2nd IMMERSE
Transnational Estuary Exchange Lab
24 November 2020, Online
Workshop Report
Breakout Session I: 'What works in sustainable sediment management strategies?'

The IMMERSE Transnational Estuary Exchange Labs (TEEL) provide a platform to share practices and progress on the development of solutions for estuarine management issues. The purpose is to advance development and transfer of solutions across those involved in estuary management in the North Sea Region.

Drawing from the programme of the TEEL planned for April 2020 in the Netherlands, IMMERSE organized an online TEEL to share project activities and foster exchange on the topic of **sediment management in estuaries and estuary governance structures and processes**. The Estuary Exchange Lab featured the management context of the **Eems-Dollard estuary** and discussed the value, role and importance of sediments in estuarine ecosystems.

The following report presents a summary of the presentations, discussions and audience engagement from **Breakout Session I: 'What works in sustainable sediment management strategies?'.** In the Elbe and Scheldt/ Upper Sea-Scheldt, sediment management strategies are being developed by exploring and testing new solutions. Although the aims of the sediment management strategies and process to develop new solutions may be similar, the way of assessing, prioritising or implementing these strategies may considerably distinguish each other since the systems are naturally different. Still, when the common goal is sustainable estuary management, best-practices arise from practices-exchange.

The session was attended by 49 individuals, in addition to the presenters and session moderators. A list of participants is provided below. All materials from this session and the other two TEEL sessions can be found on the TEEL event page: https://northsearegion.eu/immerse/transnational-exchange-labs/

Introduction to the Session (Holger Rahlf, German Federal Waterways Engineering and Research Institute / Bundesanstalt für Wasserbau, BAW)

Following a video introducing the IMMERSE project, the session moderator **Holger Rahlf** from the IMMERSE project partner **German Federal Waterways Engineering and Research Institute**

/ Bundesanstalt für Wasserbau, BAW kicked off the session with a brief presentation session agenda and objectives:

- Give an **outlook of the sediment/estuary management strategies** behind the long-term measures and pilots investigated in IMMERSE
- Encourage dialogue on what sustainable and/or adaptive sediment management **in praxis** could mean
- Identify **key components** of a sustainable sediment management strategy
- Promote discussions on **transferability** of solutions included in sustainable sediment management strategies

Participants were then asked to provide some information about themselves so the audience could get to know one another. The following images show poll results from Mentimeter.com:

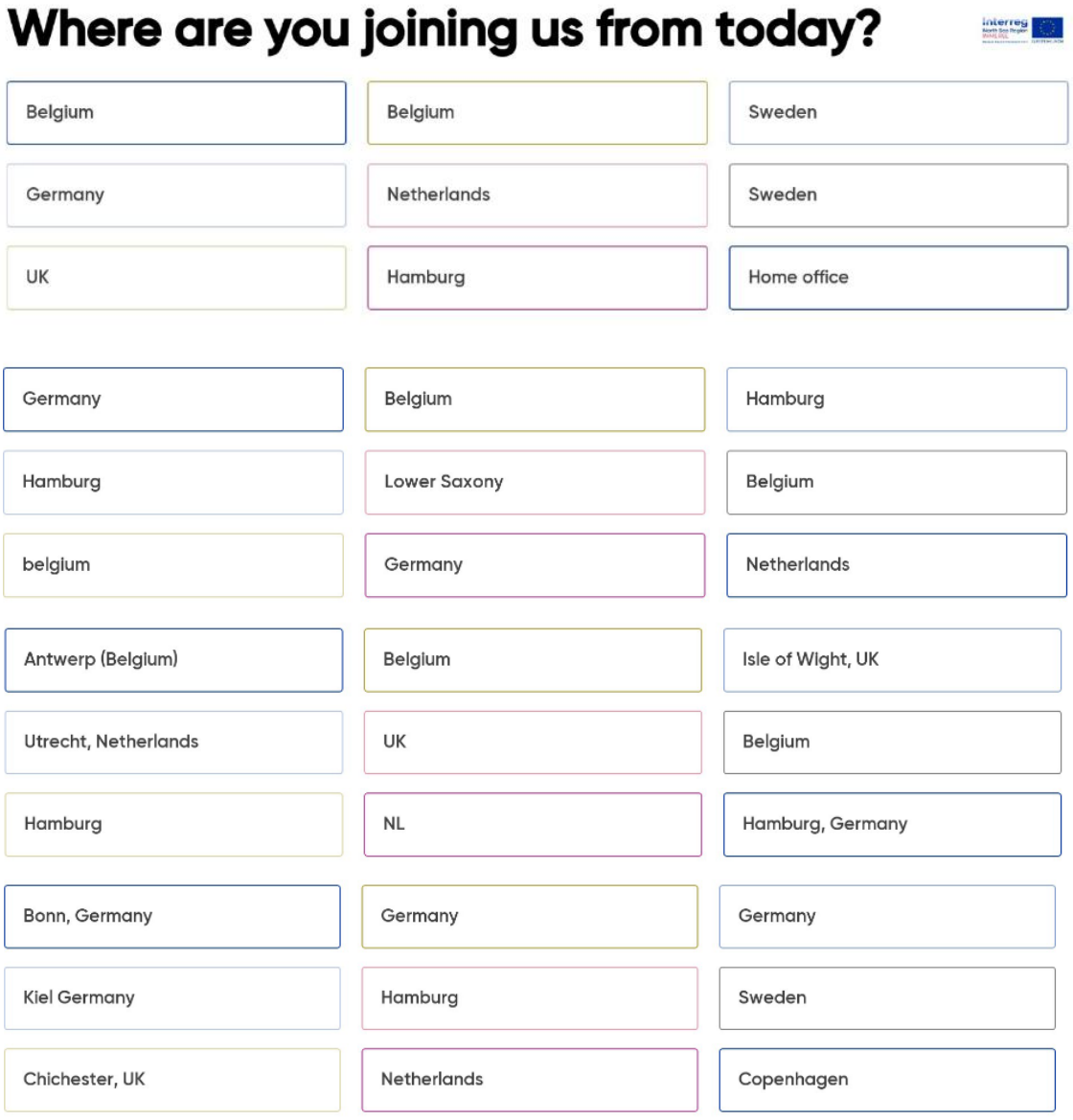

Figure 1. Location of TEEL Sediment Management session participants

Figure 2. Favourite estuaries of TEEL Sediment Management session participants

Impulse Presentations

Three presentations were delivered in an interactive way to encourage audience engagement:

i. Before each presentation, a **"thinking" question** was shared so participants could provide their existing knowledge on the general presentation topic. Responses were used to generate a word cloud

ii. Questions were submitted by the audience to the presenters.

iii. An **open question** of interest to the presenter was posed to the audience through Mentimeter.

I. *Assessment of strategies for an adaptive sediment management in the Elbe estuary* (Victoria Ortiz - BAW)

Summary

The estuary management in the tidal Elbe has become significantly challenging for the waterways administrators in the last years. The need of maintenance works increased and management measures were required to sustainably and cost-effectively improve navigation and ecological conditions, meeting at the same time common acceptance among the stakeholders. A better understanding of the estuarine system has been a key-factor assessing the strategies and new solutions, which may improve the sediment management and ecological conditions in the tidal Elbe. Current investigations of the Federal Waterways

Engineering and Research Institute (BAW) follow up with the impacts of long-term river engineering measures to create intertidal flood-plains, one of the solutions to be conducted within the efforts to improve the estuary management. The effects of the measures on the hydrodynamic characteristics as well as on tidal pumping are the first-step of the assessment to derive the impacts on the estuary functions. IMMERSE supported the assessment of one potential measure to create flood space in the estuary, namely the reconnection of the cut-off anabranch Dove Elbe to the estuary. Measure effects and benefits on the hydrodynamics and sediment transport were presented.

Materials

- Presentation slides

Questions & Answers

Q1. When will the measure be implemented?

A1. There is now a political discussion on-going: the results of the investigation have been published and are currently being evaluated.

Q2. Why did you present the only project, which will not be realised because of the local resistance?

A2. Political decisions need to have a basis regarding the potential benefits and impacts of implementing a measure. This is an important aspect to be considered before taking a decision. In fact, this measure is controversial since it involves an area densely populated where the needs of all people living there must be considered as well as the economic activities taking place there.

Q3. The area of the measure is recently farmland?

A3. Part of its surroundings. The Dove-Elbe itself (as a standing water body cut off in former times from the tidal Elbe) has different uses, including shipping and recreation.

Mentimeter Results

WC1: Which factors influence adaptive sediment management in praxis?

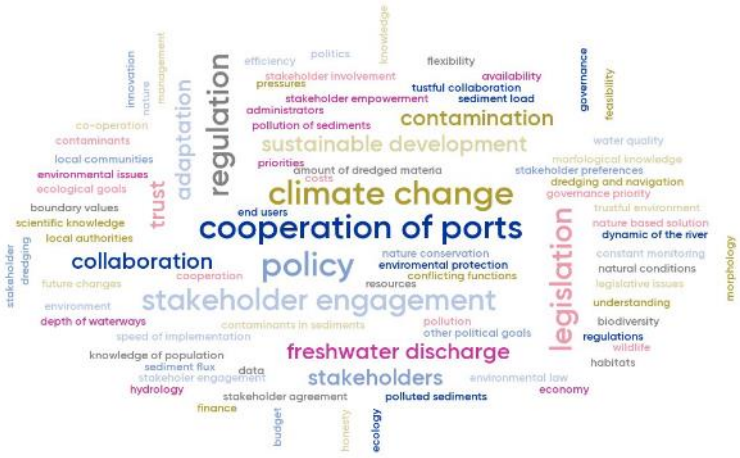

Figure 3. Responses to 1st presentation Thinking Question

Q1: Could the presented solution be applied in your estuary? Why / why not?

no, no anabranch available	Yes, this is possible in the Scheldt	No, no anabranch available
No anabranches	Not sure, that would require some investigation	Difficult as space is a premium
resistance residents	A solution, which is not realised is no solution	Yes. My estuary is the Elbe.
Not on a large scale as they are too small. The principle might be adapted though.	Yes, if you have the space	Yes, this is possible in the Scheldt.
Yes, in combination with good communication skills	My estuary is the Elbe. So... probably not because resistance against the measure is too great. The same might be true for the Alte Süderelbe. So the question remains how the three states can do something for the improvement of ecological status.	

Figure 4. Responses to 1st presentation Open Question

II. *Exploration of new solutions to adjust the sediment management strategy in the Scheldt estuary mouth* (Marco Schrijver - Rijkswaterstaat)

Summary

The beneficial use of sediment is an important theme in short and long-term management in the Scheldt estuary. Part of the research program of the Flemish-Dutch Scheldt Commission (VNSC) is therefore focused on sediment strategies to mitigate the effects of sea level rise and climate change and to contribute to improvements in the natural system and to ensure safety against flooding. In order to maintain sufficient sediment in the system, it was decided in 2014 to stop the extraction of sediment. In addition, solutions are sought over the entire estuary instead of in subsystems as the Western Scheldt. Current research focusses among others on a pilot project on cross-border relocation of sediment and a pilot nourishment in the mouth of the Western. The last one was the subject of the presentation.

Materials

- Presentation slides

Questions & Answers

Q1. How happy are the stakeholders with their involvement? How active are they? Who are the active stakeholders?

A1. It's difficult to say how 'happy' the stakeholder are: there was a meeting in July 2020 where the stakeholders reacted positively and they indicated that they were happy to be involved. The stakeholders include companies, environmental agencies, ports, fishing organisations, vessel management etc., so it is a really broad set. Once the design is ready and once the monitoring programme is available (planned for 2021), the stakeholders will be called upon again – so up until now, there has not yet been that much communication.

Q2. Is there already a so called "participation fatigue" experienced?

A2. Not so much considering that there has not really been that much communication yet.

Q3. How are formal requirements of WFD, MSFD, Natura 2000 integrated? e. g. Descriptor "seafloor integrity" in case of sediment management measures?

A3. This is currently being looked into, checking with the N2000 Management Plans and the required permits. They are also looking at the nitrogen depositioning of the pilot itself.

Q4. Are there already findings from similar projects in the past?

Q4. Not so much, but the presentations of the TEEL and the general knowledge-exchange taking place through the IMMERSE project are providing valuable contributions.

Mentimeter Results

WC2: What are key components of a sustainable sediment management strategy?

Figure 5. Responses to 2nd presentation Thinking Question

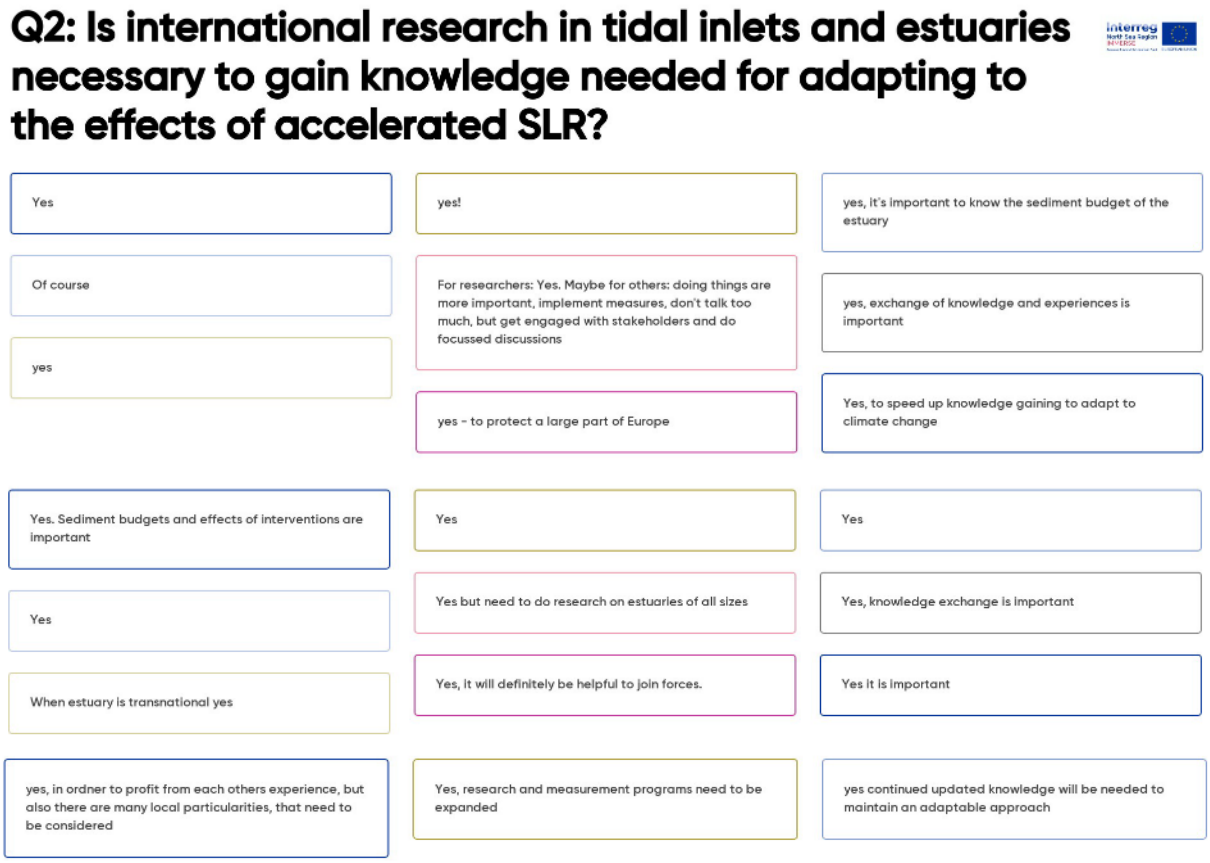

Figure 6. Responses to 2nd presentation Open Question

III. *From management plan to a vision for estuary resilience, case of the Upper Sea Scheldt in Flanders* (Michael De Beukelaer-Dossche – De Vlaamse Waterweg)

Summary

The Upper Sea Scheldt is the upper tidal branch of the Scheldt Estuary (Flanders, Belgium). Apart from its ecological and recreational functions, the Upper Sea Scheldt is an important link between the Port of Antwerp, the Port of Ghent and the Seine-Scheldt network.

However, geometrical bottlenecks limit navigability in the upper stretch of the Sea Scheldt to CEMT class IV. Furthermore, the Upper-Sea Scheldt is confronted with challenges of climate change, human activities and spatial claims, leading to an unfavourable increase in tidal range and dynamics. This affects the estuarine habitat and the suspended sediment concentrations, which in turn affects the water quality, primary production processes, the food web… Hence, a broader vision on river management is required.

In its mission to promote navigation and sustainable management of the river, De Vlaamse Waterweg nv launched an integrated study to investigate management solutions that both accommodate navigation and tackle the aforementioned challenges. The effect evaluation is based on the results of a tailor made, state of the art modelling instrument, consisting of interdependent hydrodynamic, sediment, ecosystem and higher trophic level models. Pilot projects were defined. The presentation focused on this approach to building the vision.

Materials

- Presentation slides

Questions & Answers

Q1. Are there problems with fluid mud in the Scheldt estuary?

A1. Not yet in the Scheldt estuary but there are some indicators that the mud/sediment concentration is going up, so there is a bit of anxiety that this trend will continue – so they want to have measures ready.

Q2. Will the Sustainable Development Goals also be a challenge to contribute to sustainable building blocks for (Western Scheldt) estuary?

A2. They try to make the building blocks independent of what will happen in the Western Scheldt, since the implementation would be in the whole estuary of the Scheldt.

Q3. Congratulation that integrated projects are possible in Netherlands and Belgium.

Mentimeter Results

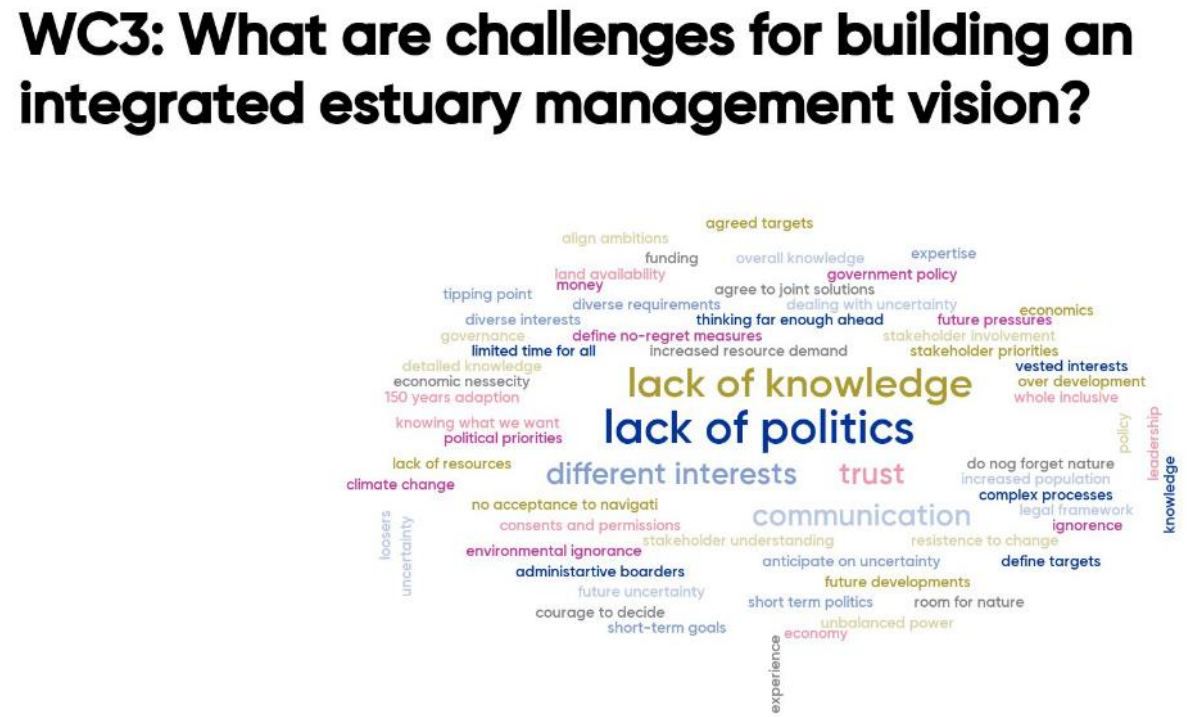

Figure 7. Responses to 3rd presentation Thinking Question

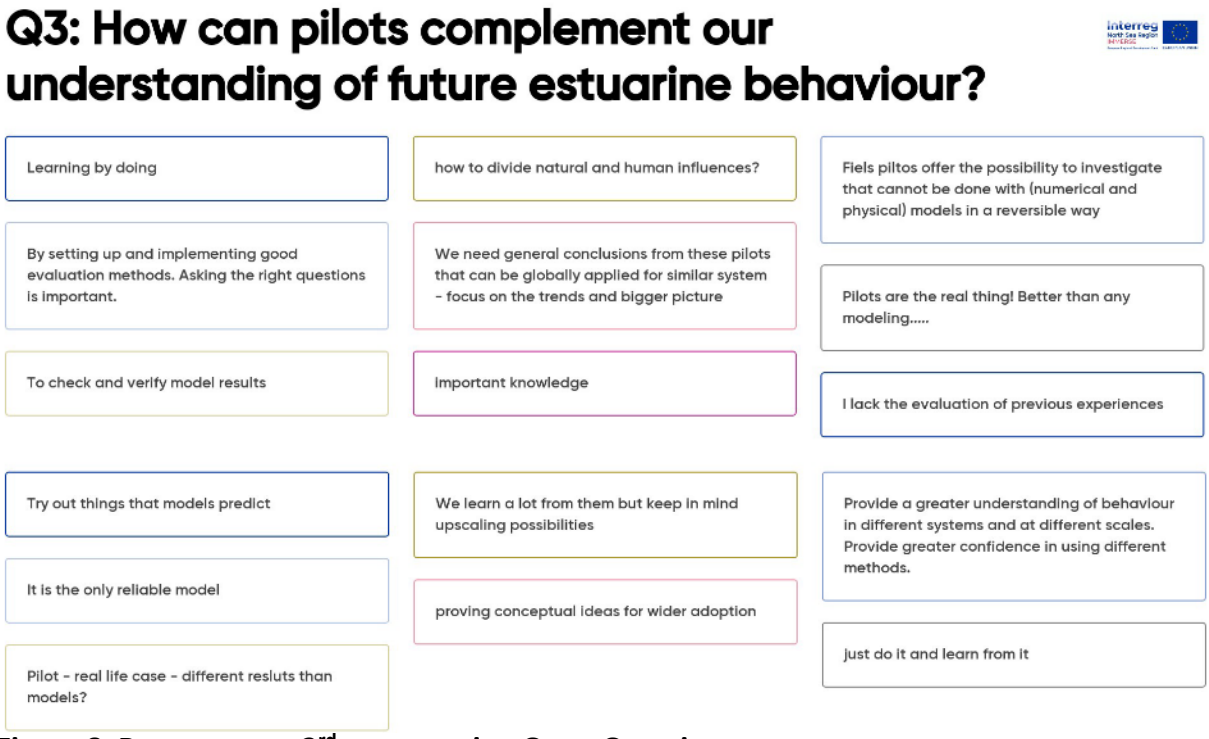

Figure 8. Responses to 3rd presentation Open Question

Wrap up and Conclusions

The presented measures and solutions in the Elbe and Scheldt estuaries gave us ideas about what could be worth thinking about in other European estuaries regions. Beside the Elbe and Scheldt the participants mentioned 11 different estuaries as their favourite estuaries. The word-clouds from the thinking questions showed the wide range of aspects concerning adaptive and sustainable sediment management and at the same time depicted the participant's clear understanding of the essential problems related to these aspects. Nevertheless, the participants realised that further research in combination with pilots and monitoring is useful and should be recommended within the estuary community.

Session moderator Holger Rahlf provided a summary of main points and conclusions from the discussions following each presentation:

- Sediment management is only one part of estuary management
- Context of nature, policy and management is to be considered
- Different types of priority measures in the estuaries
- There is a long walk to a vision for estuary resilience

Recommendations for further work:

1. We have to promote knowledge exchange
2. Make not only plans but also pilots (to get real data and to validate models)
3. Combine different types of measures
4. Involve stakeholders and science (combine know-how from different professions)

A final question was posed to the audience to capture their reflections from the session presentations:

Figure 9. Responses to final word cloud question

Participants

Last Name	First Name	Country	Organization
Abratis	Martin	Germany	Generaldirektion Wasserstraßen und Schifffahrt / Federal Waterways and Shipping Agency
Ahlhorn	Frank	Germany	Wadden Sea Forum e.V.
Andringa	Tessa	Netherlands	Sweco
Backx	Joost	Netherlands	Rijkswaterstaat
Bengtsson	Henrik	Sweden	Swedish Geotechnical Institute
Benndorf	Julia	Germany	BAW
Biernaux	Valerie	Belgium	Antea Group
Boerema	Annelies	Belgium	IMDC
Borgsmueller	Christine	Germany	BfG
Breitung	Vera	Germany	Federal Institute of Hydrology
Brinke	Alexandra	Germany	German Federal Institute of Hydrology
Claus	Beatrice	Germany	Umweltstiftung WWF
Cox	Jana	Netherlands	Utrecht University
Craven	Richard	United Kingdom	Chichester Harbour Conservancy
De Maerschalck	Bart	Belgium	Flanders Hydraulics Research
Dhondt	Jannie	Belgium	De Vlaamse Waterweg nv
Grubbe	Jørgen	Denmark	Holbæk Kommune
Hawley	Sue	United Kingdom	Isle of Wight Estuaries Partnership
Inwards	Liz	United Kingdom	Environment Agency
Kaptein	Steven	Belgium	Flanders Hydraulics Research
Klocke	Elisabeth	Germany	Elbe Habitat Foundation
Liek	Gert-Jan	Netherlands	Rijkswaterstaat
MEldgaard	Lotte	Denmark	sweco
Marx	Sarah	Netherlands	Rijkswaterstaat
Meier	Elke	Germany	NABU Niedersachsen e.V.
Pauwels	Cynthia	Belgium	Port of Antwerp

Pede	Annelies	Belgium	maritieme toegang
Plancke	Yves	Belgium	Flanders Hydraulics
Porschke	Alexander	Germany	NABU
Ravenscroft	Zahra	United Kingdom	Environment Agency
Ries	Oliver	Denmark	Sweco Denmark
Roose	Frederik	Belgium	MOW - Maritime Access
Sanders	Eve	United Kingdom	Thames Estuary Partnership
Schaper	Jürgen	Germany	Helmholtz-Zentrum Geesthacht - Institute of Coastal Research
Schilling	Eike	Germany	NABU Hamburg
Schipper	Cor	Netherlands	Rijkswaterstaat
Seifert	Annedore	Germany	Hamburg Port Authority
Sieben	Eline	Netherlands	Utrecht University
Spencer	Faith	United Kingdom	Environment Agency
Sprenger	Judith	Germany	Hamburg Port Authority
Stark	Jeroen	Belgium	Flanders Hydraulics Research
Steege	Volker	Germany	Federal Ministry of Transport and Digital Infrastructur
Strömvall	Ann-Margret	Sweden	Chalmers University of Technology
Taal	Marcel	Netherlands	Deltares
Törnqvist	Oscar	Sweden	Geological Survey of Sweden
Van Bentum	Floris	Netherlands	Rijkswaterstaat
Van Goethem	Patrick	Belgium	Maritieme Toegang
Van Malderen	Eline	Belgium	MOW
Wolfstein	Kirsten	Germany	HPA