GIS
Tips & Tricks

By Al Karlin, Ph.D., CSM-L, GISP

Need More Tools? Try These...

Geoprocessing tools are the nuts of bolts of GIS processing. An "off-the-shelf" GIS software package could come with several hundred standard tools. But what are the options for a beginning or intermediate GIS analyst when you face a GIS question that requires a new or different tool. Well… there are actually multiple options available, some easier to access than others. Below are a few "tips" for finding tools not included with the off-the-shelf GIS products. Please note that these are options, and not endorsements or recommendations.

FOR ARCGIS (DESKTOP AND PRO)

TIP #1 — Although off-the-shelf ArcGIS Pro comes with 41 toolboxes, there is always room for one more. One of my favorite "add-ins" is Arc Hydro (Figure 1). If you are look-ing for tools directed specifically for water resources, this is the toolset for you. This toolbox is available from Esri, at no cost, https://www.esri.com/en-us/industries/water-resources/arc-hydro/downloads?rsource=https%3A%2F%2Fdownloads.esri.com%2Farchydro%2Farchydro%2FSetup%2F.
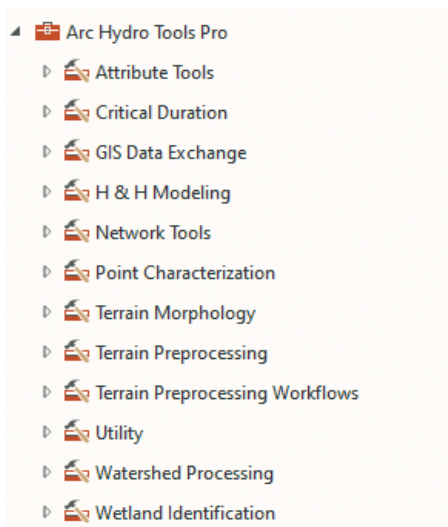

Figure 1. The Esri Arc Hydro Toolset in ArcGIS Pro.

This toolset is available for most versions of ArcGIS Desktop (ArcMap 9.3 and higher), as well as, ArcGIS Pro (2.5 and higher) and comes with a wealth of documentation. Best of all, just download the .MSI file, double-click on it and it installs itself. The "gottcha" with this toolset is that Esri is constantly upgrading it with new tools and functionality. The version number will be in the "Settings | Apps | Installed apps" description if you forgot to note it somewhere, so after a few months, you might want to update. (Hint: I generally append the version number to the downloaded .MSI file along with the date I downloaded it.)

TIP #2 — For those a little more adventurous and willing to accept an "AS IS" add-in, the WhiteBox tools (Figure 2) from MIT are a really good choice. This Python-based toolset brings a wide variety of GIS functions, some of which overlap with the "off-the-shelf" tools, but there are several unique tools; Machine Learning and Precision Agriculture for example.
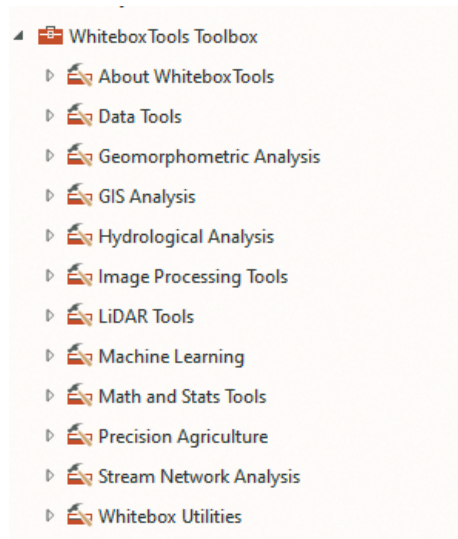

Figure 2. The WhiteBox Toolset in ArcGIS Pro.

The WhiteBox toolset for ArcGIS is available at no cost from GitHub, https://github.com/opengeos/WhiteboxTools-ArcGIS/tree/master/WBT . The WhiteBox tools are also available as a Python, Jupyter, and R library. Installation is pretty easy and the toolset is available "adding" the toolset to the Toolboxes in ArcGIS Pro | Catalog.

TIP 3 — For those less adventurous and more financially solvent, there are several commercially available add-in toolsets. One of the more robust while still economical packages is a tried-and- true package called "XTools". This toolset is offered as a "try before you buy" package that includes more than 100 tools and functions for spatial analysis, shape conversions and table management. There are versions available for both ArcGIS Desktop and ArcGIS Pro that can be downloaded from https://xtools.pro/en/overview/.

FOR QGIS

TIP #4 — The Whitebox toolset is also available to QGIS users. There is a Python Plugin Repository, https://plugins.qgis.org/plugins/wbt_for_qgis/ .

TIP #5 — QGIS maintains a large repository of plug-ins that cover a wide range of GIS analytics, ranging from Shape and Lat/Long Tools to Rubbersheeting and Image Classification. These and more are available at no cost for download at: https://plugins.qgis.org/.

FOR "FREE" GIS SOFTWARE

TIP #6 — While the above tips assume that you are using either an Esri product or an opensource product, like QGIS, there are other "free" downloadable options, and some even run on MacOS, a rarity in the GIS world. It may take a bit of patience to find the right product for your analysis, but GISGeography.com (https://gisgeography.com/free-gis-software/) is a good place to start your search.

Finally, while you are at the GISGeography.com site, for the most adventurous, there are several Python libraries (https://gisgeography.com/python-libraries-gis-mapping/) tutorials, and other support documentation to "make your own" tools.

Send your questions, comments, and tips to GISTT@ASPRS.org.

Al Karlin, Ph.D., CMS-L, GISP is with Dewberry's Geospatial and Technology Services group in Tampa, FL. As a senior geospatial scientist, Al works with all aspects of lidar, remote sensing, photogrammetry, and GIS-related projects.

GIS
Tips & Tricks

The *PE&RS* GIS Tips and Tricks column has been appearing monthly since 2018.

Together with colleagues from the GIS community, we have provided tips on using **Esri**, **Global Mapper**, **MicroStation** and **Open Source (QGIS) GIS** software products, as well as several **Python** and **cartography** tricks that we have accumulated over the years.

As a reader of the column, we would be happy to hear from you regarding suggestions for future topics, questions, and of course, contributions. Looking forward to hearing from you at: **GISTT@ASPRS.org**.
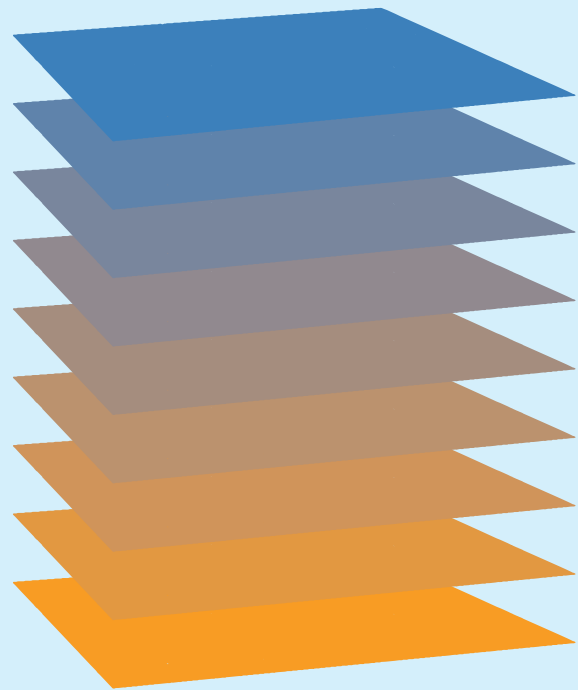
asprs THE IMAGING & GEOSPATIAL INFORMATION SOCIETY