

# **Modeling the bubbly ocean**

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Bubbles are entrained into the ocean during the breaking of surface gravity waves. They move under the action of turbulence, rise by buoyancy, and change size while exchanging gases with the water. Small bubbles, with small buoyant rising velocities, are trapped in the ocean and dissolve completely. Large bubbles, with large buoyant rising velocities, are able to rise despite the downward turbulent motions and eventually burst at the ocean surface. Recently we developed a multi-size multi-component bubble model and have embedded it in a large eddy simulation model for oceanic boundary layer flows with surface wave effects. I will present solutions for bubbly flows in the ocean boundary layer and discuss the meteorological controls on the subsurface bubble distribution and the impact of bubble buoyancy on boundary layer turbulence.