

Study Guide Questions

Lecture: Wind-Generated Waves

Reading: p. 192-217 of Knauss (1997)

1. What is the balance of forces (I.e., momentum balance) for linear (i.e., small amplitude) surface gravity waves in the horizontal (s) and vertical (z) directions?
2. Which of the 4 wave properties (period, wavelength, amplitude, phase) do not change for a linear wave?
3. What does a "dispersion relation" tell you?
4. What is the net (averaged over several wave periods) displacement of a particle in a linear wave field?
5. How can a wave traveling in 5000-m deep water be a "shallow" wave?
6. Where does the wave energy dissipating on California beaches originate from? How long does it take a 10 seconds wave from New Zealand to break on San Diego beaches?
7. Which environmental factors determine the amount of energy in a wave?
8. How does a smart surfer take advantage of the nonlinear wave field near a beach moving both onshore (surfing) and offshore ("paddling" back to where the wave breaks)?