Numerous aspects of climate research are becoming dominated by models, in particular, by large General Circulation Models (GCM’s), and theory in the traditional sense seems to be playing a smaller role. What should that role be, if any? Are theories now subsidiary to models? Do we need a theory of climate, and what would that be? Perhaps GCM’s, as the embodiment of our collective understanding, are that theory? I’ll try to connect these seemingly abstract questions with concrete and topical issues in the climate sciences, such as ocean mixing, large-scale atmospheric circulation, global warming, and understanding paleo-climate regimes.