Portland General Electric

Use and Application of EPA's EJSCREEN

Environmental Health & Safety
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Executive Summary

The term environmental justice (EJ) describes a variety of regulatory initiatives aimed at addressing adverse environmental impacts that historically have disproportionally impacted disadvantaged communities. A number of these initiatives, at both the federal and state level, could potentially or even directly affect PGE's operations. State-level legislation requires utilities to communicate effectively with a wide variety of customer groups and federal policies encourage agencies to foster effective engagement during permitting actions and enhanced compliance enforcement efforts in EJ communities. It will be increasingly important for PGE to recognize demographic differences, not only in the communities we serve, but also those surrounding our current and future generation, transmission and distribution assets. Failure to do so has the potential to undermine our standing in the community and to interrupt permitting activities, resulting in project delays and increased costs.

This paper is intended to introduce the reader to EJ issues, providing historical and regulatory context, as well as to highlight aspects of PGE's operations that may be affected. In addition, we provide detailed information on EJSCREEN, an important web-based tool developed by the Environmental Protection Agency (EPA), that can be used to identify geographic areas with potential EJ vulnerabilities.

Acronyms

ACS	American Community Survey
CB	Census Bureau
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
DEI	Diversity, Equity & Inclusion
EJ	Environmental Justice
EPA	Environmental Protection Agency
HB	House Bill
$PM_{2.5}$	Particulate matter that is 2.5 microns or less in diameter
NATA	National Air Toxics Assessment
NPL	National Priorities List
OPUC	Oregon Public Utility Commission
ORD	Office of Research and Development
RCRAInfo	Resource Conservation and Recovery Act Information
RSEI	Risk Screening Environmental Indicators
TSDF	Treatment, Storage and Disposal Facilities
US	United States

Background & Context

Beginning with Dr. Robert Bullard's publication of *Solid Waste Sites and the Black Houston community* in 1983, significant research has shown that established structures in the United States (US) expose certain demographic groups to disproportionate amounts of environmental toxins, leading to significant health disparities between members of different demographic groups[1]. There are differences in mortality and morbidity rates in communities based on factors that include race/ethnicity, income and educational attainment. The rise in claims of environmental racism sparked a movement around environmental justice in the late 1980s which has developed to have cross-sectoral impacts in the present. EJ continues to affect the day-to-day operations of federal agencies, community interactions, and the priorities of a variety of community and business entities.

EJ has been defined by the EPA as, "... 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. Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental and commercial operations or policies[2]. "Environmental justice communities" include minority and low-income communities, Tribal communities, and other communities traditionally underrepresented in public processes[3]. For PGE, this means there is a need to balance ensuring reliable power and enhancing facilities for customers combined with the need to respect the unique needs and positions of communities.

Environmental Justice Law

At the federal level, environmental justice was established as a priority under President Clinton's Executive Order 12898 on EJ "Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations," issued in 1994. Executive Order 12898 directs each federal agency to make achieving EJ part of their mission by identifying and addressing disproportionately high and adverse human health or environmental effects of the agencies' programs, policies, and activities on minority and low-income populations[4]. Under the Order, federal agencies are required to develop an Environmental Justice Strategy in addition to reporting on their compliance with the Order[5]. Executive Order 12898 initiated a surge in regulatory and policy actions by states requiring agencies to consider EJ in decisions made on policies, practices, and procedures.

More recently, the Biden Administration announced a commitment to direct 40 percent of the administration's climate and clean energy investments to disadvantaged communities and launched the Justice40 Initiative through executive order 14008, signed in January 2021.[6]

In Oregon, elements concerning EJ have been included in policies affecting agencies across the state. In 2007, Senate Bill 420 created the Environmental Justice Task Force and became the state's EJ law. The bill requires state natural resource agencies, including Oregon Department of Environmental Quality, Oregon Public Utility Commission (OPUC), and 12 other agencies, to follow prescribed steps to provide greater public participation and ensure involvement of people who may be affected by agency actions[7]. The law requires state natural resource agencies to address EJ issues as part of standard operations and report directly to the Governor on their progress. The Task Force also meets

with EJ communities across the state, reports directly to the Governor about EJ concerns those communities are facing, and works with agencies to address those concerns while meeting EJ goals[8].

In the 2021 state legislative cycle, House Bill (HB) 2021 and HB 2475 were passed, both containing elements that address EJ. HB 2021 establishes clean energy targets for retail electricity providers, but also requires energy generation to provide benefits to communities by creating and sustaining living wage jobs, promoting workforce equity, and increasing energy security and resiliency. Electricity companies are required to consult with Indigenous communities and federally-recognized Tribes on the siting, permitting, and construction of new facilities or projects if they are likely to adversely impact designated sites of archeological significance or properties of traditional, cultural, and religious importance. The bill further requires electric companies to convene a Community Benefits and Impacts Advisory group which must include representatives from EJ communities and low-income ratepayers. It also determines that companies must minimize burdens for EJ communities throughout the implementation of their clean energy targets and companies must look for opportunities to increase contracting with businesses owned by women, veterans, or Indigenous or People of Color[9].

HB 2475 authorizes the OPUC to consider differential energy burdens and other inequities of affordability in rates and offer schedules of rates applicable to individual customers or groups of customers. The bill also authorizes public utilities to enter into agreements with organizations that represent broad customer interests, including low-income residential customers or residential customers that are members of EJ communities. In these agreements, utilities may provide financial assistance, up to $500,000, to organizations that are deemed eligible[10].

Environmental Justice at PGE

In its Equity Statement[11], PGE acknowledges the disparities that exist in delivering electric service and is cognizant of the ways they have been shaped by regulatory policy, legislative policy and institutional procedures. We cannot ignore the historical barriers and biases affecting low-income households, communities of color, people with disabilities and other historically underserved communities. Nor can we ignore the societal inequities that make it harder for these groups to access renewable energy programs, technologies, and jobs. Addressing these disparities is now part of our job at PGE, and our commitment to supporting the success of the communities we serve runs deep. We must consider how environmental justice concerns will affect our process for developing safe, clean, and reliable energy to Oregon residents.

In recent years, PGE has established outreach programs to engage underserved customers by building an employee and leadership base that mirrors the communities we serve and cultivating a workplace culture that embraces equity. We've fostered relationships with key stakeholder groups and developed business practices designed to break through economic, cultural and language barriers. We want to ensure all customers – regardless of income, background, ethnicity or physical location – can benefit from the evolving way energy is generated and delivered while keeping rates low.

We've made concrete investments in clean energy for low-income populations, strategically locating electric vehicle charging stations and providing incentives for communities to adopt energy-efficient products and rooftop solar. We've designed billing and communication programs that account for the

diverse needs of our customer base and ensured that our Public Safety Power Shutoff outreach is available in Spanish. We're developing strategies to effectively communicate with communities in higher-risk areas using pre-established community networks and maintaining accessible lines of communication to address questions and concerns.

Discriminatory land use policies have historically encouraged industrial development within low-income and minority communities, presenting a variety of health concerns for residents. PGE must find ways to understand the needs of surrounding communities when evaluating new sites for generation, transmission, and distribution assets. Recognizing when public outreach might be needed early in project development will help us avoid, offset, or minimize significant adverse disproportionate environmental impact. Early attention to EJ concerns can also ensure that our outreach materials, target the right populations, avoid technical language and are available in the appropriate range of languages[12].

EPA's EJSCREEN

The EPA developed an environmental justice mapping and screening tool known as EJSCREEN in an effort to meet their responsibilities to protect both public health and the environment. This web-based tool uses publicly available data to provide demographic and environmental information on locations across the US[13]. EJSCREEN generates color-coded maps, standard reports for a selected area, and a comparison of the selected area to the site's state, EPA region, or nation as a whole.

Unlike other data sets that aggregate demographic data or environmental conditions, EJSCREEN is particularly relevant to EJ concerns because it combines both, allowing the user to rapidly assess possible EJ vulnerabilities at a particular site.

Demographic Indicators

EJSCREEN uses several demographic factors as general indicators of a community's potential susceptibility to EJ concerns. The demographic estimates displayed in EJSCREEN are sourced from the US Census Bureau's (CB) five-year American Community Survey (ACS), which is a smaller-scale survey than the more familiar 10-year census of all households. This data is produced at the block group level, where a block group is a geographic area defined by CB that typically contains between 600 and 3,000 residents[14]. It is important to keep in mind that the geographic size of a block group varies significantly depending on population density; in lower density areas, each block group will cover a larger geographic range. EPA has chosen to include six demographic indicators from the ACS reports in the 2019 version of the EJSCREEN (still in use in 2021):

- **Low-Income** Households where the household income is less than or equal to twice the federal "poverty level"
- **Minority** Individuals who list their racial status other than white alone and/or those who list their ethnicity as Hispanic or Latino (Note that the word "alone" in this case indicates that the person is of a single race, since multiracial individuals are tabulated in another category. For example, a non-Hispanic individual who is half white and half American Indian would be counted as a minority by this definition.)
- **Less than high school education** Individuals age 25 or older whose education is short of a high school diploma

- **Linguistic isolation** Individuals living in a household in which all members age 14 years and over speak a non-English language, and also speak English less than "very well"; ie. those who have difficulty with English
- **Individuals under age 5**
- **Individuals over age 64**

NOTE: Demographic information presented in the 2021 version of EJSCREEN was obtained from the ACS 2014-2018 5-year summary file, which is based on 2018 Census boundaries.

Environmental Indicators

EJSCREEN uses 11 environmental indicators as direct or proxy estimates of health risks, pollution levels or potential exposure for a one-mile buffer around a specified location. EPA selected the following environmental indicators for use in the 2019 version of the EJSCREEN:

- **$PM_{2.5}$ level in air** Annual average $PM_{2.5}$ using 2016 Office of Research and Development (ORD) monitoring and modeling estimates
- **Ozone level in air** Summer average of daily-maximum 8-hour-average ozone concentrations (2016 ORD)
- **Diesel particulate matter level in air** Diesel particulate matter concentration, using 2014 National Air Toxics Assessment (NATA) data
- **Air toxics cancer risk** Estimated lifetime inhalation cancer risk from the analyzed carcinogens in ambient outdoor air (2014 NATA)
- **Air toxics respiratory hazard index** Hazard index for respiratory effect (2014 NATA)
- **Traffic proximity and volume** A count of average annual daily traffic at major roads within 500 meters, divided by distance in meters, using the US Department of Transportation's 2017 Highway Performance Monitoring System dataset
- **Lead paint indicator** Percent of housing units built pre-1960, using US CB's 2013-2017 ACS data
- **Proximity to NPL sites** A count of sites (proposed and listed) on the National Priorities List (NPL) within 5 km, from the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database as of 2019
- **Proximity to RMP facilities** A count of Risk Management Plan (RMP) facilities within 5 km, from the RMP database as of 2019
- **Proximity to hazardous waste TSDF** A count of all commercial Treatment, Storage and Disposal Facilities (TSDF) within 5 km, from the Resource Conservation and Recovery Act Information (RCRAInfo) database as of 2019
- **Wastewater discharge indicators** Toxicity-weighted stream concentrations at stream segments within 500 meters, divided by distance in kilometers, using 2017 Risk Screening Environmental Indicators (RSEI) data

EJ Indexes

EJSCREEN provides standard reports that combine environmental and demographic data in the form of "EJ Indexes". These indexes are presented as percentiles in order to better place the data into perspective and facilitate comparisons between sites. EJSCREEN calculates one standard EJ Index for each environmental indicator at a given location by comparing the difference between the demographic composition of the block group, as measured by the Demographic Index, and the national average (approximately 35%). The demographic portion of the EJ Index can be thought of as

the additional number of vulnerable individuals in the block group, compared to a block group with an average population.

Sample EJSCREEN Output

Figure 1 is an image of the map display in EJSCREEN after a specific address is entered into the tool. For this example, the address for the Portland Service Center was used and layered with Low Income Population data. The yellow-highlighted circle represents the default one-mile buffer, and the different polygons indicate block groups, with shading of each group depending on the percentile of residents that are considered Low Income. Note that block groups in the densely populated Portland-metro area tend to be much smaller than those in outlying areas, so the one-mile buffer circle captures several block groups.

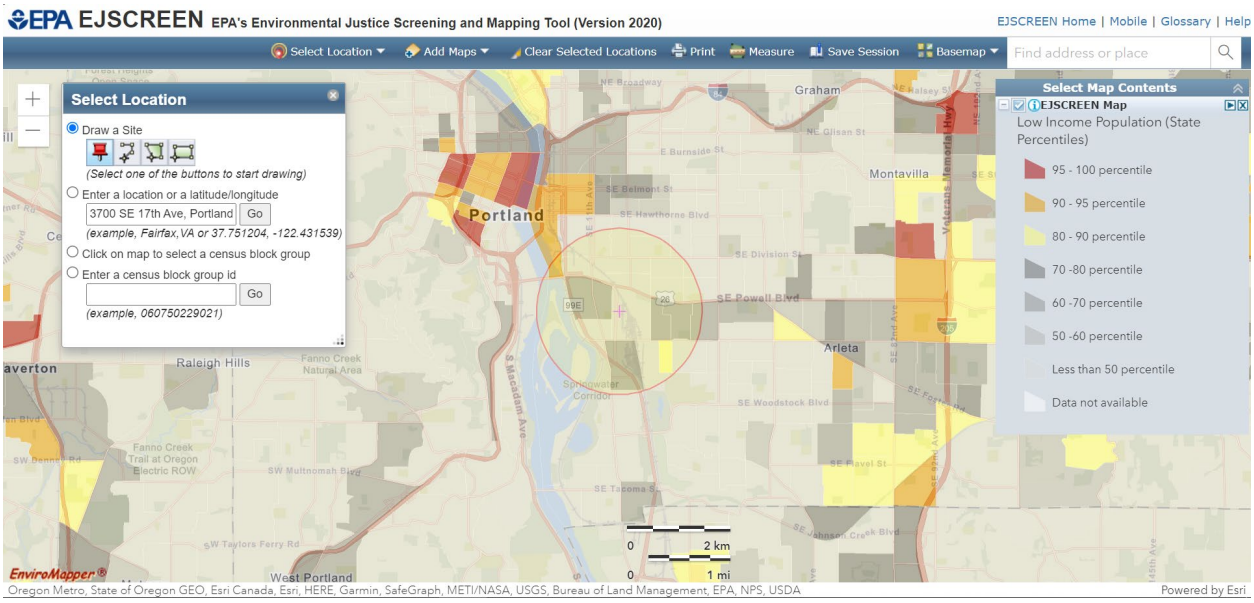

Figure 1: EJSCREEN example for Portland Service Center

In comparison, Figure 2 is a display of similar data for a more rural location – Port Westward Generating Facility. In this case, nearly the entire one-mile buffer overlaps with a single block group of individuals.

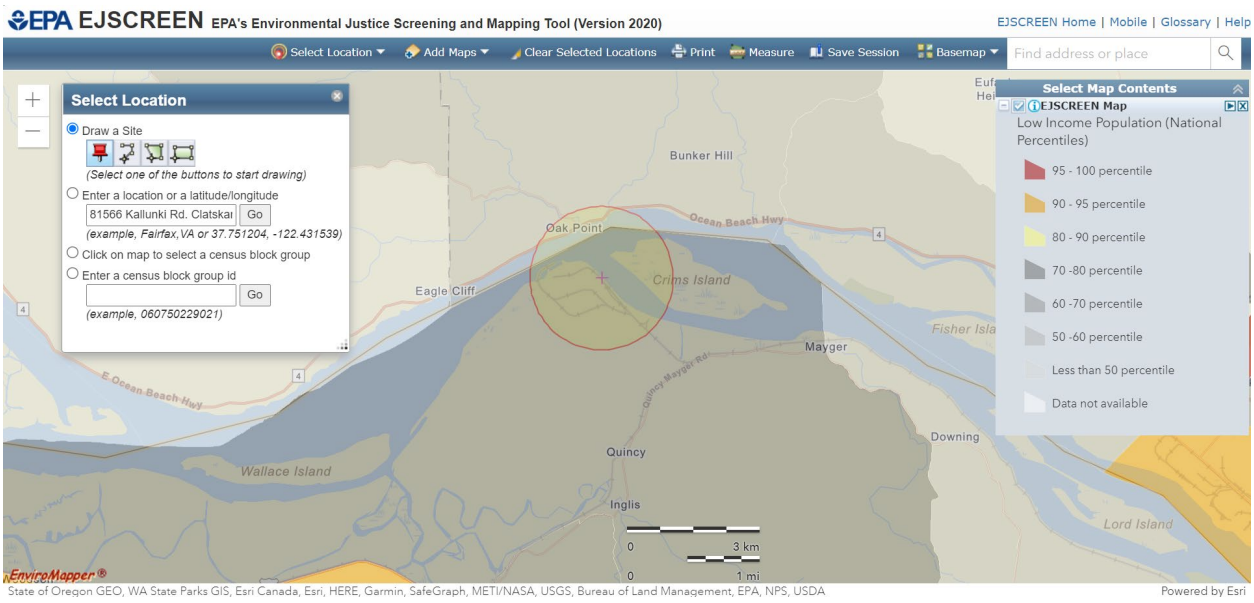

Figure 2: EJSCREEN example for Port Westward Generating Facility

Analysis of PGE Sites

PGE Environmental Health and Safety staff used EJSCREEN to evaluate our Generation and Distribution sites in the summer of 2021, with the goal of identifying which seemed most likely to present environmental justice concerns that might impact permitting activity or agency enforcement. For the purposes of this analysis, we used a 90th percentile cut-off for a single demographic indicator, in comparison to the state averages, to determine a population of concern. It is important to note that this 90th percentile threshold is not an established standard either within EJSCREEN or in industry practice but was instead a figure determined appropriate for this project and consistent with other PGE Diversity, Equity & Inclusion (DEI) initiatives.

We examined 29 facilities, including 17 generation sites (both active and decommissioned) and 12 line or service centers. Of these, six facilities were identified as being sited within a community with a demographic population over the 90th percentile cut-off. Those facilities and populations of concern were:

- **Beaverton Line Center** People of color population
- **Biglow Canyon Wind Farm** Population over the age of 64
- **Coyote Springs Generating Plant** People of color population and population under the age of 5
- **Eastside Hydroelectric Project** Population over the age of 64
- **Salem Service Center** Linguistically isolated population
- **Woodburn Line Center** Low-income population, people of color population, linguistically isolated population and population with less than a high school education

Figures 3 and 4 provide additional detail.

Generation Facilities	Low Income Population	People of Color Population	Population over Age 64	Linguistically Isolated Population	Population with Less than a High School Education	Population under Age 5
Beaver						
Biglow Canyon						
Boardman (decommissioned)						
Bull Run (decommissioned)						
Carty Generating Station						
Colstrip						
Coyote Springs						
Faraday						
North Fork						
Oak Grove						
Pelton Round Butte						
Port Westward						
River Mill						
Salem Smart Power Center						
Sullivan						
Trojan (decommissioned)						
Tucannon River Wind Farm						

90th %ile or higher
60th-89th %ile
30th-59th %ile
29th %ile or lower
No applicable populations within 1 mile buffer

Figure 3: Demographic summary for generation sites

Distribution Facilities	Low Income Population	People of Color Population	Population over Age 64	Linguistically Isolated Population	Population with Less than a High School Education	Population under Age 5
Avery Regional Service Center						
Beaverton Line Center						
Gresham Line Center						
Newberg Service Center						
Oregon City Service Center						
Portland Service Center						
Rose City Core Building						
Salem Service Center						
Sheridan Line Center						
Sunset Line Center						
Wilsonville Line Center						
Woodburn Line Center						

Figure 4: Demographic summary for distribution facilities

We then used EJSCREEN to identify which environmental indicators were most significant at each of the six facilities. From an environmental perspective, it is important to not only understand which sites are located near vulnerable populations, but also which activities might be likely to exacerbate existing conditions and promote further inequity. We used a similar 90th percentile cut-off for the 11 environmental indicators as we did for the demographic, and again it is important to note that this was an arbitrary cut-off, not one established by standard practices. Two of the six facilities of demographic interest also had environmental indicators above the 90th percentile threshold:

- **Coyote Springs Generating Plant** Particulate matter, ozone and RMP proximity
- **Woodburn Line Center** RMP proximity

Potential Applications and Cautions for Use

EPA's EJSCREEN is a powerful web-based mapping tool that can generate site-specific reports on demographic, environmental, and environmental justice indicators as well as display maps showing patterns across the nation. We suggest that this tool be used by PGE environmental staff when evaluating locations for new project development, preparing for upcoming permit renewals, and responding to enforcement actions. Depending on the project, PGE may choose to generate reports from EJSCREEN outside the default one-mile buffer or consider populations of concern below the 90th percentile threshold used in our 2021 site analysis. Further, it is important to note that EJSCREEN should not be considered a comprehensive analysis of potential EJ concerns, though it can be used to highlight places for further review, analysis or outreach to support[15]. EJSCREEN relies on a number of datasets, some of which may not represent the newest or most appropriate estimate of actual conditions or risks. Results from EJSCREEN should be supplemented with additional information and local knowledge when appropriate to provide a more complete picture of a location. In particular, PGE has a history of partnership with the Confederated Tribes of the Warm Springs and fosters relationships with a number of other Indigenous communities and Native American Tribes. EJSCREEN does not call out Tribes as a specific demographic factor, the background maps do identify Tribal Reservations. Note that at both the national and local level, there are many other tools and datasets available that examine similar environmental and demographic factor. For example, a recently published tool known as "Power Plants and Neighboring Communities" focuses on air emissions from power plants, and the default cut-offs and data sets vary somewhat between this tool and EJSCREEN[16].

It is also important to recognize the technological limitations of EJSCREEN. Its mapping limits users to viewing only a single indicator at a time, preventing a visual analysis of multiple parameters across locations. EJSCREEN output is limited to the six demographic factors and 11 environmental factors in the tool – other criteria may be more relevant for certain locations. EJSCREEN also relies on demographic and environmental estimates that involve substantial uncertainty, especially when looking at small geographic areas. EJSCREEN is perhaps best used to summarize data covering larger areas which can then be adjusted based on the specific buffer chosen for analysis[13].

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