

DAY ONE PROJECT

Establishing the AYA Research Institute: Increasing Data Capacity and Community Engagement for Environmental-Justice Tools

Alexa White

May 2022

The logo for the Federation of American Scientists (FAS), consisting of the letters 'FAS' in white, bold, sans-serif font inside a dark teal square.

The Day One Project Early Career Science Policy Accelerator is a joint initiative between the Federation of American Scientists & the National Science Policy Network.

Summary

Environmental justice (EJ) is a priority issue for the Biden Administration, yet the federal government lacks capacity to collect and maintain data needed to adequately identify and respond to environmental-justice (EJ) issues. EJ tools meant to resolve EJ issues — especially the Environmental Protection Agency (EPA)'s [EJSCREEN tool](#) — are gaining national recognition. But knowledge gaps and a dearth of EJ-trained scientists are preventing EJSCREEN from reaching its full potential. To address these issues, the Administration should allocate a portion of the EPA's [Justice40](#) funding to create the “AYA Research Institute”, a think tank under EPA's jurisdiction. Derived from the [Adinkra symbol](#), AYA means “resourcefulness and defiance against oppression.” The AYA Research Institute will functionally address EJSCREEN's limitations as well as increase federal capacity to identify and effectively resolve existing and future EJ issues.

Challenge and Opportunity

Approximately 200,000 people in the United States die every year [of pollution-related causes](#). These deaths are concentrated in underresourced, vulnerable, and/or minority communities. The EPA created the Office of Environmental Justice (OEJ) in 1992 to address systematic disparities in environmental outcomes among different communities. The primary tool that OEJ relies on to consider and address EJ concerns is EJSCREEN. EJSCREEN integrates a variety of environmental and demographic data into a layered map that identifies communities disproportionately impacted by environmental harms. This tool is available for public use and is the primary screening mechanism for many initiatives at [state](#) and [local](#) levels. Unfortunately, EJSCREEN has three major limitations:

- (1) Missing indicators.** EJSCREEN omits crucial environmental indicators such as drinking-water quality and indoor air quality. [OEJ states](#) that these crucial indicators are not included due to a lack of resources available to collect underlying data at the appropriate quality, spatial range, and resolution.
- (2) Small areas are less accurate.** There is considerable uncertainty in EJSCREEN environmental and demographic estimates at the census block group (CBG) level. This is because (i) EJSCREEN's assessments of environmental indicators can rely on data collected at scales less granular than CBG, and (ii) some of EJSCREEN's demographic estimates are derived from surveys (as opposed to census data) and are therefore less consistent.
- (3) Deficiencies in a single dataset can propagate across EJSCREEN analyses.** Environmental indicators and health outcomes are inherently interconnected. This means that subpar data on certain indicators — such as emissions levels, ambient pollutant levels in air, individual exposure, and pollutant toxicity — can compromise the reliability of EJSCREEN results on multiple fronts.

These limitations must be addressed to unlock the full potential of EJSCREEN as a tool for informing research and policy. More robust, accurate, and comprehensive environmental and demographic data are needed to power EJSCREEN. [Community-driven](#) initiatives are a powerful but [underutilized](#) way to source such data. Yet limited time, funding, rapport, and knowledge tend to discourage scientists from engaging in [community-based research collaborations](#). In addition, effectively operationalizing data-based EJ initiatives at a national scale requires the involvement of specialists trained at the intersection of EJ and science, technology, engineering, and math (STEM). Unfortunately, relatively poor compensation [discourages scientists from pursuing EJ work](#) — and scientists who work on other topics but have interest in EJ can rarely commit the time needed to sustain long-term collaborations with EJ organizations. It is time to augment the federal government's past and existing EJ work with redoubled investment in community-based data and training.

Plan of Action

EPA should dedicate \$20 million of its Justice40 funding to establish the AYA Research Institute: an in-house think tank designed to functionally address EJSCREEN's limitations as well as increase federal capacity to identify and effectively resolve existing and future EJ issues. The word AYA is the formal name for the [Adinkra symbol](#) meaning “resourcefulness and defiance against oppression” — concepts that define the fight for environmental justice.

The Research Institute will comprise three arms. The first arm will **increase federal EJ data capacity** through an expert advisory group tasked with providing and updating recommendations to inform federal collection and use of EJ data. The advisory group will focus specifically on (i) reviewing and recommending updates to environmental and demographic indicators included in EJSCREEN, and (ii) identifying opportunities for community-based initiatives that could help close key gaps in the data upon which EJSCREEN relies.

The second arm will **help grow the pipeline of EJ-focused scientists** through a three-year fellowship program supporting doctoral students in applied research projects that exclusively address EJ issues in U.S. municipalities and counties identified as frontline communities. The program will be three years long so that participants are able to conduct much-needed [longitudinal studies](#) that are rare in the EJ space. To be eligible, doctoral students will need to (i) demonstrate how their projects will help strengthen EJSCREEN and/or leverage EJSCREEN insights, and (ii) present a clear plan for interacting with and considering recommendations from local EJ grassroots organization(s). Selected students will be matched with grassroots EJ organizations distributed across five U.S. geographic regions (Northeast, Southeast, Midwest, Southwest, and West) for mentorship and implementation support. The fellowship will support participants in achieving their academic goals while also providing them with experience working with community-based data, building community-engagement and science-communication skills, and learning how to scale science policymaking from local to federal systems. As such, the fellowship will help grow the



pipeline of STEM talent knowledgeable about and committed to working on EJ issues in the United States.

The third arm will **embed EJ expertise into federal decision making** by sponsoring a permanent suite of very dominant resident staff, supported by “visitors” (i.e., the doctoral fellows), to produce policy recommendations, studies, surveys, qualitative analyses, and quantitative analyses centered around EJ. This [model](#) will rely on the resident staff to maintain strong relationships with federal government and extragovernmental partners and to ensure continuity across projects, while the fellows provide ancillary support as appropriate based on their skills/interest and Institute needs. The fellowship will act as a screening tool for hiring future members of the resident staff.

Taken together, these arms of the AYA Research Institute will help advance Justice40’s goal of improving [training and workforce development](#), as well as the Biden Administration’s goal of better preparing the United States to adapt and respond to the impacts of [climate change](#). The AYA Research Institute can be launched with \$10 million: \$4 million to establish the fellowship program with an initial cohort of 10 doctoral students (receiving stipends commensurate with typical doctoral stipends at U.S. universities), and \$6 million to cover administrative expenses and staff expert salaries. Additional funding will be needed to maintain the Institute if it proves successful after launch. Funding for the Institute could come from Justice40 funds allocated to EPA. Alternatively, [EPA’s fiscal year \(FY\) 2022 budget for science and technology](#) clearly states a goal of prioritizing EJ — funds from this budget could hence be allocated towards the Institute using existing authority. Finally, [EPA’s FY 2022 budget for environmental programs and management](#) dedicates approximately \$6 million to EJSCREEN — a portion of these funds could be reallocated to the Institute as well.

Conclusion

The Biden-Harris Administration is making unprecedented investments in environmental justice. The AYA Research Institute is designed to be a force multiplier for those investments. Federally sponsored EJ efforts involve multiple programs and management tools that [directly rely](#) on the usability and accuracy of EJSCREEN. The AYA Research Institute will increase federal data capacity and help resolve the largest gaps in the data upon which EJSCREEN depends in order to increase the tool’s effectiveness. The Institute will also advance data-driven environmental-justice efforts more broadly by (i) growing the pipeline of EJ-focused researchers experienced in working with data, and (ii) embedding EJ expertise into federal decision making. In sum, the AYA Research Institute will strengthen the federal government’s capacity to strategically and meaningfully advance EJ nationwide.

Frequently Asked Questions

1. How does this proposal align with grassroots EJ efforts?

Many grassroots EJ efforts are focused on working with scientists to better collect and use data to understand the scope of environmental injustices. The AYA Research Institute would allocate in-kind support to advance such efforts and would help ensure that data collected through community-based initiatives is used as appropriate to strengthen federal decision-making tools like EJSCREEN.

2. How does this proposal align with the [Climate and Economic Justice Screening Tool \(CEJST\)](#) recently announced by the Biden administration?

EJSCREEN and CEJST are meant to be used in tandem. As the White House [explains](#), “EJSCREEN and CEJST complement each other — the former provides a tool to screen for potential disproportionate environmental burdens and harms at the community level, while the latter defines and maps disadvantaged communities for the purpose of informing how Federal agencies guide the benefits of certain programs, including through the Justice40 Initiative.” As such, improvements to EJSCREEN will inevitably strengthen deployment of CEJST.

3. Has a think tank ever been embedded in a federal government agency before?

Yes. Examples include [the U.S. Army War College Strategic Studies Institute](#) and [the Asian-Pacific Center for Security Studies](#). Both entities have been successful and serve as primary research facilities.

4. What criteria would the AYA Research Institute use to evaluate doctoral students who apply to its fellowship program?

To be eligible for the fellowship program, applicants must have completed one year of their doctoral program and be current students in a STEM department. Fellows must propose a research project that would help strengthen EJSCREEN and/or leverage EJSCREEN insights to address a particular EJ issue. Fellows must also clearly demonstrate how they would work with community-based organizations on their proposed projects. Priority would be given to candidates proposing the types of longitudinal studies that are rare but badly needed in the EJ space. To ensure that fellows are well equipped to perform deep community engagement, additional selection criteria for the AYA Research Institute fellowship program could draw from the criteria presented in the rubric for the [Harvard Climate Advocacy Fellowship](#).

5. What can be done to avoid politicizing the AYA Research Institute, and to ensure the Institute’s longevity across administrations?

A key step will be grounding the Institute in the expertise of salaried, career staff. This will offset potential politicization of research outputs.

6. What is the existing data the EJSCREEN is using?

EJSCREEN 2.0 is largely using data from the 2020 U.S. Census Bureau's American Community Survey, as well as many other sources (e.g., the Department of Transportation (DOT) National Transportation Atlas Database, the Community Multiscale Air Quality (CMAQ) modeling system, etc.) The [EJSCREEN Technical Document](#) explicates the existing data sources that EJSCREEN relies on.

7. What are the demographic and environmental indicators of interest included in EJSCREEN?

The [demographic indicators](#) are: people of color, low income, unemployment rate, linguistic isolation, less than high school education, under age 5 and over age 64. The [environmental indicators](#) are: particulate matter 2.5, ozone, diesel particulate matter, air toxics cancer risk, air toxics respiratory hazard index, traffic proximity and volume, lead paint, Superfund proximity, risk management plan facility proximity, hazardous waste proximity, underground storage tanks and leaking UST, and wastewater discharge.

About the Author



Alexa White is a Ph.D. candidate in the department of Ecology and Evolutionary Biology at the University of Michigan, Ann Arbor. She is an agroecologist interested in international environmental governance and peasant studies. Alexa's research, based in Hawai'i and Jamaica, focuses on how the United Nations Sustainable Development Goal #2: To End Hunger is expected to impact the biology and management of small-scale farms. Alexa is also a Harvard Climate Justice Design Fellow through which she investigates how to use data science to confront local environmental justice issues. In addition, Alexa is a researcher for the University of Michigan's Sustainability Without Borders project in Kampala, Uganda, where she works to improve water-filtration systems throughout the country.

About the Day One Project



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