The Outlook for National-Scale Ceiling and Visibility Products

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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.

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
Analysis System Architecture

Real-time Observations

METARS → Quality Checks → Interpolation to RUC 20 km grid

GOES E & W → Clear or Cloudy in Gaps?

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

Future Data Sources

RUC Model → C & V in Gaps

NEXRAD → Visibility in Gaps

PIREPS → C & V in Gaps

Polar-Orb Sats → Augment GOES Sat

• 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).
Current Practice

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

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 obscurcation.

Target features for NCV development.
NCV Forecast System Architecture

Forecast Methods
- RUC & NAM
- Rapid Ref ('08)
- LAMP & MOS
- Rulesets from Data Mining
- Persistence

Real-Time Verification

Forecast Component Selection
- Forecast Selection
- Adjustment of Selection Controls

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

NWS Process
- Forecaster Feedback

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.