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## EDITORIAL

Dear readers,

DESSIN is now well into the final year. In the last months the project has successfully passed a review by independent experts appointed by the EU. The evaluation was positive with only minor clarifications requested, which has been addressed by the project participants.

At the Hoffselva demo site in Oslo, the activity is focused on comparing the high rate filter and lamella settler solutions for local combined sewer overflow (CSO) treatment. This involves the operation of both plants during CSO events with on-line measurements and sampling (from the Hoffselva river) of the water quality. The technical activities are coordinated with stakeholder observations along the river. Then the ESS Evaluation Framework will be applied to make a final evaluation of the combined results, considering the benefits of the solution, in terms of gain and value of ecosystem services and sustainability.

Similar evaluations are in progress at the other demo sites also, and will be finalized during the last months of the DESSIN project period. At the Hoffselva demo site the main project activities will be completed by the end of September and the results are to be presented at a seminar in Oslo planned for November.

Lastly, we are glad to announce that the final event of the DESSIN project will take place as a public workshop on November 28<sup>th</sup> in Brussels, alongside with the WssTP Water Knowledge Europe brokerage event. For more details, please see the final page of this newsletter.

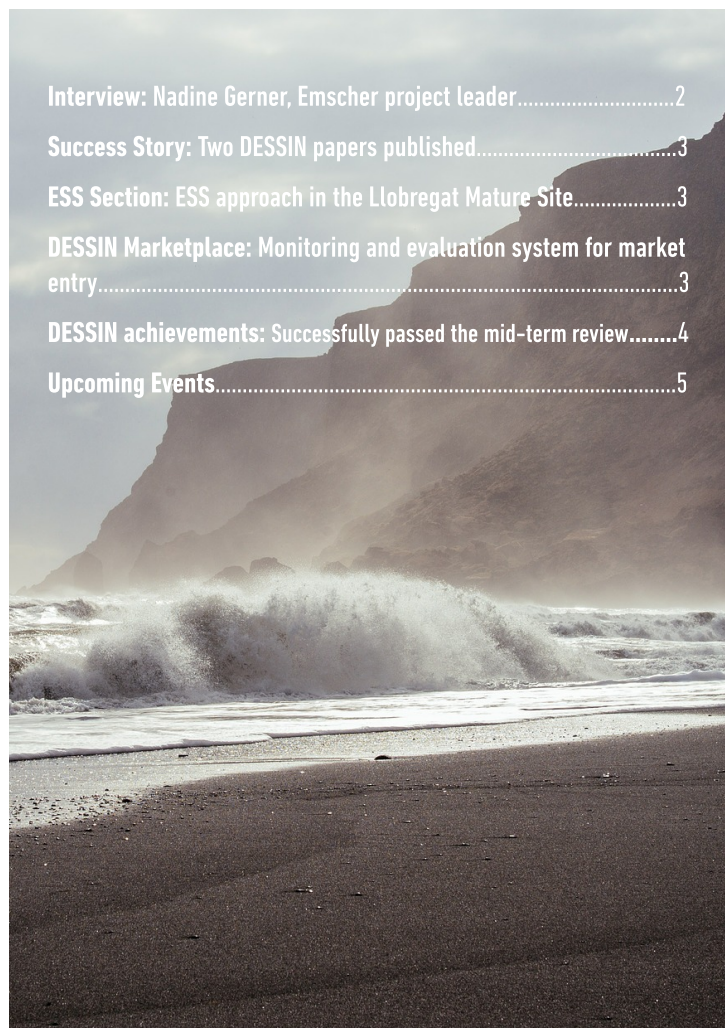
I am looking forward to exciting final months of DESSIN. For now, I wish you all a nice summer.

Best regards,

Herman Helness, Hoffselva Demo Site Leader

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## OUR DEMO SITES WHAT'S HAPPENING?

### EMSCHER (GERMANY)

Two demonstration technologies are being pilot tested in the Emscher catchment: A lamella settler at a combined sewer overflow (CSO) facility and a real-time control system (RTC) to regulate CSO facilities. Both technologies focus on water quality issues. Their aim is to decrease the amount of combined sewer overflow and to improve the quality of the overflowing water, and thus, to enhance water quality in recipient rivers.

The lamella settler pilot was developed as a container solution by the company UFT. It has been installed at a CSO location in the Emscher area. The University of Duisburg-Essen equipped the container with automated sampler and probes for real time measurements of suspended solids and chemical/biological oxygen demand at the in- and outflow, allowing to determine the container's sedimentation efficiency. During rain events, combined sewage is pumped into the container and flows through the cross-flow lamella modules. Solids from the combined sewage will settle on the lamella and the overflowing water will thus be mechanically pre-treated.

The RTC system was installed to control the water levels of five CSO facilities in the upper Emscher river section. It applies the controlling software ADESBA. Goal is the optimal utilization of the entire available underground storage volume with the final aim to reduce pollutant input into streams by reducing the overflow frequency and volume from CSOs into streams.

Based on findings from the pilot studies, predictions on the effects of these technologies on the ecosystem and its services will be made. Furthermore, a sustainability assessment will be conducted for both technologies.



Lamella settler container solution at CSO facility



RTC controllable throttles in the outflow pipes of a CSO

## INTERVIEW// NADINE GERNER - EMSCHER PROJECT LEADER



"The challenge within these last six months of DESSIN will be to evaluate the demo cases with regard to efficiency rates but also sustainability and ecosystem services"

Nadine Gerner is a biologist, specialized in freshwater ecology. She studied at the University of Frankfurt and worked in the Department of System Ecotoxicology at the Helmholtz Centre for Environmental Research – UFZ before coming to Emschergenossenschaft. Within DESSIN, she is coordinating the Emscher mature site and the two Emscher demo sites. Her research interests are on anthropogenic effects on freshwater ecosystems, ecotoxicology, river restoration and ecosystem services.

Concerning the lamella settler, the cross-flow set up is an innovative approach not conducted in practice before. The results will give first indications on the efficiency of this set up. Being able to test the lamella settler pilot also at the Hoffselva site will allow us to compare efficiency under different conditions, which is of great benefit.

### Which are the biggest achievements made at the Emscher Demo Site?

Installing the RTC was not an easy task, as the CSO facilities had to partly be retrofitted, the central and the local controlling programs to be developed and installed, security measures to be taken, and the system to be integrated into the current operation of the facilities, while preventing any negative effects on the freshly restored receiving river. And, of course, the pilot operation had to be approved by the responsible agencies.

Also the lamella settler was to be tested as realistically as possible. Thus, some adaptations were still conducted during test operation. Furthermore, to avoid any detrimental effects on the recently restored receiving waters, a laborious installation was required for approval by the agencies.

### The DESSIN team met in January in Barcelona. Which were main resolutions and conclusions you took?

At the meeting in January I was impressed on how far all the demo cases had progressed. Test runs were conducted, first results gathered and showcases established – in the form of site visits or explanatory movies. Furthermore, the MIKE decision support software for ecosystem service and sustainability assessment was almost completed and presented for the first time.

Of great importance was also our discussion on target groups of the framework, the software and the showcases.

### What do you expect from the last six months of DESSIN?

As mentioned before, the challenge within these last six months of DESSIN will be to evaluate the demo cases with regard to efficiency rates but also sustainability and ecosystem services. Also, market options as well as governance and financing issues will be part of the final conclusion. To this end, it is required to join forces between – actually all of – the work areas of DESSIN and integrate the knowledge gained throughout the project. Of great advantage is that not only this knowledge will be brought together but also opinions and background knowledge from the interdisciplinary consortium – practitioners, economists, ecologists and engineers.

### The DESSIN project is close to its end. How do you value the evolution of the project?

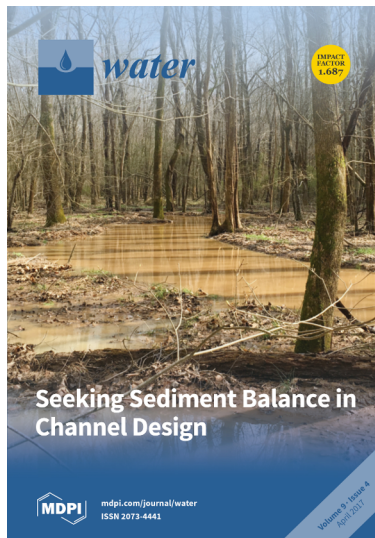
A lot of work has been put into the development of a framework for assessing ecosystem services and sustainability. This framework proved to be applicable in three mature case studies showing that it is a comprehensive and practice-oriented approach, which is of great value. The next task will be to validate the framework also in the five DESSIN demo cases. Setting up the demonstration technologies was of course challenging but now first results are available. Based on this, we will now identify the technologies' effects on ecosystem services and assess relevant aspects of sustainability.

### What makes the Emscher Demo Site unique?

Until now, the real-time control (RTC) system ADESBA has been demonstrated in practice only at one other site where it controls rectangular storage basins. At the Emscher site, however, we have adapted the system to be applicable also to circular storage channels. Furthermore, extensive simulations have been conducted to assess the efficiency of the RTC and the system was continuously optimized throughout the demonstration.

## SUCCESS STORY

### TWO DESSIN PAPERS PUBLISHED IN MDPI WATER MAGAZINE



From both, the Barcelona and Westland DESSIN demo sites, a paper was submitted and accepted for publication in a special issue on Managed Aquifer Recharge (MAR) of the MDPI Water magazine. This issue is aiming at hydrogeochemical and water quality management aspects, such as the benefits of self-purification during aquifer recharge and storage, including bank filtration, and problems due to undesired water-aquifer interactions and clogging of infiltration and injection systems.

The paper on the Barcelona demo site, written by Pere Camproví, Llobregat project leader, focuses on the clogging of the aquifer storage and recovery (ASR) wells during injection of sand filtered water, which was simulated under lab conditions. It was shown that although microbiological clogging was observed, the operational capacity of the ASR well will not be heavily impacted. This means that there is a clear potential to inject sand filtered water at the site in order to store freshwater for moments when the intake of river water is hampered.

Koen Zuurbier wrote a paper about the finding at the Westland demo site. This is the first one to report on the impact of aquifer storage and recovery and reverse osmosis (ASRRO). This system is technically able to provide a robust freshwater source. This study however analyzed the impact on the groundwater system if the technology were widely implemented. Therefore, the current situation (brackish water RO) was also evaluated. It was shown that the introduction of the DESSIN solution would have great benefits for the groundwater system, especially close to the groundwater wells on a local scale. On a regional scale, overall effects on the salinity was limited in all scenarios for 30 years and saltwater intrusion was clearly reduced by ASRRO.

[> Download Llobregat demo site paper by Pere Camproví](#)

[> Download Westland demo site paper by Koen Zuurbier](#)

## ESS SECTION

### ESS APPROACH IN THE LLOBREGAT MATURE SITE

Understanding the concept of Ecosystem Services (ESS) and what the environment can do for us is key for considering the nature based solutions as feasible investment options. The DESSIN project has as objective to evaluate the pros and cons of these nature based solutions in the Ecosystem Services, using the ESS Approach methodology.

Accordingly, Montserrat Termes, Jaume Amorós and Marta Hernández from DESSIN project partner Cetaqua presented a paper on the ESS Approach in the Llobregat Mature Site at the International Conference on National Science in Santiago de Compostela (Spain) in November 2016.

Based on the DESSIN methodology, the text presents the evaluation framework applied to the case of the use of infiltration ponds for artificial aquifer recharge in the Llobregat river (Spain). In this case, the use of aquifer as a reservoir stimulates higher water supply guarantee and increases aquatic biodiversity in the lower Llobregat River when it flows into infiltration ponds.

In order to monetize the value of changes in ecosystem services gained by the application of this solution and based on the DESSIN framework, some beneficiaries of the natural infrastructure were identified. Aigües de Barcelona was identified as the principal operator for drinking purposes. In case of non-drinking purposes, the brewery DAMM Company was identified as the most representative due to the use of large volume of pumped groundwater from the aquifer. Finally, for the other

ecosystem services, the paper uses the research opportunities and recreation aspects as cultural ecosystem services determining the scientific community and the population living in the surroundings and Barcelona metropolitan area as the final beneficiaries. This helped to quantify the specific monetary value the ecosystem services have for their beneficiaries.

[> Download the ESS Approach in the Llobregat mature site paper](#)



## DESSIN MARKETPLACE

### MONITORING & EVALUATION SYSTEM FOR MARKET ENTRY

A recurring challenge in adelphi's work with innovative SMEs from the water sector is entering new markets with a new technology. This is particularly the case for ESS-relevant technologies, as their advantages may only be a selling point in those markets that allow for (basic) ESS consideration.

Therefore, adelphi has developed an M&E system for determining those European (and other) markets in which framework conditions are the most favourable for innovative SMEs from the water sector, including DESSIN SMEs. The system is available as an online tool and consists of indicators relevant for the commercialization of water technologies which are classified into: Market Conditions, Governance as well as Finance. These can be assessed for all EU member states and selected other countries and the system allows application of individual indicators as well as a combination thereof.

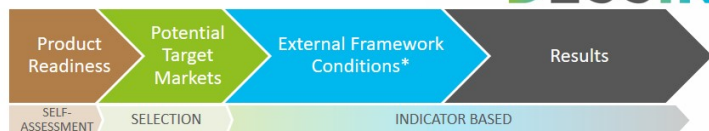
First, the tool guides a quick self-assessment regarding a product's readiness for new markets. This includes technical performance, compliance with regulations, application costs and value proposition of the technology in question. In a second step, potential target countries are chosen by the user. The system then presents indicators regarding the framework conditions in three categories, general market conditions, governance indicators and investment potential. The user selects applicable indicators and the system then generates an overview of the selected countries' scorings for comparison.



A positive assessment of general market conditions can support the decision to conduct a more in-depth analysis for a specific target market. Water challenges at national or regional scale can indicate whether there is need for new technologies. Indicator options for this include the Water Exploitation Index, the Water Risk Index (Aqueduct) as well as Water Productivity and Public Water Supply. Equally important are also general business indicators that assess the trade and investment climate within a market (e.g. the Ease of Doing Business Index and the Global Enabling Trade Report).

## Monitoring & Evaluation Platform:

@ DESSIN.adelphi.de



\* General Market Conditions, Governance Frameworks & Finance

A key challenge for DESSIN SMEs is the varying institutional and legal framework of the water sector as well as the performance of water governance among countries. Three governance indicators are included in the system to provide an overview: the Worldwide Governance Indicators of the World Bank, the Sustainable Governance Indicators and the Environmental Performance Index. The investment potential of a specific water sector is reflected through public spending on eco-related R&D activities and on environmental protection (of which a large proportion is usually allocated to the water and sanitation sector).

Four indicators on this can be selected: the Eco-Innovation Index, Cleantech Index, Global Opportunity Index and Total Environmental Protection Expenditure. The system automatically updates itself with the newest set of indicators and requires minimal external support. Initial feedback from DESSIN SMEs was positive; the results are seen as a starting point for further market research. It can thereby support an uptake of ecosystem relevant technologies beyond the timeframe of DESSIN, providing market relevant information to innovative water sector SMEs.

[> Go to the Monitoring & Evaluation online tool](#)

## DESSIN ACHIEVEMENTS

### SUCCESSFUL DESSIN MEETING IN BARCELONA

At the end of January, around 30 DESSIN partners met up for a Project Steering Board meeting in Barcelona, Spain, hosted by project partner Cetaqua.

The conference started with a small and medium-sized enterprises (SME) peer exchange workshop to reflect jointly on the expectations and results of DESSIN at the start of its final year from an SME perspective. Discussed were the SMEs' understanding of ESS relevance and how it evolved during the project. Building on this discussion, there was a peer exchange on using ESS valuation and other DESSIN results effectively in the SME and business context. This included an analysis of needs per SME and a strategy sketch of putting DESSIN results to use post-project. Lastly, relevant EU Programmes for SMEs and other opportunities to collaborate were discussed.

The second day started with a plenary meeting where the progress of the different work areas and demo sites was presented and discussed. A special focus was put on the finalized Ecosystem Services Valuation Framework and its practical application with the help of a software tool. Afterwards, cross-cutting issues and questions were discussed, a feedback from the project advisory board was received and an outlook on the final year of the project was given.

The last day of the meeting included a site visit to the drinking water treatment plant in Barcelona, which is run by Aigües de Barcelona, where one of DESSIN's demo sites is located.



The DESSIN Consortium during the visit to the drinking water treatment plant in Barcelona

## DESSIN ACHIEVEMENTS

### DESSIN SUCCESSFULLY PASSED THE MID-TERM REVIEW

In April 2017, DESSIN has successfully passed an important threshold.

The project was evaluated by two external reviewers contracted by the European Commission. They evaluated about 20 DESSIN deliverables and our first and second periodic report. Furthermore, there was a face-to-face meeting of the DESSIN Work Area Leaders with the EC project officer and both reviewers in Brussels. At this meeting, key results and progress of DESSIN were presented in more detail, and questions by the reviewers could be discussed thoroughly.

In their report, the reviewers appreciated the work done by DESSIN and emphasized that "the methodology applied is sound, innovative and modern", "the internal review process is working really well" and "the integration demonstrated is remarkable, thanks to the specific mechanisms designed and/or adopted by the

consortium". No significant weaknesses were detected, and hence the European Commission decided not to implement any changes or corrective measures.

On a purely voluntary basis, the DESSIN Management Team has decided to revise some of the DESSIN deliverables, in order to tackle minor issues that have been spotted by the reviewers. We are confident that this will further improve the professional look and dissemination potential of our key outcomes.



## UPCOMING EVENTS

24-26  
OCT

**Conference "Nature-based solutions: From innovation to Common-use"**

Organiser: Ministry of the Environment of Estonia and the University of Tallinn

Venue: Tallinn, Estonia

## DESSIN EVENTS

The DESSIN project has been invited to present its findings at the following events:

29  
SEP

**EIP Water Conference 2017**

Organiser: EIP Water

Venue: Porto, Portugal

2-3  
NOV

**European Joint Programming Initiative on Water**

Organiser: JPI Water

Venue: Dublin, Ireland

28  
NOV

**DESSIN Project final event - Call for papers**

Joint workshop on Ecosystem Services (ESS), Nature-Based Solutions (NBS) and Hybrid Grey-Green Infrastructure (HGGI)

**Organiser: DESSIN & WssTP**

**Venue: Brussels, Belgium**

Jointly with WssTP working groups, DESSIN will organise its final event as a workshop where best-practice examples of approaches and technologies will be presented and how ESS, NBS and HGGI can contribute to innovation in the water sector and help tackle water-related challenges such as water quality and water scarcity. The event will take place back-to-back with the WssTP Water Knowledge Europe Event that will be held on 29th-30th November 2017.

> [Click here to find a call for papers and more information about the event.](#)

## DESSIN PARTNERS

