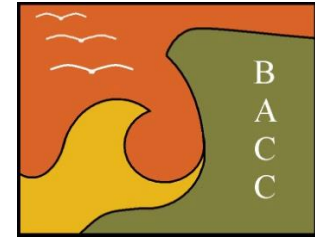


# **Dredging and the environment: common interests - common solutions?**

Roger Morris

Bright Angel Coastal Consultants Ltd.

<http://bacoastal.co.uk>



# Overview

- Background experience – origins of the approach.
- Principles of estuary management.
- The situation on the Elbe – including reflections on the RESMC.
- Some UK experience of managed realignment.
- Thoughts on possible areas of further investigation.

# We have to start somewhere!



- Why me?

## To be ‘thought provoking’



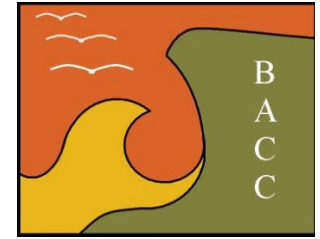
# My experience

- 30+ years experience.
- 25 years working on coastal management issues.
- 20 years working on issues concerning ports and environmental matters.
- Left role as a regulator in 2009 to become independent coastal management consultant.
- Joined Harwich Haven Authority in 2010 as a non-executive Director.

# Many changes!



- Prior to 1994 UK nature conservation legislation was weak.
- Habitats and Water Framework Directives have strengthened the legislation.
- HD caused much pain, especially for the ports industry.
- Change included better understanding of the role ports play in our lives.



# Why are ports important?

- Look around your home – many items arrive on a ship from China!
- So, who drives port activity?
- WE DO – everybody.
- We want foreign goods and shipping is therefore essential; competition leads to the development of huge ships.
- Maintenance of shipping channels is essential.

# Estuaries face many challenges



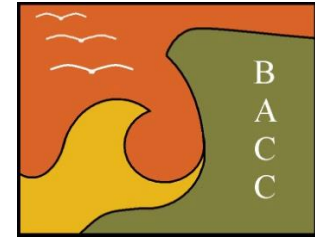
- Water quality, fish, other wildlife are under pressure.
- Changes to tidal propagation (high and low water levels).
- Changed suspended sediment levels: increased in some and decreased in others.
- Shipping and maintenance dredging can be in conflict with other users, e.g. people who either depend on estuaries for a living or value them for their intrinsic value.



# Partnership origins

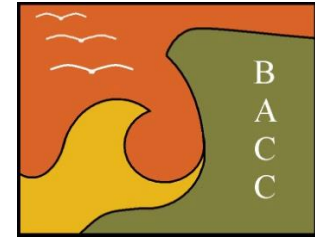
- 1991 an influential report showed that UK estuaries were seriously threatened.
- ‘Estuaries Initiative’ launched in 1993 – promoted development of ‘Estuary Management Strategies’.
- Partnerships between all interest groups – ports, wildlife organisations, local government and non-departmental Government bodies.





# A major initiative

- Between 1993 and 1998 several million GB£ spent.
- Central funding reductions 1998-2006.
- Hand-over process very tricky!
- Interpreted by some as lack of commitment — but funds were always intended as a trigger to involve others.



# Benefits of partnerships

- Reduce mis-understanding and can successfully change situations.
- Success and relevance may be misinterpreted – once conflict abates those at the top think ‘job done’.
- But, that is not the case – it is a new working environment whose benefits are intangible.
- The model has been used to develop management schemes for Natura 2000 sites.

# Principles of estuary management



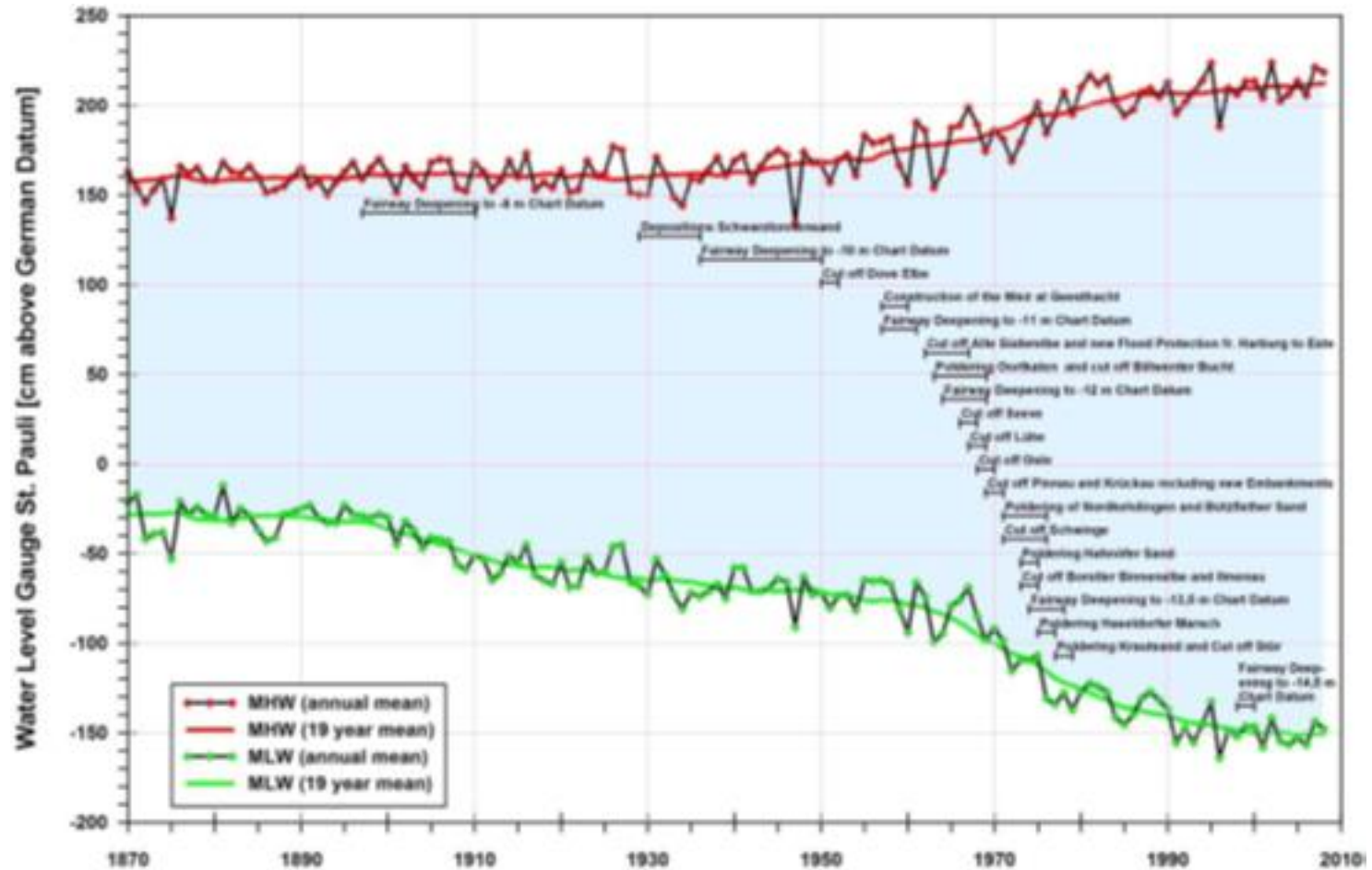
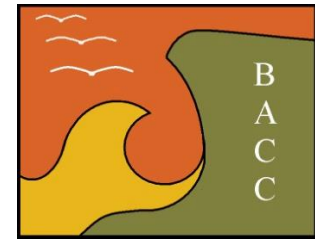
Think  
geomorphology



# Estuaries are living entities!

- They have evolved to dissipate tidal and wave energy and are ‘energy management systems’!
- They will therefore respond to modification in predictable ways, e.g.:
  - High water levels will rise and low water levels will drop if channels are deepened or floodplains are lost.
  - They will become more turbid if they are deepened and/or loose accommodation space.
  - Loss of tidal volume will lead to sedimentation.
- If you kick them they will kick you back!

# The evidence?



# Is the Elbe situation unique?



- No, and yes!
- Lots of big estuaries have been modified in a similar way: western Schelde, Seine, Thames, Clyde.
- But they don't have the historic levels of pollutants from upstream.
- So, the authorities responsible for the Elbe face a bigger and more challenging problem!

# Principles of estuary management



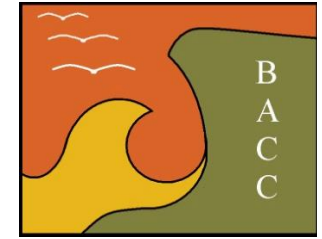
# Think Synergies

# Synergies between sediment and estuary management



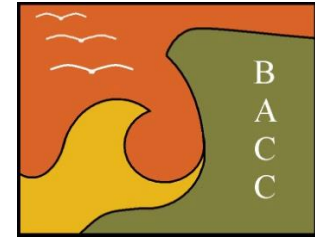
- Sediment is the building block for life!
- Builds mud and sand flats, salt meadows and alluvial forests.
- Salt meadows and alluvial forests are the first line of defence against flooding.
- As sea levels rise sediment is needed to feed the salt meadows and alluvial forests.





# Synergies: river engineering

- HPA/WSV need to manage sediment to keep shipping channels and the port running and contributing to the German economic engine-house.
- Flood defence authorities need sediment to maintain natural flood defences.
- Both must find a way of putting this valuable resource to best use.
- They have common interests.



# Synergies - fisheries

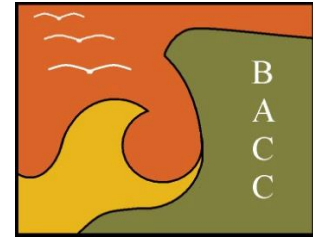
- Some fish such as Smelt *Osmerus eperlanus* are economically and culturally important.
- Shallow sub-tidal habitats and salt meadows provide fish with important breeding areas.
- Fishery management should benefit from HPA/WSV sediment management solutions.

# Synergies – Habitats/Species

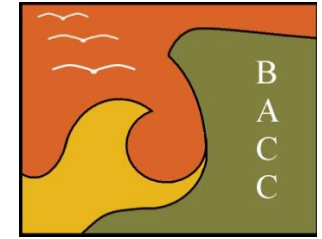


- Keep estuary alive by managing sediment.
- Maintain salt meadows, mudflats, sandflats and alluvial forests to keep pace with sea level rise.
- Some solutions can result in more habitat.
- Sediment managers have common ground with nature conservation organisations.

# Principles of estuary management



# Think Partnership



# Partnership is possible

- Synergies between port and river engineers, fishers and nature conservation are obvious.
- The foundations are provided by the work that has gone into the RESMC and the integrated plan for the tidal Elbe.
- This working group and the sediment management working groups are positive forward movement.

Real progress - the evidence



# Development of the River Elbe Sediment Management Concept (RESMC)

# RESMC international review



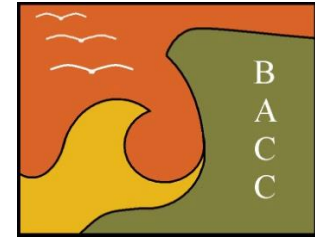
- My interpretation based on UK and wider western European experience.
- BUT, our legal framework differs from that of Germany, and our interpretation and implementation probably differs.
- Subsidiarity – as defined in the Maastricht Treaty.
- Very positive that HPA/WSV chose to seek international peer review.



# The objectives are right

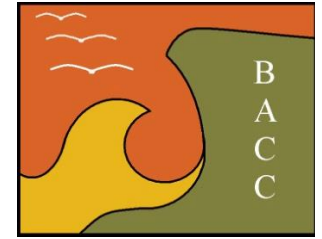
- Current levels of dredging are economically and environmentally unsustainable.
- There is an urgent need to find ways of reducing ‘tidal pumping’.
- BUT, major engineering is a long-term programme.
- Re-distribution of dredged sediment within the river is a first and important stage in the process.





# I particularly liked

- Holistic approach.
- Geomorphological basis.
- Checking for consistency with Habitats, Water Framework and Marine Strategy Framework Directives.
- Use of innovative solutions such as managed realignment and re-opening tributaries.



# A positive first project

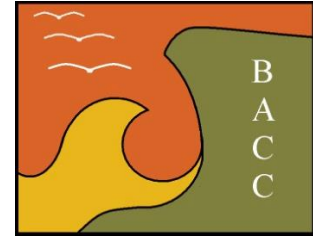
- Kreet sand is an exciting sign of progress.
- It will provide a real opportunity to look at the effects of re-engineering the functioning of the Tidal Elbe.





- 
- NORFOLK WILDLIFE TRUST**
- Environment Agency
- Hilgay Wetland Creation Project**
- Scale 1: 3500
- Legend**
- Water controls and levels**
- Water level control
  - Lower bottom
  - Pump
  - Lower wet
  - Extent of flood in perimeter ditch
  - Extent of flood in parallel ditch
  - Extent of flood in perimeter ditch
  - Extent of flood in parallel ditch
- Habitats**
- Reclaimed
  - Woodland
  - Diverse wetland
  - Wet grassland
- Landscape features**
- Existing perimeter ditch
  - Existing perimeter ditch
  - Existing perimeter ditch
  - Existing perimeter ditch
  - Existing perimeter ditch
- Scheme date 25 Feb 2010

# Parallel thinking



## Other countries face similar problems

# Making space for water



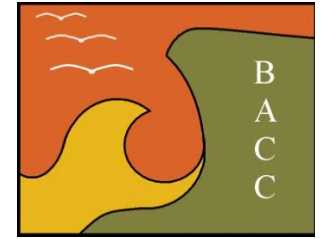
- The RESMC is designed to make space for water – it is sound from both a policy and a practical perspective.
- There are close parallels with practical measures in the UK.

# Keep sediment in the system



- UK -dredging disposal at sea only if no beneficial uses, such as:
  - Beach recharge (sand)
  - Mudflat recharge
  - Habitat creation



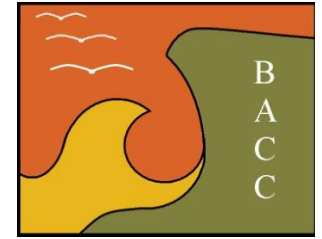


# Managed realignment

- Loved by some
- Loathed by others
- But what is the real experience?



# Allfleets Marsh (Wallasea Island)



Before

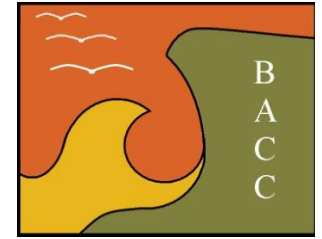


After





# Paull Holme Strays



- Sedimentation rate 30 cm in the first year (2004).
- Around 1m cubic metres of sediment deposited in 10 years.
- Rapidly developing salt meadow.



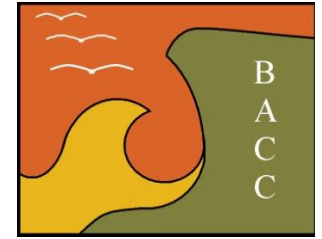
# Chowder Ness



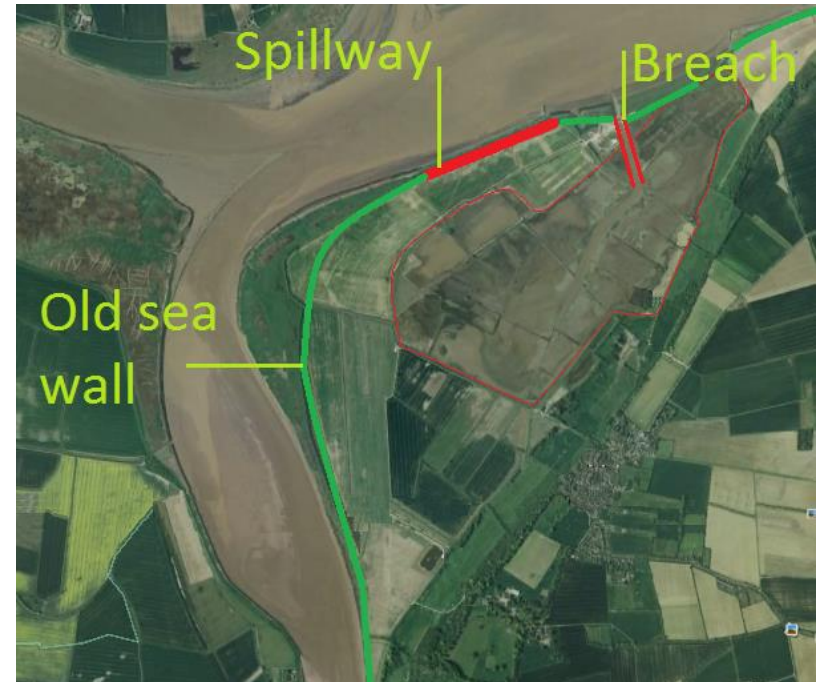
- Breached in 2006.
- At least 1 metre of sedimentation between 2006 and 2012.
- Now dry at certain times of year on neap tides.
- Big sediment sink.



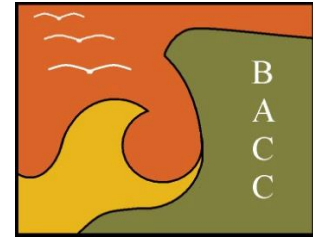
# Alkborough



- Designed to reduce surge tide heights.
- Cost-effective solution.
- Multiple benefits.



# Geomorphological lessons



- Provides a home for lots of sediment.
- Salt meadows quickly develop.
- Flood defences improve over time.
- Potentially reduces turbidity.
- Can sometimes be designed to reduce surge tides.



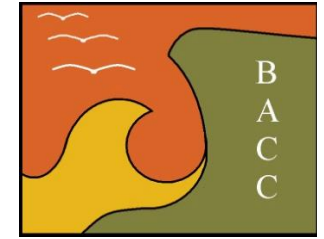
# Ecological lessons

- Salt meadows and pools act as nurseries for juvenile fish.
- Can help to improve water quality.
- Sink for carbon and nitrogen.
- Wildlife spectacle – good for green tourism.



# Next Steps

<http://bacoastal.co.uk>



# Explore common objectives

- Where can synergies be found between the objectives set within the RESMC and those of other sectors?
- Common strategic understanding may help to forge closer working.

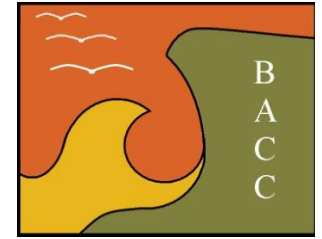


# Possible study areas

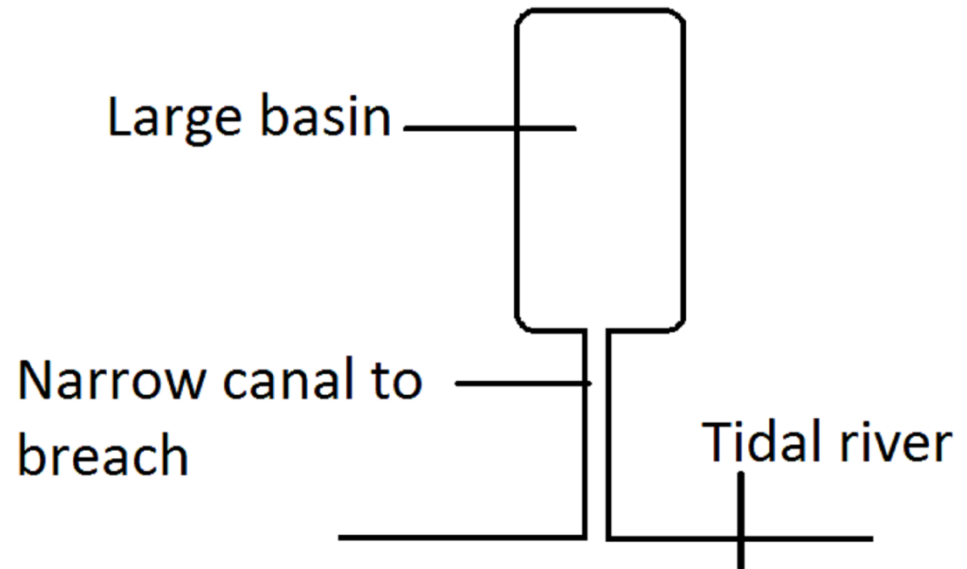
- Broader exploration of where realignment might be possible/desirable.
- Safeguard strategically important land for realignment.
- Explore how much suspended sediment might be absorbed by realignment.
- Investigate potential for green tourism linked to re-engineering the tidal Elbe.



# And finally?



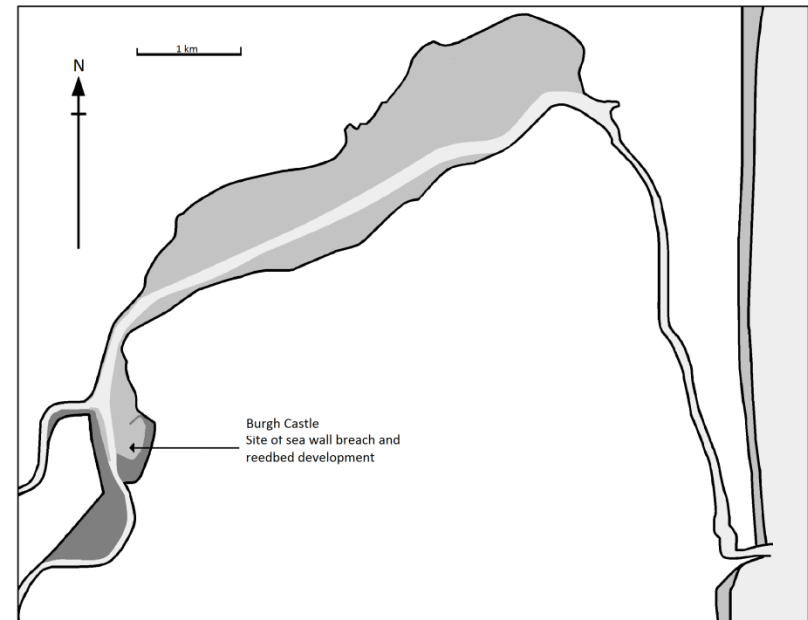
- Is there scope for creating mudflat habitats that help to maintain tidal volume?



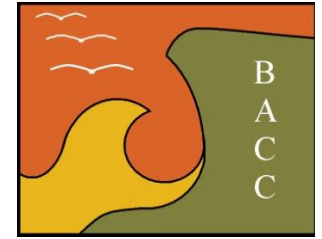
# Would it work?



- Breydon Water – a possible model?
- Mostly mudflat.
- Sediment exported during storms by rapid tidal egress.



# Green tourism



- Ecotourism is a major income generator in some rural areas.
- Maybe there is scope for similar initiatives in Germany?





Thank you for  
listening