Manual for Chilean Data Library Management – Part3

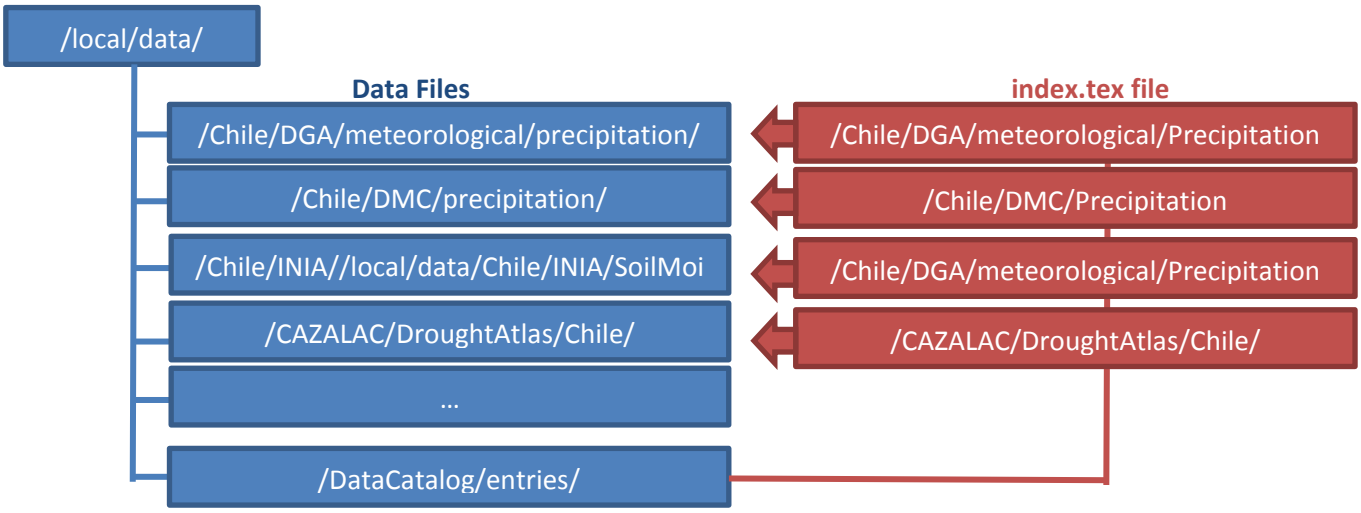
Contents

How to add data to the data library

All DL data is found under /local/data/

It has 2 components:

1) The data itself, which can be images (geotiff), stations (.txt) or other file types, like netcdf.
2) A datacatalog, that defines how the data should be read: the index.tex file



To add data:

1) Add data to /local/data/…

   You can use WinSCP to transfer files to this folder

2) Create an index.tex file under /local/data//DataCatalog/entries/…

   Each data type has a different way to setup the index.tex file

Adding station data to the DL

Add the data set to the /local/data/ folder

Each month, a new datafile is created: e.g. DMC_YearMonth.txt, or 'DMC_197101.txt'

```
year    2013
month   9
Serena  0.0
Valparaiso      0.1
Pudahuel        3.0
Quinta_Normal   6.4
Curico  16.9
Chillan 46.9
Concepcion      45.4
Temuco  72.2
Valdivia        188.7
Osorno  149.3
Puerto_Montt    135.4
Coyaique        80.4
Balmaceda       29.4
Punta_Arenas    6.6
```

Station location info is held in a Stations_metadata.csv

```
lat;lon;alt;nombre
-29.900000;-71.200000;142;Serena
-33.016667;-71.633333;41;Valparaiso
-33.383333;-70.783333;475;Pudahuel
-33.433333;-70.683333;520;Quinta_Norma
-34.966667;-71.233333;228;Curico
-36.566667;-72.033333;124;Chillan
-36.766667;-73.050000;12;Concepcion
-38.750000;-72.633333;114;Temuco
-39.616667;-73.083333;19;Valdivia
-40.600000;-73.050000;65;Osorno
-41.416667;-73.083333;85;Puerto_Montt
-45.583333;-72.116667;310;Coyhaique
-45.083333;-71.050000;520;Balmaceda
-53.000000;-70.850000;37;Punta_Arenas
```

Create the index.tex file

\begin{ingrid}

continuedataset:

datasetdefs:

grid:
/name /micol def
1 1 1
:grid

grid:
/name /ESTID def
/units /ids def
values:
(Serena) (Valparaiso) (Pudahuel) (Quinta_Normal) (Curico) (Chillan) (Concepcion) (Temuco) (Valdivia) (Osorno) (Puerto_Montt) (Coyhaique) (Balmaceda) (Punta_Arenas)
:values
:grid

grid:
/name (T) def
/units (monthtime) def

```
 /defaultvalue { last } def
 16 Jan 1971 ensotime
 1
 16 Aug 2013 ensotime
  :grid

/mitabla {
[ micol ESTID | T ]
(/local/data/Chile/DMC/Precipitation/DMC_%Y%m[T].txt)[T]
readdatafile:
[2 1]r*4astsv
:readdatafile
}defasvarsilent

:datasetdefs

/lon {
[ESTID | ]
(/local/data/Chile/DMC/Precipitation/Stations_metadata.csv)
readdatafile:
((/,(11X,F10.6,7X)))formatted
:readdatafile
/units (degree_east) def
/long_name (longitud) def
/scale_min -80. def
/scale_max -69. def
}defasvarsilent

/lat {
[ESTID | ]
(/local/data/Chile/DMC/Precipitation/Stations_metadata.csv)
readdatafile:
((/,(F10.6,18X)))formatted
:readdatafile
/units (degree_north) def
/long_name (latitud) def
/scale_min -54. def
/scale_max -29. def
}defasvarsilent
%Termina esta sub-base datos
:dataset

%la columna 1 tiene el minimo
/precip {
mitabla
micol 1. VALUE
micol removeGRID
/long_name (precipitation) def
/units (mm month-1) def
/missing_value -999. def
}defasvar

\end{ingrid}
```

A version including automatic updating when a new file is added can be found here.

Group example: creating a new station dataset in the DL

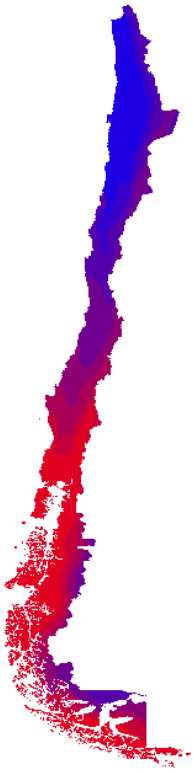
Background: the UNEA has just decided to start measuring precipitation. To help the UNEA, the DMC supports this effort by gifting its stations to UNEA since the start of the year.

Task: 1) Create an entry under /local/data/Chile for UNEA that holds these data and adjust the index.tex accordingly.

2) Make sure all references to DMC are removed.

Adding new TIFF files to the DL

Upload the image: Chile_AridZones.tif, which you can find here.



Check its properties using the following two LINUX commands:

>tiffinfo Chile.AridZones.tif

```
[root@www DrylandAtlas]# tiffinfo Chile_AridZones.tif
TIFFReadDirectory: Warning, Chile_AridZones.tif: unknown field with tag 33550 (0
x830e) encountered.
TIFFReadDirectory: Warning, Chile_AridZones.tif: unknown field with tag 33922 (0
x8482) encountered.
TIFFReadDirectory: Warning, Chile_AridZones.tif: unknown field with tag 34735 (0
x87af) encountered.
TIFFReadDirectory: Warning, Chile_AridZones.tif: unknown field with tag 34736 (0
x87b0) encountered.
TIFFReadDirectory: Warning, Chile_AridZones.tif: unknown field with tag 34737 (0
x87b1) encountered.
TIFF Directory at offset 0x8 (8)
  Image Width: 730 Image Length: 3122
  Bits/Sample: 64
  Sample Format: IEEE floating point
  Compression Scheme: None
  Photometric Interpretation: min-is-black
  Samples/Pixel: 1
  Rows/Strip: 1
  Planar Configuration: single image plane
  Tag 33550: 0.012749,0.012323,0.000000
  Tag 33922: 0.000000,0.000000,0.000000,-75.725972,-17.507550,0.000000
  Tag 34735: 1,1,0,7,1024,0,1,2,1025,0,1,1,2048,0,1,4326,2049,34737,13,0,2054,0,
1,9102,2057,34736,1,1,2059,34736,1,0
  Tag 34736: 298.257224,6378137.000000
  Tag 34737: GCS_WGS_1984|
```

Floating point types
32 bits= /realarraytype
64bits=/doublearraytype

>Listgeo Chile_AridZones.tif

It is very important to know the pixel type, which is shown here to be of type ‘double’.

```
[root@www DrylandAtlas]# listgeo Chile_AridZones.tif
Geotiff_Information:
   Version: 1
   Key_Revision: 1.0
   Tagged_Information:
      ModelTiepointTag (2,3):
         0               0               0
         -75.7259716     -17.5075497     0
      ModelPixelScaleTag (1,3):
         0.0127493565    0.0123228464    0
      End_Of_Tags.
   Keyed_Information:
      GTModelTypeGeoKey (Short,1): ModelTypeGeographic
      GTRasterTypeGeoKey (Short,1): RasterPixelIsArea
      GeographicTypeGeoKey (Short,1): GCS_WGS_84
      GeogCitationGeoKey (Ascii,13): "GCS_WGS_1984"
      GeogAngularUnitsGeoKey (Short,1): Angular_Degree
      GeogSemiMajorAxisGeoKey (Double,1): 6378137
      GeogInvFlatteningGeoKey (Double,1): 298.257224
      End_Of_Keys.
   End_Of_Geotiff.

GCS: 4326/WGS 84
Datum: 6326/World Geodetic System 1984
Ellipsoid: 7030/WGS 84 (6378137.00,6356752.31)
Prime Meridian: 8901/Greenwich (0.000000/  0d 0' 0.00"E)

Corner Coordinates:
Upper Left    ( 75d43'33.50"W, 17d30'27.18"S)
Lower Left    ( 75d43'33.50"W, 55d58'46.11"S)
Upper Right   ( 66d25' 8.19"W, 17d30'27.18"S)
Lower Right   ( 66d25' 8.19"W, 55d58'46.11"S)
Center        ( 71d 4'20.84"W, 36d44'36.65"S)
```

Now build the index.tex file for the tif-image:

```
\begin{ingrid}
continuedataset:

grid:
/name /X def
/long_name (Longitude) def
/units (degree_east) def
 -75.7259715918291363 0.0127494 dup 729.0 mul 2 index add
:grid

grid:
/name /Y def
/long_name (Latitude) def
/units (degree_north) def
-17.5075496705623905 -0.0123228 dup 3121.0 mul 2 index add
:grid

/Chile_DrylandAtlas {
[X Y | ]
(/local/data/CAZALAC/DrylandAtlas/Chile_AridZones.tif)
readdatafile:
tiffimage
/doublearraytype tiffimage
```

```
/units /unitless def
/missing_value 0 def
/long_name (Dryland Map of Chile) def
:readdatafile
}defasvarsilent

:dataset

\end{ingrid}
```

Other options for the format are: /realarraytype, /integerarraytype, /stringtype, /doublearraytype

Adding a new colorscale to the map

A first method is to define ranges and define the color scale in between

startcolormap	Starts the series of Ingrid code that defines the colorscale.
-10. 10. RANGE	Sets the upper and lower limits of the colorscale.
white purple	Sets white as the color for the areas with missing data and purple as the color for data values less than -10°C.
purple -10. VALUE	Sets purple as the color at the value of -10°C.
cyan -1. VALUE	Sets cyan as the color at the value of -1°C. The colorscale will automatically blend between the -10°C and -1°C data values.
white white 1. bandmax	Sets white as the color for values greater than -1°C and less than 1°C.
yellow 1. VALUE	Sets yellow as the color at the value of 1°C.
red 10. VALUE	Sets red as the color at the value of 10°C. The colorscale will automatically blend between the 1°C and 10°C data values.
firebrick	Sets firebrick as the color for data values greater than 10°C.
endcolormap	Ends the series of Ingrid code that defines the colorscale.

In the index.tex file you define it as:

```
Ingrid:
/test_colorscale {
 startcolormap
   -5. 5. RANGE
   SlateGrey grey NavyBlue
     -5. VALUE
     CornflowerBlue
      -4. VALUE
      LightCyan
       -0.5 VALUE
       LightGoldenrodYellow
        0.5 VALUE
        salmon
         4. VALUE
         IndianRed IndianRed
           5. bandmax
           grey endcolormap
} defcolorscale
pop
```

A list of predefined colors are found
here: http://iridl.ldeo.columbia.edu/dochelp/Tutorial/MVD/Visualization/colorchart.html

A second method is using bandmax.

In the index.tex this is defined as:

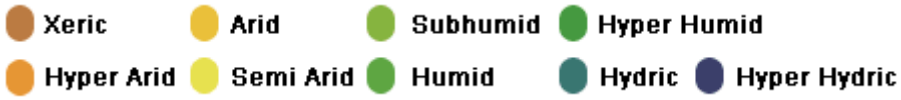
```
Ingrid:
/DM_SPI_2p5_colors {
startcolormap
DATA -2.5 2.5 RANGE
 transparent 115 0 0 RGB 115 0 0 RGB -2.05375 VALUE
 230 0 0 RGB RGBdup -1.64486 bandmax
 230 152 0 RGB RGBdup -1.28155 bandmax
 255 211 127 RGB RGBdup -0.84162 bandmax
 255 255 0 RGB RGBdup -0.5244 bandmax
 white white 0.5244 bandmax
 110 210 115 RGB RGBdup 0.84162 bandmax
 20 170 25 RGB RGBdup 1.28155 bandmax
 0 130 5 RGB RGBdup 1.64486 bandmax
 0 100 0 RGB RGBdup 2.05375 bandmax
 0 70 0 RGB RGBdup 2.5 bandmax
 0 70 0 RGB
 endcolormap } defcolorscale
pop
```

Group example: Add a new tiff image to the DL and maproom

Background: the UNEA needs to compare precipitation data to aridity condition.

Task: 1) Add the Chilean Dryland Map to the UNEA account.

2) Adjust the index.tex so it has its own color scale:




```
Ingrid:
/Drylands_colors {
  startcolormap
    0. 9. RANGE
    white white
188 123 66 RGB RGBdup 1.0 VALUE
231 149 52 RGB RGBdup 2.0 VALUE
 234 192 58 RGB RGBdup 3.0 VALUE
 231 225 79 RGB RGBdup 4.0 VALUE
 134 180 63 RGB RGBdup 5.0 VALUE
 94 166 66 RGB RGBdup 6.0 VALUE
 68 153 64 RGB RGBdup 7.0 VALUE
 56 117 112 RGB RGBdup 8.0 VALUE
 58 63 106 RGB RGBdup 9.0 VALUE
white endcolormap
} defcolorscale
pop
```

3) Add the Chilean Dryland Map to your maproom

Adding a NETCDF set to the IRI datalibrary (prepared by CEAZA)

Author: Cristian Orrego Nelson (@CEAZA, 2013, corregonelson@gmail.com)

There's one dataset from the NCEP called GHCCAMS that has the global monthly air temperature from 1943 up to now and with a resolution of 0.5°.

http://www.esrl.noaa.gov/psd/cgi-bin/db_search/DBSearch.pl?Dataset=NOAA%2FNCEP+GHCN+CAMS&group=0&submit=Search

First you have to get/update the dataset from:

ftp://ftp.cdc.noaa.gov/Datasets/ghcncams/air.mon.mean.nc

Then you put it in some folder inside /local/data/…

In this example is located in:

```
/local/data/ceaza/interanuales/GHCN2_CAMS/air.mon.mean_1948a2013.nc
```

To get the basic params you should run ncdump:

```
ncdump -h air.mon.mean_1948a2013.nc
```

and in Ingrid:

http://www.climatedatalibrary.cl/expert/%28/local/data/ceaza/interanuales/GHCN2_CAMS/air.mon.mean_1981a2013.nc%29readfile/mncsetup.html/

Both outputs will give you the information necessary to build the index.tex, you should base your index.tex in one already created for this type of files.

Then you should create de index.tex in the folder you want, for this example is located in:

```
/local/data/DataCatalog/ceaza/ interanuales/GHCN2_CAMS/
```

And the content is the folowing:

```
\begin{ingrid}
continuedataset:
/name (GHCN2_CAMS)def
% definicion de las variables independientes
grid:
/name (X) def
/units (degree_east)def
 0.25 0.5 359.75 %cantidad de lon
:grid
grid:
/name (Y) def
/units (degree_north)def
 89.75 0.5 -89.75 %cantidad de lat
:grid
grid:
/name (T) def
/units (months since 1947-12-16 00:00:00) def
1. 1. 786. %cantidad de timesteps
:grid
%---------------------------LAT-----------------------------------------------------
 /lat{
[ X Y | T] (/local/data/ceaza/interanuales/GHCN2_CAMS/air.mon.mean_1948a2013.nc) readdatafile:
/name (lat) def
 /MemoryOrder (XY ) def
 /FieldType 104 def
 /description (LATITUDE, SOUTH IS NEGATIVE) def
 /stagger () def
 /units /degree_north def
 /realarraytype netcdfrecords :readdatafile
```

```
}defasvarsilent

%---------------------------LON-------------------------------------------------------
 /lon{
[ X Y | T] (/local/data/ceaza/interanuales/GHCN2_CAMS/air.mon.mean_1948a2013.nc) readdatafile:
/name (lon) def
 /MemoryOrder (XY ) def
 /FieldType 104 def
 /description (LONGITUDE, WEST IS NEGATIVE) def
 /stagger () def
 /units /degree_east def
 /realarraytype netcdfrecords :readdatafile
}defasvarsilent
%-------------------------T2-----------------------------------
 /air{
[ X Y | T] (/local/data/ceaza/interanuales/GHCN2_CAMS/air.mon.mean_1948a2013.nc) readdatafile:
/name (air) def
 /unpacked_valid_range [ 150. 400. ] def
 /statistic (Mean) def
 /add_offset 477.64999 def
 /parent_stat (Other) def
 /Dataset (NOAA/NCEP GHCN CAMS) def
 /level_desc (Surface) def
 /valid_range [ -32765 7765 ] def
 /scale_factor 0.01 def
 /actual_range [ 196.28999 318.45001 ] def
 /long_name (Monthly mean of surface temperature) def
 /units /Kelvin_scale def

 /cell_methods (time: mean) def
 /missing_value 32767 def
 /var_desc (Air Temperature) def
 /standard_name (air_temperature) def
 /shortarraytype netcdfrecords :readdatafile
 (Celsius_scale) unitconvert %pasar el set a celcius
}defasvarsilent
:dataset
\end{ingrid}
```

Now in the datalibrary server you could visit the set in the URL:

http://www.climatedatalibrary.cl/expert/SOURCES/.ceaza/.interanuales/.GHCN2_CAMS/.air/

How to add new icons to the maproom

Icons are managed in the cascading style sheets or css. The main css is uicore.css that holds all markup elements to design the maproom, including the icons. In order to add new icons, three things need to be set. First, a new css-file needs to be created that includes the uicore.css but overrides some aspects of it, especially the icons and their size. Second, icons need to be created and added to a new folder within the maproom section, so the new css-file can access them. Third, the link to the css-file must be changed in each and every html file created (so it's best to do it early in the development process).

Troubleshooting

What if the Datalibrary does not work

- Try running 'sudo /etc/init.d/ingrid start' several or many times, always checking after each attempt with 'ps -ef | grep ingrid'. When it starts successfully, you will see an 'ingridd' process. Once it starts, stop using the 'sudo /etc/init.d/ingrid start' command.

- Check the /var/log/ingrid_log file. It may contain information about why the Data Library is not starting up.

- Check the /var/log/messages file. There may be some system messages in there that could explain why the Data Library is not starting.

Try this sequence:

- To shutdown Ingrid:

>sudo /etc/init.d/ingrid stop

- To flush squid cache

>sudo /usr/local/squid/sbin/squid –k reconfigure

- to start up Ingrid

>sudo /etc/init.d/ingrid start

- Check if ingridd is running

>ps –ef | grep ingrid

(should show one ingridd process, if not, repeat ingrid start, it may take 2 or 3 times)

What if only the Maprooms do not work

Check if httpd is running.

>ps -ef | grep httpd'

you can start httpd this way

>sudo /etc/init.d/httpd start

The maprooms are served by httpd in the apache web server software.

How to add the latest Ingrid function to the DL

>wget http://iri.columbia.edu/~jdcorral/fedora/ingrid_functions.tex

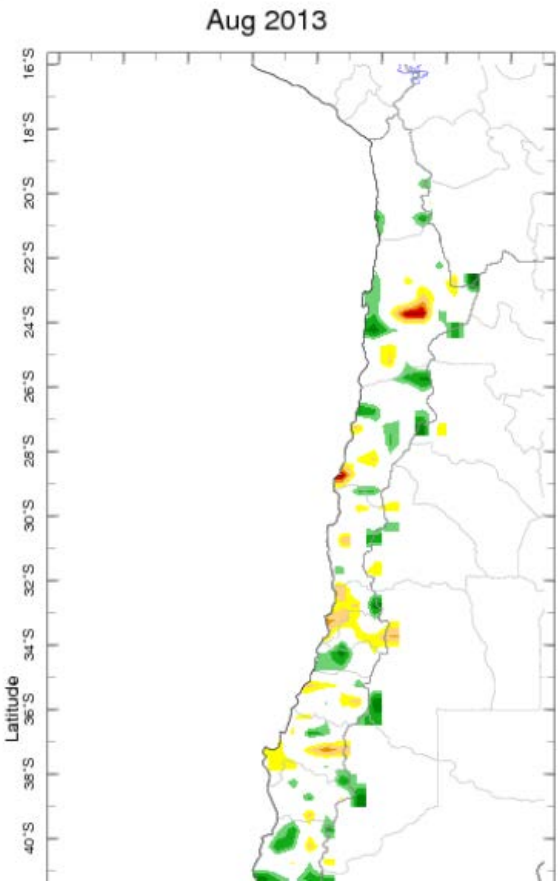
>mv /local/home/ingrid/ingrid_functions.tex /local/home/ingrid/ingrid_functions.tex.20130510

>mv ingrid_functions.tex /local/home/ingrid/ingrid_functions.tex

>/etc/init.d/reconfigura.sh

>/etc/init.d/ingrid start

What if your maps in the maproom look scrambled



You first need to delete the cache

Go to ingridcache:

>cd /local/data/ingridcache/SOURCES

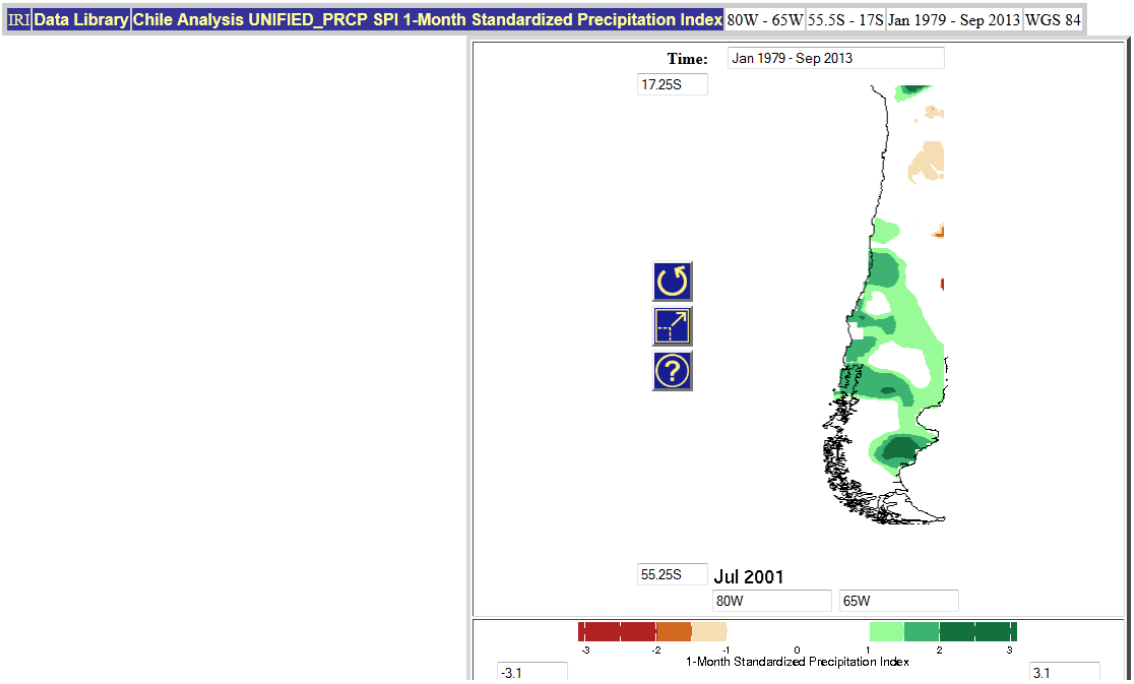
And find the dataset you are using, for example, the SPI dataset:

/local/data/ingridcache/SOURCES/Chile/Analysis/UNIFIED_PRCP/SPI

Name	Ext	Size	Changed	Rights	Owner
..			5/07/2013 9:34:47	rwxr-xr-x	dataser...
SPI12.0001		7,706,160	2/10/2013 10:03:15	rw-rw-r--	dataser...
SPI6.0001		7,706,160	2/10/2013 10:02:54	rw-rw-r--	dataser...
SPI3.0001		7,706,160	2/10/2013 9:54:45	rw-rw-r--	dataser...
SPI1.0001		7,706,160	1/10/2013 14:42:46	rw-rw-r--	dataser...
SPI9.0001		7,687,680	9/09/2013 19:54:30	rw-rw-r--	dataser...

You can now delete the cached images that are showing errors.

To make sure the images are cached correctly again, you need to go to the images in the DL and request all images, by using ‘first to last’.



Now go back to the maproom and refresh using SHIFT+refresh.