



dClimate and AWS open TESSERA's global land intelligence to world

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AWS will provide compute credits and open-data hosting to make a decade of 10-metre, analysis-ready Earth observation data freely accessible



dClimate is collaborating with Amazon Web Services (AWS) to expand TESSERA, its global geospatial AI foundation model, to worldwide coverage and make the resulting land-intelligence data freely available to researchers, businesses, developers and public institutions.

Through the Amazon Sustainability Data Initiative (ASDI) and the AWS Open Data Sponsorship Program, AWS is providing compute credits and open-data hosting to help complete TESSERA's historical global embeddings and make the resulting analysis-ready dataset publicly accessible.

Developed by Dr. Clement Atzberger, Chief Scientist at Arbol, in collaboration with researchers at the University of Cambridge, TESSERA is designed to turn satellite observations into a consistent, machine-readable representation of how Earth's surface changes over time. Arbol, an AI-native insurance and climate-risk company, has supported the project as an open-source collaborator, contributing research, engineering expertise and validation from its climate-risk underwriting applications.

The model, described in a peer-reviewed paper, processes data from Europe's Sentinel-1 radar and Sentinel-2 optical satellite missions and converts the imagery into compact 128-dimensional "embeddings". These embeddings provide a distilled representation of changes occurring across 10-metre patches of land over the course of a year.

That approach addresses a persistent challenge in Earth observation: satellites generate enormous volumes of imagery, but converting those observations into consistent datasets that can be analysed at scale requires substantial computing infrastructure, storage and technical expertise.

“What Dr. Atzberger and his collaborators at the University of Cambridge have built, and what our team has since helped advance, is nothing less than a living, machine-readable map of how the Earth's surface is changing - every field, forest, and watershed, anywhere on Earth, year after year. With AWS, we're making it free and open to everyone: the farmer deciding how to steward her soil, the scientist tracking a shrinking forest, the community on the front lines of a changing climate. Our belief is simple: the data that describes our shared planet should be a public good, not a private moat. When everyone can see how the Earth is changing, everyone can help protect it,” said Osho Jha, Co-Founder and CEO, dClimate.

The significance of the initiative lies not only in the volume of satellite data being made available, but in its historical consistency. Questions around deforestation, carbon dynamics, crop stress, ecosystem change and land degradation often require comparisons across multiple years. TESSERA is intended to provide that longitudinal record in a format that can be analysed without requiring users to process vast collections of raw satellite scenes.

The potential applications extend to financial and public-sector risk assessment. Insurers, lenders and government institutions could use high-resolution land intelligence to evaluate exposure to climate and land-related risks, while developers could build applications on top of the open data without having to recreate the underlying satellite-processing infrastructure.

“The bottleneck in Earth observation has never been satellites — it's been the cost and complexity of turning raw imagery into something a scientist or developer can actually use. TESSERA clears that bottleneck. By making a decade of analysis-ready, 10-meter embeddings freely available on AWS, we're collapsing the infrastructure burden that has kept advanced Earth observation out of reach for most organizations. We're proud to host it,” said Chris Stoner, Geospatial Lead, AWS Open Data.

TESSERA is already being applied by Arbol in climate-insurance and risk-modelling applications, particularly in underserved markets where limited historical data can make risks such as drought, flood, wildfire and crop failure difficult to underwrite.

By transforming years of satellite observations into consistent signals for individual 10-metre land patches, the technology provides a data layer that can be used to develop and assess climate-risk products. Opening the underlying data could extend these applications beyond proprietary modelling environments and into a broader ecosystem of researchers and developers.

The project is also built around an open-data model. TESSERA's code and embeddings are released under an open licence, with a public registry intended to support reproducibility and independent verification. The larger proposition is a shift in how Earth observation data is consumed. Rather than requiring users to navigate massive archives of raw imagery, TESSERA aims to provide a ready-to-analyse representation of the planet's changing surface—turning satellite observation from a specialised infrastructure challenge into an open platform for scientific, commercial and environmental applications.