PUBLIC HEALTH APPLICATIONS OF REMOTELY-SENSED ENVIRONMENTAL DATASETS FOR THE CONTERMINOUS UNITED STATES

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NASA Marshall Space Flight Center is collaborating with the University of Alabama at Birmingham (UAB) School of Public Health and the Centers for Disease Control and Prevention (CDC) National Center for Public Health Informatics to address issues of environmental health and enhance public health decision-making using NASA remotely-sensed data and products. 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 linked data sets and associated 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 ($PM_{2.5}$) exposures on a 10-km grid using the US Environmental Protection Agency (EPA) ground observations and NASA's MODerate-resolution Imaging Spectroradiometer (MODIS) data; (2) a 1-km grid of Land Surface Temperature (LST) using MODIS data; and (3) a 12-km grid of daily Incoming Solar Radiation (Insolation) and heat-related products using the North American Land Data Assimilation System (NLDAS) forcing data. These environmental data sets 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 datasets and the results of the public health linkage analyses will be disseminated to end-users for decision-making through the CDC Wide-ranging Online Data for Epidemiologic Research (WONDER) system and through peer-reviewed publications respectively. The linkage of these data with the CDC WONDER system substantially expands public access to NASA data, making their use by a wide range of decision makers feasible. By successful completion of this research, decision-making activities, including policy-making and clinical decision-making, can be positively affected through utilization of the data products and analyses provided on the CDC WONDER system.