

Homework 3: Due Sep. 30, 2014

Hand in a hard copy at the beginning of class. Show your work.

1. What is an ecosystem? How does it differ from a biome?
2. Use the following information to answer the questions below:

	Tropical forests	Estuaries	Units
Total area	17×10^{12}	1.4×10^{12}	m^2
Mean net primary production	2000	1800	$\text{g dry plant matter}/\text{m}^2/\text{yr}$
Mean plant biomass	20	0.45	kg/m^2

Forty-five percent of dry plant matter is carbon.

- (a) What is the total net primary production of tropical rain forests and estuaries in metric tons of plant matter and carbon per year?
 - (b) What is the total plant mass of these ecosystem in metric tons of plant dry matter and carbon?
 - (c) The tropical rain forests of the world lost 9% of their area due to cutting in the 1980s. How much plant dry matter does this cutting represent? How much carbon?
 - (d) If all of the carbon in the cut trees in part c were emitted to the atmosphere by burning and slow oxidation, what fraction of the atmosphere's 760 GtC would this carbon represent?
3. What are the two main types of closed tropical forests, and what are the main differences between them?