Subcommittee on Spatial Water Data

Meeting Details:

Date/Time: March 24, 2017, 1:00 - 3:00 PM Eastern Time
Location: Teleconference only (administered from USGS Headquarters, 12201 Sunrise Valley Drive, Reston, VA 20192)
Conference Line: 703-648-4848
From non-DOI locations, dial toll free 855-547-8255
Conference code 1712-0464#

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Meeting number: 716 325 658

Shared document space:
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Agenda

All Times Eastern Time Zone

1:00 - 1:10 Introductions for new attendees

1:10 - 1:30 Work Group Reports

1:30 - 1:55 New Issues

1:55 - 2:00 Adjourn

Attendees:

New (did not attend 8/28/14 or later meeting)

Christopher Round, Booz Allen Hamilton, round_christopher@bah.com
Sarah Brennan, Booz Allen Hamilton, brennan_sarah@bah.com

Returning (attended 8/28/14 or later meeting)

Al Rea, USGS, ahrea@usgs.gov
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Graeme Aggett
Nathan Swain, NOAA, nathan.swain@noaa.gov
Ed Carter, St. Johns Water Management District
Fernando Salas, NOAA, fernando.salas@noaa.gov

Items of interest:

New Hydrography Cached Map Service

Contact: Rob Dollison (rdollison@usgs.gov)

The USGS is proud to announce the availability of a new cached map service for hydrography, the "USGSHydroCached" service. The new service is designed to act as an "overlay", displaying hydrography in the familiar USGS topo map symbology, and can be displayed on top of base maps, satellite imagery, or other map services. Because it is cached, the service should perform well at many different scales. The service can be loaded into ArcGIS desktop, ArcGIS Online, or many other interactive mapping applications. The service is available at:

https://basemap.nationalmap.gov/arcgis/rest/services/USGSHydroCached/MapServer

The previous Hydro Basemap ("USGSHydroNHD") incorporated a shaded relief basemap, and could not be used as a map overlay

(https://basemap.nationalmap.gov/arcgis/rest/services/USGSHydroNHD/MapServer). This old service is outdated and will be removed in the near future after a new, updated hill shade base map is also published. Please also note that the new cached map does not include the Watershed Boundaries Dataset (WBD). The WBD continues to be available in the dynamic National Hydrography Dataset (NHD) web service, and can be added as separate layers if desired:

https://services.nationalmap.gov/arcgis/rest/services/nhd/MapServer.

Work Group Reports

No work group reports today because many members and workgroup chairs are absent.

New issues

Sensor networks - Dwane Young

- Interoperable Watersheds Network (IWN) -- presentation slides available here.
- URL for Demonstration app: http://54.210.62.171/
- Data standards -- the world is built on them -- both data standards and communications standards
- Standardized sensor data would enable better modeling, development of third-party applications, quicker and better decisions (saved time = saved money)
- NFIE is a great example of the value of standards
- IWN is one step toward solving the problem of standards -- must be a distributed approach to providing access
- Open Geospatial Consortium -- there is a gap in metadata standards, so we had to come up with our own for the IWN
- Architecture: a distributed system needs a central catalog/index that references every data owner's assets and corresponding metadata (partner data are indexed each night, similar to the way Google works)
- How are sensor data different from (for example) water quality portal data?
- Each endpoint supports sensor observation service in XML format (WaterML2)
- Open architecture allows other possibilities like development of mobile apps, and interaction with third-party tools
- IWN provides sensors data in standard format -- it's the same every time, no matter who collected/provided the data
- Request URL is included in results, allowing users to run repeat requests at time intervals
- Q: We could go to FGDC and recommend that they adopt OGC standards for sensor data. Would that be beneficial? A: Yes, with the right timing; may be best to wait a few months until the current work phase is complete.
- Link to Lessons Learned document (which includes documentation for how to interact with the services): https://www.epa.gov/sites/production/files/2017-01/documents/iwn_lessonslearned_final_201612.pdf

Inland bathymetry and Channel Morphology - Al Rea

Organizations that collect inland bathymetry:

- USGS
  - Surveyed cross sections at gages
  - Acoustic bathy surveys of reservoirs, rivers, etc.
  - Bathymetric lidar (new and evolving)
- USACE
- NOAA
- USBR
- FEMA
- Terrain data in low-water years, e.g. California during recent drought? When the reservoirs and streams are dry, terrestrial lidar is measuring a lot of what would be bathymetry in wetter times.
- NRCS - single-photon lidar - mapping land-water interface as related to wetlands; sensors with camera and elevation
- USDA/USFS River Bathymetry Toolkit https://www.fs.fed.us/rm/boise/AWAE/projects/RBT/RBT_lidar_hydro_downloads.shtml#download - in need of update, toolkit to take use flow terrestial lidar data to characterize in-stream and floodplain geomorphology to support aquatic habitat analyses and numerical models of flow and sediment transport
- Some state GIS clearinghouses host State-collected bathy data. One example: http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/dfwbathy.html

How does a user find the data and deal with different formats?

What are relevant questions about inland bathymetry that we need answered to scope and design a way to make bathymetry data available and interoperable? Refresh to the NEEA study planned, need info on what the best questions would.

- Frequency of acquisition/update?
- Spatial resolution
- Use cases
- Old coastline data, coastal change?
- Soil science community wants to map the bottom of the water bodies, i.e. soils under the water. What are the mapping standards? Required accuracy?
- Water turbidity is an issue. Not just in that it interferes with bathymetric measurements, but also the actual sediment content of the water column might be of interest. (Not sure about this, but it seems like it might be important.)
- NRCS sedimentation and irrigation basins. How much material is in those basins, and in suspension in the water? There is an NRCS group that is looking into this. Collin McCormick has points of contact and will send them on.
- Data formats: raster, vector, TIN, temporal
- Bathymetry and water surface elevation relationships, (sloped surface on rivers)
- Data accessibility is very important
- Flood forecasting and emergency management
- Identifying where and when flooding is occurring. What constitutes an emergency situation? How to identify this now that the National Water Model estimates flows in 2.7 million reaches, not just a few thousand forecast points. Channel characteristics such as depth and wetted perimeter are needed to estimate rating curves and to translate from flow to stage (water level)

- Rating curves - extracting from nationally available data, statistical models
- Seamless terrain surface would be very useful as a starting point for modeling.
- Prior to National Water Model - coastal not modeled. Bathy is extremely important in this zone, where large populations live.

Notes from Ed Carter after the call:

Weedy Bottoms:
One bathymetry issue I have faced is heavily vegetated bottoms with vegetation (SAV) growing around a meter and a half over 80% of the bottom.(Silver River, Florida)
Not only does it block acoustic bottom surveys, but it's ability to reconfigure at different flow rates, alters the stage discharge relationship in the river. Noting the presence of tall SAV could be important.
SAV beds waving in a current can also throw off bottom tracking (spatial positioning) in an acoustic survey where GPS signals are blocked or weak.
Our lagoons, (Indian River Lagoon System) has shorter SAV to interfere with bathy surveys, but it's presence is vitally important to the fishing industry. If the acoustic bathy surveys are repeated over time and indicate changes in SAV coverage and height, that can be a nice side benefit for not penetrating the SAV canopy.

Fluffy Bottoms:
If the lake or slow river bottoms are very flocculent, the acoustic surveys can return very different (shallower) values from bottom surveys measured with a pole and a bottom foot disc of a standard diameter. Since the poll penetrates the highly aqueous sediment until it provides enough resistance, some acoustic surveys bouncing off a semi-fluid bottom can be valid yet very different from "survey" depths. That is to say, sometimes what is "bottom" is subjective. I don't know if there is a question to get at that .

Is the area modeled?
There are some reaches of the St. Johns River with no detailed/recent bathymetry that might be modeled or modeled more accurately with bathymetry or better bathymetry. Collecting bathymetry in areas not well modeled could be a priority and improve flood mapping.

Integrated Topo/bathy.
Definitely vital from my perspective to have bathymetry as elevations (with a vertical datum…preferably non-tidal) rather than depths, since depths change with water levels and elevations should only change with erosion/deposition. I am aware that some biologists only care about depth, so the water surface elevation(s) along with the bathy elevations makes conversion back to depth easy.

Water surface slope as an indicator of bottom roughness:
(this may be preaching to the choir)
The flip side of depth is the water surface elevation data. Detailed water surface elevation data between stations (water surface slope) is a useful indication of bottom roughness in flowing rivers and streams, particularly as it changes over time.

If there is SAV and the bottom is sandy or hard, dual frequency can define the top of canopy and sediment surface. However, where the vegetation canopy captures organic sediment or creates thick layers of organic sediment of similar composition to the dead

SAV leaves and roots, defining the sediment surface even with dual frequency sensors I have seen, is too subjective to be reliable. For this reason, noting bottom type along with SAV presence can help evaluate bottom elevation accuracy.

Next Meeting:

Cancel April meeting -- Yes, we are cancelling the April meeting
May 26th next meeting, 1:00-3:00 PM Eastern