Healthy people, thriving communities. Place matters.

The places of our lives – our homes, workplaces, schools, parks, and houses of worship – affect our quality of health, experience with disease, and sense of well-being.

place matters. GRASP

Geospatial Research, Analysis & Services Program (GRASP)

Leadership at the Intersection of Place and Health

For the past 30 years, the Geospatial Research, Analysis, and Services Program (GRASP) has pioneered the application of geospatial science, analysis, data, technology, and visualization to transform public health science and practice at CDC/ATSDR and across the public health community. Through the lens of place, GRASP studies patterns in time and space and expands novel uses of geospatial data and methods in public health. GRASP strengthens the use of integrated data by advancing place-based indices and sustains interoperable technology within the public health ecosystem. Finally, GRASP cultivates a vibrant geospatial community at CDC/ATSDR and beyond.

Making a Difference - The Goals of GRASP

GRASP focuses on key goals across science, data, technology, and practice.

1. **Research, examine, and visualize patterns at the intersection of place and health** and integrate findings into public health science and practice.
2. **Foster collaborations by identifying and advancing opportunities** to integrate geospatial methods, data, and tools into the work of CDC/ATSDR and public health partners.
3. **Develop, integrate, and sustain geospatial technology, data, tools, and standards within the public health technology ecosystem** to accelerate informed public health action.
4. **Expand geospatial literacy, knowledge, skills, and abilities among public health professionals** at CDC/ATSDR and in the broader public health community.
5. **Cultivate a vibrant community among public health professionals** to share ideas and advance innovation in geospatial science, technology, data, and visualization.
6. **Sustain a culture of excellence in program management, communications, and evaluation** to support transformational contributions to public health science and practice.

42%

Increase in exposed population estimate using GRASP activity space data & methods.
Source: GRASP Ethylene Oxide Analysis, Covington GA (2022).

147

Publications authored by GRASP (1989 – 2024).
Source: GRASP (2024).

672

Attendees at GRASP's CDC/ATSDR Place & Health Conference (2021).
Source: GRASP (2021).

2,130+

COVID test sites placed in communities with moderate to high social vulnerability using GRASP's CDC/ATSDR Social Vulnerability Index (SVI).
Source: US HHS News Release "HHS Continues Community Based Testing …" (01/07/2021).

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CDC ATSDR

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Get to know GRASP work at the intersection of place and health.

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Patterns in Time and Space

Place, context, and geographic relationships have long been essential in informing a deeper understanding of public health at community, national, and global scales. Through the lens of place, GRASP scientists study patterns in the areas of contaminant exposure, environmental health, public health emergencies, infectious and chronic disease, and injury. Since 1989, GRASP has authored 147 peer-reviewed publications comparing geographic variations of disease with environmental, demographic, behavioral, socioeconomic, genetic, and other risk factors. GRASP has also advanced novel applications of emerging data including population mobility data, electronic health records, satellite imagery, and synthetic population data.

In notable publications, GRASP used space/time cluster analysis to detect a cancer cluster associated with environmental exposure in Pennsylvania (2010), characterized the relationship between acute chemical releases and factors including urbanicity and handling of hazardous chemicals (2015), and used spatial-temporal analysis to understand transmission of Ebola within a quarantined village (2017). GRASP scientists have evaluated post-Hurricane Sandy impacts on HIV testing (2018), explored the relationship between World Trade Center dust and respiratory outcomes (2019), and examined the connection between social vulnerability and stay-at-home behavior during the COVID-19 crisis (2021). In 2017, GRASP scientists were nominated for a Shepard Award for research identifying U.S. communities vulnerable to the rapid spread of HIV associated with intravenous drug use. Looking ahead, GRASP and ATSDR colleagues are leading the effort to develop artificial intelligence and machine learning techniques to rapidly detect acute releases of toxic substances affecting health in communities across the United States.

GRASP Place & Health Index Portfolio

The GRASP Place & Health Index Portfolio features place-based indices enabling the public health community to apply the power of integrated data to science, program, and policy. Released in 2011, GRASP's CDC/ATSDR Social Vulnerability Index (SVI) has been integrated into the work of partners at local, state, and national levels. In 2023, FEMA adopted the SVI for incorporation into the National Risk Index (NRI), a tool enabling planners to prepare communities at risk to natural hazards. GRASP's CDC/ATSDR Environmental Justice Index (EJI) was released in August 2022 and has been quickly adopted by the public health community to identify and confront environmental injustice. In 2023, the EJI was adopted by the University of Maryland for integration into the 2023 Chesapeake Bay Eco Health Report and employed by the New York Metropolitan Transit Authority to characterize environmental burden experienced by communities facing high rates of respiratory disease. Looking forward, GRASP will be using data and methods from both the SVI and EJI to develop the Heath & Health Index, an important tool useful in preparing communities for extreme heat events in the U.S.

522 SVI

Publications in the SVI SUIT database – including scientific journal articles that feature the CDC/ATSDR SVI in research spanning disaster management, community health, and more.
Source: SVI Utilization and Implementation Tool (SUIT) (2024).

2,500+

Attendees from across the public health community at EJI forums introducing the EJI as a valuable tool to generate insights on environmental injustice faced across the U.S.
Source: GRASP (2023).

100+

GRASP staff including FTEs, contractors, & fellows with expertise in geography, geospatial science, exposure science, epidemiology, geospatial statistics, environmental science, cartography, data science, remote sensing, public health informatics, population health + more.

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Analysis & Visualization – Transforming Data for Science

Over the past decade, the emergence and democratization of geospatial data, tools, and techniques have expanded novel uses of geospatial data and prompted scientific inquiry to develop a deeper understanding of the health we experience. GRASP geospatial (GIS) analysts use geospatial methods to analyze and transform place-based data for use in public health science and practice. To foster an understanding of place & time dynamics, GRASP designs and shares maps and interactive visualizations.

For ATSDR, GRASP uses proximity analysis, network analysis, surface analysis and photointerpretation to define exposure pathways, characterize exposed populations, and examine health effects. Key to this work is the use of GIS to integrate environmental data with demographic, health, and modeling data. Additionally, GRASP has employed multi-modal transportation analysis to model access to mammography clinics in Atlanta (2011) and fused USGS digital elevation model (DEM) data with stream gauge estimates to model flood water depth and extent (Hurricane Harvey, 2017). Going forward, GRASP plans to expand the use of activity space and population mobility data to enhance ATSDR exposure estimates, inform NCEH surveillance, and refine built-environment measures of access to healthcare, healthy food, and more.

GRASP Technology – Accelerating Data into Action

The GRASP Digital Ecosystem features two interoperable platforms – CDC/ATSDR OneMap and the GRASP Data Analysis & Visualization Platform (DAV-P). Both platforms equip CDC/ATSDR to develop dashboards that share data and tools that accelerate research, decision-making, interventions, and policy development, and each offer a range of options in customization, cost, and deployment speed. GRASP DAV-P hosts applications supporting the mission of partners across CDC/ATSDR. Notably, GRASP and the CDC COVID-19 Response led development of the CDC COVID Data Tracker, a GRASP DAV-P application serving as CDC's primary channel to share data on the scope and progression of the pandemic. GRASP's OneMap, an installation of widely used commercial software, enables CDC/ATSDR to rapidly share data, maps, and tools to groups ranging from project teams to the general public. OneMap hosts CDC PHOENIX, an internal application informing CDC emergency response and supports the Social Vulnerability Index (SVI) Dashboard and the Environmental Justice Index (EJI) Explorer. Widely used by the public, OneMap is also heavily used by 647 users at CDC/ATSDR and among our STLT partners.

Exploring a Collaboration with GRASP

GRASP has grown into the largest nucleus of geospatial expertise at CDC/ATSDR and sustains partnerships across CDC/ATSDR, and among HHS, federal agencies, STLT organizations, NGOs, advocacy groups, and academia.

To explore collaborating with GRASP, contact placeandhealth@cdc.gov.

GRASP Evolution

Inception Era
(1989 – 2000)
Establishment of GRASP to provide geospatial analysis and visualization support to ATSDR, enhancing the Agency's ability to analyze exposure pathways, examine health effects, and communicate findings to communities.

Expansion Era
(2001 – 2008)
Initiation & expansion of GRASP Emergency Operations Center (EOC) Partnership to provide geospatial expertise to accelerate data-driven decision-making during public health crises.

Collaboration Era
(2009 - Present)
Initiation & advancement of sustained partnerships at the intersection of place & health with partners at CDC/ATSDR and beyond.

647 OneMap

Users of GRASP's CDC/ATSDR OneMap at CDC/ATSDR and among STLT partners.
Source: GRASP (04/02/2024)

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