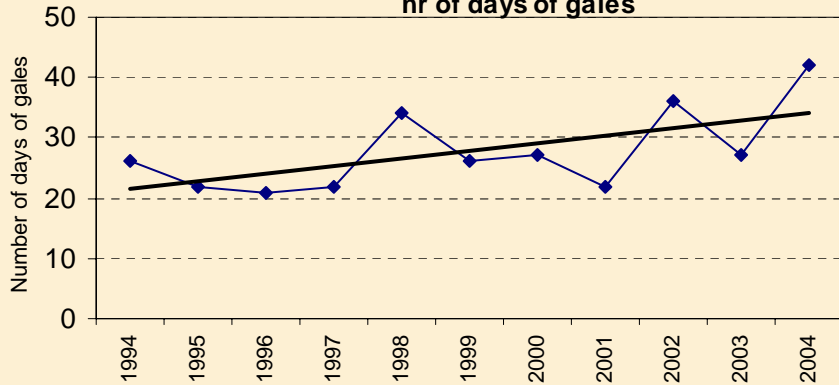
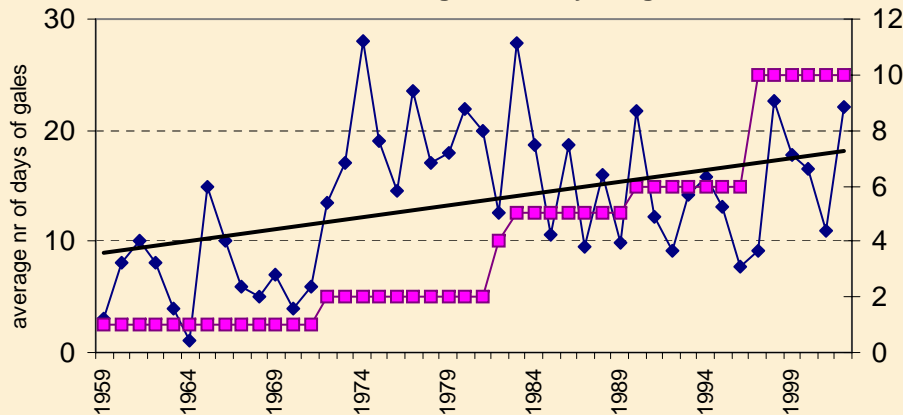


Indicator 24 Extreme weather conditions

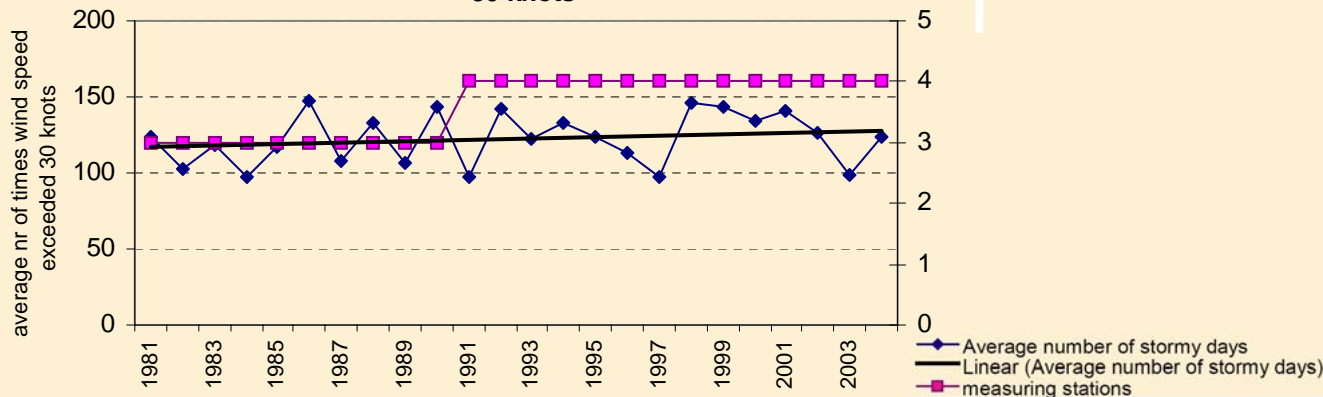
Meteopark Zeebrugge, West-Vlaanderen - nr of days of gales



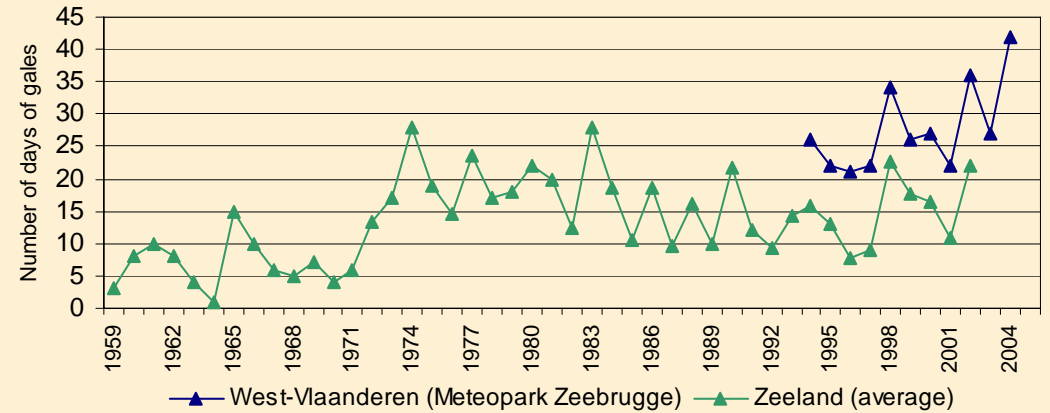
Zeeland - average nr of days of gales



Nord-Pas de Calais - average nr of times wind speed exceeded 30 knots



Number of days of gales per SAIL sub-region



Where do the data come from?

The Hydra project at the KNMI (Royal Meteorological Institute of The Netherlands) focuses on extreme wind speeds. This research supports the National Institute for Coastal and Marine Management (RWS/RIKZ) in assessing the safety levels of Dutch dyke rings, which is a legal obligation. Data on extreme wind speed in Zeeland are available since 1959 for one of the 10 stations (Vlissingen).

The Flemish Agency for Maritime Service & Coast-Division Coast, supplies data for 4 stations in the Belgian coastal zone, both onshore and offshore. The 4 coastal stations administrated by Météo France in Nord-Pas de Calais have registered wind speed since 1981.



Key Message

- A day of gale is defined as any day in which the maximum wind speed is equal to or higher than 30knots (15.432m/s).
- In Vlissingen, the longest recording station for gale activity in the study area, a slightly increasing trend is observed.
- In the absence of a larger number of long-term series, it is difficult to confirm an overall trend in the Southern North Sea. Above all, records confirm the unpredictable nature of storms.

Why monitor extreme weather conditions?

Much of the coastal area in the Southern North Sea is low-lying and therefore vulnerable to the predicted increase in flooding, inundation and erosion. Built-up settlements and coastal frontages are particularly susceptible to storm surges. Most damage to coasts is caused by extremely high sea levels and waves during storm surges. In Zeeland waters, wind is the main source of waves and hence a crucial issue in the assessment of safety levels of Dutch dyke rings. There is a need to monitor the frequency of extreme weather in support of risk assessment and management schemes in coastal zones.

What does the indicator show?

Based on the data collected in the 4 coastal measuring stations in West-Vlaanderen, no trend can be observed since MDK started recording in 1992. The number of days of gales measured at Meteopark-Zeebrugge (the longest time series available) fluctuates between 26 in 1994 to 42 in 2004.

At Météo France stations in Dunkerque and Boulogne (Nord-Pas de Calais), the number of times p.a. that wind speed exceeded 15m/s seems to have remained stable since measuring started in 1981. In Calais, frequency of gales rose from 20 in 1991 to 126 in 2004. The differences in measurements between stations may be partly due to the (inshore or onshore) location of the measuring device. Furthermore, long- time series are needed in order to interpret results: an analysis of wind speed data for 1956-2001 for Dunkerque weather station, showed a decreasing trend in the number and frequency of

storm events, although periods of increased storm activity were distinguished (GEODAL Lab, Université du Littoral Côte d'Opale). In Vlissingen, where recording started as early as 1959, a slightly increasing trend is observed. Studies in the UK reveal no clear trends in the long-term. However, between 1988-1997 the highest frequency of gales was recorded since monitoring of gale activity started in 1881.

It is difficult to confirm an overall trend in the Southern North Sea in the absence of a larger number of long-term series. Moreover, an increase in the number of days of gales does not necessarily imply an increase in the number of storms.

What are the implications for planning and managing the coast?

The changes in global climate are likely to be due to a combination of both natural and human causes. The most important of the greenhouse gases is carbon dioxide CO₂, which accounts for an estimated 60% of the enhanced greenhouse effect.

Planning guidance in most EU Member States prescribes that planning authorities must take account of climate change considerations in their development plans. This is needed in terms of mitigating the cause of climate change and adapting to the effects of climate change. Jointly with reliable data on sea level rise and detailed flood risk mapping, the monitoring of extreme weather is crucial information in development plans and risk assessments.

How reliable is the indicator?

In Zeeland and West-Vlaanderen, the number of days of gales is calculated for maximum wind speed equal or higher than 30knots (15.432 m/s). For Nord-Pas de Calais, statistics are based on wind speed equal to or exceeding 15m/s. The wind-speed measuring device in Le Touquet (Pas de Calais) broke down between 18/04/2003 and 24/06/2003, resulting in 68 consecutive days of missing data. Longer time series in a higher number of coastal stations are needed.

