The TIGGE Model Validation Portal:
An Improvement in Data Interoperability

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Boulder, CO
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CISL Computational & Information Systems Laboratory

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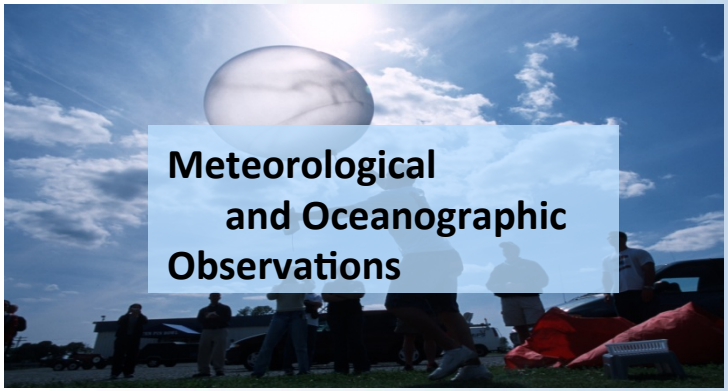
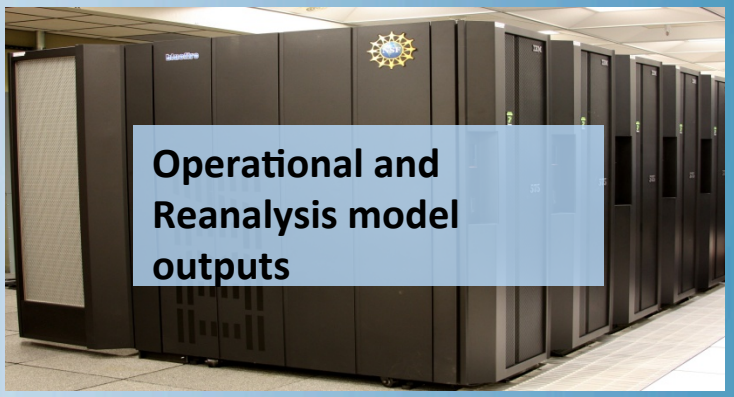
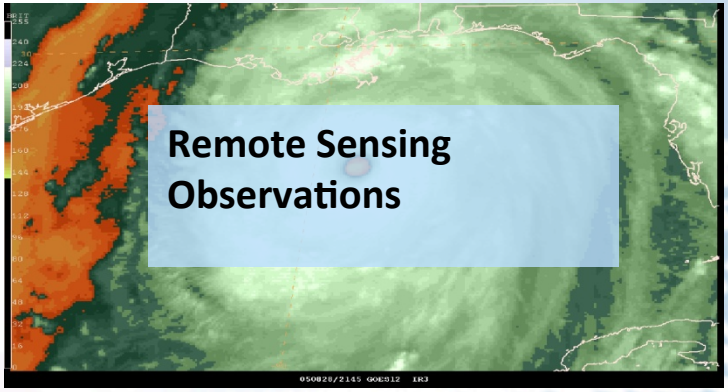
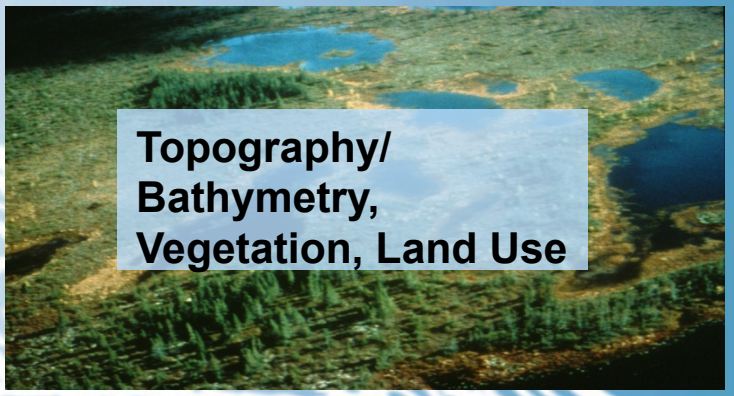
NCAR Research Data Archive

- Total archive volume over 1.3 PB
- 8000+ unique users annually









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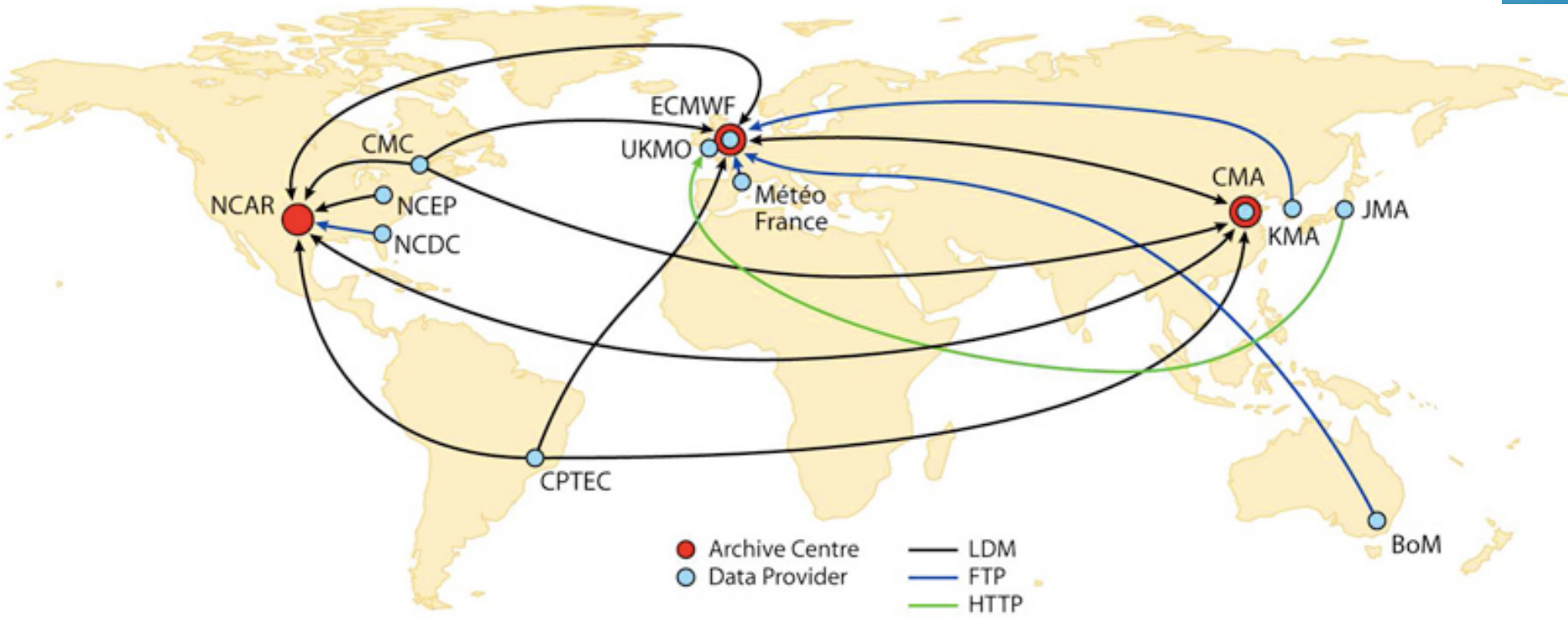
THORPEX Interactive Grand Global Ensemble (TIGGE)

Mission: Foster and accerlerate 1-day to 2-week high-impact weather forecasts.



NCAR TIGGE Data Portal

THORPEX Interactive Grand Global Ensemble

TIGGE Data Archive Portal

National Center for Atmospheric Research
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Home | Get Forecast Data | Get Model Validation Data | Tools | Help | Documentation | Login

TIGGE Data Archive Portal

Submit Data Request **Check Data Request Status**

This data portal provides full discovery of all TIGGE data available online at NCAR. Data access options include an interface to browse and select staged forecast files for download and an interface to select parameters, grid resolution, and spatial subsets across multiple centers for download.
A number of tools for analysis and visualization of TIGGE data are available.

Programme Mission

THORPEX: A Global Atmospheric Research Programme is an international research and development programme responding to the weather related challenges of the 21st century to accelerate improvements in the accuracy of 1-day to 2- week high impact weather forecasts for the benefit of society, the economy and the environment. THORPEX research topics include: global-to-regional influences on the evolution and predictability of weather systems: global observing system design and demonstration; targeting and assimilation of observations; societal, economic and environmental benefits of improved forecasts.

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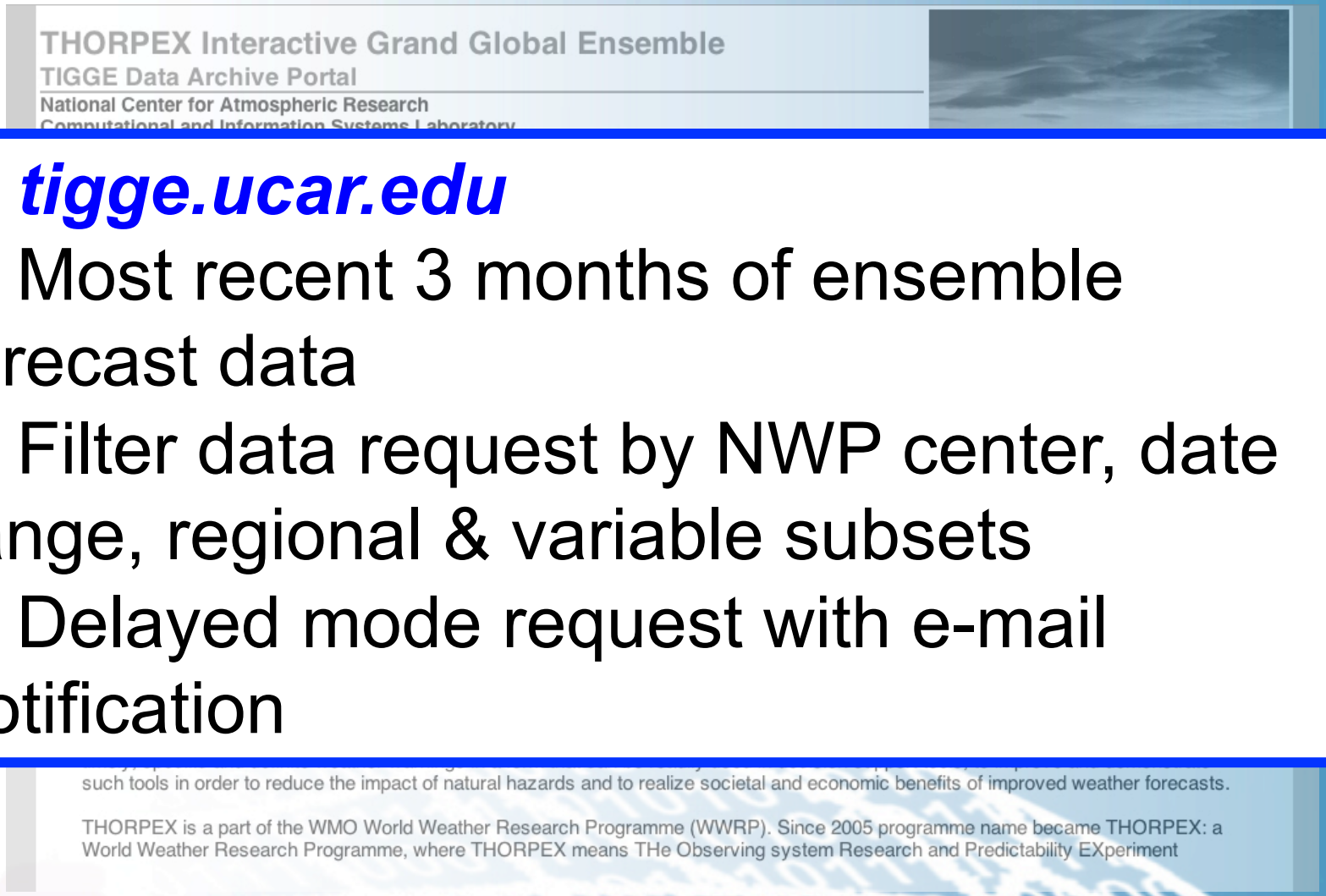
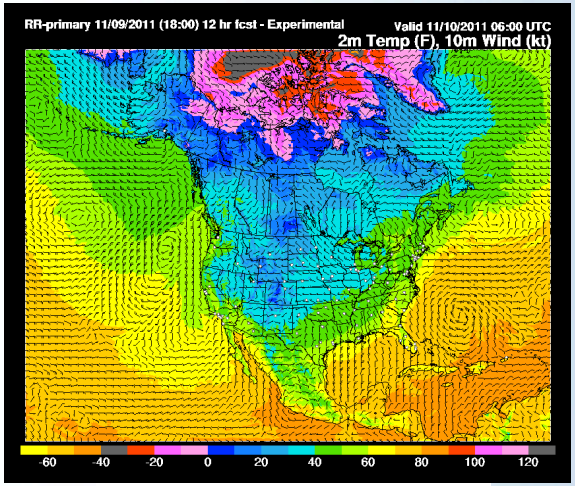
NCAR TIGGE Data Portal



- ***tigge.ucar.edu***
- Most recent 3 months of ensemble forecast data
- Filter data request by NWP center, date range, regional & variable subsets
- Delayed mode request with e-mail notification

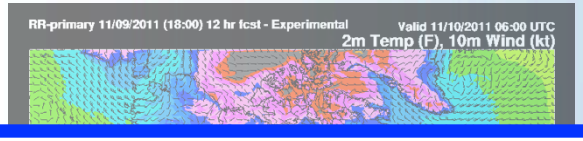
TIGGE Model Validation Portal at NCAR



Ensemble Forecast

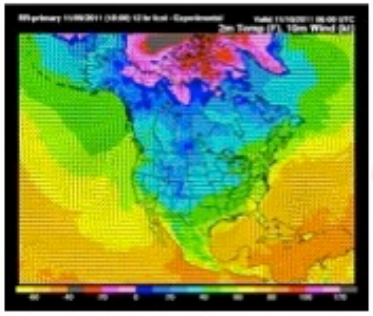
Observations

TIGGE Model Validation Portal at NCAR

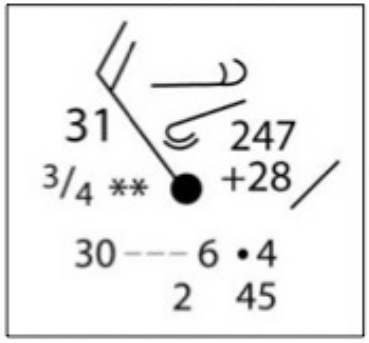


- Match observations with ensemble forecasts
- Streamline access to observational data to support model validation
- Add value to ensemble forecast research
- One-stop shop approach

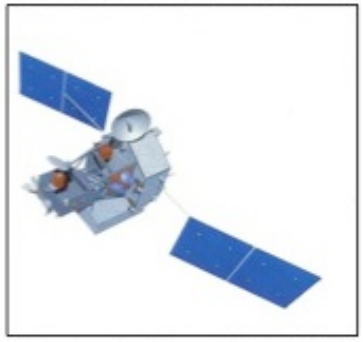
Data Access - Common Approach



Model Forecast Data



Station Observations



Remote Sensing Data

Data User

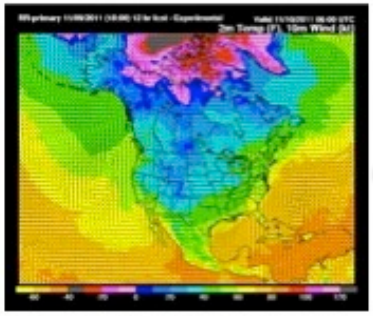
User-side resources

- Data Storage
- Format Conversion
- Re-gridding
- Subset Extraction
- Post Processing

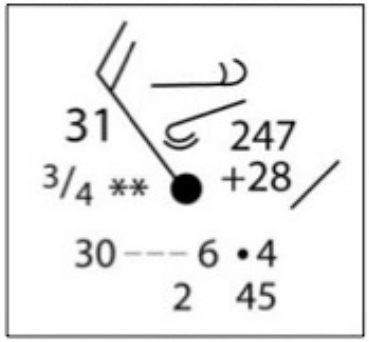
Forecast Validation

NCAR

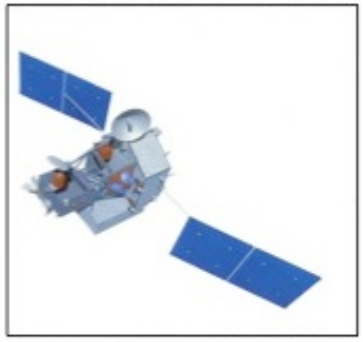
TIGGE MVP Data Flow



Model Forecast Data



Station Observations



Remote Sensing Data

NCAR RDA system processing

- Data Storage
- Format Conversion
- Re-gridding
- Subset Extraction

Data User

Validation

NCAR

How It Works

THORPEX Interactive Grand Global Ensemble

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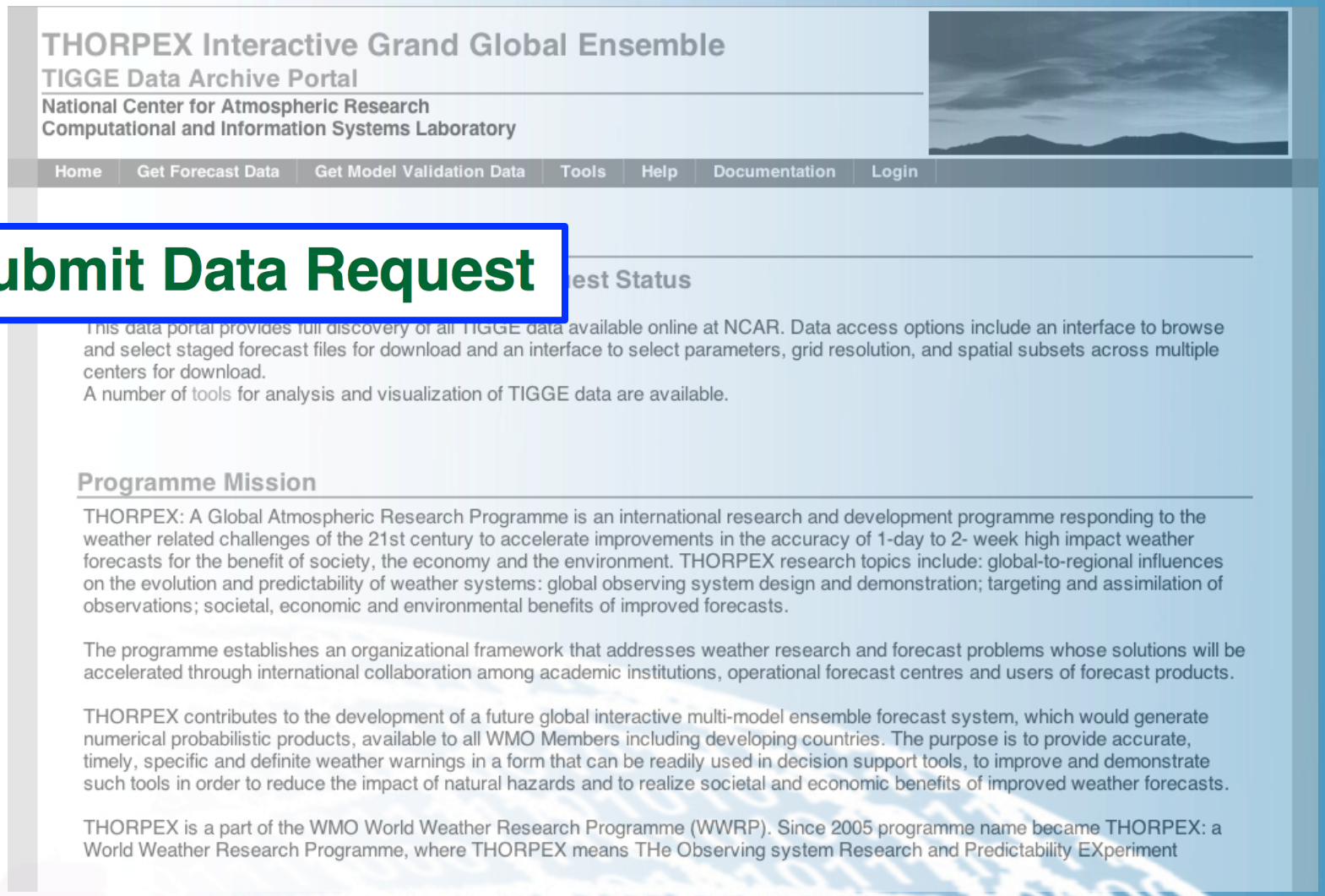
How It Works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Parameter selection

Data Subset Selection

TIGGE Portal for Sub-setting

Select Centers

Australia Bureau of Met.	China Met. Administration	Met. Service of Canada	ECMWF	United Kingdom Met. Office	USA NCEP	Met. France	Japan Met. Agency	Korea Met. Administration	Brazil CPTEC	
☐ AMMC	☐ BABJ	☐ CWAO	☑ ECMF	☐ EGRR	☐ KWBC	☐ LFPW	☐ RJTD	☐ RKSL	☐ SBSJ	All Clr

Select Forecast Initialization Hour(s)

☑ 00z ☑ 12z

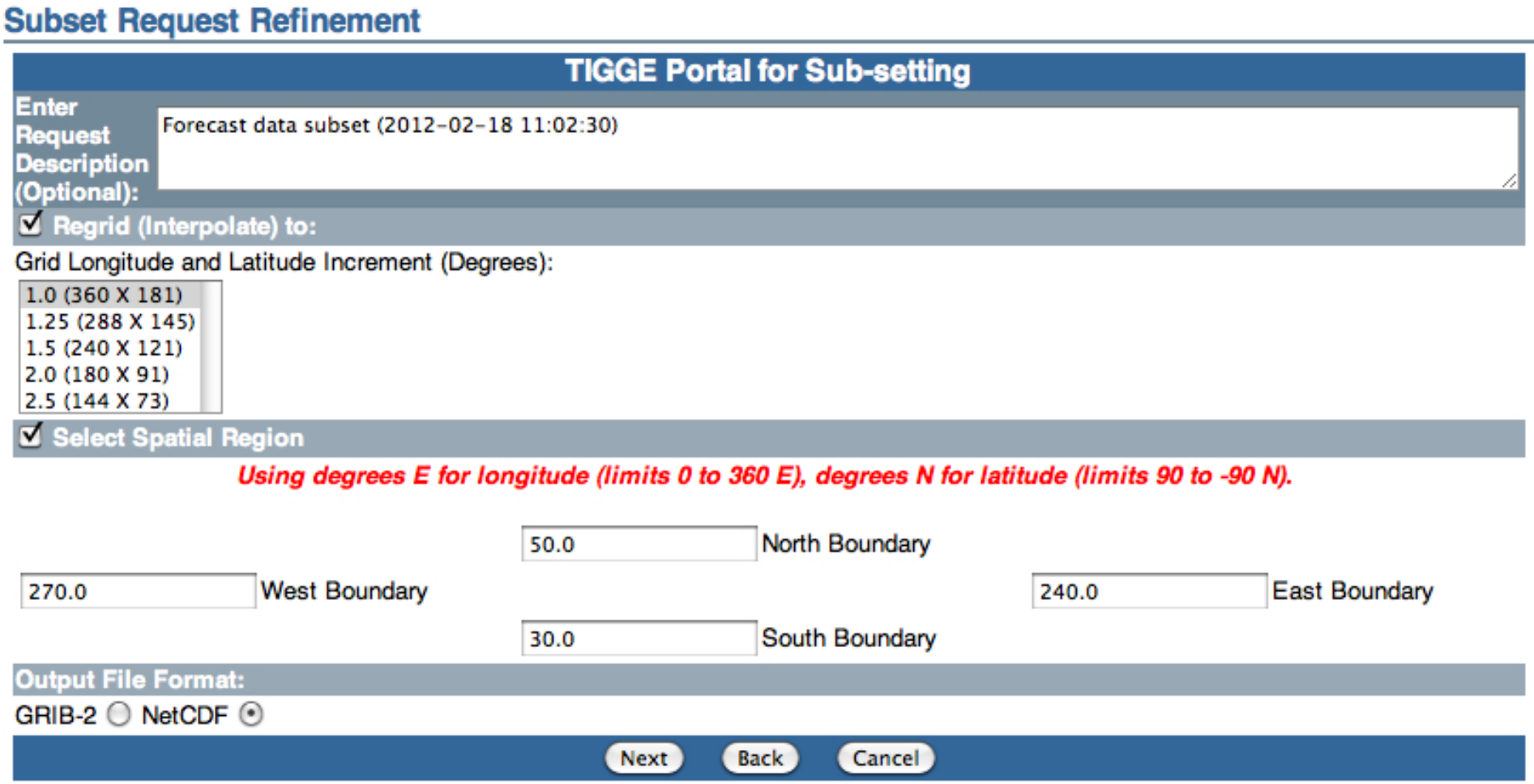
Select Forecast Initialization Date Range

Start Date	End Date
Forecast (yyyy-mm-dd hh:mn:ss) 2012-02-14 00:00:00	Forecast (yyyy-mm-dd hh:mn:ss) 2011-11-24 00:00:00

Select Variables

Variable	Long name	Units	Level Type	Level Values (Highlight desired level(s))	Forecast Hours (Highlight desired hour(s))
☐ gh	geopotential_height	gpm	PL		
☐ q	specific_humidity	kg kg^{-1}	PL		
☑ t	temperature	K	PL	700 850 925 1000 mb	30 36 42 48 hrs
☐ u	u_velocity	m s^{-1}	PL		
☐ v	v_velocity	m s^{-1}	PL		
☐ pv	potential_vorticity	K m^2 kg^{-1} s^{-1}	PT		
☐ pv2pt	potential_temperature	K	PV		
☐ pv2u	u_on_2pvu_surface	m s^{-1}	PV		
☐ pv2v	v_on_2pvu_surface	m s^{-1}	PV		
☐ 10u	10_meter_u_velocity	m s^{-1}	SL		
☐ 10v	10_meter_v_velocity	m s^{-1}	SL		
☐ 2d	surface_air_dew_point_temperature	K	SL		
☐ 2t	surface_air_temperature	K	SL		
☐ cape	convective_available_potential_energy	J kg^{-1}	SL		
☐ lsm	land_sea_mask	0 or 1	SL		
☐ mn2t6	surface_air_minimum_temperature	K	SL		

Regrid & Spatial Subsetting



Data request review

Data Subset Selection

Summary
To make changes, use your browser back button to return to previous page.

Enter Request Description (Optional):	Forecast data subset (2012-01-19 20:46:22)
Center(s)	kwbc
Forecast Times	2012-01-15 00:00:00 2012-01-15 06:00:00 2012-01-15 12:00:00 2012-01-15 18:00:00
t	temperature (K)
Level(s)	200 250 300 500 700 850 925 1000 PL
Forecast hour(s)	0 6 12 18 24
Regrid (Interpolate) to:	
Grid Longitude and Latitude Increment (Degrees)	1.0 (360 X 181)
Output File Format	
NetCDF	

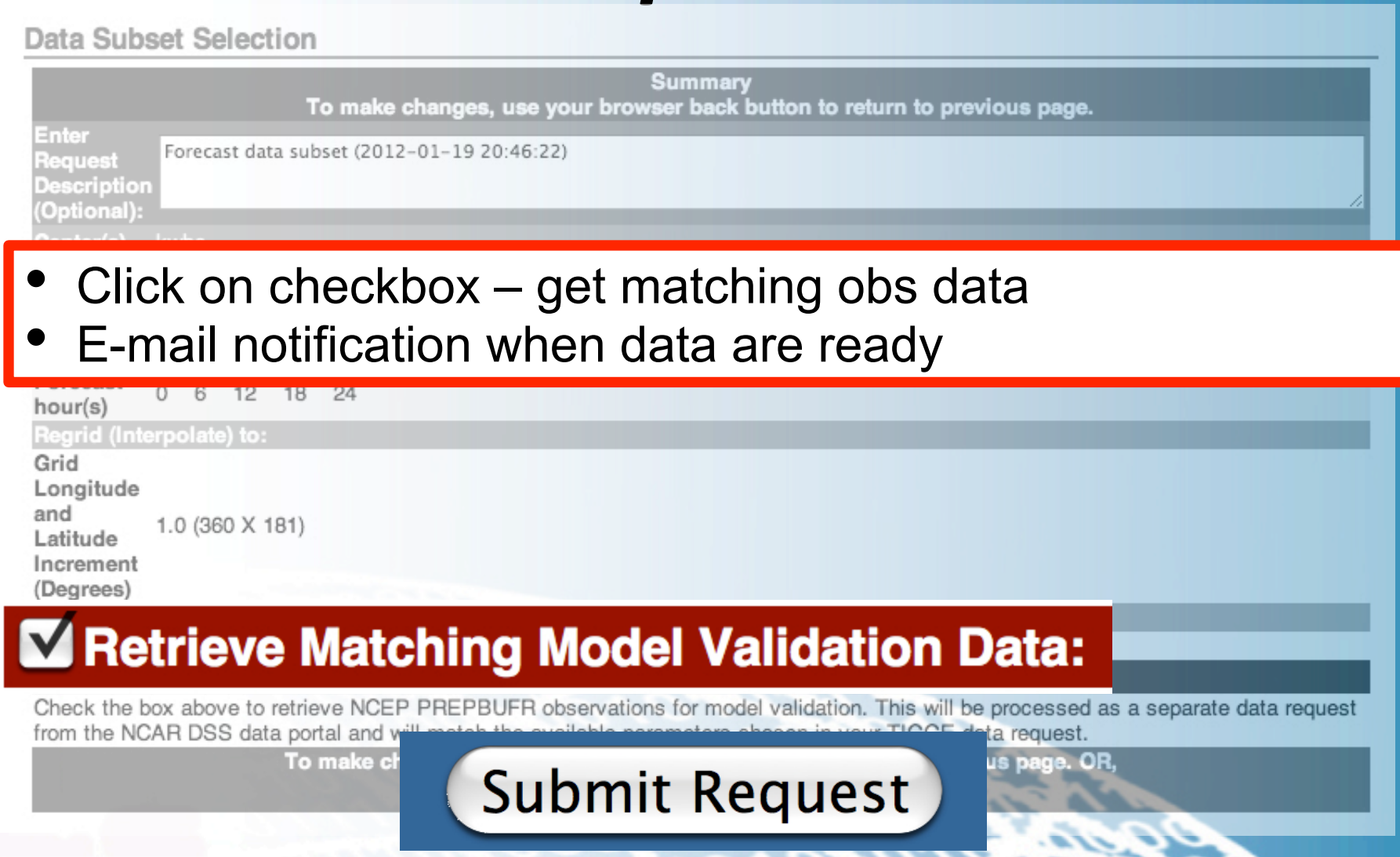
☑ **Retrieve Matching Model Validation Data:**

Check the box above to retrieve NCEP PREPBUFR observations for model validation. This will be processed as a separate data request from the NCAR DSS data portal and will match the available parameters chosen in your TIGGE data request.

To make changes, use your browser back button to return to previous page. OR,

Back Submit Request Cancel

Data request review



- Click on checkbox – get matching obs data
- E-mail notification when data are ready

Download page

Subset Data Requested from DS337.0

Go to DS337.0 Home Page.

The Subset Data requested by Thomas Cram (tcram@ucar.edu) from ds337.0 - 'NCEP ADP Global Upper Air and Surface (PREPBUFR and NetCDF formats) Weather Observations, May 1997 - Continuing' are listed below. The data files will remain available online for 5 days (until 2012-01-14 15:28:15).If you need additional time to complete the download, please notify *Thomas Cram*. After you have completed the download, please also let me know by clicking this button

I Have Finished Download, Please Purge the Request

TIGGE forecast validation subset (2012-01-09 03:17:33)

Show Selected Files/Get As a Tar File | Perl Download Script | Csh Download Script

- Total **4 Files (3.25M)** are listed below
- Click a file name to download a single file
- Select one or multiple files to get a download script
- Select multiple data files to download as a single tar file
- Currently **0 File** selected Clear Selection

	INDEX	File Name	Size	Data Format	Date Online
☐	1	gdas.9499.2012010600.nc	1.06M	PBNETCDF	01/09/2012
☐	2	gdas.9499.2012010606.nc	596.30K	PBNETCDF	01/09/2012
☐	3	gdas.9499.2012010612.nc	1.08M	PBNETCDF	01/09/2012
☐	4	gdas.9499.2012010618.nc	515.14K	PBNETCDF	01/09/2012

Show Selected Files/Get As a Tar File | Perl Download Script | Csh Download Script

Under the hood

- DSRQST daemon receives data request
- MySQL db request record created
- Perl script parses request information

dates=2012-02-12 00:00 2012-02-12 12:00&lats=30.0 N 50.0 N&lons=120.0 W 90.0 W &params=APCP TMP HGT&qualmark=2&tigge=true&fhours=0 6 12 18

Data Description

NCEP PREPBUFR Observations (1997 – present)

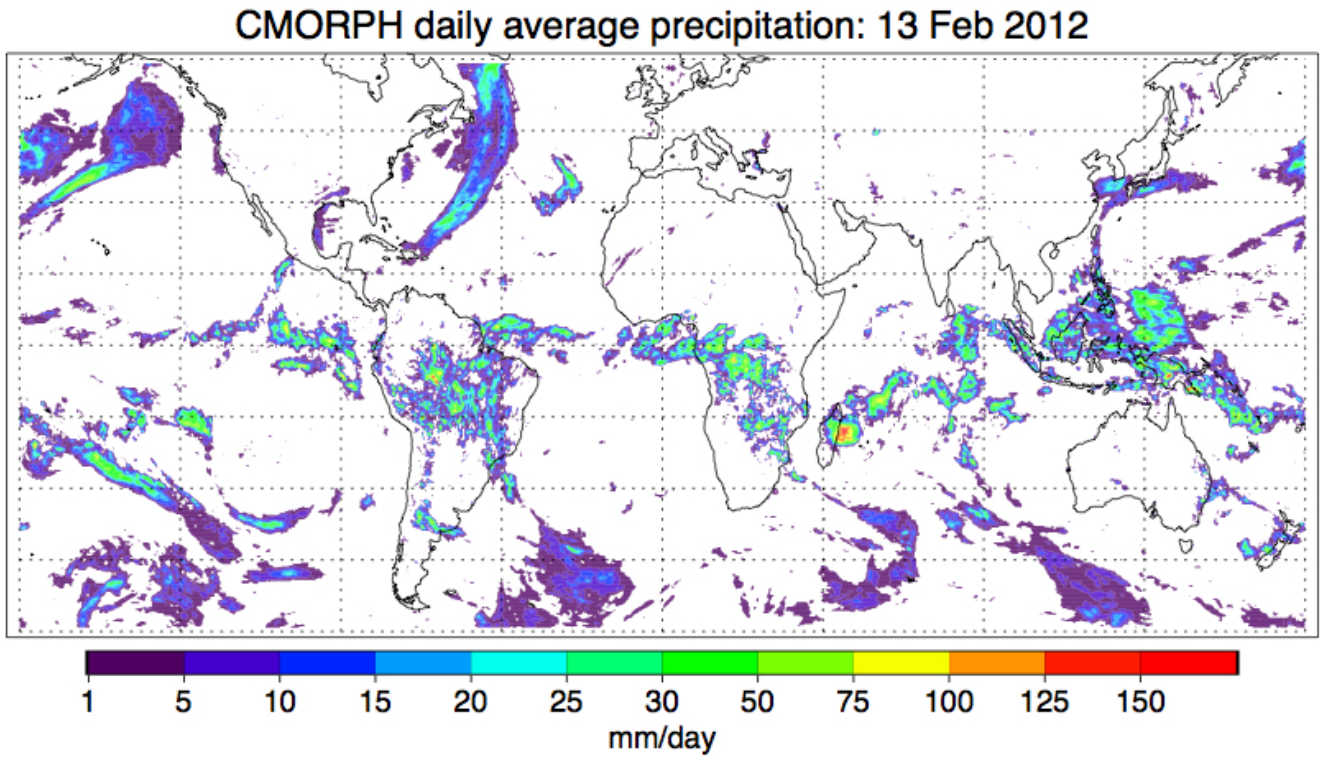
- Surface and upper air reports – used for NCEP GDAS

Geopotential	Rel. Humidity
Temperature	Specific Humidity
Wind vectors & speed	Dew Point
Mean SLP	Vapor Mixing Ratio

Data (cont.)

CMORPH Precipitation (coming soon)

- Precipitation derived from multiple satellites
- Dec. 2002 – present
- 0.25 x 0.25 grid
- 3-hourly



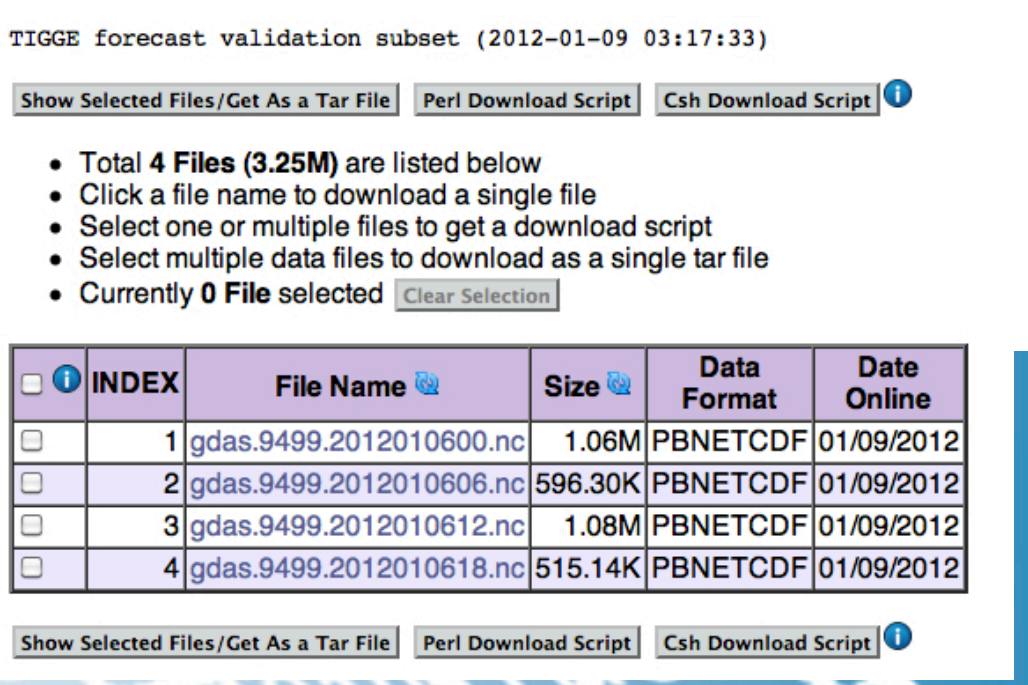
Output Format – NetCDF

PREPBUFR obs

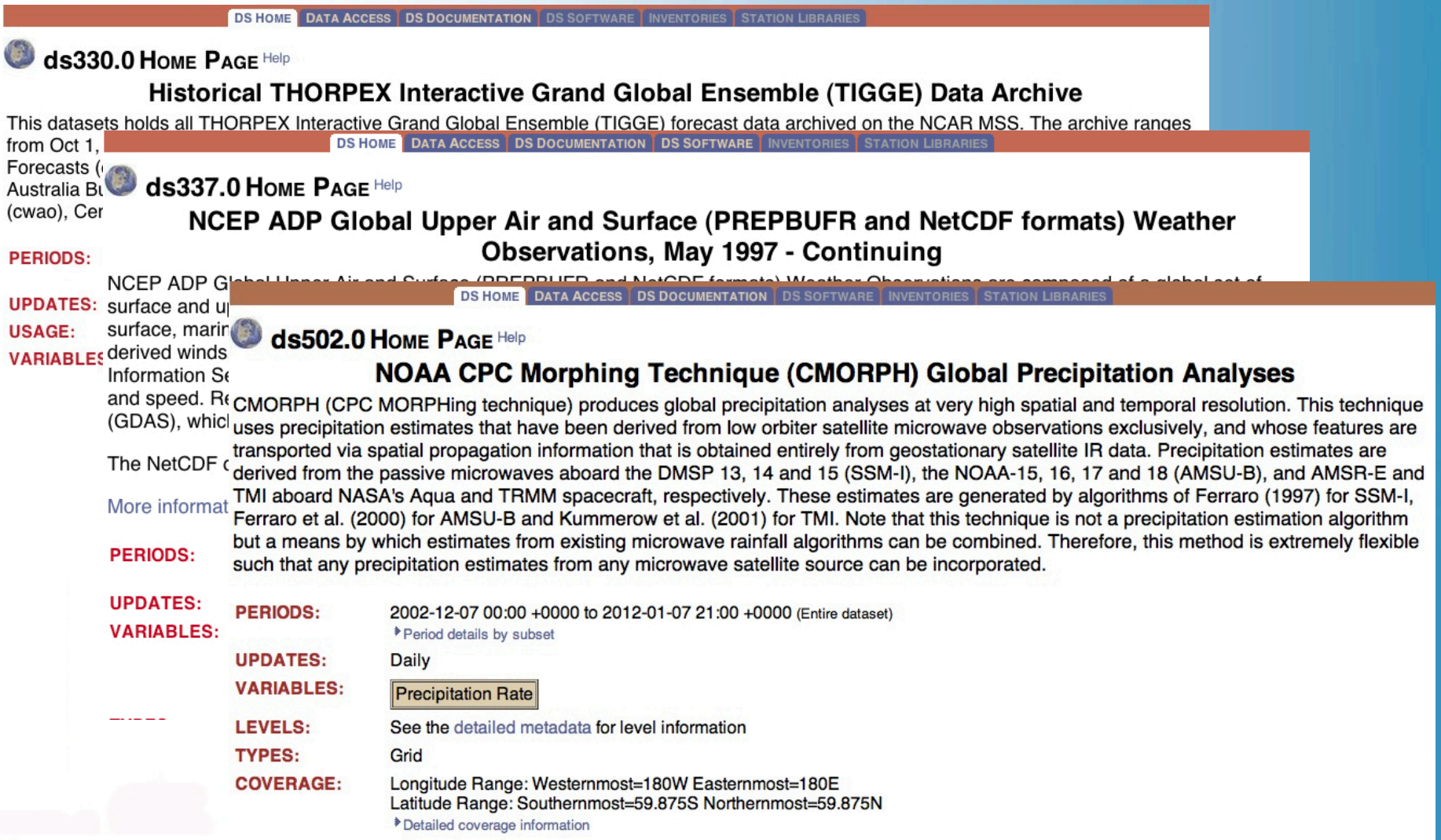
- Model Evaluation Tools software NetCDF format
  - www.dtcenter.org/met/users
- MET software ingests:
  - forecast
  - observations

CMORPH

- CF-1.5 compliant



Access to full archives of data

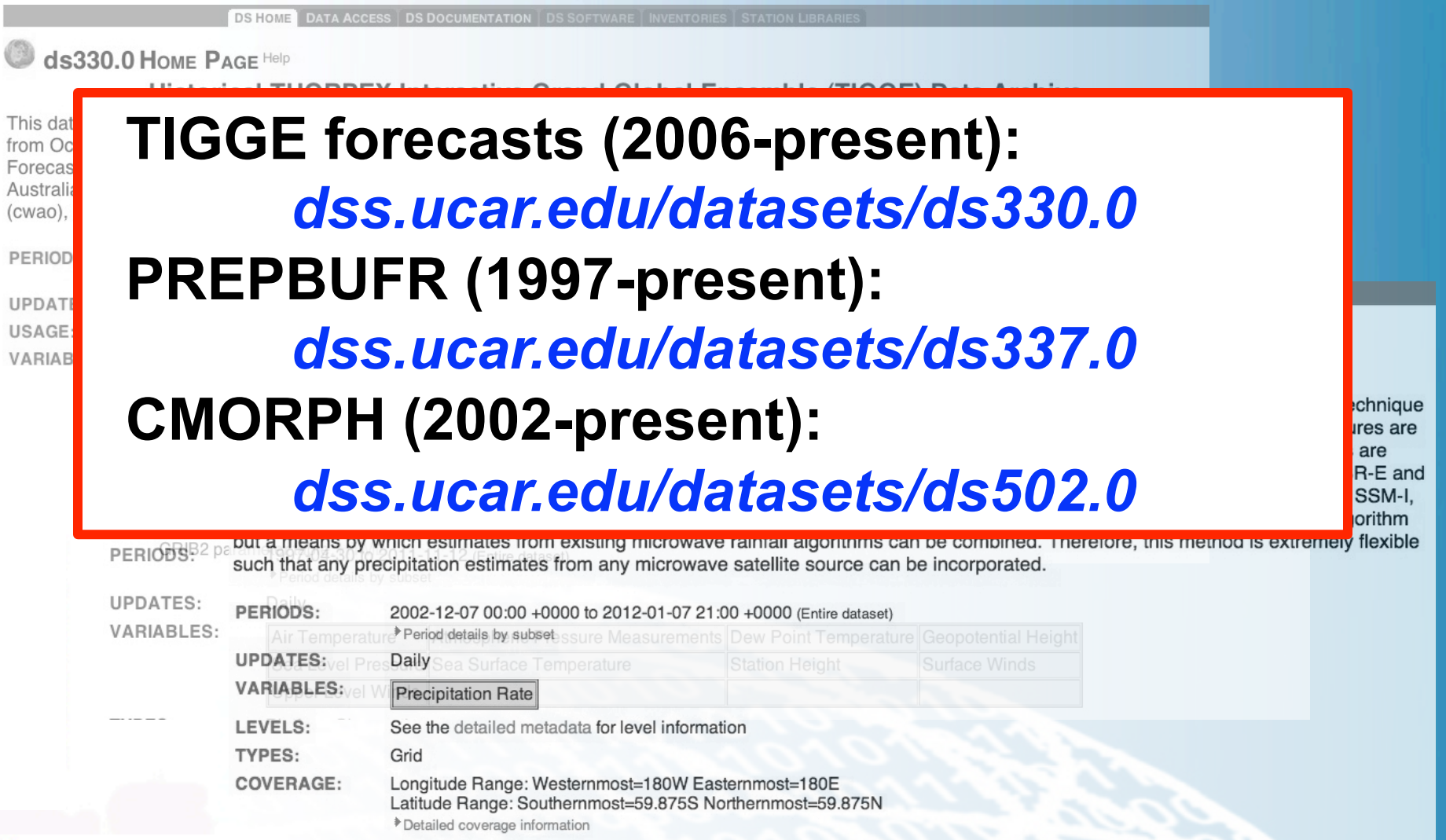


Access to full archives of data

TIGGE forecasts (2006-present):
dss.ucar.edu/datasets/ds330.0

PREPBUFR (1997-present):
dss.ucar.edu/datasets/ds337.0

CMORPH (2002-present):
dss.ucar.edu/datasets/ds502.0



Data file downloads

ds337.0 Data File Online for Download

PREPNR-NETCDF-2012 - PREPNR-NETCDF obs data for 2012

Show Selected Files/Get As a Tar File | Perl Download Script | Csh Download Script

- Total **213 Files (12.9G)** are listed below
- Click a file name to download a single file
- Select up to 2 GB data to download as a single tar file each time
- Currently **0 File** selected Clear Selection

[To **END** of the Filelist]

INDEX	File Name	Description	Size	Data Format	Date Archived
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2	netcdf.gdas.2012010106.nc	2012jan01	55.7M	PBNETCDF	01/04/2012
3	netcdf.gdas.2012010112.nc	2012jan01	61.2M	PBNETCDF	01/04/2012
4	netcdf.gdas.2012010118.nc	2012jan01	58.9M	PBNETCDF	01/04/2012
5	netcdf.gdas.2012010200.nc	2012jan02	60.7M	PBNETCDF	01/04/2012
6	netcdf.gdas.2012010206.nc	2012jan02	56.1M	PBNETCDF	01/05/2012
7	netcdf.gdas.2012010212.nc	2012jan02	60.9M	PBNETCDF	01/05/2012
8	netcdf.gdas.2012010218.nc	2012jan02	58.7M	PBNETCDF	01/05/2012
9	netcdf.gdas.2012010300.nc	2012jan03	55.9M	PBNETCDF	01/05/2012
10	netcdf.gdas.2012010306.nc	2012jan03	55.7M	PBNETCDF	01/06/2012

Data subset interface

ds337.0 NCEP ADP Global Upper Air and Surface Weather Observations Subset Request Form

This form allows a user to request a temporal and spatial subset from the NCEP ADP Global Upper Air and Surface Weather Observations. Also included is the option to select data for one or more observing stations. Once the form is completed and submitted, the user is notified through email when the data is ready for download. All information boxes must be filled, except where noted as *optional*, and are seeded with default or min./max. limits. The output data is converted from PREPBUFR format to either ASCII or NetCDF. The NetCDF data format conversion is done using the Model Evaluation Tools (MET) software and can be easily interfaced with the model validation utilities included in the MET software.

Select Temporal Range

Start Date		End Date		
1997-04-30	00:00	2012-01-07	00:00	Reset Range

Select Output Data Format

NetCDF

Select Parameters

- [x] Specific humidity (observed)
- [x] Temperature (observed)
- [x] Geopotential height (observed)
- [x] East-West wind component (observed)
- [x] North-South wind component (observed)
- [x] Dewpoint temperature (derived)
- [x] Wind speed (derived)
- [x] Relative humidity (derived)
- [x] Humidity mixing ratio (derived)
- [x] Pressure reduced to mean sea level (derived)

Select all or Clear

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optional, and are
NetCDF. The Net
with the model va

1997-

- Specific humidit
- Temperature (ob
- Geopotential hei
- East-West wind
- North-South win

Select all or Cle

Select Spatial Subset Preference

Select region via Google map

Enter latitude & longitude manually

Zoom: − +

Pan Map Draw Box

Interactive Map Instructions:

- Use the 'Pan Map' option to drag and center the map on your area of interest
- Use the 'Draw Box' option to drag a box around your area of interest. You can also manually enter bounding latitudes and longitudes in the text boxes.

North*: 90

West*: −180 Reset East*: 180

South*: −90

*Latitudes and longitudes must be specified in whole degrees

Summary

- Integrated access for ensemble forecasts and observations that can be used for validation
- Output compatible with MET software
- Service brings together diverse datasets *(burden taken off researcher)*
- Modular approach – Integrated & stand-alone access

More info:
tigge.ucar.edu
tcram@ucar.edu

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