

# Wind surge with EPS

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**12 juni 2008 KNMI**



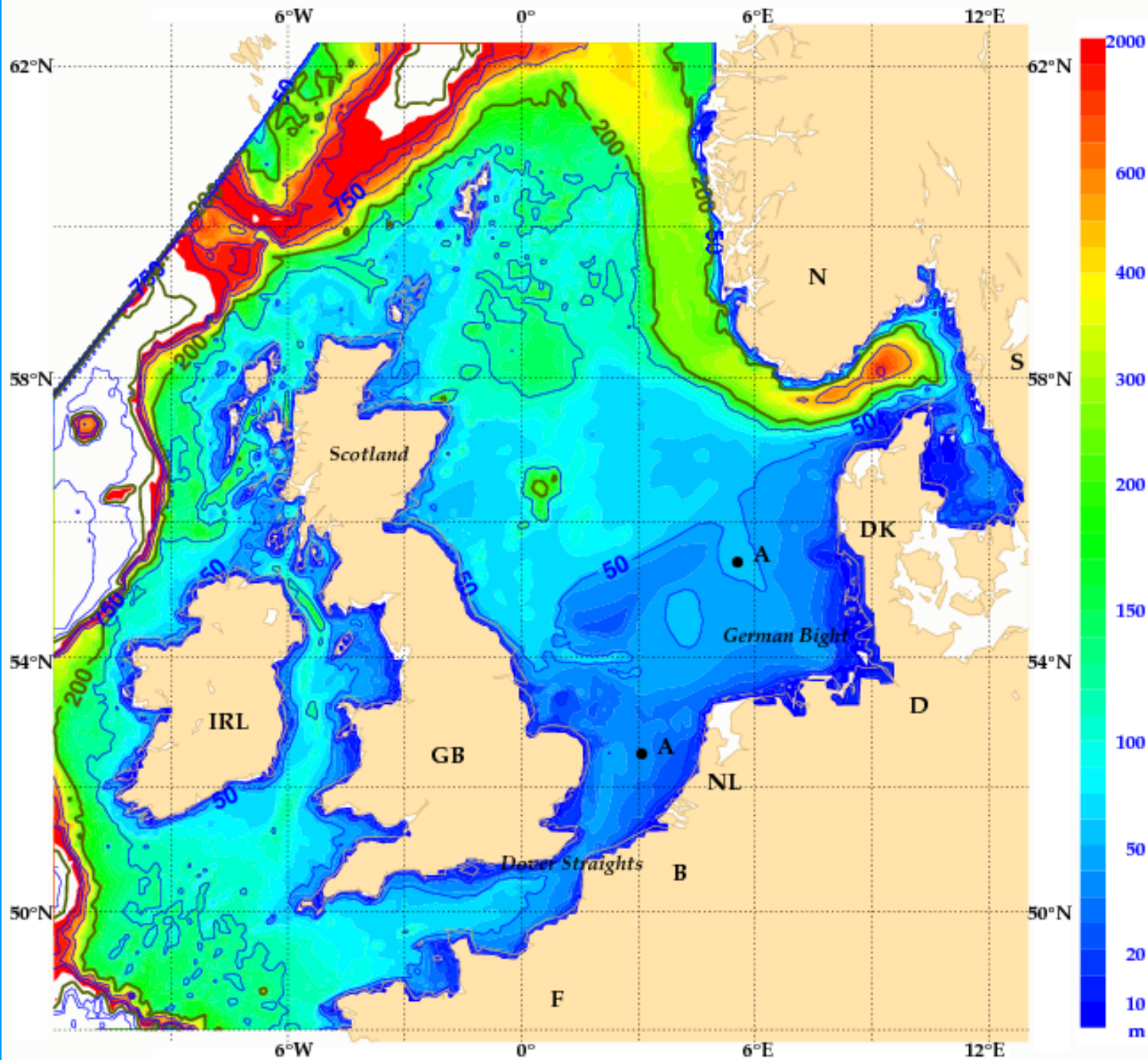


Korps Rijkswaterstaat  
Nederlandse Kustwacht



## Wind surge models

- WAQUA (8km) < Hirlam winds
- 2000: WOMOD < EPS (linearized model)
- 2008: WAQUA < EPS (8km surge model)
  
- See ECMWF Newsletter 2008



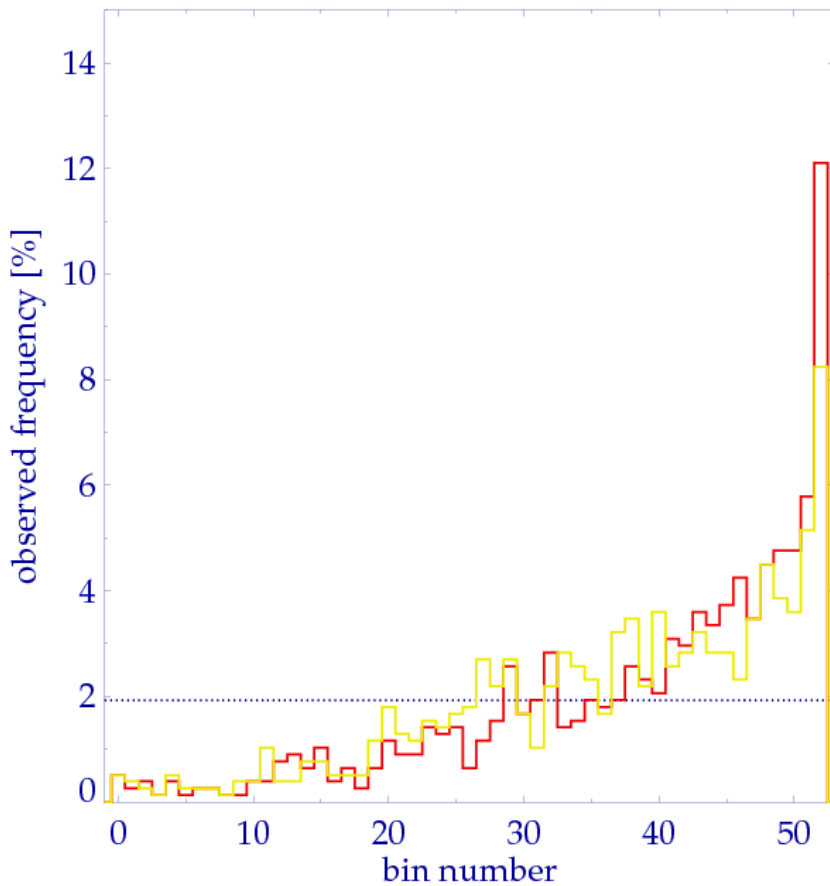
# WAQUA

- 8km model
- EPS winds interpolated to WAQUA grid
- Interpolated to WAQUA time steps

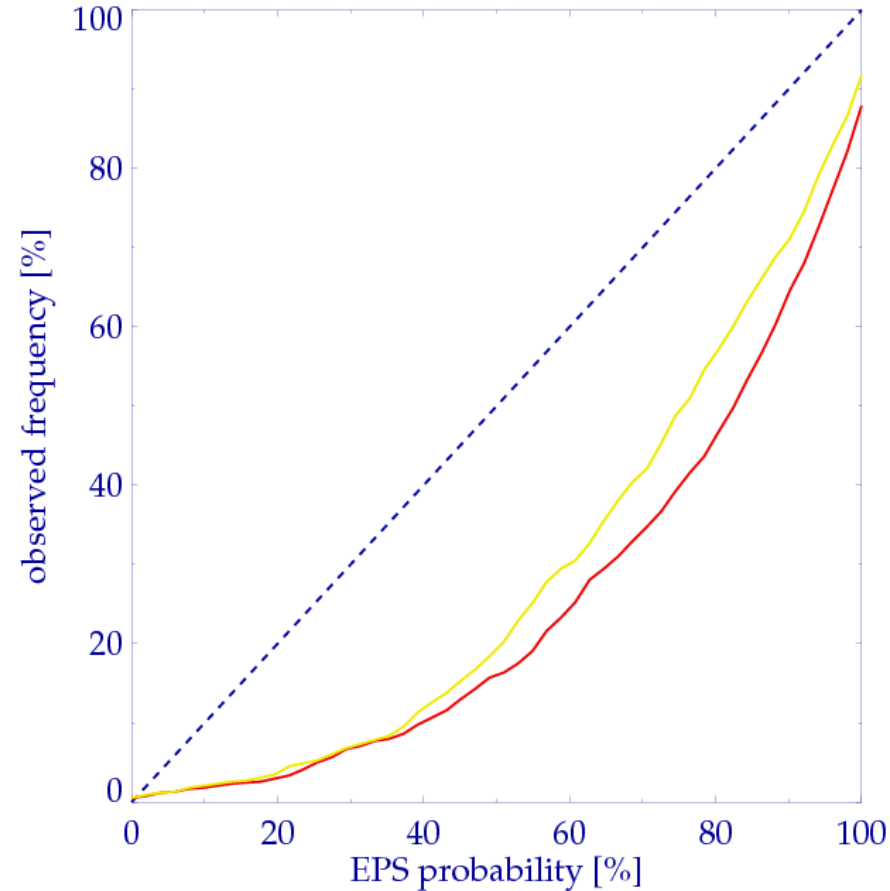


# Talagrand diagram

RH for Hoek van Holland

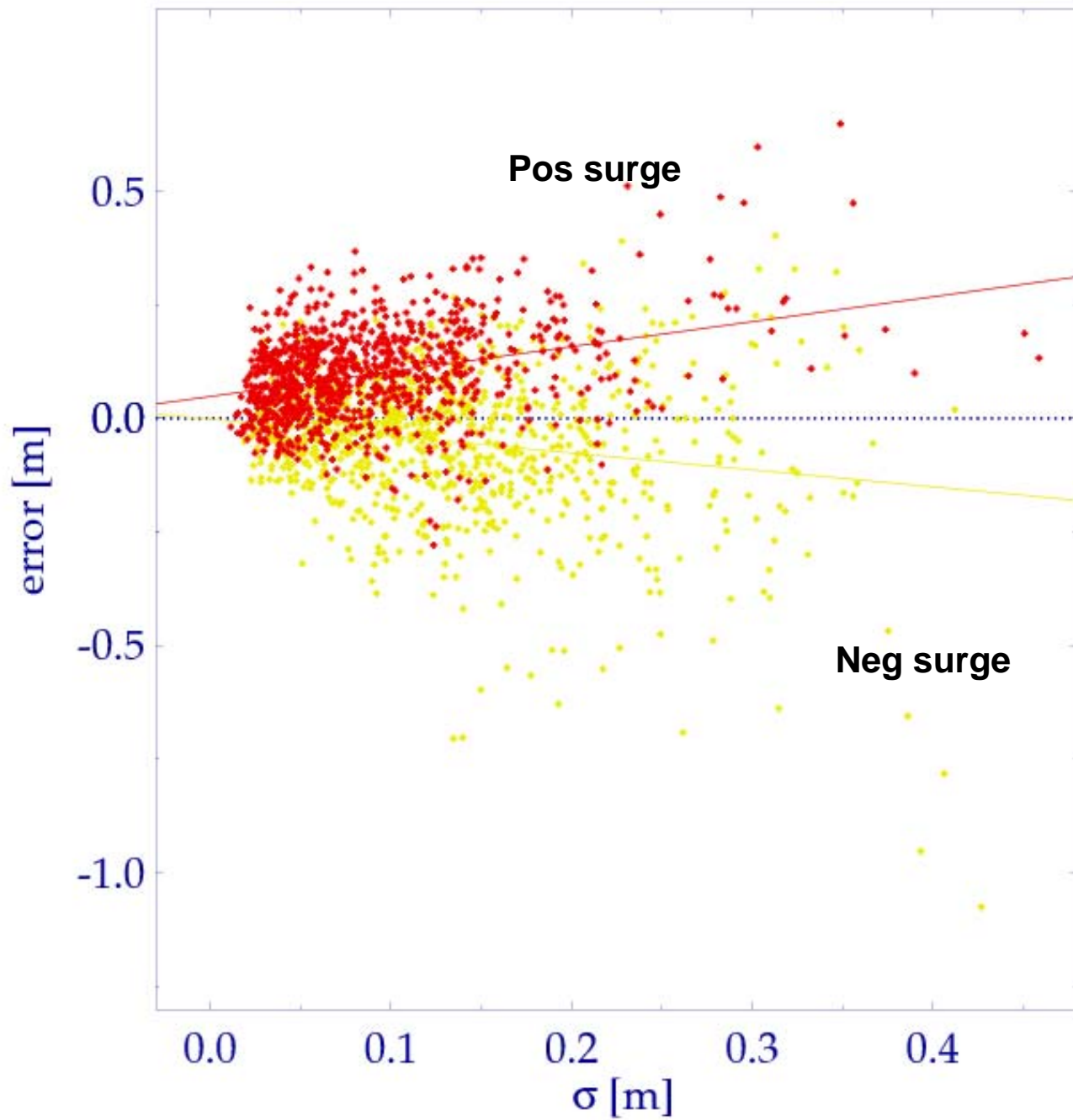


CRH for Hoek van Holland



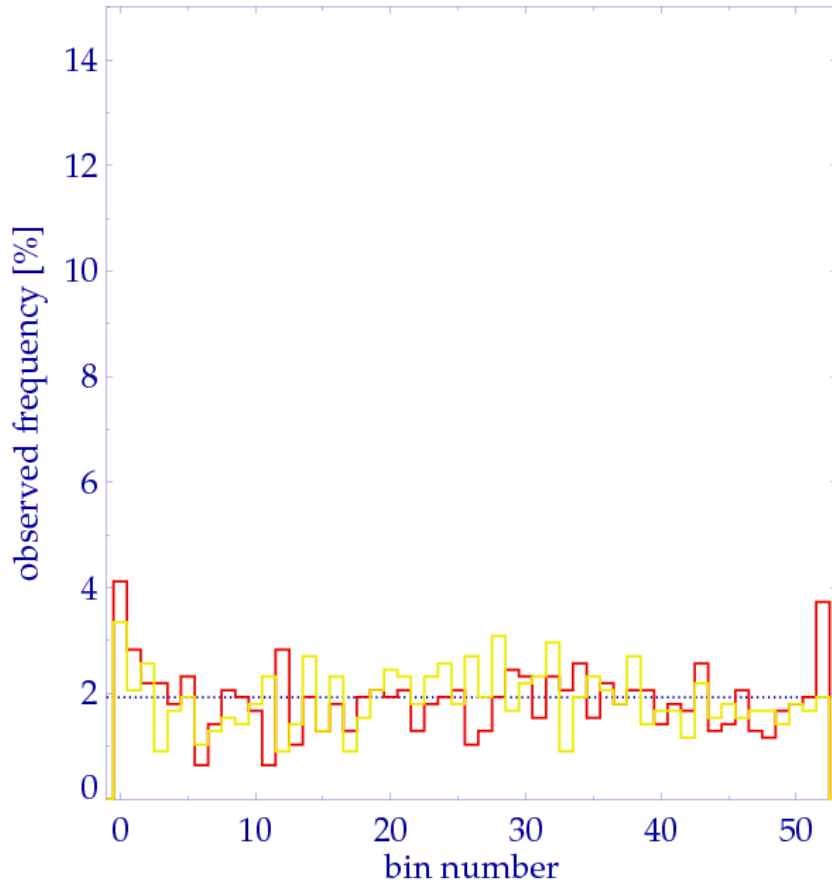
## Bias correction

- Bias increases with spread
- Different for high tide and low tide

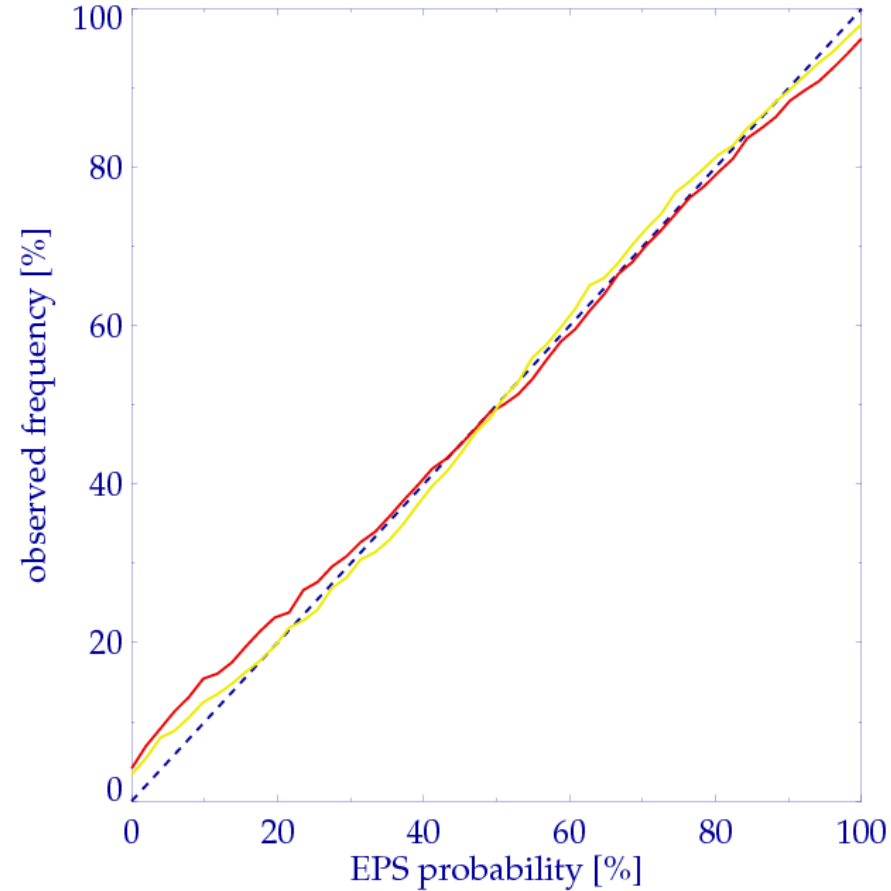


# Talagrand diagram after bias correction

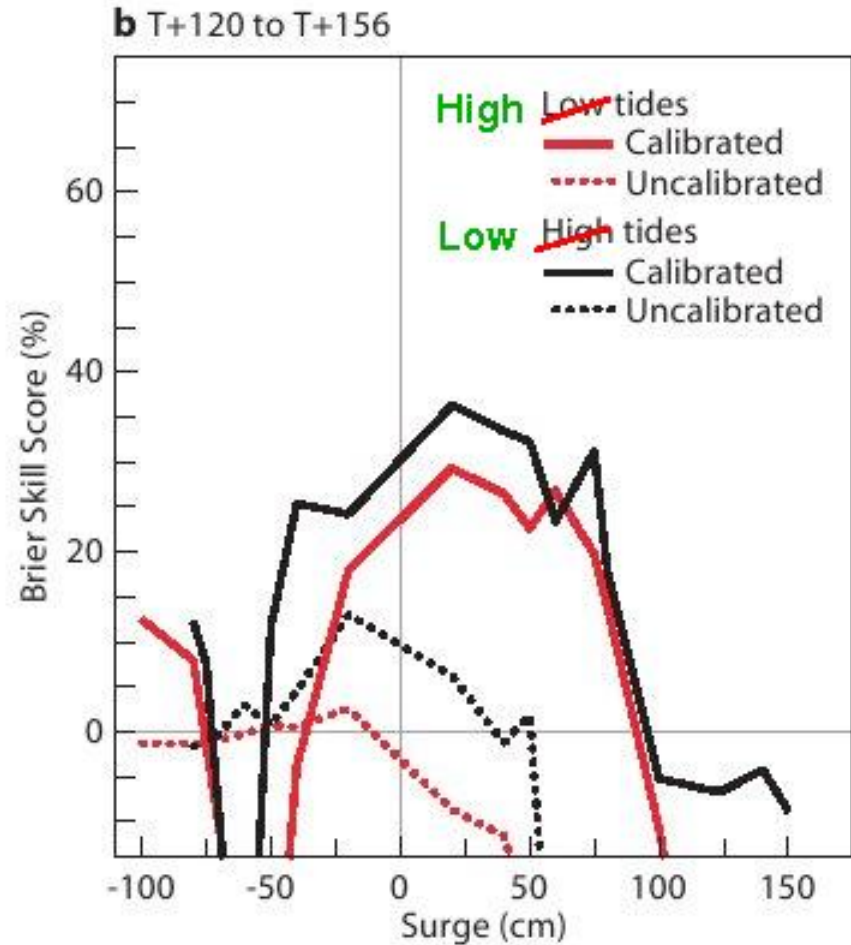
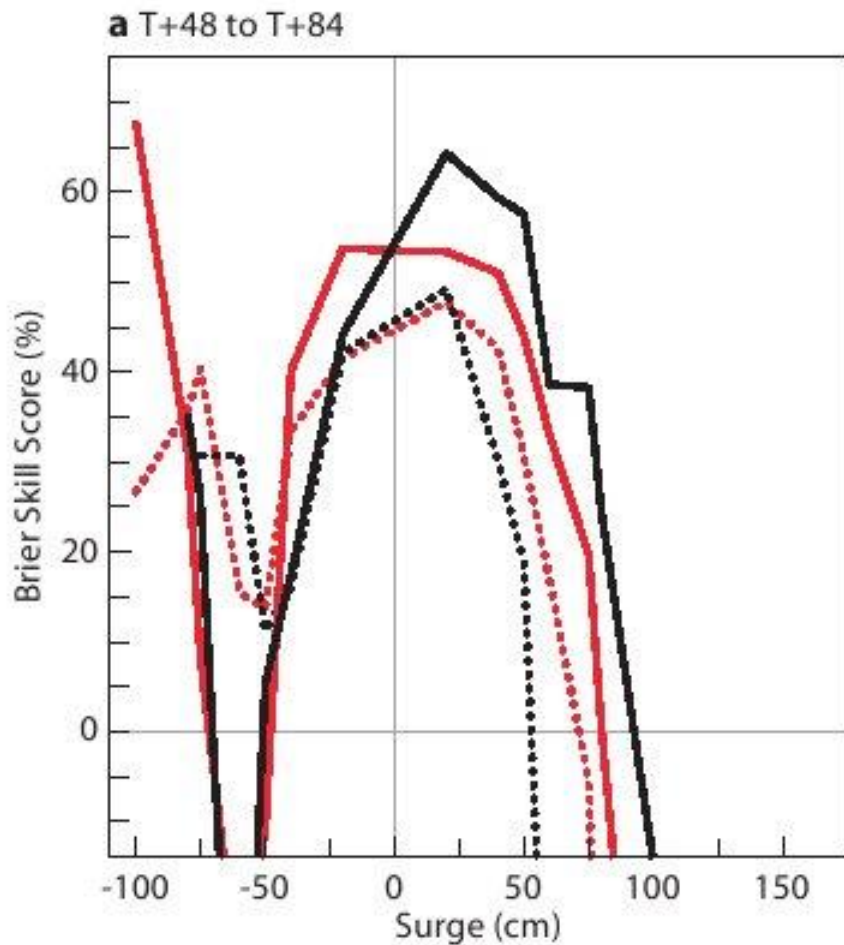
RH for Hoek van Holland



CRH for Hoek van Holland



# Brier Skill score

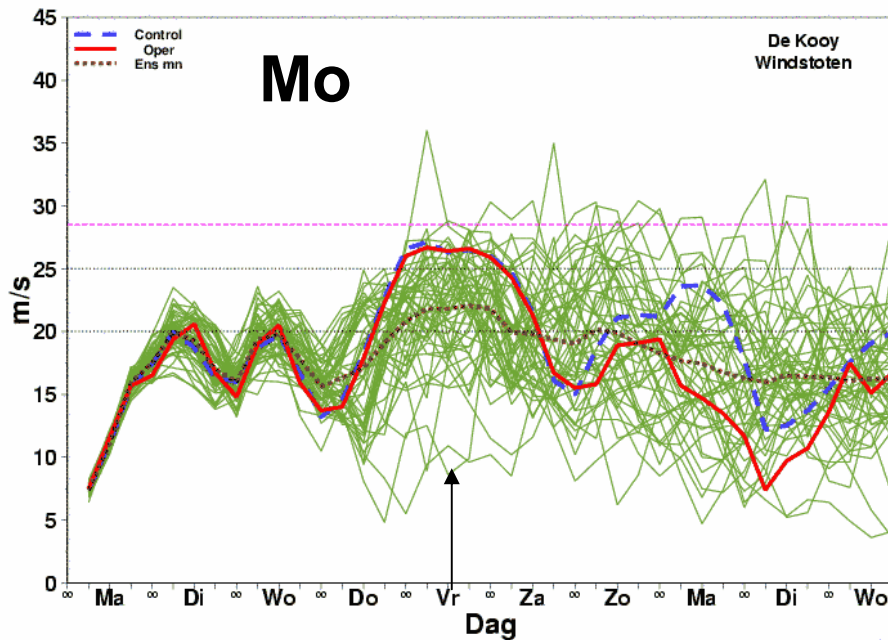


de Vries figure 8

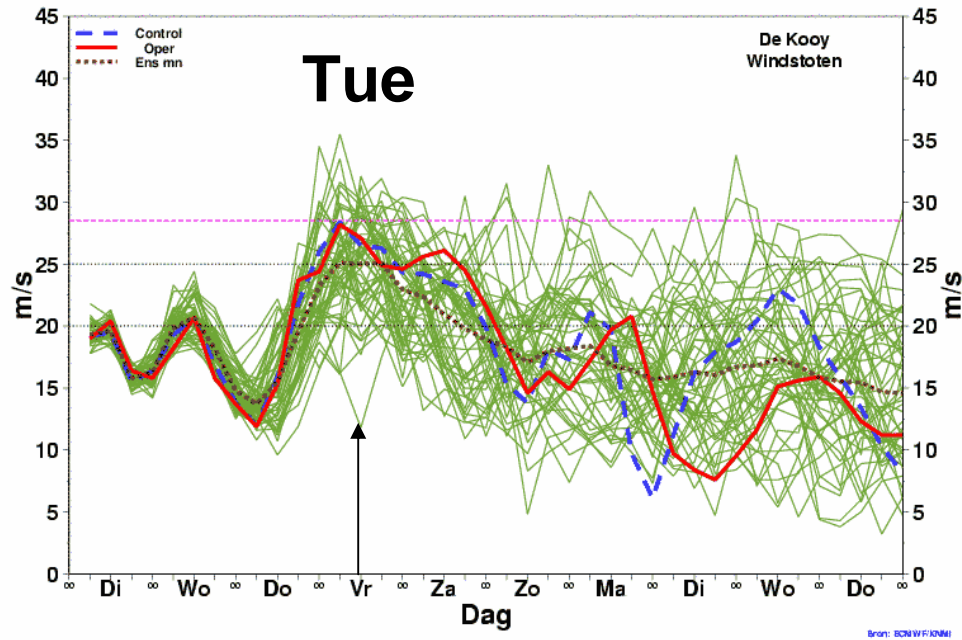
## Storm 9 november

- (1) linearized model
- (2) WAQUA EPS

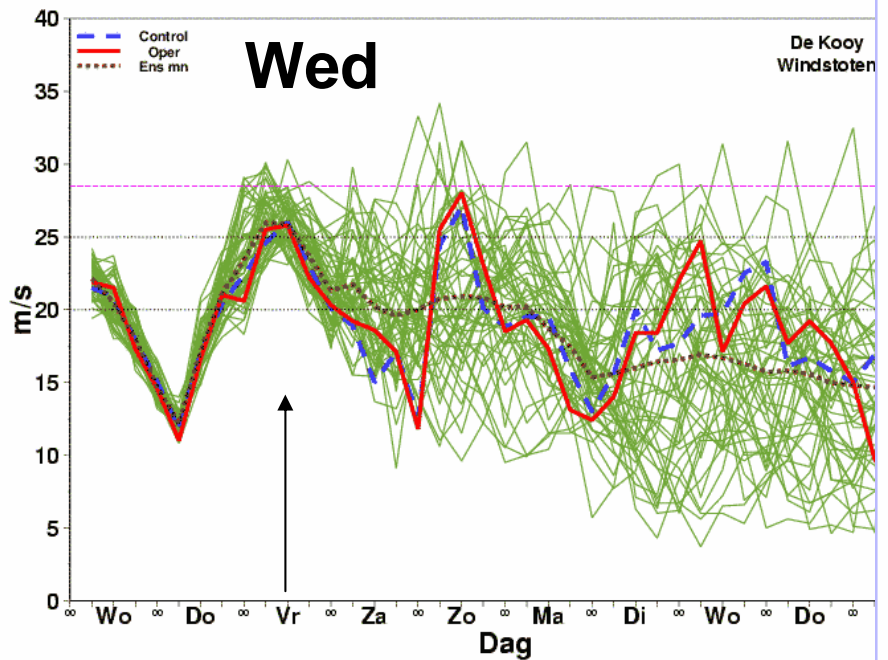
Maandag 5 November 2007 (starttijd Ma 00 UTC)



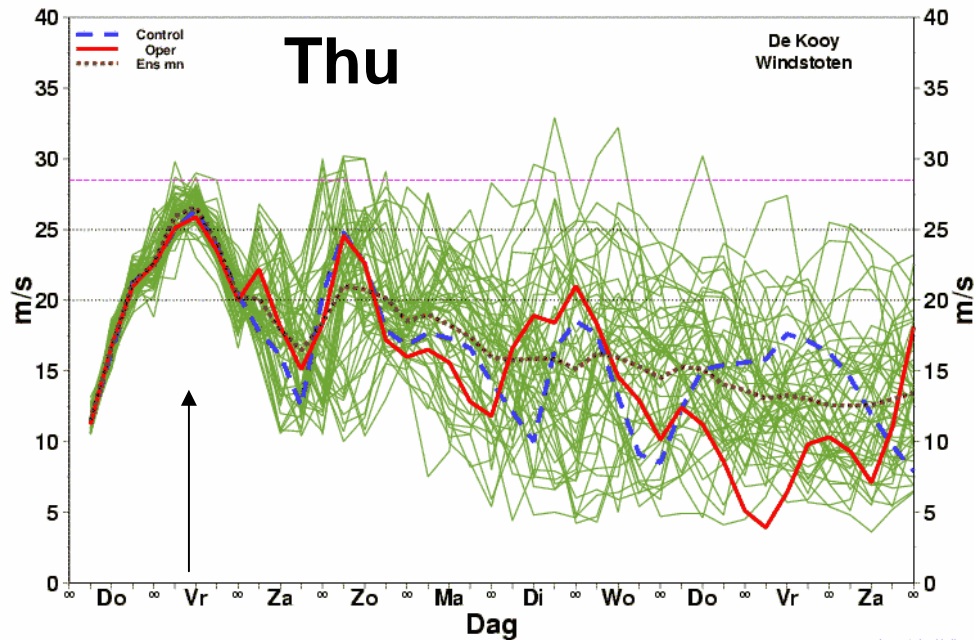
Dinsdag 6 November 2007 (starttijd Di 00 UTC)



Woensdag 7 November 2007 (starttijd Wo 00 UTC)

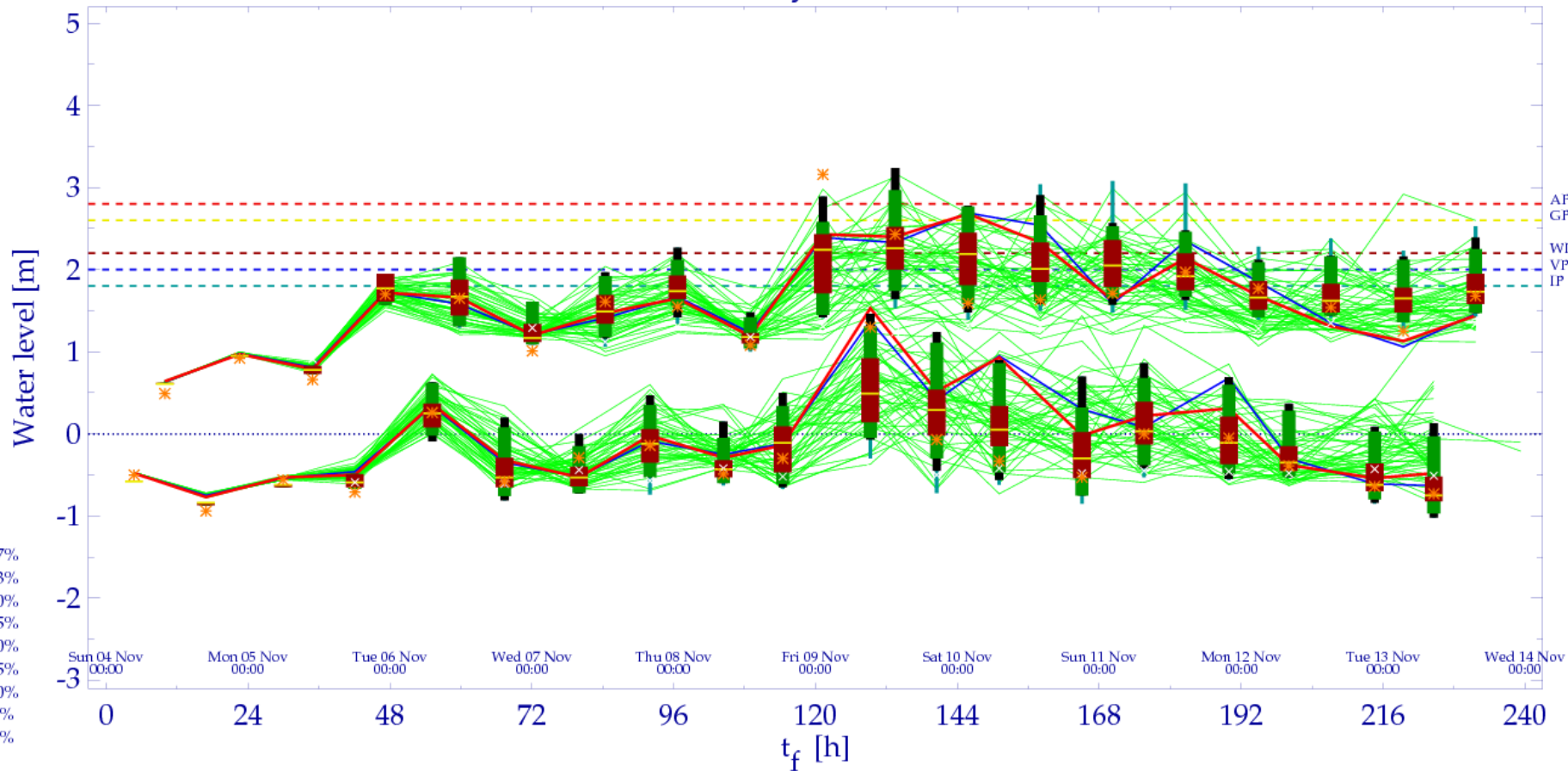


Donderdag 8 November 2007 (starttijd Do 00 UTC)

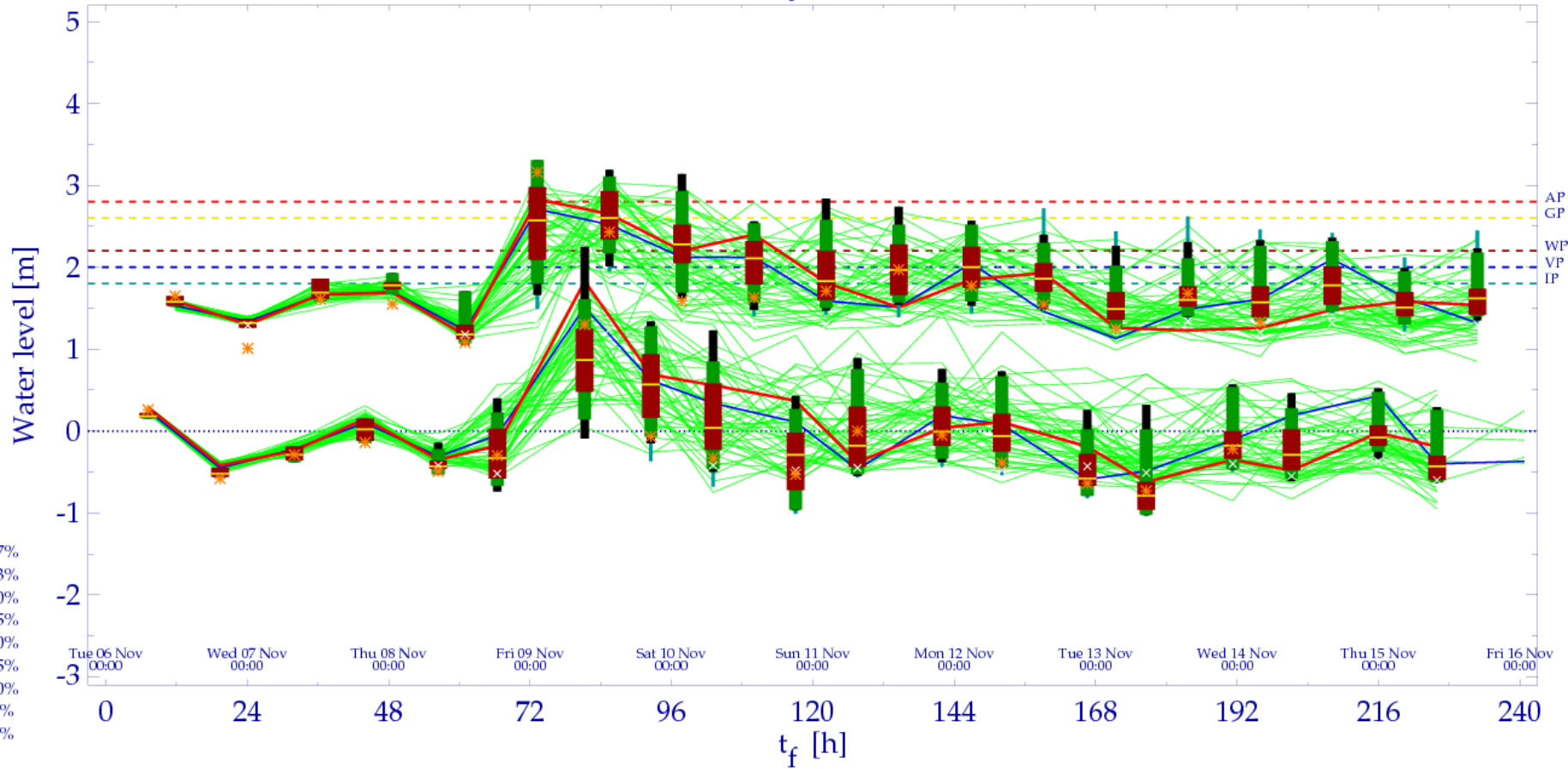


# Storm 9 november (WAQUA EPS)

Hoek van Holland: Probability forecasts from 2007110400 run

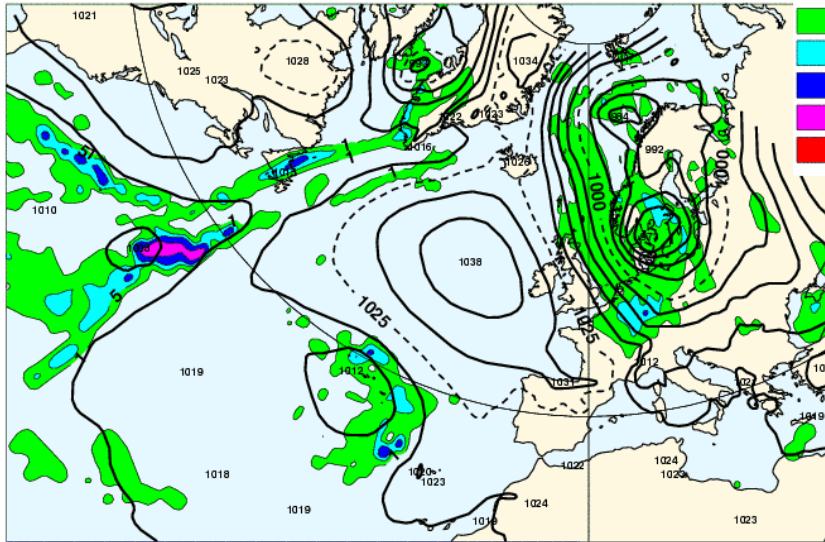


# Hoek van Holland: Probability forecasts from 2007110600 run



# T+96

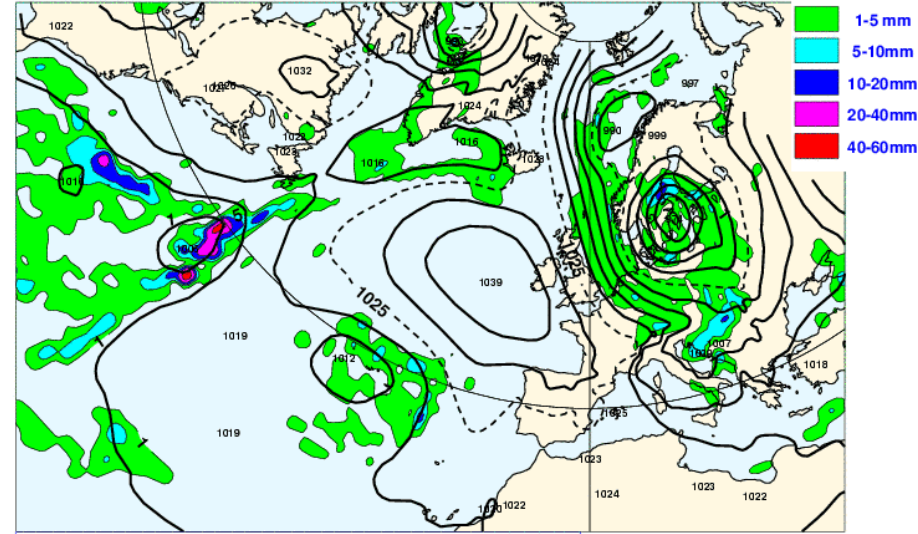
De ECMWF weersverwachting : + 96 uur  
van Maandag 5 November 2007 00 UTC  
voor Vrijdag 9 November 2007 00 UTC



Druk op zeeniveau / Tot Precip. 18-00 UTC

# T+106

De ECMWF weersverwachting : + 108 uur  
van Maandag 5 November 2007 00 UTC  
voor Vrijdag 9 November 2007 12 UTC



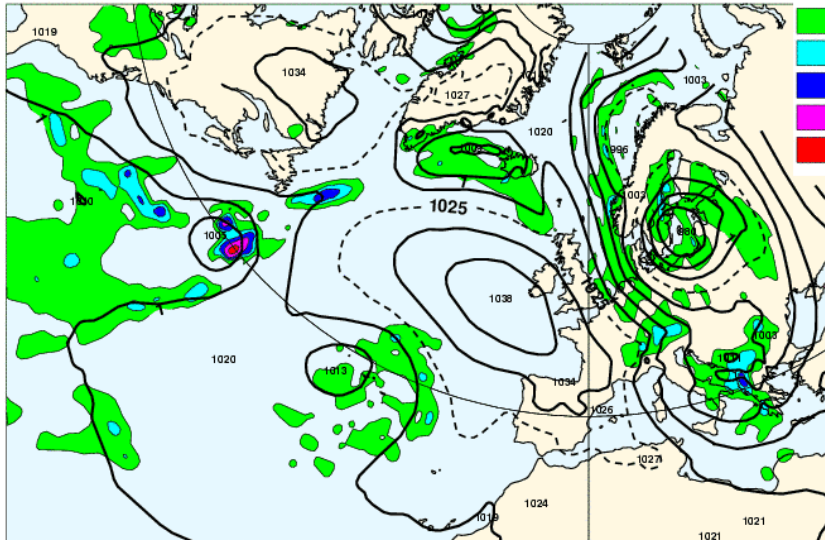
Druk op zeeniveau / Tot Precip. 06-12 UTC

Neerslag

- 1-5 mm
- 5-10mm
- 10-20mm
- 20-40mm
- 40-60mm

# T+120

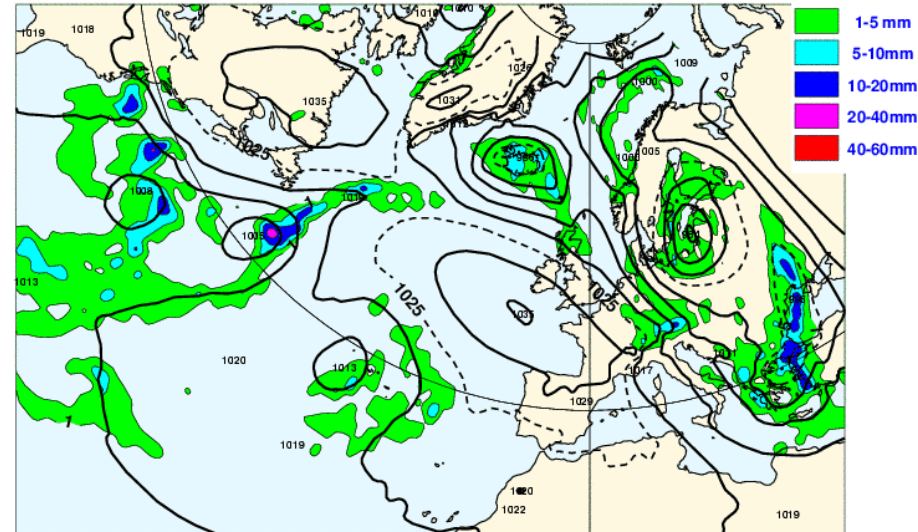
De ECMWF weersverwachting : + 120 uur  
van Maandag 5 November 2007 00 UTC  
voor Zaterdag 10 November 2007 00 UTC



Druk op zeeniveau / Tot Precip. 18-00 UTC

# T+132

De ECMWF weersverwachting : + 132 uur  
van Maandag 5 November 2007 00 UTC  
voor Zaterdag 10 November 2007 12 UTC

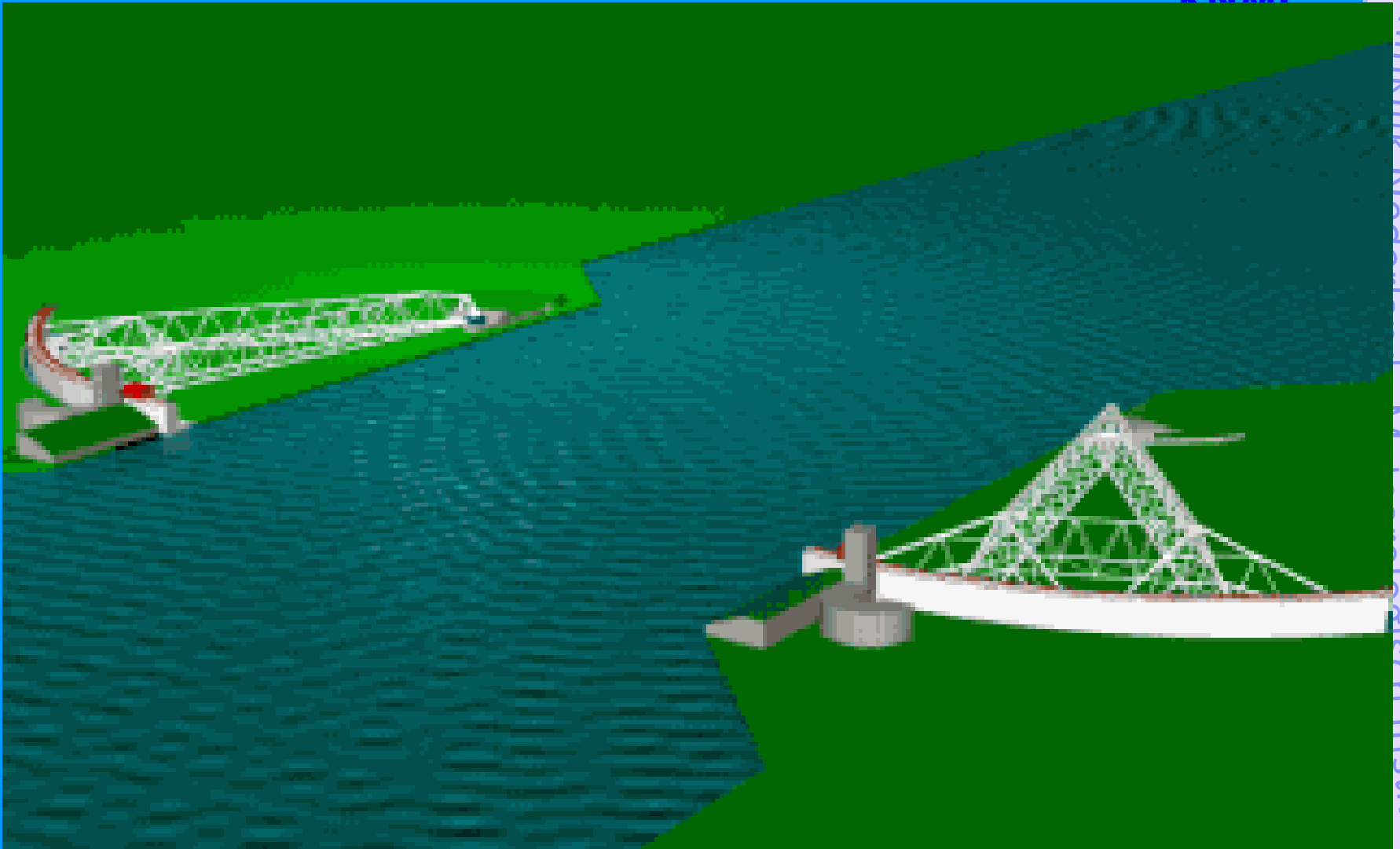


Druk op zeeniveau / Tot Precip. 06-12 UTC

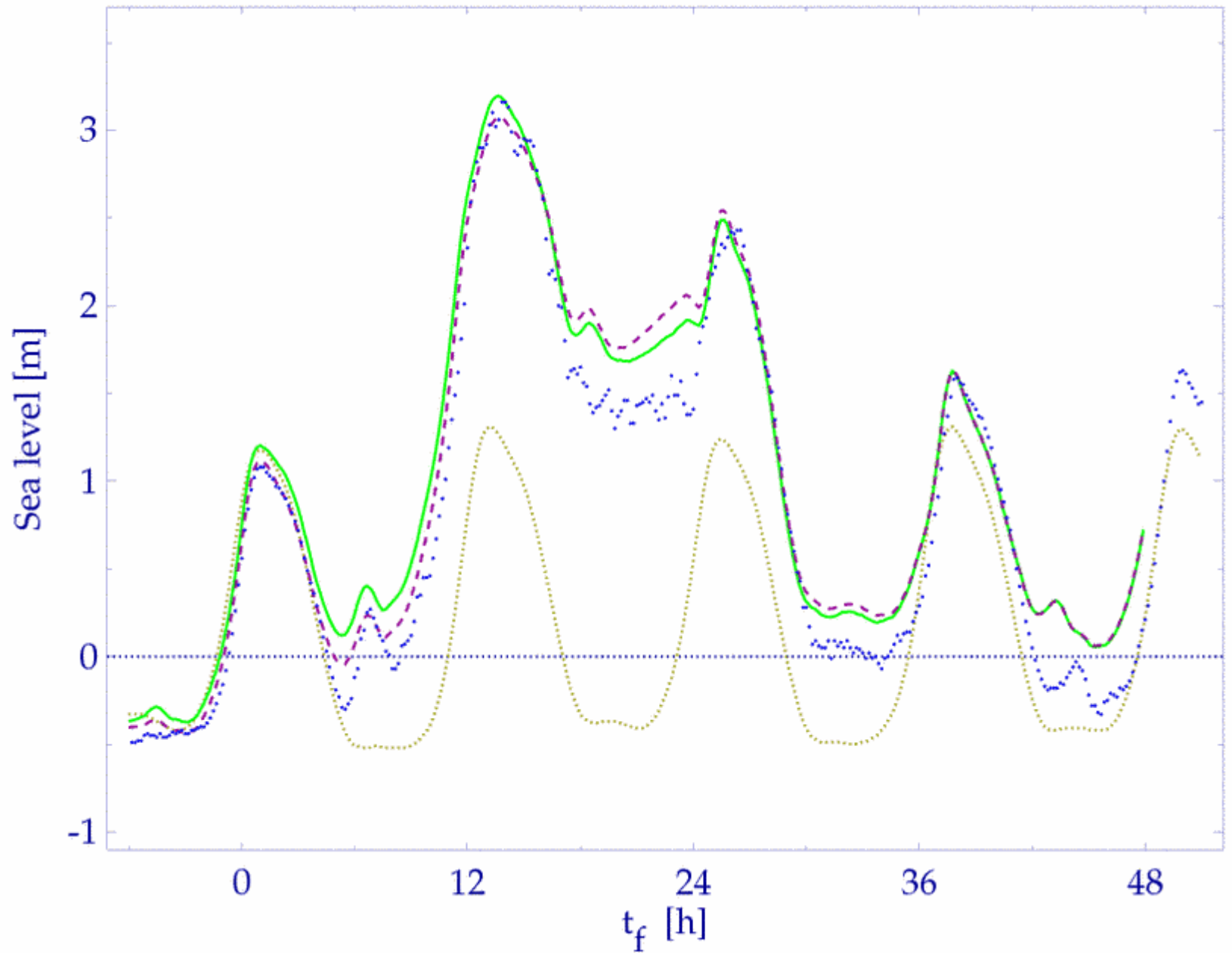
Neerslag

- 1-5 mm
- 5-10mm
- 10-20mm
- 20-40mm
- 40-60mm

# Maeslantkering



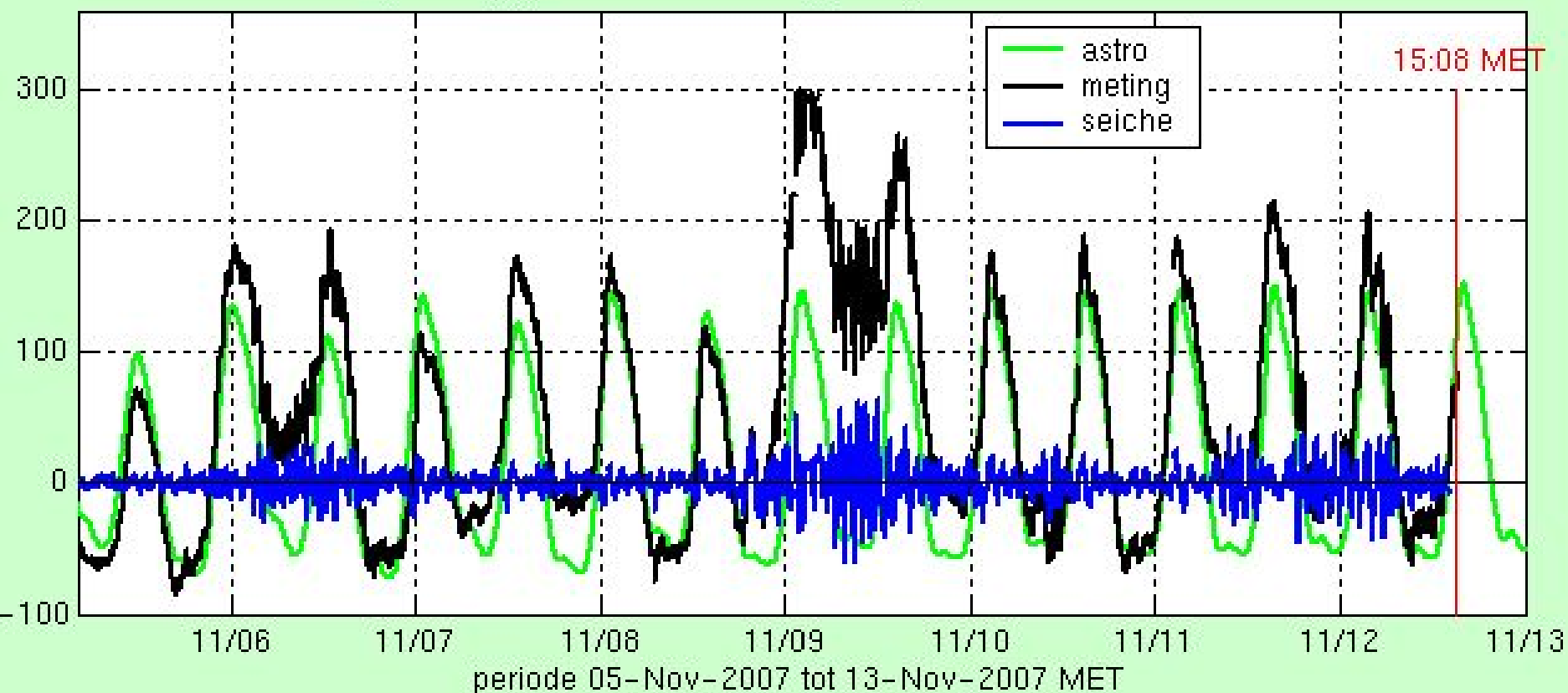
# Hoek van Holland: 2007110812





# Seiches

Rozenburgsesluis, gemeten waterstand geplote op 12-Nov-2007 15:08:37 MET



## Summary

- WAQUA EPS will be the new model
- Happy with the storm forecast 9 november (but not sure whether the right user gets the information on time)
- Suffered from Corbyn Interference

## Flood management in the Netherlands

- Traditional Dutch strategy: build dikes that prevent floods
- New focus after Katrina: managing floods
- National exercise “Waterproef” planned in autumn 2008 for testing communication, evacuation, relief structures, etc
- Increased need for medium-range forecasts
- It is planned to use ECMWF wave model
  - latest version arrived right on time for “waterproef”!

••••  
KNMI version WAM will be phased out



## Extra : Schiphol Runway Capacity Planning

- <http://cdm.klm.com/cps/default.asp>
- System is developed by KLM
- Input: full taf and trend probabilities for the short range
- Input: eps plume (wind,precip) probabilities for medium range



## Video of EPS on Belgian Television

- Every night TV forecaster presents EPS at the end of the bulletin.
- First the first three days
- Then the next seven days in plume format
- Contact : Jean Nemeghaire (KMI/RMI Belgium)