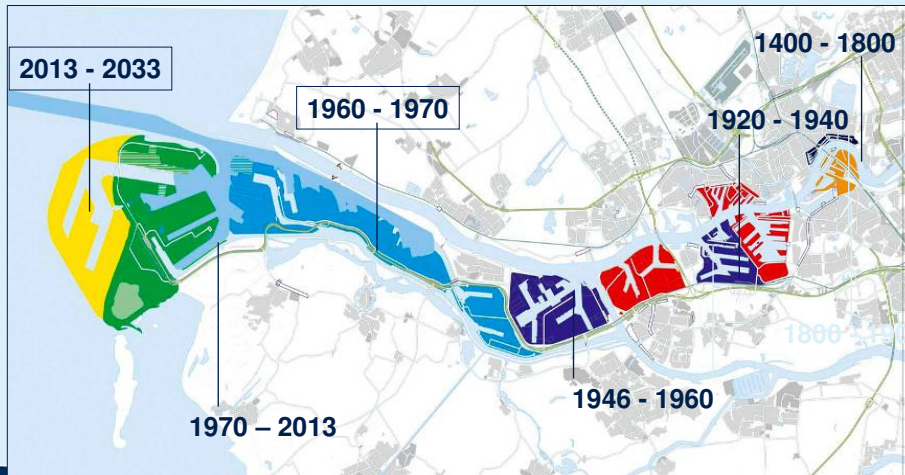




## Development of the port of Rotterdam

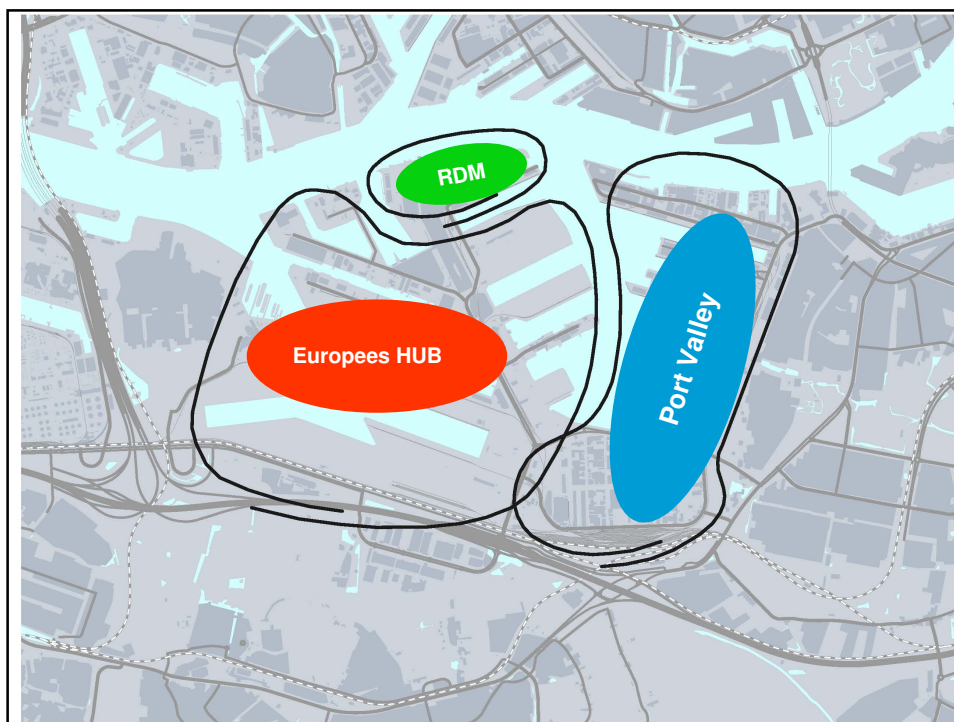


3

## Artist impression Maasvlakte 2



4



## Impact climate change scenario's



### High water levels

- Sealevel rise
- More run-off from the river in times of heavy rain

### Low water levels

- Less runoff from the river in times of drought





## Issues

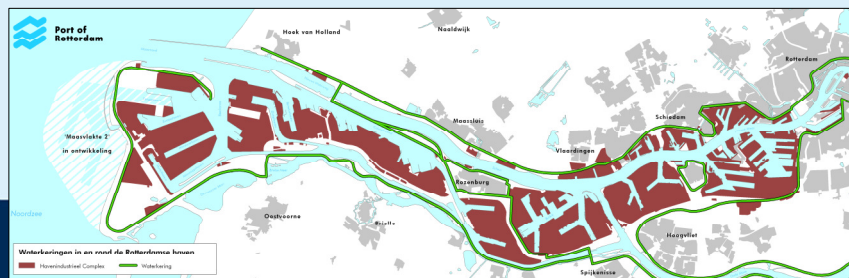
*High water levels causes a flood risk*

- Assess the effects of climate change on the development of flood-prone areas *outside* of the protective dykes and polders of the Rotterdam - Drecht Cities area

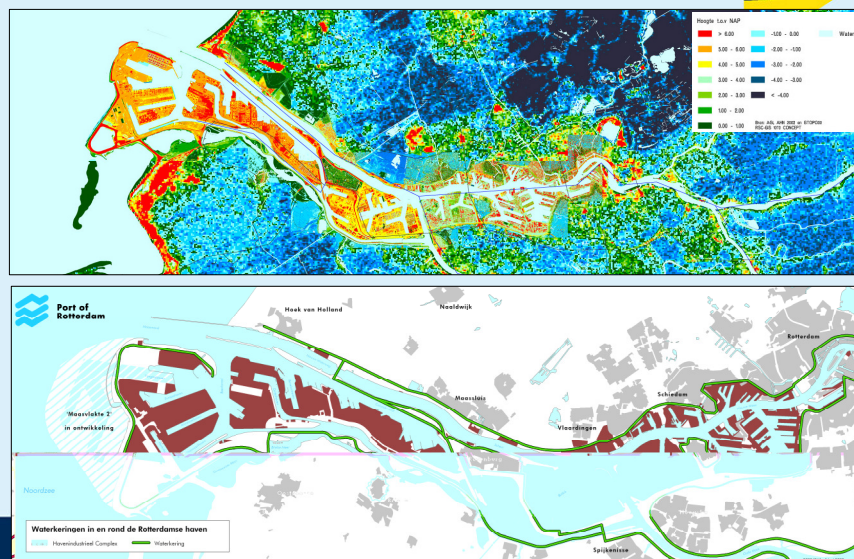
*Low water levels has an effect on fresh water supply and accessibility*

- Optimize the open access and fresh water supply for the region
- Keep up the high service level in hinterland transport

*Climate change affects spacial planning*



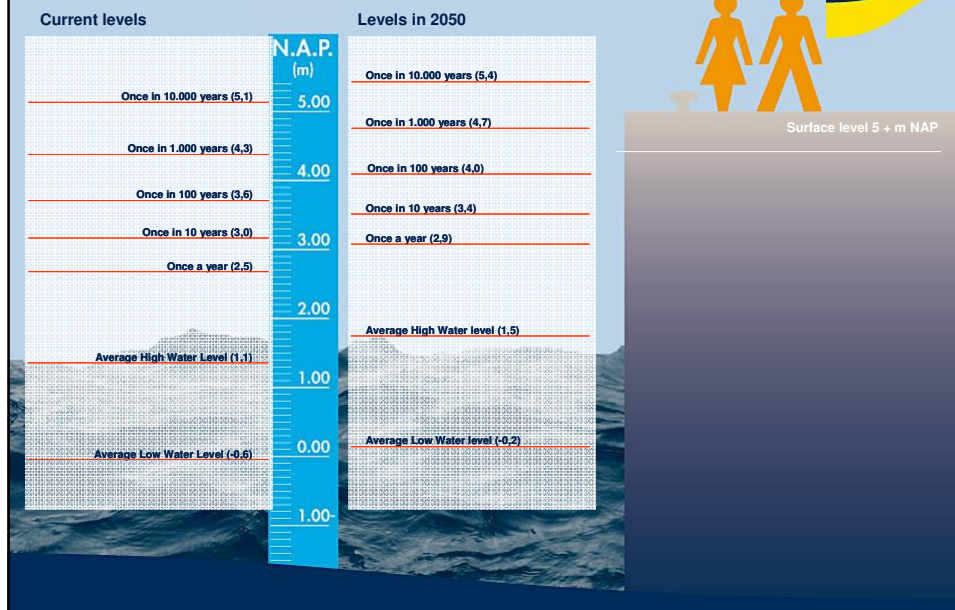
## High water levels: Flood risk



## Embanked/unembanked areas



## Flood risk



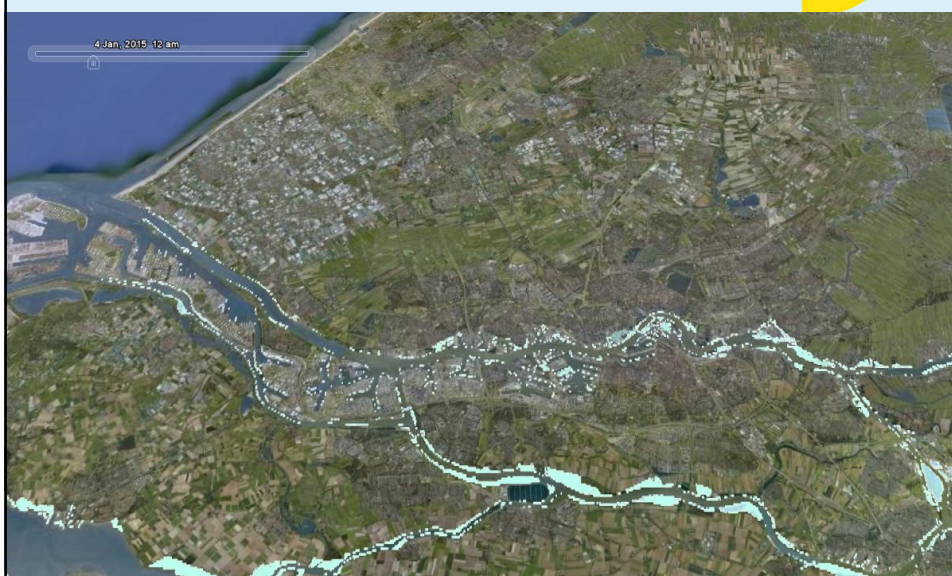
## Existing Maeslant barrier



- Protecting Rijnmond area from storm surges North Sea
- Near entrance of Port of Rotterdam



## 100 year flood

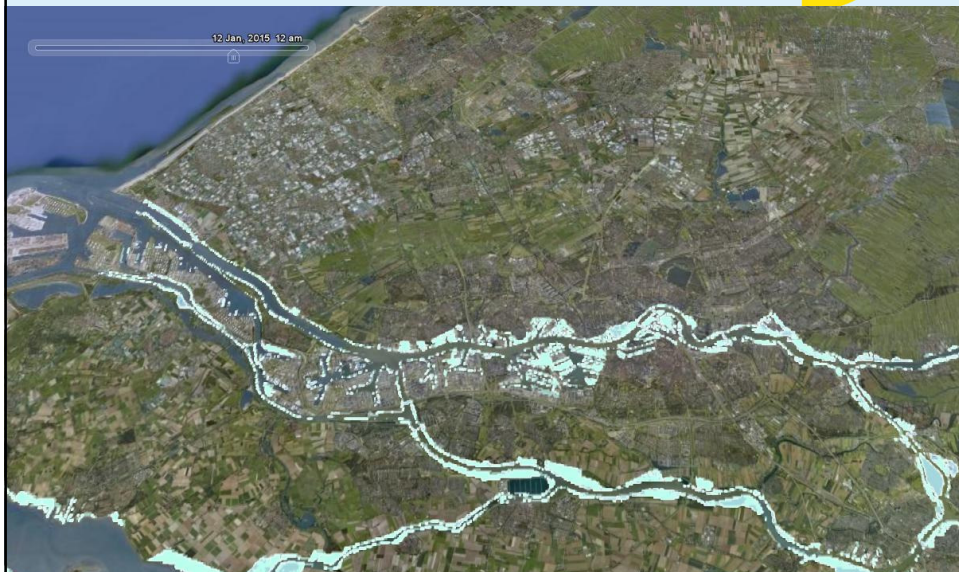




## 1000 year flood



## 4000 year flood



## Consequences of severe flooding



- (Death) Victims: unlikely
- Society in disorder: possible
- Environmental damage: not considered at this moment
- Economic loss: not considered at this moment



15

## High water - developments



- Legislation regarding the areas outside the dikes.
- Discussion on the construction standards of dikes. This is due to the rise in economic value of the inner dike areas.
- Due to the high population density of the area early decision making is key.

16

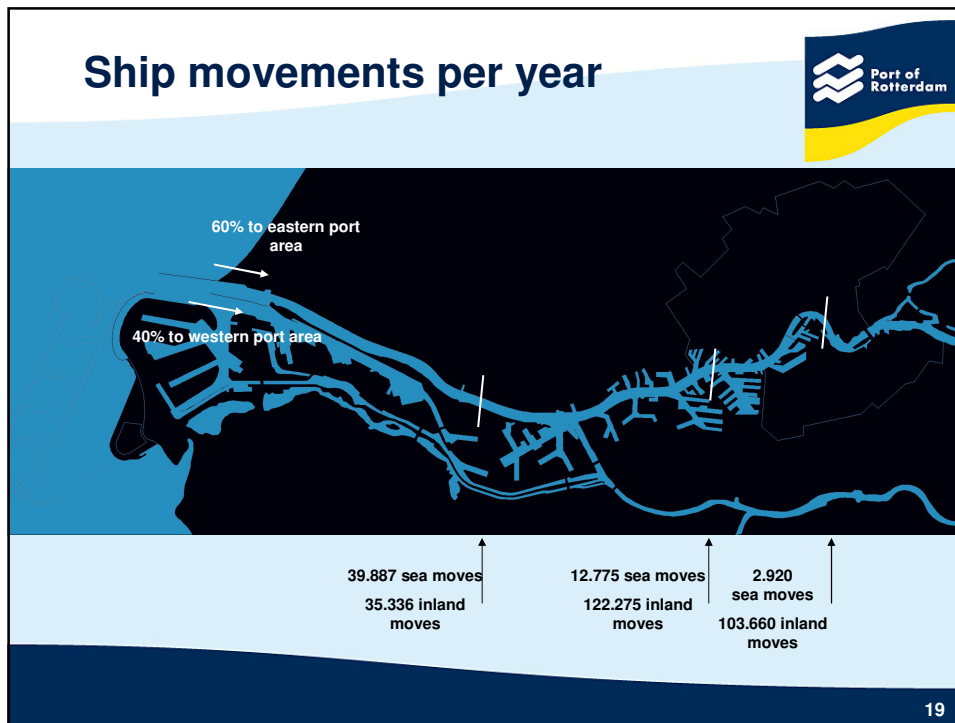


## Low water 1: Impact on shipping



## Rotterdam perfectly linked to European inland waterways





## Accessibility - developments

- The interest of the Port and Rotterdam is widely known
- Climate solutions may impact sea and/or inland shipping
- Economic effects depend on closure frequency or possibility to bypass the barrier (navigation lock)

20

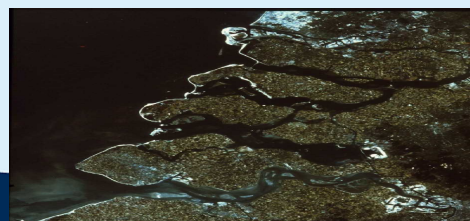
## Low water levels (2): Fresh water



21

## Fresh water - developments

- Sources of fresh water are limited
- Climate change results in extremities
- The water has to be shared
- May lead to more salt water intrusion in the southern delta



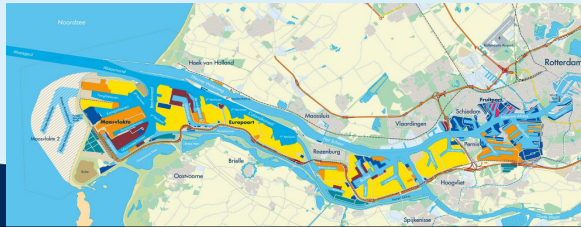


## Specific interests Port of Rotterdam



with regard to climate change

1. Open access is key. Some climate change solutions have negative effects on accessibility
2. Fresh water is available for now. In the future salt intrusion during extreme conditions may cause temporary inlet stops.
3. Flood risk is limited, though one should use climate proofing solutions as they materialize.
4. Determining and using a climate solution is reassuring to investors



## CONCLUSION

The Port of Rotterdam is securing its future by developing climate proofing