

Icing Analysis for 2/7 2025 Bering Air Case near Nome, AK

Crash occurred around 0020 UTC

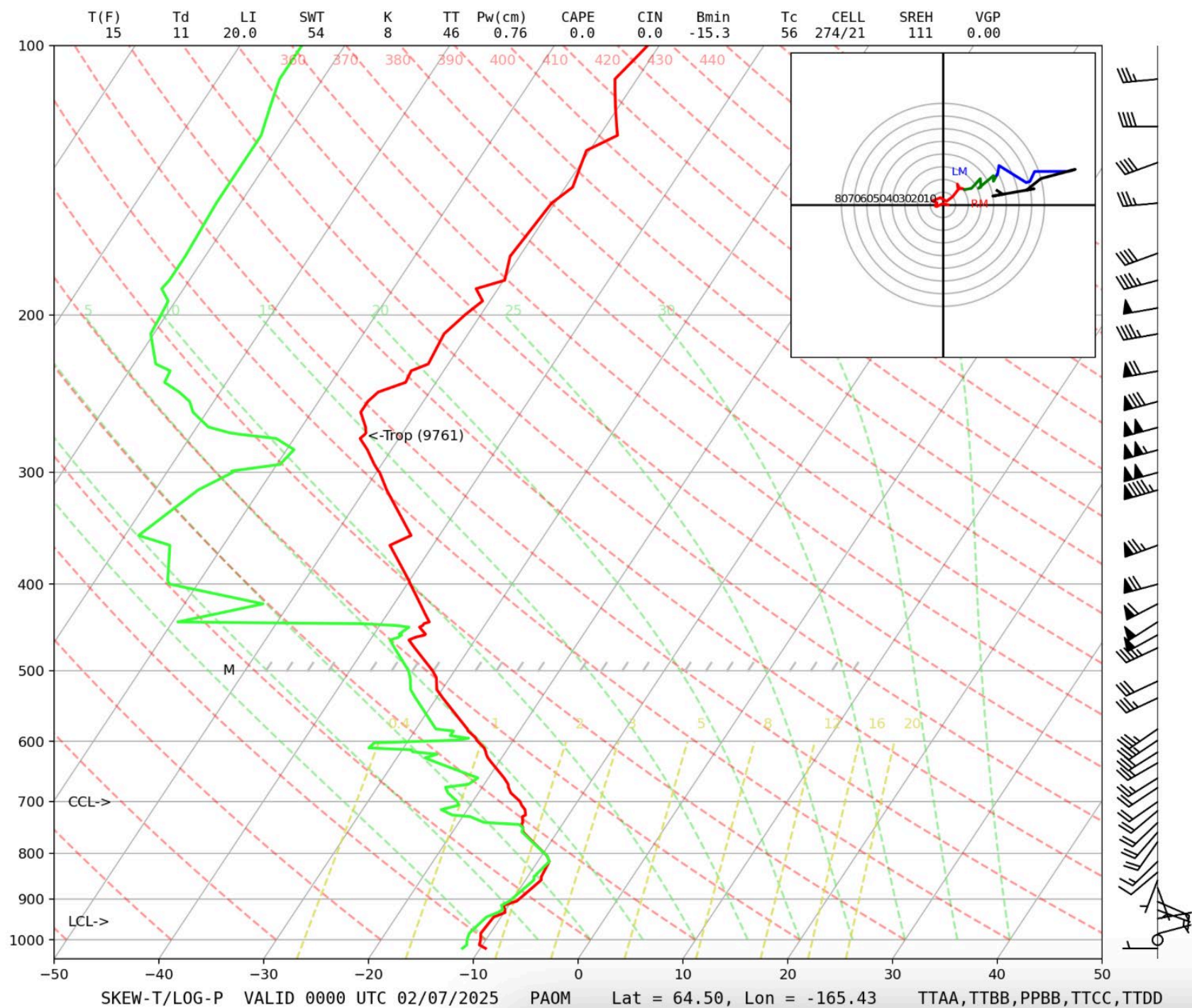
Light snow and mist at Nome leading up to crash, but then transitions to null and light snow. Afterwards, haze, mist, and some FZDZ over an hour after crash. All light snow and mist at departure airport

Nome

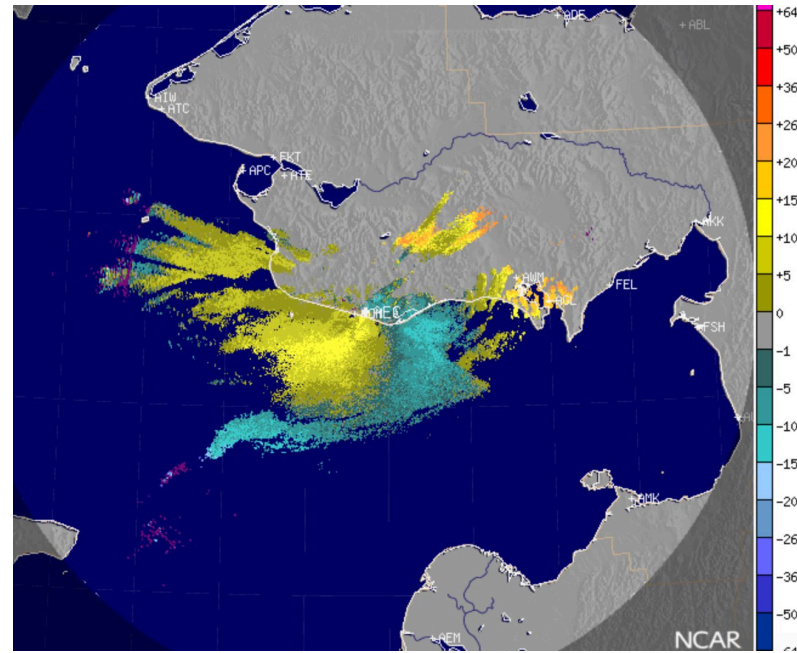
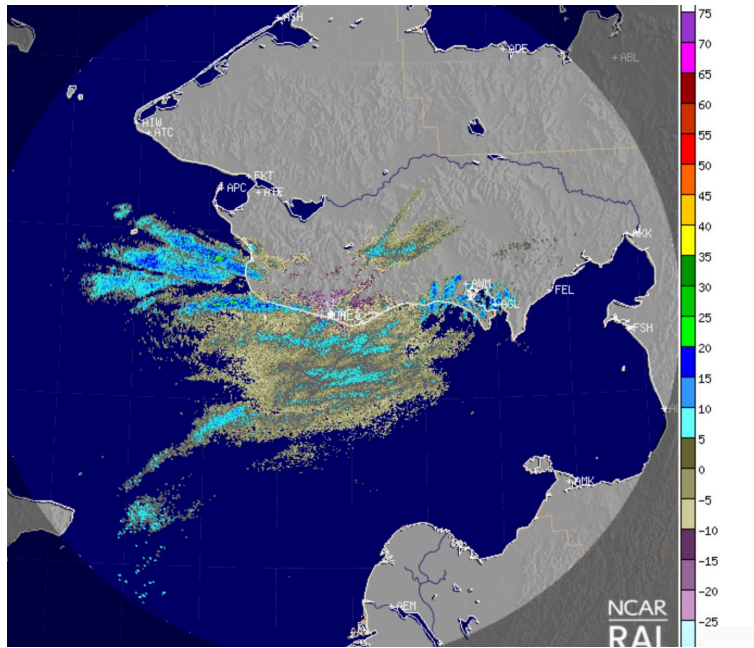
```
PAOM,2025-02-06 21:53,-SN BR
PAOM,2025-02-06 22:34,-SN BR
PAOM,2025-02-06 22:45,-SN BR
PAOM,2025-02-06 22:53,-SN BR
PAOM,2025-02-06 23:15,-SN
PAOM,2025-02-06 23:22,null
PAOM,2025-02-06 23:53,null
PAOM,2025-02-07 00:05,-SN
PAOM,2025-02-07 00:45,HZ
PAOM,2025-02-07 00:53,HZ
PAOM,2025-02-07 01:40,BR
PAOM,2025-02-07 01:53,FZDZ
PAOM,2025-02-07 02:29,-FZDZSN
PAOM,2025-02-07 02:48,-FZDZSN
PAOM,2025-02-07 02:53,-FZDZSN
```

Scott Landolt's FZDZ
algorithm does give FZDZ at
0055 though

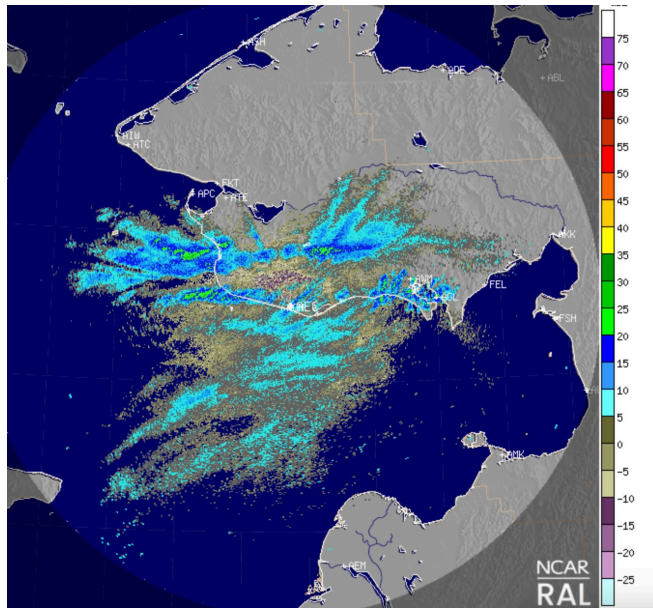
https://mesonet.agron.iastate.edu/request/download.phtml?network=AK_ASOS



Base reflectivity and velocity (0.5 degrees) at 2358 UTC on 2/6



Composite reflectivity at 2358 UTC on 2/6



Dual pol radar is also inconclusive—consistent with SLW or snow/aggregates

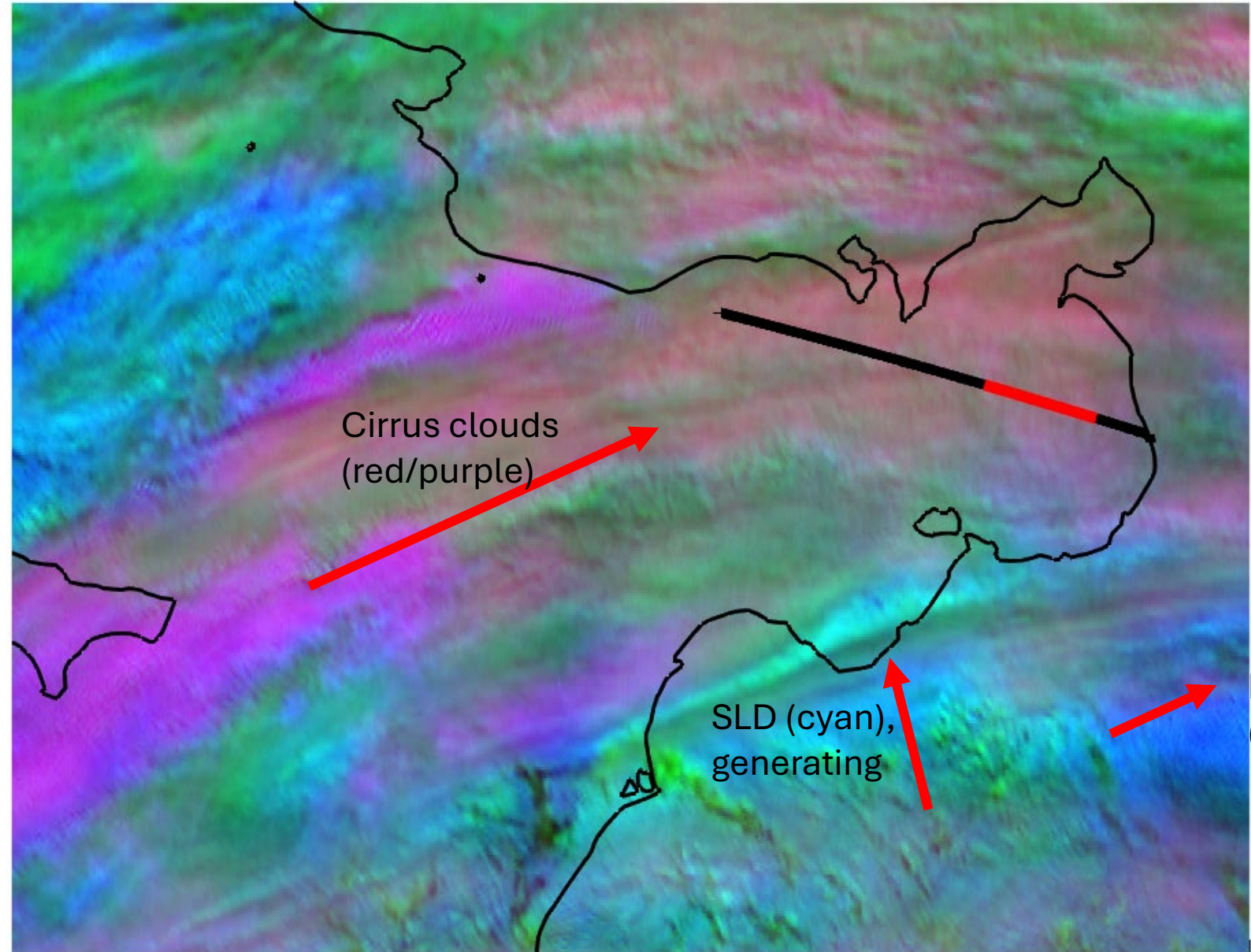
Day Icing RGB 2025 Feb 06, 2350 UTC

65.5

Icing RGB pretty inconclusive due to cirrus clouds obscuring the conditions lower down. South of the aircraft there is some suggestion of FZDZ, or at least small-drop icing conditions

Note high parallax effect up here, clouds are further North than they appear relative to the coastline and aircraft track (on the order of 5km for a cloud at 8kft, increasing error with cloud height)

62
-170



Cirrus clouds
(red/purple)

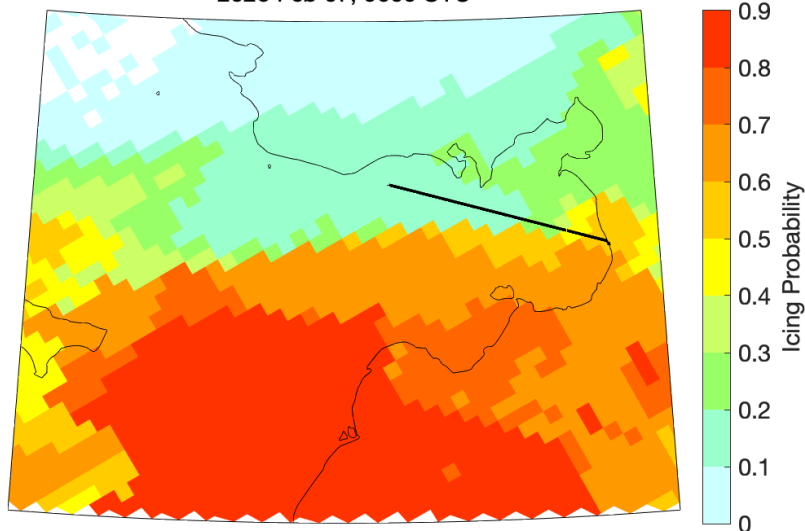
SLD (cyan),
generating

Liquid cloud
(blue)

-160

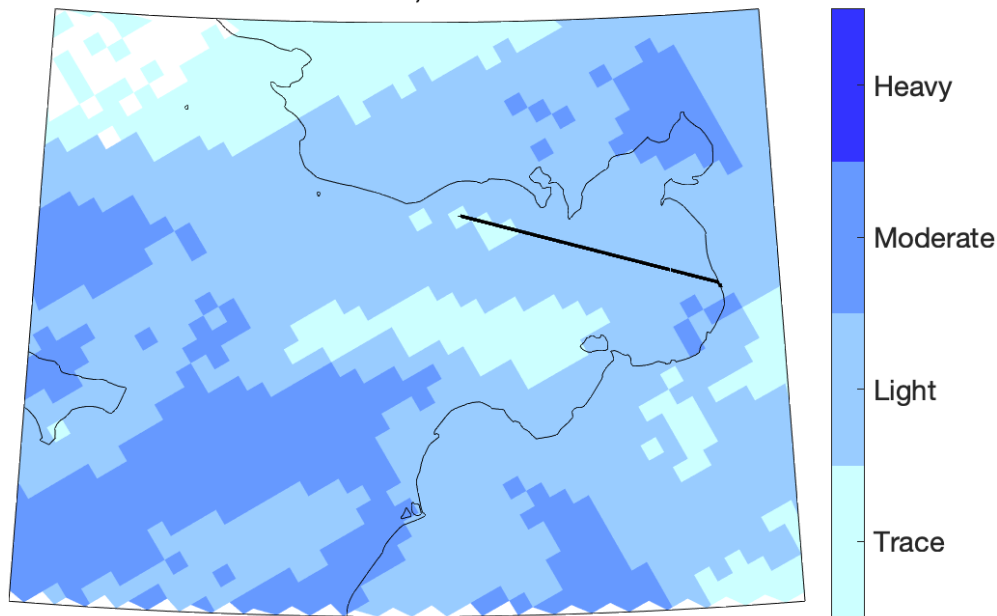
IPA-D

IPA-D Icing Probability
FL030
2025 Feb 07, 0000 UTC



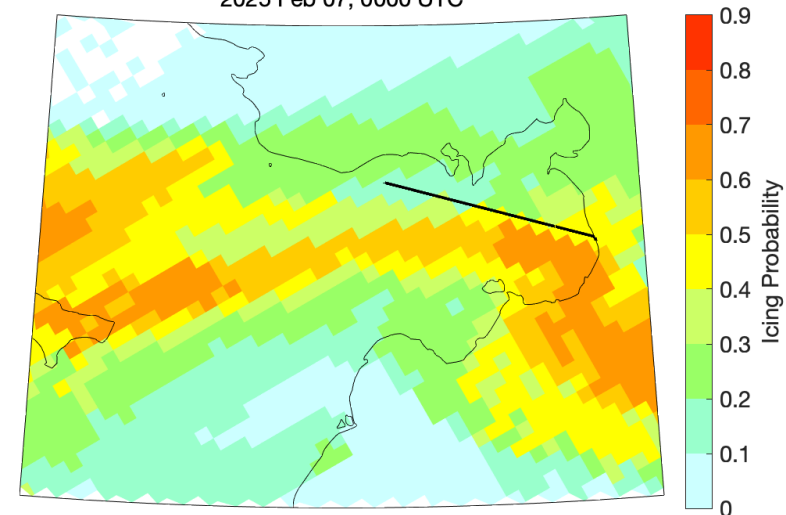
Max probability of icing around 3kft, but the high probabilities are just South of the aircraft.

IPA-D Icing Severity
Column Max
2025 Feb 07, 0000 UTC



Light severity, but some moderate in the area

IPA-D Icing Probability
FL060
2025 Feb 07, 0000 UTC

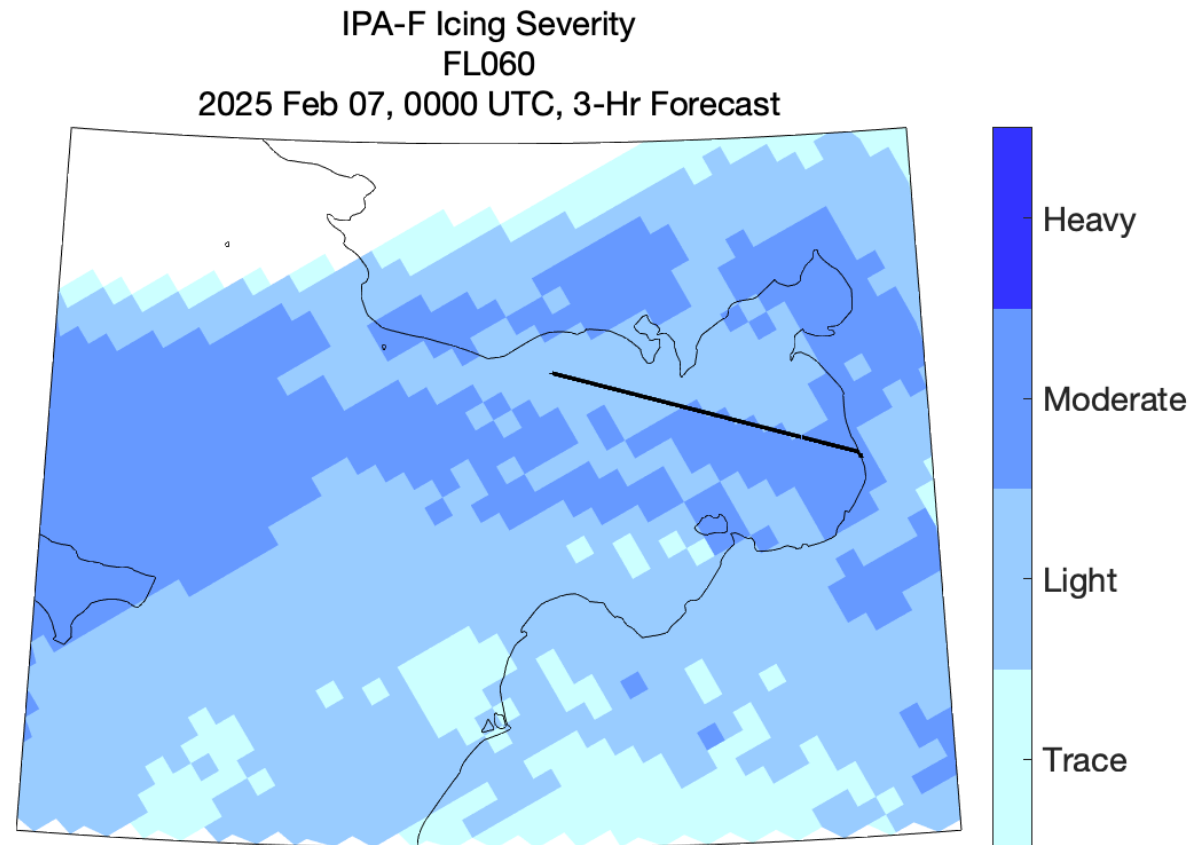
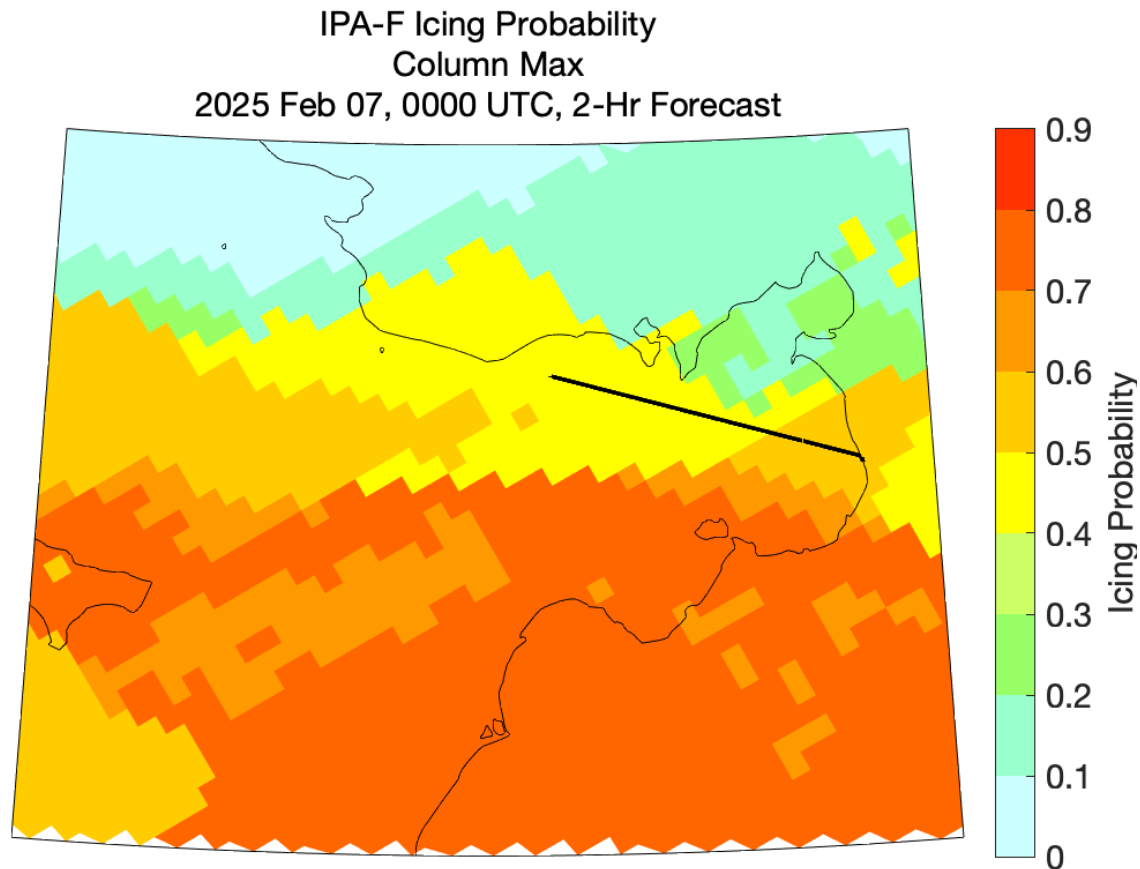


A strip of icing South of the aircraft at higher altitudes also

Very little SLD Potential

IPA-F

General agreement with IPA-D, but slightly higher Icing Probability around the actual flight path and some moderate severity along flight path depending on flight level and forecast length

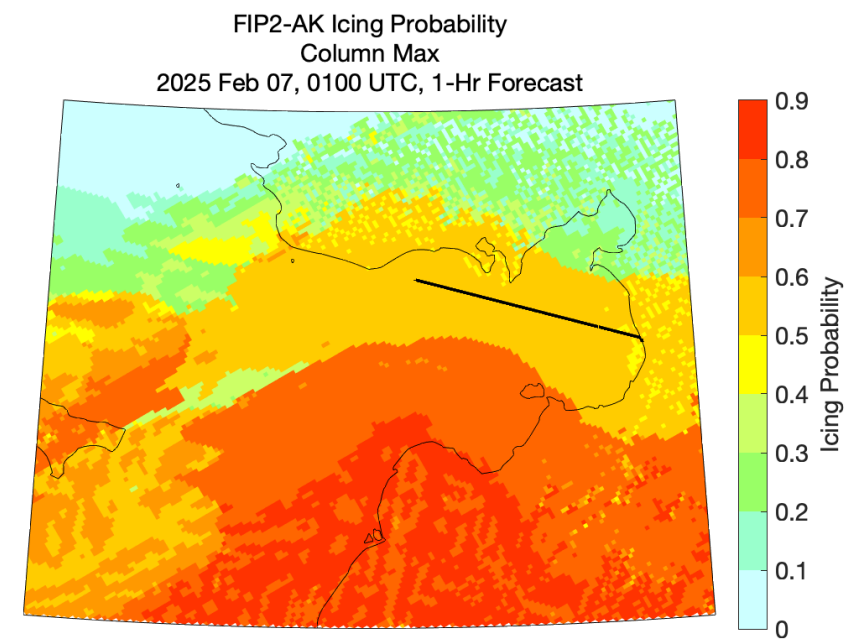
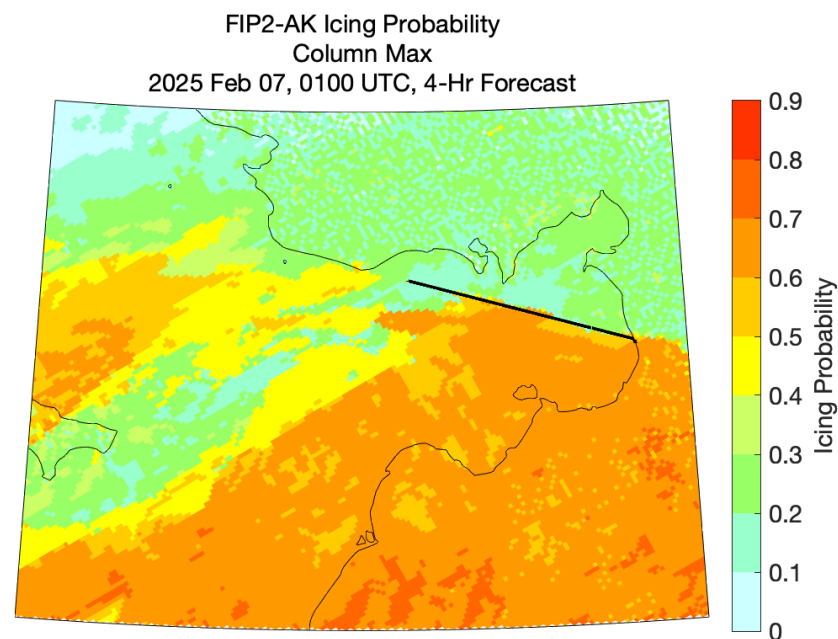
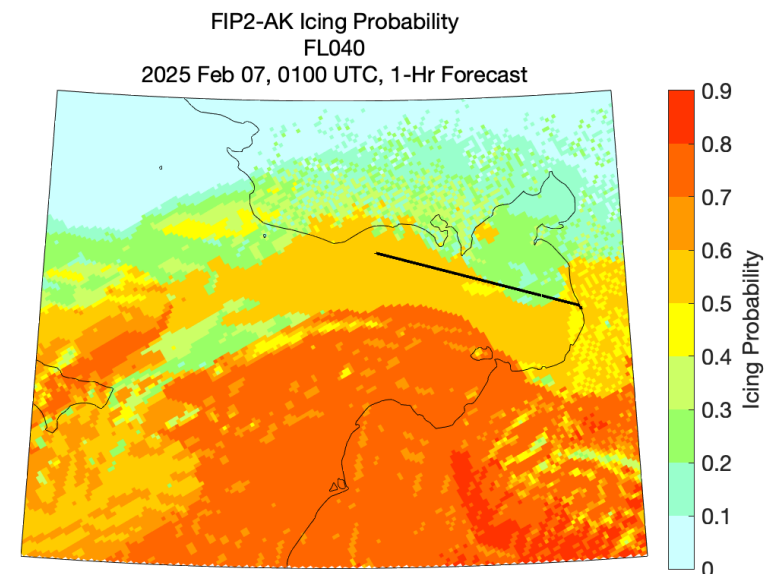
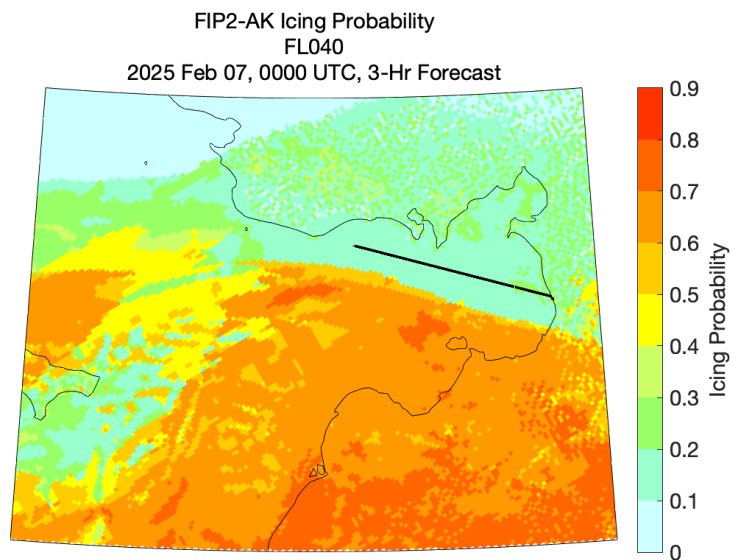


FIP2-AK

Majority of icing “arrives”
along flight path between
0000 and 0100 UTC.

Trace to
moderate
severity, SLD
potential mostly
South of the bay

Forecast length also makes a
significant difference in
where the icing is with
respect to the flight path



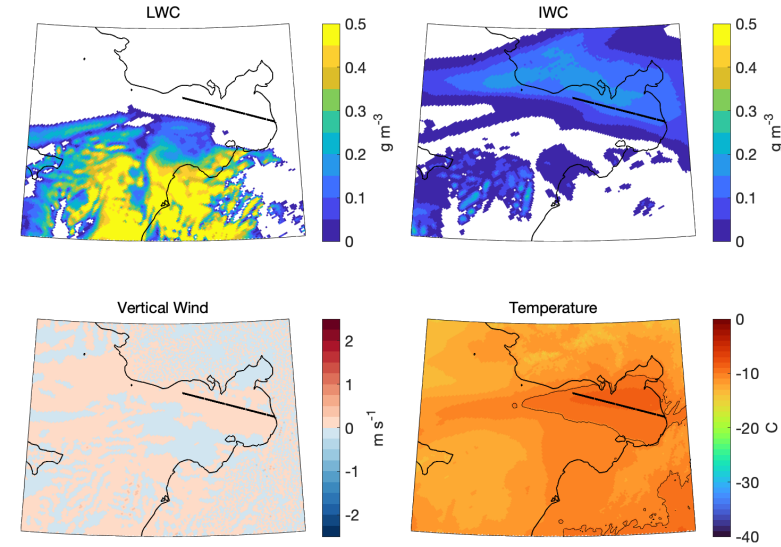
HRRR-AK

Little to no vertical motion and all sub-freezing so no recirculation of melted snow to form SLD, and no classical warm nose.

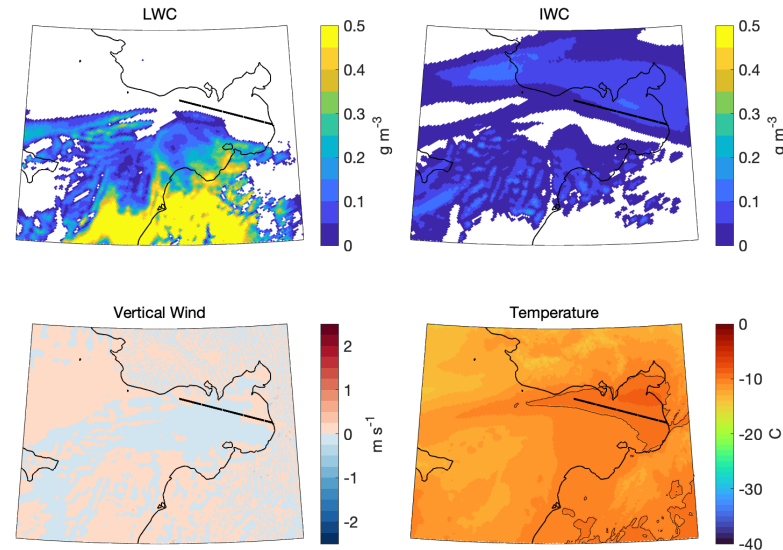
There is a temperature inversion with max temps around 4kft

Model shows the cloud around the flight path becoming more liquid-dominated with time.

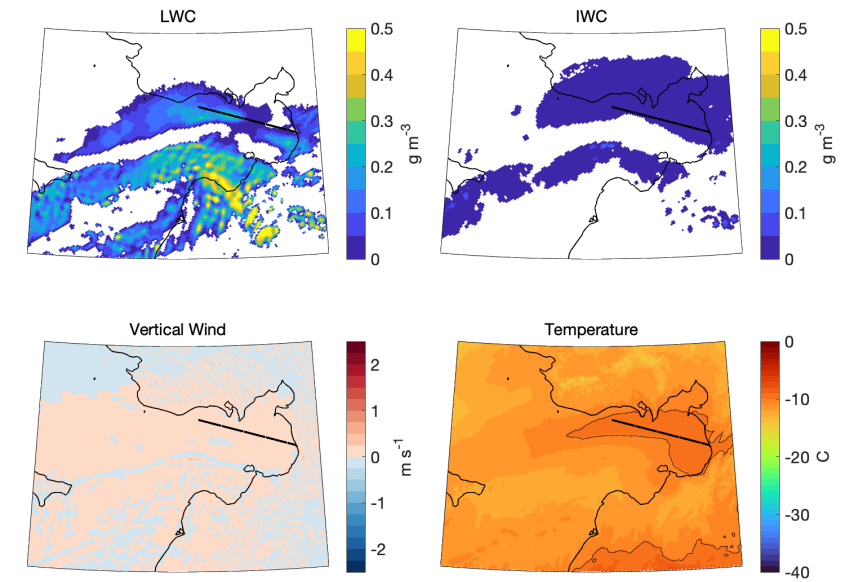
HRRR-AK 2-Hr Forecast Valid at 2025 Feb 06, 2300 UTC
Native Level 11 (approx FL051)



HRRR-AK 3-Hr Forecast Valid at 2025 Feb 07, 0000 UTC
Native Level 11 (approx FL051)

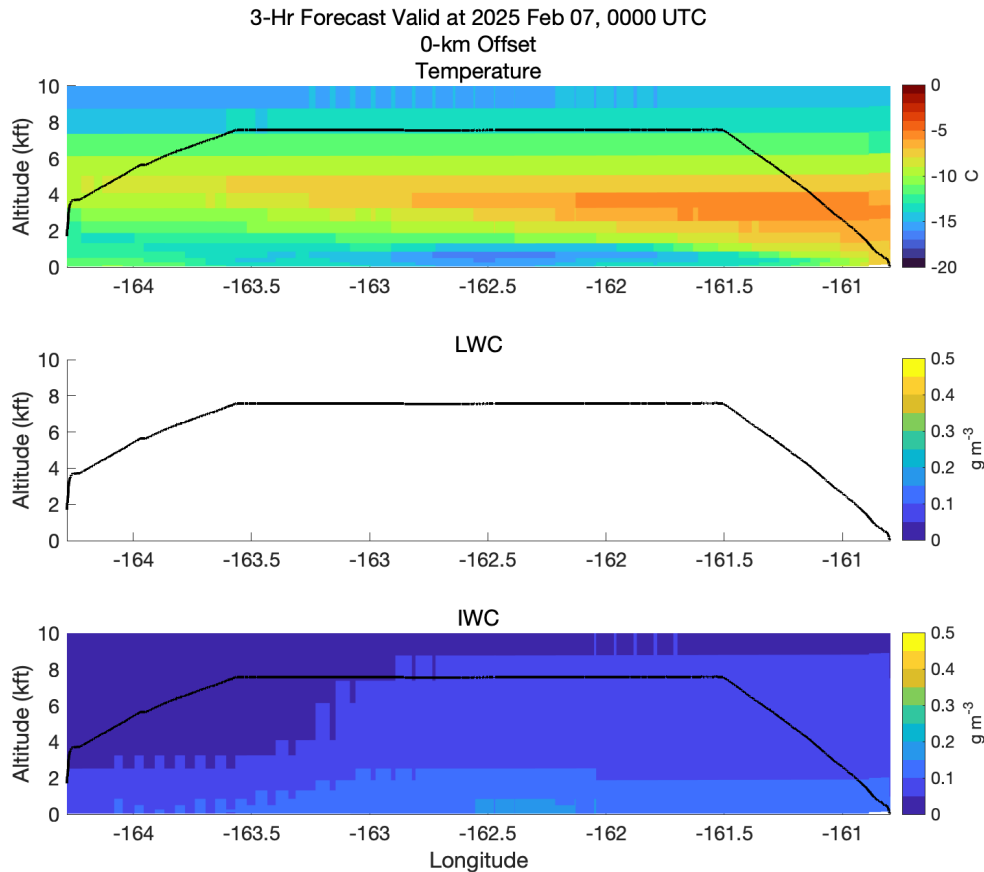


HRRR-AK 1-Hr Forecast Valid at 2025 Feb 07, 0100 UTC
Native Level 11 (approx FL051)

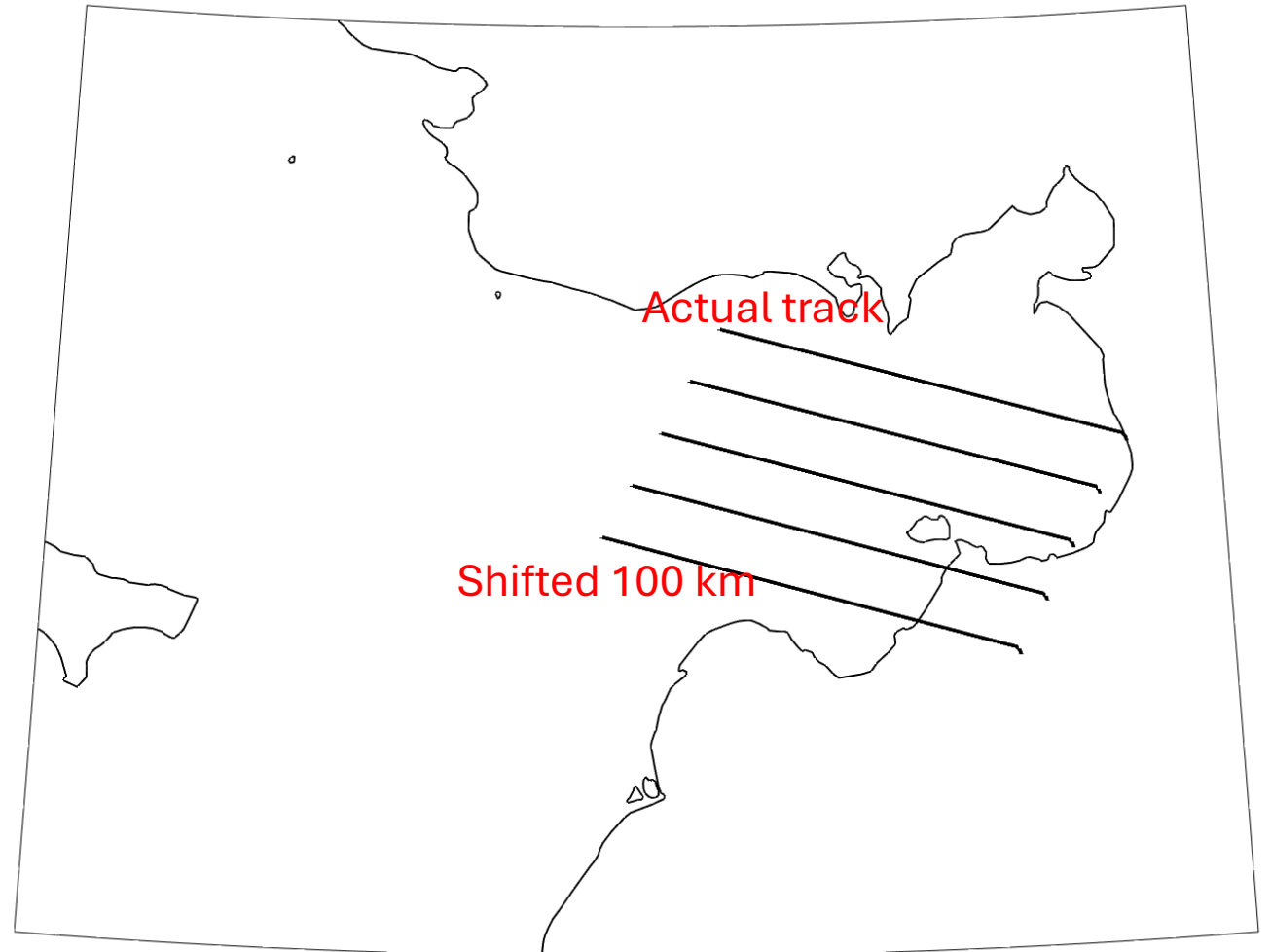


HRRR-AK

Using the closest match in time and space,
cross section of the flight track shows no icing

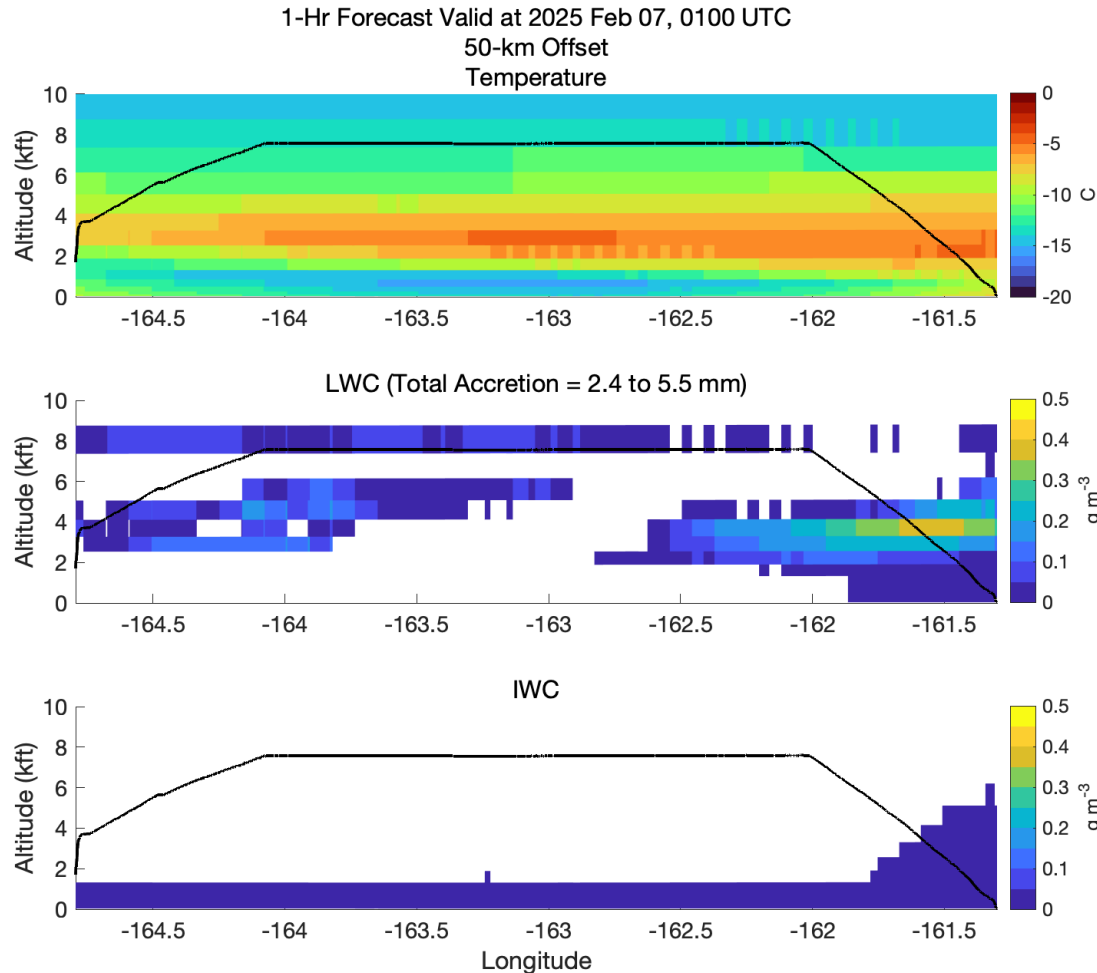


I also made cross sections and computed accretion for +/- 1 hour and with the flight track shifted 25, 50, 75, and 100 km 30 degrees West of South (210 degrees clockwise from North). These represent “what if” scenarios where the model placement of clouds is off such that the aircraft was in some of the more hazardous areas.

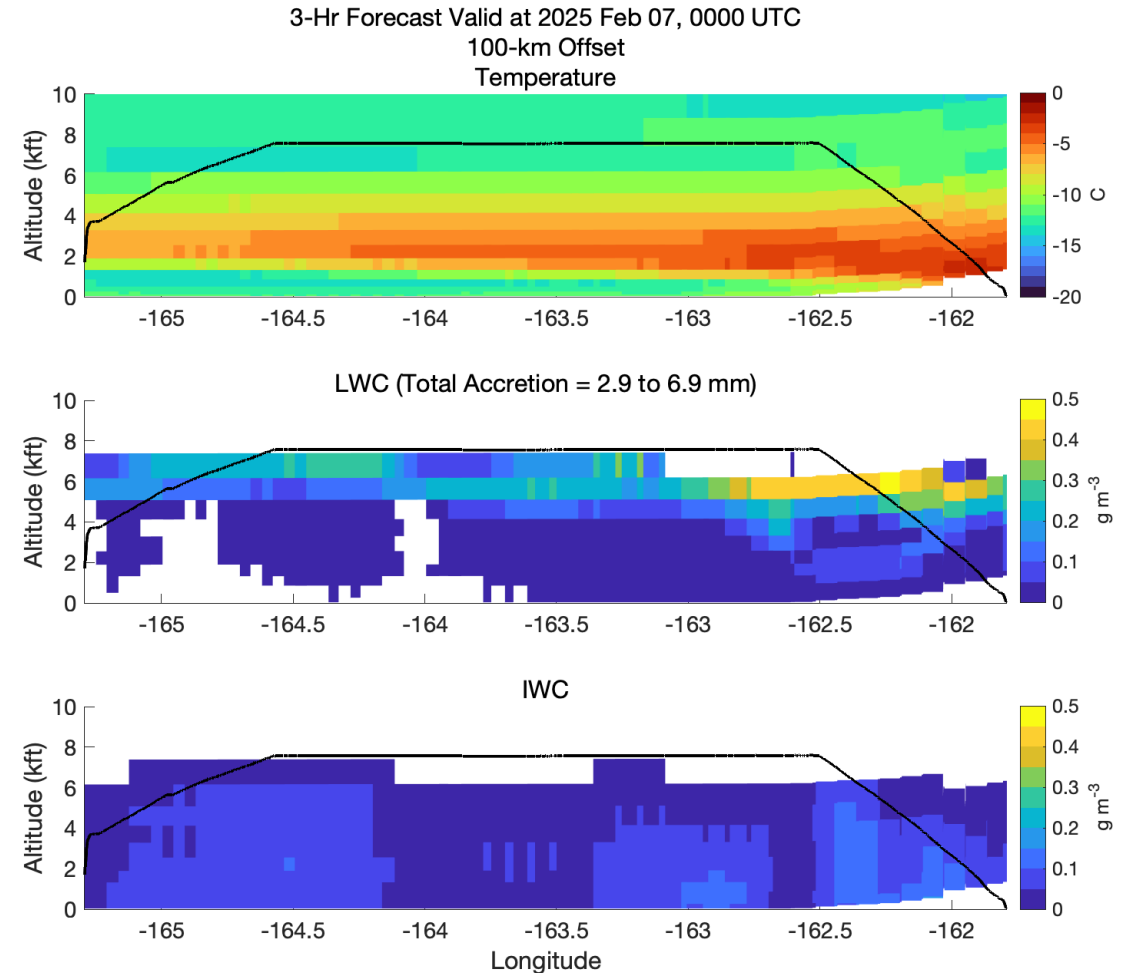


HRRR-AK

One of the only cross sections where the flight track is in liquid cloud most of the time.



Most cross sections show cloud top just below the flight track cruise altitude like this one. This is one of cross sections with the highest LWC though

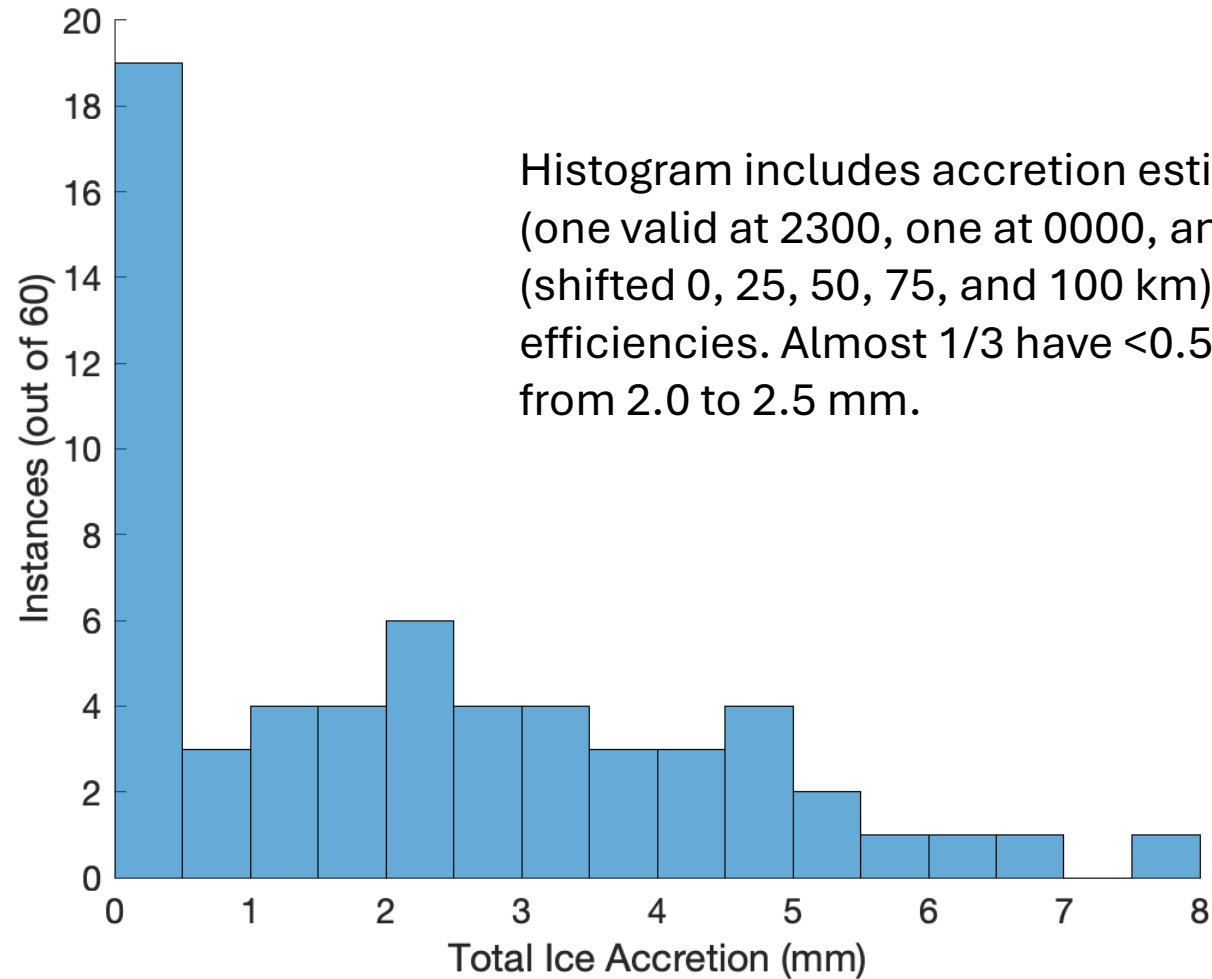


Single closest model time and grid boxes: 0 mm

Mean: 2.2 mm

Median: 2.0 mm

Maximum: 7.5 mm



Histogram includes accretion estimates from 4 model runs (one valid at 2300, one at 0000, and two at 0100), 5 flight tracks (shifted 0, 25, 50, 75, and 100 km), and 3 collection efficiencies. Almost 1/3 have <0.5 mm, with a secondary mode from 2.0 to 2.5 mm.