

## [Field experiment on alternate bar development in a straight sand-bed stream \(Eekhout et al 2013\) \[1\]](#)

Alternate bars in rivers and streams develop as a result of differences in length scales involved in the adjustment of flow and sediment transport to irregularities of the bed. The amount of field evidence supporting theoretical insights is highly limited. Here, we present results from a large-scale field experiment in a 600 m long straight reach. Over a period of almost 3 years, the channel was allowed to evolve autogenously from initially flat bed conditions, subject to discharge variation. Alternate bars developed within 8 months from the start of the experiment. The initial stages of bar development included bar growth, both in wavelength and amplitude, and bar migration. The latter was too limited to classify the bars as being migrating bars; therefore, we classify the bars as nonmigrating bars. Toward the end of the experiment, the regular alternate bar pattern evolved into an irregular pattern and bar amplitude started to decrease. From the start of the experiment we observed a declining channel slope, from 1.8 m km<sup>-1</sup> initially to 0.9 m km<sup>-1</sup> halfway the experiment, after which it stabilized. We applied two bar theories to establish their predictive capacity. Both bar theories predicted the development of alternate bars under the constructed channel conditions. In response to the declining channel slope, both theories predicted a decreasing likelihood for the development of alternate bars. Our study shows that under field conditions, the applied bar theories may predict the initial stages of bed development.

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Eekhout, J. P. C., A. J. F. Holtink, and E. Mosselman (2013), Field experiment on alternate bar development in a straight sand-bed stream, *Water Resour. Res.*, 49, 8357–8369, doi:[10.1002/2013WR014259](https://doi.org/10.1002/2013WR014259) [2].

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