

# Climate Models Explained

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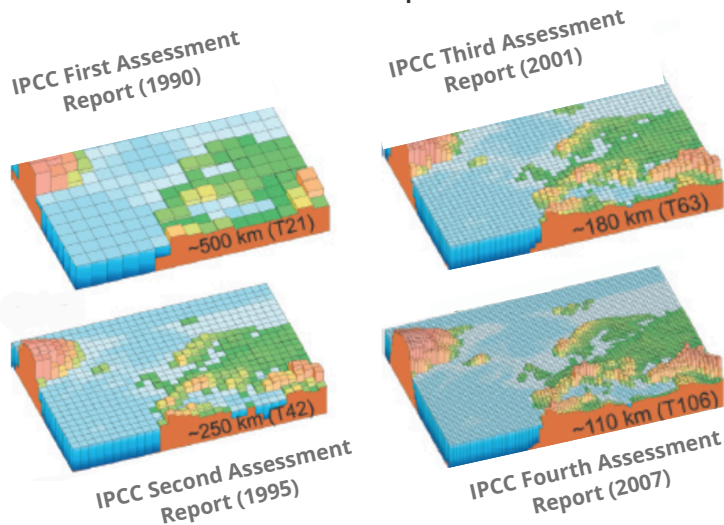
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## What are climate models?



Climate models are sophisticated computer representations of the planet. They are based on the laws of physics and the chemical cycles that govern the behavior of the atmosphere, oceans, ice, and land.

### Climate models have improved over time



Climate models have been around for decades and they have grown more complex and finer in resolution over time. Since the 1970s, climate models have accurately predicted warming as a consequence of greenhouse gas emissions.

## What do climate models do?



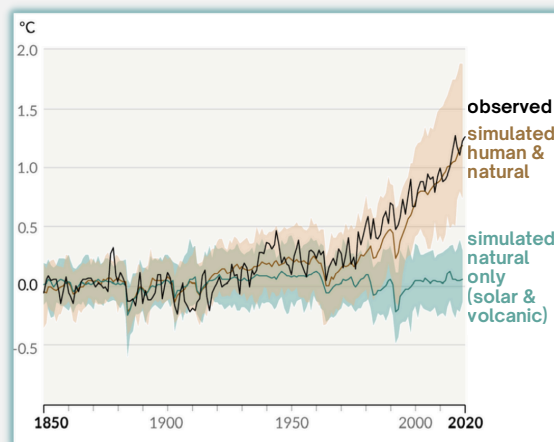
### Models allow scientists to forecast the future

Among other things, climate models enable scientists to evaluate how greenhouse gas emissions will impact the climate. For its Sixth Assessment Report, the Intergovernmental Panel on Climate Change (IPCC) aggregated approximately one hundred different climate models that were constructed and run by independent research groups around the world.

## What else do climate models tell us?

Climate models provide one important line of evidence that indicates warming is caused by human activity.

Scientists have run models of the climate system **with (brown line)** and **without (blue line)** human activities, and after comparing models with observations, scientists have repeatedly found that present warming **cannot be explained by natural causes**.



**SO** Why should judges care



Many climate cases will include questions about the reliability of scientific evidence, including climate models.



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## Sources

National Research Council, *Chapter 3: Strategies for Developing Climate Models: Model Hierarchy, Resolution, and Complexity*, A National Strategy for Advancing Climate Modeling 64 (2012), <https://nap.nationalacademies.org/read/13430/chapter/7>.

Valerie Masson-Delmotte et al., Figure SPM.1 in IPCC, 2021: Summary for Policymakers, Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (2021), <https://www.ipcc.ch/report/ar6/wg1/figures/summary-for-policymakers/figure-spm-1?ref=forwardky.com>.



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