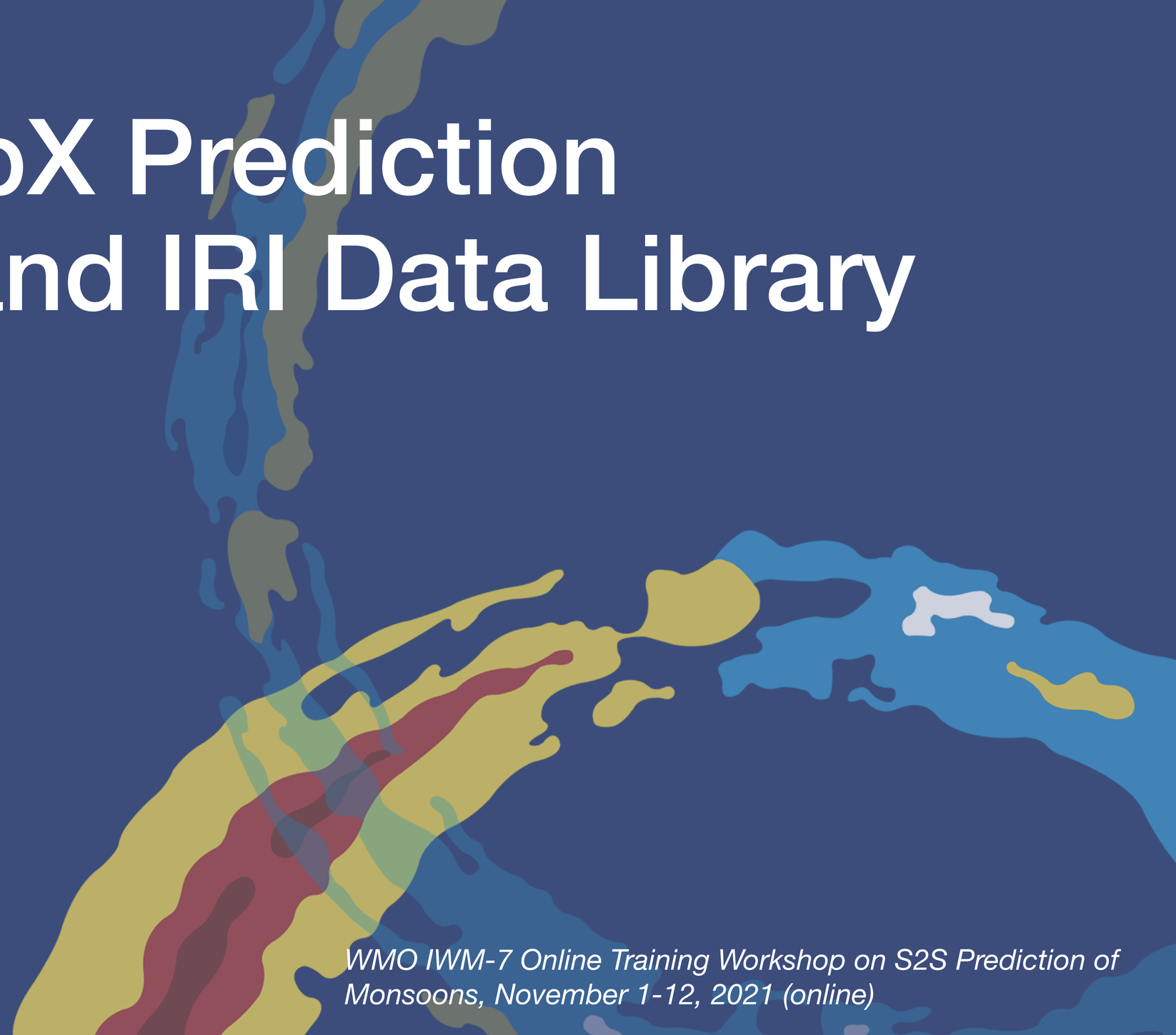
S2S and SubX Prediction Databases and IRI Data Library

Andrew W Robertson

International Research Institute for Climate and Society
Earth Institute | Columbia University



WMO IWM-7 Online Training Workshop on S2S Prediction of Monsoons, November 1-12, 2021 (online)

- The IRI Data Library hosts the Sub-seasonal to Seasonal Prediction Project (S2S) forecast and reforecast data downloaded from ECMWF for the research community.
- We download all forecasts and reforecasts of 11 S2S models.
- We are continuously downloading S2S 11 real-time forecast data (21-day delay), reforecast of 5 on-the-fly models and some newly updated models data.
- Most of the S2S database is archived at IRI, including Ocean data and MJO indices.
- 194 TB as of Sep 2021.
- Allows server-side and “lazy” computation tailored to specific user needs (eg weekly averaged anomalies of ensemble means, EOFs …)
- OpenDAP: User doesn’t need to download the data. Good for low-bandwidth context.
- Direct interface with Python R2O tools for MME, forecast calibration and verification.
- Model climatologies are now available.

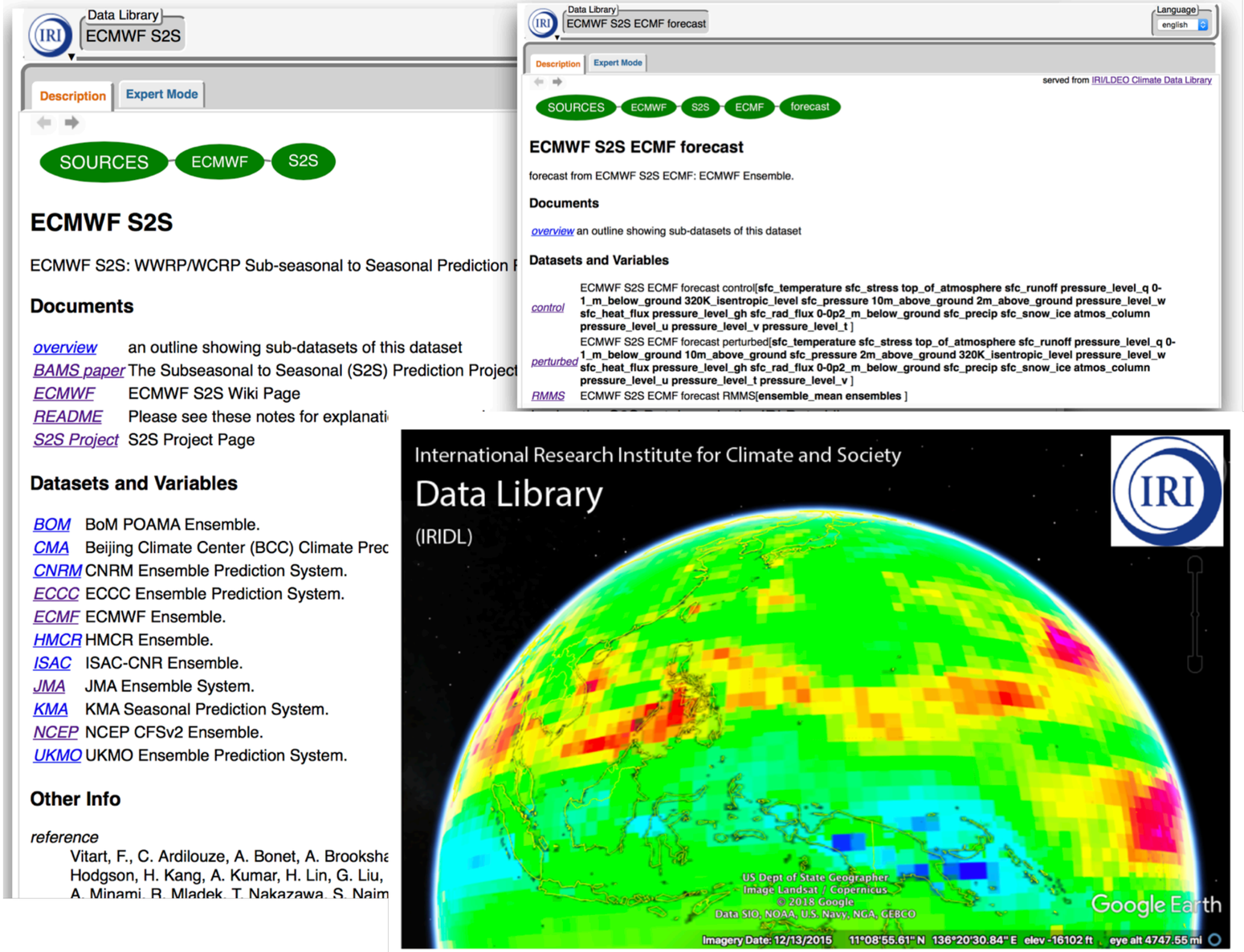


Figure 1. Visualization of an S2S forecast using Google Earth. Data was post-processed and downloaded from the IRI Data Library.

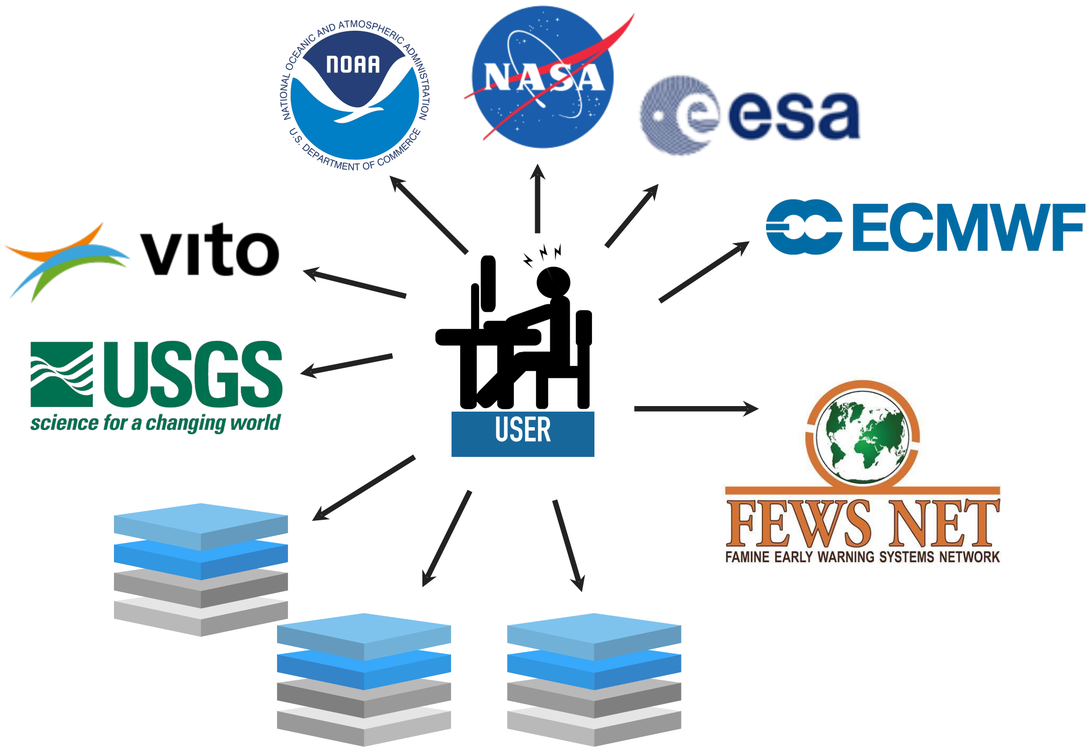
Outline

1. The International Research Institute for Climate and Society Data Library (IRIDL) - Server-side computing

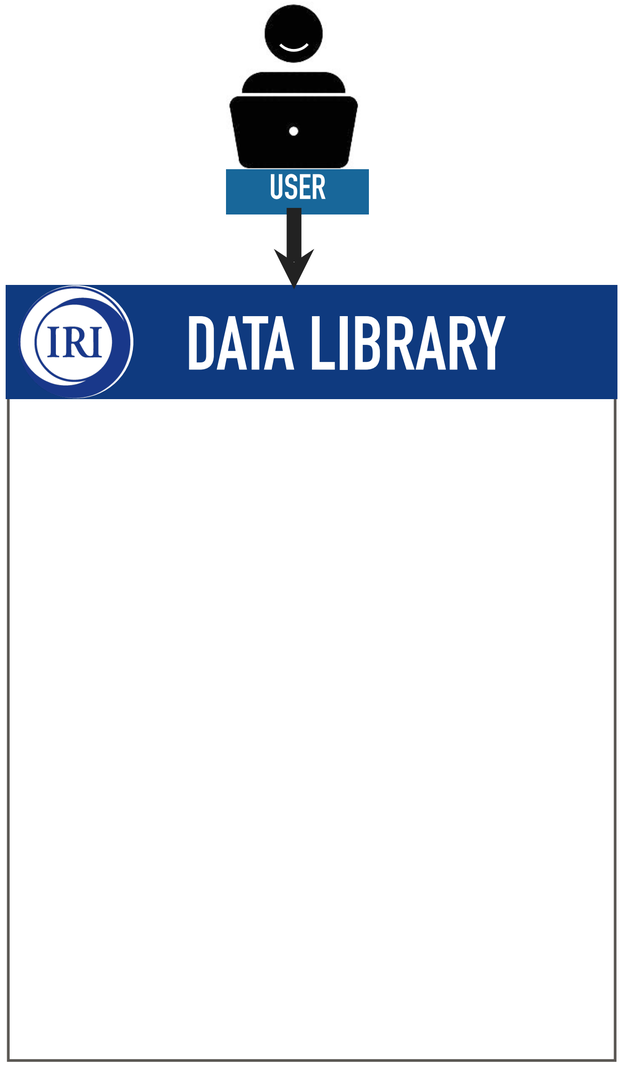
2. S2S & SubX databases in IRIDL - Holdings and data access

3. Examples of online analysis of S2S forecasts and reforecasts

CENTRAL ACCESS POINT



WHAT DATA DO I NEED?
WHERE CAN I GET THAT DATA?



ADVANTAGES

The Data Library is a powerful open-source and free computational engine that offers a multi-lingual web browser interface that enables users to:

01 Access, manage, combine and manipulate any number of datasets in a uniform temporal and geolocated framework

02 Create analyses of data using a high-level programming language and hundreds of built in functions

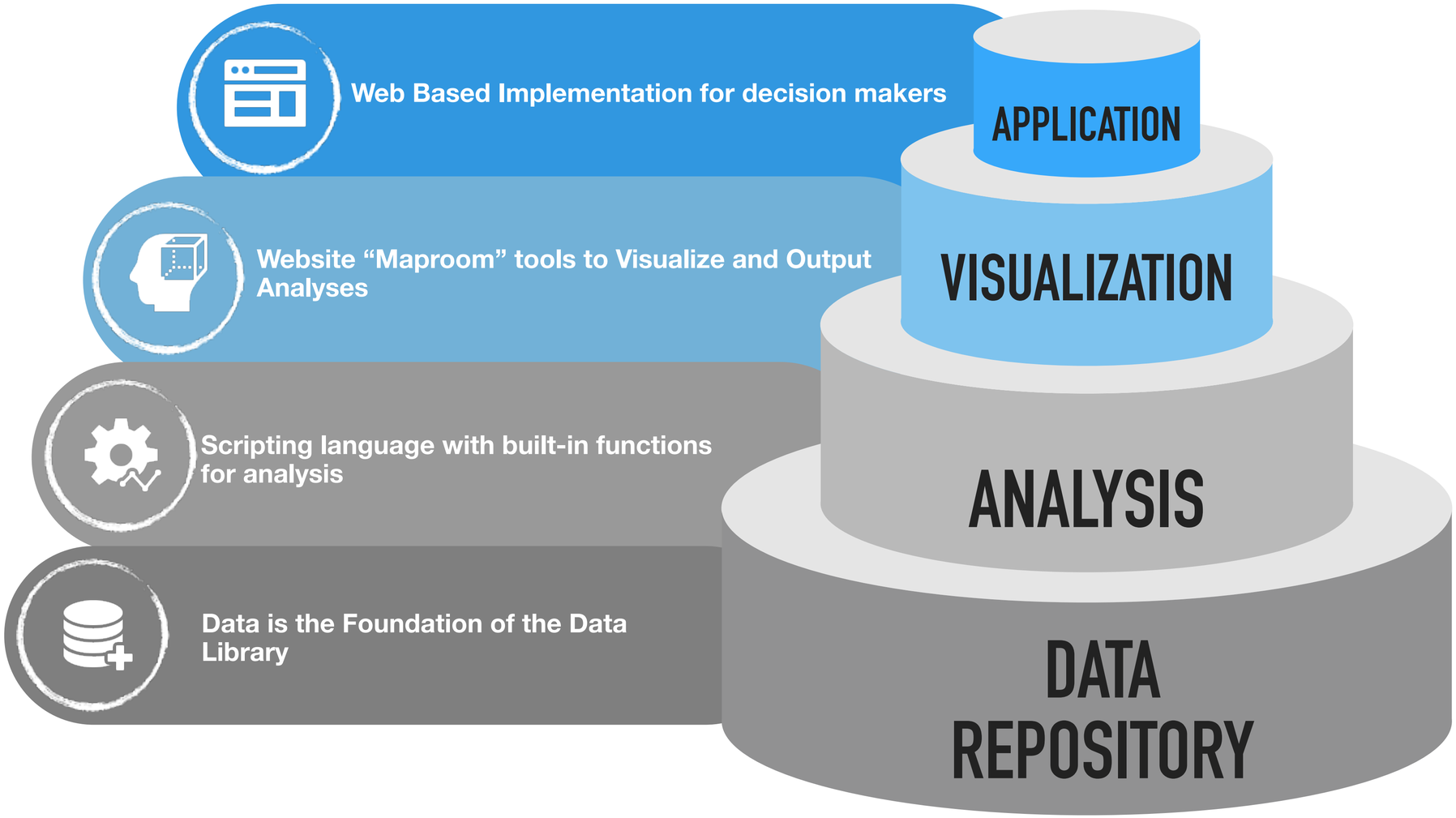
03 Monitor past and present climate/environmental conditions & Forecasts with maps and analyses

04 Create multi-dimensional visual representations of climate and data impacted by climate

05 Customize and download data plots and maps

06 Create lightweight client-side user interfaces (e.g., Maprooms) for use by decision makers.

DATA LIBRARY OVERVIEW



IRI/LDEO Climate Data Library

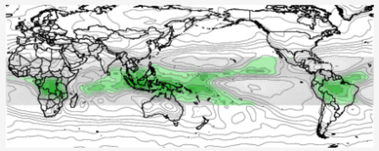
The IRI Data Library is a powerful and freely accessible online data repository and analysis tool that allows a user to view, analyze, and download hundreds of terabytes of climate-related data through a standard web browser.

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

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

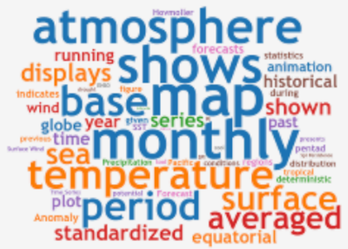
Datasets organized by source, i.e. creator and/or provider.

Data By Category

Selected Datasets for particular topics

Dataset and Map Room Browser

Find datasets and maps organized by many characteristics and keywords



Navigating Through the IRI Data Library: A Tutorial

The goal of this tutorial is to introduce you to the structure of the Data Library and the many ways to navigate through it.

Statistical Techniques in the Data Library: A Tutorial

Statistical techniques are essential tools for analyzing large datasets; this statistics tutorial thus covers essential skills for many data library users.

Function Index

Index for functions that can be used to analyze data within the Data Library.

Help Resources

The Help Resources include basic and statistics tutorials, function documentation, and other resources to help you get the maximum utility out of the Data Library

S2S database models

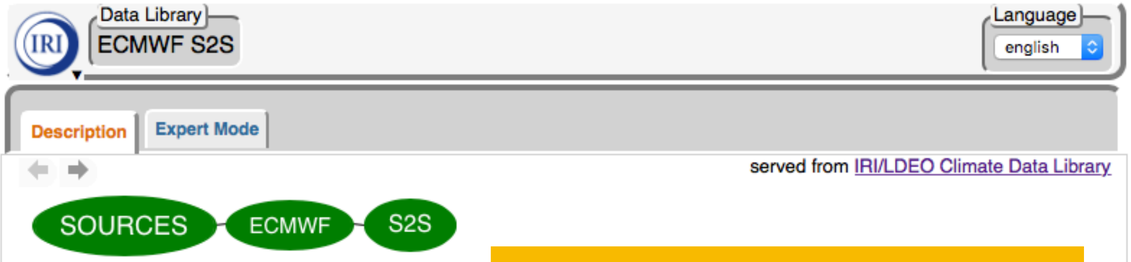
Forecasts

Hindcasts

Status on 5th January 2018	Time range	Resolution	Ens. Size	Frequency	Re-forecasts	Rfc length	Rfc frequency	Rfc size
BoM (ammc)	d 0-62	T47L17	3*11	2/week	fix	1981-2013	6/month	3*11
CMA (babj)	d 0-60	T106L40	4	daily	fix	1994-2014	daily	4
CNR-ISAC (isac)	d 0-32	0.75x0.56 L54	41	weekly	fix	1981-2010	every 5 days	5
CNRM (lfpw)	d 0-32	T255L91	51	weekly	fix	1993-2014	2/month	15
ECCC (cwao)	d 0-32	0.45x0.45 L40	21	weekly	on the fly	1995-2014	weekly	4
ECMWF (ecmf)	d 0-46	Tco639/319 L91	51	2/week	on the fly	past 20 years	2/week	11
HMCR (rums)	d 0-61	1.1x1.4 L28	20	weekly	on the fly	1985-2010	weekly	10
JMA (rjtd)	d 0-33	TI479/TI319L100	50	weekly	fix	1981-2010	3/month	5
KMA (rksl)	d 0-60	N216L85	4	daily	on the fly	1991-2010	4/month	3
NCEP (kwbc)	d 0-44	T126L64	16	daily	fix	1999-2010	day	4
UKMO (egrr)	d 0-60	N216L85	4	daily	on the fly	1993-2015	4/month	7

see s2sprediction.net for details and how to access the S2S data

S2S and SubX databases in IRI Data Library



Three weeks behind real time

ECMWF S2S

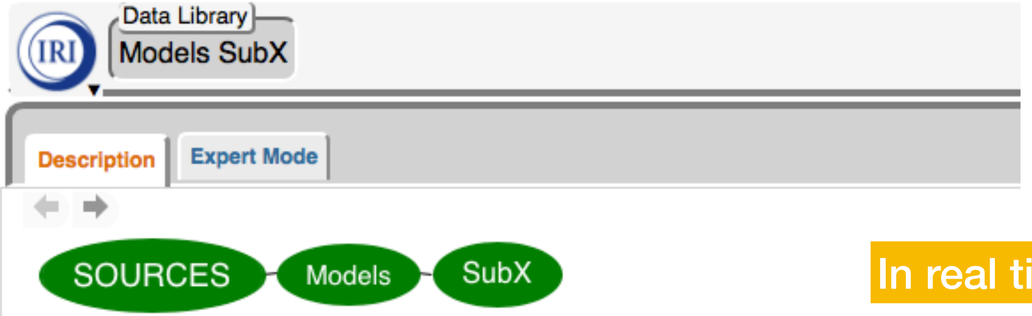
ECMWF S2S: WWRP/WCRP Sub-seasonal to Seasonal Prediction Project.

Documents

overview	an outline showing sub-datasets of this dataset
BAMS paper	The Subseasonal to Seasonal (S2S) Prediction Project Database
ECMWF	ECMWF S2S Wiki Page
Model Table	S2S Model Description Table at ECMWF S2S Wiki Page
README	Please see these notes for explanation on accessing and using the S2S Database in the IRI Data Library
S2S Project	WWRP/WCRP S2S Project Page
Wiki	IRI Wiki Page with IRIDL S2S data examples

Datasets and Variables

BOM	BoM POAMA Ensemble.
CMA	Beijing Climate Center (BCC) Climate Prediction System version 1 for S2S.
CNRM	CNRM Ensemble Prediction System.
ECCC	ECCC Ensemble Prediction System.
ECMF	ECMWF Ensemble.
EI	Era Interim Reanalysis.
HMCR	HMCR Ensemble.
ISAC	ISAC-CNR Ensemble.
JMA	JMA Ensemble System.
KMA	KMA Seasonal Prediction System.
NCEP	NCEP CFSv2 Ensemble.
UKMO	UKMO Ensemble Prediction System.



In real time!

Models SubX

Models SubX: Subseasonal Experiment (SubX).

Documents

overview	an outline showing sub-datasets of this dataset
CTB	NOAA Climate Test Bed Website
DataCite DOI Metadata	DOI:10.7916/D8PG249H
SubX Data Information	Model/Data Information from SubX Project Website
SubX Project	SubX Project Website

Datasets and Variables

CESM	Models SubX CESM[**30LCESM1 46LCESM1**]
ECCC	Models SubX ECCC[**GEM**]
EMC	Models SubX EMC[**GEFS**]
ESRL	Models SubX ESRL[**FIMr1p1**]
GMAO	Models SubX GMAO[**GEOS_V2p1**]
NCEP	Models SubX NCEP[**CFSv2**]
NRL	Models SubX NRL[**NESM**]
RSMAS	Models SubX RSMAS[**CCSM4**]

http://iridl.ldeo.columbia.edu

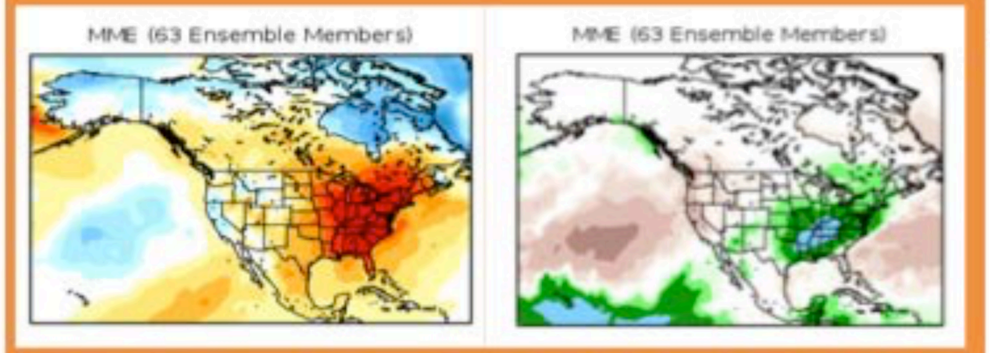
International Research Institute for Climate and Society
Earth Institute | Columbia University

The Subseasonal eXperiment (SubX)

By the Numbers...

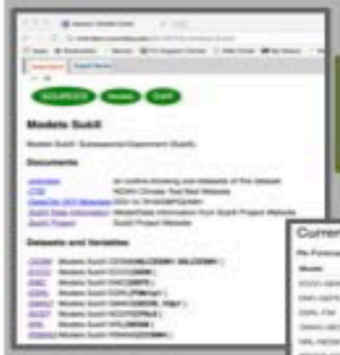
7 Global Models
17 Years of Retrospective Forecasts
1 Year of Real-time Forecasts
3-4 Week guidance for CPC Outlooks

Real-time Multi-model Forecasts

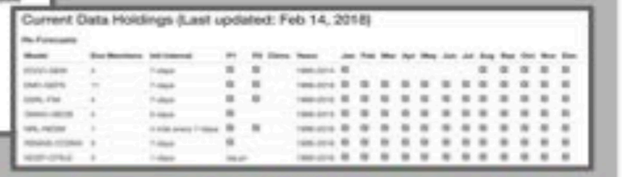


SubX Team

IRI Data Library

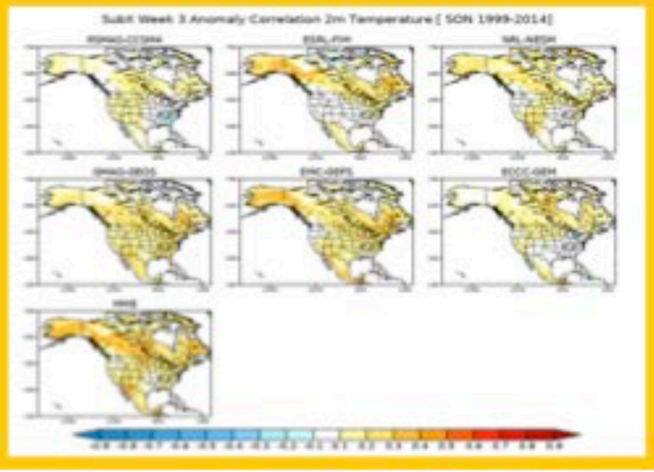


Forecast & Hindcast data publicly available



http://iridl.ldeo.columbia.edu/SOURCES/.Models/.SubX/

Skill Evaluation



http://cola.gmu.edu/kpegion/subx

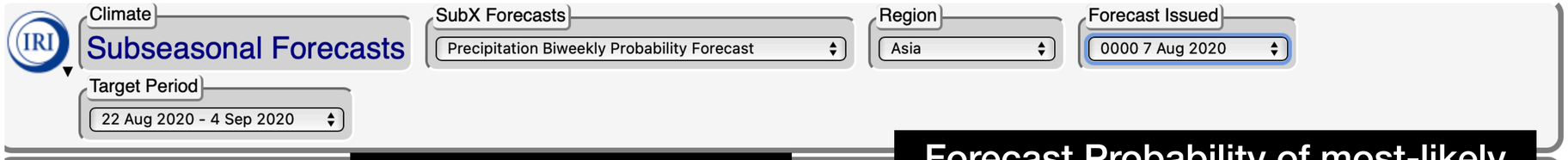
MAPP Modeling, Analysis, Predictions, and Projections

Environment Canada

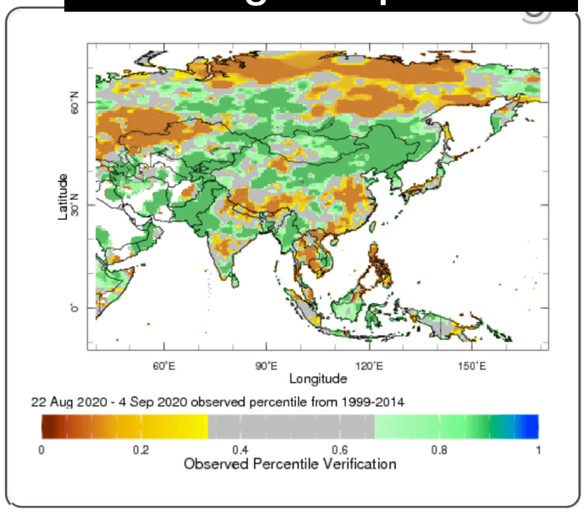
Courtesy of Kathy Pegion

SubX Real-Time Calibrated MME Maproom

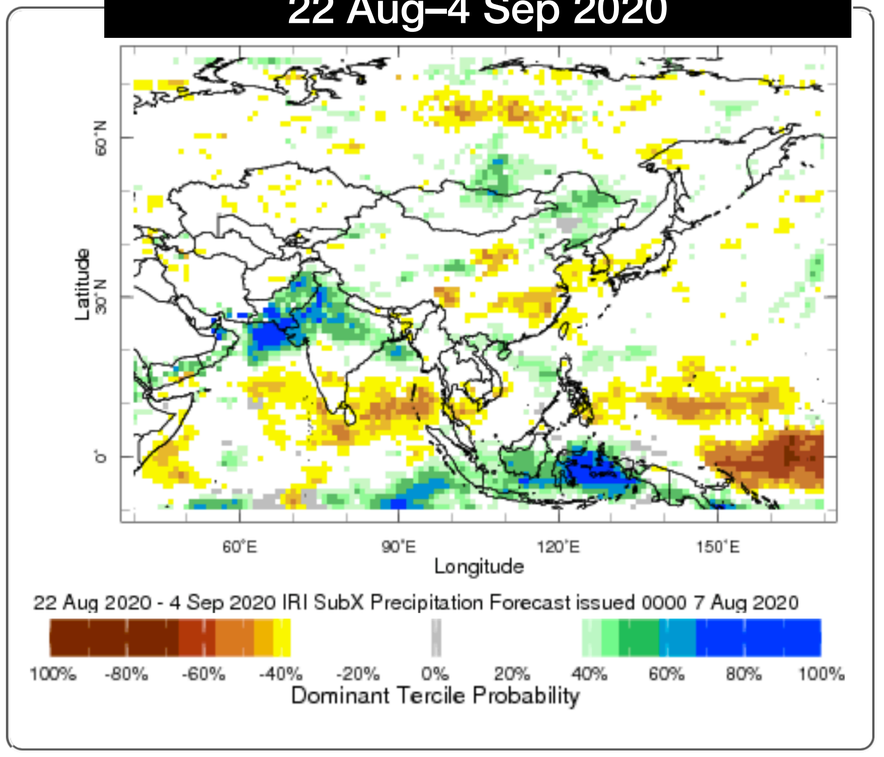
Precipitation Example: Aug 7, 2020



Observed percentile
22 Aug–4 Sep 2020



Forecast Probability of most-likely Tercile Category
22 Aug–4 Sep 2020



Precipitation Biweekly Probability Forecast

Calibrated Subseasonal tercile category biweekly-precipitation forecasts from the Subseasonal eXperiment (SubX)

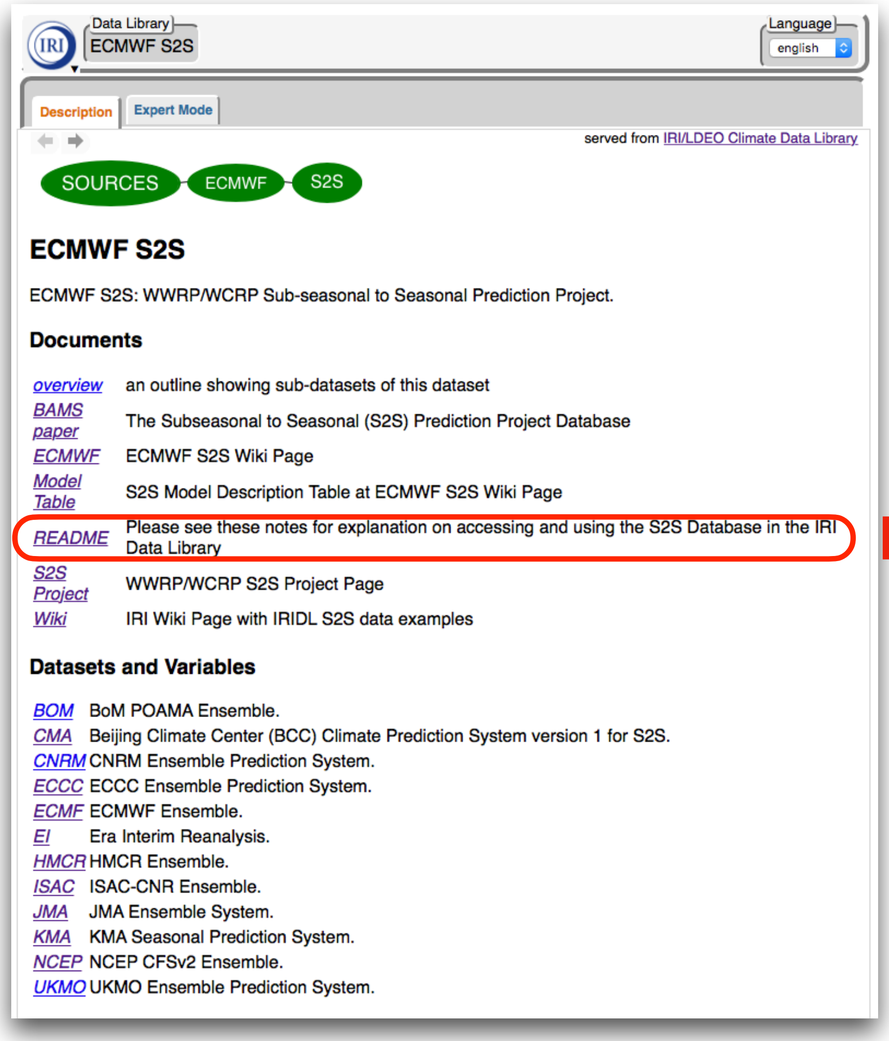
The default map shows the latest forecast for weeks 2-3 ahead (i.e. the 14-day Saturday-Friday target period, 9 to 22 days after the forecast is issued), as probability of the dominant tercile category. Previous forecasts can be viewed through the control bar menu. The weeks 3-4 forecast (i.e. the 14-day target period, 16 to 29 days after the forecast is issued) is also available. New forecasts are issued weekly on Fridays.

When navigating to a forecast of which Target Period is in the past, a smaller side map shows a verification of the forecast as the observed tercile values according to the 1999-2014 training period of the calibration of the forecast.

Issued every Friday
Based on 3 NOAA models:
CFSv2, GEFS, ESRL-FIM
Calibrated using extended logistic regression

http://iridl.ldeo.columbia.edu/maproom/Global/ForecastsS2S/

International Research Institute for Climate and Society
Earth Institute | Columbia University



README

README on using the S2S Database in IRI Data Library (Updated Feb 22, 2018)

1. The data is archived under http://iridl.ldeo.columbia.edu/SOURCES/.ECMWF/.S2S/
2. The data is a copy of the data from the ECMWF S2S MARS server and is maintained up to date with the ECMWF server as far as possible.
3. The full S2S dataset should be available, except for the HMCR, ISAC & KMA models which are archived on a 2.5-deg grid, instead of 1.5 deg. The IRI data starts in May 2015.
4. The RMM indices computed by Frederic Vitart are also available. Steve Woolnough & Tetsuo Nakazawa contributed on the validation and format definition.
5. In order to download S2S data from IRI, the user is required to agree to the ECMWF S2S Terms and Conditions, via signing in to the Data Library's authorization framework: Select the "Social" option near the top of the page and then choose from one of the "Persona" sign-in account options in the drop-down menu that appears, such as Google, Facebook, or Twitter to then gain access to the download options.
6. Visualization of the data does not require sign-in.
7. The forecast/reforecast **start time grid** is continuous in days, even when the respective starts are not every day. Non-existent start dates are padded with missing data. Please refer to the model table. https://software.ecmwf.int/wiki/display/S2S/Models
8. For on-the-fly models, the reforecasts have an additional **hdate** grid indicating the reforecast year.
9. Explanation of **Lead grids**:

   Different lead grids are used based upon whether the variable reflects an instantaneous value or the average over a day:

   L: This represents a lead grid for variables with instantaneous values, with the lead grid starting at the initialization (0.), and pointwidth of 0. (except for JMA, where the first step is 0.5, representing a 12-hour forecast, and pointwidth of 0.)

   L1: This represents a lead grid for variables with instantaneous values, with the lead grid starting at lead 1., and pointwidth of 0.

   LA: This represents a lead grid for daily average values starting at lead 0.5, and pointwidth of 1. (except for JMA, where the first step is 1.0, representing 12-36 hour average, and pointwidth of 1.)

Data Library
ECMWF S2S ECMF

Description | Expert Mode

SOURCES > ECMWF > S2S > ECMF

ECMWF S2S ECMF

ECMWF S2S ECMF: ECMWF Ensemble.

Documents

overview an outline showing sub-datasets of this dataset

Datasets and Variables

forecast ECMWF S2S ECMF f
reforecast ECMWF S2S ECMF r

Data Library
ECMWF S2S ECMF forecast perturbed sfc_precip tp
X 0.75W - 0.75W
Y 90.75S - 90.75N
S 14 May 2015 - 10 Mar 2019

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

SOURCES > ECMWF > S2S > ECMF > forecast > perturbed > sfc_precip > tp

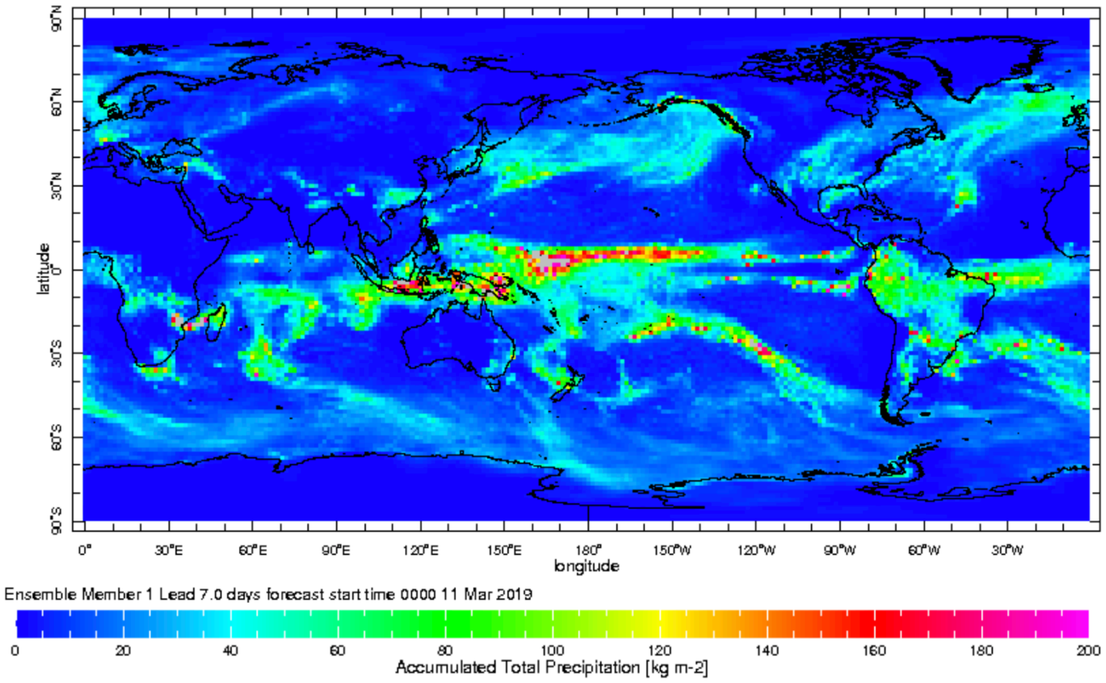
ECMWF S2S ECMF forecast perturbed sfc_precip tp: Accumulated Total Precipitation data

forecast perturbed sfc_precip Accumulated Total Precipitation from ECMWF S2S ECMF: ECMWF Ensemble.

Independent Variables (Grids)

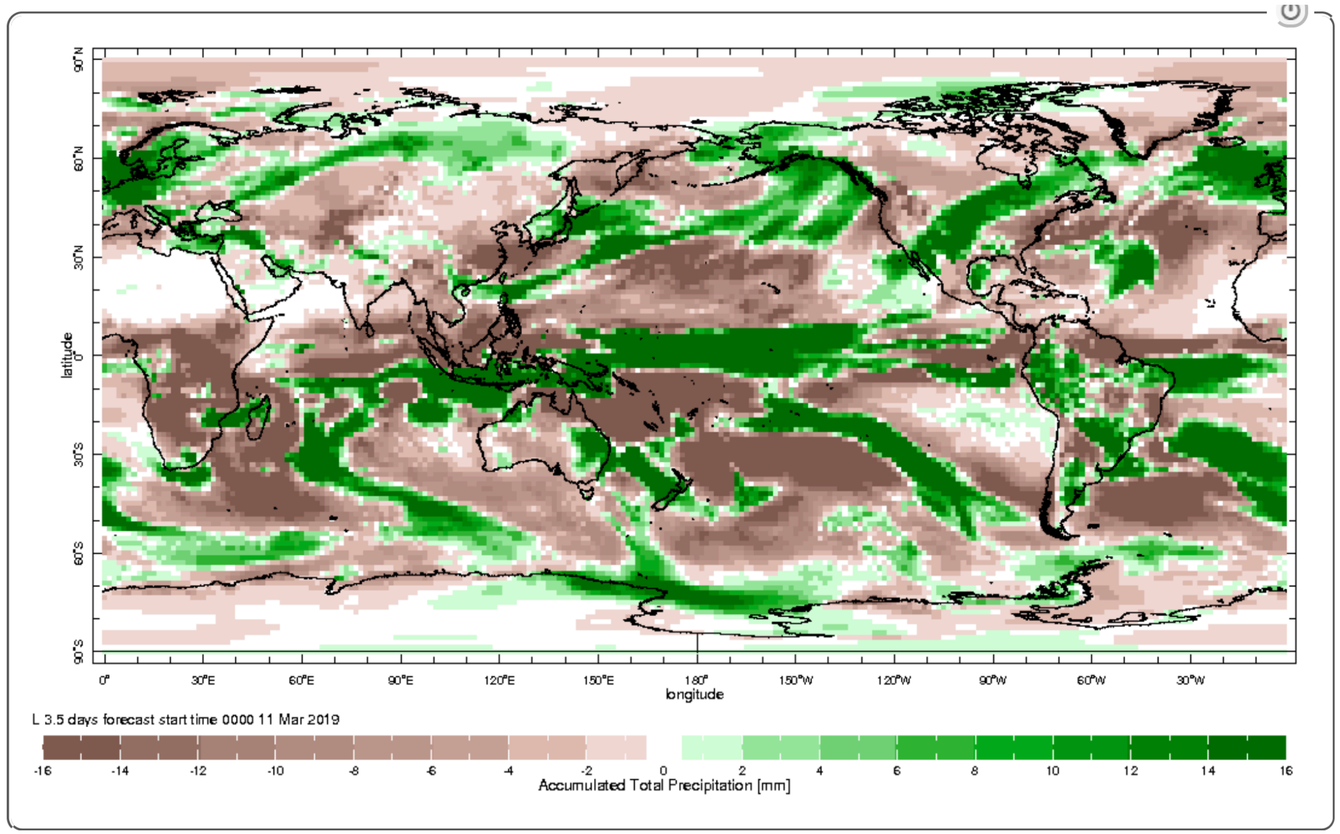
Lead (forecast_period)
grid: /L (days) ordered (0.0 days) to (46.0 days) by 1.0 N= 47 pts :grid
Ensemble Member (realization)
grid: /M (ids) ordered (1) to (50) by 1.0 N= 50 pts :grid
forecast start time (forecast_reference_time)
grid: /S (days since 1960-01-01) ordered [(0000 14 May 2015) (0000 18 May 2015) (0000 21 May 2015) ... (0000 11 Mar 2019)] N= 400 pts :grid
longitude (longitude)

Ensemble Member 1 | 1 | 50
Lead 0.0 | 7.0 | 46.0
forecast start time 0000 14 May 2015 | 0000 11 Mar 2019 | 0000 11 Mar 2019



Week 1 Precip
From 11 Mar 2019

Week 1 Precip Ensemble Mean Anomaly from 11 Mar 2019



Map is a URL!

http://iridl.ldeo.columbia.edu/SOURCES/.ECMWF/.S2S/.ECMF/.forecast/.perturbed/.sfc_precip/.tp/S/%280000%2011%20Mar%202019%29/VALUES/%5BM%5Daverage/L/0.0/7.0/VALUES/%5BL%5Ddifferences/SOURCES/.ECMWF/.S2S/.ECMF/.reforecast/.perturbed/.sfc_precip/.tp/S/%280000%2011%20Mar%202019%29/VALUES/%5BM%5Daverage/L/0.0/7.0/VALUES/%5BL%5Ddifferences/%5Bhdate%5Daverage/sub/c://name//water_density/def/998/%28kg/m3%29/:c/div/%28mm%29/unitconvert/prcp_anomaly/Y/-90/90/RANGE/X/Y/fig:/colors/thinnish/solid/coasts_gaz/:fig//plotborder+72+psdef//plotaxislength+432+psdef/#expert

Ingrid Code

```
SOURCES .ECMWF .S2S .ECMF .forecast .
perturbed .sfc_precip .tp
  S (0000 11 Mar 2019) VALUES
  [M]average
  L 0.0 7.0 VALUES
  [L]differences

SOURCES .ECMWF .S2S .ECMF .reforecast
.perturbed .sfc_precip .tp
   S (0000 11 Mar 2019) VALUES
   [M]average
   L 0.0 7.0 VALUES
   [L]differences
   [hdate]average
   sub
  c:
   /name /water_density def
   998 (kg/m3) :c
   div
  (mm) unitconvert
  prcp_anomaly
  Y -90 90 RANGE
  X Y fig: colors thinnish solid
coasts_gaz :fig
```

load

start

ensem

leads

accum

load

start

ensem

leads

climo

cbar

Ocean data example:
ECMWF Week 3-4 Sea Level Deviation Anomaly Forecast from 27 Aug 2020

Language: english

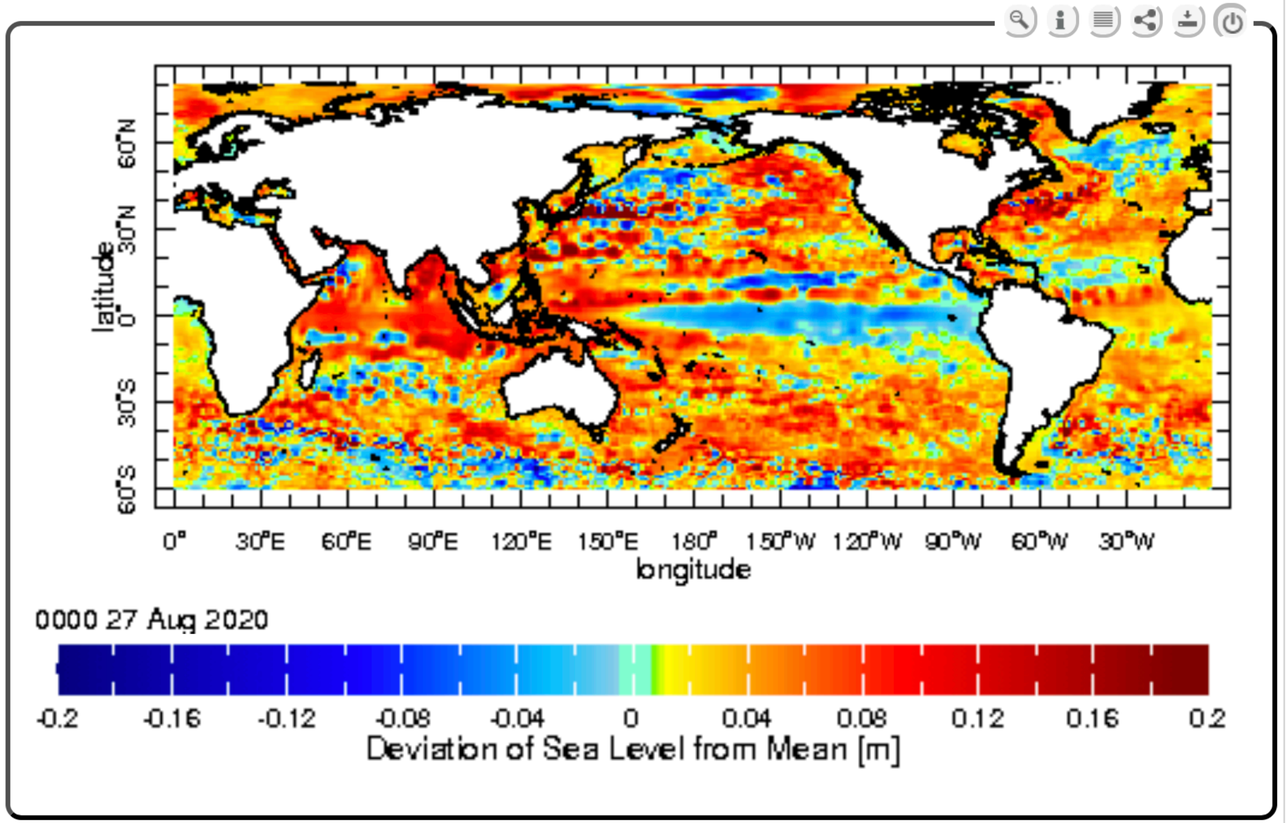
Data Library

mean mean [ECMWF S2S ECMF forecast perturbed ocean zos] - mean mean [ECMWF S2S ECMF reforecast perturbed ocean zos] 0000 27 Aug 2020

Description | Expert Mode | Options | Instructions

```
SOURCES .ECMWF .S2S .ECMF .forecast .perturbed
.ocean .zos
 S (0000 27 Aug 2020) VALUES
 [M]average
 LA (14) (28) RANGE
 [LA]average
 SOURCES .ECMWF .S2S .ECMF .reforecast .perturbed
.ocean .zos
  S (0000 27 Aug 2020) VALUES
  [M hdate]average
  LA (14) (28) RANGE
  [LA] average
  sub
 sstacolorscale
 Y -60 80 RANGE
 DATA -0.2 0.2 RANGE
 X Y fig: colors thinnish solid coasts_gaz :fig
```

OK reset



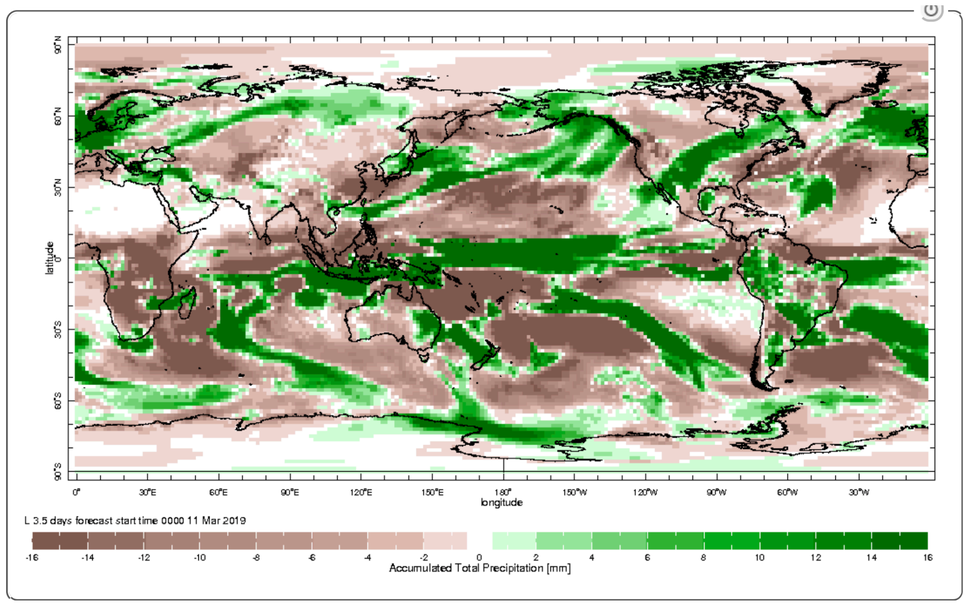
- mean mean [ECMWF S2S ECMF forecast perturbed ocean zos] - mean mean [ECMWF S2S ECMF reforecast perturbed ocean zos] 0000 27 Aug 2020[X Y I S]
- grid: /X (degree_east) periodic (0) to (1W) by 1.0 N= 360 pts :grid
- grid: /Y (degree_north) ordered (60S) to (80N) by 1.0 N= 141 pts :grid
- fig: colors thinnish solid coasts_gaz :fig

EPSG:4326

EPSG:4326 -180 -60.5 180 80.5 1.0 1.0

Map computed in IRIDL without S2S login.
No data is downloaded.
The analysis+plot is a URL!

http://iridl.ldeo.columbia.edu/SOURCES/.ECMWF/.S2S/.ECMF/.forecast/.perturbed/.ocean/.zos/S/(0000%2027%20Aug%202020)/VALUES/%5BM%5Daverage/LA/(14)/(28)/RANGE/%5BLA%5Daverage/SOURCES/.ECMWF/.S2S/.ECMF/.reforecast/.perturbed/.ocean/.zos/S/(0000%2027%20Aug%202020)/VALUES/%5BM/hdate%5Daverage/LA/(14)/(28)/RANGE/%5BLA%5D/average/sub/sstacolorscale/Y/-60/80/RANGE/DATA/-0.2/0.2/RANGE/X/Y/fig%3A/colors/thinnish/solid/coasts_gaz/%3Afig/#expert



Data Download

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

[mean (ECMWF S2S ECMF forecast perturbed sfc_precip tp) - mean mean (ECMWF S2S ECMF reforecast perturbed sfc_precip tp)] / water_density 3.5 days 0000 11 Mar 2019 Data Files

This dataset has bytes (116160 0.1107788MB) of data in it, which should give you a rough idea of the size of any file that you ask for.

Download Data To Specific Software

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 wa for food security. More information

Other Available File 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 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

Authentication

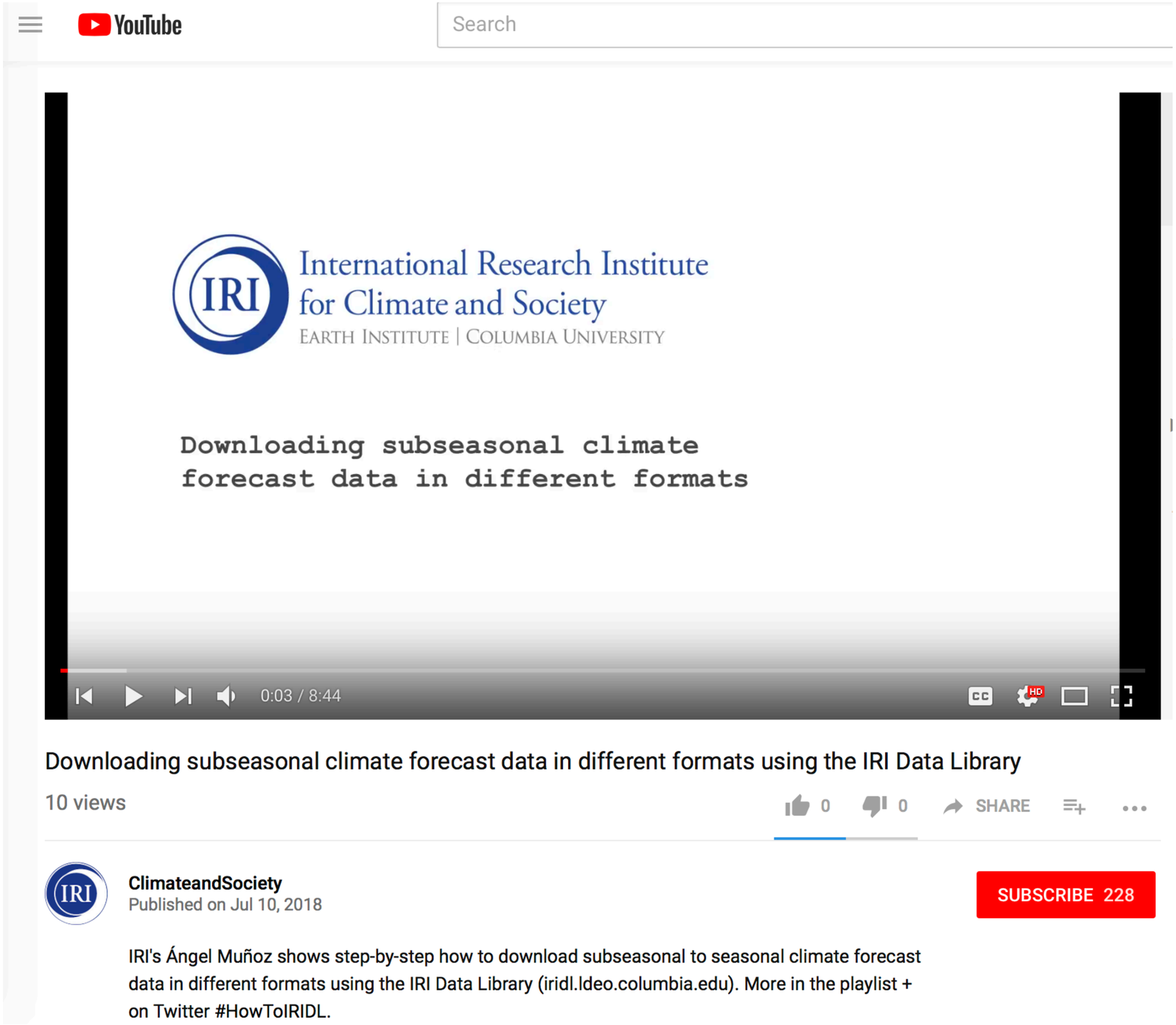
Local | OpenID | Social

Social sign in

Google

Sign in | Cancel

Tutorial Videos



2 2xtoNaN8

: :butt_filter
:c
:cressman
:Water_Balance
:WCT
:weaver

A abrat
abs
absolute value: abs
acosd
add
add_variable
addGRID
addGRIDlast
anomaly: wasp 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: average boxAverage dekadalAverage monthlyAverage monthlyMAVE monthlyMAVE_SD monthlymean pentadAverage pentadMAVE pentadmean runningAverage seasonalAverage weighted-average yearlyAverage

B beginLoop
beta
bias_mean
Binary Data Flags: flagge flaggt flagle flaglt
BofA=C
BofA=C-bounded
boxAverage
butt_design
Butterworth: :butt_filter butt_design

C categorical form: classify classifyby dominant_class
Categorization: classify classifyby distrib distrib1D distrib2D dominant_class
cca
changetruncation
classify
classifyby
climatology: yearly-climatology
Clustering: k-means136
CofA=B
CofA=B-bounded
Comparing Data: flagge flaggt flagle flaglt maskge maskgt maskle masklt max min
complete disjunctive form: classify classifyby dominant_class

geometryintersection
geometryintersects
geometrylength
geometryoverlaps
geometrysimplify
geometrytoposimplify
geometrytouches
geometryunion
geometrywithin
georect
ginverse
GRID
Grid Modification: GRID regridAverage removeGRID renameGRID replaceGRID SAMPLE_MISSING shiftdata shiftdatashort shiftGRID splitstreamgrid unsplitstreamgrid zeropointwidth
gridtomatch
gridtomatchnamed
grouptogrid
Growing Season: onsetDate seasonalLLS

H hbrier
Health and Climate Functions: k-means136 monthly3Q monthlyepithresholds monthlyMAVE monthlyMAVE_SD monthlyMAVEplus1p96SD monthlyMAVEplus1SD monthlyMAVEplus2SD monthlymean monthlymeanplus1SD monthlymeanplus2SD monthlySD pentad3Q pentadepithresholds pentadMAVE pentadMAVE_SD pentadMAVEplus1p96SD pentadMAVEplus1SD pentadMAVEplus2SD pentadmean pentadmeanplus1SD pentadmeanplus2SD pentadSD weeklytomonthly weeklytopentad
heidke
hh2c2010
hh2cfews
hh2geometry: hh2c2010 hh2cfews hh2province hh2sap
hh2province
hh2sap

I ignorance
Independent Variable Creation: :cressman :weaver classify classifyby grouptogrid invertontogrid shiftdata shiftdatashort toS
Independent Variable Modification: GRID partitiongrid regridAverage regridLB regridLinear removeGRID renameGRID replaceGRID SAMPLE_MISSING shiftdata shiftdatashort shiftGRID splitstreamgrid unifygrids use_as_grid
integral
integrate
integrateddistrib1D
integrateddistrib2D
invertontogrid
invlaplacian
isolines

K k-means136

L L4cycle:endLoop
labelgeoldintersects

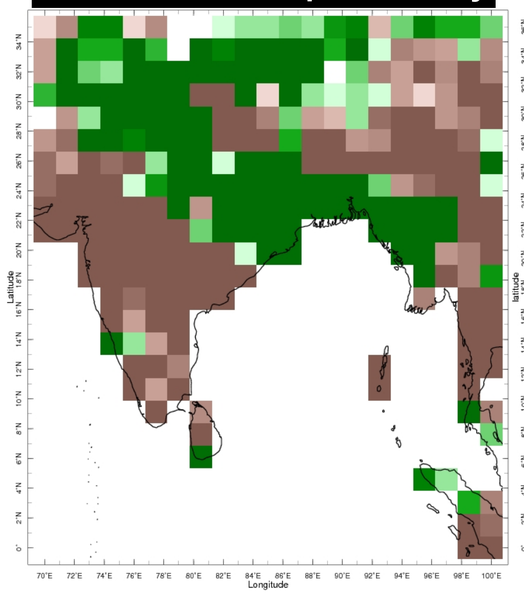
poestudnt2
potemp
pressure
prob_score
products

R randomdata
RANGE
RANGEEDGES
RANGESPAN
rankcorrelate
ranked_prob_score
Ranking Data: datarank
rasterize
ratios
readgrib
readthredds
rect
regridAverage
Regridding: GRID regridAverage regridLB regridLinear weeklytopentad
regridLB
regridLinear
removeGRID
removeVALUES
renameGRID
REORDER
replacebypercentile
replaceGRID
replaceNaN
RESCALE
rmsaover
rmsover
root mean square: rmsover
root mean square anomaly: rmsaover
rotated EOFS: varimax
rotatedata
runningAverage

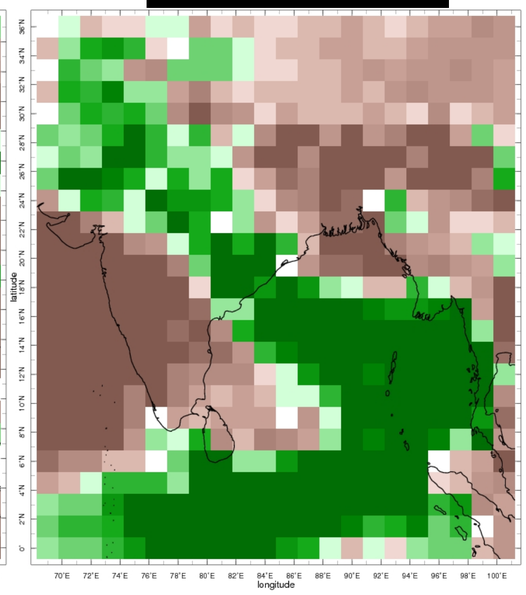
S SAMPLE
Sample by Variable: FResampler sample-along
sample-along
SAMPLE_MISSING
SAMPLELB
SAMPLEUB
SCALE
Scaling Data: RESCALE SCALE
seasonalAverage
seasonalfreqGT
seasonalfreqLT
seasonalLLS

Example: Active episode of Indian summer Monsoon

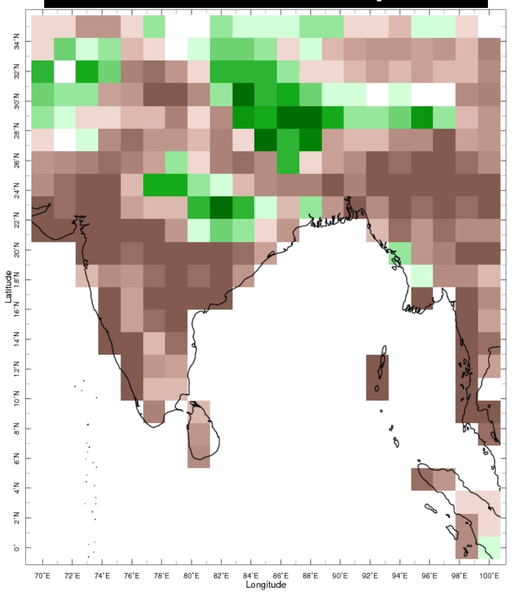
Observed Precip Anomaly



Week 3 Forecast



MJO Phase 8 Composite



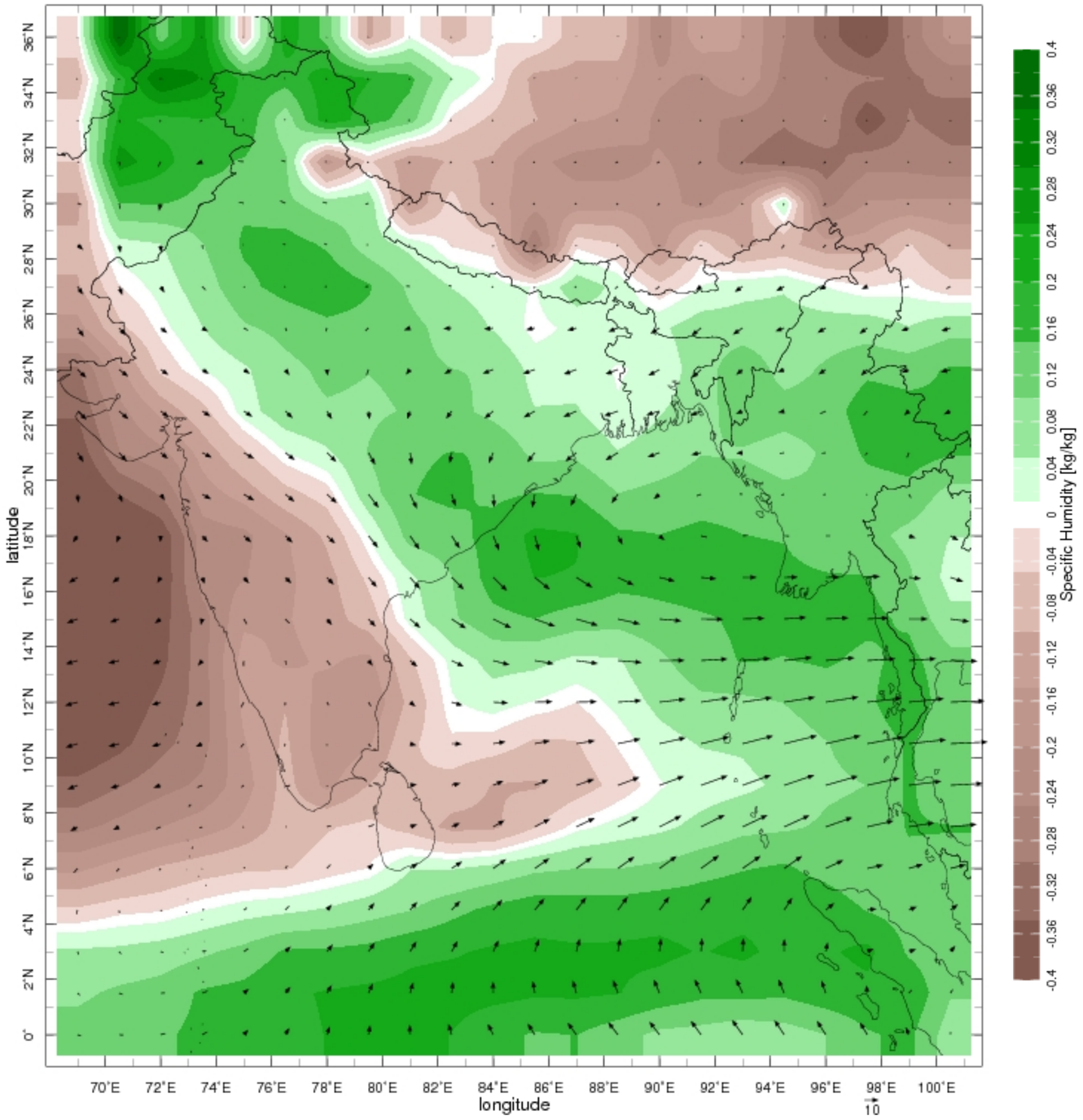

```
SOURCES .ECMWF .S2S .ECMF .forecast .perturbed .sfc_precip .tp
 Y (0N) (35N) RANGE
 X (70E) (100E) RANGE
 S (0000 22 Jun 2015) VALUES
 [M]average
 L (14.0) (21.0) VALUES
 [L]differences

SOURCES .ECMWF .S2S .ECMF .reforecast .perturbed .sfc_precip .tp
  Y (0N) (35N) RANGE
  X (70E) (100E) RANGE
  S (0000 22 Jun 2015) VALUES
  [M]average
  L (14.0) (21.0) VALUES
  [L]differences
  [hdate]average
  sub
```

Week 3 Forecast Code

MJO Phase 8 Composite Code

```
SOURCES .UCSB .CHIRPS .v2p0 .daily-
improved .global .0p25 .prcp
  T (1 Jan 1995) (31 Dec 2014) RANGE
  X 70 1.5 100 GRID
  Y 0 1.5 35 GRID
  a: SOURCES .BoM .MJO .RMM .phase
     T (1 Jan 1995) (31 Dec 2014) RANGE
     classifyby
    T (Jun-Jul) seasonalAverage
    [T]average
    :a:
     T (Jun-Jul) seasonalAverage
     [T]average
     :a
   sub
```



ECMWF week-3 forecast anomalies of vertically integrated moisture flux (vectors) and vertically integrated specific humidity (colors)

S2S Model Daily Lead-Dependent Climatologies

http://iridl.ldeo.columbia.edu/SOURCES/.ECMWF/.S2S/.climatologies/

Data Library
ECMWF S2S climatologies

Description | Expert Mode

SOURCES — ECMWF

ECMWF S2S climato

climatologies from ECMWF S2S:

Documents

overview an outline showing sub

Datasets and Variables

hindcast ECMWF S2S climatolc
observed ECMWF S2S climatolc

Last updated: *Fri, 18 Sep 2020 1*

Data Library
ECMWF S2S climatologies hindcast

Description | Expert Mode

SOURCES — ECMWF — S2S — climatologies — hindcast

ECMWF S2S climatologies hindcast

climatologies hindcast from ECMWF S2S: WWRP/WCRP S

Documents

overview an outline showing sub-datasets of this dataset

Datasets and Variables

BOM ECMWF S2S climatologies hindcast BOM[**2tClim tp**
CMA ECMWF S2S climatologies hindcast CMA[**S2Sv1_t**
CNRM ECMWF S2S climatologies hindcast CNRM[**2tClim**
ECMF ECMWF S2S climatologies hindcast ECMF[**2tClim**
JMA ECMWF S2S climatologies hindcast JMA[**2tClim tp**
NCEP ECMWF S2S climatologies hindcast NCEP[**2tClim**
UKMO ECMWF S2S climatologies hindcast UKMO[**2tClim**

Last updated: *Fri, 18 Sep 2020 19:28:54 GMT*

Data Library
ECMWF S2S climatologies hindcast ECMF

Description | Views | Data Selection | Data Files | Data Tables | Expert Mode

SOURCES — ECMWF — S2S — climatologies — hindcast — ECMF

ECMWF S2S climatologies hindcast ECMF

climatologies hindcast ECMF from ECMWF S2S: WWRP/WCRP Sub-seasonal to Seasonal Prediction Project.

Documents

outline an outline showing all sub-datasets and variables contained in this dataset

Datasets and Variables

2-meter Temperature - climatology	ECMWF S2S climatologies hindcast ECMF 2tClim[X Y I LA S]
2-meter Temperature - triangular smoothing climatology	ECMWF S2S climatologies hindcast ECMF 2tSmooth[X Y I LA S]
Accumulated Total Precipitation - climatology	ECMWF S2S climatologies hindcast ECMF tpClim[X Y I L S]
Accumulated Total Precipitation - triangular smoothing climatology	ECMWF S2S climatologies hindcast ECMF tpSmooth[X Y I L S]

Independent Variables (Grids)

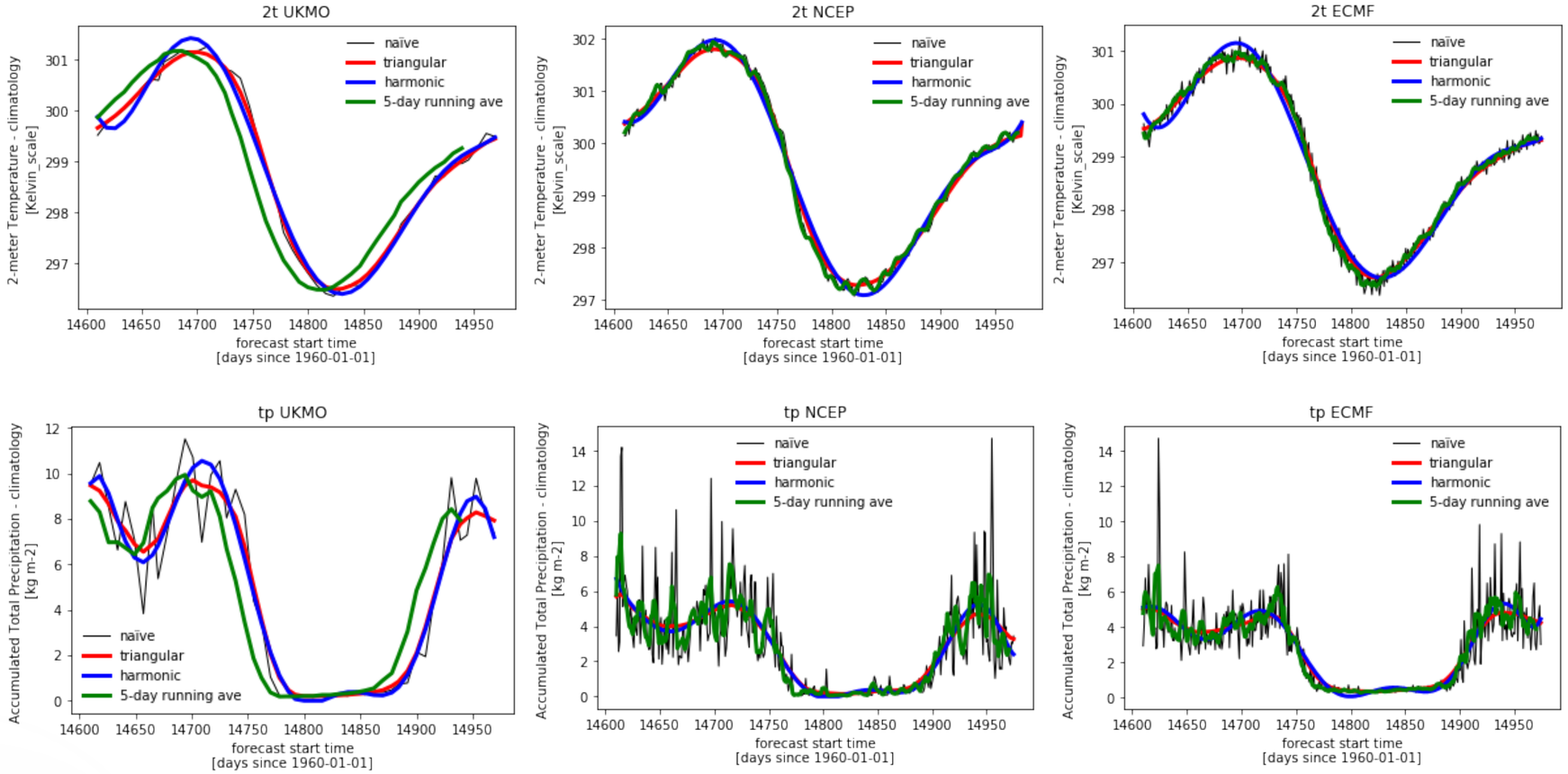
Lead (forecast_period)	grid: /L1 (days) ordered (1.0 days) to (47.0 days) by 1.0 N= 47 pts :grid
forecast start time (forecast_reference_time)	grid: /S (days since 1960-01-01) ordered (0000 1 Jan 2000) to (0000 31 Dec 2000) by 1.0 N= 366 pts :grid
longitude (longitude)	grid: /X (degree_east) periodic (0) to (1.5W) by 1.5 N= 240 pts :grid
latitude (latitude)	grid: /Y (degree_north) ordered (90N) to (90S) by 1.5 N= 121 pts :grid

Last updated: *Fri, 18 Sep 2020 19:28:54 GMT*

http://iridl.ldeo.columbia.edu/SOURCES/.ECMWF/.S2S/.climatologies/

Different methods to compute the climatologies

Naïve and triangular (Pegion et al., 2019), 5-day running average and harmonics (Muñoz et al., in prep).



Data Library

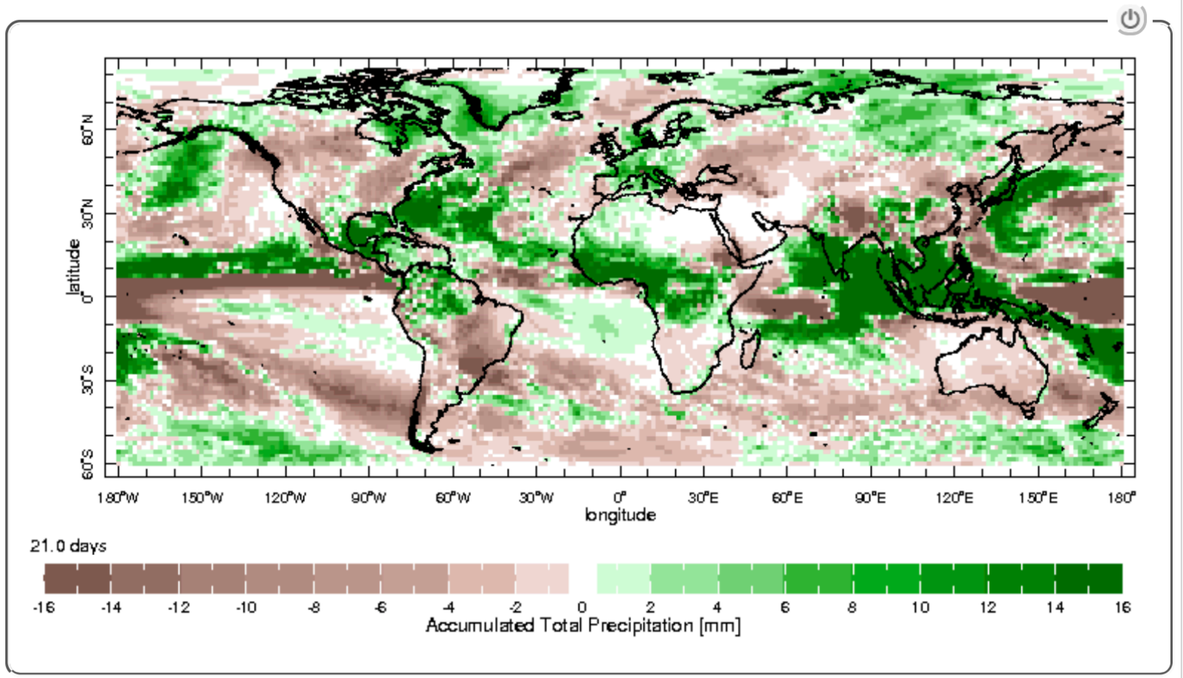
[(mean { ECMWF S2S ECMF forecast perturbed sfc_precip tp } 0000 27 Aug 2020) - (Mean 1200 26 Aug 2020)] / water_density 21.0 days

Language: english

Description | Expert Mode | Options | Instructions

```
SOURCES .ECMWF .S2S .ECMF .forecast .perturbed .sfc_precip .tp
 S (0000 27 Aug 2020) VALUES
 [M]average
 L (14) (28) VALUES
 [L]differences
 SOURCES .ECMWF .S2S .climatologies .hindcast .ECMF .tpSmooth
  L (14) (28) VALUES
  [L]differences
  S pentadAverage
  S pentadmean
  [S]regridLinear
  sub
 c:
  /name /water_density def
  998 (kg/m3) :c
  div
 (mm) unitconvert
 prcp_anomaly
 Y -60 80 RANGE
 X -180 180 RANGE
 X Y fig: colors thinnish solid coasts_gaz :fig
```

OK reset



- [(mean { ECMWF S2S ECMF forecast perturbed sfc_precip tp } 0000 27 Aug 2020) - (Mean 1200 26 Aug 2020)] / water_density 21.0 days[X Y | L]
- grid: /X (degree_east) ordered (180W) to (180) by 1.5 N= 241 pts :grid
- grid: /Y (degree_north) ordered (60S) to (81N) by 1.5 N= 95 pts :grid
- fig: colors thinnish solid coasts_gaz :fig

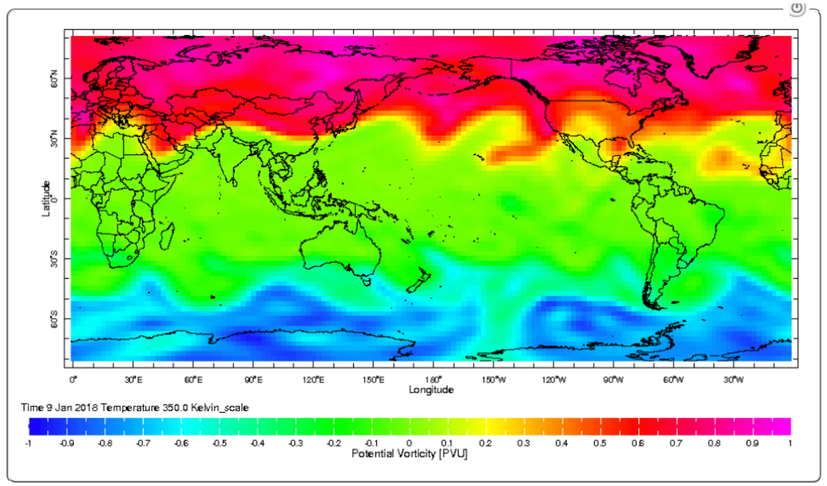
EPSG:4326

EPSG:4326 -180 -60.75 180 81.75 1.5 1.5

Share | Like 0 | Contact Us

http://iridl.ldeo.columbia.edu/SOURCES/.ECMWF/.S2S/.ECMF/.forecast/.perturbed/.sfc_precip/.tp/S/(0000%2027%20Aug%202020)/VALUES/%5BM%5Daverage/L/(14)/(28)/VALUES/%5BL%5Ddifferences/SOURCES/.ECMWF/.S2S/.climatologies/.hindcast/.ECMF/.tpSmooth/L/(14)/(28)/VALUES/%5BL%5Ddifferences/S/pentadAverage/S/pentadmean/%5BS%5DregridLinear/sub/c%3A//name//water_density/def/998/(kg/m3)/%3Ac/div/(mm)/unitconvert/prcp_anomaly/Y/-60/80/RANGE/X/-180/180/RANGE/X/Y/fig%3A/colors/thinnish/solid/coasts_gaz/%3Afig/#expert

Isentropic Potential Vorticity From Reanalysis data



SOURCES NOAA NCEP-NCAR CDAS-1 DAILY Intrinsic PressureLevel v T (9 Jan 2018) VALUES [X] partial div 110000.0 div sub add mul -1 mul add

Y cosd

u T (9 Jan 2018) VALUES [Y] partial 110000.0 div [X Y] 1.0 0.0 regridAverage

sind

temp T (9 Jan 2018) VALUES mul [P] partial 100.0 div

P ln eexp

ln eexp mul [X] partial div 110000.0 div [X Y] 1.0 0.0 regridAverage mul

[P] partial 100.0 div sub

ln eexp mul [Y] partial 110000.0 div mul

[P] partial 100.0 div

1000000.0 mul

Y -80 80 RANGE

Y -80 80 RANGE mul

ln eexp

P 350 320 310 toS

Semantic language description

http://wiki.iri.columbia.edu/index.php?n=Climate.S2S-IRIDL

Latin America
Project Integration
Ceara Resource Page
Colombia DNP
Chile-Coquimbo
Paute Basin, Ecuador

Climate Pages
ACToday Countries
Bangladesh
Vietnam

Past S2S Trainings
ICTP S2S
Teleconnections
Workshop 2017
S2S SE Asia
SCIPEA East Africa
ICTP/WCRP School
S2S Exercise
Central Africa S2S

Other Country Climate Pages
India
Indonesia
Iran
Ethiopia
Kenya
West Africa
SE South America
Indonesia NTT
Philippines
Brazil

Global
Floods work
Downscaling Methods
DMIP

Climate /

Resources for using the WWRP/WCRP S2S Project Database from IRI Data Library

A a large subset of the WWRP/WCRP S2S Project Database available online in the IRI/LDEO Climate Data Library: http://iridl.ldeo.columbia.edu/SOURCES/.ECMWF/.S2S/ We hope this will provide a valuable addition to the two official archiving centers at ECMWF & CMA, and we plan in future to make various derived products available there too.

In addition to the S2S project data, the SubX project data are archived in IRIDL here: http://iridl.ldeo.columbia.edu/SOURCES/.Models/.SubX/

Please see the README file at the top of the page for notes on accessing & manipulating the data. We are still ironing out some of the kinks, so please let us know if you encounter any problems. Most of the data should be there, though there may be delays in updating the data.

Data holdings status: (21 Dec 2018) 72TB Detailed breakdown
Data access stats: Oct 2018

This page contains Ingrid scripts as additional resources for accessing and manipulating the data.

Script access from unix command line, Matlab, R and Python

An access key is required in order to download S2S data from the command line. To obtain one, please:

1. Firstly sign the S2S terms and conditions by downloading any test data via the "Data Files" tab on the data library page, e.g. dataURL.
2. Secondly, send an email to help@iri.columbia.edu, stating that you are requesting an access key for S2S data, and including the email address that you used to sign the terms and conditions. You will be sent an access key.

Follow this example using `curl` to download the data:

```
curl -k -b '__dlauth_id=xxxyyyyzzz' 'dataURL' > file.nc
```

where xxxyyyyzzz is your key, and file.nc is your preferred name of the output NETCDF file.

Summary

- S2S and SubX databases are both available via IRI Data Library, and kept up to date
- Server-side “lazy” computation and visualization software is freely available
- S2S model daily climatologies have been computed for precipitation and 2m temperature