

Introduction to the IRI Data Library

IRI

Paula L.M. Gonzalez (gonzalez@iri.columbia.edu)

ICTP Advanced School and Workshop on Subseasonal to
Seasonal (S2S) Prediction and Application to Drought Prediction

Objectives:

- to get familiar with the organization of the Data Library
- to learn how to browse datasets and select different domains and periods
- to learn how to perform simple calculations
- to learn how to create maps and plots
- to learn how to download data files and images
- to introduce some relevant datasets and map rooms



IRI Data Library is...

Data repository

>400 datasets covering all aspects of climate-related characteristics

Data analysis tool

performs several simple and not so simple arithmetic operations (e.g. EOF analysis)

Data visualization tool

Time series, maps, cross-sections

Data download resource

Free access to several data formats such as text, binary, GIS-compatible, etc.

<http://iridl.ldeo.columbia.edu>



The screenshot shows a web browser window for the Climate Data Library at iridl.ideo.columbia.edu. The page features a header with the IRI/LDEO logo and a search bar. Below the header, there's a main content area for the "IRI Climate and Society Map Room" and several sidebar modules.

IRI Climate and Society Map Room

The climate and society maproom is a collection of maps and other figures that monitor climate and societal conditions at present and in the recent past. The maps and figures can be manipulated and are linked to the original data. Even if you are primarily interested in data rather than figures, this is a good place to see which datasets are particularly useful for monitoring current conditions.

Data by Source

Datasets organized by source, i.e. creator and/or provider.

Data By Category

Selected Datasets for particular topics

Dataset and Map Room Browser

Find datasets and maps organized by many characteristics and keywords

Latest from our What's New blog

GPCC FDP Version 7 Gridded Precipitation

atmosphere shows base map monthly sea temperature

The "Data by Source" and "Dataset and Map Room Browser" sections are highlighted with red boxes. The "Latest from our What's New blog" section and the "atmosphere shows base map monthly sea temperature" graphic are also highlighted with red boxes.



HOME PAGE - CONTINUED

The screenshot shows the Climate Data Library homepage with the URL iridl.ideo.columbia.edu in the address bar. The page is divided into several sections:

- Latest from our [What's New](#) blog**:
 - GPCC FDP Version 7 Gridded Precipitation**: A map showing global precipitation patterns for December 2013. The map spans from 30°N to 30°S and 80°E to 170°E. It uses a color scale from blue (low) to red (high). Below the map is the text "Dec 2013".
 - Version 7 of the Global Precipitation Climatology Centre (GPCC) Full Data Product (FDP)**: A detailed description of the dataset, mentioning it was recently added to the IRI Data Library, covers monthly values from January 1901 to December 2013 at three spatial resolutions (0.5°, 1.0°, and 2.5° lat/lon), and includes links to "new version", "global", "precipitation", "monthly", and "dataset". The timestamp "2015-11-04 15:57:42 GMT" is also present.
- Dataset and Map Room Browser**: A section for finding datasets and maps organized by characteristics and keywords. It features a word cloud with terms like "atmosphere", "shows", "base map", "monthly", "temperature", "surface", "standardized", and "averaged".
- Navigating Through the IRI Data Library: A Tutorial**: A section with a goal of introducing users to the library's structure and navigation methods. It includes a small icon of a person pointing right.
- Statistical Techniques in the Data Library: A Tutorial**: A section about statistical tools for analyzing large datasets, with a small icon of a person pointing right.
- Function Index**: A section for functions used to analyze data within the library, featuring icons for addition (+), subtraction (-), multiplication (x), and division (=).
- Help Resources**: A section containing basic and statistics tutorials, function documentation, and other resources to help users.



Structure of the datasets

-primary organization

-dataset

-dataset

-variables

-dataset

-variables

-dataset

-variables

-primary organization

⋮

EXAMPLE: browsing by source

-NASA

- ASDC-DAAC

- variables

- AVHRR-LST

- variables

- ERBE (Earth Radiation Budget Experiment)

- Datasets by instrument

- variables

- GISS

- LeGrande_Schmidt2006 (authors)

- GPCP (Global Precipitation Climatology Project)

- Datasets by version

- Datasets by instrument

- variables

-OTHER SOURCE



FINDING DATASETS

By source

The screenshot shows a web browser window with the following details:

- Title Bar:** dataset: SOURCES
- Address Bar:** iridl.ldeo.columbia.edu/SOURCES/
- Page Header:** Data Library SOURCES, Language: english
- Content Area:**
 - SOURCES:** A large green button.
 - SOURCES:** The main title in bold black text.
 - Documents:** A section heading.
 - overview:** A link to an outline showing sub-datasets of this dataset.
 - Datasets and Variables:** A section heading.
 - Table of Datasets:**

<u>ANEEL</u>	Agência Nacional de Energia Elétrica.
<u>ARCTIC</u>	Oceanic station data for the Arctic Region.
<u>Biosphere</u>	Biosphere 2 Laboratory.
<u>BoM</u>	Australian Bureau of Meteorology.
<u>BRF</u>	Black Rock Forest.
<u>CAC</u>	Climatological, smoothed, and raw sea surface temperature data for the tropical Pacific Ocean from the Climate Analysis Center (now known as the Climate Prediction Center).
<u>CARDONE</u>	ECMWF five day average wind stress; Cardone Level 2B data.
<u>Carton/Giese</u>	CARTON-GIESE[SODA]

FINDING DATASETS

By source

The screenshot shows a web browser window with the following details:

- Title Bar:** dataset: NASA
- Address Bar:** iridl.ideo.columbia.edu/SOURCES/.NASA/
- Header:** Data Library, NASA, Language: english
- Buttons:** Description, Expert Mode
- Text:** served from IRI/LDEO Climate Data Library
- Visual Elements:** SOURCES and NASA buttons
- Section:** **NASA**
- Text:** NASA: National Aeronautics and Space Administration.
- Section:** **Documents**
- Text:** [overview](#) an outline showing sub-datasets of this dataset
- Section:** **Datasets and Variables**
- Table:** A list of datasets and their descriptions:

ASDC-DAAC	Atmospheric Science Data Center Distributed Active Archive Center.
AVHRR-LST	NASA AVHRR-LST[landmask clid Projection lat lon stime LST]
ERBE	Earth Radiation Budget Experiment.
GES-DAAC	GSFC Earth Sciences Distributed Active Archive Center.
GISS	NASA GISS[LeGrande_Schmidt2006 GISSTEMP]
GPCP	Combined satellite-gauge precipitation estimates and error estimates from the Global Precipitation Climatology Project.
GSFC	Goddard Space Flight Center.
ISCCP	International Satellite Cloud Climatology Project.

FINDING DATASETS

Search engine

The screenshot shows a web browser window for the "Climate Data Library" at iridl.ideo.columbia.edu. A red box highlights the "Google™ Custom Search" input field and its search button. The page content includes:

- IRI/LDEO Climate Data Library**: The main title with the IRI logo.
- Introduction**: A paragraph describing the library as a powerful and freely accessible online data repository.
- Capabilities**: A list of features including access to datasets, EOF analyses, map monitoring, visual representations, and data download options.
- Latest from our What's New blog**: A section featuring "GPCC FDP Version 7 Gridded Precipitation" with a map visualization.
- IRI Climate and Society Map Room**: A section with a world map showing climate and societal conditions, followed by a detailed description of the map room's purpose and functionality.
- Data by Source**: A section showing datasets organized by source.
- Data By Category**: A section showing selected datasets for particular topics.
- Dataset and Map Room Browser**: A section for finding datasets and maps organized by characteristics and keywords, accompanied by a word cloud diagram.



FINDING DATASETS

By category

The screenshot shows a web browser window displaying the 'Dataset By Category' page of the Climate Data Library. The URL in the address bar is iridl.ideo.columbia.edu/docfind/databrief/index.html. The page header includes the IRI/LDEO logo, the Climate Data Library logo, and a 'Data Library' link. A 'Language' dropdown menu is set to 'english'. The main content area is titled 'Dataset Category' and contains two sections: 'Dataset Category' and 'Budget'. The 'Dataset Category' section lists several options with checkboxes, including Air Sea Interface, Climate Indices, Cloud Characteristics and Radiation, Atmosphere, Forecasts, Historical Model Simulations, Hydrology, Ice, and Oceanography. The 'Budget' section lists Atmosphere, Forecasts, Historical Model Simulations, Hydrology, Ice, and Oceanography. At the bottom of the page are 'Share' and 'Contact Us' buttons, along with social media sharing icons and a Like button.

Dataset Category

- Air Sea Interface
- Climate Indices
- Cloud Characteristics and Radiation

Budget

- Atmosphere
- Forecasts
- Historical Model Simulations
- Hydrology
- Ice
- Oceanography

Share

Contact Us

IRI

Datasets page content and structure

Source bar:
navigational
information

dataset
information

variables

The screenshot shows a web browser window with the following details:

- Source bar:** A horizontal navigation bar at the top of the page. It includes tabs for "Description", "Documentation", "Views", "Data Selection", "Data Files", "Data Tables", and "Expert Mode". Below these tabs is a breadcrumb navigation path: SOURCES → WCRP → GCOS → GPCC → FDP → version7. The "version7" link is highlighted with a red border.
- Main Title:** "WCRP GCOS GPCC FDP version7"
- Dataset Information:** A brief description: "GCOS GPCC FDP version7 from WCRP: World Climate Research Programme."
- Documents:** A list of links:
 - [overview](#): an outline showing sub-datasets of this dataset
 - [data](#): GPCC Full Data Reanalysis Version 7.0
 - [description](#): GPCC Full Data Reanalysis ftp site
 - [data source](#): A description of the global land-surface precipitation data products of the Global Precipitation Climatology Centre with sample applications including centennial (trend) analysis from 1901–present
 - [dataset reference](#)
- Datasets and Variables:** A list of links:
 - [0p5 WCRP GCOS GPCC FDP version7 0p5\[prcp cnts \]](#)
 - [1p0 WCRP GCOS GPCC FDP version7 1p0\[prcp cnts \]](#)
 - [2p5 WCRP GCOS GPCC FDP version7 2p5\[prcp cnts \]](#)
- Independent Variables (Grids):** A note about the time grid: "Time (time) grid: /T (months since 1960-01-01) ordered (Jan 1901) to (Dec 2013) by 1.0 N= 1356 pts :grid"

Datasets page content and structure

The screenshot shows a web browser window displaying a dataset page. The URL in the address bar is iridl.ldeo.columbia.edu/SOURCES/WCRP/GCOS/GPCC/FDP/version7/0p5/. The page title is "dataset: WCRP GCOS GPCC FDP version7 0p5". The IRI logo is in the top left, and a "Language" dropdown set to "english" is in the top right. A navigation bar at the top includes tabs for "Description" (which is active), "Documentation", "Views", "Data Selection", "Data Files", "Data Tables", and "Expert Mode". Below the navigation bar, a breadcrumb trail shows the dataset path: SOURCES → WCRP → GCOS → GPCC → FDP → version7 → 0p5. The "0p5" link is highlighted with a red box. The main content area is titled "WCRP GCOS GPCC FDP version7 0p5" and describes it as "GCOS GPCC FDP version7 0p5 from WCRP: World Climate Research Programme." A "Documents" section links to "outline" and "data description". The "Datasets and Variables" section lists "Number of gauges per grid" and "Total Precipitation". The "Independent Variables (Grids)" section lists "Time (time)", "Longitude (longitude)", and "Latitude (latitude)". A vertical red bracket on the left side of the screenshot is labeled "secondary variables".

secondary variables

dataset: WCRP GCOS GPCC FDP version7 0p5

Data Library

Language
english

SOURCES → WCRP → GCOS → GPCC → FDP → version7 → 0p5

0p5

WCRP GCOS GPCC FDP version7 0p5

GCOS GPCC FDP version7 0p5 from WCRP: World Climate Research Programme.

Documents

[outline](#) an outline showing all sub-datasets and variables contained in this dataset
[data description](#) GPCC Full Data Reanalysis Version 7.0 at 0.5 deg.

Datasets and Variables

[Number of gauges per grid](#) WCRP GCOS GPCC FDP version7 0p5 cnts[X Y | T]
[Total Precipitation](#) WCRP GCOS GPCC FDP version7 0p5 prcp[X Y | T]

Independent Variables (Grids)

Time (time) grid: /T (months since 1960-01-01) ordered (Jan 1901) to (Dec 2013) by 1.0 N= 1356 pts :grid
Longitude (longitude) grid: /X (degree_east) periodic (179.75W) to (179.75E) by 0.5 N= 720 pts :grid
Latitude (latitude) grid: /Y (degree_north) ordered (89.75N) to (89.75S) by 0.5 N= 360 pts :grid

Datasets page content and structure

Spatial and temporal domains

Grid information

WCRP GCOS GPCC FDP version7 0p5 prcp: Total Precipitation data

GCOS GPCC FDP version7 0p5 Total Precipitation from WCRP: World Climate Research Programme.

Independent Variables (Grids)

Time (time)
grid: /T (months since 1960-01-01) ordered (Jan 1901) to (Dec 2013) by 1.0 N= 1356 pts :grid

Longitude (longitude)
grid: /X (degree_east) periodic (179.75W) to (179.75E) by 0.5 N= 720 pts :grid

Latitude (latitude)
grid: /Y (degree_north) ordered (89.75N) to (89.75S) by 0.5 N= 360 pts :grid

Other Info

code
18

datatype
realarraytype

missing_value
-99999.992

standard_name

Grids (Independent Variables)

- Information about grids on which data is dependent
- Latitude (Y)
- Longitude (X)
- Time (T)
- Others (height/depth, ensemble member, etc.)



Datasets page content and structure

Functions tab

- documentation
- manipulation
- visualization
- download

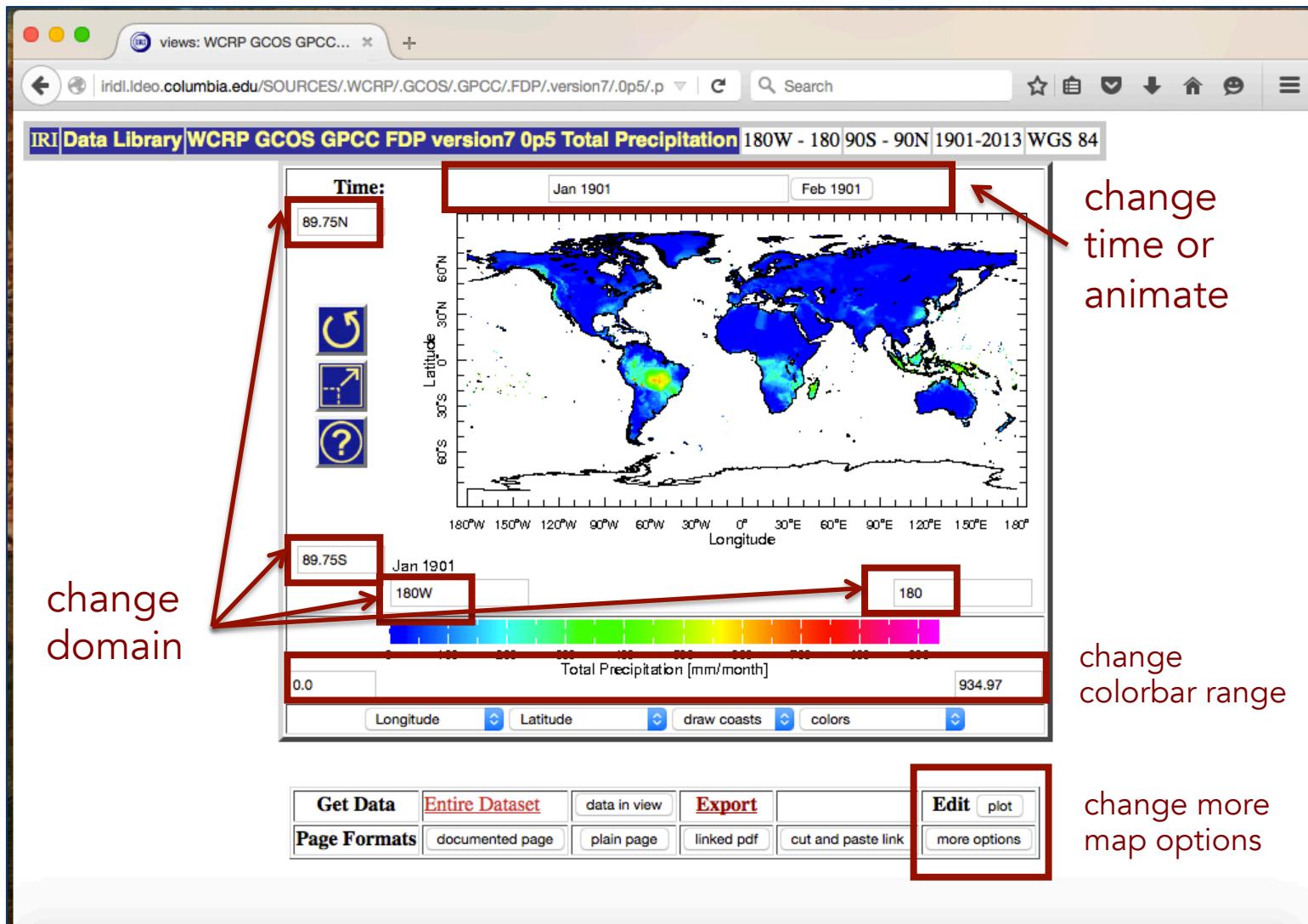
The screenshot shows a web browser window with the URL iridl.ideo.columbia.edu/SOURCES/.WCRP/.GCOS/.GPCC/.FDP/.version7/.0p5/.prcp. The page title is "data: WCRP GCOS GPCC ...". The top navigation bar includes the IRI logo, a search bar, and language selection (english). Below the header, there are several input fields for spatial and temporal coordinates: X (180W - 180), Y (90S - 90N), and T (1901-2013). A red box highlights the "Description" tab in the navigation menu, which also includes Documentation, Views, Data Filters, Data Selection, Data Files, Data Tables, and Expert Mode. The page content starts with a breadcrumb trail: SOURCES > WCRP > GCOS > GPCC > FDP > version7 > 0p5 > prcp. The main title is "WCRP GCOS GPCC FDP version7 0p5 prcp: Total Precipitation data". A descriptive text follows: "GCOS GPCC FDP version7 0p5 Total Precipitation from WCRP: World Climate Research Programme." The "Independent Variables (Grids)" section details the time grid (1356 points from Jan 1901 to Dec 2013), longitude grid (720 points from 179.75W to 179.75E), and latitude grid (360 points from 89.75N to 89.75S). The "Other Info" section lists dataset metadata: code (18), datatype (realarraytype), missing_value (-99999.992), and standard_name.

Visualizing data

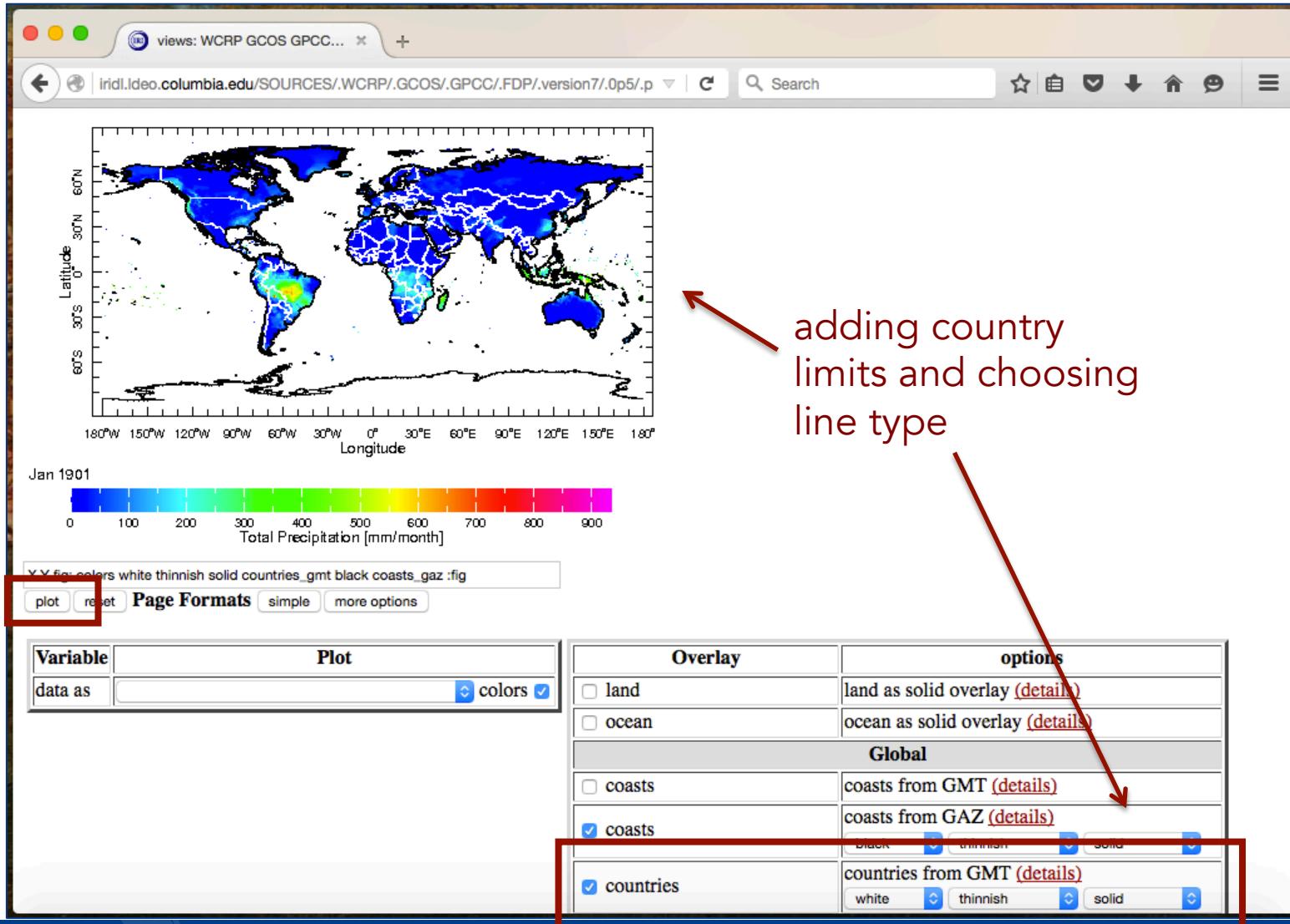
The screenshot shows a web browser window for the IRI Data Library. The URL in the address bar is iridl.ideo.columbia.edu/SOURCES/.WCRP/.GCOS/.GPCC/.FDP/.version7/.0p5/.prcp/figviewer.html?map.url=X+Y+fig+-+contours+land+-+fig. The page displays dataset metadata: WCRP GCOS GPCC FDP version7 0p5 prcp, X: 180W - 180, Y: 90S - 90N, T: 1901-2013, and Language: english. A red box highlights the "Views" tab in the navigation bar. Below the navigation bar, a section titled "Data Views" contains five options: "NEW Views" (highlighted with a red box), "data as colors", "data as contours", "colors with land", "contours with land", and "colors with coasts" (highlighted with a red circle). A red arrow points from the text "Options will depend on the grid of the dataset" to the "data as colors" button. The bottom of the page includes social sharing icons (Twitter, LinkedIn, Email, Facebook Like, Google+1) and a "Recommend this on Google" button.

Options will depend on the grid of the dataset

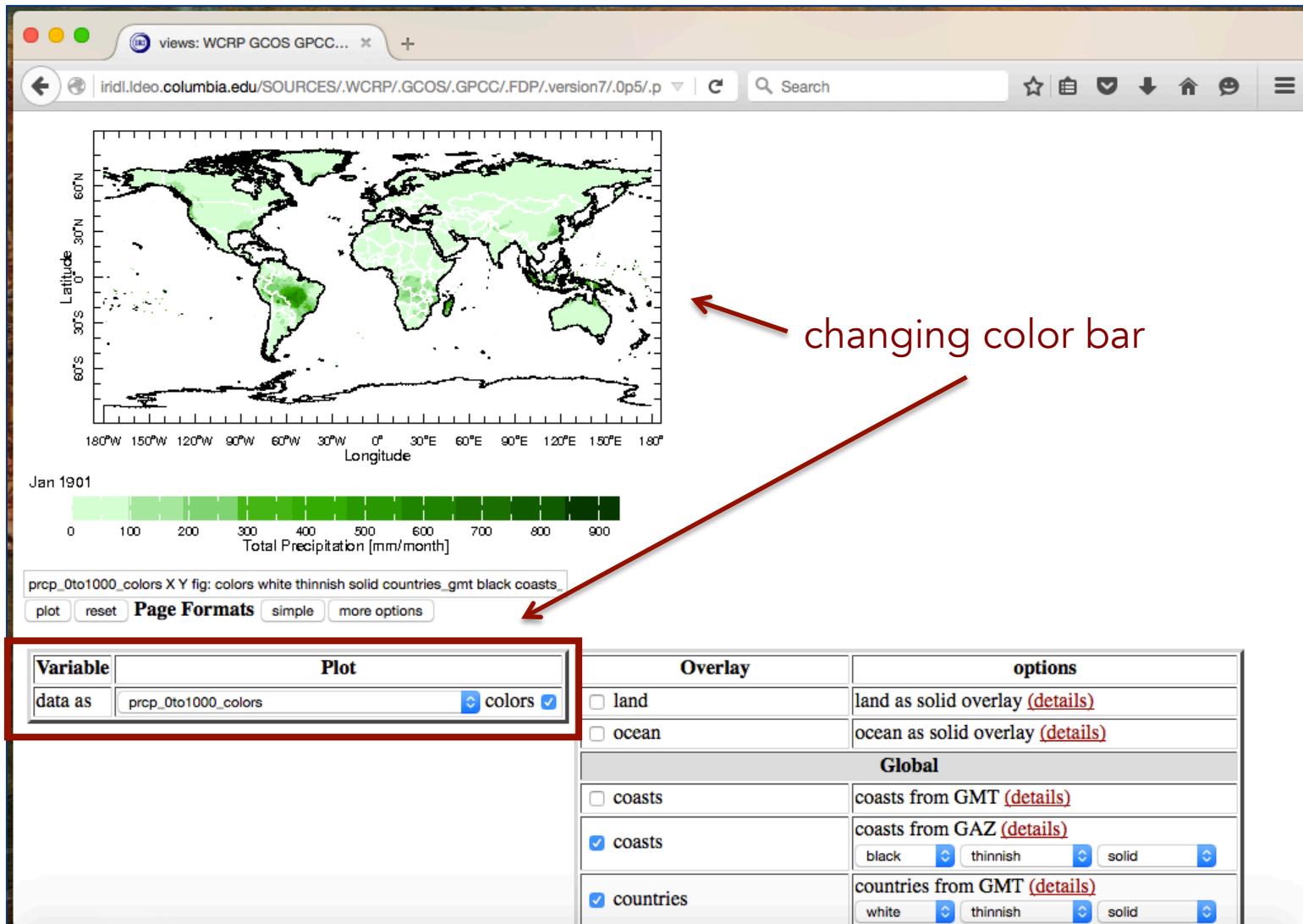
Visualizing data



Visualizing data



Visualizing data



Data selection interface

The screenshot shows a web browser window for the IRI Data Library. The URL is iridl.ideo.columbia.edu/SOURCES/.WCRP/.GCOS/.GPCC/.FDP/.version7/.0p5/prcp. The top navigation bar includes tabs for Description, Documentation, Views, Data Filters, **Data Selection**, Data Files, Data Tables, and Expert Mode. The Data Selection tab is highlighted with a red box. On the right, there is a Language dropdown set to English. Below the tabs, the main content area is titled "Data Selection". It contains two sections: one for interactive data picking and one for setting ranges.

Data Selection

You can interactively pick out the data you would like with the [Data Viewer](#).

You can reduce the amount of data by restricting the range of the grids.

The current settings for the grids are

- grid: /X (degree_east) periodic (179.75W) to (179.75E) by 0.5 N= 720 pts :grid
- grid: /Y (degree_north) ordered (89.75N) to (89.75S) by 0.5 N= 360 pts :grid
- grid: /T (months since 1960-01-01) ordered (Jan 1901) to (Dec 2013) by 1.0 N= 1356 pts :grid

If this is what you want, choose [Stop Selecting](#)

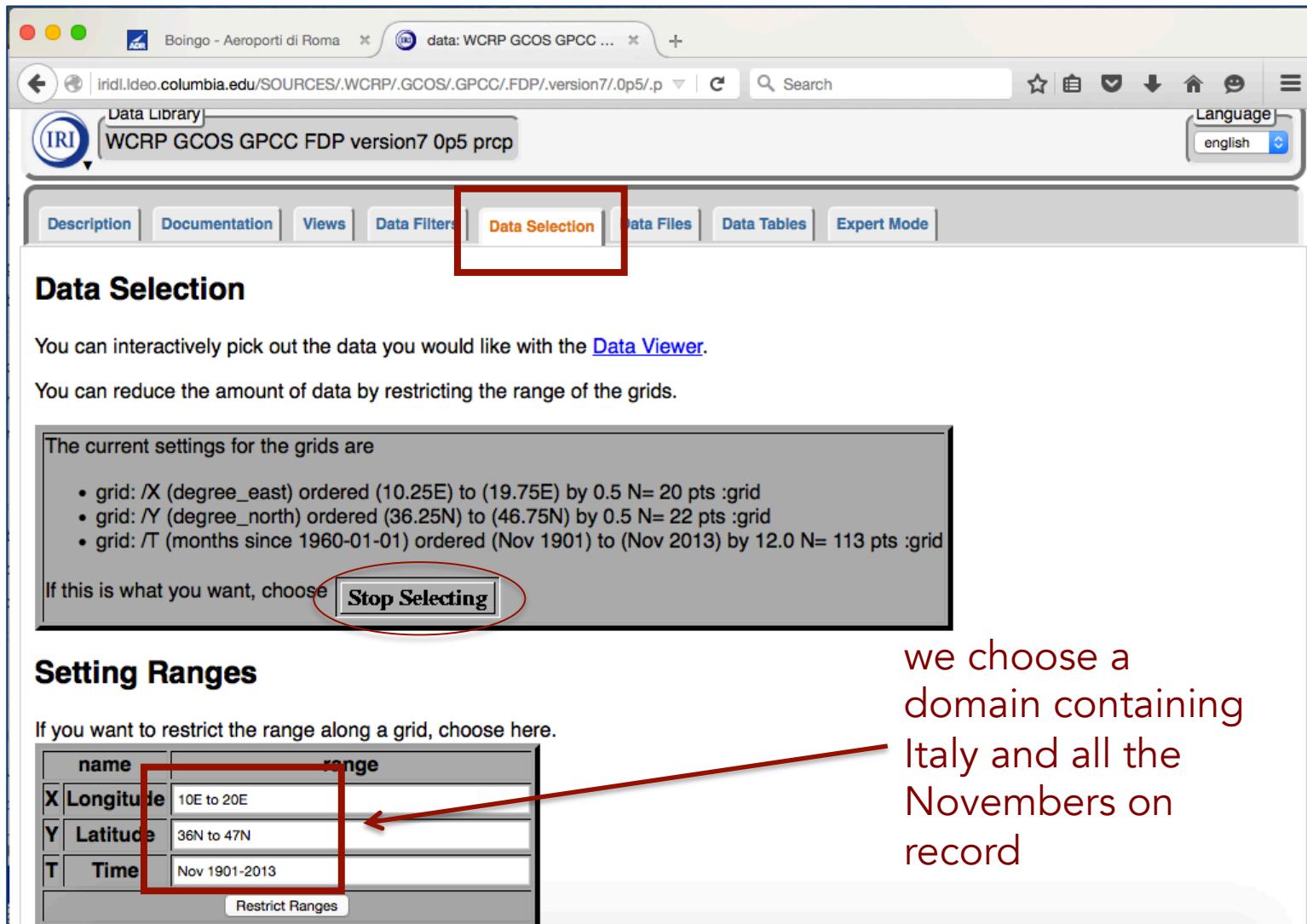
Setting Ranges

If you want to restrict the range along a grid, choose here.

name	range
X Longitude	179.75W to 179.75E
Y Latitude	89.75N to 89.75S
T Time	Jan 1901 to Dec 2013

[Restrict Ranges](#)

Data selection interface



The screenshot shows a web browser window for the IRI Data Library. The URL is iridl.ideo.columbia.edu/SOURCES/.WCRP/.GCOS/.GPCC/.FDP/.version7/.0p5/prcp. The page title is "Boingo - Aeroporti di Roma" and the tab title is "data: WCRP GCOS GPCC ...". The main content area has a red box around the "Data Selection" tab. Below it, under "Data Selection", there is text about picking data interactively with a Data Viewer and reducing data by restricting grid ranges. A list of current grid settings is provided, and a "Stop Selecting" button is circled with a red oval. A red arrow points from the "Stop Selecting" button to a table below titled "Setting Ranges".

The current settings for the grids are

- grid: /X (degree_east) ordered (10.25E) to (19.75E) by 0.5 N= 20 pts :grid
- grid: /Y (degree_north) ordered (36.25N) to (46.75N) by 0.5 N= 22 pts :grid
- grid: /T (months since 1960-01-01) ordered (Nov 1901) to (Nov 2013) by 12.0 N= 113 pts :grid

If this is what you want, choose **Stop Selecting**

Setting Ranges

If you want to restrict the range along a grid, choose here.

name	range
X Longitude	10E to 20E
Y Latitude	36N to 47N
T Time	Nov 1901-2013

we choose a domain containing Italy and all the Novembers on record



Data selection interface

Boingo - Aeroporti di Roma data: WCRP GCOS GPCC ... +

iri.idealibrary.org/SOURCES/WCRP/GCOS/GPCC/FDP/version7/.0p5/p

Search

Data Library WCRP GCOS GPCC FDP version7 0p5 prcp X] 10E - 20E Y] 36N - 47N T] Nov 1901 - Nov 2013 Language) english

Description Documentation Views Data Filters Data Selection Data Files Data Tables Expert Mode

served from IRI/LDEO Climate Data Library

WCRP GCOS GPCC FDP version7 0p5 prcp: Total Precipitation data

GCOS GPCC FDP version7 0p5 prcp prcp prcp prcp Total Precipitation from WCRP: World Climate Research Programme.

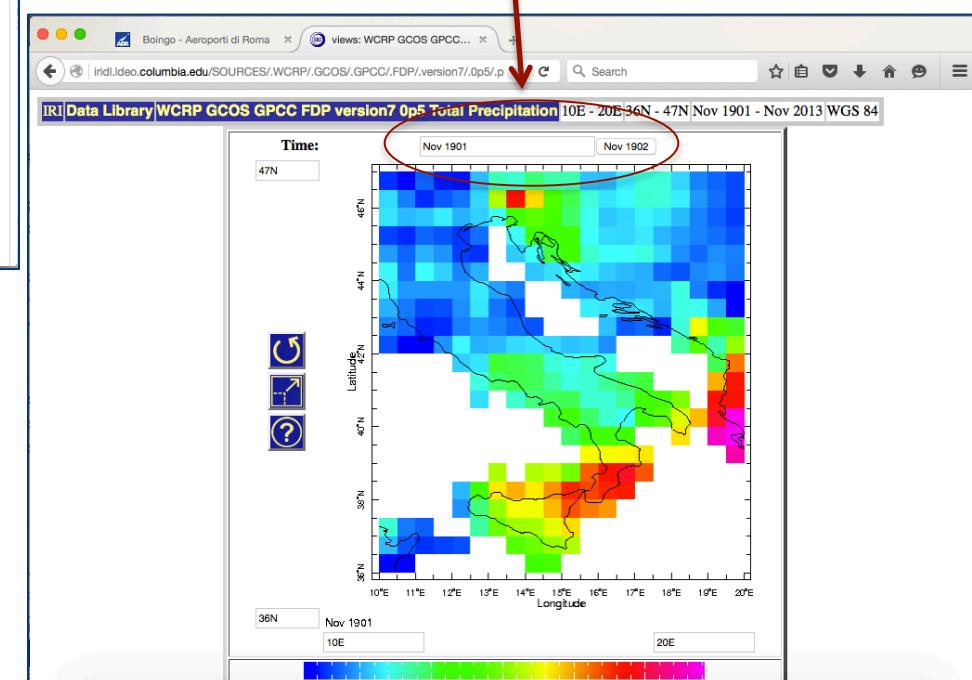
Independent Variables (Grids)

Time (time)
grid: /T (months since 1960-01-01) ordered (Nov 1901) to (Nov 2013) by 12.0 N= 113 pts :grid
Longitude (longitude)
grid: /X (degree_east) ordered (10.25E) to (19.75E) by 0.5 N= 20 pts :grid
Latitude (latitude)
grid: /Y (degree_north) ordered (36.25N) to (46.75N) by 0.5 N= 22 pts :grid

Other Info

code 18
datatype

We can loop through the November fields



Data selection seen in expert mode

Ingrid is the programming language used by the Data Library, which can be introduced and edited in the DL Expert Mode

The screenshot shows the IRI Data Library interface in Expert Mode. At the top, there are two tabs: "data: mean [WCRP GCOS ...]" and "data: UCSB CHIRPS v2p0 ...". The URL in the address bar is "iridl.ideo.columbia.edu/SOURCES/.WCRP/.GCOS/.GPCC/.FDP/.version7/.0p5/.prcp". The main header includes the IRI logo, a search bar, and a language dropdown set to "english". Below the header, there are four input fields: "mean [WCRP GCOS GPCC FDP version7 0p5 prcp]", "X 10E - 20E", "Y 36N - 47N", and a "Language" dropdown. A navigation bar below these fields includes "Description", "Documentation", "Views", "Data Filters", "Data Selection", "Data Files", "Data Tables", and "Expert Mode" (which is highlighted). The "Data Selection" tab is active, showing the Ingrid code: `mean [WCRP GCOS GPCC FDP version7 0p5 prcp][X Y] M M`. Below the code, the "SOURCES .WCRP .GCOS .GPCC .FDP .version7 .0p5 .prcp" line is followed by time and spatial domain specifications: `T (Nov 1901-2013) VALUES`, `Y (36N) (47N) RANGEEDGES`, and `X (10E) (20E) RANGEEDGES`. Two red arrows point from the text "time selection" to the "T" and "Y" lines in the Ingrid code, and another red arrow points from the text "spatial domain selection" to the "X" and "Y" lines. At the bottom of the interface are "OK" and "reset" buttons, a "Share" button with social media icons, a "Contact Us" button, and the IRI logo.

Data filters

Boingo - Aeroporti di Roma data: WCRP GCOS GPCC ... iridl.ideo.columbia.edu/SOURCES/.WCRP/.GCOS/.GPCC/.FDP/.version7/.0p5.p Search Language english

Data Library X 10E - 20E Y 36N - 47N T Nov 1901 - Nov 2013

Description Documentation Views Data Filters Data Selection Data Files Data Tables Expert Mode

Filters

Here are some filters that are useful for manipulating data. There are actually many more available, but they have to be entered manually. See [Ingrid Function Documentation](#) for more information.

- [Monthly Climatology](#) calculates a monthly climatology by averaging over all years.
- [anomalies](#) calculates the difference between the (above) monthly climatology and the original data.
- Integrate along [XYT](#)
- Differentiate along [XYT](#)
- Take differences along [XYT](#)

Average over [XYT|XYXTYT|XYT|](#)

RMS (root mean square with mean *not* removed) over [XYT|XYXTYT|XYT|](#)

RMSA (root mean square with mean removed) over [XYT|XYXTYT|XYT|](#)

Maximum over [XYT|XYXTYT|XYT|](#)

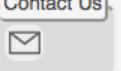
Minimum over [XYT|XYXTYT|XYT|](#)

Detrend (best-fit-line) over [XYT|XYXTYT|XYT|](#)

Convert units from **mm/month** to Convert

we choose to average over time

Note on units

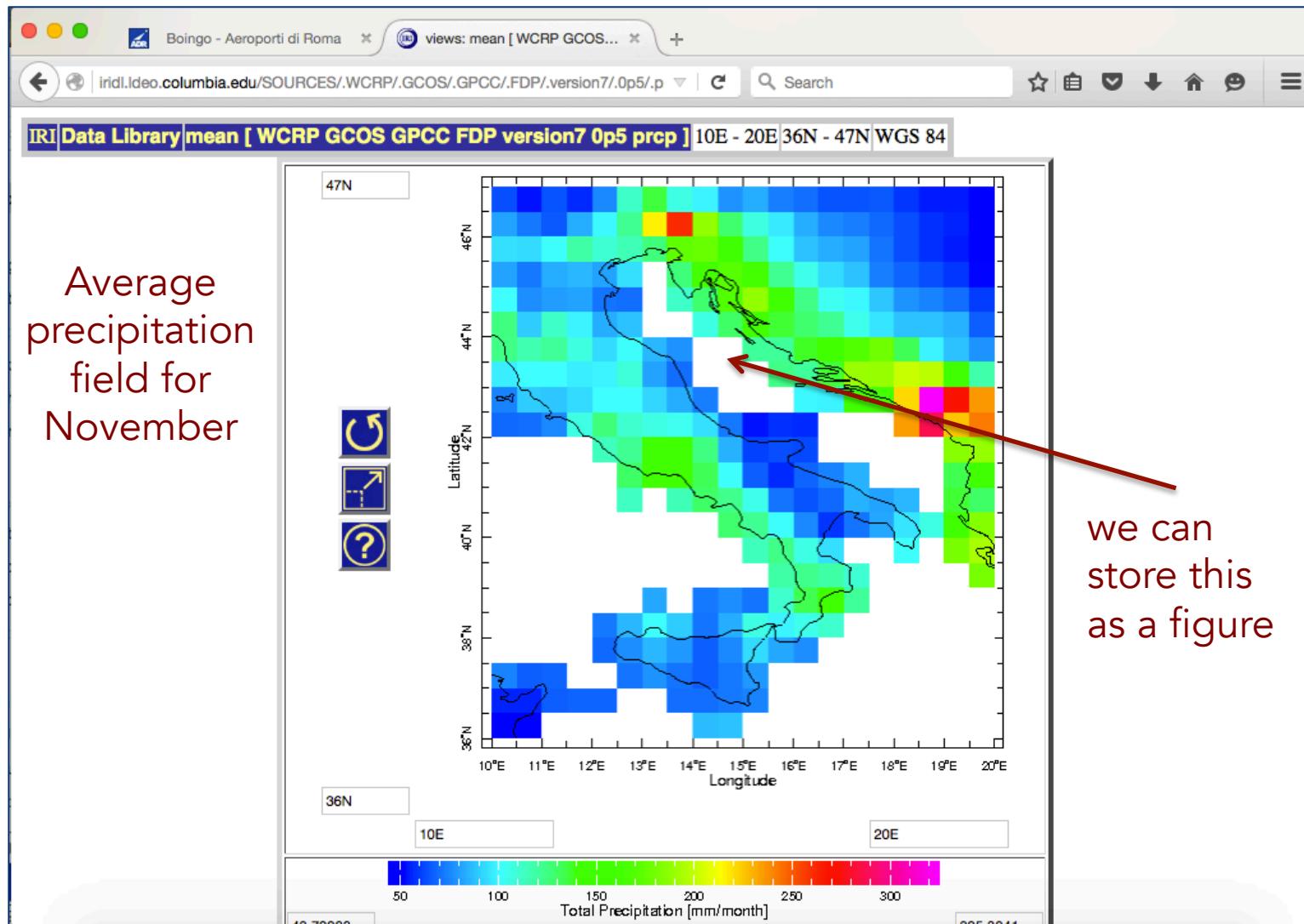
Share  Contact Us 

IRI

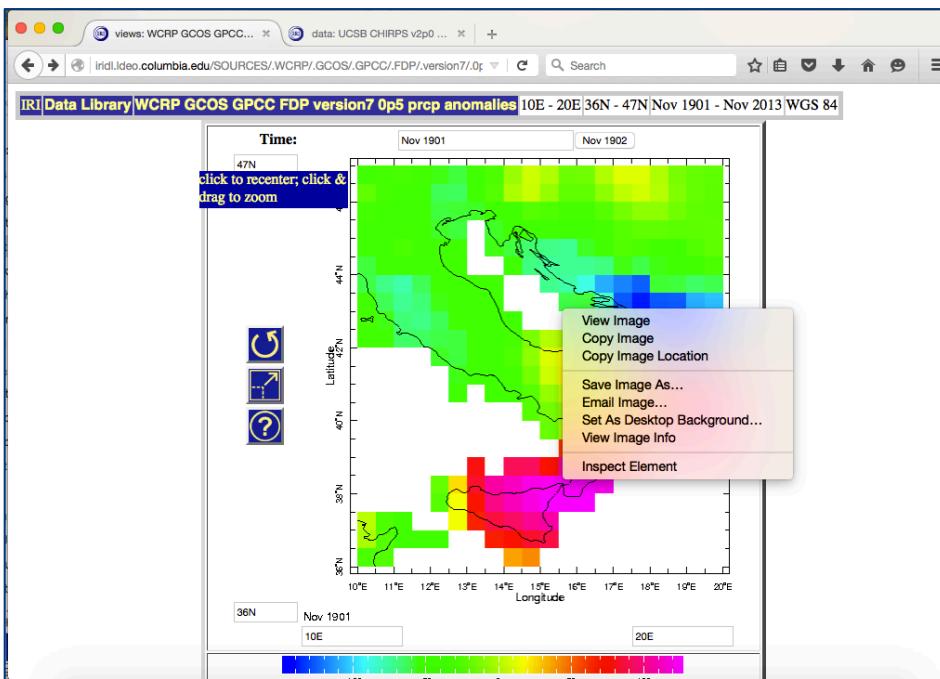
we choose to average over time



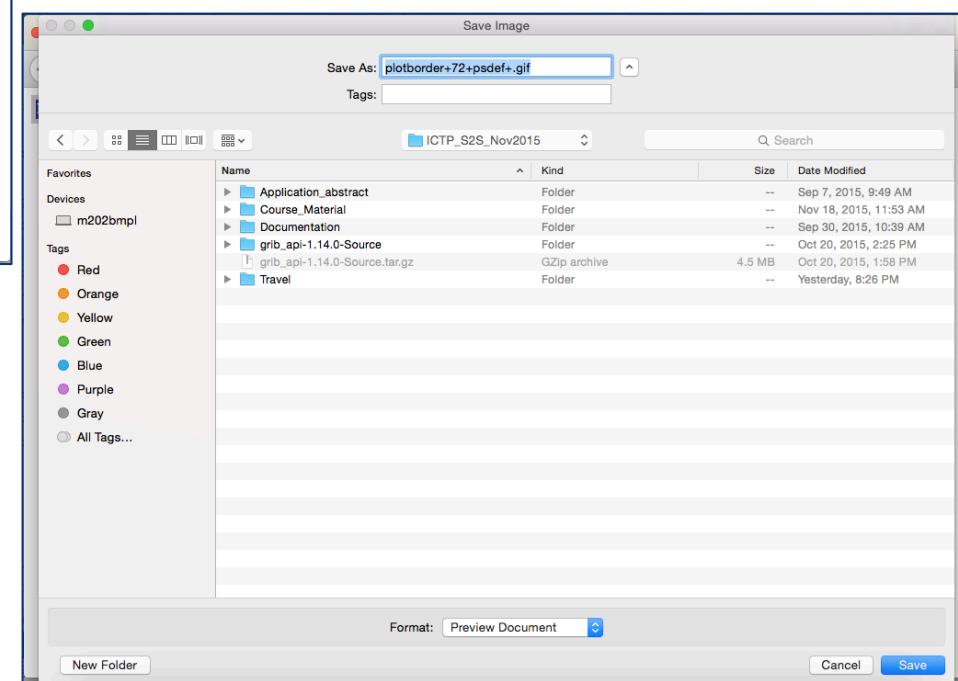
Data filters



Saving figures



NOTE:
the colorbar needs
to be stored
independently



Data filters

data: mean [WCRP GCOS GPCC FDP version7 0p5 prcp] X 10E - 20E Y 36N - 47N Language english

Description Documentation Views Data Filters Data Selection Data Files Data Tables Expert Mode

X Y

mean [WCRP GCOS GPCC FDP version7 0p5 prcp][X Y] M M

```
SOURCES .WCRP .GCOS .GPCC .FDP .version7 .0p5 .prcp
T (Nov 1901–2013) VALUES
Y (36N) (47N) RANGEEDGES
X (10E) (20E) RANGEEDGES
[T ]average
```

temporal average
in the Expert Mode

OK reset Share Contact Us IRI

Data filters: averaging over space instead ...

The screenshot shows the IRI Data Library interface for the WCRP GCOS GPCC FDP version7 0p5 prcp dataset. The top navigation bar includes the IRI logo, a search bar, and various filter options for X (10E - 20E), Y (36N - 47N), and T (Nov 1901 - Nov 2013). Below the navigation bar is a menu bar with tabs: Description, Documentation, Views, Data Filters (highlighted in orange), Data Selection, Data Files, Data Tables, and Expert Mode. The main content area is titled "Filters" and contains a list of useful filters. A red arrow points from the text "to average over the two spatial dimensions" to the "Average over XYTI" link.

Filters

Here are some filters that are useful for manipulating data. There are actually many more available, but they have to be entered manually. See [Ingrid Function Documentation](#) for more information.

- [Monthly Climatology](#) calculates a monthly climatology by averaging over all years.
- [anomalies](#) calculates the difference between the (above) monthly climatology and the original data.
- Integrate along [XYT](#)
- Differentiate along [XYT](#)
- Take differences along [XYT](#)

Average over [XYTI](#) | [XYXTYTI](#) | [XYTI](#)

RMS (root mean square with mean *not* removed) over [XYTI](#) | [XYXTYTI](#) | [XYTI](#)

RMSA (root mean square with mean removed) over [XYTI](#) | [XYXTYTI](#) | [XYTI](#)

Maximum over [XYTI](#) | [XYXTYTI](#) | [XYTI](#)

Minimum over [XYTI](#) | [XYXTYTI](#) | [XYTI](#)

Detrend (best-fit-line) over [XYTI](#) | [XYXTYTI](#) | [XYTI](#)

Convert units from **mm/month** to [Convert](#)

[Note on units](#)

Share: [Like](#) 0 [G+](#) Consiglialo su Google

Contact Us:

to average over
the two spatial
dimensions

Data filters: averaging over space instead ...

Screenshot of the IRI Data Library interface showing the search results for "mean [WCRP GCOS GPCC FDP version7 0p5 prcp]".

The search results show the following parameters:

- mean [WCRP GCOS GPCC FDP version7 0p5 prcp]
- Nov 1901 - Nov 2013
- Language: english
- Description, Documentation, Views, Data Filters, Data Selection, Data Files, Data Tables, Expert Mode tabs
- Link: served from IRI/LDEO Climate Data Library
- Filter buttons: GCOS, GPCC, FDP, version7, 0p5, prcp, T (Nov 1901-2013) VALUES, Y (36N) (47N) RANGEEDGES, X (10E) (20E) RANGEEDGES, [X Y] average

mean [WCRP GCOS GPCC FDP version7 0p5 prcp]: Total Precipitation data

GCOS GPCC FDP version7 0p5 prcp prcp prcp prcp prcp prcp Total Precipitation from WCRP: World Climate Research Programme.

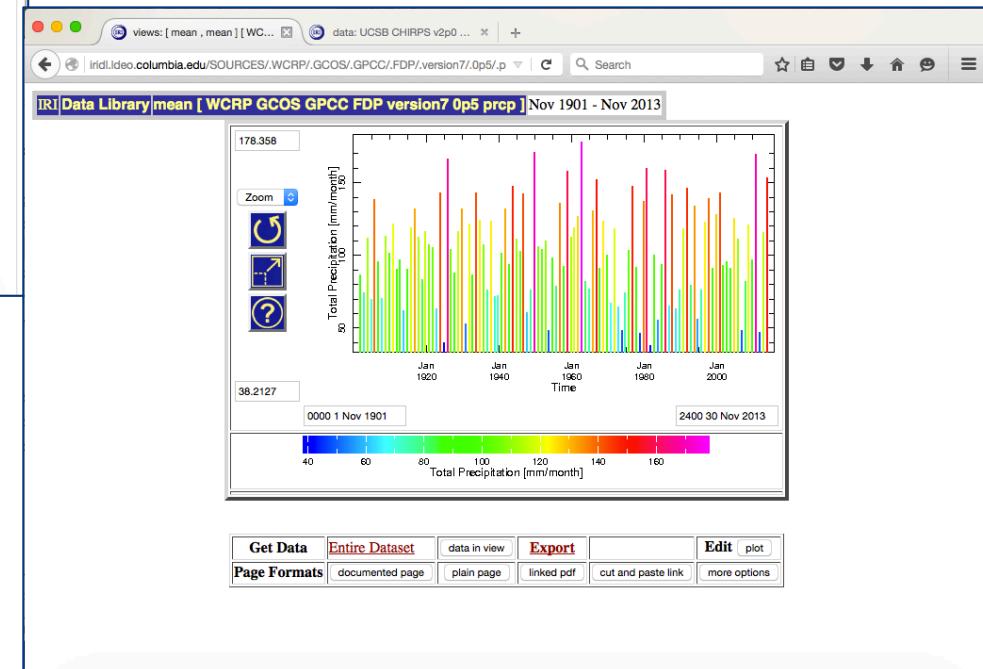
Independent Variables (Grids)

Time (time)
grid: /T (months since 1960-01-01) ordered (Nov 1901) to (Nov 2013) by 12.0 N= 113 pts :grid

Other Info

bufferworsize 8
CE null
code

temporal evolution



Data filters: anomalies

Filters

Here are some filters that are useful for manipulating data. There are actually many more available, but they have to be entered manually. See [Ingrid Function Documentation](#) for more information.

- **Monthly Climatology** calculates a monthly climatology by averaging over all years.
- **anomalies** calculates the difference between the (above) monthly climatology and the original data.
- Integrate along T
- Differentiate along T
- Take differences along T

Average over T
RMS (root mean square with mean *not* removed) over T
RMSA (root mean square with mean removed) over T
Maximum over T
Minimum over T
Detrend (best-fit-line) over T
Convert units from mm/month to Convert

Note on units

Share Contact Us

```
iridl.ideo.columbia.edu/SOURCES/WCRP/GCOS/GPCC/FDP/version7.0p5/prcp/T/(Nov 1901--UES/Y/(36N)/(47N)/RANGEEDGES/X/(10E)/(20E)/RANGEEDGES/[X+Y+]average/yearly-climatology/
```

Description | Documentation | Views | **Data Filters** | Data Selection | Data Files | Data Tables | Expert Mode

mean [WCRP GCOS GPCC FDP version7 0p5 prcp anomalies] Nov 1901 - Nov 2013

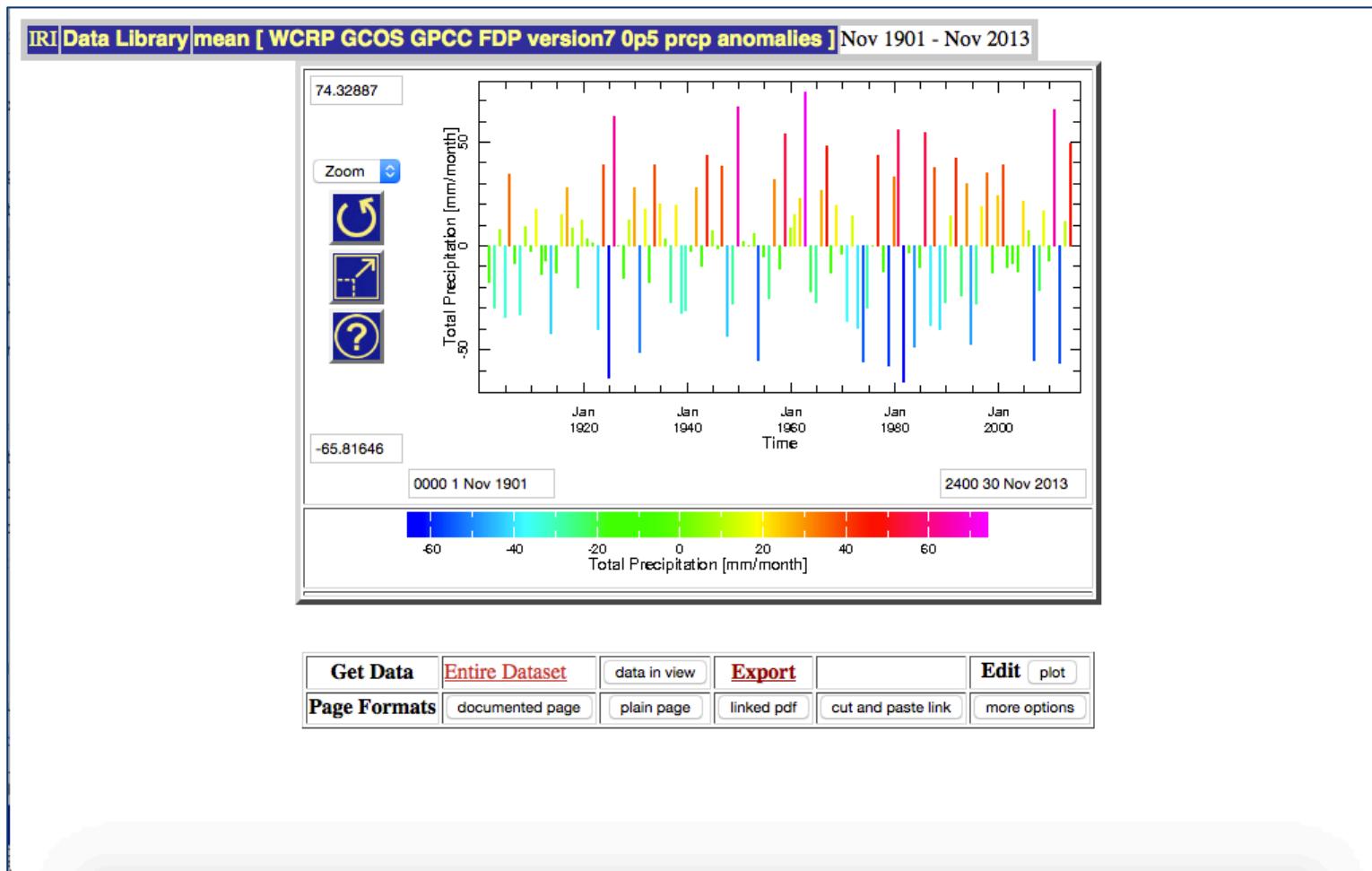
Language: english

```
SOURCES .WCRP .GCOS .GPCC .FDP .version7 .0p5 .prcp
yearly-anomalies
T (Nov 1901-2013) VALUES
Y (36N) (47N) RANGEEDGES
X (10E) (20E) RANGEEDGES
[X Y]average
```

OK | reset | Share Contact Us



Data filters: anomalies



Data files: downloading options

The screenshot shows a web browser window for the IRI Data Library. The URL in the address bar is iridl.ideo.columbia.edu/SOURCES/.WCRP/.GCOS/.GPCC/.FDP/.version7/.0p5/.prcp. The page title is "data: WCRP GCOS GPCC ...". The main content area displays the following information:

Data Library
WCRP GCOS GPCC FDP version7 0p5 prcp
X 180W - 180 Y 90S - 90N T 1901-2013
Language: english

Navigation tabs: Description, Documentation, Views, Data Filters, Data Selection, **Data Files**, Data Tables, Expert Mode. The "Data Files" tab is highlighted with a red box.

Served from [IRI/LDEO Climate Data Library](#).

Category links: SOURCES, WCRP, GCOS, GPCC, FDP, version7, 0p5, prcp.

WCRP GCOS GPCC FDP version7 0p5 prcp: Total Precipitation data

GCOS GPCC FDP version7 0p5 Total Precipitation from WCRP: World Climate Research Programme.

Independent Variables (Grids)

Time (time)
grid: /T (months since 1960-01-01) ordered (Jan 1901) to (Dec 2013) by 1.0 N= 1356 pts :grid

Longitude (longitude)
grid: /X (degree_east) periodic (179.75W) to (179.75E) by 0.5 N= 720 pts :grid

Latitude (latitude)
grid: /Y (degree_north) ordered (89.75N) to (89.75S) by 0.5 N= 360 pts :grid

Other Info

code
18
datatype
realarraytype
missing_value
-99999.992
standard_name

Trash

Data files: downloading options

The screenshot shows the IRI Data Library interface. At the top, there's a header with the IRI logo, a search bar, and a language selection dropdown set to "english". Below the header, a navigation bar includes links for "Data Library", "WCRP GCOS GPCC FDP version7 0p5 prcp", "X: 180W - 180", "Y: 90S - 90N", and "T: 1901-2013". The main content area is titled "WCRP GCOS GPCC FDP version7 0p5 prcp Data Files". It displays a message about the dataset size: "This dataset has bytes (1.4059008E09 **1.3093472GB**) of data in it, which should give you a rough idea of the size of any file that you ask for." Below this, a section titled "Download Data To Specific Software" lists various software packages and their descriptions:

- ingrid**: The Postscript-based software on which the Data Library is built.
- CPT**: Climate Predictability Tool [More information](#)
- ferret**: Interactive computer visualization and analysis software. [More information](#)
- GrADS**: Grid Analysis and Display System [More information](#)
- matlab**: Data analysis and visualization software. [More information](#)
- NCL**: NCAR Command Language [More information](#)
- WinDisp**: A public domain software package for the display and analysis of satellite images, maps and associated databases, with an emphasis on early warning for food security. [More information](#)

Below this, another section titled "Other Available File Formats" contains a "Full Information Formats" table:

Full Information Formats	
These files contain all of the available metadata.	
OPeNDAP	A system which downloads data directly to software, such as matlab, Ferret, GrADS, etc. Specific instructions are available in the table above. Note: OPeNDAP was formerly known as DODS (Distributed Oceanographic Data System). More Information

There are several formats available and compatibility with different analysis packages to input data directly

The screenshot shows the "Other Available File Formats" section of the IRI Data Library. It includes three main categories: "Full Information Formats", "Partial Information Formats", and "GIS-Compatible Formats".

Full Information Formats: These files contain all of the available metadata.

OPeNDAP	A system which downloads data directly to software, such as matlab, Ferret, GrADS, etc. Specific instructions are available in the table above. Note: OPeNDAP was formerly known as DODS (Distributed Oceanographic Data System). More Information
netCDF (network Common Data Form)	A commonly supported self-describing data format. More Information

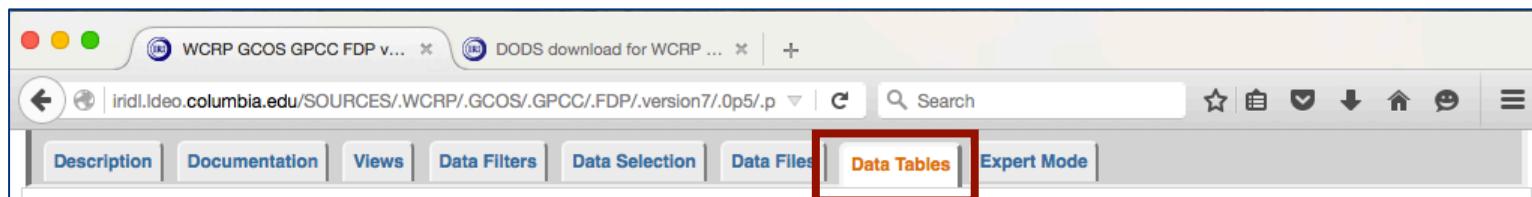
Partial Information Formats: These files contain only some of the available metadata.

Columnar Table	A table with separate columns of numbers for each independent variable (i.e., grids) and for the data. This is an inefficient format, so you would have gotten a HUGE file for dataset of this size. This file will be approximately 1328635904 bytes, with 4 columns of 351475200 numbers.
2-Dimensional Tab-Separated Tables	Tab-separated-values (tsv) file with information about the independent variables (i.e., grids). The list to the left allows you to specify the format of the table. Note: The variable running across the top of the table (identifying columns) is listed first and the variable running down the side of the table (identifying rows) is listed second.
Y X Table	
X Y Table	

GIS-Compatible Formats: There are three GIS-compatible formats available.

2-Dimensional Table	A 2-dimensional ascii file that includes an ArcInfo Header.
IDA Image	File(s) in the Image Display and Analysis format. Typically used with WinDisp.
LAN Image	File(s) in the ERDAS LAN format. Typically used with various GIS programs, including ArcView and HealthMapper.
GeoTIFF Image	File in GeoTIFF format. Typically used with various GIS programs, including ArcView and ENVI.

Data files: downloading options



The screenshot shows a web browser window with the following details:

- Address Bar:** iridl.ideo.columbia.edu/SOURCES/.WCRP/.GCOS/.GPCC/.FDP/.version7/.0p5/.p
- Navigation Bar:** Description, Documentation, Views, Data Filters, Data Selection, Data Files, **Data Tables** (highlighted with a red box), Expert Mode.
- Main Content:**
 - Section Title:** WCRP GCOS GPCC FDP version7 0p5 Total Precipitation Data Tables
 - Section:** Rectangular array of data
 - The following list lets you specify the top and side grids of the table.
 - [Y X Table](#)
 - [T X Table](#)
 - [X Y Table](#)
 - [T Y Table](#)
 - [X T Table](#)
 - [Y T Table](#)
 - Section:** 2D Tab-Separated Tables
 - The above table is also available as a tab-separated-values file. The following list lets you specify the top and side grids of the table.
 - [Y X Table](#)
 - [T X Table](#)
 - [X Y Table](#)
 - [T Y Table](#)
 - [X T Table](#)
 - [Y T Table](#)
 - Section:** Columnar Tables

Ingrid functions index

The screenshot shows a web browser window with the URL iridl.ideo.columbia.edu/dochelp/Documentation/funcindex.html. The page title is "Function Index". The left sidebar has a "Functions" menu item selected. The main content area displays a list of Ingrid functions categorized by letter.

A	abrat abs absolute value: abs acosd add add_variable addGRID addGRIDlast anomaly: yearly-anomalies Arithmetic Functions: abs add differences div eexp ln log mag mod mul RESCALE sqrt sqrtsgn sub sum asind atan2 atan2d atand Average: average boxAverage	
G	geometryintersects geometrylength geometryoverlaps geometrysimplify geometrytouches geometryunion geometrywithin georect ginverse GRID Grid Modification: GRID regridAverage removeGRID renameGRID replaceGRID SAMPLE_MISSING shiftdata shiftdatashort shiftGRID splitstreamgrid unsplithstreamgrid zeropointwidth gridtomatch gridtomatchnamed groupgrid	
H	hbrier Health and Climate Functions: k-means136 monthly3Q monthlyepithresholds monthlyMAVE monthlyMAVE_SD monthlyMAVEplus1p96SD monthlyMAVEplus1SD monthlyMAVEplus2SD	
R	randomdata RANGE RANGEEDGES RANGESPAN rankcorrelate ranked_prob_score Ranking Data: datarank rasterize ratios readgrib readthredds rect regridAverage Regridding: GRID regridAverage regridLB regridLinear transit weeklytomonthly weeklytopentad regridLB regridLinear removeGRID removeVALUES renameGRID REORDER replacebypercentile replaceGRID replaceNaN RESCALE rmsaover rmsover	

Online tutorials

through the IRI Data tutorial

Find and Understand

Locating Data

There are three ways to locate data within the Data Library: 1) a listing of some of the datasets by category; 2) a complete list of datasets according to their source; and 3) a keyword search powered by Google.

Dataset Structure

You should now be more comfortable with finding datasets in the Data Library. Let us take a closer look at the information and utilities available to you when you select a dataset. You will not use these utilities in this section, but it is important to know what they do and where they are for Parts II and III. The NOAA NCDC DAILY FSOD dataset is a commonly used dataset and is the example for this section.

Share

Contact Us

Techniques in the Data tutorial

Measures of Central Tendency

One of the most common quantities used to summarize a set of data is its center. The center is a single value, chosen in such a way that it gives a reasonable approximation of normality.

Running and Weighted Averages

Both running and weighted averages are important filtering methods for statistical analysis.

Climatologies and Standardized Anomalies

Climatology is commonly known as the study of our climate, yet the term encompasses many other important definitions. Climatology is also defined as the long-term average of a given variable, often over time periods of 20-30 years.

Data Homogeneity

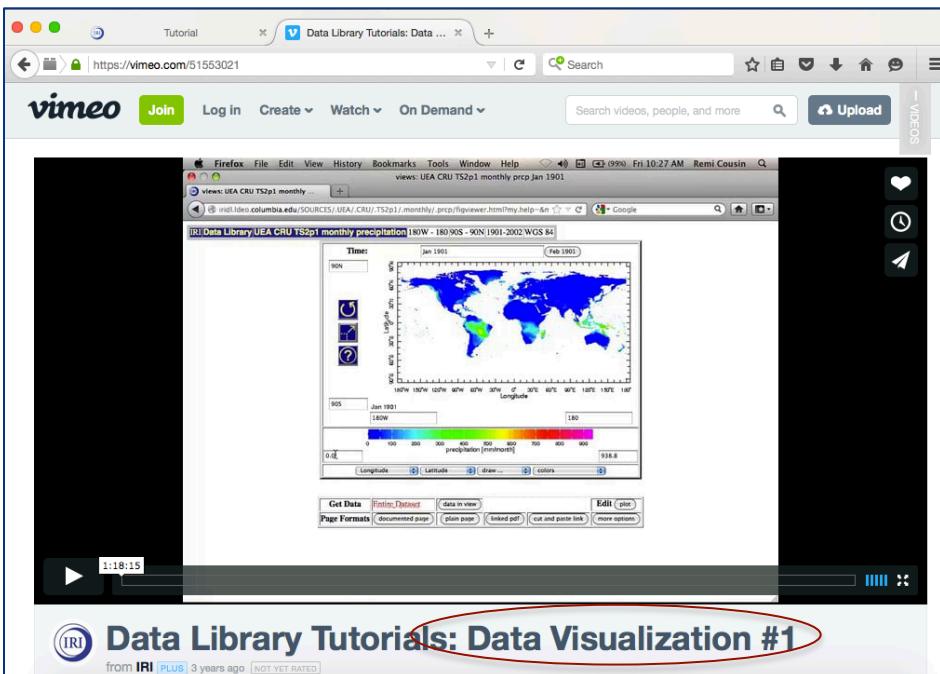
It is often important to determine if a set of data is homogeneous before any statistical technique is applied to it. Homogeneous data are drawn from a single population.

Stationarity

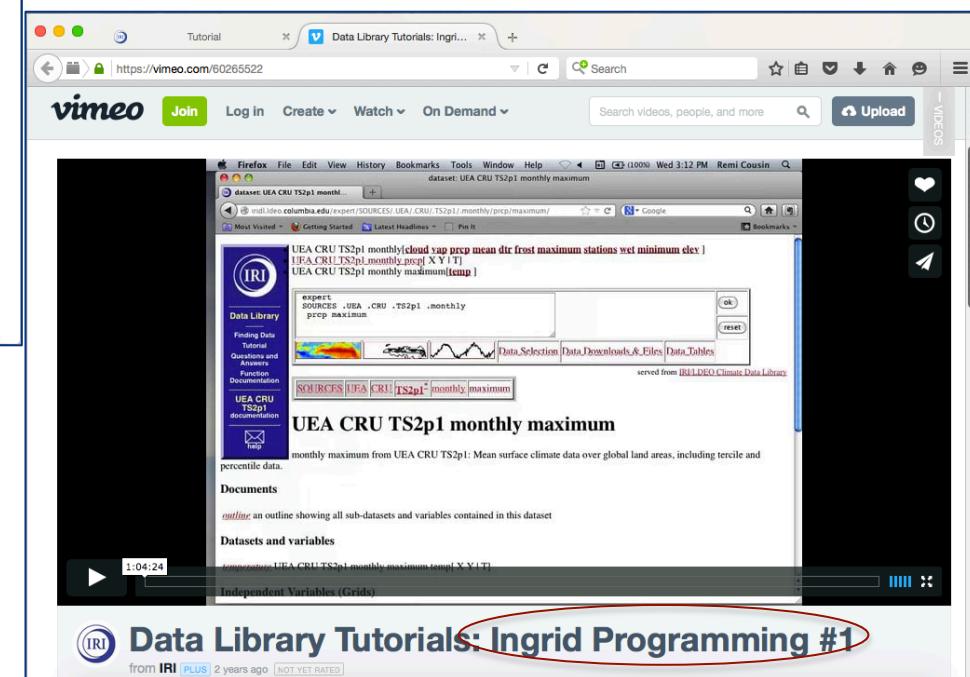
A random variable or random process is said to be stationary if all of its statistical parameters are independent of time. While most statistical techniques require that data is stationary, most atmospheric processes are visibly nonstationary.

Measures of Dispersion

Online tutorials: Vimeo training sessions



<http://vimeo.com/iri>



Relevant datasets: daily data

The screenshot shows a web browser window with multiple tabs open, all related to datasets from the International Research Institute for Climate and Society (IRI). The main content area displays the 'Data Library' for the 'NASA GES-DAAC TRMM_L3 TRMM_3B42 v7 daily precipitation' dataset. The interface includes a header with search and filter options (X: 0 - 0, Y: 50S - 50N, T: Jan 1998 - May 2015, Language: English), a navigation bar with tabs for Description, Documentation, Views, Data Filters, Data Selection, Data Files, Data Tables, and Expert Mode, and a breadcrumb trail below the navigation bar. The breadcrumb trail consists of green ovals connected by arrows, showing the path: SOURCES → NASA → GES-DAAC → TRMM_L3 → TRMM_3B42 → v7 → daily → precipitation. Below the breadcrumb trail, the title 'NASA GES-DAAC TRMM_L3 TRMM_3B42 v7 daily precipitation: Surface Rain from all Satellite and Surface data' is displayed. A descriptive text follows, stating 'Surface Rain from all Satellite and Surface from NASA GES-DAAC TRMM_L3 TRMM_3B42 v7 daily: TRMM Version 7 Daily Precipitation Estimates.' Under the heading 'Independent Variables (Grids)', there are three entries: 'Time (time)' with a grid from 1998-01-01 to 2015-05-31, 'Longitude (longitude)' with a grid from 0.125E to 0.125W, and 'Latitude (latitude)' with a grid from 49.875S to 49.875N. The 'Time' entry is circled in red. Under the heading 'Other Info', there is a section for 'datatype' which includes 'realarraytype' and 'iri:hasSemantics'.

IRI Data Library

data: NASA GE... dataset: NOAA... dataset: UCSB... NOAA NCEP...

iri.ideo.columbia.edu/SOURCES/.NASA/.GES-DAAC/.TRMM_L3/.TRMM_3B42/ Search

Data Library NASA GES-DAAC TRMM_L3 TRMM_3B42 v7 daily precipitation X 0 - 0 Y 50S - 50N T Jan 1998 - May 2015 Language English

Description Documentation Views Data Filters Data Selection Data Files Data Tables Expert Mode

served from IRI/LDEO Climate Data Library

SOURCES NASA GES-DAAC TRMM_L3 TRMM_3B42 v7 daily precipitation

NASA GES-DAAC TRMM_L3 TRMM_3B42 v7 daily precipitation: Surface Rain from all Satellite and Surface data

Surface Rain from all Satellite and Surface from NASA GES-DAAC TRMM_L3 TRMM_3B42 v7 daily: TRMM Version 7 Daily Precipitation Estimates.

Independent Variables (Grids)

Time (time)
grid: /T (days since 1998-01-01 00:00:00) ordered (1 Jan 1998) to (31 May 2015) by 1.0 N= 6360 pts :grid

Longitude (longitude)
grid: /X (degree_east) periodic (0.125E) to (0.125W) by 0.25 N= 1440 pts :grid

Latitude (latitude)
grid: /Y (degree_north) ordered (49.875S) to (49.875N) by 0.25 N= 400 pts :grid

Other Info

datatype
realarraytype

iri:hasSemantics

Examples: phase composites (courtesy of Andrew Robertson)

CASE 1: MJO phase composites

BoM MJO RMM

BoM MJO RMM: Real-time Multivariate MJO Index (with components of interannual variability removed).

Documents

- [outline](#) an outline showing all sub-datasets and variables contained in this dataset
- [data source](#) Text file of RMM1 and RMM2 values for 1974 to present (BoM)
- [summary from BoM](#) Madden-Julian Oscillation (MJO)
- [Wheeler and Hendon \(2004\) Monthly Weather Review article](#) An All-Season Real-Time Multivariate MJO Index: Development of an Index for Monitoring and Prediction

Datasets and Variables

amplitude	BoM MJO RMM amplitude[T]
phase	BoM MJO RMM phase[T]
RMM1	BoM MJO RMM RMM1[T]
RMM2	BoM MJO RMM RMM2[T]

Independent Variables (Grids)

MJO

Western Pacific

PC₂

phase 7 phase 6

phase 8

phase 5

phase 1 phase 4

phase 2 phase 3

Africa & western IO eastern Indian Ocean

Maritime Continent

PC₁

MJO 8-phase classification – Wheeler & Hendon (2004)

Examples: phase composites (courtesy of Andrew Robertson)

CASE 1: Madden-Julian Oscillation (MJO) phase composites

phase X Y

mean [(UCSB CHIRPS v2p0 daily global 0p25 prcp)] - mean [UCSB CHIRPS v2p0 daily global 0p25 prcp] [X M M M Y phase]

```
SOURCES .UCSB .CHIRPS .v2p0 .daily .global .0p25 .prcp
T (1 Jan 1981) (31 Dec 2014) RANGE
X 70 180 RANGE
Y -20 20 RANGE

SOURCES .BoM .MJO .RMM .phase
T (1 Jan 1981) (31 Dec 2014) RANGE
classifyby ←

T (Dec-Feb) seasonalAverage
[T]average
SOURCES .UCSB .CHIRPS .v2p0 .daily .global .0p25 .prcp
T (1 Jan 1981) (31 Dec 2014) RANGE
X 70 180 RANGE
Y -20 20 RANGE
T (Dec-Feb) seasonalAverage
[T]average
sub
```

} dataset to composite, domain, period

} phase dataset +
composite calculation (clasifyby/average)

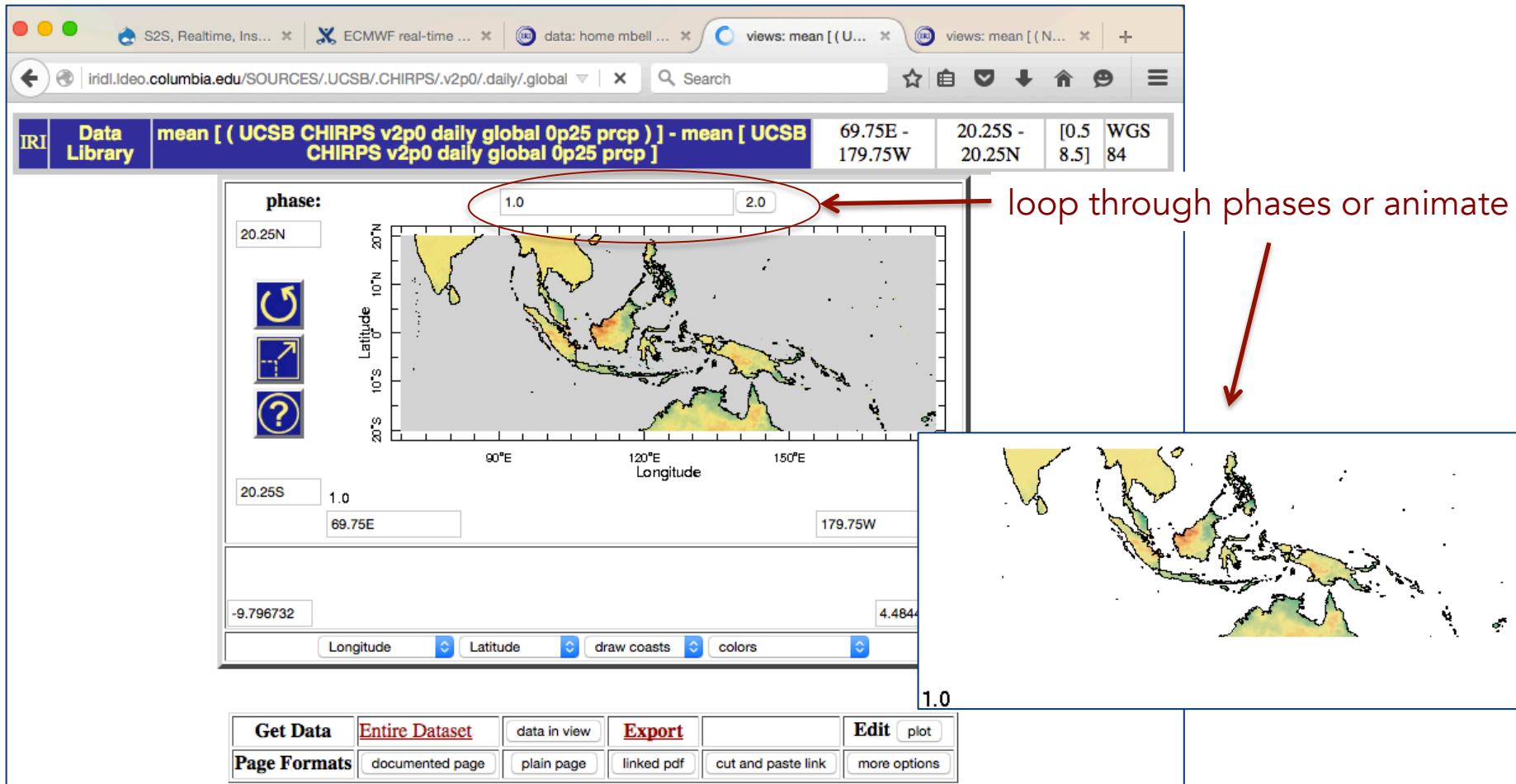
} season choice +
anomalies calculation

OK reset



Examples: phase composites (courtesy of Andrew Robertson)

CASE 1: MJO phase composites



Examples: phase composites (courtesy of Andrew Robertson)

CASE 1: MJO phase composites – phase evolution at a grid point

Screenshot of a software interface showing a histogram of precipitation phases and a command-line history.

The top navigation bar includes tabs: Description, Views (highlighted with a red arrow), Data Filters, Data Selection, Data Files, Data Tables, and Expert Mode.

The title of the main window is "mean [(UCSB CHIRPS v2p0 daily global 0p25 prcp)] - mean [UCSB CHIRPS v2p0 daily global 0p25 prcp]".

The histogram displays precipitation [mm/day] on the y-axis (ranging from -2 to 2) against phase on the x-axis (ranging from 1 to 8). The bars show a distribution with peaks at phase 2 and phase 3.

The command-line history shows the following steps:

```
SOURCES .UCSB .CHIRPS .v2p0 .daily .global .0p25 .prcp
T (1 Jan 1981) (31 Dec 2014) RANGE
X 70 180 RANGE
Y -20 20 RANGE
SOURCES .BOM .MJO .RMM .phase
T (1 Jan 1981) (31 Dec 2014) RANGE
classifyby
T (Dec-Feb) seasonalAverage
[T]average
SOURCES .UCSB .CHIRPS .v2p0 .daily .global .0p25 .prcp
T (1 Jan 1981) (31 Dec 2014) RANGE
X 70 180 RANGE
Y -20 20 RANGE
T (Dec-Feb) seasonalAverage
[T]average
sub

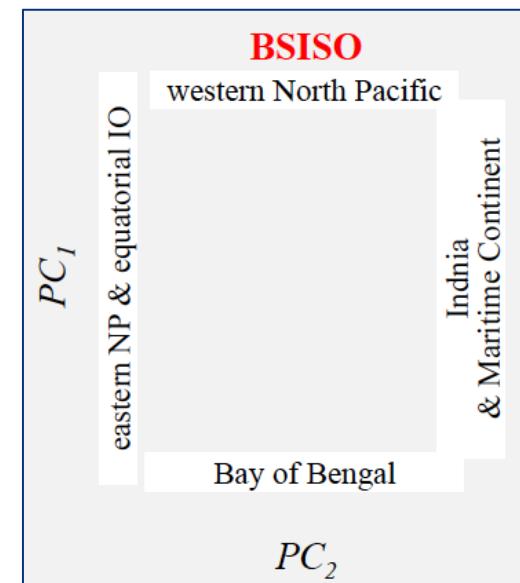
X (110) VALUE
Y (0) VALUE
```

A red arrow points from the text "coordinates for a point over land (Borneo)" to the Y(0) VALUE entry in the command-line history.

Examples: phase composites (courtesy of Andrew Robertson)

CASE 2: boreal summer intraseasonal oscillation (BSISO) phase composites

The screenshot shows a web browser window with the URL iridl.ideo.columbia.edu/home/.mbell/APCC/BSISO/B1PHASE/. The page title is "home mbell APCC BSISO B1PHASE". The main content area displays the title "home mbell APCC BSISO B1PHASE" and a brief description: "B1PHASE from home mbell APCC BSISO: Boreal Summer Intraseasonal Oscillation." Below this, there are sections for "Independent Variables (Grids)" and "Other Info". The "Independent Variables (Grids)" section includes a "Time (time)" entry with a grid spanning from 1 Jan 1981 to 31 Dec 2014. The "Other Info" section lists "missing_value" as -999.90002 and "units" as "unitless". A "References" section at the bottom lists "Lee_etal2013". At the very bottom, it says "Last updated: Tue, 10 Nov 2015 21:26:59 GMT". The top navigation bar has tabs for "Description", "Views", "Data Filters", "Data Selection", "Data Files", "Data Tables", and "Expert Mode". A "Language" dropdown is set to "english". The footer of the page is served from "IRI/LDEO Climate Data Library".



Examples: phase composites (courtesy of Andrew Robertson)

CASE 2: BSISO phase composites

IRI Data Library interface showing 'Expert Mode' selected.

Input command:

```
mean [ ( UCSB CHIRPS v2p0 daily global 0p25 prcp ) ] - mean [ UCSB CHIRPS v2p0 daily global 0p25 prcp
] [ X Y B1PHASE ]
```

SOURCES .UCSB .CHIRPS .v2p0 .daily .global .0p25 .prcp
T (1 Jan 1981) (31 Dec 2014) RANGE
X 70 100 RANGE
Y 5 35 RANGE

home .mbell .APCC .BSISO .B1PHASE
T (1 Jan 1981) (31 Dec 2014) RANGE
classifyby ←

T (Jun-Sep) seasonalAverage
[T]average
SOURCES .UCSB .CHIRPS .v2p0 .daily .global .0p25 .prcp
T (1 Jan 1981) (31 Dec 2014) RANGE
X 70 100 RANGE
Y 5 35 RANGE
T (Jun-Sep) seasonalAverage
[T]average
sub

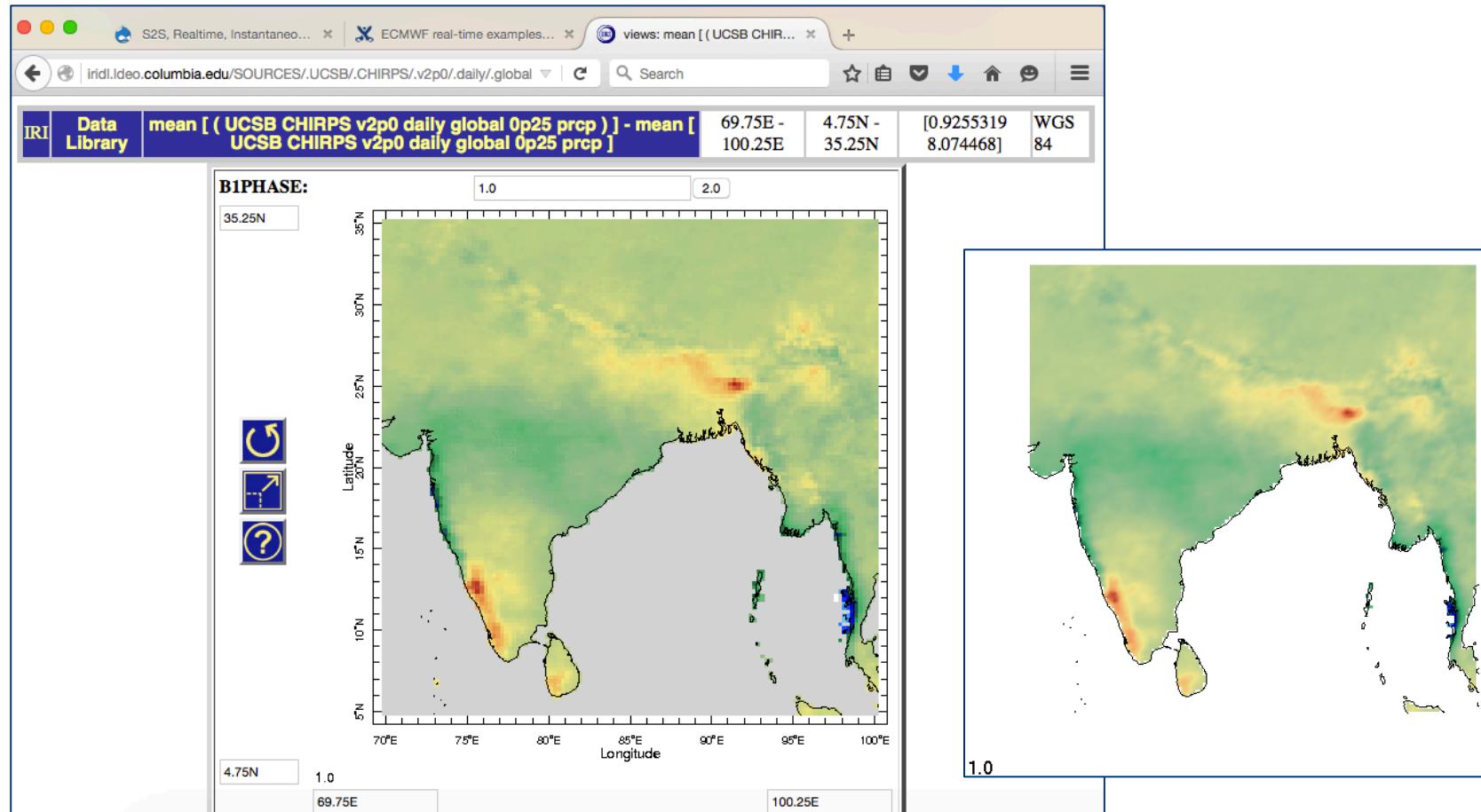
Annotations:

- } dataset to composite, domain, period
- } phase dataset + composite calculation (clasifyby/average)
- } season choice + anomalies calculation

Buttons at bottom: OK, reset

Examples: phase composites (courtesy of Andrew Robertson)

CASE 2: BSISO phase composites



Relevant datasets: daily data

The screenshot shows a web browser window with the URL iridl.ideo.columbia.edu/SOURCES/.UCSB/.CHIRPS/.v2p0/.daily/.global/.0p05.prcp. The page displays metadata for the UCSB CHIRPS v2p0 daily global 0p05 prcp dataset. Key parameters shown are X: 180W - 180, Y: 50S - 50N, and T: Jan 1981 - Oct 2015. A red oval highlights the time range (T). The page includes tabs for Description, Views, Data Filters, Data Selection, Data Files, Data Tables, and Expert Mode. Below the tabs, it says "served from IRI/LDEO Climate Data Library". A horizontal navigation bar at the bottom contains links for SOURCES, UCSB, CHIRPS, v2p0, daily, global, 0p05, and prcp.

UCSB CHIRPS v2p0 daily global 0p05 prcp: precipitation data

CHIRPS v2p0 daily global 0p05 precipitation from UCSB: UC Santa Barbara.

Independent Variables (Grids)

Time (time)
grid: /T (julian_day) ordered (1 Jan 1981) to (31 Oct 2015) by 1.0 N= 12722 pts :grid
Longitude (longitude)
grid: /X (degree_east) periodic (179.975W) to (179.975E) by 0.05 N= 7200 pts :grid
Latitude (latitude)
grid: /Y (degree_north) ordered (49.975N) to (49.975S) by 0.05 N= 2000 pts :grid

Other Info

bufferwordsizes
4
CE
100.0
colorscalename
prcp_dailyrate_max100_smooth
CC

Relevant datasets: daily data

The screenshot shows a web browser window with several tabs open, including "dataset: NOAA NCEP CPC UNIFIED_PRCP/GAUGE". The main content is a dataset page for "NOAA NCEP CPC UNIFIED_PRCP GAUGE_BASED GLOBAL v1p0". The page includes a navigation bar with "Description", "Documentation", and "Expert Mode" buttons, and a language selector set to "english". A breadcrumb trail at the top shows the dataset's path: SOURCES > NOAA > NCEP > CPC > UNIFIED_PRCP > GAUGE_BASED > GLOBAL > v1p0. Below the title, it says "GAUGE_BASED GLOBAL v1p0 from NOAA NCEP CPC UNIFIED_PRCP: CPC Unified Precipitation Analyses." A "Documents" section lists "overview" and "dataset documentation". A "Datasets and Variables" section lists "REALTIME" and "RETRO" datasets. A red bracket on the right indicates the dataset covers the period from 1979 to the present. The page also features social sharing buttons and a contact us form.

dataset: NOAA NCEP CPC UNIFIED_PRCP/GAUGE

dataset: NASA GES-DA...

dataset: UCSB CHIRPS...

dataset: NOAA NCE...

iri.ideo.columbia.edu/SOURCES/.NOAA/NCEP/.CPC/.UNIFIED_PRCP/GAUGE

Search

Data Library

NOAA NCEP CPC UNIFIED_PRCP GAUGE_BASED GLOBAL v1p0

Language: english

Description Documentation Expert Mode

served from IRI/LDEO Climate Data Library

SOURCES > NOAA > NCEP > CPC > UNIFIED_PRCP > GAUGE_BASED > GLOBAL > v1p0

NOAA NCEP CPC UNIFIED_PRCP GAUGE_BASED GLOBAL v1p0

GAUGE_BASED GLOBAL v1p0 from NOAA NCEP CPC UNIFIED_PRCP: CPC Unified Precipitation Analyses.

Documents

[overview](#) an outline showing sub-datasets of this dataset
[dataset documentation](#)

Datasets and Variables

[REALTIME](#) NOAA NCEP CPC UNIFIED_PRCP GAUGE_BASED GLOBAL v1p0 REALTIME[EOD gnum rain]
[RETRO](#) NOAA NCEP CPC UNIFIED_PRCP GAUGE_BASED GLOBAL v1p0 RETRO[EOD gnum rain]

Last updated: Fri, 18 Sep 2015 18:39:07 GMT

1979 – present

Share: [Twitter](#) [Facebook](#) [Email](#) [Like](#) [G+](#) Recommend this on Google

Contact Us: [Email](#)

IRI



Relevant datasets: daily data

The screenshot shows a web browser window with multiple tabs open, all related to climate datasets. The main content area displays the 'NOAA NCEP-NCAR CDAS-1 DAILY' dataset from the IRI/LDEO Climate Data Library. The page includes a navigation bar with tabs for Description, Documentation, Views, Data Selection, Data Files, Data Tables, and Expert Mode. Below the navigation bar, there are five green circular buttons labeled SOURCES, NOAA, NCEP-NCAR, CDAS-1, and DAILY. A sub-navigation bar below the main one has tabs for Description, Documentation, and Expert Mode. The main content area contains sections for Documents (with links to outline and griblist), Datasets and Variables (with links to Diagnostic and Intrinsic sections), and Independent Variables (Grids). It also lists Time (time) and Longitude (longitude) variables.

The screenshot shows a web browser window displaying the 'NOAA NCEP-DOE Reanalysis-2 Daily' dataset from the IRI/LDEO Climate Data Library. The layout is similar to the first screenshot, with a navigation bar, a sub-navigation bar, and sections for Documents (with a link to overview), Datasets and Variables (with links to gaussian_grid, pressure, and surface sections), and References. The main content area describes the dataset as Daily from NOAA NCEP-DOE Reanalysis-2: NCEP/DOE AMIP-II Reanalysis (Reanalysis-2).

Relevant datasets: seasonal forecasts

This screenshot shows the main dataset page for the IRI Forecast Division. At the top, there are tabs for 'Description' and 'Expert Mode'. Below the tabs, there are three green circular buttons labeled 'SOURCES', 'IRI', and 'FD'. The main content area is titled 'IRI Forecast Division' and contains the following text: 'Forecast Division from IRI: International Research Institute for Climate and Society.' Under the heading 'Documents', there is a link to 'overview'. Under 'Datasets and Variables', there is a list of models: AgMIP, ccm3.2, CCM3v6, COLA, COLA2.2.6, CPT, ECHAM3, and ECHAM4.5. A note indicates that AgMIP includes SI WA.

This screenshot shows the specific dataset page for the IRI FD Seasonal Forecast. The layout is similar to the main page, with tabs for 'Description', 'Documentation', and 'Expert Mode', and green circular buttons for 'SOURCES', 'IRI', 'FD', and 'Seasonal_Forecast'. The title is 'IRI FD Seasonal Forecast'. The main content area is titled 'IRI FD Seasonal Forecast' and describes it as providing seasonal forecasts for probabilities of below-normal, above-normal, and extreme precipitation and temperature. It includes a 'Documents' section with links to 'overview', 'Barnston et al 2003', and 'dataset documentation'. The 'Datasets and Variables' section lists various components: Climatologies, Extreme_Precipitation, Extreme_Temperature, Observations, Predictions_in_Context, Precipitation, and Temperature, each with a corresponding IRI FD Seasonal_Forecast command.



Relevant datasets: NMME seasonal forecasts

S2S, Realtime, Instantaneous... | ECMWF real-time examples... | dataset: Models NMME

iri.ideo.columbia.edu/SOURCES/.Models/.NMME/

Data Library | Models NMME

Description | Expert Mode

SOURCES | Models | NMME

served from IRI/LDEO Climate Data Library

Models NMME

Models NMME from SOURCES: the IRI/LDEO collection of climate data.

Documents

- [overview](#) an outline showing sub-datasets of this dataset
- [CTB home](#) Climate Test Bed
- [NMME Home](#) Information about the NMME project

Semantic Documents

- [auxinfo.owl](#)

Datasets and Variables

CMC1-CanCM3	Models NMME CMC1-CanCM3[FORECAST HINDCAST]
CMC2-CanCM4	Models NMME CMC2-CanCM4[FORECAST HINDCAST]
COLA-RSMAS-CCSM3	Models NMME COLA-RSMAS-CCSM3[MONTHLY]

S2S, Realtime, Instantaneous... | ECMWF real-time examples... | dataset: Models NMME

iri.ideo.columbia.edu/SOURCES/.Models/.NMME/

Datasets and Variables

CMC1-CanCM3	Models NMME CMC1-CanCM3[FORECAST HINDCAST]
CMC2-CanCM4	Models NMME CMC2-CanCM4[FORECAST HINDCAST]
COLA-RSMAS-CCSM3	Models NMME COLA-RSMAS-CCSM3[MONTHLY]
COLA-RSMAS-CCSM4	Models NMME COLA-RSMAS-CCSM4[MONTHLY]
CPC-CMAP	Models NMME CPC-CMAP[prate]
CPC-CMAP-URD	Models NMME CPC-CMAP-URD[prate]
CPC-PRECIP	Models NMME CPC-PRECIP[prate]
GFDL-CM2p1	Models NMME GFDL-CM2p1[MONTHLY]
GFDL-CM2p1-aer04	Models NMME GFDL-CM2p1-aer04[MONTHLY]
GFDL-CM2p5-FLOR-A06	Models NMME GFDL-CM2p5-FLOR-A06[MONTHLY]
GFDL-CM2p5-FLOR-B01	Models NMME GFDL-CM2p5-FLOR-B01[MONTHLY]
GHCN_CAMS	Models NMME GHCN_CAMS[updated temp]
IRI-ECHAM4p5-AnomalyCoupled	Models NMME IRI-ECHAM4p5-AnomalyCoupled[MONTHLY]
IRI-ECHAM4p5-DirectCoupled	Models NMME IRI-ECHAM4p5-DirectCoupled[MONTHLY]
LSMASK	Models NMME LSMASK[land]
NASA-GMAO	Models NMME NASA-GMAO[MONTHLY]
NASA-GMAO-062012	Models NMME NASA-GMAO-062012[MONTHLY]
NCDC-OISST	Models NMME NCDC-OISST[sst]
NCEP-CFSv1	Models NMME NCEP-CFSv1[MONTHLY]
NCEP-CFSv2	Models NMME NCEP-CFSv2[FORECAST HINDCAST]

Other Info

CITATIONS

When using the NMME data please cite the BAMS article describing the project (Kirtman et al. 2014) and in the acknowledgements please note that the NMME project and data dissemination is supported by NOAA, NSF, NASA and DOE. Please also acknowledge the help of CPC, IRI and NCAR personnel in creating,

Relevant maprooms

The Climate and Society Map Room is a collection of maps and other figures that monitor climate and societal conditions at present and in the recent past. The maps and figures can be manipulated and are linked to the original data. Even if you are primarily interested in data rather than figures, this is a good place to see which datasets are particularly useful for monitoring current conditions.

Data by Source
Datasets organized by source, i.e. creator and/or provider.

Data By Category
Selected Datasets for particular topics

Dataset and Map Room Browser
Find datasets and maps organized by many characteristics and keywords

atmosphere
running displays shows baseMap shown

Climate: Analysis, Monitoring and Forecasts
Historical, current, and future climate conditions around the globe.

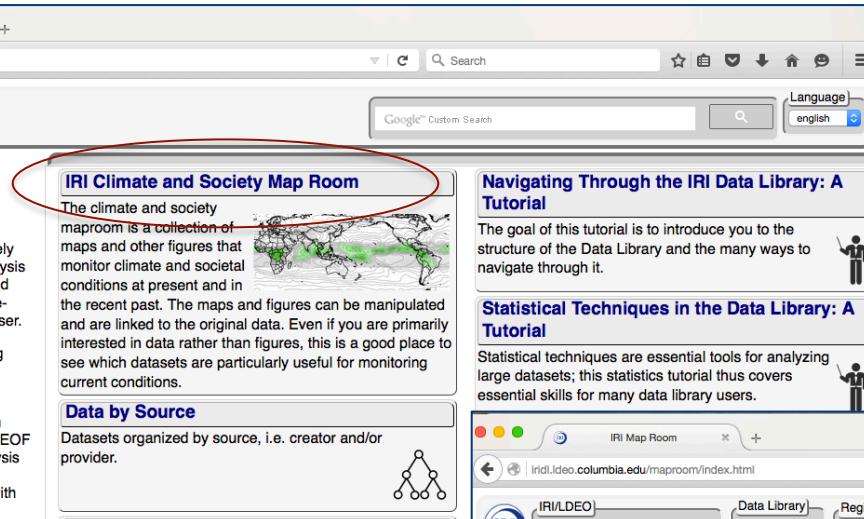
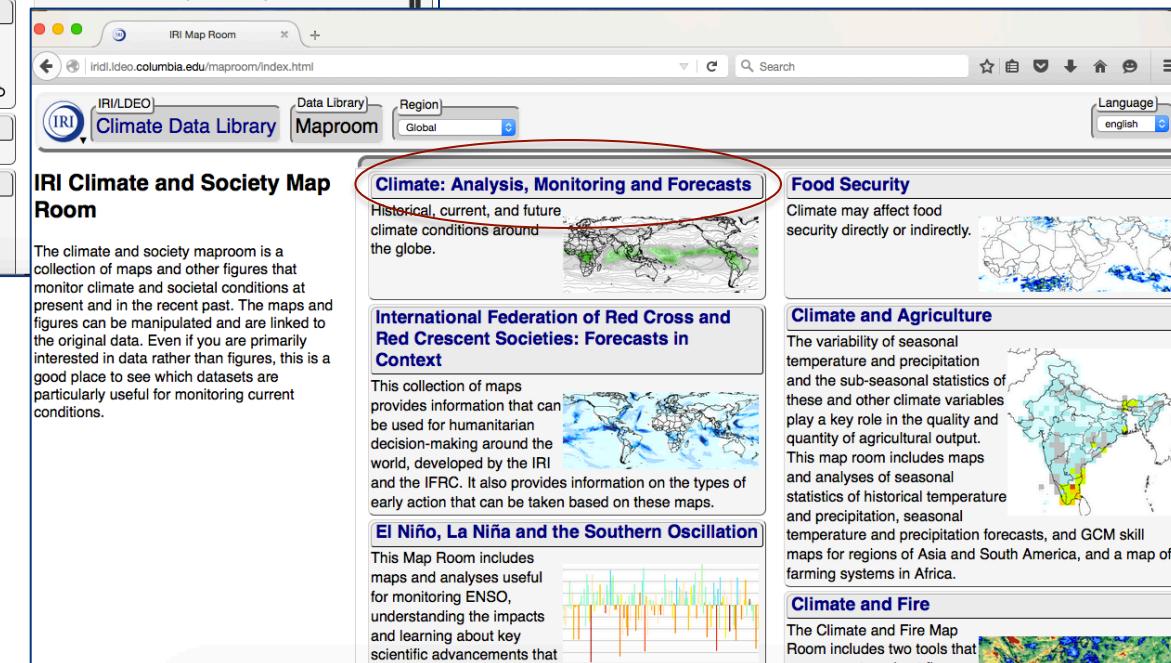
International Federation of Red Cross and Red Crescent Societies: Forecasts in Context
This collection of maps provides information that can be used for humanitarian decision-making around the world, developed by the IRI and the IFRC. It also provides information on the types of early action that can be taken based on these maps.

El Niño, La Niña and the Southern Oscillation
This Map Room includes maps and analyses useful for monitoring ENSO, understanding the impacts and learning about key scientific advancements that have led to our current level

Food Security
Climate may affect food security directly or indirectly.

Climate and Agriculture
The variability of seasonal temperature and precipitation and the sub-seasonal statistics of these and other climate variables play a key role in the quality and quantity of agricultural output. This map room includes maps and analyses of seasonal statistics of historical temperature and precipitation, seasonal temperature and precipitation forecasts, and GCM skill maps for regions of Asia and South America, and a map of farming systems in Africa.

Climate and Fire
The Climate and Fire Map Room includes two tools that can support a robust fire


Relevant maprooms

Forecasts

Seasonal forecasts of temperature and precipitation.

Forecasts

Individual Atmospheric General Circulation Models Forecast
Maps of temperature, precipitation and 500mb-geopotential height forecasts from Individual Atmospheric General Circulation Models.

Sea Surface Temperature Anomaly Forecast
Maps of sea surface temperature scenario (SST forecasts) used to force the AGCMs.

Share Contact Us

Share on Google+ Recommend this on Google

IRI Seasonal Precipitation Forecast

The seasonal forecast for above-, below- and near-normal precipitation from the IRI.

Forecast Lead Time in Months 1.0 4.0

Month Forecast Issued Sep 1997 Nov 2015 Nov 2015

click for .5° box
click-drag-release for larger or to zoom in

IRI Seasonal Precipitation Forecast issued Nov 2015

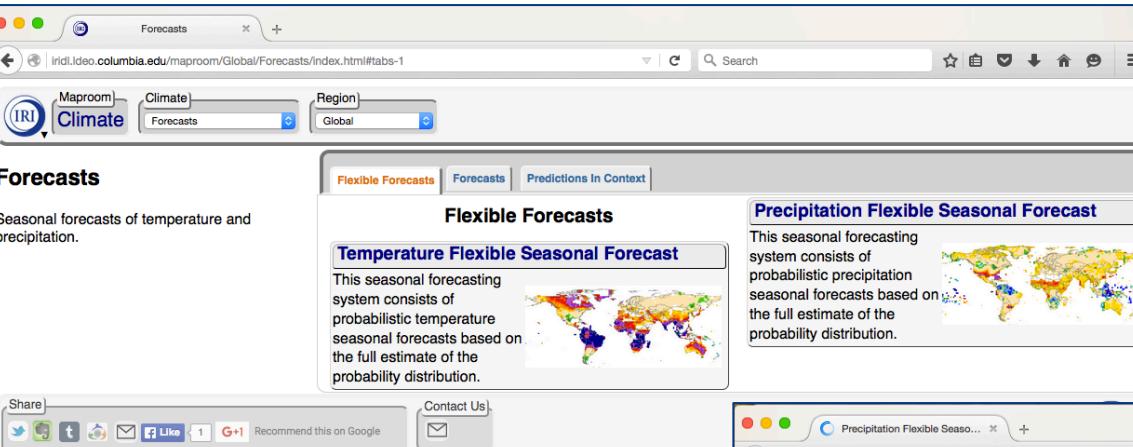
Latitude Longitude Dominant Terile Probability

180°W 150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E 180°

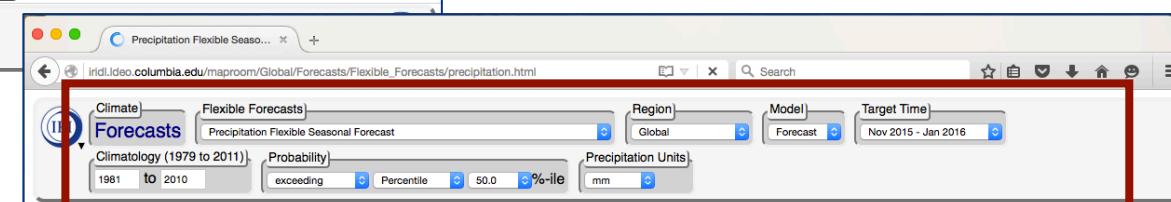
-80% -60% -40% -20% 0% 20% 40% 60% 80%

Relevant maprooms

custom threshold and configurations



The screenshot shows the IRI Maproom interface with the 'Forecasts' tab selected. It displays two main sections: 'Temperature Flexible Seasonal Forecast' and 'Precipitation Flexible Seasonal Forecast'. Each section includes a brief description, a world map showing forecast results, and a 'Flexible Forecasts' sub-menu. Below the main menu, there are social sharing options and a contact us link.



This screenshot shows the configuration page for the Precipitation Flexible Seasonal Forecast. It features a header with dropdown menus for Climate, Forecasts, Region, Model, and Target Time, all set to their default values. A red box highlights the 'Forecasts' dropdown. Below the header is a search bar and a date range selector from 1981 to 2010. A red circle highlights the 'Probability' dropdown, which is set to 'exceeding'. To its right are dropdowns for 'Percentile' (set to 50.0) and 'Precipitation Units' (set to mm). At the bottom of the page is a detailed description of the forecast system and a world map showing precipitation probability across the globe.

Relevant maprooms

Screenshot of the IFRC Forecasts in Context Maproom interface:

The page title is "IFRC Forecasts in Context". The URL is "irid.ideo.columbia.edu/maproom/IFRC/index.html". The top navigation bar includes links for "Data Library", "Maproom", "International Federation", "Forecasts in Context", "Region" (set to "Global"), and "Language" (set to "english"). Below the navigation is the International Federation of Red Cross and Red Crescent Societies logo.

International Federation of Red Cross and Red Crescent Societies: Forecasts in Context

This collection of maps provides information that can be used for humanitarian decision-making around the world, developed by the IRI and the IFRC. It also provides information on the types of early action that can be taken based on these maps.

Click the tabs (top right) for links to the following useful maps:

- Six-Day forecasts:** These maps show where heavy rainfall is expected in the next six days, and how much rainfall is expected.
- Three-Month Forecasts:** These maps show where large or small amounts of rainfall are expected in the next three months.
- Past Conditions:** These maps show rainfall patterns that can be expected for El Niño, La Niña, and average years.

Six-Day Forecasts

Where is exceptionally heavy rainfall expected?

This map shows places in the world that are forecasted to receive exceptionally heavy rainfall in the next six days relative to what is normal for their location.

How does expected rainfall compare to normal rainfall for this month?

This map shows places in the world that are forecasted to receive over the next six days a large percentage of the rainfall that normally falls over this entire month in their location.

Where is it expected to be wetter than average?

This map shows where the total rain/snow over the next six days is expected to be more or less than what is average for this time of year.

How much rain is expected?

This map shows the total amount of rain or snow (in mm) that is expected to fall in the next 6 days.

ANNEX: Station datasets

The screenshot shows the IRI/LDEO Climate Data Library homepage. A search bar at the top contains the text "GHCN". Below it, a list of search results includes "ghcn-v2", "ghcn", and "ghcn_cams". A snippet of text from the "ghcn_cams" result is visible, mentioning the Global Historical Climate Network (GHCN) dataset and its gridded version 2.

IRI/LDEO Climate Data Library

The IRI Data Library is a powerful and freely accessible online data repository and analysis tool that allows a user to view, analyze, and download hundreds of terabytes of climate-related data through a standard web browser.

It is a powerful tool that offers the following capabilities at no cost to the user:

- access any number of datasets;
- create analyses of data ranging from simple averaging to more advanced EOF analyses using the Ingrid Data Analysis Language;
- monitor present climate conditions with maps and analyses in the [Maproom](#);
- create visual representations of data, including animations;
- download data in a variety of commonly-used [formats](#), including GIS-compatible formats.

Latest from our What's New blog

GPCC FDP Version 7 Gridded Precipitation

Data by Source

Datasets organized by source, i.e. creator and/or provider.

Data By Category

Selected Datasets for particular topics

Dataset and Map Room Browser

Find datasets and maps organized by many characteristics and keywords

variables
(for each station)

GHCN v2 global historical climate network

The screenshot shows the NOAA NCDC GHCN beta version 2 (prcp) dataset page. At the top, there are tabs for Description, Searches, Views, Data Selection, Data Files, Data Tables, and Expert Mode. The SOURCES tab is active, showing links to NOAA, NCDC, GHCN, and v2beta.

NOAA NCDC GHCN beta version 2 (prcp)

NOAA NCDC GHCN beta version 2 (prcp): Monthly weather station precipitation data from the Global Historical Climate Network.

Documents

[outline](#) an outline showing all sub-datasets and variables contained in this dataset
[agreement](#)

Datasets and Variables

elev	NOAA NCDC GHCN v2beta elev[I WMO]
label	NOAA NCDC GHCN v2beta label[I WMO]
latitude	NOAA NCDC GHCN v2beta lat[I WMO]
location	NOAA NCDC GHCN v2beta location[I WMO]
longitude	NOAA NCDC GHCN v2beta lon[I WMO]
Name	NOAA NCDC GHCN v2beta Name[I WMO]
precipitation	NOAA NCDC GHCN v2beta prcp[T I WMO]

Independent Variables (Grids)

A world map showing global precipitation patterns with a color scale from -8000 to 6000 meters. A legend below the map indicates elevation values. A link "List of stations in current view" is also present.

Visualizing data: station datasets

The screenshot shows a web browser window with two tabs open: "data: NOAA NCDC GHCN v2beta prcp" and "data: UCSB CHIRPS v2p0 ...". The main content area displays the NOAA NCDC GHCN v2beta prcp dataset. At the top, there are navigation buttons for "Data Library", "T", "IWMO", and "Language" set to "english". Below these are tabs for "Description", "Views", "Data Filters", "Data Selection", "Data Files", "Data Tables", and "Expert Mode". A note at the bottom states "served from IRI/LDEO Climate Data Library". A breadcrumb trail below the tabs shows the path: SOURCES → NOAA → NCDC → GHCN → v2beta → prcp. The title "NOAA NCDC GHCN v2beta prcp: precipitation data" is displayed, followed by a description: "precipitation from NOAA NCDC GHCN v2beta: Monthly weather station precipitation data from the Global Historical Climate Network.". A section titled "Independent Variables (Grids)" lists "station" and "time". The "time" entry is highlighted with a red oval: "grid: /T (months since 1960-01-01) ordered (Jan 1697) to (Nov 2013) by 1.0 N= 3803 pts :grid". Another section titled "Other Info" lists "datatype", "missing_value", "scale_factor", "units", and "standard_units*".

station
grid: /IWMO (ids) ordered [(1001000) (1005000) (1008000) ... (98851001)] N= 20590 pts :grid

time
grid: /T (months since 1960-01-01) ordered (Jan 1697) to (Nov 2013) by 1.0 N= 3803 pts :grid

datatype
integerarraytype

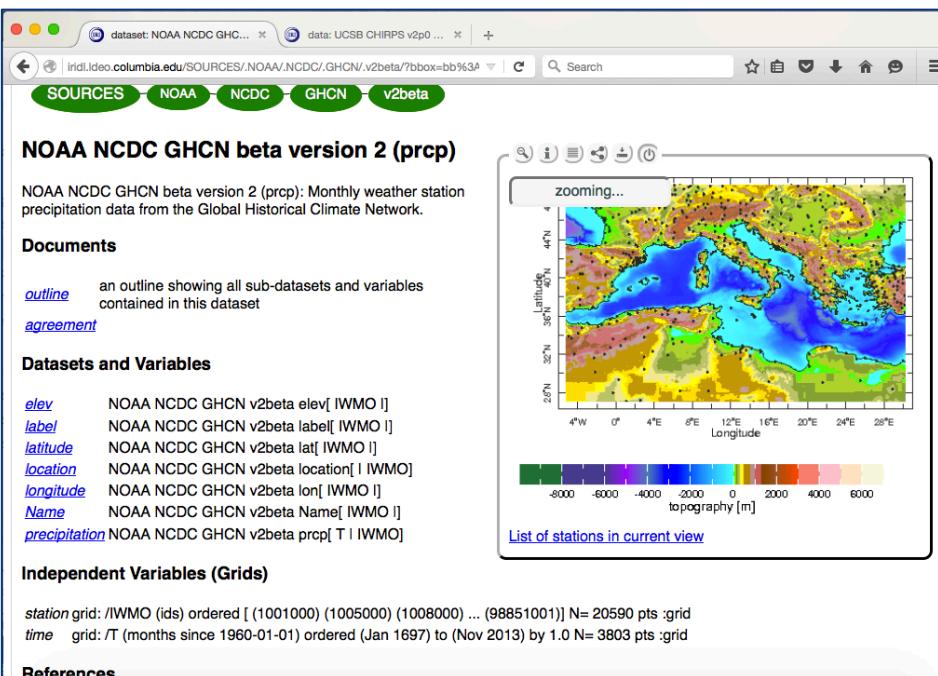
missing_value
[-9999.0 -8888.0]

scale_factor
0.1

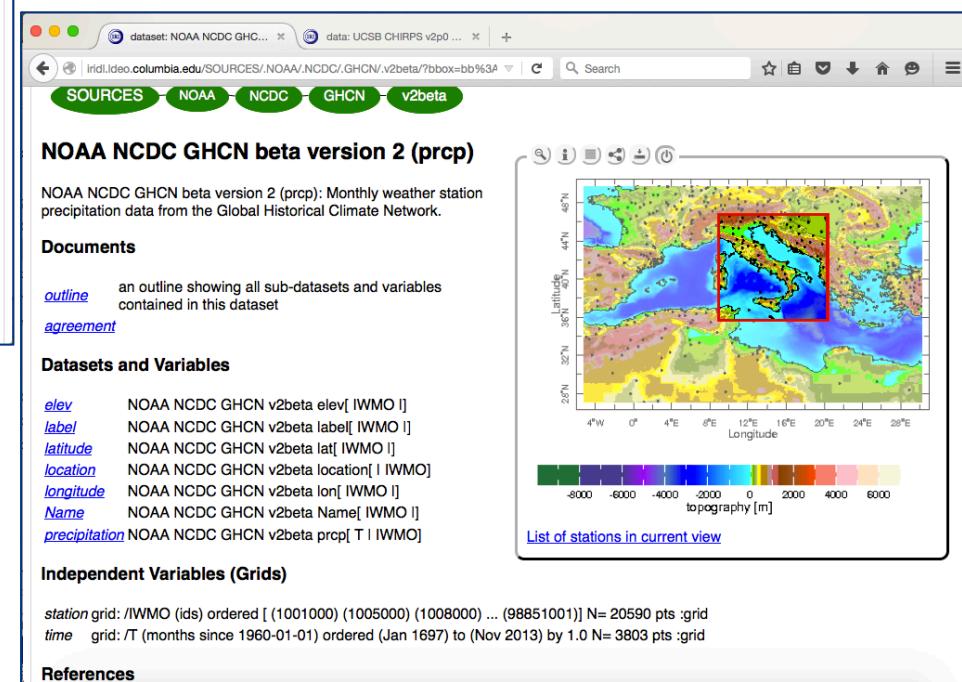
units
mm

standard_units*

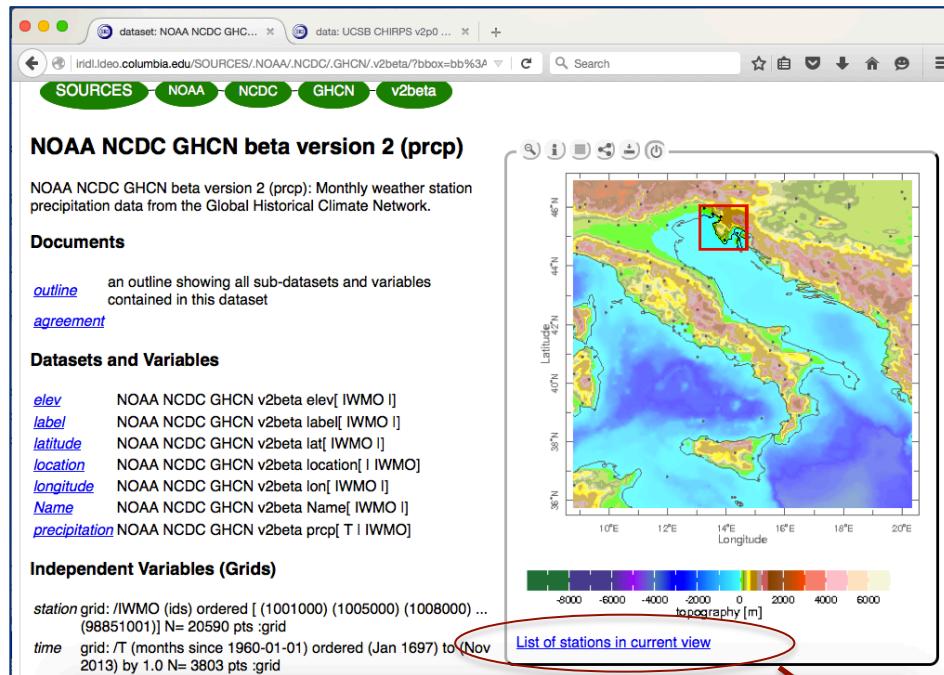
Visualizing data: station datasets



we use the mouse to zoom in on a domain

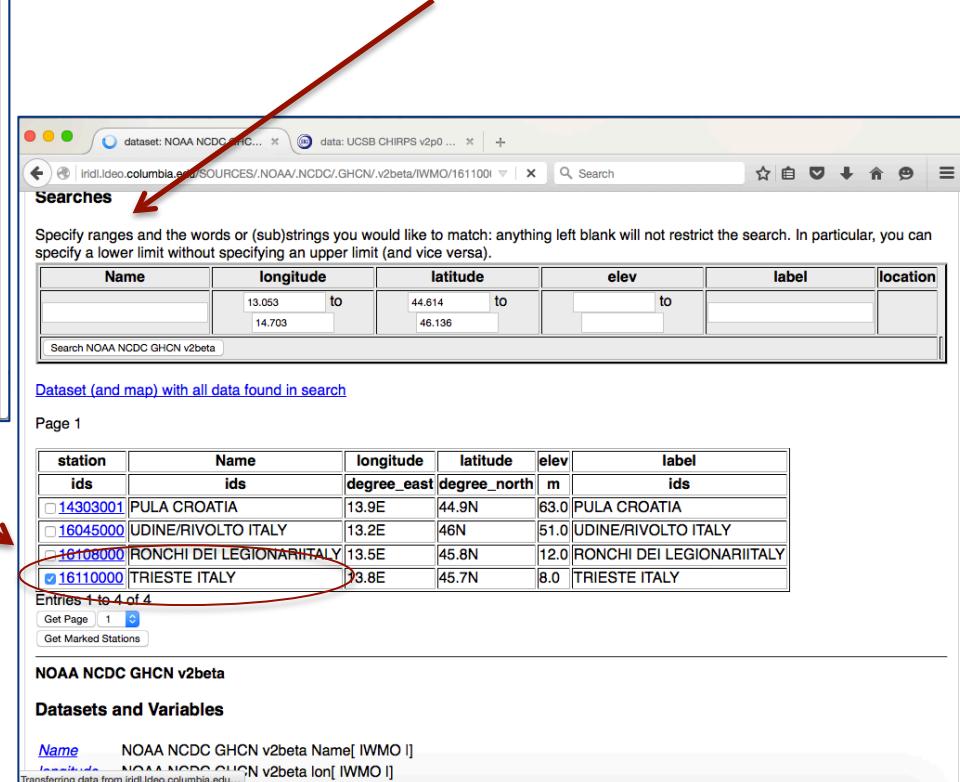


Station datasets: selecting stations



we can list and then select the stations in the domain

This dialogue box allows to search for stations according to the different variables (name, location, etc.)



Visualizing data: station datasets

dataset: NOAA NCDC GH... data: UCSB CHIRPS v2p0 ...

[iridl.ideo.columbia.edu/SOURCES/NOAA/NCDC/GHCN/v2beta/IWMO/1611000/](#)

NOAA NCDC GHCN beta version 2 (prcp)

NOAA NCDC GHCN beta version 2 (prcp): Monthly weather station precipitation data from the Global Historical Climate Network.

Documents

- [outline](#) an outline showing all sub-datasets and variables contained in this dataset
- [agreement](#)

Datasets and Variables

<i>elev</i>	8
<i>label</i>	TRIESTE ITALY
<i>latitude</i>	45.7N
<i>location</i>	
<i>longitude</i>	8
<i>Name</i>	TRIESTE ITALY
<i>precipitation</i>	NOAA NCDC GHCN v2beta prcp 1611000[T IWMO]

Independent Variables (Grids)

```
station grid: /IWMO (ids) ordered [ (16110000) ] :grid
time grid: /T (months since 1960-01-01) ordered (Jan 1697) to (Nov 2013) by 1.0 N= 3803 pts :grid
```

References

Vose, R. S., Richard L. Schmoyer, Peter M. Steurer, Thomas C. Peterson, Richard Heim, Thomas R. Karl, and J. Eischeid, 1992: The Global Historical Climatology Network: long-term monthly temperature, precipitation, sea level pressure, and station pressure data. ORNL/CDIAC-53, NDP-041. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

not all stations
cover the complete
period

dataset: NOAA NCDC GH... data: UCSB CHIRPS v2p0 ...

[iridl.ideo.columbia.edu/SOURCES/NOAA/NCDC/GHCN/v2beta/IWMO/1611000/](#)

Data Library **NOAA NCDC GHCN v2beta prcp** **T** Jan 1697 - Nov 2013 **IWMO** 16110000 **Language** english

Description **Views** **Data Filters** **Data Selection** **Data Files** **Data Tables** **Expert Mode**

served from [IRI/LDEO Climate Data Library](#)

SOURCES **NOAA** **NCDC** **GHCN** **v2beta** **IWMO 16110000 VALUES** **prcp**

NOAA NCDC GHCN v2beta prcp: precipitation data

precipitation from NOAA NCDC GHCN v2beta: Monthly weather station precipitation data from the Global Historical Climate Network.

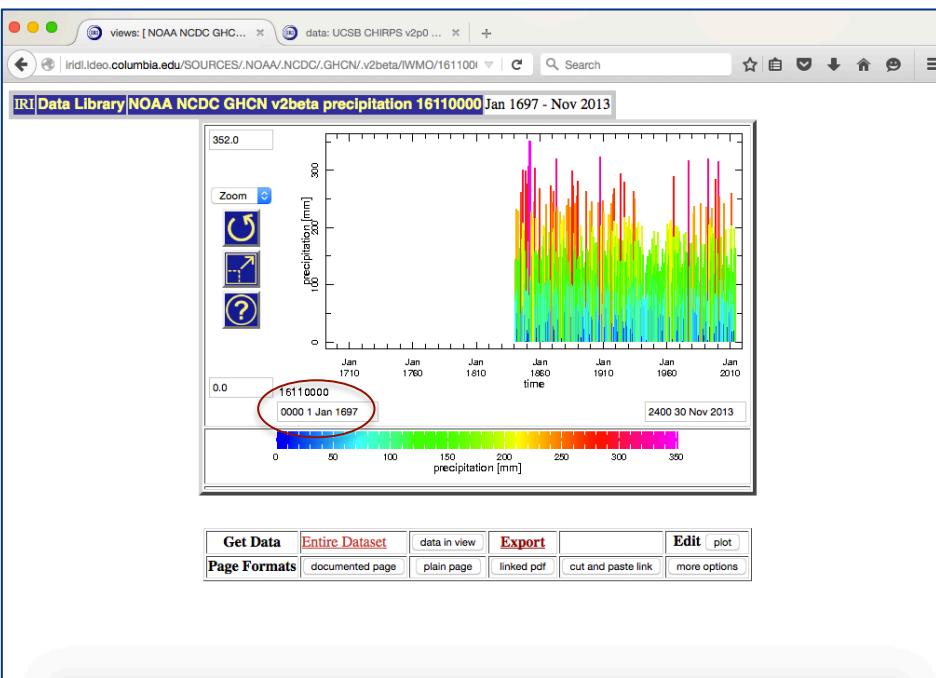
Independent Variables (Grids)

```
station
grid: /IWMO (ids) ordered [ (16110000) ] :grid
time
grid: /T (months since 1960-01-01) ordered (Jan 1697) to (Nov 2013) by 1.0 N= 3803 pts :grid
```

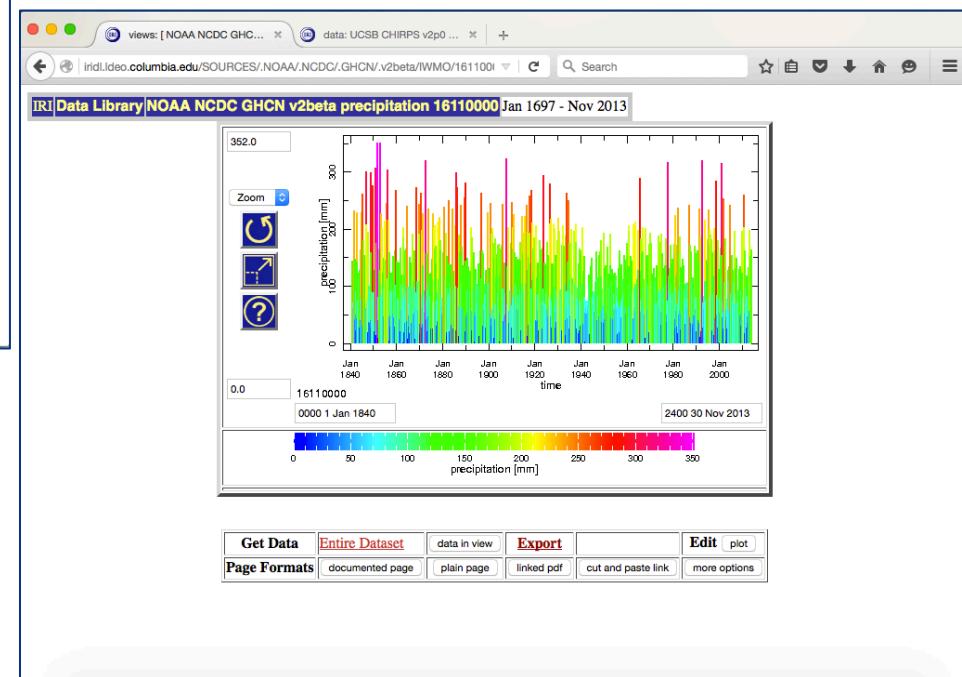
Other Info

<i>datatype</i>	integerarraytype
<i>missing_value</i>	[-9999.0 -8888.0]
<i>scale_factor</i>	0.1
<i>units</i>	mm
<i>standard_units</i>	*

Visualizing data: station datasets



adjusting for the period start



Visualizing data: station datasets

The screenshot shows the IRI Data Library interface with the URL iri.ideo.columbia.edu/SOURCES/.NOAA/NCDC/GHCN/v2beta/IWMO/1611000/. The top navigation bar includes tabs for 'Data Library', 'T' (Time), 'IWMO', 'Language' (set to English), and search. Below the navigation is a toolbar with 'Description', 'Views', 'Data Filters' (highlighted in blue), 'Data Selection', 'Data Files', 'Data Tables', and 'Expert Mode'. A 'Filters' section header is followed by a note about available filters and a link to 'Ingrid Function Documentation'. A list of filters includes 'Monthly Climatology', 'anomalies', 'Integrate along T', 'Differentiate along T', and 'Take differences along T'. Below this is a 'Average over T' section with options for RMS, RMSA, Maximum, Minimum, Detrend, and unit conversion. At the bottom are social sharing icons and a 'Contact Us' button.

we can also get the anomalies through the Data Filters

