State Mapping Advisory Committee (SMAC)

Meeting Notes

1:00 PM; January 22, 2003
Location
U.S. Bureau of Land Management, Nevada State Office
Conference Room
1340 Financial Blvd.
Reno, Nevada
For further Information please contact Ron Hess
Nevada Bureau of Mines and Geology
(775)784-6691 Ext. 121 or Email: rhess@unr.edu

1:00 PM: **OPENING REMARKS** and Welcome by Jon Price, Committee Chairman

The Chairman gave a brief overview of the State Mapping Advisory Committee (SMAC). The Governor of Nevada established the SMAC in 1983 to advise the U.S. Geological Survey (USGS) on state priorities for map products and to inform map users about the status of mapping programs and the availability of map products. The Governor named the Director of the Nevada Bureau of Mines and Geology as the chair of SMAC. Membership in SMAC and its subcommittees is open to anyone interested in mapping in Nevada. Participants have included representatives of numerous local, state, and federal agencies, community colleges and universities, and the private sector. In its early years SMAC advised the USGS on priorities for completion of 1:24,000-scale, 7.5-minute topographic maps throughout the state. With all these maps having been printed by about 1990 and with development of digital maps and GIS, SMAC has evolved. The USGS no longer explicitly seeks the advice of the state with regard to its mapping priorities but does request input from bureaus within the U.S. Department of Interior (DOI). SMAC now serves as a forum for discussion of state, local, and federal agency and private sector priorities for mapping. Generally a consensus on priorities is reached during an annual meeting. This consensus is forwarded to Department of Interior bureaus.

OLD and NEW BUSINESS

The geologic mapping subcommittee report was given by Jon Price. The subcommittee met in August to prioritize and approve the areas to be included in the current Statemap cooperative geologic mapping program request. The Statemap awards have not been announced yet due to a lack of a Federally approved budget.The next meeting of the subcommittee will be in August 2003.

The GIS subcommittee has not been active during the past year and no report was presented.

Report on U.S. Geological Survey's National Mapping Discipline projects in Nevada, by Tom Sturm and Carol Ostergen, USGS:

Introduction of the new USGS liaison for Nevada, Carol Ostergren. Carol is based in Sacramento and will be assuming the responsibilities for USGS NMD liaison activities in Nevada and is the lead for the Lake Tahoe National Map pilot project.

Tom presented the current status and availability of DOQs and 10-meter DEMs. DOQ coverage of Nevada, with the exception of the Nellis Air Force Range, should be complete by the end of 2003. The BLM will make the DOQ data available to the Keck Web site for public distribution. Eric Warmath and Mike Turner, both from the Nevada Department of Transportation (NDOT), said that they were going to continue with a project that is merging the DOQs and compressing them for easier distribution. NDOT will supply the compressed files to the Keck Web site for distribution as well. The Web address for the Keck site is http://keck.library.unr.edu/ . Jon noted that the Keck Web site is continuing to grow and contains numerous digital data sets that cover parts of or all of Nevada.

Ten-meter DEM coverage should also be complete for Nevada by the end of 2003 and merged into the

National Elevation Data (NED) system for online orders and distribution sometime in 2004. The Web address for NED is http://edcnts12.cr.usgs.gov/ned/ .

National Map overview and discussion of pilot project activities. The Web address for the National Map project is http://nationalmap.usgs.gov/ and the Web address for the Lake Tahoe Clearinghouse is http://tahoe.usgs.gov/ .

Homeland Security efforts and how they fit into National Map implementation. The national map layers have been identified as significant data sets that are required for homeland security. Acquisition of the needed data sets and high resolution aerial photography in 133 identified cities has been given a high priority. NIMA will be acquiring 1-foot imagery over the 30 highest priority cities. Las Vegas is a high priority city.

DOI high-priority mapping program status. There will be no program for the year 2004 because the USGS has reallocated internal funding to meet Homeland Security requirements. There is a concern that the USGS may not reestablish funding for the DOI high-priority mapping program in the future. This would have a significant impact on various framework data layers in Nevada. It would mean far less available funding for completion of the roads and hydrography coverage for Nevada and less potential funding for updates to existing coverages. Ron Hess suggested that Nevada should address this issue through the Western Governors' Association (WGA) GIS Council. There was consenus that the status and future of the DOI mapping program should be brought to the WGA GIS Council and possibly the National States Geographic Information Council (NSGIC) as well. The DOI high priority mapping program was funded directly out of the USGS general budget and was not a dedicated line item in their budget. SMAC members were not pleased about the DOI mapping program being put on hold.

USGS paper maps. Future USGS topographic maps will be a product of the various digital data sets that are currently being developed as part of the National Spatial Data Infrastructure (NSDI) and the National Map initiative. Map separates of existing paper topgraphic maps may become unavailable in the near future. There may be a high-resolution digitally scanned product to replace the conventional separates but that is still in the planning process. Several committee members voiced concern about the poor quality of scanned digital USGS topographic maps. The Chairman pointed out that the USGS needs to support and pursue quality map output into the future. The reputation that the USGS has today is based on the quality paper map products that they have produced over the past 30 years.

National Aerial Photography Program (NAPP). Tom Sturm reported that funding has dropped significantly over the last year. Policy changes within the program will make it harder for public-lands states to obtain NAPP coverage without dedicated local/state cooperative funding or committed funding for DOQ production. The NAPP program in general may not continue or new remote sensing technology may replace the program.

Break

National initiative to comprehensively build a publicly oriented and spatially enabled data network, Ron Hess.

Initiative title: Saving lives and saving money; An urgent call to build the national spatial data infrastructure in support of public safety. **The initiative is attachment A**. Ron gave a short overview of the initiative and handed out **supporting information from the FGDC which is attached as item B**. This initiative was originally suggested and presented at the National States Geographic Information Council (NSGIC) annual meeting in 2002. NSGIC and FGDC support this initiative. At this time more than 20 states have signed in support of this initiative.

LaRue Smith asked about GIS 12 hour response teams mentioned in attachment B and why they needed to develop and support them? Jon Price answered with a description of their usefulness with examples from the FEMA earthquake/disaster response program.

Ron Hess motioned to have the Nevada State Mapping Advisory Committee support the initiative "Saving Lives and Saving Money; An Urgent Call to Build the National Spatial Data Infrastructure in Support of Public Safety" and have the Chairman sign the initiative and forward it to NSGIC. The motion was seconded by Mark O'Brien and passed unanimously.

FGDC I-Team discussion, Ron Hess.

Ron handed out a **draft I-Team document, attachment C**, which presented summary statistics on several framework data sets for Nevada. A surprising fact that came out of the summary statistics was that our current investment for just 5 framework data layers, several still incomplete for Nevada, stands at over $11 million. This document also included several suggested additional data layers that could be included in the formal Nevada I-Team plan. Formal adoption by the committee of this draft would committ SMAC to become a formal I-Team for Nevada. He then went on to review the I-Team concept:

The I-Team Geospatial Information Initiative (I-Team Initiative) is a joint project of the Federal Geographic Data Committee (FGDC), Federal Office of Management and Budget (OMB), the Council for Excellence in Government, Urban Logic, NSGIC, NACO, and other strategic partners. Part of the next phase of efforts to build a National Spatial Data Infrastructure (NSDI), the I-Team Initiative addresses the institutional and financial barriers to development of the NSDI. It aims to offer a coherent set of institutional and financial incentives to make it easier for all levels of government and the private sector to collaborate in the building of the next generation of framework data. By aligning participant needs and resources, the I-Team Initiative will help all levels of government and the private sector to save money, migrate from existing legacy systems, make better use of existing resources, and develop the business case for additional public and private resources.

I-Teams are Self-Organizing Information Consortia. Instead of top-down mandates, the I-Team Initiative relies on locally formed, interdependent partnerships of federal, state, local, and tribal authorities, academia, and the private sector to implement state and regional portions of the NSDI in accordance with national interoperability specifications and data standards as part of their ordinary business processes. The I-Teams are voluntary, open, flexible, and adaptive collaborations for shared planning, building, using, and financing spatial data. They optimize and align interdependencies allowing institutions and citizens to rely on and share quality data from other trusted sources. Existing organizations and groups can develop I-Team goals and plans to advance the development of the NSDI.

The following data layers were suggested in the draft document for SMAC to include in the formal plan.
(* Indicates FGDC framework data layer.)

*** 1. Orthoimagery** - georeferenced image from photography or remotely sensed data (digital orthophoto quads, DOQs)

*** 2. Elevation** - elevations of land surfaces (digital elevation models, DEMs)

*** 3. Transportation** - roads, trails, railroads, airports, bridges, and tunnels

*** 4. Hydrography** - surface water features such as lakes, ponds, rivers, streams, canals, and shorelines

*** 5. Governmental Units** - state, counties, incorporated places, reservations, and boundaries

*** 6. Cadastral Data** - property extents, legal description, and ownership information

*** 7. Geodetic Control** - reference system for horizontal and vertical location control

8. Geology - bedrock and surficial geologic maps, and geologic hazard maps derived from geologic maps

9. Resource Maps - data for mineral, energy, biological, and other environmental resources

10. Soils - NRCS SSURGO and other soils data layers

11. Satellite Imagery - for statewide environmental and resource monitoring

During discussion it was determined that it would be beneficial for SMAC to develop an inventory of various

existing digital data sets, the cost to produce and update them, and in some cases, complete those that are incomplete. This may assist Nevada in getting additional mapping funds from the federal government in the future but it would also be beneficial on the state level in prioritizing mapping resources and focusing on preserving our current investment in mapping.

The following data layers were identified by the committee for inclusion in a formal I-Plan:

Orthoimagery/NAPP
Transportation
Hydrography
Governmental Units
Geology, also including mineral and energy resource maps.
Weather/Climate
Satellite Imagery

The following agencies and/or individuals agreed to form working groups to provide the detailed information needed for the I-Plan for each of the data layers listed:

Orthoimagery/NAPP: NBMG, Ron Hess; NDOT, Eric Warmath and Mike Turner; BLM, Mark O'Brien

Transportation: NDOT, Eric Warmath and Mike Turner; BLM, Mark O'Brien

Hydrography: USFS, Cheryl Johnson; BLM, Mark O'Brien; USGS, LaRue Smith

Governmental Units: NBMG, Ron Hess; NDOT, Mike Turner

Geology: NBMG, Jon Price and Ron Hess; USGS, Peter Vikre

Weather/Climate: NV Health Division, Lon Beal; NBMG, Ron Hess

Satellite Imagery: NBMG, Ron Hess

Tom Sturm and Carol Ostergren agreed to assist in developing the data inventory and cost estimates for the framework data sets.

Eric suggested flood zone maps as a possible layer to include in the I-plan. It was suggested that Kim Groenewold, the State Floodplain Manager, should be contacted for follow-up.

Mark O'Brien and Doug Potts suggested, because the GCDB project and a cadastral modernization program are both ongoing the cadastral and geodetic data layers should not be included at this time. Since 10 meter DEM coverage is nearing completion for Nevada and future technologic advances might dramatically alter the cost and way that this data is collected it was decided to not include this data layer on in the I-Plan.The NRCS, the primary federal soils mapping agency, was not present at the meeting and the soils layer was removed from the list of layers to be included. There was committee consensus on these decisions.

Ron Hess made the motion to have the Nevada State Mapping Advisory Committee accept the draft I-Team report, with the above noted deletions and additions to the data layers that are to be included in the formal I-Plan, and assume the role of I-Team for Nevada and move forward with producing a formal Nevada I-Plan. The motion was seconded by Mark O,Brien. The motion passed unanimously.

4:30 PM: ADJOURN

If you have questions please contact Ron Hess, Executive Secretary, Nevada State Mapping Advisory Committee at (775) 784-6691 x 121 or Email rhess@unr.edu.

State Mapping Advisory Committee Web Page
http://www.nbmg.unr.edu/smac/smac.htm

Virtual Clearinghouse of Nevada Geographic Information Web Page
http://www.nbmg.unr.edu/geoinfo/geoinfo.htm

Meeting Attendees

Lon Beal	Nevada Health Department
Michael Bish	Nevada Department of Transportation
Sue Boto	USGS Water Resources Discipline
Mz H Dillon	Nevada Division of Water Resources
Lindy Gash	Nevada Division of State Lands
Kimball Goddard	USGS Water Resources Discipline
Ron Hess	Nevada Bureau of Mines and Geology
Cheryl Johnson	USFS Humboldt-Toiyabe National Forest
Barney Mason	Nevada Division of Water Resources
Rose Medina	USGS Water Resources Discipline
Dave Miller	Nevada Division of Information Technology
Linda Newman	University of Nevada, Reno
Mark O'Brien	Bureau of Land Management
Carol Ostergren	USGS National Mapping Discipline
Doug Potts	Bureau of Land Management
Jon Price	Nevada Bureau of Mines and Geology
LaRue Smith	USGS Water Resources Discipline
Tom Sturm	USGS National Mapping Discipline
Mike Turner	Nevada Department of Transportation
Peter Vikre	USGS Geologic Discipline
Eric Warmath	Nevada Department of Transportation

Saving Lives and Saving Money
An Urgent Call to Build the National Spatial Data Infrastructure
in Support of Public Safety

A Declaration of Interdependence

On a daily basis **state and local governments** are engaged in activities that save lives, protect property and guarantee the safety of more than 284 million Americans. But they do so without the benefit of key data, tools and standards that can ensure improved safety for first responders and citizens alike. Spatial data (information linked to an electronic map) and associated technologies significantly increase emergency response effectiveness and efficiency. They also enhance hazard mitigation, and provide for nonemergency applications that will pay for themselves many times over. At all levels of government, for a multitude of reasons, this country must have a comprehensive National Spatial Data Infrastructure to support Public Safety and many other purposes.

National development of timely, accurate and consistent spatial data will significantly enhance government lifesaving operations and countless other government services. While a large number of local governments already use spatial technologies, many cannot reap the full benefits, because there are gaps and inconsistencies in available data, or they rely on partners that cannot afford the technology. Spatial data must be created through national initiatives to ensure that they are available to all who require their use for lifesaving and public safety applications.

Every day, police officers are dispatched countless times to stop crimes in progress and to assist citizens in need of help. Spatial data applications such as “Comstat” in New York City allow police managers to analyze crime patterns and the tactics of their departments. These tools are effective in reducing violent crime and have contributed to a 68% reduction in New York City’s annual murder rate from more than 2,000 ten years ago, to less than 650 today. Firefighters and Emergency Medical Service personnel work around the clock to put out fires and to respond to the health emergencies of individual citizens. State and local Departments of Health are engaged in daily operations to identify, track and mitigate life-threatening diseases. Departments of Transportation respond to accidents, keep roads safe, and analyze accident patterns to develop strategies that reduce injury and death.

All of these operations have two things in common. They are responsible for saving lives each and every day, and they rely upon information resources that have a spatial or geographic context that is critical to their success.

The most critical National Spatial Data Infrastructure elements for Public Safety are:

- Digital orthoimagery (map-accurate aerial photography) at

resolutions that are appropriate for every location to clearly show significant features.
- Accurate and consistent street and highway centerlines with street names and addresses affixed to them.
- Parcel boundaries, and for urban areas, building footprints with unique identifiers and basic characteristics.
- Significant natural features, including topography and vulnerable areas.
- Critical infrastructure elements such as aquifers, water distribution systems, wastewater treatment plants, bridges, tunnels, gas mains, power plants, geodetic control, telecommunication hubs, electric transmission lines, and places of public assembly.
- Locations of hazardous materials storage and other dangerous conditions or facilities.

When combined with such existing technologies as Geographic Information Systems, computer-aided dispatch systems, routing software, the Global Positioning System, Automated Vehicle Location, remote sensing and others, these data create the foundation for a modern public safety information infrastructure. During major emergencies such as terrorist attack, flood, fire, earthquake or hurricane, they can immediately be used to support the efforts of first responders. They also support hazard mitigation operations such as the tracking of potential terrorists and environmental monitoring to prevent emergencies from happening in the first place.

Lifesaving operations extend beyond the borders of local jurisdictions and also beyond state and regional boundaries. Therefore, it is essential that spatial data be built to comprehensive, consistent and nationally agreed upon standards. Because of the detailed and local nature of the data, and because they will be used every single day by local public safety personnel, they need to be built and maintained in cooperation with state and local jurisdictions.

Emergencies strike urban centers and remote locations alike, without regard for the local residents who are injured or killed, and suffer financial losses. The first responders in these communities put their lives on the line while serving others. By the time significant state and Federal relief arrives, most of the fatalities and serious injuries have already been sustained at the local level. It is therefore essential that local public safety personnel have routine access to these public safety data and be thoroughly familiar with their uses. National Homeland Security and emergency management operations must use these same data so that Federal support and response efforts can be quickly and easily integrated with efforts at local and State levels.

Creation and deployment of the Public Safety components of the National Spatial Data Infrastructure will have many additional benefits. Local and state governments can use the same data to provide a foundation for countless non-emergency operations and applications, including egovernment initiatives, economic development, waste removal, street cleaning, code enforcement, environmental protection, growth planning, construction

permitting, inspections, capital construction and human services. These applications of spatial data are known to increase workforce productivity, streamline business processes, save money and improve services delivered to the public. Nationally, the aggregations of standards based spatial data can lead to the creation of a National Map that gives America's citizens vital information for their businesses and day-to-day lives. The investment criteria for spatial data are routinely satisfied for nonemergency applications. Given the more urgent need to be better prepared for protecting our citizens in the post 9/11 world, the benefit of investments in spatial data created for public safety will extend to non-emergency applications and will pay for themselves many times over.

To take advantage of this life-saving and money-saving technology, which is currently available and should already be in the hands of every government agency across the nation, we must complete the job of comprehensively building a public safety oriented and spatially enabled data network. The creation of the Public Safety components of the National Spatial Data Infrastructure is essential now, before it is required to respond to a catastrophe, and before someone asks why it wasn't available when it was truly needed.

For these reasons the following undersigned organizations ask the Congress of the United States to create and enact omnibus legislation that will direct a coordinated national effort to fund production, maintenance and appropriate access of these data at State and local levels.

==========

Attachment B

HOMELAND SECURITY AND GEOGRAPHIC INFORMATION SYSTEMS

How GIS and mapping technology can save lives and protect property in post-September 11th America

Introduction

Timely, accurate information, easily accessed and capable of being shared across federal, state, and local political jurisdictions is fundamental to the decision making capability of those tasked with the homeland security mission. But without the real-time ability to quickly visualize activity patterns, map locations, and understand the multilayered geospatial context of emergency situations, homeland security will not be achieved.

The current state of geospatial information technology can provide decision-makers the data they need to confidently confront a wide variety of threats including natural disasters, terrorist attacks, sabotage, and similar crises. However, the current *implementation* of that technology, across all the federal, state, and local agencies and jurisdictions necessary to fully coordinate an effective response, is seriously lacking in specific areas.

As the concept of Homeland Security becomes infused into the work-a-day pattern of government and the everyday life of our citizens, decision makers will greatly profit from the crisis management "edge" that GIS provides. Homeland Security leaders should understand and implement the policy changes necessary to fully realize this technology's capability, and make the management decisions necessary to implement it on a national basis.

Background

As never before, in the aftermath of the terrorist attacks of September 11, it has become clear that in emergency situations of whatever origin our Nation is dependent on rapid access to and application of many types of current, accurate geospatial information. Critical information such as:

- Facilities and operations susceptible to attack.
- Critical infrastructure, including telecommunications; electrical power systems; gas and oil production, storage and distribution; banking and finance; water supply systems; emergency services.
- Accurate employment data tied to specific locations.
- Detailed and current "framework" data, including orthophotography, transportation, elevation, political boundaries, property ownership, hydrography and geodetic control.

Powerful geographic information systems are now available that quickly render one to several layers of digital geospatial data into map-like products. These systems can facilitate near-real time performance of a wide range of relevant geospatial analyses. These systems can be used to access and process digital geospatial data virtually anywhere because it, unlike analog data, can be instantly transmitted from wherever it's maintained and stored to any place where its needed.

These characteristics make geographic information technologies, combined with appropriate sets of geospatial information, an invaluable tool for the handling, display, and analysis of information involved in every aspect of Homeland Security. For example:

Detection: Geospatial information provides the spatial and temporal backdrop upon which effective and efficient threat analysis is accomplished. By linking and analyzing temporally and spatially associated information in real time, patterns may be detected that lead to timely identification of likely modalities and targets.

Preparedness: Emergency planners and responders must often depend on geospatial information to accomplish their mission. Current, accurate information that is readily available is crucial to ensuring the readiness of teams to respond. Geospatial information access and interoperability standards are essential elements as they support the means for the Nation's response units to react to terrorist attacks, natural disasters, and other emergencies.

Prevention: Geospatial information provides a means to detect and analyze patterns regarding terrorist threats and possible attacks. This information, coupled with information about borders, waters, and airspace, in turn may lead to the disruption of their plans or the prevention or interdiction of their attacks.

Protection: Geospatial information is a very important component in the analysis of critical infrastructure vulnerabilities and in the use of decision support technologies such as visualization and simulation to anticipate and protect against cascading effects of an attack on one system as it relates to other interdependent systems.

Response and Recovery: Geospatial information has been used by many organizations in response to and recovery from natural disasters. Similarly, this information is invaluable for emergency response services of all kinds, as well as for carrying out long-term recovery operations. The Federal Response Plan, developed by 26 federal agencies and the Red Cross, identifies overall responsibilities and the concept of operations for presidential declared disasters. A number of emergency support functions are identified, with the Federal Emergency Management Agency (FEMA) having the lead for coordinating response to natural disasters and the federal wildland agencies responsible for coordinating response to wildland fires.

Current Status

Accurate and comprehensive data are the heart of information technology, and **geographic location is a key feature of 80-90% of all government data**. It is critical that as a Nation we take the steps necessary to assure that strategic information assets relative to Homeland Security -- particularly geospatial information assets -- are created, are maintained for currency and accuracy, are readily available to those who need them, and are interoperable. Although Homeland Security requires much of the same

basic real-time spatial information needed for other uses and applications, we know from recent events that it must be immediately and comprehensively available. In short, we need to assure:

- Implementation of a comprehensive national spatial data infrastructure,
- Interoperability of the systems that process this information, and
- Commonality of the processes that collect, manage, and disseminate geospatial information.

Fortunately the Nation already has a well-founded interagency effort under way to build such a National Spatial Data Infrastructure (NSDI) under the auspices of the Federal Geographic Data Committee (FGDC) which is chartered by the Office of Management and Budget. The NSDI provides crosscutting mechanisms for organizations of many types, affiliations, and responsibilities to be able to collaborate in assuring that geospatial data and systems are in-place, ready for use. The data, technology, and associated intergovernmental and government-private mechanisms forged in this effort will be invaluable to intelligence, law enforcement, and other national security-related elements, as well as to local communities, in dealing with terrorism and other major threats to public safety and welfare.

In collaboration with all levels of government, industry, and academia, the FGDC and its member federal agencies have in-place a wide variety of effective organizational relationships and processes that could readily be used and expanded upon as needed -- given appropriate sanction and backing -- to produce a nationally consistent framework of Homeland Security-related base data characterized by common data content standards and supported by interoperable technologies. Several examples already exist of how this process works well:

- The coordinated application and use of geospatial data in New York City in response and recovery to the World Trade Center attack.
- Development of geospatial data as a foundation for critical infrastructure protection and emergency preparedness/response in the greater Chicago area.
- The use of geospatial information in wildfire suppression through the coordinated work of the Geospatial Multi-Agency Coordinating Group.

However, at present there are gaps that should be filled to achieve assurance of data and technology accessibility and interoperability. Examples are:

- National data standards still need to be developed for a number of framework and other data themes to provide data that is immediately useful in Homeland Security events.
- NSDI Framework Themes are not yet complete.

?

?? E911 capabilities are limited by the lack of consistent, standardized road data across the Nation, preventing true interoperability between all levels of government.

?

?? Current and accurate information about the Nation's critical infrastructure is not consistently available or shareable among relevant agencies, leaving the Nation unable to effectively plan for modern terrorist activities.

The FGDC believes it is imperative that the Nation accelerate implementation of the NSDI. As we move forward to improve and support planning and management activities, the contribution of geospatial information and technologies in support of critical decision-making should be fully utilized. The NSDI has already established certain standards, processes, and relationships that serve to advance Homeland Security including:

?? Well established relationships with Federal, State, Local and Tribal governments and ongoing coordination mechanisms such as I-Teams, an initiative to collect basic framework data collaboratively among all levels of government.

?

?? A multi-node geospatial information Clearinghouse Network that can be extended to promote rapid discovery, sharing, and protection of critical geospatial information.

?

?? Access to industry and international standards bodies and programs to advance standards that promote data consistency and interoperability of spatial technologies.

Recommendations

It is our opinion that more needs to be done to fully realize the potential this technology brings to decision making. To that end, we recommend that the Office of Homeland Security consider the following recommendations:

1) Address the gaps outlined above by supporting:
    a) National data standards
    b) Completion of all NSDI Framework Themes
    c) Nationwide geospatial data compatibility for E911 operations
    d) Compilation of comprehensive georeferenced information on Critical Infrastructure

2) Bring additional focus on these activities to elected officials at all levels of government across the Nation.

3) Promote, enhance, and provide sufficient resources for collaborative relationships between federal, state and local agencies and with the private sector.

4) Develop uniform approaches to planning for Homeland Security events while relying on standardized data and systems.

5) Develop sophisticated mobile GIS labs and trained staff that can be delivered to any site in the Nation within 12 hours of an event.

For more Information Contact:
Federal Geographic Data Committee
Reston, VA 20192
www.fgdc.gov
Phone 703-648-5752
Fax 703-648-5755

Attachment C

Nevada State Mapping Advisory Committee I-Team Report:

(Ron Hess; DRAFT; 1/22/03)

Introduction

The Nevada State Mapping Advisory Committee (SMAC) proposes to be the Implementation Team (I-Team) for geographic information systems (GIS) data layers in Nevada. The I-Team Geospatial Information Initiative is a joint project of the Federal Geographic Data Committee (FGDC), Federal Office of Management and Budget (OMB), the Council for Excellence in Government, Urban Logic, National States Geographic Information Council (NSGIC), National Association of Counties (NACo), and other strategic partners. As part of the effort to build a National Spatial Data Infrastructure (NSDI), the I-Team Initiative addresses the institutional and financial barriers to development of the NSDI at federal, state, and local levels. It aims to offer a coherent set of institutional and financial incentives to make it easier for all levels of government and the private sector to collaborate in the building of the next generation of digital framework data. By aligning participant needs and resources, the I-Team Initiative will help all levels of government and the private sector to save money, migrate from existing legacy systems, make better use of existing resources, and develop the business case for additional public and private resources.

The I-Team process provides a means to bring together organizations interested in particular geo-spatial data and craft a coordinated strategy for data acquisition, funding, maintenance, and distribution.

The goal of SMAC in developing this I-Team Report is to identify digital map coverages, or framework data layers, that form important components of a wide variety of map products and plan for the development and long-term maintenance for each framework data set. These framework data sets are important to a wide variety of users ranging from land-use planners to emergency-response personnel. This report will identify those framework data sets that are of importance to participating agencies; identify current status, cost to complete and/or maintain coverage for Nevada; and identify agencies that may be potential cooperators in creating and maintaining these data sets. The results of these efforts will help to provide integrated framework information for analysis of issues and decision-making at federal, state, and local levels of government. Further, it will help provide a common and timely frame of reference for communicating information and concepts of complex issues to citizens and decision makers.

Overview of the Plan

This report identifies the organizational structure of the I-Team for Nevada, defines a process for prioritizing data themes that will contribute to building Nevada's part of the NSDI, and provides a summary of framework data themes and supplemental data themes that will be included in the prioritization process.

This plan, through SMAC, addresses issues and information needs statewide for Nevada and reflects the collaboration of federal and state agencies, academia, representatives of local governments, and the private sector.

Implementation Team

The Governor of Nevada established SMAC in 1983 to advise the U.S. Geological Survey (USGS) on state priorities for map products and to inform map users about the status of mapping programs and the availability of map products. The Governor named the Director of the Nevada Bureau of Mines and Geology as the chair of SMAC. Membership in SMAC is open to interested individuals from state, local, and federal agencies; academia; and the private sector. The Federal Geographic Data Committee (FGDC), on November 6, 2000, formally recognized the Nevada State Mapping Advisory Committee as the Nevada Regional Cooperating Group in support of the National Spatial Data Infrastructure (NSDI) program. Upon acceptance of this report, SMAC agrees to serve as a regional I-Team for Nevada.

Approach

Framework Data Set. The framework is a widely available set of basic geographic data. It provides the most common geographic data themes that users need, and an environment to support the development and use of these data. The framework represents "data you can trust" – the best available data for an area, certified, standardized, and described according to a common standard. It provides a foundation upon which organizations can build by adding their own detail and compiling other data sets.

Unfortunately organizations sometimes unnecessarily spend resources on GIS duplicating other organization's data collection efforts. The same geographic data themes for an area need not be collected over and over again, at great expense. The framework will greatly improve this situation by leveraging data collection efforts so existing data can be shared. In this environment, users can perform cross-jurisdictional and cross-organizational analyses and operations, and organizations can funnel their resources into applications, rather than duplicating data production efforts.

SMAC has defined priority data themes and inventoried the progress of data development, standards, identification of custodians, and funding requirements. These include the framework data themes defined by the Federal Geographic Data Committee (FGDC):

1. Orthoimagery - georeferenced image from photography or remotely sensed data (digital orthophoto quads, DOQs)

2. Elevation - elevations of land surfaces (digital elevation models, DEMs)
3. Transportation - roads, trails, railroads, airports, bridges, and tunnels

4. Hydrography - surface water features such as lakes, ponds, rivers, streams, canals, and shorelines

5. Governmental Units - state, counties, incorporated places, reservations, and boundaries

6. Cadastral Data - property extents, legal description, and ownership information

7. Geodetic Control - reference system for horizontal and vertical location control

Other data layers not defined as framework data by FGDC but addressed by SMAC include:

8. Geology - bedrock and surficial geologic maps, and geologic hazard maps derived from geologic maps

9. Resource Maps - data for mineral, energy, biological, and other environmental resources

10. Soils - NRCS SSURGO and other soils data layers

11. Satellite Imagery - for statewide environmental and resource monitoring

SMAC recognizes that these FGDC framework data catagories, along with geology, resource maps, and satellite imagery, are primary state wide digital mapping priorities for Nevada. As the I-Team process develops, other data layers or themes of significance to Nevada may be added. We also recognize that funding opportunities and resources must be developed to complete and then maintain with regular updates the above data layers. Only by jointly working with the various federal, state, and local agencies will we be able to maintain and update these data sets for the best benefit of all agencies concerned and the general public.

Inventory and Investment in Existing Data Sets as Listed in this Report.

1. Orthoimagery (DOQs) and Aerial Photography

Of the 1,993 1:24,000-scale 7.5 minute quadrangles in Nevada, 1,913 will have DOQ coverage by the end of 2003. Most of the remaining 80 DOQs are located over the Nellis Air Force Range.

The current DOQs were created from USGS National Aerial Photography Program (NAPP) photography. NAPP photography in Nevada is 1:40,000-scale black and white, high-resolution conventional aerial photography. The dates of the original source photography for the DOQs depend on the NAPP cycle in which they were created, either 1991, 1994, or 1999. Past NAPP missions over Nevada have been primarily funded by the federal government. This may not be the case with future missions due to changing government policies and budget constraints. Future NAPP missions may require a 50% cost sharing with the USGS or may even have to be funded in whole by state and/or local agencies. The approximate full cost of a NAPP like mission covering Nevada would be approximately $1.2 million.
Standard USGS-format DOQs are produced in files that cover one-quarter of a USGS 1:24,000-scale, 7.5-minute quadrangle (these files are called digital orthophoto quarter quad - DOQQ), have 1-meter pixel size, and are designed to meet the USGS map-accuracy standard for a 1:12,000-scale map product. USGS DOQs in Nevada are black and white images. DOQs can serve as a base for development and updating of other framework data layers such as transportation and hydrography. Agencies that have funded or may fund DOQs include the Bureau of Land Management, USGS, Nevada Department of Transportation, Clark County, and the Southern Nevada Water Authority.

Cost to produce a DOQ product that covers one 1:24,000-scale quadrangle is approximately $3,200. This does not include the cost of flying and creating the needed NAPP photography.

By the end of 2003, the current investment value of Nevada's DOQ will be $6,121,600 excluding the cost of photography. To complete first time DOQ coverage for the remaining 80 quadrangles would cost an additional $256,000, but these may remain unavailable to the public for reasons of national security.

The cost to fly a statewide black-and-white photgraphy mission, similar to the previous NAPP missions, is approximately $1.2 million. The current investment in the three previous NAPP aerial photography missions over Nevada totals approximately $2.9 million.

Some counties, such as Clark and Washoe, have flown color photography missions and created their own DOQs at higher resolution (less than 1 meter). Satellite imagery, available commercially and from some foreign governments, and new airborne digital technologies can possibly replace the conventional DOQ product with a similar, more cost effective, georeferenced image product.

2. Elevation - elevations of land surfaces (DEMs).

DEMs consist of a sampled array of elevations for a number of ground positions at regularly spaced intervals. Nevada has complete coverage at 30-meter DEM grid spacing. The 30-meter product was the initial USGS DEM product generated from existing 1:24,000 mapping.

A new DEM program is underway to create 10-meter DEM for the country. Production is ongoing in Nevada. By the end of next year 1,870 quadrangles should have 10-meter DEM coverage, and 123 are not yet identified for 10-meter DEM development.

The current cost per quadrangle for the USGS to produce a 10-meter DEMs from existing mapping is $690. The current investment in 10-meter DEM data in Nevada is $1.3 million. To complete first-time DEM coverage for the remaining 123 quadrangles will cost an additional $84, 870. This figure does not include update costs for existing DEMs in areas where significant surface changes have occurred, such as in mining and urban areas.

Development of new DEM data (from new photographic or imagery sources - not from exisitng mapping) in areas of significant surface elevation change, such as in open pit mining areas, may run as high as $2,000 per quadrangle. This cost would assume use of 1999 NAPP photography. Acquisition of newer photography or imagery would be an additional cost. NASA has recently flown a shuttle radar topography mission that is creating a seamless topographic data set, that will cover all of Nevada. New and developing satellite remote sensing and airborne LIDAR technologies may provide additional solutions to DEM updates in the future. Agencies that have funded or may fund 10-meter DEMs include the Bureau of Land Management, USGS, and Nevada Department of Transportation.

3. Transportation - roads, trails, railroads, airports, bridges, and tunnels.

Only 297 of Nevada's 7.5-minute quadrangles have existing 1:24,000-scale roads digital line graphic (DLG) coverage. Many of these are quadrangles that fall on the borders of Nevada. Development of road DLG coverage of an additional six quadrangles is in progress at present.

The Nevada Department of Transportation is currently using GPS technology to capture state and some county road locations in a digital format. This information can be used cooperatively with the USGS in the creation of new road DLG coverages in rural areas and in updating existing DLGs in urban areas. Other sources of updated road information in urban areas are various county agencies that have up to date and more detailed information about the local road network. Agencies that have funded or that may fund transportation DLGs include the Bureau of Land Management, USGS, Nevada Department of Transportation, U.S. Forest Service, and various counties.

The current cost per quadrangle for the USGS to produce a road DLG is $915. The current investment in road DLGs in Nevada is $277,245. To complete first-time road DLG coverage for the remaining 1,690 quadrangles will cost an additional $1.6 million. This figure does not include update costs for existing DLGs.

4. Hydrography - surface water features such as lakes, ponds, rivers, streams, canals, and shorelines.

Only 300 7.5-minute quadrangles in Nevada have existing 1:24,000 scale hydrography DLG coverages. Many of these are quadrangles that fall on the borders of Nevada. There is increasing interest by various federal, state, and local agencies in water and related environmental issues. Accurate hydrography coverages could assist in modeling and addressing some of these issues. Agencies that have funded or that may fund hydrography DLGs include the Bureau of Land Management, USGS, U.S Forest Service, Nevada Department of Conservation and Natural Resources, and the Southern Nevada Water Authority.

The current cost per quadrangle for the USGS to produce a hydrography DLG is $940. The current investment in hydrography DLGs in Nevada is $282,000. To complete first-time hydrography DLG coverage for the remaining 1,693 quadrangles, based on existing mapping, will cost an additional $1.6 million.

5. Governmental Units - state, counties, incorporated places, reservations, and boundaries.

Of the 1,993 quadrangles in Nevada, 769 have existing 1:24,000-scale governmental unit (boundary) DLG coverage. An additional fifteen quadrangles are in progress at present.

The current cost per quadrangle for the USGS to produce a boundary DLG is $345. So our current investment in boundary DLGs in Nevada is $270,480. To complete first time boundary DLG coverage for the remaining 1,209 quadrangles, based on existing mapping, will cost an additional $417,105. Agencies that have funded or may fund boundary DLGs include the Bureau of Land Management, USGS, Nevada Department of Transportation, Clark County, and various other counties.

6. Cadastral Data - property extents, legal description, and ownership information

Cadastral data information needs to be compiled by appropriate agencies and included. Much of these data are being compiled by the Bureau of Land Management and various

counties.

7. Geodetic Control - reference system for horizontal and vertical location control

Geodetic control information needs to be compiled by appropriate agencies and included.

---Other data layers not defined as framework data by the FGDC but addressed by the Nevada SMAC include:

8. Geology - bedrock and surficial geologic maps, and geologic hazard maps derived from geologic maps

Of the 1,993 quadrangles in Nevada, 380 have existing 1:24,000-scale geologic map coverage. Maps typically include exposed bedrock and surficial (loose sediment, such as alluvium) units. Geologic hazard maps (e.g. earthquake- and flood-hazard maps) have been derived from some of these geologic maps.

The current cost per quadrangle for the Nevada Bureau of Mines and Geology (NBMG) to produce a bedrock and/or surficial geologic map is $150,000. This is the actual cost incurred to generate new 1:24,000 scale geologic mapping and produce both hard copy and digital version of the mapping. Current funding for geologic mapping comes from NBMG, USGS, and cooperative and contract funding from various state, county, regional, and local agencies. Geologic maps can be used to identify various environmental hazards such as earthquake faults, flood prone areas, and landslide areas; to explore for mineral and energy resources; and for earth science research activities.

It is anticipated that to meet the minimum needs for new geologic mapping in and around Nevada’s growing urban areas and other areas of significant environmental and economic concern will require the production of at least 20 new 1:24,000 scale geologic maps per year. To maintain a production rate of 20 new geologic maps per year will require an annual mapping budget of $3 million. Current funding is about $400,000 per year.

9. Resource Maps - data for mineral, energy, biological, and other environmental resources

The availability, area of coverage, and cost for the various resource layers that are required need to be compiled by appropriate agencies and included. NBMG creates, compiles, and maintains GIS layers on mineral and Energy resources. The USGS EROS Data Center and USGS Biological Survey develop various vegetation and land cover data sets.

10. Soils - Natural Resources Conservation Service (NRCS) will compile a list of existing data sets, areas currently covered, areas requiring coverage, time line for completion, and cost estimates for SSURGO data and other soils layers that are deemed necessary for Nevada.

11. Satellite Imagery - for State wide environmental and resource monitoring

Nevada Landsat thematic mapper (TM) data are available from the USGS with complete

coverage, almost on a monthly basis, since the launch of Landsat in the 1980's. Several different TM data sets covering Nevada are available for no charge on the Keck Web site (http://keck.library.unr.edu). New Landsat TM data sets will have to be purchased. Newer satellite systems, some with higher resolution or different bandwidths, exist and may be purchased. To help the greatest number of users, the timing and resolution requirements for this type of imagery has to be determined. Further information on the type of sensor, cost, and other data issues still need to be compiled by appropriate agencies and included.

Investment and Cost Summary for Nevada Framework Data Layers - 2003:

Framework Layer	Current Investment	Percent Complete	Cost to Complete	Total Investment after State coverage Completed
Orthoimagery (DOQs)*	$6,121,600.00	95.99%	$256,000.00	$6,377,600.00
NAPP Photography*	$2,900,000.00	100.00% **	$1,200,000.00 ***	$4,100,000.00
Elevation (10 meter DEMs)	$1,290,300.00	93.83%	$84,870.00	$1,375,170.00
Transportation (DLGs)	$277,245.00	15.20%	$1,546,350.00	$1,823,595.00
Hydrography (DLGs)	$282,000.00	15.05%	$1,591,420.00	$1,873,420.00
Governmental Units (DLG)	$270,480.00	39.34%	$417,105.00	$687,585.00
Cadastral Data ****				
Geodetic Control ****				
Geology ****		18.80%		
Resource Maps ****				
Soils****				
Satellite imagery ****				
TOTAL	$11,141,625.00		$5,095,745.00	$16,237,370.00

* Digital Orthophoto quads (DOQs) and NAPP Aerial Photography are broken out separately on the table however in the text they form one item. In the future, technology may allow the creation of DOQs directly from data sources other then conventional aerial photography such as airborne or satellite digital remote sensing data.

** Does not include Nellis Air Force Range.
*** Only needed if further NAPP missions are flown to support development of new DOQs or other framework layers.

**** Data not compiled in this report.

Questions:

Does the Nevada State Mapping Advisory Committee wish to move forward with the I-Team process and flesh out this document for long-term planning purposes? Beside identifying various funding sources for these framework data layers, do we need to add other layers? Are there key SMAC or agency staff members who wish to further define the requirements, costs, and agencies available to assist in obtaining funds to further develop these framework data sets? Most of this document is concerned with the status of existing framework coverages and what is required to complete first-time statewide coverage. However, after first-over coverage is complete, we then have to start looking at the cost and commitment required to maintain and update the coverages. This will also require a prioritization program to develop a revisitation schedule, budget, agency cooperation, and needed funds. **Do we need to go further?**

Ron Hess