

# Atmospheric scientist explains complex climate research through animations

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Climate scientist Elizabeth Barnes uses neural networks and explainable artificial intelligence to answer pressing questions about Earth's climate. These cutting-edge, machine-learning methods help unravel the

complexity of the Earth system, but they can be difficult to comprehend.

Barnes wanted to break down these concepts in a few easy-to-understand videos, so she commissioned an artist to visually communicate her group's research.

"When you watch these videos, it becomes clear that our work is rooted in the fundamentals of climate science—we just use AI as a tool for exploring the data," said Barnes, an associate professor in the Department of Atmospheric Science.

Barnes used funds she received when she was selected for the Walter Scott, Jr. College of Engineering Faculty Excellence Award in 2021 to hire Carrie Van Horn of Heartwood Visuals. Van Horn translated the group's science into videos covering four topics:

- Subseasonal-to-decadal prediction
- Robust and trustworthy AI for climate science
- Climate responses and intervention
- Forced change detection

Each [video](#) describes [neural networks](#) and explainable AI, and explains how the researchers use AI to address each topic.

Barnes' entire research group was involved in production. Graduate students and postdoctoral fellows wrote scripts, brainstormed imagery, recorded audio and communicated with the artist.

"It was really important to me for these videos to be a group effort," Barnes said. "My group is made of amazingly [creative people](#), and the videos are 100 times better because everyone was involved."

**More information:** The videos are available online:  
[sites.google.com/view/barnesgr ... u/scicomm?authuser=0](https://sites.google.com/view/barnesgr...u/scicomm?authuser=0)

Provided by Colorado State University

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