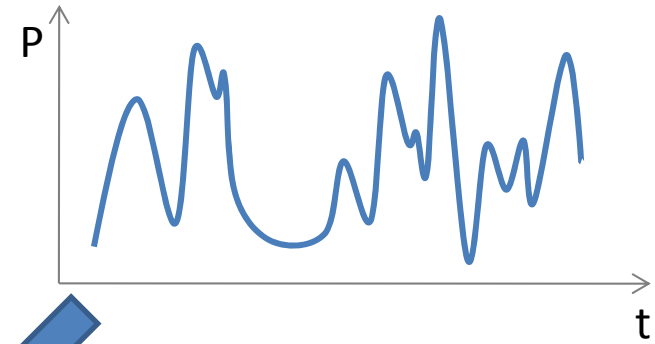
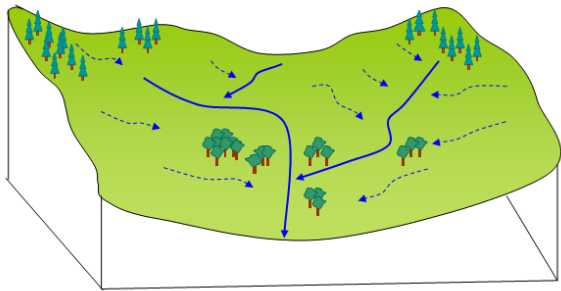


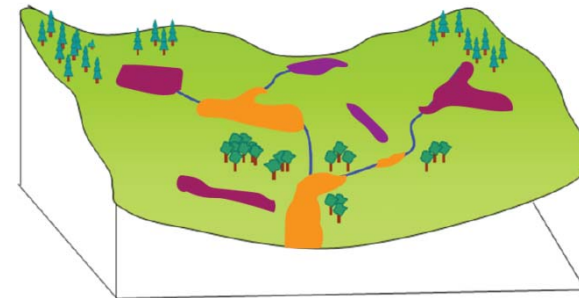
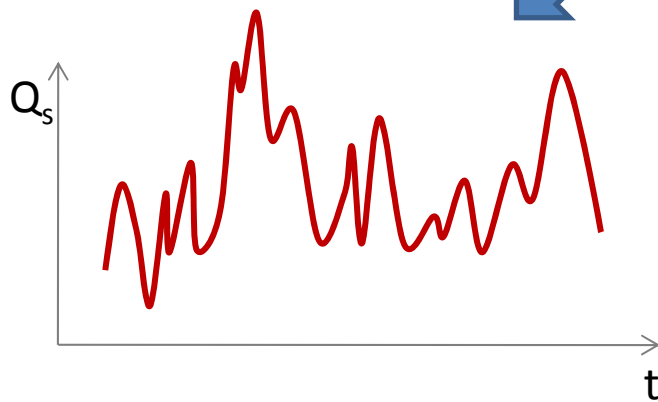
# CAESAR landscape evolution model

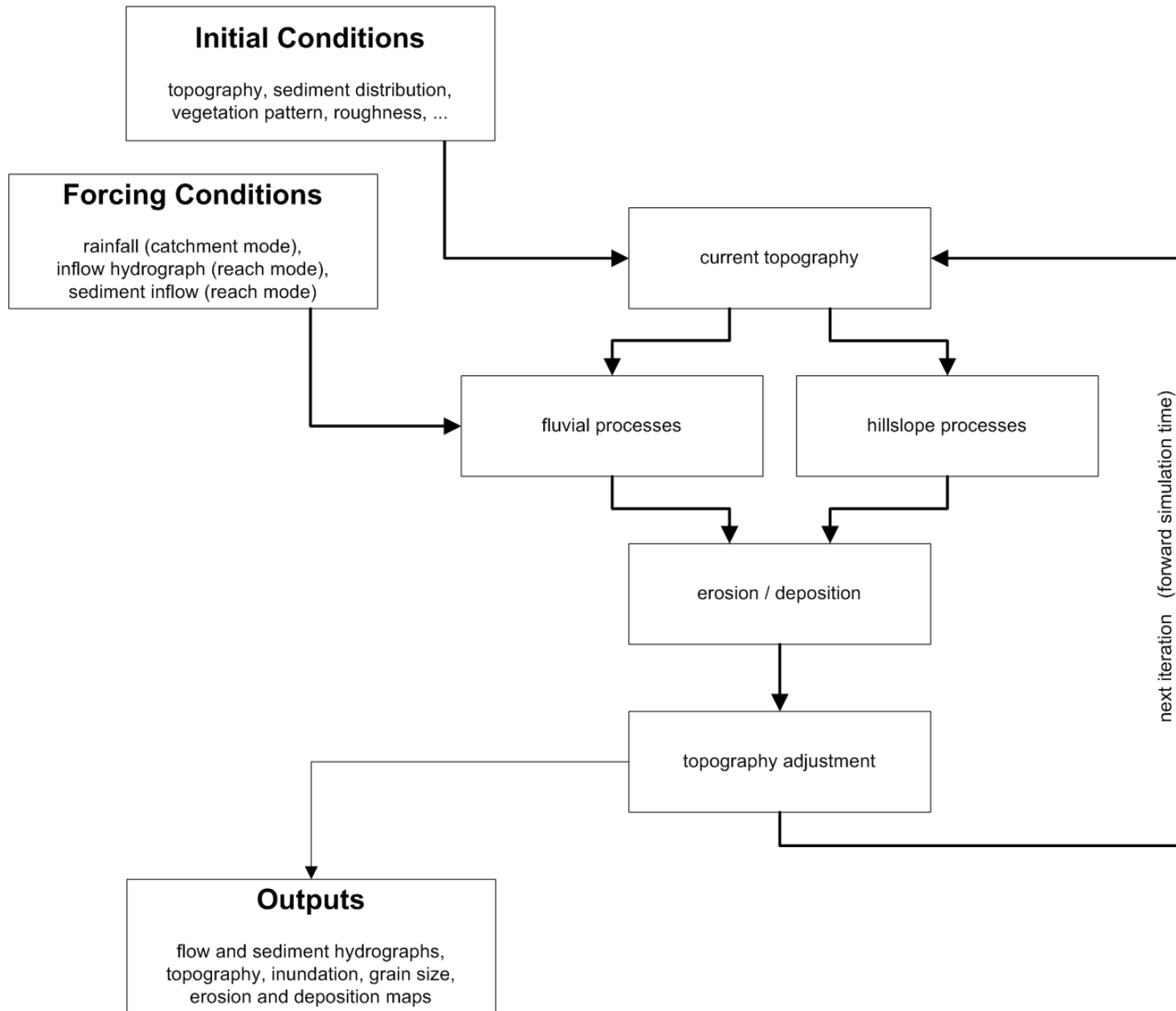
Marco Van De Wiel



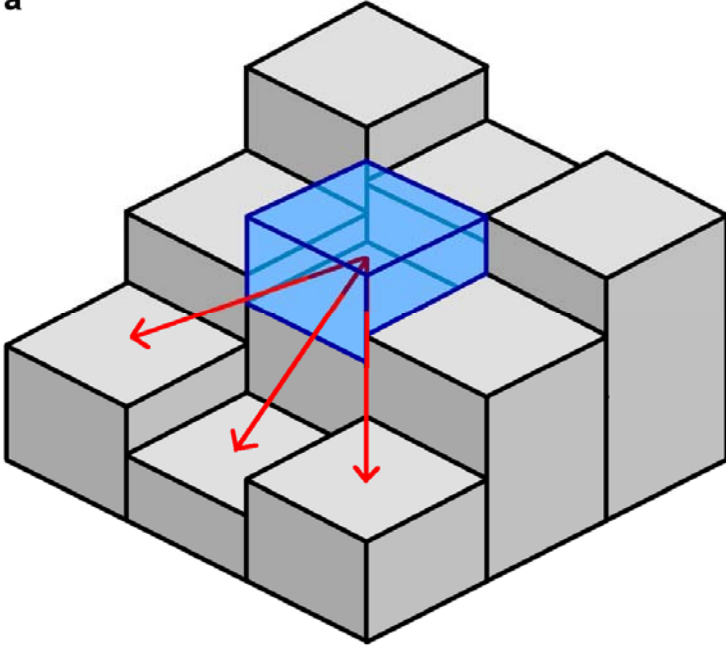
# CAESAR model

Coulthard et al. (Hydrol. Processes, 2002)  
Van De Wiel et al. (Geomorphology, 2007)

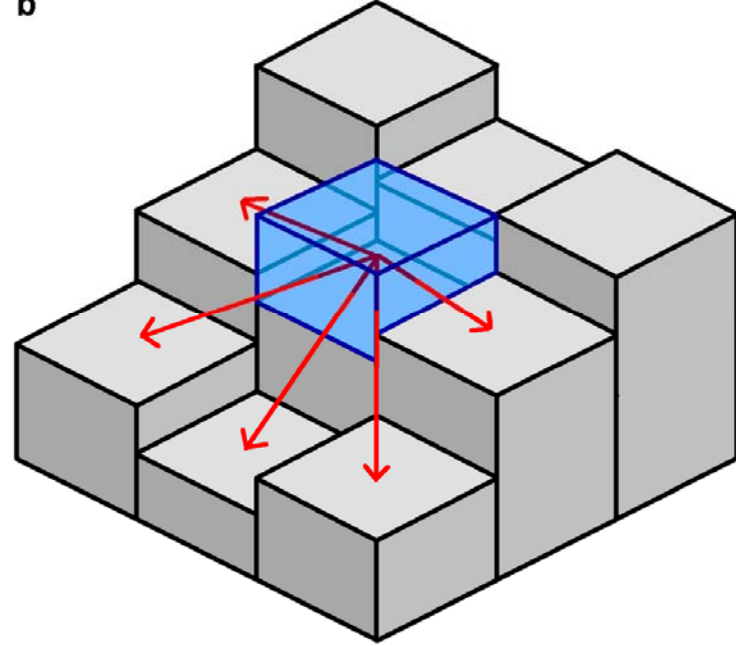


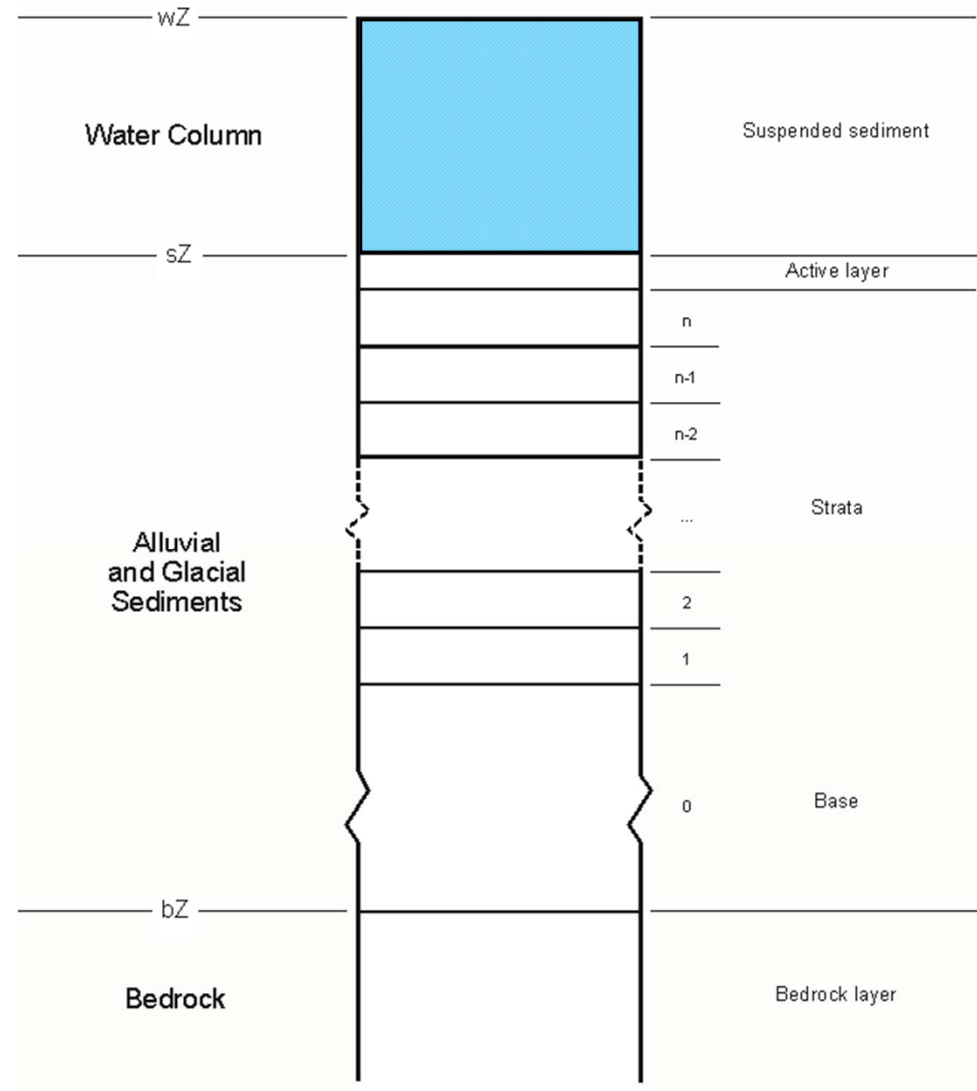
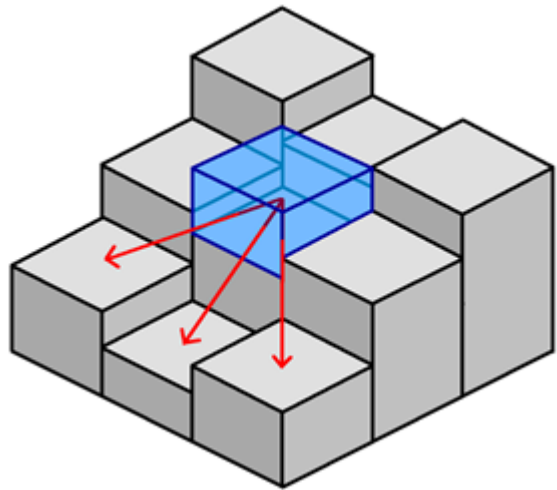


a

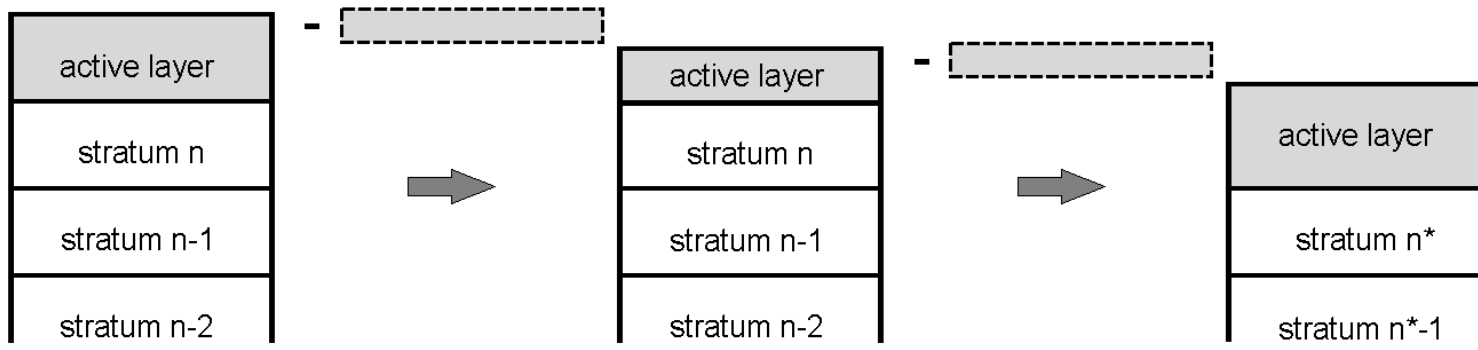


b

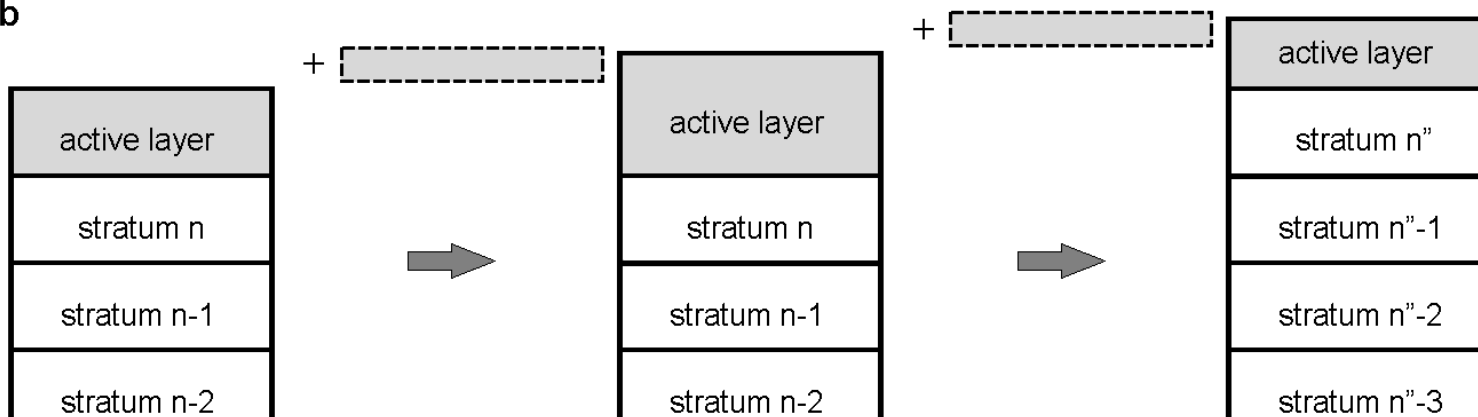




**a**



**b**



## Key publications

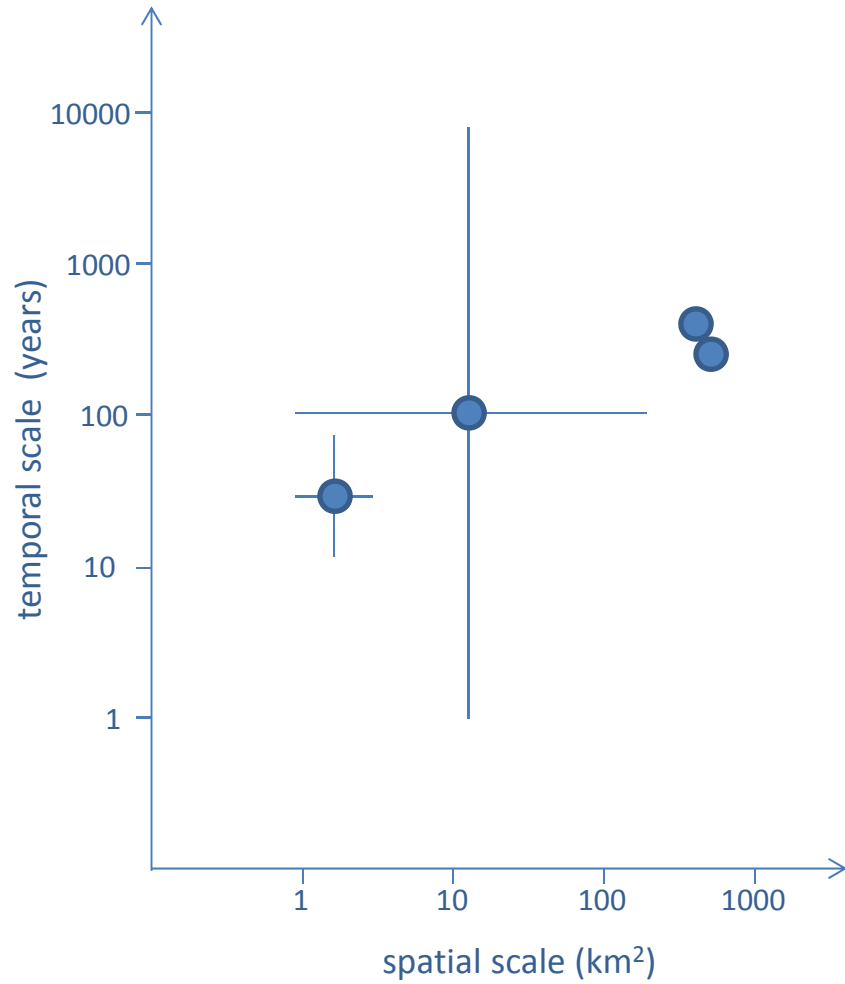
**Coulthard, T.J., Macklin, M.G., and Kirkby, M.J., 2002.** A cellular model of Holocene upland river basin and alluvial fan evolution, *Earth Surface Processes and Landforms*, 27: 269–288.

**Van De Wiel, M.J., Coulthard, T.J., Macklin, M.G., and Lewin, J., 2007.** Embedding reach-scale fluvial dynamics within the CAESAR cellular automaton landscape evolution model. *Geomorphology*, 90: 283-301.

**Coulthard, T. J., Neal, J. C., Bates, P. D., Ramirez, J., de Almeida, G. A. M., and Hancock, G. R., 2013.** Integrating the LISFLOOD-FP 2D hydrodynamic model with the CAESAR model: implications for modelling landscape evolution. *Earth Surface Processes and Landforms*, 38: 1897–1906.



# Conceptual applications



Lateral erosion and river meandering  
Coulthard and Van De Wiel, 2006. Earth Surface Processes and Landforms.

Non-linearity in sediment yields  
Coulthard et al., 2007. Geomorphology  
Van De Wiel and Coulthard, 2010. Geology.  
Van De Wiel et al., 2015. EGU Vienna (paper in prep)

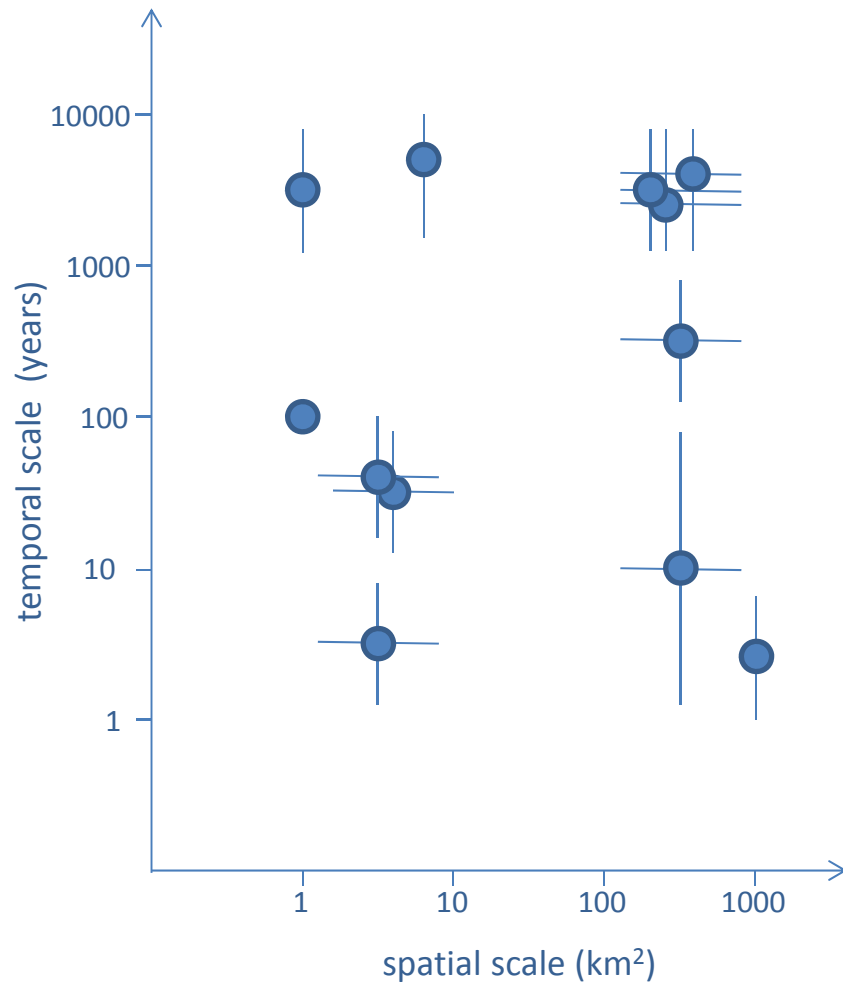
Impacts of tectonics and climate change on sediment yield  
Coulthard and Van De Wiel, 2013. Earth Surface Dynamics.

Sediment connectivity  
Coulthard and Van De Wiel, 2016. Geomorphology (in press).





## Real-world applications



Impacts of land-use change in the Swale catchment, Yorkshire, UK  
Coulthard and Macklin, 2001. *Journal of Quaternary Science*.

Alluvial fan building along a tributary of the River Wharfe, Yorkshire, UK  
Coulthard et al., 2002. *Earth Surface Processes and Landforms*.

Historical contamination of metal mining along the river Swale, Yorkshire, UK  
Coulthard and Macklin, 2003. *Geology*.

Sediment delivery to and shelf evolution of the Humber estuarine channel, Yorkshire, UK  
Shennan et al. 2003. *Science of the Total Environment*.

Catchment response to environmental change, in Yorkshire, UK  
Coulthard et al., 2005. *Geomorphology*.

Sediment delivery to an Alpine lake, Haute Savoie, France  
Welsh et al., 2009. *Holocene*.

Geomorphological change in Tin Camp Creek, Northern Territory, Australia  
Hancock et al., 2010. *Earth Surface Processes and Landforms*.

Historical lateral channel change along a small reach of the River Swale, Yorkshire, UK  
Coulthard and Van De Wiel, 2012. *Philosophical Transactions of the Royal Society A*.

Change and evolution of the Tagliamento River, Italy  
Ziliani and Surian, 2012. *Geomorphology*.

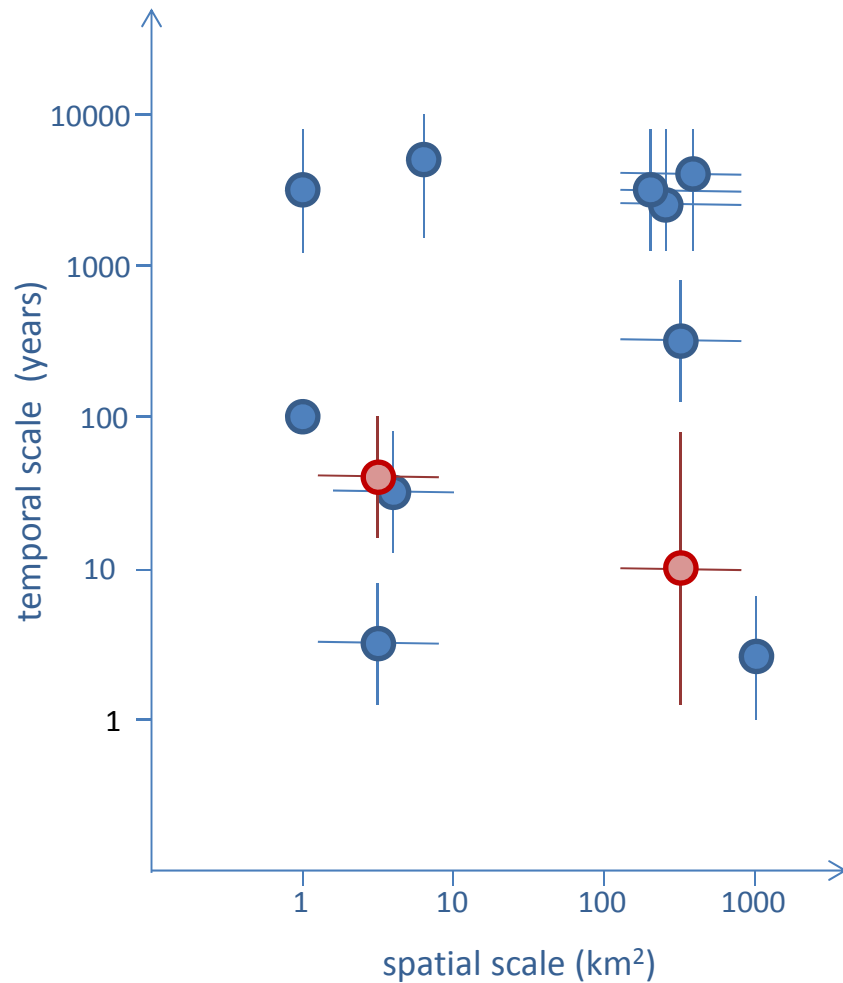
Sediment dynamics in an Alpine river, Italy  
Pasculli and Audisio, 2015. *Environmental Modelling and Assessment*.

River sediment dynamics resulting from climate change, Washington and Idaho, USA  
Praskievicz, 2015. *Earth Surface Processes and Landforms*.

Geomorphic change in the Derwent River, Derbyshire, UK  
Howard et al., 2016. *Journal of Cultural Heritage*.



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# Thank you

marco.vandewiel@coventry.ac.uk

<https://sourceforge.net/projects/caesar-lisflood/>