Use of Gridded Forecast Data

How to download gridded forecast data and indices from the TCC website

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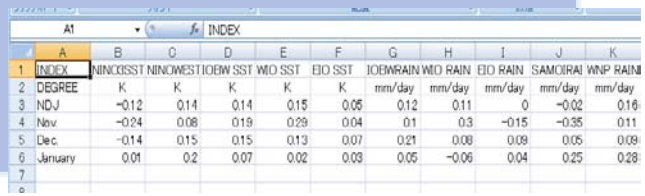
Outline

Indices forecast data

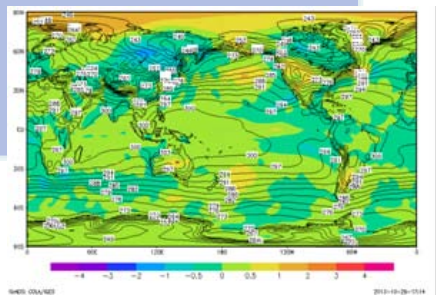
- How to download
- How to read



	A	B	C	D	E	F	G	H	I	J	K
1	INDEX	NINOSST	NINOWEST	IOBW SST	WIO SST	EIO SST	IOBWRAIN	WIO RAIN	EIO RAIN	SAMOIRAI	WNP RAIN
2	DEGREE	K	K	K	K	K	mm/day	mm/day	mm/day	mm/day	mm/day
3	NDJ	-0.12	0.14	0.14	0.15	0.05	0.12	0.11	0	-0.02	0.16
4	Nov	-0.24	0.08	0.19	0.29	0.04	0.1	0.3	-0.15	-0.35	0.11
5	Dec	-0.14	0.15	0.15	0.13	0.07	0.21	0.08	0.09	0.05	0.09
6	January	0.01	0.2	0.07	0.02	0.03	0.05	-0.06	0.04	0.25	0.28
7											

Gridded forecast data

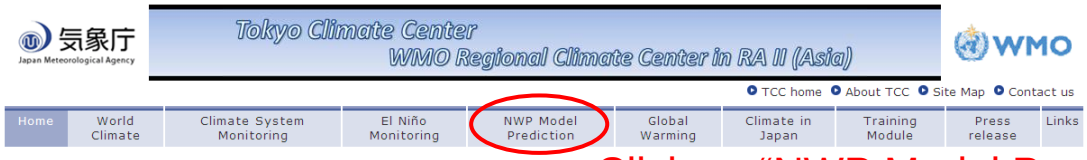
- Preparation for decoding and visualizing
- How to download
- How to decode using wgrib2
- How to visualize using GrADS



Gridded and indices data on TCC website

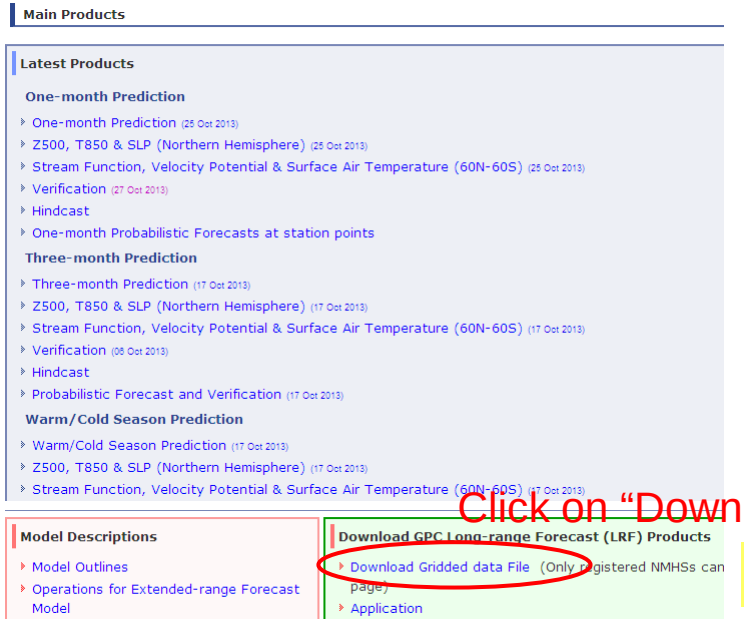
(1) TCC top page

http://ds.data.jma.go.jp/tcc/tcc/index.html



Click on “NWP Model Prediction”

(2) “Ensemble Prediction System (Products of GPC Tokyo)” page

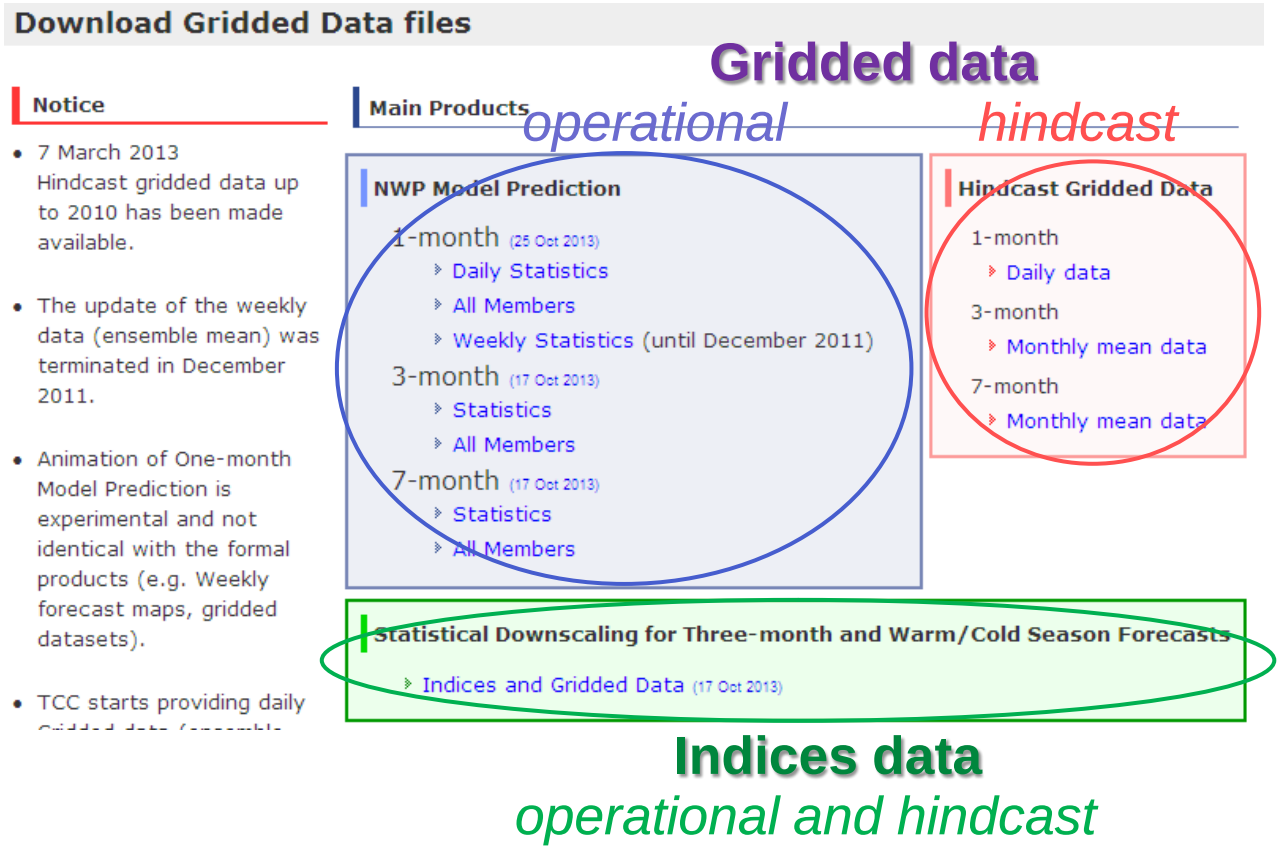


Click on “Download Gridded data File”

UID and password are needed to access this page.

Gridded and indices data on TCC website

(3) “Download Gridded Data files” page



Outline

Indices forecast data

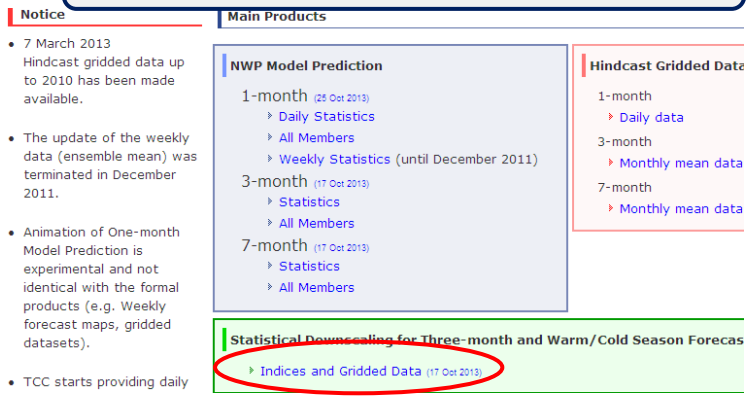
- How to download
- How to read

Gridded forecast data

- Preparation for decoding and visualizing
- How to download
- How to decode using wgrib2
- How to visualize using GrADS

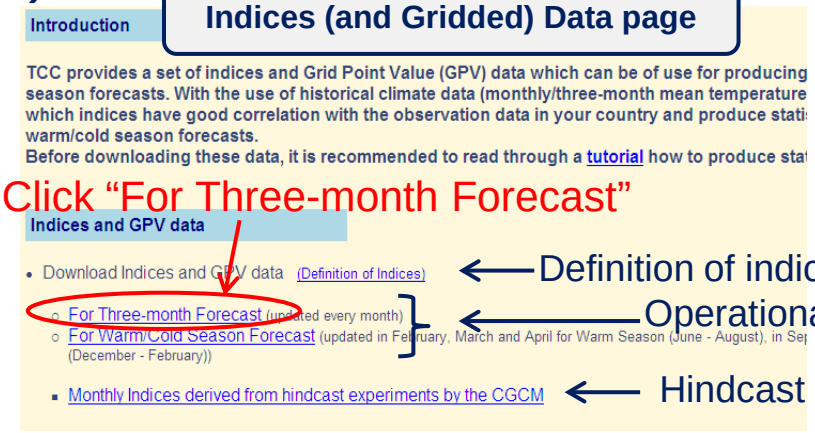
How to download indices data for operational 3-month forecast

(3) **"Download Gridded Data files" page**



Click "Indices and Gridded Data"

(4) **Indices (and Gridded) Data page**



Click "For Three-month Forecast"

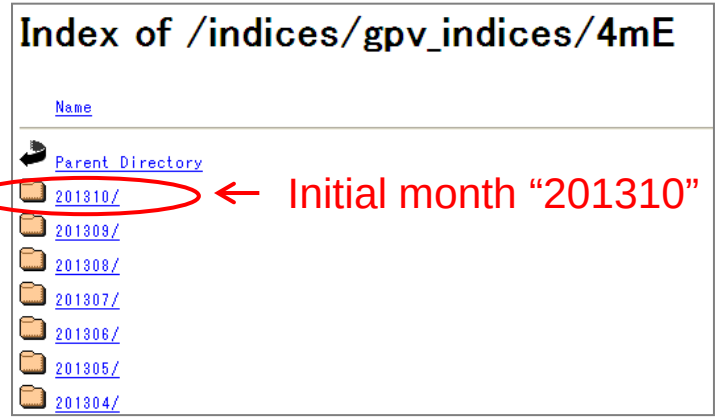
← Definition of indices

← Operational data

← Hindcast data

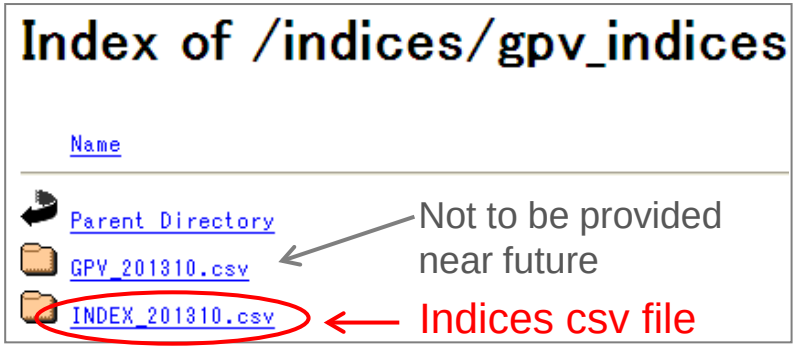
http://ds.data.jma.go.jp/tcc/tcc/gpv/indices/index.html

(5)



← Initial month "201310"

(6)

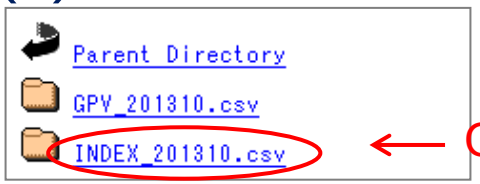


Not to be provided near future

← Indices csv file

How to read indices data for operational 3-month forecast

(6)



← Open “INDEX_201310.csv”

which is the indices CSV file for operational 3-month forecast issued in October 2013.

Index name →

3-month mean →

monthly mean

A1 | INDEX

	A	B	C	D	E	F	G	H	I	J	K
1	INDEX	NINO3SST	NINOWEST	IOBW SST	WIO SST	EIO SST	IOBWRAIN	WIO RAIN	EIO RAIN	SAMOIRAI	WNP RAIN
2	DEGREE	K	K	K	K	K	mm/day	mm/day	mm/day	mm/day	mm/day
3	NDJ	−0.12	0.14	0.14	0.15	0.05	0.12	0.11	0	−0.02	0.16
4	Nov.	−0.24	0.08	0.19	0.29	0.04	0.1	0.3	−0.15	−0.35	0.11
5	Dec.	−0.14	0.15	0.15	0.13	0.07	0.21	0.08	0.09	0.05	0.09
6	January	0.01	0.2	0.07	0.02	0.03	0.05	−0.06	0.04	0.25	0.28
7											

- Indices CSV files can be read using *Microsoft Excel*.
- Indices are defined in the table “Definition of Indices” linked from (4) Indices Data page.
- Values indicate ensemble mean anomalies.

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Indices forecast data

- How to download
- How to read

Gridded forecast data

- Preparation for decoding and visualizing
- How to download
- How to decode using wgrib2
- How to visualize using GrADS

Procedure for decoding and visualizing gridded forecast data

1. Preparation - installing the tools:
   GrADS (viewer) and wgrib2 (encoder/decoder)

2. Download gridded forecast data (GRIB2)

3. Decode the data (GRIB2) using wgrib2

4. Convert from GRIB2 to GrADS data using wgrib2

5. Edit GrADS control file

6. Visualize GrADS data using GrADS

Procedure for decoding and visualizing gridded forecast data

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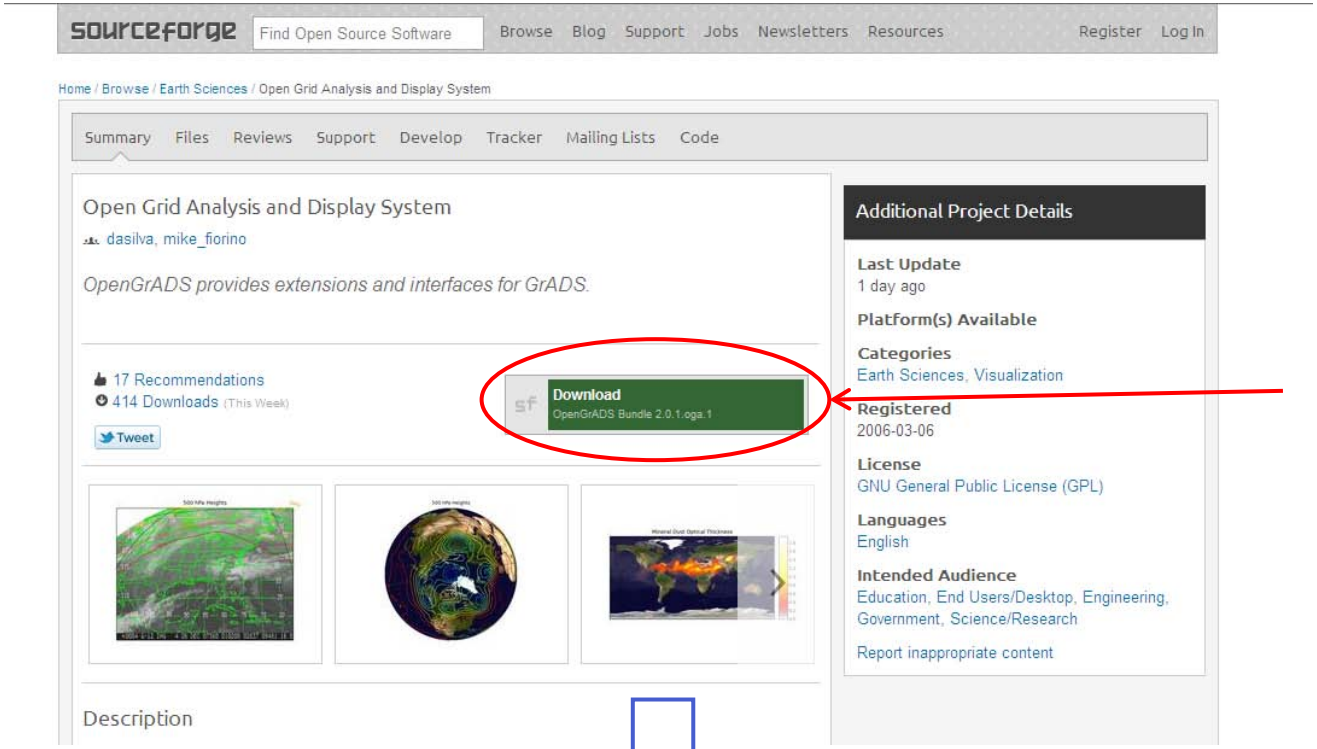
Preparation
Install OpenGrADS

- COLA/IGES provides a Windows version of GrADS.
- SourceForge provides an extension version of GrADS called “OpenGrADS”, which is based on the original GrADS.
- For download of “OpenGrADS”
  - **Visit to http://sourceforge.net/projects/opengrads/**
  - Click on the banner “**Download**”

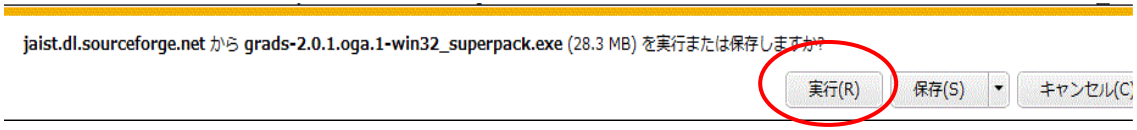
Installing OpenGrADS (1)
Top page of OpenGrADS

http://sourceforge.net/projects/opengrads/



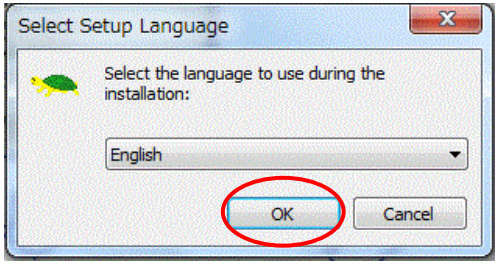
Download for install of OpenGrADS

Start install

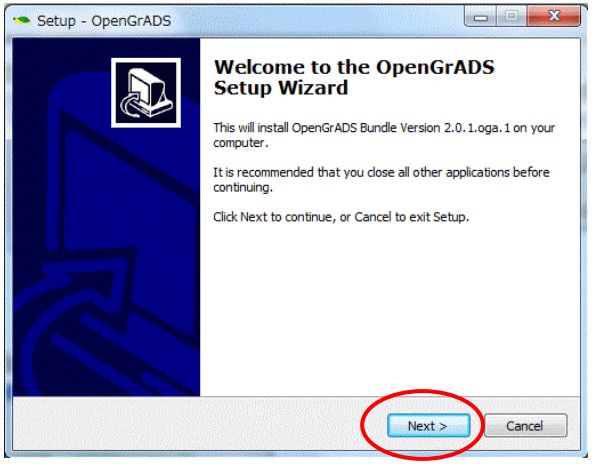


Installing OpenGrADS (2)

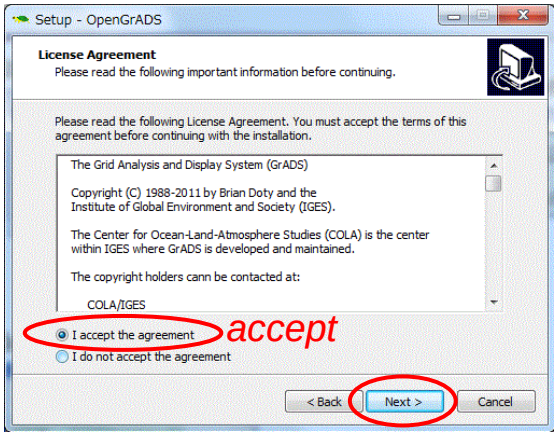
Select language



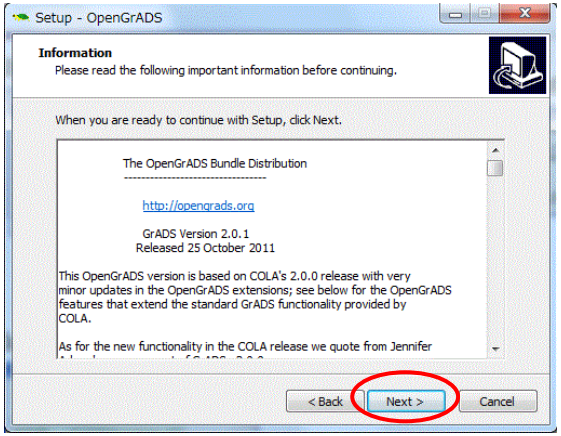
Setup Wizard



License Agreement

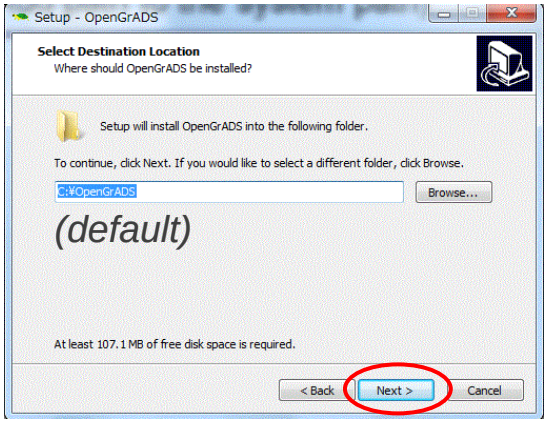


Information

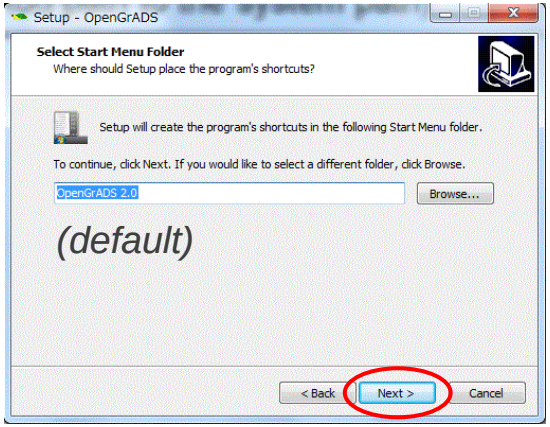


Installing OpenGrADS (3)

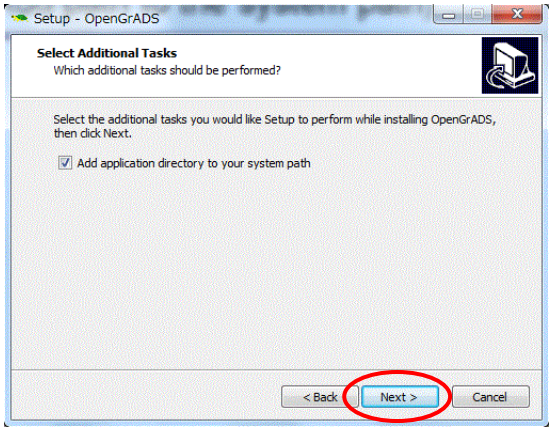
Select folder to be installed



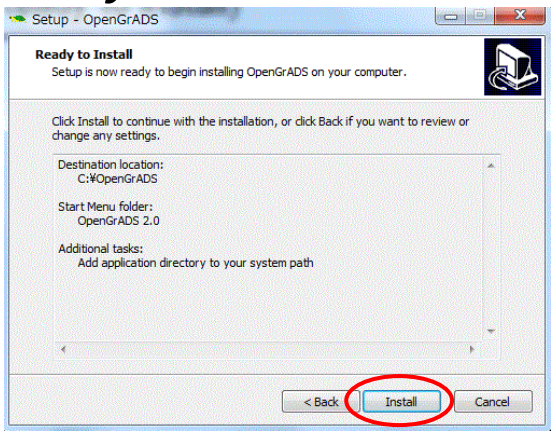
Select Start Menu Folder



Additional Tasks

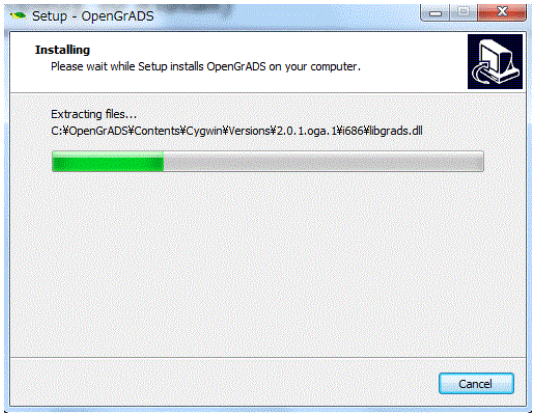


Ready to Install

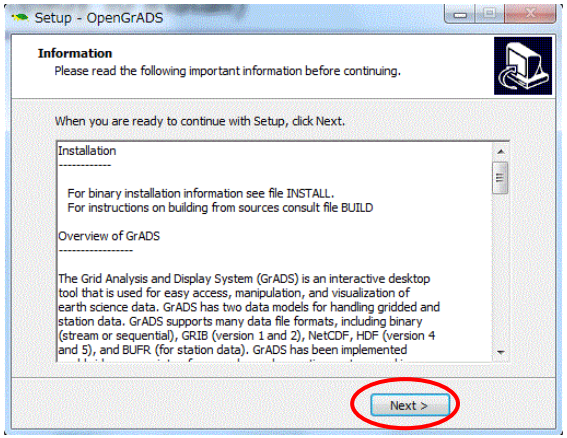


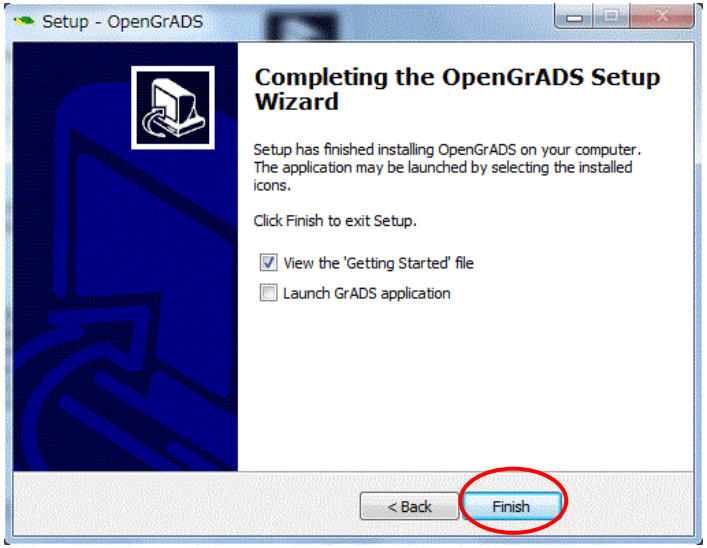
Installing OpenGrADS (4)

Installing



Information

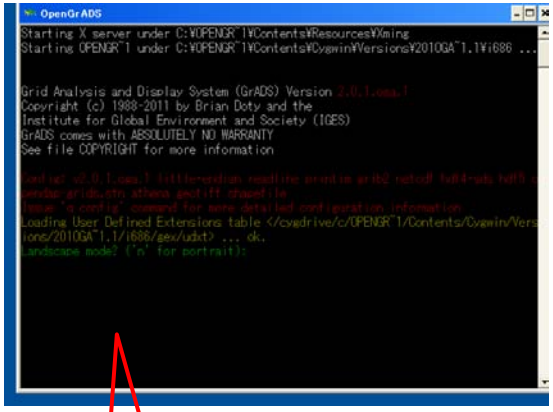




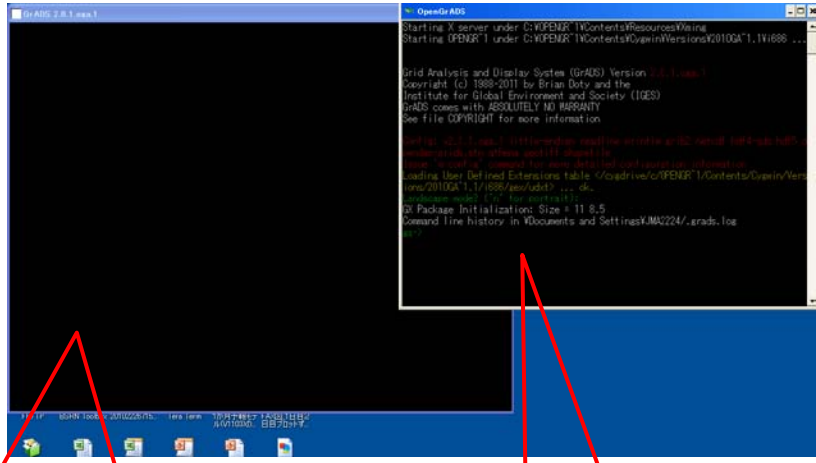
Finish

Start-up of GrADS

Click OpenGrADS



GrADS will prompt you with a landscape mode question.
Just press Enter key.



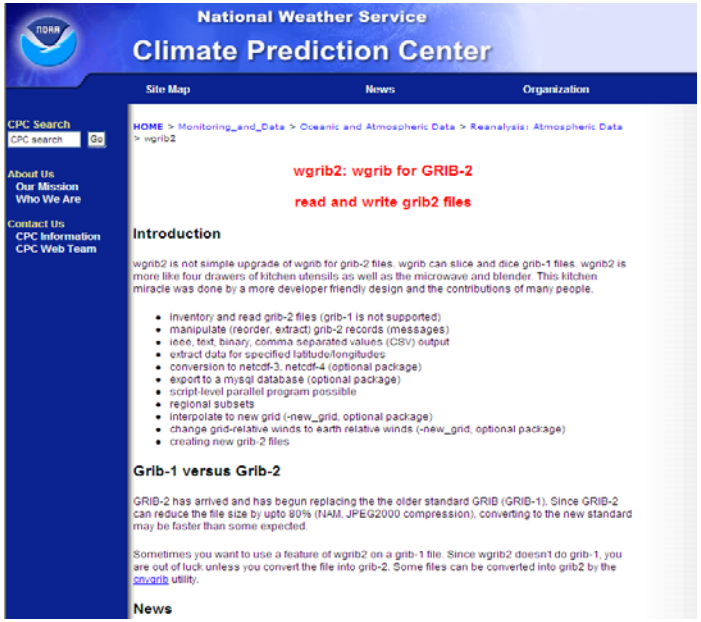
A graphics output window will open.

Enter “quit” in the text window if you exit GrADS.

Preparation
Install wgrib2

- All gridded data on the TCC website are provided in GRIB2 format.
- To handle GRIB2 files, “wgrib2” is useful.

Download page of wgrib2;
http://www.cpc.ncep.noaa.gov/products/wesley/wgrib2/



- For Windows users, no need to install wgrib2 separately because wgrib2 is packaged in OpenGrADS.

Procedure for decoding and visualizing gridded forecast data

1. Preparation - installing the tools:
   GrADS (viewer) and wgrib2 (encoder/decoder)

2. Download gridded forecast data (GRIB2)

3. Decode the data (GRIB2) using

4. Convert from GRIB2 to

5. Edit GrADS control file

6. Visualize GrADS data using GrADS

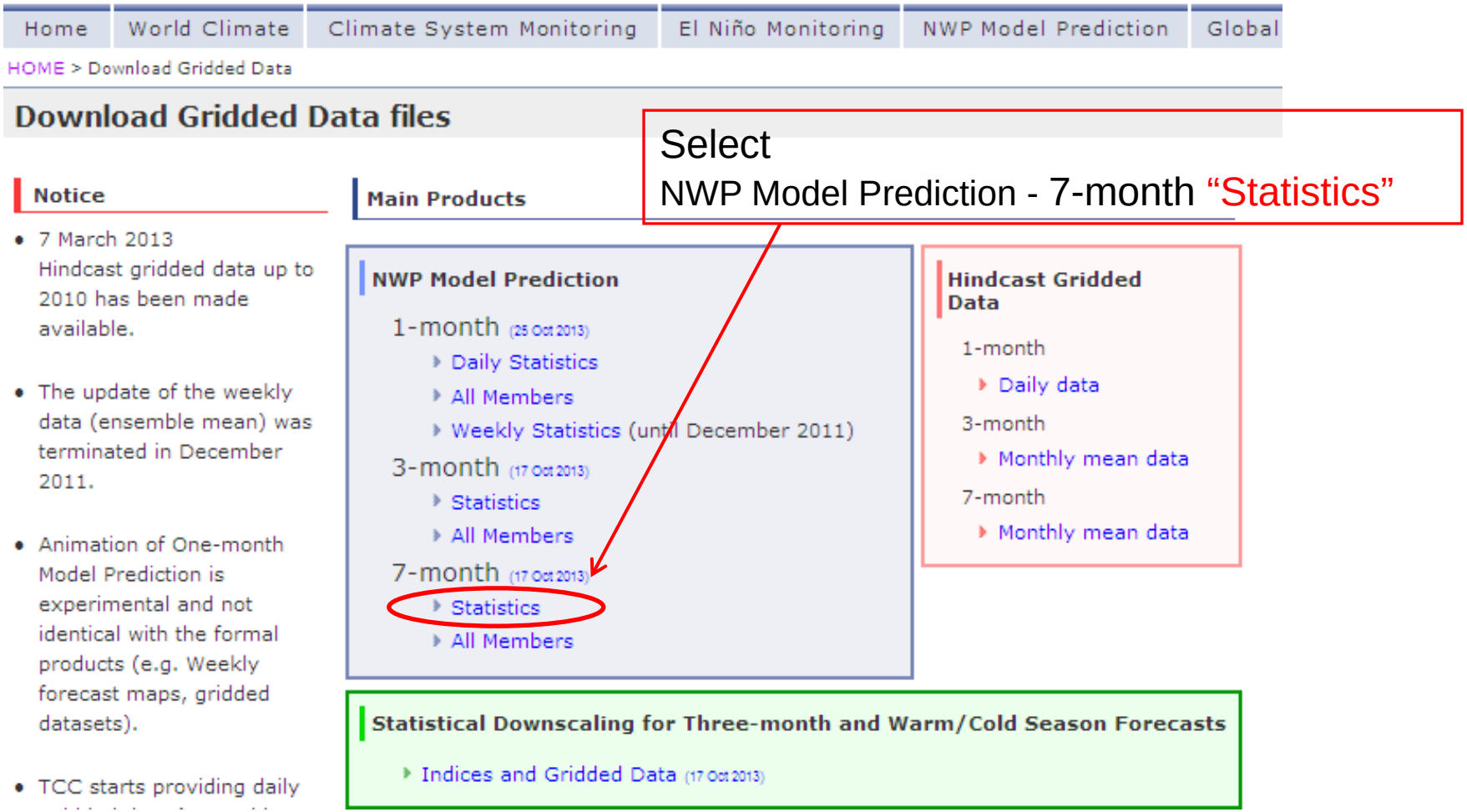
Example:

- Ensemble statistics data of the 7-month (Cold season) forecast
- Initial month: October 2013
- Element: Surface temperature (Tsurf) and its anomaly

Downloading gridded forecast data (1)

Example: Tsurf ensemble means for 7-month (cold season) forecast issued in October 2013

"Download Gridded Data files" page



Downloading gridded forecast data (2)

Example: Tsurf ensemble means for 7-month (cold season) forecast issued in October 2013

Grid point value products of Warm and Cold Season Outlook in GRIB2 format
(Ensemble statistics)

- download Grid point value (GPV) data (*201002-present*).
  - Each file is located in a folder named as 'yyyymm', which indicates year(four-digit) and month(two-digit) of an initial time. Each file name is referred in the
  - The data made from old models is here:*200402-200910*
- WGRIB2 to read GPV in GRIB2 format : for Linux for windows
- Data description
  - Elements
    - U200,V200,Z500,U850,V850,T850, mean sea level pressure,precipitation,2m temperature, and SST
    - 1-month and 3-month mean and standard deviation
    - Model normals based on hindcast from 1984 to 2005.
  - Area and spatial resolution : global, 2.5° × 2.5°
  - Lead time *(please refer to operation of the EPS)*
    - Monthly mean forecast : June,July,August for Warm Season Outlook or December,January,February for Cold Season Outlook.
    - Three-month mean forecast : average of JJA (for Warm Season Outlook) or DJF (for Cold Season Outlook).
  - Ensemble size : 51 (9 BGM & 6 days with 5-day LAF)
  - Issuance day : no later than 25th
  - Format : Gridded numerical values encoded in GRIB2, which is explained at "FM92 GRIB - Edition 2" in the WMO website (http://www.wmo.int/pages/pro
  - In addition to "FM 92 GRIB - Edition 2", some local parameters are used in this product. They are shown below.
    (These parameters are supported by decoding program provided at TCC website)

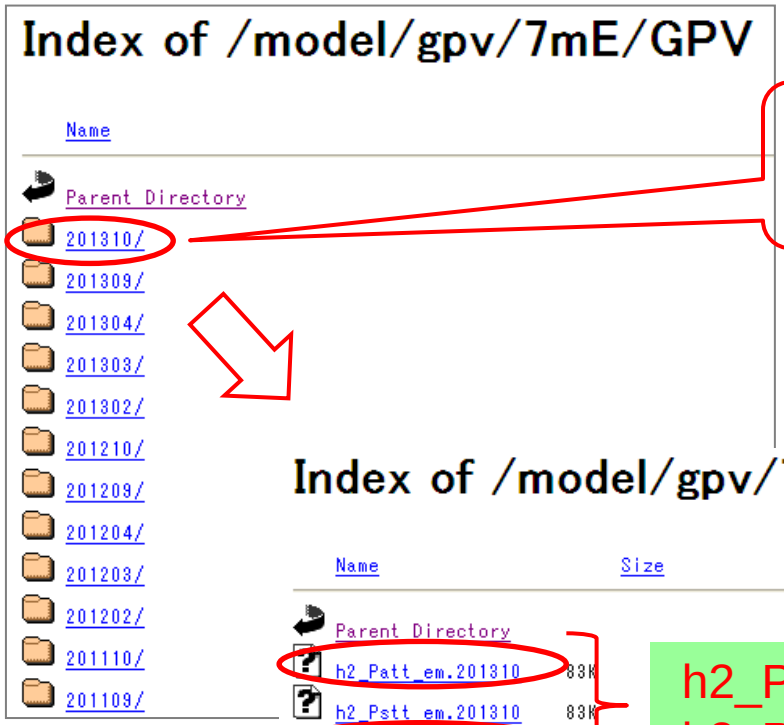
Code Table 4.2 Parameter number by product discipline and parameter category
Product Discipline 0: Meteorological products, Parameter Category 1:Moisture

Number	Parameter	Units
210	Daily mean precipitation	kg m^{-2} day^{-1}

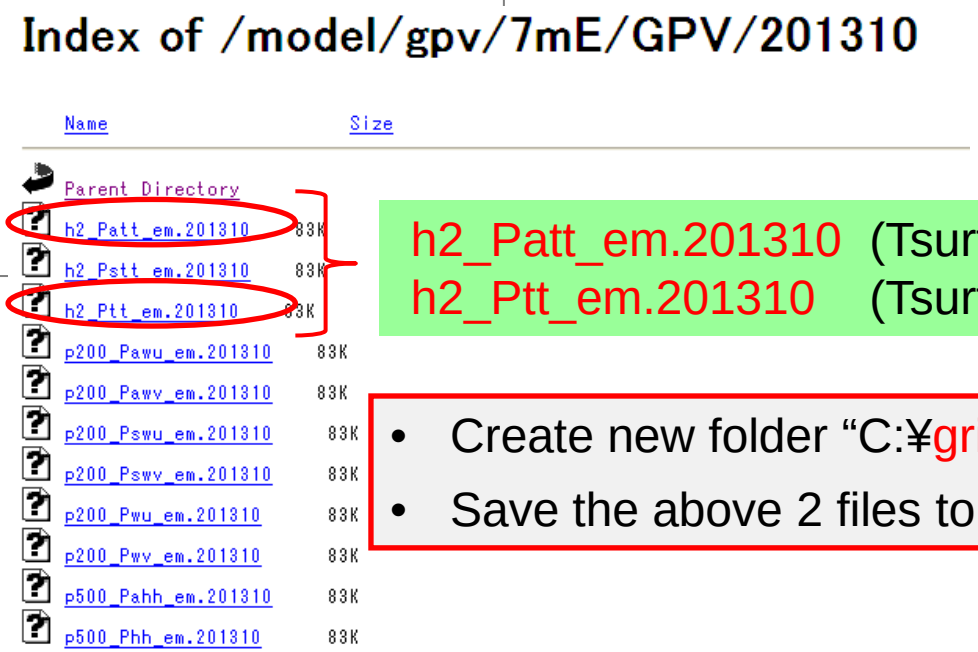
Click "download"

Downloading gridded forecast data (3)

Example: Tsurf ensemble means for 7-month (cold season) forecast issued in October 2013



Select initial month
"201310"



h2_Patt_em.201310 (Tsurf anomaly, ensemble mean)
h2_Ptt_em.201310 (Tsurf, ensemble mean)

- Create new folder "C:¥grib2test", and then
- Save the above 2 files to C:¥grib2test.

Procedure for decoding and visualizing gridded forecast data

1. Preparation - installing the tools:
   GrADS (viewer) and wgrib2 (encoder/decoder)

2. Download gridded forecast data (GRIB2)

3. Decode the data (GRIB2) using wgrib2

4. Convert from GRIB2 to GrADS data using wgrib2

5. Edit GrADS control file

6. Visualize GrADS data using GrADS

What is in a GRIB2 file?

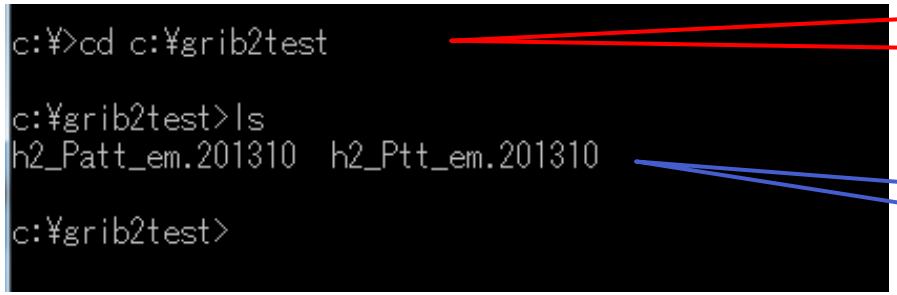
An easy way to see the contents of a GRIB2 file is to run wgrib2 on it.

- wgrib2 (*grib2_filename*)

To run wgrib2,

Open command prompt

Windows start menu
- All programs
  - Accessories
    - **Command Prompt**



Change directory to c:¥grib2test

Downloaded files

To see the contents of *h2_Patt_em.201310* ,

C:¥grib2test> wgrib2 *h2_Patt_em.201310*

What is in a GRIB2 file?

Example: Tsurf ensemble mean anomaly for 7-month (cold season) forecast issued in October 2013

C:¥grib2test> wgrib2 *h2_Patt_em.201310*

1.1:0:d=2013100100:TMPA:2 m above ground:2 month-(2 month+2160 hour ave@(6 hour fcst)++,missing=0:ens-mean

1.2:0:d=2013100100:TMPA:2 m above ground:2 month-(2 month+744 hour ave@(6 hour fcst)++,missing=0:ens-mean

1.3:0:d=2013100100:TMPA:2 m above ground:3 month-(3 month+744 hour ave@(6 hour fcst)++,missing=0:ens-mean

1.4:0:d=2013100100:TMPA:2 m above ground:4 month-(4 month+672 hour ave@(6 hour fcst)++,missing=0:ens-mean

Record-1: month 2-4
DJF 2013/14 (3-month mean)

Record-2: month 2
December 2013

Record-3: month 3
January 2014

Record-4: month 4
February 2014

Initial month (October 2013)

Lead time (month) and forecast period

4 records included

Surface (2 m) Temperature anomaly

Extract grid values from a GRIB2 file (1)

- wgrib2 (*grib2 file*) -undefine out-box *(lons):(lone) (lats):(late)* -csv *(CSV file)*

Input GRIB2 filename — *Longitude west:east* — *Latitude south:north* — *Output CSV filename*

(Example 1) a specific point (140°E, 35°N)

wgrib2 *h2_Patt_em.201310* -undefine out-box *140:140 35:35* -csv *out1.csv*

out1.csv includes grid values at 140°E, 35°N

2013/10/1 0:00	2014/2/28 0:00	TMPA.ens-mean	2 m above ground	140	35	0.044916
2013/10/1 0:00	2013/12/31 0:00	TMPA.ens-mean	2 m above ground	140	35	0.218459
2013/10/1 0:00	2014/1/31 0:00	TMPA.ens-mean	2 m above ground	140	35	-0.0418936
2013/10/1 0:00	2014/2/28 0:00	TMPA.ens-mean	2 m above ground	140	35	-0.050786

Record-1: month 2-4
Record-2: month 2
Record-3: month 3
Record-4: month 4

Extract grid values from a GRIB2 file (2)

- wgrib2 (*grib2 file*) -undefine out-box *(lons):(lone) (lats):(late)* -csv *(CSV file)*

Input GRIB2 filename | *Longitude west:east* | *Latitude south:north* | *Output CSV filename*

(Example 2) bounding box (135°E-137.5°E, 35°N-37.5°N)

wgrib2 *h2_Patt_em.201310* -undefine out-box *135:137.5 35:37.5* -csv *out2.csv*

out2.csv includes grid values in the bounding box (135°E-137.5°E, 35°N-37.5°N)

2013/10/1 0:00	2014/2/28 0:00	TMPA.ens-mean	2 m above ground	135	35	0.0800112
2013/10/1 0:00	2014/2/28 0:00	TMPA.ens-mean	2 m above ground	137.5	35	0.0515078
2013/10/1 0:00	2014/2/28 0:00	TMPA.ens-mean	2 m above ground	135	37.5	0.0781801
2013/10/1 0:00	2014/2/28 0:00	TMPA.ens-mean	2 m above ground	137.5	37.5	0.19433
2013/10/1 0:00	2013/12/31 0:00	TMPA.ens-mean	2 m above ground	135	35	0.283766
2013/10/1 0:00	2013/12/31 0:00	TMPA.ens-mean	2 m above ground	137.5	35	0.215285
2013/10/1 0:00	2013/12/31 0:00	TMPA.ens-mean	2 m above ground	135	37.5	0.332289
2013/10/1 0:00	2013/12/31 0:00	TMPA.ens-mean	2 m above ground	137.5	37.5	0.404982
2013/10/1 0:00	2014/1/31 0:00	TMPA.ens-mean	2 m above ground	135	35	-0.0214468
2013/10/1 0:00	2014/1/31 0:00	TMPA.ens-mean	2 m above ground	137.5	35	-0.0251089
2013/10/1 0:00	2014/1/31 0:00	TMPA.ens-mean	2 m above ground	135	37.5	-0.107873
2013/10/1 0:00	2014/1/31 0:00	TMPA.ens-mean	2 m above ground	137.5	37.5	0.0378183
2013/10/1 0:00	2014/2/28 0:00	TMPA.ens-mean	2 m above ground	135	35	-0.0329638
2013/10/1 0:00	2014/2/28 0:00	TMPA.ens-mean	2 m above ground	137.5	35	-0.0452318
2013/10/1 0:00	2014/2/28 0:00	TMPA.ens-mean	2 m above ground	135	37.5	0.00292492
2013/10/1 0:00	2014/2/28 0:00	TMPA.ens-mean	2 m above ground	137.5	37.5	0.134334

Month 2-4 (DJF 2013/14)

Month 2 (Dec 2013)

Month 3 (Jan 2014)

Month 4 (Feb 2014)

wgrib2 options

- wgrib2 (-h)

```
C:¥>wgrib2
wgrib2 v0.1.7.8e 2/2009 Wesley Ebisuzaki, Jaakko Hyvﾃ､tti, Kristian Nilssen, Karl Pfeiffer, Manfred Schwarb, Arlindo da
Silva, Niklas Sondell, Sergey Varlamov
 -0xSec           inv  X      Hex dump of section X (0..8)
 -MM              inv          month
 -N_ens           inv          number of ensemble members
 -RT              inv          Reference Time
 -Sec0            inv          contents of section0
 -Sec3            inv          contents of section 3 (Grid Definition Section)
 -Sec4            inv          Sec 4 values (Product definition section)
 -Sec5            inv          Sec 5 values (Data representation section)
 -Sec6            inv          show bit-map section
 -Sec_len         inv          length of various grib sections
 -T               inv          time YYYYMMDDHHMMSS
 -V               inv          diagnostic output
 -VT              inv          verf time = reference_time + forecast_time (YYYYMMDDHHMMSS)
 -YY              inv          year
 -bitmap          inv          bitmap mode
 -center          inv          center
 -ctl_ens         inv          ens info for grads
 -ctl_inv         inv          ctl inventory dump (for g2ctl/GrADS)
 -disc            inv          discipline (code table 0.0)
 -domain          inv          max limit for n/s/e/w
 -ens             inv          ensemble information
 -ftime           inv          forecast time
 -grid            inv          grid definition
 -ij              inv  X Y     value of field at grid(X,Y) X=1,..,nx Y=1,..,ny
 -ijlat           inv  X Y     lat,lon and grid value at grid(X,Y) X=1,..,nx Y=1,..,ny
 -ilat            inv  X       lat,lon and grid value at Xth grid point, X=1,..,npnts
```

or wgrib2 website:
http://www.cpc.ncep.noaa.gov/products/wesley/wgrib2/

Procedure for decoding and visualizing gridded forecast data

1. Preparation - installing the tools:
   GrADS (viewer) and wgrib2 (encoder/decoder)

2. Download gridded forecast data (GRIB2)

3. Decode the data (GRIB2) using wgrib2

4. Convert from GRIB2 to GrADS data using wgrib2

5. Edit GrADS control file

6. Visualize GrADS data using GrADS

Convert GRIB2 to GrADS (binary) format

- **wgrib2 (*grib2_file*) -no_header -bin (*output_file*)**
  - The “-bin” option writes the grid values to a specified file in binary format.
  - The default order is West-East:South-North.
  - The undefined value is 9.999e20

wgrib2 *h2_Patt_em.201310* -no_header –bin *tsurf_anm.dat*
wgrib2 *h2_Ptt_em.201310* -no_header –bin *tsurf.dat*

```
C:¥grib2test>ls -l
total 4544
-rwx------ 1 mkgroup   84577  2013-10-25 11:56  h2_Patt_em.201310
-rwx------ 1 mkgroup   84577  2013-10-25 11:56  h2_Ptt_em.201310
-rwx------ 1 mkgroup  168192 2013-10-25 14:57  tsurf.dat
-rwx------ 1 mkgroup  168192 2013-10-25 14:57  tsurf_anm.dat
```

GRIB2

GrADS data converted using wgrib2

Procedure for decoding and visualizing gridded forecast data

1. Preparation - installing the tools:
   GrADS (viewer) and wgrib2 (encoder/decoder)

2. Download gridded forecast data (GRIB2)

3. Decode the data (GRIB2) using wgrib2

4. Convert from GRIB2 to GrADS data using wgrib2

5. Edit GrADS control file

6. Visualize GrADS data using GrADS

Editing GrADS control files

Basic format of GrADS control file

```
dset  ^grads_data_filename
undef  (UNDEF value)9.999e+20
xdef  (num. of grids along X-axis)  linear   (start) (increment)
ydef  (num. of grids along Y-axis)  linear   (start) (increment)
zdef  (num. of vertical levels)  levels  (list of levels)
tdef   (num. of time steps)  linear   (starting time) (increment)
vars  (num. of parameters)
(parameter_name)      0   0  (remarks)
endvars
```

The format of GrADS control file is text.

You can create GrADS control files using a text editor such as Notepad.

Create tsurf_anm.ctl and tsurf.ctl.

C:¥grib2test¥tsurf_anm.ctl

```
dset     ^tsurf_anm.dat
undef    9.999e+20
xdef  144 linear     0 2.5
ydef    73 linear  -90 2.5
zdef      1 levels   1000
tdef      4 linear   Nov2013 1mon
vars      1
Tanm    0   0  tanm
endvars
```

C:¥grib2test¥tsurf.ctl

```
dset     ^tsurf.dat
undef    9.999e+20
xdef  144 linear     0 2.5
ydef    73 linear  -90 2.5
zdef      1 levels   1000
tdef      4 linear   Nov2013 1mon
vars      1
T      0   0  t
endvars
```

Procedure for decoding and visualizing gridded forecast data

1. Preparation - installing the tools:
   GrADS (viewer) and wgrib2 (encoder/decoder)

2. Download gridded forecast data (GRIB2)

3. Decode the data (GRIB2) using wgrib2

4. Convert from GRIB2 to GrADS data using wgrib2

5. Edit GrADS control file

6. Visualize GrADS data using GrADS

Visualization (1)
Startup GrADS on the “Command Prompt”

C:¥grib2test> **grads**

```
Starting X server under C:¥OPENGR~1¥Contents¥Resources¥Xming
Starting grads under C:¥OPENGR~1¥Contents¥Cygwin¥Versions¥20A9OG~1.1¥i686 ...

Grid Analysis and Display System (GrADS) Version 2.0.a9.oga.1
Copyright (c) 1988-2010 by Brian Doty and the
Institute for Global Environment and Society (IGES)
GrADS comes with ABSOLUTELY NO WARRANTY
See file COPYRIGHT for more information

Config: v2.0.a9.oga.1 little-endian readline printim grib2 netcdf hdf4-sds hdf5 opendap-grids,stn athena geotiff shapefile
Issue 'q config' command for more detailed configuration information Loading User Defined Extensions table
</cygdrive/c/OPENGR~1/Contents/Cygwin/Versions/20A9OG~1.1/i686/gex/udxt> ... ok.
Landscape mode? ('n' for portrait):
GX Package Initialization: Size = 11 8.5
cygwin warning:
  MS-DOS style path detected: ¥Documents and Settings¥JMA2224/.Xauthority
  Preferred POSIX equivalent is: /cygdrive/e/Documents and Settings/JMA2224/.Xauthority
  CYGWIN environment variable option "nodosfilewarning" turns off this warning.
  Consult the user's guide for more details about POSIX paths:
    http://cygwin.com/cygwin-ug-net/using.html#using-pathnames
ga->
```

Press “Enter” key

Waiting for command input

Visualization (2)
Open the grads control file and draw forecast map

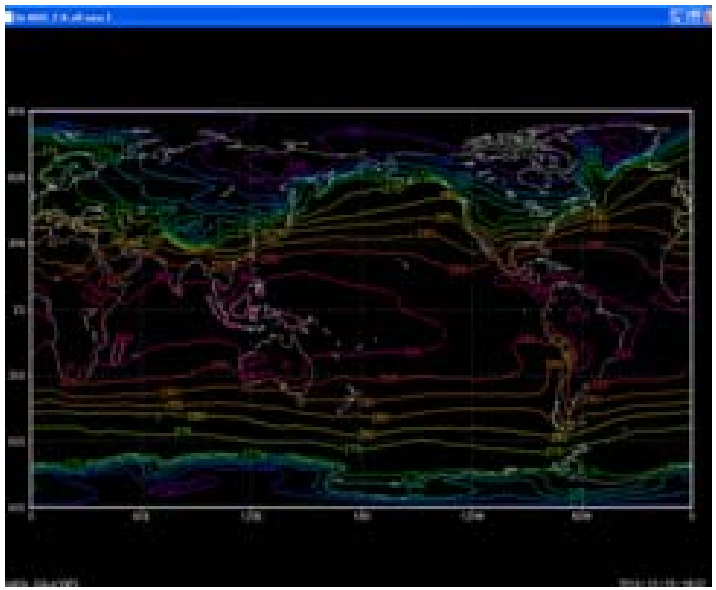
- open (*grads control file*)

```
ga-> open tsurf.ctl
Scanning description file:  tsurf.ctl
Data file tsurf.dat is open as file 1
LON set to 0 360
LAT set to -90 90
LEV set to 1000 1000
Time values set: 2013:11:1:0 2013:11:1:0
E set to 1 1
ga-> set  t  1
ga-> d t
Contouring: 240 to 305 interval 5
ga->
```

Open GrADS control file

Set time record 1

Display (element)

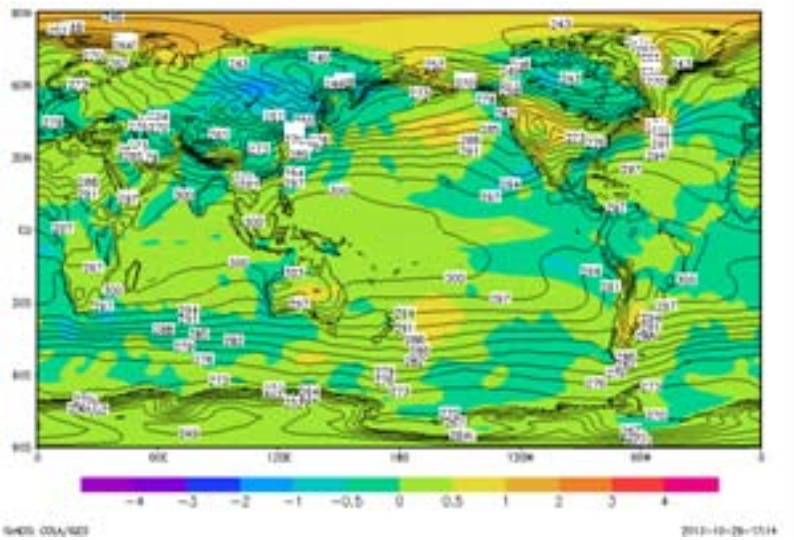


The first record of the data which is Tsurf 3-month mean for DJF is plotted.

Tsurf for DJF 2013/14

Visualization (3)
Plotting two parameters (Tsurf and its anomaly)

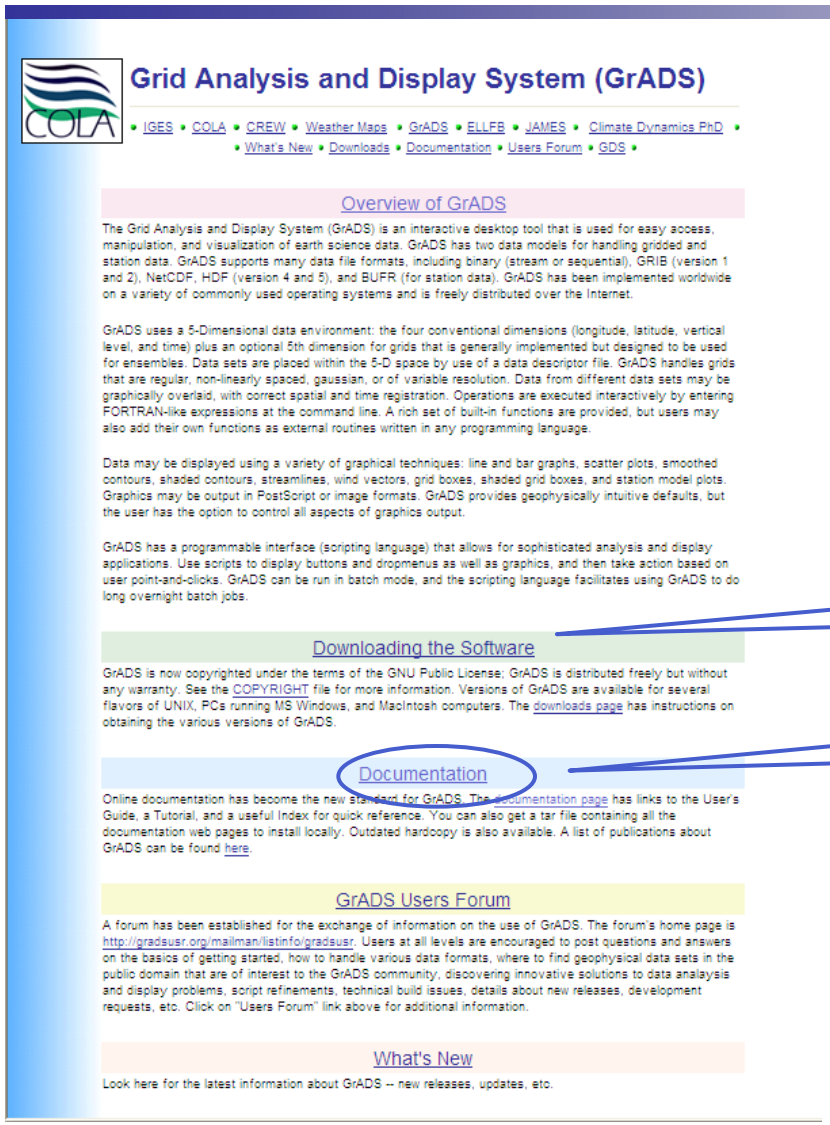
```
ga-> reinit                                   (Return GrADS to initial state)
ga-> open tsurf.ctl
ga-> open tsurf_anm.ctl                       (Open 2 control files)

ga-> set t 3          (Set time record  3  = month-2 (January 2014))

ga-> set gxout shaded
ga-> set clevs -4 -3 -2 -1 -0.5 0 0.5 1 2 3 4
Number of clevs = 11
ga-> d tanm.2                                 (Shading for Tsurf anomaly)
Contouring at clevs =  -4 -3 -2 -1 -0.5 0 0.5 1 2 3 4
ga-> run cbar.gs

ga-> set gxout contour
ga-> set cint 3
cint = 3                                      (Contours for Tsurf)
ga-> d t.1
Contouring: 237 to 306 interval 3

ga-> printim testimg.png white
                                              (Output png file)
```



Tsurf and its anomaly for January 2014

For more details about GrADS…

http://www.iges.org/grads/



Grid Analysis and Display System (GrADS)

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Overview of GrADS

The Grid Analysis and Display System (GrADS) is an interactive desktop tool that is used for easy access, manipulation, and visualization of earth science data. GrADS has two data models for handling gridded and station data. GrADS supports many data file formats, including binary (stream or sequential), GRIB (version 1 and 2), NetCDF, HDF (version 4 and 5), and BUFR (for station data). GrADS has been implemented worldwide on a variety of commonly used operating systems and is freely distributed over the Internet.

GrADS uses a 5-Dimensional data environment: the four conventional dimensions (longitude, latitude, vertical level, and time) plus an optional 5th dimension for grids that is generally implemented but designed to be used for ensembles. Data sets are placed within the 5-D space by use of a data descriptor file. GrADS handles grids that are regular, non-linearly spaced, gaussian, or of variable resolution. Data from different data sets may be graphically overlaid, with correct spatial and time registration. Operations are executed interactively by entering FORTRAN-like expressions at the command line. A rich set of built-in functions are provided, but users may also add their own functions as external routines written in any programming language.

Data may be displayed using a variety of graphical techniques: line and bar graphs, scatter plots, smoothed contours, shaded contours, streamlines, wind vectors, grid boxes, shaded grid boxes, and station model plots. Graphics may be output in PostScript or image formats. GrADS provides geophysically intuitive defaults, but the user has the option to control all aspects of graphics output.

GrADS has a programmable interface (scripting language) that allows for sophisticated analysis and display applications. Use scripts to display buttons and dropmenus as well as graphics, and then take action based on user point-and-clicks. GrADS can be run in batch mode, and the scripting language facilitates using GrADS to do long overnight batch jobs.

Downloading the Software

GrADS is now copyrighted under the terms of the GNU Public License; GrADS is distributed freely but without any warranty. See the COPYRIGHT file for more information. Versions of GrADS are available for several flavors of UNIX, PCs running MS Windows, and MacIntosh computers. The downloads page has instructions on obtaining the various versions of GrADS.

Documentation

Online documentation has become the new standard for GrADS. The documentation page has links to the User's Guide, a Tutorial, and a useful Index for quick reference. You can also get a tar file containing all the documentation web pages to install locally. Outdated hardcopy is also available. A list of publications about GrADS can be found here.

GrADS Users Forum

A forum has been established for the exchange of information on the use of GrADS. The forum's home page is http://gradsusr.org/mailman/listinfo/gradsusr. Users at all levels are encouraged to post questions and answers on the basics of getting started, how to handle various data formats, where to find geophysical data sets in the public domain that are of interest to the GrADS community, discovering innovative solutions to data analysis and display problems, script refinements, technical build issues, details about new releases, development requests, etc. Click on "Users Forum" link above for additional information.

What's New

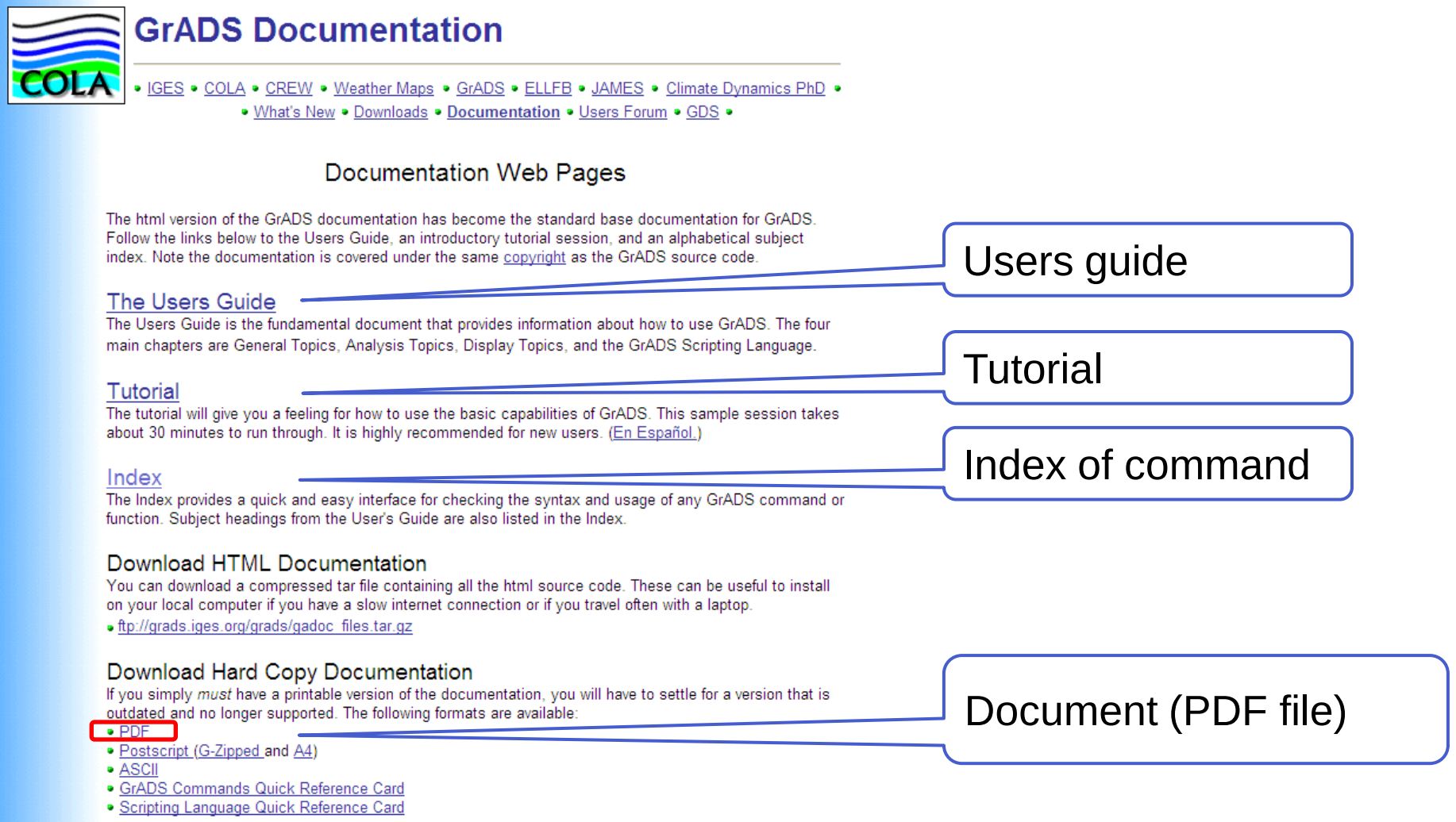
Look here for the latest information about GrADS -- new releases, updates, etc.

Download GrADS (for Linux)

Documentation

GrADS documentation page

http://www.iges.org/grads/gadoc/



GrADS Documentation

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• What's New • Downloads • **Documentation** • Users Forum • GDS •

Documentation Web Pages

The html version of the GrADS documentation has become the standard base documentation for GrADS. Follow the links below to the Users Guide, an introductory tutorial session, and an alphabetical subject index. Note the documentation is covered under the same copyright as the GrADS source code.

The Users Guide
The Users Guide is the fundamental document that provides information about how to use GrADS. The four main chapters are General Topics, Analysis Topics, Display Topics, and the GrADS Scripting Language.

Tutorial
The tutorial will give you a feeling for how to use the basic capabilities of GrADS. This sample session takes about 30 minutes to run through. It is highly recommended for new users. (En Español.)

Index
The Index provides a quick and easy interface for checking the syntax and usage of any GrADS command or function. Subject headings from the User's Guide are also listed in the Index.

Download HTML Documentation
You can download a compressed tar file containing all the html source code. These can be useful to install on your local computer if you have a slow internet connection or if you travel often with a laptop.
• ftp://grads.iges.org/grads/gadoc_files.tar.gz

Download Hard Copy Documentation
If you simply *must* have a printable version of the documentation, you will have to settle for a version that is outdated and no longer supported. The following formats are available:
• PDF
• Postscript (G-Zipped and A4)
• ASCII
• GrADS Commands Quick Reference Card
• Scripting Language Quick Reference Card

Users guide

Tutorial

Index of command

Document (PDF file)