

Using SAGA to Develop Terrain Derivatives

What is SAGA?

The System for Automated Geoscientific Analysis, or SAGA, was developed at the University of Hamburg, Delaware, and released through the GNU public license. This system is an open-source, free, and CCE-certified software. It has more built-in functionality for terrain analysis than ArcGIS, and many terrain derivatives are only available in SAGA. The system has capabilities for image and data processing as well as analysis. More information on SAGA and the SAGA user's group is available at: <http://www.saga-gis.org>. Useful guides are available here: [Volume 1](#) and [Volume 2](#).

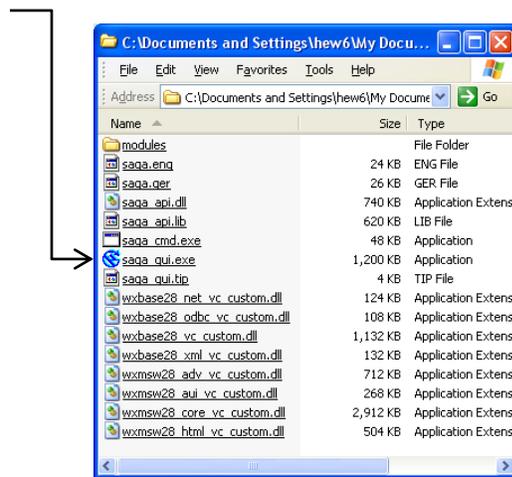
Obtaining SAGA

For a conventionally installed version of the latest CCE Certified version, contact your ITS specialist.

Opening SAGA



- Double-click on the shortcut  or
- Navigate to the install directory (e.g., "C:\Program Files\saga_2.1.0_x64") and double-click on the executable program "saga_gui.exe."

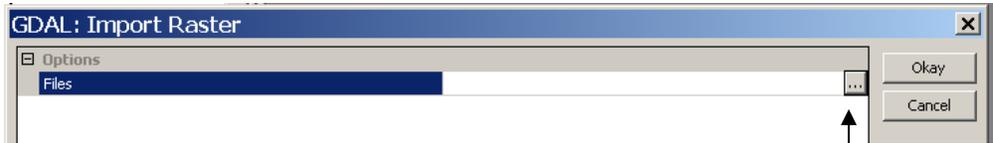


Importing Data

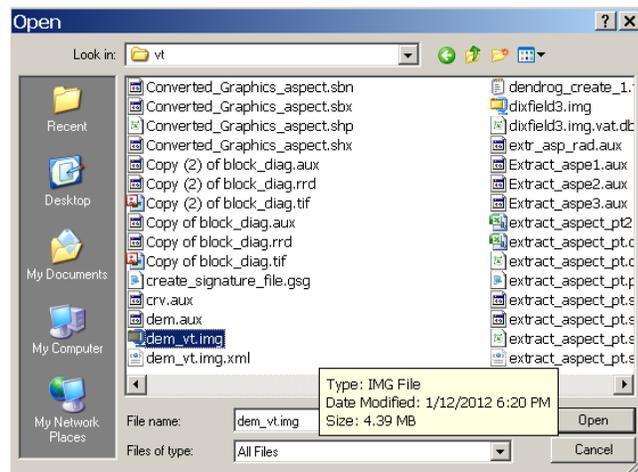
- Select a file to import with the GDAL module.



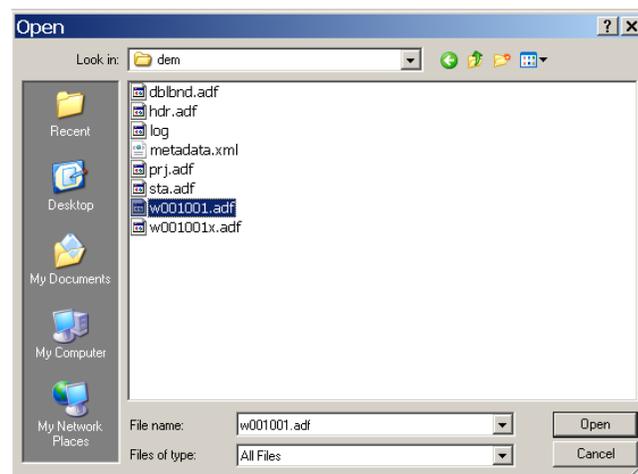
- Browse.



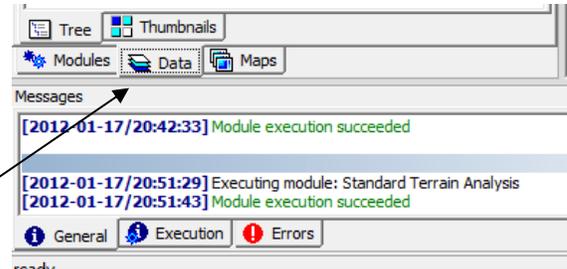
- Example of an Imagine file:



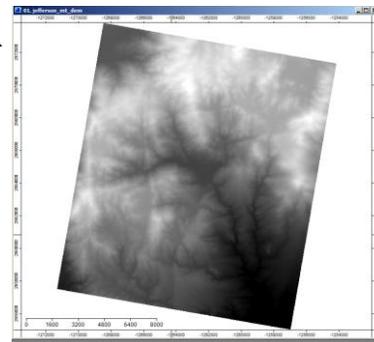
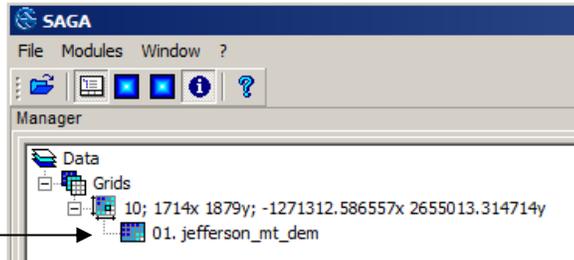
- Example of an ESRI GRID file:



- To view data, click on the Data tab.



- Double-click on the layer to open a map.



Terrain Analysis

The various modules are available from the Manager Window.



- Terrain Analysis - Channels
- Terrain Analysis - Compound Analyses
- Terrain Analysis - Hydrology
- Terrain Analysis - Lighting, Visibility
- Terrain Analysis - Morphometry
- Terrain Analysis - Preprocessing
- Terrain Analysis - Profiles

The following make up a selected list of derivatives used in digital soil mapping work:

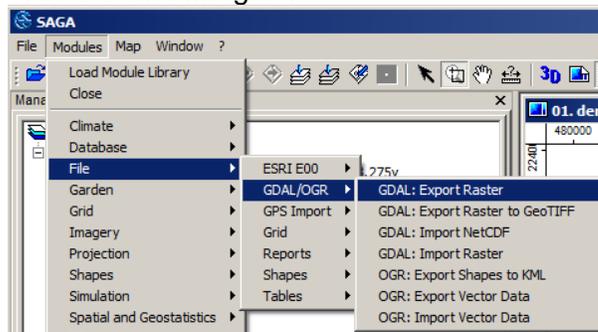
- Channel network base level (Terrain Analysis – Channels)
- Convergence index (Terrain Analysis – Morphometry)
- Downslope Distance Gradient (Terrain Analysis – Morphometry)
- Fuzzy Landform Elements from Schmidt & Hewitt (Terrain Analysis – Morphometry)
- Incoming solar radiation (Terrain Analysis – Lighting, Visibility)
- Morphometric Protection Index (Terrain Analysis – Morphometry)
- Multiresolution Index of Valley Bottom Flatness (Terrain Analysis – Morphometry)
- Overland flow distance to channel (Terrain Analysis – Channels)
- SAGA Wetness Index (Terrain Analysis – Hydrology)
- Slope length (Terrain Analysis – Hydrology)
- Standardized slope height (Terrain Analysis – Morphometry)
- Stream power index (Terrain Analysis – Hydrology)
- Terrain Surface Classification from Iwahashi & Pike (Terrain Analysis – Morphometry)
- Vertical distance to channel (Terrain Analysis – Channels)

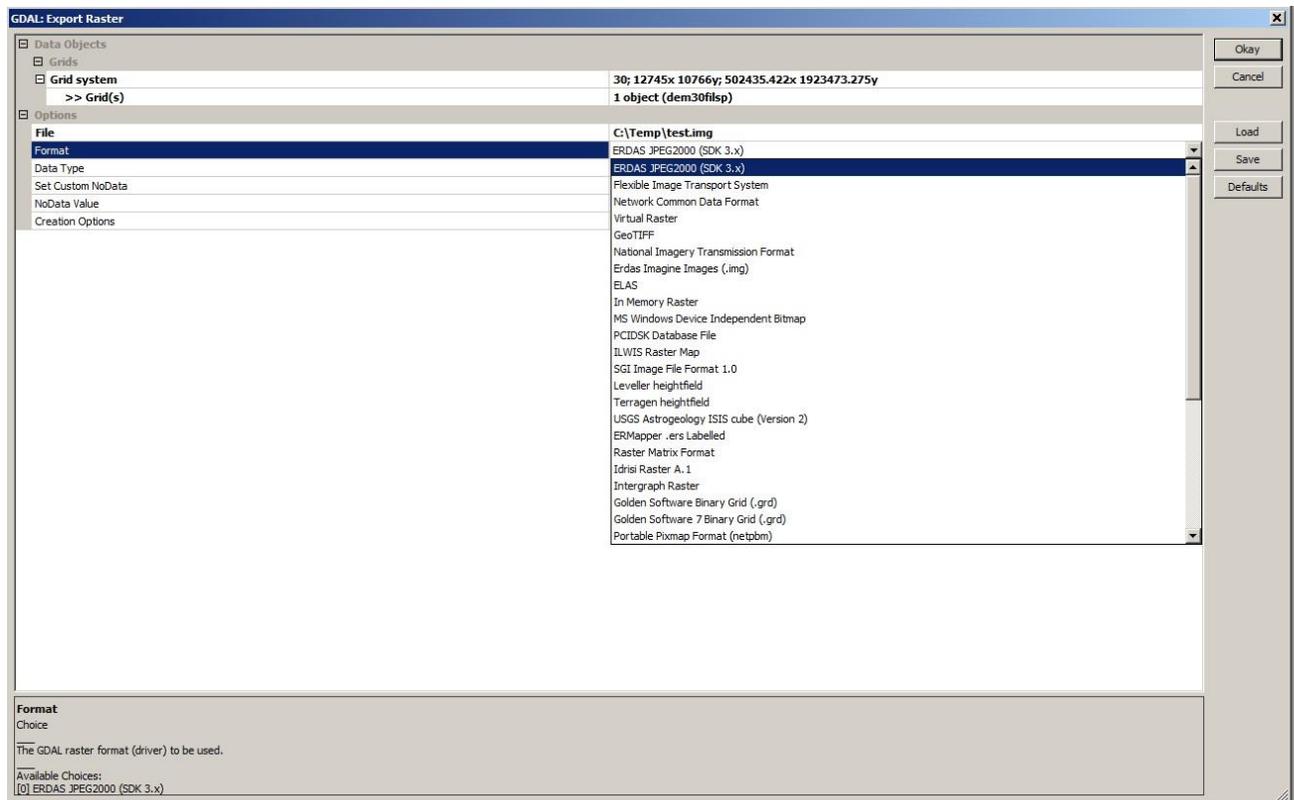
The job aid “Multiresolution Index of Valley Bottom Flatness” is useful for mapping ridgetops and valleys. It is available at:

https://sharepoint.gru.wvu.edu/sites/digital_soils/GIS%20Guides/23_MR/23_MR_VBF_sheet.pdf.

Save the Output

- Right-click on any map grid output you want to keep for future use in SAGA and click on “Save As.”
- The output will be saved in .sgrd format, the native binary format for SAGA.
- Use the GDAL Export Raster to save in formats for use with other software, such as ArcGIS and Imagine.





Tip for SAGA

SAGA stores the data and map layouts from session to session. If you would like to start SAGA with a “clean slate,” navigate to the location of SAGA and delete the file named “saga_gui.ini.”