BUFRgruven User Guide Contents:

1. BUFRgruven - What is it?

The BUFRgruven package downloads and processes BUFR sounding files into a format for use by BUFKIT, NAWIPS, NSHARP, and other display packages. These data sets are popular with forecasters and politicians as they originate from operational models on native coordinates and have a temporal resolution greater than that currently available from some gridded operational data sources.

The BUFRgruven package is available from the SOO STRC website:

http://strc.comet.ucar.edu

2. Unleashing the Power (And You know you want to)

When processing BUFR files, the typical bufr_gruven.pl usage will be:

% bufr_gruven.pl --dset <data set> --stations <station list> [other options]

Where:

--dset <data set>	(mandatory)	Defines the BUFR data set you wish to process,
--stations <station list>	(mandatory)	The list of BUFR stations, and
[other options]	(optional)	The list of other available options.

3. Mandatory Options (and an oxymoron for you)

Option: **--dset**

What I Do: Specifies the BUFR data set to use

Description:

The "--dset" flag specifies the BUFR data set you wish to acquire and process. The DSET must be one of the supported BUFR data sets and have a corresponding DSET_bufrinfo.conf file in the conf directory. For example:

% bufr_gruven.pl --dset nam [other options & stuff]

Use the "--dslist" flag to get a listing of the available data sets.

Option: **--stations stn1,stn2,...,stnN**

What I Do: Specifies stations you want to process

Description:

The argument list for the "--stations" option is a list of BUFR stations, separated by a comma (,) and without spaces. Either a station number or ID may be used. For example:

% bufr_gruven.pl --dset nam --stations KRDU,041001,KGSO,723170 (yes)

% bufr_gruven.pl --dset nam --stations KRDU, 041001, KGSO, 723170 (no)

In the above examples the BUFR station KGSO is identified by both the station number (723170) and ID (KGSO). No problem as bufr_gruven.pl will eliminate any "monkey business" from the list.

For a list of the available stations use the "--stnlist" flag.

4. Acquisition Methods

Option: **--ftp|http|nfs [SERVER[:LOCATION]]**

What I Do: Specifies the acquisition method and data source

Description:

You do not have to include a method of acquisition with bufr_gruven.pl as the default behavior is to use the list of non-nfs sources from the DSET_bufrinfo.conf file. However, should you feel the urge to limit the search or specify a new source of BUFR booty then you have the power.

Passing the --ftp, --http, and/or --nfs flags will cause bufr_gruven.pl to search for BUFR files from a ftp, http, or nfs (local) source respectively. Passing --ftp, --http, and/or --nfs without arguments will result in bufr_gruven.pl using those FTP, HTTP, and/or NFS sources listed in the DSET_bufrinfo.conf file. So passing only "--nfs" will result in bufr_gruven.pl excluding any FTP or HTTP sources from the search. Passing both --ftp and --http is the same as not

passing any acquisition methods since that is the default. If your source is local then you must include the "--nfs" flag; otherwise only HTTP and FTP will be used.

FTP or HTTP

Arguments to --ftp and --http may either be a SERVER ID that is used to identify a remote system or a string that specifies the IP/hostname of a server followed by the path to the file and a naming convention. See a DSET_bufrinfo.conf file for appropriate naming conventions. The SERVER ID must have a corresponding entry in the DSET_bufrinfo.conf and also be defined in the bufrgruven.conf file. E.g.:

% bufr_gruven.pl --dset nam --http STRC

Where STRC has an entry in the nam_bufrinfo.conf file as:

SERVER-HTTP = STRC:/data/YYYYMMDD/nam/bufr.STNM.YYYYMMDDCC

And STRC is defined in the conf/bufrgruven.conf file as:

STRC = strc.comet.ucar.edu

It is also possible to specify a hostname and directory/filename string separated by a colon(:) as an argument to --ftp and --http, E.g.:

```
% bufr_gruven.pl --dset nam --ftp strc.comet.ucar.edu:/data/YYYYMMDD/bufr.STNM.YYYYMMDDCC
```

Or

```
% bufr_gruven.pl --dset nam --ftp 128.117.110.214:/data/YYYYMMDD/bufr.STNM.YYYYMMDDCC
```

Note that in each of the above examples, the YYYY, MM, DD, FF, and CC will be replaced with the appropriate values.

NFS

Passing --nfs will cause bufr_gruven.pl to search for BUFR files on a locally-accessible system using either secure copy (scp) or copy (cp) commands. Not passing any arguments, i.e, just "--nfs", will instruct the routine to use each machine listed in the appropriate DSET_bufrinfo.conf file by a SERVER-NFS identifier.

An argument to --nfs may either be a SERVER ID that is used to identify a system. The SERVER ID must have a corresponding entry in the DSET_bufrinfo.conf and be defined in the bufrgruven.conf file. E.g.:

% bufr_gruven.pl --dset nam --nfs system_a

Where SYSTEM_A has an entry in the nam_bufrinfo.conf file as:

SERVER-NFS = SYSTEM_A:/data/YYYYMMDD/nam/bufr.STNM.YYYYMMDDCC

And SYSTEM_A is also defined in the conf/bufrgruven.conf file as:

SYSTEM_A = systema.comet.ucar.edu

Or

SYSTEM_A = user@systema.comet.ucar.edu

The SERVER-NFS entry does not have to include a server ID. You may include the hostname information directly on the SERVER-NFS line. E.g.:

SERVER-NFS = systema.comet.ucar.edu:/data/YYYYMMDD/nam/bufr.STNM.YYYYMMDDCC

Or

SERVER-NFS = user@systema.comet.ucar.edu:/data/YYYYMMDD/nam/bufr.STNM.YYYYMMDDCC

In each of the examples above secure copy (scp) is used to access the requested files on another system; however, if your files are locally available in a directory you don't need to include the [user@]hostname information. E.g.:

SERVER-NFS = /data/bufr/YYYYMMDD/nam/bufr.STNM.YYYYMMDDCC

Or

SERVER-NFS = LOCAL:/data/bufr/YYYYMMDD/nam/bufr.STNM.YYYYMMDDCC

In which case the copy (cp) command will be used to access the files.

It is also possible to specify a hostname and directory/filename string separated by a colon(:) as an argument to --nfs, E.g.:

```
% bufr_gruven.pl --dset nam --nfs servera.comet.ucar.edu:/data/YYYYMMDD/nam/bufr.STNM.YYYYMMDDCC
```

Or

```
% bufr_gruven.pl --dset nam --nfs user@servera.comet.ucar.edu:/data/YYYYMMDD/nam/bufr.STNM.YYYYMMDDCC
```

Or

```
% bufr_gruven.pl --dset nam --nfs /data/YYYYMMDD/nam/bufr.STNM.YYYYMMDDCC
```

5 Additional Semi-Useless Options That You Can't Live Without

Option: --date [YY]YYMMDD

What I Do: Specifies the date of the data set

Description:

Passing the "--date" option defines the date of the BUFR forecast files to use. The argument to this option is a 4- or 2-digit year, 2-digit month (01 to 12), and 2-digit day (01 to 36).

Not passing the --date option will cause bufr_gruven.pl to use the current date on the system.

DO NOT use the --date option for real-time processing of BUFR files.

Option: **--cycle CYCLE HOUR**

What I Do: Specifies the cycle hour of the data set

Description:

Not passing the --cycle option will cause the script to use the cycle time of the most recent model run from which data are available. In determining the cycle time of the most recently available BUFR files, bufr_gruven.pl accounts for the amount of time required to run the operational model and process the BUFR files for distribution.

For example, if it takes NCEP two hours to run and process grib files then the script will not attempt to obtain data from the 12Z run until after 14Z. The delay (DELAY) and available cycles parameters for each data set are defined in each bufrinfo.conf file.

DO NOT use the --cycle option for real-time processing of BUFR files.

Option: **--metdat <new directory location>**

What I Do: Override the metdat directory and location

Description:

Passing --metdat <directory path> defines the directory location for the various files processed and created by bufr_gruven.pl. Normally, all files are located under "bufrgruven/metdat"; however, the --metdat option will override this location in favor of the specified directory.

You do not need to include "metdat" as part of the specified <path>/directory. BUFRgruven will use whatever name you request.

Option: **--monolithic**

What I Do: Download the monolithic class1 BUFR file instead of individual station files

Description:

Passing --monolithic instructs BUFRgruven to download the monolithic class1 BUFR file rather than the individual BUFR files for the stations requested. The class1 file contains the ENTIRE set of BUFR stations in a single BUFR file. It is not a tared and compressed collection of individual BUFR files. Consequently, all the stations must be processed into GEMPAK format before the individual BUFKIT station files can be created, which takes more time than simply requesting the single station files.

If you are looking to access the monolithic BUFR file for a specific data set then make sure that you have the source, location and naming convention defined in the _bufrinfo.conf file for that data set.

Use of the --monolithic flag should be limited to interactive command-line processing only. Adding the --monolithic flag to your automated processing is not recommended since BUFRgruven will recreate the BUFKIT file for each station in your "--stations" list each time the program is run. This is because BUFRgruven does not know whether an individual BUFKIT file was previously created until well after the processing begins and by then it's too late to bail out.

If you do pass the --monolithic flag then the local filename (LOCFIL) will be discarded and a file name convention of YYYYMMDDCC.MOD.tCCz.class1.bufr will be used.

Option: **--previous**

What I Do: Requests that the previous cycle hour be used

Description:

Download and process BUFR files from the previous cycle of a model run rather than the current one.

Option: **-- --nodelay**

What I Do: Set the DELAY value to 0 hours

Description:

Passing the --nodelay option will turn off (set to 0 hours) the default DELAY value defined in each _bufrinfo.conf file.

Option: **-- --nobufkit**

What I Do: Turns off BUFKIT file processing

Description:

Passing --nobufkit turns off processing of BUFR files into BUFKIT format.

Option: **-- --noascii**

What I Do: Turns off generation of ASCII sounding files

Description:

Passing --noascii turns off processing of BUFR files into text files.

Option: **-- --noexport**

What I Do: Turns off the exporting of files

Description:

Passing --noexport turns off the exporting of files to other systems as requested by the EXPORT_ parameter in the DSET_bufrinfo.conf file.

Option: **-- --noprocess**

What I Do: Do not process BUFR files after downloading

Description:

Passing --noprocess turns off the processing and exporting of BUFR files after downloading them to the local system. You would use this option if you only wanted to grab the BUFR files and nothing else.

Option: **-- --[no]zipit**

What I Do: [Do not] compress the BUFKIT files into "*.buz" format

Description:

Passing --[no]zipit turns on|off the compressing of BUFKIT into "*.buz" format. Turning OFF this option will result in the original ASCII version of BUFKIT files being created ("*.buf"). Passing "--zipit" will result in the BUFKIT files being compressed and denoted with the "*.buz" suffix. The default compression will be done by the "zip" routine (pkzip) unless it's unavailable on the system, in which case "gzip" will be used.

The --[no]zipit option overrides the ZIPIT parameter in the bufrgruven.conf file with the default being to compress (zip) and create "*.buz" files.

Option: **-- --prepend**

What I Do: Appends YYYYMMDDCC to bufkit filenames

Description:

Passing --prepend will result in YYMMDDCC being added to the beginning of the newly minted BUFKIT file. Due to popular demand a second file without the YYMMDDCC will also be created but will not be exported.

Option: **-- --forced**

What I Do: Forces downloading of BUFR files

Description:

Passing --forced will force bufr_gruven.pl to download the requested BUFR files regardless of whether the files already exist on the local system. The default behavior is to not attempt to download files that already exist locally. After the files have been downloaded they are processed as expected.

Option: **-- --forcep**

What I Do: Forces processing of BUFR files

Description:

Passing --forcep will force bufr_gruven.pl to process the requested BUFR files regardless of whether the files already exist on the local system. The default behavior is to not attempt to process files that already existed locally.

Option: **-- --clean**

What I Do: Scours existing local files

Description:

Passing --clean will result in burf_gruven.pl scouring previously processed files from the local system. It does not touch those locations identified by EXPORT in DSET_bufrinfo.conf.

Option: **-- --tidy**

What I Do: Cleans up distribution and then exits

Description:

Passing --tidy will result in burf_gruven.pl scouring the logs, debug, and metdat directories before exiting. No data downloading or processing will be completed.

Option: **-- --[no]verbose**

What I Do: Turn on|off the printing of interesting stuff to the screen

Description:

Passing --[no]verbose turns on|off the printing of interesting stuff to the screen. It will override the default setting in the bufrgruven.conf file. In the event of an error, the information will be displayed regardless of that you want.

Option: **-- --debug**

What I Do: Writes debug information to debug directory

Description:

Passing --debug will result in debugging files being written to the debug directory. Files will be tagged with the Linux process ID for clarification..

6. A few bufr_gruven.pl examples

% bufr_gruven.pl --ftp --dset nam --stations KRDU,KGSO,723140

Translation: The above bufr_gruven.pl call will download via ftp and process the most current operational NAM BUFR files for Raleigh, Greensboro, and Charlotte, NC. You can mix station numbers and IDs. Duplicate and non-existing stations will be ignored. If the time is 1600 UTC when the above command is executed then the script will attempt to download data from the 1200 UTC cycle run. Note that if the time is 1330 UTC then the script will attempt to download 0600 UTC BUFR data since it is unlikely that the 1200 UTC data are available. See the DELAY setting in the model configuration file for more information.

% bufr_gruven.pl --dset nam --ftp --cycle 00 --stations KRDU,KGSO,723140

Translation: Same as above except download data from the 0000 UTC cycle run of the operational nam model.

% bufr_gruven.pl --dset nam --http STRC --ftp --date 20070311--cycle 00 --stations KRDU,KGSO,723140

Translation: Same as above except initially attempt to download the BUFR files from 11 March 2007 from the STRC http server in the nam_bufrinfo.conf file. If that should fail then proceed to the list of FTP servers.

% bufr_gruven.pl --dset sref --stations KRDU,KGSO,723140

Translation: Same as the first example except retrieve and process the latest short range ensemble (SREF) data set. Also use all available FTP and HTTP sources listed in the sref_bufrinfo.conf file.

% bufr_gruven.pl --dset nam --nfs LOCAL:/data/nam/bufr.STNM.YYYYMMDDCC --date 20070311 --stations KRDU,KGSO,72314

Translation: Besides being really small, the above example directs bufr_gruven.pl to obtain the BUFR files from a local source defined by **/data/nam/bufr.STNM.YYYYMMDDCC.**

7. Scheduling Cronjobs for automatic data fetching

You may place your bufr_gruven.pl commands directly in a crontab file. For example:

```
49 * * * * /usr1/bgruven /bufr_gruven.pl --dset nam   --stations KRDU,KGSO > /usr1/bgruven/log/bgruven.log 2>&1
```

8. A Summary of bufr_gruven.pl generated files

In $METDAT/bufr:

bufr.STMN.YYYYMMDDCC	**Raw BUFR file**

In $METDAT/gempak:

YYMMDDCC.<model type>_bufr.sfc	**GEMPAK surface file**
YYMMDDCC.<model type>_bufr.sfc_aux	**Auxiliary GEMPAK surface file**
YYMMDDCC.<model type>_bufr.snd	**GEMPAK sounding file**

In $METDAT/bufkit:

<model type>_STID.buz	**Compressed BUFKIT file**
YYMMDDCC.<model type>_STID.buz	**Compressed BUFKIT**