

# RDPO Regional Food System Resilience Scoping Study

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# Food System Resilience from a Disaster Risk Management Perspective

## FRAMING THE PROBLEM

A food system—growing, transforming, moving food from farm to table and managing food waste—is incredibly complex. It is also an interconnected system—its functioning depends upon the performance of numerous other systems and infrastructure. The most critical interdependencies include transportation, the road network, the electrical power system, telecommunications, water transportation and fuel supplies. Food systems encompass public, private and non-profit sectors, and operate within, and are influenced by, specific social, political and economic contexts. In the U.S., local food systems are actually national and global—nearly all food consumed in most major metropolitan areas is produced in and imported from other regions and countries.

Strategies that have significantly increased the efficiency of the U.S. food system over the past several decades, such as just-in-time delivery, concentrated ownership and production facilities, clustered warehouses, and dependency on the trucking industry, have also made it inherently vulnerable. At the same time, economic inequality continues to increase, straining the capacity of the food safety net to support a growing number of food insecure households.

### ***Project Objectives***

RDPO engaged our consulting team in September 2021 for a five-month project to (1) explore whether a comprehensive assessment of the vulnerability of the regional food system is needed; and (2) establish a foundation of work that would allow RDPO to refine a scope and objectives for future food system resilience research and planning. More specifically, the findings from this project will inform a larger grant proposed during the 2022 Urban Areas Security Initiative (UASI) grant cycle. The timing of the engagement would allow us to capture insights from the pandemic into the vulnerabilities of the region's food system. The pandemic mobilized many stakeholders to address food insecurity and food system vulnerabilities. Mapping the various initiatives and stakeholders, especially those that may serve as future research and planning partners, was a primary objective of the project.

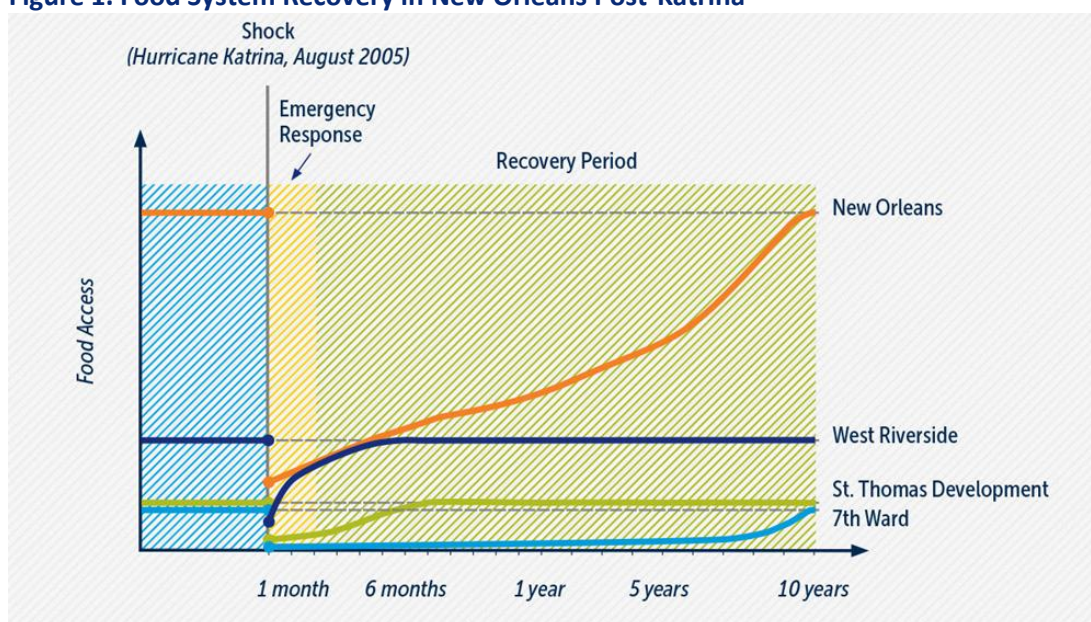
Comprehensive food system resilience involves adaptation as well as mitigation—robust interventions across the entire food system globally to mitigate negative impacts locally. Disaster risk mitigation (preparedness, response and recovery), however, has a narrower purview. The focus is on near-term, regional interventions to mitigate the impact of various types of regional disasters.

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The Feeding Cities Group developed a disaster risk mitigation framework for analyzing food system vulnerabilities to ‘local’ shocks such as natural disasters, pandemics or food terrorism.<sup>1</sup> It helps metropolitan leaders identify critical areas of weakness in their food system and prioritize the most important interventions needed for disaster risk mitigation. It isolates a specific set of vulnerabilities that could realistically be addressed in the near term. As such, the framework is focused on relevant local food production and processing (i.e., products consumed regionally that are produced regionally), food distribution and food access (retail, restaurants, institutions, and the food safety network).

The Feeding Cities Group framework is centered on equity, analyzing food supply and access at the neighborhood level to identify variances in impact for specific areas (and populations) within the city or region. Studies of natural disasters (e.g., New Orleans) show that food system disruptions will vary by neighborhood, exacerbating food access issues for populations that are already food insecure.

**Figure 1. Food System Recovery in New Orleans Post-Katrina**



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**We use the Feeding Cities Group framework, and a disaster risk mitigation and equity perspective, to guide this project. Our research included a thorough literature review, data analysis and stakeholder interviews (see Appendix for a complete list).**

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<sup>1</sup> As defined by [Johns Hopkins Center for Public Health Preparedness](#): “Food terrorism is an act or threat of deliberate contamination of food for human consumption with chemical, biological or radionuclear agents for the purpose of causing injury or death to civilian populations and/or disrupting social, economic or political stability.”

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## MOTIVATING FACTORS

The Regional Disaster Preparedness Organization (RDPO) mission is to build and maintain regional disaster preparedness capabilities in the Portland Metropolitan Region (see Appendix for more background on RDPO). Emergency food provisions have always been part of disaster planning, but recent events have caused emergency planners to reconsider their approach. The fragile nature of food supply chains and inequities in food access were put into stark relief by the COVID-19 pandemic. The pandemic demonstrated how various shocks may compromise and exacerbate food security in the Portland Metropolitan Region, particularly for communities of color and low-income households. Prior to the pandemic, food insecurity in Oregon was less than 10 percent, below the U.S. average. At the end of 2020, it had nearly doubled, mostly due to the economic crisis caused by the pandemic.<sup>2</sup> While the Cascadia Earthquake continues to dominate all emergency planning and preparedness in both Oregon and Washington, the recent wildfires, ice storms, heat dome events, and of course the pandemic and social unrest, also point to the increasing range of threats to the region.

RDPO is involved in planning efforts to address water, fuel, and shelter in emergencies, but has not yet undertaken any comprehensive planning for emergency food system preparedness, recovery, or resilience. Since 2017, the Federal Emergency Management Agency (FEMA) National Integration Center (NIC) Technical Assistance (TA) Program partnered with a cohort of major metropolitan areas, including the Puget Sound, to support supply chain resilience—initially focusing on regional food and fuel networks in 12 metros. The Puget Sound Supply Chain Analysis Network (SCAN) analysis, completed through an agreement with the Cybersecurity and Infrastructure Security Agency (CISA) and CNA as the project contractor, was focused on counties in Washington and did not include the Portland Metropolitan Region. As a result, the region lags behind its peers in terms of having a basic understanding of the vulnerability of the backbone of its food supply.

During the pandemic, FEMA Region 10, in partnership with the Oregon Office of Emergency Management (OOEM), established a weekly grocery supply chain call with the private sector to address this gap in knowledge and build relationships that were ‘not great’ before the pandemic. The leads on this effort feel that there is a need for further analysis of the vulnerabilities in the regional food system and acknowledged that their group was primarily comprised of representatives from larger food stores (although they had made concerted efforts to involve smaller grocery stores). A major barrier to these collaboration efforts, as well as outreach during disasters, is the lack of a comprehensive database of grocery stores, food markets and food distributors. FEMA Region 10 and OOEM had to develop one, as did RDPO. None of the organizations feel that they have a comprehensive list.

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<sup>2</sup> Edwards, M. (2020). [Oregon’s Food Insecurity in the Time of COVID](#). *OSU Policy Analysis Laboratory*.



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The Portland Metropolitan Region is not unique—very few cities and regions have conducted comprehensive food vulnerability assessments to date (New York City is one exception, see text box). Prior to the pandemic, most policymakers (except those in areas hit by catastrophic events) did not comprehend that their food system was vulnerable. Yet even with this understanding, there is not clear ‘ownership’ of the problem. Government involvement in the food system is fragmented among food safety, regulations and zoning, food waste management, and public health (food subsidy and nutrition programs, etc.). The private sector needs to be at the table, but does not have the same public interest. The non-profit sector is often too small and too fragmented, with competing agendas. In recognition of this issue, many cities have established public-private food policy councils, and some have dedicated food divisions (e.g., the Mayor's Office of Food Policy in New York City), to fill the leadership gap. Neither exists in the Portland Metropolitan Region.

### ***Local Government Leadership in NYC***

Hurricane Sandy in 2012 catalyzed significant food system planning in New York City as the storm surfaced vulnerabilities in its food supply chain and gaps in emergency food preparedness. One result was the commissioning of a [vulnerability study](#) of the city’s food system by the Mayor’s Office of Recovery and Resiliency (ORR) and New York City Economic Development Corporation (NYCEDC). The findings informed better preparedness plans and ultimately led to the development of the City's first ever 10-Year Food Policy Plan in 2021: [Food Forward NYC](#), a comprehensive framework for a more racially and economically equitable and resilient food system.

The structure, mission and vision of RDPO makes it uniquely suited to take leadership on food system resilience in the Portland Metropolitan Region. As noted above, FEMA has become more engaged in local food system resilience over the past decade, partnering with CNA on several [grocery store supply chain assessments](#) in recognition of vulnerable food supply chains and the limitations of current emergency food plans to address the increased frequency and severity of natural disasters. FEMA Region 10 also developed a 2021 report, [Guide to Expanding Mitigation: Connecting with Agriculture and Food Systems](#), that was focused on the production side of the food supply. RDPO has a unique convening power, experience in collaborating with broad sets of stakeholders, and valuable expertise. Further, RDPO instituted an equity and whole community approach within the organization’s guiding principles. RDPO is currently deepening that work (in response to recent social unrest in the region) by establishing a new Equity Advisory Group for the Steering Committee and adding targeted grant support to Black, Indigenous and People of Color (BIPOC) community based organizations.

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# Current Knowledge Base

The impact of climate change on food production and the risk of food terrorism to our nation's food safety have been widely studied.<sup>3</sup> However, the risks to food supply chains and food access regionally, and within cities in particular, are less well researched. Our literature review focused on Oregon, Washington and the RDPO counties: Clackamas, Multnomah, Washington, Columbia and Clark. Not surprisingly, we surfaced very few relevant studies.

The only study to address food system vulnerabilities in the region due to a natural disaster is one recently commissioned by FEMA Logistics Management Directorate (forthcoming in February). This 'life-line' Supply Chain Resilience Analysis for FEMA Region 10, covering five counties in Oregon and Washington (the impact zone of the Cascadia earthquake), includes food, along with transportation, fuel, etc. Dewberry Engineers is the lead consultant and has sub-contracted the food analysis to CNA. The findings will inform a FEMA Region 10 catastrophic earthquake preparedness plan update and will be shared with Portland UASI to inform planning for future food system resilience studies. The analysis includes Portland, but it was not a major focus and few stakeholders from the Portland region were involved in the research. Further, their analysis only included large grocery store distribution chains.

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***The lead CNA consultant for the food supply chain analysis confirmed that there was still a need for a deeper analysis of food system vulnerabilities in the Portland region, as well as research that would involve stakeholders to validate findings—a limitation of their work.***

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The strategic importance of the Portland Harbor (Oregon's largest seaport) to wheat exports is widely recognized. Marine Terminal 5 houses Columbia Grain's grain elevator and export operation, one of the largest in the country. According to the Pacific Northwest Waterways Association, 60 percent of U.S. wheat exports in 2020 came down the Columbia River.<sup>4</sup> The harbor exports the largest volume of wheat in the U.S.. While the Port's food export vulnerability is important to the national and global food system, it is less relevant from a local food system preparedness standpoint.

The Port of Portland (the Port), however, also manages three airports, four marine terminals and five business parks. The Port is a lynchpin in the region's transportation network—it is responsible for overseeing Portland

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<sup>3</sup> For food terrorism articles, see for example: U.S. Department of Homeland Security, Department of Agriculture, & Food and Drug Administration. (2015). [Food and Agriculture Sector-Specific Plan](#). Van De Light, J. (2017). [Terrorism via food systems: How should we prepare?](#) *National Provisioner*, 231, 128-130. Manning, L. (2019). Food defence: Refining the taxonomy of food defence threats. *Trends in Food, Science, and Technology*, 85, 107-115.

<sup>4</sup> Pacific Northwest Waterways Association. (2021). [Columbia Snake River System Facts](#).

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International Airport, general aviation, and marine activities in the Portland metropolitan area. We did not surface any study of the role the Port plays holistically in the local food system. We did engage representatives from the Port for our study, but due to the limited scope of our project, we were not able to fully delve into the data they may capture privately on the share and types of food consumed within the Portland Metropolitan Region that flow through the various parts of the Port’s transportation network. This would be a critical area for additional research.

Among its five business parks, the Port also developed and partially owns the Rivergate Industrial Park in North Portland. Rivergate is located in the St. Johns neighborhood at the confluence of the Columbia and Willamette Rivers. In addition to the Terminal 5 grain elevator, food manufacturers and distributors are located within Rivergate (see Map 1 in the Appendix). Levee Ready Columbia shows that Rivergate is not protected by the 27-mile levee system along the Columbia River, which could place those food businesses at risk for flooding. However, further research is needed to accurately assess flood risk (which was beyond the scope of our project) and understand the significance of these food businesses to local food supply.

Food distribution and manufacturing is typically clustered in certain areas (e.g., food manufacturing along the Columbia corridor in Portland and food distribution centers in Clackamas County) that make sense economically, but which creates certain vulnerabilities. New research is needed to understand where relevant food businesses are located within the Portland Metropolitan Region and what risks they face in terms of natural disasters in particular.

Publicly available research on food terrorism in the region is limited, although the first bioterror attack on U.S. soil was committed in The Dalles, Oregon in 1984. A cult group intentionally contaminated salad bars in local restaurants with Salmonella in an attempt to influence elections for the local zoning board (a case documented in the series *Wild Wild Country*).

## PANDEMIC INSIGHTS

We did not surface any reports related to the impact of the pandemic on the food system locally, other than on food insecurity rates and restaurant closures.<sup>5</sup> Undoubtedly many pandemic-related reports are still being written. According to estimates from Oregon State University Policy Analysis Laboratory (OPAL), food insecurity rates during the pandemic were highest for Black people, people in rural areas, and families with children. However, OPAL reports also state that current and reliable data on food insecurity rates in the state is lacking.

The State of Oregon conducted their After Action Review on the COVID-19 response in April 2021. They concluded that emergency preparation was focused on the earthquake to the detriment of other emergencies like a pandemic. RDPO’s “Regional MAC System Resource Management Interim After Action Report” from June 2021 similarly points to a need for planning for long-term and multiple incidents in the region. The report

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<sup>5</sup> Edwards, M. (2020). [Oregon’s Food Insecurity in the Time of COVID](#). OSU Policy Analysis Laboratory.

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uncovered a need for pre-established relationships and a centralized contact list among logistics staff to ensure supply chain operation.

The Oregon Restaurant and Lodging Association (ORLA) estimates that more than 1,100 restaurants across the state have closed as a direct impact of the pandemic, but they also estimate that 700 have opened since 2020, netting a loss of about 400. This is reportedly within the normal range of net openings and closing.<sup>6</sup>

The impact of the pandemic on grocery store distribution centers has been covered in the media, but we uncovered only a few research reports. Reports from KeHE Distributors (which have a location in Portland) highlight concerns about supply chain issues caused by pandemic as well as employment shortages.<sup>7</sup> Food supplier Sysco, which refers to themselves as food suppliers for everywhere except the home, had to pivot their business model when the pandemic caused widespread shut downs. Retail grocery stores were struggling with increased demand and supply chain difficulties; Sysco was able to begin supplying retail stores with the foods that they would have been supplying to restaurants and hotels who no longer needed it.<sup>8</sup> It is unclear if this was the case in the RDPO region; more research is needed into how grocery stores dealt with supply chain issues caused by the pandemic. To our knowledge, food distributors in the region have not been brought to the table for disaster or pandemic response planning.

## FOOD ACCESS MAPS

For this project, we created two initial maps of food access in the Portland Metropolitan Region to assess gaps in data (see Figure 2 and Maps 2 and 3 in the Appendix). During the pandemic, RDPO realized there was no easily accessible database of all food markets, especially smaller, ethnic-specific food retailers, in the region. RDPO had to conduct their own outreach to begin to establish such a list for public health outreach purposes in the Portland metro region during the pandemic.

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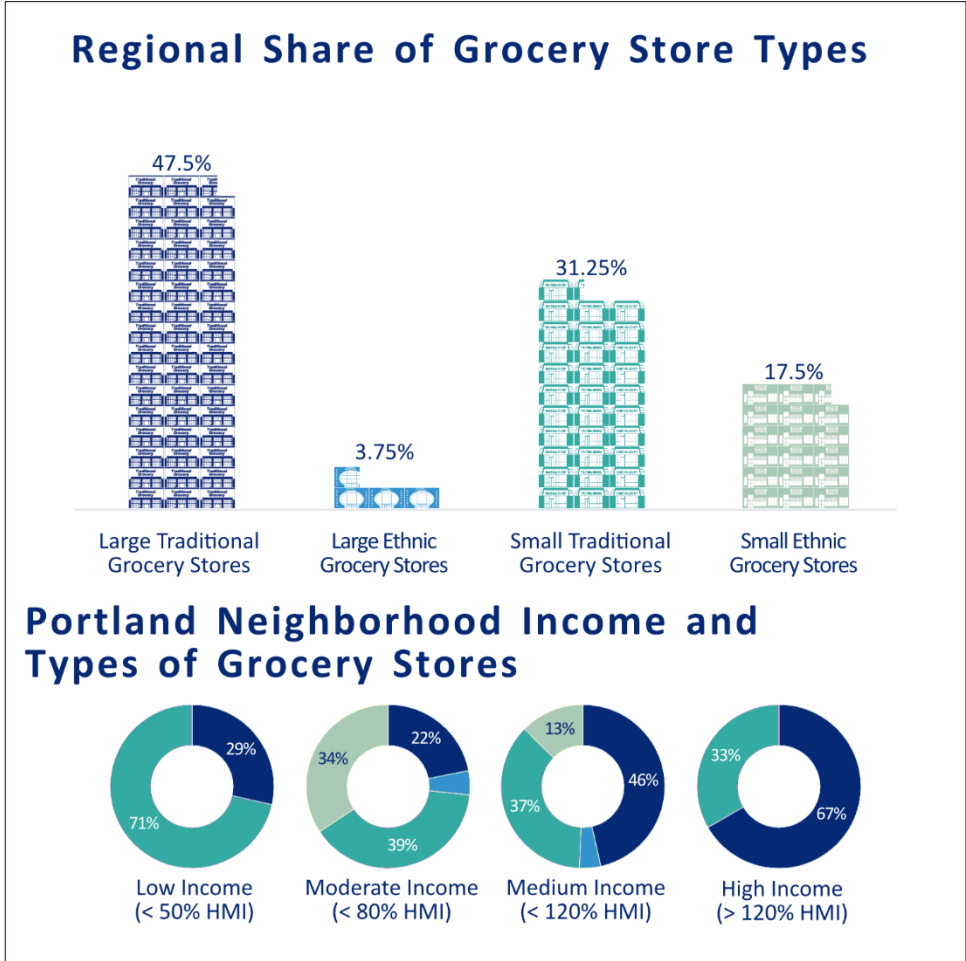
<sup>6</sup> Jackson-Glidden, B. (2021, April 14). [At Least 1,000 Oregon Restaurants Have Closed During the Covid-19 Pandemic](#). *Portland Eater*.

<sup>7</sup> Barholt, B. (2021). [The 'Next Normal' for the Food Industry](#). *KeHE Industries*.

<sup>8</sup> Steel, A. (2020, May 6). [Sysco Had to Completely Pivot After Shutdown Says CEO](#). *The Global Herald*.



Figure 2. Food Access in the Portland Metropolitan Region



# Food System Stakeholders and Resilience Initiatives

The Feeding Cities Group developed a stakeholder matrix (Table 1), which serves as an important tool for its food system vulnerability assessments. It is an efficient guide for mapping the relevant food system stakeholders from a disaster risk management and equity perspective. Perhaps more importantly, it also represents the ‘table-setting’ that needs to happen in every community to reconcile local food system agendas with the disaster risk management perspective.

**Table 1. Feeding Cities Group Food System Resilience Stakeholder Matrix**

Chief Resilience Officer/Office of Resilience	Transportation Department	Food Processing and Packaging Companies
Department of Public Health	Planning Departments	Food Retail Trade Association
Economic Development Department	FEMA	Restaurant Association
Office of Emergency Management	Food Bank	Grocery stores (large and small)
Environment and Sustainability Department	Other Food Safety Net Organizations	Harbor/Port Authority
Food Policy Councils, Task Forces, and Philanthropy	Community Development Organizations	State Department of Agriculture
Office of Food Initiatives/Policy	Food Policy and Research Centers	Utility and Telecomm Companies
Office of Small Business Development	Food Distribution Companies	Regional Water Provider’s Consortium and Water Utilities

For the purposes of this project, we identified government agencies and organizations at state, regional, county and local levels (the cities of Portland, Vancouver, Beaverton, Gresham, and Hillsboro. This exercise is not complete, and has not been validated with the stakeholders, but it does offer a broad overview of the different types of partners that will be useful to engage in further research and planning, including a potential steering committee.

Oregon Department of Human Services (ODHS) plays two important roles in food system resilience. The first is through an expanded Resilience and Emergency Management (REM) Department. REM coordinates the agency’s emergency management response in the event of a disaster, working with public and private-sector organizations across the state to secure food, shelter, and meet other basic needs. They are actively planning for Cascadia and were deeply engaged in [providing food during the recent wildfires](#). Prior to the 2021 wildfires, they had just over one person on staff, as the state had not experienced any major disasters. Currently, they have 75 people involved in the department and have established various task forces and relationships with major food and water stakeholders (e.g., the Oregon Food Bank). They partner with FEMA Region 10. During our interview, a department leader shared his enthusiasm for future RDPO research on food system vulnerabilities in the region— ‘more needs to be done on the local and regional level.’

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ODHS also manages the federal government’s food benefit program—Supplemental Nutrition Assistance Program (SNAP). During the pandemic, as it does during other disasters, the Federal government expanded food benefits to eligible, low-income individuals. Some of these benefits came in the form of greater SNAP benefits, or expanded qualifications, and others came through greater direct financial aid. The Pandemic EBT, or P-EBT, was distributed with the aid of the Oregon Department of Education, as they were able to identify families whose children were enrolled in free or reduced-price lunch programs.

The City of Portland’s Bureau of Planning and Sustainability (BPS) is collaborating with the Materials Management Program in the Oregon Department of Environmental Quality (DEQ) on two parallel initiatives: (1) foundational research on food systems to inform DEQ’s five-year Food Waste Strategic Plan 2.0 and (2) a food system landscape scan by BPS to identify gaps they might fill to drive a more sustainable (lower carbon impact) food system in the city. Staff at BPS and DEQ informed the findings of this report.

Metro has few people directly involved in food, other than in Waste Prevention and Environmental Services. However, they collect relevant data (Data Resource Center) and have departments that manage food inter-dependent systems such as transportation. Portland was one of the first cities to create a joint City/County food policy council in 2002, but it was disbanded in 2012. City staff championing the council have since retired, leaving a leadership gap for food policy work in the region. Lessons learned were documented in an [academic journal article](#).

The Oregon Food Bank is the most significant non-governmental organization addressing food insecurity in the region. The Oregon Food Bank serves the entire state of Oregon and Southwest Washington through a network of 21 regional food banks that provide food at more than 1,400 sites. However, like nearly all food banks, they are not able to meet current demand (even pre-pandemic). As is the case in every metropolitan region, there is also a group of organizations addressing food insecurity outside of the formal food bank network, such as the Tigard Free Food Project, Urban Gleaners, the PDX free fridge project and some faith-based organizations. It is important to include their perspectives in planning as they are often important assets for recovery.

The Oregon Hunger Task Force was created in 1989 by the State Legislature to support the new resolution stating that “All persons have the right to be free from hunger.” The Task Force is mandated to serve as a resource and advocate for food security in Oregon. It includes 28 members from all sectors who work with external partners to undertake food security research and develop proposals for government action. Staff support is provided by the associated non-profit, Partners for a Hunger-Free Oregon. Together, they are the leading research and advocacy organizations around food access issues in the state.

The Oregon Community Food Systems Network (OCFSN) is a collaborative network of 56 non-profit organizations and community leaders committed to developing sustainable and resilient food systems (including food production) primarily through information sharing. It was established in 2016 as a result of statewide Community Food Systems Convenings (2012-2016) to discuss the development of local and regional food systems. It could serve as a sounding board for future RDPO research on resilient food systems, especially as it relates to food access.

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A gap in our research is the philanthropic sector that supports food system work in Oregon and the Portland Metropolitan Region. The Meyer Memorial Trust, for example, funded the annual Food Systems Convenings noted above and Ecotrust research on the food system. Philanthropic organizations such as this can play a meaningful role as conveners for advisory boards, etc.

The Oregon Restaurant and Lodging Association (ORLA) is the main trade association for restaurants in Oregon, with their Metro and North Coast divisions hosting the counties within the RDPO region. They are currently in the process of creating a plan to complement the state-wide recovery plan in the hope of bolstering the food industry.

Academics at both Portland State University (PSU) and Oregon State University (OSU) are actively engaged in local food system research. Professor Megan Horst, in the Toulon School of Urban Studies at PSU, is doing the most relevant work. PSU offers a graduate certificate in sustainable food systems and a Masters of Urban Planning pathway in food systems. In 2021, she was awarded a small research grant by the Institute of Portland Metropolitan Studies (IMS) (through their Metropolitan Engaged Research Initiative (MERI) program). Professor Horst's project is focused on identifying local, small-scale, niche solutions, and community-based interventions for food system resilience in Portland through targeted community-level engagement and research. As such, her work complements and extends the research that we completed for RDPO. Laura Hanson at RDPO serves on the core project team.

Professor Mark Edwards, the Director of the Oregon State University Policy Analysis Laboratory (OPAL), has produced most of the recent research on Oregon food insecurity and serves on the Oregon Hunger Task Force. He confirmed during our interview that he is doing the most relevant work on local food systems at Oregon State University.

## **PANDEMIC MOBILIZATION**

A variety of state, regional, and local agencies, alongside nonprofit and community-based organizations, mobilized to address food insecurity during the pandemic in the Portland Metropolitan Region. The City of Portland established numerous programs. Their [Emergency Coordination Center \(ECC\)](#) provided access to affordable, nutritious, and culturally-appropriate food through their Food Security Project. The PDX CARES Cards initiative provided families with prepaid debit cards for household items and groceries. The Lunch + Play program with Portland Parks and Rec (PP&R) provided breakfasts and lunches to school-aged children while Hood to Coast helped distribute leftover meals directly to families.

The Oregon Food Bank expanded the food distributed through their existing network and increased mobile delivery and pop up distribution during 2020. They also worked collaboratively with the State to secure federal funding for emergency food assistance. In the State of Washington, the Clark County Food Bank supplied food through their food box, special service, hot meal, and mobile community sites. SUN School Pantries, supported by a partnership between Multnomah County and the Oregon Food Bank, played a significant role in providing emergency food during the pandemic.

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Zenger Farm worked with Black, Indigenous, and people of color community organizations, individual families, and food pantries to provide plant starts, seeds, home meals, and pantry staples. They pivoted to home delivery for their program, CSA Partnerships for Health, which provides food to medically fragile community members with help from food banks. They also shifted produce sales from suddenly-closed restaurants to support for Sisters of the Road, Familias en Acción, and food banks.

Ecotrust used their expertise in business development and training to try to address food system constraints and racial inequities. Among other initiatives, they hosted markets by and for BIPOC farmers and hosted a chef-led hunger relief program that grew into Feed the Mass. They also used their small-scale food hub at the Redd to facilitate purchasing agreements between BIPOC farmers and large institutional buyers.

## MAPPING FOOD SYSTEM STAKEHOLDERS

The pandemic has also catalyzed various initiatives addressing local food system resilience. To begin to capture and identify ‘who is doing what’—and who could serve as important partners for future RDPO work in this area—we conducted a review of organizations working towards food system resilience (see Figures 1 and 2 in the Appendix). Our visual mapping of stakeholders should be considered a preliminary draft based upon information gathered in this short-term project; it should serve as a foundation for the full-scale assessment and provide a starting point to validate and update with stakeholders.

In the Appendix Figure 1 visualization:

- The inner circle contains organizations that focus their work in the food system on preparing for, responding to, an/or rebuilding after an emergency event. Some engage in initiatives with the goal of diversifying inputs and supporting food entrepreneurs. Some focus on planning for disasters and climate change as it impacts the food system. Others research the impacts of disasters on the food system and provide recommendations to increase resilience. These are groups that are doing food system resilience work either in the Portland region, at the state-level, or more broadly, in the Pacific Northwest.
- The middle circle contains organizations that either work on food-related issues related to resilience or that could benefit from a resilience perspective or they focus on general emergency management without an emphasis on the food system.
- The outer circle contains organizations that focus on food generally or that interact with the food system in some form, but do not make mention of resilience and are focused on either a specific issue or engage in food system work adjacent to other work.
- Beyond the circle are organizations that impact the food system, but do not have specific initiatives or a focus on food.

## KEY REGIONAL PLAYERS

While there was a great deal of momentum around food issues as a result of the pandemic, the work has been mostly reactive to date. The [Equitable Food Economy Collaborative](#) is perhaps the most significant, strategic ‘table-setting’ effort around the local food system in the region. It is one of the first times that the major players in the food system have formally partnered on any initiative.



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Prosper Portland convenes and provides oversight for the collaboration, which is funded by a two-year [USDA grant](#) received in 2021 by the Portland Development Commission. The Collaborative includes approximately 10 organizations that include regional nonprofits, agricultural producers, Oregon State University, and the Oregon Department of Agriculture. The overarching goal of the collaboration is to ‘catalyze the development of an equitable and resilient regional food economy,’ but the current focus is on addressing barriers to entrepreneurship and growth for BIPOC agricultural producers. While this focus is not entirely relevant to a food system vulnerability assessment, the collaboration is a significant asset in building a coalition of support for food resilience planning and implementation.

[Ecotrust](#) is a key partner in the Collaborative and supports project management. It also has numerous other initiatives for building an equitable and environmentally responsible regional food system, although most focus on agricultural production and producers. This strategy is informed by their [2015 report](#): Oregon Food Infrastructure Gap Analysis: Where Could Investment Catalyze Regional Food System Growth and Development?

# Current State of Food System Planning

Each county in the RDPO region has a food system plan, although some are more than ten years old (Table 1). The plans focus on equitable food access, food insecurity, healthy food, urban and sustainable agricultural production and managing food waste. Multnomah County undertook the most comprehensive food planning process resulting in the *Multnomah Food Action Plan: Grown and Thrive 2025 Community Action Plan*, completed in 2010. The Oregon Hunger Task Force also developed a *Plan to End Hunger 2019-2022*.

**Table 2. Food Systems Plans in the RDPO Region**

Organization	Plan/Report Name	Year	Main Topics
City of Portland, Bureau of Planning and Sustainability	Portland Plan Background Report: Food Systems	2009	<ul style="list-style-type: none"> <li>- Food Access (grocery stores, restaurants/fast food, food assistance, direct marketing)</li> <li>- Urban Agriculture (community gardens, urban farms)</li> <li>- Additional Topics (institutional purchasing, processing, waste, economy)</li> </ul>
Multnomah County	Multnomah Food Action Plan: Grow and Thrive 2025 Community Action Plan	2010	<ul style="list-style-type: none"> <li>- Local Food (protecting agricultural land, supporting small and mid-scale farms, increasing urban food production and sustainable resource stewardship)</li> <li>- Healthy Eating (supportive environments, equitable access in underserved neighborhoods, encouraging healthy food choices, awareness of assistance programs)</li> <li>- Social Equity (address the causes of injustice, increase community resilience, equitable participation and decision-making, opportunity and justice for farmers and workers)</li> <li>- Economic Vitality (regional food economy and infrastructure, local product promotion, institutional support for local food system, job creation)</li> </ul>
Clark County Public Health Advisory Council and Clark County Public Health	Growing Healthier: Planning for a healthier Clark County	2012	<ul style="list-style-type: none"> <li>- Access to Healthy Food (retail recruitment and retention, availability of healthy food, community food security resources, disparities in access)</li> </ul>
Columbia County	Community Food Assessment	2013	<ul style="list-style-type: none"> <li>- The Food System Cycle (agriculture/livestock, processing, restaurants, retail, waste)</li> <li>- Community Needs and Efforts (SNAP/WIC, pantries, schools, community food education, pantry/community gardens, farmers markets, online presence)</li> </ul>

Organization	Plan/Report Name	Year	Main Topics
Western Washington County	Community Food Assessment: Bridging the Gap Between Rural and Urban	2013	<ul style="list-style-type: none"> <li>- Agriculture (UGB, industry and market changes, support for the next generation of farmers, farmworkers)</li> <li>- Community Food Assistance (homelessness, federal assistance, food pantries, gleaning, New Earth Farm)</li> <li>- Local Assets (diversity, direct market sales, rural grocery stores, granges, community and school gardens, community conversations and meetings, food web)</li> </ul>
Clackamas County	Community Food Assessment	2015	<ul style="list-style-type: none"> <li>- Food Production (agriculture, farmworkers, agricultural development, processing)</li> <li>- Food Consumption (distribution, access/assistance, waste)</li> <li>- Community Supported Food (community and school gardens, local business, education, community partnerships)</li> </ul>
Oregon Hunger Task Force	Plan to End Hunger 2019-2022	2019	<ul style="list-style-type: none"> <li>- Equitable access to resources and opportunities</li> <li>- Equitable access to nutritious food and support programs</li> <li>- Leadership by those most impacted by hunger</li> </ul>
FEMA Region 10	Guide to Expanding Mitigation: Connecting with Agriculture and Food Systems	2021	<ul style="list-style-type: none"> <li>- Regional food production statistics and definitions</li> <li>- Engaging farmers, rancher, fishers, and subsistence users in planning</li> <li>- Food system risk and vulnerability analysis</li> <li>- Role of agricultural and working landscapes in enhancing resilience</li> <li>-Funding mitigation projects</li> </ul>

The Multnomah Food Action Plan is the only one that specifically references resilience and emergency preparedness. In counties with significant rural populations, the plans raised food access issues related to limited grocery stores/grocery store closings. Clackamas County’s plan notes that many rural grocery stores in the county do not carry fresh produce. The plans also note that pantries already struggle to find transportation to the Oregon Food Bank Hub in Portland for their weekly supply.

FEMA Region 10’s Guide to Expanding Mitigation offers guidance for emergency planning around food systems in Alaska, Idaho, Oregon, and Washington. They recommend identifying complementary plans that provide a glimpse into past and ongoing shared objectives and capacity. Collaborating with landowners and managers, including farmers, ranchers, fishers, and subsistence users, as well as partners in federal, state, county, and local governments can provide insight into past events and potential impacts of future events. It also allows these groups to connect with each other to produce projects that benefit everyone. In their overview of hazards, they offer questions to consider how different hazards will impact livestock and crops, transportation and supply chains, evacuation, and safety. They explain how agricultural landscapes can be used to mitigate

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damage from flooding, drought, and erosion especially. The guide concludes with resources for funding and engaging in hazard mitigation efforts.

## PRIORITY HAZARDS FOR THE REGIONAL FOOD SYSTEM

Earthquakes pose the greatest catastrophic risk to the region and, therefore, the greatest threat to the regional food system. While a crustal quake (a more localized earthquake) would be more destructive regionally, a Cascadia Subduction Zone earthquake is more probable. However, as the pandemic and wildfires have shown, other hazards also threaten the region's food system. And while earthquakes are the focus of much of the region's hazard mitigation and emergency planning, the potential impact of other hazards on the region's food system should be addressed. Further, RDPO research and planning around specific hazards will also be instructive for earthquake plans, given that they may be cascading events and the regional/local nature of the research, while the converse is not necessarily true. The insights from assessing the potential impact from earthquakes on the food system may not be helpful for understanding the impact of wildfires, for example.

Therefore, based on a thorough review of natural hazard mitigation plans (NHMPs) and our expertise on food system vulnerabilities, we identify the following six additional hazards as priorities for any future research on food system vulnerabilities in the Portland Metropolitan Region:

- Flooding and Landslides (see Map 4 in Appendix)
- Winter Storms
- Wildfires
- Food terrorism (including cyberterrorism within the food system)
- Socio-economic disruptions (e.g., a pandemic, terrorism, etc.)

The four natural disasters were identified based on the State of Oregon's probability and risk calculations for each hazard in Region 2 (the Northern Willamette Valley) combined with Clark County's hazard rankings. Each hazard, except for wildfires, was categorized in the hazard rankings as high probability and high-risk. We also cross-referenced the [U.S. Climate Resilience Map for Oregon](#), which supports the inclusion of wildfires (part of the Portland Metropolitan Region is at fairly high risk, while the other part is at fairly low risk of wildfires).

All five RDPO counties identified severe weather, including winter storms, as one of their top or high-risk hazards. The City of Portland has its own NHMP, separate from Multnomah County. The City described severe weather as among its top hazards of concern, along with landslides and wildfires. Similar concerns were noted by other RDPO regional partners including the Washington Emergency Management Division and Emergency Management British Columbia. While the heat dome is also a recent event that may be top of mind for emergency planners, our research shows that extreme heat does not significantly impact the local food system in terms of supply and access. The disproportionate impact of climate change and natural disasters on BIPOC communities, in part because of systemic racist policies such as redlining, is the focus of a growing body of

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research.<sup>9</sup> Very little research, however, focuses on how these events disproportionately impact food supply and access in BIPOC neighborhoods.

Columbia County identified socio-economic disruptions such as dam/levee failures, terrorism, and infectious disease epidemics as hazards in their NHMP. Food terrorism was not specifically highlighted in the plan, though cyber-terrorism was mentioned briefly. Multnomah County acknowledges terrorism that targets the food and agricultural sector as well as cyber-attacks along with other human-caused and technological hazards in Annex 1 to the NHMP. Neither socio-economic disruptions nor food terrorism were mentioned in any other NHMP.

Current NHMPs primarily focus on the impact to agriculture rather than local food supply and food access (although grocery store supply chain disruptions are mentioned), which is a critical oversight. The impact to agriculture is important given its significance to the regional economy, but understanding vulnerabilities in food supply chains and food access are more important from a disaster risk management perspective because only a small share of food consumed in the region is produced in the region. The impact on fisheries/fishing is an important consideration (and is included in the City of Portland NHMP), especially because of the importance of fish to Indigenous tribes.

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***Our research did not surface any studies of the potential impact of these six hazards on the food system in the Portland Metropolitan Region.***

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<sup>9</sup> See for example, Katz, L. (2021). [A Racist Past, a Flooded Future](#). Redfin News. Portland is a handful of metro areas where formerly redlined neighborhoods have a larger share of homes at risk of flooding than other neighborhoods.



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# Does RDPO need to assess the vulnerability of its food system?

**The research conducted over the past five months strongly suggests that a comprehensive analysis of the Portland Metropolitan Region’s food system vulnerabilities is warranted.** It should include, but go beyond a grocery store supply chain analysis, and explicitly consider food access in communities at most risk to be impacted by food system disruptions. A comprehensive assessment of the region’s food system resilience will follow best practices of other leading U.S. cities and aligns with Portland’s membership in the global C40 initiative. By focusing on the Portland Metropolitan Region, it will complement research and planning for resilient food systems at state and multi-state levels (e.g., FEMA Region 10).

## LEADERSHIP AND COLLABORATORS

As discussed above, RDPO is well-suited in the region to take leadership on this type of initiative that bridges collaboration between emergency management and other disciplines. The organization’s convening power and collaborative approach also will ensure that the assessment and plan will inform FEMA management and policymaker decisions regarding food system preparedness.

A comprehensive food vulnerability analysis would benefit multiple jurisdictions, and stakeholders from all five RDPO counties would need to be involved. Further, while the RDPO has a vast network, it will be important to identify allies and partners from the stakeholder map (the inner most circle) because food system resilience spans disciplines broader than the RDPO’s existing network. This will include current partners at PSU, the City of Portland (BPS), Metro, Oregon DHS, OEM, and DEQ, and within FEMA Region 10, as well as organizations that have their own convening power and have already gained traction in bringing together stakeholders (e.g., Prosper, EcoTrust, Oregon Hunger Task Force, and Oregon Food Bank). The stakeholder matrix (see Appendix) can be used to identify other stakeholders critical for shaping and validating the research. We recommend the creation of a multi-disciplinary steering or advisory committee as an integral part of any future research, planning or framework development.

## PRIORITY HAZARDS

We recommend focusing on the six hazards listed above, although they should be validated as a first step in any future research project. They are shared hazards across the RDPO region that are not receiving as much planning attention as earthquakes. Also, new research will be able to reference and utilize the Cascadia food supply chain analysis that was recently completed at the end of 2021.

The identification of distinct hazards is important, as they impact the food system in different ways, and it follows best practice of other cities. In Toronto, for example, three weather events were analyzed—significant rain that leads to widespread flooding, an extended heat wave, and a significant winter ice storm. The project leaders within the city had a mandate to choose the most likely weather events to become significantly worse

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in Toronto in the near term due to climate change. They also wanted to choose hazards that had the potential to cause extensive damage across the city. Therefore, events such as earthquakes that are not linked to climate change, and landslides, which are very localized, were not prioritized.

## **A FOCUS ON EQUITABLE RESILIENCE**

This type of assessment would provide the region with clear priorities for addressing the greatest risks in the food system to various shocks. With the right approach, it would also identify the populations and neighborhoods in the region most likely to be impacted, allowing for an equitable recovery and resilience.

We recommend placing the most vulnerable communities and households at the center of the analysis and design work to ensure planning drives towards equitable resilience. While research on grocery supply chain vulnerabilities (which focus on the largest food distribution networks) is important, we recommend taking a systems approach that includes the last mile connections to specific neighborhoods (including culturally specific retail groceries and corner stores) and explicitly considering deep food security and access issues.

A roadmap for addressing the priorities can be used to inform local jurisdictional plans and future Natural Hazard Mitigation Plan updates, helping to address the regional response and recovery gaps that surfaced during the pandemic.

## **Acknowledgements**

The Regional Disaster Preparedness Organization (RDPO) in Oregon provided the leadership and funding for this study and Laura Hanson, Senior Regional Planning Coordinator, served as project manager and a partner in the research. Laura provided critical connections in the community and thoughtful insights that guided our work. We also thank the contributions of two project interns (graduate students in Urban and Regional Planning, Portland State University), whose energy, research and mapping skills made the tight timeframe feasible: Sarah Pearlman and Mary Hendricks.

# **RDPO Regional Food Systems Resilience Scoping Study: APPENDIX**



**January 2022**

## Stakeholder Interviews

The following list includes the 18 individuals interviewed for this report. All interviews were conducted during September 2021-January 2022 via video call and are organized by date of interview.

**Table 1. Stakeholder Interviews**

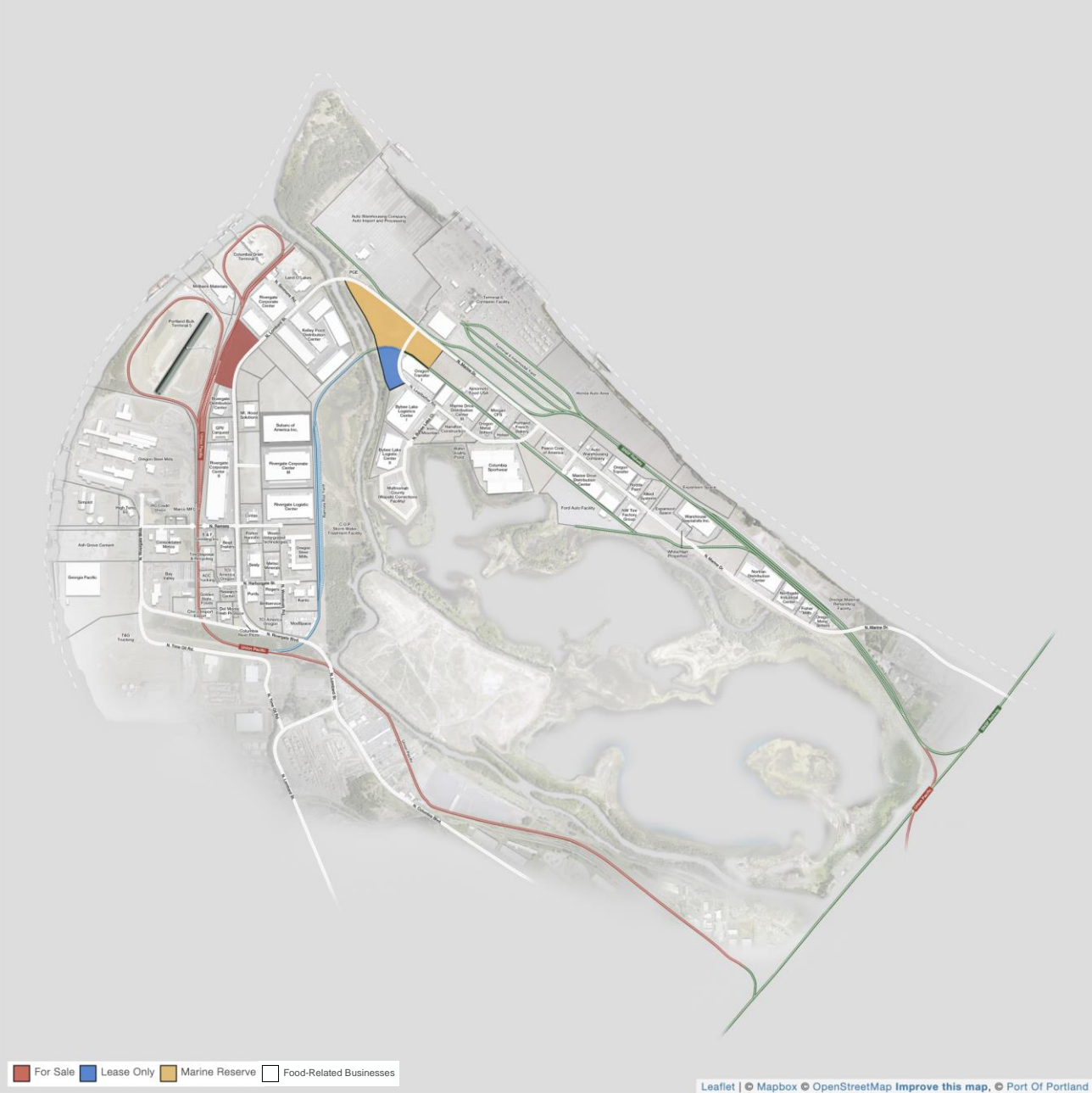
Name	Title	Organization	Date
Paul de Block Genevieve Joplin	Engagement Coordinator, Bureau of Planning and Sustainability (BPS)  Bureau of Planning and Sustainability (BPS)	City of Portland	9/9/2021, 10/14/2021, 12/8/2021
Elaine Blatt Gabrielle Hobbs	Senior Policy and Program Analyst, Materials Management Program  Food Waste Reduction Research Specialist, Materials Management Program	Oregon Department of Environmental Quality (DEQ)	9/9/2021, 10/14/2021, 12/8/2021
Noelle Dobson	Regional Planner, Waste Prevention and Environmental Services	Metro	10/13/2021
Joe Gordon	GIS Specialist, Data Resource Center (project lead for the RDPO/Metro Social Vulnerability Index/Tool)	Metro	10/20/2021
Danny Faccinetti	Director of Operations	Oregon Food Bank	10/22/2021
Sonya McCormick	Program Manager, Public/Private Partnerships	Oregon Office of Emergency Management	11/4/2021
Brett Holt Andrew Romer	Senior Stakeholder Relations Specialist, External Affairs Division	FEMA Region 10	11/4/2021
William (Bill) Tombaugh	Emergency Management Analyst	FEMA National Integration Center	11/11/2021
Lars Hanson	Research Scientist, Lead Consultant on Region 10 Supply Chain Analysis	CNA	11/12/2021
PJ Christopher	Business Development Manager	Port of Portland	11/29/2021
Ken Anderton	Senior Manager, Business and Real Estate Development	Port of Portland	11/29/2021
Phil Palin	Consultant on Region 10 Supply Chain Analysis	CNA	12/1/2021

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Name	Title	Organization	Date
Jeff Gilbert	Regional Emergency Coordinator (North)	Oregon Department of Human Services	12/21/2021
Mark Edwards	Oregon State University Policy Analysis Laboratory (OPAL) Director and Professor of Sociology	Oregon State University Oregon Hunger Task Force	1/6/2022
Kenny Ngo	Senior Director of Operations	Pacific Coast Fruit Company	1/12/2021



Map 1. Rivergate Industrial District and Food-Related Businesses

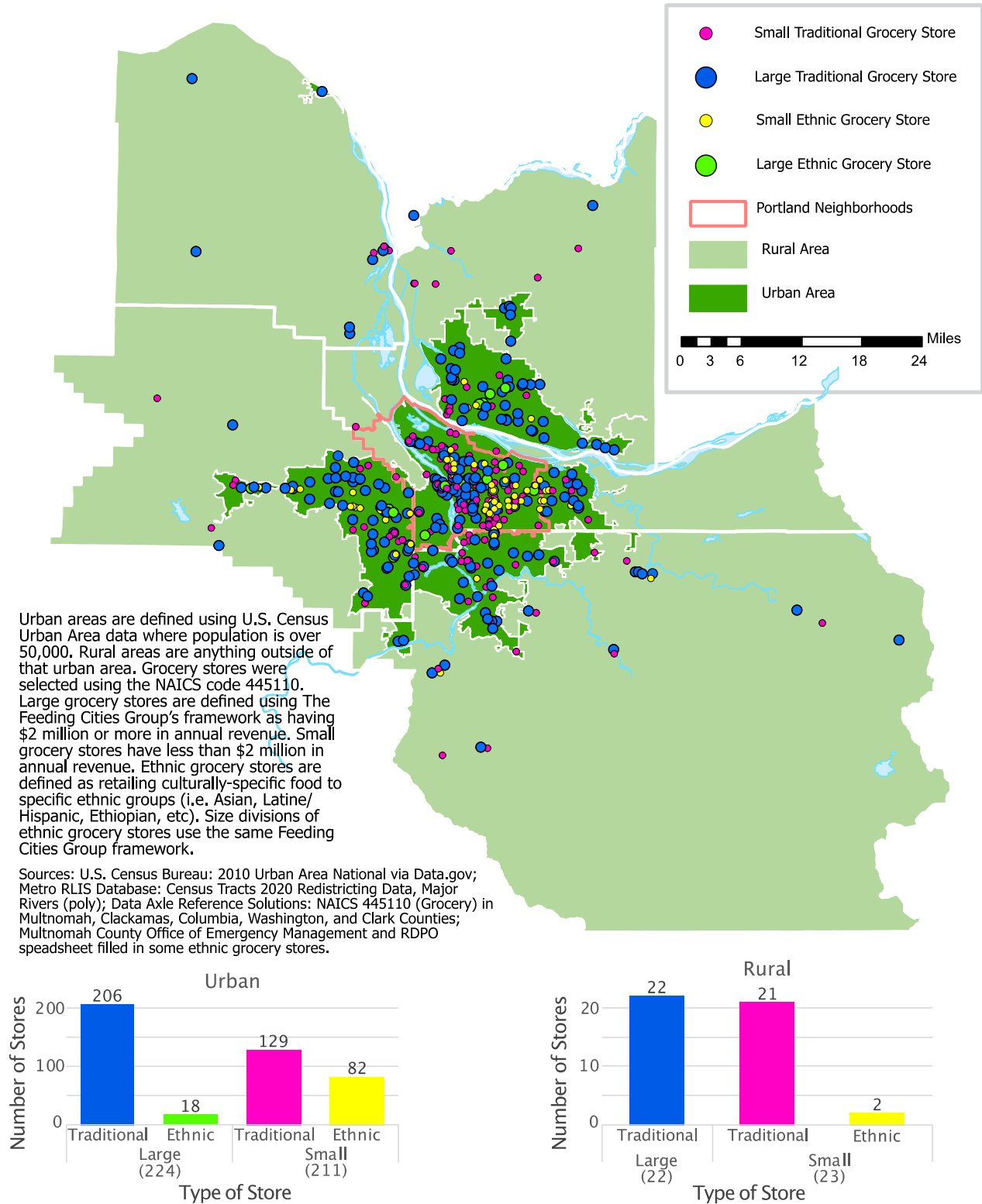


The base map including lots, buildings, rail lines, streets, and the harbor line is from the Port of Portland’s website. Highlighted in green is any building or lot that houses a business related to food many of which are export or import based distributors. These uses were determined by examining active businesses on Google Maps. Many of these uses are therefore preliminary estimates.

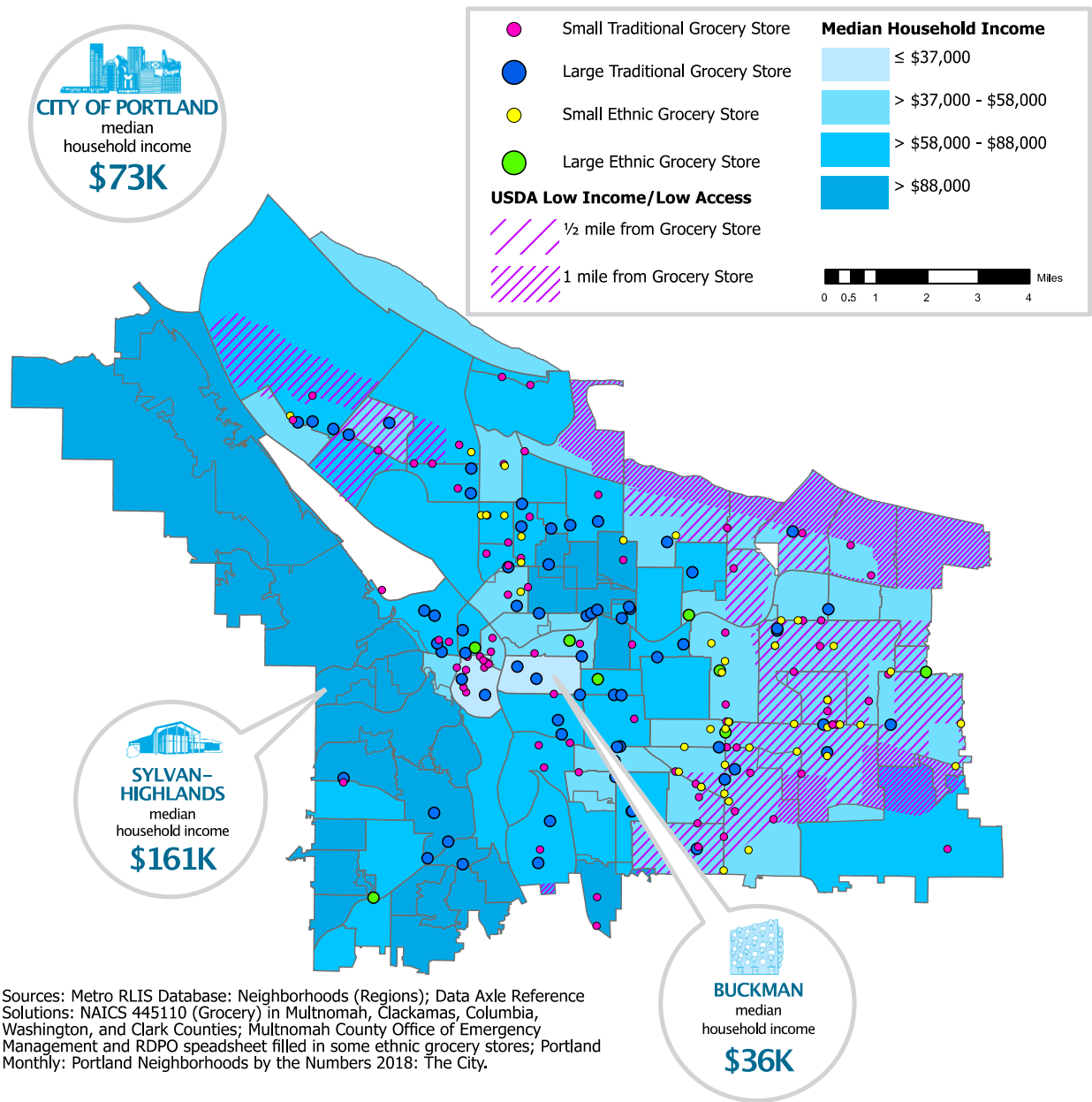
Food-related businesses and their operations (clockwise from the bottom left part of the map).

Del Monte Fresh Produce	Chin's Import Export	Golden State Foods	ADM Sweeteners (Consolidated Metco)	Papa John's Distribution (Rivergate Distribution Center)	Columbia Grain (Terminal 5)	Land O' Lakes, Purina Feed	Ajinomoto Food	SJ Distributors (Morgan CFS)	Portland French Bakery	Pizza Blends (Northgate Industrial Center)
Wholesale produce operations and sales	Food products and restaurant supplies	Food product processing and distribution.	Sugar factory	Food product distribution	Major grain export terminal	Pet and livestock feed processing and distribution	Frozen food manufacturing	Wholesale food distribution	Wholesale bakery producer and distributor	Flour production and warehouse

Map 2. Grocery Stores in the RDPO Region



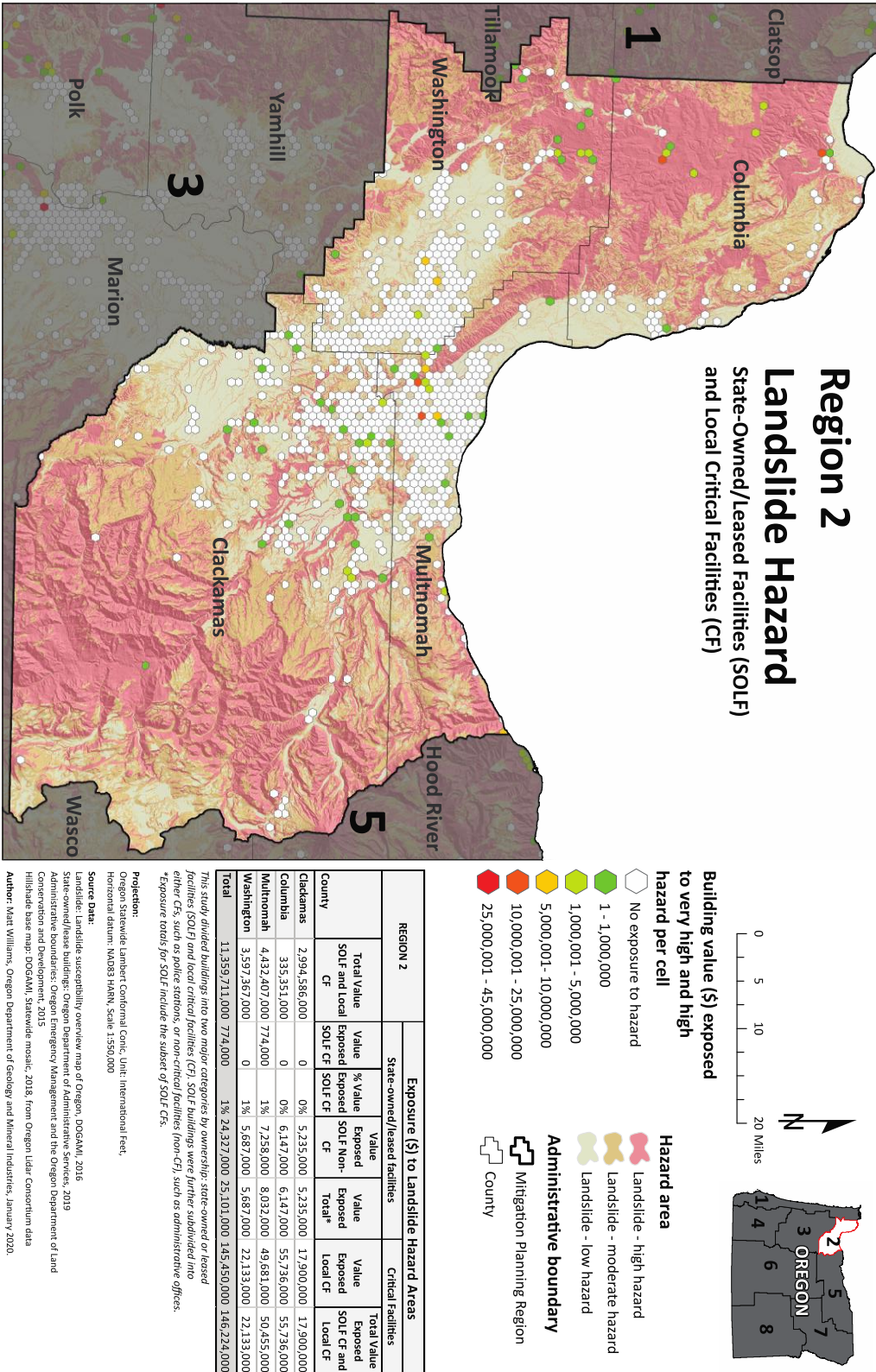
### Map 3. Food Access in the City of Portland



Grocery stores were selected using the NAICS code 445110. Large grocery stores are defined using The Feeding Cities Group's framework as having \$2 million or more in annual revenue. Small grocery stores have less than \$2 million in annual revenue. Notably, some large grocery stores are not owned by national chains and some small grocery stores are not independently owned. Ethnic grocery stores are defined as retailing culturally-specific food to specific ethnic groups (i.e. Asian, Latine/Hispanic, Ethiopian, etc). Size divisions of ethnic grocery stores use the same Feeding Cities Group framework. Ethnic grocery stores are defined as retailing culturally-specific food to specific ethnic groups (i.e. Asian, Latine/Hispanic, Ethiopian, etc). Size divisions of ethnic grocery stores use the same Feeding Cities Group framework. Household Median Income (HMI) data was selected because it was divided by neighborhood rather than Census block or tract. The data is broken up according to the Department of House and Urban Development (HUD)'s criteria for low-to-moderate income. The citywide HMI was \$73,097 in 2018 according to datausa.io. The breaks for HMI are rounded to the nearest ten thousand. The first break is below 50% of the citywide HMI, what HUD calls low income. The second is between 50% and 80% or moderate income, the third is between 80% and 120% or medium income, and the last is above 120% of HMI. The USDA ERS's Food Access Research Atlas (FARA) is based on Census Tracts rather than neighborhoods. They use two metrics, low income and low access, to replace the term "food desert." The FARA includes supermarkets, supercenters, and large grocery stores equivalent to the large grocery store category here. Low income status is determined by a poverty level of 20% or a median family income of less than or equal to 80% of either the statewide or metropolitan area median family income. Low access is characterized by a significant number or share (500 or 33%) of the population living a certain distance from a grocery store.

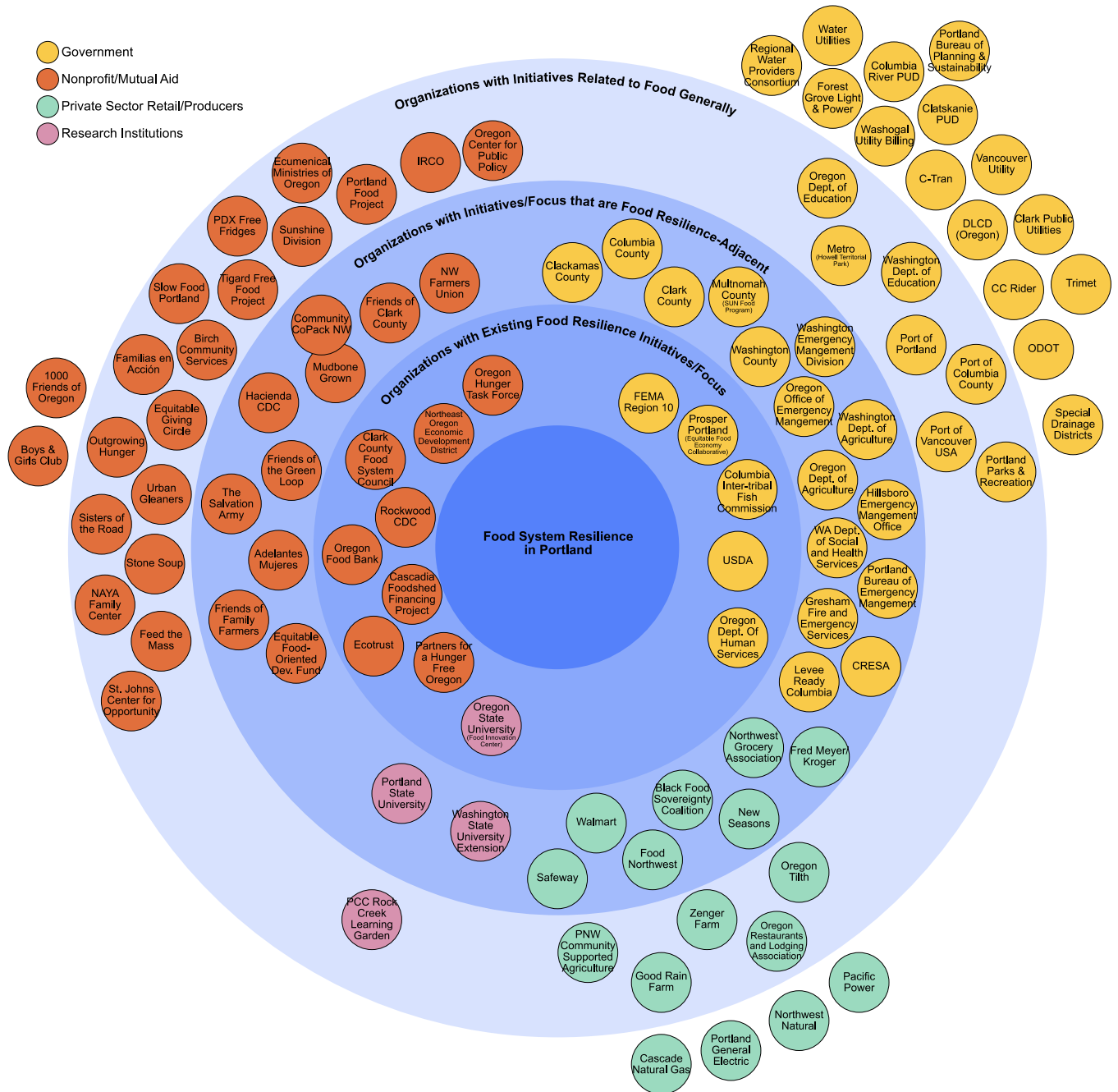
## Map 4. Landslide Hazard Map for State of Oregon Region 2

This map was downloaded from the State of Oregon NHMP Appendix 9.1.26 on January 10, 2022.





**Figure 1. Stakeholders in the Portland Regional Food System**



The inner circle contains organizations that focus their work in the food system on preparing for, responding to, an/or rebuilding after an emergency event. Some engage in initiatives with the goal of diversifying inputs and supporting food entrepreneurs. Some focus on planning for disasters and climate change as it impacts the food system. Others research the impacts of disasters on the food system and provide recommendations to increase resilience. These are groups that are doing food system resilience work either in the Portland region or in the state and Pacific Northwest.

The middle circle contains organizations either work on food-related issues that relate to resilience or that could benefit from a resilience perspective or they focus on general emergency management without an emphasis on the food system.

The outer circle contains organizations that focus on food generally or that interact with the food system in some form, but do not make mention of resilience and are focused on either a specific issue or engage in food system work adjacent to other work.

Beyond the circle are organizations that impact the food system, but do not have specific initiatives or a focus on food.



Figure 2. Food Stakeholder System in the RDPO Region

