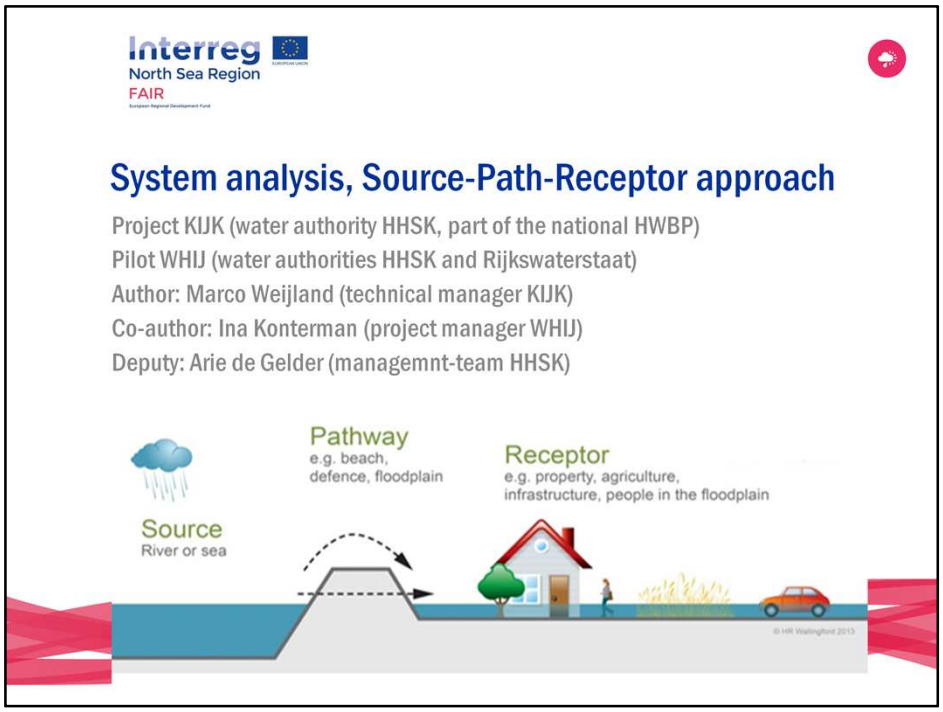
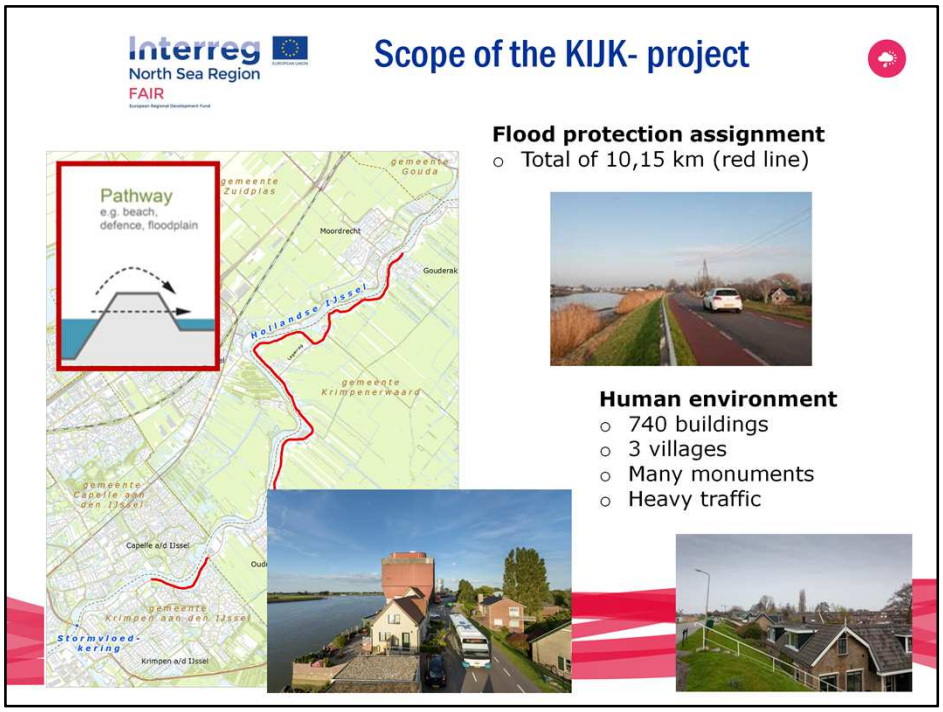
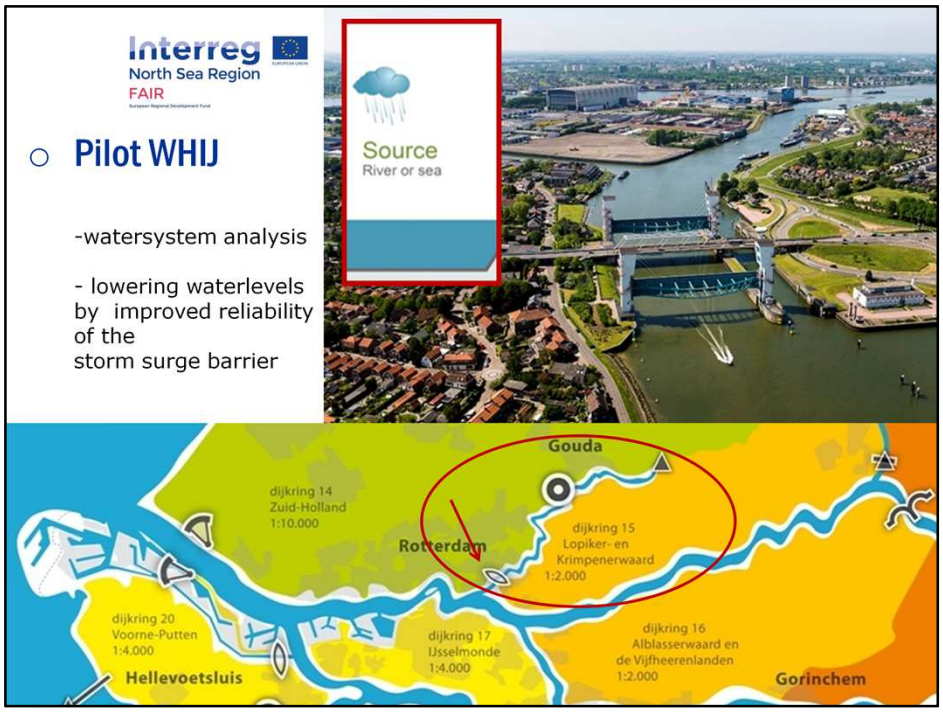


FAIR Interreg promotes a source path receptor approach of flood defence with proper life cycle analysis.

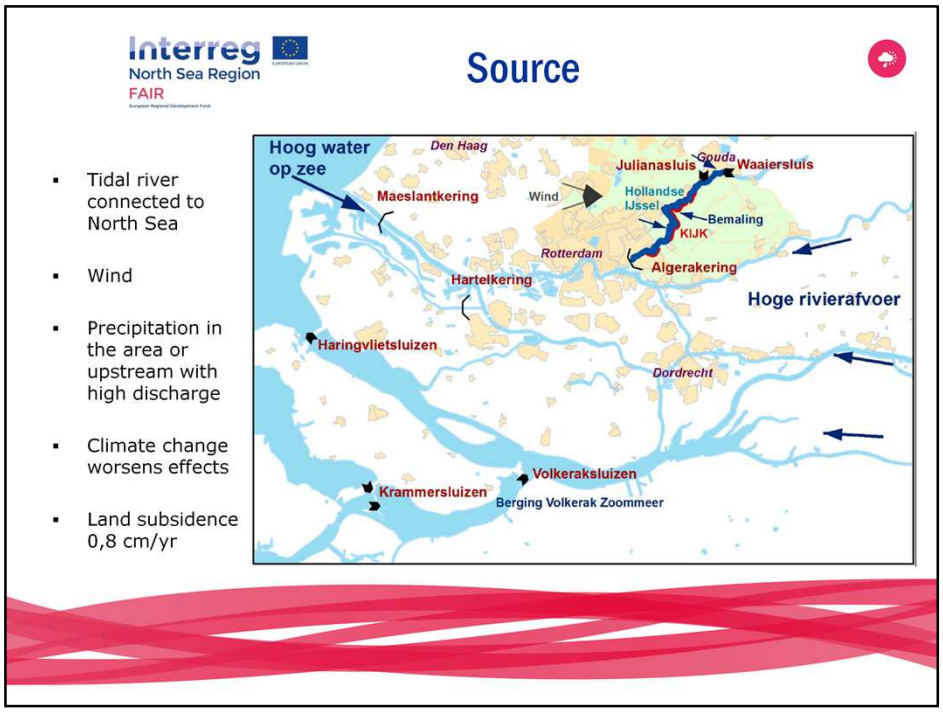
This presentation is a co production of the regional water authorities involved and the national water autority of the Netherlands.
The Dutch strict safety standards were determined by the amount of injuries and damage in case of floods
Cooperation meets lots of regulations for the different partners in flood defence



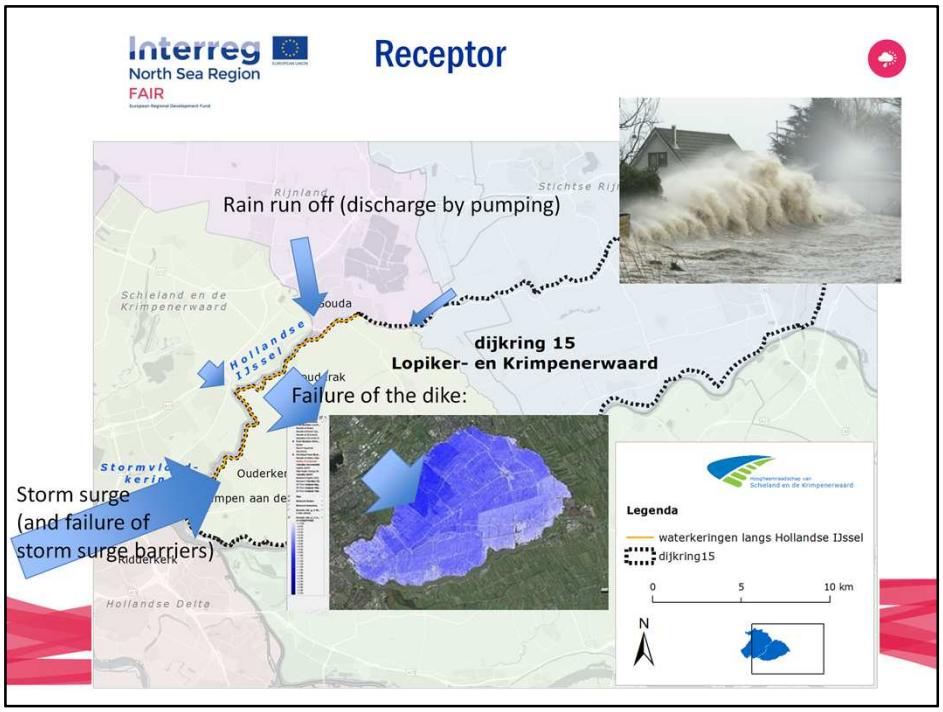
- 9 million residents and most of the jobs are in that area
- Safe from high water levels and flooding
- Next to the flood protection assignment that we have, we also have to make sure it fits. It's a steep and narrow dike. So there is a spatial assignment as well. The human environment.
- As you can see buildings are situated close to the dike: on the landside slope as well as the riverside slope there are houses, offices, schools, monuments, and hydraulic structures.
- The area here is a semi-urban environment with 3 villages that are part of the two municipalities Krimpenerwaard and Krimpen aan den IJssel. The villages have become popular commuter towns for people working in Rotterdam, and have a combined resident number of about 37.000. The road on the dike is a major infrastructure service for cars, heavy traffic, recreational cyclists, school kids cyclists, and a bus line.



The Hollandsche IJssel is a tidal river that is connected to the North Sea.
The Storm Surge Barrier was built after the 1953 North Sea flood disaster. It was built together with the Algera Bridge.
The barrier lies before 40 km dike from which 10 km is project KIJK



Flooding is caused by a combination of different sources. So are the pathways and consequences for the receptors…



- Modelling flooding scenarios: a dike breach at a certain location and a certain duration of flooding (with a closed Storm Surge Barrier)

- Total amount of damage divided by safety standards (return period) equals 4 Million Euro's a year

With closed barrier the damaged is only 10% of the damage by flooding with an open system.
If only half of the floodings is with closed barrier instead of an open system the benefits are 2 MEuro's a year

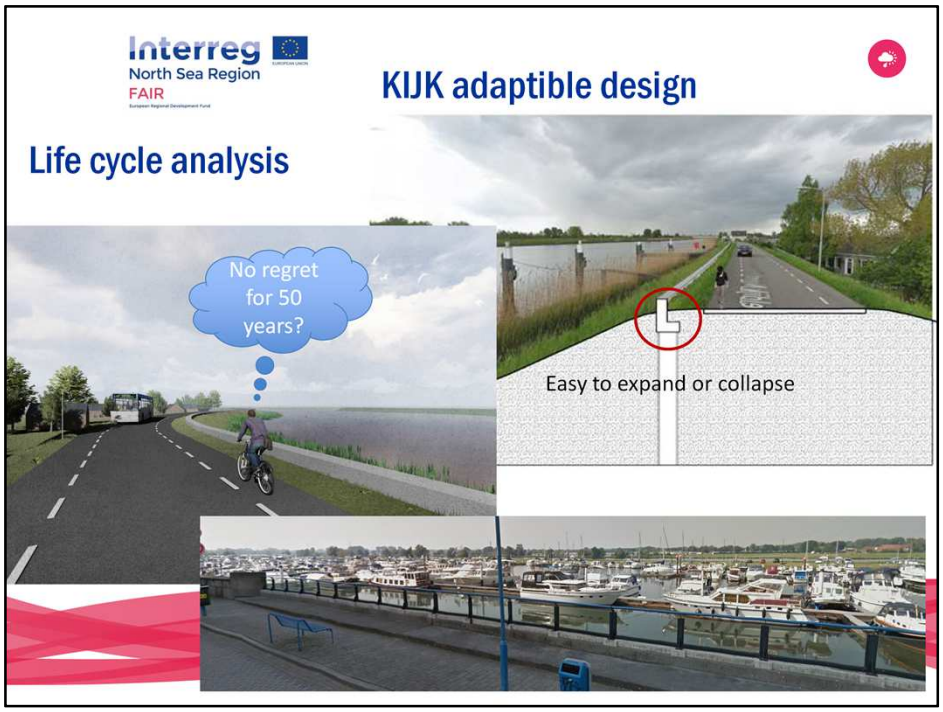
Broader perspective

- Project KIJK addresses the functional goal: protecting the citizens and economic values behind the dike against high water levels and flooding, and to meet the new Dutch safety standards.
- This could not only be solved by reinforcing the dike, but also with a combination of solutions in a broader perspective such as lowering water levels, making agreements on adjusting the closing protocol of the Storm Surge Barrier, minimizing the impact of a possible flooding, or using innovative solutions.

Approx. cost is 10 M euro to improve the storm surge barrier to function with a 5 times higher rate of reliability. This saves approx 40 M euro on dike reinforcement which is still necessary because of landsubsidence and climate change.
By saving M€ 30 on M€ 600 for the whole watersystem we meet the project result indicator for FAIR, which is 5% cost reduction.

The key to getting the optimal mix of measures is the cooperation the water authority has with RWS. Or as the recommendation in de policy brief of FAIR states, break free of the silo. FAIR played a part in forming a common understanding on the problem and the measures.

Other factors that played a part are the joint projectteam from both parties and the employing of contra expertise in case of very specific subjects, like the function of the one-of-a-kind storm surge barrier.



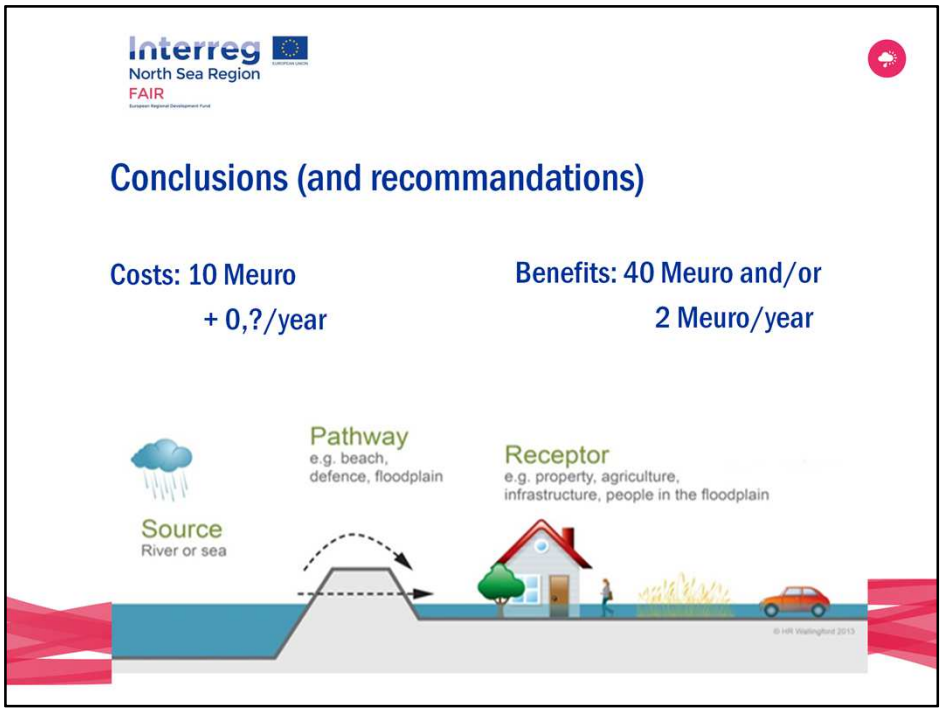
We are now also incoporating the future optimisation of the storm surge barrier into the design of the dike.

Impact of water level reduction differs for the type of solution and chosen life cycle period (relative short in the project at this moment to deal with the uncertainties in hydraulic loading). The construction should be able to ficilitate a expansion of the height.

Stand alone constructions needs a clear choice of construction height (with impact on the landscape)

- Ability to adapt the construction can be built in

If the storm surge barrier gets replaced by a dam in the distant future it should also be possible to collapse the top of the structure without to much effort. Because the dike keeps subsiding while the structure is rigid.



Save money by cooperation with a broad view and thorough analysis of the complete source-pathway-receptor and life cycle approach