

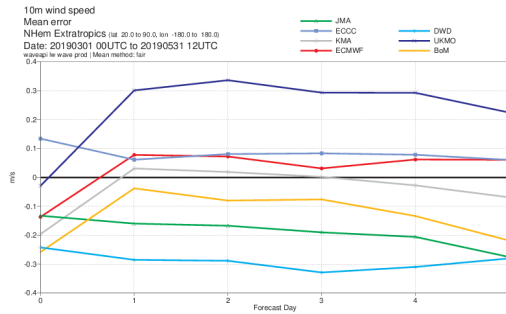
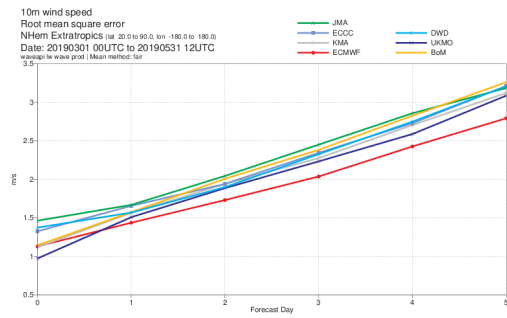
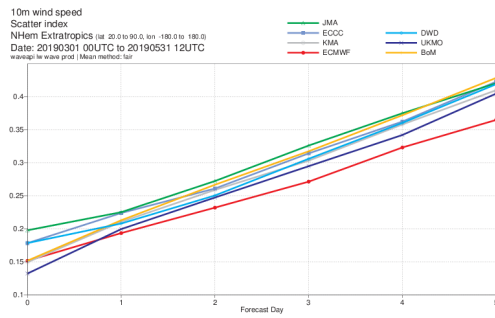
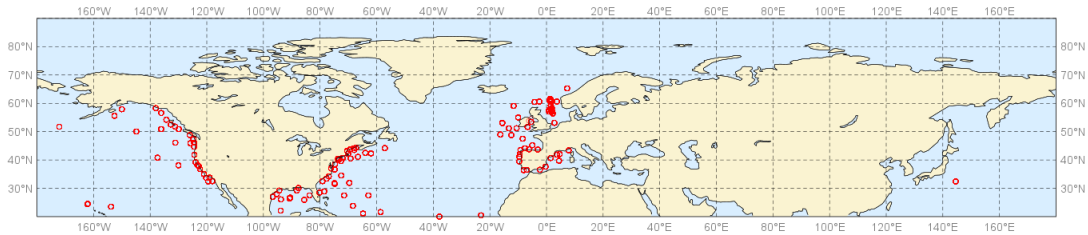
Intercomparison of operational wave forecasting systems against
in-situ observations: data from BoM, DMI, DWD, ECCO,
ECMWF, JMA, KMA, METEOAM, SHNSM, UKMO.

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

June 21, 2019

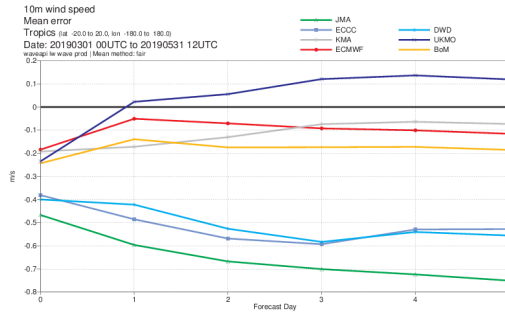
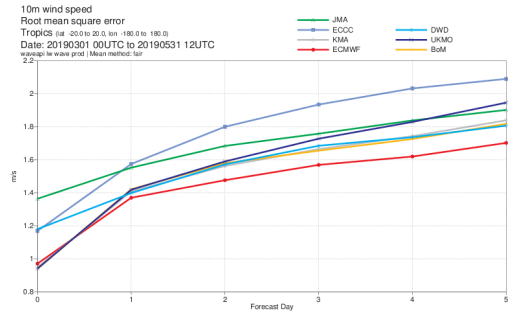
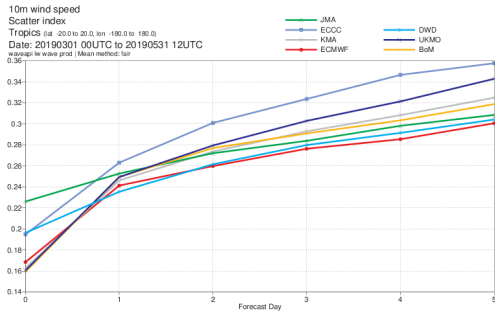
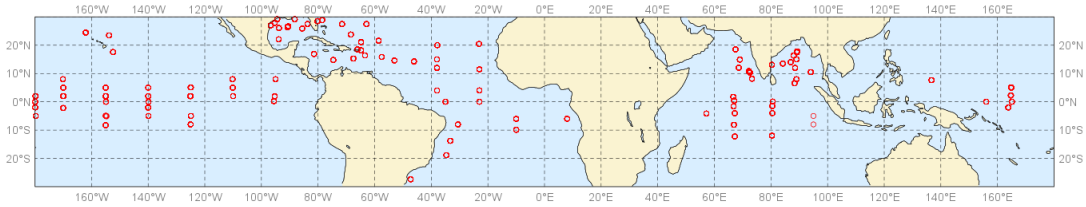
PART III: 10 meter wind speed (10ff)

Buoys observations - from 20190301 to 20190531 - (10ff)



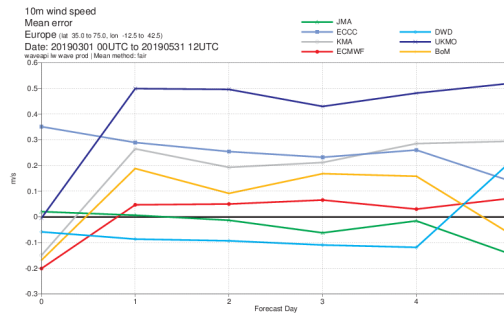
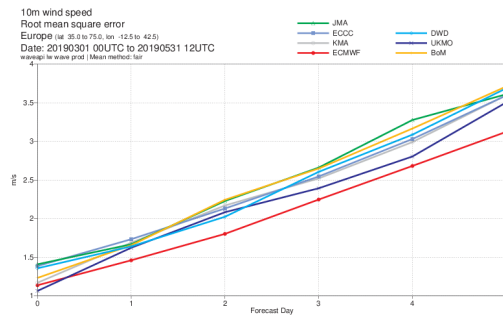
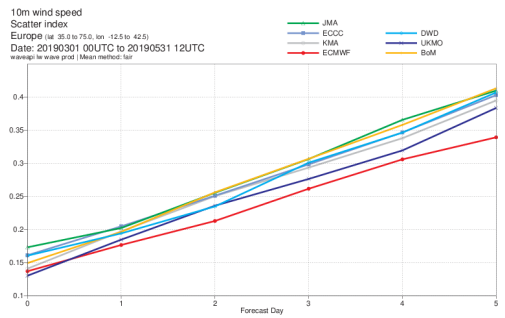
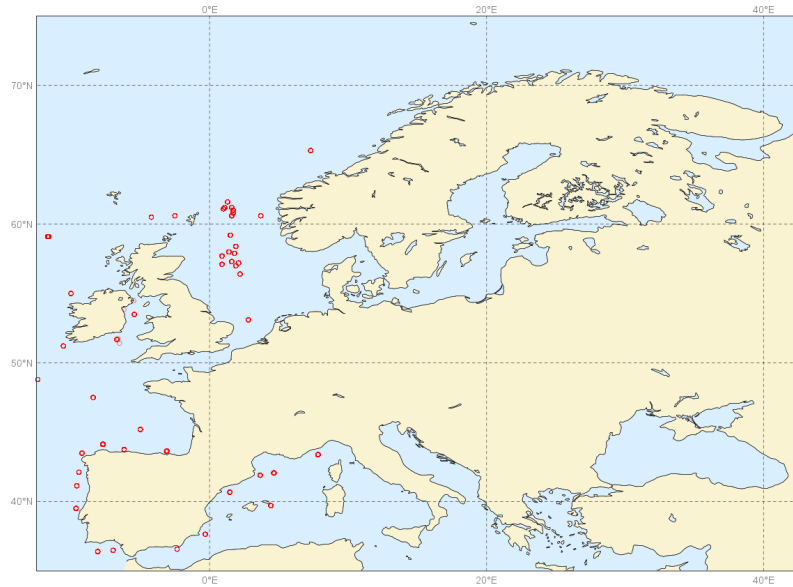
Northern Hemisphere. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20190301 to 20190531 - (10ff)



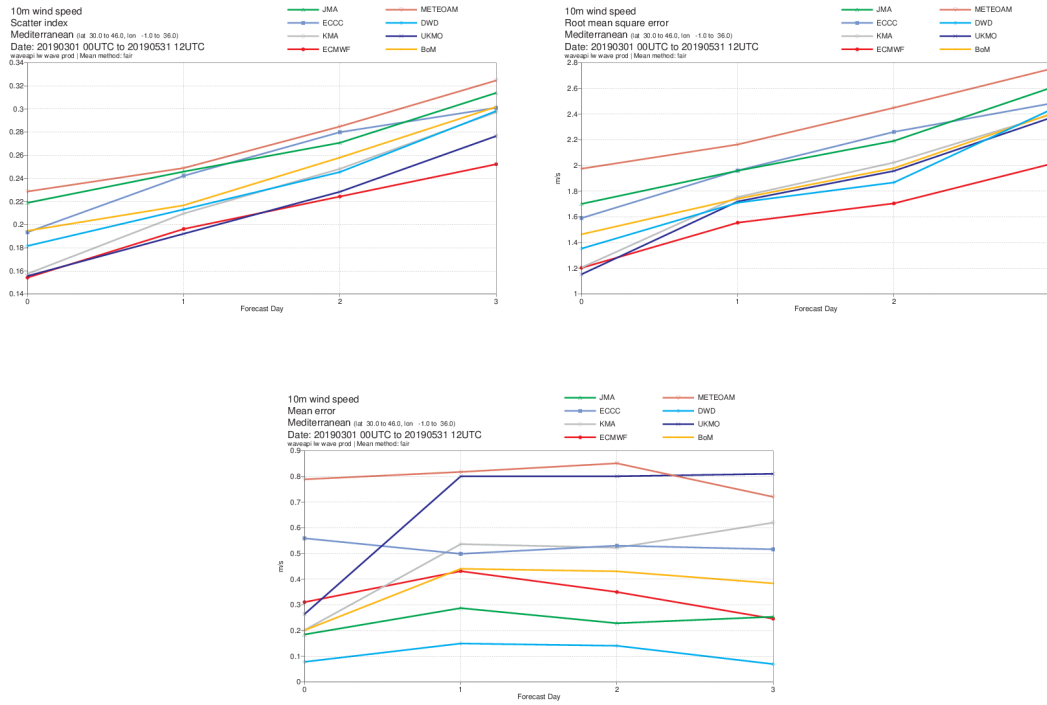
Tropics. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20190301 to 20190531 - (10ff)



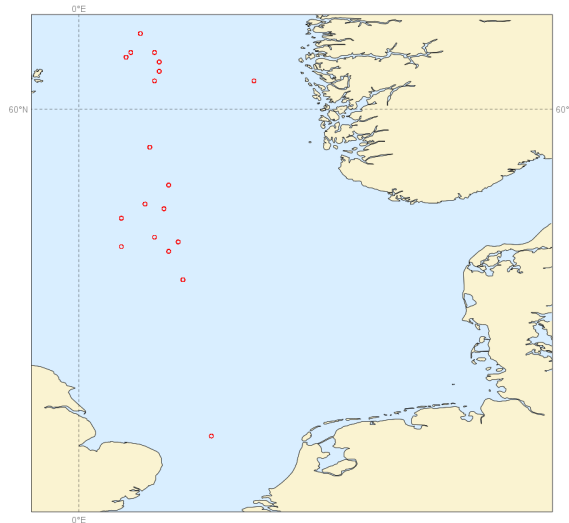
Europe. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20190301 to 20190531 - (10ff)

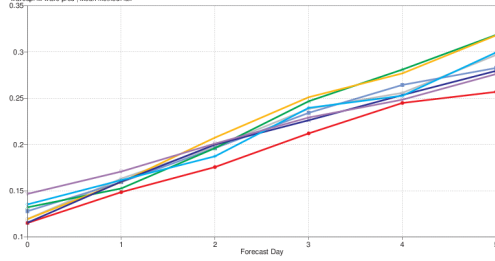


Mediterranean Sea. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

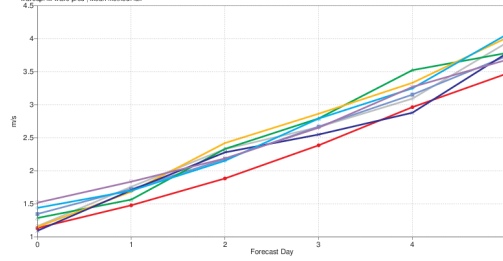
Buoys observations - from 20190301 to 20190531 - (10f)



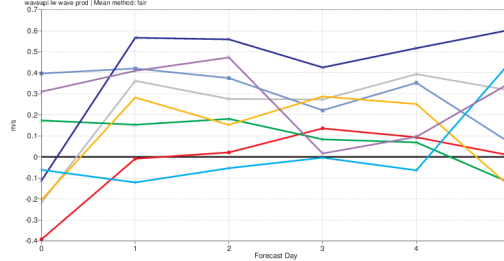
10m wind speed
Scatter index
North Sea (lat 51.5 to 62.0, lon -1.0 to 10.0)
Date: 20190301 00UTC to 20190531 12UTC
wrapup: le wave prod | Mean method: tar



10m wind speed
Root mean square error
North Sea (lat 51.5 to 62.0, lon -1.0 to 10.0)
Date: 20190301 00UTC to 20190531 12UTC
wrapup: le wave prod | Mean method: tar

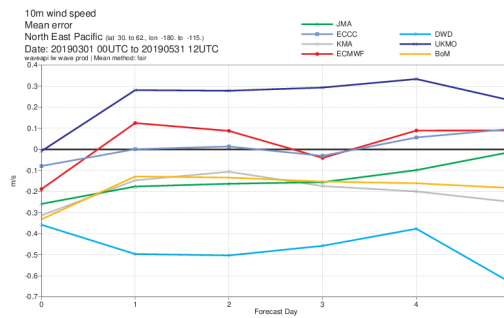
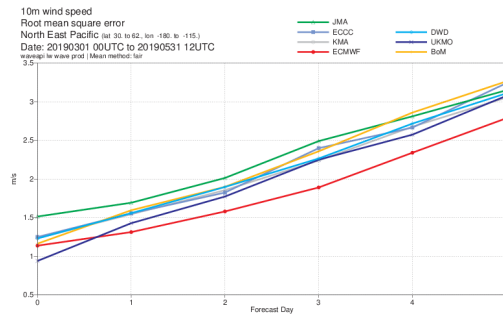
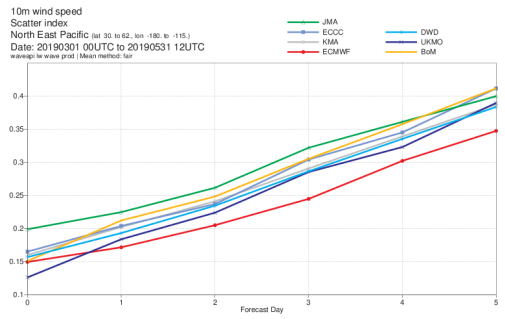
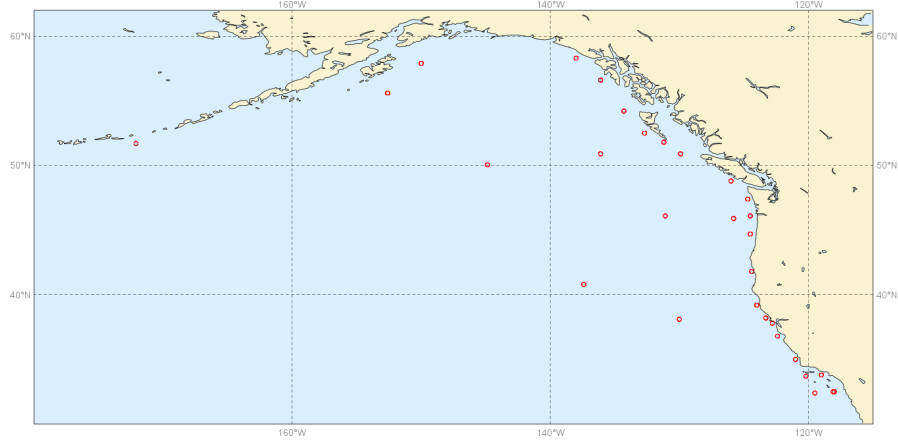


10m wind speed
Mean error
North Sea (lat 51.5 to 62.0, lon -1.0 to 10.0)
Date: 20190301 00UTC to 20190531 12UTC
wrapup: le wave prod | Mean method: tar



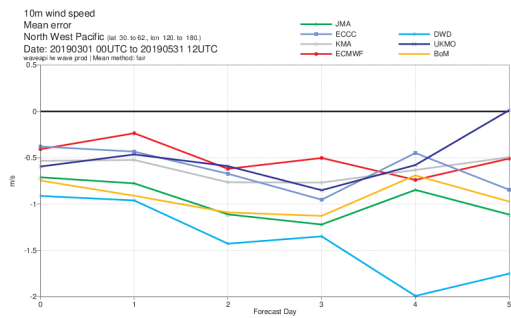
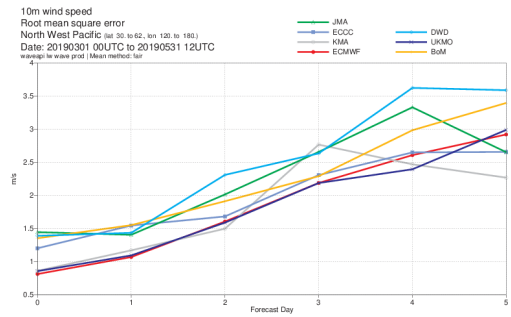
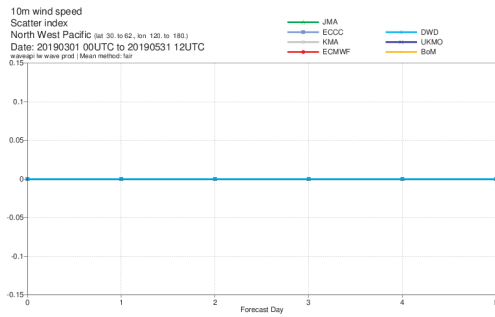
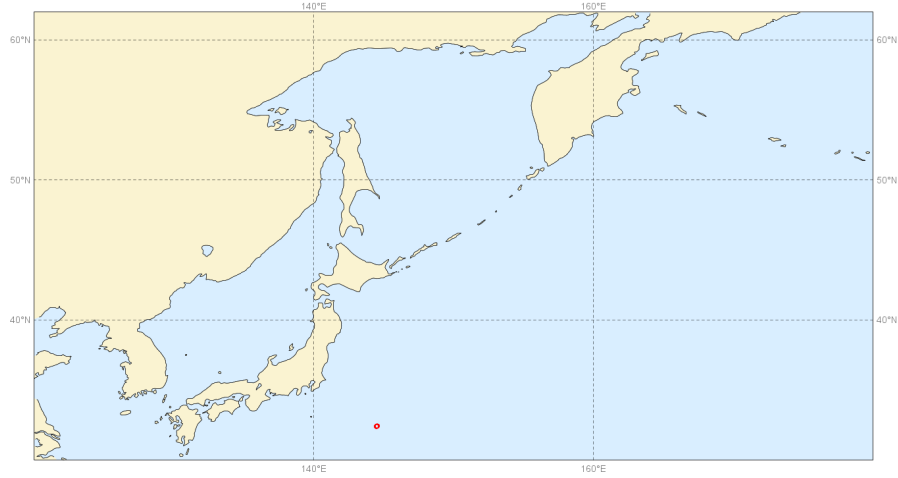
North Sea. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20190301 to 20190531 - (10ff)



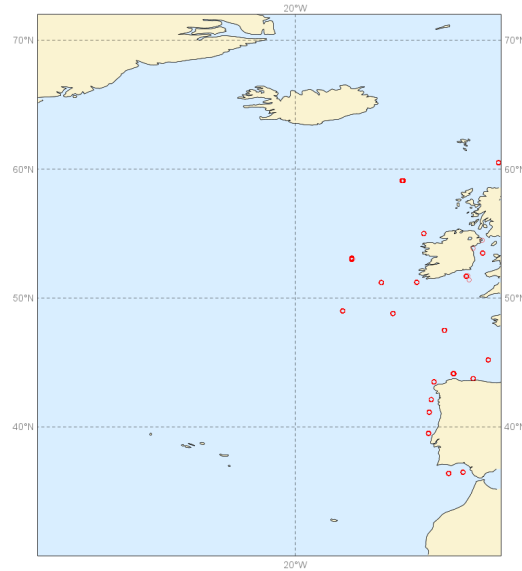
North East Pacific. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20190301 to 20190531 - (10ff)

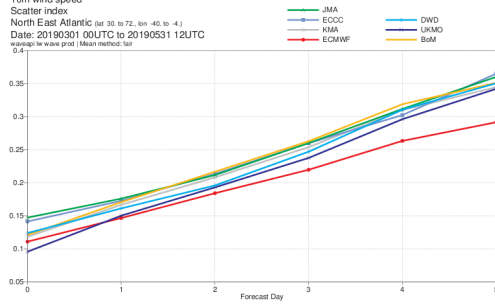


North West Pacific. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

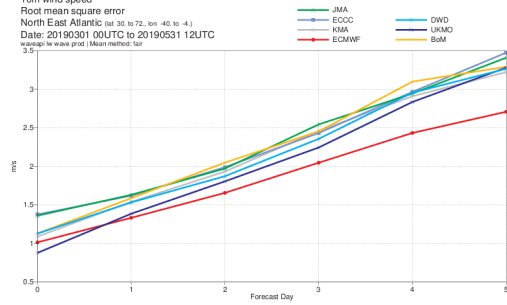
Buoys observations - from 20190301 to 20190531 - (10ff)



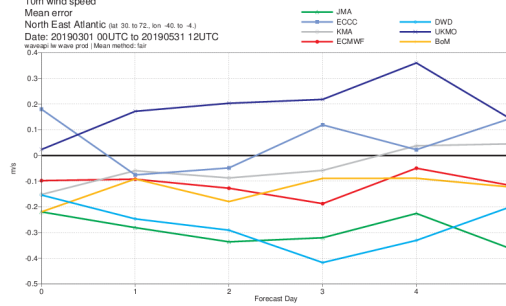
10m wind speed
Scatter index
North East Atlantic (lat 30 to 72, lon -40 to -4)
Date: 20190301 00UTC to 20190531 12UTC
average for every grid. Mean method: last



10m wind speed
Root mean square error
North East Atlantic (lat 30 to 72, lon -40 to -4)
Date: 20190301 00UTC to 20190531 12UTC
average for every grid. Mean method: last

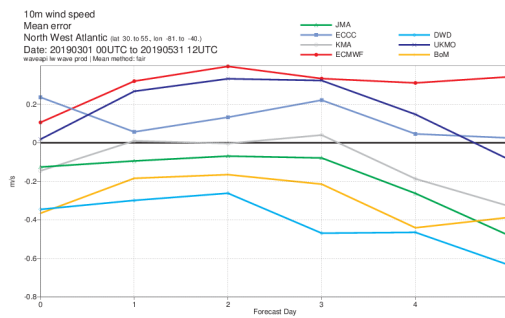
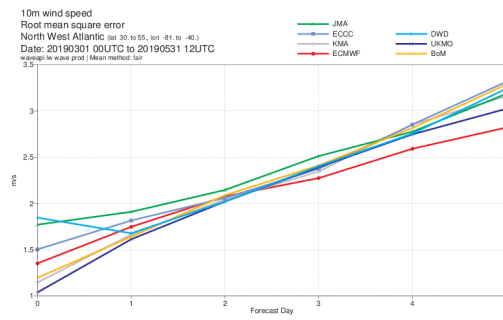
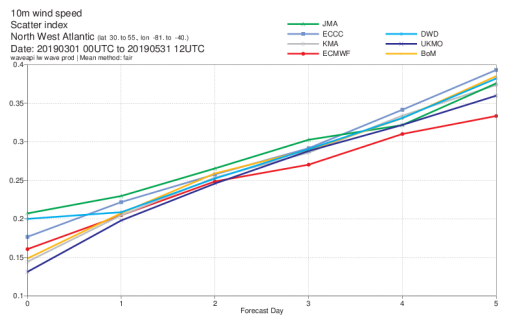
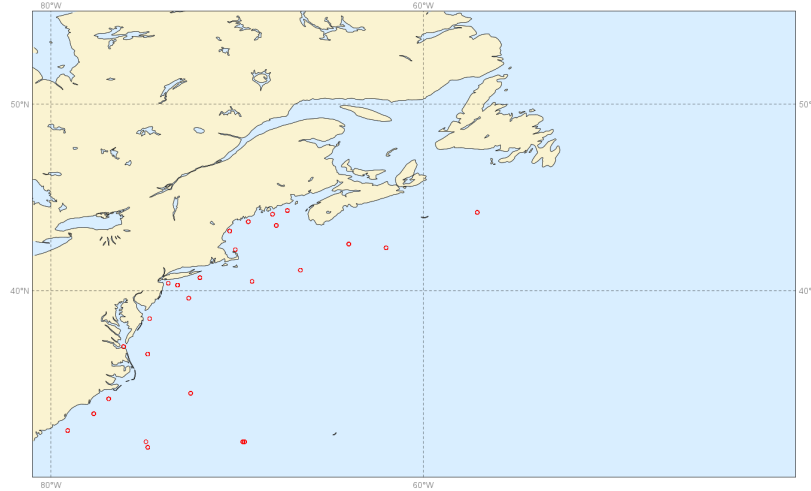


10m wind speed
Mean error
North East Atlantic (lat 30 to 72, lon -40 to -4)
Date: 20190301 00UTC to 20190531 12UTC
average for every grid. Mean method: last



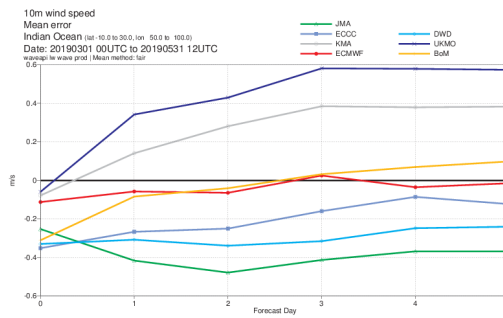
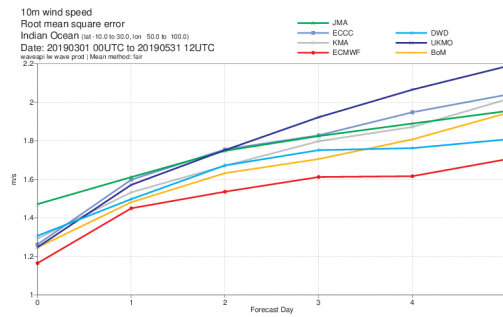
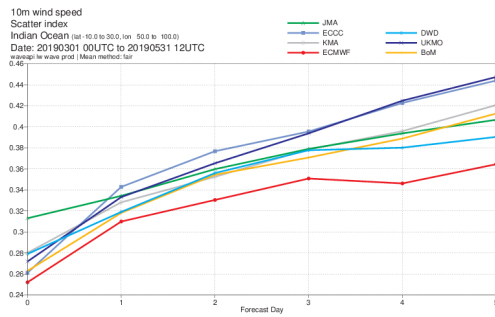
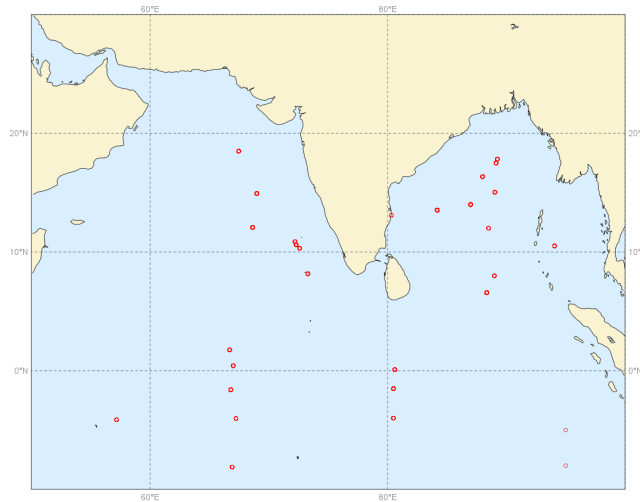
North East Atlantic. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20190301 to 20190531 - (10ff)



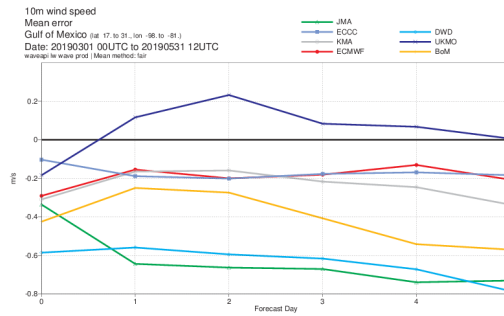
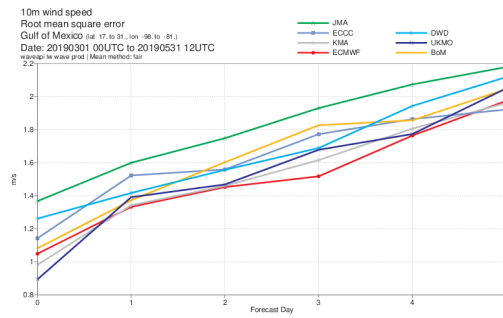
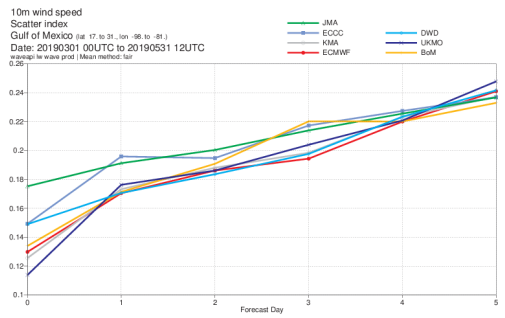
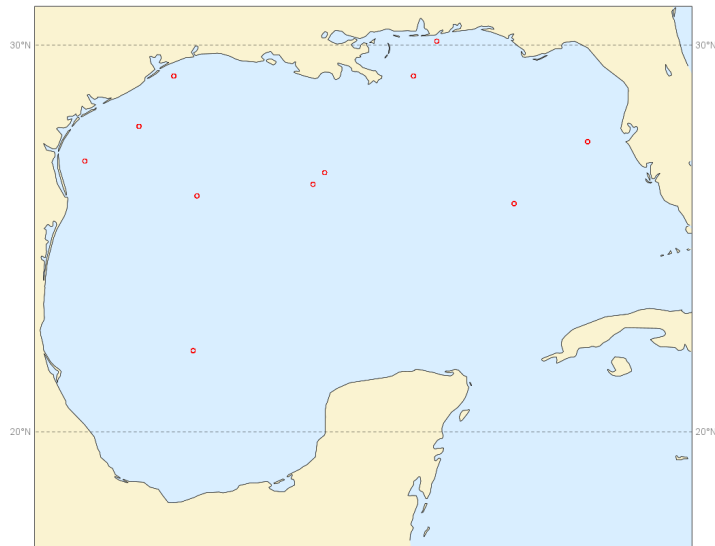
North West Atlantic. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20190301 to 20190531 - (10ff)



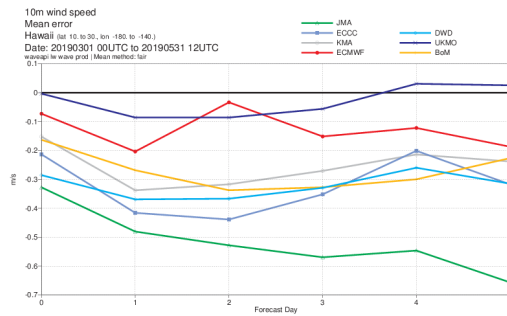
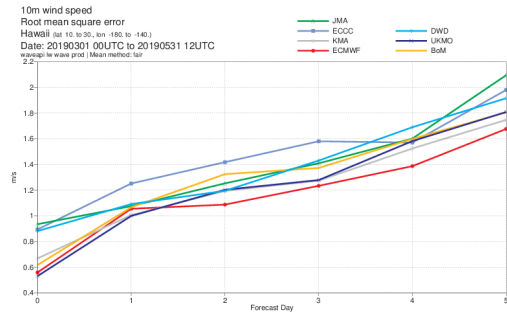
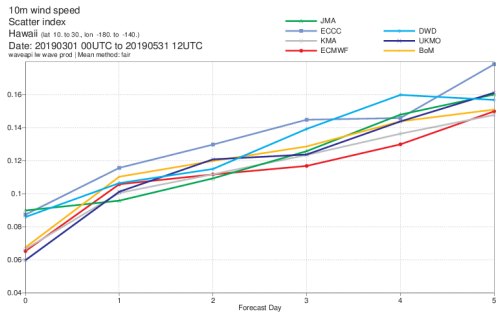
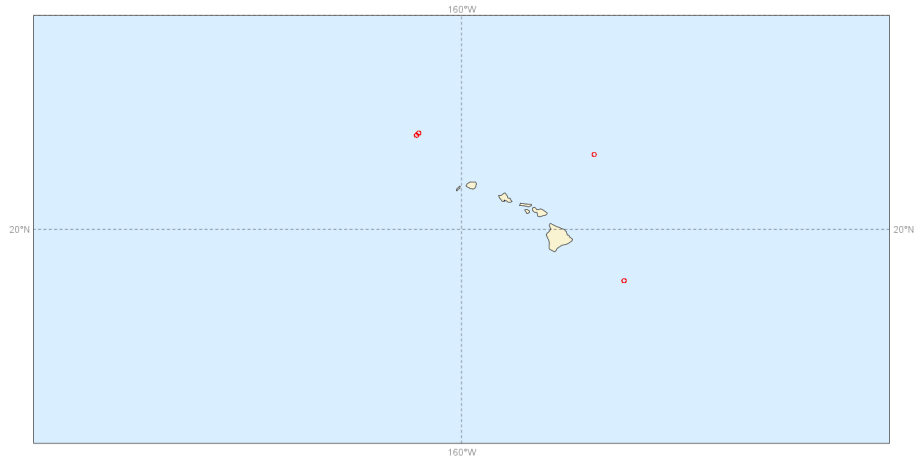
Indian Ocean. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20190301 to 20190531 - (10ff)



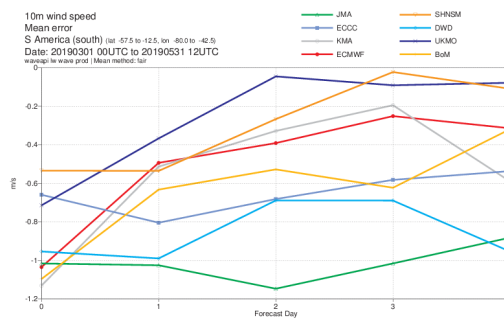
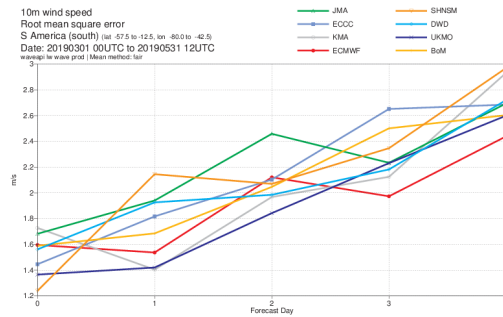
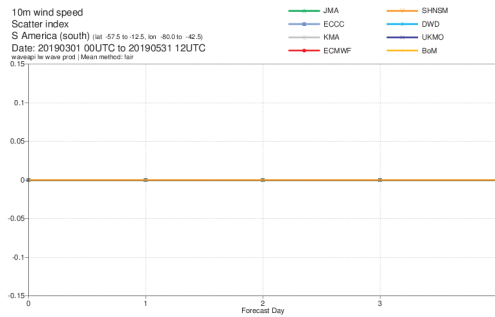
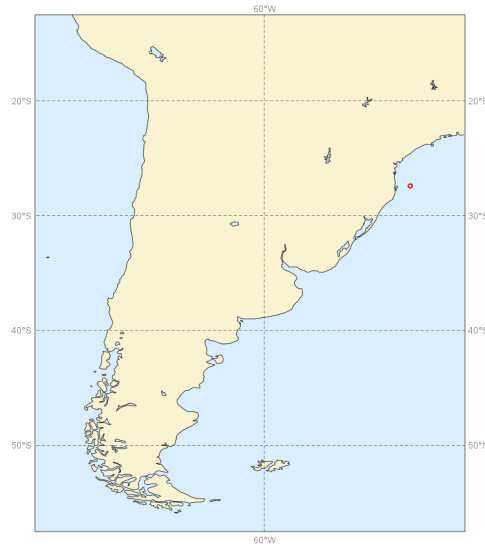
Gulf of Mexico. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20190301 to 20190531 - (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).

Buoys observations - from 20190301 to 20190531 - (10ff)



South of South America. 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).