

WFO Buffalo's 3 Hourly Routine TAF Updates and Efforts Towards Moving to Enhanced Short Term

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Outline

- **3 Hourly TAF Updates**
- **Efforts to move Towards Enhanced Short Term**
- **Aviation Grids and Generating TAF's from the Grids**

3 Hourly TAF Updates

- Issue routine TAF's 4 times per day as usual
- Issue routine amendments midway between the normal issuance times (03Z, 09Z, 15Z, 21Z)
- We wait until the top of the hour to see the latest obs before transmitting routine amendments
- Still issue amendments as necessary at other times

Why Issue a Routine Amendment?

- Issuing TAF's every 3 hours leads to a more proactive approach to changing TAF's based on observed conditions just upstream, and in many cases can lead to less chasing of observations
- Fine tune the TAF for small changes in conditions that are still within category (AVNFPS all green). For example, cross wind calculations for the new experimental enhanced aviation webpages

Personal Philosophy on Routine Amendments

- **I generally will only change the first 3 hours of the TAF with a routine amendment, possibly up to 6 hours in a rapidly changing scenario**
- **This focuses on the most important time period, the next few hours, and allows better forecast continuity in the later time periods**
- **I encourage forecasters not to chase observations, and also encourage them not to chase minor errors. If the spirit of the TAF is there, let it ride**

WFO Buffalo Enhanced Short Term Efforts

- Team of 3 travelled to WFO RLX for 3 days to see their operation in action (SOO, Journeyman, Lead)
- Brought ideas back to the staff for discussion
- Given that WFO Buffalo is an “ Experienced” (Old) forecast office, it was a difficult sell, but in the end we agreed to proceed on a trial basis
- We decided to take a “baby steps” approach to implementing enhanced short term

First Steps

- **Completely re-do shift duties distribution**
- **We were still using the antiquated system of breaking up the forecast by forecast type (i.e. Public, and Aviation/Marine)**
- **New concept: Short Term forecaster handles the first 24 hours of grids and aviation**
- **Long Term forecaster handles days 2 through 7**
- **Borrowed Tom Mazza, GFE and Smart-Tool Guru from WFO RLX for 2 days to help set up aviation and enhanced short term smart-tools**

Why Change the Shift Duties?

- The only possible way to work enhanced short term is to have one person focused on the first 1-2 periods of the forecast
- PRO – More efficient duties distribution, each person has their specific time to forecast for, no overlap
- CON – Each forecaster is on their own, as the other may not be in a position to offer their opinion on a forecast issue outside of their time period

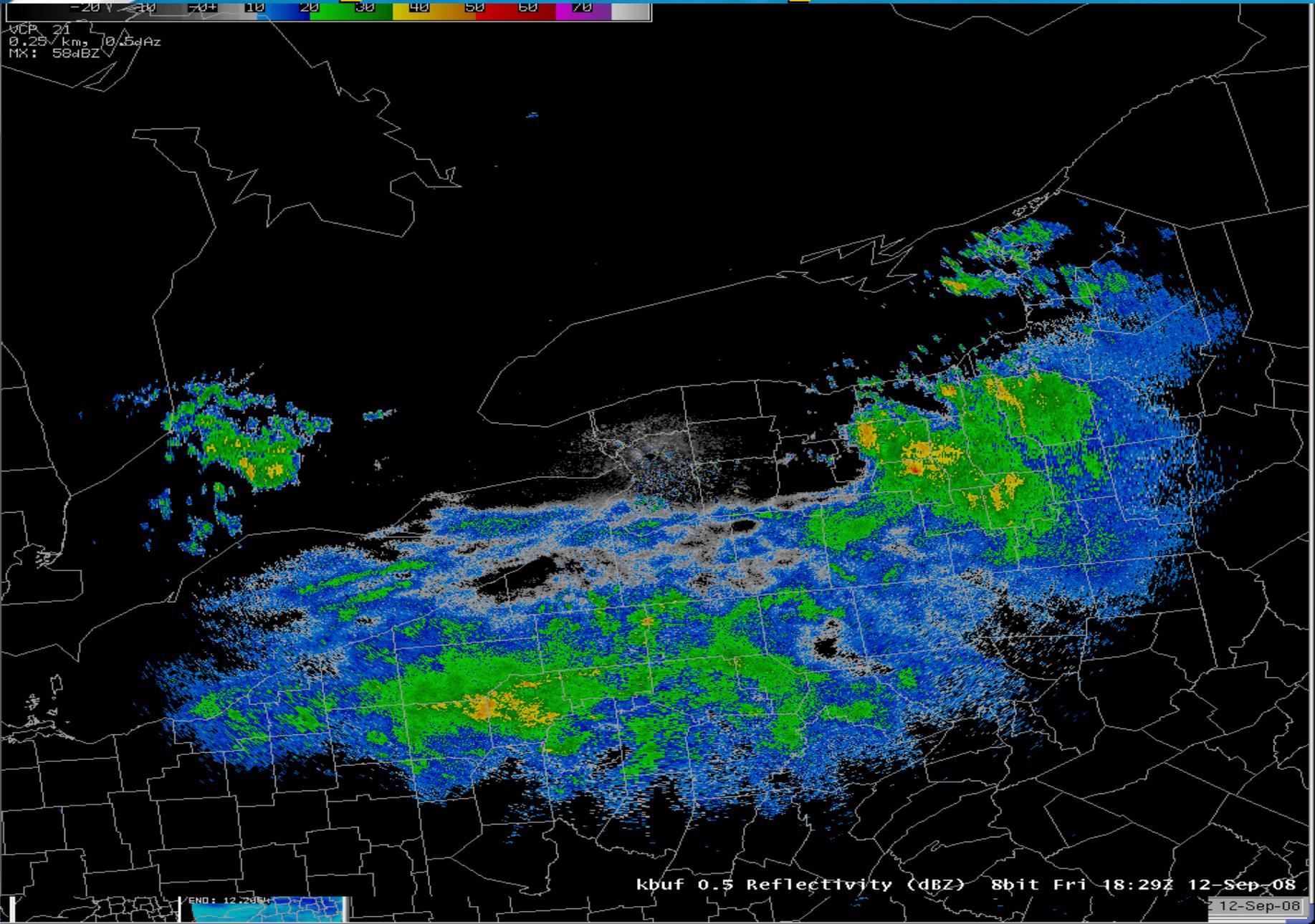
Enhanced Short Term Grid Philosophy

- Be more specific in time and space with POP, Weather, and Sky grids in first 12-24 hours. Tighten your gradients, try to eliminate mid range values
- Maintain a high quality, high detail forecast database in the short term
- Frequent Grid Updates! We recommend a minimum of once every 3 hours, but I find myself pushing new grids to ERH/NDFD 5 or 6 times per shift.
- Populate all grids with current conditions, then make adjustments out several hours based on recent trends and expected trends

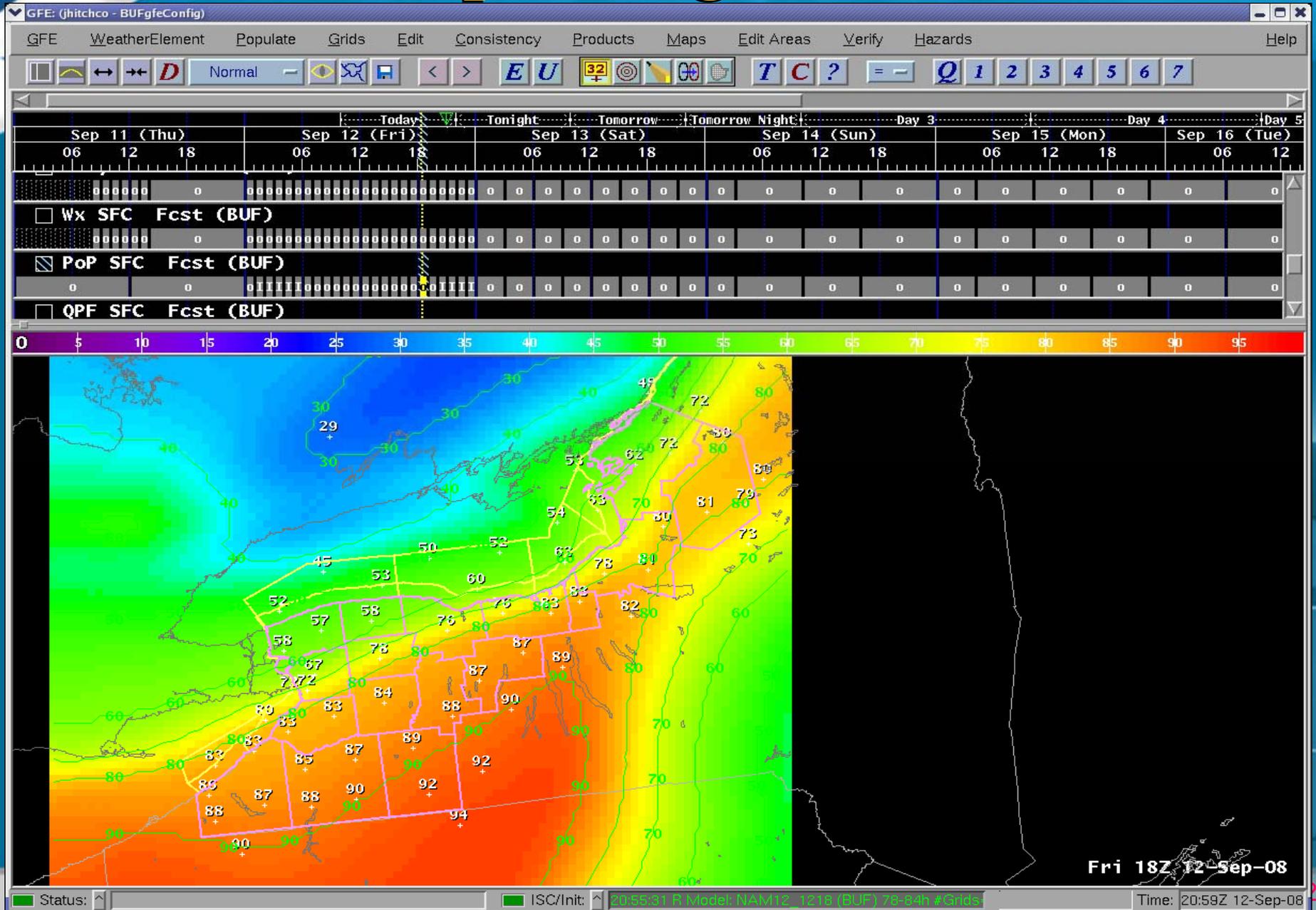
Some Caveats

- The more detailed you try to be in time and space with pops/wx, the more likely you are to be wrong! Mainly due to minor timing, placement issues
- Some forecasters are more diligent than others at keeping short term grids up to date
- Some put the high detail into the grids in the short term, and some don't
- The key is to continue to sell the benefits of enhanced short term to your forecasters, which leads to a far better point and click product, especially with hourly weather graphs

Example – Time to pick on Buf



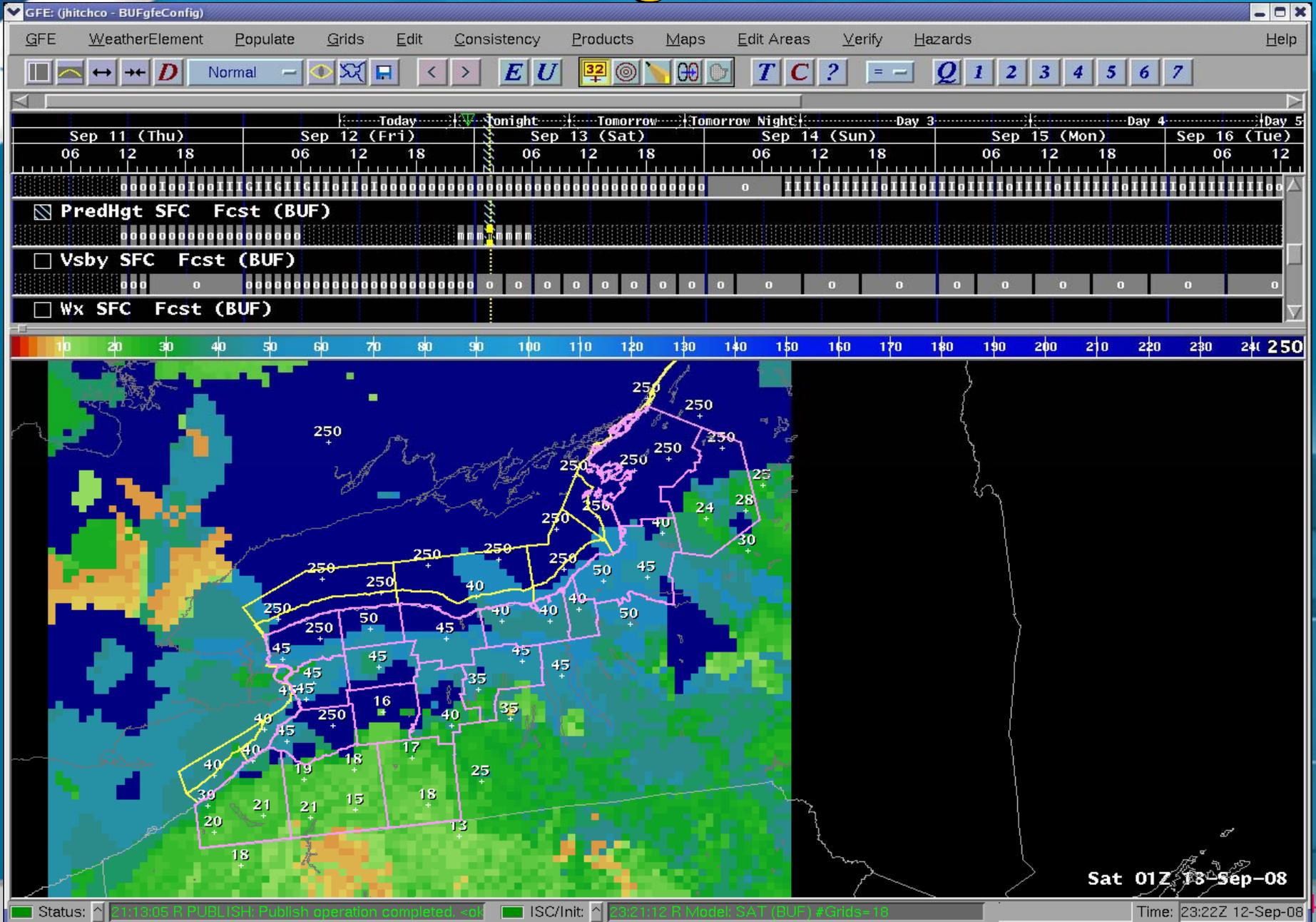
Corresponding POP Grid



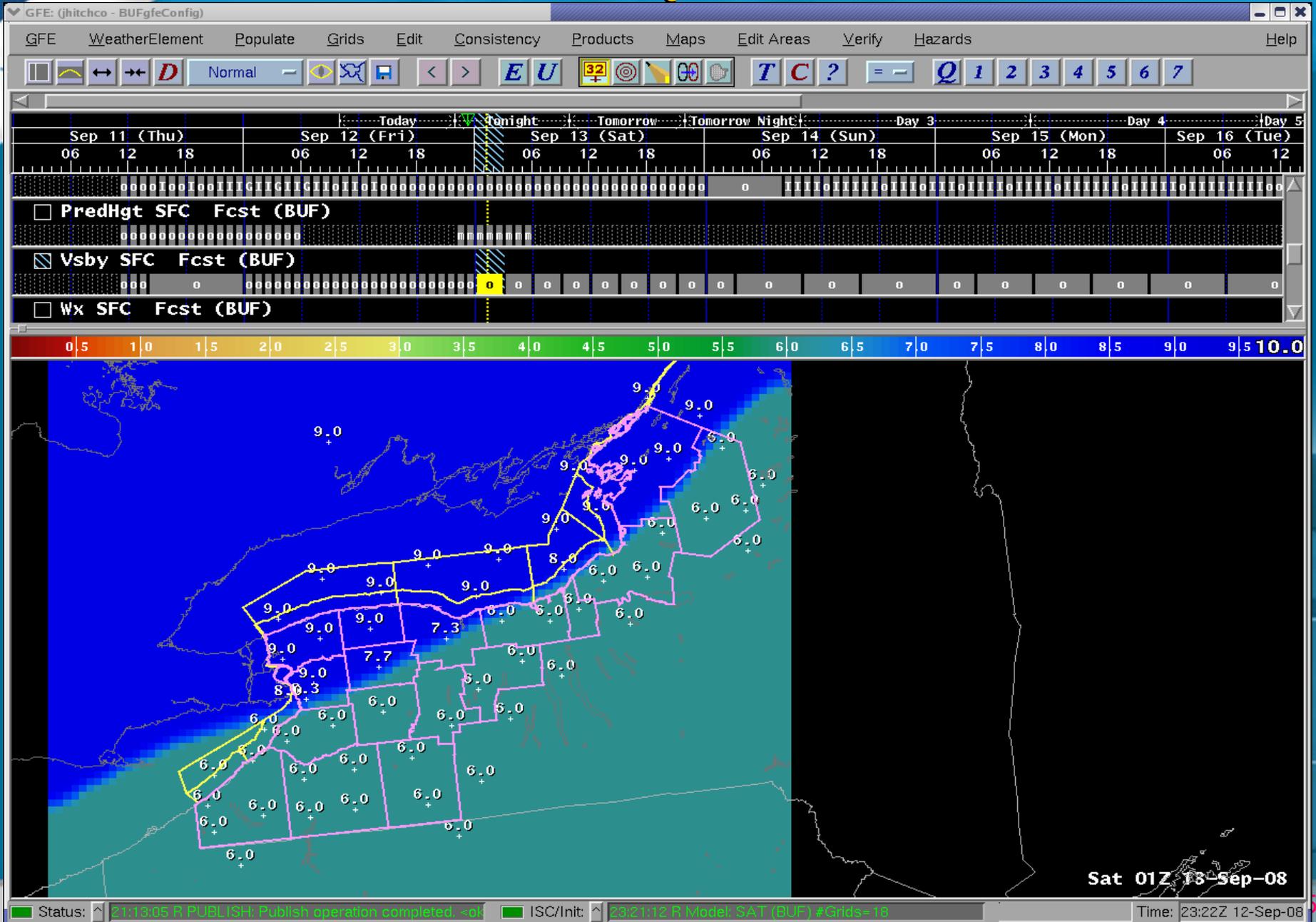
Aviation Grids

- **First step is to move towards enhanced short term concept. Pop, Wx, and Sky grids must be in high temporal and spatial detail for this to work**
- **Need two additional grids, a PredHgt grid and Visibility Grid for input into the TAF's**
- **Visibility is self explanatory**
- **PredHgt = Predominant Height – This is the height of the predominant cloud layer, and is used in conjunction with the sky grid to produce input into the TAF's for cloud information**

PredHgt Grids



Visibility Grids



How Can I Create a PredHgt Grid?

- **Smart-Tools!**
- **PredHgt From Model RH**
- **PredHgt From POP or Sky**
- **PredHgt From Fog**
- **And so on...**
- **All of the tools we have so far were developed at RLX**
- **No one tool will work for all situations, thus the diversity**
- **Beyond Smart-Tools, lots of hand work on the grids**

Example of a PredHgt Tool

PredHgtFromPoP_or_Sky Values

Derive PredHgt From:	Tool Behavior:	Use Middle Threshold?
<input checked="" type="radio"/> PoP	<input checked="" type="radio"/> Modify Entire Grid	<input checked="" type="radio"/> Yes
<input type="radio"/> Sky	<input type="radio"/> Just Lower PredHgt Where Needed	<input type="radio"/> No

Lower Threshold

Middle Threshold

Upper Threshold

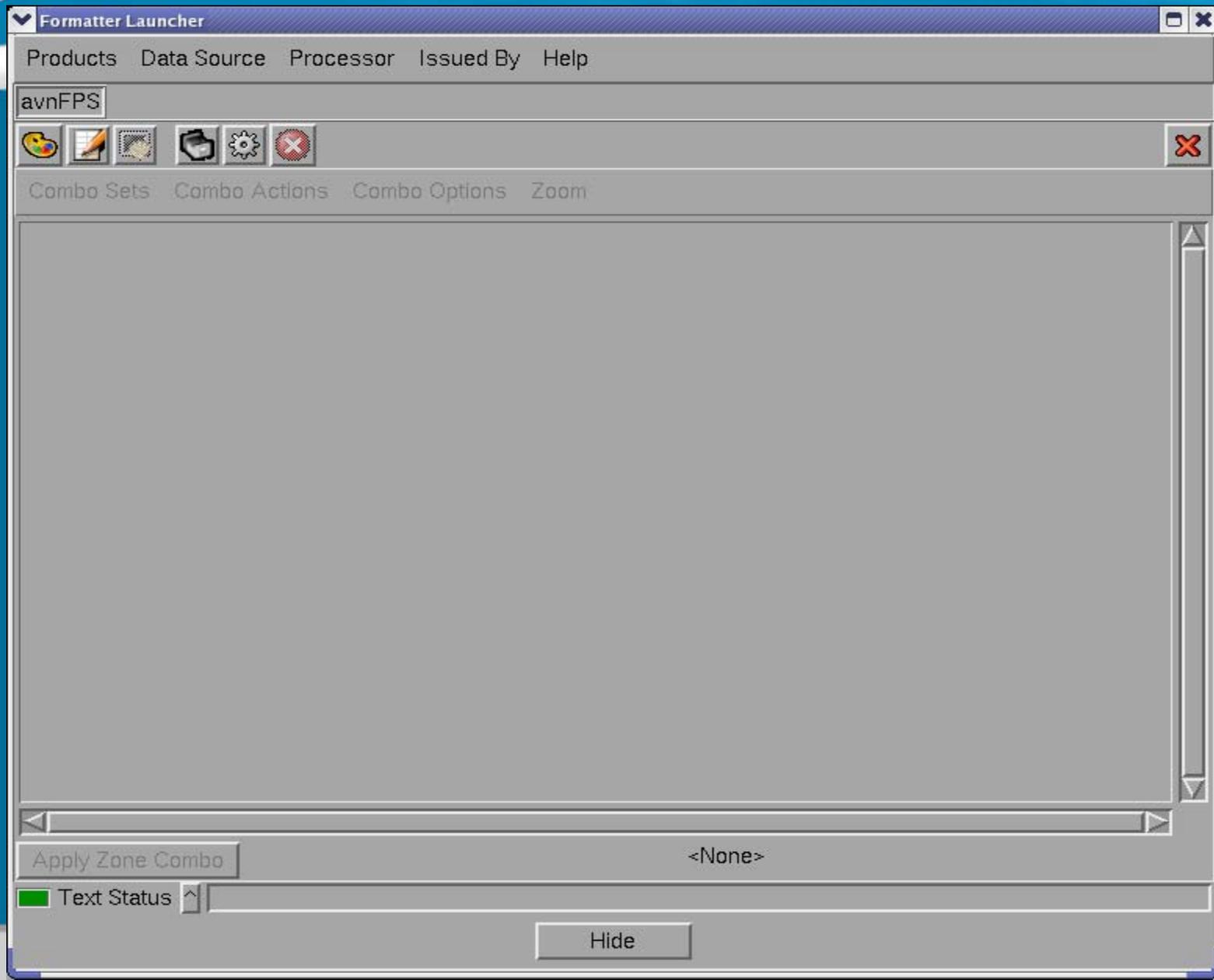
PredHgt Assigned to Lower Threshold

PredHgt Assigned to Middle Threshold

PredHgt Assigned to Upper Threshold

Auto Smooth PredHgt?	Auto Round PredHgt?
<input type="radio"/> Yes	<input checked="" type="radio"/> Yes
<input checked="" type="radio"/> No	<input type="radio"/> No

Generating the TAF



AVNEFPS

Site ID: ▼

Flight Categories: VFR MVFR IFR LIFR

Metars

GFS-MOS

TAF/LAMP

GFSLAMP

ETA-MOS

NGM-MOS

ETA-profile

Grids

All Routine Format table long short Flight Categories

KBUF NDFD Guidance 09/12/08 2100 UTC

TAF

```
KBUF 122320Z 130024 22009KT P6SM DVC050
FM0100 23009KT P6SM DVC045
FM0200 23009KT P6SM DVC250
FM0300 23009KT P6SM DVC035
FM0400 23009KT P6SM DVC035
FM0500 23009KT P6SM DVC035
FM0600 23008KT P6SM DVC300
FM0700 23007KT P6SM DVC300
FM0800 23007KT P6SM DVC300
FM0900 24006KT P6SM DVC300
FM1000 23005KT P6SM DVC300
FM1100 23005KT P6SM DVC300
FM1200 22005KT 6SM DVC300 PROB30 1213 6SM -SHRA DVC300
FM1300 22005KT 6SM DVC300 PROB30 1314 6SM -SHRA DVC300
FM1400 22005KT 6SM DVC300 PROB30 1415 6SM -SHRA DVC300
FM1500 22006KT 6SM DVC300 PROB30 1516 6SM -SHRA DVC300
```

Experiences with Grid Based TAFs

- Dave Sage and I, who went on the trip to RLX, did a full scale mock up for 6 nights on our midnight shifts in April
- We did enhanced short term, and TAF's out of the grids
- We had an extremely difficult weather regime, with several nights in a row of patchy very low Cigs and Vsby due to a stalled out frontal boundary and also local flow off the cold lakes
- It was very challenging, if not impossible to keep the PredHgt and Visibility grids up to date and accurate

However...

- We were going into this cold turkey
- We had no training, and no experience
- We were also starting with grids from the previous shift that were not enhanced short term
- Had no existing PredHgt or detailed Vsby grids to start with
- Had a very difficult regime to work with, a stalled frontal boundary and early spring lake generated stratus

More on TAFs from Grids

- I never realized how bad my Grids were until I tried to generate a TAF from them – especially winds
- Wind directions were not quite what I wanted, sky cover was not precise enough, etc.
- TAF from grids is the ultimate grid QC check. Unlike a ZFP formatter that attempts to word the forecast, the TAF formatter is just pulling precise numbers from the Grids. If your TAF doesn't come out the way you expected, it's because of your grids, not the formatter

Gridded Aviation – PRO's

- No duplication of work, once the grids are set, you can then generate all the public and aviation forecasts
- We can create a “point and click” aviation service for airports not covered by traditional TAF's
- Graphical and Digital aviation forecast products
- Weather input into the FAA's Next Generation Airspace Management System (4-D Weather Cube)

Gridded Aviation – CON's

- Some added workload with 2 more grids (1 more for WFO's already doing marine)
- Major shift in forecaster thought process when it comes to ceilings and visibility, from point forecasts to graphical forecasts
- Training and learning curve.