عنوان مقاله:

Long-term modeling of shoreline evolution using a process-based hybrid approach

محل انتشار:

ششمین همایش بین المللی سواحل، بنادر و سازه های دریایی (سال: 1383)

تعداد صفحات اصل مقاله: 4

نویسندگان:

Mohammad Dibajnia - *Baird & Associates, ۶۲۷ Lyons Lane, Suite ۲۰۰, Oakville, Ontario, Canada L۶J ۵Z۷*

Robert B. Nairn - *Baird & Associates, ۶۲۷ Lyons Lane, Suite ۲۰۰, Oakville, Ontario, Canada L۶J ۵Z۷*

خلاصه مقاله:

During past few decades, the use of computer simulations to examine and predict shoreline changes has become standard practice in engineering analyses. Commonly applied models are the so-called "shoreline" or "One-line" type models which reduce the focus to the shoreline alone and examine the change in shoreline configuration with variations in deepwater wave conditions, changes in sediment supply, or due to construction of a coastal structure. Because of their simplicity, one-line models may be applied to long-term shoreline change predictions over a large area with rather short computation time. Their success, however, 1) is limited to simple problems where alongshore transport is the key factor in evolution of the shoreline, and 2) directly depends on a correct estimation of the alongshore sand transport rate at the site through calibration of the coefficients involved. The models are thus subjective to selection of the coefficients, or in other words, the engineer needs to know the answer a priori to run the model successfully! With the increased understanding of nearshore processes, more sophisticated process-based 1D and 2D models of waves, hydrodynamics, sediment transport, and morphodynamics has also been developed which can be applied to more complicated problems essentially without a need for calibration. These complex deterministic models are ideal for studying coastal processes under a particular wave condition or a short-term storm event, but are not suitable for application over periods of decades as well as over large coastal areas. In this paper, a long-term predictive approach for evaluating beach erosion and accretion response over a period of several decades is proposed by encapsulated representation of the morphodynamic response of the process-based models. The applicability of this predictive method is demonstrated against observed long-term beach evolution at Saugatuck Harbor on Lake Michigan and along sections of the southern coast in Barbados.

کلمات کلیدی:

لینک ثابت مقاله در پایگاه سیویلیکا:

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