



CIRP: Coastal Modeling System (CMS)

Problem USACE Districts need state-of-knowledge predictive capability for operating and managing navigation projects at coastal inlets. Applications include estimation of channel infilling to proposed engineering actions such as widening and deepening, adjustment of channels and nearshore to structures, and change in ebb and flood shoals at coastal inlets where tide, waves, wind, and river inflow combine to produce water motion, sediment transport, and morphology change. This technology must be accurate, robust, and reliable, yet fast enough to allow evaluation of multiple alternatives during project development.

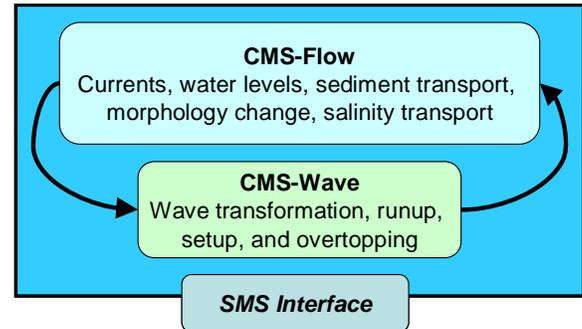


Fig. 1. The CMS is an integrated wave, current, sediment transport, and morphology change modeling system within the SMS interface

Objectives To provide Districts with an integrated system of coastal models in support of O&M programs. The system requirements are:

- Include all relevant coastal processes and spatial and time scales.
- Be accurate, robust, and time efficient for practical engineering applications with multiple design alternatives.
- Be easily applied on desk-top PCs, but also have advanced features and options for experienced coastal modelers. The system should be integrated with a convenient and integrated user interface for creating input files as well as reading and processing output data. The system should also be available to resource agencies, private consultants, and academia that support Districts in their projects.

Products The integrated Coastal Modeling System (CMS) includes CMS-Wave (described in a companion fact sheet) and CMS-Flow, which calculates depth-averaged flow, sediment transport, and morphology change such as channel infilling. The system is designed for practical engineering and research applications at coastal inlets, navigation channels, adjacent beaches, nearshore berms, and dredged-material disposal sites. The CMS is disseminated to the field in the Surface-water Modeling System (SMS) and operated on PCs. In FY10, R&D includes integration of 3D calculations within the SMS; addition of undertow, bottom streaming, bottom boundary layer processes (needed for berm migration); and dissemination of the Rapid Assessment of Morphology (RAM) methodology for quick calculation of long-term inlet evolution. R&D for shoreline change at jetties, swash zone processes, and calculation with mixed sediment grain sizes will be continued. Technology will be transferred by workshops, an online CMS Wiki website, Technical Reports, and Technical Notes.

Milestones

10-01	JP: Non-equilibrium sediment transport model for coastal inlets	Nov 09
10-02	JP: CMS-Flow: A tidal flow model for inlets and navigation projects	Nov 09
10-03	TR: Evaluation of Proposed Channel on Circulation and Morphology Chg at Kawaihae Harbor and Pelekane Bay, Hawaii, HI (shared with WU CFFF63)	Oct 09
10-04	Wiki Documentation: CMS-Flow feature list and documentation for using the Surface-water Modeling System Interface	Nov 09
10-05	11th Annual CIRP Technology Transfer Workshop	Dec 09
10-06	CMS Release, CHETN, Wiki-page: Rapid Assessment of Morphology	May 10
10-07	Draft JP: Analytical Methods for Channel Infilling (shoaling tools to CPT; WU. 1LD43G)	May 10
10-08	CIRP Mini-Tech-Transfer Workshop (during CWG workshop)	Jun 10
10-09	CHETN/Upgrade/Wiki-page: Tidal Analysis and Prediction Tools, Guidance & Examples	Aug 10
10-10	CMS Release (SMS 11) and Wiki Documentation: Telescoping Flow and Sediment Transport	Sep 10

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