

CLIMATE FORECAST APPLICATIONS NETWORK

Managing Weather and Climate Risks with Astute Intelligence

Over the years, weather and climate forecasts have evolved a lot to become much more precise and accurate. Courtesy of their advantages like improved health and safety of people, increased economic opportunities, protection of environmental resources, etc., the demand for robust weather and climate forecasts has surged over the past few years. **Climate Forecast Applications Network (CFAN)** is one of the leading companies in the weather and climate forecasting sector that is catering to these needs.

CFAN was founded in 2006 to translate cutting-edge weather and climate research into forecast products that support the mitigation of weather and climate risk, on timescales from days to decades. The company aims to leverage ensemble forecast methods, machine learning, and artificial intelligence to provide more accurate probabilistic forecasts at longer lead times.

Translating Research into Product

CFAN was formed under Georgia Tech's Enterprise Innovation Institute VentureLab program. The original aim behind the establishment of CFAN was to better manage the humanitarian work to forecast floods in Bangladesh that was supported by USAID and CARE.

Following Hurricane Katrina in 2005, a major company in the petroleum industry challenged CFAN to develop extended range, better-than-market hurricane forecasts to anticipate disruptions to energy



Judith Curry's,
President

supply, drilling, refining, and transport activities. CFAN responded to the challenge by translating its advanced tropical cyclone research into an innovative forecast product for North Atlantic Hurricanes, which became operational in 2007.

Diverse Range of Services

CFAN has developed numerous forecast products for the energy sector that include temperature and wind energy forecasts on timescales from days to weeks. More recently, the company has focused on developing products for the insurance sector, including extended range predictions of hurricane landfall impacts, fire weather, and severe convective weather. It has also developed a unique climate-dynamics-based method of developing regional scenarios on decadal time scales of both natural climate variability and greenhouse gas-related warming.

CFAN's probabilistic forecasts of temperature extremes, renewable energy production, severe convective weather, hurricanes, fire weather, and precipitation are more accurate at extended time horizons. The company's climate scenario projections and impact assessments support power plant siting and investment decisions, insurance decisions, electric power demand, and vulnerability to severe weather and coastal adaptation.

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At CFAN, our aim is to exploit ensemble forecast methods, machine learning, and artificial intelligence to provide more accurate probabilistic forecasts at longer lead times.

Forecast Innovations

The Atlantic Hurricane forecasts are CFAN's most popular offerings. The company has developed the following innovations for hurricane track and intensity.

- Use of a Monte Carlo approach to creating a large number of synthetic tracks for each forecast from the global models. This provides a better estimate of the probability of hurricane formation 3 to 7 days in advance.
- Innovations in hurricane intensity forecasting include calibrations of the intensity forecasts from the global models to account for historical errors and biases. CFAN has also developed an Innovative Rapid Intensification Index using artificial intelligence methods.
- CFAN's predictions of landfall impacts of hurricane winds use an adaptive statistical-dynamic technique to statistically downscale the coarse resolution surface winds from the global model ensembles plus the National Hurricane Center models.

An Adept Torchbearer

A major part of a company's success depends upon the leader. At the helm of CFAN, Dr. Judith Curry leads as the Co-Founder and President. She is the Professor Emerita at the Georgia Institute of Technology, where she served as the Chair of Earth and Atmospheric Sciences for 13 years. Dr. Curry is well-versed in climate dynamics, extreme weather, and decision-making under deep uncertainty. She is a fellow of the American Meteorological Society, the American Association for the Advancement of Science, and the American Geophysical Union. She is frequently called upon to give Congressional testimony and serve as an expert witness on the matter related to climate change. According to Dr. Curry, the toughest challenge for CFAN has been making a transition from a university-based research focus to customer-oriented focus. *“We have succeeded by not just providing superior forecasts, but by providing services to our clients and working with them to customize and integrate our forecasts into their own risk assessment models,”* she adds.

Awards and Recognitions

The most exciting award for CFAN to date was received by its Chief Scientist and Co-founder, Peter Webster. In 2016, he received the Prince Sultan Bin Abdulaziz International Creativity Prize for water for his work on predicting monsoonal floods in South Asia. The award was presented



by UN General Secretary Ban-Ki Moon in a ceremony at United Nations headquarters.

CFAN feels honored to be recognized among the “30 Best Companies to watch in 2022”. Speaking about the recognition, Dr. Curry enunciates, *“Given the growing importance of weather and climate information in making a wide range of decisions impacting public safety, industry and financial markets, it is very good for the weather and climate services industry to be recognized in this way.”*

Key Success Contributors

There are several factors that have propelled CFAN to become one of the best in the business. Its scientific team members are world leaders in research on extended range prediction of weather and climate extremes. The company's active engagement in research enables rapid diffusion of the latest research and modest developments into its forecast products.

Moreover, CFAN provides the most critical information about accuracy and uncertainty that helps its clients improve outcomes as they manage weather and climate risks. The company continuously works with the clients to develop new products and address their most challenging problems and lucrative opportunities.

New Developments under the Pipeline

Dr. Curry mentions that providing better solutions to

challenging weather forecast problems that have a large socioeconomic impact is a major factor to grow among the best companies in the industry. According to her, a combination of superior forecast accuracy along with depictions of forecast uncertainty, along with a client centered approach that supports decision making is also very important.

In the upcoming year, CFAN is launching a new weather forecast platform to support agriculture in India and Pakistan. The company is working with a team of crop scientists as well as local farmers to optimize its forecasts to support decision making on cropping, planting, irrigation, and harvesting. It is also developing new AI-based indices for severe convective weather and fire weather.

CFAN is upgrading its wind forecast product to provide improved accuracy and new features. Dr. Curry is also preparing for a new book entitled “Climate Uncertainty and Risk”, which is expected to be published before the end of the year.

Things to watch out for

As one of the “30 Best Companies to watch out for in 2022”, the three prominent things CFAN's clients and competitors should watch out for are,

1. A growing need for more realistic scenarios for regional climate change that can be provided by climate models
2. A growing importance of forecasts on subseasonal time scales (weeks) for the energy and agricultural sectors

Incorporation of Machine Learning and AI into operational forecast products which provides tremendous opportunities for weather and climate services. [GBL](#)

