



United States Department of Agriculture



# Gridded National Soil Geographic Database (gNATSGO)

## NRCS Complete Coverage Soils Database



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Resources  
Conservation  
Service

[nrcs.usda.gov/](https://nrcs.usda.gov/)

# What is gNATSGO?



## gNATSGO – Gridded National Soil Survey Geographic Database

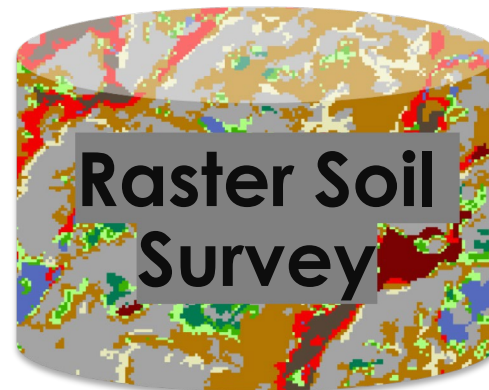
- *“A composite database providing complete coverage of the best available USDA-NRCS soils information for all areas of the United States and Island Territories.”*
- For some states we did not produce gNATSGO because they have no areas of ‘NOTCOM’ and no areas with Raster Soil Survey data. Instead, use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



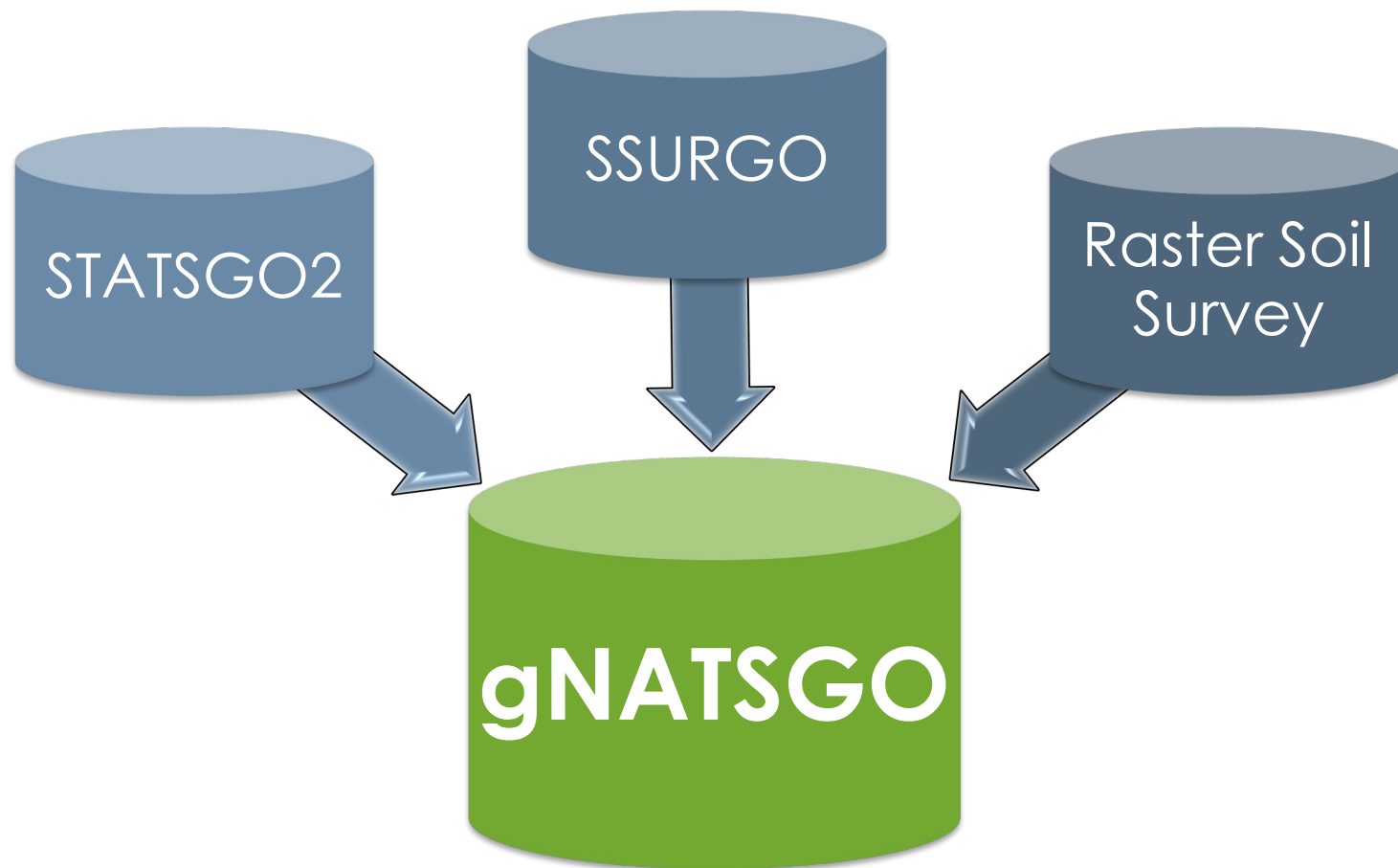
# What is gNATSGO?



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



# Combining Databases Into gNATSGO

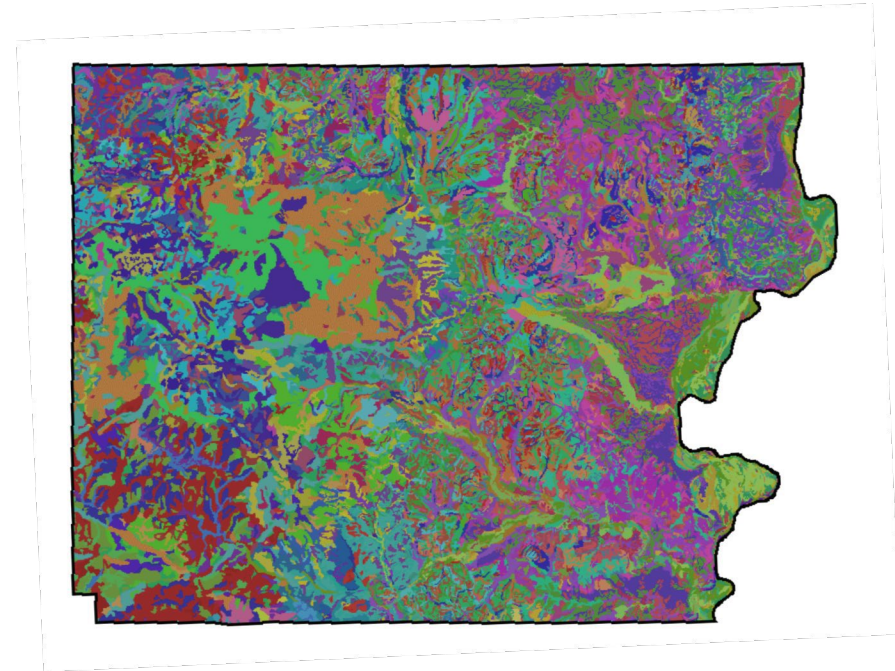




# About USDA-NRCS Soil Databases

## 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



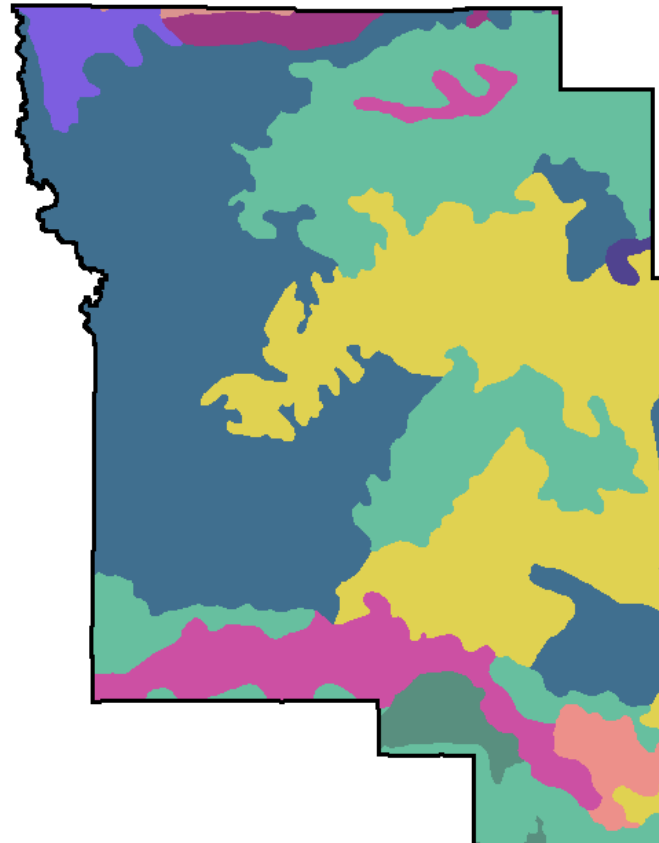
[Click For More Information About SSURGO](#)



# 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](#)



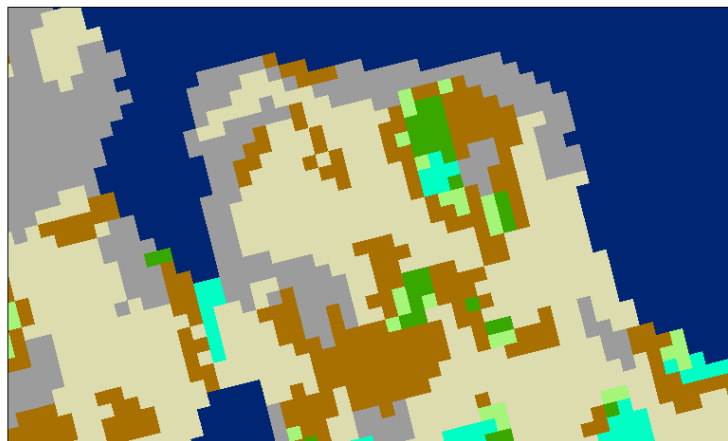
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# About USDA-NRCS Soil Databases

## 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 2021, published RSS only available for small areas of Minnesota, North Carolina, North Dakota, Tennessee, and Vermont
  - Number of RSS are expected to increase in coming years



# How gNATSGO Was Built



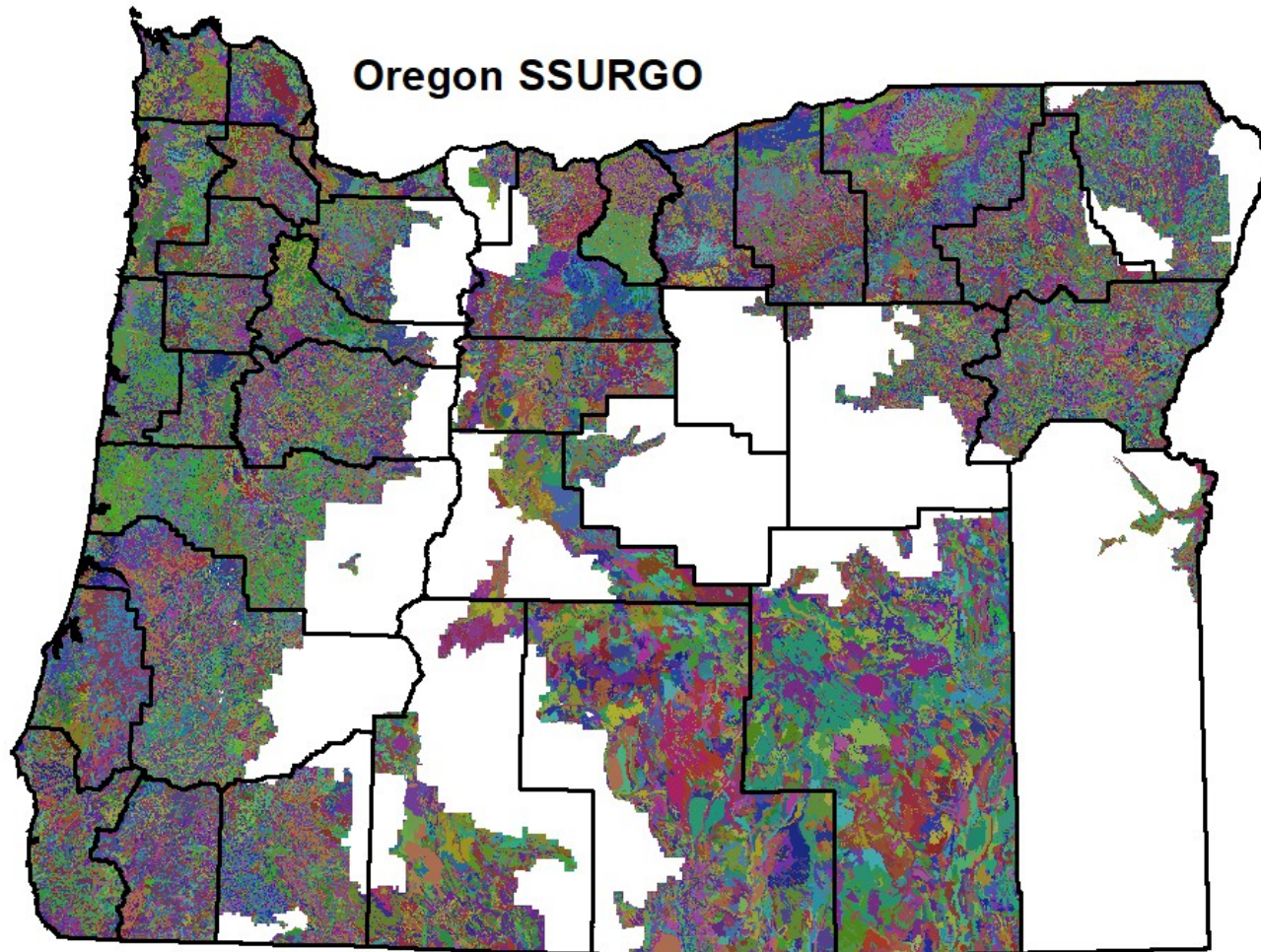
1. Started with SSURGO
2. Identified areas of SSURGO without soils information and then merged in STATSGO2 for those areas
3. Burned in published RSSs, replacing any SSURGO or STATSGO2 information

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





# Start with Incomplete SSURGO

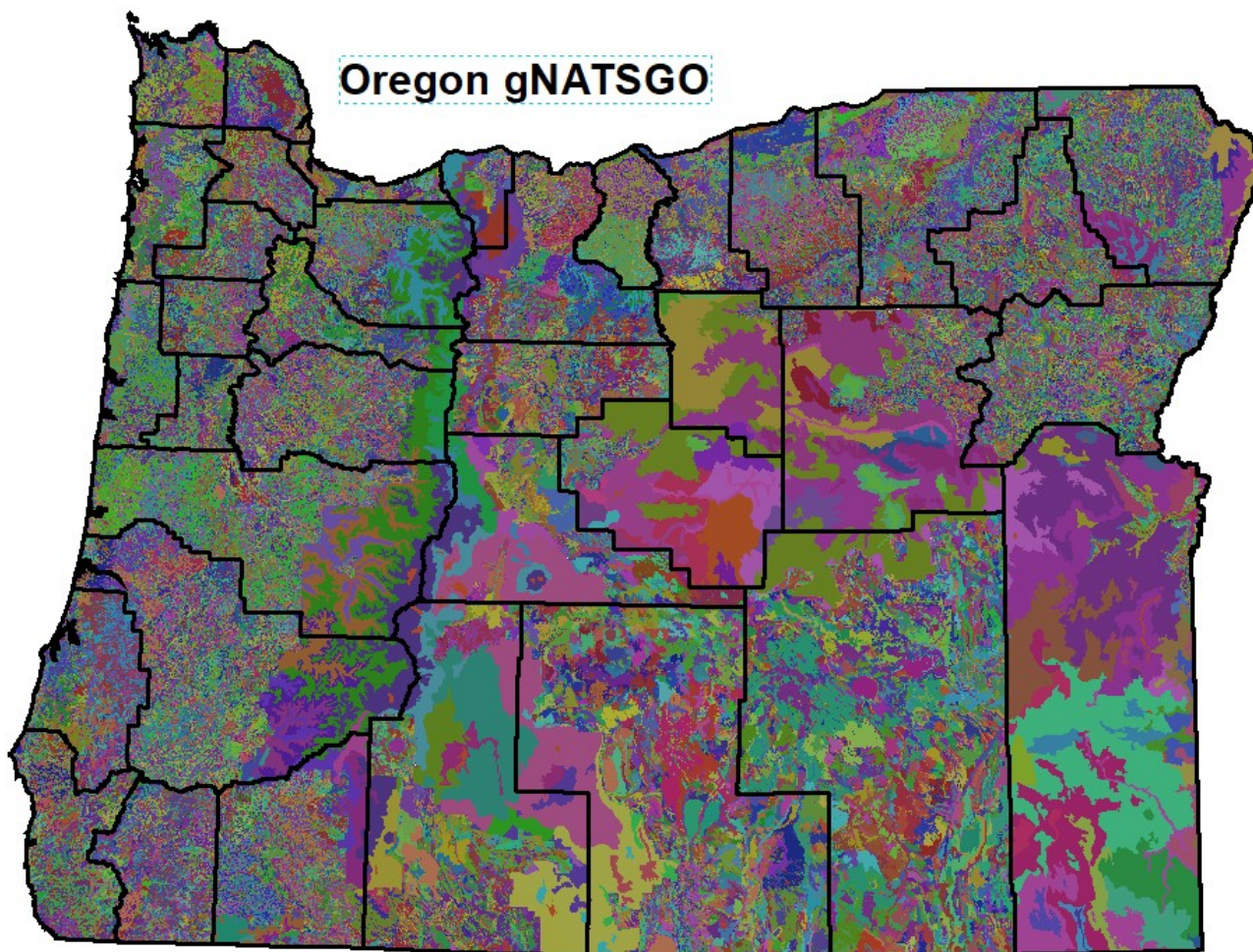


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# Fill SSURGO Gaps with STATSGO2



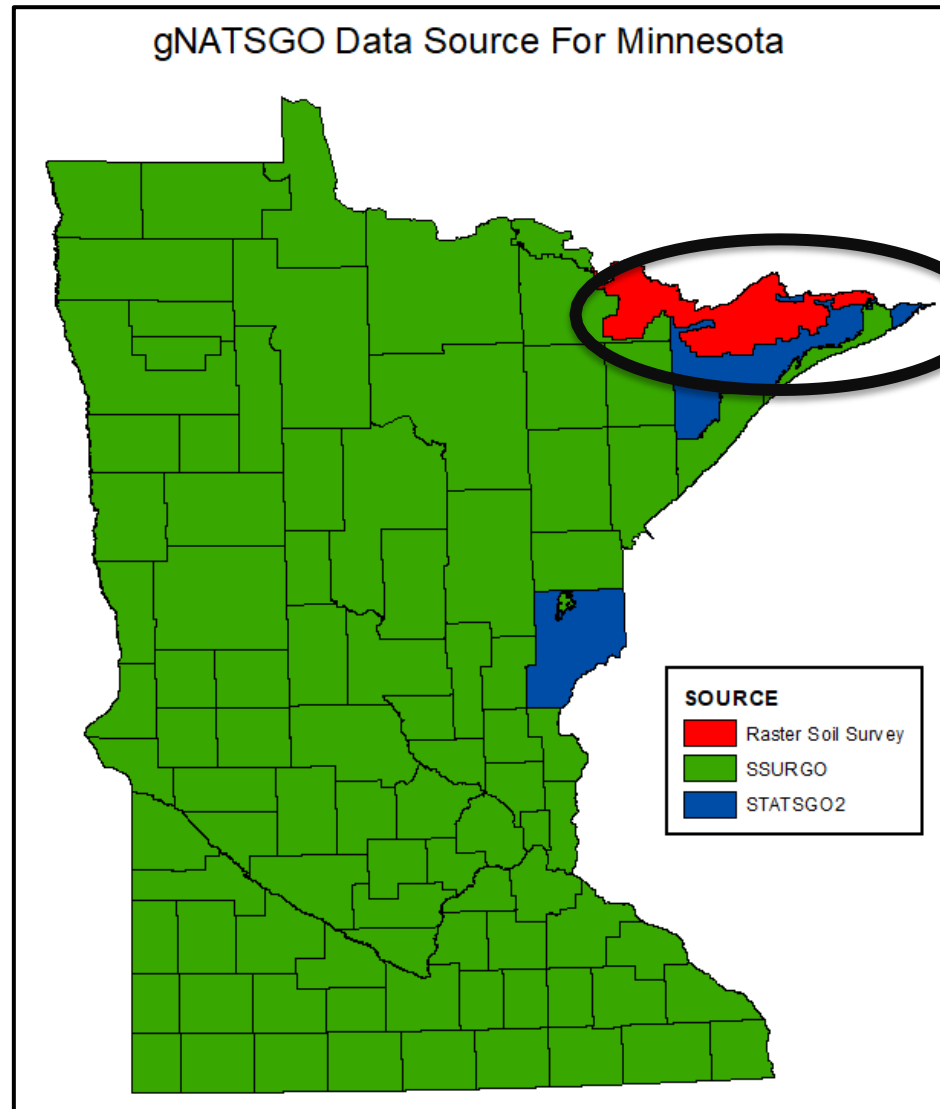
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# Burn in Raster Soil Survey When Available



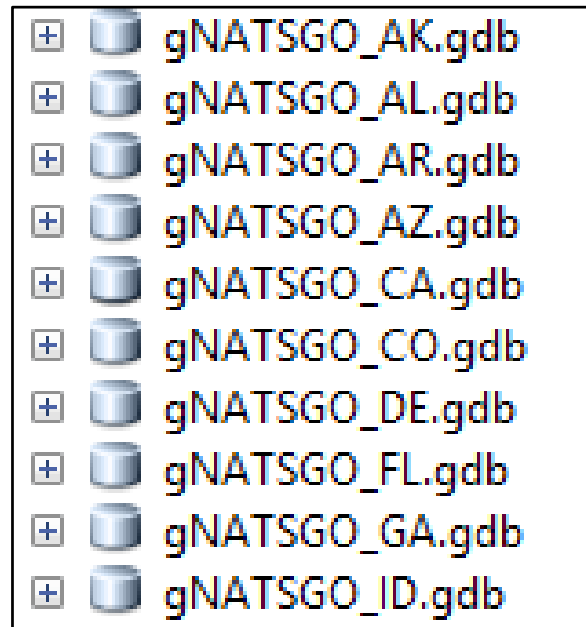
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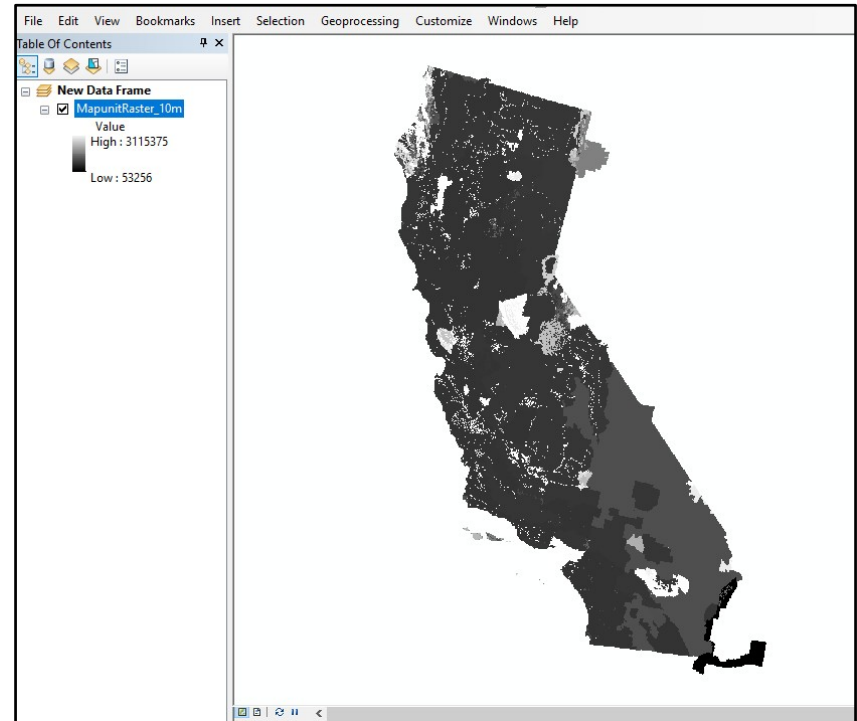
# What's in the gNATSGO database?

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



# What's in the gNATSGO database?

- Contains relationship classes that define relationships between tables

- zChaashto\_Chorizon
- zChconsistence\_Chorizon
- zChdesgnsuffix\_Chorizon
- zChfrags\_Chorizon
- zChorizon\_Component
- zChpores\_Chorizon
- zChstruct\_Chstructgrp
- zChstructgrp\_Chorizon
- zChtext\_Chorizon
- zChtexture\_Chtexturegrp
- zChtexturegrp\_Chorizon
- zChtexturemod\_Chtexture
- zChunified\_Chorizon
- zCocanopycover\_Component
- zCocropyld\_Component
- zCodiagfeatures\_Component
- zCoecoclass\_Component
- zCoeplants\_Component
- zCoerosionacc\_Component
- zCoforprod\_Component
- zCoforprodo\_Coforprod
- zCogeomordesc\_Component
- zCohydriccriteria\_Component
- zCointerp\_Component
- zComonth\_Component

- zComonth\_Component
- zComponent\_Mapunit
- zCopm\_Copmgrp
- zCopmgrp\_Component
- zCopwindbreak\_Component
- zCorestrictions\_Component
- zCosoilmoist\_Comonth
- zCosoiltemp\_Comonth
- zCosurffrags\_Component
- zCosurfmorphgc\_Cogeomordesc
- zCosurfmorphhpp\_Cogeomordesc
- zCosurfmorphmr\_Cogeomordesc
- zCosurfmorphss\_Cogeomordesc
- zCotaxfmmmin\_Component
- zCotaxmoistcl\_Component
- zCotext\_Component
- zCotrestomng\_Component
- zCotxfmother\_Component
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- zLegendtext\_Legend
- zMapunit\_Legend

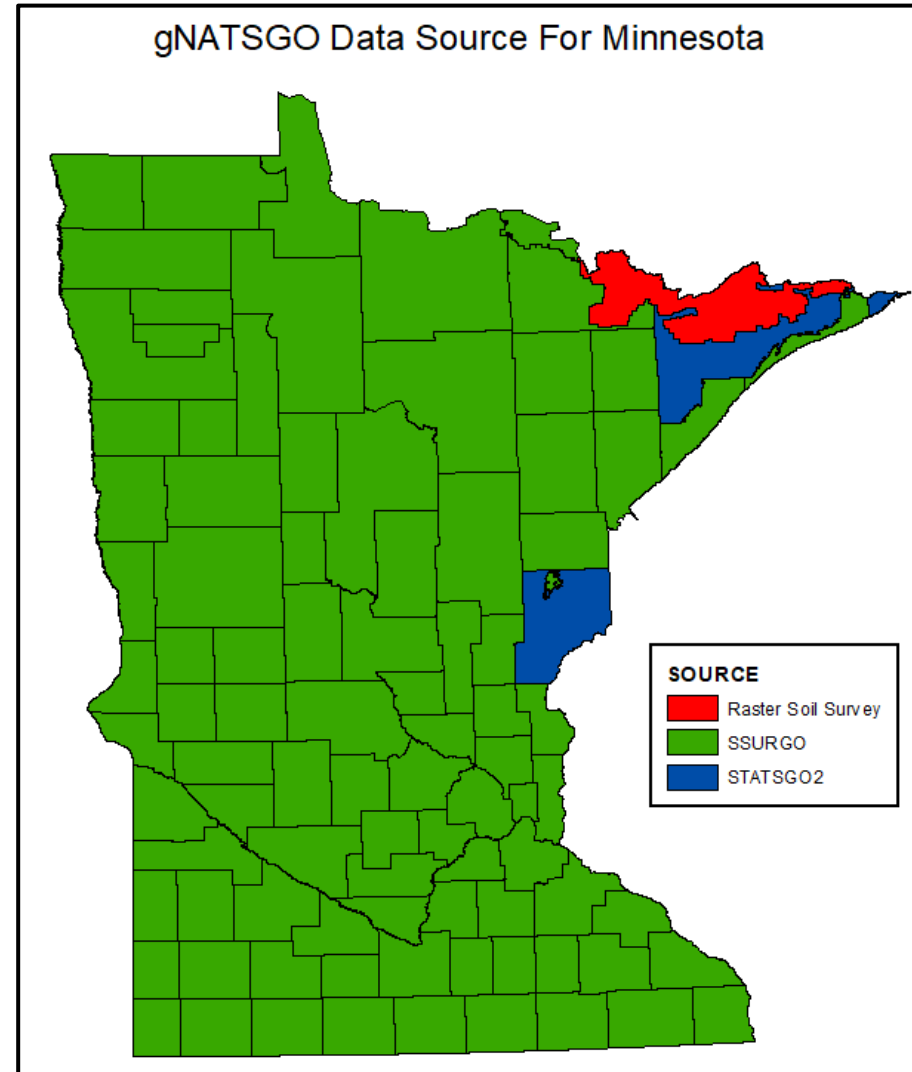


# What's in the gNATSGO database?

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

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

SOURCE
SSURGO
SSURGO
SSURGO
SSURGO
SSURGO
SSURGO
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STATSGO
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STATSGO
STATSGO
STATSGO



# 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 2021, these tools do not work in ArcPro

[Download gSSURGO Toolbox](#)

[Download gSSURGO Toolbox User Guide](#)

[Download gSSURGO Mapping Quick Guide](#)

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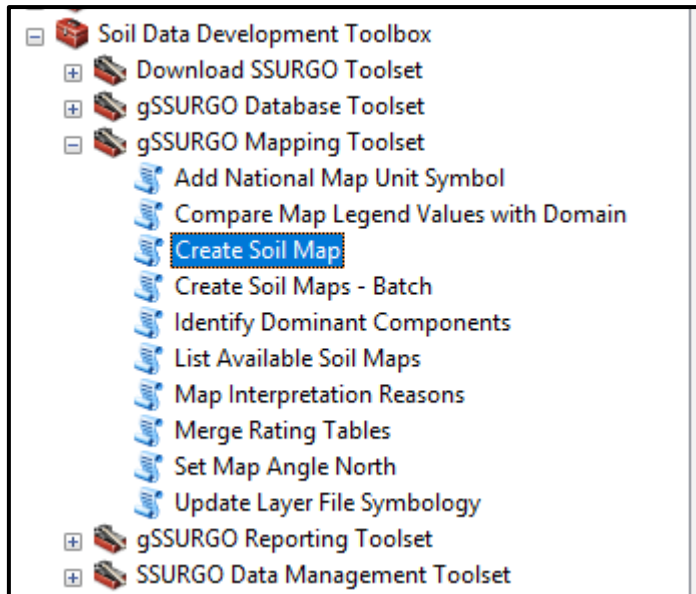
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# Working With gNATSGO



## 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

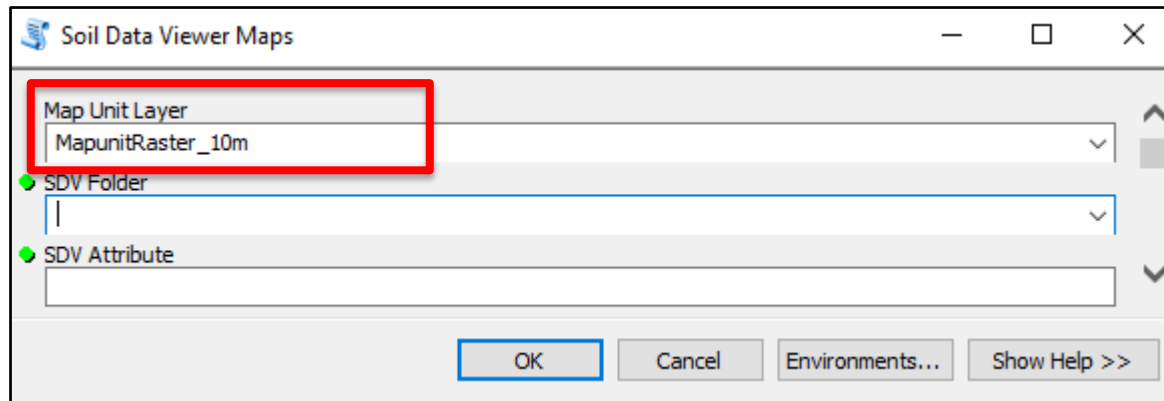




# Working With gNATSGO



## gSSURGO Tools – Create Soil Map



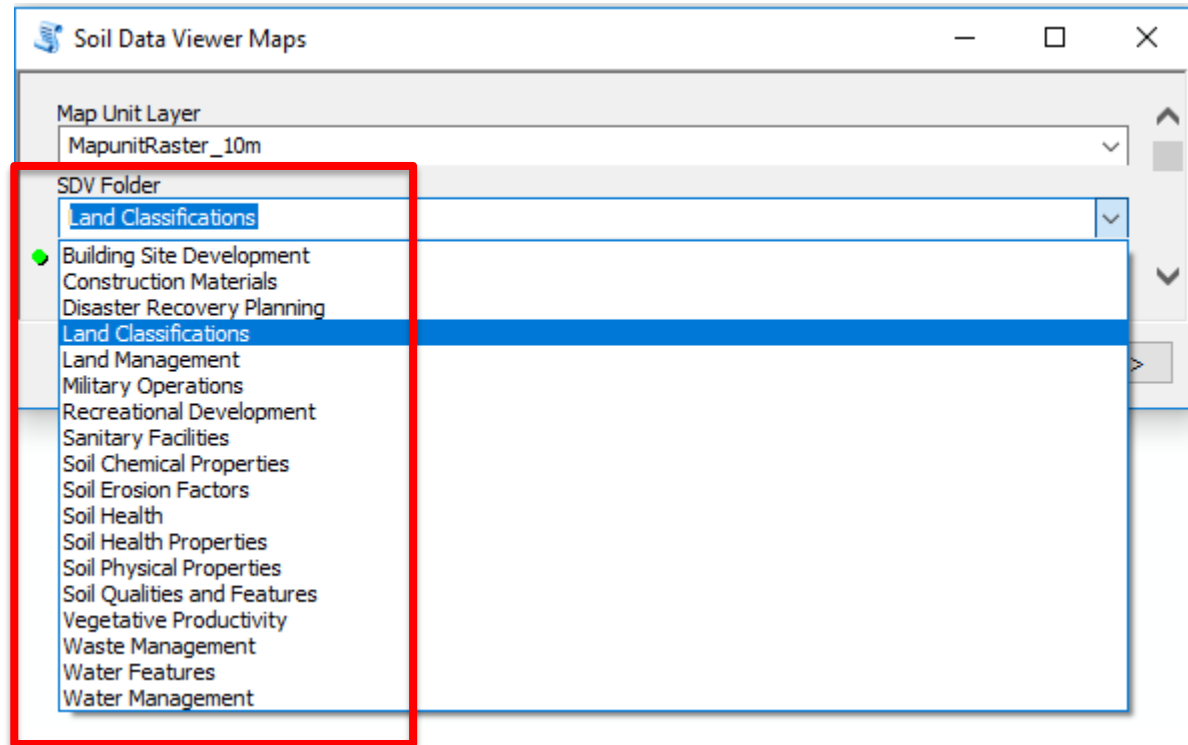
### 1. Select the 10 meter gNATSGO



# Working With gNATSGO



## gSSURGO Tools – Create Soil Map



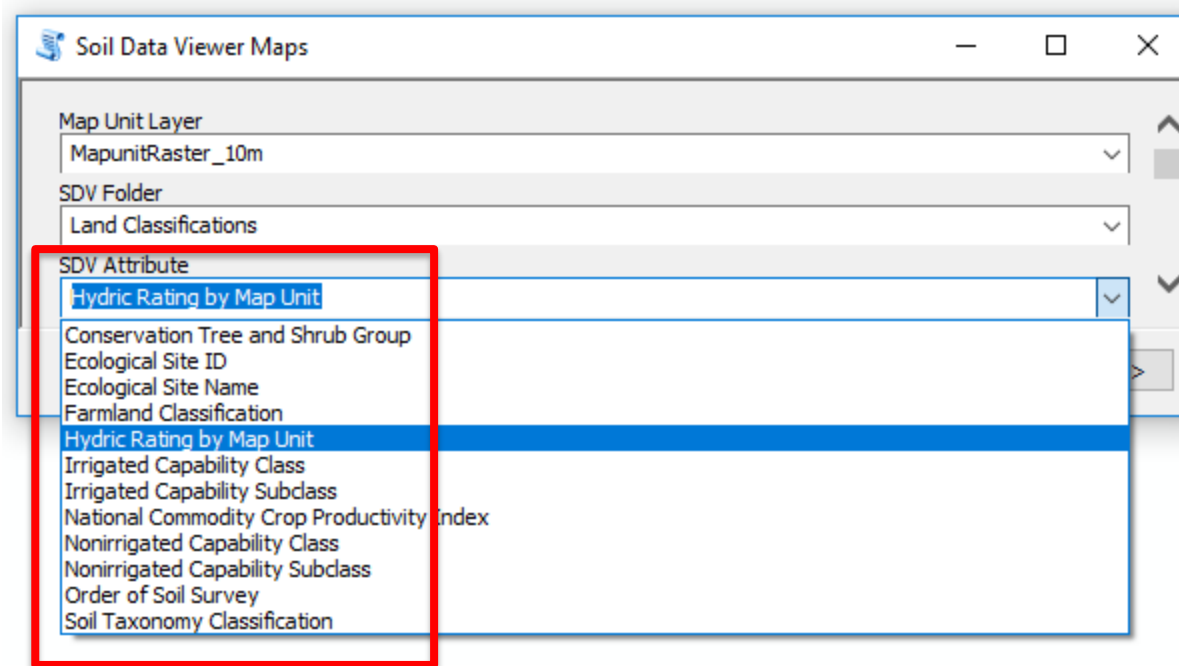
2. Choose the Soil Data Viewer Attribute folder, which is used to categorize the specific attributes



# Working With gNATSGO



## gSSURGO Tools – Create Soil Map



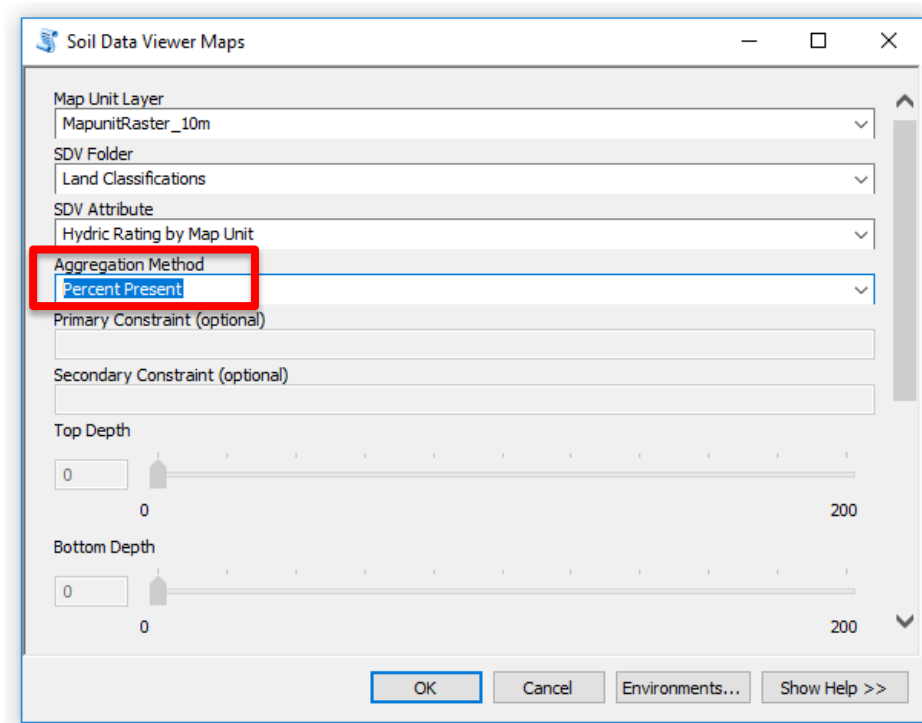
3. Choose the attribute that you want to make a thematic map of



# Working With gNATSGO



## gSSURGO Tools – Create Soil Map



### 4. Choose aggregation method and other optional constraints

- Default aggregations typically suffice



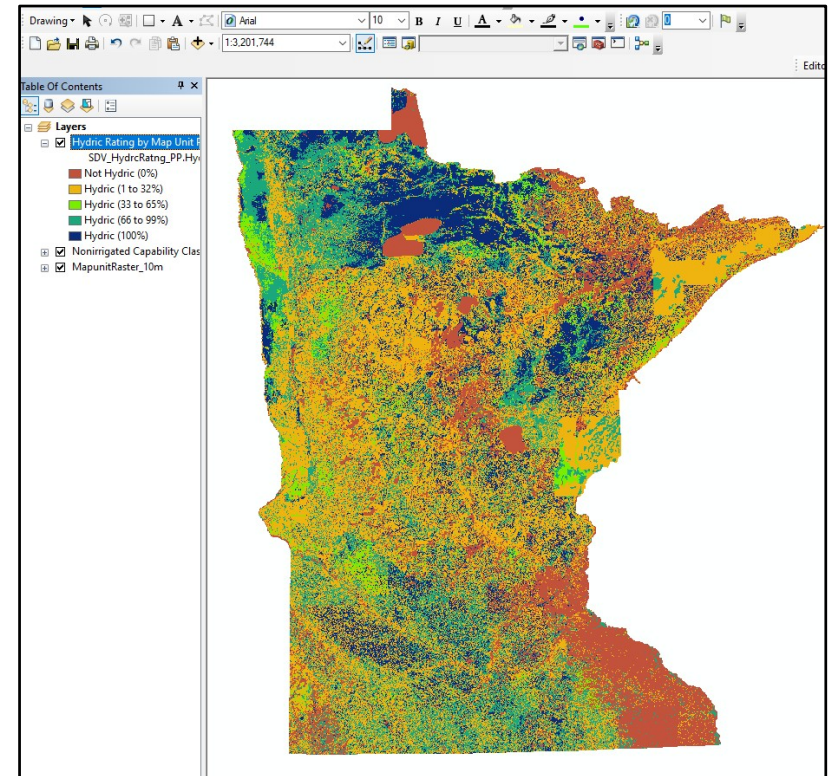
# Working With gNATSGO



- **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

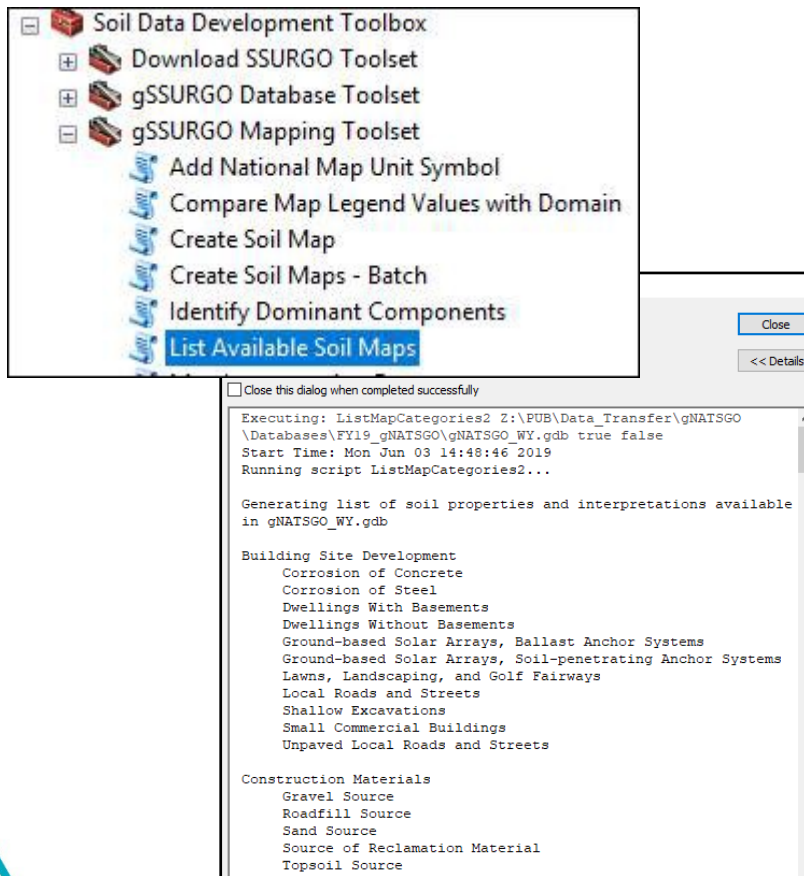




# Working With gNATSGO



## 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@lin.usda.gov](mailto:SoilsHotline@lin.usda.gov)





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