Overall Installation / Operation Instructions

1. Introduction.

This GEONETCast toolbox is developed as a stand-alone utility. The output is produced in a format that can be directly visualized or imported (e.g. in the case of shape files) in ILWIS386. The toolbox as such does not provide means for visualization. Most of the routines are developed based on data sources as provided through EUMETCast / GEONETCast.

2. Install Python and site packages required

The toolbox developed can be used on a Windows Operating System. The toolbox can be used for Python version 3.10 and above. The following Python modules and libraries / site-packages are expected to be available:

- Python modules used are: os, subprocess, shutil, glob, threading, gzip, zipfile, bz2, tarfile, webbrowser, subprocess, datetime, fnmatch, site and time

- Python site packages expected are: numpy, tk (tkinter), ilwis, netcdf4, hdf5plugin, satpy, awx, h5py, pybufrkit, sci-learn, scikit-learn, pyspectral, geopandas and rasterio

  o Note: the other packages required, such as pandas and shapely, are installed during the installation of satpy!

All above packages can be installed using pip. Open a command prompt window (cmd), navigate to your python folder and to install a site package use the following command:

> python.exe -m pip install <site_package>

Also, GDAL is required. The wheel of GDAL (for Python version>=3.10) can be obtained from: https://github.com/cgohlke/geospatial-wheels. Check the information provided in the section 'Geospatial library wheels for Python on Windows' and navigate to the Releases page (https://github.com/cgohlke/geospatial-wheels/releases), at the moment of writing this document the latest version is: v2025.3.30, under "Assets", select the option "Show all …assets".

Download the gdal wheel for your python version, e.g "gdal-3.10.2-cp310-cp310-win_amd64.whl" (for python 3.10) to your local system and use pip install, including the path to the folder where the wheel is stored, e.g:

<python310_folder>/python.exe -m pip install <path_to_folder>/gdal-3.10.2-cp310-cp310-win_amd64.whl.

Ensure you have selected / downloaded the appropriate wheel (for your Python version and Windows OS - e.g. 'win_amd64')!

3. Structure of the Toolbox

Unzip the file and preferably locate the toolbox directory obtained to the root of your disk, e.g. 'C:/gnc_py'. Within the folder the python file "GNC_start.pyw" activates the toolbox. You can create a shortcut on your desktop (Send to > Desktop – create shortcut) and when inspecting the properties of the shortcut, select the option 'Change Icon', browse to the GNC-Toolbox folder '/pics', and select the 'gnc.ico'. Eventually rename the shortcut to "GNC-TB"

The file "GNC_start.py" can be used from the 'Command Prompt' window. Operating the toolbox in this way will provide additional information when executing the python scripts activated by the user selected. Other folders and their functionality are given in the table below.

Table 1: toolbox folders and functionality

Folder Name	Functionality
ancillary	Masks used in some python scripts
docs	Pdf documents, like the various thematic help documents
extern	External resources which are used in the toolbox
license	Text files with license information details
pics	Thumbnail images
popup	Collection of python scripts executing the various import routines when selected from the main menu

Within the folder 'extern' a number of sub-directories are present. The folder 'ilwis386_2system' is containing Ilwis service objects like representations (look-up tables) and domains. These can be copied into your ILWIS386 folder '/system' and will be available when selecting a 'Representation' for map visualization.

The folders 'bufrdispay' and 'PanoplyWin' are empty. You need to download a copy the software tools into these folders yourself.

For bufrdisplay go to: https://www.elnath.org.uk/ . Select the latest version of BUFRdisplay (Windows 64-bit), download it to your local system. Copy the file 'BUFRdisplay_v084-x64.zip' in the folder '/extern/bufrdisplay'. Use 7Zip or other tool to extract the file 'BUFRdisplay-x64.exe' into the root of the folder '/extern/bufrdisplay'. Open the GNC-toolbox, navigate in the toolbox top menu to 'Utilities' and select the option 'Bufr-Visualization' > BUFR Display Tool. First time display takes some time. Consult the help to get additional information on the functionality offered.
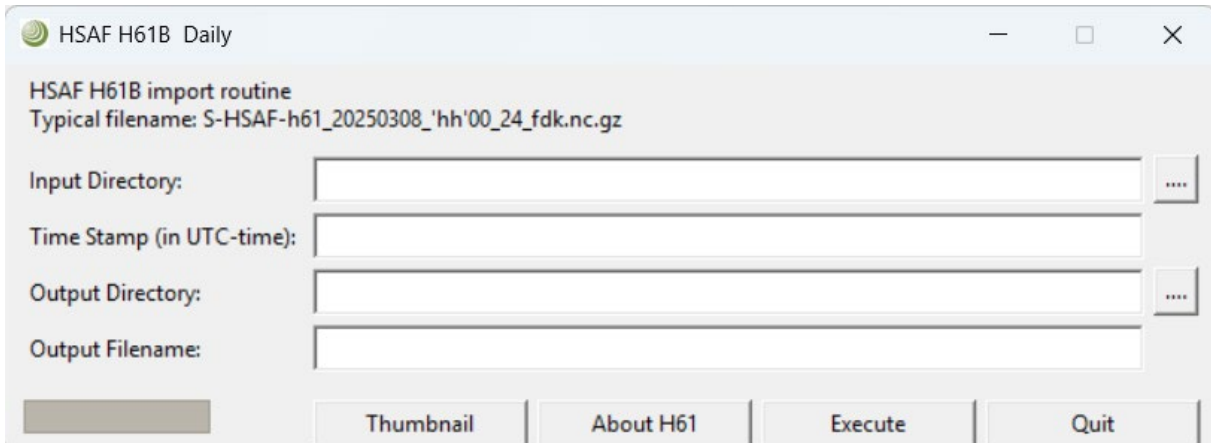
For Panoply go to: https://www.giss.nasa.gov/tools/panoply/download/. Download the latest Windows version and copy it in the folder '/extern/PanoplyWin' and uncompress the archive file. Note that a new folder is created. Navigate to this new folder and copy the content into the root of the folder '/extern/PanoplyWin'. This folder should now contain the sub-directory '/jars'. Open the GNC-toolbox, navigate in the toolbox top menu to 'Utilities' and select the option 'GRIB HDF Visualization > GRIB HDF Display. If Panoply won't start, a possible reason might be that you don't have Java or OpenJDK (https://openjdk.org/) installed on your computer. Navigate to 'https://learn.microsoft.com/en-us/java/openjdk/download' and install OpenJDK. Consult the help to get additional information on the Panoply functionality offered.

Note that above two utilities are not required but may come in useful when inspecting files of formats like: bufr, hdf, netcdf and grib.

4. Importing data from GEONETCast

From the top menu the various options to different data sources are available. Consult the help menu to get additional information on these various data sources. Once a data source is selected a popup menu appears, see also the figure below.

Figure 1: Popup menu example

The 'Input Directory' should refer to the location of the source data, can also be a network resource. The data within GEONETCast adheres to temporal resolutions, e.g. 15 minutes or hourly / daily intervals. Information on file name as well as temporal resolutions are provided under the button 'About ..', a sample resulting image is provided under 'Thumbnail'. The user has to specify an output directory and output file name. Upon pressing the 'Execute' button the import procedure is started and in the lower left hand corner progress bar shows the status of the import process. Once completed use ILWIS386 to visualize the results. If ILWIS386 is open and a new import has been executed, don't forget to 'refresh' the ILWIS catalog!

For most routines a Time Stamp has to be given, for some routines a file name has to be provided which can be interactively selected.