James B. Holt, PhD, MPA
Acting Chief
Emerging Investigations and
Analytic Methods Branch
Division of Adult and Community Health
National Center for Chronic Disease Prevention
and Health Promotion
Centers for Disease Control and Prevention
Atlanta, GA
jgh4@cdc.gov

**Current and Prospective Research Interests**

My current research interests are mainly the product by my PhD dissertation, "The Use of a Geographic Information System (GIS) and Satellite Remote Sensing for Small-Area Mortality Analysis" (University of Georgia, under the direction of C.P. Lo, 2003). From this research, my interests are in the integration of GIS and satellite remote sensing for chronic disease surveillance and research; small-area analysis of risk factors related to chronic disease morbidity and mortality; dasymetric mapping of population density and areal interpolation of socio-demographic data; and the relationship between the social and physical environment and health.

Based on work that I am involved with at the Centers for Disease Control and Prevention (CDC), my emerging research interests include: the social determinants of health; summary measures of population health; and the use of multi-level modeling to better understand the contribution of individual-level and area-level (i.e., "place") effects on health-related risk behaviors and on health outcomes. Specifically, I am actively involved in CDC's Social Determinants of Health Workgroup, which has recently funded (FY03) projects to develop a consensus set of scalable indicators of social health for the United States and individual states (and potentially applicable to sub-state administrative units); an update to the Community Health Status Indicators database (originally funded by HRSA); and the development of a model Regional Health Status Database, which will contain a collection of social, environmental, and health-related variables, for health-planning at the municipal/neighborhood level. I am tangentially interested in the development and application of summary measures of population health, to include preference-based measures such as Disability-Adjusted Life Years (DALYs) and other non-preference-based measures. I am also leading the effort to produce a series of disease condition-specific risk factor atlases, which are to be based on almost twenty years of data from the Behavioral Risk Factor Surveillance System (BRFSS). I would like to develop skills in applying multi-level modeling techniques, and I wish to improve my knowledge and abilities in spatial analysis techniques.

## Interests Related to Space and Location

My interests in space and location are mainly with the contextual ("place") effects on health risk behaviors and health outcomes (specifically chronic diseases). I have done some ecological analysis, but fully understand the inherent limitations to this approach. Therefore, I wish to become more conversant and skilled in the application of multi-level techniques.

## Current (Perceived) Limitations to Spatial Analysis

I perceive two main limitations to spatial analysis in my work. First, is the relative lack of point-level health-related data. Although there are long-established disease registries for cancer, this is the exception (at least at the national scale) for other chronic diseases. Issues of confidentiality may continue to be an impediment to the acquisition of individual-level information, although techniques exist for analyzing and displaying individual-level data without compromising individual identities (e.g., Armstrong *et al*, 1999). A promising development is the publication of Healthy People 2010 Objective 23-3: "Increase the proportion of all major national, State, and local health data systems that use geocoding to promote nationwide use of geographic information systems (GIS) at all levels." (U.S. Department of Health and Human Services, 2000).

A second (and lesser) limitation to spatial analysis is the relative lack of geographic information systems with fully-integrated spatial statistical capabilities. This limitation has been offset by the recent availability of spatial statistical applications that can be loosely-coupled with commercial GIS (e.g., Crimestat II, SaTScan 3.0, and GeoDa 0.9.3); and the availability of other packages such as S-Plus for ArcView 3.x.

## References

Armstrong MP, Rushton G, and DL Zimmerman, 1999. Geographically masking health data to preserve confidentiality. *Statistics in Medicine* 18, 497-525.

U.S. Department of Health and Human Services. *Healthy People 2010*. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S. Government Printing Office, November 2000.