Ocean Acidification

2023-02-17

Contents

Reading:

Required Reading (everyone):

- Understanding the Forecast, Ch. 10.

Reading Notes:

Some key points to be sure you understand:

- How is the steady-state concentration of methane in the atmosphere related to the rate of methane emissions?
- What are the largest natural and anthropogenic sources of methane? How does anthropogenic methane emission compare to natural emission?
- What are the dominant anthropogenic sources of CO_2 emissions?
- What do we know about the land as a sink for carbon?
- What is CO_2 fertilization and how might it affect the role of the land as a carbon sink? What are the potential benefits to plants of higher CO_2 concentrations and what constraints are there on the extent to which these benefits might be realized in practice?
- Understand the ocean carbon sink. Where, specifically, does the ocean work effectively to remove CO_2 from the atmosphere and how might this sink be affected by rising CO_2 levels?
- What is **ocean ventilation**? Why is it important and how fast does it work?
- What is the **thermocline** and why is it important to the ocean carbon sink?
- Why would increasing carbon dioxide in the atmosphere make the oceans become more acidic? How confident can we be of predictions about ocean acidification?
- What is **buffering** and how would it affect ocean acidification?
- What is the biological pump in the oceans? Are there things people might do to speed up the biological pump
- In the big picture, consider how these pieces fit together: how might rising temperatures and increasing drought around the world (two things scientists are very confident will happen as a result of rising greenhouse gas concentrations) affect the various carbon sources and sinks? How might ocean acidification affect the biological pump?