

Multi-year Expert Meeting
On Transport and Trade Facilitation:

**Maritime Transport and
the Climate Change Challenge**

16-18 February 2009

Approaches to climate adaptation in Ports

Presentation by

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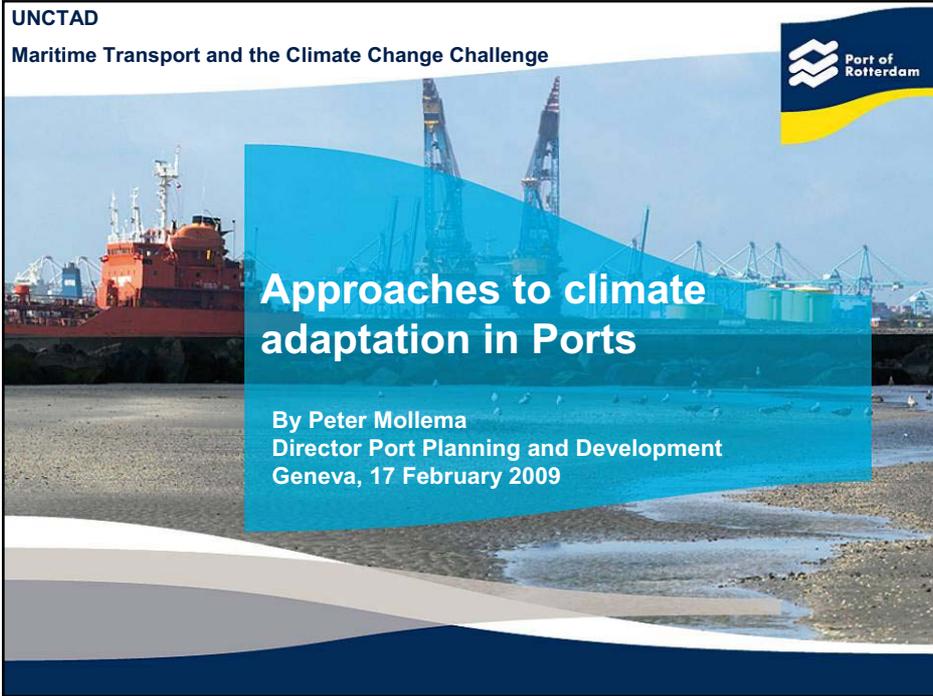
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Maritime Transport and the Climate Change Challenge

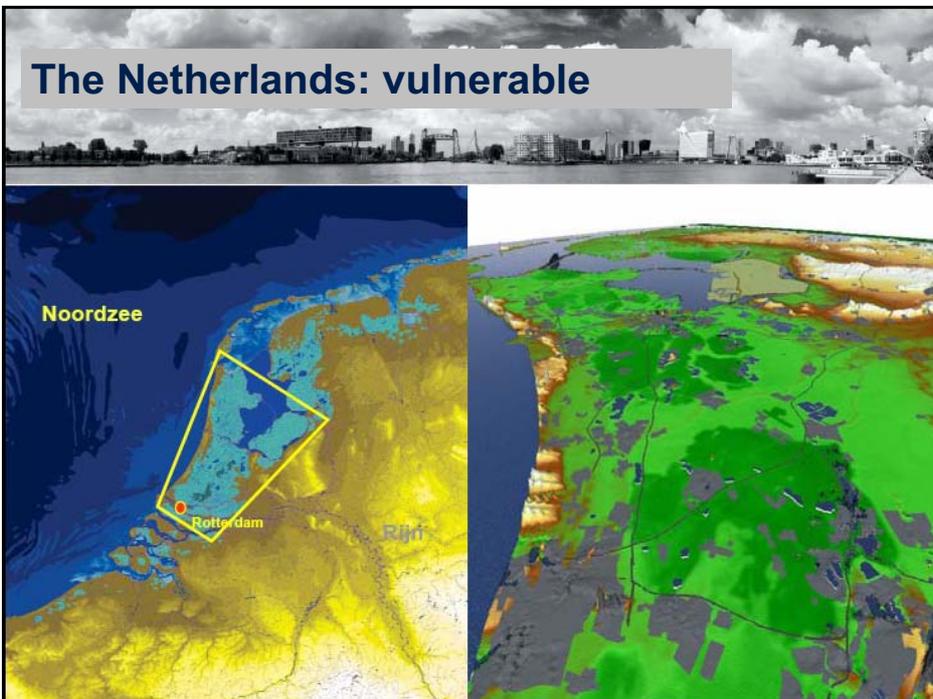


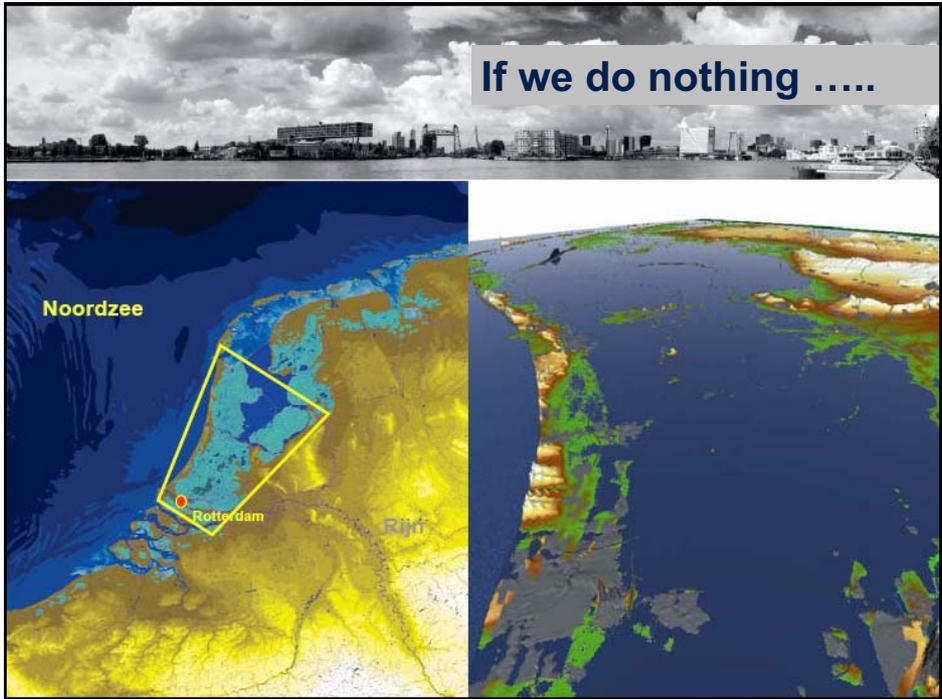
Approaches to climate adaptation in Ports

By Peter Mollema
Director Port Planning and Development
Geneva, 17 February 2009

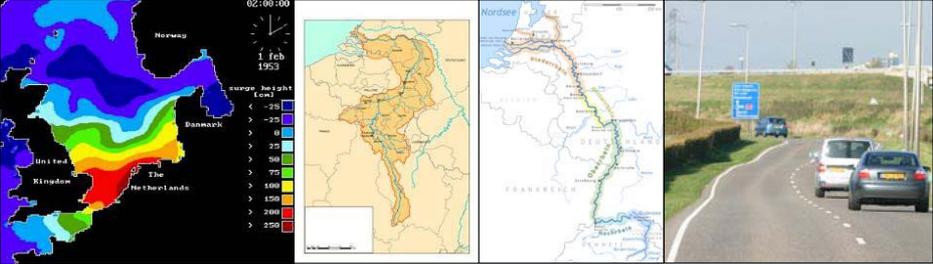


The Netherlands: vulnerable





All time challenge, but ...

Sea Rivers Subsidence

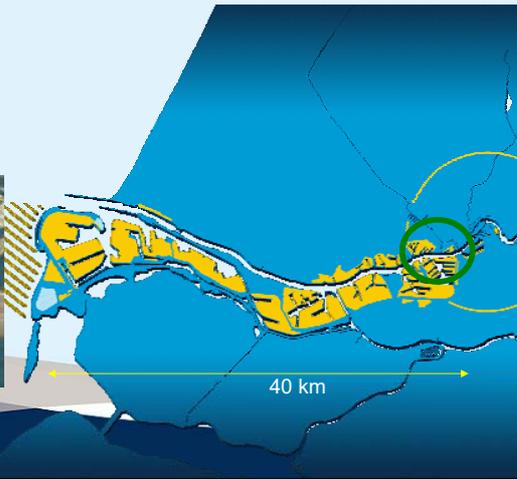


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Rotterdam: Integral Climate Change Strategy



- ◆ Mitigation ←
- ◆ Adaptation



GHG reduction & Ports: scope and influence



Port of Rotterdam Authority

Influence: ++
Effect: - -



Port and industrial complex

Influence: +
Effect: +



Supply chain

Influence: +/-
Effect: ++

GHG reduction & Ports

Huge potential



- Port Authority GHG reduction strategy (a)
- Rotterdam Climate Initiative (b)
 - Joint program by city, port, EPA, port industry
 - Energy port (CCS, bio-fuels, co-siting)
 - Sustainable mobility
 - Sustainable city

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GHG reduction & Ports

Huge potential



- World Ports Climate Initiative (a, b & c)
 - 55 world ports
 - On shore power
 - Clean terminal equipment
 - Footprint management
 - Environmental Ship Index
 - Alternative power (wind, solar)
 - Sustainable lease contracts

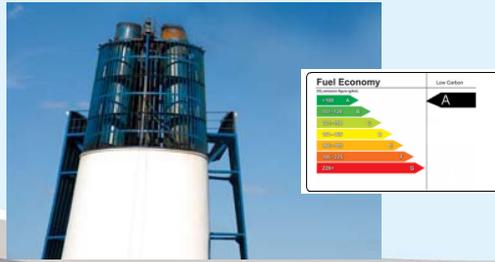


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Environmental Ship Index (ESI)



- One unique international index for ocean going shipping for air pollutants and greenhouse gasses (NO_x, SO_x, CO₂, PM)
- ... as a base for incentives to stimulate a better environmental performance of sea going shipping

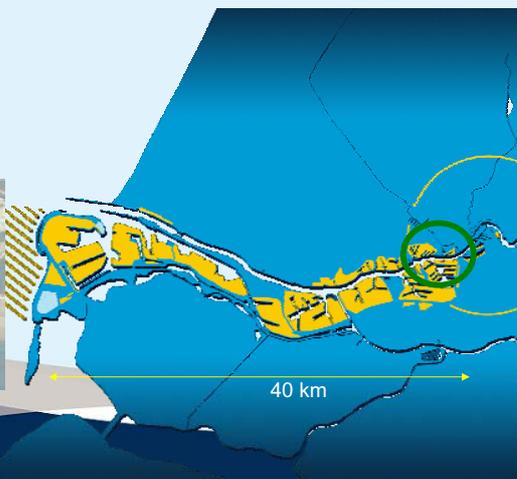


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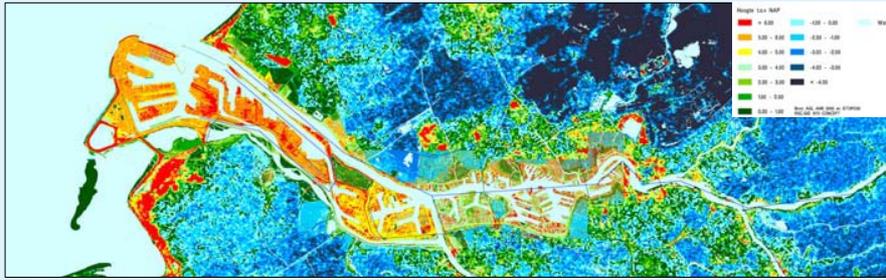
R'dam opted for an integral climate change strategy



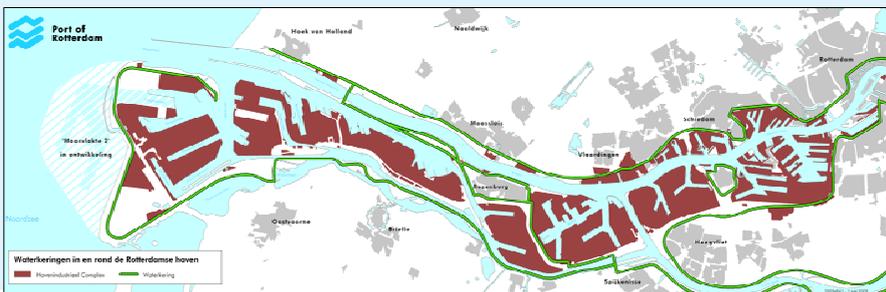
- ◆ Mitigation
- ◆ Adaptation ←



Port above sea level



Port above sea level



Maasvlakte 2: climate proof

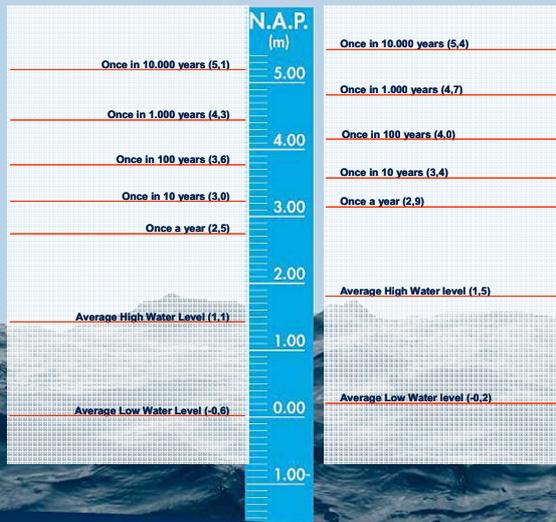


Flood risk: Return period of water levels



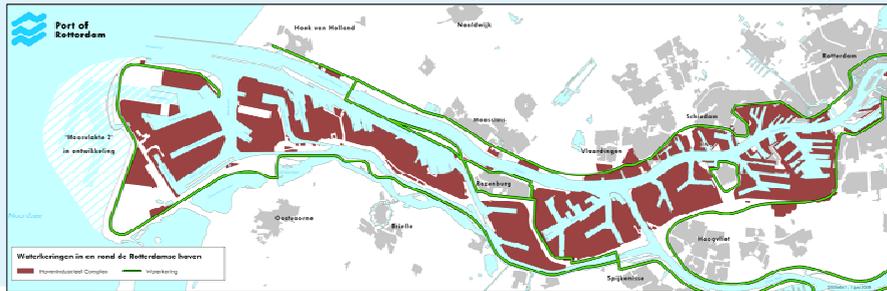
Current levels

Levels in 2050



Surface level 5 + m NAP

Port above sea level



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Protection from sea-side, Maeslantkering



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High Water threats



1. Casualties
2. Permanent environmental damage
3. Social disruption: failure of critical infrastructure / utilities (e.g. fresh water supply, energy supply)
4. Damage to cultural historic elements
5. Damage of nature
6. (Individual) economical damage



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Possible Measures



At national level

- Create water buffers in river system
- Divert river water

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Recent news

Deltacommittee, protecting the Netherlands up to 2100



Delta Plan Rotterdam Region

New storm barriers + new river + new dykes



Possible Measures



At regional level

- Providing flood risk information to companies
- Incorporate adaptation in spatial planning (higher future land area's & innovative design)
- Protection vulnerable (port) infrastructure
- Flexible water barriers at terminals
- Evacuation plans



Low water threat



- Reliability of inland shipping



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