

2016 Real-time COAMPS-TC ensemble



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Forecast Sample

| Number | Name | Forecasts |
|--------|----------|-----------|
| 06L | Fiona | 25 |
| 07L | Gaston | 44 |
| 08L | TD8 | 14 |
| 09L | Hermine | 35 |
| 12E | Kay | 20 |
| 13E | Lester | 31 |
| 14E | Madeline | 19 |
| 15E | Newton | 1 |
| 09W | Chanthu | 10 |
| 10W | Mindulle | 19 |
| 11W | Dianmu | 4 |
| 12W | Lionrock | 46 |
| 13W | Kompasu | 5 |
| 14W | TD14 | 5 |
| 15W | Namtheun | 16 |

Basic ensemble configuration

- **Same configuration as 2015 real-time ensemble**
- 1 unperturbed control + 10 perturbed members
- Synoptic-scale and vortex scale perturbations
- 2015 version of COAMPS-TC
- 3/9/27 km resolution (instead of 5/15/45 km)
- GFS deterministic is “parent model”

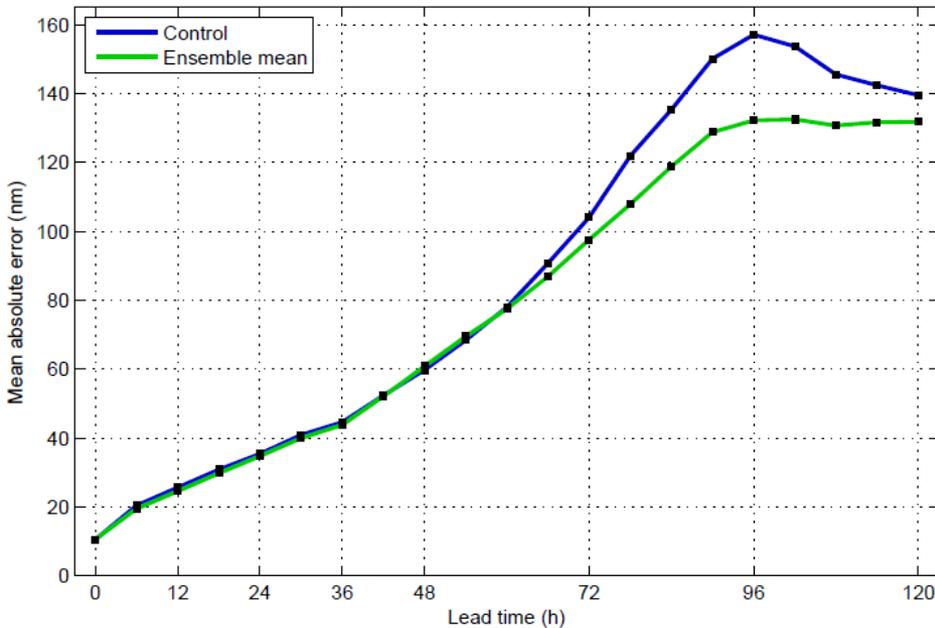


- **118 Atlantic Forecasts**
- **71 EastPac Forecasts**
- **105 WestPac Forecasts**

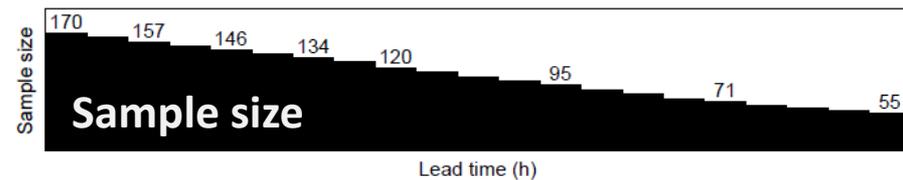
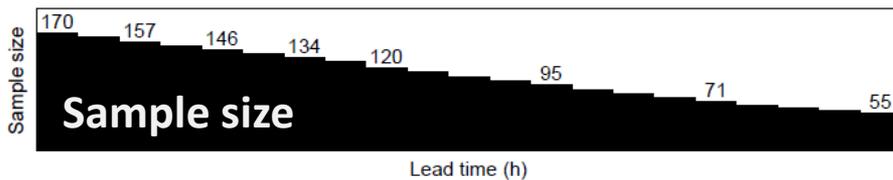
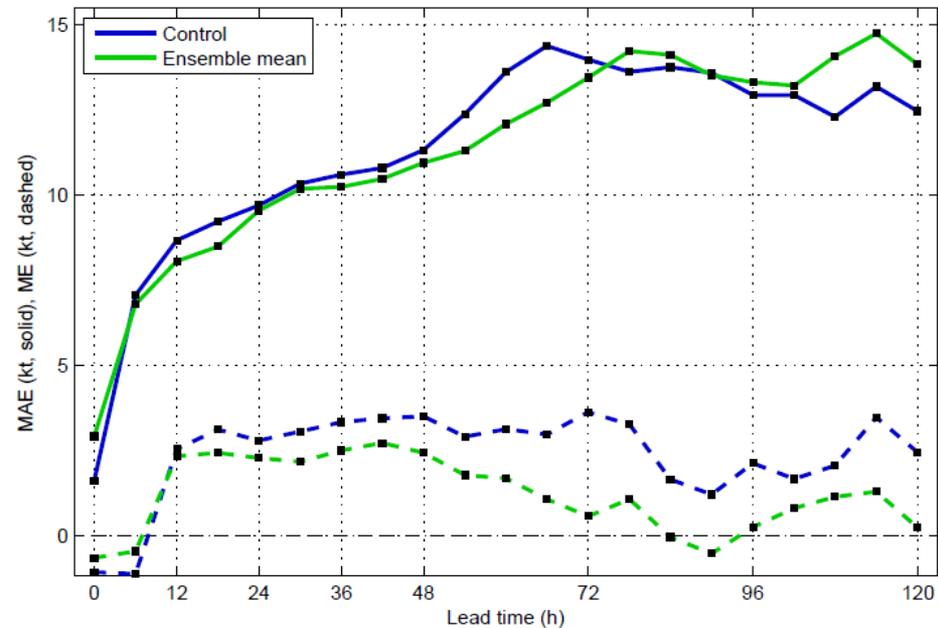
Performance statistics for ATL & EPAC

Ensemble control vs Ensemble mean

Track MAE



Intensity MAE (solid) and ME (dashed)



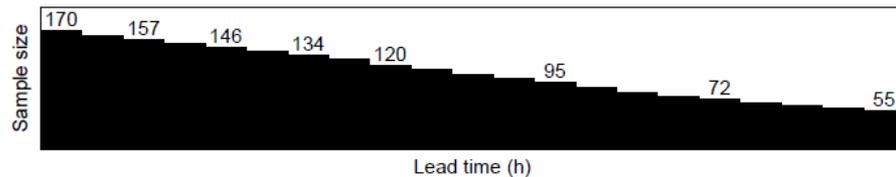
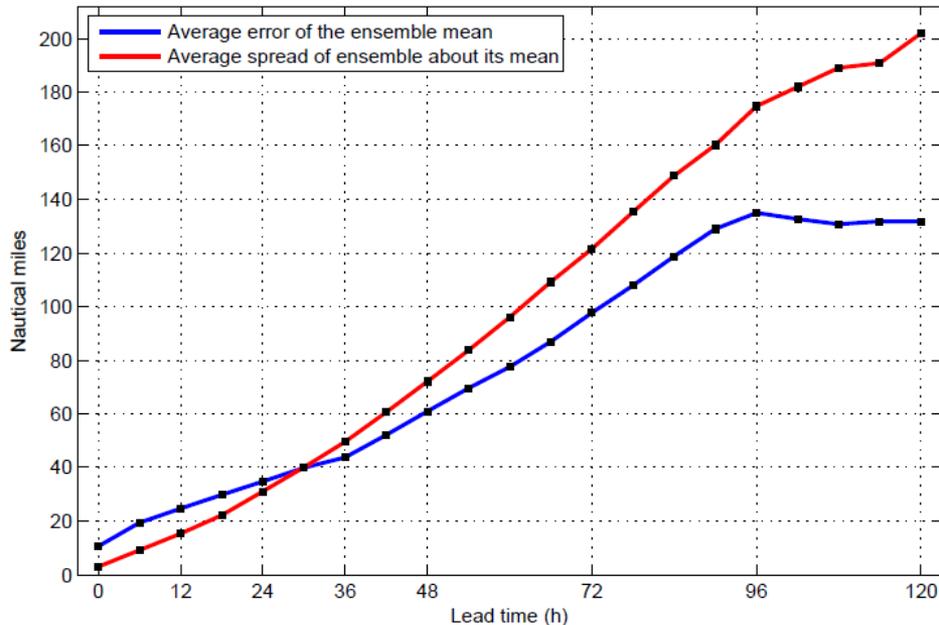
Ensemble mean outperforms control at long lead times

Ensemble mean similar or better MAE w.r.t. control for most lead times

Performance statistics for ATL & EPAC

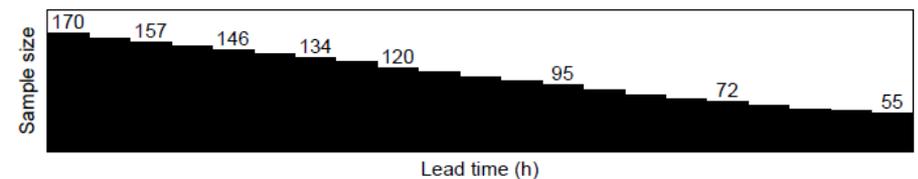
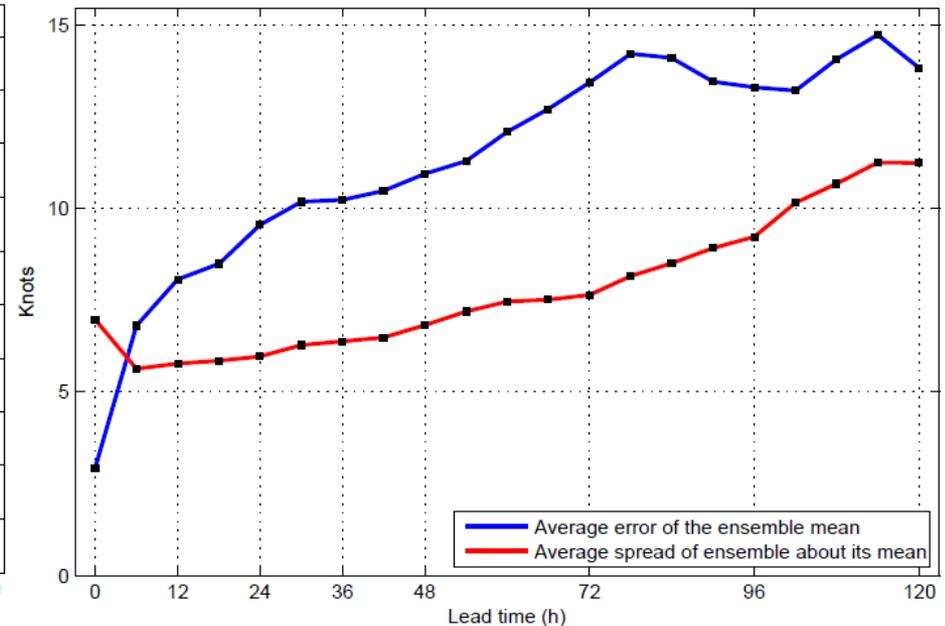
Ensemble mean error vs Ensemble spread

Track



Spread is a little too large for this sample of cases (ensemble mean very accurate)

Intensity



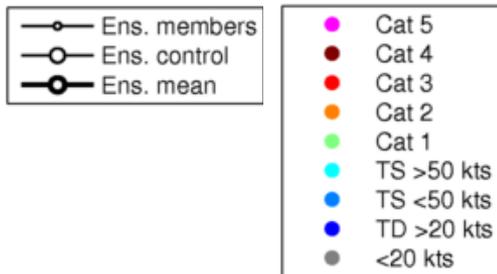
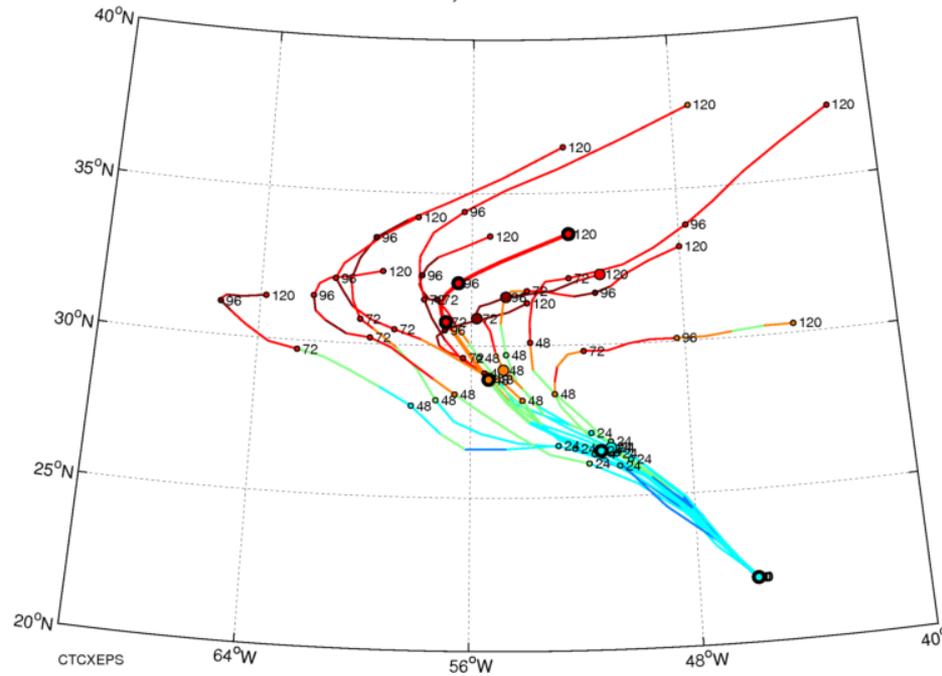
As in previous years, intensity spread is lacking relative to intensity skill

New Forecast Products: Real-time 2016

Track colored by forecast intensity

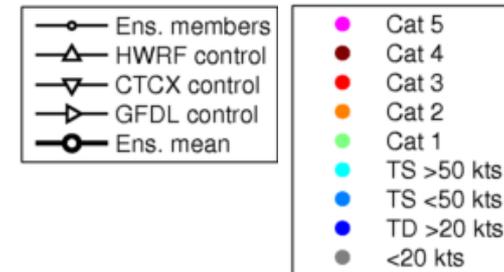
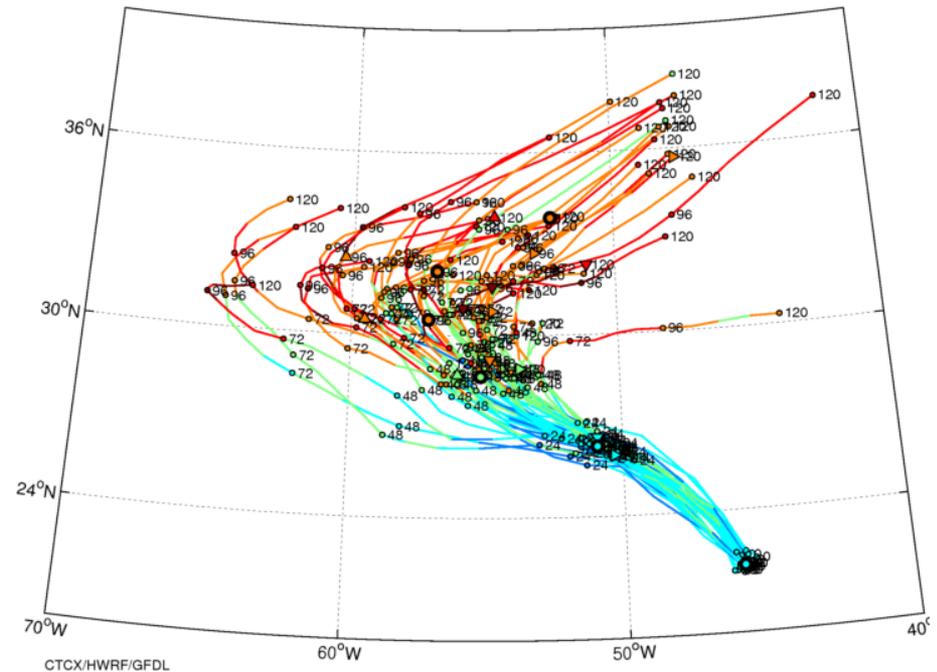
COAMPS-TC

TC = 07L2016, DTG = 2016082600



COAMPS-TC / HWRF / GFDL

TC = 07L2016, DTG = 2016082600

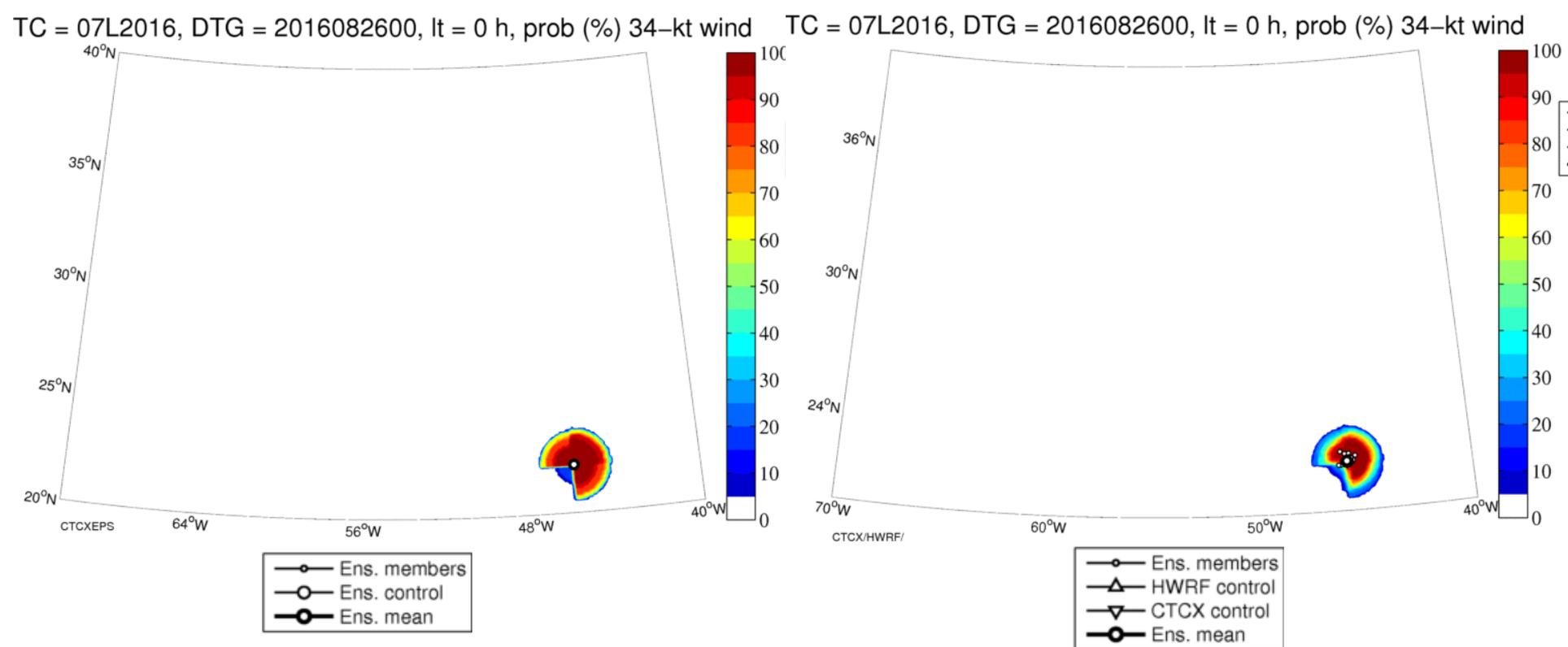


New Forecast Products: Real-time 2016

10-m wind threshold exceedance probability

COAMPS-TC

COAMPS-TC / HWRF



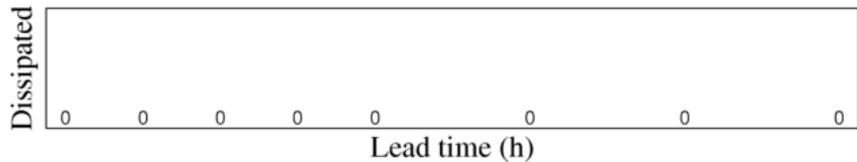
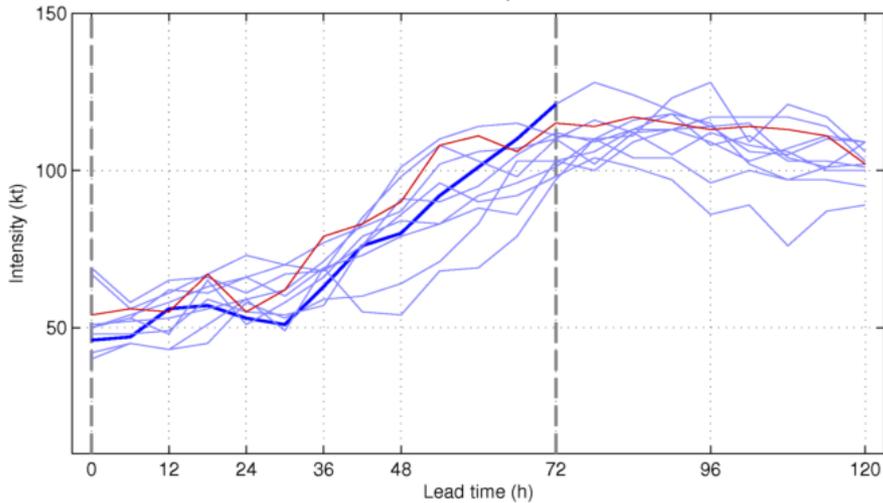
Available for 34 kt, 50 kt, and 64 kt thresholds, with both animations as shown above and static images for tau = 120 h

New Forecast Products: Real-time 2016

Rapid intensification probability

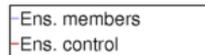
COAMPS-TC

CTCXEPS: TC = 07L2016, DTG = 2016082600



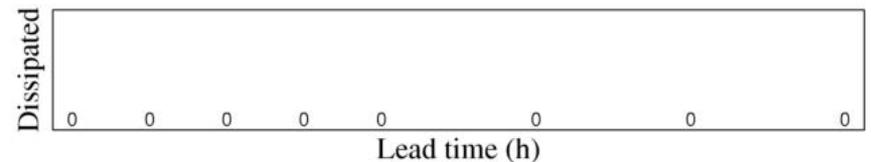
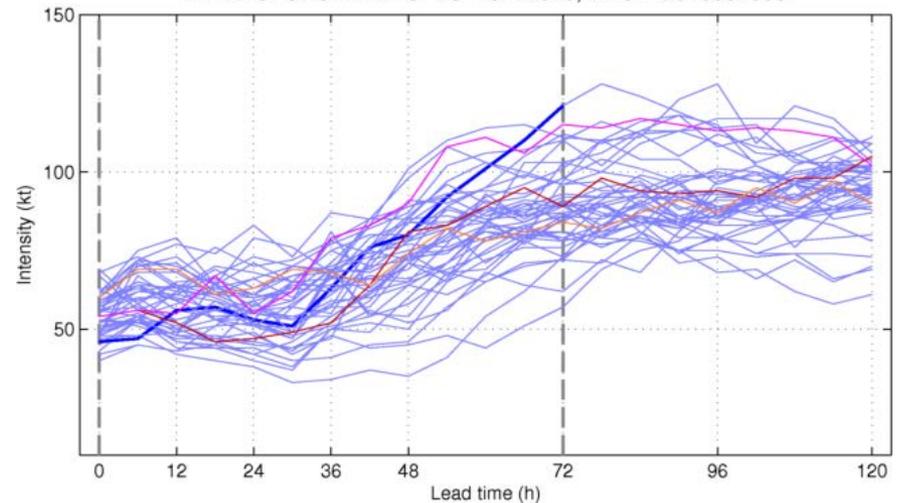
Probability of $\Delta I \geq 65$ kt in 0 to 72 h = 0.09

Members which satisfy above criteria highlighted with bold line type



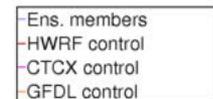
COAMPS-TC / HWRF

HWRFACTCXGFDLEPS: TC = 07L2016, DTG = 2016082600



Probability of $\Delta I \geq 65$ kt in 0 to 72 h = 0.02

Members which satisfy above criteria highlighted with bold line type



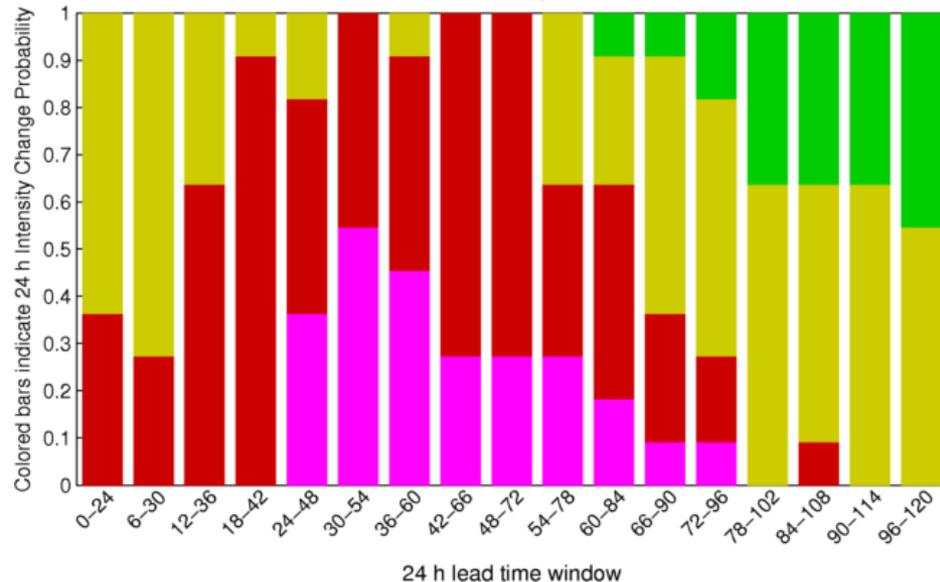
Available for $\Delta I \geq 30$ in 0 to 24 h, $\Delta I \geq 55$ in 0 to 48 h, and $\Delta I \geq 65$ in 0 to 72 h (as shown in example above)

New Forecast Products: Real-time 2016

24 h intensity change probability

COAMPS-TC

CTCXEPS: TC = 07L2016, DTG = 2016082600



$\Delta I \geq 30$ kt (Rapid Intensification)

$10 \text{ kt} \leq \Delta I < 30$ kt (Moderate Intensification)

$-10 \text{ kt} < \Delta I < 10$ kt (Steady Intensity)

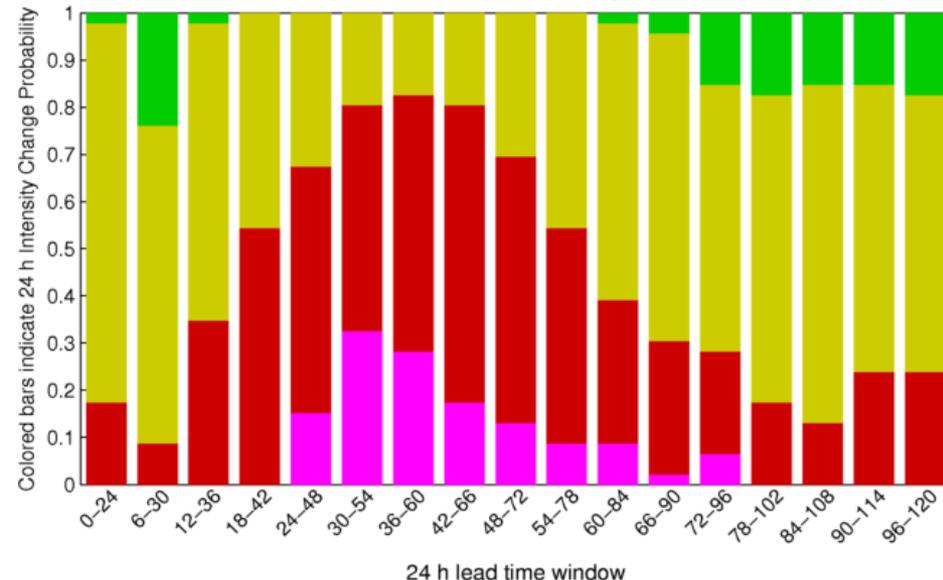
$-30 \text{ kt} < \Delta I \leq -10$ kt (Moderate Weakening)

$\Delta I \leq -30$ kt (Rapid Weakening)

TC already dissipated or dissipates during window

COAMPS-TC / HWRF

HWRFACTCXGFDLEPS: TC = 07L2016, DTG = 2016082600



$\Delta I \geq 30$ kt (Rapid Intensification)

$10 \text{ kt} \leq \Delta I < 30$ kt (Moderate Intensification)

$-10 \text{ kt} < \Delta I < 10$ kt (Steady Intensity)

$-30 \text{ kt} < \Delta I \leq -10$ kt (Moderate Weakening)

$\Delta I \leq -30$ kt (Rapid Weakening)

TC already dissipated or dissipates during window

Future Plans

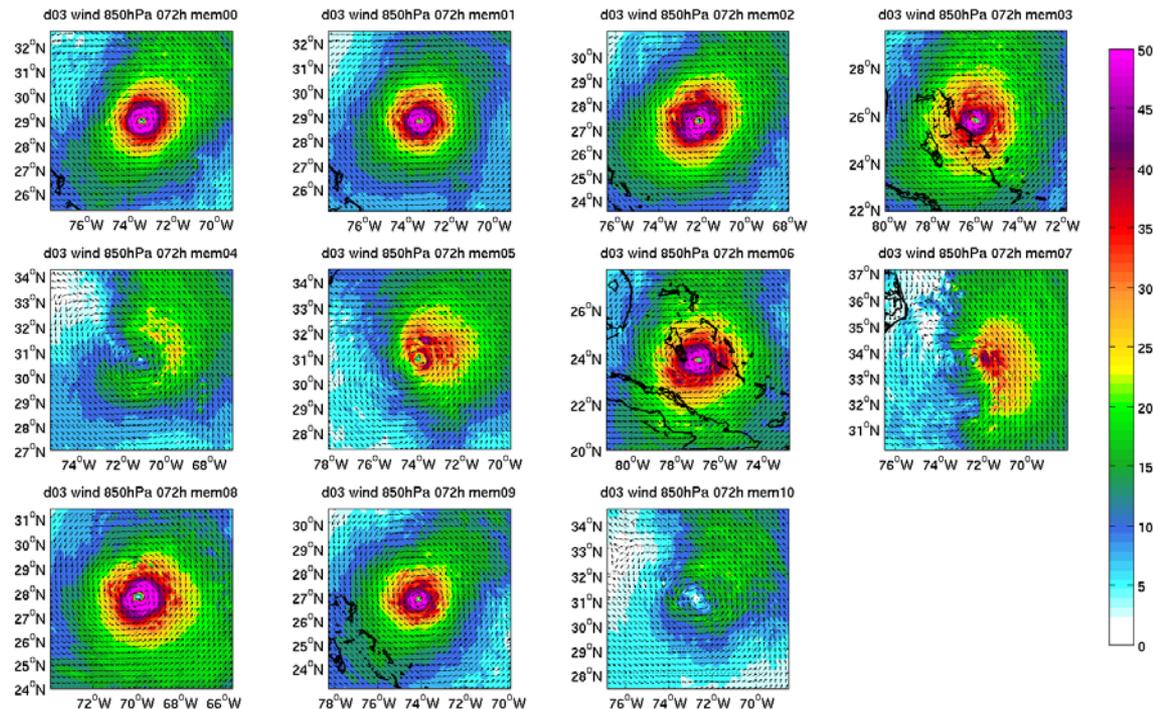
Goal for FY17: Transition COAMPS-TC ensemble to FNMOC for operational implementation

- Possible configuration: 11 members, 45/15/5 km resolution, 2015 COAMPS-TC version
- Synoptic perturbations from (1) GFS deterministic + correlated noise, or (2) NAVGEM deterministic + correlated noise, or (3) NAVGEM ensemble
- Performing retrospective tests to settle on a version of the system for transition

Additional objectives for FY17-18:

- Continued product development, interfacing with forecasters at JTWC and NHC →
- Continued contribution to HFIP multimodel ensemble
- Perturbed physical parameters, or other approaches to improve intensity forecast distribution
- Extensive testing and evaluation

Postage stamp maps



<https://www.nrlmry.navy.mil/coamps-web/web/ens>

Example: 11L (Joaquin) 2015-09-28 12Z: 850 hPa wind (m/s): D03 t=72h