

Use of ECMWF products for:

- Weatherrouting
- Offshore forecasting
- Strategy weatherrouting

by

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Maritime Service

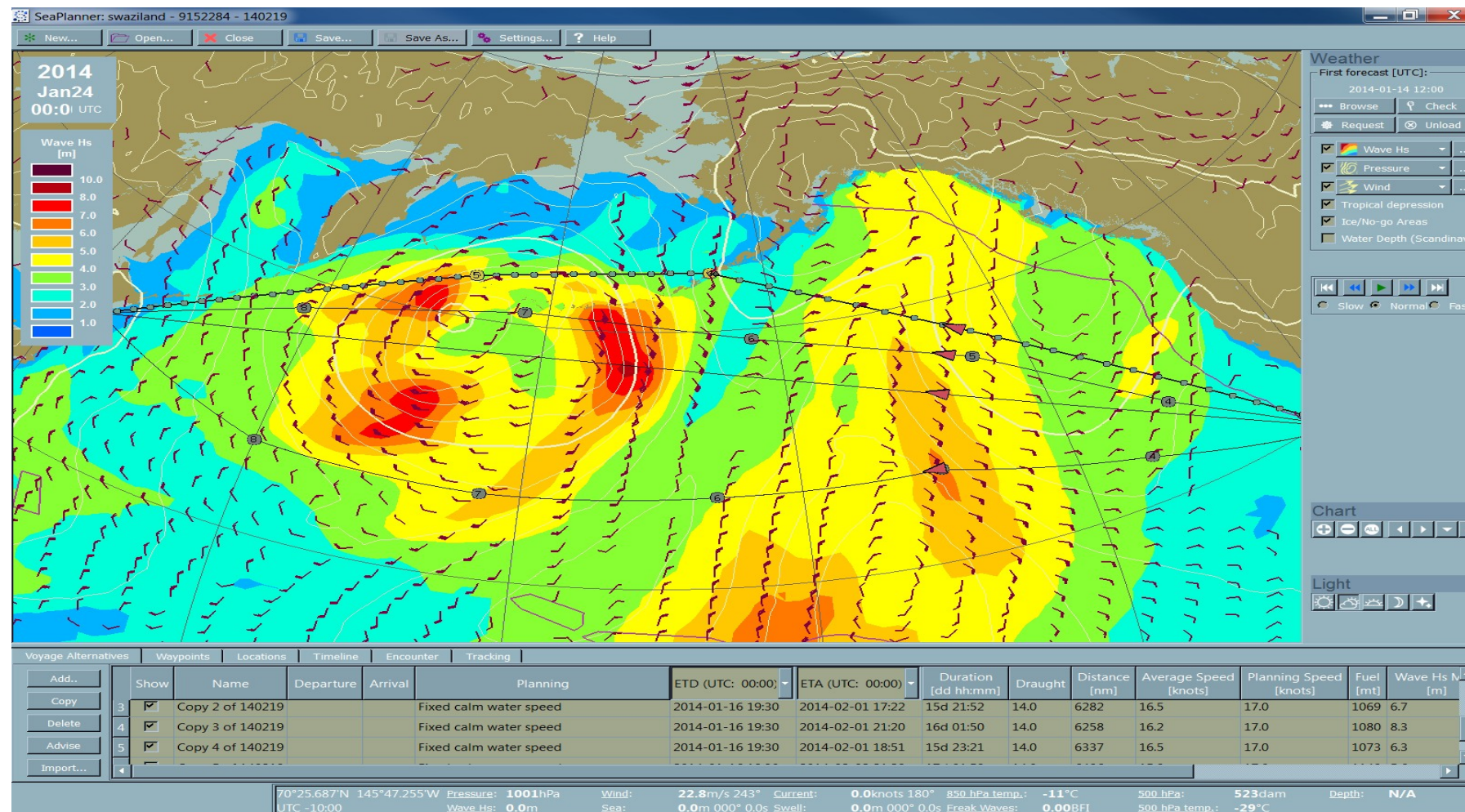
**Danish Meteorological Institute
(DMI)**

DMI provides meteorological services in the Commonwealth of the Realm of Denmark, the Faroe Islands, Greenland, and surrounding waters and airspace.

Maritime Service is a commercial section of DMI, working worldwide. Most of our customers is in the shipping and energy industry



ECMWFs deterministic forecast is used in our routeing planning program

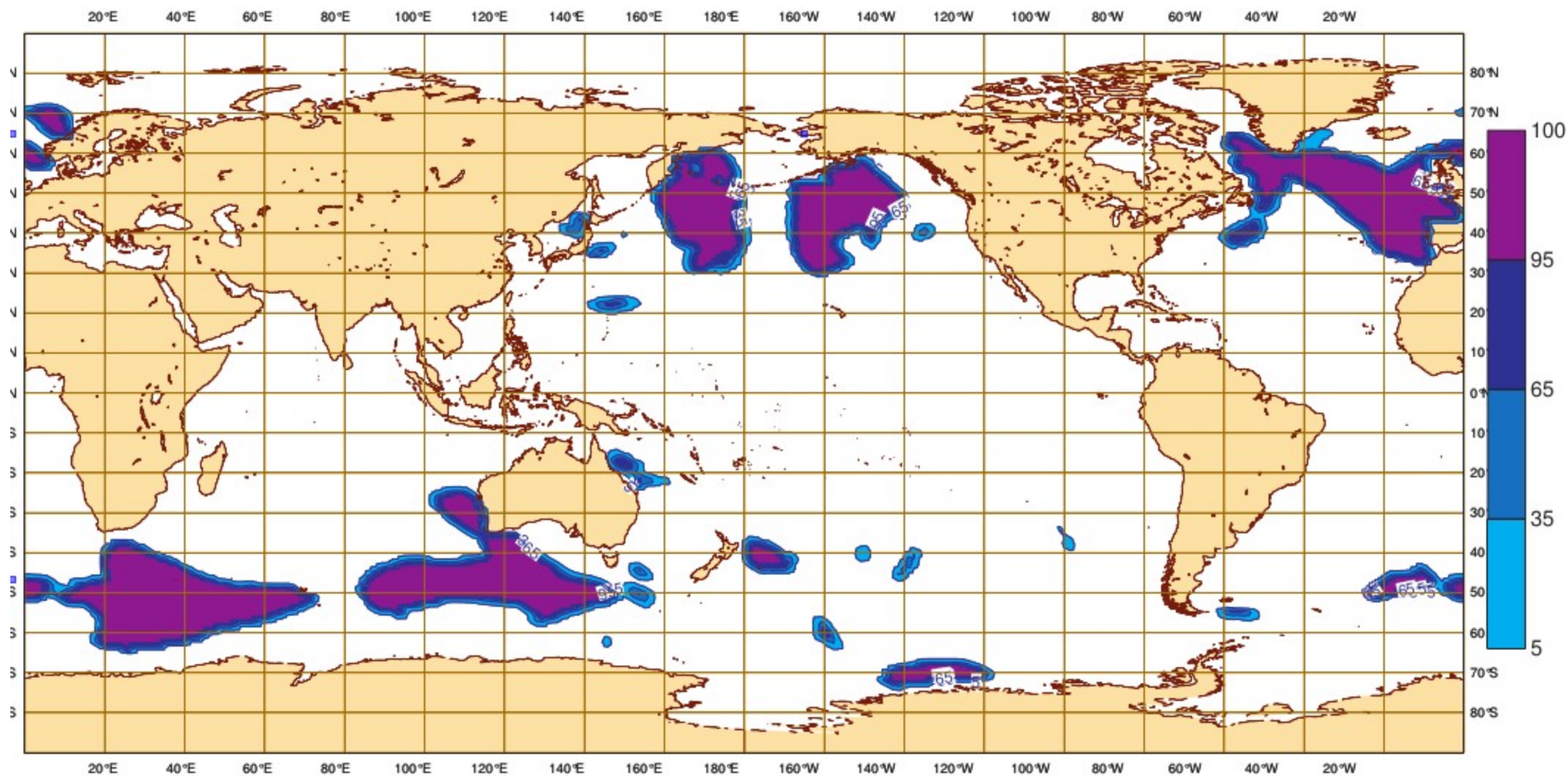


This exemple is weatherrouting of Maersk Swaziland from Lazaro Cardenas, Mexico to Vostochny, Russia.

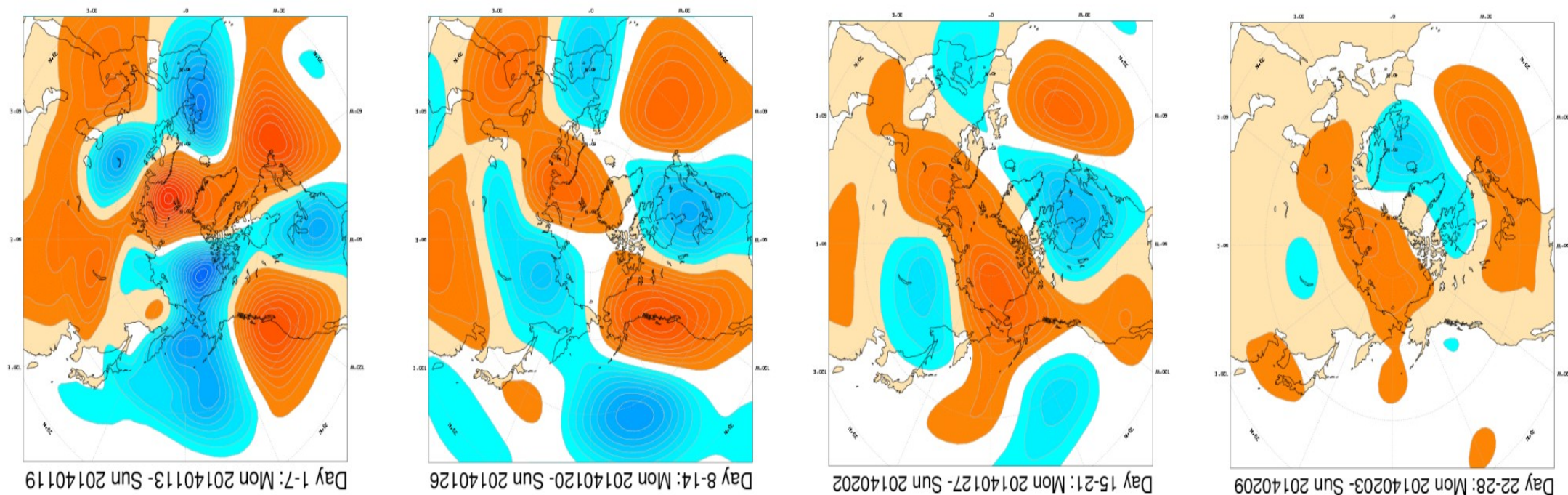
We are using wind, sea and swell

In our weather routing we also uses significant waves heights probability, to navigate outside areas with high probability

Tuesday 28 January 2014 00UTC ©ECMWF Forecast probability t+012 VT: Tuesday 28 January 2014 12UTC
Surface: Significant wave height of at least 4 m



For weather routing beyond +240h (mainly the Pacific), we use strategy weather routing based on the weekly mean 500hPa

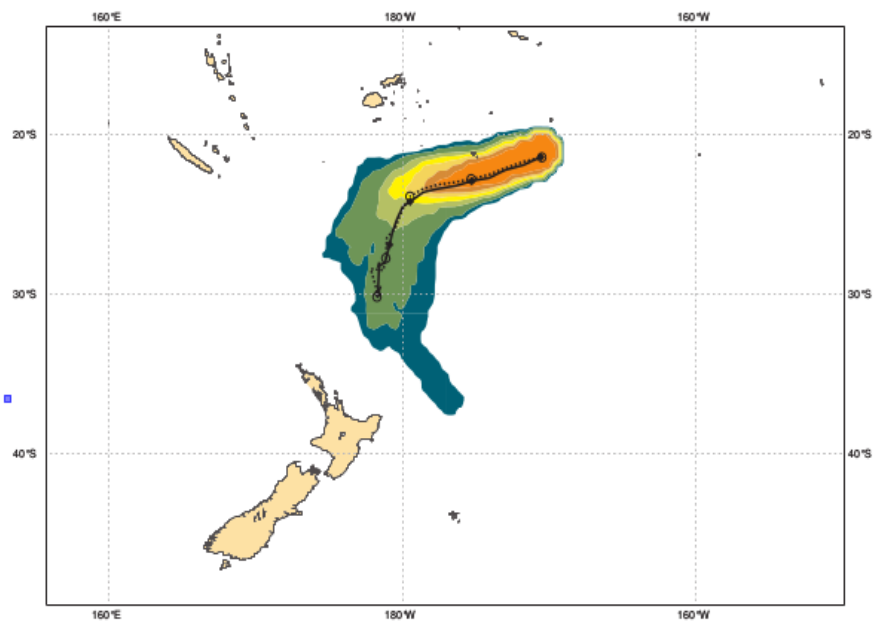


From the end of January a trend of rising mean pressure can be seen in the weekly mean ensemble charts (the two charts to the right). In week 3-4 probably less deep lows near the Aleut islands and over the northern Pacific, while lows may track north from Japan towards eastern Siberia. Northerly routes via the Aleutian islands then seems favorable.

Where vessels or offshore sites is affected by tropical cyclones, we among others uses ECMWF's tropical cyclone forecast

Date 20140123 00 UTC @ECMWF
 Probability that **XXP** will pass within 120 km radius during the next 240 hours
 tracks: **solid**=OPER; **dot**=Ens Mean [reported minimum central pressure (hPa) **NA**]

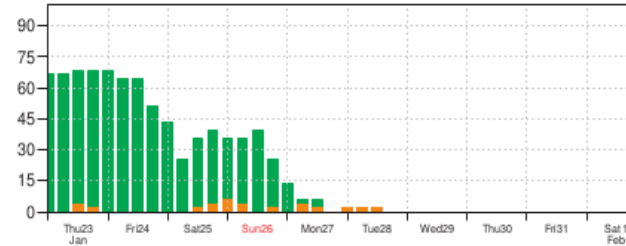
■ 5-10 ■ 10-20 ■ 20-30 ■ 30-40 ■ 40-50 ■ 50-60 ■ 60-70 ■ 70-80 ■ 80-90 ■ >90%



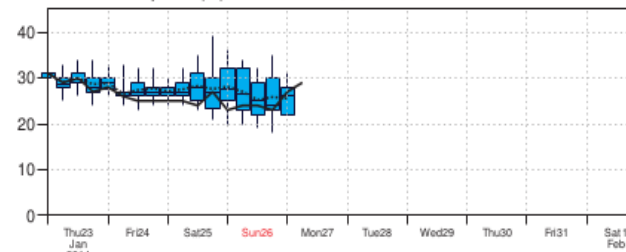
List of ensemble members numbers forecast Tropical Cyclone
 Intensity category in colours: **TD**[up to 33] **TS**[34-63] **HR1**[64-82] **HR2**[83-95] **HR3**[>95 kt]

+024 h : hrct 01	02 03 04 05 06 07 08 09 10 11	14 15	18	21 22 23 24 25 26 27 28	32 33 34 35	37 38 39 40	43	45	49 50
+048 h : hrct 01 02	05 06 07 09 10 11	14 15	18	23 25 27	32 35	38 39	43	45	49 50
+072 h : hrct	05 06 09 10	14	18	22 23 25 28	32 34	37 39 40	43	45	49
+096 h : hrct				23 25 28	32 34	38	43		
+120 h :					32				
+144 h :									
+168 h :									
+192 h :									
+216 h :									
+240 h :									

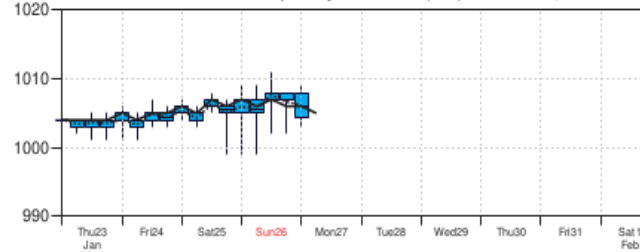
Probability (%) of Tropical Cyclone Intensity falling in each category
TD[up to 33] **TS** [34-63] **HR1**[64-82] **HR2** [83-95] **HR3** [> 95 kt]



10m Wind Speed (kt) **solid**=OPER; **dot**=Ens Mean



Mean Sea Level Pressure in Tropical Cyclone Centre (hPa) **solid**=OPER; **dot**=Ens Mean



At many of our offshore sites the significant wave height is a criteria and ECMWFs

EPSgram are very useful to estimate the accuracy of the prognosis

