

## Place and Health

### History

The **Geospatial Research, Analysis, and Services Program (GRASP)** is a team of geospatial science, technology, visualization, analysis, and public health experts within the **Agency for Toxic Substances and Disease Registry (ATSDR)** and CDC. The program that would eventually become GRASP was established in 1989 to examine environmental exposure at hazardous waste sites. GRASP champions the agency's efforts to examine the relationship between **place** and **health** in order to promote health and prevent disease.

### The Early Years: Geospatial Support for ATSDR Investigations

In its early years, GRASP provided geospatial science and geographic information systems (GIS) support to characterize communities and estimate populations at risk for environmental exposures near hazardous waste sites. As GRASP grew in size and expertise, GRASP's environmental data analysis and visualizations were expanded to better support ATSDR's work. GRASP developed the ATSDR GIS Introductory Map, which has been included in all Public Health Assessments (PHA) for ATSDR since 1994. GRASP expanded the single Introductory Map to become a map series in 2012. The map series improves scientists' abilities to visualize, analyze, and characterize exposure conditions near hazardous waste sites.

### Collaborative Tradition: Bringing GIS, Geospatial Science, and Technology Expertise to CDC/ATSDR and Beyond

GRASP's large portfolio of collaborative projects has grown to include work in all areas of public health research and practice, including environmental health, infectious and chronic disease, injury, and public health emergency preparedness, response, and recovery. GRASP works with internal and external public health partners on initiatives involving geospatial science, analysis, technology, and visualization.

GRASP established its first partnership with CDC's National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP) to support the [Interactive Atlas of Heart Disease and Stroke](#) in 1998. This was CDC's first interactive atlas, and it empowered users with more freedom to explore patterns in both space and time and the ability to interact with the data

### Timeline

Explore some of our key milestones in geospatial support to public health partners in this timeline.



through mapping, visualizations, geospatial reporting, and geocoding. Since that time, GRASP has assisted in the development of several other interactive atlases, including [FluView Interactive](#) with the National Center for Immunization and Respiratory Diseases' (NCIRD), [Patient Safety Atlas](#) with the National Center for Emerging and Zoonotic Infectious Diseases' (NCEZID), [AtlasPlus](#) with the National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention's (NCHHSTP), and [Diabetes Atlas](#) with NCCDPHP.

Additionally, in 2007, GRASP partnered with NCEH-ATSDR emergency response planners to create the CDC [Social Vulnerability Index](#) (SVI), an index of 15 variables organized into 4 domains that enable public health scientists and planners to better understand how social vulnerability impacts health across the United States. GRASP has sustained this effort and continues to regularly release SVI datasets and examine the relationship between SVI and health. Finally, the GRASP collaborative portfolio has included several research projects including efforts with the National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP) to examine the relationship between access to healthcare and cancer outcomes of many types. Additionally, since 2011, GRASP has provided key geospatial analysis and remote sensing support to advance efforts of the [Global Polio Eradication Initiative](#) (GPEI) in South Asia, Nigeria, Chad, Niger, and Somalia.

After the September 11, 2001 attacks, CDC engaged GRASP to provide geospatial science and technology capabilities to support public health emergency response. In 2003, CDC involved GRASP as part of its Information Operations in the newly established Emergency Operations Center (EOC). Today, GRASP continues to provide full-time geospatial expertise to the EOC's [Situational Awareness Branch](#) for public health emergencies, including support during the 2005 Hurricane Katrina response in Louisiana, 2014 Ebola virus outbreak in West Africa, 2016 Zika virus outbreak in Puerto Rico, 2017 Hurricane Harvey response in Texas and Louisiana, 2019 Domestic Lung Injury response in multiple states, and 2019 COVID-19 response to support mitigation efforts.

## GRASP Expands Place-Based Research Capabilities

Recognizing the impact of geospatial science in public health research, in 2015, GRASP formed a team of geospatial epidemiologists responsible for applying geospatial and temporal epidemiologic and spatial statistical methods to investigate the relationship between geographic variations of disease and environmental, demographic, behavioral, socioeconomic, genetic, and infectious risk factors. These scientists are advancing place-based research efforts at CDC/ATSDR by leading the examination of space and time trends evident in the spread of Ebola and Zika viruses, cancer incidence, and components of the opioid crisis, such as overdose deaths and drug-seeking behaviors. GRASP geospatial scientists also explore the relationship between health and social vulnerability, environmental burden, population activity space, and other processes that occur in a geographic context.

## GRASP Support to ATSDR

During periods of growth and change, it is important to note that GRASP remains committed to its support of ATSDR. Thus, GRASP continues to provide geospatial analyses and visualizations that enable ATSDR scientists and communities to better understand environmental, sociodemographic, and behavioral issues associated with chemical exposure at hazardous waste sites across the United States. As an ATSDR program, GRASP focuses on the application of GIS to site-specific investigations. Learn more about **GRASP's geospatial science and technology support to ATSDR.**



CDC Emergency Operations Center (EOC)

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# Looking Ahead: Evolving to Meet an Increased Demand for Geospatial Science and GIS in Public Health

Since its beginning, GRASP has expanded from a team of 5 to more than 70. Today, GRASP is the largest geospatial program of CDC/ATSDR, and it continues to evolve as demand increases for geospatial science and GIS applications in public health research and practice. GRASP serves as an integral part of ATSDR's mission to protect communities from harmful health effects related to exposure to natural and man-made hazards. Additionally, GRASP is continuing its collaborative tradition with CDC/ATSDR and the broader public health community by creating and sustaining partnerships featuring geospatial science, analysis, technology, and visualization in support of public health research and practice.

Learn more about how to [partner](#) with GRASP.

## Helpful Terms & Facts

**ATSDR Introductory Map:** GRASP designed and created the first ATSDR GIS Introductory Map, a map and data product that characterizes communities at risk for exposure and presents information on sensitive populations.

**ATSDR Introductory Map Series:** GRASP expanded the Introductory Map into a series of maps to provide a first look at the geographic context of a hazardous waste site and the surrounding community. The Map Series, which is generated for each site, uses maps, charts, and statistics to characterize communities affected by hazardous waste sites. The Map Series enables ATSDR scientists to explore and understand the complex and interrelated conditions associated with chemical exposure and the development of acute and chronic conditions in residents of surrounding communities.