

Re-Climate® Seasonal Climate Forecast APIs

June 2023

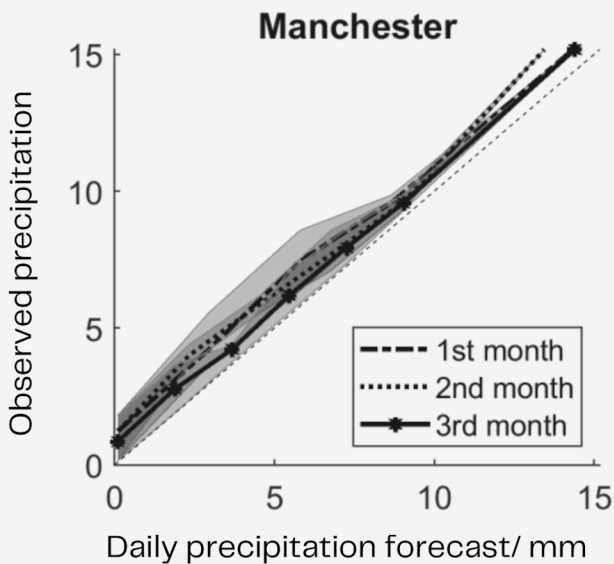
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What is a Seasonal Climate Forecast?



"Reinsurance firms, hydrologists, agrifood firms or strategic planners can benefit from incorporating quarterly hazard data into their modelling."

Seasonal climate forecasts are a powerful risk management tool. They reveal how the global circulation, oceans and other climate drivers influence weather patterns. They are not weather forecasts; however they can reliably inform on the frequency and severity of weather events associated with near-term climate variability. Seasonal forecasts are therefore like other climate products in the sense that they build awareness of extreme weather perils that likely to impact business operations.

In 2021, WeatherLogistics received an independent review of its precipitation forecasts from scientific experts at the National Physical Laboratory. Their validation work demonstrated that its forecasts are both more skilful than alternative methods while most importantly being well-calibrated. Re-Climate outperforms histories, as well as up-to-date climate model alternatives. Climate-related Financial Disclosures (TCFD) indicate that companies and LLPs should consider acute physical risks on all time frames wherever possible. Seasonal forecasts can form part of these insights.

Re-Climate® Standard API deliver data for major towns and cities across the geographies of the United Kingdom, Spain and Turkey. Re-Climate® Gauges supplies precipitation forecasts for English rainfall gauge sites. As from July 2023, climate projections will be delivered for the period from 2025 to 2050. Delivered as a collection (or "ensemble") of 100 daily weather time series, meteorological variables include: temperature, humidity, precipitation, hail risk, solar radiation and wind speed. Re-Climate can be used to assess daily weather variability on a local scale.

Re-Climate® Use Cases

Flood Risk Calculations & Modelling

- Flood preparation, advisories and allocation of resources



Optimise Operations

- Manage pumped hydropower facilities, or to plan maintenance work



Manage Drought

- Adapt agricultural decisions e.g., timings, sprays, cultivar choice; or abstraction and storage for irrigation



Re-Climate® Benefits

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Re-Climate® delivers reliable and detailed insights into extreme weather hazards that are not available from any other supplier

Reliable seasonal climate forecasts ->	Build resilience to climate risk at extended timescales
Validated flood risk product ->	Incorporate precipitation data into hydrology solutions
Powered by Google Cloud ->	Reliable delivery
Proven reliability margins ->	More accurate loss calculations
Localised climate precision ->	Assess local hazards
Collaboration with NPL ->	Independent assessment

Re-Climate® Forecasts	Alternative Solutions
<ul style="list-style-type: none"> Locally reliable insights 	<ul style="list-style-type: none"> Broad category estimates
<ul style="list-style-type: none"> Ensemble provides complete range of hydrological conditions 	<ul style="list-style-type: none"> Difficult to quantify and integrate into flood management solutions
<ul style="list-style-type: none"> Forecasts account for variability from regional climate signals 	<ul style="list-style-type: none"> Histories suggests the same weather on average as the past
<ul style="list-style-type: none"> Enables decision-makers to assess their exposure to losses, and respond accordingly 	<ul style="list-style-type: none"> Risk over or underestimated, resources incorrectly allocated

Reliable Extended Predictions

"Re-Climate® supplies well-calibrated estimates of future weather events to facilitate planning"

Our weather is getting warmer, wetter and more variable. Building subsidence is more common consequently, reducing the value of commercial and residential property. The East of England and Southeast is also now at greater risk of agricultural drought, impacting crop production and quality at harvest. Flooding events, such as that experienced in Yorkshire during late 2019 are now also more frequent, as the jet stream is liable to meandering [1]. Sir James Bevan, the Environment Agency's chief executive emphasised that in recent years several of the "reasonable worst-case scenarios" had happened in the UK from extreme weather [2].

While climate products are available of variable fidelity, independent validation is essential to ensure data integrity. Working in collaboration with the National Physical Laboratory in 2022, WeatherLogistics' precipitation forecasts were rigorously assessed. This demonstrates the potential of its Re-Climate® API for flood risk management. Combining external model data from trusted external suppliers together with its own statistical approaches, improvements were demonstrated in both accuracy and resolution. This provides businesses with best-on-market information about their exposure to acute climate risk over the next quarter.

Re-Climate® supplies well-calibrated estimates of future weather events to facilitate planning. For example, a rainfall event that is forecast to occur 1 in 10 times will have that same frequency of occurrence over a course of several years. Decisions can therefore be hedged accordingly, game-changing for those involved in supply chain planning, utilities, or transportation. Seasonal forecast products available elsewhere are often unreliable and not suitably resolved for asset management.

The Re-Climate® technology combines two approaches to better ground its forecasts with observations. Within season testing demonstrate a 64% sensitivity of cold versus warm events during a 7-month trial, contrasted to 50% otherwise.

[1] Carbon Brief, "Jet stream: Is climate change causing more 'blocking' weather events?", June 2020

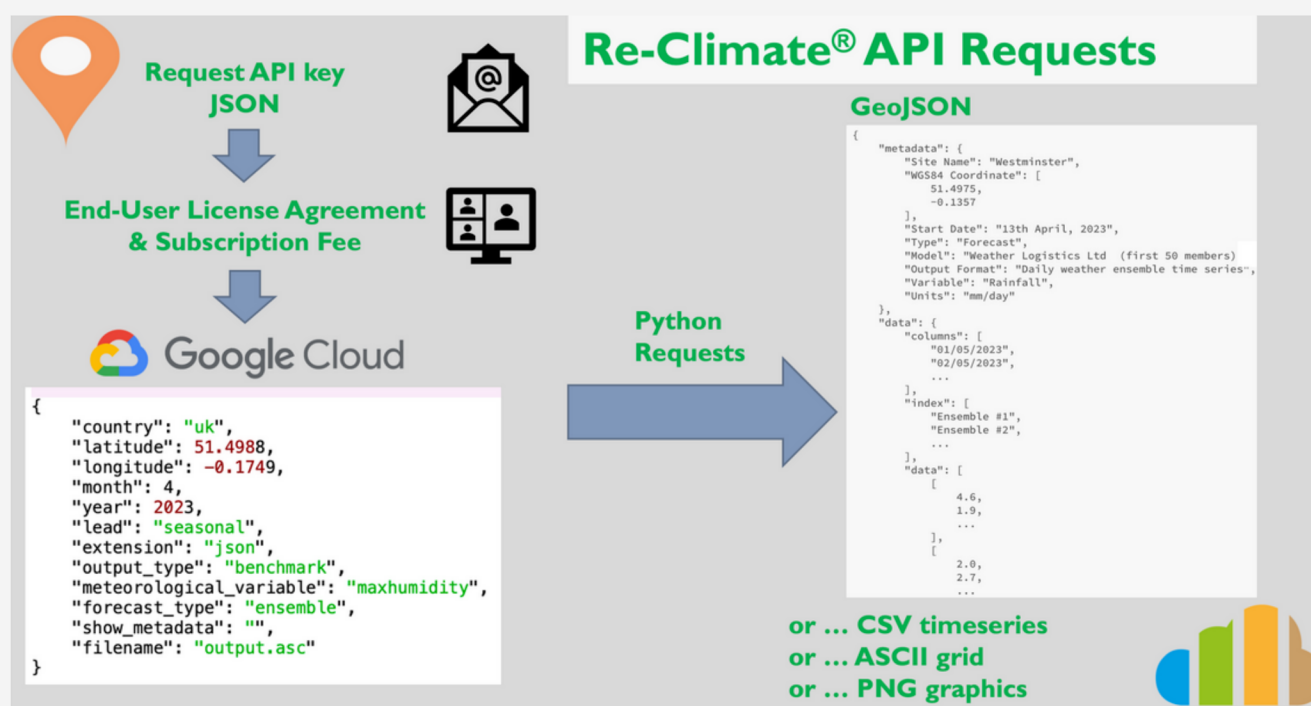
[2] The Guardian - Environment, "Climate crisis hits 'worst case scenario' levels - Environment Agency head", 23rd Feb 2021

Using Re-Climate®

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The Re-Climate® API ...

- Delivers reliable weather hazard analytics to assess daily events
- Provides access for historical start dates from month: '03', year: '2023'
- Updates climate hazard information on the 14th day of each month



Endpoints

To get started with the API request code, first request the endpoint URL

- Re-Climate® Validators, historic seasonal forecasts (except current issue)
- Re-Climate® Standard, seasonal forecasts for towns and cities
- Re-Climate® Gauges, seasonal forecasts at UK rain gauge sites

Further Product Information at:

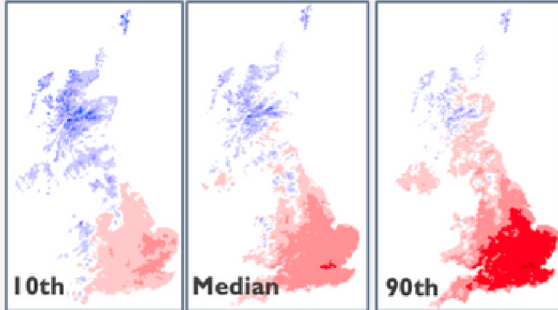
<https://github.com/cjnankervis/Re-Climate>

Weather Logistics Ltd

Re-Climate® Seasonal Climate Forecast API, 2023

Product Demos

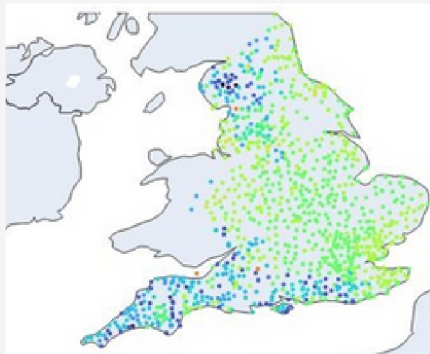
Confidence Bounded ASCII Datasets



Maximum Temperature Seasonal Forecast

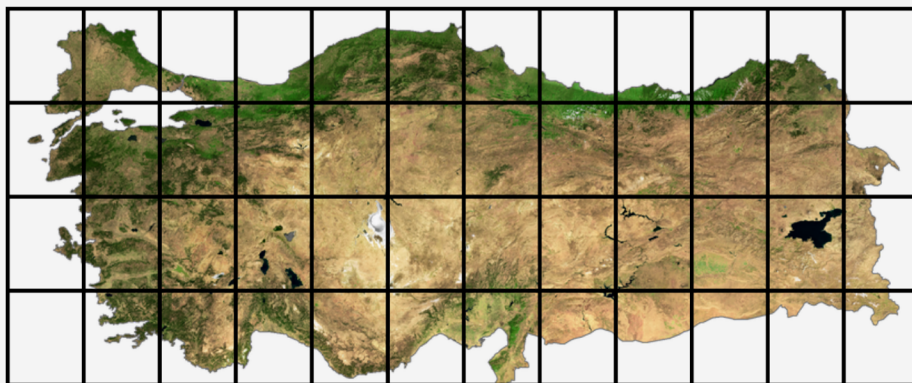
Re-Climate®

Gauges

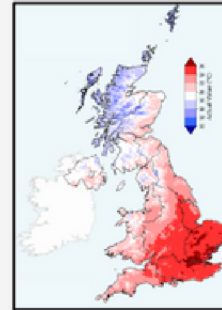


Re-Climate Simulations at open.gov.uk/ tipping bucket rain gauge sites

Custom Point Requests



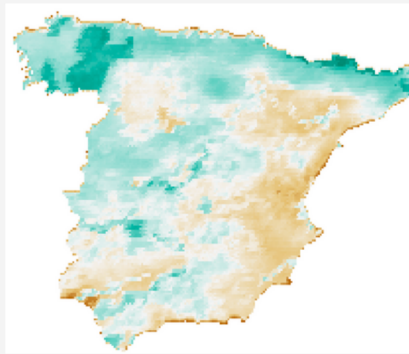
Town or City Data, or customised 100-member daily weather ensemble interpolated to a 5km/ 10km/ 20km grid



Observations

Soil Moisture

Forecasts



From July 2023. UK Climate Projections for 2025, 2035 and 2045

100-member daily weather ensemble resolved to 5km
Representative Concentration Pathways 2.6 and 8.5

Built with Re-Climate® technology

Precipitation simulations from 2018 to 2021 validated by
the National Physical Laboratory

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