Emergence of different river dynamics through changing vegetation patterns Mijke van Oorschot^{1,2*}, Maarten Kleinhans¹, Gertjan Geerling², Hans Middelkoop¹



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Background

Dynamic interactions between river morphology and vegetation affect river channel patterns and riparian species. Most models oversimplify either morphodynamics or vegetation processes. We developed a model coupling advanced morpho-dynamics and dynamic vegetation.

Objectives

- Understand and quantify the effect of dynamic vegetation development on the river pattern and morphodynamics of a meandering river.
- Investigate the long-term effect of a riparian invasive plant species on river morphology and native vegetation.





Model verification

Comparing basic vegetation patterns, age distribution and age classes with aerial photos









Year 300

500

(clonal spread)

Time (y)





References

Van Oorschot et al. (2015). Distinct patterns of interaction between vegetation and morphodynamics. Earth Surface Processes and Landforms. DOI: 10.1002/esp.3864



- dynamics of vegetation
- Increasing vegetation cover decreases sediment transport, sinuosity, meander migration rate and bed level
- High density invaders reduces native vegetation cover, while lower density invaders increase native vegetation cover compared to the scenario without invaders





Low density invade



High density invade