

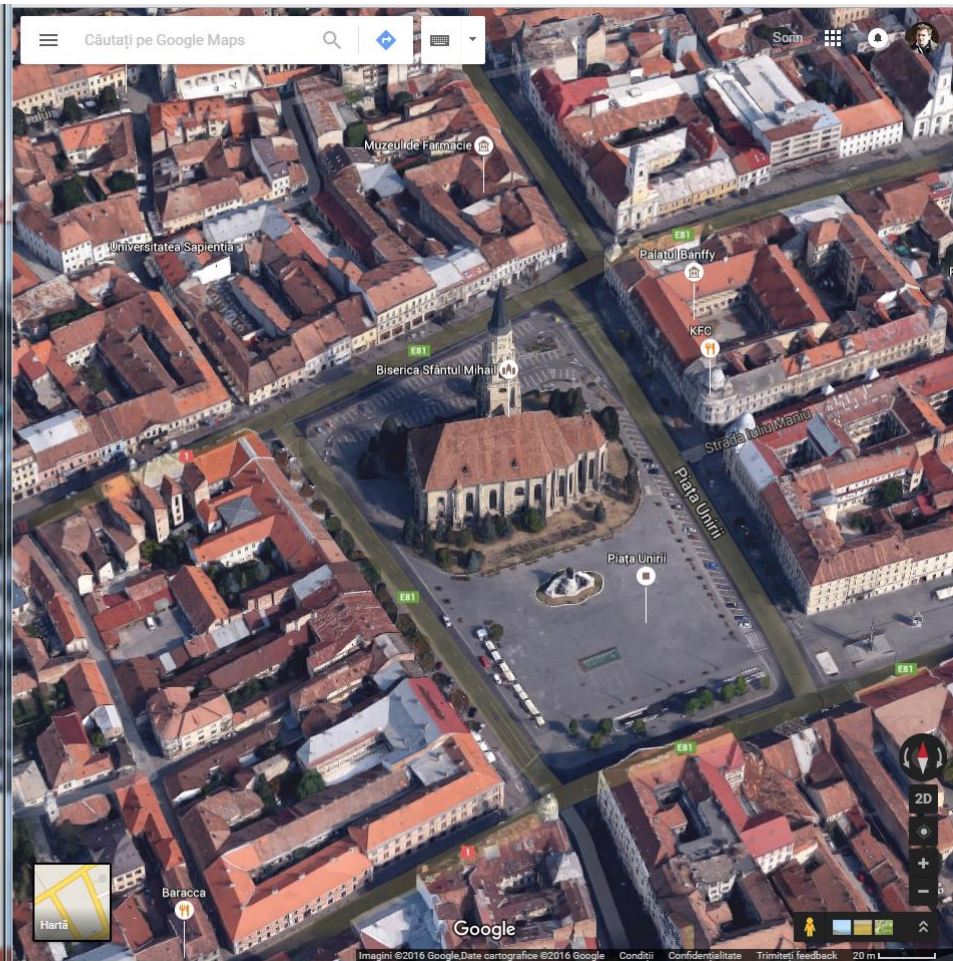
# CesiumJS

*motorul Globului personalizat și a  
viitoarelor aplicații geospațiale 3D*

Autor: **Sorin RUSU**

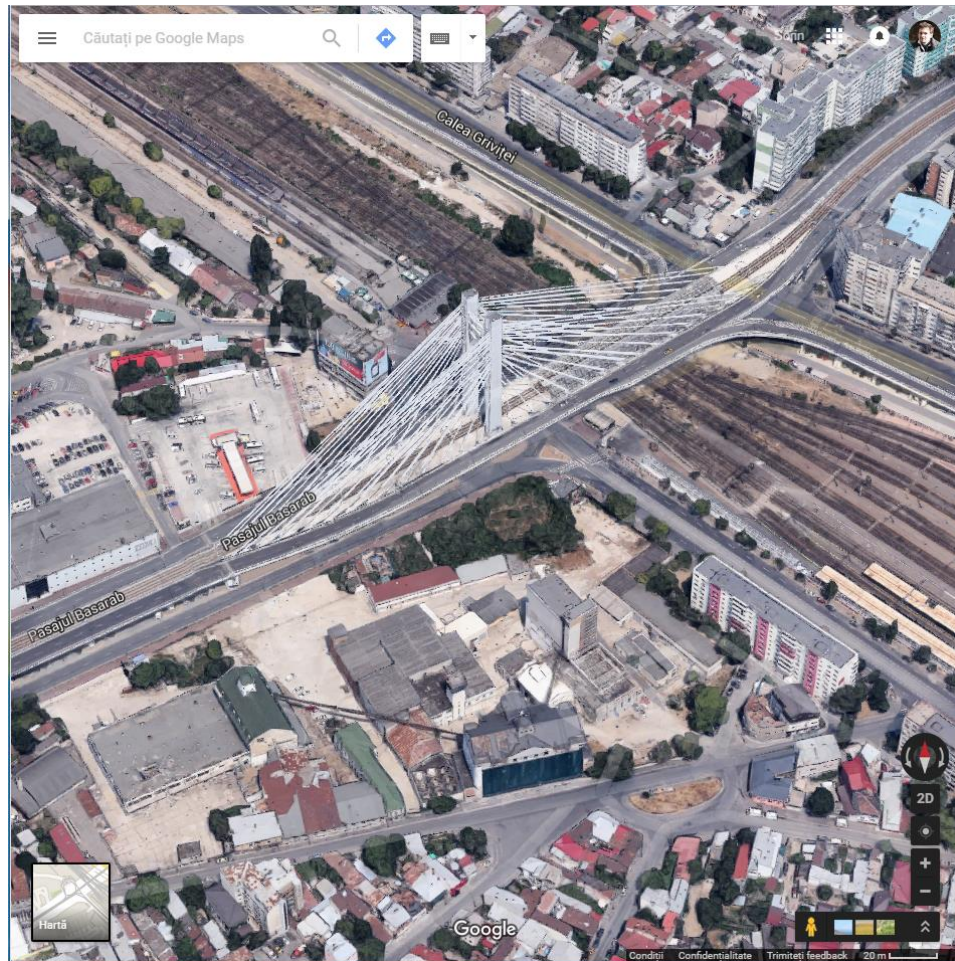
geo-spatial, Aprilie 2016, Cluj-Napoca

# WebGIS – 2D > 3D

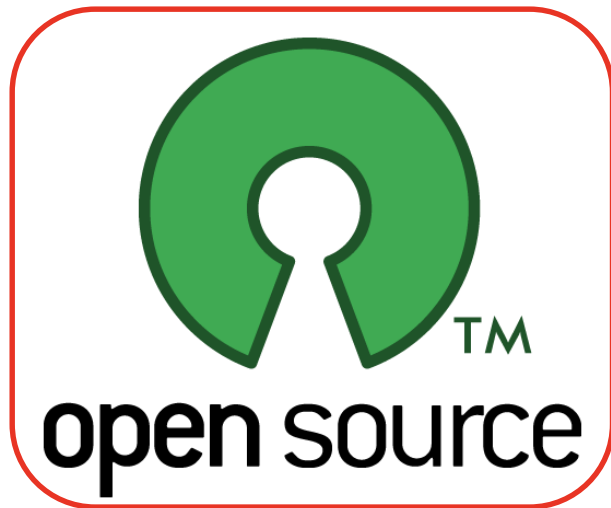




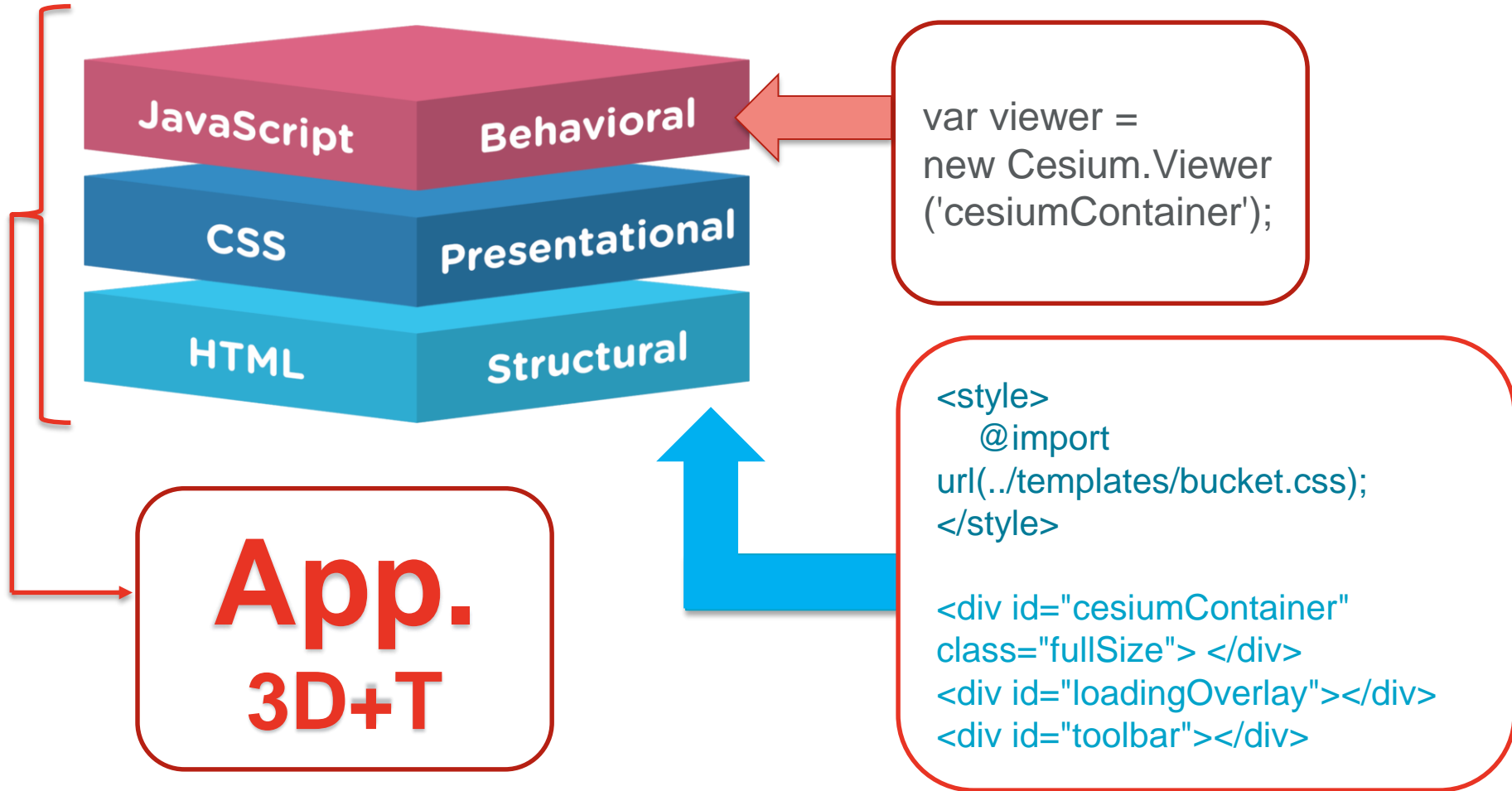
Bing, Google...



## Comunitatea geospațială?

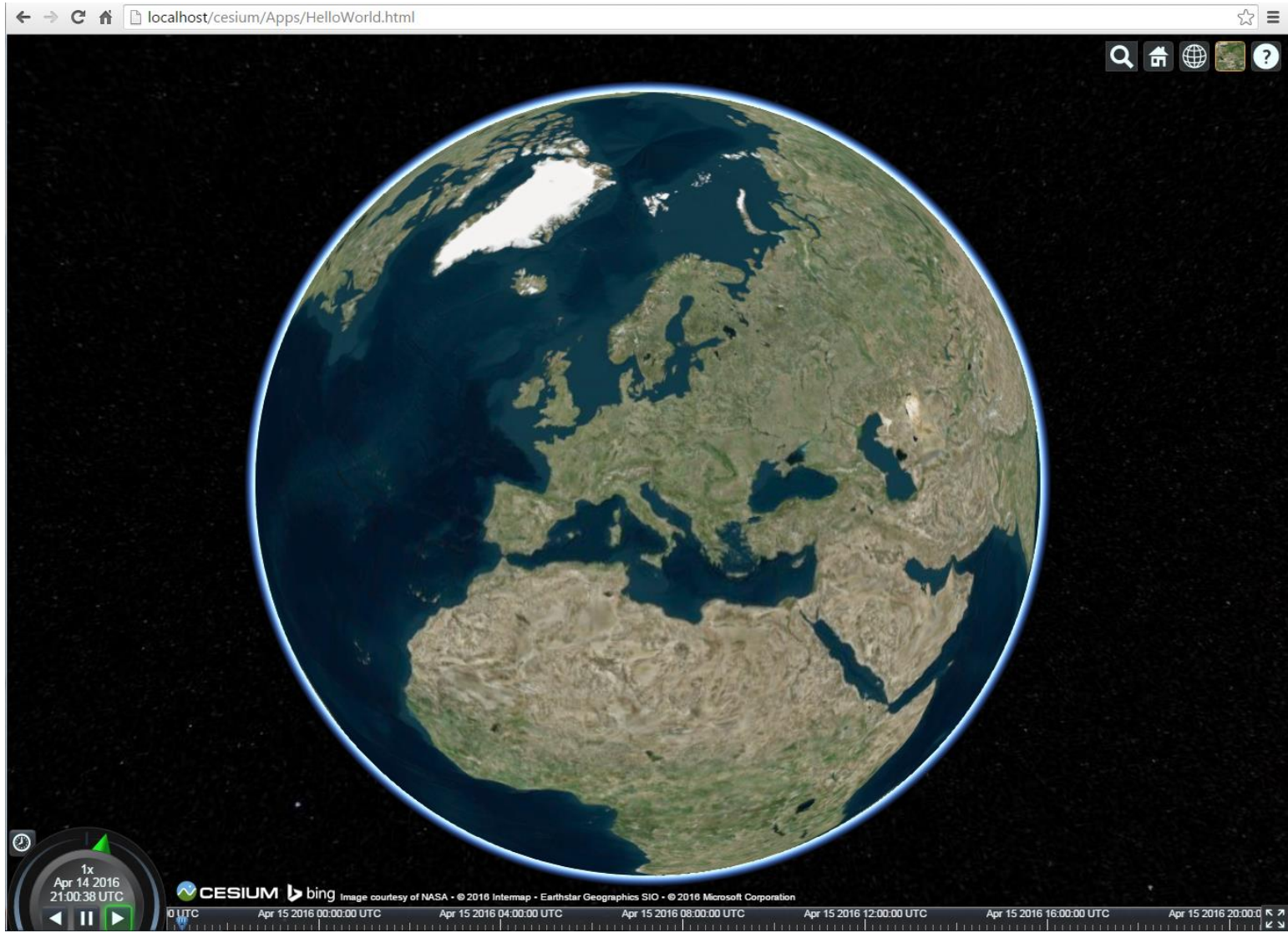


•  
• **Hello world...** •  
• •





• Hello globe!!!



# Viewer-ul Cesium



## Toolbar

- Căutare Bing + geocodare;
- Buton „Home”;
- Selector tip scenă web: glob, 3D, 2D;
- Selector basemap;
- Help!

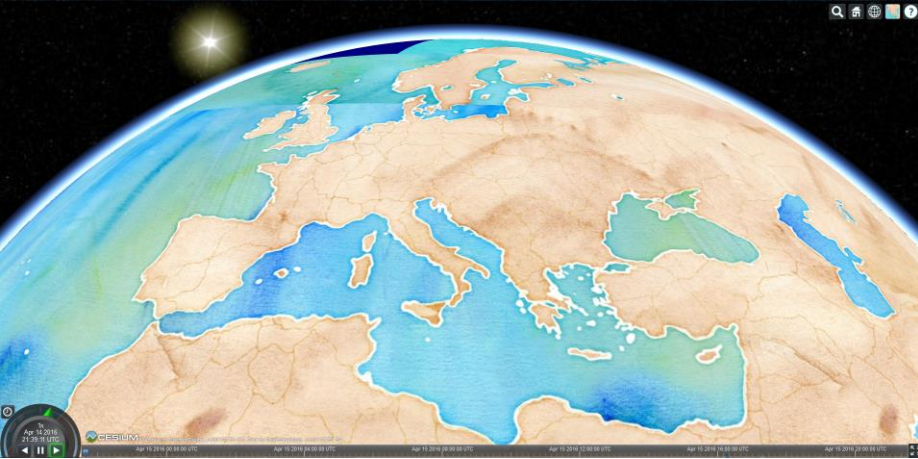
## Control animație

- Play/pause, prev./next cadru animație;
- Dată (LL/ZZ/AAAA), Timp (HH:MM:SS);
- Viteză animație.

## Scară temporală

- Selector poziție temporală;
- Derivat din date.
- Buton „Full screen”





# Out of the box

## Basemap

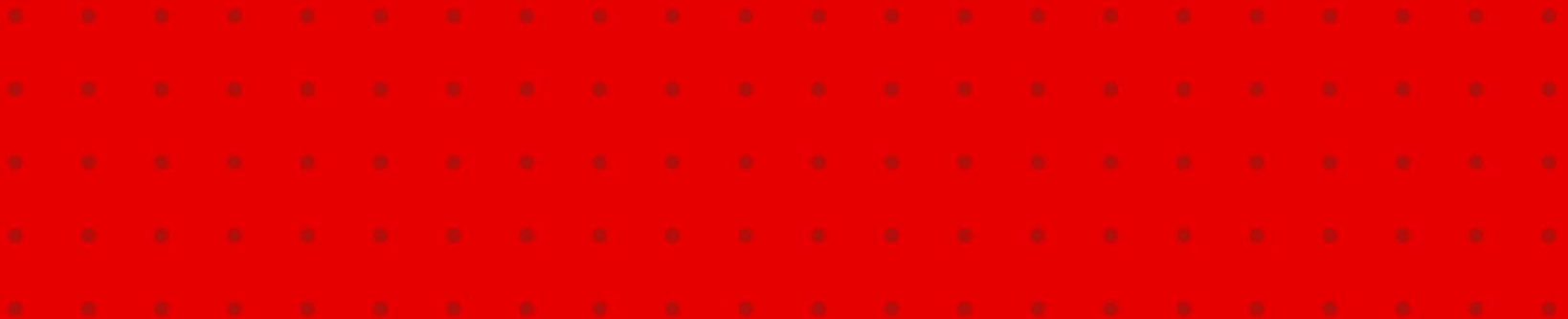
- Bing - Aerial
- Bing - Aerial + Labels
- Bing - Roads
- ESRI - Imagery
- ESRI - Street Map
- ESRI - National Geographic
- OSM - Classic OSM
- OSM - Water Color (Stamen)
- OSM - Toner (Stamen)
- OSM - Mapquest
- The Black Marble
- Natural Earth II

## Model teren

- STK Terrain



**Vreau aplicația mea...**  
**și cu datele mele!!!**



# • Programarea e grea, iar JS poate fi coșmar •



```
public function add(expression, replacement) {  
    // count the number of sub-expressions  
    // - add one because each pattern is itself a sub-expression  
    length = 1 + preg_match_all($this->SCOVs, $this->_internalEscape($expression), $matches);  
  
    // treat only strings $replacement  
    if (is_string($replacement)) {  
        // does the pattern deal with sub-expressions?  
        if (preg_match($this->SUB_REPLACE, $replacement)) {  
            // a simple lookup? (e.g. "$2")  
            if (preg_match($this->INDEXED, $replacement)) {  
                // store the index (used for fast retrieval of matched strings)  
                $replacement = (int)(substr($replacement, 1)) - 1;  
            } else { // a complicated lookup (e.g. "Hello $2 $1")  
                // build a function to do the lookup  
                $quote = preg_match($this->QUOTE, $this->_internalEscape($replacement), $matches)  
                    ? '"' : "'";  
  
                $replacement = array(  
                    'fn' => '_backReferences',  
                    'data' => array(  
                        'replacement' => $replacement,  
                        'length' => $length,  
                        'quote' => $quote  
                    )  
                );  
            }  
        }  
    }  
    return $this->_add($expression, $replacement, $length);  
}
```



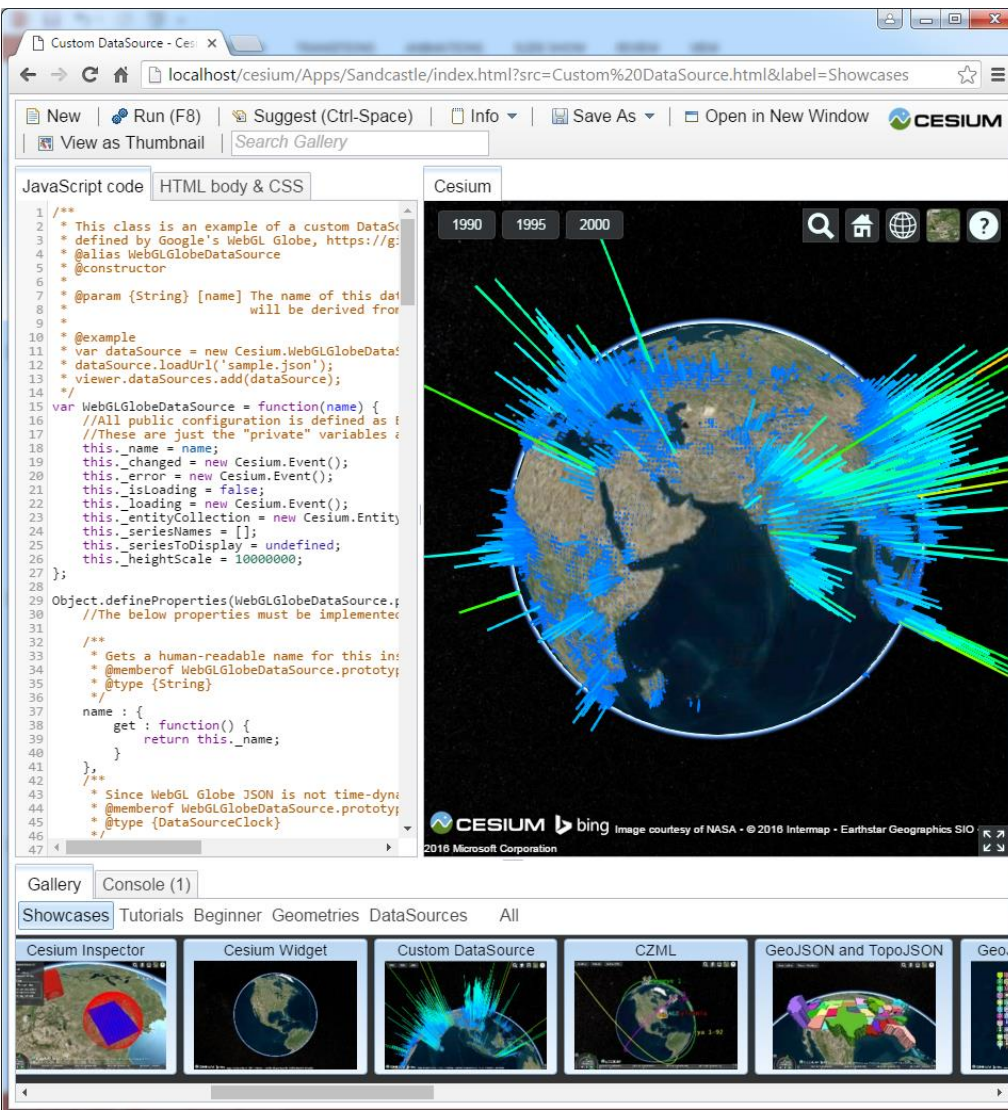
# Meet Sandbox: editor live de cod

The screenshot displays the Cesium Sandbox web application. The browser address bar shows the URL: `localhost/cesium/Apps/Sandcastle/index.html?src=Hello%20World.html&label=Showcases`. The application interface includes a top toolbar with buttons for 'New', 'Run (F8)', 'Suggest (Ctrl-Space)', 'Info', 'Save As', 'Open in New Window', 'View as Thumbnail', and a 'Search Gallery' input field. The main workspace is divided into two panes: 'JavaScript code' and 'HTML body & CSS'. The 'JavaScript code' pane contains the following code:

```
1 var viewer = new Cesium.Viewer('cesiumContainer');
2
```

The 'HTML body & CSS' pane is currently empty. To the right of the code panes is a large 3D viewer window labeled 'Cesium'. This window displays a satellite map of a rural landscape with green fields and a winding river. The viewer includes a search bar, a home button, a globe icon, and a help icon. At the bottom of the viewer, there is a timeline and a status bar. The status bar displays the Cesium logo, the Bing logo, and the following text: '© Analytical Graphics Inc., © CGIAR-CSI, Produced using Copernicus data and information funded by the European Union - EU-DEM layers - © 2016 Microsoft Corporation - Image courtesy of USGS - Image courtesy of ImagePatch.com - © Harris Corp, Earthstar Geographics LLC - Earthstar Geographics SIO'. The timeline shows the current time as 'Apr 14 2016 21:54:43 UTC' and provides buttons for '1x', 'Apr 15 2016 00:00:00 UTC', 'Apr 15 2016 06:00:00 UTC', 'Apr 15 2016 12:00:00 UTC', and 'Apr 15 2016 18:00:00 UTC'. Below the 3D viewer is a 'Gallery' tab with a 'Console (1)' tab. The 'Gallery' tab shows a list of showcases: 'Showcases', 'Tutorials', 'Beginner', 'Geometries', 'DataSources', and 'All'. The 'Beginner' tab is selected, and it displays a row of thumbnail images for various showcases: 'ArcGIS MapServer', 'Billboards', 'Cesium Widget', 'Hello World', 'Imagery Layers', 'Map Pins', 'Points', 'Show or Hide Entities', and 'Web'.

# Meet Sandbox: exemple++



- Showcases
- Tutorials
- Beginner
- Data sources

!!Live!!

Surse de imagini/servicii date:

- [GIS Image Layer \(WMS\\* + ArcGIS\)](#)
- [Teren scenă](#)

Lucru cu imagini/servicii date:

- [manipulare layere glob](#)
- [manipulare parametri imagini](#)

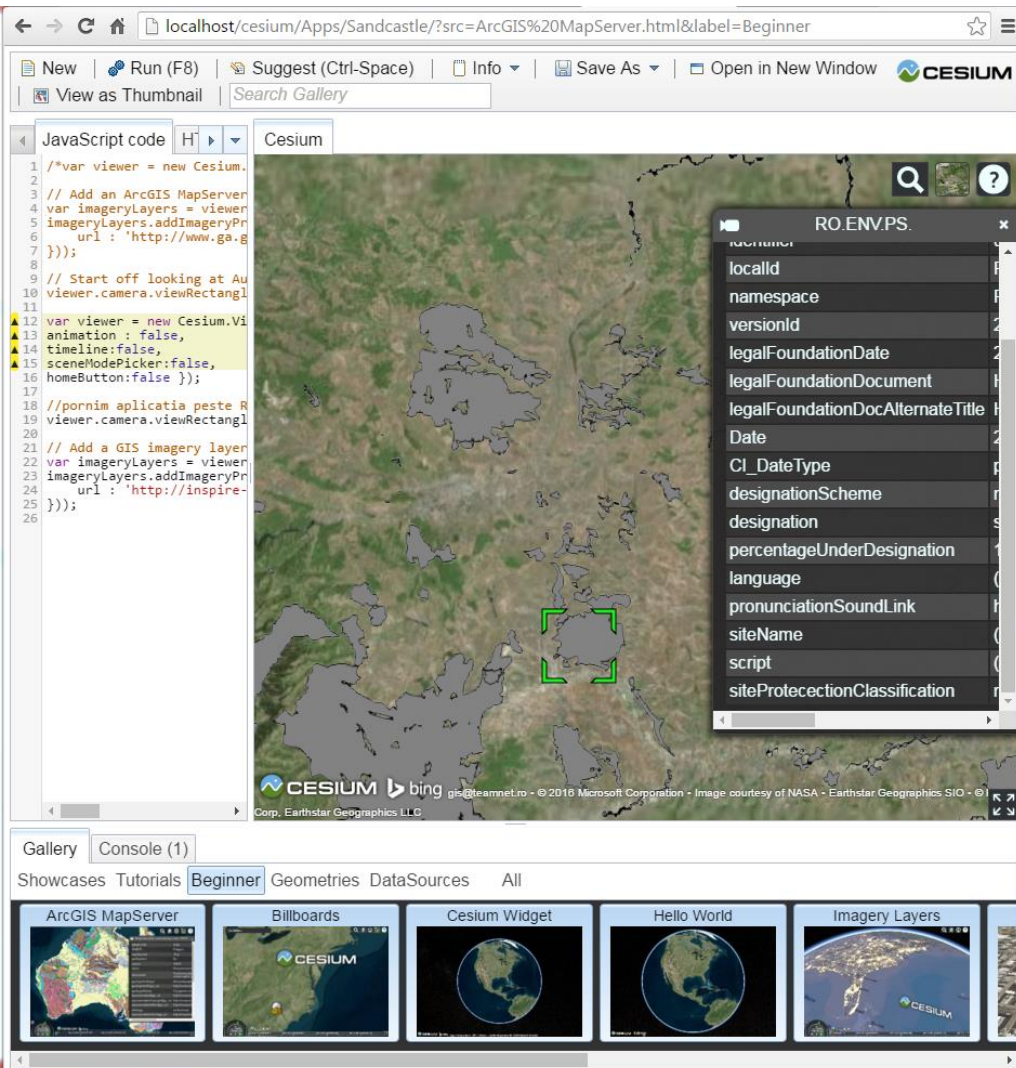
Surse date:

- [KML](#)
- \*GeoJSON & TopoJSON

Animație surpriză



# Meet Sandbox: exemple++



# Meet Sandbox: exemple++

```
1 var viewer = new Cesium.Viewer(  
  'cesiumContainer',{  
2   animation : false,  
3   timeline:false,  
4   sceneModePicker:false,  
5   homeButton:false });  
6  
7 //pornim aplicatia peste Romania  
8 viewer.camera.viewRectangle(Cesium.  
  Rectangle.fromDegrees(21, 49, 28, 43));  
9  
10 // Add a GIS imagery layer  
11 var imageryLayers = viewer.imageryLayers;  
12 imageryLayers.addImageryProvider(new Cesium  
  .ArcGisMapServerImageryProvider({  
13   url : '  
    http://inspire-view.biodiversity.ro/arcg  
    is/rest/services/Inspire/ENVPS/MapServer  
    '  
14 }));
```

- Showcases
- Tutorials
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**!!Live!!**

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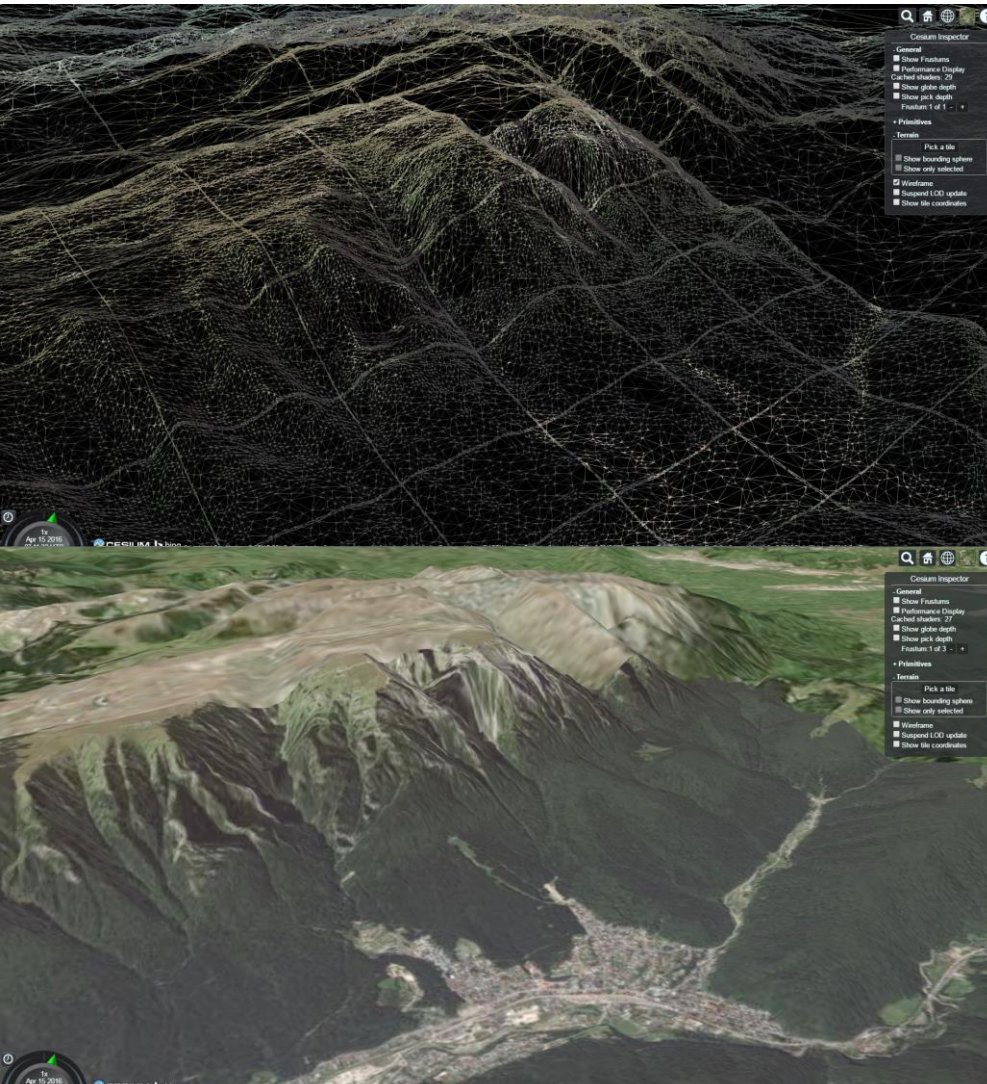
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**Animație surpriză**



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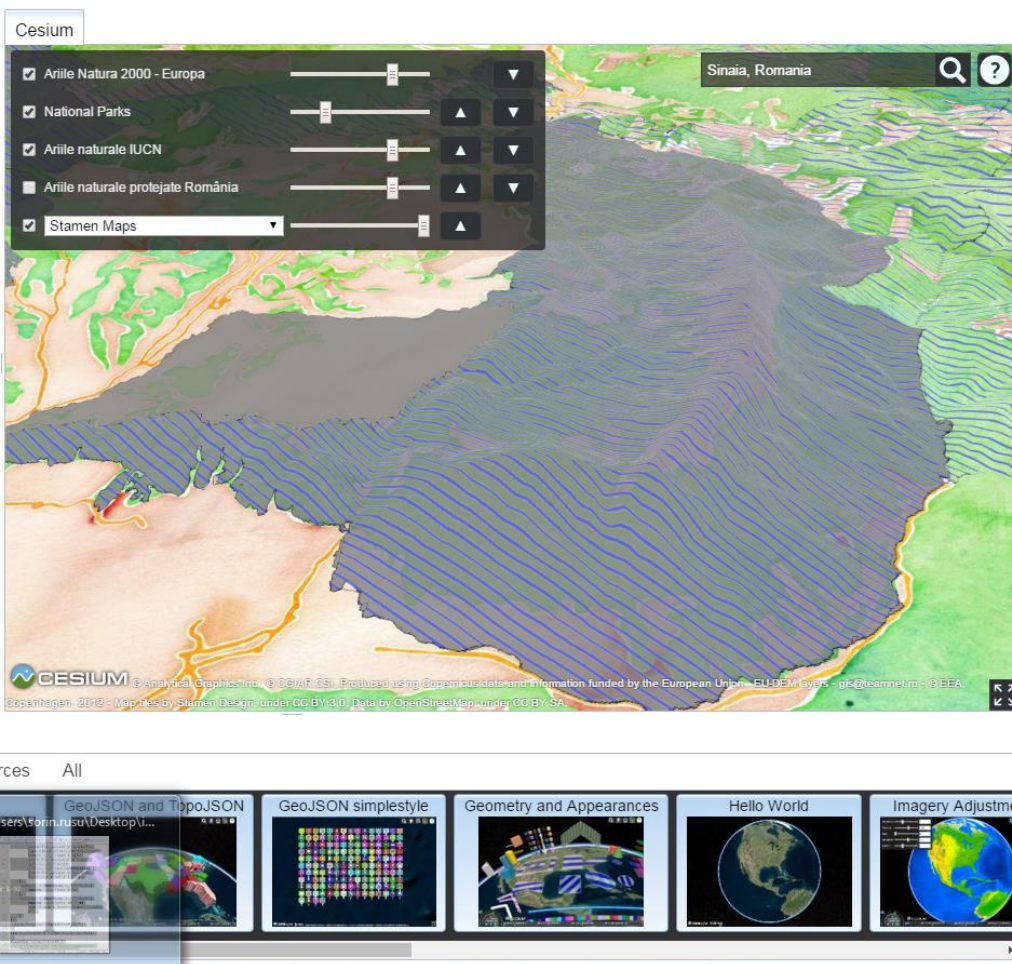
- manipulare layere glob
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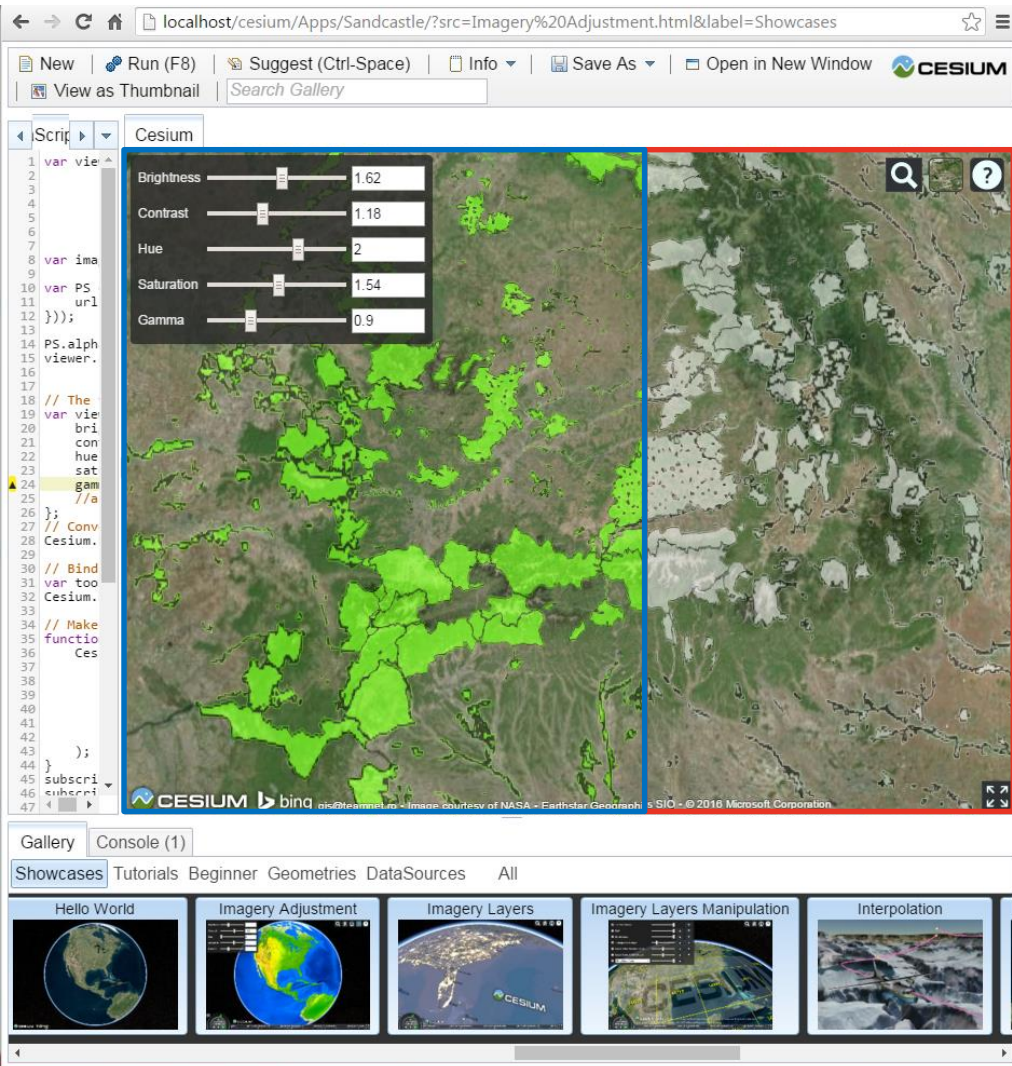
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Animație surpriză



# Meet Sandbox: exemple++



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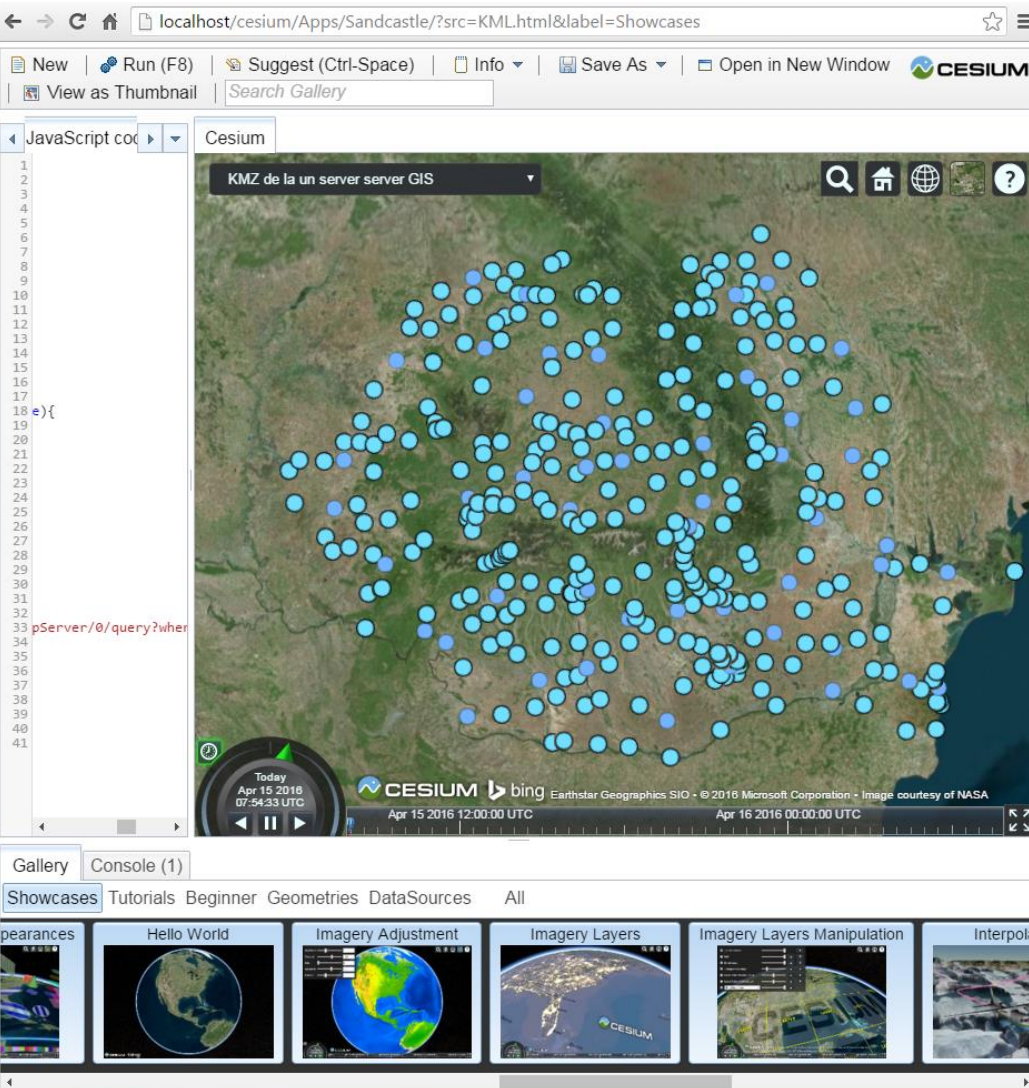
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Animație surpriză



# Meet Sandbox: exemple++



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**Animație surpriză**

# Meet Sandbox: exemple++

WFS  
REST



- Showcases
- Tutorials
- Beginner
- Data sources

!!Live!!

Surse de imagini/servicii date:

- GIS Image Layer (WMS\* + ArcGIS)
- Teren scenă

Lucru cu imagini/servicii date:

- manipulare layere glob
- manipulare parametri imagini

Surse date:

- [KML](#)
- \*GeoJSON & TopoJSON

Animație surpriză

```
1 ,
2 {text : 'KMZ de la un server server GIS',
3   onselect : function() {
4     viewer.camera.viewRectangle (
5       Cesium.Rectangle.fromDegrees
6       (21, 49, 28, 43));
7     viewer.dataSources.add(Cesium.
8       KmlDataSource.load(
9         "http://52.11.117.130:6080/
10        arcgis/rest/services/OSM_Places/
11        MapServer/0/query?
12        where=type = 'city' or type =
13        'town'
14        &outFields=*&f=kml"));
15   }}
```

• În loc de concluzii

## Merge!!!

## Exemple utile

## Tipuri de date++

## Modele 3D open-source, glTF

## Javascript și programare ☹️

# WMS nu funcționează

## Preferă TopoJSON, geoJSON nu prea

## Stereo70 nu se pretează



## • **Link-uri utile...**

Download CESIUM Dev:

<http://cesiumjs.org/downloads.html>

Aplicație arii protejate:

<http://bit.ly/1Xz41Yv>

Exemplele geospacial 2016:

<http://bit.ly/1WvcJIP>

Exemplul 01 – Serviciu web-GIS

Exemplul 02 – configurare straturi

Exemplul 03 – proprietăți straturi

Exemplul 04 – Date KML

Exemplul 05 – animația de final



• **Cât timp sunt întrebări**

View Top Down View Aircraft

