

Study Questions for Franks, 2002 (NPZ Modeling)

- In class, we described an NPZ model as a “box model” with three boxes that represent the amount of material, and arrows that represent processes or links between the boxes. What does the Franks paper call the boxes and the arrows?
- For the “N” box, what do we usually model?
- The NPZ model is describing the biology, but we said that you can’t (or shouldn’t) study biology separately from the environment. How does the physical environment fit into this model (in other words, why aren’t there oceanographic processes such as waves, currents, mixing, etc. in the NPZ model)?
- In section 4 and 5, Franks describes 3 ways that we use models, and discusses how to choose a model. Based on this paper, do you think NPZ models can be useful, or is the reviewer correct (first paragraph of the paper), that it’s too simple?

Study Questions for Boyd, 2000 (SOIREE)

- Why would we want to add iron to the Southern Ocean? What is so special about this region?
- The authors proposed to test the “iron hypothesis”, that adding iron to the ocean would result in a biological response leading to carbon dioxide draw-down from the atmosphere and sequestration to depth. Did they test this, and do you think they should accept or reject the hypothesis?
- Did the SOIREE experiment determine what the long-term effects of iron fertilization would be on the biology of the Southern Ocean? How about the effects on higher trophic levels?
- The paper describes all kinds of data, collected using a wide variety of methods. List 2 methods that you are familiar with, and 2 that you don’t really understand.
- Nature papers are supposed to highlight cutting-edge science, but in such a way that the average intelligent scientist, such as yourself, can understand why the research is important, even if you are not an expert in the scientific discipline. Do you think this paper did a good or bad job of describing to a non-specialist why their results are important and exciting?