Booz Allen®

AI-READY DATA

ENABLING ANALYTICS AND AI FOR CLIMATE AND SCIENCE MISSIONS

When urgent, complex issues like climate change demand precise, decisive action, the data that powers insights via artificial intelligence (AI) can help deliver multi-faceted solutions that are relevant to every sector of our society. Investments in the collection, curation, enrichment, and management of data are just as important to driving the advancement of AI with improvements to computational technology and machine learning (ML) algorithms

Government and commercially developed geospatial data is a key source for many organizations. It offers critical insights needed on many fronts, from providing visual evidence of extreme weather events to aiding in emergency preparedness and movement of critical assets.

As the U.S. government seeks to become "AI-ready," the ability to collect, process, and analyze geospatial data with advanced analytics will be a key component of the climate change agenda. Booz Allen currently supports critical missions—including those targeting the climate crisis—by delivering analysis and AI-ready Earth observations and environmental data across the government. Examples of the types of AI-ready Earth observations data we help organizations create include:

Climate Preparedness & Resilience

Historic and real-time conditions of sea level and hydrology for engineering reports and for downstream analysis using data from the National Oceanic and Atmospheric Administration (NOAA) sensors.

Climate Intelligence

Climate projections of future sea-level rise and indicators for drought, flooding, heat, and wildfire, among others, using outputs from NOAA climate models.

Threat Warnings

Historic and real-time conditions of water quality and meteorology for monitoring the Chesapeake Bay watershed using data from NOAA re-analysis products.

GEOSPATIAL DATAOPS FOR ANALYSIS AND AI-READY DATA

Data scientists and data engineers spend a substantial amount of time refining data for integration into scientific models toward climate mission outcomes. This can result in niche data products that are optimized for a single capability, limiting reuse for future analytic efforts. To help organizations prepare and execute their AI-adoption plans, Booz Allen has developed an open platform called aiSSEMBLE™, which integrates best practices for AI design, development, and deployment.

As a critical component to the AI lifecycle, DataOps principles are incorporated and engineered within aiSSEMBLE™ to improve the speed, repeatability, and quality of data products from data ingest to ML model development and all the way through deployment.

Using this baseline, our Geospatial DataOps pipeline (Figure 1) incorporates key data management/governance practices and data pipeline design principles to create AI-ready datasets. The solution is entirely open source and can be customized down to the source code level for testing, evaluation, and rapid operationalization of research advancements.

CASE STUDIES: DELIVERING AI-READY DATA TO SUPPORT CLIMATE AND SCIENCE MISSIONS

Space Agency: Prediction of Worldwide Energy Resources (POWER)

Booz Allen conducts data validation of the remote-synced POWER Data archive, by completing both time-series ensemble and site-specific analysis. Booz Allen develops and maintains a compilation of Application Programming Interfaces (APIs) serving more than 100,000 unique users with over 50 million data requests in a year. In addition, Booz Allen manages a suite of geospatially enabled Analysis-Ready Data (ARD). All community-specific parameters and outputs are provided in formats, naming conventions, and units that are commonly employed in each user community.

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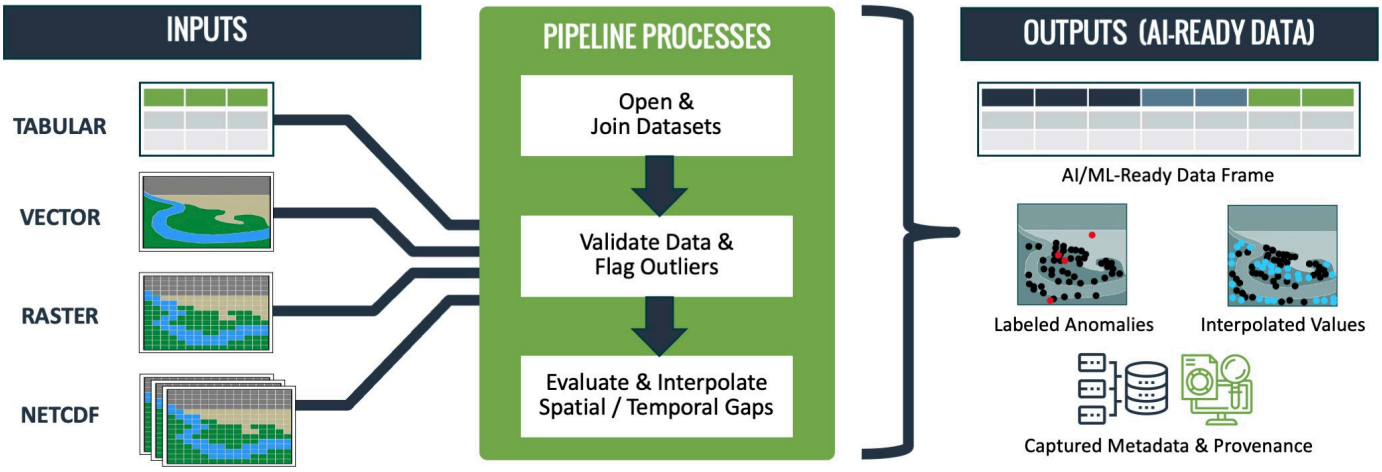
Figure 1: Geospatial DataOps Pipeline for AI-Ready Data



KEY FEATURES

- **Hyper-Localized Analysis:** Ability to drive data, analysis, and science that is locally relevant.Provides the right climate data, at the right level, for proactive climate resilience planning and responses.
- **Open Architecture with No Vendor Lock-In:** Combines best-in-class open source and cloud native services that are built on an open architecture, hosted on Google Cloud Platform, with the ability to integrate with multiple clouds.
- **Community of Data Providers:** Data exchange that allows for rapid collection, ingestion, and data fusion across public, commercial, and agency providers. Established partnerships around data accelerates the "science."
- **Data Democratization:** Empowers citizen scientists and public with a range of visualizations and self-service options, making climate intelligence relevant. Brings scale to solve this global challenge by engaging researchers, the public, scientists, and policy/decision makers.
- **Ease of Access:** Scalable, open API data fabric that allows access to curated datasets and analytic-ready data products that foster the climate innovation ecosystem
- **Single Source of Truth:** Users have access to a large number of authoritative data sources across climate threat domains

Engineering Agency
To increase the value of light detection and ranging (LiDAR) data available to the Engineering Agency client, Booz Allen has developed software and data engineering capabilities that support data fusion and correlation for a wide range of mission sets. For the Cold Regions Research and Engineering Lab (CRREL), we developed the MODEM capability. At ingest, MODEM automates file type and area of interest detection, accelerating the processing and fusion of disparate data types and data elements. Downstream, fused LiDAR data can be used for object tracking, pattern of life analysis, change detection, and AI operationalization.

Earth Observation Agency
Booz Allen has revolutionized analytic tradecraft to provide enterprise-scale analytics, ML, and activity-based intelligence in the cloud. This is made possible by the deployment of an analytics platform, which allows analysts and data scientists to rapidly spin up analytic development environments with massive compute power. This platform leverages the latest advancements in open-source geospatial technology, coupled with Databricks to enable massive-scale data processing, to generate AI-based geospatial insights from over 60 Petabytes of data and achieve 5–25 times performance increase.

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About Booz Allen

Trusted to transform missions with the power of tomorrow's technologies, Booz Allen Hamilton advances the nation's most critical civil, defense, and national security priorities. We lead, invest, and invent where it's needed most—at the forefront of complex missions, using innovation to define the future. We combine our in-depth expertise in AI and cybersecurity with leading-edge technology and engineering practices to deliver impactful solutions. Combining more than 100 years of strategic consulting expertise with the perspectives of diverse talent, we ensure results by integrating technology with an enduring focus on our clients. We're first to the future—moving missions forward to realize our purpose: Empower People to Change the World®.

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