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Review on Morphology and Turbulence Characteristics in Meandering Rivers

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Meandering rivers are one of the most complex earth-surface systems and have a significant impact on riverine ecosystem mechanics. Because of the fascinating intricacy of meander morphodynamics, scholars from various disciplines, from fluid mechanics, fluvial hydraulics, and geomorphology, have been fascinated by meandering rivers. In spite of many years of research still, many processes regarding meandering rivers are not answered. Recent decades of research are reviewed herein in this paper. Scholars and experts have studied about flow features and processes such as a distorted profile of longitudinal velocity, secondary flow, inner and outer banks flow separation, etc., and sedimentological processes such as point bars, bend scour, lateral bed slope, etc. Many of them studied time-mean flow, Reynolds stresses, turbulence intensities (TI), turbulent kinetic energy, quadrant analysis, and turbulence scales, etc. under the effect of meandering bends. Many laboratory experiments are carried out to understand the individual processes under different conditions. Due to the rapid enhancement of soft computational techniques, these experimental data sets can be validated. Some future recommendations are also suggested in the field, laboratory, and numerical modelling.

Keywords: *Meandering rivers, secondary flow, Reynolds stresses, turbulent kinetic energy, turbulence scales*