Atlas of Switzerland goes online and 3D

Concept, Architecture and Visualization

Marianna Serebryakova

Institute of Cartography and Geoinformation
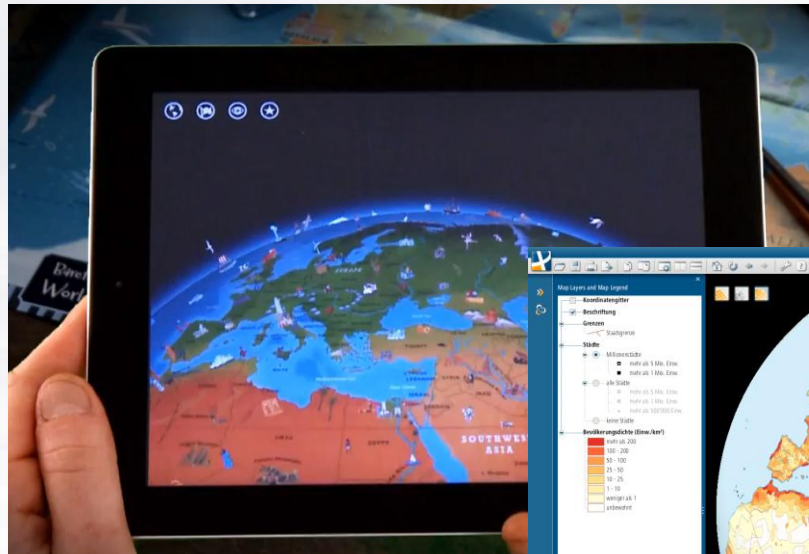ETH Zurich

René Sieber

Remo Eichenberger

Raimund Schnürer

Raluca Nicola

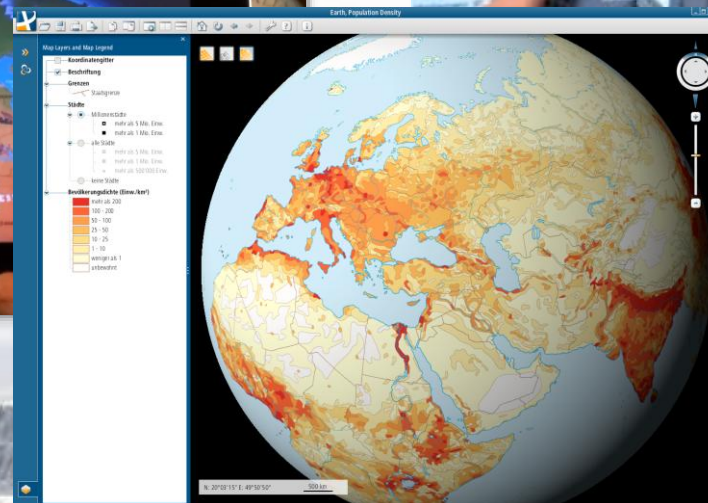# 3D Visualization in Digital Maps and Atlases

- 3D in Cartography

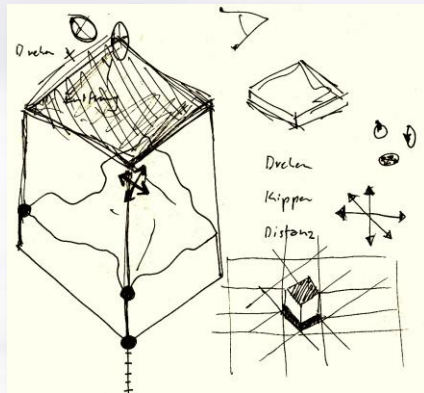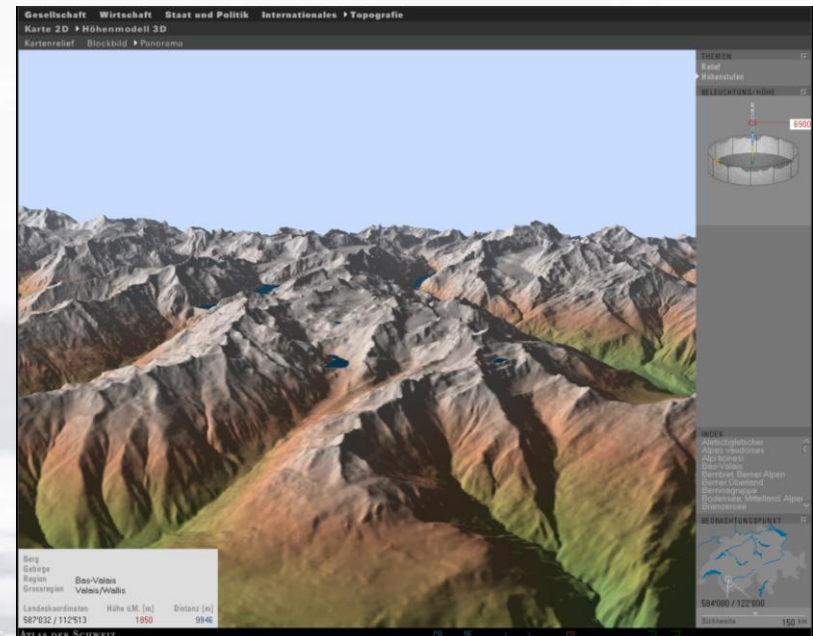www.barefootworldatlas.com

UpNext HD maps

SWA-i

3D Visualization in the Atlas of Switzerland

- 1995   First ideas for visualizing terrain in 3D

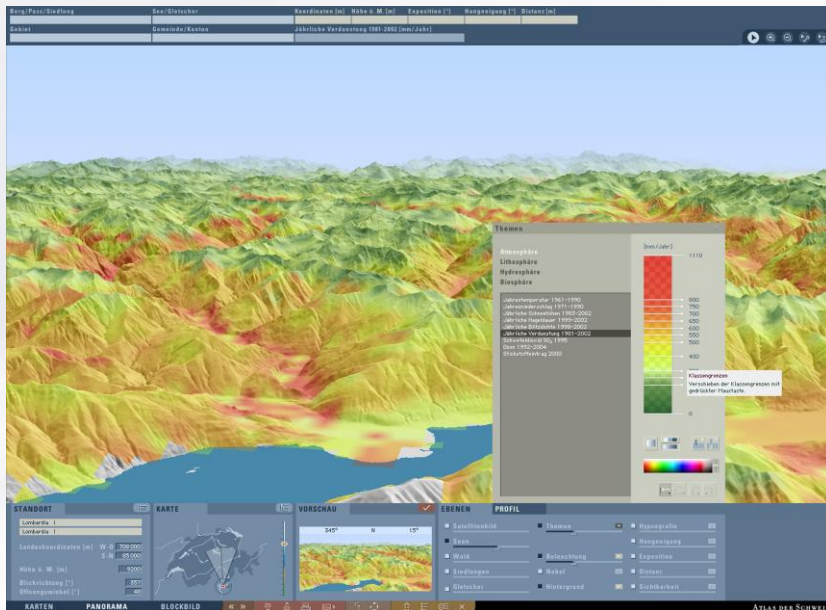- 2000   Atlas of Switzerland – interactive

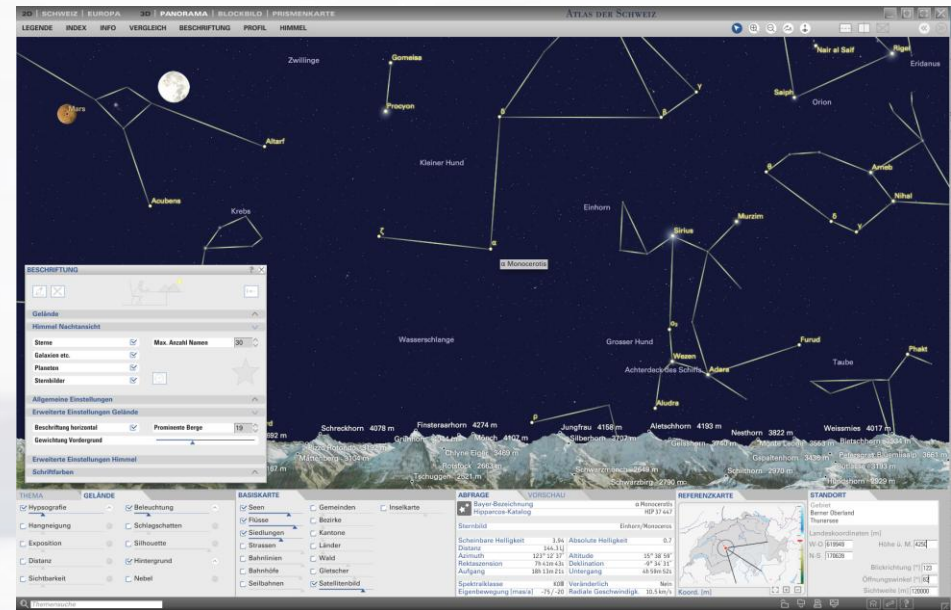Atlas of Switzerland – interactive (2000)

3D Visualization in the Atlas of Switzerland

- 2004 / 2010   Thematic 3D maps in the Atlas of Switzerland, versions 2 and 3
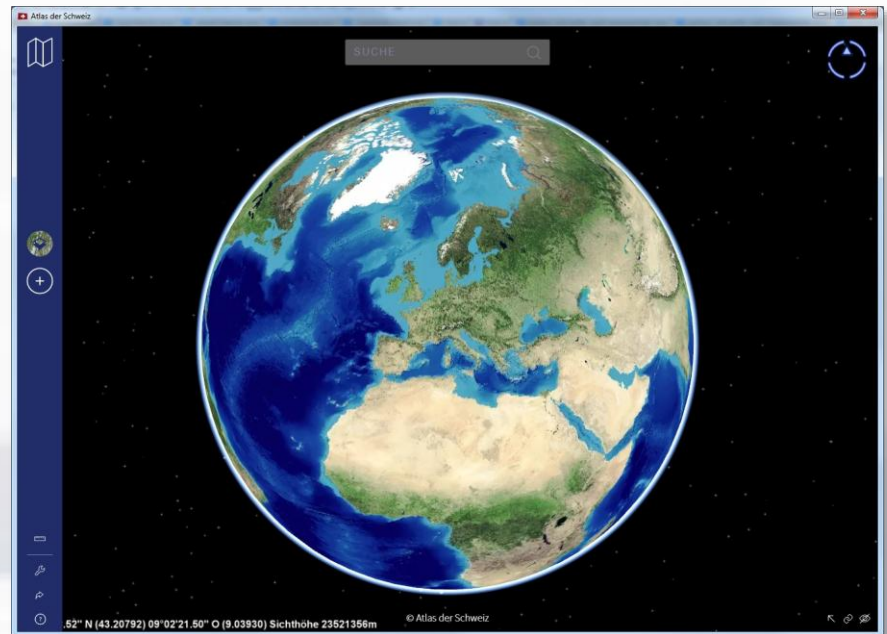

Atlas of Switzerland 2 (2004)

Atlas of Switzerland 3 (2010)

New Atlas of Switzerland

- Web-based Desktop version
  AoS – online

- **3D Cartography**
  2D maps as a special case of 3D maps

- Virtual Globe

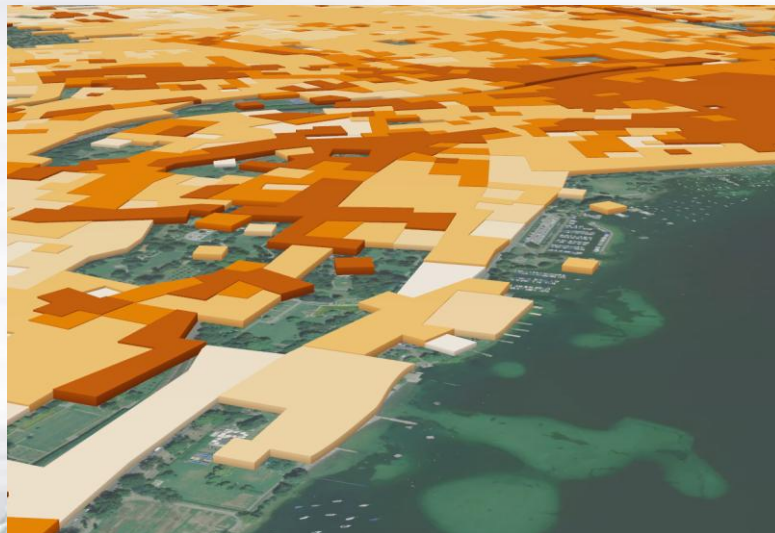- **Atlas as an Emotional Experience**
  Visualize & Explore

Atlas of Switzerland – online

New Atlas of Switzerland

▪ **Content**
- Selective list of themes
- Popular issues (e.g. national records)
- New presentation of themes (3D)

HLS: Built-up areas

▪ **10 Thematic Categories**
- Portrait of Switzerland
- History & Future
- Nature & Environment
- Landscape & Space
- Tourism & Leisure time
- Society & Culture
- State & Politics
- Economy & Energy
- Traffic & Communication
- Switzerland International
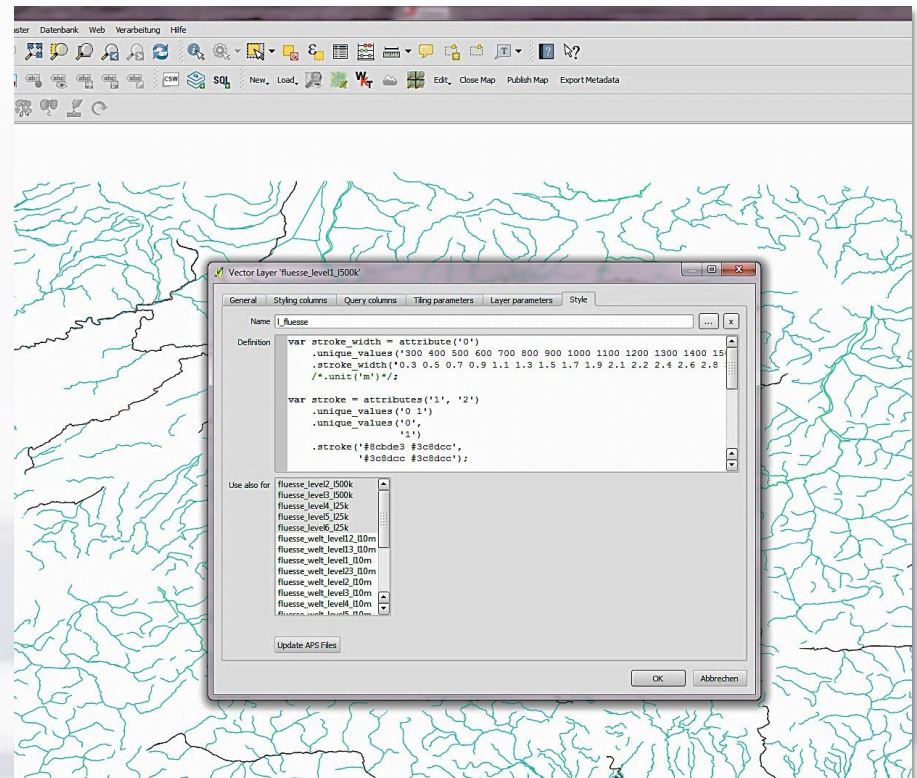
APS Data Workflow

- **Acquisition**

  Geometries, Attributes, Metadata,
  Multimedia elements
  AdS Converter (for AdS3 Data)

- **Editing**

  Quantum GIS with APS-Editor

- **Storing**

  Tiling as TFSB and TMS
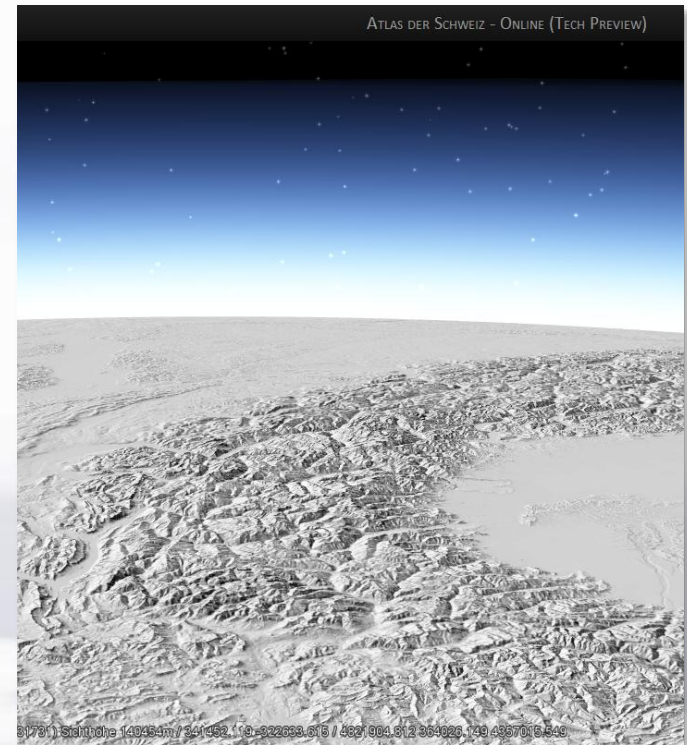 PostGIS Database
  Mongo-DB

APS-Editor

APS Globe: Virtual Globe «osgEarth»

- Implemented in C++;
  based on OpenSceneGraph (OSG)
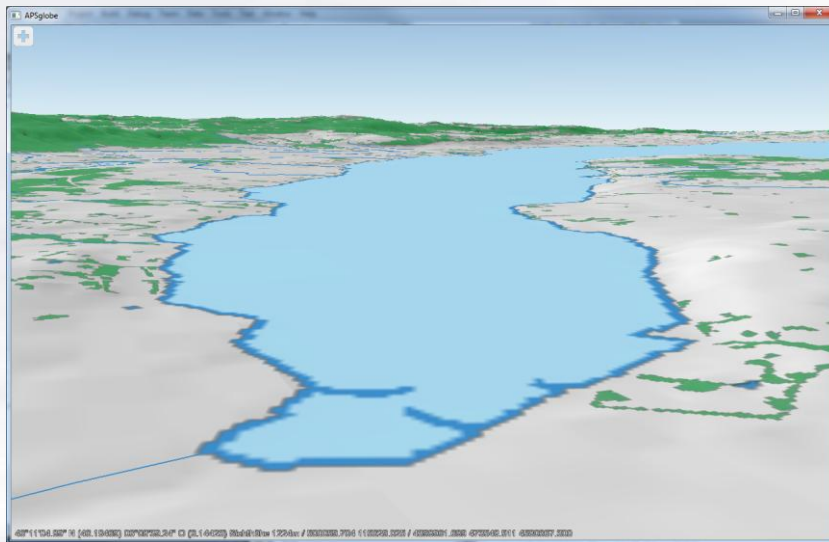
- LGPL OpenSource Licence (OSG and osgEarth)

Functions

- Rendering and navigation in near real-time

- User-defined terrain models

- Raster images / Vector data / 3D objects
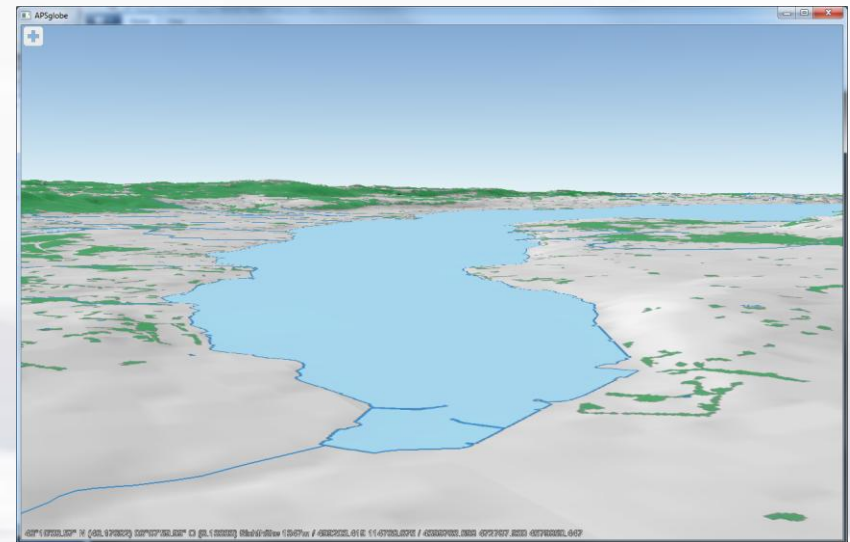
- Labeling, etc.

APS Globe: Virtual Globe «osgEarth»

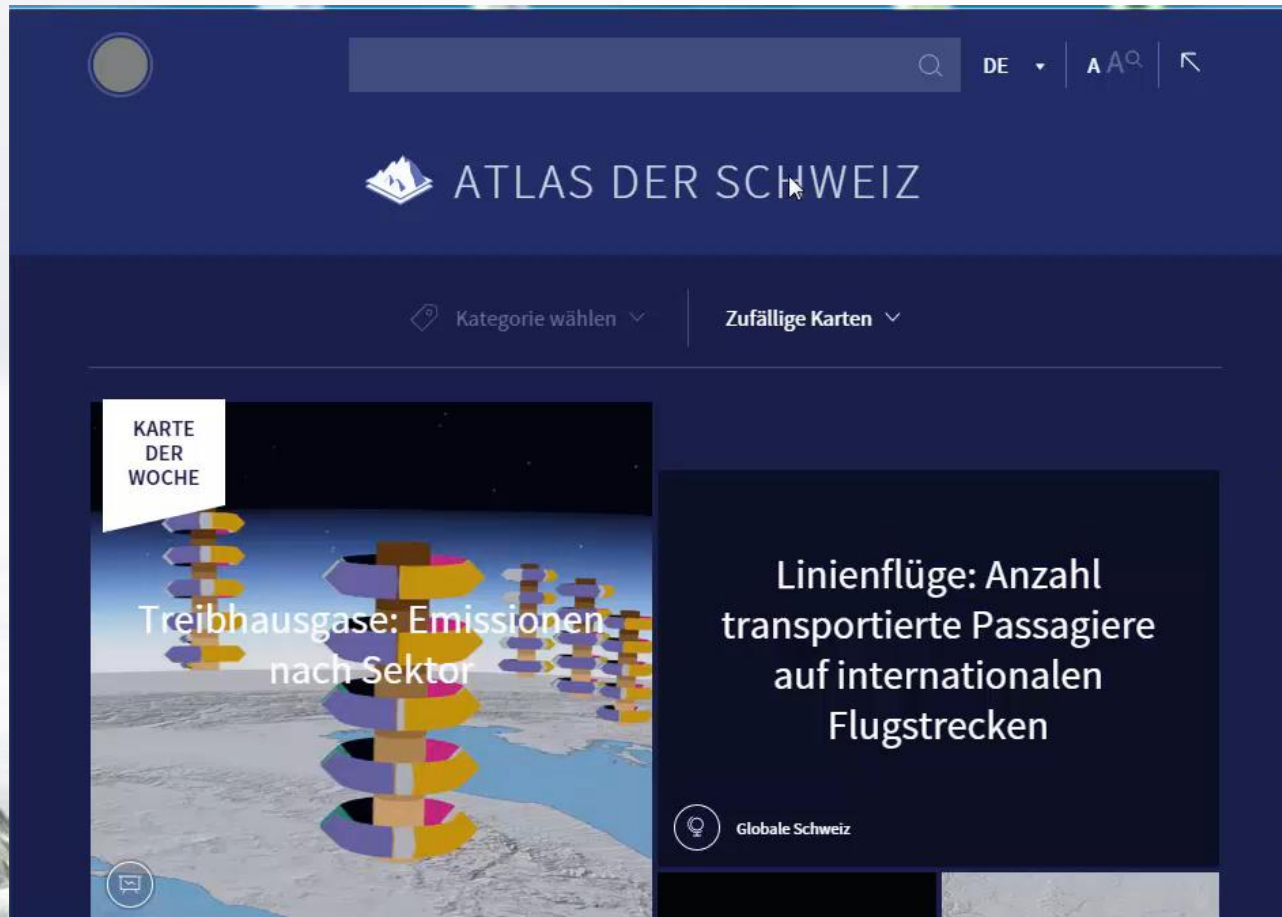- Complex techniques

- New application area: 3D Cartography

Drape Mode: Overlay Resolution Ratio = 0

Drape Mode: Overlay Resolution Ratio = 5

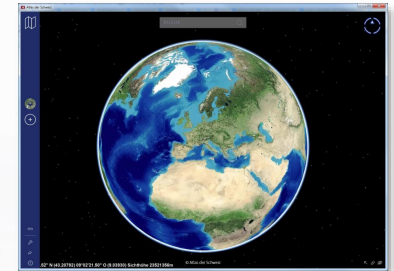# Atlas GUI

Atlas Platform Switzerland (APS)

Front-end

APS GUI	HTML, JavaScript, CSS
	Chromium Embedded Framework
APS Globe	
	osgEarth

Atlas of Switzerland – online

Back-end

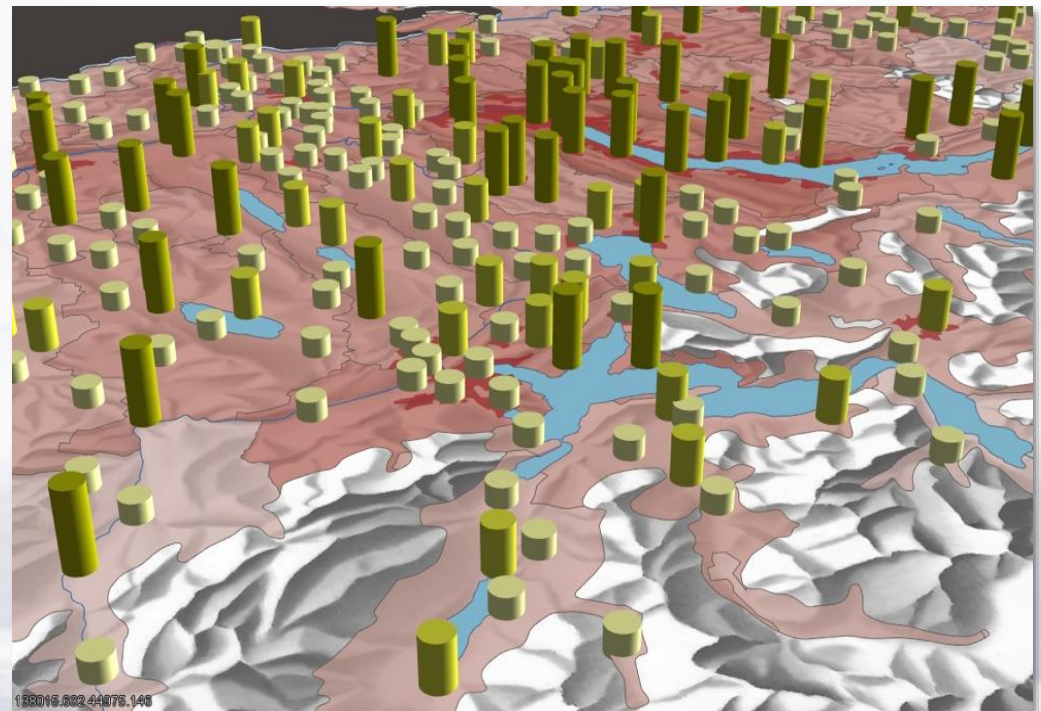| APS Server	nginx, haproxy
APS Tiles & Files	TMS, TFSB, JSON
APS Database	PostGIS, MongoDB
APS Editor	QGIS

3D Visualizations

Point Features

- Technique: Extrusion

- Base map
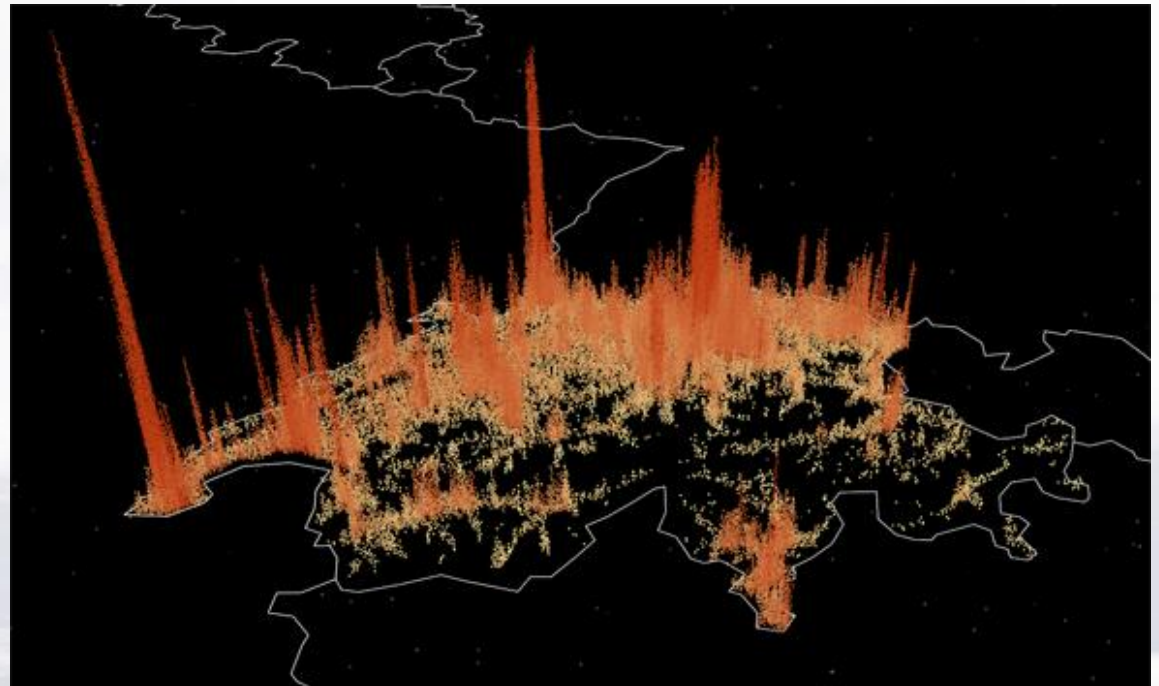 Hydrography, Relief

Bank offices as one-dimensional bar charts

3D Visualizations

Point Features

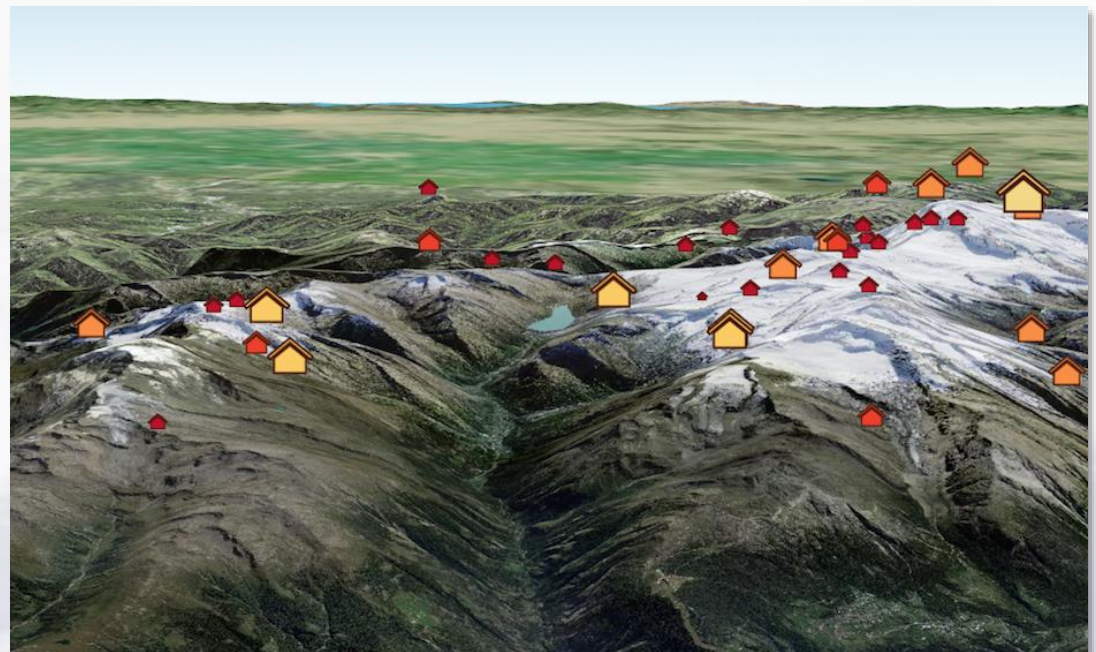- Technique: Translation

- Base map
  National borders

Number of inhabitants per commune as point cloud map

3D Visualizations

Point Features

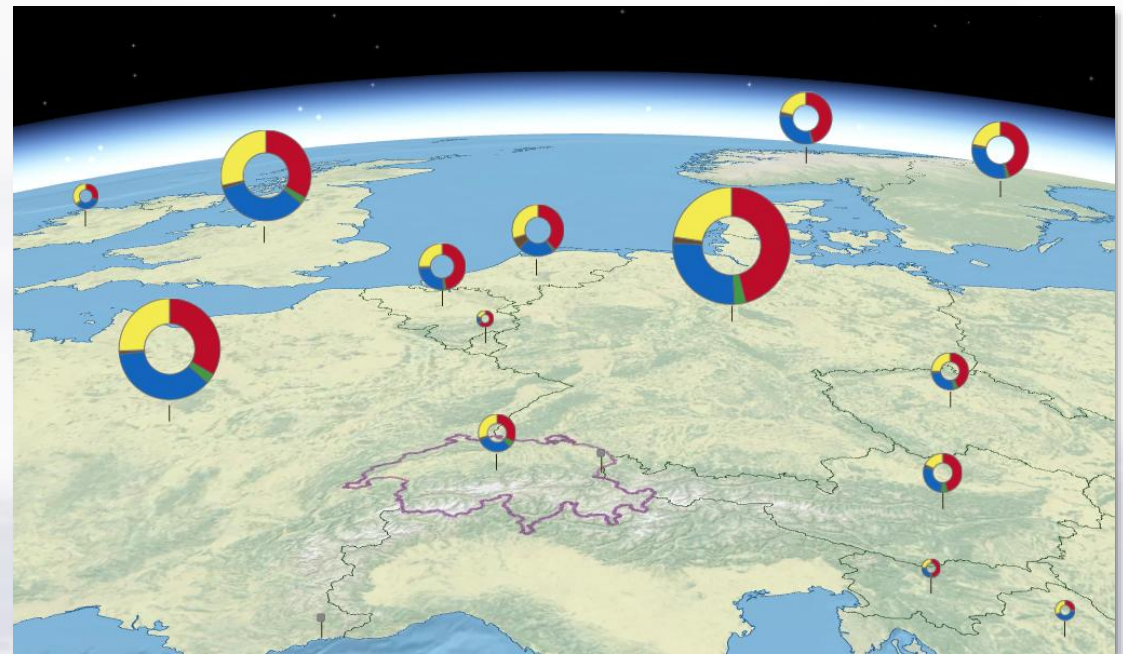- Technique: Billboard

- Base map
  Aerial/Satellite image, DHM25

Mountain huts as symbols

3D Visualizations

Point Features

- Technique: Billboard
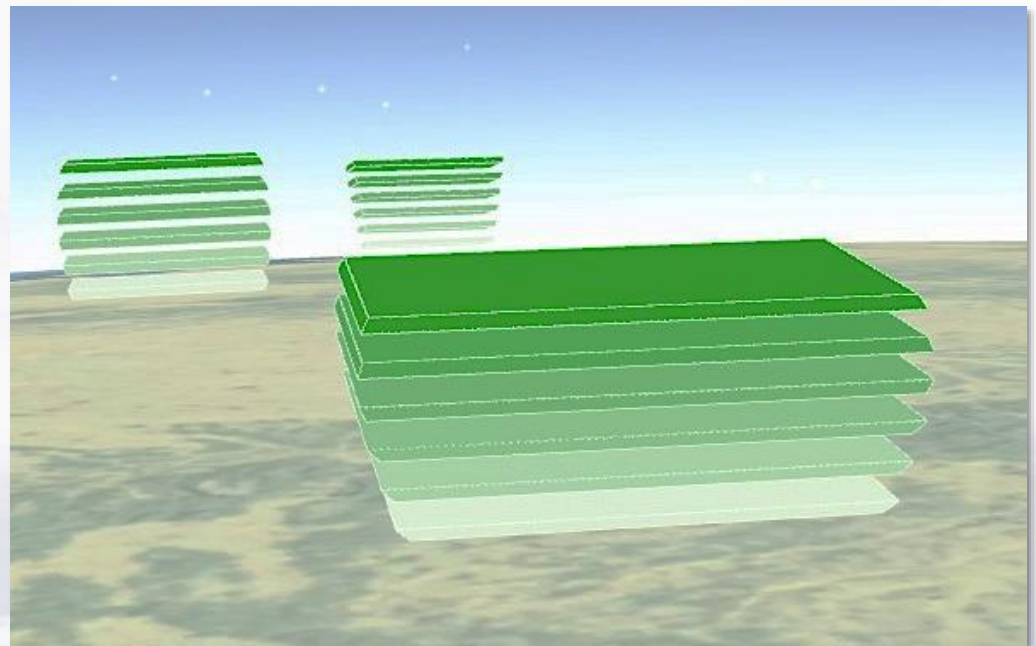
- Base map
  Color-coded Relief, Borders

Electricity consumption as ring charts

3D Visualizations

Point Features

- Technique: 3D Diagrams

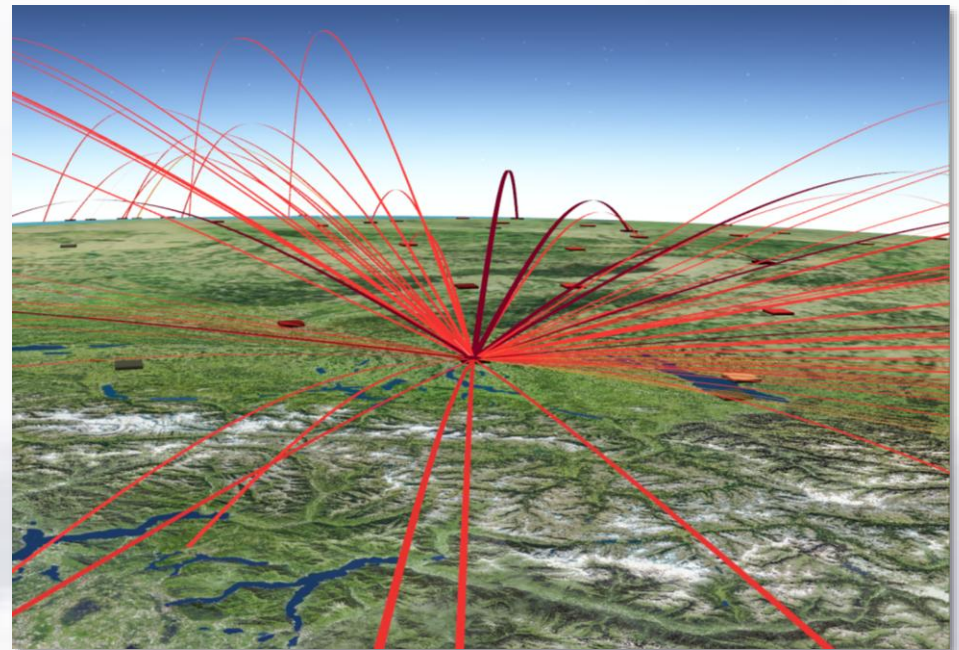- Base map
  Color-coded Relief

Population development as pyramid frustums

3D Visualizations

Line Features

- Technique: Trajectories

- Base map
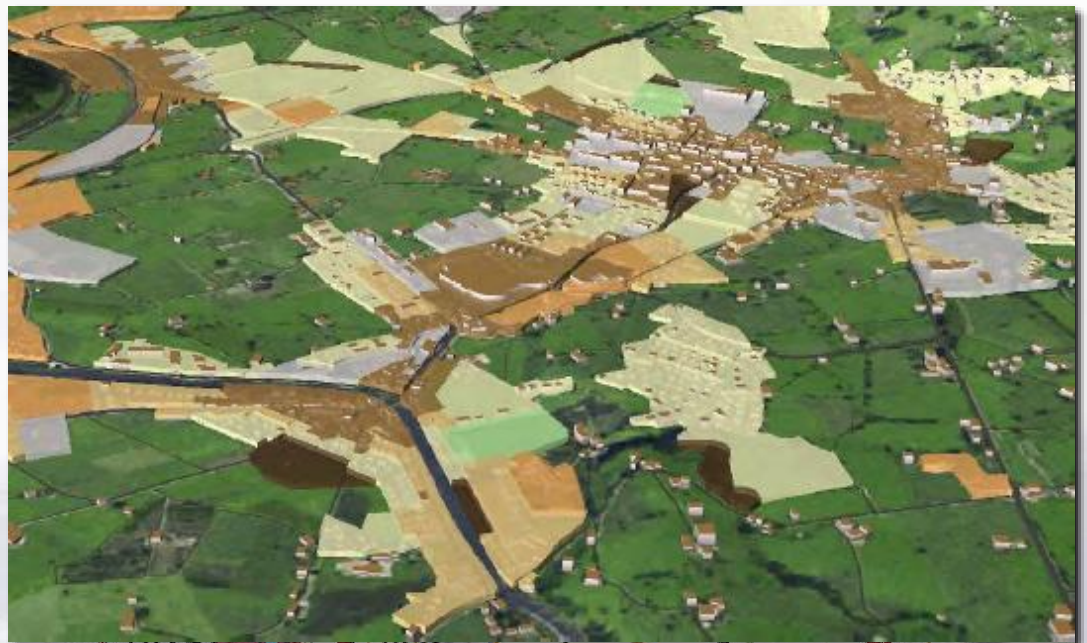 Aerial/Satellite image, Airports

Direct flights departing from Zurich as lines

3D Visualizations

Area Features

- Technique: Extrusion

- Base map
  Aerial image / National map,
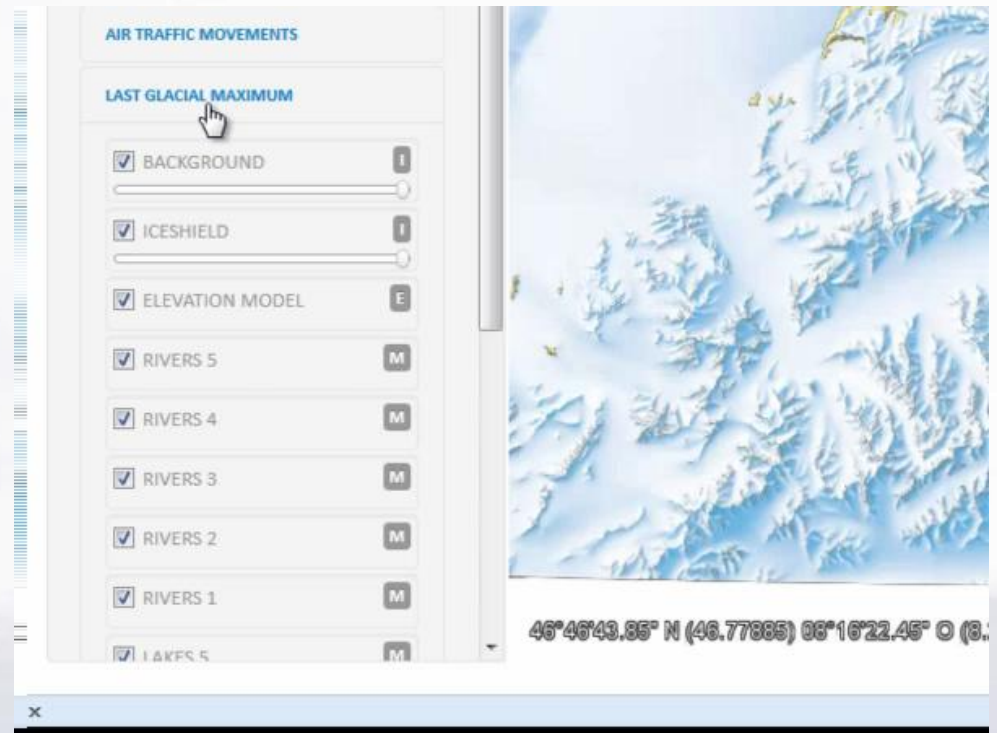 DHM25

Settlement areas and buildings as polygons [MPA P. Inauen 2013]

3D Visualizations

Volume Features

- Technique: terrain model

- Base map
  LGM Rivers and lakes, LGM-DHM25

Last Glacier Maximum LGM as raster

AoS Tasks 2015/16

- Base maps, Thematic layers, Translations

- GUI, APS Globe
  Print; Measure; WMS/GPX; Navigation

- Alpha-Version
  Usability Tests

- Beta-Version
  Functionality and Stability Tests

Atlas of Switzerland – online

Release 1.0 for WINDOWS

Future Work

- Cartographic symbolization

- LOD structure; Zooming

- Generic 3D objects

- Tools for 3D

- Animations, Story telling …

- OSX version, Tablet versions

Time for Questions ...

... or Mail to: atlasinfo@ethz.ch

www.atlasderschweiz.ch
www.atlasdelasuisse.ch
www.atlantedellasvizzera.ch
www.atlasofswitzerland.ch