

Setting up an Arc Hydro based Geoprocessing Service

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Prepared by

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1. Prerequisites

1.1. Software

- ArcGIS Desktop 10.2.x with Spatial Analyst extension.
- ArcGIS Server 10.2.x with Spatial Analyst extension.
- Arc Hydro Tools 10.2 (64bit): install the Arc Hydro Tools 10.2 for ArcGIS 10.2 by running the msi file on a computer having ArcGIS Desktop and ArcGIS Server 10.2.

1.2. Post Installation

1.2.1 Toolbox

- Copy the Arc Hydro Tools toolbox installed by the setup under the ArcGIS Desktop toolboxes folder into the server toolbox folder so that the server can have permissions to access the tools from the Arc Hydro toolbox used in the published service. (If you have a prior version of Arc Hydro installed, make sure that the tool boxes are replaced by the installation program with the latest toolboxes. Some times during uninstall/install, the toolboxes are not deleted and not updated).

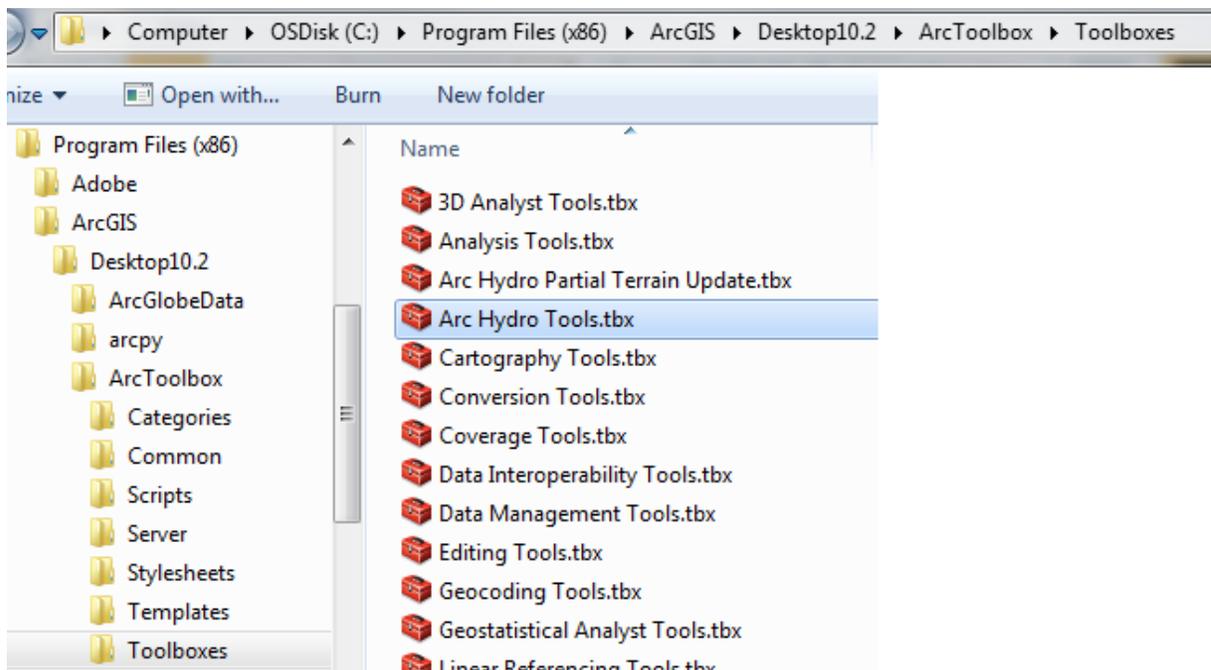


Figure 1-1 – Desktop Toolbox Location

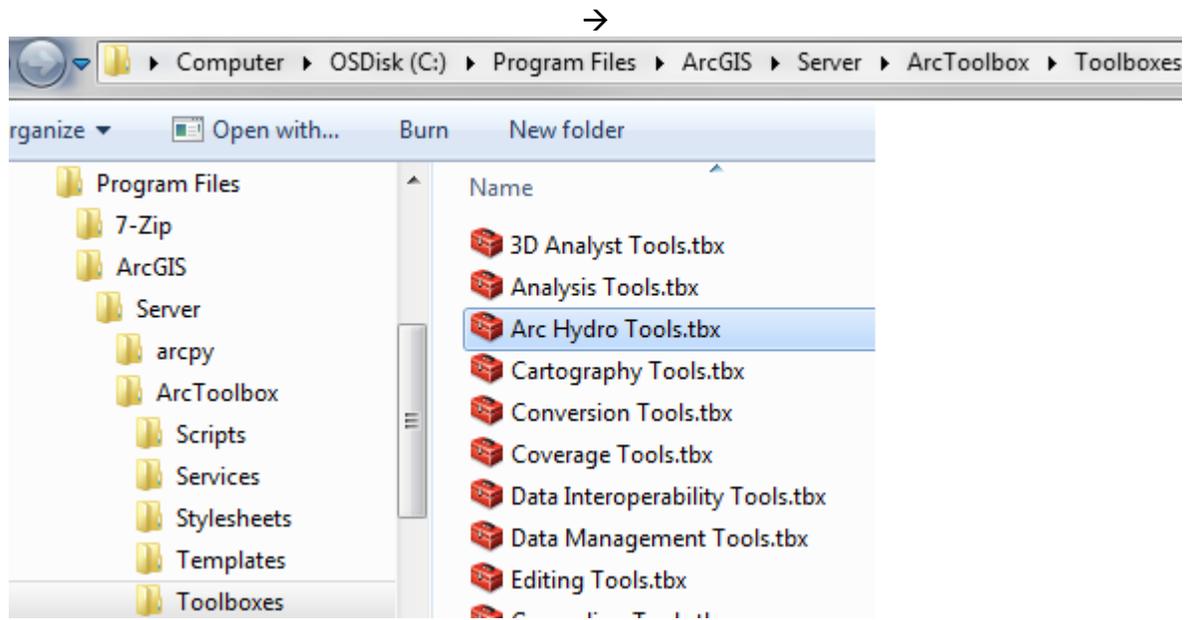


Figure 1-2 - Server Toolbox Location

1.2.1 ArcGIS User Permissions

- Give permissions to the ArcGIS user to the WaterUtils folder and subfolder both under c:\program files and C:\Program Files (x86).

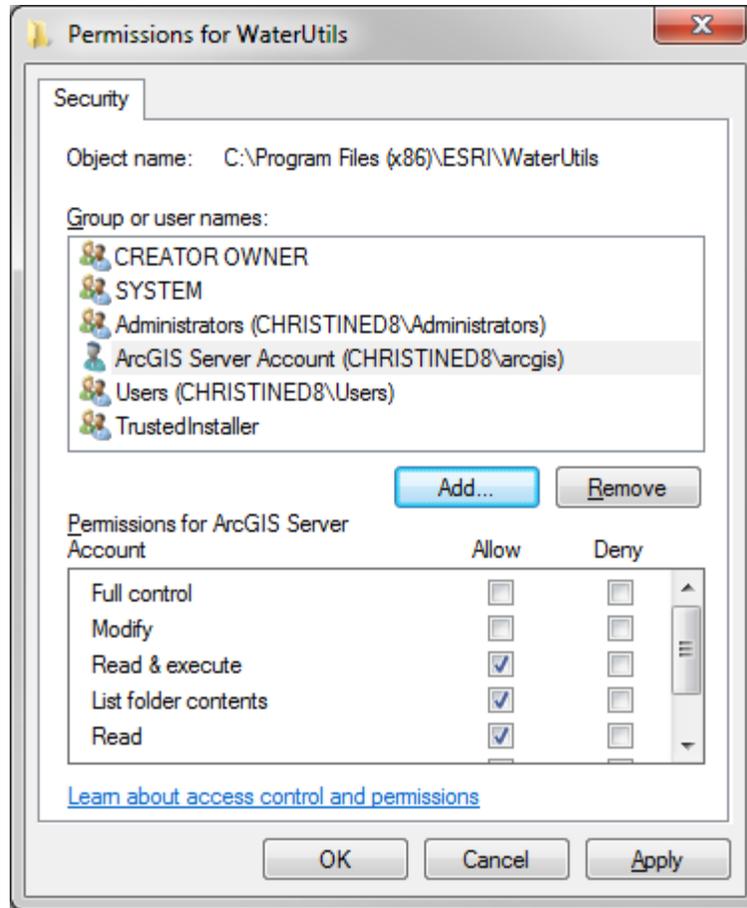


Figure 1-3 - arcgis Permissions on C:\Program Files (x86)\ESRI\WaterUtils

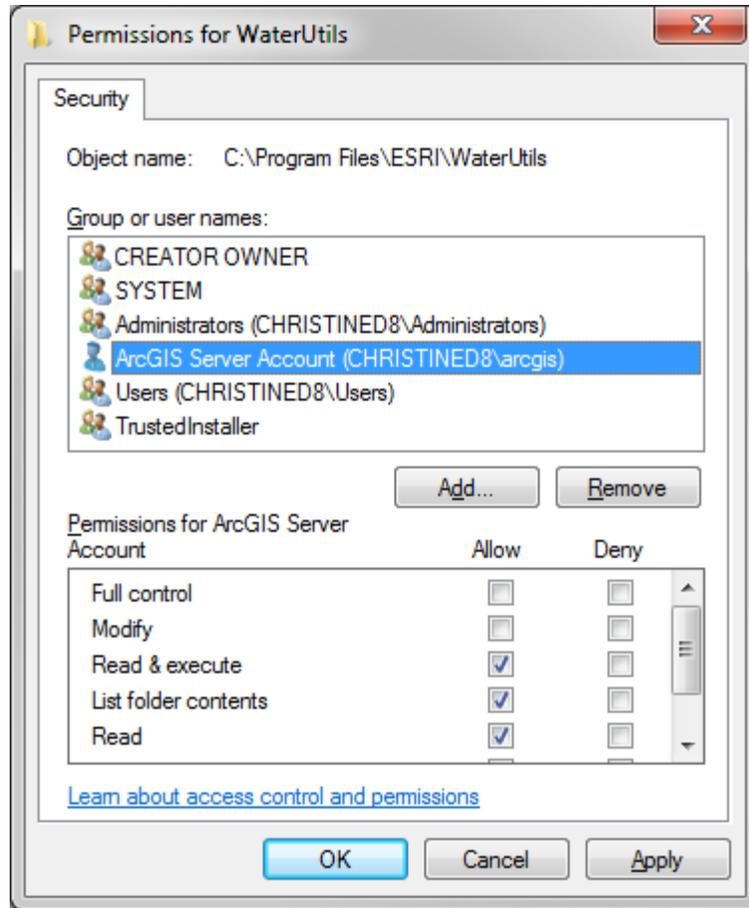


Figure 1-4 – arcgis Permissions on C:\Program Files\ESRI\WaterUtils

2. Setting up the data used by the geoprocessing service

- Copy the input data used by the service in a directory (e.g. c:\DelineationData).
- Give read access to the arcgis user to the directory and to its content on the disk as well (arcdefinebelongs to the Users group).
- Give yourself full control to the directory and to its content as well.

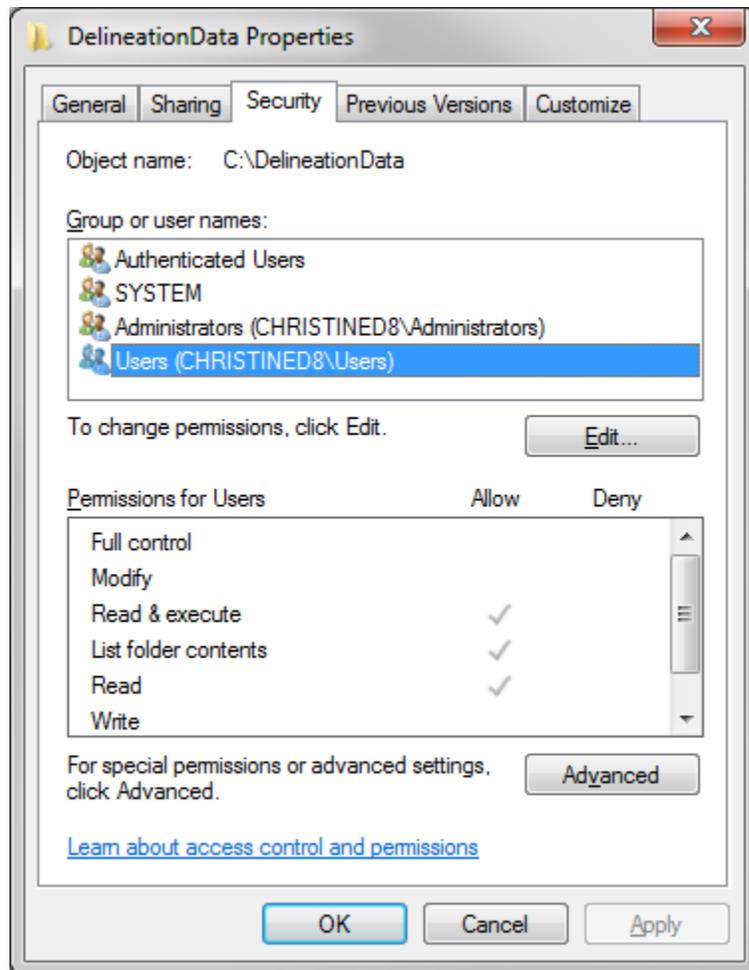


Figure 2-1 – Permissions to Data

3. Setting up the delineation service

3.1. Running the Batch Watershed Processing Tool in ArcMap

- Open a new ArcMap document and add the input data required by the model you want to create. To test the local delineation, add the following input layers:
 - Fdr
 - Str
 - Catchment
 - AdjointCatchment
 - DrainageLine (to help with display only – not used in delineation)
- Save the map in the input data folder (e.g. Delineation.mxd in this example)

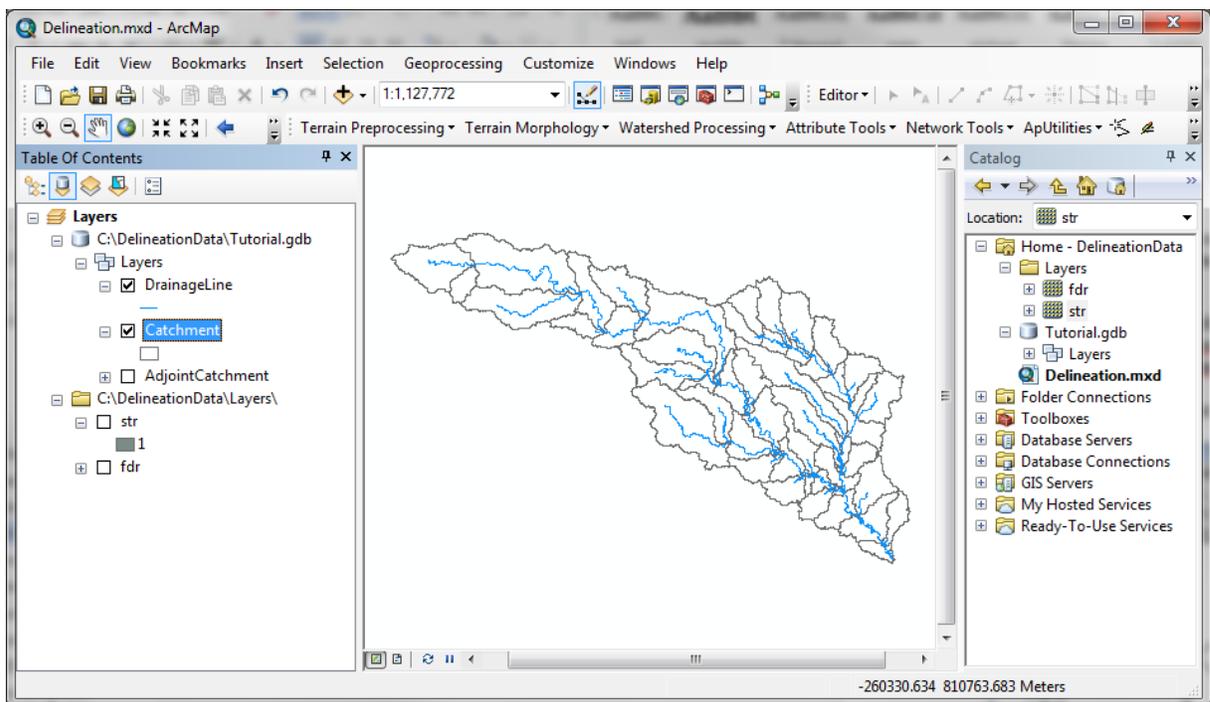


Figure 1-3-1. Input Data for Local Delineation Service.

- Reset the default target location for Arc Hydro to the database containing the input Catchment feature class using ApUtilities > Set Target Locations and selecting the HydroConfig node in the target location.

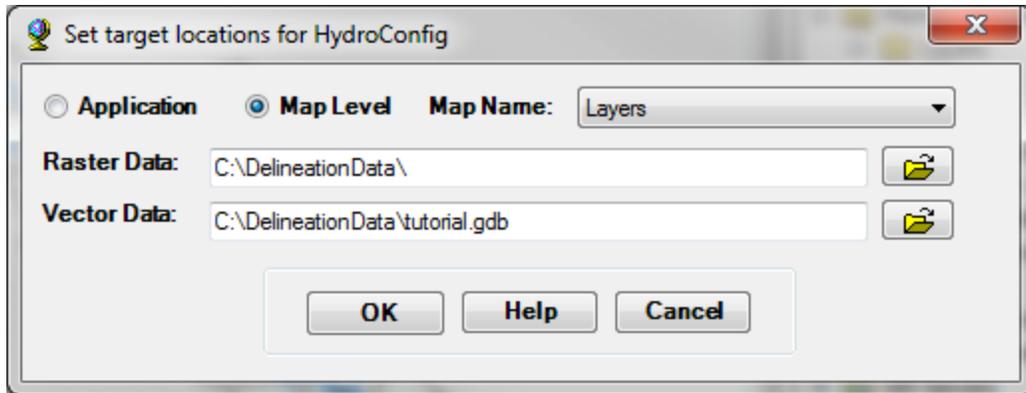
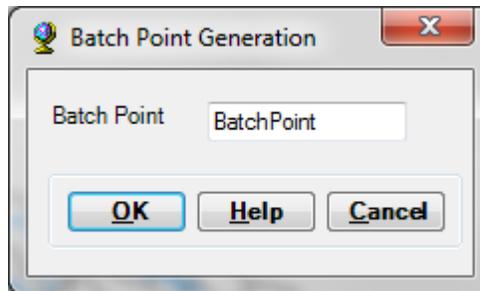


Figure 3-2 – Setting Target Location to input geodatabase

If you do not have an existing BatchPoint feature class, you can create one using the Batch Point Generation tool () on the Arc Hydro Tools toolbar.

- Click the Batch Point Generation tool and enters BatchPoint for example as the name of the output Batch Point feature class to create. Click OK.



The Batch Point feature class is generated in the target vector location and is added into the Table of Contents of ArcMap.

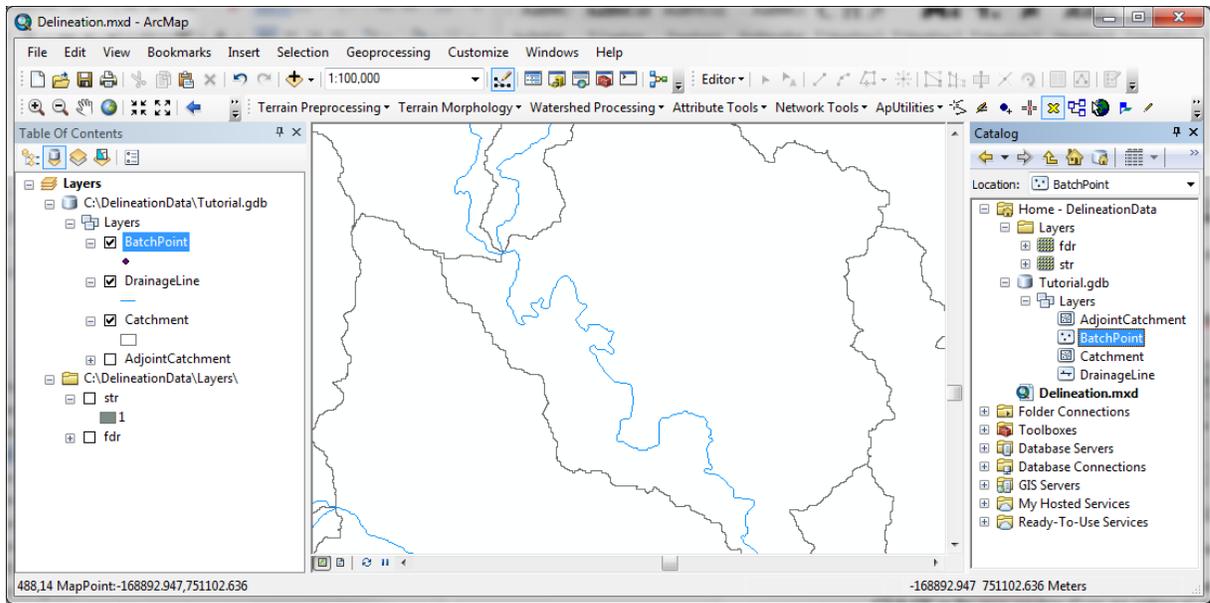


Figure 3-3 – Batch Point Feature Class

- Click on a Drainage Line feature to create a new Batch Point feature.

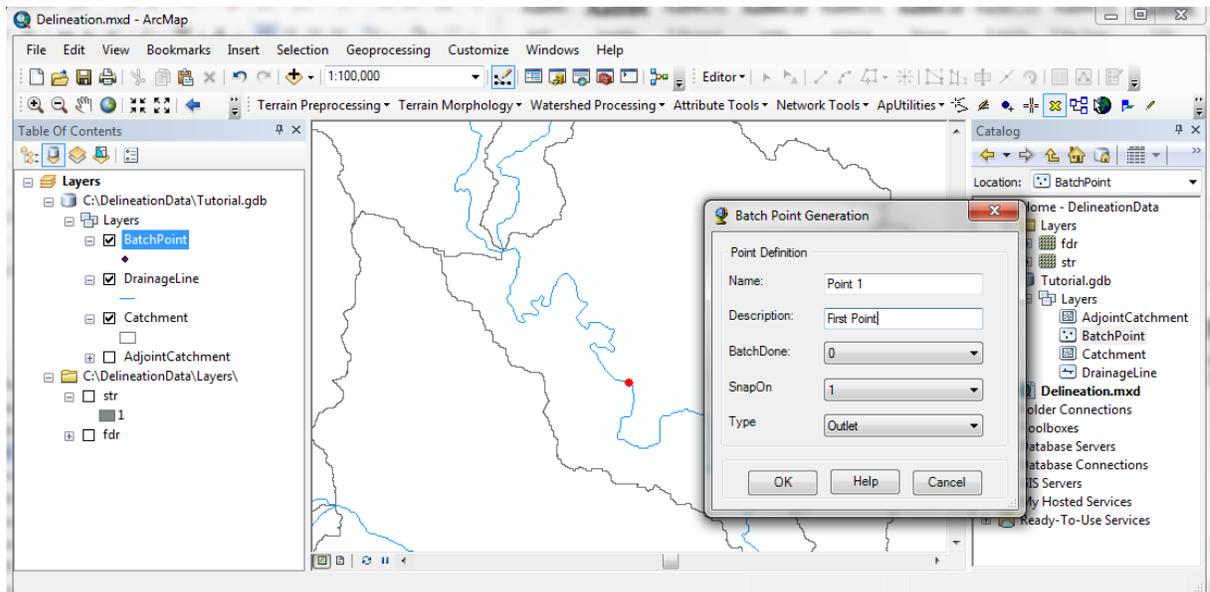


Figure 3-4 – Batch Point Generation

- In the Catalog window, open the Arc Hydro Tools toolbox under System Toolboxes.
- Browse to the Batch Watershed Delineation Tool located in the Watershed Processing toolset.

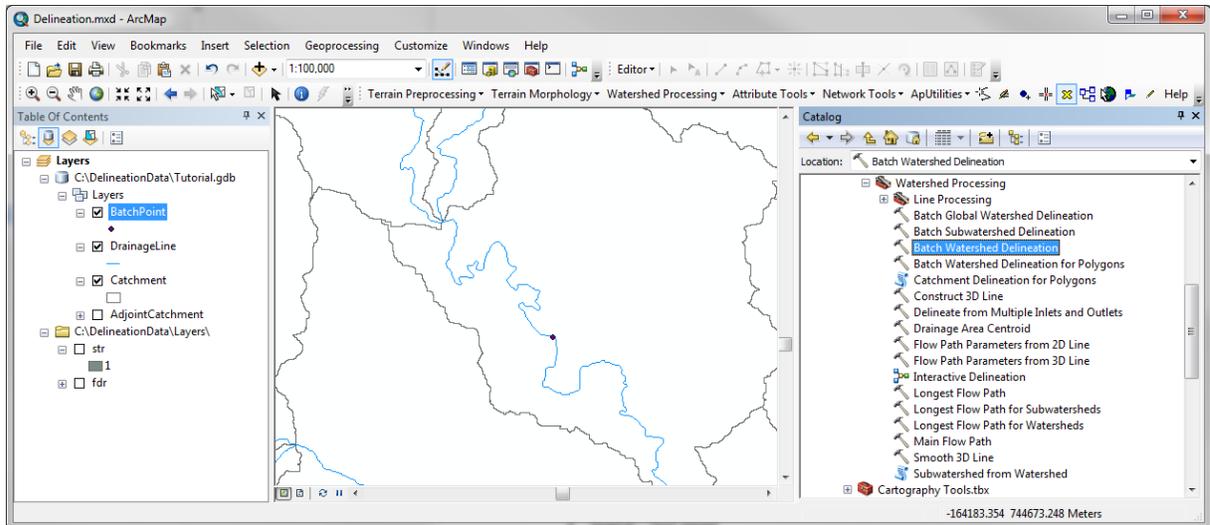


Figure 3-5 – Batch Watershed Delineation Toolset

- Double-click the tool to open it.
- Enter the name of the output watershed and watershed point and click OK to run the tool.

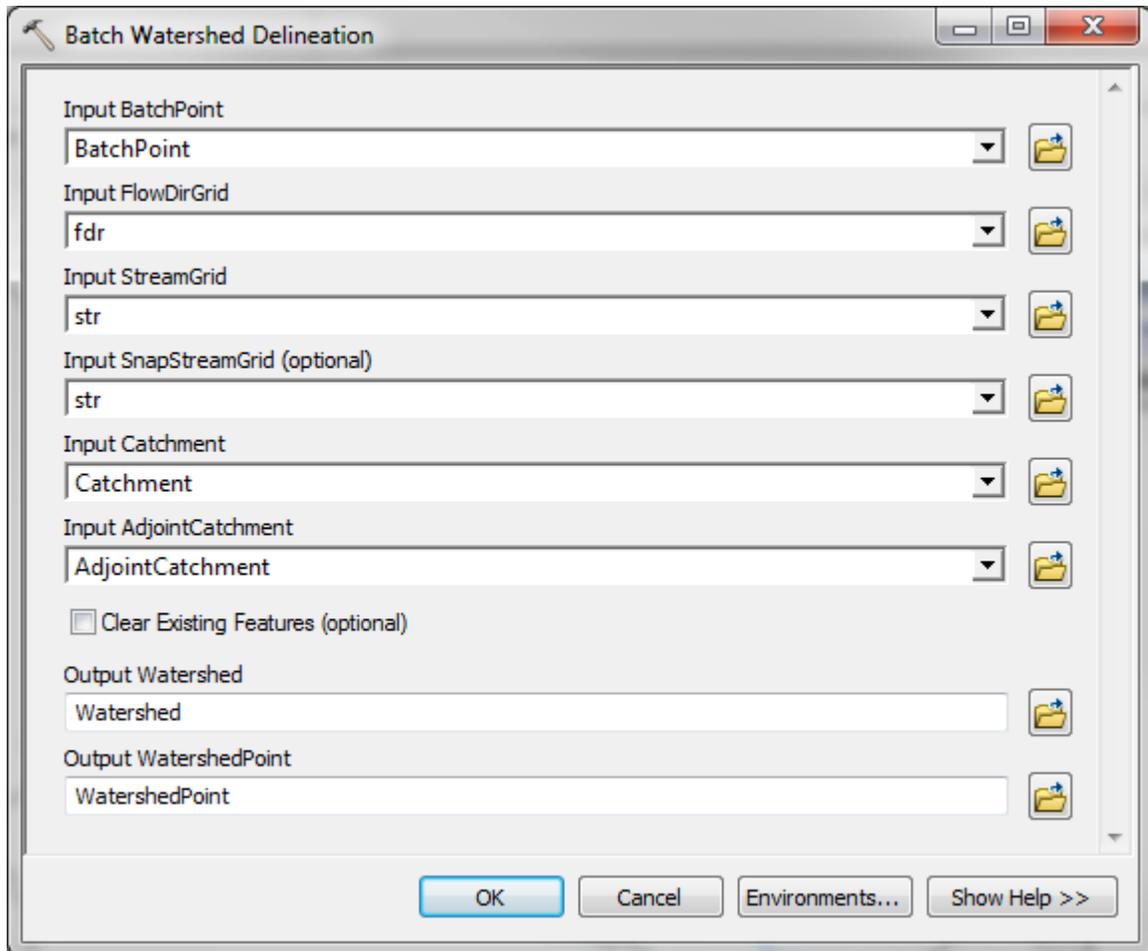


Figure 3-6 – Batch Watershed Delineation User Interface

The tool creates the watershed and watershed point and Geoprocessing Results window shows a successful completion of the Batch Watershed Delineation tool.

3.2. Publishing the service using ArcGIS Server

- In the Geoprocessing Results window, right-click Batch Watershed Delineation and select Share As > Geoprocessing Service.

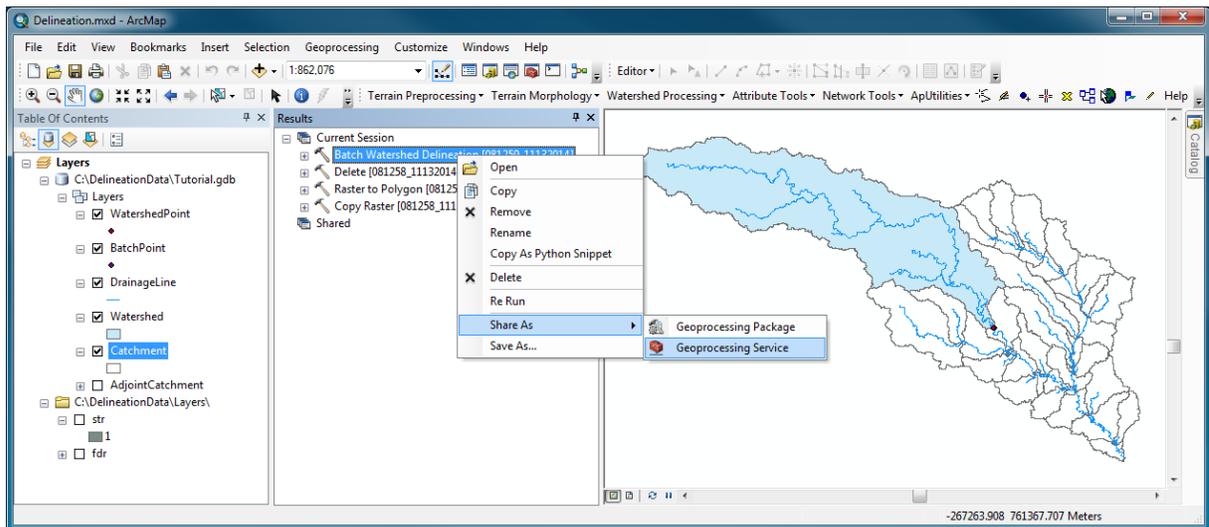


Figure 3-7 – Sharing Geoprocessing Service

- Select Publish a service and click Next.

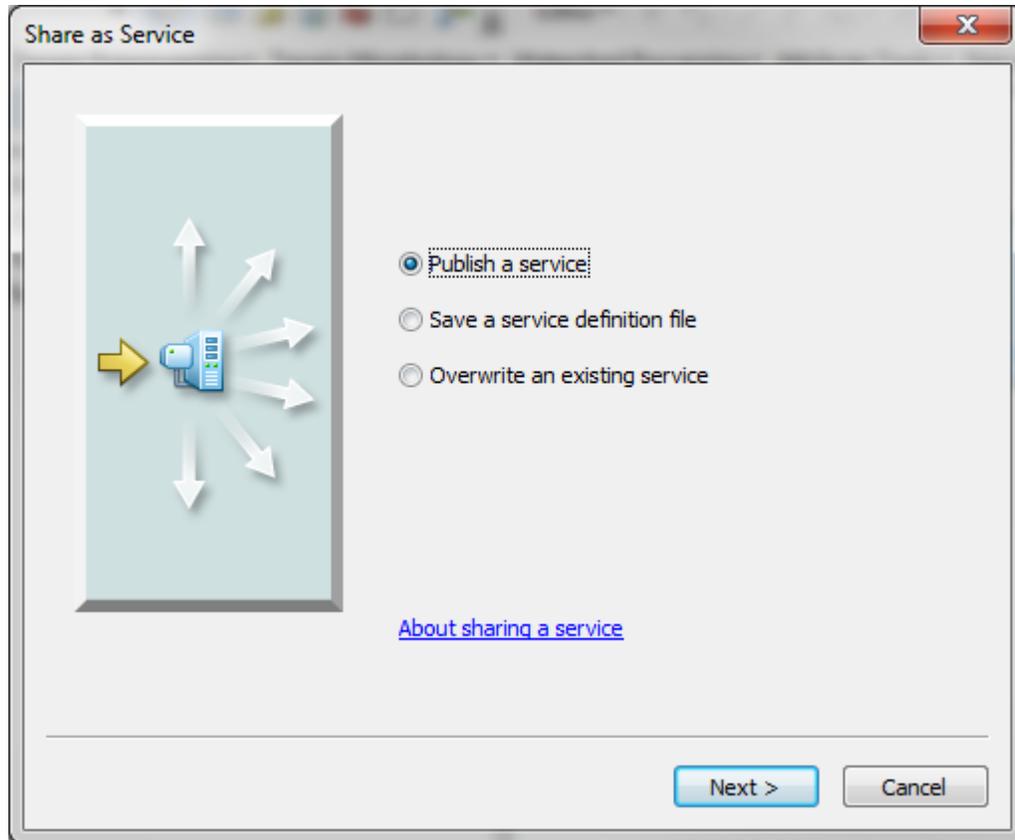


Figure 3-8 – Publish a service

- Select an existing connection in the Publish a Service window or click on  to create a new connection if needed.

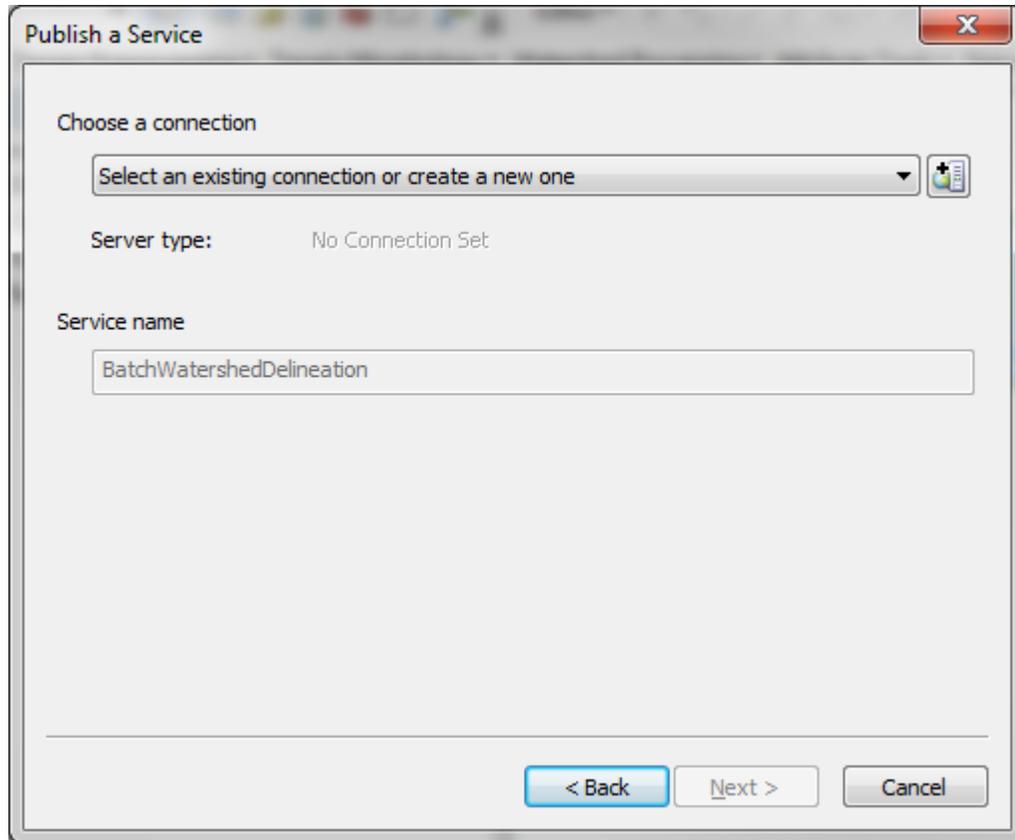


Figure 3-9 – Choose a connection

- If you need to create a new connection, click  and select the option “Publish GIS Service” then click Next.

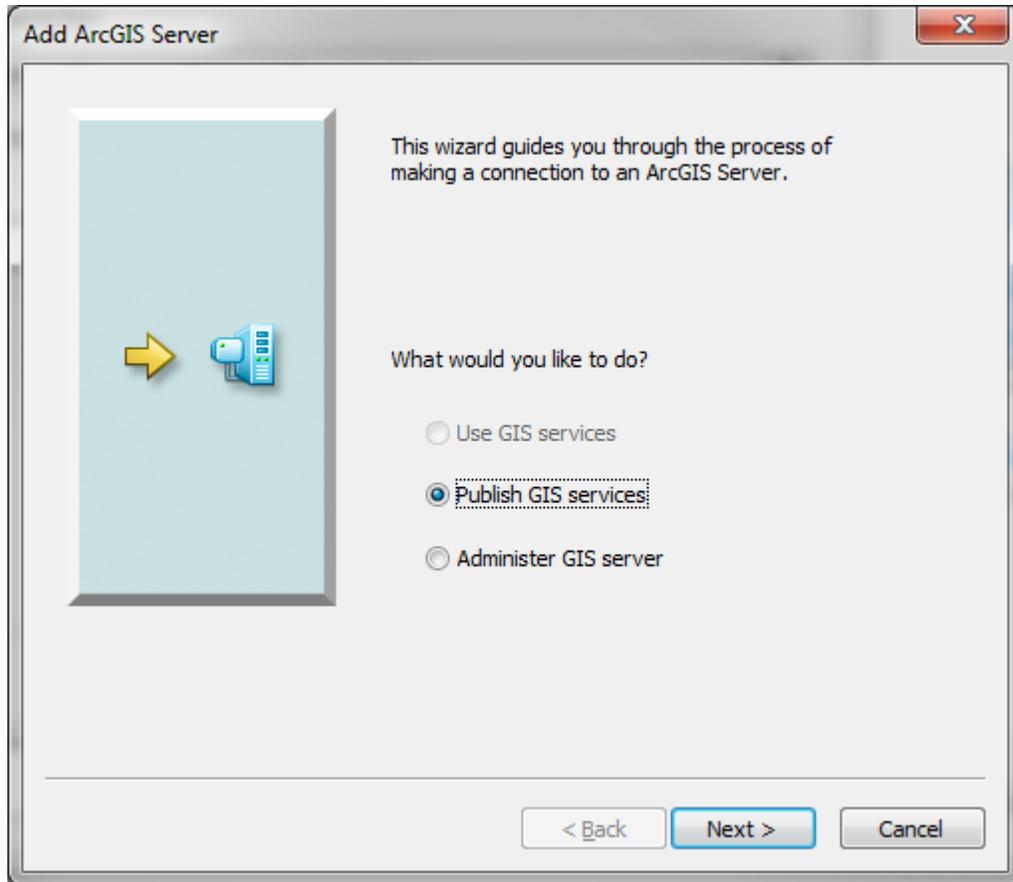


Figure 3-10 – Publish GIS Services

- Enter the Server URL and your user name and password and click Finish.

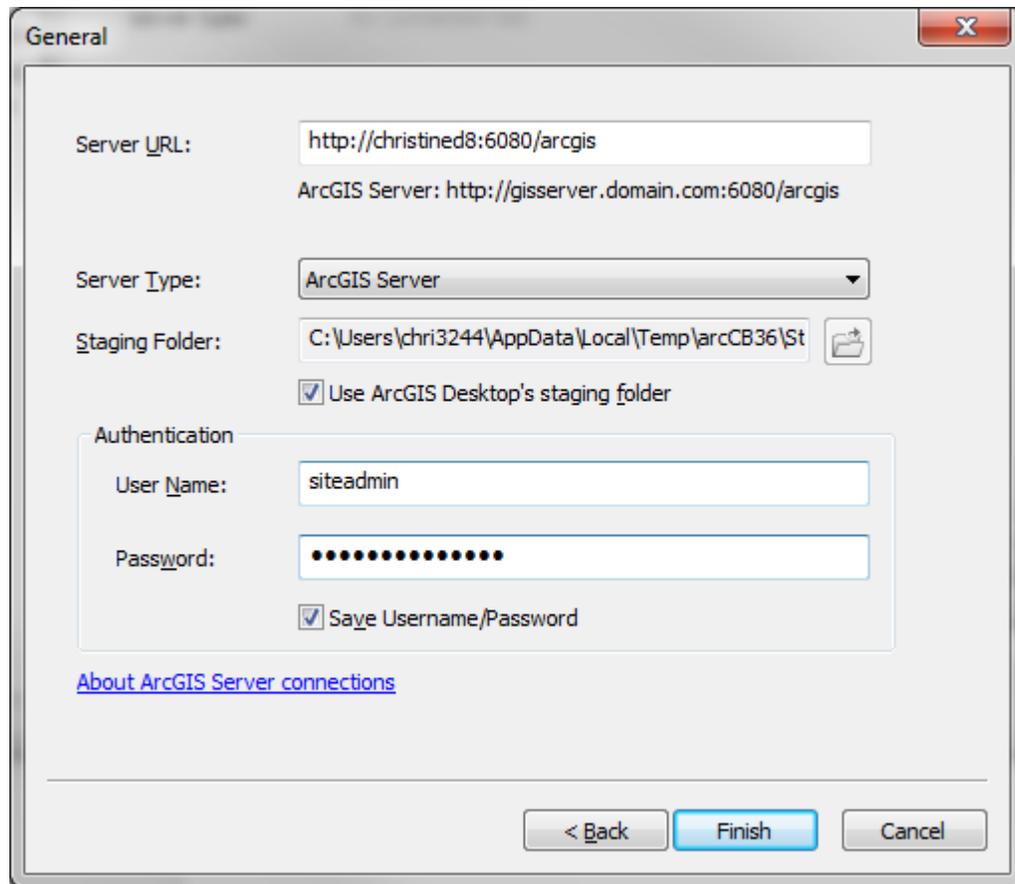


Figure 3-11 – Creating Server Connection

The application will validate the new connection and select it in the Publish a Service window.

- Modify the service name if needed and click Next.

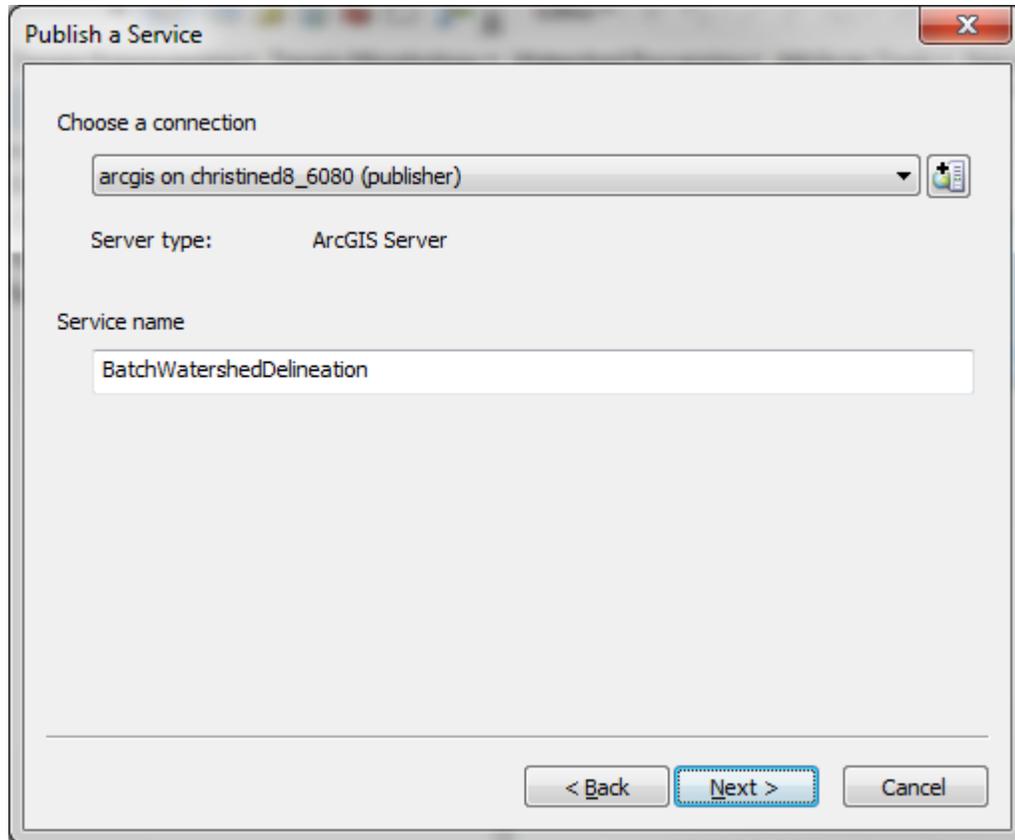


Figure 3-12 – New Connection Validated

- Select the folder for you service and click Continue.

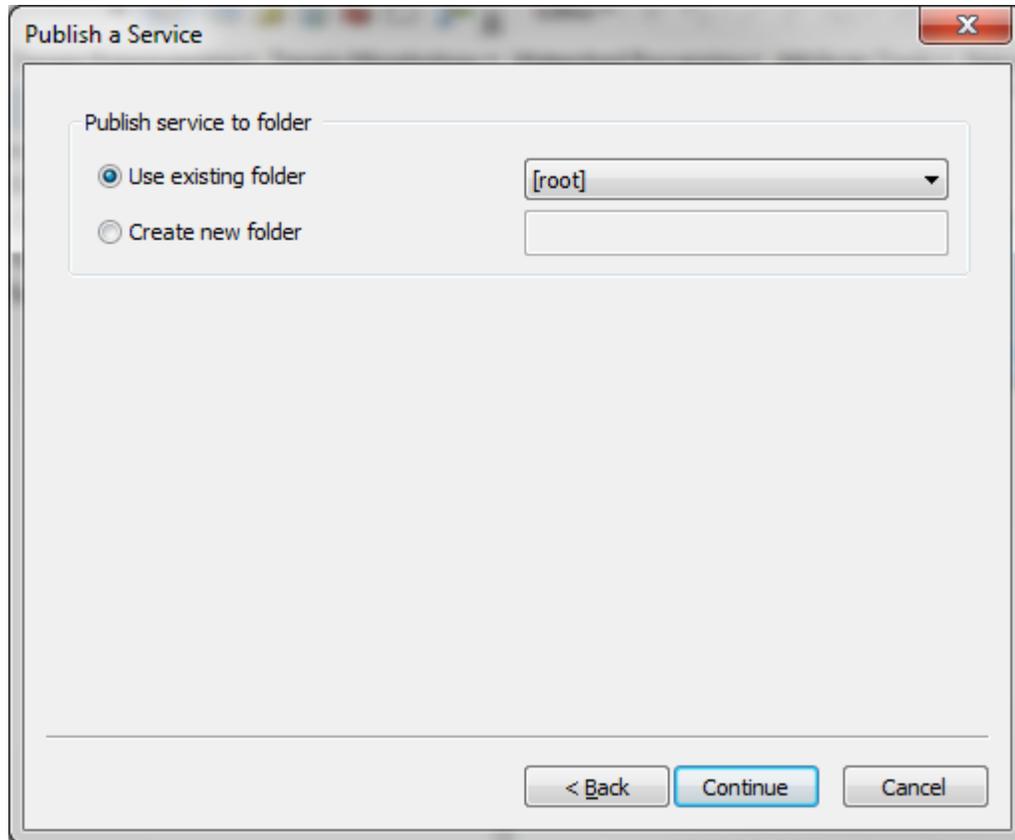


Figure 3-13 = Publishing Folder

The Service Editor Window is displayed.

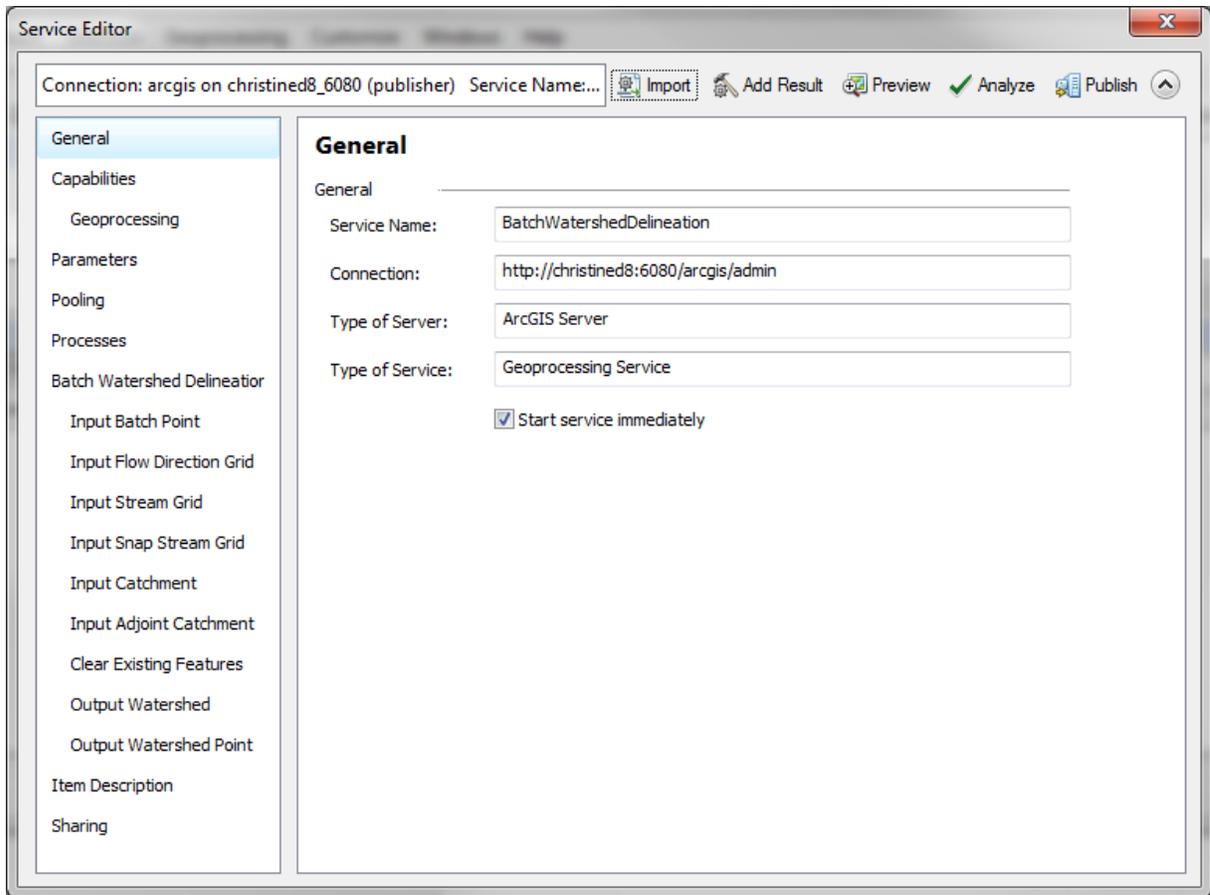


Figure 3-14 – Service Editor Window

- Click Analyze.

The Prepare window shows that 2 types of errors have been found:

- Data Source not registered (high severity)
- Tag missing (low severity)

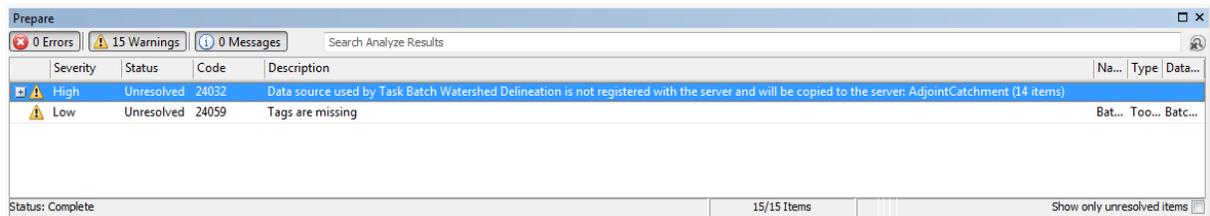


Figure 3-15 – Prepare Window

The arcgis user needs to have access to the data used by the service.

- Right-click one of the Data Source errors and select Show Data Store Registration Page.

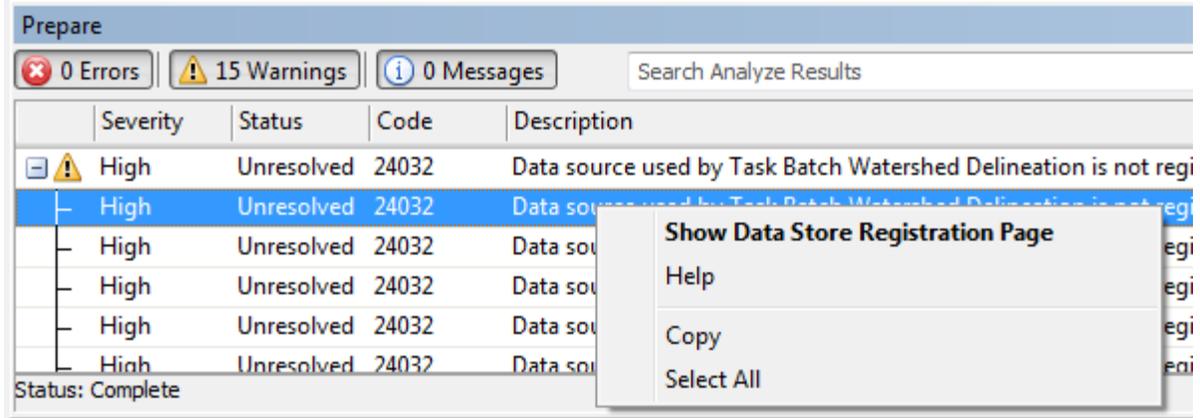


Figure 3-16 – Show Data Store Registration Page

The Data Store window is displayed.

- Click  next to Registered Folder.

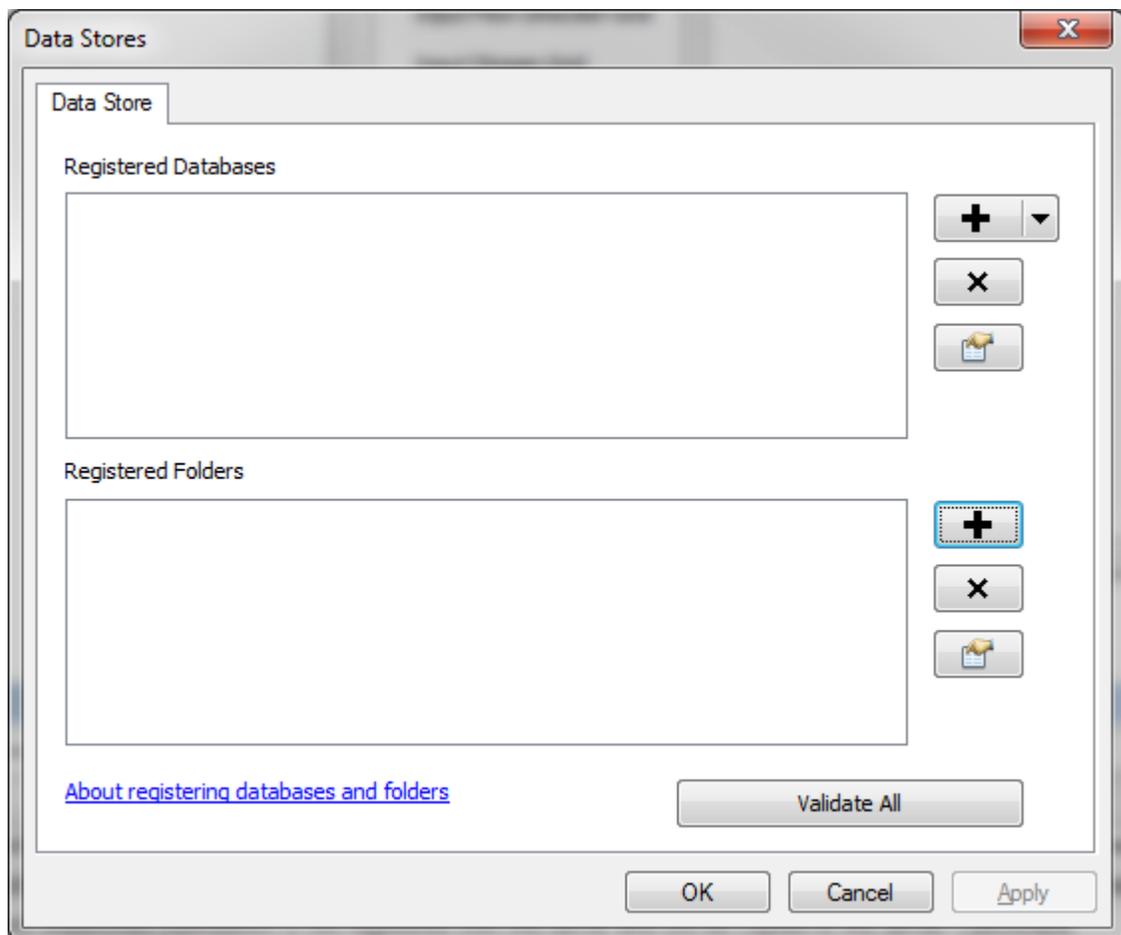


Figure 3-17 – Data Stores Window

- Enter Delineation Data as Name and browse to the Delineation Data folder. If your data is located on the same path on the ArcGIS Server machines, check the Same as published folder path, otherwise enter the appropriate path. Click OK.

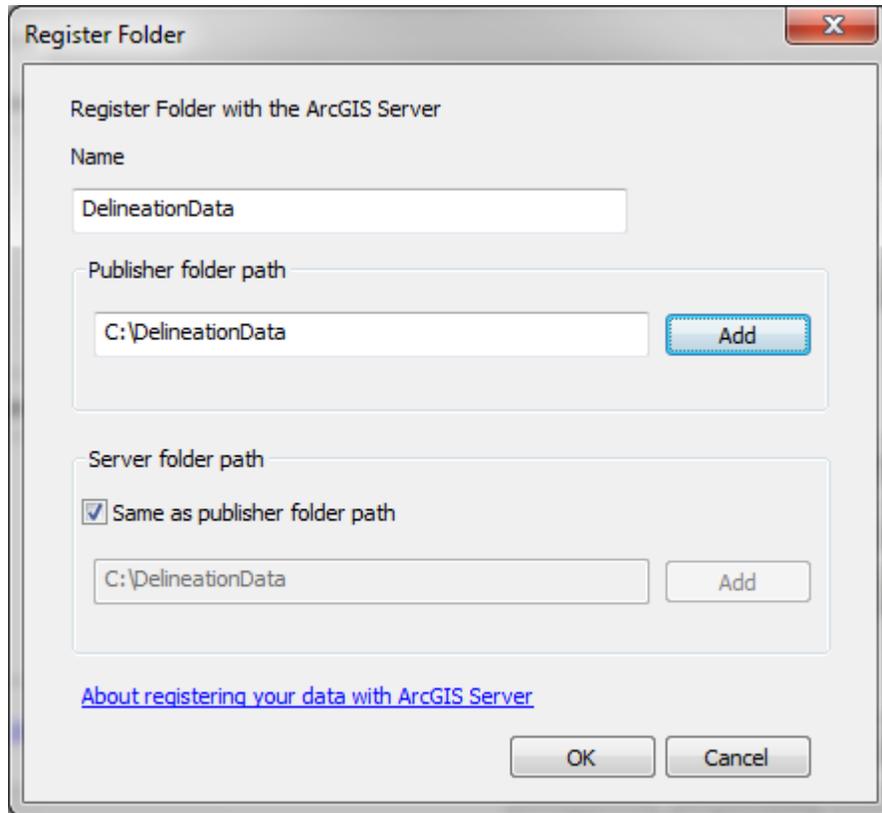


Figure 3-18 – Register Folder Window

The folder is registered with the data store. Click OK to close the window.

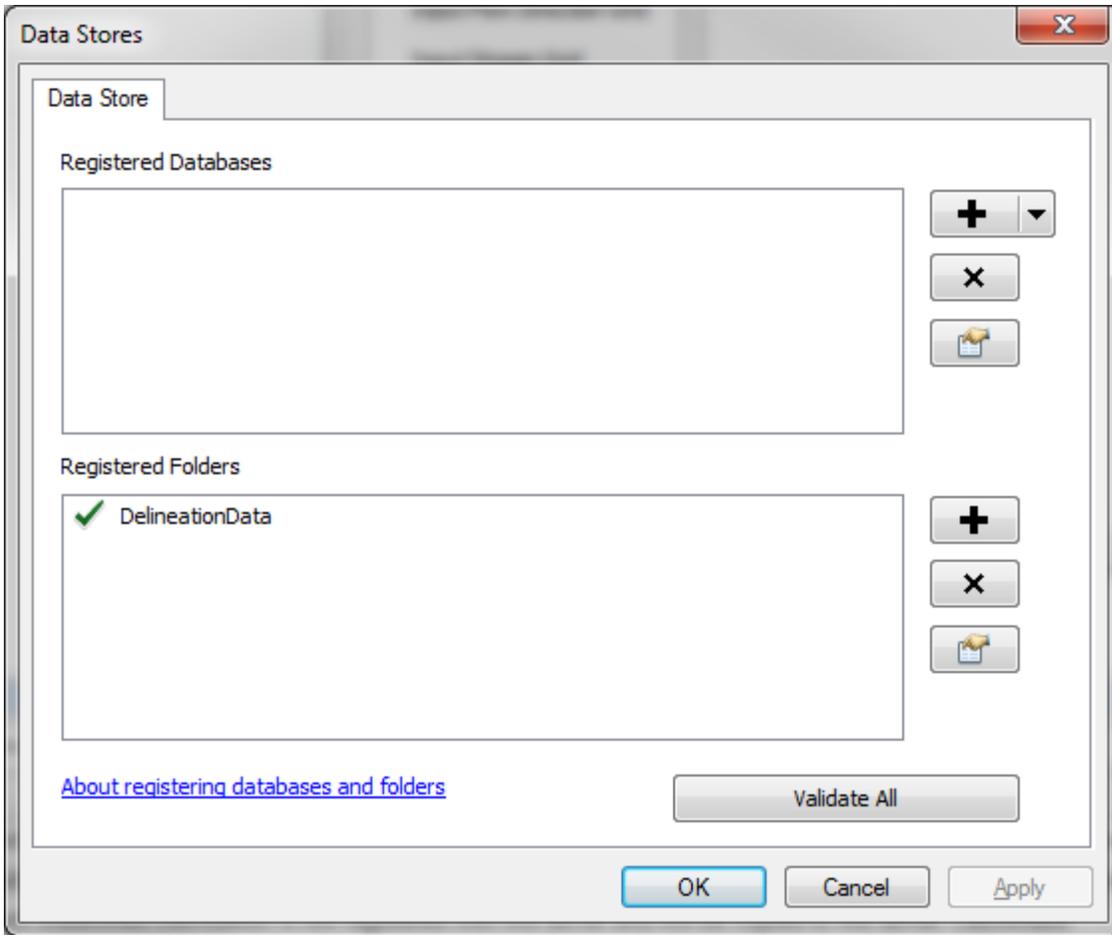


Figure 3-19 – Validated Data

- Click Analyze again.

Note that there is only one warning left.

- Right-click the warning and select Update Item Description.

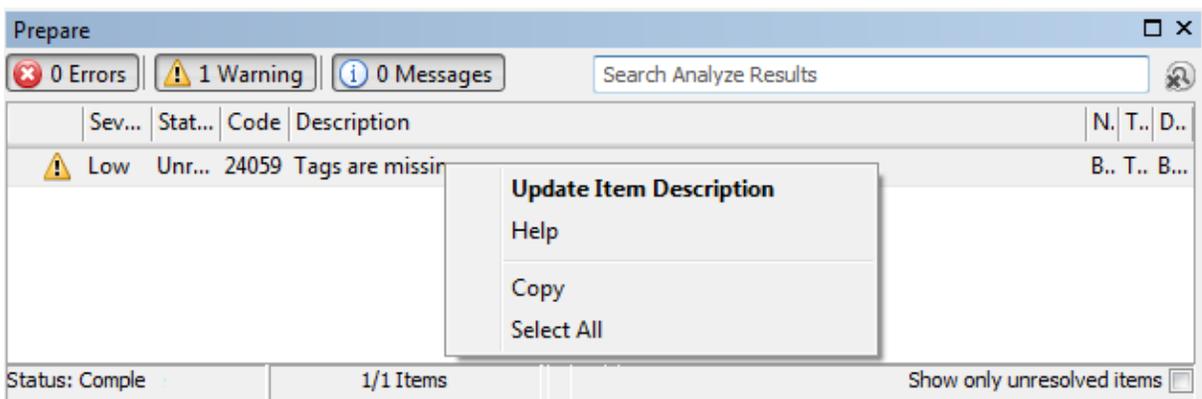


Figure 3-20 – Update Item Description

- Enter the appropriate tags. Click Analyze again.

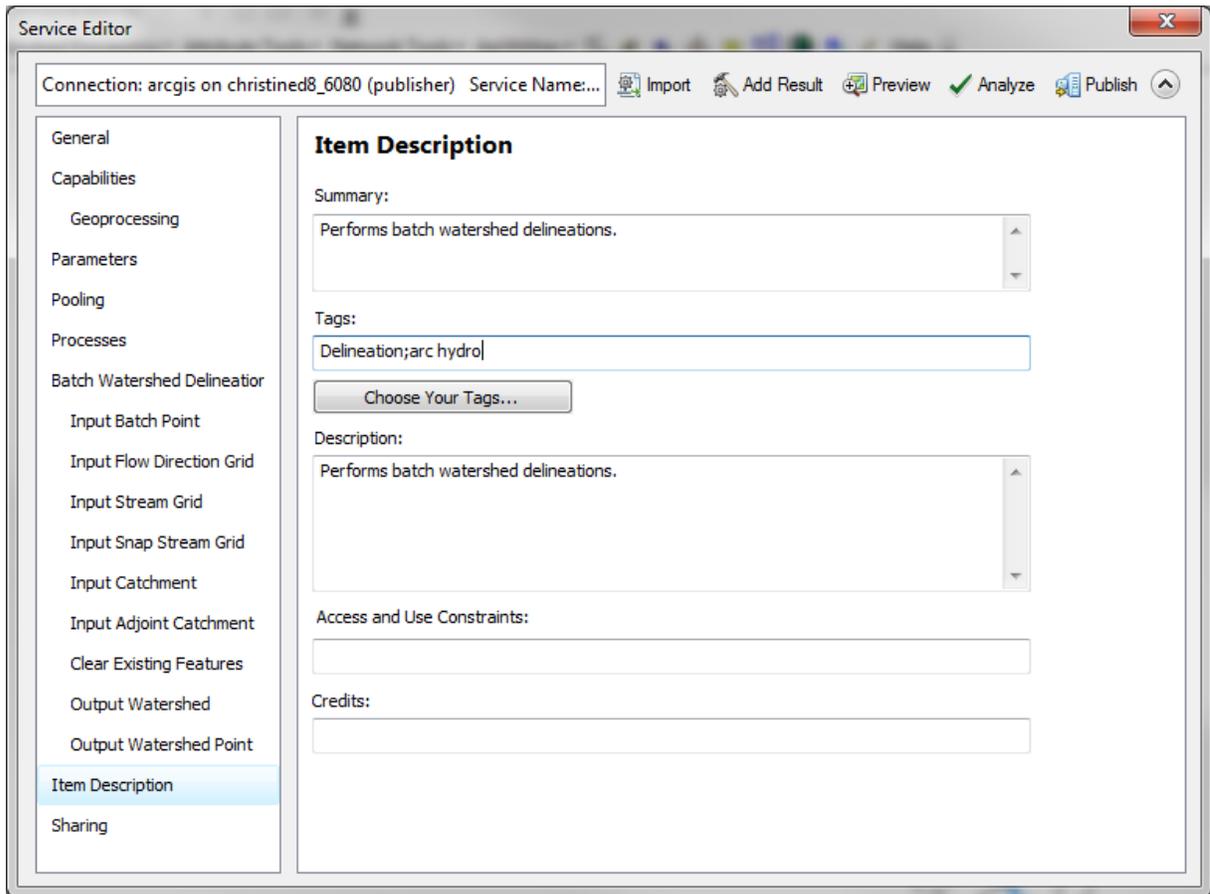


Figure 3-21 – Editing Tags

There are no remaining warnings in the Prepare window.

- Click Input Batch Point and set its Input Mode to User Defined value.

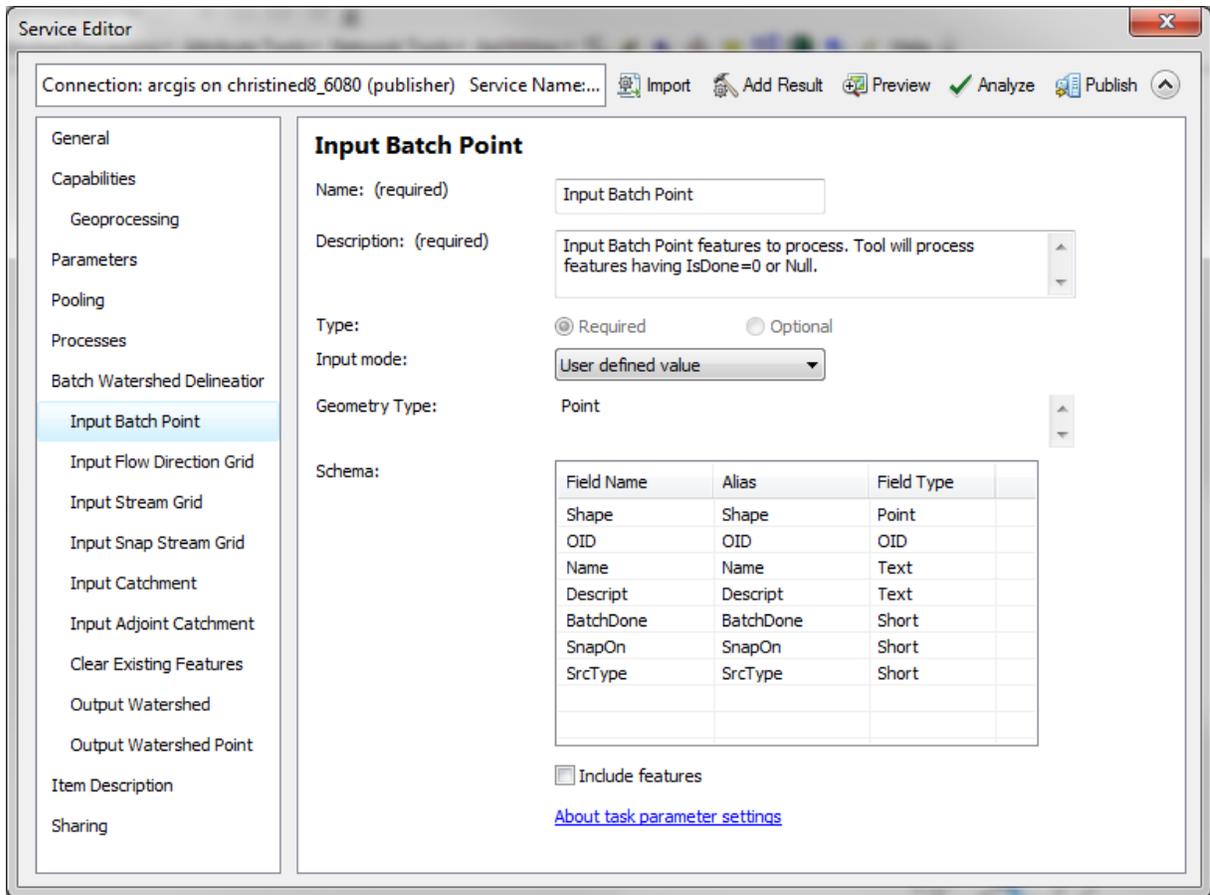


Figure 3-22 – User Defined Value Input Mode

- Click Flow Direction Grid and set its Input Mode to User Defined value.

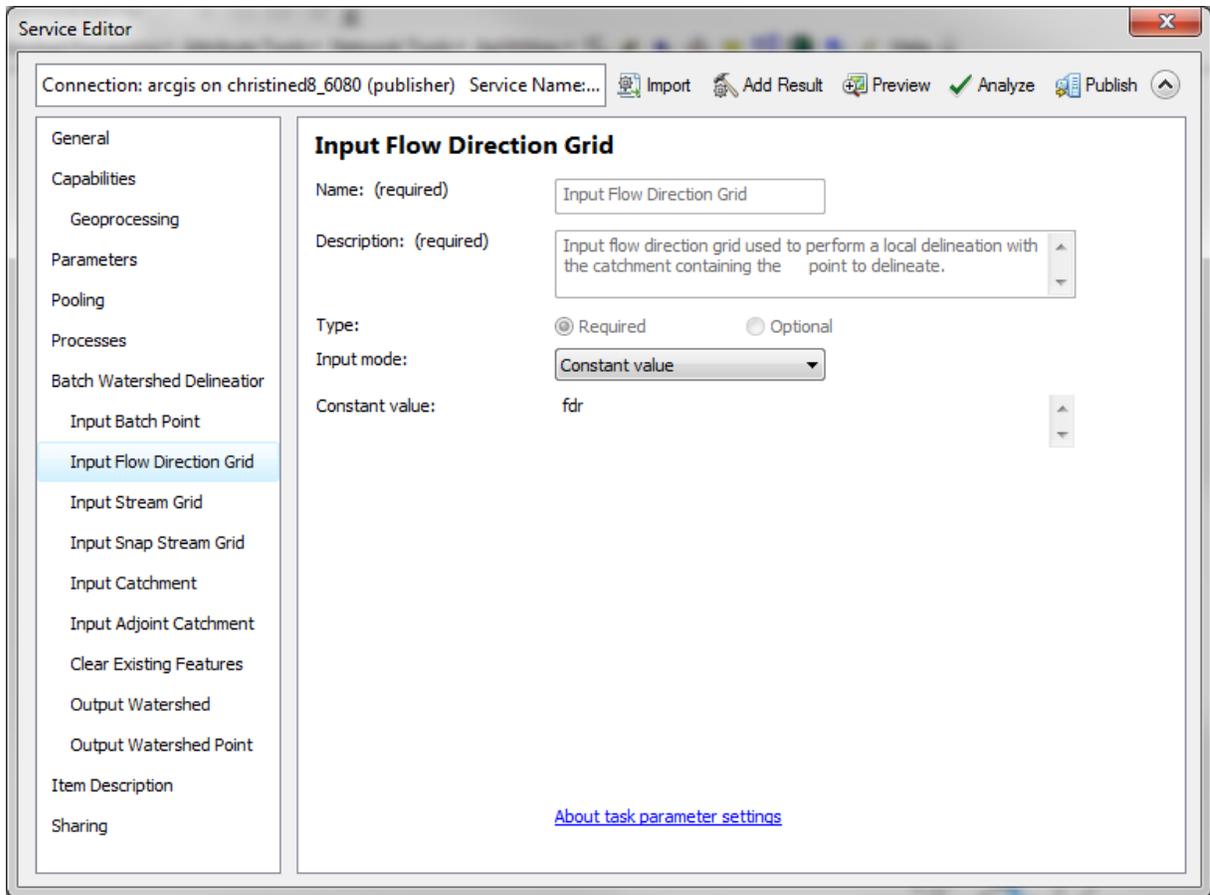


Figure 3-23 – Constant Value Input Mode

- Set all other inputs to Constant Value as well.
- Click Publish.

The publishing process will return a message indicated that the service was successfully processed.

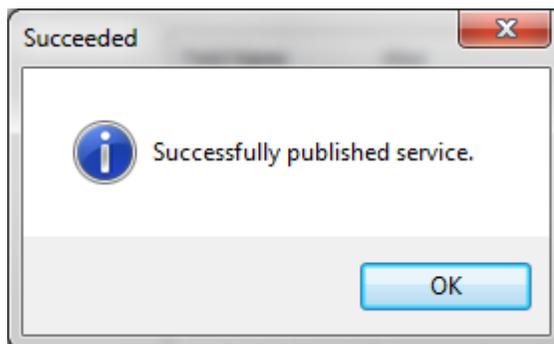


Figure 3-24 – Publishing Successfully Completed Message

The new service is displayed in the Catalog window under the ArcGIS Server connection.

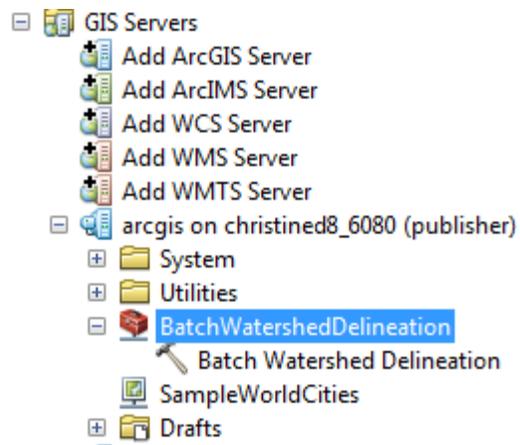


Figure 3-25 – Published Service

- Save and close the map document.

4. Testing the geoprocessing service in ArcMap

- Open a new map document and add the Drainage Line feature class for reference.
- .Browse to the newly defined service and double-click it to open it.
- Click in_batchpoint_features and then click on the map on a drainage line feature. Click OK to execute the tool.
-

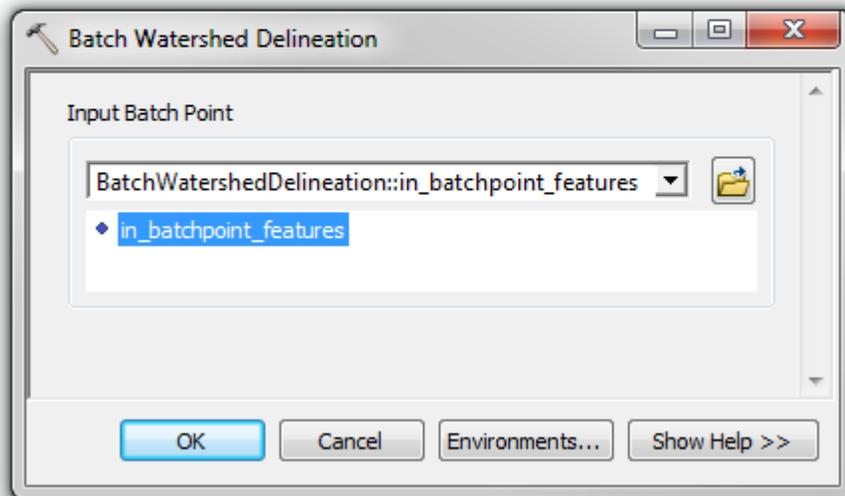
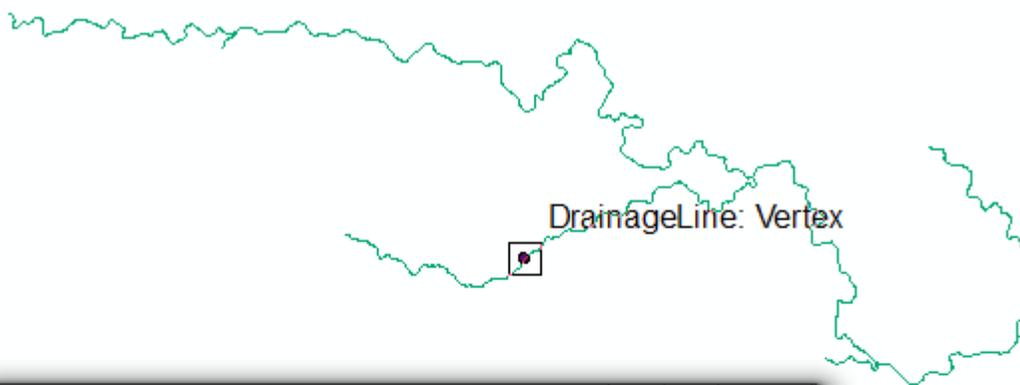


Figure 4-1 – Testing Watershed Delineation Service

The published model performs the delineation and generates the output OutputWatershed and Output WatershedPoint that are added to the Table of Contents of ArcMap.

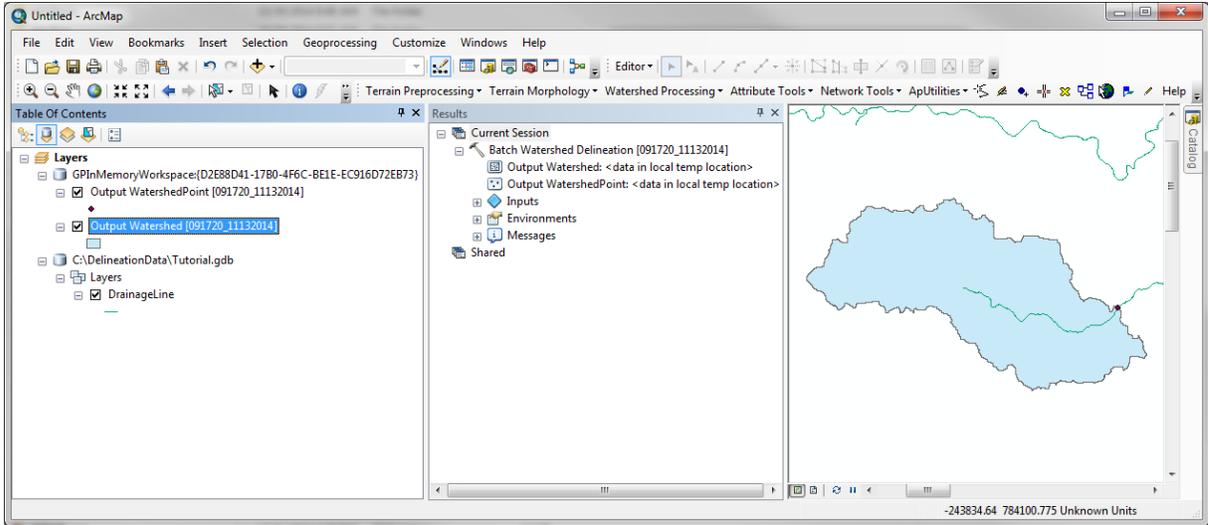


Figure 4-2 – Delineated Watershed

5. Testing the geoprocessing service using the REST API

5.1. Testing the service using REST

- Open a browser and enter the start URL for the ArcGIS Server hosting the published geoprocessing service (e.g. <http://christined8:6080/ArcGIS/rest>, where christined8 is the name of the server).

This url allows accessing the Service Directory window listing the available services.

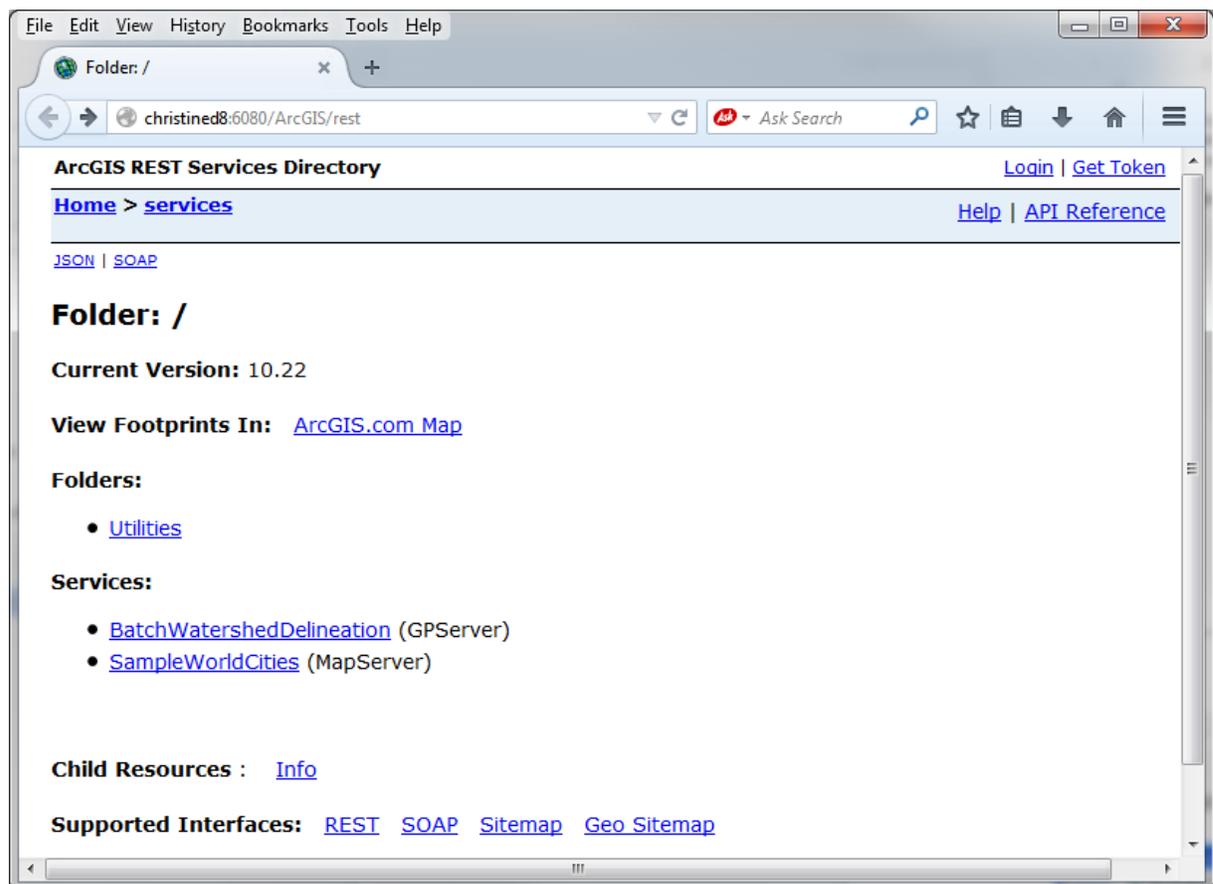
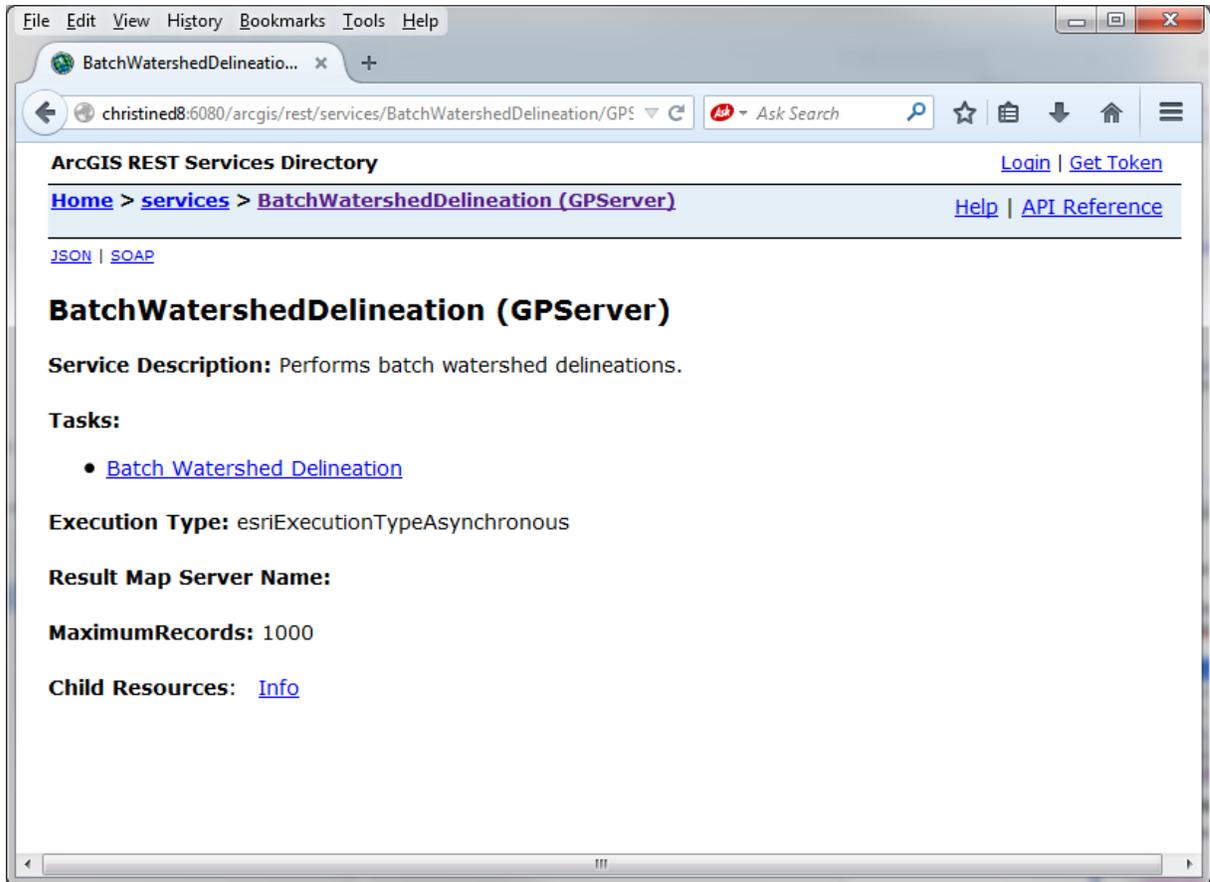


Figure 5-1 – Available Services

- Click on the new BatchWatershedDelineation (GPService) service.

The geoprocessing service is asynchronous. It supports both the REST and the SOAP interface. It has one associated task, Batch Watershed Delineation, which is the geoprocessing tool you published.



- Click the Batch Watershed Delineation task.

The window describes the service and its parameters, as well as the supported API and operation (at the end).

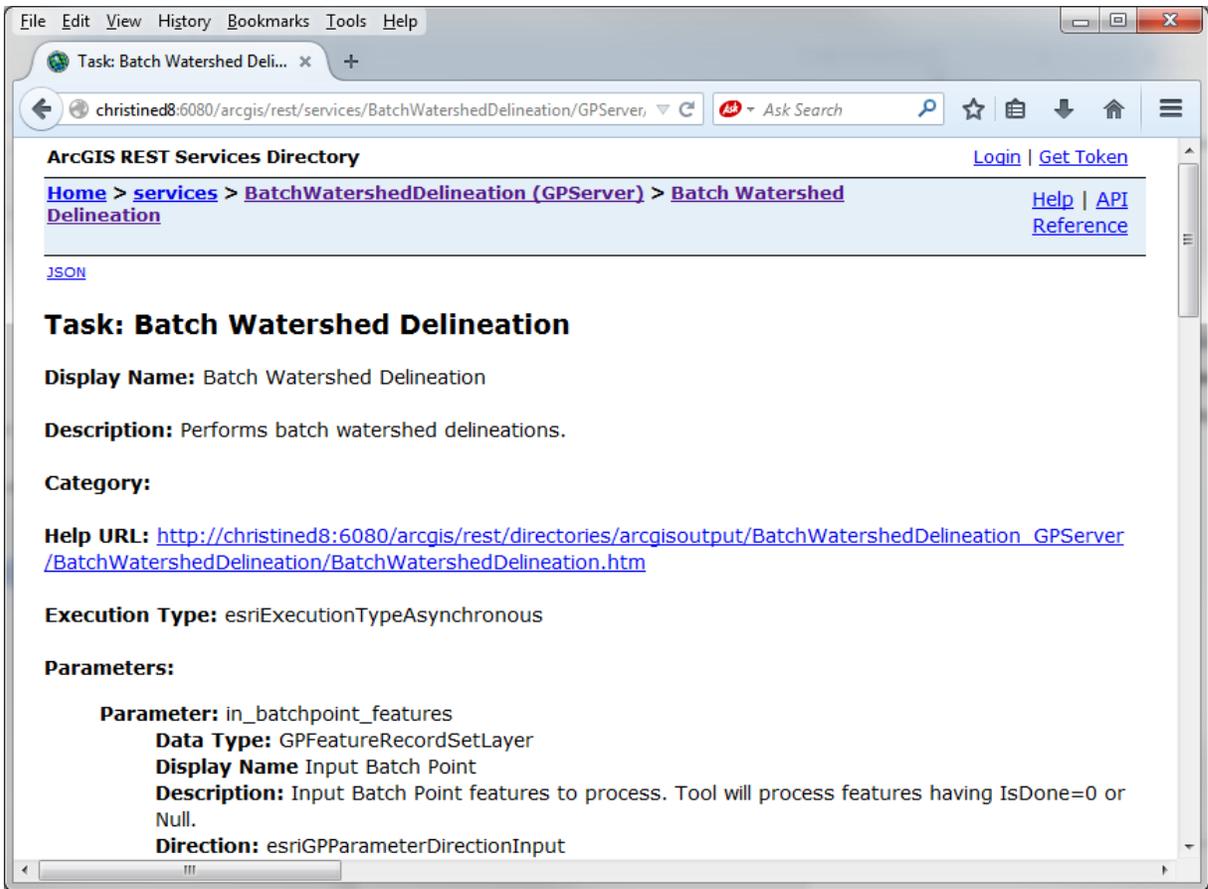


Figure 5-2 – Batch Water Delineation Task Description

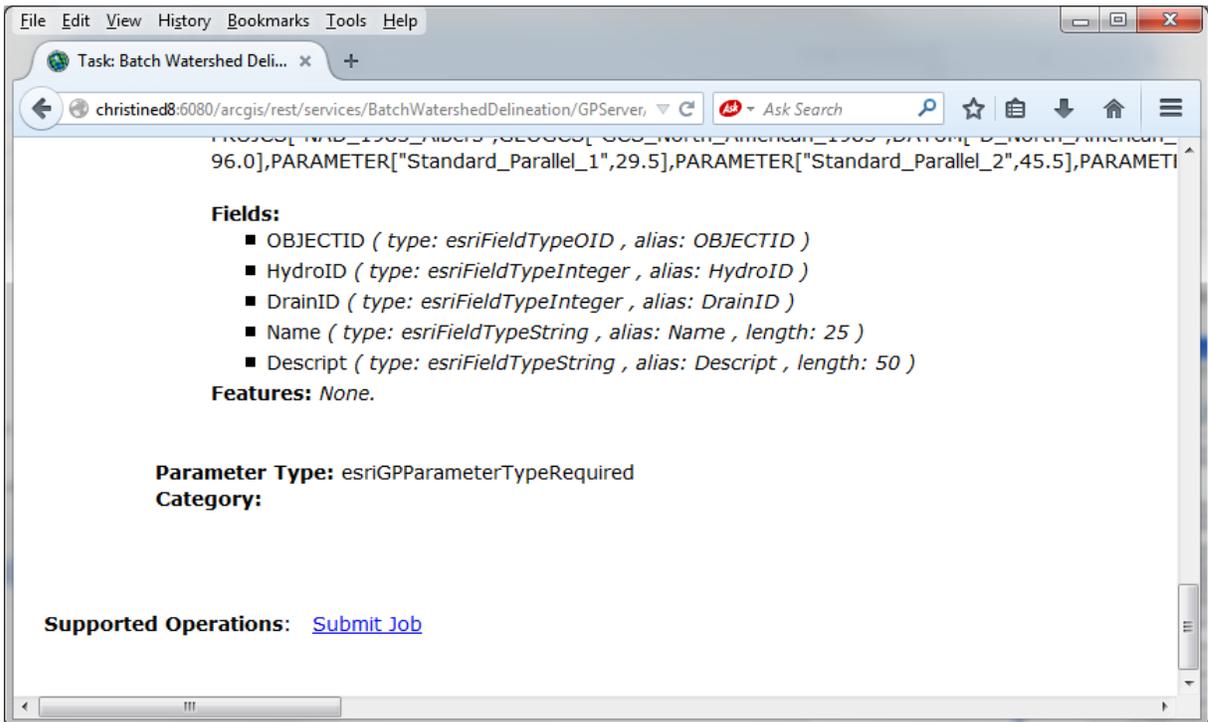


Figure 5-3 - Batch Water Delineation Task – Supported Operation

- Click Submit Job. This is the operation associated to asynchronous task.

The Submit Job (Batch Watershed Delineation) window allows entering the parameter(s) required to execute the published geoprocessing service.

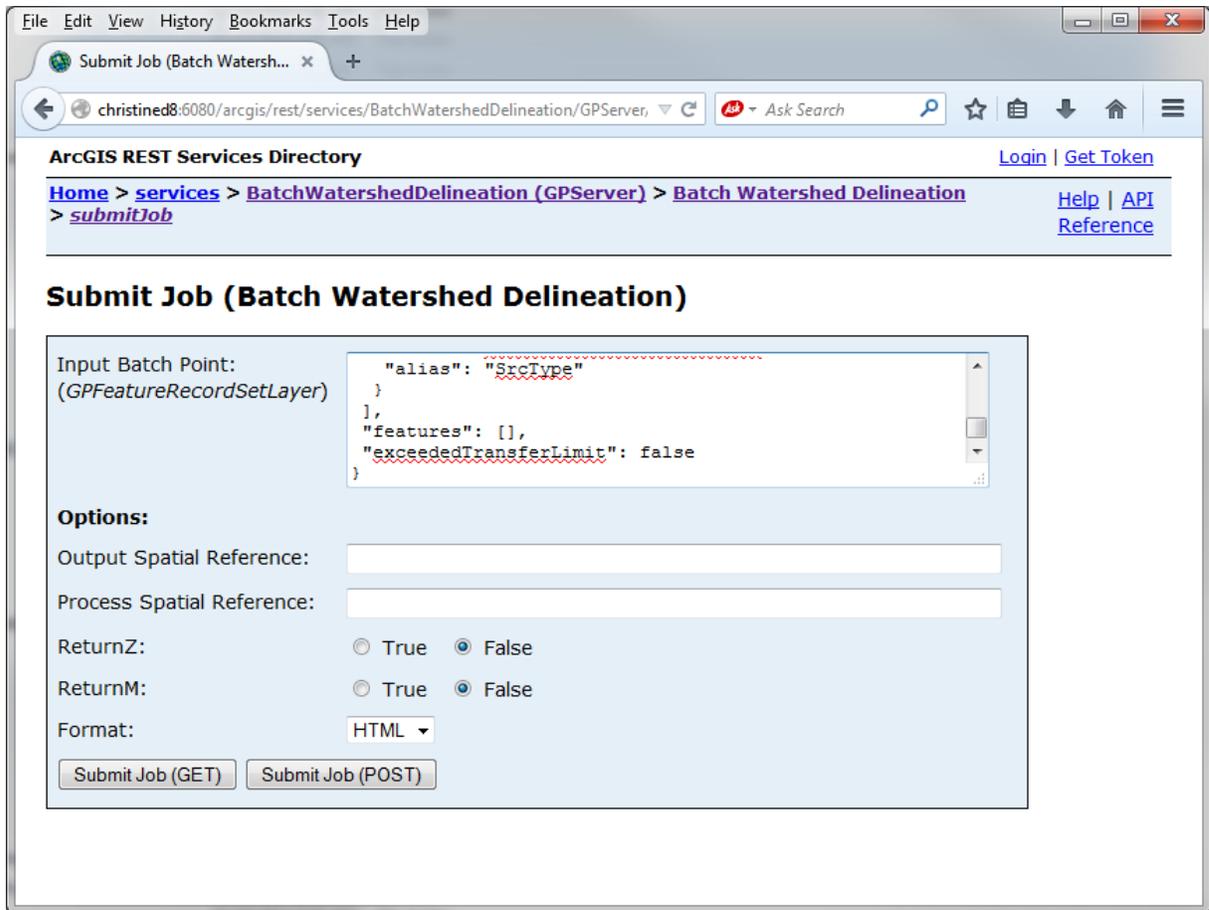


Figure 5-4 – Input Batch Point Parameters (with no coordinates)

- Identify valid x/y coordinates for you input point and replace "features" : [] with:
"features" : [{ "geometry" : { "x" : -186172.806, "y" : 756661.572}, "attributes" : { "BatchDone" : 0, "SnapOn" : 1 } }]

Where x and y are the coordinates of the input point in the same coordinates as the underlying data supporting the delineation (e.g. Albers).

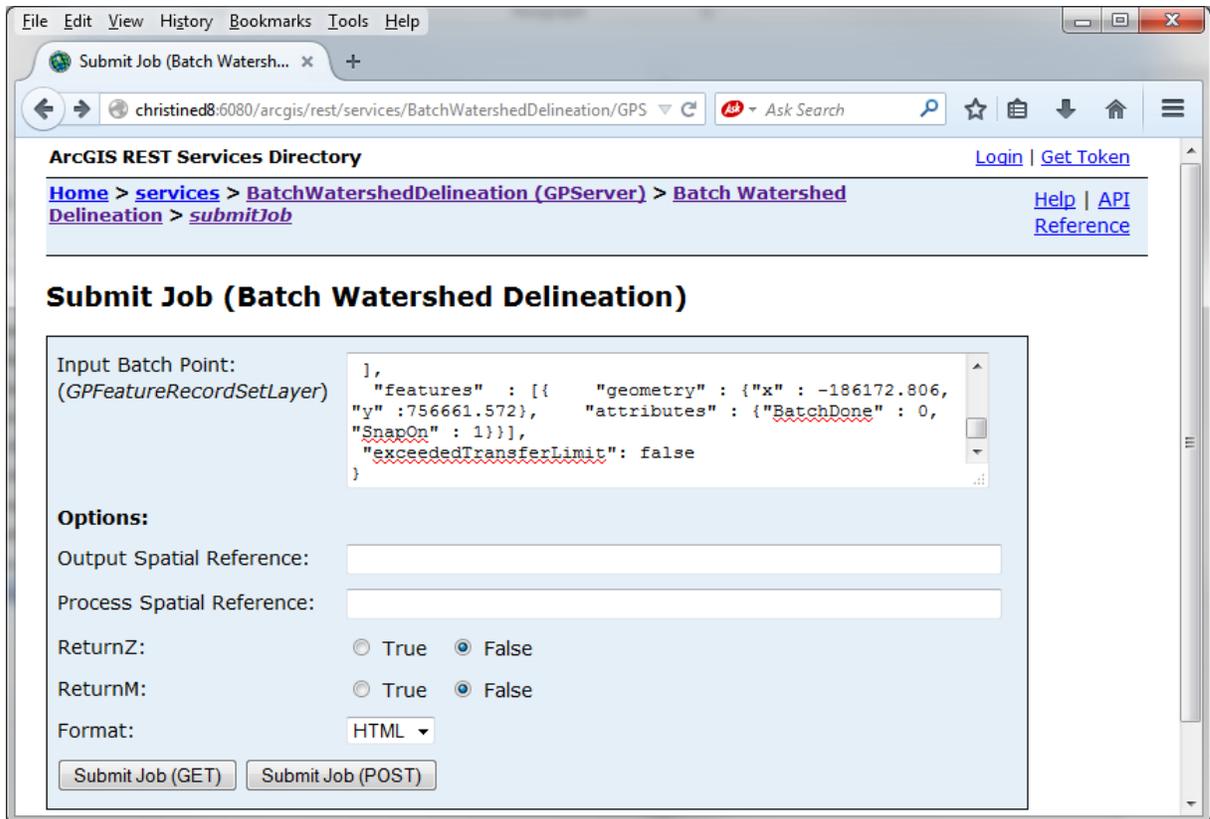


Figure 5-5 – Input Batch Point Parameters

- Click Submit Job(GET).

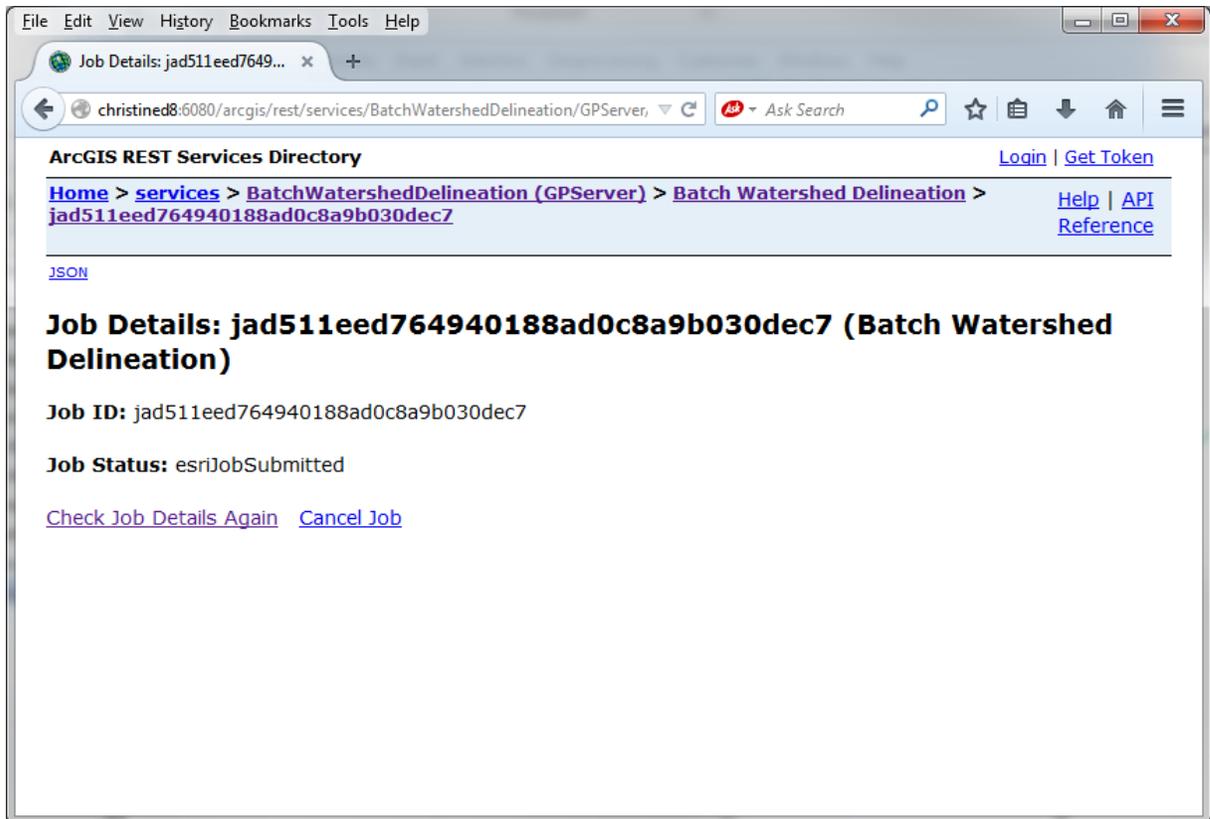


Figure 5-6 – Batch Watershed Delineation Job Status

- Click Check Job Details Again to obtain updated information on the Status.

The window contains the status of the job (esriJobSucceeded) as well as the Results in html format.

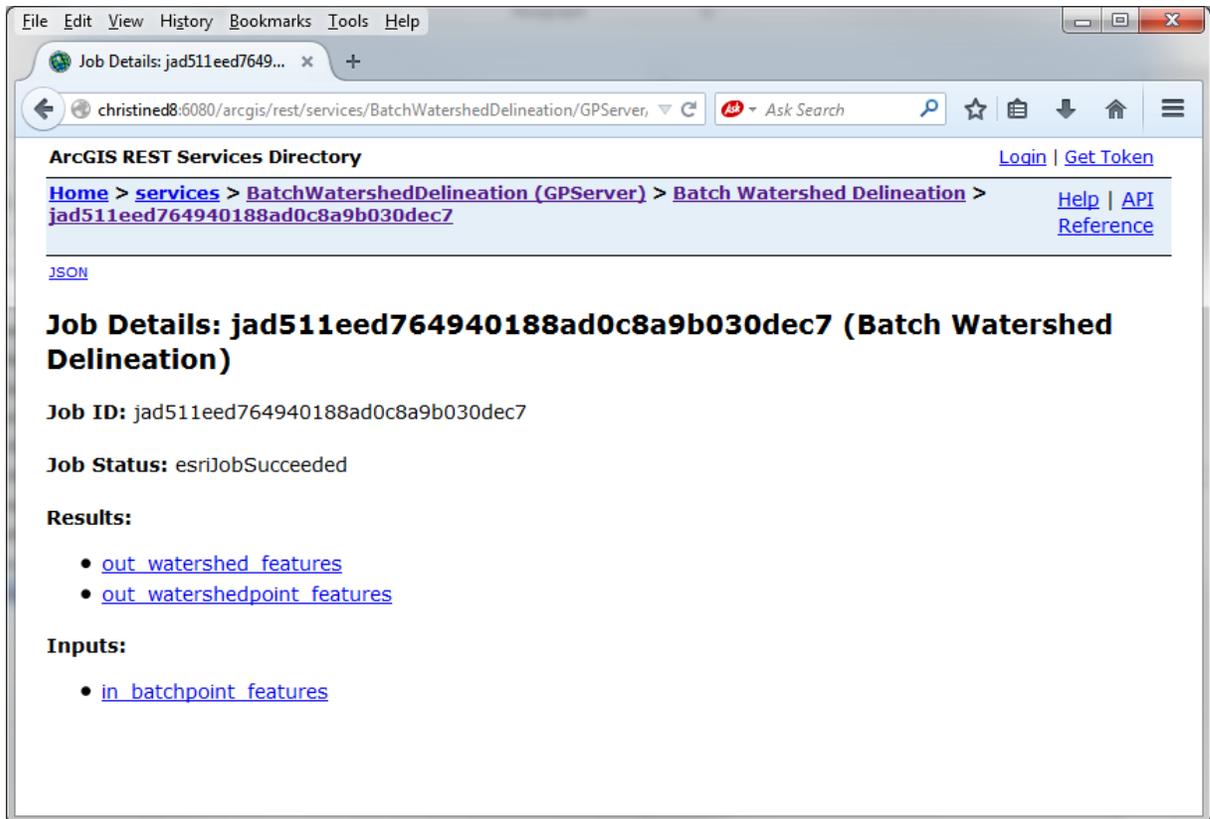
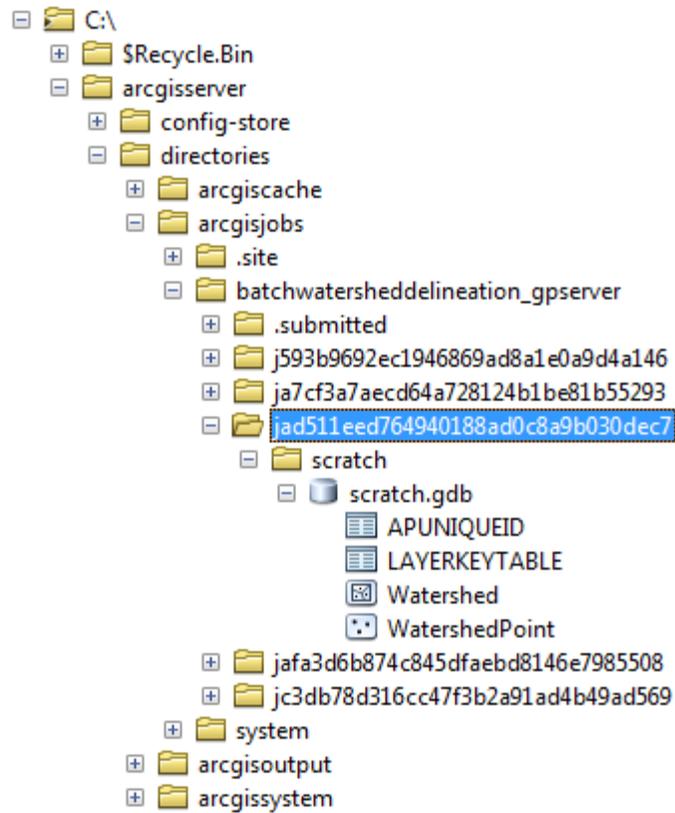


Figure 5-7 – Services Results

You can look on the server in the arcgisjobs directory for the folder associated to the job submitted (e.g.jad511eed764940188ad0c8a9b030dec7).



Note

You can access directly the job submission page for the service by entering the following url
<http://christined8:6080/arcgis/rest/services/BatchWatershedDelineation/GPServer/Batch%20Watershed%20Delineation/submitjob>

where:

Batch Watershed Delineation is the name of the task in the published geoprocessing service
BatchWatershedDelineation.

Submit job is appended because the service is asynchronous.