

**National Geospatial Advisory Committee  
National Hydrography Dataset Subcommittee Summary Report  
December 2012**

**Subcommittee Composition**

**Members:**

Mark Reichardt (Chair)  
Timothy Nyerges  
Tony Spicci  
Gary Thompson  
David Wyatt

**Participating Subject Matter Experts:**

Steve Aichele  
Mark DeMulder  
Tommy DeWald  
Vicki Lukas  
Jeff Simley

**Subcommittee Guidance:**

The Federal Geographic Data Committee (FGDC) provided guidance to the NGAC in April 2012, describing topics for NGAC review and feedback. The FGDC guidance included the following section on the National Hydrography Dataset:

***“National Hydrography Dataset – Advancing the Nation’s Hydrography Infrastructure***

*The National Hydrography Dataset (NHD) is a successful model of a national dataset that is collaboratively maintained across levels of government and managed by a Federal agency. A host of resource management challenges pose the need to advance the data model, including integration of the human-made water infrastructure with natural systems, and integration of surface and groundwater models. Success in geo-enabling decision making will require accelerated development and population of the NHD. Despite the high level of collaboration and communication within the NHD community, multiple hydrography datasets still exist in some states, and the pace and success of stewardship is uneven across the nation. The USGS is seeking review and strategic advice on the current NHD stewardship and funding model to position it for meeting growing needs. Specific questions to the Subcommittee include:*

- *What are the barriers to greater standardized use of the NHD?*
- *How can implementation of a single nationwide, and multi-agency, hydrography dataset be improved?*
- *Is the current stewardship model the optimal strategy for engaging partners and improving the data?*
- *What improvements can be made or incentives leveraged to strengthen stewardship and funding?*
- *What are the administrative/policy, technical and coordination best practices for maintaining NHD data across multiple sectors and levels of government?”*

**Background**

The National Hydrography Dataset (NHD) program has been implemented broadly across the nation. Success of NHD depends on cooperation between local, state, and federal partners as much of the data

attributed to NHD is available at the State level or below. Thirty-seven states have signed stewardship agreements, with another handful of states advancing draft agreements through their states. Of the 2247 basins in the 50 states, 947 of them have been updated as part of the NHD stewardship program. NHD is being applied to address a range of topics from water quality to fisheries management, to water discharge permitting. Progress is being made to advance NHD nationwide, but issues with data quality and currency, maintenance effort and cost and other factors have been raised as barriers to NHD advancement.

## **Discussion**

The subcommittee conducted several interviews with US Government (USG) NHD Subject Matter Experts in the summer of 2012. As a component of this process, we reviewed the results of a recent pilot survey of NHD stewards involved in NHD maintenance in twelve states. Interviews and the limited survey revealed a range of challenges with achieving the goal of coordinated maintenance of NHD nationwide. An OMB approved survey is under development for nationwide release in the coming months. While we expect this survey will yield greater insight into the progress and challenges associated with NHD, the subcommittee captured the following observations from the information provided to date.

## **Summary of Major Barriers / Challenges**

- Varying level of State agency commitment, involvement
- Multiple agencies, leads and users within some states makes coordination of NHD maintenance difficult
- Different hydrologic realities in States cause data inconsistencies at the regional / national level
- USG sponsored NHD tools are imperfect. They are steady improving with each release but there is more room for improvement
- Moderate complexity of NHD alienates some of the lesser skilled stewards. Continued technology/tool enhancements should be able to address this issue. USG finds it difficult however to identify best approach for tool development, associated costs, and expected benefit.
- Some states are maintaining NHD locally, but are not contributing back to national data set
- Continued budget pressures have stymied USG investment for improvements. Stewards at state level note that limited budget is affecting their ability to participate.
- There are inconsistencies in data collection and quality between states. Little is known about the potential impact of inconsistency between States
- There is potential for LIDAR to be of value in automating / streamlining NHD maintenance, but past experience in processing this information in support of hydro has revealed a range of issues. Is LIDAR a viable approach from cost and effort point of view?

## **The 50 State Survey Instrument**

The Subcommittee was given access to the survey instrument being prepared in coordination with OMB for nationwide release. The Subcommittee recommended a number of changes to the survey to encourage: 1) improved feedback on the value of NHD to the user community, 2) better understanding

of the application of NHD to various problem sets, and 3) an improved understanding of obstacles to NHD creation / use / maintenance. Nearly all of the subcommittee's recommendations were incorporated into the survey now in coordination for nationwide release. The following outline of key subcommittee comments and recommendations was distributed to the USGS and EPA Subject Matter Experts / survey authors in July 2012.

### **General Comments**

- Original survey seemed well constructed, good layout
- The subcommittee understands that a structured interview survey approach is desired by Subject Matter Experts:
  - Was used for the initial limited survey
  - Will likely be more successful in capturing high quality information than a stand-alone web survey due to personal engagement with those taking the survey
  - Will require substantial US government staff resources
  - Essentially precludes the Subcommittee's initial consideration of a potential 3<sup>rd</sup> party (non-US government) survey option

### **Survey Purpose**

- Need to invest time now to determine expectations and uses for survey responses. What are the actionable results? A clearly stated articulation of the goal of the survey is needed. Some of the suggested goals expressed by subcommittee members included:
  - Assess and improve strategy on effectiveness of the Stewardship program
  - Identifying opportunities for improvement
  - Support decisions on priorities
  - Rebalancing of budget / resources
  - Future investments
  - Determine value of NHD to users

### **Specific Feedback on the Survey Instrument:**

- Need to expand the survey instrument to better capture the understanding of the value of NHD to the user
- Need a better description of the application of NHD focusing on the "why" and "how"
- In the NHD application "uses" section
  - Question needed to link uses to the three goals: currency, consistency and feature/attribute richness. Maybe this could be a table with four columns, or four tables – one for each of the pair of "application use and goal"
  - Rather than radio button, use a ranking approach (e.g. rank number system) to gain insight about value of application uses. There are ways to easily elicit this by asking the interviewee to consider "most important". Then "next most important" and so on...
  - At least three spaces for "others" are needed in addition to the stated uses, whereby the interviewer can insert a "label description" to replace the term "other"
  - List both agency names and points of contact
  - Include question on the top 10 most important NHD feature types

- How might responses to questions be used to cross-reference answers on “uses”, 10 most important feature types, with “needed currency, consistency and richness”?
- In the “obstacles” section
  - At least three spaces for "others" are needed in addition to the stated obstacles, whereby the interviewer can insert a "label description" to replace the term “other”
- About NHD updates / maintenance
  - Question needed to link the application uses with information about "update type" and "update frequency".
  - Question needed to identify level of effort to review and maintain NHD (versus updates)
  - Include a question or questions to solicit ideas on how recommended new data requirements to the NHD should be properly assessed / considered relative to value to the community and overall cost of collection and maintenance
    - Criteria / guidelines for new requirements
    - Process for vetting potential new requirements (utility/application, costs for capture and maintenance)

### **Key Challenge Areas for further Subcommittee Review**

The following key challenge areas were prioritized in discussion with US Government SMEs. The subcommittee believes these represent potential areas for subcommittee development of problem statements for the US Government to leverage in responding to the following challenges.

- **Technology** – Do we need more advanced tools? If so, how should we approach this? What costs are acceptable?
- **LIDAR** – Does LIDAR provide a more cost effective method over current processes? Do we need new hydro information to replace what we already have? Is what we have good enough?
- **Consistency** – From a practical standpoint, do we really have a problem with state-to-state NHD data inconsistency? Is there a need for a flexible but interoperable data model to address different state data capture and maintenance needs?

The NHD Subcommittee is also aware that GAO, as part of their review of federal geospatial themes, is reviewing the NHD. Results of this GAO review may drive other topics for subcommittee discussion.

I wish to thank the members of the NHD Subcommittee for their leadership and participation in this NHD review. On behalf of the subcommittee I wish to extend our deepest thanks to the US Government Subject Matter Experts for sharing their knowledge and experience and time; and to Tricia Gibbons and John Mahoney for their facilitation of the subcommittee process.

Respectfully submitted,  
 Mark Reichardt, Chair  
 NGAC National Hydrology Database Subcommittee