Innovation

Research and Innovation

Progress Report 2017

waternet
waterschap amstel gooi en vecht
gemeente amsterdam

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Waternet delivers cold to Sanquin

On July 1st 2017 Waternet and Sanquin have placed an installation that will deliver cold from drinking water to Sanquin. Sanquin takes care of the blood supply in the Netherlands and, among other things, produces medicines from plasma. With the cold the production processes and cleanrooms of Sanquin are cooled.

Near Sanquin, below ground level, are two pipes of Waternet that transport drinking water to a large part of Amsterdam. The cold from one of these pipes is stored in the winter and used during the summer. It is a first step towards new customers who need cold for cooling purposes.

Read more

Amsterdam citizens test surface water

From July 5th until September 8th 2017 500 Amsterdam residents have tested the surface water in their neighbourhood for Waternet. Both the water from the canals in the city-centre as the water from the channels and ditches in the surrounding area was tested. The test results should provide information about the quality of the water on different places and at different times of the day.

It is not possible for Waternet to carry out research on a scale this large. This research produced not only lots of data. It can also lead to more involvement of the citizens in the water in their city and in the activities of Waternet in this field.

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Strengthening dikes with dike stabilizers

Sometimes dikes have to be strenghtened in areas where it is not possible to carry out major works, for instance in a city area, close to houses and the like. The application of extra soil or the pile-driving of a sheet pile would cause a lot of inconvenience to the surroundings.

With the dike stabilizer a new technique is developed. With this technique anchors are driven with a rod in a dike. Then, more or less deep in the dike, they are popped up. Finally, they are secured on the outside of the dike. The water board Amstel, Gooi & Vecht has developed this technique in a dike improvement plan for a dike in Watergraafsmeer. In the spring of 2018 this plan will be carried out.

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Starting The Calcite Factory

In March 2017 AquaMinerals has delivered the first shipment of calcium grains to The Calcite Factory in Amsterdam. The calcium grains that are formed during the softening process of drinking water are processed into new grafting material for this same softening process. During the preparation of drinking water, it is softened, because it cannot contain too much calcium.

After this first test The Calcite factory has officially opened on April 13th. It was founded by Waternet and the British Advance Minerals. Over the next three years it will be observed whether the factory has a future and if other drinking water companies will join use the new grafting material.

Read more

Mowing residue and bio-composite

Waternet is doing research on the use of mown water plants, shore plants and grass for new products. In March 2017 Rijkswaterstaat placed a bench, made of biocomposite, along the A7 near Medemblik. This bench came from Waternet.

On April 26th Waternet received two biocomposite level scales from the regional water authority of Aa en Maas. The scales were fabricated from mowing residue, calcium grains and sustainable resin by NPSP, a company producing sustainable, fiber-reinforced plastics. 80% of the scales consists of residual materials from Waternet: mowing residue from reed and calcite from The Calcite Factory. The scales are being tested in surface water for strength and water resistance.

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Testing the use of drones

At the end of March 2017 a drone with heat cameras was used to count the deer in the Amsterdam Water Supply Dunes. The heat camera is also used to locate wells around the Naardermeer. A NIR-camera (special close-range infrared camera) is going to identify vegetation limits around peat holes. Also a drone will be used to make air photo's around the Naardermeer at two different water levels, in order to examine the difference in inundation.

With a 3D-camera, the dikes around a polder get a safety check. Furthermore a channel has been inspected by using a drone. Drones will possibly be used to trace DNA in the fight against muskrats in dikes and in the development of the island of Zeeburg. Lastly, drones can be used to track down leaking sewage pipes.

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Measuring water levels with LoRaWan

LoRaWan (Long Range Wide Area Network) makes use of radio communication between machines and sensors in the IoT-area (Internet of Things) and it uses little power. In the autumn of 2016 a pilot-project was started in which Waternet is doing research on the sustainable and beneficial applications of this technology. Early 2017 LoRaWan sensors with a battery were placed on three locations in Amsterdam and on four places in the dunes. The measurements are instantly readable through a portal of the supplier and via PIMS. As a result Waternet can monitor this system for the one-year duration of this project and get insight into its functioning and reliability.

Taming brackish seapage Horstermeer

In 2017 a field experiment started in the middle of the Horstermeerpolder, in which brackish seapage water is purified into drinking water. With a deep well the brackish water is pumped up from under the polder and guided to a container at the wastewater treatment plant Horstermeer with a membrane filter installation. There the brackish groundwater is desalinated through reverse osmosis and then purified into drinking water.

If the 2-year experiment is a success, brackish seapage water will no longer be a problem in the Horstermeer-polder. The brackish water will be a new source for Waternet, from which drinking water can be prepared at the Waternet-location Weesperkarspel. Moreover, less water needs to be transferred from the Markermeer into the Horstermeer-polder to supplement the polder water with sweet water.

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Organizing innovation together

The KnowledgeActionProgramme Water started in 2016 as an initiative of the regional water authority Amstel, Gooi en Vecht and KWR, the knowledge institute of the water companies. In this programme citizens, entrepreneurs, the municipality and other organizations cooperate to experiment with new water techniques.

The programme aims at enhancing the contact between scientists, entrepreneurs, civil servants and citizens, so that they exchange their knowledge and practical experience more often with each other. This knowledge and experience can be used to anticipate new developments. The Knowledge-ActionProgramme Water is implemented in daily practice, so that the acquired knowledge and experience can be tested simultaneously.

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Removing medicine residues from wastewater

Since 2007 the wastewater treatment plant Horstermeer uses the 1 STEP®-filter, a filtering technique for wastewater treatment plants, using a reactor that is filled with active carbon. In January 2017 four organizations, including Waternet, started laboratory research to find an innovative method to remove residues of medicines from wastewater.

It will be examined if adding an ozone dose, in combination with the active carbon filters, can be used to remove organic micropollutants, such as medicine residues, from wastewater. If the experiment is a success, a demonstration-project will start at the the wastewater treatment plant Horstermeer in 2018.

Read more

Farmers and water authorities working on water quality

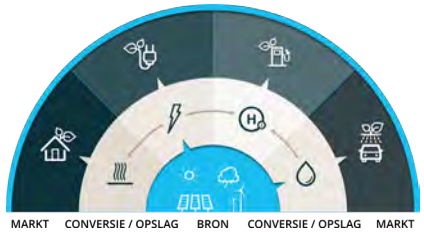
In 2017 the project “Proefpolder Kringlooplandbouw” was started in the polder of Groot Wilnis-Vinkeveen. In this project the regional water authority of Amstel, Gooi en Vecht, the district water board of Stichtse Rijnlanden and five cattle farmers cooperate to enhance the water quality in the polder. The project was kicked off by taking soil samples and measuring the water quality.

In this project, which runs until 2020 the effects of fertilizers on the quality of water and soil is examined. At the participating dairy farms we monitor test fields with varying levels of fertilization. With the results we want to close the nutrient cycle in polders and to improve the water quality.

Read more

From solar power to hydrogen

In 2017 and 2018 Waternet will develop a solar-power plant with a capacity of approximately 8,6 MW at the WRK-location in Nieuwegein. This solar-power plant will firstly provide energy to the local power grid. In the project “Power to X” will be examined if it is possible to convert a part of the produced solar power to energy-carriers, such as hydrogen and heat.



In the future hydrogen can serve as an important energy-carrier for mobility, industrial processes and re-electrification on and around the location. Furthermore, the solar power that is won in the summer could add to the heat from the intake of water from the river Lek. That heat is stored in the soil and is used in the winter to heat buildings. On March 22nd 2017 the “Power to X”-project was launched at the Aqua Netherlands Convention in Gorinchem.

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Sustainable sewage and drinking water pipes

The carbon footprint of the construction materials and pipe materials that Waternet uses, amounts to 6 kilotons of CO_2 per year. If Waternet uses more sustainable pipe materials, it can lower its carbon footprint.

Sewage pipes in a drainage system which makes use of gravity do not have to be built to withstand great pressure. Instead of using pvc, recycled pvc can also be used for these pipes. If pipes have to deal with more pressure, reinforced pvc can be used. For larger diameters plastic, that is reinforced with glass fiber is a good alternative for cast iron. Concrete pipes with a steel core can also provide a solution. The first tests show that the carbon footprint of our pipe materials could be lowered by 1/3.

Smart integral monitoring

Waternet and STOWA (Foundation for Applied Water Research Management) have developed the SIMONI-method (Smart Integral Monitoring), which can be used to determine the risks of organic micropollutants for the ecosystem. The SIMONI-method is based on biological effect measurements (bioassays), that are used to identify ecological and humanitarian risks without testing every single substance to a norm.

The SIMONI-method is taken up into the Ecological Key Factor Toxicity (EKF-TOX) by STOWA, which is part of a set of key factors that collectively give insight into the chemical condition of water bodies. The EKF-TOX consists of both regular chemical analyses and effect measurements. Both methods provide an indication of possible environmental risks.

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Amsterdam International Water Week 2017

The Amsterdam International Water Week was organized for the fourth time. It took place in the Amsterdam RAI from October 30th until November 3rd 2017. During this five-day conference, civil cervants, academics, representatives from the market sector and other stakeholders from all over the world exchanged knowledge and experience about sustainable solutions for dealing with water.

The AIWW took place in combination with the conference Aquatech, which was organized for the 26th time. Simultaneously, Floodex Europe, a fair for equipment, solutions and technologies aimed to prevent and fight floods, was organized for the first time. Because risk of floods is an important topic worldwide, this fair attracted a great variety of visitors from all over the world.

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Rainproof network expanded

Amsterdam Rainproof is a strong network of diverse partners that are actively involved in making Amsterdam rain resistant. Government institutions, the green sector, neighbourhood initiatives, knowledge institutes, entrepreneurs, consulting agencies and real estate owners, each in their own way, contribute to this network to establish a rainproof city.

In June 2017 ten gardens in Betondorp (“Concrete Village”) were transformed. The gardens were deteriorated because they were not maintained anymore. The action day was initiated by housing corporation Ymere and several foundations, including Amsterdam Rainproof. The goal was to make Betondorp more rain resistant and more green and to advise residents and housing corporations about making private gardens rain resistant.

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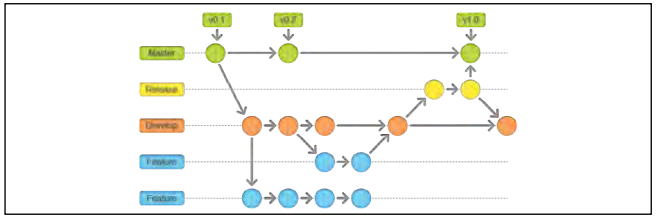
Smart handling with data in the datalab

Waternet generates a lot of data from which, using modern techniques such as machine learning and artificial intelligence, new insights and connections can be derived. These developments come together at Waternet’s Datalab.

As well as data science also data-unlocking from now will increase significantly as a result of the founding of a data warehouse for central storage and distribution. Waternet is searching for partners in this process, such as the Amsterdam municipality.



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Amsterdam Circular Challenge

Waternet, AEB (making energy out of waste) and the Harbour company of Amsterdam organized a competition of ideas to make Amsterdam more sustainable. Startups could submit innovative, sustainable ideas concerned with 1) new raw materials from waste, 2) recycling CO_2 and 3) data and IT for a circular infrastructure.

From the six most promising ideas three winners were chosen during the Clean Capital Event in September 2017. Afterwards they were given the opportunity to develop their ideas, supported by the organizing parties in every possible way.

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Colophon

Text editing: Peter Beemsterboer, Waternet
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Picture cover: the water transformer by Pavel van Houten

Waternet innovation edtion summer 2017 is published by Waternet and supported by Regional Public Water Authority Amstel, Gooi en Vecht and the City of Amsterdam