

Agricultural Impacts

- 1) What regions of the world might benefit agriculturally from global warming? What regions might be harmed? Why? (5)

Climate records

- 2) Why have some argued that the observed 20th Century surface warming is really just a consequence of the urban heat island effect? How have climate scientists dealt with this issue? (3)
- 3) Simple physical laws, as well as climate models, predict that the middle and upper troposphere (the lowest 10 km or so of the atmosphere, where weather happens) should warm more than the surface, especially in the tropics. However, both satellite and weather balloon data used to show that the mid- and upper troposphere wasn't warming at all, even as the surface was warming. The satellite data turned out to have an error in it, and now shows a temperature increase. However, the weather balloon data still shows little atmospheric warming. What do you think of this? Does this weather balloon data weaken the case for global warming? If so, how much? (4)
- 4)
 - a. Why does the IPCC claim that 20th Century increases in CO₂ concentrations are anthropogenic, and hence a *cause* of global warming rather than a *result* of them (as was the case in the past)? (2)
 - b. Why does the IPCC claim that 20th Century global warming is very likely to have been a result of anthropogenic greenhouse gases, rather than natural variability? (2)

Paleoclimate

- 5) Why is CO₂ a forcing for climate change today but a feedback for the ice age cycles? (4)

Climate Models

- 6) We know (from chaos theory) that it is impossible to predict the weather more than two weeks in advance. Why, then, do we trust the predictions of climate models for 50-100 years in the future? (3)

Discussion Question

- 7) Please write down at least one question from **this week's** material that you would like to discuss on Friday. This may be on a topic you don't feel you understand well enough, or it may be a topic you found interesting and would like to discuss more. (2)

