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Assessment of meander hydro-morphodynamics using modelling approaches in an amazonian river

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The Madre de Dios river basin belongs to the Amazon river basin, until the study area has an approximate area of 47070 km². In recent years serious problems of lateral undermining are occurring on the right bank of the river, bringing with it problems in nearby towns and the layout of the interoceanic highway that connects to the country of Brazil. The case study is the Meander "La Pastora", whose right margin is constituted by a compact clay material, which was affected by local undermining phenomena, also the approach of thalweg and sedimentation in the left margin was caused by causes of deforestation of the basin and increased solid contribution. Since 2015, measures have been built that have the function of mitigating erosion on the right bank and recovering the affected area. Using two-dimensional numerical modelling, ADCP/multibeam bathymetric surveys and limnometric records, the hydrodynamic conditions and sediment transport will be evaluated by the hand of a results from physical modelling and inclusion of structural measures, estimating erosion and sedimentation areas that may have been in the meander. BASEMENT and IRIC NAYS2DH-FASTMECH models were used which simulated the flow conditions in different minimum and maximum hydrological scenarios compared with physical modelling results and field data, considering sediment flux corrections in curved channels with significant secondary flow motions and lateral erosion to precisely capture the complex flow field induced by channel curvature and riverbank gravitational effects.