Name:

Student ID:

ATOC 1060: Our changing environment

Homework assignment 8
Climate projection and Copenhagen targets
Due: 1:45 pm, Thursday 10 December 2009 (last day of class!)

Climate models are invaluable tools for both understanding records of climate, and projecting future climate change. The IPCC uses a number of future scenarios for fossil fuel use and therefore the emission of CO_2 and other greenhouse gases, which can guide policy makers. To judge the impact of emissions suggested for Copenhagen we will use the ISAM global warming model at: http://geodoc.uchicago.edu/Projects/isam.html

1) What is the reason for using different "scenarios" in projections?

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2) What does "business-as-usual" mean for future carbon emissions?

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4) Run the model for a business-as-usual case, and read from the graphs the global CO_2 concentration in the year 2100. Also find the projected temperature and sea level as a change relative to ***preindustrial*** conditions. (i.e., not 1990 as on the temperature graph)

_____ ppm _____ °C _____ cm

5) It is expected that at the Copenhagen Climate Conference this week, President Obama will propose emission targets of 17% below 2005 levels from 2020 onwards. Modify the fossil fuel emissions in the model (values in the table on the lower left) to make a projection of the 2100 climate under Obama's new scenario.

17% less than 2005 emissions: _____GtC/year

_____ ppm _____ °C _____ cm

6) In this simulation, is the climate in equilibrium? Yes / No

7) Use the model to find a single emission target for the years 2020-2100 that would have the global temperature in 2100 about the same as the 2009 value.

Fossil fuel emission target: _____GtC/year

8) In this simulation is the climate **system** in equilibrium? Yes / No

9) Why can you make this claim?

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