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Abstract: Climate change is, by its nature, a truly interdisciplinary topic. While college level science classes now frequently include exposure to climate change issues, not all science majors, math majors and future math K-12 teachers are likely to see climate issues in the course of their studies. Here we present one self-contained topic that can be presented to those students without requiring too much additional explanation about climate change issues. This case study also can serve to illustrate the rather sophisticated concept of a “tipping point” to a diverse science audience without advanced training in dynamical systems. We consider the effect of solar radiation on the size of ice caps, and show that small changes in solar radiation can cause major irreversible changes in the size of ice caps. We present two sets of exercises that students can be asked to work on their own, after the overall conceptual model has been presented during the class.

Keywords: tipping point, climate change, ice caps, bifurcation, mathematical modeling