Progress in Icing Forecast Product Development

Marcia K. Politovich
FAA Aviation Weather Research Program
InFlight Icing Product Development Team Lead
Quick Outline

• Update/schedule on CIP/FIP
  – Changes to CIP – severity, probability
  – Testing by users

• Schedule
  – Un-restricted operational use?
  – Alaska?

• Are TAMDAR PIREPS useful for CIP?
CIP Upgrades

- Upgrades are a response to YOUR concerns
  - Probability instead of potential
  - Severity!
  - Display concepts: color, altitude resolution, etc.
By FAA policy CIP is a Supplementary Weather Product for enhanced situational awareness only and must be used with one or more primary products (safety decision) such as an AIRMET or SIGMET (see AIM 7-1-3).

Icing severity at FL190

Analysis valid 1600 UTC Thu 05 Oct 2006

NCAR
By FAA policy CIP is a Supplementary Weather Product for enhanced situational awareness only and must be used with one or more primary products (safety decision) such as an AIRMET or SIGMET (see AIM 7–1–3).

Icing severity at FL190

Analysis valid 1600 UTC Thu 05 Oct 2006

Icing PIREP Symbols

None Trace Light Moderate Heavy

Negative Trace-Light Light-Moderate Moderate-Severe

Trace Light Moderate Severe
By FAA policy CIP is a Supplementary Weather Product for enhanced situational awareness only and must be used with one or more primary products (safety decision) such as an AIRMET or SIGMET (see AIM 7-1-3).

Icing severity (prob>25%) at FL190

Analysis valid 1600 UTC Thu 05 Oct 2006
Icing severity (prob>50%) at FL190

Analysis valid 1600 UTC Thu 05 Oct 2006

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**Probability of icing at FL190**

Analysis valid 1600 UTC Thu 05 Oct 2006

Icing PIREP Symbols:
- Negative
- Trace
- Light
- Moderate
- Severe
The FIP is an automatically-generated product that supplements AIRMETs and SIGMETs by identifying areas of forecast icing potential, but it does NOT substitute for the intensity and forecast information contained in AIRMETs and SIGMETs.

Potential for icing at FL190

02 hr forecast valid 1700 UTC Thu 05 Oct 2006
The FIP is an automatically-generated product that supplements AIRMETs and SIGMETs by identifying areas of forecast icing potential, but it does not substitute for the intensity and forecast information contained in AIRMETs and SIGMETs.

Potential for icing at FL190

12 hr forecast valid 0300 UTC Fri 06 Oct 2006
The CIP is an automatically-generated product that supplements AIRMETs and SIGMETs by identifying areas of current icing potential, but it does NOT substitute for the intensity and forecast information contained in AIRMETs and SIGMETs. It is authorized for operational use by meteorologists and dispatchers.

Icing potential at FL180

Analysis valid 1600 UTC Thu 05 Oct 2006

Icing PIREP Symbols:
- Negative
- Trace—Light
- Light—Moderate
- Moderate—Severe

- Trace
- Light
- Moderate
- Severe
The FIP is an automatically-generated product that supplements AIRMETs and SIGMETs by identifying areas of forecast icing potential, but it does NOT substitute for the intensity and forecast information contained in AIRMETs and SIGMETs.

SLD Icing Potential at FL190

02 hr forecast valid 1700 UTC Thu 05 Oct 2006
Icing AIRMETs (blue) and SIGMETs (red)

chart created at 1606 UTC Thu 05 Oct 2006
AIRMETs valid until 2000z/5th, SIGMETs expire at or before 1755z/5th
Future Plans for CIP/FIP

- Color scheme
- More vertical levels
- Technical upgrades
  - TAMDAR
  - NSSL 3D radar mosaic
  - NASA LaRC advanced satellite products
  - Ensemble forecasts
- Human-Over-The-Loop
- Tie-in to GFA – G-AIRMET
  - G-AIRMET experimental Feb’07, operational Oct’07
On Deck: FIP

• D3 (experimental) decision for new FIP is March 2007
  – Code has been frozen
  – Verification data sets have been produced
  – Severity and probability
  – Product on ExADDS immediately after decision

• D4 follows a year later
  – Some tweaks
  – Need to work on FIP/AIRMET issues
Alaska

- Product development depends on model development schedule
- Current and forecast products are now experimental and on ExADDS
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Are TAMDAR icing reports useful?

- They make a visible difference in the product
- Statistically, the improvement seems low
  - Verification methods are relatively clumsy
  - Hard to obtain good “truth” data sets
- May be possible to make a map of current/recent icing from TAMDAR reports
Impacts (5K ft) – HRCIP

Voice Only

Voice + Pos TAMDAR

Large Disk – Pos & Neg

Small Disk - Pos & Neg
ROC Curves

AUC = 0.69

AUC = 0.71

AUC = 0.713

AUC = 0.703
R&D Summary

• Progress!! Success!!
• Coordinate with
  – MDL and AWC for HOTL and GFA
  – DOD for ensemble forecasts, database
  – JPDO for planning
• Incorporate new data sources as we learn to extract relevant information
  – NSSL 3D radar mosaic
  – NASA LaRC satellite products
  – TAMDAR