

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

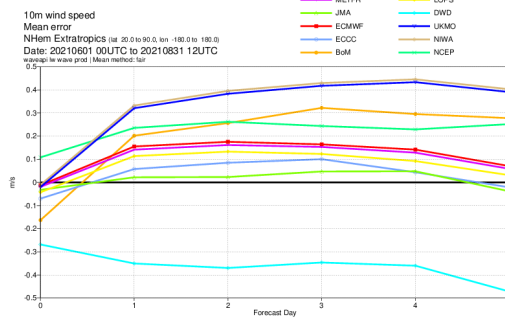
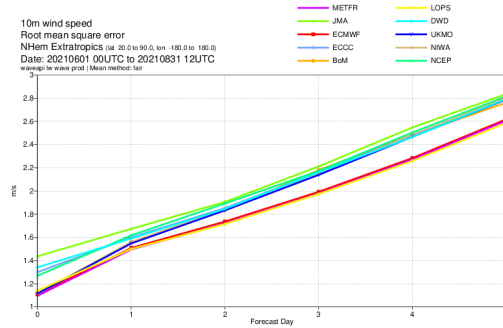
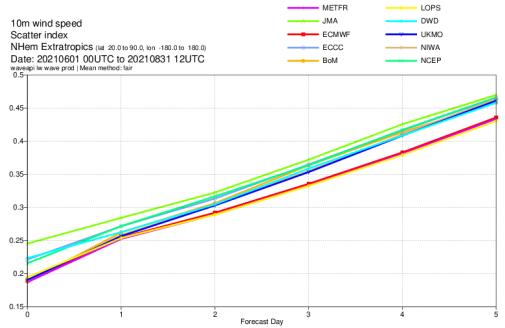
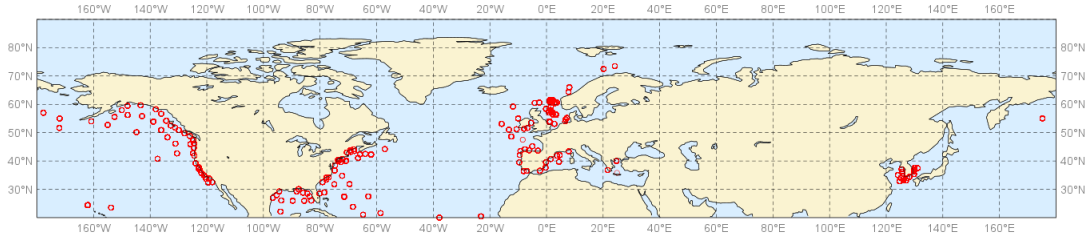
00 and 12 UTC runs

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

September 14, 2021

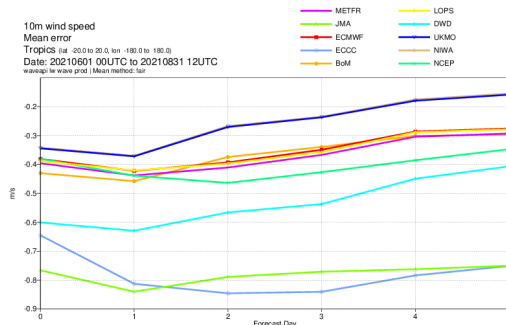
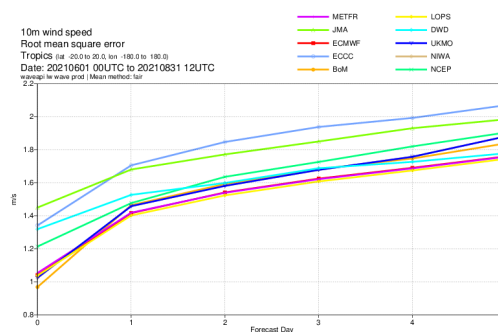
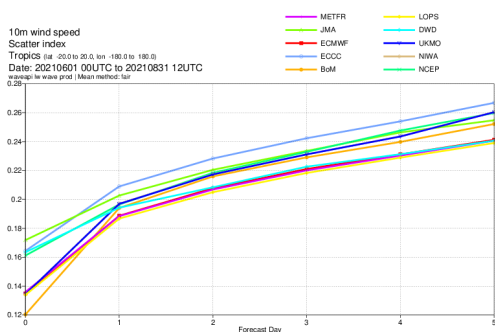
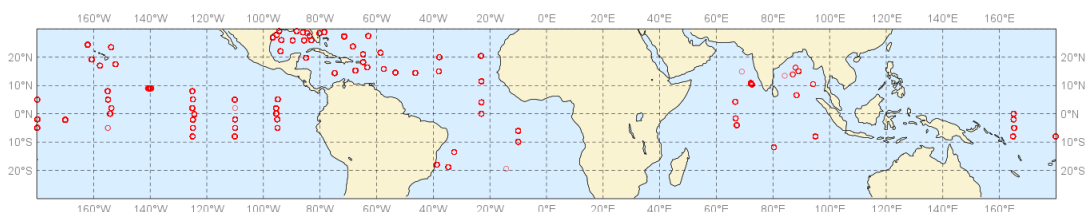
PART III: 10 meter wind speed (10ff)

Buoys observations - from 20210601 to 20210831 - (10ff)



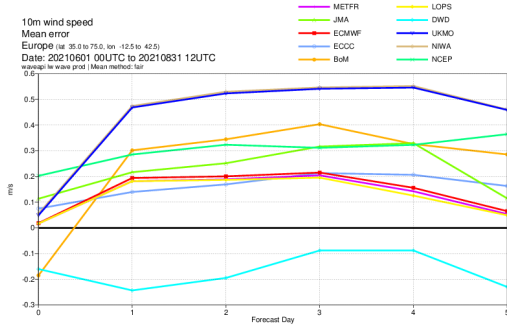
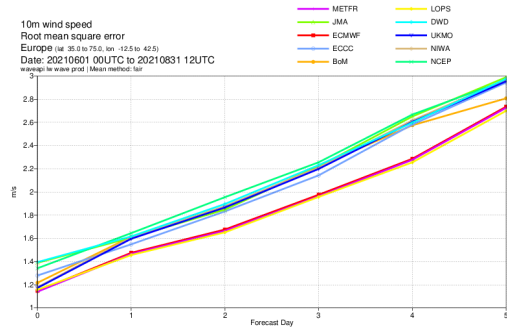
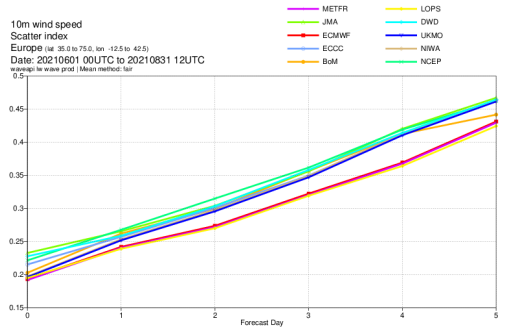
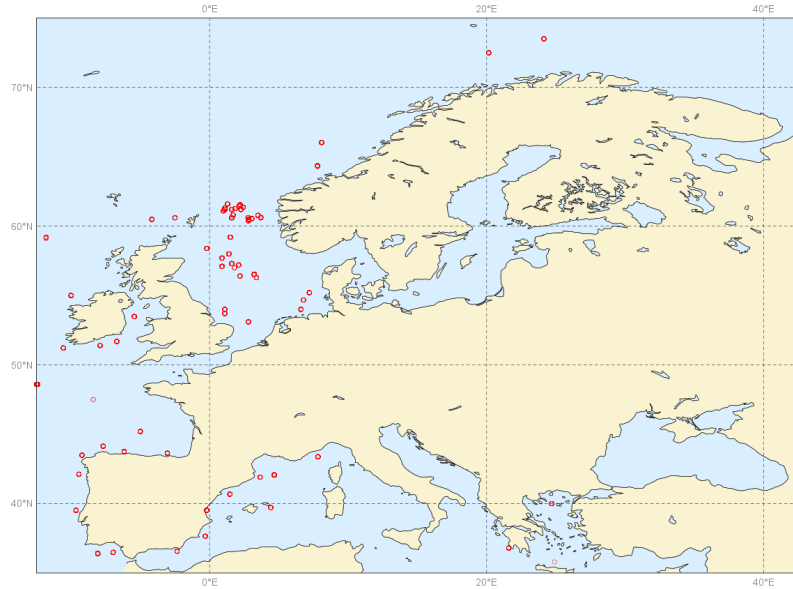
Northern Hemisphere. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20210601 to 20210831 - (10ff)



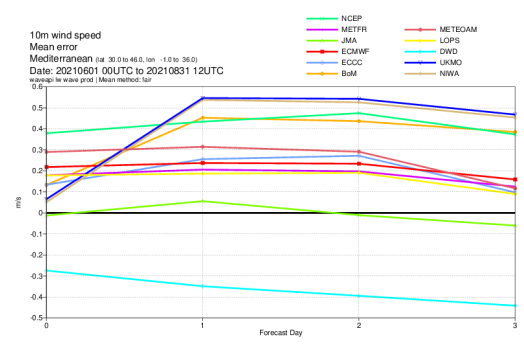
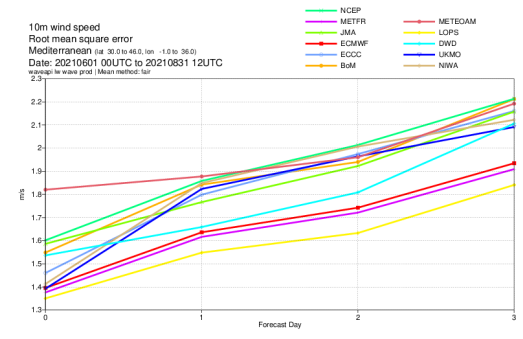
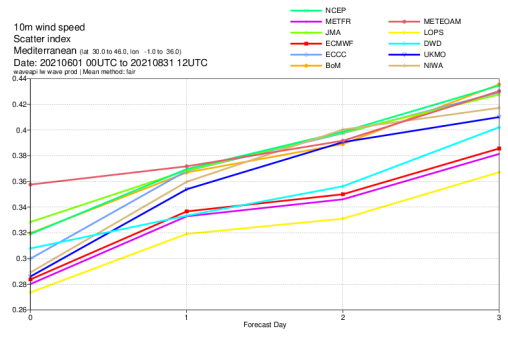
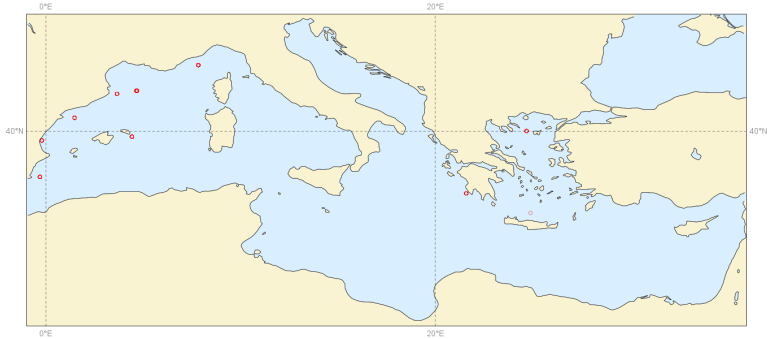
Tropics. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20210601 to 20210831 - (10ff)



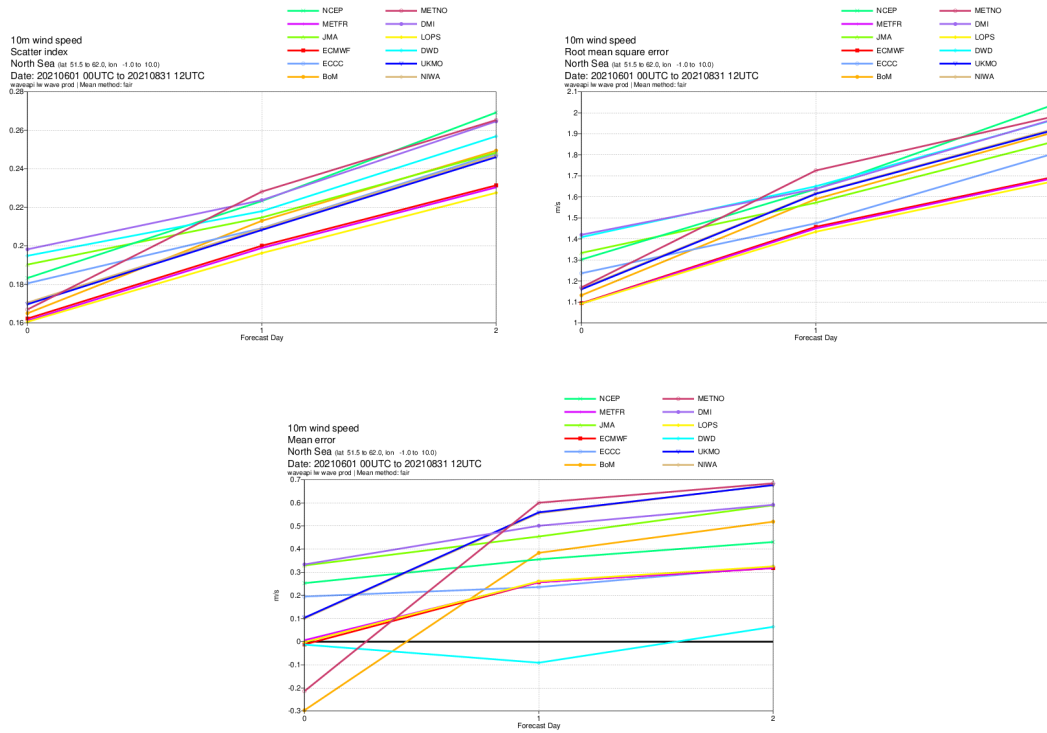
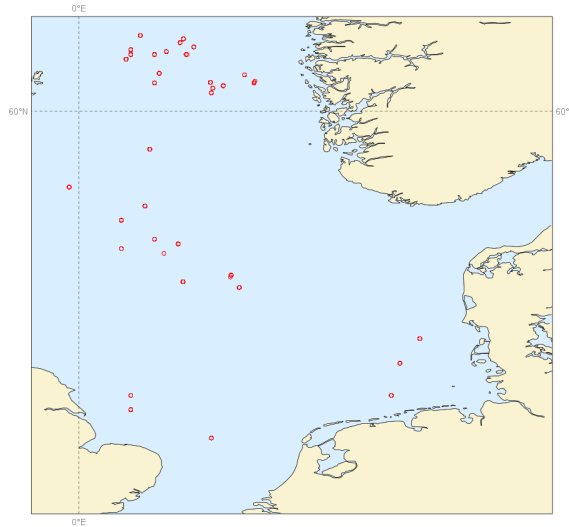
Europe. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20210601 to 20210831 - (10ff)



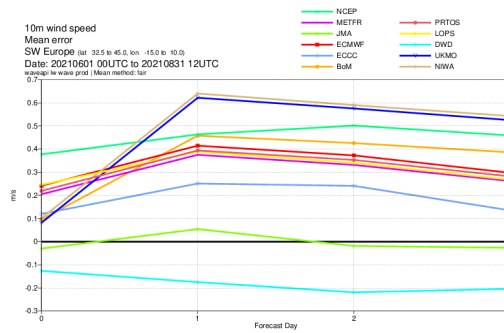
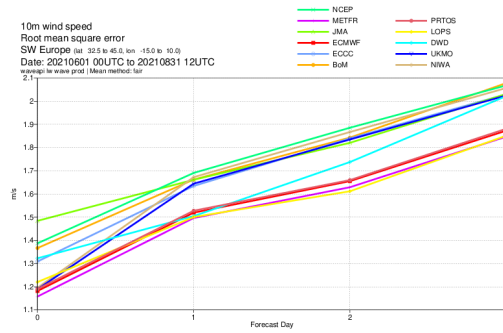
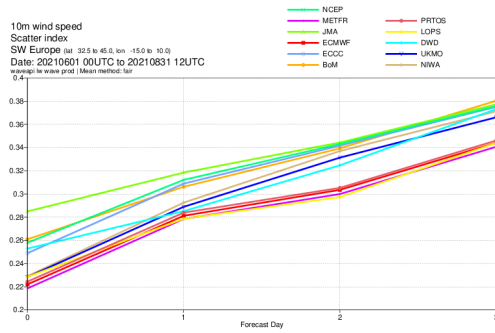
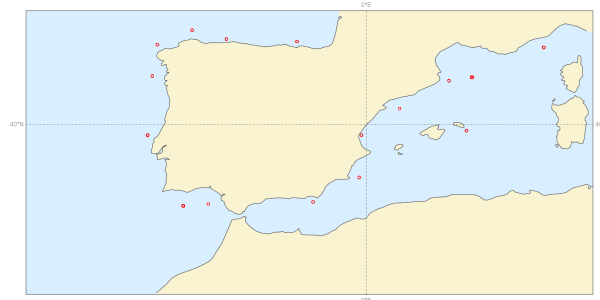
Mediterranean Sea. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20210601 to 20210831 - (10ff)



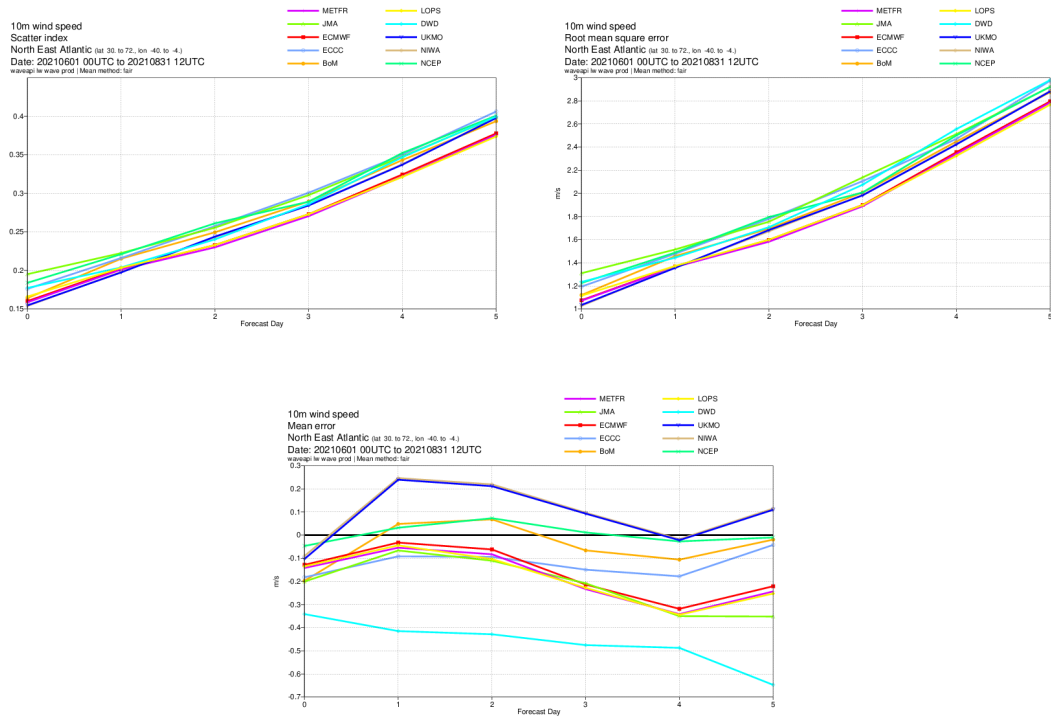
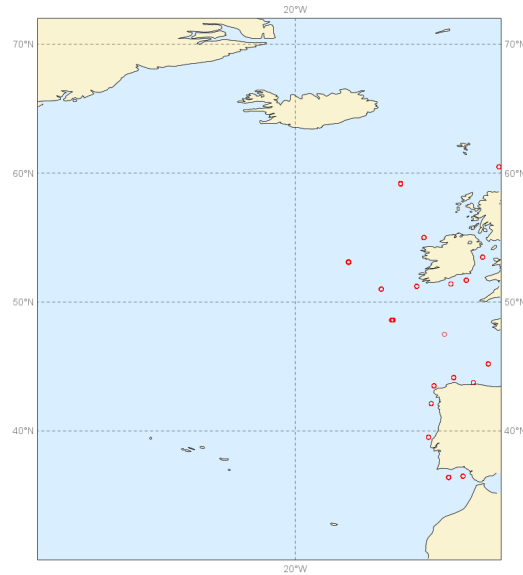
North Sea. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20210601 to 20210831 - (10ff)



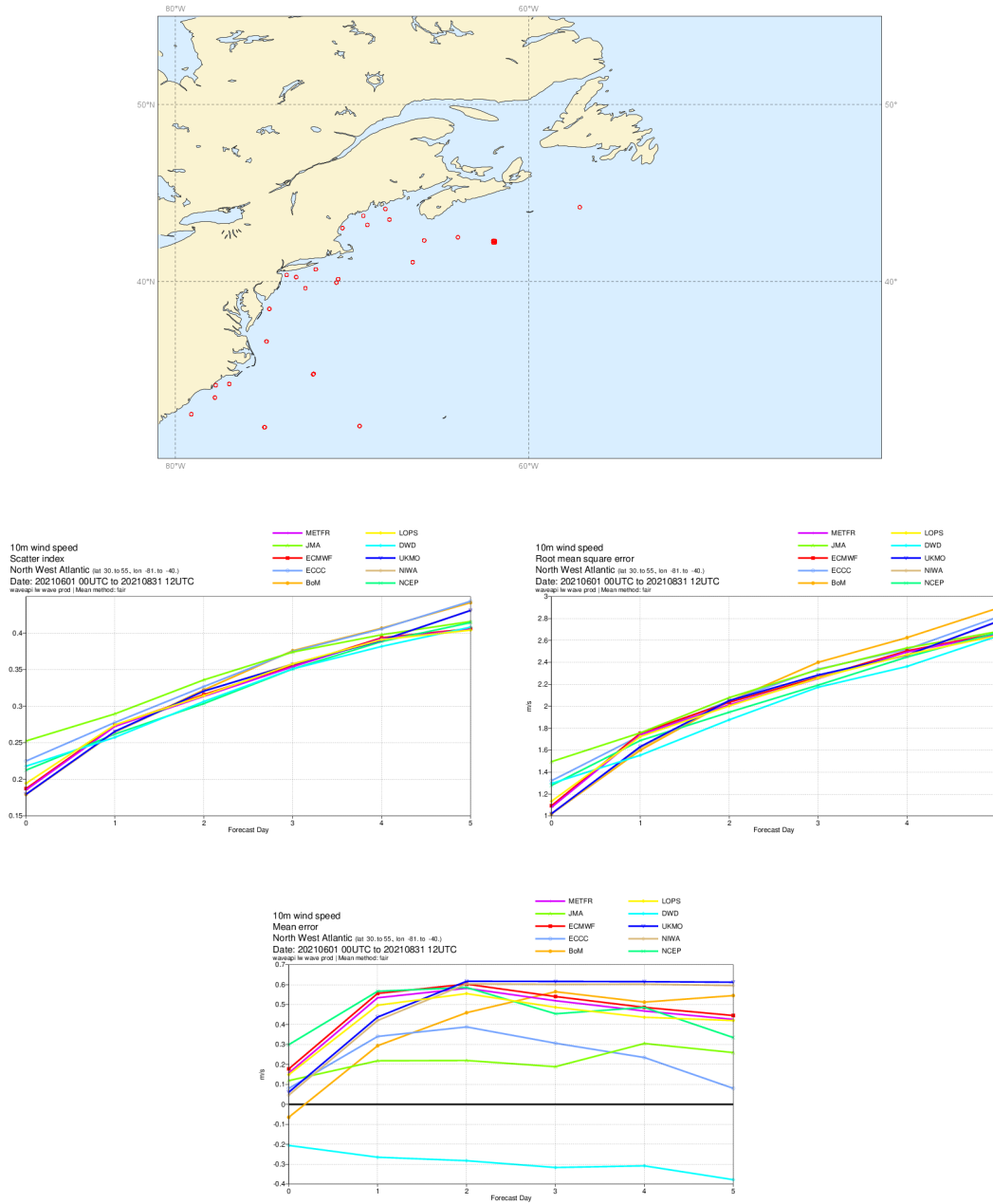
South West Europe. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20210601 to 20210831 - (10ff)



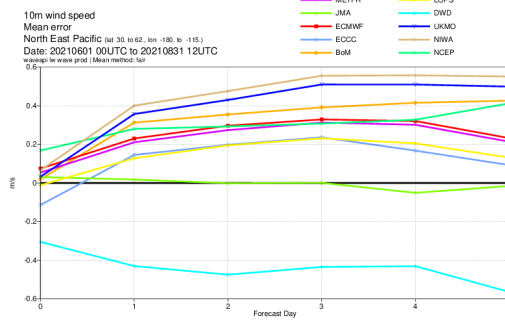
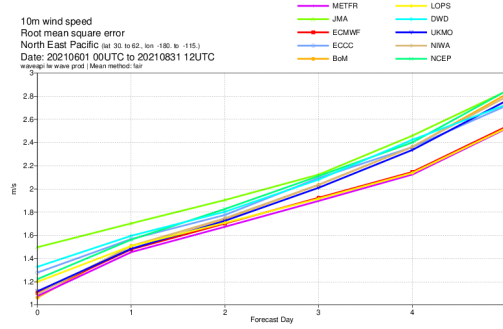
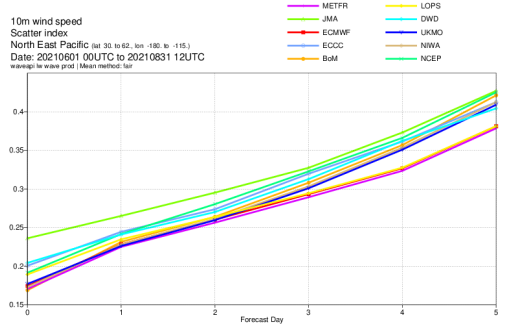
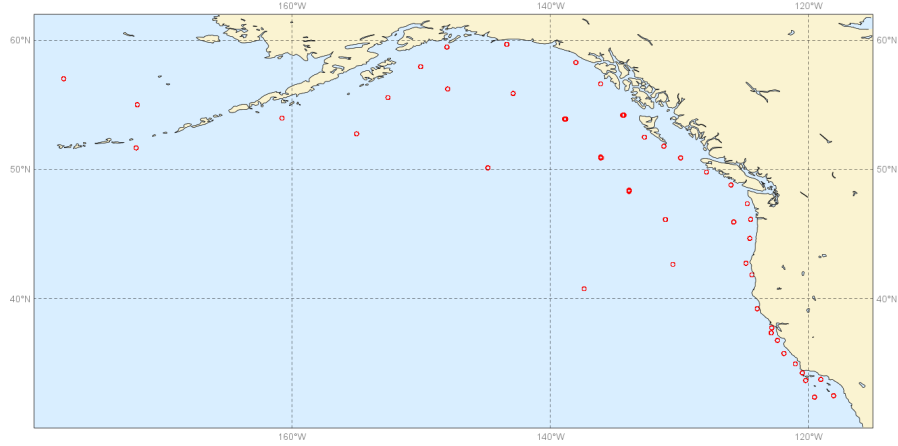
North East Atlantic. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20210601 to 20210831 - (10ff)



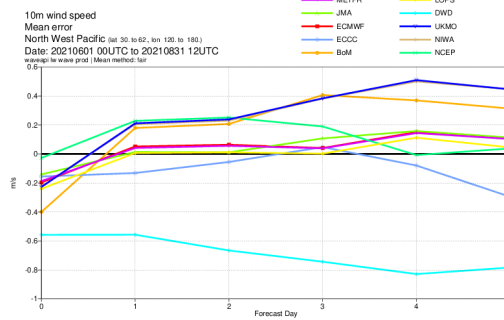
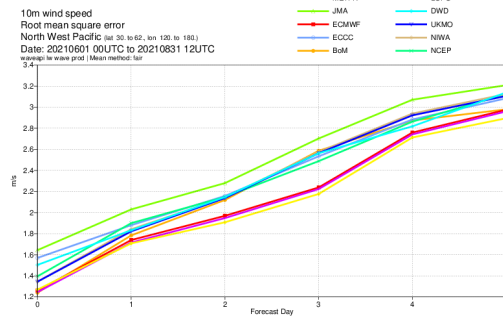
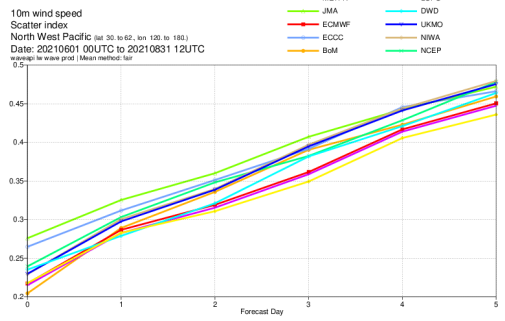
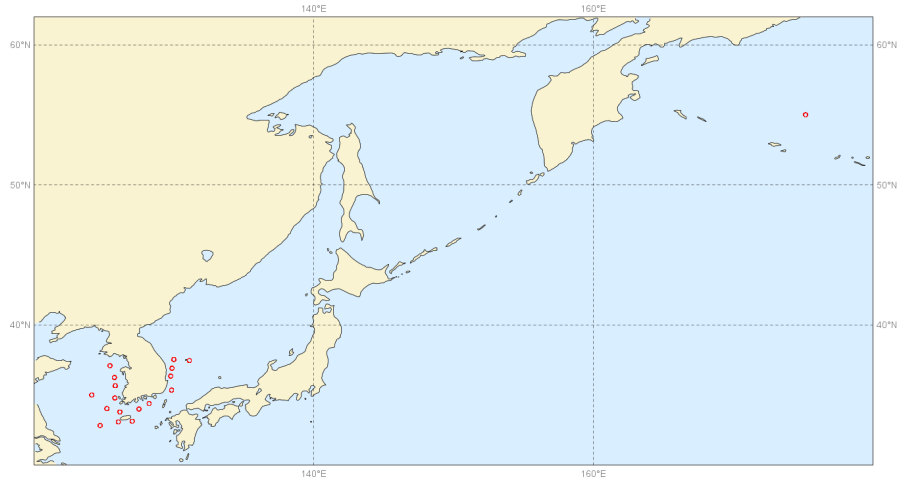
North West Atlantic. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20210601 to 20210831 - (10ff)



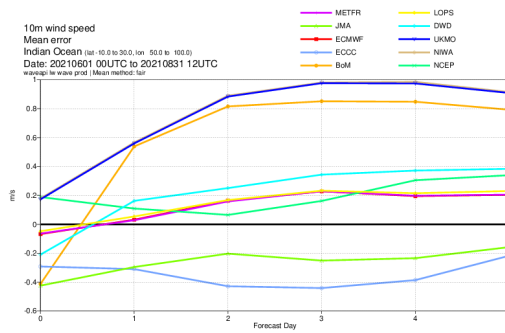
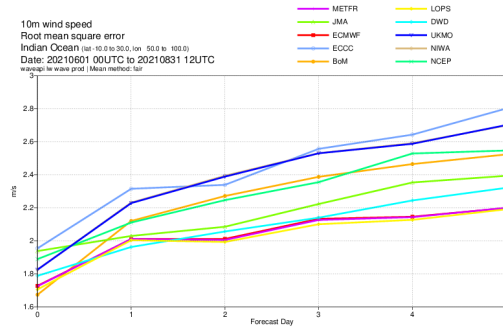
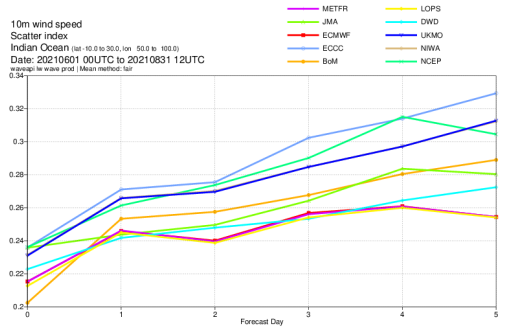
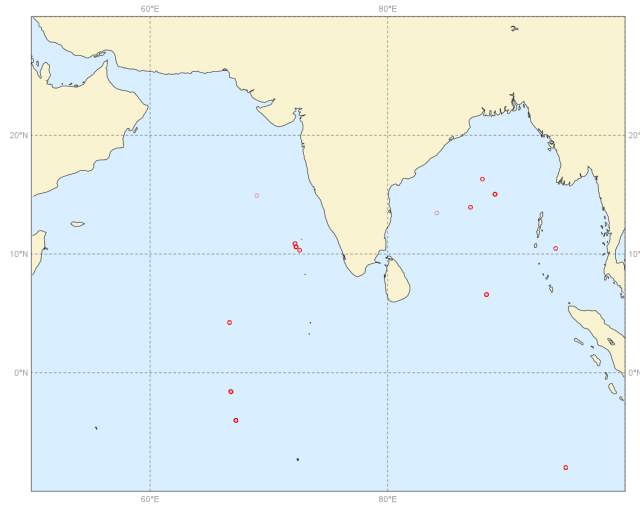
North East Pacific. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20210601 to 20210831 - (10ff)



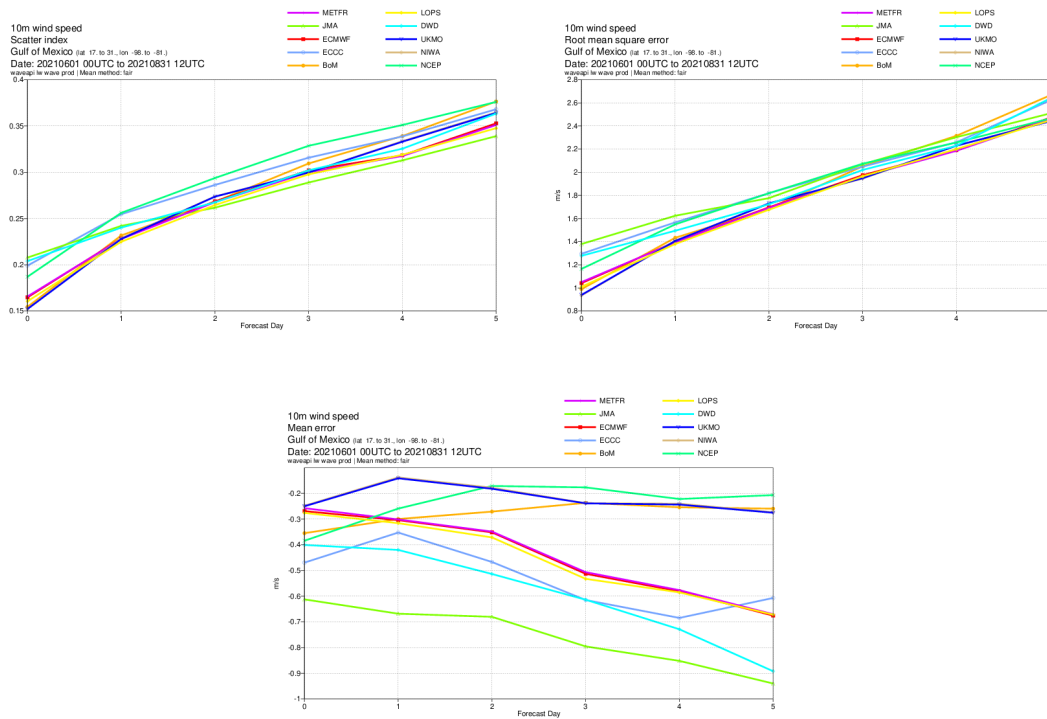
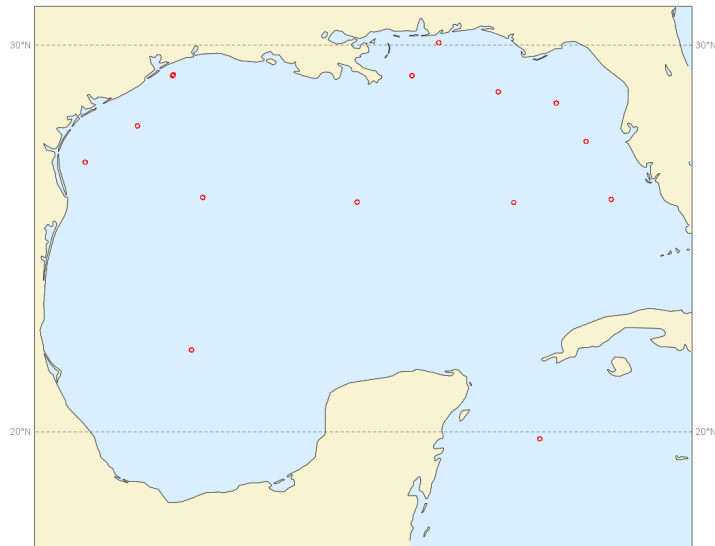
North West Pacific. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20210601 to 20210831 - (10ff)



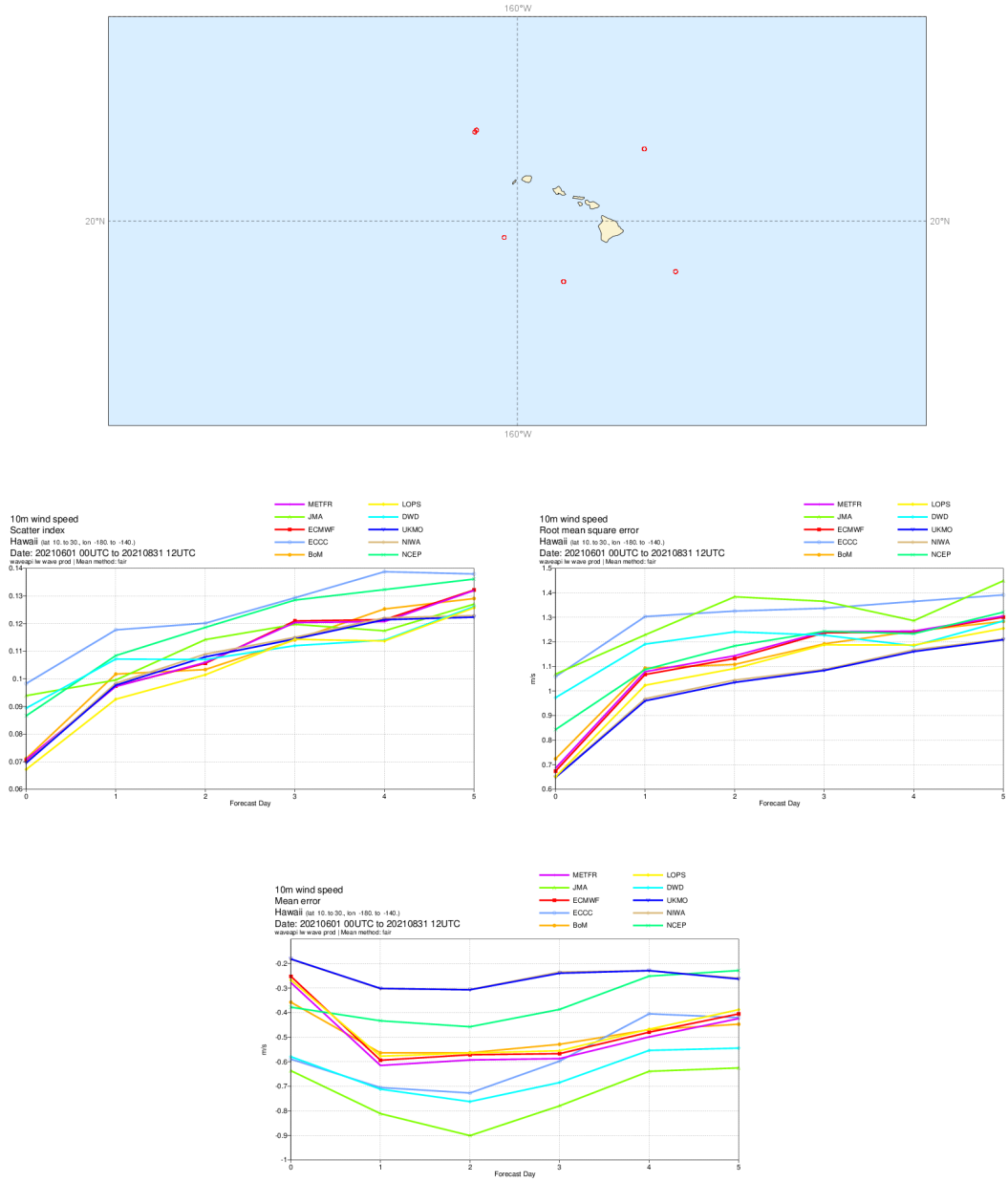
Indian Ocean. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20210601 to 20210831 - (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 20210601 to 20210831 - (10ff)

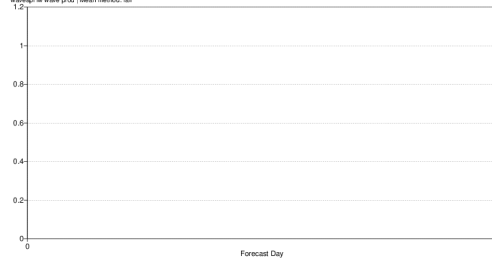


Hawaii. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

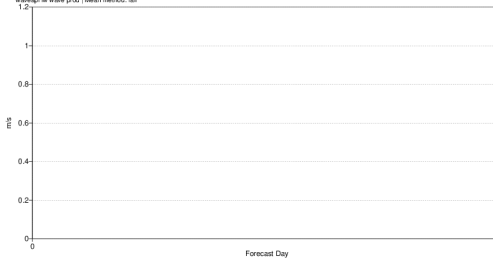
Buoys observations - from 20210601 to 20210831 - (10ff)



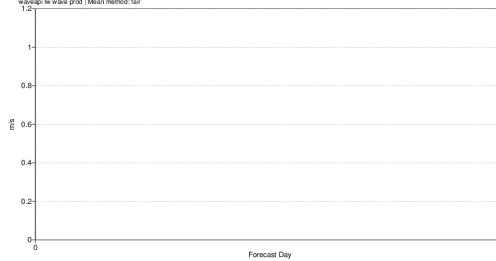
10m wind speed
Scatter index
S America (south) (lat -57.5 to -12.5, lon -80.0 to -42.5)
Date: 20210601 00UTC to 20210831 12UTC
Average for every grid. Mean method. lat



10m wind speed
Root mean square error
S America (south) (lat -57.5 to -12.5, lon -80.0 to -42.5)
Date: 20210601 00UTC to 20210831 12UTC
Average for every grid. Mean method. lat

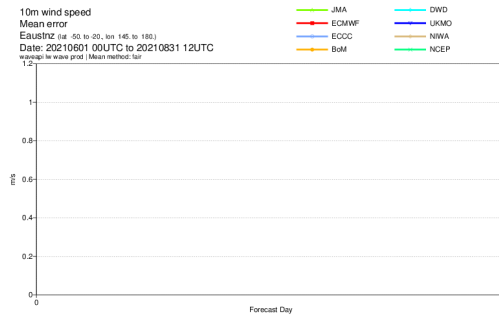
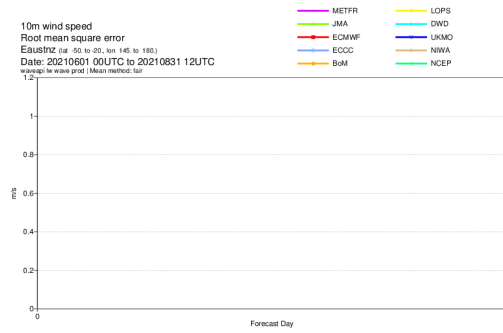
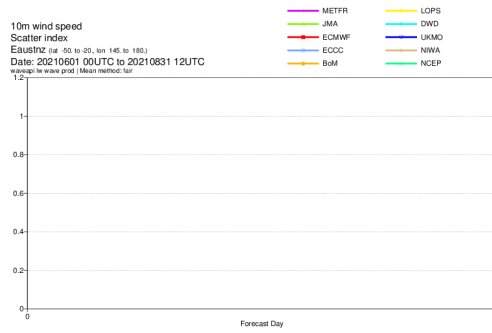
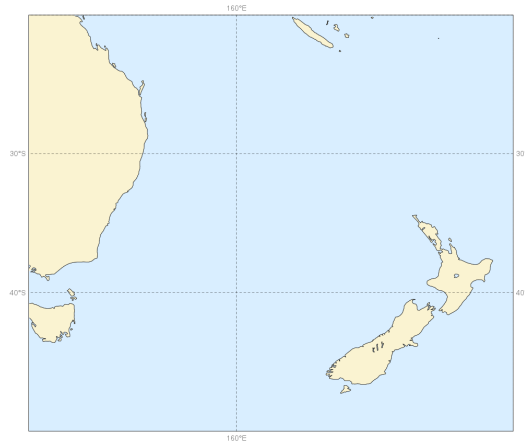


10m wind speed
Mean error
S America (south) (lat -57.5 to -12.5, lon -80.0 to -42.5)
Date: 20210601 00UTC to 20210831 12UTC
Average for every grid. Mean method. lat



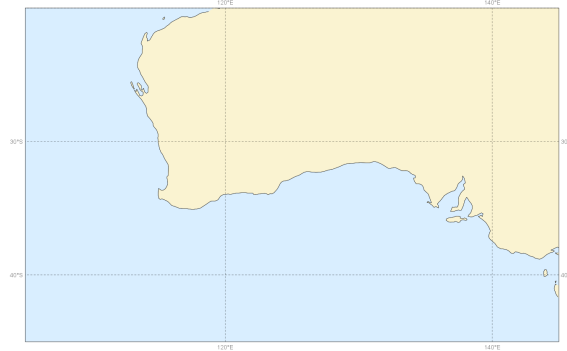
South of South America. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

Buoys observations - from 20210601 to 20210831 - (10ff)

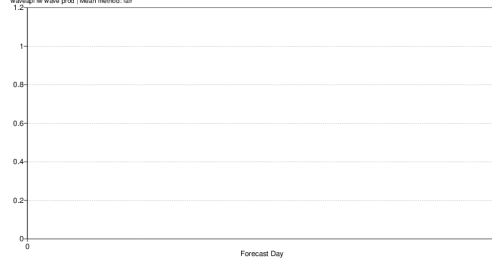


East Australia - New Zealand. Top panel: observation distribution. Middle left panel: Forecast scatter index (standard deviation of the difference normalised by the mean of the observations). Middle right panel: Forecast root mean square error (RMSE). Bottom panel: forecast mean error (bias).

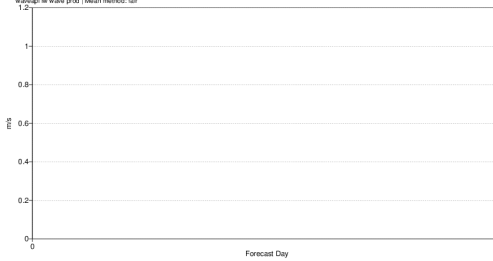
Buoys observations - from 20210601 to 20210831 - (10ff)



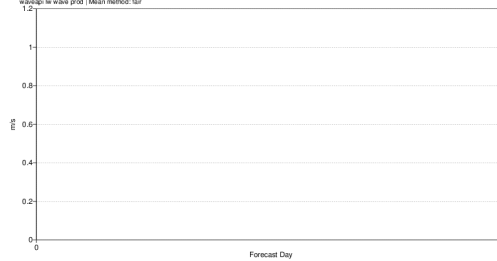
10m wind speed
Scatter index
Ssw.australia (lat 45 to 30, lon 105 to 145)
Date: 20210601 00UTC to 20210831 12UTC
wspaq: lr wave prod | Mean method: tar



10m wind speed
Root mean square error
Ssw.australia (lat 45 to 30, lon 105 to 145)
Date: 20210601 00UTC to 20210831 12UTC
wspaq: lr wave prod | Mean method: tar



10m wind speed
Mean error
Ssw.australia (lat 45 to 30, lon 105 to 145)
Date: 20210601 00UTC to 20210831 12UTC
wspaq: lr wave prod | Mean method: tar



South South West Australia. 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).