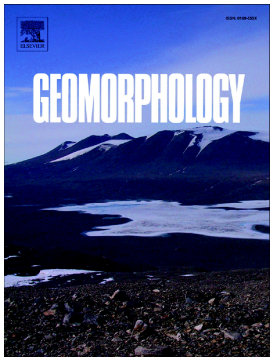

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L.A. James, J.D. Phillips, S.A. Lecce

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A Centennial Tribute to G.K. Gilbert's "Hydraulic Mining Débris in the Sierra Nevada"

L. A. James,[1] J. D. Phillips,[2] S. A. Lecce[3]

[1] University of South Carolina, USA, AJames@sc.edu
[2] University of Kentucky, USA
[3] East Carolina University, USA

Abstract

G.K. Gilbert's (1917) classic monograph, *Hydraulic-Mining Débris in the Sierra Nevada,* is described and put into the context of modern geomorphic knowledge. While the emphasis is on large-scale applied fluvial geomorphology, which is represented very well, other key elements—e.g., coastal geomorphology—are briefly covered. A brief synopsis outlines key elements of the monograph, followed by discussions of highly influential aspects including the integrated watershed perspective, the extreme example of anthropogenic sedimentation, computation of a quantitative, semi-distributed sediment budget, and advent of sediment-wave theory. Although Gilbert does not address concepts of equilibrium and grade in much detail, the rivers of the northwestern Sierra Nevada were highly disrupted and thrown into a condition of non-equilibrium. Therefore, concepts of equilibrium and grade—for which Gilbert's early work is often cited—are discussed. Gilbert's work is put into the context of complex nonlinear dynamics in geomorphic systems and how these concepts can be used to interpret the non-equilibrium systems described by Gilbert. While broad, basin-scale studies were common in the period, few were as quantitative and empirically rigorous or employed such a range of methodologies as PP105. None demonstrated such an extreme case of anthropogeomorphic change.

Key words: G.K. Gilbert; fluvial geomorphology; sediment budget, sediment waves; non-equilibrium

1. Introduction