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Subcommittee on Technology, Information Policy, Intergovernmental Relations and the Census

Hearing on

"Geospatial Information: Are we headed in the right direction or are we lost?"

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Chairman Putnam, Ranking Member Clay, distinguished Members of the Subcommittee; it is my privilege to testify before the Subcommittee on behalf of the National Research Council's Mapping Science Committee. We greatly appreciate being included in today's hearing. The Mapping Science Committee was created in 1989 and has served as a blue ribbon committee of experts from all levels of government, academia and the private sector who provide pro bono service to the Nation. Our committee has three important missions relating to today's hearing:

1. We provide independent advice to society and to government at all levels on scientific, technical, and policy matters relating to spatial data.
2. We address aspects of geographic information science that deal with the acquisition, integration, storage, and distribution of spatial data.
3. The committee promotes the informed and responsible development and use of spatial data for the benefit of society.

Since 1989 we have conducted fifteen studies and reports that relate to improving the way the federal government makes spatial data available to all aspects of society. Of particular note are the following studies:

Toward a Coordinated Spatial Data Infrastructure for the Nation (1993) that helped to define the National Spatial Data Infrastructure (NSDI),

Promoting the NSDI Through Partnerships (1994) that identified the importance of partnerships in building a successful NSDI

National Spatial Data Infrastructure Partnership Programs: Rethinking the Focus (2001) that evaluated the effectiveness of the FGDC grant programs

Weaving the National Map: Review of the U.S. Geological Survey Concept of the National Map (2003) that critiqued the USGS plan for the National Map.

Today we are pleased to present to the committee copies of our most recent report A Geospatial Framework for the Coastal Zone: National Needs for Coastal Mapping and Charting. This report highlights the cooperation between NOAA and the USGS to integrate elevation and bathymetry. We will soon release our comprehensive study Licensing Geographic Data and Services that addresses one of the most significant obstacles facing the integration of spatial data.

The Mapping Science Committee has monitored the transformation of the use of spatial data from an era dominated by paper maps into a robust $5 billion annual market that provides critical information for business, government and the general public. Our 1997 report The Future of Spatial Data and Society accessed the trends in the field and predicted the impacts on business and government. Many of our predictions are being realized today. For example, some recent forecasts expect the demand for location based services supported by GPS technology and accessed through wireless mobile devices will lead to a six fold increase in a market that could reach $30 billion in a just a couple of years. The general public is increasingly aware of and dependent on digital spatial services. A recent three page article in Newsweek highlights the importance of this technology. Few of us could survive without MapQuest and GIS technology coupled with Census data is at the core of all redistricting plans and strategies for political campaigns. Of course, we all understand that accurate and current geospatial data provides our military with a critical advantage. At the same time, a spatially aware and technically savvy public is demanding government services that fully utilize geospatial data and services. They expect on line access to information about their property and public resources. They certainly expect an ambulance to find their house. It should be noted that the increased reliance on spatial data and services led the Department of Labor to forecast that job growth in geotechnology will soon rival that of nanotechnology and biotechnology.

It is important to address the specific issues relevant to this hearing. These issues focus on whether the Federal government is on the right track with respect to its role in the coordination and utilization of geospatial data. The Mapping Science Committee believes that last year the Federal Government made an important mid-stream adjustment and the path is much better marked than it was previously. We are pleased to see an articulation of the distinct but interrelated roles of the FGDC, The National Map and Geospatial One Stop. This model of a

three legged stool appears to cover the major bases in a coherent manner. We believe that the role of the FGDC is clear and that the organization has served as a valuable focal point for coordination of federal activities. We are particularly pleased with the FGDC role in pushing the importance of spatial meta data. This effort provides a critical tool for discovering, distributing and sharing data. We are also very pleased with the serious work of the FGDC Cadastre Working Group that has brought the right players together and has worked diligently to develop a standard that is acceptable to a broad community. However, we do not believe that the FGDC has had sufficient clout to get its work done in an expeditious manner. We have found its partnership programs to be under funded, too short in duration and not sufficiently rigorous. We also believe that its future plans do not express the urgency required to complete their valuable work. We also believe that the FGDC would benefit from adopting a less federal centric governance structure.

The Committee's recent report Weaving the National Map: Review of the U.S. Geological Survey Concept of the National Map provided an in-depth analysis of the USGS plans for The National Map. We found the concept to be ambitious, challenging and worthwhile. We encouraged the agency to develop a more rigorous implementation plan, to place a priority on building the necessary partnerships, and to take a leadership role to work with the FGDC processes to nurture these partnerships. We are pleased to see the progress that the USGS is making on all of these fronts. The National Map is the critical data leg of the NSDI stool. It holds great technical and institution promise for changing the way that the public sector assembles integrates and distributes geospatial data. However, the plan requires voluntary participation from partners through all levels of government. Unfortunately, from the local and state perspective there are few incentives to create these partnerships and there is a real threat that the National Map will never be truly national in scope.

The Geospatial One Stop (GOS) E-Government experiment represents the third leg of the stool and is the one that still needs to demonstrate its value. The committee has not conducted any specific studies on the scope or performance of GOS; therefore, the following comments are my personal views. I believe that it has been a useful experiment and has brought together an extremely inclusive group of participants. In many ways, GOS is just an Internet portal that would like to be the first and most popular place for discovering and accessing geospatial data. However, in today's world, users have many ways to search and retrieve information. In this competitive environment it has not been demonstrated that GOS is the most preferred way to find geospatial data. I believe that it is a useful start and does provide a fairly comprehensive portal. Its unique contribution is to provide a place to coordinate planned data acquisition activities. It is safe to say that GOS will be evaluated in the market place. Success will be determined by user traffic and whether it truly becomes a One Stop Shop for geospatial data.

It is also important to comment on the role of the private sector. The bottom line is that we have a very robust private sector that has responded to business opportunities and seems well positioned to serve a rapidly expanding market. The data conversion companies are providing outstanding technical alternatives for the creation of affordable high quality spatial data. This means that we can truly build data bases that have a reliable high resolution framework that should stand the test of time. The software vendors have produced software that is easy to use, exciting and fully integrated into the internet. The Open GIS Consortium has successfully addressed some sticky issues regarding interoperability and made location based services a reality. I believe the business sector is well positioned to meet future needs as long as we take immediate steps to address critical labor market issues.

Therefore are we are the right path? All three of the legs of the stool have moved beyond the demonstration stages. With a few quick web searches one can find working prototypes of each program. The technology is robust and supportive of the programs. The fact that we are growing impatient is a measure of the importance of these functions. Therefore, the only successful way to reach the desired destination is to put a priority on the completion of the systems. All the FGDC standards must be completed. The federal government should assist in the creation of framework data. The National Map will only be successful if it is truly incorporates a nationwide system of local and state data sources to complement the federal programs. The GOS will only be successful when it is a comprehensive portal for the discovery of all geospatial data.

I would also like to comment on the importance of partnerships and why I believe that the absence of partnerships is the major obstacle we face. The Census Bureau and the USGS have worked to establish partnerships with state and local governments such as the North Carolina One Map program. Unfortunately, there are critical gaps across the country. If these data are considered important resources to meet federal program objectives then these gaps must be closed. For example, there are no Florida GIS operations listed as partners on the National Map web site. While there are major GIS operations in Orlando and Tampa they have not voluntarily joined the National Map program. In my state of South Carolina only Charleston and York Counties have become National Map Partners. More importantly, because of our own lack of organization there is no official relationship between the National Map and our State Government. Furthermore, in several counties excellent data will not be shared with the USGS, the Bureau of the Census or DHS. Of particular note is the Richland County GIS data created and maintained in my community. The county has invested about $6,000,000 in the creation of extraordinary spatial data to support local government business functions. These data include high resolution digital aerial photography, building footprints, highly accurate street centerlines, complete addresses, and land ownership parcels. The county even requires developers to digitally summit their plans for new roads and developments. For example,

through this program users can view planned roads prior to construction. I believe that Richland County data is the best data for the Census 2010 modernization program and to support the needs of any first responders. Unfortunately, these data resources are controlled by a licensing agreement and cannot be placed in the public domain through either the National Map or the Census program. In the absence of a local / federal partnership taxpayers will be paying to create a new set of street centerlines to accommodate the 2010 Census for Richland County. I find that to be an egregious waste of public resources.

I would also like to comment on the importance of land parcel data. The land parcel is the only authoritative source of information regarding who owns a piece of property, its use and its value. I recently co-authored an article that recommends a reexamination of the recommendations for a nation wide land parcel system made by a 1980 National Research Council Committee. That report, the Need for a Multipurpose Cadastre, advocated a strong role for the Federal government to coordinate a three-tier program that would dynamically capture and maintain a nation wide property record data base. This system would function much like the one in Richland County. Through property transactions each county would continuously monitor changes in property ownership parcels, streets and addresses. These would support all the local needs for property taxation, regulatory compliance and planning. However, instead of staying in the county these records would be forwarded to the state government that would assemble all the county records into a comprehensive, current and accurate database for state level programs such as equalization of educational funding. It should be noted that this is exactly the data required to meet the needs of federal programs such as No Child Left Behind. In this three-stage hierarchical model, the state organizations would link their data to the National Map for common distribution and integration with other data resources. Through such a system the National Map goal of seven day update for new features would be met and the Census Bureau would only have to take a snapshot of the current data to conduct the decennial census. Furthermore, the Department of Homeland Security would have fundamental geospatial data it needs to support first responders and the FEMA floodplain program. We would also do a better job of making sure ambulances and fire trucks get to the right address – even at construction sites. It should be noted that the idea of a nation wide property record system compliments the new executive order that mandates a program for Federal Real Property Asset Management which will include a Federal Real Property Council.

In summary, the Mapping Science Committee believes that Geospatial data is important to the basic functioning of government and is the catalyst for a robust economy. These data are also a critical resource to support homeland security. We believe that it is a proper role for the Federal government to take an active role in the coordination of geospatial data activities. We believe that the NSDI is about making useful data available for the operation of government and industry.

Therefore, we strongly support the USGS program for the National Map. However, much of the essential data are collected by local governments and utility companies who currently see few incentives to participate in the critical partnerships that will help us truly build a relevant National Map. Voluntary partnerships are not working and the Federal government must find a combination of carrots and sticks to realize the potential of the NSDI. We also believe that most of the critical planning, regulatory and homeland security decisions are made at the parcel level. Therefore, the new executive order relating to real property management provides an opportunity to examine whether this is the time that the United States should create the comprehensive geospatial data system that we really need.

The Mapping Science Committee is proud of its role as monitors of the NSDI and is ready to serve the Nation any way it can.