, existing resources, and existing resource gaps. b) Compile this data into a **quantitative** assessment of vulnerabilities. c) Augment quantitative data with **qualitative data**, such as campus surveys or interviews with campus unions, student groups, and representatives of vulnerable campus groups. d) Prioritize groups for support.
3) Identify and engage stakeholders	**Include diverse voices in the planning process, particularly voices that were previously unheard.**	a) Identify key stakeholders at different scales (both on and off campus) including representatives of groups identified in Step 2. b) Develop a stakeholder map that identifies which role each stakeholder will play in the planning process. c) Use in-depth outreach and collaboration with on-campus groups to shape your approach to engaging off-campus groups. d) Develop an engagement plan that outlines how each main group of stakeholders will be engaged throughout the planning process.

[8] "Vulnerable" means particularly exposed, sensitive, or unadaptable to the impacts of climate change.

4) Develop a shared vision & principles	**Develop a shared vision to set the stage and build trust in a set of principles to help guide the planning and ongoing implementation of climate resilience actions.**	a) Develop a shared vision for J.E.D.I.-centered climate resilience planning and implementation. b) Adopt a set of guiding principles that incorporate how to support the prioritized groups identified in Step 2.
5) Identify climate impacts	**Understand how the changing climate may impact the campus and what equity gaps or blind spots may exist in order to identify solutions to build resilience.**	a) Understand climate change trends and potential local hazards. b) Use climate change projections and hazard information to identify potential impacts. c) Identify campus elements and groups likely to be impacted, including those groups identified in see Step 2.
6) Analyze asset & system vulnerabilities	**Identify which people, assets, or services may be particularly exposed, sensitive, or adaptable to climate change.**	a) Assess vulnerabilities of assets, systems, and services, particularly in the context of those prioritized groups most impacted. b) Prioritize areas for action.
7) Identify & prioritize solutions	**Maximize available resources by focusing adaptation actions to "bounce back" from the most significant climate impacts and leverage co-benefits to help the campus, and particularly marginalized groups, "bounce forward" in the face of change.**	a) Establish resilience co-benefits including a J.E.D.I. lens that is reflective of the prioritized areas identified in the previous step. b) Select adaptation and resilience actions based on these indicators by identifying the types of resources or services resilient campus buildings can provide to help vulnerable campus community members be more resilient during and after disasters and everyday. c) Evaluate and prioritize actions using the vision and guiding principles developed in Step 4.
8) Move from planning to implementation	**Continue to reflect the equitable vision and guiding principles developed early in the planning process in implementation.**	a) Assign clear responsibilities and timelines for each action. b) Establish performance indicators to monitor successful implementation. c) Determine when the climate resilience goals and actions should be reviewed and updated. d) Define next steps to support ongoing implementation and mainstream climate resilience.

J.E.D.I.-Centered Climate Resilience

Climate Impacts

The Intergovernmental Panel on Climate Change estimates that human activities, including fossil fuel combustion, increasing deforestation, and intensive industrial agriculture, have already caused roughly 1.0°C (1.8°F) of global warming above pre-industrial levels and will cause 1.5°C (2.7°F) warming by 2030-2052 if emissions continue at the current rate.[9] **We are already experiencing climate impacts** —increasing overall temperatures, more extreme heat events, increasingly severe wildfires, worsening air quality, severe droughts, more frequent and intense rainfall events, and sea level rise. In fact, extreme weather is becoming the new normal; once rare weather events are now increasingly commonplace.[10] Mounting scientific evidence makes it clear that these trends will only intensify in coming years with greater variations, anomalies, and extremes in temperature and precipitation highly likely.

The impacts of this climate destabilization are anticipated to be significantly challenging for communities across California, causing power outages, water shortages, air quality impacts, stormwater flooding, food supply chain disruptions, population displacement, and rising costs of essential resources, alongside other major disruptions. **Historically marginalized and underserved communities, however, bear a disproportionate burden of the harmful impacts**: **populations with the greatest socio-economic burdens live in natural and built environments that face high climate risks**.

The COVID-19 pandemic has highlighted the systemic inequities in the U.S., revealing the disproportionate harms experienced by people of color and low-income communities and the interrelated causes of those harms. The climate crisis is likewise a threat multiplier, exacerbating the adverse impacts of existing socio-economic disparities such as isolation, lack of access to health care, or lack of homeownership, in addition to biological factors, such as age, health or impaired mobility.

Climate Resilience

Like all organizations, university campuses and medical centers will be impacted by climate change and will need to prepare in order to reduce risks, build on existing strengths, and take advantage of any opportunities that may present themselves. Second Nature defines resilience as "the ability of a system or community to survive disruption and to **anticipate, adapt, and flourish in the face of change**."[11] Adaptation actions include reducing reliance on fossil fuels, strengthening community access to information and resources, enhancing the institution and community's capacity to withstand shocks and stressors and planning for response and recovery efforts.

A university campus is both a system and a community, a center of gravity that draws students, faculty, and personnel from far and wide, and its **resilience is linked to the strengths and vulnerabilities of its community members both when they are on- and off-campus.** Communities lacking sufficient resources to prepare for and resist climate hazards are extremely vulnerable. According to a 2015 survey of UC students, 19% reported that they had "very low" food security while an additional 23% characterized themselves as

[9] IPCC, "Summary for Policymakers," 2018, In: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press.

[10] Earthjustice, "How Climate Change is Fueling Extreme Weather," June 1, 2021, https://earthjustice.org/features/how-climate-change-is-fueling-extreme-weather

[11] Second Nature, "Resilience Series: Climate Resilience Background," accessed March 6, 2021, https://secondnature.org/wp-content/uploads/Climate-Resilience-Background-Final.pdf.

having "low" food security.[12] A 2015 study from California State University found similar levels of food insecurity including that 9% of their students were homeless.[13] The resilience of vulnerable campus community members, including low income and extremely low income staff, adjunct faculty and students, is also linked to the relative resilience or vulnerability of the communities where they live. In this way, institutional resilience does not end at the campus gates.

According to the Asian Pacific Environmental Network, a community or system's ability to prevent human suffering and financial loss in the event of disaster, survive disruption, and flourish in the face of change is underpinned by two key concepts:

1. **Social infrastructure**, which refers to both the services and physical infrastructure required for a community's economic, health, cultural, and social well-being; and
2. **Social cohesion**, which refers to the sense of belonging and active participation of community members in communities that tolerate and promote a multiplicity of values and cultures.[14]

Higher education institutions can translate their long-term investments (ownership of land, buildings, and infrastructure) into unique proving grounds for resilience strategies. By shifting away from **business-as-usual** practices to embrace **comprehensive place-based innovations**, each campus has an opportunity to radically increase social infrastructure and cohesion through climate resilience solutions such as **cooling centers and localized food and energy systems**. Each campus can work at the nexus of community resilience, emergency management, climate change mitigation, and social equity to provide opportunities for vulnerable groups to become more self-determining, socially connected, and successful before, during, and after disruptions.

In describing a few key characteristics of climate resilience for campuses and communities, Second Nature states that a campus is "better protected from climate change and has greater capacity to adapt, when it cooperates with the community on building resilience together."[15] Campuses are encouraged to envision resilience at a regional level and coordinate their approaches with local and regional governments and other efforts for regional resilience, including community-driven strategies that may or may not be linked to local and regional governments. This approach can encourage significant efficiencies and lead to implementation of innovative strategies. Strategies that can be "advanced across campus and city scales" include:

- Collaborative flood risk mapping at campus, city, and regional scales;
- Construction of surface and underground stormwater management systems;
- Business continuity planning across campus and citywide systems to ensure continuity before, during, and after major climate disruptions;
- Planning, zoning, and design standards for protecting people and the campus.[16]

Defining J.E.D.I. for Climate Resilience Planning

The terms justice, equity, diversity and inclusion provide guideposts for transformational climate action and resilience planning. There is some overlap between the terms, but they support each other to provide a full picture of the work that is needed —a fundamental shift in mindset and action from extractive and exploitive to equitable and regenerative approaches. The left side of the graphic below shows examples of

[12] University of California Global Food Initiative, "Student Food Access Security and Basic Needs," https://www.ucop.edu/global-food-initiative/best-practices/food-access-security/

[13] University of California Global Food Initiative, "Redefining Student Basic Needs for Higher Education: A Study to Understand and Map University of California Student Basic Needs," July 2020, https://www.ucop.edu/global-food-initiative/_files/redefining-student-basic-needs-2020-report.pdf

[14] Zach Lou et al., "Resilience Before Disaster: The Need to Build Equitable, Community-Driven Social Infrastructure," APEN, n.d., p. 12, last accessed June 9, 2021, http://apen4ej.org/wp-content/uploads/2020/09/Resilience-Before-Disaster-Report-FINAL.pdf

[15] Second Nature, "Resilience Series: Engaging Stakeholders," https://secondnature.org/wp-content/uploads/Engaging-Stakeholders-Final.pdf

[16] MIT Office of Sustainability," 2019 Climate Action Plan Update: A Climate Resilient MIT," 2019, p. 3, https://sustainability.mit.edu/sites/default/files/resources/2020-03/climate_resiliency_brochure_web.pdf

"how the current, broken system perpetuates a cycle of harm and injustice though things like paternalistic, colonialistic and white supremacist modes of thinking." The right side shows the elements needed to shift to an "equitable and regenerative approach rooted in new power models that create sustained social and environmental well-being."[17]

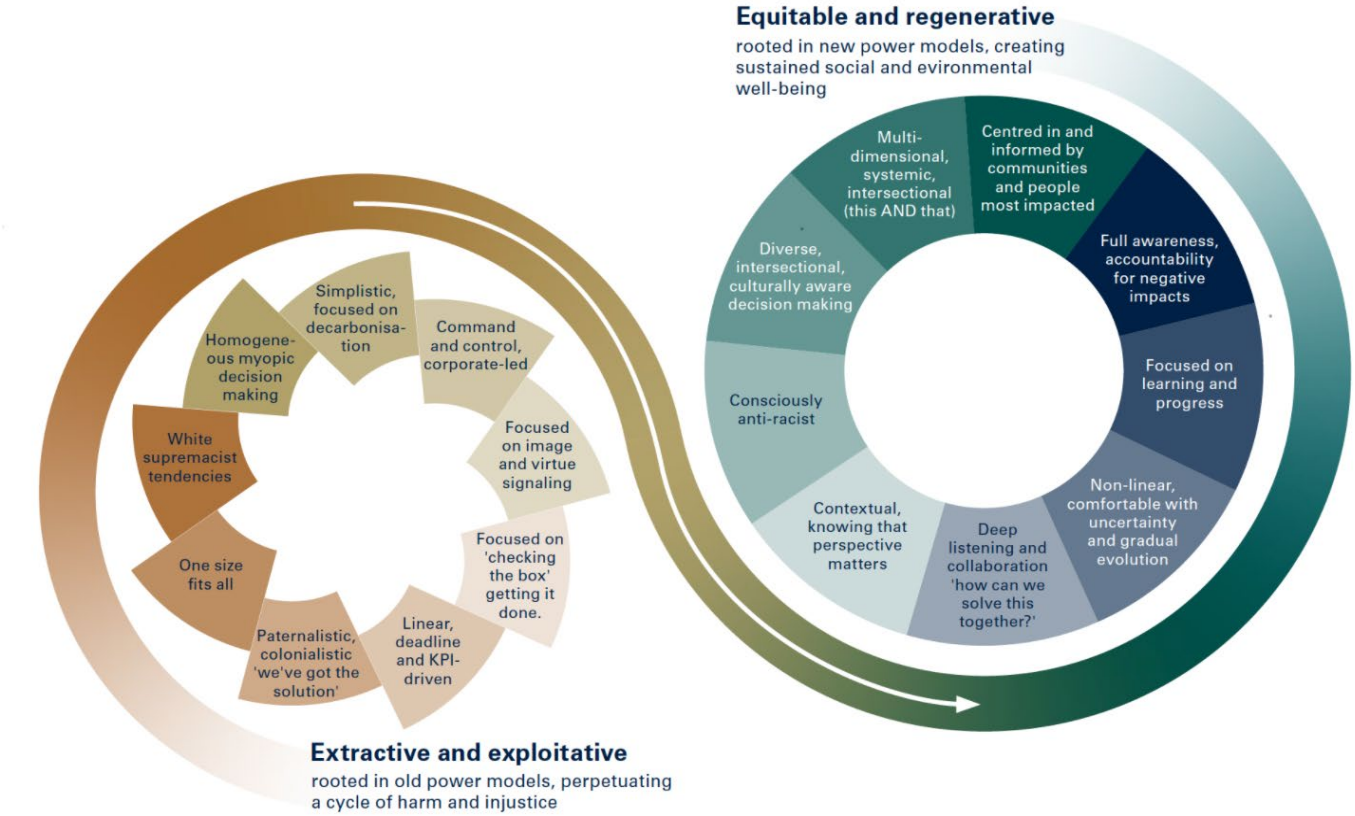

Figure 1: "Centering business climate action in justice: making the mindset shift," from The Climate Justice Playbook For Business.

Justice

*A practice of both **acknowledging and redressing** the root causes of historic and present-day disparities, through collaborative efforts that avoid causing additional harm, repair previous harms, and heal communities.*

Climate resilience planning efforts rooted in justice center the perspectives and experiences of **"frontline" communities facing the greatest climate impacts** who have been **most harmed by** and **least benefit from the extractive and oppressive social and economic systems** (e.g., structural racism, white supremacy, patriarchy) **that cause climate disruption**. Because the root causes of climate injustice also increase population exposure, sensitivity and vulnerability to climate change, **no institution can effectively tackle the climate crisis, or achieve sustainability or resilience, without addressing environmental justice.** This effort requires near-term and long-term adaptation and disaster risk management strategies that respond to changing climate risks *and* help alleviate the disproportionate climate and environmental burdens borne by vulnerable campus populations and communities which are magnified in times of crisis.

In 2021, the UC Sustainability Offices and Staff issued a statement on Diversity, Equity and Inclusion that acknowledges the complicated relationship between the environmental movement and inequality:

[17] B Lab et al, "The Climate Justice Playbook" p. 60.

The environmental movement, which we are a part of, has similarly been intertwined with structural and cultural racism, as well as classism, patriarchy, sexism, xenophobia and homophobia. Many of the historical figures which the environmental movement have lauded — John Muir, Madison Grant, Gifford Pinchot, and Theodore Roosevelt to name a few — advocated for the forced removal of Native Americans from their land and many were involved with or leaders in the eugenics movement. It is not uncommon to still see these same people recognized as environmental heroes today, including on UC campuses, their wrongs invisibilized and sanitized. Many national environmental organizations — including those that UC campuses have relationships with, such as the Sierra Club — are beginning to recognize this problematic history after sustained pressure and critique from Black, Indigenous, and People of Color (BIPOC), as well as environmental justice movements.[18]

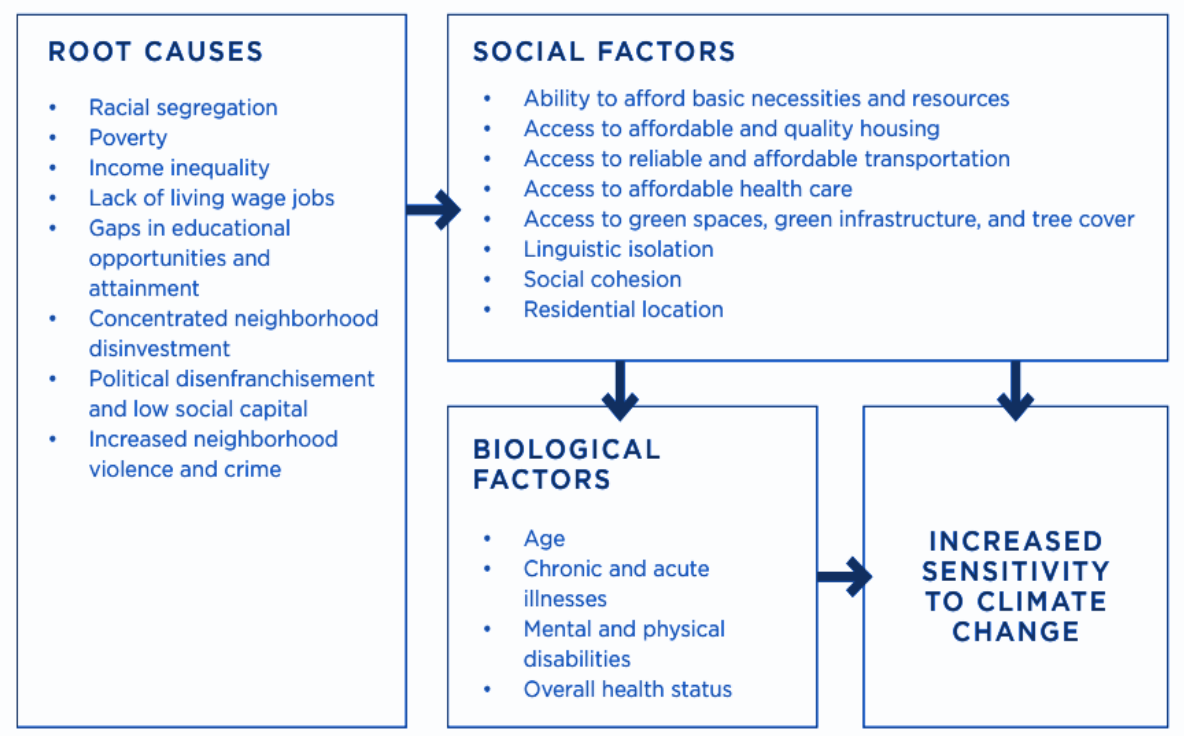

Figure 2: From the Urban Sustainability Directors Network, "Factors increasing sensitivity to climate change"[19]

Numerous historic and ongoing institutional and economic practices have dispossessed Indigenous people of their land, stripped BIPOC (Black, Indigenous, and People of Color) communities of wealth, and disproportionately externalized the harmful impacts of extractive and hazardous industries and operations (ports, factories and warehouses, transportation centers, refineries, landfills and toxic dumps) onto low-income communities of color. These systemic practices harm physical and mental health, livelihoods, life expectancy, and quality of life in BIPOC communities. For example, redlining, the federal government's practice in collaboration with local governments and financing entities, which systematically denied public and private home loans to Black and other people of color relegating them to "redlined" areas, is one of the many historic practices whose impacts are still felt today.[20] People who live in formerly redlined areas, are

[18] UC Office of the President, "Diversity, Equity and Inclusion Statement of UC Sustainability Offices and Staff," https://www.ucop.edu/sustainability/_files/sustainability-staff-dei-statement.pdf

[19] Tina Yuen et al., "Guide to Equitable Community-Driven Resilience Planning," Urban Sustainability Directors Network, May 2017, https://www.adaptationclearinghouse.org/resources/guide-to-equitable-community-driven-climate-preparedness-planning.html

[20] California Environmental Protection Agency, "Pollution and Prejudice," 2021, last accessed March 10, 2021, https://storymaps.arcgis.com/stories/f167b251809c43778a2f9f040f43d2f5 "President Franklin D. Roosevelt's New Deal was the

twice as likely to go to an emergency room for an asthma attack due to increased levels of air pollution in their neighborhood, an indicator which is exacerbated by lack of access to preventative health care.[21] Urban development practices diminished investment in green spaces in redlined areas. The proliferation of dark concrete and dearth of tree cover makes redlined areas significantly hotter (7°C/12.6°F) during extreme heat events, with fewer places to cool down, exposing these communities to greater threats.[22]

By contrast, many educational institutions in this country, including the University of California, have benefited from unjust practices that contribute to climate change and adversely impact low-income communities and communities of color. For example, the University of California retains 148,636 acres[23] of Indigenous lands from the Morrill Land Grant Act, which are part of the nearly 11 million acres the U.S. unjustly obtained through more than 160 violence-backed treaties and land cessions"[24]

The term "Just Transition" has been used to reference the need to phase out extractive and harmful industries that harm both people and planet, while building a regenerative economy with pathways for workers and communities to transition to dignified, family-sustaining and ecologically sustainable livelihoods, democratic governance, and ecological resilience. Reconciling past harm through current actions and investment is critical to achieving a just transition to a more resilient future. The healing process begins with making a commitment to correct past harms, prevent future unintended consequences, and working to mitigate, alleviate, or undo the underlying structural and institutional systems that are the root causes of social and racial inequities.

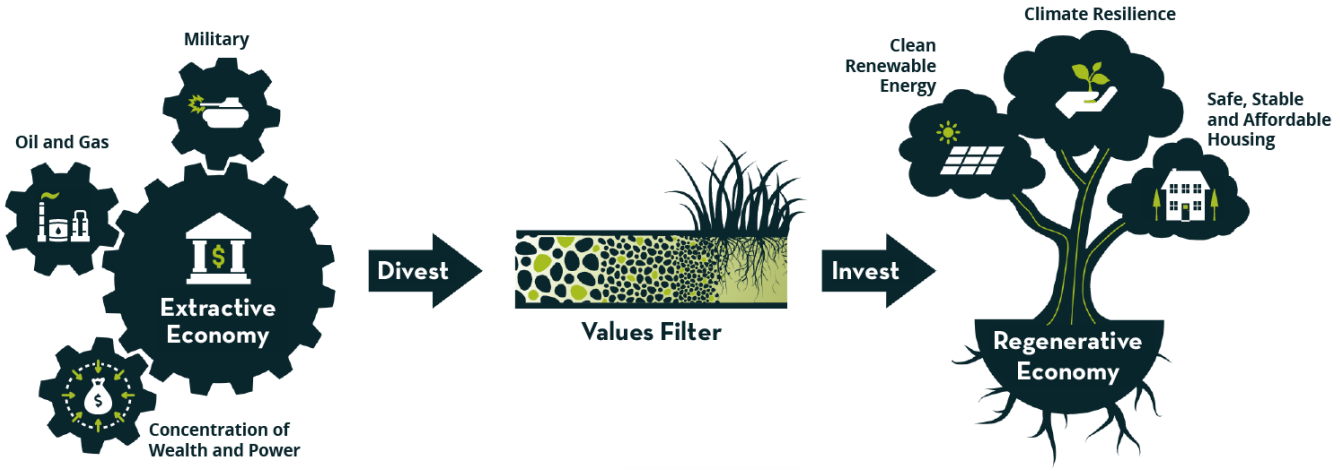

Figure 3: From the Asian Pacific Environmental Network (APEN), a "Just Transition is a vision and framework for moving toward a world where everyone has the resources they need to live full, dignified lives."[25]

Acknowledging the UC's role in harmful historical practices, such as the dispossession of Indigenous homelands, which decreased the resilience of California's multiple Indigenous communities, is the first step.

government's response to the Great Depression, and its Home Owners' Loan Act (HOLC) aimed to stabilize the nation's mortgage lending system. But not everyone had access to the act's benefits, namely government-backed mortgages with low interest and better terms. Between the 1930s and '40s, the Federal Housing Administration (FHA) and the Veteran's Administration gave government-supported, low-cost loans to millions of white Americans so they could purchase new homes in the suburbs, while denying people of color access to home mortgages and homeownership opportunities. Between 1934 and 1962, the federal government issued $120 billion in home loans, 98% of which went to whites."

[21] Kriston Capps, "Childhood Asthma: A Lingering Effect of Redlining," Bloomberg CityLab, May 23, 2019, https://www.bloomberg.com/news/articles/2019-05-23/childhood-asthma-a-lingering-effect-of-redlining

[22] Yessenia Fuentes, "Extreme Heat is Another Legacy of Segregation," Gizmodo, January 14, 2020, https://gizmodo.com/extreme-heat-is-another-legacy-of-segregation-1840979371/amp?__twitter_impression=true

[23] High Country News, "Land-Grab Universities: University of California," https://www.landgrabu.org/universities/university-of-california

[24] High Country News, "Land-Grab Universities," https://www.landgrabu.org/. The land grants raised $18 million for university endowments by the early part of the 20th century.

[25] APEN, "Just Transition," last accessed July 22, 2021, https://apen4ej.org/our-work/

The second step involves identifying members of the campus community that are more vulnerable to climate impacts due to the ongoing impacts of historical legacies. The third step is co-developing resilience strategies that address and correct the root causes of injustice, for instance, by moving research and funding from extractive and harmful practices to regenerative practices that acknowledge, protect and foster bio-cultural diversity, ecological restoration, community resilience, and social equity.

In the past, vulnerable campus groups may have been overlooked in planning efforts, preventing their input in designing solutions that better meet their needs and avoid creating further harm. While business-as-usual planning techniques may improve some outcomes for vulnerable groups, they are not designed to build resilience in the communities and populations that are and will continue to be most affected by climate change. These communities need climate resilience solutions that recognize the **differing impacts of climate change on different groups** and **allocate resources to protect the most vulnerable groups**. Centering J.E.D.I. in climate resilience planning can uncover old blind spots by including the most affected, frontline communities in building solutions. Centering the needs of frontline communities enables the creation of comprehensive, effective, and efficient solutions that benefit everyone, and meet the priority needs of both historically marginalized communities and the institution without causing any additional harm.

Examples of Just Climate Resilience Strategies:

- Partner with local Indigenous groups and Native Nations seeking to practice traditional ecological knowledge and sustainable land stewardship practices, such as cultural burning for wildfire prevention.[26] For example, The Amah Mutsun Tribal Band has partnered with the UC Santa Cruz Arboretum to help tribal members "relearn plant identification, ethnobotany, and native plant resource management."[27] The Karuk Tribe and UC Berkeley have an ongoing collaborative that promotes "networking opportunities between tribe members, the scientific community and other partners to support youth education, tribal health, ethnobiology, fire and riparian ecology, land use and cultural resource management, environmental justice, food security and food sovereignty, and sustainable economic development."[28] An additional strategy for increasing community livelihoods and resilience is returning land to Indigenous stewardship and ownership, a practice Indigenous activists broadly refer to as "Land Back."[29]

  The Indigenous practice of cultural burning can help greatly reduce California's increasingly catastrophic wildfires. As the Lakota Law Project states, "Now is the time to turn to experts: the Indigenous communities that know what to do. Many tribes' land management practices show what sustainable connections to local ecosystems can look like and that those practices, if done correctly, can reap benefits for generations."[30]

- In case of emergencies, extreme heat days, or poor air quality, provide shelter and food services for vulnerable staff, faculty and students who live off campus.

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[26] The United Nations Framework Convention on Climate Change UNFCCC has acknowledged the critical role of Indigenous people play in preserving ecosystems and preventing deforestation. Traditional Ecological Knowledge (TEK), acquired over hundreds or thousands of years of caring for the environment sustainably, is critical to climate change adaptation in California.

[27] Amah Mutsun Land Trust, "UCSC Arboretum," https://www.amahmutsunlandtrust.org/the-mutsun-gardens

[28] Karuk - UC Berkeley Collaborative, "What We Do," https://nature.berkeley.edu/karuk-collaborative/?page_id=364

[29] Claire Elise Thompson. "Returning the Land." Grist. November 25, 2020, https://grist.org/fix/indigenous-landback-movement-can-it-help-climate/ Recent examples of Land Back in California include the 2019 decision by the City of Eureka to return 200 acres of land of Dulawat Island to the Wiyot Tribe, the return of 1,200 acres of land to the Esselen Tribe from Monterey County, and the Mountain Maidu Tribe's rematriation of 3,000 acres of land from PG&E.

[30] Lakota People's Law Project, "#LandBack is Climate Justice," August 14, 2020, https://lakotalaw.org/news/2020-08-14/land-back-climate-justice

- Provide N95 masks for low-income and vulnerable campus groups and local/regional vulnerable communities during poor air quality events.
- Address any parts of campus operations that may have negative environmental consequences for local/regional communities such as fleet vehicle emissions.
- Ensure there are protections in place for workers that must be outside during extreme heat events or poor air quality, such as proper masks, access to water, air/cooling centers, and medical services.
- In case of emergency evacuation, provide safe transport for those without vehicles.
- Develop early warning communication systems.
- Partner with mission-aligned suppliers and organizations to advance climate justice initiatives.
- Restore and enhance ecological infrastructure to reduce and manage increased stormwater events, prevent downstream flooding impacts and reduce pollution runoff.
- Eliminate use of pesticides and herbicides that could otherwise contaminate local waterways and groundwater supplies and expose landscaping staff to harmful chemicals, through integrated pest management strategies.
- Increase climate resilient tree canopy on campus in places where people gather and in areas that are publicly accessible to reduce the heat island effect, reduce disparities in access to tree cover, and provide outdoor areas of respite during extreme heat events.
- Promote food sovereignty through agroecology and sustainable local food production on campus and in local/regional communities.
- Establish research partnerships with community groups to support their community-defined needs, share funding and other resources and information, and collaborate on solutions.

Case Study

The Native American Studies (NAS) Department's Food Sovereignty Lab and Cultural Work Space being created at Humboldt State University (HSU) is an example of equitable, participatory, and community-driven collaboration between a university and local tribes and tribal members. The Food Sovereignty Lab has been a grassroots, student-led participatory action research project by both Native and non-Native HSU students, who interviewed dozens of stakeholders and engaged Native leaders both on- and off-campus to ask what they wanted to see as part of the new campus space.

The NAS Food Sovereignty Lab and Cultural Work Space will provide a space for curriculum development, internships, research opportunities, workshops, and programs as well as traditional basket weaving, food preparation, and regalia making. In this way, students gain traditional ecological knowledge in support of a more resilient campus community.

Ted Hernandez, Chairman of the Wiyot Tribe said,

"*Such a lab could provide hands-on experience for students and Tribal members in fields such as botany, biology, genetics, anthropology, Native American Studies, and Natural Resources Management, to name a few. The end result would be an interdisciplinary learning lab worthy of HSU that would both attract indigenous people and students from out of the area, while also serving the local indigenous peoples by helping to preserve their food sovereignty and native food security.*"[31]

[31] Humboldt State University Native American Studies, "Food Sovereignty Lab & Cultural Workshop Space," https://nasp.humboldt.edu/fsl.

Equity

*Focusing on, prioritizing, and **allocating significant resources to vulnerable communities** that have experienced injustices and disproportionate harm in ways that eliminate barriers to meeting their needs.*

The National Equity Atlas defines "an equitable community as one where all residents — regardless of their race, [ethnicity], gender, or zip code — are fully able to participate in the community's economic vitality, contribute to its readiness for the future, and connect to its assets and resources."[32] Equitable considerations are important to all elements of climate resilience planning and implementation and include structural, procedural, substantive, and distributional equity.

Procedural and structural equity call for the empowerment of frontline communities to shape resilience strategies from design to implementation through democratic and participatory structures and processes that are transparent, fair, and inclusive. It is also important to develop and nurture authentic and reciprocal partnerships that empower once marginalized and disenfranchised community members.

Substantive and distributional equity call for crafting strategies that: (a) maximize the generation of local community co-benefits in areas with high climate risk and high social vulnerability and (b) are responsive to the ways that different groups are situated within structures, culture, and across geographies.

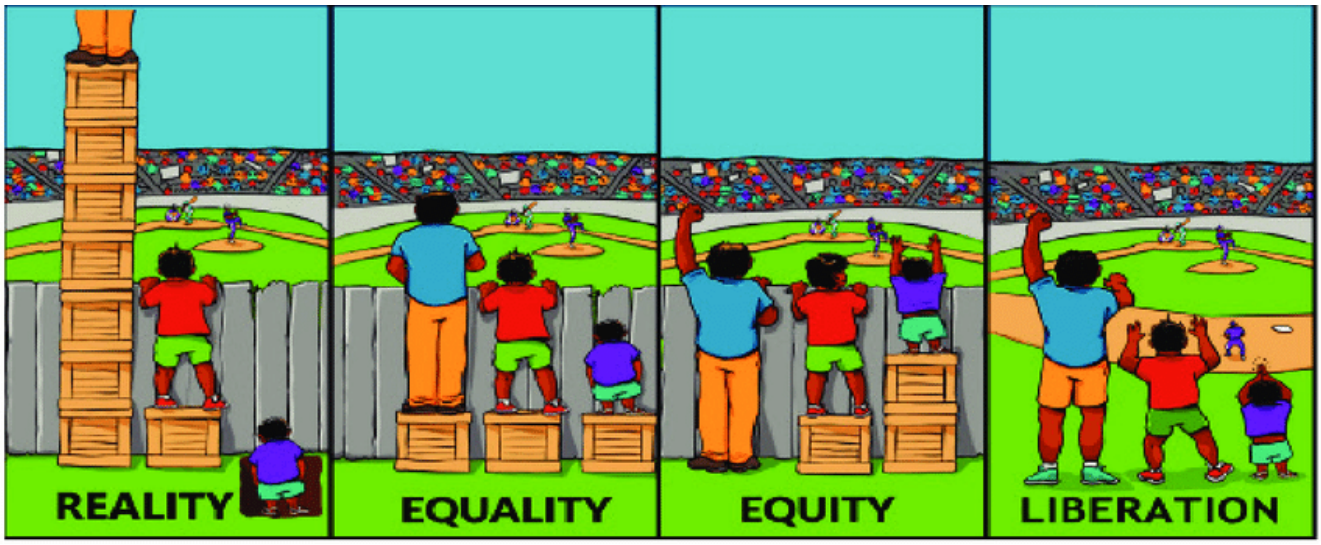

Figure 4: The difference between the terms equality, equity, and liberation, illustrated; © Interaction Institute for Social Change, Artist: Angus Maguire[33]

Examples of Equitable Climate Resilience Strategies:

- Identify underutilized or flexible university facilities with air filtration to temporarily house vulnerable students, faculty, and staff and members of local/regional communities during poor air quality events, and provide temporary shelter as needed for vulnerable students, faculty and staff and local/regional communities.
- Leverage campus resources for community benefit. For example, during the campus shutdown during the COVID pandemic, UC Santa Cruz contracted with local non-profits to produce meals using on-campus facilities, which also kept food service workers employed. Similarly, the University of Chicago

[32] National Equity Atlas, "Indicators" (last accessed June 2021)

[33] Shrehan Lynch. Sue Sutherland, and Jennifer Walton-Fisette, "The A-Z of Social Justice Physical Education: Part 1," Journal of Physical Education, Recreation & Dance, 2020, 91. 10.1080/07303084.2020.1724500.

also partnered with the Greater Chicago Food Depository to prepare and distribute 225,000 meals for those facing food insecurity on the South Side while also awarding more than $680,000 in grants and rent relief to 182 South Side small businesses impacted by the pandemic.[34]

- Give students with health needs priority access to on-campus housing with air-conditioning, and, during climate events, extend this type of priority access to low-wage campus employees.
- Provide low-wage campus workers with family-sustaining wages and benefits. For example, the University of Winnipeg's Diversity Food Services was developed to provide job opportunities for new Canadians, Aboriginal people, community residents and University students while providing sustainable and diverse menu options to the campus community.[35]
- Establish procurement policies that support local economic growth and skills development for vulnerable communities and spur the creation of family-sustaining, good green jobs or cooperatives and wealth-building opportunities. For example, UC Davis Health has developed an Anchor Institution Mission, committing to "developing and supporting jobs for local community members, partnering with local businesses, and purchasing and investing locally, [which will] help generate wealth that stays and grows within those communities."[36]
- Develop local clean energy systems resilient to Public Safety Power Shutoffs using microgrids, local renewable energy and energy storage, prioritizing critical facilities and resilience hubs in the event of disaster or grid failure. For example, several Historically Black Colleges and Universities in Atlanta, Georgia (Morehouse, Spelman College, Morehouse College and Clark-Atlanta University) formed a partnership to develop a community-serving microgrid with local solar and storage to support campus and community resilience.[37]
- Consider how vulnerable campus groups get to and from campus in emergency response planning. For example, during the wildfires in 2019 that caused extremely poor air quality, UCLA delayed cancelling classes, which meant that some graduate students who live off-campus and had longer commutes had already left home, exposing themselves to toxic levels of smoke.
- Require students to participate in research justice and allies training, civic engagement, service-learning courses and participatory action research projects focused on working and learning with underserved communities. For example, Swarthmore College hosts the Chester Semester Program, which is an "interdisciplinary program on social change" that partners students with visionary leaders in the city of Chester, a community deeply impacted by environmental injustices.[38]

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[34] UChicago News, "UChicago awards more than $680,000 in grants to small businesses on South Side," https://news.uchicago.edu/story/uchicago-awards-more-680000-grants-small-businesses-south-side

[35] Diversity Food Services, "Overview," https://www.uwinnipeg.ca/food-services/about/index.html

[36] UC Davis, Student Affairs, "Joint Statement from the Division of Student Affairs and the Office of Diversity, Equity and Inclusion: Principles of Community in Action," https://studentaffairs.ucdavis.edu/news/joint-statement-division-student-affairs-and-office-diversity-equity-and-inclusion-principles

[37] Groundswell, "Breaking Barriers: A Resilience Hub Serving the AUCC, Atlanta GA," https://groundswell.org/breaking-barriers-a-resilience-hub-serving-the-aucc,-atlanta-ga/

[38] Swarthmore College, Lang Center for Civic & Social Responsibility, "Chester Semester," https://www.swarthmore.edu/lang-center/chester-semester

Diversity

Including a broad range of voices in the planning process to integrate a comprehensive range of experiences, barriers, needs, and strengths, ***enabling the creation of robust solutions that protect biocultural diversity and solve intersectional issues****.*

One particular diversity issue plagues the mainstream, U.S.-based environmental movement: it has remained predominantly white, despite the fact that frontline BIPOC communities care deeply about the environment. Polling data has consistently shown that, even when controlling for party, "**non-white Americans are significantly more likely than whites to think global warming should be a top priority for the U.S. government.**"[39] BIPOC communities care about the environment because they are more likely to live in "communities with higher pollution burdens and vulnerabilities" than other racial/ethnic groups.[40] Legacies of environmental racism have turned their communities into *sacrifice zones* of pollution and disinvestment. The lived experiences of these community residents give them expertise on the impacts of pollution and climate change.

Another key diversity issue is the need to address biological factors related to physical health and mobility. A climate resilience planning process must consider the differing needs of older adults, pregnant women, people with limited mobility, physical disabilities, chronic health conditions or mental illnesses, and all who are more susceptible to harm from effects of climate change.

It is widely recognized that the preservation of biological and cultural diversity is central to cultivating climate resilience and mitigating climate change. Resilience is rooted in biodiverse, healthy ecosystems, recognizing the integral role of traditional cultural practices and human communities in maintaining biodiversity. As a part of their climate resilience action plans, universities can invest research, teaching, and service funding and other resources to partner with impacted communities in ways that protect and restore biological and cultural diversity, locally and globally. According to Movement Generation,

> *People experiencing the worst of the environmental and social impacts of the old economy are articulating a new vision for healthy and resilient communities and taking action to build an economy that brings into balance human communities and healthy ecosystems. These communities have a deep and complex vision of resilience that is guiding and driving their concrete efforts to: (a) respond to the current effects of climate disruption, (b) prevent new impacts, and (c) remake their relationships to each other and the natural world in ways that are deeply rooted in place.*[41]

Examples of practices, policies, or programs that increase diversity in climate resilience planning efforts:

- Engage in community-driven participatory action research to identify and implement comprehensive solutions and transition to a regenerative economy.

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[39] Sara Barnard, "Americans of Color put whites to shame on the environment," Grist, September 26, 2014, https://grist.org/climate-energy/americans-of-color-put-whites-to-shame-on-climate/

[40] Office of Environmental Health Hazard Assessment, "Preliminary Analysis of Race/Ethnicity and Draft CalEnviroScreen 4.0 Scores," CalEPA, February 2021, p. 2-3, https://oehha.ca.gov/media/downloads/calenviroscreen/document/calenviroscreen40preliminaryraceanalysisd12021.pdf "All racial/ethnic groups have some members living in communities with the lowest and highest CalEnviroScreen scores. However . . .the average CalEnviroScreen percentile score is lowest for whites and much higher for Latinos, Blacks and Pacific Islanders than for other groups. [...] Latinos, Blacks and Pacific Islanders tend to live in communities with higher pollution burdens and vulnerabilities than the other racial/ethnic groups analyzed."

[41] Lois DeBacker et al., "Pathways to Resilience: Transforming Cities in a Changing Climate," Movement Strategy Center, January 2015, p. 23, https://kresge.org/sites/default/files/Pathways-to-resilience-2015.pdf

- Invest research, training, and funding in service-learning projects that protect and restore biological and cultural diversity.
- Partner with UC students, staff and faculty that are dedicated to these efforts on campus through formations such as the Center for Climate Justice, Carbon Neutrality Initiative and Global Food Initiative Fellows, Just Transition Dialogs, etc.
- Partner with environmental and climate justice groups on- and off-campus to ensure that climate resilience solutions address root causes of environmental racism and center the needs of those most impacted.
- Partner with disability justice groups on- and off-campus to ensure that accessibility and mobility needs are included in the plan.
- Avoid defaulting to the same people that you usually work with.
- Consider the language and cultural needs of the campus community when preparing emergency response communications.
- Consult and collaborate with organizational leadership and members involved in community engagement to inform community engagement efforts. Reach out to your Office of Public Scholarship and Engagement or equivalent.[42]

[42] UC Davis, "Diversity, Equity & Inclusion, "Being an Ally Requires Being an Anti-Racist," https://diversity.ucdavis.edu/being-ally-requires-being-anti-racist

Inclusion

*Adopting practices, policies, and programs that **create conditions of belonging** to ensure that historically oppressed people and groups, who have not previously been included in decision-making processes, are meaningfully represented, respected, and actively engaged in participatory decision making.*

UC's "Principles of Community" recognize that diversity contributes to the university's strength and "rejects all forms of discrimination, commits to fostering an atmosphere of respect and empathy, pledges to defend the right of free speech and promises to promote transparency in community dealings."[43] Achieving diverse and inclusive spaces, however, requires behavioral, cultural, and structural changes to address entrenched individual and systemic patterns of paternalism, implicit bias, co-option and tokenization. For example, extracting individual or group time and knowledge from affected groups without compensation or credit can serve as a barrier to inclusion when community members are not treated as equal partners. Similarly, typical planning practices may assume what the problems are before consulting with the affected groups, leading to false solutions and community mistrust. In addition, as the "Climate Justice Playbook" states, "a vast majority of business practices demonstrate white supremacy culture characteristics: power hoarding, only one right way, fear of open conflict and even perfectionism."[44]

Because the status quo is grounded in unsustainable practices and structural racism, it is important to understand the harm, mistrust, and negative impacts that these practices can cause. Garnering this understanding requires ongoing collective and individual effort and energy to embrace personal discomfort and most importantly commit to learning together for transformation.

Inclusive organizations that utilize participatory action research and decision making and develop equitable, reciprocal partnerships with community members can bring about new ideas, effective problem solving and, ultimately, greater chances of success.

Examples of inclusive practices, policies, or programs that support just and equitable climate resilience strategies:

- Invest in equity, diversity, and inclusion (DEI) training to understand both harmful patterns and best practices for community engagement to establish reciprocal partnerships with diverse campus groups. See your campus DEI office for resources and more information.
- Commit to a practice of building trusting relationships with Native nations, and Indigenous groups so that at the outset of all planning processes, there is a foundation upon which to seek and ensure free, prior, and informed consent to any strategies that impact their lands and waterways.
- Establish participatory action research and decision-making processes, and clear roles for stakeholders to shape solutions that impact them. For example, UC Santa Cruz is conducting a "Student Success Educational Equity Participatory Action Research Pilot" to work with students to define and conduct the research and craft solutions to better understand the experience of "first-generation college students, students of color and those from working class/working poor backgrounds."45
- Ensure that technical terms or academic jargon are translated into accessible language.

[43] University of California, "UCnet, Working at UC, Principles of Community," https://ucnet.universityofcalifornia.edu/working-at-uc/our-values/principles-of-community.html
[44] B Lab et al, "Climate Justice Playbook," p. 22.
[45] UC Santa Cruz, Student Success Equity Research Center, "Student Success Educational Equity Participatory Action Research Pilot (2020-current)," https://sserc.ucsc.edu/projects/ssee-par-pilot.html

- Curate creative multi-disciplinary spaces to analyze impacts and generate solutions.
- Reflect on how the intergenerational trauma of vulnerability factors (such as poverty, marginalization or lack of access to health care) can negatively impact how a person shows up and their ability to participate. Identify healing practices —such as trust-building exercises and story sharing— to interweave throughout the planning process to support healthy participation among community members.
- Provide ongoing campus and community popular education facilitation training and programming to support disaster preparedness planning, awareness and capacity-building, particularly for vulnerable or frontline populations. For example, at the height of COVID-19, UC Irvine Community Resilience Projects and Program in Public Health partnered with regional community groups and the county health care agency to design and deliver popular education based, bi-lingual training to 300 resident leaders, UCI students, and local community health workers in health equity-focused contact tracing and community-driven COVID-19 response. The resulting learning and action community has formed the basis of new, community-owned efforts to lead community-driven climate resilience planning processes.46
- Increase awareness of and access to on-campus trauma support services to better support vulnerable campus groups.
- Provide compensation and mitigate potential barriers (i.e., provide childcare, food, accessible meeting times and locations, transportation, language interpretation, etc.) for participants from vulnerable groups to be able to meaningfully engage.
- Engage local arts and culture groups to identify key moments in the planning process where culturally relevant art forms (such as murals, public art installations, and participatory theater forums) can facilitate authentic participation from a range of stakeholders and support needed narrative change.
- Expand mental health and well-being support to help students, staff, and faculty in the face of increasing pressures and stressors of accelerating climate change.

[46] UCI Community Resilience, "Why This is the Work," June 14-28, 2020. https://communityresilience.uci.edu/why-this-is-the-work/

Case Study

Tulane University: Building Resilience After Hurricane Katrina[47]

Prior to Hurricane Katrina, Tulane University had little to no relationship with the surrounding community. The category five hurricane's devastating damage displaced about 100,000 students, decimated the surrounding community, and saw most of the city of New Orleans's workforce evacuated. While Tulane had been the largest private employer in the city, immediately after Katrina it became the city's single largest employer of any type.

Impacts

- 80% of Tulane campus flooded
- $500 million in damage
- Closed all fall semester 2005: Then-President Scott Cowen, "feared that the university might never reopen."

Response

Following Katrina, Tulane formally strengthened its commitment to New Orleans and has played an integral role in rebuilding the city. Then-President Scott Cowen worked to deepen Tulane's involvement with the surrounding community. Pivotal measures included becoming the first major research institution to require all students to take a service-learning course focused on community development. It became clear that the success and resilience of the university was tied to the resilience of the surrounding community. The lesson of Katrina, he says, is that it is important to stay "completely, continually connected to your community."

Tulane's additional efforts to restore community resilience included providing:

- Resources and education opportunities for neighborhood residents
- Housing for displaced students and residents
- Health care delivery throughout the city
- Support for city rebuilding efforts
- Partnership with hundreds of community-based organizations

Benefits

- Competitive recruitment: Increased application rate from 18,000 to 44,000 (now one of the most selective universities in the country - Kaplan/Newsweek named Tulane as one of the twenty-five "Hottest Schools in America" ("Tulane: A Plan for Renewal," n.d.)
- Improved academic rigor: first Carnegie-ranked "very high research activity"
- Surpassed its record for research awards in 2008 (by 15 percent) for more than $160 million in funding
- Completed a $700 million capital campaign despite the attrition of approximately half of the development staff following the hurricane (Cowen, 2009)
- Student and faculty retention rates have increased due to community engagement

[47] Case study derived from the following sources: Clinton School Speakers, "From Disaster to Recovery and Resilience: The Tulane University Experience," YouTube video, posted January 23, 2017, https://www.youtube.com/watch?v=sEgwa21wwe0&t=3046s; Elizabeth Giegerich, "A Look at Tulane University's Service-Learning Post-Katrina," The Nation, August 25, 2008, https://www.thenation.com/article/archive/look-tulane-universitys-service-learning-post-katrina/ ; Elisabeth Peyton Hahn, "In the Storm's Wake: Emergency Management at Tulane University After Hurricane Katrina," Doctoral dissertation, Harvard Graduate School of Education, 2018, http://nrs.harvard.edu/urn-3:HUL.InstRepos:37679889 Image Source: New Wave staff, "Recovery and resilience: Ads show Tulane progress," Tulane News, August 29, 2015, https://news.tulane.edu/news/recovery-and-resilience-ads-show-tulane-progress

Key Steps: J.E.D.I.-Centered Climate Resilience Planning

1) Establish the Team, Scope, and Baseline

Why this is important:

Initiating a resilience planning process should begin with preparatory work that sets the groundwork for a successful project. This includes defining the Core Team leading the project, identifying the scope of the effort, and reviewing what work has already been done. This means exploring past sustainability or climate planning efforts, emergency management plans, capital planning or asset plans, campus diversity reports, and others, to assess where resilience planning efforts can support or be supported by existing efforts. A scoping template to support this step is provided in **Appendix A.**

J.E.D.I. Considerations:

Consider innovative ways to build the core planning team to be racially, ethnically and culturally diverse and to represent a diversity of ideas, roles, and responsibilities. Consider ways to include students and include a member from the Diversity, Equity and Inclusion Office if feasible.

Step 1 Actions:

a) Establish a Core Team to lead the planning process:

- One of the most important steps in climate planning is establishing a Core (i.e., Leadership) Team that will scope, coordinate, and drive the planning process.
- This team is ideally a smaller group (under 6 people) that can dedicate consistent time to the project and have sufficient understanding and reach on the campus to initiate contact with other stakeholders. This team can take multiple forms, such as a task force, committee, or regular touchpoints for an existing group.
- When establishing the Core Team, consider including people who hold key knowledge about campus infrastructure systems and sustainability initiatives, emergency management and response, represent key vulnerable groups on campus, and hold expertise in climate change hazards and/or J.E.D.I. approaches.

b) Develop a project charter by which the team will operate:

- Develop a project charter that outlines the team structure, reporting process, and timeline. This could be part of the scoping template in Appendix A, or a stand-alone document with more detail. Consider phasing the planning process to best leverage staff capacity, desired level of stakeholder engagement, and available resources.
- Clarify roles and responsibilities for key team members including who will lead the effort, how decisions will be made, and what level of accountability and reporting will be required, as well as frequency of meetings and documentation.
- Determine a department sponsor and administrative leader the Team will report to and who will support the effort.

c) Determine the scope of the project:

- Determine the geographic scope of the project by asking the following questions.

- What will be the geographic or institutional boundaries of the planning process? Will you define the surrounding community as one or several specific neighborhoods, or does it include the whole town, city, or region?
- Should certain portions of the campus be excluded (e.g., medical centers, leased facilities)?
- What relationships or linkages with other geographic or institutional areas will be made or addressed?

- Map out the campus assets and identify the operations and facilities needed to make your campus and business model function. Include an identification of the major thoroughfares and routes needed to reach your location.
- Establish the planning horizon for this effort (10, 50, 80 years?).

d) Review what work has already been done that the planning process can build on:

- What plans, policies or strategies does the campus already have in place that can be used as a jumping off point? For example, other emergency management plans, J.E.D.I. or Campus Climate reports, and policies.
- Conduct a scan of the current policy and planning landscape to identify where existing strengths lie, and where the planning process can address gaps or areas of improvement. This can include research studies, risk/emergency management planning, climate mitigation plans, sustainability plans, long-term strategic plans, capital and other planning processes, past engagement efforts, and others.

e) Determine what kind of planning process is best for the campus given past efforts:

- What are the opportunities and challenges for resilience planning on the campus?
- Should this effort be integrated into multiple existing plans, update a past plan, or stand alone?
- How might the planning process be phased to best leverage staff availability, resources, engagement, and leadership buy in?

2. Identify Vulnerable On-Campus Populations

Why this is important:

Identifying vulnerable on-campus groups at the beginning of the process will keep their needs and considerations at the forefront of the planning work and provide the best opportunity to ensure that all members of the campus community can thrive before, during and after climate disruptions.

J.E.D.I. Considerations:

Many vulnerable on-campus groups can typically be overlooked in planning efforts. Focusing on identifying underserved frontline groups will help to identify previously overlooked harms that can in turn be prioritized for action in climate resilience planning efforts. Engaging with these groups can also help create greater social cohesion and open doors to connecting with other marginalized groups in the off-campus community.

Key Terms:

Vulnerability refers to the degree that a particular element or group is susceptible to impacts and is generally understood as a function of:

Exposure: The nature or degree to which the element or group is within the reach of a climate-related hazard, such as whether a building is within a flood extent or whether students are on campus during periods of extreme heat.

Sensitivity: The degree to which elements or groups have pre-conditions that make them particularly susceptible to climate change hazards. For example, individuals with pre-existing respiratory conditions are generally more sensitive to smoke events; older infrastructure is generally more sensitive to flood events); and

Adaptive capacity: The degree of ability to prepare for and respond to impacts and consequences (e.g., a population or service that is already under stress has lower adaptive capacity). The adaptive capacity of a group or population is typically directly related to existing public health and socio-economic harms, which can be discovered even before specific climate hazards are identified.

Vulnerable means particularly exposed, sensitive, or unadaptable to the impacts of climate change.

Step 2 Actions:

a) Identify the most vulnerable on-campus groups by gathering both quantitative and qualitative data:

- Core Team: Set up meetings with key departments to move beyond the initial textbook list of potential vulnerable populations, toward a detailed understanding of the quantity of those individuals on campus, university-specific needs, existing resources, and existing resource gaps. Potential departments include Student Support Services; Diversity, Equity, and Inclusion; Disability; and Employee Human Resources, which should be able to provide additional insight about vulnerable students, faculty and staff.
- Compile this data into a quantitative assessment of vulnerability indicators.
- Augment **quantitative** data with **qualitative** data, such as campus surveys or interviews with unions, student groups, and other representatives of vulnerable campus groups.
- Prioritize groups for support and engagement.

Factors that increase vulnerability to climate change

Existing inequities, institutionalized racism, or exclusion: People facing disproportionate impacts often have lower socioeconomic status, which result in fewer resources for preparing, coping and recovering from climate impacts.

Lack of investment and opportunities: The disinvestment and resource deprivation experienced by neglected communities facing inequities or isolation leads to degraded living conditions and lack of power over decisions that affect their lives.

Physical states or conditions that increase vulnerability: Older adults, young children, pregnant women, and people with chronic health conditions or mental illness are more susceptible to harm from effects of climate change.

Poor environmental conditions, access to services, or living conditions: Populations at higher risk under a changing climate include those who are uninsured or underinsured, lack access to health care or child care, lack access to transportation, live in areas with poor air quality, live on upper floors of tall buildings, live in urban "heat islands" with lots of impervious surfaces and little tree cover, lack life-supporting resources such as adequate housing and ways to cool living spaces, are food insecure or

lack adequate medications, or are tenants or renters. Populations at higher risk also include those living in "land islands" that have limited access to resources and services due to conditions of geographic isolation. [48]

Examples of vulnerable on-campus populations

- Low-income students, staff, and faculty —including students receiving financial aid, and people experiencing food and housing insecurity, or who lack access to air conditioning;
- People of color;
- Foster students or other students without parental support;
- International students, undocumented students and new immigrants or refugees;
- Differently abled and those with impaired mobility/health conditions;
- Formerly incarcerated students;
- Students with Limited English Proficiency;
- Landscape staff and others who work outside;
- Those that rely on transit and / or long commutes to reach campus;
- New and younger students and students in general.

UC Berkeley assessed that students are "more vulnerable than the general population" due to "limited life experience" that may cause them to be "less aware of risk" or of strategies for risk-management. As many students "hail from other places, their lack of experience in the local region" can increase vulnerability. Additionally, "limited finances can lower access to necessary resources in responding to emergency situations."[49]

3. Identify and Engage Stakeholders

Why this is important:

Besides the Core Team, there are many other individuals and groups from different scales across the community that can and should be included in resilience planning, including:

- **On-campus community:** People and communities directly involved with, and situated within, the campus footprint. This includes students, deans and other leadership, staff, faculty, researchers, on-campus businesses, and others.
- **Off-campus community:** University affiliates who reside or conduct university business off-campus, and their families and communities in the surrounding region where they live, work, or recreate.
- **Local/regional community:** People, communities, and organizations that are or can be impacted by the university's physical location and operations, and any adaptation actions the campus may take. This scale includes local businesses, broader community members, Indigenous communities, local community groups, local and regional governments, utilities, health authorities, and others.

[48] Office of Planning & Research, Defining Vulnerable Communities, p. 6

[49] UC Berkeley Vulnerability Assessment

All stakeholders are likely to be impacted by climate change and by any planning decisions made. Each group of campus stakeholders has a distinct type of expertise to share with campus climate resilience planning efforts and may not all need to be engaged in the same way or for the same duration. Mapping out and identifying how best to engage with these stakeholders is a critical step in effective planning.

J.E.D.I. Considerations:

The process of stakeholder mapping begins with clarifying the geographic scope of the campus community to ensure representation from all impacted and/or interested groups. It is important to take historical legacies into account and make an effort to **include voices that have been previously excluded or ignored.** It is also critical to determine **how** stakeholders will be engaged such that all stakeholders are meaningfully included rather than tokenized. Engaging key members of on- and off-campus communities early in the planning process enables them to inform the work from the beginning and helps the campus avoid missteps, build better relationships, and create solutions that incorporate the priorities and expertise of impacted communities. **Use in-depth outreach and collaboration with on-campus groups to shape your approach to off-campus outreach.**

- **Examples of Vulnerable Off-Campus Populations:** Students, faculty, and staff-members who reside off campus and are low-income, mobility impaired, transit-dependent, have limited English proficiency, long commutes or have pre-existing conditions.
- **Examples of Vulnerable Local/Regional Populations:** Residents, organizations and local businesses of communities that are adversely affected by campus operations or climate impacts, especially low-income communities, communities of color, Native Tribes or Indigenous groups.

Key Terms:

There are three primary roles stakeholders may have, including:

- **Steering Committee:** A Steering Committee can work with the Core Team (established in Step 1) to provide guidance, direction, and oversight throughout the planning process. They can also provide input into designing the engagement process and support communication and collaboration among other key departments and stakeholders.
    - Ideally the Steering Committee will include representatives and decision-makers from a broad cross-section of the university and could include sustainability, facilities, faculty, researchers and climate specialists, students, administration, and other staff. This is a great opportunity to think beyond the typical participants and invite individuals or groups that can offer a more diverse perspective.
- **Advisory Committees:** Advisory Committees can provide additional sources of area or topic-specific input and review to advise planning efforts. Advisory bodies can be helpful in numerous ways, including by:
    - Providing insight on how to reach different populations;
    - Addressing potentially controversial issues;
    - Providing feedback about the effort's overall approach to social equity, including strategies to improve the initiative;
    - Understanding sensitive campus and community needs;

- Helping to build campus and community capacity;
- Representing a greater portion of the campus and community;
- Reflecting on-campus climate change research and expertise;
- Serving as connectors between the campus and other partners such as cities, counties, and agencies;
- Helping to build trust between the campus, local community, county, and agencies.[50]

- **Key Interest Groups:** There will be a broad range of other stakeholder groups that may be impacted by climate change or have an interest in planning and actions.
  - These groups may participate at various points in the planning process. Strategies for building awareness and gathering feedback from these groups can include outreach communication such as web content, fliers, and surveys or forums for dialogue such as workshops or focus groups.
  - Engaging with these groups as part of the planning process can build their understanding of climate change and help them start thinking about their own strategies for resilience.

Step 3 Actions:

a) Identify key stakeholders at different scales:

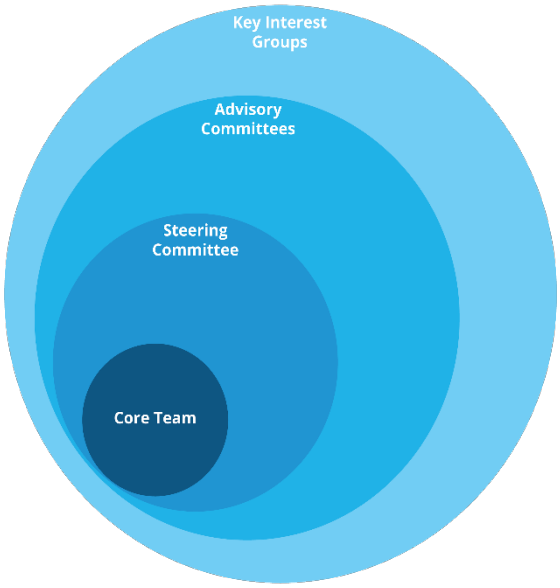
- Review the table below and customize your list for your location. Include representation of vulnerable groups prioritized in Step 2. Be as specific as possible and include contact names if known for organizations / groups.

[50] Adapted from Mohnot, S., Bishop, J., & Sanchez, A., "Making Equity Real in Climate Adaptation and Community Resilience Policies and Programs: A Guidebook," The Greenlining Institute, August 2019, https://greenlining.org/publications/2019/making-equity-real-in-climate-adaption-and-community-resilience-policies-and-programs-a-guidebook/ .

<table>
<tr><th colspan="2">Campus Community
On-Campus</th><th>Off-Campus</th><th>Local / Regional</th></tr>
<tr>
<td>Administration
University & department leadership (VCs/AVCs)
Departments
Emergency Response
Fleet Management
Energy Management
Health and Wellness
Building management
Landscape and Grounds
Campus Operations
Office for Sustainability
Planning & Project Management
Risk Management & Audit Services
Equity Office
Information Technology
Campus community liaison
Student Services</td>
<td>Students
Undergraduate
Graduate
Student body representatives
Student groups
Faculty/Researchers
Deans
Researchers
Academic Senate
Climate change scientists and specialists
Research assistants
Instructors
Teaching assistants
Adjunct Faculty members
Tenured Faculty
Other Faculty
Medical Center
Administration
Medical staff
Patients
Other
On-campus business owners
Visitors</td>
<td>University affiliates located off campus
Off-campus student housing
Families of students, faculty, and staff
Institutions that provide vital services to members of the campus community</td>
<td>Community groups
Indigenous groups & Native Nations
Interest groups
Community-based organizations and coalitions, especially health, environmental and climate justice centered
Non-governmental organizations
Businesses
Faith-based groups
Local Municipal authorities
County governments
Regional agencies
State authorities
Utilities (energy, water)
Transit providers
Health authorities
Housing authorities
Other colleges and universities
K-12 schools
Hospitals</td>
</tr>
</table>

b) Develop a stakeholder map that identifies which role each stakeholder will play in the planning process:

- Using the list of stakeholders generated in action 3a, group stakeholders using the stakeholder mapping diagram below. Refer back to the definitions of each stakeholder role under Key Terms to inform the mapping process.
- The purpose of this mapping activity is to identify how deeply the stakeholder should be engaged and then determine which role that level of involvement translates to.
- While the role of each stakeholder group may vary for each campus, generally:



The Core Team should be established under Step 1 of the planning process and acts as a leadership team rather than a stakeholder group. The team is typically made up of UCOP staff and faculty who are responsible for designing and implementing sustainability programs for the campus.

A Steering Committee will include decision-makers from stakeholder groups with important knowledge that is core to climate impacts and planning. Often steering committees include representatives from local and regional organizations and agencies who often have a broad understanding of the needs and perspectives of multiple stakeholder groups to provide a system-wide perspective.

Advisory Committees will be made up of groups with experience and knowledge that may not be climate-focused but that may be important to inform climate resilience for key impacted groups or university service areas.

Key Interest Groups are those that have an interest in staying informed and are able to share observations and priorities related to climate impacts and action in a specific interest area.

c) Develop an engagement plan that outlines how each main group of stakeholders will be engaged throughout the planning process:

- An engagement plan is a document that sets engagement objectives and outlines the specific engagement approaches and timelines to be carried out over the course of the planning process.
- Refer to the outcomes from the stakeholder mapping activity in action 3b and use the *Spectrum of Community Engagement to Ownership*[51] (see ***Appendix B***), to chart out the appropriate engagement objective for each stakeholder, taking into account their key areas of knowledge and interest and the role they will play in the planning process. Additionally, ***Appendix C*** includes *Best Practices for Engaging Community Stakeholders*.
- Based on your engagement objectives, identify the appropriate engagement approaches for engaging each key role (e.g. Steering Committee) or stakeholder group (e.g. students).
- As you develop your engagement plan, begin to engage local and regional community leaders, groups and organizations (e.g., advocates for environmental and climate justice, immigrant rights, affordable housing, etc.) **with whom the university has existing relationships of trust and reciprocity**. For local and regional groups where there is not an existing relationship, use in-depth outreach and collaboration with on-campus groups to shape an approach, identified in the engagement plan, for building relationships and partnerships with local and regional groups and community leaders. Note that community leaders may not necessarily part of local and regional governmental agencies.

[51] Rosa González, "The Spectrum of Community Engagement to Ownership," Movement Strategy Center , 2020, https://d3n8a8pro7vhmx.cloudfront.net/facilitatingpower/pages/53/attachments/original/1596746165/CE2O_SPECTRUM_2020.pdf?1596746165 . See adapted version in Appendix B.

- In many cases, it may be best to use a range of approaches along the engagement spectrum to engage with a particular stakeholder group at different phases throughout the planning process. For example, engaging students could involve sharing information about climate change through social media or the email listserv (INFORM), hosting meetings or booths in common areas (CONSULT), interactive workshops or focus groups (INVOLVE), inviting student representatives to join the Steering Committee (COLLABORATE), or initiating a student-led committee to support ongoing climate action and implementation (EMPOWER).[52]

4. Develop a Shared Vision and Guiding Principles

Why this is important:

Developing a shared vision is an important ground-setting and trust-building step in a J.E.D.I.-centered climate resilience planning process. The visioning process helps to guide and set goals, and when combined with a set of principles, provides a framework to reference during planning. A vision for climate resilience that is place-based and co-created by the community can "drive organizing, advocacy and public decision-making."[53] The vision and principles will provide the overarching framework for the climate planning process and will guide ongoing implementation and progress monitoring to ensure action stays true to the key drivers and priorities defined during the planning process.

Use this effort as an opportunity to help build relationships, educate stakeholders, and identify shared values as well.

A template to support the development of a shared vision and principles is included in **Appendix D.**

J.E.D.I. Considerations:

Use the opportunity to develop a shared language and advance a **holistic framing** of climate resiliency that can unify and inspire diverse stakeholders to work together. Carefully select lenses and frameworks that are useful for shared work. Reflect J.E.D.I. considerations in the vision and guiding principles specifically.

Key Terms:

A **vision** is a brief guiding statement that articulates the end goal for resilience planning (see example below).

Guiding principles are a set of criteria that when followed, ensure that decisions made along the planning process adhere to the overarching vision.

Step 4 Actions:

a) Develop a shared vision:

- Convene the Core Team and Steering Committee to discuss and identify a shared vision for the climate resilience planning process. Visioning sessions should develop a shared definition of

[52] González, "The Spectrum of Community Engagement to Ownership." See Appendix B.

[53] NACRP, "Community-Driven Climate Resilience Planning: A framework," October 2017, https://www.nacrp.org/ .

resilience that reflects the **unique assets and challenges** of the community and incorporates the latest thinking by climate justice thought leaders.

- Gather feedback from other stakeholder groups, including Advisory Committees and Key Interest Groups, on the draft vision through scheduled engagement initiatives defined in the Stakeholder Engagement Plan (action 3c).
    - Create opportunities throughout planning to revisit the vision to ensure that efforts are in alignment and continue to inspire stakeholders.
    - Translate the vision into metrics and indicators of local resilience and use the metrics to assess and celebrate progress.

b) Adopt a set of guiding principles:

- With the same group of stakeholders for action 4a, develop a set of guiding principles that will set out how the vision will be achieved. Share the final vision statement and accompanying principles with all stakeholders in the planning process.
- Questions to consider include:
    - *What core themes or criteria should lead climate resilience action on campus?*
    - *What guiding principles are already in place for other planning and decision making on campus?*
    - *How might principles guiding climate resilience draw on or differ from existing principles already in practice?*
    - *How can climate resilience efforts better align campus systems and services with justice, equity, diversity and inclusion to alleviate existing disparities and increase access to resources?*

Sample Vision

The campus will support students, campus personnel, and residents of local/regional communities in preparing and responding to climate change while also reducing carbon pollution and enhancing quality of life. The campus will work at the nexus of community resilience, emergency management, climate change mitigation, and social equity to ensure a thriving campus community while looking for opportunities to support and improve the resilience of surrounding neighborhoods.

Example Guiding Principles

1. Prioritize integrated climate actions, those that build resilience to climate impacts while also reducing greenhouse gas emissions providing multiple other benefits to communities.
2. Prioritize actions that promote equity, foster community resilience, and protect the most vulnerable. Explicitly include communities that are disproportionately vulnerable to climate impacts and who have historically not been given a voice.
3. Prioritize natural and green infrastructure solutions to enhance and protect natural resources, as well as urban environments. Preserve and restore ecological systems (or engineered systems that use ecological processes) that reduce risk and enhance natural system health and services such as water and food security, habitat for fish and wildlife, coastal resources, human health, recreation, housing and jobs.
4. Avoid maladaptation and false solutions. Do not adopt actions that worsen the situation or transfer the challenge from one area, sector, or social group to another. Identify and take all opportunities to prepare for climate change in all planning and investment decisions.
5. Base all planning, policy, and investment decisions on the best-available science, including local and traditional ecological knowledge, including consideration of future climate conditions out to 2050 and 2100, and beyond.
6. Employ adaptive and flexible governance approaches by utilizing collaborative partnerships across scales and sectors to accelerate effective and comprehensive problem-solving and solutions. Promote integrated mitigation and adaptation actions at the regional and landscape scales.

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7. Take immediate actions to reduce present and near future (within 20 years) climate change risks while also thinking in the long term and being responsive to continual changes in climate, ecology, society, and the economy. Use adaptive management approaches that can be adjusted to meet changing conditions based on findings from regular monitoring.

5. Identify Climate Impacts

Why this is important:

Understanding how the changing climate will potentially impact the campus is an important first step to then be able to identify potential vulnerabilities and priorities for climate action. To identify climate impacts, it is necessary to first understand how climate change trends and projections may lead to on-the-ground hazards that a campus could face.

J.E.D.I. Considerations:

It is important to keep in mind that some climate impacts may not be adequately reflected in climate science. Previous assessments may not have consulted community members or fully understood conditions on the ground, leading to equity gaps and blind spots. For instance, previous vulnerability assessments conducted by some UC campuses have relied on FEMA floodplain maps. However, a recent investigation discovered that nearly double the number of properties may be susceptible to flood damage than FEMA's federal flood maps have identified, "and minority communities often face a bigger share of hidden risk."[54] Additionally, discussions about sea level rise or stormwater flooding do not always assess impacts caused by flooding of active or legacy toxic sites. As such, it is important to seek and encourage additional sources of knowledge and insights, often from communities, into potential climate impacts, vulnerabilities, and risks throughout the climate resilience planning process.

Key Terms:

Climate change is occurring on a range of scales, with **trends** in rising air temperatures and changing precipitation patterns on a regional scale leading to specific **hazards** such as flooding and more frequent heat waves at the local scale. While some outcomes from climate change will be associated with more frequent or severe **"shock" events** such as wildfires, climate change will also lead to **slow onset "stress" events** such as sea level rise, erosion and increasing average air temperatures that will gradually and permanently change local conditions. Climate change planning should consider the broad spectrum of climate change trends and hazards that may impact campus spaces and communities.

Climate impacts that result from shocks or stresses can be thought of as primary or secondary. **Primary impacts** refers to those that occur as a direct result of changing climate conditions, such as extreme heat events or drought. **Secondary impacts** (otherwise known as knock-on or cascading impacts) occur as a result of primary impacts. For example, a power outage that affects a campus' IT infrastructure may in turn impact a population's ability to receive information on what to do during the emergency event, which could affect a population far beyond the power outage area.

Climate projections provide a science-based indication of how climate is changing on a regional scale and how future conditions could look. Climate projections can help people understand what

[54] Christopher Flavelle, Denise Lu, Veronica Penney, Nadja Popovich and John Schwartz, "New Data Reveals Hidden Flood Risk," New York Times, June 29, 2020, last accessed March 2021

impacts may occur so they can plan to avoid or mitigate their consequences. Climate projections can help people to understand what impacts we can expect so that we can avoid or prepare for them and reduce their consequences. Climate projections can also highlight opportunities that can be taken advantage of.

Step 5 Actions:

a) Understand climate change trends and potential local hazards:

- The first step is to access **climate change projections** that illustrate what climate change trends are expected to look like in your region. Climate change projections are typically available for changing air temperature or precipitation patterns, but may also be available for other climate trends such as sea level rise and wildfire risk.
    - Check if your city or region has conducted a climate resilience plan and/or is part of the 100 Resilient Cities network. If available, use this work to kickstart an understanding of climate change trends affecting the campus.
- If your city or region has not yet conducted resilience planning work or you wish to customize the understanding of potential climate impacts for your campus, use available resources to identify the key changes in climate expected for the planning boundary as identified in Step 1.
    - To get started with selecting climate projections, refer to the Cal-Adapt website, which provides an interactive platform and comprehensive database of climate projection data for air temperature, precipitation, and wildfire for each region in California.
    - For more information and resources for selecting the most appropriate climate change projections for your campus and planning process, refer to **Appendix E** for key considerations and resources.
- Once you have your projections, determine how far in the future you want to plan for (e.g. 2050s, 2080s, 2100s). This is commonly referred to as selecting a "planning time horizon", and should be influenced by the data available, your planning objectives, and align with the planning horizons used in your city, region, or campus.
    - When defining a planning time horizon, aim to select a time horizon that reflects the lifecycle of campus assets and provides enough time to prepare for and implement actions. However, keep in mind that climate projects are more uncertain further in the future and that climate resilience planning should be an iterative process that will be updated and refined as new information becomes available over time.
- Once you have your climate projection data, frame this information using a visual format such as a table or infographic with colour-coding and iconography that can be easily digested by a range of stakeholders, including in a workshop setting. Use simple explanations of each metric to clarify what they mean and highlight key trends and changes over baseline ("past") conditions for different time periods (e.g. 2035-2063, 2070-2099).
- Climate change projections provide critical information for evidence-based climate planning however often do not account for all of the possible shocks and stresses that might affect a campus. After reviewing climate projection data, consider what other hazards may be relevant to the campus and should be considered. These may include:
    - River, coastal, or overland flooding and erosion;
    - More frequent or severe wind, hail, and thunderstorm events;
    - Interface wildfires or smoke-related air quality events; or

- Drought effects on drinking water supplies, landscaping, and ecological habitats.

Climate Indicator	Plain Language Description	Past	2020	2050	2080
Warmer summers with hotter days, more heat waves, longer dry spells and air quality impacts from wildfires					
Days Above 25°C	The number of days that reach temperatures over 25°C in any one year. This measure indicates how often we can expect "summer weather" to occur in the future.	22 days	+18 days	+42 days	+70 days
Days Above 30°C	The number of days that reach temperatures over 30°C in any one year. This indicator is important to public health and facilities as mortality rates jump when temperatures are at or near 30°C.	2 days	+4 days	+13 days	+31 days
Hottest Day	The maximum temperature on the hottest day recorded annually.	86.2°F	+3.2°F	+6.8°F	+11.3°F
Cooling Degree Days (CDD)	The number of degrees that a day's average temperature is above 18°C, summed over all the days in a year. This is commonly used as a metric of building cooling requirements	83 CDD	+94 CDD	+257 CDD	+506 CDD
Tropical Nights	The number of days in a year when the nighttime low temperature is greater than 20°C. A series of hot nights can reduce the ability of buildings to cool passively at night, increasing cooling load and energy use during warm spells and leading to heat stress for occupants.	0 day	+0.4 day	+6.3 days	+25.3 days
Dry Spells	The number of consecutive days where daily precipitation is less than 1mm, denoting the longest stretch of dry days in a year, typically in summer. This number does not indicate extreme droughts, as it is averaged over the 30-year period.	24.9 days	+2 days	+2.8 days	+5.7 days
Warmer winter highs and lows					
Warmest Winter Day	The highest temperature during the winter months in an average year. When considered in combination with the coldest night, this indicator describes the "new normal" for winter temperatures.	12.9°C	+2.9°C	+4.8°C	+8.1°C
Coldest Winter Day	The minimum temperature of the coldest winter day.	17.2°F	+3.6°F	+7.0°F	+10.3°F
Heating Degree Days (HDD)	The amount of energy that it takes to heat buildings to comfortable temperatures, calculated by multiplying the number of days that the average daily temperature is below 18°C by the number of degrees below that threshold	2822 HDD	-15%	-28%	-44%
1-in-20 Coldest Night	A nighttime low temperature so cold that it has only a one-in-twenty (or 5%) chance of occurring in a given year. This indicator is a marker of extreme winter cold temperatures.	5.5°F	+4.0°F	+9.4°F	+15.5°F

Figure 4: Example summary handout of climate metrics related to increasing temperatures

b) Identify campus elements and groups likely to be impacted:

- Work with key stakeholders to develop a list of people (including vulnerable populations identified in Step 2), assets or services that may be impacted by climate change and resulting hazards.
  - It's important to note that climate change will have far reaching impacts and could potentially impact all aspects of community and campus life in small or significant ways. For this reason, it's important to think carefully about what elements you want your climate planning process to focus on, keeping in mind what information you currently have and the areas you have authority and influence. Climate change planning is iterative and new areas of impact can be explored at a later date as more information becomes available, new impacts are identified, and stakeholder group priorities change.
  - The process of identifying key impacted elements and groups may reveal other key stakeholders that should provide input into the planning process. This provides an opportunity to invite representatives from these impacted groups to join the Steering Committee or Advisory Committees to ensure their voices are heard and inform the planning process.

Campus Categories	Details
People	***On-Campus***: Students, staff, faculty, researchers, visitors etc, including vulnerable populations. ***Off-campus*:** University affiliates who reside or conduct university business off-campus, and their families and communities in the surrounding region where they live, work, or recreate. ***Local and regional community*:** People, communities, and organizations that are or can be impacted by the university's physical location and operations (e.g., near polluting facilities or impacted by campus traffic routes), and any adaptation actions the campus may take. This category includes local businesses, broader community members, Indigenous communities, local community groups, local and regional governments, utilities, health authorities, and others. It may also include people who are unhoused and/or undocumented. Special emphasis should be paid to the groups identified in Step 2 that may have unique or intersectional vulnerabilities such as language barriers, pre-existing mental or physical conditions, low income, housing insecurity, and/or other pressures related to race, gender, sexuality, and immigration status.
Assets	***Physical assets:*** existing and planned buildings/campus housing/facilities, water and energy infrastructure, IT and communications infrastructure, transportation infrastructure, utility and waste infrastructure. ***Natural assets***: green space, ecosystems such as wetlands/forests/grasslands/beaches, grounds and landscaping, air and water quality. ***Cultural assets***: public art, sacred grounds/artefacts, historical buildings, community gathering spaces, and landmarks.
Services	Social/health/emergency services, educational services/classes/research, mission continuity, campus governance

c) Use climate change projections and hazard information to identify potential impacts:

- Using the template in **Appendix F**, brainstorm a list of how each group, asset or service identified in Action 5b could be impacted by hazards identified in Action 5a. The template outlines some potential climate impacts on campuses that planning teams can use as a starting point to tailor to their local climate change planning context.
- This step can be completed with varying levels of detail, but should involve input from a diverse array of key stakeholders to form a complete picture and understanding of impacts.
- Ask questions such as the following:
    - **On-Campus:**

        - *What previous disasters, crises, or climate change impacts has the campus faced, and what impacts were observed?*
        - *How could the identified climate change trends and hazards directly impact key areas, people, assets, and services on-campus over the next 10, 20, 50, and 100 years?*
        - *What additional (secondary) impacts could result from these direct impacts?*
    - **Off-Campus:**
        - *What formal or informal services has the campus provided to the surrounding community during previous disasters, crises, extreme weather events, or unhealthy pollution days?*
        - *How could climate change impacts on campus affect key areas, people, assets, and services off-campus over the next 10, 20, 50, and 100 years?*

- Tools and strategies to support a productive brainstorming session include:
    - **Using visual tools such as maps and photos** to ground discussion in the local context. Maps should show key landmarks specific to the campus elements and groups defined in action 5b and can be used as a communication tool that stakeholders can mark up with notes highlighting observed and expected climate impacts.
    - **Tools for interactive discussion** to explore how one impact may create secondary or knock-on impacts in other areas. Interactive tools could include online whiteboards, posters and sticky notes, breakout groups for discussion, scenario activities, and interactive polls.
    - **Encouraging the use of stories**, anecdotes, and personal experiences to generate impact statements, as these are important sources of information. Using examples of past events (e.g. heat waves, fires, floods) can help make impacts feel more tangible and make it easier to identify secondary or unexpected impacts unique to the campus or key groups.
- **Refine the brainstorm into precise impact statements** for each hazard that clearly reflect a) the most significant effects on key elements and groups on campus, b) the outcome or consequence of the impact and any major secondary impacts on or off campus.
    - For example: Increases in the number of extreme heat days (hazard) could a) threaten the effectiveness of air conditioning units in older residences, which could b) reduce thermal comfort and present health risks to students with pre-existing health conditions.
    - Being clear in the impact statements helps to show discrete issues and avoid overlap between different impacts.
    - Sample impact statements are provided in **Appendix F.**

Additional Resources:

- Planning for Adaptive Communities (California Office of Planning and Research)

6. Analyze Vulnerabilities

Why this is important:

The impact statements generated in Step 5 can then be used to identify and assess specific vulnerabilities, with a focus on critical infrastructure and services as well as campus populations.

This step can and should be completed in conjunction with Step 5, in that identifying vulnerable elements and groups may help to generate additional insights into potential impacts.

This step involves using the impact statements that have been generated to identify which people, assets, or services may be particularly exposed or sensitive to changes in climate, and which may have lower adaptive capacity - making them overall more vulnerable to climate change. Outcomes from vulnerability assessment can then be used to identify priority areas for climate resilience action.

J.E.D.I. Considerations:

At this step, it is vital to utilize the deep understanding of and collaboration with vulnerable on-campus community members to hone in on key climate impacts and determine how those impacts are integrated with other campus vulnerabilities.

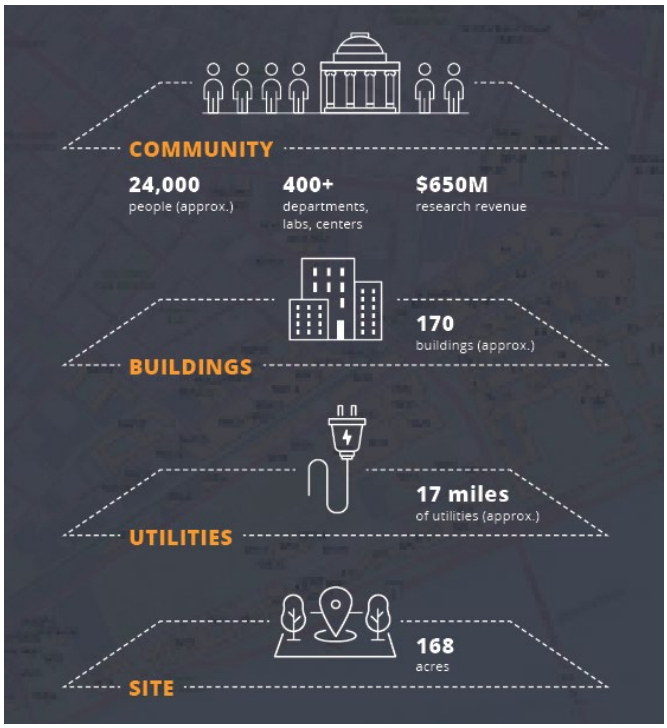

Figure 5: MIT's Framework for integrated "layers of resilience": community, buildings, infrastructure, and site.[55]

Step 6 Actions:

a) Assess vulnerabilities:

- Using the list of impact statements generated in Step 5, populations identified in Step 2, and the template provided in **Appendix F**, identify **people, assets, and services** that are particularly vulnerable to each established impact statement. The overall purpose of this step is to begin to narrow down the list of impacts to those that reveal particular vulnerabilities.
- This vulnerability assessment can be completed during an interactive workshop or series of workshops with the Core Team and/or Steering Committee to draw on diverse knowledge about the vulnerability of each element or group.

[55] MIT Office of Sustainability, "Layers of Resiliency," https://sustainability.mit.edu/topic/climate-resiliency

- For each impact, generate an understanding of the exposure, sensitivity, and adaptive capacity of each population, asset or service.
    - For ***exposure***, consider the temporal and spatial extent of the impact (i.e. to what degree is the population, service or asset going to be "in the way" of the hazard).
    - For ***sensitivity***, consider the degree to which the population, service or asset is likely to be affected by the hazard.
    - For ***adaptive capacity***, consider what plans and resources are in place that might reduce overall sensitivity. The California Adaptation Planning Guide suggests exploring adaptive capacity by completing the following:
        - Identify actions in progress, planned, or readily implemented to address the issue (e.g. infrastructure upgrades or emergency planning).
        - If the policy or program is not yet implemented, evaluate the time and resources needed for implementation.
        - Assess the extent to which the existing policy or program addresses potential impacts ("is it enough?").
        - Note the degree to which the existing policy or program could be strengthened.
- Some planning teams may wish to use a simple rating scale (e.g. low (1), moderate (2), high (3) to rate the degree to which a population, asset, or service is likely to be affected by each impact.
    - For example, a specific building may have high exposure to flood events (3), high sensitivity as a result of poor drainage or building structures (3), but a moderate level of adaptive capacity (2), as there are already plans to upgrade the building that would reduce its sensitivity

b) Prioritize areas for action:

- Results from the vulnerability assessment can be used to create vulnerability indicators that identify elements and groups that should be priorities for resilience action. If the planning team used a rating system for exposure, sensitivity, and adaptive capacity, then an overall vulnerability score can be calculated for each group using the following formula:
    - Vulnerability Score = Exposure + Sensitivity - Adaptive Capacity
- Alternatively, priorities can be set through group discussion to identify which elements or groups are considered significantly vulnerable to each impact statement and should be priorities for action. For this approach it may be helpful to use the guiding principles developed in Step 3 to shape criteria for prioritization.
- Some campuses may wish to use a risk assessment framework for prioritizing areas for action. A risk assessment can build on the results from the vulnerability assessment to determine the likelihood and consequence of climate hazards and impacts on the broader campus community. **Appendix G** provides further information on what a risk assessment involves for campuses interested in taking a deeper dive into climate impact analysis.

Additional resources:

- Neighborhoods at Risk Tool
- CDC Social Vulnerability Index
- Defining Vulnerable Communities in the Context of Climate Adaptation

7. Identify & Prioritize Solutions

Why this is important:

With high priority impacts and vulnerabilities identified, this step turns to the development of adaptation actions that can reduce and manage the most significant climate impacts on campus. It is also an opportunity to identify solutions with co-benefits that not only help the campus "bounce back" from a disruption but "bounce forward" to eradicate the pre-existing inequities and build a stronger and more resilient community. **Effective solutions will be within the universities' authority to initiate, leverage community partnerships to implement, and benefit those most vulnerable.**

A template for documenting and prioritizing climate resilience actions is included in **Appendix H.**

J.E.D.I. Considerations:

Each UC campus has the capacity to dismantle harmful legacies that exacerbate climate impacts by utilizing its role as an anchor institution to significantly increase community adaptive capacity both on- and off-campus. **Meaningful strategies include**: improving infrastructure access and services for impacted on-campus and off-campus communities; increasing access to decision-making and leadership; channelling additional resources to the neediest groups; eliminating barriers to opportunity; providing emergency support during disruptive events; and increasing community capacity to implement climate solutions. These types of actions reduce the amount of community devastation after extreme weather events and enable the university to remain an essential part of a thriving community with an engaged constituency.

This is a critical stage in the process for deep collaboration with campus stakeholders. The importance of carefully designing resilience solutions to emphasize and ensure meaningful co-benefits for previously marginalized groups cannot be overemphasized. Key questions to ask in this phase include the following:

- *What existing campus programs or initiatives could help the institution and its stakeholders be more resilient to climate change? Are there points of leverage already on campus to further develop climate resilience? Where and what are they?*
- *How can the university further utilize its infrastructure, social services, research and educational functions to mitigate vulnerabilities, reduce disparities and avoid creating future harms? Which vulnerable populations could benefit?*
- *Overall, does current campus climate resilience capacity address the uneven access to resources and power that create barriers to equity? If not, how can we develop solutions moving forward that do?*

Key Terms:

Adaptation refers to actions that aim to build system resilience to change, including reducing harm and leveraging beneficial opportunities presented by climate change[56]. Adaptation action can involve a broad range of strategies including studies and assessments, physical upgrades, organizational

[56] Adapted from Intergovernmental Panel on Climate Change (IPCC) "Annex I: Glossary", 2018. https://www.ipcc.ch/sr15/chapter/glossary/

changes, policy changes, partnerships and advocacy, and educational programs. Further information on these approaches is provided in action 6c.

Co-benefits refer to the added benefits that climate adaptation action can have for society beyond addressing climate change. Co-benefits from climate action can include improving community health and wellbeing, ecosystem and biodiversity, and opportunities for new partnerships and social cohesion. For example, reducing flood hazards by daylighting a creek on campus could also enhance ecological habitat, provide spaces for recreation and learning, and improve general aesthetics and mental health through added greenspace.

Step 7 Actions:

a) Establish climate resilience co-benefits:

- With your Core Team and representatives of the Steering Committee and/or Advisory groups, review the vision and guiding principles developed in Step 4 and adjust as necessary after completing Steps 5-6.
- Identify and list the desired co-benefits articulated in the guiding principles and brainstorm any that might be missing to help achieve the overall vision.
- Based on the vulnerabilities identified in Step 6, expand the list of desired resilience outcomes and co-benefits that meet priority community needs, reduce disparities, and increase the flow of information and resources to previously neglected populations.
    - Identify additional priority concerns; for example, a desire for actions that effectively manage hazards in a cost efficient way, or that encourage cross-campus collaboration and partnerships.
    - Modify actions as necessary to reflect the overarching vision and goals for resilience defined in Step 4.
    - Consider using a triple bottom line approach to ensure environmental, social, and economic dimensions are addressed, but add others as necessary.
- Use this list to collaboratively develop a set of criteria to evaluate each potential action.

Examples of Potential J.E.D.I.-Centered Co-Benefits:

- Develop resilience Hubs that are accessible to vulnerable community members
- Create resilience plans that reflect the knowledge, priorities, and needs of the most vulnerable groups
- Build on local cultural assets and values
- Reduce existing disparities and avoid increasing harms
- Build community capacity by increasing civic collaboration, participation and mutual accountability
- Promote workforce development, quality jobs, business development
- Improve air quality and public health outcomes
- Increase Energy Democracy/lower energy costs
- Increase tree canopy
- Provide shelter for unhoused and vulnerable populations during and after disruptive events
- Improve social fabric of the campus community by fostering active networks among different groups in the campus community
- Increase research, education levels and opportunities

Figure 6: Additional example of co-benefits of resilience solutions from ICABCCI [57]

a) Identify adaptation and resilience actions:

- Hold a workshop with the Core Team and representatives from the Steering and Advisory Committees to identify and evaluate adaptation and resilience actions.
    - For each high priority impact statement identified in Step 6, identify suitable actions that can be implemented to address priority vulnerabilities that also meet the criteria identified in Step 7a. Actions should include a combination of approaches such as physical updates, organizational changes, community-based participatory action research projects, and educational programs.
    - Consider working in smaller groups by area of interest or expertise to develop adaptation actions that are specific and based in deep knowledge of the impact.
    - Come together as a larger group to identify potential overlaps, conflicts or synergies.
    - Avoid maladaptations, which are actions that merely transfer the impacts from one group or area to another, or increase the adverse impacts on certain areas and groups, or do nothing to challenge further concentration of wealth and power. Instead, use the planning process to facilitate positive change, enhance the overall well-being of on-campus and off-campus communities, and uplift highly-impacted/vulnerable communities by eliminating chronic stressors and increasing access to resources and opportunities.

c) Evaluate and prioritize actions:

- Evaluate each adaptation action based on the defined evaluation criteria, assigning scores or values for each criterion to help in prioritizing actions. In addition to other evaluation criteria, consider adding the following details:
    - Timeline (e.g. short, medium, long term)
    - Lead and supporting actors
    - Key stakeholders
    - Estimated costs (and whether they have already been accounted for in capital plans or upcoming budgets)
    - Estimated confidence of impact in increasing resilience (e.g. low, medium, high)
    - Relevant plans or policies (either at campus or other scales)

[57] Alison Shaw et al., "Low Carbon Resilience Interventions: Case Studies at the Building, Neighbourhood and Community Levels," ICABCCI , October 2019, https://act-adapt.org/wp-content/uploads/2021/02/ICABCCI_LCR_InterventionsCase-Studies_WEB_final.pdf

Adaptation actions should…	• Support progress toward achieving the campus resilience vision and guiding principles. • Help achieve other campus priorities. • Fall within the campus' jurisdiction and abilities, with recommendations for advocating to or working with other organizations where necessary action lies outside the university's control. • Integrate stakeholder voices/perspectives wherever possible. • Define connection points with local, state and federal agencies, and other regional higher education institutions. • Be carefully evaluated for associated costs and benefits. • Draw from local knowledge and expertise, reflect best practices, and build on existing resilience initiatives and programs. • Include preparedness and resilience policies and standards for facilities, infrastructure, and communities in particularly vulnerable areas, including severe weather emergency preparedness initiatives.
Kinds of actions that campuses should consider include…	• ***Studies and assessments:*** research, technical assessments, and monitoring that can inform the baseline or changes over time (e.g. campus climate awareness survey, on-campus erosion or flood assessments, ecological habitat health assessments, etc.) • ***Physical upgrades****:* changes to buildings, landscaping, or infrastructure to increase resilience to climate hazards • ***Organizational changes:*** changes to university processes, policies, planning approaches, emergency management systems, and/or organizational structures that improve responsiveness and support highly impacted groups • ***Partnerships and advocacy***: collaboration (e.g. with student, campus or community organizations) or requests for changes at higher levels of government or by other actors (e.g. consultation with regional transit or local governments). • ***Educational programs:*** strategies to build stakeholder understanding of climate change and strategies they can take to build their own resilience. Approaches could include posting climate resilience information online, distributing fliers to common areas, and hosting educational workshops about climate impacts.

Examples of Co-Benefits/Evaluative Frameworks:

Each campus may have existing goals or criteria that are suitable for use as a co-benefits framework for climate resilience planning. However, there are many existing frameworks that can be used in their entirety or as inspiration for crafting the set of co-benefits and evaluative criteria that are right for each unique campus. Some examples of these are listed below:

- Bioregional's One Planet Living Framework is a comprehensive but adaptable and colourful framework for assessing overall sustainability

- The Environmental Protection Agency (EPA) developed the CO-Benefits RIsk Assessment (COBRA) tool to estimate the health and economic benefits of climate action policies
- The London School of Economics (LSE) Cities and C40 Cities Group produced a framework for evaluating the co-benefits of climate action, including resilience measures, based on a literature review of almost 300 identified co-benefits
- UKCIP offers a framework for evaluating adaptation options, ranging from equity to synergy between actions
- Simon Fraser University's Adaptation to Climate Change (ACT) team offers a Low-Carbon Resilience Framework to guide assessment and selection of actions, along with an initial list of co-benefits to be considered

Figure 7: Bioregional's One Planet Living offers a people-focused framework for evaluating actions

8. Move From Planning To Implementation

Why this is important:

Once campuses have identified climate actions in Step 7, the next step is to develop a strategy for how these actions will be implemented, by whom, and when. An implementation plan will provide a roadmap for next steps in the short and medium term and provide a framework for monitoring progress and tracking successes to inform future planning efforts.

An implementation plan doesn't have to be a complex document, but it should identify a target completion timeline and the person or department responsible for each priority climate action. The most effective implementation plans outline realistic timelines, make note of identified barriers or outstanding questions, highlight opportunities for funding and partnerships, and set a process for tracking implementation progress.

J.E.D.I. Considerations:

Active monitoring and evaluation are essential to enable the process to be course-corrected as necessary to achieve equitable outcomes. It is critical to maintain key stakeholder engagement

during implementation to share progress, collaborate on addressing challenges as they arise, and increase community capacity, leadership and ownership of the plan.

Key Terms:

Performance indicators refer to metrics that can be used to monitor progress and outcomes from implementation. They should be SMART (specific, measurable, achievable, relevant, and time-based) and should be accompanied by a plan for how progress will be recorded and reported. They should also be linked to the resilience vision and guiding principles defined in Step 3 to ensure ongoing implementation continues to reflect foundational goals for the planning process. Performance indicators should be:

- Developed with key stakeholders to reflect metrics of concern
- Tracked and recorded on an annual basis
- Regularly communicated to impacted groups and stakeholders

Step 8 Actions:

a) Assign clear responsibilities and timelines for each action

- Identify which department is best positioned to take on responsibility for implementing each climate action. Wherever possible, identify a specific person in that department to drive action and track progress. When assigning responsibilities, consider which department may be best suited for each task, either because they have specialized knowledge or expertise, relevant programs that the climate action could be built into, available capacity to take on the project, or ownership responsibilities over the assets to be impacted or modified.
- Develop targeted timelines for when each climate action should begin and/or be complete. Shorter term actions may be those that address highly critical climate risks and vulnerabilities, are “low hanging fruit”, or opportunistically align with projects already planned or underway. Shorter term projects should have more definite timelines set, including target start and end months.
- Longer term projects may include those that are less critical, require more information or study before they can begin, or are high cost and require phasing or budget requests. These projects may be more difficult to assign timelines to and may simply have a year set for when they should start or end.
- At this stage of climate planning, climate actions may need to be adjusted to better build on or link with existing or planned initiatives. Projects may also need to be delayed or phased to match available department capacity or the timing of other initiatives.

b) Establish performance indicators to monitor successful implementation:

- Establish a means of monitoring and evaluating the success of outcomes from the planning process. This can be established by identifying and tracking performance indicators that monitor both process (i.e. how the plan is being implemented) and outcome (i.e. the impact of the plan on improving campus resilience).
- It is important to establish a clear process for tracking and reporting out on implementation progress, including assigning roles and responsibilities, tracking and reporting tools and timelines. Consider who progress will be reported out to, whether it’s just the Core Team and

Steering Committee, more broadly to Advisory Committee and Key Interest Groups, campus and university leadership, or reported through university media channels to the broader campus and neighbouring community.

- While several performance indicators may reflect metrics that the campus may already track, it is important to ensure that additional metrics are collected as needed, including those that may be more difficult to track. Regional and local agencies and authorities (e.g. municipal, health authority, transit, etc.) represent sources of potential information that can be useful to monitoring progress on the implementation of adaptation actions.
- The table on the next page lists example performance indicators as a starting point, however each campus should define their own indicators specific to their resilience vision and guiding principles, key climate vulnerabilities, and priority adaptation actions.

c) Determine when climate resilience vulnerabilities and actions should be reviewed and updated:

- Climate change planning is an iterative and living process. Climate vulnerabilities and implementation plans should be updated periodically to reflect new and emerging climate science, new understanding of local impacts and adaptation approaches, and shifting university and stakeholder concerns and objectives.
- The Core Team and Steering Committee should determine how often the implementation plan should be reviewed to ensure it still reflects climate vulnerabilities, needs and priorities. Review schedules can be anything from annually to once every 10 years, and should reflect the review schedule and protocol the campus has in place for other policies, plans, and programs. It may also be helpful to align review schedules with the release of the IPCC reports every five years, with the next report planned for release in 2022.
- Consider also defining which changes or conditions may trigger a need. If very little has changed at the next review cycle, updates to the plan may not be needed. For example, significant changes to local climate projections could be an important trigger for updating the plan, or performance indicator results suggesting that implementation progress is far ahead or behind the established timelines.

d) Define next steps to support ongoing implementation and mainstreaming climate resilience

- The implementation plan can also include a list of recommended next steps to support implementation in the near and longer term. Next steps could include:
  - Translating lessons learned into a set of principles and protocols to create the conditions for adequate community engagement and community-driven decision-making throughout plan implementation.
  - Incorporating outcomes from the planning process into existing plans, policies, and programs across campus (e.g., emergency planning);
  - Creating an Equity Advisory Group, composed of faculty, staff, students and community members, to advise the various departments and staff on equitable implementation of the resilience planning efforts; or
  - Establishing/maintaining a Tribal and/or multi-stakeholder advisory groups and/or committees to promote and monitor accountability and progress toward equity and other goals.

Examples of Performance Indicators

Category	Example Performance Indicators
General	• Number of wildfire mitigation projects completed in highly vulnerable areas • Concentration and/or Load Reductions of PM2.5, diesel PM, nitrogen oxides (NOx), and indoor air contaminants by census tracts, race, and income
People	• Number of campus and local/regional community members engaged through emergency preparedness outreach • Number of multilingual public emergency planning exercises conducted • Number of days where cooling centers are open and operable • Number of attendees to cooling centers • Number of multilingual outreach events focused on climate risk and community preparedness • Number of local food assets • Number of memoranda of understanding regarding resilience planning and resource sharing finalized between campus entities and local/regional communities
Assets	• Number of long-term infrastructure plans that include a climate risk or vulnerability assessment • Percentage of campus infrastructure reviewed with a climate lens • Number of buildings/facilities assessed for climate vulnerability • Number of buildings/facilities integrating energy efficient solar technologies • Number of buildings/facilities with green roofs, green spaces, and gardens • Number of buildings/facilities incorporating natural habitats and landscape elements • Number of developments incorporating natural habitats and landscape elements • Number of permeable pavers and number of bioswales and rainwater infiltration in neighbourhoods • Estimated acreage of natural lands protected • Percentage of canopy cover • Number of riparian areas protected or restored • Total area treated for invasive species • Number of acres of campus-controlled land returned to Indigenous management or co-management
Services	• Number of trips taken by active transportation • Number of protected bike lanes • Number of climate resilience programs developed

Glossary of Terms

Adaptation is an adjustment of decisions, activities, and actions based on expected climate conditions, with the goal of moderating the negative impacts of climate change and making the most of opportunities.

Adaptive capacity refers to the ability to prepare for and respond to the impacts of and consequences of climate change (e.g. a population or service that is already under stress has lower adaptive capacity).

Climate refers to the weather conditions prevailing in an area in the long term (i.e. years or decades).

Climate change refers to variations in climatic conditions over time that have been observed in the past, along with future conditions that are anticipated based on these projections.

Co-benefits are positive effects associated with climate action that help to improve the campus or community, such as cleaner air and improved greenspaces.

Diversity means including a broad range of voices in the planning process to integrate a comprehensive range of experiences, barriers, needs, and strengths, enabling the creation of robust solutions that solve intersectional issues. It also includes biological diversity, or biodiversity — the wide range and variety of different plant and animal species in a given ecosystem that are necessary for ecosystem resilience. As human beings are part of nature, not outside it, human diversity can also contribute to a more resilient community.

Equity refers to a heightened focus on and prioritization of previously marginalized communities currently experiencing disproportionate harms from climate change. It involves directing significant resources to under-resourced areas to reduce disparate outcomes, meet community-identified priority needs and eliminate barriers to opportunity.

Exposure refers to the nature or degree to which people, assets or services are exposed to a climate-related shock or stress.

Frontline Communities are those impacted most by climate change and its root causes, which include white supremacy, patriarchy and colonization. These communities are embedded in legacy struggles against social, economic, and environmental injustices exacerbated by extractive and polluting industries that have been purposely and systemically sited adjacent to their communities or on their actual land. This disproportionate exposure to climate and environmental injustice results in acute and chronic impacts to human and environmental health. Frontline organizations are those created by and for frontline communities and are accountable to a base of community members. (United Frontline Table)

Impacts refer to the effects of climate change - both observed and expected - on the people, buildings, infrastructure, and natural systems that make up our communities. Impacts of climate change can either be negative outcomes to prepare for or positive opportunities to be highlighted. **Primary impacts** are those that occur as a direct result of changing climate conditions, such as extreme heat events or drought.

Secondary impacts are those that occur based on primary impacts; for example, power interruptions from an overloaded grid during a heat wave, as well as resultant economic losses.

Inclusion means adopting practices, policies, and programs that create conditions of belonging to ensure that historically oppressed people and groups, who previously have not been included, are meaningfully represented, respected, and actively engaged in participatory decision making.

Justice refers to a practice of acknowledging and redressing the root causes of historic and present-day disparities, which include colonialism, racism, white supremacy, patriarchy, and other systems of oppression, through collaborative efforts that avoid causing additional harm, repair previous harms, and heal communities. This practice centers the perspectives and experiences of those peoples who are: most harmed by injustices, least responsible for causing climate change, and impacted first and worst by climate disruption.

Likelihood refers to the chance or probability of a climate-related shock or stress occurring within a specified timeframe.

Maladaptation describes adaptation actions that are intended to enhance resilience to climate change impacts, but in practice result in increased vulnerability and/or undermine the ability to adapt in the future. There are a variety of ways in which actions can be maladaptive; for example, actions may increase greenhouse gas emissions, unfairly burden those with little capacity to support the action, or restrict the range of future options.

Participatory-decision making and participatory action research are collaborative processes that give ownership of decisions to the whole group as equals, to identify, analyze, and solve problems that face the organization.

Resilience is the ability of a system or community to survive disruption and to anticipate, adapt, and flourish in the face of shocks and stressors including the impacts of climate change.[58] Climate resilience is the ability to anticipate, prepare for and respond to hazardous events, trends, or disturbances related to climate. Improving climate resilience involves assessing how climate change will create new, or alter current, climate-related risks, and taking steps to better cope with these risks[59] in a manner that enables the people most vulnerable to be meaningful stakeholders in actions designed to enable the system or community not only to "bounce back" but also to "bounce forward" to the new systems and structures needed to transform the conditions that created the disparate impacts in the first place.[60]

Resilience Hubs are community-serving facilities augmented to support residents (e.g., faculty, staff, students, and local/regional communities), coordinate communication, distribute resources, and reduce carbon pollution while enhancing quality of life. Hubs provide an opportunity to effectively work at the nexus of community resilience, emergency management, climate change mitigation, and social equity while providing opportunities for communities to become more self-determining, socially connected, and successful before, during, and after disruptions.[61]

Risk to climate change impacts is a function of the likelihood that a climate-related shock or stress will take place, and the consequence of that event should it occur.

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[58] Adapted from Second Nature, "Climate Resilience Background," p. 1.

[59] Center for Climate and Energy Solutions, "Climate Resilience Portal," https://www.c2es.org/content/climate-resilience-overview/

[60] Lois DeBacker et al, "Pathways to Resilience," p.11.

[61] Kristen Baja, 'Resilience Hubs: Shifting power to Communities and Increasing Community Capacity," USDN, 2018, https://www.usdn.org/resilience-hubs.html#:~:text=Resilience%20Hubs%20are%20community%2Dserving,after%20a%20natural%20hazard%20event

Sensitivity describes the degree to which people, assets or services are either positively or negatively impacted by changing climate conditions (e.g. individuals with pre-existing respiratory conditions are generally more sensitive to wildfire smoke events).

Vulnerability describes the degree to which natural, built, and human systems are at risk of exposure to climate change impacts.

Vulnerable communities refer to populations or groups who experience heightened risk and increased sensitivity to climate change and have less capacity and fewer resources to cope with, adapt to, or recover from climate impacts. These disproportionate effects are caused by physical (built and environmental), social, political, and/ or economic factor(s), which are exacerbated by climate impacts. These factors include, but are not limited to, race, class, sexual orientation, physical ability, and identification, national origin, and income inequality.[62]

Weather refers to the atmospheric conditions at a given location at a given time. These conditions generally occur over a short period and are subject to frequent change.

[62] Governor's Office of Planning and Research, "Defining Vulnerable Communities in the Context of Climate Adaptation," July 2018, p.2, https://opr.ca.gov/docs/20200720-Vulnerable_Communities.pdf

Appendix

Appendix A: Planning Process Scoping Template

Careful planning sets the groundwork for a diverse planning team and a successful project. Project Core (Leadership) Teams can use this template to establish the scope and timeline for their planning process. Use the DARCI process to identify who is the Decision-Makers, Accountable, Responsible, Consulted and Informed.

A. Establishing the Core Team

Members on the Core Team will lead the climate resilience planning process and include:

Team Members	Team Role	D.A.R.C.I
Name, University Position	*Describe their primary responsibility on the Core Team (e.g. team lead, engagement lead, community liaison, climate specialist/adviser, J.E.D.I. adviser) as well as their DARCI role.*	***D**ecision-Maker* ***A**ccountable* ***R**esponsible* ***C**onsulted* ***I**nformed*
e.g. Annika Turgenev, Campus Sustainability Coordinator	*Team Lead & Sustainability Team liaison*	*Responsible*

Describe how the team will operate:

i. Target Timeline for Planning Process: _____ *(start date)* - _____ *(end date)*

ii. Core Team Meeting Frequency: _____ *(e.g. monthly, bi-monthly)*

iii. Location of Key Project Documents: _____*(file pathway)*

iv. Other key information (as needed)

B. Project Goal(s) & Objectives

Determine what the key outcome(s)/deliverables from the project will be and how the planning process will support broader department or campus goals.

i. Key Deliverables:

a. List (e.g. Climate Resilience Plan report, updated climate change chapter in the campus Sustainability or Emergency Plan, updated climate vulnerability/risk assessment spreadsheet, educational materials about climate change hazards and impacts, etc.)

b. List

ii. Project Objectives:

a. *List (e.g. build awareness of climate hazards and potential vulnerabilities on campus, build an understanding of potential climate impacts on vulnerable groups, strengthen relationships with campus and community organizations, integrate with existing climate/sustainability plans and policies, uphold the campus strategic direction for climate resilience, etc.)*

C. Establishing Project Geographic Scope

Summarize the key parameters of the climate resilience planning process:

i. Geographic scope: _____ *(e.g. institutional/street boundaries, key on- and off-campus buildings)*

ii. Excluded campus areas:

a. _____ *(list)* - _____ *(justification/reason)*

b. e.g. *Medical Centre - They are leading their own separate climate planning process*

D. Compiling Background Resources

List the existing climate change, resilience, and diversity plans, policies, reports, and other relevant documents at the campus or university level:

- *Document name, date, author/publishing department*
- *E.g. Climate Change Resilience Plan, 2014, Jane Doe, Masters Student – School of Environmental Studies*

Appendix B: Spectrum of Community Engagement

Each group of campus community stakeholders has a distinct type of expertise to share with campus climate resilience planning efforts and may not all need to be engaged in the same way or for the same duration. The **Spectrum of Community Engagement** identifies the different levels of stakeholder engagement from informing to empowerment through greater participation and leadership. Select the level of needed engagement with each stakeholder group identified in Step 2a. This tool can be applied to a particular initiative or resilience efforts generally and can be carried out collaboratively with multiple stakeholders. For more details, see the facilitation guide by Rosa Gonzalez with Facilitating Power, The Spectrum of Community Engagement to Ownership. An adaptation of the Spectrum specific to the University context is presented below, while Appendix C includes additional tips for effective stakeholder engagement.

	0 - Ignore	1 - Inform	2 - Consult	3 - Involve	4 - Collaborate	5 - Empower
Participation goal	Deny access to decision-making	Provide stakeholders with relevant information about university climate resilience plans	Gather stakeholder input and feedback about the plan; translate input into draft plan	Ensure stakeholder needs are consistently understood and considered in the plan and implementation	Partner with stakeholders in each aspect of the decision and implementation; build leadership capacity with stakeholders	Ensure leadership from stakeholders in each phase of the planning, implementation and evaluation; institutionalize stakeholder partnerships
Potential Benefits	*Temporary efficiency or cost-saving, not taking time to engage community stakeholders*	*We will keep you informed*	*We will keep you informed, listen to and acknowledge concerns and aspirations and share how input influenced the plan*	*You are making us think, and therefore, act differently about climate resilience*	*Your partnership and expertise are critical to define how we build climate resilience*	*It's time to unlock collective power and capacity for transformative solutions*
Message to Stakeholders	Your voice, needs & interests do not matter	Impacted stakeholders are informed about resilience efforts	Stakeholders have the opportunity to provide critical input to help shape a plan, helping to avoid negative impacts and roadblocks	Trust is built between stakeholders and university; university gains valuable information to create a more effective and comprehensive plan; stakeholders help to implement plan	Resilience plan is responsive to actual campus and community resilience needs and addresses root causes of inequity; builds equitable and reciprocal relationships to address social and environmental issues; university increases recruitment, retention and research funding; builds student, faculty, staff and stakeholder capacity to implement plan	Students, faculty, staff, and community partners are organized in equitable, reciprocal partnerships, feel ownership of the resilience plan, and are empowered to implement it; Equity outcomes are ensured; University and surrounding community are resilient to shocks and stressors, and able to respond to multiple crises more effectively.

Possible Engagement activities	• Closed door meetings • Misinformation • No engagement	• Fact sheets • Newsletters • Email list serve • Website	• Public comment • Focus groups • Surveys • Public meetings	• Interactive workshops • Planning meetings • Deliberative polling • Forums	• Project Advisory Committee / Council • Participatory decision-making • Engaged scholarship & participatory action research opportunities for faculty & students with community based organizations (CBOs) • Service learning partnerships and student internships • Co-development of metrics with off-campus organisations	• Permanent Advisory Committee • Visioning and priority setting • Co-development of implementation metrics with off-campus organisations • Participatory action research • Participatory decision-making • Participatory budgeting • Cooperatives for work & housing
Critical Questions	What are the root causes of systemic marginalization in the university context? How does the legacy of exclusion based on race and class persist today?	What does information flow look like for impacted stakeholders? What is contributing to it and what hinders it? What will it take for impacted stakeholders to have equitable access to information about issues that directly impact them?	When is it appropriate for impacted stakeholders to be in a consultation role? What issues should impacted stakeholders in your university context be consulted on? What is needed to move beyond consultation and get to solutions that create resilience and benefit from the genuine involvement of impacted stakeholders?	What does it take for impacted stakeholders to have a real voice in the decision-making and plans that impact then? What are the examples? What is needed to build sustained voice, participation, and power? What groups and organizations are building an informed base of leaders with the capacity to advocate on the behalf of the needs and interests of the community?	What are the opportunities for meaningful collaboration between impacted stakeholders and universities to co-develop climate resilience plans and solutions to racial & environmental injustices? What culture shift and system changes are needed for authentic collaboration between institutions and impacted community partners? What is needed to institutionalize stakeholder partnership and engagement?	What role will leadership play in closing equity gaps? What is your collective vision for collaborative leadership? What can you be doing now to lay the groundwork for collaborative leadership? What infrastructure for collaborative leadership is needed that you can start building now?

Appendix C: Best Practices for Engaging Community Stakeholders

The following best practices are excerpted from Gonzalez, R. & Toloui, M, "Process Guide for City-Community Partnerships," (September 2020), Greenlink Equity Map, p. 20-21, 26. https://ff605159-409a-4fec-9f9b-c97af652120c.filesusr.com/ugd/4aef44_77a2c3532f8a4e5d95d87bda22103c82.pdf

ENGAGE COMMUNITY PARTNERS

WHEN you engage community partners is vital. Early engagement leads to better relationships, more diverse contributions, and outcomes that incorporate the priorities and expertise of impacted communities. Early engagement sends a message to community partners that they are important to the work, not an afterthought. Community partners from impacted communities have perspectives and expertise to lend the data analysis and dissemination process that should inform the work from the beginning, to avoid missteps.

HOW you engage community partners is crucial. Here are several core values and tips for effective engagement of community partners:

Humility: Take time to clarify, with support from this guide, why community partners from impacted communities are vital to your data analysis process. What is the unique value they bring to the process? Understanding that local government cannot effectively carry out its responsibility to address inequities without the leadership of impacted communities allows you to approach community partners with appropriate humility, which can help to begin balancing uneven power dynamics that exist between government agencies and community-based organizations. Limit any tendency to take things personally.

Clarity of Purpose: Clarify what city plans, programs, and/or policy development the GEM maps will help to inform. Clarify how connecting with community-based organizations is a unique part of that purpose. Understand and be able to articulate why partnership leads to better outcomes. Reaching out to community partners with this clarity helps city staff to practice transparency, which is vital to building trust.

Genuine Listening: Be conscious of the tendency to fall into one-directional communication patterns. If you are focused on simply informing community-based organizations of what you need them to know, and not listening to what they need you to know, you can miss out on the chance to strengthen relationships and to improve your approach to data analysis and equity goals. Listening is a practice that must be cultivated, particularly by representatives of local government. The strategies below can help.

STRATEGIES FOR GENUINE LISTENING:

- Before meeting, look for documents or materials written by potential community partners, that specify key issues and opportunities they are seeing to address existing inequities.
- When reaching out to community partners, factor in enough time for an actual conversation. Work around their schedule and their location/mobility capacity.
- Ask honest questions (e.g. What has your experience of working with the city been like in the past? What do you feel could be the benefit of doing some collaborative analysis of the map? What role could you see your organization playing in that? What would your organization need to be able to partner with us on this?)
- Be ready and open to start with the community organizations' priorities, needs, purpose, and desires – both in the initial conversation and in the longer-term partnership.
- Understand and communicate that you want to be helpful. How does what you have to offer match up with the priorities of the community/community-based organization?
- As the conversation closes, be sure to reflect what was learned in the conversation, what that means for your next steps, and how you will be following up and/or using the information you've gathered in the conversation. Ask for and be open to feedback about what happens next.

Equitable Resourcing: It is important to consider the resourcing needs of community partners. They must be compensated for their time and expertise in these engagement processes. A common point of tension between community-based organizations and local government is the tendency for public agencies to contract with outside consultants to design and carry out community engagement and equity planning, when local community-based organizations are often much better equipped. When working to address systemic inequities, those who experience them and live or work in impacted communities have vital expertise on the topic. Community-based organizations can also bring trust and cultural relevance, which is key to effective engagement of impacted community members. Allocating resources to city-community partners is key to sustaining them. In addition to establishing budgetary line items for resourcing community partnerships, consider approaching philanthropic partners together to resource collaborative efforts to address inequities. Increasingly, philanthropic foundations recognize the value of such partnerships to address inequities.

Photo by Minette Layne

Transparency: A significant challenge raised by community groups seeking to work with their local governments to improve conditions for residents is the lack of transparency regarding city processes and plans. When communities are kept in the dark – whether intentionally or unintentionally – about how the system works and how they can have a voice in the decision-making that impacts them, they are left on the margins, which is one of the root causes of current inequities. City staff who are internal champions for equity can play an important role in demystifying public processes so they can truly be public. In working with community partners, be as open and honest as you can about policy development and planning processes, what you know and don't know, what you are still figuring out, the opportunities and challenges you are seeing, etc.

Acknowledgment of Past Harms: Impacted communities have experienced harm over decades – sometimes longer – that can result in distrust for city government, as well as disenfranchisement. Acknowledging marginalization involves identifying the status quo practice of current systems that have been historically designed to exclude certain populations, namely communities of color, low-income communities, women, youth, previously incarcerated people, elders, people with disabilities, and queer or gender non-conforming people. How harms are acknowledged can range in scale. A simple verbal acknowledgment during initial conversations with community partners can go a long way, such as, "I know our processes in the past have not been as inclusive as they need to be."

Building Trust Over Time: For many reasons, some of which are named above, impacted communities may carry a distrust of government. It's important to accept that fact and focus on building trust over time by following through with efforts to collaboratively close equity gaps and repair the harm of civic disenfranchisement. Recognizing the value that community-based organizations and impacted residents bring to increasing the efficiency and effectiveness of local government through racial equity practice, and then forging authentic partnerships based on that value, is the foundation for long-term trust and collaboration.

Commitment to Communication: Trust is often built when stakeholders are able to effectively grapple with challenges together. Communication is both the key to minimizing challenges and being able to work through them together, and come out the other side with more trust. Be aware of the tendency to avoid communicating when challenges arise, and instead lean in. Commit to clear communication before, during, and after the collaborative data analysis process:

- **Before:** At the start of a collaborative effort, clarify together the end goal of the process, how community input will be used, and what the process is for implementing feedback on a routine basis.
- **During:** Build in opportunities during the process to reflect on what's working and what isn't. When and if collaborative efforts hit stumbling blocks, discuss the issue and work together to address it.
- **After:** Come back to community partners with updates on progress made to integrate community voice into policy, programs, and city practices to advance equity goals. Be clear as to where and how progress is being tracked. How will the city staff communicate updates to residents and those that have been engaged throughout the process?

STRATEGIES FOR ACCESSIBILITY

- Schedule event at a time when working people can attend (outside of regular work hours).
- Provide equity stipends to resident leaders who have to miss work hours to attend.
- Ensure effective translation, if needed. If the majority of resident leaders participating speak a language other than English, consider hosting the event primarily in that language and offering translation into English.
- Use multiple ways of communicating that go beyond just the verbal-logical modes, such as embodied activities, visuals, theater, etc. when and if appropriate.
- Offer culturally relevant food, music, and atmosphere.
- Provide child care if needed.

The following best practices are excerpted from Pasque, Penny A. Ryan E. Smerek, Brighid Dwyer, Nick Bowan, Bruce L. Mallory, "Higher Education Collaboratives for Community Engagement and Improvement," 2005. National Forum on Higher Education for the Public Good, p. 15-16.
https://files.eric.ed.gov/fulltext/ED515231.pdf

Core Challenges Regarding Attainment of Effective Partnership Characteristics:

- **Power Differences** – not all partners arrive at the table feeling an equal amount of power to influence and contribute. While the partnership characteristics emphasize the importance of shared power, we need to know much more about how to make partnerships more equitable. The above mentioned CIC concept of parity is also relevant to this challenge.
- **Culture/Race Issues** – majority institutions often seek to partner in minority communities but lack cultural competencies, respect or expertise to do so. There can also be "old business" between such institutions and minority neighborhoods near campus. Turning these tensions and deficiencies into partnership assets will strengthen both campus and community capacity.
- **Language** – rhetoric is a strong influence on partnership understanding, for good or for bad, and each partner talks about their perspective in different terms, styles, and with different cultural values in mind. A common language may not be feasible, but we can explore pathways to better listening and comprehension…the essence of good communications.
- **Leadership** – strong and effective partnerships can be collapsed by leadership transitions or single strong personalities. The process/governance elements listed in the models hint at the need to learn how to create shared leadership or new leadership assets so as to avoid over-reliance on one or a few individuals.
- **Documentation and Measurement** – more work is needed to develop simple but compelling ways to measure the quality and impact of partnership work, especially from the perspective of the community. A related need is a clear strategy for how data will be used.
- **Resources** – while the models all mention assets and shared decision-making, the quest for, and management of financial resources is still a challenge. In part, this is because grant funds, by their nature, create closed-end relationships. More work is needed to build capacity for shared funding and more favorable public policy to support this work.
- **Visibility** – successful engagement programs and partnerships abound, but their stories are rarely captured and disseminated. Public media and the higher education press have not given sufficient attention to recognition of this work. Many formal and informal organizations supportive of engagement have been launched, but they do not always stay aware of one another's work and the potential for collaboration. Higher education as a sector has grown tremendously in its commitment to engagement in communities, yet the overall visibility is scant. The achievement of many of the ideal characteristics of partnerships, especially sustainability, will be enhanced by making the work better known to educational leaders, policy makers, community leaders, government, and the public.

Appendix D: Shared Vision and Guiding Principles Template

This template provides space for each campus to create and document a shared vision and guiding principles for climate resilience. Developing a shared vision and principles will be a key outcome from the location-specific workshops as part of this project.

A. Our Shared Vision for J.E.D.I.-Centred Climate Resilience:

B. Our Guiding Principles for Climate Resilience

1. *Title of Principle #1 (1 word or short phrase) - description of key features of the principle*
2. *e.g. Partnership - climate resilience planning and action will look for opportunities to work in partnership with campus organizations and equity groups, research institutes and departments, and community organizations that support our position as a key resilience hub. Partnership should be founded on meaningful collaboration and trusting relationships to build deep and lasting resilience across the campus and broader community.*
3. *Others*

C. Linkages with Other Campus & University Visions, Values, Goals, and Principles

Describe how the above vision and principles build on or link with other higher-level directions at the campus and/or university level. Campuses may choose to copy-paste relevant content from higher-level policy documents here as a reference.

Appendix E: Climate Change Projections

Campuses in areas without climate projections for their city or region will need to access climate change projections to inform their climate change planning process.

Climate change projections are a common input for climate adaptation and resilience planning, and are necessary to build an understanding of what climate change trends and climate-related hazards a campus might face. Projections give a science-based indication of how the local climate is changing and how future conditions could look. Climate projections can help people to understand what impacts we can expect so that we can avoid or prepare for them and reduce their consequences. Climate projections can also highlight climate change-related opportunities (e.g. warmer average temperatures that are more suitable for some plant species) that can be taken advantage of.

Projections are based on assumptions or **"scenarios"** of the extent to which the climate will change, which in turn depends directly on how effectively the global community coordinates to achieve greenhouse gas (GHG) emissions reductions. **Representative Concentration Pathways (RCP)** are used to describe different possible GHG emissions scenarios for the 21st century and are based on factors that drive human-caused GHG emissions (e.g. population growth, technology adoption, etc.).

In general, RCP 8.5 is typically used to explore and identify climate impacts, as it represents the likely scenario given current climate mitigation efforts. Planning with this "worst case" or "business as usual" scenario means that the campus is more likely to be prepared, given uncertainties in climate projections.

Climate resilience planning should use the latest and best available science to identify a campus' exposure to climate change. California is home to a wealth of climate planning resources that can be used in the climate planning process:

Example Scenario

If greenhouse gas emissions continue on their current trajectory, the following scenario may represent California's climate reality by the late 21st century (2070 - 2100). All figures are adapted from the Public Policy Institute of California and California's Fourth Climate Change Assessment, and compared to the historical baseline (1971-2000).

In the 2080s, Los Angeles can expect:

- Average temperatures 8-10°F higher than in the past, with 3-4 times as many heat wave days resulting in 4-6 times more heat-related deaths
- Prolonged periods of drought and 90% snowpack loss in the Sierra Nevada leading to extreme potable water shortages
- 2.5 times the number of critically dry years, contributing to a doubling of expected likelihood of catastrophic wildfires and extreme wildfire smoke coverage; these wildfires will occur at higher elevations in the Sierra Nevada mountains and will be exacerbated by dry winds during Santa Ana, Sundowner, and Diablo events
- Sea level rise of between 22-30 inches, leading to extreme flooding in coastal areas and erosion of bluffs, cliffs, and beaches

When selecting and accessing climate change projections, project teams will need to consider:

- **What climate scenario(s) to use for planning:** e.g. RCP 8.5 ("worst case" or business as usual") only or in addition to an "intermediate case" scenarios such as RCP 4.5 to understand what impacts could look like if GHG emissions begin to decrease over the next century.
- **What time horizon to account for:** e.g. do you want the plan for changes mid-century (2050s) or further out to the end of the century (2080s) or beyond (year 2100+).

- **What climate change hazards are relevant for the campus:** e.g. is the campus next to a river or coast and should consider sea level rise and/or changing patterns for high-intensity precipitation events.

Where possible, work with a climate scientist or someone experienced in climate data to help interpret the data. While the trends may seem straightforward, some variables are less well understood than others, which can have an impact on how likely the direction of change may be.

Other sources of climate change projections planning teams could draw on include:

- Cal-Adapt is an exceptional database and interactive platform that provides climate projections for temperature, precipitation and wildfire for each region in California. Users can access expected changes in a range of metrics across different emissions scenarios, which are searchable by address, city, country, census tract, or watershed.
- California's Fourth Climate Change Assessment provides overall information on the expected changes in climate and their expected impacts for different regions and sectors in California, including energy, water, oceans/coasts, forests/wildfires, agriculture, biodiversity/habitat, public health, and governance.
- California's Fourth Climate Assessment Regional Reports (Los Angeles, SF Bay Area, etc.)
- Cal-Adapt also offers an interactive map of areas threatened by sea level rise. Additional tools and resources for assessing sea level rise on the California coast include:
- NOAA's Sea Level Rise Viewer
- The Online Decision Support Tool from Our Coast, Our Future
- The Surging Seas Risk Finder from Climate Central
- California Health Assessment Tool (CHAT)
- USGS's Hazard Exposure Reporting & Analytics
- California Emergency Response Infrastructure Climate Vulnerabilities Tool
- CalEnviroScreen
- California Building Resilience Against Climate Effects (CALBRACE) Adaptation Tool
- California State Hazard Mitigation Plan
- CalTrans 12 District Climate Change Vulnerability Assessments
- California Adaptation Planning Guide
- Wildfire Risk to Communities
- University of California Hazard Mitigation Progress Report

Appendix F: Climate Change Impacts & Vulnerabilities Template

The following template provides a starting point for planning teams to identify climate change impacts (Step 4) and vulnerabilities (Step 5) on their campus. Sample content has been included to show the type of information to include, though each planning team will need to tailor and expand on this template to reflect their local context and objectives.

Example Climate Change Hazards	Example Impacted Categories (People, Assets, and Services)	Example Impact Statements	Example Vulnerability Analysis			
			Exposure	**Sensitivity**	**Adaptive Capacity**	**Overall Vulnerability**
Wildfire smoke	Campus buildings & building systems	Increased need and cost for improved air filtration in buildings, with possible closure of buildings where increased air filtration is not possible	(3) wildfire smoke will reach all buildings	(1) a large proportion of buildings have HEPA filters	(3) campus has a plan for upgrades to outstanding HVAC	**(1) Low Vulnerability**
	People with pre-existing respiratory disorders	Poor air quality exacerbating existing conditions and limiting opportunities for outdoor activities such as site work, sports, field trips, and socializing.				
	Campus research	Inability to operate labs and outdoor research during extreme air quality events.				
	Other					
Wildfire	Campus buildings & building systems	Damage to building from smoke and fire during an interface wildfire event				
	Campus Roads	Damage to roads from wildfire debris				
	Campus research	Inability to operate labs and research during wildfire events				

	Campus emergency services	Repurposing of campus facilities to provide emergency services to on- and off-campus groups				
	Campus landscaping & natural areas	Increased risk of erosion and debris slides due to rain events following a wildfire and vegetation loss				
	Other					
Increased Temperatures & Heat wave	Students	Difficulty sleeping and studying in residences due to heat.				
	Staff & Faculty	Reduced productivity for indoor staff and the potential for teaching and learning to be compromised.				
	People who are sensitive to heat	Extreme heat causing heatstroke, heat exhaustion, dehydration, or exacerbate pre-existing conditions in some people.				
	Underhoused groups	Increased number of un- and underhoused peoples and increased need to use air conditioned buildings to avoid heat and health impacts				
	Campus research	Inability to operate labs and outdoor research during extreme heat events				
	Campus buildings & building systems	Increased energy costs and GHG emissions from space conditioning, increased strain on mechanical cooling equipment, and possible equipment failure due to higher temperatures in electrical/mechanical rooms.				
	Campus landscaping & natural areas	Die-back of lawn, plants and trees during an extreme and prolonged heat wave event.				
	Other					
Drought	Campus landscaping & natural areas	Increased loss and replacement costs for campus vegetation due to increased heat stress and water restrictions.				

	Campus research	Water restrictions or drought could interrupt or delay water intensive on-campus research and labs.				
	Other					
Stormwater, River, or Coastal Flooding and Sea Level Rise	Campus buildings & building systems	Damage to buildings due to water ingress or erosion of foundations due to frequent or prolonged flooding.				
	Campus above-ground infrastructure assets (electrical, roads, paths, seating)	Damage to assets and possible service disruption due to flooding and debris from flooding from extreme flood events.				
	Other					
Other (e.g. erosion, mudslides, and debris flow)	*Other*					

Notes for using this template

- Planning teams can use this template in a range of ways, either completing the table during a workshop or distributing it to different departments to provide written input on their area of expertise.
- Planning teams should add as many impacted categories as needed, but focus on those that are directly and significantly impacted by each particular hazard to keep the list of impacts manageable for defining resilience actions. The number and list of categories will likely vary for each climate change hazard, and may include different groupings or sub-grounds of broader impacted groups identified (e.g. students → students with respiratory disorders).
- Hazards are shown in the template as the organizing field, however the template can be reorganized to be grouped by impacted categories or overall vulnerability, depending on the planning team's preference and stage of planning.
- Hazards shown in this template are primarily extreme "shock" hazards. Planning teams should tailor this list of hazards to their local context and also include slow-onset "stress" hazards such as sea level rise, gradual erosion, and increases in average temperatures.
- Impacted categories are shown here at the campus-wide level, however planning teams may want to go into more depth and describe impacts for specific buildings, assets, or groups. For example, it is very difficult to evaluate the impact that flooding could have on cultural assets, given that only some cultural assets will be exposed to flooding and some of those assets exposed to flooding may already be resilient to flood impacts (e.g. buried cultural artifacts). It is up to each planning team to determine what level of detail their impact assessment goes to, and what key assets, services, or groups they may want to focus on.
- Impact statements should be concise sentences that frame the most significant impact of a hazard on a particular impacted category.

- Sample vulnerability analysis is provided for one hazard / category for a hypothetical campus. Actual results will vary based on the specific local context of each campus. Planning teams can choose whether to:
    a) take a semi-quantitative approach (e.g. using a scale to rate each of exposure, sensitivity, and adaptive capacity) to get an overall vulnerability score (exposure + sensitivity - adaptive capacity), or
    b) take a qualitative approach that simply describes exposure, sensitivity, and adaptive capacity considerations for each hazard / category. Teams taking a semi-quantitative approach can use the "overall vulnerability" column to rate the overall vulnerability using a high-level scale (e.g. high, medium, low).

Appendix G: Deeper Dive

Assessing the vulnerability of people, assets, and services on campus is key to climate change planning. Some planning teams may wish to take a deeper dive into analyzing climate impacts by considering climate risks.

While **vulnerability** refers to the susceptibility of a particular element to a particular hazard event, **risk** refers to the *likelihood* and *consequence* of a given event on a larger system (e.g. across the campus or community). As a result of this broader context, risk assessments can become very complex and require planning teams to consider *whether* a given climate hazard might happen and, if it does, what the implications of this impact could be across the campus.

Overall, **an impact is considered higher risk when it has a higher likelihood of occurring, and/or a higher severity of its consequences**. This can help make decisions as to which impacts present the highest risk and should therefore be prioritized in action planning.

Planning teams that wish to complete a risk assessment that builds on results from their vulnerability assessment will need to consider the following key issues:

- The **likelihood** of an impact based on the expected return period or probability of the hazard event or trend occurring. Assessing likelihood can be tricky to achieve in collaboration with stakeholders, since many may not feel comfortable assessing likelihood. Wherever possible, likelihood should be based on climate science and validated by a climate scientist or someone with similar expertise.
- The **consequence** of an impact, should it occur, based on the severity of the consequence to people, assets and services. Teams can draw on results from the vulnerability assessment in **Step 5 (Appendix D)** to help inform an understanding of impacts and broader consequences to the campus community.

Planning teams may wish to complete the risk assessment in small discussion groups as part of a workshop environment. Prior to the workshop, assess existing campus methodologies for assessing risk and consider using a framework already in use on campus or adapting one for this purpose. Working with a climate scientist or someone with similar expertise can help to ground these estimates in climate science.

Identify Risk Events

The first step in a risk assessment is to identify the risk events, or impacts, that could cause harm to vulnerable elements. Workshop participants can begin with the Impact Statements developed as part of the vulnerability assessment in Step 5 (Appendix D) as a starting point for

Likelihood

To identify likelihood, workshop participants can work together to determine a *likelihood score* for each climate hazard based on past experience and events, as well as the probability of their occurrence in the future given climate change projections.

- **Low:** These impacts are the least urgent. Implementation of current strategies will likely enhance campus preparedness. These should take lower priority in resilience planning, but not be forgotten.
- **Medium:** These impacts may reduce the continued viability of the campus. They should be addressed wherever it is feasible to do so, and monitored over time to assess whether they become a high risk impact.
- **High:** These impacts are of the greatest concern to the campus. Corrective measures should certainly be introduced to reduce risk to an acceptable level.

Consequence

Similarly, stakeholders can be asked to collaboratively agree upon an appropriate *consequence score,* based on their understanding of the impact and past consequences that have occurred as a result of similar

events. While likelihood is often rated using a single metric (e.g. low, medium, high), consequence can be rated either using a rating scale OR a combination of rating scales specific to each *category* of consequence. Example categories include:

- **Health**, including mortality, morbidity, or psychological well-being
- **Campus operations**, including ability to provide education, research or provide support services
- **Loss of cultural resources**, including loss or destruction of valued cultural artefacts or sites
- **Loss of natural resources**, including loss or destruction of ecosystem function or biodiversity
- **Campus reputation**, including ability to attract investment, engage alumni or attract and retain staff, students or faculty
- **Financial cost**, including capital losses

Where consequence is rated across individual categories, their individual scores can be averaged across categories to derive a single score. Where a group uses individual categories, certain categories may be purposely weighted so that an impact with catastrophic consequences will be carried forward regardless of its average (e.g. a power outage may not directly damage the campus and may be ranked as having lower consequence, but could have severe or catastrophic consequences across other categories, such as a given population's well-being, which would warrant a higher consequence score). Regardless of the outcomes of the above, workshop participants and other key stakeholders should be given a final opportunity to review and elevate impacts ranked as even low-risk to the strategy planning stage if it is in line with organizational priorities.

Risk Assessment

Using the collectively assigned score, multiply likelihood by consequence to derive an overall *risk score*. Discuss each impact to determine if it should be moved up or down in relationship with the other scored impact statements. Move medium and high risk impacts forward for action planning under Step 6 in the overarching climate change planning process.

Appendix H: Resilience Action & Implementation Plan Template

The following template can be used by campus planning teams to identify and prioritize actions in Step 6 of the framework, and assign task leads and timelines for implementation in Step 7. Refer to the guidance under Step 6 of the Framework, including ensuring actions identified are realistic and align with the shared vision and guiding principles defined in Step 3.

It is recommended that planning teams start by listing the high priority impact statements identified in Step 5 (**Appendix F**), and outline at least one action for each. Look for efficiencies wherever possible, such opportunities to build on/integrate with existing initiatives or for actions to address multiple climate impacts. Some campuses may prefer to list impact statements in order to climate hazards to look for synergies with climate actions. Other communities may prefer to organize the list in terms of the priority of the impact statements or actions, or from shorter to longer term implementation timelines. Some campuses may also choose to also identify actions for lower and medium priority climate impact statements, though it's important that action plans are realistic and manageable.

Sample content has been included to show the type of information to include, including space to summarize the shared vision and guiding principles (from Step 3) and action evaluation criteria (from Step 6) so they are top of mind when identifying actions. This template is intended to be a starting point for each planning team to tailor and expand on this template to reflect their own context.

Shared Vision & Guiding Principles	Action Evaluation Criteria
Summarize the shared vision and guiding principles (developed in Step 3) here	*List evaluation criteria (refer to Step 6) to inform action identification and evaluate actions to set implementation priorities and timelines*

Example Impact Statements	Example Climate Change Hazards	No.	Action	Co-Benefits	Implementation Timeline	Responsible Person/ Department
Increased need and cost for improved air filtration in buildings, with possible closure of buildings where increased air filtration is not possible	Wildfire smoke	1	Complete an inventory and condition assessment of campus air filtration systems to identify priority upgrades	- Updates to the campus asset management plan	Short Term (Sept 2021 - Mar 2022)	Campus Utilities (Talisa Williams)

	Wildfire smoke	2	Carry out a campus canopy study to assess canopy cover, tree health, and opportunities for promoting shade species	- Work with local researchers - Enhance habitats, aesthetics, and stormwater management	Medium Term (2022) *as part of campus plan update*	Sustainability Department (Abed Almasi)
Poor air quality exacerbating existing conditions and limiting opportunities for outdoor activities such as site work, sports, field trips, and socializing.	Wildfire smoke	3	Linked with campus canopy study (Action 1)	"	"	"
Other						