United States
National Weather Service
Verification Program

International Verification Workshop

TAF Verification in the
U.S. National Weather Service

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Old System

- **Contingency tables- ceiling and vsby**
- **Operational categories**
- **150 TAF sites**
- **Verified 2 TAFs per day (06Z and 18Z)**
- **No amendments verified**
- **Projections: 3-, 6-, 9-, 15-hour**
- **Compares TAF to MOS guidance**

Ceiling/Visibility Categories

Ceiling

- LIFR   < 500 feet
- IFR   500-900 feet
- MVFR   1000-3000 ft
- VFR   > 3000 feet

Visibility

- LIFR   < 1 mile
- IFR   1 to < 3 mi
- MVFR   3 to 5 miles
- VFR   > 5 miles

New Ceiling/Visibility Categories

Ceiling

- < 200 feet
- 200-400 feet
- 500-900 feet
- 1000-1900 feet
- 2000-3000 feet
- > 3000 feet

Visibility

- < ½ mile
- ½ to < 1 mile
- 1 to < 2 miles
- 2 to < 3 miles
- 3 to 5 miles
- > 5 miles

New system objectives

- **Verify all terminals with a TAF**
- **More continuous – Every 5 minutes**
- **Scheduled TAFs/ Amendments / Both**
- **Evaluate TEMPO / PROB groups**
- **Combine CIG and VIS into one element**
  - **Called: Flight Category**
  - **Example: < 1000 feet or < 3 miles**
- **Compare TAF to MOS or persistence**

Operator Selections

- *Stats on Demand* operator selects one:

  - Ceiling

  - Visibility

  - Flight category (lowest of ceiling or vsby)

  - Wind direction

  - Wind speed

  - Winds gusts

  - Significant weather type

Operator Selections

- *Stats on Demand* operator defines
    - Spatial domain of data request
    - Temporal domain of data request

- *Stats on Demand* operator picks one:
    - Prevailing forecast
    - TEMPO forecast
    - PROB forecast
    - "Operational impact" forecast

Operator Selections

- *Stats on Demand* operator selects one or more:
    - 0 to 3 hours (36 data entries)
    - > 3 to 6 hours
    - > 6 to 9 hours
    - > 9 to 12 hours
    - > 12 to 18 hours
    - > 18 to 24 hours

- *Stats on Demand* operator selects one or both:
    - Scheduled TAFs
    - Amended TAFs

Operator Selections

- *Stats on Demand* operator selects:
  - GFS MOS
  - NGM MOS
  - NGM LAMP
  - Persistence

Data Demands

- **Very demanding with large requests**

- **One observation every 5 minutes**

- **Examples:**
  - **1 day, 1 terminal, 0-6 hours**
    - **(12 obs/hr) (6 hrs/TAF) (4 TAFs/day) = 288**
  - **1 month, 1 WFO area (8 terminals), 0-6 hours**
    - **(288) (30) (8) = 69,120**
  - **1 month, entire Nation (500 terminals)**
    - **(288) (30) (500) = 4.3 million**
  - **1 year, entire Nation (500 terminals)**
    - **(288) (30) (12) (500) = 52.8 million**

Operational Impact Forecast

- **Combines Prevailing forecast with TEMPO or PROB**
- **No TEMPO or PROB → OIF = Prevailing forecast**
- **If PROB in effect → OIF is most pessimistic forecast**
- **If TEMPO in effect → OIF is determined in 2 steps**
- **Step 1: Looks for variability in the observations**
  - **Every 5 minutes, variability test over 3 hours (± 90 min)**
  - **Variability ≡ 2 or more changes over 3 hours**
- **Step 2: Consequences of variability test**
  - **If Variability Test fails → OIF is most pessimistic fcst**
  - **If Variability Test passes → OIF is fcst w/ smallest error**

TEMPO Evaluation

- **Number of hours of TEMPO**
- **% of time TEMPO forecast was justified.**
  - **"Justification" based on OIF variability test**
- **Justified TEMPO, Hit**
- **Justified TEMPO, Improved TAF**
- **TEMPO Should Be FM (%)**
  - **TEMPO Hit but failed variability test**

TEMPO Evaluation cont'd

- ## TEMPO Benign
  - ### TEMPO failed variability test (unjustified)
  - ### % of time TEMPO more in error than prevailing but TEMPO wx more favorable

- ## TEMPO Hurt
  - ### TEMPO failed variability test (unjustified)
  - ### % of time TEMPO more in error than prevailing but TEMPO wx less favorable

PROB Evaluation

- **Number of hours of PROB (30 and 40)**
- **% time PROB Hit with Precip or TS**
- **% time PROB Hit w/out Precip or TS**
- **% time PROB Improved the TAF**
  - **Regardless of Precip or TS occurrence**
- **% time PROB Benign**
- **% time PROB Hurt**

For More Information

- **See NWS Instruction 10-1601, accessible via the Web: www.nws.noaa.gov/directives**

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