



33.3 YEARS OF WATER MANAGEMENT

WHERE  
WATER FLOWS →



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# PREFACE

Water connects. The grey waves of the Western Scheldt connect the slow container ships to the mudflats at Rammekens, where avocets and plovers forage for crabs and cockles among the glasswort. The perfectly straight canal through Walcheren where cormorants, in line, lead the way from the sparkling JRCZ to the sea lab in the run down PSD building, where seaweed dries on the floor and students congregate. The ditches full of common water striders, surrounded by water mint, connect the fields full of waving rye with fields full of onions evaporating in the summer sun. But water also connects the people, the stories, the dreams central to this beautiful collection.

That said, there are only few study programmes that are so deeply connected to Zeeland, so fitting for HZ and so important for the future of both as water management. This beautiful anniversary edition shows it all: how Aquatic Ecotechnology emerged from a genuine Zeeland question. How research and teaching merged in this programme from day one and what that did for quality. How, from the very first aquarium to

today's living labs, the very basis of education was and always is practical. How important internationalisation is and really not just because water knows no boundaries.

Water does not forget. This book is full of warm memories, funny anecdotes, but also valuable lessons. Above all, what it shows is the strength of the community AET, united by love for water and everything that lives. Former students who are now leading lecturers, lecturers who have dedicated more than half a lifetime to sharing their passion, generations of students who have now moved to places where they work with water, watch over it and, above all, know all about it.

Water flows. The study programme in Water Management is also ever-changing. Sometimes slow, meandering, and sometimes impetuous, churning. This is more important than ever. We are entering a time when, even in the Netherlands, we can no longer take water for granted. Take the imbalance between water scarcity and flooding. Or the dramatic state of

water life and the contrast with the promises we make about it within Europe. It is not without reason that last year the government laid down that water and soil will guide all policies from now on.

In such times, people who know about water and all that lives in it are indispensable. If this anniversary edition shows one thing, it is the enthusiasm with which everyone involved has always adapted the Water Management course to the times. In interaction with the environment, with great impact in all collaborations. That gives great confidence in the future, in which water will become increasingly important.

On behalf of the entire HZ University of Applied Sciences, congratulations to all those who made this beautiful study programme in the past 33.3 years and on to the centenary, always with water as the connection.

*Barbara Oomen,  
Chairwoman of the Executive Board HZ  
University of Applied Sciences*





## Getting acquainted

Rien Boeije on his entrance at the fledgling HZ: "In the first year, I had half an appointment at HZ and the other half at my old boss Rijkswaterstaat (Waterboard). I had just quit my job at RWS when I was invited to an introductory meeting with the Executive Board. At the time, this consisted of the managers of the merged institutions. After I had introduced myself, chairman Van Antwerpen responded. He had heard of AET, but he did not have much faith in it. He gave AET a four-year maximum, because that was the average lead time for a new study programme. I immediately quit, slammed the door with such a bang that they could hear it throughout the building, went to my room, phoned my old boss and asked if I could come back. But alas, my old job no longer existed..."

# 1. AET, WHAT'S IN A NAME?

The name Aquatic Ecotechnology has always been under discussion. Many a student and staff member has struggled to explain what Aquatic Ecotechnology actually means to the home front. And in all honesty, you have to admit that the name is a bit of a monstrosity. The reason for the long and complicated name is the attempt to capture the contents of the broad study programme in one single title. A noble endeavour, but perhaps doomed to failure. To understand how the study programme got its name we need to go back to the very beginning.

In 1987, HZ was formed from a merger of a number of higher vocational education programmes, namely HTS, HEAO, HBO-V, HLO, the merged Pedagogical Academies (the Christian and the State PA) and the De Ruyter Maritime Institution. Hogeschool Zeeland (HZ) was thus a fact. A year later, in 1988, initial thoughts about a new study programme that should be 'related to the knowledge capacity available in the province' emerged. According to Kees Bos (1937), former HZ employee and PR advisor to the board at the time, it was at a birthday party when he spoke to Wim Beeftink. Dr Ir Beeftink (1926-2014) was a scientific staff member of Delta Institution for Hydrobiological Research, the forerunner of today's NIOZ. Kees Bos on the subject: "I asked him: 'You have an institution full of academics and PhDs, but isn't there a need for bachelor graduates in your field?' Wim saw possibilities, but those graduates had to be broadly educated, such as in ecology, chemistry, hydraulic engineering and environmental law. 'Well,' I said, 'we have HLO for chemistry, a study programme in civil engineering (CT) and the MER programme for law.' HZ simply already had all this expertise in-house. So that's how the ball got rolling."

Wim Beeftink actively contributes to the content and name of the new study programme. In a thoughtful article in HZ-Gazet (volume 1, 1988), he discusses a number of variants. The beauty of his article is that he links the naming to a scientific-philosophical and even ethical approach. He starts with the working title 'Marine Environmental Technology'. According to him, this does not suffice because, "The term environment in language is usually used only with reference to humans. In this view, the environment, in which plant and animal species live and maintain themselves, is secondary or even left out completely. If natural ecosystems and their species in the marine environment are to be given an important place in the new discipline, it would be better to avoid the word 'environment' here." He suggests using the prefix 'eco': 'Marine eco-technology'. So this is where the word eco-technology first appears. But even this term can be the target of criticism: "The conception is that ecology and technology are compatible (sic) in principle. By using targeted technology to influence the environment in a sophisticated way, it would be possible to improve existing ecosystems or even create new ones. [...] This view is rightly objected to. Western culture is aggressive towards nature; knowledge and science, as well as technology, are means of exercising power. A weak, 'soft' nature succumbs to strong, 'hard' technology. The harmony model of integration is *wishful thinking* or an ingenious attempt to achieve ever greater subjugation of nature. Until Western culture changes substantially, in this other view, the conflict model is the only reasonably realistic approach." He argues that the conflict model pits technology against 'ecology'.

Ultimately, he opts for the harmony model, but first he dispenses with the illusion that science is free from value judgements: "We have become painfully aware over the last half century that a value-free science, necessary to objectify parameters, does not exist. Man determines the preconditions of science, including ecology, by all sorts of subjective means, and thus subjectifies the 'truths' of that science." His conclusion is that in the new study programme, nature must be given its due, especially because of its weakness. "If one gives primacy to nature in the study programme and wants to express this in the designation, it is recommended to include the concept of nature management in the name: 'Marine Nature Management and Ecotechnology'. If one prefers a shorter name, then 'Marine ecotechnology' may be the choice. But the latter name may need further explanation." Whether with the latter he anticipated the explanation of students and staff mentioned in the introduction is not known.

After a year, the name 'Hydro-ecotechnology' appears in the HZ Gazette, probably because the estuarine environment is also added to the curriculum. It is later decided that freshwater will also be part of the curriculum, and the prefix 'hydro' is replaced by the adjective 'aquatic', thus giving birth to AET.

Meanwhile, the name AET has been 'downgraded' to a graduate variant, and replaced for the entire discipline by the more international and broader 'Water Management'. Initiator of AET Kees Bos is clear about the current name: "Water management, that's much better!"

## 2. HAVO-6 OF THEMATIC EDUCATION; THE AET CURRICULUM

The first ever AET teacher and coordinator was Anne Oele. She had only been employed for a few months at HLO which had come over from Goes, which later became the Chemistry study programme, when her manager asked if she knew anything about ecology. "What ecology?" had Anne replied. "'There's marine ecology, terrestrial ecology et cetera'" "Okay, I say no more," said her boss, "then you will be the new AET coordinator ."

Anne was astonished about how old-fashioned things were at HZ: "During my teacher training in Amsterdam, I had already learnt to work with thematic or modular education. At HZ, it was still 45 minutes of German, then a lesson in maths, followed by English, et cetera. Very traditional." In addition, as a young woman she to hold her own in a male-dominated environment. The most resistance still came from her colleagues at HLO. "Fear of the new," according to her. But in the end, everyone cooperated. The first year of the new study programme started in September 1989 as a major of HLO. A year later, AET received its own CROHO registration, which is considered the official start of the study programme. Anne had her hands full with scheduling classes and finding teachers for them. Those teachers came from other study programmes, such as the heao and from the field, for example the Waterboard. The first year was, entirely in accordance with the prevailing teaching concept, neatly divided into separate subjects.



Lecturer Alco Nijssen started as a student in 1990 and thus belonged to the second batch of AET. For him, the first year was very chemical in nature. "I sometimes considered quitting," he recalls. "At secondary school I liked chemistry as a subject, but this was almost nothing but chemistry." Fortunately the last term was dominated by ecology and the year was ended with a field study week. "This made the first year successful for me."

Former study programme manager Rien Boeije joined AET one year after the new study programme had started. He recalls that not much was in place yet: "The first year was already over, but for the subsequent years there was absolutely no contents whatsoever." He decided to get to work start building the curriculum. He did not care too much about the view his manager had laid out during the job interview: "Oh well, it doesn't matter what you teach these young people. The most important thing is that they get four years older."

As the foundation for the AET curriculum, Rien took the Third Policy Document on Water Management, at the time, the starting point for the Netherlands' integrated water management. "I added to that everything I could get my hands on in the building of the National Institute for Coast and Sea (RIKZ) at Arnstein and then spent entire days doing nothing but copy." The combination of the Third Policy Document and the fledgling insights of integrated water management eventually formed the cornerstones of the curriculum of the entire study programme. "Initially, this applied to years two, three and four, of course, but later also the first year." The case was thus decided against those who wanted to refer to the first year as 'havo 6', because of the basic subjects that just had to be taught properly first of all.



Above: Alco Nijssen  
Below: Anne Oele and Piert Elebaas



In the late 1990s it was decided that the curriculum needed a radical overhaul. Instead of being taught in individual subjects, teaching was offered in themes, thematic teaching, so to speak. It was a major change made possible by the extra money coming in thanks to Spanish students (see: 'The Spanish adventure'). The transformation was no picnic according to Rien Boeije: "Suddenly, teachers of the individual subjects had to work together in themes, which was a mixed blessing for some teachers." The motivation for this venture was his unwavering conviction that from day one, students needed to know what they were at school for. It proved to be a hellish task at times. "The first time we got together to discuss the new themes was at Arion hotel in Flushing. I had been up until three o'clock the night before making diagrams of the contents of the themes. I had asked the teachers to send me each and every part of all subjects and divided them into themes. I was really worried that I wouldn't succeed. And then I also had to put everything on overhead sheets..." Eventually, he managed to present the contents of the first themes to the team and asked them if they agreed. At the end of that day at Vlissingen Boulevard, there was finally a proposal for the first semester of the new first year. "And so each semester we filled in a semester for the following year. After four years, the new curriculum was ready."

The resistance to this revamp was not so bad in the end, despite the great freedom teachers had at that time to determine their lesson content. Rien Boeije: "It was a different time than now. There was no OER or a long list of elaborate professional competences. Teachers were autonomous in how they design their education and what questions they asked their students. They were always used to designing their subject as they

## The plan of action

In 1989, Anne Oele was instructed by her manager to write a plan of action. "Anne," he said, "you'd better put to paper how you're going to set up that new study programme." Anne set to work and produced a voluminous report full of considered ideas, nuanced plans and responsible didactics. When she proudly handed him her paper, he said with characteristic directness: "I'm not reading that!" "Why not?" responded Anne incredulously. "It's too thick. Just put it on one A4 sheet." Bewildered, she made a summary of her writing that just fitted on one page.

wanted. So for some teachers it took some getting used to -having to give up some of their freedom- especially those who had been around longer. But in the end everyone joined in. It helped that some newcomers who supported the new curriculum wholeheartedly had joined the team." Lecturer and former student Jenny van der Welle, as a member of the professional field committee, attended the accreditation of the study programme after thematization was introduced. Her enthusiasm about the curriculum was so great that she suggested to the accreditation committee that she would like to do the study programme once again.

In 2005 thematic education came to an end when the KBL education was implemented 'HZ-wide'. Suddenly the Dublin descriptors were introduced, students and teachers were demanded to master the impossible and a number of central HZ themes were established: giving meaning and ethics, sustainability, safety and entrepreneurship and innovation. The last major change to the curriculum took place due to the internationalisation of education (read more about it in: 'From HZ to HZUAS').





### 3. THE LABORATORIES, FROM CONVERTED OFFICE TO JRCZ

Very soon after the start of AET, the demand for its own laboratory arose. Anne Oele had to work hard to convince HZ management: "Without its own lab and field study weeks, you can't provide decent ecological education. That's what I told HZ management. But all sorts of objections were raised, that it was too expensive and how long the study programme would actually exist. 'Well,' I said, 'just give me a room where I can put an aquarium, some beaker glasses and the landing nets, and I'll be satisfied for the time being.' And so we had the first lab." That first, small lab proved to be a huge magnet for recruiting new students.

As the intake increased to even two classes in the first year, making it look as if the study programme was there to stay, it was decided to build a large AET lab. The space for this was found in that of the technical library at that time. Architect Rothuizen created the design for the lab that was entirely focused on ecological practice. Anne Oele was very proud of the special tables: "They had a rim and a drain so you could work well with sludge samples, for example. But you could also put a microscope on them." When the lab was set up, the tables turned out to have been misplaced. The tables by the window were too high and the tables with the drain too low. Anne went to her managing director and said a mistake had been made that needed to be fixed. "We are not going to do that," was his response. "After all, the handover has already taken place." Anne was furious, but there was nothing more to be done. As a result, generations of AET students had to bend down to rinse out their samples at the tables which were too low for them, only to view them sitting on very small stools with the microscope or binoculars.

Alco Nijssen, who had just graduated, was appointed to set up the lab. "It was my first job for AET. In terms of space and possibilities, it was more spacious than now. There was a climate cell, adjustable lighting above the tables and lots of space. The eco-lab came in handy when Spanish students came to Vlissingen to do their practical work (see: The Spanish adventure). During those years, the lab was used intensively because of the large number of students, after that it was wasn't used as much anymore."

The ecolab has always played a major role in promoting the study programme. This is especially true of the aquariums in the adjoining classroom. Anne Oele says: "After about three years, we set up a student promotion team. You can think of the aquarium team as the core of the promotion team. Over time, that team organised many things completely independently, such as 'do-days' outside in the field for interested schoolchildren." According to Anne, students made the study programme in the first 10 years. Alco puts the aquariums' recruitment power into perspective: "It depended heavily on the commitment of the aquarium team. One year there was a highly motivated group of students working on it and the next year it looked like crap. Maybe then students were actually put off by it." Still, Anne regrets the disappearance of the aquariums after Water Management moved to het Groene Woud and JRCZ. "The aquaria and the aquarium team were the heart of the study programme. I miss the beating heart of AET, although they were replaced by other good initiatives."

With the move to JRCZ, Water Management has had to sacrifice lab space; it is perhaps only a third of that of the ecolab in Vlissingen. In itself, it is not a problem that the lab facilities are now different from those in Vlissingen, as the amount of practice in the study programme has also decreased. But JRCZ is more than the home of a (smaller) ecolab for Water Management. According to Alco, it is very suitable for students from different study programmes to work together on a project. "In the fourth year, we have the subject 'Coastal Challenge', in which students from the three majors of Water Management, combined with those of Civil Engineering and Architecture work together to find solutions to a problem, each from their own expertise." And that is great, because JRCZ was set up on the basis that students from different fields of study meet there to tackle problems that transcend disciplines.

## The opening act

If it was imperative for one part not to go wrong at the Youth World Water Forum. This was the action by which Willem Alexander would unveil the World Water Action Team (YWAT) website. Young representatives from each of the five continents brought the prince an Erlenmeyer flask of water which he emptied into a funnel mounted on a computer. On the big screen, those present watched the water level continue to rise in an animation each time. When the level had reached the top, the website would be visible. A push of a button behind the screens pushed the animation one step further each time. This interaction had been practised endlessly so that it would definitely not go wrong, which unfortunately did happen. The person at the computer, the hand trembling with nerves, accidentally pressed the button twice instead of once. Everyone in the organisation realised embarrassment was imminent. The tube was full even before the last flask had been poured into the vessel. The dismay and frustration were so great that there was some crying behind the scenes. Fortunately, Willem Alexander parried with a quip.



## 4. THE YOUTH WORLD WATER FORUM, 10 YEARS OF AET

From 25 to 28 June 2001, a unique event took place at Hogeschool Zeeland. A group of enthusiastic go-getters had managed to organise the Youth World Water Forum (YWWF) to add lustre to the 10th anniversary of the AET study programme. The YWWF was literally a congress on a global scale, with participants including Crown Prince Willem Alexander, the then UN second-in-command Klaus Töpfer and Hideaki Oda, the secretary of the Third World Water Forum 2003 in Kyoto.

The idea for a water conference especially for young professionals arose in March 2000 after a group of teachers had attended the second World Water Forum in The Hague. "Let's organise something like that, but for young people," Herman Haas had exclaimed. "Let's put Vlissingen on the map!" Besides Herman Haas, the organising committee consisted of teachers Michiel Michels, Bram Verkrujssse and Jouke Heringa and lecturer Anja de Groene. A world water forum aimed at young professionals specifically did not yet exist. Vlissingen thus staged the first of its kind. The motto of the conference was Water is everybody's business.

Rien Boeije remembers Michiel Michels coming to his room with the idea of linking the YWWF to the study programme's tenth anniversary. "I don't scare easily by any wild plan, so after discussing with a larger group what it would roughly mean, we just started. Fortunately in time, over a year before the congress was due to take place." Registration and communication with potential participants was done via a website, nowadays it goes without saying, but it was a novelty in 2001. Organiser Jouke Heringa: "Without this website, we would not have managed to get all the participants here." Bram Verkrujssse remembers that there was discussion about the age limit, which varied quite a bit from country to country. "The age limit was set at 30-35 years. At one point, the two



participants from Uzbekistan, who were clearly well above that limit, asked to speak. They jokingly told that they had been sent by their government to experience another such event before their dying day, that's how old they felt among all these young people."

The YWWF lasted for four beautiful, summer days from Monday to Thursday. There were about 200 participating students and young water professionals, from about 40 countries. The central theme was raising awareness, focusing on four major challenges: dams, water quality, floods and access to water. There was a day of field trips, as well as workshops, speeches and debates. There were discussions on water as a human right and water democracy. There was also an art workshop, where participants could express themselves in painting. And there was dancing to the world music of the moment. The week ended on Thursday with a party at the Arsenal Theatre, including a performance by Raccoon, affordable at that time, which was not the case for Bløf.

It made sense to invite Willem Alexander, as he had devoted himself to water management since 1997. Through the Crown Prince of the Netherlands, it would be easier to get other important people from the international water world to come to Vlissingen. Kees Bos was asked to raise funds and approach the big fish. Jaap van Velzen was the man of internal organisation. Among other things, he made the scripts for the conference days. Willem Alexander had already agreed to open a website on Tuesday. To give him a more substantive role, it was decided to hold a roundtable discussion at which Oda and Töpfer would also join. Kees Bos remembers exactly how things almost went wrong then.

"The State Information Service absolutely did not want to know about it. No round table with the prince, not even a Q&A with questions he would receive in advance. The reason for the RVD's caution were the crown prince's unfortunate statements in an interview about his father-in-law a few months before. But if Willem Alexander did not come, Töpfer would also stay at home in Nairobi and Oda in Japan." Through channels, Bos managed to bypass the RVD and deliver the request directly to the prince's personal secretary. The latter thought it was a fine idea. Kees Bos: "It became a very lively and sparkling discussion, especially between Töpfer and Willem Alexander. Very inspiring for the young visitors to the congress." That moments before, Willem Alexander's opening act had gone awry because someone had pressed the wrong button due to his nerves, was fortunately forgotten by then.

Tuesday went down in the books as the day of the hot shots, but on this day too, an important role was reserved for a number of young professionals who presented the results of the previous day's workshops. Jouke Heringa: "They all did that very well, a young woman from South Africa, a Chinese student and one of our students. It is especially the positive energy of those days that has stayed with me the most."

During the congress, the Young Water Action Team (YWAT) was established. The aim of the YWAT was to maintain and expand the community of young water professionals after the end of the YWWF. The secretariat of the YWAT was hosted by the Sustainability lectureship of Anja de Groene, who shortly before had been inaugurated as the first HZ lecturer (see: From HZ to HZUAS). Among other things, the YWAT



organised the second YWWF held in parallel with the Third World Water Forum in Kyoto. The YWAT continued to exist for about three years after the YWWF ended. Bram Verkruijsse says: "The second YWWF in Kyoto (2003) was successful, and prior to that we went with a delegation to a conference in Bonn in December 2001, where YWAT managed to get a youth paragraph included in the papers."

The World Water Forum has since been held nine times; the tenth edition will take place in Bali, Indonesia, in May 2024. The theme is Water for Shared Prosperity. There is no longer a separate forum for young people. Instead, the forum has a special youth programme.

That the YWAT disbanded after a few years has to do with the dispersal of members around the world and perhaps also with the changing times. The YWWF and YWAT fitted into the then notion of global agreement to achieve a better world in a 'UN way'. Education and awareness-raising were part of it and young people joined in. Today's active generation of young people is looking for other ways to influence public and politics, as Extinction Rebellion and Greta Thunberg show. Nevertheless, many young people and WM students are still active in organisations, such as youth parliaments at the provincial level, of a river basin (Scheldt), the North Sea (former student Eva de Boer is deputy mayor) and at the Euro-European level. But also at a global organisation such as Wavemakers United.

## The protocol

Jenny van der Welle, who had completed her AET bachelor's degree a few years earlier, had been asked to be the chairperson of the day at the Youth World Water Forum. She considered it an honour to meticulously manage the perfectly organised programme. On Tuesday, the hot shots arrived, including Crown Prince Willem Alexander. Since the Government Information Service (RVD) did not like the idea of a junior leading the day, it was decided to give Anja de Groene the chairmanship, alongside Jenny. The official greeting of Willem Alexander was done by the two of them. Jenny van der Welle recalls that the RVD had instructed them both on exactly how to address the crown prince of the Netherlands: "I don't remember exactly, but it was a very official line, with your royal highness and all that." When the moment came, Anja de Groene spoke the official wording first, after which it was Jenny's turn. "I thought, I'm not going to say exactly the same thing again, besides I thought it was so formal and stiff. I simply said, 'Welcome, good to have you here.' Well, the lady from the RVD didn't like that very much. She gave me a scathing look."

## 5. THE SPANISH ADVENTURE

**What can and perhaps should be looked back on with mixed feelings is the time of the Spanish students at AET. On the one hand, a time when the study programme flourished thanks to the enrolment of hundreds of extra students; on the other hand, a setback for HZ, which was reprimanded financially and administratively for a construction that was not allowed. In retrospect, one can say that HZ's cooperation with a party such as World University, which operated more like a commercial company than a collegiate educational institution was awe-inspiring.**

Seen from today's perspective, where testing and thus the degree is guaranteed by an independent examination board, such cooperation would never have taken place. Having said this, one is left with a memory of the years when the study programme had to deal with students who lit up the laboratories and classrooms with their Mediterranean sense of life. It was as though they had brought the sun with them from Madrid, Zaragoza, Valencia, Burgos and Tenerife.

In 1994, Rien Boeije was told by one of the managing directors that there were plans for an agreement with World University in Madrid. The 'colleagues' in Spain were particularly enamoured with the AET programme. The initiative for the collaboration came from Ad Vermunt, who had lived in Spain for a long time. According to him, things went differently in Spain than we were used to here. Meetings invariably started later than planned, you suddenly found yourself with others in front of you than expected, people were leaving or coming in all of a sudden, et cetera. In short, Rien first had to get used to the Spanish mores and get to know World University. Together with Walter van Uden from the communication study programme, he left for Madrid for a week. It turned out to be the week of San Isidro, the patron saint of Madrid. A week of festivities, in other words. They were dragged from place to place by a ravishing secretary all week, she had even bought tickets for bullfighting on the black market. Rien recalls that not much came of consultations about the cooperation programme: "There was a

coordinator who spoke quite decent English, but I never saw him again after that, so I suspect he was hired just for that week. I hardly spoke to the World University directors, Jesus and his wife Rosa." Shortly after this introduction, Rien was told by the board what the deal would look like. The students would get their theory in Spain and they would come to Vlissingen for three months every year to do the practical work all at once. "Just arrange it," he was told.

That meant going to Madrid for a few days three or four times a year to consult with Jesus and Rosa. Sometimes Jesus wanted things that the board in Vlissingen had said were not possible. When Rien then stood firm, he was admired by the owner of World University, who informed Ad Vermunt that he had loyal staff members. One time things went wrong. Rien Boeije: "I had come to Madrid for a few days. In the morning we had a meeting until lunch, which we enjoyed in a fancy restaurant with wine glasses in which you could easily put a sizeable bouquet. Jesus suggested something, to which I said we couldn't possibly comply. He then got so angry that he sent me back to Vlissingen. I then packed my things at the hotel, spent an afternoon at the Retiro park and took the plane at my leisure in the evening." It also happened once that he heard at the last minute that he did not have to go because there was yet another disagreement between the HZ and WU.

## Field study

The field study weeks for the Spanish third-year students were held in Spain. That was better than sending them on some salty salt marsh, a biotope you have to look for with a lantern in Spain. The Spanish had their eye on a small lake in Cuenca called la Laguna de Uña (= nail). We went to Spain for a weekend to assess whether it would be a suitable spot. In the morning there was a brief consultation in Madrid before we were to take the train to Cuenca. That consultation ran slightly late so we had to rush to catch the train. After a death-defying ride through the busy traffic of the metropolis, we caught the train in the nick of time. We were accompanied by one of the coordinators who, not entirely coincidentally, was from Cuenca. The lunch had gone for a burton in all the commotion. By now it was well into the afternoon. We appeased our emerging hunger with an apple we dug out of our bag. After a train journey of a couple of hours, we arrived in the old centre of Cuenca, which overlooks the rest of the town very beautifully. Dying for something to eat, we settled down on a terrace. In Holland, it would already be time for dinner. "I'm going to order a regional speciality for you," spoke our attendant. "Is there anything you don't like?" "We eat everything, just not entrails." His face tightened. "It's tripa (tripe), but roasted on charcoal. Very tasty." We decided to give him hell, besides, it would be rude to refuse. Plus, we were so hungry that we took the slight tripe smell rising from the roasted bits of intestine for granted.



## The periwinkle practicum

One of the experiments the Spanish students did in Vlissingen was a field measurement of periwinkles ('crickets') in the zone between high and low tide in the Western Scheldt. At low tide, we went to the Green Boulevard where, every few metres, the students collected all the periwinkles on a given surface and took them to the ecolab. There, the shells were boiled in beaker glasses after which the snail was removed from the shell to measure its dry weight. On a hefty catch, it was quite a job to pick all the crickets from their shells with a needle. It was a contemplative chore, with the students, seated at the low lab tables, chatting quietly with each other while their hands did the work. One of the students looked at each periwinkle intently, and when he found it big enough, he put the snail in his mouth and ate it. He had probably been doing this influencing the measurement results for some time. We decided to put a pedagogical spin on it by asking him what influence his predation had on the measurement results. He had no idea, which led to the conclusion that he had no idea what he was doing either. We perhaps should have known; after all, the Spanish are big fish eaters. But in all the years the practicum had been taught, not a single periwinkle had ever disappeared from a student's mouth among the Dutch cohorts.



The periwinkle practicum

Despite the disagreements, a contract was finally signed and the students came to Vlissingen at the end of their first year of study. It turned out that not every student spoke sufficient English, which was not according to the agreement. The following year, everyone was tested immediately upon arrival and the students whose English was below par were immediately sent back to Spain.

HZ would also provide accommodation for the students. That turned out to be no easy task. Alco Nijssen made an effort to find sufficient accommodation for the first group. "I had no experience with that, besides, there was no organisation back then that provided accommodation for the international students. So I just started looking for rooms like you look for a room as a student, through advertisements in the newspaper and calling around." A year later, HZ Department of Internationalisation took on that task. Still, it always remained exciting whether it would succeed in accommodating every student, especially as the numbers grew every year.

Alco has the impression that the students had a great time here. "We organised quite a lot for them outside the labs. We wanted to introduce them to the Dutch water world. I went on excursions with them to Neeltje Jans, the hydraulic laboratory in Antwerp, Amsterdam, et cetera. And of course they also went out a lot themselves during the weekends."

The Spanish students came to Vlissingen for three years for the labs, did two field study weeks, the first in the Netherlands and the second in Spain, and graduated in the fourth year with a thesis on a water-related problem. The colleagues in Spain were expected to look for internships themselves. This must have caused a lot of headaches because the situation of the WU branches was very different from that of AET, as their network with the water sector was much smaller. Nevertheless, they managed to find a subject for most students. This produced some great examples. For example, there was a student from Valencia who had researched how to treat the waste water that arises every Sunday afternoon on the coast when the paella pans are cleaned. Every July, a group of teachers went to Spain to attend students' presentations. Assessment was done with a colleague from Spain. In the beginning, they had to search for the desired level, but it became clearer and clearer over time. Still, not every student crossed the finish line at once, which had a lot to do with the lack of proper guidance during the internship. A thorough debriefing was then followed by a resit, which was usually completed with a pass.

In hindsight, whether you agree with the Spanish adventure or not, it is ominous that the commitment of the teachers at both AET and in Spain did everything they could to ensure optimal teaching quality within all constraints. The conclusion is justified that the three hundred or so Spanish students enjoyed a study programme they could not have found in Spain.





Field study group



## 6. OUT AND ABOUT, THE FIELD STUDY WEEKS

**The Biberburg, 24-hour measurement, Macedonia, field lab, card blowing, chores, staying up late and getting up early... Every student and teacher in the study programme has memories of the field study weeks. These were weeks in which mutual relationships were strengthened, tested or even changed, between students, between colleagues and between lecturers and students. When you have to work very hard for a week and interact day and night, you cannot hide. Field study weeks were moments to see each other in a different light, to get to know each other afresh. Studies like Water Management, with a large amount of practical work carried out in groups, create conditions for friendships that last a lifetime.**

The idea of going out and about with the students for a week of experiments and field measurements came from Anne Oele. "I learnt so much during my biology studies at Terschelling, in Limburg and in the former Yugoslavia that I thought from the start that with AET we should also organise field study weeks." Even the name 'field study week' she literally copied from her own study programme. According to former training manager Rien Boeije, it is absolutely essential for Water Management students to go into the field: "They do learn about the outside world, but if you never go there, something is wrong." For the first few years, the field study week was held at the end of the first year, until once it got quite out of hand. Anne: "We were somewhere in Zeeuws-Vlaanderen in a group accommodation, I think it was in Hulst. The first evening, a group of students drank all the beer we had bought for the whole week. When we came downstairs in the morning, the whole floor was littered with broken glass and wrecked furniture. It was horrible. They turned out to be students who knew they would quit at the end of the first year." It prompted the study programme to move the first field study week to the beginning of the second year. A second field study week followed in the third year in which a water system was studied as integrally as possible.



Field study week



Rien Boeije has most memories of the field study weeks in the group accommodation the Biberburg in Renesse. “It was hard work for everyone. On Monday morning, the equipment and stuff for the field lab were loaded into the rental vans and on arrival at the Biberburg, the field lab was immediately set up.” After that, everyone followed the completely buttoned-up schedule of activities. Only after ten in the evening was one free and there was time for a beer. All study programme teachers went along, even Rob Goossens (maths) and Jan Damman (English). The latter had focused on dredging, which involves pulling a trawl net across the bottom in the surf. It is hard work because the net and the wooden plank, which keeps the whole thing on course, create quite a lot of resistance. Jan Damman made sure the students did not give up too quickly. With his stentor voice, he prodded the students to keep going as long as possible. Then, when the catch was displayed in flat photo trays for determination, the German tourists crowded around it to see what had been caught. Chemistry teachers Paul van Rossem and Peter-Jan Jans were the cooks at the Biberburg at the time. Onions and garlic formed the basis of their recipe. Kilos went through them. These were the weeks when the best food was eaten.

There is no one who experienced as many field study weeks as Alco Nijssen. “Sometimes two in a row, but after that I was wrecked,” he says. He has always managed to retain the enthusiastic feeling he had as a student. And perhaps also the rashness that goes with it, like that time in Austria. “On the first day, we explored the stream we were to study. We were taken by bus to the headwaters. About four students and I were eager to walk back to our accommodation. We walked through

the bed of the stream, which was fine because of the low water level. At one point, the stream flowed into a gorge as the road curved down. We decided to continue walking.” It got later and later. And when they realised they would not make it to dinner, they decided to call the others at the hotel. A student climbed up from the gorge until he had a signal with his mobile. The quality of the call was not very good, but he thought they understood. At some point it got dark. “Fortunately, I had a torch with me so I could give everyone some light,” he said. Suddenly Guido Krijger appeared with a headlamp above his worried face. Behind him an Austrian rescue team that had been called up because they believed there were a few points in the gorge that could not be passed. According to Alco, there had indeed been a few small waterfalls along the way, but they could have scrambled over them just fine. What Alco did not know was that more water would flow through the stream in the evening from a reservoir with a hydroelectric plant higher up. Fortunately, the Austrians had called the engineers to hold the water, as a few Dutch students were walking through the bed. Jouke Heringa was then faced with the choice of reimbursing the 800 euros cost of the rescue operation or offering the men of the brigade half a litre of beer. Given the price difference, he chose the latter.

The Spanish students (see ‘The Spanish adventure’) also had two field study weeks scheduled. The first took place in Zeeland, but for the second it was necessary to find an aquatic system more suited to the situation in Spain, or in other words to look for fresh water. For the first field study week in Spain, a group of three teachers went to Cuenca (see also ‘The exploration’). The last bench of the passenger van was removed



for the equipment they were taking with them. It was a two-and-a-half-day drive. On the first day, they were stopped by two members of the French gendarmerie at the péage toll gates. The officers wanted to know what was in the vehicle. They explained in broken French what they were going to do. The gendarmes looked at each other, took another look inside the van and looked at the drug dog they were carrying. "Shall we let the dog in?" one asked the other. "A non," was the reply. They were allowed to drive on, no drugs. They took their word for it. The story was apparently believable enough. The field study week was magnificent. An idyllic little lake in the middle of the wild emptiness of the Spanish interior, an overnight address where there was delicious cooking and where a tireless nightingale lived up to its reputation.

It was just one of countless locations where field study weeks were held. Herewith an (incomplete) list: Zeeuws-Vlaanderen (1994 and 2023), Schouwen-Duiveland ( since 1995 12 times), Holwert, Voorne Putten, Austria Kalserbach (1998, 1999 and 2001), Macedonia Dragor river and Lake Ohrid (four times), France, Pas de Calais and Normandy, Germany Ruhr area, Spain Cuenca (three times) and Andalusia Guadalquivir and Guedaletta (three times), Italy River Savio (twice) and Lithuania Curonian Lagoon (three times).

## The Sampling

Perhaps one of the best field study weeks was the one in the Sierra de Gredos, west of Madrid. We slept in a holiday park with wooden cabañas. The teachers' one was closest to the mountain stream that cascaded down past the camp. Every night, we would lay our weary bodies to rest against a wall of sound that drowned out any noise from partying students. Never have we slept better during a field study week. Besides guarding our sleep, the stream was also the subject of fieldwork. The group that would sample the spring, higher up in the mountains, had an unusual sampling in mind. The water there emerged from an underground chamber as much as 10 metres deep. They knew that for sure, because one of the students from Tenerife, a great big fellow who played water polo, had jumped in and dived to the bottom. Now they wanted to take a water sample near the bottom. The student would dive to the bottom with a sample jar between his teeth, unscrew the jar and bring it back up closed. Besides pointless, it seemed dangerous to us, in water of a few degrees, but we did not want to stifle the students' adventurous enthusiasm in fearful objections. The compromise was a rope, tied around the water polo player's ankle, which could be caught up by his group mates in an emergency. The water at the bottom turned out to have exactly the same composition as at the surface.

## 7. PROGRAMME EXPANSION (STUDY TRACKS)

**In 2011, HZ launched the new Delta Management (DM) study programme, focusing on integrated development in delta areas. Students learn to look at the process, stakeholders, as well as project management. Important here are the spatial aspects, i.e. the delta environment, the market and money, or resources. DM started as a separate, independent study programme in the former Delta Academy, but later became one of the three study tracks of Water Management.**

Pierre Bleuzé, who joined DM two years after it had started, explains why: “About seven years ago, the government determined that there was a proliferation of study programmes in higher education, making it difficult for students to choose. People wanted to return to stem programmes with a clear, recognisable name and profile. The choice to place DM under the basic programme Water Management was the most obvious one. Also from the point of view of educational efficiency, we later set up a generic first year.” In 2019, the graduation track Spatial Planning & Design (SP&D) was added. This ‘track’ was also initially planned as an independent study programme, but research showed that the expected intake was not high enough for that. DM and SP&D have many similarities, but also clear differences, for instance in the professional products. Pierre sees DM more as a linguistic study and SP&D as a visual one: “In the course that is on-going now, the second-year students of DM make a query and those of SP&D a spatial design on the same case.” In mutual feedback moments, they discuss each other’s products, just as would happen in practice. He thinks it is important that they know the quality of each other’s work: “Delta managers need to be able to assess a design and designers get to work on the DM people’s plans. In the call for tender, for instance, you have to define exactly what is asked of the market, such as a design. And in doing so, you have to state the preconditions very specifically, because otherwise the design is then mothballed and you have to do it all over again.”

The first year of Delta Management began with a very motivated group of students. According to Pierre, there was a special atmosphere: “Everyone was new, the programme was new and the students felt the excitement of pioneering. They were all students who dared to opt for something that did not yet exist. After all, the curriculum was still evolving, the year was great fun until the end.” And a good year, as there were two students who concluded their first year with honours. Fortunately, there were also a number of foreign students among them, which underlined the need to use English as language of communication. “If you only have Dutch people in class and the teachers are Dutch too, you are putting on a show, it feels artificial when you teach in English,” Pierre believes. “Moreover, it is also an advantage in terms of content, because if you already have that diversity in cultures directly in the classroom, you can more easily teach future Delta managers how to take cultural differences into account.”

The international composition has remained, with sometimes more foreign students than Dutch students in a class. Pierre notices the buzz when he starts talking about the different perspectives on a problem, such as climate change: “Everyone comes up with examples from their own country.” Climate change has become such a focal point in the curriculum that the term area development no longer quite covers the load. Pierre prefers to talk about transitions, major changes needed to cope with the consequences of climate change. “You then also have to talk about uncertainties, because you don't know exactly what the consequences of climate change are, and

once you do know, it's probably too late.” The DM curriculum focuses much more than before on developing scenarios and development paths, so-called ‘adaptive pathways’. In SP&D, students also learn to take future uncertainties into account by creating a design that can be adapted to changing situations. “My profession,” Pierre beams. |“Super fun to teach them that.”

The choice of a single Water Management study programme with three majors has resulted in a common first year for all students. At the end of the first semester, students choose a major. This works very well in practice, although some students find it difficult to choose. In the second semester, most of the courses are common and a smaller part is dedicated to the thesis subject. For the AET curriculum, the joint first year means that less practical work (practicum) fits in, compared to the old situation; the advantage is that students get a broader view of their field.

DM and SP&D students are introduced to the field by means of a number of multi-day excursions. Pierre will soon set off with the second-year students. Among other things, they will then visit a few projects to give the river more space, such as polder the Noordwaard and the Waalsprong near Nijmegen. An additional advantage is that the students intermingle more during such a study trip, especially the Dutch and the international ones. Another study trip is planned in the fourth year. Pierre has been to quite a few places with his students in recent years: “We have been to London, and further Paris, Venice, Berlin, Hamburg, Dresden. In Paris, the students presented





SPD at work







DM excursion Rotterdam

the results of a survey to municipal officials. This went well for them, although they were very impressed by the grandeur of the Hôtel de Ville.” Many of the case studies used in the study programme were also collected by the teachers during a number of trips abroad, such as the Mississippi Delta in Louisiana and that of the Mekong in Vietnam.



SPD pizzasession

## 8. FROM HZ TO HZUAS, ABOUT RESEARCH GROUPS AND INTERNATIONALISATION

**In 2001, when the Youth World Water Forum in Vlissingen was coming to an end, several participants inquired whether they could possibly enrol in the wonderful study programme that had organised the forum. Lecturer-researcher Jouke Heringa, co-organiser of the water forum was caught off guard by the question. “At that time, there was no international programme. We had not seen this coming, which is strange since we were presenting internationally at the forum.”**

More than 20 years later, the situation is completely different. What was first called Hogeschool Zeeland is now officially called HZ University of Applied Sciences, in English therefore and with the addition of ‘applied sciences’. Those who make fun of this do so because they still see HZ as a regional school for higher vocational education probably do not realise that HZ has 15 associate professorships and three research groups, and that 20% of its students are international. “HZ has moved from the equivalent of an educational factory to a knowledge institution,” according to Jouke.

Water management (AET at that time) was at the cradle of HZ’s first associate professorship, and of the Netherlands, for that matter, as HZ was one of the first schools for higher vocational education to appoint an associate professor. The associate professor was Dr Anja de Groene and the associate professorship was called Sustainability and Water. The appointment was possible because the government had found that the gap between the results of scientific research and application in practice (valorisation) was too big. Colleges were seen as the place to bridge the gap through practice-oriented research. The ministry freed up budget to set up associate professorships. Jouke was one of the first to be involved in the Sustainability associate professorship. “We did great things in the beginning, such as a sustainability week for HZ in its entirety, with



a presentation by Diederik Samson.” Over time, the realisation dawned that the associate professorship needed a more specific direction. “This became the associate professorship Aquaculture. That fits Zeeland perfectly, with its saline agriculture, such as shellfish, algae, fish, ragworms and saline crops. Of course, we immediately went to Yerseke to talk to the mussel and oyster farms.” Later, other associate professorships were added such as Building with Nature, Water Technology and Resilient Deltas.

According to Jouke, this put Water Management in a unique position. “At most universities of applied sciences, a professorship is linked to one study programme; at ours, there are four. As a result, a lot of students do their orientation internship at an associate professorship. The same holds true for their graduation internship. Moreover, many colleagues are no longer typical lecturers, but teacher-researchers.” According to Jouke, this the link with society is solid. There, they acquire other competences than in dealing with students. Think of project-based work for a client, where there is a need to deliver, where the question has to come into focus. And even the question behind the question, which involves visiting the client again and thinking about follow-up questions. Taking care of good timesheets and finances complete the profile of a professional project manager. So it’s all about projects. In the very beginning of the first associate professorship, it turned out that was not yet ready for it because of the way things were organised. Jouke encountered all kinds of difficulties. “Back then, I was wearing out the doorsteps of the B-building with my questions about hourly rates and how to organise the projects. That’s all sorted out now. And that is just as well, because in our TWE domain, half of the turnover comes from hands-on research.”

Besides additional competences, the projects provide the lecturer-researchers with a mine of teaching material that is used in lessons to students. The associate professorships also provide complete modules, such as the Ecological Engineering course by the Building with Nature associate professorship and the Aquaculture course by the associate professorship of the same name. The background and study programmes of the lecturer-researchers have also changed. The percentage of PhDs has increased, and with it the research experience of the entire teaching staff. A few even obtained their PhD while working at HZ. The final benefit of the turnaround that has taken place are increased career opportunities. Jouke’s conclusion reveals his background in aquaculture. “We can offer ‘homegrown’ an interesting career path, from an intern to junior researcher and then possibly beyond. Take, for example, Jasper van Houcke, who has advanced to leading lecturer, but also researcher Aqua-culture Eva Hartog started as an AET student, as did Maria van Schaik (Water Technology), who recently received her PhD.”

The first group of foreign students started in 2009. The curriculum itself had not yet been internationalised; it was essentially an English translation of the Dutch programme. The class included a few slightly older, positively critical students from Germany who kept everyone on their toes. Thus, it soon became clear that some teachers’ command of English was not at the desired level. “The German students were very ambitious,” recalls Jouke. “They stood at my desk half an hour after the announcement of the result of a report to ask why the 8.5 was not a 9.5.” Their zeal to learn as much as possible also encouraged the Dutch-speaking students, who could then choose either the Dutch-speaking class or the international one. Jouke: “The English-speaking class was



Aquaculture Lotte





more active and driven than the Dutch class. Even now, the international students are slightly more motivated, by which I don't mean to say anything at the expense of our Dutch students. The reason is that students who come from far away have to put in more effort, which means they are probably cut from a different cloth."

As a result of the influx of international students, the curriculum of AET in particular has taken on more international accents (for the other two majors, see 'The broad scope'). Students from Eastern European countries are very interested in water treatment and water technology. By including electives in the fourth year, such as water technology, but also aquaculture and urban water management, students get the chance to specialise. As a result, the depth of especially the Dutch aspect of water management has diminished. "You simply cannot make a foreign-language student read a water board's register," Jouke observes. "But in the meantime, the curriculum is solid as a rock, it is no longer a translation from Dutch and all lecturers have a good command of English. It's just a shame that we are not managing to attract more international students. Many people have pondered why. Is Zeeland an unfavourable location, is it because of the name Water Management, it's anyone's guess..."





## 9. ILLUSIONS, DREAMS AND REALITY, THE ALUMNI

Martijn van Kalmthout and Jorik Creemers studied AET from 2002 to 2006. They were study buddies and became friends, even family (Martijn was Jorik's brother-in-law). After HZ, Jorik did a master in Nijmegen, worked there for a few years, returned to HZ as a lecturer-researcher in Aquaculture, later became study programme manager of AET and DM and now works at SAZ+ (Samenwerking Afvalwater Zeeland). After his internship, Martijn got a job at the Zeeuws-Vlaanderen water board (now Scheldestromen), where he held various positions, including in urban water management, in the assessment of zoning plans (water test) and as a developer for an adaptation strategy for climate change. He now works as a freshwater policy officer. We look back on their studies with these water professionals.

### Do you remember why you chose AET at the time?

Both have always been interested in everything to do with water. As a child, they loved looking in ditches to see what was swimming around in them, Jorik in Drunen (Brabant) and Martijn near Hulst. Jorik: "I used to catch little animals I called dragons with my landing net. It was only during my studies that I found out they actually were dragonfly larvae." When Jorik heard an AET student visiting Havo talking about the study, he knew instantly: "I announced to my parents that very evening that that was what I was going to study." Martijn was looking for a broad study programme, was pointed to AET by a classmate and made his choice after visiting an open day.

### What kind of image did you have of the study programme at the beginning?

For both Jorik and Martijn, the romantic image of the study programme that would send them out into the world as a kind of forester to stand up for the plants and animals in the water prevailed. For Martijn, it was mainly the small scale of HZ and the broad scope of the study programme that made him choose Vlissingen. The combination of green, ecology, water and practical work appealed to Jorik. The location also played a part in his choice: "At that time, the slogan 'Study by the Zeeland coast' was used. That seemed cool to me, because I had spent holidays here with my parents." Fellow students were also water lovers in the widest sense. Jorik: "Many of our classmates were into surfing, diving



Jorik in Macedonia

or sailing. The whole class loved going outside, dredging through the Saeftinghe mud together.” Both Jorik and Martijn had an aquarium, as did many of their fellow students. Jorik saw the water world in that light: “I thought you learned to turn the knobs of the system to improve water quality, like some kind of big aquarium.”

### How did that picture change during your studies?

Martijn was initially most enamoured with the green side of the study, but in the second year, the ‘red’ approach was added: “By red, I mean the civil engineering side. When we had to calculate weirs in a water system, I realised that might be necessary in my profession. Now my interests and the content of my job are more in that direction.” Jorik experienced that the broad vision of the AET study programme also broadened his outlook: “Especially the integral look at water and nature intrigued me. It is the coherence of the different aspects that I find interesting. And it is unchangingly topical. More than 30 years ago, an integral vision of water management was developed and it has not been widely accepted with open arms. There is still a compartmentalised view of the water system in some places.”

### Both of you had a strong intrinsic motivation for the study. Did that motivation change over the course of the four years, as you encountered more of the realities of the ‘profession’?

For Jorik, the motivation was enhanced because the study programme was a kind of community of like-minded people. “When we met over a beer, we very often discussed the field. In class we were in class with people who also had that passion for water and that increased my motivation. I felt that the teachers also belonged to that same community, and so did the classes and teaching. It’s hard for me to separate it; what I learnt while studying and in my free time merged.” They knew full well that later they would mainly be sitting on an office chair instead of being engaged outside, but that was no big deal. “We were not so concerned with work later; the study was fun and we got outside a lot. That was enough.”

### What did you find most enjoyable or useful about your studies?

Jorik doesn’t have to think long: “The field study week in Macedonia!” It was not just the fun, the hard work and partying together, but also what you learnt. And then that integral view of the water system emerges again: “When I got home and thought about what I had learnt that week, I saw the coherence of the different components: chemical and ecological water quality and the social context that had also been studied by a working group. I found that instructive.” Martijn cherishes the image of togetherness, studying together in the evenings: “Working together in optima forma, really as a team. You wish it would always be like that.”

### Surely there were less good moments too?

Martijn: “Not really annoying, but noteworthy was the moment I realised that a higher education study would demand more from me than what I was used to at havo (Higher General Secondary Education). It was about trigonometry in relation to wave movements. A solid piece of mathematics, of which I thought: okay, so that’s how things are done here...” Jorik thinks of Campbell’s book *Biology*, a thick tome in English. “Back then, English was not as prevalent as it is now, especially in high school. Besides, we studied things in depth right away, with the citric acid cycle and things like that. But I got used to it quickly and when the exam was taken, I knew I would pass it.” Jorik mentions the underwater internship in Bonaire together with Martijn, especially the homecoming, after months of beautiful weather and brilliant dives on the coral reef. “It was December and my graduation internship at water board de Dommel started right after we got home. Sitting there in the dark, cold Netherlands desk inside.”

### Did you think then: that much for freedom, now real life begins?

Martijn felt that switch very distinctly: “I resisted it too. I wanted the best of both worlds, the free life as a student, but also to function well as a young professional.” Jorik figured out on the Dommel desk chair that he wanted to continue to study. “I wasn’t ready for a working life yet. Besides, I hoped to specialise in a master’s degree after the broad AET study. Which turned out not to be the case, by the way.”

### What did you learn in those four years that you still use in your work on a daily basis?

Martijn mentions Nortier’s blue book on fluid mechanics and the cultural engineering *vade mecum*, both of which are at his work and which he regularly looks at. He also thinks of the broad, integral view of the AET graduate: “Monitoring the whole of the water system is an important task that is appreciated by the organisation. Complementing the specialists, of course.” For Jorik, collaborating with others and other disciplines is a competence he picked up during his studies. “It is impossible to work integrally on your own. We have learnt to bring experts from different directions together and make them understand each other.”

Do you have any tips for the study programme or current students? Martijn expects the meteoric development of artificial intelligence (AI) to cause a shift in which knowledge is less important than skills. “I don’t know exactly how, of course, but I think it’s important to anticipate that. When I was just working at the water board, the people who knew many species by their Latin names were quite high in regard. That is no longer the case; other skills are important now, such as being able to connect and other social skills.” For Jorik, knowledge is at the basis of his functioning. “When I talk to someone about content, I only feel comfortable when I know I can fall back on my content knowledge. I would recommend the study programme to maintain this basis at all times.”





Aquaculture Annika

# 10. THE NEW GENERATION

Of course, the voice of current students cannot be omitted. We invited three students currently engaged in the study programme to comment. Eva Petrova from Sofia, Bulgaria is a second-year AET. Tim Rotteveel, from Anna Paulowna (NH) is a fourth-year DM. Annika Mol (Meliskerke, Zeeland) also AET and, like Tim, is in the fourth year.

Eva wanted to study marine ecology and chose the Netherlands because of its reputation when it comes to water. An agency pointed her to HZ. As she did not want to live in a big city, the location appealed to her. Furthermore, she preferred to study near the mountains or the sea. She soon saw that the combination of mountains and the Netherlands was not obvious, so Zeeland it was. Tim wasn't sure what he wanted to study and went to Leeuwarden for the Chemical Technology study programme, but quit after a year. In a roundabout way, he heard about the Water Management study programme. As ecology and nature had always interested him, he was immediately enthused. He started in corona time which meant he had to decide without visiting the open days or HZ itself for that matter. Annika had also been interested in plants and animals from childhood and, like Tim, spent a long time looking for the appropriate study. She did a year of Nursing. When it turned out that she didn't like, she and took a look at Middelburg, she says she was blown away by the perfect combination of nature and environmental subjects.

## What image did you have of the study programme when you started?

Although he did not see the HZ building itself or his classmates in person because of the lockdown, Tim noticed that the college was small-scale and personal. He had a lot of contact with his classmates through the screen, so he got to know them well despite the constraints. The practical approach to Water Management through existing cases immediately

appealed to him, such as that of New Orleans after Hurricane Katrina in 2005. Eva knew the content of the first year through the information on the website. She knew about the fieldwork through the online discussions she had had with other students. This was something she was very much looking forward to. But actually, she was more concerned with the fact that she would come here to learn English and be part of an international community, something she did not have at home in Bulgaria. Annika was very pleased with the friendly and open atmosphere, with teachers who were not above her, but beside her, encouraging her to develop herself.

### And did the image change during your studies?

For Annika, the image of the study programme has shifted from technological and research-based to one where sustainability, ecology and climate are central. Eva sees a shift from theoretical in the first year to more applied in the second. Furthermore, she did not know beforehand what to expect from the 'management' part of the name Water Management. She envisaged more of a business interpretation rather than the management of a water system. "As far as I am concerned, it is a totally wrong name for the study programme. It should be 'water science' or something like that." Tim doesn't quite agree: "When I study DM, 'management' does apply." His view of the term 'water' has become much broader, though: "In everything we do or consume, water plays a role somewhere. I didn't know that when I started my studies."

### What profession did you want to be educated for and how did that change during the study programme?

Marine biology is still close to Eva's heart, but she did get a more realistic

view of her options. "There is simply less money available now for research on sharks than on mussels, no matter how useful the former is." She definitely wants to do a masters after AET and, if possible, a PhD. "I enjoy it far too much." Tim is also going to do a masters, International Land and Water Management in Wageningen. During the first two years of his studies, he had no idea what he would do later. "Delta management is so broad; you can go in so many directions," he says. After the internship at a water board and his graduation internship at an engineering firm, he hesitated between the two. "The advantage of a water board is that you not only make plans, but also see them implemented. In any case, I want to do something with policy development and climate adaptation." Annika only knew what she wanted after her internship where she came across seaweed farming. "I had the dream of setting up a seaweed business, and I still have that dream. However, the market for seaweed is so bad that I have put those plans on hold for now. But I remain hopeful." She is now doing research at the Sea Shell Foundation for her graduation and will continue to work there after completing her studies.

### What do you find the most fun or interesting aspect of the study programme?

For Tim, it is mainly the integrated approach that is central to the study programme. "DM is not only about ecological or spatial aspects of area development, but also about social and economic aspects. When making plans, we look at the effects on all stakeholders." Annika is motivated by the hands-on research she encounters. "Real companies facing real problems. They face climate change, for



example. This way, we are well prepared to find real-world solutions. The lecturers help us with this. They make sure we find a place in the water community.” Eva agrees with Annika about the practical case studies, although the assignments are sometimes tricky. “We had to make calculations on water treatment which I thought I wouldn’t be able to do. But it was a real-life example in which the teachers work, so not a theoretical sum of something you would never encounter in real life.” She really liked the general first year. “All the little bits from the three majors which makes it very easy to make the choice.”

### What are the things you didn’t like?

Tim didn’t always feel challenged enough. Things sometimes came too easily. “Until I realised that I could also challenge myself to score higher and deliver more.” Annika feels in retrospect that she had too few statistics. “With processing the research results for my thesis, I run into that problem. Fortunately, the study programme is also very knowledgeable about this and students are taught that subject well these days.” As a straightforward AET student, Eva disliked the subject of Water Governance. She pulls a face. “I know it’s part of it, and the DMs liked it, but I hated it!”

### You mostly talk about the content. How do you feel about the social side of the study programme, such as field trips and field study weeks?

For Annika, the field study week is still the highlight of the study. “It’s hard work, but also a lot of fun,” she says. She also reflects on the common first year: “I still have friends from the DM class, thanks

to those classes we had together.” For Eva, the field study week was a disappointment. The week itself was enjoyable, but the commitment of her fellow students disappointed her. “Maybe I took it too seriously, but I had been looking forward to it after everything I heard about it.” It wasn’t the teachers’ fault, either. “They are very approachable, not always by email, but you can look them up and they will help you.” “Group work is not for me,” she adds. But she realises that in ‘real’ life, working together is just part of it.

### What suggestions do you have for the year-long study programme?

Both Annika and Eva would have liked to learn more about marine ecology at AET. According to Annika, there is a focus on fresh and brackish environments, for example in the field week, but hardly any attention is paid to the sea itself. “That is precisely something we have a lot of here in Zeeland,” she says. For Tim, the policy aspect could be included more when carrying out assignments. What the three of them agree on is the organisation of the modules. Eva thinks the dropout rate could be reduced if prospective students knew better what they can expect. “Perhaps with a survey asking about the student’s interests leading to a particular study,” she says. Tim would like to add that HZ in general and Water Management in particular encourage students to go out and about. Many go abroad for an internship or minor, which is very motivating, which students learn a lot from and which should definitely be maintained.



**8** DECENT WORK AND ECONOMIC GROWTH



**16** PEACE, JUSTICE AND STRONG INSTITUTIONS



**11** SUSTAINABLE CITIES AND COMMUNITIES



**13** CLIMATE ACTION



DM students with the SDGs

# 11. THE FUTURE OF WATER MANAGEMENT

The preceding ten chapters provide an overview of a unique educational journey spanning over thirty years. It's an education program that, unlike any other, suits the environment in which it is located- the Zeeland Delta. Over the years, this program has broadened, fueled and strengthened by research groups, becoming international and standing firm, much like a well-built house. Or should we say, like a dike? It is valued by the students who easily find suitable jobs, as the professional world recognizes the quality and employability of those who graduate from the program. It appears to be a success story, but there are also concerns.

In discussions for the compilation of this jubilee booklet, there were mentions of the lower-than-desired intake of new students. This puts efficiency under pressure, jeopardizing the students' freedom of choice. After all, you can't offer an elective course for a limited number of students. It seems paradoxical: an excellent program with high employability, yet insufficient enrollment. What are the consequences of this situation, and what will the program look like in ten years? We discuss the opportunities and threats with four teachers; one who just started, two who can be considered seniors, and the last one with intermediate seniority.

Alexander Herrebout, a teacher at SP&D for a year, focuses on the spatial aspect of water. Bram Verkruijsse and Jouke Heringa, both in AET for over 25 years at HZ, specialize in tropical cultural technology and aquaculture, respectively. Pierre Bleuzé, associated with DM since 2013, is an architect interested in water-related design.



All acknowledge the analysis. According to Pierre, causes may also lie outside the program, for example, that Zeeland is too far for many students. Jouke remains optimistic, hoping that HZ can attract a hundred students for Water Management, similar to other universities with water programs. Alexander suggests increased communication with stakeholders, considering the program's breadth and growing attention to relevant themes like climate change. Teachers could also promote the program more actively. Jouke sees an opportunity in offering courses and masterclasses for professionals to adapt to the changing role of HZ as a knowledge institute.

### **Now, back to the question. How will the program look in approximately ten years?**

Pierre sees efficiency possibilities through increased collaboration, both within and outside the program. He is already contemplating this, currently having GPCM students in his Research course, identical to WM. Besides organization, there's the content. Looking at the significant changes in the program over the past 33 years, what should Water Management teach future students? According to Pierre, understanding the complexity of the physical environment is crucial to find solutions that address the challenges. Bram highlights climate adaptation as one of the main challenges. Jouke adds that these challenges are becoming more complex, requiring future water professionals to be well-versed in multiple areas. The term 'T-shaped professional' is mentioned - broadly educated with depth in a specific area. The width of the top of this 'T', how multidisciplinary to make the student, is a challenging question.

That question is difficult to answer. Bram thinks it is important not to lose sight of specific knowledge for students. He mentions nature and biodiversity. Pierre thinks attitude is important, the ability to understand the complexity of a situation or environment, because the future water manager will increasingly work in a multidisciplinary team.

Bram agrees with Jouke that students should be taught a sense of what is financially and economically feasible, but also the value that not everything has to be seen in an economic light. More passion for water and everything in it would make the education warmer, more loving, but most of all more fun. If you see a problem from an idea that nature, for example, has not only utility but also meaning then the solution might also become different than without that value. Alexander notices that students tend to initially opt for a technical solution. He then asks them to look for a solution that takes advantage of natural processes (nature based solution) that puts costs and benefits in a different light, namely costs spread out over a longer period of time and benefits in the form of natural values. He also asks them to reflect on the glasses through which they look at a problematic situation.

Regarding internationalization, it goes beyond just translating the curriculum into English; the content has an international perspective. Some elements relevant only to the Dutch context have been removed. Pierre and Alexander see advantages in having mixed groups, incorporating cultural differences into discussions. Jouke sees internationalization as enriching, praising the energy, discipline, and commitment of foreign students.

In conclusion, no one precisely knows how the program will look in ten years, let alone 33 years. However, the recognition that the program has adapted to changing circumstances over the past 33 years and remained

fresh and innovative inspires confidence that it can continue to do so in the future, no matter the circumstances. 'Panta rhei, everything flows', as Heraclitus said, and Water Management flows along with that current.



Students in the classroom



# THE TEACHERS



Over the past 33.3 years, dozens of lecturers and staff have contributed to the Water Management program. We thank all those people with their specific expertise and approach for their input. This has made the program unique. We are proud to have sent more than 1,300 - also unique - students into the wide world of water.





From left to right: Paul Vader, Alco Nijssen and Bram Verkruisje before departure to Spain for the first field study week.



## AFTERWORD

In 1996, Rien Boeije asked if I would be interested in giving a biology practicum to a group of Spanish students. I didn't have to think for long. This marked the start of my 'career' at HZ. More than 27 years later, Jouke Heringa asked if I wanted to write the text for this anniversary booklet. I immediately said yes. Although not connected with Water Management for some time now, the study programme and especially my colleagues are always close to my heart. It was inevitable that during the conversations about the old days, memories would surface in my mind too - the attentive reader will recognise them. Fortunately, Jouke made sure it turned out to be not just a sentimental journey. The conclusion whether the 11 chapters form a balanced picture of education is up to the reader. Many thanks to everyone who wanted to speak to me: the (former) colleagues and students interviewed. You will find their names in the text. And further I want to thank Eugène de Kok, Petra de Nooijer and Jouke for their critical comments during writing. It was my last job at HZ and it was my greatest, greatest pleasure.

*Paul Vader, former teacher  
Middelburg, January 2024*



Students on measuring ship RWS Argus



Excursie Naardermeer



Laboratory work



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