

## **Modeling of Ocean Surface Waves**

Research focuses on the propagation, transformation, and breaking of ocean surface waves over mid-shelf regions into the nearshore and surf- zone regions. We use large-scale spectral phase-averaged models and regional-scale phase-resolving refraction/diffraction models. Current research involves (1) upgrading phase-averaged numerical wave models with improved propagation characteristics, (2) investigating methods to extend current linear phase-resolving models in the nearshore by incorporating shallow water nonlinearity, (3) modeling nearshore wave-induced hydrodynamics, and (4) incorporating data assimilation techniques into modeling systems. We are particularly interested in the use of nearshore remotely sensed data from such platforms as interferometric SAR, and lidar and optical sensors (e.g., video), in conjunction with our modeling and assimilation work. Our goal is to eventually transition the models and techniques to a Navy operational wave climate prediction capability.