Forestry Use Case

Jupiter Enables Foresters to Optimize Resilience Planning and Land Management With Flexible, Hyper-Local Analysis of Multiple Climate Risk Perils

Mounting challenges from more frequent and more severe weather events, driven by climate change, confront forest managers and investors

Climate change poses a massive challenge to the world's woodlands, timberland owners, forest products industries, and forest and land managers.

Forests are vulnerable to the full range of climate change-driven perils: flooding, wind, heat, wildfire, drought, extreme precipitation, and hail. Higher temperatures and severe drought increase tree mortality and the likelihood of wildfires, encourage the proliferation of pests and pathogens, reduce yields, and degrade the quality of soils. A stressed or unhealthy forest can impact clean water supplies, handicap CO_2 storage capability (and cause carbon starvation), and damage wildlife habitats. Changes in precipitation patterns and frequent and severe flooding cause landslides that can destroy roads and disrupt the supply chain. Extreme heat and high humidity threaten the health and safety of workers.

The Food and Agriculture Organization of the United Nations warns: "In some cases, climate change is impairing the ability of forests to deliver critical goods and ecosystem services, such as wood and non-wood products and clean water, to the detriment of the livelihoods of forest dwellers, forest- dependent communities, and others who benefit from forests."

To prepare for this onslaught of disruption, foresters need a clear understanding of potential physical climate impacts from both extreme weather events and chronic conditions, at a granular, microclimate level, tailored to their specific geographies and requirements. Jupiter's forward-focused, very-high-resolution physical climate analytics solutions—based on best-in-science climate models, appropriate downscaling techniques, and machine learning—deliver that understanding.

Jupiter ClimateScore™ Global's multi-peril, very-high-resolution physical risk analysis at the microclimate level empowers decision-makers

ClimateScore Global offers forest managers and forestry-related businesses (as well as those who invest in them) support for the critical processes that help them sustain and optimize the management of woodlands and their overall value chains. These processes include:

Climate risk assessment

Hyper-local (microclimate-scale) assessment of acute and chronic physical risk from climate change across their portfolios from weather conditions and extreme events such as heat and cold waves, drought and water stress, flooding, extreme precipitation, wind, wildfire, and hail. ClimateScore Global renders very-high-resolution (90m) probabilistic projections for any point on the planet's land surface, over multiple time horizons at five-year intervals through 2100, and across different emissions scenarios. The 80-year time horizon is especially

important for foresters, who must base their planning on the long lifetimes of trees. In addition, investors can use these estimates in TCFD disclosures or to satisfy regulatory requirements.

Pest and pathogen control

Warming temperatures allow insects, pathogens, and weeds to thrive in formerly hostile climates; forest managers must adjust to the new threats they pose. ClimateScore's insights can inform mitigation strategies.

Market opportunity identification

Changing temperatures encourage tree species migration and redistribution. This creates opportunities for potential asset relocations to those more hospitable destinations. With ClimateScore Global, foresters can assess potential changes to conditions over time, locate assets in more favorable geographies, or change their product mixes.

Worker health and safety

Jupiter's metrics include the frequency of breaching critical thresholds of Wet Bulb Globe Temperature, a worldwide standard that measures heat stress to humans due to temperature and humidity.

Infrastructure modification

Changes in precipitation patterns, and the resulting floods or droughts, may demand new infrastructure investment. Jupiter analytics help prioritize capital investments.

Supply/value chain optimization

Changing weather patterns affect all aspects of production: transportation, milling, warehousing, and distribution. Understanding, via Jupiter's analysis, the impacts of a changing climate on the logistics and value chain infrastructure is crucial.

Jupiter's key advantages for users in forest-related industries

Jupiter ClimateScore Global is ideal for these applications for five key reasons:

1. Its projections are based on **rigorous climate, weather, ocean, hydrological, and data science.**

2. Its **transparent methodologies** combine the world's most respected physical models of the atmosphere and hydrosphere; cloud-computing-enabled downscaling techniques; machine learning; land use and elevation data; extensive observations illuminated by novel data sources such as satellite, air, and ocean- and land-borne sensors; and integrated, robust verification and validation processes.

3. Its **high-resolution modeling of microclimates**, driven by machine learning, helps detect variations across small regions, and enable Jupiter ClimateScore Global to drill deeply to analyze individual locations.

    - In addition, ClimateScore Global can be used to create **customizable indices** to better reflect risk across wider regions and support technical due diligence when assessing the future viability and investment in assets.

4. Its **flexible high- and low-temperature thresholds** can be adjusted and map to the needs of a particular tree species and/or the range of a particular pest.

5. Its **support of quantified uncertainty** and detailed model, scoring, and loss methodology minimize model risk.

About Jupiter

Jupiter Intelligence™ is the global market, science, and technology leader in physical climate analytics for risk management and resiliency planning.

Jupiter analytics are used across the private and public sectors. Customers include at least one of the world's five largest firms in insurance, asset management, banking, chemicals, minerals and mining, oil and gas, pharmaceuticals, power, and reinsurance—as well as critical departments and agencies within both the United States government and climate-change-vulnerable geographies around the world.

In addition, the Jupiter Promise is a global partnership with non-government organizations (NGOs) designed to provide climate analytics at little or no cost to improve resilience for the planet's most vulnerable and underserved populations.

Jupiter's enterprise-grade solutions together form the world's only global-to-street resolution climate analytics offering. In addition to ClimateScore Global's portfolio-scale analysis, the Jupiter ClimateScore Planning suite delivers ultra-high-resolution projections of peril-specific climate impacts on individual assets, facilities, neighborhoods, and communities.

For more information, please visit https://jupiterintel.com or email us at info@jupiterintel.com.