Minutes: 3D Geomatics Committee Hydrogeomorphology Workgroup

Date: **10/8/2019**
Time: 10:00 a.m. – 11:00 a.m.
Location: Skype online meeting

## I. Attendance | Hydrogeomorphology Workgroup

Accountable: **Ann Banitt** (ACOE); **Andrea Bergman** (MNIT@DNR); **Jen Crea** (MNIT@MPCA); **Matt Drewitz** (MNIT@BWSR); ~~Tyler Grupa~~ (MNSU WRC); ~~Tom Hollenhorst~~ (EPA); ~~Brandon Krumwiede~~ (NOAA Affiliate); **Rick Moore** (MNIT@DNR); ~~Sarah Porter~~ (EWG); ~~Christiane Roy~~ (USDA NRCS); **Kiah Sagami** (HEI); **Jamie Schulz** (MNIT@DNR); **Sean Vaughn** (MNIT@DNR)

Informed: ~~Lyn Bergquist~~ (MNIT@DNR); ~~Joe Brennan~~ (USDA NRCS); ~~Whitney DeLong~~ (UMN); ~~Chuck Fritz~~ (IWI); ~~Ben Gosack~~ (DNR EWR); ~~Kevin Hanson~~ (ACOE); ~~Keri Hedin~~ (Fond du Lac); ~~Jacqueline Kovarik~~ (ACOE); **Alan Laumeyer** (Goodhue Co); ~~Rick Lorenzen~~ (MNIT@DNR); ~~Grit May~~ (IWI); ~~Joel Nelson~~ (UMN); ~~Doug Norris~~ (DNR EWR); ~~Jill Pohjonen~~ (DNR EWR); **Emily Resseger** (Met Council); ~~Ben Richason~~ (SCSU); ~~Casey Scott~~ (MPCA); ~~Aaron Spence~~ (BWSR); ~~Angus Vaughan~~ (MPCA); ~~Barbara Weisman~~ (DNR EWR); ~~Jeff Weiss~~ (DNR EWR); **Andy Williquett** (MNIT@DNR)

Guests: **Clint Little** (DNR)

II. Steering Team and Subgroup Reports (15 min)

- Breachline Subgroup updates – Rick
  - Datasets continue to come in to authoritative map
  - Last few meetings and upcoming meeting, the group has been redefining "completeness" and may even choose to use a different word
  - Trying to determine "completeness" based on breachlines that are submitted, that are used in the DEM, and eventually the flow pathways that are created. Can we determine completeness through those flow pathways?
  - Look at example: Flow paths from breachlines do not fall within the channel. Use HPI as reference sign for comparison? Road crossing in SE corner was not breached, so we are getting a lot of fill to the northwest, so the breachline flow paths are not in the channel.
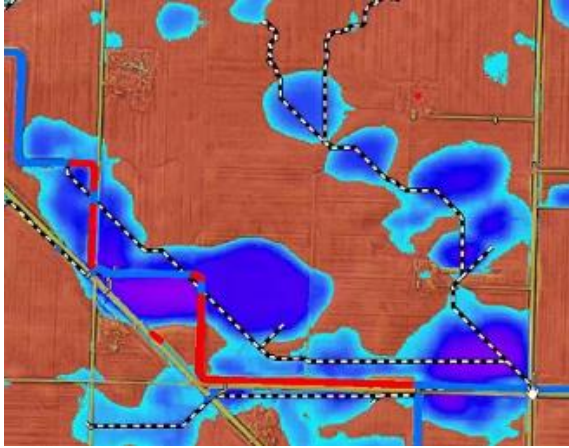
- SharePoint Permissions and Calendar – Rick and Jamie
  - Rick submitted names to Alison Slaats, she sent out invitation email for access ('Edit' for Accountable members or 'Read' for Informed members). Let us know if you have any trouble with access.
  - Jamie added a calendar to the 3D Geomatics Committee SharePoint page – view it by selecting the Hydro Home page, shows up in left sidebar navigation link under 'Recent'
    - Easy to add items, include a link to information in the description; include your name if people should reach out to you for more information.
    - All those with 'Edit' rights should be able to add events others may be interested in. Send info to a co-chair if you have only 'Read' rights.
    - This 'Recent' link is present when viewing other workgroup home pages
    - Not sure how long things live under 'Recent' – will it ever go away?
- LiDAR Acquisition Update – Sean
  - Acquisition plan is far enough along in draft form to feel comfortable enough to announce we have a draft plan in place (working document on SharePoint > Acquisition Documents > lidar plan MN Development)
  - [Draft Story Map about the draft plan](#)
  - Plan passed on to Sandi Stroud, Dan Ross, and Tim Loesch. It will go through internal review and upper level managerial review process before it goes out live.
  - Plan gives assurance and confidence to stakeholders that this is the real deal, launching a committee-guided LiDAR acquisition plan, built on input from LiDAR and GIS community.
  - We have the best interest of all business needs that we are aware of today and that will be introduced in the future.
  - LiDAR for Minnesota should have shelf life, live on for 10 years. LiDAR every 3 years is unlikely.
  - Divided state up into regions of acquisition. Worked with team to not only divide state up, but also to sync up as best possible with HUC4 watersheds. Goal is to have regions of collection to encompass the most HUC8 watersheds as possible.
  - Divided cost up by each of the regions, statewide would be:
    - $30M to acquire QL1 data
    - $16M to acquire QL2 data
    - Pushing for QL1, minimum criteria for MNDOT, most robust and detailed point cloud to serve the most business needs

III. Current Projects of Interest: GIS/LIS Conference – All (30 min)

- Session highlights
  - LiDAR Panel session
    - Announced plan, 90-minute panel session
    - Sean, Jennifer Corcoran, Colin Lee, and Alison Slaats each gave presentations
    - All LiDAR vendors who were at the conference were in attendance
    - Sean talked about the historic to current perspective – all hydrology related
      - Set out to bring LiDAR to MN in 2002, collected in 2008-2009, delivery in 2012
      - Driver of LiDAR has been contours to understand water movement and shaping landscape
      - Marketed former LiDAR acquisition on a DEM, selling point was that we would create seamless statewide 2-ft contours
      - Now convinced that the push for LiDAR acquisition needs to be geared toward the point cloud
      - ==Need to advocate that hydrology and hydrography can and should be principal driver for why we need new LiDAR==
      - 2002 acquisition cost was $80M; $40M was for the DEM
      - 1993 and 1997 floods caused $1.7B and $1.5B in damages, respectively. How much would a flood like that cost in 2020?
        - Clint Little: Duluth Flood reports
          - [Duluth Flood Recovery](#) over $47M in 2012
          - [Lakewalk restoration comes with $9 million price tag](#)
          - [Duluth streams geomorphic assessment and stream response to the 2012 flood](#)
      - Highly accurate point cloud maps everything – signs, stop lights, trees, inundation area – to serve business entities, prevention and recovery efforts
      - High definition LiDAR is a pulse/point density greater than what you currently have, capable of meeting geoanalytical needs in to the future
      - SharePoint site Acquisition documents > LiDAR plan specifications, see spreadsheet on costs and quality levels
        - Aligned cost with vendors and acquisition criteria
        - Definitions included to understand technical terms
        - Costs have come down for the same quality level, but we want a higher density product so cost will go up – more flight time, voluminous data handling and management
      - Do not have enough money to collect full state, or even a small footprint. Needs momentum. If we do not have support, what about doing something small and very complete? Show what it can do based on its accuracy and density; use it to derive hydrography data. Get our hydrography data in sync because it comes from the same source.
  - Keynote Speakers
    - Educators – any GIS volunteers in the group? No

- ▪ Kiah provided link to AAG GeoMentors program
- ▪ GAC always has an Education representative, help bring GIS in to the schools
- Favorite presentations
  - o Work with conference organizers to see if presentations can be made available on GIS/LIS website?
  - o Sean Vaughn presented on DNR Culvert App
  - o Kiah Sagami presented on ACPF and PTMApp
    - ▪ Importance of how hydroconditioning affects any surface models we use
    - ▪ Basics of how ACPF and PTMApp work and how they work together – strengths and weaknesses – how putting them together can give you a lot of information that people need to get grants or to report back to the state on how dollars are being spent, benefits, are goals attainable.
    - ▪ Money doesn't solve everything, still need to look at what's going on the ground, be effective in reducing pollutants
    - ▪ Chris Sanocki presented right after and talked about holding back pollutants from tributaries going in to the Great Lakes
      - • Great Lakes Coastal Wetland Restoration Assessment
      - • Raster models to find and target certain areas
    - ▪ Minnesota has decent data and people realize the importance of hydroconditioning that can lead to better data and results
    - ▪ Sean: Talk about the time and cost required to do the work on the DEM to get it right for proper flow and connectivity?
    - ▪ Kiah: Stress what you put in to the model is what you get out. If you share results with a landowner, it has to be correct to be taken seriously.
    - ▪ Sean: Our citizens expect more from our data than ever, what is perception of landowner when they use our products? Our vector data reflects what was on the landscape in the 1960s, decision makers need to hear what it costs and what it takes to get the LiDAR derived DEM to work for those surface models.
    - ▪ Kiah: PTMApp has BWSR required training, hoping to make YouTube videos, how to hydrocondition the DEM.
      - • Sean: Don't want upper level managers to think that if we get new LiDAR we won't need to condition the surfaces, but new LiDAR will help expedite the work needed to modify the DEMs
      - • Clint: If funding helps, Carlton, St. Louis, Lake and Cook SWCDs are eligible for conference support funding from coastal program grants.
      - • Matt Drewitz: We have not done PTMApp training at BWSR academy because the workshop sessions are too short to cover the material in enough detail.
- Did you attend any sessions that demonstrated work that could benefit from updated LiDAR or LiDAR-derived hydrography?
  - o Alan Laumeyer: Attended the undergraduate and graduate competition sessions.
    - ▪ UMD – Soil erosion model project on Mission Creek in Duluth

- If new LiDAR data can get in the hands of college students, who knows where they will take it. Hidden benefit to the education group – students coming up with projects most of us would never think of.
- Most students did not use current LiDAR in their projects
  - Sean: LiDAR means different things to different people, to most it means the DEM, but it really is the point cloud
    - Future for LiDAR and modeling is in that point cloud, direction things are going
    - Building infrastructure management is working heavily in 3D point cloud
    - 3D point cloud is embedded in the lexicon of many different industries
    - The technicians ability to work with the point cloud isn't keeping pace
    - Cost of additional tools to work with the point cloud (LP360) is a hindrance. ESRI is opening the door to work with that point cloud, we all need to get familiar with and get a better understanding of them
      - Clint: LAS tools for QGIS, Cloud Compare
      - Rick: ArcGIS Pro does a great job of viewing the Point Cloud in their 3D Scene
    - Students have access to the point cloud, but that isn't part of their curriculum, the focus is on the derived products
    - Jamie: Need to clean up old legacy data that people don't realize is old, people don't realize they are not using the most current and up to date information. Think about how to serve data in ways that makes things apparent to those who aren't as familiar with it.
      - Sean: Story Maps training, instructor said there are 1 million story maps out there already. People consume data, put it in a StoryMap, many people assume that any data in a map is current, true, and has been peer reviewed. It keeps living a life.

Next meeting: Alan Laumeyer – How local government uses LiDAR products to assist in the development of answers to citizens questions

IV. Work Plan – tabled for November

2019 Review

2020 Suggestions

Future Meetings

Date: 11/12/2019

Time: 10:00 a.m. – 11:00 a.m.

Location: Skype online meeting

Agenda items: (submit proposed agenda items to Jamie Schulz)