

USING NASA REMOTELY SENSED DATA TO HELP CHARACTERIZE ENVIRONMENTAL RISK FACTORS FOR NATIONAL PUBLIC HEALTH APPLICATIONS

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The overall goal of this study is to address issues of environmental health and enhance public health decision making by using NASA remotely sensed data and products. This study is a collaboration between NASA Marshall Space Flight Center, Universities Space Research Association (USRA), the University of Alabama at Birmingham (UAB) School of Public Health and the Centers for Disease Control and Prevention (CDC) Office of Surveillance, Epidemiology and Laboratory Services. The objectives of this study are to develop high-quality spatial data sets of environmental variables, link these with public health data from a national cohort study, and deliver the environmental data sets and associated public health analyses to local, state and federal end-user groups. Three daily environmental data sets were developed for the conterminous U.S. on different spatial resolutions for the period 2003-2008: (1) spatial surfaces of estimated fine particulate matter (PM_{2.5}) on a 10-km grid using US Environmental Protection Agency (EPA) ground observations and NASA's MODerate-resolution Imaging Spectroradiometer (MODIS) data; (2) a 1-km grid of MODIS Land Surface Temperature (LST); and (3) a 12-km grid of daily incoming solar radiation and maximum and minimum air temperature using the North American Land Data Assimilation System (NLDAS) data. These environmental datasets were linked with public health data from the UAB REasons for Geographic and Racial Differences in Stroke (REGARDS) national cohort study to determine whether exposures to these environmental risk factors are related to cognitive decline, stroke and other health outcomes. These environmental national datasets will also be made available to public health professionals, researchers and the general public via the CDC Wide-ranging Online Data for Epidemiologic Research (WONDER) system, where they can be aggregated to the county-level, state-level, or regional-level as per users' need and downloaded in tabular, graphical, and map formats. This provides a significant addition to the CDC WONDER online system, allowing public health researchers and policy makers to better include environmental exposure data in the context of other health data available in CDC WONDER. It also substantially expands public access to NASA data, making their use by a wide range of decision-makers feasible.