

OL3-Cesium: 3D for OpenLayers

Guillaume Beraudo

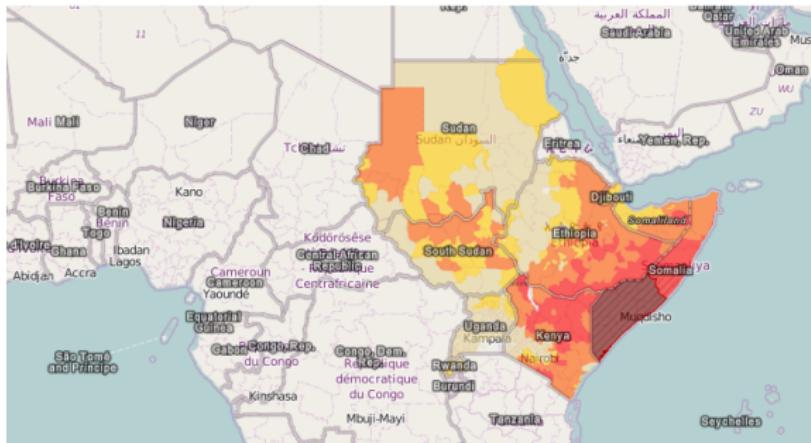
FOSS4G Bonn, August 26th 2016



About me

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

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 arbitrary 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
- ▶ XYZ, terrain, models, lights
- ▶ WebGL, custom optimized renderer

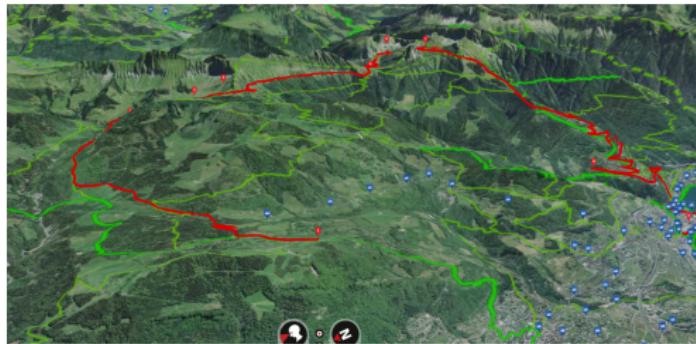
Cesium - Challenges

- ▶ Vector on (dynamic) terrain
- ▶ Raster on steep terrain
- ▶ 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 and give to the community
- ▶ Start interacting in one world and continue in the other
- ▶ Easiest path to add 3D to an OpenLayers 3 map
- ▶ In a nutshell **it makes a great application awesome**

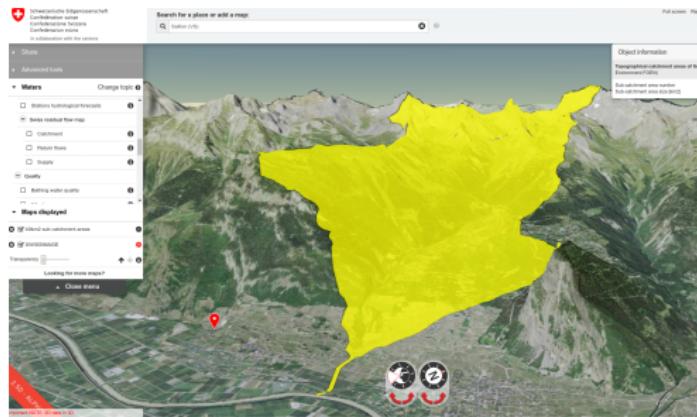
OL3-Cesium - Ready for prime time



SchweizMobil - outdoor application

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

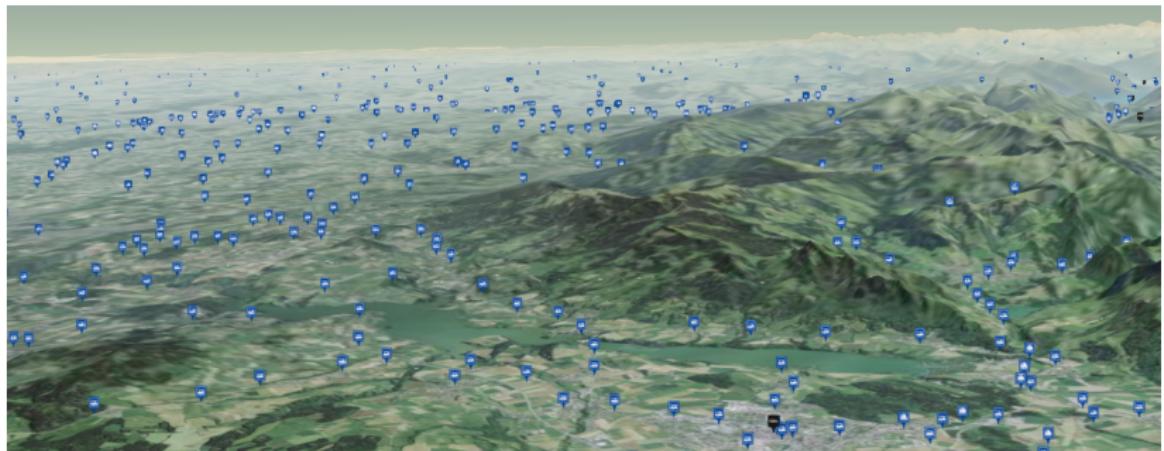
OL3-Cesium - Ready for prime time



Geoadmin - Swiss geoportal

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

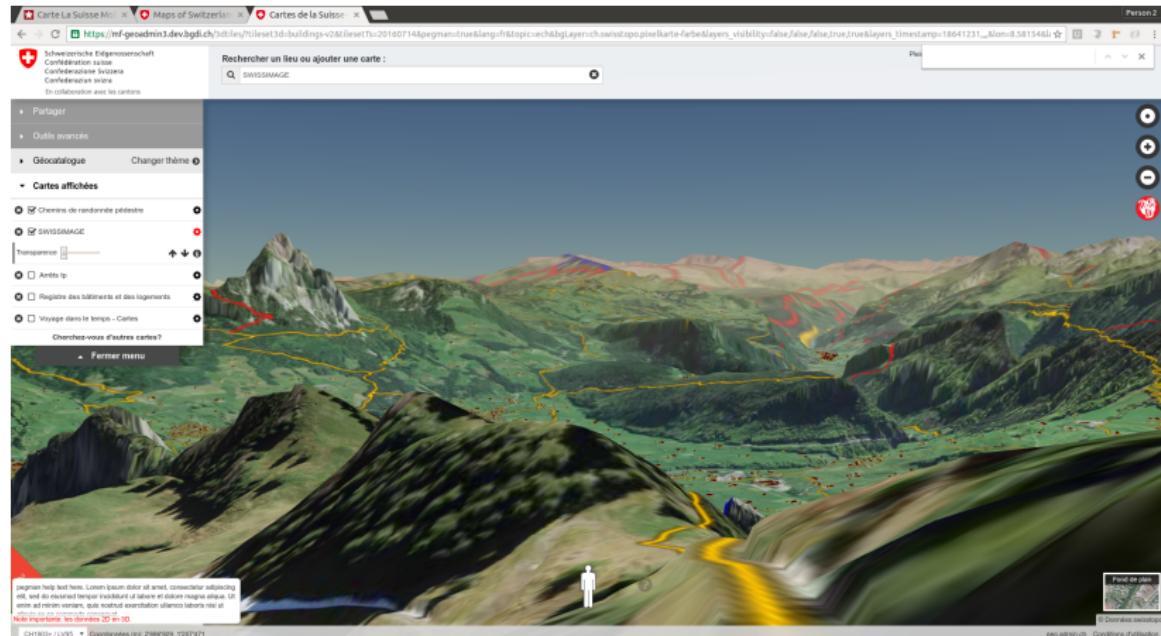
OL3-Cesium - quality / bandwidth



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

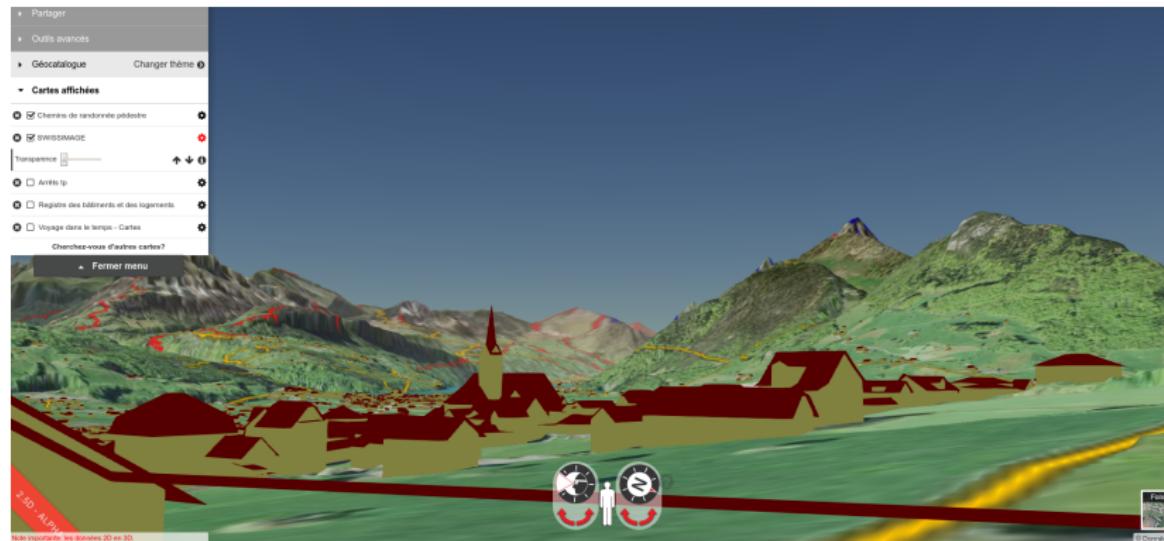
OL3-Cesium - Immersive views

View from a mountain trail



OL3-Cesium - Immersive views

View through a window



Ideas for the future - need founding

- ▶ Lines on terrain workaround (corridor geometries)
- ▶ Integrate 3D vector clustering
- ▶ Client side 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. The repository page includes sections for issues, pull requests, wiki, pulse, graphs, and settings.

OpenLayers - Cesium integration <http://openlayers.org/ol3-ceesium/> — Edit

815 commits 5 branches 20 releases 14 contributors

Branch: master New pull request Create new file Upload files Find file Clone or download

gberaudo committed on GitHub Merge pull request #383 from openlayers/update_externs ... Latest commit faada2d 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

- ▶ Thanks to OSM, SchweizMobil and swisstopo
- ▶ Thanks to 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

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