Is NHC Intensity Forecast Skill Increasing?



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Outline

- History of NHC intensity errors
- Recent verification
- Comparisons of Atlantic to eastern Pacific
- Causes of error changes













Statistical Intensity Models: SHIFOR

- <u>Statistical Hurricane Intensity FOR</u>ecast
- Based solely on climatology and persistence
- Predictor Variables
 - Julian day
 - Initial intensity, latitude and longitude
 - Intensity change (last 12 hr)
 - Zonal and meridional storm motion (last 12 hr)
- Used as the intensity skill baseline
- Can inflate skill in aclimatological situations that aren't difficult to forecast











Atlantic Track Error Trends









SHIFOR Intensity Error



Reasons for Error Decrease

- Improved numerical guidance (e.g. HWRF, SHIPS, etc.)
- Development of a skillful model consensus
- Forecasters able to squeeze the most out of guidance
- Easier storms to forecast (Atlantic)













SHIPS vs OFCL forecasts



- SHIPS model (and others) have helped NHC's POD of intensification of 20 kt or greater.
- At first, model skill far below NHC– now comparable in this metric
- Example of model development steering the NHC predictions
- Likely seeing impacts of SHIPS-Rapid Intensification guidance as well on the forecasters

Summary

- Intensity forecasts are improving, slowly at short range and more significantly at long range
- Appears we have entered an era similar to 1990s track prediction
 – better forecasts (but not stellar)
- Improvements to statistical and dynamical models playing dominant role
- Without recent model improvements, eastern Pacific errors would likely have gone notably up

Thanks for listening!

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NHC 24-h Official Intensity Error Trend **Atlantic Basin** Eastern North Pacific Basin 40 25 ----- Intensity change of less than 20 kt Intensification of 20 kt or greater ---- Intensity change of less than 20 kt 35 Intensification of 20 kt or greater 20 30 Forecast Error (kt) Forecast error (kt) 25 15 20 10 15 10 5 5 0 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 Year Year

NHC 24-h Official Intensity Error Trend

- Decrease in both series, although less in the "quick" intensifiers (orange) since late 1990s ۲
- 2015 was the 2nd largest error in 20 years in 20 kt or greater cases due to Danny/Joaquin •



Although only a small decrease in errors, skill has gone up from negligible to ~20%