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AI-Based Climate Modelling Market Opportunity, Growth Drivers, Industry Trend Analysis, and Forecast 2025 – 2034

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Abstracts

The Global AI-Based Climate Modelling Market reached USD 266.4 million in 2024 and is forecasted to grow at an impressive CAGR of 23.1% from 2025 to 2034. This growth is propelled by heightened awareness of climate change and its severe impacts, driving the need for advanced tools to predict and mitigate climate-related risks effectively. Innovations in artificial intelligence, particularly in machine learning and deep learning, have enabled more precise, granular, and real-time climate predictions, transforming the landscape of climate science.

One of the primary drivers of this market is the increasing demand for predictive tools in disaster risk management. With extreme weather events becoming more frequent due to climate change, governments and organizations are turning to AI-driven models for early warning systems and strategic preparedness. These cutting-edge tools enhance capabilities to minimize economic losses and safeguard vulnerable populations, proving critical in resilience-building efforts globally.

The AI-based climate modelling market is segmented into software and services. In 2024, the software segment dominated with an 80% market share and is projected to grow significantly, reaching USD 1.4 billion by 2034. The widespread adoption of software solutions stems from their versatility and scalability across industries. Advanced algorithms and machine learning frameworks empower these tools to process vast amounts of climate data, delivering accurate forecasts and actionable insights. Sectors such as agriculture, energy, and disaster management heavily rely on these solutions for real-time, data-driven decision-making.

By application, the market is categorized into weather forecasting, climate prediction,

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disaster risk reduction, environmental monitoring, and others. The weather forecasting segment held the largest share—45%—in 2024. This dominance is attributed to the critical need for accurate, real-time weather predictions across sectors like agriculture, energy, and transportation. AI models analyze extensive datasets, including satellite imagery and meteorological data, to deliver precise forecasts, enabling businesses to better plan operations and mitigate risks effectively.

The U.S. AI-based climate modelling market captured a substantial 80% revenue share in 2024 and is projected to reach USD 500 million by 2034. This leadership is fueled by the country’s robust technological infrastructure and a strong presence of leading technology companies and startups. Significant investments in AI research and development, coupled with a focus on climate resilience, disaster management, and environmental sustainability, have spurred the innovation of sophisticated climate modeling tools. Additionally, governmental initiatives to advance climate-focused technologies further bolster market growth.

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