



Landscape Architects in Climate Action Planning In the American Northwest



A project submitted in partial fulfillment of the requirements of the degree of
Masters of Landscape Architecture by Zach Heffernan
Supervisor: Raffaella Sini, December 2023

ACKNOWLEDGEMENTS

I would like to express my gratitude to those that contributed to completion of this research project:

To my professors and fellow students for preparing me with the essential tools

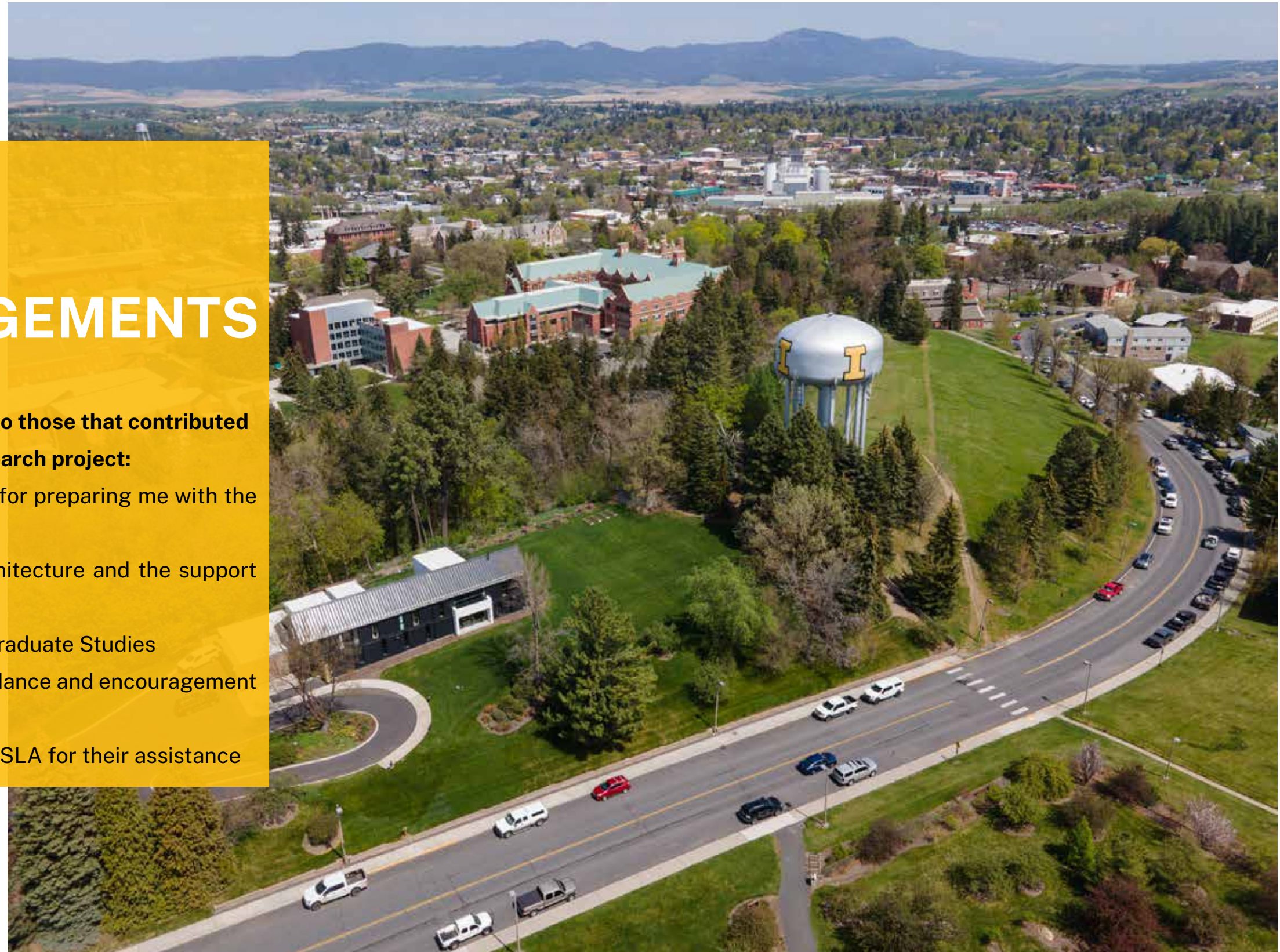
To the Department of Landscape Architecture and the support staff

To the University of Idaho College of Graduate Studies

To my mentor Megan Terry for her guidance and encouragement

To my family for their support

To the Idaho-Montana chapter of the ASLA for their assistance



METHODOLOGY

Research Question:

What is the role of landscape architects in climate action planning in the American Northwest?

1. Case Studies

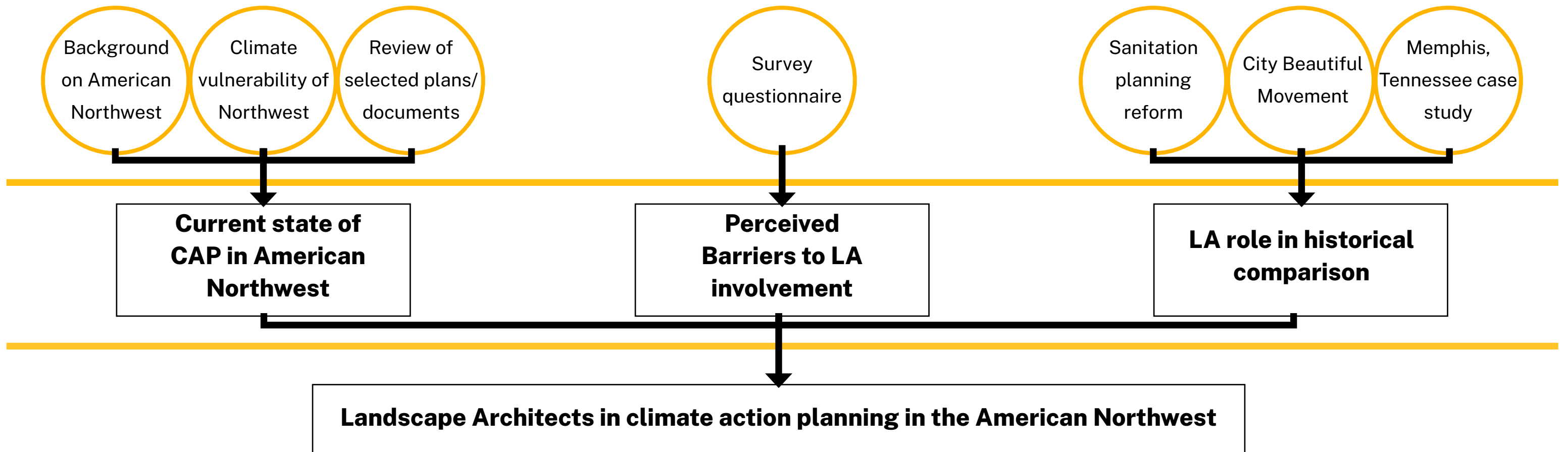
A review of selected case studies related to climate action and sustainability/resiliency planning documents from around the American Northwest.

2. Professional Survey

A survey conducted to gather experiences from professionals and educators in the fields of landscape architecture and planning.

3. Historical Context

An examination of the role of landscape architects in responding to public health crises and the impact on American cities and cultural landscapes.



DEFINITIONS

Technical language associated with climate action planning can be confusing and may be used inconsistently when comparing across multiple documents. Within the context of this research the following definitions from the US Environmental Protection Agency (EPA) Vocabulary Catalog of Climate Change Terms shall apply:

Adaptation: Adjustment or preparation of natural or human systems to a new or changing environment which moderates harm or exploits beneficial opportunities.

Climate Change: Climate change refers to any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among others, that occur over several decades or longer.

Co-benefit: The benefits of policies that are implemented for various reasons at the same time including climate change mitigation acknowledging that most policies designed to address greenhouse gas mitigation also have other, often at least equally important, rationales (e.g., related to objectives of development, sustainability, and equity).

Greenhouse Gases (GHG): Airborne gases with the capability of trapping heat, typically refers to carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated gases.

Greenhouse Gas Equivalents (GHGe or CO₂e): Metric tons of CO₂ emissions with the same global warming potential as one metric ton of another greenhouse gas.

Greenhouse Gas (GHG) Inventory: An accounting of greenhouse gas emissions by a community, organization, or government categorized by emissions scope and source, measured in tons of CO₂e.

Intergovernmental Panel on Climate Change (IPCC): The purpose of the IPCC is to assess information in the scientific and technical literature related to all significant components of the issue of climate change. The IPCC draws upon hundreds of the world's expert scientists as authors and thousands as expert reviewers. Leading experts on climate change and environmental, social, and economic sciences from some 60 nations have helped the IPCC to prepare periodic assessments of the scientific underpinnings for understanding global climate change and its consequences. With its capacity for reporting on climate change, its consequences, and the viability of adaptation and mitigation measures, the IPCC is also looked to as the official advisory body to the world's governments on the state of the science of the climate change issue. For example, the IPCC organized the development of internationally accepted methods for conducting national greenhouse gas emission inventories.

Mitigation: A human intervention to reduce the human impact on the climate system; it includes strategies to reduce greenhouse gas sources and emissions and enhancing greenhouse gas sinks.

Resilience: A capability to anticipate, prepare for, respond to, and recover from significant multi-hazard threats with minimum damage to social well-being, the economy, and the environment.

Snowpack: A seasonal accumulation of slow-melting snow.

Vulnerability: The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. A function of the character, magnitude, and rate of climate variation to which a system is exposed; its sensitivity; and its adaptive capacity.

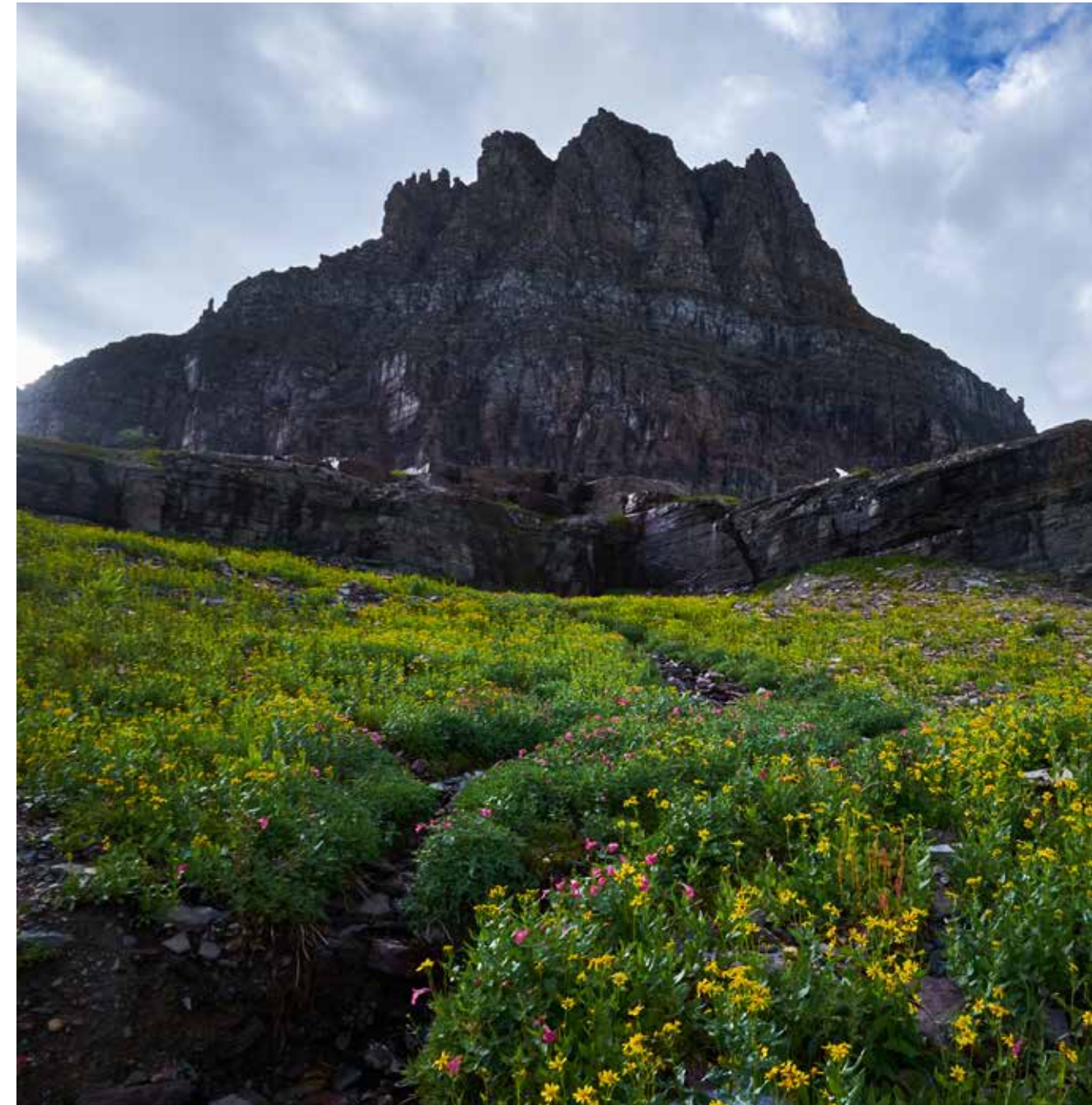
The Northwest

Communities and Climate Action in the Northwest

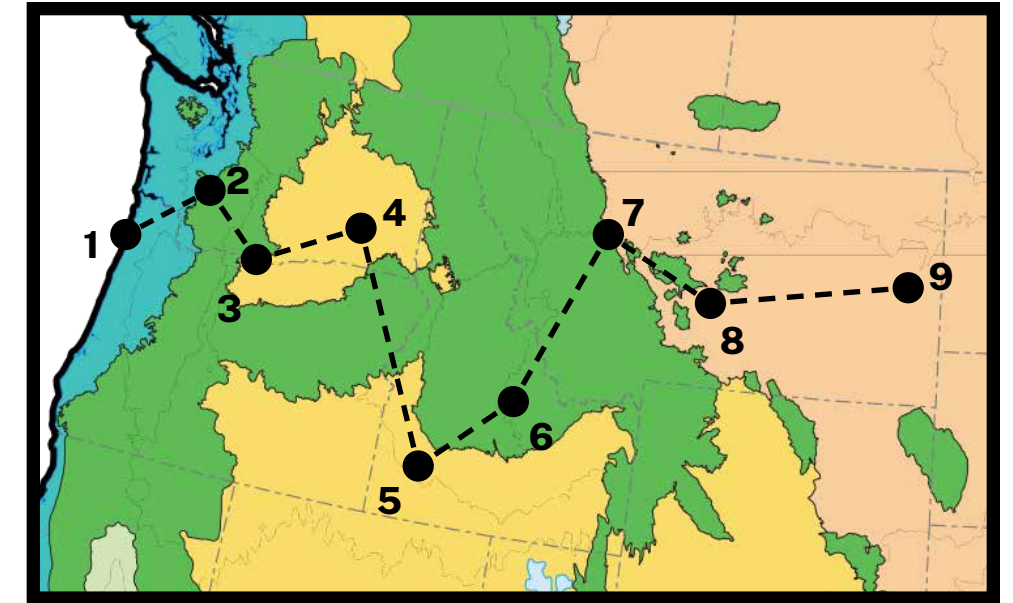
This section provides the background context on the communities of the American Northwest, and establishes a set of common conditions found in states, cities, and towns in this region. It will provide information on the physical conditions in the region as well as published documents which detail the potential impact of climate change on Northwestern communities and the vulnerabilities that threaten public health and wellbeing.



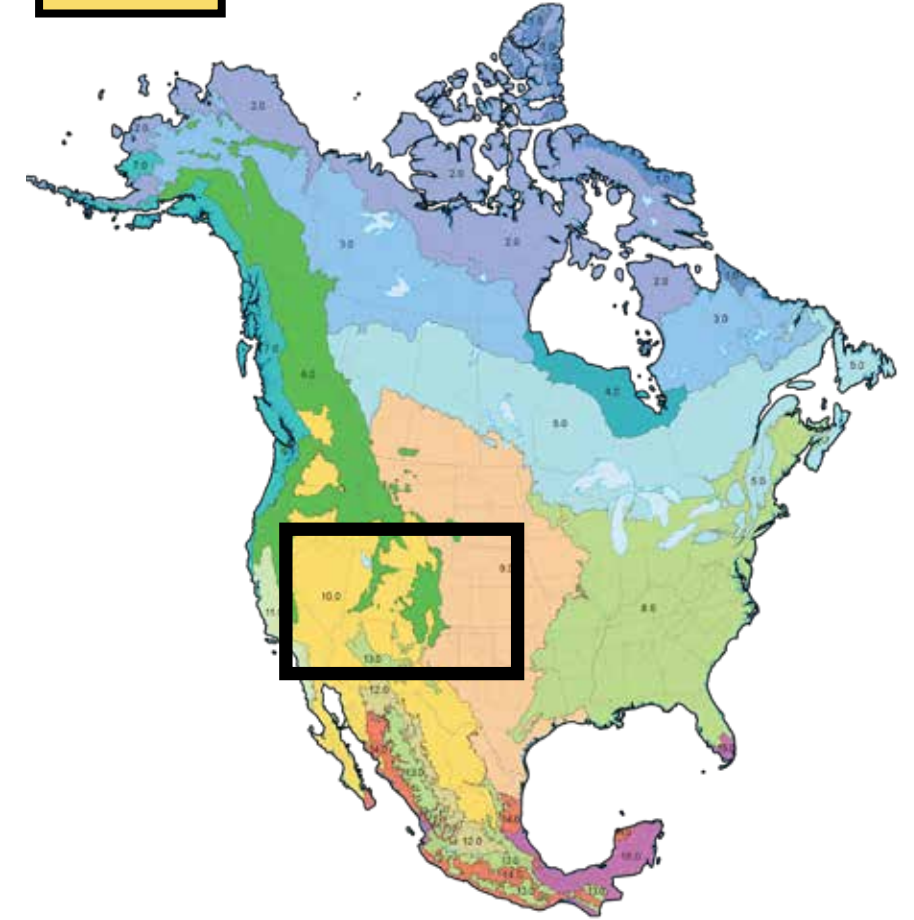
Frank, "Views of the Wilderness Trail" <https://w.wiki/8P2A>



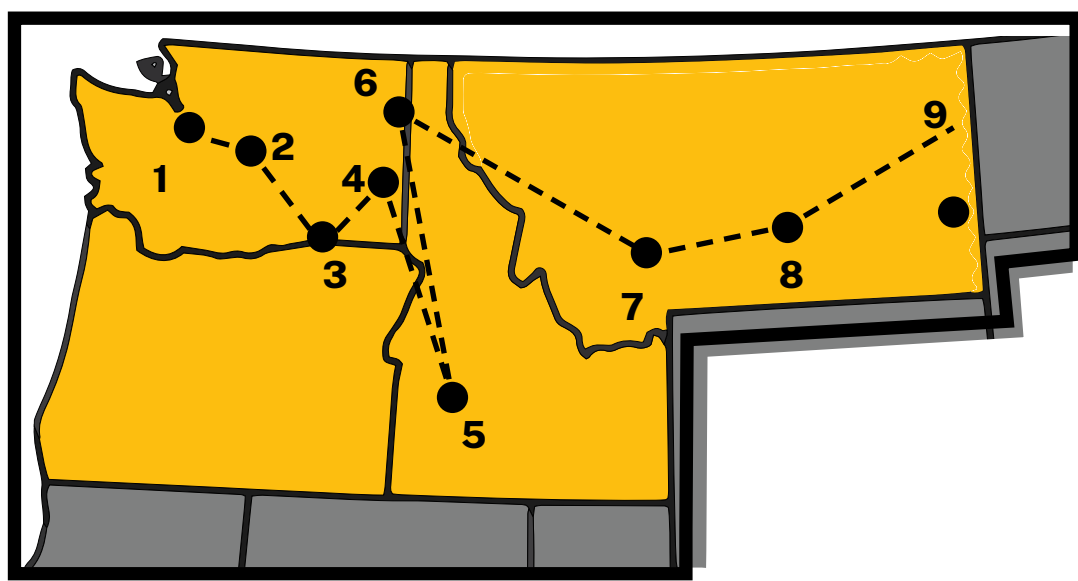
Darwin, "Flowers Of The Continental Divide" <https://w.wiki/8NDA>



- Northwestern Forested Mountains
- Marine West Coast Forest
- Great Plains
- North American Deserts



Level I Ecoregions of North America



Ecoregions

The region is **highly diverse**, ranging from **desert to rainforest**. From the coast, we cross the Cascade Mountains then follow the river gorges of the Columbia and Snake Rivers through the plains of central Washington and Oregon and southern Idaho. The plains and foothills rise to the Rocky Mountains of Idaho and western Montana before giving way again to rolling hills and prairies of eastern Montana. From the western coasts to the easternmost prairies is a **journey of nearly 1,000 miles crossing 5 distinct bioregions**.

Cities and Towns

Cities and towns in this region show **variation in response to their locations**. Viewing the images from left to right, line by line, will provide a visual transect development in the Northwest from west in the top left to east in the bottom right. Near the coast, we find large metropolitan complexes like Portland and Seattle. Moving eastward we experience the cities that accompany the corresponding landscapes highlighted in Fig. 1. In order left to right and top to bottom we have 1. Seattle, WA; 2. Leavenworth, WA; 3. Richland, WA; 4. Pullman, WA; 5. Boise, ID; 6. Spokane, WA; 7. Butte, MT; 8. Billings, MT; and 9. Sidney, MT.

Fig. 1. Visual Photo Transect-Ecoregions

Top, Left to Right: "Oregon Coast" <https://w.wiki/8NDC>. Herman, "Emeral Peak by Patrick Herman 2013" <https://w.wiki/8NDE>. "Historic Columbia River Highway -Island in the Columbia River" <https://w.wiki/8NDF>. **Middle, Left to Right:** Dsdugan, "Palouse Fields from Kamiak Butte" <https://w.wiki/8NDH>. "Snake River Canyon at Twin Falls, Idaho" <https://w.wiki/8NDJ>. Safira, "Fishfin Ridge" <https://w.wiki/8NDK>. **Bottom Left to Right:** "Flathead National Forest in Montana" <https://w.wiki/8NDN>. Norton, "Little Bighorn Battlefield National Monument" <https://w.wiki/8NDS>. Michel, "American Prairie Reserve" <https://w.wiki/8NDT>.

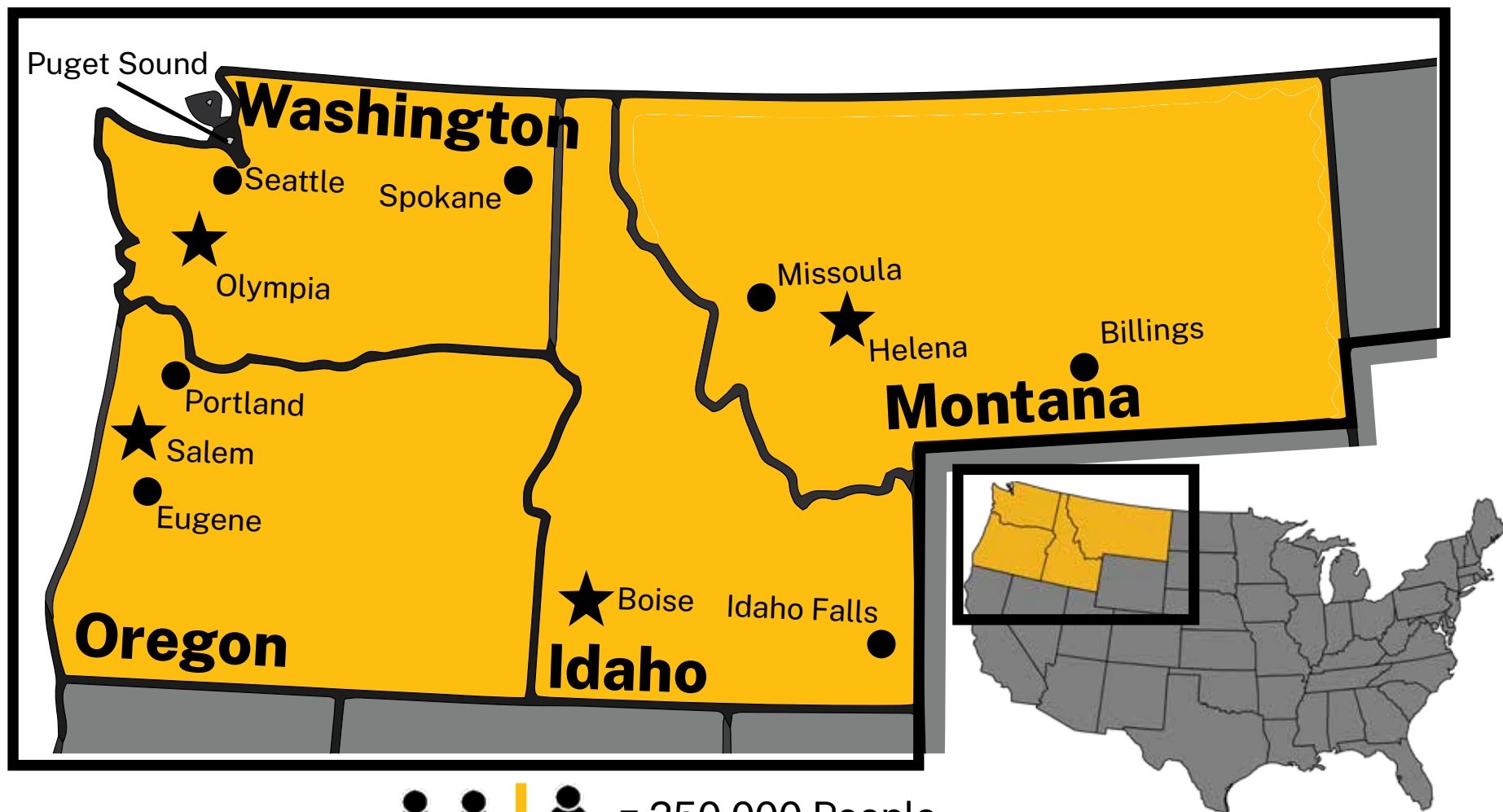
Fig. 2. Level I Ecoregions of North America

Adapted From :Commission for Environmental Cooperation. *Ecological Regions of North America: Toward a Common Perspective*. The Commission, 1997, https://gaftp.epa.gov/EPADDataCommons/ORD/Ecoregions/cec_na/CEC_NAeco.pdf. Accessed on November 16, 2023. Below: Fig. 3. Ecoregion Images

Left to Right: "Watson Lakes in the Noisy-Diobsud Wilderness, Mt Baker Snoqualmie National Forest" https://w.wiki/_ufpY. "Oregon Coast Trail at Cape Meares" <https://w.wiki/8NDX>. Appple, "Castilleja levisecta (golden paintbrush) at Rocky Prairie" <https://w.wiki/8NDb>.

Fig. 3 Visual Photo Transect-Cities & Towns

Top, Left to Right: Betongfejset, "Seattle View 125" <https://w.wiki/8NDg>. RocOast3r, "Main street in Leavenworth, Washington" <https://w.wiki/8NDI>. UmptanumRedux, "Richland Pasco Kennewick" <https://w.wiki/8NDn>. **Middle, Left to Right:** Spicypepper999, "Pullman aerial" <https://w.wiki/8NDo>. mWeston85, "Boise trees as seen from the North" <https://w.wiki/8NDp>. Yassie, "Spokane, WA From South Hill" <https://w.wiki/8NDq>. **Bottom, Left to Right:** St. John, "Butte, Montana, U.S.A" <https://w.wiki/8NDt>. "Late afternoon view of Billings, MT" <https://w.wiki/8NDv>. Stormchasing Videos, "Multiple Cinematic Tornadoes near Sidney, MT and North Dakota Border" https://youtu.be/4xU3S_mjLrc.



Population & Demographics

Climate planning documents typically use **demographics as a tool** to understand and describe local community factors related to age, race, income, and community health characteristics. These factors are relevant to the planning process as they help to identify **potentially vulnerable populations** and to evaluate the application of **social justice and equity** in a planning area. These factors may also help direct community engagement efforts and to identify stakeholder groups which may have valuable input or which might be uniquely impacted by climate disruption.

Population centers for the region are generally concentrated in the area between the Pacific Coast and Cascade Mountains. **The Puget Sound in Washington alone is nearly 29% of the population for the all four states combined** according to the Puget Sound Regional Council's April 2022 report. The Portland Metro area grew by nearly 13% over the same time period to over 2.5 million in 2020 (2020 Census Metropolitan Statistical Area Profiles).

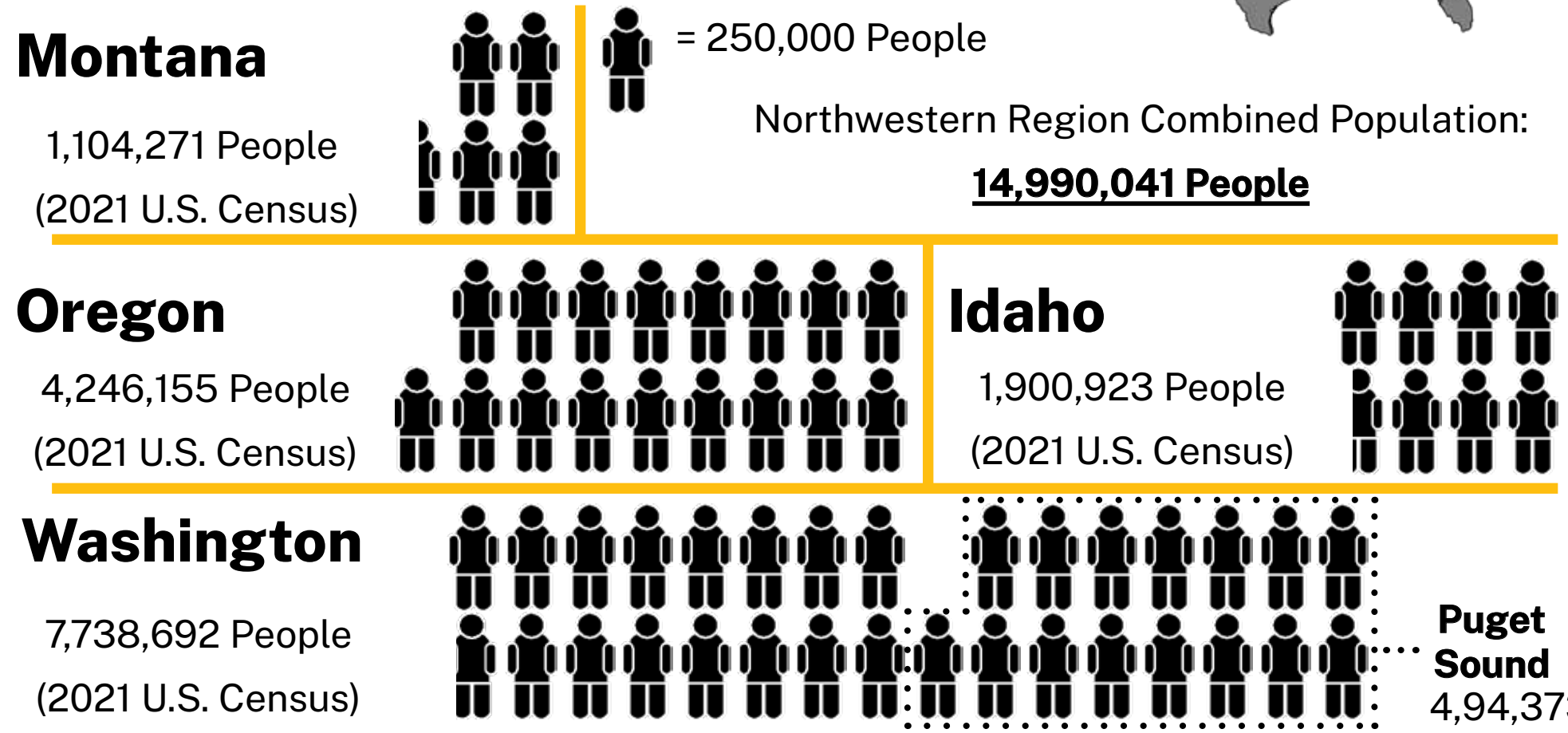
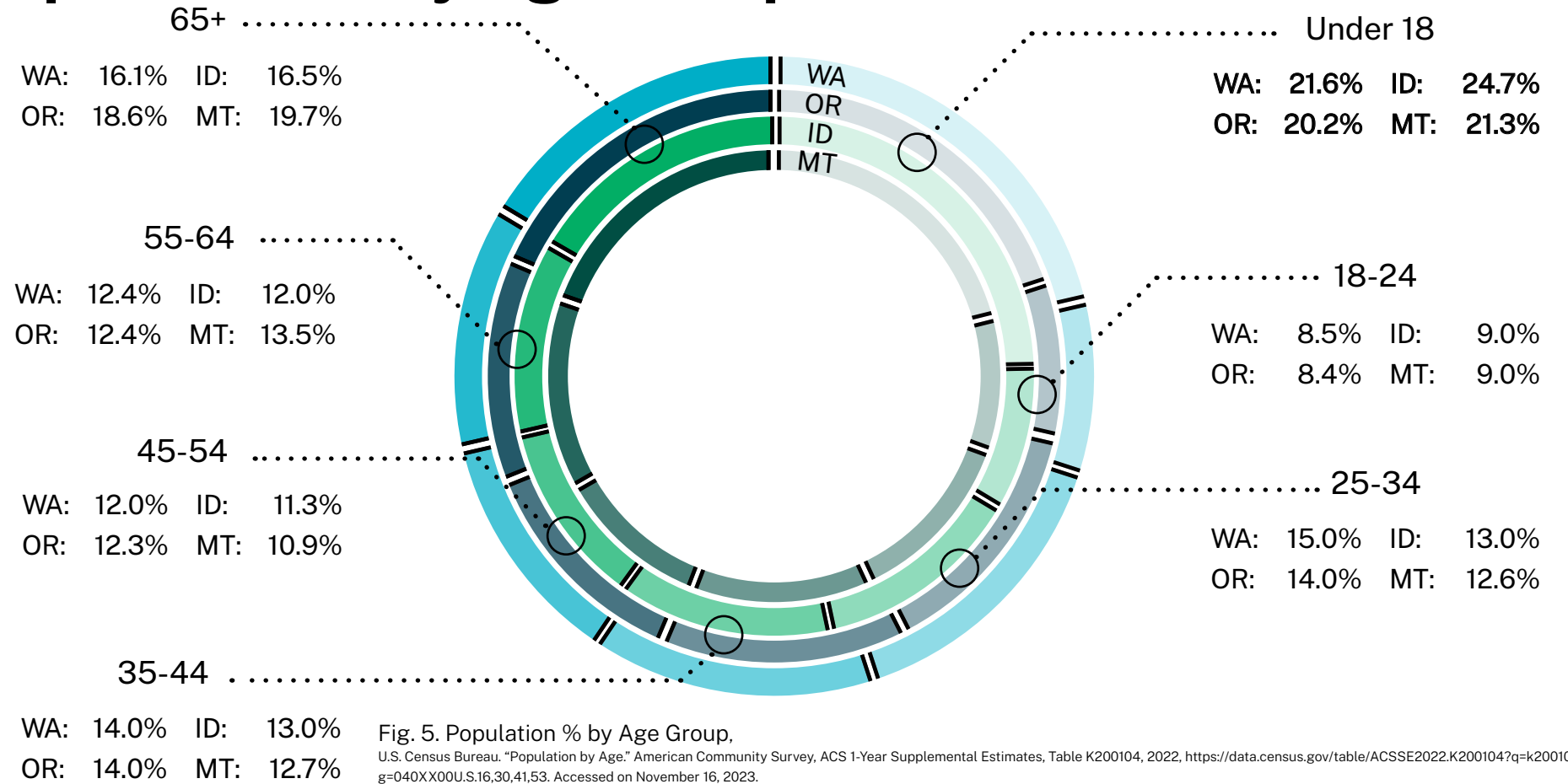


Fig. 4. State Populations
 U.S. Census Bureau. "Population and Housing Unit Estimates" Population Estimates Program (PEP), ACS 1-Year Supplemental Estimates, QuickFacts, 2022, <https://www.census.gov/quickfacts/fact/table/U.S.,ID,OR,WA,MT#>. Accessed on November 16, 2023.

Outside of these metropolitan areas, the majority of towns are small. In Montana only one city, Billings, has over 100,000 people in the current day and only 8 towns have greater than 10,000 residents. In Idaho there are only three cities, Boise, Meridian, and Nampa that have over 100,000 residents, and only 25 towns with greater than 10,000 residents.

- Washington and Oregon are generally more racially diverse
- Aging population with Washington and Oregon showing the largest portion of working age-persons between the ages of 18 and 64 (WA: 61.9%, OR: 61.8%). Idaho has the largest youth population (24.7%) Montana has the greatest percentage of persons 65 and older (19.7%).

Population: % by Age Group



Population: % by Racial Identification

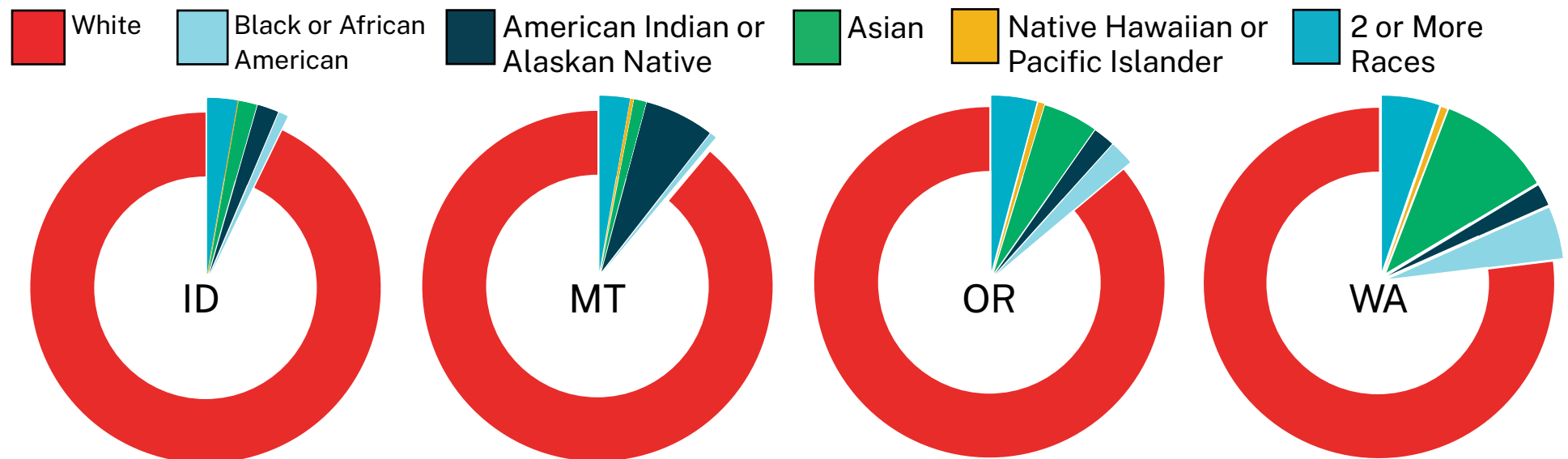
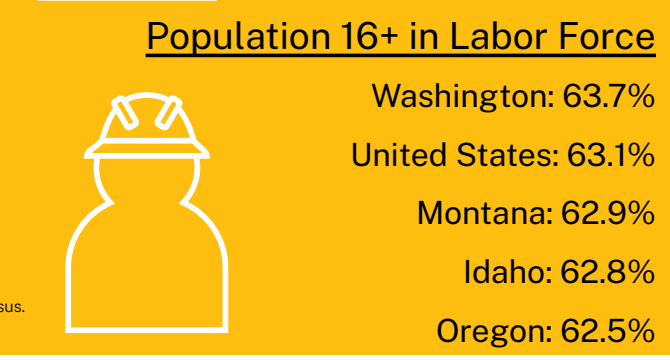
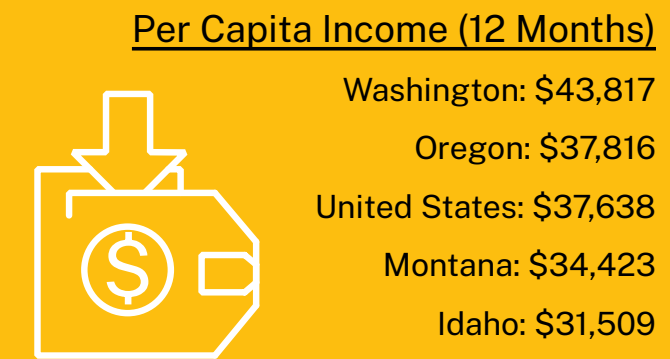
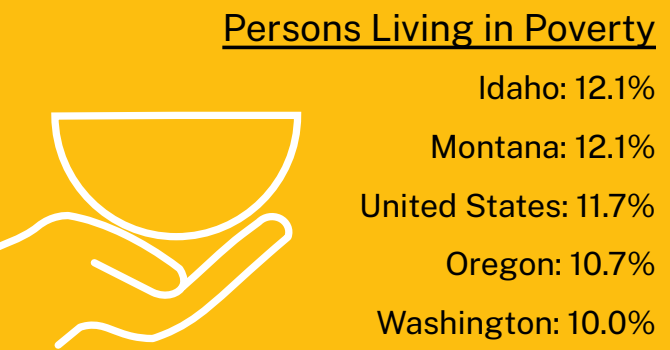
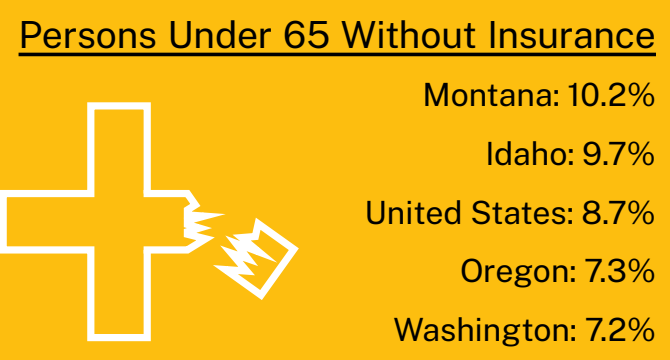
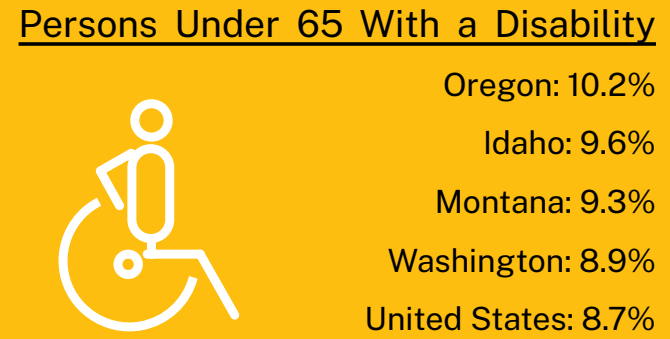
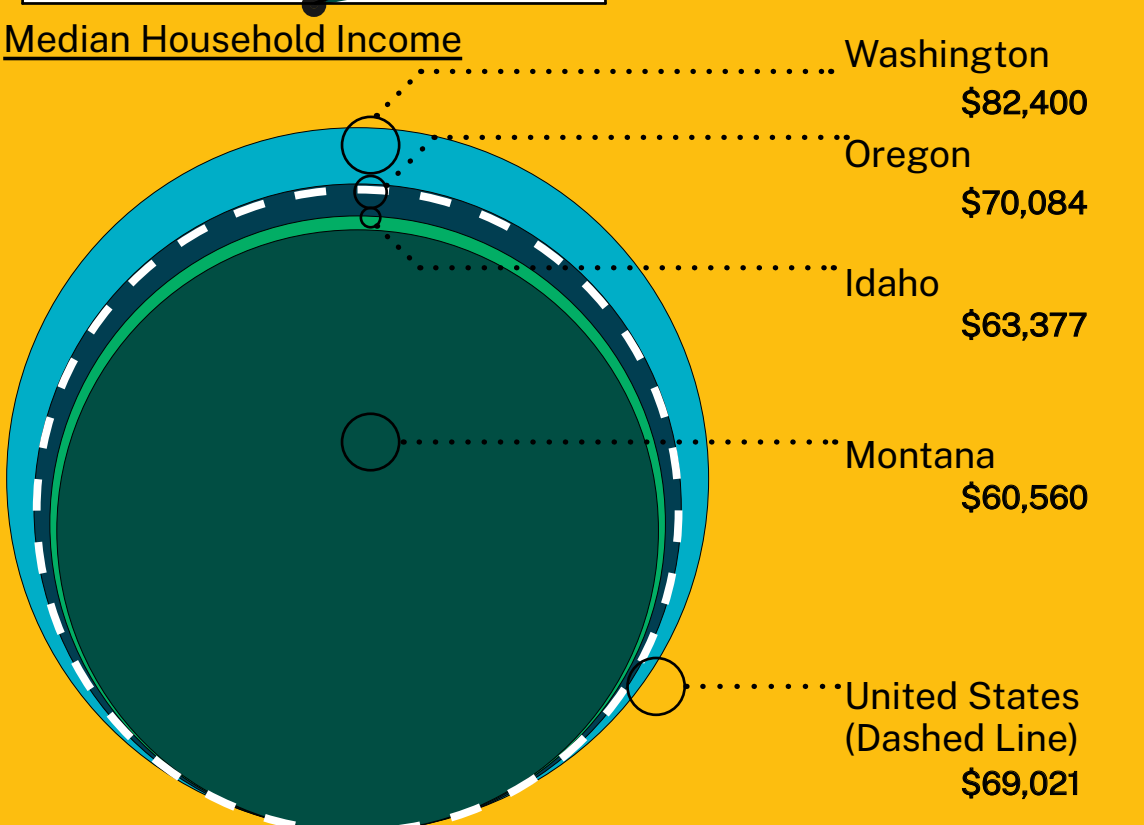
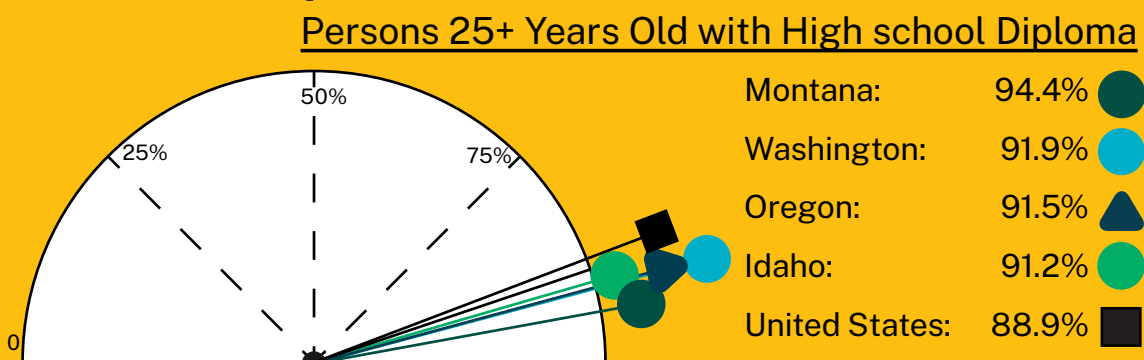
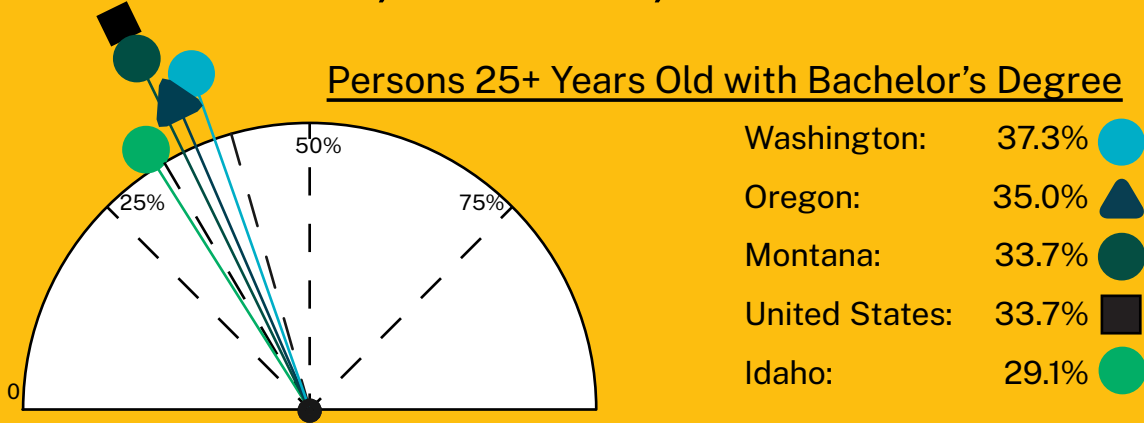


Fig. 6. Population % by Racial Identity
U.S. Census Bureau. "HISPANIC OR LATINO, AND NOT HISPANIC OR LATINO BY RACE." Decennial Census, DEC Demographic and Housing Characteristics, Table P9, 2020. <https://data.census.gov/table/DECENNIALDHC2020.P9?q=race+&g=040XX00U.S16,30,41,53>. Accessed on November 16, 2023.

Education, Health, & Income



- **Montana, Oregon, and Washington** have **higher levels of persons with a high school diploma** compared to the national average (88.9%). While **only Idaho has less persons with a bachelors degree (29.1%) than the national average (33.7%)**, and **only Washington has levels of persons in the workforce (63.7%) which are higher than national averages (63.1%)**.

- **Earnings per capita and per household in Washington (\$43,817 per capita, \$82,400 household) and Oregon (\$37,816 per capita, \$70,084 household) surpass national averages (\$37,638 per capita, \$69,021 household). Idaho and Montana see lower wages on average and have greater rates of poverty than the national average (11.7%).**

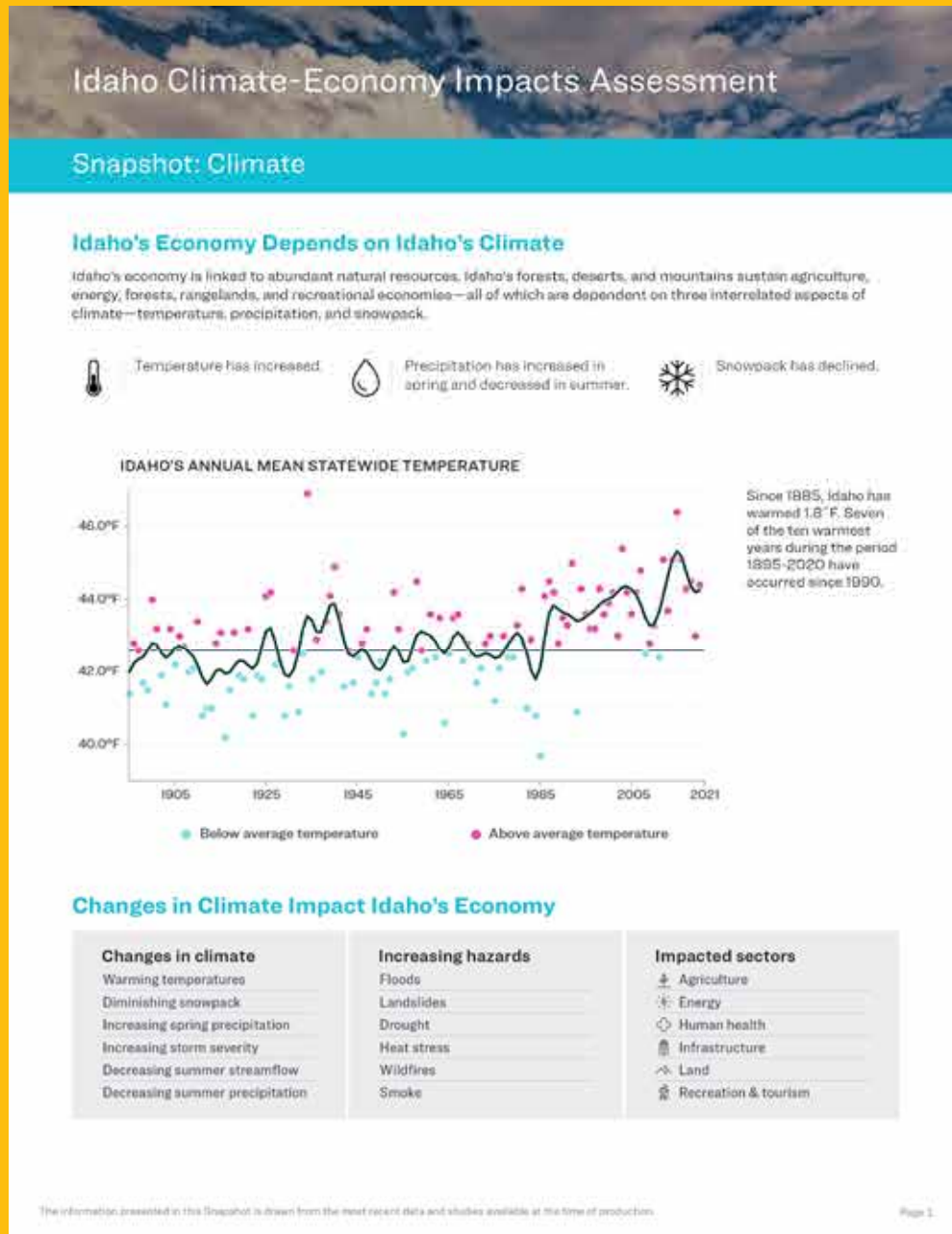
- **All states in the Northwest have higher rates of persons under 65 years of age with a disability than the national values**, Higher rates of poverty and lower rates of workforce participation are reflected in **the number of persons without insurance**, with **Idaho (9.7%) and Montana (10.2%) exceeding the national values (8.7%)** while **Oregon (7.3%) and Washington (7.2%) are well below.**

Above: Fig. 7. Educational Attainment, **Below:** Fig. 8. Median Household Income **Right:** Fig. 9. Indicators
 U.S. Census Bureau. "Population and Housing Unit Estimates" Population Estimates Program (PEP), ACS 1-Year Supplemental Estimates, QuickFacts, 2022. <https://www.census.gov/quickfacts/fact/table/U.S.,ID,OR,WA,MT#>. Accessed on November 16, 2023.

Idaho's Vulnerability

1. Rising temperatures in the state mirror rising temperature trends in the Northwest based on measurements going back to 1895.
2. Precipitation state-wide has not shown significant changes over the same time period despite precipitation in the Northwest increasing.
3. Over the last 70 years precipitation in the mountain areas has been declining with snowpack reducing up to 15%.
4. Streamflow has shown an overall reduction and peak streamflow is occurring 1-2 weeks earlier.
5. While drought conditions remain dynamic and nuanced across the state, dry conditions have increased with downstream impacts to fire potential.

Future scenarios for Idaho's climate generally indicate a **severe reduction in the portion of precipitation that will fall as snow** in the coldest parts of the year, leading to **increased potential for drought and wildfire conditions**. The primary impacts will come from **wildfire smoke and reduced air quality**. Other impacts related to disease, water quality and availability, algae blooms, food security, and mental health were also specified. Research also indicated that the **negative impacts would not be evenly distributed** across the state, with **major challenges to vulnerable populations**.



Idaho Climate-Economy Impacts Assessment, "Climate Snapshot"
<https://www.uidaho.edu/-/media/UIDaho-Responsive/Files/president/direct-reports/mcclure-center/iceia/iceia-climate-snapshot-2021.pdf?la=en&hash=5BB9C0043F277A8573D591AB8FC5C8CF214356FD>



2017 MONTANA CLIMATE ASSESSMENT

Stakeholder driven, science informed

montanaclimate.org



2017 Montana Climate Assessment, Cover
<https://montanaclimate.org/chapter/title-page>

Montana's Vulnerability

1. Temperatures in the state (minimum, maximum, and average) have increased by 2-3°F between 1950 and 2015.
2. Seasonal precipitation has shifted with average annual winter precipitation decreasing by around .9 inches and spring precipitation increasing.
3. Temperature increases will continue to accelerate with increase of 5.6-9.8°F possible depending on different climate projections.
4. Precipitation is projected to increase in all seasons except summer with the central and southern parts of the state likely to see the biggest decreases in summer precipitation.

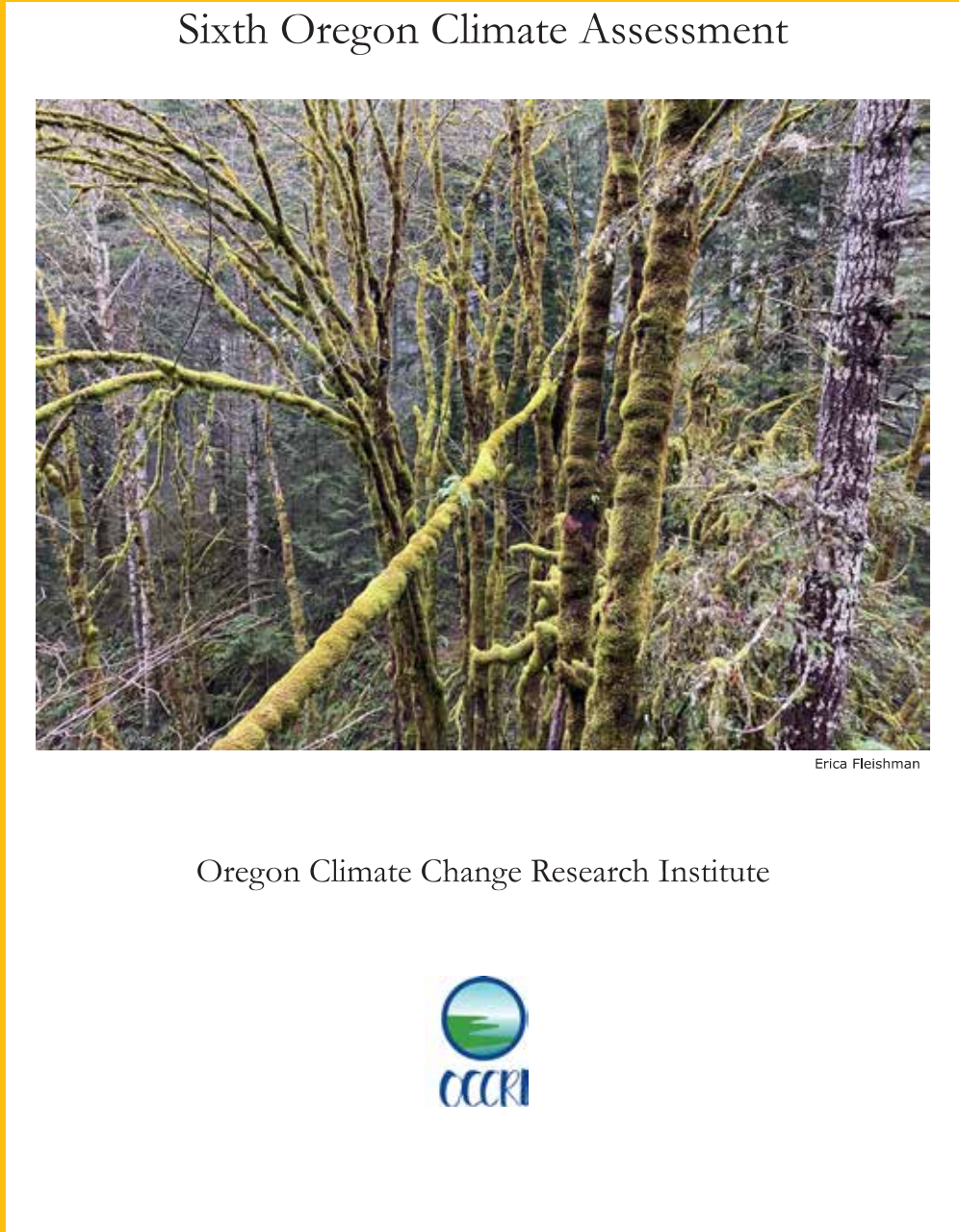
This report details **impacts to Montana's water resources, forests, and agriculture**. With **snowpack reducing and melting sooner** and precipitation decreasing in the hottest parts of the year, **water resources face potential for strain** with increased demand on groundwater and **worsening drought conditions**. These conditions exacerbate **wildfire potential and forest mortality**, and multi-year droughts in parts of the state could devastate agriculture in Montana.



Oregon's Vulnerability

1. Oregon is becoming both warmer and drier, from 1895 to 2021 average annual temperatures increased by 2.2°F with a further increase to 8.2°F by the 2080's.
2. Precipitation totals are not predicted to change significantly, but seasonal precipitation will shift towards drier summers and wetter winter months with less precipitation falling as snow.
3. Weather events such as extreme heat and drought are projected to increase in frequency and magnitude.
4. Coastal areas also face increased risk of flooding and disruptive climate events.

The report identifies the need for strategies to address a variety of needs and challenges to community adaptation. **Extreme weather events, drought, and wildfire** present real **threats to Oregon's economy and public health**. This report details how these impacts are not equitably distributed. Primary threats include **wildfire smoke, impacted air quality, and extreme heat events** which are projected to have major effects on future public health, **especially for tribal and other vulnerable groups**.



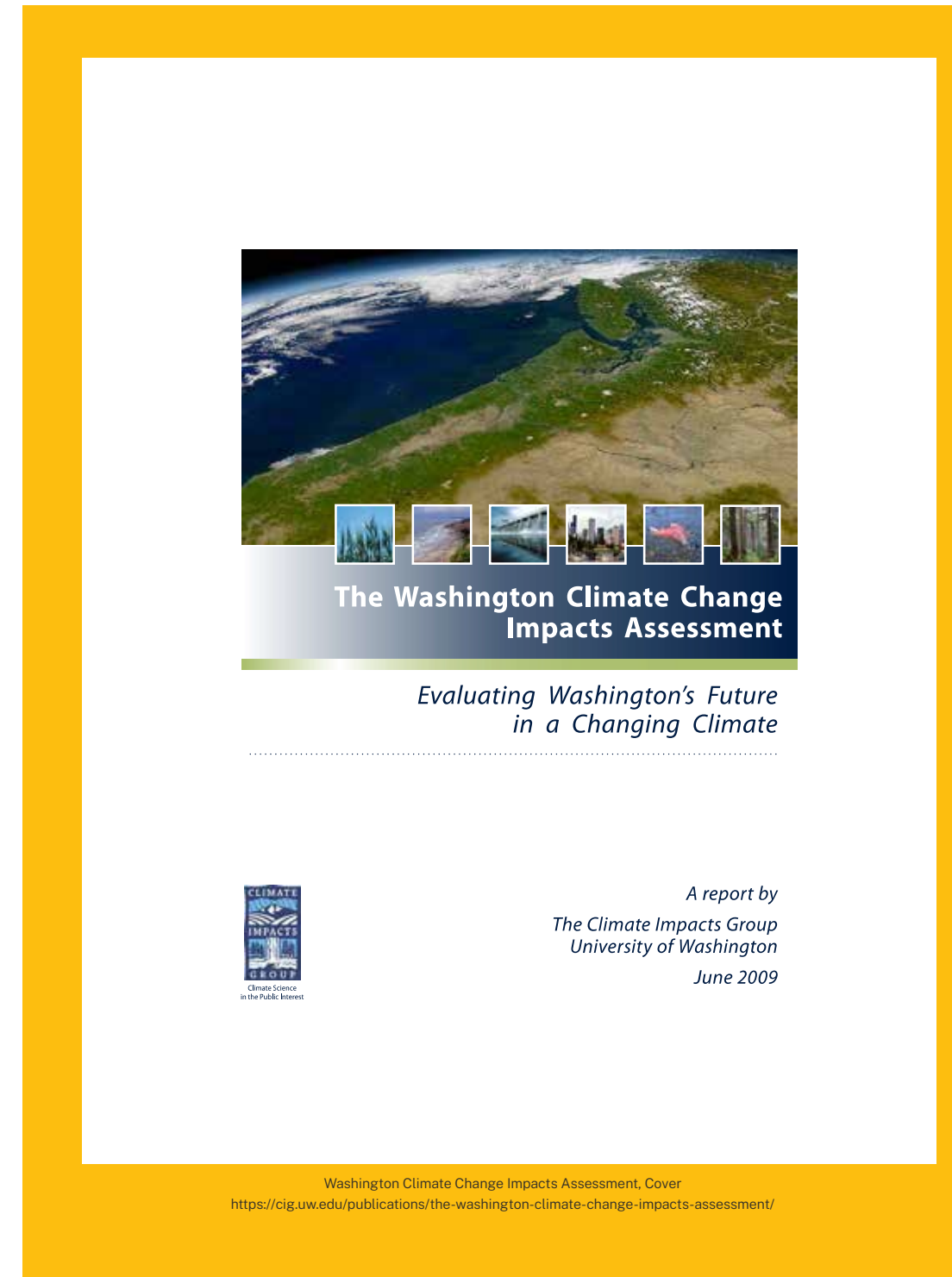
Sixth Oregon Climate Assessment, Cover
<https://blogs.oregonstate.edu/occri/oregon-climate-assessments/>

"Fall colors quillayute river coast estuary d archuleta 2015" <https://w.wiki/BP5K>

Washington's Vulnerability

1. Average annual temperatures are projected to increase by 5.3°F by the 2080's.
2. Snowpack will decrease by up to 59% in the 2080's compared to historical averages.
3. Some reservoir systems are projected to fall short of demand from water users.
4. Rising temperatures will further warm streams and water courses impacting already vulnerable wildlife populations, particularly salmon.
5. The areas burned by wildfires are projected to triple in acreage by the 2080's.
6. Areas in the Puget Sound face threats from increasing extreme precipitation events.
7. Air quality and heat-related deaths are projected to increase significantly.

This assessment identifies **mortality from hazardous air conditions and extreme heat** as the **main concern for public health**. The Puget Sound has been identified as being **particularly vulnerable with older populations** facing the highest risk. **Extreme precipitation** threats also could potentially destabilize economic and agricultural production one on side of the state, while **summer drought conditions** will put additional **stress on water systems** in the Northwest.



Northwest Vulnerability Discussion

All states in the Northwest face serious and immediate threats as a result of climate change. All states are projected to experience a trend towards warmer average temperatures with reduced summer precipitation and fall snowpack. These conditions further aggravate situations like drought and extreme weather events. Increasing temperatures and reduced summer precipitation also leads to an increase in the frequency and intensity of destructive wildfires.

Technologies and strategies employed by landscape architects at the more local scale may prove to be valuable tools in actions to mitigate or adapt to climate change as their adoption increases or becomes required to meet resource reduction and sustainability targets. Green stormwater infrastructure, water-wise landscapes, coordinated management strategies, sustainable materials selection, renewable energies, urban canopies, alternative transportation, and community mobilization are all areas in which landscape architects are prepared to take on a greater role in informing on alternatives and promoting sustainable solutions.



Fig. 11. Extreme Climate Impacts of the Northwest
Above Left: Millette, "Aircraft drops fire retardant on the 2021 Richard Spring Fire in Montana" <https://w.wiki/8NEC>. **Above Right:** "Tracking Drought" <https://w.wiki/8NED>. **Middle Left:** O'Reilly, "Lick Fire on the Umatilla National Forest burning at night" <https://w.wiki/7HXA>. **Middle Right:** Reid, "Oso Landslide aerial" <https://w.wiki/8NEG>. **Bottom:** McKeon, "Kintla Glacier 1901 vs 2019" <https://w.wiki/8NEK>.

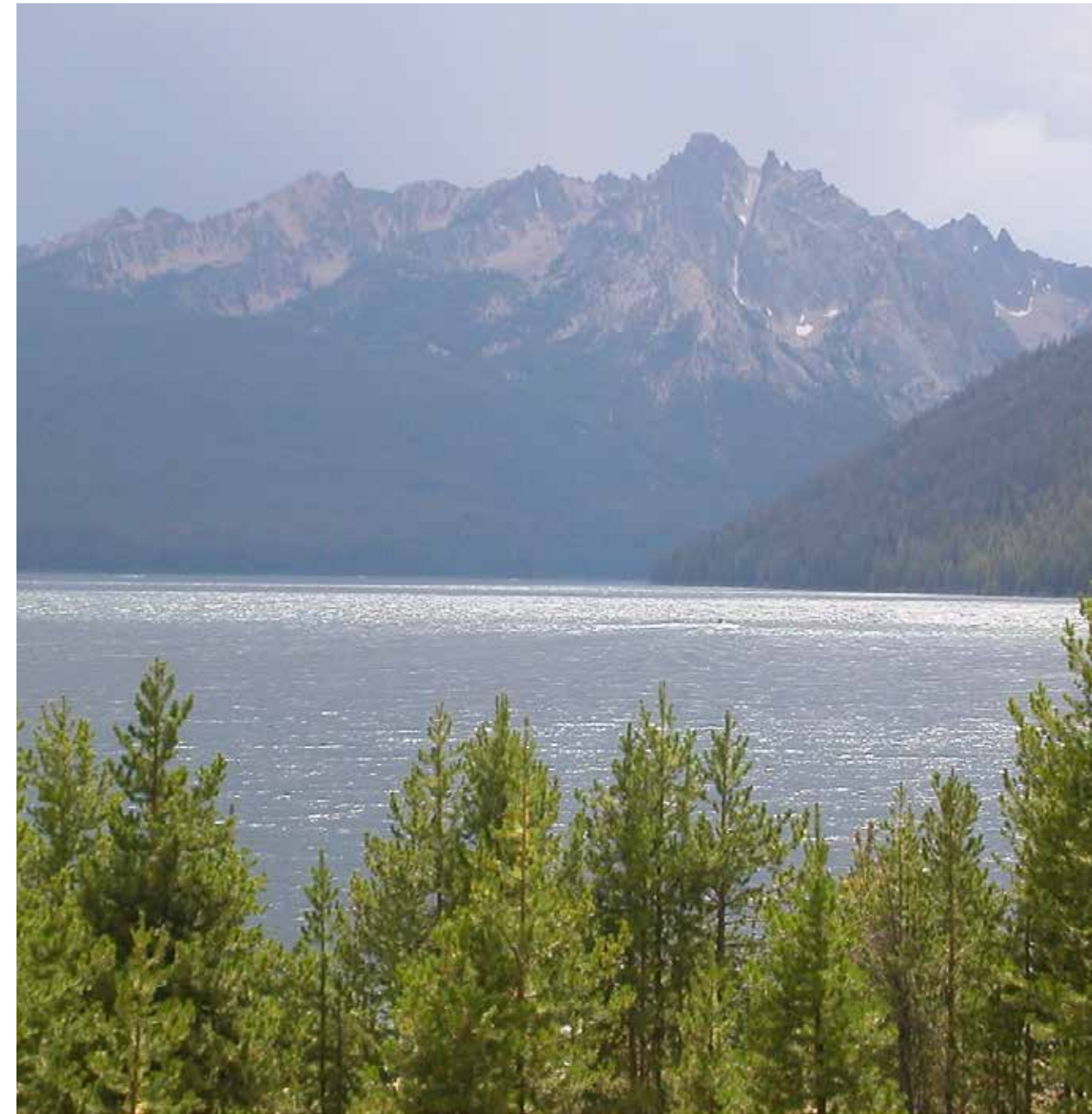
Case Studies

Selected Climate Action and Resiliency Plans

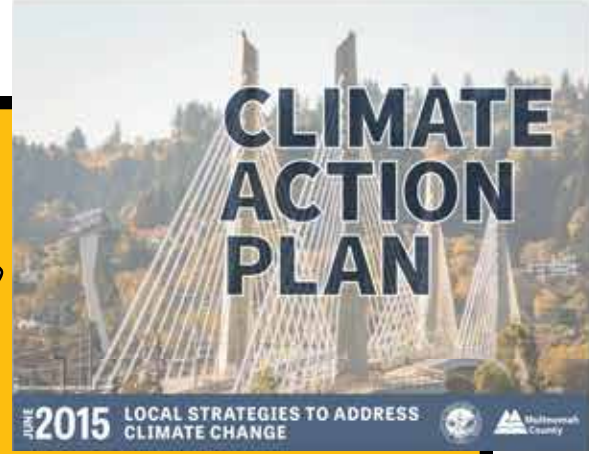
This section highlights a series of case studies which share a similar format and strategy which is generally applicable to most CAPs for towns and cities across the Northwest. Similar components and metrics make comparison across plans possible, but not all plans contain the same information and not all plans have compiled all the relevant documents in a single place. Examples of unique planning efforts and ongoing project will also be discussed.



Clausen, Johannesburg Mountain from Sahale" <https://w.wiki/8P23>



Jloft, "DC and Sawtooth 198" <https://w.wiki/8P5E>

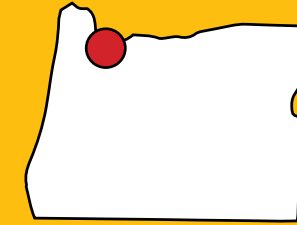


Case Study #1 City of Portland and Multnomah County

Climate Action Plan- June 2015

Location:

City of Portland and Multnomah County, Oregon



Population:

Portland Metro: 635,067 (2022), Multnomah County: 795,083 (2022)

Emissions Inventory:

6,132,000 metric tons CO₂equivalents in 2012, down 22% since 1990

GHGe (GHG emissions) Profile:

Transportation: 37%, Commercial Energy: 24%, Residential Energy: 20%, Industrial Energy: 18%, Waste: 1%

Emissions Reduction Targets:

2009 Plan first with Kyoto Protocol targets, predates Paris Climate Agreement adopted later in 2015

40% Below 1990 levels by 2030, 80% Below 1990 levels by 2050

Key Initiatives:

Global Warming Reduction Strategy (1993), City/County Local Action Plan on Global Warming (2001), Climate Action Plan (2009, 2015), Climate Action Through Equity (2016), 100% Renewable Energy Resolution (2017), Climate Emergency Declaration (2020), Climate Action Emergency Workplan (2022-2025)

Climate Impacts:

1. Increase in temperatures and frequency of extreme heat, 2. Increase in drought conditions, 3. Increase in wildfires impacts, 4. Increase in flood events, 5. Increase in landslide occurrences

Summary

Portland,OR has long been a leader in climate action and innovation in the U.S. in collaboration with Multnomah County. The city has had an established framework for policy and action and provides tools for residents and businesses in an effort to further climate action. Social and economic equity, as well as public health are primary concerns for planners in this area and actions undertaken by the city and county have seen some major successes in sustainability and resiliency initiatives related to alternative transportation and energy use.

Case Study #2 City of Seattle

Climate Action Plan-June 2013, Updated-April 2018

Location:

Seattle, Washington

Population:

City of Seattle: 749,256 (2022)

Emissions Inventory:

7,695,000 metric tons CO₂equivalents in 2013, down 14% since 1990

GHGe (GHG emissions) Profile:

Transportation: 66%, Commercial Energy: 18%, Residential Energy: 14%, Industrial Energy: 18%, Waste: 3% (2012)

Emissions Reduction Targets:

2013 Plan utilizes Kyoto Protocol Targets, includes net-zero by 2050 commitments made by city in 2011

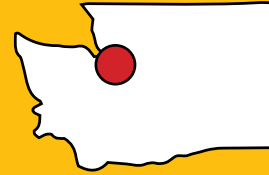
40% Below 1990 levels by 2030, Net-Zero GHGe by 2050.

Key Initiatives:

Green Building Standard (2000), Climate Action Plan (2006, 2013), Greenhouse Gas Inventory (2012), Seattle Climate Strategy (2018), Climate Executive Order (2021), Climate Vulnerability Assessment (2023)

Climate Impacts:

1. Flooding, 2. Extreme heat, 3. Wildfire smoke, 4. Unpredictable, extreme weather events, 5. Public health



ACTION SEATTLE CLIMATE ACTION PLAN

Summary

Like Portland, Seattle has a history of leadership in climate action and planning. A focus on transparency, equity, and implementation results in a robust planning mechanism with clear policy intents. Seattle's location on the Puget Sound of Washington amidst a sprawling metropolitan complex of over 4 million people makes it particularly vulnerable to widespread impacts from climate disruption and destructive weather events and impacted air quality from wildfire smoke. Flooding and sea level rise threaten water resources and property while current evidence suggests an increase in the intensity and frequency of these events in the future.



Case Study #3 City of Spokane

Spokane Sustainability Action Plan- 2021

Location:

Spokane, Washington

Population:

City of Spokane: 230,160 (2022)

Emissions Inventory:

2,108,796 metric tons CO₂equivalents in 2016

GHGe (GHG emissions) Profile:

Transportation: 46%, Residential Energy: 24%, Commercial Energy: 22%, Waste: 5%, Industrial Energy: 2% (2016)

Emissions Reduction Targets:

Goals set by Washington State in 2019 exceed the baseline Kyoto Protocol targets 45% Below 1990 levels by 2030, 95% Below 1990 levels by 2050 and reaching net-zero emissions

Key Initiatives:

Sustainability Action Plan (2009, 2021), Water Conservation Master Plan (2020), 100% Renewable Energy by 2030 (2018),

Climate Impacts:

1. Trends in reduced summer precipitations, 2. Increase in average temperatures and extreme heat events, 3. Public health impacts from wildfire smoke and heat, 4. Shift from snow to rain in winter months, 5. Larger more destructive wildfires from drier summers, 6. Altered streamflow timing



Summary

Though it has less of an established reputation as a climate-minded city, Spokane also has a history of climate action and response to the challenges of climate change. Due to dependence on tourism and recreation opportunities for good economic health, climate disruption to seasonal recreational pursuits such as skiing, whitewater rafting, fishing, and camping is projected to have negative impacts in many of the outlying communities.

Case Study #4 City of Boise

Boise Climate Action Roadmap-2021

Location:

Boise, Idaho

Population:

City of Boise: 236,634 (2022)

Emissions Inventory:

2,500,000 metric tons CO₂equivalents in 2018, down 3% since 2015

GHGe (GHG emissions) Profile:

Transportation: 46%, Commercial/Industrial Energy: 28%, Residential Energy: 23%, Waste: 3%, (2021)

Emissions Reduction Targets:

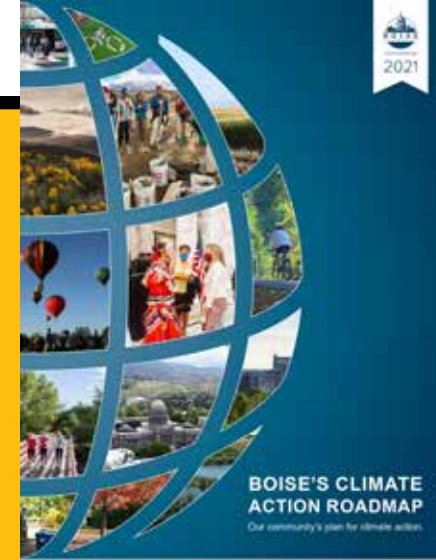
40% Below 1990 levels by 2030, Carbon-neutral Community by 2050, Carbon-neutral city government by 2035, 100% Clean Electricity by 2035

Key Initiatives:

Boise Climate Adaptation Assessment (2016), Climate Action Roadmap (2021)

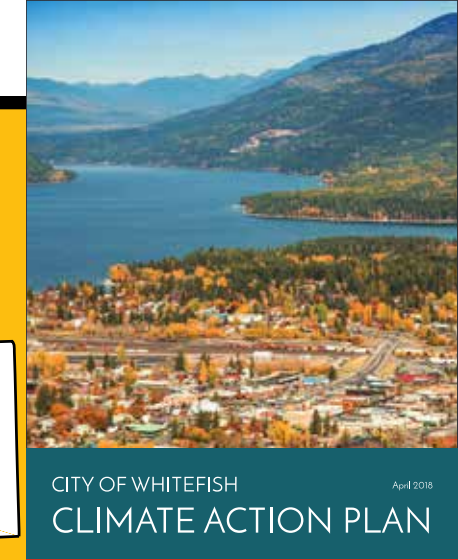
Climate Impacts:

1. Increase in number of “heat stress” days, 2. Increase in heavy precipitation events, 3. Drought Conditions, 4. Flooding, 5. Poor air quality resulting from wildfire smoke, 6. Reduction in stream flows, 7. Impaired water quality and availability, 8. Impacts to agricultural production



Summary

Boise is the largest city in Idaho and one of the few to complete a vulnerability assessment, emissions inventory, and action plan within the state. Boise's location in the dry plains of southwest Idaho make it particularly vulnerable to threats from impacted water resources, with threats to agriculture and irrigation demand causing serious concern for planners. Intense rain events and extreme heat also threaten the area, which extends into a suburban complex including cities like Meridian, Nampa, Eagle, Kuna, and Caldwell. Increases to development and a growing population offer further challenges to community resiliency and sustainability in southwest Idaho.



Case Study #5 City of Whitefish
City of Whitefish Climate Action Plan- April 2018

Location:

Whitefish, Montana

Population:

City of Whitefish: 8,915 (2022)

Emissions Inventory (Governmental Operations Only):

1,760 metric tons CO₂ equivalents in 2016

GHGe (GHG emissions) Profile:

Water & wastewater treatment: 42%, Buildings: 24%, Vehicle Fleet: 21%, Employee Commute: 7%,

Street Lights: 6% (2016)

Emissions Reduction Targets:

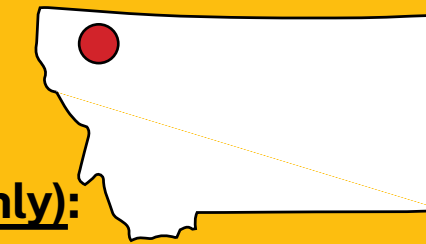
Committed to Paris Agreement in 2017, 26% Reduction (from 2016 levels) goal for emissions by 2025 adopted goal, 43% Reduction by 2030, 71% Reduction by 2040, Carbon-neutral by 2050

Key Initiatives:

Climate Action Committee (2016), Greenhouse Gas Inventory (2016), Climate Action Plan (2018)

Climate Impacts:

1. Reduced annual precipitation in winter, 2. Increase in average temperatures and extreme heat events, 3. Longer fire season, 4. Longer growing season, 5. Earlier snowmelt, 6. Altered streamflow timing



Summary

With limited access to data and resources compared to other planners, this volunteer committee was able to prepare and publish an effective plan which was adopted by the city council in 2018. While limited in its ability to truly analyze the sources and scale of emissions in the community, it is a step in the proper direction and provides guidance to average people looking to understand the reality of climate change and potential impacts on Whitefish. It contains some interesting historical and humanized perspectives on climate change that are particularly effective in communicating this message to residents.

Case Study #6 Big Sky

Big Sky Community Climate Action Plan- February 2023

Location:

Unincorporated Big Sky (CDP), MT

Population:

3,591 (2020)

Emissions Inventory:

145,183 metric tons CO₂equivalents in 2018

GHGe (GHG emissions) Profile:

Residential Energy: 33%, Transportation: 33%, Commercial Energy: 16%, Industrial Energy: 14%, Waste: 3%, (2018)

Emissions Reduction Targets:

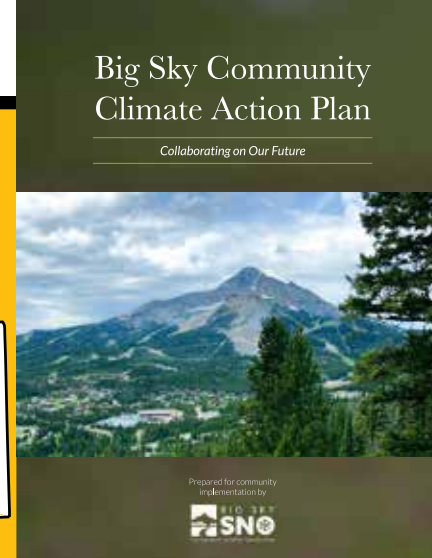
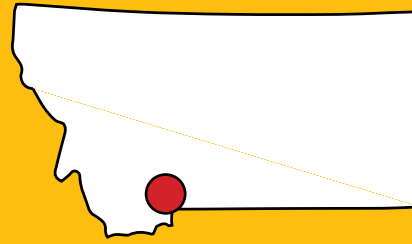
Net-zero by 2050

Key Initiatives:

Community Greenhouse Gas Inventory (2018), Big Sky Community Action Plan (2023), Community Waste Composition Assessment (2023)

Climate Impacts:

1. Increasing temperatures, 2. Increase in precipitation, 3. Reduced snowpack, 4. Reduced summer precipitation, 5. Poor air quality resulting from wildfire smoke, 6. Increasing wildfire frequency



Summary

This planning effort is unique in its application to an area with unofficial boundaries which crosses multiple towns and counties involving a broader effort for implementation. Communities in this planning area are highly reliant on tourism and seasonal recreation for survival. Winter and summer resorts are major employers in the area and tourism associated with Yellowstone National Park and outdoor recreation opportunities in the area fuel the local economy. These communities face real challenges from climate disruption. Despite their small size communities in this planning area can benefit from a robust framework for climate action which can improve the long-term sustainability and resiliency in this vulnerable area.

ASLA Climate Action Framework



Fig. 12. ASLA Action Framework
"Climate Action Plan" American Society of Landscape Architects.

ASLA Action Initiatives

- 

Initiative 1- **Carbon Draw-down**
Achieve zero emissions, double sequestration by 2040

- 

Initiative 2- **Climate Resilience**
Enhance resiliency of livable cities and communities

- 

Initiative 3- **Climate Agency**
Advocate for climate justice and social well-being

- 

Initiative 4- **Cultural Empowerment**
Learn from cultural knowledge systems and practices of care

- 

Initiative 5- **Climate Leadership**
Galvanize climate champions

- 

Initiative 6- **Global Alliance**
Advance the UN's SDGs and expand collaboration

ASLA Climate Action Plan

Aims to provide a unified decision-making framework to alter established methodologies and shift to a new focus on advocacy, equity, and changes to practice which contribute to climate resilience and carbon draw-down. (ASLA Climate Action Plan). This framework is intended to apply to all projects conducted by landscape architects simultaneously.

There is no GHGe inventory, no emissions profile, no planning area, and no local climate impacts. The ASLA has set a goal of zero emissions from projects, business operations, and the product marketplace by 2040.



"Climate Action Plan Panel" American Society of Landscape Architects. <https://www.asla.org/land/LandArticle.aspx?id=62037>

Butte-Silver Bow SHARP Plan

Butte, MT's sustainability, health, and resiliency plan, or **SHARP** is an evolving planning draft of document for Butte-Silver Bow, an incorporated county-city in southwest Montana. This researcher has been involved with the preparation and drafting of the SHARP beginning in May of 2023 as part of a professional internship with consults hired by the National Center for Appropriate Technologies (NCAT).

In 2022 Eco Adapt performed stakeholder-driven **risk assessments** and sought to **interpret the community's understanding of climate vulnerability** and to begin **developing action strategies** to address those vulnerabilities. A **multidisciplinary volunteer steering committee facilitated by consultants was formed** which aimed to continue the momentum of climate action in Butte and to form local partnerships and draft a resiliency planning document.

The SHARP plan focuses on priorities established in the EcoAdapt workshops and looks to **complete a GHGe inventory for the years 2019-2021**. Strong partnerships with local energy providers, guidance from the International Council for Local Environment Initiatives (ICLEI), and cooperation from local data sources has made it possible for this team, **led by a landscape architect**, to make significant progress towards completing a draft for this plan.

This researcher's contribution to the process consisted primarily of drafting data request forms, interpreting and formatting data submissions from local officials, building a GHGe inventory utilizing ICLEI's Clearpath tool, analyzing emissions scopes, and contributing to the development of **action items and strategies**. The public engagement aspect of this plan involved public meetings, public awareness and promotion, and participation in community events like Montana Folk Festival.



Sustainability, Health, and Resilience Plan

A Community Climate Action Plan for Butte-Silver Bow

This Plan is Overseen by The Resilient Butte Steering Committee in Partnership with The National Center for Appropriate Technology (NCAT), Montana Technological University, and the Consolidated City-County Government of Butte-Silver Bow, Montana (BSB).

November 2023



Photos Courtesy of Resilient Butte

Climate Action Planning

Climate action and resiliency planning

This section aims to define a climate action plan and to show how they are generally composed. “Climate action plan” may have different definitions based on the circumstances and jurisdiction, this section will cover the basic components of a climate action or resiliency plan as well as the reasons a community may undertake such an effort, it will also cover the types of professionals involved in the process and a general framework for plan development.



Frank, "Spatter Cones at Sunrise from Inferno Cone" <https://w.wiki/8P2S>



Mirk, "People's Climate March PDX" <https://w.wiki/8NCx>.

What is a Climate Action Plan?

World Resources Institute

(WRI)-

“A climate action plan creates a framework for cities to reduce or “mitigate” greenhouse gas emissions in coordination with other city plans for development, transport, health, and other issues. When successfully orchestrated, a climate action plan can create a shared vision around a climate goal and can align climate policies with social and economic development goals, unlocking complementary social and economic benefits for cities.”

Center for Climate and Energy Solutions

(C2ES)-

“Climate action plans generally include greenhouse gas (GHG) emissions reduction targets and detail actions the state can take to help meet those goals. The plans may also include additional components such as resilience strategies, clean energy targets, and economic and social goals. The individual characteristics of each state’s economy, resource base, and political structure provide different opportunities for addressing climate change.”

Climate Action Planning: A Guide to Creating Low-Carbon, Resilient Communities-, Boswell et al.

“Climate action planning is a strategic planning process for developing policies and programs for reducing (or mitigating) a community’s greenhouse gas emissions and adapting to the impacts of climate change. Climate action planning may be visionary, setting broad outlines for future policy development and coordination, or it may focus on implementation with detailed policy and program information.”

WRI: World Resources Institute <https://www.wri.org/events/2019/5/introduction-city-climate-action-planning-learning-guide>

C2ES: Center for Climate and Energy Solutions <https://www.c2es.org/document/climate-action-plans/>

(Boswell et al. , 8)

- Definitions for “Climate Action Plan” can vary widely between organizations or countries, and some definitions limit the scope of climate action planning to a specific level of government. But many plans have been published in recent decades, and **only a portion of those is directly limited to a single city or governmental entity.**
- Inventories in line with IPCC standards are **required to address the sectors of energy, transportation, waste , and land use.** Emissions reduction targets are already established in those protocols so for many **plans the focus will be on developing action items and implementation strategies.**
- Some plans which have already been completed and distributed may not fit neatly into commonly accepted definitions. **Some published plans include an internal definition for “climate action plan”** but often the definitions from **one plan may not be directly compatible with another.**
- It is common for plans use the word “**Sustainability**” or “**Resiliency**” in their title, but often **climate action is the primary focus** and the plan aimed to limit **GHG emissions as a priority.** The names for these plans are used interchangeably in a way which can be confusing when attempting to categorize or compare between plans.

Climate Action Plans

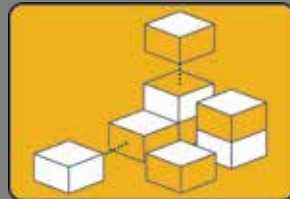
(1) Provide Emissions Reduction Targets



(2) Establish Goals or a Vision for the Planning Area



(3) Develop a Framework for Action and Policymaking



(4) Address Local Needs for Community Sustainability and Resiliency



(5) Establish Protocols and Standards for Monitoring and Evaluation



Fig. 13. Climate Action Plan Goals

What are the components of a Climate Action Plan?

In *Climate Action Planning: A Guide to Creating Low-Carbon, Resilient Communities*, Boswell et al. identified seven standard pieces of content for a climate action plan which adhere loosely to the framework described previously, in this planning model some aspects are broken down into even more specific components:

- 1. Background on climate change and impacts with a climate vulnerability assessment for the planning area**
- 2. An inventory and forecast of local GHG emissions**
- 3. Goals and objectives including emissions reduction targets**
- 4. Emissions reduction strategies to cover energy, transportation, waste, and land use**
- 5. Adaptation strategies**
- 6. An implementation program with responsibilities, timelines, costs, and financing support defined**
- 7. Monitoring and Evaluation Programs**

ClearPath



ICLEI is a leading global organization in greenhouse gas recording protocols and serves as the national authority on emissions management in the United States. Use of their inventorying tool, known as ClearPath, allows for planners to develop science based inventories which are in line with global climate science recording protocols. The software allows for the recording of emissions sources and provides tools to fill in the gaps in data where information is difficult or otherwise impossible to collect.

ClearPath also provides a framework with which planners can approach climate action planning and forecasting. ICLEI promotes Five Pathways as an integrated solution to “balance the patterns of human life and the built and natural environments”

- Low Emissions Pathway
 - Resilience Pathway
- Equity and People-Centric Pathway
 - Circular Pathway
 - Nature Based Pathway

ICLEI: Local Governments for Sustainability <https://icleiusa.org/pathways/>

GHGe Inventory

- **Modeling of GHG emissions** potentials and the application of climate science protocols to standardize this data is complex and **requires a significant understanding of the underlying climate science and chemical properties of GHG emissions** which go beyond what is typically included in the education and training of landscape architects. **Lack of availability of complete and relevant data sets and reliance on private community members** with minimal or no obligation to report can make it extremely difficult in many jurisdictions to complete an inventory which meets the minimum standards established by the International Panel on Climate Change (IPCC) for governments or Science-Based Targets Initiative (SBTi) science-based assessment for private sector actors.
- Use of **inventorying tools like ICLEI’s ClearPath** allows professionals with less of a background in technical climate science **to complete these inventories** and can also help facilitate the gathering of data. The **minimum required categories for a “science-based” inventory in ClearPath are residential, commercial, and industrial energy consumption, solid waste management, water and wastewater management, and on-road transportation.**

International Protocols

Climate Action in the U.S. is often tied to development goals and climate protocols. Plans typically are influenced by one of three international standards for climate action and community sustainability. Local politics, priorities, and resources strongly influence the interpretation and realization of these protocols.

(1) Kyoto Protocol

Adopted in 1997, it set the standards for plans written prior to 2014. It provided nation-specific emissions reduction targets for 192 current signatories with a goal of reducing emissions to below 1990 levels. Much of the intention behind the Kyoto Protocol has been expanded in the Paris Climate Agreement which exists as a parallel document to the Kyoto Protocol and is not intended as a replacement.

(2) Paris Climate Agreement

Taking effect in 2015, the Paris Climate Agreement set specific targets for emissions reductions and limits to global temperature increases. This agreement is the driving force behind much of the climate action in the U.S.. Related initiatives like the U.S. Climate Mayors and C40 initiative aim to further educate and motivate future action after the U.S. left the Paris Climate Agreement 2020.

(3) UN Sustainable Development Goals

These 17 goals to guide equitable and sustainable development provide much of the framework for action strategies and priorities. Despite having specific climate goals, this framework is often used to provide a compelling justification for action.

Risk Assessment

In addition to an inventory to account for GHG emissions and community vulnerability assessment, a critical tool for planners to develop strategies is the development of a risk assessment. These assessments may take on specialized forms in response to unique attributes of the planning area and the persons involved with conducting the assessment.

Severity of Outcome

		Negligible	Minor	Moderate	Major
Probability of Outcome	Improbable	Lower Priority			
	Unlikely				
	Likely		Moderate Priority		
	Assured				Higher Priority

This generalized example shows a typical arrangement for a risk matrix. The number of squares and categories can vary with the planning area and the complexity of local climate factors. The matrix helps to prioritize action by combining the likelihood that an event will occur with the severity of outcomes if that event occurs. Events which have high probability and severity should be a higher priority than events which have lower likelihood of occurrence and severity of impact.

Fig. 14. Risk Assessment

Vulnerability & Risk Assessment and Next Steps

- With a completed inventory and vulnerability assessment, planners will be **able to identify which sectors should be targeted for specific actions**. Dividing these inventories into sectors helps planners identify where consumption is having the greatest effect on emissions. Being able to **evaluate and target these individual sectors** allows for the development of strategies and action items which **specifically address the issues identified in the inventory section**.
- As an example, **completion of the inventory** for residential energy consumption **may indicate to planners** that the average home in their study area uses a higher level of energy compared to comparable neighboring communities or they may observe a trend in the portion of total emissions which is generated by residential energy consumption. Action items which can influence the consumption of energy at the residential level should then be prioritized to address this situation. Conversely, **if the inventory identifies areas where the potential returns from an action are low and risk is low**, then those areas will become the **lowest priority** so that other, more severe situations can first be addressed.

Phase 1

1. Make a community commitment
2. Build community partnerships
3. Establish planning process goals
4. Assemble climate action team (CAT)
5. Consider logistics of planning process
6. Establish a public education and outreach program
7. Audit existing community policies and programs

Phase 2

8. Conduct baseline GHG emissions inventory and preliminary forecast
9. Conduct climate change vulnerability assessment
10. Formulate vision, goals, and targets
11. Develop, evaluate, and specify climate action strategies

Phase 3

12. Develop and administer an implementation program
13. Monitor, evaluate, and report implementation
14. Modify and update strategies

Source: (Boswell et al., 39)

Estimated Time Frame

Time frames for completion of an inventory are dependent on the level of complexity and the completeness of previous climate efforts, updates and regular monitoring of previous efforts can significantly shorten the required times. New plans take longer to prepare and depend on the sizes and sources of community emissions. Funding and team composition can also have major impacts on the time needed. Some actions should be ongoing, with updates and revisions to the plan every 2-5 years following completion. Ongoing progress towards implementation should be considered and reported on every 1-2 years to ensure the plan stays current and has the opportunity to highlight successes and improve as necessary.

Phase 1: 3-6 Months

Make a community commitment: 1-2 months

Build community partnerships: Ongoing

Establish planning process goals: 1-2 months

Assemble climate action team (CAT): 2-3 months

Consider logistics of planning process: 1-2 months

Establish a public education and outreach program: Ongoing

Audit existing community policies and programs: 2-3 months

Phase 2: 9-18 Months

Conduct baseline GHG emissions inventory and preliminary forecast: 4-6 months

Conduct climate change vulnerability assessment: 4-6 months

Formulate vision, goals, and targets: 2-3 months

Develop, evaluate, and specify strategies: 6-8 months

Phase 3: Ongoing

Develop and administer an implementation program: Ongoing

Monitor, evaluate, and report implementation: Every 1-2 years

Modify and update strategies: Every 2-5 years

Source: (Boswell et al., 65)

What is the process for developing a Plan?

- Plans may take any number of pathways on their way to being published and/or adopted. Boswell et al. simplified this complex planning process into three phases. **In Phase 1** planners **form an action team** and undergo actions which establish or clarify a **community commitment** to action, **build partnerships** within the community, and **evaluate the technical logistics** that will be required by the planning process. In this first phase an **audit of existing policies** and incentives helps to focus the efforts of the planning team and to unify existing documents with future policy.
- In Phase 2**, planners conduct an **inventory of GHG emissions and develop a forecast** for future conditions. In this phase a **vulnerability assessment** is made and specific **goals, targets, and a vision** for the planning area are generated which take into account the community's commitments or aspirations. Next planners begin to **generate and test strategies for implementation**.
- In the **Phase 3**, planners will finalize and enact an **implementation plan** and make plans for how to **observe and record the results** of implementation. Finally, planners will interpret these results of implementation to further **update and refine planning strategies** and actions.

Estimated Staff Hours

While the exact number of hours and the budget required for planning efforts varies significantly based on the planning area and scope, Boswell et al. provide an estimation of the number of hours needed to complete the various stages of the process. Actual time required for completion will depend on the expertise, commitment, and quantity of staff involved.

1. Protocol-compliant GHGe inventory and forecast	=150 to 200 hours
2. Comprehensive climate change vulnerability assessment	= 300 to 600 hours
3. Limited public outreach and participation	= 60 to 100 hours
4. Extensive public outreach and participation	= 600 to 1000 hours
5. Development of action strategies	= 80 to 100 hours
6. Quantification of GHGe reduction	= 6 to 15 hours per strategy
7. Implementation and monitoring	=40 to 80 hours
8. Full climate action plan preparation (includes above hours)	=1000 to 2500 Hours Total

Source: (Boswell et al., 61)

Northwest Climate Cities

Membership in climate networks varies across the region. States like Washington and Oregon have more member cities in the Puget Sound and Portland Metro areas and as a result, there are many published action plans for these states. Oregon and Washington have also enacted legislation that further incentivizes or requires the development of sustainability or climate action plans. The cities and towns below have made a commitment to climate action as member of U.S. Climate Mayors, a global alliance of cities committed to action.

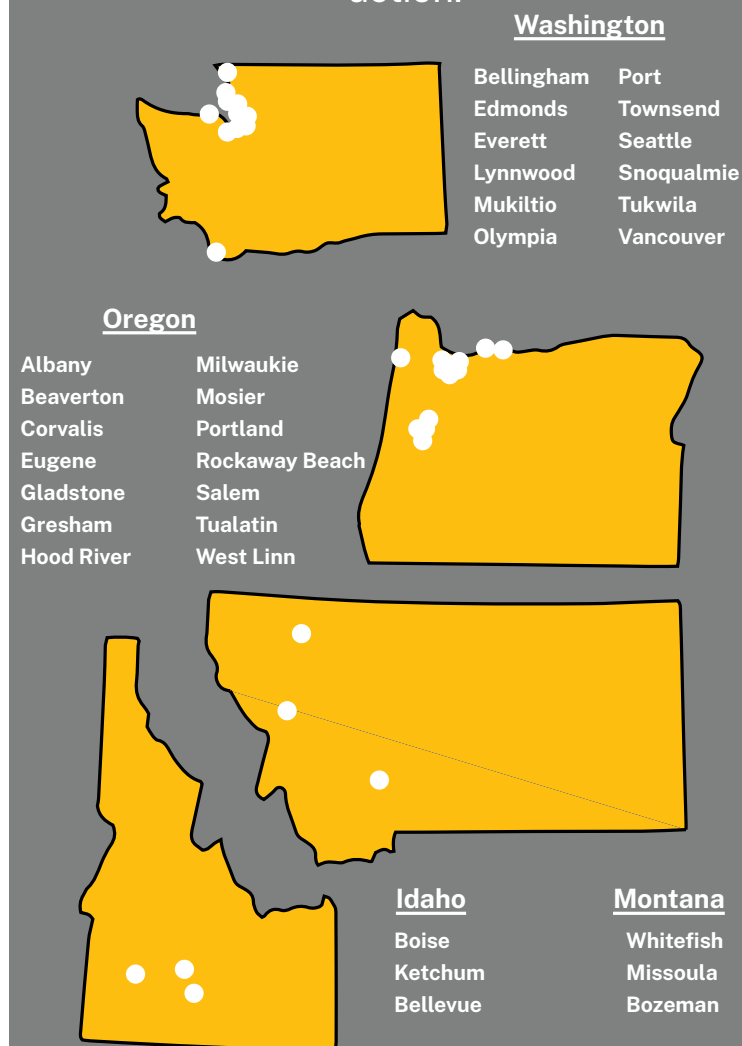


Fig. 15. Northwest US Climate Mayor Cities
Member Cities. Climate Mayors. <https://climatemayors.org/member-cities/>

What motivates the creation and adoption of a Climate Action Plan?

- **Most CAPs are developed at some level of government** from cities and towns up to the national level. **Private advocacy groups and businesses also frequently engage in developing CAPs** to some degree. It would be most accurate to say that **CAPs are developed by entities which have the resources and influence necessary** to develop the constituent parts of a CAP and to publish and distribute these parts.
- **Climate action planning can help a community fulfill obligations** that come with membership in a climate alliance like ICLEI, C40 Cities, the Carbon Neutral Cities Alliance (CNCA), or other related public commitments to climate action. These **commitments set the framework for defining community goals and priorities**. If organizational leadership has made a commitment by joining a group of cities like the CNCA, then their planning efforts should be directed towards meeting the goals and vision defined by the CNCA or whichever group they have joined.
- **Any organization can undergo this process**, non-profit groups comprised mostly of volunteers with little or no access to funding have successfully completed and published CAPs. The City of Whitefish Climate Action Plan and Big Sky Community Climate Action Plan are such plans. These plans were developed by a multi-disciplinary, volunteer committee which were formed in order to honor their commitments to the Paris Climate Agreement and as a USCM city in the case of Whitefish, and to address local demands for climate action in the case of Big Sky CAP.
- **National professional organizations** like the ASLA can also undergo their own **internal planning process for climate action**, these plans may have a more unique format and are **not likely to have all the standard components of a CAP** such as a GHG inventory or vulnerability assessment.

Who is involved in planning efforts?

Many different disciplines and backgrounds can be involved in the climate action planning process. These efforts are often led by a multidisciplinary group of government officials, practicing professionals, volunteers, and major stakeholders.

categories for needed expertise are:

1. Facilities Management
2. Government Fleet Management
3. Employee Travel Behavior
4. Transportation
5. Water and Wastewater
6. Facilities Assessment
7. Solid Waste
8. Parks and Recreation/ Green spaces
9. Administration/Finance
10. Long-range Planning
11. Development Review
12. Economic Development

Why engage in Climate Planning Efforts?

1. **Global Leadership-** Communities recognize they have an moral obligation in the climate crisis
2. **Energy Efficiency-** Increased energy efficiency benefits the community and saves money
3. **Green Community-** Communities desire to project an image of themselves as sustainable or green
4. **State Policy-** Communities are compelled by state policy or to avoid the need for mandates
5. **Grant Finding-** Some desirable sources of funding require communities to undergo climate action planning for access
6. **Strategic Planning-** Cities want to unite separate planning elements related to climate action from sustainability, smart, green, or resiliences policies all in one plan to facilitate operations and management.
7. **Public Awareness-** Communities want to raise awareness of and support of climate action to enable more ambitious future efforts.
8. **Community Resiliency-** Communities recognize that they are vulnerable and hope to develop greater resilience to climate change.

Source: (Boswell et al. Ch. 2)



Historical Context

Common origins in sanitation reform and City Beautiful

This section aims to explore the historical connections of planning and landscape architecture to provide an understanding of the common origins of both professions. The role of both professions in the era of sanitary reform and city beautification coincided with an era of activism and strong belief in the obligation to public wellbeing. Landscape architects role in this era and their adaptability to the planning strategies emerging the 19th and early 20th centuries can provide a template for today.



Stutts, "SapphireMtnfoothillsMontana" <https://w.wiki/8P63>



Moreland, "Sunrise at Lake Owyhee, Oregon-Flickr -Bonnie Moreland" <https://w.wiki/8P5X>



End of the poor Funeral from a tenement house in Baxter Street, Five Points, New York // from a sketch by our artist. Photograph. Retrieved from the *Library of Congress*.

<www.loc.gov/item/98513809/>.

Sanitary Reform

- Both professions have **origins in the United States during the “Gilded Age”**, a time period extending roughly from the end of the Civil War up until the first World War. In the mid 19th century, the distinction had not yet been made clear between professions such as architecture, urban planning and design, public planning, landscape architecture, and public health planning.
- Wide-scale planning in the United States started at a time when environmental and **public health legislation was essentially non-existent**. American cities had become crowded and were unable to cope with the rapid urbanization. **Most professionals of the day** advocating for planning and designing for urban environments and public spaces **shared similar goals: controlling communicable diseases** through premeditated central planning, distribution and **disposal of human wastes**, addressing **housing density**, ensuring **clean water and food supplies**, providing access to **fresh air and green spaces**, and access to **leisure space**.

Sanitary Survey Planning

- Unification of approaches and the development of tools for a more comprehensive **vision for urban planning developed into a consensus** which evolved into a set of ideals and principles for design of American communities which were **experiencing multiple public health crises**.
- The **first critical process to emerge** from this movement was a standardized approach to planning that involved inventorying existing conditions and developing a site-appropriate response. **“Sanitary Survey Planning”** is a modern term applied to a then novel process which **provided a major tool** in planning for and **responding to conditions which favor the spread of disease**.
- This process **involves an inventory stage** which is similar to site analysis techniques currently employed in the practice and study of landscape architecture as well as to the inventory procedures essential to climate action planning. This **detailed approach analyzes many of the same factors** such as **drainage, soil conditions, open space, and land use**. This advancement allowed for planners to **account for certain conditions**, to **mitigate negative impacts, recognize and magnify positive outcomes**, and gave a **basis for comparison** which allowed planners to **recognize potential hazards** before they arose based on previous observations and results.



"A Tent Scene at Camp Joe Williams, Memphis" Illustration. Frank Leslie's Illustrated Newspaper. 21 September, 1878. *Digital Archive of Memphis Public Libraries*. <https://memphislibrary.contentdm.oclc.org/digital/collection/p13039coll5/id/956/>.

1878 Saw the worst outbreak of yellow fever yet to strike Memphis, TN. 1 in 9 persons living in Memphis died in the epidemic that year. In 1879 the National Board of Health responded by launching the largest sanitary survey ever conducted at the time. The Memphis program served as the model application of novel sanitary survey and planning techniques which addressed every single lot, structure, and property within city limits. The plan detailed lot-specific remedial actions and issued over 12,000 recommended actions.

(Peterson 25)



Memphis Epidemics

- In the decades following the Civil War, Memphis, Tennessee had a reputation, with repeated outbreaks of yellow fever, cholera, and smallpox plaguing the city. Memphis saw thousands of residents die every year. In 1879 the National Board of Health responded by initiating the most ambitious planning effort in the era of sanitary reform.
- Seven physicians with 26 assistants made a complete door-to-door assessment of every structure and lot in the city. They utilized a standardized approach to collection of data and formatting of records. In 5 weeks they completed an elaborate picture of the city from a public health perspective. In addition to assessment of developed urban space, the report also examined the city's drainage and fresh water supplies. (Ellis 65)
- The Memphis Project saw progress almost immediately with the death rate going down by more than half, with accompanying economic boom and recovery of land values. (Ellis 72) This era saw the city's first organized green spaces and parks as improvements to sewers and infrastructure reduced swamp-like conditions near the river's edges and made land available for public use.

“A city, most sanitarians would have agreed, should be arranged as an airy, verdant setting free from the excessive crowding and physical congestion then common in major urban centers. Its site should be dry and readily drained of stormwater, parks and trees should be abundant enough to refresh the air. There should be ample opportunities for outdoor exercise. A pure water supply should be available as well as a water-carriage sewer system. Nuisance trades, such as slaughterhouses, should not operate within built-up districts. Sunless, ill-ventilated tenements, dark, moist cellar dwellings, and backyard privies and cesspools should be avoided. In other words, freedom from organic wastes, stagnant water, ground moisture, and human congestion and the presence of abundant clean water, fresh air, and sunlight formed the basis of Townsite Consciousness.”

(Peterson 27-28)



"1930 Riverside Drive" Photograph. Frank Leslie's Illustrated Newspaper. 1930. *Digital Archive of Memphis Public Libraries*. <https://memphislibrary.contentdm.oclc.org/digital/collection/p13039dc/id/996/rec/2>

Emerging from decades of public health disasters and disease outbreaks, in 1930 Memphis formed the first governmental Beautification Commission in the United States. Modern Memphis is a perfect example of the intersection of sanitation reform and beautification. Memphis today features one of the nation's best river park systems operated with the Memphis River Parks Partnership. The images above and below show the same waterfront 90 years apart.



"Memphis River Parks" 2022. Memphis River Parks Partnership. <https://www.localmemphis.com/article/news/community/memphis-in-may-return-tom-lee-park-2023/522-8f156c54-a198-4935-aeb6-87c3314108ee>

Townsite Consciousness

- A growing body of professionals and **their work developed** into a movement referred to in modern sources as "**Townsite Consciousness**". Critique of **city conditions, faulty land drainage, disorganized layout, topography, green space, and conflicting land uses** form the early basis for evaluation of urban systems.
- The father of American landscape architecture, **Frederick Law Olmsted**, was **highly involved in planning for sanitary reform**, being a member of the United States Sanitary Commission during the Civil War.
- **Townsite Consciousness impacted Olmsted's processes.** He advised clients to consult sanitary engineers, required topographic maps for sites, and demanded preliminary surveys to documenting soil characteristics, position of swamps, and locations for creeks, brooks, ditches, and other water courses, a practice **unique to sanitation planners at the time** (Peterson 28).
- What **distinguished the work of Olmsted** from sanitary reformers and planners is the intention with which he evaluated conditions and proposed **mitigation techniques combined with the aesthetic design** and considerations for public use: "...he recognized the natural landscape not only as an aesthetic and cultural resource but as a sanitary one as well. Much of his thinking pivoted upon this insight." (Peterson 28)



Frederick Law Olmsted / engraved by T. Johnson ; from a photograph by James Notman. [Oct] Photograph. Retrieved from the *Library of Congress*. <www.loc.gov/item/95514014/>.



"Portrait, Charles Mulford Robinson, author and city planner" Photograph. Circa 1910. Retrieved from *Local History & Genealogy Division, Rochester Public Library*. <http://photo.libraryweb.org/rochimag/rochpublib/rpf/rpf00/rpf00436.jpg>.



Whiting, R. R., Copyright Claimant. Festival Hall, World's Fair, St. Louis, Mo, Cincinnati, Ohio: Whiting View Company. Photograph. Retrieved from the *Library of Congress*.
<www.loc.gov/item/2013649778/>.

Proponents of the City Beautiful Movement found an outlet for expression in the planning and execution of a model city exhibit for the 1904 St. Louis World's Fair. This project involved a wide range of public improvement projects which impacted every part of life for those living in St. Louis and brought a rapid expansion in public art and parks. The exhibit helped popularize the trend of comprehensive planning in the United States at a time when thousands of new community organizations were forming.

(Peterson 27-28)

City Beautiful Movement

- **Drawing momentum from the nation's push for modern sanitary reform**, this movement went on to mobilize thousands of allied professionals and community organizations executing a grand vision at varying scales. Sparked initially by a movement to support municipal art projects in New York City, the City Beautiful Movement was occurring in tandem with the efforts towards sanitation reform. The **movement initially featured three major components: (1) Municipal Art, (2) Civic Improvement, and (3) Outdoor Art.**
- **"Village Improvement" societies** for improving smaller communities and suburbs formed and developed national leadership. The American Park and Outdoor Art Association (APOAA). Composed of mainly landscape architects, advocated for public parks and outdoor spaces, "proper" principles of development, promoting the landscaping of public and private properties, and advocating for land and forest preservation. (Peterson 51)
- In 1904 American League for Civic Improvement and the American Park and Outdoor Art Association merged to form the **American Civic Association** promote a **"model city" for the St. Louis World's Fair**. This era is known for its lasting impact, and ushered in a new era of public engagement and mobilization. This movement generated action not only in larger urban areas, but primarily by the spread of smaller, **local organizations the City Beautiful Movement had a long-term impact on planning and improvement efforts for even the smallest of communities.**
- The work of **Charles Mulford Robinson** channeled the **enthusiasm and appeal** of the City Beautiful Movement into a framework which established goals and priorities. Robinson's book *The Improvement of Towns and Cities* is one of the **earliest calls for comprehensive planning** in American cities. Robinson's work has had a **lasting influence on zoning codes, subdivisions regulations, land use regulations, and local ordinances** all around the country. (Peterson 54) It was **in this City Beautiful Movement** that the principles of **design, public health, planning, conservation, and regulation** were mobilized with a common purpose.

PROFESSIONAL SURVEY

Barriers to Involvement in Climate Action Planning for Landscape Architects

This section highlights the methods and results of a survey for retired and practicing educators and professionals in the fields of landscape architecture or planning. The goal of this survey was to better understand perceptions of climate action and climate action planning for the field of landscape architecture so that in the future, strategies can be developed which further inform the profession and improve the level of involvement.



- Study utilized **convenience sampling methods to collect data** from practicing professionals and educators in the Northwest using established professional networks such as the IMASLA (Idaho-Montana Chapter of the American Society of Landscape Architects) to **promote the survey utilizing electronic mailing lists and word-of-mouth**. This researcher also be **promoted participation in the survey at the National ASLA conference in Minneapolis in October of 2023**, and at professional networking events promoted by the Department of Landscape Architecture and College of Art & Architecture.
- This study was conducted via an online survey utilizing Qualtrics XM for preparation and publication and data is stored on secure University cloud storage services. The survey was distributed online via email utilizing existing networks of landscape architecture professionals. **Collection of personally identifiable information was not necessary** for participation, and participants were not eligible to be compensated for their participation in the study. **This survey could be completed in a compatible browser or utilizing a personal mobile device.**
- After an initial intent to disclose introduction form, there were with **definitions of terms** followed by questions related to: professional status, experience with participation in climate action planning, and opinions on what barriers may or may not exist to limit the involvement of landscape architects in climate action planning. The survey **took about 10 minutes** to complete and **included questions** such as: **“What would best describe your current professional status?”** and **“Do you believe landscape architects, landscape architects in training, and/or educators in the field of landscape architecture have a significant role to play in the planning phase of climate action?”**.



A 5-10 Minute Survey

Landscape Architects in Climate Action Planning in the American Northwest

Climate action planning is an expanding area of public and private planning which aims to mitigate and/or adapt to the impacts of climate change on communities and both natural and constructed landscapes. This type of planning may also be referred to as sustainability or resiliency planning.

In the Northwest, these planning efforts are often completed without the direct involvement of landscape architects. Plans can impact regulations and priorities at all levels of government, as well as public spending and adoption of “green” or “smart” technologies and policies.



Interested or Involved in Climate Action?



This study aims to identify barriers to greater involvement of landscape architects and your opinion, even if you have not yet been involved in this type of planning, is valued.

Questions or Comments?
heff0850@vandals.uidaho.edu

Landscape Architects in Climate Action Planning



A Short Survey



Interested or Involved in Climate Action?

Climate action planning is an expanding area of public and private planning which aims to mitigate and/or adapt to the impacts of climate change on communities and both natural and constructed landscapes. This type of planning may also be referred to as sustainability or resiliency planning.

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Results

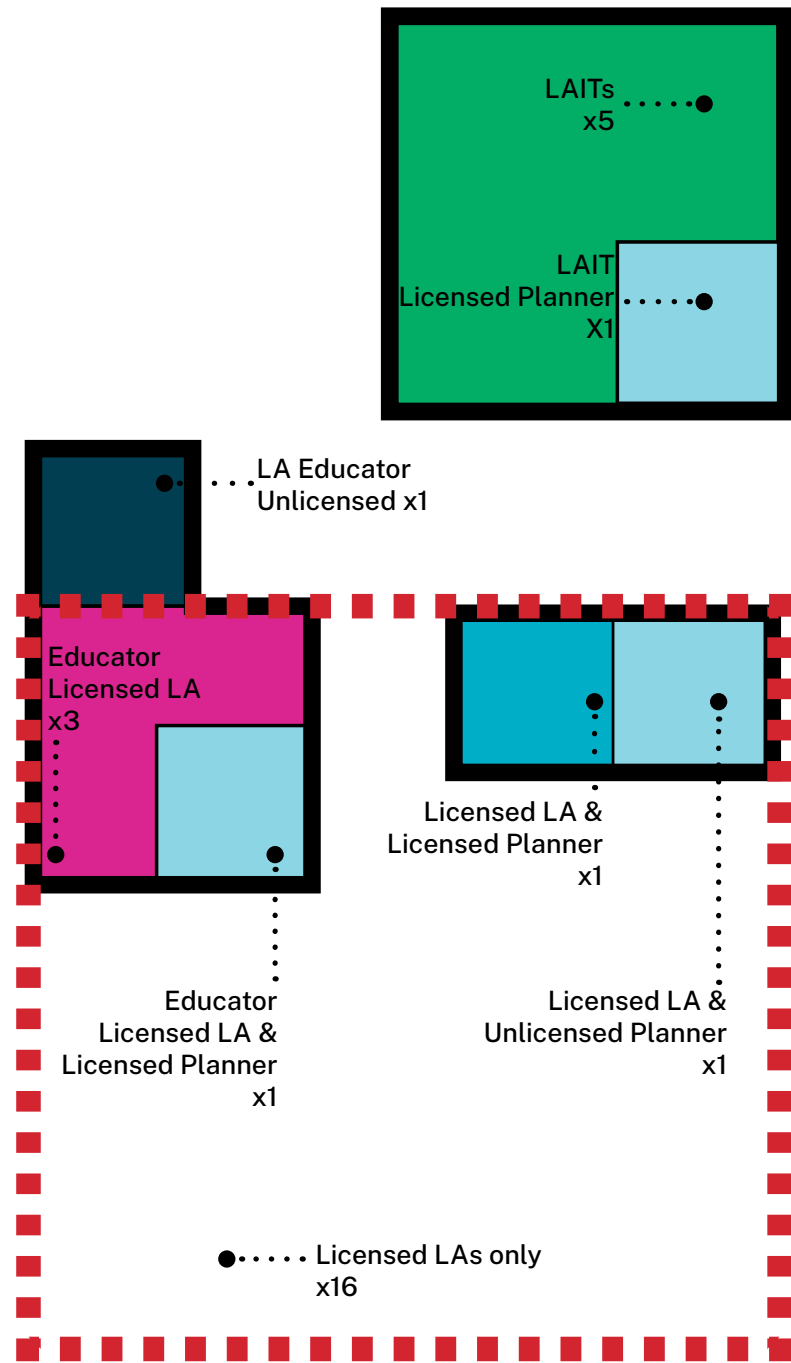


Fig. 16. Survey Profession Breakdown
See Appendix A-Survey Results for data tables Q1

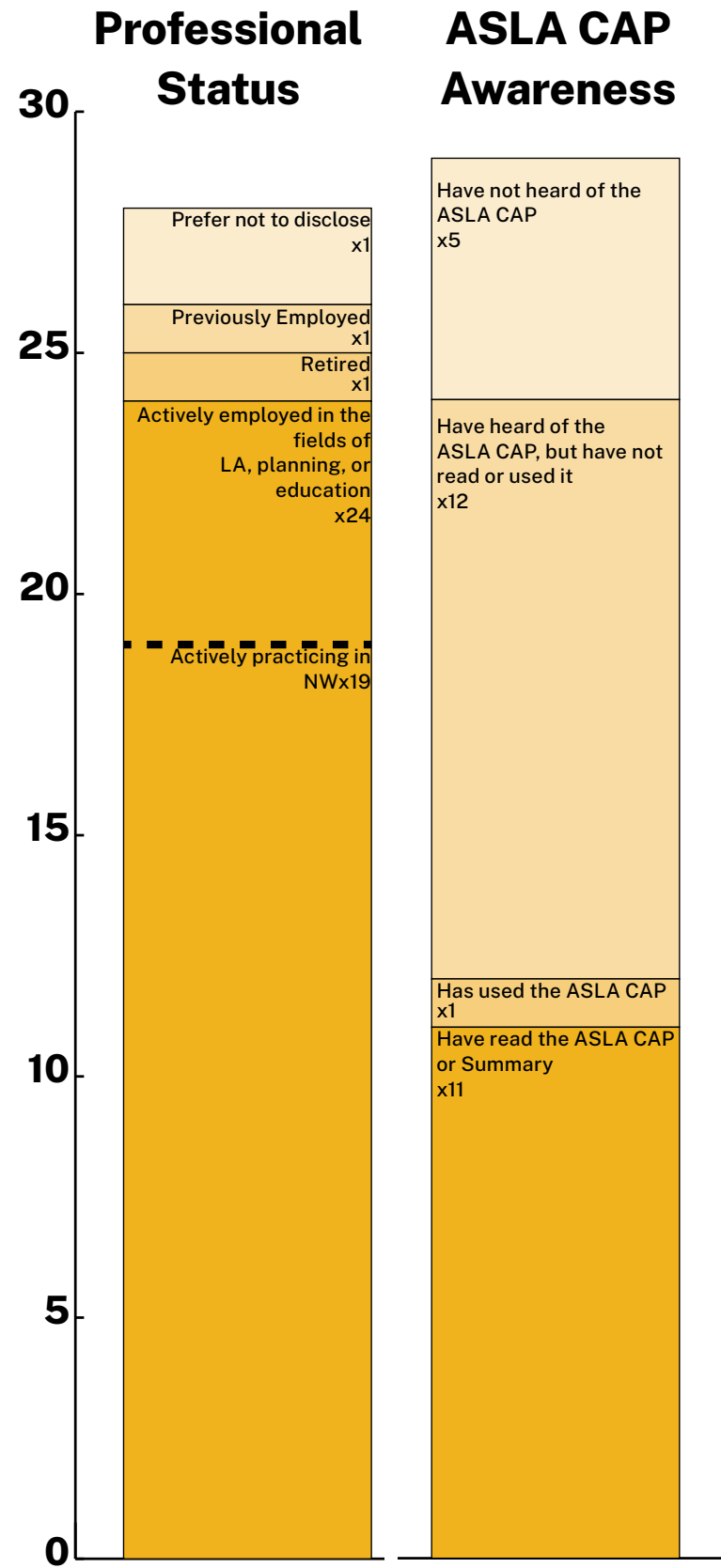


Fig. 17. Actively Practicing in Northwest & ASLA CAP Awareness
See Appendix A-Survey Results for data tables Q2, Q3, Q4

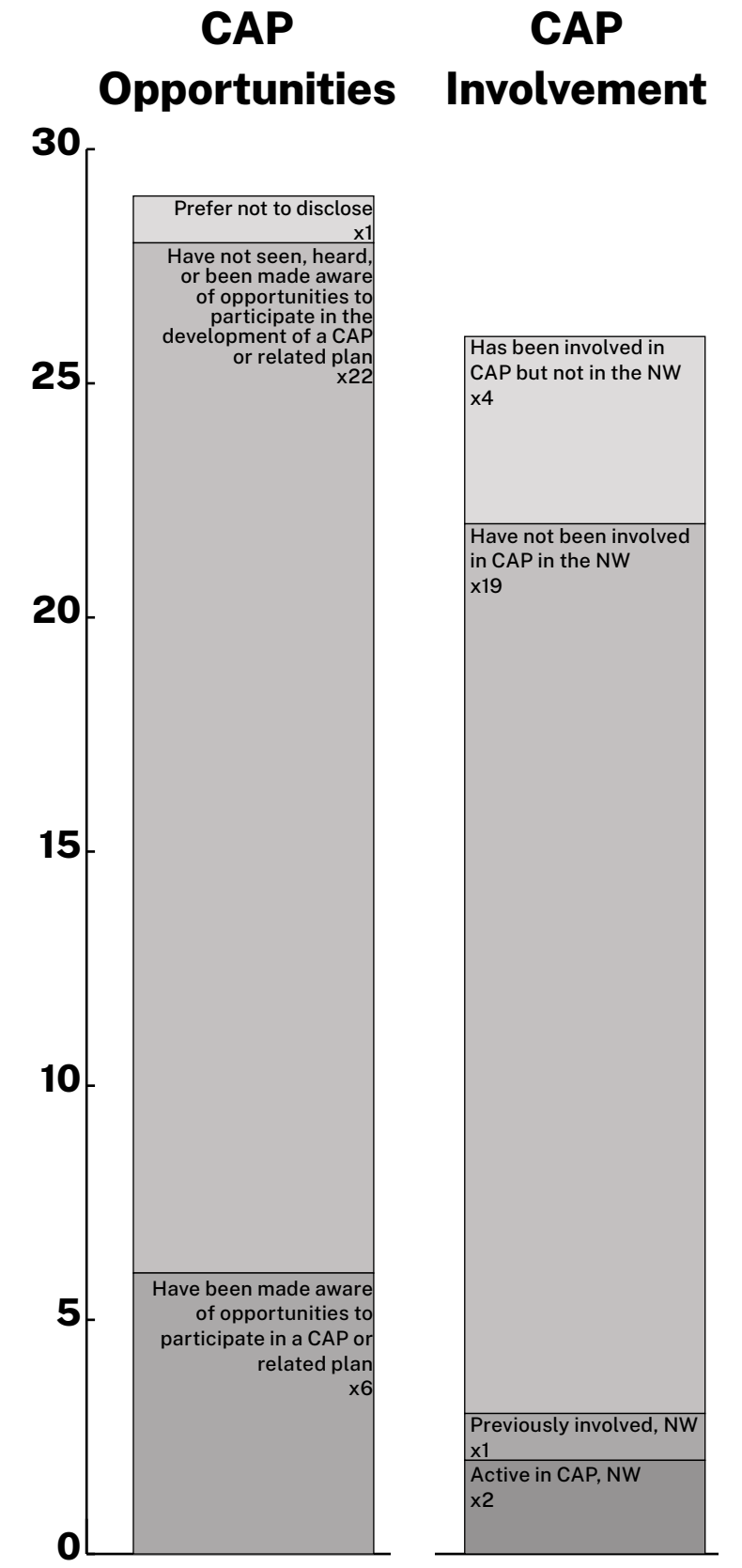


Fig. 18. Opportunities to Participate & Involvement
See Appendix A-Survey Results for data tables Q5, Q6

Belief in CAP Impact

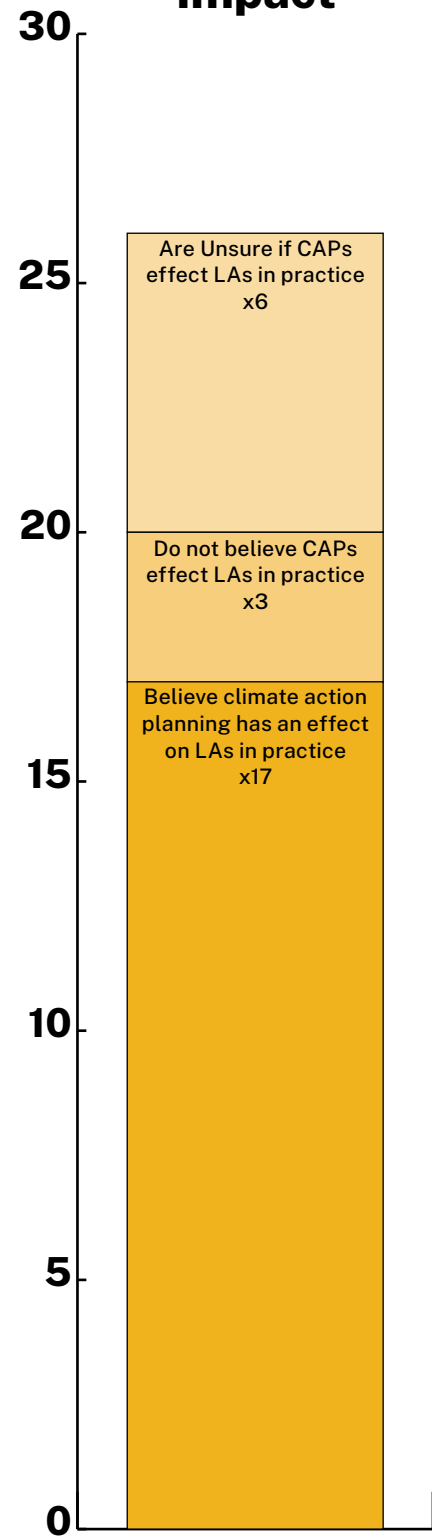
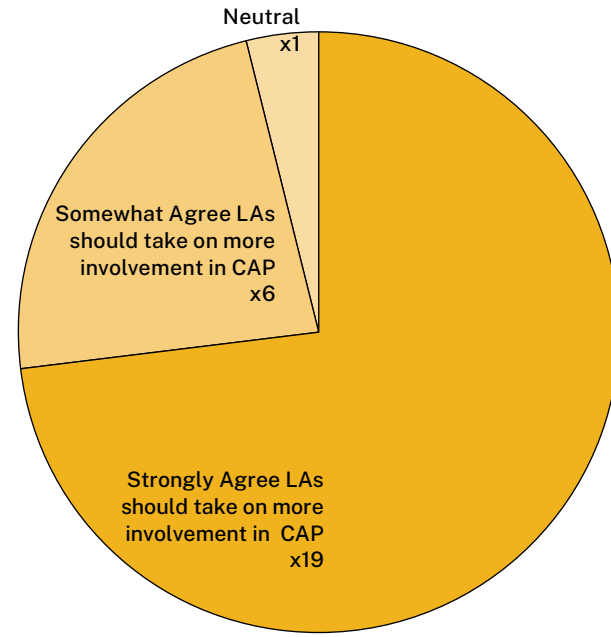


Fig. 19. Belief in CAP Influence on LA Practice
See Appendix A-Survey Results for data tables Q8

Take on More Involvement



*Participants also had the option to “Somewhat disagree”, or “Strongly disagree” but no respondents chose those options

Belief in Barriers

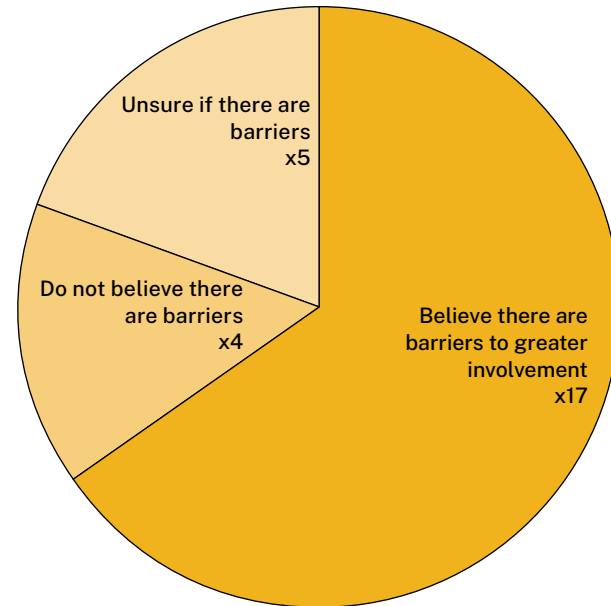


Fig. 20. Belief in Greater Role & Belief in Barriers
See Appendix A-Survey Results for data tables Q9, Q10

Perceived Barriers Rankings



Fig. 21. Perceived Barrier Rankings
See Appendix A-Survey Results for data tables Q11

Variance in Responses

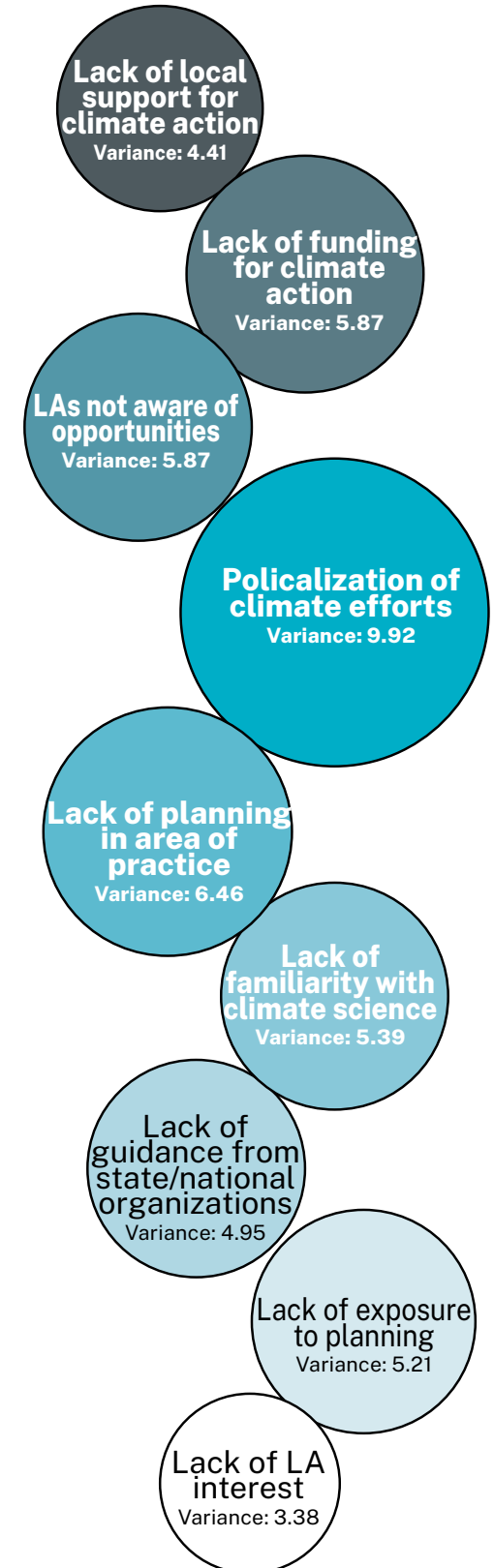


Fig. 22. Level of Consensus, Variance
See Appendix A-Survey Results for data tables Q11

Q4a - Do you think the ASLA's Climate Action Plan is/was a useful tool and/or framework for you to utilize in your work as a professional or educator? Why or why not?

Do you think the ASLA's Climate Action Plan is/was a useful tool and/or framework for you to utilize in your work as a professional or educator? Why or why not?

The ASLA's Climate Action Plan was a great summary of knowledge that provides information and guidance that can be applied to all projects to address the concerns and realities of climate change and its impacts.

I think the ASLA's Climate Action Plan is a useful tool to utilize as an educator. It is a general framework that addresses the main topics and challenges, as well as provide general guidelines. However, it should then be adapted to the local situation, which has its own challenges and peculiarities.

Yes it's a start. Implementation is the 'devil in the details'.

Yes and no. It's a great big picture tool, but working in much smaller population areas makes it difficult to apply - especially when there's a stigma associated with climate action and living in a fuel producing state.

Yes. It helps reinforce the focus of our profession on environmental, ecological and social values by providing us with a field guide to use in our daily work, whether we are conversing amongst colleagues or presenting to clients and the public.

It is important that our professional society have such a declaration and action document, both to state our role in addressing climate issues and to support the work of our members in this field. This document does a good job of laying out the arguments for action, and giving practitioners thoughtful guidance in how to address climate.

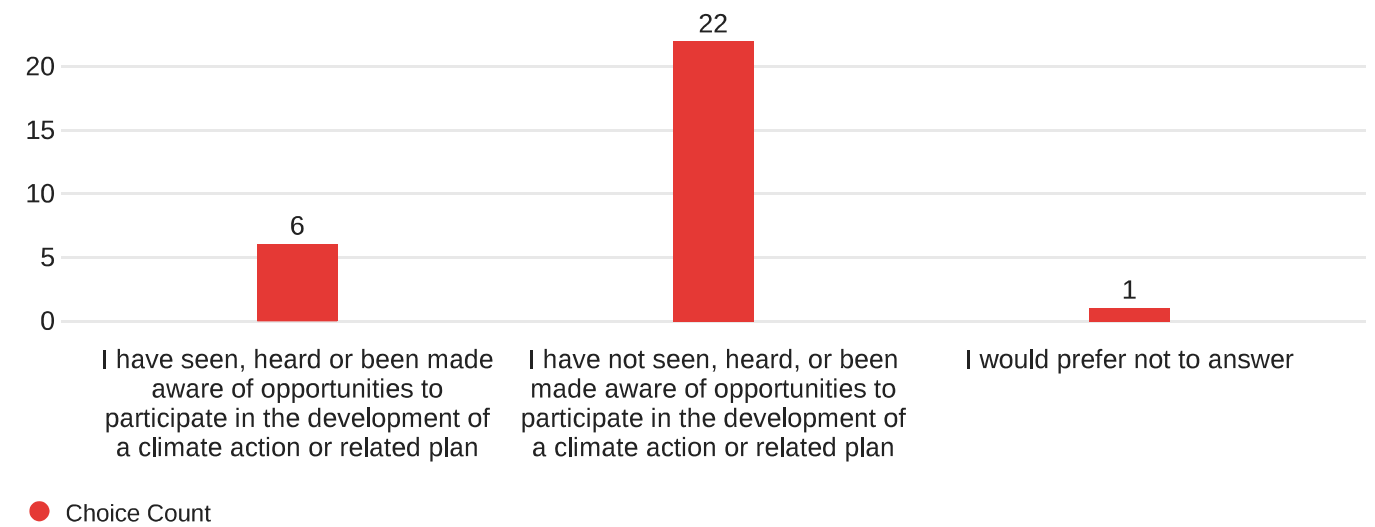
I feel the ASLA Climate Action Plan aligns with our profession and will assist landscape architects in leveraging our knowledge to assist communities in solving or minimizing climate issues we are facing

It is a good document but not utilized or helpful in the professional realm as other professions are not utilizing it or seem to alter their practices to consider climate change.

Yes. All tools that strengthen our ability to make good decisions on projects that improve climate is helpful.

I think there are better resources out there - it was very vague as far as application in the field was concerned. I actually utilized SITES and LEED for sustainability more so than this tool and other tools such as the US Climate Resilience Toolkit, which I found much more applicable in practice.

Q5 - Public Notices



Q5a - Where/How were you made aware of these requests for qualifications or proposals, invitations to bid, requests or invitations for participation, or opportunities to serve on a steering committee or stakeholder group to develop a climate action plan?

Where/How were you made aware of these requests for qualifications or proposals, invitations to bid, requests or invitations for participation, or opportunities to serve on a steering committee or stakeholder group to develop a climate action plan?

ASLA provides opportunities for volunteering in a number of different committees related to a climate action plan.

My town have a CAP in place.

Planning projects & clients in WA state inquired about a climate action plan because WA state provides funding to communities who want to plan and apply for grant \$\$

Asla

Broadly advertised in LAM.

In our case, we were asked to apply from a member of the steering committee - not because we were landscape architects, but because we had planning experience. We also work in a smaller community that wanted to hire locally so options were limited.

Q7 - Climate Action

Climate Action

Landscape architects work on exterior open spaces are critical to a natural design solution to climate change and rising sea levels. Our work involves topographical change to protect flood prone areas, opportunities to mitigate the impact of heat island effects and create water edge environments for recreation and resilience.

LA's do and should play a role in climate action since we are responsible for designing the outdoor spaces we live in.

Landscape architects' training makes them particularly suitable in the role of leaders and coordinators of multidisciplinary groups of professionals working on broad and overarching issues such as climate change. Action plans need leading professionals, such as landscape architects, that can look at environmental, social and cultural issues on a variety of scales and from different perspectives.

Yes, I feel we have the skill set and knowledge to make a significant impact. I feel that in the region I practice, climate change is not taken seriously or incorporated into policy and planning.

Yes we have knowledge of the broader landscape, and we do site work, which affects climate and infrastructure.

I think landscape architects can play an important role in climate action in that they have the skills to plan and design various scales.

Yes. LAs understand that project sites are part of larger holistic systems - ecological and cultural systems.

Yes. We are the go betweens from the built to the natural environment. Our discipline allows us to approach design solutions from several different lenses, and makes us excellent conduits for change.

Yes! Because the intervention on landscape can affects the environment in a positive or negative way.

I believe landscape architects, planners, engineers, and architects can all make significant contributions to climate action. Planning and design play a critical role in permitting, materials selection, functional design, and ultimately implementation of any plan.

Yes. Landscape Architects have the gift of understanding everyone else's work, and finding innovative ways to bring a project all together as one. Climate action requires a vast multi-disciplinary approach with experts from many disciplines that landscape architects work with regularly. As a profession that excels in communication, collaboration, and creativity, it is our duty to play a key role in climate action.

Yes.

Landscape Architects are intimately involved with the development and management of the built environment that has a direct effect on climate change.

Of course we do. We are educated across a broad spectrum that gives us knowledge and skills to address many of the aspects of climate change, whether related to water, biodiversity, soils, human health and well-being, carbon sequestration - the list is long and we have the responsibility as well as the capacity to make a difference.

I agree landscape architects have a significant role to play in climate action and feel we all should recognize we need key partners and collaborators to be most affective.

Yes, I think we do. I think we have a tendency to get caught up with the day to day needs and lose sight of the broader climate action planning needs. Time, project scope and budget limitations seems get in the way.

Yes, because it will be small daily design decisions that add up to a large change.

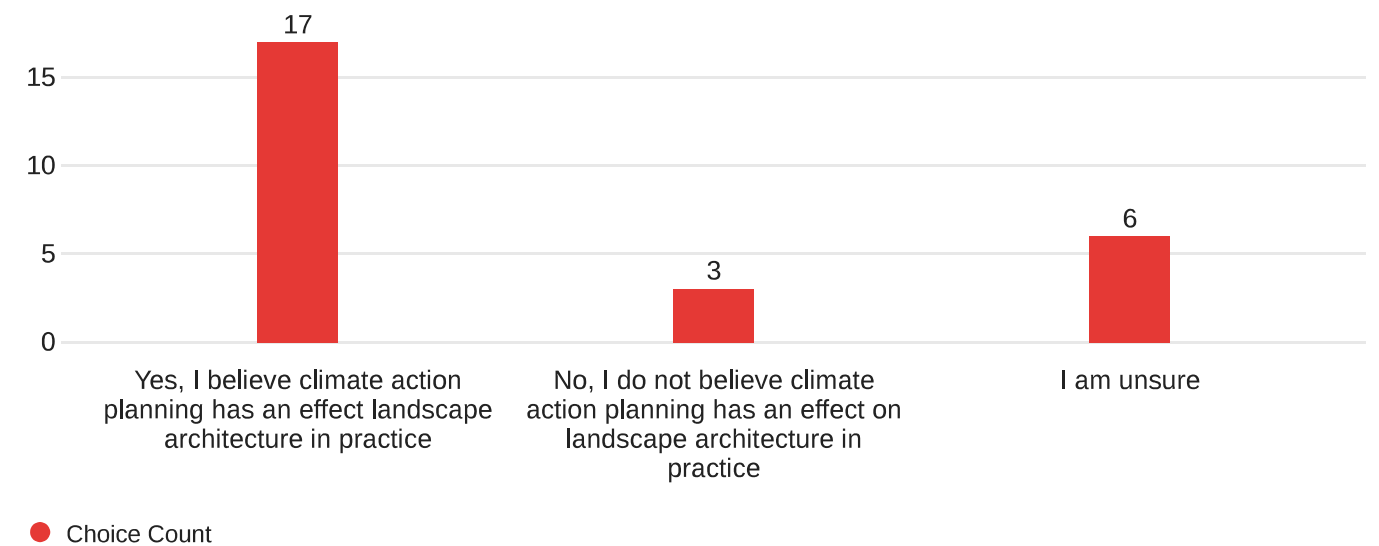
I have mixed views on this. I believe LA's SHOULD have a significant role in climate action, as we're involved with the built environment and natural landscapes. However, not all LA positions fit that scope. The private sector often deals with developers who have little concern or budget for environmental/climate action. We tend to be the first program item to be cut from a budget, so it's difficult to push for climate action or environmental improvement without having the means to make it happen.

yes, we should all be interested in or educated in sustainability and BMPs for a changing world.

Yes, at all scales, from designing streetscapes with shade trees to planning large-scale developments that take into account potential climate-affecting issues.

Yes, absolutely! All that we do, from a project standpoint, can affect the emission of greenhouse gases in a positive way.

Q8 - Do you believe climate action plans have an effect on how landscape architects operate in professional practice once adopted?



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Landscape Architects in Climate Action Planning In the American Northwest



A project submitted in partial fulfillment of the requirements of the degree of
Masters of Landscape Architecture by Zach Heffernan
Supervisor: Raffaella Sini, December 2023