Including the wider Education and EO community

Remaining up-to-date with developments in computing, remote sensing technologies and the growing number of applications will always be a challenge for the EO community. To meet it requires collaboration between remote sensing specialists, environmental scientists and educationalists. LearnEO’s ambition is to encourage and support such collaboration by offering a platform for discussion between contributors to the capacity building effort, a contact point for reviewing EO new education material, and a platform for distributing case-study data, tools and lessons to a wider audience. Moreover, an on-line lesson developer’s Resource Library will be provided as part of the Web Portal. It will be a repository for processing tools and background information for future authors using the Data Set collection to develop their own lessons.

LearnEO! Lesson Writing Competition

Are you using Earth observation data in your work? Do you have examples of how satellite data can contribute to better understanding of the world? Do you want to share your experience and expertise with others?

If so, you could participate in the LearnEO! lesson-writing competition. Taking part can bring your work to a world audience. It will also give you a chance to win one of the three main prizes:


Find a good case study and think about how to present it. Who is your target audience? What are the key points you want to make? What processing steps are involved?

Who can take part? Anyone who uses satellite data can participate as an individual or as part of a team. Teams must nominate a first author to act on their behalf. First authors must be over 18 on 1 January 2014.

What topics are included? Geophysical, environmental or social science themes are welcome as long as the lesson demonstrates how Earth observation can contribute.

Special conditions: Lessons must follow the LearnEO! format. They must include data from ESA missions on their own or in combination with other data. Hands-on activities must use the Bilko software.

Information and registration on www.learn-eo.org/competition.php

Registering will give you access to resources and support for participating lesson authors and allows us to send you updates.

http://www.learn-eo.org

The development of remote sensing over the past 20 years has increased our capacity to monitor the environment, understand & forecast its variability, manage natural resources, support humanitarian aid and emergencies management. Remote sensing is no longer a specialist technology, but simply a powerful tool. The interpretation of satellite information is a skill of strategic and economic importance, which should be developed widely and distributed globally.

The LearnEO! project supported by ESA aims to "stimulate the understanding and application of ESA EO data sets by implementing and maintaining an educational framework for teachers and students in the 18-25+ age group (upper high school to university level)"

LearnEO!: a user-driven project

Learn EO! has two main aspects. One is the development of online learning resources, peer-reviewed, concerning all Earth observation techniques, including hands-on lessons (using the Bilko UNESCO software), and a collection of data, available on the web site for educational purposes.

The other is to develop and foster a community of LearnEO! ‘users and producers’; support this community throughout the duration of the project; and develop plans for continuing such support beyond the lifetime of LearnEO!
The LearnEO! web portal is designed to support the EO education community by offering easy access to all resources provided in the project.

This includes:
- Easy access to data sets and description through keyword search, geographical location or selective browse tool,
- Overview of lessons, with links to more information and lesson downloads
- Software descriptions, with links to downloads and tutorial for image processing and display

### Lessons

1. **The Amazon River plume**
   
   This plume is clearly visible in satellite data of salinity and ocean colour. The Amazon lesson uses data from SMOS and EnviSat MERIS to explore how water from the Amazon influences the tropical Atlantic.

2. **Oil spill detection**
   
   Synthetic aperture radar (SAR) is the main sensor for monitoring oil pollution at sea, but for cloud-free areas, optical data is also used. This lesson uses ASAR and MERIS data from the Deepwater Horizon oil spill to show how satellite data is used in oil spill detection and provide support for response.

3. **El Niño-Southern Oscillation**
   
   El Niño involves both the ocean and the atmosphere. It influences ocean temperatures and sea level, and affects weather patterns in many parts of the world through a coupling between winds and movements of ocean water. It can be visualized with many EO sensors, including altimetry, sea surface temperature, and with support from scatterometers.

4. **Monitoring Atlantic storms**
   
   Several hurricane-force storms cross the North Atlantic Ocean every year. Observation of winds and waves during these storms is a challenge, as they take place in the middle of the ocean, and in extreme conditions. The way significant wave height can be measured by remote sensing will be shown, as well as wind speeds.

5. **Observing Earth gravity: the geoid**
   
   Gravimetry satellites, including GOCE have improved the knowledge of the geoid. The lesson explains what the geoid is, and how it reflects Earth Mantle inhomogeneities and sub-marine reliefs.

6. **Monitoring Arctic Sea Ice**
   
   The Arctic is strongly affected by global climate change. It is also difficult to measure in situ, so satellite observations become particularly important. The lesson shows how different sensors are used to monitor Arctic impact of global warming.

7. **Forest monitoring**
   
   This lesson demonstrates the use of multi-temporal spaceborne SAR data to monitor deforestation. In the case of forest fires, SAR data may also be used to monitor vegetation recovery. The lesson explains how the measured backscattering is due to both vegetation and soil moisture effects, and looks at synergies between SAR and optical data.

8. **Urban growth monitoring**
   
   The archive of radar images is a useful resource for studying change in a variety of situations. This lesson shows how decametric single-polarisation SAR images may be used to monitor change in large urban areas.

9. **Land cover mapping**
   
   Hyperspectral and very high spatial resolution data have the potential for detecting subtle difference in ground cover. However, the techniques involved differ from those used for conventional analysis of spectral data.

10. **Monitoring soil moisture**
    
    The SMOS instrument measures microwave radiation emitted from Earth’s surface in the L-band (1.4 GHz), using an interferometric radiometer. This lesson explains the physical principles of soil moisture retrieval from SMOS and demonstrates the processing chain needed to produce soil moisture maps.