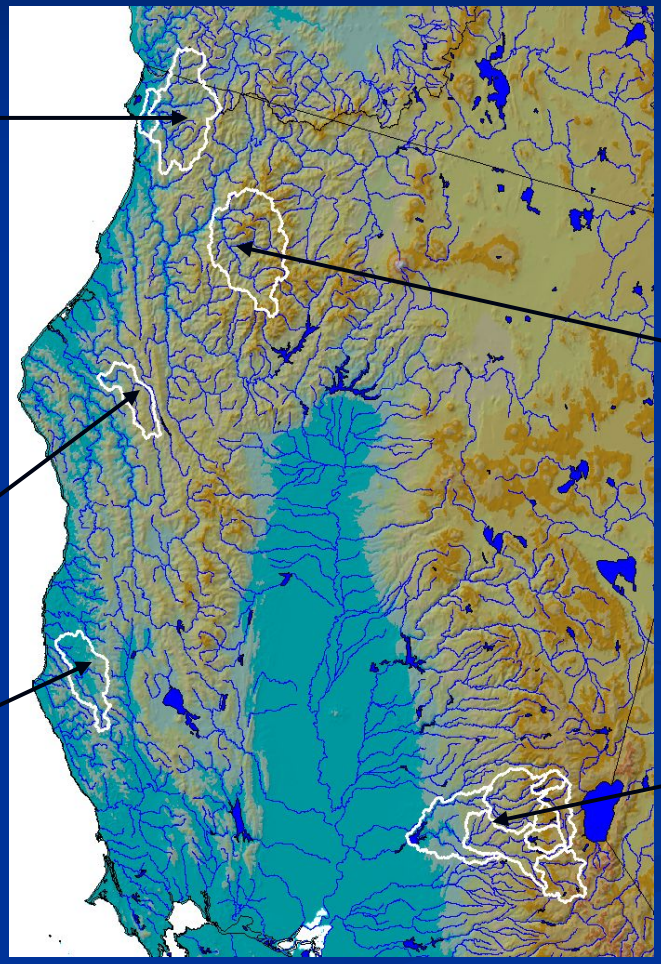
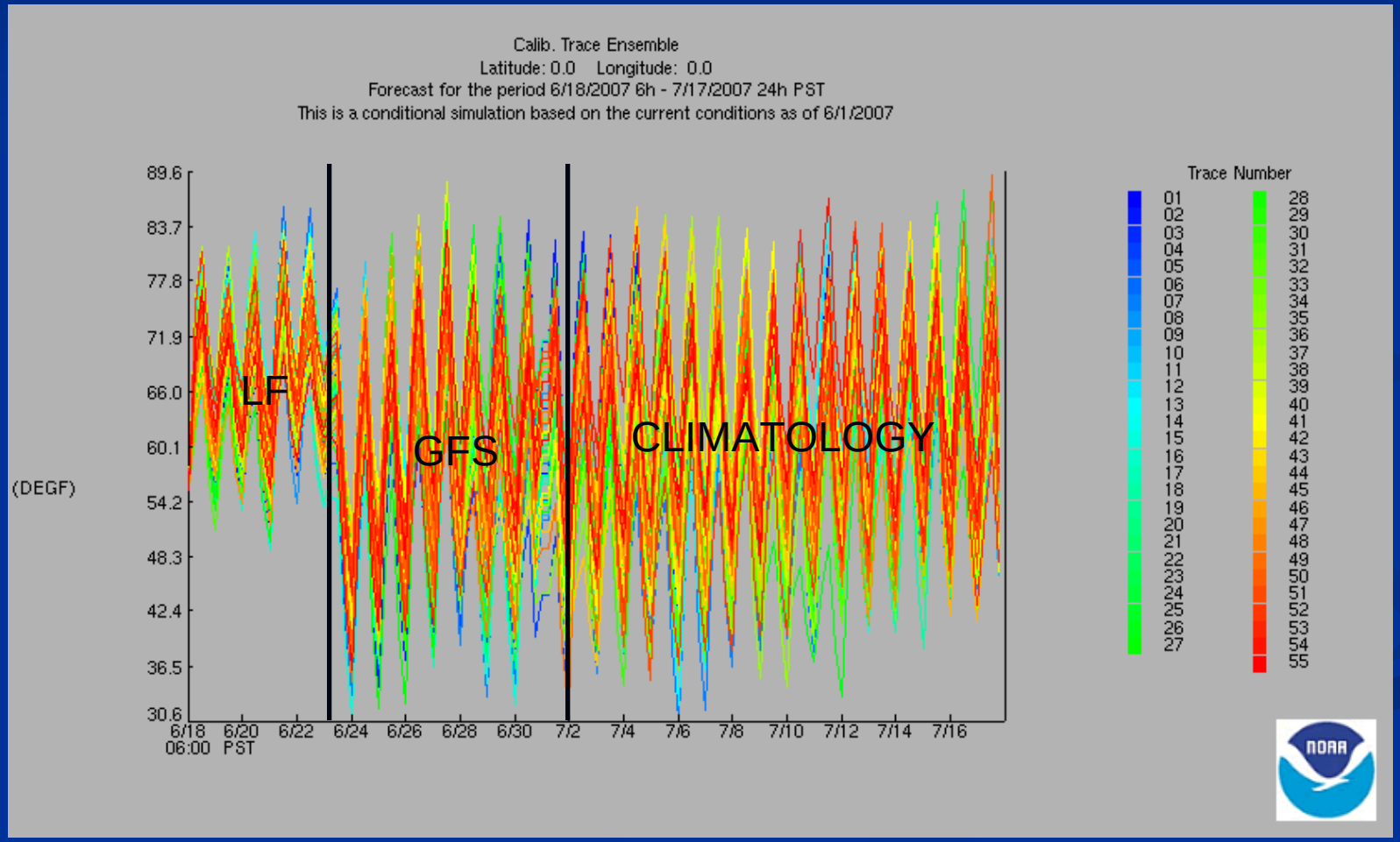
Experiences with Ensemble Pre-Processing at CNRFC

Rob Hartman
NOAA's National Weather Service
California-Nevada River Forecast Center
Sacramento, CA

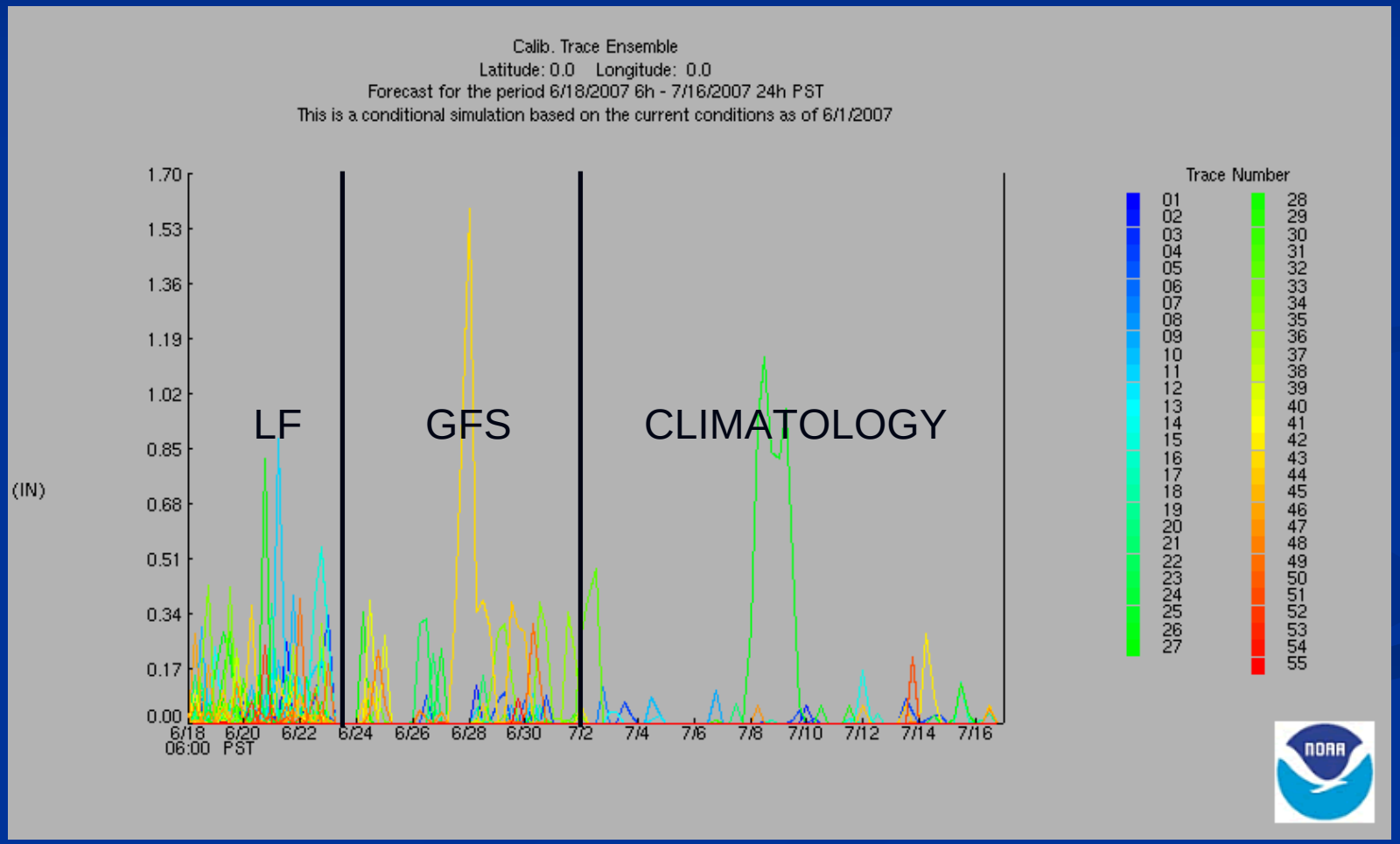
Short-term Ensemble Prototype at the CNRFC



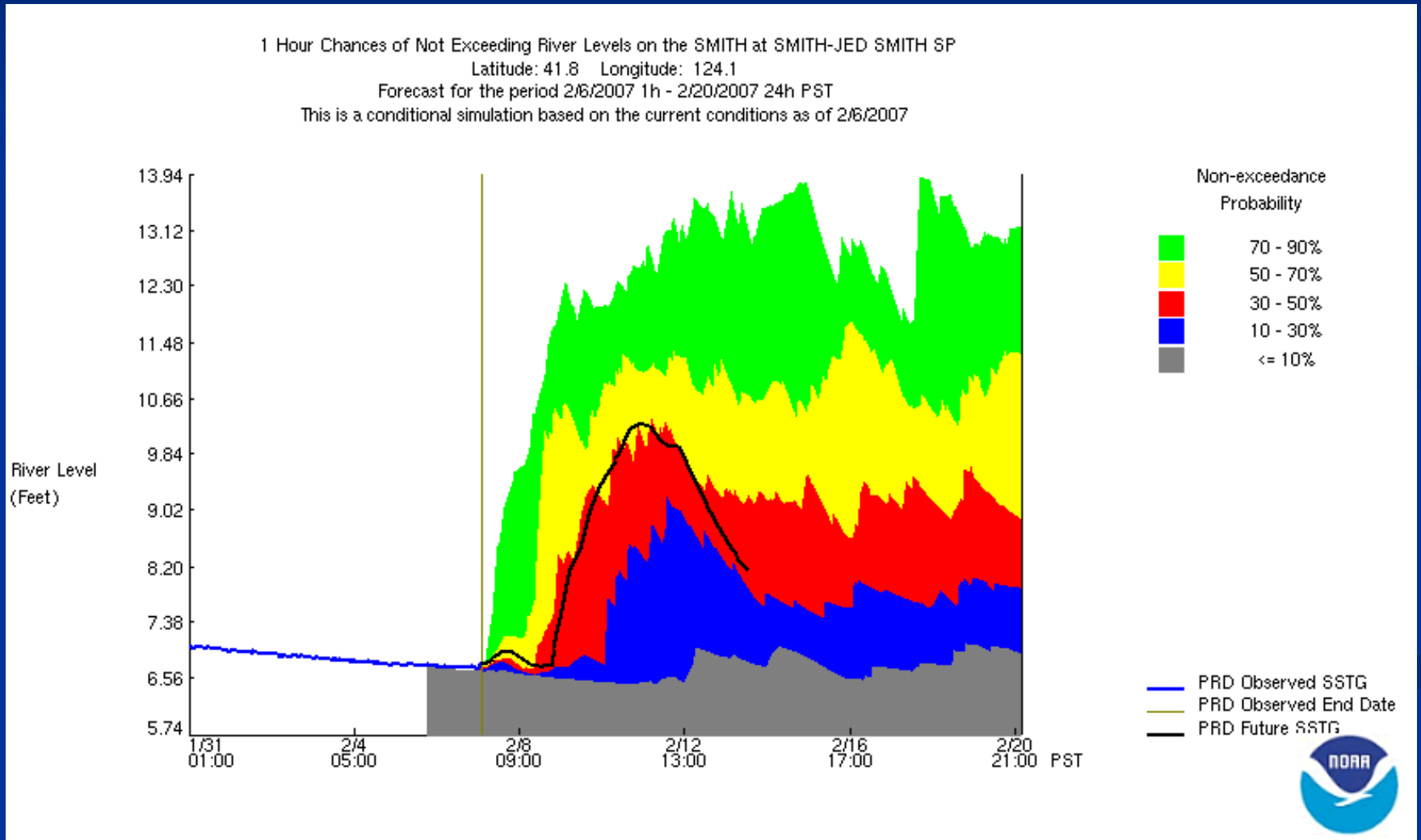
30-day Temperature Ensembles



30 day Precipitation Ensembles



Smith River – February 7, 2007



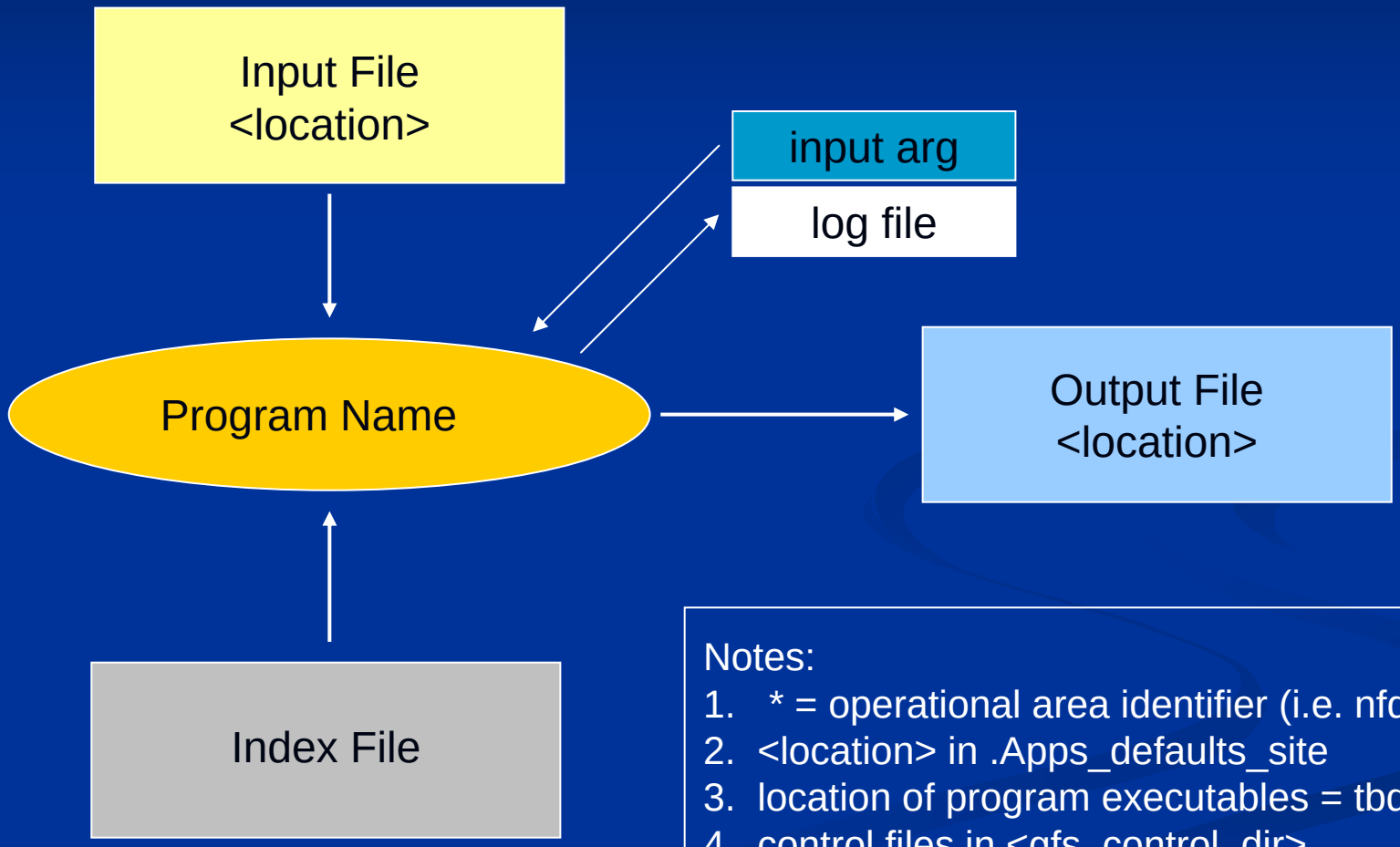
EPP Architecture - Programs

- Reformat data into a consistent and efficient form
  - rfc_praw_conv
  - mos_traw_conv
  - map06_sbmap06
  - matanalysis
  - rfc_traw_conv,
  - runcalbmat
  - sbtxtn
  - sbmap06_stats
- Develop calibrated parameters
  - gfs_precip_parms
  - gfs_temp_parms
- Generate MAP and MAT ensembles
  - gfs_precip_epp
  - gfs_temp_epp

EPP Architecture – Common Features

- .Apps_defaults_site
  - 26 tokens
  - locations for everything
- Index files
  - point and basin information
    - map_ts_index.txt
    - matanal_stations.txt
    - mat_area_loc.txt
    - map_area_loc.txt
    - temp_stn_normals.txt
    - mat_tx_index.txt
- Control files
  - parameters for execution
    - gfs_precip_parms
    - gfs_precip_eff
    - gfs_temp_parms
    - gfs_temp_epp

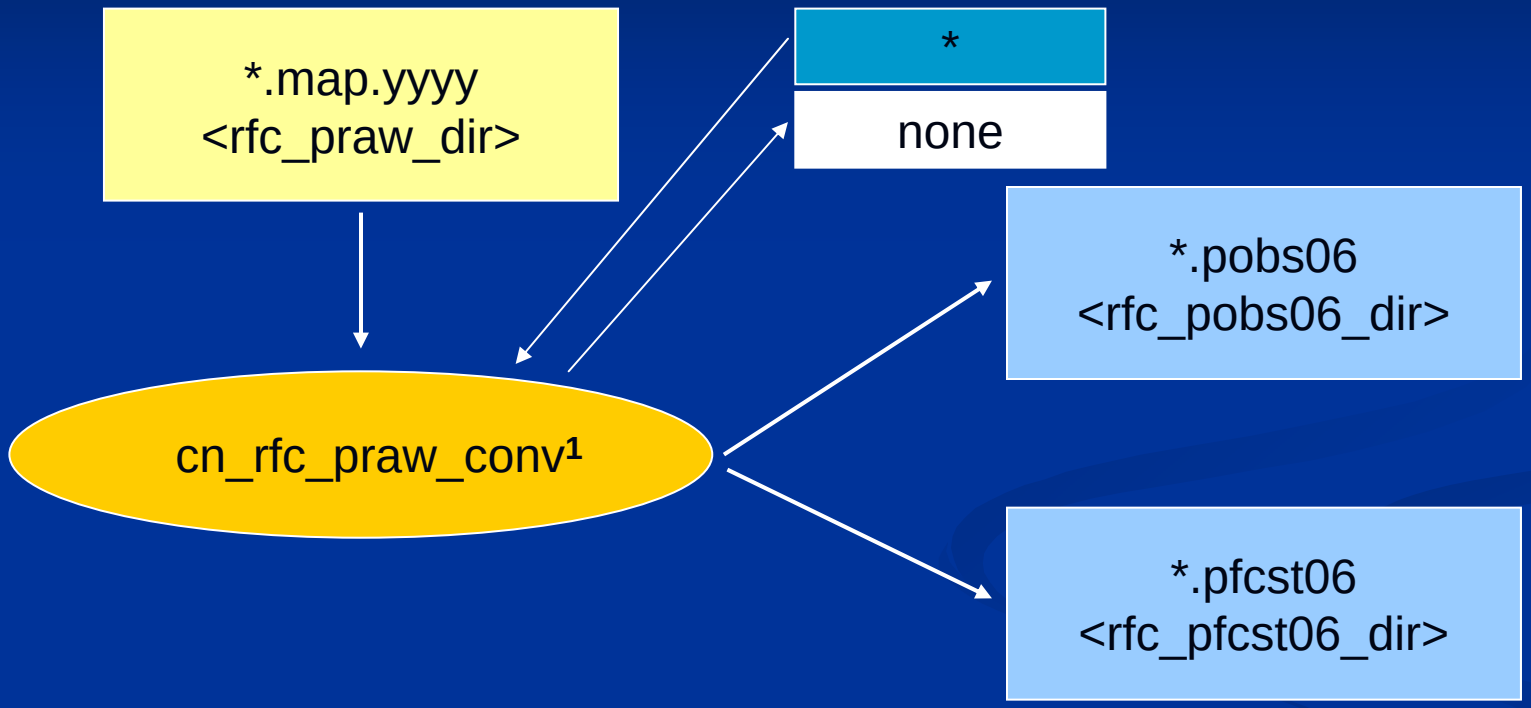
GFS Ensemble Precipitation Preprocessor Subsystem Diagram Key



Notes:

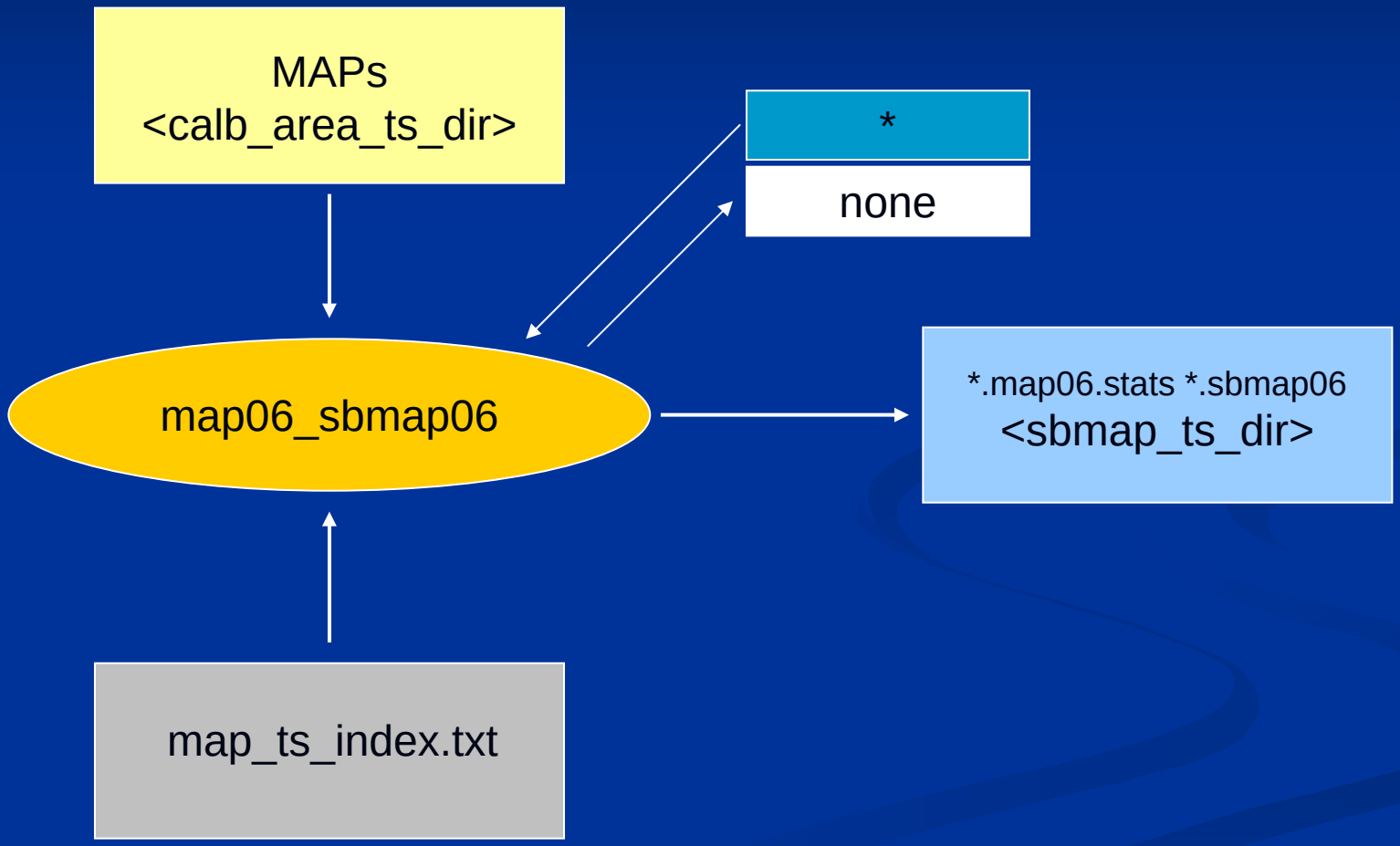
1. * = operational area identifier (i.e. nfdc1huf)
2. <location> in .Apps_defaults_site
3. location of program executables = tbd
4. control files in <gfs_control_dir>
5. log files in <gfs_log_dir>

Conversion of RFC QPF verification files into binary observed and forecast files

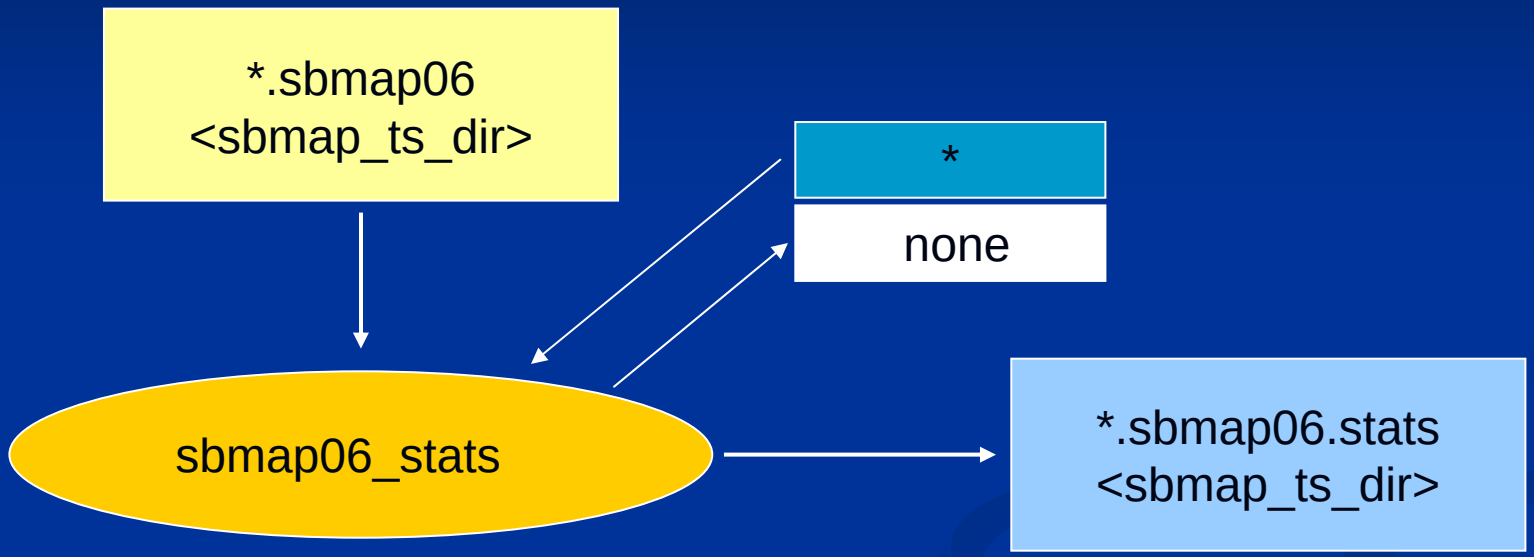


[1] Program will need to be specific for each RFC until a standard input format is established.

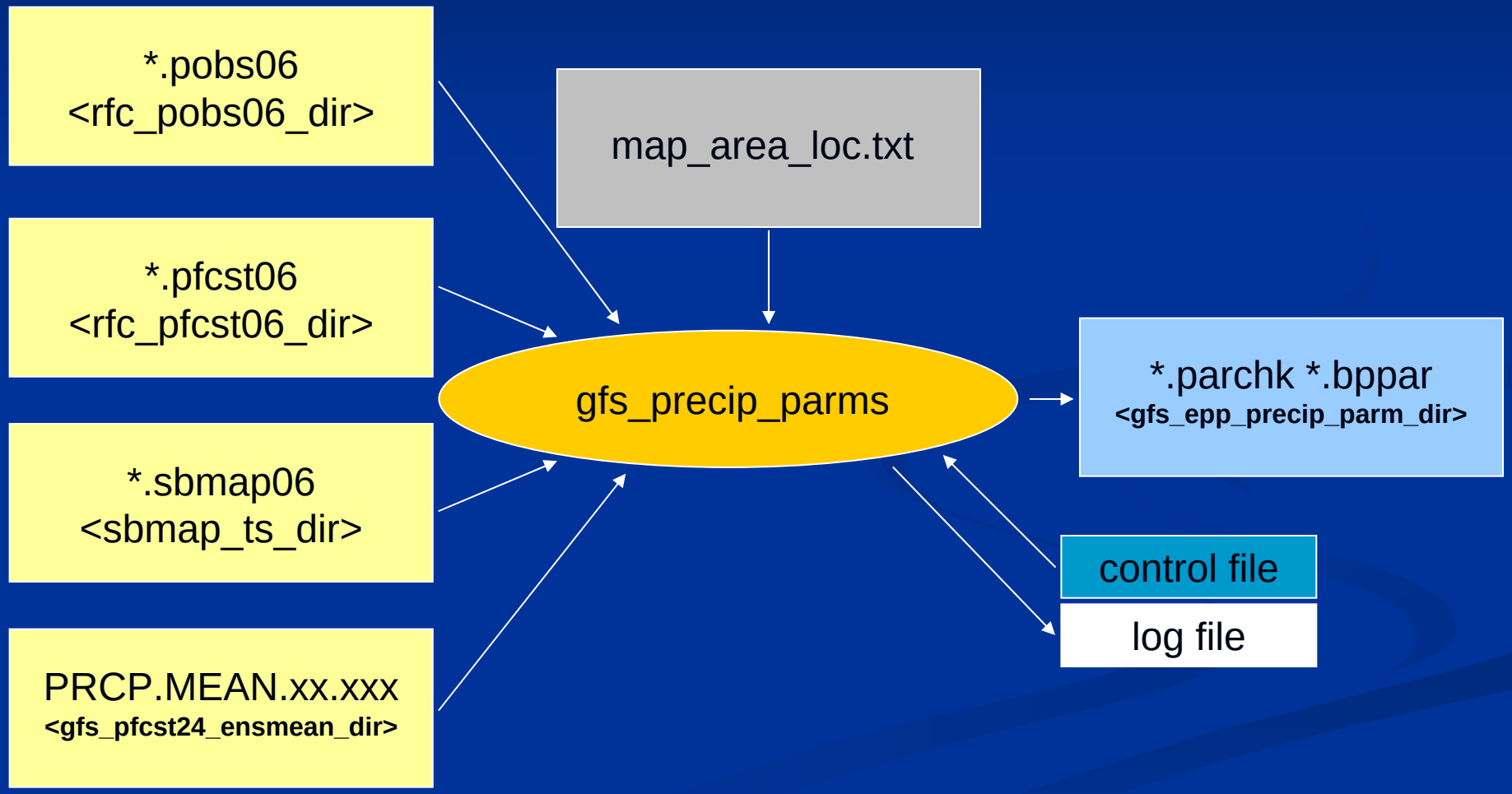
Conversion of calibration MAPs into sequential binary format



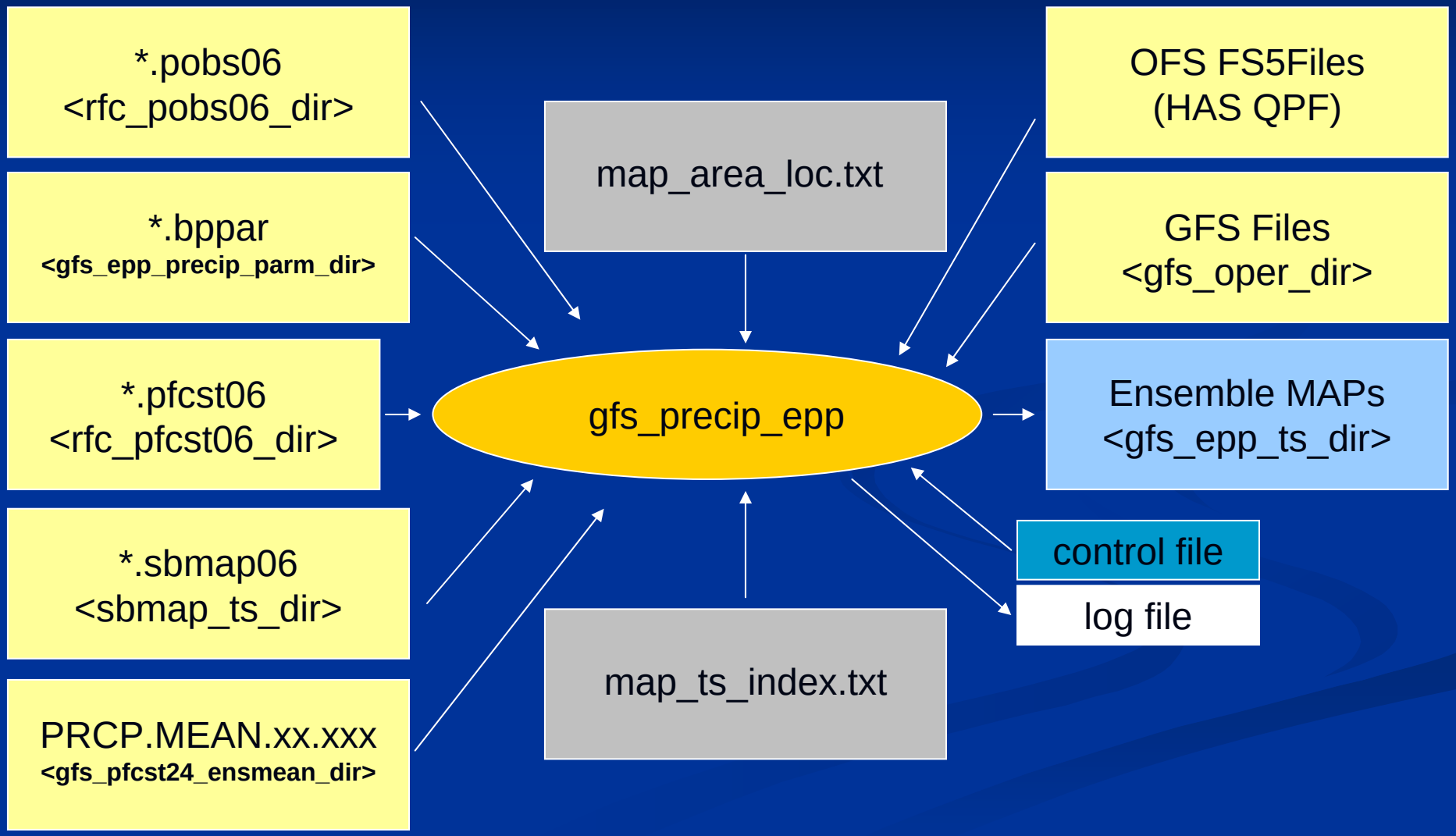
Compute monthly statistics from sbmap06 files (diagnostic only)



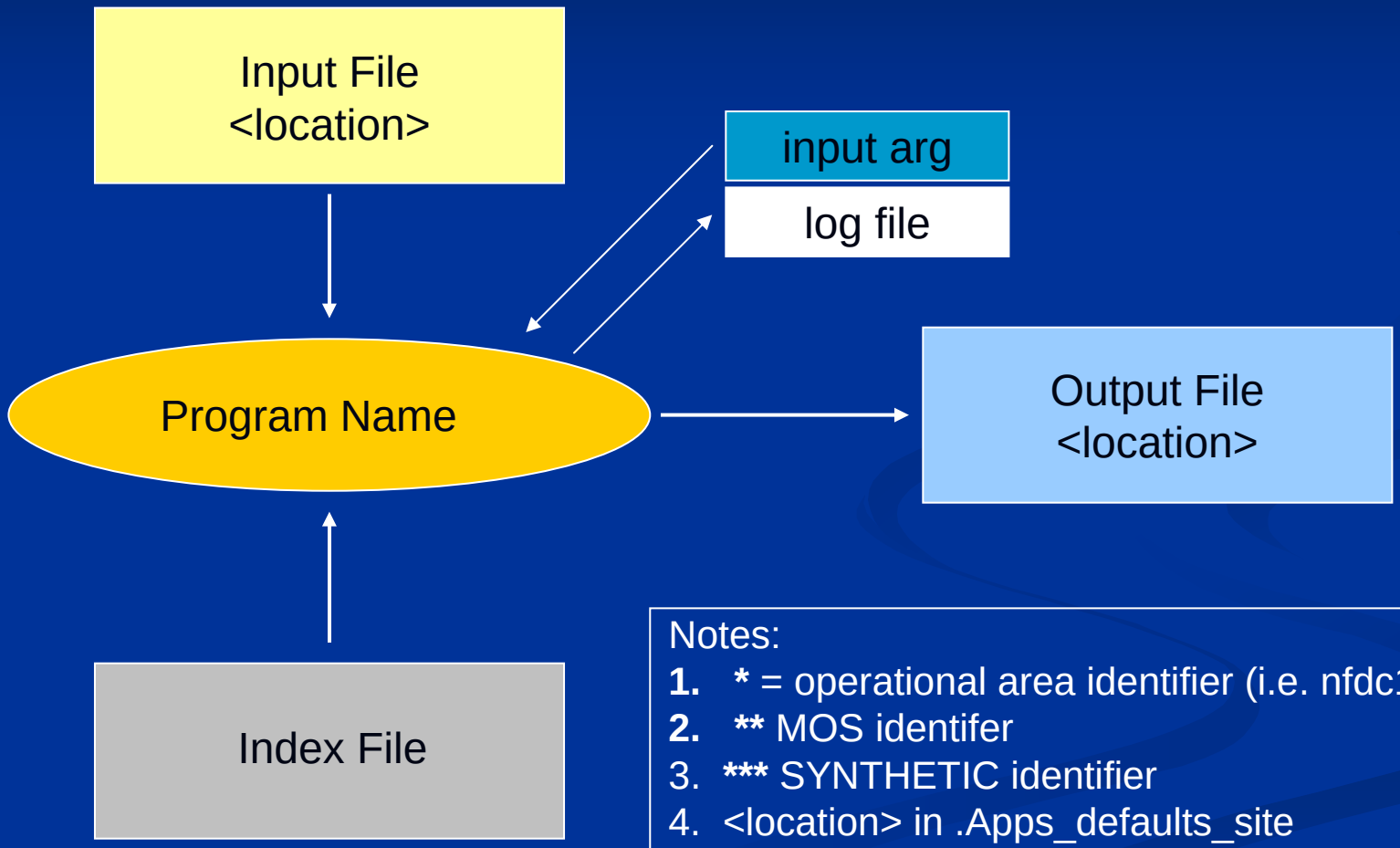
MAP Parameter Generation



MAP Ensemble Generation



GFS Ensemble Temperature Preprocessor Subsystem Diagram Key

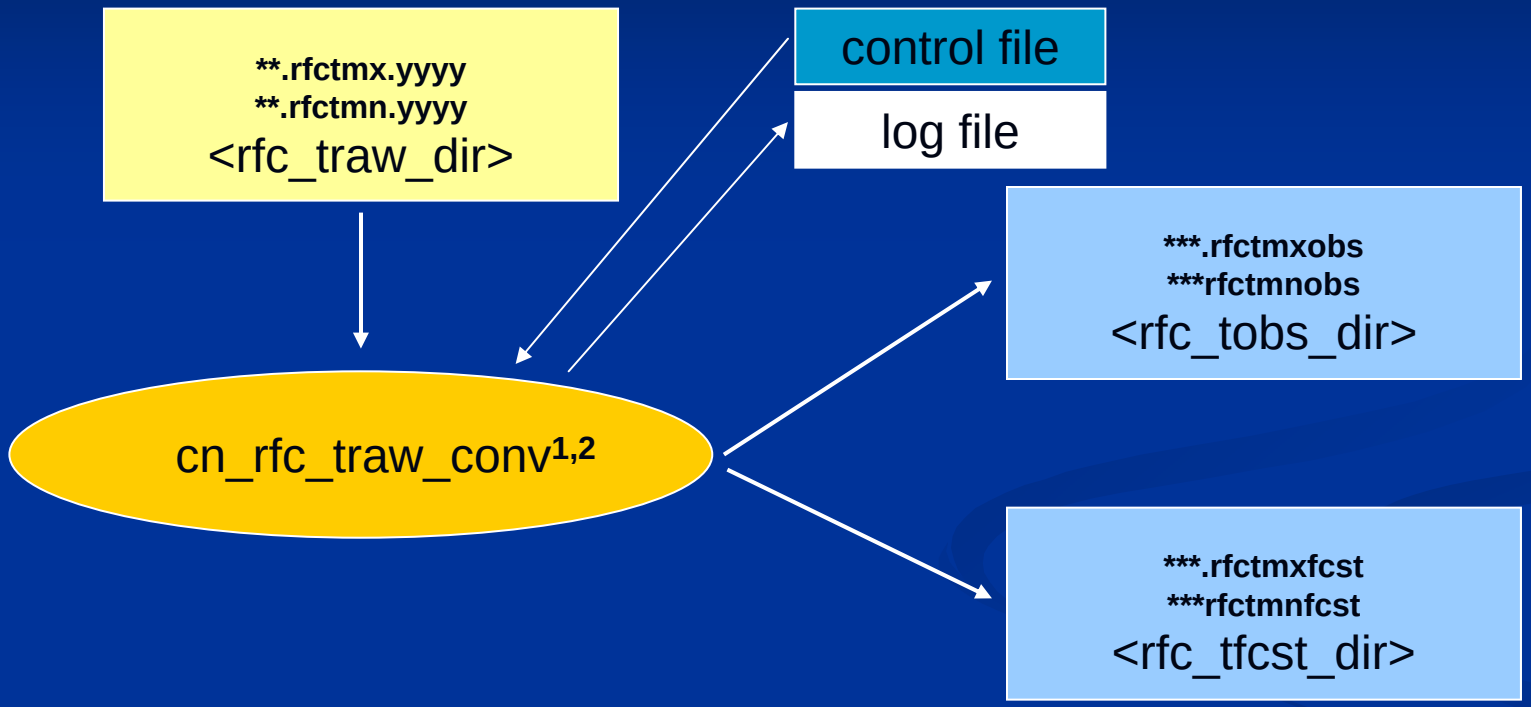


Notes:

1. * = operational area identifier (i.e. nfdc1huf)
2. ** MOS identifer
3. *** SYNTHETIC identifier
4. <location> in .Apps_defaults_site
5. location of program executables = tbd

*** can be same as * if synthetic stns not used.

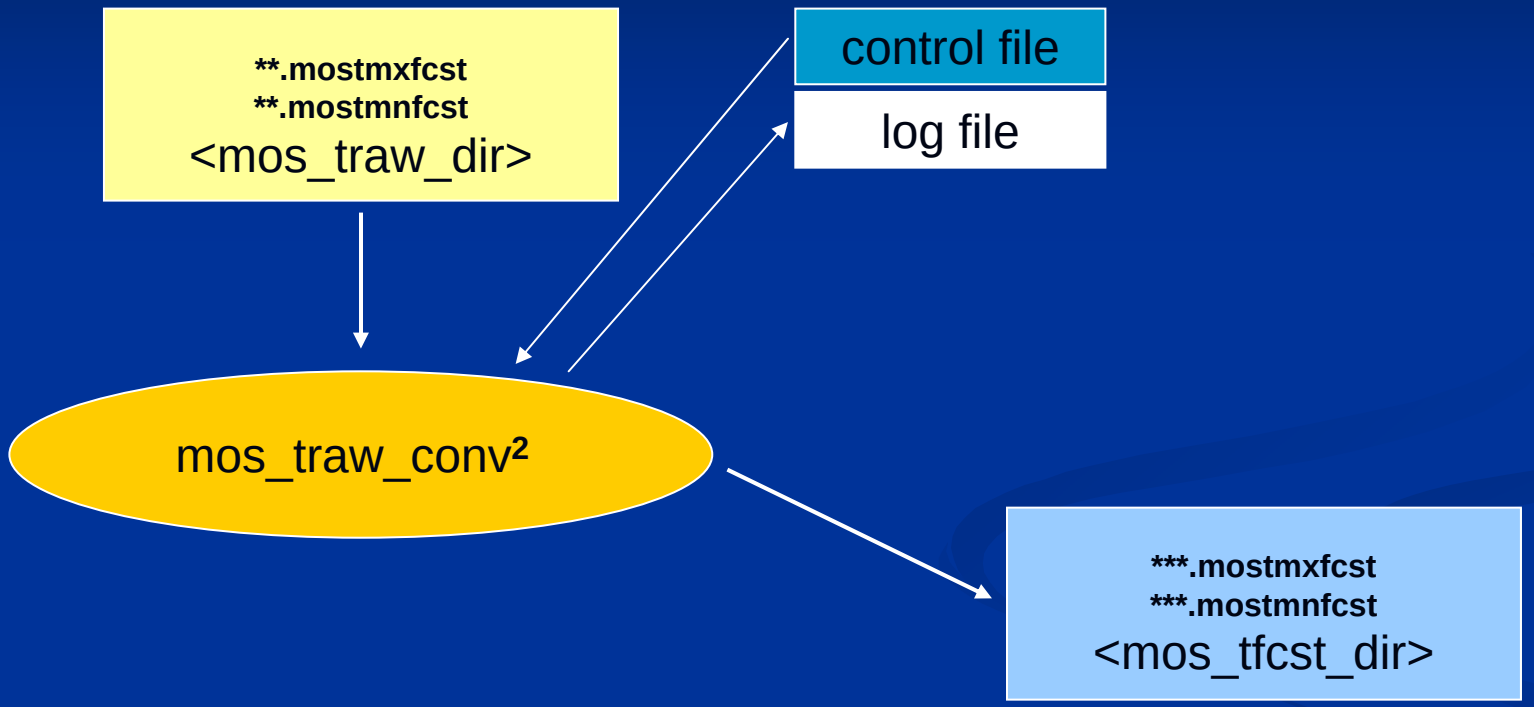
Conversion of RFC temperature verification files into ascii observed and forecast files



[1] Program will need to be specific for each RFC until a standard input format is established.

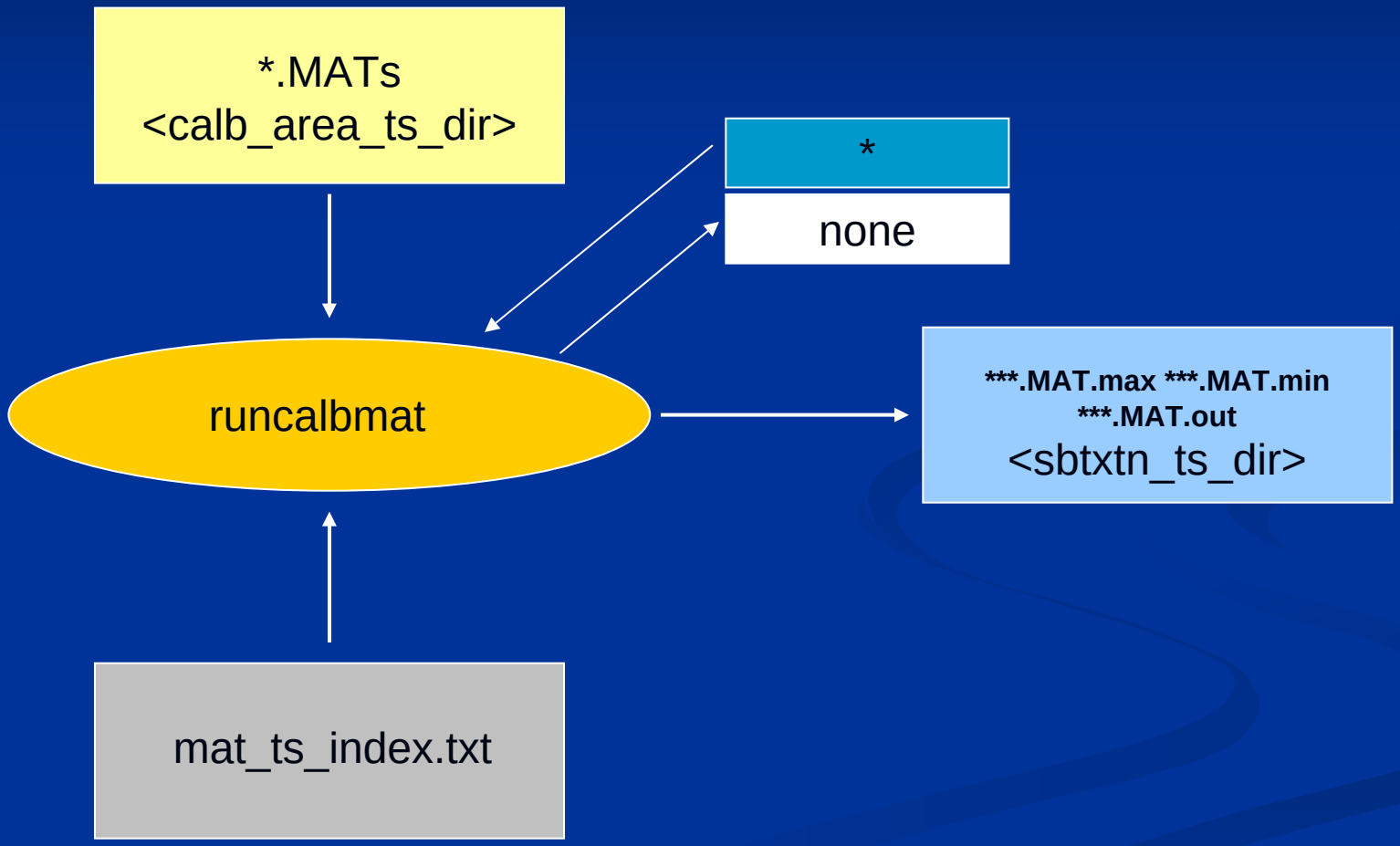
[2] Program includes *analysis* to translate stations to SYNTHETIC locations that represent areas.

Conversion of MOS temperature forecast files into ascii forecast files

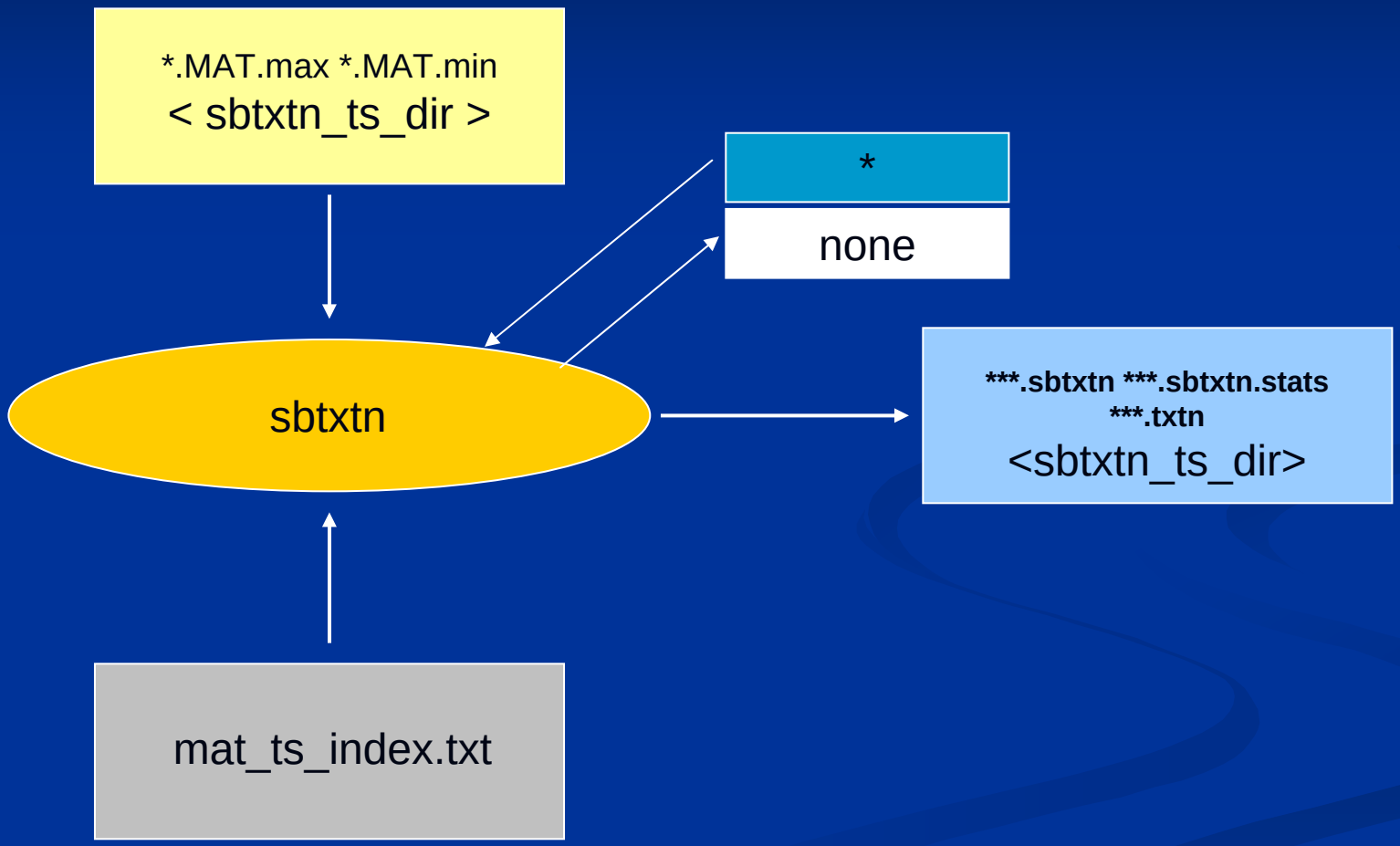


[2] Program includes *analysis* to translate stations to SYNTHETIC locations that represent areas.

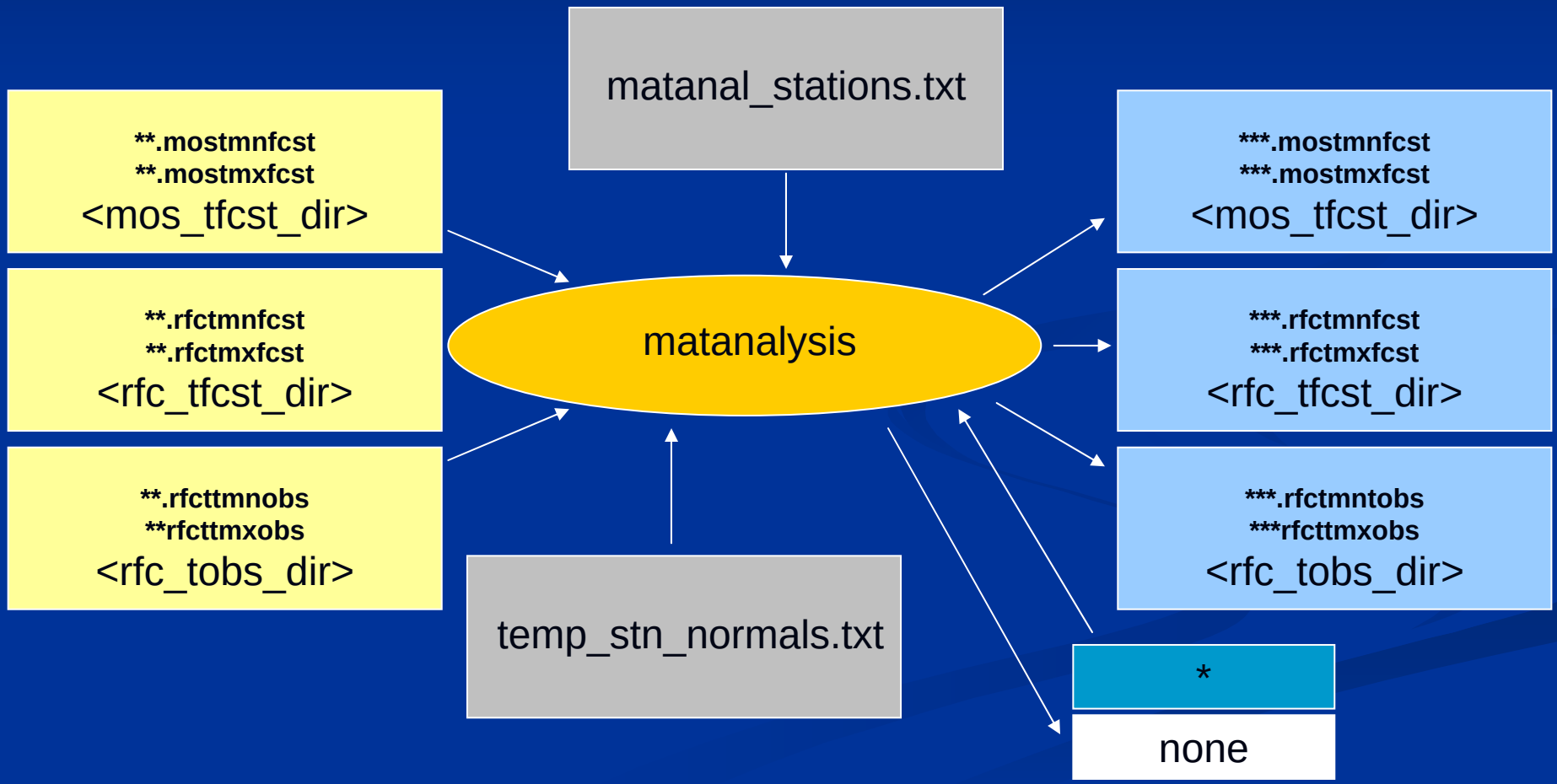
Conversion of calibration MATs into tx and tn



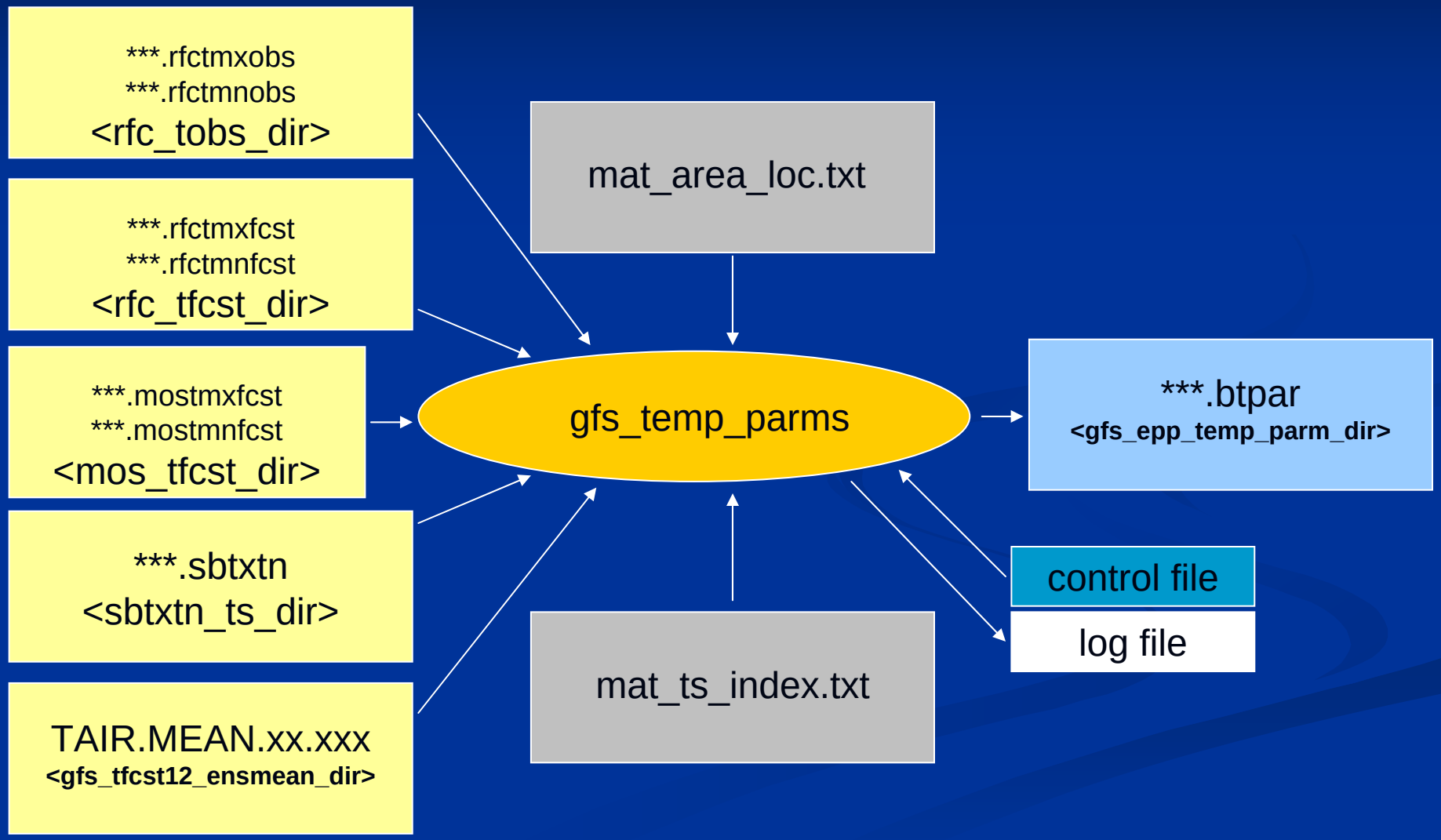
Conversion of (calibration) tmax and tmin into sequential binary format



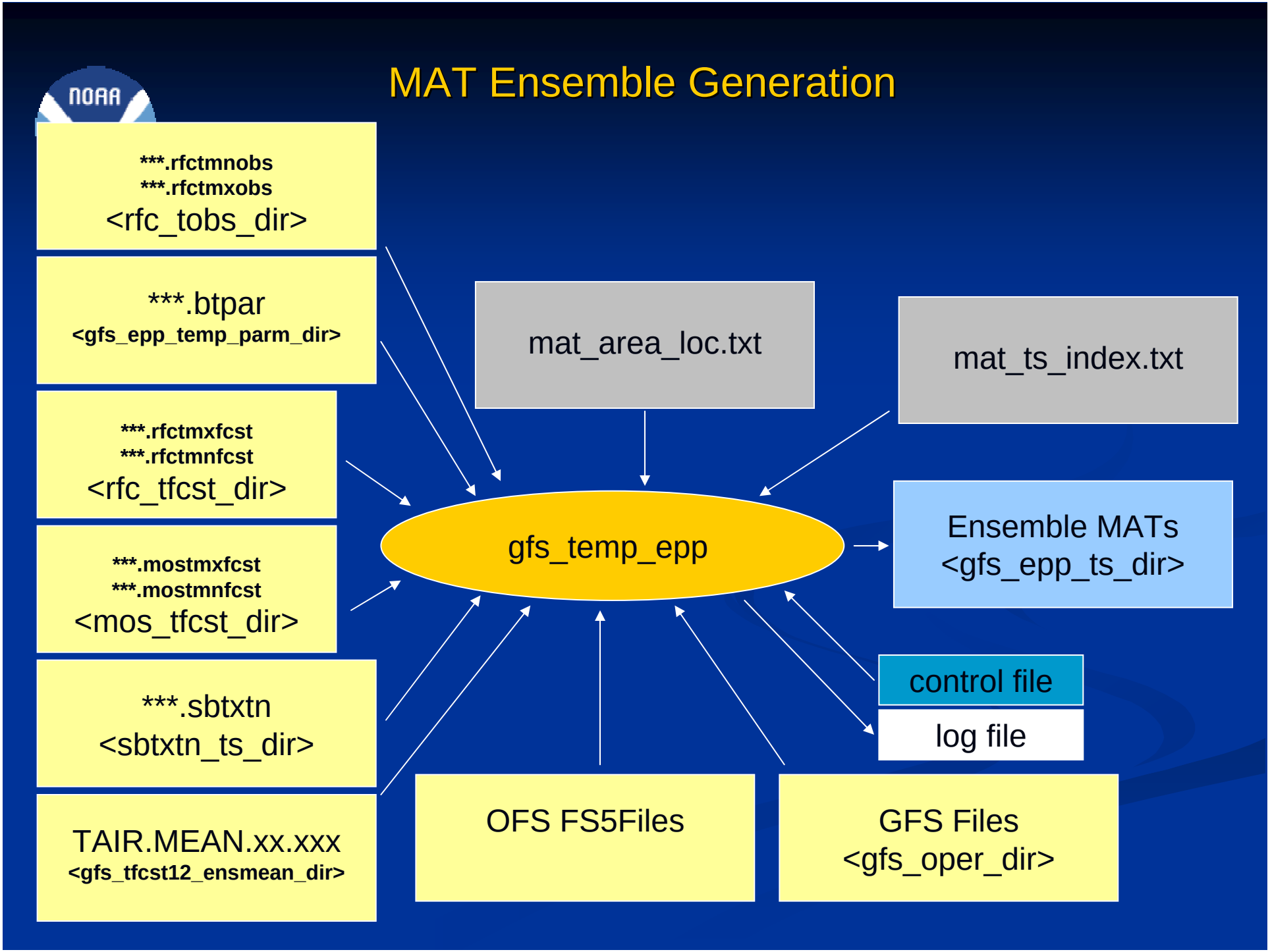
MAT Analysis



MAT Parameter Generation



MAT Ensemble Generation



Experience

- A new basin can be added to the system in less than a day's work
- Local archives of forecast/observed temperature and precipitation are critically important
- System is awkward and prone to (human) errors
  - There's a lot to keep track of between the data, index, and control files
  - Need a GUI to simplify the calibration and execution process
- Need solid and intuitive diagnostics to determine:
  - if calibrations are suspect or reliable
  - if generated ensembles are suspect or reliable

Thank You