Project Name: National S2S Fire Weather

Project Number (STI): 923088

How to Use this Data Dictionary

* In Word, press View>Navigation to navigate to subsections via the side panel
* Save the update file here….
* Other instruction…

Data Manager Contact: Samantha Kramer skramer@sonomatech.com

Last Updated Date: 02/22/2024 KABC

# NCEP Reanalysis

## Data Overview

### Data origin

NCEP reanalysis is an established, well-known dataset used historically for climatological analysis. This dataset has been commonly used to cross validate new datasets but has coarse resolution to more modern products. Data covers 1948-present and includes observation assimilations.

### Citation

* NCEP-DOE AMIP-II Reanalysis (R-2): M. Kanamitsu, W. Ebisuzaki, J. Woollen, S-K Yang, J.J. Hnilo, M. Fiorino, and G. L. Potter. 1631-1643, Nov 2002, Bulletin of the American Meteorological Society.

### Size

* 1 Variable, 1 Year, 4x Daily, Global 103MB

### Location (internal)

University of Miami server: /raid60B/s2sfire/NOAA\_S2S/database\_files/NCEP

### Location (external)

<https://psl.noaa.gov/data/gridded/data.ncep.reanalysis2.html>

## Data Contents

Missing data is flagged with -9.96921e+36f.

## Data Properties

### Raw Files

|  |  |
| --- | --- |
| Data Type | Gridded |
| Data Name | var.YYYY.nc; var.2m.gauss.YYYY.nc |
| File Format | NetCDF |
| Data Resolution | 2.5° x 2.5° (~277 km) |
| Domain Extent | Global |
| XY Coordinate System (Projection) | Unknown |

### Database Files

|  |  |
| --- | --- |
| Data Type | Gridded |
| Data Name | var\_NCEP\_REANALYSIS\_V2\_Abs\_YYYY.nc  var \_NCEP\_REANALYSIS\_V2\_AVG\_Daily \_YYYY.nc  var\_NCEP\_REANALYSIS\_V2\_MAX\_Daily\_YYYY.nc  var\_NCEP\_REANALYSIS\_V2\_MIN\_Daily \_YYYY.nc |
| File Format | NetCDF |
| Data Resolution | 2.5° x 2.5° (~277 km) |
| Domain Extent | 85°N-0°N, 180°W-360°W |
| XY Coordinate System (Projection) | Reprojected to latitude/longitude grid where surface files are on a gaussian grid. |
| Variables | Temperature (air), Fosberg Fire Weather Index (ffwi), surface based Hot-Dry-Windy (hdwi), precipitation rate (prate), relative humidity (rhum), soil moisture (sm), u-compenent of the wind (uwnd), v-component of the wind (vwnd), vapor pressure deficit (vpd), wind direction (wdir), wind speed (wspeed) |

## Data Use

Appropriate uses of the database product include:

* Cross comparison of data from matching time periods
* Domain statistics
* Event analysis

## Data Processing

* Raw data processed to reduce domain to relevant study area.
* Reprojection of variables that are on gaussian grid to a latitude/longitude grid using xesmf library in Python.
* Generated the 24-hr minimum, maximum, and average for majority of variables where appropriate.
* Due to the shortened period of 2011-2018, proper climatological and anomaly analysis could not be performed. Harmonics analysis was applied to develop a study period average and deviations from the average for each variable.

## Data QC

To check for quality, plots of each variable at all 10 GACC locations and Kona, HI (11 total) were plotted from 2011-2018. Seasonal and study period average maps were also produced for each variable for the entirety of the domain.

# ERA5 Reanalysis

## Data Overview

### Data origin

Excerpt from the [Copernicus Climate Data Store](https://cds.climate.copernicus.eu/#!/home): “ERA5 is the fifth generation ECMWF reanalysis for the global climate and weather for the past 8 decades. Data is available from 1940 onwards. ERA5 replaces the ERA-Interim reanalysis.

Reanalysis combines model data with observations from across the world into a globally complete and consistent dataset using the laws of physics. This principle, called data assimilation, is based on the method used by numerical weather prediction centres, where every so many hours (12 hours at ECMWF) a previous forecast is combined with newly available observations in an optimal way to produce a new best estimate of the state of the atmosphere, called analysis, from which an updated, improved forecast is issued. Reanalysis works in the same way, but at reduced resolution to allow for the provision of a dataset spanning back several decades.”

### Citation

Hersbach, H, Bell, B, Berrisford, P, et al. The ERA5 global reanalysis. *Q J R Meteorol Soc*. 2020; 146: 1999– 2049. <https://doi.org/10.1002/qj.3803>

### Size

125.6 MB/file (125,600,000 bytes)

### Location (internal)

University of Miami server: /raid60B/s2sfire/NOAA\_S2S/database\_files/ERA5

### Location (external)

The [Copernicus Climate Data Store](https://cds.climate.copernicus.eu/#!/home) hosted by the European Centre for Medium-Range Weather Forecasts (ECMWF) on behalf of the European Union.

## Data Contents

The reanalysis data was obtained from 2011-2018.

## Data Properties

### Raw Files

|  |  |
| --- | --- |
| Data Type | Gridded |
| Data Name | File named in download process. |
| File Format | netCDF |
| Data Resolution | 0.25° x 0.25° |
| Domain Extent | National |
| XY Coordinate System (Projection) | Geographic Coordinate System |

### Database Files

|  |  |
| --- | --- |
| Data Type | Gridded |
| Data Name | var\_ERA\_REANALYSIS\_Abs\_YYYY.nc  var\_ERA\_REANALYSIS\_AVG\_Daily \_YYYY.nc  var\_ERA\_REANALYSIS\_MAX\_Daily\_YYYY.nc  var\_ERA\_REANALYSIS\_MIN\_Daily \_YYYY.nc |
| File Format | NetCDF |
| Data Resolution | 0.25° x 0.25° |
| Domain Extent | 85°N-0°N, 180°W-360°W |
| XY Coordinate System (Projection) | Latitude/longitude grid |
| Variables | Boundary layer height (blh), convective available potential energy (cape), convective precipitation (cp), 2-m dew point (d2m), Fosberg Fire Weather Index (ffwi), surface based Hot-Dry-Windy (hdwi), instantaneous 10-m wind gust (i10fg), large-scale rain rate (lsrr), relative humidity (rh), volumetric soil moisture from surface (0cm)-7cm (swvl1), 2m-temperature (t2m), total precipitation (tp), ), u-compenent of the wind (u10, v-component of the wind (v1-0), vapor pressure deficit (vpd), wind direction (wdir), wind speed (wspeed) |

## Data Use

Appropriate uses of the data product include:

* Cross comparison of data from matching time periods
* Domain statistics
* Event analysis

## Data Processing

* Raw data processed to reduce domain to relevant study area.
* Generated the 24-hr minimum, maximum, and average for majority of variables where appropriate.
* Due to the shortened period of 2011-2018, proper climatological and anomaly analysis could not be performed. Harmonics analysis was applied to develop a study period average and deviations from the average for each variable.

## Data QC

To check for quality, plots of each variable at all 10 GACC locations and Kona, HI (11 total) were plotted from 2011-2018. Seasonal and study period average maps were also produced for each variable for the entirety of the domain.

# NAM Reanalysis

## Data Overview

### Data origin

### “The North American Mesoscale Forecast System (NAM) is one of the National Centers For Environmental Prediction’s (NCEP) major models for producing weather forecasts. NAM generates multiple grids (or domains) of weather forecasts over the North American continent at various horizontal resolutions. Each grid contains data for dozens of weather parameters, including temperature, precipitation, lightning, and turbulent kinetic energy. NAM uses additional numerical weather models to generate high-resolution forecasts over fixed regions, and occasionally to follow significant weather events like hurricanes.”

“As of June 20, 2006, the NAM model has been running with a non-hydrostatic version of the Weather Research and Forecasting (WRF) model at its core. This version of NAM is also known as the NAM Non-hydrostatic Mesoscale Model (NAM-NMM). Between February 15, 2005, and June 20, 2006, NAM was run with the Meso-ETA model. The analyses from all NAM and ETA runs are unified under the NAM-ANL product type.”

### Citation

* DOC/NOAA/NWS/NCEP/EMC > Environmental Modeling Center, National Centers for Environmental Prediction, National Weather Service, NOAA, U.S. Department of Commerce

### Size

* Every variable available [112], 4x Daily, North America 483.40 MB
* [North America](https://www.emc.ncep.noaa.gov/mmb/namgrids/g212.12km.jpg), can process down to U.S. domain to reduce size

### Location (internal)

University of Miami server: /raid60B/s2sfire/NOAA\_S2S/database\_files/NAM

### Location (external)

## <https://www.ncei.noaa.gov/thredds/catalog/model-namanl-old/catalog.html> OR

<https://www.ncei.noaa.gov/data/north-american-mesoscale-model/access/historical/analysis/>

## Data Contents

Analysis of forecasts available 20x daily for 112 variables on various surfaces. For each model init time (00, 06, 12, 18) there are five possible +hour ‘analysis forecasts’ (0, 1, 2, 3, 6).

A screenshot of a computer

Description automatically generated

## Data Properties

### Raw Data

|  |  |
| --- | --- |
| Data Type | Gridded |
| Data Name | namanl\_218\_YYYYMMDD\_HH00\_00H.grb |
| File Format | Grib |
| Data Resolution | 12km x 12km (~0.108°) |
| Domain Extent | North America |
| XY Coordinate System (Projection) | Lambert Conformal |

### Database Files

|  |  |
| --- | --- |
| Data Type | Gridded |
| Data Name | var\_NAM\_HISTORICAL\_Abs\_YYYY.nc  var\_NAM\_HISTORICAL\_AVG\_Daily\_YYYY.nc  var\_NAM\_HISTORICAL\_MAX\_Daily\_YYYY.nc  var\_NAM\_HISTORICAL\_MIN\_Daily \_YYYY.nc |
| File Format | NetCDF |
| Data Resolution | 12km x 12km (~0.108°) |
| Domain Extent | North America |
| XY Coordinate System (Projection) | Reprojected onto a latitude/longitude grid using xesmf. |
| Variables | Convective available potential energy (cape)\*, Fosberg Fire Weather Index (ffwi), 10-m wind gust (gust), surface based Hot-Dry-Windy (hdwi), relative humidity (r), soil moisture (sm), 2m-temperature (t2m), total precipitation (tp)\*^, u-compenent of the wind (u10), v-component of the wind (v10), vapor pressure deficit (vpd), wind direction (wdir), wind speed (wspeed) |

\* = only available for 2017-2018

^ = 1-hr forecast

## Data Use

Appropriate uses of the data product include:

* Cross comparison of data from matching time periods
* Domain statistics
* Event analysis

## Data Processing

* Raw data processed to reduce domain to relevant study area.
* Reprojection of variables that are on gaussian grid to a latitude/longitude grid using xesmf library in Python.
* Generated the 24-hr minimum, maximum, and average for majority of variables where appropriate.
* Due to the shortened period of 2011-2018, proper climatological and anomaly analysis could not be performed. Harmonics analysis was applied to develop a study period average and deviations from the average for each variable.

## Data QC

To check for quality, plots of each variable at all GACC locations except for Fairbanks, AK (9 total) were plotted from 2011-2018. Seasonal and study period average maps were also produced for each variable for the entirety of the domain.

# NARR Reanalysis

## Data Overview

### Data origin

### “The North American Regional Reanalysis (NARR) is a model produced by the National Centers for Environmental Prediction (NCEP) that generates reanalyzed data for temperature, wind, moisture, soil, and dozens of other parameters. The NARR model assimilates a large amount of observational data from a variety of sources to produce a long-term picture of weather over North America.”

Data assimilated to initialize the model to real-world conditions include:

* Temperatures, winds, and moisture from radiosondes
* Pressure data from surface observations
* Dropsondes
* Pibals
* Aircraft temperatures and winds
* Satellite radiance (a measure of heat) from polar (orbiting Earth) satellites
* Cloud drift winds from geostationary (fixed at one location viewing Earth) satellites

### Citation

### Mesinger, F., G. DiMego, E. Kalnay, K. Mitchell, and Coauthors, 2006: North American Regional Reanalysis. *Bulletin of the American Meteorological Society*, 87, 343–360, [doi:10.1175/BAMS-87-3-343](http://dx.doi.org/10.1175/BAMS-87-3-343)

### Size

* All Variables, 4x Daily, North American Domain ~224MB

### Location (internal)

University of Miami server: /raid60B/s2sfire/NOAA\_S2S/database\_files/NARR

### Location (external)

## <https://www.ncei.noaa.gov/thredds/catalog/model/narr.html>

## Data Contents

## <https://www.ncei.noaa.gov/sites/default/files/2021-04/narr_archive_contents.pdf>

## Data Properties

### Raw Files

|  |  |
| --- | --- |
| Data Type | Gridded |
| Data Name | narr-a\_YYYYMMDD\_HH00\_000.grb |
| File Format | Grib |
| Data Resolution | 0.3° x 0.3° (~32km) |
| Domain Extent | North America + Some (see below) |
| XY Coordinate System (Projection) | Lambert Conformal |

### Database Files

|  |  |
| --- | --- |
| Data Type | Gridded |
| Data Name | var\_NARR\_REANALYSIS\_Abs\_YYYY.nc  var\_NARR\_REANALYSIS\_AVG\_Daily \_YYYY.nc  var\_NARR\_REANALYSIS\_MAX\_Daily\_YYYY.nc  var\_NARR\_REANALYSIS\_MIN\_Daily \_YYYY.nc |
| File Format | NetCDF |
| Data Resolution | 12km x 12km (~0.108°) |
| Domain Extent | North America |
| XY Coordinate System (Projection) | Reprojected onto a latitude/longitude grid using xesmf. |
| Variables | Boundary layer height (blh), Fosberg Fire Weather Index (ffwi), surface based Hot-Dry-Windy (hdwi), precipitation rate (prate), relative humidity (rh), soil moisture (sm), 2m-temperature (t2m), total precipitation accumulated over 3-hrs (tp3hr), u-compenent of the wind (uwnd), v-component of the wind (vwnd), vapor pressure deficit (vpd), wind direction (wdir), wind speed (wspeed) |

## Data Use

Appropriate uses of the data product include:

* Cross comparison of data from matching time periods
* Domain statistics
* Event analysis

## Data Processing

* Raw data processed to reduce domain to relevant study area.
* Reprojection of variables that are on gaussian grid to a latitude/longitude grid using xesmf library in Python.
* Generated the 24-hr minimum, maximum, and average for majority of variables where appropriate.
* Due to the shortened period of 2011-2018, proper climatological and anomaly analysis could not be performed. Harmonics analysis was applied to develop a study period average and deviations from the average for each variable.

## Data QC

To check for quality, plots of each variable at all 10 GACC locations and Kona, HI (11 total) were plotted from 2011-2018. Seasonal and study period average maps were also produced for each variable for the entirety of the domain.

# HRRR Analysis

## Data Overview

### Data origin

From the National Oceanic and Atmospheric Administration (NOAA) Global Systems Laboratory: “the HRRR is a NOAA real-time 3-km resolution, hourly updated, cloud-resolving, convection-allowing atmospheric model, initialized by 3km grids with 3km radar assimilation. Radar data is assimilated in the HRRR every 15 min over a 1-h period adding further detail to that provided by the hourly data assimilation from the 13km radar-enhanced Rapid Refresh.”

HRRR analysis data is based on observations of current weather conditions, while forecasts are based on predicted weather conditions.

### Citation

### Dowell, D. C., and Coauthors, 2022: The High-Resolution Rapid Refresh (HRRR): An Hourly Updating Convection-Allowing Forecast Model. Part I: Motivation and System Description. Wea. Forecasting, 37, 1371–1395, <https://doi.org/10.1175/WAF-D-21-0151.1>.

NOAA High-Resolution Rapid Refresh (HRRR) Model was accessed on 12/01/2023 from https://registry.opendata.aws/noaa-hrrr-pds.

### Size

125,583,348 bytes per file

### Location (internal)

* University of Miami server: /raid60B/s2sfire/NOAA\_S2S/database\_files/HRRR

### Location (external)

* HRRR analysis can be found on [Amazon Web Services](https://registry.opendata.aws/noaa-hrrr-pds/) or [Google Cloud](https://console.cloud.google.com/marketplace/product/noaa-public/hrrr?project=python-232920&pli=1).

## Data Contents

* The data was obtained from 2014-2018.

## Data Properties

|  |  |
| --- | --- |
| Data Type | Gridded |
| Data Name | 20160903\_00z\_anal.nc; YEARMONDAY\_TIMEz.nc. |
| Columns and Rows | 1799, 1059 |
| Number of Bands | n/a |
| Cell Size (X, Y) | 3km x 3km |
| Pixel Type | Floating Point |
| Pixel Depth | 32-bit |
| Extent (top, left, right, bottom) | (50°, -130°, -65°, 25°) |
| XY Coordinate System | Lambert Conformal Conic Projection |
| Linear Unit | 3km |

### Database Files

|  |  |
| --- | --- |
| Data Type | Gridded |
| Data Name | var\_HRRR\_HISTORICAL\_Abs\_YYYY.nc  var\_HRRR\_HISTORICAL\_AVG\_Daily\_YYYY.nc  var\_HRRR\_HISTORICAL\_MAX\_Daily\_YYYY.nc  var\_HRRR\_HISTORICAL\_MIN\_Daily \_YYYY.nc |
| File Format | NetCDF |
| Data Resolution | 3km x 3km (~0.027°) |
| Domain Extent | North America |
| XY Coordinate System (Projection) | Reprojected onto a latitude/longitude grid using xesmf. |
| Variables | Boundary layer height (blh), convective available potential energy (cape), 2-m dewpoint (d2m), Fosberg Fire Weather Index (ffwi), 10-m wind gust (gust), surface based Hot-Dry-Windy (hdwi), soil moisture (mstav), precipitation rate(prate), relative humidity (rh), 2m-temperature (t2m), total precipitation (tp)^, u-compenent of the wind (uwnd), v-component of the wind (vwnd), vapor pressure deficit (vpd), wind direction (wdir), wind speed (wspeed) |

^ = 1-hr forecast

## Data Use

Appropriate uses of the data product include:

* Cross comparison of data from matching time periods
* Domain statistics
* Event analysis

## Data Processing

* Raw data processed to reduce domain to relevant study area.
* Reprojection of variables that are on gaussian grid to a latitude/longitude grid using xesmf library in Python.
* Generated the 24-hr minimum, maximum, and average for majority of variables where appropriate.
* Due to the shortened period of 2011-2018, proper climatological and anomaly analysis could not be performed. Harmonics analysis was applied to develop a study period average and deviations from the average for each variable.

## Data QC

To check for quality, plots of each variable at all GACC locations except for Fairbanks, AK (9 total) were plotted from 2011-2018. Seasonal and study period average maps were also produced for each variable for the entirety of the domain.

# CONUS 404

## Data Overview

CONUS404 is a unique, high-resolution hydro-climate dataset appropriate for forcing hydrological models and conducting meteorological analysis over the conterminous United States. CONUS404, so named because it covers the CONterminous United States for over 40 years at 4 km resolution, was produced by the Weather Research and Forecasting (WRF) model simulations run by NCAR as part of a collaboration with the USGS Water Mission Area. The CONUS404 includes 42 years of data (water years 1980-2021) and the spatial domain extends beyond the CONUS into Canada and Mexico, thereby capturing transboundary river basins and covering all contributing areas for CONUS surface waters.

The CONUS404 dataset, produced using WRF version 3.9.1.1, is the successor to the CONUS1 dataset in ds612.0 (Liu, et al., 2017) with improved representation of weather and climate conditions in the central United States due to the addition of a shallow groundwater module and several other improvements in the NOAH-Multiparameterization land surface model. It also uses a more up-to-date and higher-resolution reanalysis dataset (ERA5) as input and covers a longer period than CONUS1.

### Data origin

### Citation

* In addition to the RDA dataset citation, authors are required to include the following citations in publications that base outcomes on this dataset:
* 1. Rasmussen, R.M., F. Chen, C.H. Liu, K. Ikeda, A. Prein, J. Kim, T. Schneider, A. Dai, D. Gochis, A. Dugger, Y. Zhang, A. Jaye, J. Dudhia, C. He, M. Harrold, L. Xue, S. Chen, A. Newman, E. Dougherty, R. Abolafia-Rozenzweig, N. Lybarger, R. Viger, D. Lesmes, K. Skalak, J. Brakebill, D. Cline, K. Dunne, K. Rasmussen, G. Miguez-Macho, 2023: CONUS404: The NCAR-USGS 4-km long-term regional hydroclimate reanalysis over the CONUS. Bull. Amer. Meteor. Soc., under revision.
  + Has list of variables
* 2. Rasmussen, R.M., Chen, F., Liu, C., Ikeda, K., Prein, A., Kim, J., Schneider, T., Dai, A., Gochis, D., Dugger, A., Zhang, Y., Jaye, A., Dudhia, J., He, C., Harrold, M., Xue, L., Chen, S., Newman, A., Dougherty, E., Abolafia-Rozenzweig, R., Lybarger, N., R. Viger, Dunne, K., Rasmussen, K., Miguez-Macho, G., 2023, Four-kilometer long-term regional hydroclimate reanalysis over the conterminous United States (CONUS), 1979-2020: U.S. Geological Survey data release, https://doi.org/10.5066/P9PHPK4F

### Size

* 815.86 TB (Entire dataset)
* 400-450 MB/file (hourly)

### Location (internal)

* University of Miami server: /raid60B/s2sfire/NOAA\_S2S/database\_files/CONUS404

### Location (external)

* https://thredds.rda.ucar.edu/thredds/catalog/files/g/ds559.0/catalog.html

## Data Contents

* The data was obtained from 2011-2018.

## Data Properties

### Raw Files

|  |  |
| --- | --- |
| Data Type | Gridded |
| Data Name (example) | wrf2d\_d01\_1980-09-26\_01:00:00.nc |
| File Format | netCDF4 |
| Data Resolution | 4km x 4km |
| Domain Extent | Longitude Range: Westernmost=137.873W Easternmost=58.463W  Latitude Range: Southernmost=17.631N Northernmost=56.704N |
| XY Coordinate System (Projection) | Lambert Conformal |

### Database Files

|  |  |
| --- | --- |
| Data Type | Gridded |
| Data Name | var\_CONUS404\_ANALYSIS\_Abs\_YYYY.nc  var\_CONUS404\_ANALYSIS\_AVG\_Daily\_YYYY.nc  var\_CONUS404\_ANALYSIS\_MAX\_Daily\_YYYY.nc  var\_CONUS404\_ANALYSIS\_MIN\_Daily \_YYYY.nc |
| File Format | NetCDF |
| Data Resolution | 4km x 4km |
| Domain Extent | CONUS |
| XY Coordinate System (Projection) | Reprojected onto a latitude/longitude grid using xesmf. |
| Variables | Boundary layer height (PBLH), mixed layer convective available potential energy (MLCAPE), surface based convective available potential energy (SBCAPE), Fosberg Fire Weather Index (ffwi), surface based Hot-Dry-Windy (hdwi), soil moisture (SMOIS), precipitation accumulation (PRECC\_ACC), relative humidity (rh), 2m-temperature (T2), 2-m dewpoint (TD2), u-compenent of the wind (U10), v-component of the wind (V10), vapor pressure deficit (vpd), wind direction (wdir), wind speed (wspeed) |

## Data Use

Appropriate uses of the data product include:

* Cross comparison of data from matching time periods
* Domain statistics
* Event analysis

## Data Processing

* Raw data processed to reduce domain to relevant study area.
* Reprojection of variables that are on gaussian grid to a latitude/longitude grid using xesmf library in Python.
* Generated the 24-hr minimum, maximum, and average for majority of variables where appropriate.
* Due to the shortened period of 2011-2018, proper climatological and anomaly analysis could not be performed. Harmonics analysis was applied to develop a study period average and deviations from the average for each variable.

## Data QC

To check for quality, plots of each variable at all of the GACC locations except for Fairbanks, AK (9 total) were plotted from 2011-2018. Seasonal and study period average maps were also produced for each variable for the entirety of the domain.

# UFS Retrospective

## Data Overview

The Unified Forecast System (UFS) is a community-based global coupled Earth modeling system with the capability of configuring a set of common components (model components for atmosphere, land, ocean, sea ice, waves, aerosols, etc.) into different UFS Applications targeting predictions that span local to global domains, and forecast timescales ranging from sub-hourly to seasonal. The UFS is established in response to advice from the community that the NOAA modeling and data assimilation efforts should be integrated and collectively managed based on a unified modeling framework in a unified collaborative strategy. The UFS is being developed to support the NOAA’s operational forecast capabilities and is also envisioned to become a state-of-the-art community modeling system for research applications in the near future.

The Unified Forecast System Subseasonal to Seasonal prototypes consist of reforecast data from the UFS atmosphere-ocean coupled model experimental prototype version 5, 6, 7, and 8 produced by the Medium Range and Subseasonal to Seasonal Application team of the UFS-R2O project. The UFS prototypes are the first dataset released to the broader weather community for analysis and feedback as part of the development of the next generation operational numerical weather prediction system from NWS. The datasets includes all the major weather variables for atmosphere, land, ocean, sea ice, and ocean waves.

A Prototype is a retrospective run for the period from 2011 to 2018. The runs are initialized twice per month (1st and 15th) and the length of the forecast is 35 days with an output frequency of 6 hours.

### Data origin

### Citation

### NOAA Unified Forecast System Subseasonal to Seasonal Prototypes was accessed on DATE from <https://registry.opendata.aws/noaa-ufs-s2s>.

### Size

* 1 day, 1 forecast init, ALL variable, global ~300MB per file

### Location (internal)

* University of Miami server: /raid60B/s2sfire/NOAA\_S2S/database\_files/UFS\_S2S

### Location (external)

## [AWS S3 Buckets](https://noaa-ufs-prototypes-pds.s3.amazonaws.com/index.html)

## Data Contents

* Opening the raw grib2 file with python/xarray à have to select/filter by layer:
  + filter\_by\_keys={'typeOfLevel': 'meanSea'} filter\_by\_keys={'typeOfLevel': 'hybrid'} filter\_by\_keys={'typeOfLevel': 'atmosphere'} filter\_by\_keys={'typeOfLevel': 'surface'} filter\_by\_keys={'typeOfLevel': 'planetaryBoundaryLayer'} filter\_by\_keys={'typeOfLevel': 'isobaricInPa'} filter\_by\_keys={'typeOfLevel': 'isobaricInhPa'} filter\_by\_keys={'typeOfLevel': 'depthBelowLandLayer'} filter\_by\_keys={'typeOfLevel': 'heightAboveGround'} filter\_by\_keys={'typeOfLevel': 'heightAboveSea'} filter\_by\_keys={'typeOfLevel': 'atmosphereSingleLayer'} filter\_by\_keys={'typeOfLevel': 'heightAboveGroundLayer'} filter\_by\_keys={'typeOfLevel': 'tropopause'} filter\_by\_keys={'typeOfLevel': 'maxWind'} filter\_by\_keys={'typeOfLevel': 'isothermZero'} filter\_by\_keys={'typeOfLevel': 'highestTroposphericFreezing'} filter\_by\_keys={'typeOfLevel': 'pressureFromGroundLayer'} filter\_by\_keys={'typeOfLevel': 'sigmaLayer'} filter\_by\_keys={'typeOfLevel': 'sigma'} filter\_by\_keys={'typeOfLevel': 'potentialVorticity'}

## Data Properties

### Raw Files

|  |  |
| --- | --- |
| Data Type | Gridded |
| Data Name (ex from AWS) | gfs.t00z.pgrb2.0p25.f000 |
| File Format | grib2 |
| Data Resolution | 0.25° x 0.25° |
| Domain Extent | Global |
| XY Coordinate System (Projection) | C384 converted to regular 1536x768 |
| Init and lead | 1st and 15th of every month, hourly out to 35 days |
| Currently Available | Prototypes 5, 6, 7, 8 |

### Database Files

|  |  |
| --- | --- |
| Data Type | Gridded |
| Data Name | Stored by each Protoype#/initialization\_day/  INITYYYYMMDD = init date for ex: 20110401  var\_UFS\_S2S\_FORECAST\_Abs\_INITYYYYMMDD.nc  var\_UFS\_S2S\_FORECAST\_AVG\_Daily\_INITYYYYMMDD.nc  var\_UFS\_S2S\_FORECAST\_MAX\_Daily\_INITYYYYMMDD.nc  var\_UFS\_S2S\_FORECAST\_MIN\_Daily\_INITYYYYMMDD.nc |
| File Format | NetCDF |
| Data Resolution | 0.25° x 0.25° |
| Domain Extent | 85°N-0°N, 180°W-360°W |
| XY Coordinate System (Projection) | Latitude/longitude |
| Variables | Convective available potential energy (cape), Fosberg Fire Weather Index (ffwi), wind gust (gust), surface based Hot-Dry-Windy (hdwi), precipitation rate (prate), 2m-relative humidity (r2), 2m-temperature (t2m), u-compenent of the wind (u10), v-component of the wind (v10), vapor pressure deficit (vpd), wind direction (wdir), wind speed (wspeed) |

## Data Use

Appropriate uses of the data product include:

* Cross comparison of data from matching time periods
* Domain statistics
* Event analysis

## Data Processing

* Due to the shortened period of 2011-2018, proper climatological and anomaly analysis could not be performed. Harmonics analysis was applied to develop a study period average and deviations from the average for each variable.

## Data QC

To check for quality, multiple plots of each variable on various pressure levels were analyzed. Data cross compared to other reanalysis and historical datasets.

# SubX

## Data Overview

### Data origin

### Citation

### Size

### Location (internal)

University of Miami server:

### Location (external)

## Data Contents

## Data Properties

|  |  |
| --- | --- |
| Data Type | Gridded |
| Data Name (example) |  |
| File Format |  |
| Data Resolution | ° x ° |
| Domain Extent |  |
| XY Coordinate System (Projection) |  |

## Data Use

Appropriate uses of the data product include:

* Cross comparison of data from matching time periods
* Domain statistics and climatology
* Event analysis

## Data Processing

-Raw data processed to reduce domain to relevant study area

-Remove leap years

-Restructure?

## Data QC

To check for quality, multiple plots of each variable on various pressure levels were analyzed. Data cross compared to other reanalysis and historical datasets.

# NNME

## Data Overview

### Data origin

### Citation

### Size

### Location (internal)

University of Miami server:

### Location (external)

## Data Contents

## Data Properties

|  |  |
| --- | --- |
| Data Type | Gridded |
| Data Name (example) |  |
| File Format |  |
| Data Resolution | ° x ° |
| Domain Extent |  |
| XY Coordinate System (Projection) |  |

## Data Use

Appropriate uses of the data product include:

* Cross comparison of data from matching time periods
* Domain statistics and climatology
* Event analysis

## Data Processing

-Raw data processed to reduce domain to relevant study area

-Restructure?

## Data QC

To check for quality, multiple plots of each variable on various pressure levels were analyzed. Data cross compared to other reanalysis and historical datasets.