

## Reading Guide

CEEG 340–Introduction to Environmental Engineering

Instructor: Deborah Sills

**Reading assigned for Friday 9/20: Textbook, pp.122–131**

After completing the reading, you should be able to:

1. Define the terms *conservative compound*, *zero-order decay*, *first-order decay*
2. Apply the principle of mass balance to calculate concentrations in a completely mixed flow reactor under the following conditions:
  - (a) steady state with a conservative chemical,
  - (b) nonsteady state with a conservative chemical
  - (c) Describe the term retention time in one sentence and define HRT in equation form.
  - (d) Derive an equation for, and draw a graph of concentration out of a completely mix flow reactor (CMFR) as a function of time, and HRT after a pulse (instantaneous) input of a conservative tracer at  $t=0$ .
  - (e) Compare and contrast the effects of inlet spikes of a conservative compound for a CMFR and PFR.
  - (f) Describe engineered and natural systems that the plug flow reactor (PFR) is used to model.