

Random thoughts I have pondered about carbon sequestration

Mark A. Eiteman

NOTE: Don't take this document to be a "to do list" or a homework assignment. Do not merely answer these questions. You do not have to address any of these questions. The point is that these are thoughts that I have had, and that I would probably find interesting to address if I wrote a report on the topic. These may be similar to thoughts you have during the preparation of your report...you should ask (similar) critical questions to yourself and address them.

- 1) What is the numeric relationship between C and CO₂?
- 2) What is the volume of the earth's atmosphere?
- 3) Given the volume of the earth's atmosphere, and assuming that one can find the mass of CO₂ entering in the atmosphere (in mass/year), does the calculated accumulation agree with the current increase in CO₂ concentration (observed at Mauna Loa)?
- 4) Given recent trends for CO₂ flowing into and out of the atmosphere, can the accumulation of CO₂ in the atmosphere (in mass/year) be predicted 30 years henceforth? Can the concentration of CO₂ in the atmosphere be predicted 30 years in the future?
- 5) For each possible approach for reducing (or reversing) the accumulation of CO₂ in the atmosphere, which approach, regardless of cost, will have the greatest numeric affect on the CO₂ concentration 30 years in the future? Provide numeric evidence (i.e., don't guess, calculate). Which of the possible approaches, or combination of approaches, is the most economically and socially practical? (Don't guess, calculate.)
- 6) What is the volume of water in all the oceans combined?
- 7) Given that the temperature of the atmosphere has increased (e.g., by 0.5°C over recent decades), if the entire water volume of the oceans were saturated with CO₂ and were to increase by 0.5°C, what would be the amount of CO₂ released into the atmosphere? What would be a similar impact of a reasonable change in pH? How would the resulting amount of CO₂ released from the ocean waters impact the CO₂ concentration 30 years in the future? What would be the increase in ocean volume merely as a result of density decreasing with increasing temperature?
- 8) What would be the effect of every person in the U.S. planting ten trees on the CO₂ concentration 30 years in the future?