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## Is “Morphodynamic Equilibrium” an oxymoron?

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**Abstract**

Morphodynamic equilibrium is a widely adopted yet elusive concept in the field of geomorphology of coasts, rivers and estuaries. Based on the Exner equation, an expression of mass conservation of sediment, we distinguish three types of equilibrium defined as static and dynamic, of which two different types exist. Other expressions such as statistical and quasi-equilibrium which do not strictly satisfy the Exner conditions are also acknowledged for their practical use. The choice of a temporal scale is imperative to analyse the type of equilibrium. We discuss the difference between morphodynamic equilibrium in the “real world” (nature) and the “virtual world” (model). Modelling studies rely on simplifications of the real world and lead to understanding of process interactions. A variety of factors affect the use of virtual-world predictions in the real world (e.g., variability in environmental drivers and variability

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