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DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
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Manual
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Engineering and Design
COASTAL ENGINEERING MANUAL

1. Purpose. The purpose of the *Coastal Engineering Manual* (CEM) is to provide a comprehensive technical coastal engineering document. It includes the basic principles of coastal processes, methods for computing coastal planning and design parameters, and guidance on how to formulate coastal flood studies, shore protection, and navigation projects.

2. Applicability. This manual applies to all HQUSACE elements and all USACE commands having Civil Works and military design responsibilities.

3. Discussion. The CEM is divided into two major subdivisions: science-based and engineering-based. The science subdivision is further divided into three parts. The first part, "Coastal Hydrodynamics," leads the reader from the fundamental principles of wave theory and ocean wave generation through the process of wave transformation as the wave form approaches and reacts with the shore including water-level variations and currents. The second part, "Coastal Sediment Processes," addresses longshore and cross-shore transport as well as shelf, and wind transport processes. The third part, "Coastal Geology," covers geomorphology, coastal classification, and morphodynamic processes on sandy shores.

The engineering-based subdivision is oriented toward a project-type approach, rather then the individual structure design and is divided into two parts. The first one, "Coastal Planning and Design," provides information on the design process and selection of appropriate type of solution to various coastal problems. The second part, "Design of Coastal Project Elements," provides engineering guidance on materials, fundamentals of design, and reliability.

4. Distribution Statement. Approved for public release, distribution unlimited.

FOR THE COMMANDER:

1 Appendix
Appendix A - Glossary

ROBERT CREAR
Colonel, Corps of Engineers
Chief of Staff

This manual supersedes *Shore Protection Manual,* 1984; EC 1110-2-289, 30 September 1996; EC 1110-2-292, 31 March 1998; EM 1110-2-1004, 30 November 1993; EM 1110-2-1412, 15 April 1986; EM 1110-2-1414, 7 July 1989; EM 1110-2-1502, 20 August 1992; EM 1110-2-1616, 31 January 1991; EM 1110-2-1617, 20 August 1992; EM 1110-2-1618, 28 April 1995; EM 1110-2-2904, 8 August 1986; EM 1110-2-3301, 31 May 1995.