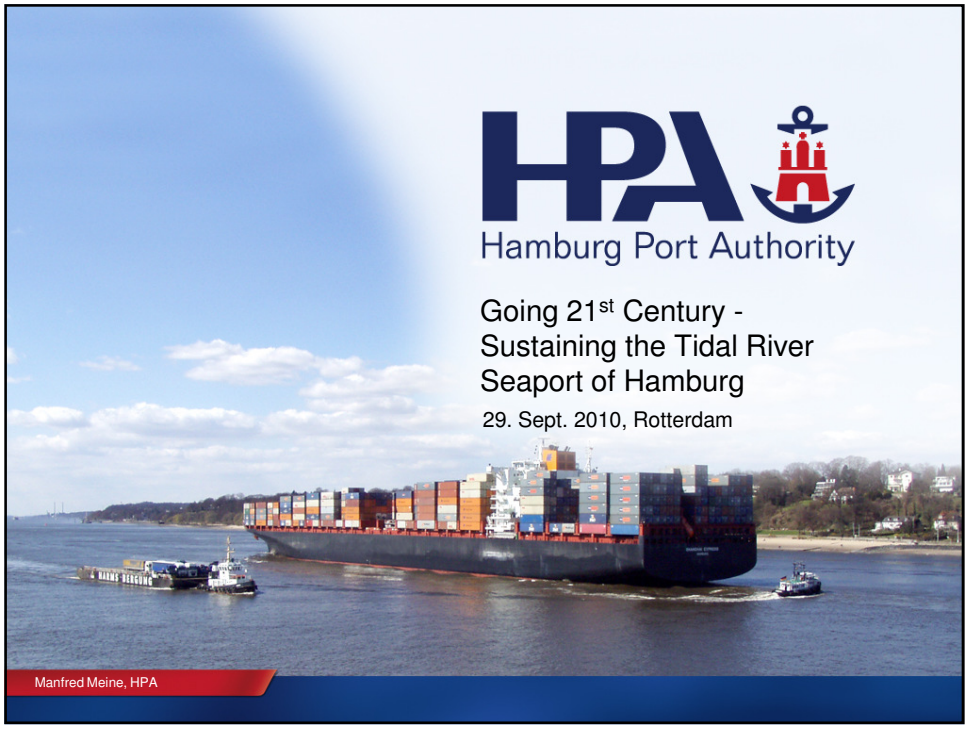

Prologue: Inland-Seaport saves CO_2

HPA Hamburg Port Authority

	kg/TEU/km
Containership = 4800 TEU	0,119
Barge/Feeder = 400 TEU	0,477
Train = 80 TEU	0,673
Truck = 2 TEU	2,296

→ 130 km inland:
679 t CO_2 saved/Containervessel *!

* compared to trucks

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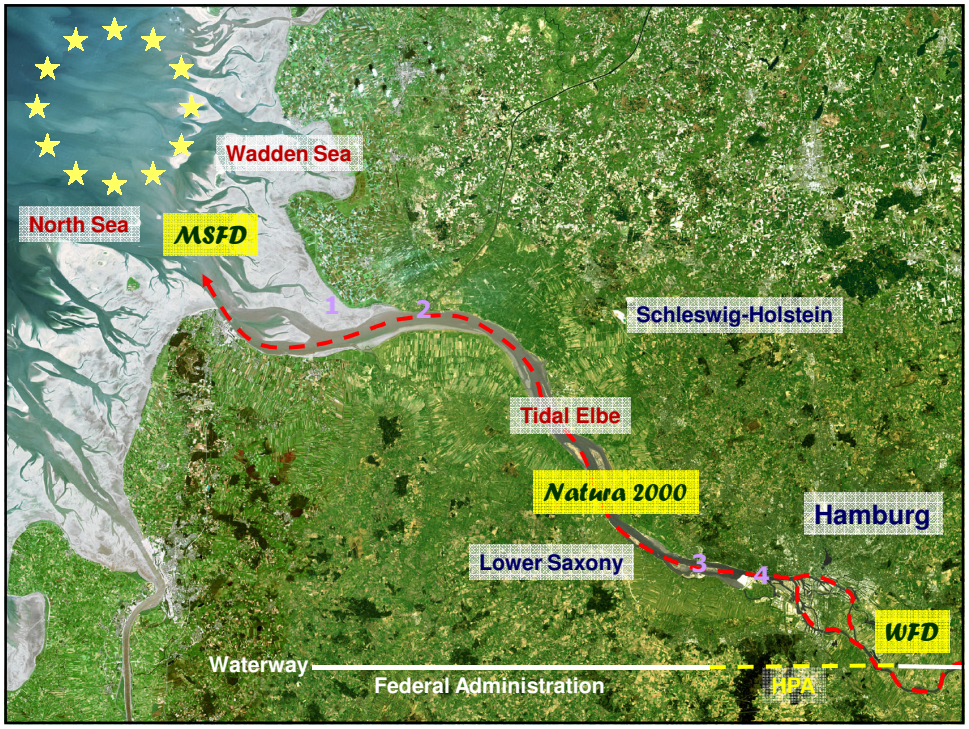

Wadden Sea
North Sea
MSFD
1
2
Schleswig-Holstein
Tidal Elbe
Natura 2000
Hamburg
Lower Saxony
3
4
WFD
Waterway
Federal Administration
HPA

1 The Mouth

2 Kiel Canal and Brunsbüttel
Manfred Meine

3 Islands and Channels

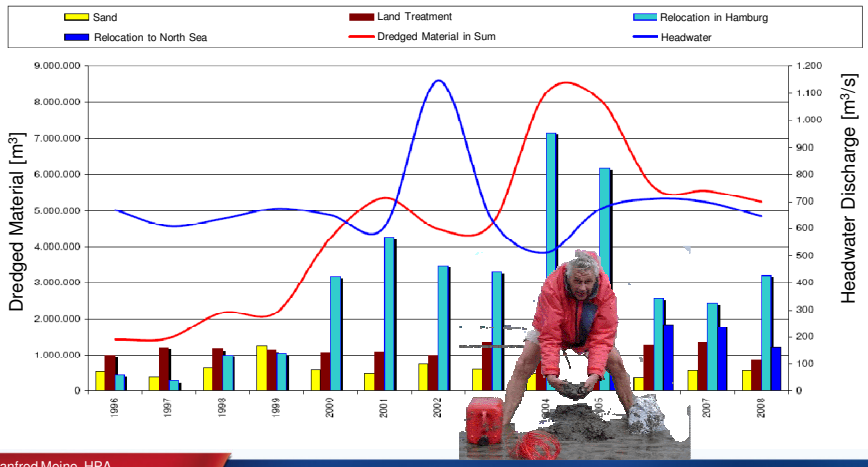
4 The City and Port of Hamburg

4 The City and Port of Hamburg
• 3rd in Europe
• 72 km2
• 275,000 Jobs in Germany
• 7 Mio. TEU / 110 Mio. t in 2009
(1/3rd stays in Hamburg)
• Fairway 12.80/13.80 m
• further deepening on its way

Incentive: Dredging hit Maximum in 2004

Hamburg Port Authority

Development of Dredged Material within the Port and the River Elbe in Hamburg 1996 - 2008



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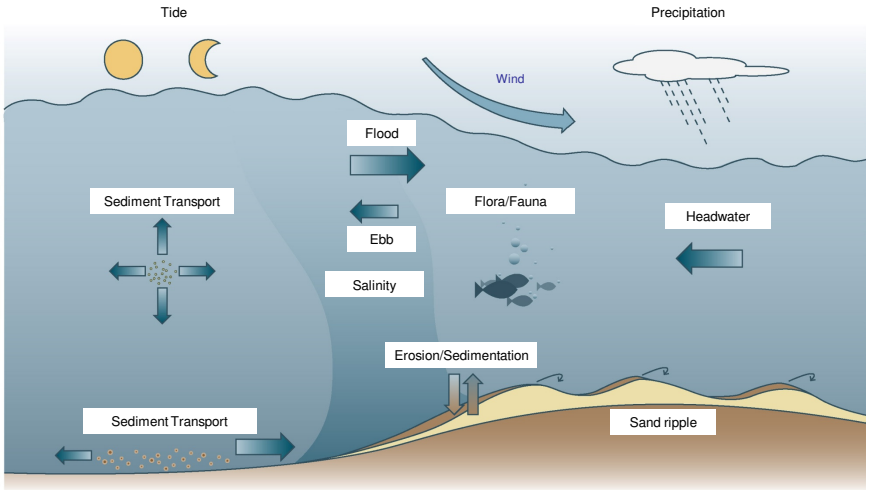
Estuaries are complex open Systems

Hamburg Port Authority



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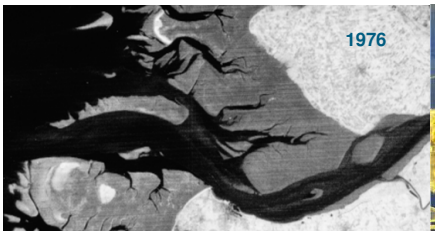
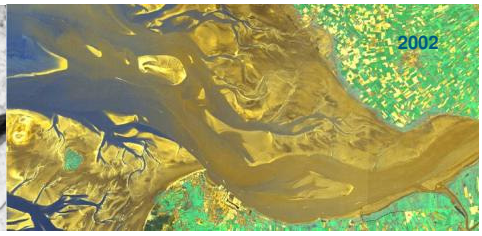
10

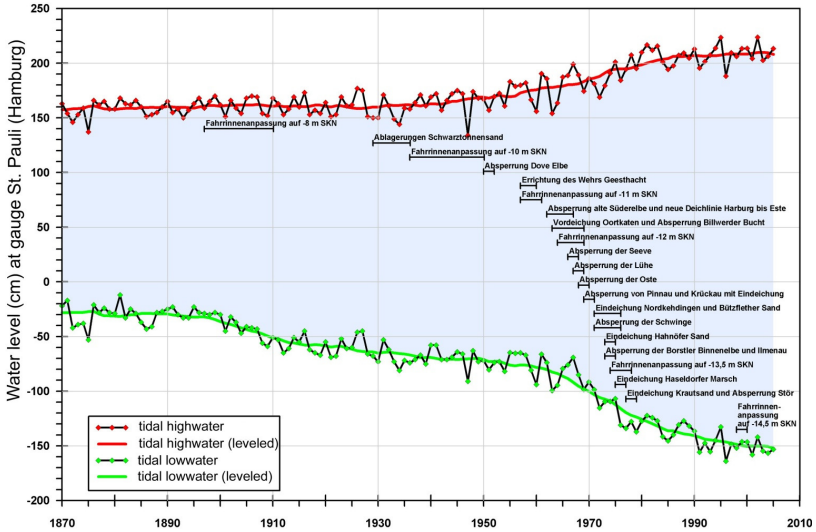
Estuaries are changing…



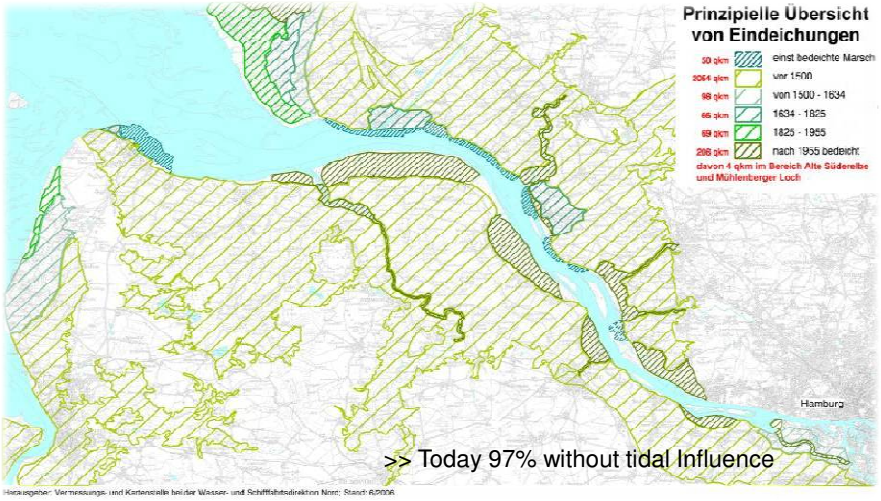


…and they are being changed

Changing Estuary: Tidal Range and Measures

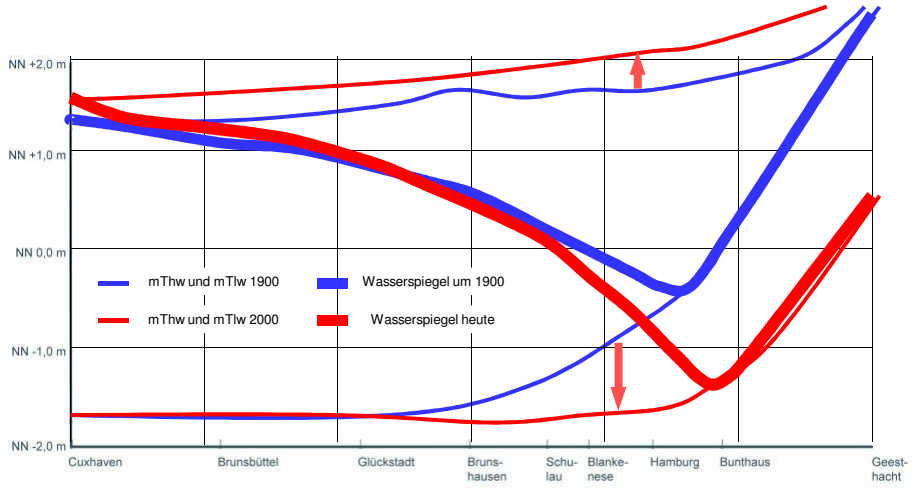


Changing Estuary: Land Reclamation and Dykes

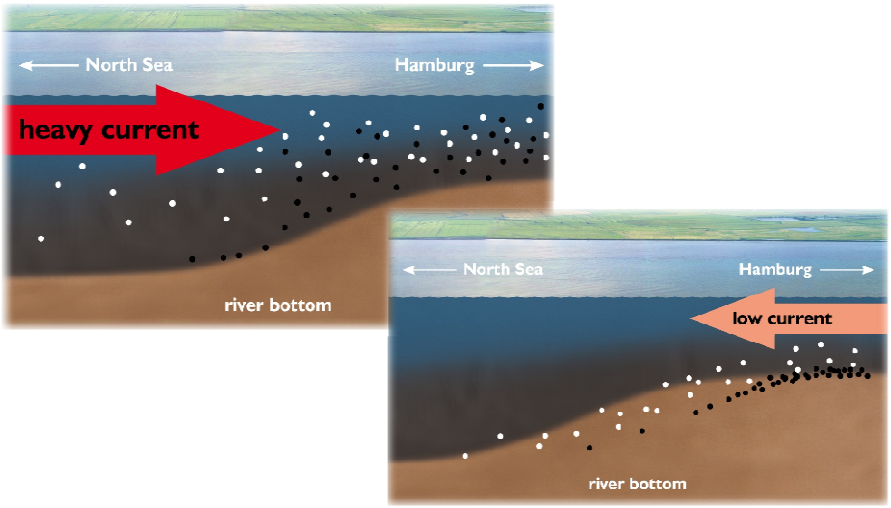


>> Today 97% without tidal Influence

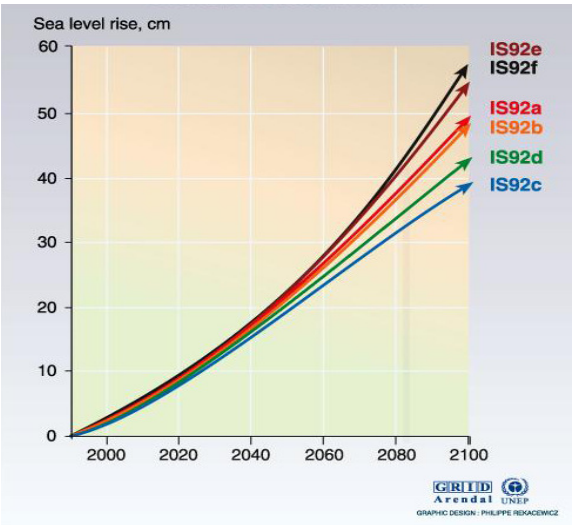
Changing Estuary: Water Level 1900 - 2000



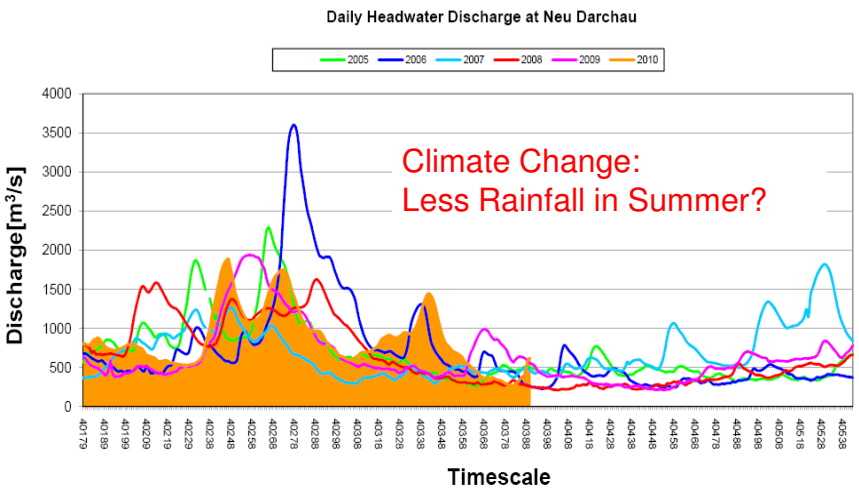
Changing Estuary: Tidal Pumping



Changing Estuary: Sea Level Rise Scenarios



Changing Estuary: Headwater Discharge



Historical Contamination: Sediment Trap Port of Hamburg

Fixing the Estuary: The Tidal Elbe Concept

Hamburg Port Authority

Concept for a sustainable development
of the Tidal Elbe River as an artery
of the metropolitan region Hamburg and beyond

A contribution for discussion by Hamburg Port Authority and
the Federal Administration for Waterways and Navigation

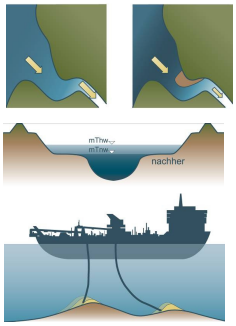
Hamburg Port Authority

Wasser- und Schifffahrtsverwaltung des Bundes

Wasser- und Schifffahrtsdirektion Nord

Dr.-Ing. Hans Peter Dücker
Dipl.-Ing. Heinz Glindemann
Dr.-Ing. Hans-Heinrich Witte
Dipl.-Ing. Karsten Thode

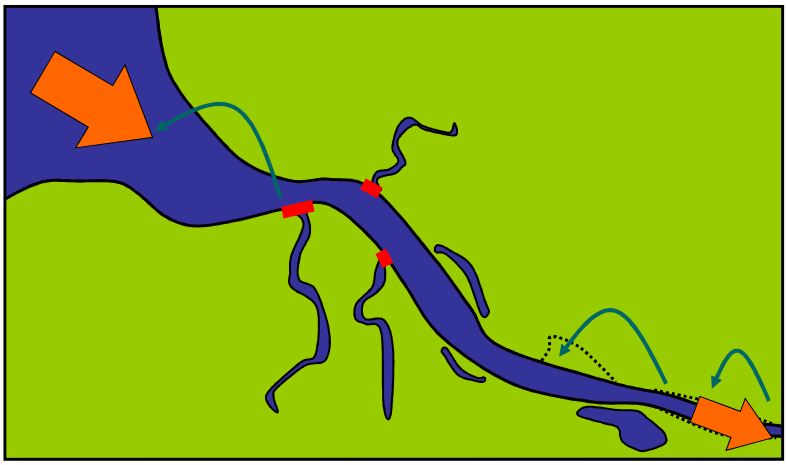
Three Cornerstones for a Future Action Plan:



1. **Attenuation of the Tidal Energy through River Engineering in the Mouth of the Estuary,**
2. **More Room for the River (Tidal Volume) in the upper Part**
3. **Optimisation of the Sediment-management considering the whole System of the Elbe**

The Tidal Elbe Concept: before Implementation

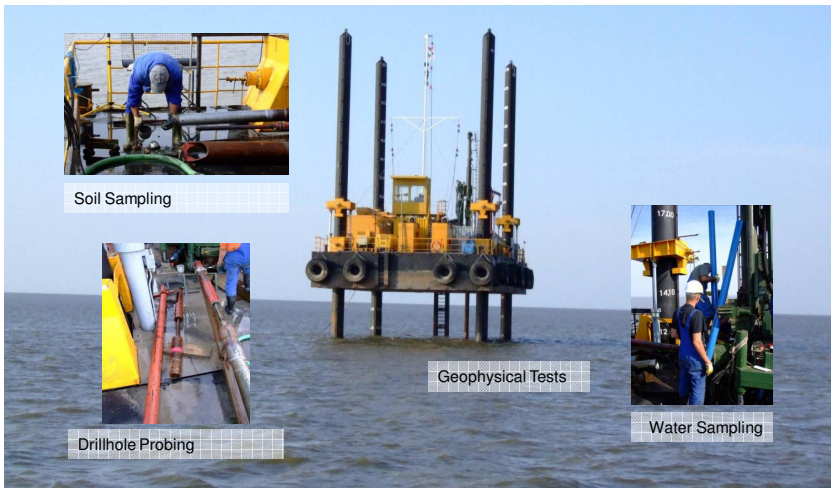
Hamburg Port Authority



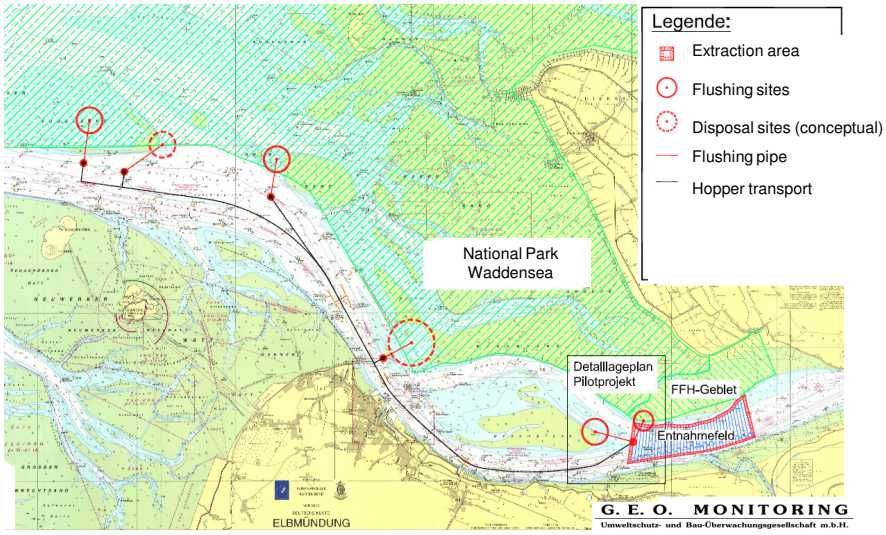
The Tidal Elbe Concept: after Implementation

1) Taming the Tide: Sand Islands in the Mouth

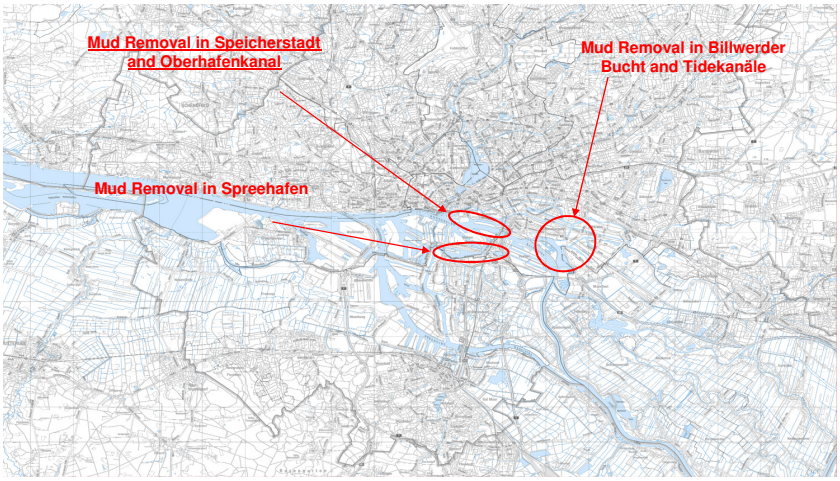
1) Taming the Tide: Searching for Sand



1) Taming the Tide: Feasibility Study – "Feeding" Sand Islands



2) Tidal Volume: Scenarios for Hamburg



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2) Tidal Volume: Cleaning up the Port

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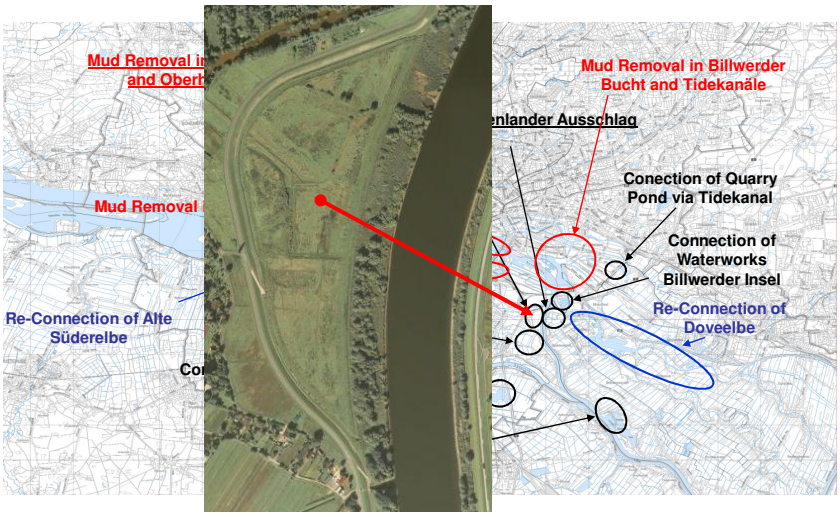
26

2) Tidal Volume: Scenarios for Hamburg



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2) Tidal Volume: Pilot Project Spadenlander Busch

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2) Tidal Volume: Pilot Project Spadenlander Busch

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2) Tidal Volume: creating Tidal Landscapes

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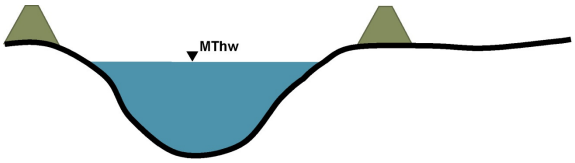
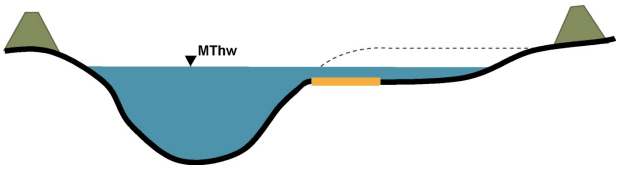
2) Tidal Volume: Added Value Flood Protection

Hamburg Port Authority

Normal Tide



Current Situation



With adittional Tidal Area
And submerged Shutter at
normal Tide

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2) Tidal Volume: Added Value Flood Protection

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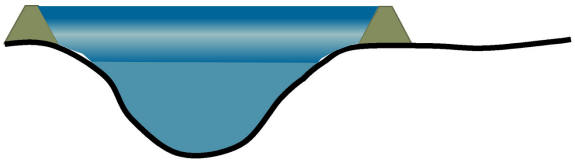
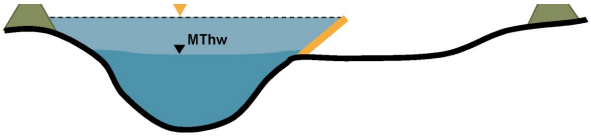
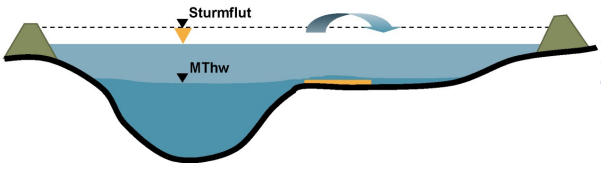
Storm Surge



Future?



Storm Surge Polder:
Shutter is raised until shortly before
the Peak of the Surge



Storm Surge Polder:
Shutter is lowered shortly before Peak
of the Surge

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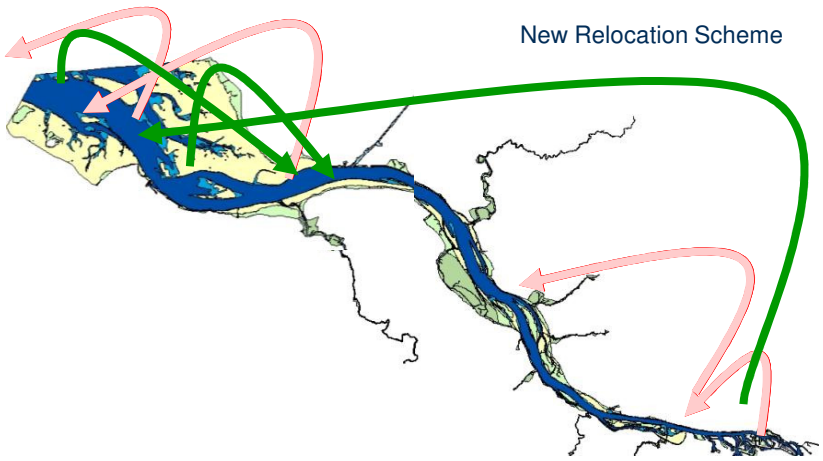
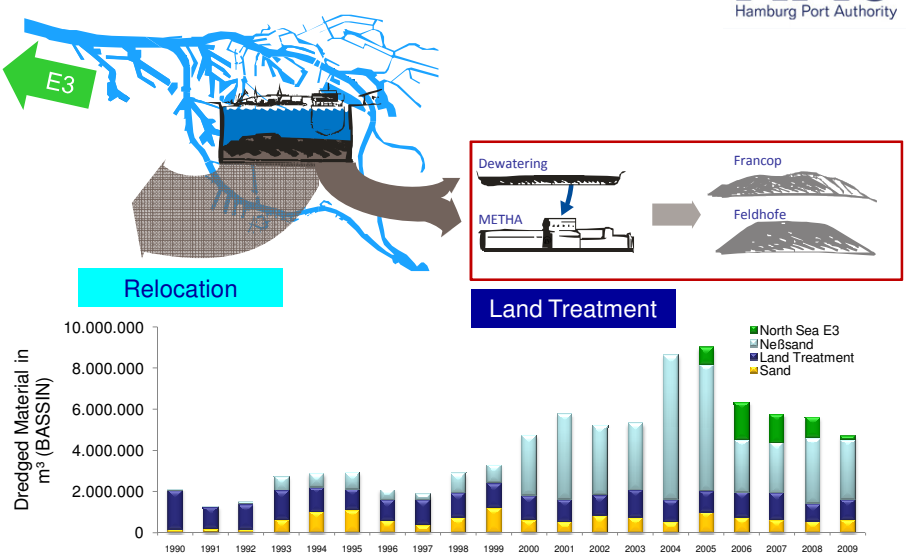
3) Sediment Management: New Strategy



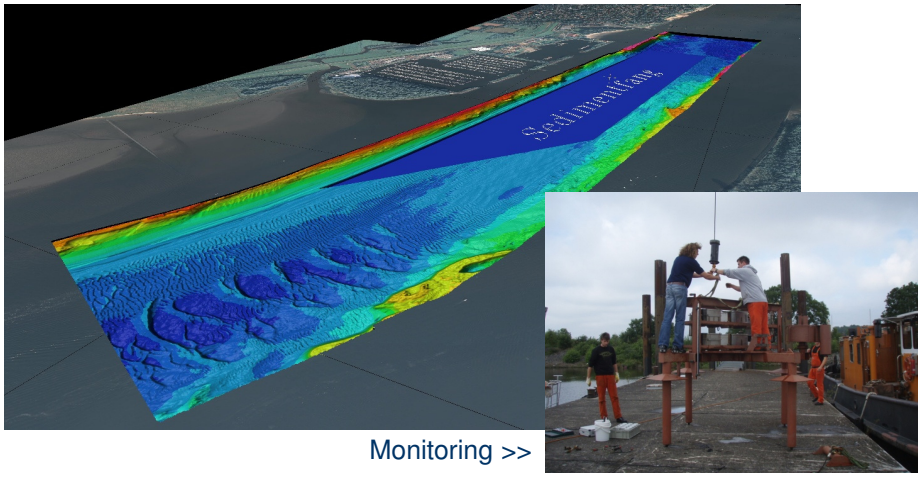
3) Sediment Management: Port of Hamburg



3) Sediment Management: Catching Sediments

Hamburg Port Authority

Pilot Measure: Sediment Catchment Basin



Monitoring >>

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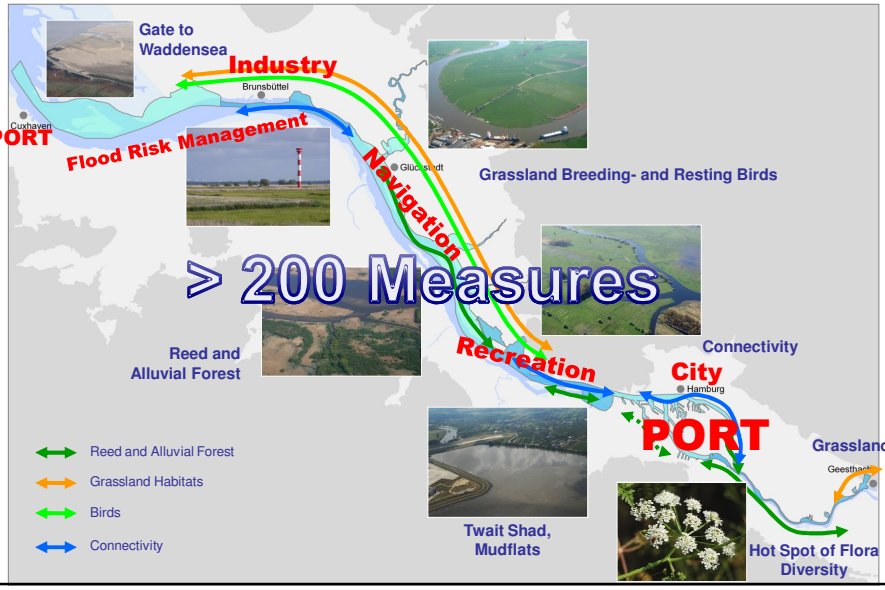
Working Together: Integrated Management Plan

Hamburg Port Authority

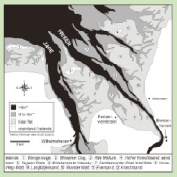


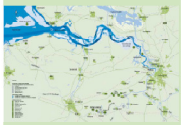
Working Together: Expert Exchange TIDE

Hamburg Port Authority

TIDE
Tidal River Development

Elbe / DE	Weser / DE	Humber / GB	Schelde / NL - BE
Port of Hamburg Length: 141 km	Port of Bremerhaven Length: 40 km	Ports of Hull, Immingham, Grimsby and Goole Length: 121 km	Port of Antwerp Length: 160 km





The Interreg IVB North Sea Region Programme

www.tide-project.eu

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Sea Level Rise: Future Scenarios for the Mouth

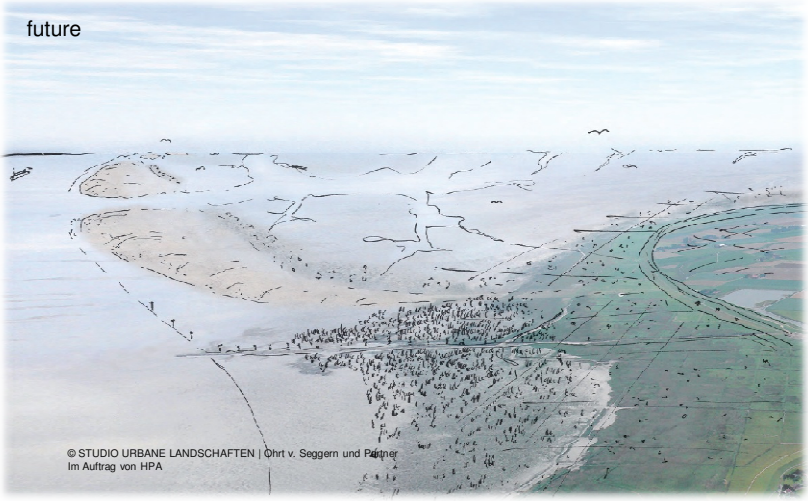
Hamburg Port Authority

Manfred Meine, HPA

Sea Level Rise: Future Scenarios for the Mouth

Manfred Meine, HPA

Sea Level Rise: Future Scenarios for the Mouth



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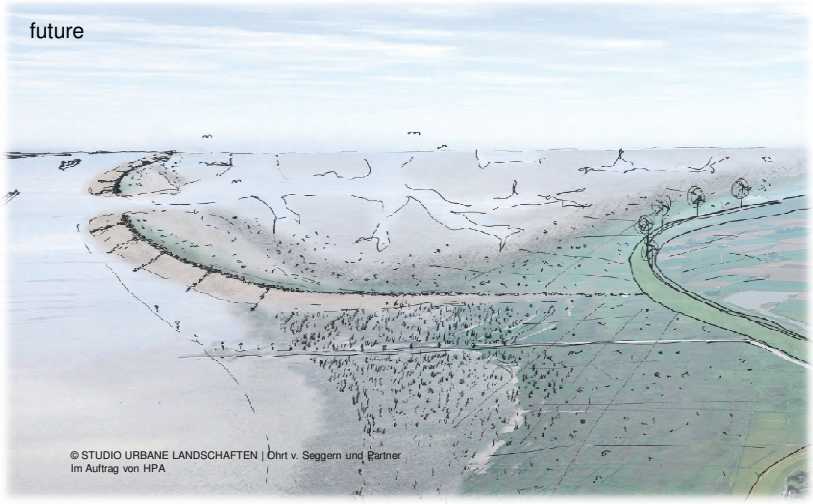
Sea Level Rise: Future Scenarios for the Mouth



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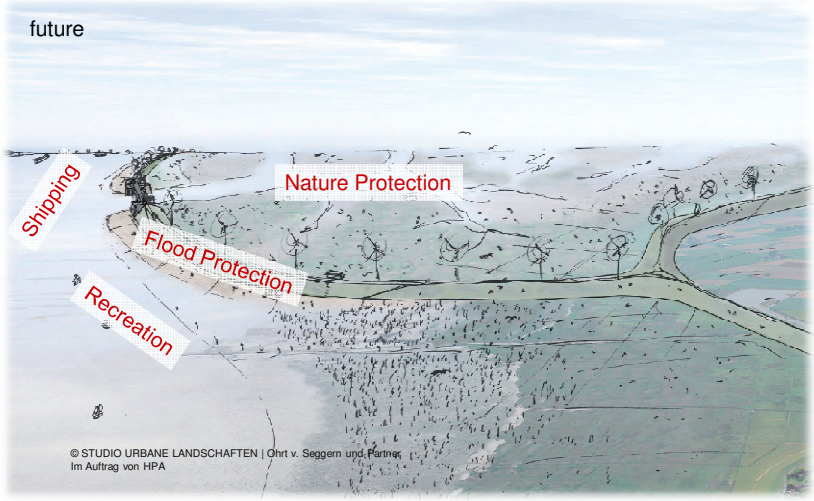
Sea Level Rise: Future Scenarios for the Mouth



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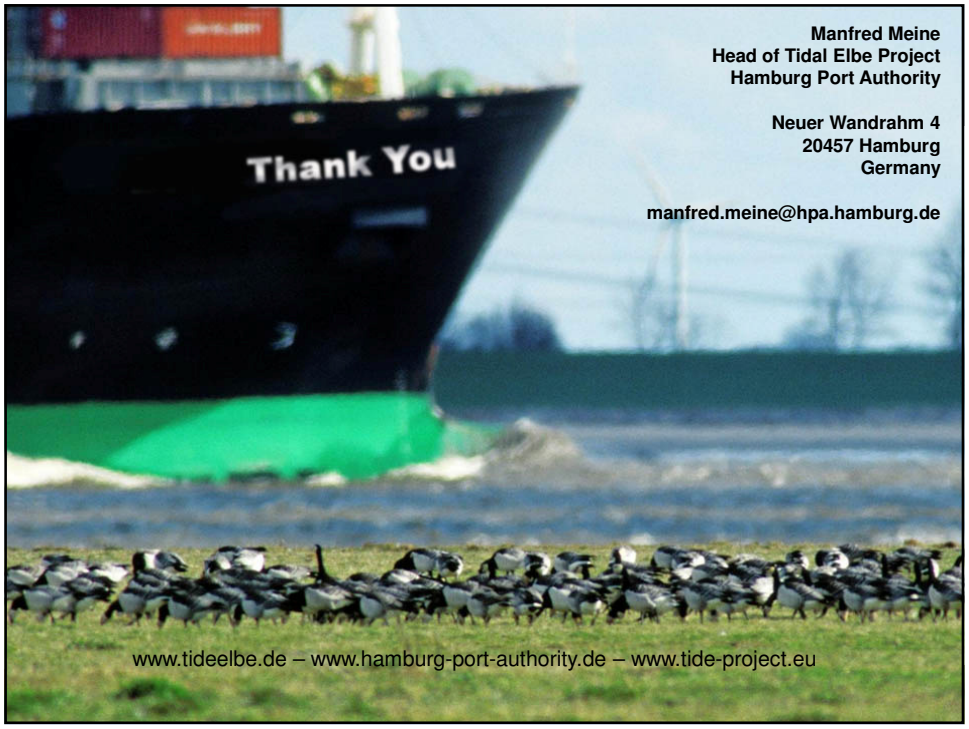
Thank You
Manfred Meine
Head of Tidal Elbe Project
Hamburg Port Authority
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20457 Hamburg
Germany
manfred.meine@hpa.hamburg.de
www.tideelbe.de – www.hamburg-port-authority.de – www.tide-project.eu