SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Lift-Off - Secondary Space Education (2)

Author: Mr. Gil DENIS
Planete Sciences, France

Dr. Francesco Sarti
European Space Agency (ESA), Italy
Mr. David Hello
Terranis, France
Mr. Philippe Lattes
Aerospace Valley, France
Mrs. Claire Stride
Inside books, France

SENTINEL-2: A NEW SOURCE OF EARTH OBSERVATION IMAGES AND AN OPPORTUNITY TO PROPOSE INNOVATIVE EDUCATIONAL TOOLS TO TEACHERS

Abstract

55 years after the first man in orbit, Space activities have still a strong vocational dimension for children. Using space in support of education is an opportunity to propose innovative tools to teachers in the classroom.

Beyond the development of technological activities and projects (experimental rockets, satellites, stratospheric balloons), the increasing interest for space applications and uses in our daily life (Cpernicus and environment, Galileo, Climate Change, etc.) adds a new dimension to outreach activities.

In particular, Earth observation can be a very motivating and attractive support to address either the scientific and technical topics or the application domains.

Launched in 2015, Sentinel-2A, one of the main satellites of the European Copernicus programme, with its multispectral imager, is a new source of optical images with very interesting features: the resolution (between Landsat and SPOT), the rather high revisit (5 days with two satellites) and the number of spectral bands (13 from visible to infrared). Sentinel-2 satellites will serve a number of applications: environment, agriculture, forestry, coastal management, land cover and urban development, etc.

After a presentation of the Sentinel-2 mission and its main operational applications, the paper reviews the potential use in the classroom and describes the first examples of pedagogic exploitation in the classroom. These first experiments show that Sentinel-2 trigger interesting opportunities, not only for STEM education but also for geography or natural sciences.

Sentinel-2 images can be used by teachers, both for local activities around the school (e.g. land cover mapping or agriculture monitoring) and for global issues (deforestation, climate change, worldwide heritage). Furthermore, the simple visual interpretation of satellites images is also a good opportunity to recognize the risks of preconceptions, hasty judgments and the importance of rigorous and critical examination.

Basic image analysis, work on times series, multispectral classification can easily be performed with freeware tools, LEOWorks, SNAP, Bilko or specialized software. Beyond the features of Sentinel-2 instrument, the free and open data distribution policy makes this pedagogic use very affordable. Synergies between the use in the formal education system and the dissemination on social media are highlighted.

A few difficulties have been identified. There are related to the large size of the image files (3-6 GB) and the need for high speed networks and high performing computer. The last part of the paper addresses

these issues and proposes solutions to improve the interface between the final user (the teacher) and the Sentinel Data Hub.