

# 10TH INTERNATIONAL SYMPOSIUM ON **Digital Earth & Locate17**

03-06 April 2017 | International Convention Centre Sydney

DIGITAL TRANSFORMATION - OUR FUTURE

---

## STREAM

CS01.8 Virtual Globes

---

## TITLE

How Open Source Virtual Globe is supporting the SDGs –  
The Case of NASA World Wind

---

## PRESENTED BY

Gabor Remetey-Fülöpp, Member of HUNAGI, ISDE, GSDI and NASA  
WWEC Scientific Committee

---

# How Open Source Virtual Globe is supporting the SDGs – The Case of NASA World Wind



## OUTLINE

- FROM MDGs TO SDGs
- NASA WORLD WIND
  - THE WWEC
- THE URBAN TARGETS OF SDGs
- THE CITYSMART CALL OF WWEC 2016
- THE DEL BIANCO CITY SMART
  - THE WWEC 2017
- CONCLUSIONS



# How Open Source Virtual Globe is supporting the SDGs – The Case of NASA World Wind

The eight Millennium Development Goals (MDGs) in effect from 2000-2015

- 1 Eradicate extreme poverty and hunger
- 2 Achieve universal primary education
- 3 Promote gender equality and empower women
- 4 Reduce child mortality
- 5 Improve maternal health
- 6 Combat HIV/AIDS, malaria and other diseases
- 7 Ensure environmental sustainability
- 8 Develop a global partnership for development



# How Open Source Virtual Globe is supporting the SDGs – The Case of NASA World Wind

## Extended SDGs for 2016-2030

The UN Sustainable Development Goals have been elaborated by a UN Working Group co-chaired by Csaba Körösi (Ambassador of Hungary to UN) and Macharia Kamau of Kenya in 2014-15. 17 Goals and 169 Targets have been selected and approved by the UN General Assembly for the years 2016-2030 (**UN Agenda 2030**)



Picture: Eskinder Debebe.

Source:

<http://citiscopes.org/story/2014/comparing-mdgs-and-sdgs#SDGs>

# How Open Source Virtual Globe is supporting the SDGs – The Case of NASA World Wind



## Some keywords of the 17 Sustainable Development Goals (SDGs) for 2016-2030

- 1) NO POVERTY
- 2) NO HUNGER
- 3) GOOD HEALTH AND WELL-BEING
- 4) QUALITY EDUCATION
- 5) GENDER EQUALITY
- 6) CLEAN WATER AND SANITATION
- 7) AFFORDABLE AND CLEAN ENERGY
- 8) GOOD JOBS AND ECONOMIC GROWTH
- 9) INDUSTRY, INNOVATION AND INFRASTRUCTURE
- 10) REDUCED INEQUALITIES
- 11) SUSTAINABLE CITIES AND COMMUNITIES
- 12) RESPONSIVE CONSUMPTION AND PRODUCTION
- 13) CLIMATE ACTION
- 14) LIFE BELOW WATER
- 15) LIFE ON LAND
- 16) PEACE, JUSTICE AND STRONG INSTITUTIONS
- 17) PARTNERSHIPS FOR THE GOALS

# How Open Source Virtual Globe is supporting the SDGs – The Case of NASA World Wind

## THE URBAN TARGETS OF SDG No.11

Make cities and human settlements  
inclusive, safe, resilient and sustainable

## THE NEW URBAN AGENDA

an Enhanced SDG 11 adopted by the UN  
General Assembly in December 2016 After the  
HABITAT III held in Quito

access for all to  
adequate, safe,  
affordable  
housing and  
upgrade slums

protect and  
safeguard the  
world's cultural  
and  
natural heritage

access to safe,  
inclusive and  
accessible, green  
and public  
spaces

access to safe,  
affordable,  
accessible and  
sustainable  
transport systems

decrease the  
economic  
losses caused by  
disasters, incl.  
water-related

strengthening  
national and  
regional  
development  
planning

participatory,  
integrated and  
sustainable  
human settlement  
planning

paying special  
attention to air  
quality, municipal  
and other waste  
management

mitigation and  
adaptation to  
climate change,  
resilience to  
disasters

Support least  
developed  
countries for  
sustainable and  
resilient buildings

# How Open Source Virtual Globe is supporting the SDGs – The Case of NASA World Wind

## SDGs IN ACTION

UN STATDIV IAEG SDGS WGGI

GEO - EO4SDGS

OGC SDGS, CEOS SDGS

UN-GGIM & REG NETWORKS

THE WORLD BANK, ICA, IAG

## GSDI 15TH WORLD CONFERENCE

- Session on Regional and Global SDI Initiatives
- UN SDGs
- UN-GGIM Global and Regional Initiatives
- GEO EO4SDGs

GSDI's Marine/Coastal SDI Best practices  
Series of webinars 2016-2017



# How Open Source Virtual Globe is supporting the SDGs – The Case of NASA World Wind

## **WORLD WIND**

**HISTORY:** developed over 15 years by a project team at NASA ARC by computer graphics and geospatial experts

**AIM:** serving the operational needs of the geospatial community.

### **FEATURES include:**

- as API, it can be plugged into any application which needs virtual globe capability
- apps using WW can add manipulate analyse and share virtually any 2D or 3D information in response to the user
- It is an web based open source platform providing extensive functionality,
- Its user community range from academia to governmental agencies



# How Open Source Virtual Globe is supporting the SDGs – The Case of NASA World Wind

THE WORLD WIND EUROPA CHALLENGE  
RELEVANCE IN THE UN SDGs CONTEXT



## THE URBAN TARGETS OF SDG No.11

Make cities and human settlements  
inclusive, safe, resilient and sustainable

This will be the selected topic for the  
2nd UN SDGs WGGI Meeting in Kunming,  
8-10 May, 2017

<http://eurochallenge.com.polimi.it>

The WWEC theme for 2016 and 2017 is for  
smart and sustainable cities, 'CitySmart.'  
There to improve the ability for advances in  
urban management to be shared worldwide!

# How Open Source Virtual Globe is supporting the SDGs – The Case of NASA World Wind

THE WWEC - ENGAGEMENT OF  
STUDENTS AND PROFESSIONALS

## PROJECT (APPS) FEATURES

OPEN SOURCE PROJECT

PROJECT CODE RELEASE

SHORT PROJECT VIDEO

PROJECT WEBPAGE

PROJECT APPS GOAL

TRANSPARENT PROJECT  
EVALUATION CRITERIA

## A FLASHBACK

**2012** COMO  
SUMMER THINK TANK

**2013** FLORENCE  
INSPIRE CONFERENCE

**2014** BREMEN  
1st FOSS4G-EUROPE

**2015** COMO  
2nd FOSS4G-EUROPE

**2016** TRENTO WORKSHOP  
PERUGIA CONFERENCE

## WEIGHTED CRITERIA

*SOPHISTICATION*

*PERFORMANCE*

*WEBSITE*

*USER  
INTERFACE*

*IDEA*

*OUTREACH*

# How Open Source Virtual Globe is supporting the SDGs –

## The Case of NASA World Wind

1	<a href="#">Air Quality Monitor</a>	11	<a href="#">MultiVis Analysis Suite</a>
2	<a href="#">Drone Aid</a>	12	<a href="#">Quake Hunter</a>
3	<a href="#">Drone Mission Planner</a>	13	<a href="#">Radioactivity Monitor</a>
4	<a href="#">ESP</a>	14	<a href="#">Smart Garbage</a>
5	<a href="#">Green Advisor</a>	15	<a href="#">Social Trends Global</a>
6	<a href="#">Groundpedia</a>	16	<a href="#">Space Birds</a>
7	<a href="#">gvSIG-Desktop</a>	17	<a href="#">Sunrise Optimize PV</a>
8	<a href="#">gvSIG-Online</a>	18	<a href="#">UAV Ortho-Mosaic</a>
9	<a href="#">Land of Glaciers</a>	19	<a href="#">Where Is My Package</a>
10	<a href="#">Wildfire Management Tool</a>	20	<a href="#">World Weather</a>

**WWEC 2016  
Top  
Contenders**

# How Open Source Virtual Globe is supporting the SDGs – The Case of NASA World Wind

## 1 AIRQUALITYMONITORING

[HTTP://OPENAIRQUALITY.ECO.UMASS.EDU](http://openairquality.eco.umass.edu)

Open Source Geospatio-Temporal Sensing,  
Visualization, and Analytics  
Supporting Air Quality  
Policy and Management in Cities

*In 2016*

## 14 SMART GARBAGE

[HTTP://AETOS.IT.TEITHE.GR/~GPOLITIS/ABOUT.HTML](http://aetos.it.teithe.gr/~gpoltis/about.html)



Smart waste management

## 17 SUNRISE

[HTTP://SUNRISE.CLOUDNO.DE](http://sunrise.cloudno.de)



## 5 GREENADVISOR

[HTTPS://GREENADVISOR.ME/](https://greenadvisor.me/)



Crowdsourcing  
and LBS enabled  
approach

# How Open Source Virtual Globe is supporting the SDGs – The Case of NASA World Wind

## ***ESP! - Earthquake Signal Precursors***

- to develop an accurate forecast system for an impending earthquake.
- installed nine (9) monitoring stations, (four were designed and built by the Kodiak High School team) collecting nano-tesla magnetic field data at 50Hz to detect magnetic field anomalies
- to build the algorithm that allows us to predict the increasing risk for an earthquake several hours before the event.



<http://aworldbridge.com/real-time-projects/nasa-europa-challenge/nasa-europa-challenge-2016/>

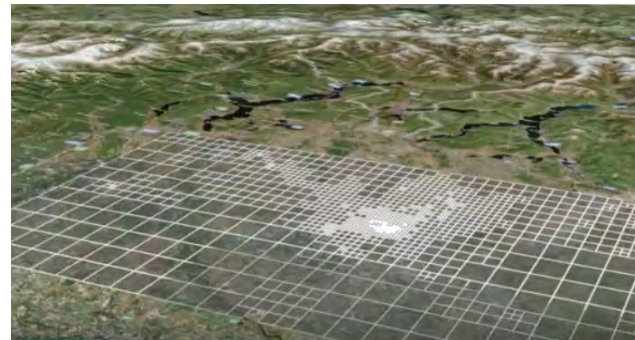
# How Open Source Virtual Globe is supporting the SDGs – The Case of NASA World Wind

## MUVIAS

NASA Web WorldWind Application to visualize and analyze multidimensional datasets

## FEATURES

- Uses Doxel (Dynamic Voxel) model to show the data
- Dynamic download of data to generate doxels on the fly
- Options available to customize the view and import different datasets



# How Open Source Virtual Globe is supporting the SDGs – The Case of NASA World Wind

NASA WVEC 2016    PROJECTS UNDER PROGRESS

**THE DEL BIANCO CITY SMART**

Developed by

Gabriel Militao Lopes (Cornell University, and Brazil)

Miguel Del Castillo Hoffman (Mexico University)

Supported by ESA and NASA

Roumaldo Del Bianco Foundation



Introduced at the Heritage for Planet Earth  
Florence, 11-13 March, 2016

# How Open Source Virtual Globe is supporting the SDGs – The Case of NASA World Wind

## **Del Bianco CitySmart** – ‘Uniting the World on urban management of global challenges’

An open, freely available, integrated, web-based framework for urban infrastructure management and visualization

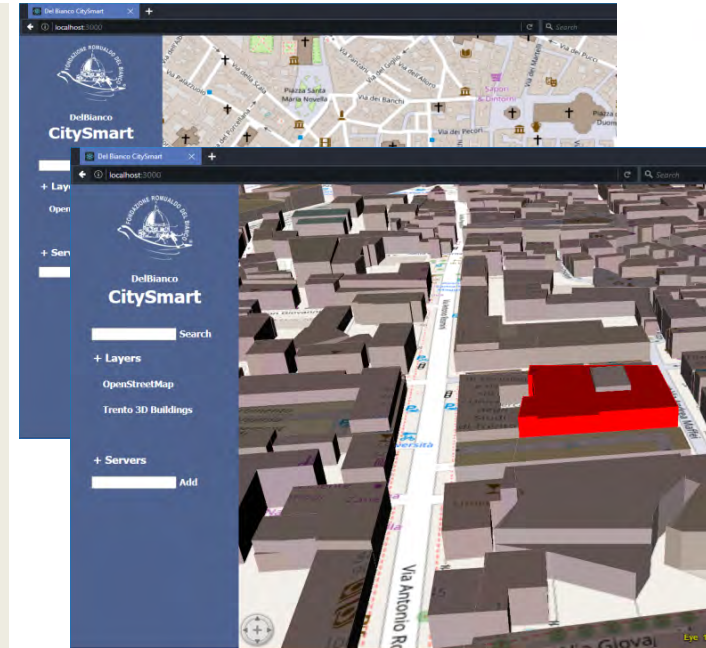
NASA Web World Wind co-developed with ESA

Frontend to backend - all open source components

CitySmart data and services so far includes:

- Web Map Services
- Open Street Maps
- 3D buildings + topography

Collaboration via open source public repositories



Courtesy of Miguel Del Castillo Hoffman and Gabrie Militao Lopes



# How Open Source Virtual Globe is supporting the SDGs – The Case of NASA World Wind

## CONCLUSIONS 1

- UN Agenda 2030 for SD - a driving force for implementing innovative solutions both in the developed and developing countries. The main goals, targets and indicators have been approved
- The New Urban Agenda is an extension for SDGs, a key instrument for the implementation in the next 2 decades.
- Not only national and sub-national/regional but also local governments are directly affected.

# How Open Source Virtual Globe is supporting the SDGs – The Case of NASA World Wind

## CONCLUSIONS 2

- “We know, that without the involvement of cities and local governments, the world will not be able to address the global challenges of our times”  
(Dennis Codere, Mayor of Montreal at HABITAT III)
- Local governments needs smart technologies and tools which Del Bianco CitySmart offers by multipurpose analysis and visualization capabilities, to bring data and information closer to decision makers.
- A contribution to SDGs and NUA related regional and national indicator monitoring, review and reporting
- but by the way bringing analysis ready data and information closer to decision makers which improves the quality of local planning and policies

# How Open Source Virtual Globe is supporting the SDGs – The Case of NASA World Wind

## CONCLUSIONS 3

- “All cities need essentially the same tools to manage urban infrastructure, What if we established an open source platform that allowed cities to share the functionalities each of them need? And what if the academic community as well as small and medium enterprise were challenged to work with their cities to build those solutions? Solutions developed by the more affluent cities would be entirely accessible to every other city. This way a world could advance in a collective enterprise advancing solutions they all need.

**Del Bianco CitySmart is simply an open source platform that allows this to happen”**

(Extract from an interview made by Lisa Cornish for DEVEX, Australia)

# How Open Source Virtual Globe is supporting the SDGs – The Case of NASA World Wind

Thank you for your attention!

