

# Greater than the sum of the parts

Collaboration between academia and industry can yield great outcomes for all partners, for the nation and for the global maritime sector



Professor Susan Gourvenec  
University of Southampton

This article showcases a selection of recent projects between the maritime industry sector and the Marine and Maritime Institute at the University of Southampton, demonstrating great outcomes resulting from collaboration between industry and academia.

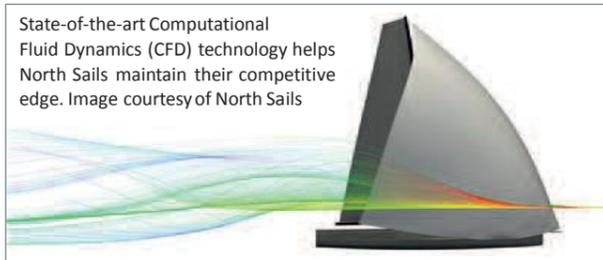
## Win-win

“Just 15 years ago the world’s most advanced racing yachts were travelling at 10-15 knots”,

explains Principal Research Engineer at the Wolfson Unit, Dr Sandy Wright, “now, the world’s elite racing boats are foiling catamarans, travelling at 50 knots in the air, which makes aerodynamics a far more important aspect to yacht racing.”

The Wolfson Unit at the University of Southampton worked with North Sails to optimise the aerodynamics of its sail and spar designs.

The 36th America’s Cup, due to be held in Auckland, New Zealand in 2021, is a current focus point for North Sails. North’s designers are already collaborating with teams for a new class of hydro foiling monohull. University facilities at Southampton allow hundreds of data points on multiple sail designs to be interrogated simultaneously.



State-of-the-art Computational Fluid Dynamics (CFD) technology helps North Sails maintain their competitive edge. Image courtesy of North Sails

“It would be fair to say that our collaboration with the University of Southampton has significantly contributed to maintaining our competitive advantage in the racing world” says Jeremy Elliott, of North Sails Design Services, himself a graduate of the University of Southampton.

## Humanitarian shipping

The 2017 World Economic Forum Global Risk Report ranked Water Crises as the third biggest world issue with demand for water forecast to exceed supply by 2030. Potable water supplies are typically limited to local sources or short trans-national pipelines, while desalination is both expensive and environmentally unfriendly.

Exagenica Research worked with material scientists, structural engineers, ship scientists and hydrodynamicists at the University of Southampton through our consultancy enterprise unit, Rifi, to develop a concept to enable bulk liquid and dry tanker ships to transport water on their return journeys - without the need for costly and lengthy cleaning procedures. The objective was to be able to supply water-stressed nations with a cost-effective alternative to desalination. A proof-of-concept was completed for a collapsible membrane, capable of ‘dual purposing’ vessels to allow storing and transporting vast quantities of potable water by sea economically - to regions of water shortage.

Exagenica Research was keen to work with the University of Southampton, not only for its materials expertise but also because of its close partnership with Lloyds Register, enabling Exagenica Research to define a pathway to the Approval in Principle (AiP) programme, which it hopes to achieve in the near future. “It is vitally important for us to achieve AiP for the working HYDRA prototype, so we can test it on a suitable vessel. Southampton’s knowledge and understanding of materials testing and its close working relationship with Lloyds Register was the best combination of skills for us to progress to this point.” says Exagenica Research’s Chief Executive Officer, John Walsh.

## Setting the agenda

The Global Marine Technology Trends 2030 report is the culmination of a collaborative project between Lloyd’s Register, QinetiQ and the University of Southampton. The report examines the transformative impact of eighteen technologies on ship design, on naval power and on the use of ocean space in 2030. A follow up report looked in more detail at the future of autonomous maritime systems, presenting an update on the major technologies likely to influence the future of the global Marine and Maritime Sector in three key areas – Commercial Shipping, Naval and Ocean space sectors.



University of Southampton’s new 138 m long towing tank

Klaus Schwab Founder and Executive Chairman World Economic Forum has stated “We stand on the brink of a technological revolution that will fundamentally alter the way we live, work and relate to one another.” This so-called 4th Industrial Revolution is a challenge to be tackled as a partnership between industry and academia. Working together can deliver industry-ready solutions to industry-defined challenges, but also develop the next generation of maritime system specialists to take the sector forwards.

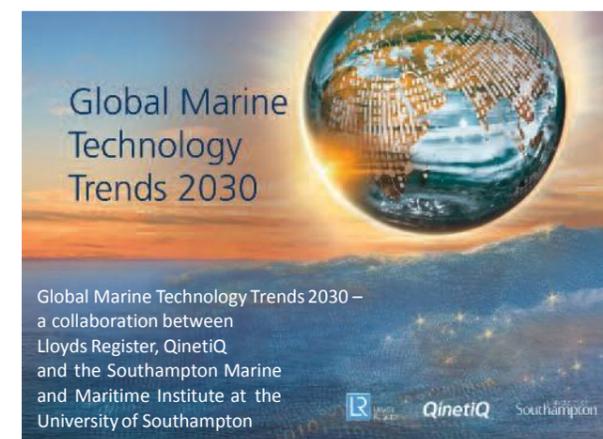


Part of the University of Southampton Boldwood Innovation Campus home to world class maritime testing facilities and the LR Global Technology Centre

and engineers keen to develop their knowledge and solve real world problems.

For example, the Boldwood Innovation Campus at the University of Southampton hosts world class hydrodynamic facilities including a new 138 m long towing tank, the Marine Robotics Laboratory, and the Autonomous Systems Laboratory, alongside Lloyd’s Register’s Global Technology Centre. The National Infrastructure Laboratory is currently under construction and will house new materials testing, heavy structures, and geotechnical element testing laboratories, including a 3 m-radius geotechnical beam centrifuge. These facilities will extend the range of maritime challenges that can be addressed from deep within the seabed to high up in the sky.

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## Working together

Universities offer a wealth of technical expertise and facilities that can be utilised to deliver solutions to industry challenges. They also train numerous enthusiastic and inspiring scientists