

RiverCare Newsletter

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Side channels, floodplain monitoring and participation
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Preface

RiverCare researchers prepare this newsletter twice per year. We are now starting our 2nd year and we have two years to go! Every newsletter, starting from this issue, we share a brief update on interesting progress or relevant results of three of the RiverCare subprojects. We hope that you enjoy this newsletter, contact us to get additional information and/or to contribute to our activities.

Interdisciplinarity in the RiverCare day: The organizers' and participants' view

By Menno Straatsma and Tjitske Geertsema



Figure 1. Interdisciplinary snapshots of the RiverCare day

A participants' point of view

To achieve the objective, the program was as follows:

- An inspiring lecture by Prof. Wil Thissen (Fig. 1-2), who highlighted the challenges of multi-, inter- and trans-disciplinary approaches in science. In the lively discussion that followed, we concluded that we should also be proud of the multidisciplinary approaches that researchers have already pursued.
- Pitches by researchers, project leaders, and the program board, who also introduce the possibility to create a promotion movie. The pitches gave insight into the main results and frustrations of the researchers.
- A break with an enjoyable fluviually annotated lunch walk (Fig. 1-3).
- The afternoon was spent “learning by doing” in a workshop of joint abstract writing (Fig. 1-4), which resulted in 15 inspiring abstracts with two to three researchers involved (Fig. 1-5). It was amazing how even non obvious combinations of researchers could create new ideas for working together.
- A discussion on three RiverCare propositions about the meaning of a ‘joint-project’ (Fig. 1-6), which gave

RiverCare researchers and supervisors meet every six months in a ‘RiverCare day’. The third edition was organised by Utrecht University (UU) on May 12th (Fig. 1-1) and revolved around the topic of interdisciplinarity.

RiverCare day organizers' view

While organising the RiverCare day, we asked ourselves two fundamental questions: “What is the RiverCare program within the multitude of other professional networks, and what should we learn as a group to create additional value out of a ‘joint project’?” After an energetic brainstorm session with all co-workers at UU, we decided on the theme of interdisciplinarity. A buzzword, and an approach to science that is glorified by many, but thoroughly implemented by few.

Our working definition of interdisciplinarity was “the transformation of scientific identity due to symbiosis of monodisciplinary questions, methods, and truth claims (DJA, 2015)”. In short: “be a brick, not a pile of sand.” Too much to aim for in a single day, so we formulated the objective that:

“ Participants would go home with a better understanding of the nature of interdisciplinary research, and with interdisciplinary conference abstracts. ”

insight into the different perspectives of researchers and showed a greater consensus than initially expected.

The day was very enjoyable and fruitful. The evaluation showed that almost everybody achieved the objectives. We were really living the theme with interdisciplinary cooperation, discussion and confusion. Although not straightforward, we saw unexpected possibilities. As a concluding message:

“ We can work towards interdisciplinarity by thinking and discussing about it. ”

RiverCare Research Spotlights

RiverCare consists of 21 researchers each with a subproject studying varieties of topics ranging from river interventions to integrated effects, management, communication and river applications. In every newsletter, starting from this issue, we give you a glance of interesting progress of three of the RiverCare subprojects. In this edition, we share up-to-date results about the river side channels, floodplain monitoring and participation subprojects. Whenever available, we also refer to the related publication or report. Please email the specific researcher in case you are interested in more detailed information.

Side Channels dynamics explained



By Pepijn van Denderen MSc
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“As part of Room for the River, side channels were constructed to reduce the water levels during (extremely) high discharges. These channels slowly fill up with sediment and therefore require regular maintenance which is expensive and is undesirable. What causes this sedimentation?,”

A difference in length of the channel is an important parameter. **Fig. 2** shows an example of a two channel system in the River Ain, France, near the village of Mollon:

- Shortly after the year of 1968, the west channel closed. Moreover, due to a flood in 1996, the channel reopened.
- Between 1968 and 1996, the meandering of the river lengthened the east channel creating a difference in slope between the east and west channel. Due to the difference in length, the west channel attracts more discharge, causing the channel to erode, while discharge in the east channel reduces leading to sedimentation.
- Since 2003, the main discharge has been conveyed by the west channel, and between 2005 and 2010, the east channel closed.

With a simple 1D numerical model, we can reproduce the effects of a slope difference and morphological changes as shown in the River Ain. However, in some of the cases, other riverine processes also add to the morphological changes. These processes are, for example, the bifurcation angle, mixed sediment and vegetation.

“The effects of these processes will be studied to be able to construct a maintenance-free system in the future.”



Figure 2. Timeline of morphological changes in a two channel system in the River Ain, France,

Further information behind this research is available in: Van Denderen et al. (2016), *Characteristics of side channels in the River Ain, France*. Proceedings Riverflow 2016, St. Louis. (in press).

Monitoring low floodplain vegetation



By Wimala van Iersel MSc
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“Restoration projects of floodplain ecology have resulted in a more natural and heterogeneous floodplain vegetation. To document and evaluate floodplain characteristics, monitoring of floodplain vegetation has therefore become essential.”

Reported land cover classifications showed low accuracies for grassland and herbaceous vegetation, due to the spectral (e.g. colour) and structural (e.g. height) similarity of these vegetation types. The increased availability of Unmanned Aerial Vehicles (UAV), also known as drones, allows low-cost production of high resolution images and digital surface models. Multi-temporal imagery may reveal new possibilities to identify vegetation-type specific seasonal or year-to-year changes, and may be used as input for an improved classification methodology.

The aim of this study was to evaluate the performance of the UAV surface models for extracting vegetation-type specific seasonal changes (See Fig. 3).

- We studied 28 field plots (15x15m²) in a typical Dutch floodplain.
- During field surveys, the average vegetation height in the plots was measured 6 times between February 2015 and January 2016.
- UAV images were used to create surface models of the field plots.
 - True-colour surface models were used to derive the predicted vegetation height.
 - The false-colour surface models were used to derive an index representing plant health (NDVI in Fig. 3).

We found that at plot scale:

- (1) the vertical accuracy of UAV surface models is high enough to obtain temporal height profiles of low vegetation over the growing season.
- (2) the plant health index and vegetation height show expected vegetation-type specific seasonal changes.

“Building on these results, next step of this project is performing a multi-temporal classification at floodplain scale.”

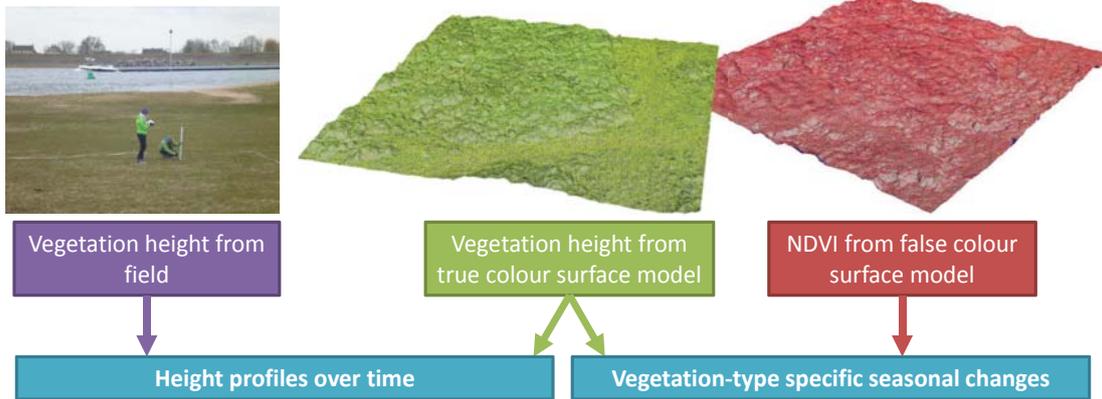


Figure 3. Relation between the data sources of this subproject and its main results.



Further information behind this research is available in: van Iersel et al. (2016) Monitoring vegetation phenology of grassland and herbaceous vegetation with UAV imagery. In: Proc. XXIIIrd Congress of the ISPRS 2016.

van Iersel et al (2016). Monitoring vegetation height of low vegetation with UAV imagery. Poster at NAC 13 congress (1st poster prize award)

Public involvement in river monitoring: who's in and why?



Laura Verbrugge PhD
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“Surveying public opinion gives a point of reference to assess whether the intervention had positive or negative consequences for public perceptions and appreciation of the landscape. More importantly, survey results also inform water managers the stakeholder concerns and their motivations for participating in collaborative monitoring.”

In this subproject we surveyed local residents, recreational fishermen, boaters and bargemen (shipping professionals) to monitor how they perceive the planned construction of longitudinal training dams in the River Waal. We found that opinions on the longitudinal training dams differed between groups. Local residents are more positive about the intervention than fishermen and bargemen, especially in terms of increasing flood safety (See Fig. 4).

During the next stages of the project, we will collect data on experiences of recreational fishermen and bargemen in the pilot project ‘participatory monitoring’ (2016-2017). These observations will contribute to the evaluation of safety aspects and the recreational value of the area, as well as to ecological monitoring in the form of reported catches by fishermen.

“Volunteers can make a valuable contribution to monitoring the changes in the area, by sharing their experiences and knowledge.”

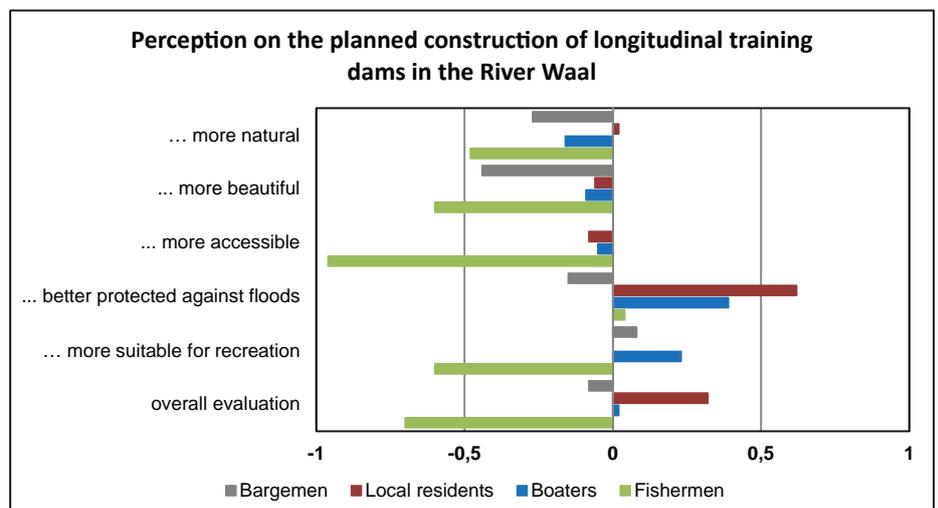


Figure 4. Responses of four stakeholder groups to the following statements: “In my opinion, the placement of longitudinal training dams will make the landscape ... (measured on a 5-point scale from -2 to 2).



Further information about the research is available in: Verbrugge, L.N.H. & Van den Born, R.J.G. (2015). Beleving langsdammen: nulmeting onder bewoners, sportvissers, recreatievaarders en binnenvaartschippers. Prepared for Rijkswaterstaat Oost-Nederland by the Radboud University, Nijmegen (in Dutch).

Some facts and trivia

- We welcome a new RiverCare researcher, Wessel Ganzevoort. He will contribute to Laura's research about "Participation and civic engagement in monitoring and evaluation of innovative (engineering) intervention".
- Jasper (researcher in the "Morphodynamics of regional river systems" subproject) has saved 2 MSc students; one from a peat bog and one from a ditch.
- Nick (researcher in "Wealthy Waal: export possibilities" subproject) supervised a MSc student that finalized his thesis. The thesis resulted in a first overview of important Dutch actors, platforms and strategies, regarding the export of Dutch water knowledge.
- Juliette (researching on "The potential of online platforms to support knowledge exchange in river management") is interviewing potential users of the RiverCare platform, including professionals from Belgium, USA and South Korea!
- Victor (researcher "Improving prediction of sediment management measures") made a Matlab function that acts as a 'Telegram Servicebot': When he types 'Rhine' in the chat conversation of his phone, he receives a message with the discharge and water level measured at Lobith (gauging station Rhine river located in the German-Dutch border). It is just fun! :D

RiverCare outreach and plans for our mid-term meeting

By Ralph Schielen (representative of the program board)

“RiverCare started in the fall of 2013 and ends in the fall of 2019. That means that we are now almost halfway and that is a good time to take stock. Already in the midterm of our program, we want to organize some activities to exchange knowledge, increase the exposure and evaluate the program so far.”

RiverCare Course (Save the date):

RiverCare explicitly wants to exchange the knowledge gained by the researchers with the users (e.g. Rijkswaterstaat, Waterboards, consultancy firms). To do this, we are organizing a course on **October 31st** and **November 1st 2016** (most probably in Utrecht). In this course the researchers will give short presentations about their findings so far, with an emphasis on the 'practical' use of their results. 'Short presentations' were chosen to give ample time for discussion. An announcement will follow shortly. We kindly ask you to save the date!

Mid-term review:

At the time of the course there will also be a mid-term review by an international committee of outstanding river researchers. Committee members will have the opportunity to attend parts of the course and discuss with the researchers and supervisors. We have asked the committee to evaluate the program so far, and give us advice whether we are still on the right track or (small) adaptations are advisable.

RiverCare promotion movie:

An interactive movie will be made to promote river research in general and to generate more exposure for the RiverCare program in particular. The movie will be shot on a floodplain where a viewer can look around and see the different RiverCare research areas. By focussing on the area of interest, the viewer can get more information about the specific RiverCare research. This movie should be ready in time of the course and the midterm review, and will be made available to the users.

LATEST PUBLICATIONS

Besides the contributions in the RiverCare spotlight section, some of our latest publications are:

- Arkesteijn, et al. (2016). [Simplified treatment of the flow and the use of a morphodynamic factor in long-term morphodynamic computations](#). Abstract 90355, poster presentation at the 31st IUGG Conference, Paris, 6-10 June.
- Chavarrias, et al. (2016). [Ill-posedness of the Saint-Venant-Hirano Model](#). Abstract 90221 presented at the 31st IUGG Conference, Paris, 6-10 June.
- Harezlak et al (2016). [Floodplain rehabilitation. Linking process to landscape patterns](#). Poster at NAEM congress.
- Geertsema et al. (2016), [Simultaneous occurrence of discharge peaks in a large river and its lowland tributaries](#). RiverFlow 2016: abstract and proceeding, 12-15 July, 2016, St. Louis.
- Straatsma et al. [Optimizing river management: integrated assessment of floodplain interventions](#). In, 2015/6/30 2015. p 1

COMING EVENTS

- June 27-July 1; [Summer School on Fluvial Geomorphology](#), Losone (Canton Ticino), Switzerland.
- 27 June - 1 July: [IAPS \(International Association People and Environment Studies\)](#), Lund (Sweden)
- June 30 - July 1 : [LANDac conference](#), Utrecht, (NL)
- July 4-9: [Future Deltas Summerschool](#), (Utrecht, NL)
- July 14-16: [GEOBIA congress](#), Enschede (NL)
- July 10-14: [8th International Congress on Environmental Modelling and Software](#), (Toulouse, France)
- 12-19 July: [ISPRS XXIIIrd conference](#), Prague (Czech Republic)
- July 28: [Third symposium on the hydrological modelling of the Meuse basin](#), Liege, (Belgium)
- July 12-15: [River Flow 2016](#), (St Louis, MO, USA)
- September 20-23: [River Restoration Conference](#), Krakow, (Poland)

NCR WEBSITE

NCR website (<http://www.ncr-web.org/>) is being used to communicate the RiverCare activities. A renewed website with links to our RiverCare program results will be available from the next issue.

NEXT ISSUE (DEC/2016):

Give us [here](#) your feedback about this issue:

Do you have something to contribute to the RiverCare newsletter?

Let us know:
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