

→ **POLSARPROF**

PRESENTS



# PolSARpro v6.0 (Biomass Edition)

## A GENERAL INTRODUCTION



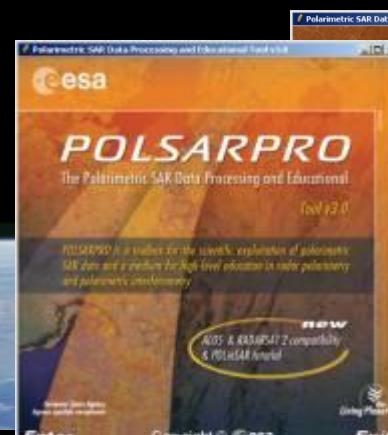
2003



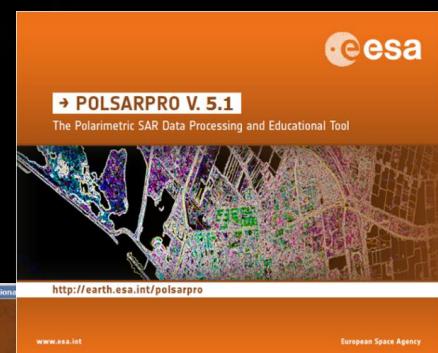
2004



2005

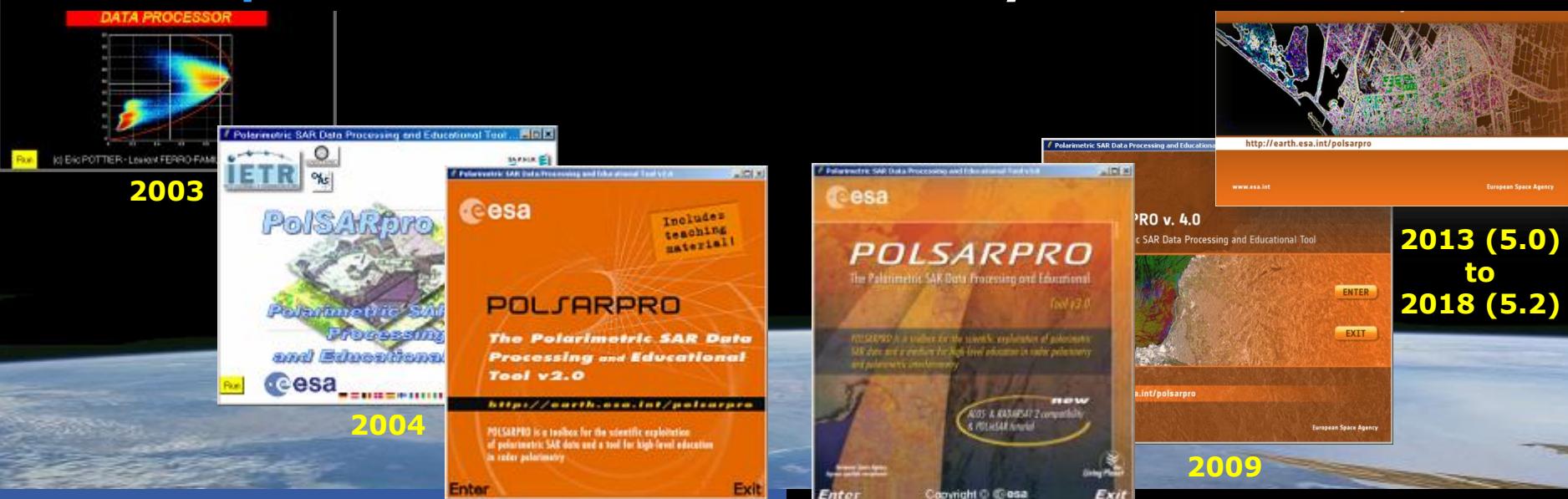


2009

2013 (5.0)  
to  
2018 (5.2)

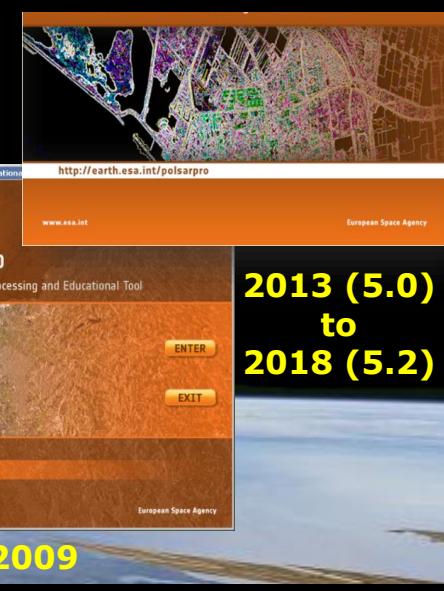
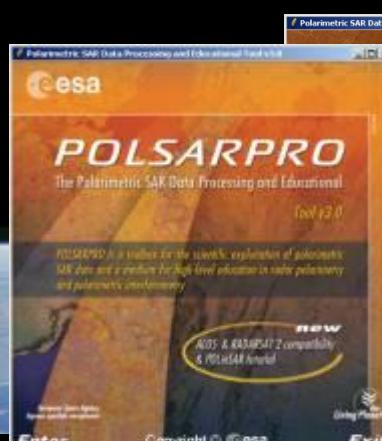


The initiative development of **PolSARpro Software** is a direct result of recommendations made during the **POLinSAR 2003 Workshop** held at ESA-ESRIN in January 2003.

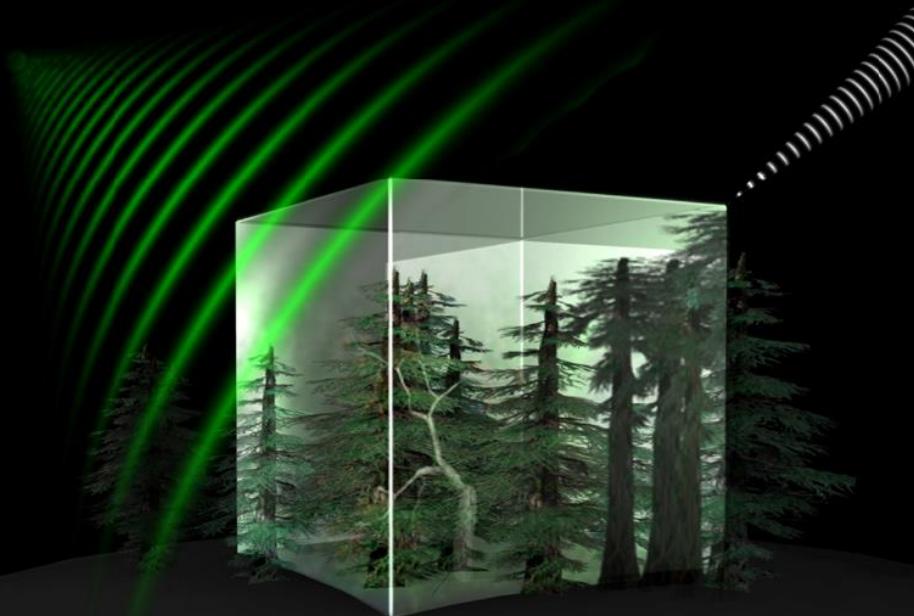




The initiative development of the **POLinSARpro Software** is a direct result of recommendations made during the **POLinSAR 2003 Workshop** held at ESA-ESRIN, Italy, during January 2003.



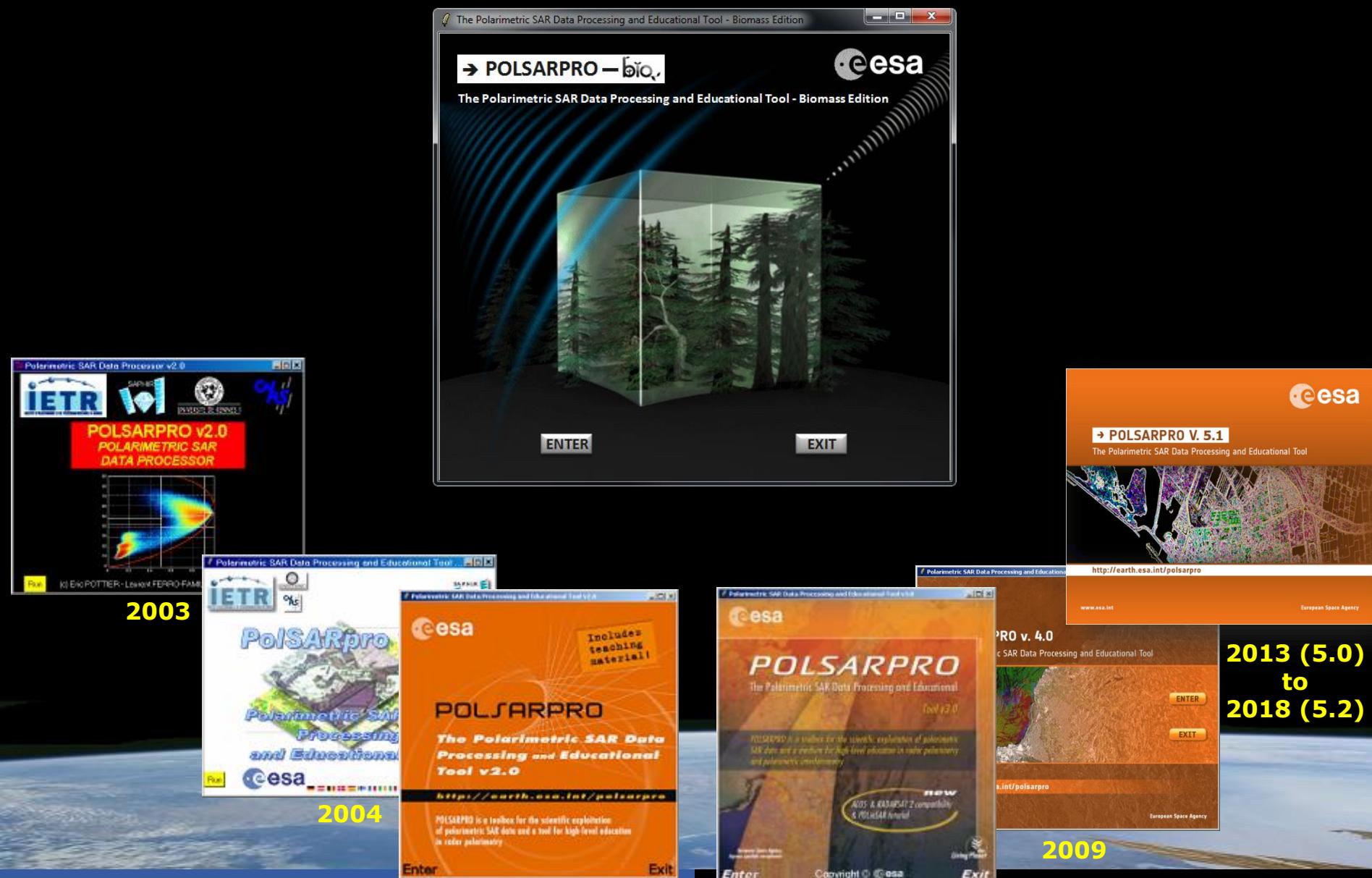
## BIOMASS mission : 7th ESA Earth Explorer (2022)



Biomass will provide **global maps** of the amount of **carbon** stored in the world's forests and how this **changes** over time.

Further our **knowledge** of the role **forests** play in the **carbon cycle**.

P-Band **Pol-TomoSAR** spaceborne mission





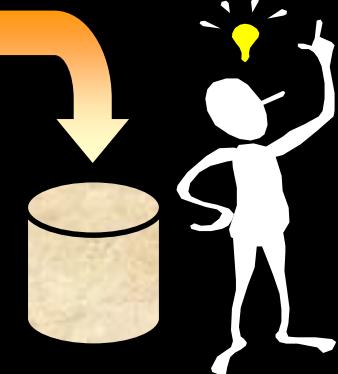
**Toolbox specifically designed to handle : Pol-SAR, Pol-InSAR, Pol-TimeSAR and now Pol-TomoSAR data.**

**Educational Software offering a tool for self-education in the field of Polarimetric SAR data processing and analysis.**

**Developed to be accessible to : a wide range of users from novices to experts in the field of Pol-SAR, Pol-InSAR, Pol-TomoSAR, Pol-TimeSAR....**



Around **1800** different Pol-SAR,  
Pol-InSAR, Pol-TimeSAR and now  
Pol-TomoSAR **functionalities**.



Each element of the Software (*a function*) can be **extracted** and **incorporated** individually into **users'** own processing software.



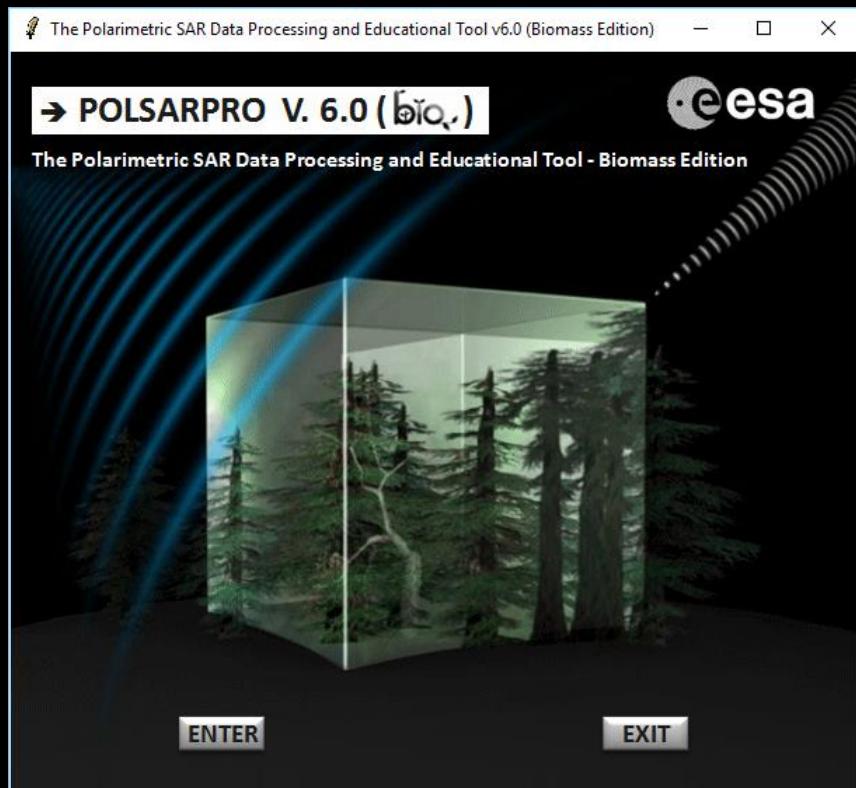
PolSARpro v6.0 (Biomass Edition) Software is made available following the: **Open Source Software Development (OSSD)** approach, and follows the: **GNU General Public License v2 – June 1991**.



- +3000 registered users
- +70 foreign countries

## International Collaborative Project (4 Agencies, 19 Research Centres, 21 Universities)

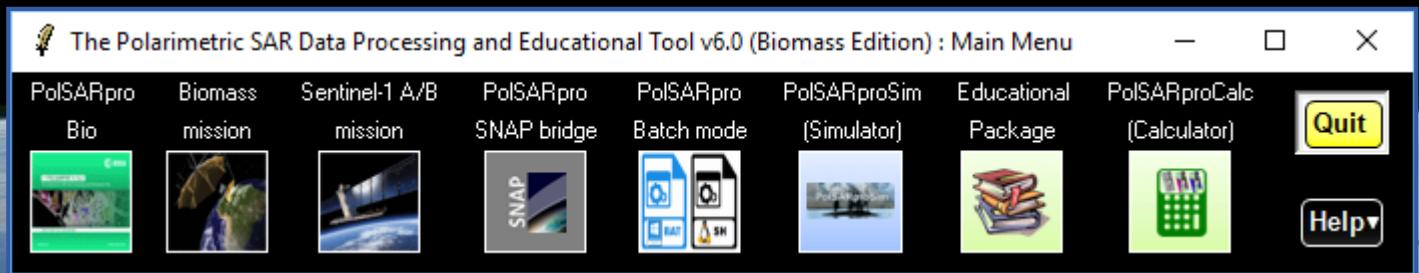


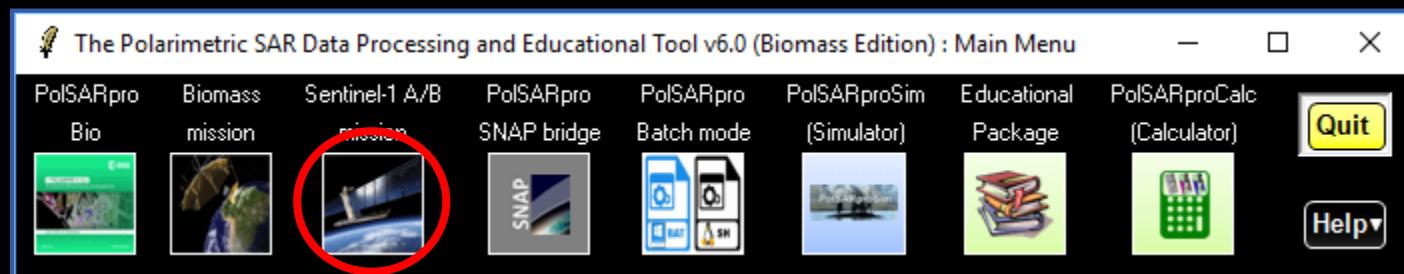


ENTRY SCREEN

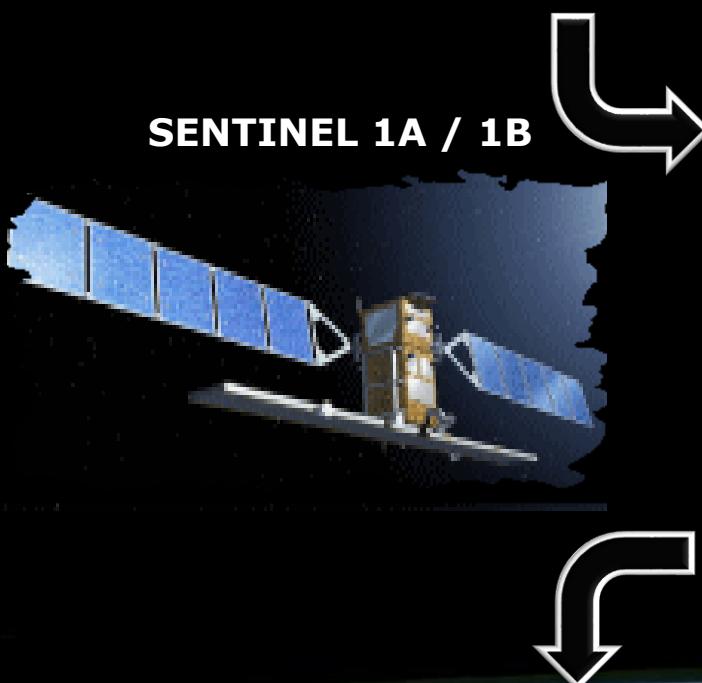


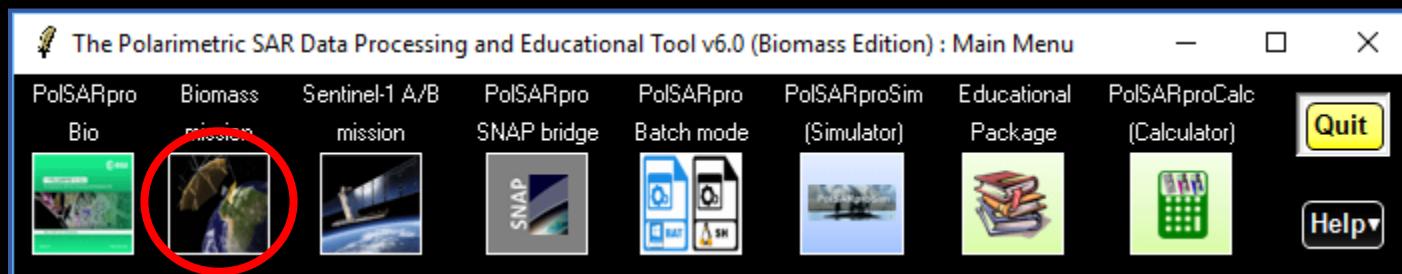
MAIN WINDOW



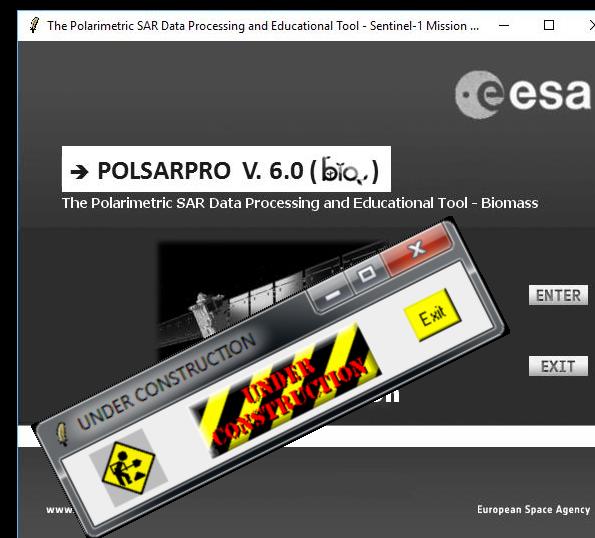


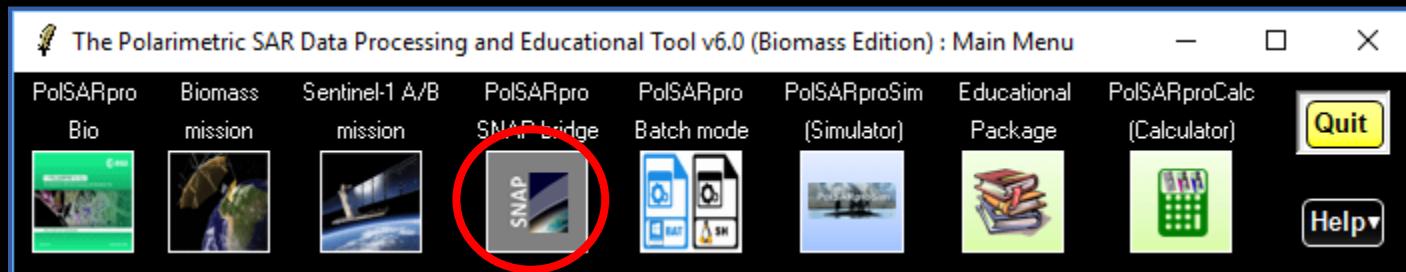
SENTINEL 1A / 1B



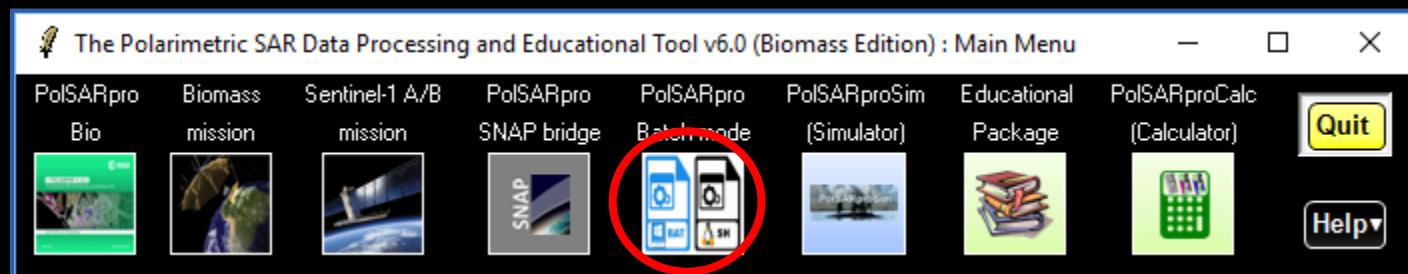


BIOMASS





- **S1 toolbox**  
(split, deburst, merge ...)
- **Geocoding toolbox**
- **Terrain correction**
- **Interferometric toolbox**  
(co-registration, flat Earth estimation ...)



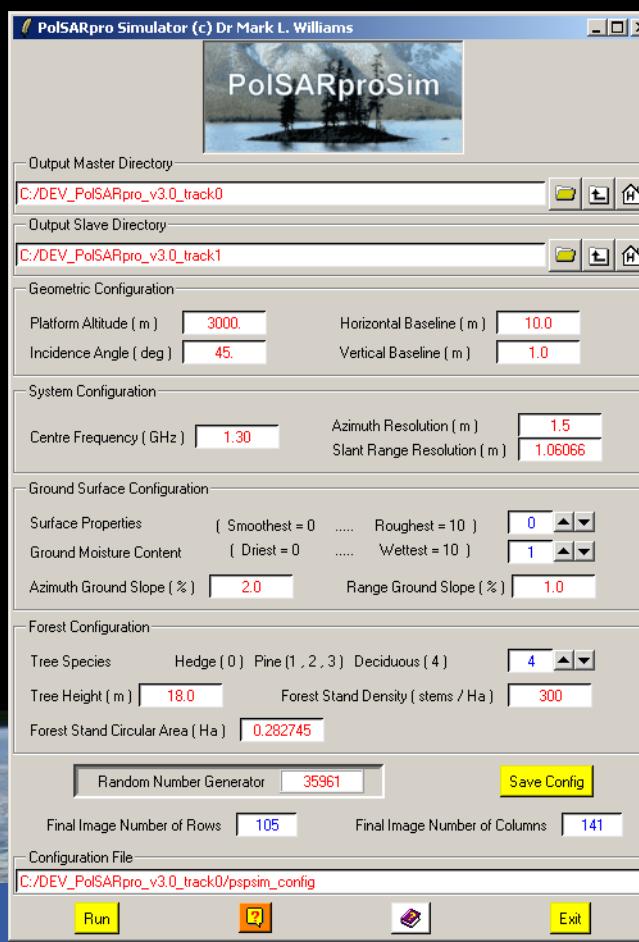
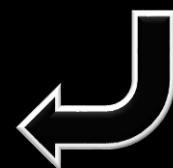
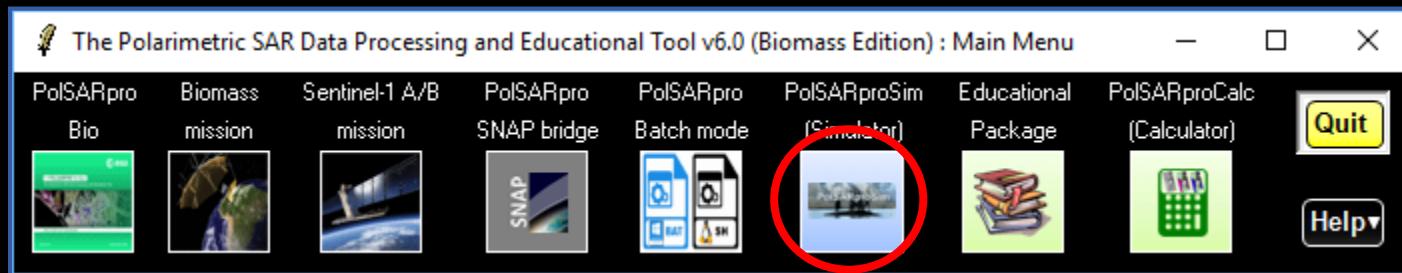
The screenshot illustrates the PolSARpro Batch Mode interface. It consists of three overlapping windows:

- Read Menu:** This window contains a "Read" button, a "Main Input Directory" dropdown, and a "Polarimetric SAR Sensors" section with radio buttons for ALOS-1 (selected), Cosmo-Skymed, and RISAT. It also includes a "Reset" button and an "Exit (with save)" button.
- New Toplevel 1:** This window is titled "New Toplevel 1" and contains a "Read" button, a "Speckle Filter" button, and a "Batch : Data Processing" window. The "Batch : Data Processing" window has a flowchart: "Read" → "Speckle Filter" → "Process". It includes sections for "Dual-Pol : [C2]" and "Quad-Pol : [T3]", each with checkboxes for "Matrix Elements", "Correlation Coefficients", "Polarimetric Functionalities", "Polarimetric Classifications", and "Polarimetric Decompositions". It also features "Window Size Row" and "Window Size Col" input fields and "Reset" and "Save & Exit" buttons.
- Data Processing:** This window is titled "Batch : Data Processing" and follows the same flowchart structure: "Read" → "Speckle Filter" → "Process". It includes the same processing options and window size settings as the "New Toplevel 1" window.

A large white arrow points from the "Read Menu" towards the "Data Processing" window. To the right of the windows, there is a separate window titled "UNDER CONSTRUCTION" with a yellow and black hazard sign and the text "UNDER CONSTRUCTION" and "Exit".

## PolSARpro Batch Mode

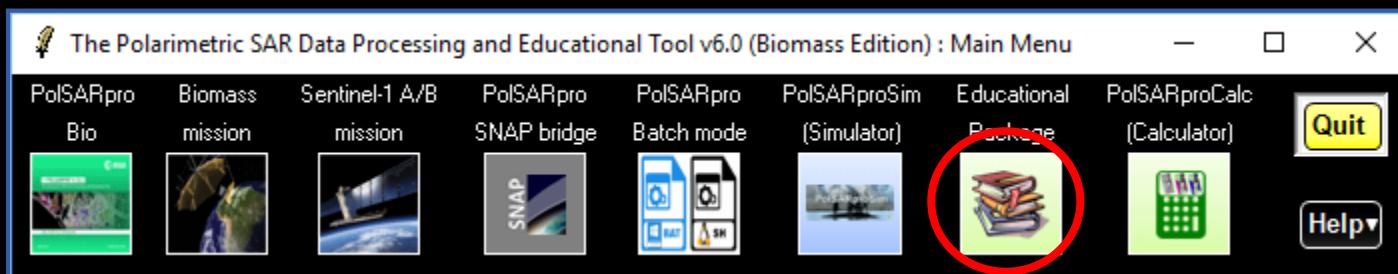
Create a bat (windows) or a sh (linux) file to run different polarimetric data processes in a batch processing mode.



## PolSARpro - Sim

**This educational tool creates and provides simulated test data of sufficient fidelity to be used to illustrate the concepts of Pol-InSAR when applied on ground surface, ground surface covered with low vegetation or forest stands.**

*This simulator is developed by Mark Williams ©*



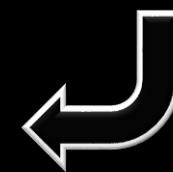
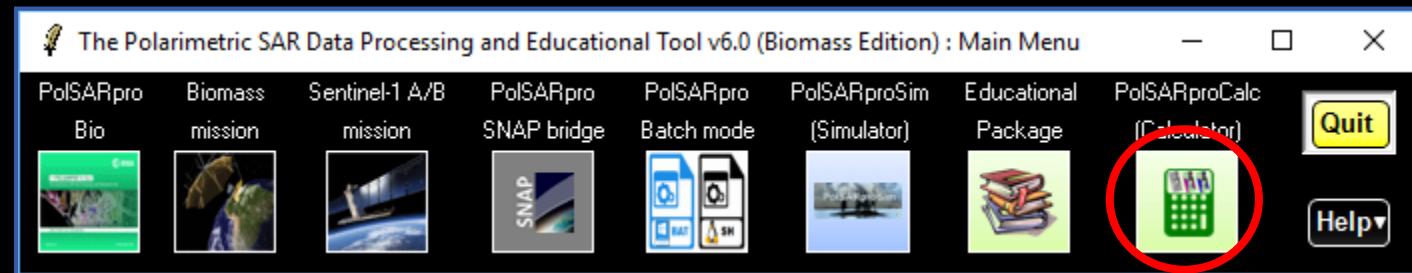
## PolSARpro – Biomass Edition web site

- *On-line tutorials*
- *On-line self training packages*

New lecture course  
New topics  
Re-design of the *Do It Yourself*

- *Video / Quizz*
- *Blog / Forum*

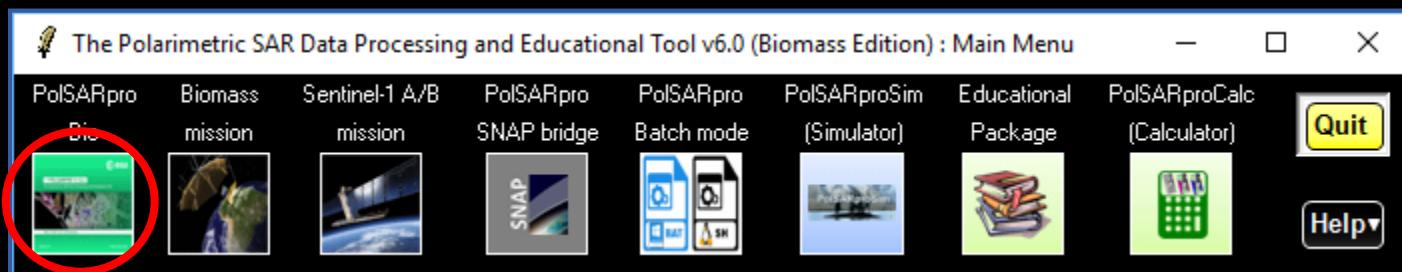




**PolSARpro Calculator v1.0**

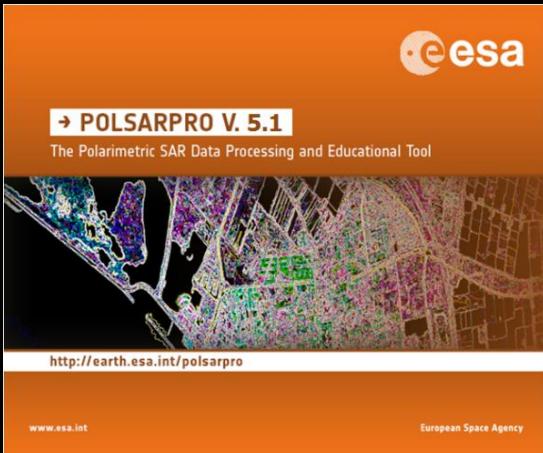
## PolSARpro - Calc

This tool proposes a Polarimetric Pocket Calculator offering basic functionalities which are applied on a set of SAR Polarimetric datasets.



# PolSARpro v6.0 (Biomass Edition) SOFTWARE

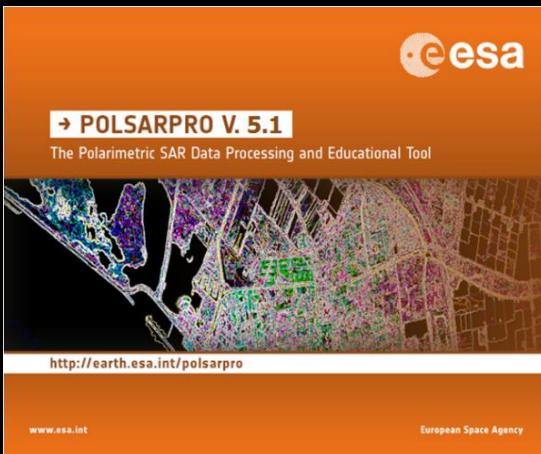




CURRENT



**PolSARpro v5.2 Software offers the possibility to handle and convert polarimetric data from a range of well established CURRENT polarimetric airborne platforms.**

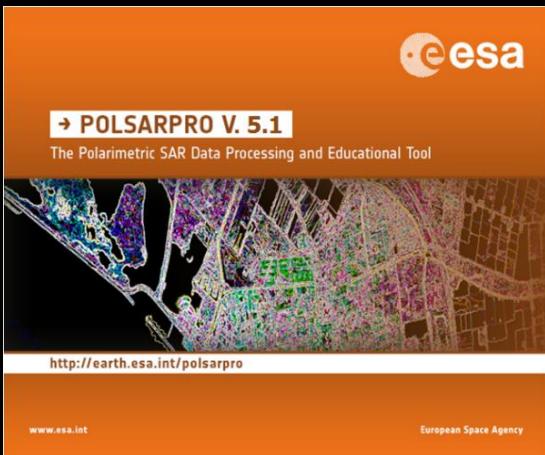


ALOS – PALSAR



PAST

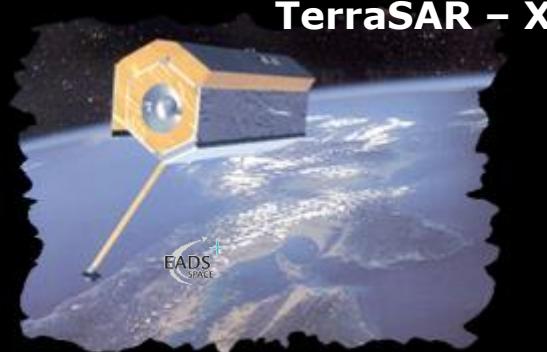
**PolSARpro v5.2 Software offers the possibility to handle and convert polarimetric data from a range of well established **PAST polarimetric spaceborne platforms.****



CURRENT



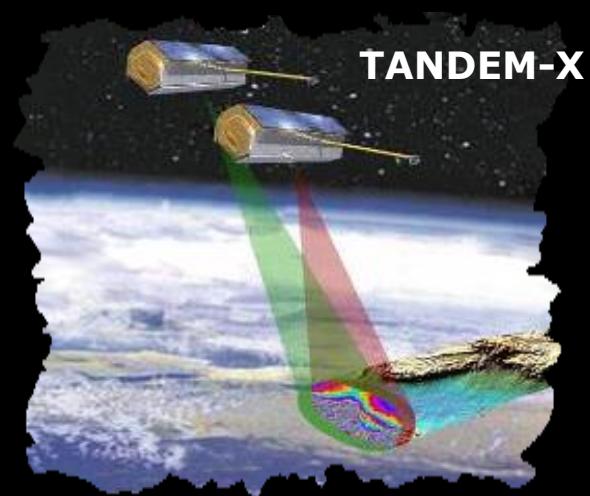
RADARSAT 2



TerraSAR - X

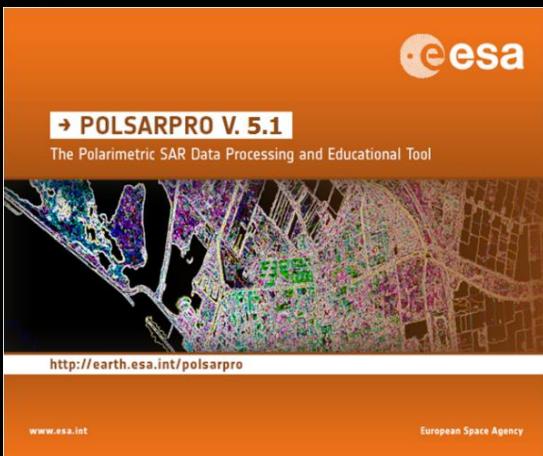


COSMO - SKYMED



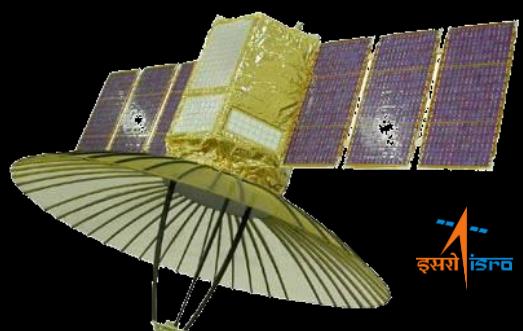
TANDEM-X

**PolSARpro v5.2 Software offers the possibility to handle and convert polarimetric data from a range of well established CURRENT polarimetric spaceborne platforms.**



CURRENT

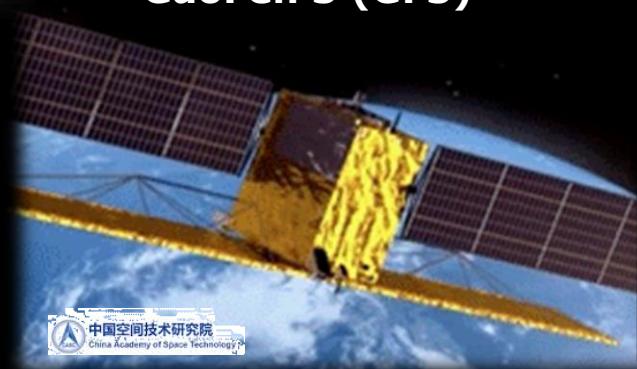
RISAT



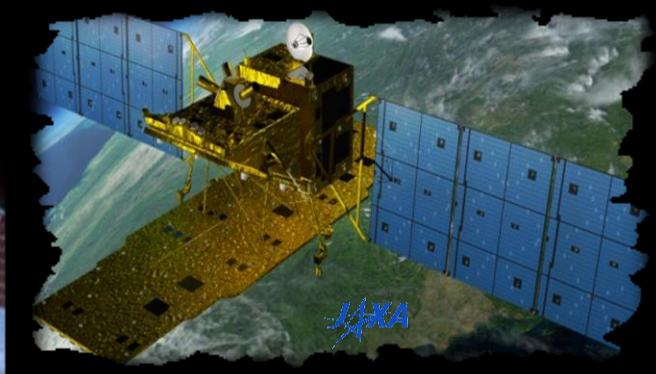
SENTINEL 1A / 1B



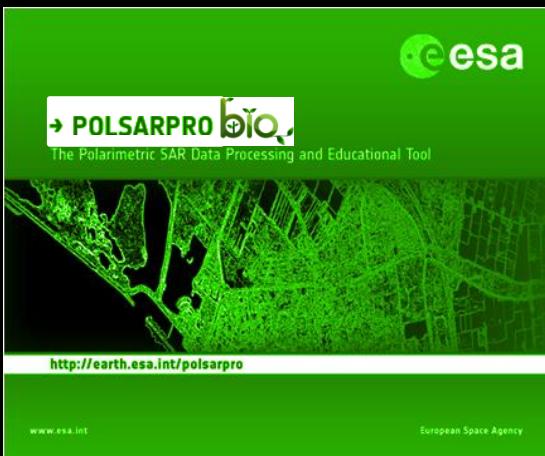
GaoFen 3 (GF3)



ALOS-2 – PALSAR-2



**PolSARpro v5.2 Software offers the possibility to handle and convert polarimetric data from a range of well established CURRENT polarimetric spaceborne platforms.**



Radarsat Constellation Mission  
(RCM)



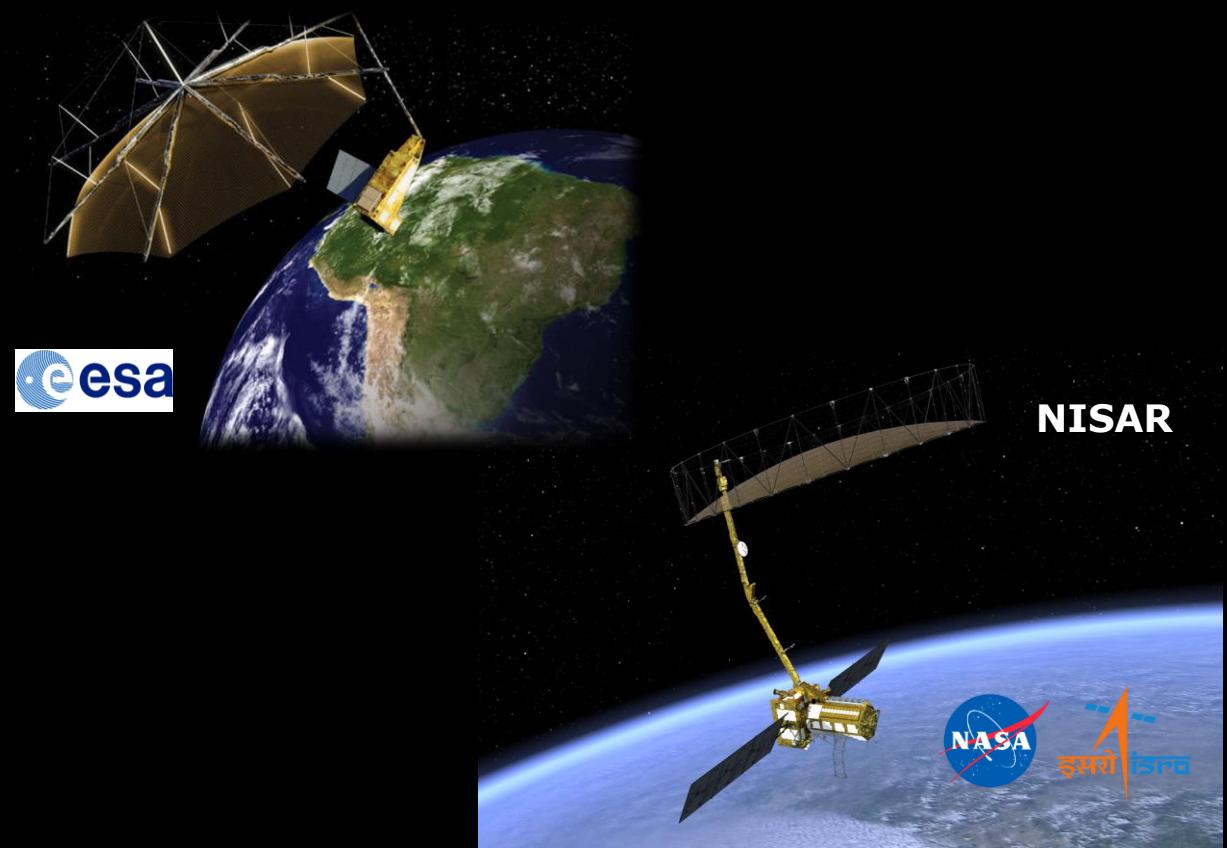
Cosmo – Skymed NG



CURRENT

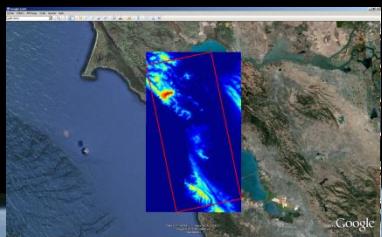
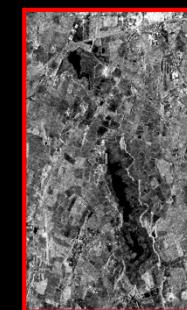
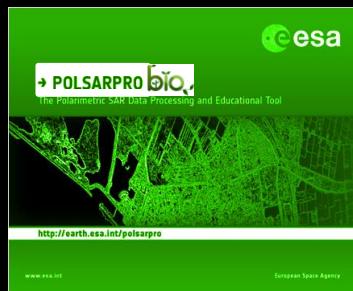
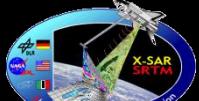
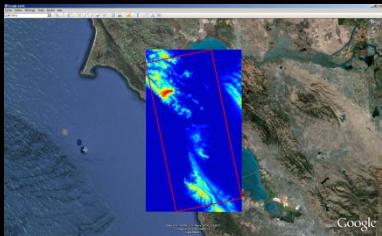
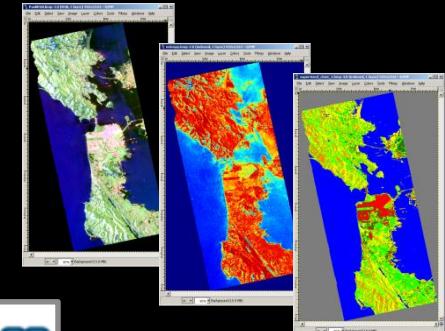
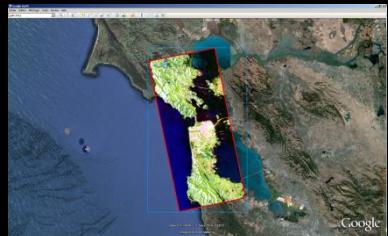
**PolSARpro v6.0 – Biomass Edition Software is today offering the possibility to handle and convert polarimetric data of VERY NEW polarimetric spaceborne platforms.**

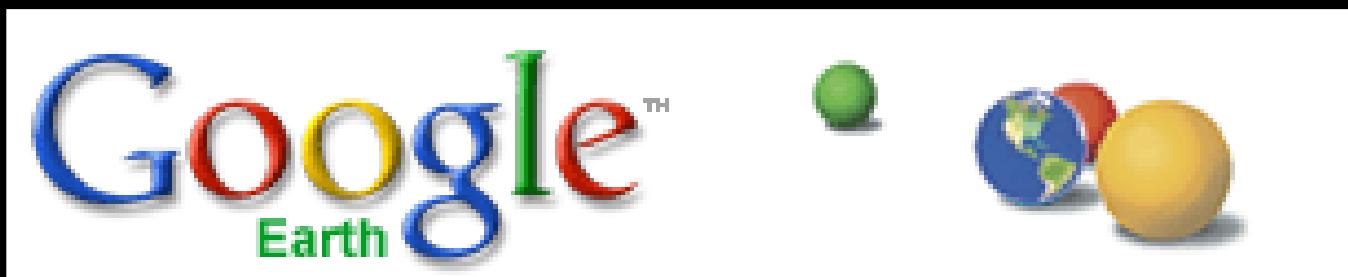
## BIOMASS

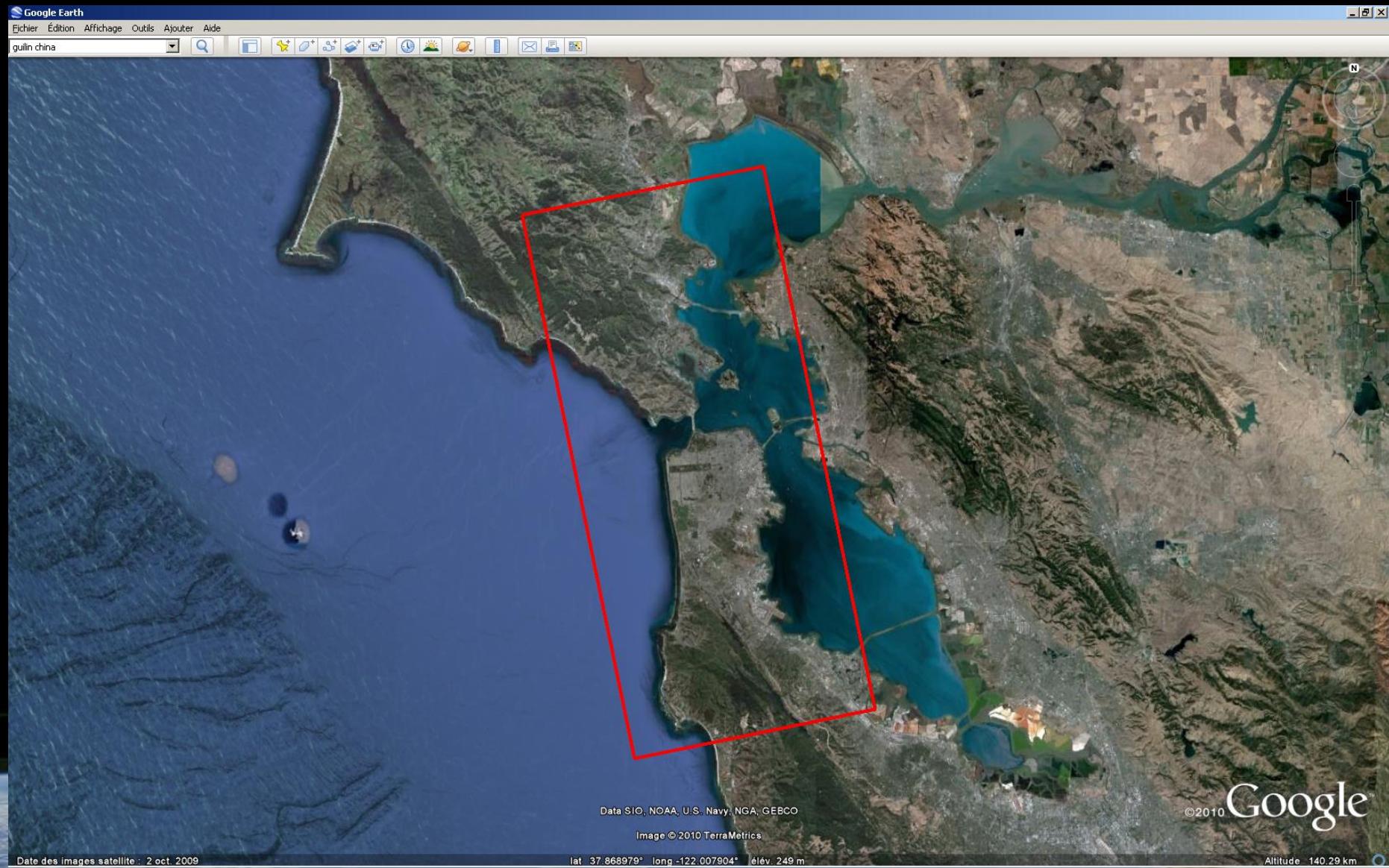


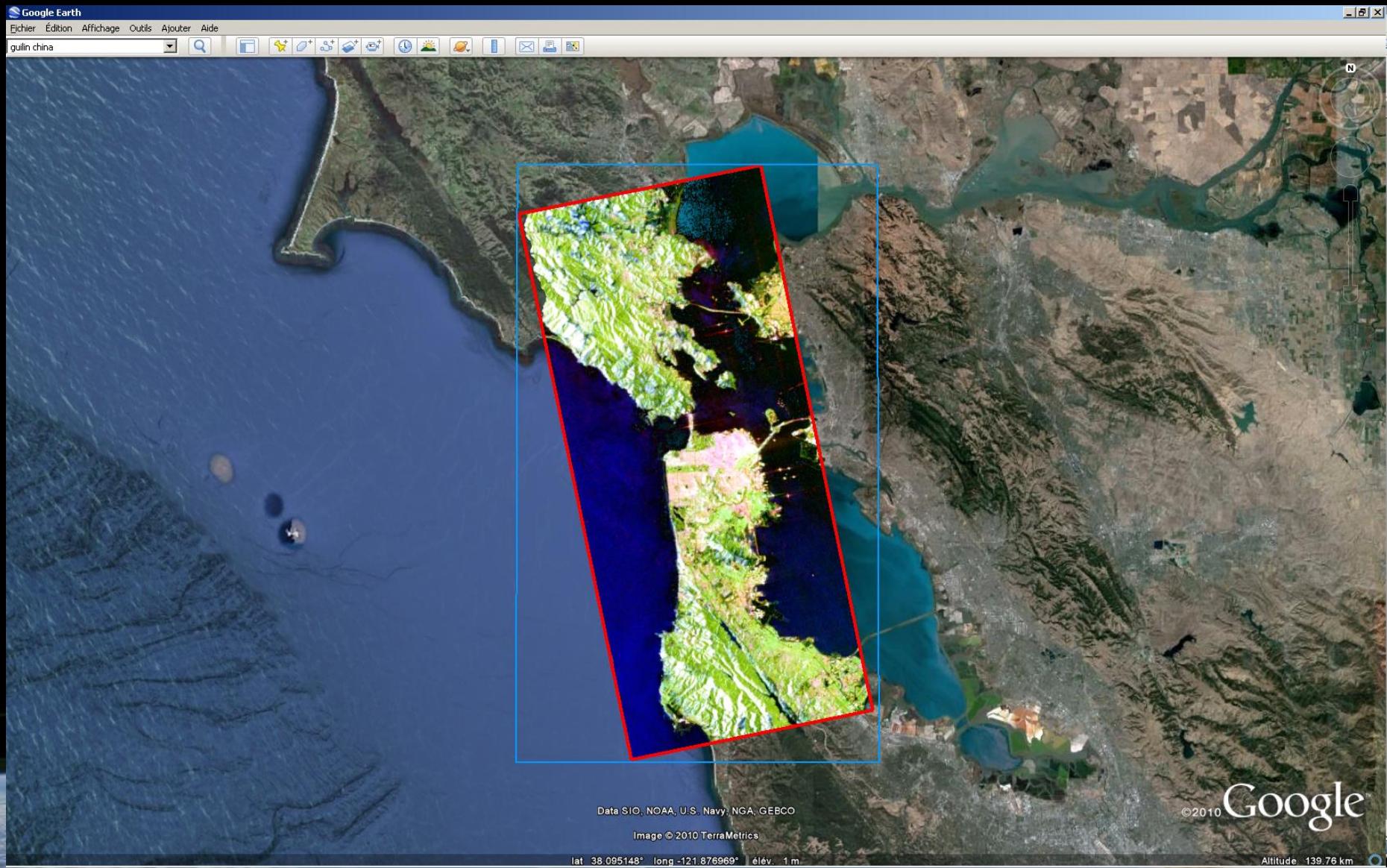
**PolSARpro v6.0 – Biomass Edition Software will also offer the possibility to handle and convert polarimetric data of FUTURE polarimetric spaceborne platforms.**

## External Softwares

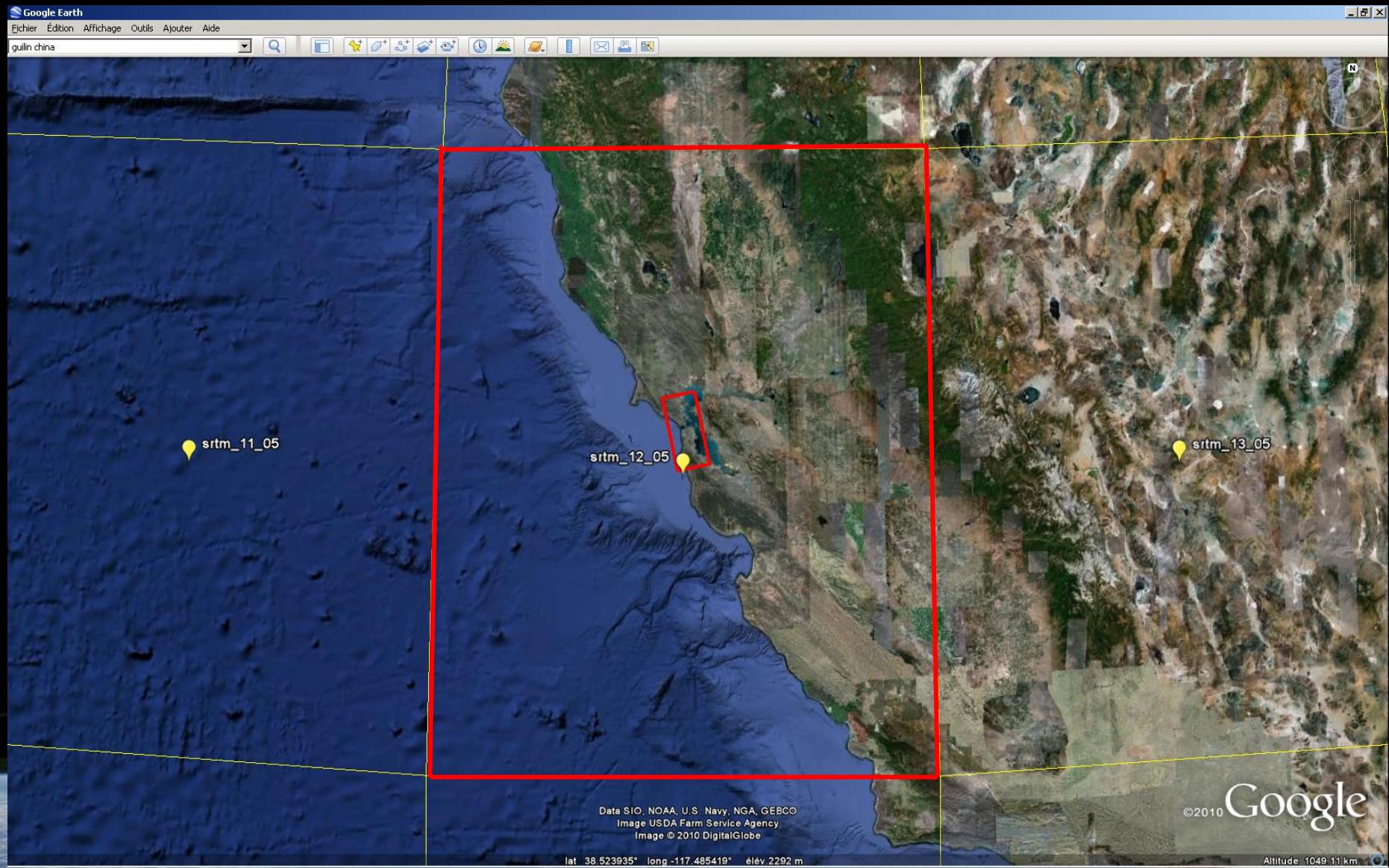


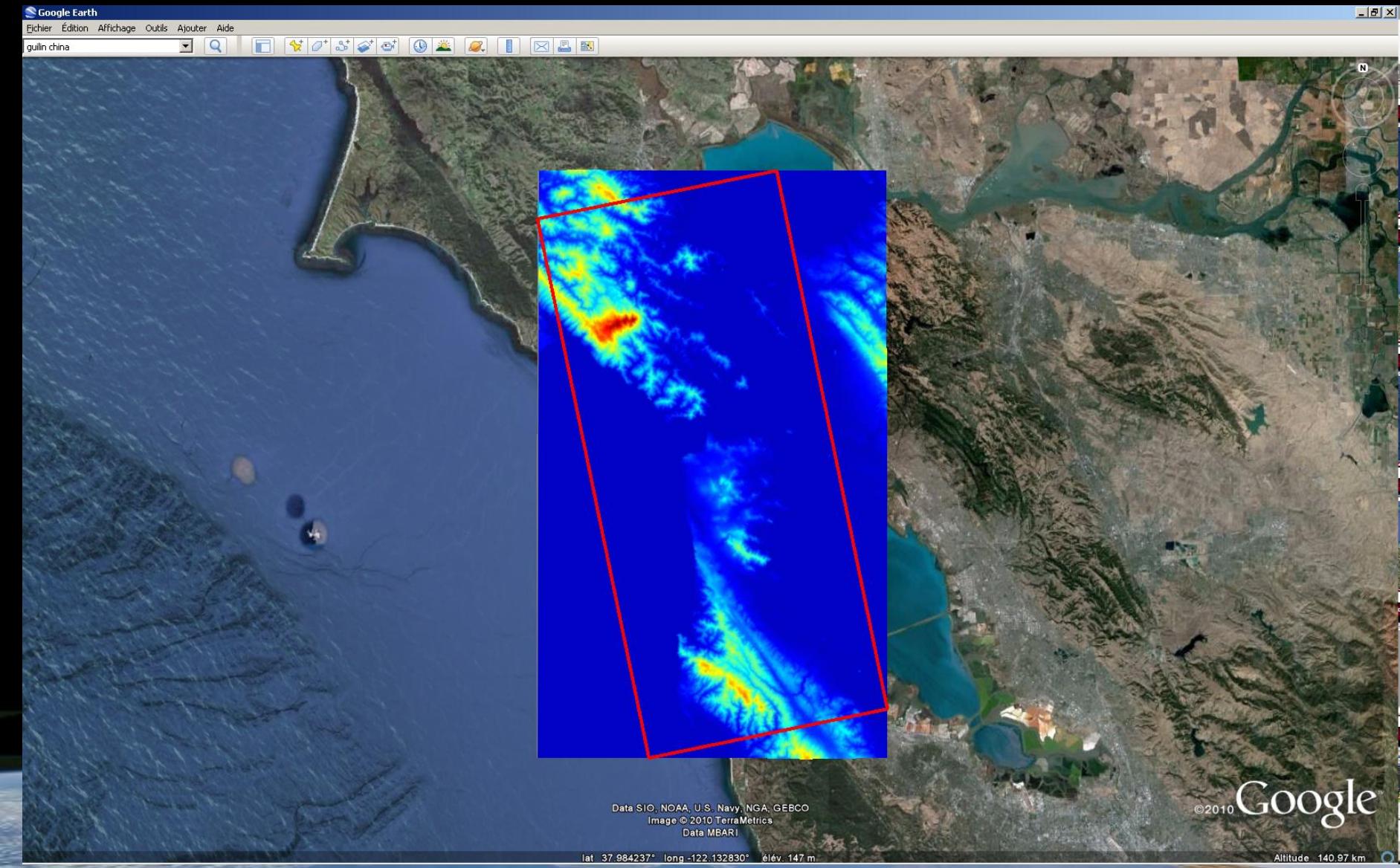


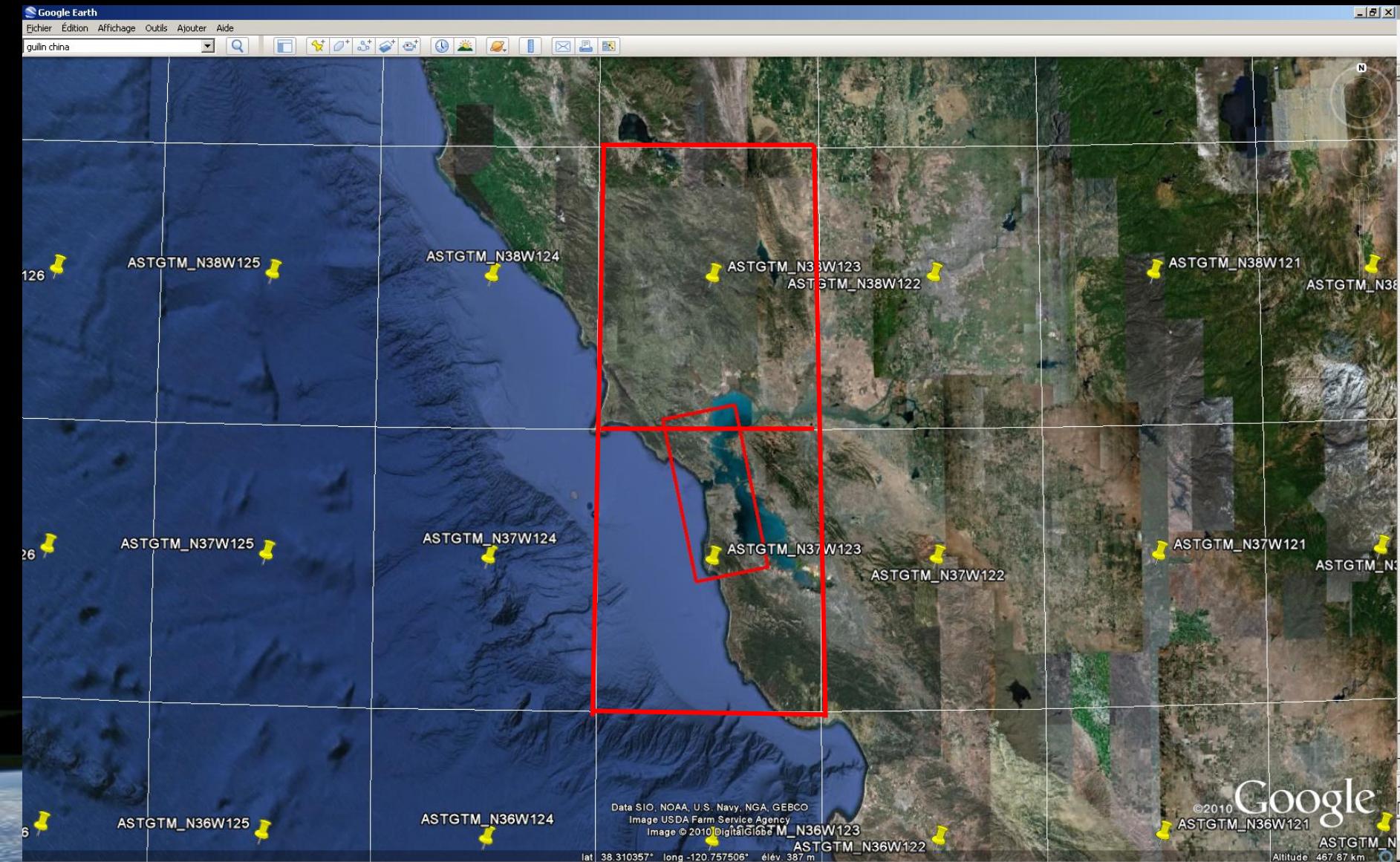


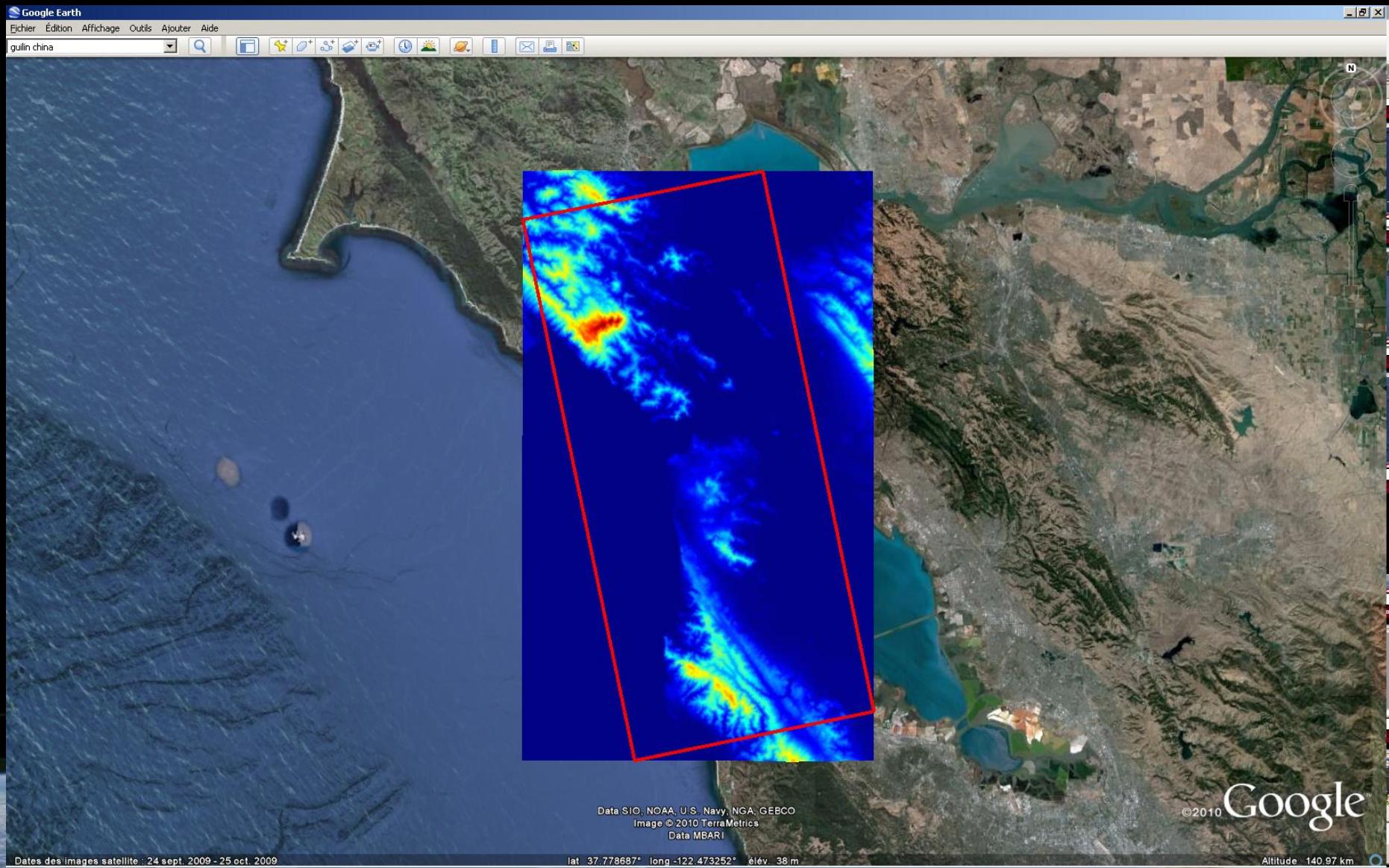






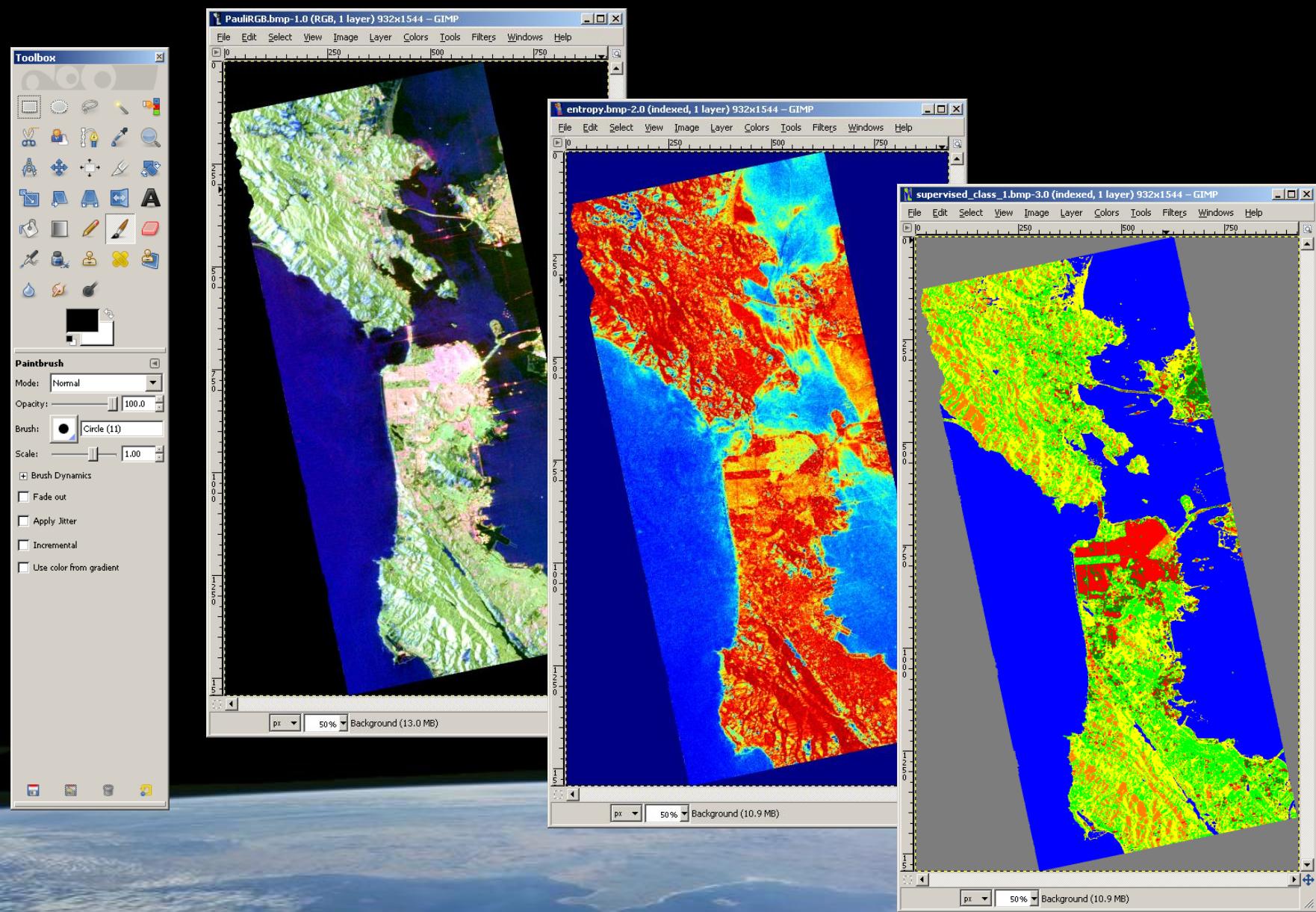








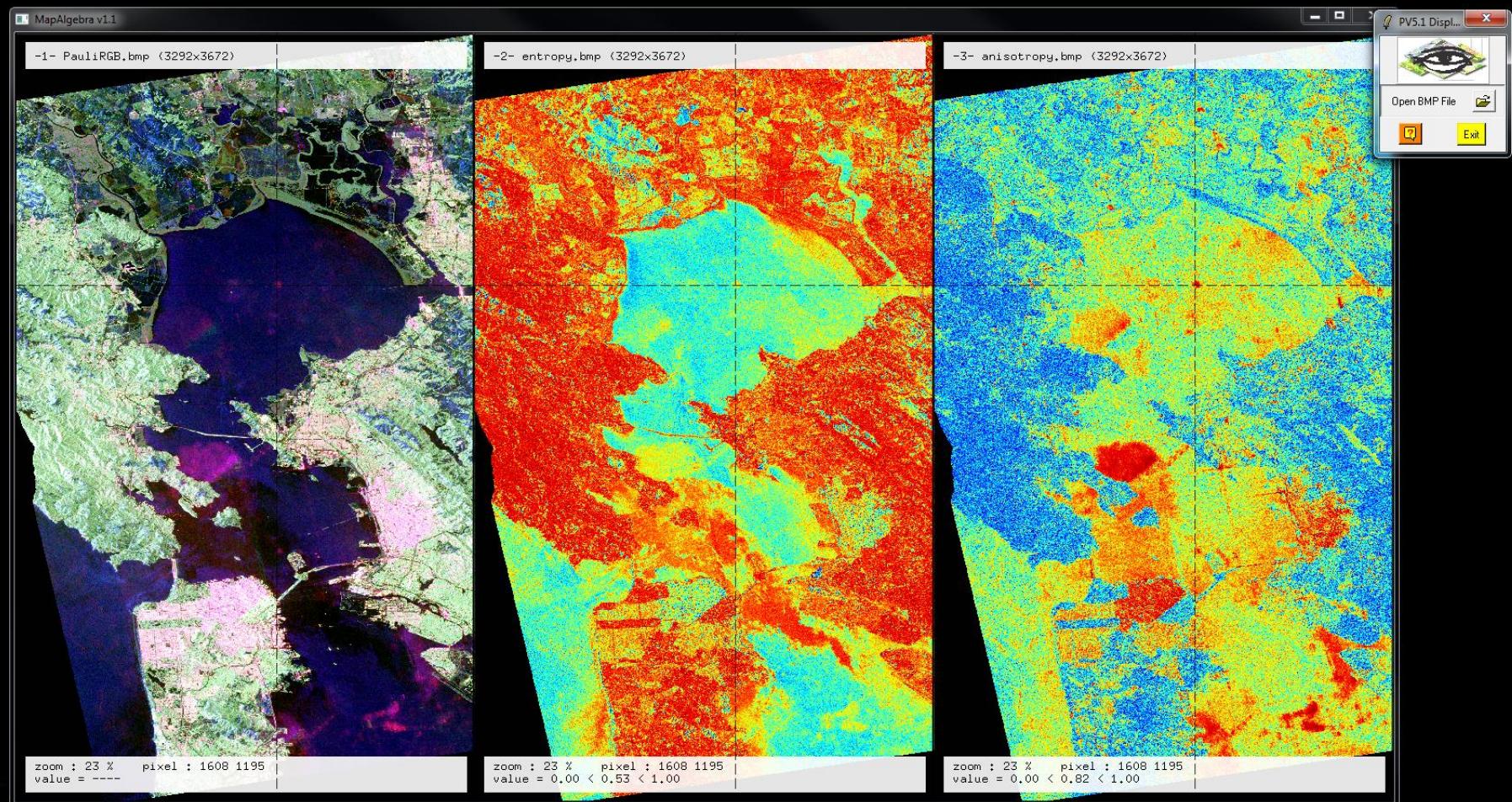
**GNU Image Manipulation Program  
Open Source  
GNU License  
(Win, Linux, Unix)**





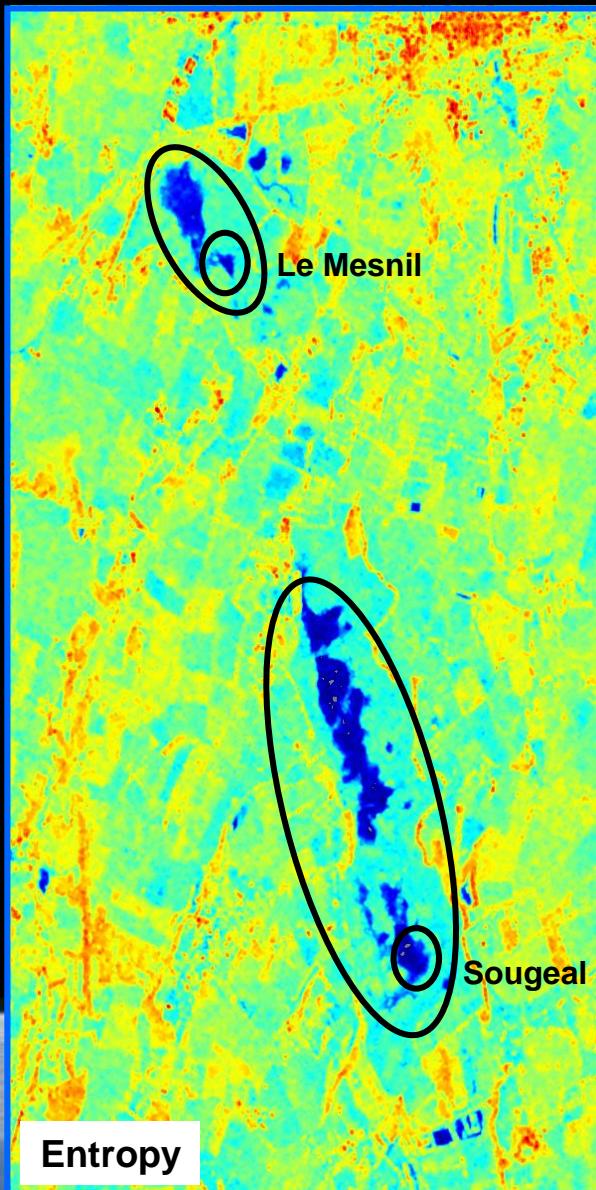
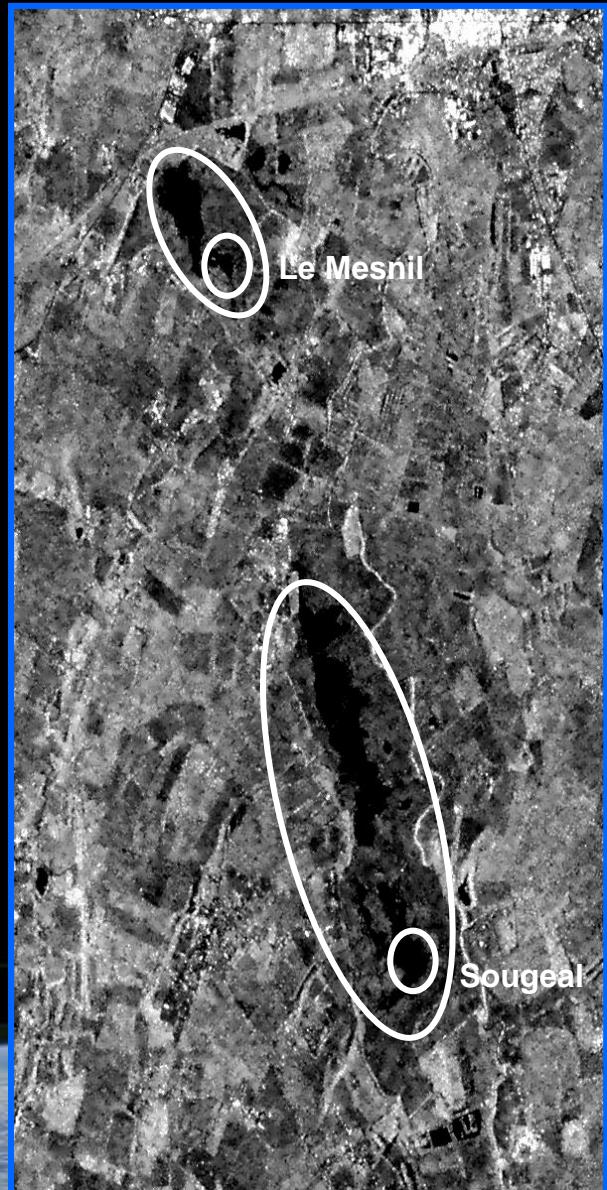
**Map Algebra : A new tool for visualization**

**Based on the OpenGL technology**

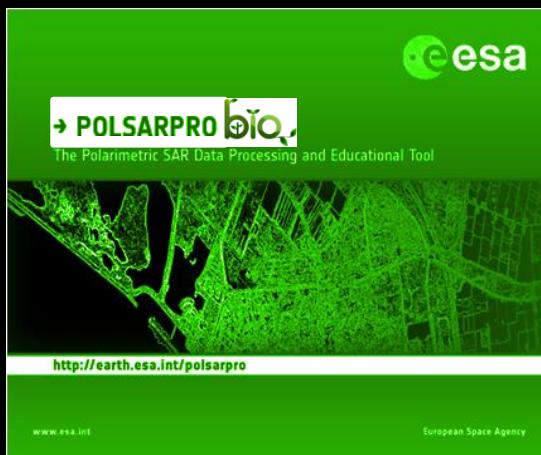


## Display N BMP Images





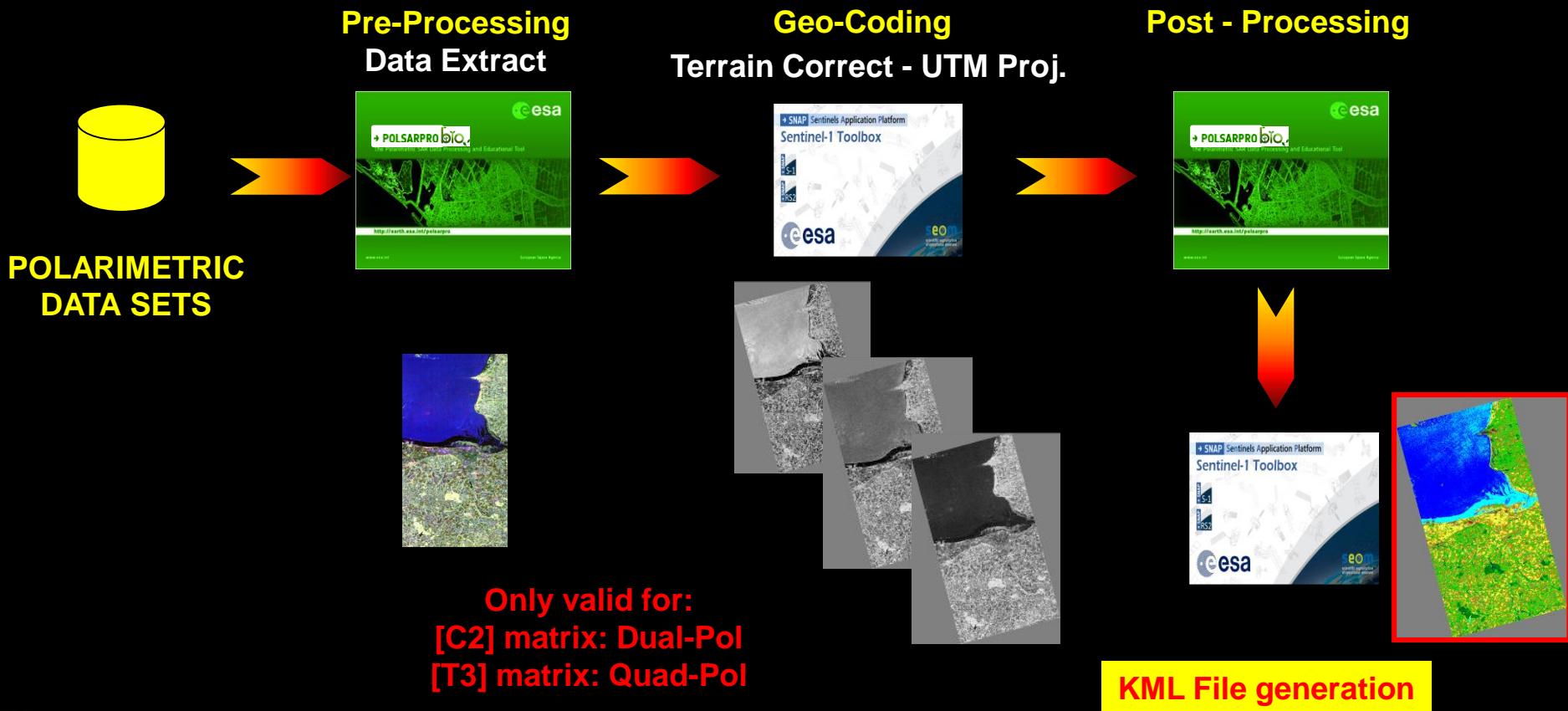
## PolSARpro - SNAP bridge



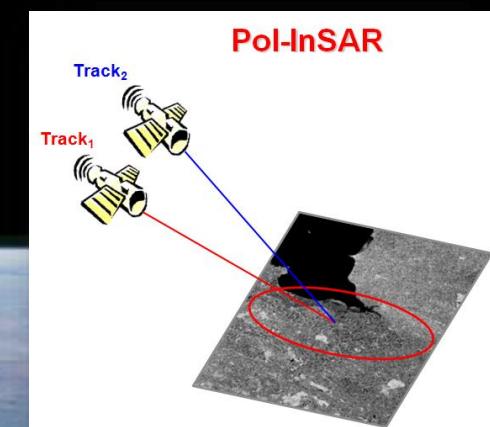
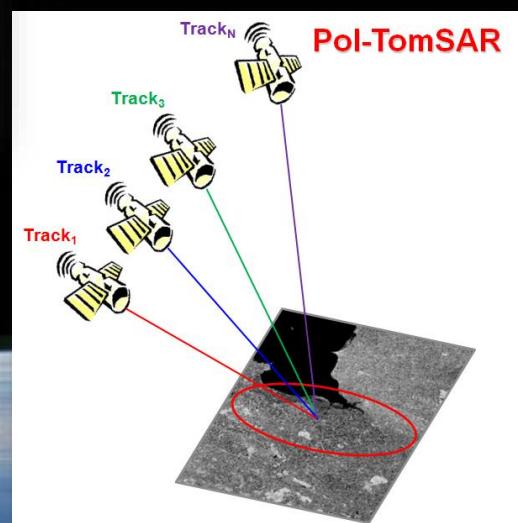
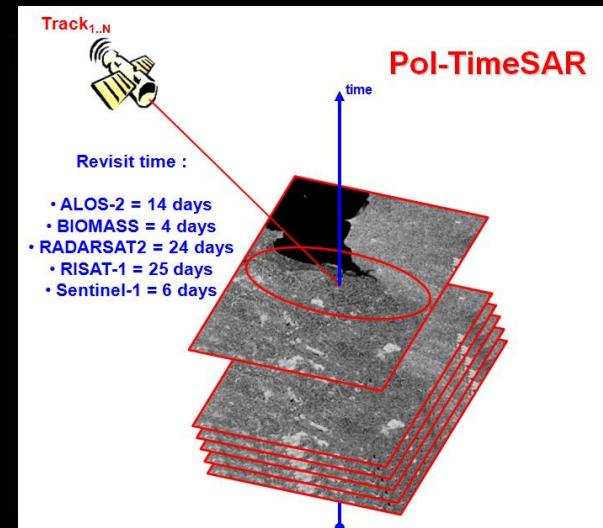
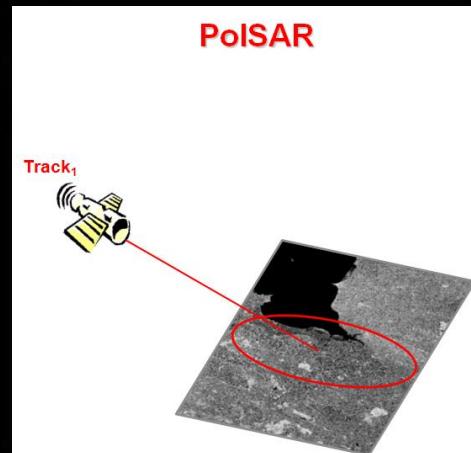
## Polarimetric SAR Data Processing

- **S1 toolbox**  
(split, deburst, merge ...)
- **Geocoding toolbox**
- **Terrain correction**
- **Interferometric toolbox**  
(co-registration, flat Earth estimation ...)

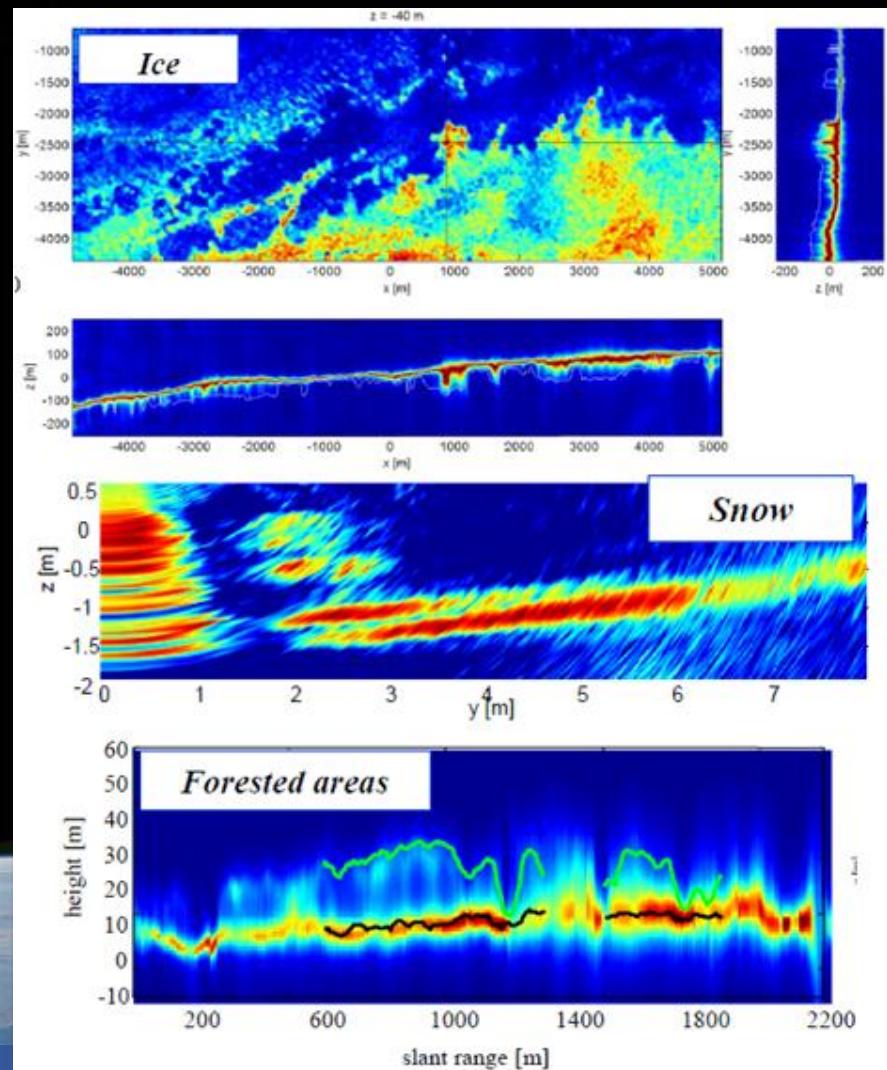
# ESA – SNAP Software



## New functionalities



## Pol-TomoSAR processor



The Polarimetric SAR Data Processing and Educational Tool v6.0 (Biomass Edition) : Main Menu

PolSARpro Bio   Biomass mission   Sentinel-1 A/B mission   PolSARpro SNAP bridge   PolSARpro Batch mode   PolSARproSim (Simulator)   Educational Package   PolSARproCalc (Calculator)   **Help**

New PolSARpro Patch Available

**esa**  
A new PolSARpro V. 6.0 (Biomass Edition)  
**patch**  
is now available for update

POLSTAR V. 6.0 (bio)

Université de Rennes I  
iETR

Continue with this

New PolSARpro Release Available

**esa**  
A new PolSARpro V. 6.0 (Biomass Edition)  
**release**  
is now available for update

POLSTAR V. 6.0 (bio)

Université de Rennes I  
iETR

Any request can be made by sending an email to : **polsarpro.team@yahoo.com**

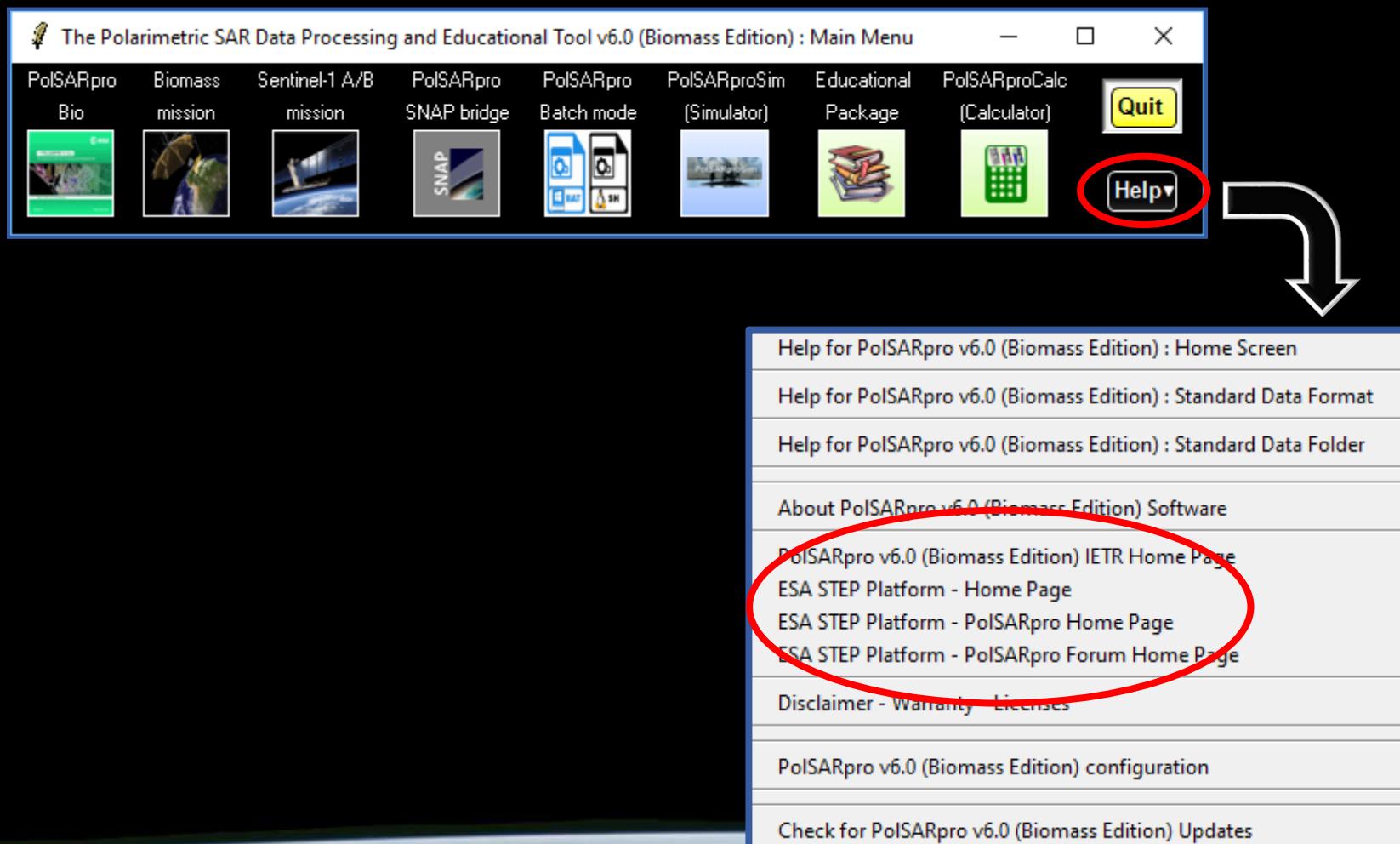
Continue with this current version   Quit this current version

Help for PolSARpro v6.0 (Biomass Edition) : Home Screen  
Help for PolSARpro v6.0 (Biomass Edition) : Standard Data Format  
Help for PolSARpro v6.0 (Biomass Edition) : Standard Data Folder  
About PolSARpro v6.0 (Biomass Edition) Software  
PolSARpro v6.0 (Biomass Edition) IETR Home Page  
ESA STEP Platform - Home Page  
ESA STEP Platform - PolSARpro Home Page  
ESA STEP Platform - PolSARpro Forum Home Page  
Disclaimer - Warranty - Licenses  
PolSARpro v6.0 (Biomass Edition) configuration  
Check for PolSARpro v6.0 (Biomass Edition) Updates

ADVICE WARNING

NO NEW PolSARpro v6.0 (Biomass Edition)  
PATCH OR RELEASE AVAILABLE FOR UPDATE

OK



The following results have been obtained thanks to the Sentinel Toolboxes :

The screenshot shows the PolSARpro v6.0 (Biomass Edition) Toolbox page on the step.esa.int website. The top navigation bar includes links for ESA, STEP, TOOLBOXES (which is highlighted in blue), DOWNLOAD, GALLERY, DOCUMENTATION, COMMUNITY, and THIRD PARTY PLUGINS. A search bar is also present. The main content area displays the title "PolSARpro v6.0 (Biomass Edition) Toolbox" and a thumbnail image of the software interface showing a forest scene. To the right, there is a sidebar for "seom" (scientific exploitation of operational missions) featuring news items from 2018 and 2017, along with logos for various partners.

**step**  
science toolbox exploitation platform

ESA STEP TOOLBOXES DOWNLOAD GALLERY DOCUMENTATION COMMUNITY THIRD PARTY PLUGINS

Search...

Home > Toolboxes > PolSARpro v6.0 (Biomass Edition) Toolbox

## PolSARpro v6.0 (Biomass Edition) Toolbox

**POLSARPRO V. 6.0 (bio.)**  
The Polarimetric SAR Data Processing and Educational Tool - Biomass Edition

The ESA PolSARpro v6.0 (Biomass Edition) Software is the new version of the ESA PolSARpro Toolbox (The Polarimetric SAR data Processing and Educational Toolbox) which has been developed since 2003 under continuous ESA-ESRIN contracts by different consortiums leaded by the Institute of Electronics and Telecommunications of Rennes (IETR – UMR CNRS 6164) of the University of Rennes, France.

The objective of this project is to provide an Educational Software that offers a tool for self-education in the field of Polarimetric SAR data analysis and a comprehensive suite of functions for the scientific exploitation of fully and partially polarimetric data sets. The PolSARpro v6.0 (Biomass Edition) Software proposes a great collection of well-known algorithms and tools and establishes a foundation for the exploitation of polarimetric techniques for scientific developments and stimulates research and applications developments using Pol-SAR, Pol-InSAR, Pol-TomoSAR and Pol-TimeSAR data.

The PolSARpro v6.0 (Biomass Edition) Software specific interface performs complete end-to-end processing without the need for other software and is selectable from the main menu. In order to take advantage of specific functionalities offered in the Sentinel-1 Toolbox, a dedicated bridge has been built between the two softwares.

The PolSARpro v6.0 (Biomass Edition) Software offers the possibility to handle and convert polarimetric data from a range of well established polarimetric spaceborne

**2018**

Mapping Urban Areas from Space (MUAS 2018)

THE EEA EARTH OBSERVATION WEEK EO Open Science and FutureEO 30-31 November 2018 ESA-ESRIN (Frascati, Italy)

EO Open Science 2018

8th Advanced Land Training Course

**2017**

EO OPEN SCIENCE 2017

EO Open Science 2017

The screenshot shows a web browser window with the title "PolSARpro v6.0 (Biomass Edition)" in the tab bar. The URL in the address bar is "step.esa.int/main/download/polsarpro-v6-0-biomass-edition". The page content is as follows:

**step**  
science toolbox exploitation platform

**esa**

**ESA STEP TOOLBOXES DOWNLOAD GALLERY DOCUMENTATION COMMUNITY THIRD PARTY PLUGINS**

**SNAP**  
Sentinel 1 Toolbox  
Sentinel 2 Toolbox  
Sentinel-3 Toolbox  
SMOS Toolbox  
Proba-V Toolbox  
PolSARpro  
**Download** (circled in red)  
Community  
Useful Links

**SNAP SURVEY**

**Home > Download > PolSARpro v6.0 (Biomass Edition) Toolbox Download**

**PolSARpro v6.0 (Biomass Edition) Toolbox Download**

**POLSPARPRO V. 6.0 (bio\_v1)**  
The Polarimetric SAR Data Processing and Educational Tool - Biomass Edition

**PolSARpro v6.0 (Biomass Edition) Download :**

Both Windows (64 bits) and Linux versions can be downloaded from the website :  
<https://www.ietr.fr/polsarpro-bio/> (circled in red)

This current version is a beta version and will be improved and upgraded gradually over time.

To be informed of future new releases and/or patches of the PolSARpro v6.0 (Biomass Edition) Software , user has to click on the "Help" button of the Main Menu window and run the "check" functionality.

**PolSARpro v6.0 (Biomass Edition) General Presentation**

**PolSARpro v6.0 (Biomass Edition) Main Menu Presentation**

**seom**  
scientific exploitation of operational missions

**2018**

Mapping Urban Areas from Space (MUAS 2018)

THE ESSA EARTH OBSERVATION D-WEEK EO Open Science and FutureEO  
32-30 November 2018 ESA-ESON (Frascati, Roma), Italy

**EO Open Science 2018**

6th Advanced Land Training Course

**2017**

EO OPEN SCIENCE 2017

EO Open Science 2017

The screenshot shows a web browser window displaying the PolSARpro v6.0 (Biomass Edition) software landing page. The page features the IETR logo, a central image of a laptop screen showing a forest scene with blue light rays emanating from it, and the University of Rennes 1 logo. The title "ESA PolSARpro v6.0 (Biomass Edition) Software" is displayed, along with the message "Version 6.0.3 released (2021/01/01)". Below this, a paragraph describes the software as the new version of the ESA PolSARpro Toolbox, developed since 2003 under different ESA-ESRIN contracts. The page includes download links for Windows 64-bit and Linux versions, a QGIS plugin download, sample datasets, and a forum link. At the bottom, there is an email contact form and copyright information.

PolSARpro v6.0 (Biomass Edition) Software

Version 6.0.3 released (2021/01/01)

The **ESA PolSARpro v6.0 (Biomass Edition) Software** is the new version of the **ESA PolSARpro Toolbox** (*The Polarimetric SAR data Processing and Educational Toolbox*) which has been developed since 2003 under different ESA-ESRIN contracts.

[Download Windows 64 bits Version \(Read-me first\)](#)

[Download Linux Version \(Read-me first\)](#)

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[Download PolSARpro v6.0 - QGIS plugin](#)

[PolSARpro polarimetric sample datasets \(PolSAR, Pol-InSAR, Pol-TomoSAR\)](#)

Visit the PolSARpro v6.0 (Biomass Edition) [FORUM](#) at the [ESA STEP website](#)

For any help / request / comment, please contact : [polsarpro.team@yahoo.com](mailto:polsarpro.team@yahoo.com) (c) E. Pottier (2020) PIWIK Analytics

The screenshot shows a web browser window with the URL [https://www.ietr.fr/polsarpro-bio/sample\\_datasets/](https://www.ietr.fr/polsarpro-bio/sample_datasets/). The page displays three panels illustrating different SAR acquisition modes:

- PoSAR**: Shows a single satellite (Track<sub>1</sub>) emitting signals to a ground target.
- Pol-InSAR**: Shows two satellites (Track<sub>1</sub> and Track<sub>2</sub>) emitting signals to the same ground target.
- Pol-TomoSAR**: Shows multiple satellites (Track<sub>1</sub>, Track<sub>2</sub>, Track<sub>3</sub>, and Track<sub>4</sub>) emitting signals to the same ground target.

Below these diagrams, a section titled "Polarimetric Sample Datasets (PoSAR, Pol-InSAR, Pol-TomoSAR)" provides download links:

- Download PoSAR dataset (ALOS-1 / PALSAR-1)
- Download Pol-InSAR dataset (PoSARpro-SIM)
- Download Pol-TomoSAR dataset (BioSAR-2 Krycklan-L)

At the bottom of the page, there is a note: "Do not forget to visit the GaoFen-3 (GF-3) and the San Francisco webpages."

(c) E. POTTIER (2020)  
PIWIK Analytics

[https://ietr-lab.univ-rennes1.fr/polsarpro-bio/sample\\_datasets](https://ietr-lab.univ-rennes1.fr/polsarpro-bio/sample_datasets)

The screenshot shows a web browser window titled "San Francisco | Institut d'Électronique et de Mécanique des Réseaux et des Télécommunications". The URL is <https://www.ietr.fr/polsarpro-bio/san-francisco/>. The page displays a series of polarimetric SAR images of San Francisco, transitioning from grayscale to color-coded land cover maps. Below the images, a section titled "San Francisco Polarimetric SAR Datasets" lists the following datasets, each with an icon of the sensor and its name:

- AIRSAR
- ALOS-1 / PALSAR-1
- ALOS-2 / PALSAR-2
- GAOFEN-3
- RADARSAT-2
- RISAT
- SENTINEL-1A (2018/01/25)
- SENTINEL-1B (2018/01/02)

Courtesy of CNSA, CSA, ESA, IECAS, ISRO, JAXA, MDA, NASA-JPL, NSOAS (c) E. POTTIER (2019) PIWIK Analytics

**<https://ietr-lab.univ-rennes1.fr/polsarpro-bio/san-francisco>**

FAQ Questions ? FAQ

