

# OL3-Cesium: 3D for OpenLayers

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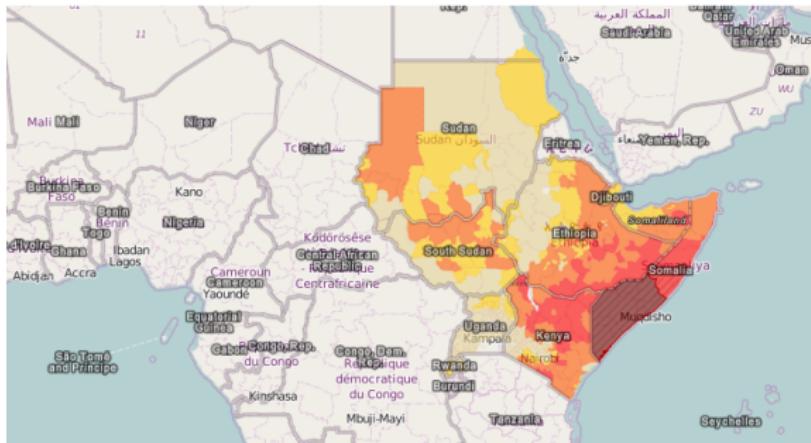
## About me

- ▶ Senior software engineer at Camptocamp
- ▶ OL3-Cesium main developer and release manager
- ▶ OpenLayers 3 and Cesium contributor
- ▶ On github: [@gberaudo](#)

# Agenda

- ▶ OpenLayers 3
- ▶ Cesium
- ▶ OL3-Cesium
- ▶ Now is prime time - showcases
- ▶ Future

# OpenLayers 3 - The world is flat!



# OpenLayers 3 - The world is flat!

- ▶ Developement since 2013 (2006 for OpenLayers 2)
- ▶ Raster and vector layers drawn on top of each other
- ▶ View with custom projection, rotation, resolution, position
- ▶ Same resolution for all pixels
- ▶ Flexible, optimized, pixel perfect
- ▶ **flat?**

# Cesium - The world is a realistic 3D scene



# Cesium - The world is a realistic 3D scene

- ▶ Developement since 2012
- ▶ Only Mercator and Lonlat (EPSG:3857 and EPSG:4326)
- ▶ WGS84 ellipsoid
- ▶ Z dimension, terrain, models, lights
- ▶ WebGL, custom optimized renderer

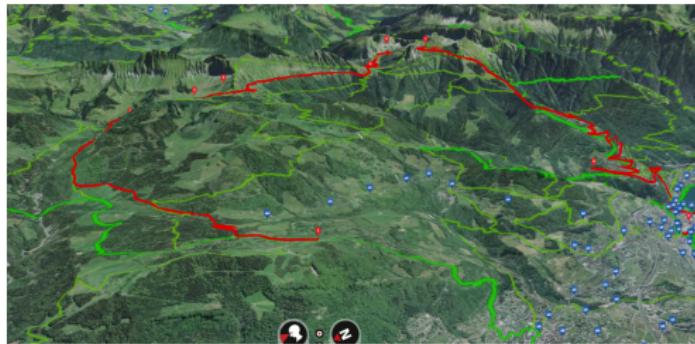
## Cesium - Challenges

- ▶ Vector on (dynamic) terrain
- ▶ Raster on steep terrain
- ▶ Large datasets: trees, planes, bridges, buildings ([3D-tiles](#))
- ▶ Needs (lots of) CPU, GPU, bandwidth

# OL3-Cesium - The best of all worlds

- ▶ Developement since 2014
- ▶ Write once, use in 2D and 3D
- ▶ Receive from and give to the community
- ▶ Start interacting in one world and continue in the other
- ▶ Easiest way to add 3D to an OpenLayers 3 map
- ▶ In a nutshell **it makes a great application awesome**

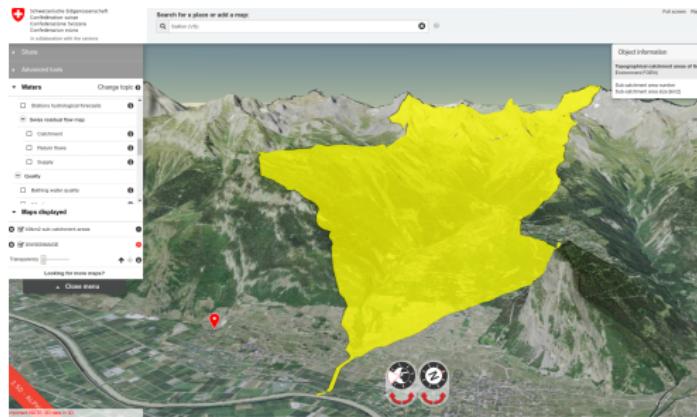
# OL3-Cesium - Ready for prime time



SchweizMobil - outdoor application

- ▶ Custom 3D terrain - different projections
- ▶ 3D vector clustering with 30'000 points
- ▶ Optimized for a high number of users
- ▶ CPU/GPU resource saving by stopping the render loop
- ▶ Workaround for lines on terrain

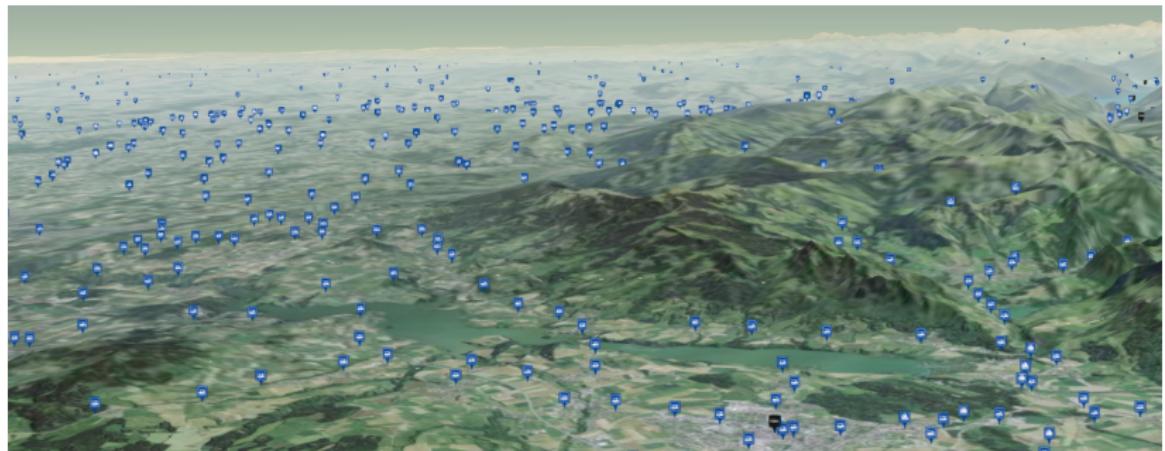
# OL3-Cesium - Ready for prime time



Geoadmin - Swiss geoportal

- ▶ Lazy loading - nice 2D/3D transitions
- ▶ 3D tiles: buildings, bridges
- ▶ Own synchronizers (raster → vector, different projections)
- ▶ New points of views

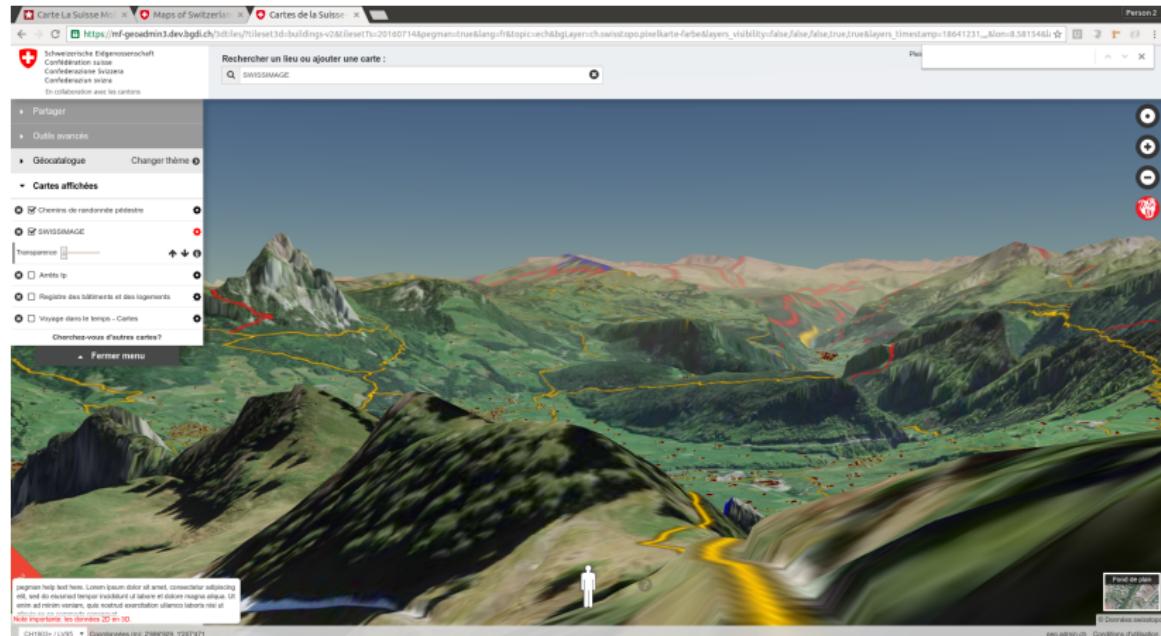
## OL3-Cesium - quality / bandwidth



- ▶ **Vector clustering:** top quality, some geojsons instead of millions of raster tiles
- ▶ **Fog:** reduce details according to distance from the camera

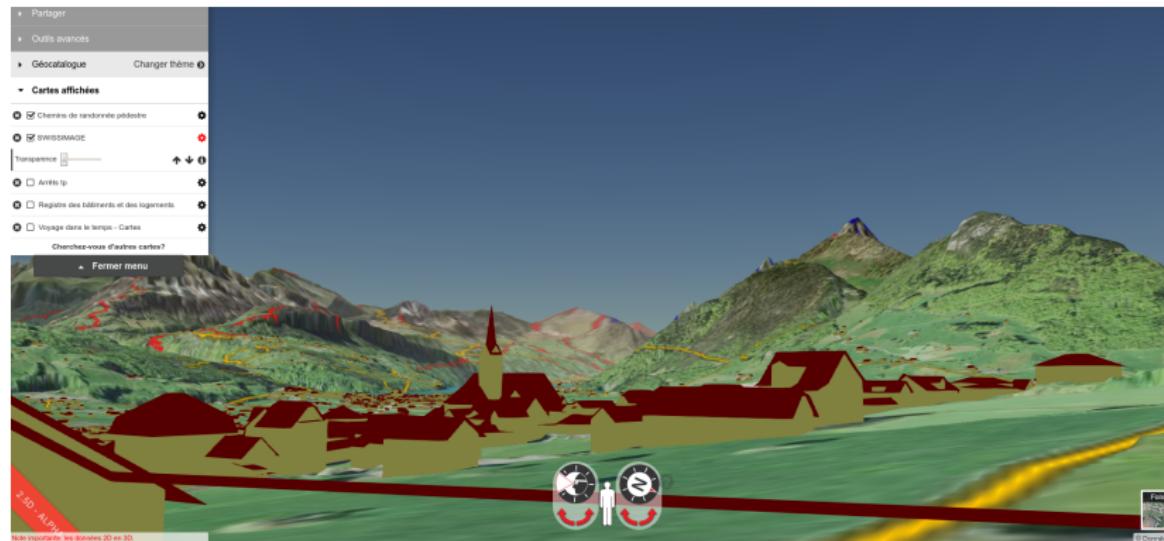
# OL3-Cesium - Immersive views

## View from a mountain trail



# OL3-Cesium - Immersive views

## View through a window



## Ideas for the future - need funding

- ▶ Lines on terrain workaround (corridor geometries)
- ▶ Integrate 3D vector clustering
- ▶ Client side raster reprojection
- ▶ Official extruded polygons support

# Questions?

The screenshot shows the GitHub repository page for 'openlayers / ol3-ceesium'. The repository has 815 commits, 5 branches, 20 releases, and 14 contributors. The latest commit was made a day ago. There are buttons for creating new files, uploading files, finding files, and cloning or downloading the repository.

Author	Commit Message	Date
gberaudo	Merge pull request #383 from openlayers/update_externs	a day ago
build	Port to OL 3.17.1 (typedefs, renamed symbols)	a month ago
cesium @ 9b20bee	Port to Cesium 1.24	11 days ago

- ▶ Thank you for listening
- ▶ Danke - Questions?

## Future: 3D imagery



- ▶ We need more precision where the terrain is steeper
- ▶ We need multi-view capture of imagery (not just top-down)

# Links and Credits

- ▶ OL3-Cesium
- ▶ OL3 cluster Tool
- ▶ Geoadmin Swiss geoportal / github
- ▶ SchweizMobil
- ▶ Cesium-terrain-builder heightmap terrain
- ▶ 3d-forge quantized terrain
- ▶ OpenStreetMap