

Probabilistic Turbulence, In-Flight Icing, and Convection

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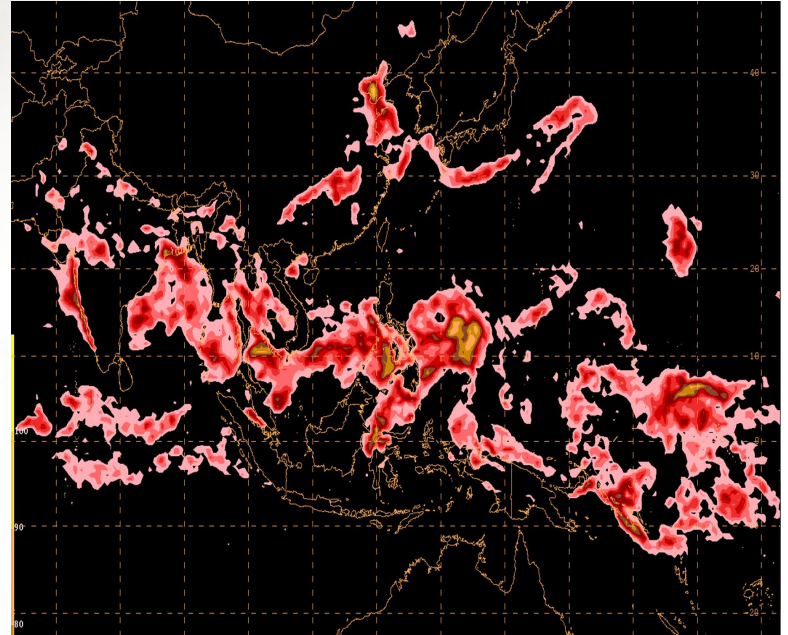
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Introduction

The International Civil Aviation Organization has tasked World Area Forecast Centers, Washington and London, with developing probabilistic guidance for in-flight icing, turbulence, and convection by 2027. The Aviation Weather Center (AWC) currently displays operational and experimental versions of probabilistic products. The global version of the Forecast Icing Product is currently being run on all members of the Global Ensemble Forecast System (GEFS). A calibrated version of the Graphical Turbulence Guidance (GTG) on a subset of GEFS members is being developed in order to demonstrate a computationally-efficient method for achieving optimal ensemble spread. The graphics displayed here are either being derived and produced at AWC, or are images from an operational platform.

EPOCH – Convection

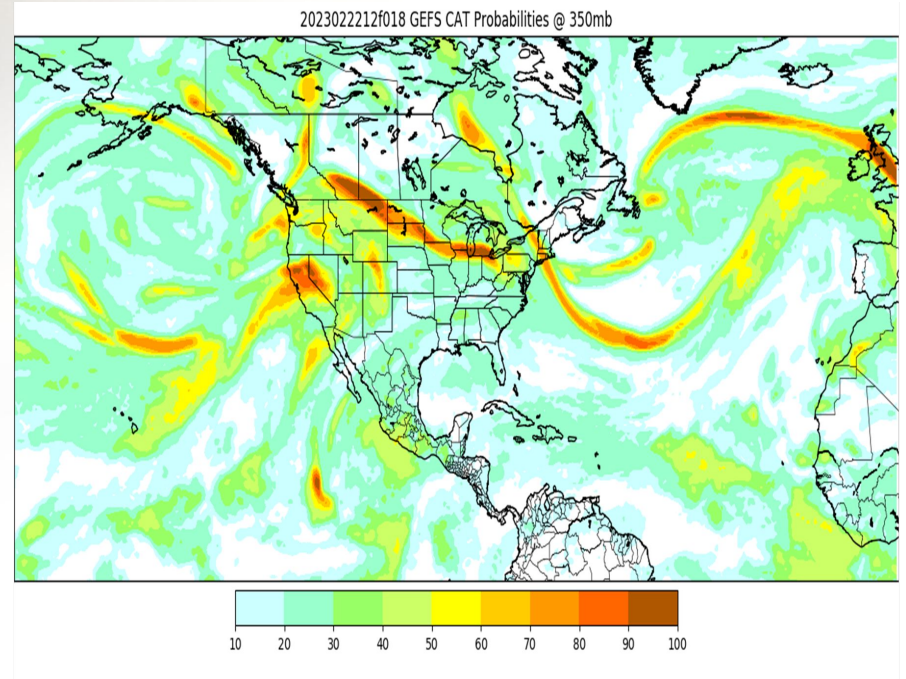
The Ensemble Prediction of Oceanic Convective Hazards (EPOCH) went operational in June 2023 and produces grids for calibrated thunderstorms, and probabilities for cloud top heights exceeding 30, 35 and 40 kft. EPOCH runs every 6 hours and provides forecasts out to 48 hours.



Calibrated Thunder Valid July 23, 2023 21 UTC

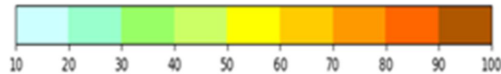
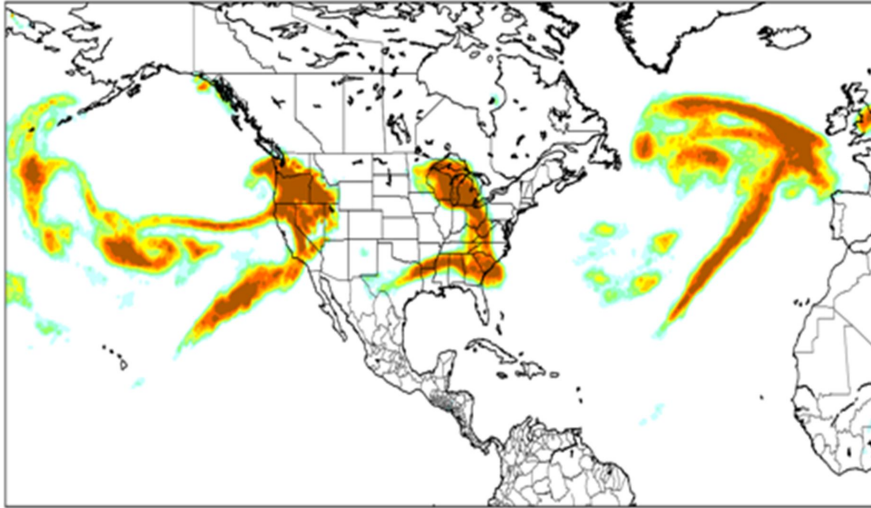
Turbulence

A simplified version of the National Center for Atmospheric Research's probabilistic GTG research was performed at AWC. Five diagnostics were calculated and combined to create probabilities based on the number of members to meet each parameter's threshold.



In-Flight Icing

GEFS Icing Valid March 10, 2023 06 UTC
Probability of Moderate or Greater 600mb



GEFS icing severity values are extracted for all members. Probabilities are created by dividing the number of members meeting a certain threshold by the total number of members:

$$P[\text{Moderate or Greater}] = \frac{\# \text{ members of value } > 3}{\text{total members}}$$



Probabilistic Products Display:
testbed.aviationweather.gov/viewer

Password protected, so access is required!

Thank you!
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