

Downstream Morphological and Sedimentary Transformations in Modern Continental-Scale Rivers

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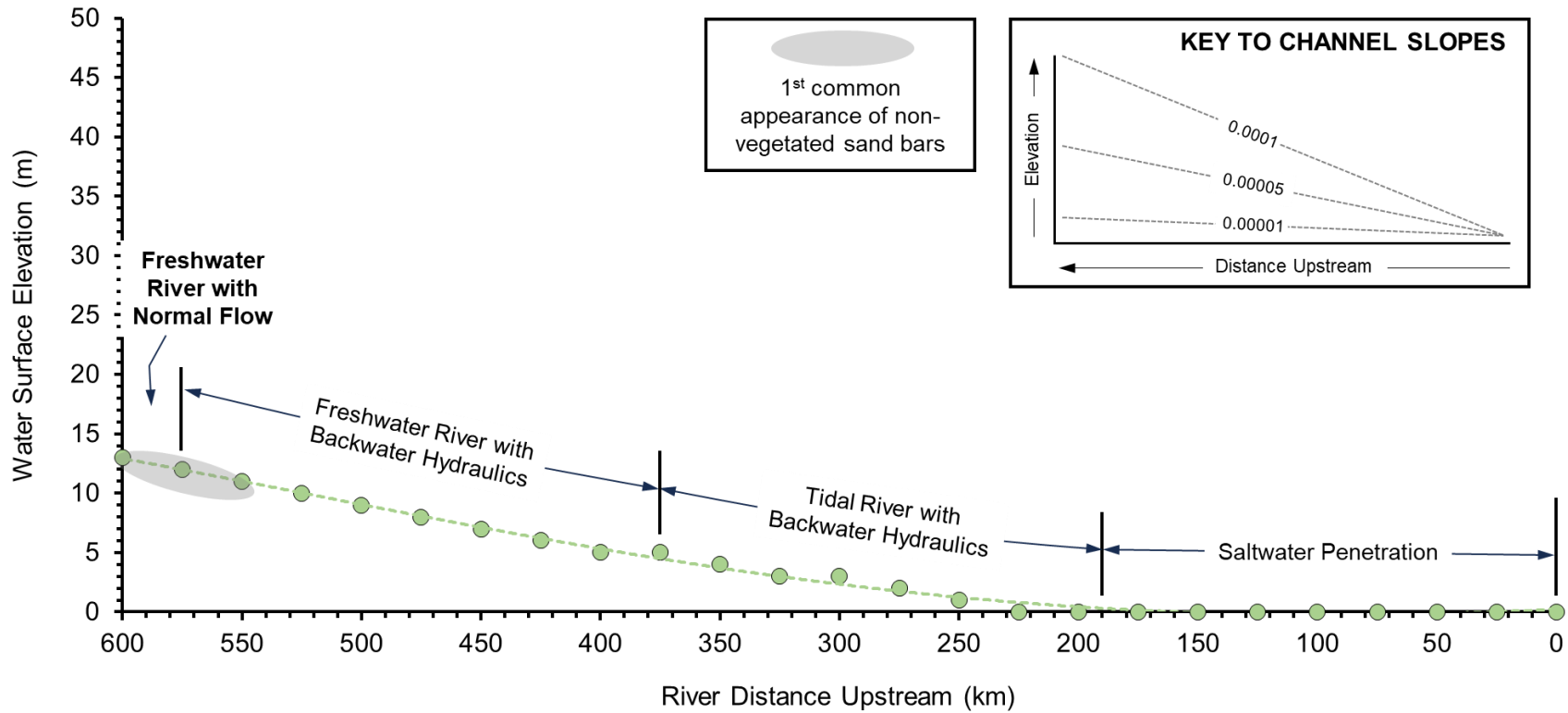
Supplementary Material

This document presents supplementary material to accompany this submission. It includes modern river channel gradient measurements and plots, modern river measurements and data analysis deduced from the overall detest. Below is a summary of the supplementary material included:

Supplementary Material	Description
Table SM1	Channel gradient measurements of the 5 studied modern river systems, covering a distance from the river mouth ($x=0$) to a variable distance upstream in kilometers. These measurements are based on water-surface elevations from SRTM DEM data in Google Earth, measured every 25 km over variable along-channel distances for each river.
Tables SM2-SM6	Measurements of the 5 river systems in this study (Mississippi, Paraná, Niger, Indus and Irrawaddy), including upstream RK distances from the river mouth, normalized distance to backwater transition, channel width(es), channel belt width, B_{ChB}/B_{Ch} ratios, sand- vs. mud-dominated measurements and S/M ratio
Table SM7	Drainage basin areas, total river lengths, and mean annual discharge for large rivers examined in this study (from Linke et al., 2019).
Table SM8	River Channel Gradient Analysis for Large River Systems Examined in this Study.
Table SM9	Tidal river and saltwater penetration lengths for the large rivers examined for this study.
Table SM10	Morphometrics and analysis for channel-belt widths, channel widths, and sand-to-mud ratios for river systems examined in this study.
Plots SM11-15	Modern river channel gradients show the change of elevation (y-axis) in relation to change in distance from the river mouth ($x=0$), highlighting the change in slope. These plots are based on water-surface elevations from SRTM DEM data in Google Earth, measured every 25 km over an along-channel distance of 600 km. Reaches with common unvegetated bars at lower flow based on Google Earth imagery time series, which shows different flow stages over time
Plot SM16	A summary plot of presented channel gradients in Plots 1-5 for comparison.
Plot SM17	Amazon River channel gradient measurements – not included in the study, but presented here for comparisons.
Plot SM18	Mississippi River tidal vs. backwater reaches comparisons, highlighting morphological differences and variable magnitude of tidal range between different parts of the river, collected from gauging stations. It also includes the maximum limit of recorded saltwater penetration.

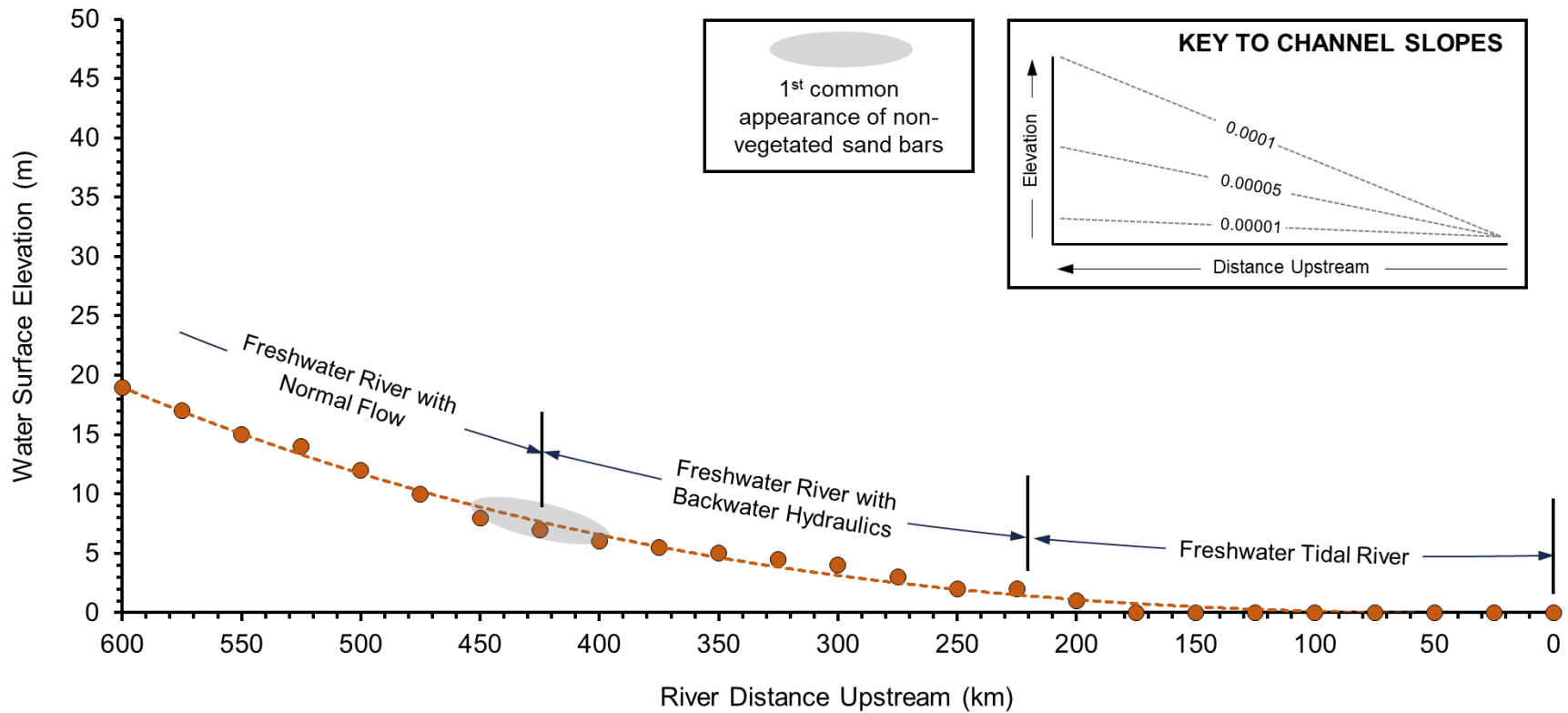
Moder River Channel Gradient Plots:

Mississippi River



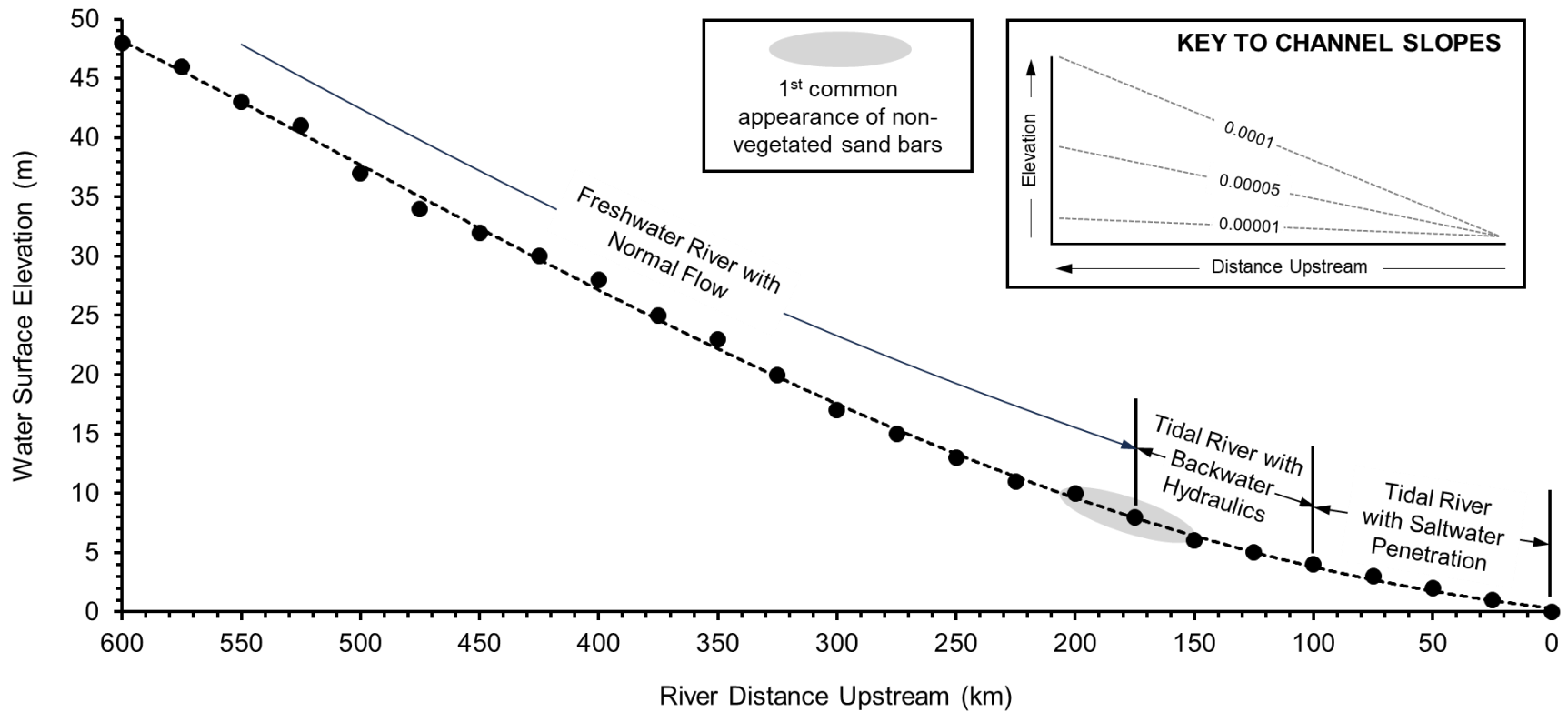
Plot SM11: Mississippi River channel gradient estimation.

Parana River



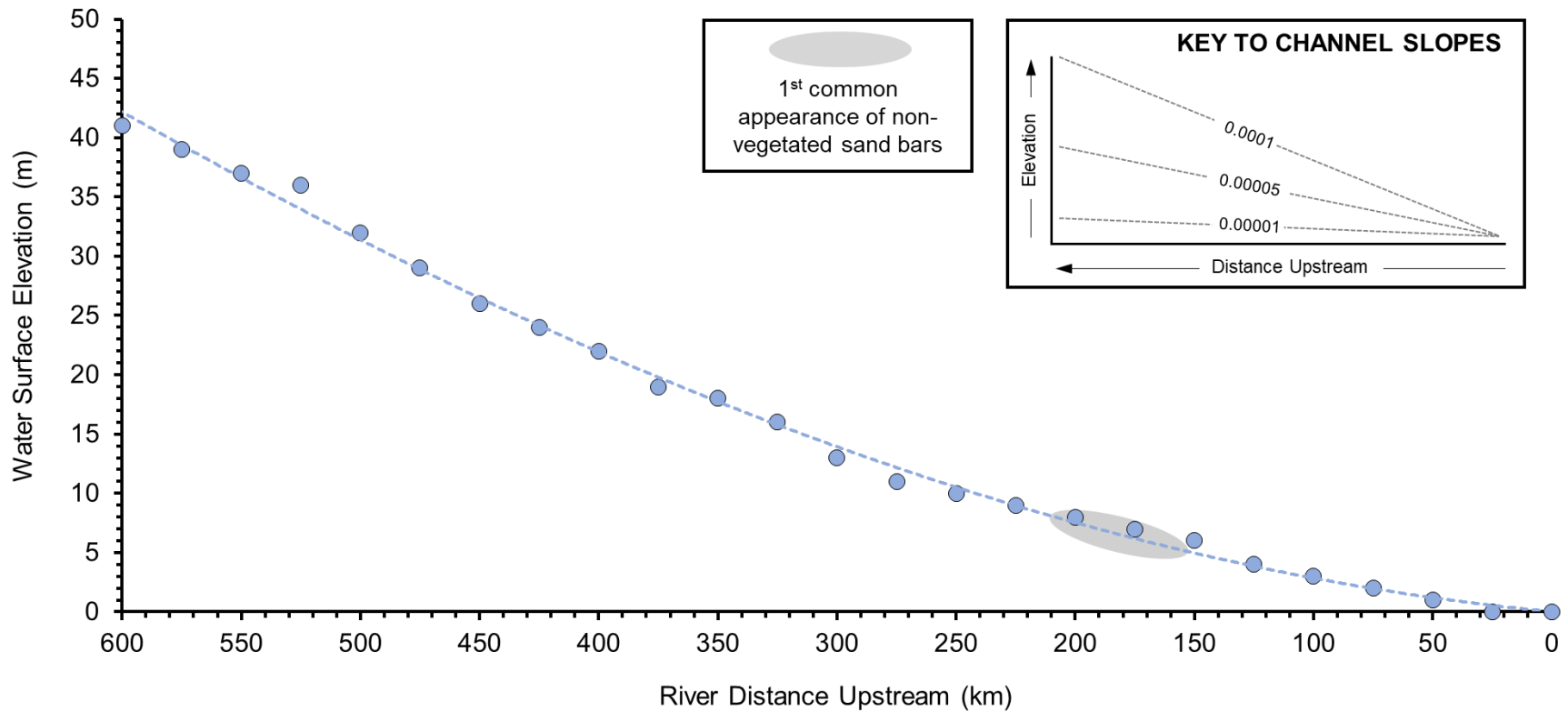
Plot SM12: Paraná River channel gradient estimation.

Niger River



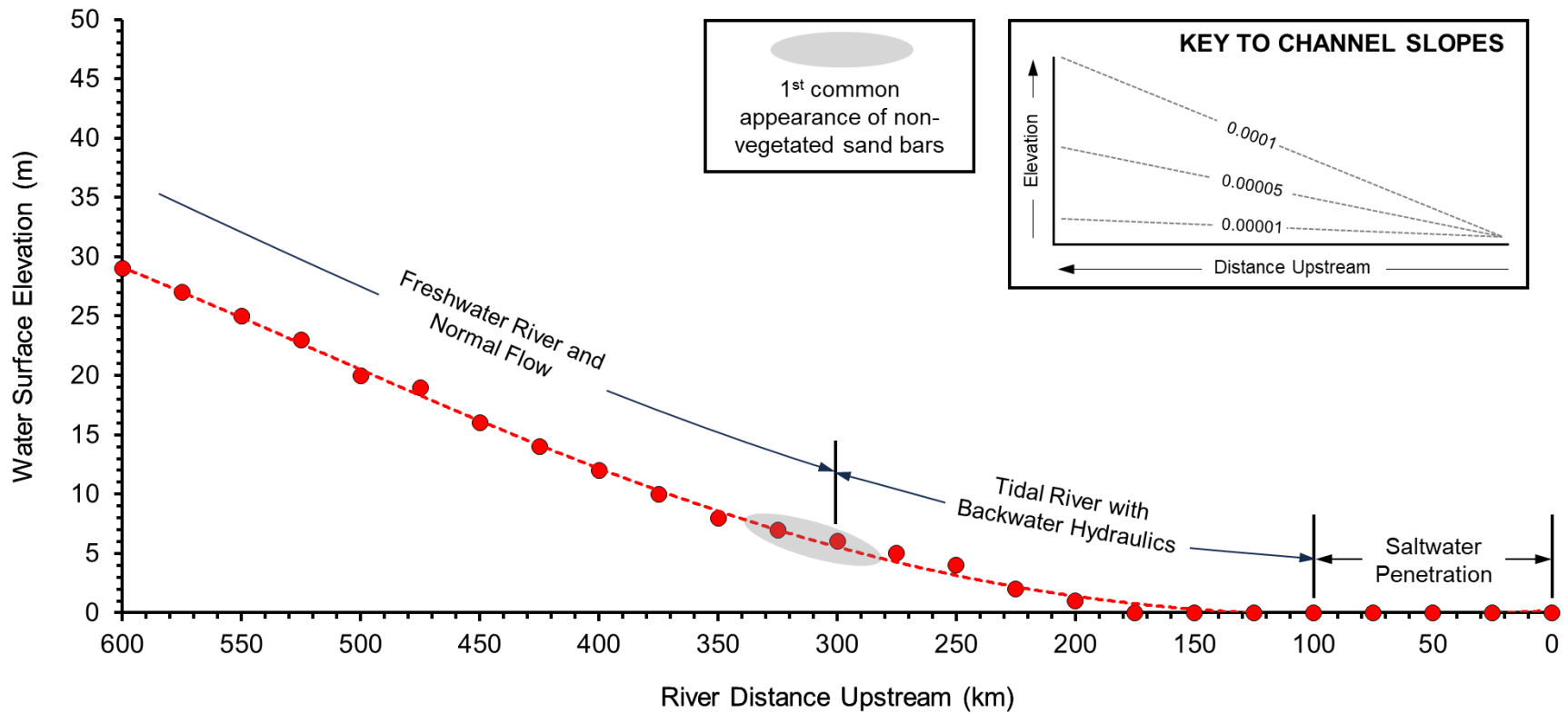
Plot SM13: Niger River channel gradient estimation.

Indus River



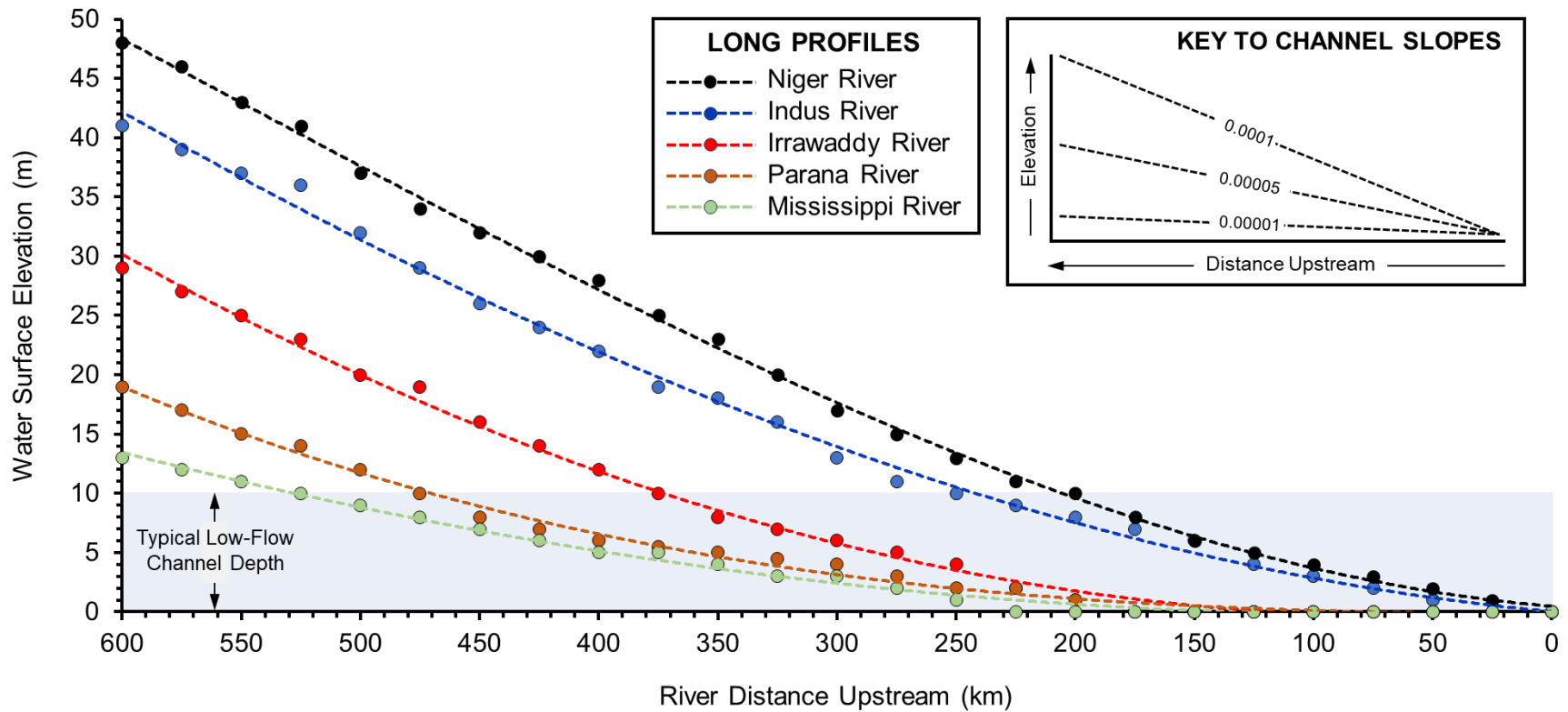
Plot SM14: Indus River channel gradient estimation.

Irrawaddy River



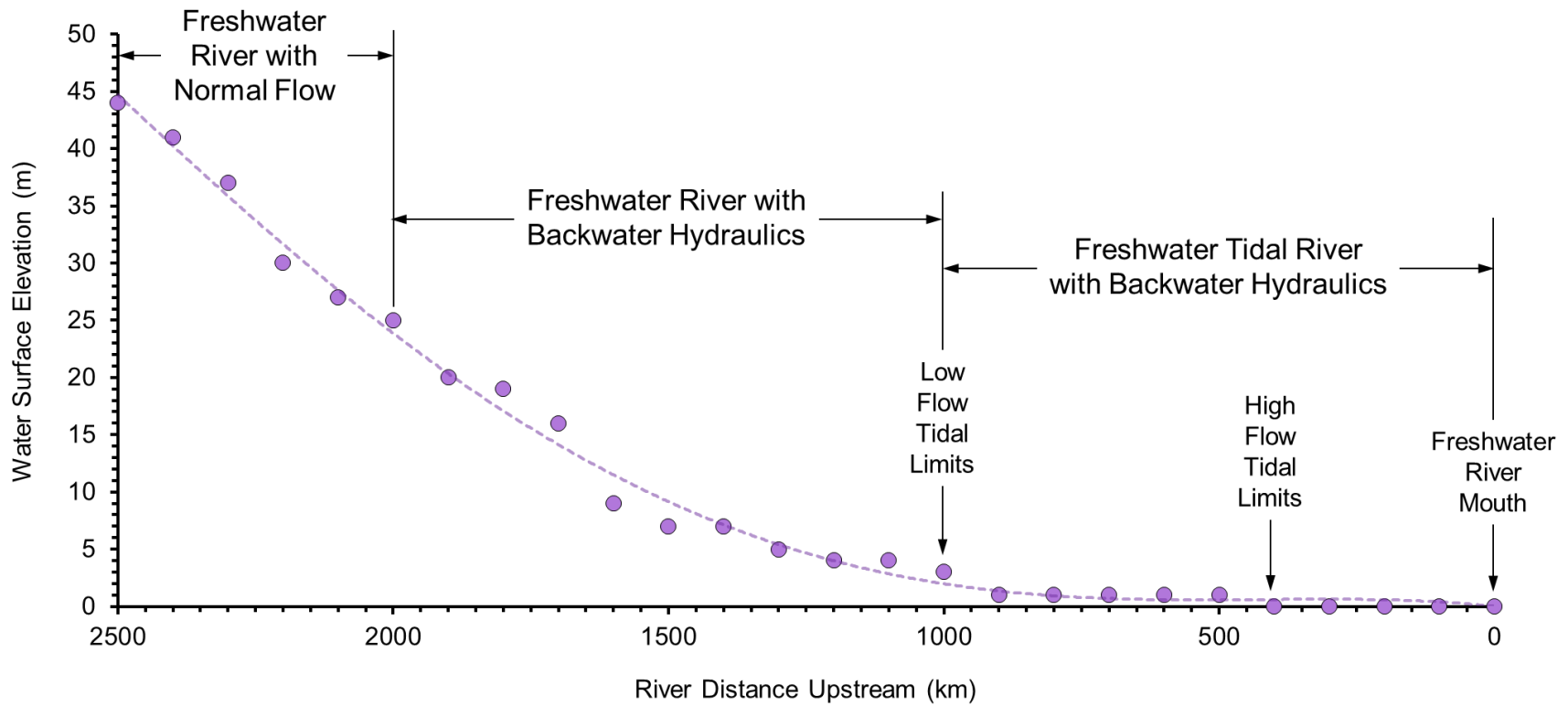
Plot SM15: Irrawaddy River channel gradient estimation.

Slopes of Large Rivers



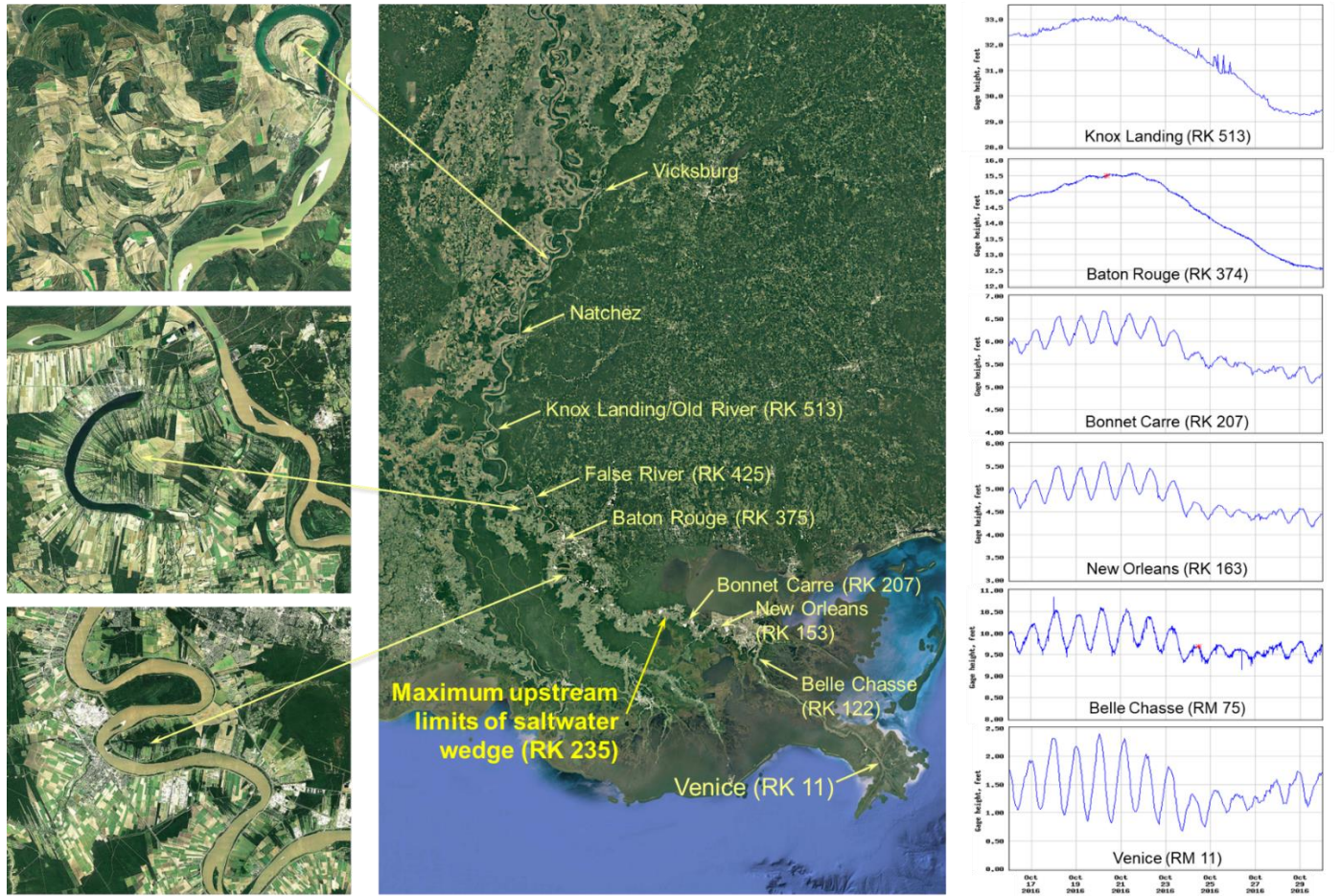
Plot SM16: Summary gradient estimation of five large river channels in this study.

Amazon River



Plot SM17: Amazon River channel gradient estimation.

Mississippi River Tidal and Backwater Reach



Plot SM18: Mississippi River tidal vs. backwater reaches comparisons, highlighting morphological differences and variable magnitude of tidal range between different parts of the river, collected from gauging stations. It also includes the maximum limit of recorded saltwater penetration.