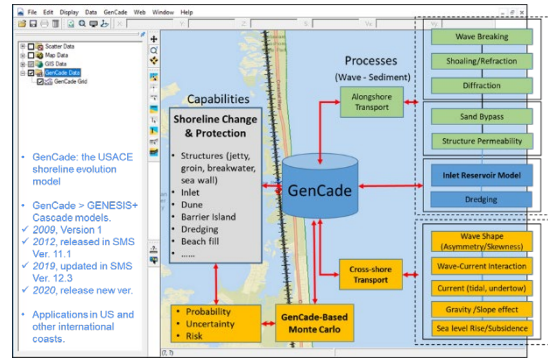


Building Strong® DISCOVER | DEVELOP | DELIVER

GenCade Model, Version 1.1 (FY20)

Background: Predicting long-term shoreline change plays an important role in planning and management of coastal zones and regional sediment management. Shoreline change is driven not only by natural processes such as wave- and current-induced sediment transport, but also by engineering activities such as placement of coastal structures and beach nourishment. The shoreline evolution model GenCade has been developed to assess the impact of coastal engineering projects. GenCade calculates shoreline change, wave-induced longshore sand transport, and morphology change along open coasts and at inlets on a local to regional scale. It also accounts for engineering structures such as jetties, seawalls, and groins, as well as engineering activities such as dredging and beach nourishment. In an effort to expand upon existing model capabilities, new features are presently being developed to better constrain the effects of cross-shore sediment transport, model uncertainty, and sea level rise. In addition, continued validation is a long-term strategic goal to improve model performance.



Approach: Through continued model validation and verification and improvements, GenCade becomes reliable and robust for predicting long-term shoreline evolution in a regional-scale coastline. Monte-Carlo shoreline simulation of GenCade provides a methodology for engineers to assess uncertainty and risk of predicted shoreline changes. Improvement of the graphical user interface (GUI) with new features (Monte-Carlo and cross-shore transport) facilitates model applications and simulation result analysis.

Technical Advancements: GenCade is a numerical model which combines the engineering power of GENESIS and the regional processes capability of the Cascade model. GenCade calculates shoreline change, wave-induced longshore and cross-shore sand transport, and morphology change at inlets on a local to regional scale and can be applied as a planning or engineering tool. GenCade is operated within the Surface-water Modeling System interface, bringing functionality of a georeferenced environment together with accessibility to other U.S. Army Corps of Engineers numerical models. GenCade is being developed by the Coastal Inlets Research Program and the Regional Sediment Management Program.

Payoff: GenCade provides a rapid assessment of multiple engineering alternatives in a robust self-contained operating platform that can be setup and executed with minimal preparation. As such, it serves as an economically viable application for shoreline change analysis.

ERDC Points of Contact:

Yan Ding, Yan.Ding@usace.army.mil, (601) 634-5374
Richard Styles, Richard.Styles@usace.army.mil,
(601) 634-4065
<http://cirp.usace.army.mil/products/gencade.php>

Tanya M. Beck, Program Manager
(601) 634-2603
Tanya.M.Beck@usace.army.mil
Coastal Inlets Research Program

