**Packages Coming Soon**

**Code Module Description**

Functions:

* Dictionary

Code 1 Gather Data: Reanalysis, SubX, UFS, NMME

* Identify which datasets and variables
* Grab raw data available (sub daily)
* Clean up data
* (optional) Output clean data files in organized manor
* (optional) Delete raw data files

Code 2 Calculate Metrics: Reanalysis, SubX, UFS, NMME

* Read in clean data from Code 1
* Calculate relative metrics, daily values, stats
* Output data into final database format and file tree

Code 3 Calculate MME/MPM: SubX, UFS, NMME

* MME or MPM calculation from data in Code 2
  + Add output data into final database format and file tree

Code 4 Harmonic: Reanalysis, SubX, UFS, NMME

* Apply harmonics for time range available for each dataset/variable [harmonic 1-5]
* Output period normal and daily anomaly
  + Add output data into final database format and file tree

Code 5: SubX, UFS, NMME

* Transmute data from initialization time to forecast lead time series

Code 6: Standardize Data: Reanalysis, SubX, UFS, NMME

* Grid projection and standardization
* Unify object types
* Unify/update metadata

Code 7: Basic Visualization

* Read in gridded data
  + Select model, variable, time
* Plot gridded data
  + Selected domain
* Save as PNG file

Code 8: Point Assessment

* Read in CSV data points
* Extract data at each point into CSV format

**Bonus Code Modules for UFS**

Code A: Downscaling

* A1: Statistical Downscaling
  + Tool: CDO
    - 13 km – 15min/set
    - 3 km – 6 days / set
    - UFS 5-8 and MPM
    - Region?
* A2: ML Downscaling
  + Tool: TBD
    - 13 km
    - 3 km
    - UFS 5-8 and MPM?
    - Region?
* A3: Dynamical Downscaling
  + Tool: EPIC
    - 13 km
    - 3 km
    - UFS 5-8 and MPM?
    - Region?

Code B: Calibration

**File Tree Structure**

Clean Data (e.g., Code 1 output):

/Reanalysis/Clean/Dataset

/SubX\_Retrospective/Clean /Model

/UFS\_Retrospective/Clean /Version

/NMME\_Retrospective/Clean /Model

Fire Metric Database (e.g. Code 2, 3, 4 output);

/FireMetricDatabase/Variable/Dataset/

Files by VAR\_DATASET\_TYPE\_YYYY.nc

e.g., HDW\_SUBX\_CCSM\_RETROFORE\_2020.nc

HDW\_NCEP\_REANALYSIS\_2020.nc

**Accompanying Documentation**

* Data Dictionary
* README for file description (code output 2-4)
* Code Repo

Code Repo Tree

* **User Facing** 
  + **Reanalysis**
    - Data grab $
    - Data clean $
    - **Calculate metrics**
      * Standard Vars
        + WS $
        + ~~RH~~ 🡪 worked into VPD code $
        + VPD $
      * (optional) Fosberg $
      * (optional) HDW $
    - Harmonics $
    - Standardize
      * Lat/lon projection $
      * Metadata + Var names$
      * Var names$
      * ~~Float 32~~
  + **UFS\_S2S**
    - Data grab $
    - Data clean $
    - **Calculate metrics**
      * Standard Vars
        + WS $
        + ~~RH~~ 🡪 worked into VPD code $
        + VPD $
      * (optional) Fosberg $
      * (optional) HDW $
    - (optional) Calculate MPM, transmute $
    - Harmonics $
    - Standardize
      * Lat/longitude $
      * Metadata $
      * Var names $
      * ~~Float 32~~
    - *(optional) Downscale*
    - *(optional) Calibrate*
  + **SubX**
    - Data grab
    - Data clean
    - **Calculate metrics**
      * Standard Vars
        + WS
        + RH
        + VPD
      * (optional) Fosberg
      * (optional) HDW
    - (optional) Calculate MME
    - Transmute
    - Harmonics
    - Standardize
      * Lat/lon
      * Metadata
      * Var names
      * Float 32
  + **NMME**
    - Data grab
    - Data clean
    - **Calculate metrics**
      * Standard Vars
        + WS
        + RH
        + VPD
      * (optional) Fosberg
      * (optional) HDW
    - (optional) Calculate MME
    - Transmute
    - Harmonics
    - Standardize
      * Lat/lon
      * Metadata
      * Var names
      * Float 32
  + **Analysis**
    - **Gridded**
      * Domain selection $
      * Basic map visualizer $
    - **Point**
      * Point selection + Data grab at points $
      * Visualize at points

sFRWD Files

* /sFWRD/Dataset/
  + README
  + Variable/
    - VAR

Files by VAR\_DATASET\_TYPE\_YYYY.nc

e.g., HDW\_SUBX\_CCSM\_RETROFORE\_2020.nc

HDW\_NCEP\_REANALYSIS\_2020.nc