

# Decoding Carbon

## #DECODINGCARBON

### Backgrounder: Evolution of Climate Science and its Role in Shaping Policy



Climate study has played an important role in shaping environmental and climate policies around the world. This is understood by the rich history of climate study that led to the creation of the United Nations Environment Program and the subsequent birth of the Intergovernmental Panel on Climate Change (IPCC), where the latter has played a major role in informing today's climate policy.

### Climate Modeling

**Climate models** are used to understand and project future climate conditions under different scenarios. Also known as general circulation models (GCMs), "climate models are based on well-documented physical processes to simulate the transfer of energy and materials in the climate system", allowing us to understand "how energy and matter interact in different parts of the ocean, atmosphere and land" (NOAA Climate.gov, n.d.).

Climate models use various scenarios to predict future conditions and trends in different parts of the world. In its special reports, the Intergovernmental Panel on Climate Change (IPCC) notes different scenarios by "letter-number combinations such as A1, A2, B1 and B2", where each scenario reflects different assumptions and relationships between the numerous variables driving the outcome such as "socioeconomic forces driving greenhouse gas and aerosol emissions" (NOAA Climate.gov, n.d.). Scientific study of climate modeling dates back to the 1920s where scientists used numerical processes to predict

weather. By the 1960s, scientists had made several contributions to the understanding of impacts of CO<sub>2</sub> levels on temperature rises (Carbon Brief, 2018). In 1967, an influential paper called *Thermal Equilibrium of the Atmosphere with a Given Distribution of Relative Humidity* was written by Syukuro Manabe and Richard. T.

Wetherald was published where they successfully demonstrated quantifiable interrelationships between various factors that contribute to changes in the earth's temperature, in particular variations in temperature and humidity (Forbes, 2017). The duo concluded:

"According to our estimate, a doubling of the CO<sub>2</sub> content in the atmosphere has the effect of raising the temperature of the atmosphere (whose relative humidity is fixed) by about 2 °C" – (Manabe & Wetherald, 1967)

The model presented by Manabe and Wetherald is considered to be the first accurate climate model, which predicted global warming fairly accurately and played an important role in influencing modern study of climate science (Forbes, 2017).

### United Nations Environment Program and the Intergovernmental Panel on Climate Change

In the early 1970s, more than 100 climate scientists met in Massachusetts to discuss the effects of human activities on the climate, which led to the publishing

IPCC has been a leader organization ever since in providing the world with scientific information in the form of Assessment Reports, informing decision makers in taking the right course of action for tackling climate change (Carbon Brief, 2018).

## Climate Change Denial – Debunking Common Myths

Climate change has become one of the most pressing human issues of our generation. Despite the consensus of over 90% scientists (Skeptical Science, 2016) and experts on the current and potential impacts of manmade climate change, there remain various groups of people that deny the science of climate change. Such misinformation seriously undermines the need for climate action as it creates skepticism within the general population around the validity of climate science. The following resource provides a detailed explanation for common myths around climate change, together with a response for debunking the myth:

<https://skepticalscience.com/argument.php>

Additional Resources:

- [https://skepticalscience.com/docs/Guide\\_to\\_Skepticism.pdf](https://skepticalscience.com/docs/Guide_to_Skepticism.pdf)
- <https://skepticalscience.com/global-warming-scientific-consensus.htm>
- <https://skepticalscience.com/How-people-use-Scientific-Guide-to-Global-Warming-Skepticism.html>
- <https://www.bloomberg.com/graphics/2015-whats-warming-the-world/>

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