

Using ECMWF's Ensemble Products and Forecasts at DWD (German Weather Service)

German Meteorological Service

Divisions:

- Climate and Environment
- Weather Forecasting
- Technical Infrastructure and Operations
- Research and Development
- Personnel and Business Management

Operational Meteorological Service:

- Headquarter in Offenbach/Main & regional offices in Hamburg, Potsdam, Leipzig, Essen, Stuttgart, and Munich
- 6 regional climate offices (consultancy services concerning climate and environment)
- 5 advisory centres for aviation

Governmental Tasks

- Meeting meteorological requirements arising from all areas of economy and society in Germany
- Provision of meteorological services (such as forecasts)
- Meteorological safeguarding of aviation and shipping
- Issuing of official weather warnings
- Short and long-term recording, monitoring, and evaluation of meteorological processes in the atmosphere, its structure and composition
- Recording of interactions between atmosphere and other environmental spheres
- Monitoring of atmosphere for radioactive trace elements and forecasting of their dissemination
- Operation of necessary measuring and observation systems
- Provision, storage, and documentation of meteorological data and products

International cooperation



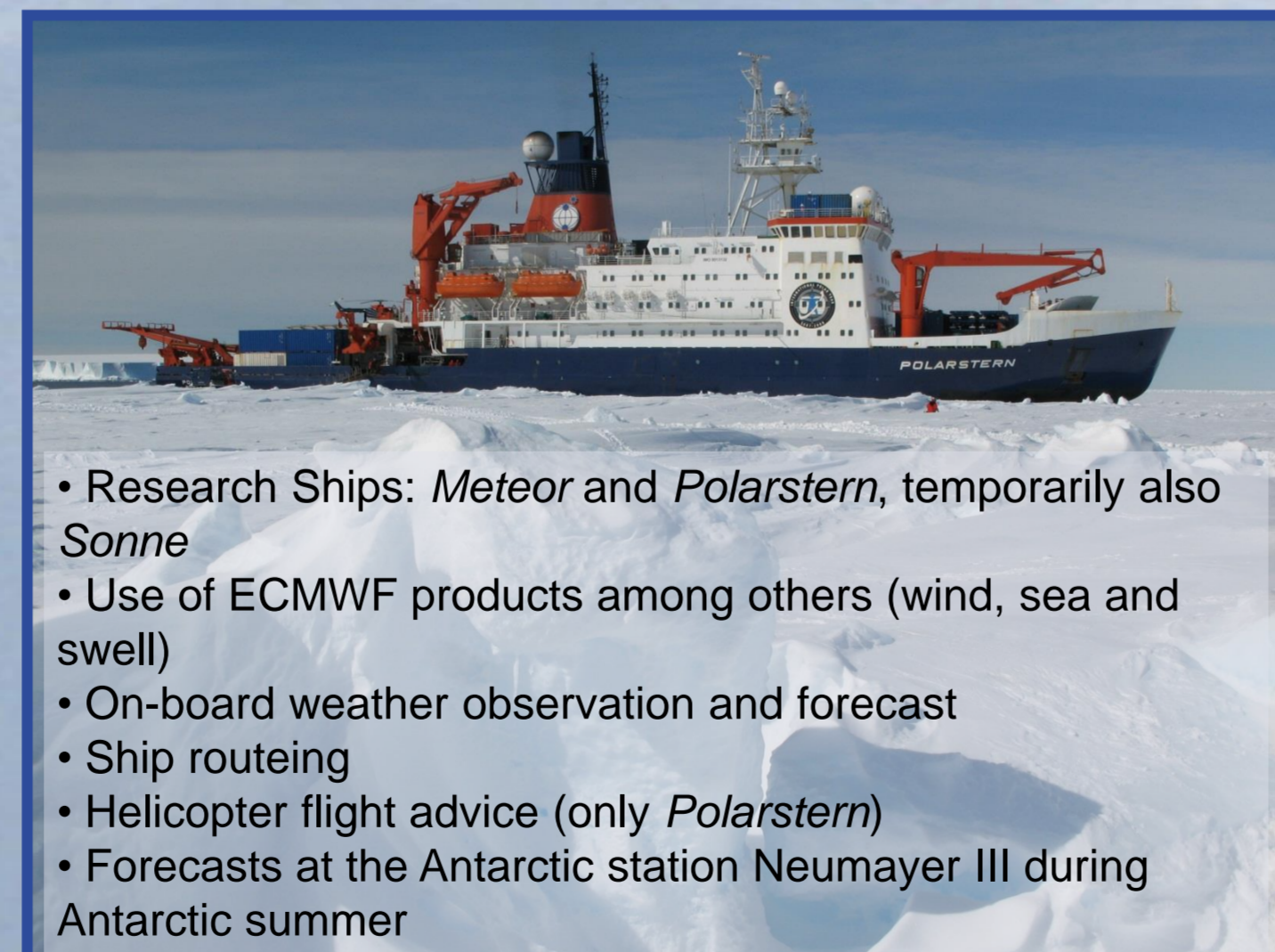
Marine Meteorological Service



Marine Weather Forecasts

- Forecasts for North Sea, and certain areas of the Baltic Sea, as well as for English Channel, parts of the Mediterranean Sea, Bay of Biscay and Canary Islands
- Forecasting wind, significant weather (thunder storms, gusts, fog, ...), sea/swell, and ice
- Issuing hurricane warnings
- Broadcasted via radio, internet, fax
- Cooperation with German Maritime and Hydrographic Agency (BSH; wind forecasts in case of storm surges)
- Worldwide ship routing

Ship Routing & duty aboard



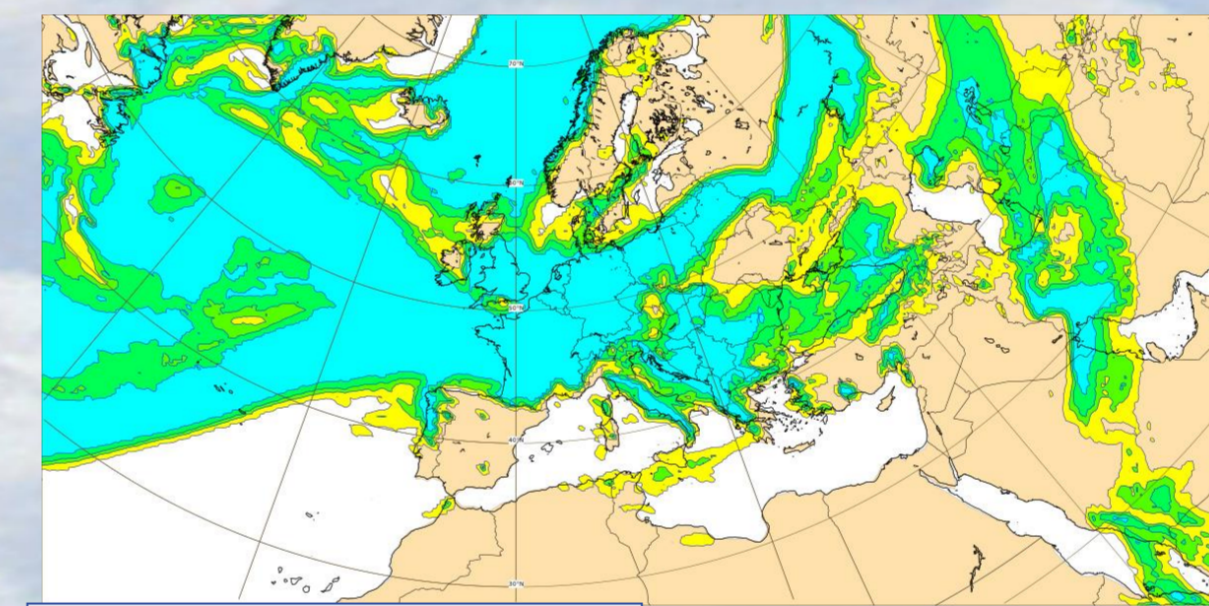
- Research Ships: *Meteor* and *Polarstern*, temporarily also *Sonne*
- Use of ECMWF products among others (wind, sea and swell)
- On-board weather observation and forecast
- Ship routing
- Helicopter flight advice (only *Polarstern*)
- Forecasts at the Antarctic station Neumayer III during Antarctic summer

Using ensemble models and data of ECMWF-Products

- Weather Forecasting: land meteorology for Northwestern Germany including official warnings for severe weather
- Marine forecasting as described in section "Marine Weather Forecasts" including official wind warnings in case of severe wind conditions like storm, gale, severe storm or hurricane force, nationally for German coastline and internationally (NAVTEX) for both the marine areas German Bight, Western and Southern Baltic Sea
- Use of ECMWF Products (among others) visualized in the work platform NinJo or via the ECMWF homepage (individual chosen different dashboards), on the meteorological offices aboard only the ECMWF homepage can be used in case of a working internet connection
- Usage of ECMWF EPS 15-days-forecast for general weather situation classified through synoptic patterns, can also show if very cold, cold, warm or very warm air-masses will flow into Germany

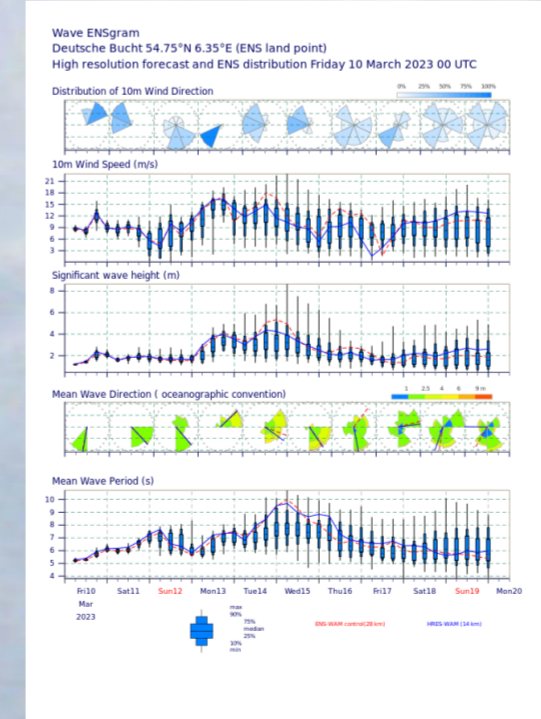
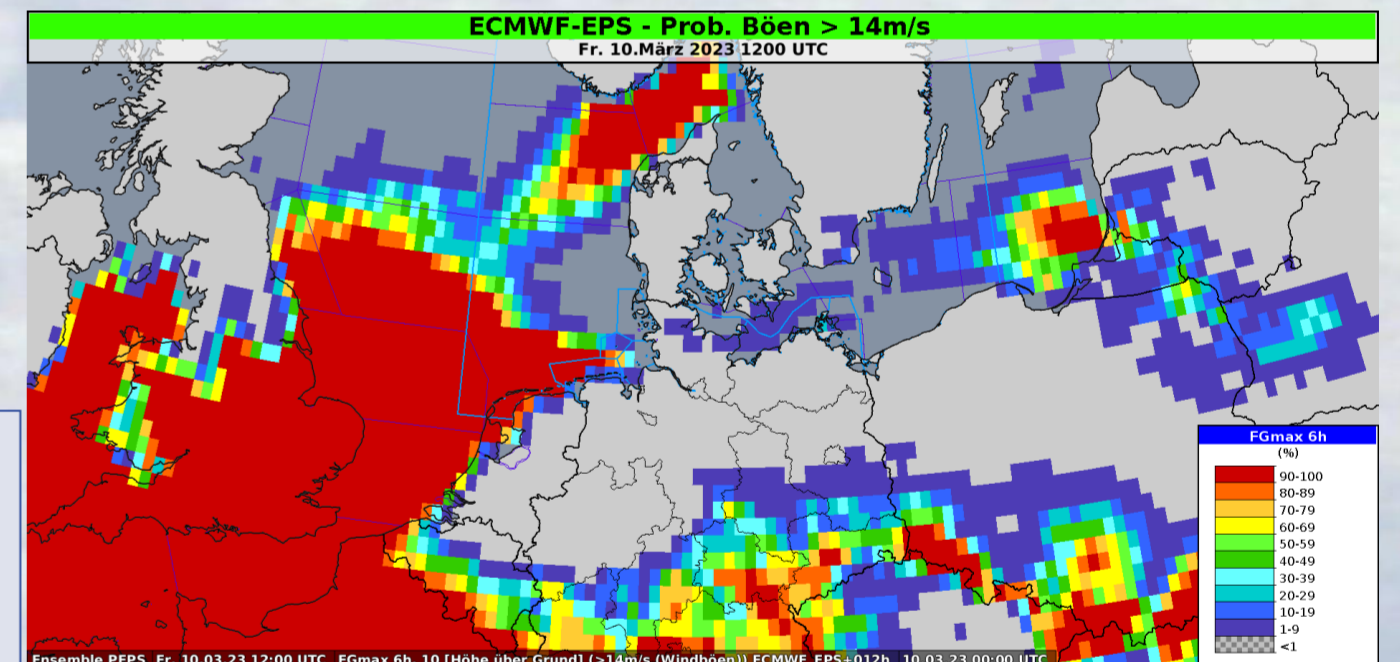
Classification of general weather situation: e.g. Wz – west cyclonic, SWz/SWa south- western flow cyclonic/anticyclonic, BMc – ridge central Europe cyclonic, HNz – high Arctic Ocean cyclonic

10 Mrz 2023 00 UTC		Großwetterlagen EZMW EPS 15-Tage-Prognose															Prä-Operationelle Version									
Primäre Sequenz		EZMW-Verstärkung (mit globalem Filter)															Extrem-Mittelglieder (Dauerbeobachtung) ab Tag 5									
Tag		02	04	06	08	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50
Wz	Fr. 10 Mrz	Wz															KALT	WARM	NASS							
Wz	Sa. 11 Mrz	Wz															Nr. 10	Nr. 43	Nr. 45							
Wz	So. 12 Mrz	Wz																								
Wz	Mo. 13 Mrz	Wz																								
Wz	Di. 14 Mrz	Wz																								
Wz	Mi. 15 Mrz	Wz																								
Wz	Do. 16 Mrz	Wz																								
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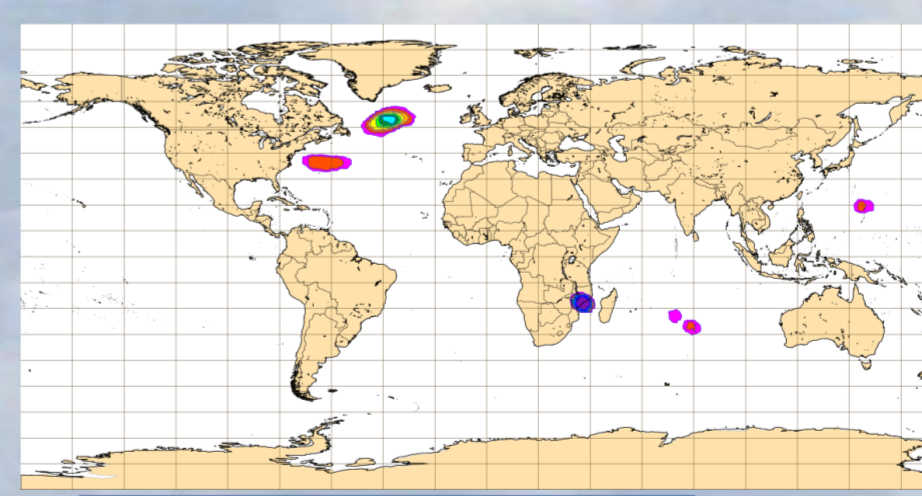


24 hour total precipitation derived from the ECMWF ensemble (ENS), shown for 10 March 2023

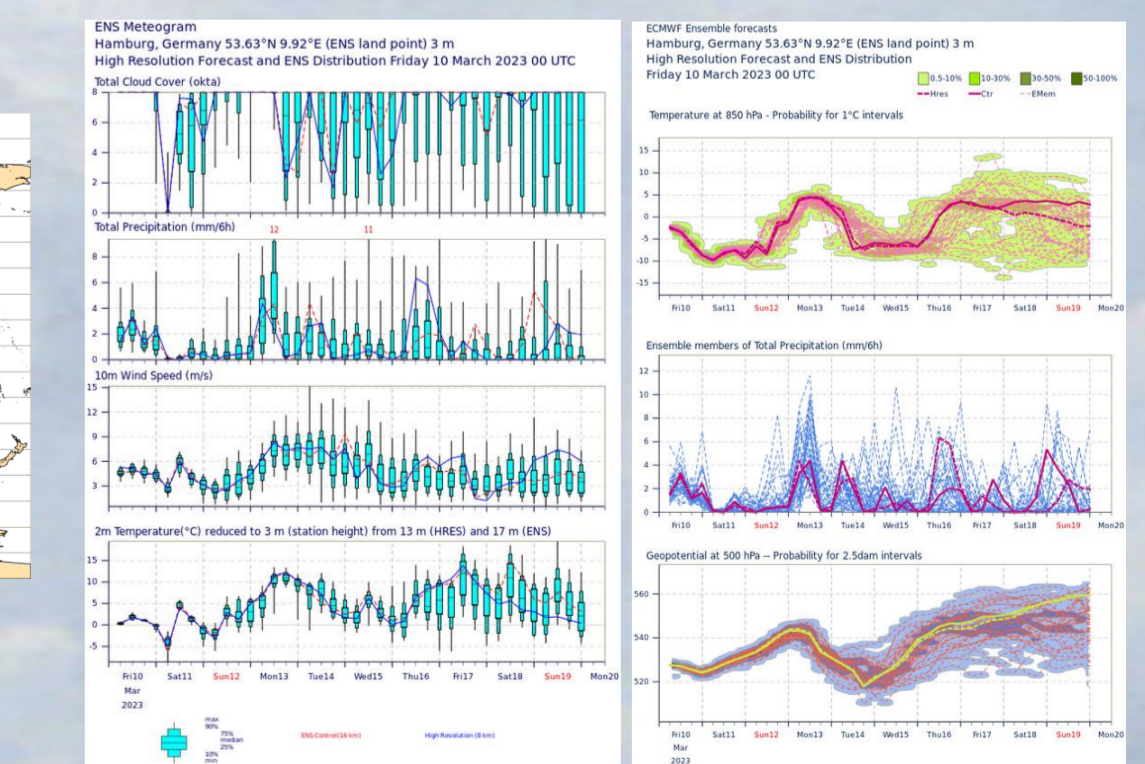
NWP-Layer in NinJo: gusts (shown here), others: Sign. wave height or mean wind



EPS wavegram:
 • Sign. wave height
 • Mean wave direction



Tropical Cyclone Activity: shown from 10 March 2023. Animation shows daily development in a forecast, which can be used as a strike probability



High resolution forecast and ENS distribution: Total cloud cover, Total precipitation 6h, 10m wind speed, 2 m temperature, Temperature 850 hPa, Geopotential 500 hPa