

Title of the project: Investigating the morphological development of side channels in river floodplains: Modelling and field data analysis	
Assignment no.: 18.24	Internal/external: External
Head graduation committee: Dr. Denie Augustijn (UT)	Daily advisor: Dr.ir. Vasileios Kitsikoudis (UT) Ir. Thorvald Rorink (Arcadis)
Name(s) of participating companies or institutes: Arcadis	Start of the project: As soon as possible
Required courses: River Flow Processes, River Morphodynamics.	
Short description and objective of the project:	
<p>The Dutch river systems of Rhine, Meuse and their distributaries are constantly subject to human intervention. Through numerous large-scale programs (e.g. Water Framework Directive, Room for the River, and many other programs) a lot of side channels have been constructed in the river flood plains. During the design phase, it is common to make (numerical) calculations for the effects of side channel on the bed level of the main channel. However, little quantitative studies are done to investigate the morphological development of the side channels themselves. Currently, this is mostly done through expert judgement. This poses a challenge for maintenance, as the functioning of the side channel is assessed based on the effects it has on the main channel. In the design of side channels, special attention must be given to the stability of the side channel profile, as well as the inflow of water and sediment to ensure morphological stability. An example of an imbalance is given in Figure 1.</p> <p>The aim of the study is to investigate (and predict) the development of side channels based on some physical design parameters to optimize maintenance strategies. Further content will be determined together with you. Examples of activities include:</p> <ul style="list-style-type: none"> • Literature research into the dominant factors driving morphological response of side channels; • Data analysis using field measurements and hydraulic data to derive key parameters in side channel behaviour; • Setting up a simple model to calibrate/validate side channel behaviour; • Sensitivity analysis into erosion and/or sedimentation speeds of side channels. <p>This project requires a student:</p> <ul style="list-style-type: none"> • In the final stage of their Masters programme with a relevant background • With knowledge and intrinsic interests in river morphodynamics, GIS and/or river modelling; • With strong analytic and communication skills; • With strong Dutch/English speaking and writing skills; • Who is willing to travel to the Arcadis offices in Amersfoort and Zwolle; • Who is available for minimum 16 weeks (32-40 hours per week), starting preferably in October 2024. 	

This position has been advertised by Arcadis also in other universities and there will be a selection process by Arcadis. Nonetheless, you still have to go through the initial UT process about the master theses, so please contact Martijn Booij (m.i.booij@utwente.nl) if you are interested in taking this project.

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Figure 1: Example of bank erosion along a side channel of the Lek River