

Educational office of the European Space Agency (ESA)

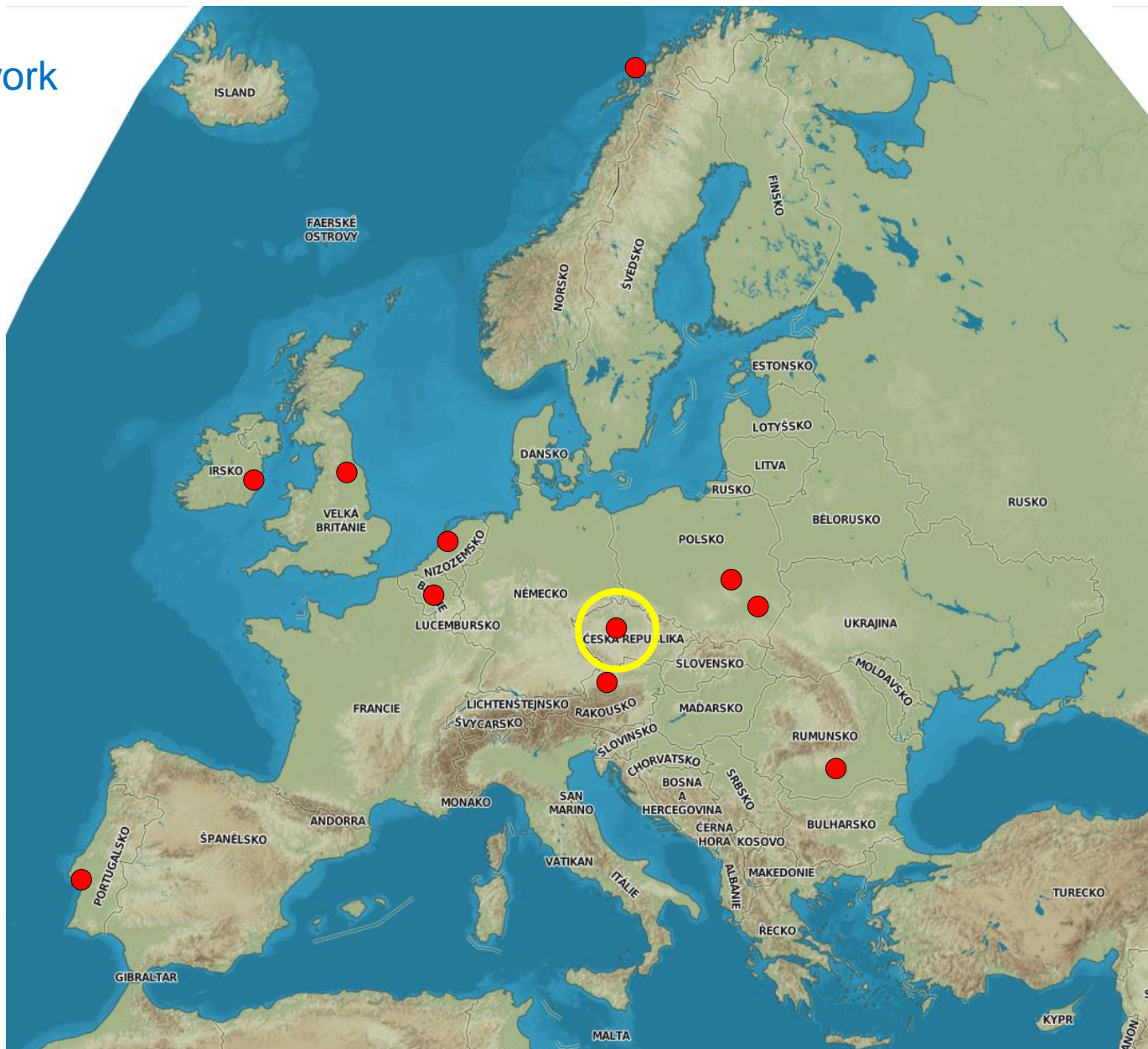


ESERO CZ

Implementation of Space and ESA topics into primary education

- ▶ Educational resources (primary and secondary schools)
- ▶ Accredited teachers' training
- ▶ Competitions
- ▶ Summer school for teachers
- ▶ Involvement in national curricula preparation
- ▶ Contact point for ESA – related education

ESERO network in Europe



ESERO CZ consortium



SCIENCE IN (contractor)



Charles University in Prague



Astronomical Institute AS CR



TEREZA Educational Centre



iQLandia Science Centre



Czech Technical University in Prague



Pedagogická
fakulta
Univerzita Palackého
v Olomouci

Palacky University Olomouc

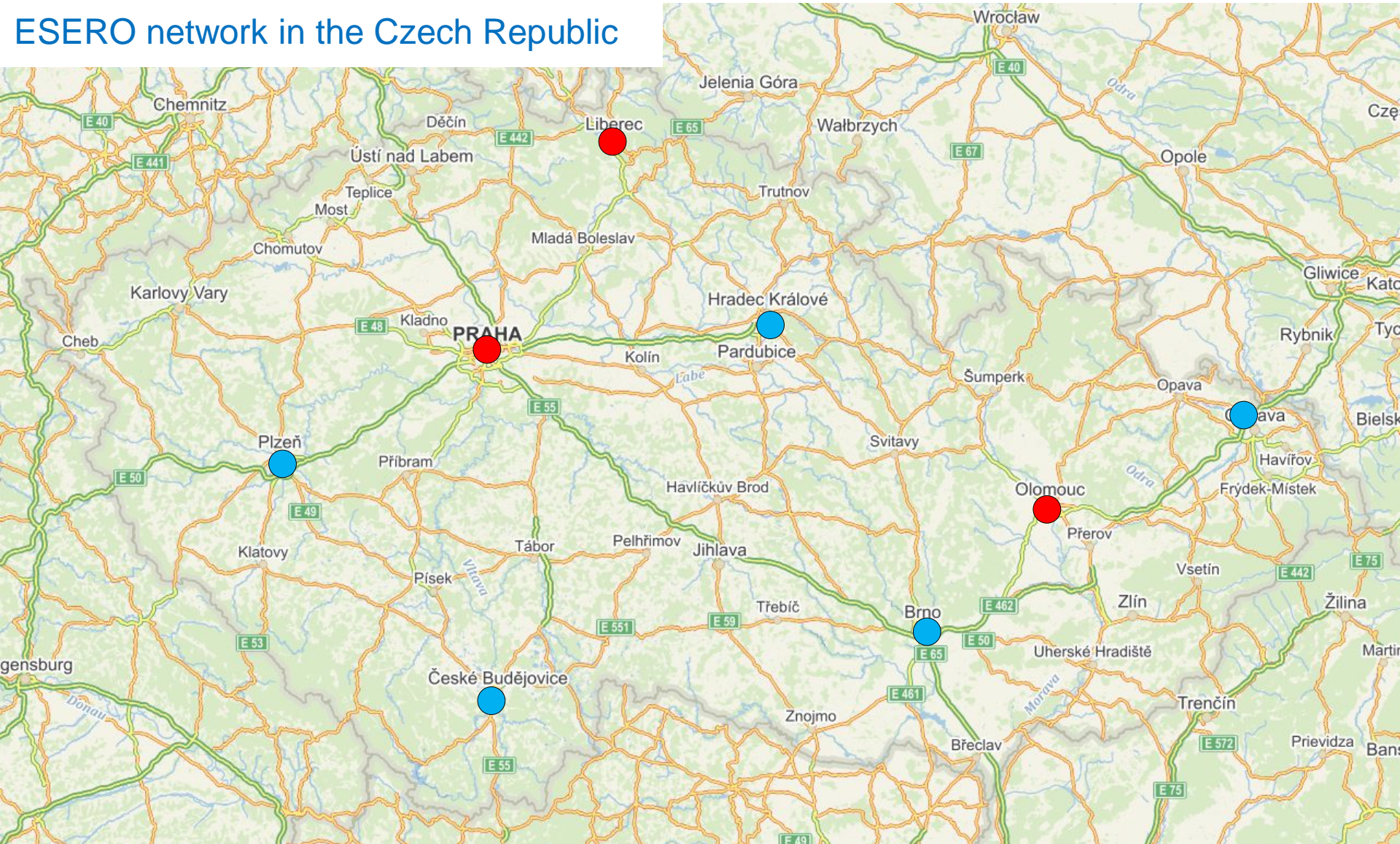
Collaboration with



vesmír



ESERO network in the Czech Republic



Promotion of ESA-Edu topics



Průběh kancelář Esero vyhledá a šíří...
Foto: Petr Mareš

V Praze bude vzdělávací centrum ESA

Evropská vesmírná agentura Zvele dva deset let na celém dotápných dávkách a vzdělávání

Evropské kosmické průzkumy...
rozhodnutí. Byly proto vyhlášeny...

novou úroveň, než stáhnou přístroj...
Abyste mohli data z družicového průzkumu Země odnést vyučitel, musí jí ruku v ruce technologický pokrok a vzdělávání, je podle Evropské agentury také na vzdělávací oblasti a modely atrakčních programů pro žáky a učitele, zaměřených na mezigenerační aspekty při činnosti. Programy připravuje vzdělávací ESA Education Resource Office (ERO) společně s dříve provozovanou ESA Education Resource Office (ERO) má v Evropě proužků vsm kanc...
Měsíčníky byl proužků vsm kanc...
Je Česká republika s tímto uspokojena v mezinárodní úrovni a přinášíme aktualizovanou...
dělší kancelář v Praze. Naše funkce je hlavním partnerem realizátorů kon...
sancí s tímto proužků vsm kanc...

Přemysl Štych,
Petr Mareš,
Lukáš Křížanek

Chcete-li vědět více, kontaktujte koordinátora...
esero@esero.cz



ZE DNE 2.6.2015
MINUTY REGIONU

ESA – ESERO ČR

Vzdělávací kancelář Evropské vesmírné agentury pro Česko

POZNÁVÁME VESMÍR(EM)

Desetileté výročí naší spolupráce bylo loni ověřeno přitímáním projektu ESERO ČR (European Space Education Resource Office pro Českou republiku). Stali jsme se tak oficiálními partnery Evropské vesmírné agentury (ESA) pro oblast vzdělávání a zapojili se do celoevropské sítě takových institucí, jako je například National STEM Centre v anglickém Yorku či varšavské science centrum COPERNICUS.

ESERO rozšiřuje naše horizonty, nejenom tenařsky – úkolem průzkumnářského vesmíru, ale i co se vzdělávání týče (včetně zkušeností napříč Evropou).

Vytvářte si vlastní vesmírné příběhy a sdílejte je s ostatními...
Stáhněte si aplikaci ESERO ČR...
Stáhněte si aplikaci ESERO ČR...
Stáhněte si aplikaci ESERO ČR...

POZNÁVÁME VESMÍR(EM)

- Poznáváme vesmír(em)
- Přírodovědné a technické předměty
- Akreditované vzdělávání učitelů
- Moderní technologie ve výuce
- Sdílení výukových materiálů napříč Evropou

Nejmenší ze je vesmír podivnější, než si myslíme. Je dokonce podivnější, než si dokážeme představit. (J. B. S. Haldane)

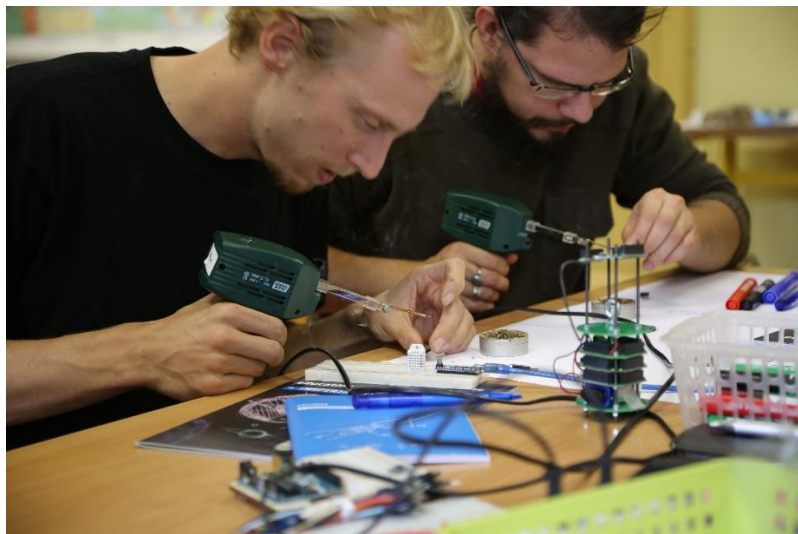
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EUROPEAN SPACE EDUCATION RESOURCE OFFICE
A collaboration between ESA & national partners

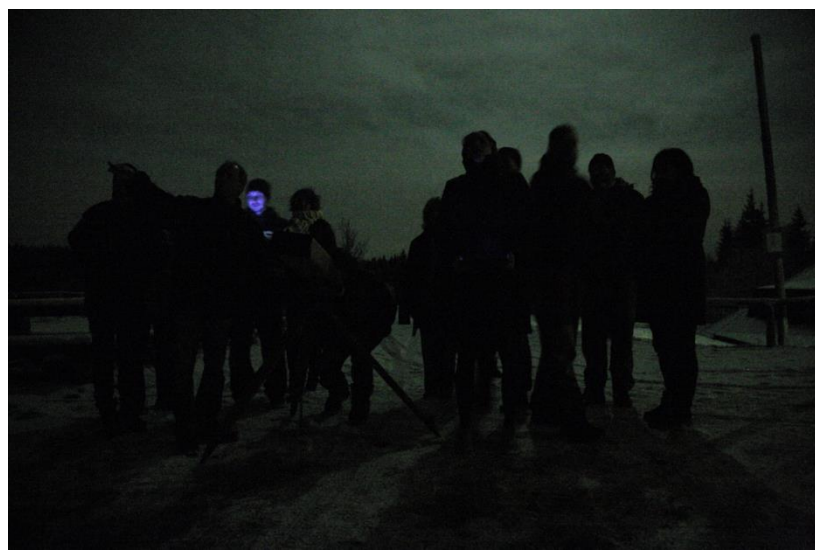
VZDĚLÁVACÍ KANCELÁŘ EVROPSKÉ VESMÍRNÉ AGENTURY PRO ČESKO

esero.scientia.cz

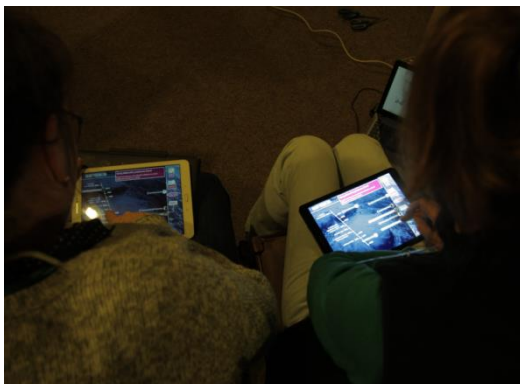




Teachers' Training School



Teachers' Training School



Competitions

► CanSat



► Mission-X



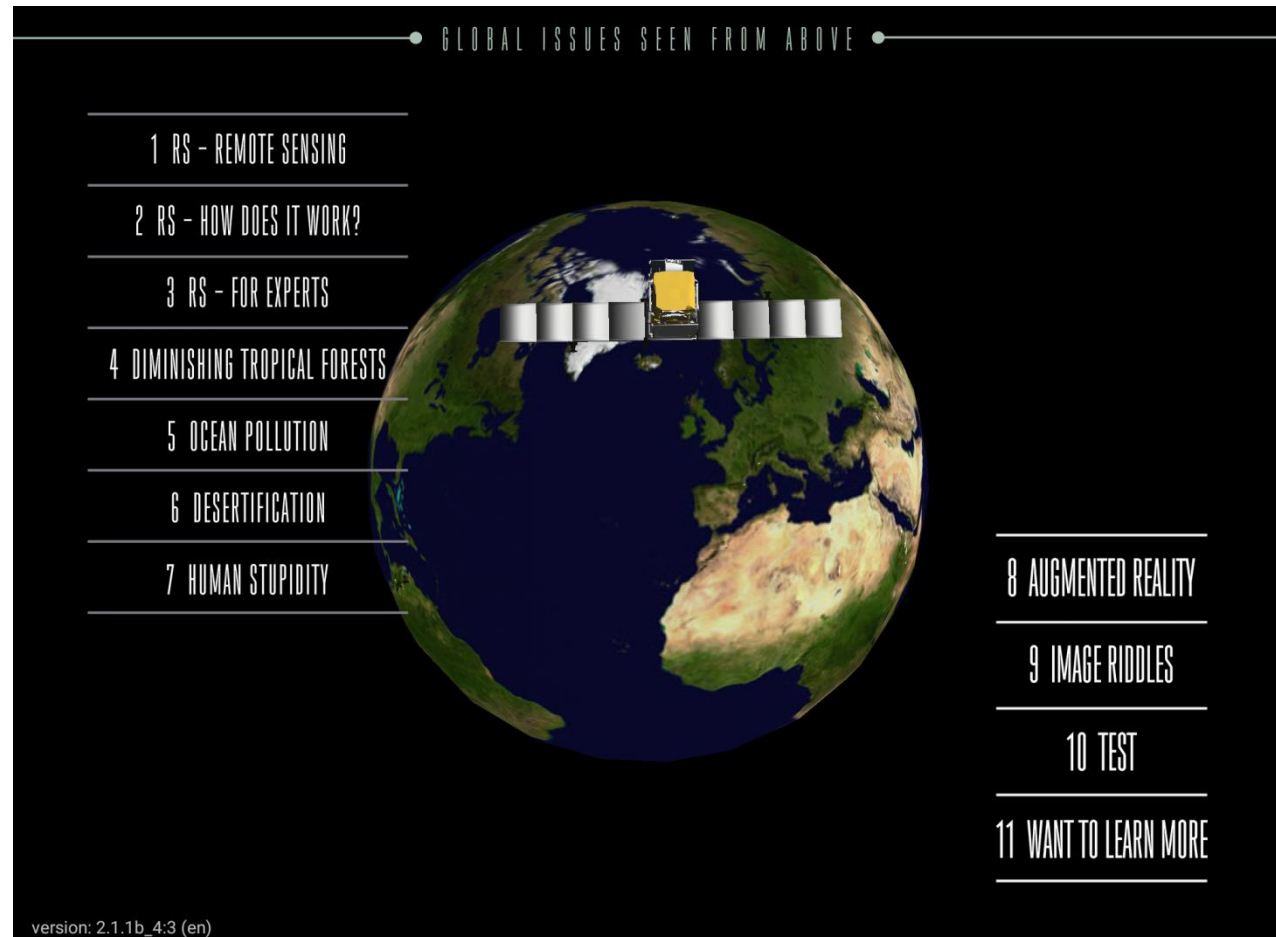
Global Issues from Above (EO tablet app)

For Android (now) and iOS (July 2017)

16/10 or 4/3 display ratio

Czech and English,
other languages possible


Introduction to EO
and Global issues
applications



► Earth Observation (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

ENCYCLOPAEDIA

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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.

HOME


ENCYCLOPAEDIA

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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.

HOME

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EVALUATE

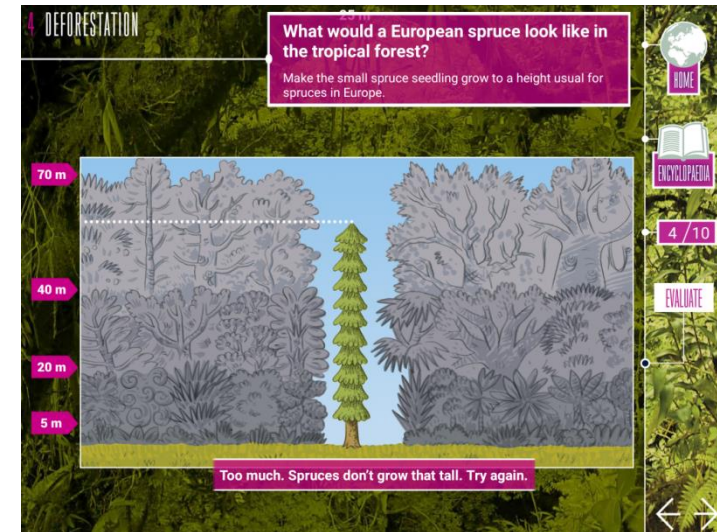
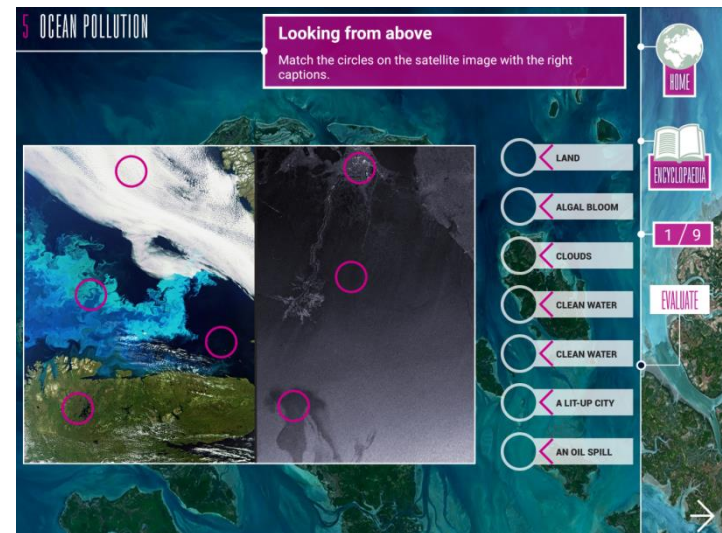
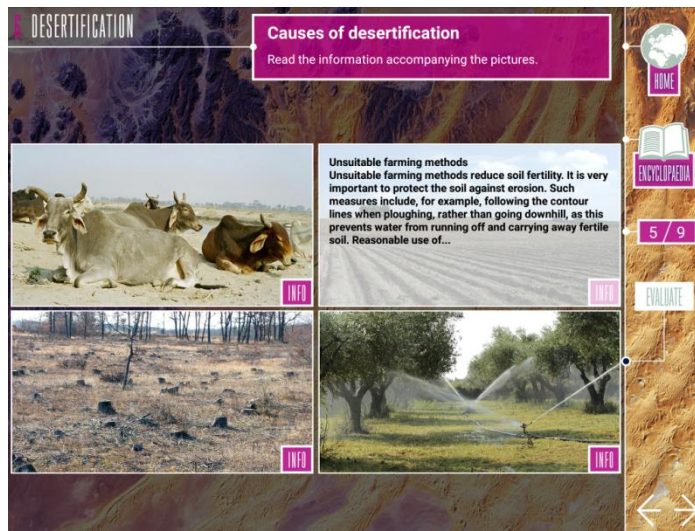
► Global issues – EO applications

Deforestation

Ocean pollution

Desertification

(Human stupidity)

► Specials

Augmented Reality

Image riddles

Test (shared evaluation)

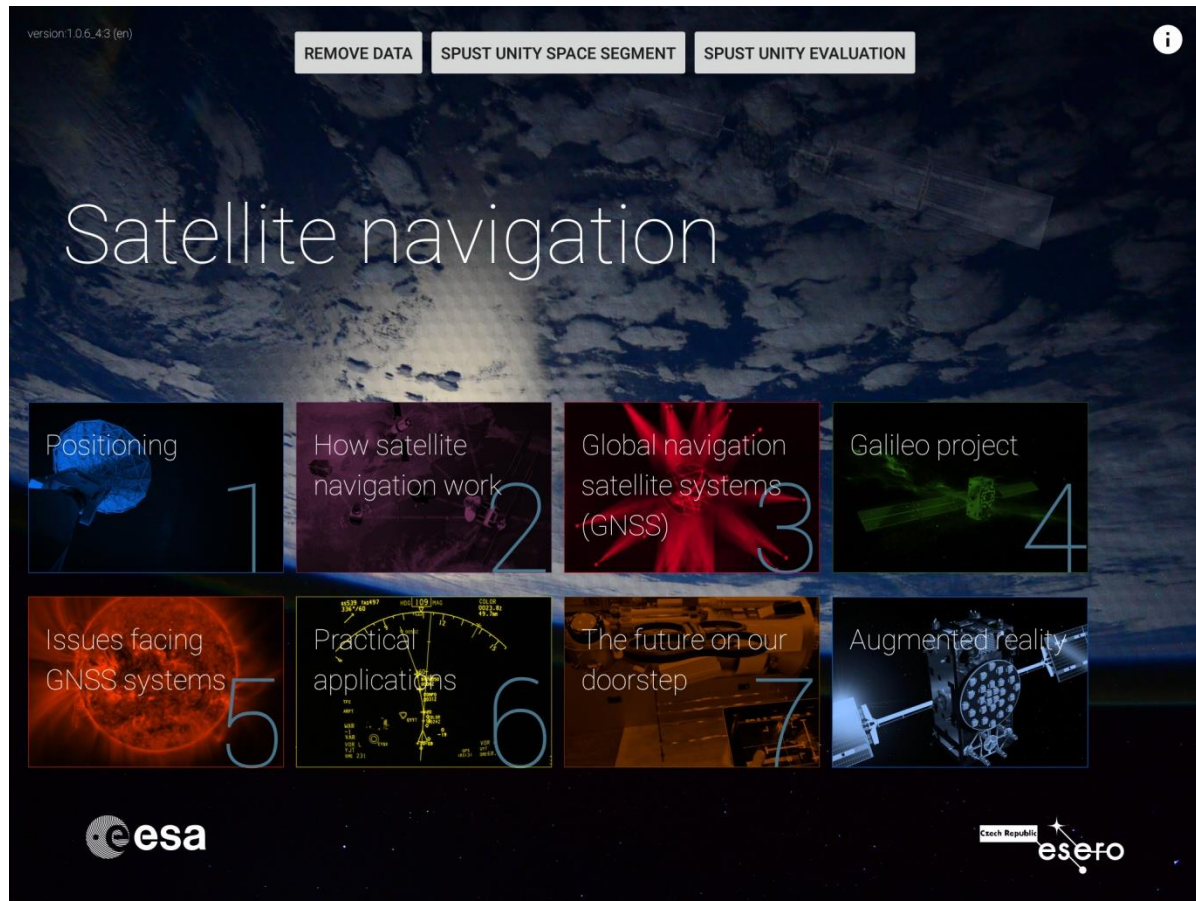


Satellite Navigation (GNSS tablet app)

For Android (now) and iOS (December 2017)

16/10 or 4/3 display ratio

Czech and English,
other languages possible



► Satellite Navigation (principles, evolution, applications)

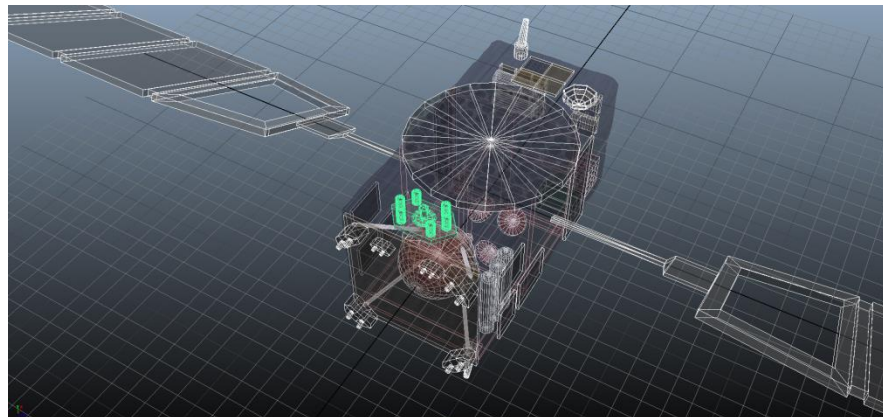
Satellite navigation > Positioning

Positioning

Later on, other ways of determining one's position in the landscape appeared. The invention of the compass and the creation of maps, used mainly in sea navigation, represented an important step forward. Besides natural landmarks, the landscape filled with man-made landmarks such as castles, churches and other structures.

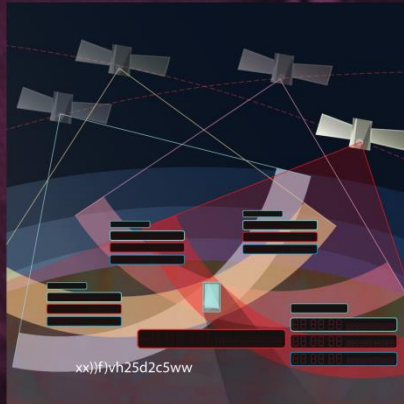


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Satellite navigation > How satellite navigation work

Positioning principles



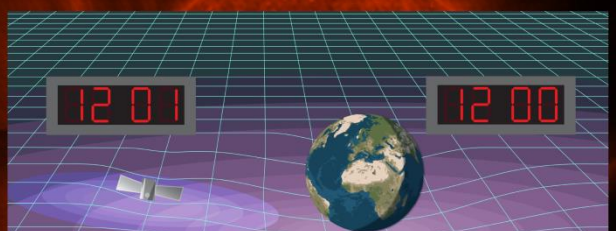
Information from a fourth satellite enables the receiver to precise the reception times (and also the receiver clock time) using numerical calculations.

Put simply: there are four unknowns: the x , y and z coordinates, and the clock error t . For these unknowns we have four equations (see image). These calculations make it possible to precise the position to within several tens of metres or even several metres.

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Satellite navigation > Issues facing GNSS systems

General theory of relativity



Another type of inaccuracy that needs compensation is described in the general theory of relativity. Since the Earth's mass is relatively big (6×10^{24} kg), spacetime is deformed in its vicinity. This is why time passes faster in orbit than it passes on the Earth's surface. This effect is much more pronounced e.g. in black holes.

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