Surface-Wave Dynamics

John W. Miles
University of California, San Diego
Cecil H. and Ida M. Green Institute of Geophysics & Planetary Physics
La Jolla, CA 92093-0225
phone: 858 534 2885 fax: 858 534 5332 email: jmiles@ucsd.edu

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LONG-TERM GOALS

My long-term goals are to understand (or at least contribute to our understanding of) the generation, nonlinear evolution, dissipation and diffraction of water waves over the spectrum from capillary waves to tides.

OBJECTIVES

See LONG-TERM GOALS.

APPROACH

My primary approach is through mathematical models. Solutions ultimately are developed in both analytical and numerical form, but my primary objective is to obtain analytical results that inform phenomenological models for the prediction of physical events.

WORK COMPLETED

See PUBLICATIONS. Other work funded by this grant began only in July, 2003.

RESULTS

See above.

IMPACT/APPLICATIONS

The results of my research are applicable to coastal engineering and naval operational problems and to our understanding of air-sea interaction.

RELATED PROJECTS

None

PUBLICATIONS

(with A. Sneyd) The response of a floating ice sheet to an accelerating line load (*J. Fluid Mech.*, in press, August, 2003)

The two-dimensional response of a thin, floating sheet of ice to a line load that accelerates from rest at $t = 0$ to a uniform velocity V for $t \geq T$ is determined through an integral-transform solution of the linearized equations of motion. If $T = 0$ -- i.e. if the load is impulsively started with velocity V -- the solution exhibits singularities at $V = c_0$, the shallow-water-gravity-wave speed, and $V = c_{\min}$, the minimum speed for transverse motion of the ice, but these singularities are avoided by the acceleration of the load through the critical speeds.