

GeoPlanet: Earth and Planetary Sciences

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Marek Sarna

Subhasish Dey

## Fluvial Hydrodynamics

Hydrodynamic and Sediment Transport Phenomena

The state-of-the-art in fluvial hydrodynamics can be examined only through a careful exploration of the theoretical development and applied engineering technology. The book will be primarily focused, since most up-to-date research findings in the field will be presented, on the research aspects that involves a comprehensive knowledge of sediment dynamics in turbulent flows. It begins with the fundamentals of hydrodynamics and particle motion followed by turbulence characteristics related to sediment motion. Then, the sediment dynamics will be described from a classical perspective by applying the mean bed shear approach and additionally incorporating a statistical description for the role of turbulence. The book will finally describe the local scour problems at hydraulic structures and scale models. It is intended to design as a course textbook in graduate/research level and a guide for the field engineers as well, keeping up with modern technological developments. Therefore, as a simple prerequisite, the background of the readers should have a basic knowledge in hydraulics in undergraduate level and an understanding of fundamentals of calculus.

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