The Outlook for National-Scale Ceiling and Visibility Products

Paul Herzegh
Lead, FAA/AWRP National C&V Team

The NCV Team: A Safety/GA Orientation

Team Members

- NCAR
- NOAA/ESRL
- Naval Research Lab (Monterey)

Product Focus

- General Aviation
- En-route Safety
- The VFR Pilot
- Current Conditions
- Pilot Decisions
  - Preflight Plan
  - Go vs No-Go
  - Avoiding IFR
  - Escaping IFR

Photo Credit: AOPA Air Safety Foundation.

Real-Time Analysis of C&V Conditions

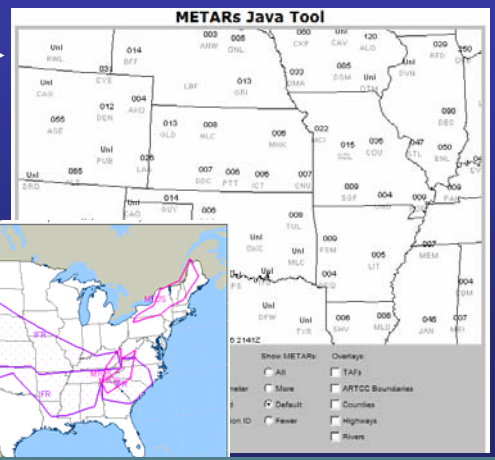
Current Practice

- Textual METARS
- Textual METAR station plots.
- AIRMETS: Related to current conditions.
- Availability: ADDS, commercial, DUAT, FSS, others.

Aviation Digital Data Service (ADDS)

Output produced by METARs form (2141 UTC 20 March 2006)
found at http://adds.aviationweather.noaa.gov/metars/index.php

```
KMKC 202059Z 09013G23KT 2SM RA BR BKN014 OVC022 04/02 A2971 RMK AO2 P0000
```



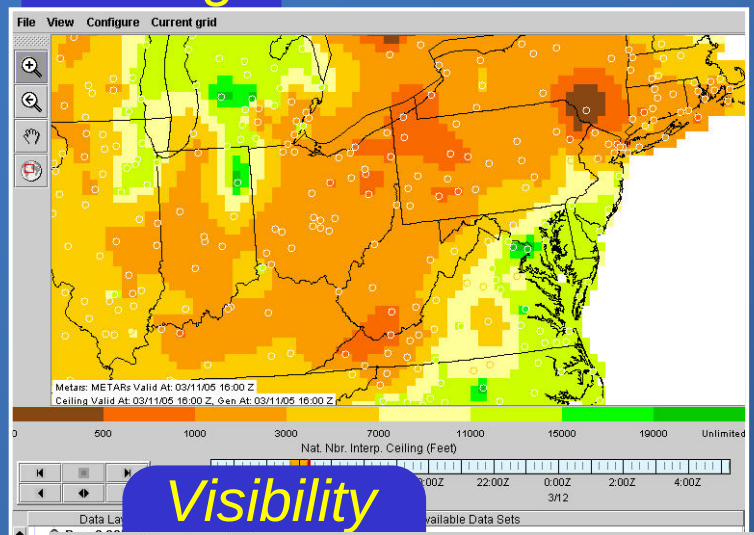
Shortfalls in Current Practice

- No gap-filling – *what lies between stations?*
- Terrain – *effects on ceiling between stations?*
- Lacks true graphical output.
  Needs - *Cockpit-compatible presentation.*
  - *Ceiling, visibility & flight category.*
  - *Expected terrain obscuration.*
- AIRMETS infrequent (4 per day).

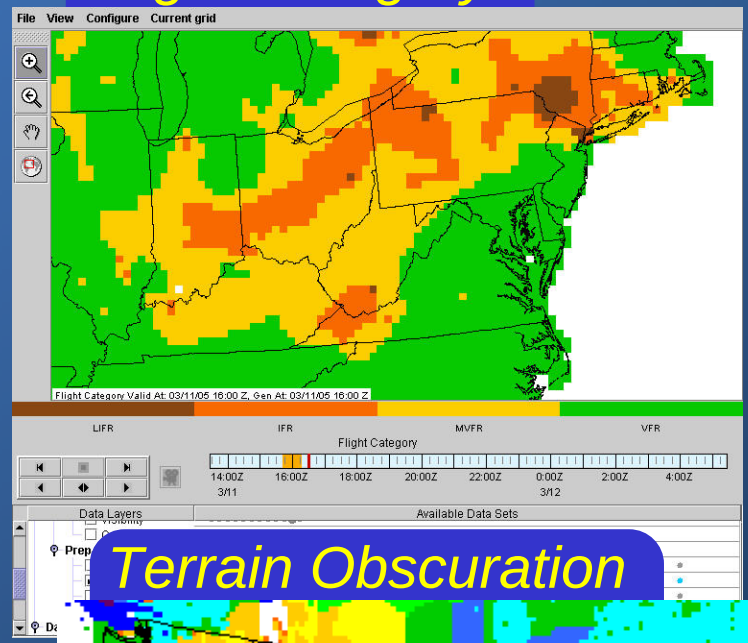
Target features for NCV development.

The NCV Gridded Analysis Product

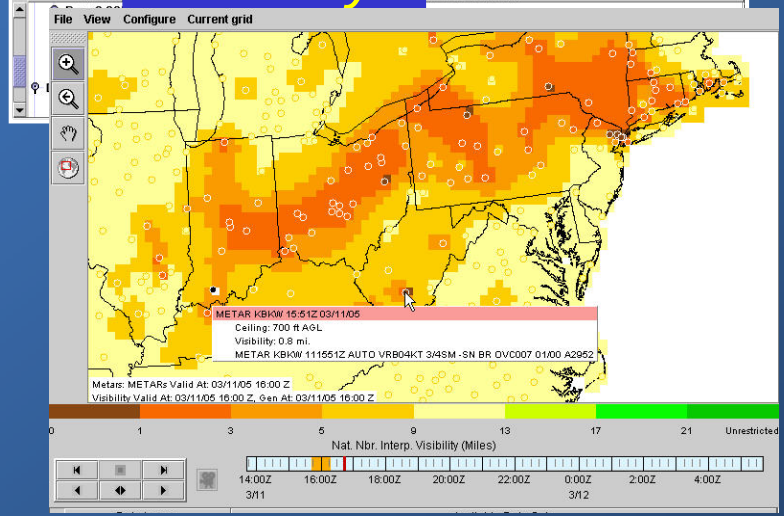
Ceiling



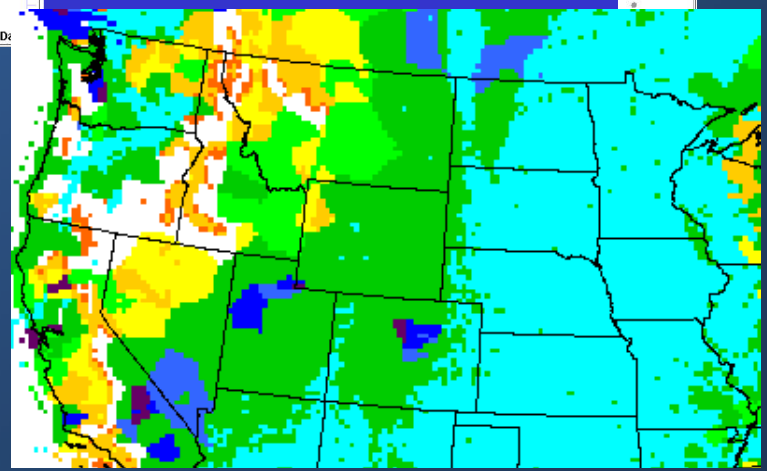
Flight Category



Visibility



Terrain Obscuration



Analysis System Architecture

Real-time Observations

METARS

GOES E & W

Quality Checks

Clear or Cloudy in Gaps?

Interpolation to RUC 20 km grid

Future Data Sources

RUC Model

NEXRAD

PIREPS

Polar-Orb Sats

C & V in Gaps

Visibility in Gaps

C & V in Gaps

Augment GOES Sat

Integration to Web Display & Digital Grids
(15 min updates)

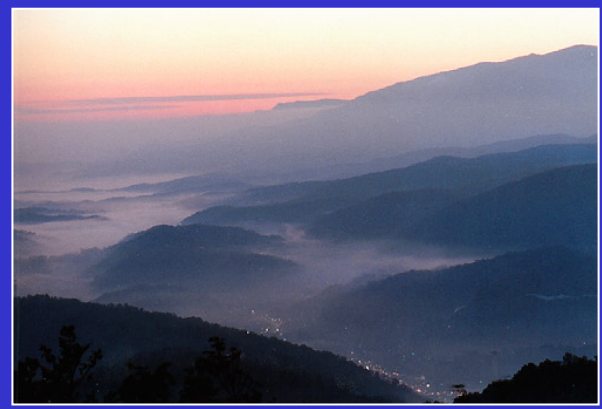
- Exp'l ADDS
- NCV website
- Future – cockpit.

- Grid trial at NWS
- Future – to NDFD

NCV Analysis Product Wrapup

Performance

- Product is a *Value-Added METAR Interpretation*.
  - ✓ Extends geographic domain of METAR information.
    - IFR detection in gaps = 0.74
    - IFR false alarm ratio in gaps = 0.30
  - ✓ Frequent (15 min) updates.
  - ✓ Improves visualization. Adds terrain.
  - ✓ Utilizes METARS & Satellite data.
  - ✓ Radar, model, other data planned for future.



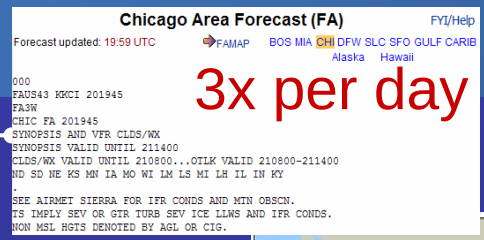
Timeline

- Currently experimental status (not for operational use).
- 14 months to operational status (May ’07).

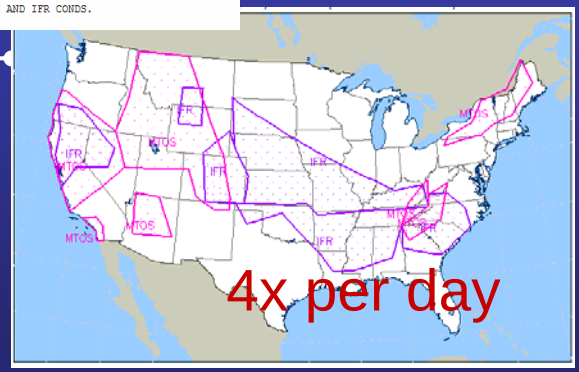
Forecasting Ceiling & Visibility Hazards

Current Practice

- Area Forecast. (graphical form is experimental)
- AIRMETS.
- TAFs *(4x per day)*.
- Availability: *ADDS, commercial, DUAT, FSS, others.*



3x per day



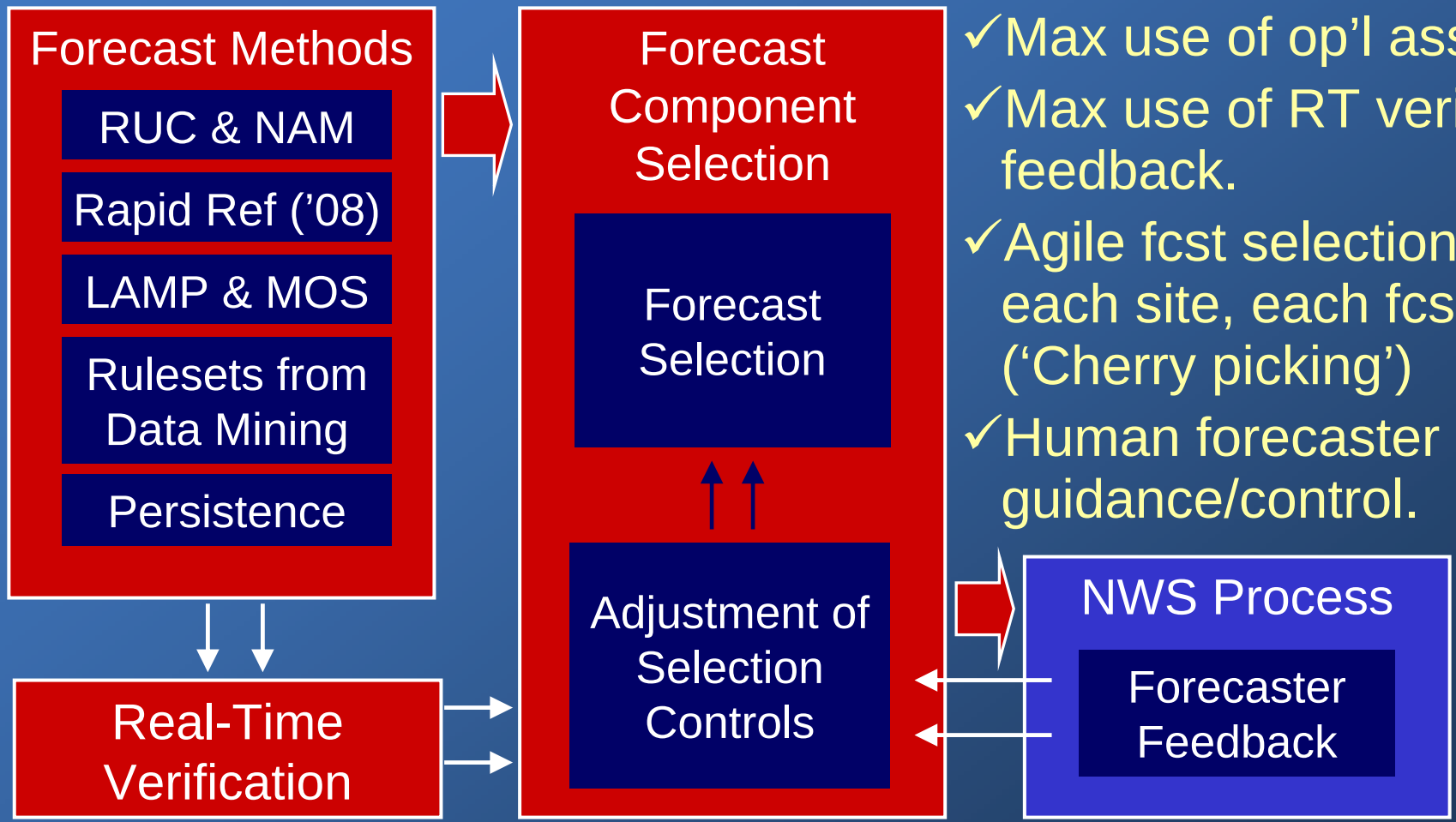
Shortfalls

- Area Forecast – *Text only, issued each 8 hours.*
- AIRMETS – *Time/space ambiguity across 6 h affected area.*
- Minimal automation – *limits update frequency, ultimately limits skill.*
- Lacks true graphical output.

  Needs - *Cockpit-compatible presentation.*
  - *Ceiling, visibility & flight category.*
  - *Expected terrain obscuration.*

Target features for NCV development.

NCV Forecast System Architecture



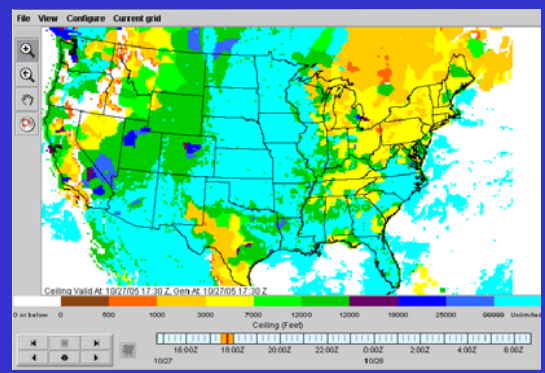
- ✓Max use of op'l assets
- ✓Max use of RT verific. feedback.
- ✓Agile fcst selection – each site, each fcst. ('Cherry picking')
- ✓Human forecaster guidance/control.

Verification Feedback to Control Selection

NCV Forecast Product Wrapup

Status

- Produces 1-10 hr forecasts across ConUS on 20 km grid.
  - Ceiling, visibility, flight category, terrain obscuration.
  - Extend to 18-24 h & 5-10 km grid spacing.
- Experimental grids flowing to NWS for trial evaluation.
- Hourly frequency.
- Current skill comparable to NWS guidance.
  - Skill increasing as development continues.



Timeline

- Currently test product status (undergoing development).
- 14 months to experimental status (May ’07).
- 2 to 2½ years to operational status (May or Nov ’08).

Looking Ahead

R&D Areas

- Effects of higher spatial resolution.
- Use of improved models & other product inputs.
- Improved translation (model output to C and V)
- Future: Slant range visibility product (from altitude)

Operational Capabilities within Reach

- Improved weather/terrain integration.
- C&V in a flight path planning tool (e.g. ADDS cross-section flight path tool).
- Scalable, intuitive graphics for cockpit & other access.