# Article information:

Multidecadal climate oscillations during the past millennium driven by volcanic forcing | Science  
<https://www.science.org/doi/10.1126/science.abc5810>

# Article summary:

1. The Atlantic Multidecadal Oscillation (AMO) is a 50- to 70-year variation of climate centered in the North Atlantic region that was previously thought to be an internal oscillation of the climate system.

2. New research shows that the AMO is actually forced externally by episodes of high-amplitude explosive volcanism, and there is no evidence to show that it has been internally generated during the last millennium.

3. Paleoclimate data demonstrates multidecadal oscillatory behavior during the preindustrial era, but this is an artifact of pulses of volcanic activity during that time period that project onto the multidecadal frequency band.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

The article "Multidecadal climate oscillations during the past millennium driven by volcanic forcing" published in Science discusses the Atlantic Multidecadal Oscillation (AMO), a quasiperiodic variation of climate centered in the North Atlantic region. The authors argue that this variation is forced externally by episodes of high-amplitude explosive volcanism, rather than being an internal oscillation of the climate system as previously thought.

The article provides a detailed analysis of state-of-the-art climate model simulations spanning the past millennium and concludes that there is no evidence for an internally generated, multidecadal oscillatory AMO signal in the climate system. Instead, they suggest that there is a 50- to 70-year “AMO-like” signal driven by episodes of high-amplitude explosive volcanism with multidecadal pacing.

While the article presents a thorough analysis of the available data and models, it may have some potential biases and limitations. For example, the authors rely heavily on climate models to evaluate the causes of AMO, which may not accurately reflect real-world conditions. Additionally, while they acknowledge conflicting results from previous studies on AMO-related indices, they do not explore these counterarguments in depth or provide possible explanations for these discrepancies.

Furthermore, while volcanic activity is identified as a significant driver of multidecadal variability in AMO-like signals, other external factors such as anthropogenic greenhouse gases and sulfate aerosols are dismissed as weak or absent before the 20th century. This claim may be unsupported given limited data availability and calibration issues with proxy data.

Overall, while this article provides valuable insights into the drivers of multidecadal variability in AMO-like signals, it should be read with caution and considered alongside other research on this topic.

# Topics for further research:

* Conflicting results on the internal vs. external drivers of AMO
* Limitations of climate models in evaluating AMO causes
* Anthropogenic greenhouse gases and sulfate aerosols as drivers of AMO
* Calibration issues with proxy data for AMO analysis
* Other potential drivers of multidecadal climate variability
* Implications of volcanic forcing on future AMO trends

# Report location:

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