

# Cesium

Virtueller 3D Globus im Web



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# Übersicht

- Camptocamp
- Was ist Cesium?
- Datenquellen
- Features
- OL3 – Cesium
- Ausblick



- Open Source Lösungen als Editor und Integrator seit 2001
- 50 Mitarbeiter
- Camptocamp bringt Sie mit den neuesten Open Source Technologien vorwärts



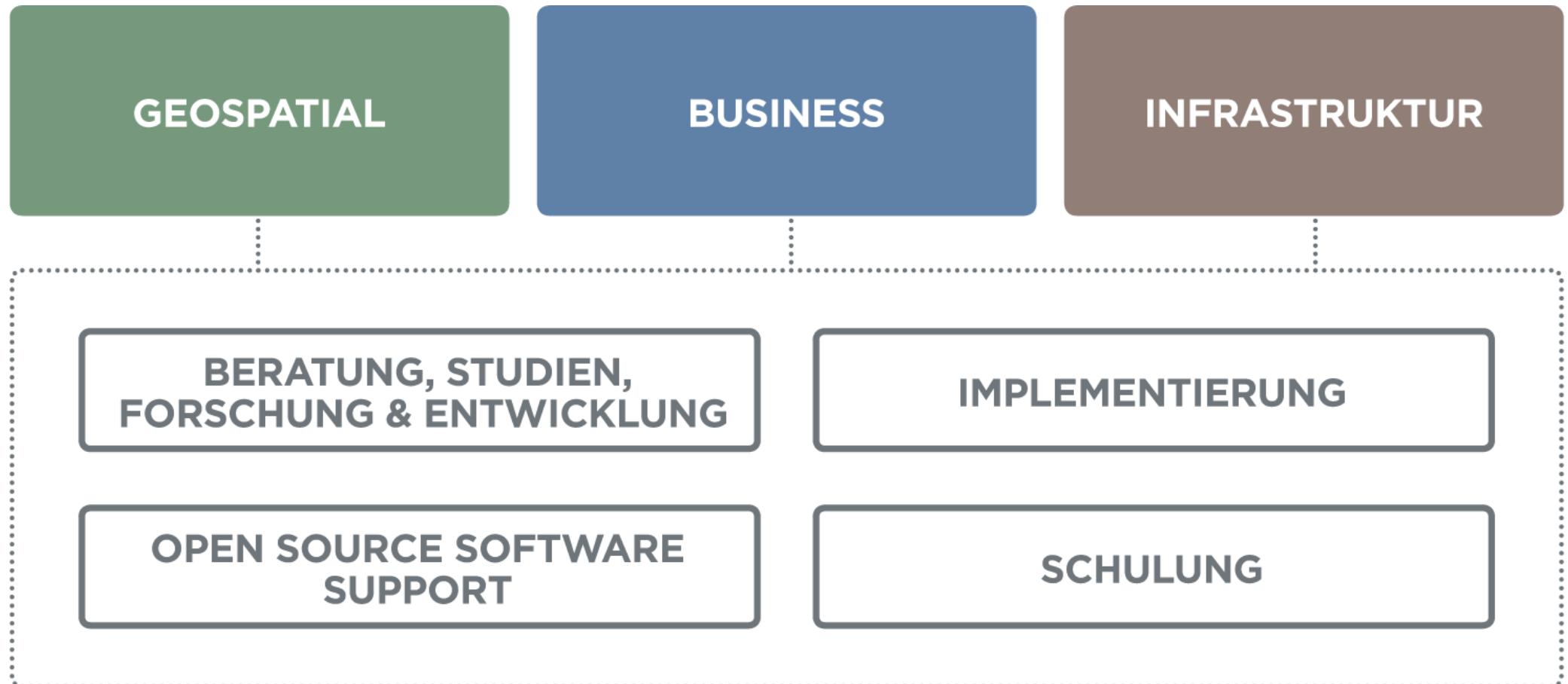
Wien

Lausanne



Chambéry

# Campnocamp: 3 Bereiche





# Cesium



- Open-Source **JavaScript** Programmmbibliothek  
für einen **performanten 3D Globus** im Web

Application

Cesium

WebGL

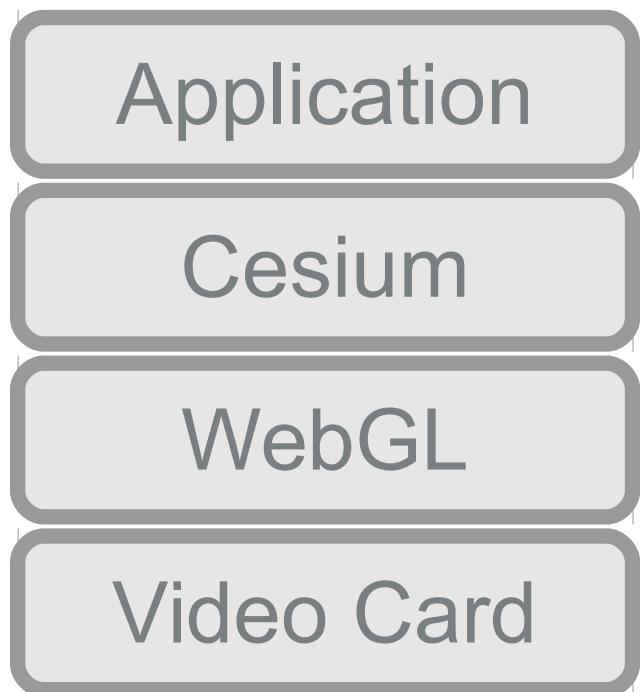
Video Card



# Cesium



- Open-Source **JavaScript** Programmmbibliothek  
für einen **performanten 3D Globus** im Web



JavaScript  
+  
WebGL → Kein Plugin



# WebGL



[http://www.khronos.org/assets/uploads/developers/library/2011-siggraph-mobile/Khronos-and-the-Mobile-Ecosystem\\_Aug-11.pdf](http://www.khronos.org/assets/uploads/developers/library/2011-siggraph-mobile/Khronos-and-the-Mobile-Ecosystem_Aug-11.pdf)



# WebGL Unterstützung



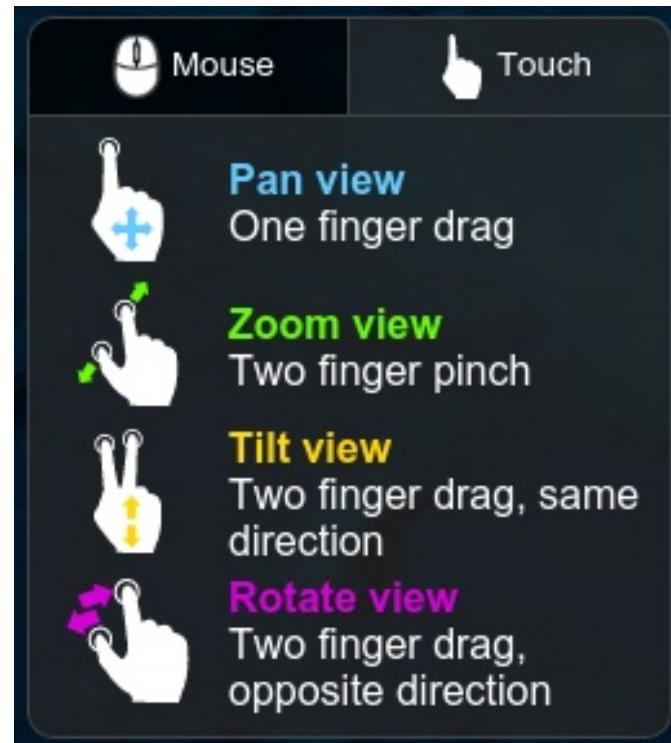
<http://caniuse.com/webgl>



# Mobile?



# Mobile !



# Cesium



- Open-Source **JavaScript** Programmmbibliothek  
für **schnelle 3D Karten**
- Braucht JavaScript + **WebGL** → **kein Plugin**
- Entwickelt grösstenteils durch AGI, mit einer breiten User-/Entwicklungscommunity
- Apache 2.0 Lizenz  
→ **frei** nutzbar und erweiterbar (liberale / permissive Lizenz)



# Datenquellen

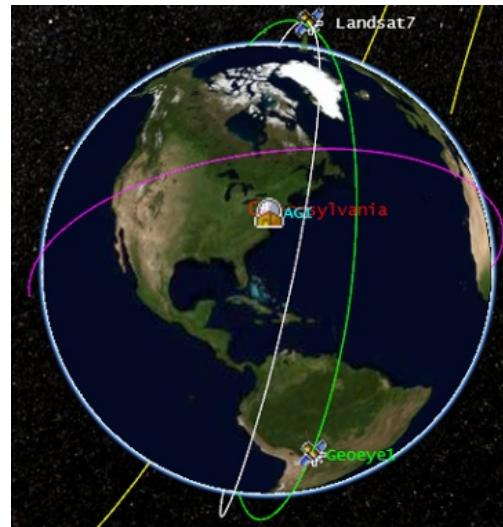
## Raster data\*

WMS, WMTS, TMS,  
OSM, Bing, ArcGIS,  
Images

## Vector data\*

KML, GeoJSON,  
TopoJSON

\* zusätzliche Formate  
über OL3



## Terrain data

Cesium .terrain  
format

## Models, Buildings

glTF (COLLADA),  
KML

## Scene description

CZML



# Features

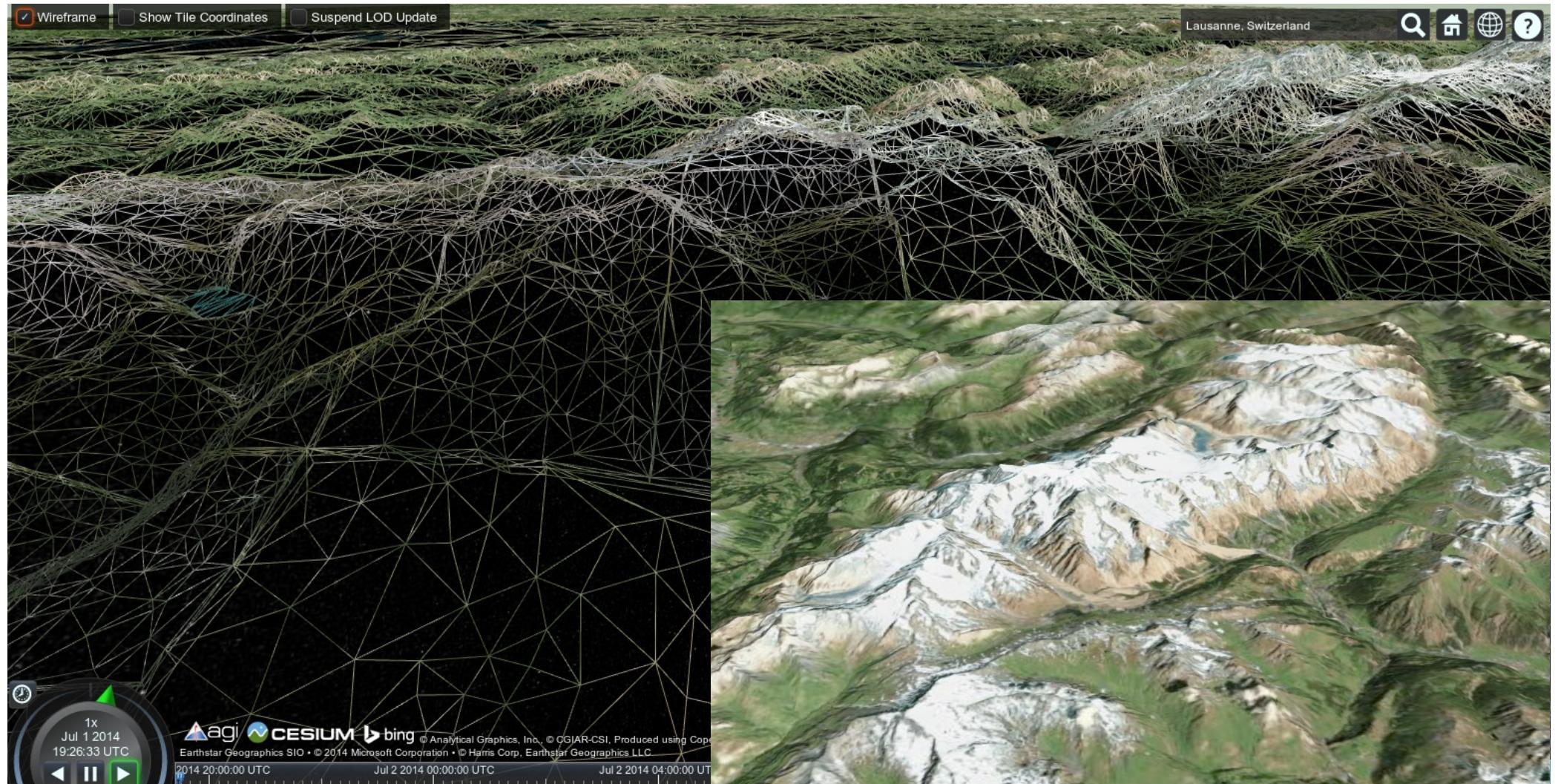
... anhand von Beispielen



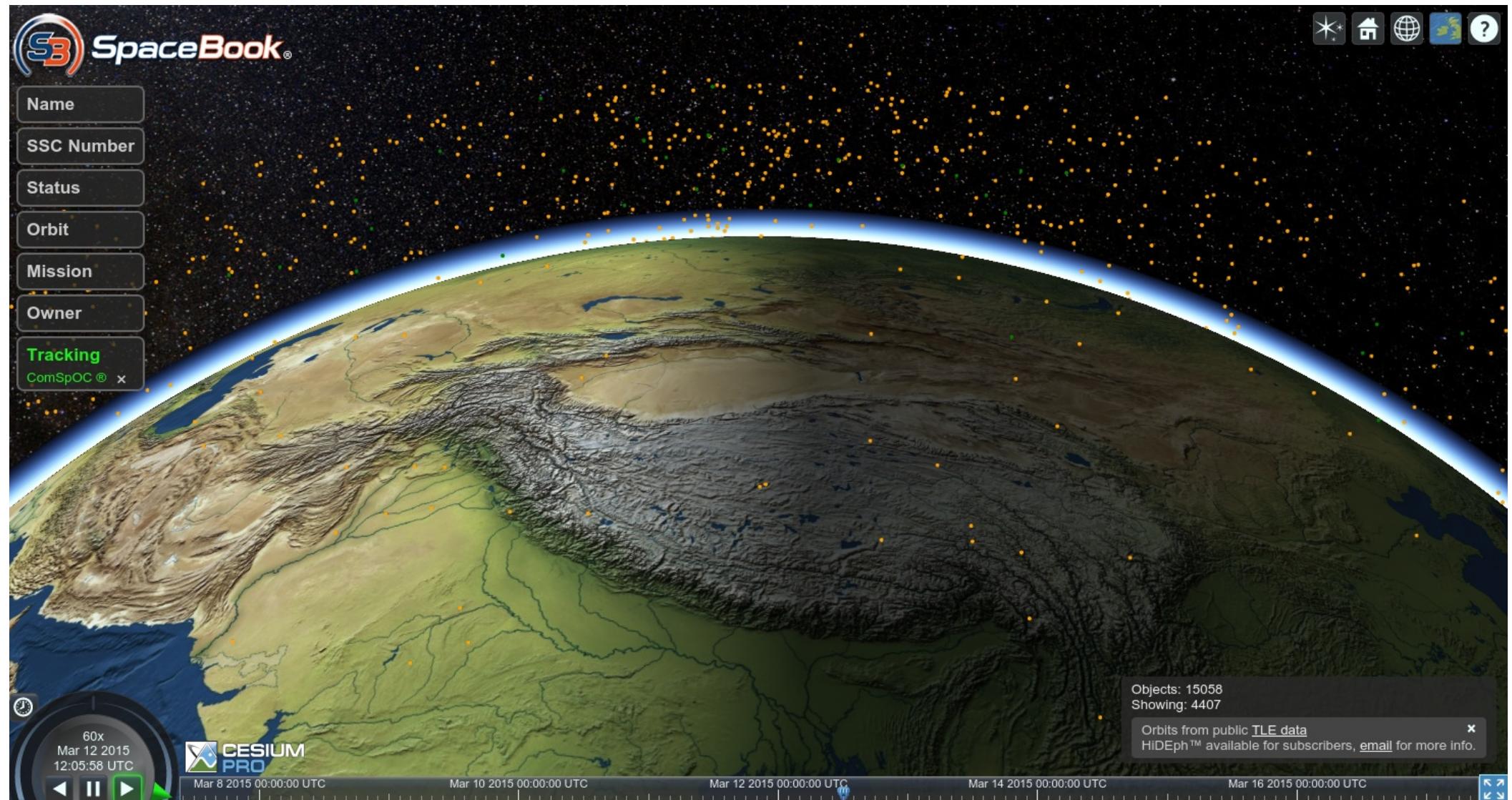
# 3D Ellipsoid



# Terrain



# Zeit-dynamische Szenen mit CZML



<http://apps.agi.com/SatelliteViewer/?Status=Operational>



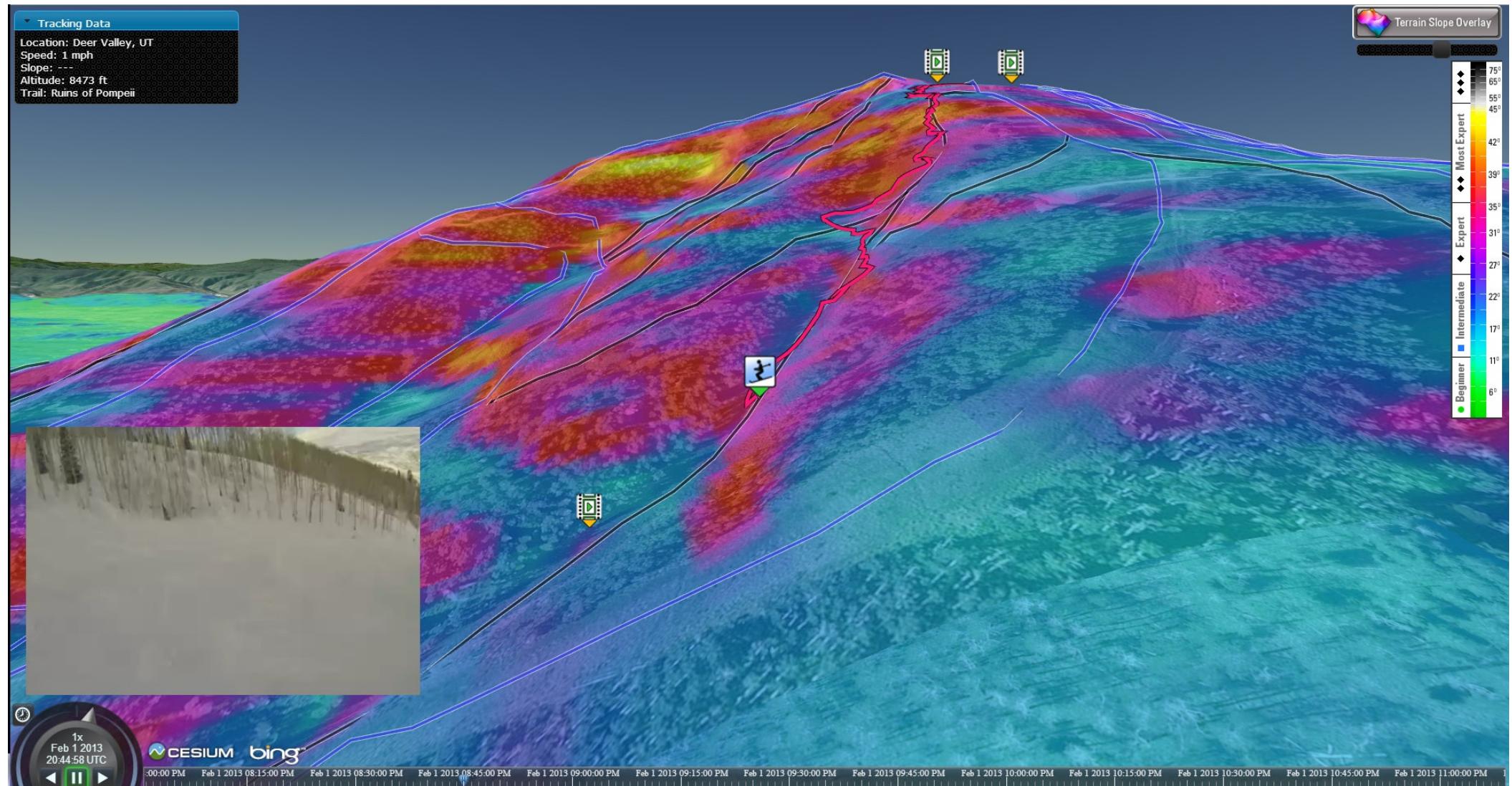
# Overlays



<http://cesiumjs.org/powdertracks/>



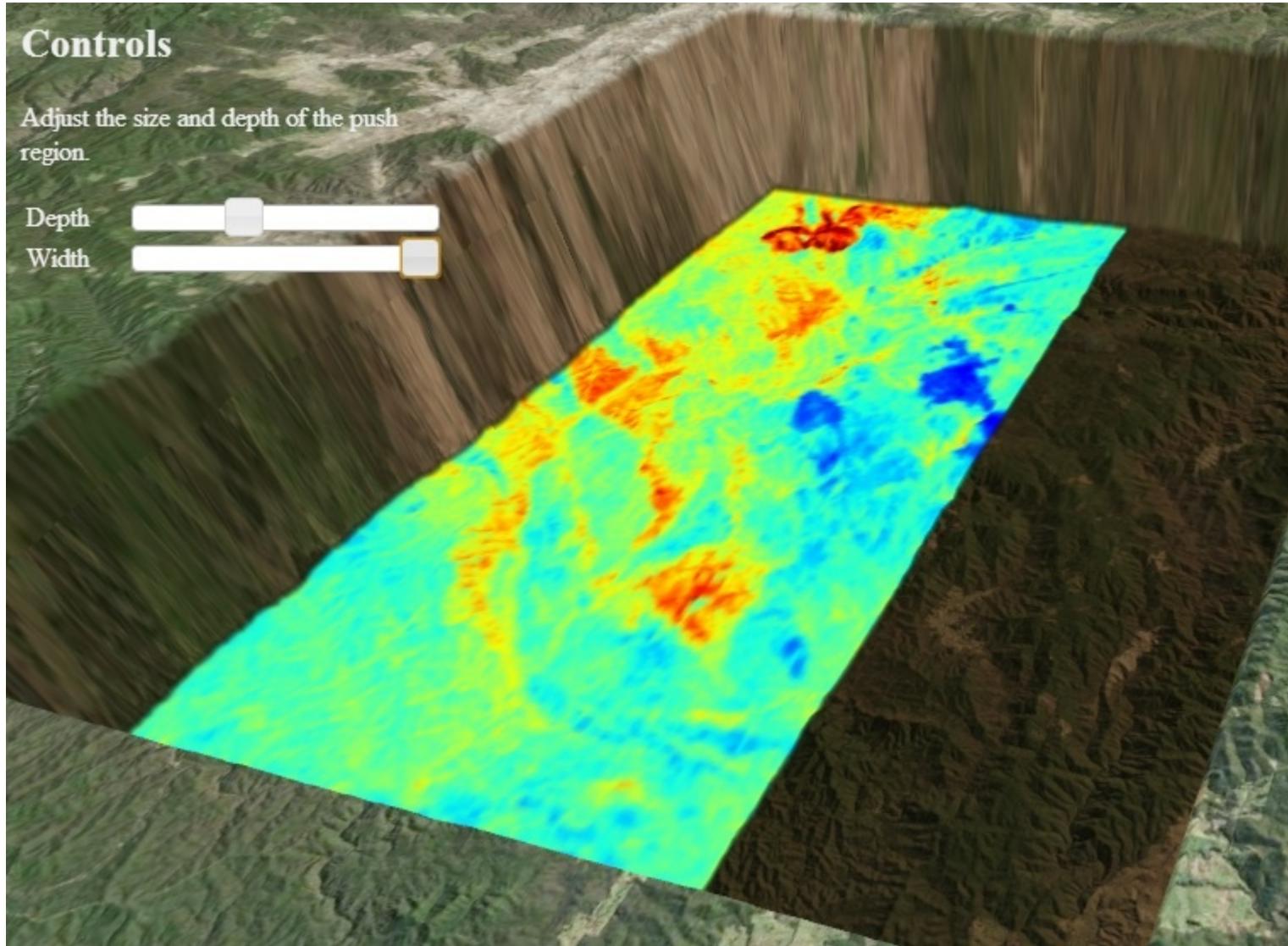
# Overlays + Media



<http://cesiumjs.org/powdertracks/>



# Abgesenktes Terrain (Plugin) + Overlay



<http://subspace.nicta.com.au/> / <https://github.com/NICTA/cesium-groundpush-plugin>



# Terrain Visualisierung SchweizMobil

The screenshot shows the homepage of the SchweizMobil website. The top navigation bar includes the logo "SchweizMobil" with a red star icon, language links for "français", "italiano", and "english", and a link "Selber Touren zeichnen". The left sidebar features a menu with "My Tours" highlighted in red, followed by categories like "Wanderland", "Veloland", "Mountainbikeland", "Skatingland", "Kanuland", "Bahn | Bus | Schiff", "Übernachten", "Services", and "Wetter". Below the sidebar is a large 3D terrain model of the Matterhorn mountain, with a green base layer and a detailed grey shaded relief overlay. At the bottom of the map are three circular icons: a person walking, a target, and a compass rose. The footer contains a "Partner" section with logos from various Swiss cantons and federal agencies, and a copyright notice: "Koordinaten (40) | Geodaten © swisstopo (E7040001301) | Toposuisse | Copyright © Datenschutz und Freiheit | Kontakt | Legende".



# Modelle



# Modelle



# Modelle



# Modelle



<http://subspace.nicta.com.au/#publicDemos>



# Interaktion



<http://analyticalgraphicsinc.github.io/cesium-google-earth-examples/demos/milktruck/>



# Cesium Sandcastle

Run (F8) | Suggest (Ctrl-Space) | Info | Save As | Open in New Window | View as Thumbnail | Search Gallery | CESIUM

JavaScript code    HTML body & CSS

```
1 var widget = new Cesium.CesiumWidget('cesiumContainer');
2 var terrainProvider = new Cesium.CesiumTerrainProvider({
3     url : 'http://cesiumjs.org/smallterrain'
4 });
5 widget.centralBody.terrainProvider = terrainProvider;
6
```

Cesium (standalone)

The image shows a detailed 3D terrain model of a mountain range. The peaks are covered in white snow, and a deep valley below contains a light-colored, winding path or riverbed. The terrain is rugged with various slopes and shadows. In the bottom left corner of the main view, there are small logos for AGI, bing, and Earthstar Geographics, along with copyright information: © 2012 GeoEye • © 2012 IGN • © 2012 Blom.

Gallery    Console

Showcases    Tutorials    Beginner    Geometries    Appearances    All

CZML	Geometry and Appearances	Hello World	Imagery Adjustment	Imagery Layers	Imagery Layers Manipulation	jQuery UI Demo	Labels	Map Projections
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www.camptocamp.com / AGIT 10.7.2015    29/41



# OL3 – Cesium Integration Library



# OL3 – Cesium Integration Library

```
var ol3d = new olcs.OLCesium({map: map});  
ol3d.setEnabled(true);
```



# OL3 – Cesium Integration Library

The screenshot shows the GitHub Pages site for the OL3-Cesium project. The header features the project name "OL3-Cesium" and a subtitle "OpenLayers - Cesium integration library". A GitHub icon with the text "View project on GitHub" is present. Below the header are four buttons: "Download Release" (blue), "Browse Examples" (purple), "View API Docs" (purple), "Download zip file" (blue), and "Download .tar.gz file" (blue). The main content area includes sections for "OL3-Cesium" (describing the integration library) and "Features" (listing map context, raster and vector data sources, and map selection). It also mentions future features like animated transitions and synchronization in other projections. A note at the bottom states the page is maintained by openlayers.

OL3-Cesium

OpenLayers - Cesium integration library. Create your map using [OpenLayers 3](#), and visualize it on a globe with [Cesium](#).

// **Features**

Switch smoothly between 2D and 3D and synchronize:

- Map context (bounding box and zoom level);
- Raster data sources;
- Vector data sources in 2D and 3D;
- Map selection (selected items).

Stay tuned for more exciting features like animated transitions between map and globe view, and synchronization of maps in projections other than EPSG:4326 and EPSG:3857.

View project on GitHub

Download Release

Browse Examples

View API Docs

Download zip file

Download .tar.gz file

is maintained by [openlayers](#).

This page was generated by [GitHub Pages](#) using the Architect theme by [Jason Long](#).

<http://openlayers.org/ol3-cesium>

Demo: <http://map.schweizmobil.ch/?cesium>



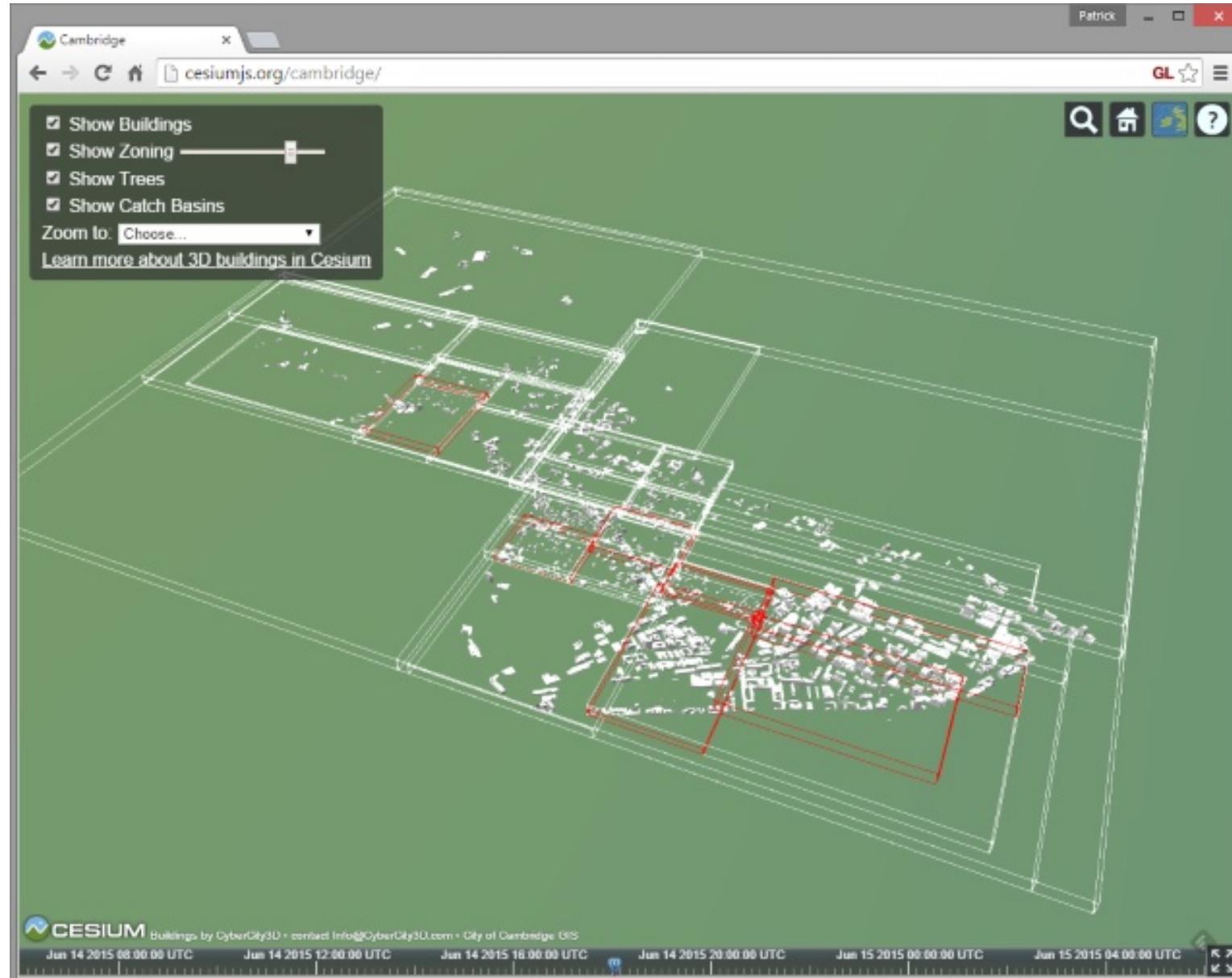
# Ausblick

- Cesium Roadmap 2015
  - **KML** (erweiterter Support: z.B. LookAt, Camera, altitudeMode/Offset)
  - Polygone, Polylinien, und Labels **auf Terrain**: in Arbeit
  - **Streaming** von 3D Gebäuden (Binary glTF) → erste Demos vorhanden:

<http://cesiumjs.org/WashingtonDC/>



# Building Streaming



# Ausblick

- Cesium Roadmap 2015
  - **KML** (erweiterter Support)
  - **Polygone, Polylinien, Billboards und Labels auf Terrain** → Punkte OK, Polyline + Polygon in Arbeit
  - **Streaming** von 3D Gebäuden (Binary glTF) → erste Demos vorhanden:
  - WebGL 2, mehr Tutorials und Demos
- <https://github.com/AnalyticalGraphicsInc/cesium/wiki/Roadmap>



# Ausblick

- OpenLayers 3 und Cesium
  - Vector on Terrain Synchronisation
  - Voller WebGIS Support (Picking, Editing on Terrain, Permalink)



# Zusammenfassung

- Cesium = performanter, Plugin-freier Globus
- WebGL wird breit unterstützt
- Zeitabhängige Daten aus verschiedenen Quellen
- glTF Modelle
- Sehr aktives Open Source Projekt mit vielen Anwendungen (cf. <http://cesiumjs.org/demos.html>)
- 3D WebGIS mittels OL3 und Cesium



# Danke für die Aufmerksamkeit!



# Danke für die Aufmerksamkeit!

- Cesium: <http://cesiumjs.org>
- OL3-Cesium: <http://openlayers.org/ol3-cesium>

elisabeth.leu@camptocamp.com

... oder beim Open Source Stand



# Quellen

- CesiumJS Dev Mailingliste
- <http://cesiumjs.org/presentations/TheRiseOf3DGISOnTheWeb.pdf>
- <http://cesiumjs.org/presentations/CesiumGeoScaleDataVisualization.pdf>
- <http://cesiumjs.org/features.html>
- <http://cesiumjs.org/data-and-assets/>
- <http://cesiumjs.org/presentations/Cesium3DMapsOnTheWeb.pdf>
- [http://www.itc.nl/library/papers\\_2014/msc/gfm/chaturvedi.pdf](http://www.itc.nl/library/papers_2014/msc/gfm/chaturvedi.pdf)
- <http://www.geospatialworldforum.org/2014/presentation/geo3d/Emmanuel%20Belo%20M.pdf>



