Appendix A

Justice, Equity, Diversity, and Inclusion in the Delaware Estuary and Basin

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Justice, Equity, Diversity, and Inclusion (JEDI) are central to the long-term health of the people that reside within the Delaware Estuary and Basin. Twenty years ago, PDE released the first State of the Estuary Report. Since then, we have become increasingly aware of the need to address systemic issues, such as environmental justice and racism, which currently plague the Estuary and Basin. Within this TREB, and those that will follow, PDE and its partners will continue to find ways to open discussions about possible inequities with respect to environmental health within the Delaware Estuary and Basin. The first step in a JEDI framework was to perform a JEDI audit of the 2017 TREB. Here, we review the findings of our audit to steer and inspire future work.

The JEDI audit was a multi-step process. We began this audit by researching environmental issues as they intersect with race and socioeconomic backgrounds of the Delaware Estuary and Basin. This enabled us to review the 2017 TREB and identify places where environmental justice issues were relevant. We were particularly mindful of racial diversity, socioeconomic diversity, land usage and ownership, and opportunities for education initiatives. The next step of our process was propose environmental justice metrics to use moving forward. We determined a need to identify equity gaps for things such as environmental jobs, home ownership, funding trends, and engagement opportunities. Although we could not address every question, metric, or suggestion in the 2022 TREB, this framework provides necessary direction for future TREB reports.

Specific environmental issues with equity or justice focus included flooding, air pollution, soil contamination, blood lead levels, tree cover, access to clean water, access to boat launches, and location of environmental justice communities. Metrics for engagement include adaptive capacity of communities, incorporation of local knowledge in management and municipality connectedness. Providing the necessary support that the Lenni Lenape— the indigenous people of the Delaware River Watershed— say they need to participate in all discussions about the management of this land as they desire is also an essential step in dismantling some of the harm done by colonization.

General notes

Be mindful of:

- Racial diversity
- Socioeconomic diversity
- Land usage and ownership
- Education initiatives
- There should be an accessible online database for the data used, where possible

Moving forward:

- Moving climate change to the front so environmental indicators act as a response to the greater issues
- Metric: using EJ communities in relation to spatial mapping
- Highlight EJ NJ law passed last year
- Listing each EJ definition for each state in the watersheds
- Utilizing census data and EJ Screen for EJ analyses
- Is there information on consumption advisories? Where would that best go?

Watersheds and Landscapes

Overarching Suggestions

- Be mindful to not ignore: racial diversity, socioeconomic diversity, land usage and ownership, and educational attainment.
- Populations
- Including information on racial diversity, socioeconomics, land ownership / segregation, and educational attainment can help set the stage for later discussion of economic and racial justice metrics.
- May include EPA Environmental Justice (EJ) screening tool.
- One idea that could be propagated throughout this chapter is to identify environmental justice communities based on the methodology of the PA DEP (basically 30%+ non-white and/or 20%+ below federal poverty line). This is more of a binary metric, while the EPA EJ screening tool is a continuous variable. If you locate the EJ communities, you can then look for differences in different metrics (current land cover, land cover change, impervious cover, open space, etc) based on values for EJ communities in comparison to non-EJ communities. This would translate into a simple metric of inequality.
- Consideration of how the demographics are changing.
- Is gentrification happening? Where?

Land use/ land cover

- A metric or map that tracked differences in land cover by race / income (or in EJ community vs. not) could be useful.
- Maps that track changes in relation relative to EJ communities (or racial and socioeconomic divisions) could be useful.
- Who lives in the spaces where land cover is changing?

Impervious cover

- A metric to show the difference in impervious surface coverage in EJ vs non-EJ communities.
- Land cover and impervious surface coverage is related to heat stress, which is an important climate change vulnerability for EJ communities.

Public open space

- A metric to show the difference in public open space access for EJ vs non-EJ communities (such as using a cost-distance function)
- Who is utilizing the open space?

Public access points

- Show whether there is inequality or not in EJ vs. non-EJ communities with respect to access

Natural capital value

- Are environmental jobs / workers mainly white?

- Is there demographic information for jobs that could be used to show if there is equality or inequality across race?
- Actions and needs section can focus on need for equity in access to green jobs

Water Quantity

Overarching Suggestions

- How do you think about water usage in an environmental justice framework?
- Are upstream users claiming water at the expense of water quantity / quality downstream?
- Do all have equal access to the resources? Is there patterns related to affluence?
- Per capita water use: which areas use more resources? Which use less? Why?
- Need more on tributaries
- Effects on underrepresented communities along tributaries should be addressed
- How does prioritizing NYC affect communities around the Delaware River and Delaware Bay?
- Is management of access to the resources done equitably?

Water Withdrawals: Tracking Supply & Demand

- Break down by race and socioeconomic standing for basin water use
- Who has used water from the basin in the past?
- Are there any concerns about water use? Is it different for different communities? If not, why not?
- Do certain populations use more water than others? Why?
- If certain populations consume more water, what specific solutions can we offer them

Per Capita Water Use

- Who lives in the eight sub-basins
- If certain populations consume more water, what specific solutions can we offer?
- Who has or where is leaky/poor infrastructure?

Groundwater Availability

- Who lives in areas most stressed?

Salt Front Location & Movement

- What are the downstream ecological and societal effects of water diversion upstream?

Water Quality

Overarching Suggestions

- How does water quality affect the ecosystem and human populations?
- How has water quality historically affected the ecosystem and human populations?
- Give concrete ideas for solutions and improvements
- Mention water quality issues such as CSO overflows, plastics, emerging contaminants (PFAS), trash in waterways.
- Report focuses on mainstem, which we agree integrates the watershed. However, this obscures where in the watershed are input/contamination hotspots. Can some information from tributaries (e.g., from USGS data) be integrated?
- Water security as it relates to water quality is an important issue. Specific examples that could be touched on: drought, freshwater availability (relative to salt line drift or salt intrusion)
- Access to potable water in at risk communities need to be more tightly monitored

Tidal

Dissolved oxygen

- Should we talk more about the locations where the DO is being tested? For example Philadelphia has a lot of marginalized populations and is close to the airport. Other sites should be built out the same way.
- How has this historically affected the ecosystem and human populations?

Contaminants

- Metals, pesticides and polycyclic aromatic hydrocarbons (PAHs): how are these affecting the ecosystem and human population?

Fish Contaminant Levels

- What other contaminants have been measured on a time series?
- How do contaminants affect people?
- Is there anything that can be done to treat the effects people experience if eating these fish?

Emerging Contaminants

- Is there anything that can be done to treat the effects people experience of eating these fish and shellfish?
- Give concrete ideas for solutions and improvements

Whole effluent toxicity

- Does toxicity vary based on whether the community is an EJ community?

Non-tidal

- Emerging Contaminants: Expand on effects of pharmaceuticals
- Temperature Progress on PA's seasonally specific temperature criteria for warm water fisheries?

Sediments

Overarching Suggestions

- Are some communities exposed to toxic sediment, due to being located near sources of contamination, polluting industries and waste management?
- Who lives by the filled dredged materials lots? How are they affected?
- How are different communities affected by sediment loss or erosion?
- Are dredging activities carried out equitably?

Dredging Activity

- How does dredging affect surrounding communities? Does the dredged sediment contain hazardous material?
- What types of land settlements tend to need dredging? Are routine dredging activities prioritized equitably?
- Is there equal funding/opportunity for dredging needs? Commerce vs. recreation vs. both?
- Where are the upland dredging disposal sites?

Habitats

Overarching Suggestions

- How can we be proactive in promoting environmental equity?
- Where are there equity gaps in habitat quality and how can they be remedied?
- Greenspace – How does it fit in?
- Environmental equity analysis could be done on most spatially explicit data – comparing EJ to non-EJ communities.
- For riparian corridors specifically: Overall, cities and urbanized areas play an important role in environmental quality. Cities that have high density have a lower carbon footprint per person, and people are able to live more sustainably – not driving as much, consuming less resources, and altering the land cover over a much smaller footprint than folks that live in rural areas, suburbs, and exurban areas. In this context, we need to be able to determine what biodiverse, healthy, and revitalized cities look like so that we can create them across a development gradient. Here, it is important to just adjust the tone as to not put as strong a value judgment on urbanization.
- Action items should incorporate equity concerns, especially focusing on the importance of restoration, high quality habitat, and public access to greenspace in cities generally and overburdened neighborhoods specifically.

Subtidal habitats

- How have human activities contributed to the status of soft or hard bottom habitat communities?
- The 2012 TREB reports high benthic diversity in the marine part of the estuary and low diversity in the freshwater portion, indicating polluted condition in the freshwater portion of the Estuary. This suggests poor habitat quality in the freshwater part of the Estuary, where human populations and environmental justice communities are. This could be added to the discussion.

Nontidal habitats

Freshwater Wetlands

- Do these overlap with residential areas? Commercial? Where are they? Who lives here?
- Add action items related to environmental equity, such as: determine whether wetland policy has created inequities as to who receives benefits of wetlands.

Fish Passage

- How does dam removal affect communities?
- Dam removal prioritization should include equity as part of its return.

Hydrological Impairment

- Talk about the location of this, where it is, who they effect and how
- Stormwater runoff fees – Need for equitable education so the public votes/ understands needs for them, particularly in the context of climate change.

Living Resources

Overarching Suggestions

- Include consumption advisories

Climate Change

Overarching Suggestions

- Include discussion of the importance of equity in resilience planning and recovery from climatic event emergencies.
- What types of climatic events are likely to affect EJ communities? Some examples include extreme flooding and heat stress.
- Integrate information about how temporal trends in climate change are affecting particular communities compared to others
- How has temperature changed by socioeconomic status?
- How do these indicators affect people? How are people affected differently?

Air Temperature

- What are the effects of air temperature on animals, humans, ecosystems, infrastructure etc.?
- How does it disproportionately affect people by race or socioeconomic standing?
- How will warming affect day-to-day life of different socioeconomic groups?

Precipitation

- How does increased precipitation affect people, ecosystems, animals, infrastructure?
- Are people affected by indigenous status, race, or socioeconomic factors?

Extremes: Air Temperature and Precipitation

- How is this affecting air temperature on animals, humans, ecosystems, infrastructure etc.
- How does it disproportionately affect people by race, socioeconomic standing?

Streamflow

- What about development trends & destruction of habitats?
- How does it disproportionately affect people by race, socioeconomic standing?

Restoration

Acres Restored Annually

- How do restored areas compare with racial diversity or socioeconomic diversity?
- Which parts are identified as needing help, but then not getting it? Who lives there?
- Which parts of the watershed are increasing in protection? Who lives there?
- Which parts of the basin have improved the most since data has been collected? What are the data trends? Who lives there?
- Are there different trends in funding based on position within the watershed or socioeconomic status?
- How will different people in different parts of the basin be affected?

Restores Habitat Types

- Who lives in or near the greatest habitat losses? Can we balance investing in those systems?
- Add maps showing different restored habitats, racial diversity, and socioeconomic diversity
- Are there different trends in funding based on position within the watershed or socioeconomic status?
- Who lives where the most critical habitats are?

Restoration Need

- Who lives in the other watersheds that are more funded?