



**13th Meeting of the International Committee
on Global Navigation Satellite Systems**
全球卫星导航系统国际委员会第十三届大会



International Committee on
Global Navigation Satellite Systems

GNSS Capacity Building in Africa French-Speaking Countries: Contribution of CRASTE-LF



African Regional Centre for Space Science and
Technology Education- in French Language
'CRASTE-LF' affiliated to UN

Anas EMRAN

Wyndham Grand Xi'an South Hotel 4 – 9 November 2018, Xi'an, RP China





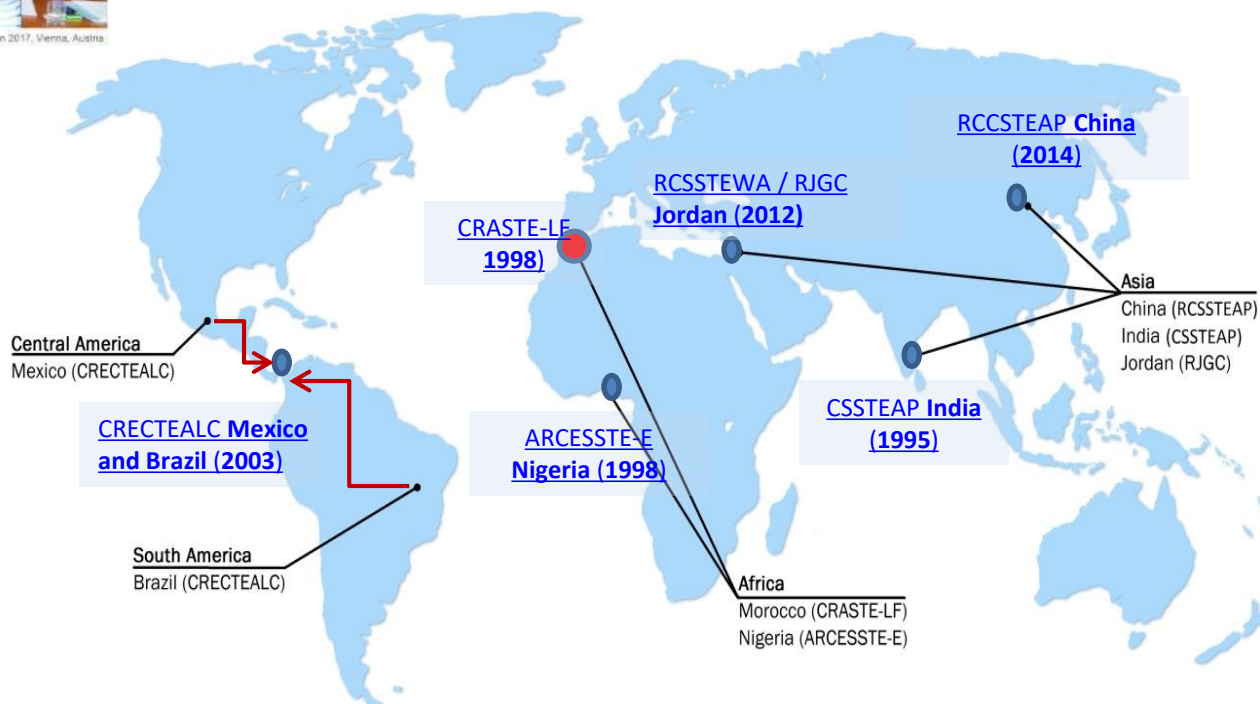
Meeting of the Directors, June 2017, Vienna, Austria

Juin 2017



Alliance
of Regional centres
affiliated to the UN

Regional Centres for Space Science and Technology Education
(affiliated to the United Nations)



<http://www.unoosa.org/oosa/en/ourwork/psa/regional-centres/index.html>



The CRASTE-LF was
established in Morocco
on 23 October 1998

under the initiative of the UNOOSA /UN General Assembly Resolution
- 45/72 of 11 November 1990
- 50/27 of 6 December 1995



13 Member States

Algeria – Cameroon - Cape Verde - Central African Republic - DR Congo - Côte d'Ivoire - Gabon
Morocco – Mauritania – Niger - **Senegal** – Togo - Tunisia



Objectives of the Centre

- To **increase knowledge** in Space Sciences and Technologies by organizing Postgraduate and/or Short courses, Seminars, Workshops, Conferences at the Regional level.
- To improve the technical **competences** of the **experts, teachers, decision-makers** and to hold them informed about technical progress .
- To **assist** the countries of the region on the development of endogens capacities in space tools.
- To **Strengthen** the Local and Regional Capacities.
- To promote **Cooperation** between the **Developed Countries** and **States Members** as well as among **these States**.
- To develop **expertise** in Space Sciences and Technology.
- **Provide advisory services to Member States** and regional institutions that have made the request.
- **Collect and disseminate information** related to space and space technologies.

Capacity Building





Postgraduate Training courses /Master

Main Courses Programs

Education Curricula established and Published by UN-OOSA for Regional Centres for Space Science and Technology Education in:



Remote Sensing & GIS



Satellite Meteorology & GC



Satellite Communications



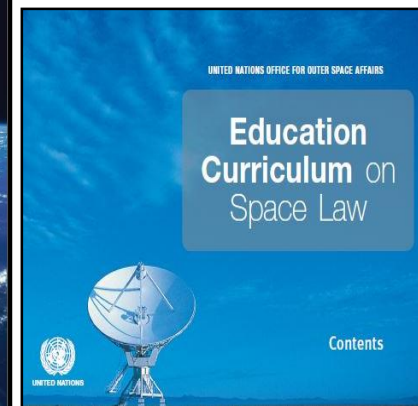
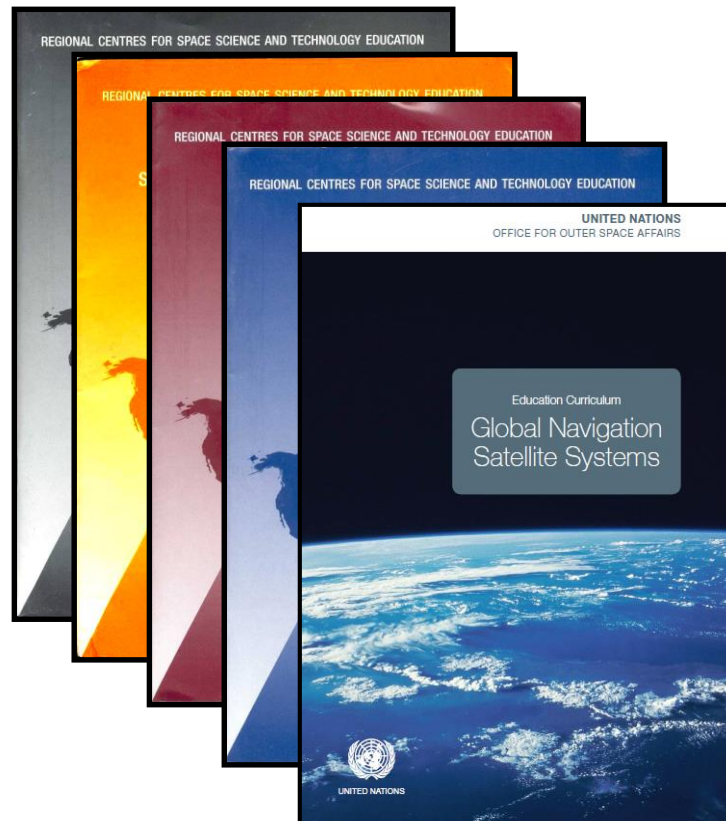
Space and Atmospheric Science



GNSS



Space Law





Postgraduate Training courses /Master

Since 2012, CRASTE-LF has agreed its post-graduate training in partnership with the Mohammed V University of Rabat and the Agronomic and Veterinary Institute Hassan II

Each Training Session takes place in 2 phases / in four (04) semesters



Phase I : 3 semesters , in CRASTE-LF, theoretical and practical courses, land study and pilot project.



Phase II: 1 semester (6 – 12 months), achieve the Research Project in their institution (their countries).



End of phase II : Defense of Memoire in Centre (Jury Members are Professors and Experts).

Detail of courses : http://www.unoosa.org/oosa/en/ourwork/psa/regional-centres/study_curricula.html
& www.crastelf.org.ma





Postgraduate Training courses /Master

Introductory lectures



Opening ceremony of the first accredited GNSS training course





Postgraduate Training courses

September 2018

Faculté des Sciences



كلية العلوم



Opening of the Postgraduate Training courses september 2018 with professors & students





Postgraduate Training courses /Master

Start-up meeting : students , administration and the coordinators of the Master



28	OULD AHMED ABDAM MOHAMED ABDELLAHI	Licence Professionnelle en Géologie Appliquée option : Géologie Minière	Ministère de l'Enseignement Supérieur et de la Recherche Scientifique	Mauritanie	
29	SGHIR ZAKARIAE	Licence d'Etudes Fondamentales Filière Sciences de la Terre et de l'Univers	Faculté des Sciences de Rabat	Maroc	
30	TINE DOME	Licence Es Lettres d'Enseignement Section Géographie	Ministère de l'Enseignement Supérieur et de la Recherche	Sénégal	
31	YABORO JEAN- NOEL	Master 1 en Biochimie	Ministère de l'Enseignement Supérieur et de la Recherche Scientifique	Centrafrique	



Postgraduate Training courses /Master

Theoretical class - practical work





Postgraduate Training courses /Master

Field trip - Ecology

- Ecologie végétale : vérité de terrain prise dans la région de Chefchaouen

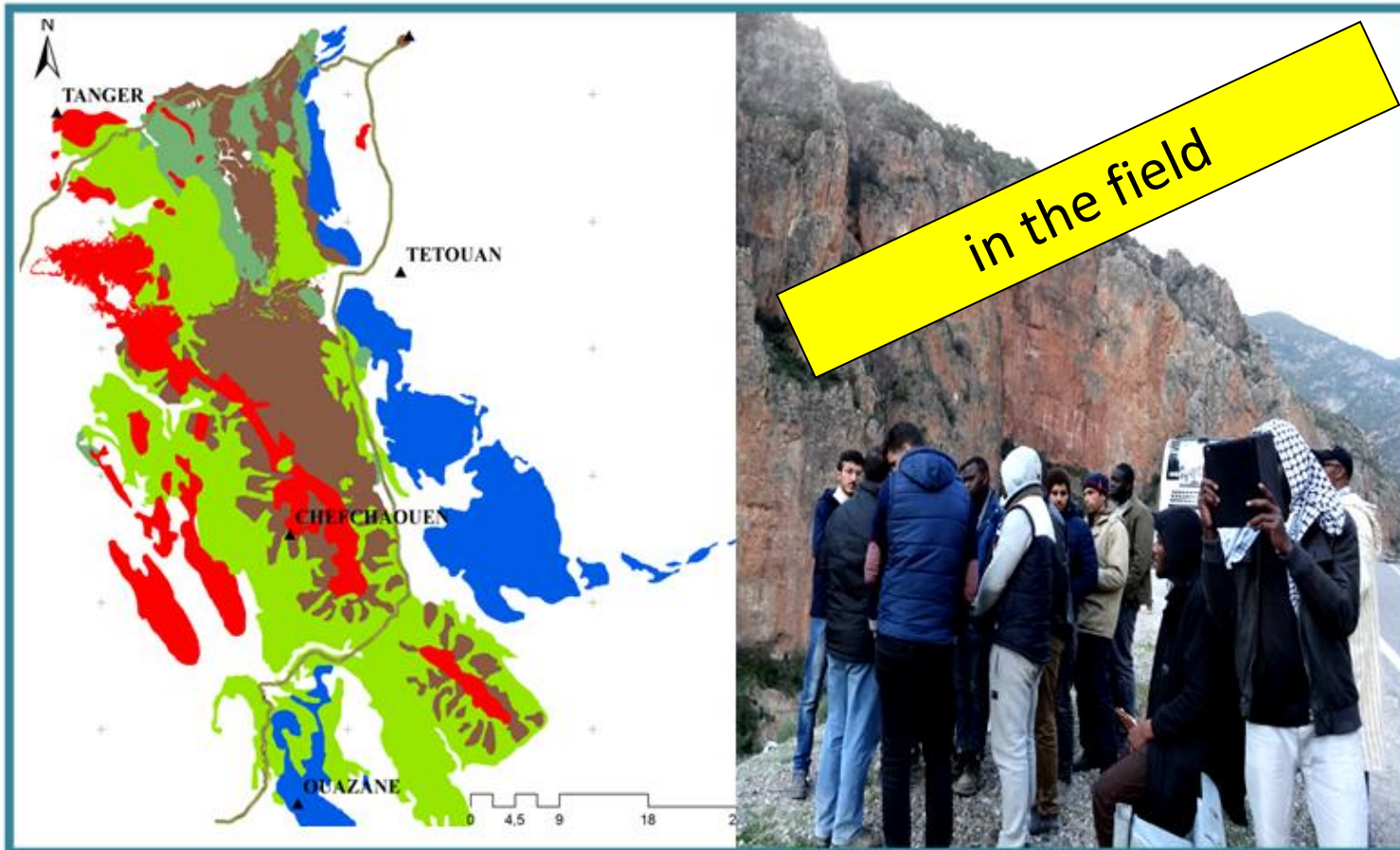




Postgraduate Training courses /Master

Field trip - Geology

- Géologie du Rif Occidental : coupe Chefchaouen – Oued Laou





Postgraduate Training courses /Master

Field trip - port infrastructure

Port industriel Tanger-Med



in the field





Postgraduate Training courses /Master

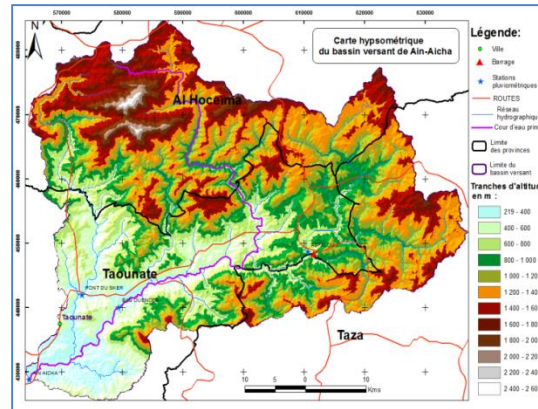
Participation in scientific events



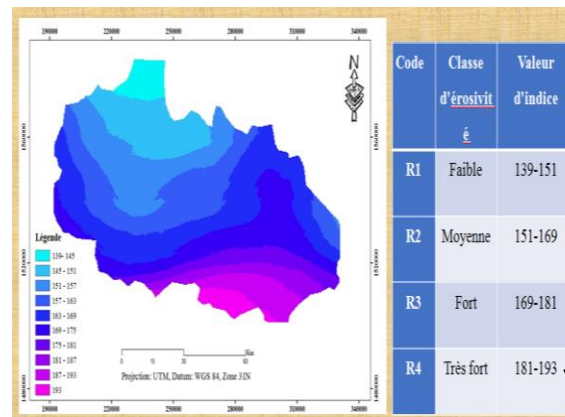


Postgraduate Training courses /Master

Master's Defense



Accéder à ce document en ligne



the defenses of memories





Postgraduate Training courses



Remote Sensing & GIS – **14 sessions** / **257 trainees**



Satellite Meteorology & Global Climate - **6 sessions** / **62 trainees**



Satellite Communications – **3 sessions** / **38 trainees**



Space Science and Atmospheric

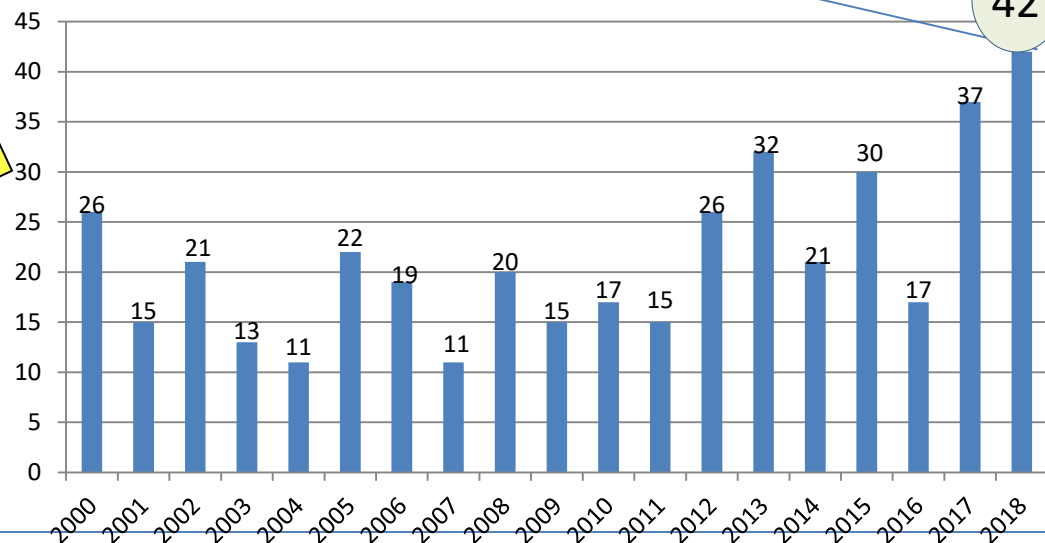


GNSS (Since 2012) – **4 sessions** / **53 trainees**



Space Law

Since 2000
27 sessions - **408 trainees**
22 countries

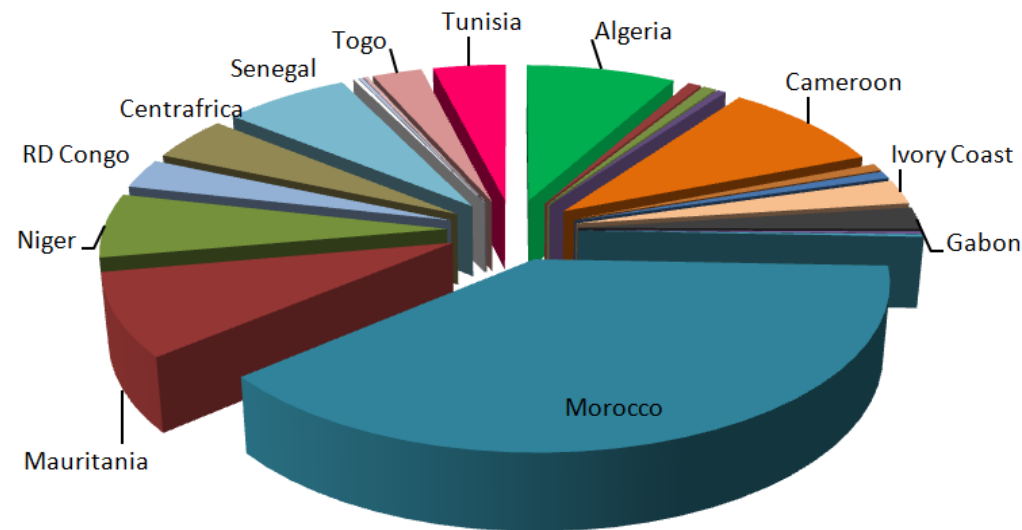




Postgraduate Training courses /Master

Country	Number
Algeria	33
Benin	3
Burkina Faso	3
Burundi	2
Cameroon	37
Cabo Verde	3
Congo (Brazzaville)	3
Ivory Coast	10
Gabon	9
Madagascar	1
Mali	1
Mauritania	34
Morocco	157
Niger	26
Congo DR	12
Central African Republic	18
Senegal	28
Swaziland	1
Syria	1
Chad	1
Togo	11
Tunisia	16
Total	410

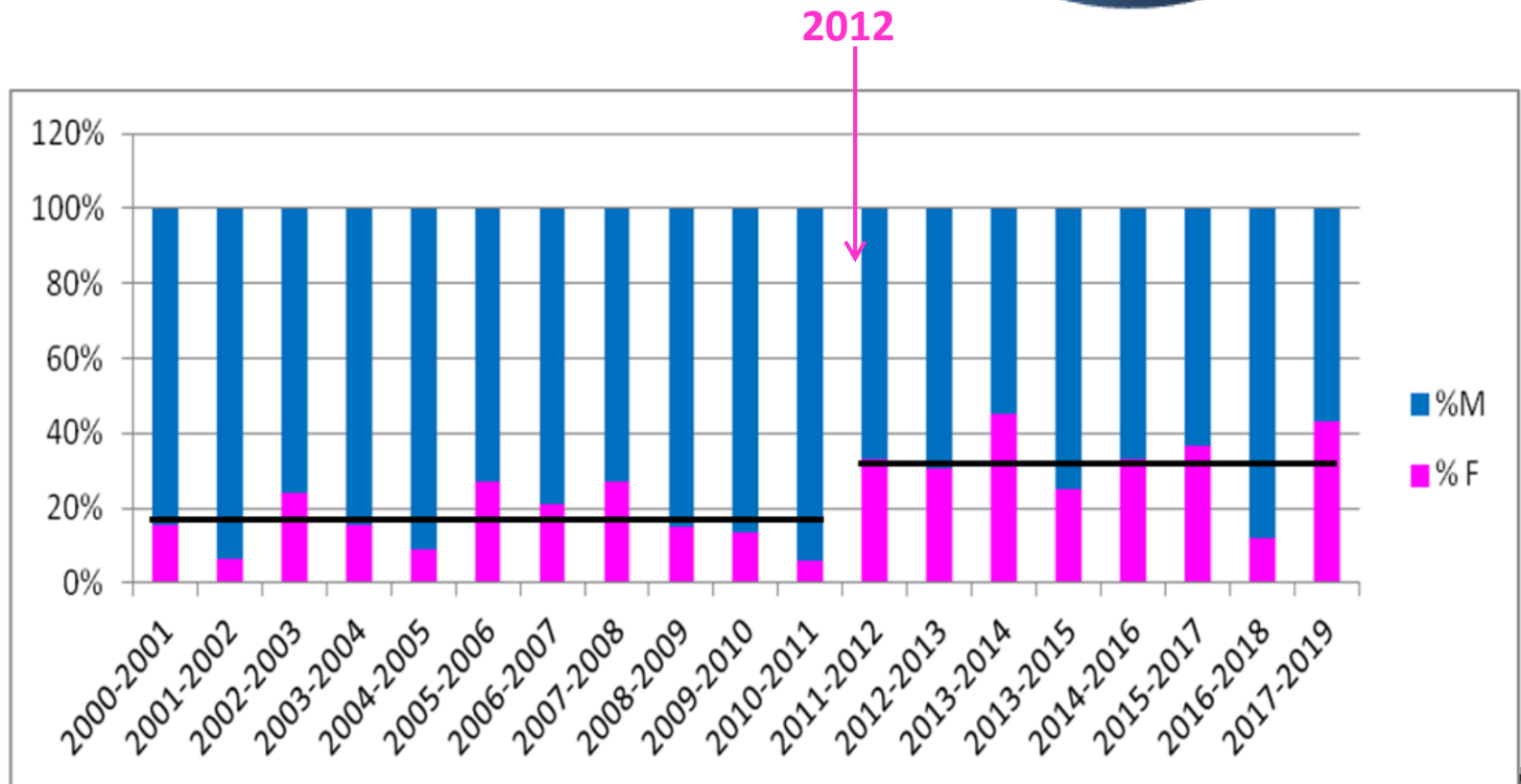
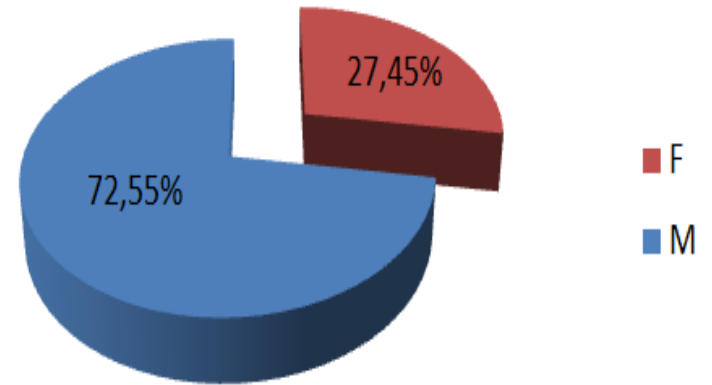
By Country %





Postgraduate Training courses /Master

Gender %





Postgraduate Training courses

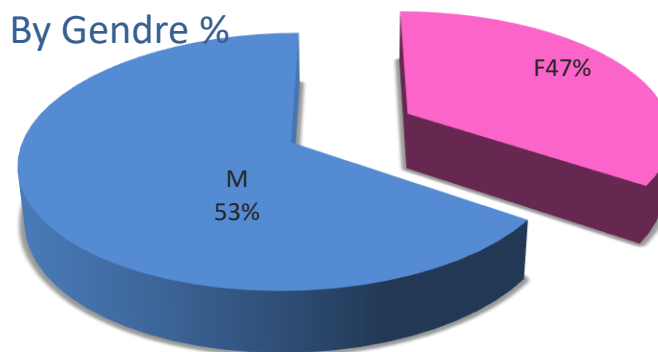
2017-2019

Distribution by gender

Females 37

Males 42

By Gendre %



Distribution by options

Option Nb /session

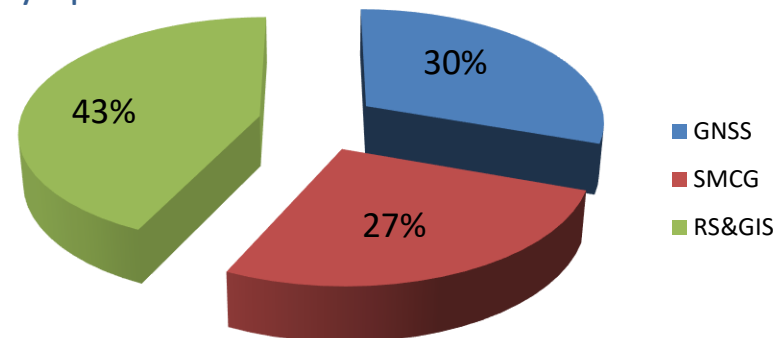
GNSS 24 /S23 & S26

MSCM 21 /S22 & S25

T&SIG 34 /S21 & S24

• Total 79 / 6 sessions

By option %



15 nationalities : Algeria – Benin – Burkina Faso – Burundi – Cameroon – Cabo Verde – Centrafica – Congo DR – Gabon – Morocco – Mauritania – Niger – Senegal – Togo - Tunisia

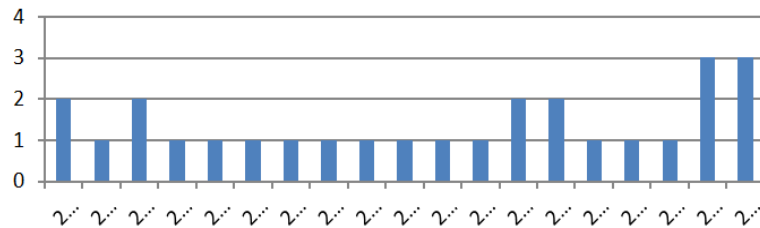




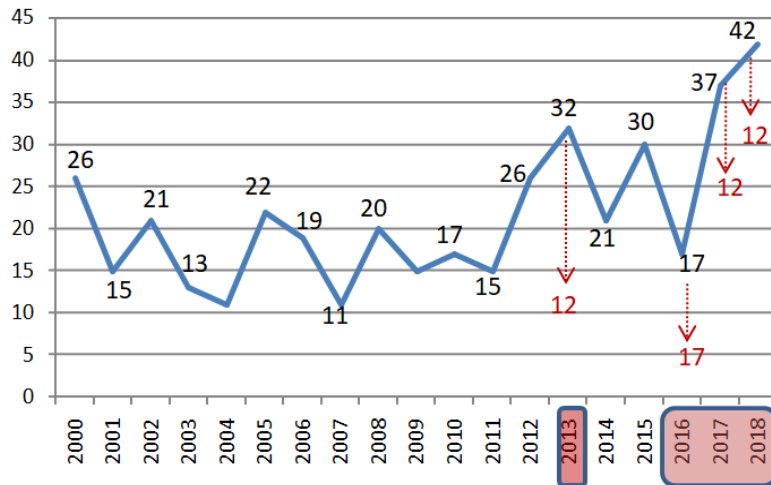
Postgraduate Training courses /Master

GNSS Sessions

Since 2013 - 4 GNSS sessions & 53 africans students



Number of promotions
per year



Number of students per
year

53 in GNSS





Short courses, Seminars, Workshops and Conferences

66 activities in space technologies (Short courses, Seminars, Workshops and Conferences).

Thematic :

Climate change
water resources
Agriculture
Health
....

Biodiversity
Drought
Disasters
GNSS
....

<http://crastelf.org.ma/event/>



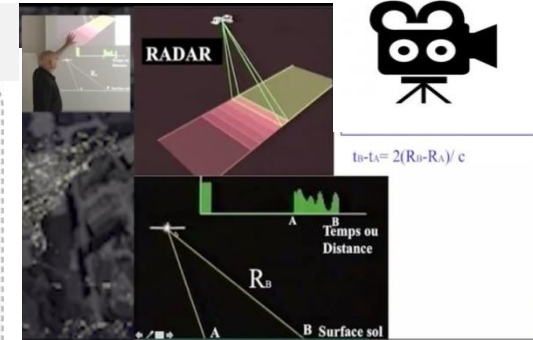
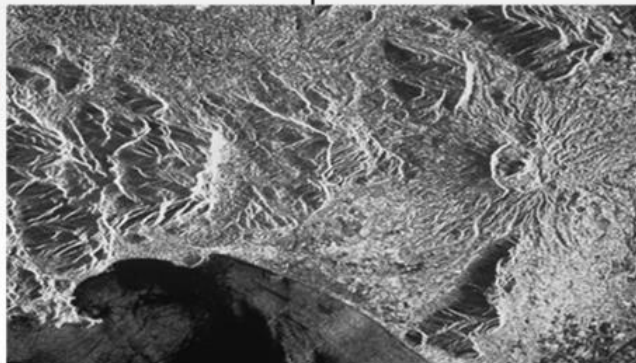


Short courses, Seminars, Workshops and Conferences

2016 - 1

EMI (Rabat, Morocco) January 14, 2016

Conférence Régionale sur «*l'Initiation et développement de cartographie géospatiale via Web pour la mutualisation et le partage de l'information géospatiale*», tenue à Rabat (Maroc), le 14 janvier 2016.



108 participants
13 Countries





Short courses, Seminars, Workshops and Conferences

2016 - 2

CNDT-MINRESI (Yaoundé, Cameroon) 3-5/5/2016



45 participants
3 Countries





Short courses, Seminars, Workshops and Conferences

GNSS Activity

2016 - 3

EMI (Rabat, Morocco) 23-26/5/5 2016



**25 participants
5 Countries**

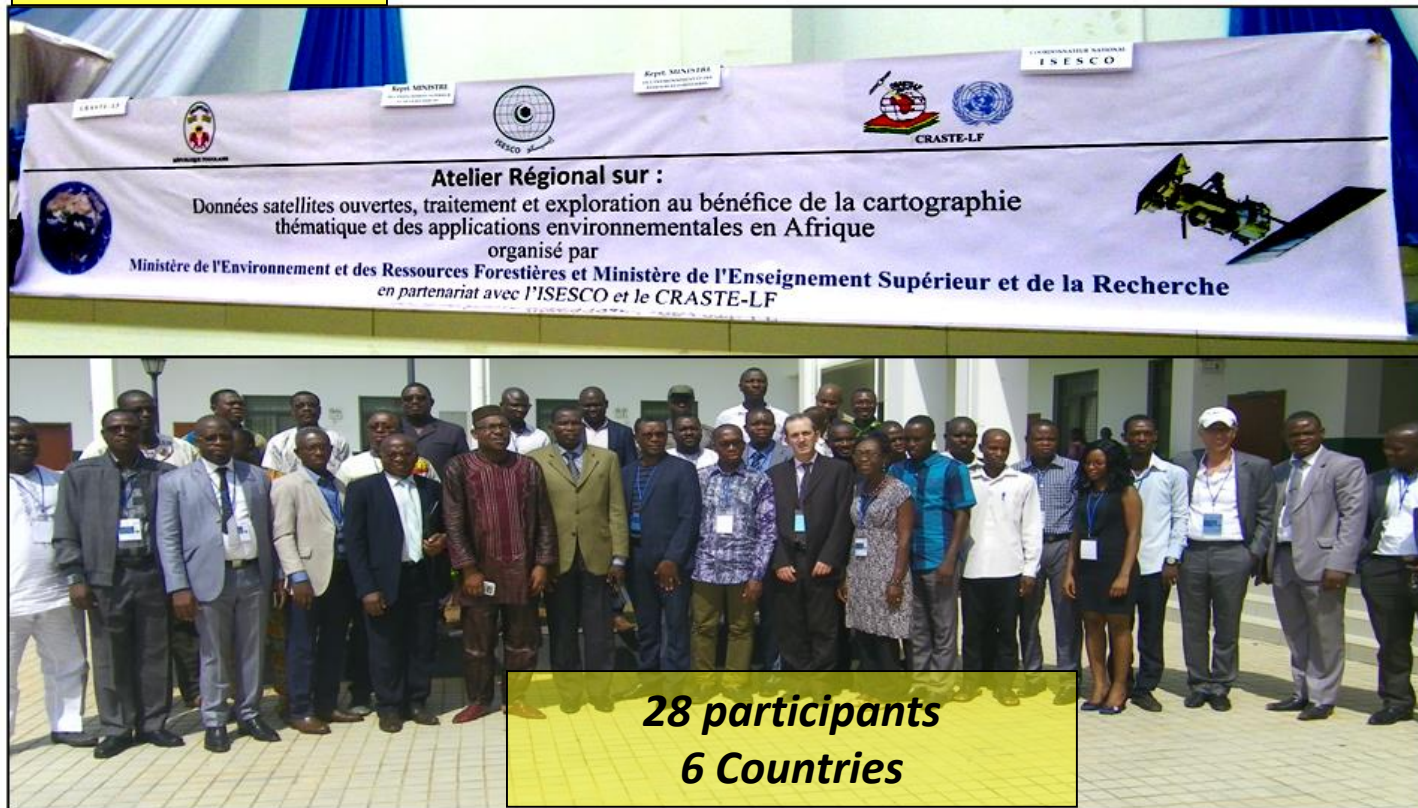




Short courses, Seminars, Workshops and Conferences

2016 - 4

Lomé University (Togo) 22-22/12/2016





Short courses, Seminars, Workshops and Conferences

GNSS Activity

2017- 1

EMI (Rabat, Morocco) 12-20/1/ 2017

Formation de courte durée sur «Les traitements GPS appliqués à l'ionosphère» tenue à Rabat (Maroc), du 16 au 20 janvier 2017.



**21 participants
5 Countries**





Short courses, Seminars, Workshops and Conferences

2017- 2

AGEOS (Libreville, Gabon) 3-6/7/ 2017

Workshop Régional sur «La télédétection multi-échelle au service du développement durable : du satellite au drone TMDD» tenu à Libreville-AGEOS (Gabon), du 3 au 6 juillet 2017.



MESRSFC GABON



AGEOS
AGENCE GABONAISE D'ÉTUDES
ET D'OBSERVATIONS SPATIALES



**40 participants
7 countries**





Short courses, Seminars, Workshops and Conferences

GNSS Activity

UFHB (Givenchy, Côte d'Ivoire) 16-28/10/ 2017

Formation de courte durée «3^{ème} édition de l'école de météorologie de l'espace - IMAO 2017»
tenue à Abidjan (Côte d'Ivoire), du 16 au 28 octobre 2017.

Sous le Haut Patronage du Ministère de l'Enseignement Supérieur et de la Recherche
Scientifique de la République de Côte d'Ivoire

**49 participants
12 Countries**





Short courses, Seminars, Workshops and Conferences

2017- 5

CURAT-UFHB (Abidjan, Côte d'Ivoire) 25-27/10/ 2017



**90 participants
6 Countries**





Short courses, Seminars, Workshops and Conferences

Activities in 2018

1. Regional Workshop : '**GNSS** BEIDOU' in collaboration with RCSSTEAP-China **April Rabat (Morocco)**
2. Regional Workshop : '3D forest mapping from Lidar data and optical satellite imagery in collaboration' with ISESCO and Cameroon authorities **May Yaoundé (Cameroon)**
3. International Conference 'African Large Rivers Basin Hydrology' with Medfriend **May Algiers (Algeria)**
4. Regional Workshop : '**GNSS** applications' in collaboration with ISESCO **July Ouagadougou (Burkina Faso)**
5. Regional Workshop : 'Microsatellite and nano satellite technologies' in collaboration with RCSSTEAP-China **October Rabat (Morocco)**
6. Regional Workshop : '**GNSS** applications_ SBAS' in collaboration with JPO (Joint Programme Office) & Egnos-Africa **November Dakar (Senegal)**
7. Regional Workshop : 'Applications of Remote sensing and GIS in Earth Sciences' in collaboration with **AIDMO September Rabat (Morocco)**





Short courses, Seminars, Workshops and Conferences

2018- 1

GNSS Activity

**Short Course : 'Global BeiDou Satellite Navigation System (BDS)'
EMI (Rabat, Maroc) 23-26 April 2018**

Formation de courte durée sur le
Système Mondial de Navigation par
Satellite BeiDou (BDS)

Rabat, Maroc 23 - 26 avril 2018

[Détails](#)



39 participants - 7 Countries





Short courses, Seminars, Workshops and Conferences

2018- 2

Regional Workshop : '3D Forest Mapping from Lidar Data and Satellite Images'

CNDT-MINRESI (Youndé, Cameroon) 2-4/5/2018



La cartographie forestière en 3D à partir des données Lidar et des images satellitaires optiques

Yaoundé, Cameroun, du 30 avril au 4 mai 2018

Présidé par Son Excellence Madame le Ministre de la Recherche Scientifique et de l'Innovation du Cameroun

[Détails](#)



35 participants - 9 Countries





Short courses, Seminars, Workshops and Conferences

2018- 5

GNSS Activity

Regional Workshop : 'GNSS : Foundation and Applications'

(Ouagadougou, Burkina Faso) 9-12 /07/2018



Systèmes Mondiaux de Navigation
par Satellite (GNSS)
Fondements et Applications

Ouagadougou, Burkina Faso, du 9 au
12 juillet 2018

[Détails](#)



35 participants - 9 Countries





Short courses, Seminars, Workshops and Conferences

2018- 8

Regional Workshop : 'Microsatellites Technology'

EMI-CRASTE-LF (Rabat, Morocco) 22-26/10/2018



Conference :121 participants - 15 Countries

Workshop : 29 participants – 7 countries





Short courses, Seminars, Workshops and Conferences

2018- 10

Regional Workshop : 'GNSS- Augmentation par satellites (SBAS)'

JPO (Dakar, Senegal) 13-15/11/2018

GNSS Activity





Short courses, Seminars, Workshops and Conferences

2018- 10

Regional Workshop : 'Contribution of Earth Observation Techniques to Geological Mapping and Mining Prospecting'

Scientific Institute (Rabat, Morocco) 10-14/12/2018

The poster features logos at the top for Institut Scientifique Université Mohammed V UMS, ONHYM (Organisation Nationale des Hydrographes et des Hydrographes), CRASTE-LF (Centre Régional pour l'Analyse Spatiale et la Télédétection), and the United Nations. The title is in French: « Contribution des techniques de l'Observation de la Terre à la cartographie géologique et à la prospection minière ». The location and dates are: Royaume du Maroc, Rabat, 10-14 Décembre 2018. The poster includes four images: a 3D geological map, a satellite view of Earth, a person using a tablet, and a drone. The section 'Présentation de l'activité' describes the use of remote sensing and GIS for geological mapping and mining prospecting, highlighting the importance of satellite data and the need for technical skills in developing countries.

Workshop Régional (Formation)

« Contribution des techniques de l'Observation de la Terre à la cartographie géologique et à la prospection minière »

Royaume du Maroc, Rabat, 10-14 Décembre 2018

Présentation de l'activité

La télédétection spatiale et les Systèmes d'Information Géographique (SIG), communément appelés les techniques de l'Observation de la Terre (OT), constituent désormais des outils incontournables dans l'analyse et l'extraction de l'information géologique, notamment, l'établissement des cartes géologiques et le développement des travaux de recherche et de prospection minière.

Sur le plan pratique, il existe actuellement énormément de données satellitaires, souvent libres et gratuites, ainsi que des données acquises par des missions aériennes de haute qualité technique. Cependant, le manque de compétences dans les pays du sud empêche une exploitation adéquate de ces données et l'extraction des informations thématiques, notamment celles afférentes aux sciences de la terre.





Short courses: Seminars, Workshops and Conferences

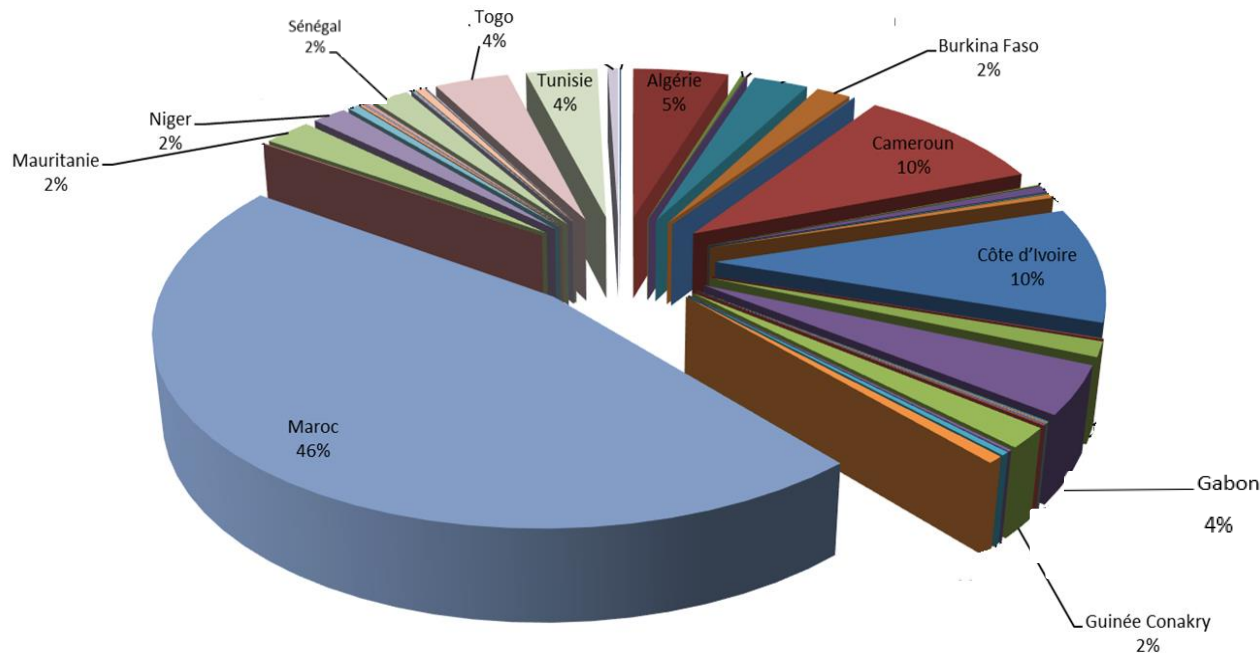
2010-2017

-29 conferences

-2074 participants

- 40 countries

Conferences





Short courses, Seminars, Workshops and Conferences

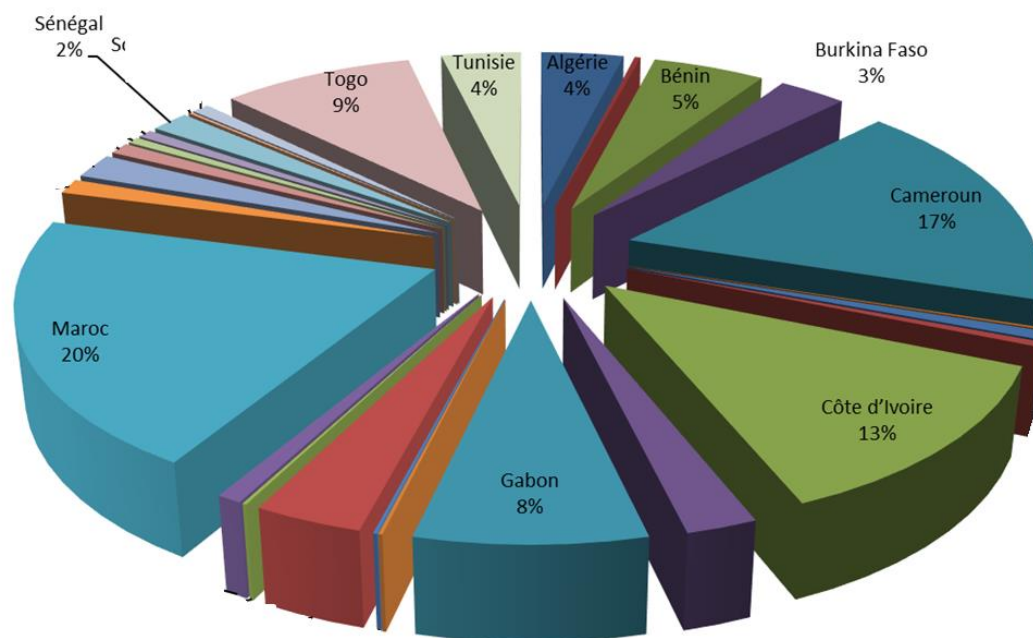
2010-2017

- **25** Short Courses

- **725** participants

- **27** countries

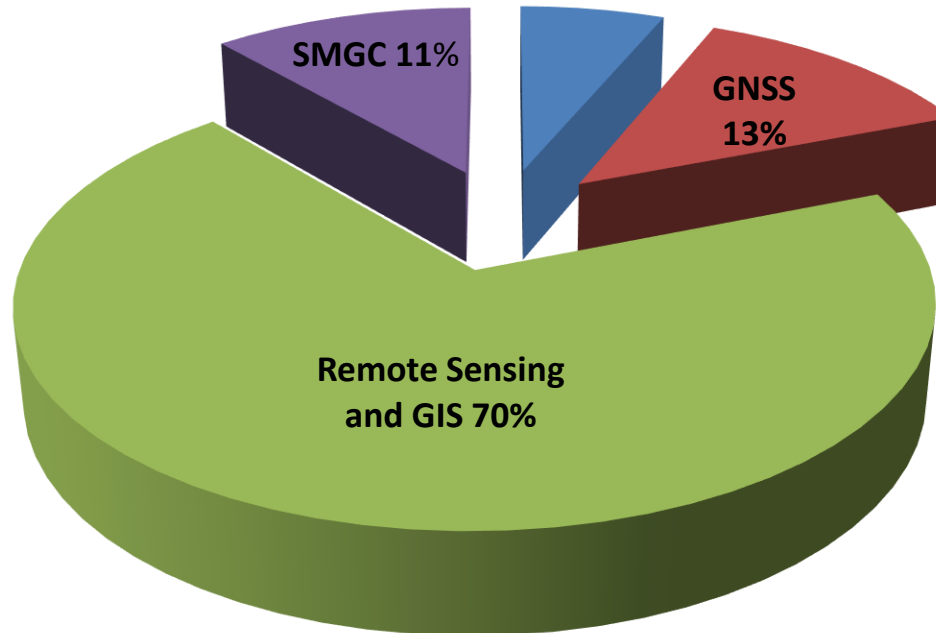
Short courses





Short courses, Seminars, Workshops and Conferences

% Number of participants



GNSS activities : 7

- 2 in 2017

- 3 in 2018

**Number of
participants : 345**





The dissemination of EO & CB



- By putting data and educational resources created in the scientific events on the CRASTE-LF website crastelf.org.ma :

crastelf.org.ma

Centre Régional Africain des Sciences et Technologie de l'Espace en Langue Française

Affilié à l'ONU

Accueil Formation Conseil d'administration Produits OT

Formation

Le programme de formation du centre est orienté vers la diffusion des connaissances dans le domaine des sciences et tech l'espace. Initialement, le centre devra offrir un enseignement en profondeur, un programme global de formation et les bases des projets pilotes , une formation continue, une perception et évaluation des programmes. Ce programme bénéficiera des spécialistes et professionnelles touchant la technologie spatiale.

Le centre offre des cours de formation pour les universitaires, chercheurs, administrateurs suivantes:

1. **Télédétection et système d'information géographique**
2. **Télécommunications par satellite**

Produits OT

- Scientifique
- Organisation
- Géographique
- Télécharger d'images satellitaires
- Logiciels libres pour SIG
- Antenne ICG
- Antenne LANDSAT

the CRASTE-LF is trying to conduct a data dissemination policy adapted to the region





- By establishing the link with other geoportals such as the GEOCAB, GEOSS etc



- By developing Open Geoportal Data



Approche Spatialisée de l'Impact des activités agricoles au Maghreb sur les transports solides et les ressources en Eau De grands bassins versants

ENGLISH FRANÇAIS

HOME PROJECT DATA AND GIS PICTURES

You are here: [Accueil](#) > [Data and GIS](#) > The maps

The maps

SIGMED GEOPORTAL (Bouregreg Success Story - Morocco)

MAPS

The contour of the basin, click on:

Pedology, click on:

The hydrographic network click on:

Bouregreg Sub-basins click on:

Administrative divisions click on:

vegetation click on :

Geology click on :





Participation in some European Research Program by promoting the Earth Observation for development in the African countries



**GMES
AND AFRICA**





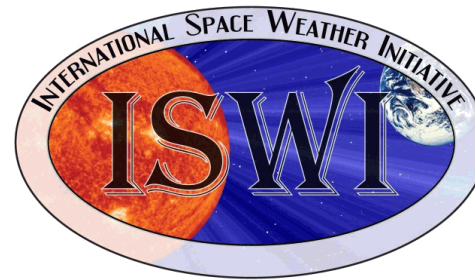
Cooperation

International

Regional and International organisations



UNOOSA



Centres Régionaux

CSSTE-AP - **India**

CSSTE-EL - **Nigéria**

CRECTEALC - **Mexique**

RCSSTEWA - **Jordanie**

RCSSTEAP - **Chine**



**Alliance of Régional Centres
affiliated to UN**





Cooperation

International

Regional and International organisations





Cooperation

National

National organisations and institutions



Office National des
Oeuvres Universitaires,
Sociales et Culturelles

