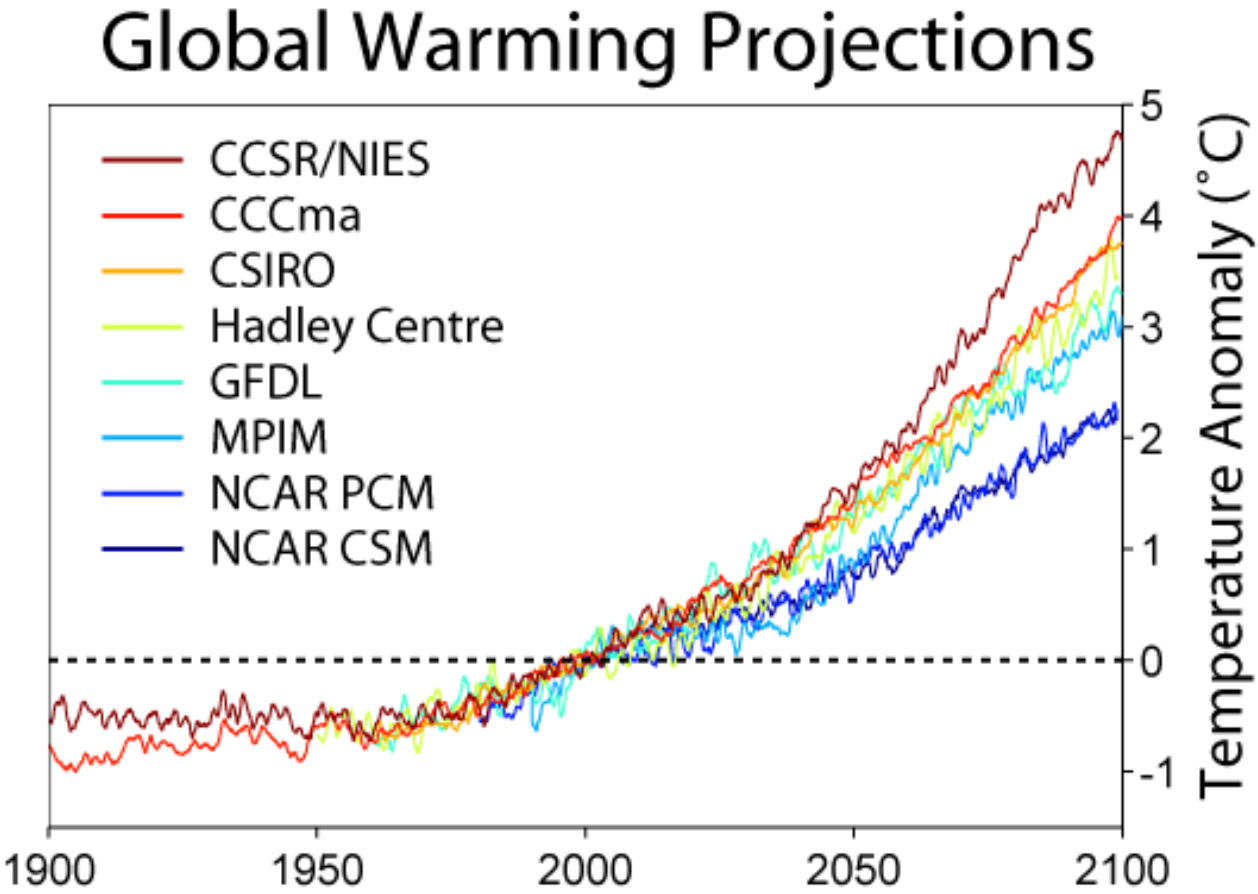
General Circulation Models (GCMs)

By Lennart Kiil



Different climate models' projections of how global warming will develop.

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The most important parts of a climate model.

General Circulation Model is often shortened to GCM. The abbreviation can also refer to a global climate model, which is almost the same as a General Circulation Model, but is used when the model is dealing specifically with global climate change.

A GCM can be used for weather forecasting, understanding climate and predicting climate change. General Circulation Models take many factors into account including atmospheric, chemical, biological, ocean movement and more.

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General Circulation Models are divided into several types depending on which factors they include in their simulation of climate and weather.

The two main types of General Circulation Models are Atmospheric and Ocean models. Separately they account for the changes within the atmosphere and the ocean respectively. Put together they make up a complete climate model. When two systems are connected the resulting more complete system is called a 'coupled' model.

Coupled atmosphere-ocean General Circulation Models (AOGCMs) are the models most often used to make the predictions of future climate. These predictions are sometimes called scenarios.

Based on different scenarios the IPCC can recommend measures to mitigate global warming and can predict what results a specific reduction in greenhouse gas emission are likely to have.

Advanced coupled atmosphere-ocean General Circulation Model can also to some extent predict regional climate changes. These predictions are used to determine what actions nations and regions should take to prepare for the coming changes.

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