

Multi-scale Flood Monitoring and Assessment Services for West Africa (MiFMASS)



EO - Flood Watch

GMES - CSSTE Consortium Newsletter



Volume 1, No 1. December, 2020

Message from the Consortium Lead



It is my pleasure to welcome you to the maiden edition of the CSSTE Consortium Newsletter – EO-Flood Watch - through which you will get information about the Consortium, flooding challenges and regional efforts being made to mitigate the disaster. The Consortium is made up of seven (7)

Partners spread across five (5) West African Countries - Nigeria, Benin, Ghana, Burkina Faso, and Cote D'Ivoire. CSSTE Consortium is one of the 12 Consortia of the Global Monitoring for Environment and Security and Africa (GMES & Africa) support programme - a joint initiative of the African Union and the European Union targeted at using Earth Observation data (Satellite data) to tackle existing challenges in Africa, by Africans and for Africa. In this phase of the GMES & Africa programme, challenges that are addressed are categorized under two sub-themes; (i) Water and Natural Resources (WNR) (ii) Marine and Coastal Resources. Our Consortium is focusing on Multiscale Flood Monitoring and Assessment Services for West Africa (MIFMASS) which falls under the WNR sub-theme.

The EU made available Copernicus resources to the Consortia to develop applications, services or even adapt existing Copernicus services to meet the needs of the region. In this regard, the CSSTE Consortium will be using Sentinel data to develop a Flood Forecasting and Nowcasting service that will be disseminated across various levels of the community, from Disaster Management organizations (DMOs) to the local communities. Other Services / Products are: an updatable Flood event database that will serve as a repository of historical Flood events and present occurrences; long & short term capacity building for DMOs; Damage Assessment and forecast maps; etc.

In this issue of the newsletter, you will get to know the Consortium and its Partners as well as the Products and Services being developed for the West African Sub-region in the area of Flood management and mitigation. In subsequent editions, the Product /Services will be elaborated on. The Consortium is committed to and has been working with relevant National institutions across the region to build / enhance the capacity of these institutions for improved delivery of their mandate. It is our hope that the cooperation and successes the Consortium has had so far with our stakeholders will continue even beyond the lifetime of the project.

Wishing all our readers, a safe and Happy Yuletide Season!

Meet the CSSTE Consortium



Group photo of CSSTE Consortium Partners

CSSTE consortium is one of the 13 Consortia who were awarded the GMES & Africa support programme grant across the five geographic regions in Africa. They are commissioned to use 'Earth Observation for the Africa We Want' particularly using Sentinel data of the Copernicus programme of the European Union. The title of the action being implemented by the CSSTE consortium is Multi-scale

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Need to know about MiFMASS



Agungi area of Lekki axis, Lagos Source: najauto.com
Riviera palmeraie: 25 June 2020 Cote D'Ivoire Source: https://ghanapoliticsnews.com/2020/02/28/heavy-floods-to-hit-acra-kasoa-in-march-gma-warns
Burkina Faso flood Source: http://news.bbc.co.uk/2/hi/africa/8237546.stm

MiFMASS is an action under the Water and Natural Resources sub-theme of the GMES & Africa support programme. The action is designed to develop a Flood Monitoring and Forecasting System for ECOWAS countries.

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Meet the Partners



Nigeria

Centre for Space Science and Technology Education (CSSTE) is one of the activity Centres of the National Space Research and Development Agency (NASRDA) for developing indigenous capacity in Space Science and Technology Education. The Centre develops capacities in application areas such as; application of remote sensing, satellite communications, meteorological satellite applications, space and atmospheric sciences and technology, global navigation satellite system, space law and geographical information systems for sustainable development in Nigeria. The emphasis of the Centre is to concentrate on in-depth education, research, application programmes and continuing education/awareness programmes.

As a Regional Implementation Centre (RIC) for the GMES & Africa Support Programme in West Africa, CSSTE is saddled with the responsibility of the overall management of the MiFMASS project as well as contribute to following Work-Packages: Development of a Regional Flood Event Database; EO data download and pre-processing; Capacity Building; Development of a Flood Forecasting System; Establishment of a Flood Assessment System and Product/Service Generation and Delivery.

For more information: www.arcsstee.org.ng



Ghana

The Department of Earth Science, University of Ghana is the foremost Center of Excellence in geoscience training in Ghana and the West African sub-region. The department offers training and research in the areas of hydrological sciences, geology, mineral exploration, petroleum geosciences, engineering geology, environmental geology and related areas and has 70 years of experience in building capacity and research innovation in the West African sub-region. The department's strength is in the diversity of expertise of its staff. The University is administering several funded research projects running into several dozens of millions of United States Dollars, procured through international competitive bidding processes. The University is widely acclaimed for high levels of

teaching quality and the credibility of its credentials

Together with the Water Research Institute (WRI) of the Council for Scientific and Industrial Research (CSIR), the University of Ghana team is developing a forecasting system for the most vulnerable parts of the Black Volta Basin in Northern Ghana. The University will work hand in hand with disaster management organisations like NADMO and to boost their human capacity to enhance their services.

For more information: www.ug.edu.gh



Burkina Faso

The Volta Basin is a transboundary river basin shared by six (6) countries, namely Benin, Burkina Faso, Côte d'Ivoire, Ghana, Mali and Togo. These countries which established the Volta Basin Authority on 19th January 2007, have a high population growth rate with ever rising physical pressure on the natural resources of the basin. The Volta Basin Authority is created to promote IWRM within the Volta basin with the view to contributing to reduce poverty and promoting sustainable development in the basin.

Hence, the growing need for greater action in response to the adverse effects environmental problems created by these anthropogenic activities, exacerbated by climate change. Some of these problems include land and water quality degradation and frequent flooding in several parts of the basin. To this effect, it is worth noting that environmental challenges of this nature will hardly be addressed effectively through initiatives by individual countries. Sustainable long-term solutions can only be found through multilateral cooperation, based on the cardinal principles of Integrated Water Resources Management (IWRM).

For more information: www.abv.int



Ghana

CSIR-WRI is one of the 13 constituents research institute of CSIR, with a mandate for research into water and related resources. The institute generates and provides scientific information, strategies and services towards the rational development, utilization and management of water resources in support of socio-economic advancement of Ghana. The institute has well established 6 Technical Division/Unit (Surface Water, Groundwater, Environmental Chemistry and Sanitation Engineering, Environmental Biology and Health, Fishery and Aquaculture, Biomedical and Public Health Research Unit) that are specialized in various aspects of water but work in an interdisciplinary manner to provide water related evidence-based solutions that are sustainable.

The project is being implemented in the Black Volta Basin in Ghana. CSIR-WRI's role under WP2 on the MiFMASS project, is to review existing flood event databases in order to aid in developing a harmonized regional database that can be updated by the respective DMOs. This will help in developing a regional flood event database, which is the ultimate aim of WP2. The database will be used to keep records of flood occurrences in the project implementation locations (Nigeria, Burkina Faso, Cote D'Ivoire, Benin, Ghana).

For more information: www.csir-water.com

Meet the Partners contd.

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Burkina Faso

Institut Supérieur d'Etudes Spatiales et des Télécommunications (ISESTEL) was set officially in Ouagadougou (Burkina Faso) on September 27th 2011 by the Ministerial Order N°2011-327/MESS/SG/DGERS/DEPr. ISESTEL is set to give deliver training and research in space technologies and all applied areas (natural resources, land management, land use, land cover, water resources, urban and rural management, socioeconomic analysis, etc.) Training at ISESTEL concerns short training and diploma training (Licence, Bachelor, Master)

ISESTEL is a member of various international organizations (GEO, LDN/UNCCD). It is the focal point of SERVIR West Africa set by NASA and USAID in ECOWAS region.

For more information: www.isestel.org



Côte d'Ivoire

The University Center for Research and Application in Remote Sensing, abbreviated CURAT, was created in 1995. located within Félix Houphouët-Boigny University of Abidjan, CURAT belongs to Earth Sciences and Mineral Resources faculty and performs two main activities master student training and research.

The centre has five (5) masters programme :

- climate Environment an sustainable development,
- water agriculture and food security
- lands and ecosystems planning and management
- Digital Image Analysis and Processing
- Ocean and coastal areas

CURAT is a Partner within MiFMAS project and leads many tasks and activities through the different workpackages (WP):

T2.4: Develop updatable regional database

T3.1: Identify all required RS data

T3.2: Automated download and preprocessing routine

T3.5: Geospatial Database development

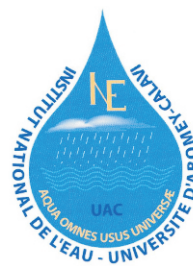
T4.2: Setup nowcast/ forecast model chain

T4.3: Harmonise hydrological models boundary cond.

T5.2: Drone image acquisition and analysis

T7.2: Develop training materials

For more information: www.curat-edu.org



Benin

As a World Bank Center of Excellence for water resources and sanitation, the National Water Institute is one of the leading research and capacity building institutions in the area of water resources in West Africa. INE hosts the regional WASCAL (West-African Science Service Centre in Climate Change and Adapted Land Use) doctoral research program on climate change and water resources (DRP-CC&WR). In recent years, INE has successfully implemented various water related projects, among others, Disaster Risk Reduction Practice Research and Capacity Building Support to ECOWAS (805,000 US\$), Managing new risks and opportunities of agricultural development of African floodplains (259,388 US\$), Capacity Building in Support of Weather, Water and Climate

Services in Mali and Niger (600,000 US\$). At regional level, INE has a sound working relationship with various stakeholders including government departments, research and academic institutions.

Within the MiFMAS project, INE is contributing to the following:

- Development of a flood forecasting system: setup hydrological models and ensemble meteorological forecast (HEC-RAS and HEC-HMS).
- Establish flood assessment system: development of a flood assessment system based on remote sensing and GIS data. Image analysis routines to map flooded areas in real-time (including drone acquisitions) will be developed while a GIS database of base layers such as land use/land cover, population, settlements, etc., will assist in estimating the extent of damage.
- Identification of flood vulnerability hotspots; Setup flood forecasting model & Flood frequency extension intensity analysis

For more information: <https://ine-uac.bj/>

Need to know about MiFMAS contd.

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The main objective is to enhance the flood monitoring assessment and management in West Africa by providing Earth Observation (EO) based services on near real time basis to disaster management organizations and boosting their human capacity to adapt to these services. The project is targeted to help community members and smallholders such as farmers, traders and fishermen who are constantly affected by floods.

The project is also aimed to provide essential information on flood monitoring to meteorological organizations, hydrological organizations and mapping agencies. Therefore by the end of this project, it is expected that there will be reduced loss of lives and property due to flooding disasters in West Africa amongst other things like well-developed indigenous capacity for flood disaster forecasting.

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Product and Services



- Updatable regional flood event database
- Digital Maps (Flood Hazard maps etc)
- Damage Assessment Maps
- Capacity Building
- Public awareness and Enlightenment

Expected Impact of the Project

- Establish an updatable flood event database.
- Provide DMOs timely information before, during and after flood events.
- Strengthen the capacities of DMOs and other target groups in the use of EO data for flood monitoring assessment and management.

Meet the CSSTE Consortium

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Flood Monitoring and Assessment Services for West Africa (MiFMASS). The action will promote an active involvement of a wide range of stakeholders involved in disaster risk reduction; national (e.g. meteorological, hydrological, mapping, ministries), regional (e.g. ECOWAS) and private (e.g. media, civil society groups) through knowledge exchange and services, co-implementation and capacity development. CSSTE is the lead of the action (project) and its role is to serve as overall project manager as well as carry out the research in Nigeria's chosen study area.

The CSSTE consortium is made up of Seven (7) Partners from Five (5) different West African countries, namely;

Nigeria, Benin, Ghana, Burkina Faso and Cote D'ivoire

CSSTE Consortium Partners

1. Centre for Space Science and Technology Education (CSSTE), Nigeria
2. Institut Supérieur d'Etudes Spatiales et Télécommunications (ISESTEL), Burkina Faso
3. Volta Basin Authority (VBA), Burkina Faso
4. CSIR-Water Research Institute (CSIR-WRI), Ghana
5. University Of Ghana (Dept. of Earth Science), Ghana
6. Centre Universitaire de Recherche et d'Application en Teledetection (CURAT), University Félix Houphouët-Boigny, Cote D'ivoire
7. National Water Institute (NWI), Benin

Need to know about MiFMASS contd.

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The following products and services are the deliverables from MiFMASS:

1. Flood Forecast
2. Forecast Maps & Updatable Regional Flood Event database
3. Flood Mitigation and Management
4. Damage Assessment
5. Capacity Building (Long term and Short term trainings)

Consortium activities so far...

1st National Stakeholders Meeting, Nigeria

At the onset of the implementation of CSSTE-GMES & Africa project, CSSTE as the lead institution organized its 1st National Stakeholders Meeting in Nigeria which took place on the 29th August, 2018 at the Centre for Space Science and Technology Education, Nigeria. This meeting brought together 65 stakeholders from national institutions around Nigeria who would be the final beneficiaries of the Products and Services to be developed on the project. Universities, Disaster Management organizations, Meteorological organization, CBOs, Media, relevant Federal and State ministries as well as NGOs were all represented. MiFMASS project was unveiled to the stakeholders with its expected deliverables particularly the capacity building and ownership/domestication aspect of the action within Nigeria. The meeting concluded with the unwavering commitment of the stakeholders to work with CSSTE in Nigeria to ensure a successful and impactful project.



1st GMES & Africa Forum, Gabon

The 1st GMES & Africa forum which took place from 19-23 November, 2018 in Libreville, Gabon, brought together Consortia, technical experts and stakeholders across Africa and Europe to discuss the use of Earth Observation for addressing environmental/societal challenges in Africa. CSSTE Consortium presented its Flood assessment and Monitoring service and also engaged in exchanges to enable a successful development and deployment of its services.



1st Regional Stakeholders and Technical meeting, Cote D'Ivoire

The CSSTE Consortium held its 1st Regional Stakeholders and Technical meeting at CURAT from 7 - 9 May 2019 in Abidjan, Cote d'Ivoire. The aim was to create regional awareness about MiFMASS and GMES & Africa and encourage active involvement of the different categories of stakeholders in the project. It is also to enhance interaction among stakeholders and CSSTE-Consortium.



PICTURES Legend

- | | | |
|--|--|---|
| <p>1 Participants registration at the 1st National Stakeholder's Meeting, Nigeria</p> <p>4 Group Photograph of participants at the 1st National Stakeholder's Meeting, Nigeria</p> <p>7 Panel discussion at the 1st GMES & Africa Forum, Gabon</p> <p>10 Cross section of participants at the 1st Regional Stakeholders & Technical meeting, Abidjan</p> | <p>2 Professor Akinyede, Director of CESRA, FUTA addressing the stakeholders at the 1st National Stakeholder's Meeting</p> <p>5 Communication team members at the CSSTE consortium exhibition stand, 1st GMES & Africa Forum, Gabon</p> <p>8 The CSSTE Consortium chairing a technical session at the 1st GMES & Africa Forum, Gabon</p> <p>11 Technical session of partners at the 1st Regional Stakeholders & Technical Meeting, Abidjan</p> | <p>3 Cross section of participants at the 1st National Stakeholder's Meeting, Nigeria</p> <p>6 H.E. Sarah Anyang, AUC Commissioner for Human Resources Science and Technology (HRST) at the exhibition, Gabon</p> <p>9 Dignitaries at the 1st Regional Stakeholders & Technical, Abidjan</p> <p>12 Group Photograph of participants at the 1st Regional Stakeholders & Technical meeting, Abidjan</p> |
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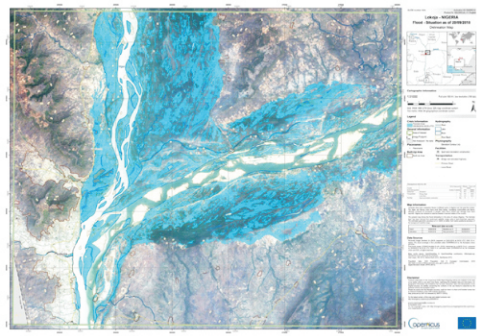
Useful Links of Partners/Stakeholders

COPERNICUS: www.copernicus.eu
 GMES blog: www.gmes4africa.blogspot.com
 SODEXAM: www.sodexam.com
 NADMO: www.nadmo.gov.gh
 NIHSA: www.nihsa.gov.ng
 NIMET: www.nimet.gov.org

Do you know that

The goal of GMES is to develop operational information services on a global scale, using both space and ground-based monitoring systems, in support of environment and security policy needs. Projects under GMES&Africa support programme use Copernicus EO data to develop services.

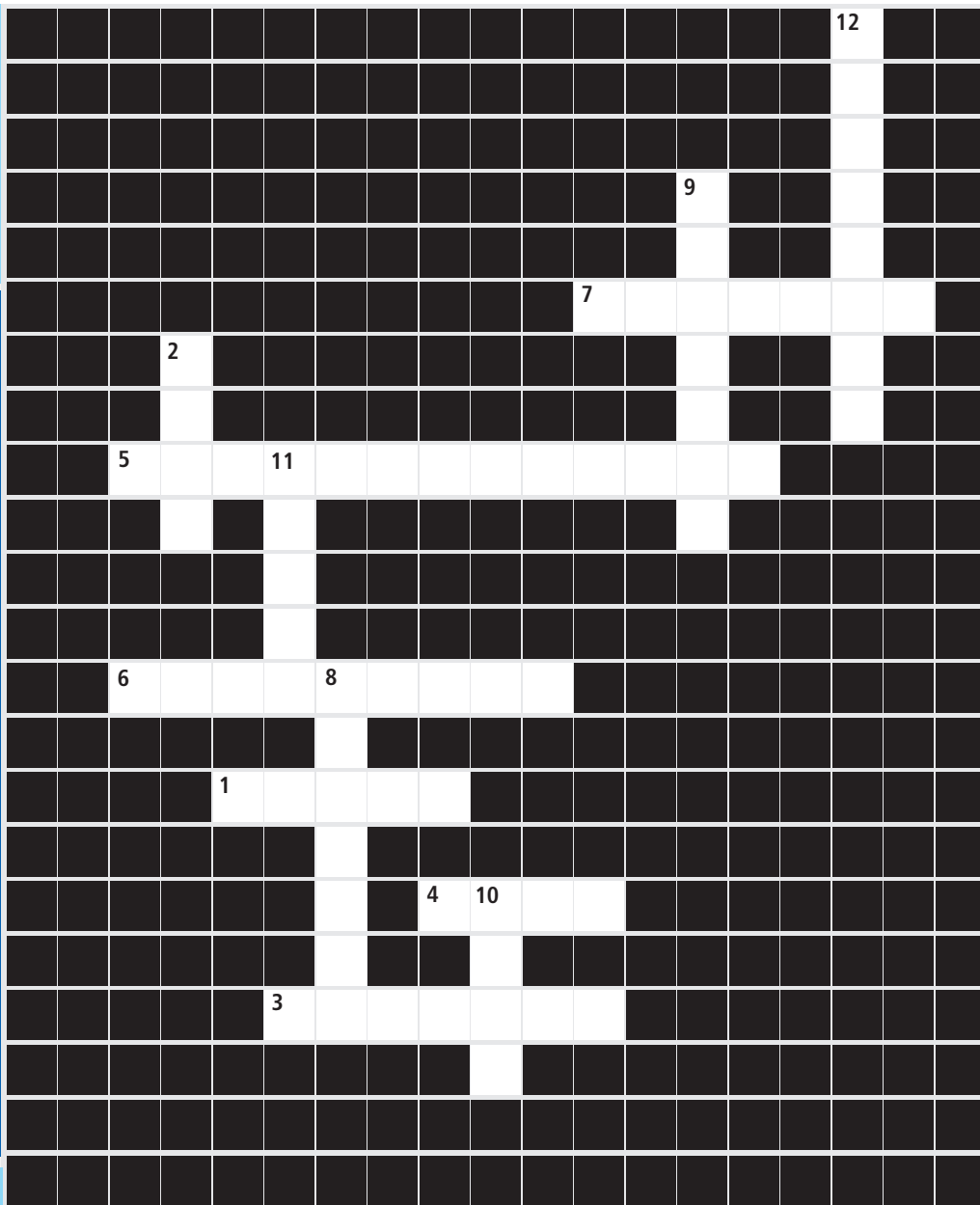
For more information about GMES & Africa, visit: gmes4africa.blogspot.com



Flooded areas in Lokoja, Nigeria, 2018
 (Copernicus EMS © 2018 EU)

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ACROSS

1. The curved path of a celestial object around a planet or moon.
3. The force that attracts a body toward the center of the earth.
4. The fourth planet from the sun
5. A group of stars that form a pattern in the sky.
6. A person who travels in space.
7. The planet nearest the sun.

DOWN

2. The natural satellite of the earth.
8. A spacecraft used to study a planet over a long period of time.
9. The line where the earth or sea seems to meet the sky.
10. The imaginary line that runs through earth.
11. Relating to or denoting the energy derived from the sun's rays.
12. The range of colors that appears in a beam of visible light.

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<https://bit.ly/CSSTE-GMES>

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GMES & Africa



Project funded by the European Union

A joint initiative of the African Union and European Union Commissions