Morphometric fingerprinting of submarine canyon and channel processes revealed by time-lapse bathymetric surveys from the Congo Fan

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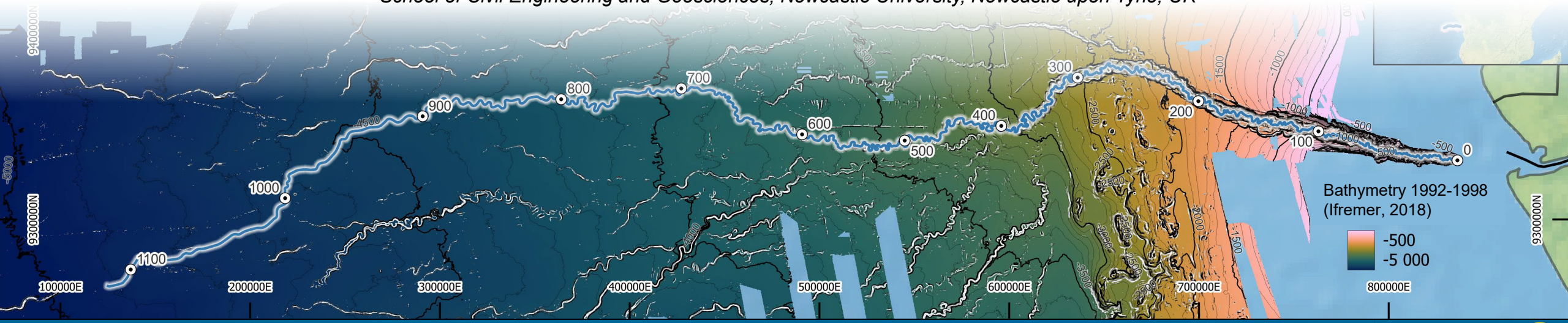

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Methods

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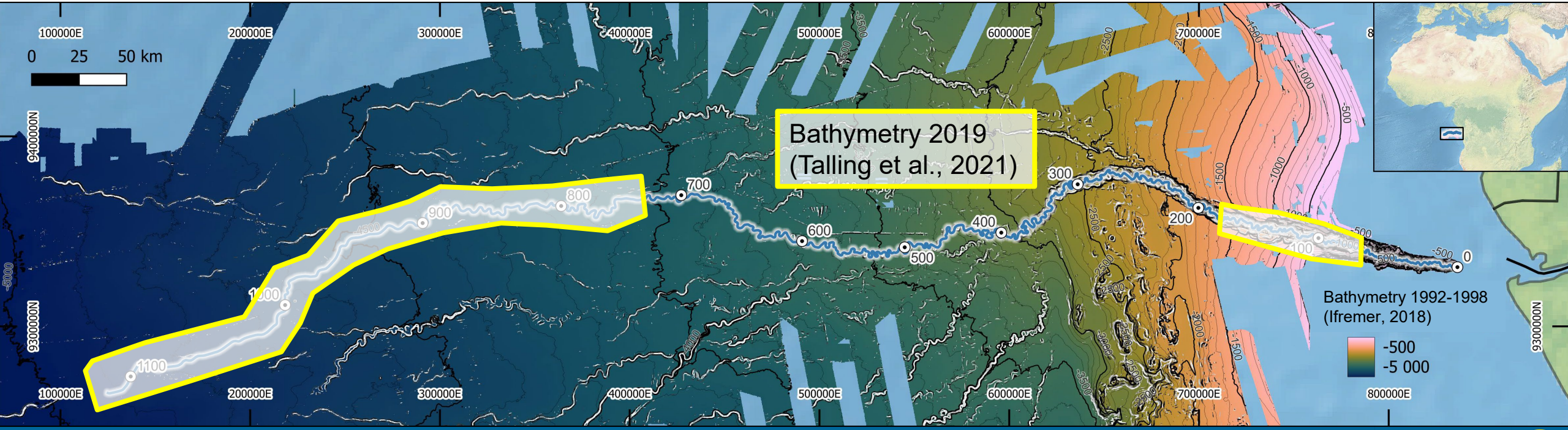
A Matlab script for the morphometric analysis of subaerial, subaquatic and extra-terrestrial rivers, channels and canyons

Martin Hasenhündl, Koen Blanckaert



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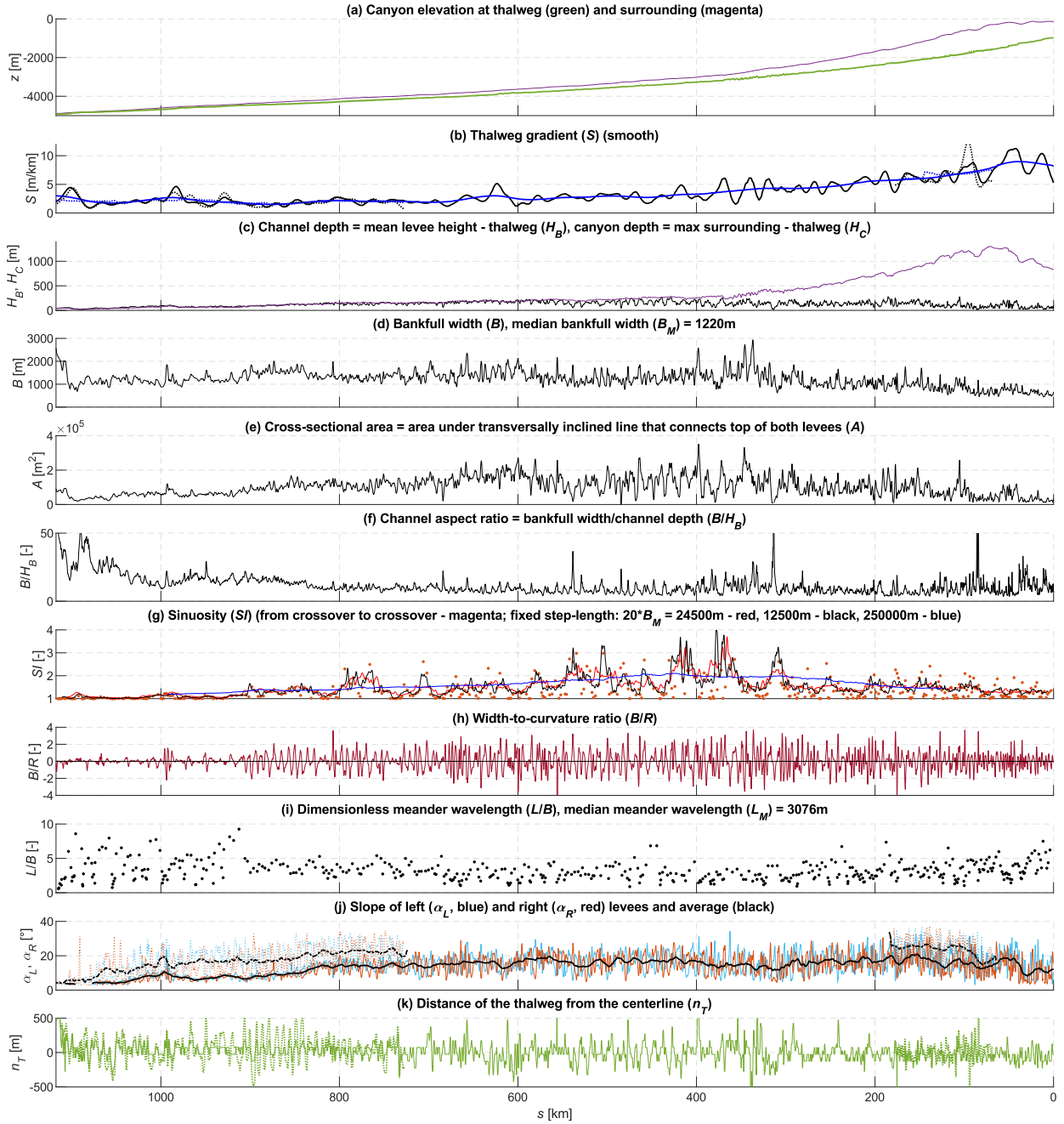
Results



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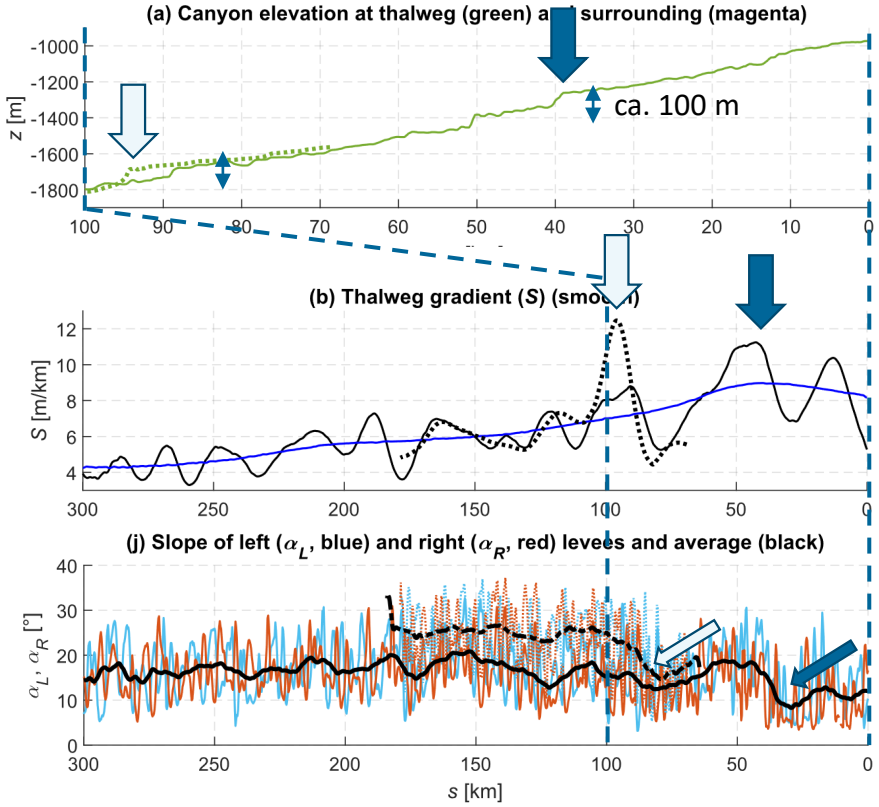
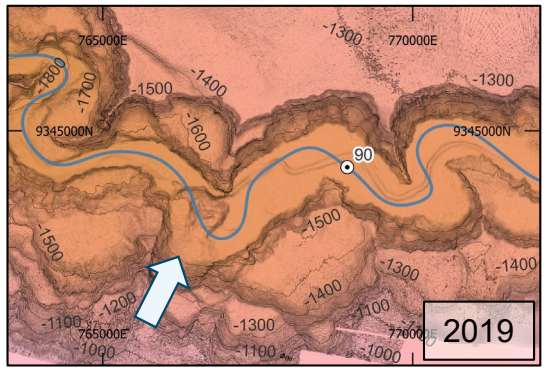
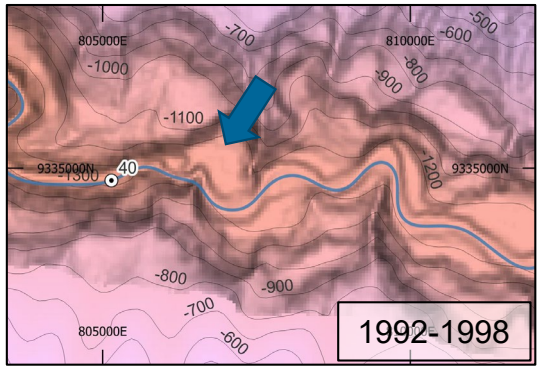
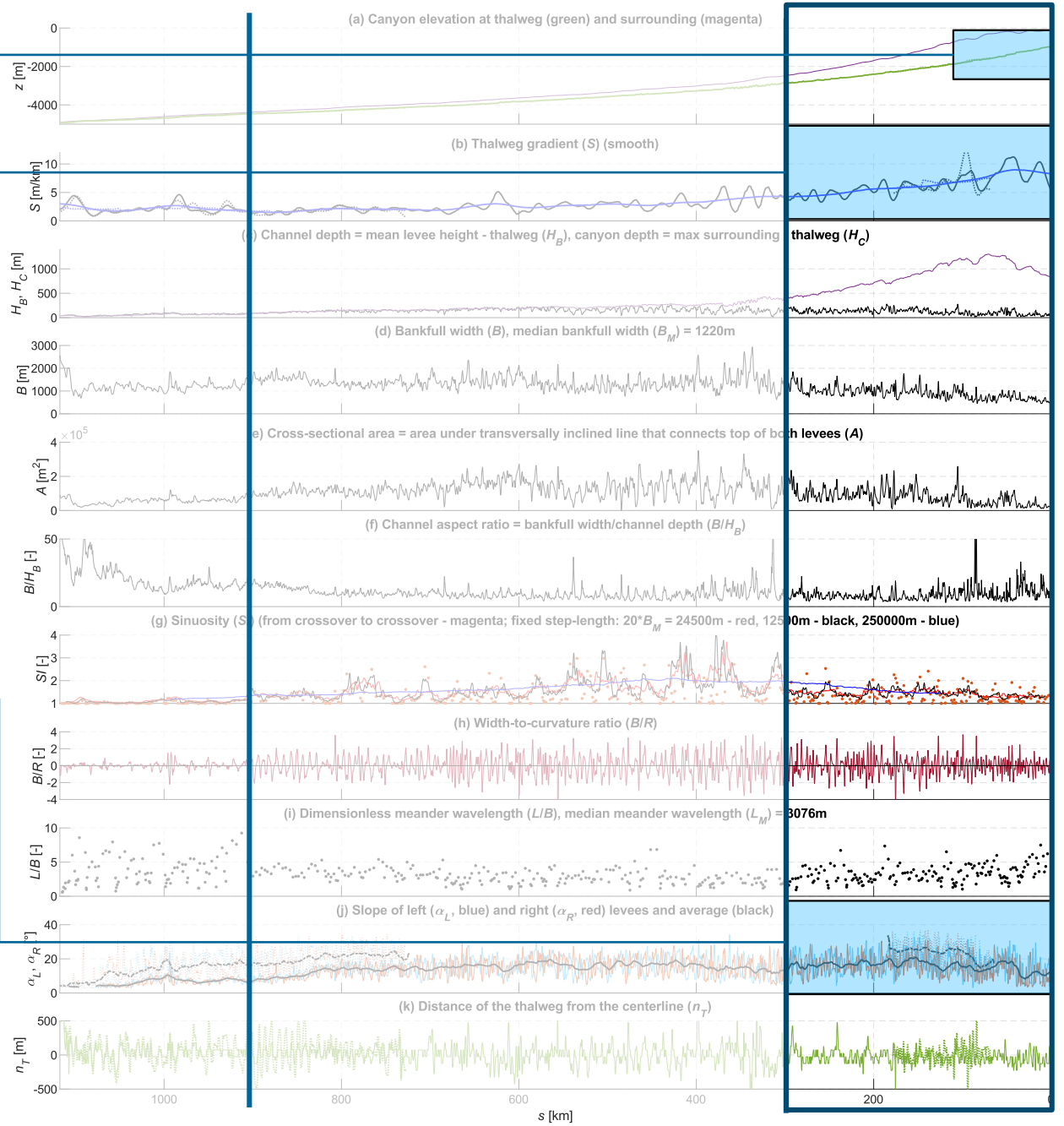
Results – Canyon/Landslides







described in detail in Pope et al. (2022, in press)



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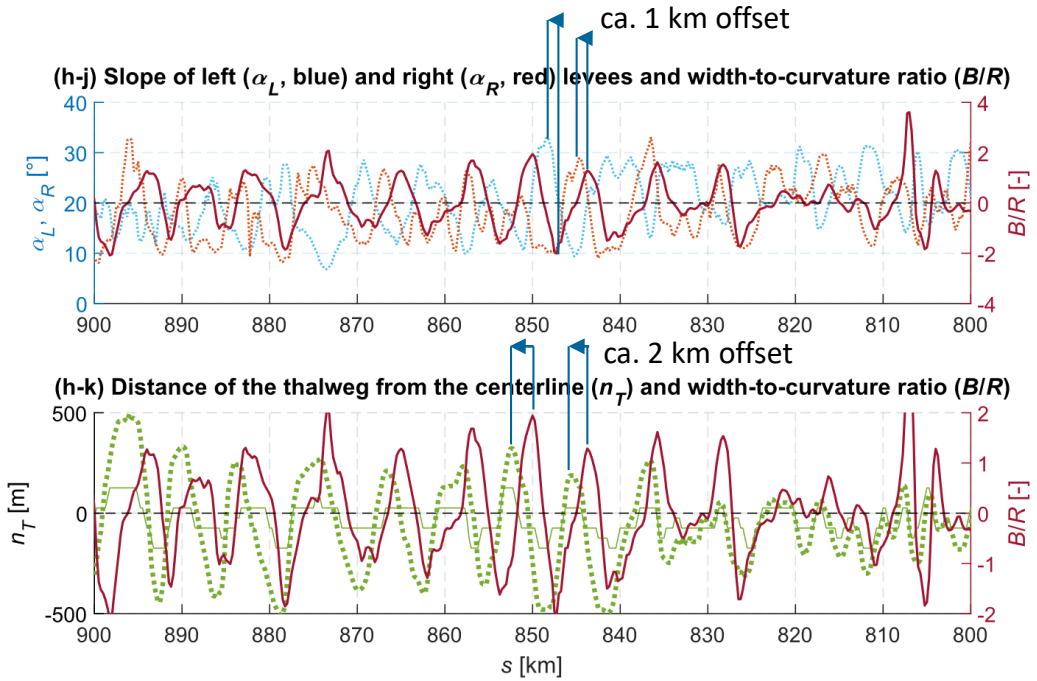
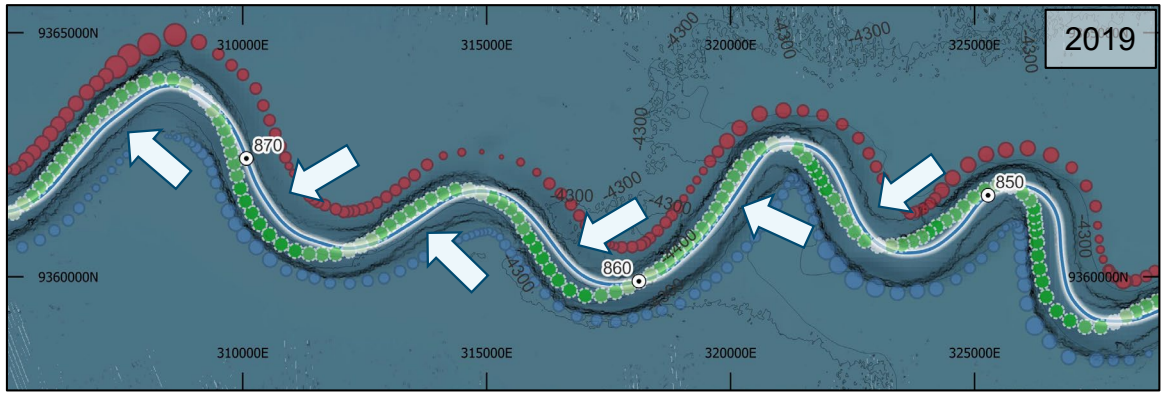
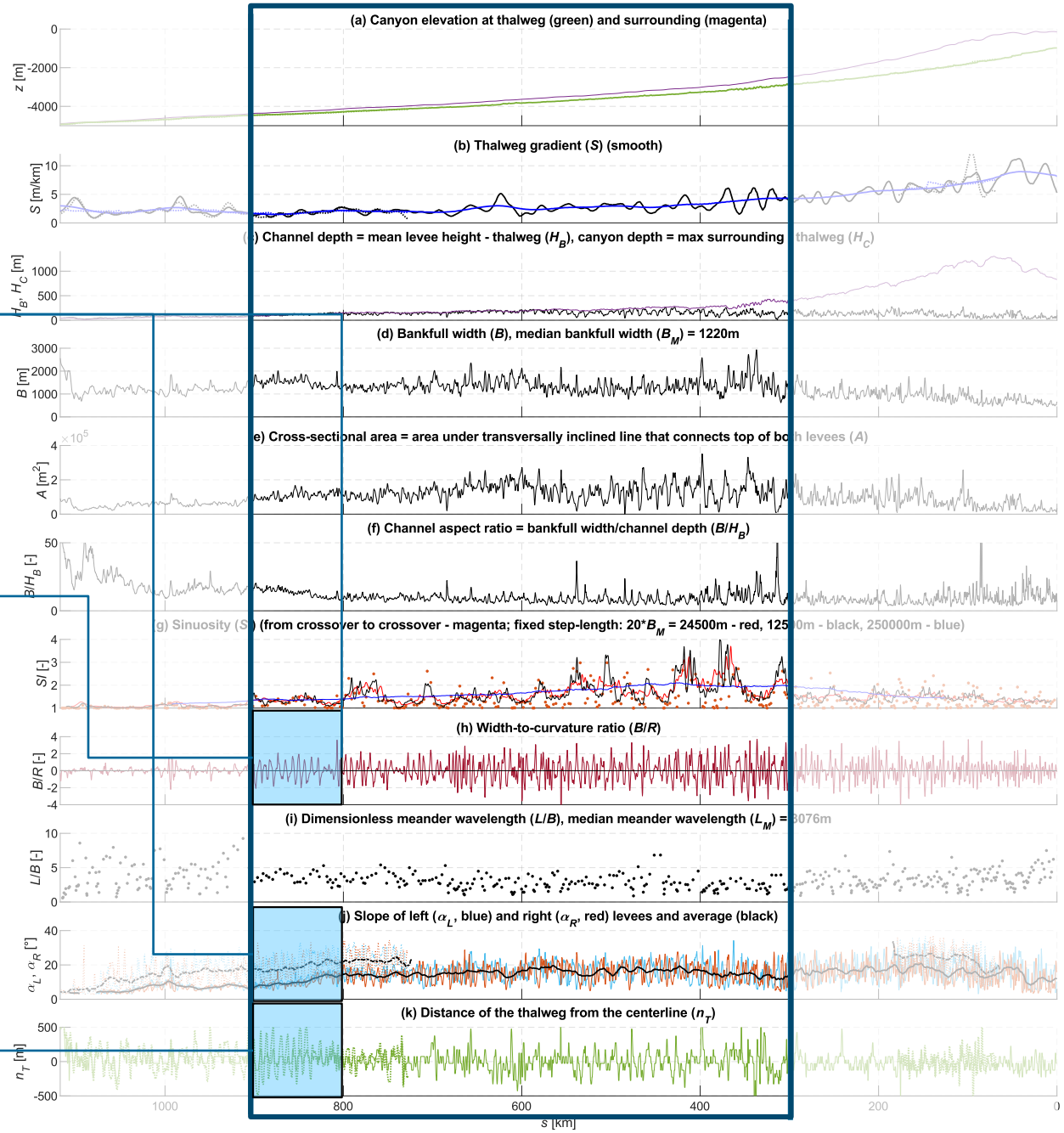
Results – Channel/Meander







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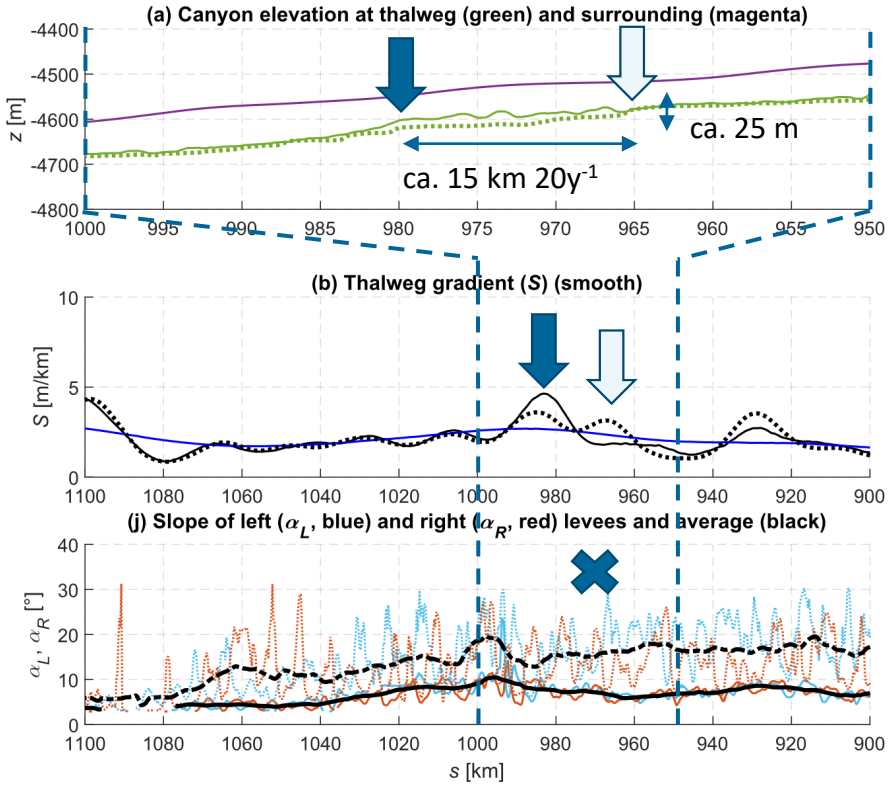
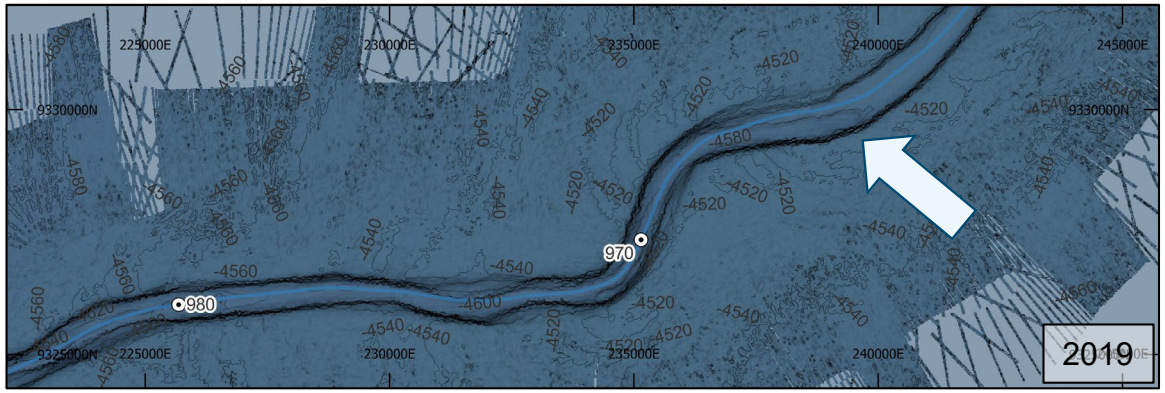
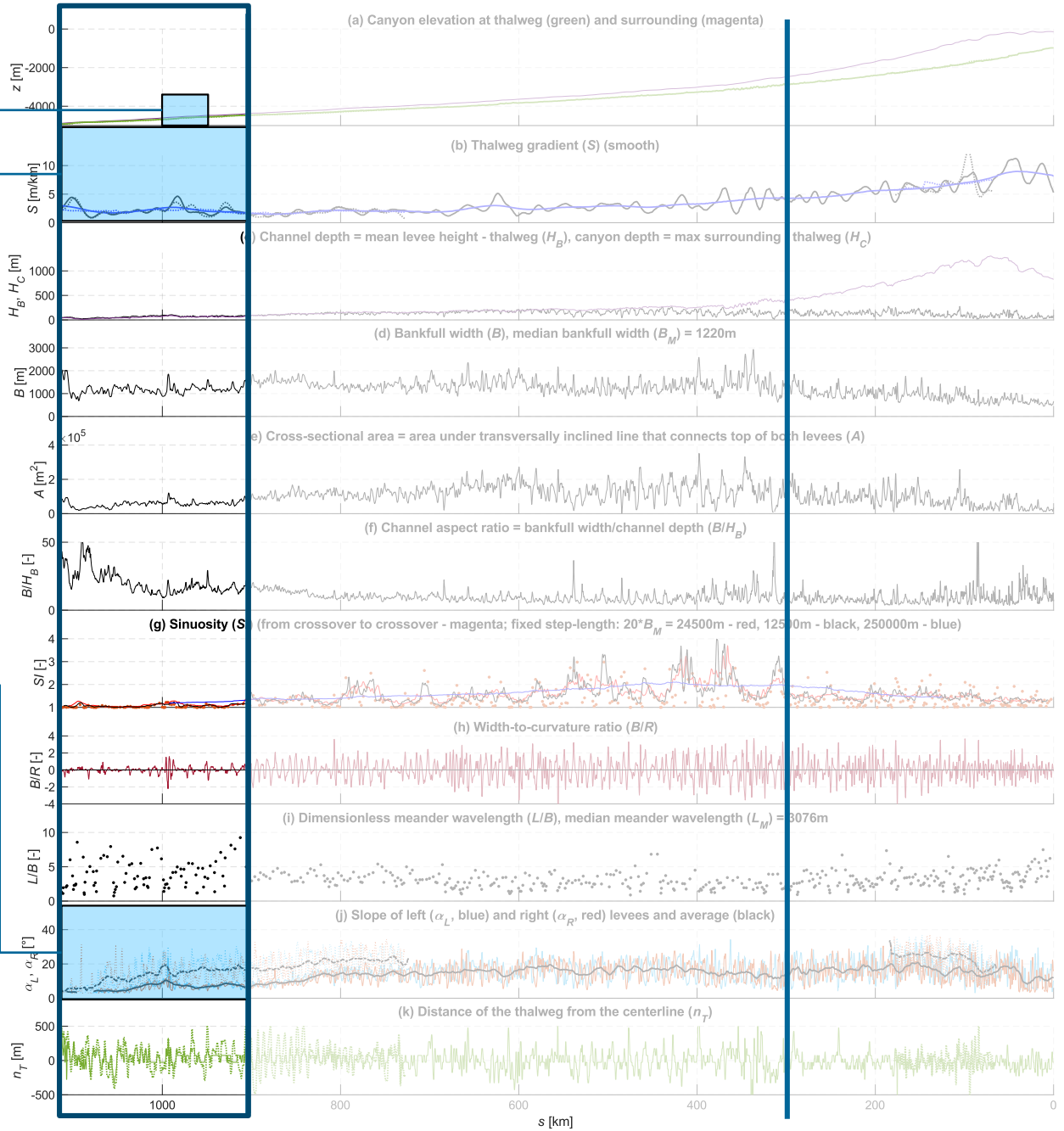
Results – Channel/Knickpoints







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Conclusion

Channel

knickpoint dominated

- migrates upstream ~15 km 20y^{-1}
- „shuffling“ sediment downstream

morphometric fingerprint:

- peak in thalweg gradient
- no change in levee slope

Channel

meander dominated

- swing and sweep downstream
- seems like a state of equilibrium

morphometric fingerprint:

- levee slope correlation with offset
- thalweg movement correlation with offset

Canyon

landslide dominated

- on timescales of decades
- storage of ~0.4 km^3 of sediment (Pope et al., 2022)

morphometric fingerprint:

- decline and peak in thalweg gradient
- decreasing levee slope

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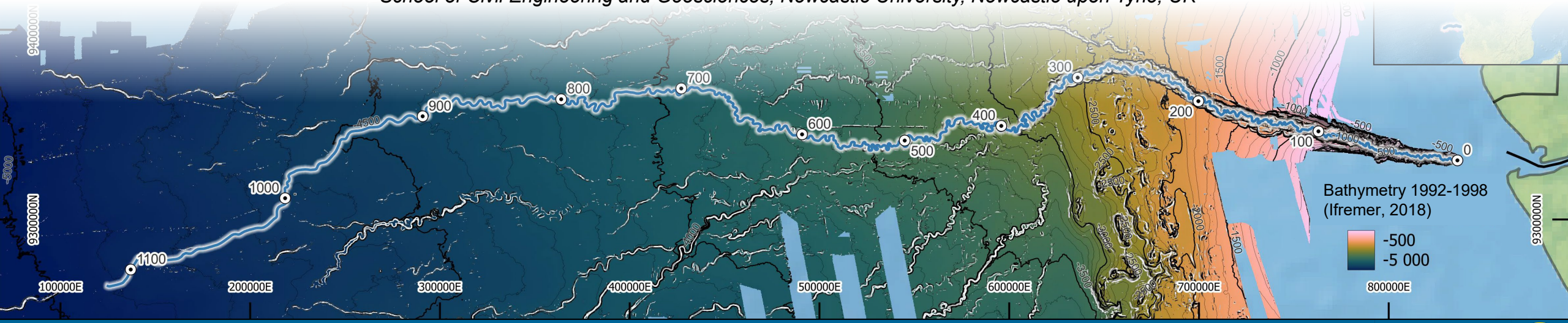

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