Agenda: 3D Geomatics Committee Hydrogeomorphology Workgroup

Date:	**4/9/2019**
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); ~~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)~~; ~~Brian Huberty~~ ~~(USFWS)~~; ~~Alan Laumeyer~~ ~~(Goodhue Co)~~; **Clint Little** (DNR-EWR); ~~Rick Lorenzen~~ ~~(MNIT@DNR)~~; **Grit May** (IWI); ~~Joel Nelson~~ ~~(UMN)~~; ~~Doug Norris~~ ~~(DNR EWR)~~; ~~Jill Pohjonen~~ ~~(DNR EWR)~~; ~~Ben Richason~~ ~~(SCSU)~~; ~~Casey Scott~~ ~~(MPCA)~~; **Gerry Sjerven** (MN Power); ~~Aaron Spence~~ ~~(BWSR)~~; ~~Angus Vaughan~~ ~~(MPCA)~~; ~~Barbara Weisman~~ ~~(DNR-EWR)~~; **Andy Williquett** (MNIT@DNR)

II. Welcome and Agenda Review - Jamie

- Any agenda additions? None

III. Homework Reminders (10 min) - Jamie

- Soliciting testimonials for new LiDAR derived hydrography (received 1 so far!)
    - Jamie: Looking for examples where you could have used better data, what you could have done with better data, where you had to create data for your own needs, just a couple of sentences. We are keeping track in a document so we have something to share.
- Membership: Academic research contacts, additional soil specialists in our group? *(Also people for education and acquisition, helping out the other groups)*
    - Jamie: Assessing membership, seeing where we are missing representation – academic research or soil specialists. Also looking to help the Education or Acquisition work groups.
    - Andrea: Missing from our group was someone from MetCouncil. Pleased to announce Emily Resseger will join as a Consulted/Informed member. Later this summer she may do a

presentation on a localized flooding study. Met Council have their own data – what are their sources, how are they updated, etc.

- o Jamie: Moved steering team and workgroup updates up in the agenda to ensure we have time.

IV. Steering Team and Subgroup Reports (15 min)

- 3D Geomatics Steering Team – Sean
  - o Name update
    - Sean: We have undergone a name change, gave us an opportunity to revisit how we structured the names. The committee diagram tends to remain as #1 go-to for providing the structure of committee. Took out reference to "3D Geo" and "3D Derived" descriptors prefaced names around wheel.
    - Hydrogeomorphology group at top because when Sean and Dan Ross established committee, it was all going to be about hydrography. Was able to make the case that LiDAR and 3d data group needs to be diversified. Hydro was too narrow in scope of what LiDAR serves.
    - "Software" changed to "Data Governance" – more encompassing to hardware, software, systems, metadata.
    - Proposal to take out "sensing" or "remote sensing," but wanted to remind folks, never want to lose sight of remote sensing as a technology, a description of how we collect imagery, LiDAR, stereo paired imagery – all are remote-sensing techniques. From that, we collect data. Data acquisition is all encompassing as well. Remote sensing is the technique or the technology that brings data in. Data acquisition is the bigger picture, bringing it in, assembling, managing, disseminating it.
  - o Updates made to Hydrogeomorphology web page (name change, work plan, etc.)
    - Sean: 3D was dropped from name, committee wide decision
    - "3D Derived" was a data reference, "3D Geo" as precursor is short form for 3D Geomatics
  - o 3DGeomatics Committee Organizational Chart and Supporting Context
    - Sean: New organizational chart, will be used to share with Supervisors and others to show where we fit in to hierarchy
    - Chart will exist out on web page and SharePoint site
    - Hydrogeomorphology definition will be refined
  - o Northeast LiDAR acquisition and what it means for this group
    - Sean: Some confusion over that, how does it relate to a statewide effort?
    - One-page document will be available summarizing effort
    - Dan Ross learned USGS has $7m leftover funds if LiDAR area of interest/footprint can be established
    - Extended 4/15 deadline, can we get those funds for NE acquisition? Interest in northeast is to piggy back on DNR Forest Resource Assessment Office acquisition area –

already have two footprints of quality level 1 or level 0 which is as good as you can get. Interest is to map trees and tree canopies.
- Reached out to stakeholders in arrowhead region to inform that the Geomatics Committee working with MnGeo guiding a statewide collect that will begin in NE MN. Idea is this 1-pager could be used anywhere in state – descriptive context on left would remain. Right hand side would change for region or geographic footprint for LiDAR acquisition.
- Still up in the air if we can make this happen. The emergency response we made, forced us as a state, as a committee, to get acquisition group established. It taught us how to work with different funding sources, identified why there is confusion and what we need to do over the summer in educating stakeholders on what acquisition means.
- Acquisition is the LiDAR but also the delivery of usable products. Acquiring is one thing, making derived products published and usable is another. It all needs to be part of the package.
- Lyn: Meeting 4/9 to discuss LiDAR acquisition further. Wanted to use MNIT Odyssey fund stash for future projects, might still be alive for this year.

- Relational diagram of LiDAR derived products
  - Sean: Draft of diagram showing derived products, for conversation purposes
  - Attention to 3D point cloud – mobilization of air craft and people watching weather, snowmelt, greening, leaf on/off etc. to ensure vendors collect LiDAR in a manner that will meet the needs of what we expect LiDAR to do for us
  - Vendor does processing and classification – point cloud points with XYZ needs classification veg, building, bare earth. Vast majority of users are using derived products, do not know much about point cloud.
  - Generational products – each step away from the point cloud has a mathematical iteration on the product that changes the product, mathematical computations that have been done on the data, can't really cite metadata from original point cloud.

- Data Catalog update – Jamie
  - Populated spreadsheet we prepared for DNR Geospatial Water Resource Team – 52 layers! Sending out to Data Catalog subgroup for review – document what's out there, how are they available, geographic coverage, comment just so we have an idea of what information what people are using.
  - Should be able to share something at next meeting in May
- Breachline Subgroup updates – Rick
  - Breachline database subgroup working on map of where work has been completed for different types of hydromodification. Not complete yet, working with group members.
  - A lot of SW area has been acquired, working with Grit May to get Red River area.
  - Using PLS Section as container – high/med/low status. High means section has breachlines to satisfy level 3 hydromodification.
  - Not ready yet for breachline database QAQC, hopefully within a month will have map of areas where we have work done, get info on where ACPF work has been done.

V. Current Projects of Interest (30 min) – ACPF and PTMApp Discussion - Implications of Neglecting Due Diligence in DEMs used in Tools - Rick

- Continue March discussion on ACPF and PTMApp *(See November and December meeting notes)*
    - Rick: Back to discussion on ACPF and PTMApp. Look at two tools and implications of hydromodification on those tools. Any questions on the tools themselves?
    - Question to Kiah and Matt about training:
        - Matt: Working to identify groups to train better. Higher end groups running toolbar, another group just using products from app, others using web app, other group that are decision makers but aren't running the toolbar/web app/don't use GIS at all. Break it down into those groups to target those audiences. Get the right mix of people in the room. Be more mindful – diverse audience is good, but want to tailor for use so people aren't bored or lost.
        - Kiah: Looking at doing in person trainings, web videos. Really piecing it down to specific parts so people can go to one little piece, products, etc. Trying to target what is most necessary for what people need right away versus what they need later. People have options if they do not have training or are temporally removed from training – if you go to training now but don't use part of it for 6 months you can forget what you did.
- Chuck Fritz (IWI): Those of us with knowledge of LIDAR - hDEM creation understand the subtle fine – scale editing issued just discussed. What we don't yet have is the "so what" descriptor. What are the resulting implications (e.g. PTMApp data output) for neglecting due diligence?
    - Rick: A lot of data go in to this, inputs or base data. Implications of data not getting data hydromodified correctly. Example – travel time tool. If hydromodification is not in channel, may have issues with erroneous travel time distances or speeds if we don't modify to a level 3. Anyone see issues – DEMs being affected where work has not been done but influences outputs?
    - Kiah: Travel time big factor. Tools can change, need to be mindful of product, and Arc version. Drawing in a long burn line versus just crossing the culvert can affect travel time, slope perspective.
    - At the SWCD level, looking specific BMPs, go out to ground truth, if hydro conditioning was not done well, can find placing things in wetlands or way off. Comes down to inputs – for land use which is a 30x30m grid. Different parts have different implications. Hydro modified DEM is most significant input since it drastically changes flow lines. Tools use flow lines to determine slope for BMPs?
    - Rick: So back to OUR group, new generation of hydrography to actually get it in the channel, the way we hydromodify DEMs will have an influence on the outputs of those pathways. Next generation will get things to flow correctly and get tools to run. Look at end product – doing hydromodification to satisfy all needs or just our business need? As a group, our discussion should focus on that hydrology and pathways. Want to use what has been done out there by groups to create LiDAR derived hydrography.
    - Clint: When you mention land use data, are we talking about actual land use data or land cover? If it is land use data, can you point me to source data? True land use data are hard to find

- - - Kiah: In PTMApp - the NLCD is used in a lot of the products, but also use CDL (crop data coverage) for other things (ACPF uses that) but it is still a 30x30m grid
      - Matt: Land cover issue, talked to Dave Mullah for an LCCMR project, looking at cropland data layer could be looked at differently, improve upon that layer down the road, will see where that goes
      - Clint: Check into NOAA C-CAP data for the NE part of the state https://coast.noaa.gov/ccapftp/#/).
      - Kiah: New release in April, supposed to be data from 2016? But still a 30m resolution
      - Clint: NOAA is working on a high-resolution c-cap. Covers the Nemadji watershed. Check with Brandon Krumwiede from NOAA
      - Clint: Check out local parcel data for land use classes. i.e. St. Louis County parcel data has some decent classification of commercial forest, ag and more
  - Rick: Sarah Porter has moved on, David James is retiring. Mark Tomer also retiring.
  - Matt: Lost quite a few folks who worked on that model, looking at staff at Iowa State to support that going forward
  - Jamie: As derived product user, discussion going on over last few months, think about where data has come from, how created, what was done to the underlying data to create derived product I'm using. So talk of the data, was it a 30m turned into a 5m vs an actual 5m dem? It has opened my eyes to 'errors,' or rather inconsistencies or inaccuracies that can be introduced down the line in the derived products. How can we document that and avoid that in the future. Helped educate me what to be concerned with when we are talking derived products.
  - Sean: That has been a concern since we started bringing LiDAR to MN since 2002. With ESRI tools, it can be quite easy to create a product. Sometimes products are just not all that good. Product discussion at all levels – derived products, point cloud. Need to recognize, develop and serve authoritative data products. North Dakota, they are expecting folks to create their own contours and that's not the path we want to go down. People can download data and they assume it has to be good, it is authoritative.
- Next meeting: May – **Volunteer? (*SharePoint site?*)**

VI. Future Topic Items (5 min)

- Topics to address/presentations for future meetings *(see work plan survey?)*
- Start a list – on the SharePoint site!
- Field season approaching

Future Meetings

Date: 5/14/2019

Time: 10:00 a.m. – 11:00 a.m.

Location: Skype online meeting

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