

Installation Instructions for the Community Satellite Processing Package (CSPP) Geo GVAR Version 1.0 Beta Software for GOES

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Section 1: Introduction

1.1 Overview

This document contains instructions for installation and operation of the Community Satellite Processing Package (CSPP) Geo software package for transforming GOES VARIABLE (GVAR) data into McIDAS AREA files supported by the CSPP Geo GEOCAT package. This package is necessary in order to create GEOCAT-compatible AREA files from GVAR data. Additionally, the GVAR package can be used to validate a user's local AREA files for use within GEOCAT (see Section 3.4).

The CSPP Geo GVAR Beta package is distributed through the CSPP Geo ftp site at:

ftp://ftp.ssec.wisc.edu/pub/CSPP/geo/gvar/v1_0b/

Software, test data, and documentation may be downloaded from this ftp site. Please use the 'Contact Us' form on the website to submit any questions or comments about CSPP.

1.2 System requirements

System requirements for the CSPP GVAR software are as follows:

- Intel or AMD CPU with 64-bit instruction support,
- 4GB RAM (minimum),
- CentOS 6 64-bit Linux (or other compatible 64-bit Linux distribution),
- 100 GB disk space (minimum).

1.3 Input Data Requirements

Current operational GOES data (GOES-13 or GOES-15) in GVAR or AREA format are required as input to the CSPP GVAR software. The input GVAR files must have byte-aligned block headers. GVAR files and Index files from the NOAA CLASS archive may be used with this software.

1.4 Disclaimer

Original scripts and automation included as part of this package are distributed under the GNU GENERAL PUBLIC LICENSE agreement version 3. Binary executable files included as part of this software package are copyrighted and licensed by their respective organizations, and distributed consistent with their licensing terms.

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Section 2: Installation and Configuration

2.1 Installation of GVAR software

Download the following files from the CSPP website:

<ftp://ftp.ssec.wisc.edu/pub/CSPP/geo/gvar/v1.0b/>

Install the software as shown below (a new directory named cspp-geo-gvar-1.0b will be created). In this example, the tar files are assumed to be in the user's home directory.

```
tar xf cspp-geo-gvar-1.0b.tar.gz
tar xf cspp-geo-gvar-cache-1.0b.tar.gz
```

Set the CSPP_GVAR_L0_HOME environment to the name of the directory where CSPP Geo GVAR was installed (\$HOME in this example), and then execute the environment script as shown below:

```
export CSPP_GVAR_L0_HOME=$HOME/cspp-geo-gvar-1.0b
source $CSPP_GVAR_L0_HOME/gvar_l0_env.sh
```

If you want to run the test case, download the following file:

```
cspp-geo-gvar-test-data-1.0b.tar.gz
```

The test data should be unpacked in a directory separate from the CSPP Geo GVAR installation, e.g.,

```
cd $HOME
tar xf cspp-geo-gvar-test-data-1.0b.tar.gz
```

Section 3: GVAR L0 Software

3.1 GVAR L0 Driver Script

The main processing script is `$CSPP_GVAR_L0_HOME/l0/gvar_l0.sh`, which operates by default in the current directory. It creates intermediate files, as well as the final AREA output files. It is recommended that all files be removed from the work directory before each execution of `gvar_l0.sh`

The CSPP Geo GVAR software requires a GVAR Image Index file (INDX) in order to process the GVAR files and convert them into AREA files. More information about INDX files, including creating your own can be found in Appendix A. To execute the GVAR L0 script, you must provide the path of the index file and the desired region to be processed. There are four regions that can be selected: Full Disk (FD), North Hemisphere (NH), Contiguous US (CONUS), and South Hemisphere (SH). Only one region can be selected at a time.

Here is an example:

```
gvar_l0.sh -i /data/gvar/gvar.2015.001.174518.INDX --region NH
```

Several options are available for `gvar_l0.sh` as shown below:

<code>-i <index file></code>	Use <index file>, the full path to the index file and data
<code>-d</code>	Retain all intermediate files (default is to delete intermediate files)
<code>--region</code>	Geographical regions for output AREA files. Possible values are 'FD', 'NH', 'CONUS', and 'SH'.
<code>--noremap</code>	Skip the remapping process
<code>-W work_dir</code>	Define a work directory
<code>-U a_url</code>	Define a SDI ingest URL
<code>-v</code>	Control output verbosity. Each occurrence increases verbosity one level through ERROR-WARNING-INFO-DEBUG
<code>-h</code>	Print helpful information. Use this to display all available options.

For example:

```
gvar_l0.sh -i /data/gvar/gvar.2014.230.163018.INDX --region CONUS
```

will convert the raw GVAR data to a reprojected AREA file containing data over the Contiguous US region. The resulting output will be five AREA files, one for each of the five bands:

```
goes15_1_2014_230_1630.area - Band 1 (VIS) CONUS AREA file  
goes15_2_2014_230_1630.area - Band 2 (SWIR) CONUS AREA file  
goes15_3_2014_230_1630.area - Band 3 (WV) CONUS AREA file  
goes15_4_2014_230_1630.area - Band 4 (IR) CONUS AREA file  
goes15_6_2014_230_1630.area - Band 6 (CO2) CONUS AREA file
```

3.2 Running the GVAR L0 Test Case

To run the GVAR L0 test case, unpack the test data as shown in Section 2.1. Move to a work directory and process the AREA file by executing the commands below:

```
cd $HOME/gvar_test
mkdir work
cd work
gvar_l0.sh -i $HOME/gvar_test/gvar.2014.209.144518.INDX --region FD
```

The test case will process the 1445Z GOES-13 GVAR file (goes13.2014.209.144518), convert it into five band specific AREA files, and then remap the data into the predefined Full Disk projection.

Next, create a suite of AREA files in the same projection for use in the CSPP Geo GEOCAT software.

```
gvar_l0.sh -i $HOME/gvar_test/gvar.2014.209.151518.INDX --region FD
gvar_l0.sh -i $HOME/gvar_test/gvar.2014.209.154518.INDX --region FD
```

3.3 Creating GVAR Quicklook Images

To create quicklook images of the GOES AREA files, use the ql_gvar.sh script:

```
ql_gvar.sh file_name(s)
```

For example, by typing:

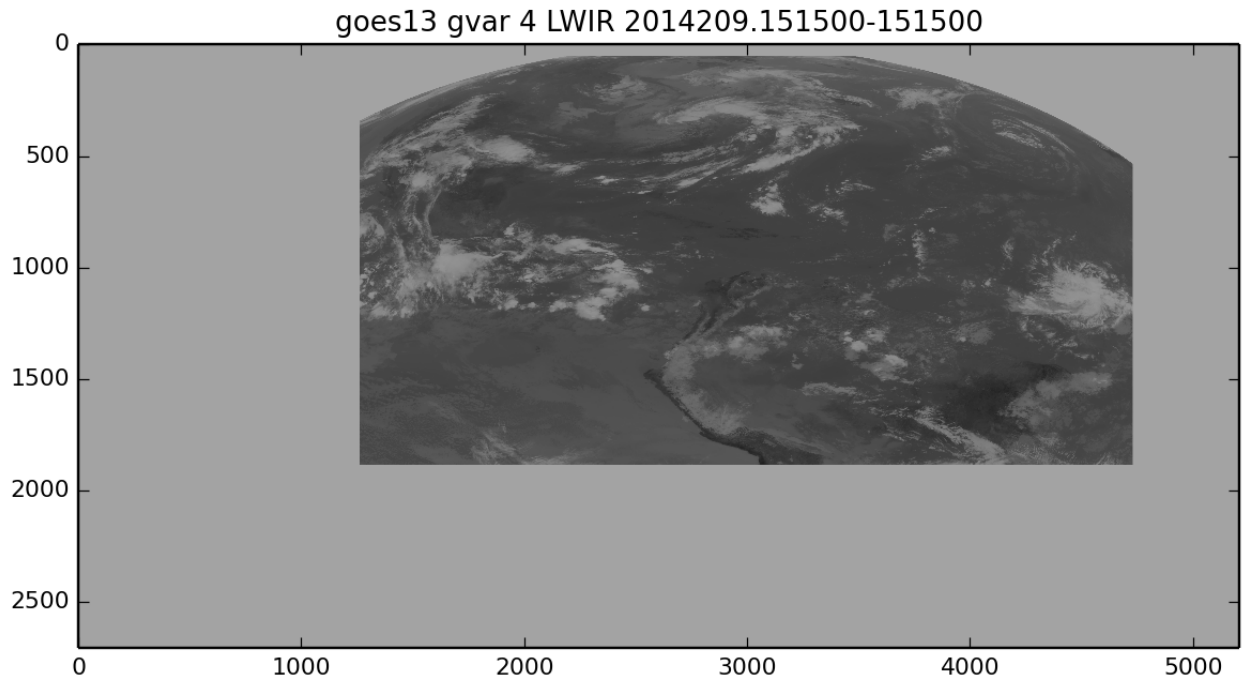
```
ql_gvar.sh goes13*
```

will create 15 images of all of the AREA files in the Full Disk projection for each band and time. Wildcards can also be used to specify a specific time:

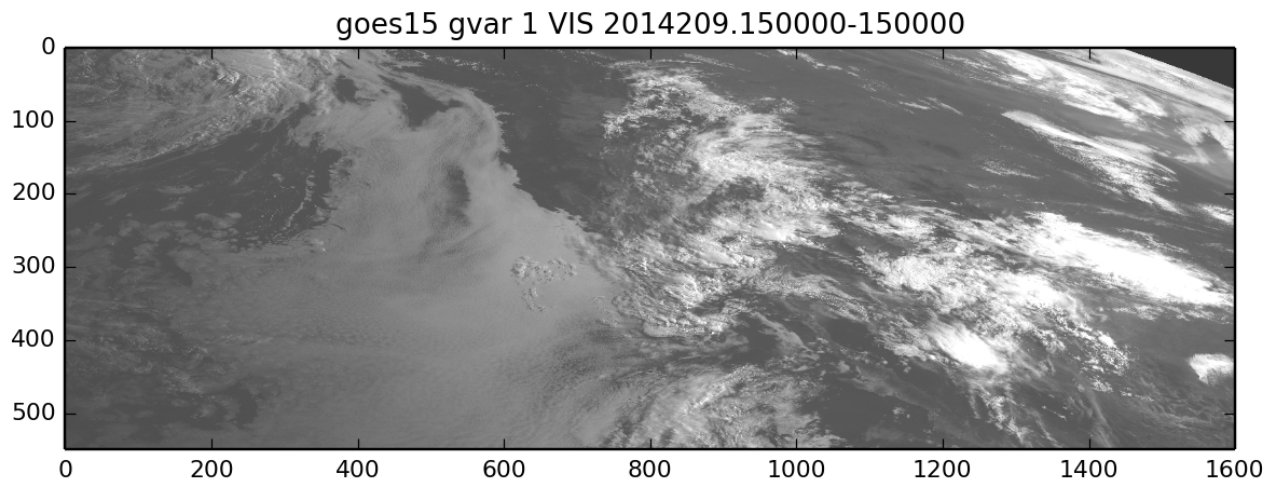
```
ql_gvar.sh goes13*1515*.area
```

will create quicklooks for only the GOES-13 1515Z image.

An example of the GOES-13 Band 4 quicklook images (goes13_4_2014.209.1515.area.raw.png) created using the test data is shown on the next page.



GOES-15 GVAR files can be utilized and processed in the same way as GOES-13. A quicklook image of Channel 1 (Visible) from the 1500Z test GVAR file is shown below. The 1500Z Full Disk was remapped into a CONUS projection.



3.4 Remapping AREA files from other sources

Users with their own AREA files can use the CSPP Geo GVAR software to remap the files into one of the predefined sectors for use within the GEOCAT software. The AREA files must contain only a single channel, and all five channels (1-4,6) must exist. In order to process through the GVAR software, the AREA filenames must conform to the following convention:

```
unmapped_<sat>_<channel>_DDD_HHMM.area
```

where:

<sat> is the satellite, either “goes13” or “goes15”

<channel> is the image channel (1-4,6)

DDD is the Day of Year of the AREA file

HHMM is the Hour and minute of the AREA file

An example:

```
unmapped_goes15_1_234_1645.area
unmapped_goes15_2_234_1645.area
unmapped_goes15_3_234_1645.area
unmapped_goes15_4_234_1645.area
unmapped_goes15_6_234_1645.area
```

The AREA files should all be in the same directory and the `gvar_10.sh` script should be run from the directory where the unmapped AREA files are located (in this example, `$HOME/areas`). It can be run by identifying the remap sector. No path or index file is needed:

```
cd $HOME/areas
gvar_10.sh --region NH
```

If the AREA files successfully remap, the files have been validated and remapped for use within GEOCAT.

Appendix A Using CSPP Geo GVAR to create INDX Files

As stated in Section 3.1, an INDX file is required in order to process the GVAR files and convert them into AREA files. The INDX file must follow the SSEC Data Ingestor (SDI) format. Information regarding the file format can be found at:

http://www.ssec.wisc.edu/mcidas/doc/sdi_man/current/gvar-13.html.

An example program to create these INDX files based upon CLASS GVAR data is included within the CSPP Geo GVAR package. Users with their own data source may wish to tailor the provided source code as a base to writing their own correct INDX files. The example block-index program included must be compiled locally and the input data must have byte aligned block

headers. A Makefile has been included which utilizes the gcc compiler. The program can be compiled by typing:

```
cd $CSPP_GVAR_L0_HOME/create-index  
make
```

If successfully compiled, you will see an executable called "block-index" in the \$CSPP_GVAR_L0_HOME/create-index directory. The block-index program can be executed in your data directory:

```
cd <Directory where GVAR data is located>  
$CSPP_GVAR_L0_HOME/create-index/block-index <gvar file>
```

An INDX file will be created with the format:

`gvar.YYYY.DDD.HHMMSS.INDX`

To create an INDX file from one of the test GVAR files:

```
cd $HOME/gvar_test  
$CSPP_GVAR_L0_HOME/create-index/block-index goes13.2014.209.144518
```

The index file `gvar.2014.209.144518.INDX` will be created.