

**RFA 24-1. CUMULATIVE IMPACT ASSESSMENT FOR DECISION-MAKING: A COMMUNITY-ACADEMIC PARTNERSHIP APPROACH****SUMMARY**

The Health Effects Institute (HEI) aims to promote environmental justice by supporting research that answers pressing questions and generates knowledge and solutions for historically marginalized communities and communities overburdened by environmental pollutants (hereafter referred to as “historically marginalized communities”). This RFA aims to address community-based environmental health concerns by funding cumulative impact assessments tailored to a specific intervention, program, policy, outreach method, or other action aimed at reducing chemical or nonchemical stressor exposures. An important feature of this RFA is that it provides funding for partnership<sup>1</sup> building and strengthening, research translation, and research continuity, which are elements of community-based research that are not typically supported under traditional funding mechanisms.

The research focus of this RFA is the cumulative impacts<sup>2</sup> of air pollution and other chemical and nonchemical stressors over time on health outcomes in historically marginalized communities. Chemical stressors can arise from multiple sources and pathways that connect exposure sources with people. Nonchemical stressors are individual- and community-level factors that adversely affect human health independently and might also increase exposure to or magnify the health effects of chemical stressors. Examples of nonchemical stressors are segregation, climate stressors (e.g., heat), lack of green space, poor housing conditions, community violence, low food accessibility, poverty, low social support, and noise (Payne-Sturges et al. 2018).

Funding for this solicitation will occur in two phases:

Phase I: During this phase, community organizations and research institutes will strengthen their partnership by understanding their mutual research needs and forming diverse research teams spanning various sectors. Partners will collaborate to identify pressing questions regarding community cumulative impacts, identify relevant decision contexts (see definition below), shape a clear research question, develop engagement strategies with the community, and outline plans for sharing research progress and findings effectively.

Phase II: During this phase, plans from Phase I will be put into action. The research team will use innovative or proven methods to conduct an assessment of cumulative impacts

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<sup>1</sup> Examples of partnerships among research institutes and community organizations are a research organization advising a community organization that is leading a research or health initiative, community and research organizations collaborating as investigators on a study, or community and research organizations collaborating on an implementation project that is addressing an environmental or health concern. (Adapted from <https://www.pcori.org/sites/default/files/PCORI-2023-Cycle-1-PARTNER-PFA.pdf>.)

<sup>2</sup> Cumulative impacts are defined as the totality of exposures to combinations of chemical and nonchemical stressors and their effects on health, well-being, and quality of life outcomes. Cumulative impacts include contemporary exposures, as well as exposures throughout a person’s lifetime, and can encompass both direct and indirect effects on people. Adapted from (US EPA 2022).

for a specific decision context (see definition below). The goal is to share insights in a way that resonates with different groups, ensuring that the information can be used effectively by those who need it most.

Applicants can apply to one of two tracks:

Track 1: Apply directly to Phase I; approval to proceed to Phase II is contingent on achieving specific milestones and outputs established in Phase I.

Track 2: Apply directly to Phase II with a preliminary application, and if invited, a full application that includes many of the outputs that would have resulted from completing Phase I.

Applications for each track will be evaluated independently of each other.

## **BACKGROUND AND RATIONALE**

### Persistent Environmental Health Disparities

It is well documented that historically marginalized communities in the United States suffer disproportionately high exposures to environmental pollutants and adverse health outcomes compared to other communities (Gee and Payne 2004; Johnston and Cushing 2020; Mohai and Saha 2015; Saha et al. 2022; Smith et al. 2022). These inequities have persisted despite the implementation of environmental policies that have successfully decreased pollution concentrations over time on a national scale but that might not provide benefits at the community level, thereby potentially increasing disparities in adverse environmental exposures and health outcomes (Liu et al. 2018, 2021; Rosofsky et al. 2018; Wang et al. 2022). Multiple overlaying chemical and nonchemical stressors exacerbate environmental health inequities and pose a barrier to the equitable distribution of environmental burdens and benefits resulting from environmental health policies and actions. Thus, there is a pressing need to identify and assess which multiple, overlaying (i.e., cumulative) chemical and nonchemical stressors lead to environmental health inequities to help focus policies and other actions on the most harmful stressors or combination of stressors.

### Past and Current Cumulative Impacts Research and Policies

Many past and current environmental policies focus on a single pollutant rather than the many chemical and nonchemical stressors that contribute to adverse environmental exposures and health outcomes. Environmental justice advocates and advisory groups have urged government agencies to consider cumulative impacts in environmental policymaking to address the overlapping environmental and social inequities comprehensively (Environmental Justice Health Alliance for Chemical Policy Reform and Coming Clean 2022; National Environmental Justice Advisory Council [NEJAC] 2004). Federal and state agencies and Congress have responded in recent years by enacting policies, developing screening tools and regulatory guidance, and introducing bills that aim to address both chemical and nonchemical stressors experienced by historically marginalized communities and that prioritize the most vulnerable communities for action (OEHHA 2021; Sen. Duckworth 2021; Overburdened Communities, Title 13. Chapter 1D. Part XI. (§§1-5 - C.13:1D-157 to 13:1D-161) 2020). Agencies have also provided unprecedented funding directly to communities and for conducting research to identify and address the cumulative impact of the various stressors (e.g., US EPA 2022, 2023).

At the same time, there have been new and novel research efforts to understand and quantify the combined risk to human health from multiple, overlapping stressors. Approaches include use of advanced analytical methods, animal models to study physiological responses to multiple environmental stressors, improved stressor measurement techniques, new risk assessment frameworks, mapping tools, and qualitative methods to collect data that inform research design and statistical models (Cushing et al. 2015; Fox et al. 2017; Huang and London 2012; Huang et al. 2018; Payne-Sturges et al. 2018, 2021; Sadd et al. 2011; Scammell et al. 2014; Sexton 2012). Moreover, there are opportunities to advance cumulative impact research through new data aggregation methods, measurement techniques, qualitative data collection methods, citizen and participatory science methods, and improved statistical models.

Although cumulative impact assessment can be used to document persistent environmental health disparities, there is a need to focus cumulative impact assessments on identifying strategies to mitigate the adverse effects of these disparities. It is that type of solution-oriented research focused on a specific decision context that is the focus of this RFA.

### Community-Academic Partnerships

A common thread in effective policymaking and research around cumulative impacts is the participation of community groups and decision-makers (Davis and Ramírez-Andreotta 2021; Huang and London 2016; North et al. 2014). One approach to community engagement is community based participatory research, which is typically centered around a community-academic partnership whereby community organizations and other groups interested in or affected by the research outputs are meaningfully involved in all aspects of the research from its development to its dissemination (Israel et al. 2010). An authentic, trusted community-academic partnership provides many benefits both to the community where the research is occurring and to the research itself (Balazs and Morello-Frosch 2013; Sadd et al. 2014), such as the following:

- Generation of data and technical tools that can be used to address environmental health challenges faced by the community.
- Strengthening of community capacity to understand the decisions that have led to the social and environmental factors of concern and to pursue solutions for addressing these factors.
- Implementation of engagement strategies that are not only accessible, culturally appropriate, and adapted to the local context, but also are receptive to community needs.
- Inclusion of insights on navigating local politics and historical factors.
- Creation of a bridge between the community and academic investigators.

Previous research has documented challenges associated with implementing community-academic partnerships, including misalignment of research aims and timelines, ineffective communication of technical concepts to a variety of audiences, administrative burdens on community-based organizations (CBOs), power and funding imbalances, determining data sharing processes and ownership, and inability to continue the partnership and actions beyond the life of the grant (Ornelas Van Horne et al. 2023; Payne-Sturges et al. 2015; Yuen et al. 2015). However, there are examples where community-academic partnerships have demonstrated that they can implement strategies to overcome these challenges and address environmental health concerns equitably and effectively (Balazs and Morello-Frosch 2013; Cook 2008; Wilson et al. 2014).

### Rationale for RFA

In Fall 2022, HEI hosted a [workshop](#) with participants from academia, community organizations, industry, government, and nongovernmental organizations (NGOs) to identify knowledge gaps and

barriers to conducting effective environmental justice (EJ) research and explore components of successful community-academic partnerships. The key takeaways are described in a [workshop summary](#). Participants discussed the EJ knowledge gaps or topics that could be prioritized in a new research program, including the need for assessments that consider environmental, social, and economic factors as drivers of environmental health disparities. They also provided recommendations for a research program to support EJ research effectively and equitably. Specific recommendations include restructuring the traditional grant model by offering a staged research process, encouraging equitable funding mechanisms between academic and community partners, encouraging the use of mixed methods, and supporting research led by community-academic partnerships focused on community concerns.

The format and research focus of this RFA was informed by the major themes that emerged from the workshop, recommendations from a wide array of stakeholders, research gaps identified by US EPA (Julius et al. 2022), published recommendations for research funders about how to better support community-engaged research (Payne-Sturges et al. 2015; Yuen et al. 2015), and the state of cumulative impacts literature and policymaking .

## **OVERALL OBJECTIVES**

The objective of this RFA is to address community-based environmental health concerns by conducting cumulative impact assessments where results would be incorporated into a specific decision context. This RFA also aims to strengthen community-academic partnerships, develop tools, and conduct dissemination activities designed to improve health and uptake of the research for decision-making.

Decision contexts include solutions for addressing the environmental health problem under study, such as interventions, programs, policies, outreach methods, or other actions aimed at reducing chemical or nonchemical stressor exposures. They can range from local siting decisions and education campaigns to national regulatory, permitting, and enforcement actions (US EPA 2022). Some examples of decision contexts eligible for funding include the following:

- State permitting of unconventional oil and gas development.
- Emissions reduction strategies in port communities.
- Source-specific state implementation plans.
- Historic housing or transportation policies.
- Climate resilience and disaster preparedness at the local, regional, state, or federal level.
- Green infrastructure to mitigate urban heat effects in a particular community.
- Environmental awareness campaigns with a local or regional focus.

The core research questions and approaches to identify solutions will be based on the community's environmental health concerns and its unique context. Ultimately, what is learned and demonstrated at a local level would include lessons learned that are applicable beyond the local community engaged in the research. In defining the decision context, investigators must specify the organizations that have jurisdiction over the decision, the laws and rules that govern the decision, and the type of data and information that are required or permissible for consideration in the decision. That information should inform the research design.

Outputs from the research will include 1) data and results that fill knowledge gaps about chemical and nonchemical stressors that cumulatively impact environmental exposures and health in historically marginalized communities, and 2) translation of results to relevant decision-makers and other communities that are facing similar decision contexts. Proposals that focus on exposures through air and other environmental media (e.g., surface water, groundwater, and noise) are encouraged. *Studies that do not apply cumulative impact methods to a specific decision context will not be considered responsive.*

## **ELIGIBILITY**

This RFA provides funding to research-community partnerships. Partnerships consist of one Principal Investigator (PI) from a research institution and one PI from a community-based organization (CBO) (see Box 1) representing a historically marginalized community. The PIs will serve as dual PIs to promote joint decision-making.

The research PI must be affiliated with an established academic or independent, nonprofit research institution, must possess an advanced degree, and be an expert in their field with a track record of producing high-quality and objective research on environmental and social stressors published in the peer-reviewed scientific literature. This PI should demonstrate experience in successfully leading a multidisciplinary team of scientists. Track 2 PIs must have a track record of trusted community-research partnerships and experience conducting community engaged research.

The CBO PI must be affiliated with an organization that focuses on social or environmental stressors and meets the criteria described in Box 1. The organization must have 501(c)(3) or 501(c)(6) tax exempt status or must be incorporated as a nonprofit under state law. This PI should demonstrate experience collaborating on research projects and have a track record of engagement with the community in which they work. Engagement experience can include lived, professional, and leadership experience in the community; participation in community governance, councils, or coalitions; or other activities that promote trusted relationships with the communities in which they work.

HEI does not allow the PI or co-PI to submit more than one application in response to a single research solicitation. However, someone who applies as the PI on one application can serve as a collaborator on other applications submitted in response to the same research solicitation. Applicants are welcome to apply to multiple HEI research solicitations at the same time.

### Box 1. Community-Based Organization Definition

HEI has adopted the US Environmental Protection Agency's definition of a "community-based non-profit organization" (CBO): a public or private nonprofit organization that supports and/or represents a community and/or certain populations within a community through engagement, education, and other related services provided to individual community residents and community stakeholders. A "community" can be characterized by a particular geographic area and/or by the relationships among members with similar interests and can be characterized as part of a broader national or regional community where organizations can be focused on the needs of urban, rural, and/or tribal areas, farmworkers, displaced workers, children with high levels of lead, people with asthma, subsistence fishers, and other similar groups (US EPA 2023).

The expectation is that the CBO should be driven by community residents in core aspects of its existence:

- The majority of the governing body and staff consists of local residents.
- The main operating offices are in the community.
- Priority issue areas are identified and defined by residents.
- Solutions to address priority issues are developed with residents.
- Program design, implementation, and evaluation components have residents intimately involved in leadership positions. (National Community-Based Organization Network 2023)

Sources:

US Environmental Protection Agency. 2023. The Environmental Justice Thriving Communities Grantmaking Program (EJ TCGM). Available: <https://www.epa.gov/environmentaljustice/environmental-justice-thriving-communities-grantmaking-program>. [accessed 2 November 2023].

National Community-Based Organization Network. What is a CBO? 2004. Available: <https://sph.umich.edu/ncbon/about/whatis.html>. [accessed 2 November 2023].

### HISTORICALLY MARGINALIZED COMMUNITY DEFINITION

The community CBO partner and the community for which the research serves should be defined as a historically marginalized community or community overburdened by pollution. Applicants can define the community using the following methods:

- Using definitions in regulatory actions (e.g., [Executive Order No. 13985](#) [2021 [definition](#) of underserved and disadvantaged communities]).
- Using publicly available tools for identifying disadvantaged or environmental justice communities (e.g., EPA's [EJScreen](#), the White House Council on Environmental Quality's [Climate and Economic Justice Screening Tool](#), the Centers for Disease Control and Prevention's [CDC] [Environmental Justice Index](#), CDC and Agency for Toxic Substances and Disease Registry's [Social Vulnerability Index](#), US Department of Transportation's [Equitable Transportation Community Explorer](#), or US Department of Energy's [Energy Justice Mapping Tool, or similar other tools](#)).
- Defining the characteristics of the community and why those characteristics are responsive to this solicitation, and if applicable, connect those characteristics to relevant screening tools.

### STUDY DURATION AND BUDGET

A total of \$3 million will be available for this RFA to fund up to three Track 1 studies (Phase I and Phase II) and up to two Track 2 (Phase II only) studies.

Track 1:

- Maximum study budget: \$625,000 for the full study (\$75,000 for Phase I, and \$550,000 for Phase II)
- Maximum duration: 1 year for Phase I; 2 years for Phase II

For Phase I, applicants will have the option to have HEI award two separate contracts to the research institute and CBO PIs or have the research institute subcontract the CBO.

Track 2:

- Maximum study budget: \$550,000
- Maximum duration: 2 years

For Phase II and Track 2, research institutes will subcontract the CBO. Applicants are asked to separate the first six-month CBO budget from the total budget so that HEI can provide those funds directly.

Budgets must reflect the time and contributions of all team members and equitable compensation for other community members and others who are meaningfully involved in the work.



## PHASE I: PARTNERSHIP STRENGTHENING AND PROBLEM FORMULATION

### SUMMARY

The objective of Phase I is to build new partnerships or strengthen established partnerships between research institutions and CBOs that serve historically marginalized communities. During this phase, CBOs and research institutions work together to formulate research questions relevant to the objectives of this RFA and build or strengthen teams representing key groups and multiple sectors (e.g., community members, practitioners, businesses, and government agencies, including policymakers, departments of education, housing, and public health) to support implementation and uptake of the work to be performed in Phase II. Applicants should consult Phase II text (below) for details about the research objectives around which Phase I activities should be based.

Funding a standalone phase for partnership strengthening and problem formulation serves several purposes: 1) ensures that members of the community-research partnership are aligned in their goals and priorities, 2) ensures that multiple interested or potentially affected groups are involved in research formulation and dissemination to foster the uptake of the research into practice, 3) builds capacity for CBOs to engage in useful research and identify solutions to address the identified stressors, and 4) encourages university partners to build their capacity for authentic community engagement.

### PHASE I ACTIVITIES

Activities in this phase include the following (see “Phase II” description and application instructions for additional details):

- *Formulate problem statement:* Identify the scope of the problem that the research will address, research objectives, methods to answer research questions, and potential barriers to conducting the research, communicating its findings, and putting the research findings into practice. Define the decision context that the research will inform, ensuring that the decision context allows consideration of the cumulative impacts of concern. US EPA’s Collaborative Problem Solving Model is one framework that partners can use to formulate their problem statement collaboratively and design their study (US EPA 2008)
- *Develop a budget:* Determine the lead applicant, terms of contracts, and overhead amounts and negotiate costs associated with research, including staff time, materials and supplies, fringe, and administrative rate for each organization.
- *Identify research team and collaborators:* Establish a research team with a range of expertise and knowledge to conduct the proposed research and dissemination activities. For new partnerships, HEI encourages inclusion of a community leader or liaison as a research team member to enhance community trust in the research institute partner.
- *Develop Community Engagement Plan:* Formulate a plan for engaging residents in the affected community and community-engaged approaches that benefit both the research and the community.
- *Develop Translation and Dissemination Plan:*
  - Describe the target audience and decision makers and the plan for providing education and outreach about the research findings, as well as the limitations, uncertainties, and the factors captured or not captured in the research.
  - Specify the pathway from study findings to action.



- Describe the team’s plan for interpreting and communicating interim and final results in the context of health risks for affected communities.
- *Identify facilities, infrastructure, and relevant datasets:* Ensure that research facilities, infrastructure, and staff are adequate to implement the research and engagement plans.
- *Establish a Memorandum of Understanding (MOU) or Partnership Agreement:* Develop a written agreement between the partnership PIs that outlines the roles and expectations of the partners, the scope of the project, mechanisms for integrating traditional scientific and local knowledge into the research, decision-making processes (including a decision tree that describes team member responsibilities), and provisions for conflict resolution. Applicants can use templates from the [University of Washington](#), [The Engagement Lab at Emerson College](#), [Tishman Environmental and Design Center](#), or other similar.
  - The MOU or Partnership Agreement should include a *data sharing agreement*, including agreements around intellectual property ownership and publishing; a summary of the data that will be created; who has access to the data; data storage, management, and maintenance practices; what facilities and equipment will be required; and persons responsible for each activity.
- *Define measures to evaluate success of the engagement methods and of the translation and dissemination of results for use in decision-making.* An example is developing an accountability plan that describes how the applicants will track successes, failures, and progress. Please refer to [National Institute of Environmental Health Sciences’ Evaluation Metrics Manual](#), Chapter 1 for guidance.

## PHASE I OUTPUTS

Outputs for Phase I include the following:

- Months 5 and 10: Submit reports demonstrating that specific milestones described in the application have been achieved and documenting measures of success.
- At Completion of Phase I:
  1. Application for Phase II, which includes the following elements (see “Phase II” section for guidance):
    - a. Research Project Plan that includes the studies, methods, and timeline for research activities, as well as the following two plans:
      - i. Data Sharing and Management Plan
      - ii. Research Translation and Dissemination Plan
    - b. Community Engagement Plan
    - c. Preliminary Quality Assurance/Quality Control Plan
    - d. Budget
  2. Memorandum of Understanding or Partnership Agreement between the core partners.
  3. Contribution to an HEI summary report that combines lessons learned from all teams awarded under Phase I facilitated by HEI.
  4. Attendance at HEI’s Annual Conference.

## PHASE II: RESEARCH IMPLEMENTATION AND TRANSLATION

### SUMMARY

In Phase II, investigators will implement the plans described in the outputs produced in Phase I. Track 2 applications (i.e., those who did not participate in Phase I) must include many of the outputs described under Phase I in the proposals.

### RESEARCH OBJECTIVES

HEI seeks to fund studies that assess cumulative impacts of chemical and nonchemical stressors on health, tailored to a specific decision-making context. Research will generate evidence to support solutions for reducing the cumulative impacts of chemical and nonchemical stressors on health. Solutions can include interventions, programs, policies, outreach methods, or other actions aimed at reducing chemical or nonchemical stressor exposures. All proposals must produce results that can be applied to an actual decision.

Proposals should describe which groups are the focus of research translation activities, why they are the focus of those activities, and how or if they will be involved in research implementation, translation, and dissemination activities. The study design and scope should be tailored to the specific decision context and the context's specific legal and regulatory constraints. The technical proposal ideally will be informed by engagement with experts who represent multiple sectors (e.g., academia, communities, regulatory and public health agencies, industry, and nongovernmental organizations) and will include them in research as appropriate. *HEI encourages use and evaluation of new and novel methods to conduct the assessment (e.g., prioritizing stressors, combining chemical and nonchemical stressors into a single model, and combining quantitative and qualitative data).* Data used for the study must undergo relevant quality assurance and quality control procedures to ensure its quality and reduce uncertainty.

### CRITICAL STUDY DESIGN CONSIDERATIONS

HEI considers the following features of the study design important to meet the overall objectives:

Potentially Affected Community. The research team should define the potentially affected community (see “Historically Marginalized Community Definition” section, above). Note that consideration needs to be given as to whether the potentially exposed community can demonstrate sufficient differences in exposure or health, within itself or with a comparison group, to answer the research question.

Mixed Methods. Applicants are encouraged to use both quantitative and qualitative methods and advance cumulative impacts methodology beyond distributional assessments of exposures and health outcomes, such as by proposing new methods for combining both quantitative (e.g., biomarkers, environmental measurements, and epigenetic data) and qualitative data (Tulve et al. 2024). Applicants can propose the use of existing data or the collection of empirical data to conduct their assessments. Regardless of the approach, HEI requires that investigators examine or explain the relationship between identified nonchemical stressors with increased exposure or health outcomes. All proposals must include a quantitative component.

- *Quantitative Approaches.* Applicants can propose a variety of conceptual approaches to conduct cumulative impact assessments. Examples include risk-based approaches and

statistical models such as supervised models (e.g., regression and classification models) or unsupervised models (e.g., factor analysis and machine learning) (Huang et al. 2018). Statistical models must be evaluated against observations. All analytical approaches should incorporate feedback and data collected from the community partner and others involved. All approaches should integrate quantitative measures of uncertainty in their assessments.

- *Qualitative Approaches.* Qualitative methods, such as oral histories, one-on-one interviews, Indigenous Knowledge approaches, videos, photovoice, and focus groups can contribute to the understanding of contextual factors (e.g., policy landscape, cultural barriers, history of community involvement in addressing environmental inequities) that investigators must consider in their analyses. They can also reveal perceptions of the community and the research question under study, help identify causal relationships that underlie quantitative associations, aid in hypothesis generation, fill in gaps where quantitative data are not available at the appropriate spatial resolution, and help to identify other factors that contribute to disparities and influence exposure to chemical and nonchemical stressors (Payne-Sturges et al. 2015; Scammell 2010).

Investigators can also propose Health Impact Assessments that take into consideration cumulative impacts.

Exposure Estimation. Potential exposure to chemicals through air must be included as an element of the proposal. Proposals that focus on exposures through air *and* other environmental media (e.g., surface water, groundwater, and noise) are encouraged. HEI encourages research teams to identify and assess nonchemical stressors relevant to the research question and community context. Applicants should justify the selection of nonchemical variables (e.g., income as a proxy for socioeconomic status), as well as the temporal and spatial scales of the measurements.

HEI encourages leverage existing data to the extent possible to support rigorous assessment of chemical and nonchemical stressors. Investigators are encouraged to determine whether the community with which they are working is a recipient of recent grants to conduct environmental quality monitoring or cumulative impact assessments and to incorporate those data into their investigations.

Regions and communities that are the focus of this solicitation might have insufficient density or numbers of monitors to capture small-scale variations in air pollution. Investigators can use one or a combination of methods to conduct environmental measurements (e.g., ground-based sampling using inexpensive sensors, routine monitoring, personal activity monitoring, and remote observations) and nonchemical stressor data (e.g., surveys, interviews, and focus groups). Investigators can combine environmental measurements with models to predict exposures. Studies with indoor air quality monitoring can incorporate personal air sampling into the exposure estimation. Biomonitoring data will also be considered responsive. The proposed use of such data must be accompanied by a plan for ensuring its quality and for protecting confidentiality (see [Data Management, Preservation, and Access Policy](#)).

Health outcomes. Applicants choosing to investigate health outcomes (i.e., morbidity or mortality) should give a clear rationale regarding 1) how the research question relates to the RFA objectives and 2) the relevance of evaluating that health outcome for decision-making. Measures of individual or community well-being will be considered responsive.

Scalability. Investigators should identify the contextual factors (e.g., population demographics, local policies, historical context, and environmental and social stressors) that inform the application of

findings to other communities or larger geographic scales. Proposals must include expected outcomes that have the potential to be scaled and transferred to other communities.

Multisector Involvement. Investigators should consider involving individuals from different sectors at appropriate stages of research to optimize the research methods to ensure that decision makers can put the research outputs into practice, help identify relevant data, recruit study participants, provide historical contexts, and educate the community about the research. Examples include community members, faith leaders, educational institutions (e.g., researchers with relevant expertise), non-profit organizations, local businesses, industry, and local, regional, or state-level regulators or policymakers.

#### **DATA SHARING AND MANAGEMENT PLAN**

HEI expects each PI that it funds to adhere to HEI's [Policy on Data Management, Preservation, and Access](#), which requires PIs to provide at the outset of the study: (1) a plan for organizing, protecting, archiving, and making all data, data descriptions, analytical summary, metadata, and computer codes described above available to HEI during or upon completion of the study to enable HEI's rigorous review process to ensure high quality of the results and to allow for independent quality assurance/quality control of the data, and (2) a plan for making research data available to other investigators following publication of the results—preferably using public repositories that are made available under an open license—to allow for replication and reproduction of the results, as well as further exploration of the data by other investigators.

The Data Sharing and Management Plan should also build on HEI's [Policy on Data Management, Preservation and Access](#) by describing preliminary data sharing agreements among the co-PIs, such as data ownership, levels of access for different partners and staff members, data infrastructure, and maintenance, and the type of consent needed before using data outside of the project. Investigators can cross-reference data ownership agreements established in MOUs or Partnership Agreements.

#### **COMMUNITY ENGAGEMENT PLAN**

During Phase I and Track 2, applicants will be asked to provide a Community Engagement Plan that describes how the PIs and team members will engage the community at large and other sectors interested in or potentially affected by the work. The plan should describe the strategies and the specific roles of collaborators throughout the study period to conduct constructive community engagement and foster relationships during research, as well as information on how community members and groups who might play a more active role in the research will be compensated for their time and expenses and what strategies will be used to lower barriers to participation (e.g., enhance cultural competency, provide multiple engagement opportunities, or provide childcare).

The plan should describe how the team will measure progress of the desired outcomes for community engagement based on both outputs (e.g., number of meetings and range of interests represented at meetings) and outcomes (e.g., perceptions of the research topic, levels of participatory governance, and changes in exposures of concern). The Track 2 full application instructions will contain additional guidance.

## RESEARCH TRANSLATION AND DISSEMINATION PLAN

Effective research translation and dissemination to communities and decision-makers is critical to ensuring community members' understanding of the results and using the results to develop solutions. The goals of the Research Translation and Dissemination Plan are to 1) spread awareness and increase knowledge of the research, 2) provide decision-makers with tools to interpret and apply the research to reduce chemical and nonchemical stressor exposures, and 3) inform future policies, interventions, and other actions. The plan provides a guide for the research team to communicate the project and the project's findings in the most effective, accessible manner for both the community of interest and the larger audience of interested sectors. Community partners and residents should play a substantial role in conducting research translation and dissemination activities in the community.

For policy-makers, the plan should map the pathways between the study findings and the action, intervention, or policy that is the focus of the research. It should also include to whom the results will be shared, the timepoints during and at the end of the research when results will be shared and how those timepoints relate to the lifecycle of the policy or other action, and bi-directional feedback mechanisms. For community members, the plan should incorporate community partner knowledge of best practices for communications within their specific community.

*The research budget and timeline must account for creating materials to be used in research dissemination and implementing the plan among targeted groups.*

Investigators should tailor activities to their audiences and research objectives. Examples of activities in this stage include the following:

- *Provide bi-directional training opportunities:* Develop training opportunities to increase the partners' strengths and capacity for conducting their work. Some examples are research groups that train community members, especially youth, to enhance their scientific capacity and community groups that train researchers to communicate effectively with their community.
- *Distribute fact sheets:* Distribute fact sheets, either digital or physical, to the community that explain the project and project findings in accessible, culturally competent language (Parker et al. 2005).
- *Hold regular meetings:* Communicate with local government officials, environmental groups, other CBOs, and relevant industries about the project, the project's findings, and next steps in terms of actions, interventions, or policies.
- *Conduct community workshops:* Hold forums for interested community members that are focused on explaining the project and its findings and provide an opportunity for discussions and questions, which promote understanding and involvement. Training-based workshops for actions and interventions related to the findings can be used to help empower the community to apply the evidence.
- *Host webinars:* Conduct online webinars to inform the broad community of interested sectors of the goals and results of the project along with actionable next steps and provide a space for discussion.
- *Utilize media and various communication channels:* Use various means of communication (e.g., social media, local TV channels, and local papers) to reach the wider community (McCormack et al. 2013).

The plan should include the frequency and reach of dissemination activities and plans for describing data limitations, uncertainties, and risk-based interpretation of results. It should also

define measures of success about the study reach, perspectives of the affected community and other interested groups on the research and decision context, and whether there are plans to use the results to address the cumulative impacts identified in the study.

In interpreting preliminary and final data for the public, the research team should anticipate and address any negative effect that findings might have on the audience and review and interpret the data and findings in anticipation of questions and concerns, including potential risks to human health. The translation activities should address study limitations or constraints that limit its use for policies or regulations related to the decision context. Research teams might detect chemical concentrations that are suggestive of a serious concern for health; each team should be prepared to respond to such findings with a plan prepared in accordance with any Institutional Review Board or other applicable requirements.

## **RESEARCH TEAM**

The research team should include members who have the broad range of knowledge necessary to conduct the proposed research. It may include those who have expertise in policy making, environmental justice, air pollutant emissions, control technologies, air quality modeling and monitoring, community engagement, social science, exposure assessment, epidemiology, statistics, and knowledge of the involved community. The full team can include the PIs, their immediate team (other faculty, research scientists, post docs, students, and technicians) and staff members, co-investigators or collaborators at other institutions, community members, and consultants.

HEI strongly encourages applicants to diversify their research teams by including individuals from groups that are underrepresented in environmental exposure and health research and, to the extent appropriate given the study locations, are attuned to and knowledgeable about the communities in which the studies are taking place. For this purpose, HEI has adopted the National Institutes of Health (NIH) definition of underrepresented populations in the US Biomedical, Clinical, Behavioral and Social Sciences Research Enterprise.<sup>3</sup>

Invited Track 2 full applications must include an organizational chart that identifies each team member, their affiliation and role in the research, and lines of communication among team members and the PIs who oversee the research and coordinate its successful completion.

If the study requires access to a physical site or data managed by other groups, the team should demonstrate access, for example, by including letters of support from site owners or data managers in the proposal. The study team should have access to or be able to purchase or rent facilities, equipment, instrumentation, or cloud computing services needed to support the proposed research and have prior experience with preparing and implementing quality assurance plans.

## **PHASE II OUTPUTS**

Outputs for Phase II include the following:

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<sup>3</sup>NIH's definition of underrepresented populations includes individuals from racial and ethnic groups underrepresented in health-related sciences on a national basis, individuals with disabilities who are defined as those with a physical or mental impairment that substantially limits one or more major life activities, and individuals from disadvantaged backgrounds, recognizing that women from these three backgrounds face particular challenges at the graduate level and beyond in scientific fields (Source: <https://grants.nih.gov/grants/guide/notice-files/NOT-OD-20-031.html>).

- Biannual reporting demonstrating that specific milestones described in the application have been achieved
- Final Report that is reviewed by an independent Review Committee and that includes the following elements:
  - A summary of the decision-making contexts around which the study is designed, the study methods, and complete findings (both positive and negative)
  - Description of the research methods and outcomes that can be transferred to and benefit other communities and relevant policies
  - Evaluation of success metrics
  - A compilation of research dissemination materials categorized by sector
- A continuity plan for building on the HEI-funded work and continuing the partnership and next steps for identifying solutions not addressed in this project
- Bi-annual meetings with other awardees, hosted by HEI
- Attendance at HEI's Annual Conference
- Participation in a webinar hosted by HEI with other awardees summarizing the projects and sharing lessons learned.



### APPLICATION INSTRUCTIONS

Application forms and instructions for Phases I and II can be downloaded from [the RFA webpage](#). Please note that the required font size is 11-point with 1-inch margins. Also note that if selected for funding, the PIs enter into a cost-reimbursement contract with HEI rather than a grant. For additional details about the HEI research and review processes, please consult documents on the HEI Research and Review Processes and Investigator Commitments.

HEI will host a **webinar on April 3, 2024**, to provide an overview of this solicitation and answer questions from potential applicants. [Visit here](#) for more information and to register.

HEI is also offering one-on-one technical assistance meetings. [Click here to schedule a meeting](#).

Questions regarding the applications should be directed to Dr. Anna Rosofsky ([arosofsky@healtheffects.org](mailto:arosofsky@healtheffects.org)).

### TRACK 1

Please use the Track 1 Application Form and accompanying instructions to complete the application. Please submit applications to <https://www.surveymonkey.com/r/F9XMGW2> no later than **June 18, 2024**

The HEI Environmental Justice Oversight Panel will discuss the applications, and applicants will be notified about the funding decision by early August.

### MAIN COMPONENTS OF TRACK 1 APPLICATIONS:

*(see application instructions for details)*

1. Qualifications of the PIs
  - Biographical sketch and resumes
2. Proposed activities and benefits of the partnership
3. Collaboration plan and facilities
4. Project plan and timeline
5. Cultural Competency Statement
6. Budget

### REVIEW CRITERIA FOR TRACK 1 APPLICATIONS:

1. **Qualifications of the PIs:** Expertise of research organization PI and CBO PI are appropriate and uniquely positioned for implementing the work. Each PI demonstrates experience engaging with communities or tribal members on environmental health topics, and working with communities, tribes, academic researchers, government entities, or industry to develop or implement environmental health research.
2. **Proposed activities and benefits of the partnership:** Proposes potential research questions, activities, and milestone that lead to a project that would provide useful research, tools, and information relevant to decision-making. Project benefits both the community

and other decision-makers. Community is defined as historically marginalized or overburdened by pollution.

3. **Collaboration Plan and Facilities:** Demonstrates shared governance between research institute and CBO partners; clear description of how the team will work together to advance the goals of the project, what each team member will contribute to the work, and the provisions for conflict resolution. Demonstrates adequacy and validity of facilities to implement the proposed activities, including meeting spaces, computer or laboratory space, and other support necessary to conduct Phase I activities (as applicable).
4. **Project plan and timeline:** Proposes a set of activities and timelines that are relevant and feasible and align with the project objectives. The activities and their description demonstrate previous experience conducting the proposed activities or methods to improve knowledge about and implementation of those activities.
5. **Cultural competency statement:** The research institute PI demonstrates sufficient knowledge of cultural competency and provides relevant examples of how they practice equitable knowledge production in their work.
6. **Budget:** Budget that reflects the time and contributions of all team members and equitable compensation for other community members and others who are meaningfully involved in the work.

## **TRACK 2**

The submission and review of applications will entail a two-stage process.

- Investigators should submit **a Preliminary Application by May 13, 2024**. The HEI Environmental Justice Oversight Panel will discuss the preliminary applications and invite a few investigators to submit a full application. Feedback will be provided in July 2024.
- Invited investigators should submit **a Full Application by September 24, 2024**. Full applications will be reviewed by the HEI Environmental Justice Oversight Panel, and applicants will be notified about the funding decision by November 2024.

Preliminary applications should be submitted electronically to <https://www.surveymonkey.com/r/LLXJZQQ> no later than **May 13, 2024**.

### **MAIN COMPONENTS OF TRACK 2 PRELIMINARY APPLICATIONS**

*(see application instructions for details)*

1. Plain Language Project Summary
2. Study Description
3. Community Engagement Plan
4. History of the Partnership
5. Qualifications of the Investigators
6. Cultural Competency Statement
7. Biographical Sketches and Resumes

### **REVIEW CRITERIA FOR TRACK 2 PRELIMINARY APPLICATIONS:**

1. Relevance to the objectives of the RFA and HEI's overall mission to provide high-quality, policy-relevant research.
2. Scientific merit and novelty of the study design.

3. Experience, competence, and diversity of the research team, including principal investigator, scientific staff, and collaborating investigators.

#### **MAIN COMPONENTS OF TRACK 2 FULL APPLICATIONS:**

*(by invitation only)*

- Budget
- Project Plan
- Community Engagement Plan, and associated measures of success
- Data Access and Sharing Plan
- Research Translation and Dissemination Plan, and associated measures of success
- Research team biosketches, CVs, or resumes
- Memorandum of Understanding or Partnership Agreement
- Letters of support

#### **REVIEW CRITERIA FOR PHASE II FULL APPLICATIONS:**

1. **Relevance to the objectives of the RFA** and HEI's overall mission to provide high-quality, policy-relevant research.
2. **Scientific merit and novelty** of the study design, data collection and analysis methods, exposure generation or modeling approaches, data evaluation, and overall quality assurance.
3. **Experience, competence, and diversity of the research team**, including principal investigator, scientific staff, and collaborating investigators.
4. **Adequacy of facilities**, including (1) access to study sites, instrumentation, and relevant data sets or specimens; and (2) adequacy and validity of facilities to implement the proposed research, including laboratory space, exposure and health measurement capabilities, computing facilities, and other support necessary to deliver high-quality research (as applicable).
5. **Reasonableness of the proposed budget** (i.e., budget is commensurate with the proposed research). Community partnerships and community engagement should be reflected in the proposed budget if they are part of the application. Allocation of adequate effort to each team member should allow for successful implementation of the proposed research, community engagement, and dissemination of the results.
6. **Plans for disseminating results**. The proposal includes a brief plan that clearly describes how and to whom results will be shared to inform decision-making by communities, government officials, industry, or other interested parties, as applicable.

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