Floating Future Newsletter

An interdisciplinary project to enable implementation of floating islands for societal, industrial and ecological win-wins

December 2025

The Floating Future project is finalizing its second year. This newsletter introduces the five case studies that are at the core of the project and reflects on past activities.

Case studies

The project defined five case studies (Amsterdam Growing Island, Rotterdam Merwe Vierhaven, Green Heart Venice, Port of Rotterdam Energy Transition, and North Sea Multi-Purpose Hub), which are studied over the course of the project by researchers and societal partners. This newsletter introduces the cases and shares a brief update. For more information regarding the case studies, feel free to connect with us.

Rotterdam Merwe Vierhaven

Emma Wolff (NIOZ)

The RMV case study explores the potential development of a future floating neighborhood in the Merwe Vierhaven area of Rotterdam. In recent years, the city has invested in a range of floating solutions: floating villas, floating trees, a floating office, and even a floating farm. A fully floating residential area would be the next step in Rotterdam's floating ambitions. In collaboration with the Municipality of Rotterdam, designers Space&Matter and Posadmaxwan created several future scenarios illustrating how such a neighborhood could take shape.

On 26 November, we hosted a *Climate Café*, an interactive day where we interviewed stakeholders, including local government actors, potential future residents, and representatives of the surrounding community. Together, we discussed the proposed scenarios, along with their potential benefits and drawbacks. These conversations helped us better understand the barriers and opportunities for scaling up floating structures in the Netherlands.

To get insight in the ecosystem of the harbor, we also conducted a baseline ecological assessment of the harbor. Using an underwater drone, we measured salinity, oxygen, light penetration and took underwater footage to see what currently grows in the harbor. Additionally, we took measurements beneath the floating pavilion, one of the existing floating platforms in the area.

We ended the day by sharing our initial findings to Alderman Zeegers, who is responsible for climate, construction, and housing. It illustrated the integrated values we're developing. She was convinced of the relevance of the research work and the Merwehaven case.

In the coming months, Tim, Eefke, Sonja, and Barbara will analyze the interviews and the surveys conducted through a PublicTwin. The PublicTwin, developed by the designers, is a virtual representation of the different scenarios with discussion points. Emma will carry out a field experiment in the Rotterdam harbor. Using small floating islands, she will study the growth of organisms under floating conditions, such as shade, less air-water interaction, and altered water flow.

Port of Rotterdam Energy Transition

Buddhi Weerasinghe (Erasmus University)

Rotterdam is preparing for a new phase in maintaining its position as Europe's leading logistics hub, where the drive toward net zero shipping and port sustainability will increasingly shape how space, infrastructure and operations evolve. The shift to renewable and green energy and large scale storage demands new infrastructure that the port can no longer place on land, while the growing interest in marine resources like seaweed introduces its own supply chain needs for cultivation, harvesting and processing. Floating infrastructure offers a flexible path for both, creating room on the water for energy systems and emerging biobased activities without adding pressure on scarce land.

This case study uses participatory action research to bring together Rotterdam Port Authority (PoR), energy companies and operators, ecologists, designers and engineers as they examine feasibility, environmental effects, safety considerations towards sustainable business models.

In this effort, several PhD researchers have already started generating insights. Buddhi Weerasinghe (WP1 Governance) is conducting interviews to understand stakeholder needs pathways for bringing floating solutions into Rotterdam's energy transition. Katherine Álvarez (WP2 Technology) is running experiments on connector systems and load behavior in modular floating platforms. Xiaoyu Wang (WP2 Technology) is testing floating breakwater performance, including Eco-Reef concepts. Tim van den Bosch (WP3 Ecology) is developing simulations to assess water quality and mussel growth around floating structures. Vera Hartman (WP3 Ecology) is carrying out experiments on how hydrodynamics shape seaweed growth and composition.

The project is advancing through close collaboration with the PoR, Smartport, Kuiper Compagnons, MARIN, Vopak, and operational and ecological partners, highlighted by a 25 July 2025 field visit provided by Jorick van der Heijden (PoR) and organized by Charné Theron (Case Coordinator) to assess future floating operations. Early industry signals indicate that floating units can add operational capacity, buffer storage, and expansion potential while supporting ecological functions that enable nature-inclusive development.

Green Heart Venice (& Deltacongres)

Barbara Dal Bo Zanon (Delft University of Technology)

The Green Heart Venice case explores the potential of floating and amphibious housing in low-lying peat areas in the Netherlands.

On 28 October, Christiaan, Eefke, and Barbara visited the case study area Kerkwetering in Oudewater and took part in the third expert session, “Floating Construction in Kerkwetering.” The session brought together a multidisciplinary group of participants, including urban designers, engineers, and representatives from Hoogheemraadschap de Stichtse Rijnlanden (the waterboard), the Municipality of Woerden, and the College van Rijksadviseurs.

Research conducted by Bosch+Slabbers provided an important foundation for the workshop. Their analysis of soil conditions, water dynamics, and landscape characteristics highlighted the spatial and environmental challenges of the area. This research informed the design exercises, which explored multiple spatial scales and different construction approaches, including pile-supported, amphibious, and fully floating structures. Despite the site challenges, the municipality and waterboard continue to actively explore the potential for floating development in Kerkwetering, as well as for other forms of occupation.

In parallel, floating development was also a central topic at the recent Nationaal Deltacongres, which took place on 13 November 2025. One of the dedicated sessions, "Ronde 1 | 5 – Drijvende wijken met water en bodem als basis", was explicitly devoted to floating neighbourhoods and their viability as a response to both water-management challenges and subsidence in peat and soft-soil areas. The presence of floating development in this national forum indicates that it is no longer seen solely as an experimental niche, but is increasingly being considered as part of the broader debate on future-proof spatial development in the delta.

North Sea multi-purpose hub

Xiaoyu Wang (Delft Univ. of Technology)

As one of the more future-oriented cases in Floating Future, the Offshore Multi-purpose Hub (OFM) serves as a platform for innovative ideas in an offshore development. This collaborative case brings together partners from diverse sectors: MARIN (Coordinator), RVO (Public stakeholder), Smartland (Designer), PhD researchers from all work packages, and companies, NGOs and governmental organizations from within and outside the consortium.

Drawing on different expertise and perspectives, the OFM team aims to develop an offshore hub concept based on specifications of future demands. The approach builds upon insights from previous projects including Space@Sea and HybridEnerSeaHub. Expected outcomes include concept prototypes and validation through 3D wave basin testing (2026).

On a blustery Thursday, our team embarked on a field investigation to Marker Wadden, an artificial archipelago in the Markermeer. Departing from Lelystad port, we headed

toward the islands by ferry—fortunately accompanied by Klaas Jan (Smartland), one of the project's designers, who shared fascinating stories behind the development.

While the Markermeer was once a saltwater body, the transition to freshwater (following closure of the Afsluitdijk in 1932) dramatically altered the lake's species composition, creating a vulnerable local ecosystem. Without natural islands, many bird species lacked essential habitats and feeding grounds—particularly in the shallow waters that are crucial for biodiversity.

Klaas Jan, Foor and Joep presenting

The design of Marker Wadden primarily addresses these ecological needs. Seeing the tangible results was truly inspiring: the islands now host thriving populations of birds, fish, plants, and insects, transforming what was once a depleted environment into a vibrant ecosystem. With a beautiful view of beach and lake as background, Klaas Jan and Joep shared slides about design sketches and environmental conditions.

While nature restoration is the primary goal, the project thoughtfully accommodates human access for tourists and researchers. Observation points allow visitors to witness birds and fish in their natural behaviors without disturbance. The Houtribdijk, a dam connecting cities on opposite shores north of the islands, demonstrates how artificial structures can help balance nature and human activities in large water bodies. At the unique underwater viewpoint, Floor organized a role play round to collect demands and opinions from different perspectives. From this session we exchanged ideas about how different parties can access the platform.

Marker Wadden offers valuable lessons for future floating infrastructure projects, showing how engineered solutions can simultaneously serve ecological restoration and societal needs.

Amsterdam Growing Island

Sonja Rombach (University of Groningen)

In July, our team gathered in Amsterdam for the first site visit —a dynamic day filled with presentations, hands-on workshops, and a bike tour to view existing floating homes and the planned future site for the case study. Together with Franco Pantano (Municipality of Amsterdam) and Ankie Stam (Waterstudio), we examined how floating solutions can support climate adaptation, housing needs, and sustainable urban expansion around Amsterdam's Growing Island.

Conversations with policymakers, market suppliers, residents and neighboring residents in Steigereiland/IJburg showed both interest in floating living and concerns, from unclear responsibilities and regulations to financial hurdles, exclusivity, and limited integration with the wider neighborhood.

Across the site visits and discussions, one message kept coming back: inclusive communication is key to navigating the technical, legal, and social questions around floating developments while staying grounded in the needs and concerns of local communities.

Meet the research team (part III)

The core of the Floating Future project is formed by a team of early-career researchers at various universities. This newsletter introduces our final project member, Erika Varik.

Erika Varik (University of Groningen)

My name is Erika Varik, and I work in the Department of Spatial Planning and Environment at the University of Groningen as a junior researcher. I hold a Master's degree in International Relations and International Security from the same university.

I joined the Floating Future consortium in April 2025, becoming part of a network that has developed since 2024. I contribute to WP1 on Governance (social value) by studying the floating multi-purpose hub (FMPH) concept in the North Sea. Before joining the project, I was already familiar with floating solar and floating offshore wind in the North Sea. However, I became particularly interested in the floating hub, as people have different perspectives on what kind of multi-use it is, how it should be designed, and what it represents societally.

My research investigates how people envision the future role of the FMPH by examining its framing. I am analyzing discussions about the FMPH to learn what can be gained from various maritime experts' visions for its future. I experience that this consortium offers an excellent platform for collaboration among diverse disciplines and societal partners to create societal impact beyond research results.

Research updates

Learning community at Hanze

Charné Theron (Hanze)

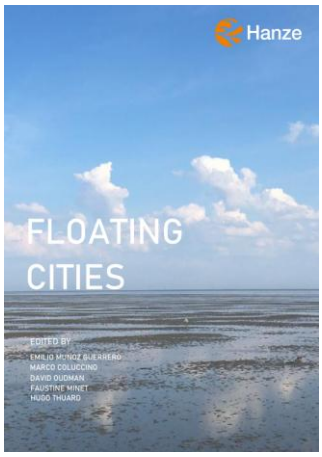
Over the last year, researchers from the Hanze University of Applied Sciences have overseen student work related to the Floating Future research project. Over one hundred students, both on bachelors and master's levels, have participated in PESTEL* research activities based on an interdisciplinary approach to respond to the challenges of climate change, rising sea levels, flooding and urban population growth. Project outcomes have been published collectively in two volumes[1], showcasing shared achievement of students from different disciplines. Students also had the opportunity to present their work at research days including the New Energy Forum event as well as at the annual Kenniscentrum NoorderRuimte Symposium and ClimateCafe's[2].

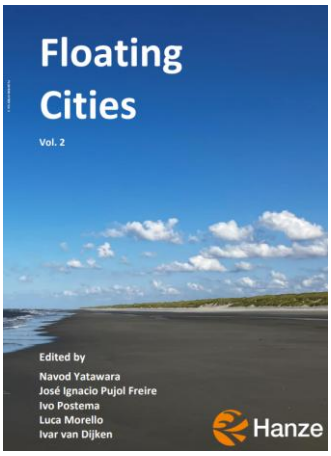
Currently, the Learning Community at the Hanze University of Applied Sciences, is also collaborating with the University of

[1] Floating Cities I. 2025. A PESTEL Analysis. Hanze University of Applied Sciences.pdf; Floating Cities II. 2025. A PESTEL Analysis. Hanze University of Applied Sciences.pdf.

[2] Presentations Climate Cafe's WP 4 - Hanze University of Applied Sciences and publications Floating Future: Participatory Climate Café's for raising awareness and climate action in the Netherlands - Hanze University of Applied Sciences; ClimateCafe Floating Future Zeeland - Hanze University of Applied Sciences.

Hasanuddin in Indonesia. Bachelor students at both universities will investigate how floating infrastructure can offer sustainable and cohesive urban environments for communities vulnerable to rising sea levels.





The project requires students to investigate design strategies relating to sustainable floating infrastructure and innovative solutions. Their work covers detailed layout plans, modular construction methods, and sustainable concepts that integrate circular design principles that prioritize renewable materials, minimise waste, ensure energy efficiency, long-term flexibility and connectivity. Through this multidisciplinary collaboration, the Floating Future project is cultivating a new generation of designers equipped to envision resilient, water-based futures.

*PESTEL - political, environmental, social, technological, economic, legal

World Conference on Floating Solutions 2025

Elizabeth Macafee (University of Groningen)

The Floating Future team was well represented at the World Conference on Floating Solutions in Espoo, Finland in September with researchers, entrepreneurs, and local governments all present to learn, network, and exchange ideas (and enjoy the floating sauna). The conference was a valuable opportunity to share our work and learn about the cutting edge of floating developments around the world.

We are proud of PhD researchers Buddhi Weerasinghe, Katherine Álvarez, and Sonja Rombach, who each presented papers on their preliminary findings about port governance, modular connectors, and social acceptance respectively. In addition, Charne Theron (Hanze University) presented about the Climate Cafe method, Margo van den Brink (RUG) shared a paper about aspects of living on the water that people value, and Elizabeth MacAfee (RUG) and Christiaan Weiler (Blue Revolution Foundation) presented about the first year of the PAR research process.

Consortium members also played a central role in a variety of plenary sessions, including an investor roundtable moderated by Christiaan Weiler, a panel discussion about learning from urban planning success stories led by Koen Olthuis (WaterStudio), and a keynote presentation about emerging frontier business by Akane Takahashi (Shimizu Corporation).

Keep an eye out: several of the presentations are based on conference papers which will be published in the WCFS proceedings quite soon.

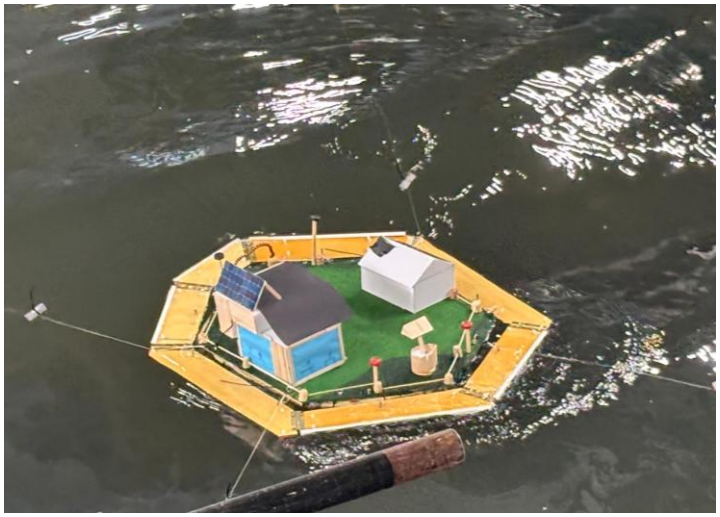
Technasium project: floating structures from wind turbine blades (Waterstudio)

Ankie Stam (Waterstudio) and Joep van der Zanden (MARIN)

Every year, millions of tonnes of wind turbine blades reach their end of lifetime. Currently there are no good ways to recycle these

blades. So, would it be possible to fit them to another purpose, such as a floating structure?

This initiative is conceived and developed by Waterstudio Waterstudio, and was presented as a design assignment to some 120 students (age 12 – 18) of Technasium school De Breul in Zeist. Inspired by existing architecture but using their own imagination, the students designed and built a floating scale model using (3D printed) wind turbine blades as a main construction element.



The most promising designs were tested up to survival limits in MARIN's shallow water wave basin. The designs included a floating holiday parc, a festival terrain, a restaurant, apartment blocks, and a cinema. All models remained afloat, so the students sure convinced Waterstudio and MARIN of their creations!

The results will be used by Waterstudio to further develop the concept.

Scientific output

Da Bo Zanon, B., Iuorio, L., Hooimeijer, F. (2025). *Floating developments: The next chapter in Dutch delta management?* In: Fuzzy Boundaries, Threshold Between Water and Land. Dal Cin, F., de Mesquita ima, J. and Barreiros Proença, S. Taylor and Francis Group.

Floating Future in media

- Margo van den Brink (University of Groningen) shares her vision for infrastructure and water in the Volkskrant.
- Podcast Eefke Huisman (Open University) on her research related to legal challenges of floating homes.
- World Expo Osaka: project video by University of Groningen.

Outlook

In the upcoming year, the project is expected to share the first scientific insights and papers, some of which are presently undergoing review. We will continue working on the case studies.

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