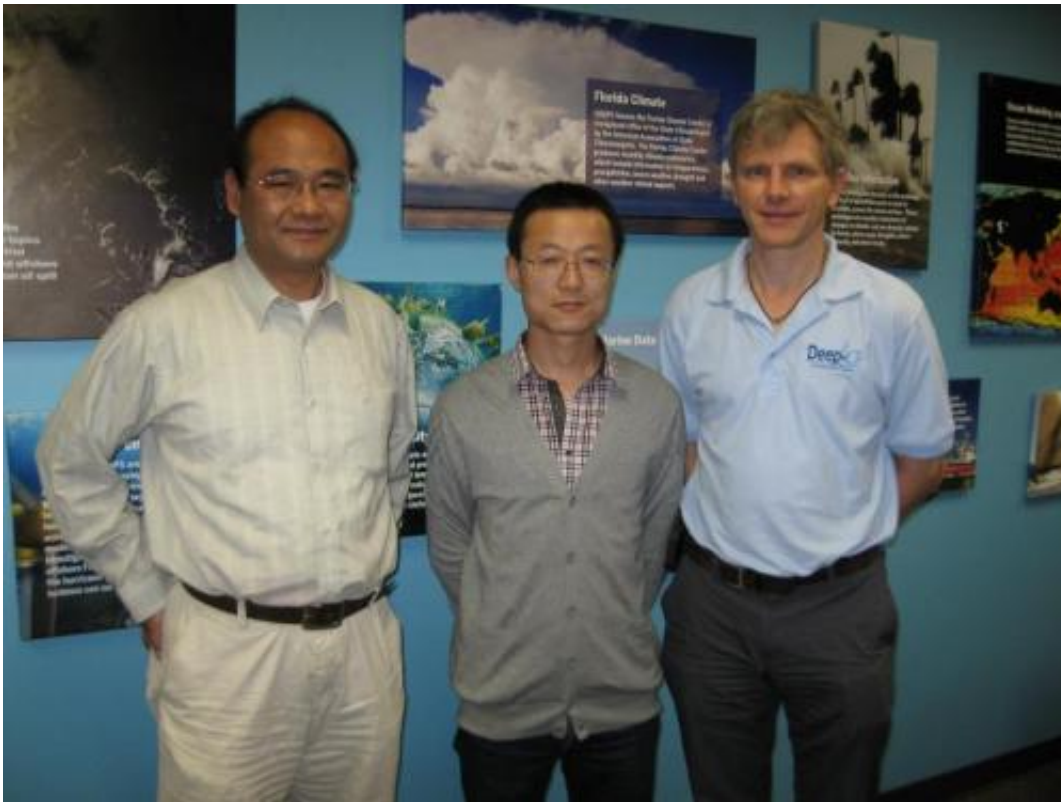


Research sheds new light on global warming trends

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Assistant Professor Zhaohua Wu, doctoral student Fei Ji, and Center for Ocean-Atmospheric Prediction Studies Direct Eric Chassignet have provided the first detailed look at when and where the earth has warmed up and cooled down. Credit: Meredith Field/Center for Ocean-Atmospheric Prediction Studies

New research by a team of Florida State University scientists shows the first detailed look at global land surface warming trends over the last 100

years, illustrating precisely when and where different areas of the world started to warm up or cool down.

The research indicates that the world is indeed getting warmer, but historical records show that it hasn't happened everywhere at the same rate.

And that new information even took scientists by surprise.

"Global warming was not as understood as we thought," said Zhaohua Wu, an assistant professor of meteorology at FSU.

Wu led a team of climate researchers including Fei Ji, a visiting doctoral student at FSU's Center for Ocean-Atmospheric Prediction Studies (COAPS); Eric Chassignet, director of COAPS; and Jianping Huang, dean of the College of Atmospheric Sciences at Lanzhou University in China. The group, using an analysis method newly developed by Wu and his colleagues, examined [land surface](#) temperature trends from 1900 onward for the entire globe, minus Antarctica.

Previous work by scientists on [global warming](#) could not provide information of non-uniform warming in space and time due to limitations of previous analysis methods in climate research.

The research team found that noticeable warming first started around the regions circling the Arctic and subtropical regions in both hemispheres. But the largest accumulated warming to date is actually at the northern midlatitudes. They also found that in some areas of the world, cooling had actually occurred.

"The global warming is not uniform," Chassignet said. "You have areas that have cooled and areas that have warmed."

For example, from about 1910 to 1980, while the rest of the world was warming up, some areas south of the equator—near the Andes—were actually cooling down, and then had no change at all until the mid 1990s. Other areas near and south of the equator didn't see significant changes comparable to the rest of the world at all.

The team's work is featured in the May 4 edition of the journal *Nature Climate Change*.

The detailed picture of when and where the world has warmed or cooled will provide a greater context to global [warming](#) research overall, Wu said.

More information: Paper: [dx.doi.org/10.1038/nclimate2223](https://doi.org/10.1038/nclimate2223)

Provided by Florida State University

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