

Products from the NAACCR GIS Committee



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Alaska Cancer Registry

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Alaska Cancer Registry

What is the GIS Committee?



- Formed in January 2001 as a workgroup under the IT Committee
- Status changed to *ad hoc* committee in July 2004
- Established to address the appropriate uses of geographic information systems (GIS) in cancer registry practice



How the Committee Pursued this Mission

- Established a web page on the NAACCR web site
- Easy-to-remember address:
www.naacr.org/gis
- Developed various GIS work products and posted them on the web page





Tour of the GIS Committee Web Page...



Alaska Cancer Registry

What's on the Web Page?

- Administrative items
 - Mission statement
 - Objectives for the last two years
 - Roster of committee members
 - Minutes of teleconferences & in-person meetings



What's on the Web Page?

■ Publications

- GIS Basic Practices Handbook
- Review of Cluster Analysis Software



■ Educational items

- 20-page report on GIS-related web sites
- Presentations on geocoding and cartography

■ 2005 GIS Survey questionnaire

■ Great Circle Distance Calculator



GIS Survey

- This survey is meant to assess the GIS capabilities and training needs of the NAACCR membership registries. The survey results will be used to identify areas where GIS tools or resources may be needed and encourage NAACCR to promote development of education and training activities, and resources that could be pooled or shared by its member registries.
- [GIS Survey](#) (Word)

Distance Calculator

- This SAS code calculates the great circle distance between the locations of cases at the time of diagnosis and the locations of treatment facilities. Case locations are taken from NAACCR items 2352 (latitude) and 2354 (longitude) in a NAACCR v10 or v11 record layout file. The program can use either source (unconsolidated) or consolidated case records as input. A second input file contains facility IDs, latitude, and longitude.
- [Distance Calculator SAS code](#) (Text)
- [Distance Calculator documentation](#) (Word)
- [Distance Calculator - How to add coordinates to an GIS attribute table](#) (PDF)

Meeting Minutes (Word)

- [April 12, 2006](#) 
- [March 8, 2006](#)
- [February 8, 2006](#)
- [January 11, 2006](#)
- [December 14, 2005](#)
- [November 9, 2005](#)
- [October 26, 2005](#)
- [September 22, 2005](#)
- [August 24, 2005](#)
- [July 20, 2005](#)
- [June 6, 2005](#)
- [May 18, 2005](#)
- [April 20, 2005](#)
- [March 16, 2005](#)

GIS Basic Practices Handbook

- Developed with the assistance of Dr. Lyna Wiggins of Rutgers University
- Published in October 2002
- Outlines the appropriate uses of GIS by central cancer registries
- Makes several recommendations to NAACCR regarding GIS data standards, research, and education, many of which have already been implemented



GIS Basic Practices Handbook

- Section I: Introduction to GIS basic concepts
- Section II: Geocoding patient address data
- Section III: Confidentiality – be careful when mapping areas represented by a small number of cases so as not to identify individual patients



GIS Basic Practices Handbook

- Section IV: Spatial analysis – the process of using GIS to examine data and solve problems, such as performing cluster analysis
- Section V: Cartography/map design
- Section VI: Internet access issues for the disabled
- Section VII: Recommendations to NAACCR in the areas of GIS data standards, research, and education



Review of Cluster Analysis Software

- Written by Dr. Luc Anselin, University of Illinois at Urbana-Champaign, in consultation with the committee
- Published in September 2004
- Reviews 4 computer programs: *CrimeStat*, *GeoDa*, *SaTScan*, and packages developed in the open source R programming environment (specifically, the packages *spatial*, *splanacs*, *spatstat* and *spdep*).



Review of Cluster Analysis Software

■ Software criteria:

- free and/or open source
- up to date and under active development
- come with a manual and documentation
- downloadable from the Internet
- work in a Microsoft Windows operating system



GIS Training Web Site Document

- 20-page document listing GIS-related web sites that can be used for educational purposes
- Includes organization name, web site name, web site address, and detailed description of web site
- Grouped by category



GIS Training Web Site Document

Categories:

- Address Standards
- Cartography
- Census-Related
- Data Standards
- Geocoding
- GIS-Related Organizations
- Healthcare
- Journals & Books
- Maps & Data
- Metadata
- Person & Place Lookup
- Software
- Spatial Analysis



GIS Slide Presentations

- Three educational slide presentations on GIS concepts:
 - Geocoding (Frederick Broome, U.S. Census)
 - Cartography (Kevin Liske, EDS)
 - Map Design (Linda Pickle, NCI)



Address Coding and Other Georeferencing: A Primer for Effective Geocoding

presented to
the National Center for Health Statistics
GIS Program Series

by
Frederick R. Broome
Geospatial Research and Standards Staff
Geography Division
U.S. Census Bureau

16 May 2001



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Cartographic Concepts

Kevin Liske



Alaska Cancer Registry

2001 Cancer Conference

Research in Map Design

Linda Williams Pickle, Ph.D.



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Great Circle Distance Calculator

- SAS code calculates the “great circle” distance between DxAddress & Dx/Tx facilities
- Case locations are taken from NAACCR items 2352 (latitude) and 2354 (longitude) in a NAACCR v.10 or v.11 record layout file
- Uses either source (unconsolidated) or consolidated case records as input
- Second input file contains facility IDs, latitude, and longitude



Great Circle Distance Calculator

- Distances can be used for “quality of care” studies
- The facility ID file is based on a proprietary file available from ESRI’s ArcMap software
- Consolidated records may not include facility ID!
- If you use unconsolidated source records from the hospitals, the program will use the first 5 facilities
- Need to filter data first on “Class of Case” to distinguish between Dx and Tx facilities



GIS Survey

- First GIS survey of registries conducted in 1999 by Ric Skinner, NJ Cancer Registry
- Follow-up survey first discussed by NAACCR GIS Committee in fall 2002
- Survey released to the NAACCR registries in March 2005
- Goal: Assess GIS capabilities & training needs of NAACCR member registries
- Highlights of survey results published in Spring 2006 NAACCR Narrative





GIS Survey Highlights...

Map of Alaska showing survey highlights



Alaska Cancer Registry

Respondents

- Of the 72 NAACCR registries, 45 responded (41 U.S., 4 Canadian)
- Response rate of 63%



Geocoding

- 82% of respondents geocode the patient DxAddress
- Who does the registry's geocoding?
 - 27% by registry
 - 26% by private vendor
 - 19% by non-registry staff within the organization
 - 19% by combo of reg staff & others within org
 - 7% by combo of reg staff & private vendor



Geocoding

- Who does address QC/cleanup prior to geocoding? 70% said this was done in-house
- What kind of address QC/cleanup is performed?
 - 78% match to a geographic centroid (e.g., town or zip code) when a street address does not match
 - 70% standardize street address format
 - 57% use manual interactive geocoding for records that don't batch match



Geocoding

- 54% segregate non-geocodable addresses (e.g., PO Boxes) from geocodable ones
- 51% can manually adjust matching criteria on their geocoding software
- 46% use address-parsing techniques to increase the probability of an address match (e.g., Northgate Way to N Gate Way)
- 27% do an automated comparison of more than one geocode source for a given address



Geocoding

- Number of geocodes attempted each year is 1.7 times the annual caseload
- 16% of cases fail batch geocoding
- 7% of cases are not able to be geocoded (unknown or invalid address)



Geocoding

- 18% of registries assign existing geocodes to repeated incoming addresses
- 26% of registries link external address data to their registry database for updating or confirming patient addresses
- 58% of registries have access to a list of facility geocodes



GIS Activities

- Of registries currently performing certain GIS activities:
 - 44% are mapping
 - 36% are performing spatial analysis
 - 40% are using GIS for cancer control activities



GIS Activities

- Of registries NOT currently performing certain GIS activities:
 - 68% plan to map their data in the next 12 months
 - 38% plan to perform spatial analysis in the next 12 months
 - 41% plan to use GIS for cancer control activities in the next 12 months



GIS Staffing

- Of registries currently geocoding & using GIS, 63% have staff with geocoding or GIS in their job description
- Of staff with GIS in job description, average percentage of time allocated for GIS is 28%
- 58% of all registries feel the level of support for GIS activities is not sufficient



Training

- 49% of registries have found the NAACCR GIS Basic Practices Handbook to be a useful as a training resource
- 90% of registries said they would benefit from on-line GIS training



Registry Ranking of Training Priorities

1. Geocoding methodology (data cleansing & standardization)
2. GIS applications in cancer control
3. Basic mapping methodology (cartography)
4. Spatial analysis
5. Web-based GIS applications
6. Data & map resources



Registry Ranking of Planned Activity Priorities

1. Geocoding, address cleaning, and standardization
2. Map-making (cartography)
3. Spatial statistical analysis
4. Application of GIS in healthcare, planning & evaluation of programs, and cancer control
5. Internet mapping applications



Acknowledgements

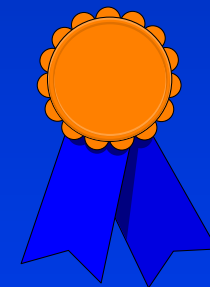
NAACCR GIS Committee's hard work and dedication:

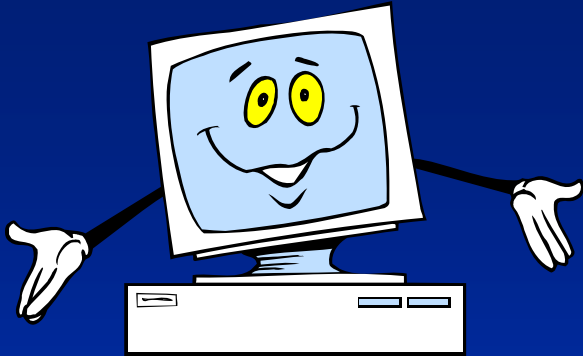
- Members: David O'Brien (Chair, AK), Frank Boscoe (Vice Chair, NY), Robert Borchers (WI), Susan Ross Brown (CA), Myles Cockburn (USC/Keck School of Medicine), Jim Files (AR), Stephanie Foster (CDC), Heidi Gianella (IMPAC), Carolyn Halbert (VA), Yongping Hao (ACS), Kevin Henry (NJ), Ken Hill (Scotts Hill Associates), Holly Hodges (CA), Chris Johnson (ID), Christian Klaus (NC)...



Acknowledgements

- Members (continued): Mary Mroszczyk (MA), Jennifer Murray (TN), Chris Newton (AZ), Kim Porter (ACoS), Baozhen Qiao (IL), Recinda Sherman (FL), David Stinchcomb (NCI), John Williams (KY), Kevin Zhang (ORC Macro)
- Alternates: Pamela Agovino (NJ), Dianne Enright (NC), Annette Gardner, (CDC), Tom Richards (CDC), Linda Pickle (NCI) Lydia Voti (FL)
- NAACCR Support: Dawn Gwinn (NAACCR), Eric Holowaty (Board, ON)





Thanks very much!



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