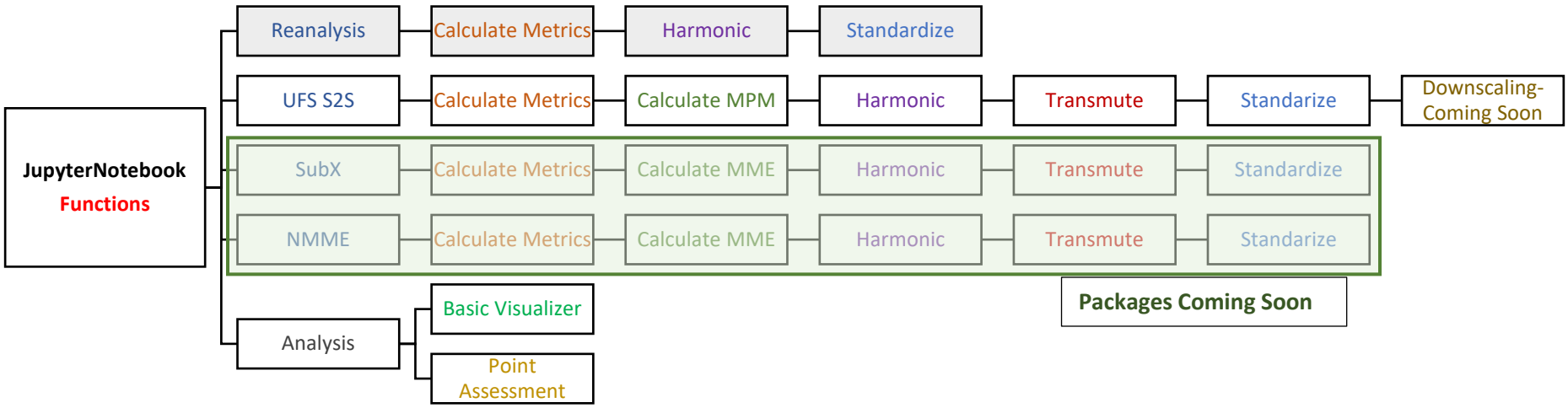
JupyterNotebook
Functions
Reanalysis
Calculate Metrics
Harmonic
Standardize
UFS S2S
Calculate Metrics
Calculate MPM
Harmonic
Transmute
Standarize
Downscaling-
Coming Soon
SubX
Calculate Metrics
Calculate MME
Harmonic
Transmute
Standardize
NMME
Calculate Metrics
Calculate MME
Harmonic
Transmute
Standarize
Packages Coming Soon
Analysis
Basic Visualizer
Point
Assessment

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