Data Deliverable Readme

Dataset: Standardized Fire Weather Research Database (sFWRD): CONUS404_Analysis

Abbreviation: sFWRD_C404An

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NOAA Grant Title: Subseasonal Predictability of Fire Weather Metrics for Decision Support

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Prepared by:

Kayla Besong-Cowan; KBesong@sonomatech.com
Samantha J. Kramer, skramer@sonomatech.com
Tyler Fenske, tfenske@sonomatech.com
ShihMing Huang, shuang@sonomatech.com
Sonoma Technology, Inc
Petaluma, CA
1-707-665-9900

Deliverable Summary:

Data Overview: Raw data processed to reduce domain to relevant study area [17.63-56.65º N, 222.1-301.471º W], with 4km spatial resolution. The hourly data available from CONUS404 is also processed to the 24-hr minimum, maximum, and average for majority of variables where appropriate. Due to the shortened period of 2011-2018, standard climatological and anomaly analysis cannot be performed. Harmonics analysis was applied to develop a 'period average' for each variable for use in anomaly assessments. Each dataset is projected to represent variables on a standard coordinate system (time, latitude, longitude) for ease-of-use. Each variable file is provided in netCDF format, following the naming convention detailed

below. Variable names, descriptions, and units are also detailed below. Each file is compatible with the python sFWRD codebase.

Data File Naming Convention

Baseline:

- {VAR}_CONUS404_ANALYSIS_Abs_YYYY.nc
  - —Native dataset time series (hourly)
  - —Format: (time, latitude, longitude)
- {VAR}_CONUS404_ANALYSIS_{STAT}_Daily_YYYY.nc
  - —Aggregated dataset time series (daily)
  - —Format: (time, latitude, longitude)
  - —STAT:
    - +AVG: daily average value
    - +MAX: daily maximum value
    - +MIN: daily minimum value

Harmonic:

- {VARS}_{NORM}_CONUS404_ANALYSIS_Abs_period.nc
  - —Native dataset time series (hourly)
  - —Period value from harmonic 1-5, representing a ‘climatology’ or ‘anomaly’ for analysis
  - —Format: (time, latitude, longitude)
  - —NORM:
    - +ANOM: ‘anomaly’ value based on period normal
    - +NORM: ‘climatology’ value based on period normal
- {VARS}_{STAT}_{NORM}_CONUS404_ANALYSIS_Daily_period.nc
  - — Aggregated dataset time series (daily)
  - —Period value from harmonic 1-5, representing a ‘climatology’ or ‘anomaly’ for analysis
  - —Format: (time, latitude, longitude)
  - —NORM:
    - +ANOM: ‘anomaly’ value based on period normal

+NORM: ‘climatology’ value based on period normal

—STAT:

+AVG: daily average value

+MAX: daily maximum value

+MIN: daily minimum value

Metadata: Each data file has the same standards for coordinate variables. The time variable is in datetime format, with hour values for the absolute time series. All other variables use float32 numerical format. Missing data is represented with a value of NaN.

Coordinates	Parameter Description	Units	Data Type
time	ABS: hourly value AVG/MIN/MAX: daily value	YYYY-MM-DD HH:MM:SS YYYY-MM-DD	datetime64
latitude	Degrees north	Decimal degrees	float32
longitude	Degrees east	Decimal degrees	float32

{VAR}	Variable Description	Units	Data Type
pbl	Boundary layer height	m	float32
sbcape	Surface based convective available potential energy	Jkg^{-2}	float32
d2	2-m dew point	K	float32
ffwi	Fosberg fire weather index	N/A [0-100 scale]	float32
hdw	Hot-Dry-Windy surface value	$m\ s^{-1}$ hPa	float32
mlcape	Mixed layer convective available potential energy	Jkg^{-2}	float32
rh	Relative humidity	%	float32
vsm	Volumetric Soil Moisture	m^3m^{-3}	float32
t2	2-m temperature	K	float32

tp	Total precipitation amount	mm	float32
u10	10-m zonal wind component	m s^{-1}	float32
v10	10-m meridional wind component	m s^{-1}	float32
vpd	Vapor pressure deficient	hPa	float32
wd	10-m wind direction	Degrees (0-360)	float32
ws	10-m wind speed	m s^{-1}	float32

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Database Citation:

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CONUS404 Source Citation:

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.