

4.3: Computer Model for Changing Fluxes Worksheet

A. Collect and record results for Model 2

1. See what happens with different settings. Start with the settings suggested for runs 1, 2, and 3, then try your own settings! Click on the graph to see a sliding line that you can use to get the exact pool and flux sizes for a specific time.

Run #1: Settings in the middle

Initial settings (0 years)			Results of Run				
CO ₂ pool	Organic pool	Photosynthesis limit	Time	CO ₂ pool	Org. pool	Phs. flux	CR flux
500 kg	500 kg	50 kg/yr	1 year	kg	kg	kg/yr	kg/yr
			5 years	kg	kg	kg/yr	kg/yr
			20 years	kg	kg	kg/yr	kg/yr

Run #2: Change the pool settings

Initial settings (0 years)			Results of Run				
CO ₂ pool	Organic pool	Photosynthesis limit	Time	CO ₂ pool	Org. pool	Phs. flux	CR flux
800 kg	200 kg	50 kg/yr	1 year	kg	kg	kg/yr	kg/yr
			5 years	kg	kg	kg/yr	kg/yr
			20 years	kg	kg	kg/yr	kg/yr

Run #3: Change the photosynthesis limit

Initial settings (0 years)			Results of Run				
CO ₂ pool	Organic pool	Photosynthesis limit	Time	CO ₂ pool	Org. pool	Phs. flux	CR flux
500 kg	500 kg	90 kg/yr	1 year	kg	kg	kg/yr	kg/yr
			5 years	kg	kg	kg/yr	kg/yr
			20 years	kg	kg	kg/yr	kg/yr

Run #4: Your own settings

Initial settings (0 years)			Results of Run				
CO ₂ pool	Organic pool	Photosynthesis limit	Time	CO ₂ pool	Org. pool	Phs. flux	CR flux
kg	kg	kg/yr	1 year	kg	kg	kg/yr	kg/yr
			5 years	kg	kg	kg/yr	kg/yr
			20 years	kg	kg	kg/yr	kg/yr

Run #5: Your own settings

Initial settings (0 years)			Results of Run				
CO ₂ pool	Organic pool	Photosynthesis limit	Time	CO ₂ pool	Org. pool	Phs. flux	CR flux
kg	kg	kg/yr	1 year	kg	kg	kg/yr	kg/yr
			5 years	kg	kg	kg/yr	kg/yr
			20 years	kg	kg	kg/yr	kg/yr

B. Questions about Patterns

3. What is the main setting that determines pool size after 20 years? Why do you think this happens?

4. What is the main setting that determines fluxes after 20 years? Why do you think this happens?

5. What happens to the fluxes over the 20-year period? What would happen in 50 years?

6. In Lesson 2 you discussed ecosystems with different total organic matter pools. For each ecosystem, what are your ideas about the *limiting resource*—the thing that plants are most likely to run out of so that they can't increase the photosynthesis flux?

Desert:

Forest:

Cornfield:

Prairie:
