

# Watery science in Amsterdam

Bridges are being built between academics, water authorities, and the private sector in Amsterdam – a city historically constructed on water, and currently rich fishing grounds for innovations in the area of water science.

text **Steven McCarron** photography ???

When you think of Amsterdam, a few standard icons probably pop into your head: tulips, Rembrandt, cycling, or perhaps cheese. But chances are it won't take long before water images flood your mind. After all, how many nations owe so much of their development and history to harsh battles with the elements as the Netherlands? Water is a key part of life in the country, and the centuries-old efforts to tame flood surges and reclaim land have also shaped the country's scientific community. This is why Amsterdam's water scientists are amongst the best in the world. A strong core of today's research talent can be found at the University of Amsterdam's (UvA) Institute for Biodiversity and Ecosystem Dynamics and in the VU University Amsterdam's Faculty of Earth and Life Sciences. And as of 2015, a formal bridge has been built between these two university communities: Amsterdam Water Science.

Initiated thanks to funding from the Amsterdam Academic Alliance, this new consortium forms a unified front to evolve the degree programmes, attract new students, drive funding for postdoctoral

research positions and pilot projects, and build stronger connections with the City of Amsterdam, private businesses and water authorities.

Under the umbrella of Amsterdam Water Science, both the UvA and the VU have developed an exciting programme that pairs natural sciences (aquatic ecology, oceanography, eco-hydrology and meteorology) with social sciences (water economics and water governance). And while their research ties in with a wealth of international research projects, it's the water-rich landscape upon which Amsterdam has developed that serves as the ultimate testing ground for their research.

## Key wetland areas

In practice, this means that the researchers and students are extremely active throughout the region. They take advantage of the natural and artificial landscapes that encompass key wetland areas in the province of Noord-Holland, in the Markermeer and IJsselmeer lakes, at the Port of Amsterdam, and, of course, in those iconic canals in the heart of the city. Tackling

projects from both the natural science and social science perspectives has resulted in ongoing themes such as applications in water management, benthic ecology, an economic perspective on peatland restoration and integrated monitoring for water quality.

'The local aim of our studies in the Markermeer is to understand the main processes that influence the ecological functions of this manmade lake,' explains Dr. Arie Vonk of Amsterdam Water Science, referring to aspects of the research being carried out on Amsterdam's doorstep. 'Even after decennia of lowered nutrient loads, the goals set for this 'Natura 2000' area haven't been reached. Globally, many new lakes are being created in densely-populated delta areas for reasons such as water security and flood protection, so understanding the main drivers of ecological development around Amsterdam can be exported to these international cases.'

Unsurprisingly, another of Amsterdam Water Science's key research topics is looking at how climate extremes can influence communities, and the measures government agencies and private companies can take



**‘Understanding the main drivers of ecological development around Amsterdam can be exported to other densely-populated delta areas’  
(Dr. Arie Vonk, Amsterdam Water Science)**

to manage the quality of water, flood risks and water shortages. Dr. Elco Koks has been busy with a collaborative project that is looking into the potential effects of extreme weather events on the port of Amsterdam and its supply chains.

#### **Important ‘what ifs’**

Koks is quick to note that the Port of Amsterdam is one of the safest ports in the world, and that the probability of flooding is so low it doesn’t even register on the risk matrixes of most companies. ‘The project nevertheless looks at a wide variety of ‘what if’ scenarios to analyse the potential impact of extreme weather events on businesses in the port,’ he says. ‘Could 20 to 30 centimetres of water disrupt supply chains? In Amsterdam, probably not. But as the Port and the City of Amsterdam aim to incorporate robust and climate resilient designs into any new developments, these ‘what ifs’ are important.’ What’s more, these models are applicable to other regions and international cities, and of great interest across different industries, from oil companies to data centres. As well as working to evolve the university

programmes at both the UvA and the VU, Amsterdam Water Science has initiated an annual symposium. Combining academic presentations with applied sessions, the symposium brings together students with industry experts, professors and researchers. The success of the inaugural event tells its own story: seven out of eight presentations became funded projects, and Rijkswaterstaat (the organisation responsible for the main infrastructure facilities in the Netherlands) will not only sponsor but also host the 2016 edition.

‘What’s great is that we’re getting to cover all sides,’ notes Amsterdam Water Science coordinator Dr. Roxana Petrescu, summarising the advantages reaped throughout the consortium’s first year. ‘The students are a goldmine. We have an excellent education programme, so not only can we attract the best students, but we can grab the attention of businesses and stakeholders. And in turn we’re bringing in some exceptional researchers who can write proposals, involve these students and even help to place them within companies. We’re really dealing with the complete picture now.’

#### **The Amsterdam Water Science Consortium**

- Launched in 2015 after being awarded startup capital from the Amsterdam Academic Alliance (AAA).
- Its core research partners are the VU University Amsterdam and the University of Amsterdam, and there is collaboration with academic, commercial and non-profit stakeholders in Amsterdam and the rest of the Netherlands.
- Employs 110 researchers, and research takes place across a wide range of international projects in collaboration with leading universities in Europe, the USA, Asia and Australia. This is funded through 14 major research grants (ERC and NWO Vici, Vidi and Veni).
- Amsterdam and its water-rich environment serve as a test bed for the consortium’s research and education. Three postdoc projects and seven pilot projects are currently underway.
- Within Amsterdam Water Science, future water scientists have access to two main aquatic education tracks: Limnology and Oceanography, and Hydrology. The latter has been named a national ‘Top Rated Programme’ for the second year running.