CLIMATE +HEALTH
Adaptation Plan

Version 1.1

2023

Lincoln + Benton Counties

Acknowledgments

This report was produced by Rede Group in July 2023.

Letter from the Directors

We are excited to share the Lincoln and Benton Climate and Health Adaptation Plan.

We are excited to share the Lincoln and Benton Climate and Health Adaptation Plan. While each county has some unique climate characteristics and risks, we have much more in common. At the outset of this project, we believed there was much to be gained by coming together and inviting the community to the table from valley to coast. This plan represents an opportunity for our counties to share resources, collaborate, and learn from each other.

The evidence that a plan like this is necessary is undeniable. The Oregon Climate Change Research Institute has released its sixth assessment of what climate change means for Oregon, and the content is sobering. The intent of this document is to raise awareness about the array of health impacts of climate change we are facing, beyond those that our community has already experienced firsthand. Our hope is that this plan allows us to increase capacity and learning, through new conversations and actions.

There are many opportunities for us to take climate adaptation action. The list of ideas at the end of this document is not intended to be all-inclusive. Rather, it includes immediate actions as well as stretch goals that will require more resources to accomplish. We are grateful to our State Legislature for their continued investment in Public Health Modernization. These investments have enabled us to develop this plan, and continued funding will move this essential work forward. This and other public health

modernization initiatives are crucial to creating an equity-centered public health system in our modern, changing world.

We also recognize that our communities are diverse, driving our first strategy to plan in an equitable and culturally responsive way. If we are to truly strengthen our climate resilience, we will need to continue addressing systemic inequities that put some in our communities at higher risk of climate impacts than others. Some adaptation actions both improve health and reduce greenhouse gas emissions that are worsening climate change. Creating inviting, walkable communities is one example. Another is supporting our local agriculture and fishing industries to be more climate resilient. This strengthens our local food system, which is a public health as well as an economic and climate solution.

Together with our partners, we are working to address some of the greatest health challenges of our time. We invite everyone in our communities to collaborate with us on adaptation actions that will strengthen our overall resilience.

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FLORENCE POURTAL
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Executive Summary

Climate change is a global phenomenon that impacts communities differently depending on local conditions.

Climate change is a global phenomenon that impacts communities differently depending on local conditions. Human activities have substantially increased the amount of carbon dioxide and other greenhouse gasses in Earth's atmosphere, leading to increasingly warmer temperatures and warmer oceans. In turn, these changes to the climate are causing changes to ocean chemistry, sea level rise, and more intense and frequent drought, wildfires, and weather events.

The Oregon Climate Change Research Institute (OCCRI) is mandated by Oregon law to assess the state of climate change science and the likely effects of climate change on the state at least once each biennium. OCCRI also assesses climate effects by county. In January of 2023 they released their latest state assessment.

Projected impacts for Lincoln and Benton counties are increasing heat waves, heavy rains, flooding, and wildfire; loss of wetland ecosystems; coastal hazards and changes in ocean temperature and chemistry; expansion of non-native invasive species and increased invasive species risk; and reduced air quality.

These climate hazards create many changing health implications. These include displacement and migration due to wildfires (NOAA, 2017). The need

for Public Health to engage with partners and communities to address these issues is more important than ever.

Planning and action are key to adapting to our changing climate and can bring significant health and economic benefits (Balbus et al). According to the Lancet Countdown on Health and Climate Change, "Climate change is the greatest global health threat facing the world in the 21st century, but it is also the greatest opportunity to redefine the social and environmental determinants of health" (Lancet, 2022).

Lincoln and Benton County Public Health divisions ("Public Health") continue their commitment to improving health equity and community resilience. Equity is at the forefront of all public health climate change policy, planning, and action. Due to systemic inequities and racism, some populations in our communities are disproportionately affected by climate change and therefore need to be prioritized, including:

- young children,
- older adults (aged ≥ 65 years),
- people who are pregnant,
- people who are socially or geographically isolated,
- people living with chronic health conditions,
- people navigating poverty,
- people of color, and
- people who work outside.

Public Health planning and engagement to reduce the health risks associated with climate change will create more resilient and equitable communities, while also modeling these strategies and outcomes for other agencies beginning

Health equity is achieved when everyone can attain their full potential for health and well-being.

—WORLD HEALTH ORGANIZATION

Resilience is the capacity of a community, business, or natural environment to prevent, withstand, respond to, and recover from a disruption.

—U.S. CLIMATE RESILIENCE TOOLKIT

this work. In 2013, Benton County released their first climate adaptation plan, which served as a catalyst for other county agencies to begin including climate change into their own planning. Lincoln and Benton counties are among the first few counties in Oregon working on a comprehensive climate and health adaptation plan.

This plan puts forward a framework aligned with public health modernization to guide Lincoln and Benton County climate and health work. This framework provides strategies and actions to increase public health expertise and capacity, prioritize work, and build on existing plans, initiatives, and community strengths.

Although some actions to address the health impacts of climate change are underway, particularly with emergency planning, further action will be difficult to achieve without long-term commitment and resources to support dedicated staff.

Public Health is essential to planning for and mitigating the climate impacts facing Lincoln and Benton counties. Now is the time to address the many impacts of climate change on health and equity.

A community prepared for the health impacts of climate change will be more resilient to them. This is the first joint plan for Lincoln and Benton County Public Health divisions. It aims to build on their communities' readiness for action and desire to protect cherished places and populations at higher risk of experiencing negative health impacts due to our rapidly changing climate.

Public Health is essential to planning for and mitigating the climate impacts facing Lincoln and Benton counties. Now is the time to address the many impacts of climate change on health and equity.

Key Strategies for Public Health to Address Climate Change and Health

Health Equity and Cultural Responsiveness
1. Standardize the use of an equity framework
2. Listen to new voices, empower new leaders, and build on existing relationships

Community Partnership Development
3. Ensure meaningful engagement in planning and action
4. Acknowledge and support programmatic activities that strengthen social networks and social cohesion

Assessment and Epidemiology
5. Prioritize, track, analyze, and share key climate and health indicators for Lincoln and Benton counties
6. Use mixed methods to assess resilience

Policy and Planning
7. Integrate climate and health considerations into planning efforts and policies
8. Promote and inform policies and planning that improve air quality and water quality and quantity
9. Promote and inform policies and planning that improve community resiliency and protect infrastructure

Emergency Preparedness and Response
10. Integrate climate and health information into coordinated emergency preparedness plans and activities
11. Support emergency planners in developing an equitable response for community members at highest risk including culturally and linguistically responsive ways
12. Identify resources to support community resiliency

Communications
13. Collaborate with community-based organizations and other partners to deliver climate and health messages
14. Use storytelling methods, such as case studies and story maps, to engage and learn from community members and interested parties

Leadership and Organizational Competencies
15. Provide active, positive, and bold leadership on climate
16. Improve internal operations to lower carbon footprint and save resources

Part One: Why is Public Health Action Needed Now?

Earth's climate is changing rapidly, challenging our ability to maintain healthy conditions for all in our community to thrive.

Earth's climate is changing rapidly, challenging our ability to maintain healthy conditions for all in our community to thrive. Climate change is becoming more visible in Lincoln and Benton counties, with the heat dome of 2021 and the wildfires of 2020. This visibility is increasing the level of concern across communities and they are looking to local authorities to not only have plans in place, but also to be actively working to protect beloved places, ways of life, and the health of community members.

The development of the Lincoln and Benton Climate and Health Adaptation Plan included an assessment of local climate hazards, a vulnerability assessment, an organizational capacity survey of Lincoln and Benton counties across multiple areas, and interviews, focus group discussions, and surveys sent to a diverse cross-section of community members, leaders, government officials, and county staff. This plan is intended to focus on local needs within the scope of Public Health, while acknowledging that the most effective approach to adapting to climate change must include efforts across all sectors.

Community engagement revealed that there is widespread concern about the impacts of climate change, especially for those community members with insufficient resources to adapt to the changes or to recover from severe weather events or other emergencies. While many participants had started to make the connection between climate change and human health

through their own experiences with wildfire smoke and loss of access to favorite places, there was further learning needed to connect climate change with other health impacts. This is an important finding because the primary climate impacts on people are health impacts in both the short- and long-term.

The organizational assessment demonstrated that while there is crucial support for this work by Public Health leadership, both counties have low funding capacity and there are few other agencies planning for climate change or taking climate action. This positions Public Health as a leader in climate work, but challenged by the need for more resources to advance strategies and build community resilience.

While this plan focuses on Public Health, we acknowledge that the health challenges of climate change will require coordinating and mobilizing with all sectors that impact the health of our communities. Public Health engagement on climate change has been limited in Benton County and is just beginning in Lincoln County due to lack of dedicated funding, staff capacity, and subject matter expertise. A community prepared for the health impacts of climate change will be more resilient.

This is the first joint plan for Lincoln and Benton County Public Health divisions. It aims to build on their communities' readiness for action and desire to protect cherished places and populations at higher risk of experiencing negative health impacts due to our rapidly changing climate.

Climate Change in Lincoln and Benton Counties

There is near unanimous agreement around the world that human influence has warmed the atmosphere, ocean, and land. As a result, widespread and rapid changes have occurred in the atmosphere, ocean, and all areas of the Earth where life exists. The scale of recent changes across the climate system as a whole – and the present state of many aspects of the climate system – are unprecedented over many centuries to many thousands of years (IPCC, 2022).

Lincoln and Benton counties are not immune from these changes and are experiencing climate change. Locally, air and ocean temperatures and sea levels have risen. Ocean chemistry has changed as more carbon dioxide from the air has dissolved into the water. Sea levels are rising, threatening infrastructure and housing and contributing to larger storm surges that can damage boats and marinas. We are experiencing more frequent and intense heat waves and wildfires that blow harmful smoke across wide swaths of the land. Drier air and fewer days without rain contributes to less moisture in the soil leading to drought and strain on forests and crops. 2021 was the warmest in Oregon's history so far, and conditions experienced that year are predicted to become more common by mid-century. The snowpack and glaciers that contribute snowmelt to the Willamette River are decreasing and more precipitation falls as rain rather than snow, leading to less water available during longer and drier summers. Certain plants produce more pollen in an atmosphere with more carbon dioxide. Warmer temperatures combine with

2021 was the warmest in Oregon's history so far, and conditions experienced that year are predicted to become more common by mid-century.

tailpipe emissions to create ground level ozone. All of these contribute to poor air quality (Fleishman et al, 2023, Dalton 2020, Dalton et al, 2022).
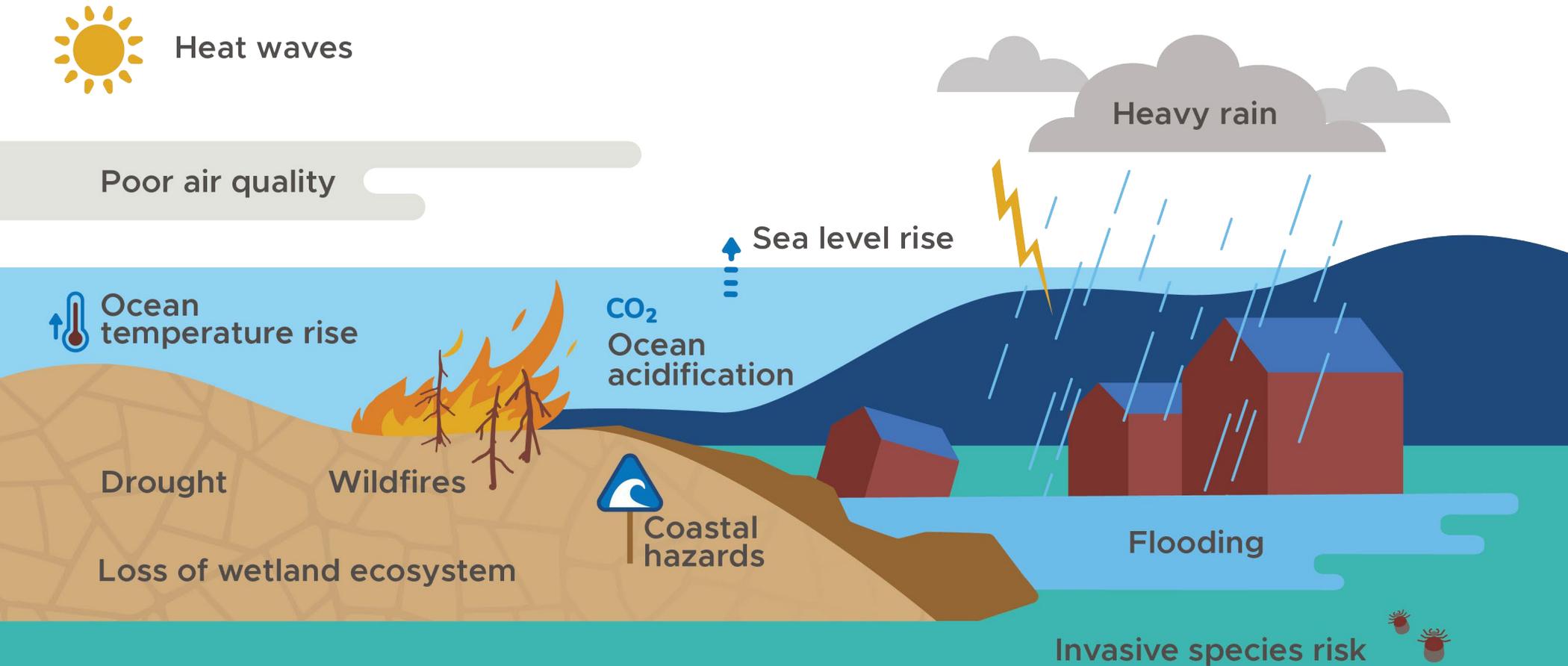
It is important to note that climate change is a long-term phenomenon that is not just evidenced by extreme, short-term events. "Weather" refers to short term atmospheric conditions, while "climate" is the weather of a specific region averaged over a long period of time. "Climate change" refers to long-term changes, most often 30 years or longer (USGS, 2023; National Academies, 2023). We can still have cool days, clouds, and rain while also having a warming climate (National Academies, 2023). Evidence collected in Oregon over decades and at many locations support this trend, showing dramatic declines in glaciers and warmer temperatures across the state (Fleishman et al, 2023). This means that long-term changes to our climate are still happening even if some weeks, seasons, or even a year seem to be the opposite of those trends.

Human activity and land use can affect the local climate as well. Urban areas with few trees and large amounts of pavement become "heat islands," much hotter than surrounding areas, and often align with households navigating poverty and communities of color. Changes in land use have contributed to loss of wetlands, which protect our infrastructure from floods and high tides, and impact water quality. Dry soils can amplify extreme heat events through less evaporative cooling of the surface. Soil-moisture may have played a role in the June 2021 heat dome which followed the driest spring in Oregon's recorded history (Fleishman et al, 2023). See the glossary at the end of this document for a list of climate and health related definitions.

Long-term changes to our climate are still happening even if some weeks, seasons, or even a year seem to be the opposite of those trends.

Climate Hazards in Lincoln and Benton Counties

The illustration below summarizes the projected climate hazards in the region.

Heat waves

Poor air quality

Heavy rain

Sea level rise

Ocean temperature rise

CO_2 Ocean acidification

Drought

Wildfires

Coastal hazards

Loss of wetland ecosystem

Flooding

Invasive species risk

Health Impacts of Climate Change in Lincoln and Benton Counties

All of these changes to our climate bring new and worsening threats to our health. Some impacts are felt directly and immediately, and some are indirect or occur over time. Working with mental and physical health care providers, community-based organizations, community members, and across local governments to understand the health impacts of climate change and collaborate on adaptation plans will strengthen resilience.

Systemic inequities and racial disparities

While everyone in our counties will be impacted by climate change, not everyone will be impacted in the same way, to the same degree, or have the same ability to respond (Oregon Health Authority, 2015). Oregonians navigating poverty, communities of color, tribal communities, and rural communities face considerable inequities in the social, economic, and environmental aspects of life that affect health, otherwise known as the "social determinants of health."

Heat-related impacts

Heat is the leading weather-related killer in the United States, even though most heat-related deaths are preventable through outreach and intervention (U.S. Environmental Protection Agency, 2021). Extreme heat can cause heat exhaustion, heat stroke (which can be fatal), and contribute to heart attacks and other cardiovascular, respiratory, kidney, and cerebrovascular (brain and circulation) conditions. Research conducted by the Oregon Health Authority indicates that emergency department visits go up during heat events.

"Well, [people experiencing houselessness], because they have no roof over their heads, they have no way to shelter from extreme heat or extreme cold or respiratory challenges like wildfire smoke, or... And they are already more stressed just because they don't know necessarily where their next meal's going to come from or whether they're going to be safe sleeping or you name it."

—INTERVIEWEE

There is evidence that, due to consistently lower temperatures of coastal climates compared to non-coastal climates, residents of Lincoln County are more sensitive to heat and begin experiencing severe impacts at lower temperatures than elsewhere in the state (Rubado, 2011).

Heat can have significant impacts on mental health as well, including increases in irritability, symptoms of depression, and suicide. It can also affect behavior, contributing to increased aggression, incidence of domestic violence, and use of alcohol or other substances to cope with stress. Research has also linked high temperatures to problems with memory, attention, and reaction time. Sleep difficulties associated with extreme heat can contribute to and further exacerbate mental health symptoms (American Psychiatric Association, 2021).

Wildfire smoke and air quality

Wildfires are becoming more frequent and intense, and the fire season has lengthened. Wildfire smoke contains particulate matter (called PM 2.5) that is so small it can lodge in the lungs and even pass through the lungs into the bloodstream. Smoke exposure increases cardiovascular and respiratory illness and exacerbates existing illness. When air quality is hazardous for longer periods of time, it begins to impact mental health for residents that are staying indoors to protect their health. It is particularly hazardous for outdoor workers and others that cannot stay indoors to work.

Most outdoor pollution that affects health is produced by burning fossil fuels. Stopping the burning of fossil fuels would not only stop the production of greenhouse gas emissions causing climate change, but it would also dramatically improve our health, particularly for those living closest to pollution

"Thinking about that extreme weather, a lot of us will have heaters, but might not have air-conditioned spaces. So we've been struggling a lot during the heat waves, finding long- term air conditioned spaces for folks who need it. Not only unhoused, but also just the general population. They can survive a 90-degree day once, but if we're getting over or close to 100 degrees, multiple days in a row, we start to have a lot more problems."

—INTERVIEWEE

sources. Furthermore, when emissions from the burning of fossil fuels are produced in warm weather, ground level ozone is produced which is linked to asthma, bronchitis, heart attacks, and premature death.

More warm days, overall warmer weather, and a high carbon dioxide environment lead to higher pollen production and longer allergy seasons. Rising temperatures combined with wetter weather can also increase mold indoors and result in more asthma-like conditions.

Water impacts from sea level rise, changing ocean chemistry, loss of wetlands, heavy rain, flooding, and drought

As our climate warms, more of our precipitation falls as rain rather than snow. Changes to the amount of water available, and the timing of that availability, bring potential health impacts. Heavy rain and floods can cause direct injury and landslides that threaten infrastructure like roads, bridges, homes, and businesses. Combined with sea level rise, the impacts can be even more severe. Flooded buildings can develop mold and may pose a health risk. Heavy rain and floods can also increase waterborne disease outbreaks by carrying pathogens into recreational waters, shellfish harvesting water, and drinking water sources. Warmer air also alters the season of growth for freshwater and marine toxin-producing harmful algae, Vibrio bacteria, and other toxins and pathogens that can bring a variety of illness.

Drinking water in Lincoln and Benton counties comes from wells and surface water. Both groundwater and surface water can be contaminated by wildfires, landslides, and floods that carry toxins from the land such as certain

"When we had the wildfires, that was really a problem for a lot of people, and we didn't seem prepared or equipped here to help people with that in their homes. And so that was a big deal for people with just underlying medical conditions because even though they come here, we don't have a lot of health care here."

—INTERVIEWEE

agricultural herbicides. In turn, drought can also impact drinking water quality by concentrating toxins and reducing the available amount, both of which contribute to water insecurity.

Food insecurity and economic impacts

Fishing and agriculture are significant components of the economies in Lincoln and Benton counties. Drought, heat, flooding, rising sea levels, and changing ocean chemistry are all detrimental to these industries causing income loss and food insecurity. Sea level rise also threatens infrastructure and beaches and has already impacted some coastal areas. These can lead to chronic stress, malnutrition, chronic disease (such as diabetes), and mental health impacts that can be severe.

Vector-borne disease

A vector-borne disease is a disease that requires a host, such as a mosquito, tick, or flea. Climate influences the interaction between where that insect can survive and the diseases it may carry. It is a complex relationship, but the geographical and seasonal distribution of key vectors is changing. Ticks that carry Lyme disease are moving northward in the United States, and rising temperatures, changing precipitation patterns, and extreme weather events are impacting mosquitoes and mosquito-borne illness.

Mental health impacts

Climate change can impact mental health through many pathways bringing a range of responses from mild distress to depression, anxiety, post-traumatic stress disorder (PTSD), and suicidality. Specific groups of people are at higher risk including children, older adults (aged ≥ 65 years), women, pregnant and

"The levels of domoic acid in crab… if it's too high, crabbing is suspended until it goes lower, so we lose days of fishing because of that. What happens is [domoic acid] reduces the size of the meat inside them, so they're not considered marketable"

—INTERVIEWEE

postpartum people, people experiencing mental illness, first responders, and those whose livelihood is reliant on the local natural environment.

Our local economies depend on the natural environment for sustenance and livelihood, particularly farming, fishing, tourism, and recreation. Extreme heat in particular is a risk factor for all of these groups of people, but especially for those living with or experiencing mental illness, older adults (aged ≥ 65 years), and for people taking medication that makes body temperature more difficult to regulate (Crimmins, A., J. et al, 2016).

"Mental health is a big issue. When the people from the community told us they want to be prepared for a climate emergency, that is a reflection and expression of some level of anxiety they're going through. Saying 'What do I do if there is a fire in my neighborhood or I lose my house?' So there is already a mental health effect that I think is represented in terms of anxiety, to deal with the uncertain. So that is why it's so important to start preparing now."

—INTERVIEWEE

"I'm concerned about future generations and what they're going to have to cope with."

—INTERVIEWEE

Climate Impacts on Human Health

Adapted from: OHA, Public Health division. Climate and Health Program.

Allergies
Increasing pollen counts and potency result from rising temperatures and carbon dioxide levels. Increasing mold growth following storms and flooding also causes higher rates of allergic rhinitis and asthma attacks.

Respiratory disease and illness
Air pollution and wildfires smoke can exacerbate preexisting conditions and cause new respiratory diseases.

Violence
Heat waves can increase heart rate, blood circulation, and sweating, and influence metabolic changes linked to the fight or flight response; increasing violent behavior.

Vector-borne disease
Stagnant water bodies caused by heat or drought provide a habitat for pests, such as mosquitoes and ticks. Higher temperatures also change the life cycle of certain pests that transmit diseases.
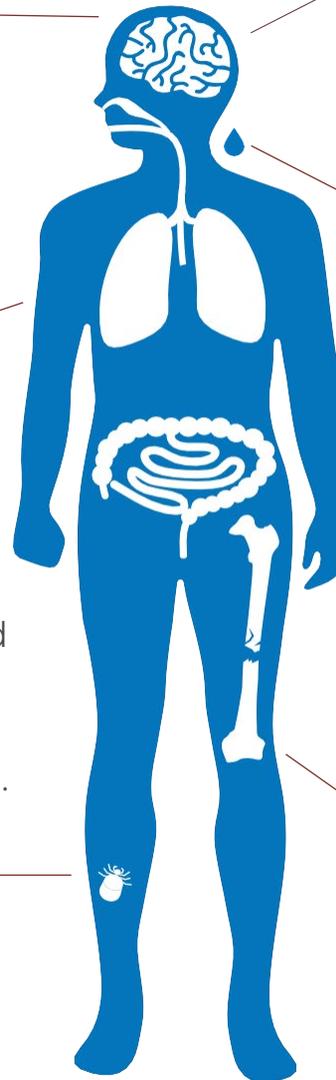
Mental health
Displacement, illness, and injury because of environmental changes can lead to anxiety, depression, suicidal ideation, and disruption of social networks.

Heat-related illness
Increasing temperatures and heat wave days result in elevated body temperatures; leading to heat stroke, heat syncope (fainting), heat exhaustion, heat cramps, and heat rash.

Gastrointestinal disease
Winter storms, flooding, and harmful algal blooms can contaminate drinking water with viruses, parasites, and bacteria; increasing GI illness.

Injury
Winter storms, flooding and landslides can cause injuries from falling trees, electrical hazards, unsafe structures, and flying debris.

Climate impacts, health outcomes, and populations at increased risk

The following table summarizes primary and secondary data collected during the Lincoln and Benton Climate and Health Assessment. The table includes climate hazards, health impacts associated with those hazards, and populations who are at increased risk of experiencing these health impacts due to climate change.

Climate hazard	Health impact	Populations at increased risk
Indirect Impacts of All Climate Events	**Economic instability and income loss for forestry, fisheries, agriculture, and tourism industries** – Food insecurity, mental health, chronic disease	– People navigating poverty – People who are economically dependent on forestry, fishing, agriculture, or tourism industries – People living in rural areas – People living in coastal areas – Native Americans/American Indians – Communities of color
	Mental and behavioral health – Chronic stress, anxiety, depression, suicide	– People navigating poverty – People who are economically dependent on climate stability – Parents – Youth – People living with existing chronic diseases – People living with existing mental health conditions
	Migration – Infectious disease	– Uncertain. The number of people migrating due to severe climate change in their home area is likely to increase
	– Displacement – Communicable disease in crowded evacuation centers, mental illness, stress	– People navigating poverty – People living in low-lying/coastal high-risk landslide areas – Native Americans/American Indians – People living in wildland/urban interface areas

| Climate hazard	Health impact	Populations at increased risk
Sea Level Rise and Ocean Acidification	**Income loss** –Food insecurity, chronic disease	–People living in coastal areas
	Displacement –Anxiety, depression, suicide	– People living in coastal areas – Native Americans/American Indians
	Mental and behavioral health –Anxiety, depression, suicide	– People living in coastal areas – Native Americans/American Indians
	Income Loss for fisheries –Food insecurity, chronic disease	– Native Americans/American Indians – People who are economically dependent on fisheries
Heatwaves and Heat Dome	**Heat related illness and death** – Illness: Heat rash, heat cramps, heat exhaustion, heat syncope (fainting), heat stroke – Death: Cardiovascular disease, renal failure, heart attack, stroke, heat stroke, deaths from respiratory illness	– Young children – Older adults (aged ≥ 65 years) – People navigating poverty – People who are socially isolated (living alone and far away from familial support) – People who work outdoors (particularly people working in agriculture, forestry, and construction, especially migrant and seasonal workers) – People living with chronic diseases – Pregnant people – People who are not used to hotter weather (e.g., coastal communities) – Communities of color – People living in urban areas
	Violence –Intentional injury, homicide	–Children and young adults
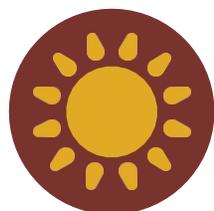
Climate hazard	Health impact	Populations at increased risk
Heatwaves and Heat Dome continued	**Air pollution (respiratory illness)** –Chest pain, coughing, throat irritation, congestion, reduced lung function, exacerbation of emphysema, bronchitis and asthma, cancer deaths	– People living near heavy traffic – People living with existing chronic respiratory illness – Children and young adults
	Harmful algal blooms –Rash, paralytic shellfish poisoning, gastrointestinal illness, neurotoxic shellfish poisoning, food insecurity	– People who eat shellfish – People who are economically dependent on the seafood industry or coastal tourism – Native Americans/American Indians
	Recreational risk –Drowning, dehydration	– Children – Males
Wildfire	**Air quality (respiratory illness and visibility)** –Cardiopulmonary disease, ischemic heart disease, asthma, bronchitis, pneumonia, cancer, motor vehicle crash injury due to low visibility	– People living with existing chronic illness – Children – Older adults (aged ≥ 65 years) – People who work outdoors (particularly migrant and seasonal workers) – Wildland firefighters
	Water quality – Increased flows of sediment, elevated temperatures – Gastrointestinal illness, Methemoglobinemia	– Infants – People who use private wells
	Occupational Risks –Heat stress, respiratory illness, heat-related illness, unintentional injury, hearing loss, rhabdomyolysis, death	– Wildland firefighters – People who work outdoors (particularly migrant and seasonal agricultural workers)

Climate hazard	Health impact	Populations at increased risk
Drought	**Income loss** – Stress, chronic disease, premature death	– Farmers and others who work in agriculture – People living in rural areas – Native Americans/American Indians
	Food insecurity – Malnutrition, obesity, chronic diseases	– Communities of color – Native Americans/American Indians – People living in rural areas – Expectant parents and children
	Water insecurity – Water-borne disease (microorganisms, biotoxins and toxic contaminants) – Dehydration	– People living in rural areas – People navigating poverty – People who use private wells – Native Americans/American Indians – Infants
	Mental and Behavioral health – Stress, anxiety, depression, suicide	– Farmers and others who work in agriculture – People living in rural areas – People navigating poverty
Heavy rain, flooding	**Landslides** – Stress, injury, death – Blockage/destruction of critical roadways, damage to infrastructure including drinking water/sewer Systems	– People living, working, or spending time in buildings near steep slopes – First responders
	Flooding – Injury, water-borne disease, respiratory illness, exposure to toxins, death	– People living in coastal areas – People living in low-lying areas
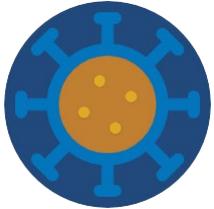
Climate hazard	Health impact	Populations at increased risk
Infectious Disease	**Vector-borne disease** –Ex. West Nile virus, Lyme disease	– People who work outdoors – People in routine contact with animals, people living in areas with ticks
	Food-borne disease –Ex. gastroenteritis, campylobacteriosis, salmonellosis, V. parahaemolyticus	–People who consume shellfish, possibly through improper food storage and handling during hot weather
	Fungal disease –Ex. Cryptococcus gattii cryptococcosis	–Research is still exploring this

Climate Resilience Builds Community Resilience

"Climate change is the greatest global health threat facing the world in the 21st century, but it is also the greatest opportunity to redefine the social and environmental determinants of health" (Lancet, 2022). The changing climate impacts our landscapes, waters, community members, and ultimately, our way of life. While we cannot undo the greenhouse gas emissions of the past, reducing emissions going forward still has tremendous benefits and will greatly impact the climate in the next few decades and beyond. We can also invest in our community strengths and advance adaptation strategies to protect the health of all community members, particularly those who are disproportionately affected by climate events. A community prepared for the health impacts of climate change will be more resilient.

We can also invest in our community strengths and advance adaptation strategies to protect the health of all community members, particularly those who are disproportionately affected by climate events. A community prepared for the health impacts of climate change will be more resilient.

Climate change is a "threat multiplier," making existing health threats worse (United Nations, Weller et al). Communities in Lincoln and Benton counties that already bear the biggest burden of disease and poor health, including communities of color and households navigating poverty, are also more at risk of climate-related threats. Starting from a point of poor health means more severe impact from events such as heat waves and hazardous air from wildfire smoke. Not only are these community members more susceptible, these same groups often have fewer resources and opportunities to prepare for, recover from, and adapt to climate impacts.

Key to maintaining a healthy community will be planning ahead to help community members remain safe and healthy at home as much as possible. When this is not possible, we must have safe emergency spaces with sufficient capacity so as not to overwhelm local health care and other resources. Participants in the assessment already felt that health care resources, especially in Lincoln County, were insufficient and were concerned about its ability to care for large numbers of people in a climate emergency.

Community leaders acknowledged that Public Health engagement is extremely important for adaptation planning and expressed interest in the idea that mitigation efforts that reduce greenhouse gas emissions can also bring health improvements. They are ready to engage and want to be part of solutions. This assessment and plan is a key step, but this effort must be sustained in order to be impactful and maintain community trust. Following through on action steps will be an important demonstration that Public Health is fulfilling its role in protecting and promoting healthy communities for all.

Key to maintaining a healthy community will be planning ahead to help community members remain safe and healthy at home as much as possible.

Part Two: Developing Bold Leadership for Action

Over 150 people or organizations were invited to participate in the assessment.

Developing the Lincoln and Benton Climate and Health Adaptation Plan

The Lincoln and Benton Climate and Health Adaptation Plan was developed based on the values, concerns, and priorities of Public Health, community members, other partner agencies, and community-based organizations. On behalf of Lincoln and Benton counties, Rede Group conducted an assessment that included an organizational readiness survey for both counties, individual interviews, group interviews, focus groups, and a survey of community members and leaders to assess broader knowledge and concerns.

Over 150 people or organizations were invited to participate in the assessment, with an emphasis on priority populations in the region that would be most impacted by the health impacts of climate change based on existing state and national vulnerability indices (OHA, 2015). Other community members and leaders; organizations that are actively involved in environmental advocacy; those who provide health services to the region; and city, county, and state government representatives were also invited to participate. A total of 13 interviews were conducted, 16 people participated in focus groups, and 22 people completed surveys. A data party was hosted to share results with Public Health staff from Lincoln and Benton counties as

well as all the organizations and individuals that were invited to participate in the assessment.

Data parties allow collaborators and interested individuals to reflect on findings and delve deeper into questions. This is a valuable step in community engagement, allowing attendees to ask for further clarification on findings and share how the information found can be best used to guide their work. Rede provided preliminary findings from the initial data analysis at the data party and facilitated a discussion among participants to answer questions and elevate key take-aways.

Rede also completed a climate hazards assessment using reports produced by the Oregon Climate Change Research Institute (OCCRI), the Oregon Fifth and Sixth Climate Assessments and Future Climate Projections for Lincoln, Lane, Linn, and Marion counties. OCCRI anticipates its projections for Benton County will be complete later in 2023. As advised by OCCRI's Director, Rede analyzed Lane, Linn, and Marion County climate projections as a proxy for Benton County, given that all are located within the Willamette Valley.

Furthermore, Rede completed a climate and health profile report for Lincoln and Benton counties which describes the health impacts associated with each climate hazard and the populations at increased risk of experiencing these health impacts (see pages 21-25 of this report). The framework and health impacts draw from the Oregon Climate and Health Profile Report, which was developed based on multiple data indicators and academic research. The climate and health profile report includes a list of climate and health indicators for the region and can be found in the appendix of the assessment linked above.

To access the full Lincoln and Benton Climate and Health Assessment, click the image below.
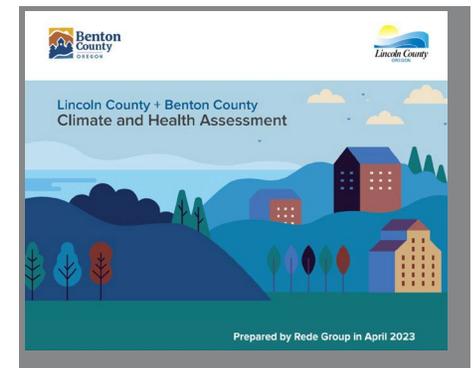
Key Themes that Emerged from the Assessment:

Knowledge: Overall, community members, Public Health staff, and other city and county staff who participated are concerned about climate change. However, few had begun connecting health impacts with climate change except for instances where they'd already had a direct impact including wildfire smoke and extreme heat. When people were presented with potential health impacts, they did express concern and sometimes highly so. A few participants also recognized the compounding nature of climate change on health, connecting existing respiratory illness, COVID-19, Long COVID, and wildfire smoke. The majority of people that participated in the assessment were interested in learning more about health impacts and what they could do to preserve both their own health and the health of community members, particularly those at higher risk.

Readiness: A majority of respondents indicated readiness for action and felt that we are not moving quickly enough. A few participants expressed frustration that existing county or city plans (not developed by Public Health) have not resulted in significant action. Some participants noted that this assessment and plan is a key step, while others wondered if this effort will be sustained and impactful.

Capacity, roles, and action: The organizational capacity survey showed both counties have key support from Public Health leadership. However, in all other aspects of capacity there is either a different level of capacity between the counties or a need for more. Lincoln County generally has lower capacity than Benton, but their partnership allows Lincoln to learn from Benton, and models

The majority of people that participated in the assessment were interested in learning more about health impacts and what they could do to preserve both their own health and the health of community members, particularly those at higher risk.

creative intergovernmental partnership. Crucially, both counties indicate low applicable funding and few other agencies planning or taking action in their communities. This indicates a need for Public Health to be a bold leader on climate change throughout its own work and across sectors, and to prioritize creative funding methods.

Priorities: Addressing climate change is a priority across sectors of the community and government who participated. Generally, the findings from the assessment on health impacts align with the scientific findings of climate hazards from OCCRI, although very few community members living on the coast mentioned sea level rise as a concern. Top health concerns from community members were respiratory illness from wildfire smoke and extreme heat effects.

Across data collection methods, participants highlighted their concerns about the social and economic impacts of climate change and how this will affect health. Food insecurity stemming from ocean warming and acidification, drought, poor water quality, and extreme weather, displacement (people being forced to leave) and migration (people choosing to leave), and recreation access were uplifted by participants as key considerations for climate and health resilience. Participants were also concerned about mental health, especially for youth and people working in agriculture or fishing. While interventions in these areas might not always be squarely within the scope of Public Health, these responses provide important context and guidance for shaping the priorities of broader regional adaptation and implementation plans.

Top health concerns from community members were respiratory illness from wildfire smoke and extreme heat effects.

Equity: Public Health should maintain its equity approach, integrating it across their work as well as supporting other agencies in learning and incorporating equity. Climate change does not impact all people equally and planning must be made with this key concept as its foundation. Racism has burdened communities of color in particular with higher rates of disease and illness that are exacerbated by climate change. Ensuring equity as the foundation of any climate planning will increase preparedness and community resilience.

Role of Public Health in Preparing for Climate Change and Supporting Community Resilience

Public Health is concerned with protecting the health of entire populations. These populations can be as small as a local neighborhood, or as big as an entire country or region of the world (CDC Foundation, 2023).

In Lincoln County, Public Health is a division of Lincoln County Health and Human Services (HHS) that serves as the local authority to protect and promote the health of Lincoln County residents (Lincoln County, 2015). In Benton County, Public Health is a division of the Benton County Health Department.

Given that climate change has such a tremendous impact on the health of all the people that live, work, and play in our two counties, Public Health has an important role to play.

Ensuring equity as the foundation of any climate planning will increase preparedness and community resilience.

The strategies and ideas for action in this plan align with the foundational capabilities of public health, which guides all of our work. This plan will allow Public Health to contribute our unique understanding of the health implications of climate change to the policies, systems, and environments that shape the daily lives of all who live in and visit Lincoln and Benton counties.

Moving Forward: Key Strategies and Ideas for Action

These key strategies and actions build upon the recommendations for local Public Health in the Oregon Health Authority's Oregon Climate and Health Resilience Plan. They were further informed by feedback from the Lincoln and Benton Climate and Health Assessment, local climate and health plans from around the Northwest, research findings, and community-based groups around Oregon focused on building climate resilience. The following illustration summarizes the strategy areas, for a detailed summary of the strategies, see page 9 of this report.
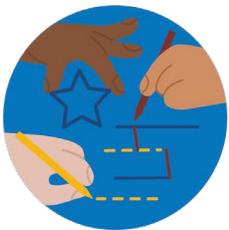
Health Equity and Cultural Responsiveness

Community Partnership Development

Assessment and Epidemiology

Policy and Planning

Emergency Preparedness and Response

Communications

Leadership and Organizational Competencies

Health Equity and Cultural Responsiveness

Strategy 1: Standardize the use of an equity framework

- 1.1 Work across programs to identify, adopt, and use an equity lens or framework.
- 1.2 Increase local health department staff knowledge and understanding of equity including mechanisms for putting equity into practice.
- 1.3 Participate in and promote environmental justice trainings for local health department staff, governmental partners, and community partners.
- 1.4 Consult and collaborate with the regional health equity coalition and other equity-based community organizations to learn and develop culturally responsive climate and health messaging.
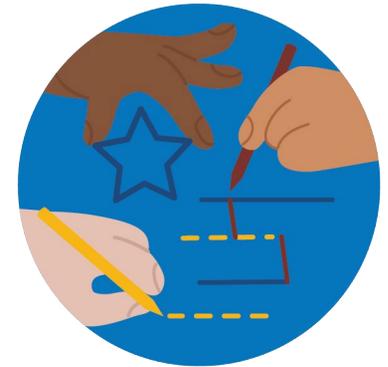
Strategy 2: Listen to new voices, empower new leaders, and build on existing relationships

- 2.1 Align with organizational equity and inclusion goals that increase institutional resilience through best practices in hiring and retaining a diverse workforce.
- 2.2 Investigate creative staffing for climate related work, such as the AmeriCorps VISTA program or internships with local community colleges and universities.
- 2.3 Increase the flexibility of Public Health programming for more culturally responsive approaches, promising practices and community pilot projects.
- 2.4 Support staff to foster and strengthen authentic relationships with culturally specific organizations to increase community climate resilience.

Community Partnership Development

Strategy 3: Ensure meaningful engagement in planning and action

- 3.1 Actively work to reduce barriers to engage community partners and support involvement including economic, language, transportation and other social considerations.
- 3.2 Actively work to ensure that the voices of "front line" community members and groups who have been socially marginalized are included in climate adaptation and action plans.
- 3.3 Continue to invite partners that informed the climate and health assessment to meaningful engagement opportunities.
- 3.4 Pursue policy, systems, and environmental changes identified through partnerships with affected communities and other interested parties.
- 3.5 Explore methods to increase community member and community organization capacity such as a resilience hub.
- 3.6 Partner with other county and city agencies and local community groups to host conversations about the health implications of climate change, how they can contribute to community resilience, and the health co-benefits of reducing greenhouse gas emissions.

Strategy 4: Acknowledge and support programmatic activities that strengthen social networks and social cohesion

- 4.1 Learn about the relationship between social networks, social cohesion, and Public Health programming.
- 4.2 Expand programs that address loneliness and increase social connection for older adults and households that may be isolated for other reasons such as language, economics, or other social or geographical factors.

Assessment and Epidemiology

Strategy 5: Prioritize, track, analyze, and share key climate and health indicators for Lincoln and Benton counties

- 5.1 Prioritize local climate risks and indicators, including co-benefits such as social connectedness.
- 5.2 Build capacity for improved data collection and monitoring health impacts such as from extreme heat, air pollution, wildfire smoke, and infectious disease (e.g., foodborne, waterborne, vector-borne) to inform emergency response and preparedness.
- 5.3 Include climate data with existing monitoring work (e.g., heat events/ temperature, changing ocean temperature and chemistry/frequency of harmful algal blooms).
- 5.4 Monitor indicators and use Oregon's syndromic surveillance system (ESSENCE) to inform Public Health interventions for climate change.
- 5.5 Create an annual action evaluation plan, adjusting the objectives and activities as needed.

Strategy 6: Use mixed methods to assess resilience

- 6.1 Increase the number of jurisdictions with local resilience assessments and plans.
- 6.2 Engage diverse partners, including indigenous communities, in identifying and generating meaningful quantitative and qualitative data to inform local and culturally appropriate climate action.
- 6.3 Partner with government agencies, academic institutions, and community groups to develop new tools for focused climate and health interventions, such as GIS mapping of local climate and health indicators to visualize communities at increased risk.

Policy and Planning

Strategy 7: Integrate climate and health considerations into planning efforts and policies

- 7.1 Integrate climate considerations into community health assessments, community health improvement plans (CHIPs), and other community and environmental health assessments.
- 7.2 Provide climate and health perspective in local planning projects being led by non-public health agencies in the city or county.
- 7.3 Educate local elected officials on the health impacts of climate change and the health co-benefits of climate action.
- 7.4 Engage partners, youth, older adults, tribal nations, and communities of color in identifying policy actions and implementation methods.

Strategy 8: Promote and inform policies and planning that improve air quality and water quality and quantity

- 8.1 Develop tools and provide technical assistance to support local jurisdictions' efforts to reduce exposure to air pollution.
- 8.2 Help to inform new policies and plans to protect and improve air and water quality, including health impact assessment of proposed land use and transportation projects.
- 8.3 Join partners to support land use and active transportation improvements to decrease air pollution.

Strategy 9: Promote and inform policies and planning that improve community resilience and protect infrastructure

- 9.1 Support community partners with developing and implementing healthy food system policies.
- 9.2 Provide climate and health input in planning to protect infrastructure from sea level rise and other climate hazards.
- 9.3 Incorporate food system and community resilience strategies into community health improvement plans (CHIPs).
- 9.4 Engage partners, youth and older adults in identifying policy and planning actions to work on together.

Emergency Preparedness and Response

Strategy 10: Integrate climate and health information into coordinated emergency preparedness plans and activities

- 10.1 Review and use climate and health guidance and tools for local preparedness planners including establishing or strengthening a relationship with the National Weather Service.
- 10.2 Incorporate local climate hazard, health risk, and climate resilience considerations from the assessment into hazard mitigation planning.
- 10.3 Inform and support changes in local land use and zoning code to improve the safety of future development and strengthen community resilience against climate hazards.

Strategy 11: Support emergency planners in developing an equitable response for community members at highest risk including culturally and linguistically responsive ways

- 11.1 Participate in training to incorporate trauma-informed and strengths-based approaches to preparedness planning and response such as Community Resilience, Climate Adaptation Planning for Emergency Management, and other National Disaster Preparedness Training Center (NDPTC) trainings.
- 11.2 Strengthen relationships with community-based organizations that represent and serve diverse populations.
- 11.3 Provide the health equity perspective in local cross-sector emergency planning and invite community-based organizations to the table.

Strategy 12: Identify resources to support community resiliency

- 12.1 Investigate possibilities from current partnerships, existing government programs, or external funds.
- 12.2 Identify community resources needed to help address climate impacts, such as funding for heat pumps, air filters, and other tools to stay safe and healthy at home.

Communications
Strategy 13: Collaborate with community-based organizations and other partners to deliver climate and health messages

- 13.1 Embed the connections between climate and health throughout our work.
- 13.2 Ensure website contains easy to find climate and health information and remains up to date for timely community member and partner use.

– 13.3 Partner with mental and physical health care providers and other direct service providers to develop and share messages and/or materials.

– 13.4 Prioritize relationships with providers that serve populations at increased risk of climate-related health impacts (e.g., pregnant people, young children, older adults (aged ≥ 65 years), people who are socially or geographically isolated).

– 13.5 Host relevant guest speakers and invite direct service providers and those working in the health care sector to learn about climate and health actions.

– 13.6 Use lessons learned from the COVID-19 response to improve timeliness and cultural responsiveness of messages to improve accessibility and ensure messaging is delivered to emerging multilingual households, and households that are socially or geographically isolated.

Strategy 14: Use storytelling methods, such as case studies and story maps, to engage and learn from community members and interested parties

– 14.1 Participate in story project training.

– 14.2 Use case studies and story projects to engage with diverse stakeholders and advance climate and health work.

– 14.3 Engage youth in storytelling work to elevate their concerns and connect with policy makers.

Leadership and Organizational Competencies
Strategy 15: Provide active, positive, bold leadership on climate

– 15.1 Build climate and health literacy among Public Health and other county agency leaders and employees by providing access to learning

opportunities including online trainings and materials, and local, northwest regional and national climate and health events.

- 15.2 Increase buy-in from Public Health staff by offering opportunities to learn and share together about how climate change impacts them, their families and the people they serve, and ways we can adapt.
- 15.3 Provide clear leadership on climate and health issues through formal statements and by signing on to joint declarations and resolutions that call for climate action.
- 15.4 Develop (or participate in) a cross-sector climate change work group at the local level.
- 15.5 Participate in and sustain the network of Oregon local Public Health staff working on climate change.
- 15.6 Seek opportunities to represent public health and health equity concerns on commissions, councils, or other committees.

Strategy 16: Improve internal operations to lower carbon footprint and save resources

- 16.1 Emphasize health co-benefits of reducing carbon emissions.
- 16.2 Support Public Health employee participation in an internal and/or inter-agency sustainability committee.
- 16.3 Include sustainability considerations in worksite wellness efforts and other decisions that affect worksite environments, practices, and policies.
- 16.4 Share information on cost savings of reducing the organizational carbon footprint with local elected officials.

Implementing and Evaluating Climate and Health Strategies

Partnerships are essential to strengthening the resilience of our communities.

Vision for Implementation

This plan demonstrates the urgent need for action within local Public Health planning and programs, but also across Lincoln and Benton counties. Furthermore, meaningful and culturally responsive partnerships are essential to strengthening the resilience of our communities.

Public Health has been a leader on climate action in Benton County since publishing its first climate and health adaptation plan in 2013. While Lincoln County is just beginning to plan for climate change, Public Health is an emerging leader there, too. Grounded in protecting and promoting health and principles of equity, Public Health brings key perspectives to the work. However, Public Health cannot carry the entire load of adapting to climate change. Our role is to inform and influence policies that can reduce greenhouse gas emissions that in turn bring health co-benefits. This plan can be used as a tool for policy makers, highlighting where policy change is needed. Public Health can also help policy makers explore the health co-benefits that come with reducing emissions, which not only improve health but bring significant cost savings.

Lincoln and Benton County Public Health will implement this plan, focusing first on the most immediate climate impacts. This includes developing and implementing comprehensive heat adaptation plans. It also includes

preparing for and responding to urgent climate needs while building resilience in our community with actions in the short, medium, and long term. Providing learning opportunities for staff will help them bring climate considerations into their work. With designated and consistent resources, climate and health knowledge, and partner collaborations, Public Health can more fully develop and implement the actions included in this plan.

Guidance for Evaluation

Lincoln and Benton counties will each be responsible for developing their own specific action plans and evaluation metrics for the strategies included in this adaptation plan. This section provides a template to help develop action plans for each climate hazard identified in the climate and health assessment, as well as some guiding questions to assess progress on the strategies under each Public Health foundational competency. Together, these tools can be used by Lincoln and Benton counties to operationalize their strategies and identify important milestones in their ongoing climate and health adaptation work.

This action plan template was adapted from the Bay Area Regional Health Inequities Initiative (BARHII) assessment tool, and a Word document version was provided to Lincoln and Benton counties for future use. The action plan template is intended to assist each county in outlining the steps, resources, contributors, and timeframe to address climate hazards identified in the climate and health assessment. An example plan has been provided on the following page to show how to use each column. Each county may need to adjust this table for their individual needs and preferences.

"In this community, actually, there's all sorts of opportunity to collaborate. Once you tell people what you want to do, it's a community that really likes to volunteer, really likes to throw out things, really likes to chew it apart, but it needs to be focused. If we tell people, 'this is the issue we want to do, what all can you do?' You'll see private industry, you'll see nonprofits, you'll see all sorts of people jump in on that."

—INTERVIEWEE

Example Climate hazard:

Health impact: Heat exhaustion

Vulnerable population: Unhoused individuals

Action	Resource	Partners	Leader	Timeline	Monitoring	Result
What is the action?	What do we need?	Who should we consult, inform, or collaborate with?	Who will serve as the point person for making this happen?	What are the steps, and when will we aim to achieve them?	What are the milestones of progress, and how will we measure them?	What change do we want to see? What does success look like?
Stand up cooling centers when temperatures are above 100 degrees.	Venue/space, electrolyte packs, water bottles, sunscreen, cooling towels, transportation plan for those without their own vehicle or money for transit	[CBO] who serves unhoused individuals in our county	[insert names]	[name] will connect with CBO to discuss available and needed resources and determine a start date for cooling centers. CBO and PH will promote the cooling centers through existing channels	– Regular venue secured – Promotional channels established – Transportation plan prepared	– Qualitative feedback from unhoused individuals that the cooling centers are welcoming and effective – Qualitative feedback about what modes of transportation – Meeting community need, no one was turned away, sufficient supplies

The following questions are meant to prompt each county to reflect on their progress within the strategies (organized by foundational competency). "Internal capacity building" is not a foundational competency, but was added to this evaluation plan as it is a key component of advancing all other strategies. Similar to the action plans, these questions may be adapted to fit the needs of each county as they build out their individual evaluation plans and metrics.

Internal Capacity Building

a. Have key staff attended trainings or conferences to build their knowledge and capacity for climate and health work?
b. What additional resources have been acquired/leveraged to build Public Health's capacity for climate and health work?
c. Have any creative staffing solutions been implemented?
d. How has Public Health leveraged intergovernmental partnerships? Are agencies and partners coordinating on climate strategies?

Health Equity and Cultural Responsiveness

a. Has the organization adopted the use of an equity framework? How have they applied it to their climate and health work?
b. Do organization leaders, administrators, and staff understand how to better account for equity and health impacts in climate decision-making?
c. Can the organization point to ways that climate actions have contributed to decreasing disparities, especially among identified populations at increased risk?
d. How can the organization show that their climate and health work has improved the quality of life in their community?

How can the organization show that their climate and health work has improved the quality of life in their community?

Community Partnership Development

a. Has the organization hosted public events, including presentations, teach-ins, or knowledge exchanges, to build local knowledge of the connection between climate change and health?
b. What kinds of feedback have community partners provided to help increase/sustain collaboration?
c. Have key partners been involved in developing shared understanding of climate and health impacts among community members? How so?
d. Have key partners been involved in developing climate and health action plans with the county?
e. How have the county and key partners engaged populations that are socially or geographically isolated to improve social cohesion?

Assessment and Epidemiology

a. Does the organization have a structure to track, analyze, and share key climate and health indicators for their county?
b. How has the community been engaged in conversations about the health impacts of climate change and resilience to these impacts? Does the organization have both quantitative and qualitative data?
c. In what ways is Public Health and their partners continuing to assess health impacts and resilience among identified populations at increased risk?
d. Can the organization point to injuries, illnesses, and/or deaths that have been reduced or prevented due to their efforts?

Policy and Planning

a. How have the climate and health strategies in this plan been integrated into other existing policy and planning efforts?

How have the climate and health strategies in this plan been integrated into other existing policy and planning efforts?

b. How has the organization promoted and informed policies and planning that improve air quality and water quality and quantity?
c. How has the organization promoted and informed policies that improve community resilience and protect infrastructure?
d. Have there been changes in policy, systems, and environments that reflect recommendations in this plan? How did Public Health contribute?

Emergency Preparedness
a. How has the organization integrated climate and health strategies into coordinated emergency preparedness plans and activities?
b. What resources have been identified to support community resilience to natural disasters? Were those resources deployed to the community? How was the need determined and how many households were served? How have they been utilized?
c. Has the organization developed a preparedness and/or action plan for each climate hazard identified in the climate and health assessment?
d. How have Public Health and Emergency Preparedness collaborated to develop a more equitable response for people at increased risk that addresses cultural, linguistic, developmental, and other needs?

Communications
a. Has the organization collaborated with community partners to develop and/or share climate health information and messaging?
b. How has the organization incorporated storytelling methods (e.g., case studies and story maps), to engage community members on topics of climate and health? What was done with the stories? How did the storytelling impact community health?

Has the organization developed a preparedness and/or action plan for each climate hazard identified in the climate and health assessment?

c. Do community members and partners have a mechanism to provide feedback and recommendations to Public Health to improve the climate and health response in their community? How is it used by Public Health?

Leadership and Organizational Competencies
a. What opportunities have Public Health staff and leadership had to learn and share together about the impacts of climate change on themselves, their families, and the people they serve?
b. Has the organization issued formal statements or signed on to joint declarations or resolutions that demonstrate their commitment to climate action?
c. What cross sector climate change work has Public Health engaged in?
d. How has the organization adapted internal operations to lower their carbon footprint?
e. In what other ways has the organization demonstrated themselves to be an emerging or established leader in climate and health adaptation?

What opportunities have Public Health staff and leadership had to learn and share together about the impacts of climate change on themselves, their families, and the people they serve?

Glossary

This document uses the following terms and definitions.

Adaptation: The adjustment in natural or human systems to a new or changing environment that exploits beneficial opportunities or moderates negative effects. Definition from the U.S. Global Change Research Program.

Climate and Health Adaptation: The *intentional* adjustment in natural or human systems to a new or changing environment that exploits beneficial opportunities or moderates negative health effects.

Climate: Climate is the weather of a specific region averaged over a long period of time. "Climate change" refers to long-term changes, most often 30 years or longer. Definition from National Academies.

Co-benefits: Co-benefits in this document refer to the health benefits that come from mitigation efforts that reduce greenhouse gas emissions. Health co-benefits can arise from many actions but include cleaner air and water. Learn more from the Lancet.

Community-Based Organization (CBO): Community-based organizations in this document refer to local organizations that are often not for profit that partner with governmental public health in a variety of ways to improve the health of communities. One academic definition is: Community-based organizations are important health system partners as they provide numerous, often highly valued programs and services to the members of their community. A community can be defined in many ways - geographic, cultural, racial, spiritual, etc. In addition, networking and/or developing partnerships between organizations is often particularly important in contexts where organizations may need to build coalitions, exchange/share resources, partner, and avoid service duplication. Furthermore, community-based organizations often provide services and support to the most marginalized, disadvantaged, and stigmatized sections of society.

Definition adapted from Wilson, M.G., Lavis, J.N. & Guta, A. Community-based organizations in the health sector: A scoping review. Health Res Policy Sys 10, 36 (2012).

Environmental Justice: Environmental justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies. Definition from US Environmental Protection Agency.

Environmental Justice Movement: Environmental justice is an important part of the struggle to improve and maintain a clean and healthful environment, especially for those who have traditionally lived, worked, and played closest to the sources of pollution. Definition from Natural Resources Defense Council.

Equity: Equity is the absence of unfair, avoidable, or remediable differences among groups of people, whether those groups are defined socially, economically, demographically, or geographically or by other dimensions of inequality (e.g., sex, gender, ethnicity, disability, or sexual orientation). Definition from the World Health Organization (WHO).

Health Equity: Health equity is achieved when everyone can attain their full potential for health and well-being.

Health and health equity are determined by the conditions in which people are born, grow, live, work, play and age, as well as biological determinants. Structural determinants (political, legal, and economic) with social norms and institutional processes shape the distribution of power and resources determined by the conditions in which people are born, grow, live, work, play, and age.

People's living conditions are often made worse by discrimination, stereotyping, and prejudice based on sex, gender, age, race, ethnicity, or disability, among other factors. Discriminatory practices are often embedded in institutional and systems processes, leading to groups being under-represented in decision-making at all levels or underserved.

Progressively realizing the right to health means systematically identifying and eliminating inequities resulting from differences in health and in overall living conditions. Definition from the World Health Organization (WHO).

Mitigation: Processes that can reduce the amount and speed of future climate change by reducing emissions of heat-trapping gases or removing them from the atmosphere. Definition from the U.S. Climate Resilience Toolkit.

Resilience: The capacity of a community, business, or natural environment to prevent, withstand, respond to, and recover from a disruption. Definition from the U.S. Climate Resilience Toolkit.

Public Health Modernization: Public Health Modernization is a framework for ensuring local public health departments (LPHAs) across Oregon can serve their communities through:

- Tracking and preventing the spread of communicable (infectious) diseases
- Promoting community resilience in the face of climate change
- Responding to public health emergencies
- Promoting health and well-being
- Ensuring Oregonians have access to health care
- Providing clear, timely, and culturally relevant communication to their communities on public health concerns
- Building relationships and collaborating with community partners (such as community-based organizations, faith communities, health care providers, schools, and more) to deliver public health services
- Building a well-trained, diverse public health workforce
- Creating policies that support health and well-being

- Advancing health equity by lifting up the voices of people who are harmed the most by the health issues we face and intentionally undoing systems that treat people differently because of their race, ethnicity, language, class, disability, gender identity, sexuality, or any intersections of these identities.

Definition from Oregon Coalition of Local Health Officials.

Social Determinants of Health: Social determinants of health (SDOH) are the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks. SDOH can be grouped into 5 domains: Economic Stability, Education Access and Quality, Health Care Access and Quality, Neighborhood and Built Environment, Social and Community Context. SDOH have a major impact on people's health, well-being, and quality of life. Examples of SDOH include:

- Safe housing, transportation, and neighborhoods
- Racism, discrimination, and violence
- Education, job opportunities, and income
- Access to nutritious foods and physical activity opportunities
- Polluted air and water

– Language and literacy skills

Definition from U.S. Department of Health and Human Services. Office of Disease Prevention and Health Promotion.

Vectors: Vectors are living organisms that can transmit infectious pathogens between humans, or from animals to humans. Many of these vectors are bloodsucking insects (e.g., mosquitos, ticks), which ingest disease-producing microorganisms during a blood meal from an infected host (human or animal) and later transmit it into a new host, after the pathogen has replicated. Often, once a vector becomes infectious, they are capable of transmitting the pathogen for the rest of their life during each subsequent bite/blood meal. Definition from World Health Organization.

Vector-borne diseases: Vector-borne diseases are human illnesses caused by parasites, viruses and bacteria that are transmitted by vectors. Distribution of vector-borne diseases is determined by a complex set of demographic, environmental, and social factors. Local examples are Lyme disease and West Nile Virus. Definition from World Health Organization.

Vulnerable: Vulnerable or vulnerability in this document is used in the context of vulnerability to the impacts of climate change. Climate vulnerability describes the degree to which natural, built, and human systems are at risk of exposure to climate change impacts. Vulnerable communities 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 and identification, national origin, and income inequality. Definition from Governor's Office of Planning and Research, State of California.

Weather: Weather refers to short term atmospheric conditions. Definition from US Geological Service.

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