

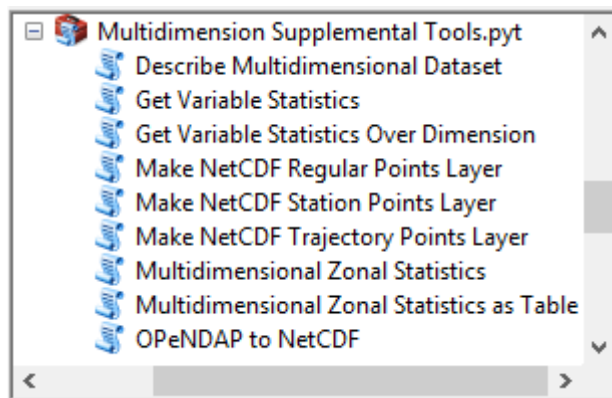
ArcGIS Multidimension Supplemental Toolbox Version 1.2

Installation Instructions

The Multidimension Supplemental Toolbox requires the installation of a third-party Python module – netcdf4-python. To install this library and use the Multidimension Supplemental toolbox:

1. Extract the contents of the Multidimension Supplemental Toolbox zip file to a local drive.
2. Close all ArcGIS applications.
3. Double-click the netCDF4-1.0.4.win32-py2.7.exe file to run the program. In addition to the tool's Python libraries, this program will install customized versions of the NetCDF4, HDF5, zlib, and slib libraries in the default ArcGIS Python Lib/site-packages directory.

In ArcCatalog, browse to the location where you extracted the tools. The Multidimension Supplemental toolbox will contain the following tools:



Tool Descriptions

- **Describe Multidimensional Dataset**

This tool accesses a local or remote (via the OPeNDAP protocol) multidimensional file and reports the names and attributes of the variables contained in the file. Global information about the file origin and processing history are also reported if available. This tool is the ArcGIS geoprocessing equivalent of the popular command line tool ncdump.

One of the chief advantages of multidimensional datasets such as netCDF and HDF is that they are self-describing. This means that file has embedded information about the data it contains. Accessing information such as the full description of each variable and its measurement units is a necessary first step in analyzing the data.

The core geoprocessing tools *Make NetCDF Feature Layer*, *Make NetCDF Raster Layer*, and *Make NetCDFTable View* of the Multidimension toolbox were designed to provide you with the maximum flexibility for reading a broad range of netCDF-formatted files. However, providing this level of flexibility meant that the tools had to have many parameters. The following tools are designed to provide a simpler way to access netCDF file that contain well-known geometries, such as station and trajectory data.

- **Make NetCDF Regular Points Layer**

This tool makes a point feature layer from a netCDF file that contains regularly gridded points.

- **Make NetCDF Station Points Layer**

This tool makes a point feature layer from a netCDF file that contains data from observation stations such as weather stations or fixed ocean buoys.

- **Make NetCDF Trajectory Points Layer**

This tool makes a point feature layer from a netCDF file that contains observations from moving platforms such as planes or ships.

- **OPeNDAP to NetCDF**

This tool will subset and download data from web-based servers that support the OPeNDAP protocol. You can constrain which data are downloaded by specifying specific variables, a spatial extent, and the starting and ending values of the dimensions that define a variable.

While scientific data has become increasingly abundant and distributed, being able to locate and acquire data that is current and well-documented has become an important component of the scientific process. Increasingly, authoritative data providers such as NOAA and NASA are using OPeNDAP (Open-source Project for a Network Data Access Protocol) to deliver data. OPeNDAP makes data stored on a remote server accessible to you locally in the format you need it, regardless of its format on the remote server.

New to the toolbox are tools for statistical operations on multidimensional data.

- **Get Variable Statistics**

This tool calculates an overall statistic value, such as the mean or maximum, for a variable in a multidimensional dataset.

- **Get Variable Statistics Over Dimension**

This tool calculates statistics over a dimension of a variable in a multidimensional dataset, allowing data summarization or compositing as well as dimensionality reduction.

- **Multidimensional Zonal Statistics**

This tool calculates zonal statistics over the non-surface dimensions of a variable in a multidimensional dataset. For example, for a variable in dimensions x, y, z, t, the tool will calculate x-y zonal statistics on each (z, t) slice of the data. This tool is designed to work over regularly gridded netCDF data as well as select discrete sampling geometry feature types.

- **Multidimensional Zonal Statistics as Table**

This tool calculate zonal statistics over the non-surface dimensions of a variable in a multidimensional dataset and outputs the result as a table.