Similarities
## Among the Proposed Statistical-Distributed Modeling Approach, FFG, and the Lumped Site-specific

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Main idea: Use modeled historical events as comparative indices to assess the threat level of forecasted flood events.

This is analogous to current comparisons between forecasted flood stage to historical flood stages but **applicable to ungauged locations**.
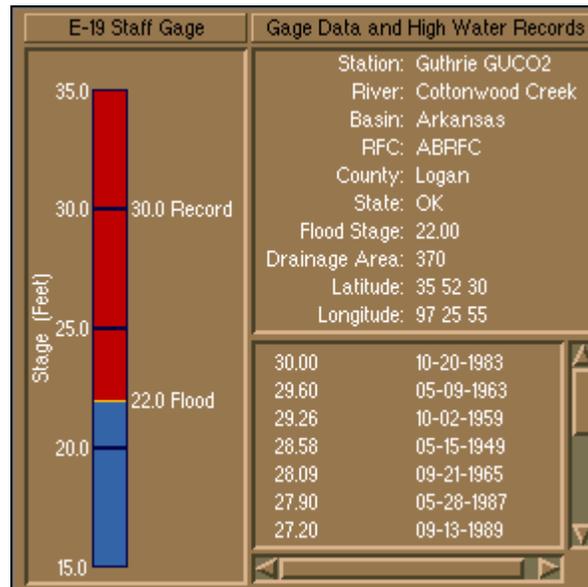
Graphic from "Hydrology for the meteorologist" COMET training

The statistical-distributed approach includes features similar to site-specific and FFG approaches

Site-specific:
- lumped model run at WFO
- states can be refreshed from RFC model
- used for gauged locations

FFG:
- lumped hydrologic model run at RFC maintains soil moisture states
- updated FFG values sent to WFO 2-3 times daily
- used for ungauged locations

Statistical-distributed:
- distributed model run at WFO
- states can be refreshed from larger area model
- biggest benefit expected for ungauged locations
- distributed framework can also be a future alternative to lumped models for gauged locations

Running Soil Moisture Accounting at the WFO

"A notable problem with FFG has been that it is not updated frequently enough during rain events and becomes unrepresentative of the prevailing hydrologic conditions. When implemented, more modern FFG techniques such as the SSM will reduce this limitation."

Quotes from "Hydrology for the meteorologist" COMET training

1 hr FFG at Two Different Updating Frequencies

Cowleech Fork Sabine, R. at Greenville, TX (GNVT2)
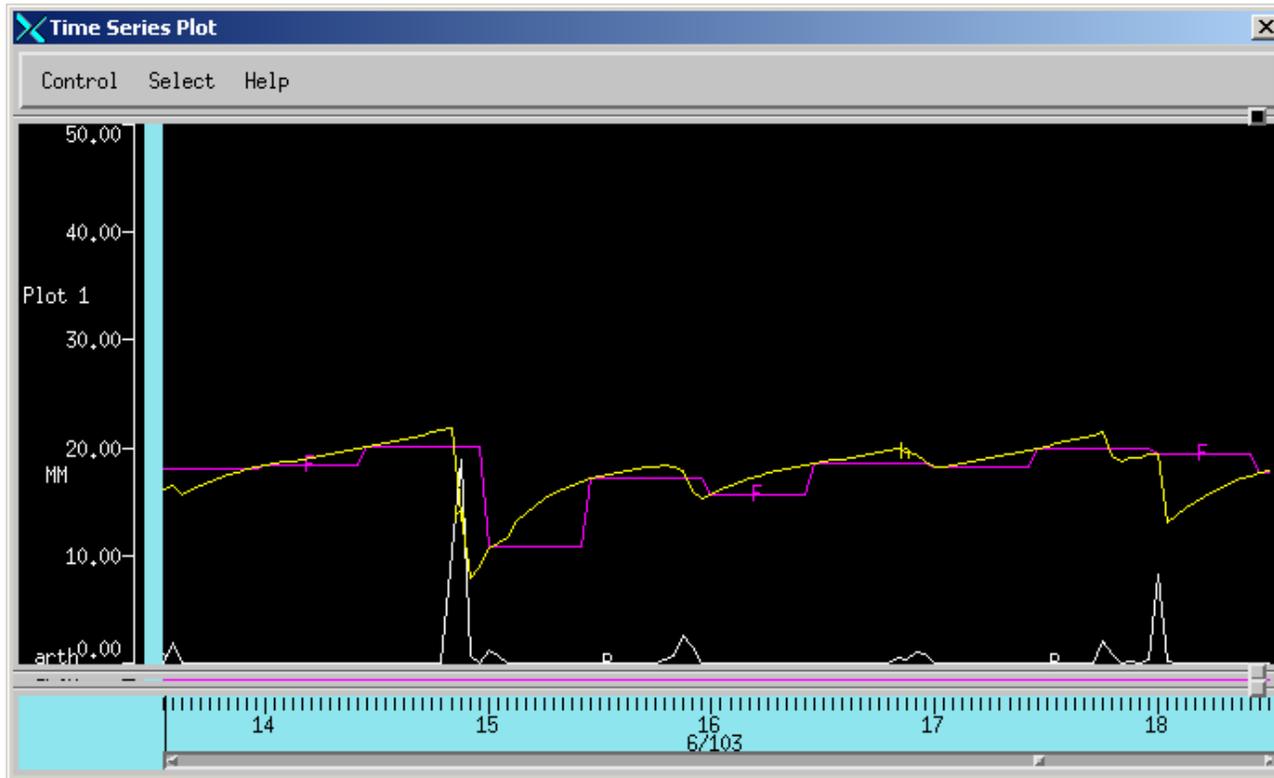
Yellow line: 1 hr FFG with hourly updating

Pink line: 1 hour FFG with 12 hourly updating

White line: 1 hour MAPX

During a 22 month simulation period (Jan 2002 – Oct 2003), hourly MAPX exceeds FFG for:

16 hours with hourly updating

9 hours with 12 hourly updating

Another Case

Cowleech Fork Sabine, R. at Greenville, TX (GNVT2)

Yellow line: 1 hr FFG with hourly updating

Pink line: 1 hour FFG with 12 hourly updating
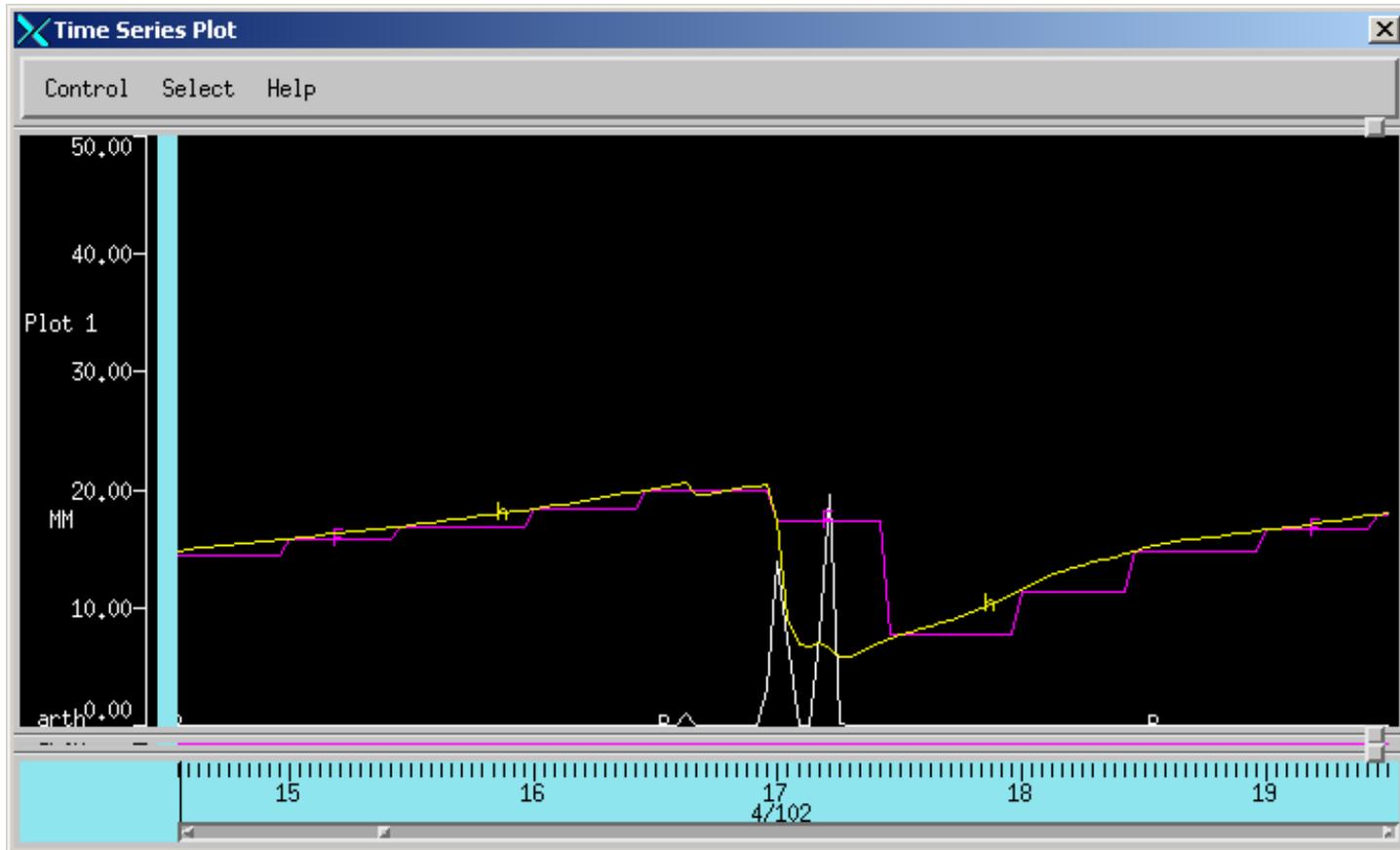
White line: 1 hour MAPX

Summary

• The proposed statistical-distributed approach has some characteristics similar to Site-Specific and some similar to FFG

    o Primarily geared towards ungauged locations (similar to FFG)

    o Uses soil moisture accounting model at WFO (similar to site-specific)

• The statistical-distributed approach offers an improved alternative to FFG

• A distributed modeling approach may also offer an **alternative** to lumped Site-Specific modeling at gauged locations