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The "lost" channels of the Amazon floodplain

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We demonstrate the use of Landsat TM images to investigate the spatial characteristics of the multitude of Amazon floodplain channels. This analysis identifies important spatial patterns and relationships in the floodplain channels that, for the first time, provide a method of breaking down the complex heterogeneity of the Amazon floodplain into functional hydrologic units. The fact that these floodplain areas have very different hydrological characteristics has important implications for many biogeochemical studies in the Amazon, which rely on an understanding of these characteristics in order to quantify and estimate dependent processes. Comparison of these channels with vegetation corrected shuttle radar topography data (SRTM) of the floodplain shows that approximately 96% of these channels are missing from the SRTM topography and even the bigger channels are poorly represented. These “lost” channels help explain some of the filling and draining problems encountered when conducting large scale LISFLOOD-FP hydraulic modelling of the Amazon river and floodplain using SRTM data. Explicitly including these channels in the hydraulic model demonstrates improved simulation of the hydrodynamics of the floodplain.