

# Les projets Copernicus et H2020 chez SIRS : de l'implémentation à la conception

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Groupe de travail en Observation  
de la Terre (GT EO)

Wavre  
Mardi 20 septembre 2016

# A propos de SIRS...



## Prestataire de Services en Observation de la Terre



- PME (40 personnes)
- Indépendante
- Existe depuis 1989
- Siège à Villeneuve d'Ascq (Lille), France
- CA : 4 M €

- Principales activités:
- Suivi des territoires:
  - Planification urbaine
  - Aménagement du territoire
  - Forêt
  - Environnement
- Cartographie Opérationnelle:
  - Urgence (catastrophes)
  - Défense, Sécurité
- Contrôles réglementaires:
  - Eau, Forêt & Agriculture

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## Programme d'Observation de la Terre pour l'environnement et la sécurité de l'Union Européenne: **6 services 'core'**

### 1. Territoires

- Global
- Pan-Européen: Corine Land Cover, couches hautes résolutions (HRL)
- Local: Urban Atlas,...

### 2. Urgences

- GIO Emergency Mapping Services: Rush and Non-Rush

### 3. Sécurité

- FP7 GNext

### 4. Océan

### 5. Atmosphère

### 6. Changements climatiques

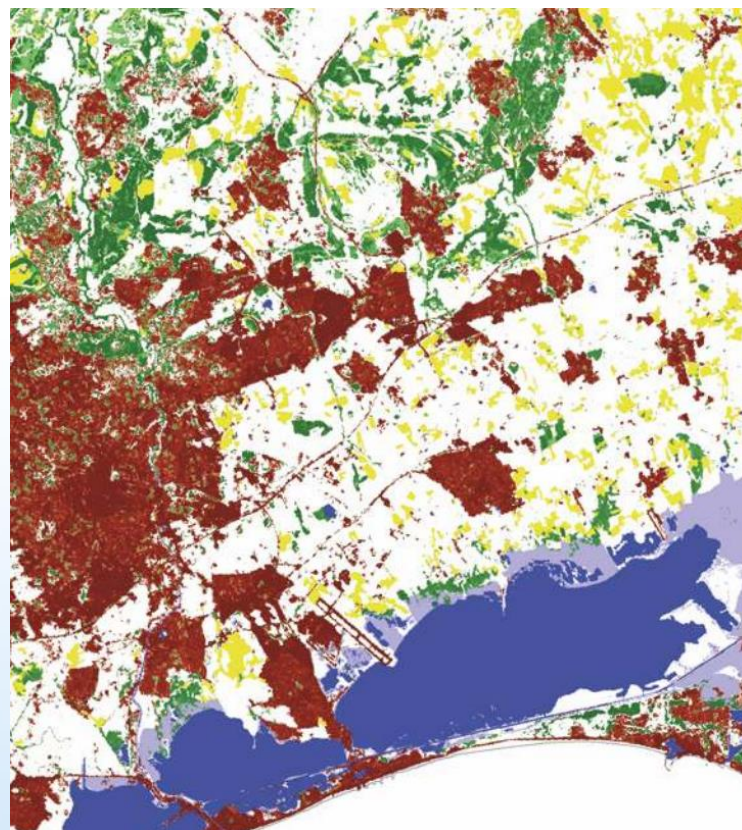
- **SIRS** est une des rares PME présentes sur trois des six services 'core'.



# Couches Haute Résolution (HRL)



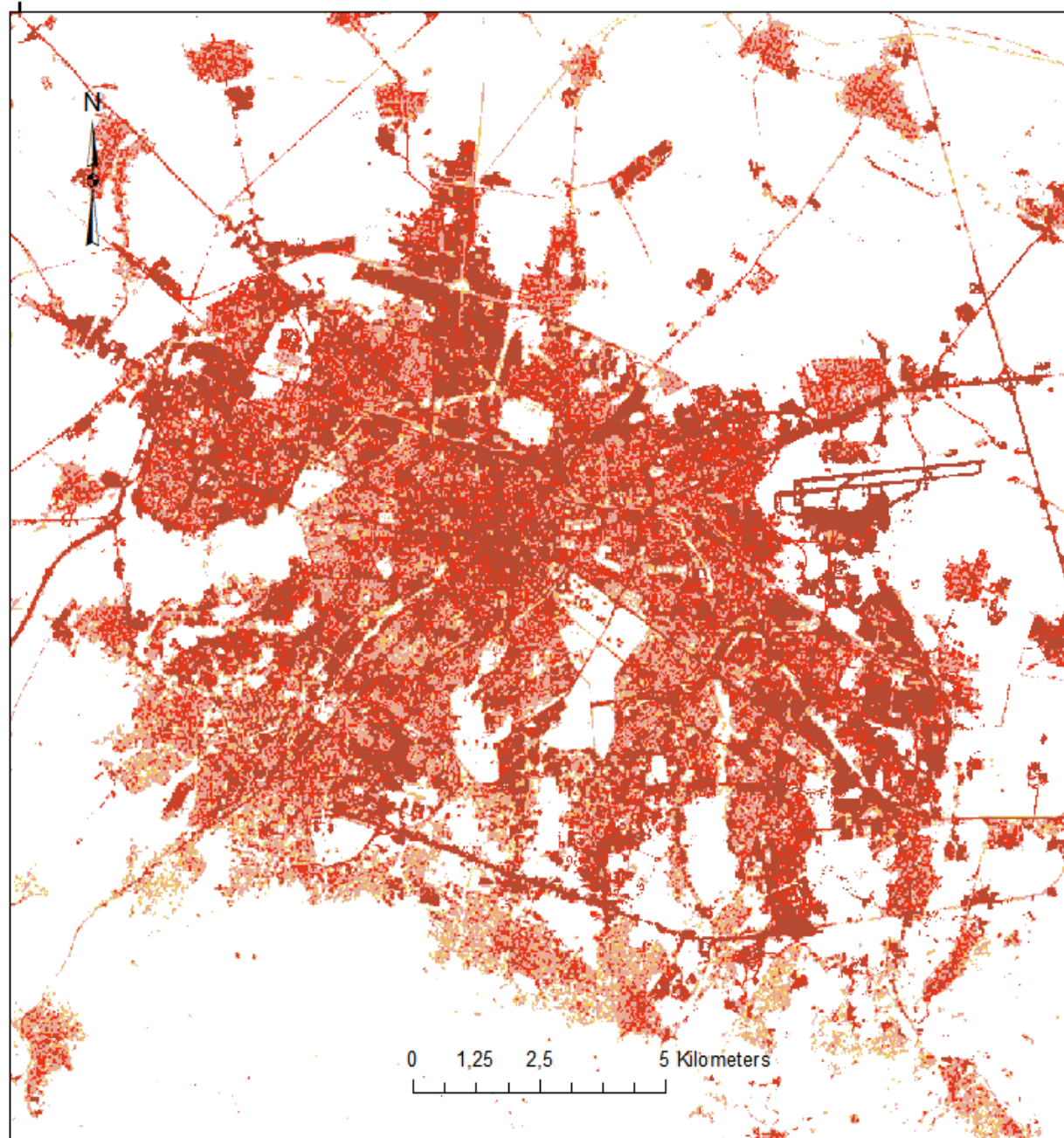
- 5 couches haute résolution:
  - Imperméabilisation
  - Forêt
  - Surface en eau permanente
  - Zones humides
  - Prairies permanentes
- Couverture continue à l'échelle européenne sur plus de 39 pays
- Objectif: fournir des couches à plus haute résolution spatial et temporelle par rapport à CORINE Land Cover sur 2012
- Nouveau projet HRL 2015



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5 400 000



5 400 000

## Degree of Imperviousness 2012 - Bulgaria

### Legend



 No Degree of Imperviousness 2012 produced

 Degree of Imperviousness 2012 produced

### National Reference System

Projection : European projection systems  
Ellipsoid : GRS\_1980



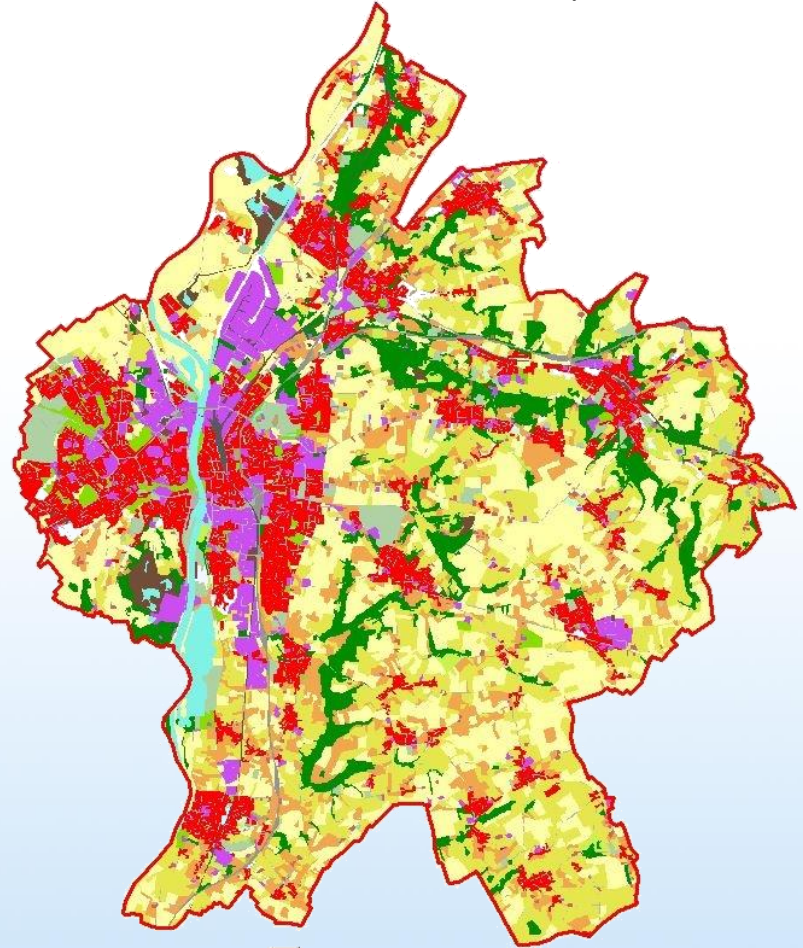


# Urban Atlas 2012



Maastricht UA2012 LC/LU

- Carto 1/10.000 (27 classes)
- 305 → 695 villes (50.000 hab.)
- Presque 1 million km<sup>2</sup> (EU28)
- Precision de position. <5m
- 3 produits vectoriels:
  1. Detailed land cover/Land Use
  2. Urban Atlas 2006-2012 changes (for around half of total UA2012 area)
  3. Street Tree Layer



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# Atlas Urbain: Classes thématiques



- 11100: Continuous Urban fabric (S.L. > 80%)
- 11210: Discontinuous Dense Urban Fabric (S.L.: 50% - 80%)
- 11220: Discontinuous Medium Density Urban Fabric (S.L.: 30% - 50%)
- 11230: Discontinuous Low Density Urban Fabric (S.L.: 10% - 30%)
- 11240: Discontinuous very low density urban fabric (S.L. < 10%)
- 11300: Isolated Structures
- 12100: Industrial, commercial, public, military and private units
- 12210: Fast transit roads and associated land
- 12220: Other roads and associated land
- 12230: Railways and associated land
- 12300: Port areas
- 12400: Airports
- 13100: Mineral extraction and dump sites
- 13300: Construction sites
- 13400: Land without current use
- 14100: Green urban areas
- 14200: Sports and leisure facilities
- 20000: Agricultural, semi-natural and wetland areas
- 30000: Forest
- 50000: Water

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- 13100: Mineral extraction and dump sites
- 13300: Construction sites
- 13400: Land without current use
- 14100: Green urban areas
- 14200: Sports and leisure facilities
- 21000: Arable land (annual crops)
- 22000: Permanent crops
- 23000: Pastures
- 24000: Complex and mixed cultivation patterns
- 25000: Orchards
- 31000: Forests
- 32000: Herbaceous vegetation associations
- 33000: Open spaces with little or no vegetations
- 40000: Wetlands
- 50000: Water

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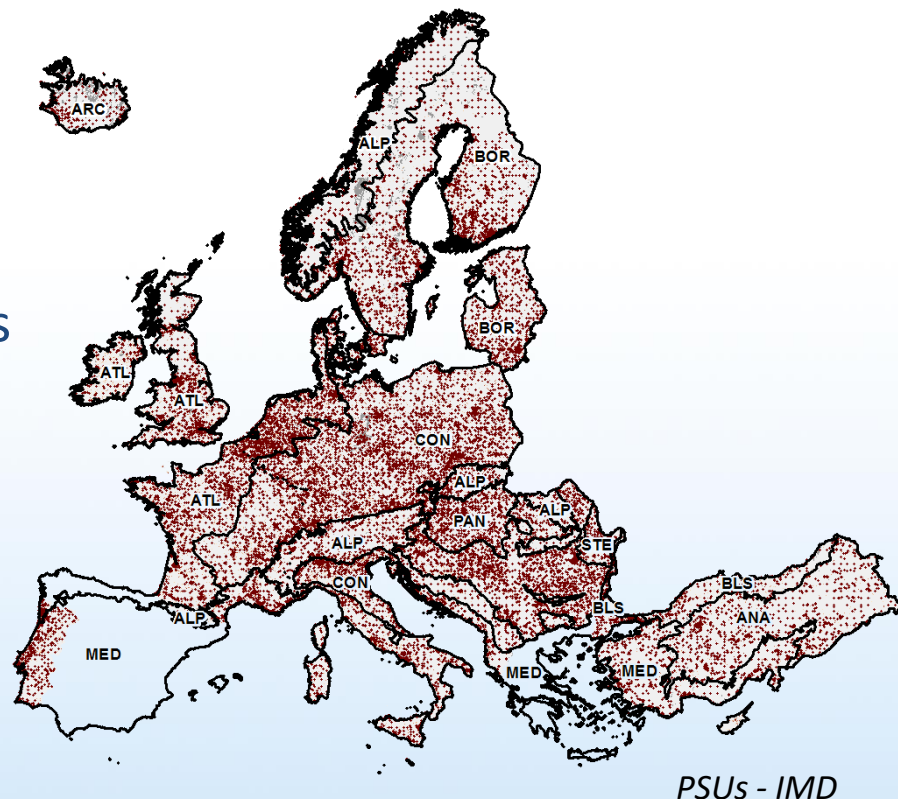




# Validation des produits Copernicus Land



- Élaborer une stratégie de stratification et d'échantillonnage statistique solide adaptée à chaque produit
  - Vérification de la cohérence
  - Précision thématique
- Mettre en œuvre la validation des produits sélectionnés et fournir un rapport de validation détaillé
  - Par pays ou groupes de pays
  - Par régions bio-geographiques
  - À l'échelle européenne
- Rapports préliminaires sur :  
<http://land.copernicus.eu/>



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# Validation de 20 produits Copernicus



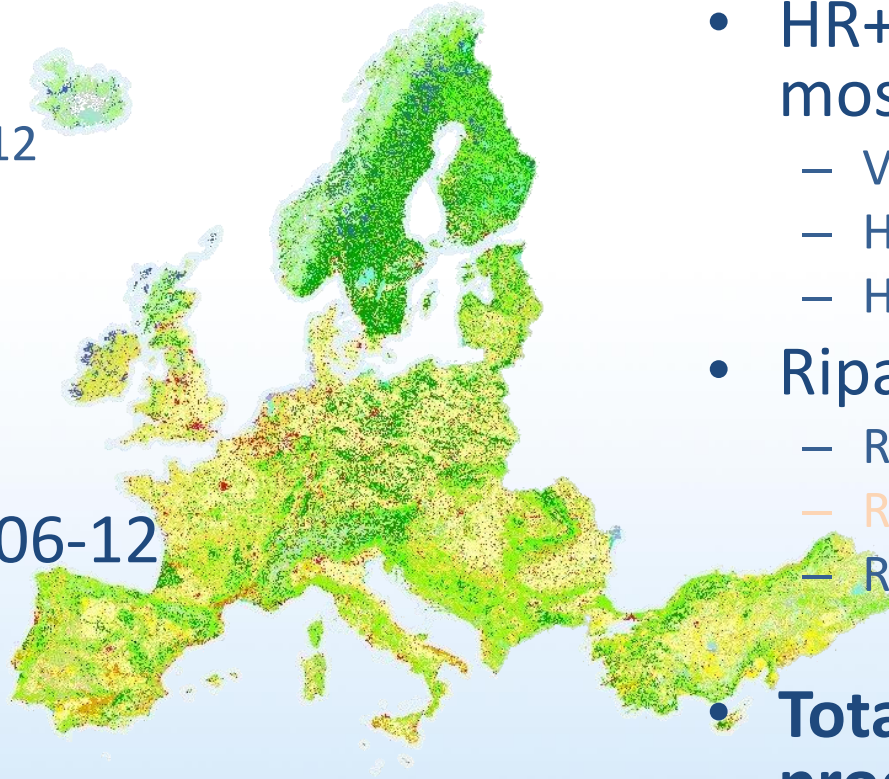
- 5 HR Layers

- IMD2012/IMC 2006-09 / 200912
- TCD
- FTY
- GRA/NGR
- PWB
- WET

- CLC2012/CLCC06-12

- UA2012

- UA2012 LCLU
- UAC2006-12
- STL



- HR+VHR image mosaics

- VHR mosaics
- HR cov1 mosaic
- HR cov2 mosaic

- Riparian Zones

- RZ LCLU
- RZ Del
- RZ GLE

- **Total of 20 products**

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## GIO-EMS (*Emergency Management Service*)

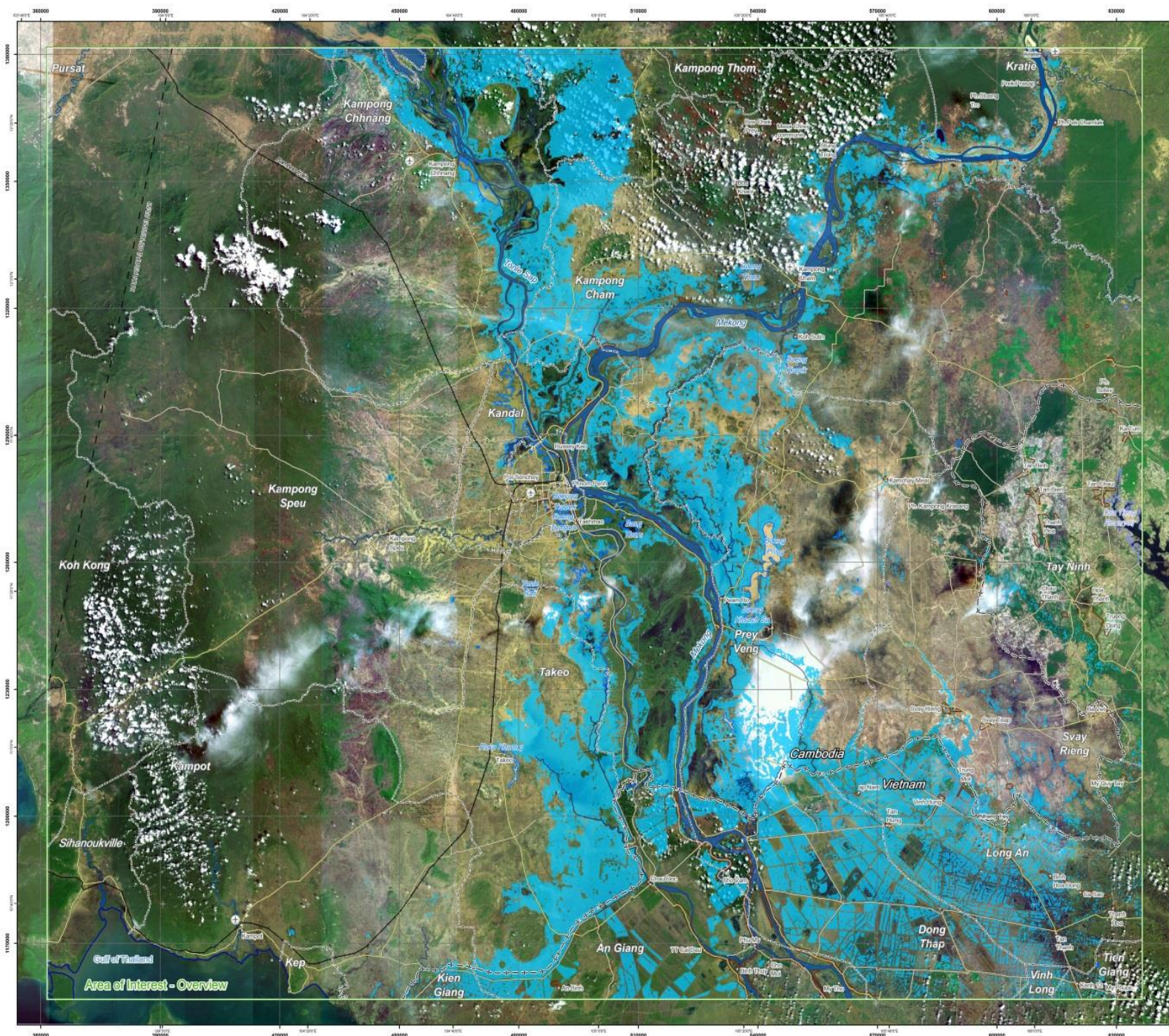
- Service actif depuis Avril 2012, disponible 24h/24, 7j/7
- Catastrophes naturelles majeures en Europe et dans le reste du monde
- Production de données vectorielles et de cartes de situation avant (REFERENCE) et après la catastrophe (POST-EVENT : délimitation des zones affectées, évaluation des dégâts causés sur les infrastructures et milieux) sur la base d'une analyse d'images satellitaires (optiques et/ou radar)
- Délai de livraison : 6h (REFERENCE), 3h-24h (POST-EVENT) à réception des images
- Utilisateurs : Services de protection civile des Etats membres, services de l'UE, institutions non gouvernementales (Nations Unies, WB, etc.)



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GLIDE number: TC-2013-000120-49H4
Activation ID: EMRS-052
Product N: 02PhnomPenh\_v1

### Phnom Penh - CAMBODIA

#### Flood - 28/09/2013

#### Delineation Map - Overview

Production date: 10/10/2013

#### Cartographic Information

1:425000  
Full color ISO A1, high resolution (300 dpi)

0 5 10 20 km

Grid: WGS 1984 UTM Zone 48N map coordinate system  
Tick marks: WGS 84 geographical coordinate system

N

#### Legend

##### Crisis Information

- Flooded Area (09/10/2013 22:30)

##### General Information

- Area of Interest
- Sensor Footprint

##### Administrative boundaries

- International boundary
- Region

##### Settlements

- Populated Place
- Residential

##### Transportation

- Aerodrome
- Railway
- Primary Road
- Secondary Road

##### Hydrology

- Coastline
- River
- Lake
- Reservoir

|                      | Official | Final AOI |
|----------------------|----------|-----------|
| Flooded area         | km²      | km²       |
| Estimated population | 200      | 10 000    |
| Primary roads        | km       | 1 000     |
| Secondary roads      | km       | 1 000     |
| Rivers               | km       | 100       |
| Aerodromes           | 0        | 0         |

#### Map Information

During September 2013 Cambodia has suffered from the impact of low pressure system and tropical storms. The heavy rainfall and the Mekong river flooding in less than three weeks have claimed tens of thousands of lives and affected more than 100 000 families and about 100 000 hectares of rice seedlings are also inundated.

Thousands of people have been displaced and are being hit by flooding. Many roads, bridges, and infrastructure are damaged. The situation is very serious and the need for humanitarian aid is urgent.

The scope of the map is to provide support to planning and rescue operations.

#### Data Sources

Map data based on: Administrative boundaries (JRC, 2013, GISC2, 2010, © EuroGeographics, Hydrography, Transportation (Natural Earth, 2012, Software: GeoNames, 2013), RADIARAT 2 (© MDA, acquired on 09/10/2013 at 22:30 UTC, GSD 50 m) provided under ESA-GSD-CA-2009 License.

Latest GSD-CA-2009 License: Latest GSD-CA-2009 License: 2000 - 2010, GSD 15 m, 5 % cloud coverage.

Base water levels based on Copernicus, GeoNames, GAIL (approx. 1:25 000, extracted on 10/10/2013, referred to 2005).

Water bodies extent in human coordinates provided by WFP.

All data sources are available and up to date.

#### Dissemination/Publication

No restrictions on the publication of the mapping activity.

Delivery formats are GeoTIFF, GeoPDF, GeoPDF and vectors (shapefile and KML, formats).

#### Framework

The products developed in the framework of current mapping in real mode activation are realized to the best of our ability, within a very short time frame during a crisis, optimizing the available data and information. All geographic information has reference data to scale, resolution, date and interpretation of the original data sources. The products are compliant with ISO 9001:2008 Product Portfolio specifications.

#### Map Production

The present map shows basic topographic features such as transportation, hydrology and settlements in the area of Phnom Penh (CAMBODIA). These basic topographic features are derived from the activation of the RADIARAT 2 (© MDA, acquired on 09/10/2013 at 22:30 UTC, GSD 50 m) provided under ESA-GSD-CA-2009 License.

The latest GSD-CA-2009 License: 2000 - 2010, GSD 15 m, 5 % cloud coverage.

The base water levels based on Copernicus, GeoNames, GAIL (approx. 1:25 000, extracted on 10/10/2013, referred to 2005).

Water bodies extent in human coordinates provided by WFP.

All data sources are available and up to date.

Humanitarian Aid  
Resilience  
Copernicus



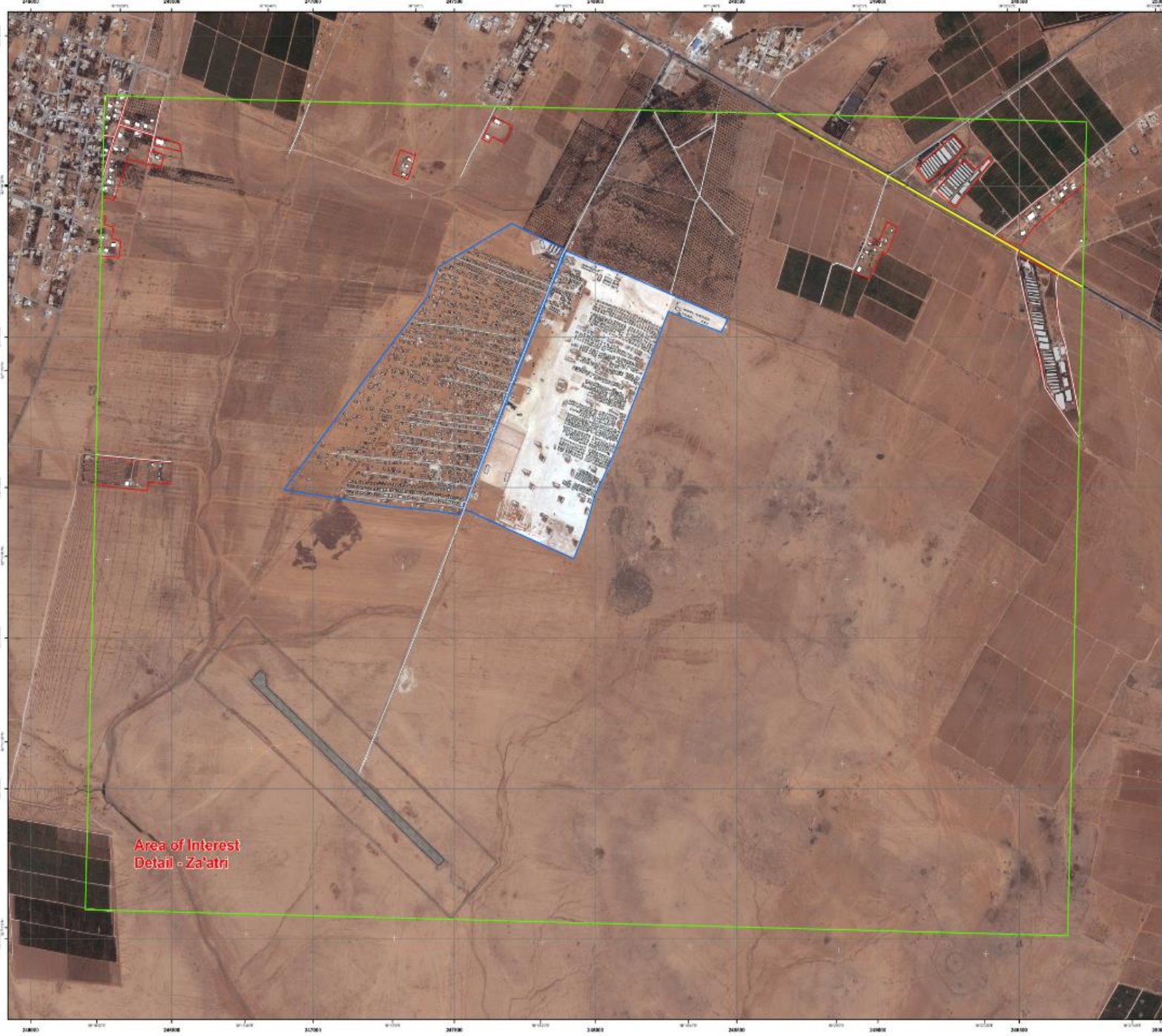
## G-NEXT (*Service in support of EU External Action*)

- Service actif depuis Juillet 2013, disponible 24h/24, 7j/7
- Protection et sécurité des populations et infrastructures dans un contexte à risque (événement fédérateur, frontières) voire de crise humanitaire (guerre civile, camps de réfugiés) survenant partout hors Europe
- Production de données vectorielles et de cartes de situation (REFERENCE), notamment dans le cadre d'une action de prévention / planification et, selon le contexte, après un événement (POST-EVENT)
- Délai de livraison : 1 semaine à 1 mois
- Utilisateurs : Service européen pour l'action extérieure, institutions non gouvernementales (Nations Unies, WB, etc.)

A horizontal strip of three satellite images. The left image shows a brown, arid landscape. The middle image shows a complex highway interchange with several overpasses. The right image shows a river flowing through a green, forested area.

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Area of Interest  
Detail - Za'atri

GLIDE number: N/A      Activation ID: EMGR-014

**Al Mafrq - JORDAN**  
Refugee camp authorized area  
Reference Map - Detail Monit 03

Production date: 15/09/2012



#### Cartographic Information

1:6 000 Full color ISO A1, high resolution (300 dpi)



Map Coordinate System: WGS 1984 UTM Zone 37N  
Units are: WGS 84 geographical coordinates

**Legend**

## General Information Building



Number of shelters/sites: 2715 units  
Number of people housed in the refugee camp: 26,034 internally  
(source: UNHCR updated 7 Sept 2012).

### Map Information

The 25,000-strong population of Jordan is steadily growing, with 700,000 having already been assisted by humanitarian organisations (source: UNHCR, updated 10 Sept 2012). The Jordanian Ministry of the Interior (2009) supports efforts in setting up a refugee camp at Ajlun (Jordan) close to the Syrian border.

### Data Sources

WorldPop 2.0 (<http://ghsl.jhu.edu>) 1/1/2012, 0.025 m, 6% above coverage  
 Global Urban Footprint (GUF) ([www.gis.com](http://www.gis.com))  
 1 km vector layers from OpenStreetMap (approx. 19,000, estimated on 2/20/2012),  
 Wikipedia (approx. 15,000, estimated on 2/20/2012), GeoNames (approx. 15,000, extended on  
 2/17/2012), edited by THACA  
 Evaluation date: 8/27/14 (50m pixel)  
 A: Data sources are complete and with no gaps.

## Dissemination/Publication

FOR GOVERNMENTAL USE ONLY.

Delivery formats are GeoTiff, GeoPDF, Geo, PDS and  
**Framework**

The authors declare that the framework of current research in work stress collection are

155061

analytic data and information. All programs for information have limitations due to scale, resolution, data and interpretation of the original data sources. The products are compliant with GAO-QARS RUS-11 Product Portfolio specifications.

#### Map production

FIGURE 10.10 Map shows the current situation at the area of JARVIS (JARVIS). These data (topographic features are derived from publicly open sources and institutions of data sets), related by means of visual interpretation of post-event. The MARS-2 satellite image (7/10/2012, 0.80

The satellite region has been sedimentologically examined and identified using RFC and RTM (considerable data) (20m posting)

The estimated geometric accuracy of this product is 6.5 m (CE90) or better, from visible positional accuracy of the background satellite image.

Map produced on 1/10/2012 by JRC/JRC contract ZV276 with the European Commission. All products are fit of the European Commission.  
Name of the release inspector (or any other JRC staff) (JRC).

✉ [info@edmgr.com](mailto:info@edmgr.com)





# Projet FP7 PanGeo: Risques géologiques



Exemple d'application  
PanGeo: vérification de la  
présence de risques  
géologiques pouvant  
causer le mouvement de  
certaines structures à  
risques sur un complexe  
industriel produisant des  
matières dangereuses

# Projet H2020 EOMonDis



- Titre: “Earth Observation Services for Monitoring Dynamic Forest Disturbances” (<https://www.eomondis.info/>)
- Appel H2020-EO-1-2015
- Durée: 1/02/2016 – 31/01/2019
- Objectif: Améliorer l'opérationnalité des produits/services forestiers tropicaux basés sur les besoins des utilisateurs et l'évaluation du marché pour les programmes REDD+ et Zero Deforestation (ZD)
- Produits
  - Cartes Forêt/Non-Forêt et de changement
  - Carte de Perturbation et Dégradation Forestières
  - Carte de biomasse et de changement

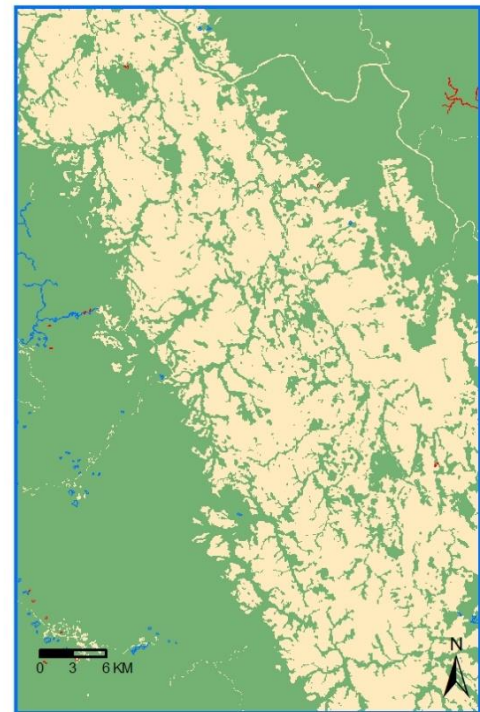
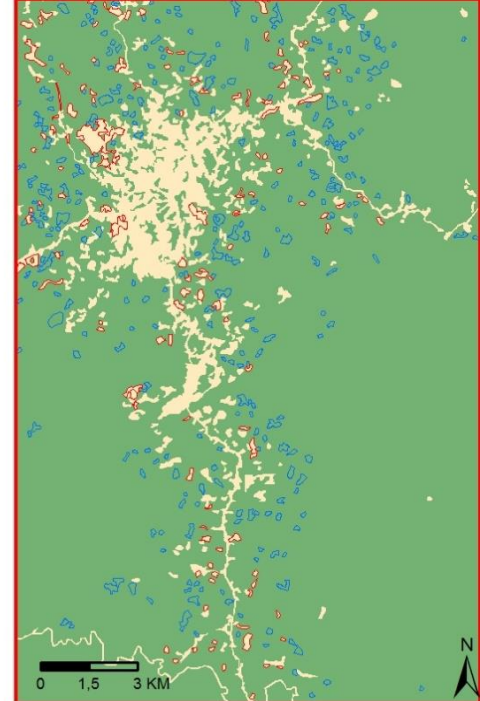
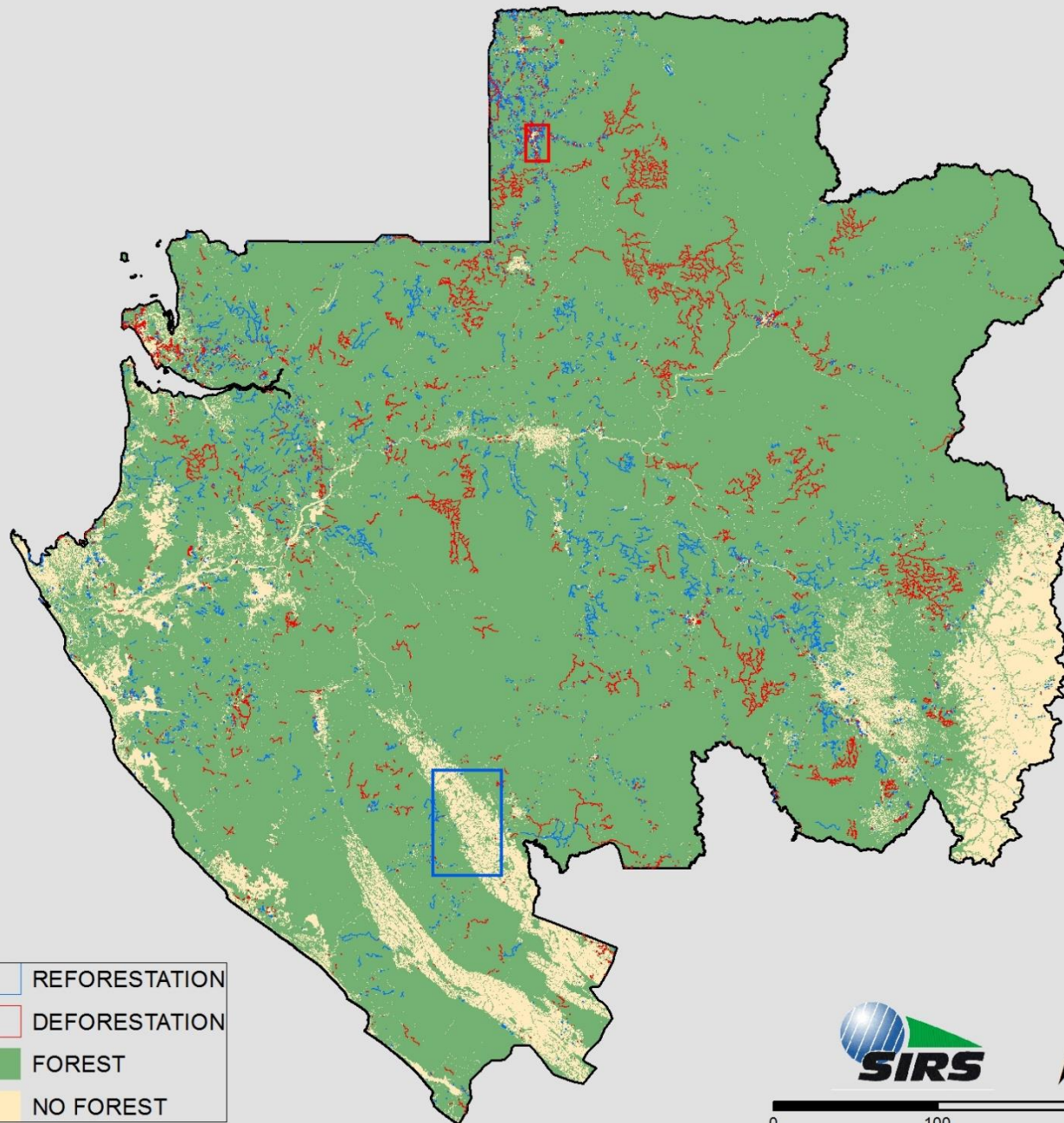


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# FOREST COVER CHANGE MAP 2000/2010



# Projets Copernicus et H2020

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- Urban Atlas:
  - 2006
  - Extension 2012
- Corine Land Cover 2012
- High Resolution Layers (HRL): 2012 et 2015
- Validation des produits Copernicus (EU & local)
- GeoFairTrade (2009-2012)
- PanGeo (2011-2014)
- REDDAF (2011-2013)
- Urban Nexus (2011-2014)
- Gnext (2013-2015)
- URBIS (2014-2017)
- EOMonDis (2016-2019)

A horizontal strip of three satellite images. The left image is a brown-toned map of a desert region. The middle image is a high-resolution aerial view of a suburban area with a large circular building and surrounding greenery. The right image is a high-resolution aerial view of a river flowing through a forested area.

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# Montage du projet



- Veille technologique
  - Information (NCP, H2020, Space Info Day, ...)
  - Partenariat et Références
- Phase de préparation
  - Décryptage et évaluation de l'opportunité
  - Développer des idées innovantes
  - Consortium: Partenaires complémentaires et int.
  - Leadership (moteur, références, capacité)
  - Management: Découpage en Work Packages, ...
- Phase de rédaction
  - Découpage du document, Timing serré, Réactivité importante
- Phase d'implémentation

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- Appels H2020
  - Nombreux appels à projets (notamment en OT)
  - Nécessité d'investissement amont
  - Ouvert aux structures publiques
  - Lien avec le privé (PME)
  - Très concurrentiels: +/- 15 % de réussite
  - Investissement important
- Points forts pour un succès:
  - Concept très innovant (R&D)
  - Réponse ciblée à l'appel:
    - Specific Challenge, Scope & Expected Impact
  - Dossier solide et projet ambitieux
    - Excellence, Impact & Implementation



- Développer des solutions adaptées à base d'Observation de la Terre (OT) pour des services opérationnels
  1. Développement de services « core » basés sur l'OT (expériences fortes dans les services "core" Copernicus) pour le Land, Climate et Emergency
  2. Développement de services avals basés sur l'OT
  3. Validation des services basés sur l'OT (contrôles qualité et analyses statistiques)
  4. Expertise scientifique et technique
  5. Réseau international

# ***Merci !***

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