Observations:
   a. Climate has been warming in the past 200 years;
   b. Atmospheric CO2 and other greenhouse gases have been increasing since the preindustrial revolution 200 years ago;
   c. Atmospheric CO2 increase is about half of emissions from fossil fuel combustion – land and oceans have absorbed the remainder.

\[ \Delta \text{CO}_2 = \text{sources} - \text{sinks}. \]

Theory: CO2 is a greenhouse gas

Hypothesis: Warming is due to increasing CO2 concentration

Counter-hypothesis: the warming can be part of natural oscillations in climate


Bush: “Kyoto Protocol is fatally flawed”.

May 2001: National Academy Report in response to questions from the White House: “Climate Change Science: An Analysis of Some Key Questions” – warming “observed over the last several decades are likely mostly due to human activities, but we cannot rule out that some significant part of these changes are also a reflection of natural variability. Human-induced warming and associated sea level rises are expected to continue through the 21st century.”

June 2001: Bush Rose Garden Speech: greenhouse warming is a serious problem.

Scientific challenge: what are the mechanisms that ecosystems and oceans absorb CO2 from the atmosphere? How will these mechanisms change with climate?

Policy challenge: how to factor the environment into decisions about economy, unemployment, trade, …