



The Rise of Data Platforms & Fusion for
Defense Intelligence

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Strategic Advisor
Cesium

With the explosion of sensor availability, 3D geospatial data about the operational environment is being gathered and shared faster, cheaper, in greater amounts, and with better resolution than ever before.

And leaders are demanding the ability to make critical decisions with it.

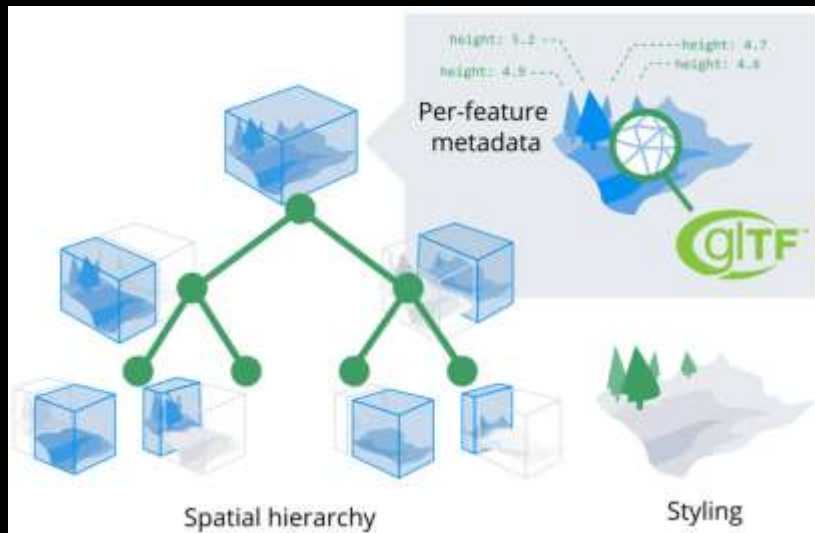
The challenge Cesium overcomes is making that data quickly and easily available in one picture with the precision and global scale needed for analysis and action.



Learn more: [Why Cesium?](#)



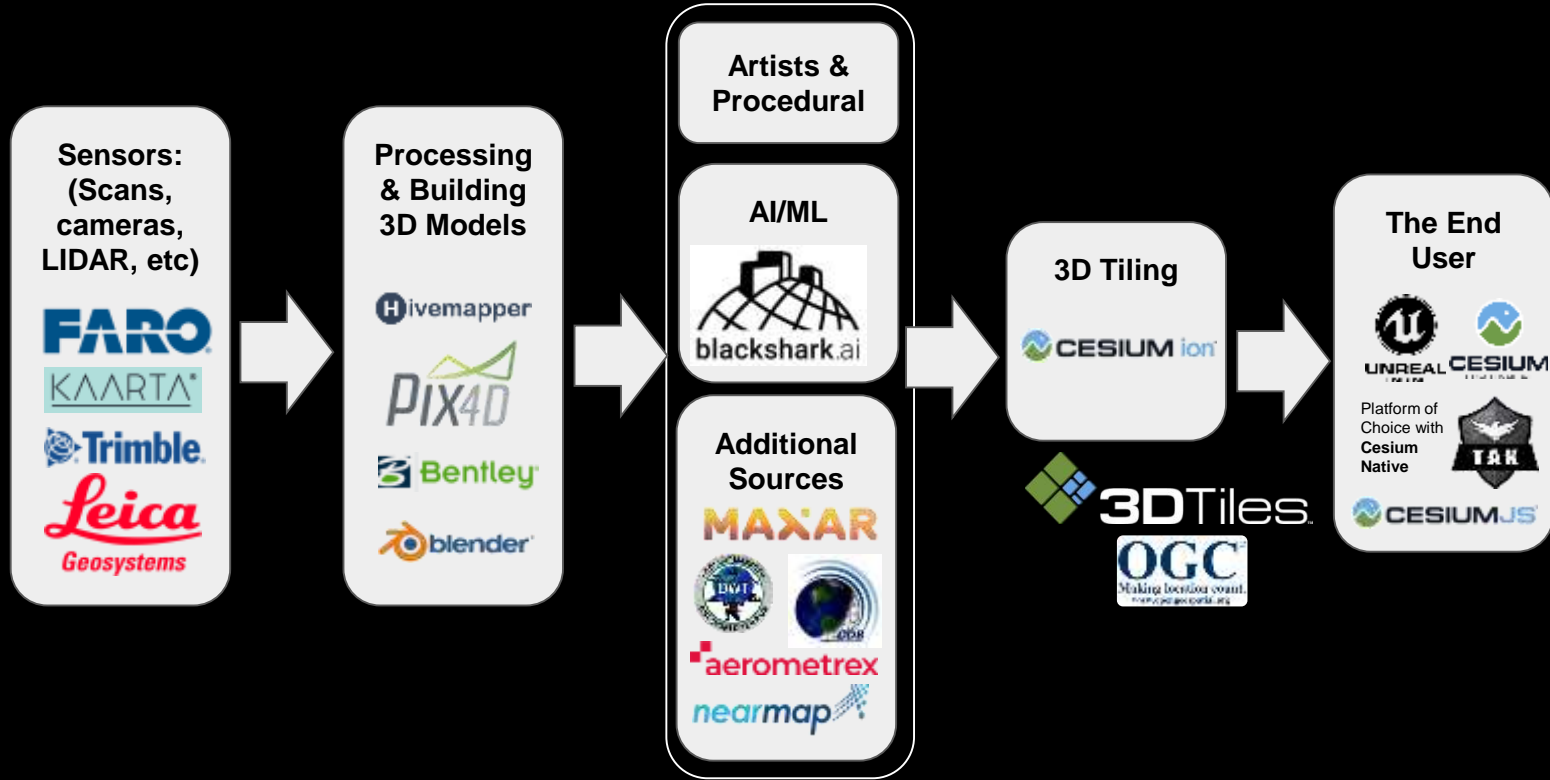
3DTiles™



- **Efficient**, streamable massive heterogeneous 3D geospatial datasets: terrain, imagery, 3D buildings, photogrammetry, point clouds, BIM/CAD, interiors, etc.
- Designed for visualization & analysis
- Combines:
 - Flexible spatial data structure in JSON
 - “Runtime ready” binary tile formats
 - Khronos glTF open standard for 3D models
 - Vertex/polygon-level metadata
 - Declarative styling
- Open Geospatial Consortium (OGC) Community Standard

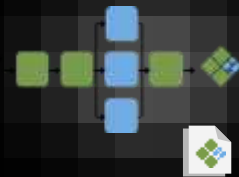


Our Place in the Ecosystem



Connecting 3D data production to 3D data consumption

Cesium is the open platform for 3D geospatial.



3D Data: Formats & Pipelines

Open standards & the best available tiling tools to optimize a variety of data for streaming



Visualization

Open source web-based runtime engine



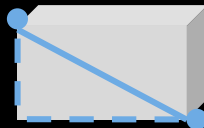
Modeling & Simulation

Streaming global scale & WGS-84 precision for game engines



Curated 3D content

Ready-to-stream 3D assets



Analysis

GPU-accelerated 3D geospatial analysis

More on the platform: [Cesium ion](https://cesium.com)



CesiumJS



Developers across industries, from aerospace to smart cities to drones, use CesiumJS to create interactive applications for viewing, analyzing, and sharing dynamic geospatial data.

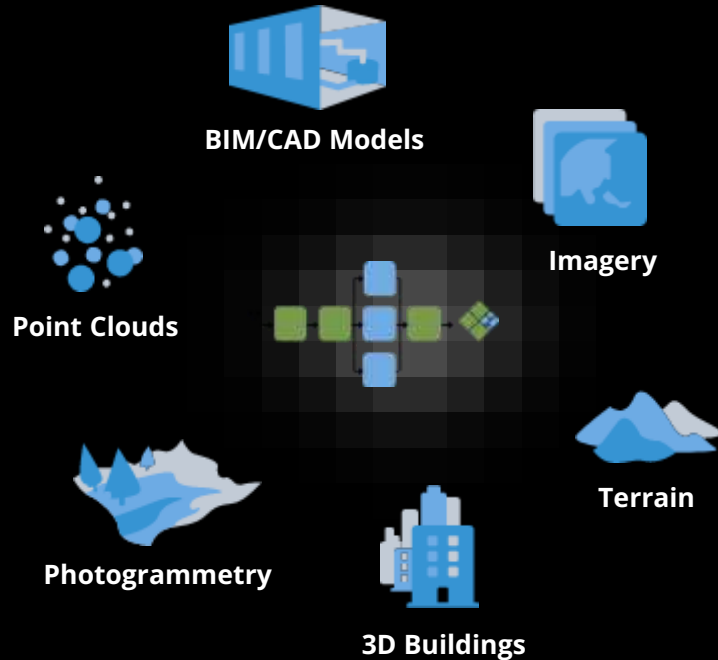
Open source JavaScript library for creating world-class 3D globes and maps with the best possible performance, precision, visual quality, and ease of use.

- Built on open formats, CesiumJS is designed for robust interoperability and scaling for massive datasets.
- Stream in 3D Tiles and other standard formats from Cesium ion or another source
- Visualize and analyze on a high-precision WGS84 globe
- Share with users on desktop or mobile

Learn more and try it out: [CesiumJS](#)



3D Tiling Pipeline



Tile your 3D data and fuse it with other data types

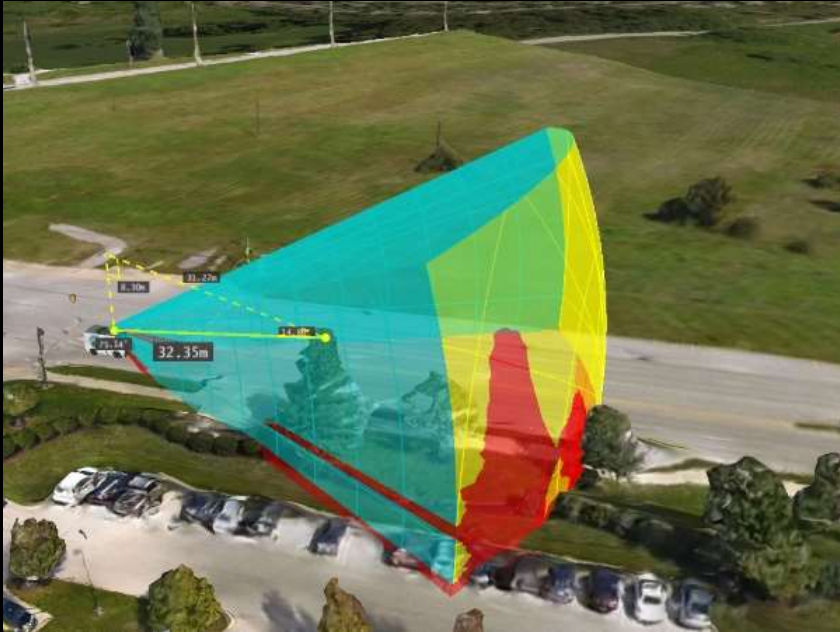
- Optimize massive 3D data with tools built to scale for lightning fast processing
- Integrate into local workflows to reliably tile large datasets without losing fidelity
- Measure, analyze, and make decisions with confidence based on visualizations as precise as your source data

More detail on the [3D Tiling Pipeline](#):

- [Point Cloud Tiler](#)
- [Photogrammetry Tiler](#)
- [3D Model Tiler](#)
- [3D Buildings Tiler](#)
- [Imagery Tiler](#)
- [Terrain Tiler](#)



Analytics & Data Fusion



JavaScript library with features including ready-to-use distance, area, and volume measurement tools, and 3D visibility analytics

Data fusion: Analyze within a dataset or across disparate datasets—from point clouds to BIM models to terrain to stationary or dynamic objects.

Precision: Draw confident conclusions using a level of precision originally developed for aerospace.

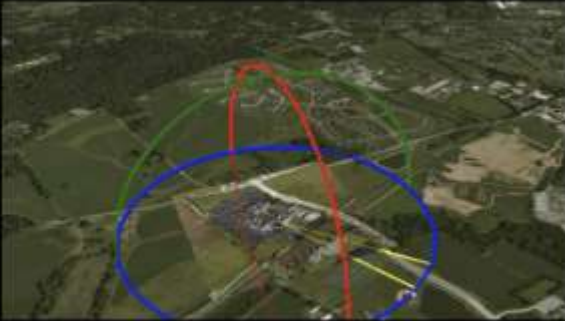
GPU acceleration: Get optimal performance for client-side analysis using the parallelism and computational power of the GPU.

Developer friendly: Build apps using a fully documented API, code examples, and customizable components with the same quality as CesiumJS.

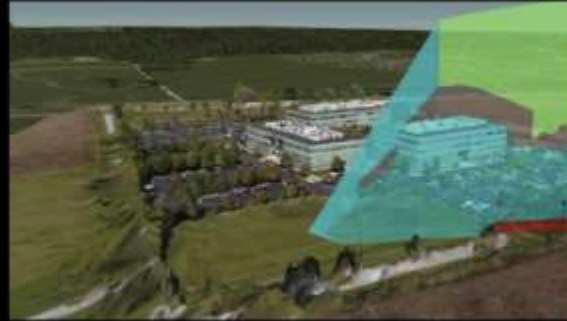
More on [Cesium SDK for Analytics](#)



Analytics & Data Fusion



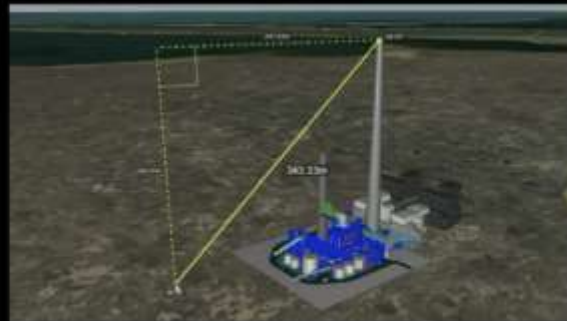
Transform editor



Sensor geometries and visibility analysis tools



Clipping planes editor



Measurement tools



Analytics & Data Fusion – Interior Space

Explore 3D point clouds of interior spaces
Clearly find Ingress/Egress Routes



Quickly gather key information, including MGRS, Lat/long/ elevation, height and slope of any location or entity with a click.



Simple, intuitive display of 3D geospatial data layers (gov, open source and commercial) including geo-rectified high resolution insets of interior spaces.



Measuring dimensions of critical infrastructure underneath the Oculus at the World Trade Center Transportation Hub. (point clouds courtesy of Kaarta)



Understand the location and disposition of friendly elements in the area of operations with models & 2525D symbology. Integrate multiple time dynamic data feeds and see the 3D map from the perspective of each entity.

3D Tiles for One World Terrain

MAXAR
VRICON



Defining a Standard: Cesium is building [US Army's OWT Well Formed Format](#) with Vricon, a Maxar company, on [3D Tiles](#) for high-speed creation, processing, and dissemination of high resolution terrain.

Realistic, common, accessible and automated 3D terrain data set.

Usable by all simulation trainers that represent the complexities of the Operational Environment (OE) in support of training as provisioned through the Synthetic Training Environment (STE).

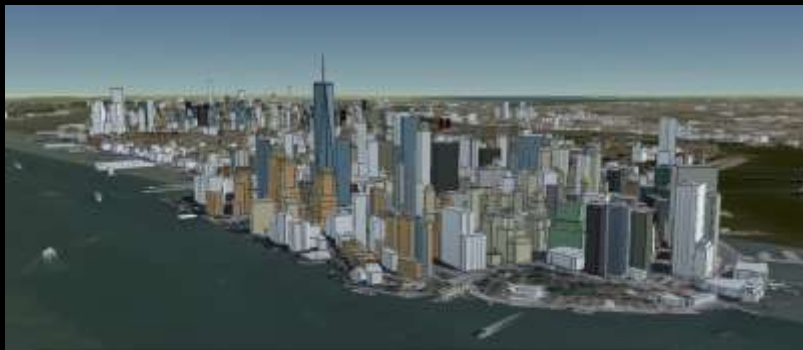
Dynamically rendered at the point of need, leveraging streaming technologies enabled by new advances in fiber optic and wireless networks.



Curated 3D content:



Cesium OSM Buildings



Global Coverage in [3D Tiles](#), updated monthly

3D buildings layer covering the entire world.

Ready for use in custom applications with CesiumJS or any client that supports 3D Tiles.

Derived from [OpenStreetMap](#) and contains over 350 million buildings with per-building metadata.

Metadata includes basic information like building name and height, to address, opening hours, and even type of material for individual parts of buildings.

Try it in the [Cesium OSM Buildings Sandcastle](#)



Cesium World Terrain

Global coverage in [quantized-mesh-1.0](#)

- Get accurate elevation data for planning & analysis
- Create more realistic visualizations by adding your architecture and building models, or drone imagery, on top of 3D terrain
- Combine your own terrain DEMs with this global layer by uploading them to Cesium ion

Fuses several data sources into a single quantized-mesh terrain tileset optimized for 3D map visualization and efficient streaming into CesiumJS and other 3D engines.



Coverage	Approx. resolution
United Kingdom	1 m to 2 m
Australia populated areas and coasts	5 m
New Zealand	8 m
United States West Coast	50 cm
United States	1 m to 30 m
Canada	30 m
Europe	30 m
Mexico	30 m
Approximately -60 to 60 degrees latitude	30 m to 90 m
Entire Earth	1,000 m

Source
NZ 8m Digital Elevation Model (2012)
Digital Elevation Model (DEM) of Australia derived from LIDAR 5 Metre Grid
LIDAR Composite DTM - 1m & 2m
Digital Elevation Model over Europe (EU-DEM)
CGIAR SRTM
GTOPO30, SRTM, and National Elevation Dataset (NED)

More on [Cesium World Terrain](#)



The global scale and accuracy of the WGS84 standard with the performance and visual realism of game engines



PROJECT ANYWHERE

PROJECT SPOTLIGHT



See more: [Project Anywhere with Epic Games, Microsoft & NVIDIA](#)

The Latest with Cesium



3D Tiles in Army's One World Terrain

- One World Terrain Well Formed Format based on 3D Tiles
- 3D Tiles Next: metadata availability, runtime performance



3D at the Tactical Edge

- Edge performance of SOF data: [CDB-to-3D Tiles Next Pipeline](#)
- Compression for mobile



3D for MCS COP

- Prototype Integration: Line of Sight, Viewshed, 3D Telestration & ROZ, CONOP Integration



3D for Disconnected Operations

- 3D visualization of the operational environment



3D for NGA's Map of the World

- Current ATO on 3 domains through Global Visualization Services



Cesium for Unreal

- March 30 release of [the Open Source Plugin](#)
- Over 50,000 Unique Users today

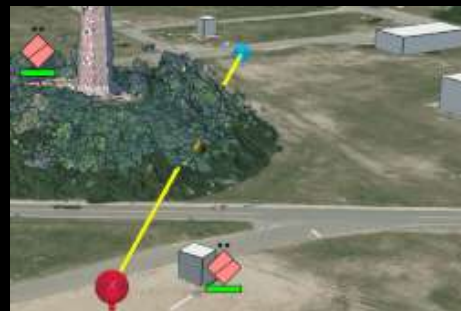




SOF 3D Common Operating Picture

View your constantly evolving operational environment in the context of time and 3D space.

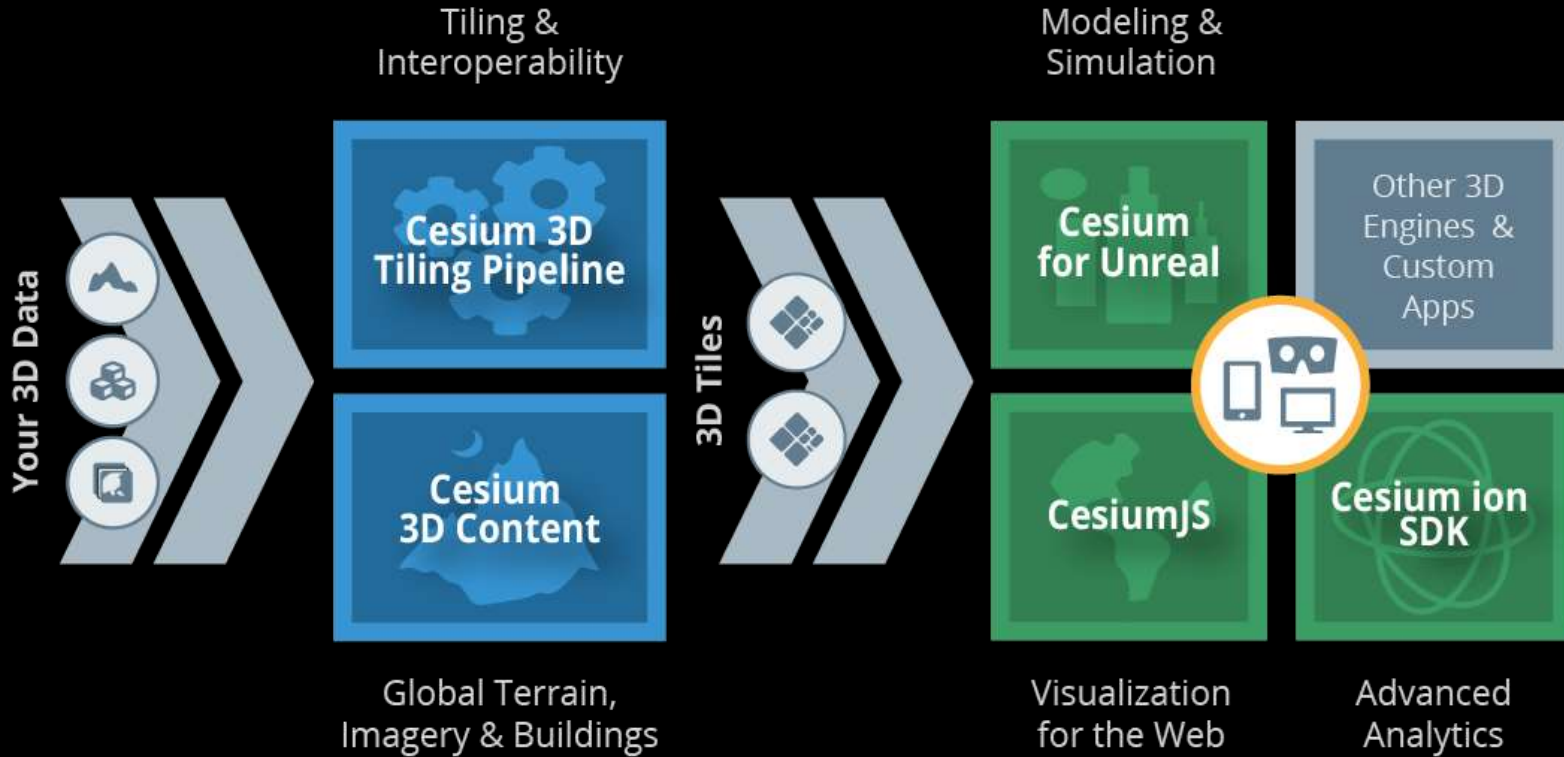
- **Use customizable controls** to view the operational environment and filter out the noise
- **View time-dynamic objects & tracks** from authoritative feeds along with graphic control measures (**drag & drop your KMLs**)
- **Track & re-play events** with an integrated timeline
- **Access curated 3D geospatial data** and combine it with your own
- **Use intuitive 3D tools** like Line of Sight and Viewshed for dynamic 3D insight





How it all works together:

Components for Commercial & Private Cloud



The platform: [Cesium ion Components](#)



CESIUM[®]

If this deck leaves you with any questions or you'd like to work together, please feel free to contact me at brady@cesium.com or 910-964-0962 anytime.

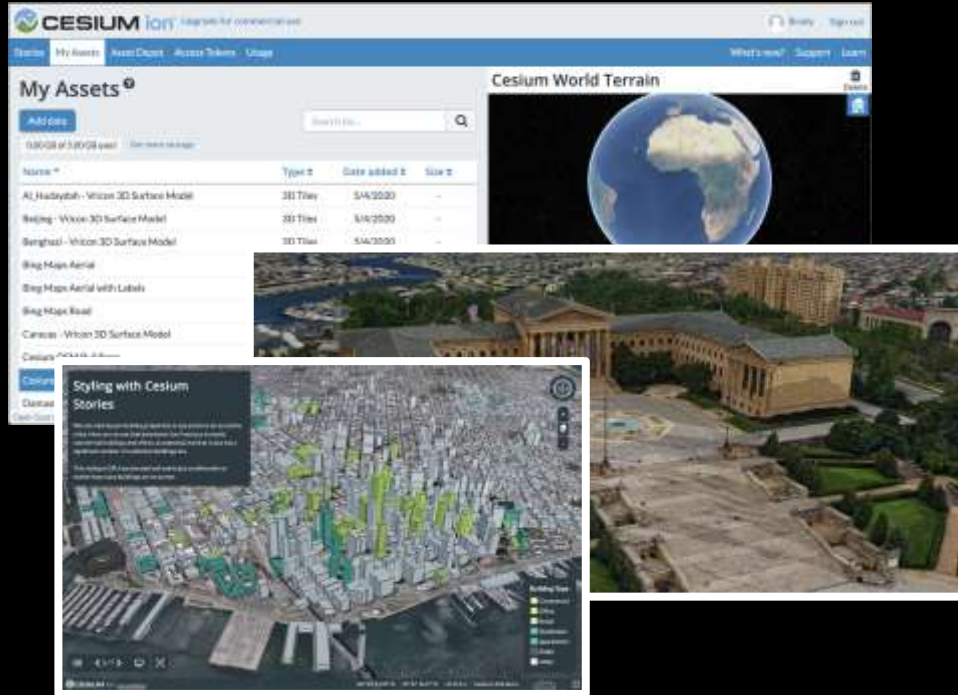


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Try it out now



Cesium ion Community Account

- **Vricon Surface Mesh** of 30 global locations for .mil or .gov users
- **Cesium Stories:** Dynamic Briefing
- **Cesium World Terrain:** Elevation & Imagery
- **Cesium OSM Buildings**
- **Cesium Analytics:** Measurement, Location
- cesium.com/cesium-ion



Additional Links

Hands-on Demos: [Cesium Sandcastles](#)

Satellite photogrammetry of 30 global locations for .mil or .gov users: [Cesium/Vricon Work-From-Home](#)

Use Case: [Visualize Underground Layers with Cesium](#)

Use Case: [Analyze Detailed Point Clouds with Cesium](#)

Use Case: [Explore 3D Models with Cesium](#)

Dynamic Briefing: [Cesium Stories](#)

AI/ML Integration: [Intel Geospatial](#)

AI/ML Integration: [Komatsu SmartConstruction](#)

[Cesium ion Components for Closed Networks](#)

[Cesium ion SaaS Pricing](#)

[Cesium ion Integrations](#)