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United States Department of Agriculture

Gridded National Soil Geographic Database (gNATSGO)

NRCS Complete Coverage Soils Database

Natural Resources Conservation Service

nrcs.usda.gov/

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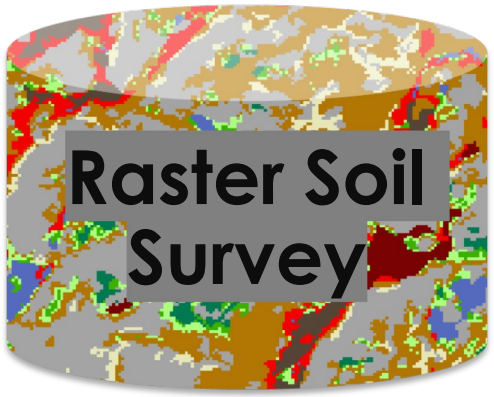
What is gNATSGO?

gNATSGO – Gridded National Soil Survey Geographic Database

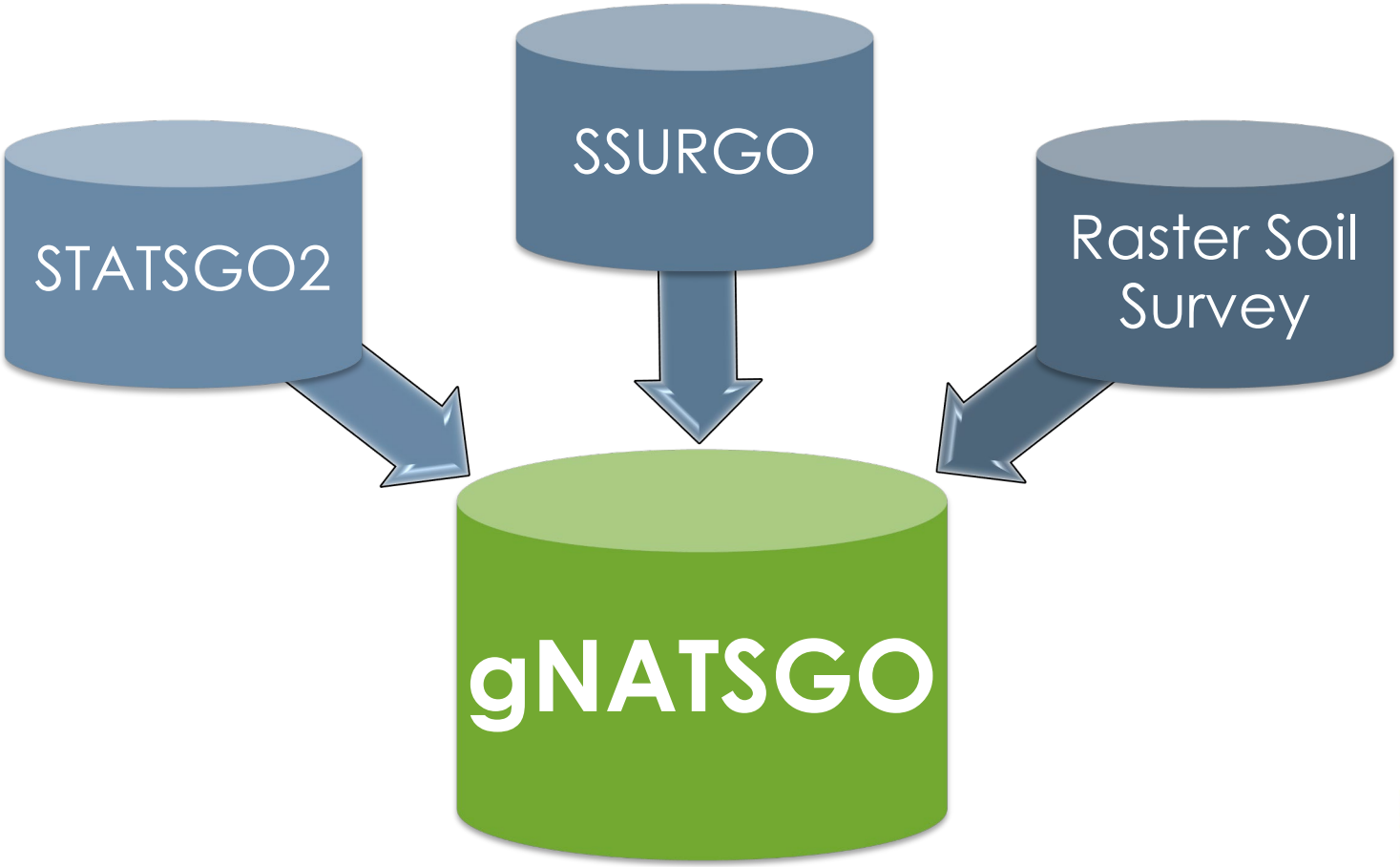
- *"A composite database providing complete coverage of the best available USDA-NRCS soils information for all areas of the United States and Island Territories."*
- For some states we did not produce gNATSGO because they have no areas of 'NOTCOM' and no areas with Raster Soil Survey data. Instead, use gSSURGO for these states.
- Version history:
  - Version 1 – 08_2019
  - Version 2 – 03_2020
  - Version 3 – 11_2020
  - Version 4 – 12_2021
  - Version 5 – 01_2023

What is gNATSGO?

- Combines 3 USDA-NRCS soil databases into a single database



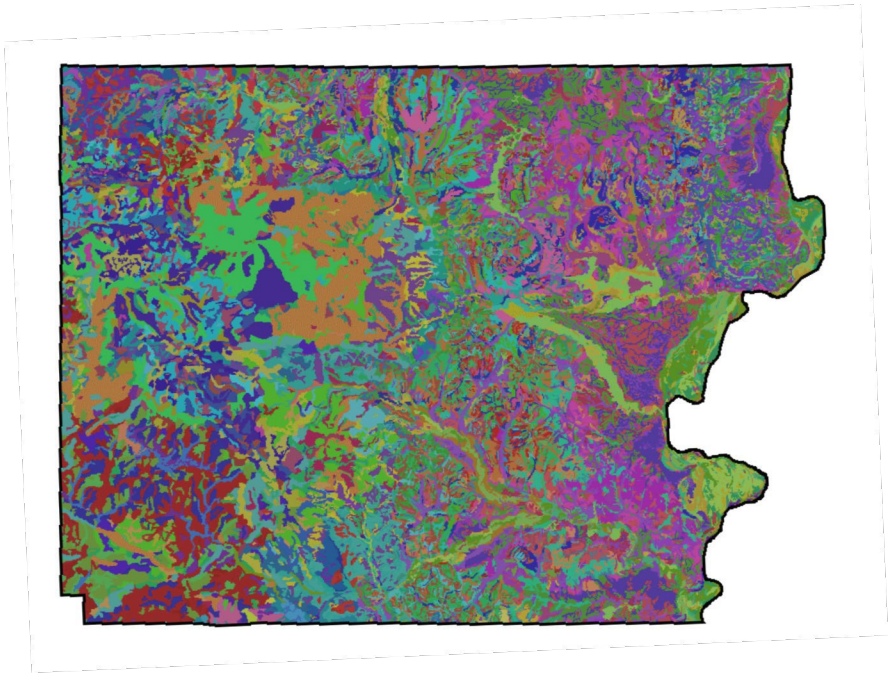
Combining Databases Into gNATSGO



About USDA-NRCS Soil Databases

1. SSURGO

- Historic NRCS county based flagship product
- Over 100 years of boots on the ground data
- Typically published at a scale of 1:12,000 to 1:24,000

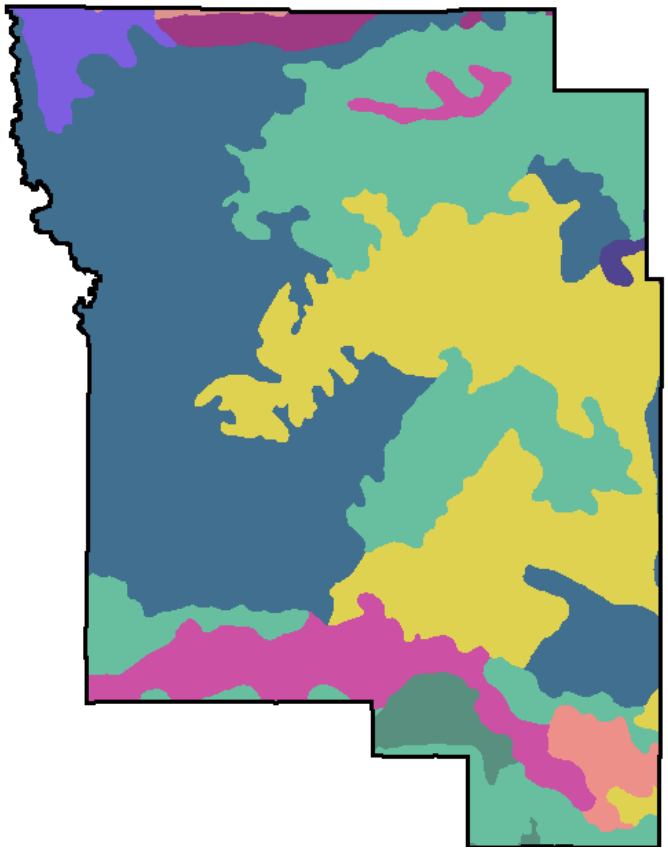


Click For More Information About SSURGO

About USDA-NRCS Soil Databases

2. STATSGO

- General soil maps
- Minimal field data
- 1:1,000,000 scale in Alaska and 1:250,000 scale for all other areas of the United States and Island Territories

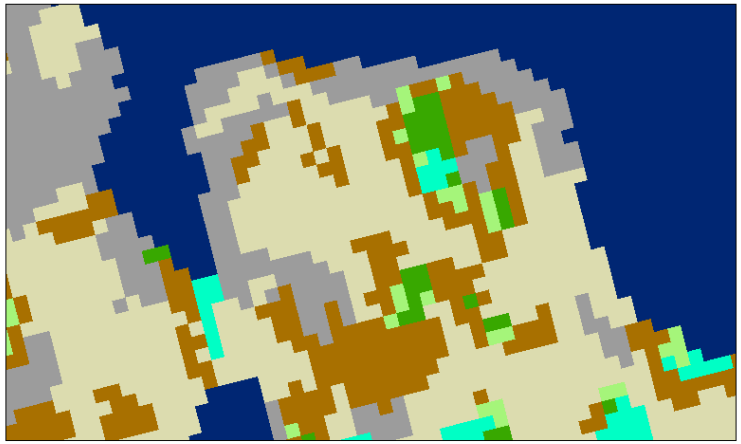


Click For More Information About STATSGO2

About USDA-NRCS Soil Databases

3. Raster Soil Survey (RSS)

- Next generation soil survey product
- Gridded soil surveys developed with predictive digital soil mapping (DSM) techniques
- Produced for both areas with and without SSURGO
- As of 2023, published RSS only available for small areas of Florida, Minnesota, North Carolina, North Dakota, Tennessee, Vermont, and Wisconsin
    - Number of RSS are expected to increase in coming years

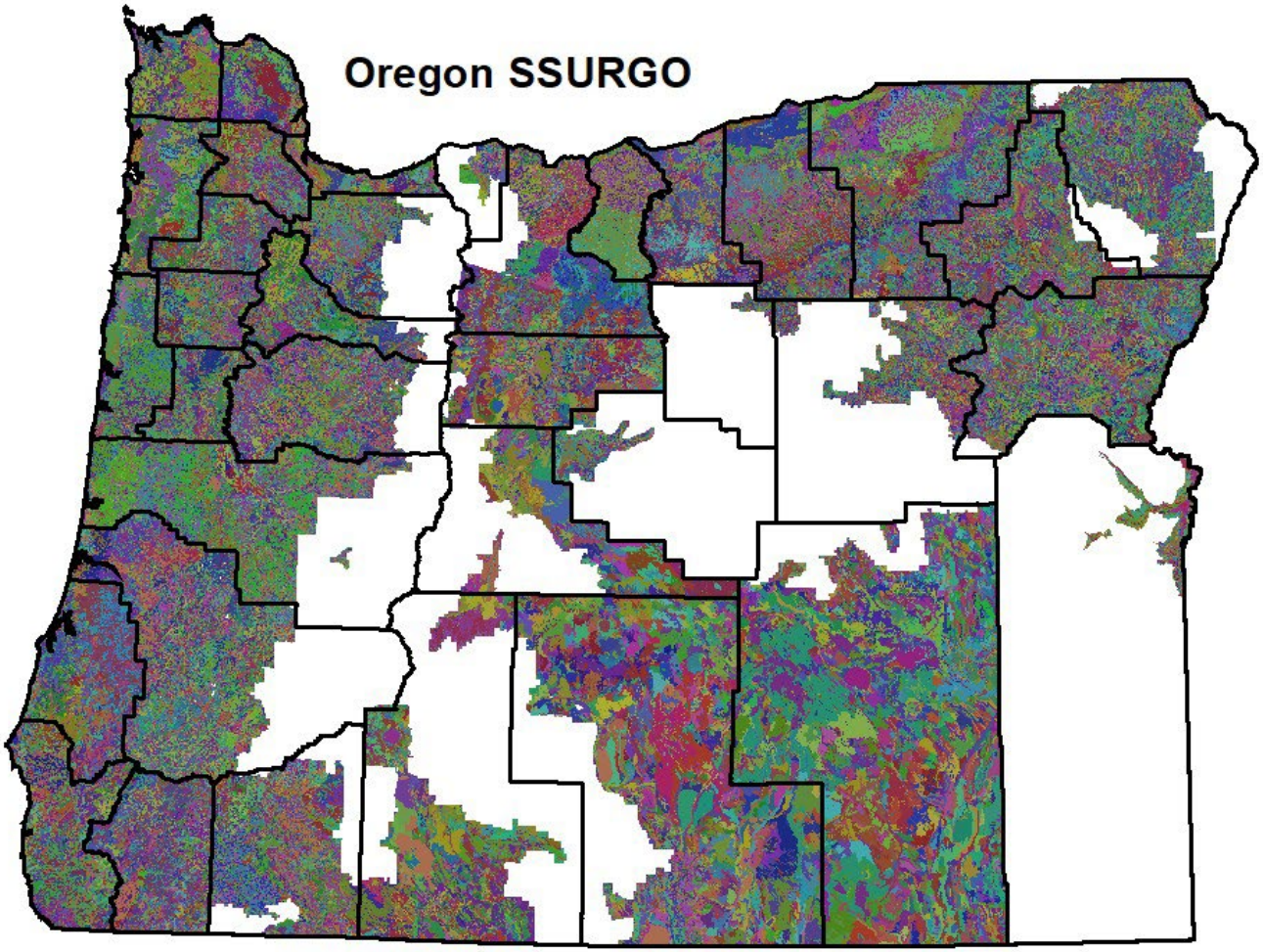


How gNATSGO Was Built

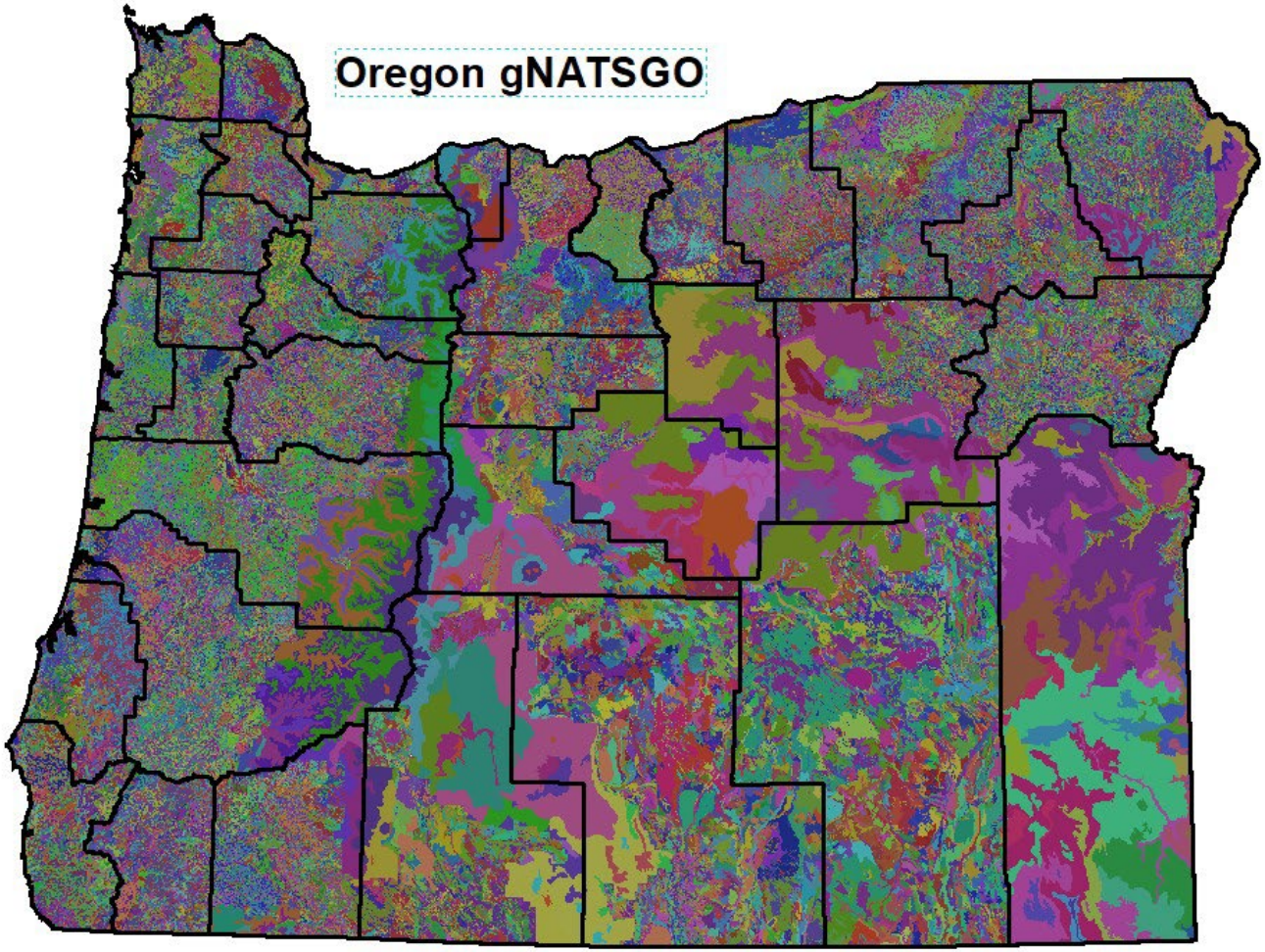
1. Started with SSURGO
2. Identified areas of SSURGO without soils information and then merged in STATSGO2 for those areas
3. Burned in published RSSs, replacing any SSURGO or STATSGO2 information

Mostly consists of STATSGO and SSURGO due to limited availability of RSS

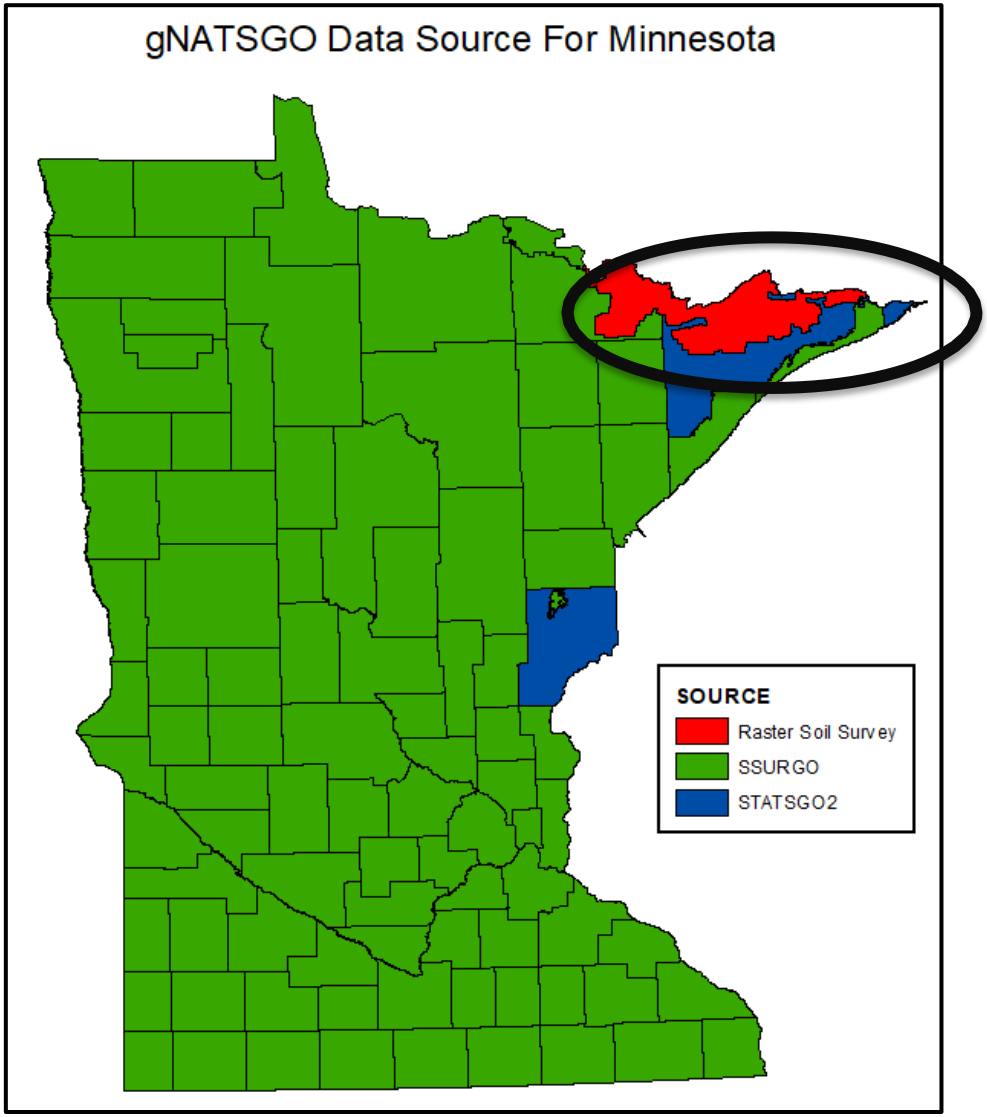
Start with Incomplete SSURGO



Fill SSURGO Gaps with STATSGO2

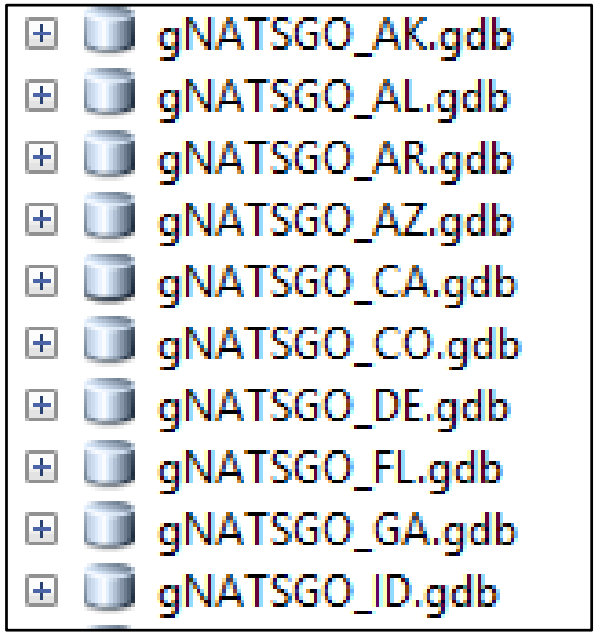


Burn in Raster Soil Survey When Available



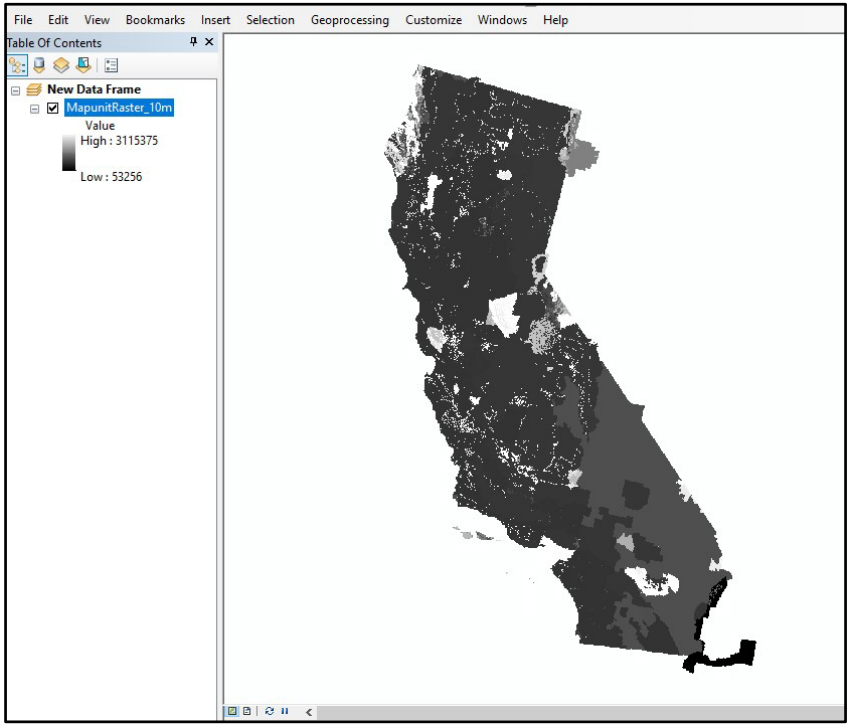
What's in the gNATSGO database?

- **Delivered as an ESRI file geodatabase**



What's in the gNATSGO database?

- Contains soil map units formatted as 10m raster*
- The vectorized version of the soil map units IS NOT INCLUDED in gNATSGO



*CONUS gNATSGO has a 30m raster due to the size of the geographic area.

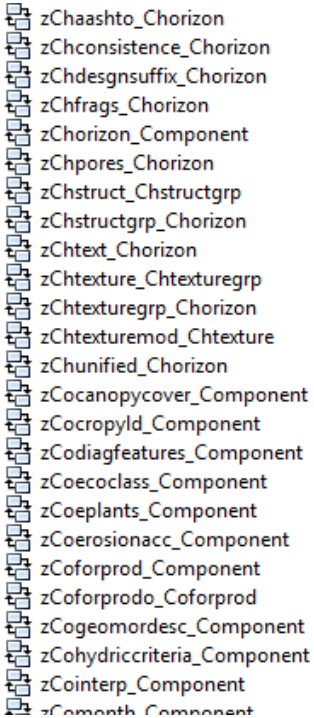
What's in the gNATSGO database?

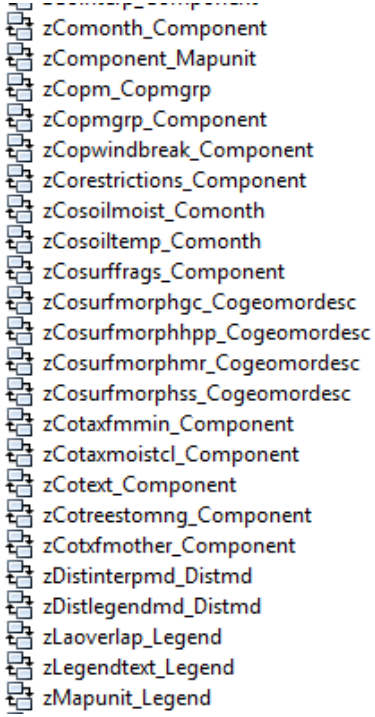
- **Contains standard soil attribute data delivered as a series of interrelated tables**

chaashto
chconsistence
chdesgnsuffix
chfrags
chorizon
chpores
chstruct
chstructgrp
chtext
chtexture
chtexturegrp
chtexturemod
chunified
cocanopycover
cocropyld
codiagfeatures
coecoclass
coeplants
coerosionacc
coforprod
coforprodo
cogeomordesc
cohydriccriteria
cointerp
comonth
component
copm
copmgrp
copwindbreak
corestrictions
cosoilmoist
cosoiltemp
cosurffrags
cosurfmorphgc
cosurfmorphhpp
cosurfmorphmr
cosurfmorphss
cotaxfmmin
cotaxmoistcl
cotext
cotreestomng
cotxfmother
distinterpmd
distlegendmd
distmd
featdesc
laoverlap
legend
legendtext
mapunit
mdstatdomdet
mdstatdommas
mdstatidxdet
mdstatidxmas
mdstatrshipdet
mdstatrshipmas
mdstattabcols
mdstattabs
month
muaggatt
muaoverlap
mucropyld
mutext
sacatalog

What's in the gNATSGO database?

- **Contains relationship classes that define relationships between tables**



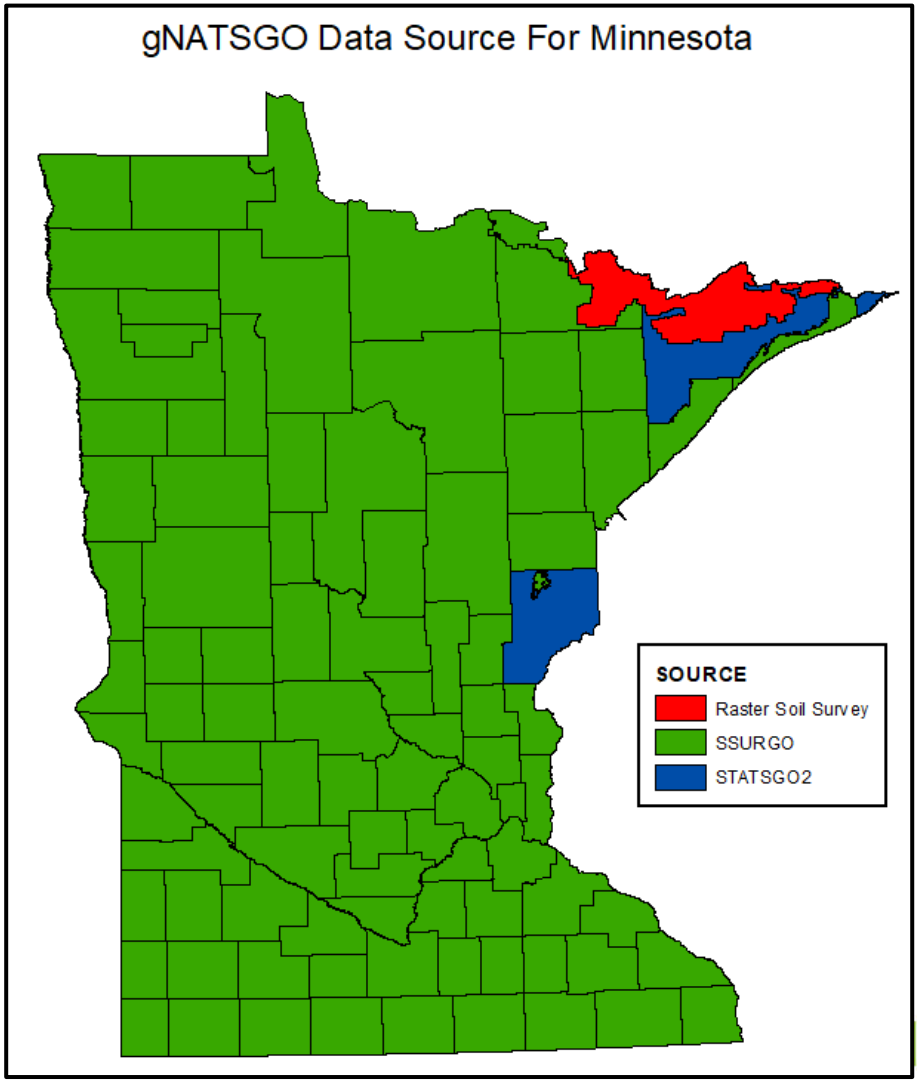


What's in the gNATSGO database?

- **Contains a SAPOLYGON layer that shows the boundaries of the soil survey areas.**

SOURCE
SSURGO
SSURGO
SSURGO
SSURGO
SSURGO
SSURGO
STATSGO
STATSGO
STATSGO
STATSGO
STATSGO

- Has a field called "Source" which can be used to determine if the data was derived from SSURGO, STATSGO2, or RASS



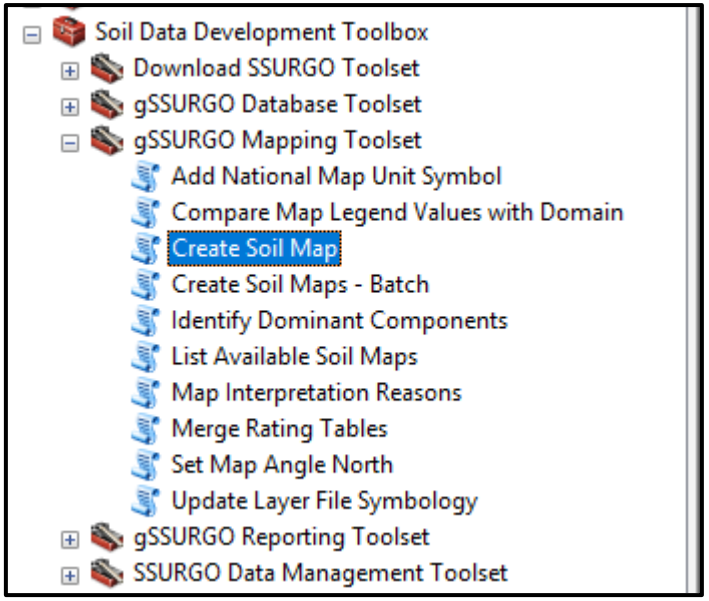
How do I work with all those tables?

Grab the gSSURGO Tools

- Free USDA-NRCS ArcGIS Desktop Toolbox
- Rapidly create thematic maps of soil properties and interpretations over large geographic areas
- Work on both State and Continental (CONUS) gNATSGO Databases
- Replicate thematic map functionality of Web Soil Survey (WSS) & Soil Data Viewer (SDV)
  - NOTE – As of 2023, these tools do not work in ArcPro

Working With gNATSGO

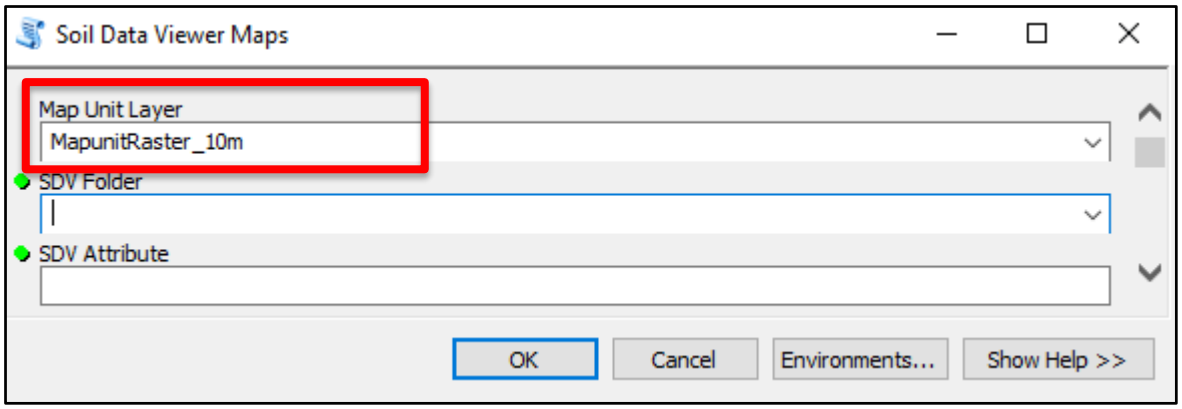
gSSURGO Tools



- Most customers will only need to use the **Create Soil Map tool**
- This tool replicates soil data viewer and web soil survey functionality
- Allows customers to generate thematic maps of soil properties and interpretations

Working With gNATSGO

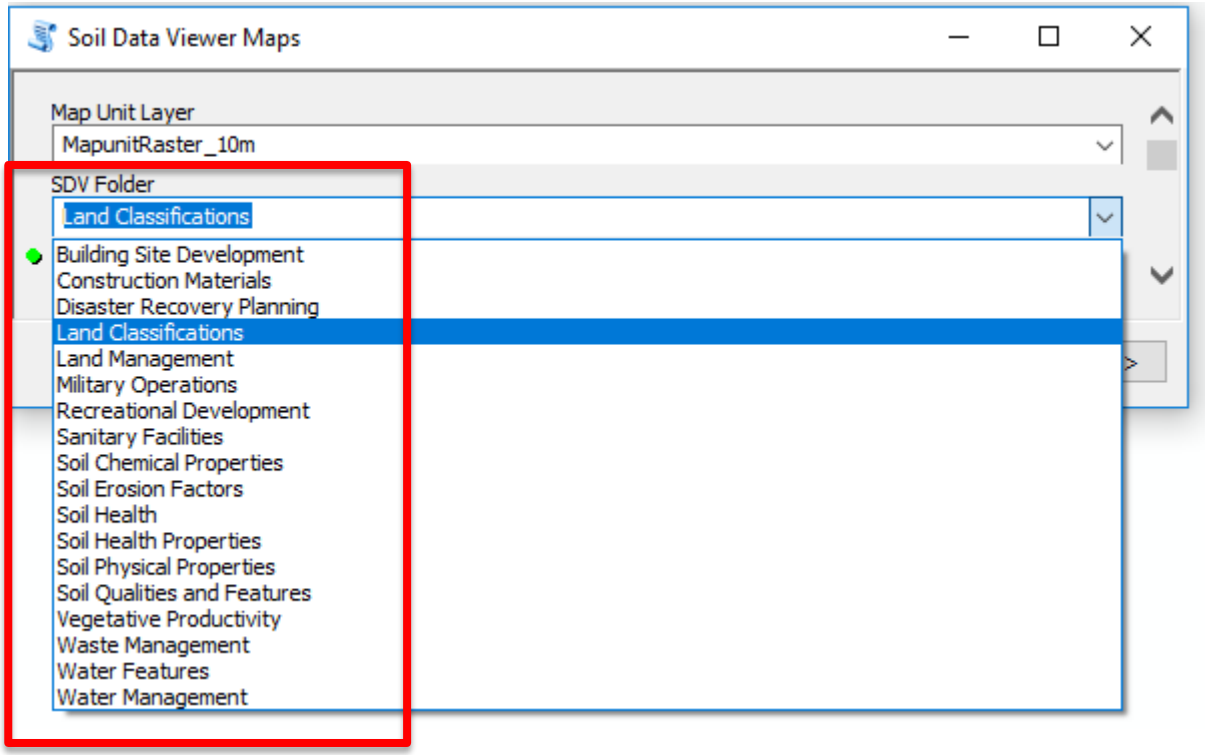
gSSURGO Tools – Create Soil Map



1. Select the 10 meter gNATSGO

Working With gNATSGO

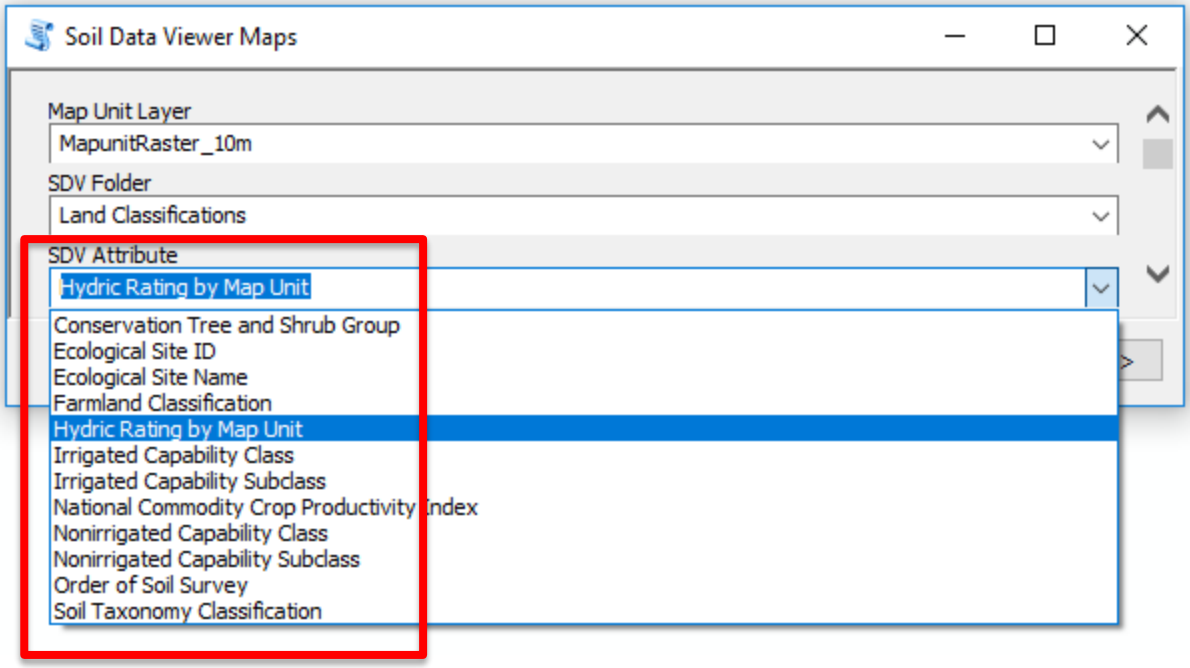
gSSURGO Tools – Create Soil Map



2. Choose the Soil Data Viewer Attribute folder, which is used to categorize the specific attributes

Working With gNATSGO

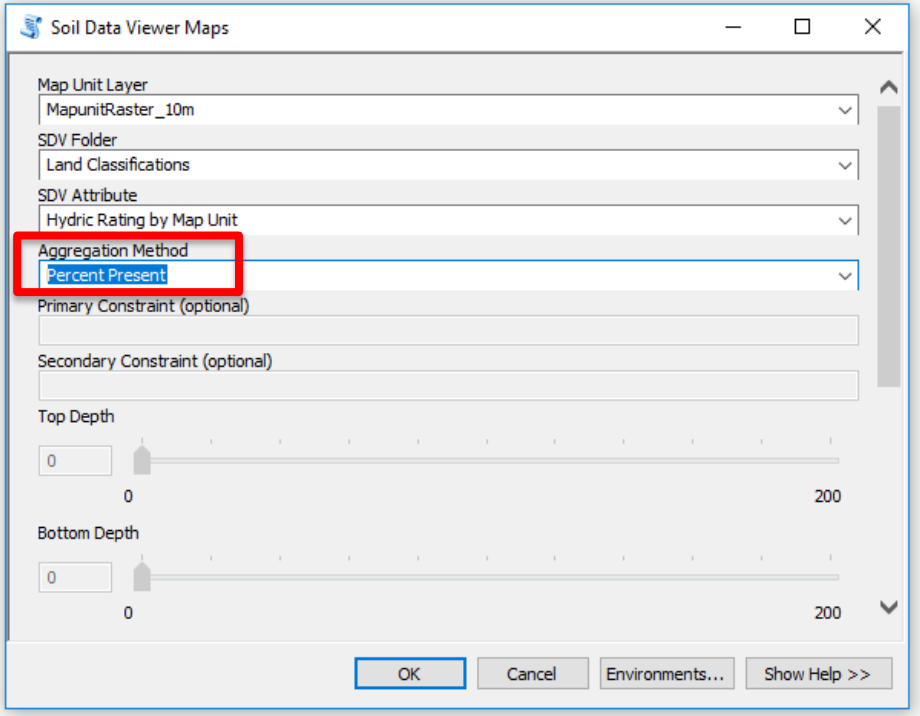
gSSURGO Tools – Create Soil Map



3. Choose the attribute that you want to make a thematic map of

Working With gNATSGO

gSSURGO Tools – Create Soil Map



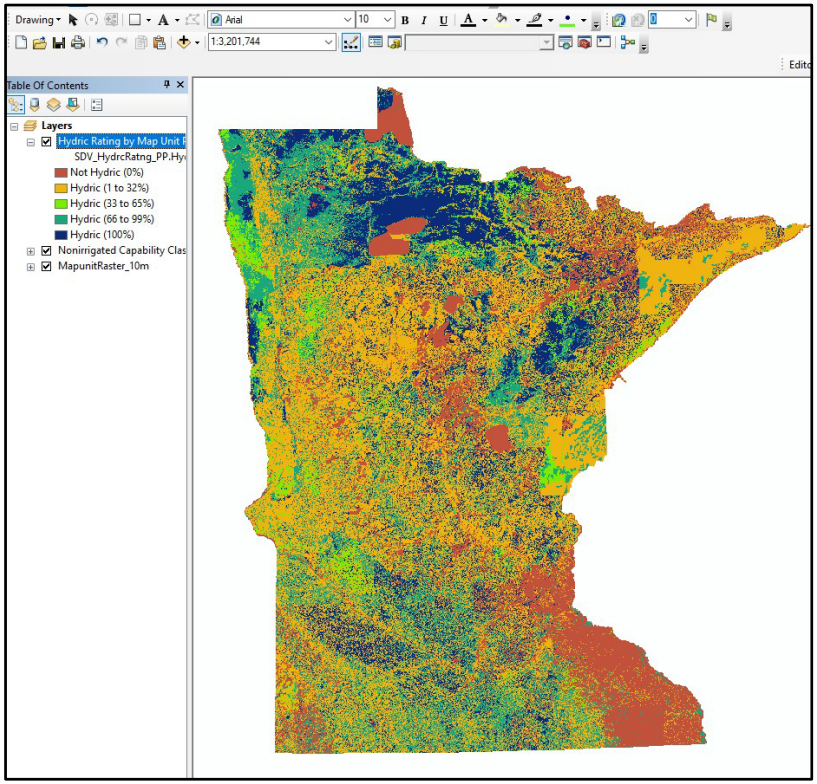
4. Choose aggregation method and other optional constraints

- Default aggregations typically suffice

Working With gNATSGO

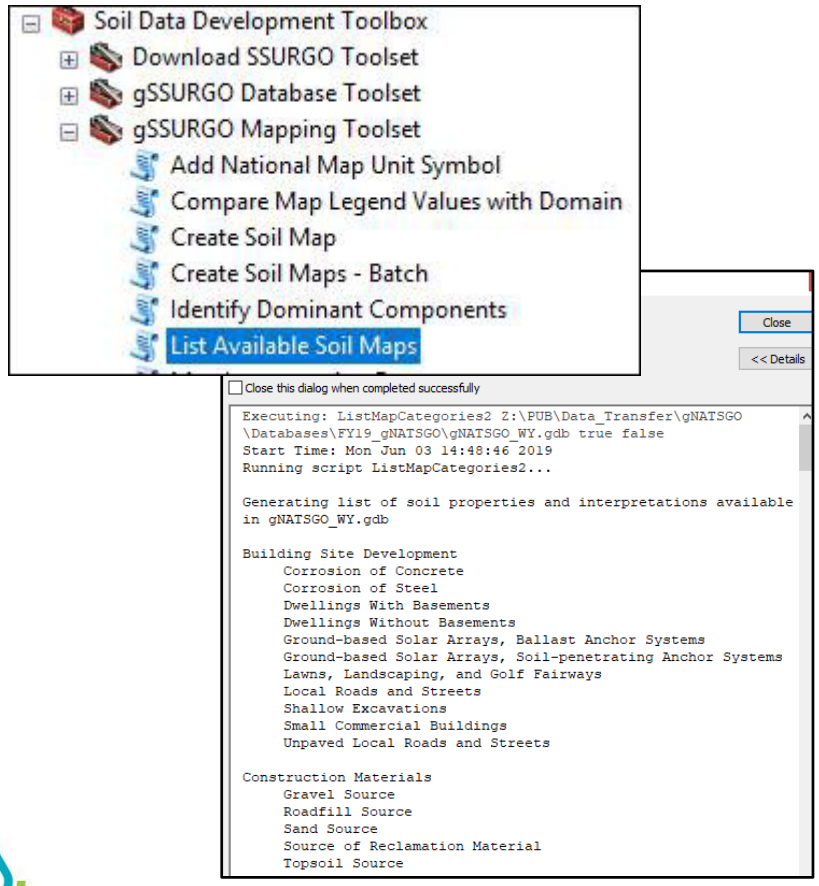
- **Run tool and produce thematic map**
  - **NOTE**: When generating ratings of soil interpretations, the user will have to manually symbolize the output layer

Percent Hydric Rating By Map Unit



Working With gNATSGO

gSSURGO Tools – List Available Soil Maps



- Complimentary to the Create Soil Map tool
- Lists all possible soil maps, categorized by SDV folders
- Runs quick
- Output can be copied and pasted into Microsoft Word

Will gNATSGO Be Updated Annually?

- Yes, we have been releasing a new version sometime after each annual SSURGO refresh.

Contact For Technical Assistance

To obtain technical information about the use of soil data, please contact the NRCS State Soil Scientist in your state, or the Soils Hotline Staff at SoilsHotline@usda.gov

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