**Properties Sub-Team meeting**

**8/7/18**

Participants:

* 1. Dylan Beaudette – absent
  2. Colby Brungard – absent
  3. Tom D’Avello
  4. Chad Ferguson – absent
  5. Suzann Kienast-Brown
  6. Zamir Libohova – absent
  7. Jessica Philippe – absent
  8. Stephen Roecker
  9. Alex Stum
  10. Travis Nauman
  11. Jim Thompson
  12. Rob Vaughan
  13. Skye Wills
  14. Dave Zimmerman – absent

Agenda:

* Update on properties initiative agreement (Jim)
  + Paperwork submitted to NRCS in Lincoln
  + Been through WVU and NMSU
  + 150k, 94k to NMSU (post-doc salary) one year of funding for salary
  + 2 years of funding; if recurring funds are available, up to 1 year can be added (can go up to 3 years total)
  + Next step is to hire post-doc position; discuss with Amanda
  + USGS in Moab may have extra funds to channel to NMSU to help fund project past one year of salary to guarantee 2 years
* Update on field week
  + In process with NRCS leadership to request participation from NRCS employees
  + Availability will be the main hurdle
    - Set a date now before we request people’s participation – first week of Oct: 9/30-10/6 (Sun-Sat)
      * Tom will check with Tiffany
  + Check in with other NRCS participants
  + Send most recent copies to Travis
* Interpretations
  + Have approval for Bob Dobos to work on it, just need to get him data (currently out of office)
* Update on CONUS 30m covariates (Rob)
  + 30m NED product for CONUS; simple hydro correction in Arc; 10m fill
  + On Google drive – will send to group
  + HUC 10 boundaries
  + Floating point for AK, CONUS, CA, MX
  + Floating point for CONUS by watershed
  + Integer product as well
  + Not sure how the “best available data” from USGS will impact performance; issues from LiDAR data
  + National covariate stack – citrix
    - Can be used internally and externally eventually
* Stratification options
  + Use centroid of each polygon for prediction to create overlap between physiographic regions
  + MLRA (227) – used to label field points
    - Being updated in FY19
    - Use some sort of DSM process to update MLRA
  + EPA ecoregions (85) (water focused), ecological provinces, USFS subsections (being updated currently; expected in FY19)
  + May not even really matter – mainly need enough points and good covariate stack to capture variability, and process to stitch model results seamlessly together
* Coding and computing
  + Develop flexible code to switch out strata and test them all
  + Develop a workflow
  + Coding in R – several options for parallel processing
    - Tensorflow package in R – use of GPU
  + Possibly interface between R and python when needed
  + Keep all options open as we work through projects; share code on Github
  + Computing options
    - USGS Astro Sciences computing system (Travis)
    - WVU – HPC – free access
      * Jim could request guest account remote access for collaborators
      * Could use GRU funds to purchase disk space if needed
      * Tom is testing development of derivatives – wait for this for next step
      * This seems like best option for collaborative work while still pursuing NRCS in-house solution
    - Long term goal is for in-house (NRCS) solution – may be Citrix
* Set specific project goals to rally around
  + Example: make property maps for field week MLRA
  + Come to next meeting with ideas for specific project to work toward and decide on one to move forward
    - Benefit short term project and longer term overall goals

**Properties Sub-Team meeting**

**7/26/18**

Participants:

* 1. Dylan Beaudette – absent
  2. Colby Brungard
  3. Tom D’Avello
  4. Chad Ferguson
  5. Suzann Kienast-Brown
  6. Zamir Libohova
  7. Jessica Philippe – absent
  8. Stephen Roecker – absent
  9. Alex Stum – absent
  10. Travis Nauman
  11. Jim Thompson
  12. Rob Vaughan – absent
  13. Skye Wills
  14. Dave Zimmerman – absent

Agenda:

* Update on properties initiative agreement – any new developments? (Jim)
  + Sub-award with NMSU to have post-doc housed there; facilitate collaboration with people in the SW region
  + Start date 9/25/18 – 2 year agreement with one year extension possible
  + Do we want to pursue any of the stratification ideas with the SoilGrids100 data prior to the post-doc starting?
    - Would be wise to get something started; start date is for $ not necessarily the person (they will likely start later)
    - Move forward and provide foundation for post-doc to step into
    - Have a working plan laid out, which can be flexible
      * Start with stratification testing with soilgrids100 data
      * MLRAs – approx. 200 across US
      * EPA/FS ecoregions – nested coarser and finer scale stratification
      * Before the next meeting – everyone
        + Explore options; post data or links to Github
        + Discuss options and decide which stratification to start with at next meeting
      * Colby will test MLRA stratification in upper CO River basin on his prediction of soil depth project
* Update on field week
  + Leadership reviewed; RDs were next
  + Not sure when this will get attention due to recent upheaval in agency chaos, but Suzann will follow-up hopefully within the next week
* Interpretations
  + Follow up with Bob Dobos
    - Travis’ dataset with a specific request for Valley Fever interpretation
    - Travis, Skye, Chad, Suzann
    - Cc Maxine on email request; ask to prioritize after she returns
  + Interpretations staff
  + Volunteers to focus on this?
* Update on CONUS 30m covariates (Rob)
  + 30m hydrologically corrected DEM
  + Landsat composite imagery
    - Disturbance-free imagery?
  + Data access
    - Chat with Rob and come up with a solution
* Webinar – Travis: Applied Digital Soil Mapping
  + Others to join him?
  + Date – Sept or Oct
  + Email Shawn and cc Travis
* gPROP name – is this really it?
  + Solicited group for a product name
    - A few suggestions submitted; will wait for more before voting
* Properties sub-team website
  + Other sub-teams will have open meetings; thoughts on that?
    - Not at this time
  + Link to Github?
    - yes
* Calendar items for meetings – everyone got it?
  + yes

**Properties Sub-Team meeting**

**7/10/18**

Participants:

* 1. Dylan Beaudette – absent
  2. Colby Brungard
  3. Tom D’Avello
  4. Chad Ferguson
  5. Suzann Kienast-Brown
  6. Zamir Libohova – absent
  7. Jessica Philippe – absent
  8. Stephen Roecker – absent
  9. Alex Stum – absent
  10. Travis Nauman – absent
  11. Jim Thompson
  12. Rob Vaughan – absent
  13. Skye Wills – absent
  14. Dave Zimmerman – absent

Agenda:

* Follow-up from Northeast/South Region NCSS meeting (Jim, Tom)
  + DSM discussion period – Jim, Tom, Matt Levi on panel
  + Some of the standard questions, but some stood out
    - Product versioning – What does it mean? Change in soils? Change in knowledge? Not a temporal change – we need to be clear
    - Dynamic soil properties – particularly in the surface layers – how can we capture these? Future meeting
* Update on properties initiative agreement (Jim)
  + Conversation with Hoover and Kinney/Travis and Amanda (noted in last meeting minutes)
  + Jim working on logistics of hiring, etc. with WVU/remote location
    - Research Assistant Professor vs. Post-Doc
    - 18-24 months of funding combining existing funds with new funds
  + Pursue both position to focus on project and group workshops
  + NRCS travel cannot be supported with initiative money – cooperator travel can
  + Draft deliverables in CESU to capture transfer of expertise/technology (raster datasets, scripts, process document, etc.), expectation of interaction with the DSM Focus Team, and other items identified by properties sub-team
  + Do we want to pursue any of the stratification ideas with the SoilGrids100 data prior to the post-doc starting? Future meeting
* Update on field week (Tom)
  + Conversation with Lindbo – very receptive and supportive
  + Proposal to NHQ this week
    - Great Smoky’s NP – 7 field crew
    - 5 DSM Focus Team soil scientists – 3 NRCS, 2 cooperators
  + Ratio of local crew to DSM Focus Team members for future field weeks will be project dependent
  + Lindbo suggested two field weeks for FY19 field season – one western (Bob Marshall Wilderness or Cascades); one eastern (White Mtn NF)
  + Work with field crew prior to field week for sampling design and other prep work for modeling
* gPROP name – is this really it?
  + Solicit group with a product name and vote
* Github – everyone accessing ok? Send url again
* Raster products weekly article 6/29/18

Agenda items tabled until next meeting:

* Interpretations
  + Follow up with Bob Dobos
  + Interpretations staff
  + Volunteers to focus on this?
* Update on CONUS 30m covariates (Rob)
* Webinar – Travis: Applied Digital Soil Mapping
  + Others to join him?
  + Date – Sept or Oct
* Calendar items for meetings – everyone got it?
* Properties sub-team website
  + Other sub-teams will have open meetings; thoughts on that?
  + Link to Github?

**Properties Sub-Team meeting**

**6/18/18**

Participants:

* 1. Dylan Beaudette – absent
  2. Colby Brungard
  3. Tom D’Avello
  4. Chad Ferguson
  5. Suzann Kienast-Brown
  6. Zamir Libohova – absent
  7. Jessica Philippe – absent
  8. Stephen Roecker
  9. Alex Stum
  10. Travis Nauman – absent
  11. Jim Thompson
  12. Rob Vaughan – absent
  13. Skye Wills
  14. Dave Zimmerman

Agenda:

* Update on WVU agreement details – Jim
  + Soils2026 raster continuous soil properties project
  + Conversation with Hoover, Kinney
    - Explained focus team vision for these products
    - Supportive of approach and products
      * Not using SSURGO or STATSGO for input data – derived from point data using statistical/machine learning methods
    - What is the delivery mechanism and how does that influence what we produce?
  + 150k over 2 years
    - Opportunity to add funding after 2 years
    - Extension for 3 years available if needed
  + Post-doc
    - Conversation with Amanda and Travis
      * She is interested
    - Preference is for post-doc to be in Morgantown, but not imperative
      * Location not as important as getting the right person and getting the work done
      * Could sub-contract with Colby at NMSU
      * Main goal is get this done; continuous soil property rasters for US asap
    - Create momentum and push goals of focus team forward
  + Kinney requested proposal by July 15
    - Contract to start before Sept 30 to obligate FY18 funds; to begin spending on Oct 1
  + Improvements to previous efforts
    - Covariates – better input data
      * For example: parent materials – Skye and others working on this
      * Rob is also working on 30m covariates (elevation, imagery)
    - More input point data
    - Stratification of the modeling domains
  + What role does the focus team play?
    - Post-doc becomes a member of the sub-team
    - Collaborates with sub-team who provides direction, discussion, oversight
      * Sub-team actively engaged with post-doc
    - Engage with SSD staff; incorporate property products into yearly workloads
      * Share your ideas on how to make this succeed
        + Ownership of update process to improve product
        + Connect to acre goals
        + Connect to DSM projects that SSOs are already doing in their local areas
        + Replicate node idea of GSM structure with each SSD Region serving as a node
    - Goal is to integrate work of post-doc and sub-team into agency so NRCS/NCSS has ownership over methods and products
* 2018 field week proposal – Tom
  + Proposal emailed to group
    - Dates have not been decided; will wait for proposal to move forward and determine how many people can be supported to attend
  + Training via an in-progress project (update or initial)
  + Cross pollinate between DSM focus team and field crew
  + Achieve objective of project
  + Develop a network of SSD staff
  + Feeds into goals of DSM sub-teams (initial, update, properties)
  + Structure weeks to integrate both field and modeling activities
* Interpretations update – info from Maxine – Suzann will send email
  + Approved as SSRA priority; not funded
    - Have the ability to adjust soil properties from site specific locations and generate on the fly interpretations (from ready-to-use interpretations) for desktop and mobile applications.
    - Have the ability for users to create new interpretations outside of the transactional NASIS database.
    - Have the ability to use geospatial layers from many formats to integrate into the soils data for developing more spatially explicit interpretations.
  + Dylan will summarize work that he and Jason started
  + Set up meeting with interpretations staff to discuss what we envision
    - Subset of people who want to focus on this?
* Github – dsm-properties-subteam under ncss-tech
  + Stephen – done
  + Add members and meeting info and other supporting documentation

**Properties Sub-Team meeting**

**6/6/18**

Participants:

* 1. Dylan Beaudette
  2. Colby Brungard
  3. Tom D’Avello
  4. Chad Ferguson
  5. Suzann Kienast-Brown
  6. Zamir Libahova
  7. Jessica Philippe – absent
  8. Stephen Roecker
  9. Alex Stum
  10. Travis Nauman
  11. Jim Thompson
  12. Rob Vaughan – absent
  13. Skye Wills
  14. Dave Zimmerman

Agenda:

* Follow-up from West Region NCSS meeting (Suzann, Travis, Colby)
  + Raster interpretations
    - Raster interpretations generator project (gSSURGO)
      * Drew Kinney and Dave Hoover both talked about this project at the conference
      * Upon further clarification – the project has been approved but not funded; received information from Maxine Levin and passed on to Dylan to compare to what he and Jason had worked on previously
      * Suzann will follow up with interpretations staff and set up a meeting to discuss our goals of developing interpretations from continuous properties
    - Bob Dobos – sub-team to provide example dataset to start exploration of interpretations from continuous property data
      * Travis has a dataset from the upper CO River basin that has continuous properties predicted in depth intervals; data structure is similar to what we are pursuing
      * Perhaps Bob can focus on Valley Fever interpretation for this test dataset
      * Suzann will follow up with Bob and propose the CO River basin dataset for testing; perhaps set up a meeting with him
      * Skye and Zamir can follow up with Bob if needed
  + Soils2026 continuous properties project funded
    - Funds channeled through WVU; Jim will expand on this to the group
      * Jim awaiting details of agreement from Hoover; he hopes to have details at our next sub-team meeting
    - Discuss best use of funds
      * Personnel – hire a post-doc
        + Focus on specific tasks such as ranking/weighting of point data, stratification for modeling domains, etc
        + Person needs to be fully integrated with NRCS/NCSS and this sub-team for this to be successful
        + Amanda Ramcharan was suggested; Travis will inquire about her situation
      * Working sessions – bring everyone together in workshop setting for a week at a time since time is everyone’s limiting factor
        + Funds from agreement could be used for non-NRCS personnel travel; we can submit a proposal to HQ to fund NRCS personnel for working sessions
    - Ideally, we would do both – hire task oriented post-doc and hold working sessions
  + Other items from the meeting?
    - None
* Group discussion
  + As we move forward, it is imperative we demonstrate the application of these raster products
  + Appeal to those inside and outside NCSS with application for specific concerns
    - Link to conservation planning; farm bill programs
    - Wetlands
    - Ecological site development
    - Dust
  + Discussion initiated about 30m scale – need to determine scale that will help manage expectations – what’s possible vs. what’s reasonable – will table discussion for future meeting
* Next steps
  + Test some ideas on SoilGrids100 covariate data
    - Use this data to test some of the most pertinent questions as we are working toward preparing other covariate data
    - Prioritize testing
      * Stratification of modeling domains
        + Perhaps start with MLRAs to stratify and compare results to SoilGrids100
        + Parallelization of workflow should be evaluated
      * Ksat, AWC, depth to restrictive layer, and thickness were key to hydrologists needs (from TX meeting)
  + Continue work with Rob and Colby
    - Development of 30m covariates
  + Others?
* Other items
  + gPROP for name of continuous property products – chime in if you have other ideas
  + Suzann is working with Kyle Stephens from the database focus team on a short article for the SSD weekly outlining the gridded products and how they are related, or not
  + The DSM focus team has presented five NSSC webinars in the past six months and would like to continue the series with one every month or so; please volunteer if you have interesting DSM projects that could fit into a one-hour webinar
    - Travis has a couple projects he could present
    - Dave White from Las Cruces SSO has also agreed to present his update work

Next meeting: June 18 @12:30pm CST

**Properties Sub-Team meeting**

**5/16/18**

Participants:

* 1. Dylan Beaudette
  2. Colby Brungard
  3. Tom D’Avello
  4. Chad Ferguson
  5. Suzann Kienast-Brown
  6. Zamir Libahova – absent
  7. Jessica Philippe
  8. Stephen Roecker – absent
  9. Alex Stum
  10. Travis Nauman
  11. Jim Thompson
  12. Rob Vaughan
  13. Skye Wills
  14. Dave Zimmerman

Agenda:

* Focus team update
  + Vision
    - Nationwide continuous property stack
    - Follow GlobalSoilMap specifications as a starting point
      * Recognize the flexibility to adapt as needed
        + Add more properties, change depth intervals, etc.
        + Add properties to some parts of the country, not others (e.g. EC)
    - Properties predicting using pedon point data for training
    - Discussion of the need to consider horizons vs. depth intervals (local vs. national scale product)
  + Soils2026
    - National coverage continuous soil property data is Tier 3 of the Soils2026 effort
    - Question yet to be answered: when is the national coverage property data considered full-coverage soils information for meeting the Soils2026 goal?
      * We will need to produce something to demonstrate utility before this question is considered
  + Ground work – Rob and Colby
    - Discussions between Suzann, Rob, and Colby have led to some developments in testing and exploring options
    - Rob is heading up an effort to create a thinner set of covariates (compared to Soilgrids) and use resources at USFS GTAC to test capabilities with GEE and Tensorflow to predict properties
      * Option to keep covariates on GEE as assets, but not necessarily create there, especially hydrologically based derivatives
      * Process available from GTAC to develop spectral data from Landsat archive that removes disturbances in imagery
        + May impact dynamic soil properties effected by land use changes; will need to consider
      * Desire to leverage GEE resources without getting too tied into Google; definitely no plan to use GEE as final data repository or require users to interact with GEE in any way
    - Colby is entering agreement with USFS to provide property data for the Cascades region
      * Focus team members already looped into project: Jim, Suzann, Travis
      * Project can serve as test area for ideas/methods to apply to larger effort
      * Will focus on Mt. Hood area initially, then expand to greater Cascades region
      * Exploring discrete entities to stratify the area for modeling; Noller – geomorphic environments; LRUs
* Group discussion
  + Data processing options
    - GEE
    - HPC options; Univ of Illinois, WVU, USGS
    - Citrix-based virtual desktop system at NRCS Ft. Worth center; can customize to meet processing needs; only available to those with a LincPass
  + Discrete units in modeling
    - MLRAs; LRUs; what is appropriate?
    - Option to use discrete elements as modeling domains and develop local models
    - Option to develop global model with more sophisticated algorithm and incorporate discrete elements as a covariate
    - Leave location our cross-validation methods could be explored
    - Balance model interpretability with prediction accuracy
    - Comparison of local vs global results
      * Set goal posts early in process
      * Use some sort of matrix for comparison
      * Do the models have pedogenic interpretation? Does it matter?
* Group – these items will be requested by email
  + Vision
  + Expertise or interests
  + Involvement
* Next steps
  + Test some ideas on soilgrids 100 covariate data
    - Use this data to test some of the most pertinent questions as we are working toward preparing other covariate data
    - Will discuss this further and prioritize testing at next meeting
  + Continue work with Rob and Colby
  + Others?
* Decide on meeting frequency and set next meeting
  + Minimum of once a month – more frequent is better for building and maintaining momentum
  + Next meeting scheduled for Wed June 6 @1pm CST