



CLIMATE ECONOMY

WHY WEATHER MEANS BUSINESS

by Jenny Mangelsdorf

For biologists, the year 2000 is remembered for the unveiling of the human genome. For climate scientists, the start of the new millennium was famous for another reason — that is, until recently.

The streak from November 1999 to October 2000 is no longer the hottest 12-month period on record, according to the U.S. National Oceanic and Atmospheric Administration (NOAA). The recent mild winter and warm spring in the U.S. were a pleasant surprise for some, but they were also historic. May 2011 to April 2012 were the warmest 12 months ever recorded (since 1895) in the U.S., edging out the previous milestone by 0.1°F and beating the 20th century average by 2.8°F.

But it isn't only weather in the U.S. making headlines in 2012. In March, Scotland felt its warmest temperature ever recorded; Victoria, Australia, broke monthly rainfall records in one day, and Norway had its warmest March since national records began in 1900. With extreme weather becoming more commonplace, what used to be the province of the scientific community is increasingly moving mainstream, as public and private sectors search for better climate insights and techniques to mitigate risk, limit disruptions and adapt.

Adapting to change

"Whatever the cause, climate and weather patterns have fundamentally changed," says Sharon Hays, vice president of CSC's Office of Science and Engineering and former deputy

director for science in the White House's Office of Science and Technology Policy. "Even if you don't want to think about why they're changing, you have to at least be asking how your business might be affected."

CSC supports climate research and helps manage some of the world's largest climate and weather data collection and storage systems. To help organizations whose operations rely on or are affected by the weather, CSC launched ClimatEdge™, an online reporting service providing previously untapped earth observation data gathered by the U.S. government coupled with financial analysis and scientific insight — delivering more accurate intelligence for better informed decisions.

"Climate change can also represent opportunity," says Dan Walker, CSC's chief climate scientist. For example, exploiting knowledge of how emerging climatic conditions may favor certain crops could maximize production even in the face of change. "People are thinking about how to adapt to change," adds Walker, "but what they always stub their toe on is how do they spend their resources most wisely?"

The finances of weather

The financial community certainly thinks about the subject, as evidenced by the U.S. Securities and Exchange Commission's (SEC) issuance of the world's first economy-wide climate risk disclosure requirement. In the SEC's interpretive guidance,

it directs companies to evaluate for disclosure purposes the actual and potential material impacts of environmental matters on their business.

NOAA's Comprehensive Large Array-data Stewardship System, a secure and evolutionary environmental data storage and distribution system that CSC helps maintain, has seen an increase in inquiries for weather data, with property and casualty insurers, reinsurers and catastrophe modelers being among the familiar groups of requesters. Commodities traders, in their own right, keep a close eye on this information as well.

"Any perturbation in the climate has ripple effects on everything from grain and cocoa prices all the way through to meat and dairy. These industries are feeling the change in climate more deeply than the rest," says Guy Turner, director of commodity market research at Bloomberg New Energy Finance, noting the power markets' sensitivity to weather, too. "Businesses that depend on or are highly sensitive to the weather are having to look at those risks and put plans in place to mitigate the potential impact."

CSC supports many organizations' interest in the climate through its suite of ClimatEdge reports, which are available directly or through services such as Bloomberg Professional, a software platform that provides real-time and historical data, and market-focused news and analytics. Commodities traders and risk managers looking at energy and agriculture, for example, can leverage the reports when making purchasing decisions and managing risk through financial futures and options.

The reports provide insight into potential market risk by applying advanced analytics and aggregating satellite and earth-based observation data to create sector-specific knowledge, indices and maps. They allow users to identify potential weather and climate risks several months into the future, supporting decisions on investments with a 30- to 60-day horizon.

"Most of the weather industry has a short-term focus," says Michael Ferrari, CSC Climate Informatics director and senior scientist. "By tapping into this data and applying new techniques and methods, we can help our clients identify weather risks over a longer time frame than other industry analysis offers."

Impact on infrastructure

While many sectors keep a semi-annual or seasonal focus on the weather, others consider a decade a short run. Those involved in infrastructure typically factor the climate, as opposed to weather, into their calculations, and the potential for variability in future patterns has them looking for better data and knowledge.

"There's been a lot of discussion around climate change for quite some time, but traditionally that's been around energy efficiency and greenhouse gas mitigation," says Ben Preston, deputy director of the Oak Ridge National Laboratory's (ORNL) Climate Change Science Institute. "What's more recent is the thinking about climate adaptation and risk management,

particularly over long time scales, and what actions we can implement now that make us more resilient 10, 20 or 50 years down the road."

To help water utilities assess local climate threats and incorporate critical infrastructure needs associated with climate change into long-term capital planning strategies, a CSC team developed a climate resilience evaluation and awareness tool (CREAT) in support of the U.S. Environmental Protection Agency.

"This climate data-driven, adaptation decision support tool, which has been piloted at some of the nation's largest water utilities, will save both water and wastewater utilities — and their public rate-payers — hundreds of millions of dollars in avoided infrastructure impacts due to emerging risks," says Shalini Jayasundera, CSC program management principal leader.

Climate risks also affect other global issues, such as food security, biodiversity and pollution. CSC and ORNL, which is the U.S. Department of Energy's largest science and energy laboratory, have agreed to collaborate on solutions to help customers address potential effects of climate change. One key challenge is the sheer quantity of the data.

"When you're talking about 100 terabytes of data, that's orders of magnitude beyond what many people out there in the user community can use or need to use," Preston says. "Then the question is how we synthesize those data streams in order to get at key bits of information. That's where folks like CSC, who are quite comfortable working with large data streams, can play a helpful part." ■

Advanced Analytics for Climate Data Mining

CSC ClimatEdge™ is a suite of reports that use data from NASA, NOAA and other sources to help commodity traders, financial analysts and infrastructure managers make better decisions. ClimatEdge applies advanced analytics to satellite, modeling and Earth observation data to enhance business insights and knowledge needed to manage climate-related risk and exposure.

ClimatEdge was previously exclusive to users of the Bloomberg Professional® service, but is now available to any customers by subscription. ClimatEdge examines climate and weather events several months into the future, supporting decisions on investments with a 30- to 60-day horizon. By mining "Big Data" sources, the reports uncover unique relationships and create predictive indices that provide additional insight into market behavior.

Learn more at www.csc.com/ClimatEdge.

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