



NRCS National Wetland Conservation (WC) Tool

State Tool Administrator Guide

Version – 1.0.9

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Overview

Purpose

The Natural Resources Conservation Service (NRCS) makes Certified Wetland Determinations to locate and certify the existence of wetlands subject to the Food Security Act's conservation provisions. The Wetland Conservation Tool (WC Tool) was created through an NRCS of the Future initiative to improve the quality, consistency, and timeliness of these determinations. The WC Tool consists of a series of toolboxes in a customized ArcGIS Pro template that guides the user through the wetland determination mapping process and produces required documentation and client products. The WC Tool uploads completed geospatial records for improved management of certified wetland determination geospatial records and workload. This geospatial information is published for use in Conservation Desktop and provides unique but complimentary functionality to the Conservation Desktop HELC/WC Determination Tracking Tool. This Administrator Guide provides instructions to State Tool Administrators to implement and deploy the tool in their state.

State Tool Administrator

The WC Tool is designed to be customized and distributed at the State level by one or more staff members designated by the State Conservationist (e.g., Business Tools Specialist, GIS Specialist, Compliance Specialist, and/or Area staff or Subject Matter Expert positions). This guide refers to the designated staff member(s) as the State Tool Administrator. The State Tool Administrator is responsible for customizing and deploying the WC Tool to their state, providing access to the WC Tool for their employees in the USDA Portal Groups, and training and supporting the WC Tool within their state.

User Requirements

Wetland Conservation Job Approval Authority (JAA) - The WC Tool is exclusively intended for making Food Security Act (FSAct) Certified Wetland Determinations. Use of the tool assumes knowledge of FSAct procedures and State designated JAA for making Wetland Determinations.

GIS Skills – The WC Tool requires use of ArcGIS Pro. Users require basic skills in ArcGIS Pro navigation, digitizing, and map layout creation. Support from the State GIS Specialist and/or State Tool Administrator is required to ensure that users properly install and use the WC Tool.

System Requirements

This WC Tool requires the following software and accounts.

1. *ArcGIS Pro version 2.7.3 or higher.*
2. *R for Windows 4.1.3 and R Studio 2022.02.1 + 461.*
3. *User account access to USDA GeoPortal, GIS States Portal along with membership in the NRCS WC Tool group.*

Food Security Act

Resources related to the NRCS Wetland Conservation provisions can be found in the Highly Erodible Land and Wetland Conservation section of the [NRCS Share Point](#), the [Conservation Compliance and USDA Programs](#) webpage, in the [eDirectives](#) under Manuals → Title 180, and in the [Code of Federal Regulations](#).

State Tool Administrator Deployment Workflow

The following outline shows the steps that a State Tool Administrator needs to perform to download, configure, and deploy the tool in their state. The remaining sections of this guide provide details for each step.

- Setup State Tool Administrator Roles
- Manage State WC Tool Users in Portals
- Install Base Software – ArcGIS Pro, R for Windows, and RStudio
- Install the WC Tool
- Create State APRX Template(s)
- Update NRCS Addresses Spreadsheet
- Deploy WC Tool within the State
- Train and Support WC Tool Users within the State

Production vs Training

The WC Tool is deployed in both a Production and Training version. Each version consists of a unique ArcGIS Pro template project (APRX) in the same install folder. This guide is written from the standpoint of configuring and deploying the Production version of the tool. However, additional steps for also deploying a Training version are called out, where applicable.

Both the Production and Training tools interact with the USDA ArcGIS Portal web environments – GeoPortal and GIS States Portal. The Portals accessed by the tools vary slightly, in the following manner:

- **GeoPortal** is accessed by both the Training and Production versions of the WC Tool to download the Common Land Units needed for requests.
- **GIS States Portal** is used by the Production and Training versions of the WC tool for screening existing data and uploading results. The Production data and Training data are maintained in separate sets of data layers that do not synchronize with each other.

When deploying the WC Tool in your state, it is important to clearly label any Training ArcGIS Pro templates (APRX files) appropriately. Users that open training templates will be connected to the Training WC Tool data layers GIS States Portal and their work will not be saved, long term, because the training data may be reset from time to time as tool updates are developed. This is appropriate for training data, but clear guidance should also be provided to direct your staff to use the production version of your state templates when conducting actual work.

Setup State Tool Administrator Roles

State Tool Administrators will need to have accounts on three different USDA ArcGIS Portals to use the WC Tool. In addition, they will need to belong to the *NRCS WC Tool Group* (GIS States Portal) as a *Group Manager* to add or remove access to the WC Tool for employees. As a State Tool Administrator, please complete the following steps to configure your portal accounts to request the *Group Manager* role in the *NRCS WC Tool* groups, if not done already.

GeoPortal Account

This section describes how to create a GeoPortal Account so that you can access the CLU layer in the Production and Training versions of the WC Tool. You do not need to complete this section if you already have a GeoPortal account.

- Open Chrome or Edge, or a new tab in one of those browsers.
- Navigate to <https://gis.sc.egov.usda.gov/portal/home>
- Click *Sign In* in the top-right corner of the screen to sign-in with your LincPass or Eauth.



Figure 1: A screenshot of the GeoPortal home page with the Sign In button present.

- After signing-in, you are done with GeoPortal account setup. Your account on GeoPortal only needs to exist to access CLUs.

GIS States Portal and the NRCS WC Tool Group

This section describes steps for a State Tool Administrator to create a GIS States Portal Account and request the *Group Manager* membership role in the *NRCS WC Tool* group. This Portal is used for the Production version of the tool.

- Open Chrome or Edge, or a new tab in one of those browsers.
- Navigate to <https://gis-states.sc.egov.usda.gov/portal/home>. It is suggested to bookmark this site if you haven't already.
- Click *Sign In* in the top-right corner of the screen to sign-in with your LincPass or Eauth.



Figure 2: A screenshot of the GIS States Portal home page with the Sign In button present.

- After signing-in, click *Groups* from the links across the top of the page.

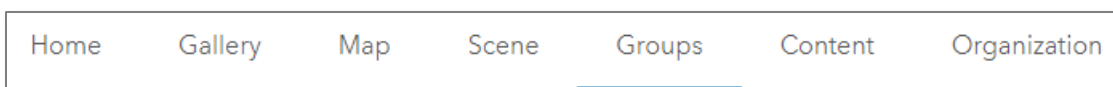


Figure 3: A screenshot of the Portal menu with Groups selected.

- Review your Groups for the *NRCS WC Tool* Group.
- If you find the *NRCS WC Tool* group in your existing Groups:
 - Click the *NRCS WC Tool* Group name.
 - From the blue toolbar across the top, click *Members*.
 - Search for your own name to review your role. Try with both normal case or all caps to find your name. Note: Search does not support the use of “AND” or “OR” operators.
 - If you find your name and your role is already *Group Manager*:
 - You have appropriate access as a State Tool Administrator and are done here.
 - If you find your name and your role is *Member*:
 - E-mail bethany.l.munoz@usda.gov to request an upgrade to the *Group Manager* role for the *NRCS WC Tool* group on GIS States Portal. Do **not** use the built-in *Request Access* or *Join Group* functions.
- If you do not find the *NRCS WC Tool* group in your existing Groups:
 - E-mail bethany.l.munoz@usda.gov to request membership and the *Group Manager* role for the *NRCS WC Tool* group on GIS States Portal. Do **not** use the built-in *Request Access* or *Join Group* functions.

Once you are a *Group Manager* in the *NRCS WC Tool* group, you can add or remove any *Members* to manage your state's users in the group (see the next section).

Manage State WC Tool Users in Portals

As a *Group Manager* for the *NRCS WC Tool* (production) group, State Tool Administrators are responsible for adding and removing employees from their state to control employee access to WC Tool data. Employees cannot use the WC Tool without belonging to the *NRCS WC Tool* group. States can manage the access request process to this group as they see fit.

Add a Group Member

- Instruct an employee to sign-in to the [GIS States](#) home page (automatically creates an account for them on first sign-in). Sign-in must be completed before a State Tool Administrator can enroll the employee the *NRCS WC Tool* group.
- Instruct the employee to notify you or a fellow State Tool Administrator after they sign-in.
- As a State Tool Administrator, sign-in to the GIS States portal.
- Click *Groups*.

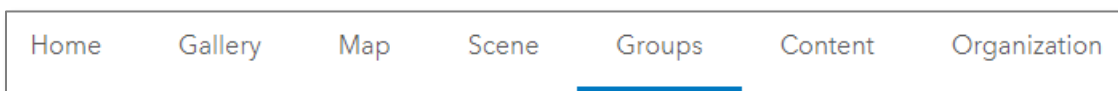


Figure 6: A screenshot of the Portal menu with Groups selected.

- Open the *NRCS WC Tool* Group.

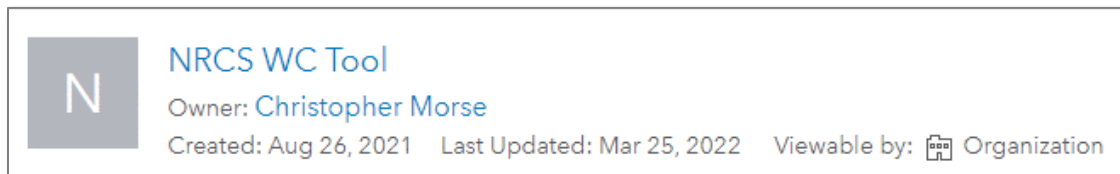


Figure 7: A screenshot of the NRCS WC Tool information tile in GIS States Portal.

- Click *Invite users*.

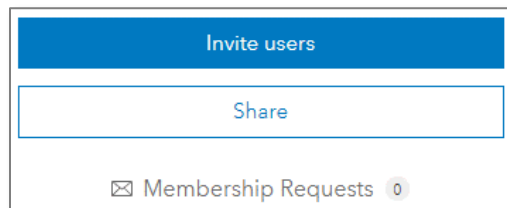


Figure 8: A screenshot of the Invite users button.

- Search for the employee's name.
- Select the employee's record so that it has a check mark.
- Make sure the box for *Add organization members without requiring confirmation* is active and then click *Add to group*.
- Do **not** promote normal users to the *Group Manager* role.
- Notify the employee that they now have access.

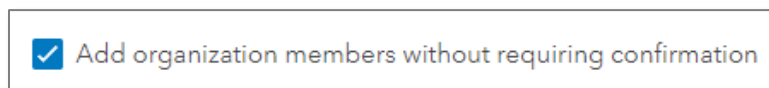


Figure 9: A screenshot of the bypass confirmation notification checkbox.

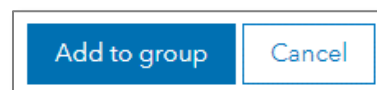


Figure 10: A screenshot of the Add to group button.

Remove a Group Member

- As a State Tool Administrator, sign-in to the GIS States portal.
- Click *Groups*.

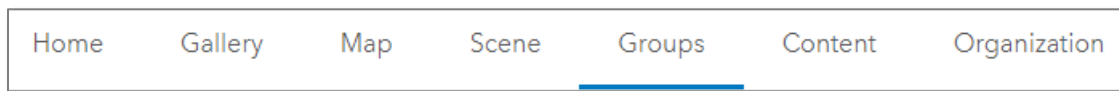


Figure 11: A screenshot of the Portal menu with Groups selected.

- Open the *NRCS WC Tool* Group.

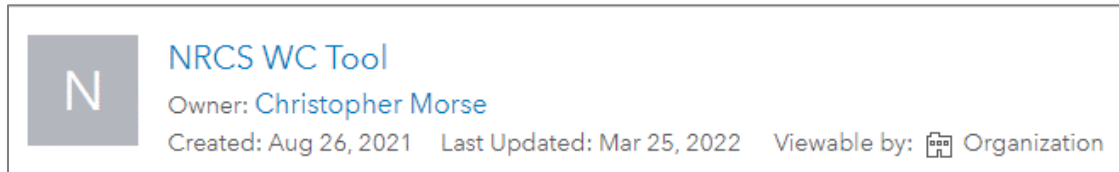


Figure 12: A screenshot of the NRCS WC Tool information tile in GIS States Portal.

- Click *Members*.



Figure 13: A screenshot of the user menu within Portal with Members selected.

- Find the employee's name within the existing group members list and select it.
- Once selected, click *Remove Member From Group*.

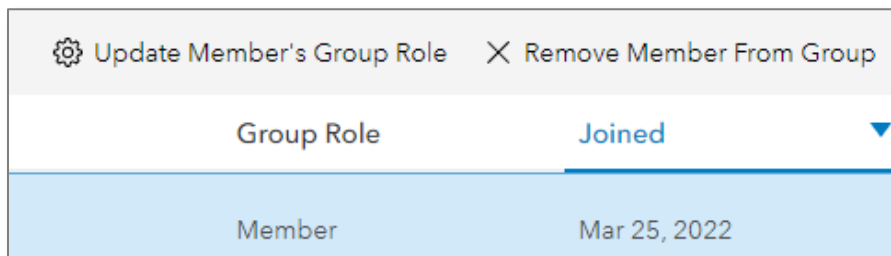


Figure 14: A screenshot of a selected member with the Remove Member From Group context command visible.

Grant CLU Access

As a State Tool Administrator, you will also need to instruct users to have a GeoPortal account, however they do not have to be added to a Group on GeoPortal.

- Instruct an employee to sign-in to the [GeoPortal](#) home page.
- An account either exists or is automatically created for them on first sign-in.
- They now have access to download up to date CLUs within the WC Tool.

Install Base Software

Install ArcGIS Pro

The WC Tool is built within ArcGIS Pro. ArcGIS Pro can be installed by users from Software Center and is also required by State Tool Administrators to configure the WC Tool. As a large program, it is recommended to perform the install while connected to the USDA network via the best available network connection, typically the Service Center or duty station for an employee. As of the release of WC Tool 1.0.5, ArcGIS Pro 2.7.3 or higher is supported, but version 2.9.1 or higher is recommended. If earlier versions of ArcGIS Pro are required by any other tools in your state, the following versions are supported by the WC Tool:

- **ArcGIS Pro 2.7.3** – Install ArcGIS Pro 2.7.26828 followed by ArcGIS Pro Patch 2.7.3

OR

- **ArcGIS Pro 2.8.3** – Install ArcGIS Pro 2.8.29751 followed by ArcGIS Pro Patch 2.8.3

OR

- **ArcGIS Pro 2.9.3** – Install ArcGIS Pro 2.9.32739 followed by ArcGIS Pro Patch 2.9.3

Users can request ArcGIS Pro installation through the CEC Help Desk if they have trouble installing it from Software Center.

License ArcGIS Pro

USDA employees are generally advised to configure Concurrent Licensing for ArcGIS Pro from the USDA license servers. Please refer to the *Licensing* section of the [Getting Started with ArcGIS Pro](#) guide from FPAC-GEO for details on configuring licenses. When instructing users to install and license ArcGIS Pro in your state, be sure to include licensing instructions appropriate to your state, either from the *Getting Started with ArcGIS Pro* guide or your state's equivalent document. Note that Portals guidance in this document supplements or exceeds the Portals guidance from the *Getting Started with ArcGIS Pro* guide.

Install R for Windows and RStudio

R for Windows and RStudio can be installed by users from Software Center and are required to use the WC Tool. These two programs are small enough to be installed either onsite at a USDA Service Center, or offsite while using VPN. Installation of new versions of R for Windows or RStudio can be performed from Software Center without uninstalling previous versions.

- Install *R for Windows 4.2.0*, or the latest version available
- Install *RStudio 2022.02.1 + 461*, or the latest version available

Users can request R and RStudio installation through the CEC Help Desk if they have trouble installing them from Software Center.

Install the WC Tool

Delete Existing Install

Old versions of the WC Tool should be deleted prior to downloading a new version. This section is only needed if you have pre-existing versions of the WC Tool, and previously run projects.

- Open *File Explorer* and navigate to *C:\GIS_Tools*, or to the other location your state has designated for tool installation.
 - (OPTIONAL) Go to the ... \SUPPORT\Templates folder within the existing install and copy the *NRCS_Address.xlsx* file. Paste it elsewhere on your system to be retained for future reference.
 - At the installation location level (e.g., *C:\GIS_Tools*) select and delete the *NRCS_Wetland_Tools_Pro* folder.
- Navigate to *C:\Determinations*, if it exists.
 - **Real Sites Run for Production:** Backup project folders to an external drive. Then delete the project folders from *C:\Determinations*. Any in-progress projects may need to be started over in the new version.
 - **Test Sites Run for Training:** Delete these project folders from *C:\Determinations*.

Download the WC Tool

The WC Tool is available for download from the following repositories or links by State Tool Administrators, and not normal users. State Tool Administrators should use these locations to download the generic version of the WC Tool prior to applying State-level customizations. After applying customizations, State Tool Administrators should repackage their custom version of the tool and deploy it within their state according to the state's preferred distribution methods (note: e-mail is not recommended).

- [National NRCS HELC/WC SharePoint – GIS Tools Folder](#)
- Microsoft Teams (requires Team membership, view the Files tab):
[National Wetland Tool Team, General page](#)
- GitHub:
<https://github.com/USDA-NRCS/Wetland-Tools---ArcGIS-Pro>

Unzip the WC Tool

The WC Tool must be unzipped so that it resides in the **C:\GIS_Tools** directory on the computer. If this directory does not exist, it may need to be created prior to unzipping.

The resulting installation path should be **C:\GIS_Tools\NRCS_Wetland_Tools_Pro** and appear per the screenshot to the right.

Note: Slight variations in individual folders and files may exist, compared to this screenshot.

Please verify that you do not nest the installed folder into a deeper path such as:

C:\GIS_Tools\GIS_Tools\NRCS_Wetland_Tools_Pro.

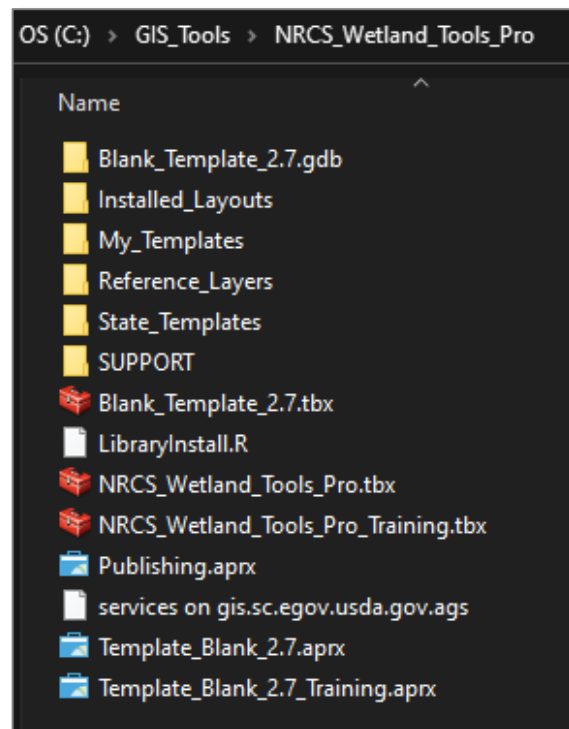


Figure 15: A screenshot of the install directory during development.

Create Determinations Directory

The **C:\Determinations** folder must be created if it doesn't exist already.

- Open *File Explorer* and navigate to the **C:** drive.
- Confirm that a *Determinations* folder exists.
 - If it does not exist, create a new folder at the **C:** drive level and name it *Determinations*. This should result in a folder of **C:\Determinations** now being present on your system.

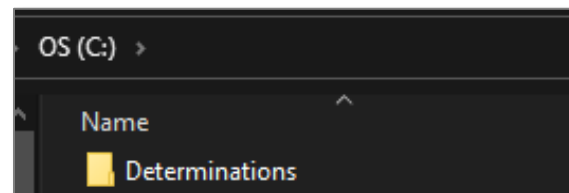


Figure 16: A screenshot of the C:\Determination folder, where determination project folders are stored by the tool.

Configure R

The WC Tool comes with an R file that must be run in RStudio to setup the packages that will build the letters and forms at the end of the workflow. This requires each user to run these steps after unzipping the WC Tool. The instructions are provided here for reference, and State Tool Administrators are encouraged to perform them to gain familiarity with the process. Running these steps are strongly encouraged after any new install or version update to the WC Tool.

- Close ArcGIS Pro (if it is open).
- Navigate to `C:\GIS_Tools\NRCS_Wetland_Tools_Pro` and double-click **LibraryInstall.R**. This will open the script in R Studio.

Note: The “.R” file name extension may not be visible if your system hides file extensions.

- Manually run the code, below, in the RStudio window.
- **One at a time, highlight the indicated code line(s), below, and then click the *Run* icon.**

Note: The red font color in the RStudio Console window does not indicate an error in the script.

- Highlight line 20. Click Run. Wait for the code to stop running. If there is no package to be removed, the script will indicate an error. It is okay to proceed past the error.
- Highlight lines 23-24. Click Run. Wait for the code to stop.
- Highlight line 27. Click Run. Wait for the code to stop.
- Highlight line 30. Click Run. Wait for the code to stop. This may take some time to complete.
- Highlight line 33. Click Run. Wait for the code to stop.



Figure 17: A view of the lines to be highlighted and run in the R file, indicated by line number and outline boxes shown in this graphic.

- After running all code blocks is complete, close RStudio:
 - Click *File > Quit Session....*
 - Click Save workspace if prompted.

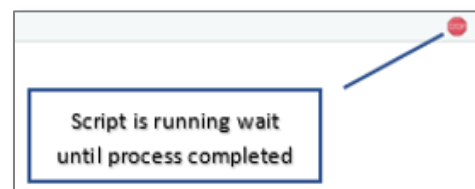


Figure 18: An example of the red status light in RStudio when code is running. Do not start the next block while this indicator remains red.

Configure ArcGIS Pro

Configure ArcGIS Pro General Options

For best results, the Project Recovery setting in ArcGIS Pro should be disabled. This prevents inadvertent file locks being applied to temporary datasets used for processing in the tools if a script fails or if ArcGIS Pro crashes. These steps are needed after any ArcGIS Pro install or patch.

- Open any ArcGIS Pro project (blank or existing).
- Click *Project* or *Settings*, then click *Options*, and then click *General*.
- Expand *Project Recovery* and disable the *Create a backup...* option.

Configure arcgisbinding

The WC Tool requires ArcGIS Pro to be linked to R through the arcgisbinding package. Each user needs to perform these steps after running the RStudio steps in the previous section. The instructions provided here are for reference, and State Tool Administrators are encouraged to perform them to gain familiarity with the process. Repeat these steps after any new install or version update to the WC Tool.

- Open any ArcGIS project (blank or existing).
- Click *Project*, then click *Options*, and then click *Geoprocessing*.
- Under R-ArcGIS Support, review the *Detected R home directories*.
 - Click the dropdown and select the R installation.
Note: If clicking this dropdown causes an error, please make sure your ArcGIS Pro version is 2.7.3 or higher.
 - If an R installation folder isn't listed, make sure you completed all previous R and RStudio installation and setup steps. If so, you can manually navigate to and select the standard R installation path which is **C:\Program Files\R\R-<version number>**.
- Beneath the R home directory setting, look for the *arcgisbinding* package installation status.
 - If already installed, it should be at least version 1.0.1.244.
 - If you have an earlier version number, click the drop-down and select *Check Package for Updates* and then install the updates
 - If no version is already installed, select the drop-down and click *Install package from the internet*.

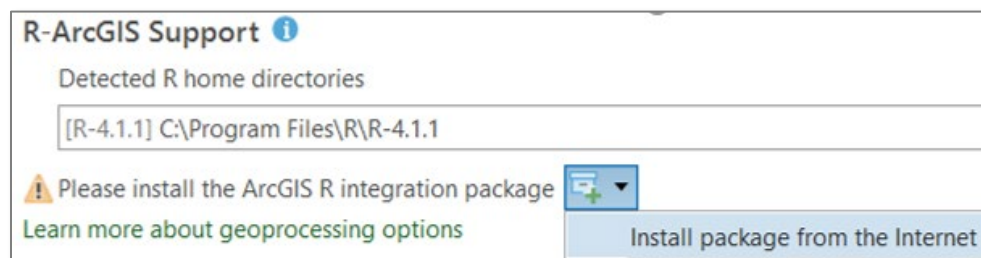


Figure 19: A screenshot of the R-ArcGIS Support options where an R install directory has been set and the ArcGIS R integration package menu for installation is available.

Configure Portals in ArcGIS Pro

The WC Tool connects to various USDA GIS Portals depending on whether you are using the Production or Training version. Previous steps in the setup had administrators and employees create their accounts and join Groups, but the steps in this section are specific to configuring access to these Portals within ArcGIS Pro. It is recommended that each user add these Portals in ArcGIS Pro after installing or updating ArcGIS Pro.

- Launch ArcGIS Pro (**Start → ArcGIS → ArcGIS Pro**). In the lower-left corner of the Pro window, click **Settings**. From the list of settings, click **Portals**.
Note: If you are in an active project, click the **Project** tab to access the **Portals** menu.
- A list of portals will be displayed. It will contain ArcGIS Online (www.arcgis.com) by default, and any portals you've previously added. For first time users, only ArcGIS Online will be visible.

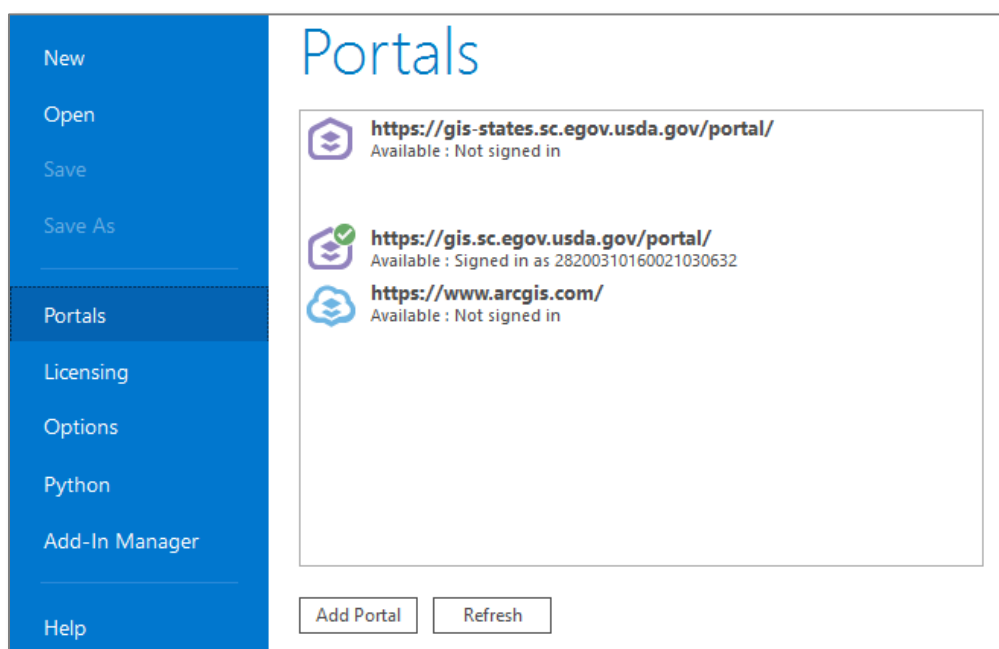


Figure 20: A screenshot example of additional portals configured in Pro for use with the WC Tool.

- If any of the following portals are missing, click **Add Portal**, type the URL for the portal to add, and then click **OK**. Repeat this step to add each of the following portals not already on your list:

GeoPortal:

<https://gis.sc.egov.usda.gov/portal>

GIS States Portal:

<https://gis-states.sc.egov.usda.gov/portal>

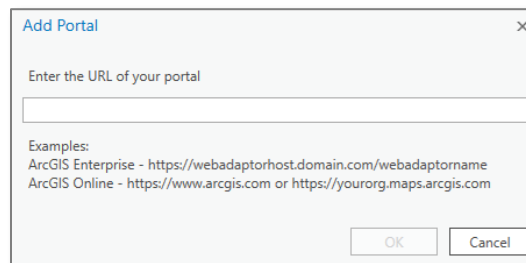


Figure 21: An example of the interface to enter a new Portal address.

Customize State APRX Template(s)

State Tool Administrators must create one or more State Templates prior to deploying the tool in their state. Typically, it is also a best practice to create or update State Templates whenever a new version of the tools is released.

Create State Template File

A State Tool Administrator should create at least one template per UTM Zone in their state. An administrator may create additional templates to accommodate staffing structure and/or geodata deployment in their state, as needed.

- Navigate to **C:\GIS_Tools\NRCS_Wetland_Tools_Pro** and open the *Template_Blank_2.7.aprx* file. When the file opens, you may be prompted to sign-in to GeoPortal.
- Click *Project* → *Save As...*
- Navigate to:
C:\GIS_Tools\NRCS_Wetland_Tools_Pro\State_Templates.
- Give the template an appropriate name for its geography. You may also want to include the UTM zone in the name, if necessary.
Example: *Indiana_WC_Template_Zone16*
- Click *Save*.

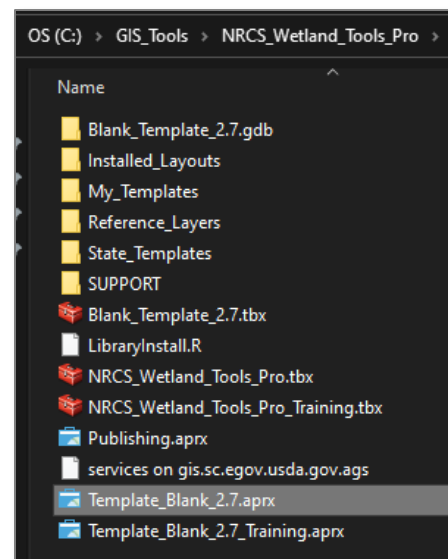


Figure 22: An example of the WC Tool install directory.

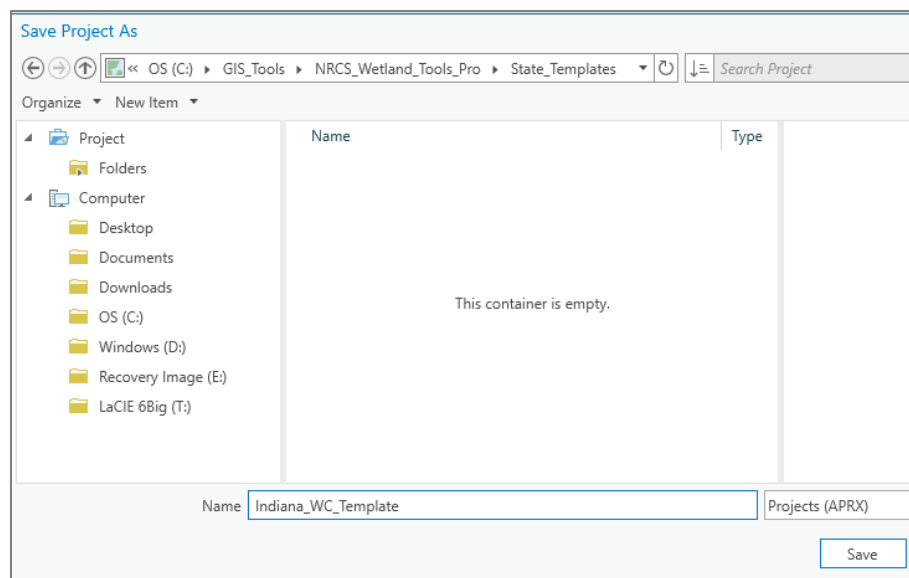


Figure 23: A screenshot of the Save Project As window, in ArcGIS Pro.

Set WGS 1984 UTM Coordinate System

After creating the template file, its UTM Coordinate System needs to be assigned. A WGS 1984 based UTM coordinate system is required by the tool to best align all geoprocessing in the tools with uploaded Web Mercator data in the related Wetlands Conservation web services.

- Open the *Determinations* map within the project, if not already open.
- In the *Contents* pane, right-click the *Determinations* header name and then click *Properties*.
- Click the *Coordinate Systems* tab on the left side.
- In the *XY Coordinate Systems Available* box do the following:
 - Click *Projected Coordinate System* →
 - *UTM* →
 - *WGS 1984* →
 - *Northern Hemisphere* →
 - *WGS 1984 UTM Zone #N*

Note: Replace “#” with the UTM zone number appropriate to your state or region and the file name you created in the previous step. Refer to this [map link](#) for assistance in selecting zones when creating your State Templates.

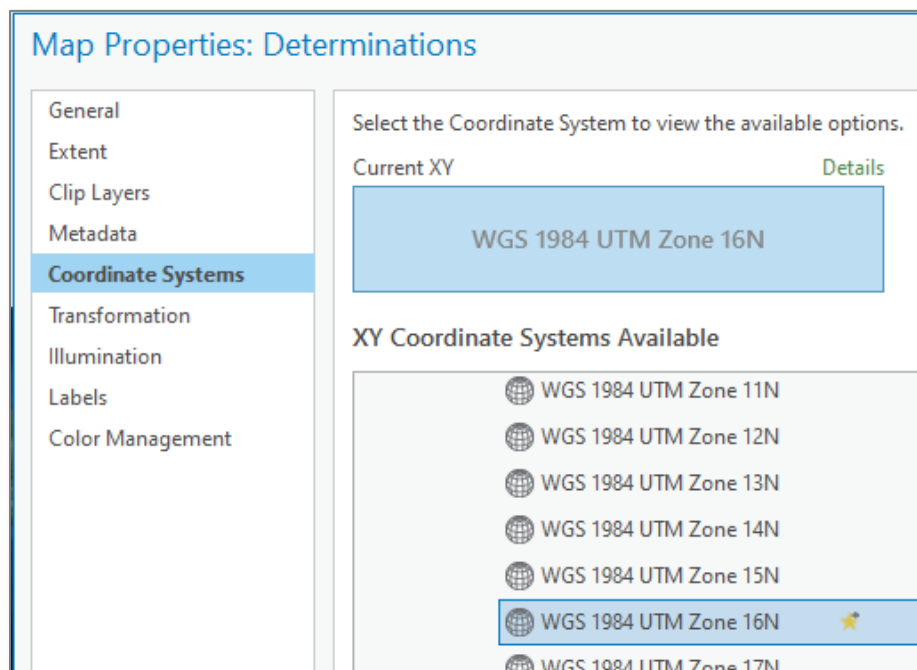


Figure 24: A screenshot of the Coordinate System selection in the Map Properties in ArcGIS Pro. In this example, Zone 16 North is selected. Your configuration will vary by the zone(s) covering your state.

- Click OK to close the Map Properties window.
- Click Project → Save to save the project.

(Optional) Add Data to the State Template

The State Tool Administrator can also add data layers to the State Template being created. State Tool Administrators should take care that users will have access to the same data layer sources when they access the templates.

- Use *Add Data* to add local or state layers needed for preliminary data gathering (e.g. state legacy Certified Wetland Determination (CWD), local LiDAR, current and/or historic imagery, transportation, hydrography, field data collection web services, etc...).

Note: The following layers are already included within default template or will be generated by the WC Tool workflow and do **not** need to be added again:

- CLU – Nationwide Common Land Units map service
 - SSURGO – Provided during the WC Tool steps as a project download from Soil Data Access (SDA)
 - NWI – GeoPortal National Wetlands Inventory Feature Service. **Pending GeoPortal service restoration by national. Use local NWI for now.**
 - GeoPortal Imagery Basemaps – Available from the Basemap selector.
- (Optional) If coverage in your template's area is available, use *Add Data* to add one of the NRCS Bare Earth or DTM Elevation services to the map, appropriate to your template's area. Pre-made LYRX files for these services are available in **C:\GIS_Tools\NRCS_Wetland_Tools_Pro\Reference_Layers**.

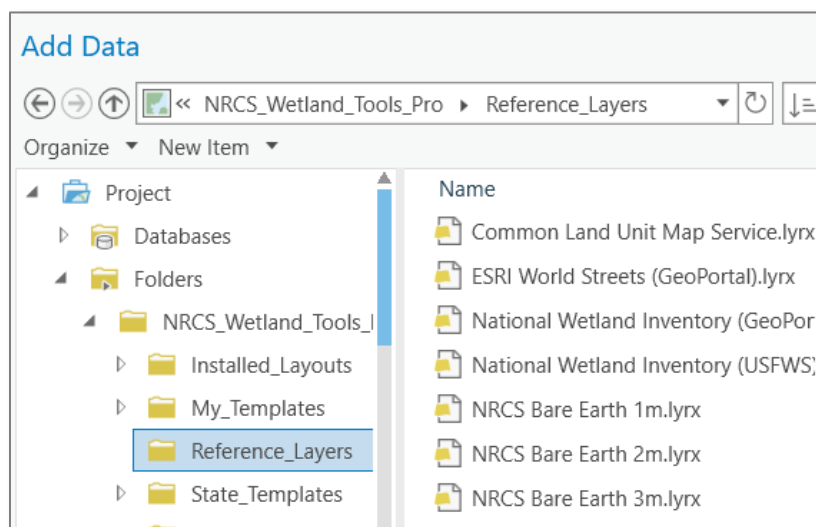


Figure 25: A screenshot of the Add Data interface in ArcGIS Pro.

- Click Project → Save to save the project.

(Optional) Create More State Templates

After finishing a template, repeat the template creation steps as necessary to create additional State Templates for each UTM Zone in your state, with optional reference data layers for the respective templates, as needed. The same process can also be used to create State Training Templates, but be sure to start with the Blank Training template and to name output Training Templates accordingly.

Update NRCS Address Spreadsheet

State Tool Administrators must update the NRCS Address Spreadsheet prior to distributing the WC Tool in their state. This spreadsheet will contain the address information for the NRCS and FSA Service Centers used as return addresses on determination letters. State Tool Administrators should update the spreadsheet for each new release of the WC Tool. An NRCS_Address spreadsheet that is set aside from a previous version of the WC Tool may be able to be copied over the new NRCS_Address spreadsheet with each new release but be alert for any release notes that indicate a change in the spreadsheet's format.

Note: The NRCS_Address spreadsheet from version 1.0.3 or earlier is not compatible with the spreadsheet in version 1.0.4 and later. Spreadsheets from version 1.0.3 or earlier should **not** be used to overwrite the spreadsheet in 1.0.4 and later.

- Navigate to **C:\GIS_Tools\NRCS_Wetland_Tools_Pro\SUPPORT\Templates** and open the **NRCS_Address.xlsx** file.
- Populate the **NRCS_Offices** tab with one row per **NRCS** Service Center. Use the first row as an example of what to enter. Once you have established data rows for your state, you can delete the example row.

	A	B	C	D	E	F	G	H
1	NRCSOffice	NRCSAddress	NRCS CITY	NRCS STATE	NRCS ZIP	NRCS PHONE	NRCS FAX	NRCS County
2	Decatur Service Center	975 S. 11th St	Decatur	IN	46733	(260) 724-4124	(855) 391-1916	Adams
3	Fort Wayne Service Center	9602 Coldwater Road, Suite 104	Fort Wayne	IN	46825	(260) 484-5848	(855) 373-6988	Allen

Figure 26: A screenshot of a few rows from the NRCS_Offices tab of the NRCS_Address spreadsheet for Indiana.

- If an NRCS service center covers multiple counties, you should create a duplicate row for each county it covers and only list each county once in column H, respectively.
- If a county has multiple service centers, simply continue to list each service center on its own row.
- Populate the **FSA_Offices** tab with one row per **FSA** Service Center. Use the first row as an example of what to enter. Once you have established data rows for your state, you can delete the example row.
 - If an FSA service center covers multiple counties, you should create a duplicate row for each county it covers and only list each county once in column H, respectively.
 - If a county has multiple service centers, simply continue to list each service center on its own row.
- When finished populating the **NRCS_Offices** and **FSA_Offices** tabs of the spreadsheet, click **Save** and then close the spreadsheet.
- Open a State Template for the WC Tool and open the Catalog pane.
- Expand **Toolboxes**, expand the **NRCS Wetland Tools Pro** toolbox. Expand section **F. Utilities**.
- Run the **Import Office Address Tables** tool. Close Pro when finished.

The updated version of the NRCS_Address file that was modified by the State Tool Administrator must be deployed with the version of the WC Tool that is released in your state. If done correctly, users will receive your updated address file and will not need to populate this spreadsheet individually.

Note: In some cases, users may need to customize their copy of the NRCS_Address spreadsheet. In such a case, the State Tool Administrator(s) should assist them with modifying the spreadsheet.

Deploy WC Tools within the State

After completing state level customizations to the WC Tool, State Tool Administrators should package together the files they've updated and provide the state customized version of the WC Tool to employees with their state. States have full discretion to carry out this process as appropriate to their staffing and data structure. The following sections describe some ways this might be managed.

Deploy and Maintain Supporting Geodata

If the State Template customized for your version of the WC Tool contains unique geodata for your state or parts of your state, please make sure that you provide your employees in the state with the necessary geodata to correspond to the provided templates. This should be done prior to providing them with the state customized version of the WC Tool with the State Templates, or any time you make changes to your geodata structure that would impact the tools.

Repackage WC Tool with State Customizations

After creating State Templates and updating the NRCS Address file, along with any other additional customized files, be sure to repackage an updated and custom version of the WC Tool for your state to be deployed to your employees. Generally, it is recommended to create a zip file of your WC Tools folder which will include all of your customizations by default:

- Close ArcGIS Pro, ArcMap, Excel, and RStudio if open. Close any application that may be accessing any file within the *NRCS_Wetland_Tools_Pro* folder.
- Create a new zip file on your computer. Do NOT create the zip file within the *NRCS_Wetland_Tools_Pro* directory.
- Drag and drop the *NRCS_Wetland_Tools_Pro* directory from your computer into the zip file so that all contents, including your custom contents, are copied into the zip.
- Save and close the zip file.

Deploy the Custom WC Tool Files

After creating your state's custom WC Tool zip file for deployment, State Tool Administrators need to deploy the zip file to employees that will use the tool. They also need to notify the employees of the zip file's availability and how to obtain it. There is no set way to do this, but the following suggestions are provided. Use the method that works best for your state, which may or may not include these options.

- Post the zip file on an NRCS State SharePoint Site for download by users.
- Post the zip file on GIS States in a User Group managed by your state for WC Tool Users.
- Deploy the zip file to a shared drive, or all office shared drives, in your state.
 - Users can copy, paste, and extract the zip file from this location
OR
 - Provide the users with an extraction batch script that runs from USDA\Work to extract the files to a specific local directory.

Provide Installation Instructions to Users

The National WC Tool User Guides or Lessons found in the [Wetland Determination Tool folder](#) on the [National Highly Erodible Land and Wetland Conservation SharePoint](#) can be provided to the users, as is, for base line documentation. Those guides will also contain instructions to install base software (ArcGIS Pro, R, and RStudio), set up Portal Accounts, and configure R and ArcGIS Pro. The national User Guides or Lessons will also generally refer to *obtaining a custom version of the WC Tool for your state from your State Tool Administrator*, where appropriate, so that users are not downloading the default tool from national that does not contain a state's customizations.

If you would like to obtain original copies of the national guides or lessons to modify for use in your state, Word document versions are available in the [Wetland Determination Tool folder](#) on the [National Highly Erodible Land and Wetland Conservation SharePoint](#). Some examples of items that may be useful to update for your state are where to find and download the state customized version of the WC Tool or how to complete associated documentation procedures for a determination in your state. If utilizing the national guides or lessons, please download copies of these documents for modification and do not modify them directly on the National SharePoint. Permissions will be configured to mitigate this possibility, but please be attentive to not editing the national guides or lessons directly.

If you do create customized user guides for the employees in your state, it is at your discretion for how to deploy those guides in your state.

Train Users

State Tool Administrators will be the primary trainers for employees in their state. The following suggestions are made to conduct a training with the tool.

- Follow this user guide to create a custom version of the tool for your state.
- Be sure to have yourself and all trainees sign-in GeoPortal and GIS States Portal and enroll them in the NRCS WC Tool group in the latter.
- Be sure to create Training versions of your State Templates from the Blank Training APRX template provided with the National WC Tool download. The provided Blank Training Template connects to training layers on the GIS States Portal.
- Provide trainees with your state's custom version of the WC Tool (with training Templates) to conduct the training.
- When guiding users through a scenario, you have two options for training data:
 - Conduct work on real requests and/or have students conduct work on individual requests. This has the best chance for you to find matching CLU tract numbers from the live CLU data service.
 - Conduct work on a single training scenario (check shortly before training to get the most up to date tract number for the site). When doing this, users should NOT upload their results to the Server at the end of the process. They'll just end up overwriting each other's work.

Appendix A - Advanced Support Scenarios

This appendix describes scenarios for modifying determination data. State Tool Administrators should refer to this section by scenario when answering questions or troubleshooting data maintenance. Generally, direct editing of the web services that support the WC Tool is highly discouraged, except in rare cases which are discussed below.

Updating Determinations

This section describes the various ways to update a determination and the considerations for each update scenario.

Determination Changed Using the Original Project Folder

In this scenario, a user needs to correct their determination for some reason, either of their own accord by noticing a mistake before issuing the determination, or as part of the reconsideration process. To do this, the user simply works in their existing project folder to perform changes to the determination and then uploads their results again. The new upload will overwrite the entire previous area that was uploaded. It will also remove any extraneous areas that were leftover if the request extent was reduced for some reason.

Determination Changed Using a New Project Folder

In this scenario, a different user needs to correct an uploaded determination for some reason. To do this, the new user should start a new project and define the request extent needed. The tool will download existing data from the services. The user can mark the existing areas that need correction with the “Revision” evaluation status and continue forward in the process. When they upload, their corrections will replace the live data services in the corresponding extent and will be added as an updated copy in the master data services where past data is retained. If you need the previous data for any reason, it can be found in the master data services.

Editing Web Services Data

Generally, it is recommended that users not edit the web services data at all. State Tool Administrators should not create layer files of the editable services for users to load into their maps. State Tool Administrators should also actively train users against manually loading and editing the layers.

It is also recommended that State Tool Administrators minimize edits that they might perform in the web service layers. The typical scenarios for modifying data would usually be to delete data due to a rescinded determination (very rare) or to delete data due to an improper upload (rare). Most other edits should be completed by re-running the tool and doing a new upload (see the scenarios in the previous section of this appendix).

Deleting a Determination

This should only be done to completed data in the services when a valid reason to delete an uploaded set of shapes for a determination exists. Keep in mind that a mistaken upload can often be corrected by the users simply completing a local project correction and uploading the same determination job again for the same area. However, in rare circumstances a user may have uploaded work that simply isn't needed in the production data at all, such as if they inadvertently ran a training scenario in the production version of the tools.

The procedure to delete data from the web services is as follows:

Warning: DO NOT use any variation of the "Select All" command to select and copy/paste or delete data in any of the services, otherwise we will have to rollback and recover all the web services for the WC Tool from a backup.

- Confirm with the user the exact particulars of the determination to be deleted, including admin county, tract number, and determination date.
- If no previous determinations exist in the master data for the site:
 - Open the web map for editing either in a Browser or in ArcGIS Pro.
 - Production: [NRCS WC State Tool Administrator's Map](#)
 - Training: [NRCS WC Tool State Administrator's Map - Training](#)
 - Navigate to the determination site in question.
 - Use layer visibility and selection tools to edit, select, and delete the features in question.
 - Edits are implemented immediately. No Save Edits command is needed, unless you are in ArcGIS Pro.
- If previous determinations exist in the master data for the site:
 - Open the map for editing in ArcGIS Pro using the *Open in* dropdown button.
 - Production: [NRCS WC State Tool Administrator's Map](#)
 - Training: [NRCS WC Tool State Administrator's Map - Training](#)
 - Navigate to the determination site in question.
 - First, use layer visibility and selection tools to edit, select, and delete any incorrect features at the site from the LIVE data services.
 - Use layer visibility and the *Select* or *Select by Attributes* tools to select the matching incorrect records for the site in the MASTER or ARCHIVE data services. Once selected, delete them.
 - Use layer visibility and the *Select* or *Select by Attributes* tools to select the most recent, previous, and valid determination records for the site from a MASTER data service layer. Once selected, copy and paste the master data (using paste special) to the corresponding LIVE data service layer. Repeat this step for all MASTER data service layers that contain valid previous data for the site.
 - Save Edits and close ArcGIS Pro.

Topology Edits

It is generally advised not to be concerned with minor topology edits in the master data services. If such areas get downloaded in a new determination extent that is adjacent to or overlapping a previous determination, such as if FSA slightly shifted their field boundaries between determinations, topological clean-up can be performed in the new determination and uploaded again. This will passively manage such issues in line with the workflow in an ongoing fashion.

Recovering Lost Data

This section will describe how to recover lost data from the backups of GIS States portal. Typically, this would be used to recover deleted data in an extreme circumstance where data was inadvertently deleted from the services. This process is not to be used to help users upload newly completed work that was generated during an outage period of GIS-States Portal.

- Go to [ServiceNow](#) and click *Report An Issue*.
- For *Watch List*, enter bethany.l.munoz@usda.gov as an additional e-mail for notifications on this ticket. Enter any additional e-mail addresses, comma-separated, as needed.
- For *Application Affected*, select *Geospatial Support*.
- Describe your issue as follows, replacing <date> with the date you believe had the last good version of the data prior to corruption or loss. Also, remove from the data list any services not impacted (for example, if only the live data was impacted, request only those services; or if only the archive data was impacted request only the master services):

I have observed data loss or corruption in the Hosted Feature Layers on GIS-States Portal for the NRCS Wetlands Conservation Tool and need to recover data. I need data from the following list of layers as it existed in the last backup prior to <date>.

NRCS_ROPs
NRCS_ROPs_Master
NRCS_WC_Drains
NRCS_WC_Drains_Master
NRCS_WC_Reference_Points
NRCS_WC_Reference_Points_Master
NRCS_Sampling_Units
NRCS_Sampling_Units_Master
NRCS_PJW
NRCS_PJW_Master
NRCS_CWD
NRCS_CWD_Master
NRCS_CLU_CWD_Points
NRCS_CLU_CWD_Points_Master
NRCS_CLU_CWD
NRCS_CLU_CWD_Master
NRCS_CWD_Summary_Points
NRCS_CWD_Summary_Points_Master
NRCS_CWD_Summary_Areas
NRCS_CWD_Summary_Areas_Master

- Work with the ServiceNow support agents to obtain file geodatabases (FGDBs) and feature classes of the last good backup.
- Load the provided feature classes from the backup FGDBs into an ArcGIS Pro project.
- Load the affected web service(s) from the GIS-States portal into the ArcGIS Pro project.
- Use search queries to find good data from the backups that needs to be restored. Copy and paste it into the related data service layer. For master data services, overlap doesn't matter too much. For live data services, do not create overlapping features (clean-up any overlaps).

Appendix B – Troubleshooting

Issue Reporting

Review existing issues and report new issues on GitHub at:

<https://github.com/USDA-NRCS/Wetland-Tools---ArcGIS-Pro/issues>

Note: You will need to create a GitHub account to report issues. Review open issues to see if the error or problem was already reported by a different user. Update or add further information to existing issues or re-open closed issues, if needed.

When you report or create a new issue, please provide a description, screenshots, and/or logs (if relevant). Please include your USDA e-mail address in either your issue description or your GitHub profile so that developers can contact you.

Note: Text logs for any given project can be found at
C:\Determinations\<project_folder>\<project_name>.txt.

Sometimes developers can resolve an issue that you report without directly contacting you. If an issue can be resolved without further contact, comments may be added directly to the issue posts on GitHub and you can always check there for the latest changes. If you have disabled e-mail notifications for issue updates on GitHub, you may not see any communication that an issue was acknowledged or resolved and directly reviewing your issues may be the only way that you see that it is being reviewed or has been addressed.

Note: Not all resolved issues will be immediately deployed in the current fix or build.

Known Issues

Refer to the Troubleshooting appendix in the WC Tool User Guide for a list of known issues.

Appendix C – Customizing WC Tool Letter Templates

Customizing the default/template letter is discouraged. The output forms and letters from the WC Tool are generated in MS Word to allow users to easily adjust the output documents, as needed.

WARNING: This is an optional task that should only be completed by the State Tool Administrator.

Customizations will need to be applied for each new release of the tool prior to deploying to field users.

- Open File Explorer.
- Navigate to **C:\GIS_Tools\NRCS_Wetland_Tools\Pro\Support\Templates**.
- Copy and paste the WC_CustomerLetter file within the directory to create a backup copy of the installed file for recovery.
- Open the WC_CustomerLetter file in RStudio. If prompted to an app to use to open the file, select RStudio.
- Review the contents of the WHITE SPACE in the top-left pane of RStudio, as indicated in the below screenshot. DO NOT make edits in the GRAY SPACE.
- Save and close RStudio when done.

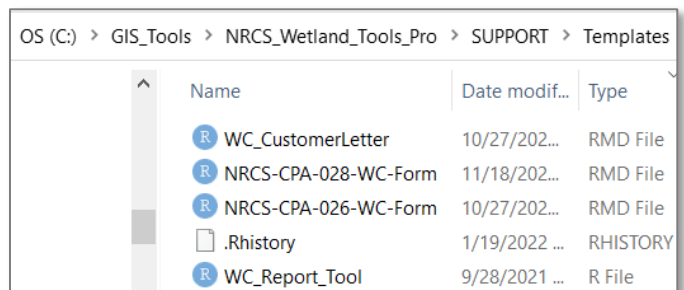


Figure 26: A screenshot of the Templates install folder and the WC_CustomerLetter file.

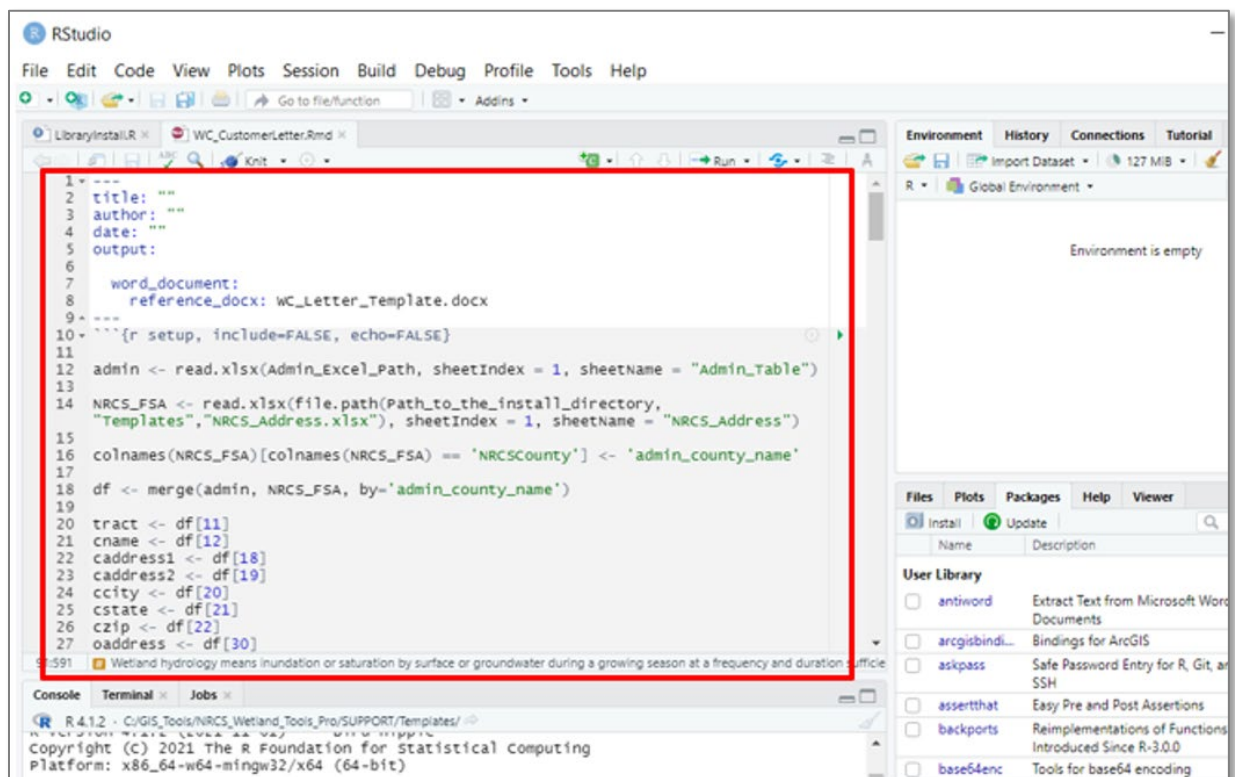


Figure 27: A screenshot of the WC_CustomerLetter opened in RStudio. Only the WHITE SPACE area within the red box should be edited!

Edits to the Letter

The default letter contains the transmittal language as required by agency policy. Additional State and Local disclaimers may be added into the WHITE SPACE in RStudio, as defined on the previous page.

Note: A safer way to edit the letter is to provide users with a template statement in a separate document to be copied and pasted into each letter produced by the tool while completing a project.

Editing the Letter Format

Formatting of the Customer Letter is controlled by the RStudio code syntax, referred to as “rmarkdown”. The code is edited within the WHITE SPACE of the *WC_CustomerLetter* RStudio file. The formatting corresponds with the MS Word *WC_Letter_Template.docx* “Styles.”

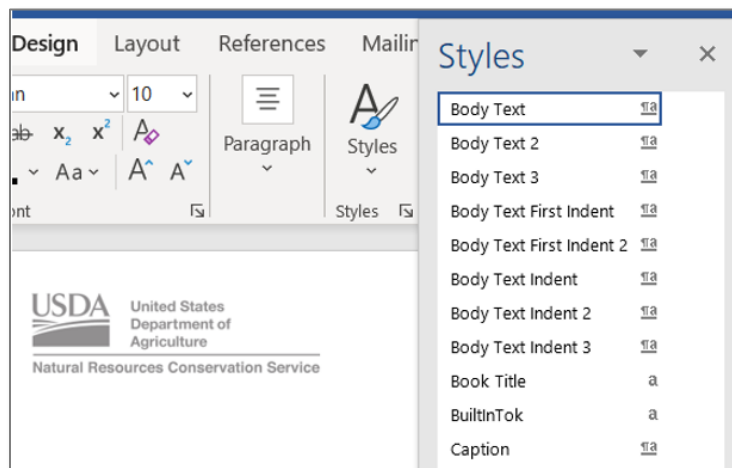


Figure 28: A screenshot of the Styles panel in MS Word configured in the “WC_Letter_Template.docx” file.

Learn more about rmarkdown syntax at [rmarkdown-cheatsheet \(rstudio.com\)](https://rmarkdown-cheatsheet.rstudio.com) or by searching the web for RStudio rmarkdown information.

Edits are not applied to the MS Word file, as this is a “shell” that is populated when the WC Tools are executed.

Appendix D – Create Custom Symbolology & Label Styles

The WC Tool map products conform with National standards however the State Tool Administrator has the option to create and deploy a customized Style file and/or Layer file with a State's preferred symbology for the Determination Map. State customizations to create and deploy these files must be redone whenever a new WC Tool Version is deployed, although existing custom Style files (.stylx) can be transferred to a new version if the corresponding attribute domain for a layer does not change. For example, an existing style file with all wetland labels can be transferred to a new tool installation if there are no new or removed wetland labels associated to the style. State's will develop their own user instructions to describe the location and process to Import Symbolology.

The WC Tool provides a custom Style file (.stylx) in the "Styles" folder for CWD layers within the install. It begins as a generic style with default symbols, but State Tool Administrators can alter it to manually or create new symbols from existing symbols to modify it.

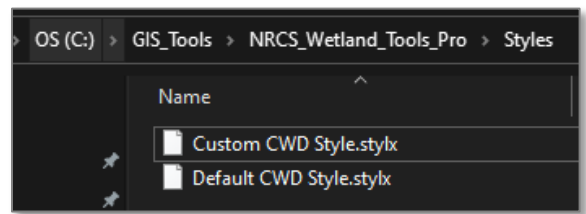


Figure 29: A screenshot of the Styles directory in the install folder and the Custom styles file.

Modify the Custom Style Sheet Manually in Catalog View

Use this method to manually set the symbology options in the installed *Custom CWD Style* file found in the WC Tool's "Styles" folder.

- Open an ArcGIS Pro state template (APRX) for the WC Tool. These should have been created from the original WC Tool installation APRX templates.
- Open the Catalog view and double-click Styles. The *Custom CWD Style* should be in the list.
 - If not, right-click in the grey-area of the Catalog view below the listed styles
 - Click *Add* →, and then click *Add Style...*
 - Navigate to the WC Tool install folder, and then open the Styles folder.
 - Select the *Custom CWD Style* and click OK.

- Right-click the *Custom CWD Style* and click *Manage*. A view of default symbols will display on the left side, and detailed information will appear on the right side.

Note: If the detailed information doesn't appear to the right of the list of symbols, click the *View* tab and then click *Details Panel*. When *Details Panel* is visible, it appears to be highlighted.

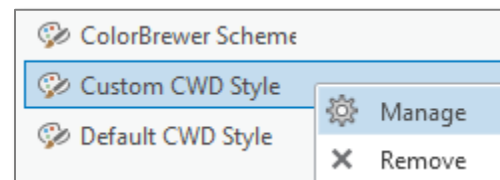


Figure 30: An example of activating the Manage styles command from a style's context menu.

- Select a symbol on the left side of the *Catalog View* that you want to change (such as “W”).
 - On the right-side of the *Catalog View*, go to the bottom of the details section and click the *Properties* tab.
 - Use the symbology properties that appear to change the symbol. When finished, click *Apply*.
- Repeat the previous step for each symbol to be customized, until finished. The custom style file is automatically changed and will embed in the state’s template(s) and tool distribution.
- Close *Catalog View* and ArcGIS Pro without saving.

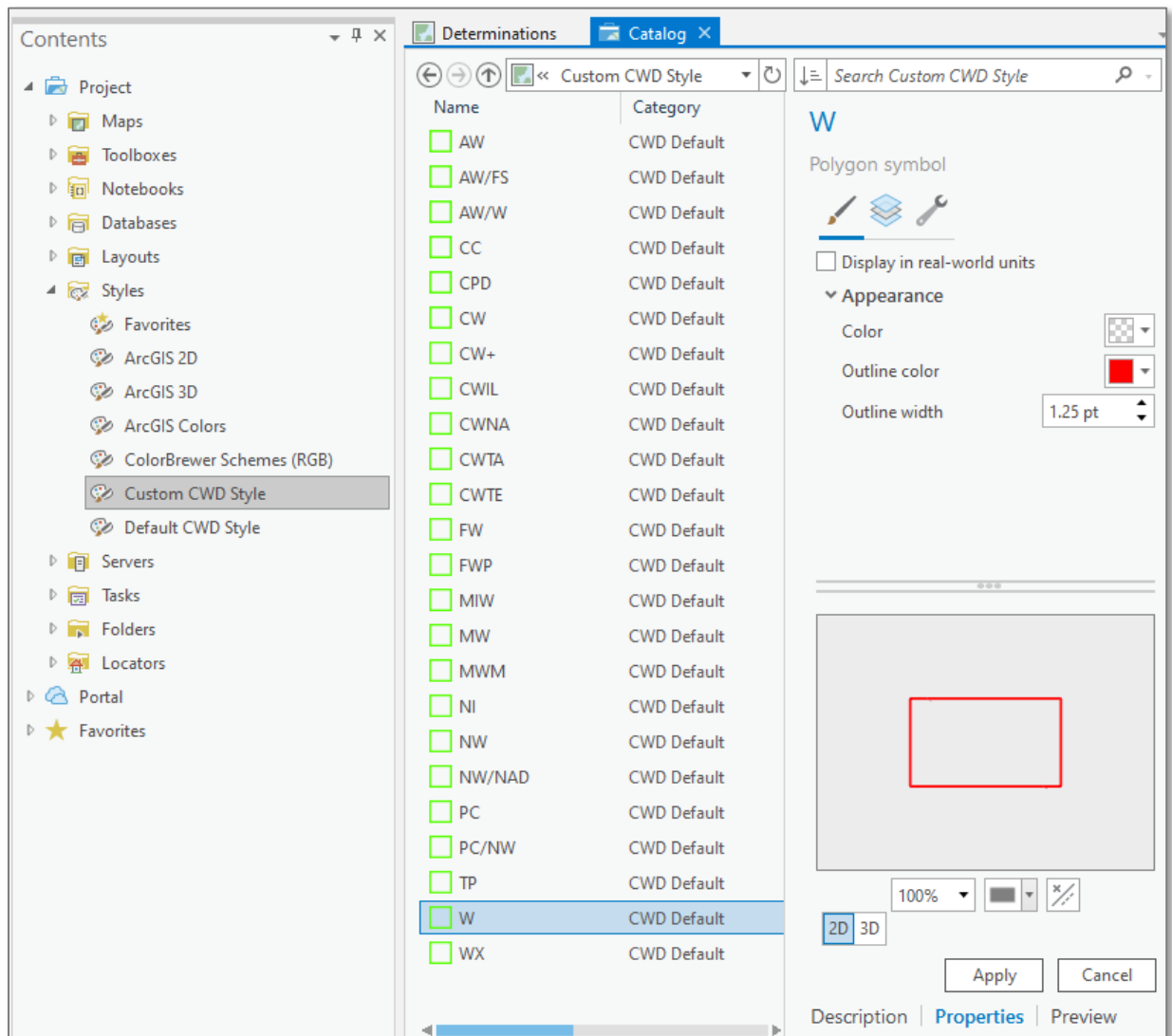


Figure 31: A screenshot of manually customizing a style symbol in the *Catalog View*. Note that the *Properties* tab of the details pane on the bottom right is active to access these options.

Create a Style from ArcMap Symbology

Use this method to take the existing symbology for a wetlands layer from an ArcMap and transfer it to the custom style file.

Note: If using existing data from ArcMap, the symbols in the style must match the intended symbols in the destination style. For example, wetland labels must be “PC”, “NW”, “W”, etc... in the layer you will be using to define the new symbols so that they correspond to the exact same labels in the new style.

- Open an ArcGIS Pro state template (APRX) for the WC Tool. These should have been created from the original WC Tool installation APRX templates. This should make the *Custom CWD Style* be available in the template when saving symbols to existing styles, later in this process.
- Add the ArcMap layer to the Pro project:
 - Option 1 – Import an ArcMap project which contains a layer with the desired symbology
 - Click the *Insert* tab in Pro.
 - Click the *Import Map* icon.
 - Select and import an MXD file.

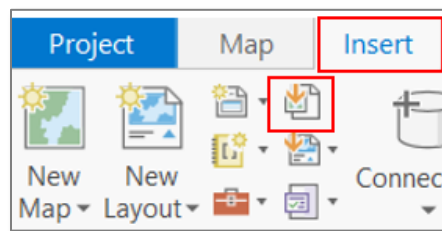


Figure 32: A screenshot of the insert and import MXD items in Pro.

- Option 2 – Add an ArcMap layer file to the Pro project:
 - In ArcMap, right-click on layer with desired symbology, then click *Save as a Layer file*.
 - Complete the process to save a LYR file.
 - Use *Add Data* in ArcGIS Pro to add the LYR file to the Pro project.

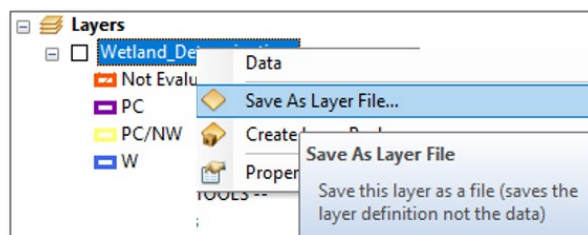


Figure 33: A screenshot of accessing the context menu for a layer in ArcMap to save a layer (.lyr) file.

- A layer with the desired symbology has been added to the ArcGIS Pro project. The symbology from the imported layer(s) can now be saved to the *Custom CWD Style*.
- Double-click on a desired symbol in the *Contents* pane. This opens the *Format Polygon Symbol* options.
- Click the *Menu* button in the *Symbology* window and then click *Select Save symbol to style...*

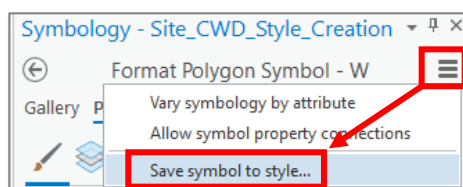


Figure 35: Using the symbology menu to access the Save symbol to style command.

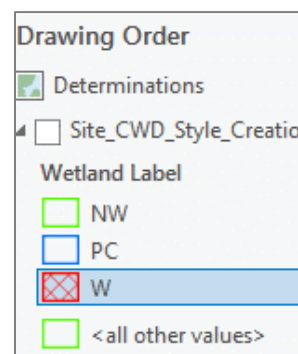


Figure 34: An example to double-click on the symbol to change.

- Set the properties for the updated symbol:
 - Name the symbol with the label for the symbol you are updating. The name must match the Wetland Label attribute choice you are modifying.
 - Select the target style to save the symbol in the *Style* dropdown. The *Custom CWD Style* should be available as a choice if the style is loaded in the project already (which it should be if you created a state template from a WC Tool installed blank template).
 - Set the category to “Default CWD”. You can use the dropdown to select the category name that already exists in the specified Style.
 - Click OK to complete the save process. The symbol will be added to the *Custom CWD Style* with a new unique key.

Figure 36: Setting the symbol properties to save a symbol to a style.

- Repeat the previous step for each symbol in the layer’s symbol legend.
- In ArcGIS Pro, click the *View* tab and then click *Catalog View*.
- Explore *Catalog View* to find the *Styles* section of the project. Then right-click the *Custom CWD Style* and click *Manage*.
- In the list of symbols, select the original symbols that now duplicate your new symbols. Use CTRL + click to select multiples, if necessary. Right-click the selected duplicate (original) symbols and then click *Delete*.

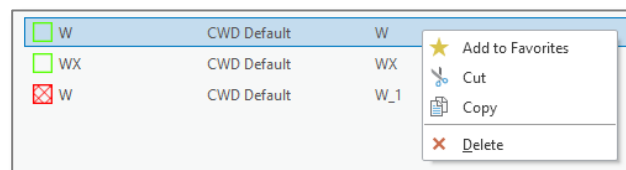


Figure 37: Removing duplicate symbols from the style.

- The custom style file has been updated and its changes will be embedded in the state’s template(s) and tool distribution. Remove the imported layouts or layers from ArcMap. Close *Catalog View* and ArcGIS Pro.

Deploying the Custom Style Sheet

Once the style is customized, the altered style file should be deployed in the state within the “Styles” folder. In addition, the style can be added to the state’s custom template(s). In that manner, users will be able to use the custom style.

Manually Create Custom Label Styles

In the same way that you can save map symbology elements to a style, you can also save labeling symbols to a style. The first method to do this is to customize the label appearance for any existing layer manually and save the results to a style.

- Open an ArcGIS Pro state template (APRX) for the WC Tool. These should have been created from the original WC Tool installation APRX templates. This should make the *Custom CWD Style* be available in the template when saving symbols to existing styles, later in this process.
- Add a layer to the map or label an existing layer in the map. Customize the labels as needed for font, size, color, halo, callouts, etc...
- After customizing the label, click the *Menu* button and then click *Save symbol to style...*
- Complete the label style properties:
 - Create a name for the custom label style.
 - Select the *Custom CWD Style* from the drop-down (or from the install folder if not present).
 - Create or select the “CWD Labels” category.

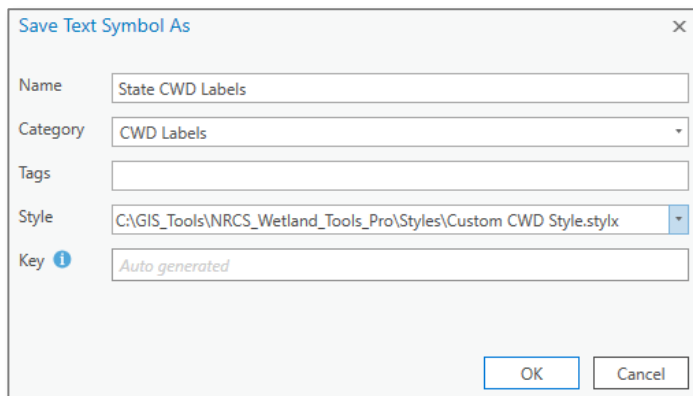


Figure 39: Setting a label symbol's properties to be saved to a style.

- The customized label style has been saved directly to the Custom CWD Style, which loads with templates and projects created in the WC Tool process. Deploy as normal with your state templates and the custom label style will be available as a preset in ArcGIS Pro.

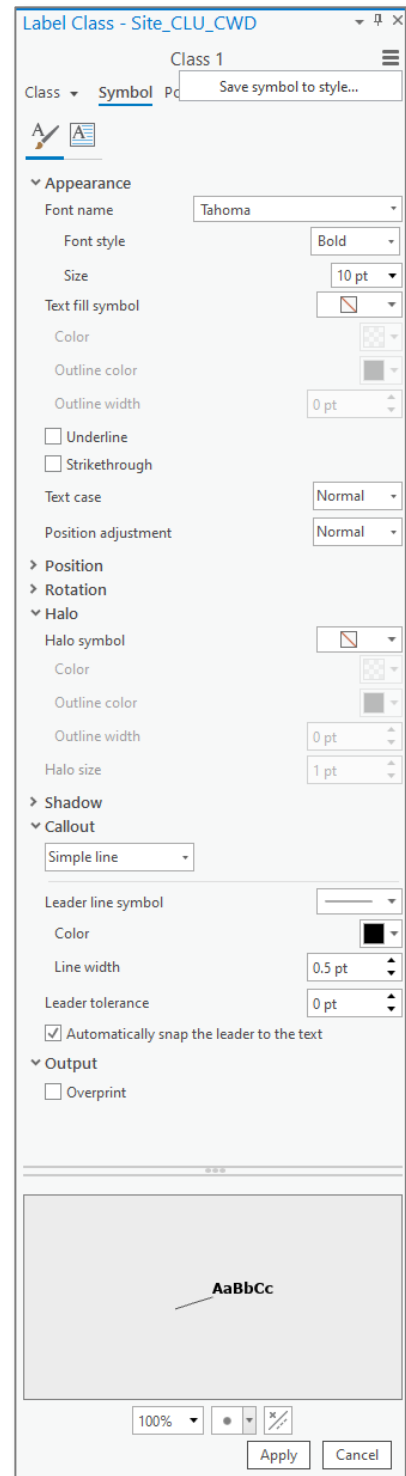


Figure 38: Customizing a label's appearance.

Import Custom Label Styles from ArcMap

Importing labels styles from ArcMap is similar to the manual process except you import existing MXD or LYR data first and then immediately save the custom label style from the imported data.

- Open an ArcGIS Pro state template (APRX) for the WC Tool. These should have been created from the original WC Tool installation APRX templates. This should make the *Custom CWD Style* be available in the template when saving symbols to existing styles, later in this process.

- Add the ArcMap layer to the Pro project:
 - Option 1 – Import an ArcMap project which contains a layer with the desired symbology
 - Click the *Insert* tab in Pro.
 - Click the *Import Map* icon.
 - Select and import an MXD file.

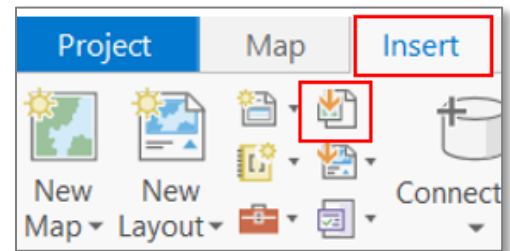


Figure 40: A screenshot of the insert and import MXD items in Pro.

- Option 2 – Add an ArcMap layer file to the Pro project:
 - In ArcMap, right-click on layer with desired symbology, then click *Save as a Layer file*.
 - Complete the process to save a LYR file.
 - Use *Add Data* in ArcGIS Pro to add the LYR file to the Pro project.

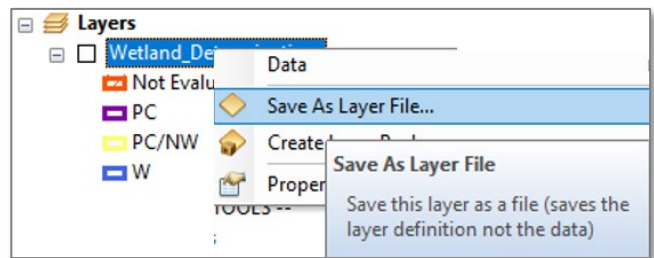


Figure 41: A screenshot of accessing the context menu for a layer in ArcMap to save a layer (.lyr) file.

- View the label style for an imported layer. Make changes as necessary and confirm the label appears as desired. Verify all elements of the label, such as font, size, color, halo, callouts, etc...

Note: Not all features of ArcMap labels are directly translated to ArcGIS Pro labels so you may have to make some adjustments.

- After confirming the label's customizations, click the *Menu* button and then click *Save symbol to style...*
- Complete the label style properties:
 - Create a name for the custom label style.
 - Select the *Custom CWD Style* from the drop-down (or from the install folder if not present).
 - Create or select the "CWD Labels" category.

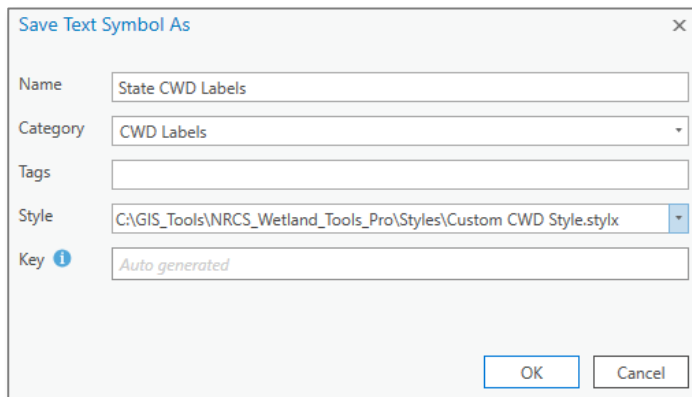


Figure 43: Setting a label symbol's properties to be saved to a style.

- The customized label style has been saved directly to the Custom CWD Style, which loads with templates and projects created in the WC Tool process. Deploy as normal with your state templates and the custom label style will be available as a preset in ArcGIS Pro.

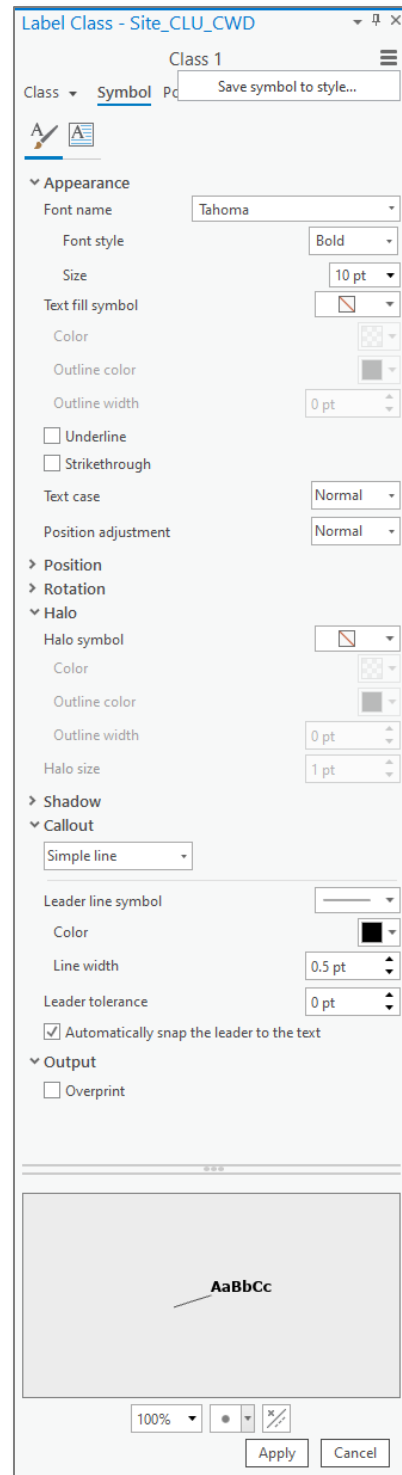


Figure 42: Customizing a label's appearance.

Appendix E – Wetland Determinations Dashboard

The data uploaded to the GIS States server from the WC Tools goes into several Hosted Feature Services for legacy data preservation, some of which are further used to populate an Operations Dashboard. The [Wetland Determinations Dashboard](#) (requires E-auth level 2) displays the number and acres of determinations and delineations from these data layers and has a number of filters and an interactive map that can be used to update the display of those values. This dashboard is a read-only view of the data layers and data only appears for the “live” data layers after a project has been uploaded to the GIS server. If any data changes for a site due to a revision, that data is retained in the respective archive or master data layers, but only the most current data is shown and tabulated in this dashboard. Depending on how a revision was processed and how much of a site was revised, the total count of determinations may or may not change. The changes in values have more to do with how this dashboard aggregates the spatial data, regardless of how policy drives the issuance of reconsiderations or official revisions. Generally, if an entire site is changed, the counters will not change: one entire site was completely changed into one entire revised site, but the tally of new versus revised determinations will shift by one. Alternately, if only part of the site is changed, the total count will increase: one determination for the unchanged remnant of the original determination and one more determination for the newly revised area subset from the original determination extent.