



HYDROPOWER AND ENVIRONMENTAL JUSTICE – A LIHI CASE STUDY

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1. Introduction

Motivated by a confluence of pressing social salience, federal and state priorities, and rising investor interest, organizations are seeking to better understand their relationships with environmental justice (EJ) communities. The Low Impact Hydropower Institute (LIHI) is no exception. Since 1999 LIHI has incorporated social, cultural, and tribal impacts in our Low Impact Hydropower criteria and standards. However, we recently embarked on an effort to better understand the interplay between LIHI and environmental justice issues and environmental justice community priorities, beginning with a proximity analysis of LIHI Certified facilities to EJ communities.

It is our intention that this is the first of many conversations and analysis of hydropower impacts, and the opportunities to help alleviate aspects of EJ communities' key concerns related to hydropower. We hope that by sharing our work, we will provide US hydropower owners and operators with a framework to conduct their own analysis and prompt their own learning and broader community engagement. We look forward to continuing this conversation. If you would like to join the conversation, please contact Shannon Ames, LIHI Executive Director at sames@lowimpacthydro.org.

Environmental Justice Defined

On April 21, 2023, the Biden Administration issued an Executive Order, Revitalizing Our Nation's Commitment to Environmental Justice for All, which provides a government-wide definition of Environmental Justice as:

"The just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision-making and other Federal activities that affect human health and the environment so that people:

(i) are fully protected from disproportionate and adverse human health and environmental effects (including risks) and hazards, including those related to climate change, the cumulative impacts of environmental and other burdens, and the legacy of racism or other structural or systemic barriers; and

(ii) have equitable access to a healthy, sustainable, and resilient environment in which to live, play, work, learn, grow, worship, and engage in cultural and subsistence practices."¹

Several states have developed their own EJ community definitions to better reflect local circumstances. They often include minority and indigenous populations, low-income populations relative to the median state income, and limited English proficiency, or some combination of

¹ <https://www.whitehouse.gov/briefing-room/presidential-actions/2023/04/21/executive-order-on-revitalizing-our-nations-commitment-to-environmental-justice-for-all/>

these metrics. States also use different thresholds to identify which communities are considered EJ communities.

Environmental Justice Issues in Hydropower

Conventional hydropower projects are necessarily developed where rivers with significant elevation changes make hydropower feasible. Historically such development spurred economic and social development in host communities but significantly changed river flows, impacted existing fishing practices, inundated communities, farms and forests, and displaced people in the process.

The Blackstone River in southeastern Massachusetts and Rhode Island is considered the birthplace of the American industrial revolution, beginning with construction of the Slater Mill in Pawtucket RI in the late 1700's.² Entire cities across New England grew up around these mills that originally used water to drive mechanical processes long before hydroelectric technologies replaced hydromechanical power at these sites.

Dam construction in the Western US commenced in the early 1900's with passage of the federal Reclamation Act with a primary purpose to provide water storage, diversion and delivery for irrigation, flood control, and water supply, with hydropower added as a secondary purpose for these development projects.³ Many very large federal dams followed starting in the 1930's until the 1960's in the South including 26 Tennessee Valley Authority dams, in the West including Hoover, Grand Coulee, Glen Canyon, and Shasta dams⁴, and in the Midwest including the Pick-Sloan Missouri Basin project.⁵ This level of construction had profoundly negative impacts on indigenous and local communities that have not been rectified to this day, including the flooding of lands, displacement of people and destruction of their livelihoods, removing land from other uses, destruction of culturally significant Native American sites, and releasing methane from reservoir inundation. These efforts were made to provide water-related services and flood protection to more advantaged communities.

Dams and water-related operations can also create adverse impacts to river flows, water quality, aquatic and terrestrial habitats, and to traditional cultural resources and recreation access. Certain EJ issues are especially relevant when it comes to dam construction, which is now primarily—though not exclusively—occurring in developing countries.

Legacy EJ issues often remain at previously developed dam sites whether or not they include hydropower. New EJ community concerns can arise as hydropower projects are licensed and relicensed by the Federal Energy Regulatory Commission (FERC), or at hydro projects that change their facilities or operations in ways that exacerbate existing impacts. Furthermore, the increased focus on Native American tribal concerns, traditional cultural resources, and treaty

² <https://www.nps.gov/blrv/learn/historyculture/index.htm>

³ <https://www.usbr.gov/power/who/history.html>

⁴ <https://www.usbr.gov/history/HistoryofLargeDams/LargeFederalDams.pdf>

⁵ <https://www.govinfo.gov/content/pkg/CHRG-110shrg39935/pdf/CHRG-110shrg39935.pdf>

rights that were historically ignored by the federal government has brought this component of EJ issues to the forefront in recent hydropower relicensing proceedings.

Climate change initiatives driving the continued expansion of renewable energy sources, including new conventional hydro and new closed loop and open loop pumped storage hydro, can also exacerbate pre-existing legacy burdens in EJ communities if the new facilities are not sited to benefit these historically disadvantaged communities. New EJ issues can be created if potential social and environmental harms are not acknowledged, addressed, and rectified during the facility planning and approval process.

2. History and Current Status of Environmental Justice Initiatives in the US

The environmental justice movement emerged in the 1980s from the Civil Rights Movement of the 1960s, which resulted in Title VI of the Civil Rights Act of 1964.⁶ At that time, the leading EJ issue related to hazardous-waste facilities being sited disproportionately in minority and poor neighborhoods. The EJ movement was sparked in part by protests in North Carolina in 1982 over the siting of a PCB-contaminated soil dump in the state's poorest county which had a majority Black population.

This was followed by the First National People of Color Environmental Leadership Summit, held in Washington, D.C. in 1991. The summit brought together minority leaders from every state to discuss the issue of environmental justice.⁷ The outcome was a set of 17 Principles of Environmental Justice, wherein minority leaders pledged to build a national environmental justice movement to address the ecological threats facing minority and disadvantaged communities (see [Appendix 1](#)).⁸ Since that defining moment, the Principles have served as a defining document for the ever growing grassroots movement for environmental justice. Environmental justice has become more visible in recent years. In 2019, the Equitable and Just National Climate Platform was launched with over 300 signatory environmental justice and environmental organizations.⁹ The platform organizations collaboratively seek to promote and support a bold national climate policy agenda that advances the goals of economic, racial, climate and environmental justice to improve the public health and well-being of all communities.

Federal Initiatives

Federal EJ guidance has existed since the 1990's as spelled out in the 1994 Executive Order 12898, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations¹⁰ which required each Federal agency to make achieving environmental justice part

⁶ [Title VI of the Civil Rights Act of 1964](#)

⁷ <https://lawdigitalcommons.bc.edu/cgi/viewcontent.cgi?article=1168&context=ealr>

⁸ Additional historical background on the EJ issue can be found at <https://lawdigitalcommons.bc.edu/cgi/viewcontent.cgi?article=1168&context=ealr>

⁹ <https://ajustclimate.org/index.html>

¹⁰ [Executive Order 12898, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations](#)

of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. Notably, as an “independent agency”, FERC was only requested, not required to comply with it.

Recently, there has been renewed federal focus on EJ issues. On his first day in office on January 20, 2021, President Biden issued Executive Order (EO) 13985, Advancing Racial Equity and Support for Underserved Communities Through the Federal Government.¹¹ It directed federal agencies to assess whether, and to what extent, their programs and policies perpetuate systemic barriers to opportunities and benefits for people of color and other underserved groups in order to better equip the agencies to develop policies and programs that deliver resources and benefits equitably to all. By April of 2022, over 90 agencies had released Equity Action Plans that address strategies and commitments to fulfill the Order.¹²

Executive Order 14008, Tackling the Climate Crisis at Home and Abroad¹³, was issued the next day, on January 21, 2021. This landmark order authorized the “Justice40 Initiative” which represents the Biden administration’s commitment to direct at least 40% of climate and infrastructure investment benefits to disadvantaged communities (defined as communities that have been historically marginalized and overburdened by pollution and under-investment in housing, transportation, water and wastewater infrastructure, and health care). Interim Implementation Guidance for the Justice40 Initiative¹⁴ was issued in July 2021. All Justice40 programs are required to engage in stakeholder consultation and ensure that community stakeholders are meaningfully involved in determining a program’s benefits. The White House Environmental Justice Advisory Council (WHEJAC)¹⁵ was also formed under EO 14008. The Council provides independent advice and recommendations to the Council on Environmental Quality (CEQ) and to the White House Interagency Council on Environmental Justice on how to increase the Federal Government’s efforts to address current and historic environmental injustice.

As noted above, the most recent EO, Revitalizing Our Nation’s Commitment to Environmental Justice for All was issued on April 21, 2023. It expands upon the 1994 EO 12898 and specifically addresses all adverse human health and environmental effects and hazards, including those related to climate change, the cumulative impacts of environmental and other burdens, and the legacy of racism or other structural or systematic barriers.¹⁶ It also establishes the White House Office of Environmental Justice within the CEQ. This new EO’s stated goals require:

¹¹ [Executive Order \(EO\) 13985, Advancing Racial Equity and Support for Underserved Communities Through the Federal Government](#)

¹² <https://www.whitehouse.gov/equity/>

¹³ [Executive Order 14008, Tackling the Climate Crisis at Home and Abroad](#)

¹⁴ [Interim Implementation Guidance for the Justice40 Initiative](#)

¹⁵ <https://www.epa.gov/environmentaljustice/white-house-environmental-justice-advisory-council>

¹⁶ See Factsheet <https://www.whitehouse.gov/briefing-room/statements-releases/2023/04/21/fact-sheet-president-biden-signs-executive-order-to-revitalize-our-nations-commitment-to-environmental-justice-for-all/#:~:text=The%20new%20Executive%20Order%20makes,civil%20rights%20and%20environmental%20laws>.

- Investing in and supporting culturally vibrant, sustainable, and resilient communities in which every person has safe, clean, and affordable options for housing, energy, and transportation.
- Prioritizing building an equitable, inclusive, and sustainable economy that offers economic opportunities, workforce training, and high-quality and well-paying jobs, including union jobs, and facilitating an equitable transition of the workforce as part of a clean energy future.
- Improving equitable access to parks, tree cover, playgrounds, sports fields, rivers, ponds, beaches, lakes, and all of the benefits provided by nature, including America’s public lands and waters.
- Engaging in meaningful engagement and collaboration with underserved and overburdened communities to address the adverse conditions they experience and ensure they do not face additional disproportionate burdens or underinvestment.

FERC issued a two-year Equity Action Plan¹⁷ in 2022 as part of Chairman Glick’s initiative to expand FERC’s consideration of EJ concerns in all Commission decisions, and to make participation by EJ communities on par with participation by other stakeholders. The plan seeks to promote equity and removal of barriers for underserved communities including EJ communities, and details how the Commission will incorporate equity and environmental justice into the Commission’s operations in several key areas. FERC has also recently begun to evaluate EJ issues directly during hydropower licensing proceedings with EJ evaluation included in NEPA environmental impact analyses.¹⁸ staff considers whether environmental justice communities exist in the project area; whether impacts on environmental justice communities are disproportionately high and adverse; and, if so, what mitigation measures might be needed.¹⁹

State Initiatives

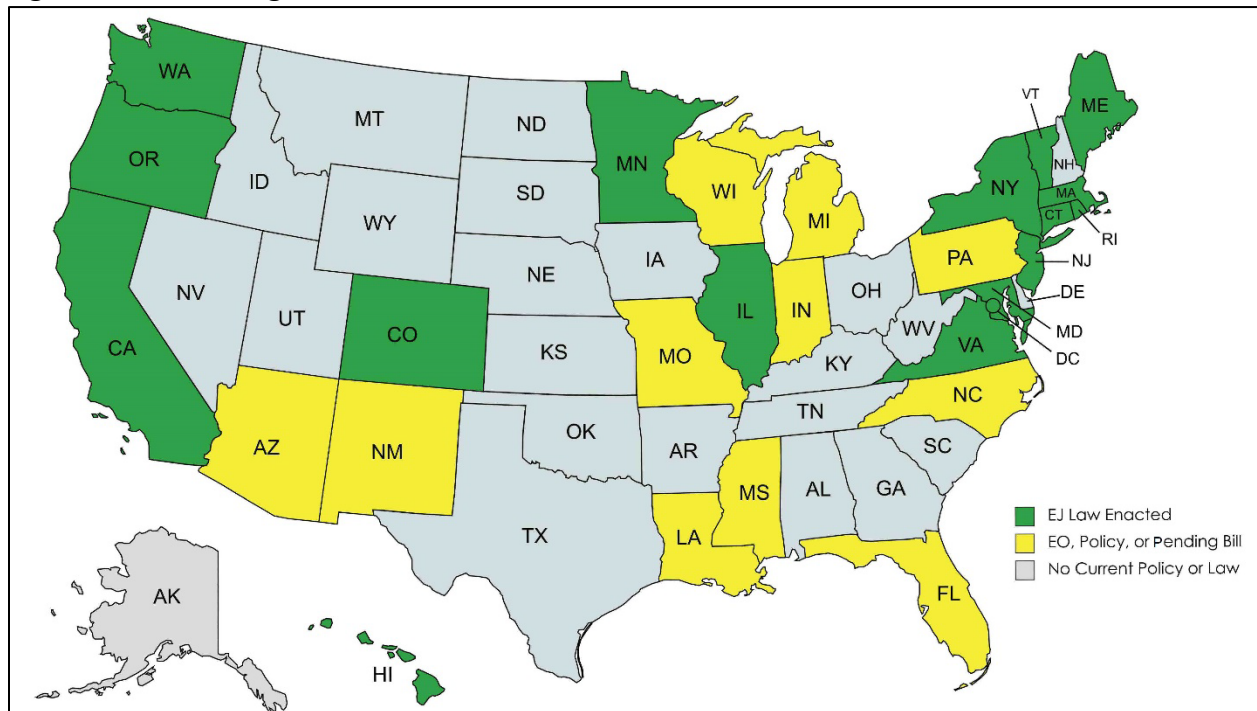
Sixteen states and the District of Columbia have enacted EJ-related legislation. Another eleven states have introduced bills that are working their way through the state legislature; or have otherwise enacted state-wide policies or executive orders related directly to environmental justice or to broader equity issues within land use policy or climate change initiatives (see Figure 1). Some of those states have established task forces, commissions or executive offices focused on providing recommendations and implementing strategies to protect disadvantaged communities. Seventy-eight percent of LIHI facilities are located in these states and the remaining 22% are located in states without EJ laws or policies. New LIHI applications have been and likely will continue to come from these states particularly for new hydro projects at existing federal dams on major US rivers. The regulatory landscape in these states may also begin to change as they focus more on implementing climate justice policies.

¹⁷ <https://www.ferc.gov/news-events/news/ferc-issues-equity-action-plan>

¹⁸ See for example, the April 2022 [FERC EA for Mother Ann Lee Project](#), LIHI #24.

¹⁹ FERC NEPA EJ analysis follows guidance in the 2016 [Promising Practices for EJ Methodologies in NEPA Reviews. Report of the Federal Interagency Working Group on Environmental Justice and NEPA Committee.](#)

Figure 1: State EJ Legislation, Policies, and Executive Orders²⁰



3. Analysis of LIHI Certified® Facilities associated with EJ Communities

LIHI staff conducted a geo-based review to identify the overlap of LIHI facilities within or adjacent to EJ communities. The primary data source was the Climate and Economic Justice Screening Tool (Version 1.0, published November 22, 2022)²¹ developed by the White House Council on Environmental Quality (CEQ). It identifies disadvantaged communities that are marginalized, underserved, or overburdened by pollution. Under that methodology, communities are considered disadvantaged if they are in a census tract that meets certain CEQ-defined thresholds:

1. At or above the threshold for one or more of eight climate, environmental, or other burdens, and also at or above the threshold for an associated socioeconomic burden (e.g., income or education); or
2. On land within the boundaries of Federally Recognized Tribes or at point locations of Alaska Native Villages²²; or
3. Completely surrounded by disadvantaged communities and the census tract population is at or above the 50% percentile for low income.

²⁰ Sources: <https://news.bloomberglaw.com/bloomberg-law-analysis/analysis-state-laws-are-codifying-environmental-justice> and <https://emp.lbl.gov/publications/assessing-current-state-us-energy>

²¹ <https://screeningtool.geoplatform.gov/en/#3/33.47/-97.5>

²² Alaska Native Villages are included as point locations that are smaller than a census tract.

Notably, CEQ Screening Tool's major limitation is that it does not consider minority population as a metric, although that data is included in the underlying dataset and can be used for deeper analysis.²³ Table 1 identifies the categories and thresholds of EJ burdens included in the CEQ mapping tool that are derived from a variety of data sources.²⁴

A few states where LIHI facilities are located (CT, MA, NY, PA) have their own mapping tools (see [Appendix 2](#)), and some other states are developing them (e.g., VT). EPA notes that state-level tools can be more accurate since they may be based on more local knowledge; yet most of the state datasets used in current mapping tools are limited to a few metrics such as share of the population considered low-income, minority populations, and in some cases, populations with limited English proficiency, which simplify analysis and may also incorporate other burdens used by CEQ which are often correlated to these metrics.

States may also use census block groups that are smaller than census tracts. Census tracts generally have a population size between 1,200 and 8,000 people, with an optimum size of 4,000 people while block groups are generally between 600 and 3,000 people.²⁵ Connecticut also has a separate category of “distressed municipalities” which includes the 25 highest ranked towns in the state based on high unemployment and poverty, aging housing stock and low or declining rates of growth in job creation, population, and per capita income.²⁶

LIHI facility locations were visually compared in Google Earth to the CEQ and applicable state mapping tools to determine if the facilities are in or adjacent to identified EJ communities. It was beyond the scope of this initial analysis to compare LIHI facilities based on the 31 individual CEQ metrics (burden subcategories) listed in Table 1 below or to compare metrics between the CEQ database and individual state databases. Given the large number of subcategories and census tract specific conditions (for instance urban versus rural), and the number of possible data combinations that could designate a disadvantaged community, there is likely to be significant variability among LIHI facilities at that level.

²³ <https://static-data-screeningtool.geoplatform.gov/data-versions/1.0/data/score/downloadable/1.0-communities.xlsx>

²⁴ <https://static-data-screeningtool.geoplatform.gov/data-versions/1.0/data/score/downloadable/1.0-communities-list.pdf>

²⁵ https://www.census.gov/programs-surveys/geography/about/glossary.html#par_textimage_4

²⁶ https://portal.ct.gov/-/media/DECD/Research-Publications/Distressed_Municipalities/Distressed-municipality-criteria.doc

Table 1: CEQ Climate and Economic Justice Screening Tool Burden Categories

Category	Dataset	Description
Tribal lands	Land Area Representation (LAR) dataset	Identifying lands of Federally Recognized Tribes and Alaska Native Communities
All categories (Workforce Development uses a different metric, see below)	Low income	People in households where income is less than or equal to twice the federal poverty level, not including students enrolled in higher education.
Climate change	Expected agriculture loss rate	Economic loss to agricultural value resulting from natural hazards each year
	Expected building loss rate	Economic loss to building value resulting from natural hazards each year
	Expected population loss rate	Fatalities and injuries resulting from natural hazards each year
	Projected flood risk	Projected risk to properties at projected from floods from tides, rain, riverine and storm surges within 30 years
	Projected wildfire risk	Projected risk to properties from wildfire from fire fuels, weather, humans, and fire movement within 30 years
Energy	Energy cost	Average annual energy costs divided by household income
	PM 2.5 in the air	Level of inhalable particles, 2.5 micrometers or smaller
Health	Asthma	Share of people who have been told they have asthma
	Diabetes	Share of people ages 18 years and older who have diabetes other than diabetes during pregnancy
	Heart disease	Share of people ages 18 years and older who have been told they have heart disease
	Low life expectancy	Average number of years a person can expect to live
Housing	Historic under-investment	Census tracts with historically high barriers to accessing home loans
	Housing cost	Share of households making less than 80% of the area median family income and spending more than 30% of income on housing
	Lack of green space	Share of non-crop land covered with artificial materials like concrete or pavement
	Lack of indoor plumbing	Share of homes without indoor kitchens or plumbing
	Lead paint	Share of homes that are likely to have lead paint
Legacy pollution	Abandoned mine land	Presence of one or more abandoned mine land within the tract
	Formerly Used Defense Sites	Presence one or more Formerly Used Defense Site within the tract
	Proximity to hazardous waste facilities	Count of hazardous waste facilities within 5 kilometers
	Proximity to Superfund sites	Count of proposed or listed Superfund (or National Priorities List (NPL)) sites within 5 kilometers

Category	Dataset	Description
	Proximity to Risk Management Plan (NPL) facilities	Count of Risk Management Plan (RMP) facilities within 5 kilometers
Transportation	Diesel particulate matter exposure	Amount of diesel exhaust in the air
	Transportation barriers	Average relative cost and time spent on transportation
	Traffic proximity and volume	Count of vehicles at major roads within 500 meters
Water and wastewater	Underground storage tanks and releases	Formula of the density of leaking underground storage tanks and number of all active underground storage tanks within 1500 feet of the census tract boundaries
	Wastewater discharge	Modeled toxic concentrations at parts of streams within 500 meters
Workforce development	Linguistic isolation	Share of households where no one over age 14 speaks English very well
	Low median Income	Comparison of median income in the tract to median incomes in the area
	Poverty	Share of people in households where the income is at or below 100% of the Federal poverty level
	Unemployment	Number of unemployed people as a part of the labor force
	High school education	Percent of people ages 25 years or older whose high school education is less than a high school diploma

As of February 2023, there are 177 active LIHI Certificates located on 102 rivers and on 10 irrigation or water systems, in 24 states across the US. Some LIHI Certificates include multiple dams and/or powerhouses creating a dataset of over 300 separate facilities. All LIHI facility locations are geo-referenced in an internal dataset layer for use in Google Earth Pro.

Given that rivers often provide convenient and often used geo-political borders, some LIHI facilities were found in multiple census tracts (e.g., on both sides of a river). In addition, some facilities cover a large geographic area with long impoundments and/or long downstream reaches that also encompass multiple census tracts. If any portion of a LIHI facility was found to be in or directly adjacent to an EJ community census tract at the state or federal level, it was included in this analysis.

Overall, 54.8% (N=97) of all LIHI Certificates have one or more facilities or portions of facilities in or adjacent to EJ communities (N=170). Some facilities (N=13) were identified as associated with EJ communities by their state but not by CEQ. Conversely, some facilities (N=7) were included in the CEQ dataset but not identified by their state.

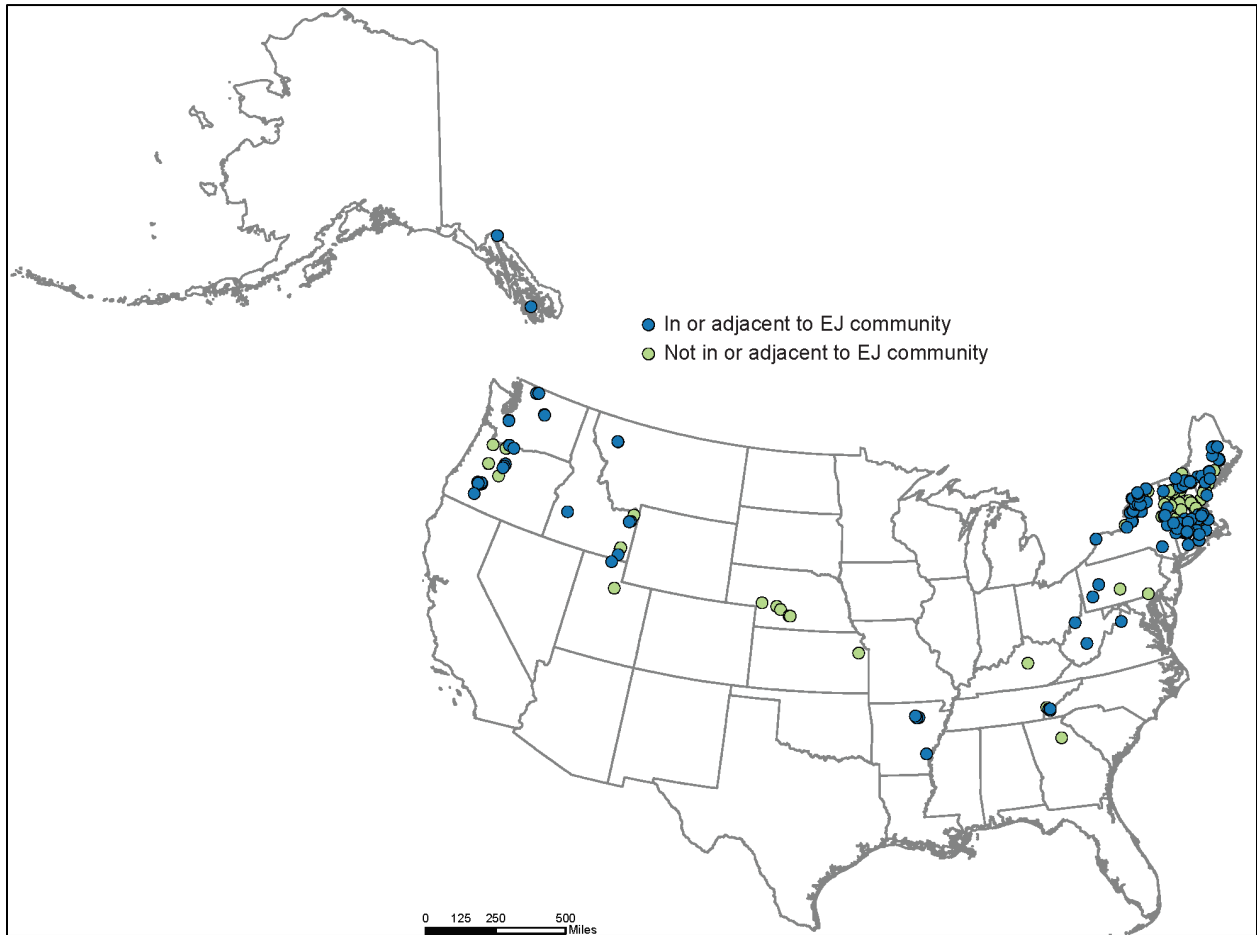
LIHI facilities are disproportionately located in regions where certification provides a financial benefit under state Renewable Portfolio Standard (RPS) programs that recognize certification. These include facilities in New England and New York that can participate in the Massachusetts

RPS; facilities in Mid-Atlantic states that can participate in the Pennsylvania RPS; and facilities located in Oregon or owned by Oregon utilities in neighboring states that can participate in Oregon’s program. The regional breakdown of LIHI facilities associated with EJ communities provides additional context and is summarized in Table 2. Figure 2 illustrates the locations of LIHI facilities and their association with EJ communities. The facility (blue dot) is in or adjacent to an EJ community, or the facility (green dot) is not associated with an EJ community.

Table 2: LIHI Facilities in or adjacent to EJ Communities by Region

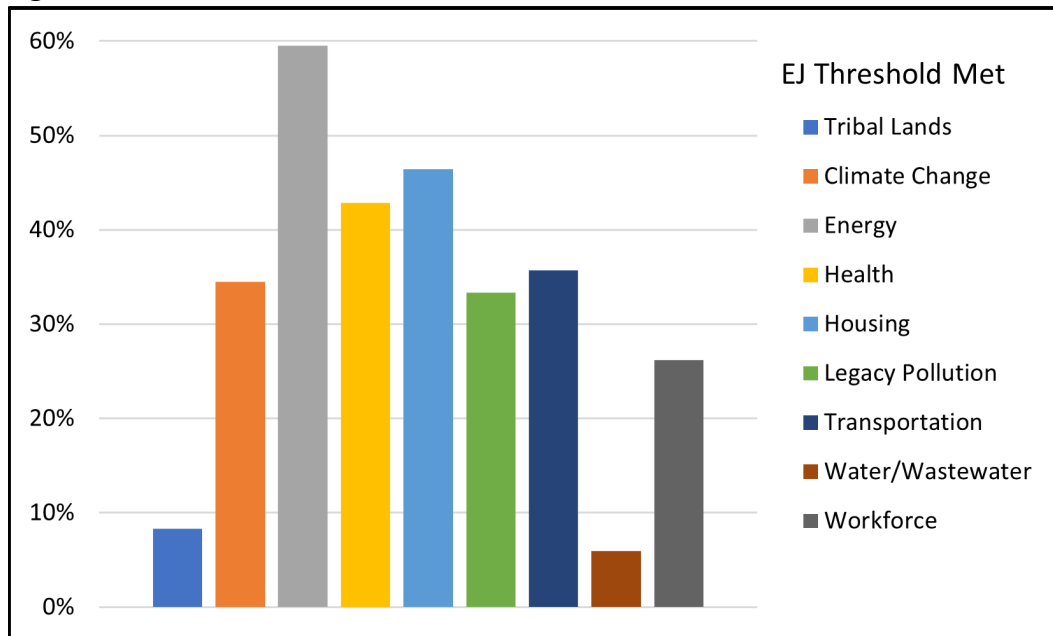
Region	No. of LIHI Certificates	Percent of all LIHI Certificates	No. of LIHI Certificates associated with an EJ Community	Percent of LIHI Certificates in the region associated with an EJ Community
New England	110	62.1%	53	48%
New York	27	15.3%	17	63%
West	22	12.4%	14	64%
Mid-Atlantic	7	4%	6	86%
South	7	4%	5	71%
Alaska	2	1.1%	2	100%
Midwest	2	1.1%	0	0%
Total	177	100%	97	

Figure 2: LIHI Facilities and EJ Community Status



For consistency, only LIHI facilities identified in the CEQ dataset (N=84) were analyzed. That dataset's eight burden categories and thresholds along with the federally recognized Tribal lands attribute were used to identify the most prevalent EJ burdens in communities hosting LIHI facilities. Figure 3 illustrates that energy burden (energy cost and air pollution) is the most prevalent indicator of disadvantaged community status within LIHI EJ communities. This is followed by health and housing burdens, encountered at over 40% of all LIHI facilities in such communities; and then by climate change, legacy pollution, and transportation burdens at over 30%. Workforce development burdens are a factor at over 25% of LIHI facilities while Tribal lands and water and wastewater burdens lag at less than 10%.

Figure 3: Prevalence of EJ Burdens in EJ Communities with LIHI Facilities – Nationally



A comparison between regions of the country where LIHI facilities are co-located with EJ communities shows some significant differences. New England and New York are home to the majority of LIHI Certificates (77%) as well as the majority of LIHI facilities in or adjacent to EJ communities (72%). Within the CEQ dataset, the Northeast region accounts for 68% of LIHI facilities associated with EJ communities. The types of burdens encountered in the Northeast show a similar pattern to LIHI facilities in such communities at the national level, although the percentages differ somewhat, particularly for Tribal lands and climate change related burdens which are much less prevalent in the Northeast than nationally. Conversely, the energy burden is significantly higher in the Northeast than nationally.

There are also some minor differences between New England and New York (Figures 4 and 5). New York has a higher concentration of LIHI facilities associated with EJ communities (63% versus 48%, see Table 2). In addition, New York has an overall higher concentration of CEQ-defined EJ communities than do the New England states (36% versus 29%).

Figure 4: Prevalence of EJ Burdens in EJ Communities with LIHI Facilities – New England

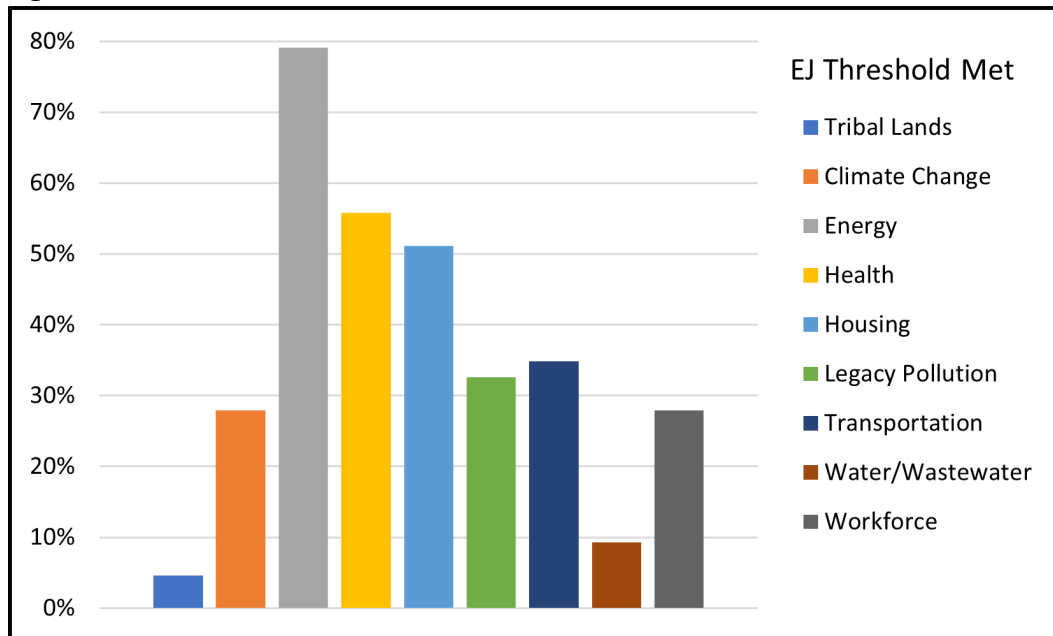
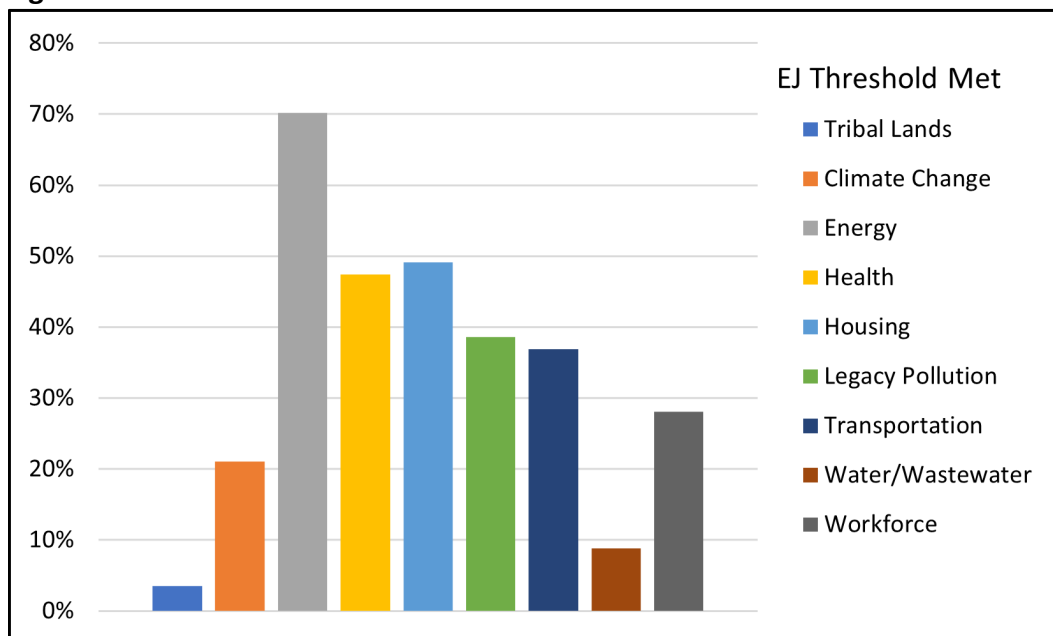
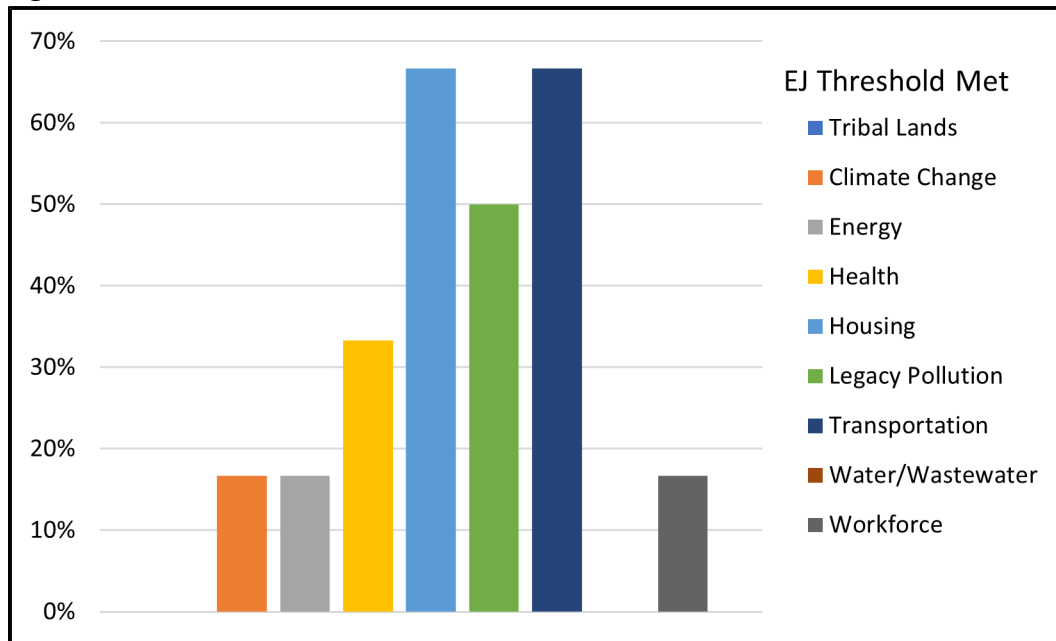


Figure 5: Prevalence of EJ Burdens in EJ Communities with LIHI Facilities – New York



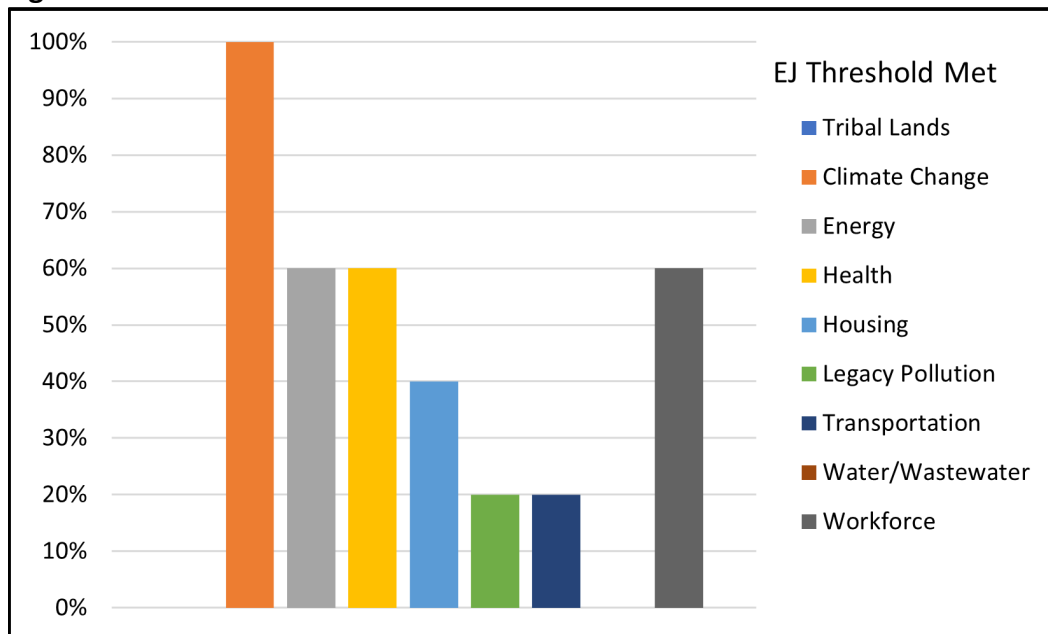
Four Mid-Atlantic states are home to only 4% of all LIHI Certificates and only 2% of all LIHI facilities, including those within and outside of EJ communities. While a small sample, the EJ burdens in communities with LIHI facilities in this region are significantly different from those in the Northeast and across the country. Housing, legacy pollution, and transportation are the largest burdens in this region (Figure 6).

Figure 6: Prevalence of EJ Burdens in EJ Communities with LIHI Facilities – Mid-Atlantic



Five Southern states are home to another 4% of all LIHI Certificates and 3.4% of all LIHI facilities, again a small sample. Yet, the types and prevalence of EJ burdens in communities with LIHI facilities in this region are also significantly different from those in other regions and from those at the national level, particularly with regard to climate change burdens, followed by health, and workforce development burdens that are the most prevalent and at much higher levels in communities with LIHI facilities than elsewhere (Figure 7).

Figure 7: Prevalence of EJ Burdens in EJ Communities with LIHI Facilities – South



LIHI facilities in Alaska and the Pacific Northwest account for 13.6% of all LIHI Certificates, 13.4% of all LIHI facilities, and 19% of all LIHI facilities in the CEQ dataset. Climate change is the most prevalent burden in these communities although less overall than in the South, and significantly more LIHI facilities are associated with federally recognized tribal lands. The energy burden is less except as compared to the Mid-Atlantic region. Like the Mid-Atlantic and South, no communities with LIHI facilities in this region are burdened by water or wastewater issues.

Figure 8: Prevalence of EJ Burdens in EJ Communities with LIHI Facilities – Alaska and Pacific Northwest

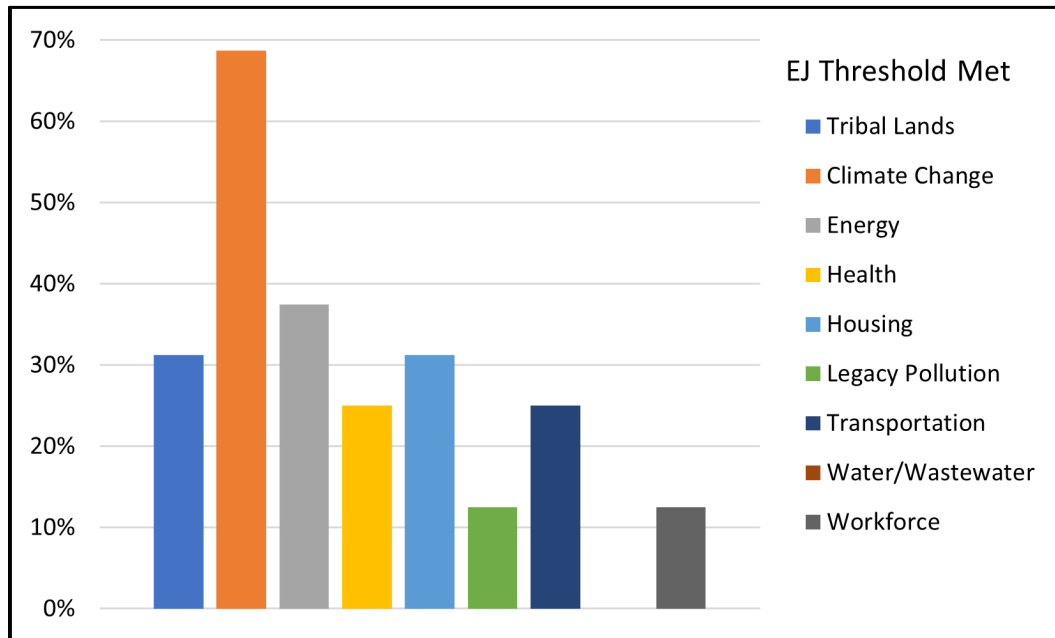
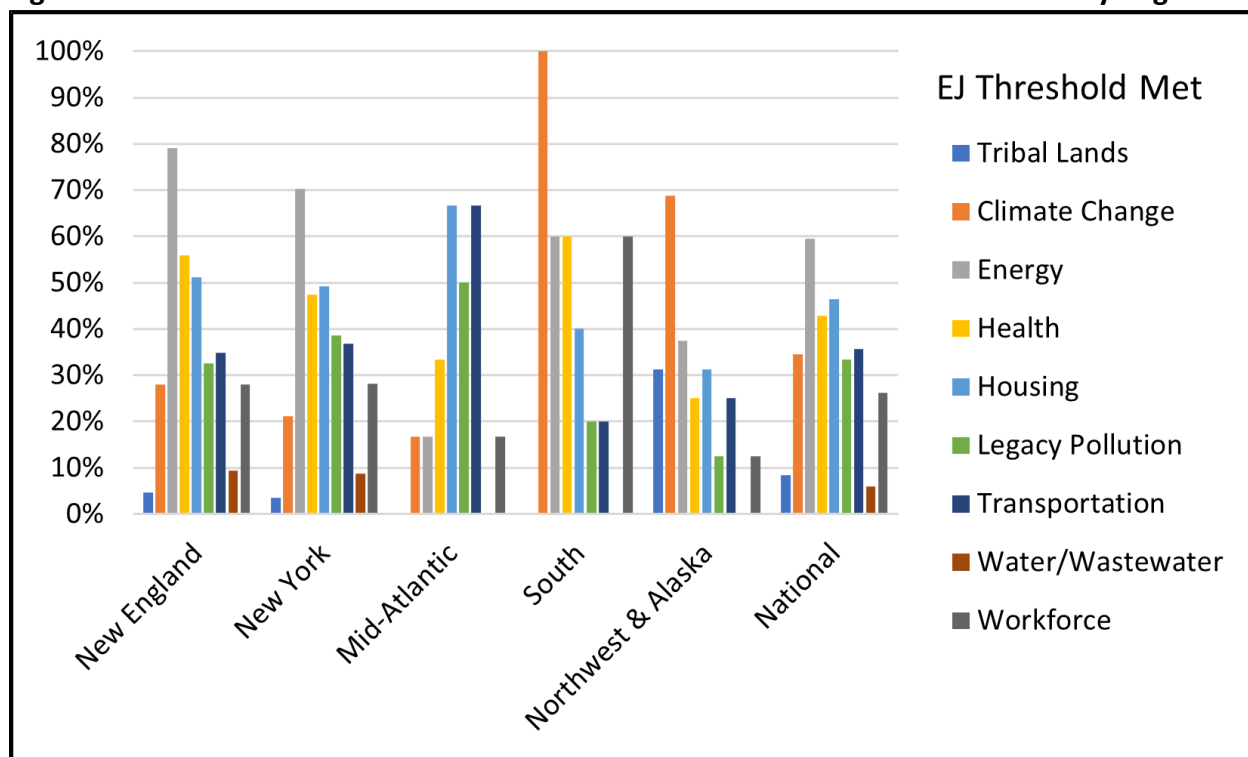


Figure 9 below illustrates the range and prevalence of burden types encountered in different EJ communities that host LIHI Certified® facilities across regions and nationally.

Figure 9: Relative Prevalence of EJ Burdens in EJ Communities with LIHI Facilities by Region



4. Conclusions and Recommendations

This initial analysis highlights the regional differences in the types and prevalence of different equity burdens faced by disadvantaged communities that host LIHI Certified® facilities. The small number of LIHI facilities as compared to all hydropower facilities in the US limits the data value, and this analysis does not enable drawing broader conclusions about any potential relationships between the entire US hydropower fleet and disadvantaged host communities. However, one notable result is that more than half of all LIHI facilities are co-located with such communities, and it would be important to determine if the same holds true across the hydropower fleet.

Broader analysis could be very informative to help shape future state or regional hydropower policy, and deeper analysis would be helpful at the facility level for hydro owners and stakeholders to understand and address local EJ issues. Valuable data could be derived by merging available comprehensive datasets such as the Oak Ridge National Laboratory Existing Hydropower Assets database²⁷ with the CEQ Climate and Economic Justice Screening Tool using its burden subcategories to obtain detailed hydro facility-level data. One challenge encountered in this analysis that would also be encountered in a larger analysis is to account for multiple census tracts that fall within the geographic extent of a hydro project’s lands and waters.

²⁷ <https://hydrosourc.ornl.gov/dataset/EHA2022>

An even more robust analysis would merge data from the National Inventory of Dams²⁸ with the CEQ dataset or other EJ datasets to inform decision makers about EJ issues to consider in new hydropower development located at existing dam sites. Future analysis should also look at the impact of using state-level EJ definitions and datasets instead of the federal definition, for the states that have them.

Hydropower projects can exacerbate existing EJ issues or create new ones if care is not taken to understand the specific community burdens and plans are not implemented to minimize or mitigate for them in facilities and operations. Some steps that all hydro owners could take to support local disadvantaged communities include the following, if the facility is found to be in or near an EJ community:

- Identifying the specific EJ issues within the community (see [Appendix 3](#) for a short list of resources).
- Determining if Tribal treaties extend Tribal rights or interests to the hydro project area or its operations and engaging with Tribes to ensure those rights are upheld.
- Proactively seeking input from, and partnering with Tribal, EJ and other community-based organizations on local environmental justice initiatives.
- Partnering with local trade schools and community colleges to train and hire employees from disadvantaged populations.
- Contracting with local disadvantaged businesses for products and services. Most states have a list of Disadvantaged Business Enterprises (DBEs).
- Ensuring that project recreational amenities and opportunities are co-created with, then promoted within the community, in the different languages prevalent in the community.
- Ensuring that local EJ and community-based organizations are invited to participate in FERC licensing processes, that their input is considered, and their issues and concerns addressed.

²⁸ <https://nid.usace.army.mil/#/>

Appendix 1 - Principles of Environmental Justice²⁹

1. Environmental Justice affirms the sacredness of Mother Earth, ecological unity and the interdependence of all species, and the right to be free from ecological destruction.
2. Environmental Justice demands that public policy be based on mutual respect and justice for all peoples, free from any form of discrimination or bias.
3. Environmental Justice mandates the right to ethical, balanced and responsible uses of land and renewable resources in the interest of a sustainable planet for humans and other living things.
4. Environmental Justice calls for universal protection from nuclear testing and the extraction, production and disposal of toxic/hazardous wastes and poisons that threaten the fundamental right to clean air, land, water, and food.
5. Environmental Justice affirms the fundamental right to political, economic, cultural and environmental self-determination of all peoples.
6. Environmental Justice demands the cessation of the production of all toxins, hazardous wastes, and radioactive materials, and that all past and current producers be held strictly accountable to the people for detoxification and the containment at the point of production.
7. Environmental Justice demands the right to participate as equal partners at every level of decision-making including needs assessment, planning, implementation, enforcement and evaluation.
8. Environmental Justice affirms the right of all workers to a safe and healthy work environment, without being forced to choose between an unsafe livelihood and unemployment. It also affirms the right of those who work at home to be free from environmental hazards.
9. Environmental Justice protects the right of victims of environmental injustice to receive full compensation and reparations for damages as well as quality health care.
10. Environmental Justice considers governmental acts of environmental injustice a violation of international law, the Universal Declaration on Human Rights, and the United Nations Convention on Genocide.
11. Environmental Justice must recognize a special legal and natural relationship of Native Peoples to the U.S. government through treaties, agreements, compacts, and covenants affirming sovereignty and self-determination.
12. Environmental Justice affirms the need for urban and rural ecological policies to clean up and rebuild our cities and rural areas in balance with nature, honoring the cultural integrity of all our communities, and providing fair access for all to the full range of resources.
13. Environmental Justice calls for the strict enforcement of principles of informed consent,

²⁹ https://www.ucc.org/what-we-do/justice-local-church-ministries/justice/faithful-action-ministries/environmental-justice/principles_of_environmental_justice/

and a halt to the testing of experimental reproductive and medical procedures and vaccinations on people of color.

14. Environmental Justice opposes the destructive operations of multi-national corporations.
15. Environmental Justice opposes military occupation, repression and exploitation of lands, peoples and cultures, and other life forms.
16. Environmental Justice calls for the education of present and future generations which emphasizes social and environmental issues, based on our experience and an appreciation of our diverse cultural perspectives.
17. Environmental Justice requires that we, as individuals, make personal and consumer choices to consume as little of Mother Earth's resources and to produce as little waste as possible; and make the conscious decision to challenge and reprioritize our lifestyles to ensure the health of the natural world for present and future generations.

Appendix 2 - Data Sources

1. CEQ: <https://screeningtool.geoplatform.gov/en/#3/33.47/-97.5>
2. CT: <https://ctdeep.maps.arcgis.com/apps/webappviewer/index.html?id=d04ec429d0a4477b9526689dc7809ffe>
3. MA: <https://mass-eoeaa.maps.arcgis.com/apps/webappviewer/index.html?id=1d6f63e7762a48e5930de84ed4849212>
4. NY: [https://www.arcgis.com/home/webmap/viewer.html?url=https://services6.arcgis.com/DZHaqZm9cxOD4CWM/ArcGIS/rest/services/Potential Environmental Justice Area P EJA Communities/FeatureServer&source=sd](https://www.arcgis.com/home/webmap/viewer.html?url=https://services6.arcgis.com/DZHaqZm9cxOD4CWM/ArcGIS/rest/services/Potential_Environmental_Justice_Area_P_EJA_Communities/FeatureServer&source=sd)
5. PA: <https://padep-1.maps.arcgis.com/apps/webappviewer/index.html?id=f31a188de122467691cae93c3339469c>

Appendix 3 - Additional Resources

Resources that support environmental justice initiatives are becoming more and more available as EJ issues are increasingly reflected in policy priorities. Internet searches can provide up-to-date information at the federal, state, or local level. It is important to understand the differences in metrics and thresholds used in available resources in order to identify the scope and purpose of each. For example, the US Department of Energy (DOE) has a mapping tool for use in DOE funding that uses its own set of burden indicators and further limits, for purposes of equitable funding, the definition of disadvantaged communities to the highest 20% of such communities in each state.³⁰ Thus, it does not capture the universe of disadvantaged communities across the country.

- EPA has an extensive website of NEPA-related EJ information³¹ including a Community Guide to Environmental Justice and NEPA Methods³² as well as additional EJ information³³ unrelated to the NEPA process.
- EPA also has an Environmental Justice Screening and Mapping Tool (“EJSCREEN”)³⁴ with 12 environmental indicators and 6 demographic indicators including minority status. Users can compare threshold EJ screening data for a specific project location to data at statewide, regional, and national levels (see Appendix 2).
- NREL has a State and Local Planning for Energy (SLOPE) platform.³⁵ It includes a mapping tool containing energy and justice datasets and a social vulnerability index at the county level that uses EPA’s EJSCREEN mapping tool as its basis.³⁶
- The Centers for Disease Control has an Environmental Justice Index mapping tool³⁷ with 14 social vulnerability indicators, 5 health vulnerability indicators, and 17 environmental burden indicators.³⁸
- The Equitable and Just National Climate Platform's Justice40 Initiative Resource Guide³⁹ and Funding Finder⁴⁰ provides information on the Justice40 Initiative; federal agency programs that fall under the initiative, including programs funded through the Infrastructure Investment and Jobs Act; information on accessing funding from Justice40 programs; and how to direct advocacy efforts to improve Justice40 outcomes.
- Many individual states also have climate and/or environmental justice tools and resources available that can be searched online.

³⁰ <https://energyjustice.egs.anl.gov/>

³¹ <https://www.epa.gov/environmentaljustice/environmental-justice-and-national-environmental-policy-act>
³² [Community Guide to Environmental Justice and NEPA Methods](#)

³³ <https://www.epa.gov/environmentaljustice>

³⁴ <https://www.epa.gov/ejscreen>

³⁵ <https://maps.nrel.gov/slope/>

³⁶ See factsheet: https://www.energy.gov/sites/default/files/2021-08/SLOPE-Fact-Sheet_May2021v2.pdf

³⁷ <https://onemap.cdc.gov/portal/apps/sites/#/eji-explorer>

³⁸ See factsheet <https://www.atsdr.cdc.gov/placeandhealth/eji/docs/EJI-2022-Indicators-508.pdf>

³⁹ https://ajustclimate.org/justice40_guide.html

⁴⁰ <https://docs.google.com/spreadsheets/d/1ErL4SPkgRsQMuDyKfWh8-ggcu2125h3SgEFZtiqU0Qg/edit#gid=0>