

Trans-Atlantic Training and Capacity Building Activities in EO

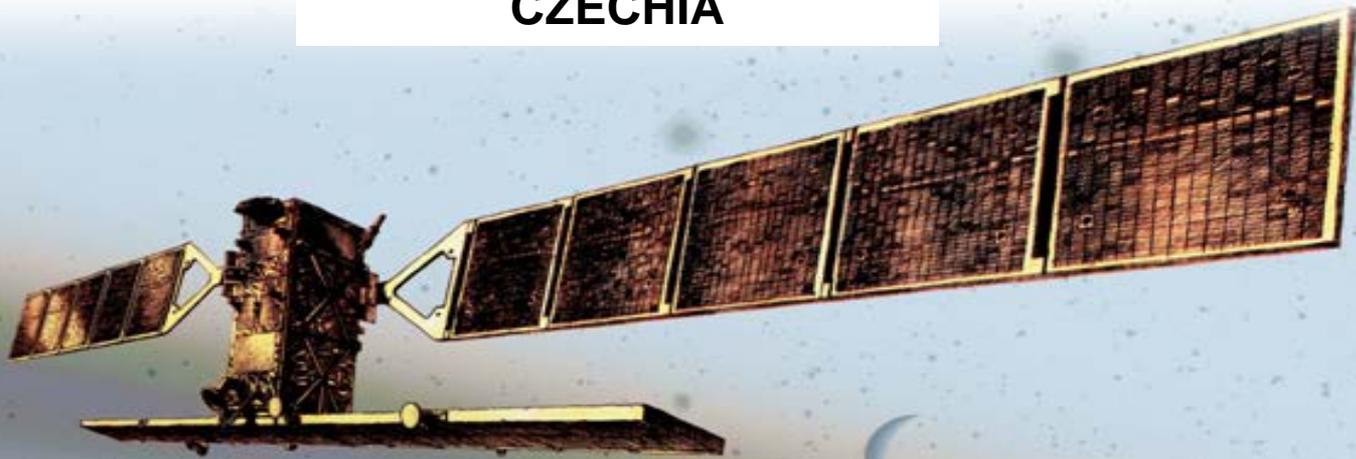
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Charles University in Prague

CZECHIA



Aim of presentation

- To promote a relevancy of education aspect of EO
- Introduction of Trans-Atlantic Training (TAT)
- Presentation of selected results of GLOBE Programme
- Introduction of ESERO CZ Office
- Perspectives, planes...

Trans-Atlantic Training (TAT)

ESA advanced training course in land remote sensing in Prague

28 June – 3 July 2009

Charles University and Czech Technical University

66 students from 22 countries

12 leading scientists in land RS techniques



Francesco Sarti (ESA)



NASA Valmiera Training Workshop

April 18, 2010

„Quantitative research methods in human dimensions of environmental change within Eastern Europe“



Garik Gutman (NASA)

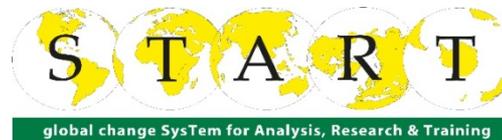


Land-Cover / Land-Use Change Program

Trans-Atlantic Training (TAT)

<http://web.natur.cuni.cz/gis/tat/>

- *Trans-Atlantic Training (TAT) initiative is an activity to develop stronger awareness of NASA and ESA products in EO*
- ***LANDSAT and SENTINEL missions***
- *to promote capacity building among recent university graduates and postgraduate in EO research area.*
- *Training courses are focused on land-cover, social science processes, land-use modeling,*
- *Trainers are invited from US and EU countries*



Trans-Atlantic Training (TAT)

<http://web.natur.cuni.cz/gis/tat/>

• **ESA support** – contract between Charles University and ESA

• **NASA support**

South Central European Regional Information Network (SCERIN)

The Northern Eurasia Earth Science Partnership Initiative (NEESPI),

START - Global change SysTem for Analysis, Research & Training

Coordination: Charles University in Prague (Premysl Stych)



TAT - Trans Atlantic Training

3 events so far:

2013 – Prague (SCERIN):

Prague, Czech Republic, three days during 20-22 June 2013

“Classification methods in Land-Use/Land-Cover Change”.

22 participants from five countries

2014 – Krakow (SCERIN)

Krakow, Poland, from 5 to 7 June 2014.

“Land Use/Land Cover Change and Ecosystem Processes”

36 participants from 12 countries

2015 – Prague (NEESPI):

Charles University in Prague, Czech Republic during 8-12 April 2015,. **“Earth Observation in Terrestrial Ecosystem Dynamics“**

29 participants from 9 countries



Trans-Atlantic training and Capacity Building Activities in EO





Venue: TAT 2016 training “**Multi-sensor Approaches in Monitoring Ecosystem Dynamics**”, **23.-27.7. 2016**

Registration: <http://web.natur.cuni.cz/gis/tat/>

Coordinated with SCERIN

Training location: National Forest Centre and Technical University in Zvolen, Slovakia

Goals and objectives

“Multi-sensor Approaches in Monitoring Ecosystem Dynamics”.

Thematically focused on the new trends in optical remote sensing techniques with emphasis on Landsat-8 and Sentinel-2 missions.

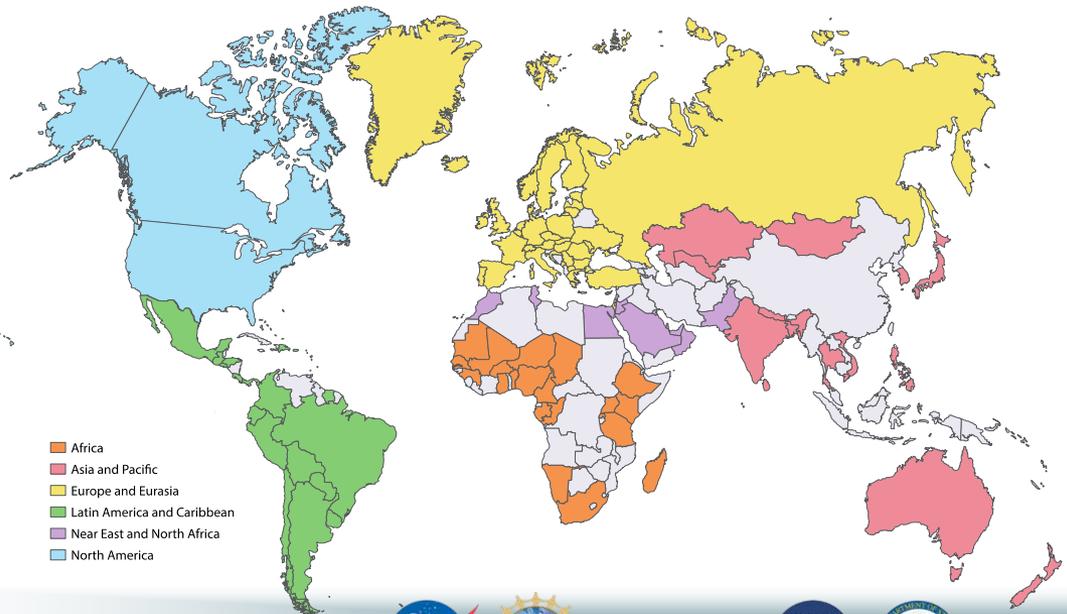
Applications in the ecosystems dynamics and biomass estimation, Lidar data

Global Learning and Observations to Benefit the Environment

Program Goals:

www.globe.gov

- Improve** student understanding across the curriculum;
- Enhance** environmental awareness;
- Contribute** to scientific understanding of Earth as a system;
and
- Inspire and Connect** the next generation of global scientists



Diversity of the activities

How to do a research in environmental disciplines

- **Education curricula** – GLOBE is implemented in many different ways
 - part of curricula (included in subjects)
 - school projects
 - after school activities (youth clubs)
- **Teaching approach** – sharing examples of good practice
- **School facilities**
- **Community involvement** - involving scientists, parents and public in the GLOBE Program
- **Environmental Education / Science Education**
- **Languages** - GLOBE is implemented in national language of each country – teachers/students need to know English for cooperation
- **Cultures and traditions** – intercultural learning

Region Annual Meeting 2015

- Poland, Warsaw on November 23rd -27th



Regional Events – the start of cooperation

GLOBE Games in the the Czech Republic – May 28th – June 1st 2015 students from Slovak republic, Poland, Germany + CC Netherlands, GIO Gary Randolph



Changes in land use and land cover in Medimurje between 2000. and 2014 using LANDSAT satellite images

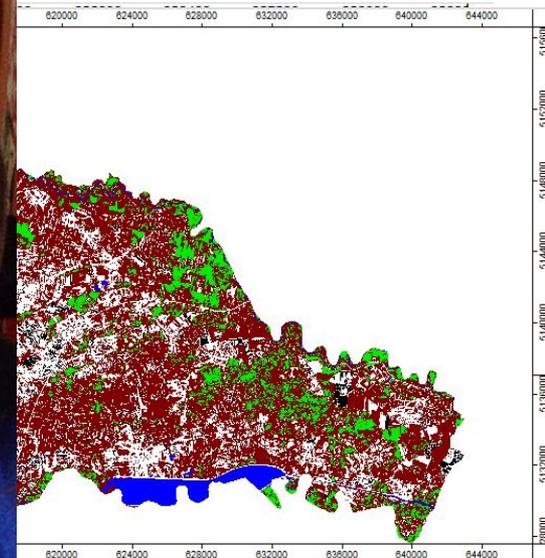
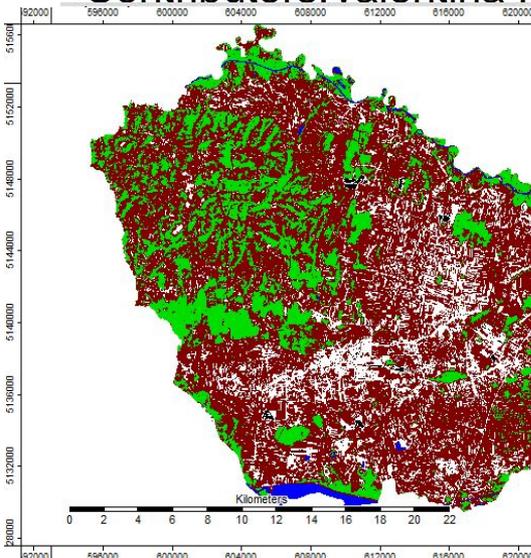
Organization: Srednja skola Prelog

Student(s): Josipa Golombos Lara Klaric Patricija Furdi

Grade Level: Secondary (9-12)

GLOBE Teacher: Kristina Jancec

Contributors: Valentina F



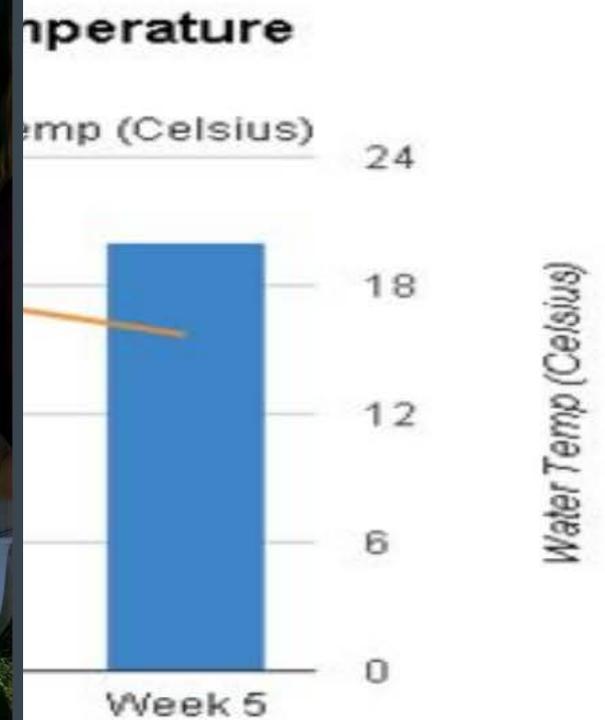
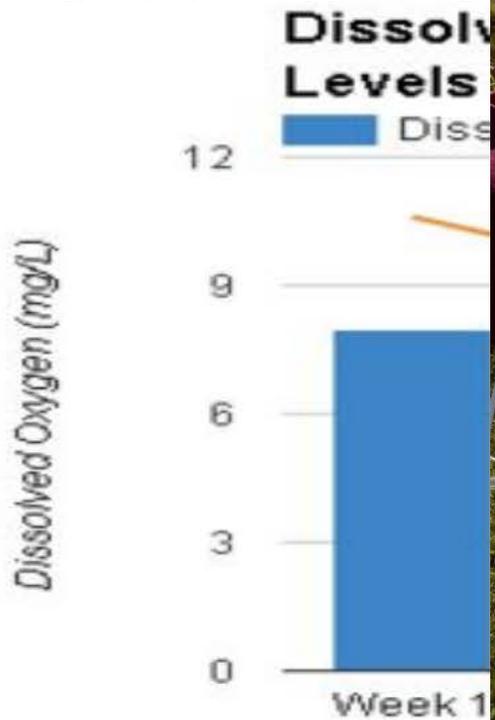
After completing our spatial analysis, we came to our results.

program we came to

Furthermore, we are planning to expand our research and as a main focus set our city Prelog

The Effect of Land Use on Water Quality

Organization: St. Francis
 Student(s): Madison Sie...



ESERO Czech Republic



ESA's main way of supporting the primary and secondary education community in Europe.

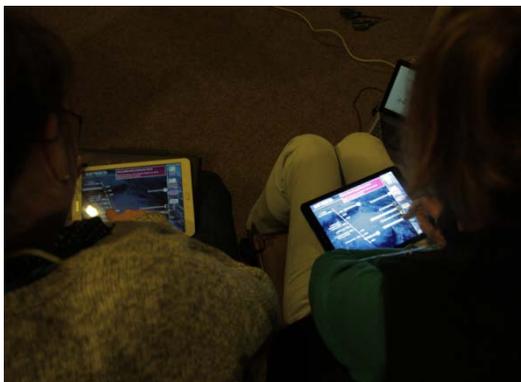
ESERO CZ

Czech Republic



www.ESERO.SCIENTICA.cz

Teachers' Training School





► Remote Sensing (introduction to principles and function)

RS - FOR EXPERTS

True and false colours

Choose a surface type and drag the bar across the image to see how false colours make the surface type stand out.



When processed by special software, satellite images can be displayed in true or false colours. A true-colour image shows surfaces the same way as the human eye sees them. By converting an image into a false-colour image, we can highlight things that are not distinguishable in a true-colour image, such as different types of vegetation.

In a true-colour image a forest looks completely uniform. In a false-colour image we can, for example, tell a coniferous forest from a deciduous one, or distinguish the height of the trees.

FOREST WATER BARE LAND FIELDS WITH CROPS

HOME

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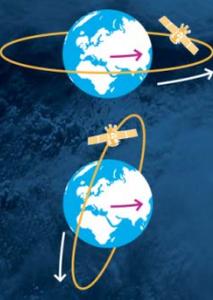
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EVALUATE

RS - HOW DOES IT WORK?

Orbits

To learn more, click on "Info".



INFO How does a satellite move?

INFO **Geostationary orbit**

A geostationary orbit is an orbit above the Earth's equator. Since satellites in such an orbit move at the same speed and in the same direction as the Earth's rotation, they seem to "hang" in the sky above the same place on the Earth's surface (always above the equator). These satellites monitor the same area all the time, being unable to "see" the opposite hemisphere or the polar regions.

INFO **Polar orbit**

Satellites in a polar orbit fly in a plane that is approximately perpendicular to the equator. Due to the Earth's rotation they monitor a different area on each of their orbits and are thus able to cover the whole surface of the planet over time. However, they are not able to monitor one place on a continuous basis.

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EVALUATE

RS - REMOTE SENSING

Why observe the Earth with satellites?

By clicking on the small satellite/eye, you can change the reflected spectrum. At the bottom, you can switch between a forest and a bus.



WHAT DOES THE HUMAN EYE SEE?

The human eye is only capable of discerning some of the reflected electromagnetic radiation - the visible light.



WHAT DOES A SATELLITE "SEE"?

Satellites, or more precisely, the instruments carried by satellites are able to record other parts of the electromagnetic spectrum as well (such as ultraviolet and infrared radiation), thus collecting more information than humans. After they are launched, they orbit the Earth for many years, sending out huge amounts of data without the need for human intervention.

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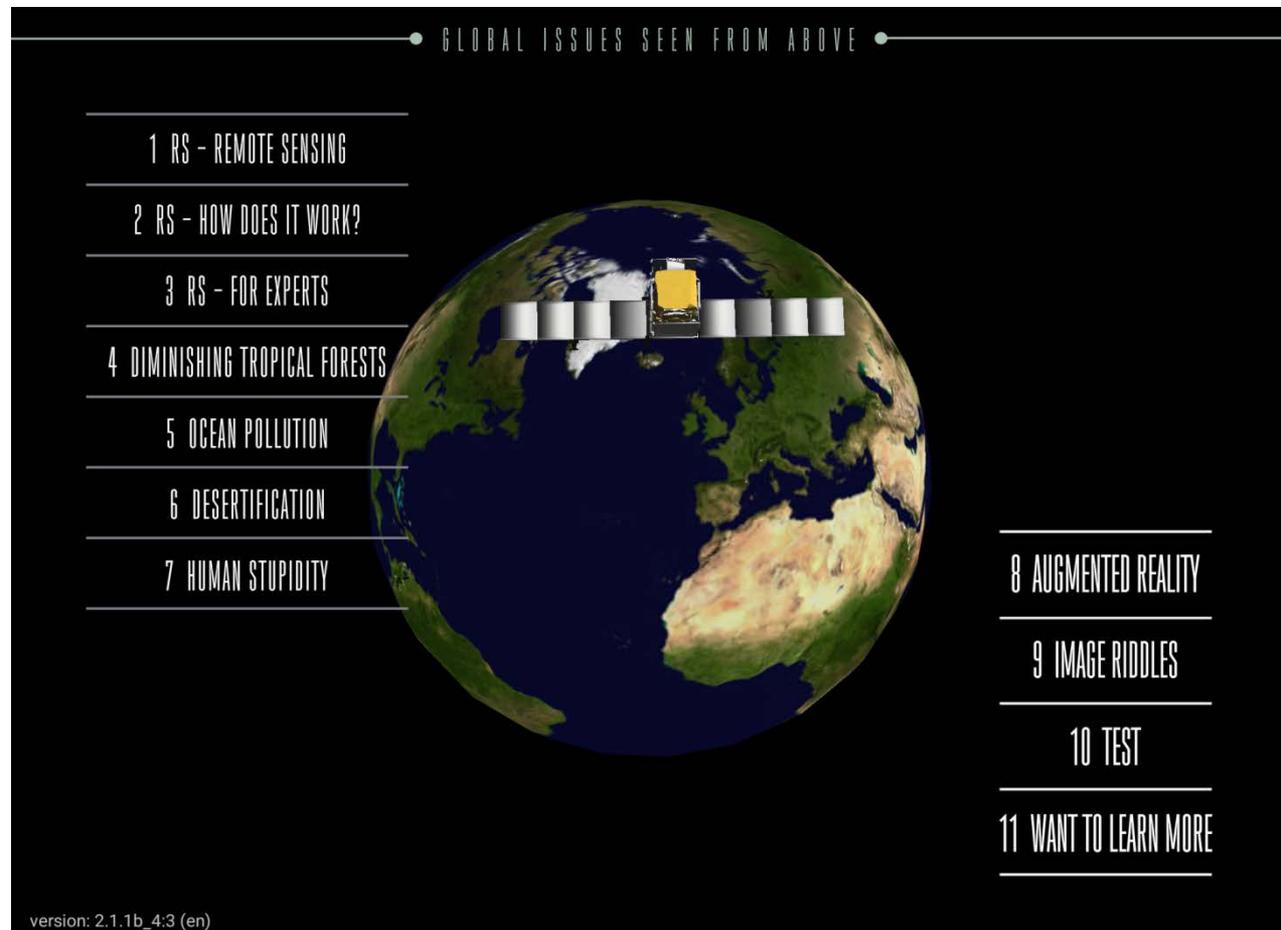
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EVALUATE

Global Issues from Above (EO tablet app)

Czech and English,

Introduction to EO
and Global issues
applications

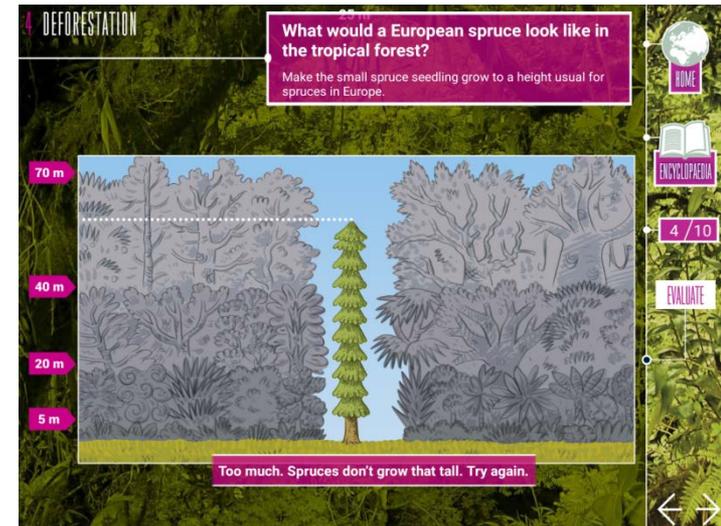


► Global issues – EO applications

Tropical forests

Ocean pollution

Desertification



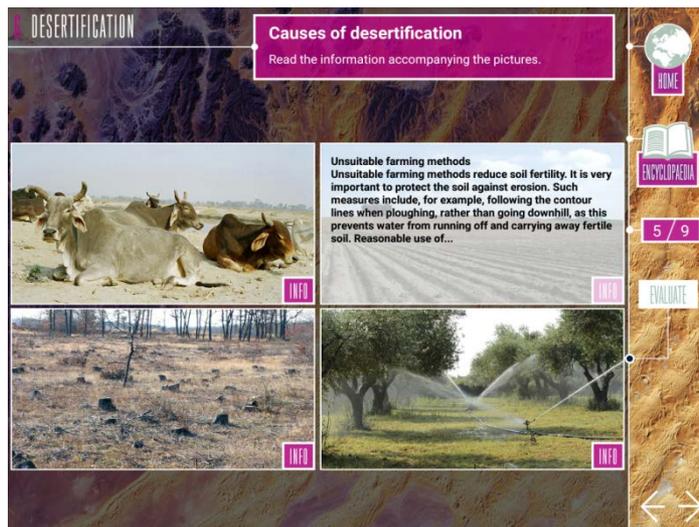
DEFORESTATION

What would a European spruce look like in the tropical forest?
Make the small spruce seedling grow to a height usual for spruces in Europe.

70 m
40 m
20 m
5 m

Too much. Spruces don't grow that tall. Try again.

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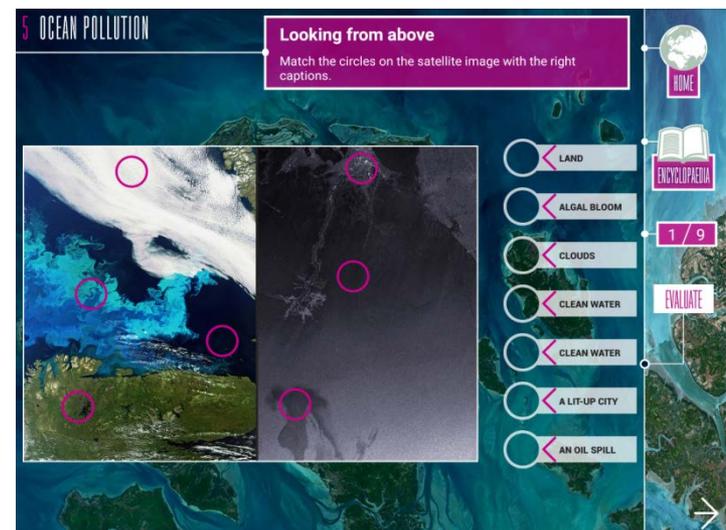


DESERIFICATION

Causes of desertification
Read the information accompanying the pictures.

Unsuitable farming methods
Unsuitable farming methods reduce soil fertility. It is very important to protect the soil against erosion. Such measures include, for example, following the contour lines when ploughing, rather than going downhill, as this prevents water from running off and carrying away fertile soil. Reasonable use of...

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OCEAN POLLUTION

Looking from above
Match the circles on the satellite image with the right captions.

LAND
ALGAL BLOOM
CLOUDS
CLEAN WATER
CLEAN WATER
A LIT-UP CITY
AN OIL SPILL

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EVALUATE

► Specials

Augmented Reality
Art



Art and Networking – HURRAY TO SPACE!

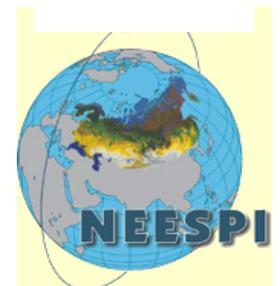


Summary

- Making the science more relevant and visible for students: to show applications, present our projects and results, to explain relevancy of our research
- Linking closer the scientists and young generation: very important is personal experience, social networks
- Offering the new educational tools and approaches
- To motivate talented students for EO/Science

Thank you to many people and institutions:

Garik Gutman, Chris Justice, Francesco Sarti, Petya Campbell, Pavel Groisman, Jana Albrechtova, Lucie Kupkova, Petr Mares, Antonios Mouratidis, Ivan Sackov, Julie Malmberg, Kasia Ostapowicz....teachers...students...and many more...



Thank you for your attention

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Looking forward to our collaboration in EO education!