Weather history 'time machine' created

Date: October 15, 2014
Source: San Diego State University

Summary: A software program that allows climate researchers to access historical climate data for the entire global surface (excluding the poles) has been developed. This software include the oceans, and is based statistical research into historical climates.

During the 1930s, North America endured the Dust Bowl, a prolonged era of dryness that withered crops and dramatically altered where the population settled. Land-based precipitation records from the years leading up to the Dust Bowl are consistent with the telltale drying-out period associated with a persistent dry weather pattern, but they can't explain why the drought was so pronounced and long-lasting.

The mystery lies in the fact that land-based precipitation tells only part of the climate story. Building accurate computer reconstructions of historical global precipitation is tricky business. The statistical models are very complicated, the historical data is often full of holes, and researchers invariably have to make educated guesses at correcting for sampling errors.

"In the past, only a couple dozen scientists could do these reconstructions," Shen said. "Now, anybody can play with this user-friendly software, use it to inform their research, and develop new models and hypotheses. This new tool brings historical precipitation reconstruction from a 'rocket science' to a 'toy science.'"

The National Science Foundation-funded project is a collaboration between Shen, University of Maryland atmospheric scientist Phillip A. Arkin and National Oceanic and Atmospheric Administration climatologist Thomas M. Smith.

Related Articles
- Computer software
- Climate
- Temperature record of the past 1000 years
- Climate model
- Attribution of recent climate change
- Aspect-oriented programming

Related Topics
- Earth & Climate
  - Weather
  - Severe Weather
  - Climate
- Computers & Math
  - Computer Modeling
  - Hacking
  - Encryption
Weather history 'time machine' created -- ScienceDaily

New tool for climate change models

For example, Shen referenced a region in the middle of the Pacific Ocean that sometimes glows bright red on the computer model, indicating extreme dryness, and sometimes dark blue, indicating an unusually wet year. When either of these climate events occur, he said, it's almost certain that North American weather will respond to these patterns, sometimes in a way that lasts several years.

"The tropical Pacific is the engine of climate," Shen explained.

In the Dust Bowl example, the SOGP program shows extreme dryness in the tropical Pacific in the late 1920s and early 1930s -- a harbinger of a prolonged dry weather event in North America. Combining this data with land-record data, the model can retroactively demonstrate the Dust Bowl's especially brutal dry spell.

"If you include the ocean's precipitation signal, the drought signal is amplified," Shen said. "We can understand the 1930s Dust Bowl better by knowing the oceanic conditions."

The program isn't a tool meant to look exclusively at the past, though. Shen hopes that its ease of use will encourage climate scientists to incorporate this historical data into their own models, improving our future predictions of climate change.

Researchers interested in using SOGP 1.0 can request the software package as well as the digital datasets used by the program by e-mailing sogp.precip@gmail.com with the subject line, "SOGP precipitation product request," followed by your name, affiliation, position, and the purpose for which you intend to use the program.

More From ScienceDaily
Global natural gas boom alone won't slow...
Climate change not responsible for altering...
Ancient fossils of bizarre figure-eight water...
Researchers develop world's thinnest electric...
Future computers could be built from magnetic...
Ultra-fast charging batteries that can be 70...
Discarded cigarette ashes could go to good use...
Earth's magnetic field could flip within a...

More Computers & Math News
Thursday, October 30, 2014

Featured Research
from universities, journals, and other organizations

Game Technology Can Make Emergency Robots Easier to Control
Oct. 30, 2014 — A method borrowed from video gaming can make remote-controlled emergency response robots easier to use — enabling the operator to focus more on the dangerous situations they... full story

> Robotics; Artificial Intelligence; Robotics Research; Vehicles

Featured Videos
from AP, Reuters, AFP, and other news services

Mind-Controlled Prosthetic Arm Restores Amputee Dexterity
Robots Get Funky on the Dance Floor
IBM Taps Into Twitter’s Data With New Partnership
Google To Use Nanoparticles, Wearables To Detect Disease

Search ScienceDaily
Number of stories in archives: 140,361

Find with keyword(s): Search

Free Subscriptions
Get the latest science news with ScienceDaily's free email newsletters, updated daily and weekly. Or view hourly updated newsfeeds in your RSS reader:
> Email Newsletters
> RSS Feeds

Get Social & Mobile
Keep up to date with the latest news from ScienceDaily via social networks and mobile apps:
> Facebook
> Twitter
> Google+
> iPhone
> Android
> Web

Have Feedback?
Tell us what you think of ScienceDaily -- we welcome both positive and negative comments. Have any problems using the site? Questions?
> Leave Feedback
> Contact Us

About ScienceDaily | Editorial Staff | Awards & Reviews | Contribute | Advertise | Privacy Policy | Terms of Use
Copyright 2014 by ScienceDaily, LLC or by third-party sources, where indicated. All rights controlled by their respective owners.
Content on this website is for informational purposes only. It is not intended to provide medical or other professional advice.
Views expressed here do not necessarily reflect those of ScienceDaily, its staff, its contributors, or its partners.