

How safe is safe enough

NUWCREN workshop: Development of 'yardstick' for flood preparedness

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Program

- Welcome and Scope
- What is Safety (US)
- NL criteria for emergency preparation
- US criteria for emergency preparation
- Workshop: “develop a yardstick”
- Wrap up



Scope

- The risk is a combination of probability x consequences
- A multiple layer approach by
 - Prevention (dikes etc)
 - Land use planning (where and how to build)
 - Emergency management
- Emergency management is a 'layer' in a Multiple Layer Approach:
 - Reduces the consequences (casualties, movable goods)
 - Can cause damage as well (economical processes, false alarms)
 - Why are investments necessary (cost benefits, accountability, etc)
- Flooding requires specific attention:
 - No system is designed for flooding / evacuation, a emergency system is already in place but designed for other incidents
 - Rescue services are outnumbered by citizens
 - Low frequency of events
 - Measures that normally work might not work (registration, rescue, traffic management etc)



Ambition of the workshop

- To define a 'Yardstick' for flood preparedness related to
 - 1) acceptable risk &
 - 2) accountability
- Therefore we focus on:
 - Conceptual framework of such a yardstick
 - Use of data and expertise
 - Research questions en Policy issues
- This Yardstick has to be used to evaluate:
 - 1) the need for investments in emergency management in a multiple layer approach
 - 2) to evaluate the level of preparedness of a local, regional or national authority

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Multiple layer Safety in current practice in NL



- Water Act: Norms for water levels (1/2000 y), Durably maintain the achieved safety level, Assessment each 6 years



- Current evaluation (FLORIS, WV21)



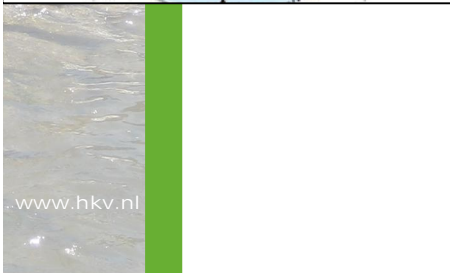
- "Watertoets" process-management tool for land use planning

- Process driven, not result (risk) driven

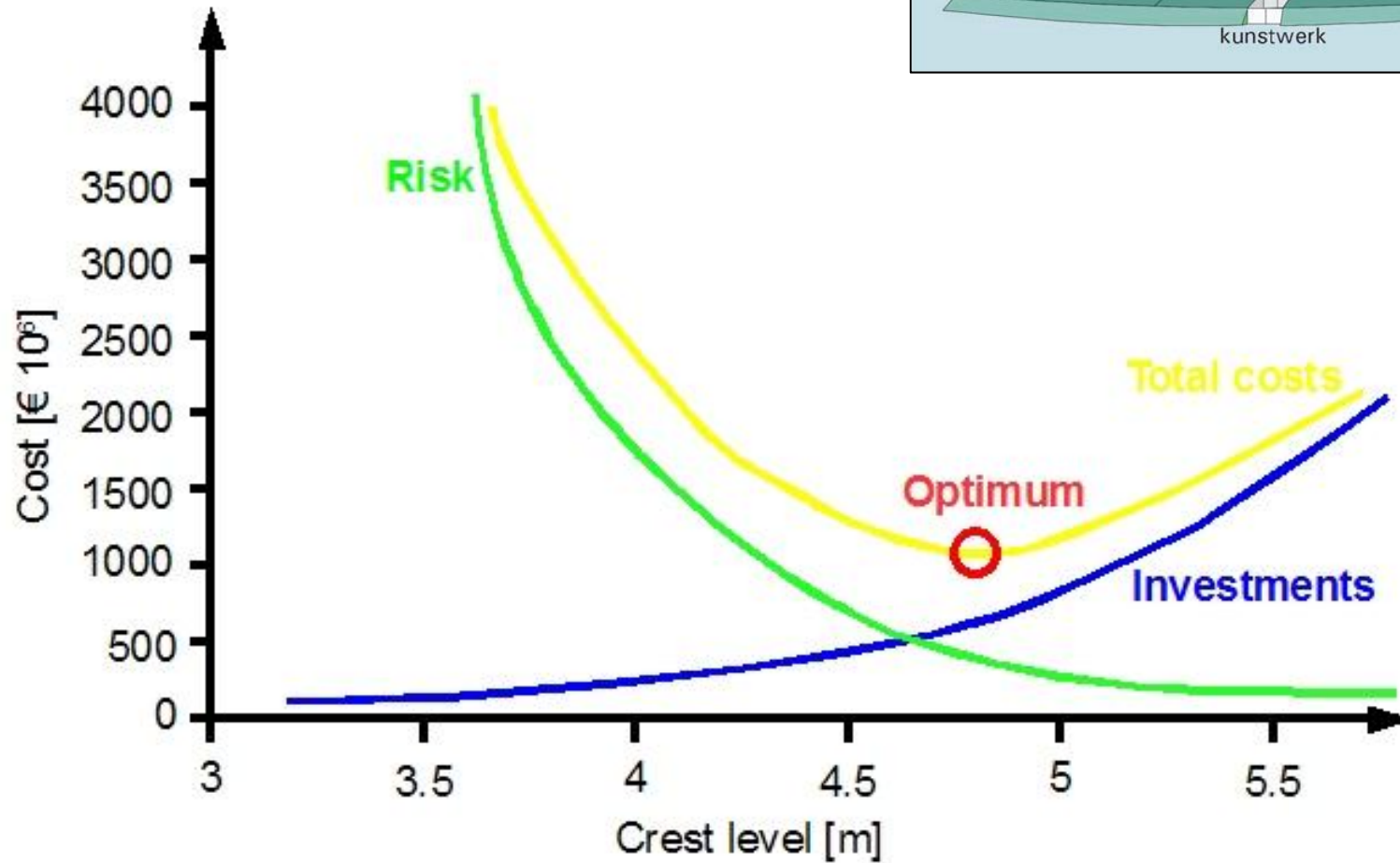
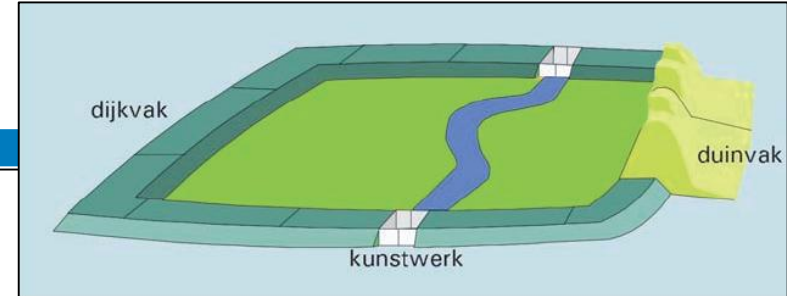


- Emergency planning, exercises, risk communication
- Process driven (Water Act): "*effective response*" & "*at least for comment to the safety region*"

- Not result (risk) driven

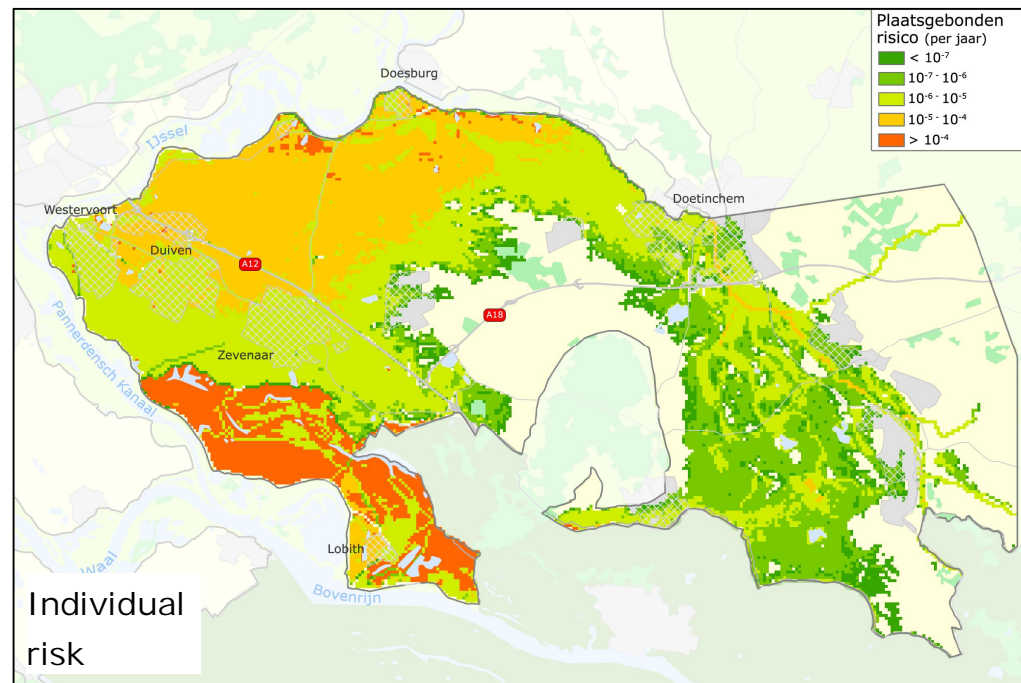


Cost-benefit analysis Delta-Committee (1960)



Decision criteria

- Individually acceptable level of risk
- Socially acceptable level of risk
- Economic optimisation: cost-benefit analysis
- Value of casualties defined in economical loss (20%)

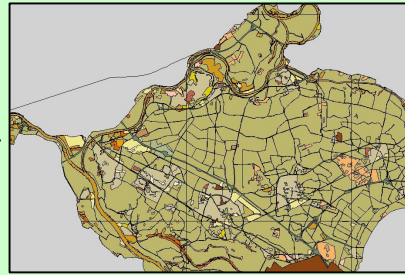
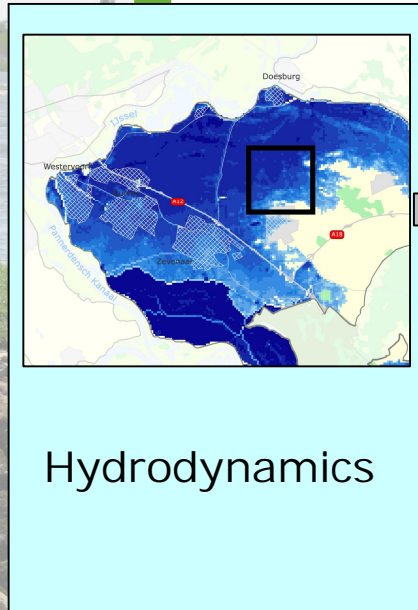


Damage and casualties

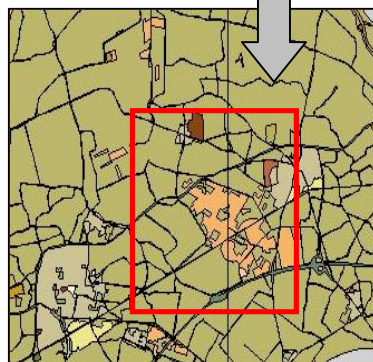
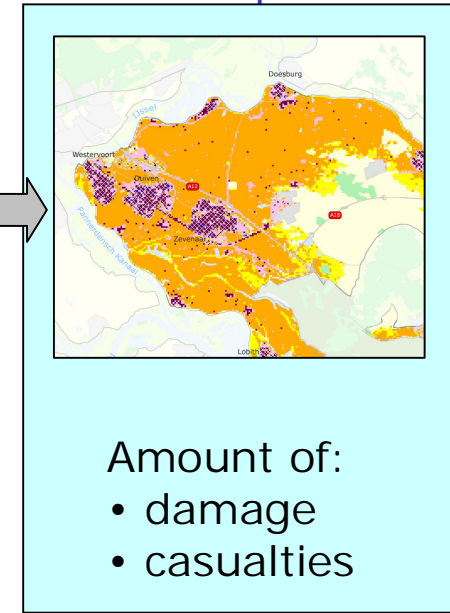
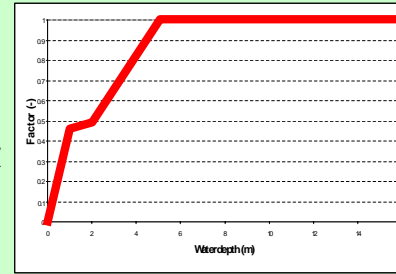
Input

Module

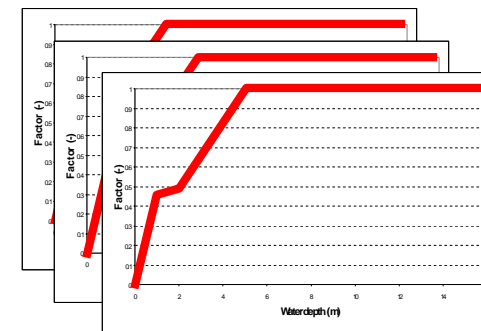
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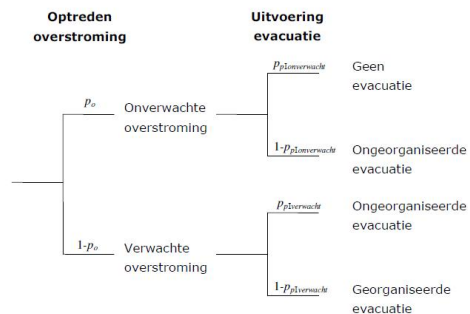
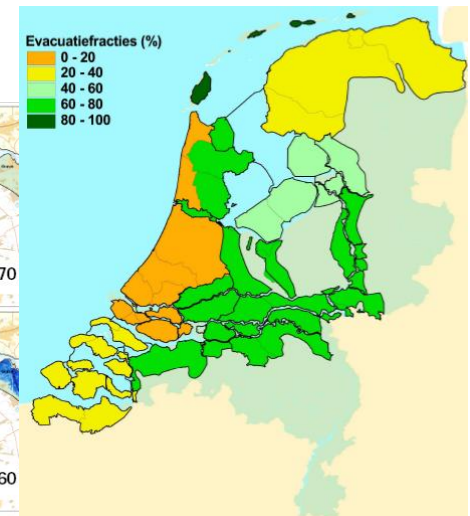
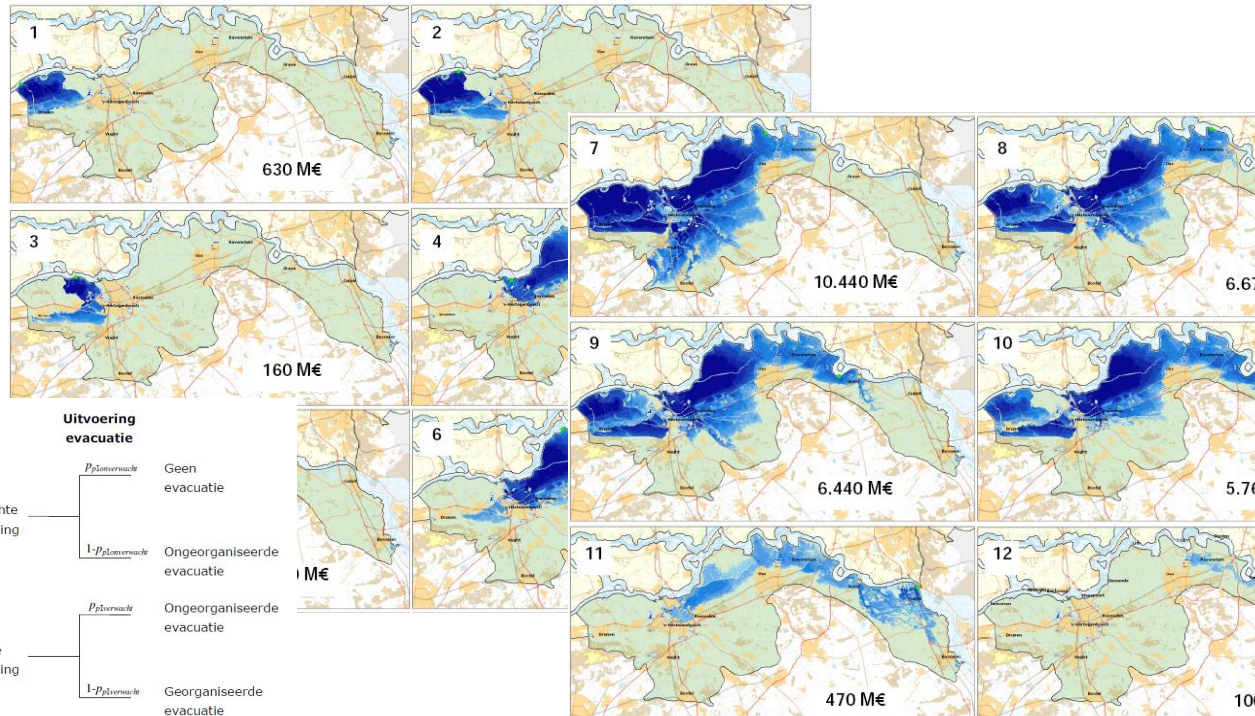


Agriculture:	2500 m ²
Houses:	115
Appartments:	35
....
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Method "flood risk"

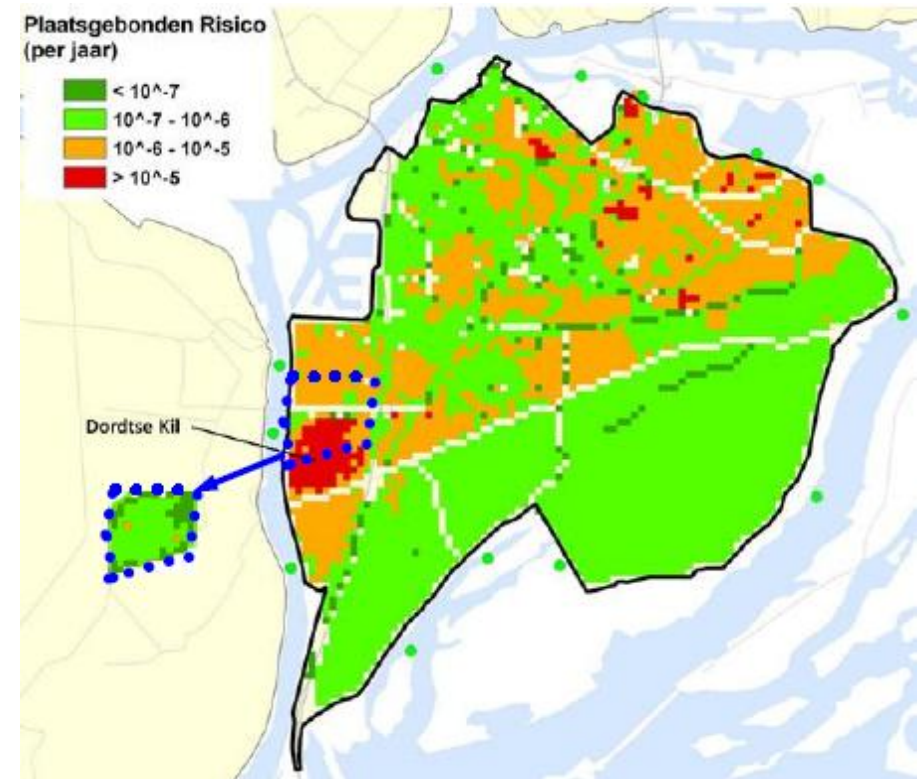
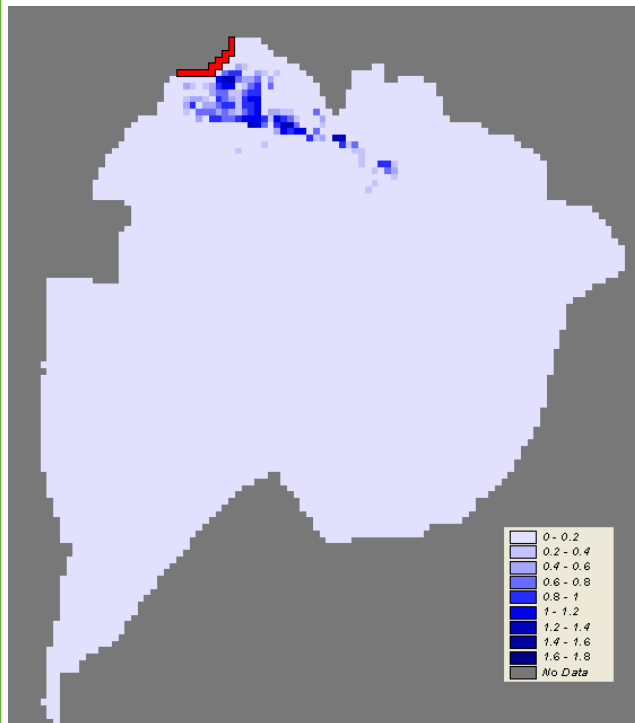
1. Probability for flooding
2. Evacuation fraction (people that can leave the area before a flood) example 20% of dikering 14, 75-80% for river area
3. Damage
4. Casualties



Examples

Voorstraat (Dordrecht):

- Height does not meet safety standard
- Other solutions?

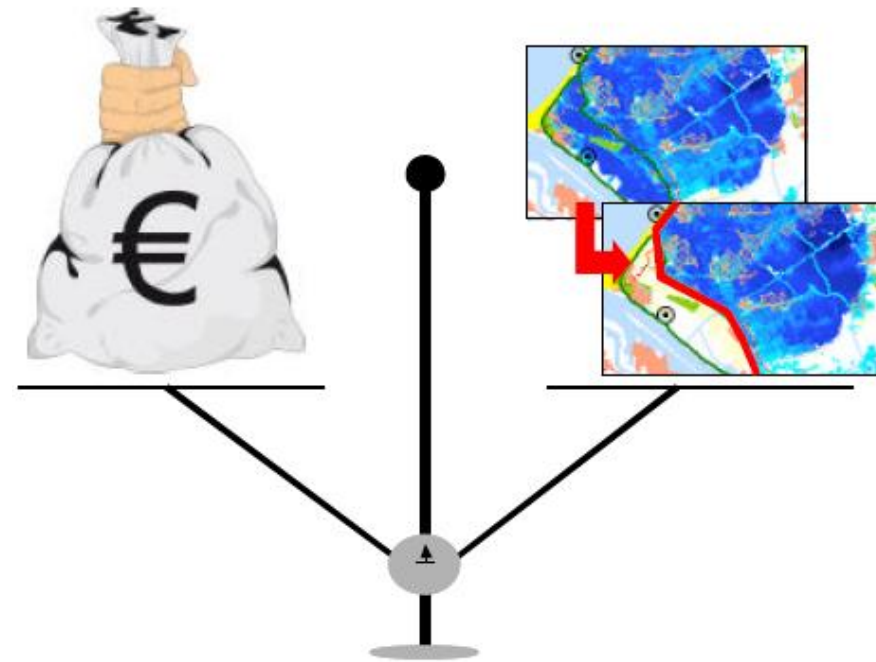


Basisveiligheid in een dijkring

- Dijken versterken?
- Lokaal oplossen?

Cost-benefit analysis

- Balance costs and benefits (reduction of risk) of each measure
- Prioritize measures



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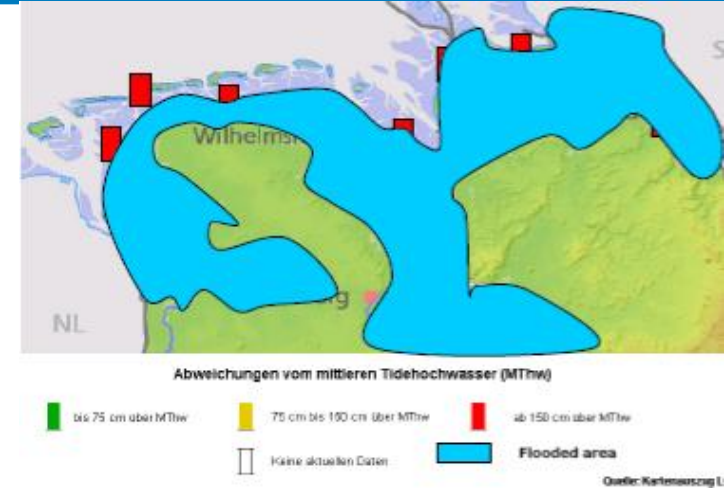
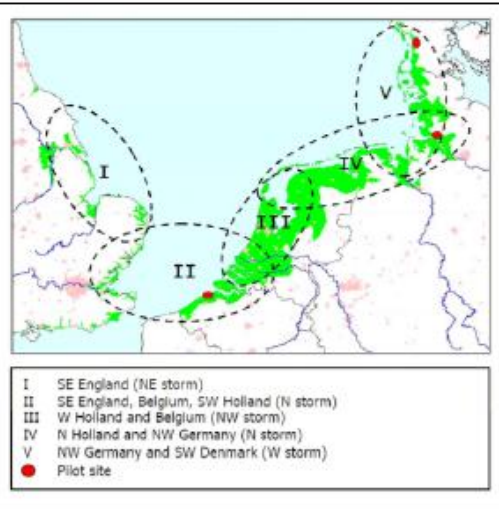


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Scenario (1): North Sea Flood (Floodex)

Day	Weather	Probability for flooding
D-6	Normal	5%
D-5	Normal	5%
D-4	Normal	15%
D-3	Normal	15%
D-2	Normal	15%
D-1 Start of CPX	Extreme wind	40%
D-1 afternoon	Extreme wind	55%
D0	Extreme wind	Flood



Scenario (2)

Time	Lead in The Netherlands	Lead in Germany	Lead in United Kingdom
D-6	<ul style="list-style-type: none"> • Detection by KNMI and LCO • Start up crisis management and crisis structure 	<ul style="list-style-type: none"> • Detection by meteorological office and flood forecast centre • Start up crisis management and crisis 	<ul style="list-style-type: none"> • Detection by Met office (wind) and environmental agency (Flood warning) and Flood Forecast Centre (lead time and guidance to

X 1.000 people		The Netherlands	Germany	United Kingdom
Evacuated people outside the threatened area	Self supporting	1100	Tens of 1.000	+ / - 500
	Non self supporting	317		
Evacuated people inside the threatened area which require rescue	Self supporting	1400	Couple of 1.000	39
	Non self supporting	37		1
Evacuated people inside the threatened area which do not require rescue			Hundreds of 1.000	

Figure 4: Result of evacuation and objective of rescue operation and needed assistance

- No evacuation for self supporting

- pipelines at Emden/Dornum;
- closing of specified roads (A28, A29, A31) in Niedersachsen/ Bremen

Questions

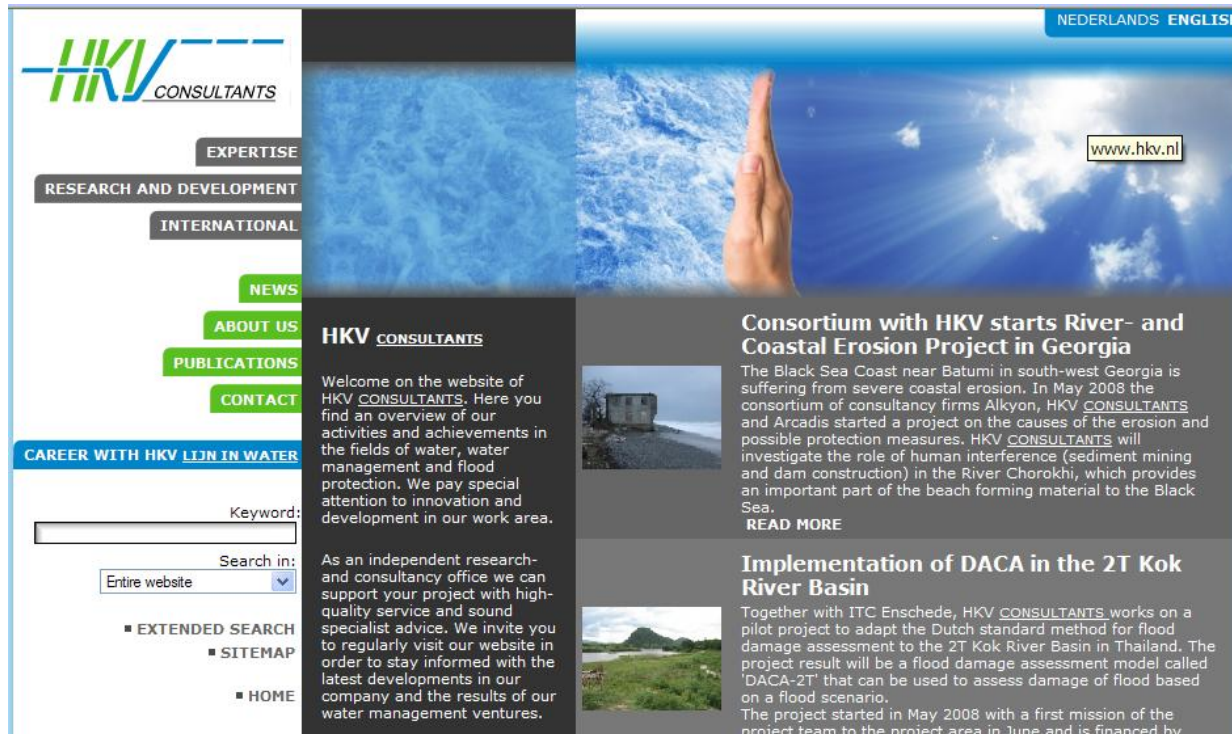
1. Summarize possible elements of emergency preparation (planning, exercises etc)
2. Discuss if these contribute to “reduction of risk” & “accountability”
3. Define the relation between each element and “reduction of risk” & “accountability”
4. Define outline of “Yardstick” for flood preparedness
5. Summarize
 - Research questions
 - Policy issues

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Thanks for your attention



The screenshot shows the HKV CONSULTANTS website homepage. At the top right, there are language options for "NEDERLANDS" and "ENGLISH". The main header features a large image of a hand reaching up towards a bright sky with clouds, with the URL "www.hkv.nl" overlaid. A navigation menu on the left includes "EXPERTISE", "RESEARCH AND DEVELOPMENT", "INTERNATIONAL", "NEWS", "ABOUT US", "PUBLICATIONS", and "CONTACT". Below this is a "CAREER WITH HKV LIJN IN WATER" section with a search bar and a dropdown menu set to "Entire website". A sidebar on the left lists "EXTENDED SEARCH", "SITEMAP", and "HOME". The main content area has a heading "HKV CONSULTANTS" and a welcome message. Two news articles are featured: "Consortium with HKV starts River- and Coastal Erosion Project in Georgia" and "Implementation of DACA in the 2T Kok River Basin".

HKV CONSULTANTS

Welcome on the website of HKV CONSULTANTS. Here you find an overview of our activities and achievements in the fields of water, water management and flood protection. We pay special attention to innovation and development in our work area.

As an independent research- and consultancy office we can support your project with high-quality service and sound specialist advice. We invite you to regularly visit our website in order to stay informed with the latest developments in our company and the results of our water management ventures.

Consortium with HKV starts River- and Coastal Erosion Project in Georgia

The Black Sea Coast near Batumi in south-west Georgia is suffering from severe coastal erosion. In May 2008 the consortium of consultancy firms Alkyon, HKV CONSULTANTS and Arcadis started a project on the causes of the erosion and possible protection measures. HKV CONSULTANTS will investigate the role of human interference (sediment mining and dam construction) in the River Chorokhi, which provides an important part of the beach forming material to the Black Sea.

Implementation of DACA in the 2T Kok River Basin

Together with ITC Enschede, HKV CONSULTANTS works on a pilot project to adapt the Dutch standard method for flood damage assessment to the 2T Kok River Basin in Thailand. The project result will be a flood damage assessment model called 'DACA-2T' that can be used to assess damage of flood based on a flood scenario.

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