

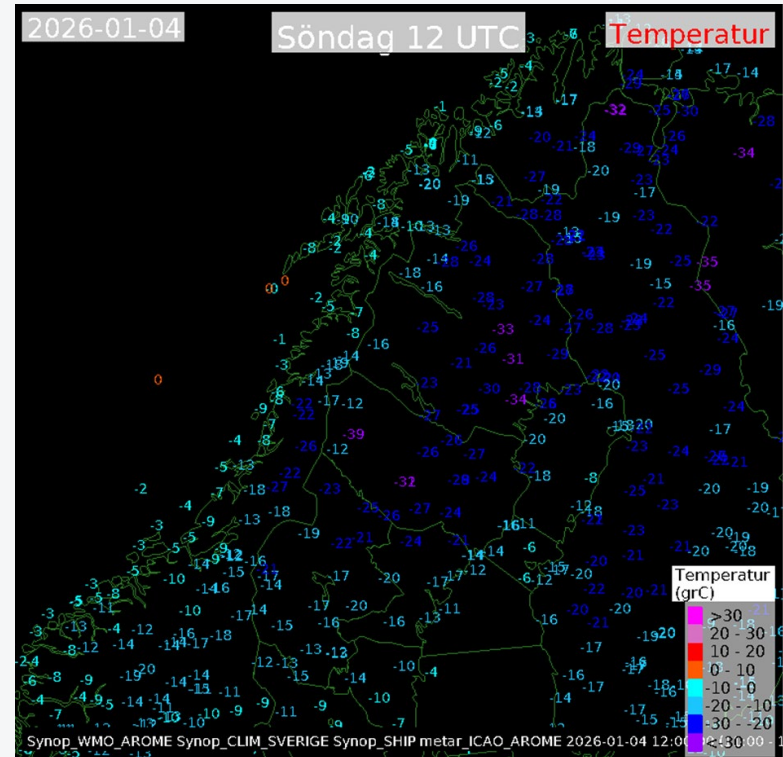
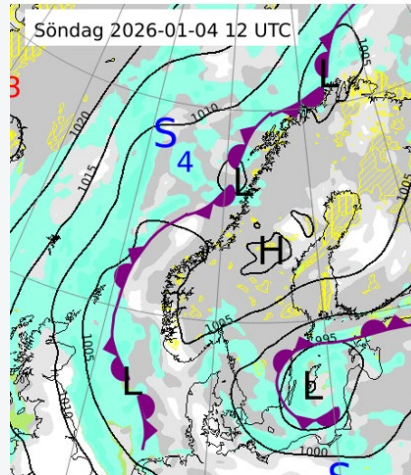
A decorative graphic on the left side of the slide consisting of several thin, black, irregular contour lines that resemble topographic map lines or weather isobars. These lines are layered and overlap, creating a sense of depth and movement. They are positioned on the left side of the slide, partially overlapping the text area.

EVALUATION OF ECMWF 2M TEMPERATURE FORECASTS DURING EXTREME COLD EVENTS IN NORTHERN SWEDEN

ANTONIO FUENTES MORENO, SMHI

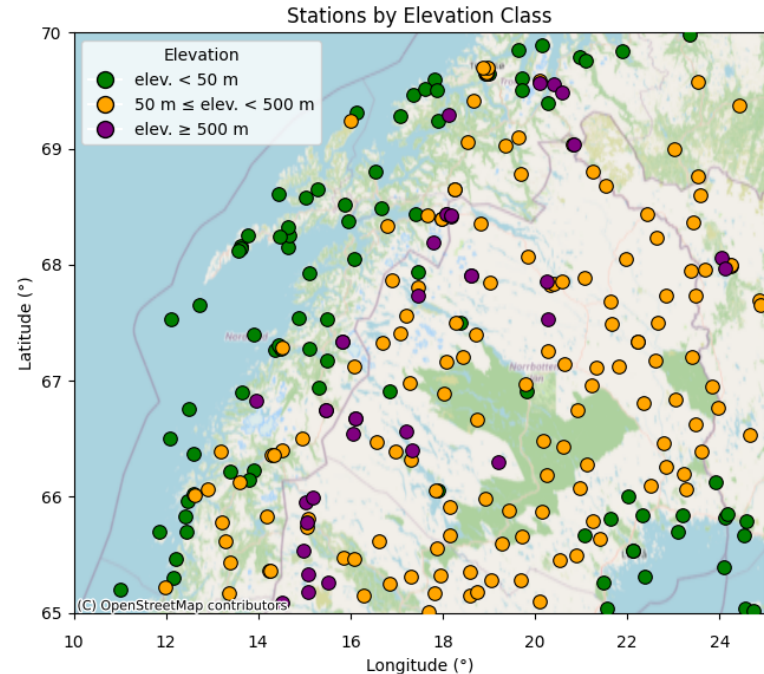
2 JUNE 2026

- **Cold events (Jan–Feb): $-30\text{ }^{\circ}\text{C}$ to $-40\text{ }^{\circ}\text{C}$**
- **Goal: Assess ECMWF 2-m temperature forecast performance**



Analysis and 2-m Temperature at 12 UTC on 4 January 2026

- **Area:** 65-70°N; 10-25°E
- **Stations grouped by elevation:**
 - elev. < 50 m: 44 stations
 - 50 m ≤ elev. < 500 m: 52 stations
 - elev. ≥ 500 m: 13 stations
- **IFS Forecasts:** 00, 06, 12 and 18 runs, 3-hour lead time steps.
- **Period:** January-February 2026

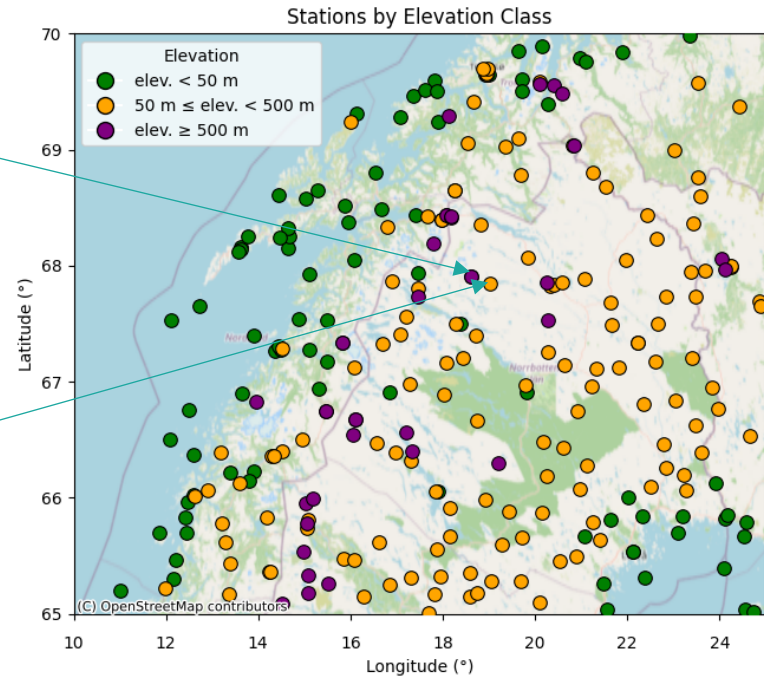




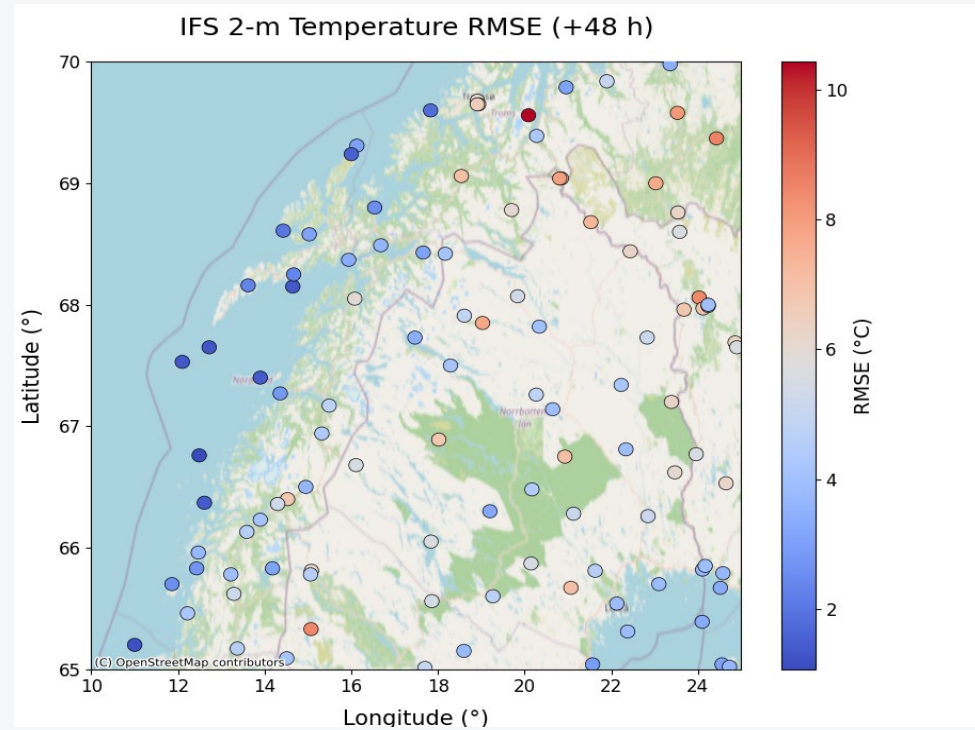
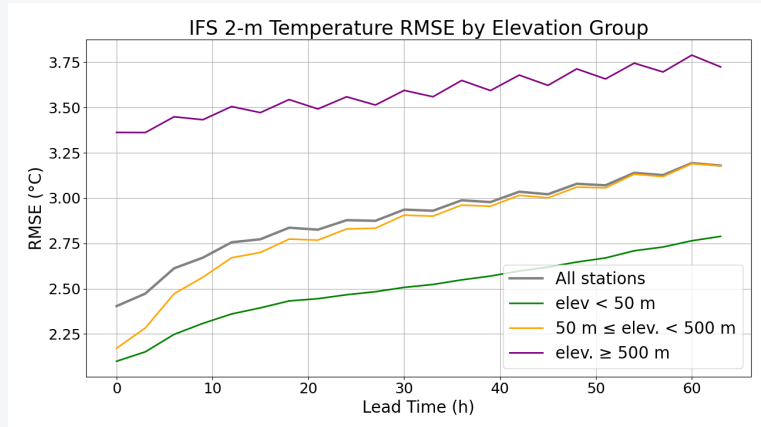
Tarfala 1,144 m



Nikkaluokta 467 m

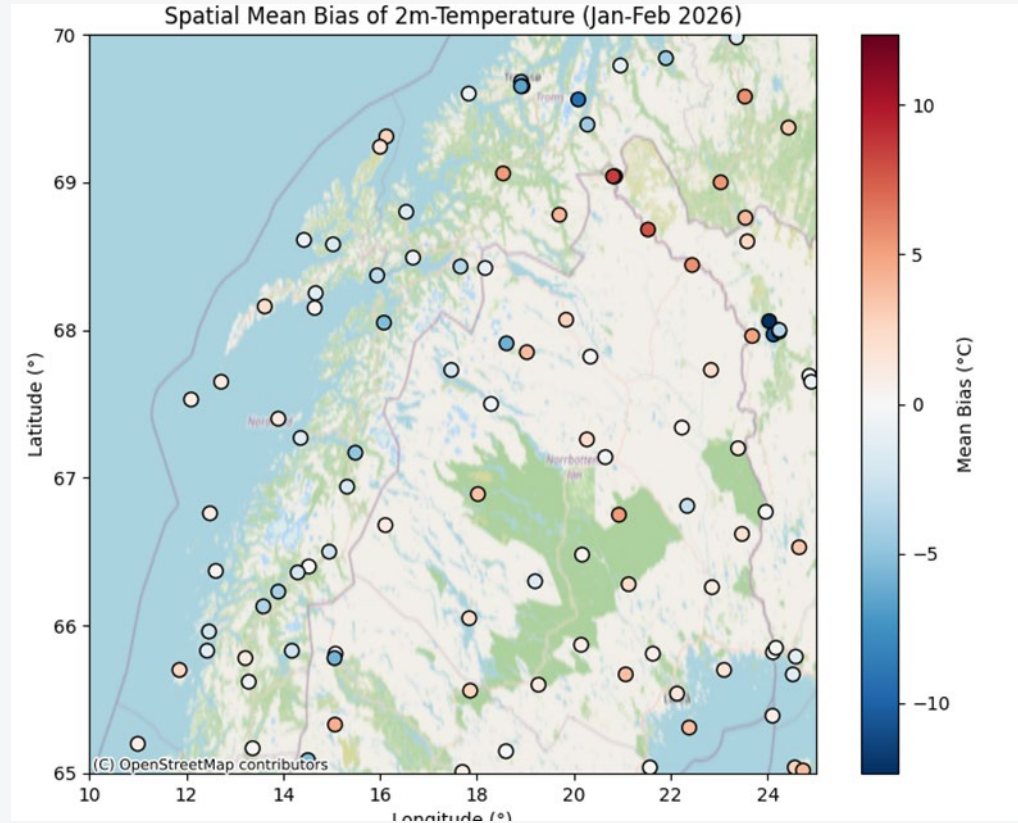
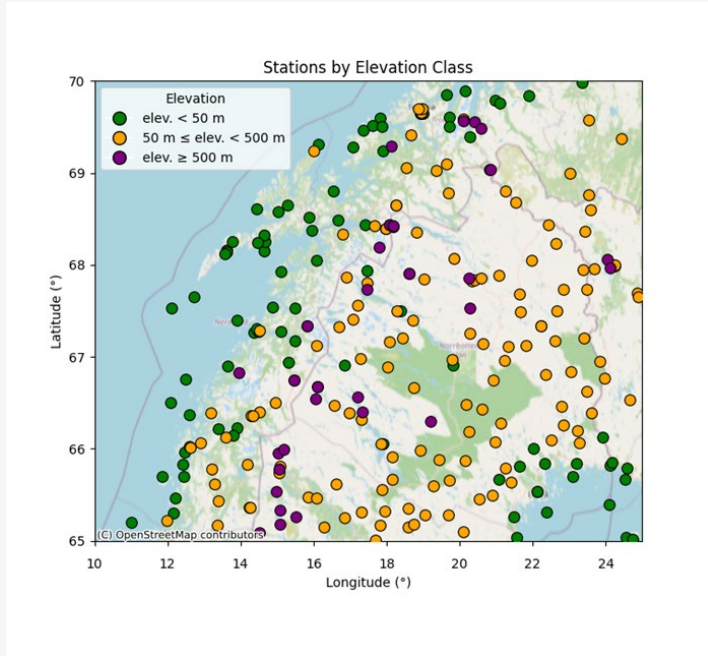


RMSE – Jan-Feb 2026

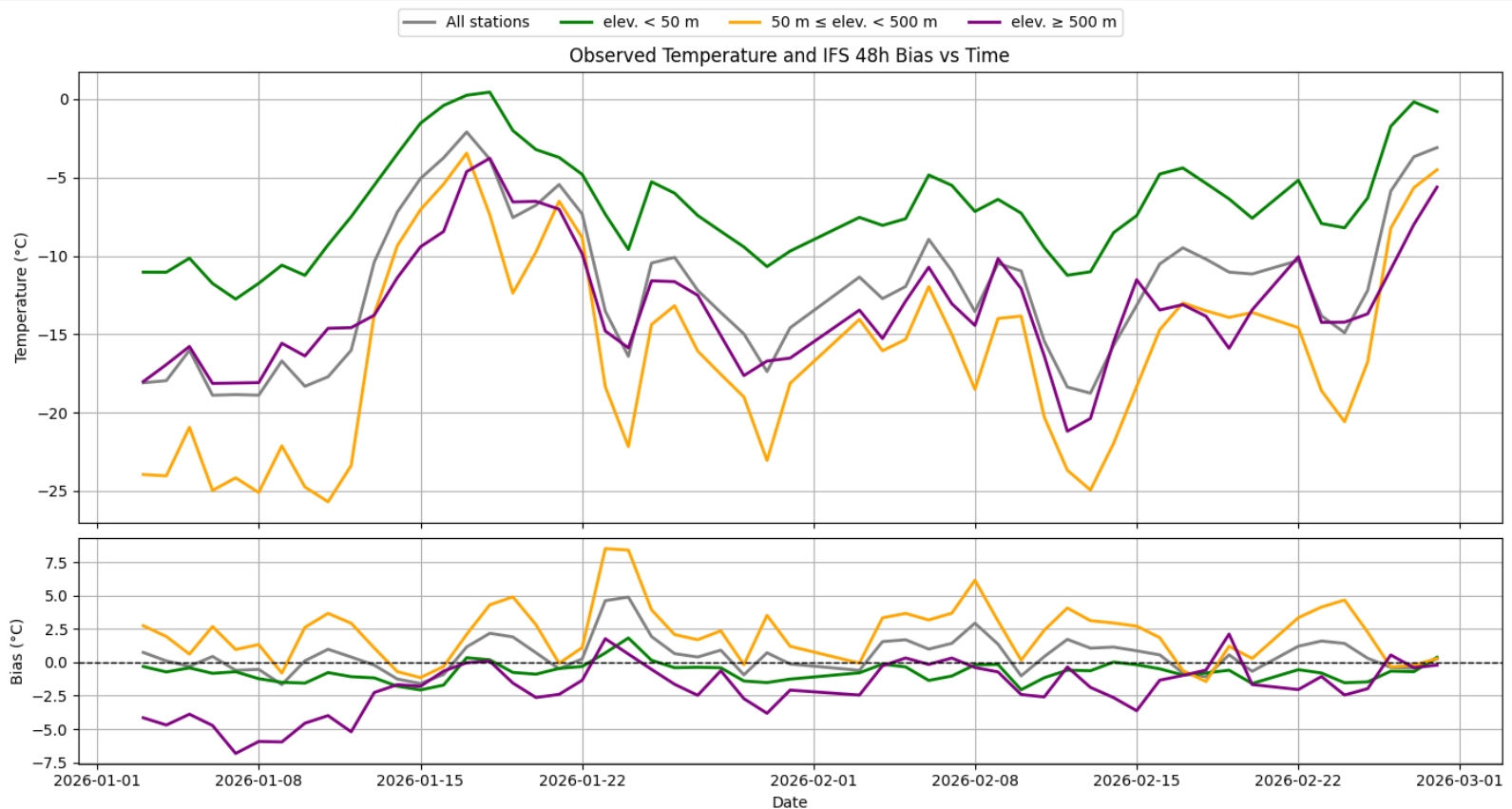


Spatial Mean Bias – Jan-Feb 2026

- Significant spatial differences in mean bias

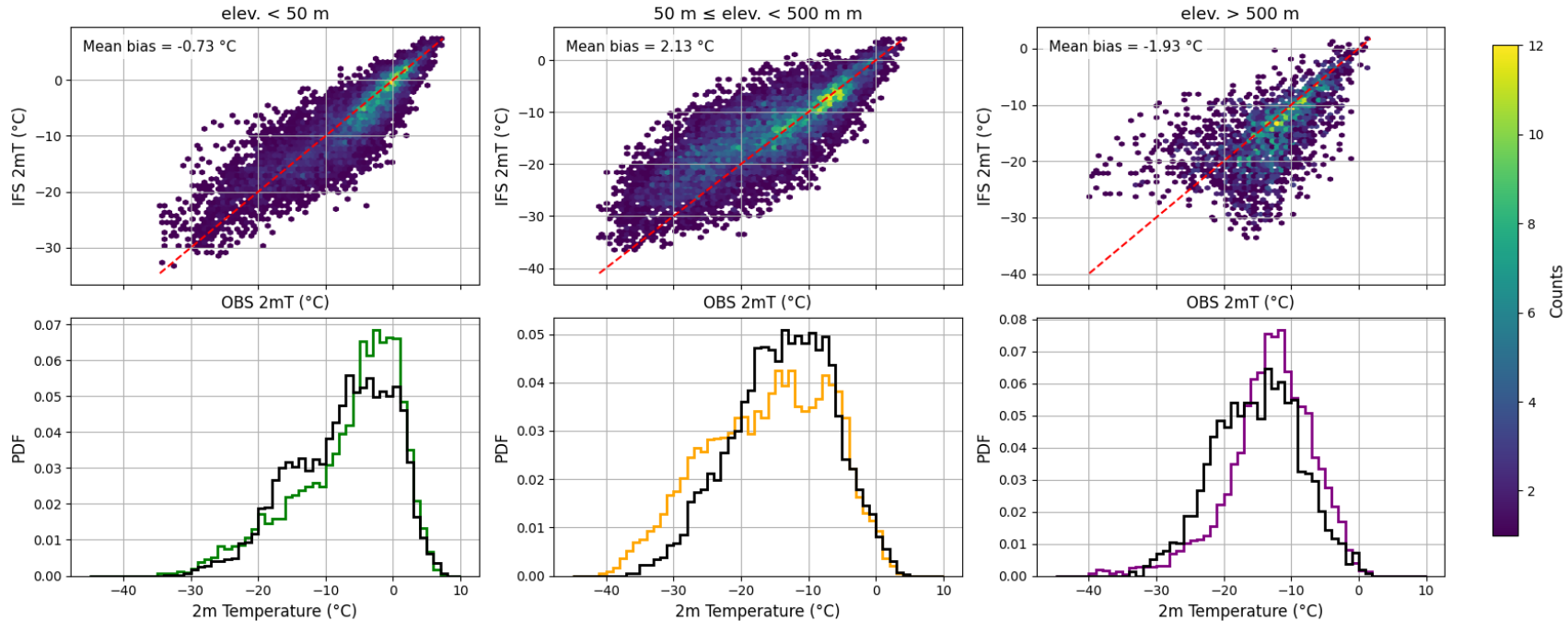


2-m Temperature & Bias – Jan-Feb 2026



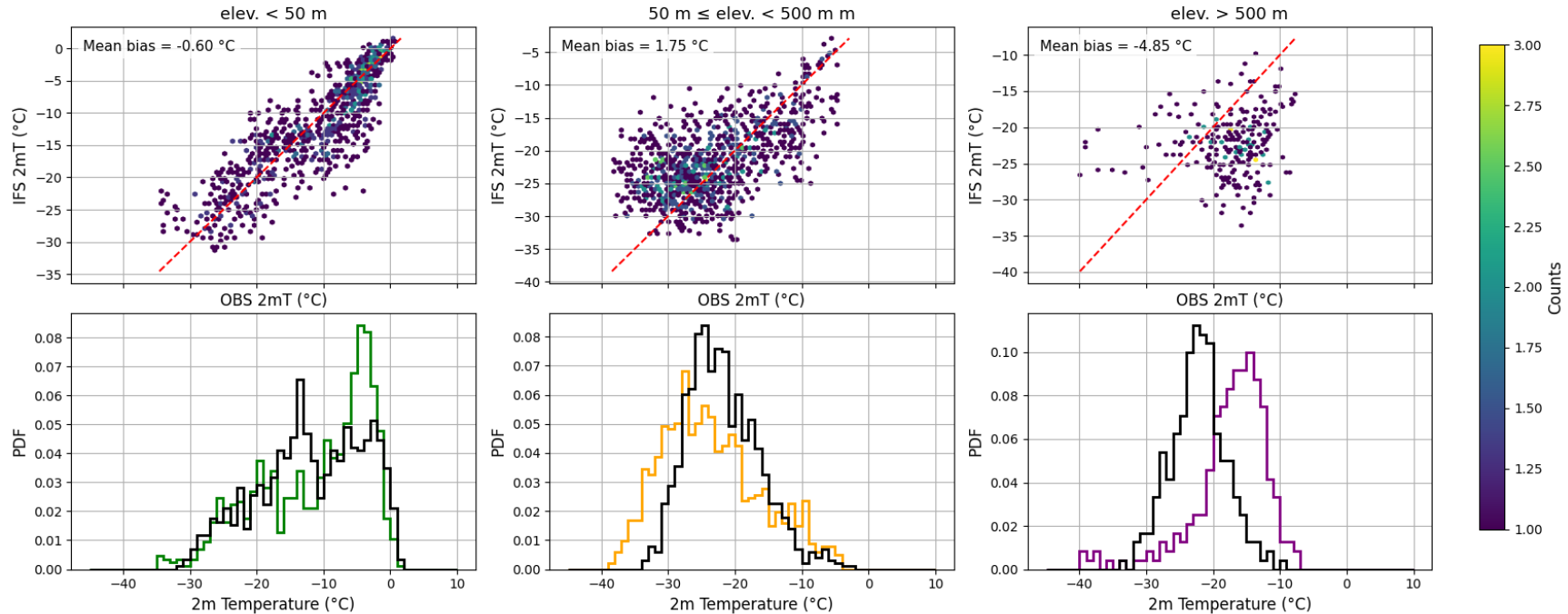
Observed and Forecast 2-m Temperature Distributions

OBS vs IFS 48h - Jan-Feb 2026 | All stations bias = 0.53 °C



Observed and Forecast 2-m Temperature Distributions

OBS vs IFS 48h - 1-7 Jan 2026 | All stations bias = 0.04 °C



Key findings

- RMSE increases with elevation.
- Mid-elevation stations show a warm bias (+2.1°C).
- Low-elevation and mountain stations show a cold bias (-0.7°C and -1.9°C).
- During the January cold outbreak, the mountain bias increased to -4.9°C.
- Extreme cold events remain particularly challenging to forecast in mountainous regions.



**Thank you for your attention.
Questions?**