Date:	April 9 th
Time:	11:00 AM
Location:	Ames 234
Speaker:	Dr. Stephen Monismith Stanford University
Title:	"Mean flows under surface gravity waves"

Abstract

Fluctuating currents associated with surface waves often dominate nearshore coastal environments. As first shown by Stokes in the nineteen century, surface waves also lead to a difference between Lagrangian and Eulerian mean flows known as the Stokes drift, an effect that can play an important role in the transport of materials in nearshore coastal waters. In this talk I will discuss several laboratory experiments that include measurements of mean velocity made in several different flumes in the presence of surface waves. The flows shown involve several different types of mechanical wave makers, channels of differing sizes, and two different types of end conditions. In all cases, when surface waves, nominally Stokes waves, are generated, counter flowing Eulerian flows appear that act to cancel locally, i.e., not in an integral sense, the mass transport associated with the Stokes drift. The simplest explanation of this behavior is that these laboratory waves are Gerstner waves, rotational waves that have closed orbits and thus do not alter the Lagrangian mean flow when they are added to a steady Eulerian mean flow.