

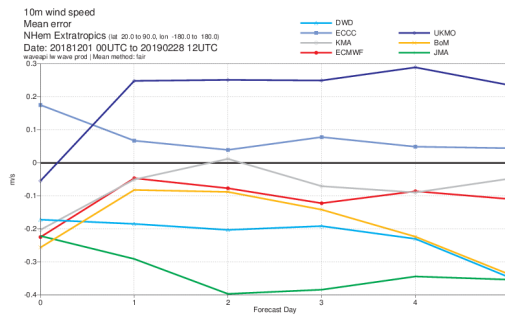
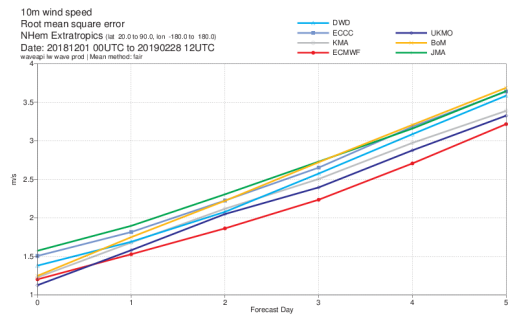
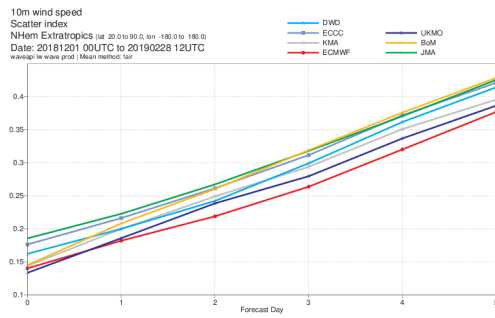
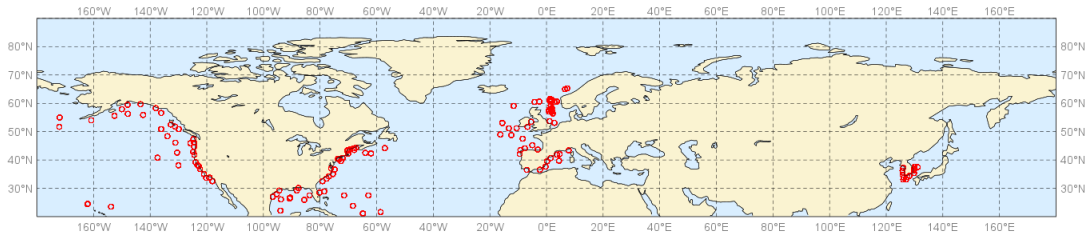
Intercomparison of operational wave forecasting systems against
in-situ observations: data from BoM, DMI, DWD, ECCO,
ECMWF, JMA, KMA, METEOAM, UKMO.

WMO Lead Centre for Wave Forecast Verification LC-WFV,
European Centre for Medium-Range Weather Forecasts ECMWF

March 15, 2019

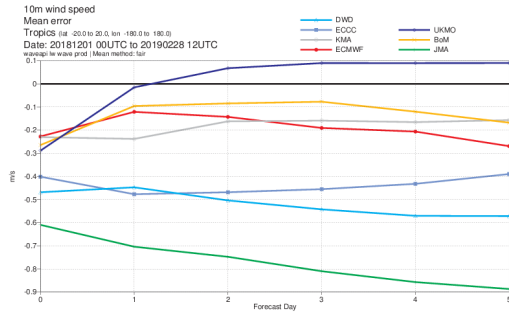
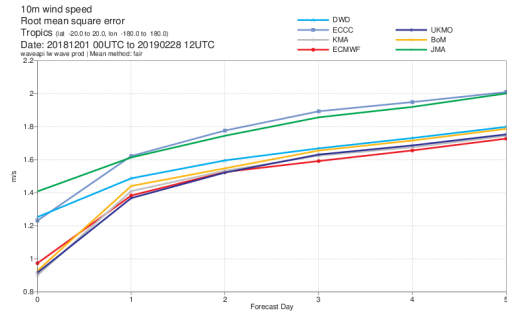
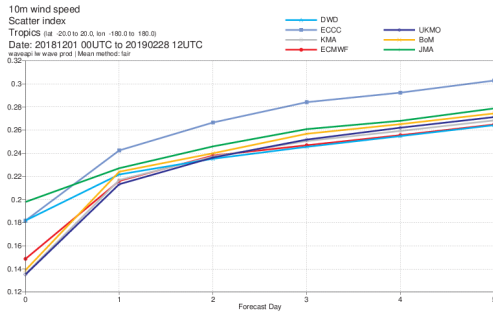
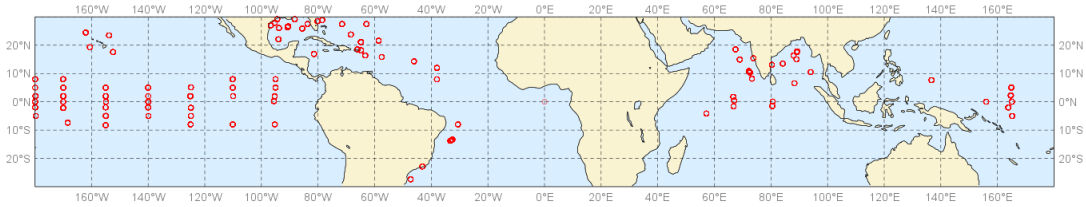
PART III: 10 meter wind speed (10ff)

Buoys observations - from 20181201 to 20190228 - (10ff)



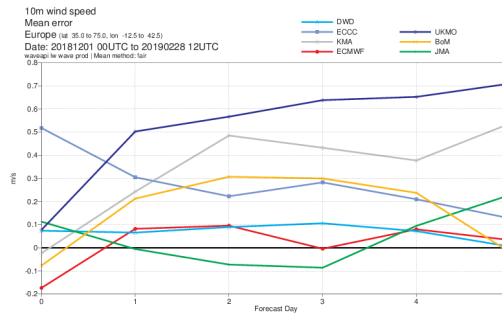
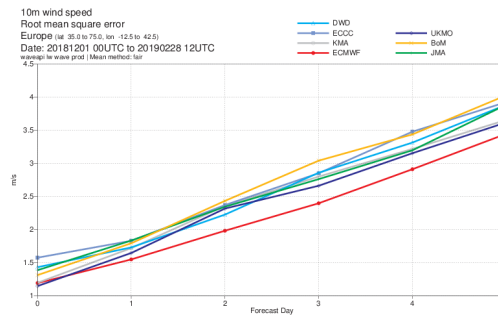
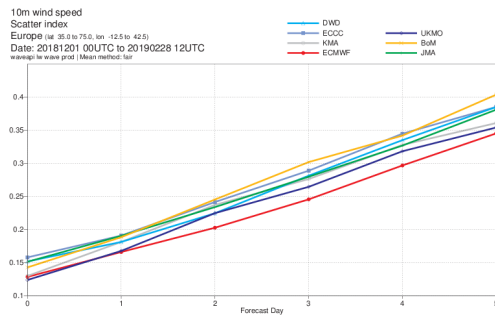
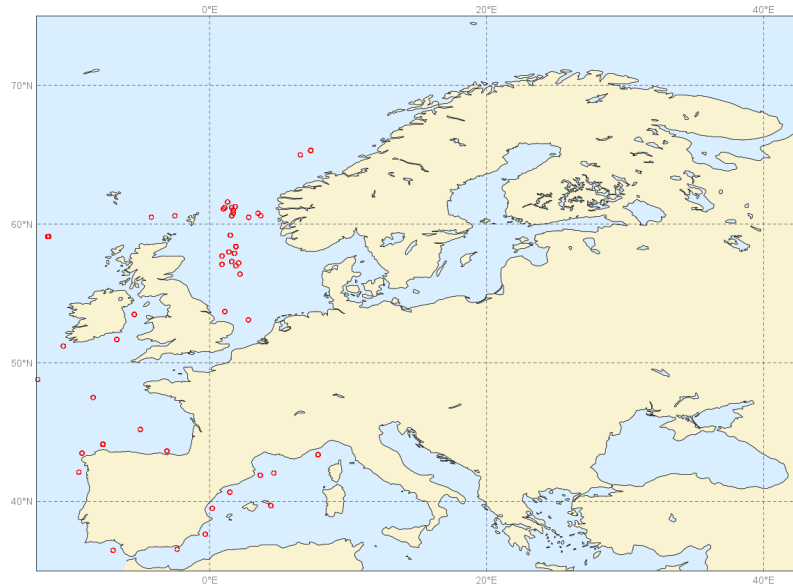
Northern Hemisphere. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20181201 to 20190228 - (10ff)



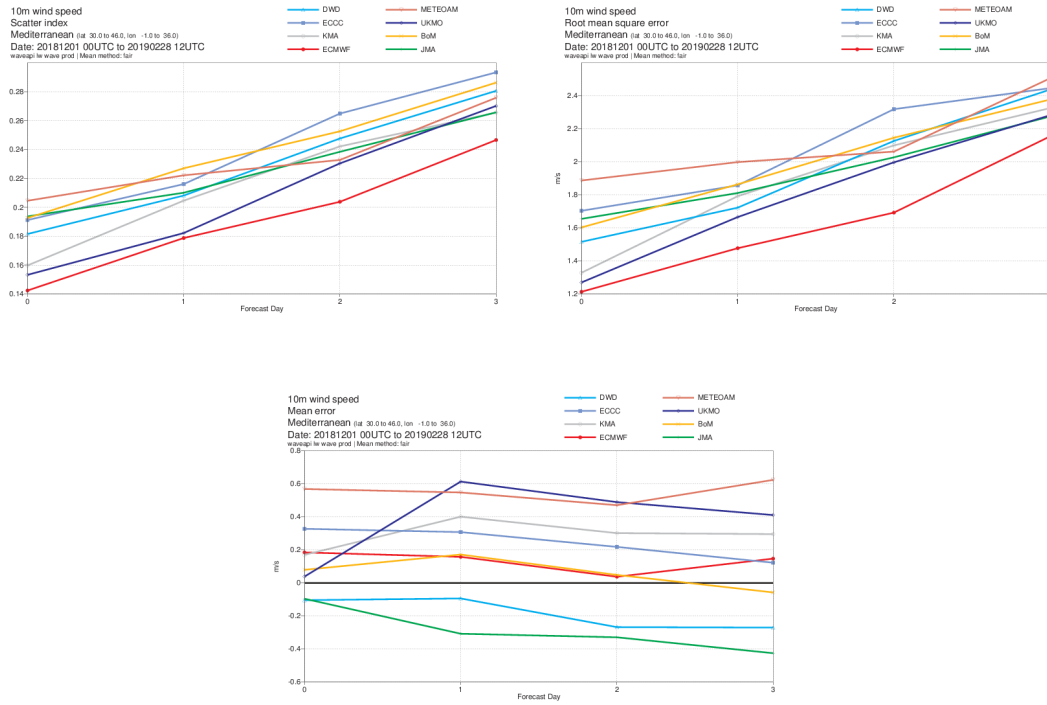
Tropics. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20181201 to 20190228 - (10ff)



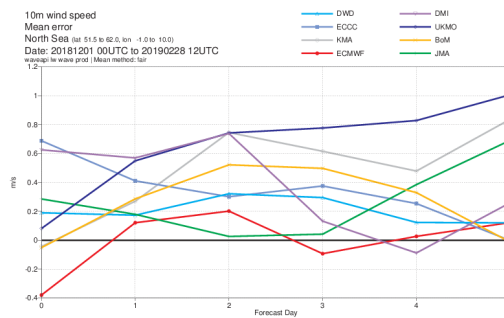
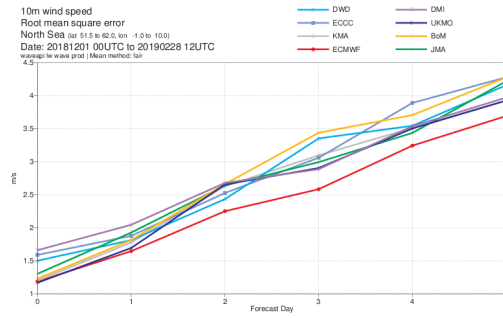
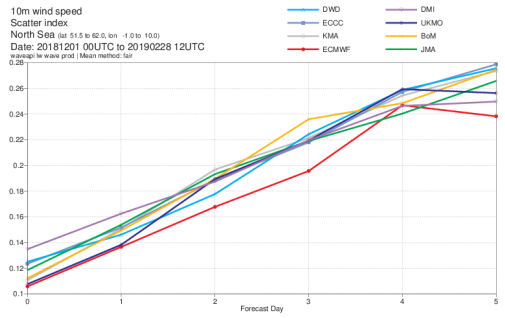
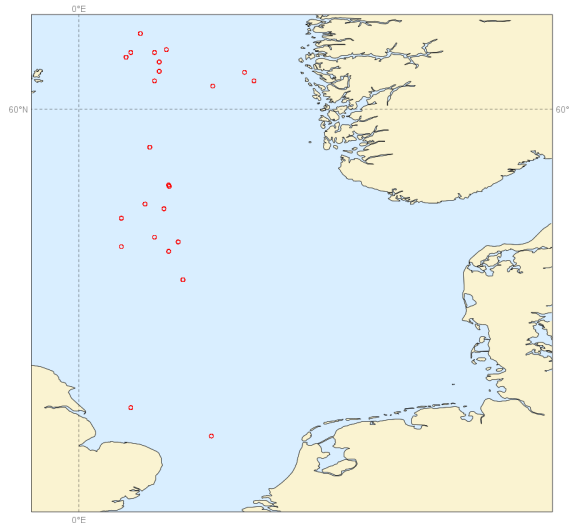
Europe. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20181201 to 20190228 - (10ff)



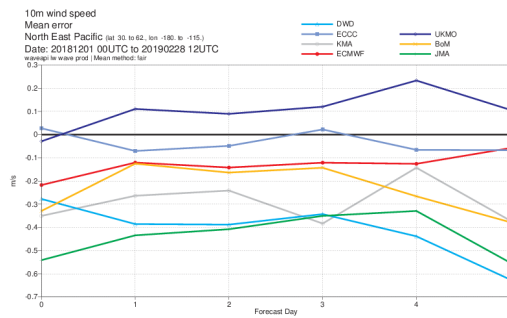
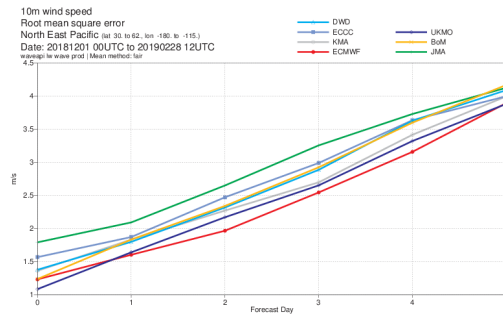
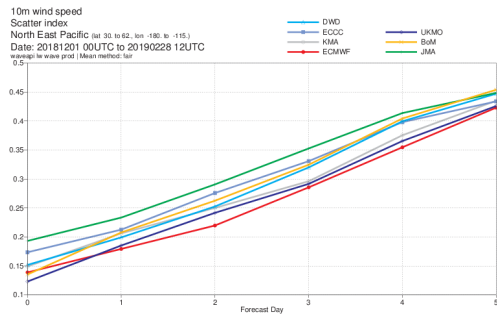
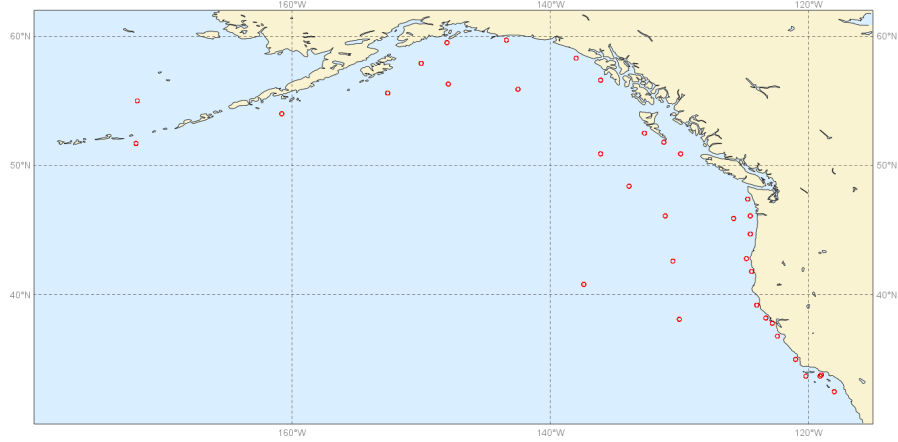
Mediterranean Sea. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20181201 to 20190228 - (10f)



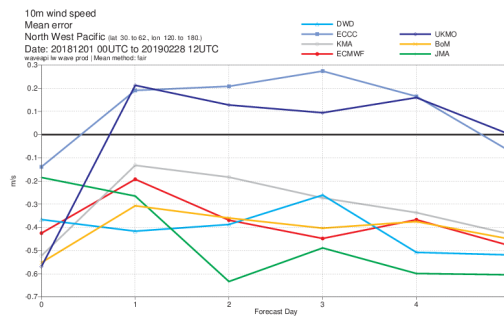
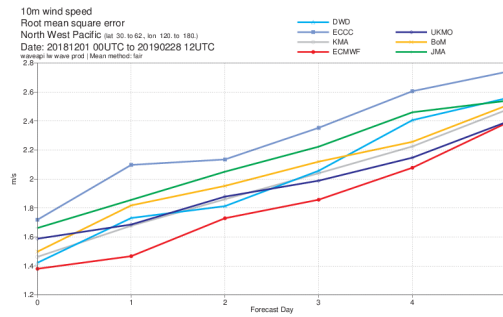
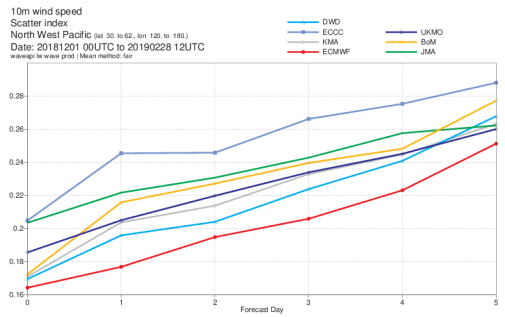
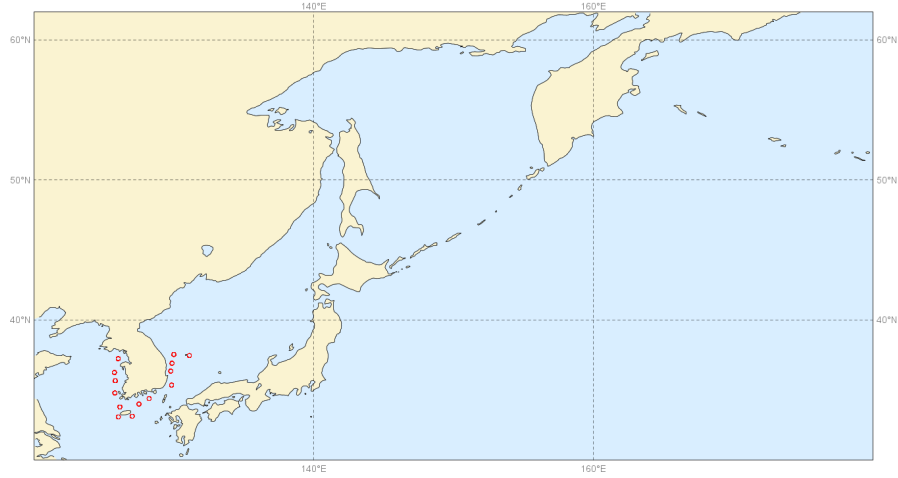
North Sea. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20181201 to 20190228 - (10ff)



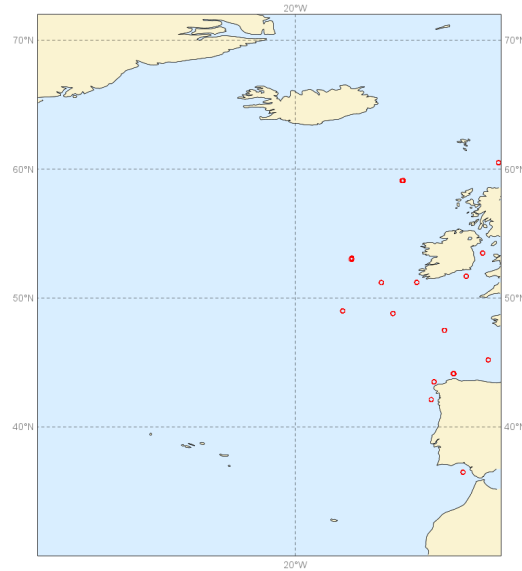
North East Pacific. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20181201 to 20190228 - (10ff)

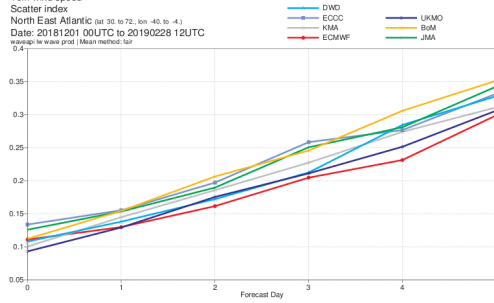


North West Pacific. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

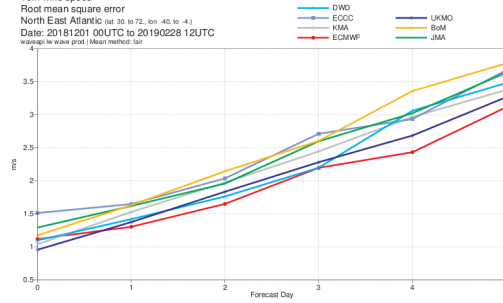
Buoys observations - from 20181201 to 20190228 - (10ff)



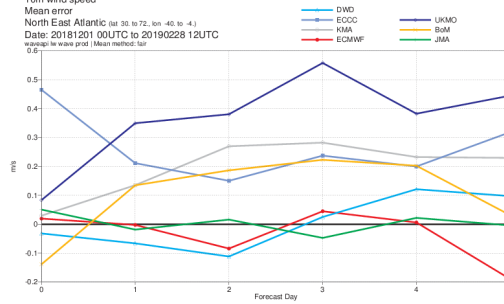
10m wind speed
Scatter index
North East Atlantic (lat 30 to 72, lon -40 to -4)
Date: 20181201 00UTC to 20190228 12UTC
average for area grid. Mean method. lat



10m wind speed
Root mean square error
North East Atlantic (lat 30 to 72, lon -40 to -4)
Date: 20181201 00UTC to 20190228 12UTC
average for area grid. Mean method. lat

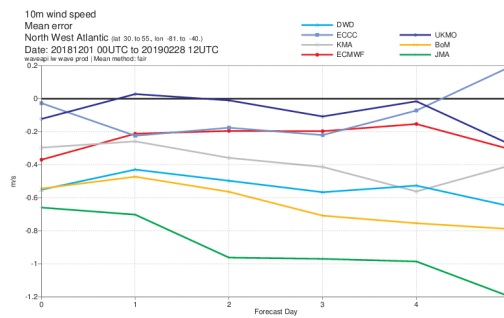
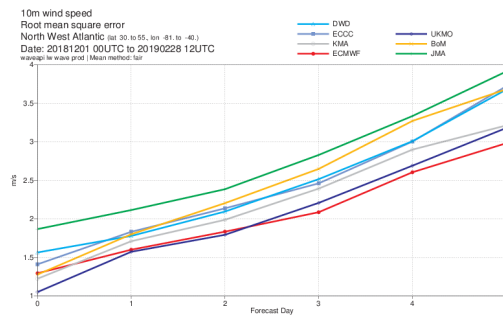
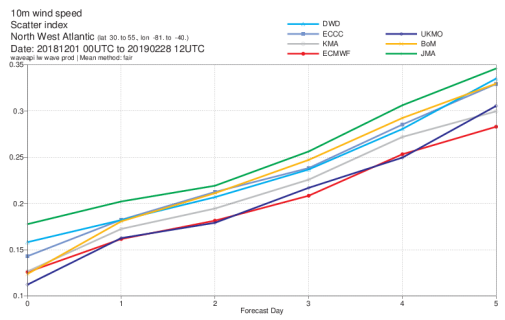
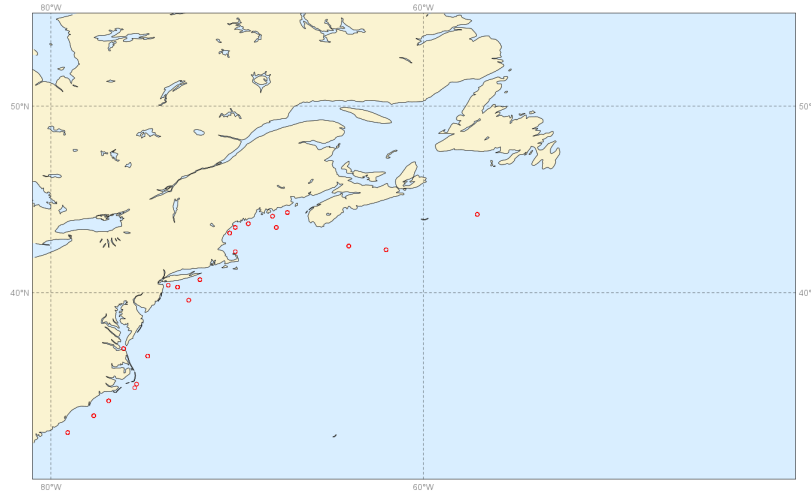


10m wind speed
Mean error
North East Atlantic (lat 30 to 72, lon -40 to -4)
Date: 20181201 00UTC to 20190228 12UTC
average for area grid. Mean method. lat



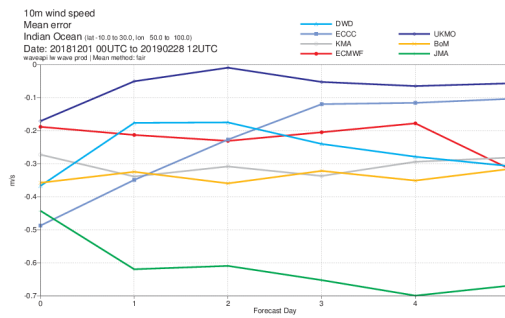
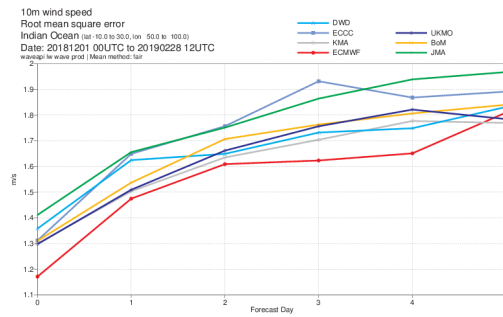
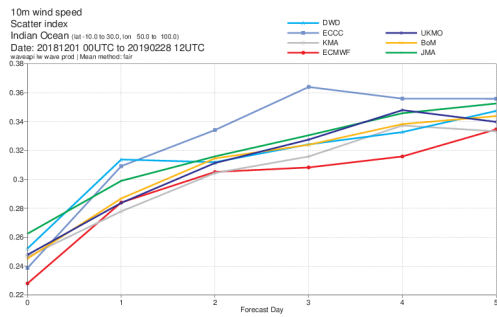
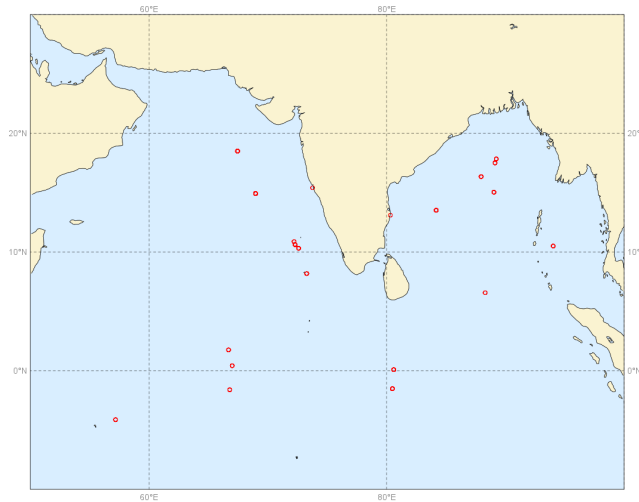
North East Atlantic. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20181201 to 20190228 - (10ff)



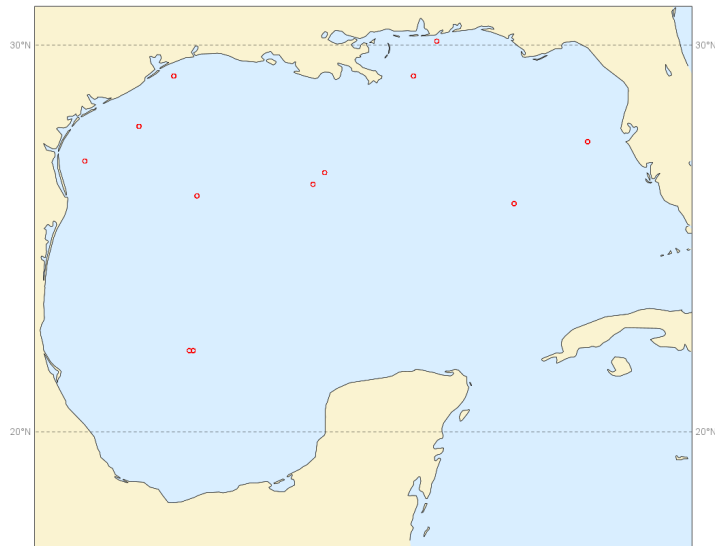
North West Atlantic. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20181201 to 20190228 - (10ff)

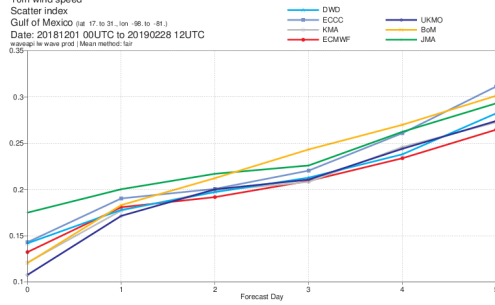


Indian Ocean. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

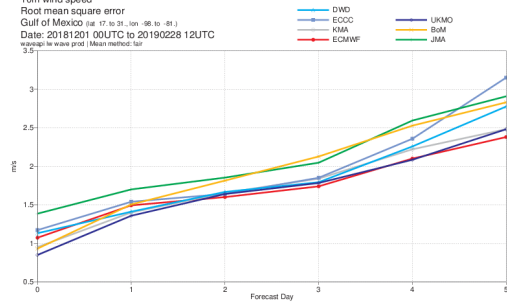
Buoys observations - from 20181201 to 20190228 - (10ff)



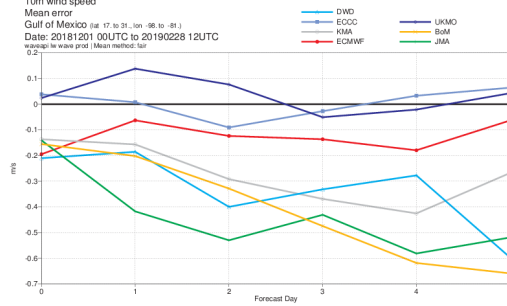
10m wind speed
Scatter index
Gulf of Mexico (lat 17 to 31, lon -96 to -81)
Date: 20181201 00UTC to 20190228 12UTC
Average for area grid. Mean method. Sat



10m wind speed
Root mean square error
Gulf of Mexico (lat 17 to 31, lon -96 to -81)
Date: 20181201 00UTC to 20190228 12UTC
Average for area grid. Mean method. Sat

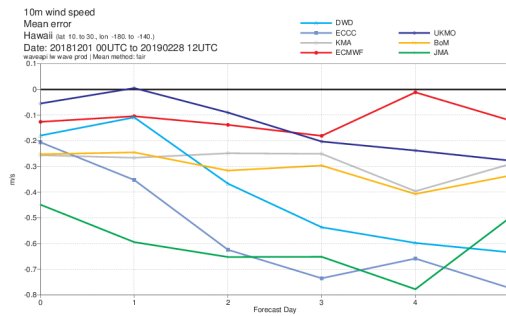
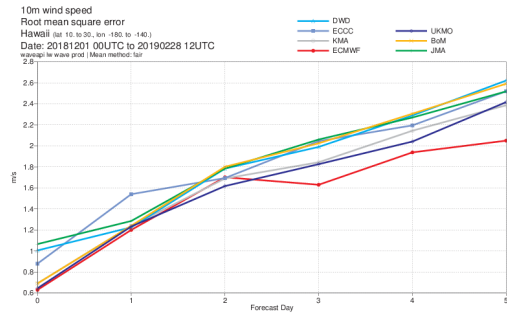
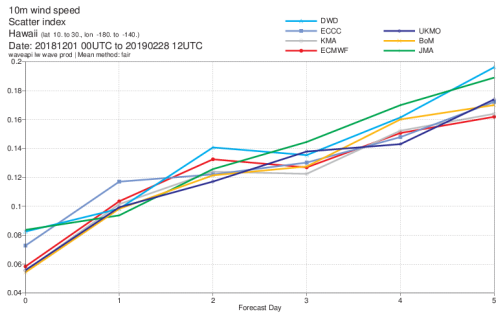
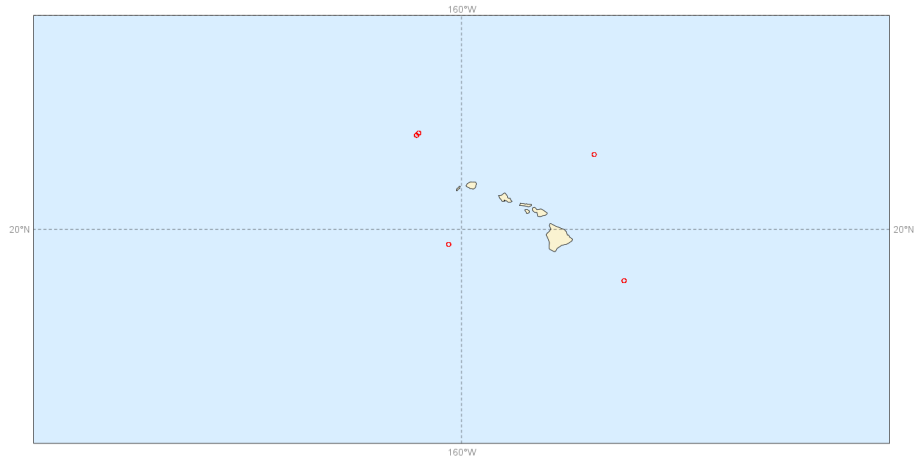


10m wind speed
Mean error
Gulf of Mexico (lat 17 to 31, lon -96 to -81)
Date: 20181201 00UTC to 20190228 12UTC
Average for area grid. Mean method. Sat



Gulf of Mexico. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20181201 to 20190228 - (10ff)



Hawaii. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).