

Geodata. Universal. Usable.

For a sustainable and digital society.

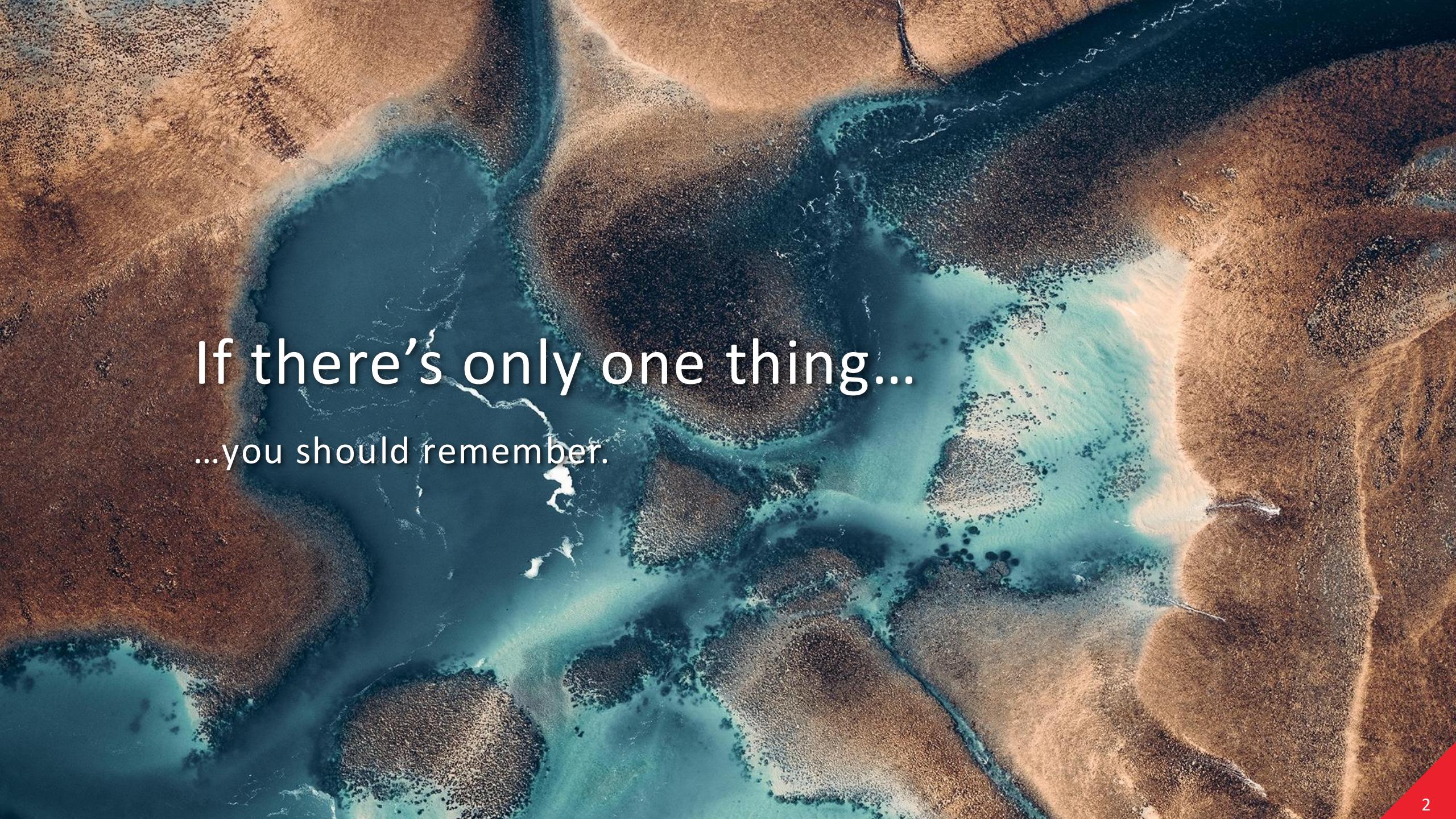


From Imagery to Interactive 3D Maps.

AnDOUC TechCast.

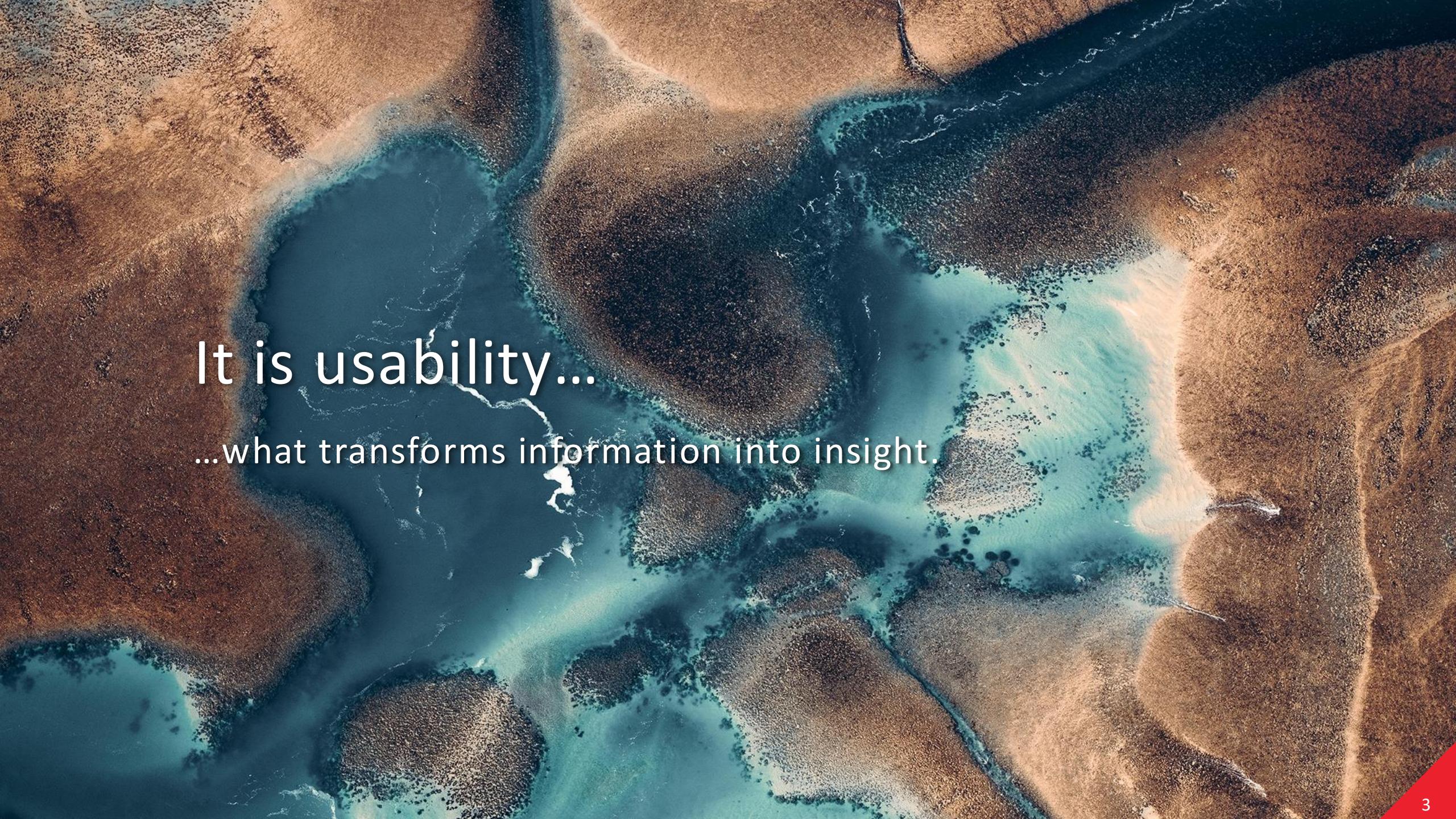
Dr. Alexander Willner (CISS TDI GmbH)

Online, 13.11.2025.

An aerial photograph of a coastal area. The land is a mix of brown, dry, textured terrain and bright, sandy beach areas. The water is a deep blue, with lighter, turquoise-colored patches where it meets the shore or over shallow reefs. The overall pattern is organic and flowing, resembling a large, stylized 'S' or a series of interconnected bays and inlets.

If there's only one thing...

...you should remember.



It is usability...
...what transforms information into insight.

An aerial photograph of a coastal area. The land is a mix of brown, dry, textured terrain and lighter, sandy areas. The water is a deep blue, with lighter, turquoise-colored patches where it meets the shore or where it flows over lighter-colored sandbars. The overall pattern is organic and somewhat abstract, resembling a map of a country or a complex river system.

Let me tell you why.

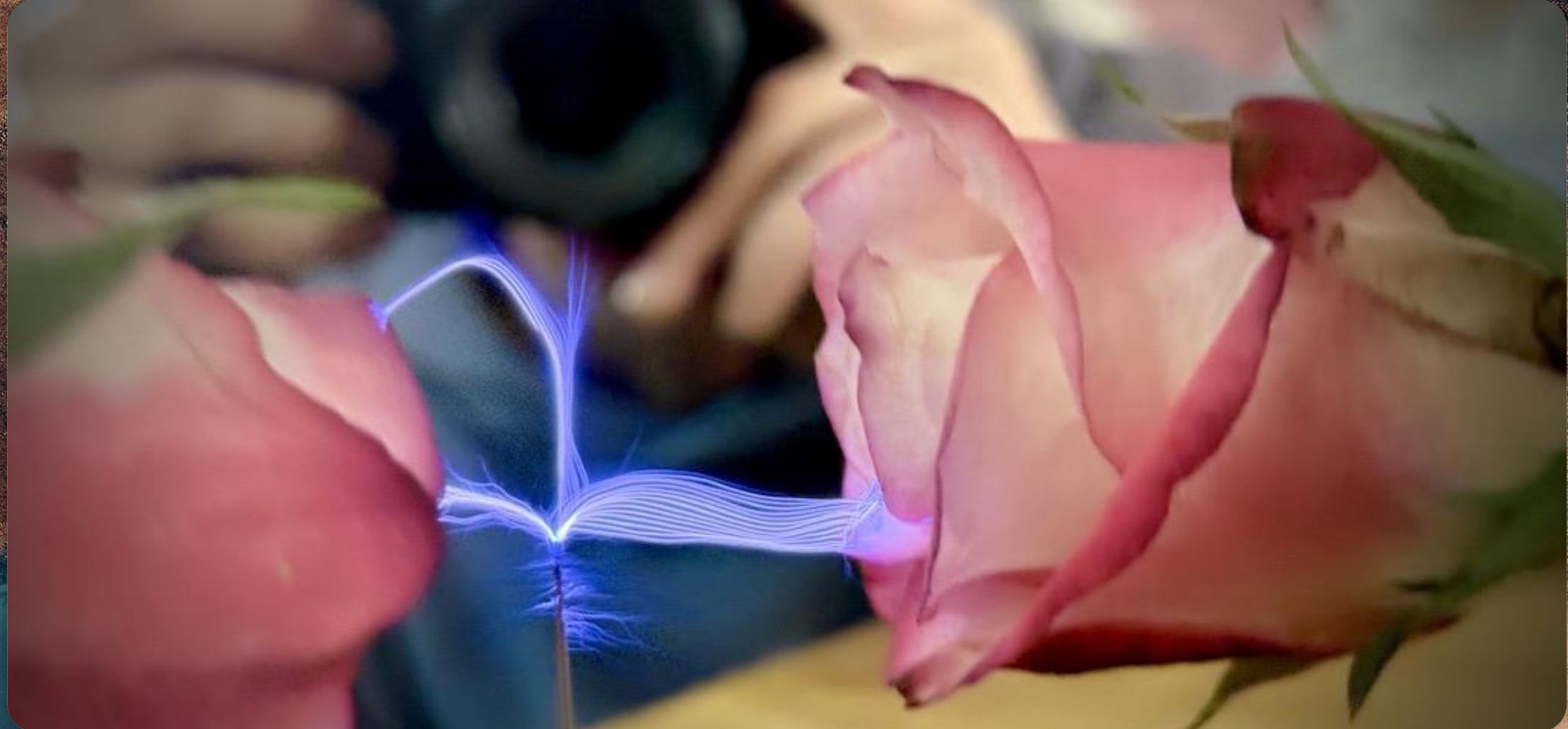
I'm the father of three wonderful young children.

You sometimes find yourself volunteering for school events.



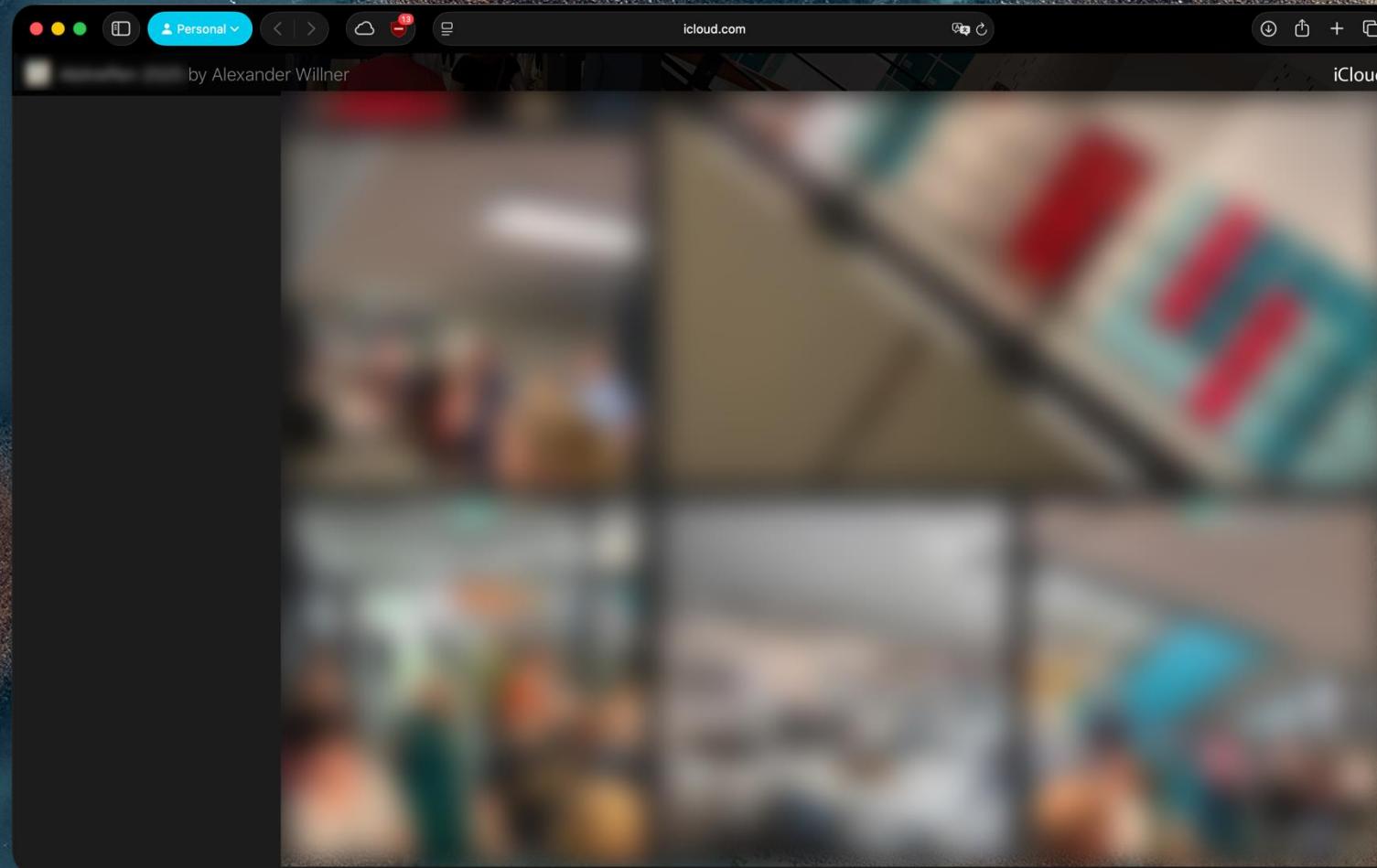
Taking some photos and videos of a school performance.

It was a lovely event — full of energy, emotion, and proud parents.



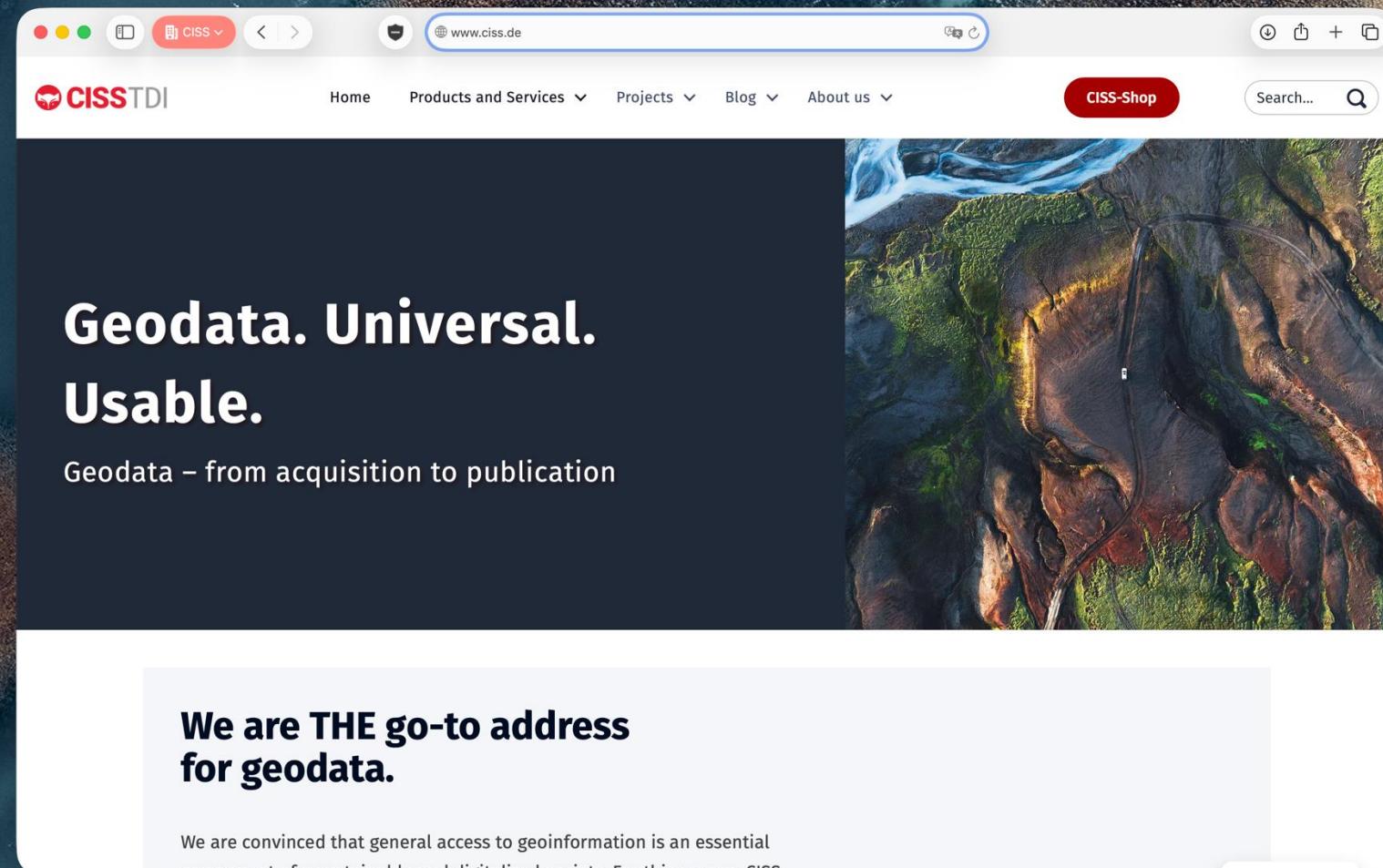
Today sharing is easy. One click in my photo library.

The simplicity hides the complexity of the problem in the background.



In our professional lifes, things are a bit different.

We work with others that manage large amounts of spatial data.



The image shows a screenshot of a website for 'CISS TDI' as viewed in a web browser. The browser's address bar shows 'www.ciss.de'. The website has a dark header with the 'CISS TDI' logo, a navigation menu with links for 'Home', 'Products and Services', 'Projects', 'Blog', and 'About us', and a red 'CISS-Shop' button. To the right of the menu is a search bar with a magnifying glass icon. The main content area features a large, dark, textured background image of a landscape with a winding road and a river. Overlaid on this image is the text 'Geodata. Universal. Usable.' in large, bold, white letters. Below this, in a smaller white box, is the text 'Geodata – from acquisition to publication'. At the bottom of the page, in a white footer area, is the text 'We are THE go-to address for geodata.' followed by a smaller paragraph about the company's mission.

Geodata. Universal.
Usable.

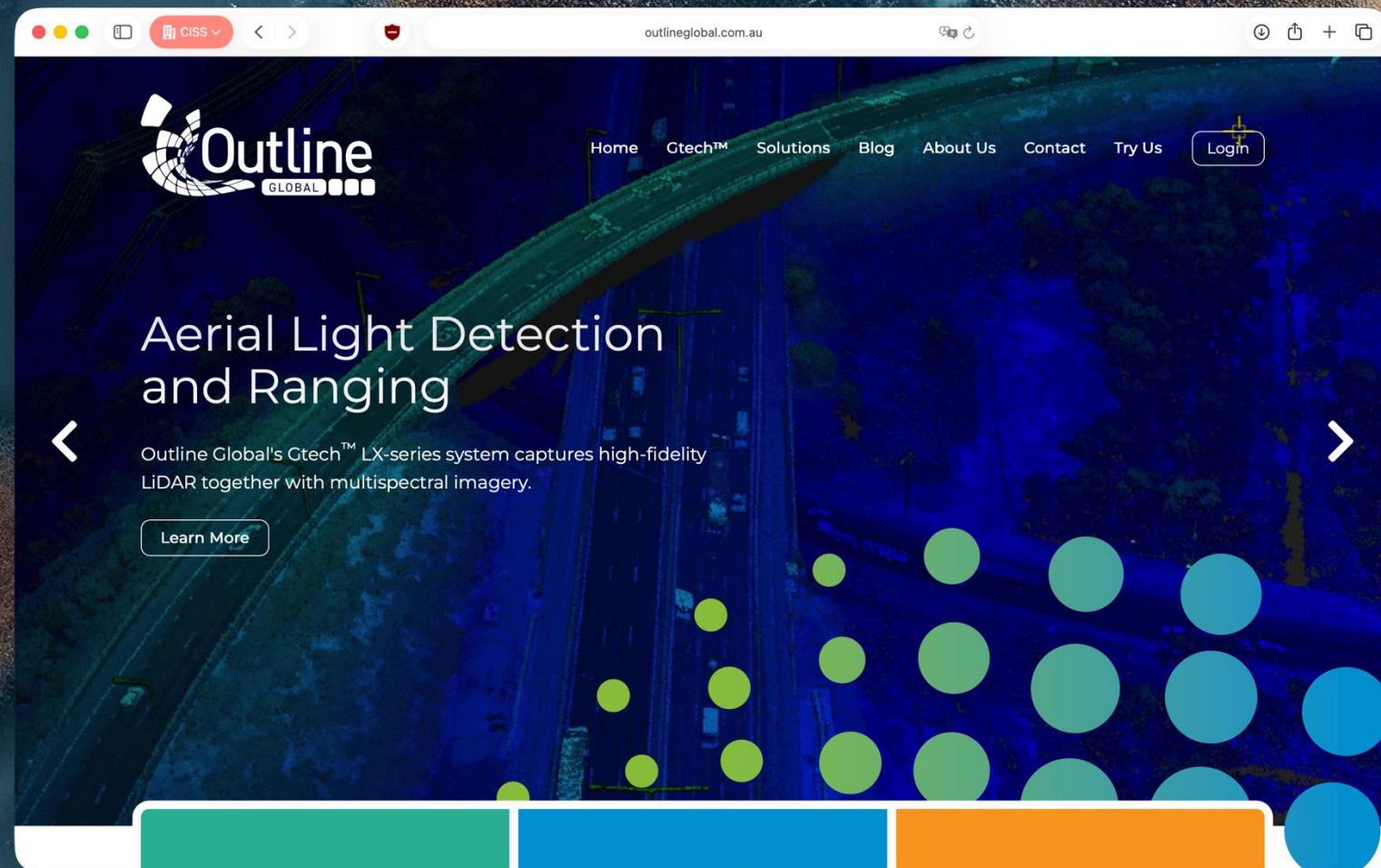
Geodata – from acquisition to publication

We are THE go-to address
for geodata.

We are convinced that general access to geoinformation is an essential component of a sustainable and digitalized society. For this reason, CISS

About a year ago we met Outline Global.

Premium quality geospatial imagery, LiDAR and location-based AI.





Several terabytes of data...

...need to be processed and delivered. Clients must download, inspect, evaluate, approve, and sometimes reorder datasets.



This still happened the old-fashioned way.

Unstable transfers, different file formats, versioning, ...

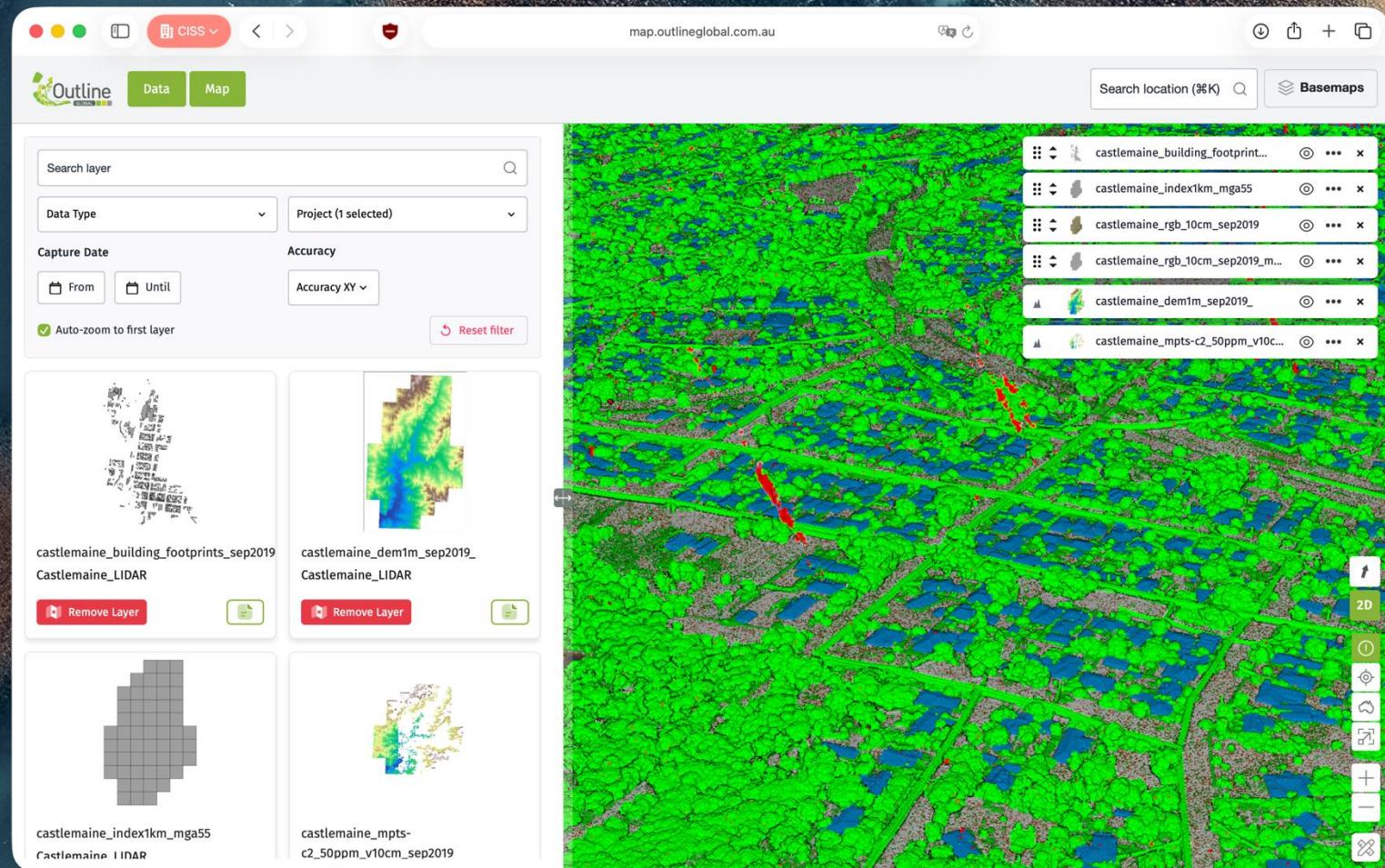
The background image is an aerial photograph of a coastal wetland. The land is a mix of brown and tan colors, appearing dry and textured. The water is a deep blue in the deeper areas, transitioning to a lighter turquoise near the shore. The water's edge is irregular, showing many small inlets and shallows where the land meets the sea.

So we set out to change that.

A joint effort of Outline Global, Oracle and CISS TDI.

An “iCloud” for aerial and geospatial data.

For data generated by Outline Global and consumed by their clients.



The system was designed with three main parts.



Frontend

Portal developed by Oracle Consulting using APEX.



Map and Geoservices

Developed by CISS TDI using SvelteKit, Giro3D, OpenLayers, Three.js, FastAPI, Celery, Untwine, LASpy, GDAL, PDAL and many more.



Infrastructure

Deployed in an Oracle Cloud Infrastructure (OCI) tenant with Oracle Autonomous Database, MapViewer and Spatial Map that provide the OGC Services, do the hierarchy building, ...

An aerial photograph of a coastal area. The land is a mix of brown and tan colors, appearing dry and textured. The water is a deep blue, with lighter, turquoise-colored patches where it meets the shore. The water's edge is irregular, showing various inlets and small islands of land. The overall scene is a natural, coastal landscape.

How does it look like?

Map: Meta Data.

With details for different layers (Boundary, Index).

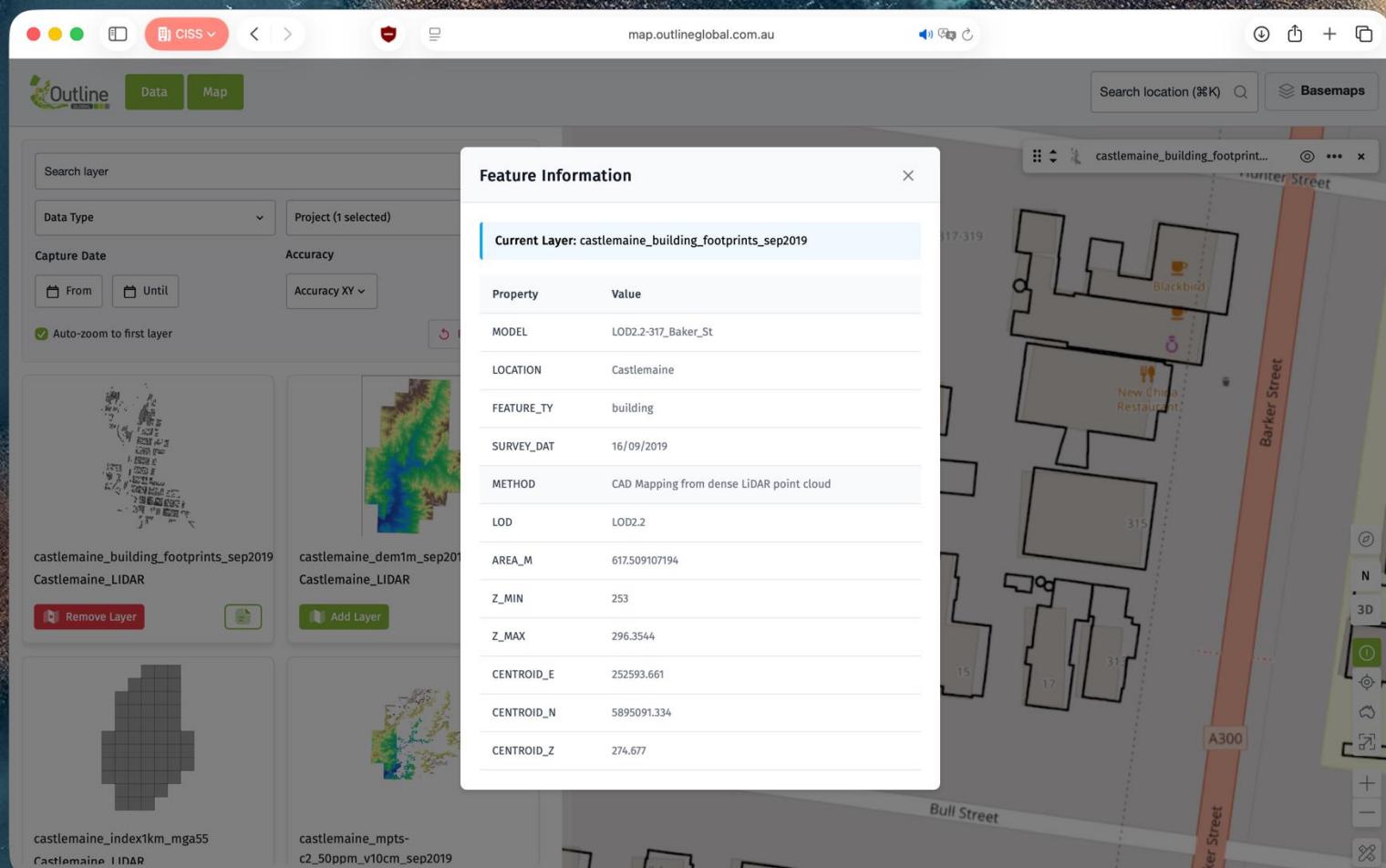
The screenshot shows the Outline Global web application interface. The top navigation bar includes a logo, a dropdown menu for 'CISS', and a search bar with the placeholder 'Search location (30K) Castlemaine'. Below the search bar are buttons for 'Basemaps' and a magnifying glass icon. The main interface has tabs for 'Data' and 'Map'. On the left, a sidebar lists data layers: 'castlemaine_index1km_mga55' (selected), 'castlemaine_mpts-c2_50ppm_v10cm_sep2019' (Castlemaine_LIDAR), 'castlemaine_rgb_10cm_sep2019' (Castlemaine_LIDAR), and 'castlemaine_rgb_10cm_sep2019_mosaic-boundary' (Castlemaine_LIDAR). Each layer has 'Remove Layer' and 'Add Layer' buttons. The central area displays a map of Castlemaine, Victoria, with a grid overlay. A 'Feature Information' modal is open, showing '2 of 2' pages. The first page is titled 'Current Layer: castlemaine_index1km_mga55' and lists properties and their values:

Property	Value
DEM	e249n5894_castlemaine_2019sep16_dem1m_v10cm_mga55.asc
LAS_ELL	e249n5894_castlemaine_2019sep16_mpts-c2_v10cm_ell-mga55.las
LAS_AHD	e249n5894_castlemaine_2019sep16_mpts-c2_v10cm_ahd-mga55.las
ORTHO	e249n5894_2019sep16_air_vis_10cm_mga55.tif
DSM	e249n5894_castlemaine_2019sep16_dsm1m_v10cm_mga55.asc
CHM	e249n5894_castlemaine_2019sep16_chm1m_v10cm_mga55.asc
BHM	e249n5894_castlemaine_2019sep16_bhm1m_v10cm_mga55.asc

The map shows various geographical features like roads, hills, and parks, with the grid highlighting specific areas of the index layer. The bottom right corner of the image has a red diagonal bar with the number '16'.

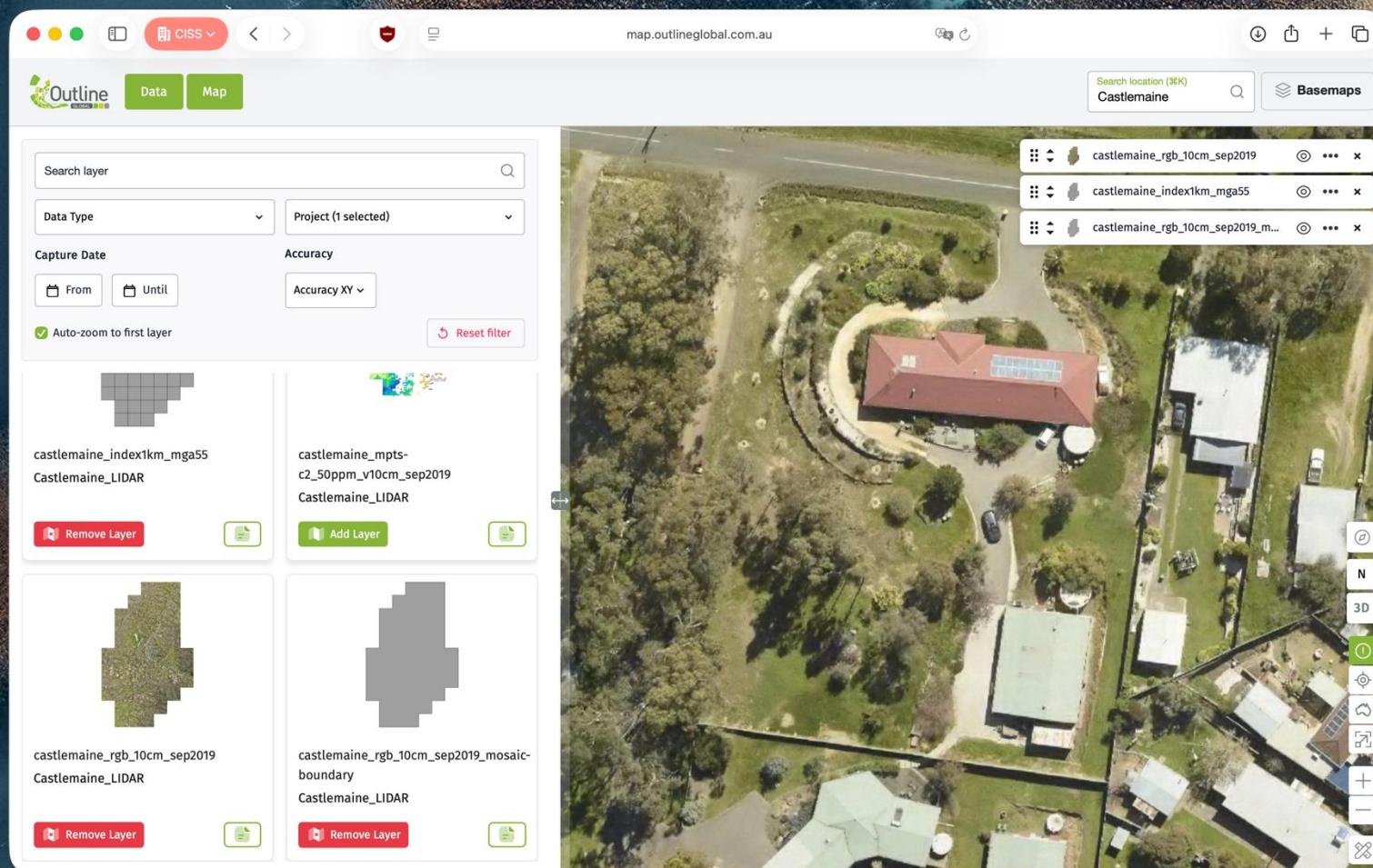
Map: Vector / 3D Data.

For example Level of Detail (LOD).

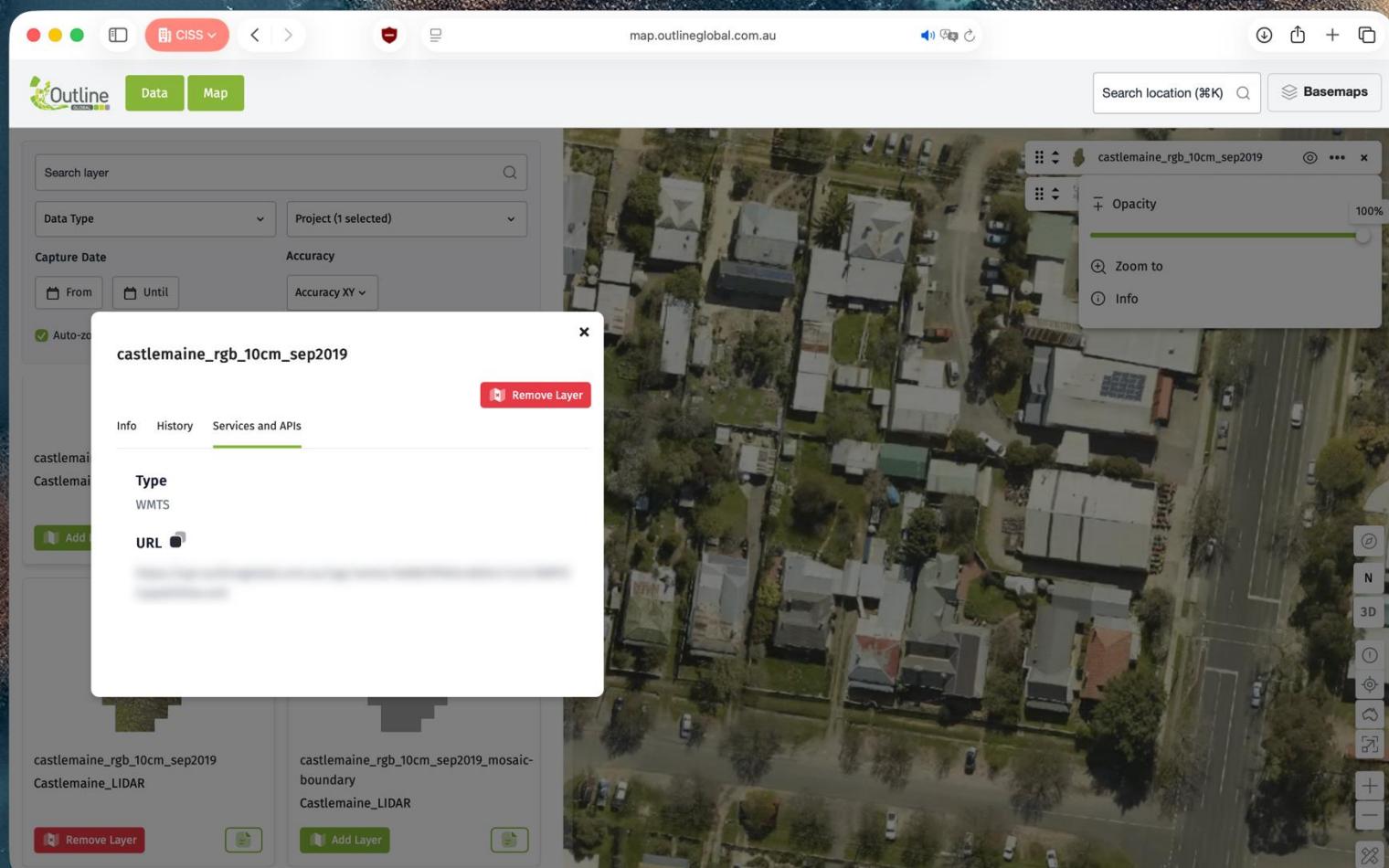


Map: Imagery.

With a higher resolution than a typical base map.

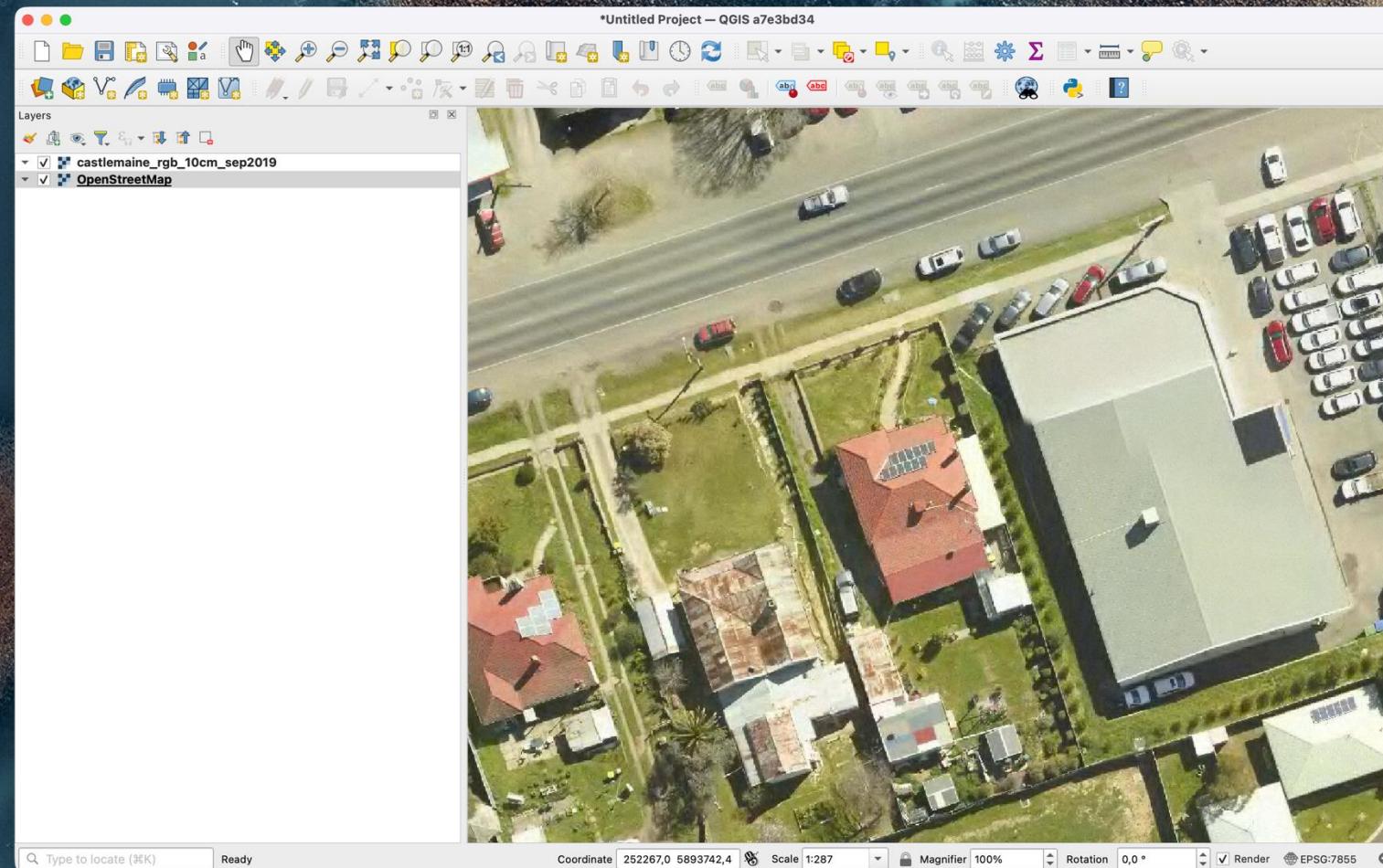


Map: OGC Endpoints.



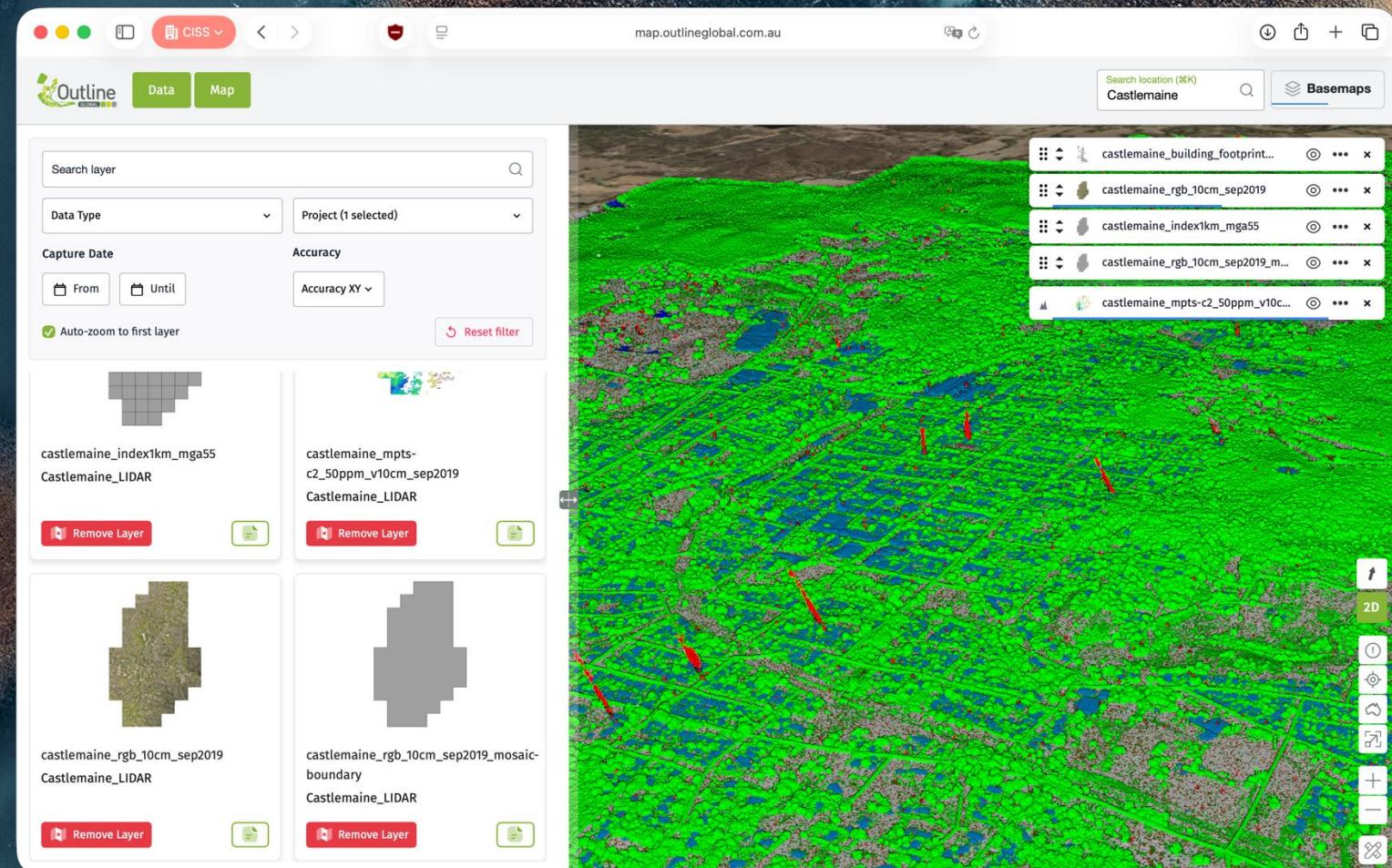
Map: Imagery.

Direct access in a GIS via OGC services (WMTS in this example).



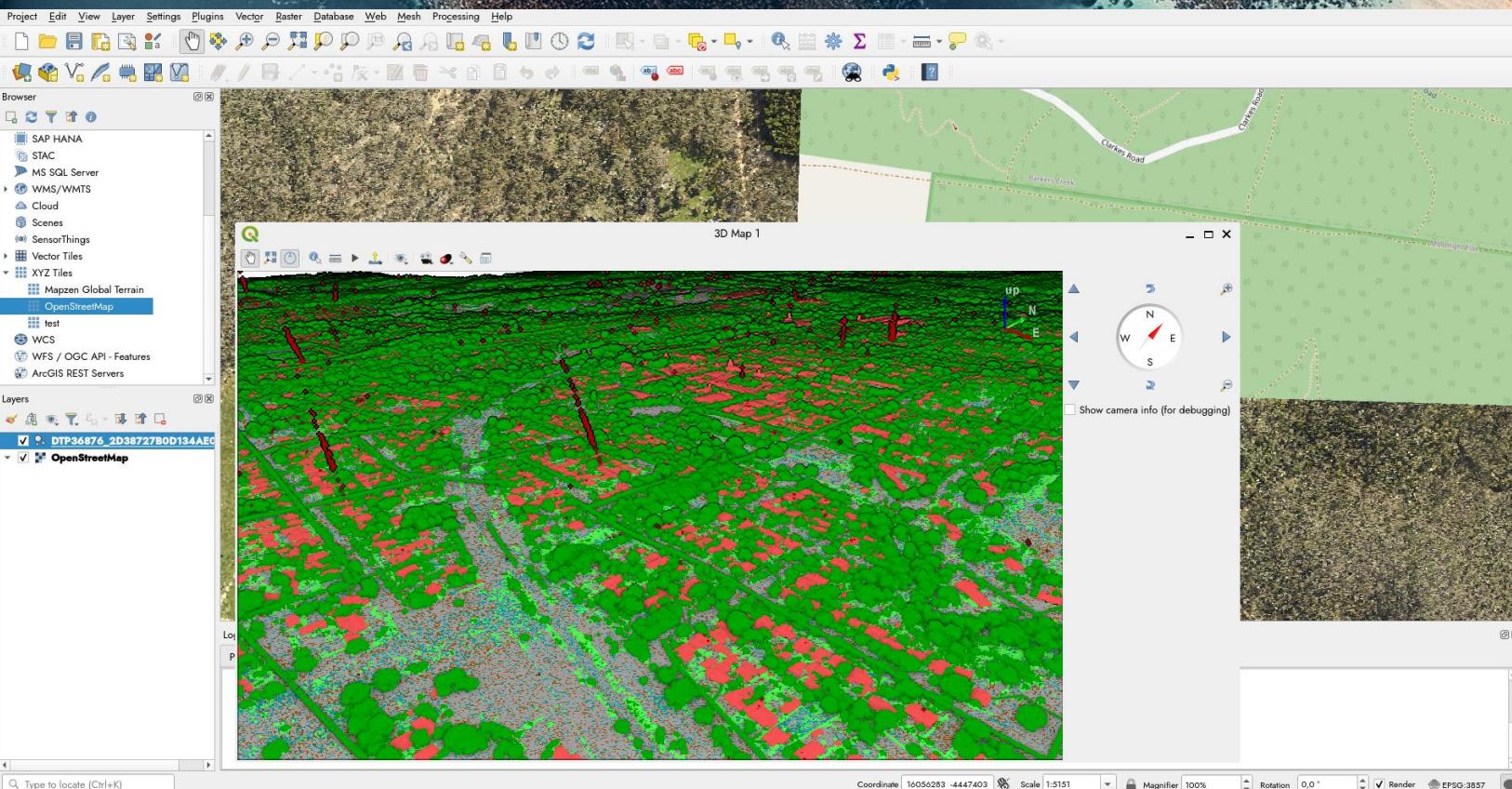
Map: Cloud Optimized Point Clouds (COPC).

Multiple detail levels for elevation, intensity, color, and classification.



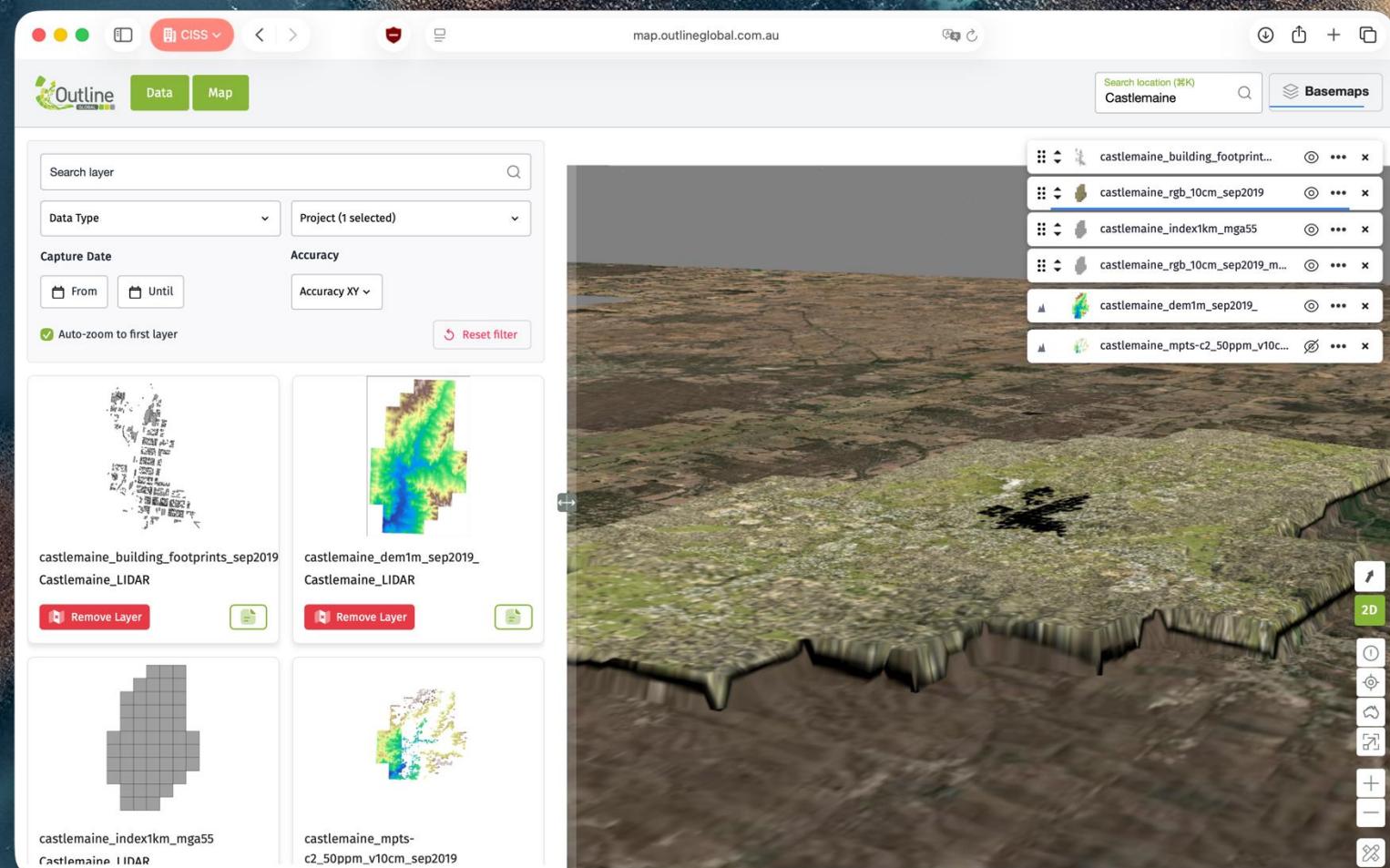
Map: Cloud Optimized Point Clouds (COPC).

Direct access in a GIS via HTTPS services.



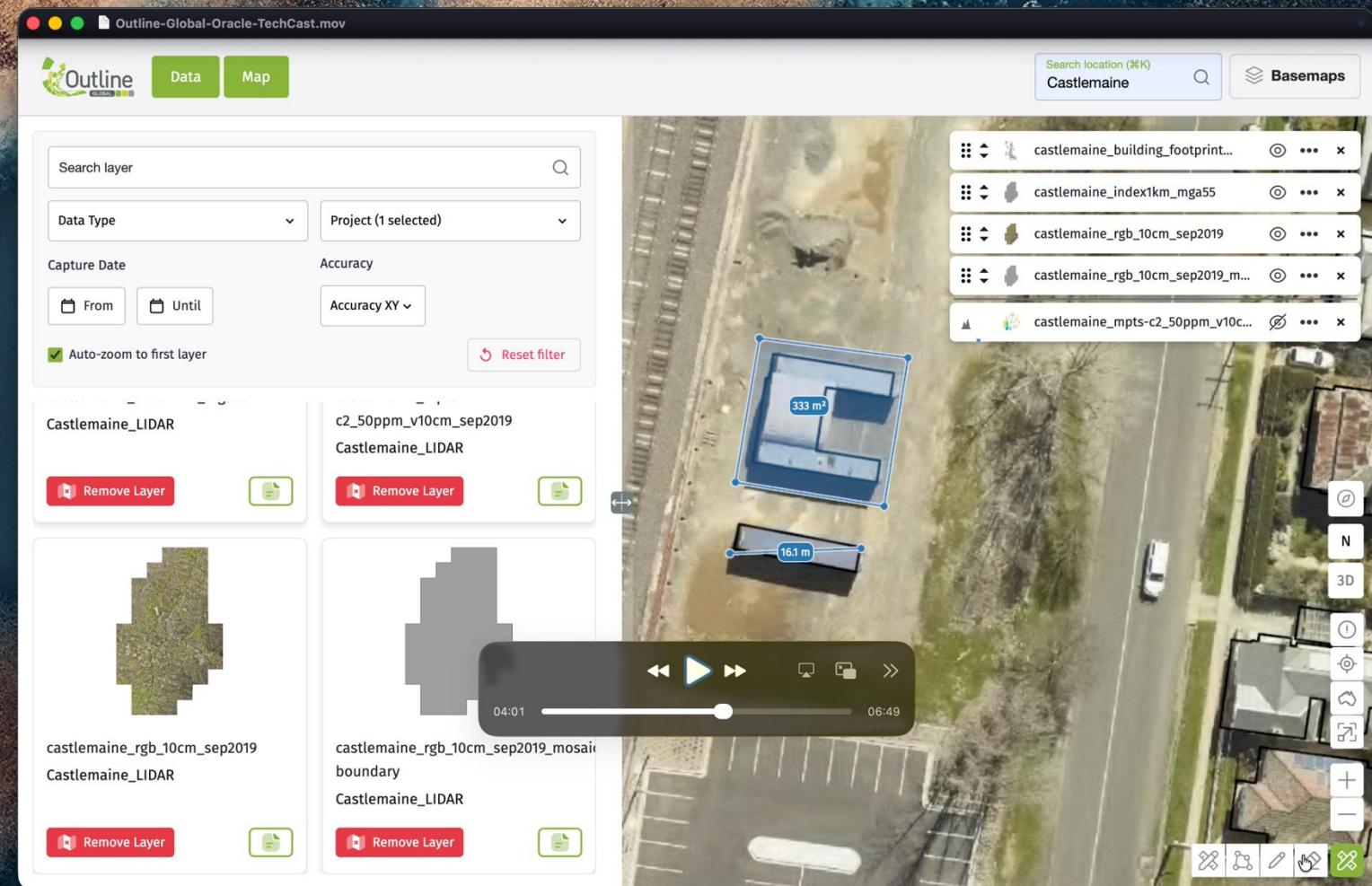
Map: Digital Elevation Model (DEM).

A 2.5D digital representation of the surface.



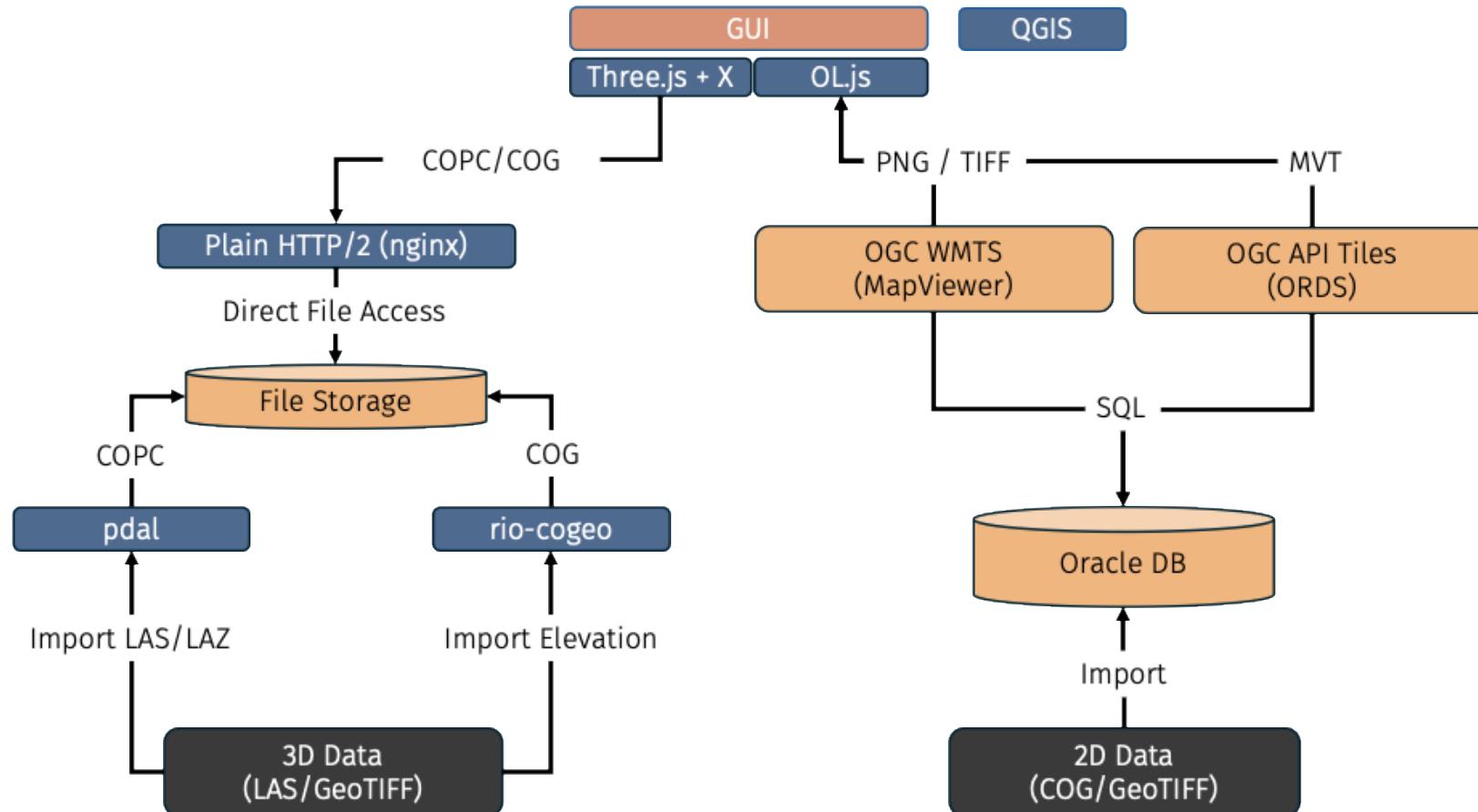
An aerial photograph of a coastal area. The land is a mix of brown and tan colors, appearing dry and textured. The water is a deep blue, with lighter, turquoise-colored patches where it meets the shore or where it flows over lighter-colored sand or rock. The overall pattern is organic and somewhat abstract, resembling a map or a natural fractal.

Let's have a live demo, shall we?



Some more technical background.

Architecture of the 2D / 3D ETL pipeline with OGC endpoints.



Outlook.

Beyond that, many more ideas are waiting to be implemented. The foundation is strong.



Spatial ML Algorithms

Analysis and prediction of geospatial data.

Oracle 23ai has support for cluster analysis, outlier analysis, spatial correlation, regression analysis, spatial classification, spatial aggregation, ...



Geometric Intersection

On-demand polygon-based extraction and data conversion to allow users to select an area of interest and download only what they need and how they need it.

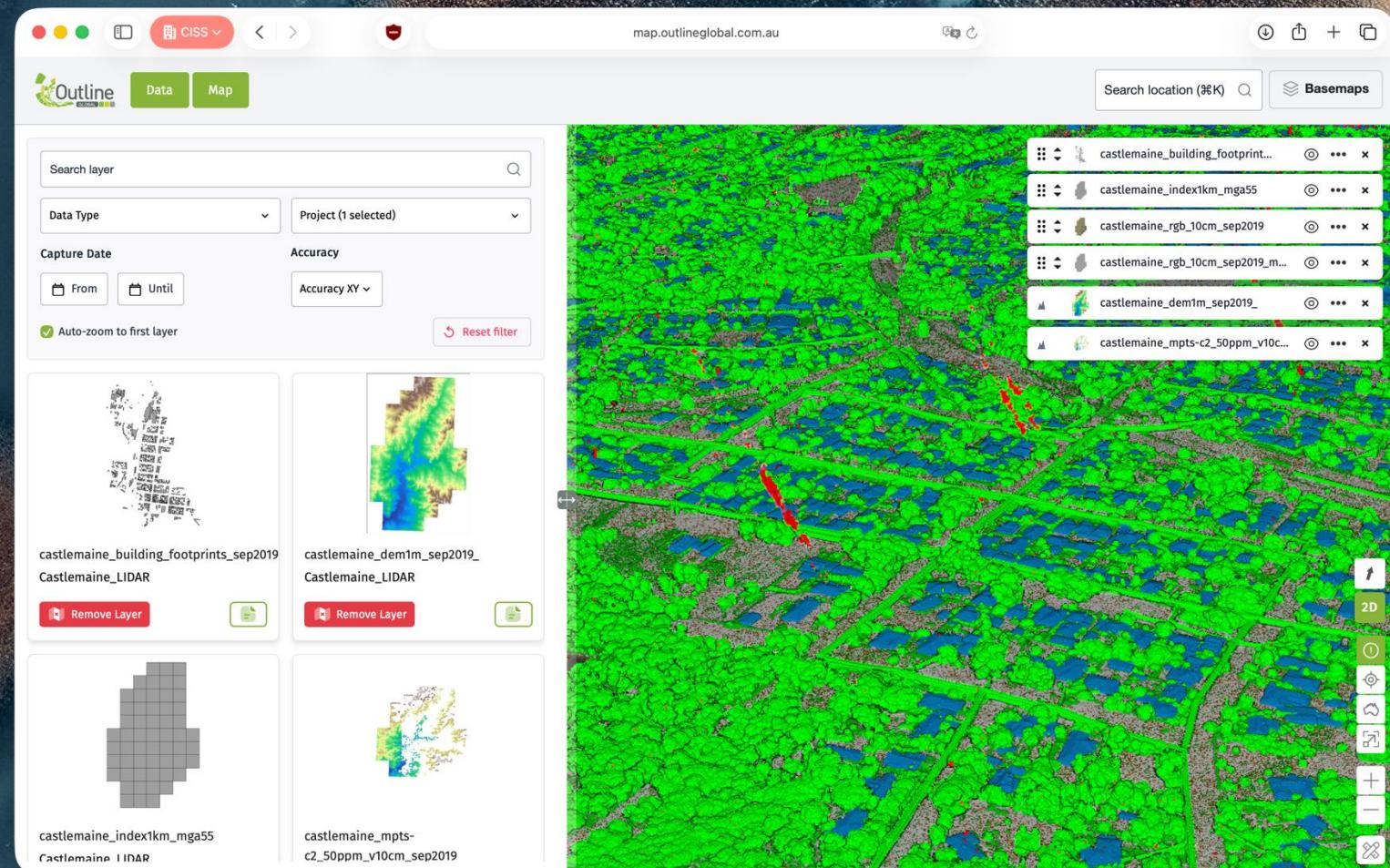


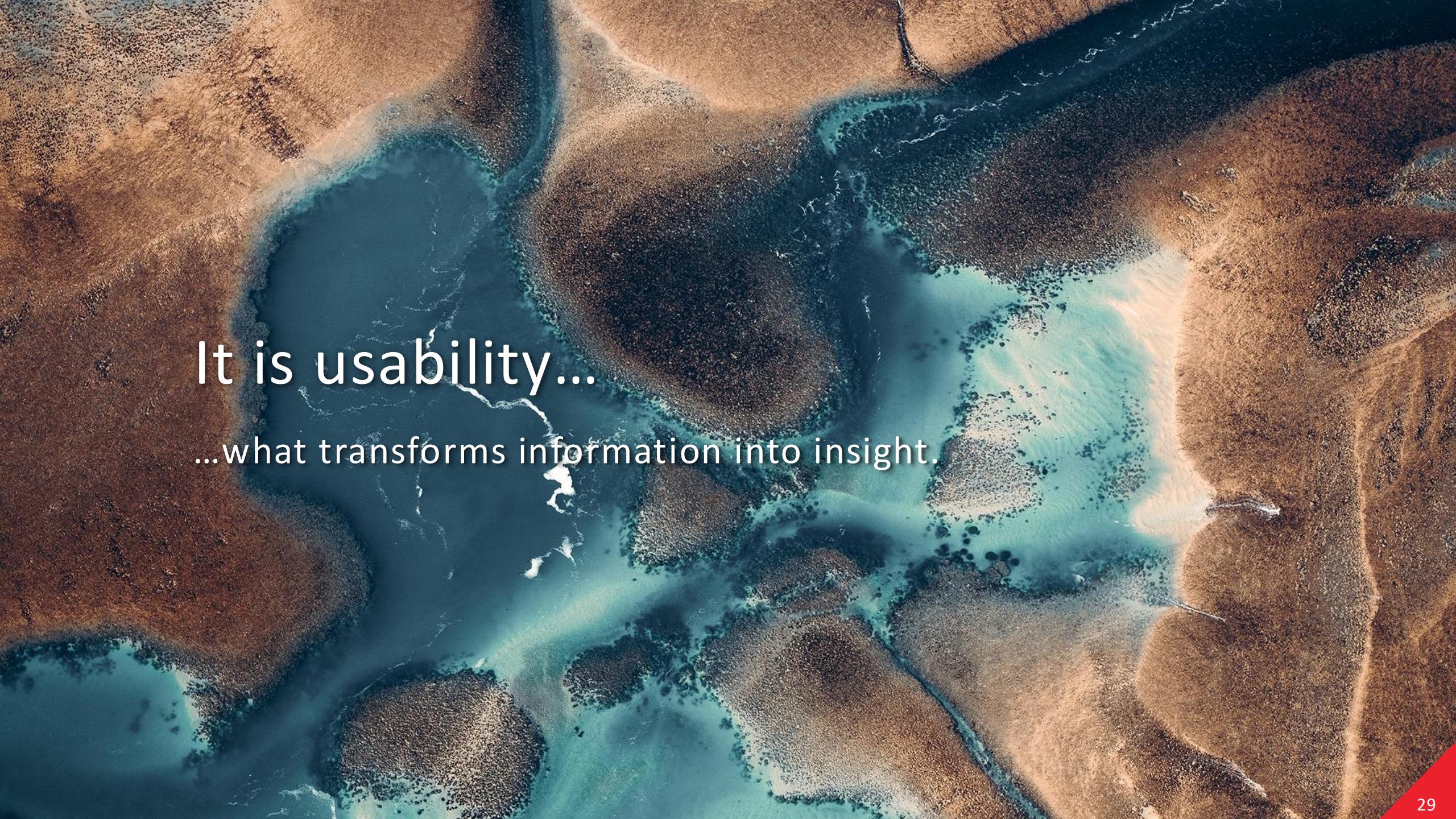
Order via Portal / API

Let customers select an area and type of information to request for flyovers.

The goal was an “iCloud” for aerial and geospatial data.

For data generated by Outline Global and consumed by their clients.





It is usability...
...what transforms information into insight.

Here Today

Representing a Great Team



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