Newsletter

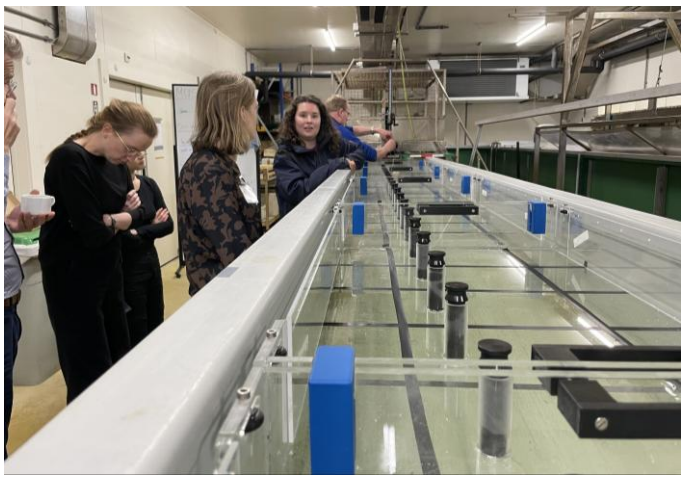
An interdisciplinary project to enable implementation of floating islands for societal, industrial and ecological win-wins

March 2025

The Floating Future project has entered its second year. The full team of project researchers (10 PhD candidates and 1 postdoc) has started; you get to know them through this newsletter. This letter further reflects on several successful project events and we look ahead towards research activities in the coming period.

Floating Future visits Zeeland

The Floating Future Consortium gathered in Zeeland for an annual project meeting on 6 and 7 March, hosted by NIOZ and the Watersnoodmuseum. We spent two fruitful days discussing and reflecting on the first year of the project and looking forward towards more exciting collaborations going forward.



PhD candidate Emma Wolff presenting basin tests at NIOZ

The program started with a presentation by project coordinator Joep van der Zanden (MARIN). Joep reflected on the many accomplishments of the first year of the project, including the kick-off meeting, online Climate Cafe webinars, case study meetings, investor round tables, and of course the significant behind-the-scenes work of the PhDs.

Technology WP lead Floor Spaargaren

Next on the agenda were presentations by market partners Shimizu, Reefy, Deltares, and Smartland, who shared insights about their approaches to floating infrastructure. The full diversity of the Floating Future project was on display, showcasing ecological, design, and architectural perspectives.

Then Rutger de Graaf (Blue Revolution Foundation) led a short conversation about the 6 levels of interaction that lead to cocreation. In a number of steps - meeting, learning, applying, implementing - we can develop our exchanges to be more fruitful,

eventually leading to an adaptive learning community of scientists and practitioners achieving societal and scientific breakthroughs! Various practical solutions were also presented so as to activate the collaborations, such as internships, Master thesis and of course PhD Thesis work.

In the afternoon nearly everyone was involved in a Pecha Kucha session - a series of 90 second presentations where project members re-introduced themselves and their research questions. The session was intense and highly engaging, and at the end many participants noted that they feel they now have a much more comprehensive overview of the project and what everyone is up to.

Floating Future team at the Watersnoodmuseum (Ouwerkerk)

We then were treated to a poster session showcasing the early work of the PhDs and a visit to the experiments of Emma Wolff and Vera Hartman, where several brave consortium members tasted the seaweed that may someday be cultivated on floating structures in the North Sea.

On Friday we were lucky to welcome a member of the Project Advisory Committee, Simon Richter (University of Pennsylvania). In his keynote he shared with us some reflections on the history of the Dutch Deltaworks, noting a lack of conceptual progress in the last 60 years, regardless of all the technical advancements. Simon's online alter ego Professor Poldergeist is optimistic though - and he sees floating developments as an inevitable part of the future of the Netherlands.

With these thoughts in mind we toured the Watersnoodmuseum to learn more about the Dutch history of fighting against, and protecting itself from, water. The Floating Future team wants to contribute to a shift in this narrative, going beyond living with water, to living on water.

To close the meeting, we divided into 5 case study groups to discuss how to optimize our collaboration going forward. The groups were also tasked with imagining an exhibition of their case study object in 2050, after it has been successfully realized. For example, the group working on the Rotterdam Energy Transition case proposed an elaborate exhibit with a large-scale model of the port, a storyline of the long journey of floating development to its eventual position as a mainstream solution, and demonstrations of innovative floating port technologies.

Remi van der Wijk (SmartPort): "The future exhibition in the Watersnood-museum will be a chance to look back on how Floating Future helped us move past the crippling uncertainty around the energy transition and floating solutions, ultimately leading us to a port that lives in and with the city"

The results were inspiring, and we look forward to seeing these creative presentations using VR, interactive games, and immersive experiences in action someday!

Meet the research team (part II)

The core of the Floating Future project is formed by a team of 10 PhD candidates and 1 postdoc, who will develop key insights in their specific domains (governance, technology, ecology). The first newsletter introduced five of the PhD candidates, the present newsletter introduces the rest of the team.

Eefke Huisman (Open University)

My name is Eefke Huisman and I am a PhD researcher at the Faculty of Law at the Open Universiteit Heerlen. My research, part of WP 1 (Governance), focuses on how large-scale floating structures can be integrated into Dutch law. The aim of my research is to develop a legal framework that facilitates the scaling up of floating structures.

What excites me most about this topic is its connection to some of today's most pressing societal challenges. Floating structures provide an innovative solution to the growing flood risks in the Netherlands, while also addressing the urgent need for additional living space in a country with an ever-increasing housing demand. The societal relevance of this research is something that strongly motivates me.

I am eager to collaborate with fellow PhD researchers and stakeholders to turn the vision of a sustainable floating future into a reality!

Miao Yu (Delft University of Technology)

I am Miao Yu, a PhD student at Delft University of Technology. As a member of WP2, My research focuses on how floating islands influence current dynamics, including their spatial and temporal variations. My journey into hydraulic research began during my master's program at University of Tokyo, where I concentrated on how hydrodynamic forces impact structures during events like floods. Inspired by this work, I decided to expend my research scope to the more complex marine environment.

As climate change persists and land diminishes, floating islands are becoming crucial solutions. The presence of floating islands can not only alter current dynamics but may also have long-term effects on ecosystems and coastal morphology. Currently, my research begins by analyzing the specific impacts of floating islands on current dynamics. I primarily use numerical simulation to conduct this research and observe how various parameters influence the behavior of currents. Future research will focus on how these effects spread to broader areas. Therefore, my initial research question is how the presence of floating islands impacts the hydrodynamics processes within their immediate vicinity?

Tim van den Bosch (Utrecht University/Deltares)

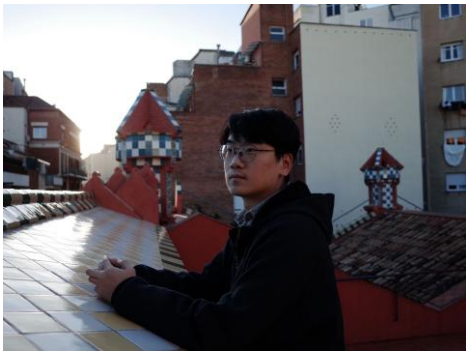
In 2023 I graduated from Wageningen University with a Master's degree in Biology. During my academic journey I mostly specialized in ecology. Throughout my studies I became involved with multiple projects about aquatic ecology and the North Sea. These projects made me fall in love with the North Sea, its different habitats and the connection we humans have with it.

With rising sea levels and a lack of available land space, a lot of construction is moving seawards (wind, solar, etc.). This is why I joined Floating Future, because the project and I believe that this seaward expansion must not come at the expense of the aquatic environment.

As part of the ecology work package (WP3) I hope to answer the question of "how and to what extent these floating structures might impact the water quality". To be able to answer this question I will make use of the modelling expertise and knowledge of Deltares and Utrecht University. My aim is to model how the scale of a floating structure in relation to the ecosystem characteristics impact the water quality and how expected biofouling might play a role in that.

Xiaoyu Wang (Delft University of Technology)

I am Xiaoyu Wang, a PhD researcher at the Section of Hydraulic Structures and Flood Risk at TU Delft. Prior to this position, I completed my studies at Tsinghua University and gained professional experience at CRTG Sweden, where I acquired comprehensive knowledge in various aspects of Civil Engineering and practical applications.



My master's thesis focused on the statistical and hydrodynamic properties of floating foundations for floating bridges, utilizing both numerical and experimental methods. This work ignited my passion for floating structures, which I am continuing to explore in my current research on offshore breakwaters for floating cities, under the supervision of Dr.ir. Bas Hofland. In particular, I focus on Task 2.2, focusing on Floating Eco-Reefs for Wave Attenuation.

The challenge of managing wave forces in offshore conditions remains a significant technical hurdle for floating applications. Breakwaters, which are commonly used for coastal protection, must be adapted to provide effective defence for large-scale floating platforms. My research aims to develop innovative design principles for offshore breakwaters through a combination of theoretical and experimental approaches. The focus is on creating new forms of breakwater systems that integrate ecological functions and floating applications.

Katherine Alvarez (Delft University of Technology)

Hi! My name is Katherine Alvarez. I'm a Naval Architect and recently graduated with a master's degree in Naval Architecture and Ocean Engineering from Universidad Austral de Chile. I specialise in the interaction of floating bodies under wave conditions, focusing on the development of floating energy using both experimental and numerical tools.

Nowadays, I work at TU Delft as a PhD researcher of WP2 and my job is to find the optimal loads in the connector system between modular structures through experimental research. The connector system, an indispensable component of a modular structure, fulfils the function of maintaining the integrity of the entire structure through its interconnection. Its design should be based on the main purpose of the structure: is it for living? Then the

connector system should restrict the movement of the modules for the residents' comfort; is it for energy generation? Then the connector system should be flexible enough to allow relative motion between modules, but strong enough to prevent failure.

My motivation for this project is to find innovative solutions to the challenges of living in a shared ecosystem, such as climate change and population growth - and what a better way to approach this than through physics!

Elizabeth MacAfee (University of Groningen)

My name is Elizabeth MacAfee (also known as Mac), and I am joining the Floating Future project as a postdoc researcher at Rijksuniversiteit Groningen. Water, and increasingly the risks associated with living near water in the context of climate change, has always been an important part of my research.

I completed my masters in International Environmental Studies at the Norwegian University of Life Sciences, and PhD in Society, Development, and Planning at the same university. In my masters I studied vulnerability to groundwater contamination in Zanzibar, Tanzania and in my PhD I focused on drinking water quality governance and planning in Senegal. Afterwards I moved to the Netherlands for a postdoc at Radboud University, where I study human-environment interactions and resilience to water-related challenges in low-income areas near rivers in Indonesia.

I will be supporting the Participatory Action Research portion of the project, and I am very excited to explore the possibilities of floating infrastructure to become an important tool for climate adaptation in the Netherlands and elsewhere.

World Conference on Floating Solutions 2024

Researchers from the Floating Future project participated in the inspiring World Conference on Floating Solutions (WCFS) 2024 in Hong Kong. The event brought together experts, policymakers, and innovators from around the globe providing insights and solutions to address critical challenges in the field of floating development.

At WCFS 2024, Floating Future co-initiator and workpackage leader Rutger de Graaf, PhD students Eefke Huisman and Barbara Dal Bo Zanon, and consortium partner Gil Wang presented their ongoing work and exchanged ideas with leading professionals in the field.

Barbara Dal Bo Zanon (TU Delft/Blue21) presented the paper "Exploring the Design of Floating Urban Developments: Integrating Density and Environmental Considerations". This presentation, authored with Rui Gomes (Blue21) and Rutger de Graaf (Blue21, Indymo, BlueRevolution Foundation) focused on an integrated and multi-disciplinary approach for designing floating urban developments.

The paper "Studying Water Quality Impacts of Large Scale Floating Structures: Insights from Floating Solar Projects (Invited Paper)" examined the environmental impacts of large-scale floating structures, with a focus on water quality changes observed around floating solar installations. Presented by Rutger de Graaf, this work is part of the ongoing research about monitoring water quality via underwater drones carried out by our consortium partner Indymo and PhD candidate Rui de Lima.

Finally, the paper "Unlocking the Global Potential of Urban Development Offshore Floating Solutions in the Mediterranean

Region" presented by Gil Wang from Cameri explored the potential locations for implementing Modular Floating Structures, by integrating diverse data sources through GIS.

Barbara, Rutger and Eefke at WCFS 2024.

WCFS 2024 has been a fruitful and inspiring event, providing valuable insights and collaborations directly relevant to our Floating Future research project. The knowledge gained will continue to shape and strengthen our work in the months to come.

The next WCFS will take place from 1-3 September 2025 in Espoo, Finland. For more information about WCFS 2025, please visit WCFS2025.

Pakhuis de Zwijger evening

On 12th November, Floating Future participated in the interesting and well attended discussion evening on floating housing in Pakhuis de Zwijger (Amsterdam). The evening was initiated by platform Circular Floating Districts. Floating Future was well represented by its two initiators Rutger de Graaf and Olaf Waals, project coordinator Joep van der Zanden, PhD candidate Eefke Huisman and advisory committee member Vera Bauman. See our website for the key take-away messages.

Floating Future in media

- Interview Margo van den Brink (University of Groningen) in Dagblad van het Noorden
- News item EenVandaag featuring Rutger de Graaf (Blue Revolution Foundation) and Gijs de Haan (PosadMaxwan)

Outlook

In the upcoming year, the research team is expected to pick up steam and will work towards delivering the first scientific insights and papers.

The project has 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 will be further studied over the remainder over the project by researchers and societal partners.

Meet us!

- 1-3 Sept 2025: World Conference on Floating Solutions, Espoo Finland, with several Floating Future attendees.

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