

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**



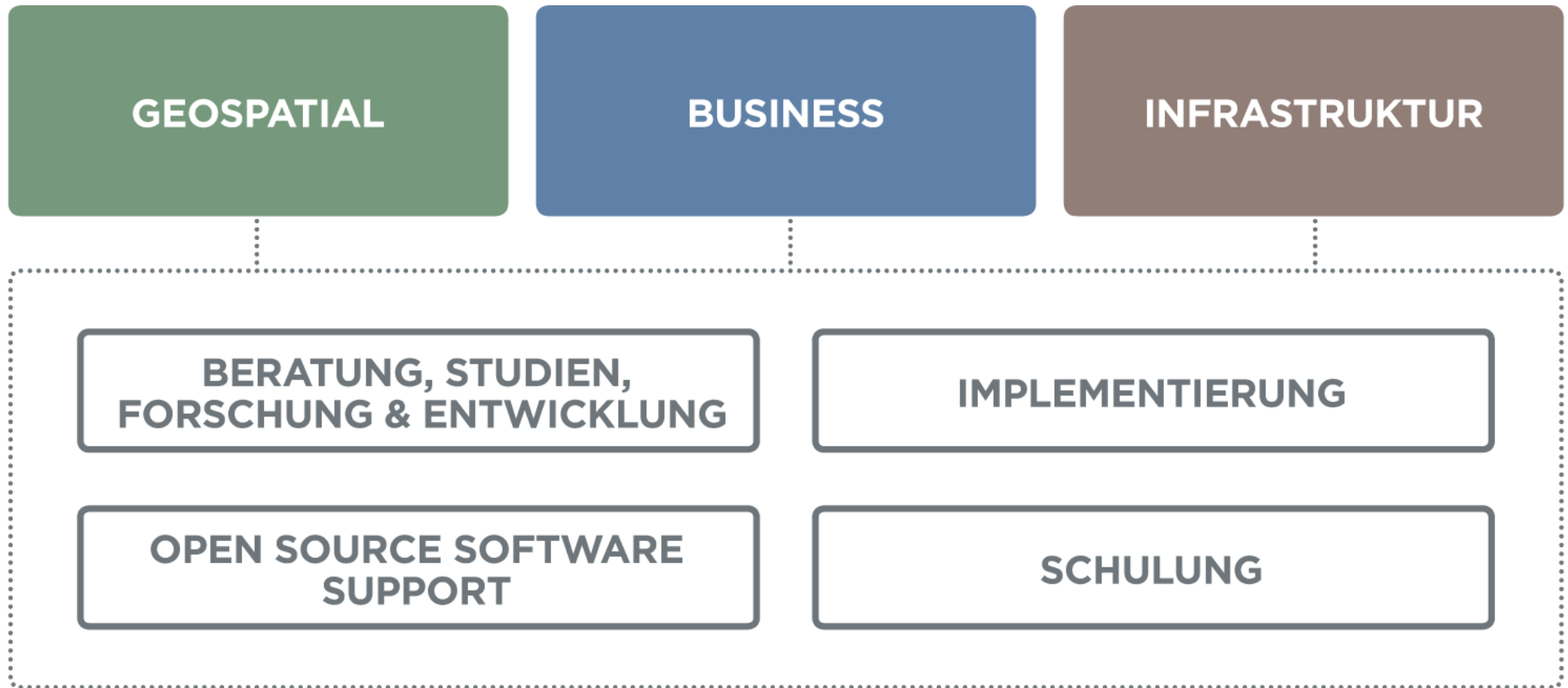
Wien

Lausanne



Chambéry

Camptocamp: 3 Bereiche





Cesium



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

Application

Cesium

WebGL

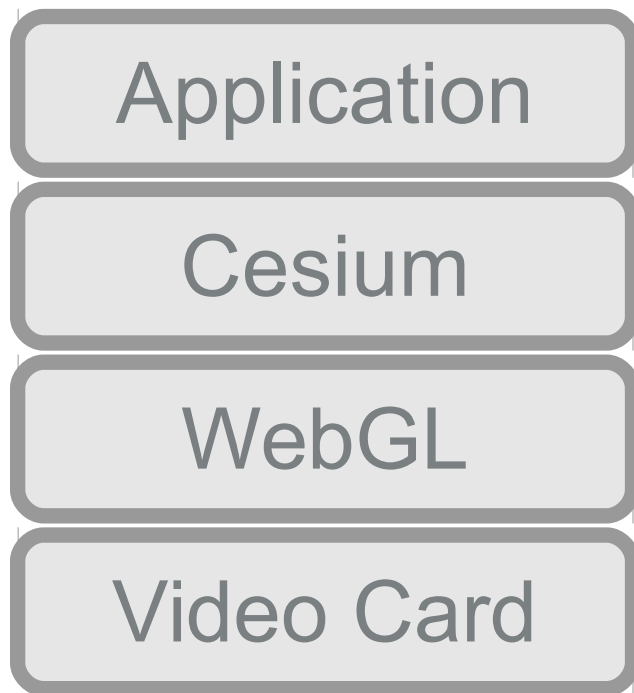
Video Card



Cesium



- Open-Source **JavaScript** Programmbibliothek 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



WebGL Unterstützung

Current aligned Usage relative Show all								
IE	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
		31						
		36						
		37					4.1	
8		38					4.3	
9		39					4.4	
10	35	40	7.1		7.1		4.4.4	
11	36	41	8	27	8.1	8	37	40
TP	37	42		28				
	38	43		29				
	39	44						

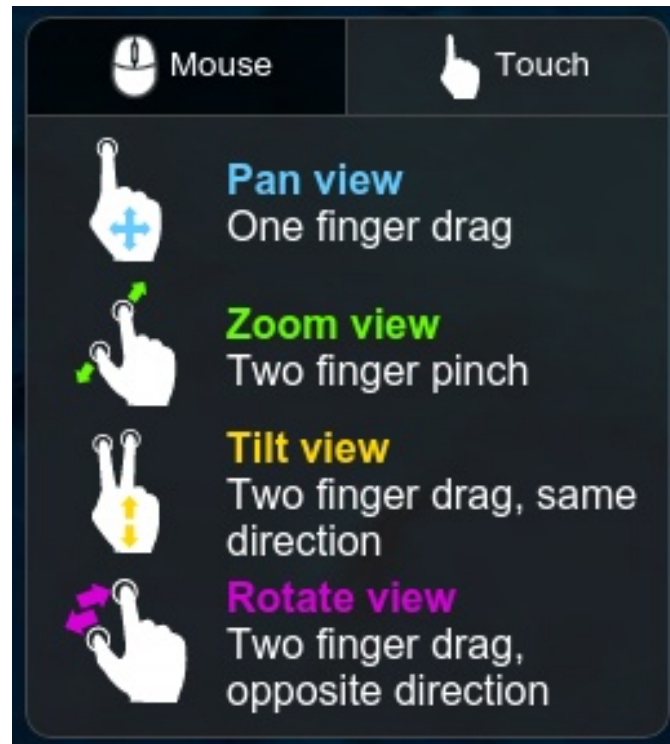
<http://caniuse.com/webgl>



Mobile?



Mobile !



Cesium



- Open-Source **JavaScript** Programmbibliothek 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

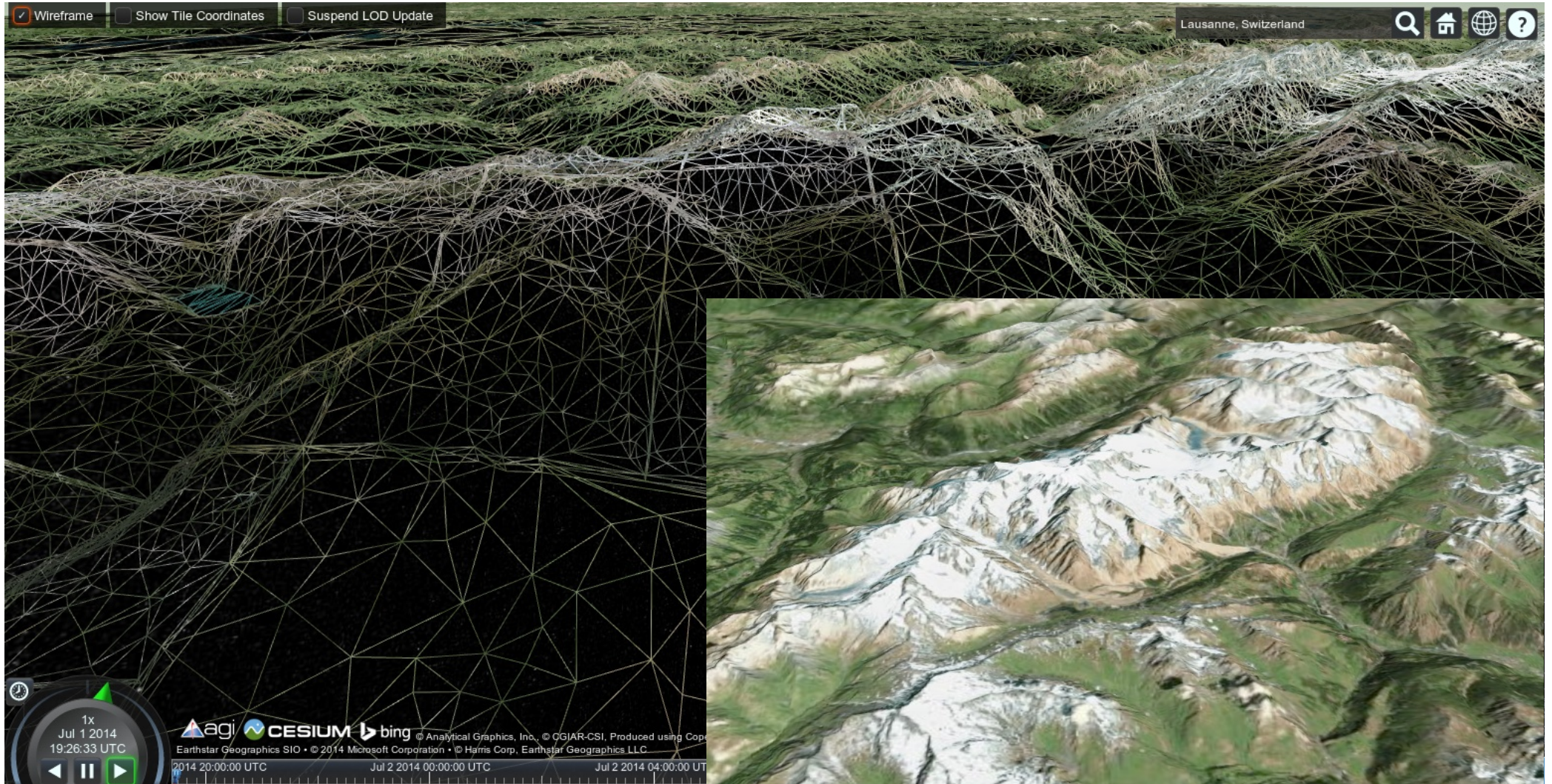
... anhand von Beispielen



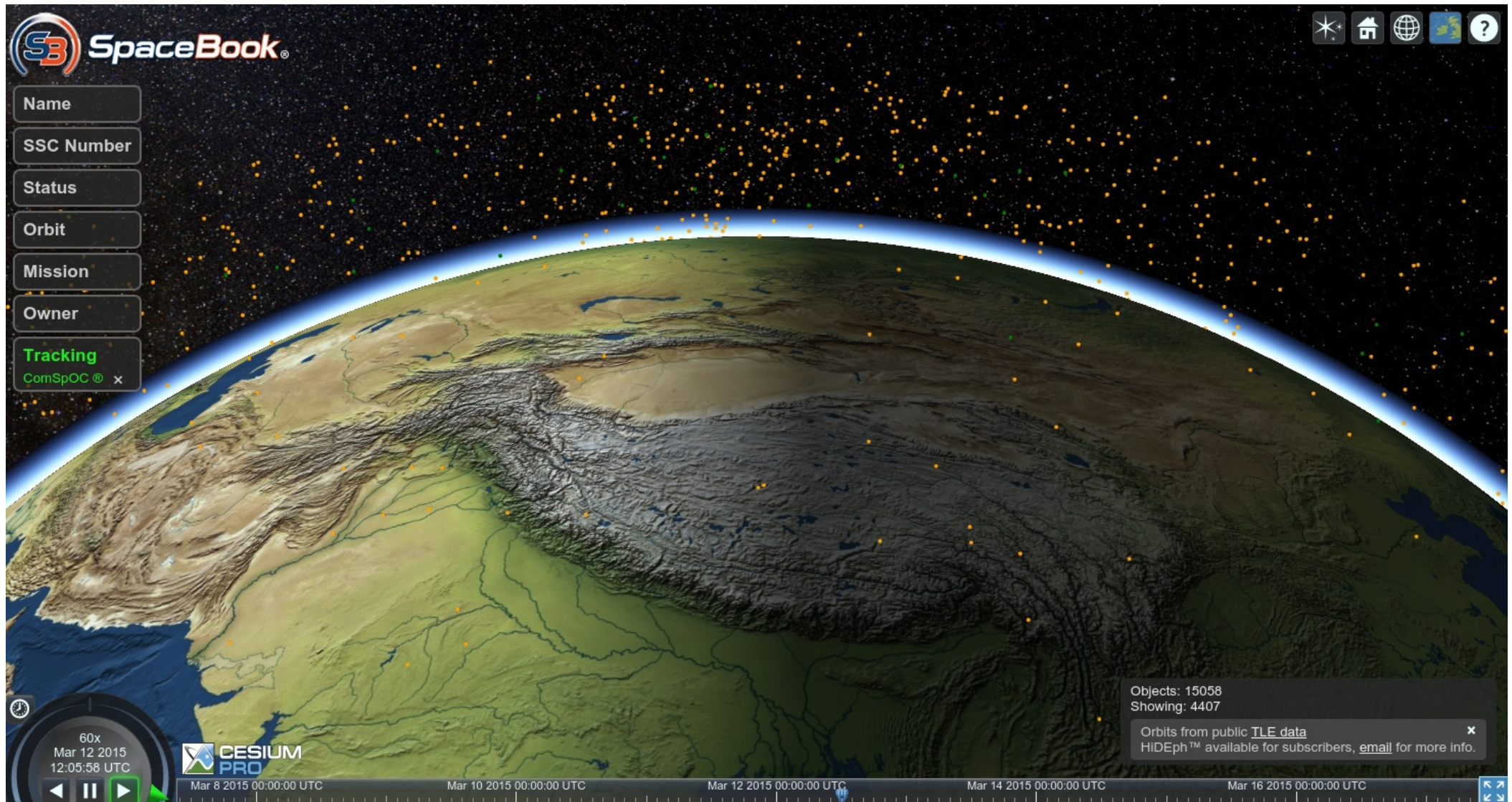
3D Ellipsoid



Terrain



Zeit-dynamische Szenen mit CZML



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



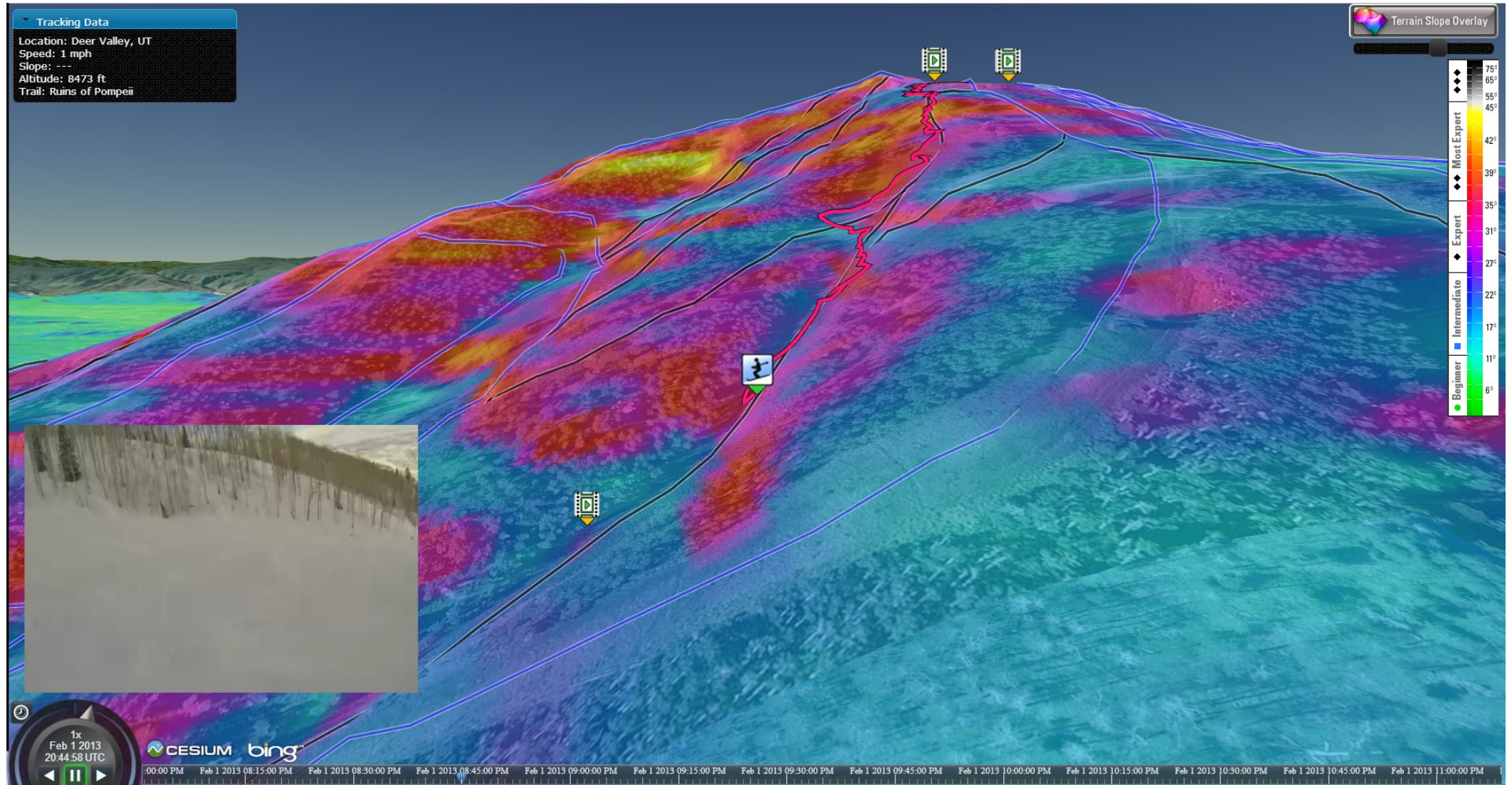
Overlays



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



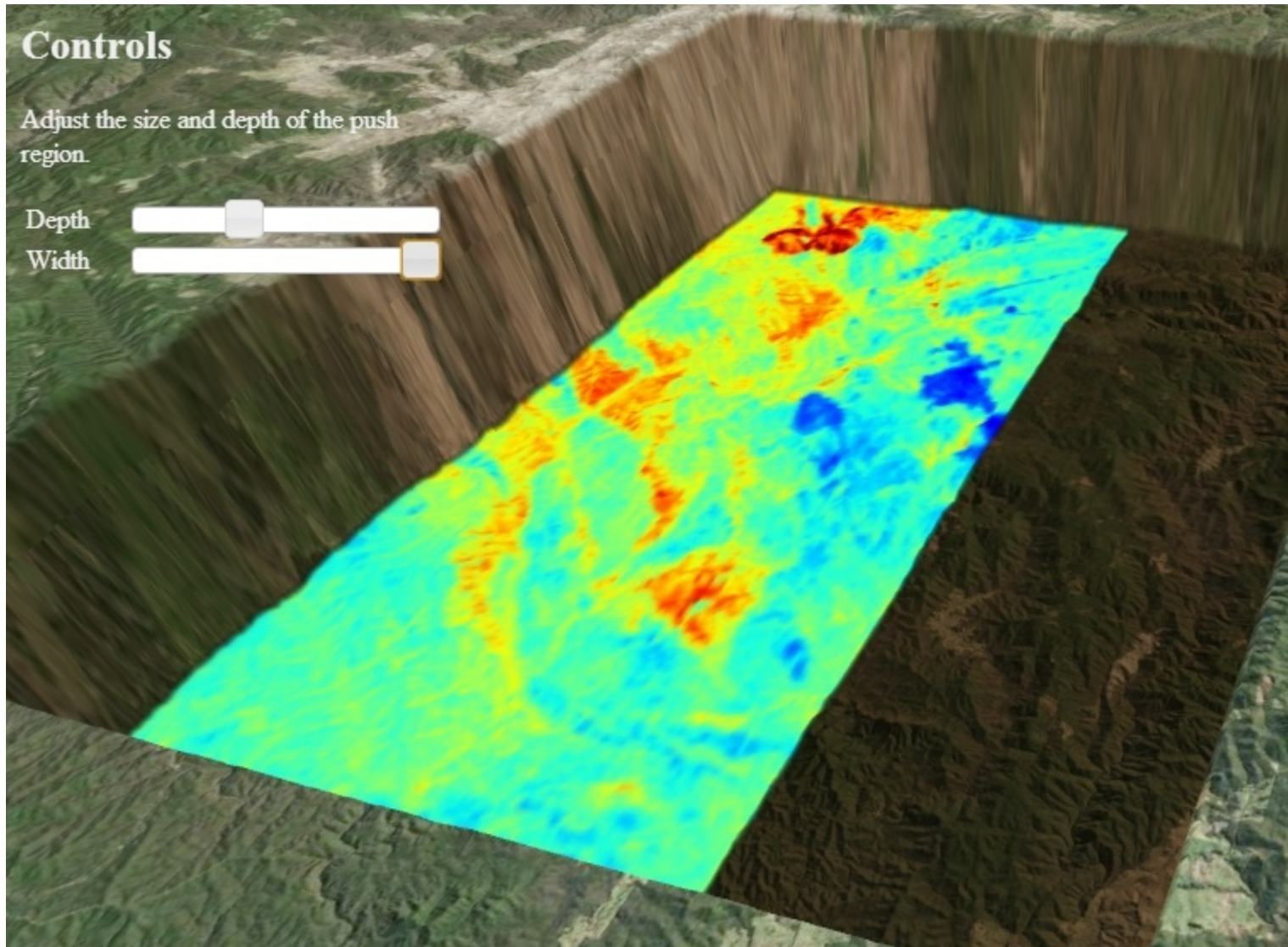
Overlays + Media



<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 displays the SchweizMobil website interface. The main content area features a 3D terrain visualization of a mountain range, likely the Matterhorn region, with snow-capped peaks and rocky slopes. The interface includes a top navigation bar with the SchweizMobil logo, a Swiss flag, and various icons representing different activities (hiking, cycling, etc.). Below the logo, there are language options: français, italiano, and english. A search bar at the top right contains the text "Selber Touren zeichnen". On the left side, there is a sidebar menu with options: Matterhorn | Mont Cervin | Monte Cer..., 3D, Karte, Foto, Grau, Print, Tellen, My Tours, Wanderland, Veloland, Mountainbikeland, Skatingland, Kanuland, Bahn | Bus | Schiff, Übernachten, Services, and Wetter. At the bottom of the sidebar, there is a red arrow icon pointing up. The bottom of the website features a footer with logos of partner organizations, a copyright notice, and a small map icon.



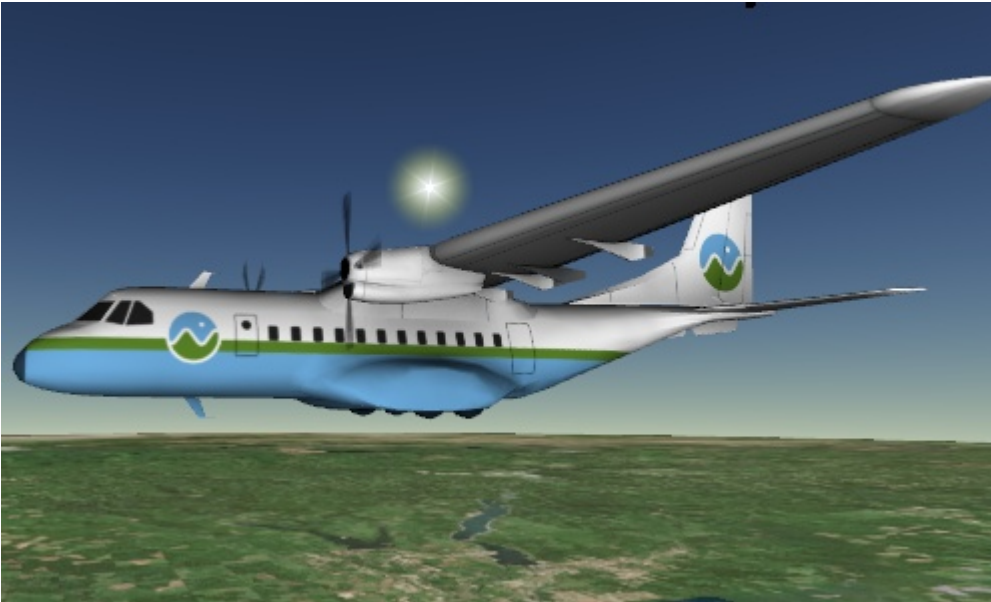
Modelle



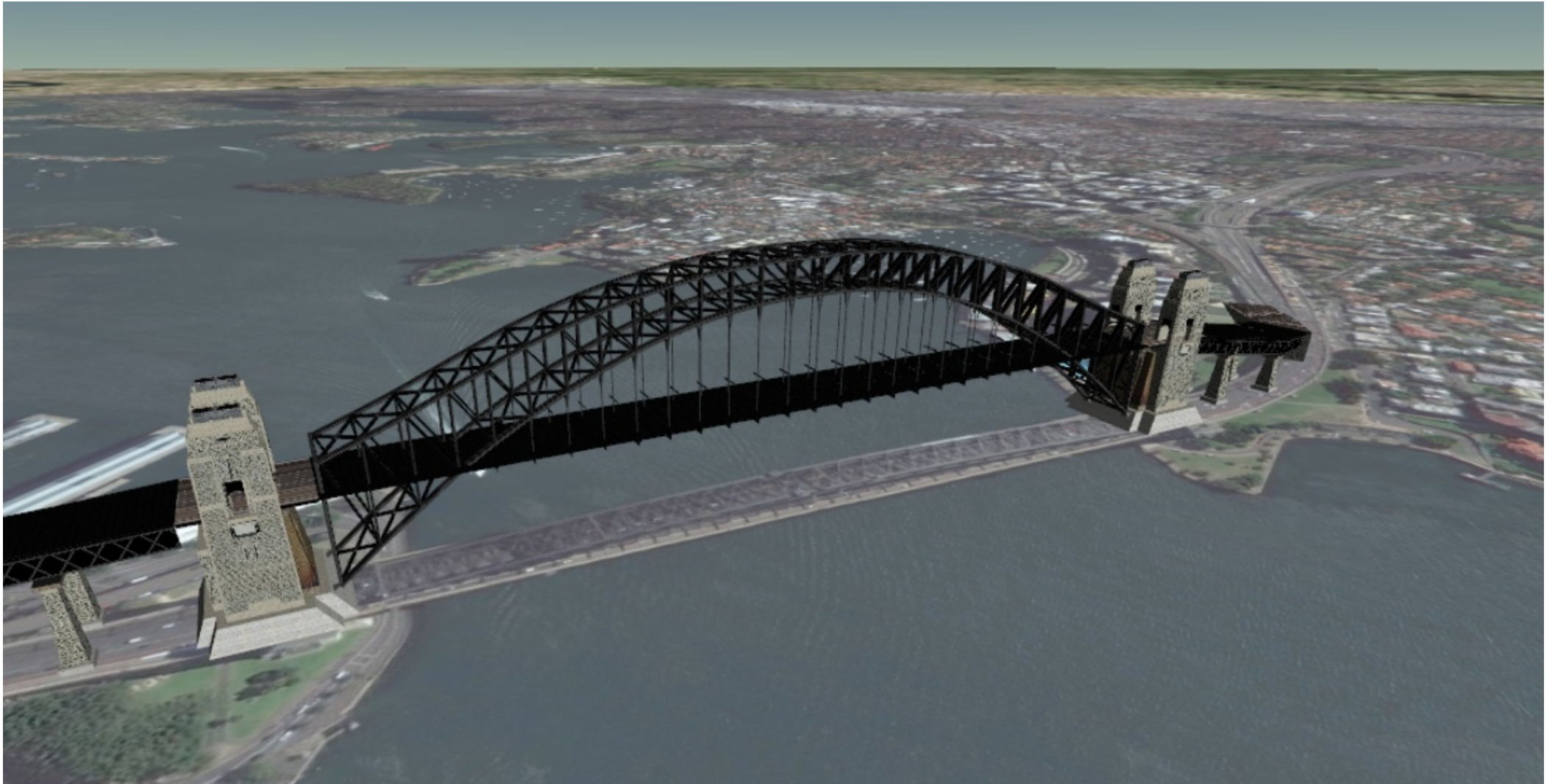
Modelle



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/smallerTerrain'
4 });
5 widget.centralBody.terrainProvider = terrainProvider;
6
```

Cesium (standalone)



CESIUM agi bing Earthstar Geographics SIO · © 2014 Microsoft Corporation · Image courtesy of NASA · © 2012 Intermap · © Harris Corp. Earthstar Geographics LLC · © 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



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 OL3-Cesium website. The header is blue with the text 'OL3-Cesium' and 'OpenLayers - Cesium integration library'. A GitHub logo and 'View project on GitHub' link are in the top right. Below the header are three buttons: 'Download Release', 'Browse Examples', and 'View API Docs'. To the right are two buttons: 'Download .zip file' and 'Download .tar.gz file'. The main content area has a heading 'OL3-Cesium' followed by a description: 'OpenLayers - Cesium integration library. Create your map using OpenLayers 3, and visualize it on a globe with Cesium.' Below this is a 'Features' section with a list of features: 'Map context (bounding box and zoom level);', 'Raster data sources;', 'Vector data sources in 2D and 3D;', and 'Map selection (selected items).'. At the bottom of the features section, it says '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.'

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

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



Ausblick

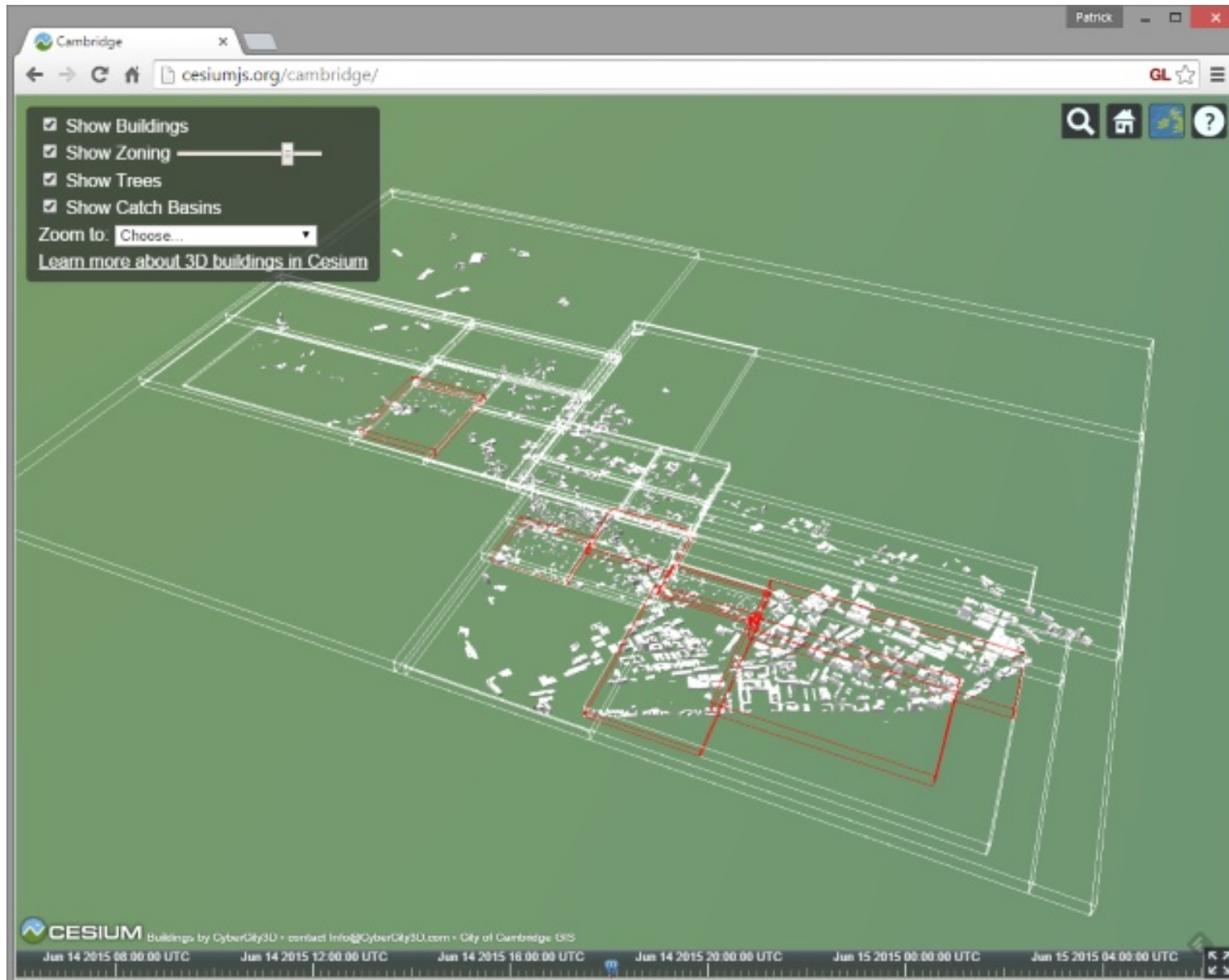
■ Cesium Roadmap 2015

- **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>

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... 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.geospatialworldforum.org/2014/presentation/geo3d/Emmanuel%20Belo%20M.pdf>



to camp 

camp **to** camp

INNOVATIVE SOLUTIONS
BY OPEN SOURCE EXPERTS