

Case 20240210

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Info Provided:

- UAL accident
- 2/10/2024
- Around 2043 UTC (1543 EST)
- Near:
 - 42.1006 N
 - 75.3904 W
- Between FL200 and FL230.

In situ Equipped Boeing 777

Upon review, it was determined that the aircraft in question has the NCAR in situ EDR algorithm installed onboard and reported an EDR of 0.43 about the approximate time/location provided while descending.

Subset of EDR reports from aircraft about the accident time/location
Note: report time/position is end of minute period over which EDR is calculated

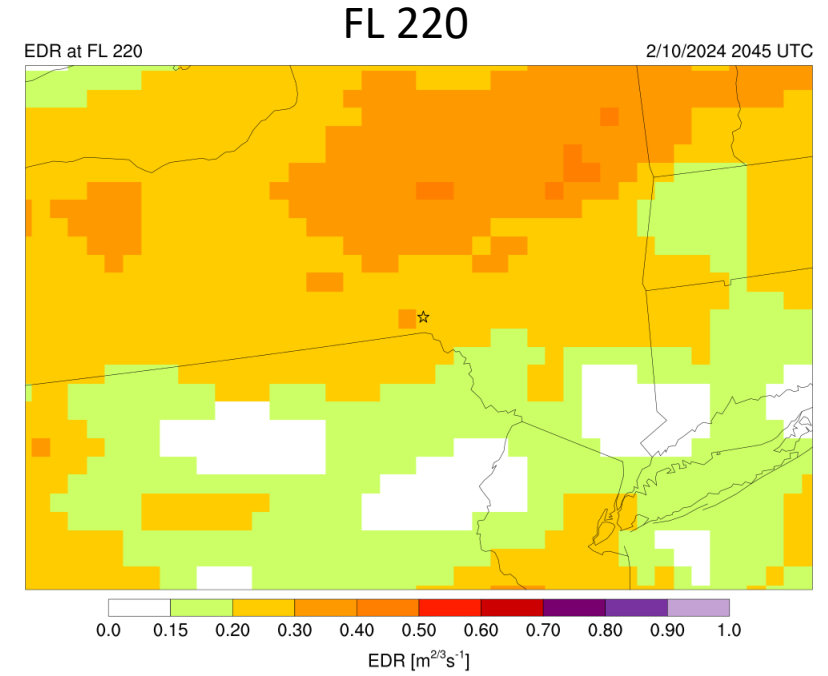
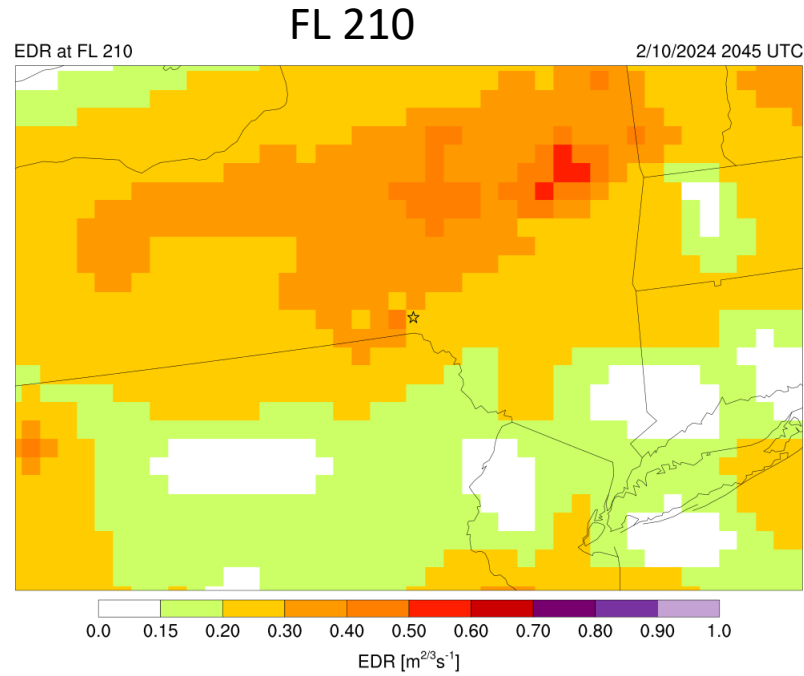
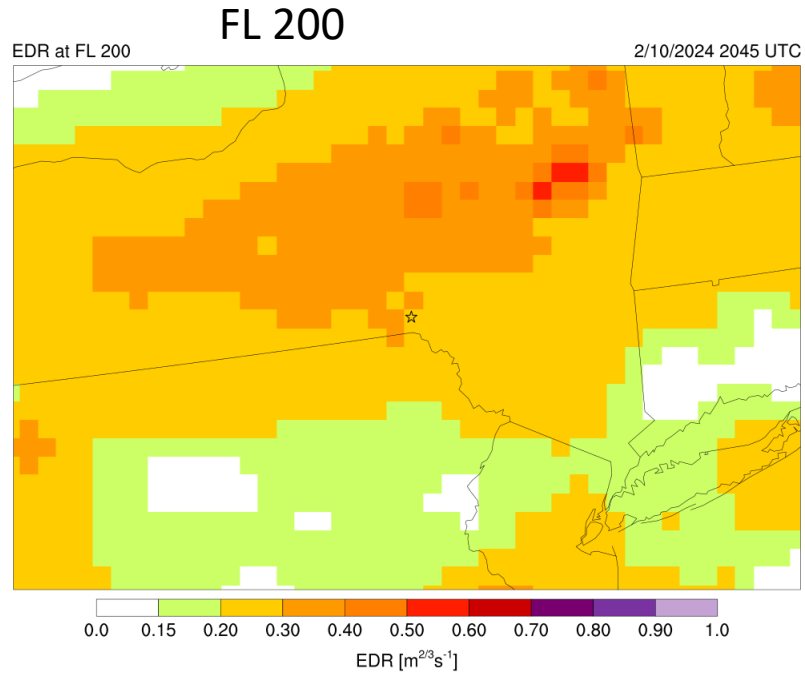
An EDR of 0.431 was reported that was measured between 2042 and 2043 UTC and between 21,453 ft and 20,414 ft, matching the provided info. NCARs research suggests EDRs in the 0.4 - 0.5 range generally correspond to moderate to severe turbulence for this class (heavy) of aircraft.

Time	Lat	Lon	Alt	Mean EDR	Peak EDR
2041	-75.612	42.212	23242	0.01	0.012
2042	-75.45	42.137	21453	0.03	0.072
2043	-75.303	42.064	20414	0.285	0.431
2044	-75.159	42.012	18962	0.189	0.249
2045	-75.02	41.961	18990	0.235	0.316
2046	-74.879	41.908	18984	0.197	0.286
2047	-74.74	41.854	17947	0.138	0.184
2048	-74.622	41.786	16509	0.065	0.106

Graphical Turbulence Guidance Nowcast (GTGN)

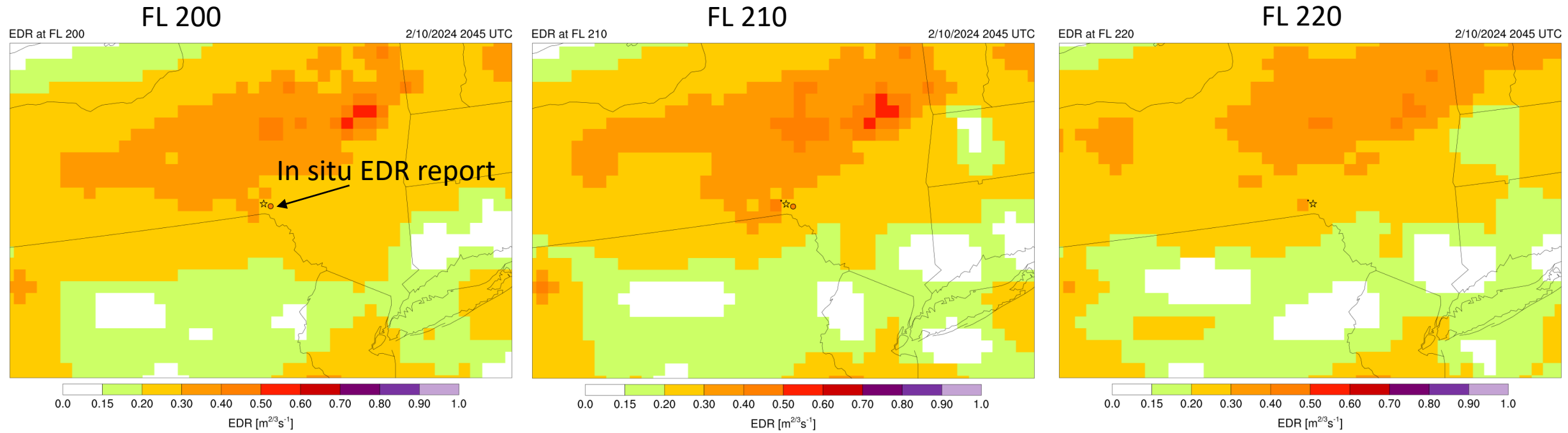
- Updates every 15 minutes
- Uses short term GTG forecast (1- or 2-hour) as basis
- Inputs in situ EDR reports + PIREPs within previous hour
- Inputs RADAR based NTDA EDR observations within previous 15 minutes that provides in-cloud turbulence information
- Nudges short term forecast to be in line with turbulence observations.
- Real time GTGN has short term input data transmission delay, meaning data from 2043 UTC would be ingested into the 2100 UTC GTGN update.

Real Time GTGN valid at 2045 UTC; FL200 – FL220



Real Time GTGN valid at 2045 UTC; FL200 – FL220

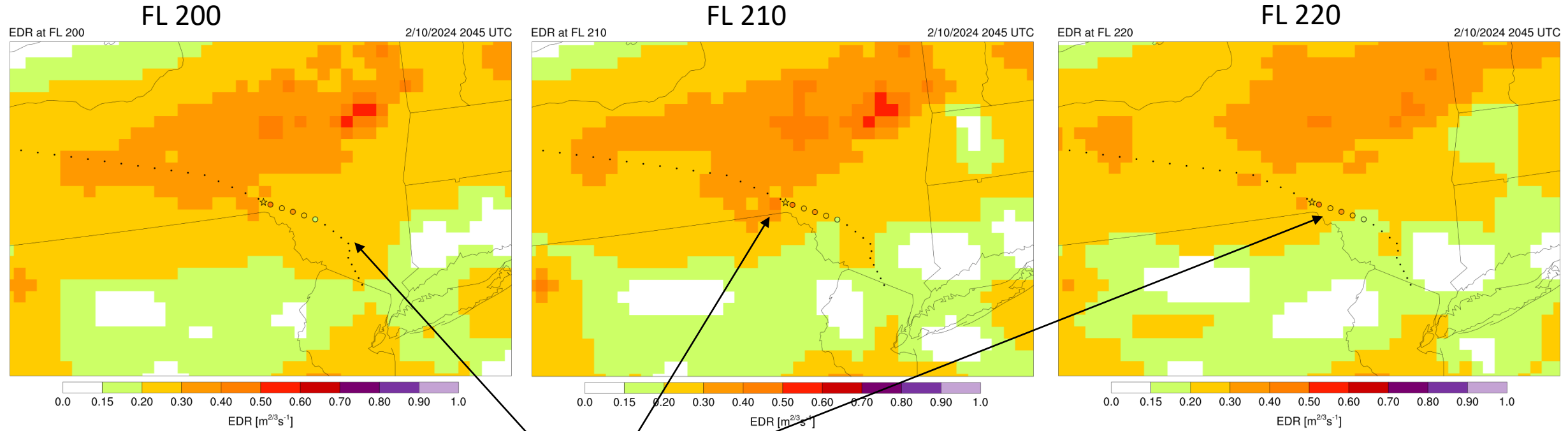
With In situ EDR data overlaid



In situ EDR data reported (end point) **within 1000 ft of flight level** are shown.

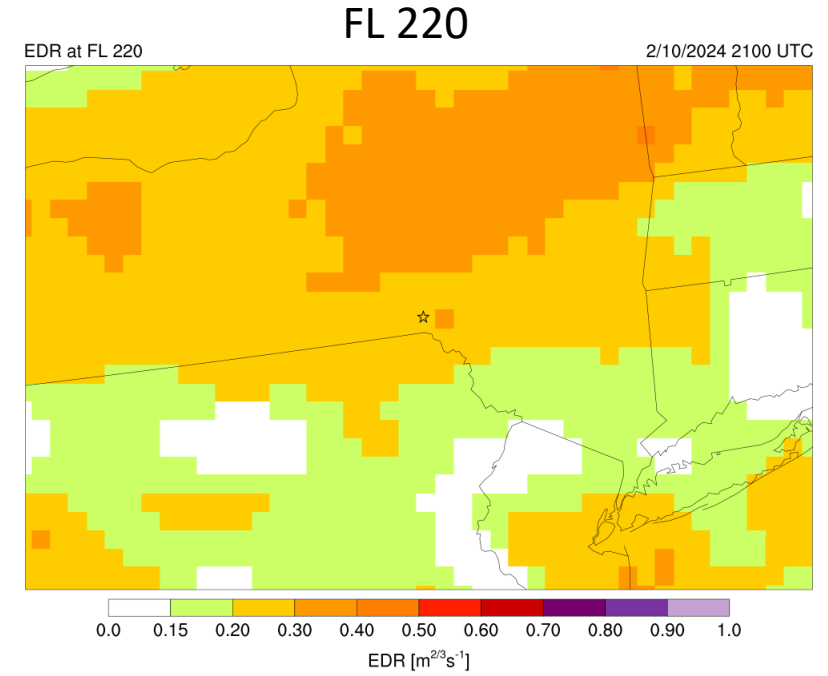
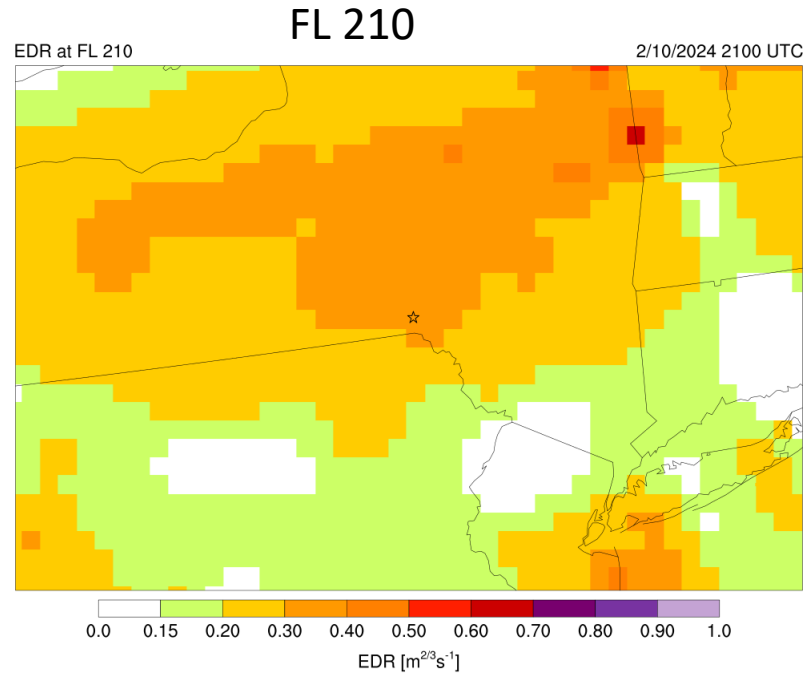
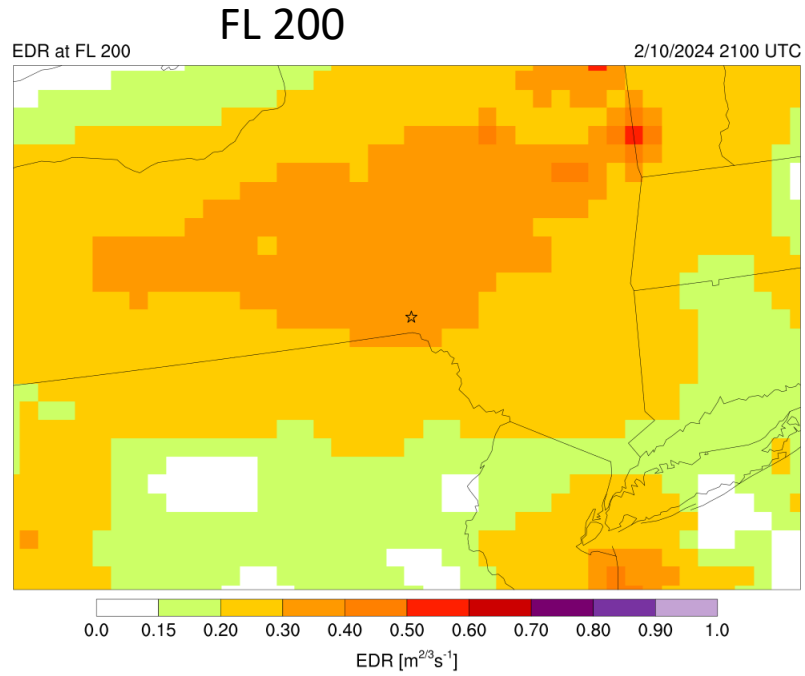
Real Time GTGN valid at 2045 UTC; FL200 – FL220

With In situ EDR track overlaid



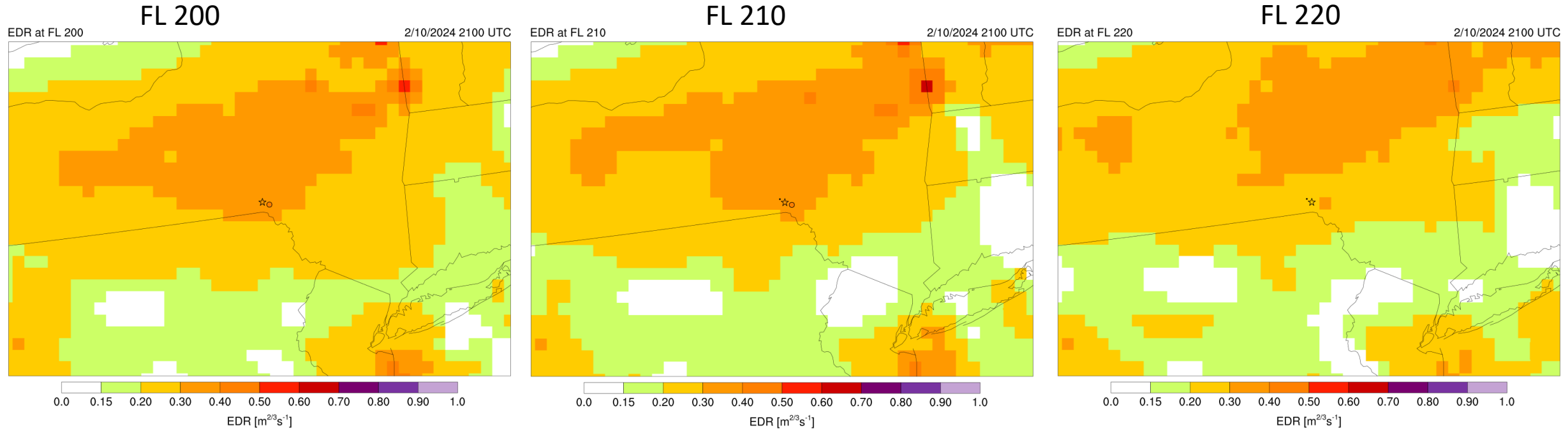
In situ EDR data for all altitudes are shown.

Real Time GTGN valid at 2100 UTC; FL200 – FL220



Real Time GTGN valid at **2100 UTC**; FL200 – FL220

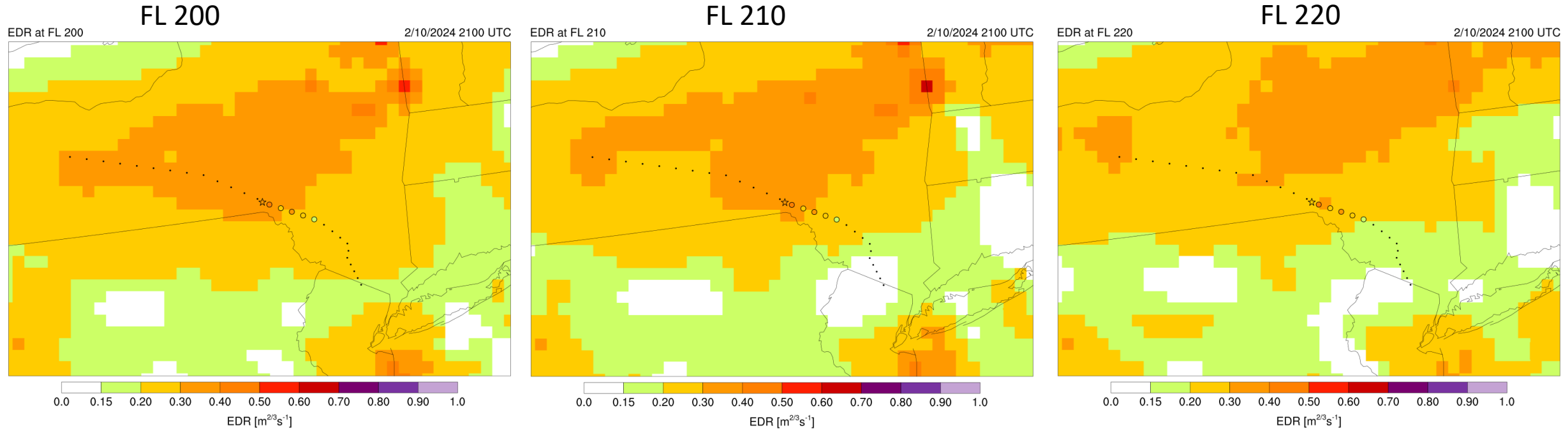
With In situ EDR data overlaid



In situ EDR data reported (end point) within 1000 ft of flight level are shown.

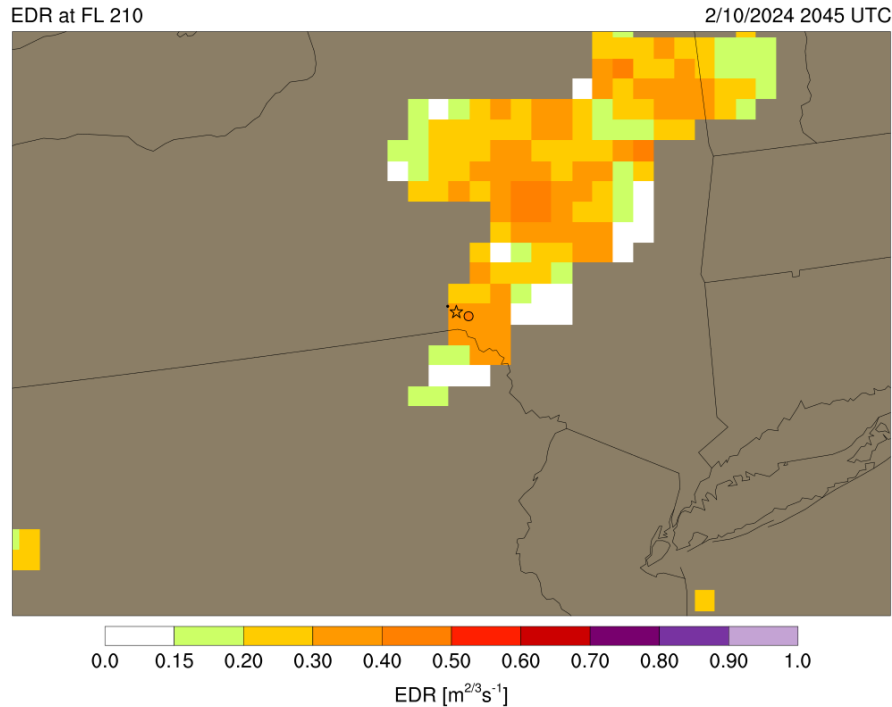
Real Time GTGN valid at **2100 UTC**; FL200 – FL220

With In situ EDR track overlaid

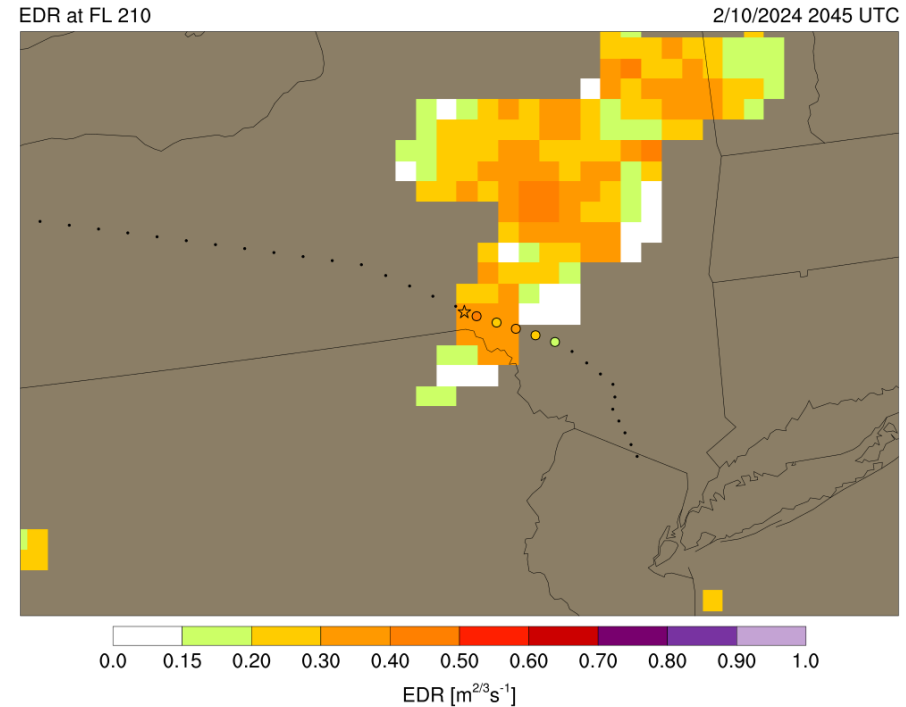


In situ EDR data for all altitudes are shown.

NTDA valid at 2045 UTC at FL210



In situ EDR data reported (end point) within 1000 ft of FL210 are shown.



In situ EDR data for all altitudes are shown.

Summary of Findings

- GTGN nowcast EDR values in the range of 0.2 to 0.5 at the provided accident location and time.
- The aircraft involved is an in situ EDR equipped Boeing 777 aircraft that reported several minutes of elevated turbulence with a maxima peak EDR of 0.43 occurring while descending at approximately 21,000 ft.
- Output of the NTDA algorithm identifies elevated in-cloud turbulence, up to 0.4 EDR, about the location of the accident.
- NCARs research suggests EDRs in the 0.4 - 0.5 range generally correspond to moderate to severe turbulence for this class (heavy) of aircraft.