

Topic 2: Realtime mesoscale analysis

There are five steps in the Internet-based Problem Solving Technique.

- 1) Define Problems
 - 2) Break down each problem, discuss interests and how they affect each WFO, identify common interests.
 - 3) Set performance standards.
 - 4) Timed Brainstorming (alternative generation)
 - 5) Discussion of Pros and Cons
 - 6) Solution Summary
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1) Define Problems

- Lack of observational sites to actually provide the backbone for a mesoscale network
- Non-uniformity of observing equipment
- With ASOS being the highest standard in many instances, having no reliable backup power source is MAJOR!
- If mesonet stations are installed, who pays, and for recurring maintenance costs?
- WFOs may need additional computer resources to support real-time meso analyses. We need to run a minimum of 4 times / hour.

2) Break down each problem, discuss interests and how they affect each WFO, identify common interests.

- **Lack of observational sites to actually provide the backbone for a mesoscale network**
 - Marine data,; lack of; not one buoy in our entire marine CWA which is largest in CONUS (EYW). Not one buoy in Miami CWA - waters which border 7 million people.
 - Must replace Dry Tortugas C-MAN. This has been delayed now going on 10 months. This C-MAN is critical to the Keys and Gulf coast states.

- On the other hand, mesonets tend to be clustered in population centers; this often leaves coastal areas with micronets and inland areas with a 'no net'
- **Non-uniformity of observing equipment \ siting**
 - Burgeoning private sector surface obs, some bad \ no standard.
 - QC of observations more important than ever!
 - Real time access to Cuban Radar.
 - Siting standard?
- **With ASOS being the highest standard in many instances, having no backup power source is MAJOR!**
 - description of problem stands as is!
- **If mesonet stations are installed, who pays, and for recurring maintenance costs?**
 - Budget, budget, budget!!!
 - Faster maintenance on ALL instrumentation (C-MAN moored buoys left in dis-repair long periods of time).
- **WFOs may need additional computer resources to support real-time meso analyses. We need to run a minimum of 4 times / hour.**
 - LAPS
 - not flexible enough; needs to be 'more configurable' at the WFO level.
 - only runs once an hour
 - No GUI to allow forecasters to take bad observations out of the analysis on the fly?
 - functionality not well documented
 - LAPS is a 'black box'
 - Any mesoscale objective analyses:
 - Proper influence radius for partial objective analysis ??? (Barnes \ Cressman Objective Analysis)
 - $1/r^2$ or other?
 - what to do with numerous observations in one grid box?

3) Set performance standards

- **Lack of observational sites to actually provide the backbone for a mesoscale network**
 - define minimum grid spacing and work to achieve that
 - need surface data 4 times/hour at each site
 - NWS COOP Modernization will help
 - find a way to work with private sector entities to fill in holes (i.e., promote data sharing, as everyone wants the most complete data set possible)

- **Non-uniformity of observing equipment \ siting**
 - produce a standard for observational instrumentation
 - produce a standard for observational instrumentation 'siting'

- **With ASOS being the highest standard in many instances, having no backup power source is MAJOR!**
 - work with NWS \ FAA \ DoD to make sure that all ASOSs have adequate, functioning and reliable and backup power sources; each entity must acknowledge this problem, make it a top priority and come up with a fix!

- **If mesonet stations are installed, who pays, and for recurring maintenance costs?**
 - 'maintenance turn around time' is made the very highest priority with regard to any pertinent budget decisions; does not make sense to add more sites when existing ones do not work; putting the cart before the horse.
 - new installation and maintenance are made a top priority with regard to any pertinent budget decisions

- **WFOs may need additional computer resources to support real-time meso analyses. We need to run a minimum of 4 times / hour.**
 - Define minimum set of required hardware characteristics to perform below:
 - For any hourly mesoscale analyses (not just LAPS):
 - configurable (wrt/ domain, spatial&temporal resolution)
 - run 4 times / hour
 - QC GUI, remove bad data, and re-run
 - R&D to determine best influence radius for objective analyses
 - Improved incorporation of model guidance in data void areas (currently,

most analysis tools start with model first guess, then make gradual adjustments using observation data...is this the best way to go?)

- In the case of LAPS, the above requires coordination with FSL
- Must be able to integrate with other data sets in AWIPS (e.g., satellite, radar, model)

- H*WIND

- H*Wind fields could be useful as background input to your own meso analyses.
- alternatively, an applet version of H*Wind could allow a WFO to perform their own analysis although a parser would have to be developed to provide the gridded fields in formats that can be brought into awips.
- advantage is that it can run on a web browser.
- disadvantage is that its experimental and not contained within awips, and the analyst has to invest time (probably a few minutes) when they are already busy doing lots of other stuff.