How spatial vegetation distribution affects soil erosion and sediment transport

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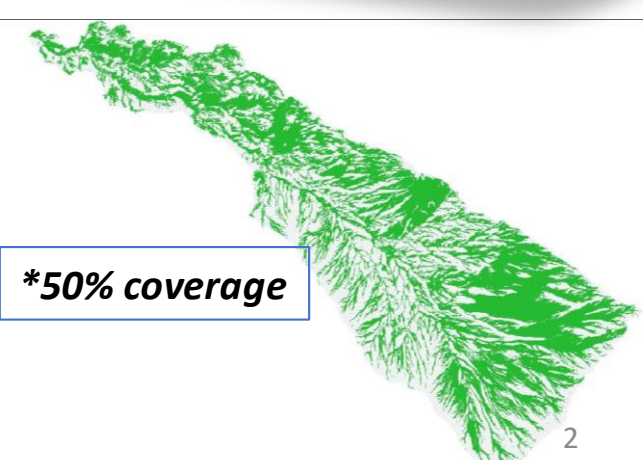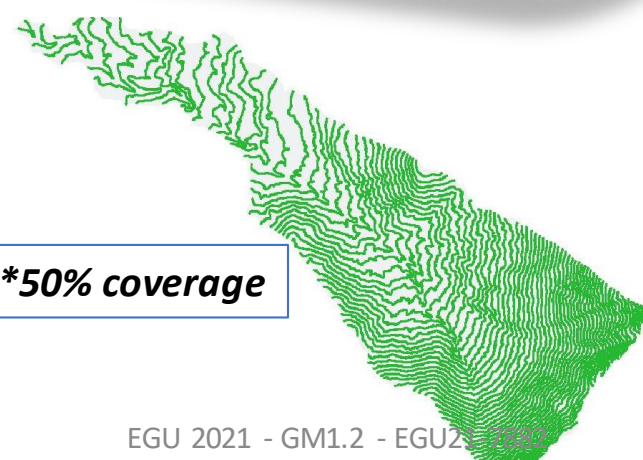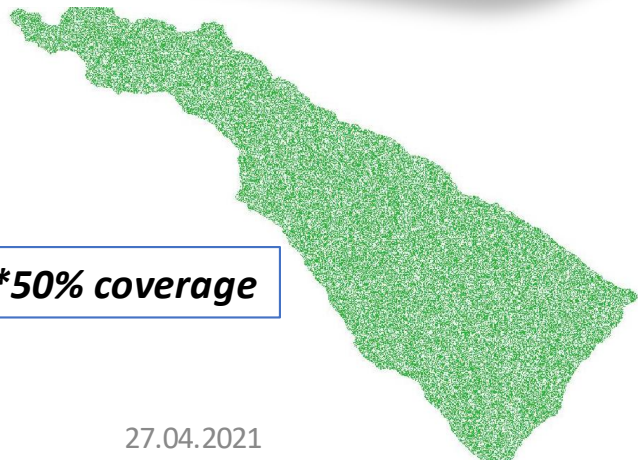Lothar Schrott (University of Bonn)
Jürgen Schmidt (Freiberg University of Mining and Technology)
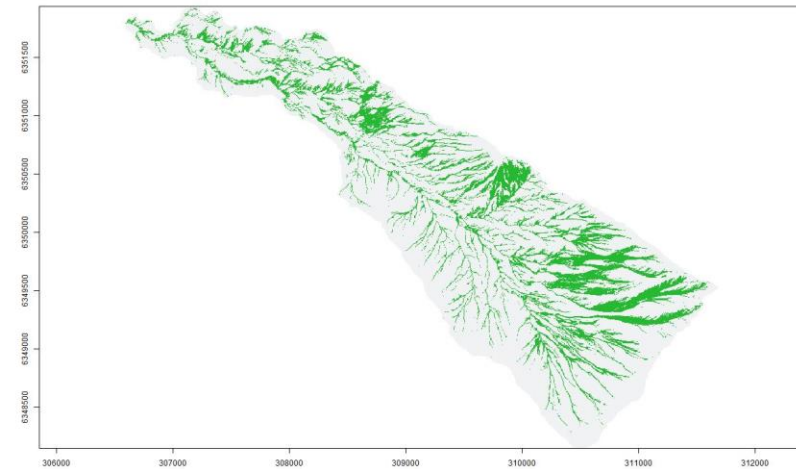
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Research question:

Is it just the amount of vegetation/biomass which impacts soil erosion or does the spatial distribution of plants have a significant impact on erosion rates within a catchment?
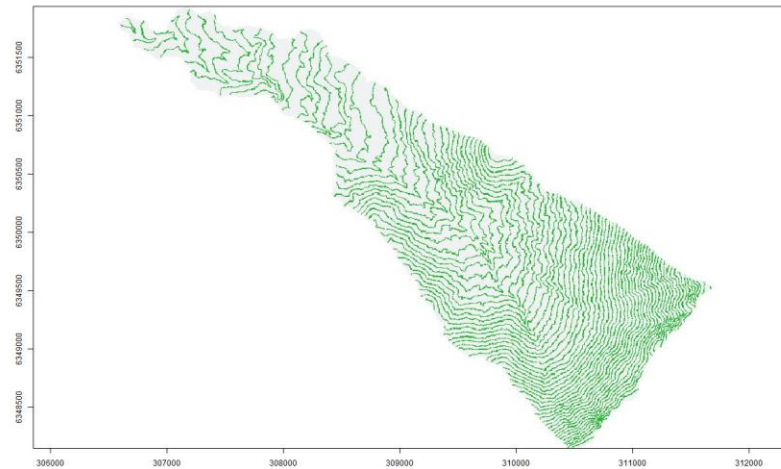

50% coverage

50% coverage

50% coverage

Approach:
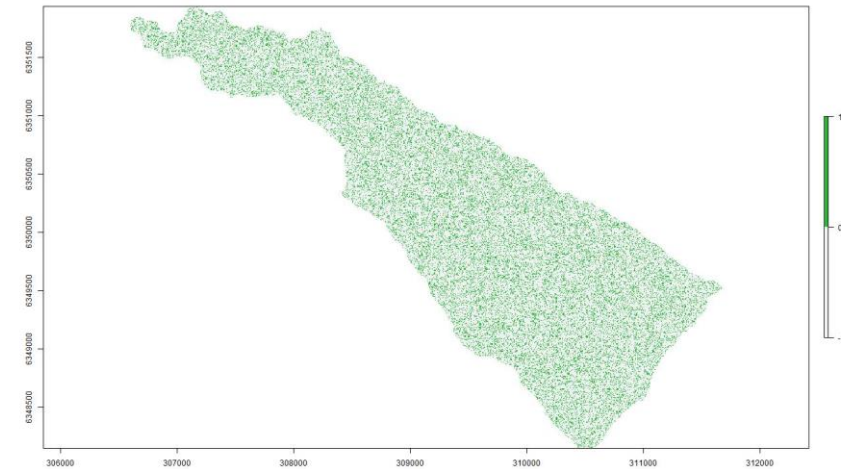## Creation of three vegetation patterns

Distribution along areas
with potential high wetness

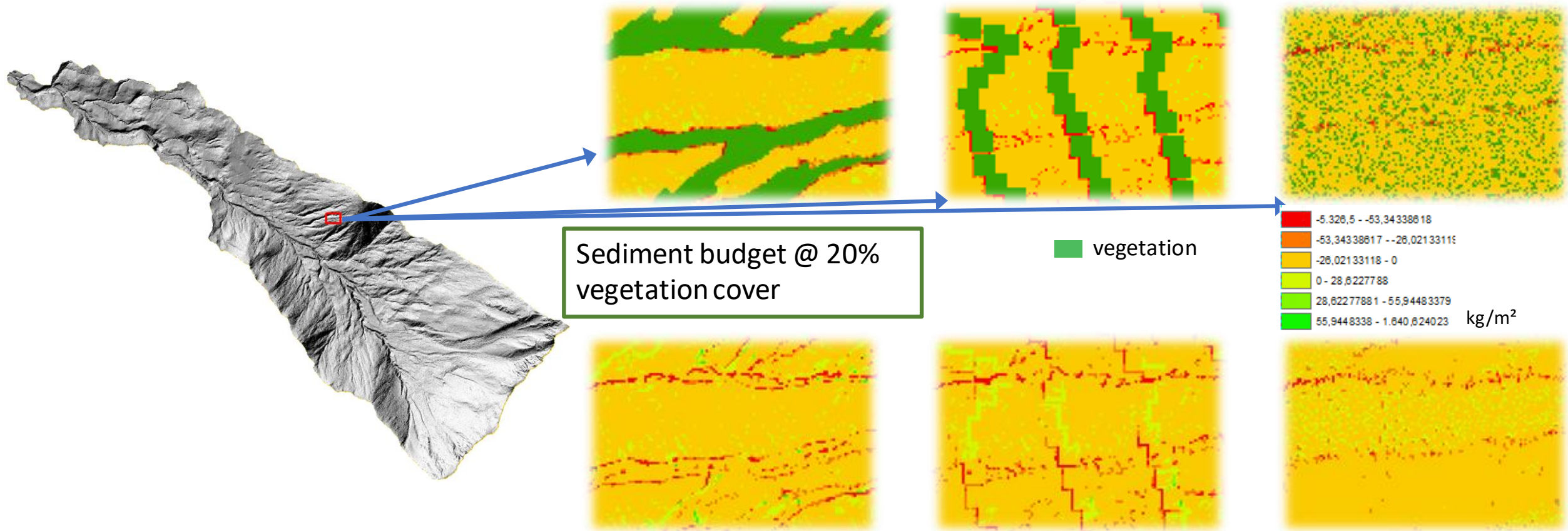$$\rightarrow \frac{TWI\ (topographic\ wettness\ index)}{IRR\ (solar\ irradiace)}$$

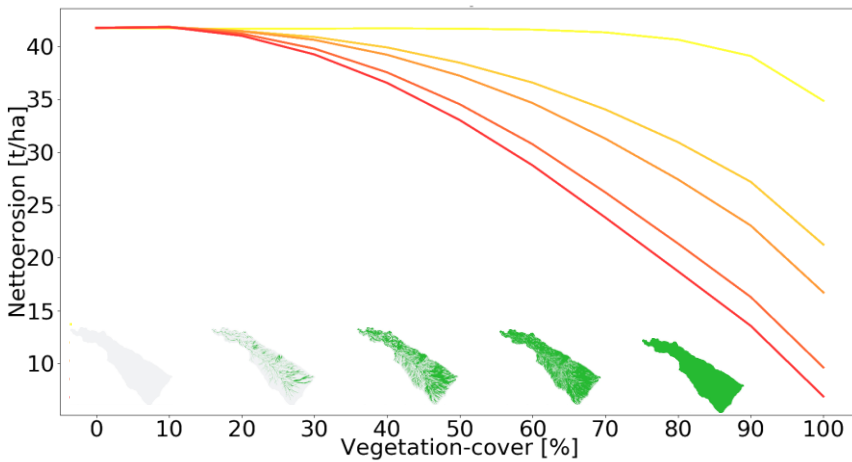Distribution parallel
to contour lines
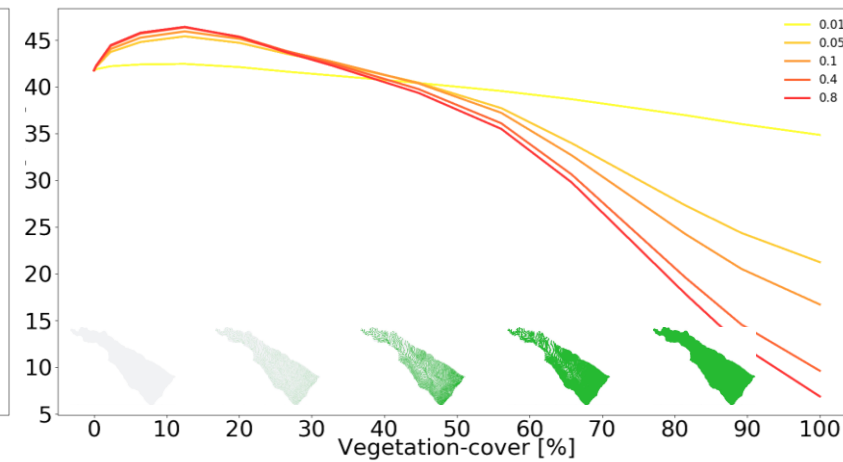
Random distribution of
vegetation

Methodology:

Stepwise increase of vegetation cover of the three vegetation-pattern-types within the catchment area and application of an erosion model (EROSION-3D)
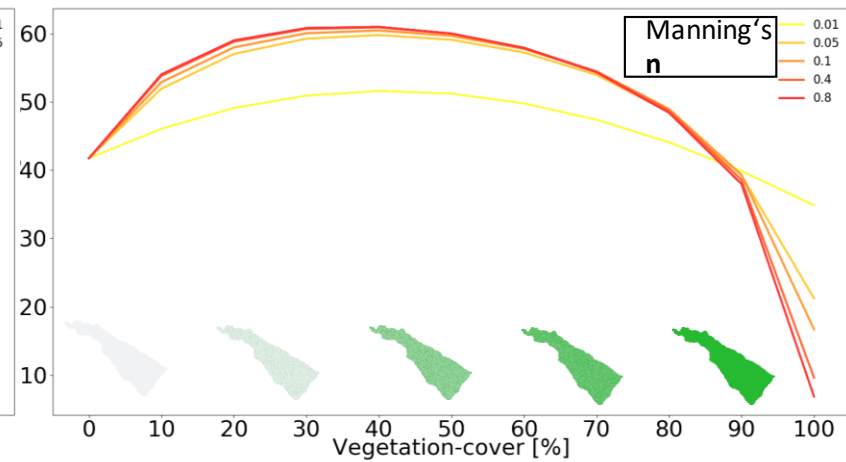

Sediment budget @ 20% vegetation cover

vegetation

🟥	-5.326,5 - -53,34338618
🟧	-53,34338617 - -26,02133119
🟨	-26,02133118 - 0
🟨	0 - 28,6227788
🟩	28,62277881 - 55,94483379
🟩	55,9448338 - 1.640,624023

kg/m²

Results

TWI-based distribution

Banded distribution

Random distribution

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