Has Improving Hurricane Track Forecasts Improved Hurricane Intensity Forecasting?

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Introduction

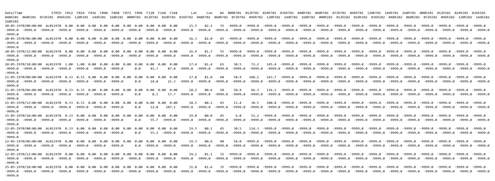
- In recent years, there have been significant improvements in hurricane track and intensity forecasting
- There remain some questions about the nature of these improvements, specifically whether intensity forecasting has improved independently of track forecasting

Research Question

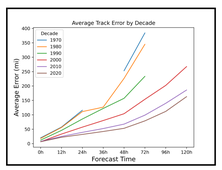
Have our improvements in hurricane track forecasting caused our recent improvements in hurricane intensity forecasting?

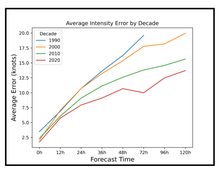
Methods

NHC Official Error Database

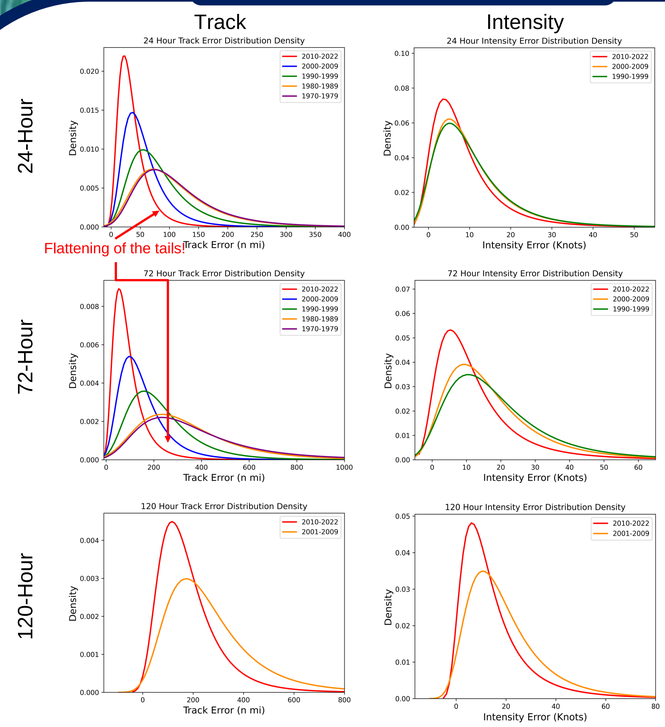


Plots



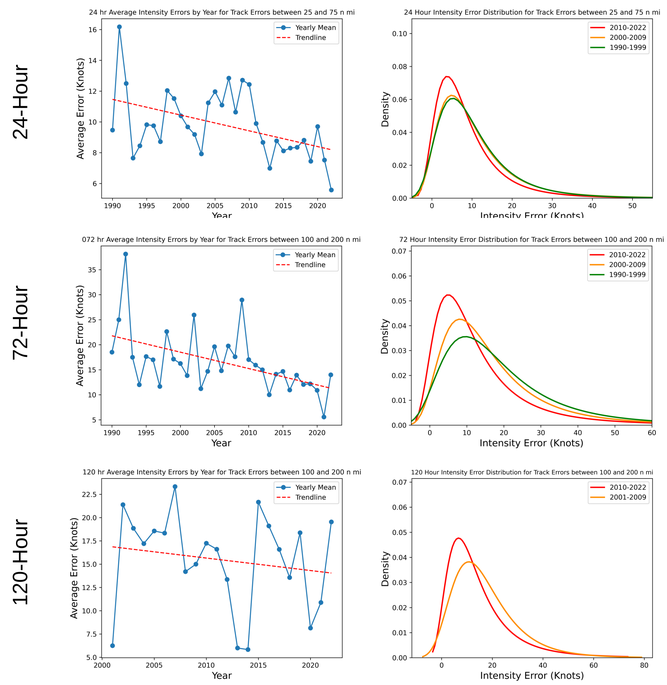


Results



- We made PDFs to help create bins of track errors to isolate improvement in intensity

Figure 1. Probability Density Functions for 24, 72, and 120-hour forecast intervals for track error and intensity errors.



- With the fixed track errors, there is still a noticeable decrease in intensity errors

Figure 2 Trendlines and Probability Density Functions fat 24, 72, and 120-hour forecast intervals for intensity errors within certain track error ranges.

Discussion

- PDFs show track errors have decreased in recent decades, with notable improvements in outlier cases
- Smaller improvements are seen in hurricane intensity errors
- When isolating for just intensity errors, we see a consistent decrease in intensity errors that is independent of improvement in track errors
- Trends are similar but slightly more variable at higher forecast intervals, which could be linked to a smaller sample size

Conclusion

- There have been pronounced improvements in hurricane track and intensity forecasting over the years
- Hurricane intensity forecasting has improved independently of improvements in track error
- Future work would be delving deeper into the database, creating subsets in the data, and looking for trends in those smaller datasets

References and Acknowledgments

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