DESCRIPTION

This book presents a comprehensive overview of the first longitudinal study of the downstream response of a major river to the establishment of a large hydropower facility and dams. Peace River, a northward flowing boreal river in northwestern Canada was dammed in 1967 and the book describes the morphological response of the 1200 km downstream channel and the response of riparian vegetation to the change in flow regime over the first forty years of regulated flows.

Beginning with a description of the effect of regulation on the flow and sediment regimes of the river, the book proceeds to study changes in downstream channel geometry on the main stem, on the lowermost course of tributaries, and on the hydraulic geometry, the overall morphology of the channel, and riparian vegetation succession. The river is subject to annual freeze-up and break-up, so a chapter is devoted to the ice regime of the river. A chapter compares the effects of two extraordinary post-regulation flood events. The penultimate chapter presents a prediction of the ultimate equilibrium form of the regulated river based on rational regime theory. An online database of all the main observations will provide invaluable material for advanced students of river hydraulics and geomorphology.

This book carefully brings together a range of studies that have been previously inaccessible providing a rare and comprehensive analysis of the effects of a big dam on a river, a river that itself represents an example of the kind of system that is likely to receive considerable attention in the future from dam engineers and environmentalists.

• An invaluable reference to river scientists, hydroelectric power developers, engineers and environmentalists
• Focus on a northward flowing boreal river, a type that holds most of the remaining hydroelectric power potential in the Northern Hemisphere

• Exceptional separation of water and sediment sources, permitting study of the isolated effect of manipulating one of the two major governing conditions of river processes and form

• Unique example of water regulation and both natural and engineered flood flows

• Detailed study of both morphological changes of the channel and of the riparian vegetation

• Online data supplement including major data tables and numerous maps. Details of the main observations and provides material for problem study by advanced students of river hydraulics and geomorphology are provided

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🚀 ABOUT THE AUTHOR

**Michael Church** is Professor Emeritus at the University of British Columbia, where he taught geomorphology, hydrology and studies in resources and environment for 38 years. He researches river morphodynamics, with a major interest in sediment transport and sedimentation. He has focused much work on the large Fraser and Peace rivers in western Canada, the former an important salmon stream, the latter a regulated boreal river.

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