GMES AND AFRICA

African Union

Sahara and Sahel Observatory

Integration of a module focusing on GMES and Africa services into CRASTE-LF curricula

BACKGROUND:

The GMES and Africa Consortium in charge of developing EO-based services on Water and Natural resources in North Africa, led by the Sahara and Sahel Observatory (OSS), has been implementing the project "Earth Observation for Sustainable Land and Water Management in North Africa» under the GMES and Africa Support Program since 2017. The consortium is implementing two services, related to "Water abstractions and seasonal agriculture monitoring", and "Land Degradation Monitoring and Assessment".

These services are accessible through tools, such as MISBAR, MISLAND, and GuetCrop, which are operational platforms valorizing ESA Copernicus Sentinel data. Since 2021, trainings on GMES and Africa services has been taught to the students of African Regional Centre for Space Science and Technology in French Language (CRASTE-LF). The success of this training initiative has led to its integration as a course module into the CRASTE-LF curriculum. The module is named "Applied EO products and African specificities" and covers 20 hours. Its teaching began in November 2023, with a promotion of Master students who have successfully handled the tools to develop use case studies.

END-USER'S PROFILE:

Based in Rabat, Morocco, CRASTE-LF is a Regional Centre whose mission is to strengthen the knowledge of African specialists, teachers and decision-makers in the field of Space Science and Technology. CRASTE-LF aims to improve technical skills and develop expertise in Remote Sensing and GIS, Space Telecommunications, Space Meteorology and Global Climate, Space

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and Atmospheric Sciences. The centre brings together 13-member countries, including: Algeria, Cameroon, Cape Verde, Central African Republic, Ivory Coast, Congo DRC, Gabon, Mauritania, Morocco, Niger, Senegal, Togo and Tunisia.

END-USER'S NEEDS:

The CRASTE-LF has updated its curriculum and program by introducing applied EO products relying on GMES and Africa EO-based services. Its need is, firstly, to valorise the already existing operational GMES and Africa services which provide timely access EO-derived data, biophysical and thematic indicators on a variety of themes, such as Agricultural land monitoring, Environmental features monitoring, Land cover mapping, land use land cover change monitoring, Vegetation and forest cover monitoring, Fire Monitoring. The second of need of CRASTE-LF is to train its students and trainees to the use and uptake of these services as acknowledged in its program. To get the optimal input useful for their analysis, the CRASTE-LF need to provide to the student thorough capacity building sessions on the use of the functionalities of the MISBAR, MISLAND, and GuetCrop platforms.

INFORMATION PROVIDED:

In response to the needs of the CRASTE-LF, the GMES and Africa provided a 20-hours course focused on MISBAR, MISLAND and GuetCrop platforms, combining theoretical sessions and practical demonstrations. The GMES and Africa also trained the students in performing concrete use cases. The training courses were interactive, giving priority to dynamic exchanges with the students. At the end, the students were able to familiarise themselves with the MISBAR, MISLAND, and GuetCrop tools, using the services offered to access data and indicators on their study areas.

USAGE:

As a result of the training provided to the students, they were able to access Geo-services which makes it possible to display EO data, including a wide range of indicators on their theme of interest. These resources dealt with timeseries Sentinel data, NDVI indicator, vegetation, land cover data, etc. The GMES and Africa platforms were utilized, either to perform analysis on the fly to harvest thematic information used to develop used cases or to collect and upload geospatial data on a local GIS for further exploitation to derive customized data and information. These resources were useful to them in carrying out their end-of-studies projects.

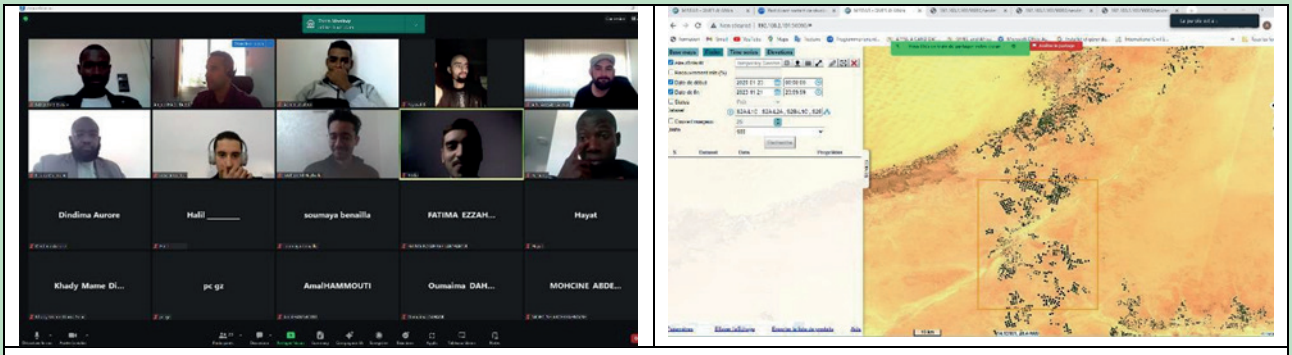
IMPACT:

The CRASTE-LF Regional Centre had the opportunity to leverage the GMES and Africa services to enrich its course curriculum. the Master students of the Centre using the GMES and Africa services were able to developed their use cases with consistent support and mentorship from the OSS. The first impact is easy and timely access of the GMES and Africa EO-based services by CRASTE-LF and its students. CRASTE-LF is a reference institution offering advanced training in space science and technology to the students. Through the GMES and Africa, CRASTE-LF has been a main interface of the promotion of the GMES and Africa platforms and thematic resources, enabling students from 13 African countries to address many of their concerns, including practical application of the theoretical sessions learned in the various modules, access to time series data and indicators, methods for calculating indicators, research into study topics, etc. Besides, the GMES and Africa has impacted the creation of the module “Applied EO products and African specificities” module covering 20 hours, which teaching began with the class of 2023-2024 with 20 students, and for which preparations for the 2024-2025 academic year are already underway with CRASTE-LF. The Platform relies on innovative technologies in Big data and cloud computing. GMES and Africa also influenced the integration of these innovative technological aspects in the CRASTE-LF Curricula.

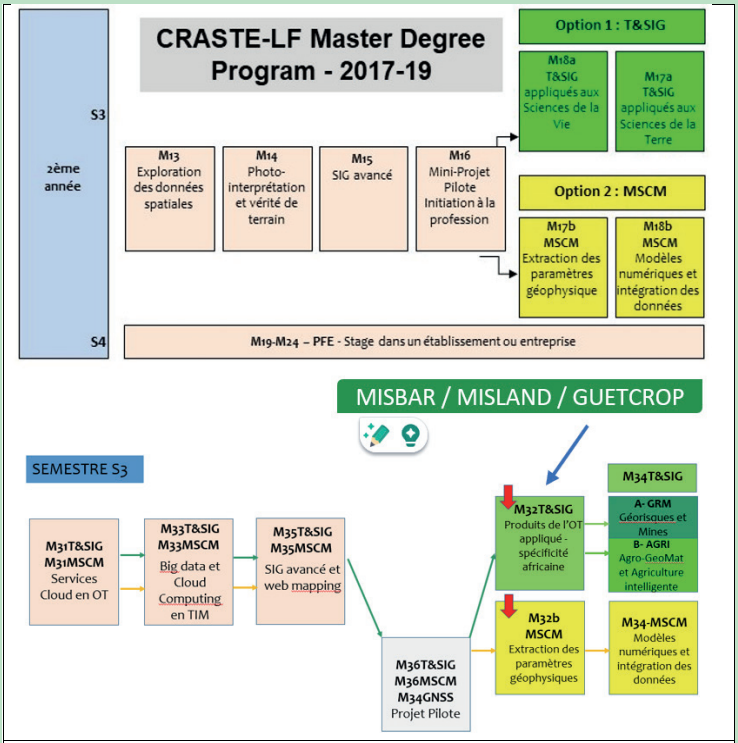
OUTREACH:

CRASTE-LF plays an essential role in improving knowledge and technical skills in the field of Space Science and Technology. By agreeing to dedicate a training module to the GMES and Africa services of the North Africa Consortium, this institution is helping to ensure the promotion, appropriation, and effective use of EO-derived tools and products. By setting up these operational services and strengthening the expertise of the nationals of these member countries of the regional centre in the field of space science and technology, the GMES and Africa and CRASTE-LF are thus contributing to achieving the objectives of the GMES and Africa continental programme, which aims at leveraging EO technologies to support sustainable

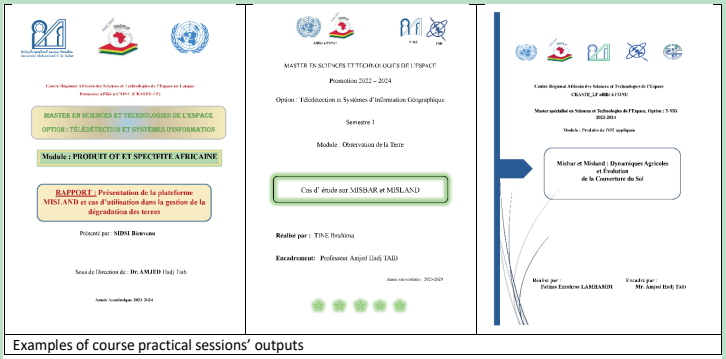
development and environmental management across Africa. The students from these countries, once they have returned to their own countries at the end of this training, act as ambassadors, promoting better use of EO products, in particular the Sentinel data from the Copernicus programme, in various fields (agriculture, natural resource management, etc.) and advocating their integration into the decision-making process.



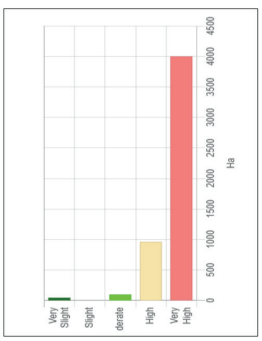
Online course on MISLAND and MISBAR for CRASTE-LF students



GMES and Africa services integration in the CRASTE-LF Curriculum



Examples of course practical sessions' outputs



Graphique 2. Quantité de sols perdus en 2019

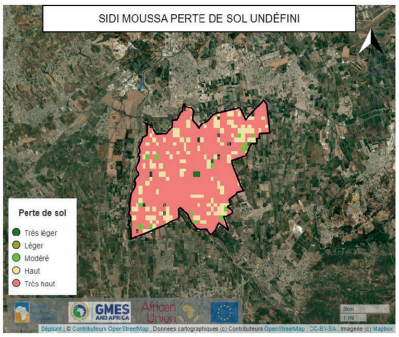


Figure 3. Répartition spatiale des pertes de sol en 2019