



13 July 2006

MEMORANDUM  
UNCLASSIFIED

TO: eDiplomacy

FROM: IRM/BPC/eDIP - C. Christian

SUBJECT: Geographic Information Systems Survey Results

CC: INR, HIU, HR, BC

Summary

The Office of eDiplomacy in the Bureau of Information Resource Management (IRM) has conducted a survey of Department of State (DoS) individuals interested in Geographic Information Systems (GIS). The main results are that nearly all offices and many posts see the utility of GIS for Department work on a routine basis. Personnel regularly collect a great deal of geographic data from external sources and need even more geographic data that could or should be supplied by the Department using GIS standards. Many staff believe that training in GIS tools should be widespread and suggest that an individual in their own office or post should be trained to use GIS tools for analytical purposes. These individuals would serve as a local expert and would be supported by a centralized source of expertise. Most respondents agree that an investment in GIS would improve effectiveness at a modest cost and prefer locally controlled purchasing, training and implementation. An ancillary result is that respondents voiced keen interest in using GoogleEarth on their Department desktops.

Introduction

GIS are systems that are used to visualize data, usually from a database or spreadsheet, in a graphical map form. Information that describes regions or areas also can be superposed with tabular type data. GIS are tools capable of integrating, storing, editing, analyzing, and displaying important textual information related to a specific location or region. If presented online or through a desktop system, the information exhibited can be interactively linked by the GIS to the underlying information and database, thus creating an interactive "smart map."

In DoS, most of the foreign policy and diplomacy activities pursued are intrinsically associated with information tied to a locality, a region, a country, or larger area. In disasters, a quick, visual situation analysis such as an annotated map or "Common Operational Picture" is critical for understanding where and how to best apply assets and coordinate with other organizations. Many other examples exist and are related to virtually all types of work carried out in Washington and at posts overseas. Map-based representations present a visual summary of a great deal of pertinent information. To assess the utility of GIS in DoS, user feedback was collected through a survey, a number of interviews, and voluntary feedback.

## Data Collection Method

The primary tool used to obtain user feedback was through an online survey constructed by the Office of eDiplomacy in collaboration with the Bureau of Intelligence and Research (INR), Human Resources, and IRM's Business Center (IRM/BPC/CST/BC). The survey was supplied to a list of "GIS Users" who had attended one of several meetings on GIS over the past two years, as well as several individuals who had participated in GIS demonstrations and focused discussions, for a total of about 100 recipients. 32 individuals responded, representing a third of survey recipients.

A second method was to interview individuals from a variety of bureaus who had expressed interest in using GIS for their work. Face-to-face interviews with about 10 individuals took place over a period of six months in 2005. Interviews of individuals at a few posts overseas were carried out in 2006.

Additional information was supplied voluntarily to eDiplomacy either verbally or by email, prompted by demonstrations of GIS and news regarding the survey, bringing the total number of individuals who provided information for this report to approximately 60. Feedback from experienced practitioners in INR (including the Humanitarian Information Unit – HIU), the IRM/BPC/CST/BC, and the Bureau of Resource Management (RM) was also included.

## RESULTS

Detailed results from the survey tool are attached in Appendix A of this document. Interviews and other feedback touched upon the same subjects. Therefore, the results in Appendix A can be considered representative of all feedback obtained.

**Wide applicability:** DoS users are engaged with numerous issues and topics that would benefit from use of GIS. Applications range from crisis monitoring, to regular reporting on international economic and political developments, to domestic concerns and routine internal administrative and logistical work.

**Data:** Users documented a wide range of data that they collect, review, analyze, and report on. Sources of data are largely external to the Department. Many users believe their office or post has data that could be valuable to the Department and that could be shared more effectively using GIS standard formats. These data are quite varied but include economic, narcotics and crime, trafficking, environmental, visa, and demographic statistics. **All** users were interested in Department-supplied data such as infrastructure location and integrity, populations, political boundaries, and city data. The data desired includes tabular information such as in a database, but also descriptions of regions, locales, or other areas that are of policy and diplomatic interest.

**Reporting and analysis:** Users typically report through email and textual documents. Many users report graphical or visual information through email graphics attachments and Power Point. ALDAC and cables appear to be lower on the preference list of reporting methods, especially for information that would be better represented visually. Most users analyze data by reviewing textual material, examining spreadsheets, or conducting database queries. Most users thought, however, that visual presentation using GIS tools would be superior for analysis, understanding trends, and spatial relationships that are hard to compare using simple text or multiple spreadsheets.

**Implementation:** Most respondents wish to be trained on GIS and felt that a modest investment (that is, if the cost of software and introductory training for one shared desktop system totaled about \$5000 per year) would be sufficient to implement GIS in their office or post. All users felt that training of a local office expert in GIS would occupy about 50% to 100% of an individual's time. Users favored a model where some sort of deeper expertise would be available to the local expert through a centralized structure, possibly in INR, RM or IRM/BPC/CST/BC.

**Barriers:** Most users commented that supervisors and management were not familiar with the power of GIS and likely would be reluctant to allocate even modest resources for this purpose. Nevertheless, many personnel are very interested in obtaining and using GIS to support Department and mission strategic goals.

### Recommendations

The survey respondents collectively recommended scenarios that would enhance deployment of GIS throughout the Department:

1. Establish a GIS support office, possibly in INR, IRM or RM to assist local experts (in offices or posts) users with GIS questions
2. "Think Big. Start Small. Gain Momentum." Develop recommendations for entry level desktop GIS solutions and for initial training and use of GIS "locally" (office or post) – this would be accomplished by the GIS support office discussed above
3. Establish a regular training program for GIS users through the GIS support office
4. Re-invigorate the GIS Users Group to provide a forum for discussion, sharing expertise, and specification of data sets for Department-wide (political boundaries, infrastructure, cities, etc.)
5. Stimulate IRM to submit GoogleEarth as soon as possible for ITCCB approval for desktop and laptop systems

## Appendix A: Detailed Survey Results and Feedback

### ***Respondent Demographics***

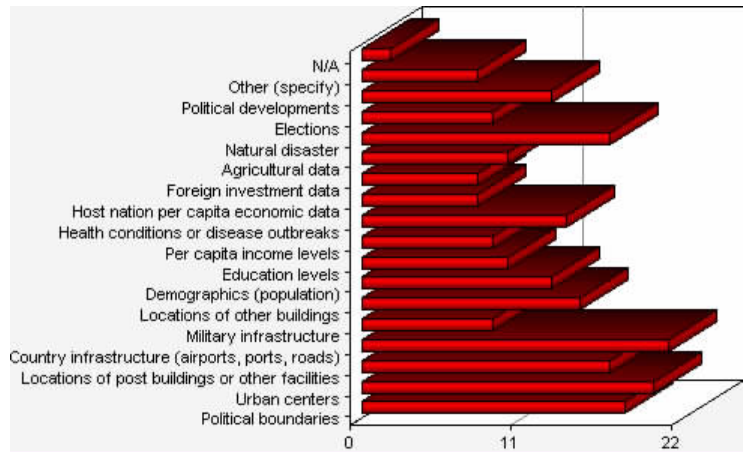
A variety of offices and posts were represented in the survey by the 32 respondents including:

- Domestic bureaus: WHA, EUR, WAP DS, CA, IRM, HIU/INR, RM, and USAID
- Individuals with current postings at: Chengdu, Tbilisi Georgia, Bolivia, Copenhagen, and a few others

The largest number of respondents came from OBO (7), with INR, EAP and DS each with 3 respondents.

### ***Reporting: Annual and Spot produced by DoS units***

Respondents indicated that their organizational units provide location specific reports on a variety of subjects, as shown in the graphic. Particular reporting identified in the written comments includes reports on locations of real estate, property management, and construction as well as evacuation and emergency planning.



Other reports include humanitarian events and other crises, locations of Americans in country, and various types of hazards, including security, crime and insurgency. Reports include discussion of infrastructure, boundaries, and economic data. Information on narcotics agriculture monitoring and health care delivery is also included in location specific reporting.

### ***Routine use of data specifically tied to geographic locations***

Respondents were asked to comment on the types of data they need on a regular basis. Country or local data used include: infrastructure (roads, schools, and hospitals, for example), agricultural data and environmental data such as types, sources and levels of pollution. Spatially referenced health facility locations and various administrative boundaries are valuable.

Regarding crises – data on natural disasters, insurgency, and information from NGOs are important. Posts are interested in local crime statistics as well as at the country level. Site conditions such as flood plain analysis, seismic data, and other environmental data are of interest for both infrastructure stability and environmental considerations.

Census data are of interest to bureaus and any data that could be acquired from international organizations. Data principally focused on coca cultivation areas, especially any “shape files” (outlines of regions) developed from analysis of satellite or airborne imagery are routinely needed.

Data specifically related to DoS functions include consular data as well as a considerable amount of data regarding locations abroad such as site conditions; utilities (infrastructure); and location

of support service delivery platforms. OBO is interested in the location of buildings to be occupied, and in data on U.S. housing, US owned properties and utilities. Also data on upgraded development plans for existing posts, US mission infrastructure, threats, US mission assets and vulnerabilities, and Post security infrastructure and security event data are important.

### ***Data sources***

Individuals often find the data they need through the Internet and /or are compiled by staff themselves through their own individual sources. Some data are compiled by embassy staff, other data are supplied by contractors commissioned to survey and accumulated needed information. Data are derived from individual foreign government entities and international organizations and early responders to humanitarian crises.

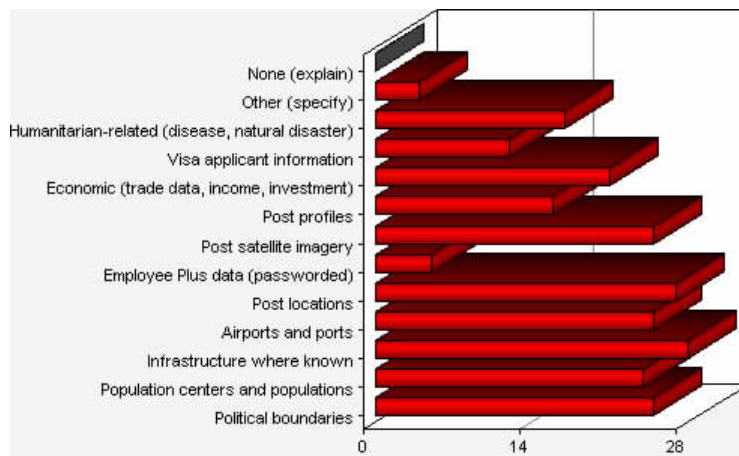
For personnel asset location, the Human Resources database and post personnel systems are important sources as are the Mission Performance Plan (MPP) database and the USAID performance database. Quite a few units would be interested in access to this data.

Some respondents remarked that they have “abundant data in hardcopy that need to be digitized and put into a GIS structure”. This comment pertains in particular to OBO data, but is true elsewhere.

An emerging source of information needed comes from Google Earth.

### ***Data desired from the Department***

Users were asked what data should be supplied and shared within the Department. The graphic shows the selected data of interest. Comments expanded on the users views.



Some data desired relates to current post locations and the location of new embassy and consulate sites. OBO felt that all these data were important since most of their work is tied to a geographic location.

Other users felt that the Visa data is very important and can be used for a variety of analyses to unveil correlations and trends.

Additional data that the Department should share widely was noted:

Mission Performance Plan dashboard data is available with Business Objects (License fee per user) but could be available through a GIS, American citizen residence locations, and economic data compiled by the Department. The spatial distribution of diseases is an example of an information set that should be shared widely from offices that collect such data.

Other comments suggested that the Diplomatic Security infrastructure security plans should be added to a GIS platform.

***Data that are supplied by bureaus and posts to the Department***

Users were queried about data that their own units supply to the rest of the Department through reporting. The idea is that adopting a standard, possibly these data could be shared in a GIS and in GIS standard formats, but this is not a standard practice at this time. It was remarked that DoS has an appetite for ingesting data (such as documented in the previous questions) but supplies little between bureaus or outside the Department, though it should. Data such as election results, visas, trafficking in various commodities, assistance provided, information on property and housing, and disease outbreaks are most commonly reported are useful throughout the Department and quite likely by other agencies.

***Methods of reporting data***

The survey asked users how they report data today. The most common reporting is through textual email, the second is in attachments, and then through websites. PowerPoint presentations are also used. A fourth method is the use of Cables or ALDACs. Hardcopy maps and database entries are also used.

***Methods of presenting and analyzing data***

As in the previous question, the presentation (as opposed to routine reporting) of information is in text, PowerPoint, spreadsheets and databases. A few individuals actually use GIS systems for presentation and analysis. Other analysis methods seem to be use of databases and spreadsheets and visual inspection of printed material.

***Usefulness of GIS and applications***

All respondents either used GIS or strongly desire to use GIS for spatial and comparative analysis, creating map products for presentation, and reporting. Some users would like to present and report analysis, findings, and maps through web interfaces. Again, GoogleEarth was mentioned as an interface of interest for publishing information.

(Surveyor's Note – GIS systems such as the ESRI<sup>1</sup> can create information that can be overlaid for publication in GoogleEarth.)

***Scale of data (city, loca, country, world wide) used***

The scales of interest are quite varied and appear equally distributed from interest in a fine city scale up to world-wide scales depending upon the context of the data being analyzed.

***Support for GIS in DoS - training of current staff, new hires and consultants***

Interestingly, most respondents prefer that much of the current staff in their own offices be trained to use GIS as a tool, like other tools they use. They envision that organizations could easily allocate one person either 50% or 100% to be the GIS expert in their unit, with additional centralized support for specific problems or complex requests. Few respondents thought a vendor or a consultant would be a preferable support strategy for their GIS needs, unless candidate contractors are already integrated into office teams.

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<sup>1</sup> ESRI Corporation is the largest, but one of many companies providing GIS systems. Data compatible with ESRI systems is provided by government agencies such as NOAA, DOD, DIA, commercial companies such as airlines, and universities.

***Purchasing hardware and software***

Most respondents felt that a modest hardware and software investment (~\$5000) in an office would be valuable and improve productivity. All respondents felt that if improved performance could be demonstrated, the cost would be easily justifiable, although they offered no specific ideas on what constitutes “improved productivity” in their respective offices.

***Dissemination of GIS products.***

Users wish to disseminate GIS products in a variety of ways, making use of all available methods such as paper, digital graphics, publishing to a website, and interactive web interfaces. Some situation maps in a very large format are preferred for very complex information and briefings.

Again, users comment that GoogleEarth should be made available on desktops for dissemination.