

METplus Feature Relative Overview

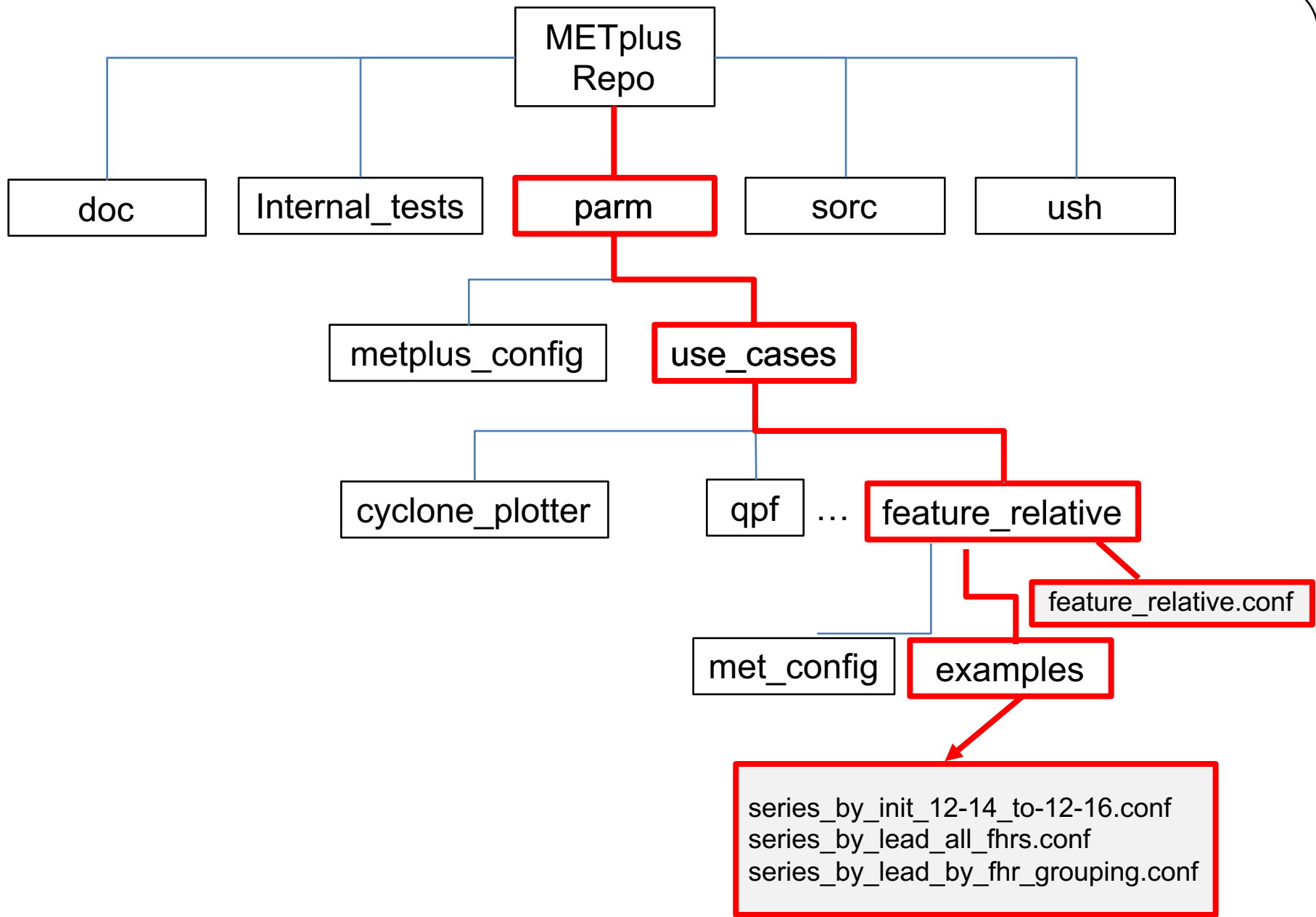
Background

The feature relative use case ingests tropical cyclone Adeck and Bdeck data performs a series analysis by init time or lead (fcst) time.

Tools

MET Tools involved:

1. **tc_pairs** is run to match an ATCF format tropical cyclone (TC) forecast with a second ATCF format reference TC dataset (most commonly the Best Track analysis).
2. **tc_stat** tool is run if the user has requested additional filtering on the output from tc_pairs.
3. **regrid_data_plane** tool is used to facilitate in the extraction of tiles from the tc_pairs output.
4. **series-analysis** is called to perform the series analysis
5. **plot_data_plane** to generate the plots



Configuring METplus for Use Case

Verify that PYTHONPATH and PATH are set correctly:

csh:

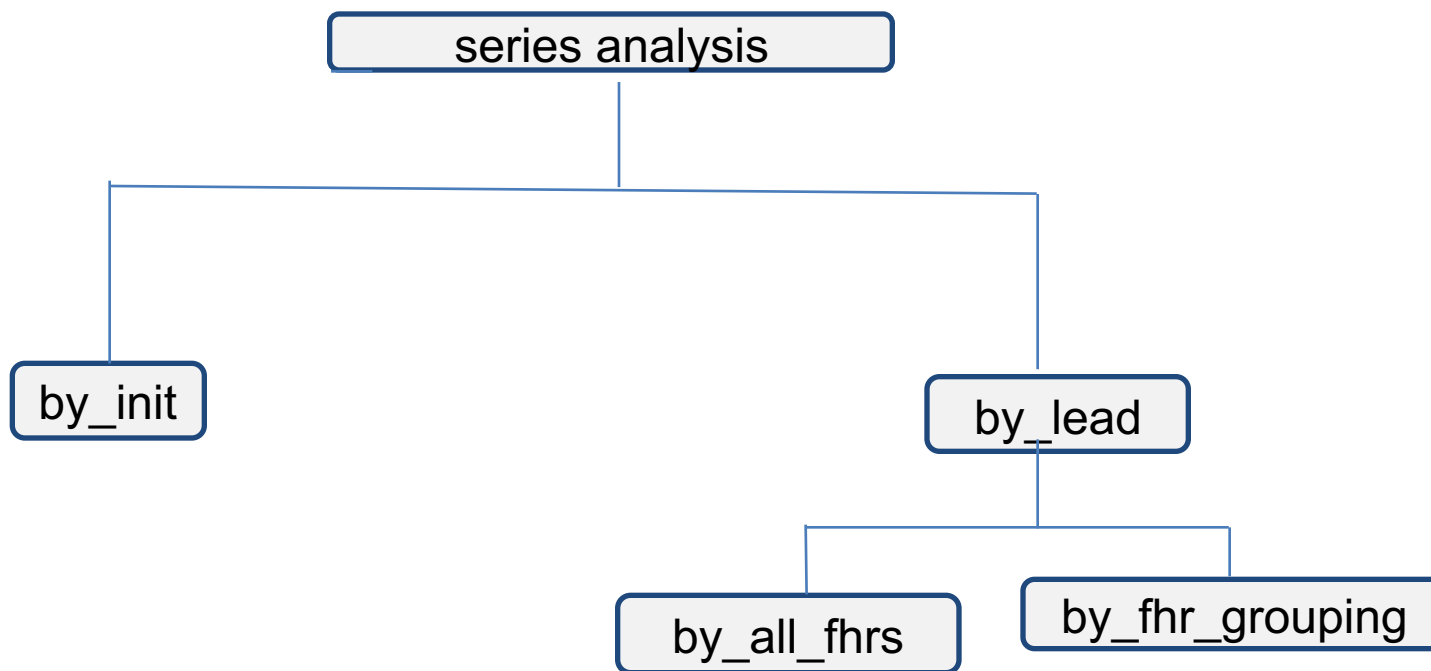
```
setenv PYTHONPATH ~/METplus/ush:~/METplus/parm :$PYTHONPATH  
setenv PATH ~/METplus/ush:$PATH
```

bash:

```
export PYTHONPATH="~/METplus/ush:~/METplus/parm:$PYTHONPATH"  
export PATH="~/METplus/ush:$PATH"
```

Configuring METplus for Use Case

Overview of Series Analysis portion of the Feature Relative Use Case



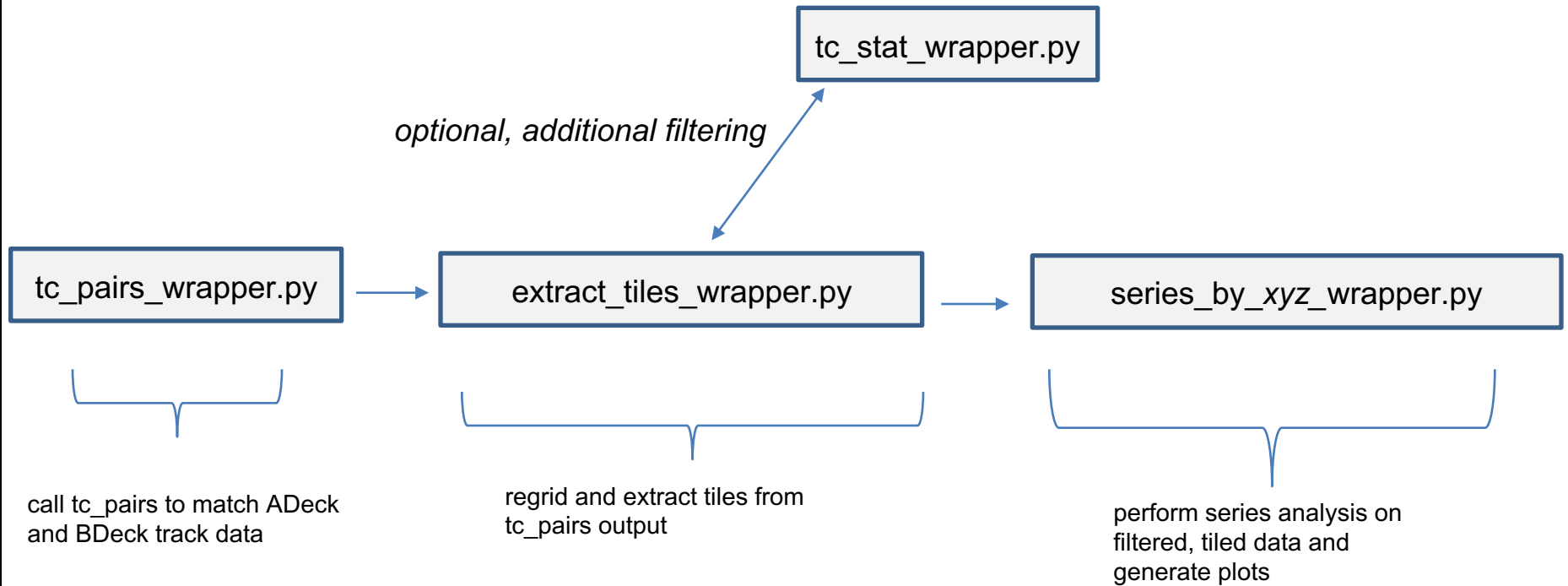
Configuring METplus for Use Case

There are currently four examples in the feature relative use case:

1. `parm/use_cases/feature_relative/feature_relative.conf`
2. `parm/use_cases/feature_relative/examples/series_by_init_12-14_to_12-16.conf`
3. `parm/use_cases/feature_relative/examples/series_by_lead_all_fhrs.conf`
4. `parm/use_cases/feature_relative/examples/series_by_lead_by_fhr_grouping.conf`

Configuring METplus for Use Case

Common “Work flow” in all feature relative examples:



Configuring METplus for Use Case

1. Create your own custom config file
2. View (in GitHub) or open (in editor):

`parm/use_cases/feature_relative/feature_relative.conf`

3. Find any `/path/to` in the `feature_relative.conf`
 - a. Replicate the section header e.g. `[dir]`, `[config]`, etc. in your custom conf file. **The Glossary in the User Documentation is your friend*
 - b. Define any variables in your custom config file wherever there are `/path/to`'s in the `feature_relative.conf` file **See next slide*
 - c. Save your changes in your custom conf file
 - d. Your custom conf file will now work for all the examples in the `use_cases/feature_relative` and `use_cases/feature_relative/examples` directories

Configuring METplus for Use Case

Variables that you should define in your custom config file

under the [dir] section

PROJ_DIR

MODEL_DATA_DIR

ADECK_TRACK_DATA_DIR

BDECK_TRACK_DATA_DIR

OUTPUT_BASE

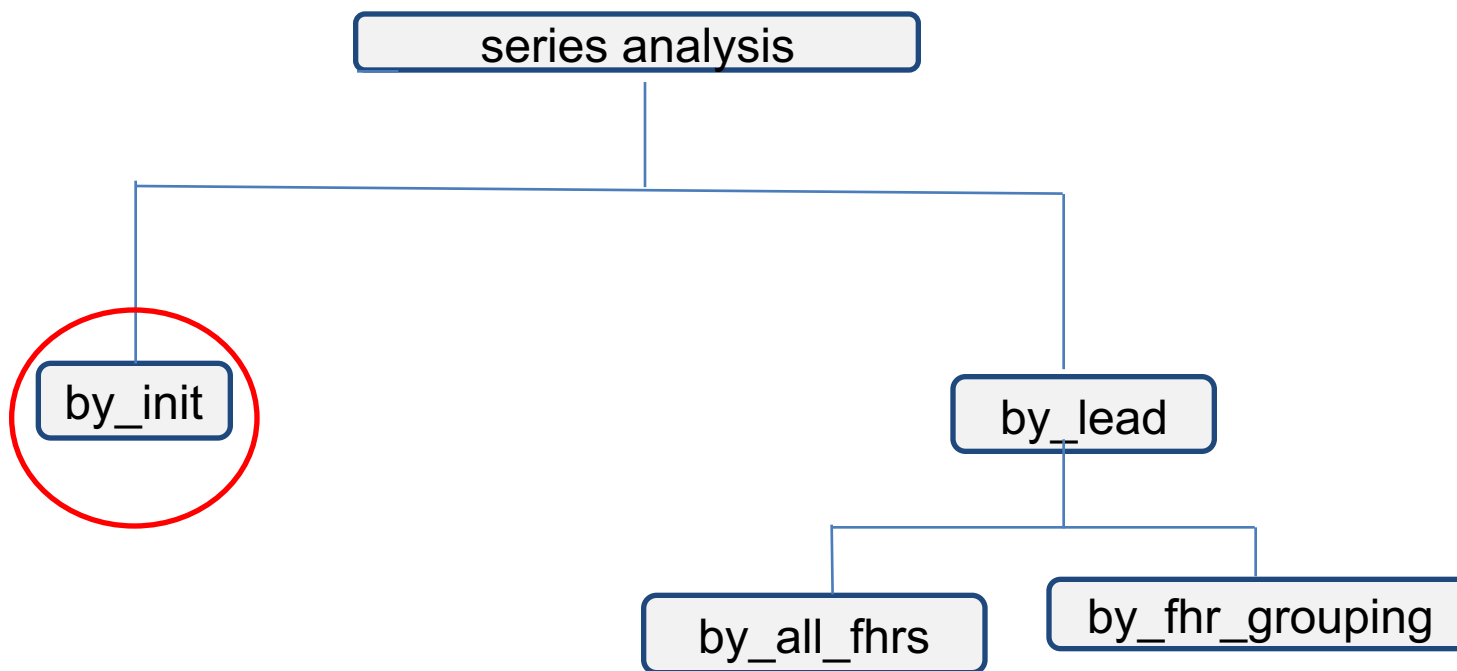


for tc-pairs

Over rides what is in the parm/use_cases/feature_relative/feature_relative.conf
and the **OUTPUT_BASE** in the conf files in parm/use_cases/feature_relative/examples

Configuring METplus for Use Case

Overview of Series Analysis portion of the Feature Relative Use Case



Configuring METplus for Use Case

Snippet of config file requesting series by init

*these variables are located under the [config] family

```
EXTRACT_TILES_FILTER_OPTS = -basin ML ← additional filtering on matched pairs
```

```
# The init time begin and end times, increment, and last init hour.
```

```
INIT_TIME_FMT = %Y%m%d
```

```
INIT_BEG = 20141214
```

```
INIT_END = 20141215
```

```
#INIT_INCREMENT = 86400
```

```
INIT_INCREMENT = 21600
```

```
#21600 ;; The increment in seconds in integer format
```

```
INIT_HOUR_END = 18 ;; Should be a string in HH or HHH format
```

```
# Used for performing series analysis based on lead time
```

```
FHR_BEG =
```

```
FHR_END = ←
```

```
FHR_INC =
```

Leave these three variable undefined for series by lead, if set to empty/undefined then series by init

```
# The following three should be uncommented to perform series analysis on the
```

```
# entire range of lead times for each forecast hour in the range defined
```

```
# by the FHR_BEG, FHR_END, and FHR_INC defined above.
```

```
FHR_GROUP_BEG =
```

```
FHR_GROUP_END = ←
```

```
FHR_GROUP_LABELS =
```

Leave these undefined/empty for consistency with the above three variables

Running the use case with METplus

Example 1. Series analysis by initialization time

```
master_metplus.py -c parm/use_cases/feature_relative/feature_relative.conf \  
-c /path_to_your/custom_conf_file.conf
```

Example 2. Series analysis by initialization with modified time

```
master_metplus.py -c parm/use_cases/feature_relative/feature_relative.conf \  
-c parm/use_cases/feature_relative/examples/series_by_init_12-14_to_12-16.conf \  
-c /path_to_your/custom_conf_file.conf
```

Post-run overview: logging

```
DEBUG 1: Opening data file: /d1/jfrimel/pytmp_dev2.0/series_by_init_12-14_to_12-16/series_analysis_init/20141215_00/ML1201192014/series_TMP_Z2.nc
DEBUG 1: Creating postscript file: /d1/jfrimel/pytmp_dev2.0/series_by_init_12-14_to_12-16/series_analysis_init/20141215_00/ML1201192014/series_TMP_Z2_OBAR.ps
09/26 18:48:09.007 metplus.SeriesByInit (command_runner.py:155) INFO: RUNNING:
/usr/bin/convert -rotate 90 -background white -flatten
/d1/jfrimel/pytmp_dev2.0/series_by_init_12-14_to_12-16/series_analysis_init/20141215_00/ML1201192014/series_TMP_Z2_OBAR.ps
/d1/jfrimel/pytmp_dev2.0/series_by_init_12-14_to_12-16/series_analysis_init/20141215_00/ML1201192014/series_TMP_Z2_OBAR.png
09/26 18:48:09.008 metplus.SeriesByInit (command_runner.py:156) DEBUG: RUNNING
exe('/usr/bin/convert')['-rotate','90','-background','white','-flatten','/d1/jfrimel/pytmp_dev2.0/series_by_init_12-14_to_12-16/series_analysis_init/20141215_00/ML1201192014/series_TMP_Z2_OBAR.ps','/d1/jfrimel/pytmp_dev2.0/series_by_init_12-14_to_12-16/series_analysis_init/20141215_00/ML1201192014/series_TMP_Z2_OBAR.png']
09/26 18:48:09.412 metplus.SeriesByInit (series_by_init_wrapper.py:218) INFO:
INFO: Finished series analysis by init time
```

Post-run overview: output

Output for **series analysis by init...**

Directories created:

```
extract_tiles  
logs  
metplus_final.conf  
series_analysis_init  
series_init_filtered  
tc_pairs  
tmp  
track_data_atcf
```

Post-run overview: output

series_analysis_init directory has YYYYMMDD_HH sub-directories:

```
drwxr-xr-x 14 minnawin rap 448 Sep 29 18:02 20141214_00
drwxr-xr-x 13 minnawin rap 416 Sep 29 18:02 20141214_06
drwxr-xr-x 15 minnawin rap 480 Sep 29 18:02 20141214_12
drwxr-xr-x 12 minnawin rap 384 Sep 29 18:02 20141214_18
drwxr-xr-x 9 minnawin rap 288 Sep 29 18:02 20141215_00
```


Post-run overview: output

...and each **YYYYMMDD_HH** sub-directory has sub-directories that are grouped by storm ID:

```
for 20141214_00/
```

```
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 ML1200942014
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 ML1200972014
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 ML1200992014
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 ML1201002014
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 ML1201032014
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 ML1201042014
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 ML1201052014
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 ML1201062014
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 ML1201072014
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 ML1201082014
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 ML1201092014
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 ML1201102014
```

Post-run overview: output

...and **FINALLY**, each stormID sub-directory has the static series analysis plots (.ps and .png) based on the specified field, level, and statistic

for ML1200942014/:

```
-rw-r--r-- 1 minnawin rap 6292 Sep 29 18:02 ANLY_ASCII_FILES_ML1200942014
-rw-r--r-- 1 minnawin rap 6292 Sep 29 18:02 FCST_ASCII_FILES_ML1200942014
-rw-r--r-- 1 minnawin rap 56188 Sep 29 18:02 series_HGT_P500.nc
-rw-r--r-- 1 minnawin rap 9607 Sep 29 18:02 series_HGT_P500_FBAR.png
-rw-r--r-- 1 minnawin rap 4804 Sep 29 18:02 series_HGT_P500_FBAR.ps
-rw-r--r-- 1 minnawin rap 9624 Sep 29 18:02 series_HGT_P500_OBAR.png
-rw-r--r-- 1 minnawin rap 4799 Sep 29 18:02 series_HGT_P500_OBAR.ps
-rw-r--r-- 1 minnawin rap 8143 Sep 29 18:02 series_HGT_P500_TOTAL.png
-rw-r--r-- 1 minnawin rap 3963 Sep 29 18:02 series_HGT_P500_TOTAL.ps
-rw-r--r-- 1 minnawin rap 56188 Sep 29 18:02 series_PRMSL_Z0.nc
-rw-r--r-- 1 minnawin rap 9605 Sep 29 18:02 series_PRMSL_Z0_FBAR.png
-rw-r--r-- 1 minnawin rap 4804 Sep 29 18:02 series_PRMSL_Z0_FBAR.ps
-rw-r--r-- 1 minnawin rap 9618 Sep 29 18:02 series_PRMSL_Z0_OBAR.png
-rw-r--r-- 1 minnawin rap 4799 Sep 29 18:02 series_PRMSL_Z0_OBAR.ps
-rw-r--r-- 1 minnawin rap 8162 Sep 29 18:02 series_PRMSL_Z0_TOTAL.png
-rw-r--r-- 1 minnawin rap 3963 Sep 29 18:02 series_PRMSL_Z0_TOTAL.ps
-rw-r--r-- 1 minnawin rap 56186 Sep 29 18:02 series_TMP_Z2.nc
-rw-r--r-- 1 minnawin rap 9606 Sep 29 18:02 series_TMP_Z2_FBAR.png
-rw-r--r-- 1 minnawin rap 4822 Sep 29 18:02 series_TMP_Z2_FBAR.ps
-rw-r--r-- 1 minnawin rap 9620 Sep 29 18:02 series_TMP_Z2_OBAR.png
-rw-r--r-- 1 minnawin rap 4817 Sep 29 18:02 series_TMP_Z2_OBAR.ps
-rw-r--r-- 1 minnawin rap 8120 Sep 29 18:02 series_TMP_Z2_TOTAL.png
-rw-r--r-- 1 minnawin rap 3981 Sep 29 18:02 series_TMP_Z2_TOTAL.ps
```

Post-run overview: output

*Special note:

In the *series_analysis_init* /<YYYYMMDD_HH>/<stormID> sub-directory, there are two ASCII (text files):

ANLY_ASCII_FILES_IN_<STORMID>

FCST_ASCII_FILES_IN_<STORMID>

e.g.

ANLY_ASCII_FILES_ML1200942014

FCST_ASCII_FILES_ML1200942014

These are useful for trouble-shooting.

They summarize the files that are included in the series analysis

/d1/jfrimel/pytmp_dev2.0/series_by_init_12-14_to_12-16/series_init_filtered/20141214_00/ML1200972014/ANLY_TILE_F000_gfs_4

/d1/jfrimel/pytmp_dev2.0/series_by_init_12-14_to_12-16/series_init_filtered/20141214_00/ML1200972014/ANLY_TILE_F000_gfs_4

/d1/jfrimel/pytmp_dev2.0/series_by_init_12-14_to_12-16/series_init_filtered/20141214_00/ML1200972014/ANLY_TILE_F006_gfs_4

/d1/jfrimel/pytmp_dev2.0/series_by_init_12-14_to_12-16/series_init_filtered/20141214_00/ML1200972014/ANLY_TILE_F012_gfs_4

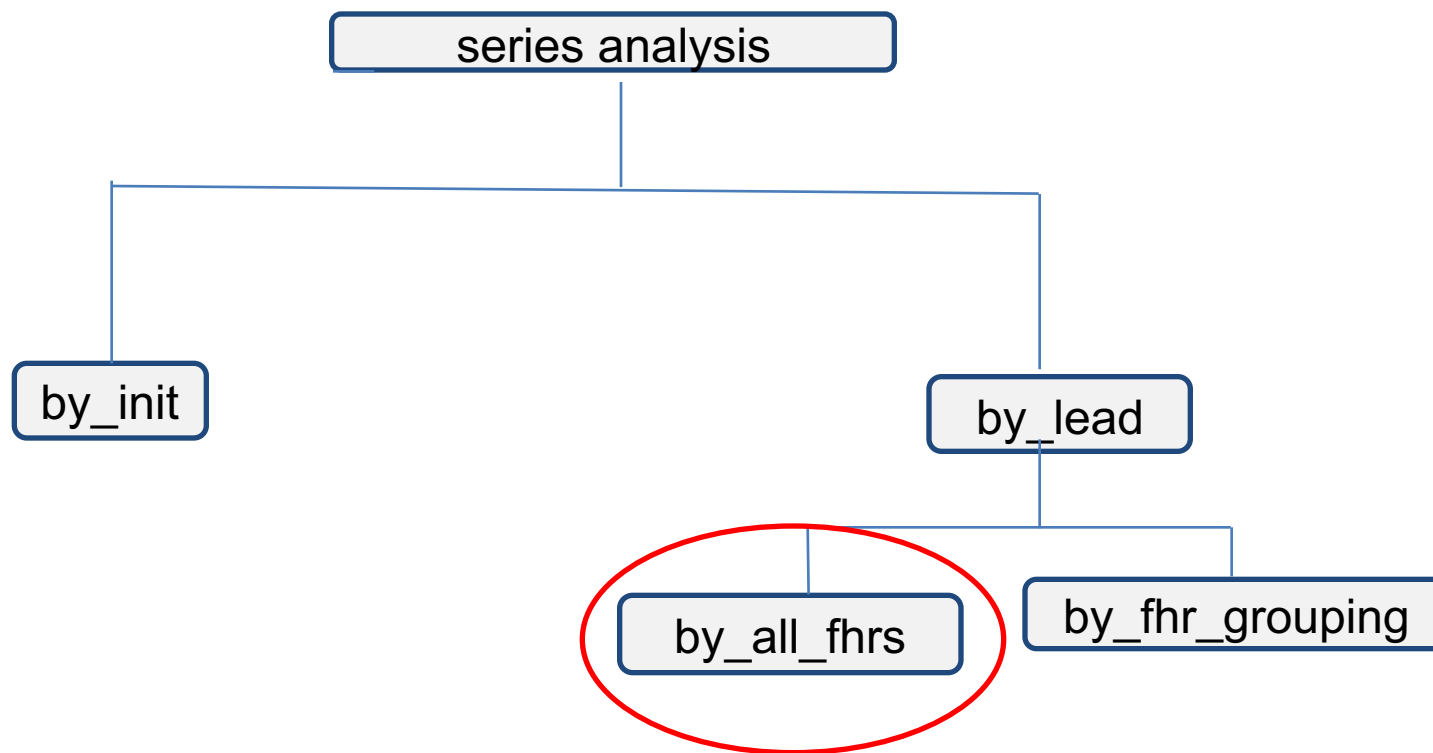
/d1/jfrimel/pytmp_dev2.0/series_by_init_12-14_to_12-16/series_init_filtered/20141214_00/ML1200972014/ANLY_TILE_F018_gfs_4

Post-run overview: output

And now for something completely different, the **series analysis by lead for all fhrs....**

Configuring METplus for Use Case

Overview of Series Analysis portion of the Feature Relative Use Case



Configuring METplus for Use Case

Snippet of config file requesting all fhrs, under [config]:

```
EXTRACT_TILES_FILTER_OPTS = -basin ML ← additional filtering on matched pairs
```

```
# The init time begin and end times, increment, and last init hour.
```

```
INIT_TIME_FMT = %Y%m%d
```

```
INIT_BEG = 20141214
```

```
INIT_END = 20141215
```

```
#INIT_INCREMENT = 86400
```

```
INIT_INCREMENT = 21600
```

```
#21600 ;; The increment in seconds in integer format
```

```
INIT_HOUR_END = 18 ;; Should be a string in HH or HHH format
```

```
# Used for performing series analysis based on lead time
```

```
FHR_BEG = 0
```

```
FHR_END = 96
```

```
FHR_INC = 6
```

← Define these three variable for series by lead, if set to empty/undefined then series by init

```
# The following three should be uncommented to perform series analysis on the
```

```
# entire range of lead times for each forecast hour in the range defined
```

```
# by the FHR_BEG, FHR_END, and FHR_INC defined above.
```

```
FHR_GROUP_BEG =
```

```
FHR_GROUP_END =
```

```
FHR_GROUP_LABELS =
```

← Leave these undefined/empty to use all fhrs in the series analysis

Running the use case with METplus

Example 3. Series analysis by lead time all fhrs

```
master_metplus.py \  
-c parm/use_cases/feature_relative/feature_relative.conf \  
-c parm/use_cases/feature_relative/examples/series_by_lead_all_fhrs.conf \  
-c /path_to_your/custom_conf_file.conf
```

Post-run overview: output

Output for **series analysis by lead (all fhrs)**...

Directories created :

```
drwxr-xr-x  7 minnawin rap  224 Sep 29 18:02 extract_tiles
drwxr-xr-x  3 minnawin rap   96 Sep 29 18:02 logs
-rw-r--r--  1 minnawin rap 4791 Sep 29 18:02 metplus_final.conf
drwxr-xr-x 12 minnawin rap  384 Sep 29 18:02 series_analysis_lead
drwxr-xr-x  9 minnawin rap  288 Sep 29 18:02 series_lead_filtered
drwxr-xr-x  3 minnawin rap   96 Sep 29 18:02 tc_pairs
drwxr-xr-x  2 minnawin rap   64 Sep 29 18:02 tmp
drwxr-xr-x  3 minnawin rap   96 Sep 29 18:02 track_data_atcf
```


Post-run overview: output

series_analysis_lead (all fhrs) directories has sub-directories **series_Fhhh** and a **series_animate** dir:

```
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 series_F000
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 series_F006
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 series_F012
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 series_F018
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 series_F024
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 series_F030
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 series_F036
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 series_F042
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 series_F048
drwxr-xr-x 11 minnawin rap 352 Sep 29 18:02 series_animate
```

Post-run overview: output

and in the **series_Fhhh** directories are the ASCII (text) files and static plots:

```
-rw-r--r-- 1 minnawin rap 7579 Sep 29 18:02 ANLY_FILES_F000
-rw-r--r-- 1 minnawin rap 7579 Sep 29 18:02 FCST_FILES_F000
-rw-r--r-- 1 minnawin rap 56180 Sep 29 18:02 series_F000_HGT_P500.nc
-rw-r--r-- 1 minnawin rap 9169 Sep 29 18:02 series_F000_HGT_P500_FBAR.png
-rw-r--r-- 1 minnawin rap 4801 Sep 29 18:02 series_F000_HGT_P500_FBAR.ps
-rw-r--r-- 1 minnawin rap 9109 Sep 29 18:02 series_F000_HGT_P500_OBAR.png
-rw-r--r-- 1 minnawin rap 4779 Sep 29 18:02 series_F000_HGT_P500_OBAR.ps
-rw-r--r-- 1 minnawin rap 8248 Sep 29 18:02 series_F000_HGT_P500_TOTAL.png
-rw-r--r-- 1 minnawin rap 3945 Sep 29 18:02 series_F000_HGT_P500_TOTAL.ps
-rw-r--r-- 1 minnawin rap 56180 Sep 29 18:02 series_F000_PRMSL_Z0.nc
-rw-r--r-- 1 minnawin rap 9596 Sep 29 18:02 series_F000_PRMSL_Z0_FBAR.png
-rw-r--r-- 1 minnawin rap 5016 Sep 29 18:02 series_F000_PRMSL_Z0_FBAR.ps
-rw-r--r-- 1 minnawin rap 9538 Sep 29 18:02 series_F000_PRMSL_Z0_OBAR.png
-rw-r--r-- 1 minnawin rap 4982 Sep 29 18:02 series_F000_PRMSL_Z0_OBAR.ps
-rw-r--r-- 1 minnawin rap 8345 Sep 29 18:02 series_F000_PRMSL_Z0_TOTAL.png
-rw-r--r-- 1 minnawin rap 3945 Sep 29 18:02 series_F000_PRMSL_Z0_TOTAL.ps
-rw-r--r-- 1 minnawin rap 56178 Sep 29 18:02 series_F000_TMP_Z2.nc
-rw-r--r-- 1 minnawin rap 9398 Sep 29 18:02 series_F000_TMP_Z2_FBAR.png
-rw-r--r-- 1 minnawin rap 5088 Sep 29 18:02 series_F000_TMP_Z2_FBAR.ps
-rw-r--r-- 1 minnawin rap 9422 Sep 29 18:02 series_F000_TMP_Z2_OBAR.png
-rw-r--r-- 1 minnawin rap 5123 Sep 29 18:02 series_F000_TMP_Z2_OBAR.ps
-rw-r--r-- 1 minnawin rap 8260 Sep 29 18:02 series_F000_TMP_Z2_TOTAL.png
-rw-r--r-- 1 minnawin rap 3961 Sep 29 18:02 series_F000_TMP_Z2_TOTAL.ps
```

Post-run overview: output

and in the **series_animate** directory, the animated GIF files, labelled by the level, height and statistics that were set in the use case config file

```
- -rw-r--r-- 1 minnawin rap 212017 Sep 29 18:02 series_animate_HGT_P500_FBAR.gif
-rw-r--r-- 1 minnawin rap 199965 Sep 29 18:02 series_animate_HGT_P500_OBAR.gif
-rw-r--r-- 1 minnawin rap 112760 Sep 29 18:02 series_animate_HGT_P500_TOTAL.gif
-rw-r--r-- 1 minnawin rap 218058 Sep 29 18:02 series_animate_PRMSL_Z0_FBAR.gif
-rw-r--r-- 1 minnawin rap 214865 Sep 29 18:02 series_animate_PRMSL_Z0_OBAR.gif
-rw-r--r-- 1 minnawin rap 113333 Sep 29 18:02 series_animate_PRMSL_Z0_TOTAL.gif
-rw-r--r-- 1 minnawin rap 204497 Sep 29 18:02 series_animate_TMP_Z2_FBAR.gif
-rw-r--r-- 1 minnawin rap 205774 Sep 29 18:02 series_animate_TMP_Z2_OBAR.gif
-rw-r--r-- 1 minnawin rap 111570 Sep 29 18:02 series_animate_TMP_Z2_TOTAL.gif
```

Post-run overview: output

Special note:

In the *series_analysis_init*
/*<YYYYMMDD_HH>/<stormID>* sub-directory, there are
two ASCII (text files):

ANLY_FILES_Fnnn

FCST_FILES_Fmmm

where nnn = start fhr
 mmm = end fhr

e.g. ANLY_FILES_F042
 FCST_FILES_F042

These are useful for trouble-shooting.

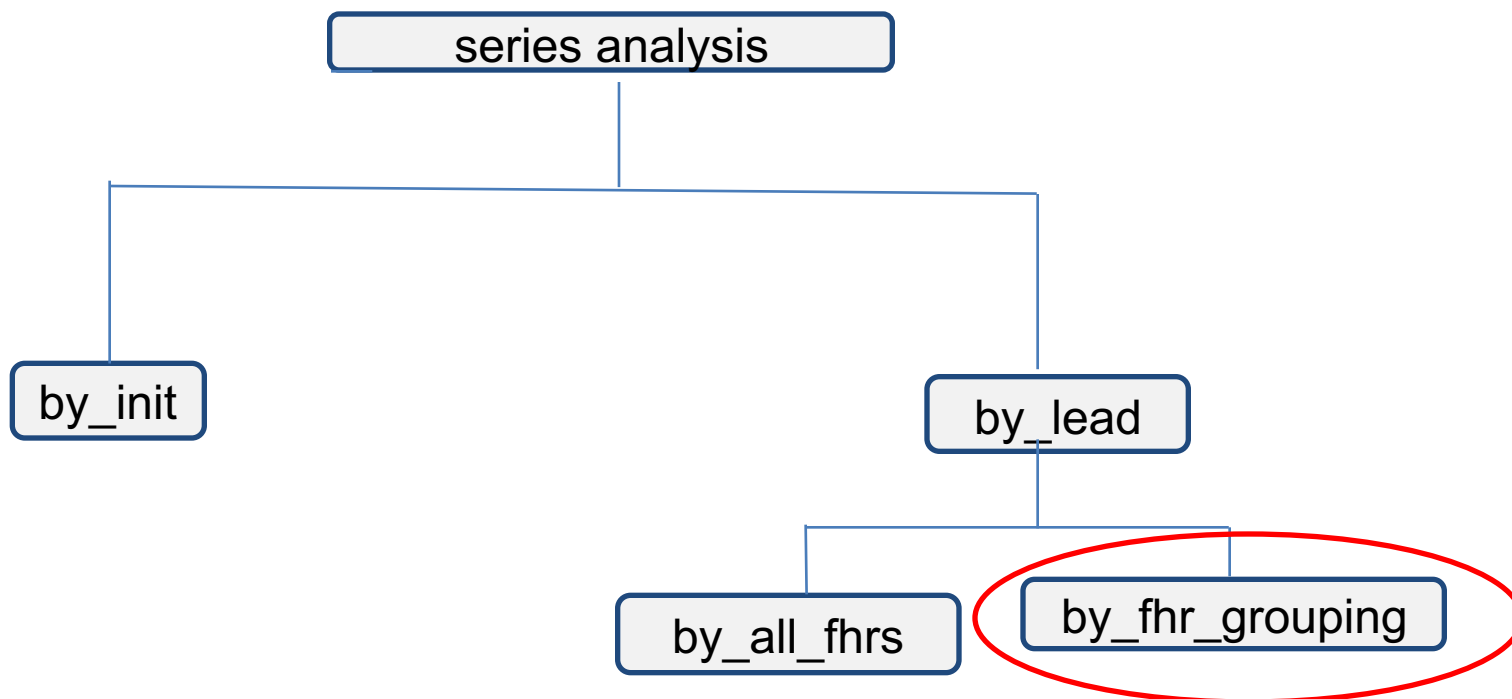
They summarize the files that are included in the series
analysis

Post-run overview: output

And finally, **series analysis by lead**, where we are **grouping by fhrs...**

Configuring METplus for Use Case

Overview of Series Analysis portion of the Feature Relative Use Case



Configuring METplus for Use Case

Snippet of config file requesting series by lead by fhr groupings

* these are under the [config] family

```
EXTRACT_TILES_FILTER_OPTS = -basin ML ← additional filtering on matched pairs
```

```
# The init time begin and end times, increment, and last init hour.
```

```
INIT_TIME_FMT = %Y%m%d
```

```
INIT_BEG = 20141214
```

```
INIT_END = 20141215
```

```
#INIT_INCREMENT = 86400
```

```
INIT_INCREMENT = 21600
```

```
#21600 ;; The increment in seconds in integer format
```

```
INIT_HOUR_END = 18 ;; Should be a string in HH or HHH format
```

```
# Used for performing series analysis based on lead time
```

```
FHR_BEG = 0
```

```
FHR_END = 96 ←
```

Define these three variable for series by lead, if set to empty/undefined then series by init

```
FHR_INC = 6
```

```
# The following three should be uncommented to perform series analysis on the
```

```
# entire range of lead times for each forecast hour in the range defined
```

```
# by the FHR_BEG, FHR_END, and FHR_INC defined above.
```

```
FHR_GROUP_BEG = 0, 24, 48, 72 ←
```

```
FHR_GROUP_END = 18, 42, 66, 72
```

```
FHR_GROUP_LABELS = Day1, Day2, Day3, Day4
```

Define these three variables with fhr grouping boundaries and labels for series analysis by fhr groupings

Running the use case with METplus

Example 4. Series analysis by lead, by fhr grouping

```
master_metplus.py \  
-c parm/use_cases/feature_relative/feature_relative.conf \  
-c parm/use_cases/feature_relative/examples/series_by_lead_by_fhr_grouping.conf \  
-c /path_to_your/custom_conf_file.conf
```


Post-run overview: output

series_analysis_lead (fhr grouping) directories has output directories:

```
drwxr-xr-x 7 minnawin rap 224 Sep 29 18:02 extract_tiles
drwxr-xr-x 3 minnawin rap 96 Sep 29 18:02 logs
-rw-r--r-- 1 minnawin rap 4854 Sep 29 18:02 metplus_final.conf
drwxr-xr-x 7 minnawin rap 224 Sep 29 18:02 series_analysis_lead
drwxr-xr-x 9 minnawin rap 288 Sep 29 18:02 series_lead_filtered
drwxr-xr-x 3 minnawin rap 96 Sep 29 18:02 tc_pairs
drwxr-xr-x 2 minnawin rap 64 Sep 29 18:02 tmp
drwxr-xr-x 3 minnawin rap 96 Sep 29 18:02 track_data_atcf
```

Post-run overview: output

the **series_analysis_lead** directory has subdirectories that reflect the specified groupings and a **series_animate** directory:

```
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 Day1
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 Day2
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 Day3
drwxr-xr-x 25 minnawin rap 800 Sep 29 18:02 Day4
drwxr-xr-x 11 minnawin rap 352 Sep 29 18:02 series_animate
```

Post-run overview: output

each **Day n *** directory contains the static plots, based on the variable, level, and statistic set in the use case config file:

```
analysis_lead] minnawin% cd Day1
[vpn49:pytmp.series_by_lead_by_fhr_grouping/series_analysis_lead/Day1] minnawin% ls -l
total 992
-rw-r--r-- 1 minnawin rap 79500 Sep 29 18:02 ANLY_FILES_F000_to_F018
-rw-r--r-- 1 minnawin rap 79500 Sep 29 18:02 FCST_FILES_F000_to_F018
-rw-r--r-- 1 minnawin rap 56188 Sep 29 18:02 series_F000_to_F018_HGT_P500.nc
-rw-r--r-- 1 minnawin rap 9986 Sep 29 18:02 series_F000_to_F018_HGT_P500_FBAR.png
-rw-r--r-- 1 minnawin rap 5050 Sep 29 18:02 series_F000_to_F018_HGT_P500_FBAR.ps

-rw-r--r-- 1 minnawin rap 10015 Sep 29 18:02 series_F000_to_F018_HGT_P500_OBAR.png
-rw-r--r-- 1 minnawin rap 5062 Sep 29 18:02 series_F000_to_F018_HGT_P500_OBAR.ps
-rw-r--r-- 1 minnawin rap 8818 Sep 29 18:02 series_F000_to_F018_HGT_P500_TOTAL.png
-rw-r--r-- 1 minnawin rap 4016 Sep 29 18:02 series_F000_to_F018_HGT_P500_TOTAL.ps
-rw-r--r-- 1 minnawin rap 56188 Sep 29 18:02 series_F000_to_F018_PRMSL_Z0.nc
-rw-r--r-- 1 minnawin rap 10096 Sep 29 18:02 series_F000_to_F018_PRMSL_Z0_FBAR.png
-rw-r--r-- 1 minnawin rap 5056 Sep 29 18:02 series_F000_to_F018_PRMSL_Z0_FBAR.ps
... etc.
```

**This can be any label you chose, this is set in the use case config file
parm/use_cases/feature_relative/examples/series_by_lead_by_fhr_grouping.conf*

Post-run overview: output

the `series_animate` directory has the animated GIF files:

```
-rw-r--r--@ 1 minnawin rap 111876 Sep 29 18:02 series_animate_HGT_P500_FBAR.gif
-rw-r--r-- 1 minnawin rap 109147 Sep 29 18:02 series_animate_HGT_P500_OBAR.gif
-rw-r--r-- 1 minnawin rap 52654 Sep 29 18:02 series_animate_HGT_P500_TOTAL.gif
-rw-r--r-- 1 minnawin rap 101680 Sep 29 18:02 series_animate_PRMSL_Z0_FBAR.gif
-rw-r--r-- 1 minnawin rap 100967 Sep 29 18:02 series_animate_PRMSL_Z0_OBAR.gif
-rw-r--r-- 1 minnawin rap 52895 Sep 29 18:02 series_animate_PRMSL_Z0_TOTAL.gif
-rw-r--r-- 1 minnawin rap 113336 Sep 29 18:02 series_animate_TMP_Z2_FBAR.gif
-rw-r--r-- 1 minnawin rap 116398 Sep 29 18:02 series_animate_TMP_Z2_OBAR.gif
-rw-r--r-- 1 minnawin rap 52191 Sep 29 18:02 series_animate_TMP_Z2_TOTAL.gif
```

Post-run overview: output

* **Special Note for series by lead (by fhr grouping)**

Two ASCII (text) files in the series_by_lead_by_fhr_grouping/<grouping_label> directory:

ANLY_FILES_Fnnn_to_Fmmm

FCST_FILES_Fnnn_to_Fmmm

*where nnn= start forecast hour
mmm = end forecast hour

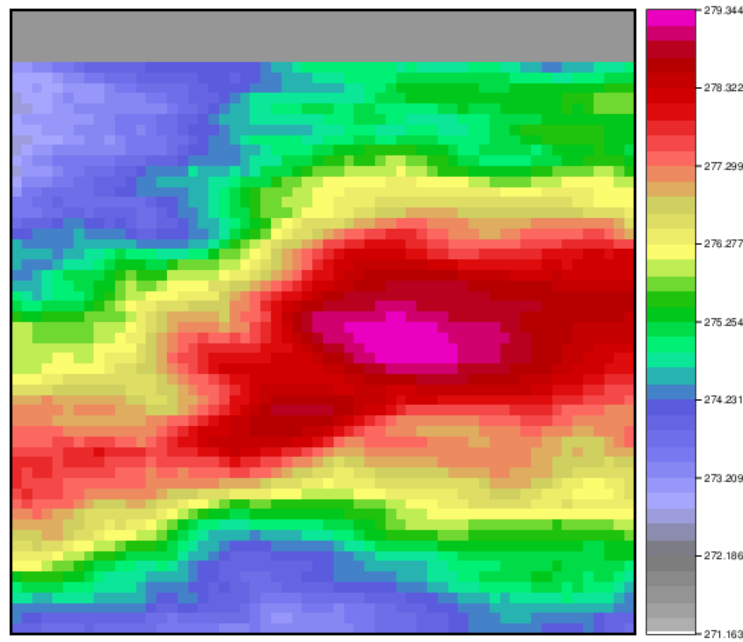
e.g. ANLY_FILES_F000_to_F018
FCST_FILES_F000_to_F018

These files contain the analysis and forecast files that were found to meet the series analysis criteria and are useful for troubleshooting.

Post-run overview: output

series_F000_to_F018_TMP_Z2_FBAR.png

GFS series_F000_to_F018 Forecasts (N = 530), FBAR for TMP/Z2



series_F000_to_F018_TMP_Z2.nc

Questions