



FLEGT Watch

Support de formation



Serge RIAZANOFF
Directeur

serge.riazanoff@visioterra.fr
<http://www.visioterra.fr>



serge.riazanoff@u-pem.fr
<http://www-igm.univ-mlv.fr/~riazano/>



Table des matières

➤ Administration

- ☐ Organisation du projet
- ☐ Gestion des utilisateurs
 - Enregistrement des participants
- ☐ Gestion des aires à surveiller

➤ L'observation par satellites

- ☐ Plateformes, orbites et instruments
- ☐ Sentinel-2 – Optique HR
- ☐ Sentinel-1 – Radar HR

➤ Photo-interprétation

- ☐ Examiner les événements d'une aire à surveiller
- ☐ Vérifier un événement avec:
 - les cartes de base
 - des images optiques
 - les précipitations l'ayant précédé

➤ Mission de terrain

- ☐ Préparer une mission
- ☐ Exécuter une mission
- ☐ Retourner de mission, partager les ressources



VT-P281-TRN-004-F-01-00 - Agenda de la formation
- page 1 -

**Formation « FLEGT Watch »
pour le secteur privé forestier**
Introduction - Paramétrage du système



Jeudi 3 octobre 2019

Matin

- Présentation des participants
- Objectifs et organisation du projet « FLEGT Watch »
- Création des comptes utilisateurs : « Responsable national du secteur privé » et « Concessionnaires »
- Présentation des « Aires surveillées » (concessions forestières) actuellement actives
- Création éventuelle de nouvelles « Aires surveillées » - présentation du SIG d'appui

Après-midi

- Photo de famille
- Le programme Copernicus et sa composante Sentinel
- Images optiques Sentinel-2 et radar Sentinel-1
- La composante « FLEGT Watch Web » (sur PC)

Vendredi 4 octobre 2019

Matin

- La composante « FLEGT Watch App » (sur smartphone)
- Téléchargement de l'application Android
- Préparation et partage d'une mission

Après-midi

- Mission de terrain simulée en extérieure à proximité du lieu de l'atelier
- Partage des observations
- Visualisation des missions dans « FW Web »
- Edition du rapport de mission

Matériel des participants :

- PC et/ou smartphone avec navigateur Web et gestionnaire d'e-mails.

Contact FLEGT Watch : flegtwatch@visioterra.fr





Organisation du projet

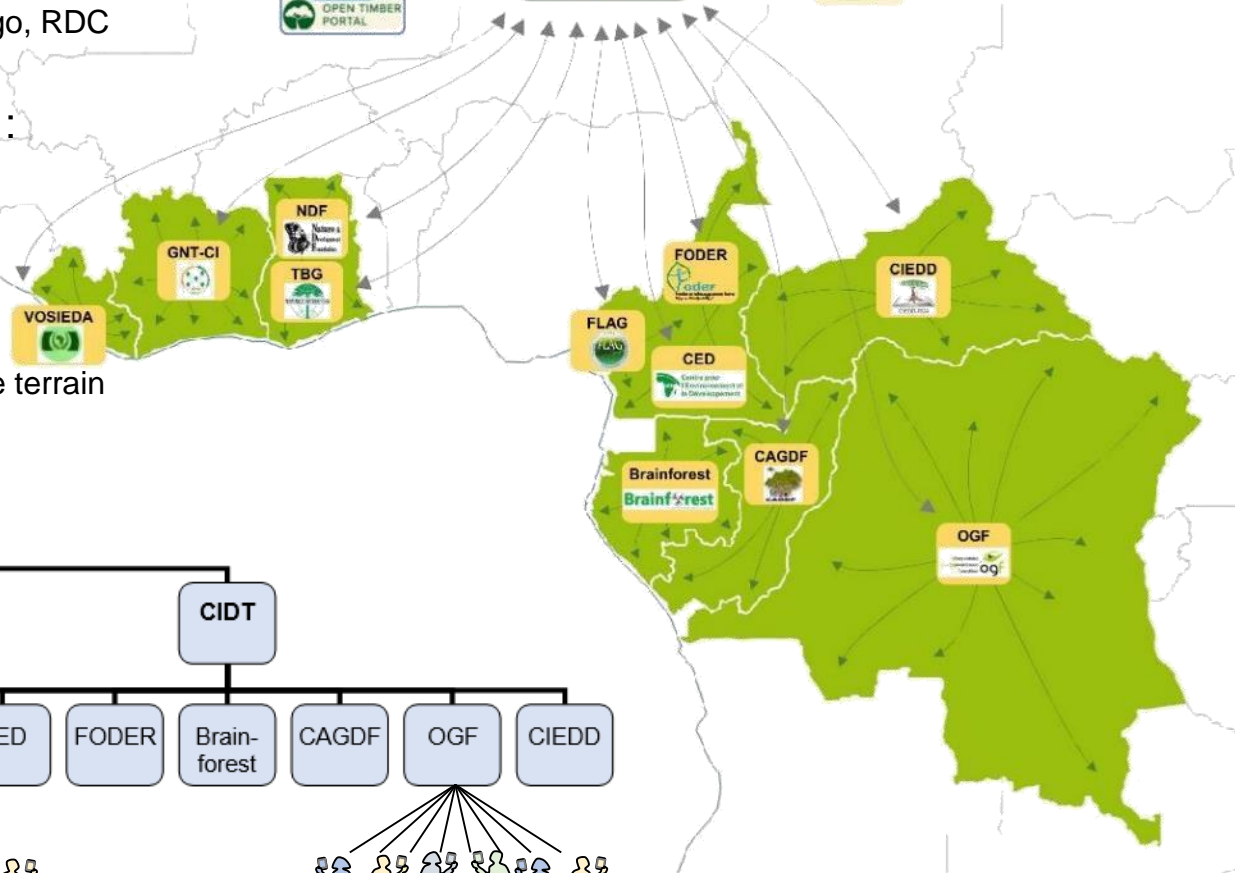
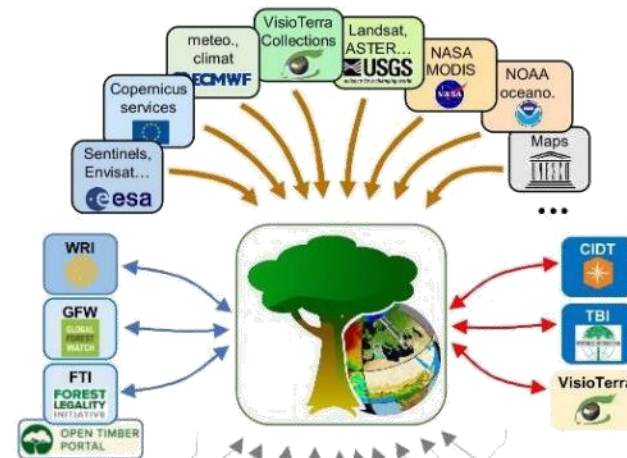
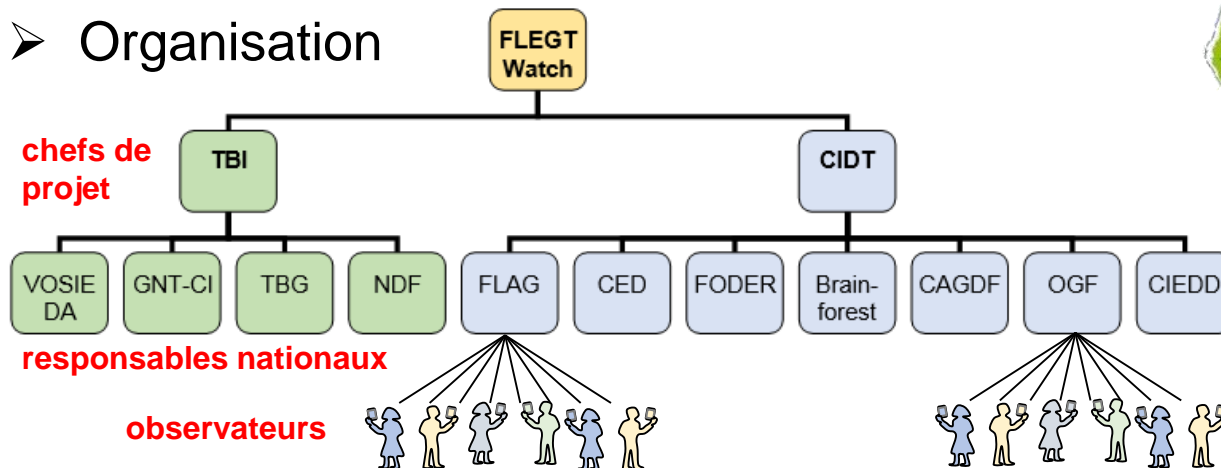
- “FLEGT Watch” offre les mêmes services aux deux sous-régions:

- ❑ Afrique de l'Ouest – Liberia, Côte d'Ivoire, Ghana
- ❑ Afrique Centrale – Cameroun, Gabon, République Centrafricaine, Congo, RDC

- Objectifs de “FLEGT Watch” :

- ❑ performances – en utilisant les toutes nouvelles technologies
- ❑ sécurité – en protégeant la communauté des observateurs
- ❑ traçabilité – en enregistrant les observations des satellites et de terrain

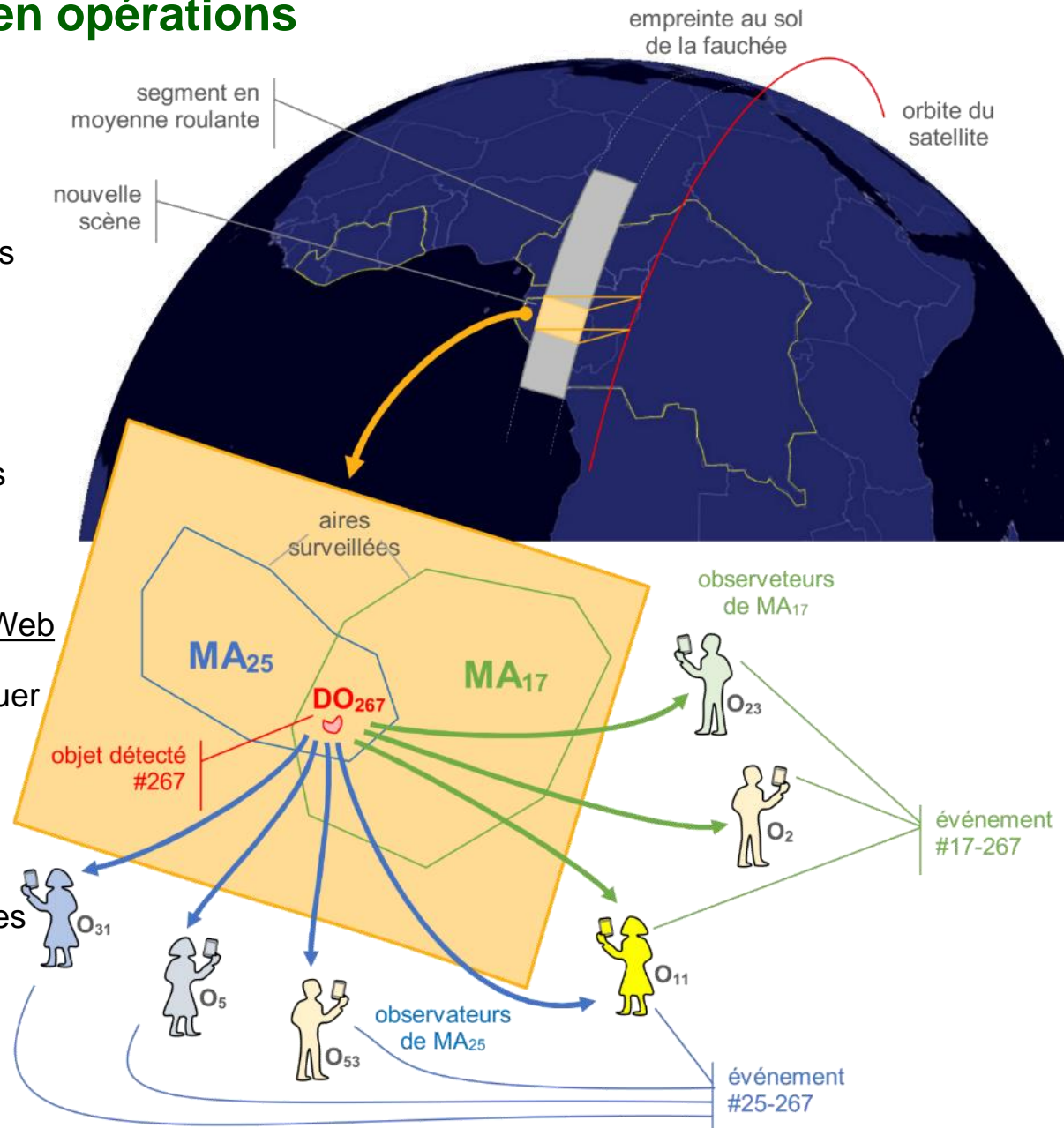
- Organisation





FLEGT Watch en opérations

- Observations satellite tous les 6 jours en utilisant S1A et S1B
- Détection automatique avec des algorithmes toujours optimisés
- Les objets détectés ont un indice de confiance
- Distribuer les événements dans les aires à surveiller
- Les observateurs évaluent un événement sur FLEGT Watch Web
- Les observateurs peuvent évaluer l'événement sur le terrain
- Des observations de terrain peuvent être collectées
- Ces observations sont partagées à travers la communauté
- On peut produire un rapport de mission de terrain





Observateurs au Cameroun (liste collectée le 3 octobre 2019)

Prénom(s)	NOM	Organisation	adresse e-mail
Chef de projet			
Aurelian	MBZIBAIN	CIDT	A.Mbzibain2@wlv.ac.uk
Responsable national			
Horline	BILOGUE MVOGO	FLAG	hunjike@gmail.com
Cyrille Jonathan	KOLLY EPALE	FLAG	cyrillekolly@gmail.com
Observateurs			
Napoléon	MOYO POLA	SIM-SA	moyopola@yahoo.fr
Martial	TCHUILENG SADJUE	DINO & fils	sadjuemartial@yahoo.fr
Daniel	ABOMO ELA	DINO & fils	danielabomo@dinofils.com
Alexis	NGNOCHE	DINO & fils	alexisngnoche@yahoo.fr
Willy	NKOLO EVINA	CUF	nkolo.evina@cufcm.com
Eric	DASSIE WENDJI	COMIFAC	eric.dassie@ppecf-comifac.com
Nicolas	NJIB II	SEFAC	njib2nicolas@yahoo.fr
René	GWETH	SEFAC	gwethsamuel@yahoo.fr
Patrice	ALOO	ALPICAM	patrice.aloo@alpiwood.com
Fousséni	FETEKE	GFBC	flegt@gfbcam.com
Louis-Marie	NGOUA	Rougier Gabon	ngoua@groupe-rougier.com
Marie Cécile	NGOUE	PALLISCO	certification@pallisco-cifm.com

DINO & Fils <http://dinofils.com/>

GFBC Groupement de la Filière Bois du Cameroun - <http://gfbcam.com/>

PPECF Programme de Promotion de l'Exploitation Certifiée des Forêts (COMIFAC) - <http://www.ppecf-comifac.com/>

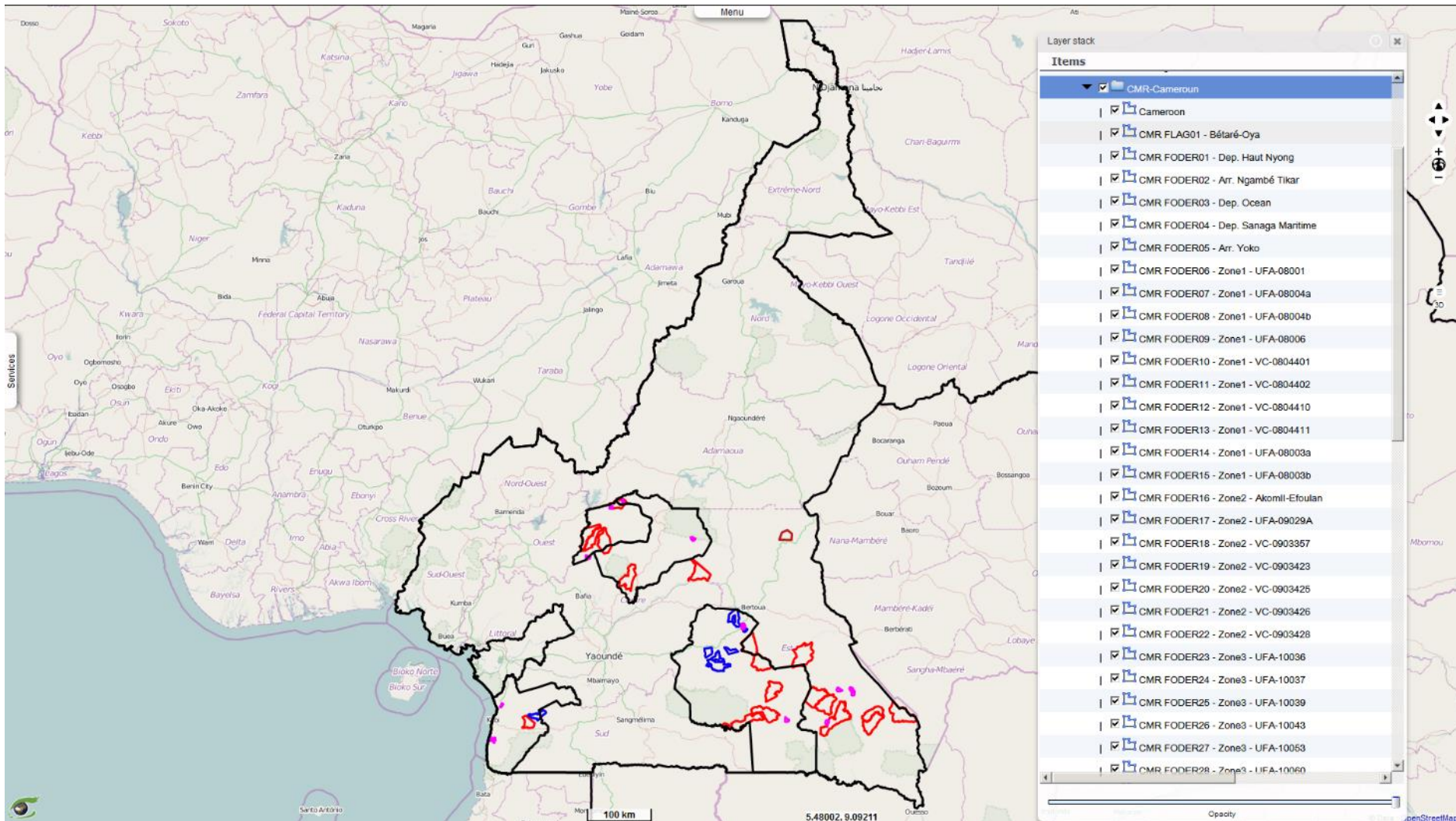
SEFAC Société d'Exploitation Forestière et Agricole du Cameroun - <http://www.groupesefac.com/?lang=fr>

SIM-SA Société Industrielle de Mbang - <http://www.sim-cmr.net/>



Les aires à surveiller (*monitored areas*) au Cameroun

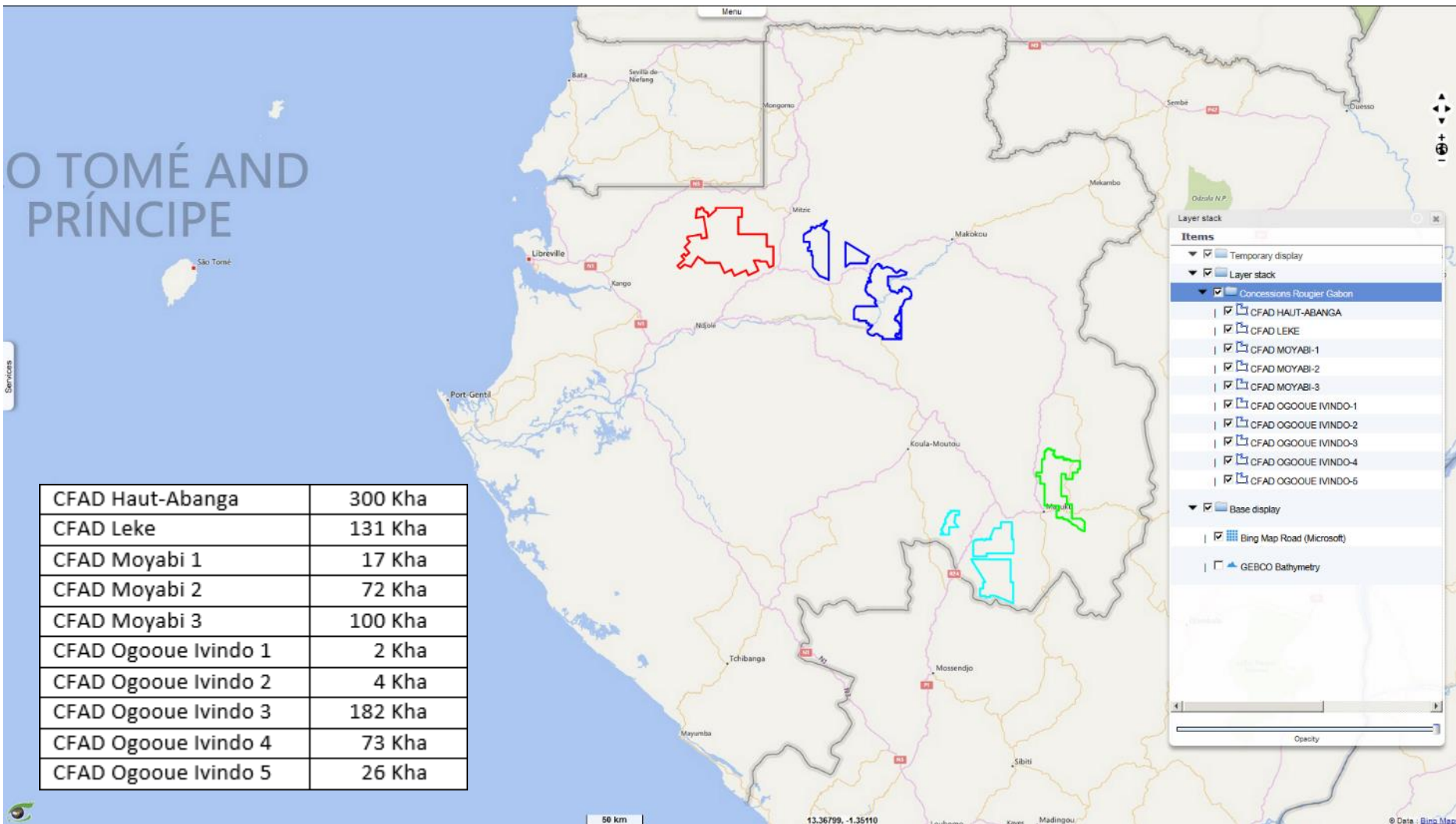
Hyperlook





Les aires à surveiller proposées par Rougier au Gabon

Hyperlook





Evénements à examiner

FlegtWatch Finder Missions GFW Base Maps Elevations

Monitored Area: CMR FODER15 - Zone1 - UFA-08003b / angel

Confidence: ☐ Low ☒ Medium ☐ High Search

Events: 1-7 of 7

Event	Description	Date	Link
#54872	Forest cover change - CMR FODER15 - Zone1 - UFA-08003b	2019/03/05 17:28:41	[Link]
#54850	Forest cover change - CMR FODER15 - Zone1 - UFA-08003b	2019/03/05 17:28:41	[Link]
#54731	Forest cover change - CMR FODER15 - Zone1 - UFA-08003b	2019/02/21 17:28:41	[Link]
#53985	Forest cover change - CMR FODER15 - Zone1 - UFA-08003b	2019/01/28 17:28:42	[Link]
#53178	Forest cover change - CMR FODER15 - Zone1 - UFA-08003b	2019/01/04 17:28:43	[Link]
#52494	Forest cover change - CMR FODER15 - Zone1 - UFA-08003b	2018/09/30 17:28:45	[Link]
#52487	Forest cover change - CMR FODER15 - Zone1 - UFA-08003b	2018/09/30 17:28:45	[Link]

Event #54850 - Forest cover change

2019/03/05 17:28 - Now

FlegtWatch Finder Missions GFW Base Maps Elevations

Monitored Area: CMR FODER15 - Zone1 - UFA-08003b / angel

Confidence: ☐ Low ☒ Medium ☐ High Search

Events: 1-7 of 7

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#52494	Forest cover change - CMR FODER15 - Zone1 - UFA-08003b	2018/09/30 17:28:45	[Link]
#52487	Forest cover change - CMR FODER15 - Zone1 - UFA-08003b	2018/09/30 17:28:45	[Link]

Event #54850 - Forest cover change

2019/03/05 17:28 - Before



Hyperlooks à examiner

- Document d'hyperlooks – Photo-interprétation réalisée par Elisée TCHANA
 - ❑ [HYP-080-Sentinels-v3](#) – FLEGT Watch dichotomique sur CMR-FLAG01 (Bétaré Oya)

Fig.1: Sentinel-1A moyenne 06-12-2018 → 04-02-2019 (gauche) et 16-02-2019 (droite)

[vue gauche](#) [vue droite](#)

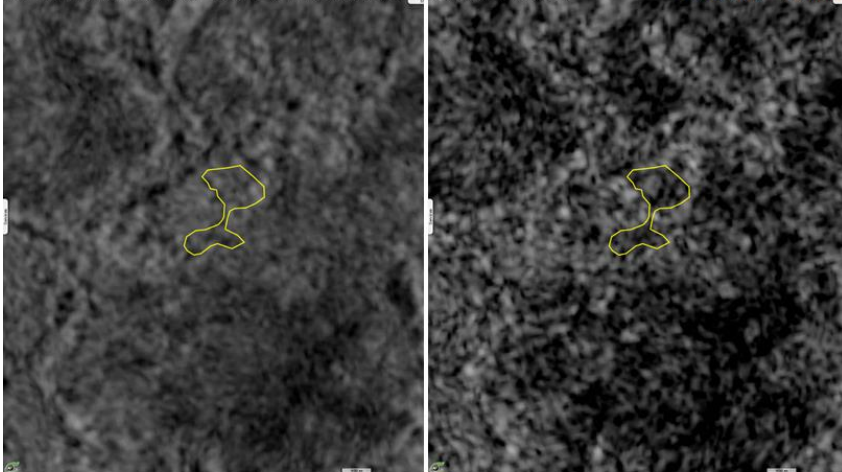


Fig.2: Sentinel-2A observé le 09-01-2019 (gauche) et le 18-02-2019 (droite).

[vue gauche](#) [vue droite](#)

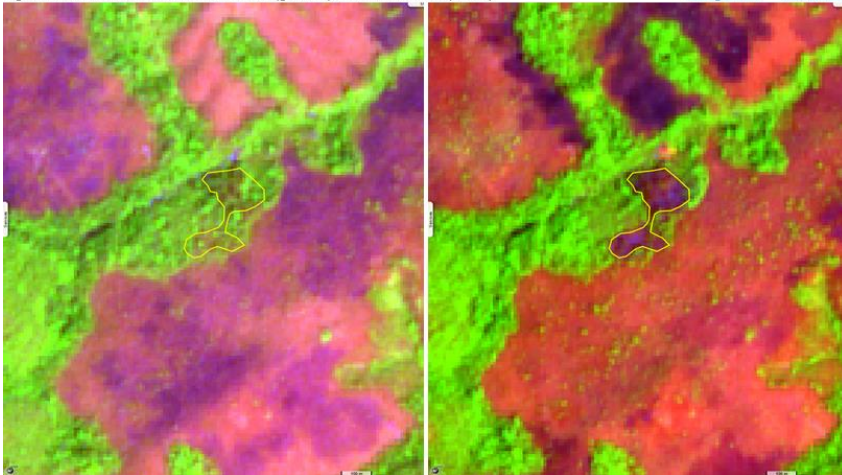


Fig.3: Sentinel-1A moyenne 11-12-2017 → 09-02-2018 (gauche) et 21-02-2018 (droite)

[vue gauche](#) [vue droite](#)

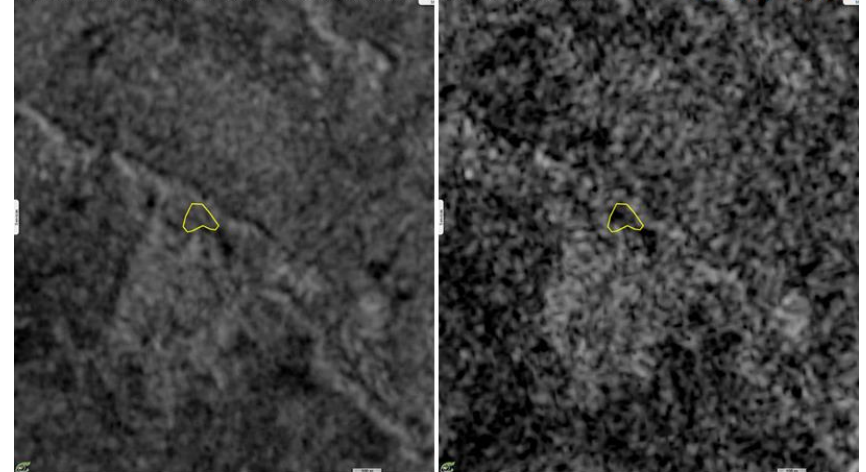
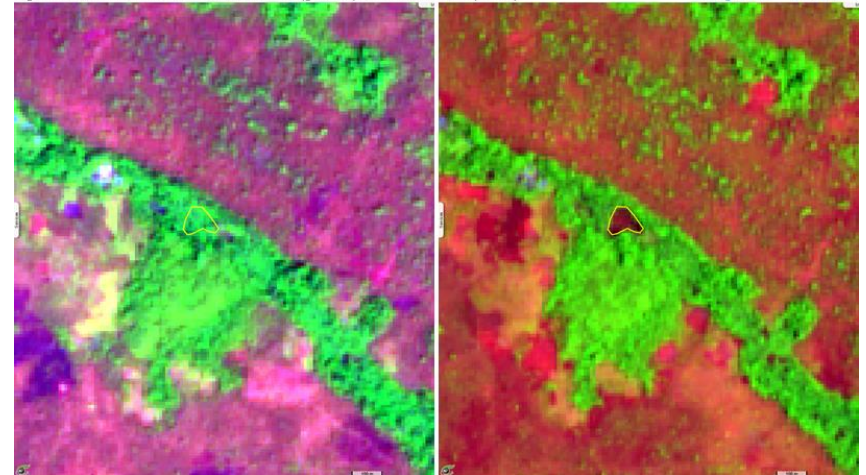


Fig.4: Sentinel-2A-B observé le 04-01-2018 (gauche) et le 10-03-2018 (droite).

[vue gauche](#) [vue droite](#)





Documentation de FLEGT Watch

➤ Brochures

- ❑ [VT-P281-BKL-001-E-01-06](#) – Introduction to FLEGT Watch
- ❑ [VT-P281-BKL-001-F-01-06](#) – Introduction à FLEGT Watch (français)
- ❑ [VT-P281-BKL-002-E-01-00](#) – FLEGT Watch in operation
- ❑ [VT-P281-BKL-002-F-01-00](#) – FLEGT Watch en operation (français)

➤ Manuels utilisateur

- ❑ [VT-P281-SUM-005-E-01-01](#) – FLEGT Watch user's manual
- ❑ [VT-P281-SUM-005-F-01-01](#) – Manuel utilisateur de FLEGT Watch (français)

➤ Vidéos

- ❑ [VT-A003-VID-010-E-01-01](#) – Application for field observations
- ❑ [VT-A003-VID-010-F-01-01](#) – Application d'observations de terrain (français)

➤ FLEGT Watch App

- ❑ visioterra.fr/flegtwatch/app.apk

➤ Support

- ❑ flegtwatch@visioterra.fr



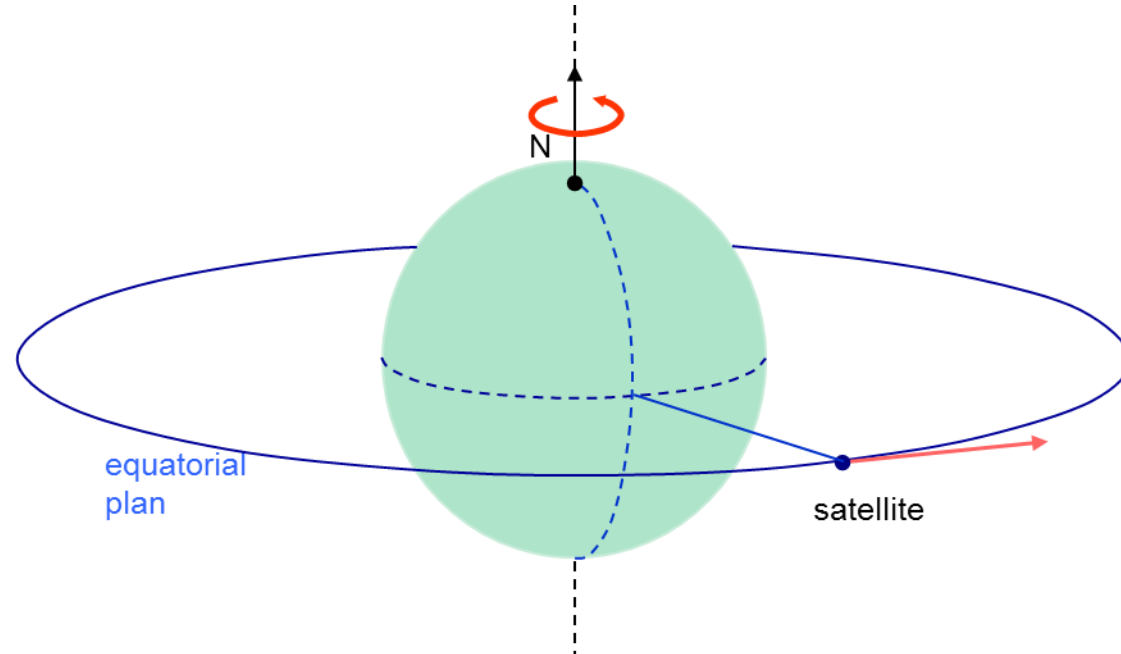
Les satellites

Plateformes, orbites et instruments

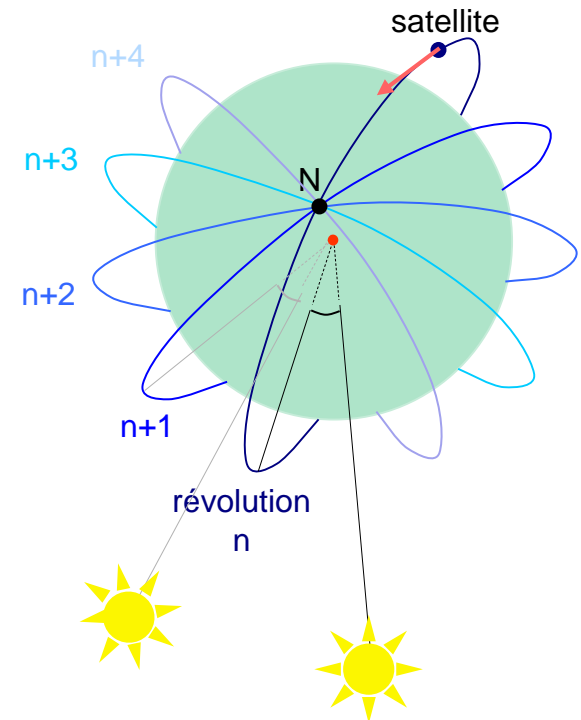


Types d'orbites, révolutions et temps de cycle

satellite géostationnaire



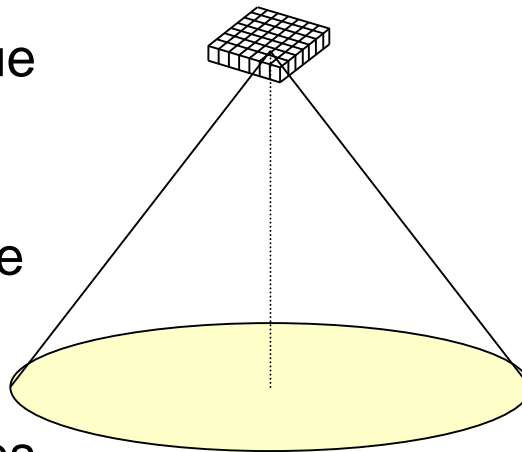
satellite héliosynchrone



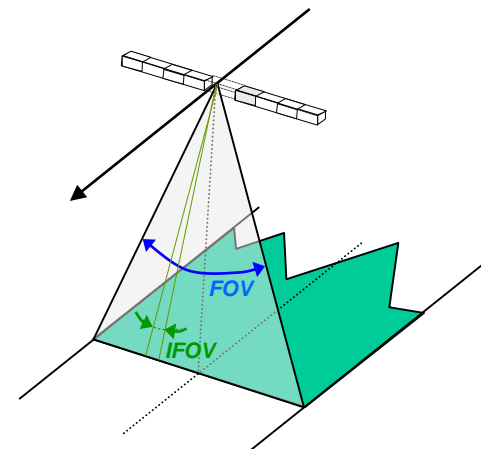


➤ Satellites et instruments – Géométrie de prise de vue

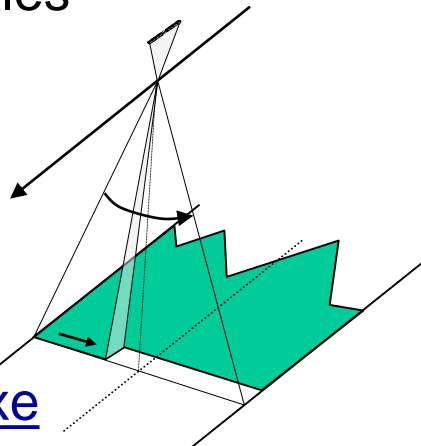
- ❑ Capteur matriciel
Géométrie conique
(*frame camera*)



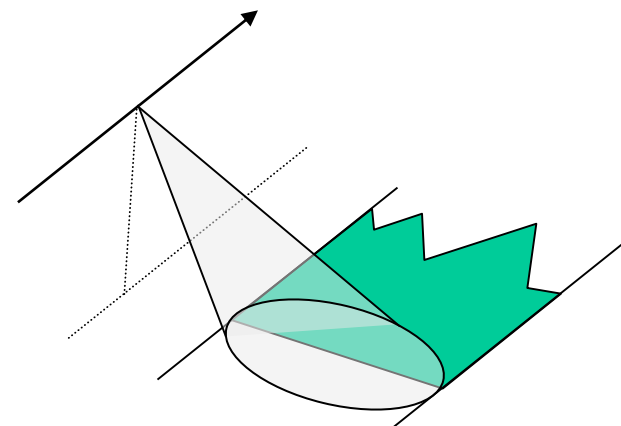
- ❑ Capteur en peigne
(*pushbroom*)



- ❑ Fauchées latérales
(*whiskbroom*)



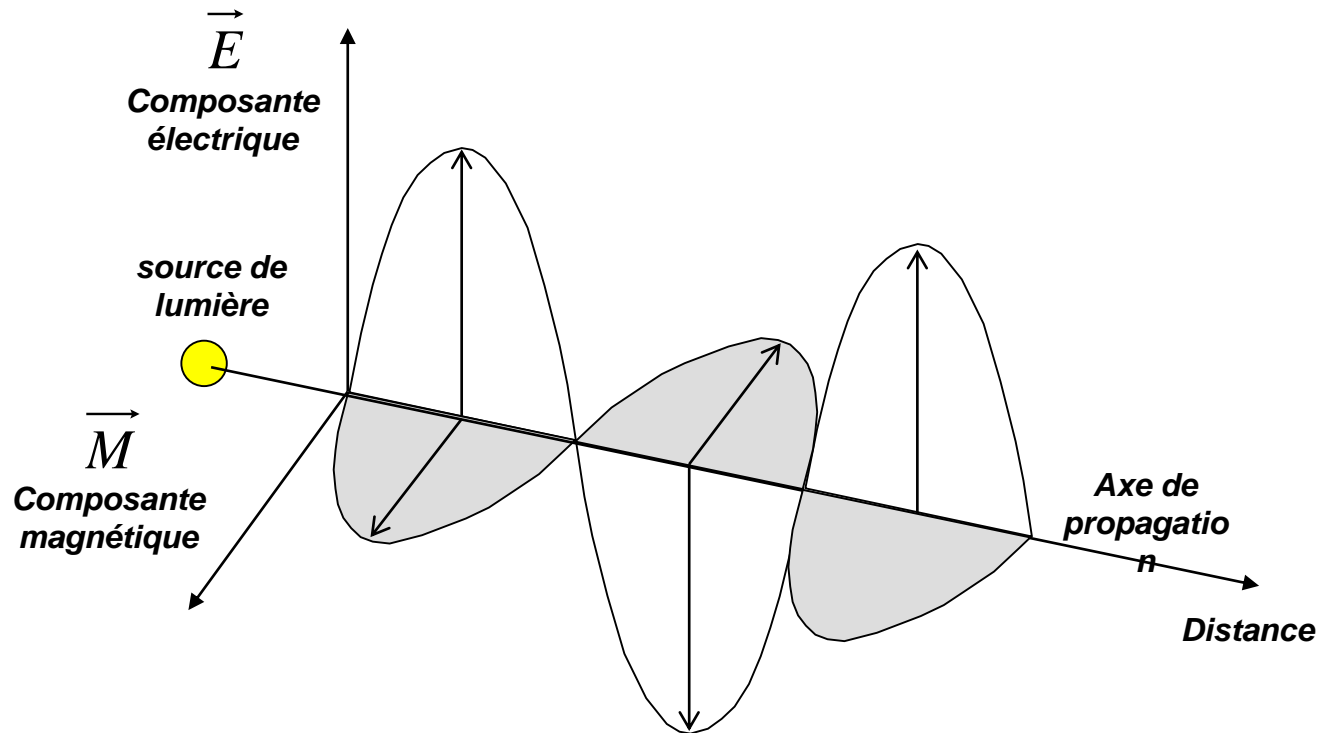
- ❑ Radar



Erreurs de parallaxe

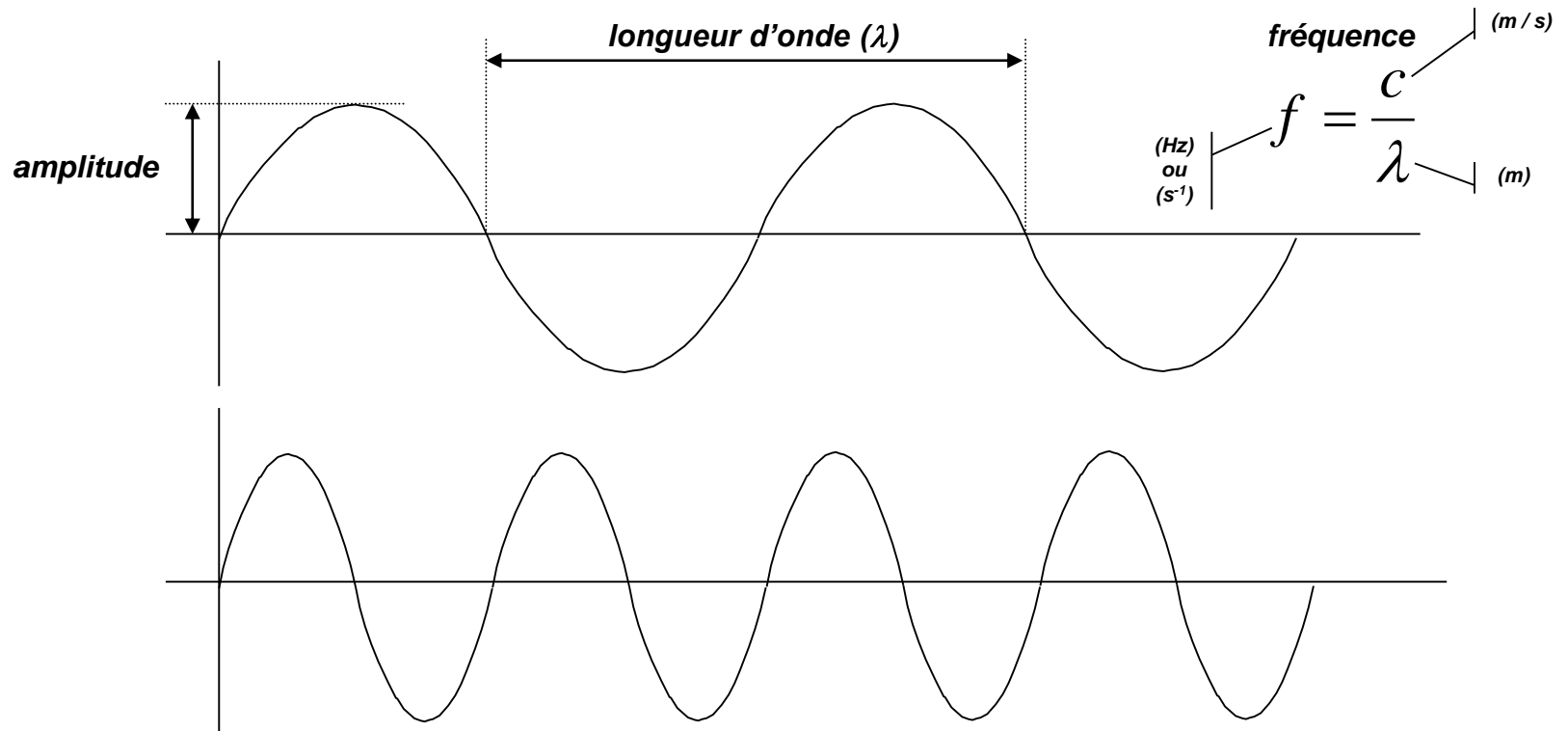


La radiation électromagnétique





➤ L'onde électromagnétique

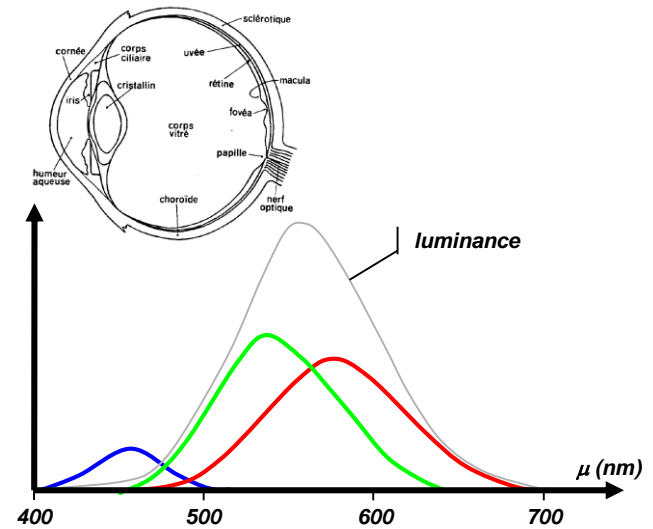
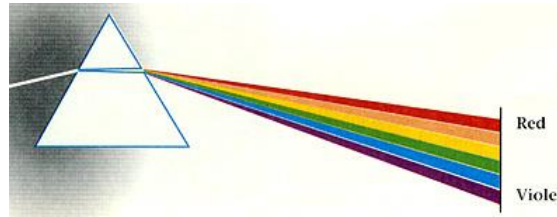




➤ Le spectre électromagnétique

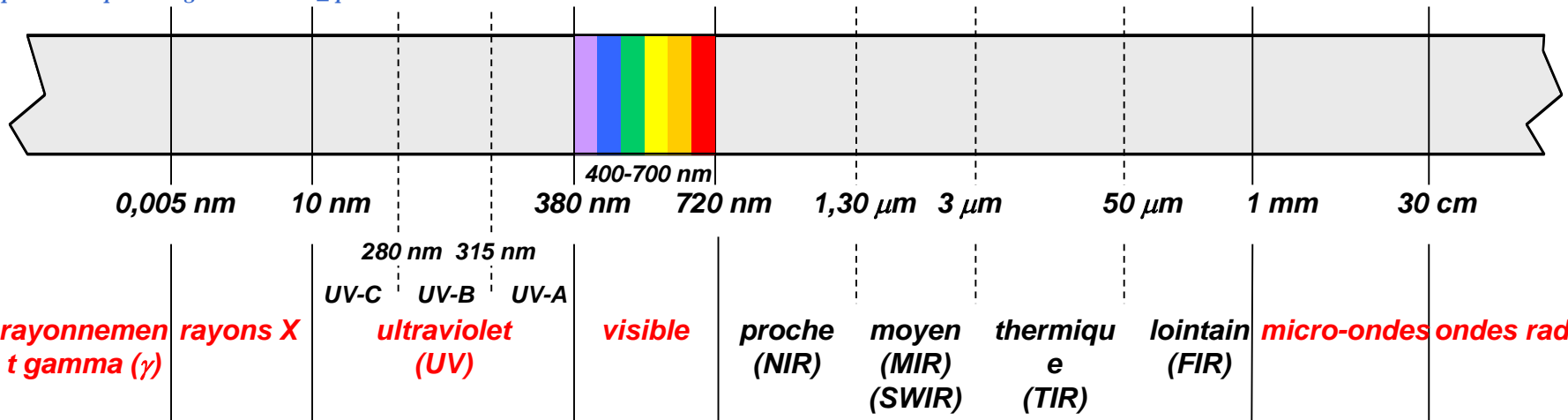
	
violet	380–450 nm
blue	450–495 nm
green	495–570 nm
yellow	570–590 nm
orange	590–620 nm
red	620–750 nm

http://en.wikipedia.org/wiki/Visible_spectrum



Sensibilité spectrale des cônes de l'œil

<http://www.rennes.supelec.fr/ren/perso/jweiss/tv/perception/percept4.html>



Energie du photon: $E = h \times \nu$

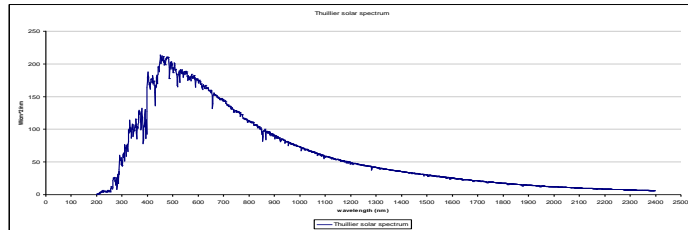
ν

Constante de Planck: $h = 6,626\,068\,96 \times 10^{-34}$

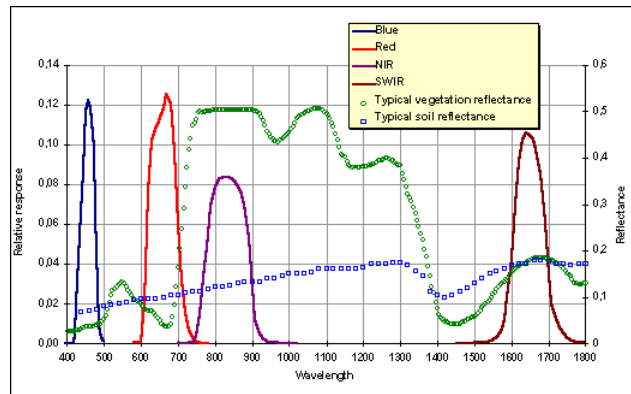
J.s



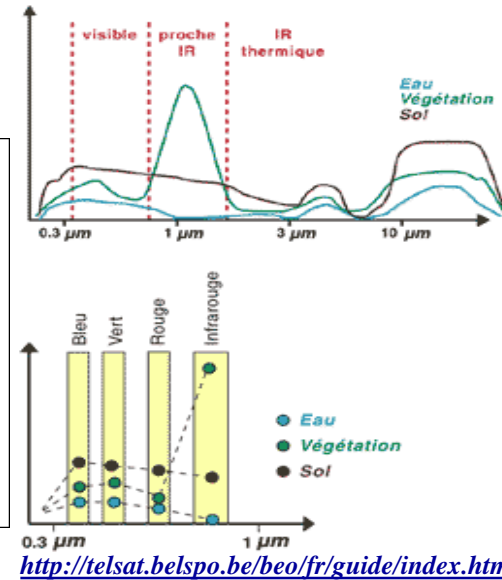
➤ Instrument passif



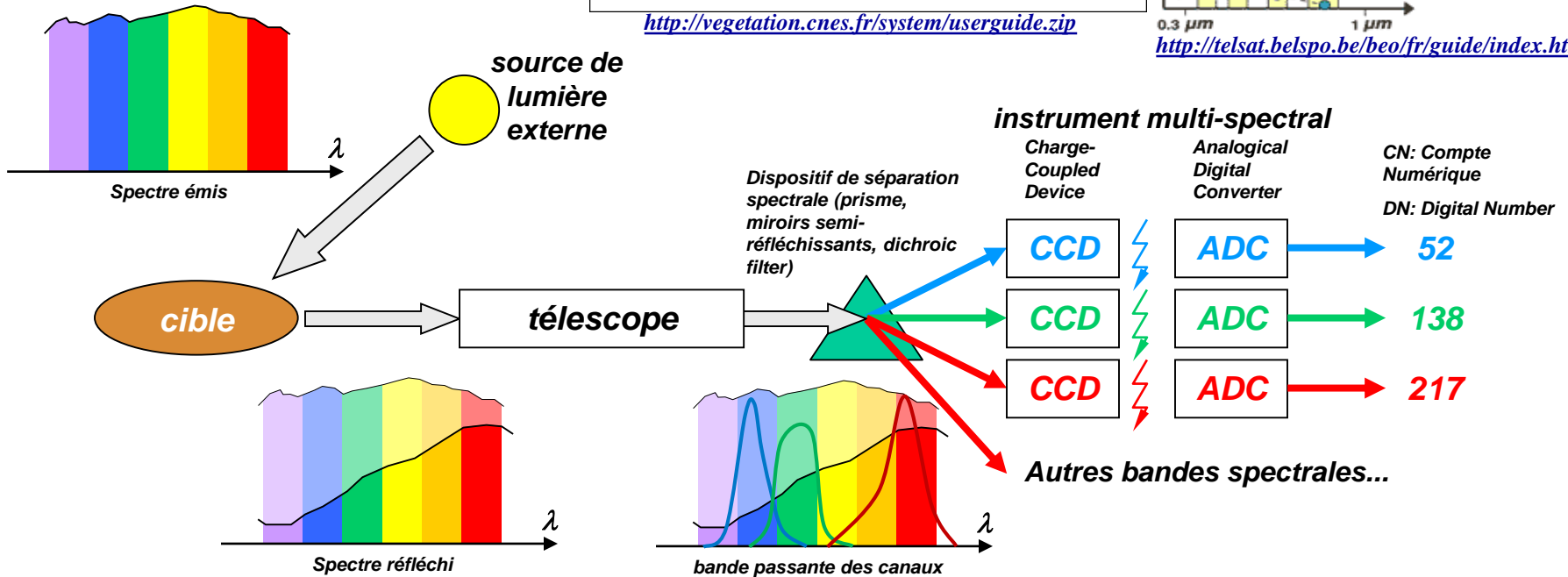
Thuillier (2003) solar spectrum - wavelength range 200 - 2397nm
 Thuillier, G., M. Hersé, P. C. Simon, D. Labs, H. Mandel, D. Gillotay, and T. Foujols, 2003,
 "The solar spectral irradiance from 200 to 2400 nm as measured by the SOLSPEC
 spectrometer from the ATLAS 1-2-3 and EURECA missions, Solar Physics, 214(1): 1-22
http://oceancolor.gsfc.nasa.gov/DOCS/RSR_tables.html



<http://vegetation.cnes.fr/system/userguide.zip>



<http://telsat.belspo.be/beo/fr/guide/index.htm>





Sentinel-2

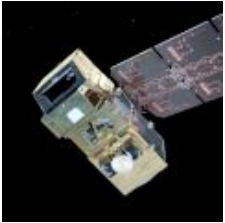
optique Haute résolution (HR)



Sentinel-2 – HR optical

<https://sentinel.esa.int/web/sentinel/missions/sentinel-2>

Sentinel-2



10 days cycle

launch 1st data

S2A 23.06.2015 27.06.2015

S2B 07.03.2017 ???.??.????

+5 days phase

Instrument

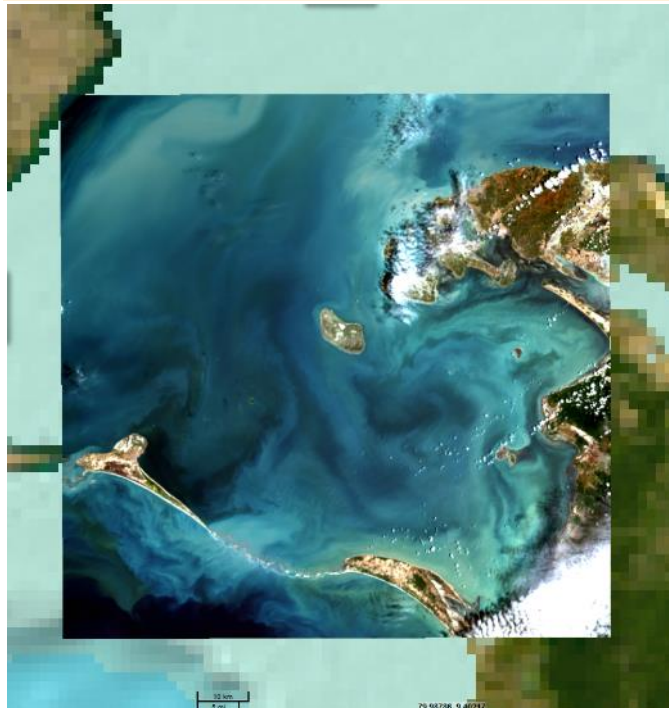
- MSI (Multi-Spectral Instrument) – optical – 290km swath

13 Bands

- VIS (visible): 2,3,4 (10m)
- Red edge: 5,6,7 (20m)
- NIR (Near Infrared): 8 (10m) 8A (20m)
- SWIR (Shortwave infrared): 11,12 (20m)
- Absorption (used for atmospheric corrections): 1,9,10 (60m)

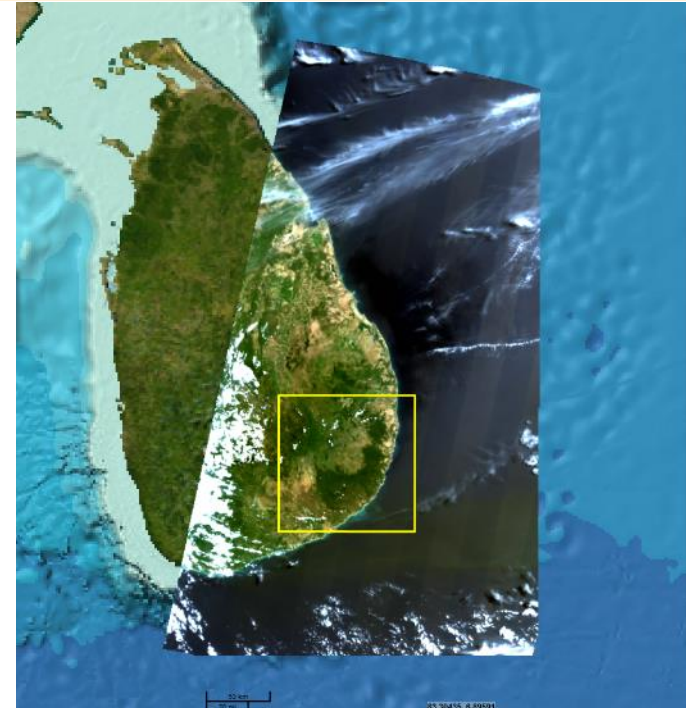
Bay of Kachchativu (North) on
18.09.2017 04:56:51 GMT
One tile (100km x 100km).

2D-view-left



East coast of Sri-Lanka on
27.07.2017 05:06:01 GMT
5x3 tiles (tile D1 highlighted).

2D-view-right



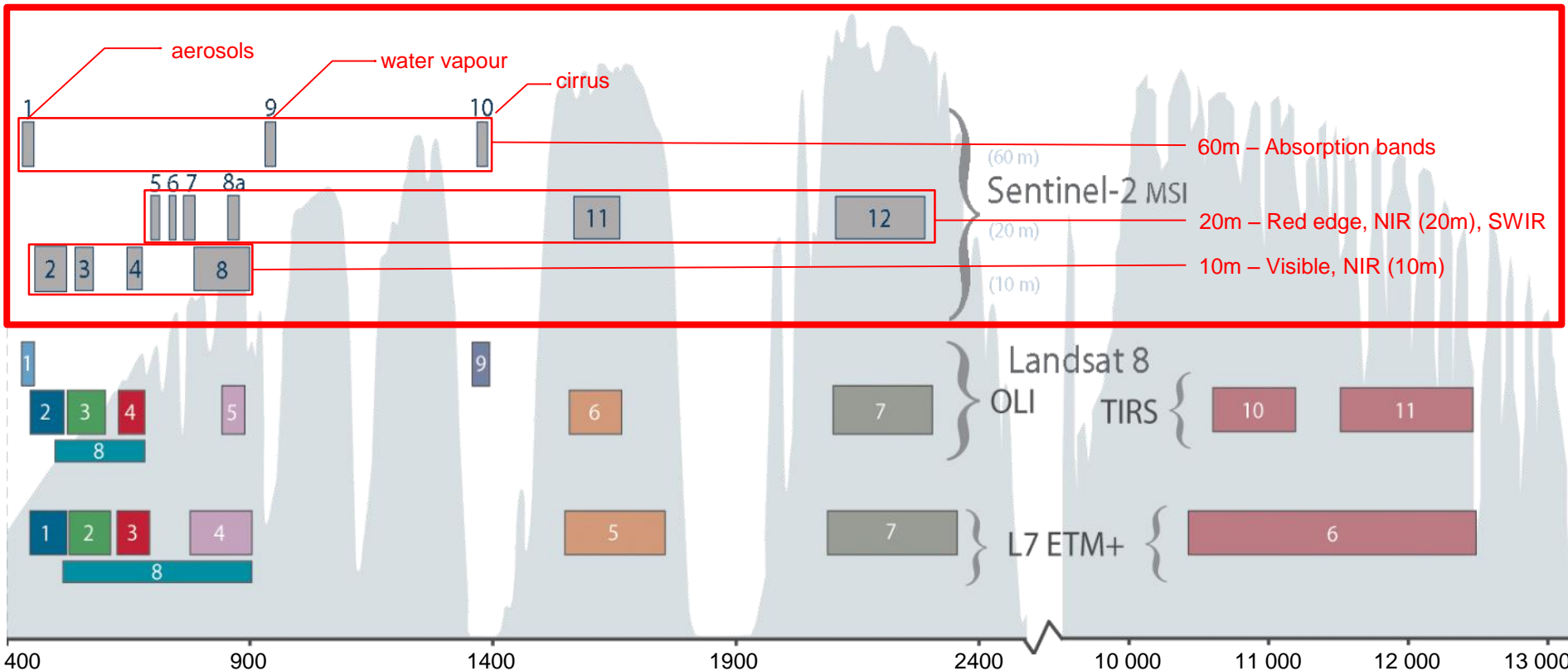


Sentinel-2 MSI – Spectral bands

MSI radiometry values: <https://earth.esa.int/web/sentinel/technical-guides/sentinel-2-msi/msi-instrument>

MSI 10m, 20m, 60m groups: <https://earth.esa.int/web/sentinel/user-guides/sentinel-2-msi/resolutions/spatial>

Landsat heritage: <https://landsat.gsfc.nasa.gov/wp-content/uploads/2015/06/Landsat.v.Sentinel-2.png>



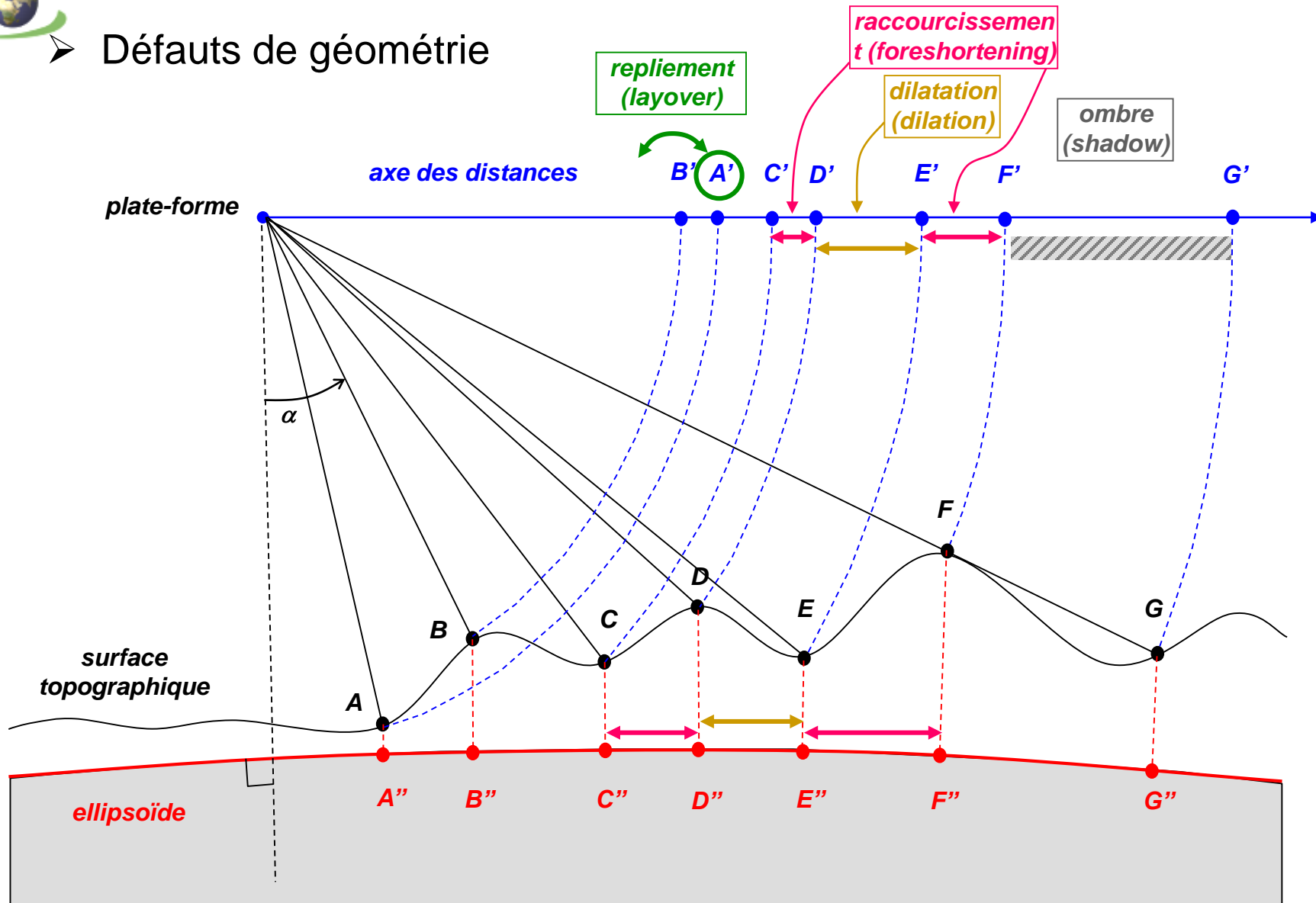


Sentinel-1

radar Haute résolution (HR)



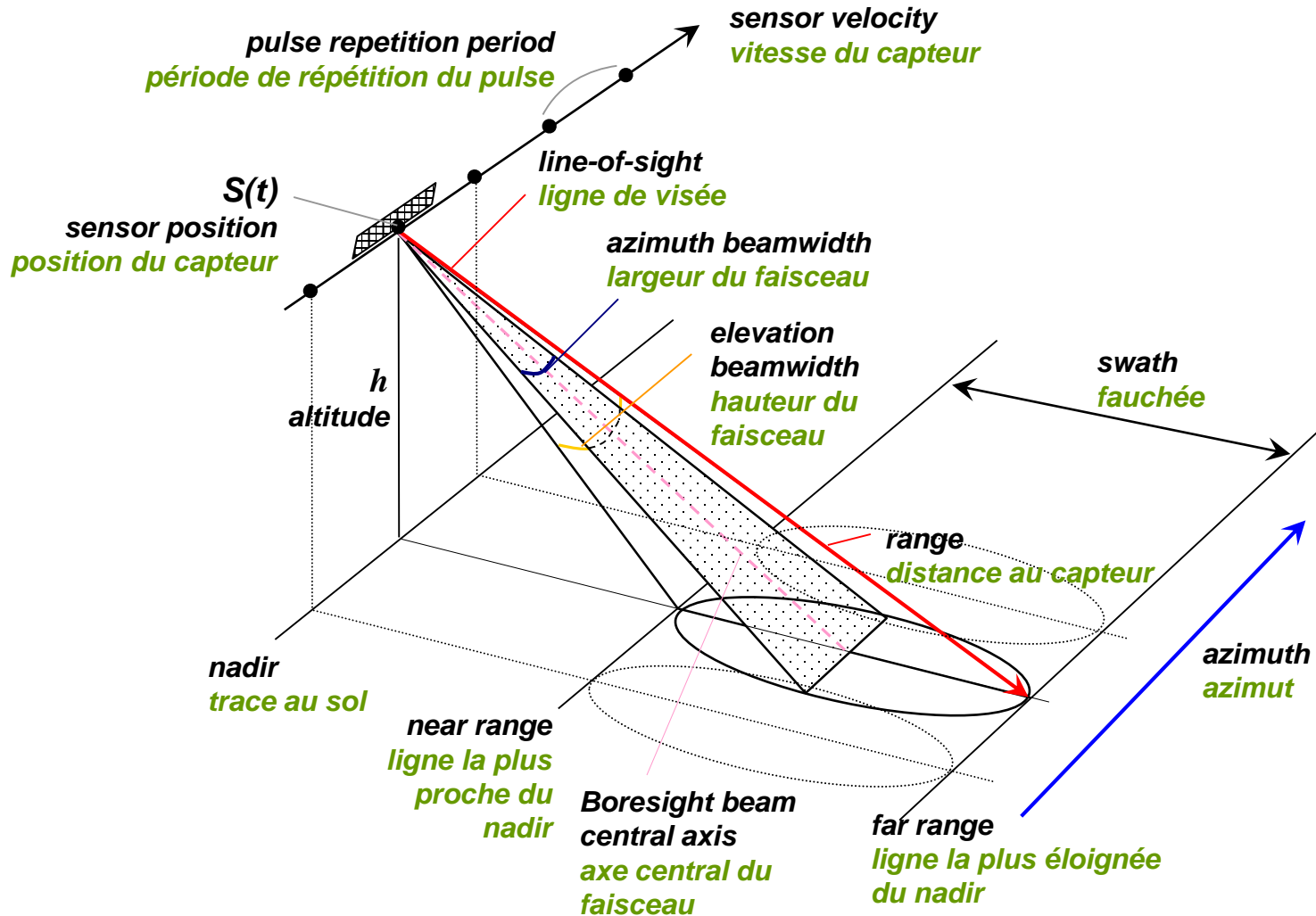
➤ Défauts de géométrie





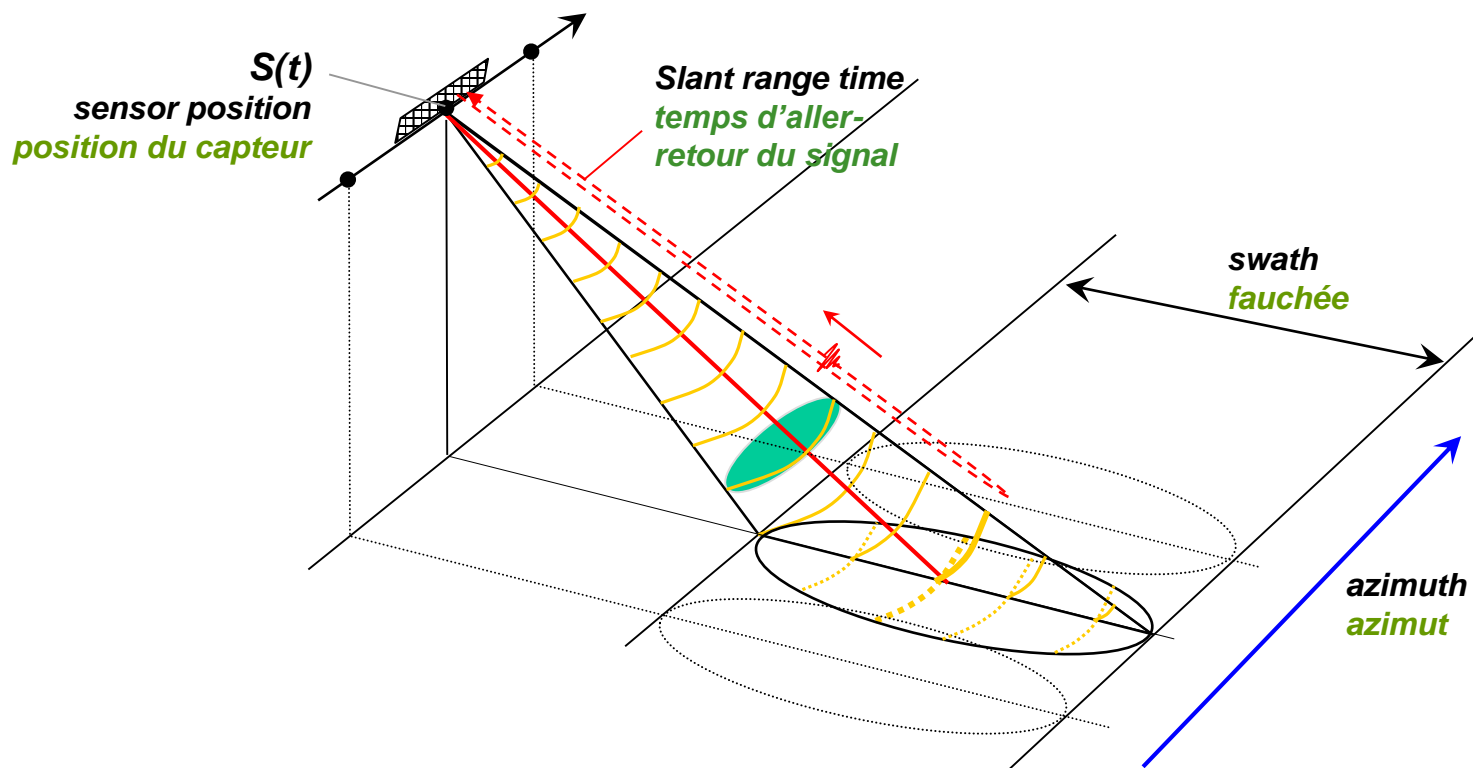
Physique de l'acquisition

RADAR ↔ RAdio
Detection And Ranging



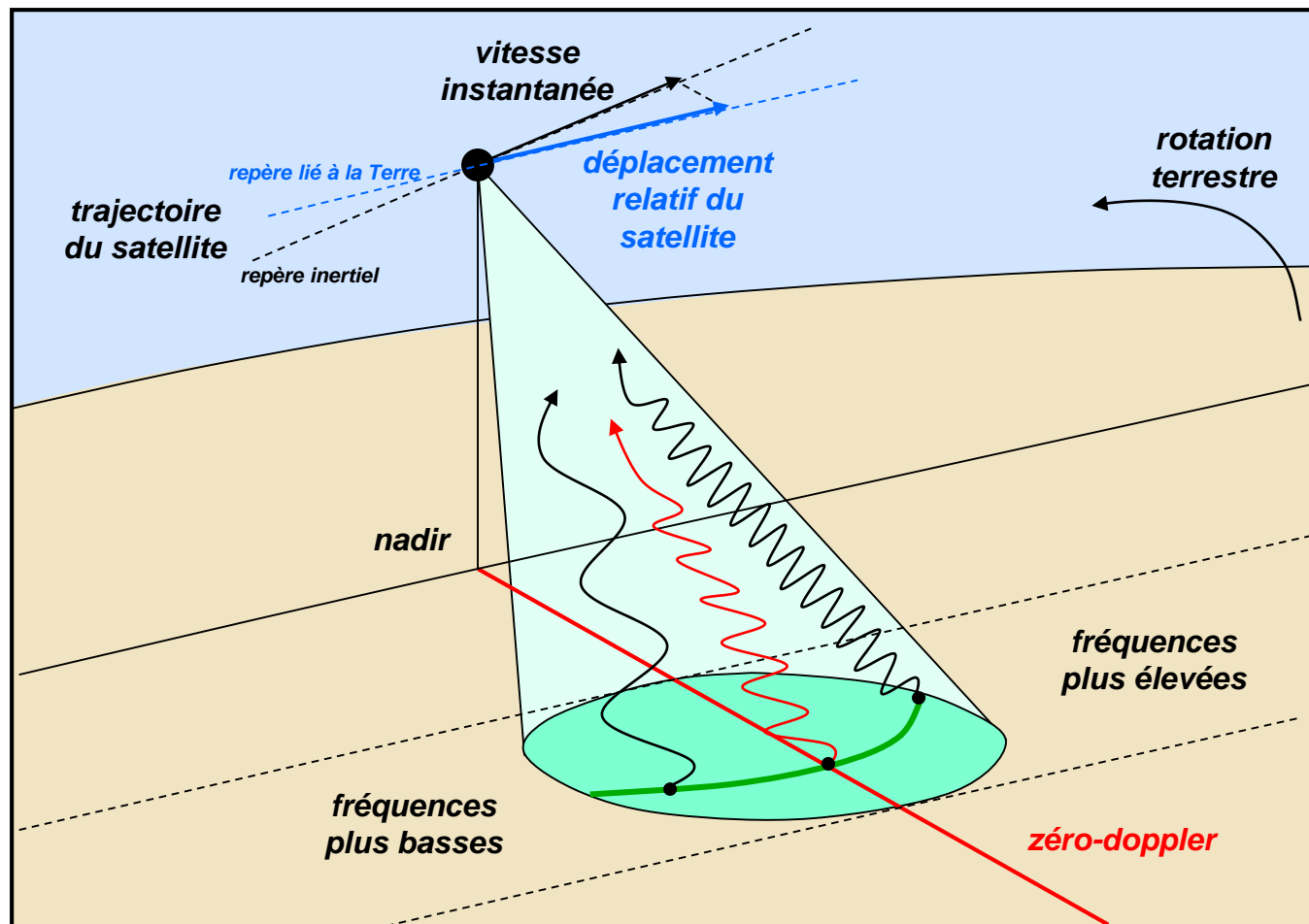


Positionnement en distance (range)





Positionnement en azimut (azimuth)





Fréquence du signal radar

$$f = \frac{c}{\lambda}$$

(Hz) (m/s) (m)

JERS-1/SAR – 1.2 GHz

Seasat – 1.3 GHz

Radarsat – 5.3 GHz

ERS/SAR – 5.3 GHz

TerraSAR-X – 9.65 GHz

Bande	Fréquence (GHz)	Longueur d'onde (cm)
P	0.255 – 0.390	133 – 76.9
L	0.390 – 1.550	76.9 – 19.3
S	1.550 – 4.20	19.3 – 7.1
C	4.20 – 5.75	7.1 – 5.2
X	5.75 – 10.90	5.2 – 2.7
K	10.90 – 36.0	2.7 – 0.83
Ku	10.90 – 22.0	2.7 – 1.36
Ka	22.0 – 36.0	1.36 – 0.83
Q	36.0 – 46.0	0.83 – 0.65
V	46.0 – 56.0	0.65 – 0.53
W	56.0 – 100.0	0.53 – 0.30

λ > 2 cm - Pénétration des nuages
λ > 4 cm - Pénétration de la pluie
Meilleure pénétration des sols secs

How the trees are seen by the SARs ?



Pinus Nigra



X-band
λ= 3 cm

TerraSAR-X
COSMO-SkyMed



C-band
λ= 5 cm

Sentinel-1
RADARSAT



L-band
λ= 27 cm

PALSAR(-2)
NISAR (2022)



P-band
λ= 70 cm

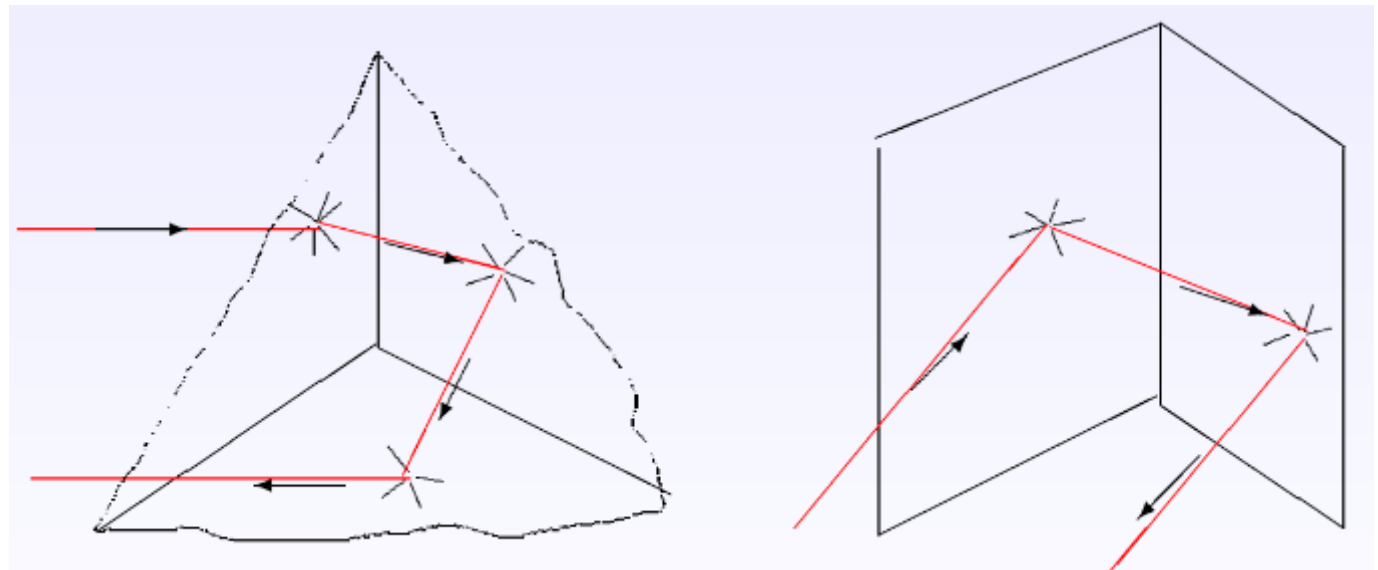
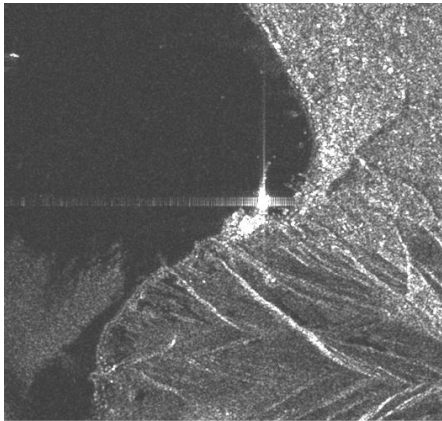
BIOMASS (2021)

Low frequency SARs: interact with woody tree elements
→ linked to above ground biomass





Mécanisme de rétrodiffusion (*back-scattering*)



trièdre
(corn-reflector)

bièdre

http://smc.cnes.fr/PLEIADES/Fr/PDF/methodo/presPolar_inglada.pdf



La polarisation de la lumière



filtre vertical (V)



filtre horizontal (H)



Sentinel-1 – HR Radar

<https://sentinel.esa.int/web/sentinel/missions/sentinel-1>

Sentinel-1



12 days cycle

launch

1st data

S1A 03.04.2014 03.10.2014

S1B 22.04.2016 26.09.2016

+6 days phase

Instrument

- C-SAR (Synthetic Aperture Radar), 5.405 GHz,

Modes

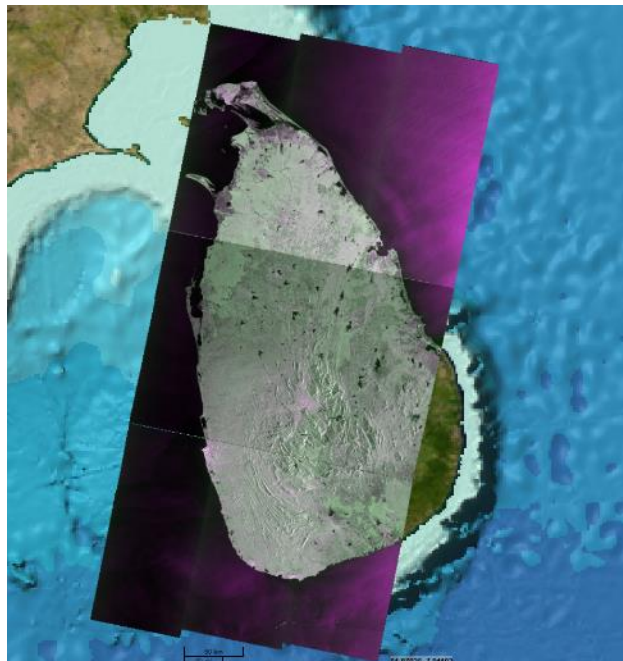
- IW (Interferometry Wide Swath) – swath=240km – GSD=10m
- EW (Extended Wide Swath) – swath=400km – GSD=40m
- SM (Stripmap) – swath=80-100km – GSD=6-10m

Polarization

- Single: Vertical (V) or horizontal (H)
- Dual: VV, VH (V emission, V or H reception) or HH, HV (H emission, V or H reception)

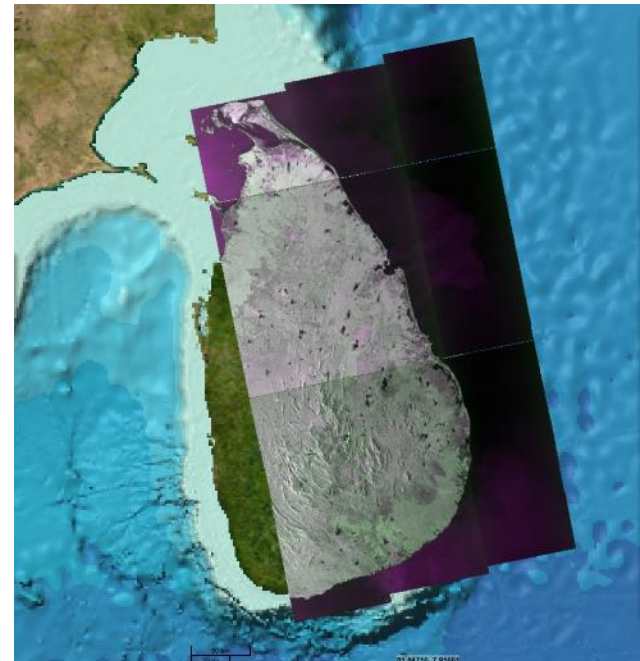
Series of 3 scenes
acquired on 21.09.2017
00:24:24 GMT
in descending orbit (left)

2D-view-left



Series of 3 scenes
acquired on 21.09.2017
12:49:54 GMT
in ascending orbit (right)

2D-view-right





Sentinel satellites (S3)

<https://sentinel.esa.int/web/sentinel/missions/sentinel-3>

Sentinel-3



27 days cycle

launch 1st data

S3A 16.02.2016 18.10.2016

S3B ???.2018

+?? days phase

Instruments

- OLCI (Ocean Land Colour Instrument) – optical
 - 21 bands [0.4-1.02] μm
 - GSD = 300m
 - swath width = 1270 km
- SLSTR (Sea and Land Surface Temperature Radiometer)
 - 9 bands [0.55-12] μm , NADIR + backward
 - GSD = 500m (VIS, SWIR), 1 km (MWIR, TIR)
 - swath width = 1420 km (NADIR), 750 km (backward)
- SRAL (SAR Radar Altimeter)
 - Range measurement: Ku-band (13.575 GHz) and C-band (5.41 GHz)
 - Sampling rate: 1 Hz ($\approx 850\text{m}$) and 10 Hz ($\approx 85\text{m}$)

Sri-Lanka seen by:

OLCI on
30.09.2017 09:30:04 GMT.

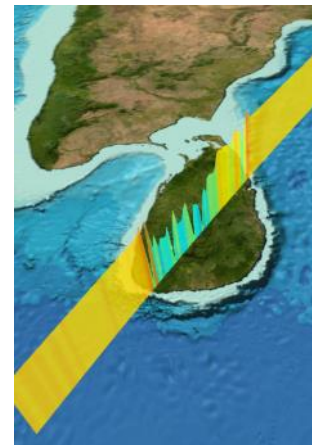
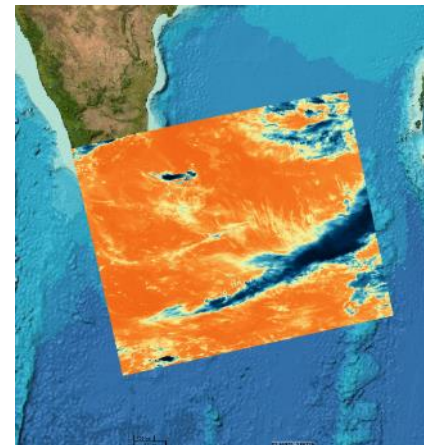
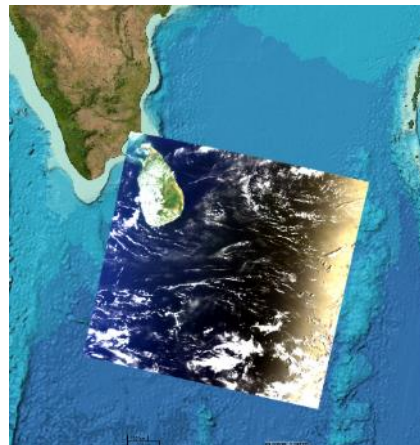
2D-view-left

SLSTR on
01.10.2017 16:28:18 GMT.

2D-view-middle

SRAL on
29.09.2017 04:35:48 GMT.

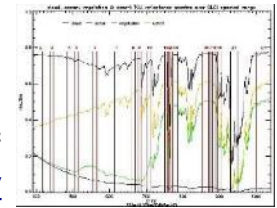
2D-view-right





Sentinel-3 OLCI – Spectral bands

See fig.48 of
eoPortal Directory



OLCI bands function: <https://sentinel.esa.int/web/sentinel/user-guides/sentinel-3-olci/resolutions/radiometric>
Envisat MERIS heritage (<https://sentinel.esa.int/web/sentinel/user-guides/sentinel-3-olci/overview/heritage>)

Band	λ centre (nm)	Width (nm)	Function
Oa1	400	15	Aerosol correction, improved water constituent retrieval
Oa2	412.5	10	Yellow substance and detrital pigments (turbidity)
Oa3	442.5	10	Chlorophyll absorption max., biogeochemistry, vegetation
Oa4	490	10	High Chlorophyll, other pigments
Oa5	510	10	Chlorophyll, sediment, turbidity, red tide
Oa6	560	10	Chlorophyll reference (Chlorophyll minimum)
Oa7	620	10	Sediment loading
Oa8	665	10	Chlorophyll (2nd Chlorophyll absolute max.), sediment, yellow substance / vegetation
Oa9	673.75	7.5	For improved fluorescence retrieval and to better account for smile together with the bands 665 and 680 nm
Oa10	681.25	7.5	Chlorophyll fluorescence peak, red edge
Oa11	708.75	10	Chlorophyll fluorescence baseline, red edge transition
Oa12	753.75	7.5	O2 absorption / clouds, vegetation
Oa13	761.25	2.5	O2 absorption band / aerosol correction
Oa14	764.375	3.75	Atmospheric correction
Oa15	767.5	2.5	O2A used for cloud top pressure, fluorescence over land
Oa16	778.75	15	Atmos. corr./aerosol corr.
Oa17	865	20	Atmos. corr./aerosol corr., clouds, pixel co-registration
Oa18	885	10	Water vapour absorption reference band. Common reference band with SLSTR instrument. Vegetation monitoring
Oa19	900	10	Water vapour absorption/vegetation monitoring (maximum reflectance)
Oa20	940	20	Water vapour absorption, atmosphere / aerosol correction
Oa21	1 020	40	Atmosphere / aerosol correction

bands absent in the previous
Envisat / MERIS instrument



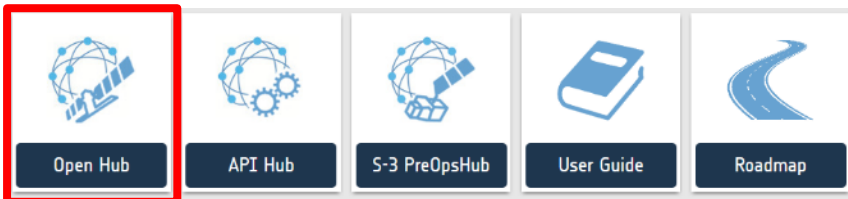
Sentinel infrastructures

<https://sentinel.esa.int/web/sentinel/sentinel-data-access>

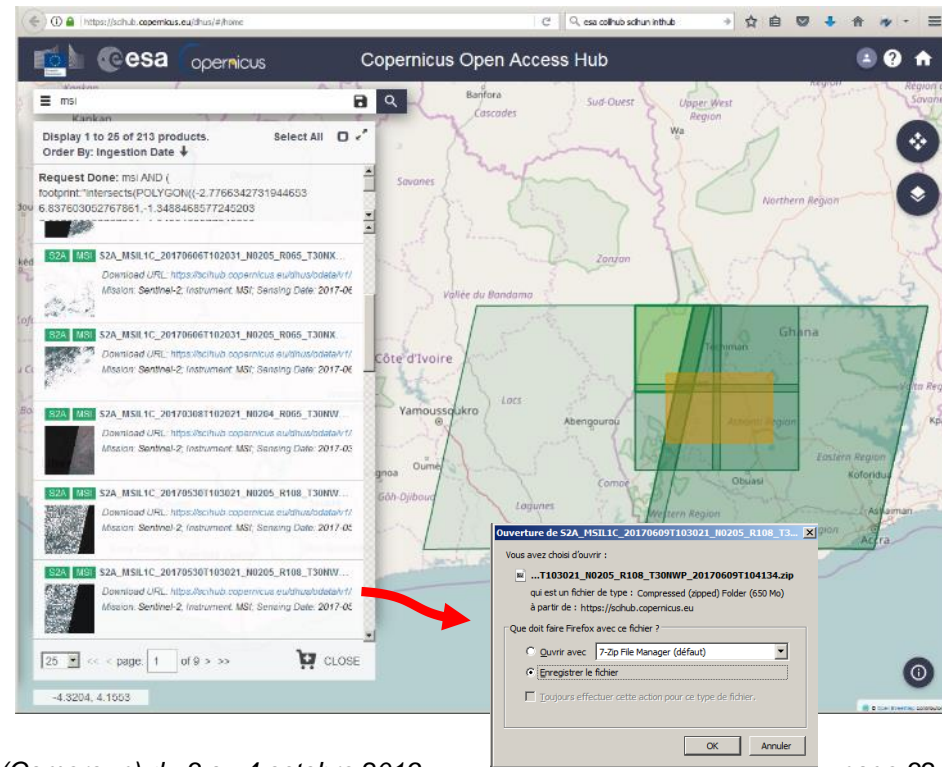
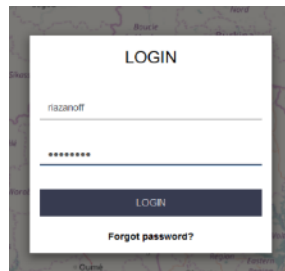


Copernicus Open Access Hub (COA)

<https://scihub.copernicus.eu/>



<https://scihub.copernicus.eu/dhus>





Traitement d'images

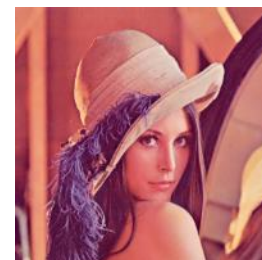
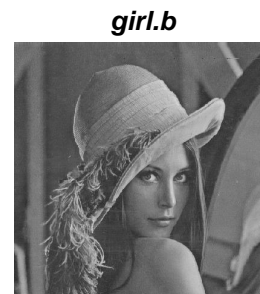
Histogramme, stretching linéaire



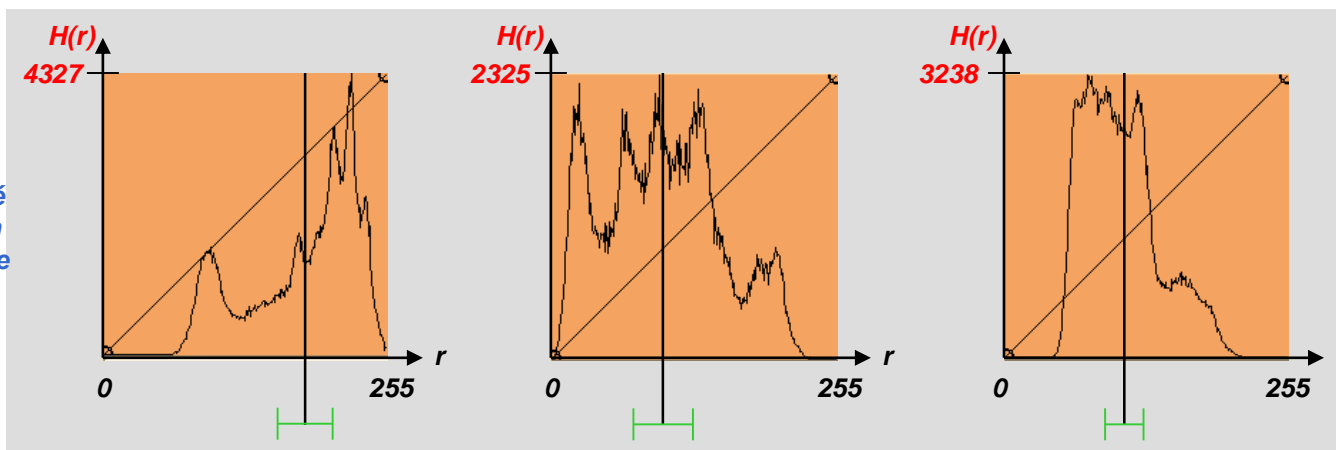
➤ Histogramme

$$\forall r = 0 \dots 2^d - 1, H(r) = \text{Card} \left(\{ R(i,j)=r, i=0..(M-1), j=0..(N-1) \} \right) \text{ avec } d: \text{ nombre de bits par pixels}$$

$H(r)$
Occurrences de
la radiométrie r
dans l'image
entière



affichage calibré
sur le maximum
de l'histogramme
($\max(H(k))$)



$m = 180,22$
 $\sigma = 49,05$

$m = 99,05$
 $\sigma = 52,88$

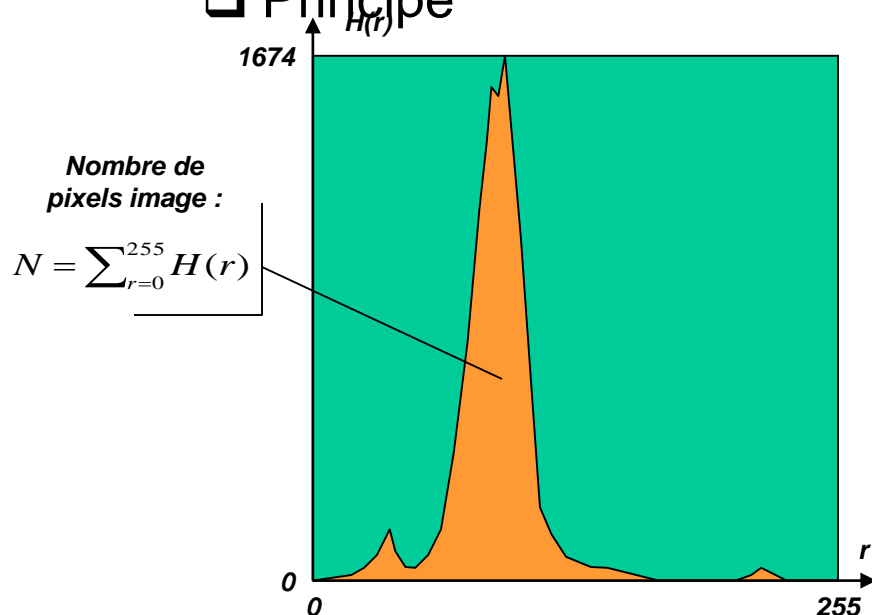
$m = 105,41$
 $\sigma = 34,06$



➤ Stretching linéaire automatique

Déterminer automatiquement les bornes a et b du stretching linéaire

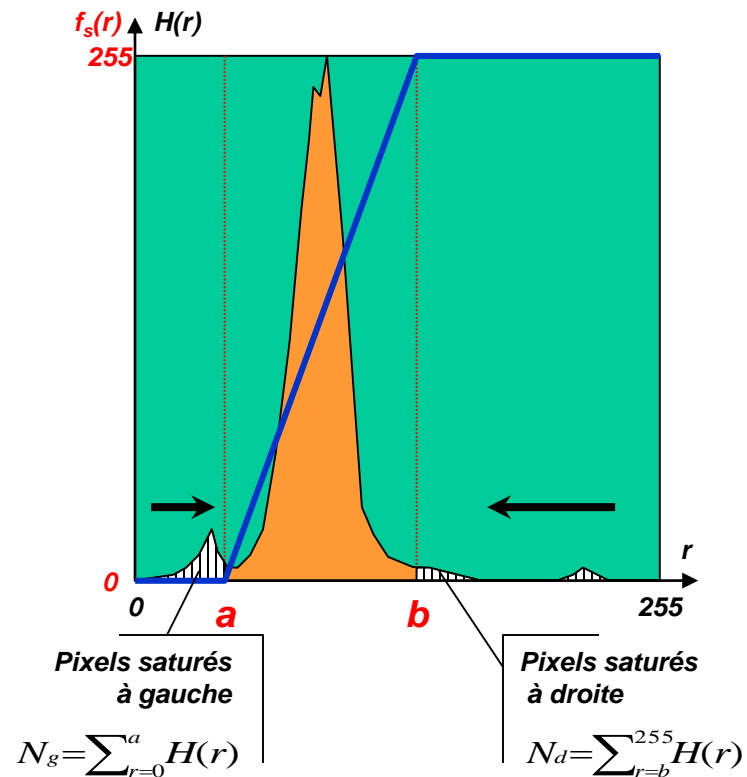
□ Principe



α_s : Pourcentage de saturation

$N_s = N \times \alpha_s$: Nombre de pixels image saturés

$N_s = N_g + N_d$



2 méthodes:

- saturer $N_g/2$ pixels à gauche puis $N_d/2$ pixels à droite
- saturer du côté où l'histogramme est minimal

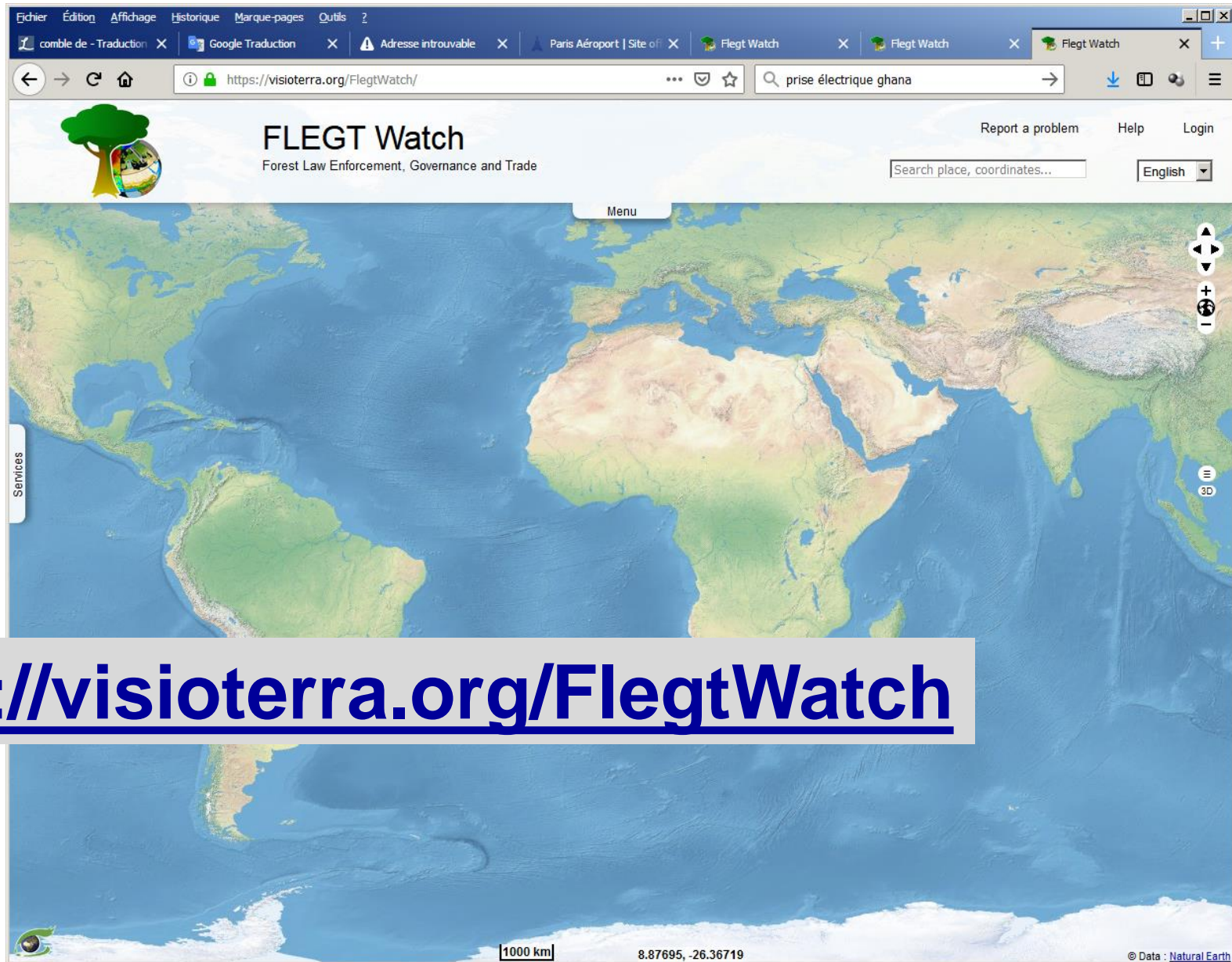


FLEGT Watch Web

Utilisation pas-à-pas



Lancer FLEGT Watch (Web)



<https://visioterra.org/FlegtWatch>



Entrer son e-mail et son mot-de-passe

FLEGT Watch
Forest Law Enforcement, Governance and Trade

Report a problem Help Login

Search place, coordinates... English

Menu

Authentication

Not logged in

Login (email) : myadress@myserver.xx

Password :

Login Logout Edit profil Close

Services

1000 km 13.09570, 28.12500 © Data : Natural Earth

La valeur par défaut du mot-de-passe des observateurs est “fw”

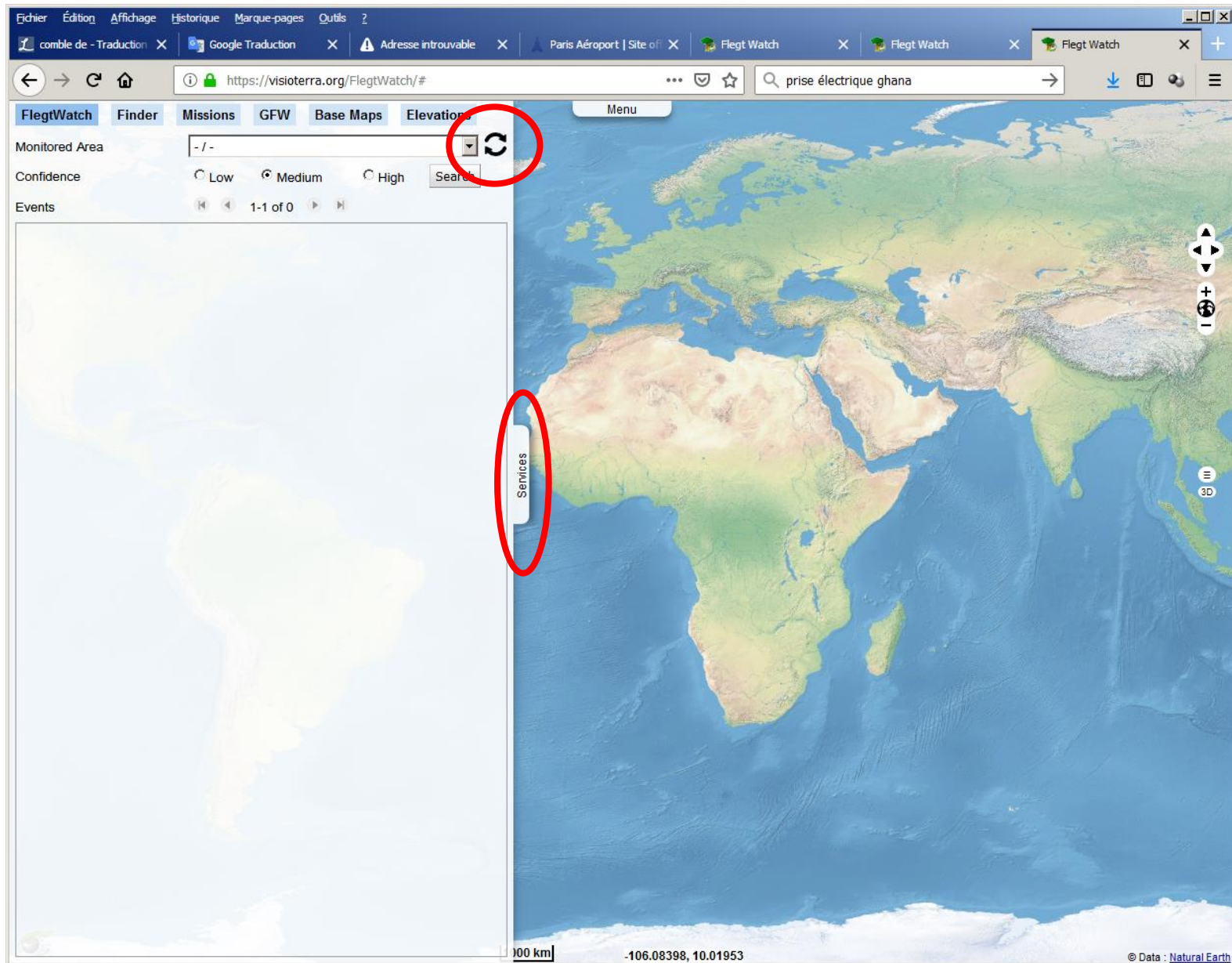


Vérifier que l'e-mail et le mot-de-passe ont été acceptés

The screenshot displays the FLEGT Watch web application in a browser. The browser's address bar shows the URL <https://visioterra.org/FlegtWatch/#>. The page header includes the FLEGT Watch logo, the text "Forest Law Enforcement, Governance and Trade", and navigation links for "Manage monitored areas" and "Manage u...". A green notification box in the top right corner states "Login successfully". Below the header is a search bar with the placeholder text "Search place, coordinates..." and a language dropdown menu set to "English". The main content area features a world map with a "Menu" button above it. On the left side of the map, there is a vertical "Services" button. At the bottom of the map, a scale bar indicates "1000 km" and the coordinates "-22.76367, -13.53516" are displayed. The bottom right corner of the map area includes the text "© Data : Natural Earth".



Ouvrir le panneau “Services” et actualiser les “Monitored areas”





Sélectionner une de vos aires à surveiller

Monitored Area: - / -

Confidence

Events

- CMR FODER01 - Dep. Haut Nyong / angeline.modjo@gmail.com
- CMR FODER02 - Arr. Ngambé Tikar / angeline.modjo@gmail.com
- CMR FODER03 - Dep. Ocean / angeline.modjo@gmail.com
- CMR FODER04 - Dep. Sanaga Maritime / angeline.modjo@gmail.com
- CMR FODER05 - Arr. Yoko / angeline.modjo@gmail.com
- Cameroon / flegtwatch@visioterra.fr
- Central Africa / flegtwatch@visioterra.fr
- Central African Republic / flegtwatch@visioterra.fr
- Congo / flegtwatch@visioterra.fr
- Democratic Republic of the Congo / flegtwatch@visioterra.fr
- GHA NDF01 - FR Krokosua / awoode@ndfwestafrica.org
- GHA NDF02 - FR Suhuma / awoode@ndfwestafrica.org
- GHA TBG01 - FR Sui / dannyrock51@yahoo.com
- GHA TBG02 - FR Tano-Suhen / dannyrock51@yahoo.com
- GHA VT01 - Kumasi / flegtwatch@visioterra.fr**
- Gabon / flegtwatch@visioterra.fr
- Ghana / flegtwatch@visioterra.fr
- Ivory Coast / flegtwatch@visioterra.fr
- Liberia / flegtwatch@visioterra.fr
- West Africa / flegtwatch@visioterra.fr

100 km

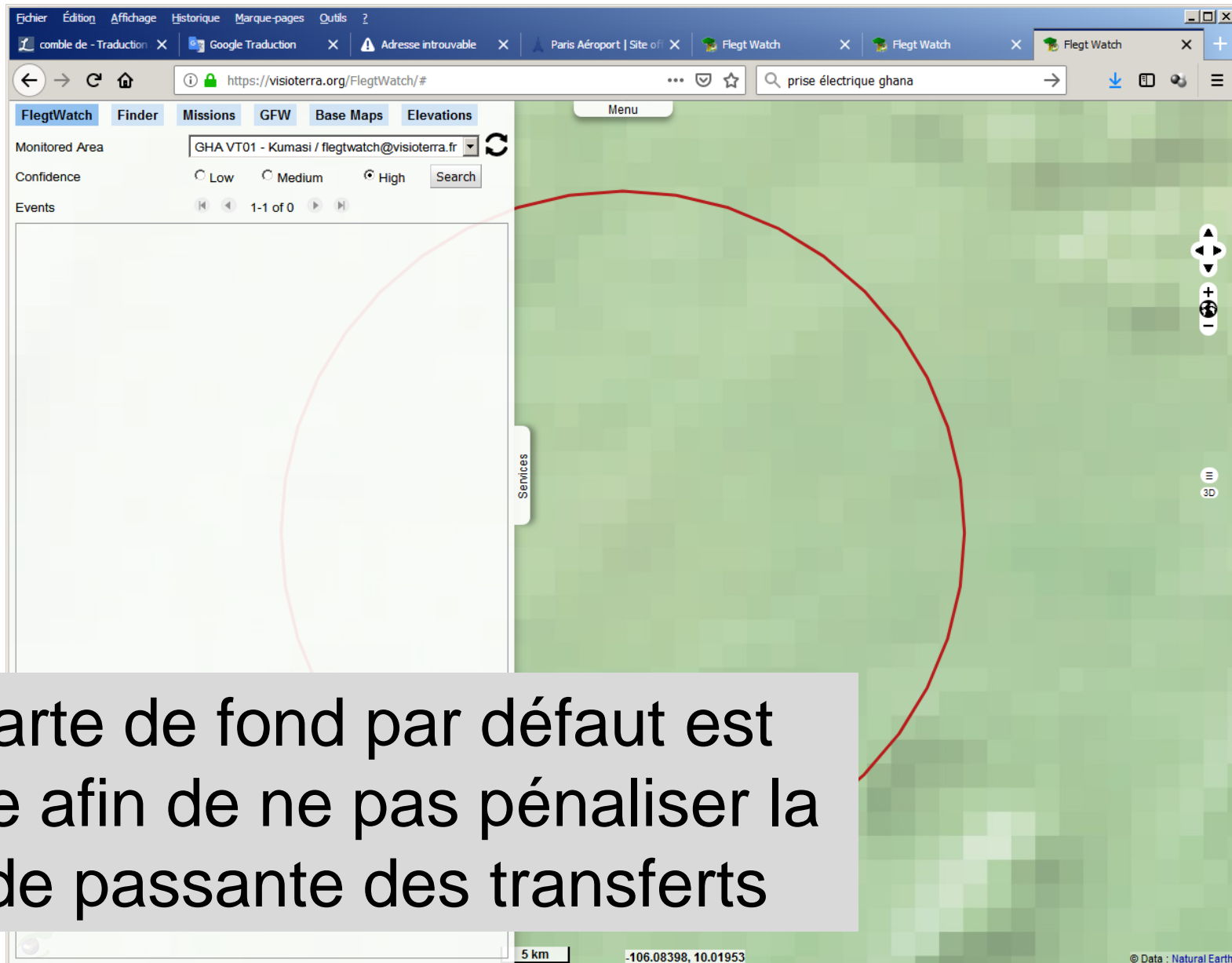
-106.08398, 10.01953

© Data : Natural Earth

Ici, je suis le gestionnaire du système
et c'est la raison pour laquelle je vois
toutes les “*monitored areas*”



Vous voyez le polygone de votre aire à surveiller



La carte de fond par défaut est pauvre afin de ne pas pénaliser la bande passante des transferts



Obtenir la liste – Indice de confiance moyen

Screenshot of the Flegt Watch web application interface. The browser address bar shows <https://visioterra.org/FlegtWatch/#>. The search bar contains "prise électrique ghana". The interface includes tabs for "FlegtWatch", "Finder", "Missions", "GFW", "Base Maps", and "Elevations". The "Monitored Area" is set to "GHA VT01 - Kumasi" and "Flegtwatch@visioterra.fr". The "Confidence" level is set to "Medium". The "Events" list shows 14 of 11 events, with the first 10 visible. The map on the right shows a satellite view of the area with a red circle indicating the monitored area. The bottom of the map shows a scale bar for 5 km and coordinates -106.08398, 10.01953. The data source is cited as "© Data : Natural Earth".

Monitored Area: GHA VT01 - Kumasi, Flegtwatch@visioterra.fr

Confidence: Low, **Medium**, High

Events: 14 of 11

Event #	Description	Date	Time	Action
#49980	Forest cover change	2019/03/17	18:17:40	<input type="checkbox"/>
#46432	Forest cover change	2019/02/27	18:18:24	<input type="checkbox"/>
#46328	Forest cover change	2019/02/21	18:17:40	<input type="checkbox"/>
#46308	Forest cover change	2019/02/21	18:17:40	<input type="checkbox"/>
#46305	Forest cover change	2019/02/21	18:17:40	<input type="checkbox"/>
#45775	Forest cover change	2019/01/16	18:17:41	<input type="checkbox"/>
#45438	Forest cover change	2018/12/23	18:17:42	<input type="checkbox"/>
#45262	Forest cover change	2018/12/11	18:17:42	<input type="checkbox"/>
#45158	Forest cover change	2018/10/18	18:18:27	<input type="checkbox"/>
#45157	Forest cover change	2018/10/18	18:18:27	<input type="checkbox"/>
#45037	Forest cover change	2018/09/30	18:17:43	<input type="checkbox"/>

5 km | -106.08398, 10.01953 | © Data : Natural Earth



Obtenir la liste – Indice de confiance faible

Screenshot of the Flegt Watch web application interface. The browser address bar shows <https://visioterra.org/FlegtWatch/#>. The search bar contains "prise électrique ghana". The "Monitored Area" dropdown is set to "GHA VT01 - Kumasi / flegtwatch@visioterra.fr". The "Confidence" filter is set to "Low", which is circled in red. The "Search" button is also circled in red. The "Events" list shows 25 of 2,322 events, all labeled "Forest cover change - 2019/04/04 18:18:24" and "GHA VT01 - Kumasi". The map on the right shows a satellite view of a forested area with a red circle indicating the monitored area. The bottom status bar shows coordinates "-106.08398, 10.01953" and a scale of "5 km".

Event	Description	Date	Location
#51333	Forest cover change	2019/04/04 18:18:24	GHA VT01 - Kumasi
#51332	Forest cover change	2019/04/04 18:18:24	GHA VT01 - Kumasi
#51331	Forest cover change	2019/04/04 18:18:24	GHA VT01 - Kumasi
#51330	Forest cover change	2019/04/04 18:18:24	GHA VT01 - Kumasi
#51329	Forest cover change	2019/04/04 18:18:24	GHA VT01 - Kumasi
#51328	Forest cover change	2019/04/04 18:18:24	GHA VT01 - Kumasi
#51327	Forest cover change	2019/04/04 18:18:24	GHA VT01 - Kumasi
#51326	Forest cover change	2019/04/04 18:18:24	GHA VT01 - Kumasi
#51325	Forest cover change	2019/04/04 18:18:24	GHA VT01 - Kumasi
#51324	Forest cover change	2019/04/04 18:18:24	GHA VT01 - Kumasi
#51323	Forest cover change	2019/04/04 18:18:24	GHA VT01 - Kumasi
#51322	Forest cover change	2019/04/04 18:18:24	GHA VT01 - Kumasi
#51321	Forest cover change	2019/04/04 18:18:24	GHA VT01 - Kumasi
#51320	Forest cover change	2019/04/04 18:18:24	GHA VT01 - Kumasi
#51319	Forest cover change	2019/04/04 18:18:24	GHA VT01 - Kumasi
#51318	Forest cover change	2019/04/04 18:18:24	GHA VT01 - Kumasi



Sélectionner un événement → GHA VT01 / #50900

**Sentinel-1B radar
observée le
29.03.2019
18:17:42 CET**

The screenshot displays the FLEGT Watch web application. The interface includes a top navigation bar with tabs for 'FlegtWatch', 'Finder', 'Missions', 'GFW', 'Base Maps', and 'Elevations'. The 'Finder' tab is active, showing a search bar with the text 'GHA VT01 - Kumasi / flegtwatch@visioterra.fr'. Below the search bar, there are radio buttons for 'Confidence' (Low, Medium, High) and a 'Search' button. The 'Events' section shows a list of events, with #50900 selected. The event details for #50900 are: 'Event Forest cover change - 2019/03/29 18:17:40 GHA VT01 - Kumasi'. The map on the right shows a dense forest cover change, with a yellow lightning bolt icon indicating the location of the event. The event details panel on the right shows the event name 'Event #50900 - Forest cover change' and a timeline from '2019/03/29 18:17 - Now'.

Event	Description	Date/Time	Location
#50915	GHA VT01 - Kumasi		
Event	Forest cover change	2019/03/29 18:17:40	
#50914	GHA VT01 - Kumasi		
Event	Forest cover change	2019/03/29 18:17:40	
#50904	GHA VT01 - Kumasi		
Event	Forest cover change	2019/03/29 18:17:40	
#50903	GHA VT01 - Kumasi		
Event	Forest cover change	2019/03/29 18:17:40	
#50902	GHA VT01 - Kumasi		
Event	Forest cover change	2019/03/29 18:17:40	
#50901	GHA VT01 - Kumasi		
Event	Forest cover change	2019/03/29 18:17:40	
#50900	GHA VT01 - Kumasi		
Event	Forest cover change	2019/03/29 18:17:40	
#50899	GHA VT01 - Kumasi		



Differences avec les acquisitions précédentes (moyenne de 4)

Interface de Flegt Watch montrant une carte satellite de la région de Kumasi, Ghana, avec des données de surveillance forestière. La carte est colorée en vert et magenta, indiquant des changements de couverture forestière. Une zone spécifique est délimitée par une ligne jaune.

Le menu de gauche affiche une liste d'événements (Forest cover change) pour la zone GHA VT01 - Kumasi, datés du 2019/03/29 18:17:40. Les événements sont numérotés de #50899 à #50915. L'événement #50900 est sélectionné.

Le panneau de droite affiche une vue avant/après de l'événement #50900 - Forest cover change, daté du 2019/03/29 18:17. Des boutons de navigation (précédent et suivant) sont visibles, encadrés en rouge.

Le statut de la zone est GHA VT01 - Kumasi / flegtwatch@visioterra.fr. Les paramètres de confiance sont réglés sur Low. Le nombre d'événements est 101-125 of 2,322.

Le panneau de droite affiche une vue avant/après de l'événement #50900 - Forest cover change, daté du 2019/03/29 18:17. Des boutons de navigation (précédent et suivant) sont visibles, encadrés en rouge.

Le statut de la zone est GHA VT01 - Kumasi / flegtwatch@visioterra.fr. Les paramètres de confiance sont réglés sur Low. Le nombre d'événements est 101-125 of 2,322.



Utiliser le “layer stack”

The screenshot displays the VisioTerra Flegt Watch web application. The interface includes a sidebar on the left with a list of events, a main map area, and a layer stack panel on the right. A red box highlights the 3D button in the top right corner, and another red box highlights the 3D button in the layer stack panel. A yellow outline highlights a specific event on the map.

Monitored Area: GHA VT01 - Kumasi / flegtwatch@visioterra.fr

Confidence: Low Medium High

Events: 101-125 of 2,322

Event	Description	Date
#50915	GHA VT01 - Kumasi	
Event	Forest cover change - 2019/03/29 18:17:40	
#50914	GHA VT01 - Kumasi	
Event	Forest cover change - 2019/03/29 18:17:40	
#50913	GHA VT01 - Kumasi	
Event	Forest cover change - 2019/03/29 18:17:40	
#50912	GHA VT01 - Kumasi	
Event	Forest cover change - 2019/03/29 18:17:40	
#50911	GHA VT01 - Kumasi	
Event	Forest cover change - 2019/03/29 18:17:40	
#50910	GHA VT01 - Kumasi	
Event	Forest cover change - 2019/03/29 18:17:40	
#50909	GHA VT01 - Kumasi	
Event	Forest cover change - 2019/03/29 18:17:40	
#50908	GHA VT01 - Kumasi	
Event	Forest cover change - 2019/03/29 18:17:40	
#50907	GHA VT01 - Kumasi	
Event	Forest cover change - 2019/03/29 18:17:40	
#50906	GHA VT01 - Kumasi	
Event	Forest cover change - 2019/03/29 18:17:40	
#50905	GHA VT01 - Kumasi	
Event	Forest cover change - 2019/03/29 18:17:40	
#50904	GHA VT01 - Kumasi	
Event	Forest cover change - 2019/03/29 18:17:40	
#50903	GHA VT01 - Kumasi	
Event	Forest cover change - 2019/03/29 18:17:40	
#50902	GHA VT01 - Kumasi	
Event	Forest cover change - 2019/03/29 18:17:40	
#50901	GHA VT01 - Kumasi	
Event	Forest cover change - 2019/03/29 18:17:40	
#50900	GHA VT01 - Kumasi	
Event	Forest cover change - 2019/03/29 18:17:40	
#50899	GHA VT01 - Kumasi	

Layer stack:

- Temporary display
- GHA VT01 - Kumasi
- Layer stack
- Event #50900
- Base display
- Natural Earth From VisioTerra
- GEBCO Bathymetry

Event #50900 - Forest cover change

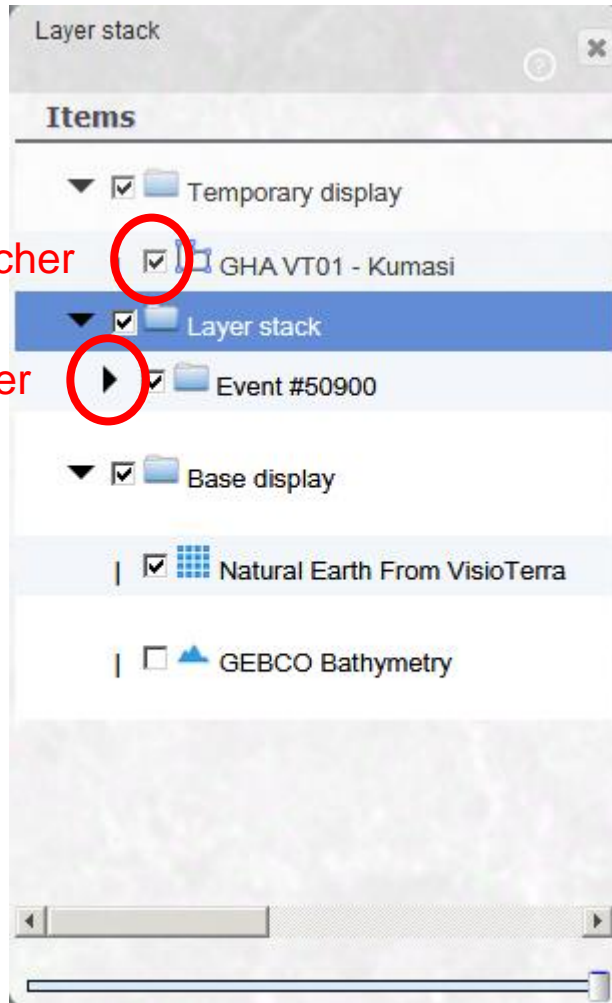
2019/03/29 18:17 - Before



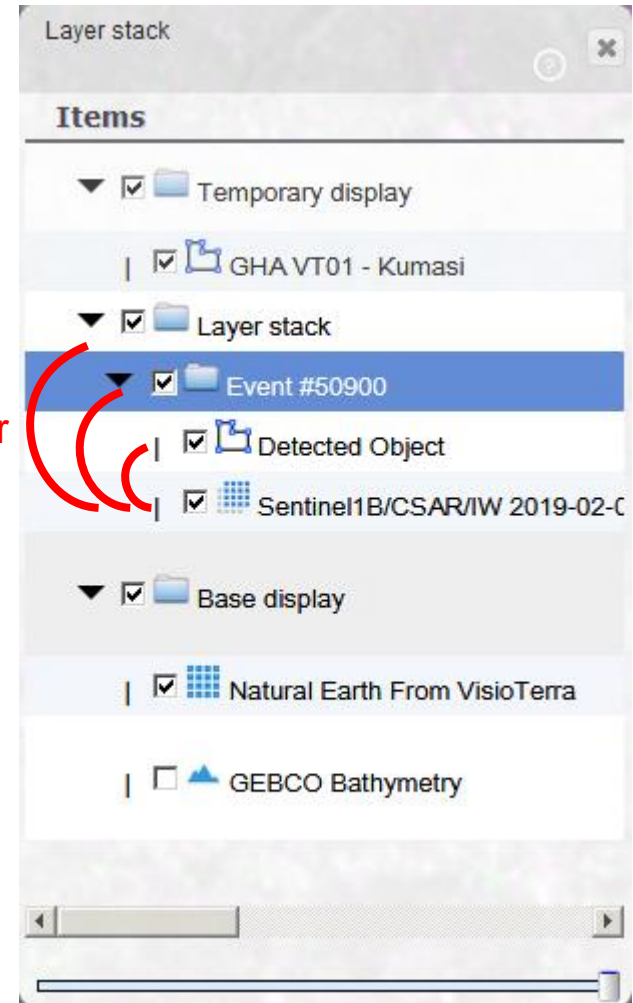
Manipuler les éléments du “*layer stack*”

afficher / cacher

plier / déplier

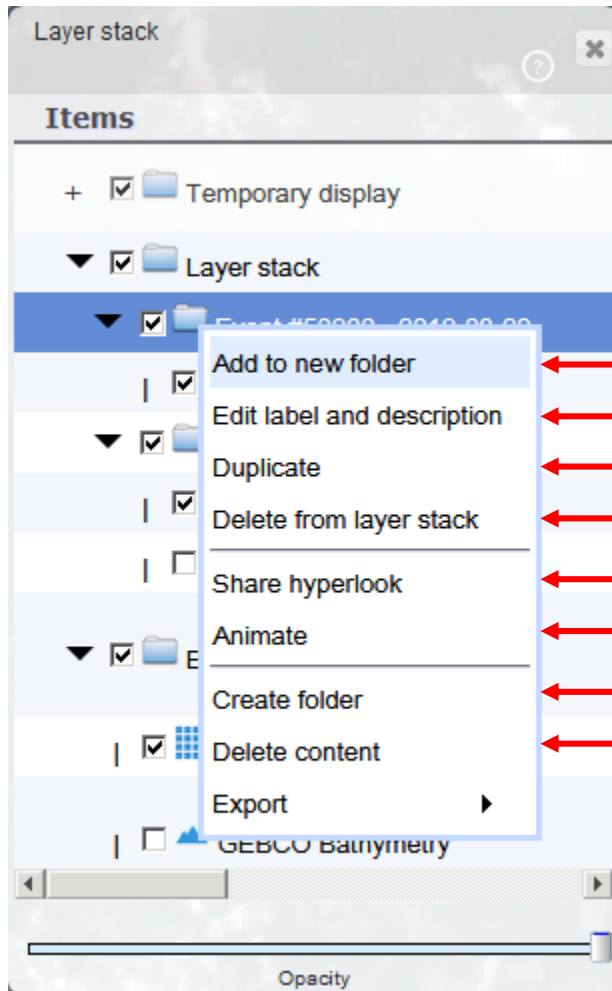


déplacer





Manipuler les éléments du “*layer stack*” (2)



Ajouter un nouveau dossier

Editer le label et la description

Dupliquer

Enlever du « layer stack »

Partager un hyperlook

Animer

Créer un répertoire

Supprimer le contenu



Changer de carte de fond - OpenStreetMap

The screenshot displays the VisiO Terra web application interface. The top navigation bar includes tabs for 'FlegtWatch', 'Finder', 'Missions', 'GFW', 'Base Maps', and 'Elevations'. The 'Background Maps' panel on the left lists various map sources, with 'OpenStreetMap' selected and highlighted by a red box. The main map area shows a street view of a city with a yellow outline of a building. A 'Layer stack' panel on the right lists various layers, including 'OpenStreetMap' and 'GECBO Bathymetry'. A bottom panel shows 'Event #50900 - Forest cover change' with a date range of '2019/03/29 18:17 - Before'.



Changer de carte de fond (2) – Bing map

The screenshot shows the Flegt Watch web application interface. The browser address bar displays <https://visiorterra.org/FlegtWatch/#>. The application has a top navigation bar with tabs: FlegtWatch, Finder, Missions, GFW, Base Maps, and Elevations. The 'Base Maps' tab is active.

On the left side, under 'Background Maps', there is a grid of map thumbnails. The 'Bing Map (Microsoft)' thumbnail is highlighted with a red rectangle. Other visible thumbnails include VMap0 (OSGeo), Blue Marble (NASA), Landsat-7 (NASA), OpenStreetMap (Terrestris), OpenStreetMap, OSM Humanitarian, and Bing Map Road (Microsoft). Below this grid is an 'Overlay Maps' section and a 'Custom WMS source' button.

The main map area displays a satellite view of a forested area. A yellow lightning bolt icon is overlaid on the map. A 'Layer stack' panel is open on the right, showing a list of layers:

- Temporary display
 - GHA VT01 - Kumasi
- Layer stack
 - Event #50900
 - Detected Object
 - Sentinel1B/CSAR/IW 2019-02-0
- Base display
 - Bing Map (Microsoft)
 - GECBO Bathymetry

At the bottom of the map, there is a status bar showing coordinates: -1.51167, 6.75166. A small pop-up window at the bottom center displays 'Event #50900 - Forest cover change' with a date/time selector set to '2019/03/29 18:17 - Before'.



Caractériser l'occupation du sol

forêt dégradée ou
agroforesterie ?





Obtenir d'autres données – 1. Définir son aire d'intérêt

The screenshot shows the Flegt Watch web application interface. The 'Finder' tab is active, displaying search parameters for an Area of Interest (AOI). The parameters include:

- ☒ Area of interest (AOI)
- ☐ Minimum overlay (%)
- ☒ Date start: 2019-02-01 00:00:00
- ☐ Date stop: 2019-04-07 23:59:59
- ☐ Status: Ready
- Dataset: S2A_MSI ; S2A_MSI_L2A ; S2B_MSI ;
- ☐ Cloud Cover: 25
- Limit: 100

A red circle on the satellite map indicates the defined AOI. A dialog box titled 'Select a layerstack item' is open, showing 'GHA VT01 - Kumasi' as the selected item. A toolbar with four icons (globe, up arrow, menu, and zoom) is highlighted with red arrows pointing to a text box.

à partir de l'étendu de l'écran
à partir du "layer stack"
à partir d'un fichier externe
à partir du globe virtuel



Obtenir d'autres données – 2. Définir d'éventuels date / intervalle

Screenshot of the FlegtWatch web application interface. The browser address bar shows <https://visioterra.org/FlegtWatch/#>. The search bar contains the text "prise électrique ghana".

The left sidebar contains the following settings:

- ☒ Area of interest (AOI)
- ☐ Minimum overlay (%)
- ☒ Date start
- ☐ Date stop
- ☐ Status
- Dataset
- ☐ Cloud Cover
- Limit

The "Date start" setting is highlighted with a red box. The "Date stop" setting is set to 2019-04-07 23:59:59. The "Status" dropdown is set to "Ready". The "Dataset" dropdown is set to "Temporary Geomet". The "Cloud Cover" dropdown is set to "25". The "Limit" dropdown is set to "100".

The main map area displays a satellite image of a forested area. A large yellow circle indicates the search area. A smaller yellow rectangle highlights a specific location within the search area. The map includes a scale bar (5 km) and coordinates (-1.59971, 6.77169). The bottom status bar shows "Search cancelled" and "Data - Bing Maps".



Obtenir d'autres données – 3. Définir une (ou des) collection(s)

Sélectionne les données Sentinel-2 optique HR



Obtenir d'autres données – 4. Lancer “Search” et obtenir le nombre de résultats

1. Ajuster le max. de résultats
2. Lancer “Search”
3. Presser sur “Continue” ou “Cancel”

The screenshot displays the Flegt Watch web application interface. The main window shows a satellite map of a forested area with a yellow circle indicating the search area. A search result dialog box is open, showing 'Found 7 result(s) for Sentinel2A/MSI' and 'Found 7 result(s) for Sentinel2B/MSI'. The 'Continue' button is highlighted with a red circle and the number 3.

The search settings panel on the left includes the following fields:

- Area of interest (AOI):** Temporary Geomet
- Minimum overlay (%):** (empty)
- Date start:** 2019-02-01
- Date stop:** 2019-04-07
- Status:** Ready
- Dataset:** S2A_MSI ; S2B_MSI
- Cloud Cover Limit:** 25
- Limit:** 100 (highlighted with a red circle and the number 1)
- Search:** (highlighted with a red circle and the number 2)

The search result dialog box shows:

- Search result:**
- Found 7 result(s) for Sentinel2A/MSI
- Found 7 result(s) for Sentinel2B/MSI
- Continue:** (highlighted with a red circle and the number 3)
- Cancel:** (highlighted with a red circle and the number 3)



Obtenir d'autres données – 5. Examiner les résultats (empreinte au sol du produit)

Fichier Édition Affichage Historique Marque-pages Outils ?

comble de - Traduction X Google Traduction X Adresse introuvable X Paris Aéroport | Site off X Flegt Watch X Flegt Watch X Flegt Watch X

https://visioterra.org/FlegtWatch/# prise électrique ghana

FlegtWatch Finder Missions GFW Base Maps Elevations

☒ Area of interest (AOI)
☐ Minimum overlay (%)
☒ Date start
☐ Date stop
☐ Status
Dataset
☐ Cloud Cover
Limit

Temporary Geomet
2019-02-01 00:00:00
2019-04-07 23:59:59
Ready
S2A_MSI ; S2B_MSI
25
100

Search

S	Dataset	▲ Date	Properties
	S2B_MSI	2019-02-01 10:22:49	CCN=083%
✓	S2A_MSI	2019-02-06 10:22:11	CCN=021%
✓	S2B_MSI	2019-02-11 10:21:49	CCN=000%
	S2A_MSI	2019-02-16 10:21:11	CCN=006%
	S2B_MSI	2019-02-21 10:20:39	CCN=020%
✓	S2A_MSI	2019-02-26 10:20:21	CCN=000%
	S2B_MSI	2019-03-03 10:20:19	CCN=010%
	S2A_MSI	2019-03-08 10:20:21	CCN=048%
✓	S2B_MSI	2019-03-13 10:20:19	CCN=002%
✓	S2A_MSI	2019-03-18 10:20:21	CCN=045%
✓	S2B_MSI	2019-03-23 10:20:29	CCN=063%
✓	S2A_MSI	2019-03-28 10:20:21	CCN=078%
✓	S2B_MSI	2019-04-02 10:20:29	CCN=002%
	S2A_MSI	2019-04-07 10:20:21	CCN=077%

Settings Clear temporary display Help

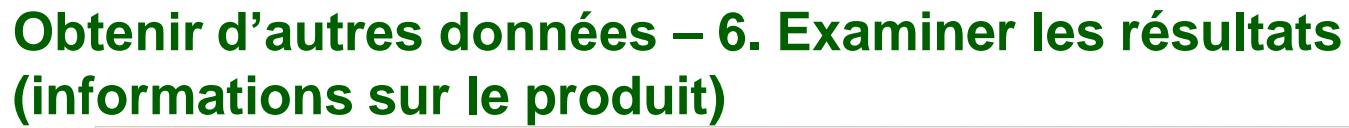
Menu

Services

100 km

20 km -1.56950, 6.39060

© Data - Bing Maps



VT-P281-SLD-007-F-01-01 – FLEGT Watch, Support de formation – Douala (Cameroun) du 3 au 4 octobre 2019



Obtenir d'autres données – 7. Examiner les résultats (voir le quick-look)

1. Activer le bouton "Settings"
2. Dans le menu "Show thumbnail" sélectionner "In a window"
3. Sélectionner un produit à afficher comme image (quick-look) dans la fenêtre "Thumbnail"

The screenshot shows the Flegt Watch web application interface. The left sidebar contains a 'Finder' tab with various filters and a table of products. The main area displays a satellite map of a region in Ghana, with a yellow rectangle highlighting a specific area of interest. A red circle with the number '1' points to the 'Settings' button at the bottom left. A red circle with the number '2' points to the 'Show thumbnail' dropdown menu, which is set to 'In a window'. A red circle with the number '3' points to the 'Thumbnail' window, which displays a satellite image of the selected area.

Finder

☒ Area of interest (AOI)
☐ Minimum overlay (%)
☒ Date start
☐ Date stop
☐ Status
Dataset: S2A_MSI ; S2B_MSI
☐ Cloud Cover: 25
Limit: 100

Table:

S	Dataset	Date	Properties
	S2B_MSI	2019-02-01 10:22:49	CCN=083%
✓	S2A_MSI	2019-02-06 10:22:11	CCN=021%
✓	S2B_MSI	2019-02-11 10:21:49	CCN=000%
	S2A_MSI	2019-02-16 10:21:11	CCN=006%
	S2B_MSI	2019-02-21 10:20:39	CCN=020%
✓	S2A_MSI	2019-02-26 10:20:21	CCN=000%
	S2B_MSI	2019-03-03 10:20:19	CCN=010%
	S2A_MSI	2019-03-08 10:20:21	CCN=048%
✓	S2B_MSI	2019-03-13 10:20:19	CCN=002%
✓	S2A_MSI	2019-03-18 10:20:21	CCN=045%
✓	S2B_MSI	2019-03-23 10:20:29	CCN=063%
✓	S2A_MSI	2019-03-28 10:20:21	CCN=078%
✓	S2B_MSI	2019-04-02 10:20:29	CCN=002%
	S2A_MSI	2019-04-07 10:20:21	CCN=077%

Map View:

Thumbnail: No product selected

Focus on last selected product
Show thumbnail: In a window

Settings

Clear temporary display

Help

20 km

-1.97874, 7.43705

© Data: Bing Maps



Obtenir d'autres données – 8. Voir un produit déjà préparé

Sélectionner un produit dont le « status » (S) est marqué.

The screenshot shows the VisioTerra FlegtWatch web application. The sidebar on the left contains filters for Area of interest (AOI), Minimum overlay (%), Date start, Date stop, Status, Dataset, Cloud Cover, and Limit. The main area displays a table of products with columns for S, Dataset, Date, and Properties. A red circle highlights the 'S' column, indicating the status of the products. The table lists various datasets (S2A_MSI, S2B_MSI) with their respective dates and CCN values.

S	Dataset	Date	Properties
	S2B_MSI	2019-02-01 10:22:49	CCN=083%
✓	S2A_MSI	2019-02-06 10:22:11	CCN=021%
✓	S2B_MSI	2019-02-11 10:21:49	CCN=000%
✓	S2A_MSI	2019-02-16 10:21:11	CCN=006%
✓	S2B_MSI	2019-02-21 10:20:39	CCN=020%
✓	S2A_MSI	2019-02-26 10:20:21	CCN=000%
✓	S2B_MSI	2019-03-03 10:20:19	CCN=010%
✓	S2A_MSI	2019-03-08 10:20:21	CCN=048%
✓	S2B_MSI	2019-03-13 10:20:19	CCN=002%
	S2A_MSI	2019-03-18 10:20:21	CCN=024%
✓	S2A_MSI	2019-03-18 10:20:21	CCN=045%
✓	S2B_MSI	2019-03-23 10:20:29	CCN=063%
	S2A_MSI	2019-03-28 10:20:21	CCN=078%
✓	S2B_MSI	2019-04-02 10:20:29	CCN=002%
✓	S2A_MSI	2019-04-07 10:20:21	CCN=077%
	S2B_MSI	2019-04-12 10:20:29	CCN=041%
✓	S2A_MSI	2019-04-17 10:20:31	CCN=055%
✓	S2B_MSI	2019-04-22 10:20:29	CCN=053%
✓	S2A_MSI	2019-04-27 10:20:31	CCN=070%
✓	S2B_MSI	2019-05-02 10:20:29	CCN=023%
✓	S2A_MSI	2019-05-07 10:20:31	CCN=031%
✓	S2B_MSI	2019-05-12 10:20:29	CCN=043%



Obtenir d'autres données – 9. Préparer un produit

On peut préparer un produit en cliquant sur le bouton droit de la souris et en activant « Prepare data ».

Un maximum de 3 préparations est permis par jour !

Vérifier le quick-look et la note de couvert nuageux (ici 41%).

Le pourcentage d'avancement de la préparation est affiché.

The screenshot shows the VisioTerra FlegtWatch web application. The interface includes a top menu bar, a search bar, and a sidebar with tabs for 'FlegtWatch', 'Finder', 'Missions', 'GFW', 'Base Maps', and 'Elevations'. The 'Missions' tab is active, displaying a table of satellite data. A yellow circle on the map highlights a specific area of interest. The 'Prepare data' button in the sidebar is highlighted with a red rectangle.

S	Dataset	Date	Properties
✓	S2B_MSI	2019-02-01 10:22:49	CCN=083%
✓	S2A_MSI	2019-02-06 10:22:11	CCN=021%
✓	S2B_MSI	2019-02-11 10:21:49	CCN=000%
✓	S2A_MSI	2019-02-16 10:21:11	CCN=006%
✓	S2B_MSI	2019-02-21 10:20:39	CCN=020%
✓	S2A_MSI	2019-02-26 10:20:21	CCN=000%
✓	S2B_MSI	2019-03-03 10:20:19	CCN=010%
✓	S2A_MSI	2019-03-08 10:20:21	CCN=048%
✓	S2B_MSI	2019-03-13 10:20:19	CCN=002%
✓	S2A_MSI	2019-03-18 10:20:21	CCN=024%
✓	S2A_MSI	2019-03-18 10:20:21	CCN=045%
✓	S2B_MSI	2019-03-23 10:20:29	CCN=063%
✓	S2A_MSI	2019-03-28 10:20:21	CCN=078%
✓	S2B_MSI	2019-04-02 10:20:29	CCN=002%
✓	S2A_MSI	2019-04-07 10:20:21	CCN=077%
✓	S2B_MSI	2019-04-12 10:20:29	CCN=041%
✓	S2B_MSI	2019-04-17 10:20:31	CCN=055%
✓	S2B_MSI	2019-04-22 10:20:29	CCN=053%
✓	S2B_MSI	2019-04-27 10:20:31	CCN=070%
✓	S2B_MSI	2019-05-02 10:20:29	CCN=023%
✓	S2B_MSI	2019-05-07 10:20:31	CCN=031%
✓	S2B_MSI	2019-05-12 10:20:29	CCN=043%

Buttons in the sidebar: Add to layer stack, Get information, Focus on product, **Prepare data**.



Merci de votre attention.
Thank you for your attention.

Questions ?



VisioTerra

Serge RIAZANOFF

Director

serge.riazanoff@visioterra.fr

www.visioterra.fr