Measuring Aviation Weather Forecast Performance and Operational Utility

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Measuring Product Performance

• Better meteorological skill does not necessarily yield operational benefits

• Operational context matters
  – Performance evaluation (verification) techniques
  – Determining performance requirements

• Verification techniques are evolving to capture the operational context
Weather Translation

- Weather translation highlights forecast characteristics that matter to operations
- Using translation in verification techniques provides performance information relative to operational context
- Performance information is used to improve meteorological forecast quality
- Translation is applied at various levels of sophistication
  - VIP Level 3 and above
  - Incorporating traffic patterns to emphasize constraint severity
Flow Constraint Index

FCI = measure of wx permeability + traffic

raw weather

density of J,Q airways

constraint in areas of denser traffic → more heat
Forecast Impact and Quality Assessment

Section 5

Raw observations

Translated observations

Forecast A

Forecast B

Forecast C

Forecast Impact and Quality Assessment Section
Considerations

• Measuring performance in ‘translation space’ is only as good as its translation
  – Translation must accurately capture operational context, connect to operational decisions
  – Requires collaboration with the operational community
• Performance information needs to feed back into forecast development/production
  – Will affect the characteristics important to operational context
  – Requires collaboration with the forecast community
• Operational Utility
  – Performance measurement is one piece of the puzzle
  – Tie translation characteristics to specific decisions such as Traffic Management Initiatives (TMIs)
  – Link performance in TMI scenarios to operational benefits