



National Institutes of Health

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Climate Challenges and Solutions: NIH-Wide Climate Change and Health Initiative

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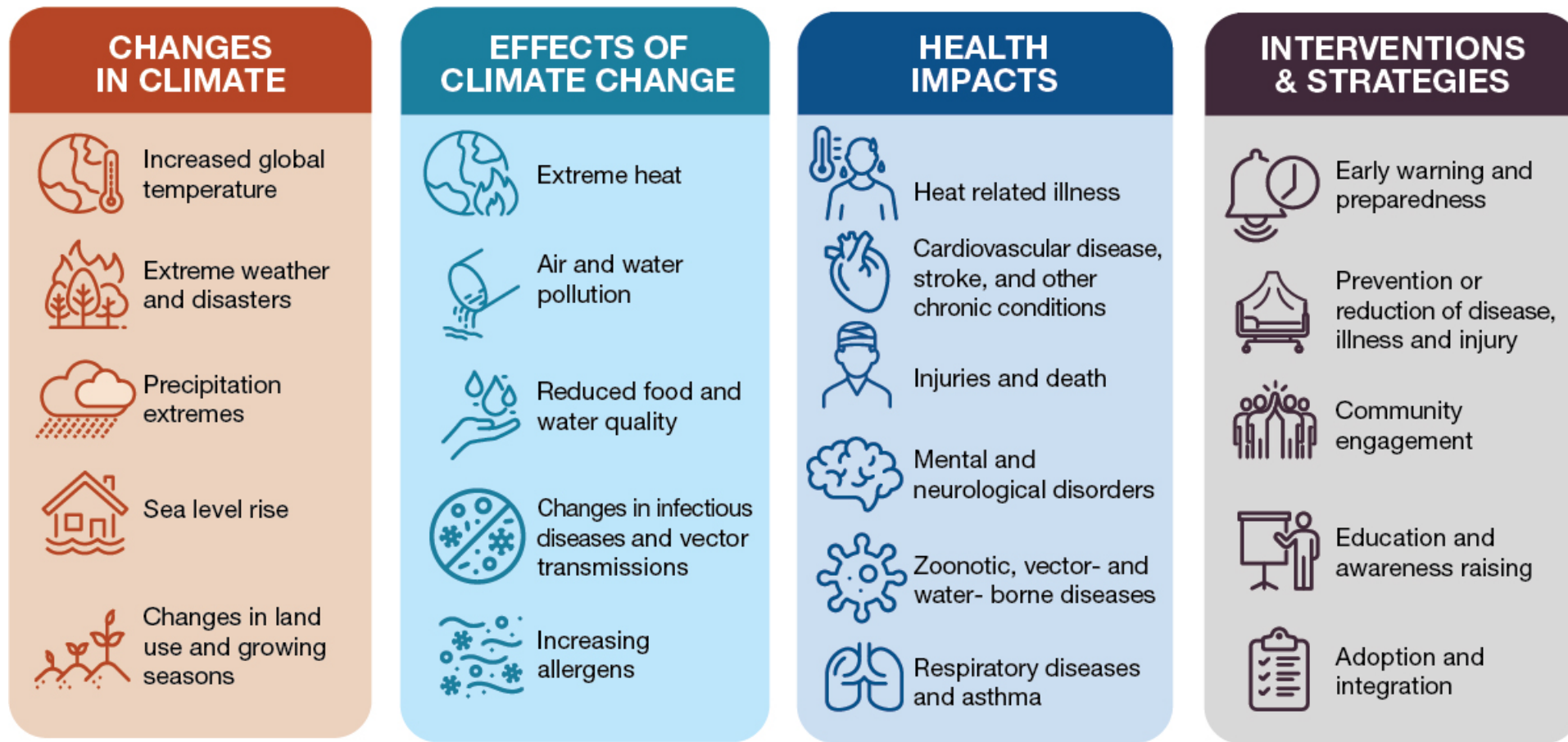
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Impacts of Climate Change on Human Health and Associated Research Needs

A changing climate impacts a range of factors that can affect health. Research is needed to better understand complex health outcomes, prevention measures, and intervention actions that can save lives around the world.





Climate Change Affects Us Unequally



Under-served populations with health disparities

(Some communities of color; Low-income populations; Low-educational attainment groups; Immigrant groups; Indigenous populations)



Exposed workers

(e.g., farmers, construction workers)



Persons with disabilities



Vulnerability by life stage

(Fetal/pre-natal, infants, young children, pregnant women, elderly)



Vulnerability associated with chronic medical conditions

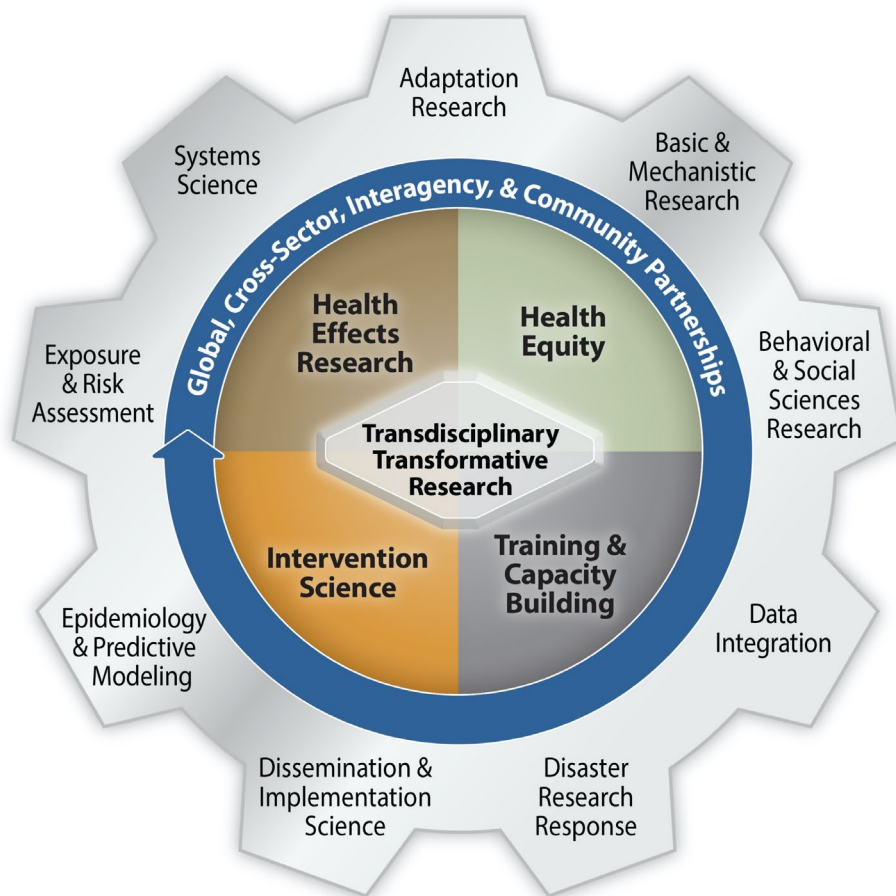
(e.g., diabetes, asthma, cardiorespiratory diseases, psychiatric diseases)



Populations in LMICs

(Higher rates of existing diseases, malnutrition, and extreme poverty)

<https://www.nih.gov/climateandhealth>



Generating Evidence for Climate Change Action

- *There are many needs for evidence that will propel climate change action*
 - Need for advanced **scientific discoveries**
 - Need for **transdisciplinary understanding** of the complex causes of changes in health with multiple concurrent environmental stressors
 - Need for **assessments of tipping points** that pose risks to health
 - Need for research enables tangible actions
 - Facilitation of **early warnings** to impending climate change threats to human health
 - Evaluation of the **effects of adaptation and mitigation on health**
 - Use of **data** to enhance accountability and transparency



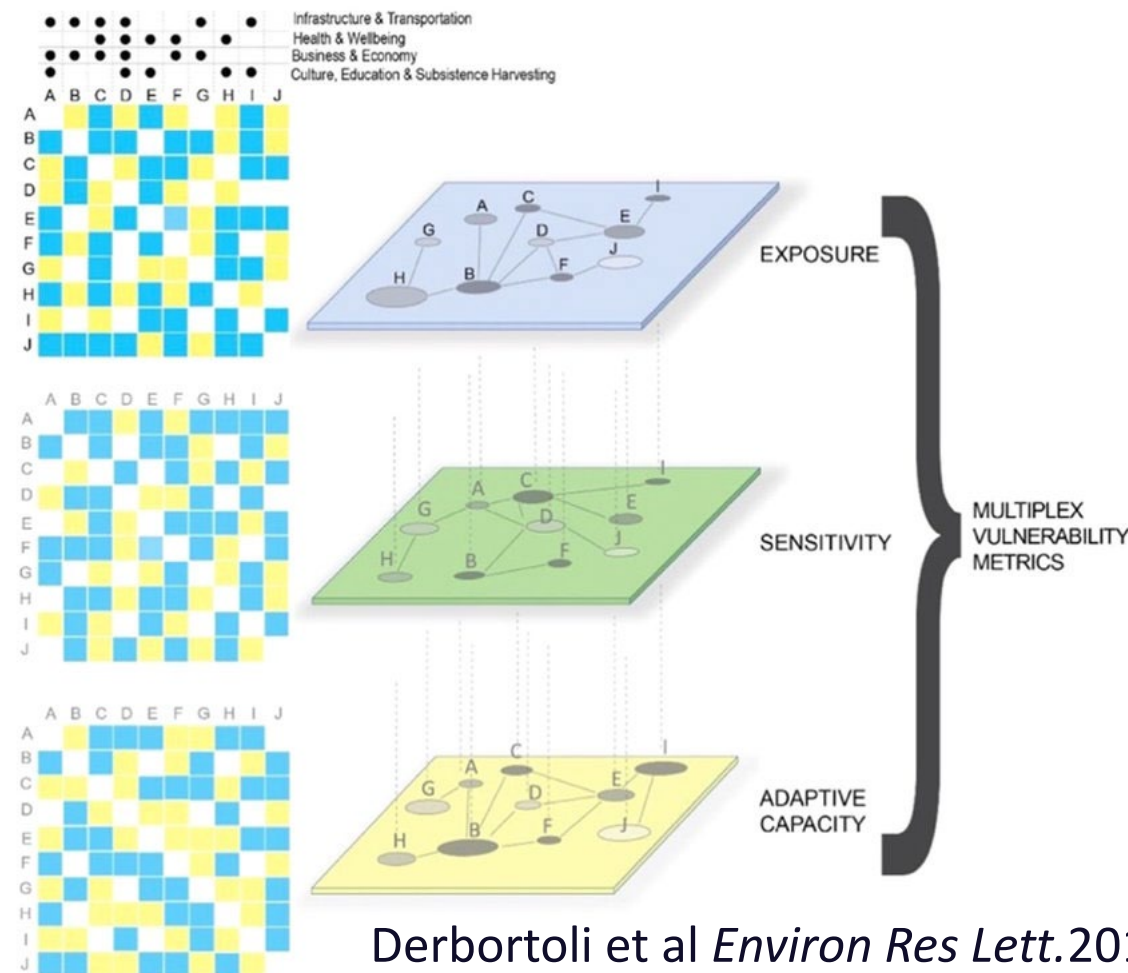


Climate Adaptation Science and Health Co-benefits of Mitigation

Examples of projects needing framing for health:

- Cyclone shelters
- Cooling centers
- Cash remittances to disaster victims
- Early Warning Systems for extreme weather
- Indoor air quality interventions
- Sea walls
- Tree planting and greenspace interventions
- Reforestation projects
- Vector-borne disease surveillance and response

Vulnerability may be conceptualized as a multiplex network with social and environmental variables interacting with the key components: exposure, sensitivity, and adaptive capacity



From 2011-2020 NIH funded 350 research grants on climate change and health topics. NIH conducted a portfolio analysis in development for our strategic framework.

- **Health Outcomes n=215**

- Respiratory

- Birth/Premature Birth

- Maternal Health

- Occupational Health

- Malaria & Dengue

- Heat Stress

- **Weather Related Concepts n=233**

- Extreme heat/weather/temperature

- Drought/flood/rain/precipitation

- Hurricanes /Tropical Cyclones

- Climate variability/seasons

- Fire/wildfire

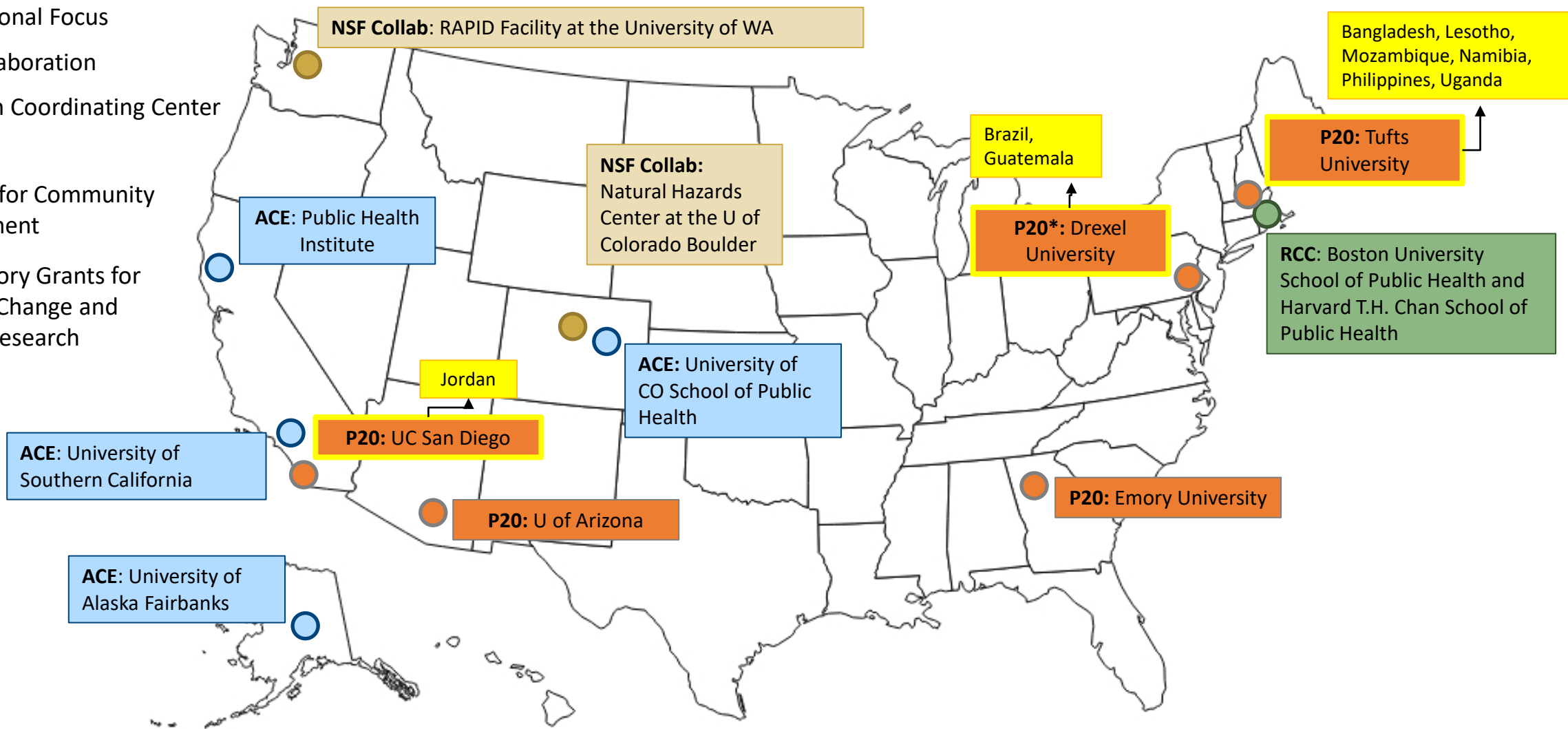
- Humidity

When analyzing the portfolio by research cog from our signature diagram, we found that most of the grants were in the epidemiology/predictive modeling, exposure and risk assessment cogs. Scientific gaps were noted for climate adaptation, interventions/implementation science, and systems science. We have a manuscript submitted with further details of our expanded portfolio analysis.



Map of Currently Funded NIH CCH Research Centers

- International Focus
- NSF Collaboration
- Research Coordinating Center
- Alliance for Community Engagement
- Exploratory Grants for Climate Change and Health Research Center



*Funded by NIMHD, not the NIH CCHI appropriation

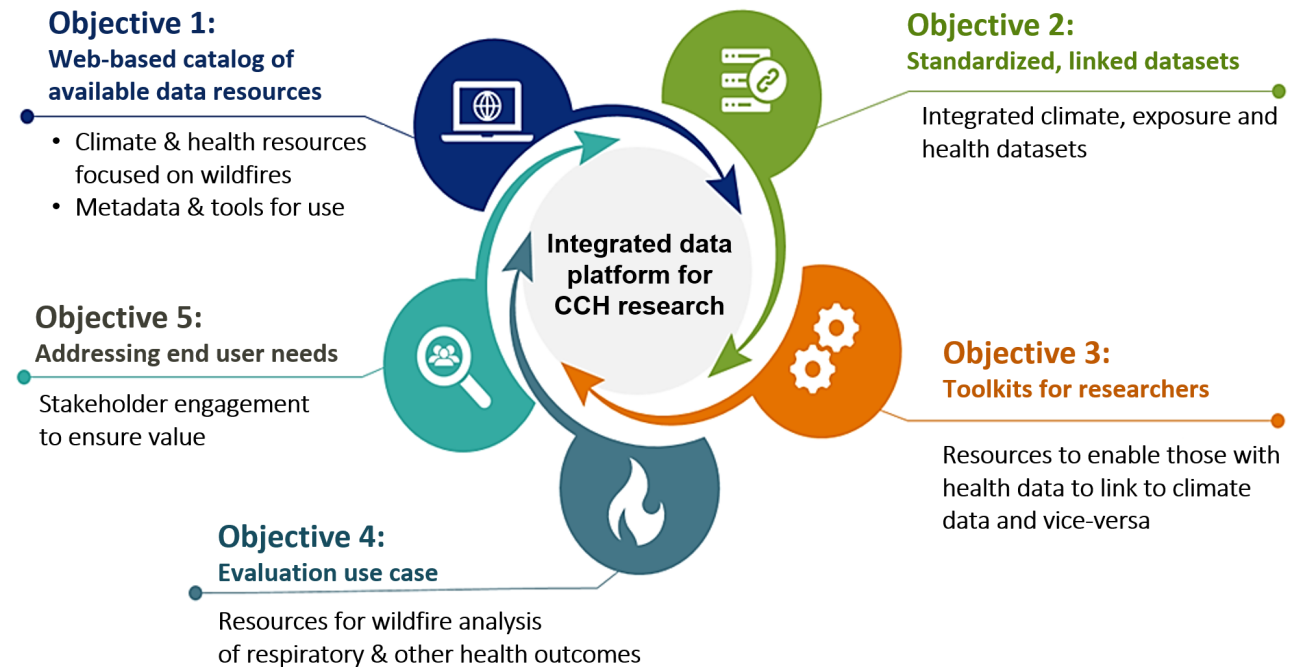


Data Integration: NIH Climate and Health Outcomes Research Data Systems (CHORDS)

Goal: This new project will create a resource that links **climate and environmental data with health outcomes data** so that researchers can identify, analyze, and reduce the health effects associated with climate-related events and improve patient and population health outcomes

Project: Effort to harmonize, standardize, and link diverse types of data, in order to produce publicly accessible data products and resources to improve patient and population health.

- **Examples of data types:**
 - GIS mapping data
 - Climate satellite data
 - Personal Exposure data
 - Electronic Health records



Collaboration partners: NIEHS, NHLBI, NIA, CDC, NASA, AHRQ, HHS-OS



NIH Intramural Targeted Climate Change and Health (ITCCH) Awardees



**Lindsey Criswell, M.D.,
D.Sc., M.P.H.,**

- Senior Investigator, NIAMS
- “Effects of wildfire smoke exposure on the epigenome and health in a multi-ethnic cohort.”



**Una Grewal, Ph.D.,
M.P.H.**

- Senior Investigator, NICHD
- “Climate change and its effects on reproductive health, pregnancy, and birth outcomes



Edward Lakatta, M.D.

- Senior Investigator, NIA
- “Effects of climate change on cardiovascular aging and diseases.”



**Qing Lan, M.D., Ph.D.,
M.P.H.**

- Senior Investigator, NCI
- “Combined effects of extreme climate and air pollution on multi-omics upper airway and plasma biomarkers related to risk of lung cancer.”



**Emily Ricotta, Ph.D.,
M.Sc.**

- Independent Research Scholar, NIAID
- “Analysis of data management capacity in regions with high infectious disease spillover risk.”



Dale Sandler, Ph.D.

- Senior Investigator, NIEHS
- “Characterizing the role of epigenetic adaptation in the relationship between extreme heat and metabolic dysfunction: A paired human and mouse study.”

NIH P-20 Exploratory Grants [RFA-ES-23-007]

Exploratory Grants for Climate Change and Health Research Center Development

- This funding opportunity is to solicit applications for Climate Change and Health Research Centers which will support the development of a transdisciplinary research environment to sustain a program of fundamental and applied research to examine the impacts of climate change on human health.

Key Dates

- Letter of Intent Due Date(s): October 7, 2023
- Application Due Date(s): November 6, 2023





Current Funding Opportunities

- **Notice of Special Interest (NOSI) Climate Change and Health [NOT-ES-23-006]:**
 - **Goal:** Supports CCH research in the U.S. and globally. Encourages use of common data element and collection tools. Open for 3 years.
 - 16 Institutes @ NIH signed on



NOT-ES-23-006



NCI PAR Exploratory/Development Grant [PAR-23-153]

Exploratory Grants for Impacts of Climate Change Across the Cancer Control Continuum

- This notice of funding opportunity (NOFO) aims to support innovative research relevant to advancing the understanding of the effects of climate change across the cancer control continuum, from cancer etiology and cancer risks through survivorship, and ways to prevent or mitigate negative health effects. This includes, but is not limited to, studies to improve knowledge of the impact of climate change related environmental effects on cancer risks, control and behaviors.
- **Key Dates**
 - **Next Open Date (Earliest Submission Date): February 5, 2024**
 - **Open through February 2026**
 - **Letter of Intent Due Date(s): 30 days prior to application due date.**



NIH Climate Change and Health Resources

- **NIH Climate Change and Health Initiative**

Information on the Initiative and Framework

- www.nih.gov/climateandhealth



- **Public Climate Change and Health Webinar Series**

Promoting transdisciplinary discussion and collaboration against this threat to health.

- <https://www.nih.gov/climateandhealth#seminar-series>



- **Climate Change and Human Health Literature Portal**

Searchable database to provide access to the most relevant scientific literature

- <https://tools.niehs.nih.gov/cchhl/index.cfm>





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Climate Change and Health Initiative



Thank you!