

THE SEARCH CENTER: SOLUTIONS FOR ENERGY, AIR, CLIMATE, AND HEALTH

The SEARCH Center (Solutions for Energy, Air, Climate, and Health), funded by a five-year Air, Climate and Energy (ACE) Center grant from the U.S. Environmental Protection Agency, aligns cutting-edge scientific research and technology to support the EPA's strategic goals of protecting human health and the environment. Based at Yale University, with major participation by Johns Hopkins University, the SEARCH Center involves more than two-dozen researchers across a number of institutions including North Carolina State University, Stanford University, Northeastern University, University of Chicago, University of Michigan, and the Pacific Northwest National Laboratory.

The center's main objectives are to: (1) investigate energy-related transitions underway across the United States by combining state-of-the-science modeling of energy systems, air quality, climate, and health; (2) characterize factors contributing to emissions, air quality, and health associated with key energy-related transitions in order to understand how these factors affect regional and local differences in air pollution and public health today and in the future; and (3) identify key modifiable factors (e.g., transportation, land use, power generation) and how those factors and their air pollution impacts are likely to change over time. The center has four research projects, two support units, and an administrative core.

- Project 1 (*Modeling Emissions from Energy Transitions*) encompasses economic modeling of national emissions and air quality under different energy policy scenarios.
- Project 2 (*Assessment of Energy-Related Sources, Factors, and Transitions Using Novel High-Resolution Ambient Air Monitoring Networks and Personal Monitors*) measures and examines real-world exposure to air pollution using stationary and personal monitors.
- Project 3 (*Air Quality and Climate Change Modeling*) draws upon projects 1 and 2 to model relationships between air quality, policy, and health under various climate change scenarios using air quality and climate change modeling.
- Project 4 (*Human Health Impacts of Energy Transitions*) estimates the health impacts of various air quality scenarios from the other SEARCH projects and identifies populations most vulnerable to air pollution.
- The Policy and Decision-Making Unit bridges the divide that often separates science and policy through iterative processes bringing SEARCH scientists and real-world policy makers together.
- The Environmental Data Science Unit provides statistical support for all four projects. This unit is developing statistical methods to address the scientific questions of interest and will facilitate integration across different projects. This unit will also encourage reproducible research through dissemination of data and statistical code, where feasible.