



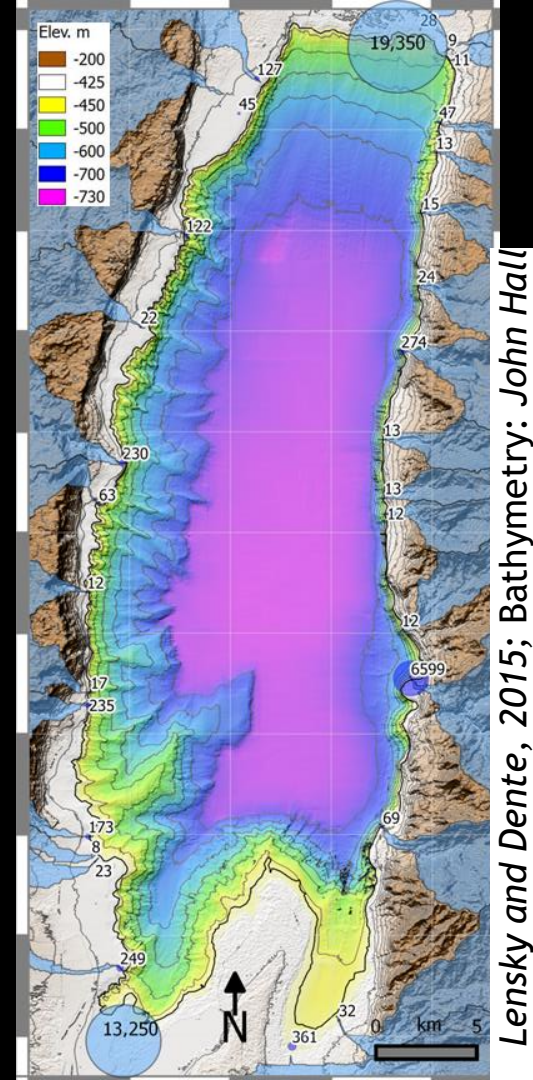
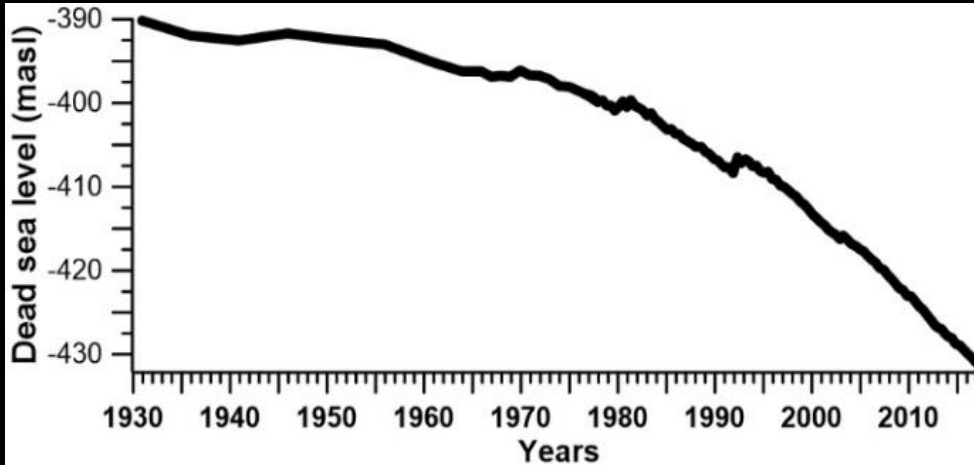
Photo: Peleg Michaeli(2005)

Out of equilibrium sinuosity: The development of incised meandering channels in response to base-level fall

Elad Dente, Nadav Lensky, Efrat Morin, and Yehouda Enzel

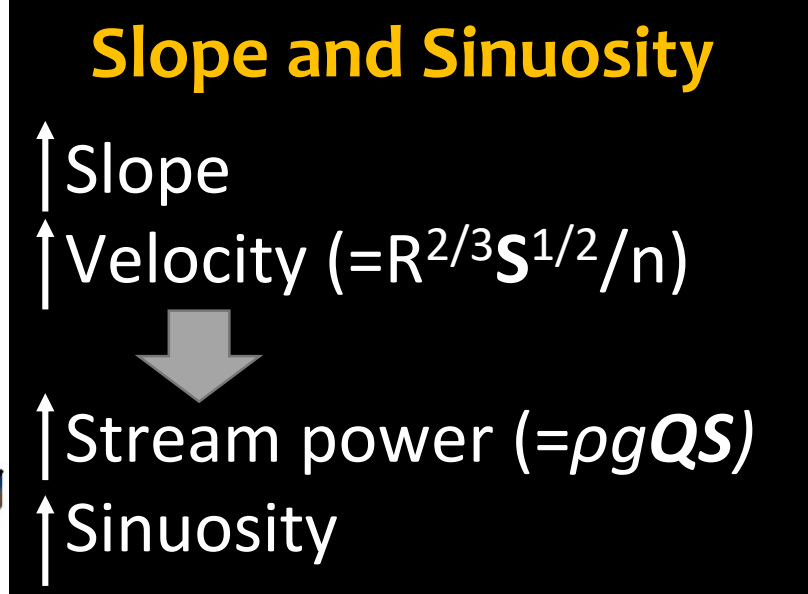
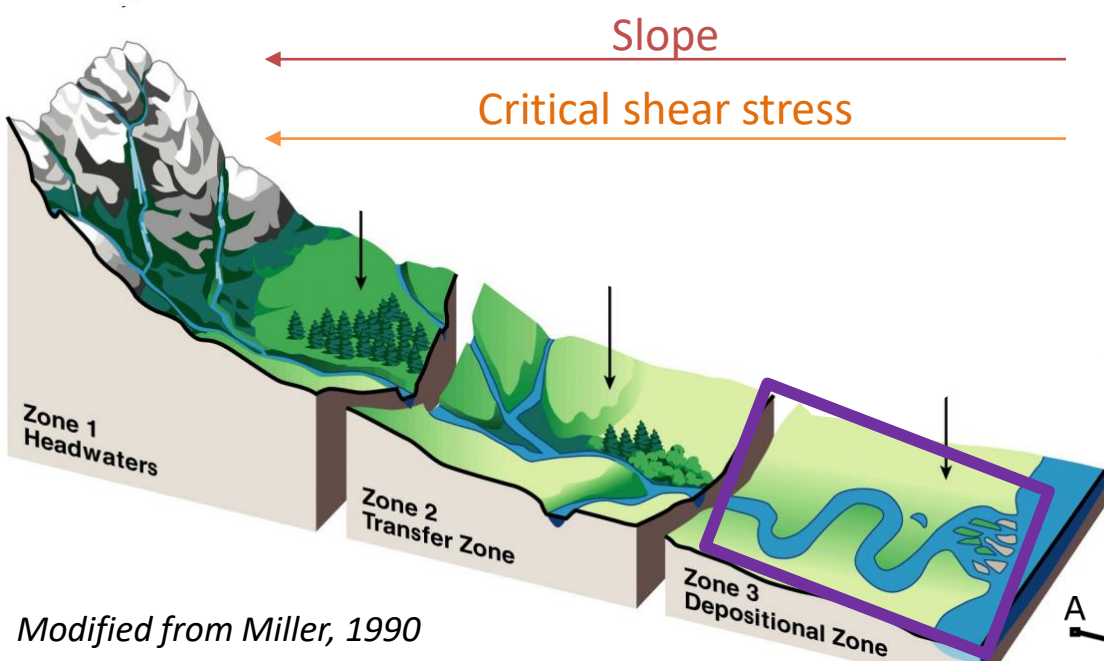
THE DEAD SEA GEOMORPHOLOGICAL WONDERLAND

- Deep lake experiencing 40 m level drop at 1 m yr^{-1} !
- > 40 channels are responding
- Various slopes, substrates and hydrologic regimes
- High resolution data (time and space)

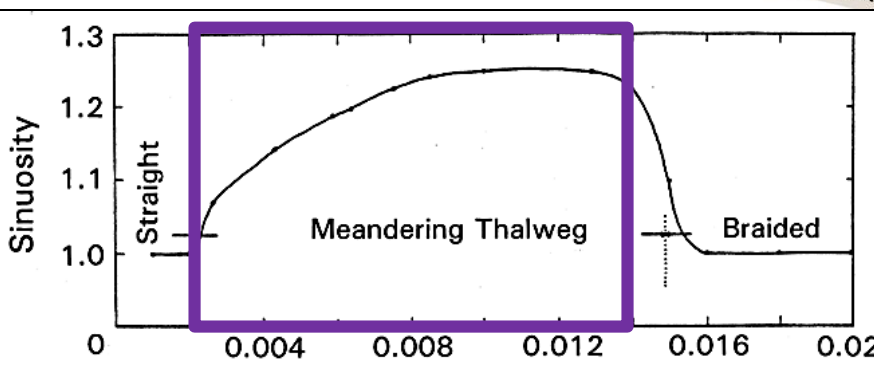


Ein Feshkha study area
provides a field-scale
laboratory for observing
the impact of steepening
regional slope on the
channel pattern

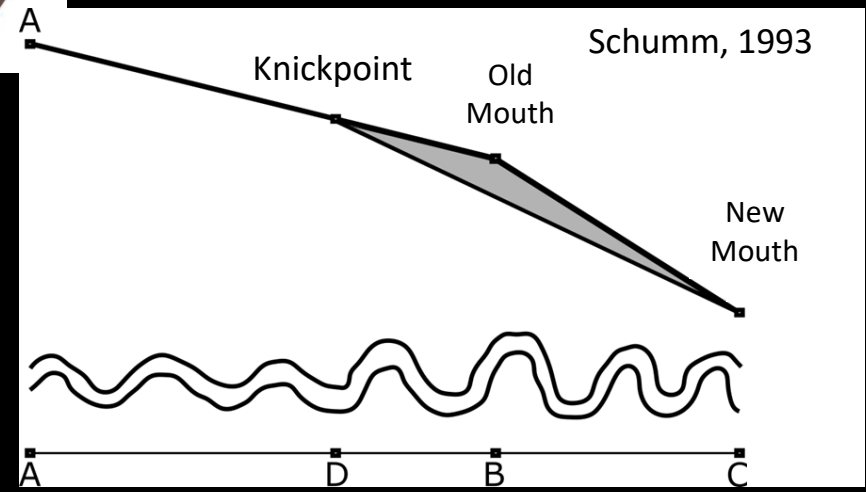
- Homogeneous substrate
- Relatively stable discharge
- 12 channels
- Different slope settings



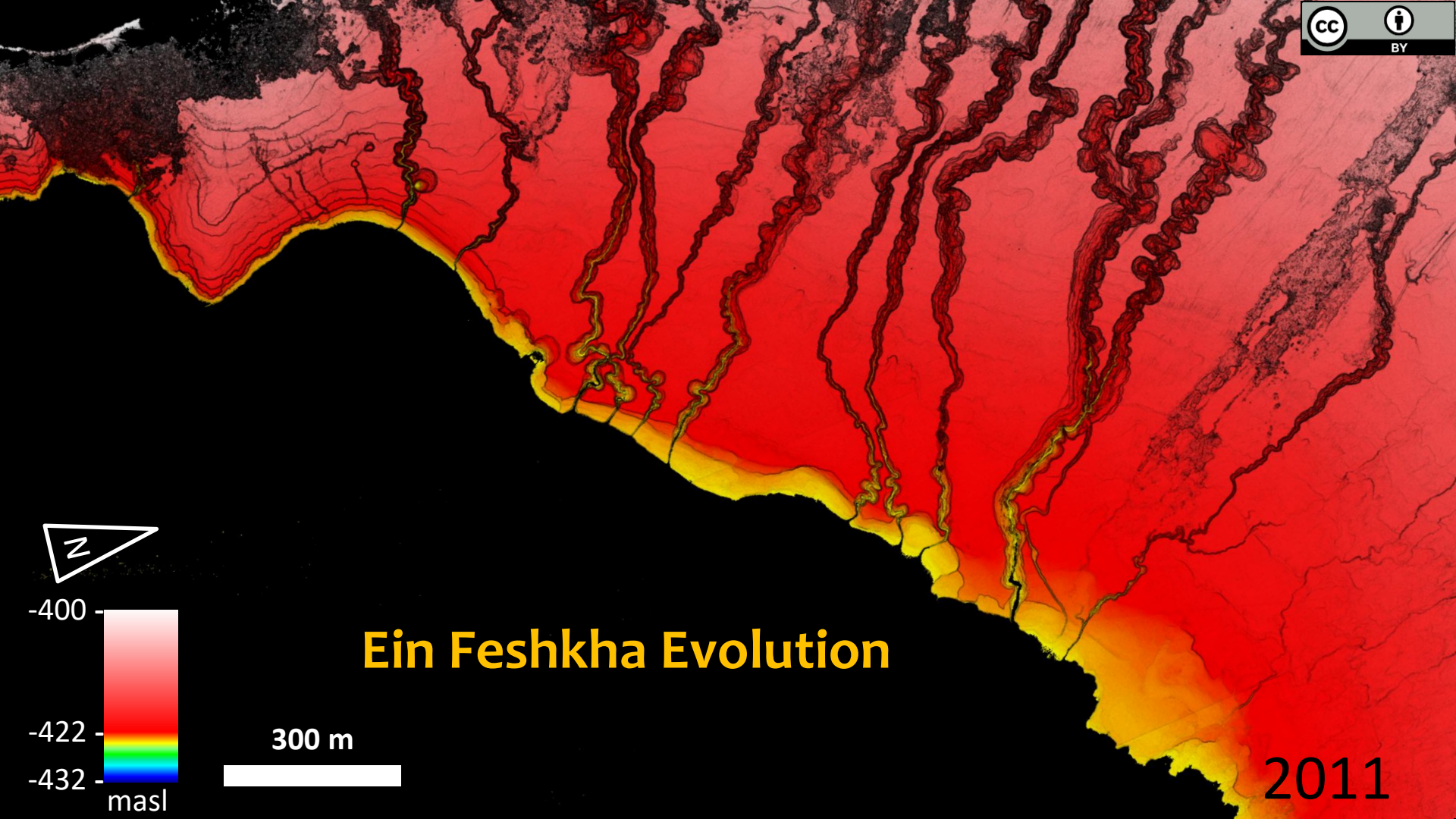
Modified from Miller, 1990

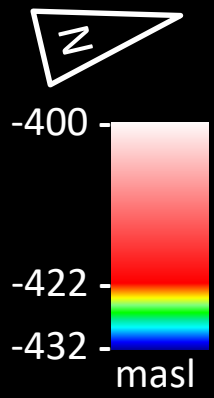
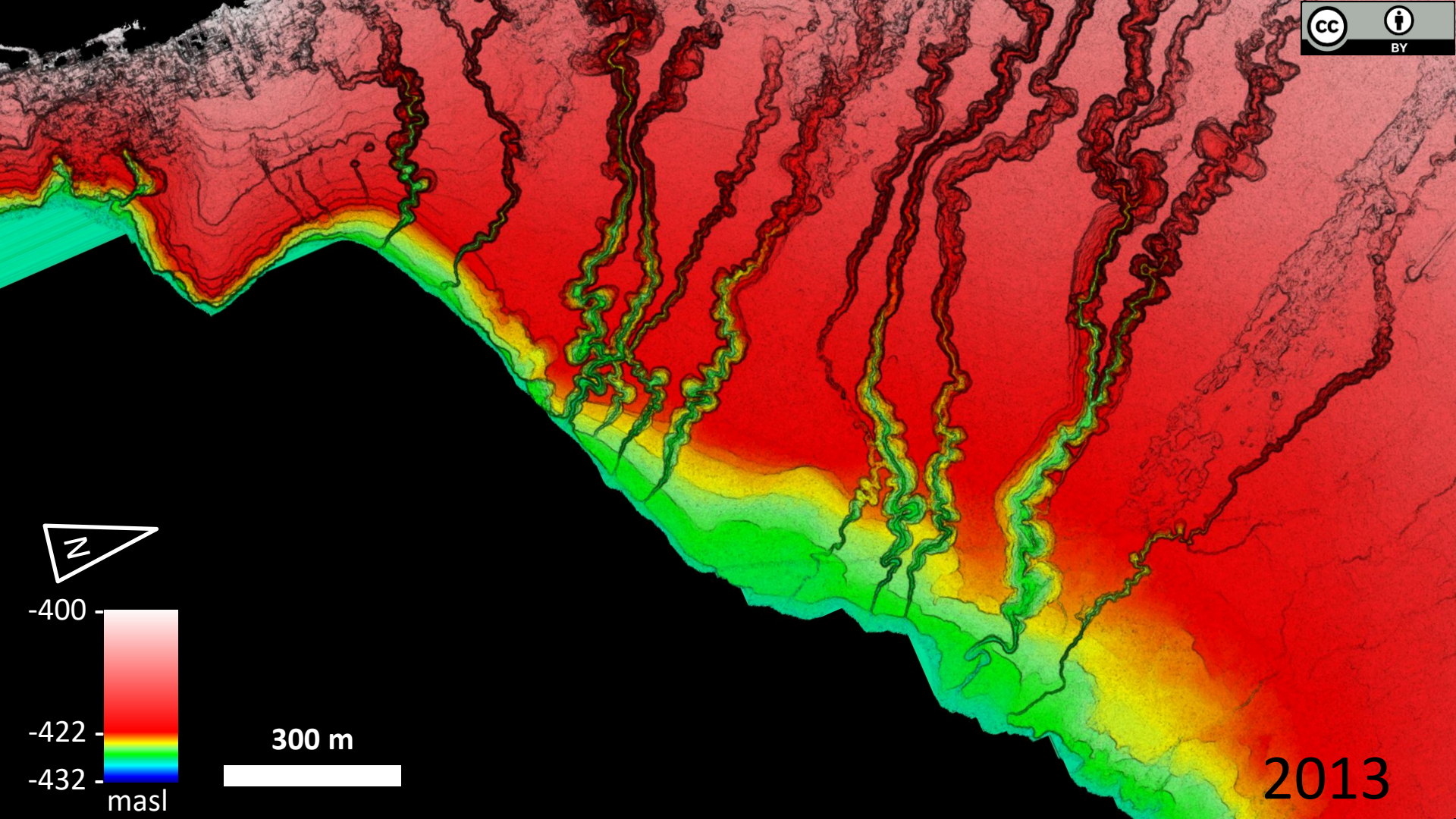


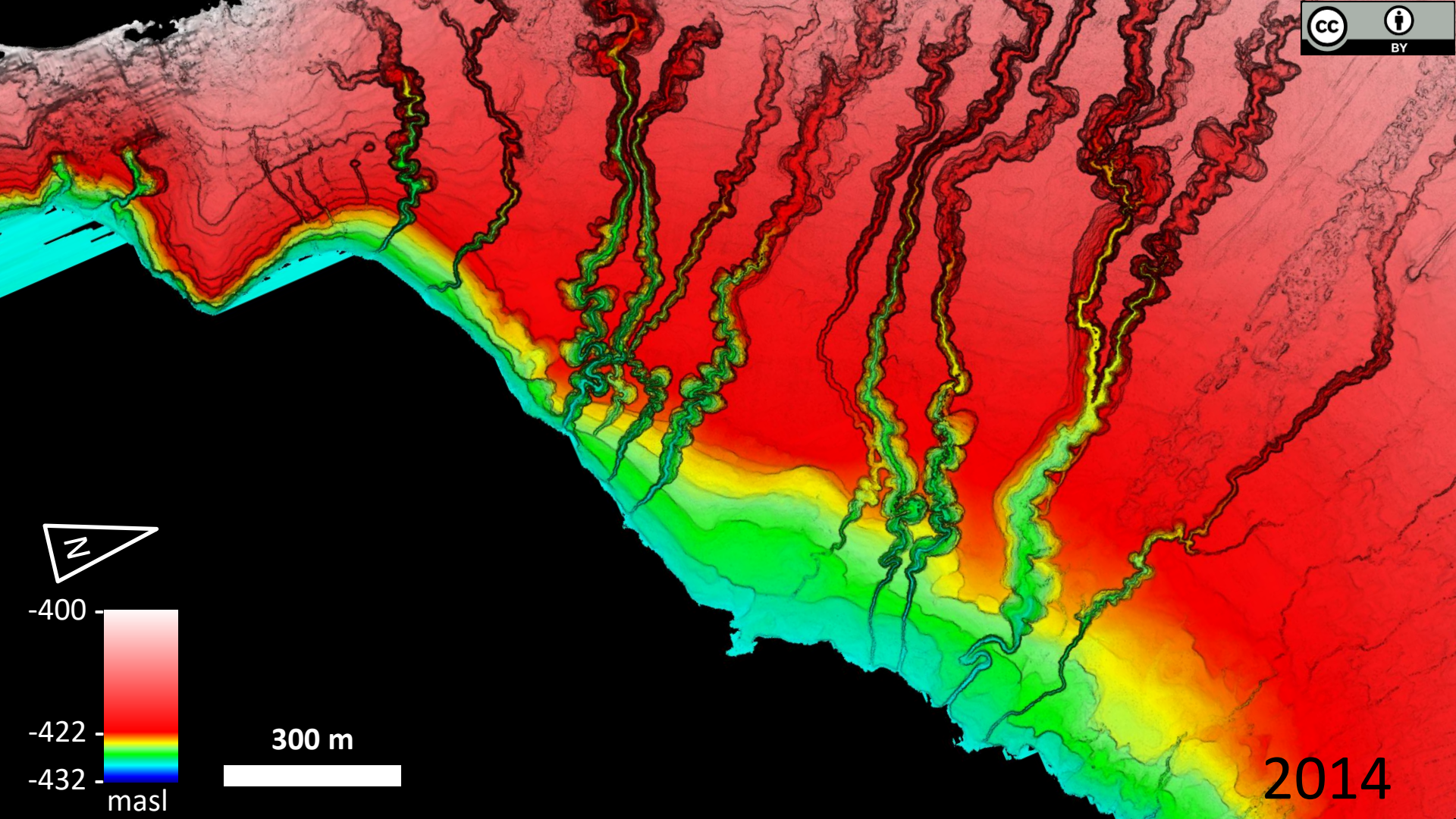
Schumm and Kahn (1972) Slope

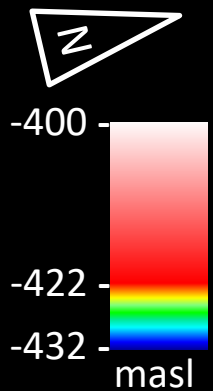
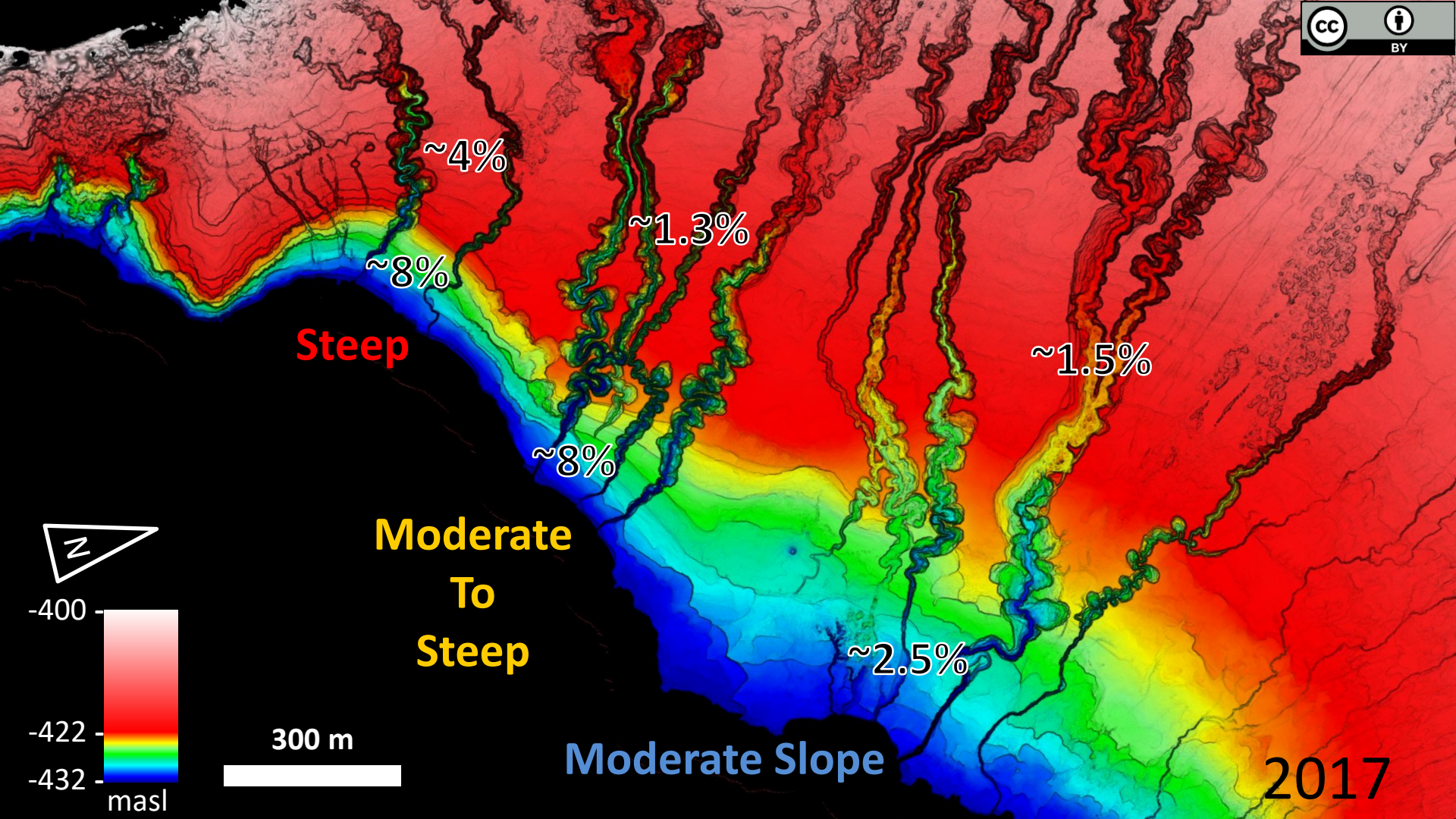


Schumm, 1993





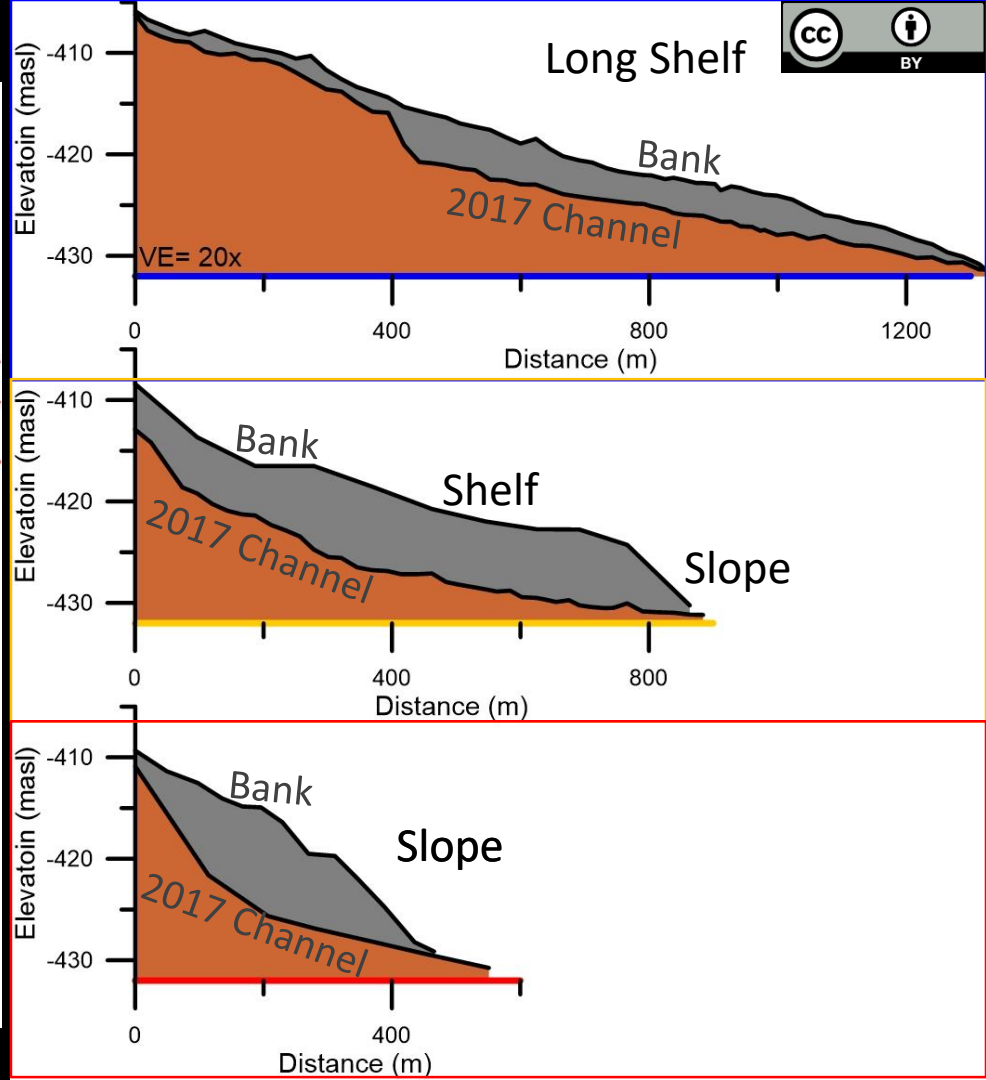
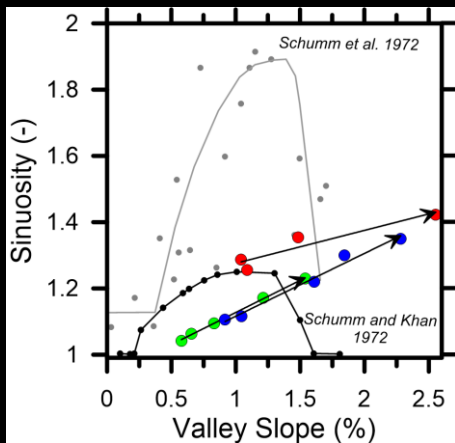
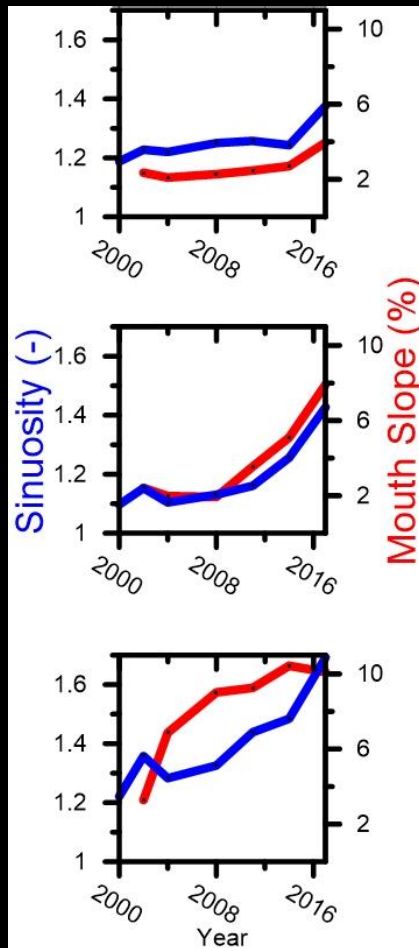
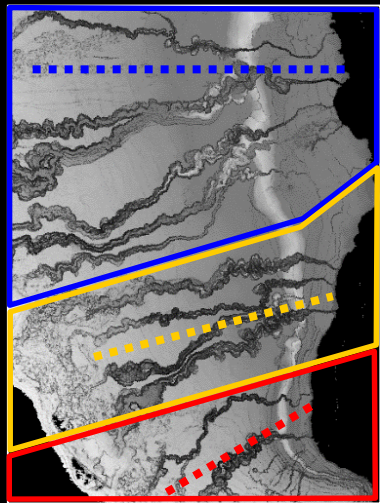




2019



Sinuosity Evolution



Main Insights

- All the channels exhibit a sinuosity increase with steepening regional slope due to base-level fall.
- Under the effect of steep and constant valley slope, and erodible substrate, the channels first elongate through the formation of new straight reaches, following the receding Dead Sea shoreline.
- Subsequently, under the impact of steepening valley slope, rapid incision confines the flow. In turn, the confined flow exerts lateral erosion on the banks and increases channel sinuosity.

