climacell

Weather Intelligence

Turn weather data into actionable insights

2.26.2021

About me

鄭嵎

- ClimaCell since 2018
- University of Miami PhD (2012-2018)
- 中研院環變中心 (2011-2012)
- 台大大氣 (2010)
- https://fischcheng.github.io

About ClimaCell

90% of businesses cannot ***understand*** what weather data means for them

85% of the people around the globe doesn't have ***reliable*** real time and forecast weather data

About us

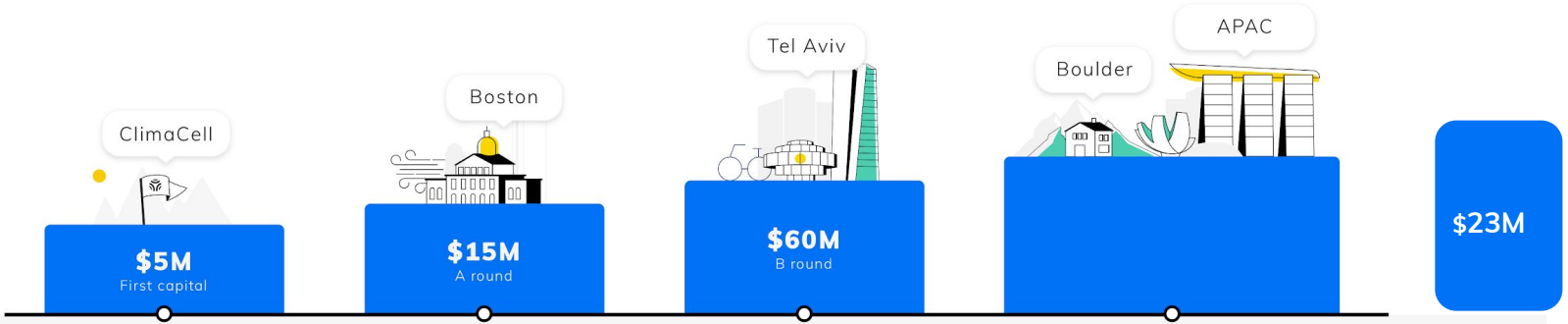
We are powering actionable weather insights around the world.

Our mission is to ***help people*** and organizations manage weather related challenges with the best information and insights.

AMONG OUR CUSTOMERS

Uber nationalgrid USTA - US OPEN PATRIOTS PROCORE aws

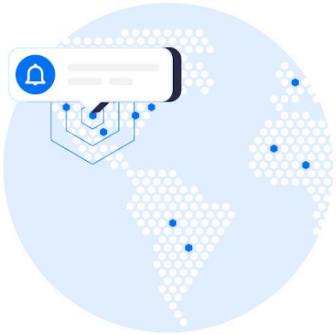
DELTA jetBlue Ford UNITED Via amadeus



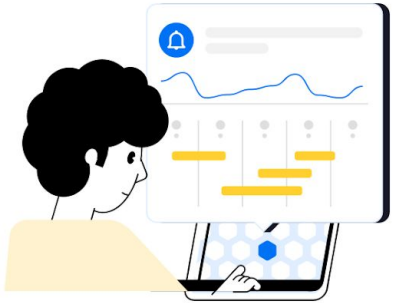
INVESTORS

jetBlue Canaan SquarePeg capital FONTINALIS PARTNERS SoftBank Ford

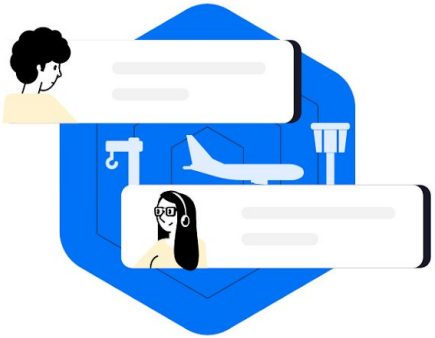
What's ClimaCell MicroWeather OS Does For You



Providing you with the right ***information***



Equipping your business with invaluable ***insights***



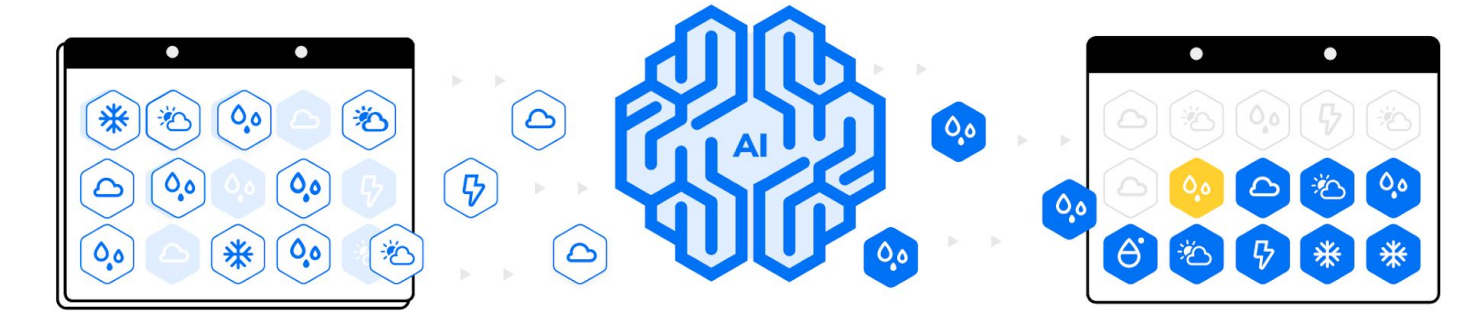
Driving collaboration and ***actions***

1 2 3

Information

The Right Information

ClimaCell ***MicroWeather OS*** provides high resolution historical, real time, and forecast ***weather data***

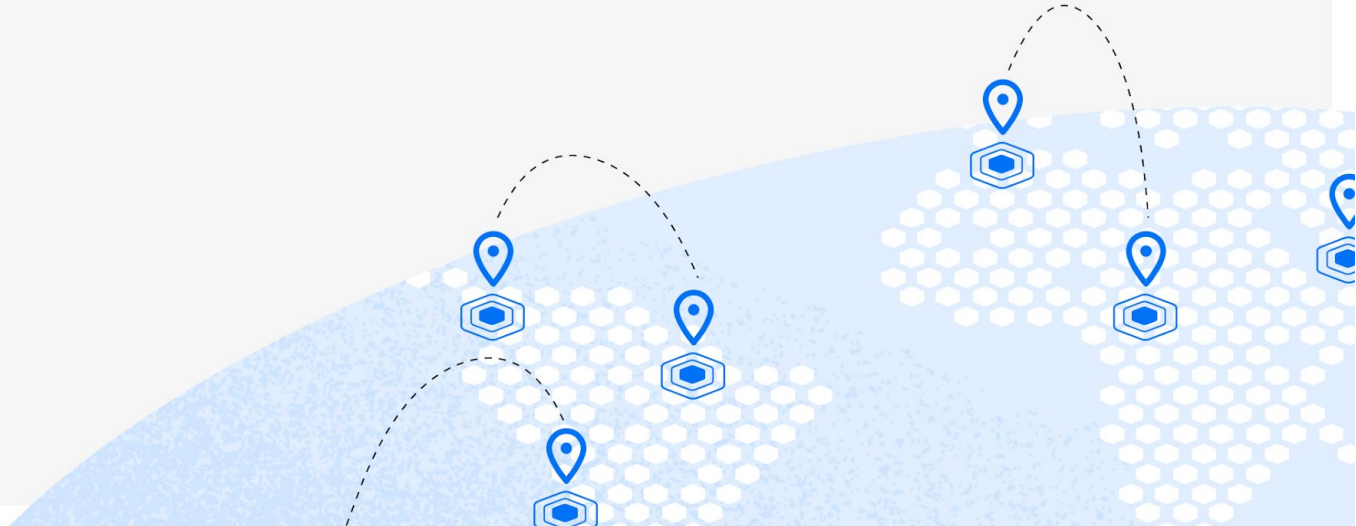


1 2 3

Information

Everywhere

Help people and companies work smarter, making sure that partners, employees, and customers are informed - ***globally***

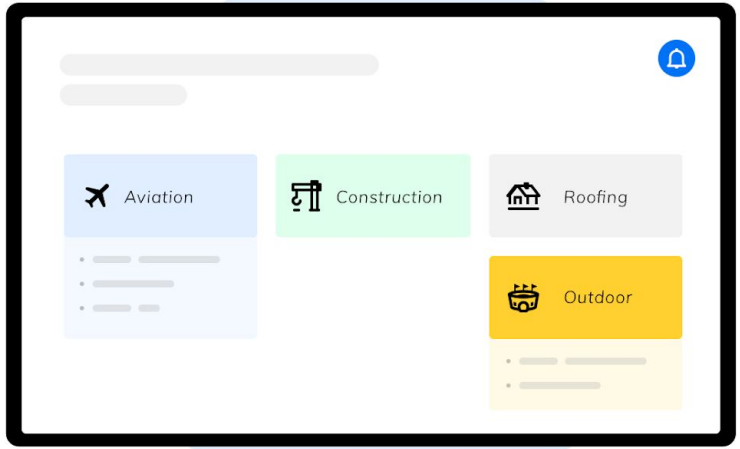


1 2 3

Insights

Invaluable Insights

Provide your team with global weather knowledge and the ***business impact*** it means for them

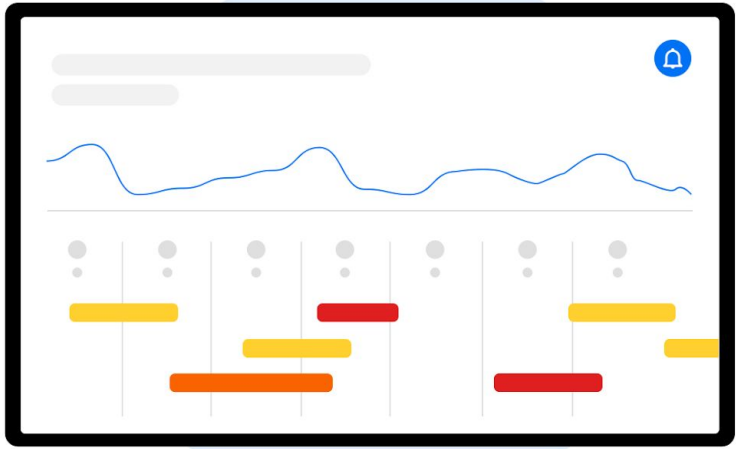


Choose from our vertical-based **insight library**

1 2 3

Insights

Apply insights or create your own **customized insights**



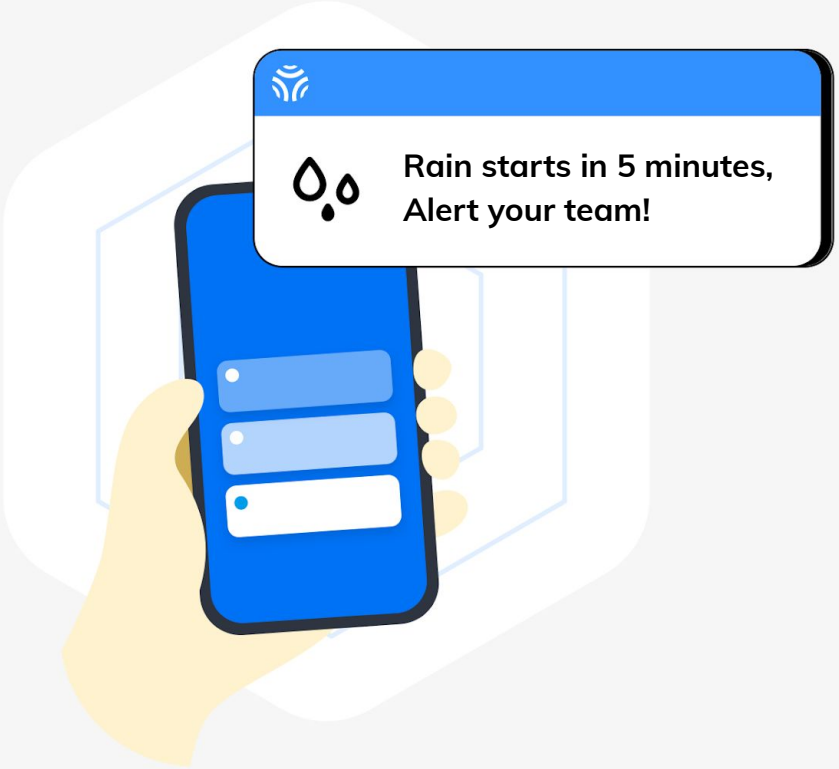
Start watching the **impact** on your business

1 2 3

Actions

Driving Actions

to improve situational awareness and trigger teams to take the best action at the ***right location, time and context***

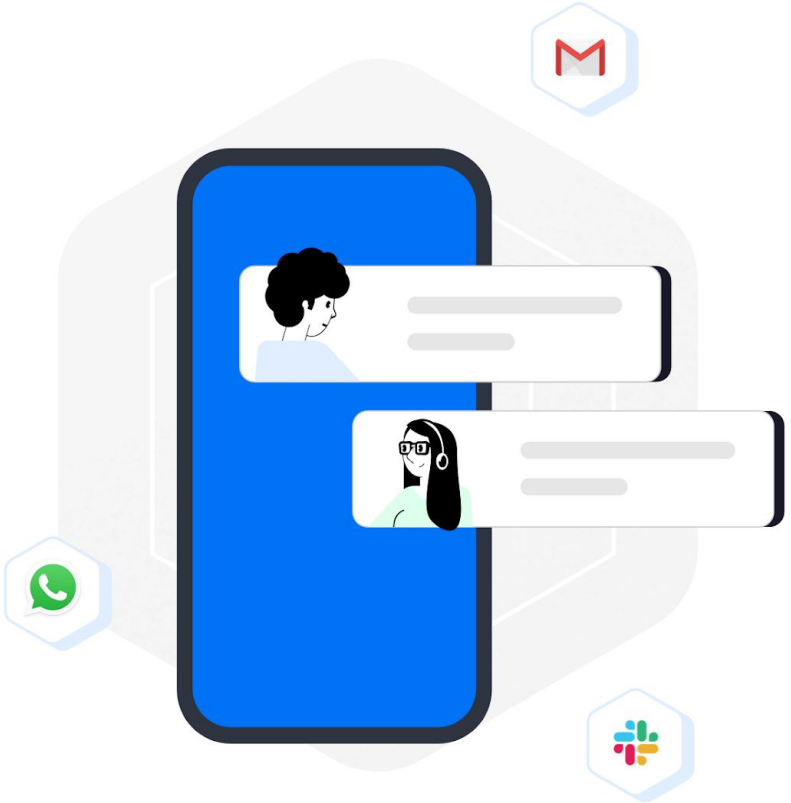


1 2 3

Actions

Collaboration Tools

Share information, insights and decisions using ClimaCell's collaboration tools, via emails, apps, text messages, and more



Business Products

HyperCast

HyperCast is the next generation of ClimaCell's revolutionary weather forecasting platform.

API

The modern weather API - providing the most accurate weather and air quality data everywhere in the world.

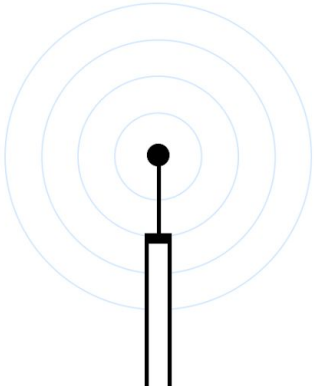
See how HyperCast™ works

Consumer Products

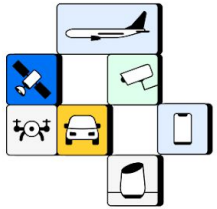
Weather Assistant

Have you ever cancelled a picnic due to “40% chance of rain” only to have sunny skies? Taken your dog for a walk and gotten stuck in unanticipated rain? Wished you’d left the house 10 minutes earlier to avoid suddenly stormy conditions?

All weather data and model outputs are generated by ***governments and repackaged by private companies***

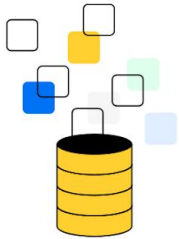


How it Works?



Our Data – Weather of Things

Millions of data points from proprietary sources such as IoT, Drones, Airplanes, Cellular Signals, Sat Com Signals, Cameras, and more, combined with traditional data sources.



Our MicroWeather Models

Proprietary models that are researched and developed in-house, optimized to achieve the highest degree of accuracy in history.

MicroWeather Technology Engine

Optimized for low latency, high accuracy, and integration with our MicroWeather Operating System tools. Weather data optimized to solve complex business problems.

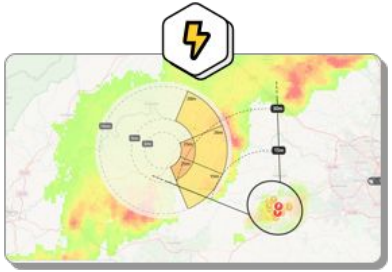
Proprietary Global Solutions

Wildfire Risk

Road Risk

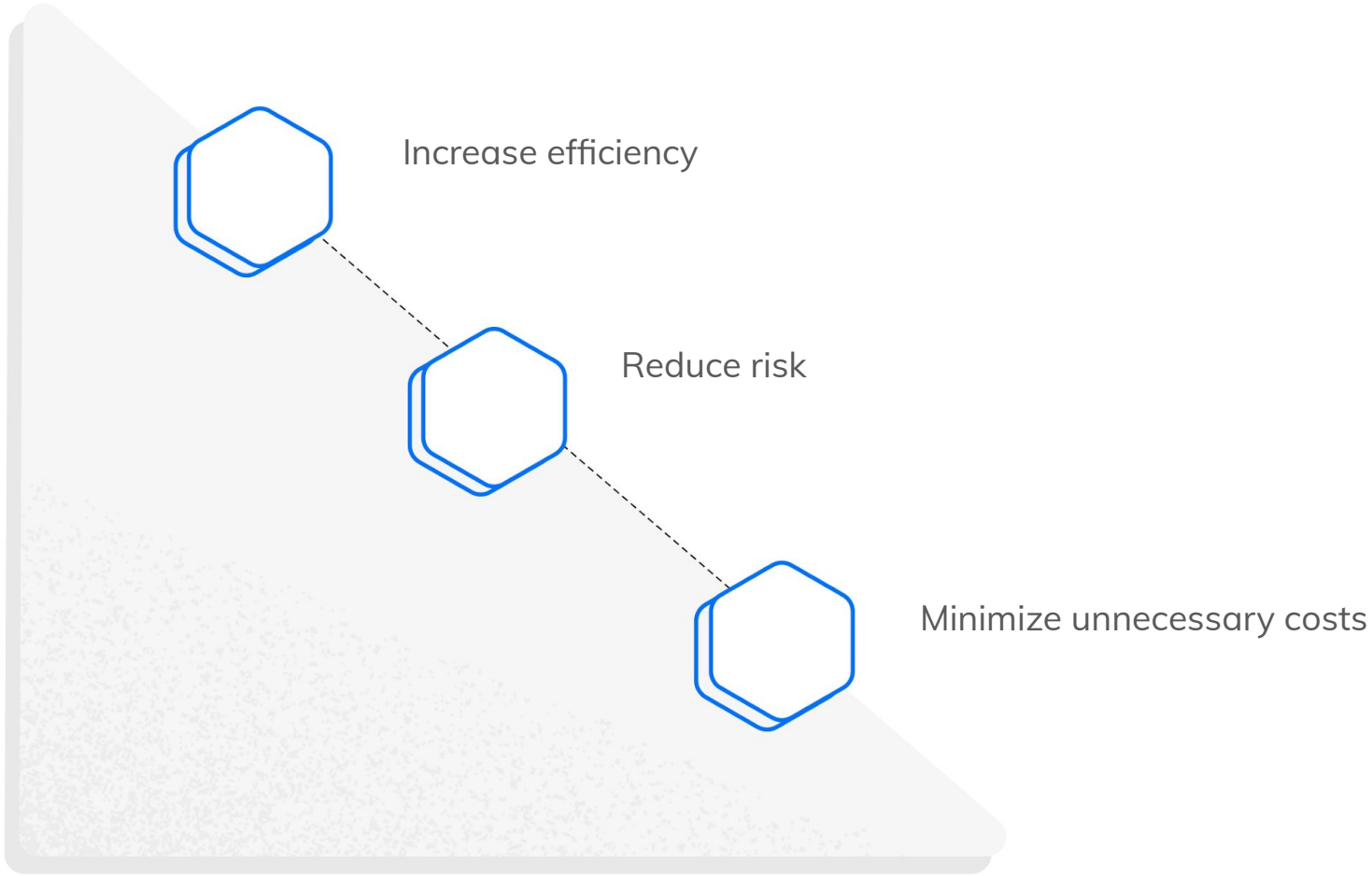
Flood Alerts

High Res Air Quality



Lightning Forecast

What Customers Say About ClimaCell


Increase efficiency
Reduce risk
Minimize unnecessary costs

Aviation

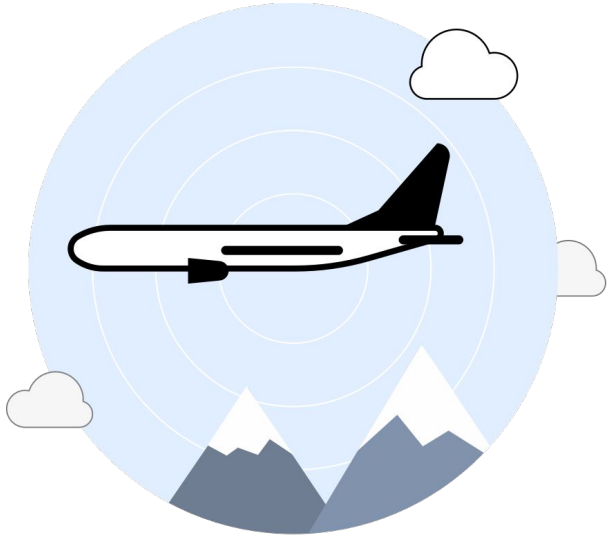
- Improve Safety
- Optimize Operations
- Reduce Flight Delays

What Customers say about ClimaCell?

“This tool was designed with an understanding of the decision-making pressure airport leaders face every day.”

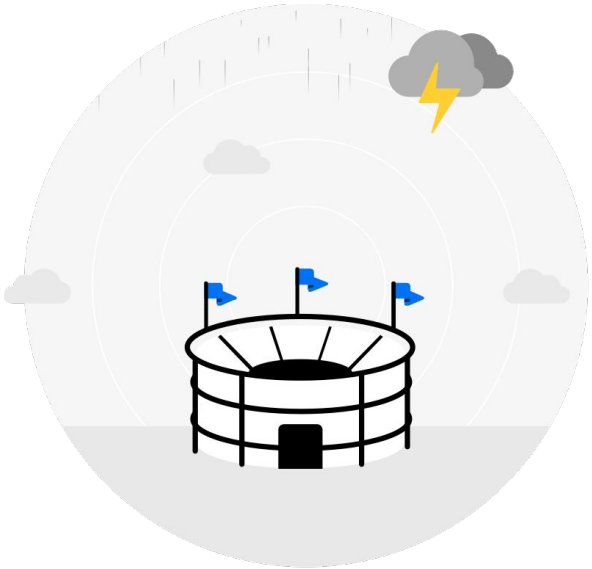
jetBlue

Ian Deason, SVP Customer Experience



Sports & Outdoor

- Minimize Unnecessary Delays and Cancellations
- Reduce Equipment Damage
- Prepare for Extreme Weather Conditions



What Customers say about ClimaCell?

"If lightning is going to touch down on the property, we need to know about the threat in advance - we need to get everyone to sheltered areas. ClimaCell's tools tell us when to expect a weather event and when it will pass us."

PATRIOTS

Jason Stone, Senior Director of Operations,
Kraft Sports and Entertainment

Drones

- Ensure Safety
- Improve Route Planning
- Increase Operational Efficiency

What Customers say about ClimaCell?

"Our goal at UASidekick is to help pilots be safe when they take to the skies. Providing next generation tools, such as Climacell's MicroWeather solution, is essential to moving the UAS industry forward."

UASidekick

Nathan Ruff, UASidekick CEO

Construction

- Increase Operational Efficiency
- Improve Crew Safety
- Lightning Forecast

What Customers say about ClimaCell?

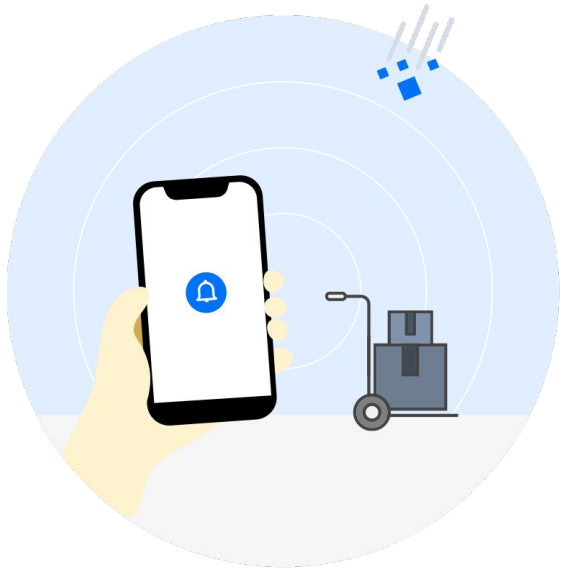
”Our biggest problem is when everything suggests that the weather will be good, we send our crews out, and then a thunderstorm hits seemingly out of nowhere. Now, with the alert system, we are automatically informed in advance”

WHITE CASTLE ROOFING

Zach Clarke, Director of Residental Operations

On Demand

- Prepare for Changes in Supply and Demand
- Increase ETA Accuracy
- Protect Assets



What Customers say about ClimaCell?

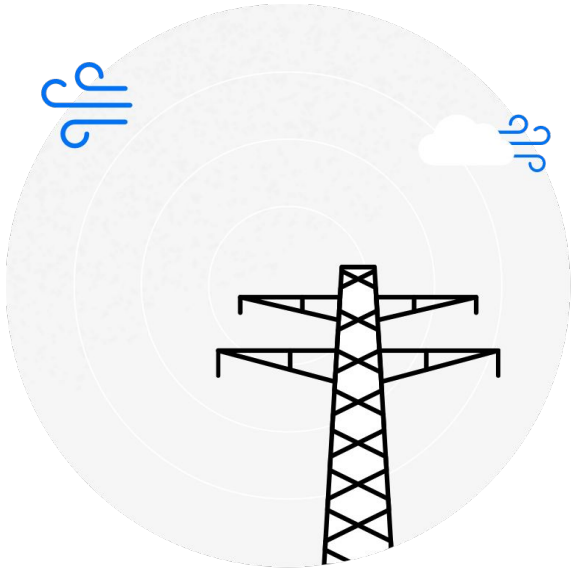
“ClimaCell forecasts provide accurate, actionable insights in real time. We’ve been very impressed with ClimaCell’s products, which help inform our operational decisions and offer quality service to our users.”

Via

Ari Luks, Operations

Energy

- Get Real-Time Data for Asset Utilization
- Up-to-the-Minute Precipitation and Fire Index
- Asset-Specific Weather Insights



What Customers say about ClimaCell?

"Weather is important to us for disaster planning and for responding and recovering from storms, when we can get precise information about what weather will be doing in an area, we can improve readiness and reduce costs."

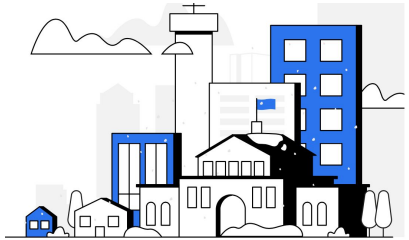
nationalgrid

Lisa Lambert, Chief Technology and Innovation Officer of National Grid plc, and Senior Vice President of NGP

Others

Smart cities

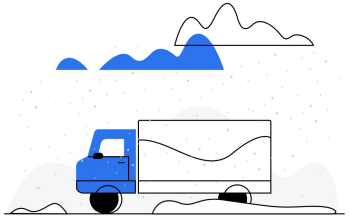
- Air quality-related application: reduce exposure to high PM2.5 conditions
- Flooding warning and management
- Prepare community for incoming weathers



Renewables

- Maximize power generation
- Increase crew safety and protect assets

Logistics



- Smart routing that take weather conditions into account
- Railway managements: avoid derailing due to crosswinds, monitor buckling associated with high temperature

ClimaCon
2020

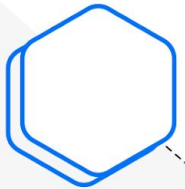
The brands people rely on most, rely on ClimaCell

Forget the forecast.

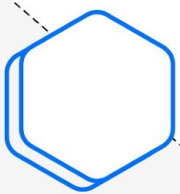
climacell
So you can take control

Q&A

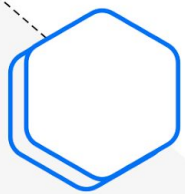
個人經驗、觀察



What’s the role of an “Atmospheric Data Scientist (ADS)”?



How is it like doing “research” in a startup, compared to academia?

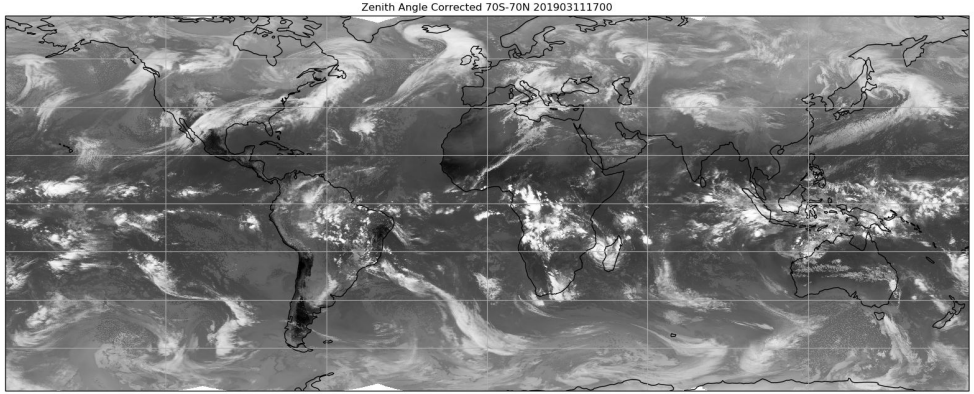


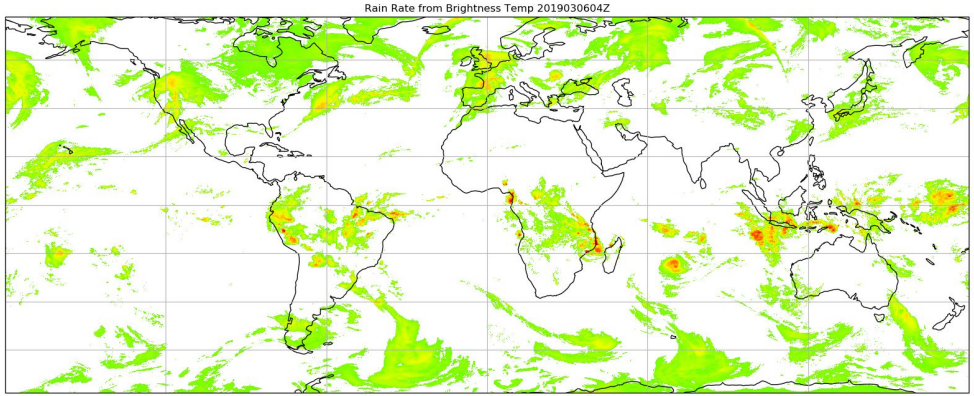
My takes on the weather industry

What's an ADS?

- Overall theme: post-process raw-data, and blend all sorts of weather data, leveraging open source tools and atmospheric science knowledge.
- Including surface obs, numerical model outputs, radar and satellite images (more obs every month).
- Heart of every products (much more than repackaging)
- **A LOT MORE ENGINEERING THAN SCIENCE**

Global Precipitation layer

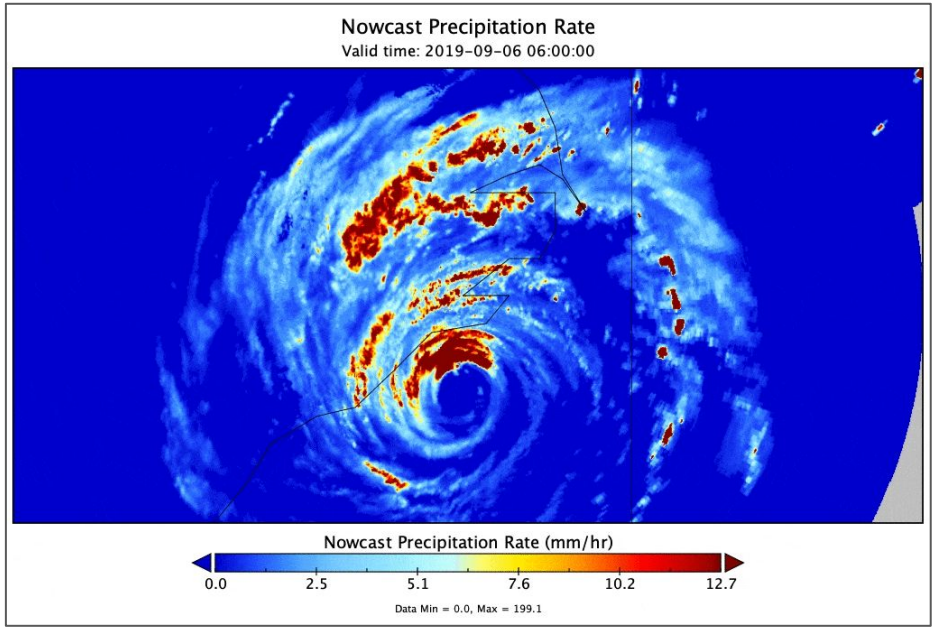




- Merging 5 geostationary satellites to ensure global coverage
- Simple relation: **higher cloud <> heavier rain**
- In house rain rate conversion following NOAA works (hydro-estimator)
- < 20 min latency (vs NASA IMERG >4 hr)

Nowcast

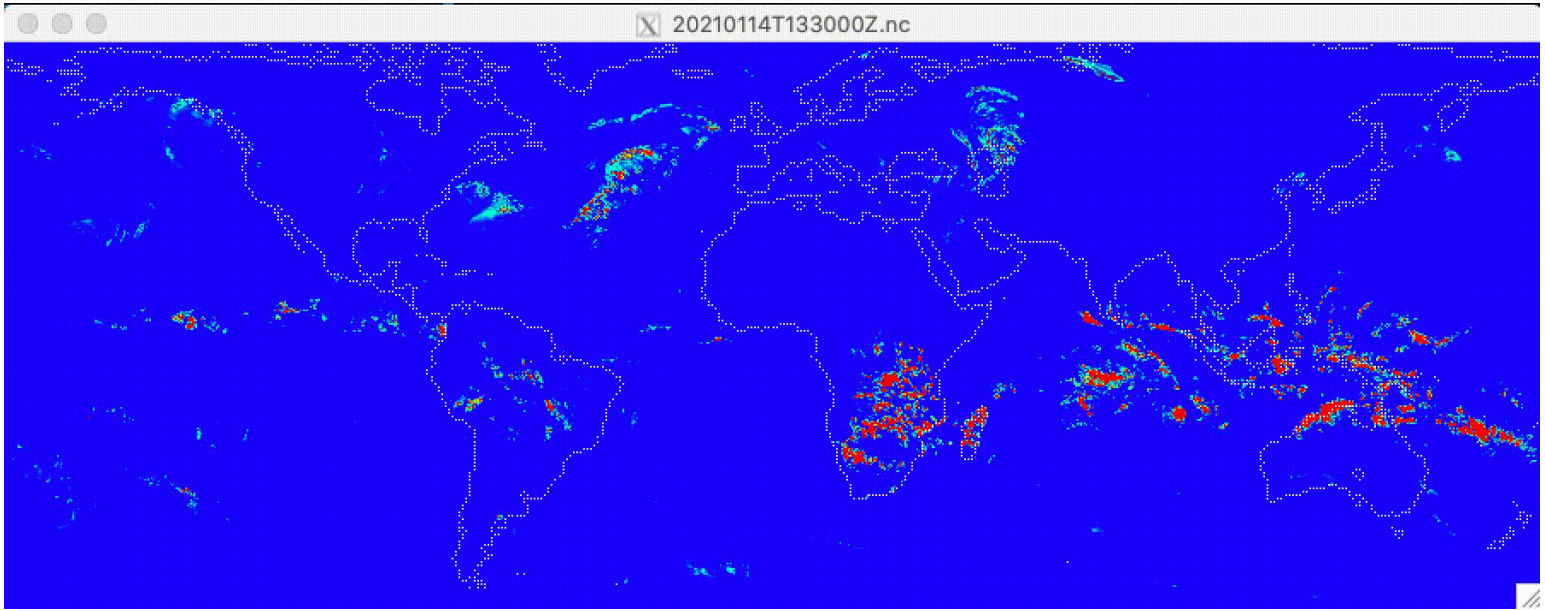
Near real-time, very short range forecast



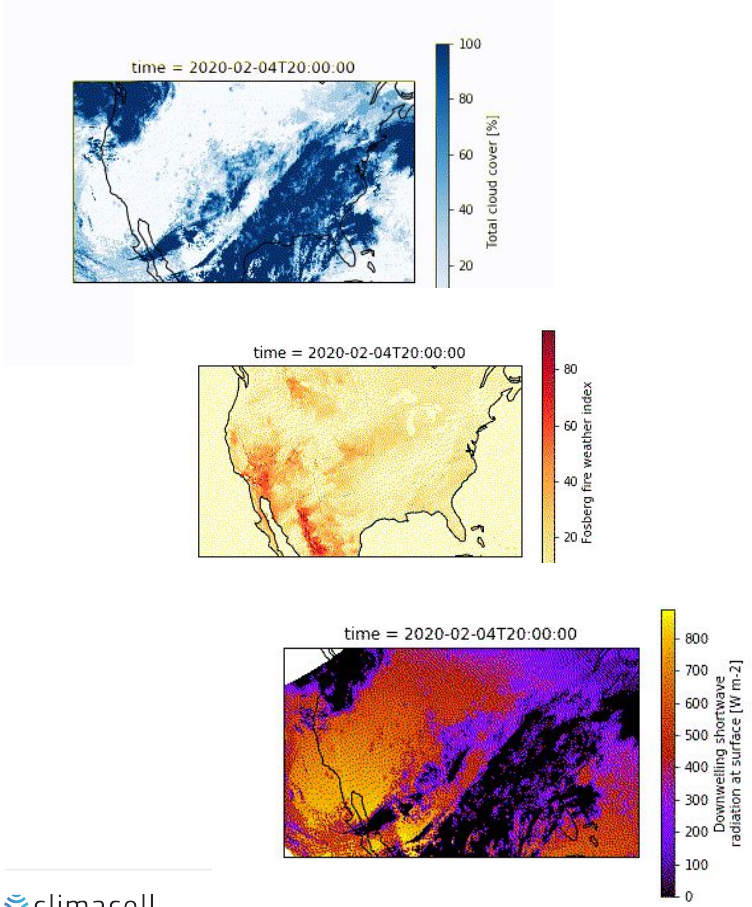
- Very short range forecast; updates every 5-15 minutes (depending on region)
- Ingests a series of images to describe how precipitation changes over time for a region
- Analysis of how precipitation is moving with images (optical flow)
- Estimates how precipitation moves over time (advection)

Global Nowcast

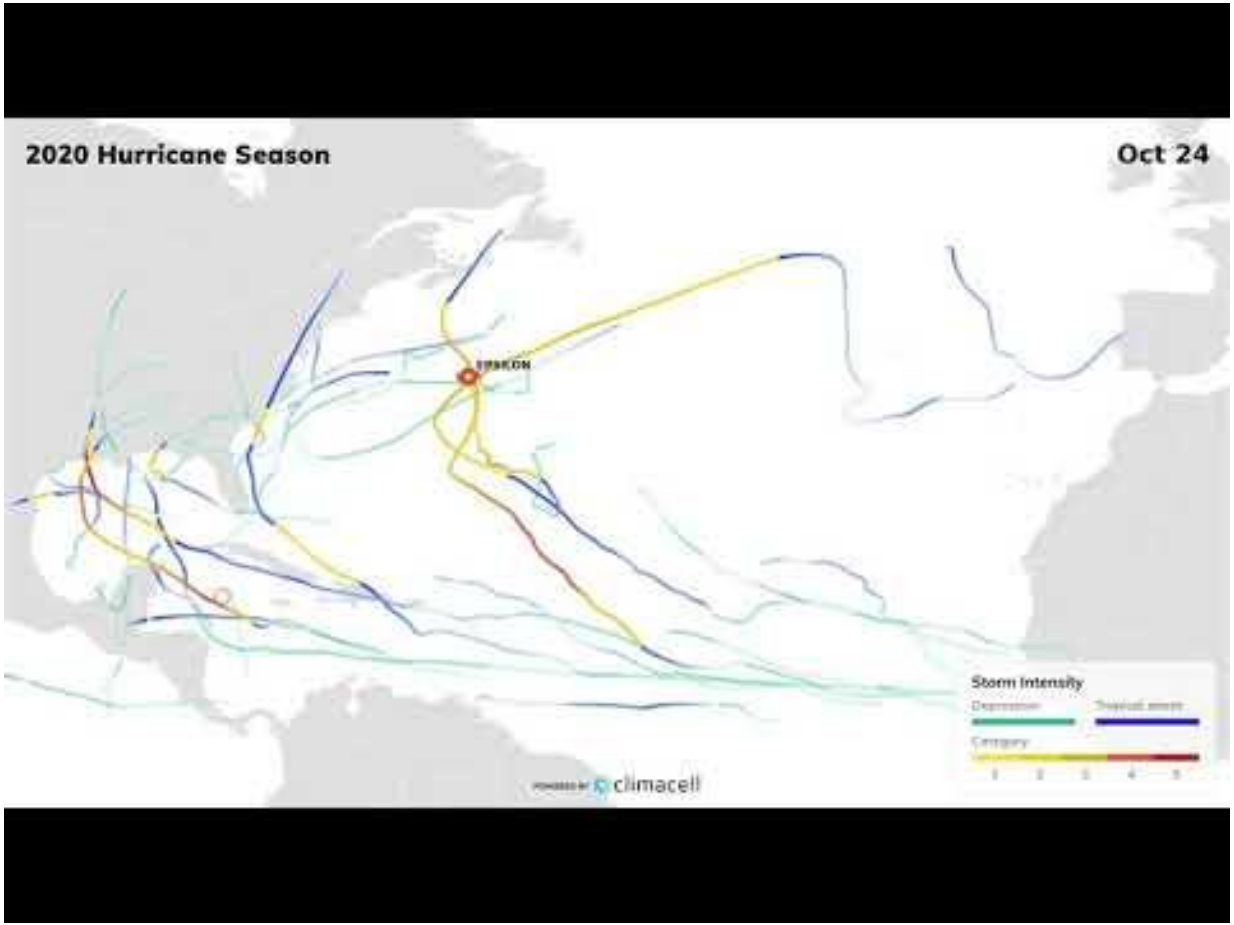
- With cloud infrastructure, we can run the Nowcast algorithm, globally.
- Derived Motion field using GFS precipitable water (similar to the approach in IMERG)



CURRENT CONDITIONS



- A statistical downscaling product that enhances background models and combines in observations.
- Observations can be from standard sources or IoT (e.g. car temperatures).
- Additionally, some fields (like cloud cover) are developed using proprietary algorithms that combine satellite observations.
- The model is used as a reanalysis and put on hypercast as our real-time product for all dry parameters.


2020 Hurricane Season
Oct 24
Storm Intensity
climacell

Proto-typed projects

- Including car sensor data from Porsche and Ford into CCL
- Boundary layer wind for various heights for potential wind farm clients
- Neural-Net-based rain/no-rain detectors, using cell phone signals between towers.
- Train ML model to determine rain/no-rain using traffic-cam data in the US.
- Blending cell phone barometer data to GFS in Japan.

Research in a Startup

- The roadmap is pretty much in flux
- Requests from everywhere
- Not much chance for long-term planning, researching and execution.
- Too many verticals to shoot for. But resources are limited, a lot of context switching and wasted POCs.
- ***We were on an on-call schedule!!!!***

Research in a Startup

- We see our works in the products pretty fast!
- Roadmap in flux welcome more ideas
- Collaborate with seasoned software engineers, get our feet wet, learn things fast.
- Startup mindsets: Get something out fast, and iterate.

On weather industry

- Weather data are commodities: the key lies in bridging the gap between data and decision making.
- We must not see the weather agencies as “competitors” but “partners.”
- We believe there should be robust ways to utilize the ever growing weather data. ClimaCell continues experimenting ways to ingest new data to improve forecasts.
- It’s our mission to make weather data available to the regions of poor coverage https://www.climacell.org

climacell
So you can take control

Q&A