



DELTA IN TIMES OF CLIMATE CHANGE II

INTERNATIONAL CONFERENCE

OPPORTUNITIES FOR PEOPLE, SCIENCE, CITIES AND BUSINESS
 ROTTERDAM THE NETHERLANDS, 24-26 SEPTEMBER 2014

<p>Deltas in Practice, policy-practice sessions</p> <p>Deltas in Practice Theme 2. Adaptation strategies</p>	
<p>DP 2.8 Extreme weather impacts on critical infrastructures: International lessons to improve analysis</p>	
Chair	MSc Jaap Flikweert, Royal HaskoningDHV, United Kingdom
Organised by	MSc Jaap Flikweert, Royal HaskoningDHV, United Kingdom
Presentations	<ul style="list-style-type: none"> • Craig Woolhouse, Environment Agency, United Kingdom
	<ul style="list-style-type: none"> • Jan-Moritz Müller, City of Hamburg, Germany
	<ul style="list-style-type: none"> • Michaël De Beukelaer-Dossche, Ministry for Mobility and Public Works, Flanders, Belgium
	<ul style="list-style-type: none"> • Bart Vonk, Rijkswaterstaat, the Netherlands
Panel	<ul style="list-style-type: none"> • MSc Lisette Heuer, Royal HaskoningDHV, the Netherlands
Session topic	<ul style="list-style-type: none"> • The December 2013 tidal event had a similar intensity across the North Sea. This makes it an excellent case study to compare and contrast how different countries manage coastal flood risk and to identify opportunities to learn from each other and support adaptation to climate change.
Objective of the session	<ul style="list-style-type: none"> • The goal is to collect four stories of four different countries, the Netherlands, Germany, United Kingdom and Belgium, and how they experienced and dealt with the same December storm. <p>The audience was asked to pay attention to find differences and similarities, lessons learnt and good practices to one of the three topics below:</p> <ul style="list-style-type: none"> • Understanding the risk (Sources, Pathways, Receptors) • Mitigation and preparedness (Policies, Procedures, Structures) • Response (Forecasting, Warning, Incident management, Recovery)
<p>Main conclusions and lessons learnt from the presentations</p>	
<p><i>United Kingdom</i></p> <p>England experienced a series of floods during the last 15 years and they put much emphasis on the response side. During the December storm the highest sea levels were recorded on the east coast of England; a significant coastal surge with a return period of about 100 years. In many places the storm coincided with high tide, but there were limited waves. A lot of breaches occurred, most of them at places that were already known as weak spots. The early warning was effective through social media and direct messages. The Thames Barrier closed and flooding in London was prevented. Though a lot of homes were flooded, due to the investment in flood defences of the last decades, also a lot of homes were prevented from flooding. Recovery works are now ongoing, 322 projects in total.</p>	





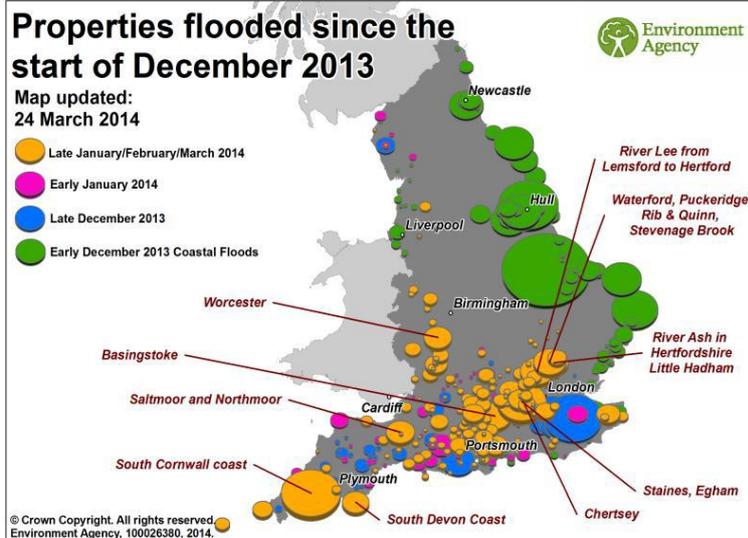
DELTA IN TIMES OF CLIMATE CHANGE II INTERNATIONAL CONFERENCE

OPPORTUNITIES FOR PEOPLE, SCIENCE, CITIES AND BUSINESS
ROTTERDAM THE NETHERLANDS, 24 – 26 SEPTEMBER 2014

Properties flooded since the start of December 2013

Map updated:
24 March 2014

- Late January/February/March 2014
- Early January 2014
- Late December 2013
- Early December 2013 Coastal Floods



Germany

The river Elbe is influenced by tides and storm surges and these cause high water levels along the Elbe in Hamburg. After a flood in 1962 the sea dikes of the Elbe were raised to 8m above mean sea level. The December storm surge was the highest since 1750 and water levels were measured of +6.09m above mean sea level. Hamburg provided extensive risk communication. You could register for the sms texting warning service and several warnings were given; gun shots, radio warnings and sub-titles on TV channels. The flood protection facilities were in a good state. There was only financial damage by removal of pollution on dikes, flooded areas and streets.



Belgium

After a flood event in 1976, the Sigma plan was developed to protect the Sea Scheldt for a 1/10.000 storm. In 2005 Sigma 2.0 was developed with a 'room for the river approach'; amongst others Flood Controlled Areas (FCA). Also a coastal safety master plan was developed; the main protection measure was beach nourishment. The predicted water level of the December 2013





DELTA IN TIMES OF CLIMATE CHANGE II INTERNATIONAL CONFERENCE

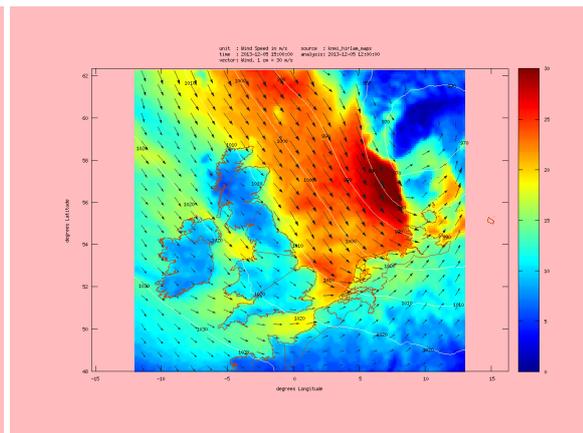
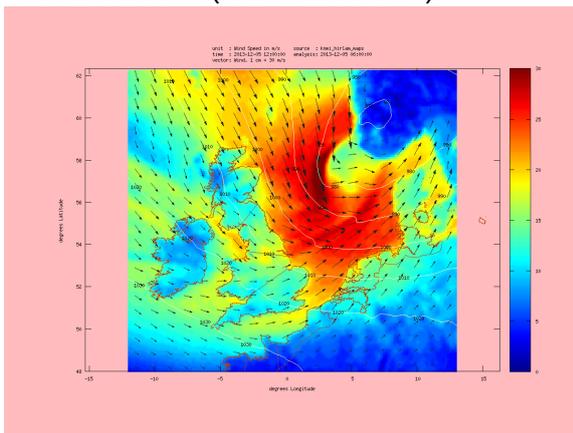
OPPORTUNITIES FOR PEOPLE, SCIENCE, CITIES AND BUSINESS
ROTTERDAM THE NETHERLANDS, 24-26 SEPTEMBER 2014

storm corresponded with a 50 year storm flood; the highest water level recorded since 1953. Predictions turned out to be good and reliable, three days in advance the water height was known. The flood control areas came into action and proved their necessity. A lot of actions were taken before and during the storm. One of the weakest points of the coastline is the harbour area, but no major problems occurred. The main damage was essentially loss of sand and sand cliffs on the beaches.



The Netherlands

After the big storm in 1953 with severe flooding the Delta works were built. Nowadays the safety standards consist of a probability of exceedance per dike ring. The Netherlands must be prepared, both for coastal flooding and for flooding caused by a high river discharge. In case of a flood threat the National Coordination committee for Flood threats (LCO) comes into action to give early warning information and to give advice at a national level. The forecast of the December storm surge showed quite some developments due to the colliding of two storms and the effect of a local depression. Eventually a water level was measured of 1 cm under the highest ever measured level at Delfzijl; a one in 50 year event. As expected, there was relatively little damage to the coastal defences (dunes and levees).



Main conclusions of the discussion

Understanding the risk(Sources, Pathways, Receptors)

Differences and similarities

In all countries closing the gates was an important element. Though the organisational

Lessons learnt and good practices

The uncertainty how to handle a risk and how to predict it, is still significant. Expert





DELTA IN TIMES OF CLIMATE CHANGE II

INTERNATIONAL CONFERENCE

OPPORTUNITIES FOR PEOPLE, SCIENCE, CITIES AND BUSINESS
 ROTTERDAM THE NETHERLANDS, 24-26 SEPTEMBER 2014

aspect (who is leading) was different.	judgement is still needed. For example how to interpret varying forecasts of local depressions. Adequate use of social media is important.
<i>Mitigation and preparedness(Policies, Procedures, Structures)</i>	
<u>Differences and similarities</u> Historically seen, in each country there was a flood first and then a plan to prevent future flooding. Every country learnt from their experiences. The countries used different strategies: BE used a soft approach for example. All countries have different standards and approaches.	<u>Lessons learnt and good practices</u> Focussing on people to people communication, internally as well as to the wider public.
<i>Response (Forecasting, Warning, Incident management, Recovery)</i>	
<u>Differences and similarities</u> In all countries flood experts' knowledge was present, every country used forecasting. The awareness was very different: in DE there was high awareness, in UK there was medium awareness and in NL and BE there was little awareness.	<u>Lessons learnt and good practices</u> It is good to raise awareness: before and after the storm. To prevent failure at a twin storm: take care of damage before the next one hits. Take into account cyber crime for your flood system.
Main result or conclusion of the session	
<p>When a storm of this size happens, it becomes a common problem and it has started the conversation between four countries. There are a lot of differences between the countries. In the UK flood events have occurred regularly; there is more acceptance of the risk and there is more focus on the response side. In the Netherlands flood prevention is the standard. In Germany a lot of attention is paid on the awareness of the inhabitants to prevent damage. In Belgium no flooding occurred. Probably because the storm was only a 1:50 year's storm, mainly offshore and next to this controlled flooding measures and beach nourishment came into action.</p>	
Most exciting insights or outcomes	
<ul style="list-style-type: none"> ● UK: Erosion occurred which normally would take 10-15 years. ● UK: The flood went totally off the media, due to the death of Nelson Mandela. ● DE: Sub-titles on TV channels warned for the storm and also mentioned to check on your neighbours! ● BE: People in the crisis team were getting too tired! In the future more people are needed and more periods need to be taken into account. ● BE: The sigma plan came into action during the storm; 10 out of 12 controlled flooding areas showed off! ● NL: The right forecast was known on Friday afternoon (the storm started Friday night), due to a sudden change in wind direction ● NL: There was no anxiety among the people in the Netherlands, other than: will the train still ride? 	

