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Five common mistakes in fluvial morphodynamic modelling

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Recent years have seen a marked increase in the availability of morphodynamic models and a proliferation of new morphodynamic codes. As a consequence, morphodynamic models are increasingly developed, used and evaluated by non-experts, sometimes leading to mistakes. This presentation draws attention to five types of common mistakes. First, new morphodynamic codes are developed as extensions of existing hydrodynamic codes without including all essential physical processes. Second, model inputs are specified in a way that imposes morphodynamic patterns beforehand rather than letting them be computed freely. Third, detailed processes are parameterized inadequately for application to larger spatial and temporal scales. Fourth, physical and numerical phenomena are confused when interpreting model results. Fifth, the selection of modelling approaches is driven by the belief that complete data are a prerequisite for modelling and that the application of 2D and 3D models requires more data than the application of 1D models. Examples from fluvial morphodynamics are presented to illustrate these mistakes.