

ESM 202 Environmental Biogeochemistry

Assignment #4

Due: Friday 03/02/2007 (email to Darcie)

Carbon Cycle Solutions

The feedback on the assignment #3 was quite positive, so let's continue focusing on solutions. To minimize climate change, Sweden is looking into going "non-carbon". Is this possible? How? What are the challenges?

Your assignment for the next 10 days is to look into a number of non-carbon "solutions", or at least some that are "no net carbon release". A few ideas for such solutions are:

- Conserving tropical forests
- Capturing and storing CO₂ underground, deep in the ocean, etc.
- Biofuels (e.g. ethanol, biodiesel) for transportation
- Solar or Wind for electricity and other uses
- Biomass/Domestic waste for electricity and/or heating
- Nuclear energy for electricity
- Hydrogen (from solar, nuclear, other non-C options) for transportation
- Your idea here (\$25 million available for the silver bullet...!)

We will discuss these options during Discussion Section in Week 9. If you are presenting that week, let's coordinate the topics to be presented and discussed (email me).

Gather information on

- (1) How does it work?
- (2) How much does it cost (some unit cost info)?
- (3) What are the challenges or limitations? Is this a long-term C storage?
- (4) Is it truly "no net C released to the atmosphere"?

(5) Are there some useful case studies that can be relied upon?

Also, some useful graphics may help. Using this information, write a short (3-4 pages, 12 point font, 1" margins, double line spacing) summary of your findings.

Be critical of the information. Cite your sources. Careful using internet sources that are not "peer-reviewed", such as Wikipedia, or people selling a technology. At the end, provide a recommendation – do you think it does work, or do you think the disadvantages are too large? Are there policy barriers that need to be overcome, or incentives that need to be provided? Again, you are not promoting the solution, just assessing it.

If you feel that it is useful, you can formulate this as a summary recommendation to use, or not to use, the proposed solution for your environmental organization. Keep the language simple, yet use the scientific information you have picked up in class. The following grading guide should be useful for you in terms of figuring out how much to emphasize different parts of your answer, as well as format and presentation:

Description of solution (general public)	10%
How is C stored? Net C?	15%
How much does it cost?	5%
What are advantages/disadvantages?	20%
Case study:	5%
Policy/econ considerations:	10%
Summary recommendation:	15%
Clear writing/presentation:	15%
Adequate citation of sources:	5%

Make sure you proof-read your document. If you collaborate on your research, make sure your document is clearly an individual effort.