

InFlight Icing Activity Summary

AWRP, mostly
+ some NASA and NOAA

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IFIPDT Lead

Deputy Director for Science, NCAR RAL Aviation
Applications Program

Summary of Functional Requirements for Icing Forecasting

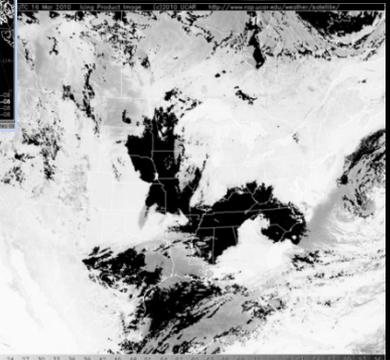
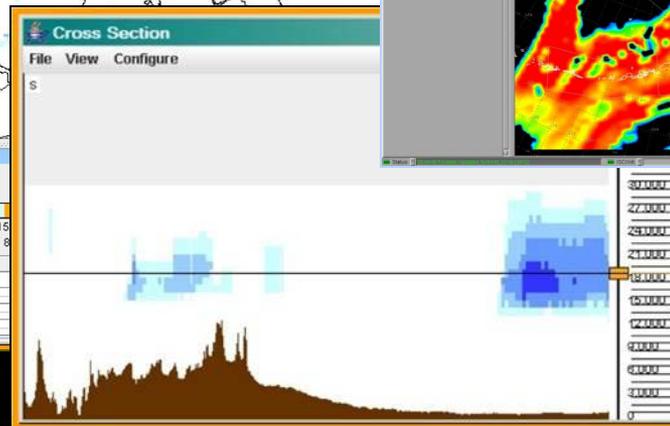
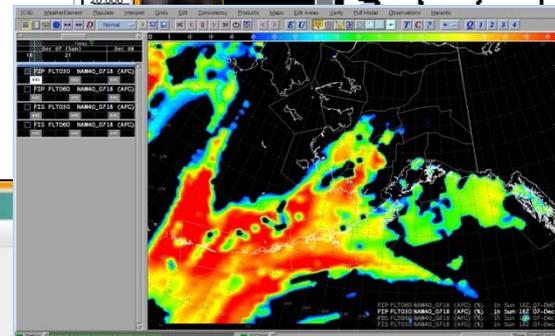
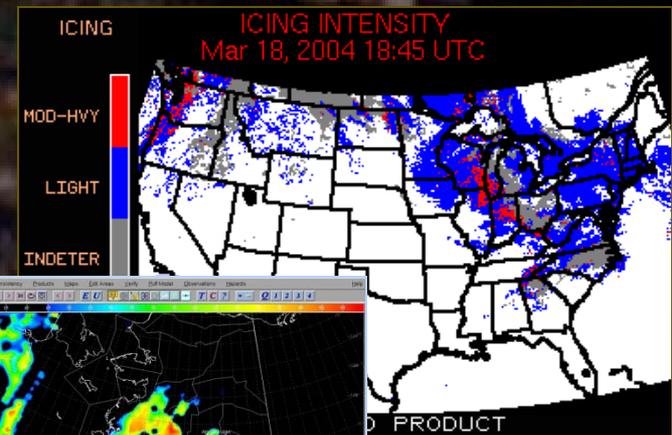
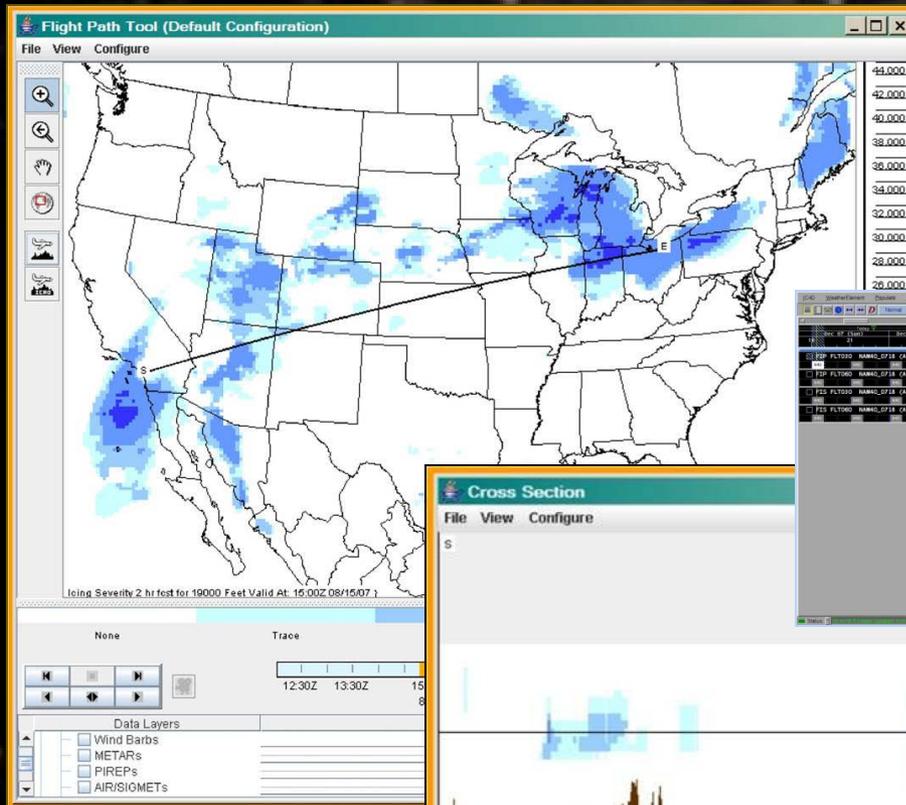
Application	Resolution	IFIPDT
NAS over North America and adjacent coastal waters	4 km 500 ft 1-h (0-60 h) 3 h (60 h – 14 d)	Currently 20 km, 1000 ft, with diagnoses at 0,2,3,6 and 9 h. 18 h currently under consideration. CIP/FIP will go to 5 km when HRRR is operationally available; lead times depend on the lead times of the models.
Terminal (within 50 km of centerfield to top of the terminal volume)	1 km 100 ft (sfc-2900 ft) 250 ft (3000–4550 ft) 500 ft (>5000 ft)	These are really better addressed through observations than models – IFIRT had done work on icing detection but these activities were discontinued in 2005 and 2006. NASA GRC is supporting a vertical-pointing remote sensing system for icing; the FAA Nexrad program office is supporting Nexrad dual-polarization-based Icing Hazard Level algorithm development starting mid FY09. <i>To meet this functional requirement, improved models and observational systems are needed which are far beyond the purview of the IFIRT.</i>
Outside NAS	10 km 500 ft 1-h (0-60 h) 3 h (60 h – 14 d)	The IFIRT is developing on a Global FIP –severity ; resolution depends on the Global Forecast Model which currently has 1° resolution updated daily, with forecasts to 60h. Higher resolution (time and space) and longer lead times are model dependent.
10-min increment forecasts	Update every 5 min	Not in IOC plans, can do for MOC or beyond. Updates would be based on METARS speci and PIREPS; radar and satellite update rates are 6-15 min. <i>(Note that we are assuming this is a 10-min increment of <u>current</u> conditions, updated every 5 min. If a 10-min time window for forecasted conditions is necessary, this is dependent on the models' abilities to forecast at that granularity)</i>
15-min “ “	Update every 7.5 min	<i>Same as 10-min increment</i>
1-h “ “	Update every 30 min	Currently updated hourly. Models currently only give hourly information so the 30-min update rate will depend new satellite, radar, and METAR speci information.
3-h “ “	Update every hour	Already being done for FIP.
Climatological forecasts	Monthly	Not in IOC plans, can do for MOC or beyond. Would base on our historical FIP/CIP runs or selection of parameters from historical NCEP NWP runs.

Primary of Flight Path Tool

Resolution

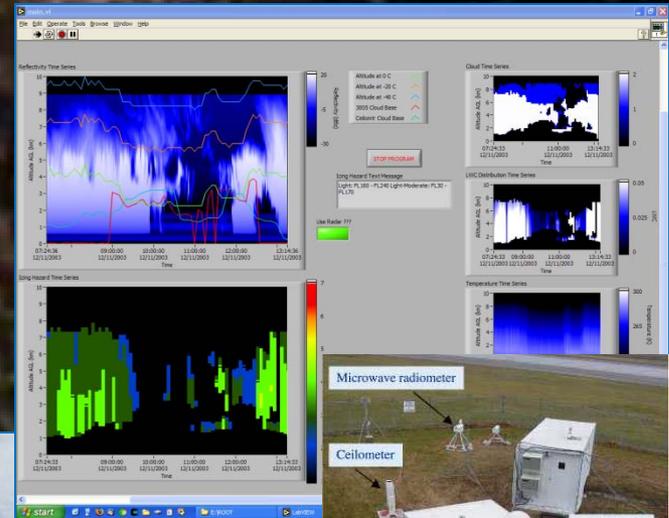
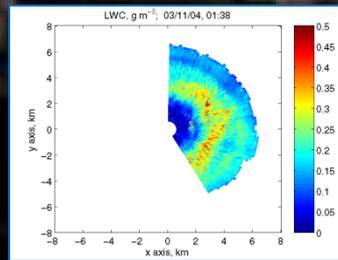
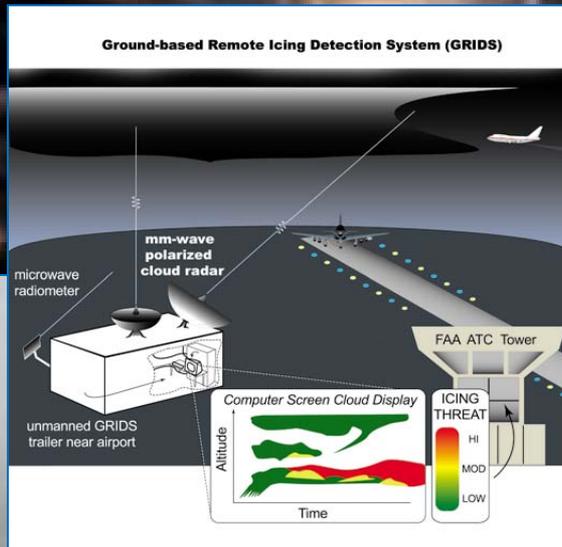
Flight Path

Application	Resolution	IFIPDT
NAS over North America and adjacent coastal waters	4 km 500 ft 1-h (0-60 h) 3 h (60 h – 14 d)	Currently 20 km, 1000 ft, with diagnoses at 0,2,3,6 and 9 h. 18 h currently under consideration. CIP/FIP will go to 3 km when HRRR is operationally available; lead times depend on the lead times of the models.



Primary of Functional Requirements Light Icing

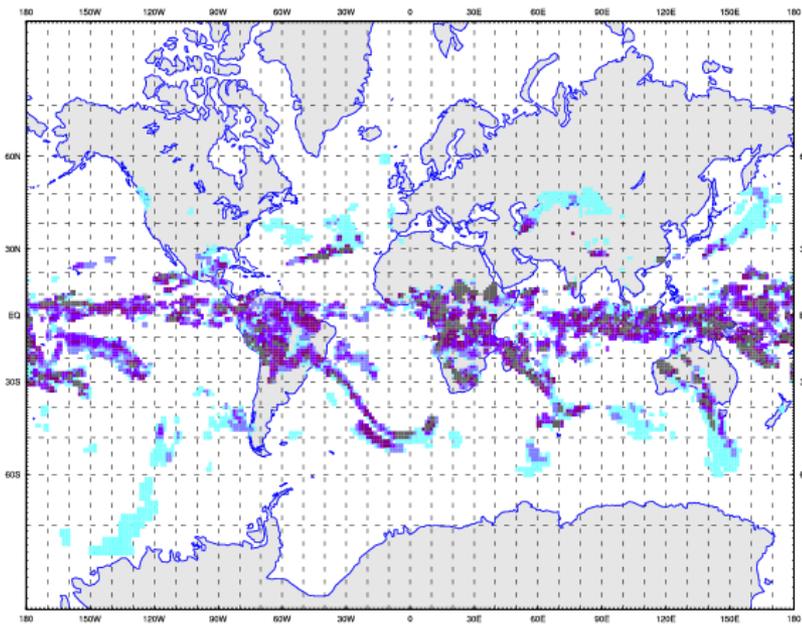
Application	Resolution	IFIPDT - NIRSS
Terminal (within 50 km of centerfield to top of the terminal volume)	1 km 100 ft (sfc-2900 ft) 250 ft (3000–4550 ft) 500 ft (>5000 ft)	These are really better addressed through observations than models – IFIRT had done work on icing detection but these activities were discontinued in 2005 and 2006. NASA GRC is supporting a vertical-pointing remote sensing system for icing; the FAA Nexrad program office is supporting Nexrad dual-polarization-based Icing Hazard Level algorithm development starting mid FY09. <i>To meet this functional requirement, improved models and observational systems are needed which are far beyond the purview of the IFIRT.</i>



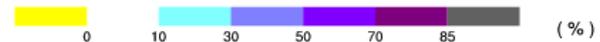
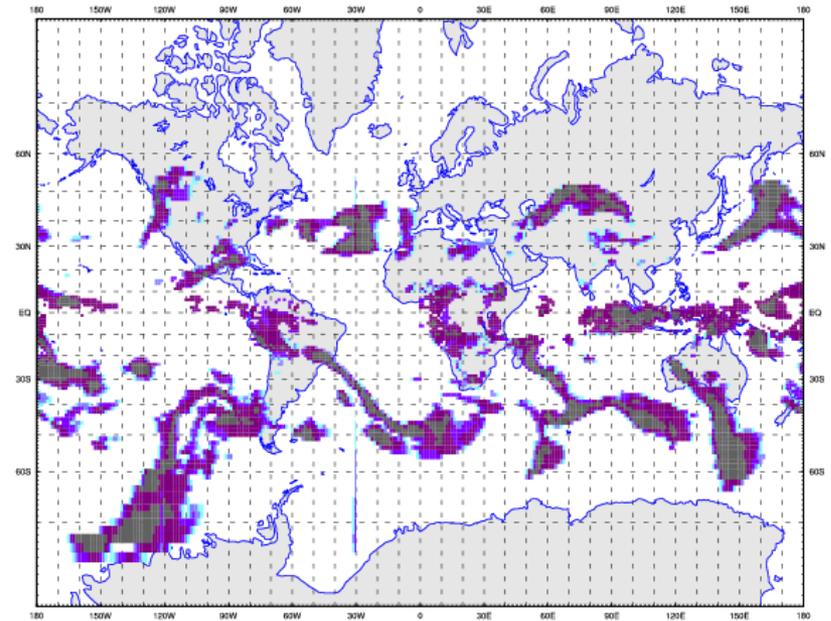
Primary of 4 - Icing Potential - light long

Application	Resolution	IFIPDT
Outside NAS	10 km 500 ft 1-h (0-60 h) 3 h (60 h – 14 d)	The IFIRT is developing on a Global FIP –severity ; resolution depends on the Global Forecast Model which currently has 1° resolution updated daily, with forecasts to 60h. Higher resolution (time and space) and longer lead times are model dependent.

WAFC WASHINGTON
 MAXIMUM ICING POTENTIAL
 FL180
 VALID 18 UTC 16 MAR 2010
 (BASED ON 12 UTC 16 MAR 2010)



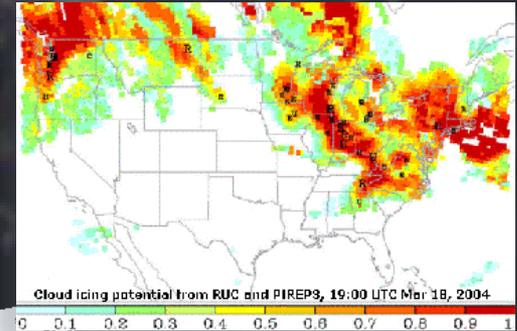
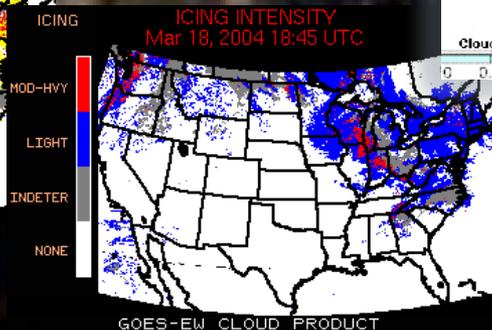
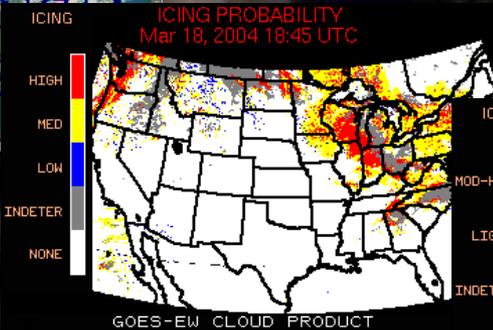
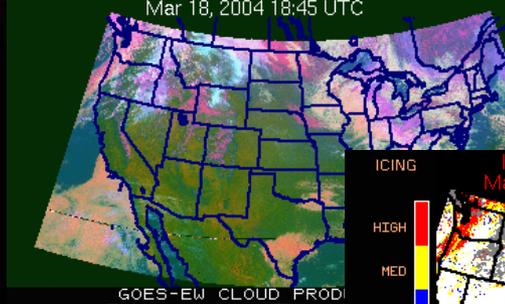
WAFC LONDON
 MAXIMUM ICING POTENTIAL
 FL180
 VALID 18 UTC 16 MAR 2010
 (BASED ON 12 UTC 16 MAR 2010)



Summary of 4-Dimensional Data for Icing

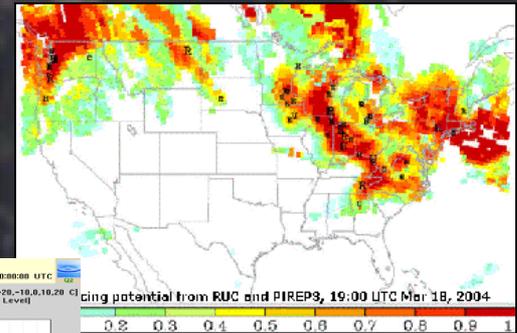
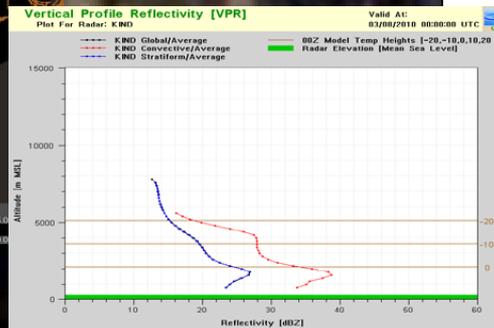
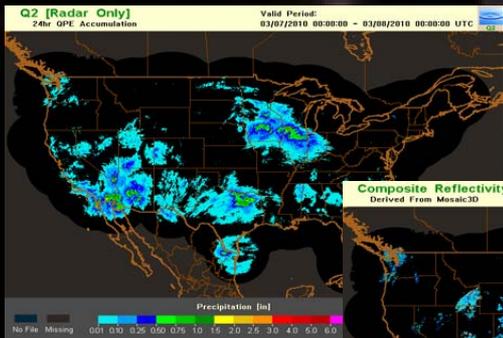
Application	Resolution	IFIPDT
10-min increment forecasts	Update every 5 min	Not in IOC plans, can do for MOC or beyond. Updates would be based on METARS speci and PIREPS; radar and satellite update rates are 6-15 min. <i>(Note that we are assuming this is a 10-min increment of <u>current</u> conditions, updated every 5 min. If a 10-min time window for forecasted conditions is necessary, this is dependent on the models' abilities to forecast at that granularity)</i>
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3-h " "	Update every hour	Already being done for FIP.

Multichannel (RED=R.65 GRN=T3.9-11 BLUE=T11)
Mar 18, 2004 18:45 UTC



Summary of 4-Function IFIPDT Resolution and Update Frequency Light Icing

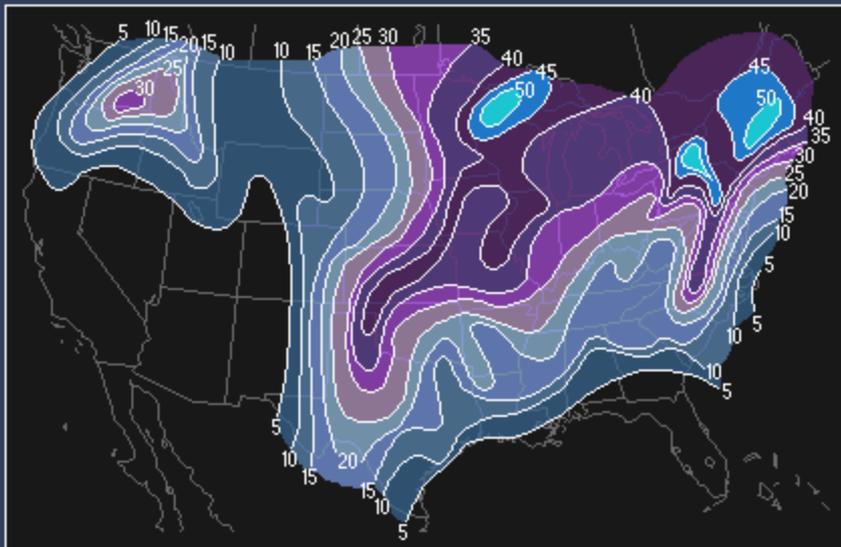
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Summary of Applications for the IFIPDT Functionality

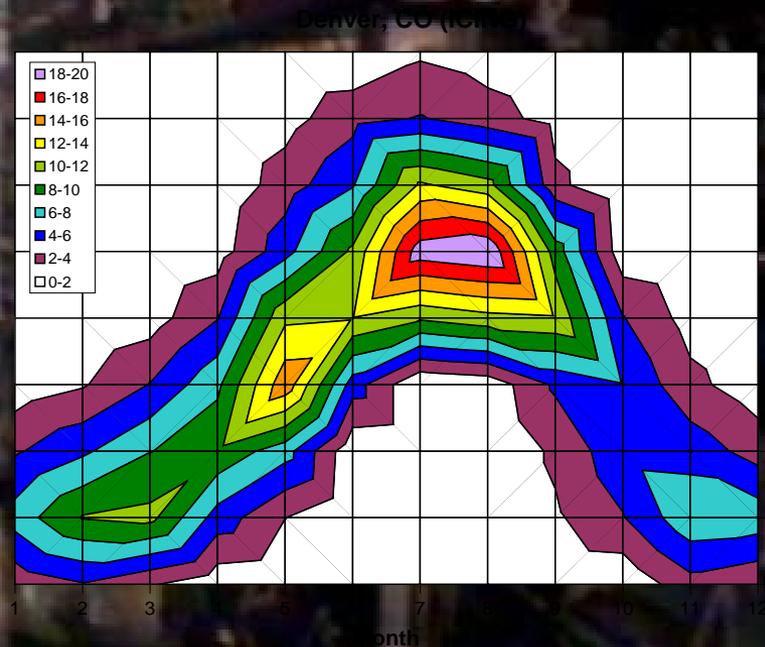
Freezing Precipitation (Light Icing)

Application	Resolution	IFIPDT
Climatological forecasts	Monthly	Not in IOC plans, can do for MOC or beyond. Would base on our historical FIP/CIP runs or selection of parameters from historical NCEP NWP runs.



Frequency of Freezing Precipitation (ZR & ZL in hours / year)

Modified from Berstein 1997



Month