Fig. 1. IPCC Cover: Stocker, Thomas F. and Dahe Qin (eds.). *Climate Change 2013 The Physical Science Basis: Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Geneva: Intergovernmental Panel on Climate Change (2013), i.

Fig. 2. NIPCC Cover: Idso, Craig D., Robert M. Carter, S. Fred Singer (eds.). *Climate Change Reconsidered II: Physical Science*. Chicago: The Heartland Institute (2013), i.

Fig. 4 NIPCC Table of Contents: Idso, Carter, and Singer (eds.). *Climate Change Reconsidered II*, xii.
1.1 Observed changes in the climate system

Meaning of the climate system is anthropogenic, and since the 1980s, the rate of observed changes have accelerated and become irreversible. The atmosphere and oceans have warmed, the ice sheets have melted, and sea levels have risen. The global average temperature has increased by about 1°C since the pre-industrial period. The rate of change is unprecedented and is caused by human activities, primarily the burning of fossil fuels and deforestation.

1.1.1 Announcements

Each of the last three decades has been successively warmer than the previous one. The scientific consensus is that the observed changes are consistent with the theory of anthropogenic climate change. The Intergovernmental Panel on Climate Change (IPCC) has issued five assessments, the most recent in 2014.

Confidence in the diagnosis of change over this period has increased over the previous assessments. The models used in the 2014 report are more complex and better able to simulate the Earth's climate system. The models have improved in their ability to reproduce key features of the climate system, such as the global energy budget, and to simulate the effects of different forcing agents, such as greenhouse gases and aerosols.

1.1.2 Science

Recent warming dominates the increase in energy stored in the climate system, accounting for over 90% of the energy imbalance in the climate system. The imbalance causes the Earth's climate to warm. The models used in the 2014 report are able to reproduce the observed warming, and the models used in the 2014 report are more complex and better able to simulate the Earth's climate system. The models have improved in their ability to reproduce key features of the climate system, such as the global energy budget, and to simulate the effects of different forcing agents, such as greenhouse gases and aerosols.

1.2 Observed changes and their causes

The observed changes in the climate system are caused by human activities, primarily the burning of fossil fuels and deforestation. The increase in greenhouse gas concentrations has caused the Earth's climate to warm. The models used in the 2014 report are able to reproduce the observed warming, and the models used in the 2014 report are more complex and better able to simulate the Earth's climate system. The models have improved in their ability to reproduce key features of the climate system, such as the global energy budget, and to simulate the effects of different forcing agents, such as greenhouse gases and aerosols.