

Minutes: 3D Geomatics Committee Hydrography Workgroup

Date: 12/11/2018
Time: 10:00 a.m. – 11:00 a.m.
Location: Skype online meeting



I. Attendance | Hydrography Workgroup

Accountable: ~~Ann Banitt~~ (ACOE); **Andrea Bergman** (MNIT@DNR); **Jen Crea** (MNIT@MPCA); **Tom Hollenhorst** (EPA); ~~Brandon Krumwiede~~ (NOAA Affiliate); **Rick Moore** (MNIT@DNR); **Jessica Nelson** (MNSU-WRC); **Christiane Roy** (USDA-NRCS); **Kiah Sagami** (HEI); **Jamie Schulz** (MNIT@DNR); ~~Aaron Spence~~ (MNIT@BWSR); **Sean Vaughn** (MNIT@DNR)

Informed: ~~Lyn Bergequist~~ (MNIT@DNR); ~~Joe Brennan~~ (USDA-NRCS); **Whitney DeLong** (UMN); **Matt Drewitz** (BWSR); ~~Chuck Fritz~~ (IWI); ~~Ben Gosack~~ (DNR-EWR); ~~Kevin Hanson~~ (ACOE); ~~Keri Hedin~~ (Fond du Lac); ~~Brian Huberty~~ (USFWS); ~~Alan Laumeyer~~ (Goodhue Co); **Rick Lorenzen** (MNIT@DNR); **Grit May** (IWI); ~~Joel Nelson~~ (UMN); ~~Doug Norris~~ (DNR-EWR); ~~Jill Pohjonen~~ (DNR-EWR); ~~Ben Richason~~ (SCSU); ~~Casey Scott~~ (MPCA); ~~Angus Vaughan~~ (MPCA); ~~Barbara Weisman~~ (DNR-EWR); **Andy Williquett** (MNIT@DNR)

II. Welcome and Review (5 min) – Rick

- Any agenda additions?
 - Sean - add update from the Gov IT nomination
- Last meeting was presentation on ACPF by David James (USDA)
 - Any comments or questions?
 - Points for extended discussion to be noted for January meeting
 - Rick – Any questions or further discussion from the meeting? Email it is for the Jan meeting agenda, we can discuss ACPF and PTMApp then.
 - Andrea – recording available if you had to leave
 - Rick – working on a way to post these for members, currently can use the FTP site if needed

III. Homework

- None

IV. Current Projects of Interest (40 min) – Matt Drewitz (BWSR), Kiah Sagami (Houston Engineering)

- Prioritize, Target, and Measure Application (PTMApp) <https://ptmapp.bwsr.state.mn.us/>
 - Overview
 - DEM Preparation methodology
 - PTMApp toolbar and workflow
 - Derived products
 - Web Application Development
- Matt
 - PTMApp origin – based out of work done in the Red River Valley in the mid-2000s
 - Two Components:

ArcGIS Desktop Toolbar	Web App
<ul style="list-style-type: none"> • Runs the model and creates output data • Requires high level of GIS expertise • Some local governments and partners using the tool on a small scale • Certain output products can't be viewed in the web app <ul style="list-style-type: none"> ○ Terrain analysis ○ ArcGIS experience needed to analyze info 	<ul style="list-style-type: none"> • Quickly view desktop output products • Showing layers in interactive format, but data are static and not true model • Can view user friendly maps, tables, reports • Currently working with MnGeo to see how robust the app can be <p>Things you can't do in the Web App:</p> <ul style="list-style-type: none"> ○ Bring in additional data layers or base maps ○ Change symbology or transparency ○ Create custom maps ○ Re-run model ○ Geoprocessing ○ Bring in raster files (working on this) ○ See all the products developed in toolbar (Base, Planning, and Processing Output Geodatabases)

ArcGIS Desktop Toolbar	Web App
Support: <ul style="list-style-type: none"> • HEI developer support for maintenance and enhancements • HEI provides user support and access to toolbar • BWSR and MNIT - initial planning for additional support staff from the state staff 	Support: <ul style="list-style-type: none"> • HEI developer support and creation of new functionality • MNGeo to take over web server hosting and use support • BWSR provides support on navigation and usage of web app

- Review of PTMApp – done by outside parties in an external advisory committee
- HEI contract (2 years, September 2018 to August 2020):
 - Maintenance, bug fixes, and enhancements for web/desktop
 - Desktop user support and training
 - Training
 - PTMApp Needs assessment – prioritize work for the next few years
- Training Plan
 - Focus on video modules in next 6-9 months
 - Materials for self-learning for web app
 - In-person training - tailor training to audience based on knowledge of GIS
 - Identified five separate user groups to help focus training needs
- Kiah
 - DEM Preparation Methodology
 - Different types and levels of hDEMs yield different results
 - Building on hydro-conditioning
 - Practical implication - accuracy of field scale hydrologic boundaries

Pros	Cons	Business Needs	Difference?
Level 1 – H1DEM			
<ul style="list-style-type: none"> • Quick and easy • Low cost 	<ul style="list-style-type: none"> • Doesn't allow for good LiDAR interpretation • Flow lines will only be as good as the most recent data used • Many areas on the landscape will be missed 	<ul style="list-style-type: none"> • Planning only • Watershed delineation and simple terrain analysis • Large scale watershed planning 	<ul style="list-style-type: none"> • No control over flow accumulation • No consideration for non-contributing/ponding areas • Complete reliance on existing data

Pros	Cons	Business Needs	Difference?
Level 2 – H2DEM and H2DEM +			
<ul style="list-style-type: none"> • Uses existing data and builds on it • Fairly quick to do • Can incorporate lake routing in H2DEM+ • Low cost 	<ul style="list-style-type: none"> • Misses many culverts • Misses many field disturbances • Not able to do field scale products 	<ul style="list-style-type: none"> • Watershed delineation and simple terrain analysis • For large scale watershed planning • For sub-watershed scale size planning • Starts to use Flow and Load Routing with Planning level BMP Analysis 	<ul style="list-style-type: none"> • Conditioning for Lake Routing • More control over Flow Lines • Non-Contributing areas can be considered
Level 3 – H3DEM and H3DEM +			
<ul style="list-style-type: none"> • Best interpretation of the landscape • Can be used for both planning and field scale • Can use products created from the process for other projects • Hydro enforcement lines can be built on throughout the years • Condition is done to include Lake Routing • More credible for land owner 	<ul style="list-style-type: none"> • Higher cost • Takes time 	<ul style="list-style-type: none"> • Planning and Implementation • Watershed delineation and simple terrain analysis • Large scale watershed planning • Sub-watershed scale size planning • Single field scale analysis • Flow and load routing with BMP effectiveness analysis, buffer alternative practice analysis and potential preliminary BMP design • Hydro enforcement lines can be used to help start culvert inventory 	<ul style="list-style-type: none"> • Uses local knowledge • QAQC • Non-contributing is used during conditioning • Field scale application • Implementation scenarios can be made and acted upon • Can be improved upon in future

- Quality of HDEM Matters

- Use: Planning vs Implementation
- Higher Quality hDEM:
 - Higher likelihood of accurate representation of water movement across field
 - Accurate load routing through lakes
 - Deliberate representation of “closed” basins

- Importance of non-contributing (NC) depressions
 - Review NC areas to find evidence of drainage (aerial imagery, outlet/flowlines, culvert)
 - Check with locals to see if that area does outlet (locate lake outlets, tield ag. fields)
 - Add burnlines where needed
 - If no evidence is found, then leave as NC
- Summary of reasons to remove NC areas if there was evidence of drainage
 - Agricultural fields
 - Tile inlets/outlet visible in aerials
 - Information from project partners
 - Lakes/Wetlands
 - Outlet missing in LiDAR (typically covered in vegetation)
 - Other areas
 - Culvert missed during conditioning
 - LiDAR has errant obstruction to flow (vegetation in ditch, trees)
- Matt
 - PTMApp Toolbar and Workflow
 - Context diagram of how PTMApp system works
 - Desktop application (components, data, processes) → Information goes to web application to show in a more user friendly format and for wider audiences
 - Applications connect to each other
 - Diagram of desktop toolbar components
- Kiah – Hold off on demo due to time, system performance
- Matt – PowerPoint will be sent to the group
- Kiah – PTMApp can ingest ACPF products into the benefits analysis
- Matt
 - Planning products
 - Prioritize resource concerns
 - Target practices
 - Measure the impacts
 - Implementation
 - Field scale products, terrain analysis, BMP suitability
 - Profile - maps, tabular data, text, strategize
 - Partnerships: BWSR, MNIT@BWSR, MNGeo, HEI, IWI
- Q & A
 - Rick – describe the process of PTMApp
 - Ingests a lot of data, works through travel time
 - Kiah - https://ptmapp.bwsr.state.mn.us/files/Session1_Develop_Inputs.pdf

- Standard set of inputs
- Generated from HDEM
 - Flowacc
 - Flowdir
 - Travel time (upstream and downstream)
- Generated from soils, RUSSELL products
 - SSURGO inputs
 - Curve number factor
 - RUSSELL inputs
 - Plan boundaries, priority resource points (can be HUC outlets)
- Creates BMP inputs
 - Storage
 - Infiltration
- Cost of BMP
- Christiane – soils from websurvey or copies
 - Kiah – soils data downloaded from websurvey
- Sean – noncontributing area
 - Would like to see an action item to create a standard for identifying NC areas
 - Currently people look at NC differently - we are inconsistent
- Rick – DNR staff doesn't use the app directly, but use products. When will the release of the updates happen?
 - Matt – try to release quarterly updates, may be late Jan or later
- Rick – Web app – based on ArcGIS online?
 - Matt – using basemaps from ArcGIS online
 - Not same as ArcGIS Online, is on a different platform
 - Kiah – sole source code, but uses some resources from AGOL
- Rick – how the system uses ACPF data
 - Kiah – Instead of PTMApp creating same products as ACPF, PTMApp uses the actual data from ACPF for different practices.
 - Puts them through the benefits analysis of PTMApp
 - Rick – does it add to the outputs?
 - Kiah – the report will have the PTMApp results and add it to ACPF
 - Benefits
 - Costs
 - One step further than what ACPF provides
- Next meeting January – DNR Hydrography Data (Jamie Schulz and Andrea Bergman, MNIT@DNR)

V. Subgroup Reports (10 min)

- Data Catalog – Jamie
 - Last meeting on 11/29/18
 - Looking at how to collect the data, what data to collect, what is out there
 - Andrea found some interesting existing lists of data that we are checking into
 - Andrea is also investigating how to collect information from MN Geospatial Commons on layers and downloads
 - There will be no meeting in DEC – using that time to research and share findings
 - Next meeting will be 1/31/19
- Breachline Subgroup – Rick
 - Rick
 - Standardized attributes - will create a database
 - Methodology and techniques
 - Mission statement and goals for 2019
 - Sean - Breachlines (or burnlines)
 - Geared toward HDEM
 - Dependency of ACPF and PTMApp on these
 - Work of subgroup is critical

VI. Upcoming Work (5 min) – Sean

- Hydro standards documents
 - Basin ID
 - Watercourse ID
 - Watershed ID
- Review team working on draft now through January
- Draft distributed for review at February meeting
 - Sean
 - Have been existing standards, created under the former hydrography committee
 - Those standards have existed without much attention/use/reference
 - Updating so they can be used and referred to
 - Help define and create attributes
 - Request from GAC
 - Brought to DNR & PCA
 - Members are part of this workgroup
 - Updates being done by data stewards

- Timeline
 - Jan/Feb - review
 - March - to GAC

Future Meetings

Date: 1/8/2019
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Agenda items: (submit proposed agenda items to [Andrea Bergman](#))

Future Items for Discussion (Waiting in the “lobby” for the appropriate time)

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?