

— CASE STUDY

Forecasting Climate Risk for 1,500 Automotive Plants Worldwide

A serverless AWS analytics pipeline that scores production plants against 8+ natural hazards and translates each one into financial exposure for OEM customers.

— OVERVIEW

Turning Hazard Data into Plant-Level Financial Risk

The client, a global ratings and market analytics provider, wanted to give its automotive and OEM customers a view of physical risk at each production plant. The product had to predict hazards such as coastal flooding, wildfire, drought, water stress, extreme heat and cold, and cyclones, and show what each would cost.

The Challenge

The data came from multiple sources held in separate AWS accounts, which made this a distributed computing problem from the start.

Workloads fluctuated sharply, so compute had to scale without overspending. Multi-step batch jobs depended on one another, and a single failure could not be allowed to cascade through the pipeline.



The hard part wasn't the models, it was getting data from every source to run reliably every time. JRD broke the problem into pieces we could trust, and our customers now get plant-level risk they can act on.



Anonymous

Head of Climate and Sustainability Analytics, global ratings provider



WHAT WE DELIVERED

Four workstreams, one risk pipeline



Cross-Account Data Integration

- Connected data sources across multiple AWS accounts into one processing framework
- Broke the pipeline into small functional units that could be built and tested independently
- Integrated outputs with the client's existing enterprise systems



Event-Driven Orchestration

- Triggered and chained workflows with cloud events and AWS Step Functions
- Built retry and failure handling to stop errors cascading across batch jobs
- Managed dependencies between multi-step jobs on AWS Batch and Fargate



Cost-Aware Serverless Compute

- Ran variable workloads on Lambda, Fargate and Batch, sized per job
- Balanced instance types for cost against processing time
- Tracked spend with AWS Budgets and Cost Management



Resilience and Reporting

- Encrypted data at rest and in transit, with fine-grained IAM access
- Configured cross-region replication and automated backups
- Delivered risk reporting to analysts through Power BI

— THE RESULT

Plant-Level Risk. Reliable Runs. Controlled Cost.

The client's OEM customers can now see which plants face which hazards, and what that exposure could cost. The pipeline scales with demand on serverless compute and recovers from job failures without manual restarts. It runs across regions with automated backups, so a regional outage does not stop the product.

8+

Natural hazard types modeled

1,500

Plants assessed

35%

Lower compute cost vs. baseline