



National Institutes of Health

Athawit Katsak / Shutterstock.com

NIH Climate Change and Health Initiative: Strategic Vision and Opportunities for the Future

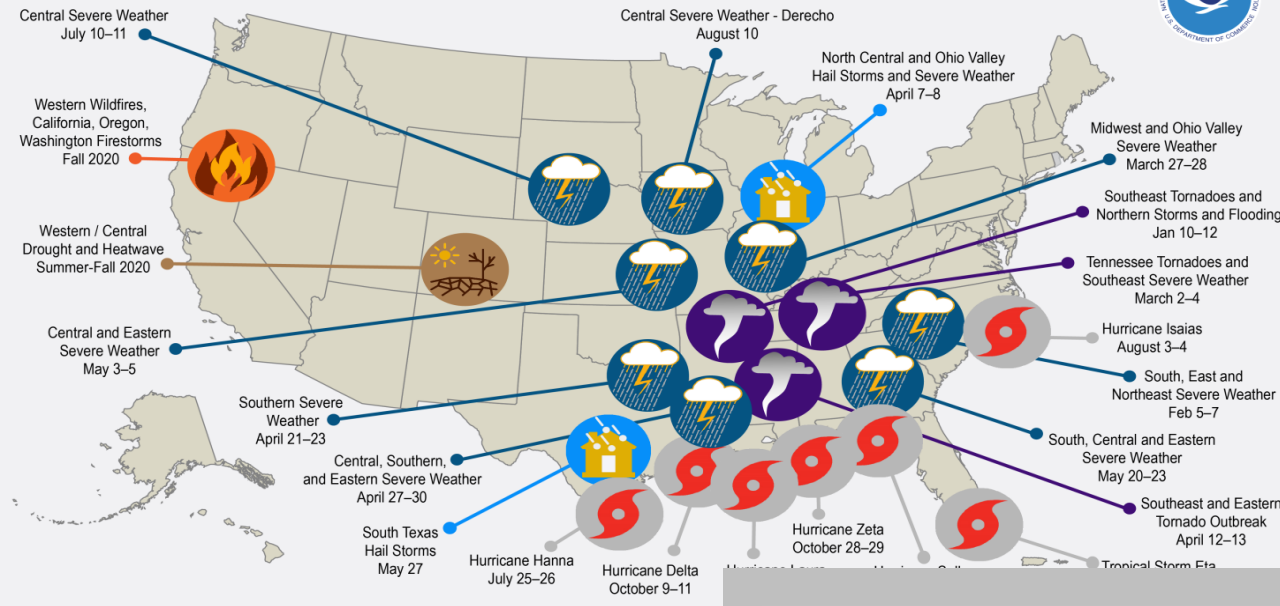
Aubrey K. Miller, MD, MPH

Gwen W. Collman, PhD

**Office of Scientific Coordination, Planning and Evaluation (SCOPE)
National Institute of Environmental Health Sciences**

**Conference on Innovations in Climate Resilience
March 30, 2023**

U.S. 2020 Billion-Dollar Weather and Climate Disasters



"Code Red for Humanity"

UN Secretary General on IPCC 2021 report





Impacts of Climate Change on Human Health

CHANGES IN CLIMATE



Increased global temperature



Extreme weather and disasters



Precipitation extremes



Sea level rise



Changes in land use and growing seasons

EFFECTS OF CLIMATE CHANGE



Extreme heat



Air and water pollution



Reduced food and water quality



Changes in infectious diseases and vector transmissions



Increasing allergens

HEALTH IMPACTS



Heat related illness



Cardiovascular disease, stroke, and other chronic conditions



Injuries and death



Mental and neurological disorders



Zoonotic, vector- and water- borne diseases



Respiratory diseases and asthma



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)



New NIH Wide Climate Change and Health Initiative

- **Executive Orders Bring Renewed Focus on Climate Change Across Agencies**

- Executive Order 14008 *Tackling the Climate Crisis at Home and Abroad*

- **Formally launched in 2021**

- Builds on past NIH efforts and funding, with roots in 2009

- **Led by Collaboration of seven NIH Institute and Center Directors**

- National Institute of Environmental Health Sciences (NIEHS),
 - Fogarty International Center (FIC),
 - National Institute on Minority Health and Health Disparities (NIMHD),
 - National Institute of Mental Health (NIMH),
 - National Institute of Nursing Research (NINR),
 - Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD);
 - National Heart, Lung, and Blood Institute (NHLBI)
- Working Group of more than 140 members across 25 Institute's and Centers









Initiative Goals and Objectives

Goals: Reduce health threats across the lifespan and build health resilience in individuals, communities, and nations around the world, especially among those at highest risk.

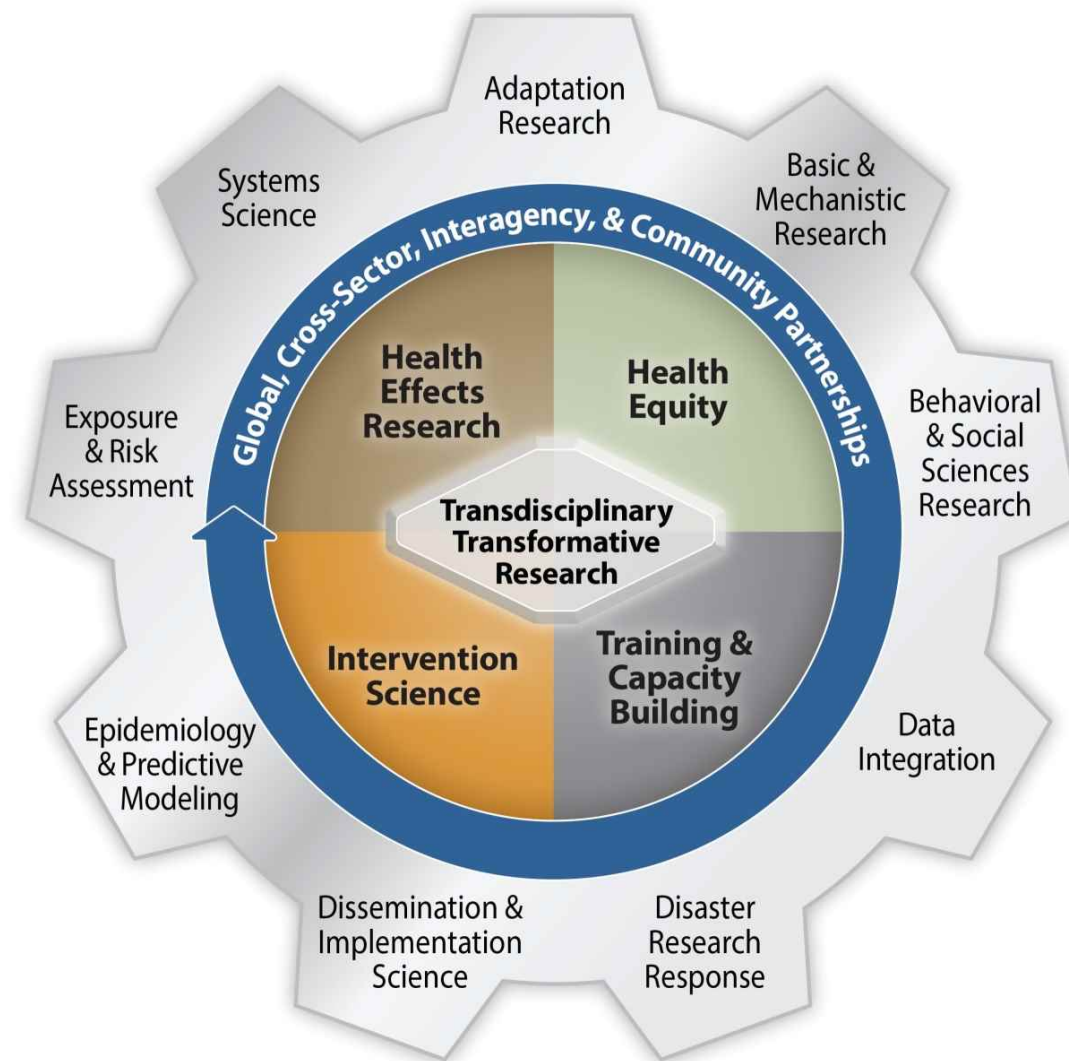
Objectives:

-  **Identify risks and optimize benefits** to the health of individuals, communities, and populations from actions to mitigate or adapt to climate change
-  Develop the necessary **research infrastructure and workforce** to enable the generation of timely and relevant knowledge, drawing from the full spectrum of biomedical disciplines
-  **Leverage partnerships** with other scientific and social disciplines and organizations to achieve the most impactful results
-  **Innovate** across the research translation continuum to ensure findings are credible, accessible, and actionable for achieving these goals



Climate Change and Health Framework

- **Core Elements**
 - Health Effects Research
 - Health Equity
 - Intervention Research
 - Training and Capacity Building
- **Emphasis on Partnerships**
- **9 Focus Areas of Science**

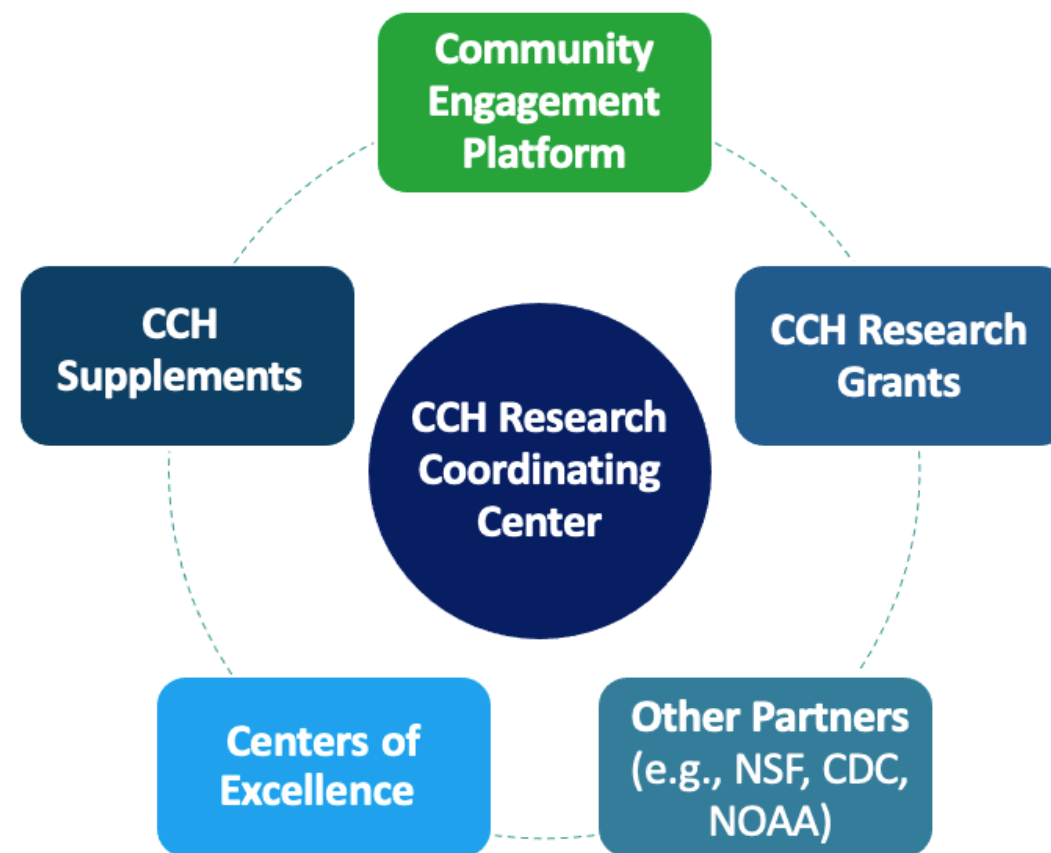




Ongoing Initiatives: Building a robust CCH Community of Practice

CCH Research Coordinating Center (RCC)

- Brings together NIH-funded CCH researchers and scientific, community, and interagency partners to form a **CCH Community of Practice** research network
- **Catalyzes transdisciplinary research** to address climate threats to human health in populations that are most at risk



CCH Research Ecosystem

Alliance for Community Engagement – Climate and Health (ACE-CH)

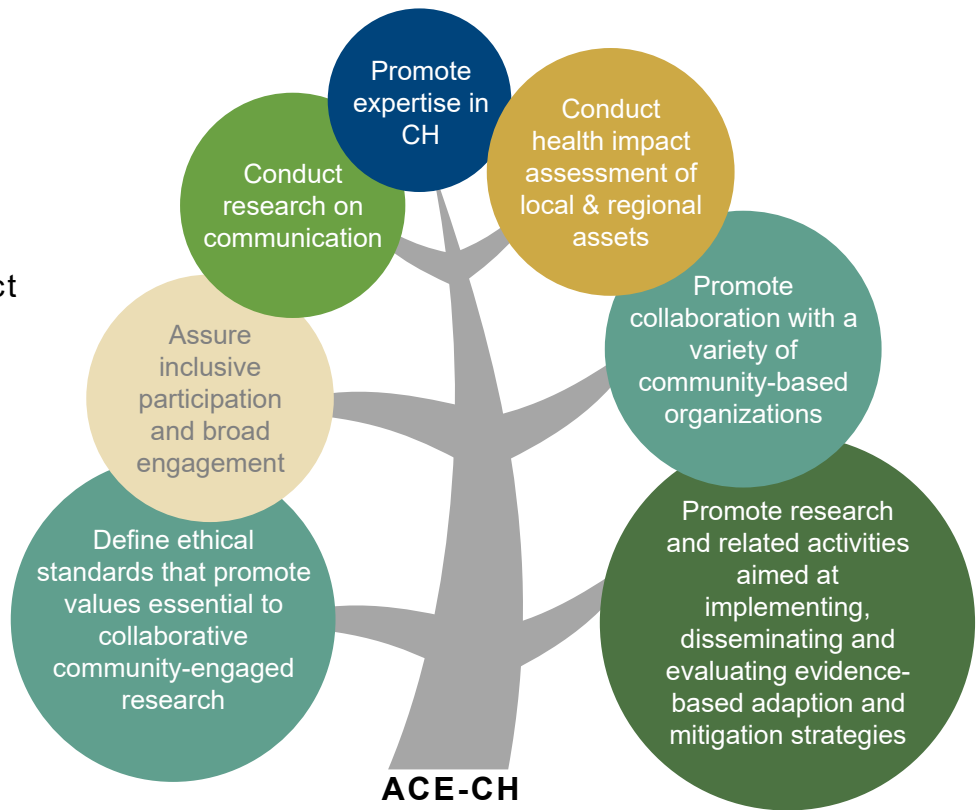
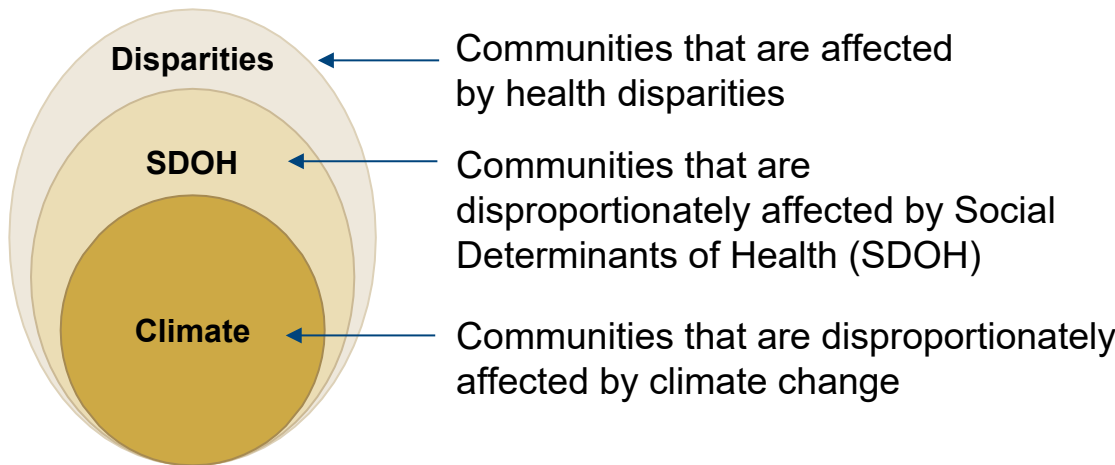
VISION FOR ACE-CH

A community-engaged alliance to empower community-driven, sustainable strategies to address the impact of climate change on vulnerable populations and promote health equity.

Awards

- Alaska Alliance for Community Engagement – Climate and Health (AK ACE-CH)
- Mountain West ACE-CH Hub: Climate Change Engagement Platform to Support Resilient Rural and Urban Communities
- Community-driven Approaches to Environmental Justice and Health in the Face of the Climate Crisis in Southern California
- Climate Health Adaptation and Resilience Mobilizing (CHARM) Lake County Project

Communities of Focus:



ACE-CH will work in close collaboration with community partners, including health service providers, public health agencies, policymakers, community-based organizations, health advocacy groups, environmental justice and climate justice groups, and other stakeholders as appropriate.



2022-2023 NIH Climate and Health Scholars Program

- Brings Climate and Health **scientists from outside the U.S. government** to work with NIH staff to **share knowledge and help build our capacity for climate and health research.**
- During their time at NIH, the scholars will be invited to **collaborate with NIH staff on one or more of a diverse array of research, training, and policy activities** that share their scientific knowledge with NIH laboratories, program offices, and the wider NIH community.





Current Funding Announcements: Developing the Science

- **NOT-HD-23-006 Notice of Special Interest (NOSI)**
 - **Goal:** Supports CCH research in the U.S. and globally. Encourages use of common data elements and collection tools; requires submission of a Data Management and Sharing Plan
 - <https://grants.nih.gov/grants/guide/notice-files/NOT-ES-22-006.html>
- **NOT-ES-22-009 & NOT-ES22-010: Notices of Special Interest: Innovative Technologies for Research on Climate Change and Human Health (SBIR/STTR)**
 - **Goal:** Supports technologies for capturing the effects of climate change/extreme weather on human health and to reduce the health threats posed by climate change
 - <https://grants.nih.gov/grants/guide/notice-files/NOT-ES-22-009.html>
 - <https://grants.nih.gov/grants/guide/notice-files/NOT-ES-22-010.html>



Recently Announced Funding: Developing the Science

- **Exploratory Grants for Climate Change and Health (P20) RFA-ES-23-007**

- **Goal:** This program will support the development of a transdisciplinary research environment to examine the impacts of climate change on health and to develop action-oriented solutions to protect the health of individuals, communities, and nations from the hazards posed by climate change.

Available Due Dates: May 01, 2023; November 07, 2023; Expiration Date: Nov 8, 2023

- <https://grants.nih.gov/grants/guide/rfa-files/RFA-ES-23-007.html>

- **Administrative Supplements**

- **Goal:** To supplement active NIH awards as well as seed new activities and partnerships in climate change and health (CCH) research and research training.

- Due Date: May 9, 2023

- <https://grants.nih.gov/grants/guide/notice-files/NOT-HD-23-006.html>

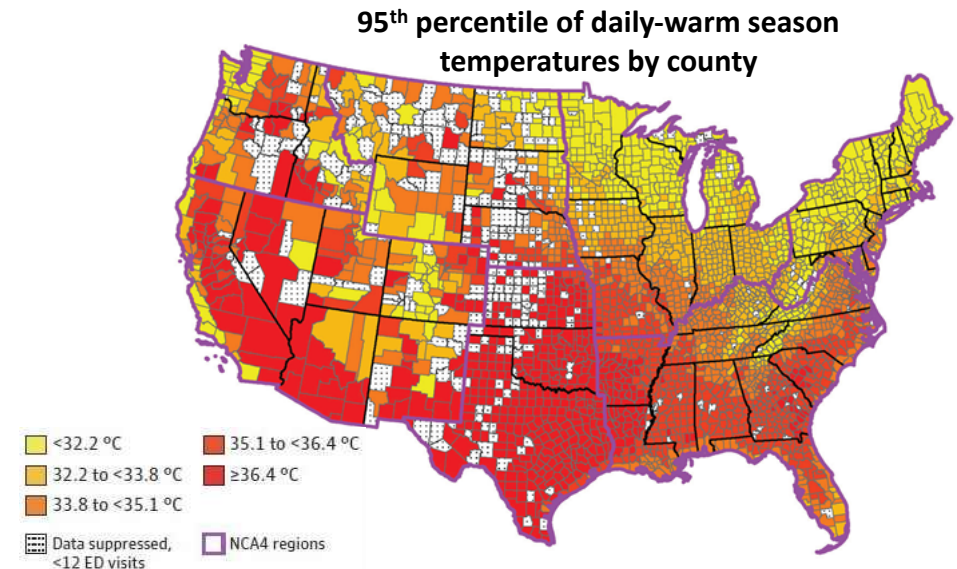
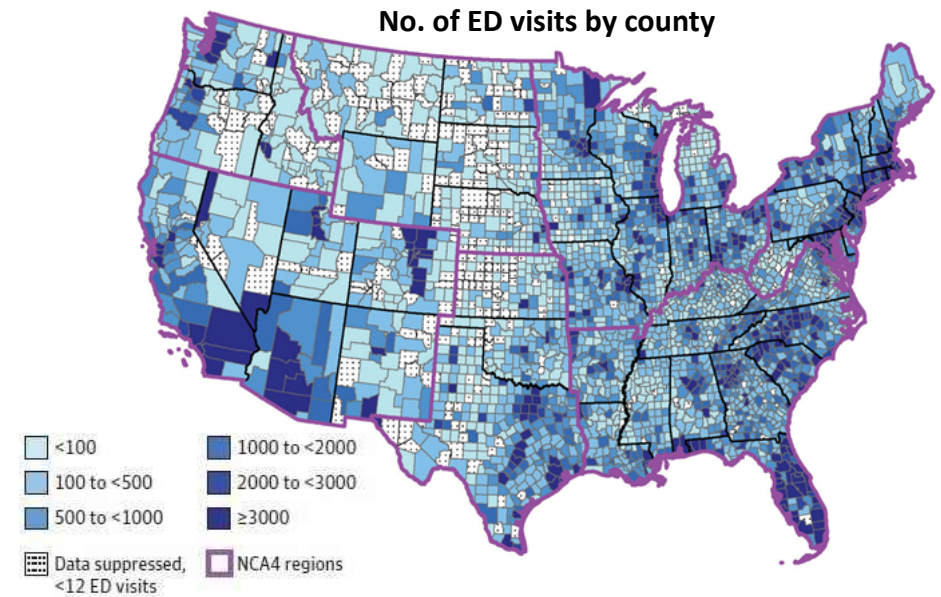




Extreme Heat Linked to Increases in Mental Health-Related Emergency Department Visits

- Associations observed for any **mental health condition** and specific conditions:
 - Substance use disorders
 - Anxiety, stress-related and somatoform disorders
 - Mood disorders
 - Schizophrenia and delusional disorders
 - Self-harm
 - Childhood-onset behavioral disorders
- Associations were higher among men and in regions where populations may be **less well adapted to heat** (e.g., Northeast, Midwest, Northwest)

Nori-Sarma et al., JAMA Psychiatry, 2022



NIH Research: Wildfires and Birth Outcomes

- New research shows that wildfire smoke exposure can contribute to pre-term birth across sociodemographic groups.
- Prematurity is a **major determinant of newborn death and disability.**
- NIH CCH funded project will develop models evaluate the **associations between exposure of pregnant women in Alaska to wildfire smoke and pre-term birth.**



NIH CCH Resources: Data Integration of Climate and Health Data



Satellite Data



Environmental & Exposure Data



SDOH and Neighborhood GIS data



Mobile & Digital Data



Electronic Health Records (EHRs)



Epidemiologic and Population Health Studies



WILDFIRE SMOKE COULD HARM PREGNANCY

Objective 1:

Web-based catalog of available data resources

- Climate & health resources focused on wildfires
- Metadata & tools for use

Objective 5:

Addressing end user needs

Stakeholder engagement to ensure value!

Objective 4:

Evaluation use case

Resources for wildfire analysis of respiratory & other health outcomes

Objective 2:

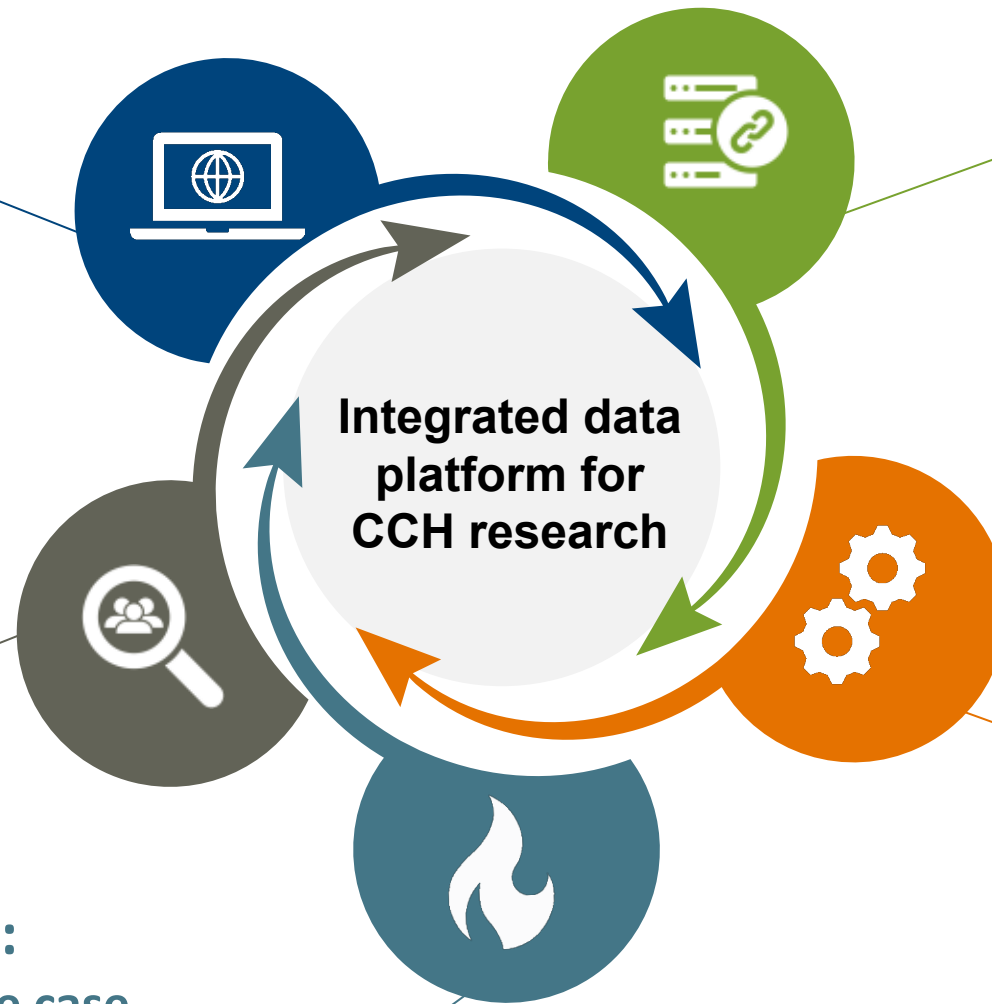
Standardized, linked datasets

Integrated climate, exposure and health datasets

Objective 3:

Toolkits for researchers

Resources to enable those with health data to link to climate data and visa-versa



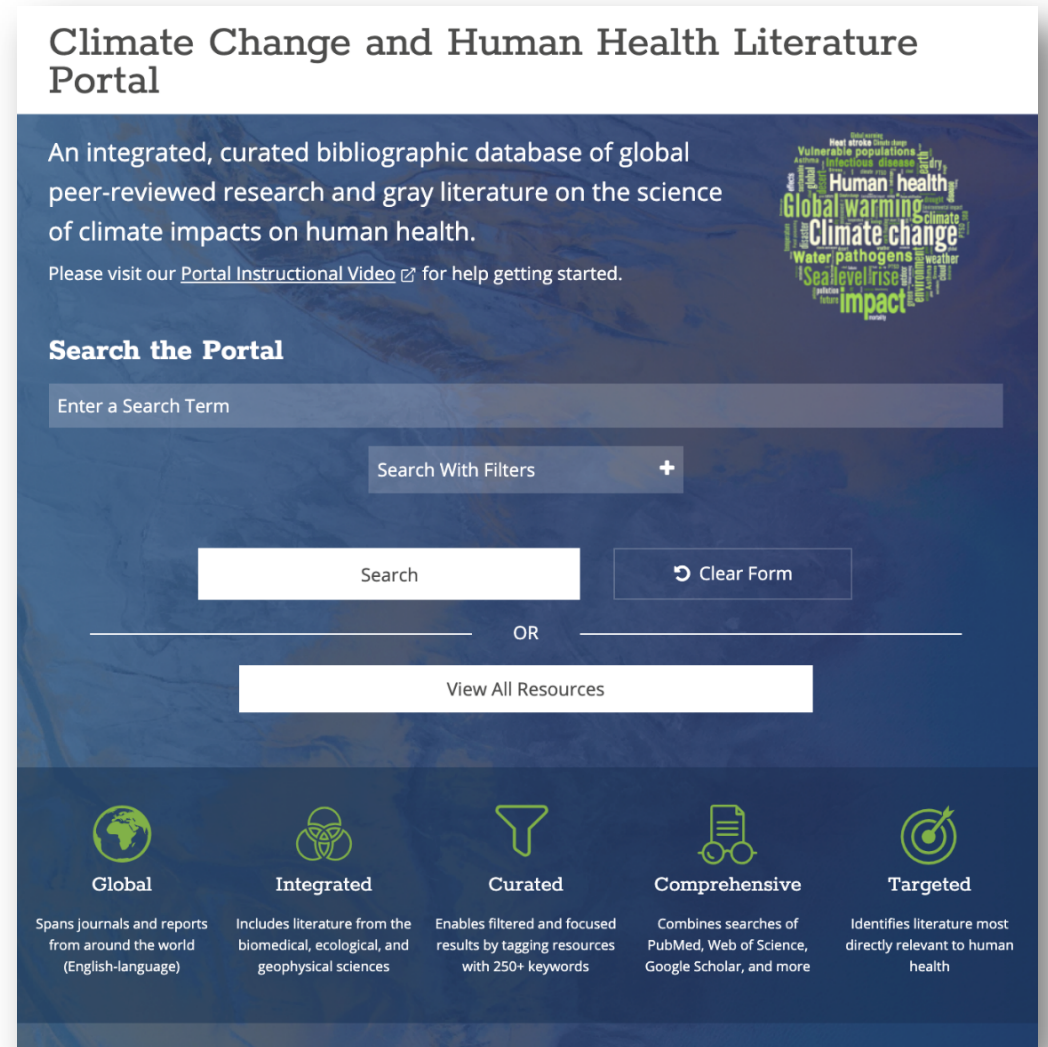
NIH CCH Resources: Climate Change and Human Health Literature Portal

- Resource portal for curated, searchable climate and health peer reviewed publications
- 15,000+ publications (since 2009)
- Over 100 Searchable fields
- 4000+ for extreme weather events & disasters

Disaster Research Response Portal

- > 500 curated Resources (surveys, research protocols, common data elements, training materials)

<https://www.niehs.nih.gov/research/programs/disaster/index.cfm>





Please Join Us in Furthering Needed Research to Understand & Address the CCH Impacts

EXAMPLES OF NEEDED RESEARCH



What are the new and emerging health risks from climate change?



Who is most at risk?



What health interventions are effective?



Can we predict future health outcomes from climate models?



What health benefits or costs come with climate actions?



How can disaster warning systems best save lives?



How can health care systems prepare for challenges to providing adequate care?



How can communities best adapt to a changing climate?

Public Seminar Series

Promoting transdisciplinary discussion and collaboration against this threat to health.

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

Funding Announcements

Updated live as announcements are released

www.nih.gov/climateandhealth

NIH Climate Change and Health Initiative

Information on the Initiative and Framework

www.nih.gov/climateandhealth

Climate Change and Health Literature Portal

Searchable database to provide access to the most relevant scientific literature

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