National Institutes of Health
Funding Opportunity

Spatial Uncertainty: Data, Modeling, and Communication
(Sponsoring Institutes: NCI, NHLBI, NIAAA, NIAID, NICHD, NIDA, and NIEHS)

For the full text of these PAs, visit:
http://grants.nih.gov/grants/guide/pa-files/PA-11-238.html
http://grants.nih.gov/grants/guide/pa-files/PA-11-239.html
http://grants.nih.gov/grants/guide/pa-files/PA-11-240.html

Overview

Spatial uncertainty is the lack of, or the error in, knowledge about an object's geographic position (i.e., longitude, latitude, and altitude), which leads to uncertainty about the spatial relationship among its neighbors. For example, an error in a patient's residential address will introduce spatial uncertainty about where the patient lives and this error will further bias any association between the patient's health status and specific environmental exposure. Spatial uncertainty in public health information is ever present–from data collection and model specification to interpretation, visualization, and communication. Estimates of disease patterns or trends contain a certain degree of uncertainty. Bias may be introduced if the uncertainty is ignored or misunderstood.

Research Objectives

This Funding Opportunity Announcement (FOA) invites applications using the R01, R21 and R03 mechanisms to support research that identifies *sources of spatial uncertainty*, incorporates the inaccuracy or instability into *statistical methods*, and develops novel tools to *visualize and communicate the nature and consequences of spatial uncertainty*.

Areas of Focus

Spatial Uncertainty in Data. This FOA encourages research projects to improve data collection and quality control in the following types of data:
- Disease registry data, such as improvements in geocoding methods;
- Small-area demographic data and intercensal estimates;
- Historic risk factor exposure data to account for latency of disease development;
- Residential histories of patients to address uncertainty in exposure assessment;
- Use of remote sensing and image data alone or in combination with data from fixed monitoring sites to construct exposure assessment;
- Data on multiple types of exposures to account for possible cumulative exposure effects;
- Electronic health record data and new media sources that give a more comprehensive view of disease surveillance, control, and prevention; and
- Linked data from various data sources.

Statistical Methods. Examples of specific statistical methods that may be developed in response to this FOA include, but are not limited to:
- Methods for incorporating spatial uncertainty from various sources, such as physical activity, diet, food environment, etc.;
- Methods for integrating data across spatial and temporal scales such as census tracts and counties at multiple time periods;
- Methods for quantifying spatial uncertainty in maps at different levels of aggregation;
- Methods for quantifying spatial uncertainty in cluster identification algorithm; and
- Methods for large, complex, and detailed datasets (e.g., spatial data mining) that help with gaining new knowledge in disease or exposure patterns.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

Geographic Information System (GIS) as a Tool to Visualize Spatial Uncertainty. Examples of specific GIS methods that may be developed in response to this FOA include, but are not limited to:

- An integral GIS that identifies, categorizes, stores, assesses, and visualizes spatial uncertainty in public health and exposure data; and
- User-friendly tools for performing uncertainty analysis in existing GIS frameworks.

Communication of Spatial Uncertainty. This FOA will support research on sound methods for communicating uncertainty to a variety of audiences. Appropriate topics include, but are not necessarily limited to:

- Studies of end-users' cognitive perception of visual displays of spatial uncertainty;
- Development of an internet resource that accumulates best practices for visualizing uncertainty;
- Development of visualization skills that communicate the hot-spot disease clusters and the uncertainty of their locations to end-users;
- Development of visualization techniques that communicate to end-users about uncertainty in people's environmental exposure patterns and the association between disease and environmental exposure; and
- Translation of statistical concepts of uncertainty into maps.

Funding Mechanism

Mechanism	Title	Description
R01	Research Project	To support a discrete, specified, circumscribed project to be performed by the named investigator(s) in an area representing his or her specific interest and competencies.
R03	Small Research Grants	To provide research support specifically limited in time and amount for studies in categorical program areas. Small grants provide flexibility for initiating studies which are generally for preliminary short-term projects and are non-renewable.
R21	Exploratory/ Developmental Grants	To encourage the development of new research activities in categorical program areas. (Support generally is restricted in level of support and time.)

Eligibility Requirements

Diverse educational, public, private, and non-profit organizations are eligible to apply. Refer to the full text of the PAs for additional details.

Review

Applications will be assigned to the NIH Institutes and Centers (ICs) on the basis of established Public Health Service (PHS) referral guidelines. Appropriate scientific review groups convened in accordance with the standard NIH peer review procedures will evaluate applications for scientific and technical merit.

Further Assistance

Application Submission Contact
Grants.gov Customer Support
http://www.grants.gov/contactus/contactus.jsp
(Questions regarding Grants.gov registration and submission, downloading or navigating forms)
Contact Center Telephone: 800-518-4726
Email: support@grants.gov

GrantsInfo
(Questions regarding application instructions and process, finding NIH grant resources)
Telephone: 301-435-0714
TTY: 301-451-5936
Email: GrantsInfo@nih.gov

eRA Commons Help Desk
(Questions regarding eRA Commons registration, tracking application status, post submission issues)
Telephone: 301-402-7469 or 866-504-9552 (Toll Free)
TTY: 301-451-5939
Email: commons@od.nih.gov

Grant Writing Tip Sheets
http://grants.nih.gov/grants/grant_tips.htm

Application Submission Dates
http://grants.nih.gov/grants/funding/submissionschedule.htm

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See the full text of the PAs for contacts in other NIH institutes.