National Geospatial Advisory Committee (NGAC)

3D Elevation Program Subcommittee

Study Question 2 - 3DEP Data Acquisition Coordination

Draft, 25 August 2015

Background:

The FGDC provided guidance to the NGAC for 2015, which included the following study question:

> 3DEP Data Acquisition Coordination - A Broad Agency Announcement (BAA) was announced by the USGS in July, 2014 in FedBizOpps as a visible, publicly accessible partnering opportunity for 3DEP data acquisition. Along with the BAA process comes new rules related to Federal contracting about how the USGS can communicate and coordinate partnership opportunities. As a result, Liaison roles have changed. Given the new approach, what advice and/or recommendations does NGAC have for improving coordination and communication on 3DEP partnerships among community stakeholders?

This paper provides the NGAC's response to this study question.

Summary:

- **Coordination and Education of Partners and Associations**
  - Continue to promote and engage traditional geospatial practitioner community
  - Expand engagement and promotion of 3DEP to the non-technical state and local executive community
- **Support Local Cost-Shares and Data Acquisition Coordination**
  - Enable the USGS National Map Liaisons to be more active in the upfront coordination
  - Five models of successful large scale LiDAR efforts

Study Question 2 - 3DEP Data Acquisition Coordination:

The United States Government and the United States Geological Survey (USGS) have a long and successful history of developing and utilizing ground breaking mapping technologies. This began with their topographic map series that has been published since 1884, including the widely known 7.5-minute series maps, and continues today as the US Topo maps. In 1972, the USGS launched Landsat 1 and its 80 meters sensor that forever changed the way scientists study the earth. Then in 2001, the USDA's National Agriculture Imagery Program began to capture 1 meter leaf on imagery and has provided three and four band imagery for the continental U.S. Finally, in 2014 the USGS began its 3DEP program to systematically collect enhanced elevation data in the form of high-quality 0.7 meter or better light detection and ranging (LiDAR) data over the conterminous United States, Hawaii, and the U.S. territories, with data acquired over an 8-year period.

Coordination and Education of Partners and Associations: One of the challenges facing 3DEP's BAA is that it is still not very widely known or understood as a LiDAR partnership funding opportunity at the

local government level. Additionally, LiDAR is still a new technology and its day-to-day uses are still relatively unknown by most of the non-geospatial community. Even traditional geospatial practitioners are struggling to fully understand the utility of LiDAR to adequately justify the high cost of acquisition and processing to their administration.

Draft Recommendations:

- Continue to promote and engage stakeholders through expanded in-person outreach such as the 3D Elevation Program Stakeholder meeting, national webinars, and in-person workshops to the traditional geospatial practitioner community. These events have proven to be successful at sharing critical information about the program, objectives, and participation. The meeting also provided an opportunity for the local geospatial community to openly discuss future plans for LiDAR acquisitions in the region. Some suggested topics of interest for future webinars include: what to expect when managing a large LiDAR project associated with 3DEP; what hardware, software, training, staff resources, and IT infrastructure are needed to support LiDAR within an entity; and share best practices on how to hydrologically enforce 3DEP LiDAR-derived DEMs so that models of water flow across the landscape can correctly route water through culverts and bridges.
- Expand engagement and promotion of 3DEP to the non-technical state and local executive community including, but not limited to, the national associations of governors, counties, cities, regional councils, CIO's, engineers, assessors, planning, and utilities. Outreach should focus on justifying data quality requirements, standards, solutions, and benefits of participating in the program. To provide the most impact, outreach efforts should demonstrate uses and value of final products and tools that solve local problems. Target not-for-profit and private companies with nationwide interests as noted in the 2012 Dewberry National Enhanced Elevation Assessment Final Report Appendix D.
- Continue to promote the time savings for procurement of LiDAR using the USGS Geospatial Product and Service Contract (GPSC) and similar cooperative agreements.
- Continue to refine the BAA process schedule to align with the LiDAR spring flight season and continue to improve the application process structure, formatting, and pricing detail to streamline the submission process. One suggested improvement would be to provide evaluation reports with feedback to applicants of proposals that were not selected.

Support Local Cost-Shares and Data Acquisition Coordination: Currently, about $50 million is invested annually in LiDAR and interferometric synthetic aperture radar (IfSAR) data by all public agencies, and the U.S. Interagency Elevation Inventory shows that only 6% of the lower 49 States and territories have LiDAR data that meets quality level two (0.7m) that is required by the USGS. An additional $96 million is needed annually to implement 3DEP. To be able to realize this level of investment will involve substantial outreach, collaboration, and coordination efforts between not only Federal, State, and Local government partners but also with non-traditional elevation users from academia, natural resources based organizations, utilities, and the private industry.

Draft Recommendations:

- Enable the USGS National Map Liaisons to be more active in the upfront coordination effort while still adhering to the BAA protocols. This includes more in-person visits to network, cultivate, and maintain long-term relationships with participation in state level geospatial advisory councils, state GIO, or regional government meetings and activities. These groups in turn could provide information on how best to localize the 3DEP message and focus outreach efforts.
- Further refine the 3DEP Public Areas of Interest Project Collector Tool mapping tool with improved project detail to include funding priority and fiscal year targets.

Models of Successful Large Scale LiDAR Efforts:

- Tennessee statewide LiDAR program

  Department of Finance and Administration, Office for Information Resources, GIS Services (OIR) began an effort to update their elevation dataset in 2011 when they received funding assistance from the FGDC Fifty States Initiative, Cooperative Agreements Program (CAP) to develop a business plan for enhanced elevation. Following a successful 3-county pilot in 2013 that demonstrated the utility of LIDAR based elevation data, OIR was able to expand the project into a 2.7 million 27-county regional flight with funding from the Tennessee Department of Transportation, Tennessee Department of Environment and Conservation, OIR, Hamilton County, and USGS 3DEP. Future flights are planned with additional funding from the Tennessee Valley Authority, Department of Energy, Department of Agriculture, and local governments with the goal to fly a quarter of the State in alignment with the existing orthophotography program managed currently by Tennessee Department of Transportation.

- Indiana statewide LiDAR program

  In 2013, the Indiana Office of Information Technology completed a three-year program to acquire orthophotography and either 1.0 or 1.5 meter LiDAR using funding from state agencies, local governments, and grants. The multi-year project involved the acquisition of new LiDAR along with county and academia LiDAR contribution and compilation of hydro-enforced breaklines to support inclusion of the dataset in the national elevation dataset.

- Iowa statewide LiDAR program

  In 2008, the Iowa LiDAR Consortium (the Iowa Department of Agriculture and Land Stewardship, Iowa Department of Natural Resources, Iowa Department of Transportation, the USDA NRCS, and the USGS) led by the Iowa Department of Natural Resources completed a $4 million statewide 1.4 meter LiDAR project. Funding for the

project came together quickly to be able to utilize a USGS Geospatial Product and Service Contract. To make this happen, Iowa DNR worked closely with key state agencies to evaluate the value of the proposed LiDAR data based on their current uses of elevation data and gave prospective partners estimates on their rate of return and made them think of additional uses. The acquisition was spread over three years and involved FEMA compliant product for 19 counties and a standard project for 80 counties.

- Minnesota statewide LiDAR program

  Minnesota began their efforts for a statewide LiDAR in 2002 with the release of a whitepaper by the MnDNR and 24 partners on the development of high-resolution DEM and floodplain mapping program. Entities moved forward independently with their own LiDAR acquisition projects with scattered geographic coverage, inconsistent specifications, higher production costs and data access restrictions. Then in July 2009, the Minnesota Legislature appropriated $8.3 million from the Minnesota Legacy Amendment - Clean Water Fund, along with additional investment by several federal agencies, counties and cities, helped the MnDNR realize the goal of creating a seamless elevation model by filling in the areas where data either did not exist or was deemed old enough to be replaced.

- North Carolina statewide LiDAR program

  North Carolina originally flew a 3.0 meter LiDAR from 2000-2005. In 2014 the Geospatial & Technology Management Office, in coordination with the Department of Transportation, USGA, & NRCS, began a new five-year collection of Q2 0.7 meter or better LiDAR. In 2016, with support from state and private agricultural, energy, and lumber industry entities, an eight county pilot area collection is planned for high density 20+ points per meter LiDAR.