

WORCAP2019

Workshop de Computação Aplicada

INPE - São José dos Campos - 17 a 19 de setembro de 2019



Processamento de Imagens de Sensoriamento Remoto para Resposta à Desastres: Uso de Imagens *CBERS-4* e Sentinel com ferramentas do INPE e da ESA

Laércio Namikawa

laercio.namikawa@inpe.br



Processamento Digital de Imagens Radar com Software Livre com Exemplos de Aplicações em Mapeamento para a Resposta à Desastres

OBJETIVO

Apresentar as técnicas de processamento de imagens radar de sensoriamento remoto para a identificação de danos em apoio a resposta à desastres, utilizando os softwares SNAP (ESA) e TerraView5 (INPE)

Conteúdo

1. Seleção e Download de Imagens
2. Recorte
3. Multilook
4. Calibração
5. Filtragem Speckle
6. Correção geométrica - correção terreno
7. Conversão para dB
8. Visualização Antes/Depois
9. Fatiamento para áreas inundadas
10. Cálculo de Área
11. Exportação KML

Inundaciones en Uruguay Flooding in Uruguay

June 8th, 2017
International Charter Call ID 614



Seguro | <https://www.elobservador.com.uy/aumenta-5200-la-cantidad-personas-desplazadas-las-inundaciones-m1082940>

EL OBSERVADOR

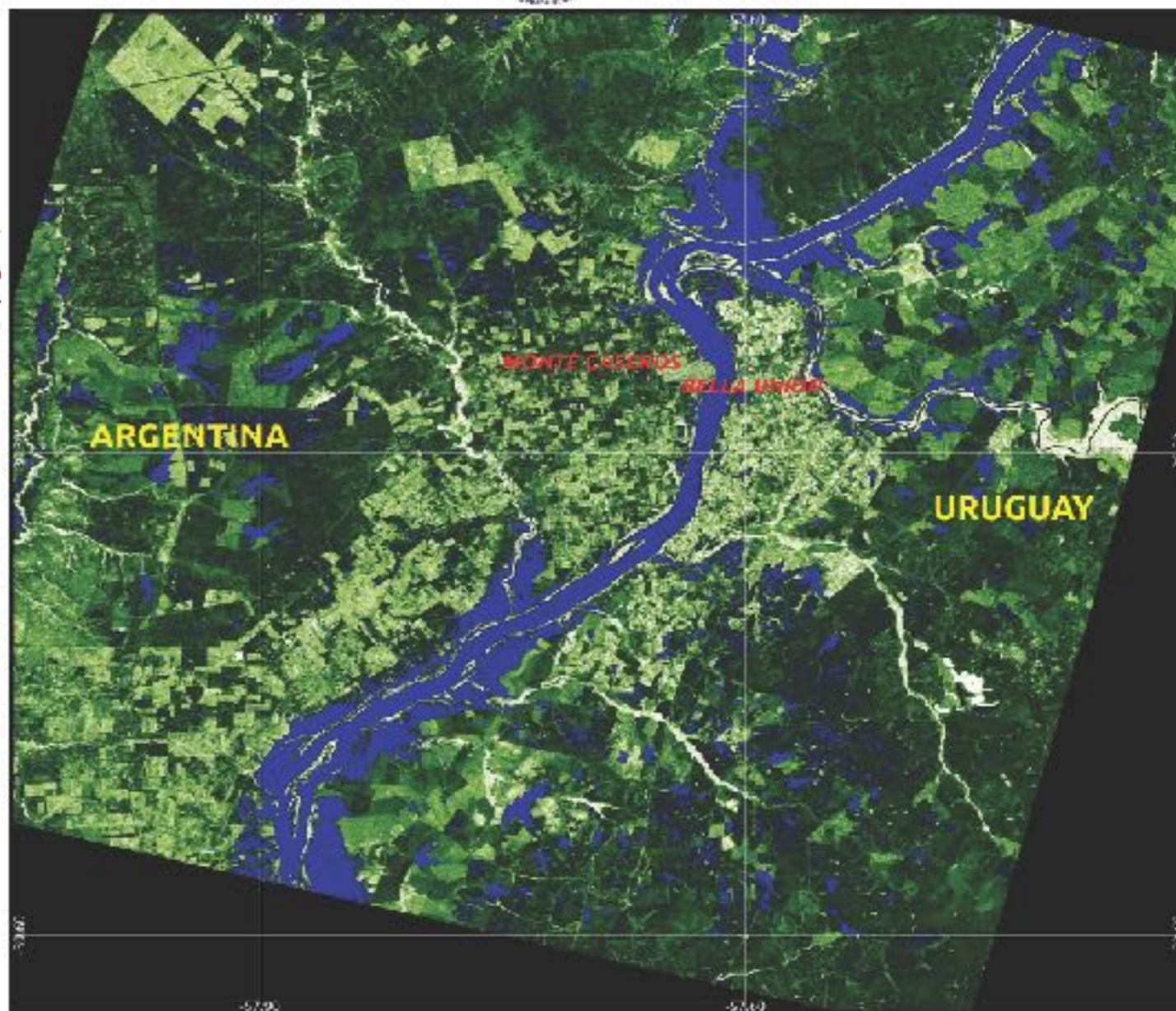
SECCIONES CROMO REFERI AGRO PADRES HOY OTV BLOGS M



2 de 6

Inundaciones. Archivo

El último relevamiento realizado este sábado por el Sistema Nacional de Emergencia (Sinae), da cuenta que hay 5.208 personas desplazadas de sus viviendas en todo el país, a causa de las inundaciones. De esa cantidad 1.407 son evacuadas y 3.801 son autoevacuadas.



Legend
International boundary

Data source
Mission: ALOS 2
Sensor: SAR
POLARIZATION: HV
Pixel size: 12.5 m
Date of orbit image: June 8th 2017
The satellite orbit and its acquisition were provided under the International Charter - Space and Major Disasters.

Description of the event

Heavy rains caused severe flooding in Uruguay's Salto Department, Paysandú Department and Bella Unión city of the Artigas department displacing 3500 people. Uruguay's National Emergency System (SINAe) are visiting affected areas to assess the damage and prepare relief efforts. Many of the displaced people are already receiving food, shelter, and medical care. Northern parts of Uruguay have been under a heavy rain warning since 24 May, and authorities expect further rain with flood waters set to continue rising.

Map development

This map was developed on 13/06/2017 by the Argentinian Space Agency (Ala @ CAFEARTE - CONAE, Argentina).



ALOS-2 Data and Products © JAXA (2017). All Rights Reserved.



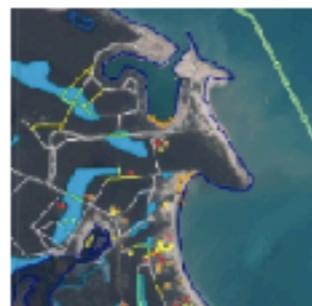
The International Charter Space and Major Disasters

Providing satellite data to those affected by natural or man-made disasters through registered organisations, for use in monitoring and response activities. [Read more](#)

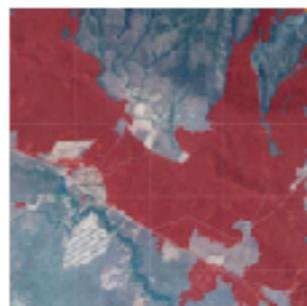
[How the Charter Works](#)

[How to become a user](#)

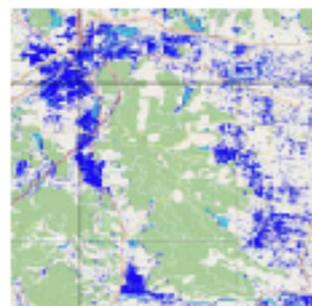
Latest Charter Activations



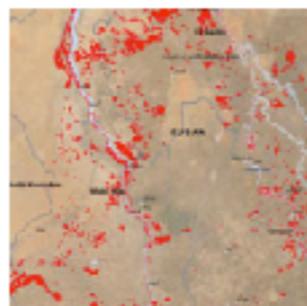
04 SEPTEMBER 2019
Hurricane Dorian in Bahamas



02 SEPTEMBER 2019
Fire in Bolivia



29 AUGUST 2019
Flood in Japan



26 AUGUST 2019
Flood in Sudan



21 AUGUST 2019
Fire in Bolivia

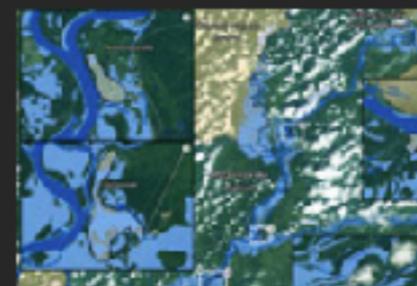


15 AUGUST 2019
Flood in Russia

Recent Information



10 SEPTEMBER 2019
International Charter Newsletter - September 2019 - Issue 19



14 AUGUST 2019
Charter Value Added Products are now available via EUMETCast

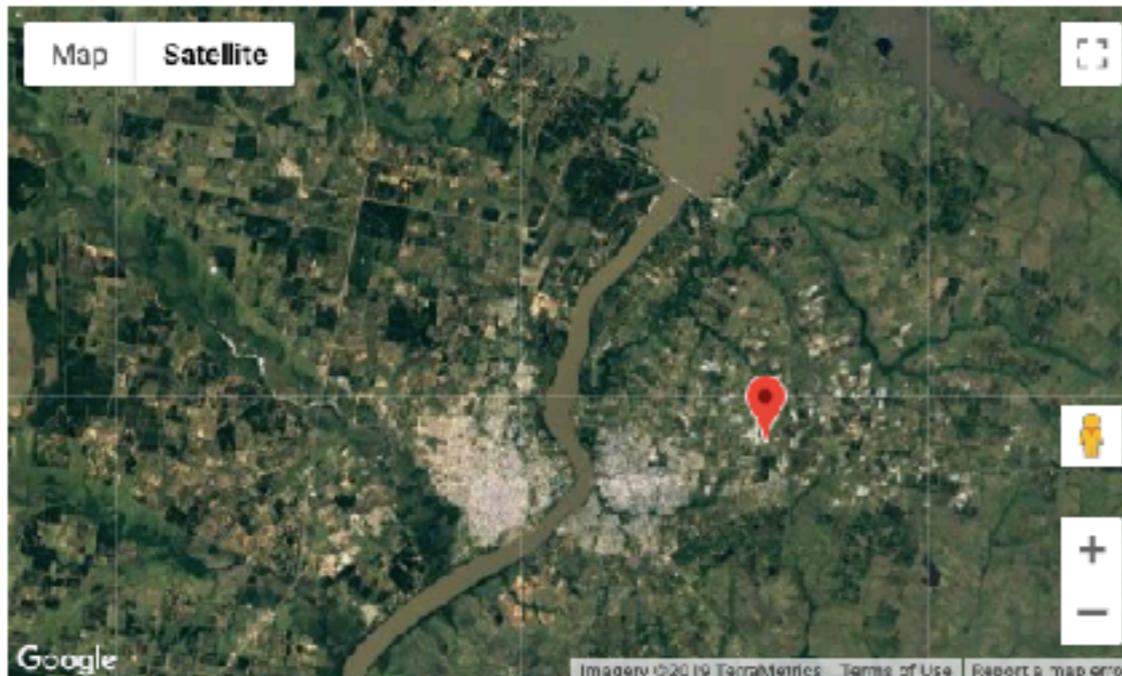


Charter activations

06 JUNE 2017

Flood in Uruguay

[Browse activations on map](#)



Location of Event:	Uruguay
Date of Charter Activation:	6 June 2017
Time of Charter Activation:	16:17:00
Time zone of Charter Activation:	UTC+03:00
Charter Requestor:	Sistema Nacional de Emergencias - Presidencia de la República
Activation ID:	535
Project Management:	CONAE

Heavy rains caused severe flooding in Uruguay's Salto Department, Paysandú Department and Bella Unión city of the Artigas department displacing 3500 people.

Uruguay's National Emergency System (SINAE) are visiting affected areas to assess the damage and prepare relief efforts. Many of the displaced people are already receiving food, shelter and medical care.

Northern parts of Uruguay have been under a heavy rain warning since 24 May, and authorities expect further rain with flood waters set to continue rising.

Products



Flooding in Uruguay

Source: CartoSat-2
Acquired: 20/06/2017

Copyright: CartoSat-2 data © ISRO (2017), all rights reserved

Map produced by CONAE



Comparison of flooding in Uruguay

Source: RADARSAT-2
Acquired: Pre-disaster: 22/02/2017
Post-disaster: 08/06/2017

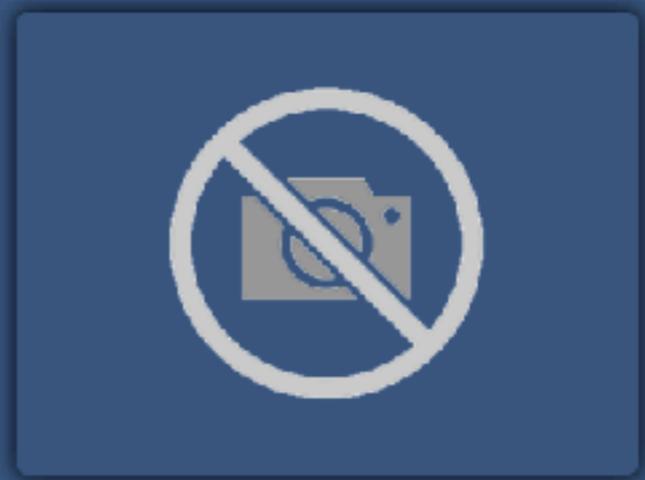
Copyright: RADARSAT-2 Data and Products © MacDonald, Dettwiler and Associates Ltd. (2017) - All Rights Reserved. RADARSAT is an official trademark of the Canadian Space Agency.



Activation 535
Acquisitions [32]
Products [0]

Flood
Tuesday, June 6, 2017

Flood in Uruguay
[+Info](#)



Country: **Uruguay**
Extent: --- km²

Heavy rains caused severe flooding in Uruguay's Salto Department, Paysandú Department and Bella Unión city of the Artigas department displacing 3500 people.

Last update: Jul 28, 2017, 1:08 PM

Jan'00 - Sep'18

v1.3.3



Products



Inundaciones en Uruguay

Fuente: CartoSat-2
Adquirido: 20/06/2017

Copyright: CartoSat-2 datos © ISRO (2017), todos los derechos reservados

Mapa producido por CONAF



Comparación de las inundaciones en Uruguay

Fuente: RADARSAT-2
Adquirido: Antes del desastre: 22/02/2017
Después de los desastres: 08/06/2017

Copyright: RADARSAT 2 de datos y productos © MacDonald, Dettwiler y Asociados SA (2017) todos los derechos reservados. RADARSAT es una marca oficial de la Agencia Espacial Canadiense. Mapa producido por CONAF



Inundación en Salto

Fuente: SPOT-6
Adquirido: 11/06/2017

Copyright: SPOT-6 © CNES 2017 - Distribución: Airbus DS, todos los derechos reservados

Mapa producido por CONAF



Inundaciones en Uruguay

Fuente: SPOT-6
Adquirido: 11/06/2017

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Mapa producido por CONAF



Inundaciones en Paysandu

Fuente: SPOT-6
Adquirido: 11/06/2017

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Mapa producido por CONAF



Inundaciones en Uruguay

Fuente: CartoSat-2
Adquirido: 10/06/2017

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Mapa producido por CONAF

Inundaciones en Uruguay
Flooding in Uruguay
08/06/2017



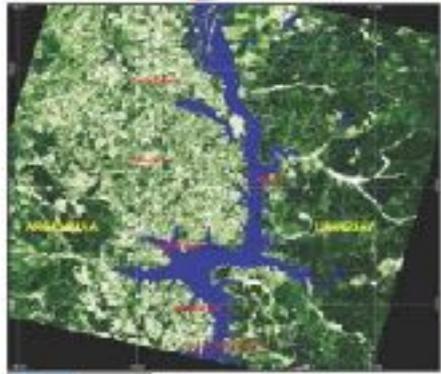
Flooding in Monte Caseros and Bella Unión, Uruguay

Fuente: ALOS-2
Adquirido: 08/06/2017

Copyright: ALOS © JAXA (2016) All rights reserved
Mapa producido por CONAF



Inundaciones en Uruguay
Flooding in Uruguay
08/06/2017



Flooding in Salto Department, Paysandú Department and Bella Unión City, Uruguay

Fuente: ALOS-2
Adquirido: 08/06/2017

Copyright: ALOS © JAXA (2016) All rights reserved
Mapa producido por CONAF



Inundaciones en Uruguay
Flooding in Uruguay
10/06/2017



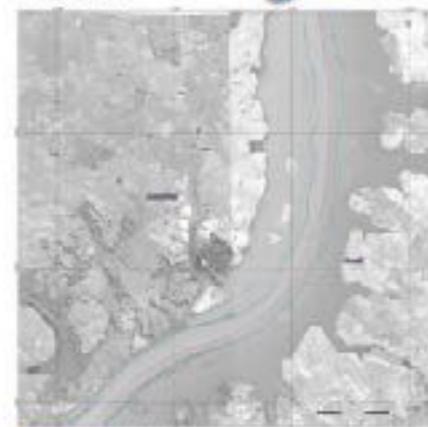
Inundaciones en Uruguay

Fuente: SPOT-7
Adquirido: 10/06/2017

Copyright: SPOT 7 © CNES 2017 - Distribución: Airbus DS, todos los derechos reservados
Mapa producido por CONAF



Inundaciones en Uruguay
Flooding in Uruguay
11/06/2017



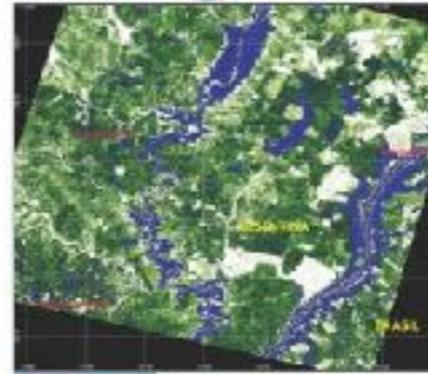
Inundaciones en el departamento de Salto, departamento de Paysandú y ciudad de Bella Unión

Fuente: CartoSat-2
Adquirido: 11/06/2017

Copyright: CartoSat 2 data © ISRO (2017). Todos los derechos reservados
Mapa producido por CONAF



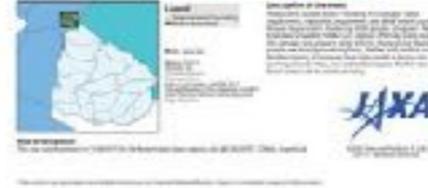
Inundaciones en Uruguay
Flooding in Uruguay
08/06/2017



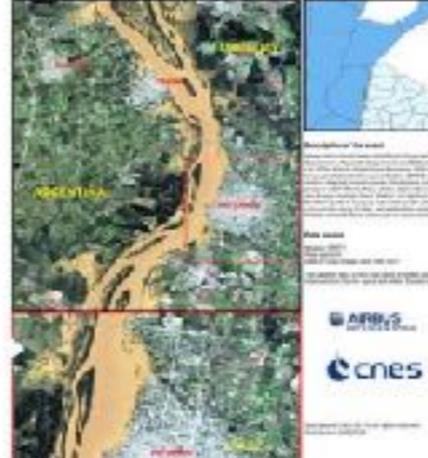
Flooding in Salto Department, Paysandú Department and Bella Unión City, Uruguay

Fuente: ALOS-2
Adquirido: 08/06/2017

Copyright: ALOS © JAXA (2016) All rights reserved
Mapa producido por CONAF



Inundaciones en Uruguay
Flooding in Uruguay
10/06/2017



Inundaciones en Uruguay

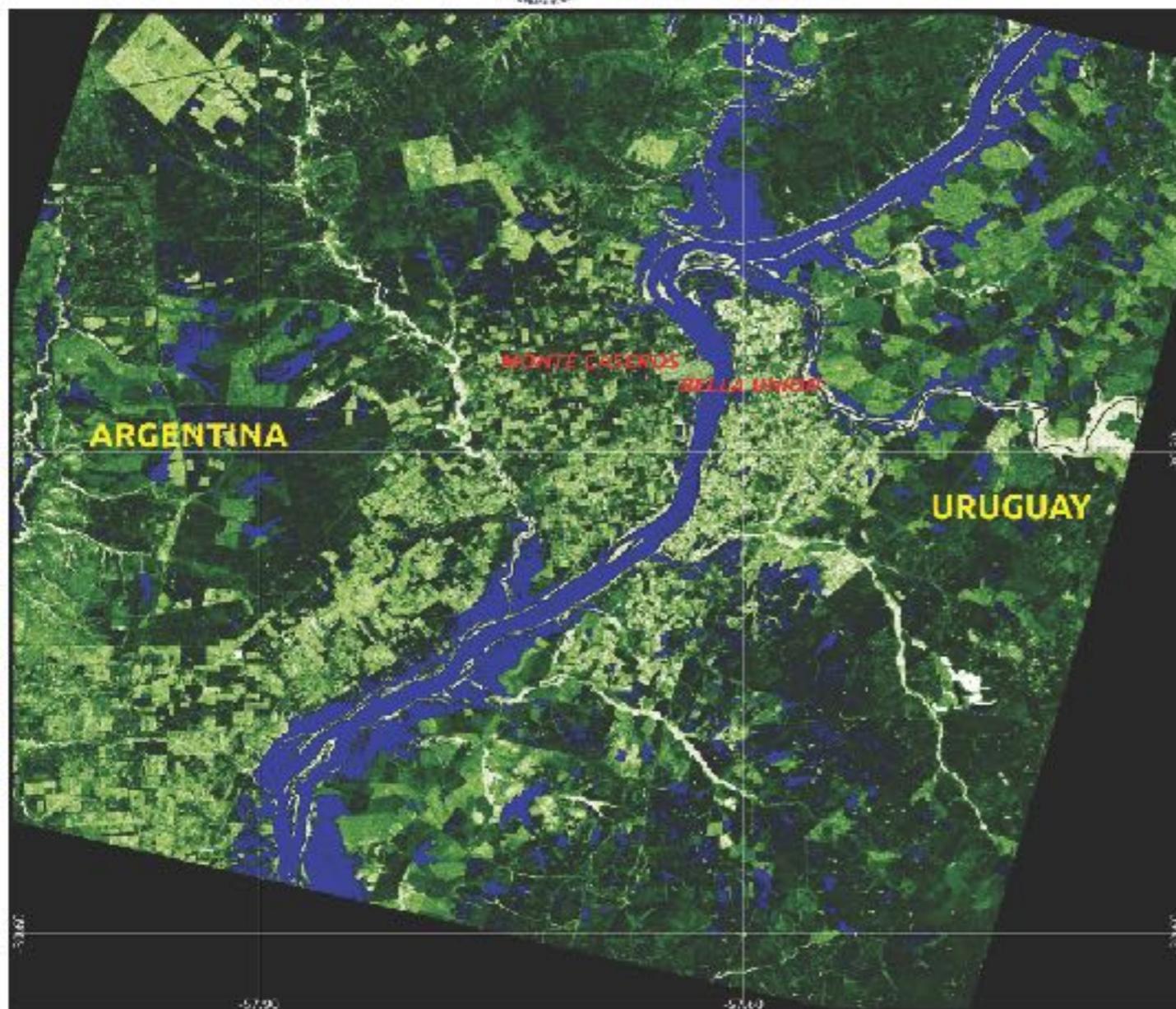
Fuente: SPOT-7
Adquirido: 10/06/2017

Copyright: SPOT 7 © CNES 2017 - Distribución: Airbus DS, todos los derechos reservados
Mapa producido por CONAF



Inundaciones en Uruguay Flooding in Uruguay

June 8th, 2017
International Charter Call ID 614



Data source

Mission: ALOS 2
SENSOR: SAR
POLARIZATION: HV
Pixel size: 12.5 m
Date of crisis image: June 8th 2017
The satellite data in this map were provided under the International Charter Space and Major Disasters



Legend

International boundary

Data source

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Map development

This map was developed on 13/06/2017 by the Argentinian Space Agency (AI@ CAFARTE - CONAE, Argentina).

- SNAP
- Sentinel 1 Toolbox
- Sentinel 2 Toolbox
- Sentinel-3 Toolbox
- SMOS Toolbox
- Proba-V Toolbox
- PoliSARpro
- Download
- Community
- Useful Links



[Home](#) > [Download](#) > SNAP Download

SNAP Download

Here you can download the latest installers for SNAP and the Sentinel Toolboxes.

Data provision is available to all users via the [Sentinel Data Hub](#).

Current Version

The current version is **7.0.0** (22.07.2019 13:30 UTC).

For detailed information about changes made for this release please have a look at the release notes of the different projects: [SNAP](#), [S1TBX](#), [S2TBX](#), [S3TBX](#), [SMOS Box](#), [PROBA-V Toolbox](#)

We offer three different installers for your convenience. Choose the one from the following table which suits your needs. During the installation process, each toolbox can be excluded from the installation. Toolboxes which are not initially installed via the installer can be later downloaded and installed using the plugin manager. Please note that SNAP and the individual Sentinel Toolboxes also support numerous sensors other than Sentinel.

	Windows 64-bit	Windows 32-bit	Mac OS X	Unix 64-bit
Sentinel Toolboxes	These installers contain the Sentinel-1 , Sentinel-2 , Sentinel-3 Toolboxes			
	Download	Download	Download	Download
SMOS Toolbox	This installer contains only the SMOS Toolbox . Download also the Format Conversion Tool (Batch Explorer to NetCDF) and the User manual .			
	Download	Download	Download	Download
All Toolboxes	These installers contain the Sentinel-1 , Sentinel-2 , Sentinel-3 Toolboxes, SMOS and PROBA-V Toolbox			
	Download	Download	Download	Download

If you later decide to install an additional toolbox to your installation you can follow this [step-by-step guide](#).

Search...



2018



Mapping Urban Areas from Space (MUAS 2018)



ED Open Science 2018



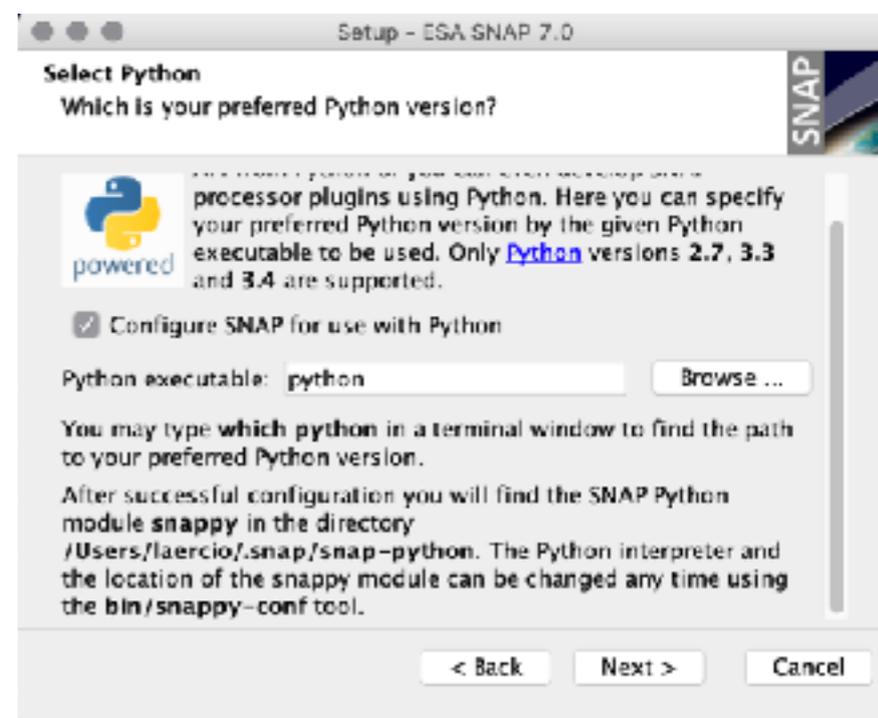
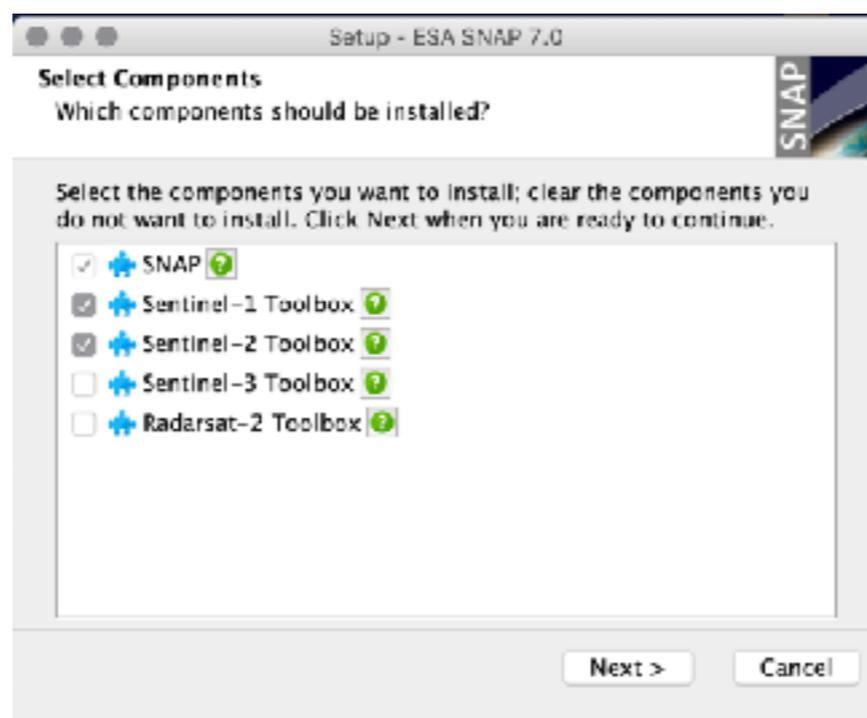
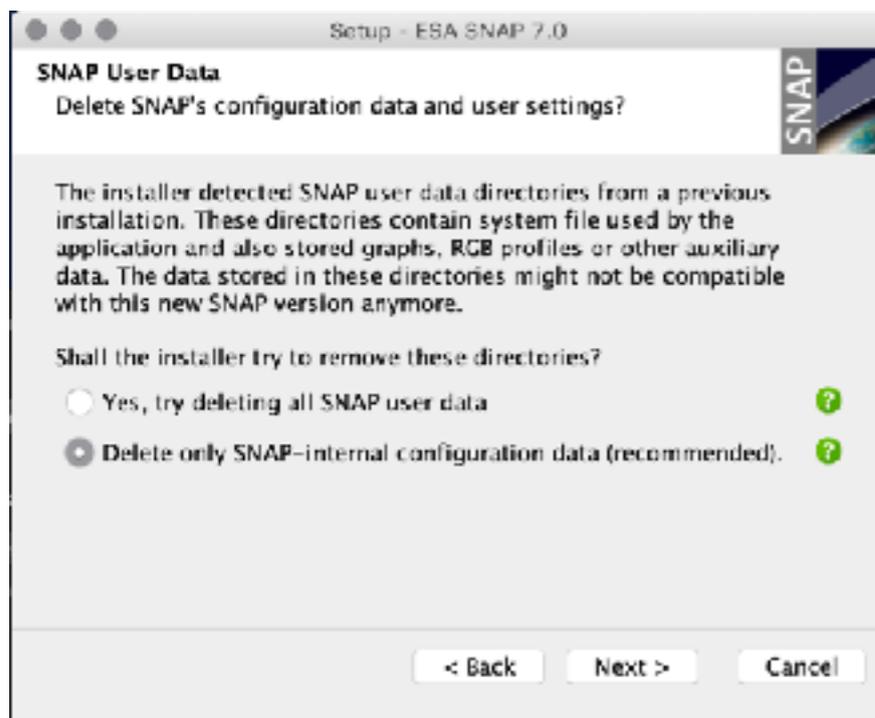
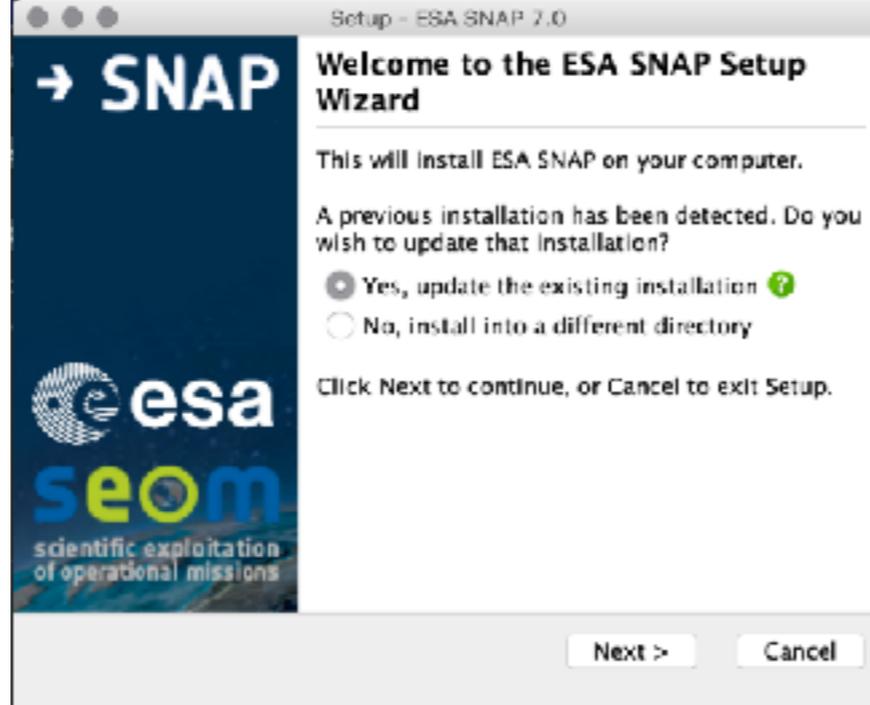
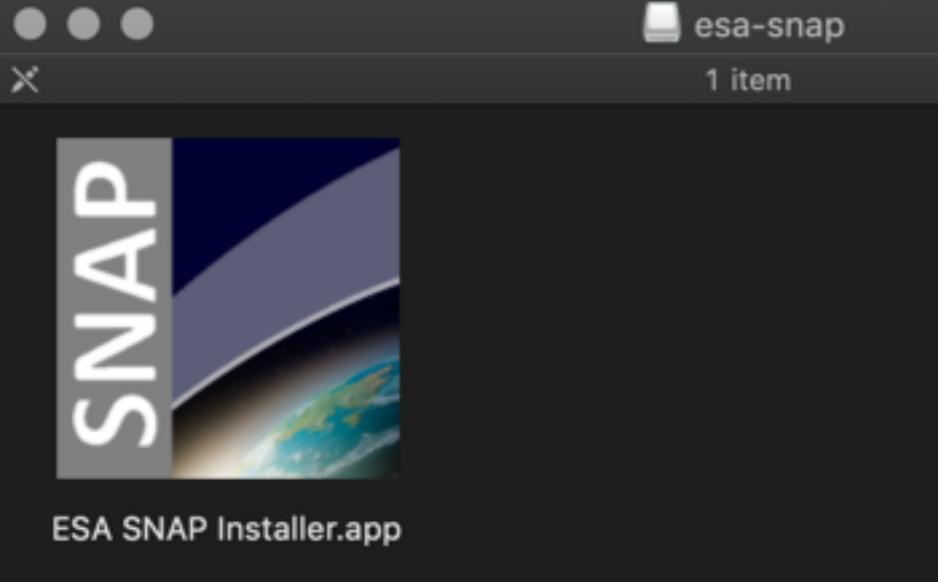
gh Advanced Land Training Course

2017



ED Open Science 2017

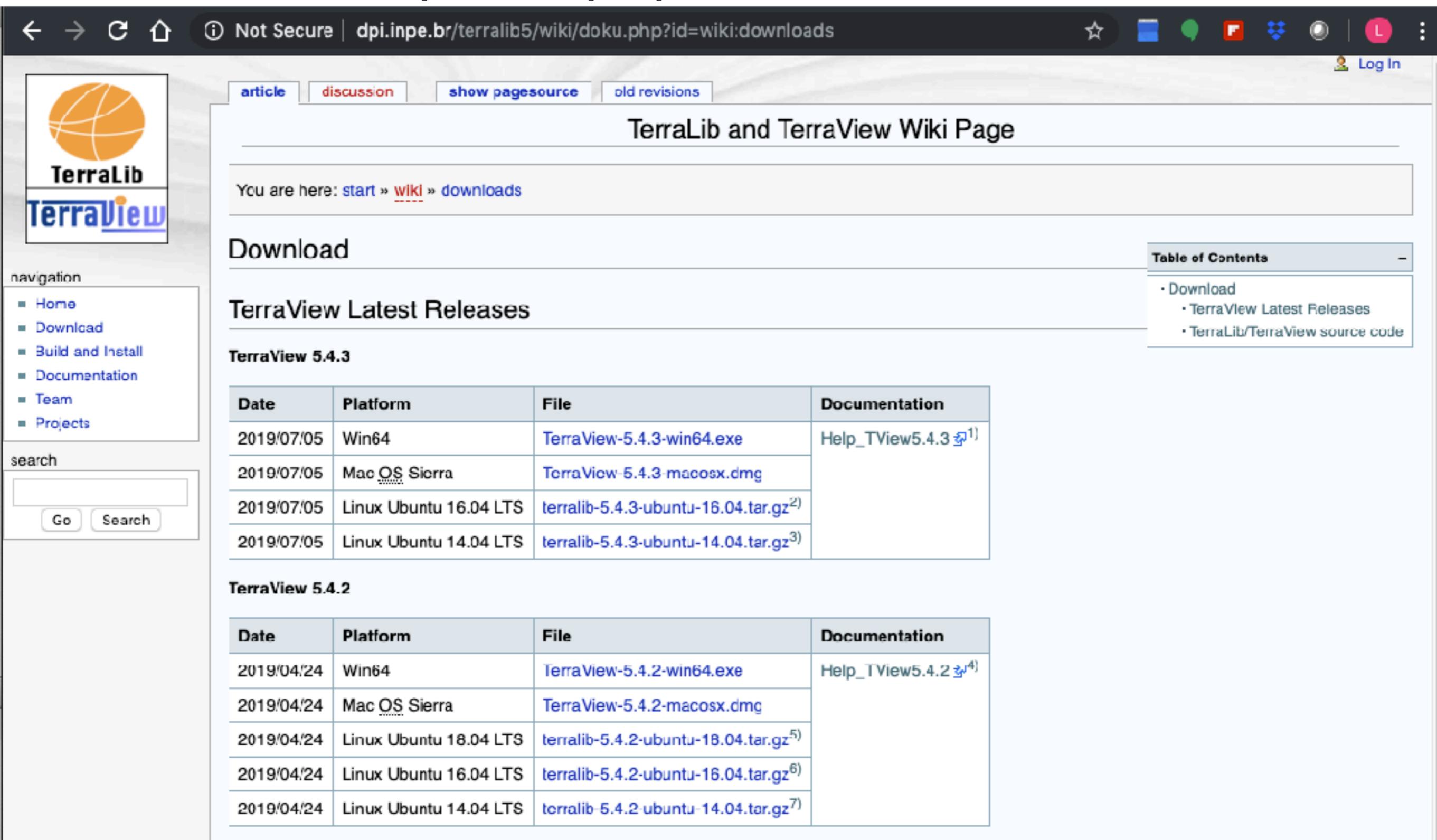
Download SNAP



Instala SNAP

Download TerraView5

<http://www.dpi.inpe.br/terralib5/> Download



The screenshot shows a web browser window with the address bar displaying `http://www.dpi.inpe.br/terralib5/wiki/doku.php?id=wiki:downloads`. The page title is "TerraLib and TerraView Wiki Page". The breadcrumb trail is "You are here: [start](#) » [wiki](#) » [downloads](#)". The main heading is "Download". Below it, the section "TerraView Latest Releases" is visible. There are two tables of download links for TerraView 5.4.3 and 5.4.2. A "Table of Contents" sidebar is on the right, listing "Download", "TerraView Latest Releases", and "TerraLib/TerraView source code". The left sidebar contains navigation links: Home, Download, Build and Install, Documentation, Team, and Projects. A search box is also present in the left sidebar.

TerraView Latest Releases

TerraView 5.4.3

Date	Platform	File	Documentation
2019/07/05	Win64	TerraView-5.4.3-win64.exe	Help_TView5.4.3 ¹⁾
2019/07/05	Mac OS Sierra	TerraView-5.4.3-macosx.dmg	
2019/07/05	Linux Ubuntu 16.04 LTS	terralib-5.4.3-ubuntu-16.04.tar.gz²⁾	
2019/07/05	Linux Ubuntu 14.04 LTS	terralib-5.4.3-ubuntu-14.04.tar.gz³⁾	

TerraView 5.4.2

Date	Platform	File	Documentation
2019/04/24	Win64	TerraView-5.4.2-win64.exe	Help_TView5.4.2 ⁴⁾
2019/04/24	Mac OS Sierra	TerraView-5.4.2-macosx.dmg	
2019/04/24	Linux Ubuntu 18.04 LTS	terralib-5.4.2-ubuntu-18.04.tar.gz⁵⁾	
2019/04/24	Linux Ubuntu 16.04 LTS	terralib-5.4.2-ubuntu-16.04.tar.gz⁶⁾	
2019/04/24	Linux Ubuntu 14.04 LTS	terralib-5.4.2-ubuntu-14.04.tar.gz⁷⁾	

Seleção e Download de Imagens

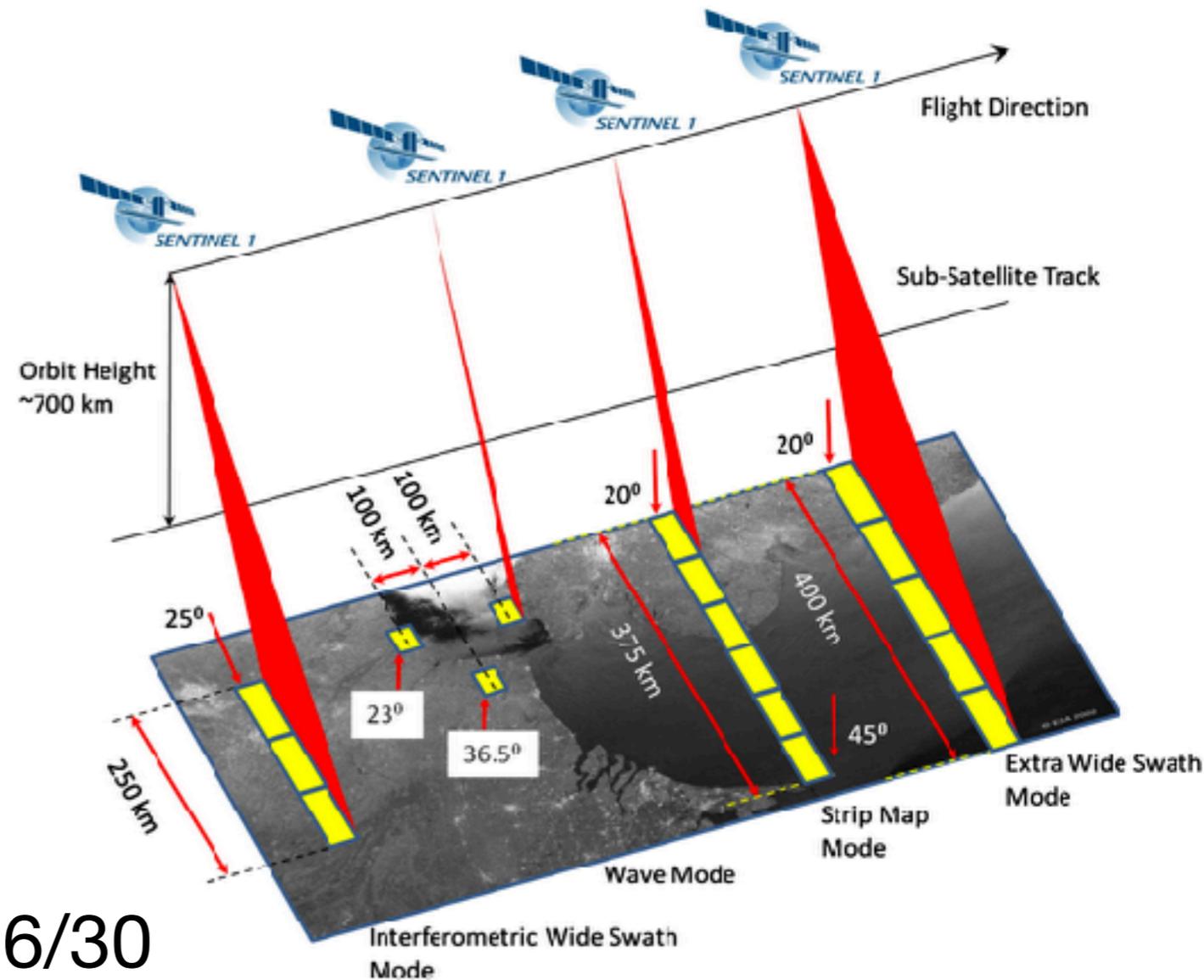
scihub.copernicus.eu/dhus

Data entre 2017/06/01 e 2017/06/30

Missão: Sentinel 1 - S1A e S1B .

Produto: GRD (Ground Range Detected - Projetado em Ground Range, valores em magnitude, não existe fase).

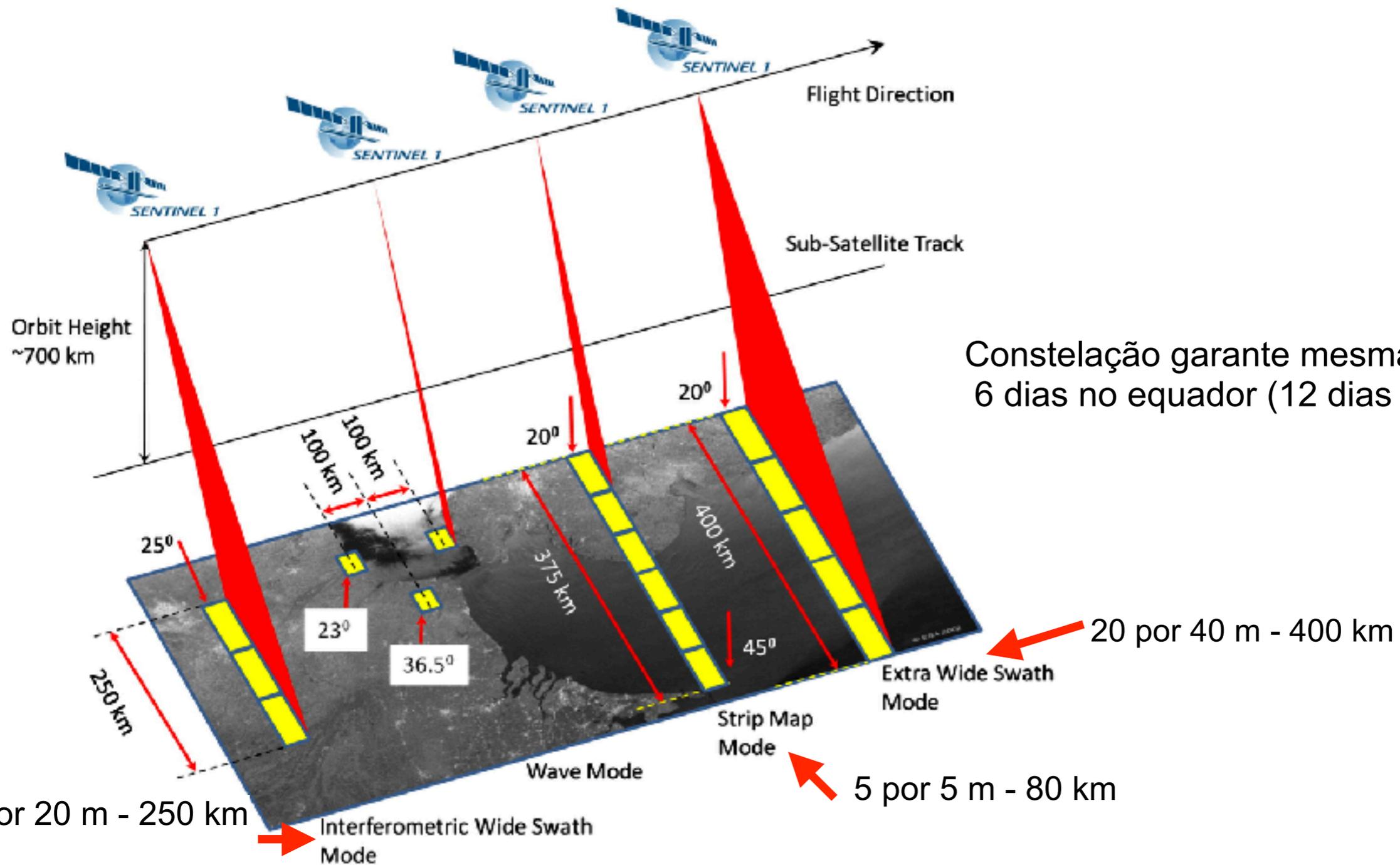
Modo: IW (Interferometric Wide Swath - Adquirido em 3 faixas, resolução espacial de 20x22 metros em Range x Azimute)



SENTINEL-1

C-band SAR: frequência central 5.405 GHz; right looking

Polarização Dual (HH+HV, VV+VH): transmite H ou V e recebe H e V



scihub.copernicus.eu/dhus

The image shows a web browser window displaying the Copernicus Open Access Hub website. The browser's address bar shows the URL <https://scihub.copernicus.eu/dhus/>. The website header features the ESA and Copernicus logos, the title "Copernicus Open Access Hub", and navigation buttons for "SIGN UP" and "LOGIN". A red arrow points to the "SIGN UP" button, which is labeled with a red box containing the number "1". Below the header is a search bar with the placeholder text "Insert search criteria...". The main content area is a map of Europe and the Mediterranean region, with various cities and countries labeled. At the bottom of the map, there are navigation controls: "Pan", "Box", "Polygon", and "Clear".

Register new account

Sentinel data access is free and open to all.

On completion of the registration form below you will receive an e-mail with a link to validate your e-mail address. Following this you can start to download the data. Username field accepts only lowercase alphanumeric characters plus ".", "-", "_" and "+".

Firstname	Lastname
Username	
Password	Confirm Password
E-mail	Confirm E-mail
Select Domain	
Select Usage	
Select your country	

Preencher

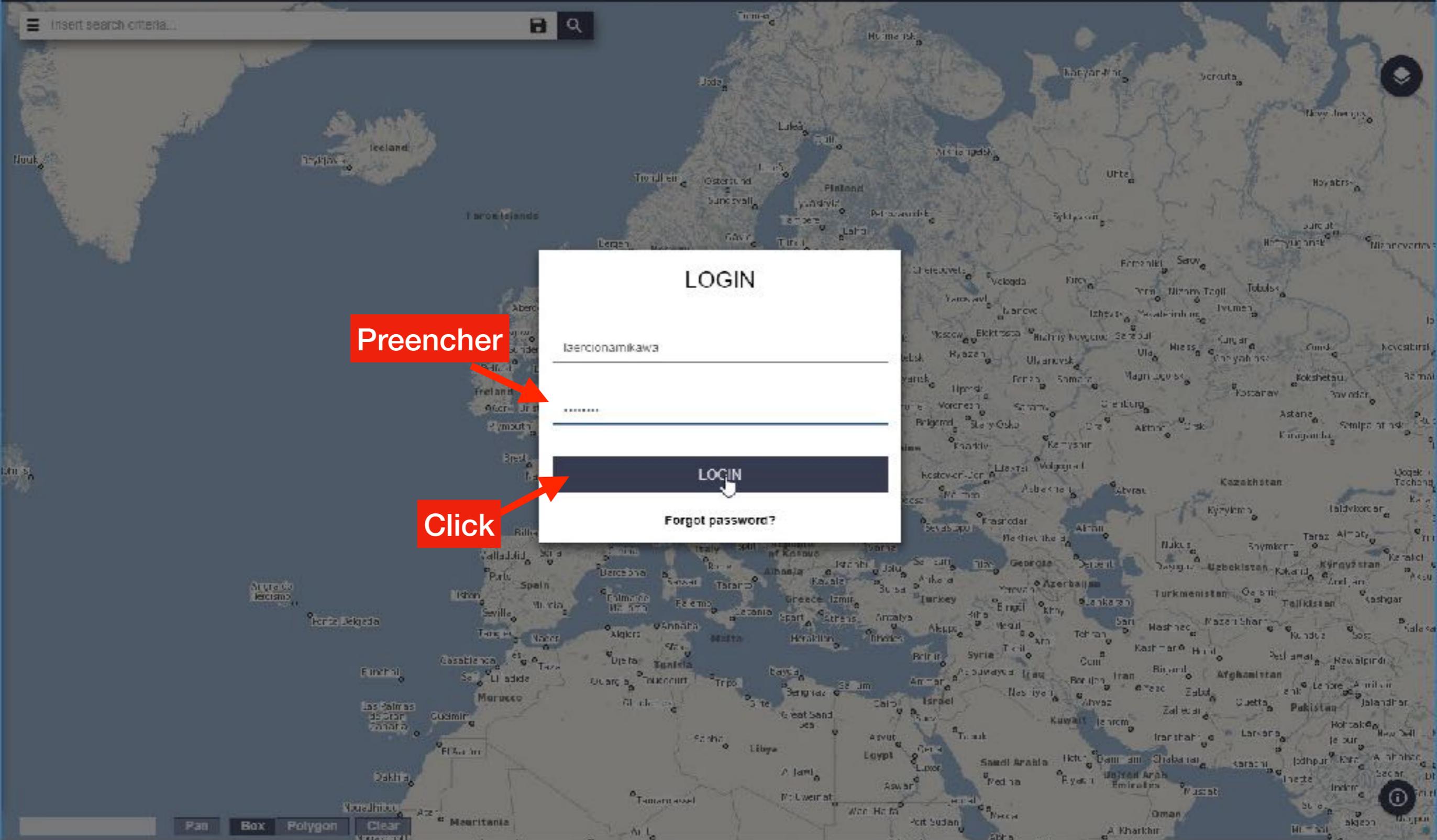


By registering in this website you are deemed to have accepted the T&C for Sentinel data use.

Click

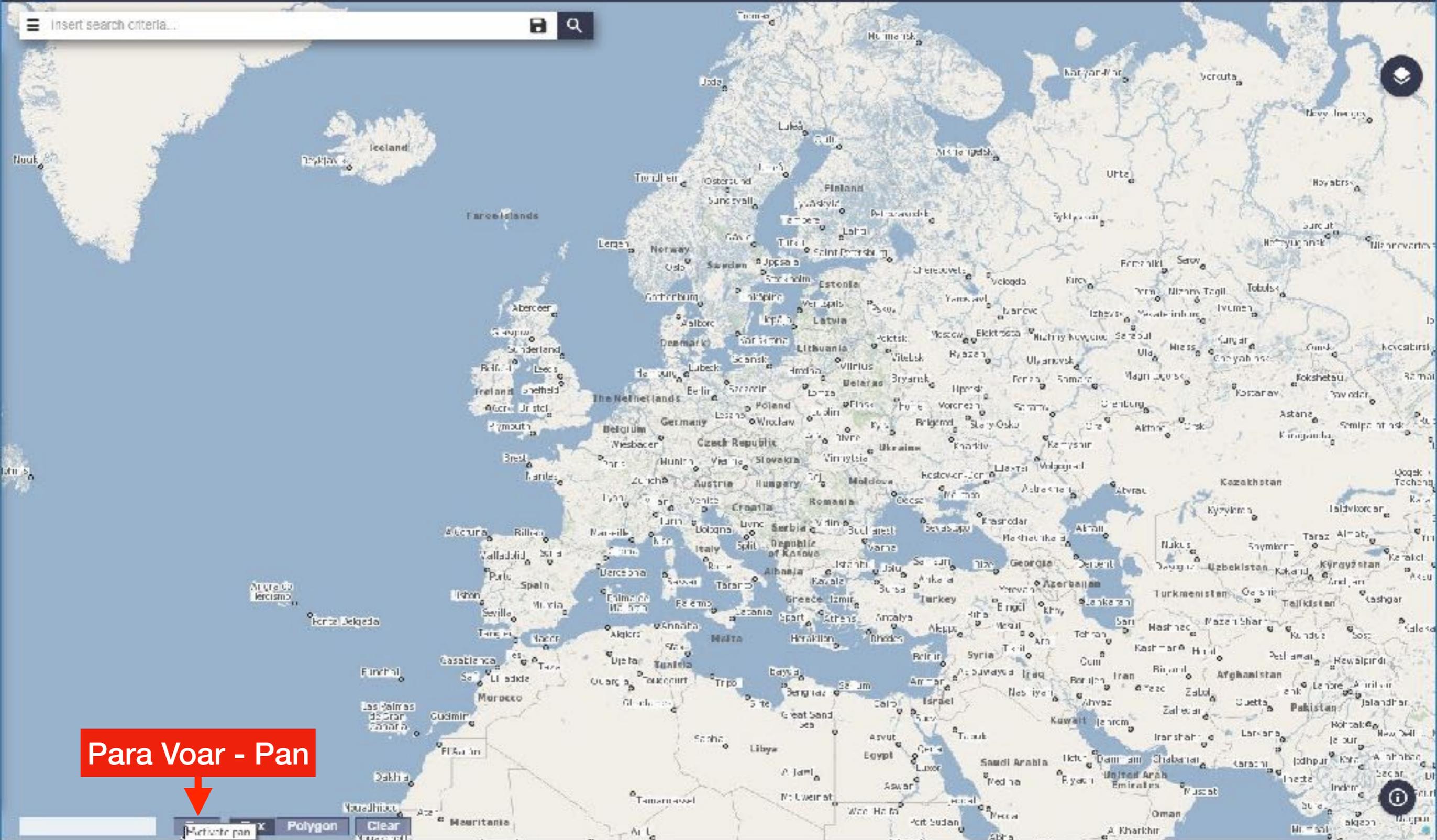


REGISTER



Preencher

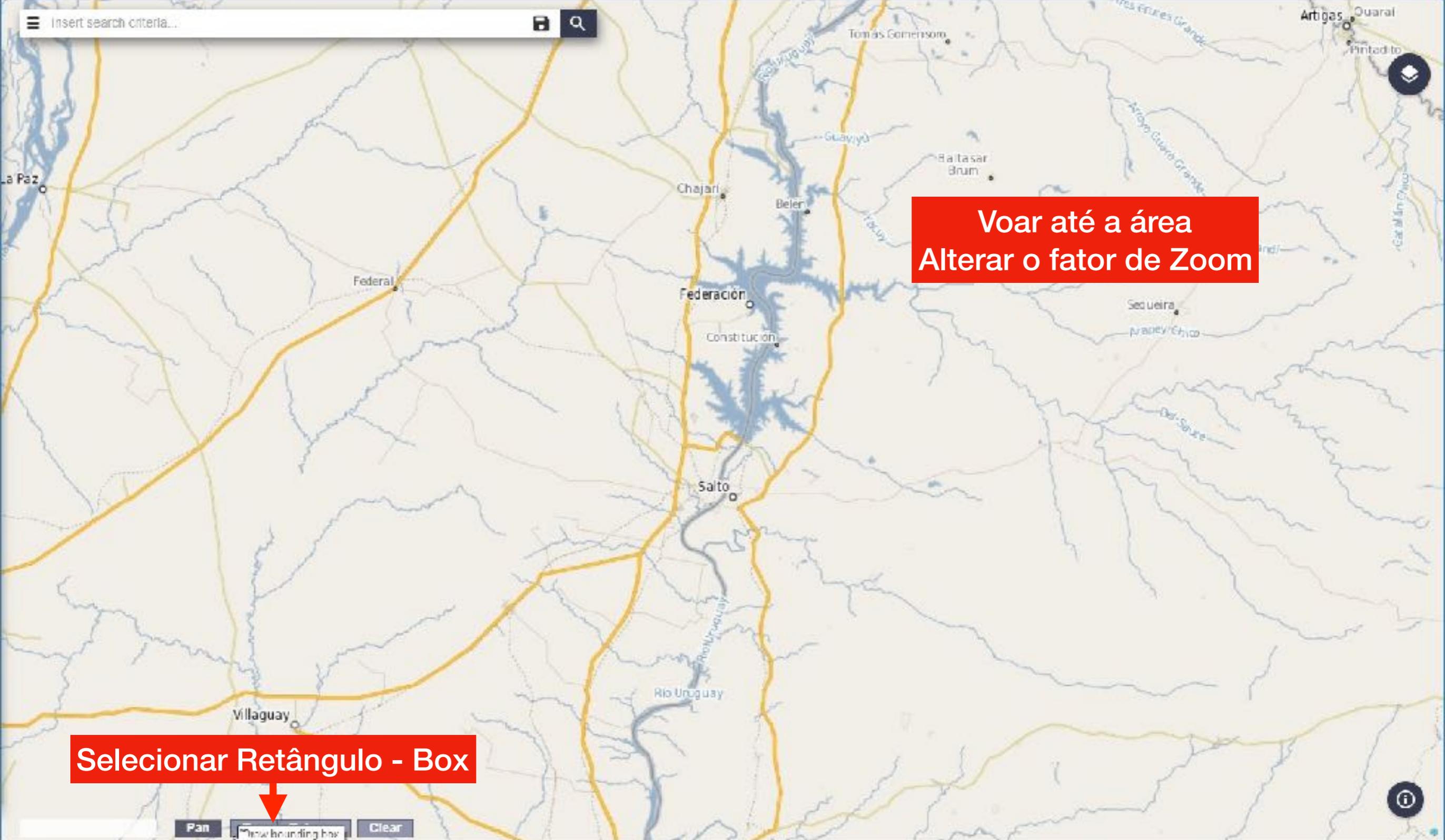
Click



Para Voar - Pan

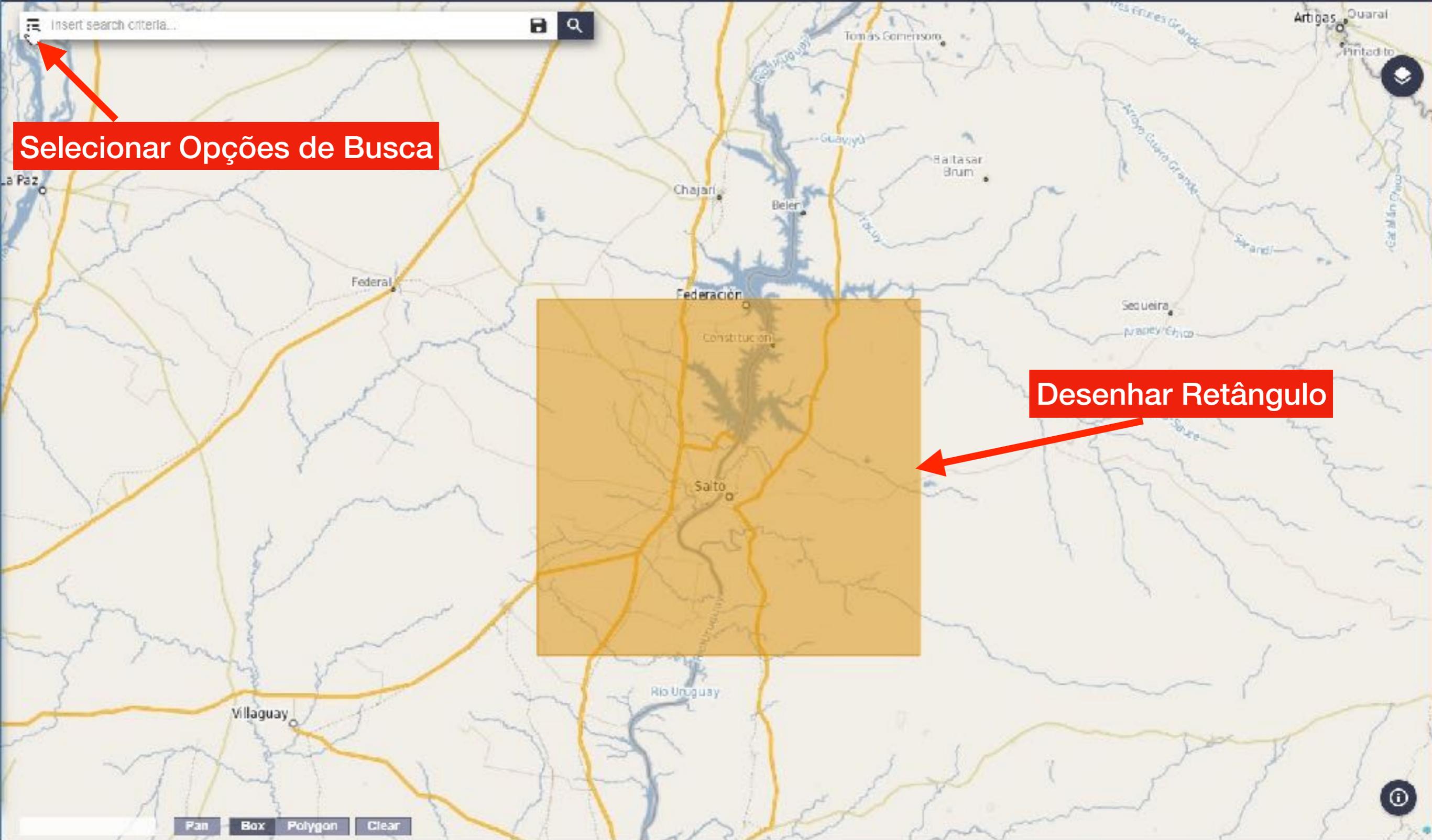


Activate pan Polygon Clear



**Voar até a área
Alterar o fator de Zoom**

Selecionar Retângulo - Box



Selecionar Opções de Busca

Desenhar Retângulo

Insert search criteria...

Definir data inicial

Definir data final

Buscar

Advanced Search

Sort By: Ingestion Date

Order By: Descending

Sensing period: From: 2017/06/01 to: 2017/06/30

Ingestion period: From: to:

Mission: Sentinel-1

Satellite Platform: S1A_*, S1B_*

Polarisation: [Dropdown]

Relative Orbital Number (from 1 to 175): [Input]

Mission: Sentinel-2

Satellite Platform: [Dropdown]

Product Type: [Dropdown]

Cloud Cover % (0 to 100): [Dropdown]

Satellite Platform dropdown menu with options S1A_*, S1B_*

Product Type dropdown menu with options SLC, GRD, OCN

Sensor Mode dropdown menu with options SM, IW, EW, WV

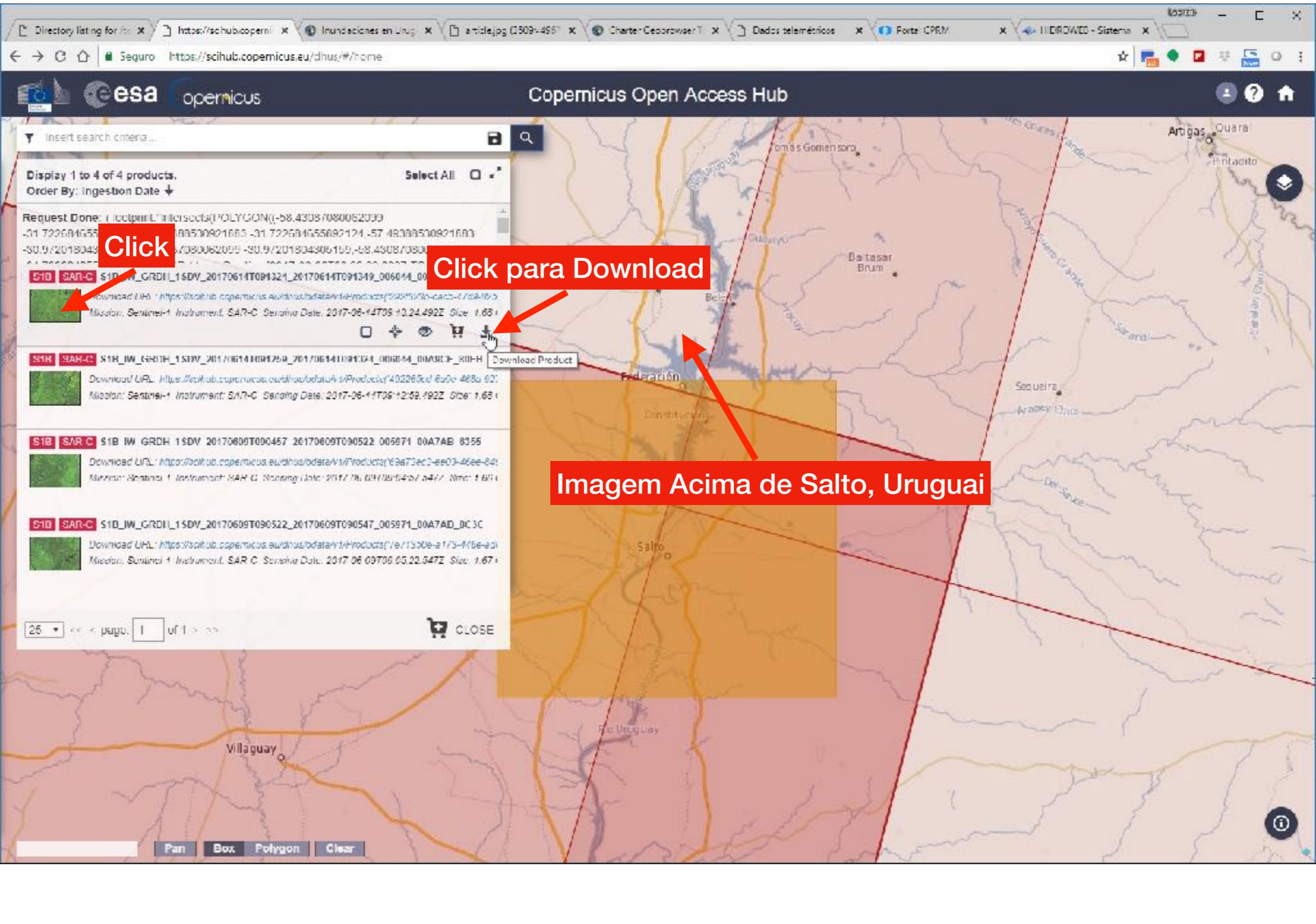
Click

Seleccionar

Seleccionar



Pan, Box, Polygon, Clear



Insert search criteria...

Display 1 to 4 of 4 products. Order By: Ingestion Date

Request Done: 1 footprint intersects POLYGON((-58.43087080062099

S1D SAR-C S1D_IW_GRDH_1SDV_20170614T091321_20170614T091349_006014_00

Download URL: https://scihub.copernicus.eu/dhus/odata/v1/Products('5995576-cac0-47a8-167b

Mission: Sentinel-1 Instrument: SAR-C Sensing Date: 2017-06-14T09:13:24.492Z Size: 1.68

S1H SAR-C S1H_IW_GRDH_1SDV_20170614T091254_20170614T091324_006014_00A0C3_R01H

Download URL: https://scihub.copernicus.eu/dhus/odata/v1/Products('402265ed-6a9e-468a-927

Mission: Sentinel-1 Instrument: SAR-C Sensing Date: 2017-06-14T09:12:59.192Z Size: 1.68

S1B SAR-C S1B_IW_GRDH_1SDV_20170609T090457_20170609T090522_005971_00A7AB_8355

Download URL: https://scihub.copernicus.eu/dhus/odata/v1/Products('63e73ec2-ee03-46ee-847

Mission: Sentinel-1 Instrument: SAR-C Sensing Date: 2017-06-09T09:04:57.247Z Size: 1.67

S1D SAR-C S1D_IW_GRDH_1SDV_20170609T090522_20170609T090547_005971_00A7AD_DC3C

Download URL: https://scihub.copernicus.eu/dhus/odata/v1/Products('1e1350e-a173-416e-ea1

Mission: Sentinel-1 Instrument: SAR-C Sensing Date: 2017-06-09T09:05:22.547Z Size: 1.67

25 << >> page: 1 of 1 >>> CLOSE

Click

Click para Download

Imagem Acima de Salto, Uruguai

Directory listing for /... x | https://schub.copernicus... x | Inundaciones en Uruguay x | article.jpg (2509x455) x | Charter Geobrowser T... x | Datos telemáticos x | Fortel CPERM x | HIDROWEB - Sistema x

Seguro | https://schub.copernicus.eu/dhus/#/home

esa | copernicus | Copernicus Open Access Hub

Insert search criteria...

Definir data inicial

Definir data final

Advanced Search

- Sort by:
- Order by:
- Bursting period: From: to:
- Ingestion period: From: to:

Mission: Sentinel-1

Satellite Platform:

Product Type:

Polarisation:

Sensor Mode:

Relative Orbit Number (from 1 to 174):

Collection:

Mission: Sentinel-2

Satellite Platform:

Product Type:

Relative Orbit Number (from 1 to 143):

Cloud Cover % (e.g. [0 TO 9.4]):

Pan | Box | Polygon | Clear

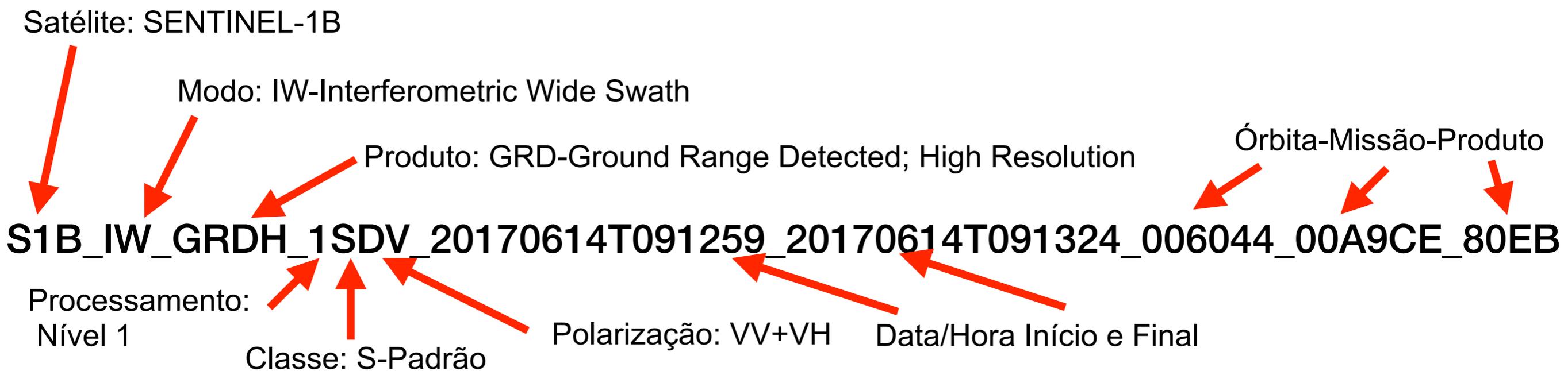
Evento

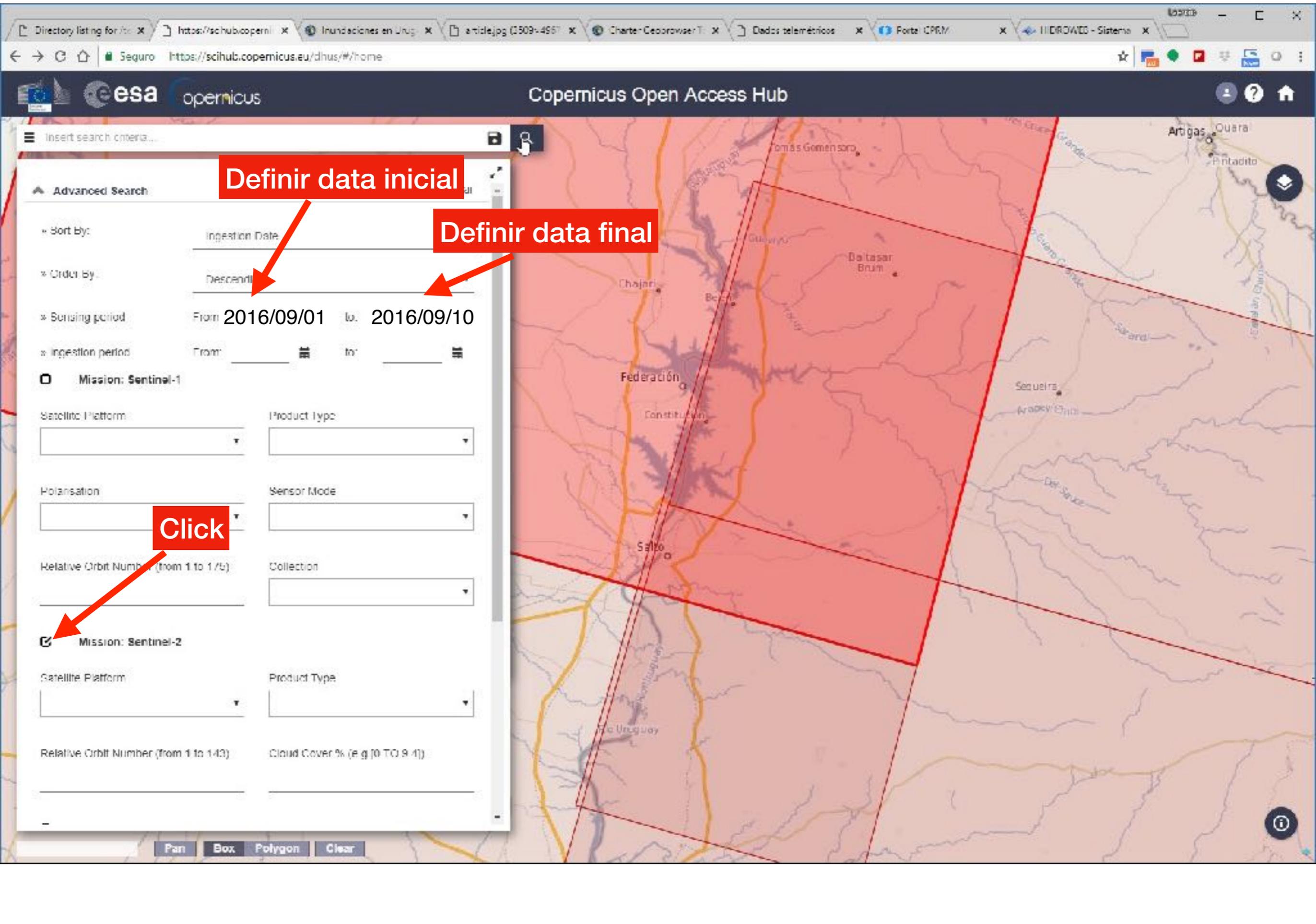
S1B_IW_GRDH_1SDV_20170614T091259_20170614T0*.dim

The screenshot shows a web application interface with a search bar at the top containing the text "Insert search criteria...". Below the search bar, there is a product list. The first product is highlighted and has a status of "Offline". The product details include a small thumbnail image, a download URL, and mission information: "Mission: Sentinel-1 Instrument: SAR-C Sensing Date: 2017-06-14T09:1:".

At the bottom of the interface, there is a pagination control showing "25" items per page, "page: 1 of 1".

A modal dialog box is overlaid on the interface, titled "Offline product retrieval initiated". The dialog contains a green checkmark icon and the text: "Offline product retrieval has been initiated. Please check again your Cart to know when it will be online." An "OK" button is located at the bottom right of the dialog.





Definir data inicial

Definir data final

Click

Advanced Search

Sort by: Ingestion Date

Order by: Descend

Bursting period: From 2016/09/01 to 2016/09/10

Ingestion period: From to

Mission: Sentinel-1

Satellite Platform: Product Type:

Polarisation: Sensor Mode:

Relative Orbit Number (from 1 to 174): Collection:

Mission: Sentinel-2

Satellite Platform: Product Type:

Relative Orbit Number (from 1 to 143): Cloud Cover % (e.g. [0 TO 9.4])

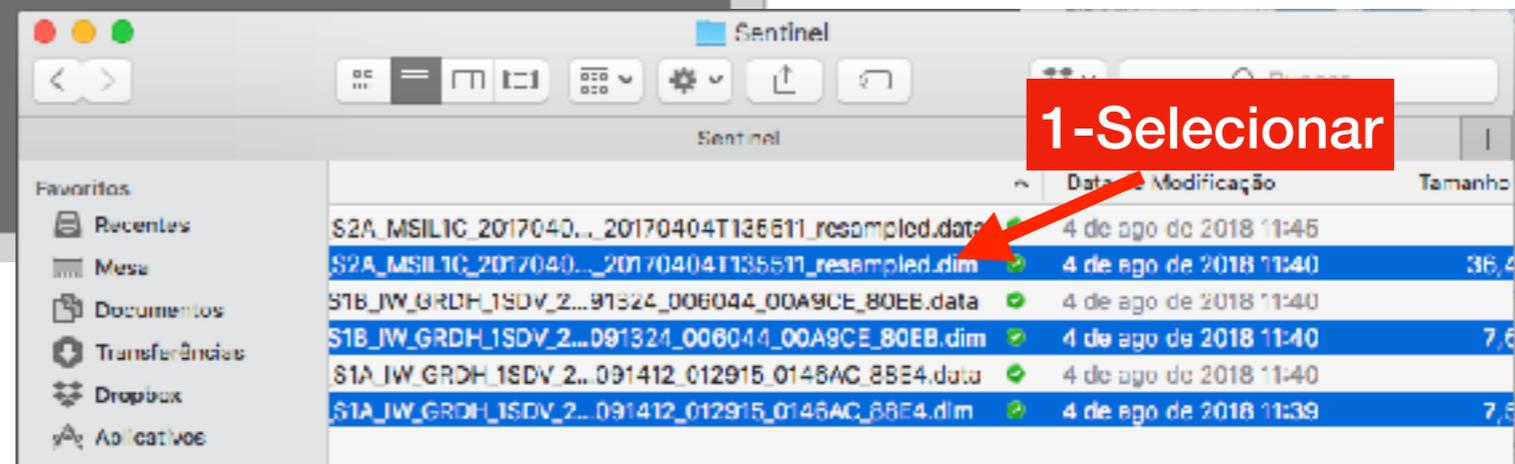
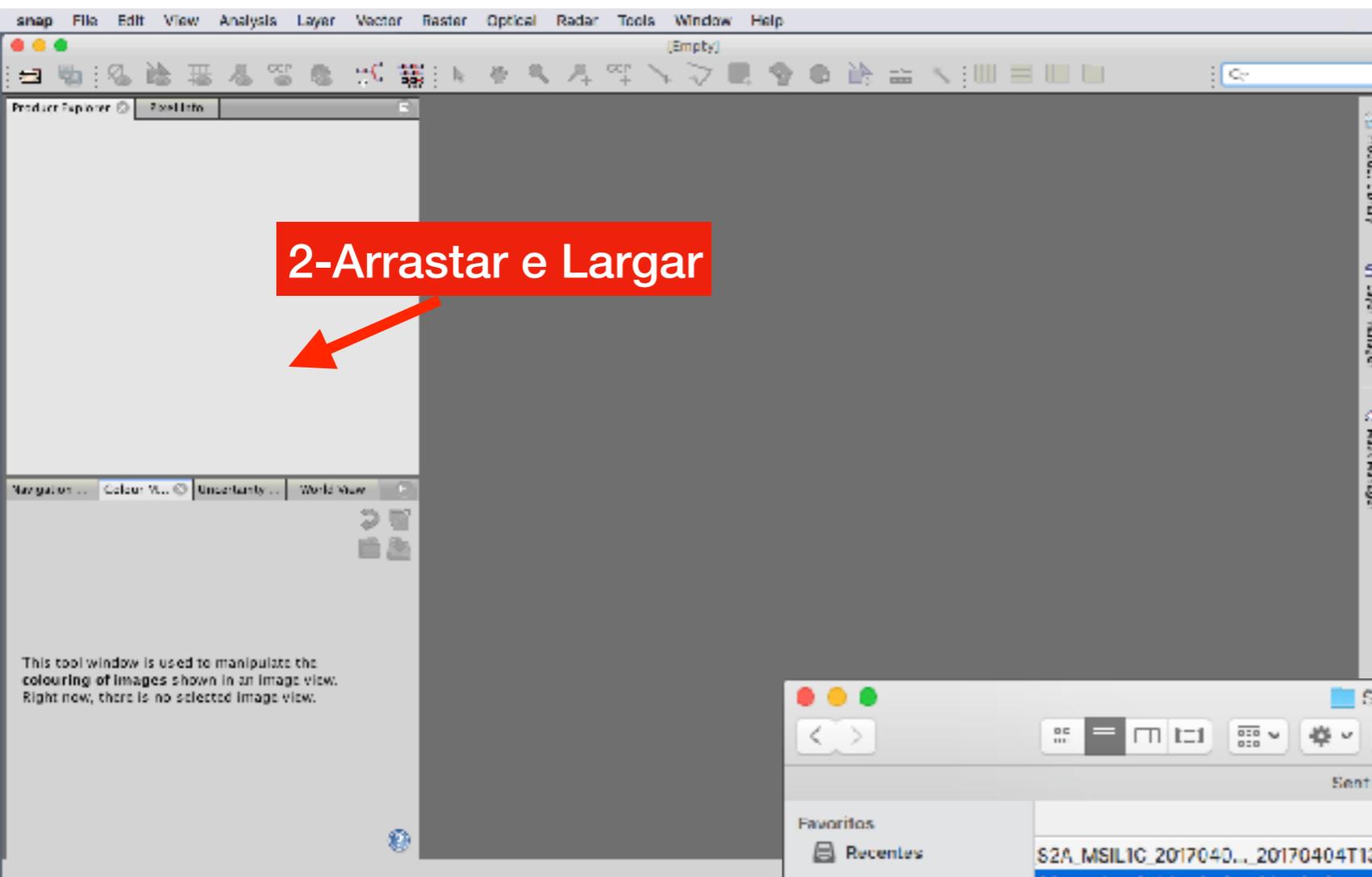
Pan Box Polygon Clear

Pré Evento

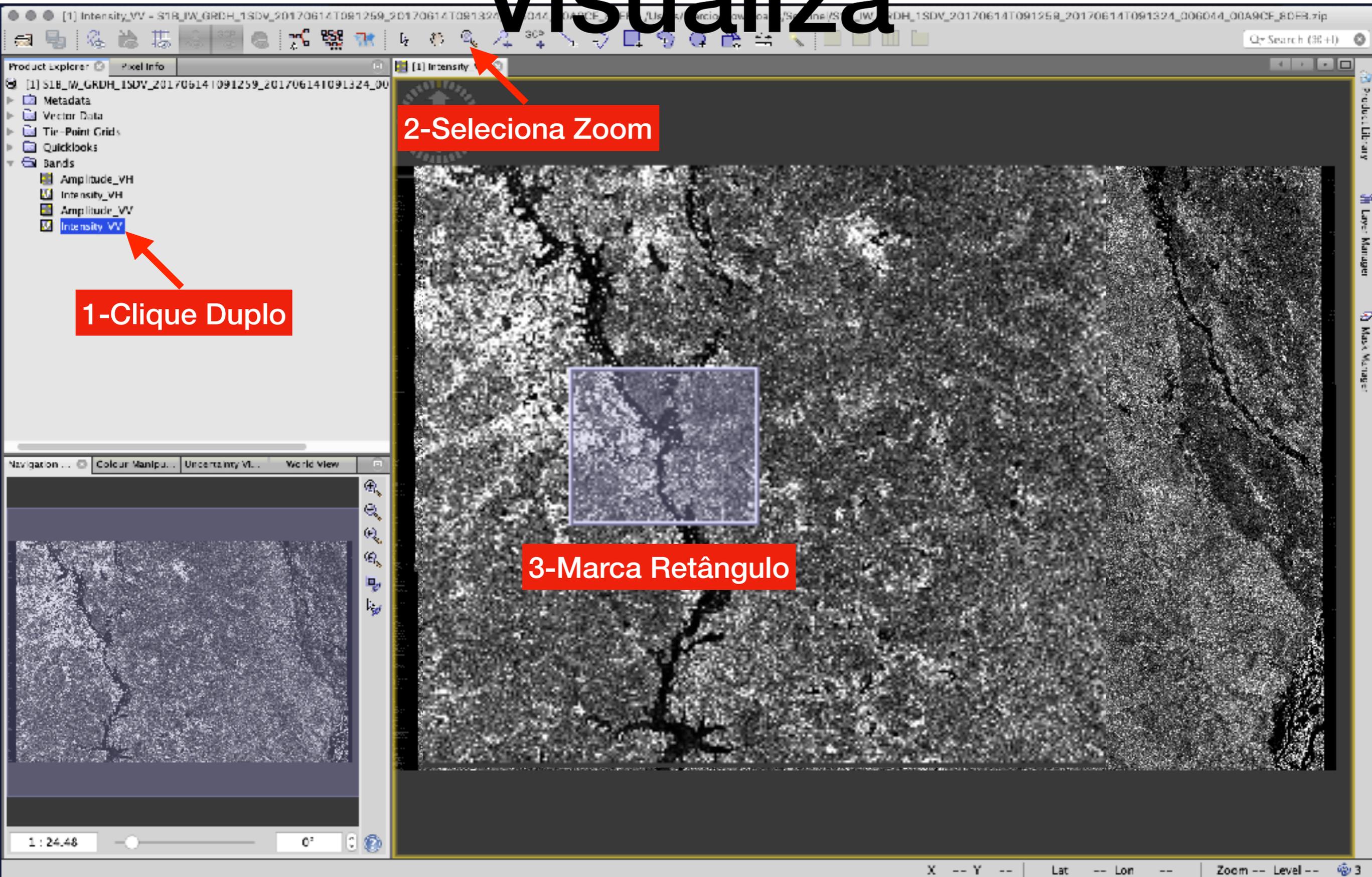
S1A_IW_GRDH_1SDV_20160905T091347_20160905T0*.dim

The image shows a screenshot of a satellite data search interface. The background is a map of Uruguay, with a yellow rectangular footprint overlaid on the Río Uruguay. The map includes labels for Chajarí, Belén, Federación, Embalse Salto Grande, and Constitución. The interface features a search bar at the top with the text "Insert search criteria...". Below the search bar, a panel displays "Display 1 to 1 of 1 products." and "Order By: Sensing Date ↓". To the right of this panel, it says "0 products selected". Below this, a "Request Done:" message shows a footprint polygon: "Intersects(POLYGON((-57.93342862293958 -30.9600157077902,-57.8095298950377 -30.9600157077902,-57.8095298950377 -30.9600157077902,-57.93342862293958 -30.9600157077902))". Below the request message, a product entry is shown with a thumbnail image of a SAR image. The product name is "S1A IW GRDH 1SDV 20160905T091347_20160905T09...". The status is "Offline". The download URL is "https://scihub.copernicus.eu/dhus/odata/v1/Products('03c...". The mission is "Sentinel-1", the instrument is "SAR-C", and the sensing date is "2016-09-05T09:13:47". At the bottom of the interface, there is a pagination control showing "25" items per page, "page: 1 of 1", and a shopping cart icon.

Visualiza



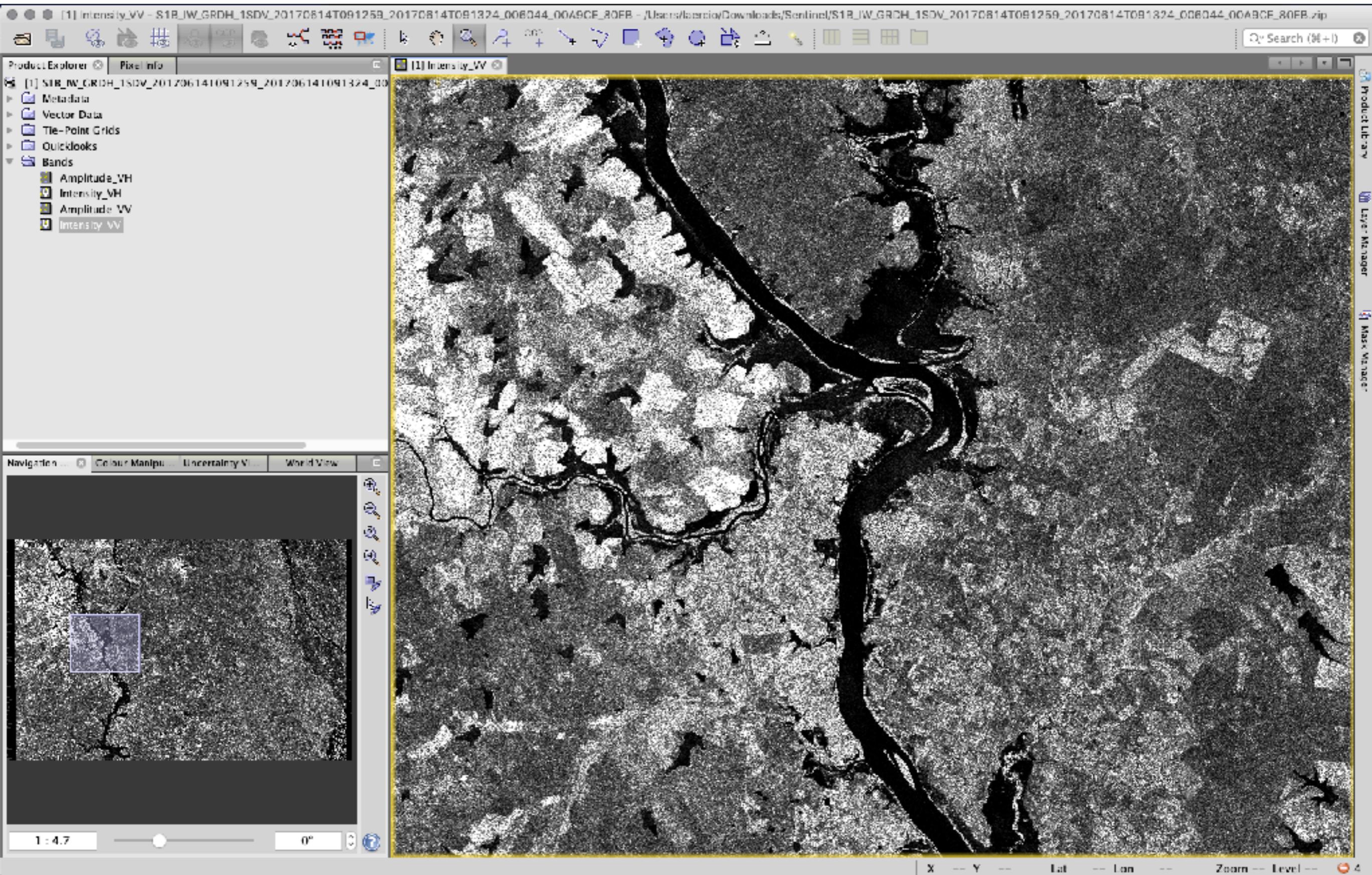
Visualiza



1-Clique Duplo

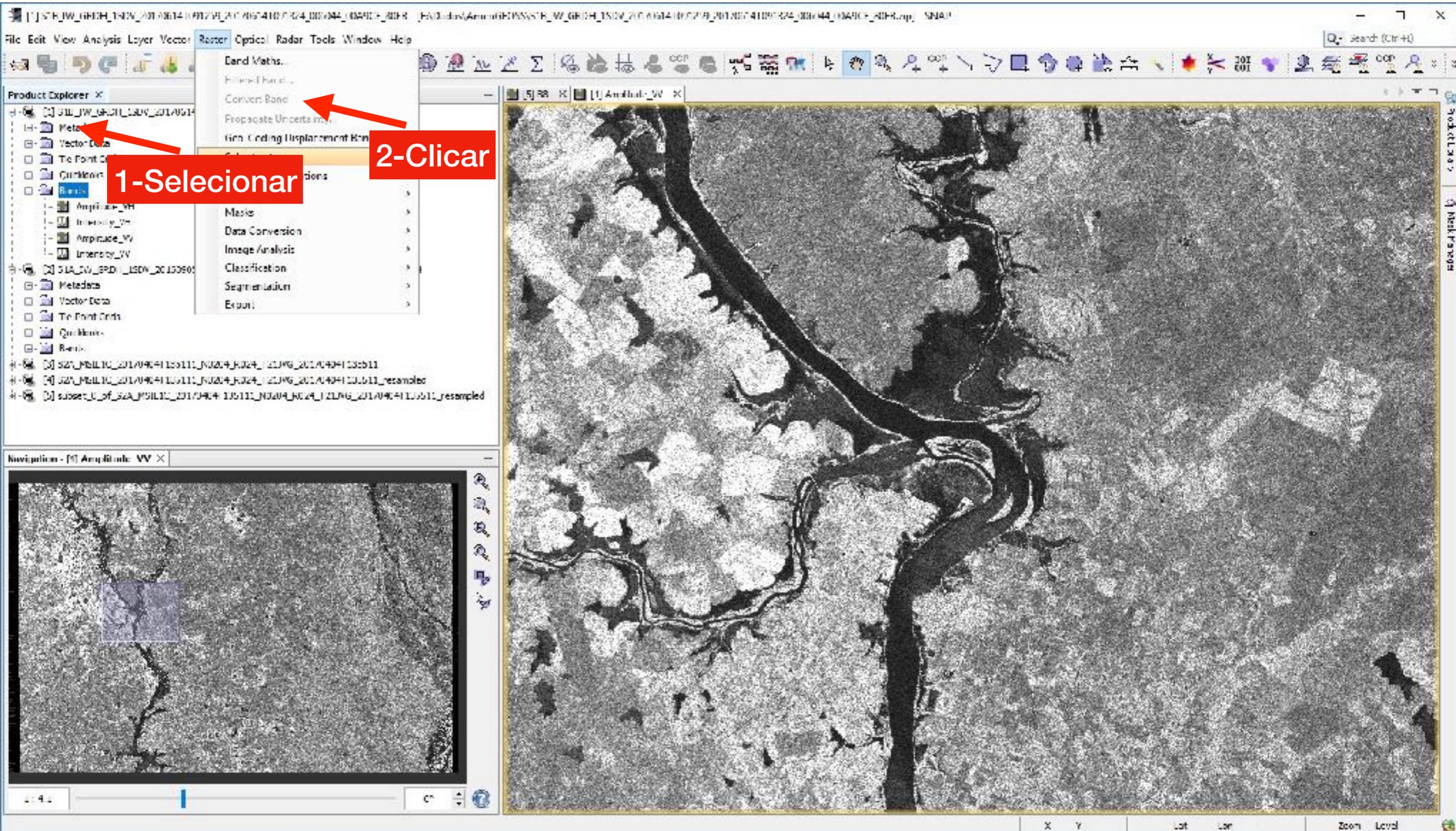
2-Seleciona Zoom

3-Marca Retângulo



Recorta

S1B_IW_GRDH_1SDV_20170614T091259_20170614T091324_006044_00A9CE_80EB



-30.05
-57.50
-30.35
-57.80

3-Clickar

1-Clickar

2-Digitar

5-Clickar

4-Clickar

6-Clickar

Specify Product Subset

Spatial Subset Band Subset Tie-Point Grid Subset Metadata Subset

Pixel Coordinates Geo Coordinates

North latitude bound: -30.05
West longitude bound: -57.50
South latitude bound: -30.35
East longitude bound: -57.80

Scene step X: 1
Scene step Y: 1

Subset scene width: 1948.0
Subset scene height: 3911.0
Source scene width: 26678
Source scene height: 16884

Use Preview Fix full width Fix full height

Estimated, raw storage size: 7.3M

OK Cancel Help

Specify Product Subset

Spatial Subset Band Subset Tie-Point Grid Subset Metadata Subset

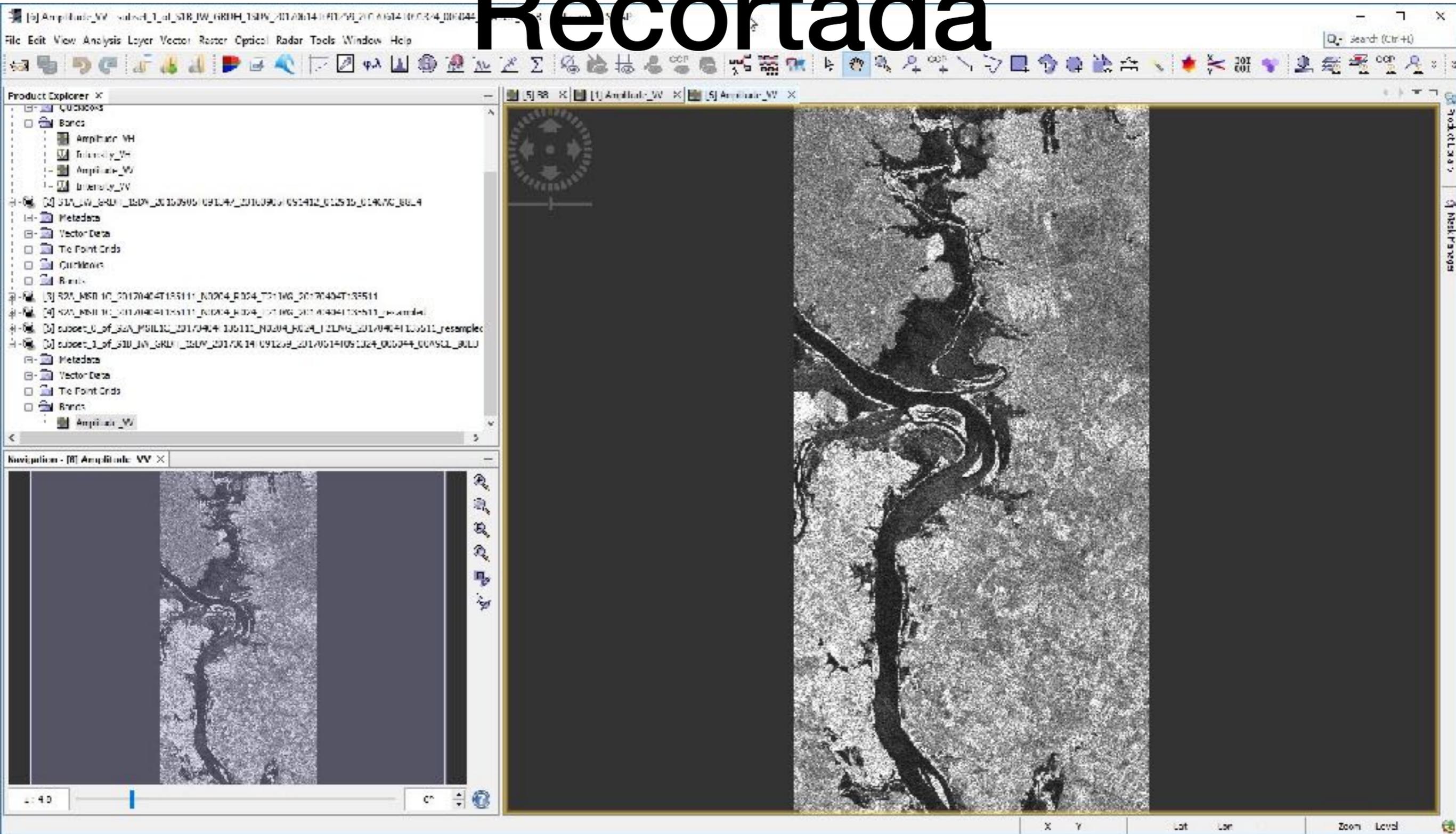
Amplitude_VH
 Intensity_VH *Intensity from complex data*
 Amplitude_VV
 Intensity_VV *Intensity from complex data*

Select all Select none

Estimated, raw storage size: 13.9M

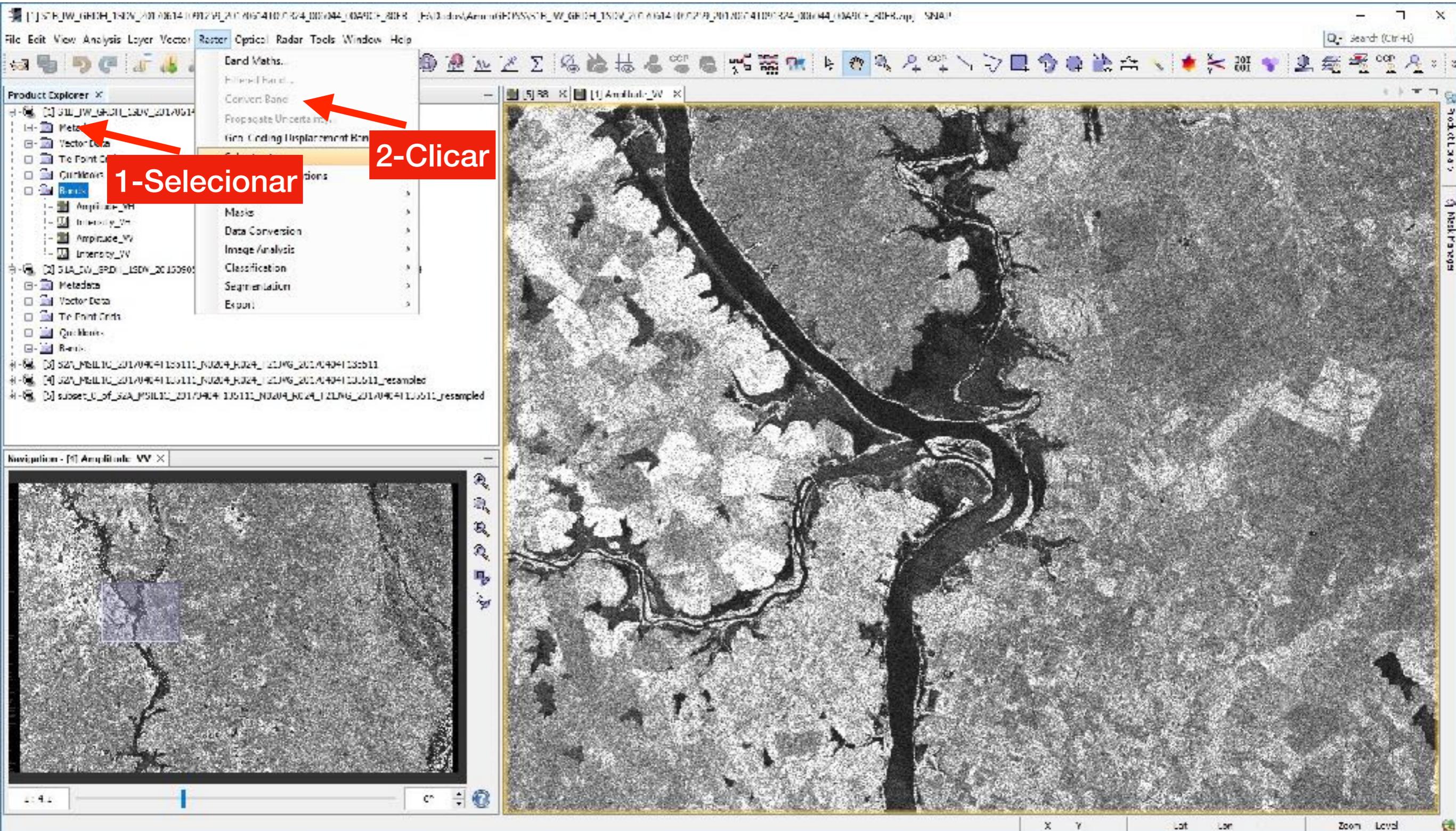
OK Cancel Help

Recortada



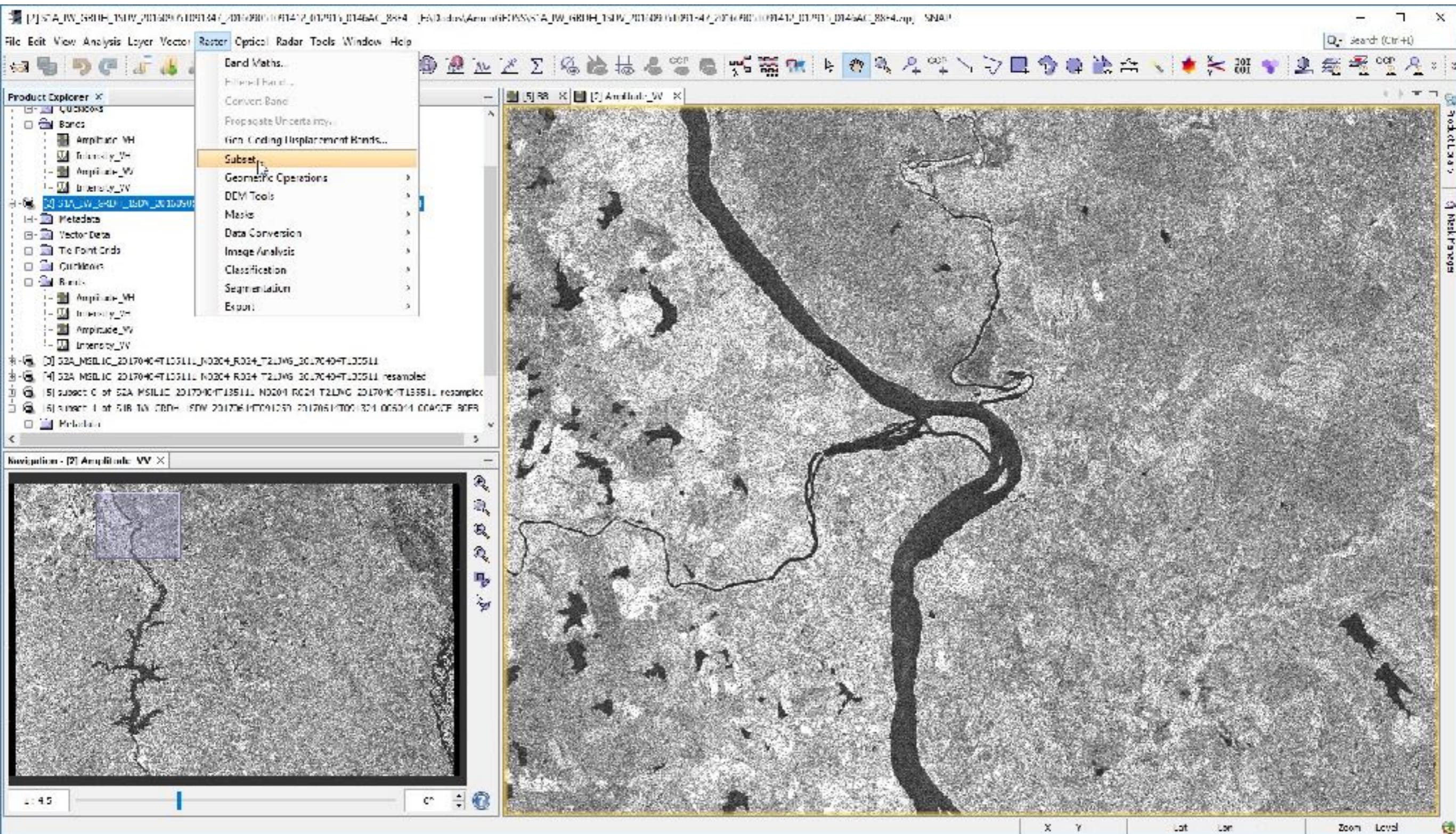
Recorta

S1A_IW_GRDH_1SDV_20160905T091347_20160905T091412_012915_0146AC_88E4

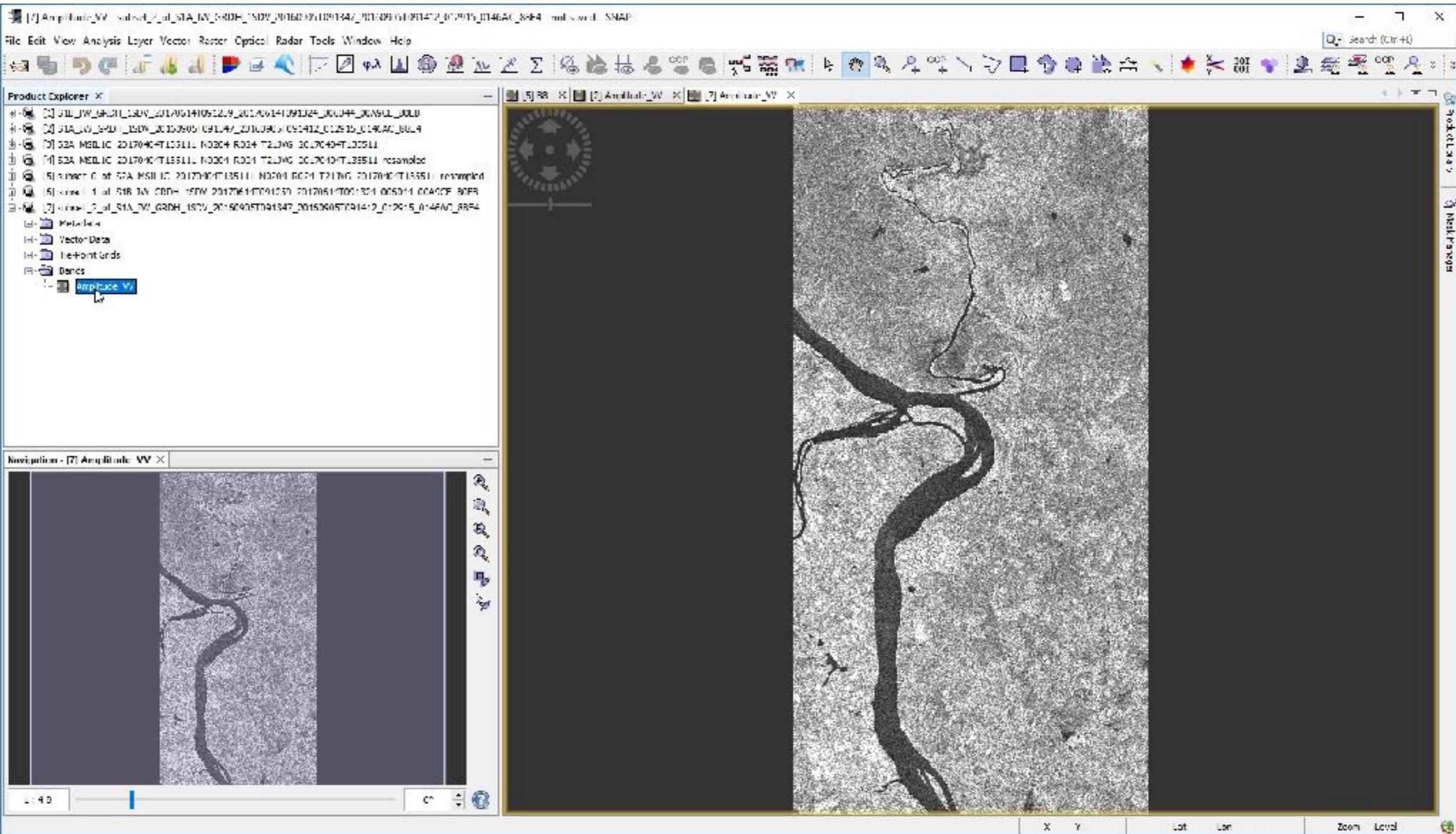


Recorta Pré Evento

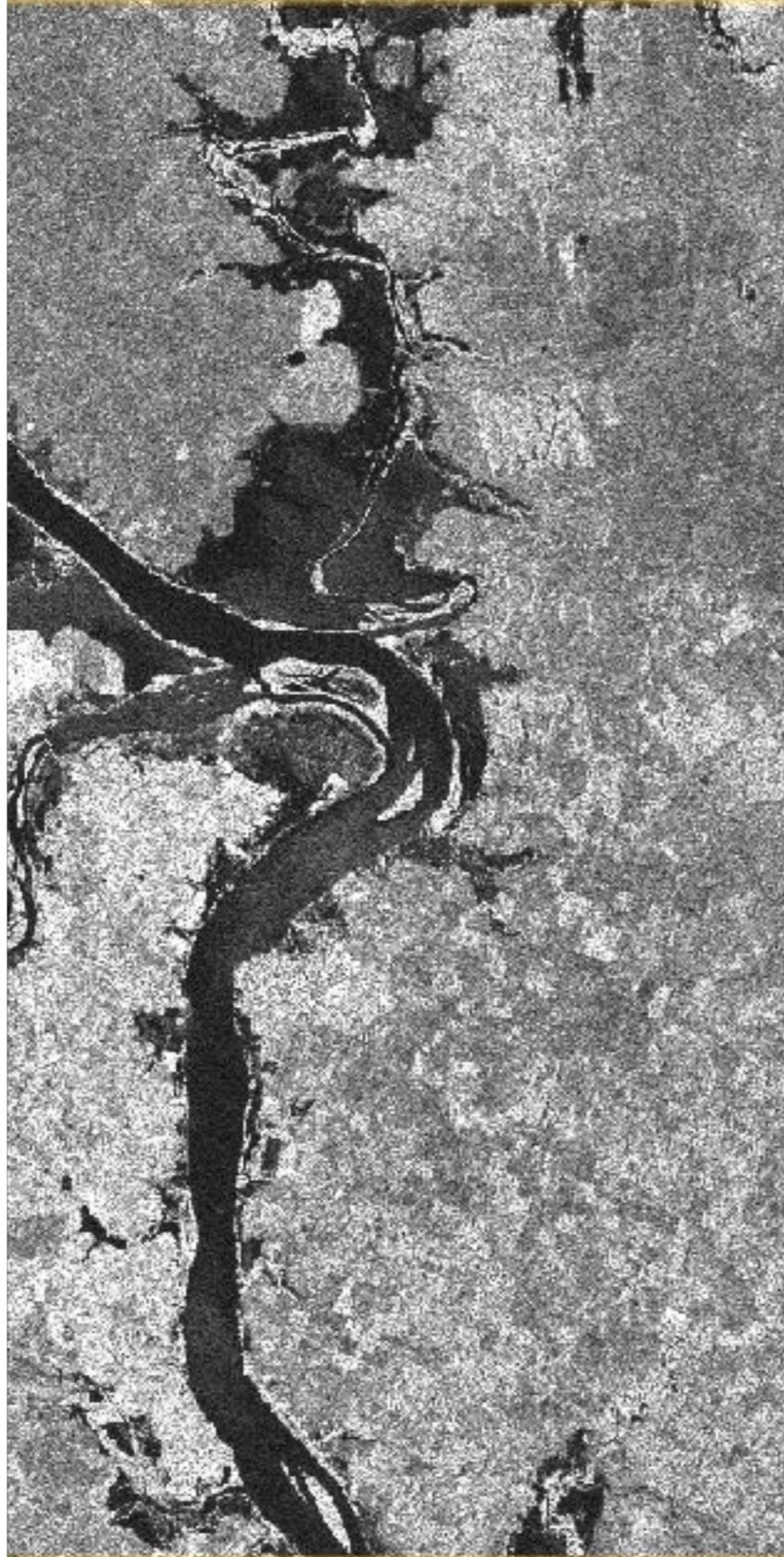
S1A_IW_GRDH_1SDV_20160905T



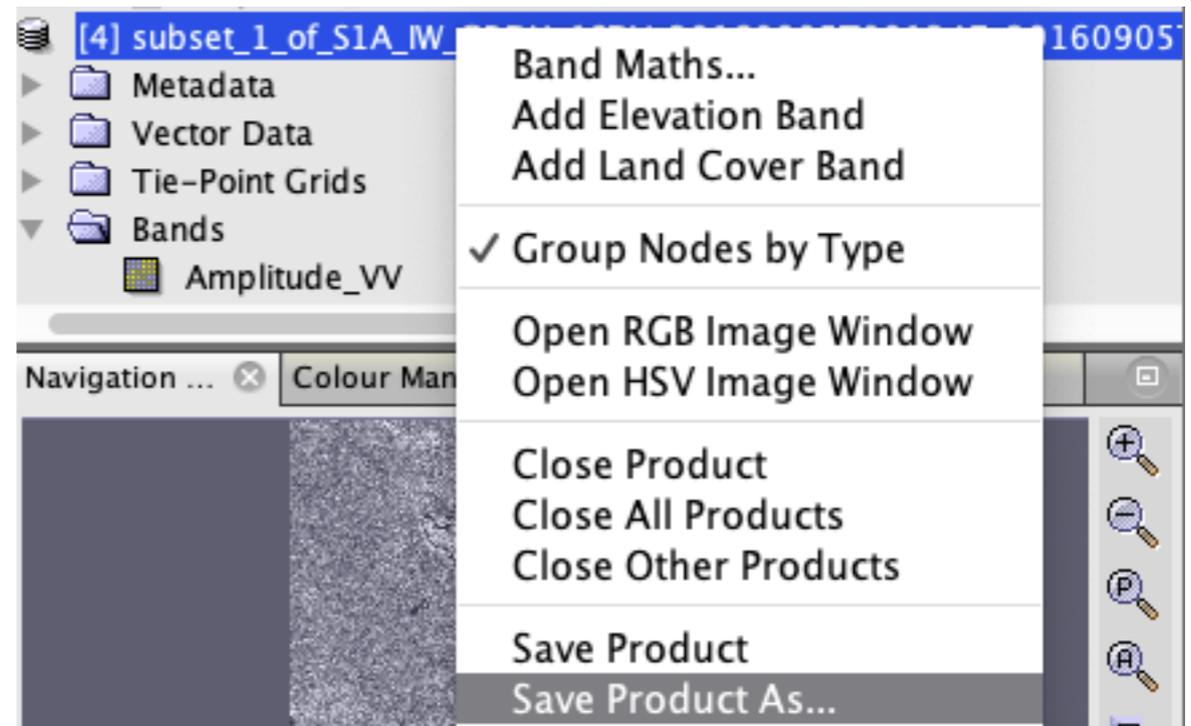
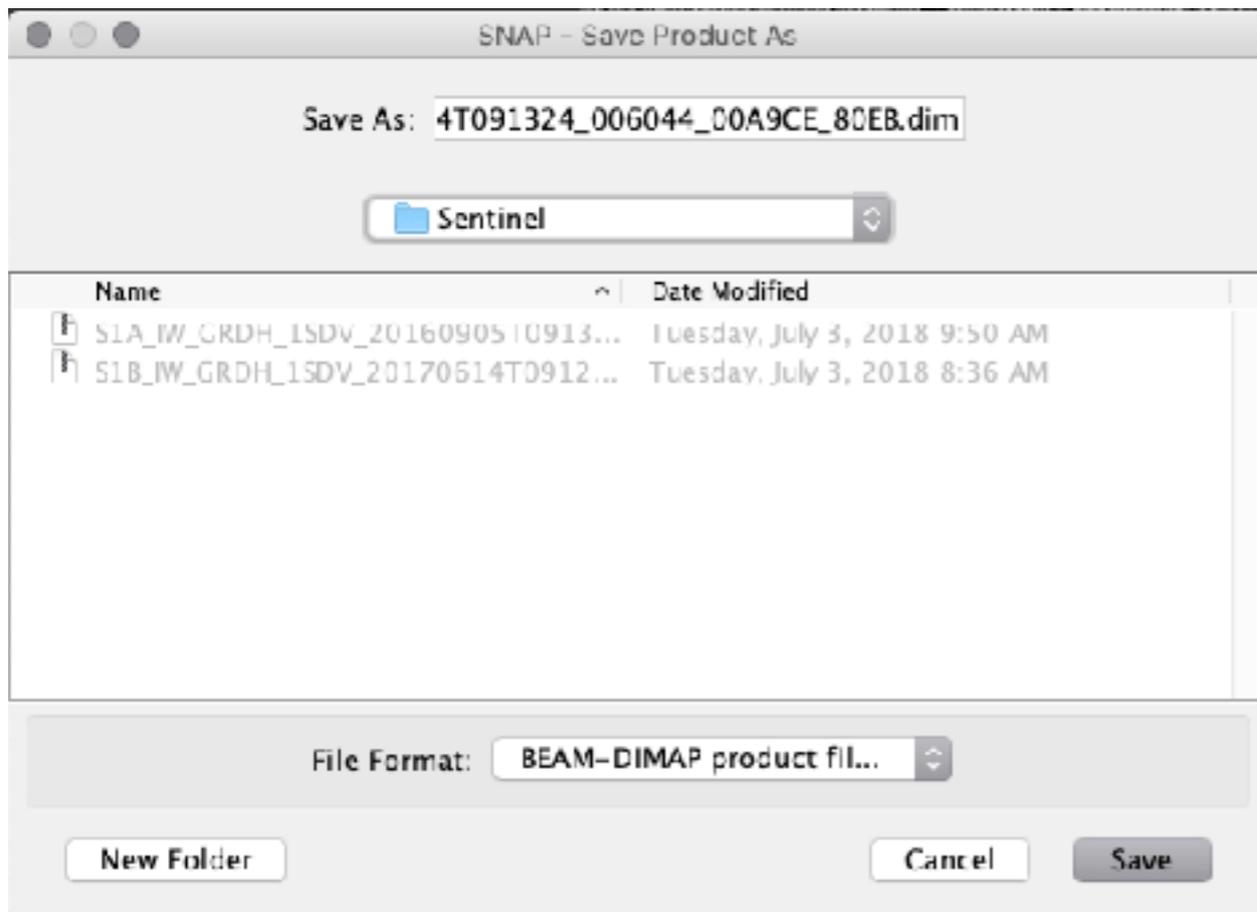
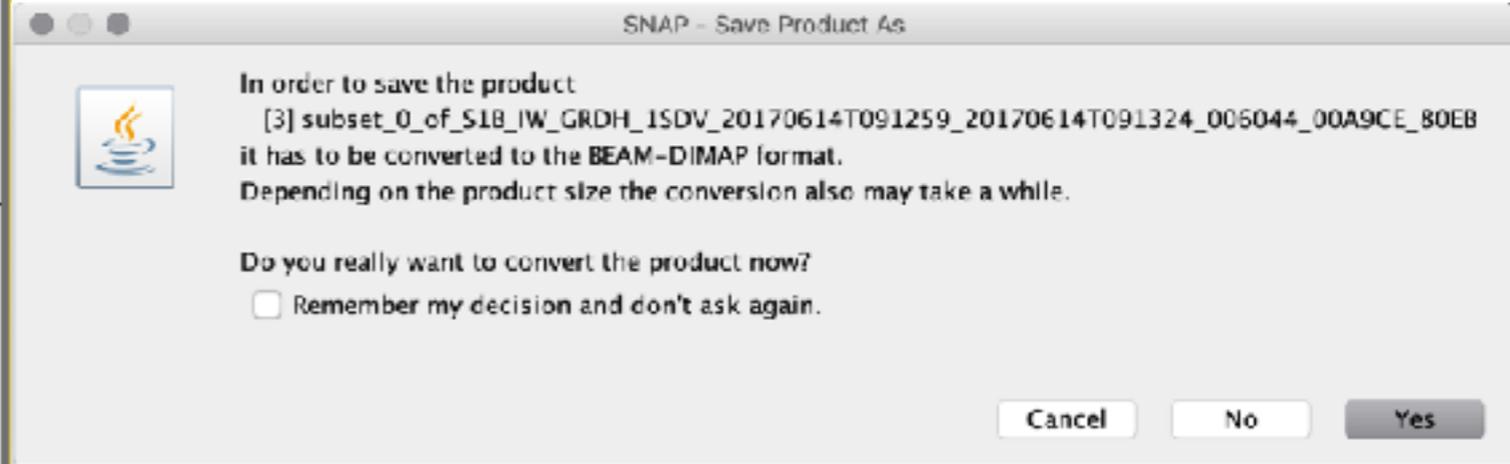
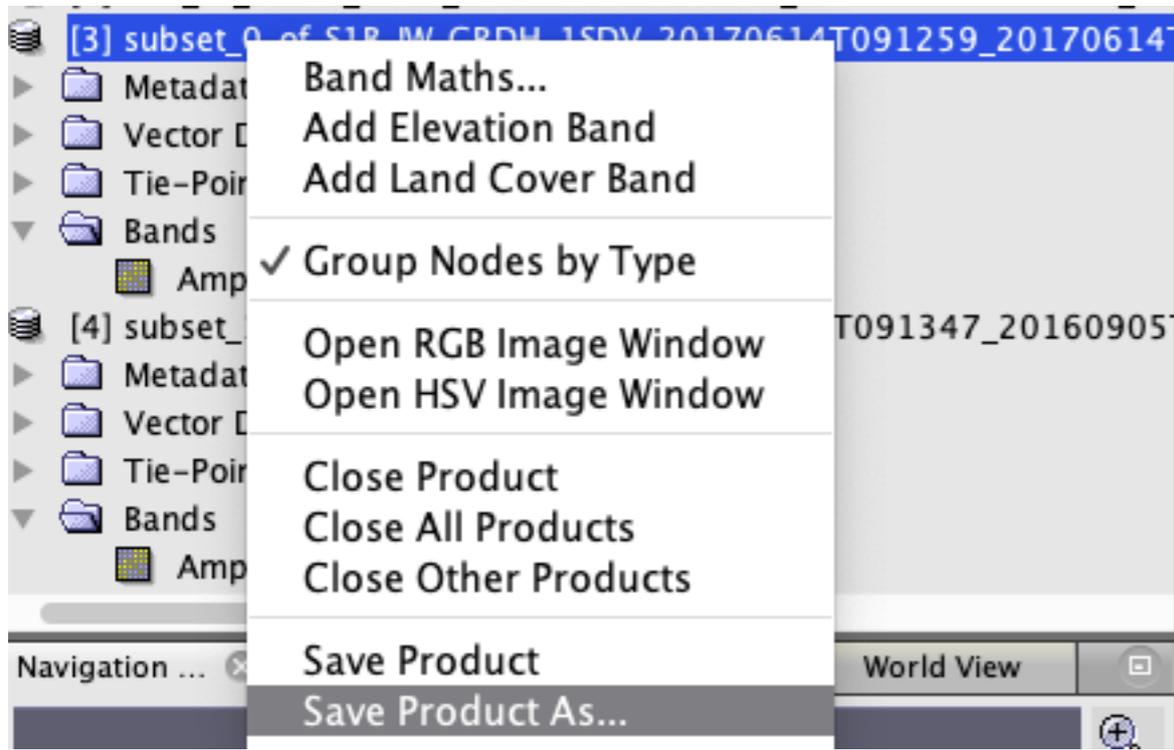
Recortada Pré Evento



Recortadas Evento e Pré Evento



Salvando Recortes



▼	subset_0_of_S1B_IW_GRDH_1SDV_201706...14T091324_006044_00A9CE_80EB.data	Today 15:22	--	Folder
	Amplitude_VV.hdr	Today 15:22	250 bytes	Radiance
	Amplitude_VV.img	Today 15:22	30,5 MB	NDIF Disk Image
▶	tie_point_grids	Today 15:22	--	Folder
▶	vector_data	Today 15:22	--	Folder
	subset_0_of_S1B_IW_GRDH_1SDV_201706...614T091324_006044_00A9CE_80EB.dim	Today 15:22	7,6 MB	SNAP s...IMAP)
▼	subset_1_of_S1A_IW_GRDH_1SDV_201609...905T091412_012915_0146AC_88E4.data	Today 15:22	--	Folder
	Amplitude_VV.hdr	Today 15:22	250 bytes	Radiance
	Amplitude_VV.img	Today 15:22	30,5 MB	NDIF Disk Image
▶	tie_point_grids	Today 15:22	--	Folder
▶	vector_data	Today 15:22	--	Folder
	subset_1_of_S1A_IW_GRDH_1SDV_201609...0905T091412_012915_0146AC_88E4.dim	Today 15:22	7,5 MB	SNAP s...IMAP)

	S1A_IW_GRDH_1SDV_20160905T091347...60905T091412_012915_0146AC_88E4.zip	3 July 2018 09:50	1,03 GB	ZIP archive
	S1B_IW_GRDH_1SDV_20170614T091259...0614T091324_006044_00A9CE_80EB.zip	3 July 2018 08:36	1,01 GB	ZIP archive
▶	subset_0_of_S1B_IW_GRDH_1SDV_201706...14T091324_006044_00A9CE_80EB.data	Today 15:22	--	Folder
	subset_0_of_S1B_IW_GRDH_1SDV_201706...614T091324_006044_00A9CE_80EB.dim	Today 15:22	7,6 MB	SNAP s...IMAP)
▶	subset_1_of_S1A_IW_GRDH_1SDV_201609...905T091412_012915_0146AC_88E4.data	Today 15:22	--	Folder
	subset_1_of_S1A_IW_GRDH_1SDV_201609...0905T091412_012915_0146AC_88E4.dim	Today 15:22	7,5 MB	SNAP s...IMAP)
	SubSets_Sentinel1.zip	Today 15:23	26,4 MB	ZIP archive

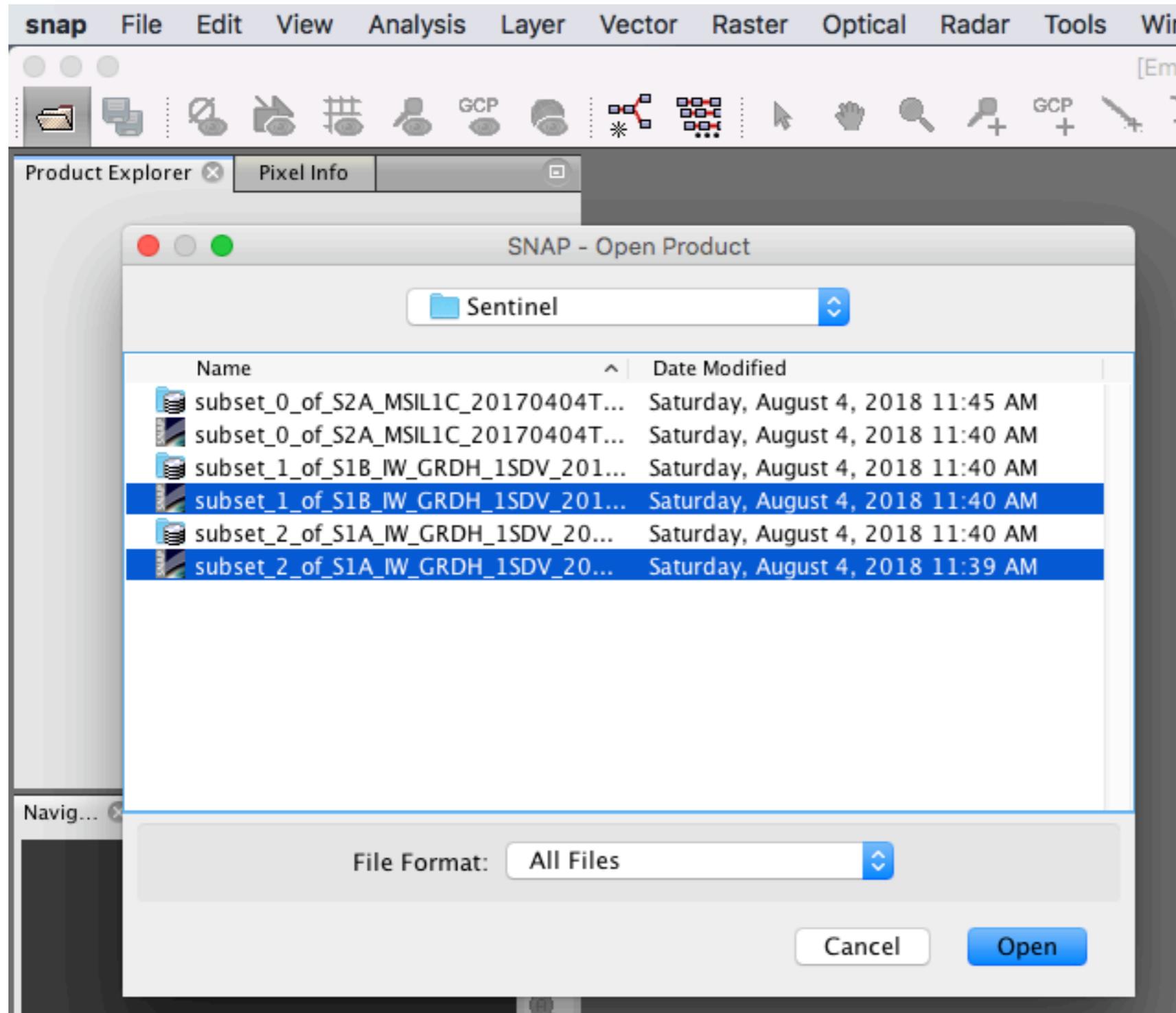
Mapeando Áreas Inundadas



S1A_IW_GRDH_1SDV_20160905T091347_20160905T091412_012915_0146AC_88E4 (Pre Evento)

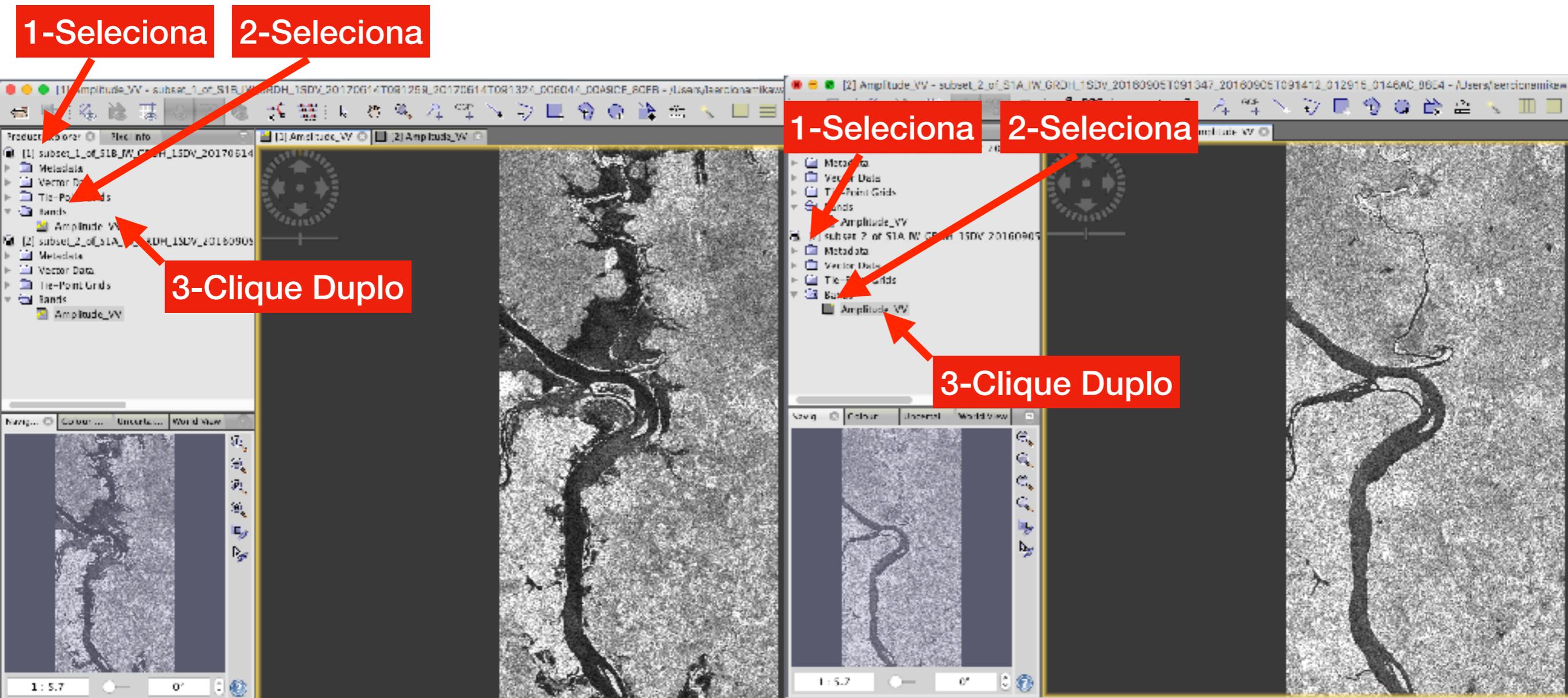
S1B_IW_GRDH_1SDV_20170614T091259_20170614T091324_006044_00A9CE_80EB (Evento)

Abrir as 2 imagens no SNAP

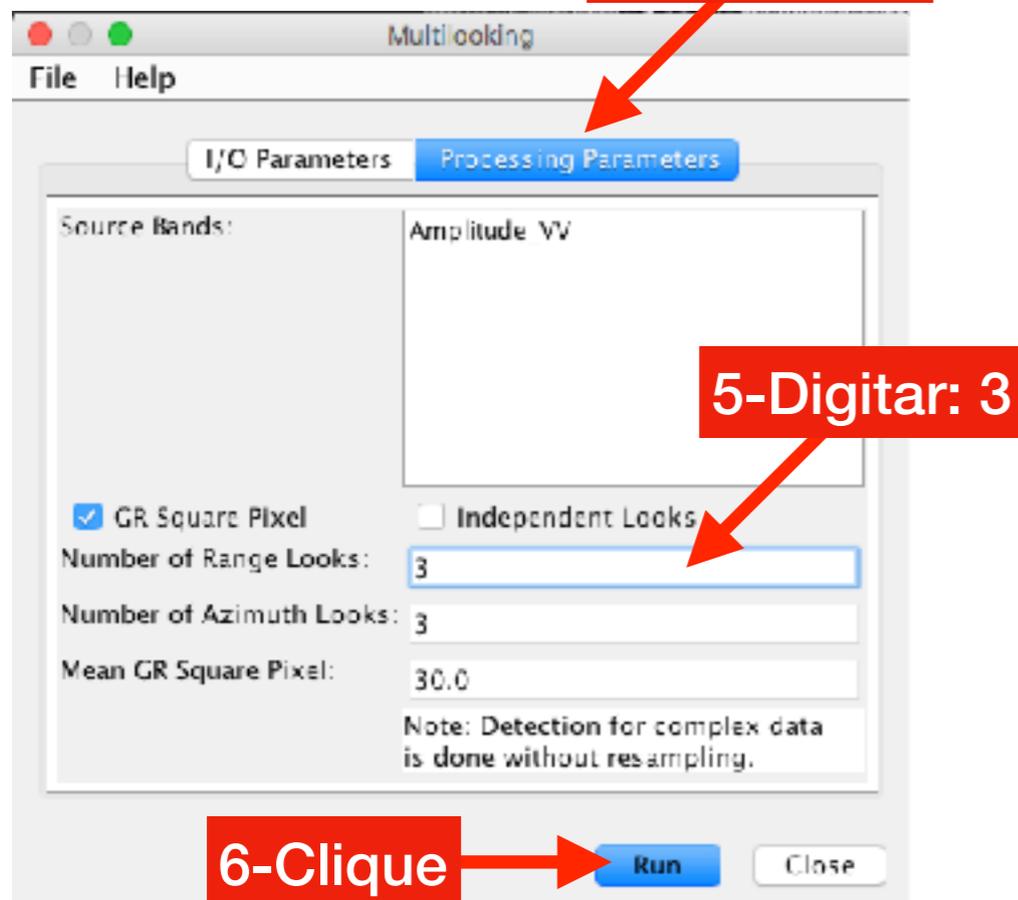
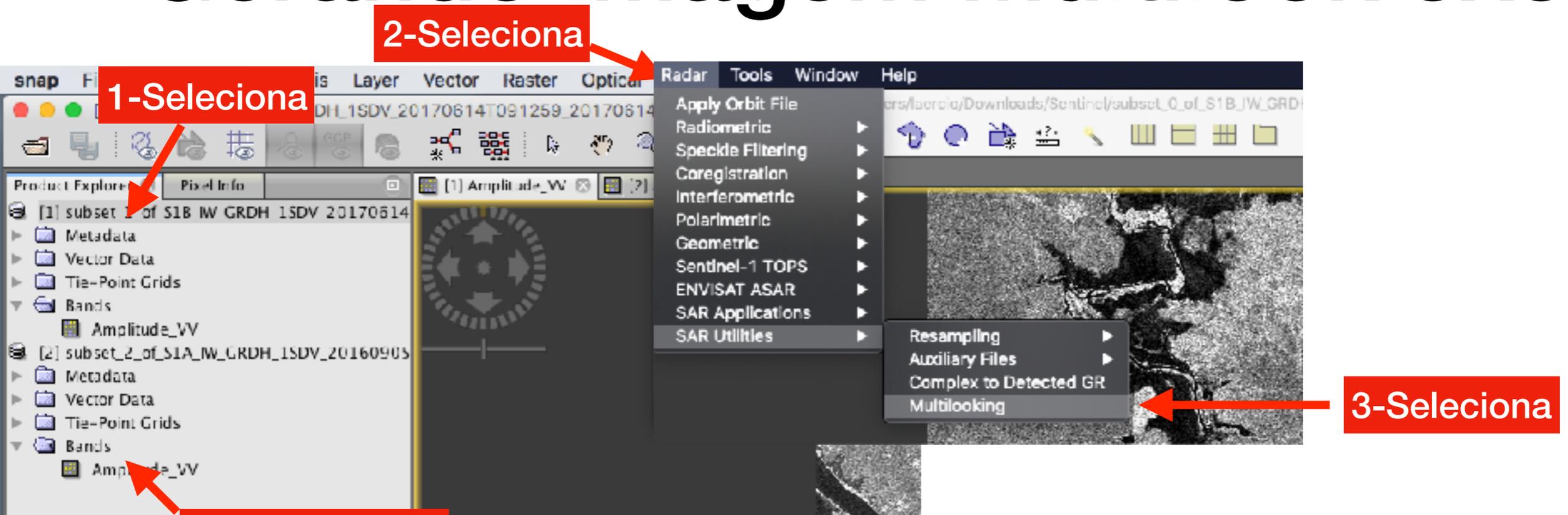


Ou Marca e Arrasta

Visualiza as Imagens



Gerando Imagem Multilook 3x3



Reduz o ruído através de uma composição de visadas múltiplas (simuladas neste caso, onde existe somente uma visada)

Repetir para o outro recorte

Multilook

Antes

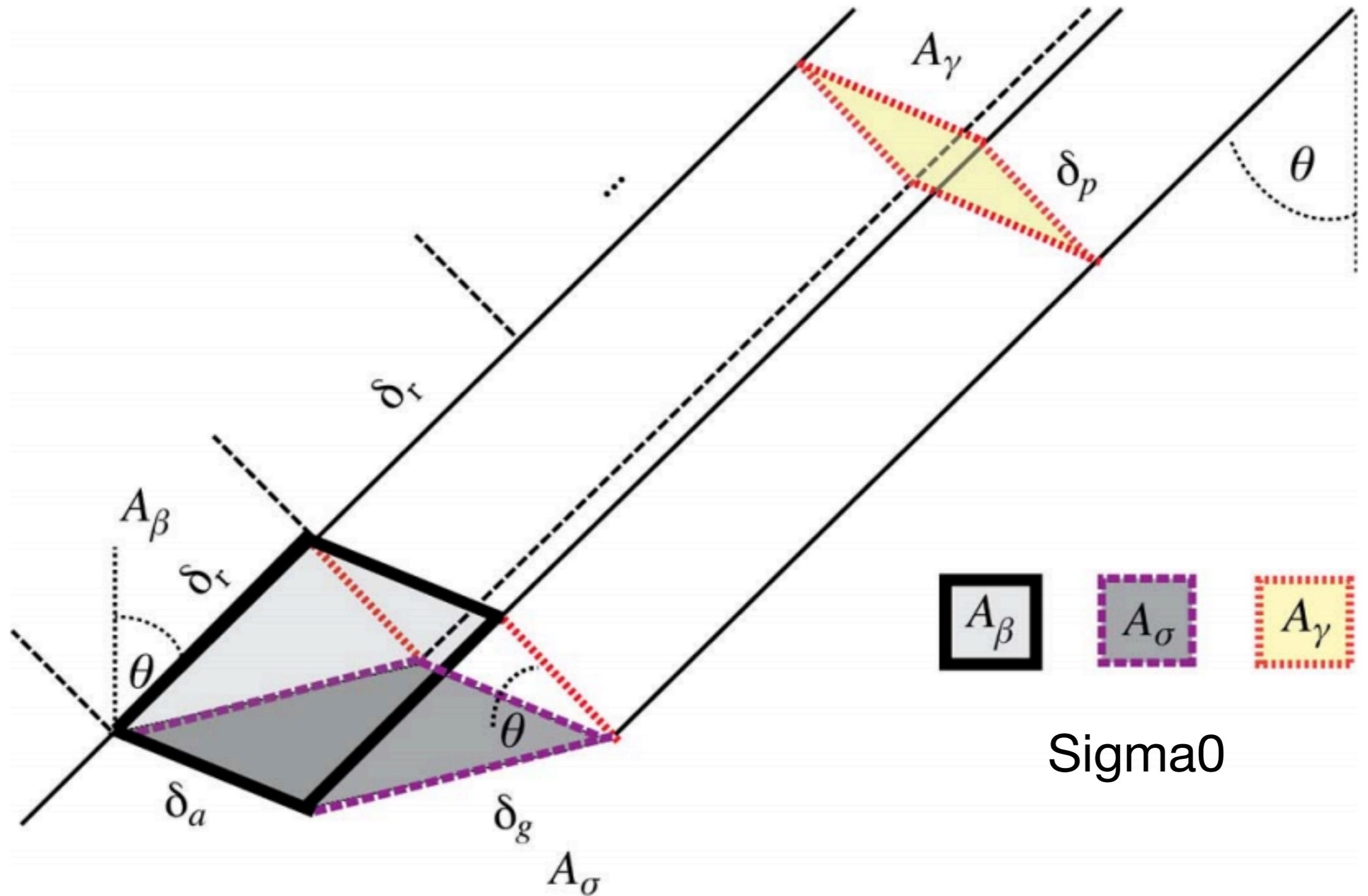
Depois



Espalhamento

- Retorno ao Radar (Retroespalhamento - Backscattering)
- Medidas Normalizadas:
 - Razão entre Potência Retroespalhada (P_s) e Potência Incidente (P_i)
 - Coeficiente de Retroespalhamento: razão por área de referência
 - No ângulo de visada: β_0
 - No plano tangente ao modelo elipsoidal: σ_0
 - No plano perpendicular ao ângulo de visada: γ_0

Unidades de Área (m²)



Sigma0

Calibrando Imagens Saída em Sigma0

Imagem calibrada apresenta o valor de retorno do radar (backscattering) sem influências "externas" e permite comparações quantitativas

The image displays a sequence of steps in the SNAP software interface for SAR image calibration:

- 1-Seleciona Multilook:** The 'Radar' menu is open, and 'Multilooking' is selected under the 'Radiometric' submenu. A red arrow points to the 'Amplitude_VV' band in the Product Explorer.
- 2-Seleciona:** The 'Calibration' dialog box is open, showing the 'I/O Parameters' tab. The 'Source Product' is set to the selected SAR data. A red arrow points to the 'Processing Parameters' tab.
- 3-Seleciona:** The 'Processing Parameters' tab is active, and 'VH' is selected in the 'Polarisations' list. A red arrow points to the 'VH' option.
- 4-Clique:** The 'Run' button is highlighted. A red arrow points to the 'Run' button.
- 5-Visualiza:** The main window shows the calibrated 'sigma0_VV' band. A red arrow points to the 'sigma0_VV' band in the Product Explorer.

Sem Calibração

Calibrada



Repetir para o outro recorte

Filtro Ruído Speckle

The image shows a sequence of steps in the SNAP software interface for applying a speckle filter. The main window displays a SAR image with a speckle filter applied, showing a smoother result. The 'Radar' menu is open, showing the 'Speckle Filtering' sub-menu with 'Single Product Speckle Filter' selected. The 'Processing Parameters' dialog box is open, showing the 'Gamma Map' filter selected, with 'Filter Size X' and 'Filter Size Y' both set to 5. The 'Run' button is highlighted. A smaller window shows the 'Product Explorer' with the 'Sigma0_VV' layer selected. A zoomed-in view of the filtered image is shown in the bottom left corner.

1-Selecciona Calibrada

2-Selecciona

3-Selecciona

4-Digitar: 5

5-Clique

6-Visualiza

Filtro Speckle

Sem Filtro

Com Filtro



Repetir para o outro recorte

Correção Geométrica

Considera a Projeção devido ao Relevo

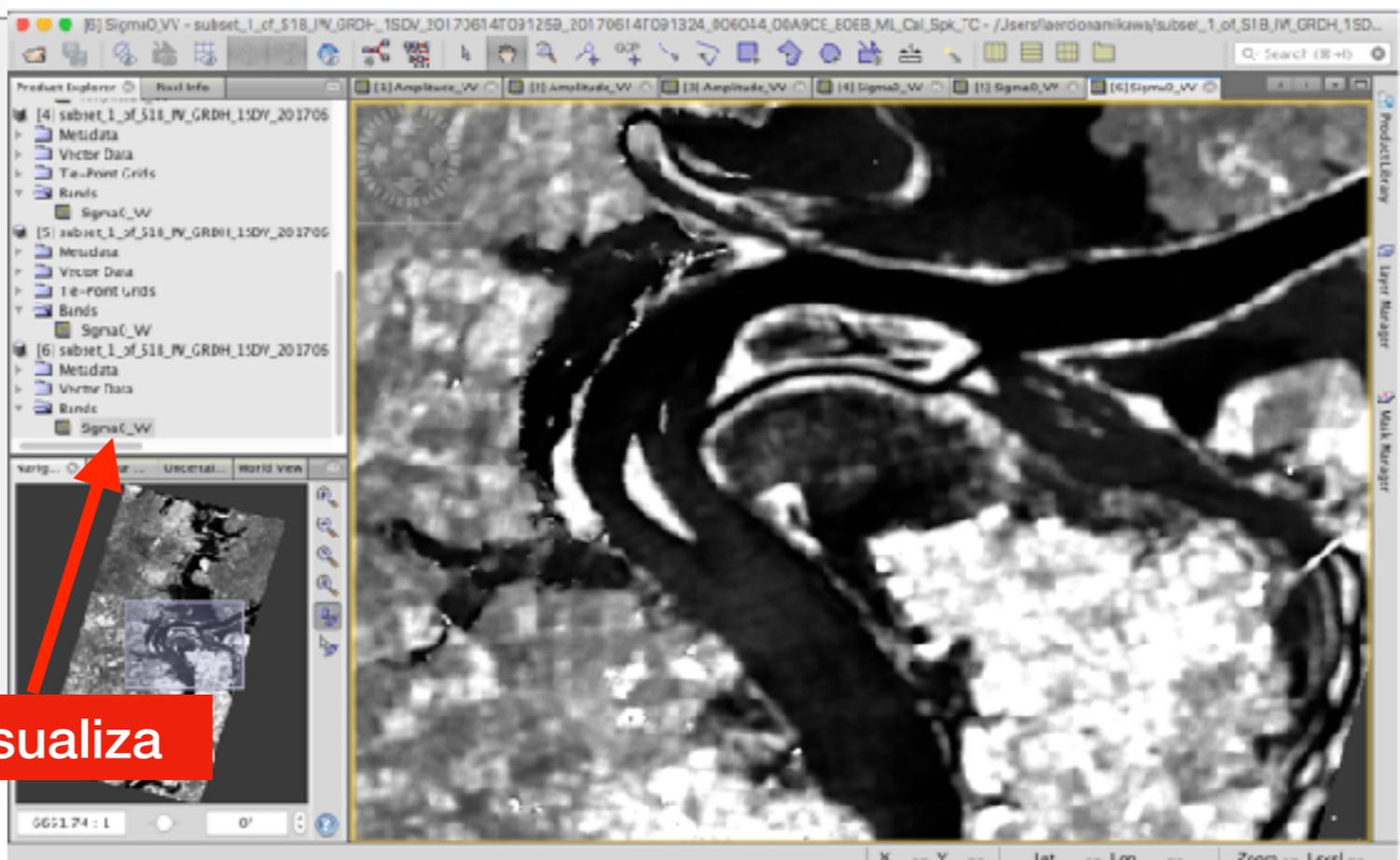
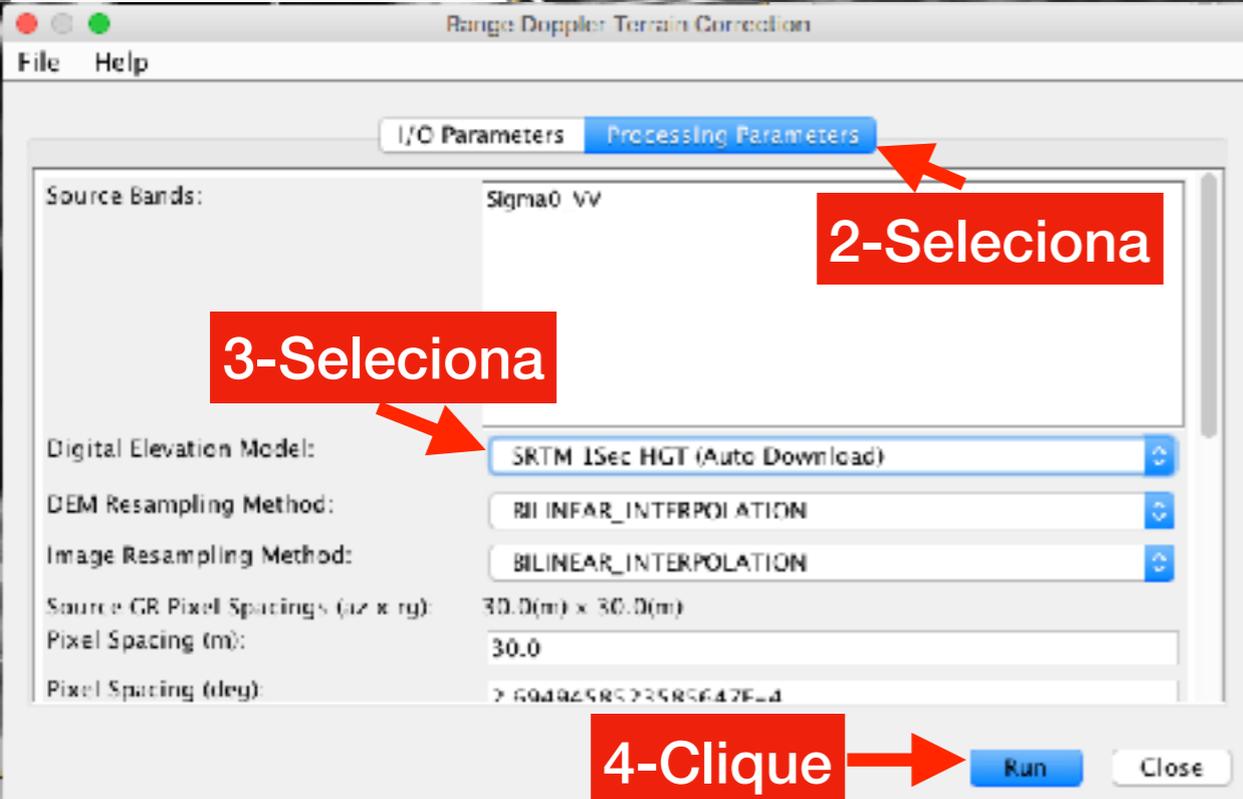
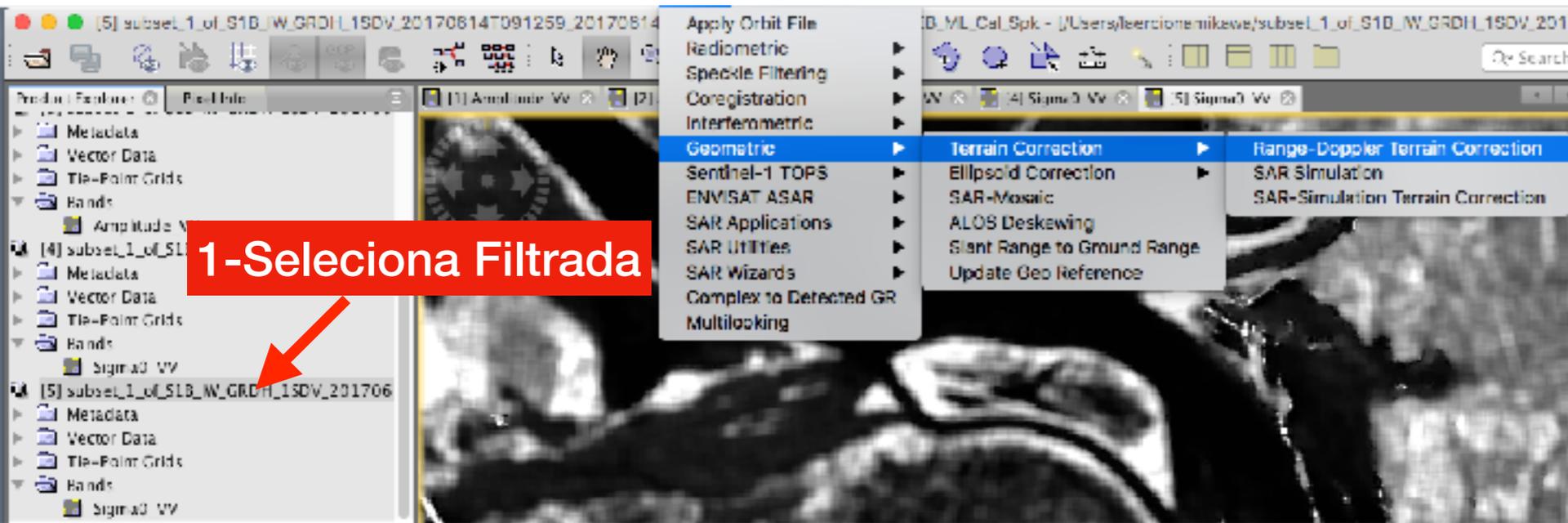


Imagem Corrigida

Antes

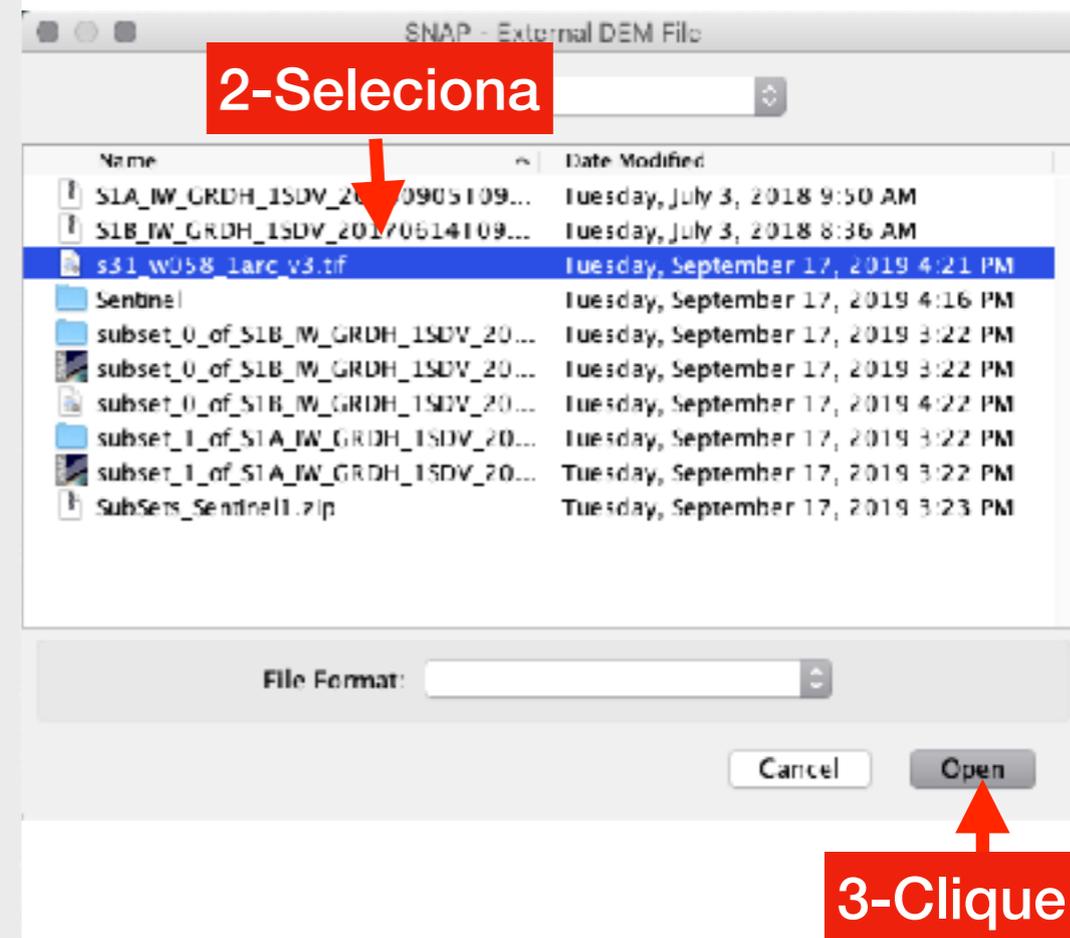
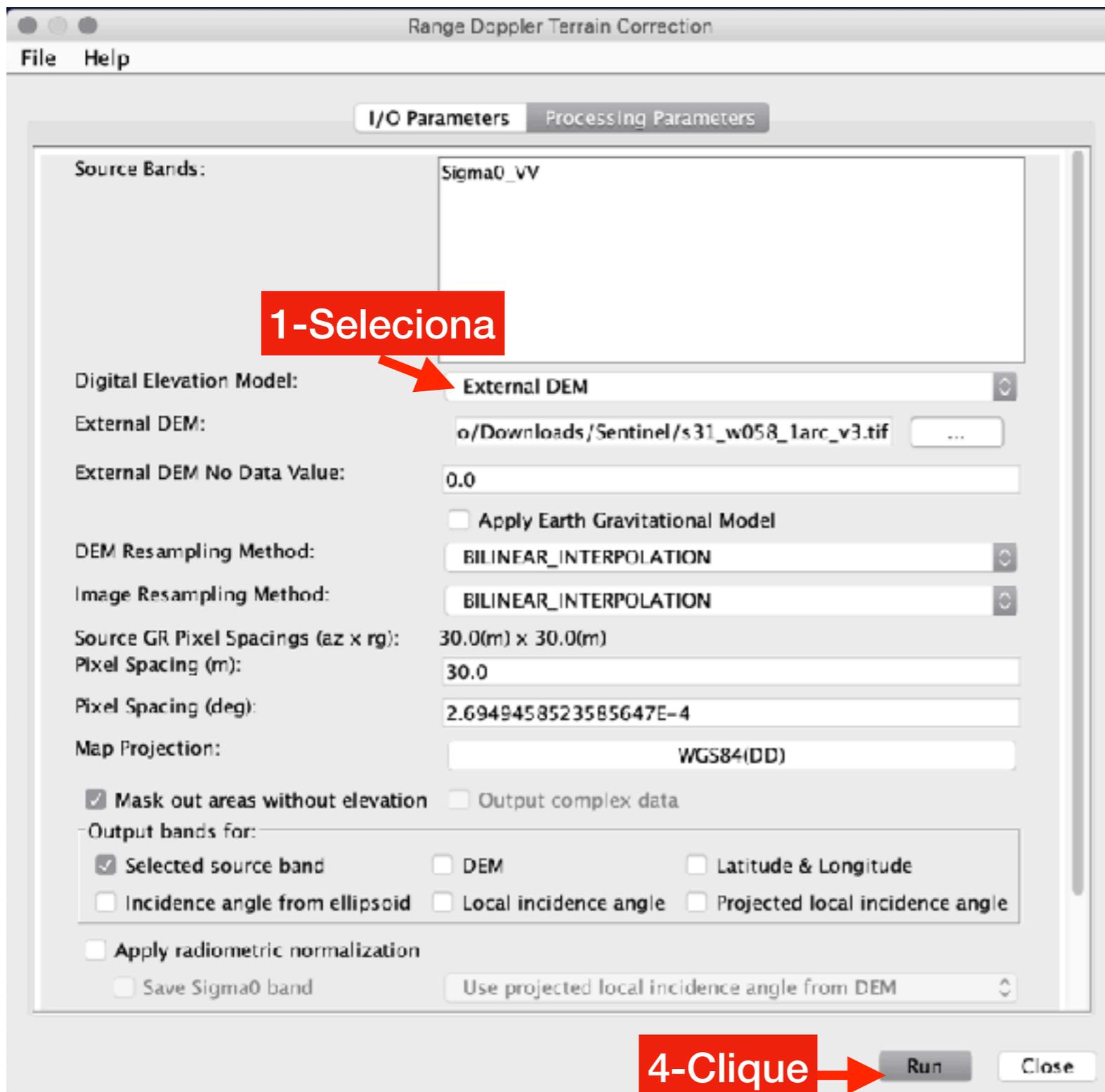


Depois



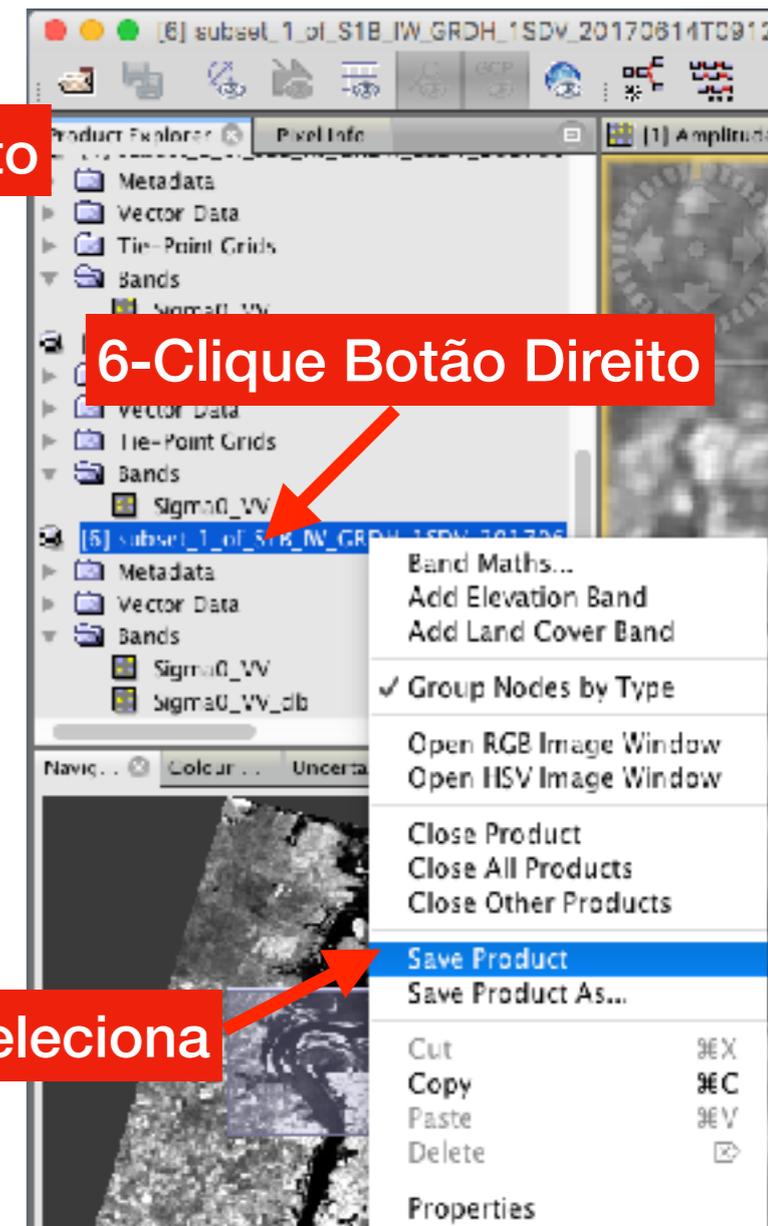
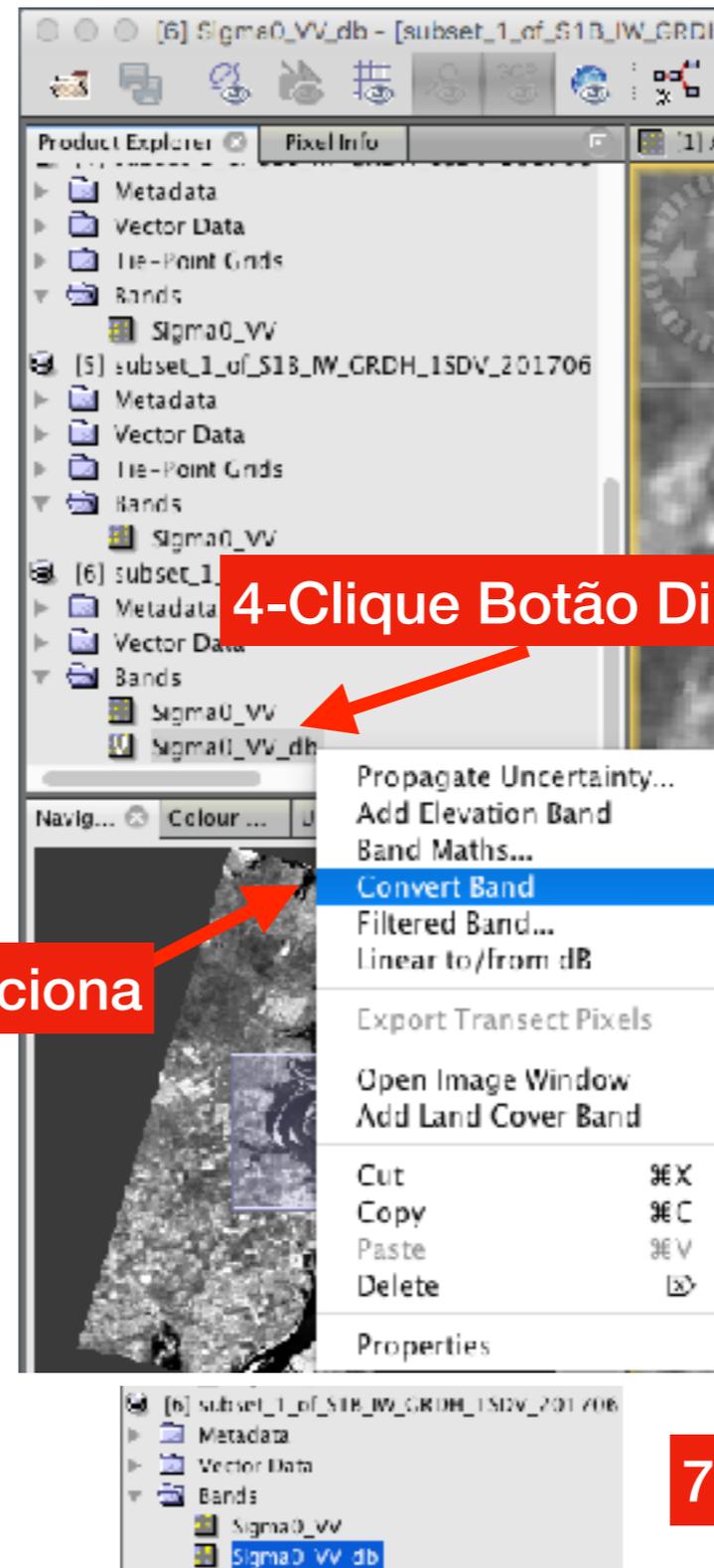
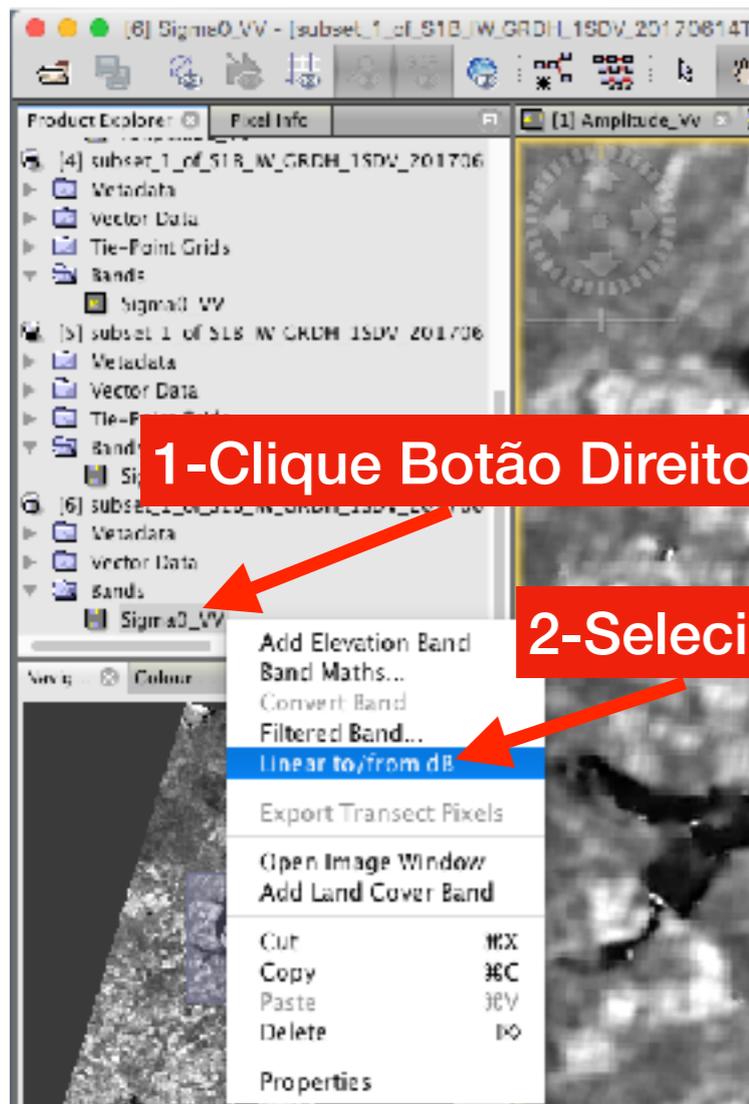
Repetir para o outro recorte

Correção geométrica Com Arquivo DEM (Offline)



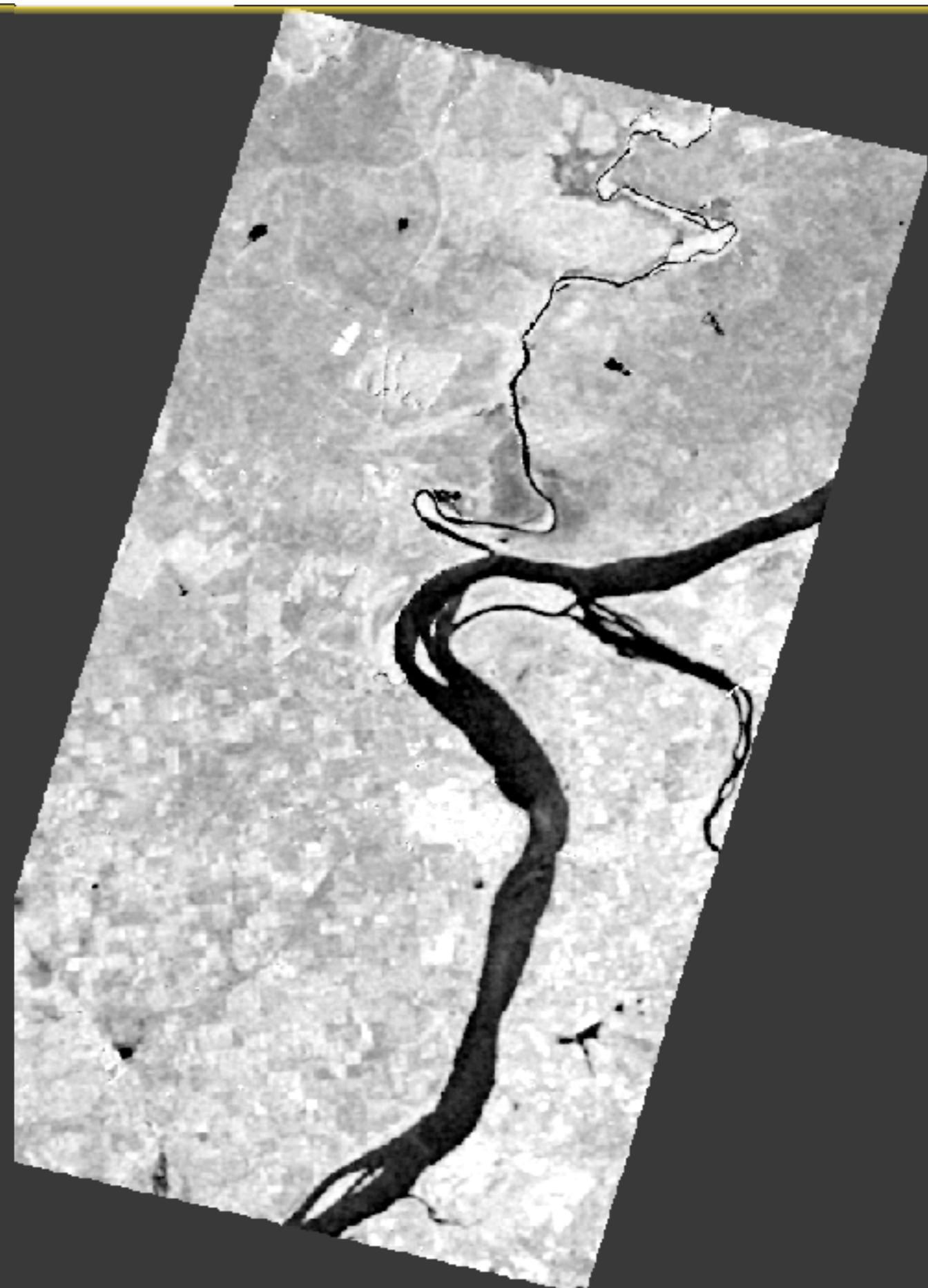
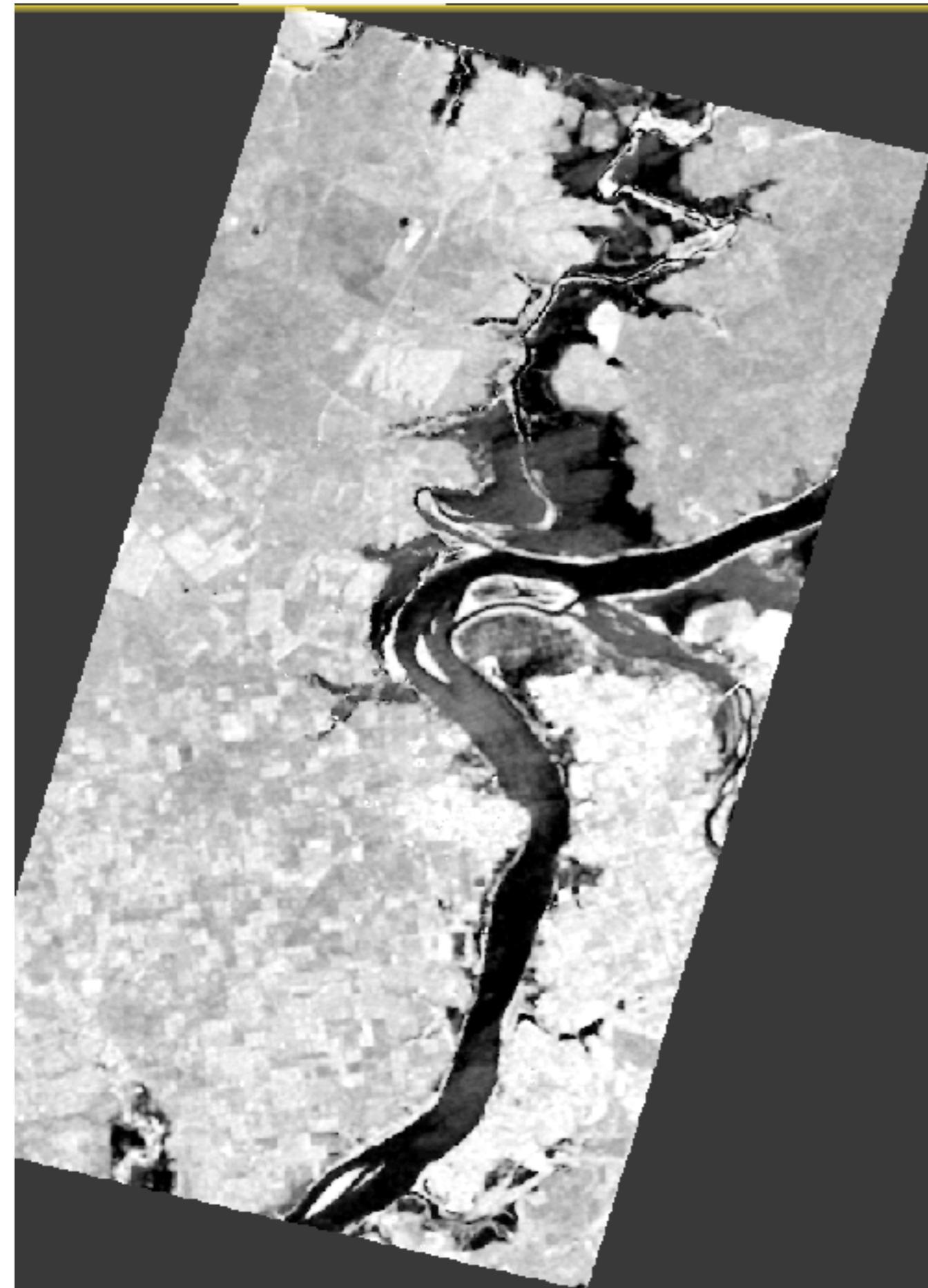
Converte para Decibel

Repetir para o outro recorte

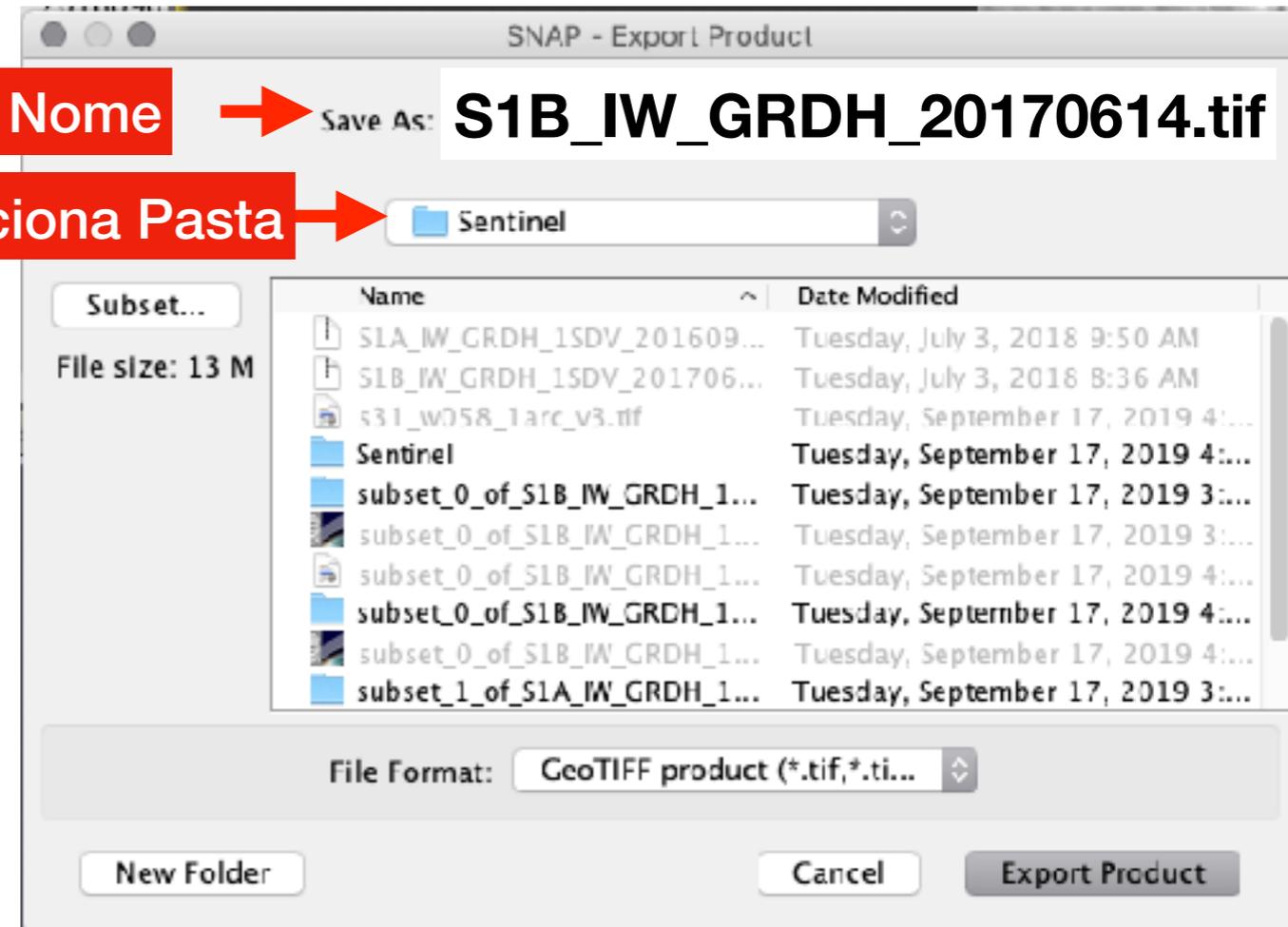
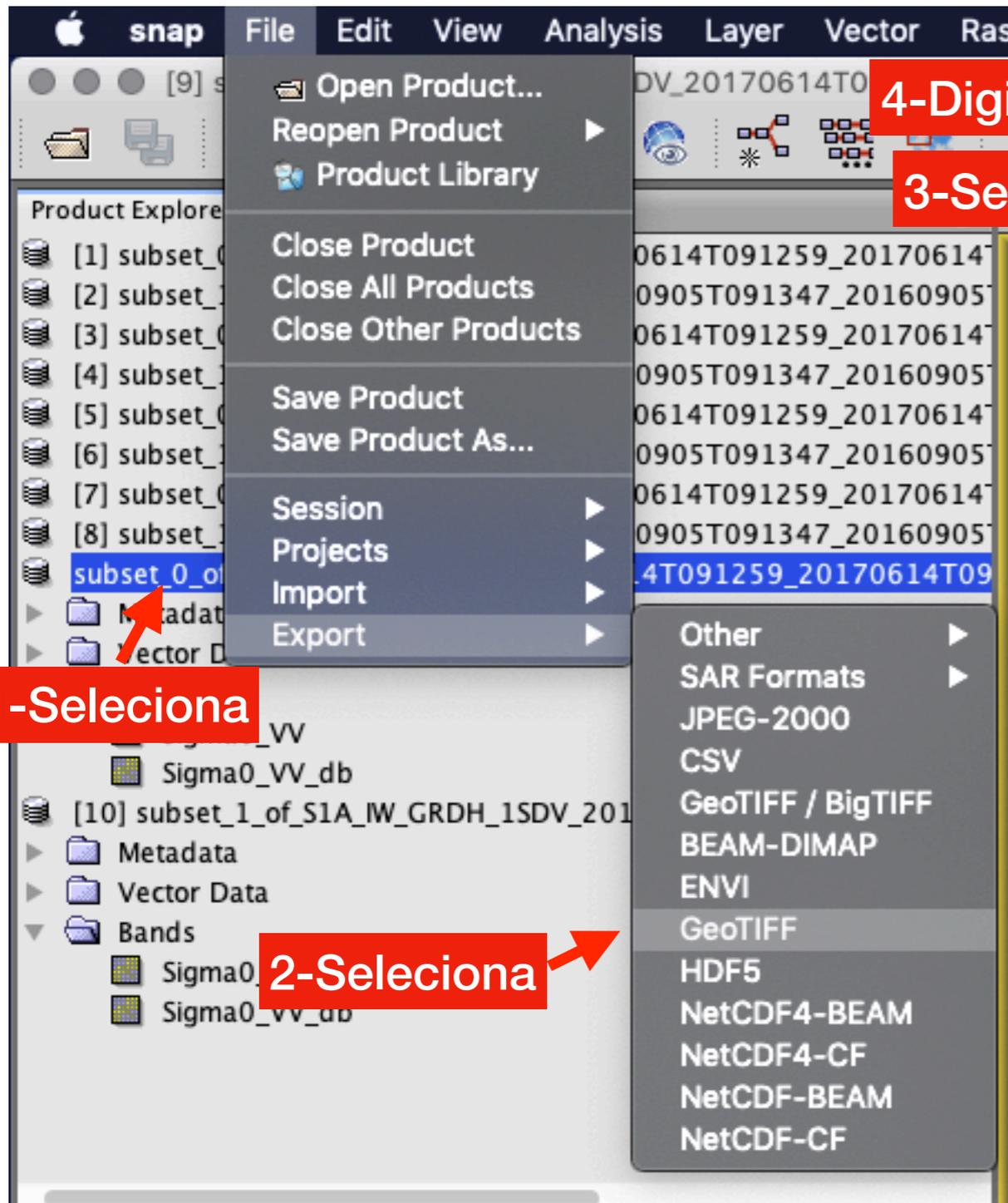


3-Seleciona

7-Seleciona



Exportação para GeoTIFF



Repetir para a Imagem Pré Evento (2016)
Nome: S1B_IW_GRDH_20170614.tif

Estimativa de Área Inundada no TerraView

Abrir Imagem

Visualizar em monocromático e colorida

Fatiamento

Vetorização

Cálculo

Exportação KML - Visualiza no Google Earth

Abrindo as Imagens GeoTIFF Exportadas

The screenshot shows the TerraView software interface. On the left, the 'Layer Explorer' panel is visible. The main workspace displays a file list with the following items:

File Name	Date	Size	Type
S18_IW_GRDH_1SDV_201706141091259_06141091324_060644_06A9CE_80EB.zip	3 July 2018 08:36	1,01 GB	ZIP archive
SubSets_Centinel1.zip	Yesterday 15:23	26,4 MB	ZIP archive
S1A_IW_GRDH_20160905.tif	Yesterday 17:06	20,3 MB	TIFF image
S1B_IW_GRDH_20170614.tif	Yesterday 17:02	20,4 MB	TIFF image
s31_w058_1arc_v3.tif	Yesterday 16:21	26 MB	TIFF image
subset_0_of_S1B_IW_GRDH_1SDV_201706141091259_06141091324_060644_06A9CE_80EB_ML_Cal_Spk_TC.tif	Yesterday 16:22	14 MB	TIFF image

Red annotations provide instructions:

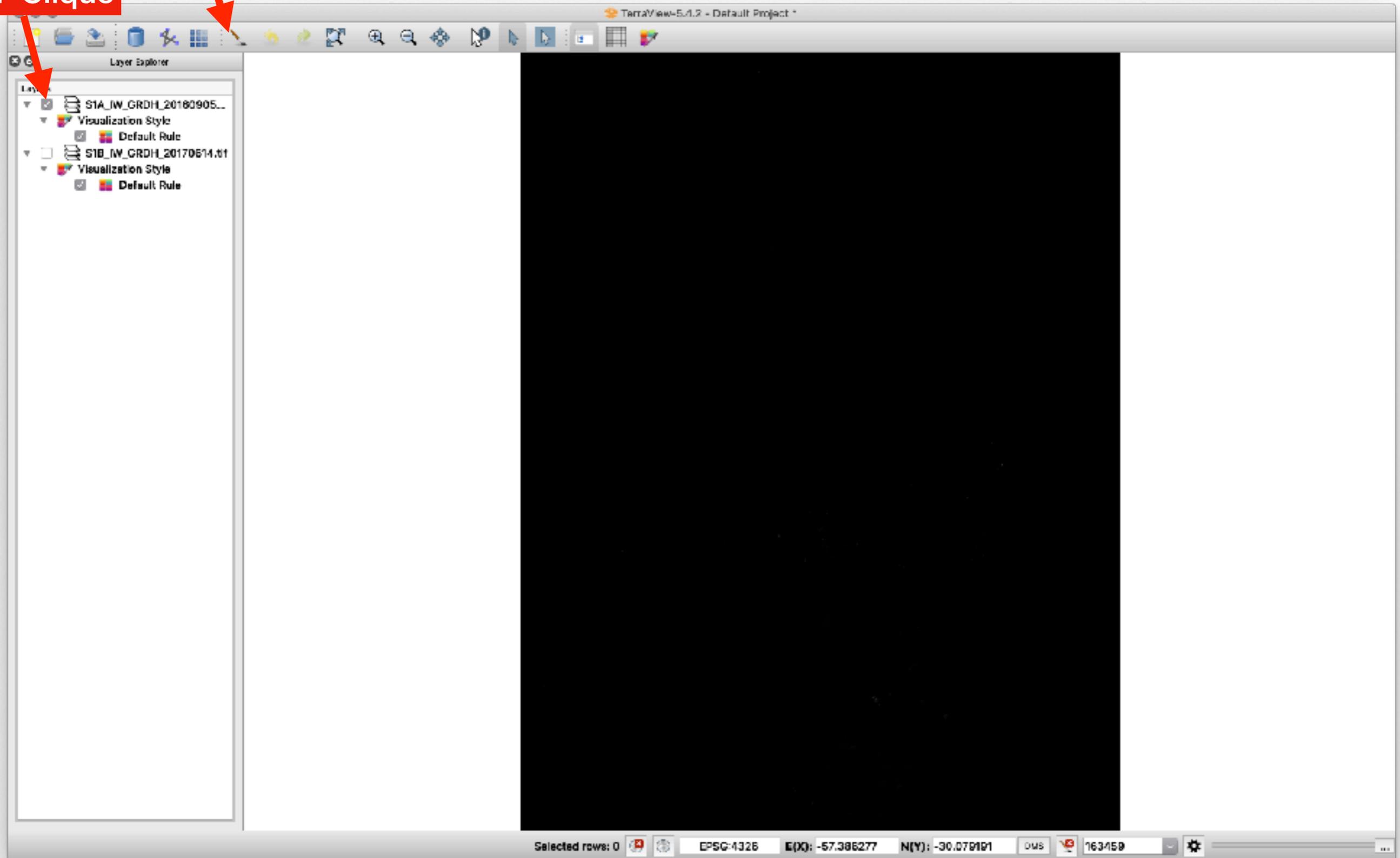
- Soltando no Explorer** (Releasing in Explorer) with a downward arrow pointing to **Sem Desenho** (No Drawing).
- Soltando na Tela** (Releasing on Screen) with a rightward arrow pointing to **Desenho Automático** (Automatic Drawing).
- 2-Arraste e Solte** (2-Drag and Drop) with an arrow pointing to the selected files in the list.
- 1-Seleciona as Imagens Pre e Evento** (1-Select the Pre and Event Images) with an arrow pointing to the selected files in the list.

The bottom status bar shows: Selected rows: 0, Unknown SRS, E(X):, N(Y):, OMS, Scale, and a settings icon.

Visualizando

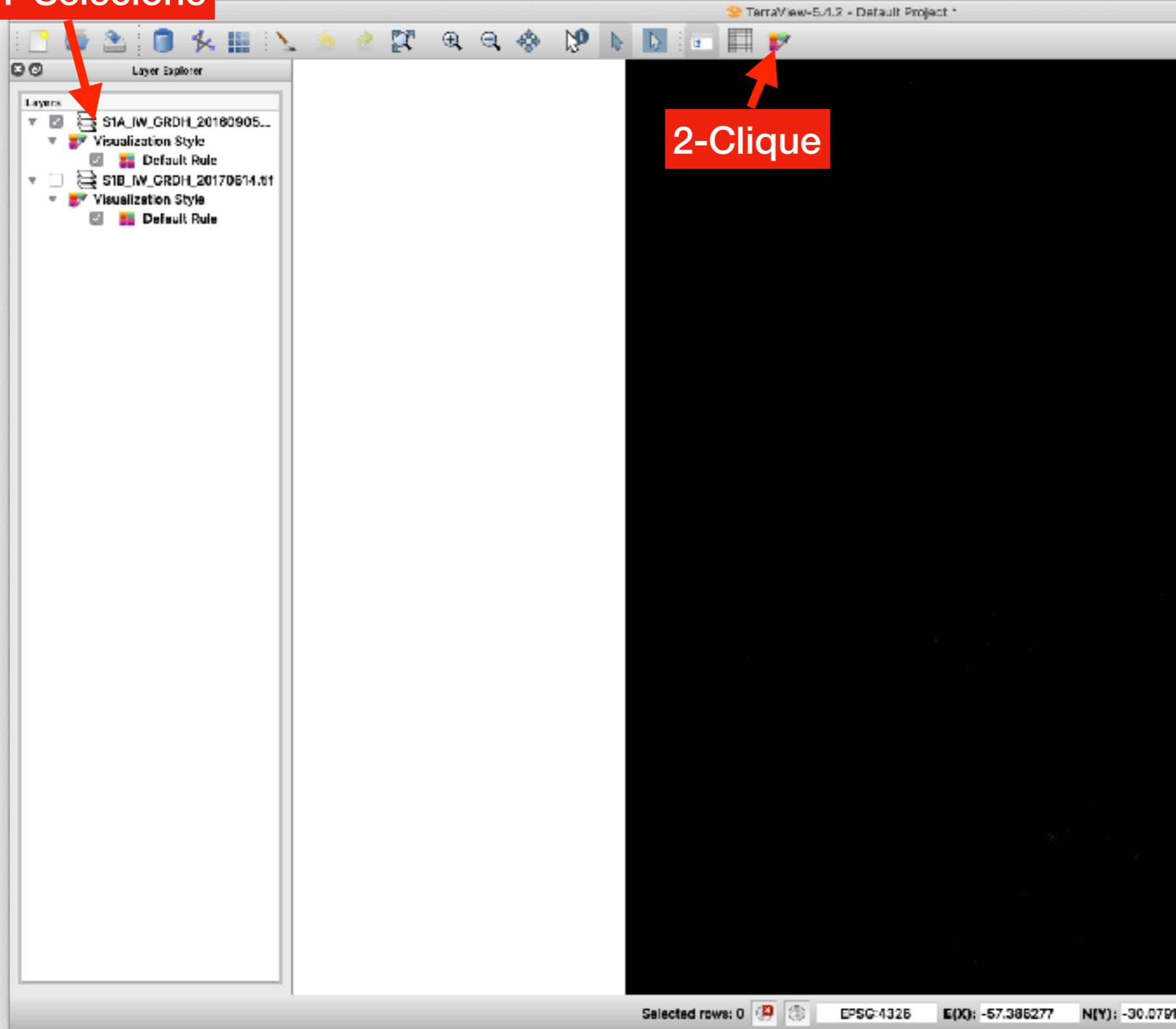
1-Clique

2-Clique

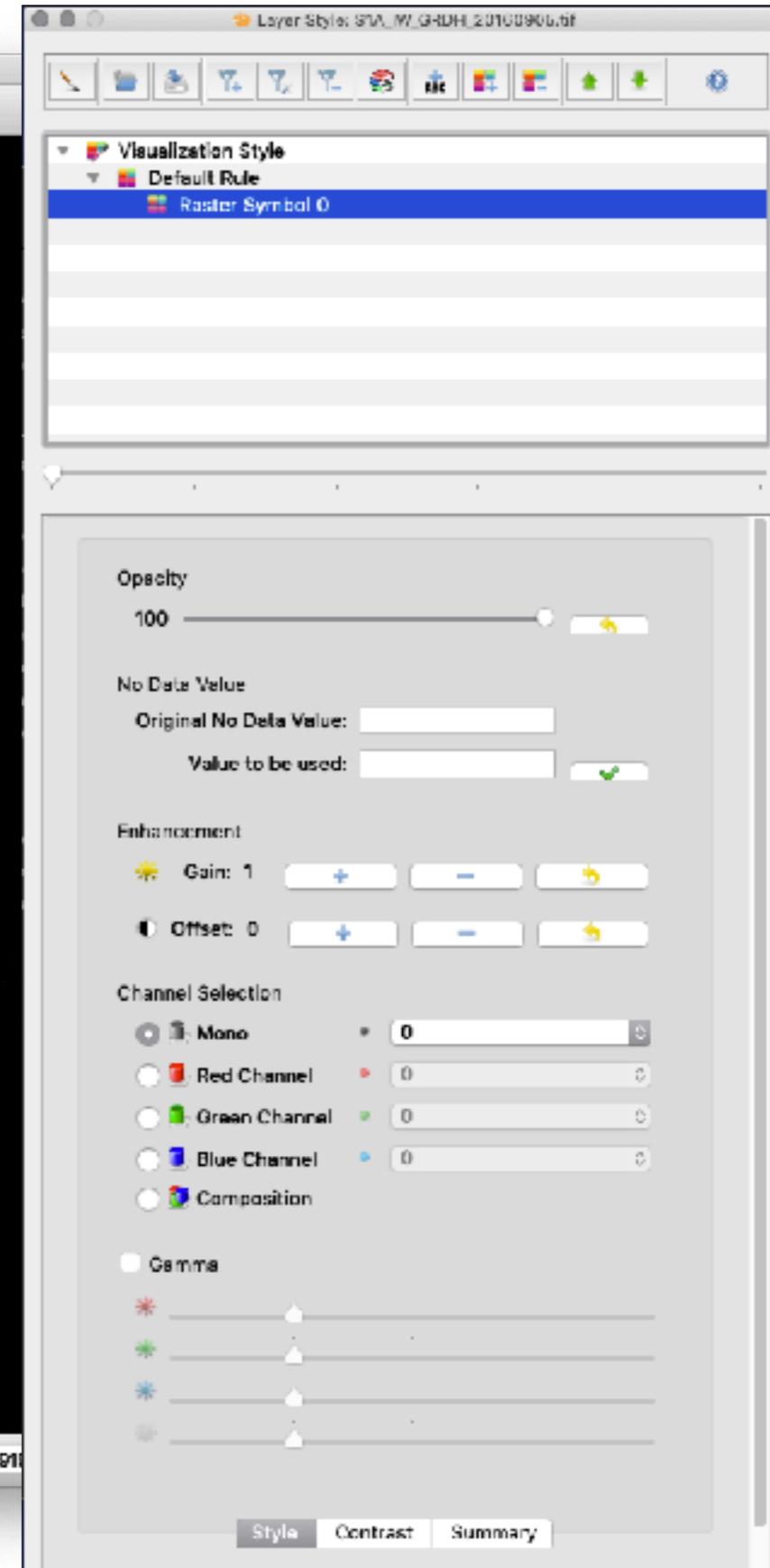


Definindo a Visualização

1-Seleção

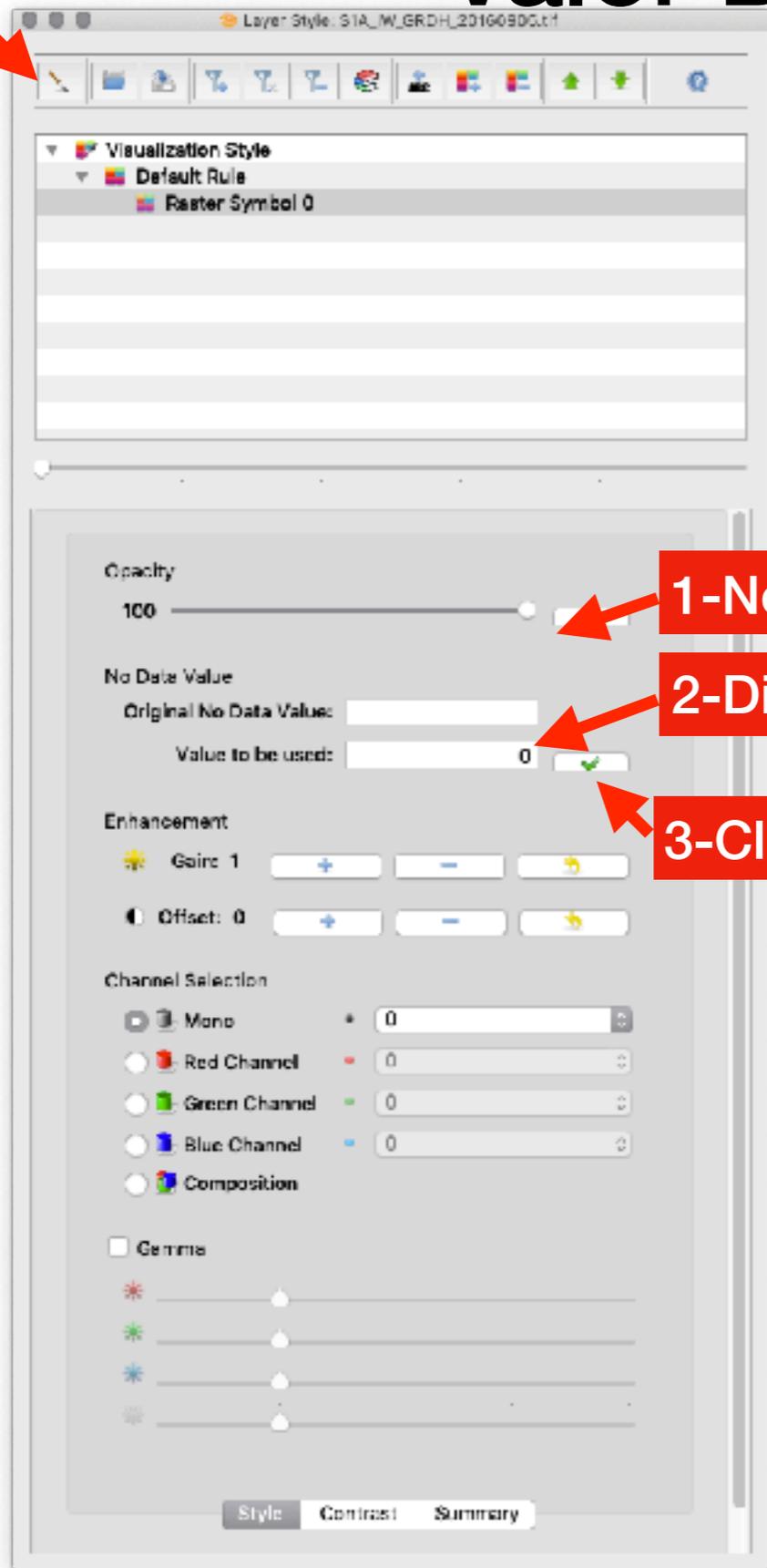


2-Clique



Definindo a Visualização Valor Dummy - No Data

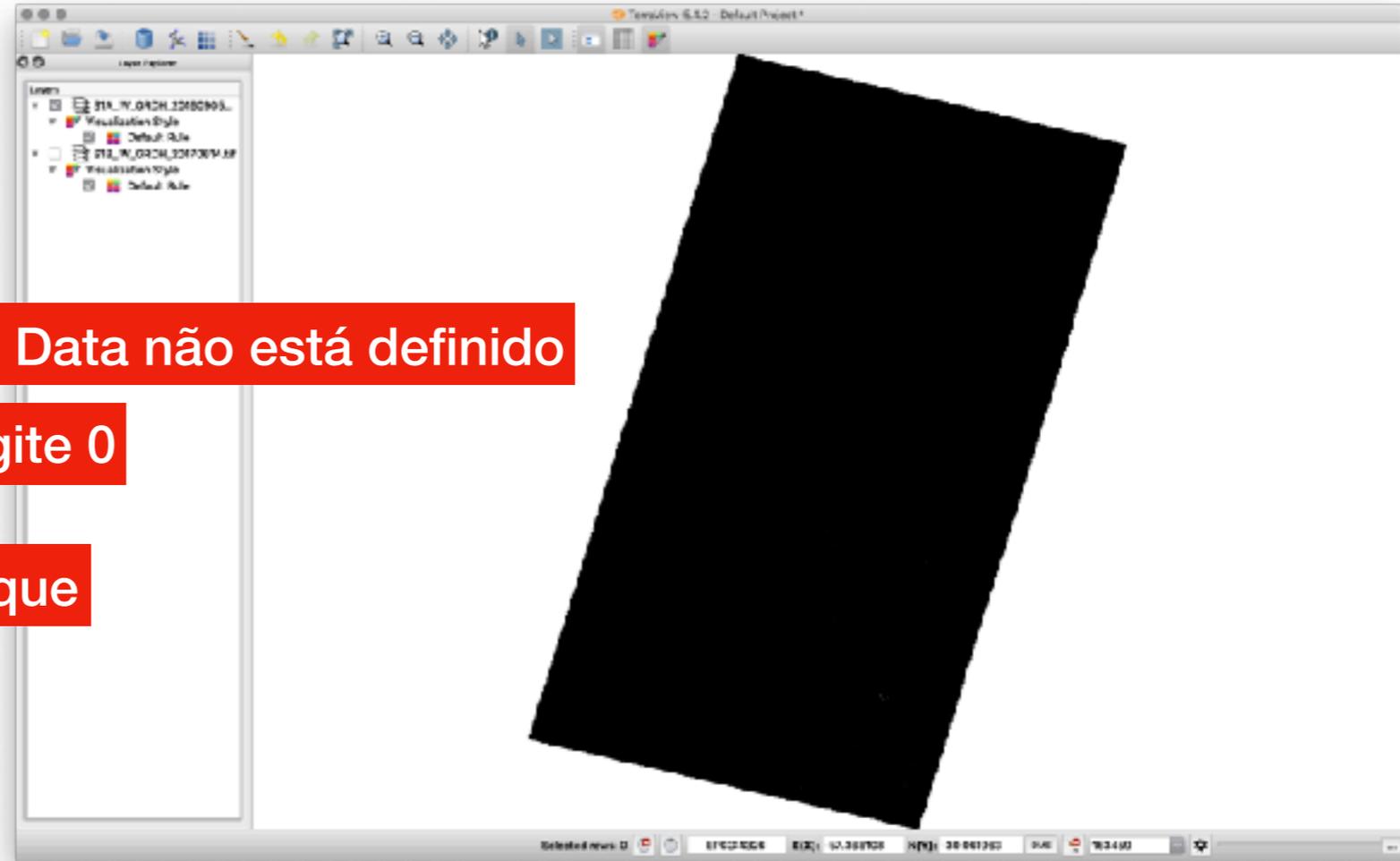
4-Clique Para Desenhar



1-No Data não está definido

2-Digite 0

3-Clique



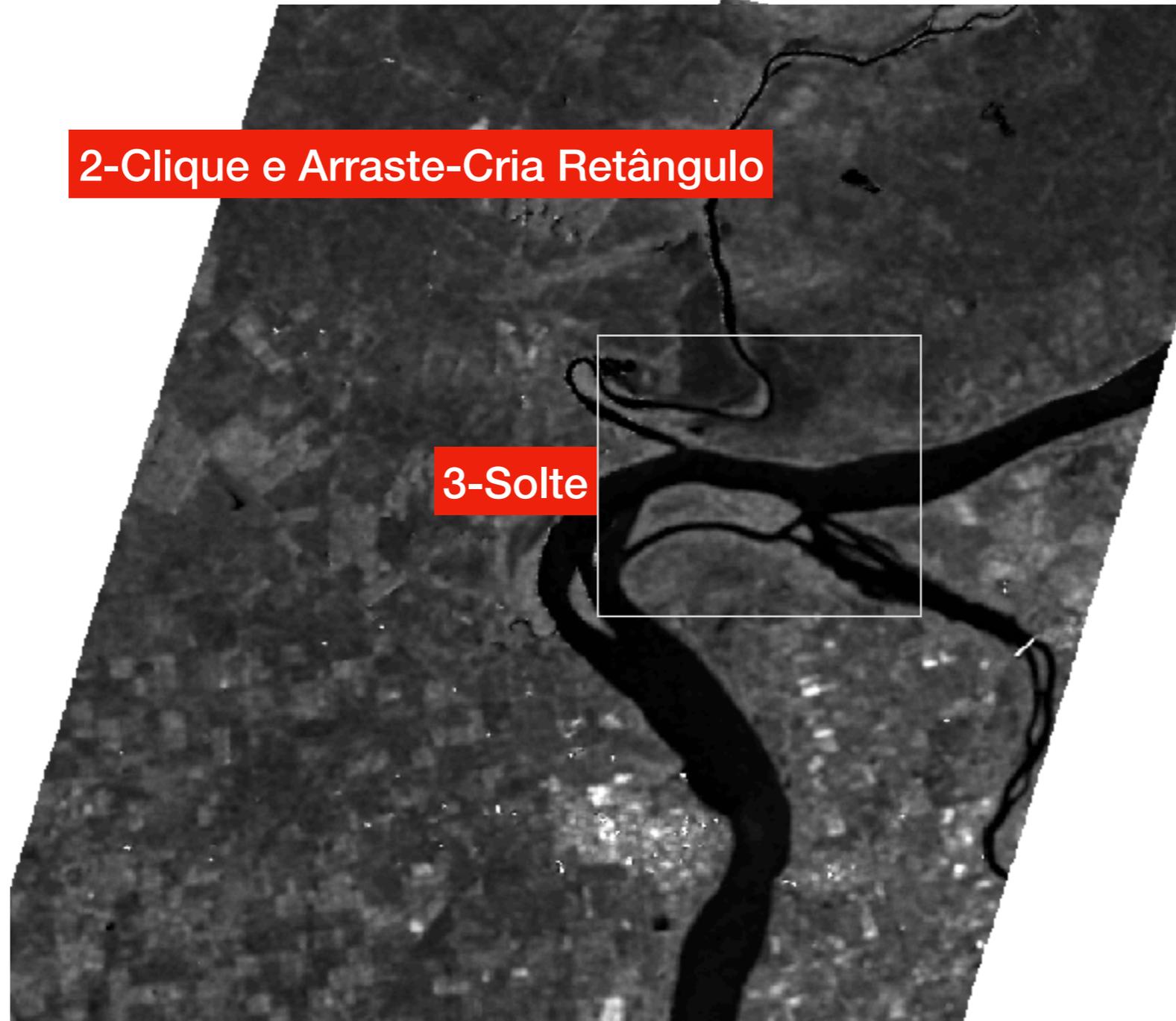
Definindo a Visualização Ampliando

1-Selezione

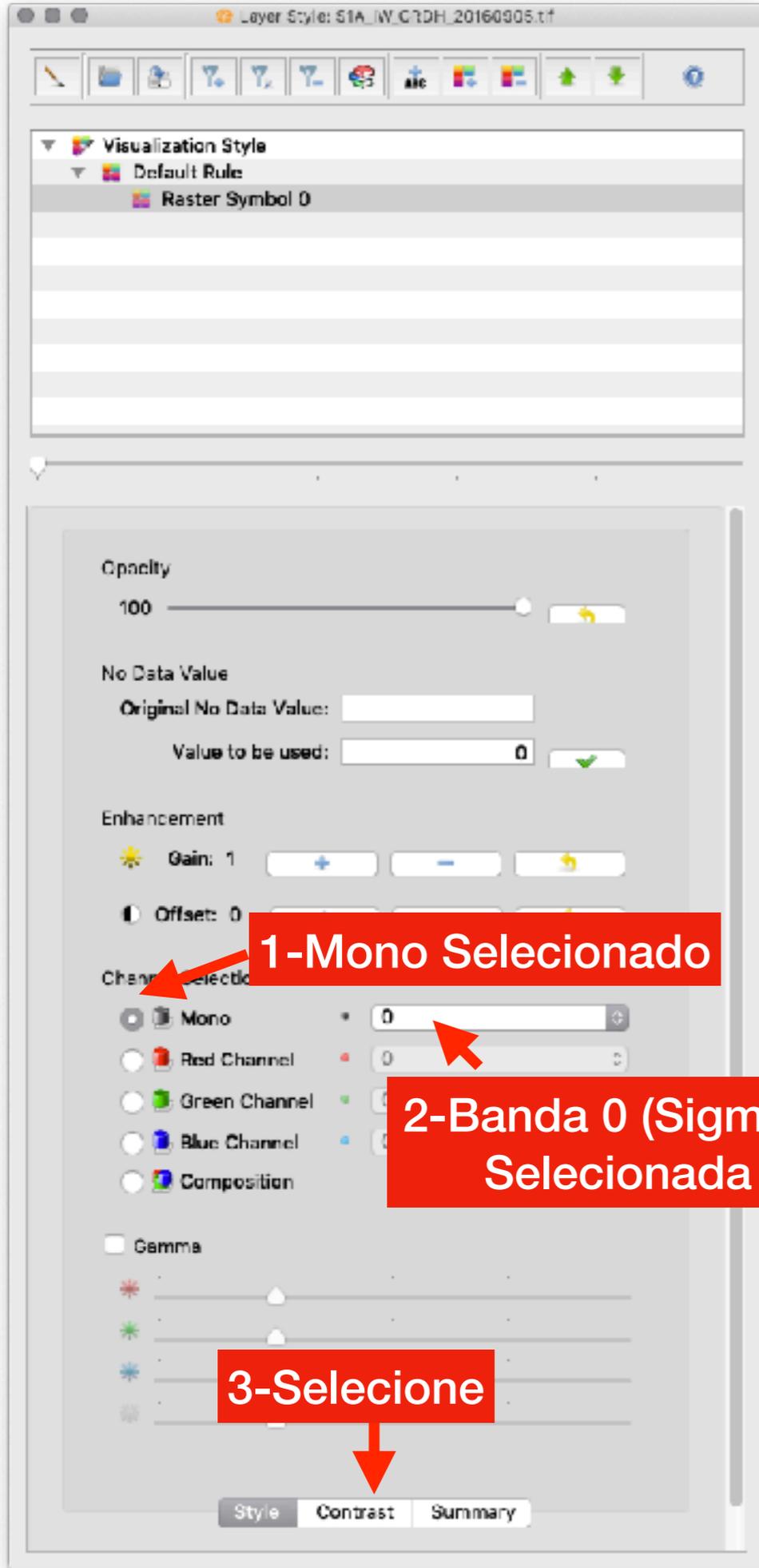


2-Clique e Arraste-Cria Retângulo

3-Solte



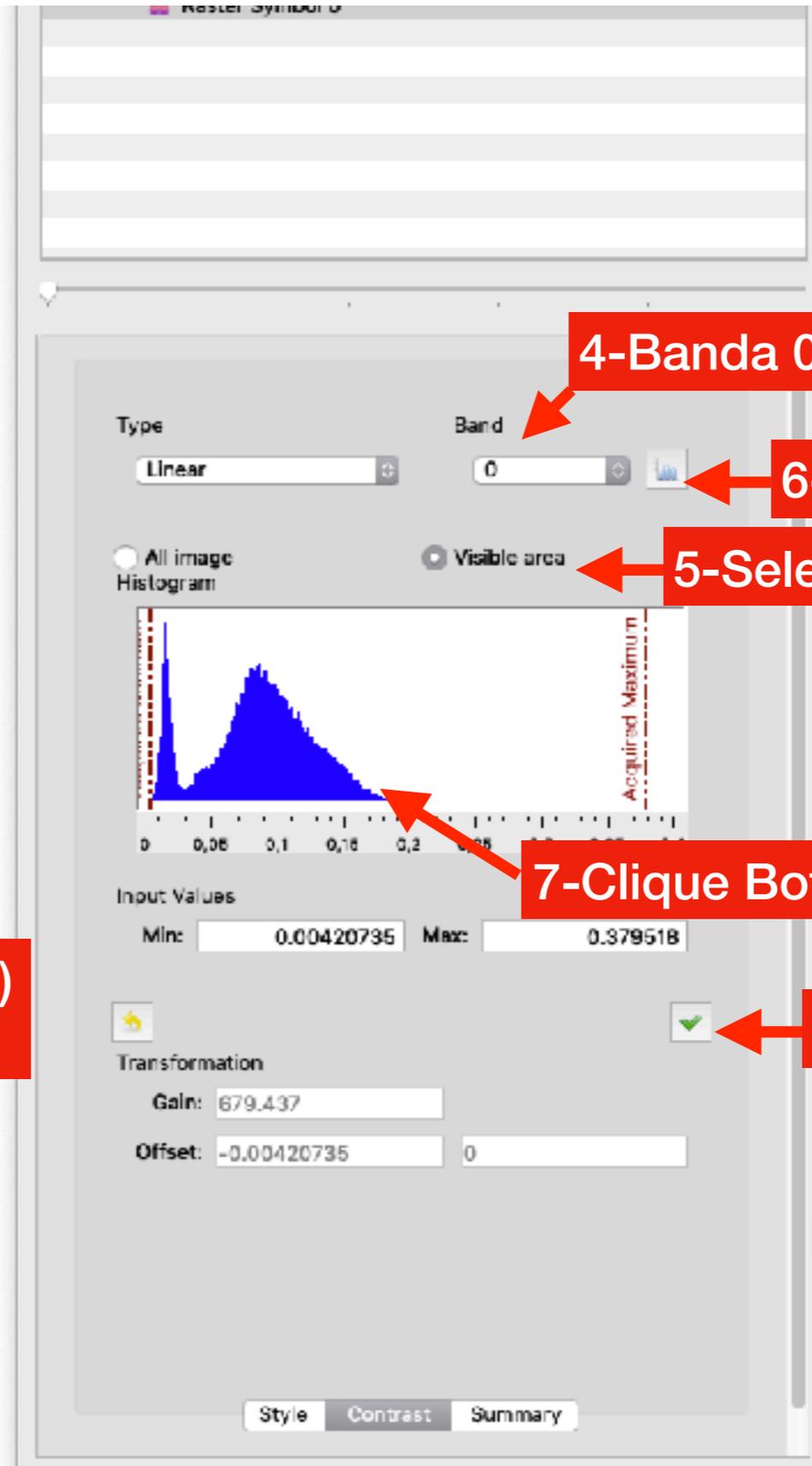
Definindo a Visualização Contraste



1-Mono Seleccionado

2-Banda 0 (Sigma0) Seleccionada

3-Seleccione



4-Banda 0 Seleccionada

6-Clique

5-Seleccione

7-Clique Botão Direito

8-Clique

Repetir para a Banda 1
Sigma0 em dB



Visualization Style

- Default Rule
- Raster Symbol 0

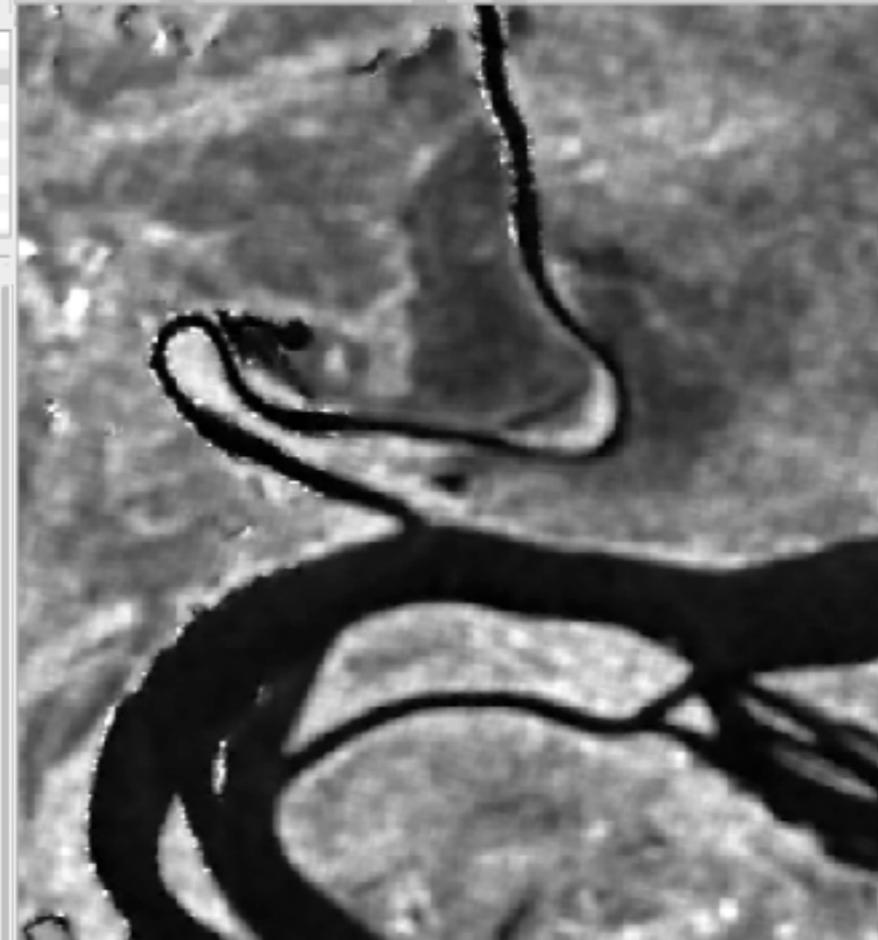
Type: Linear Band: 1

All Image Histogram Visible area

Input Values
Min: -21.5005 Max: -3.06687

Transformation

Gain: 17.0000 Offset: 21.5000



Visualization Style

- Default Rule
- Raster Symbol 0

Type: Linear Band: 1

All Image Histogram Visible area

Input Values
Min: 0.60420700 Max: 0.920001

Transformation

Gain: 1379.25 Offset: -3.00420700

Repetir para a Imagem de 2017



Visualization Style

- Default Rule
- Raster Symbol 0

Type: Linear Band: 1

All Image Histogram Visible area

Input Values
Min: -26.4661 Max: -1.80002

Transformation

Gain: 13.0072 Offset: 26.4661



Visualization Style

- Default Rule
- Raster Symbol 0

Type: Linear Band: 0

All Image Histogram Visible area

Input Values
Min: 0.00289850 Max: 0.54663

Transformation

Gain: 10.0072 Offset: 26.4661

Definindo a Visualização Áreas Inundadas em Azul

Modo Composição Adiciona - Pre

1-Seleção

2-Seleção

Modo Composição Padrão - Evento

3-Clique Botão Direito

4-Seleção

Layer Explorer

Layers

- ✓ S1A_IW_GRDH_20160905
- Visualization Style
 - ✓ Default Rule
- ✓ S1B_IW_GRDH_20170614
- Visualization Style
 - ✓ Default Rule

Remove Item(s)

Rename Layer... F2

Exchange...

Edit Legend...

Histogram...

Scatter...

Edit Style...

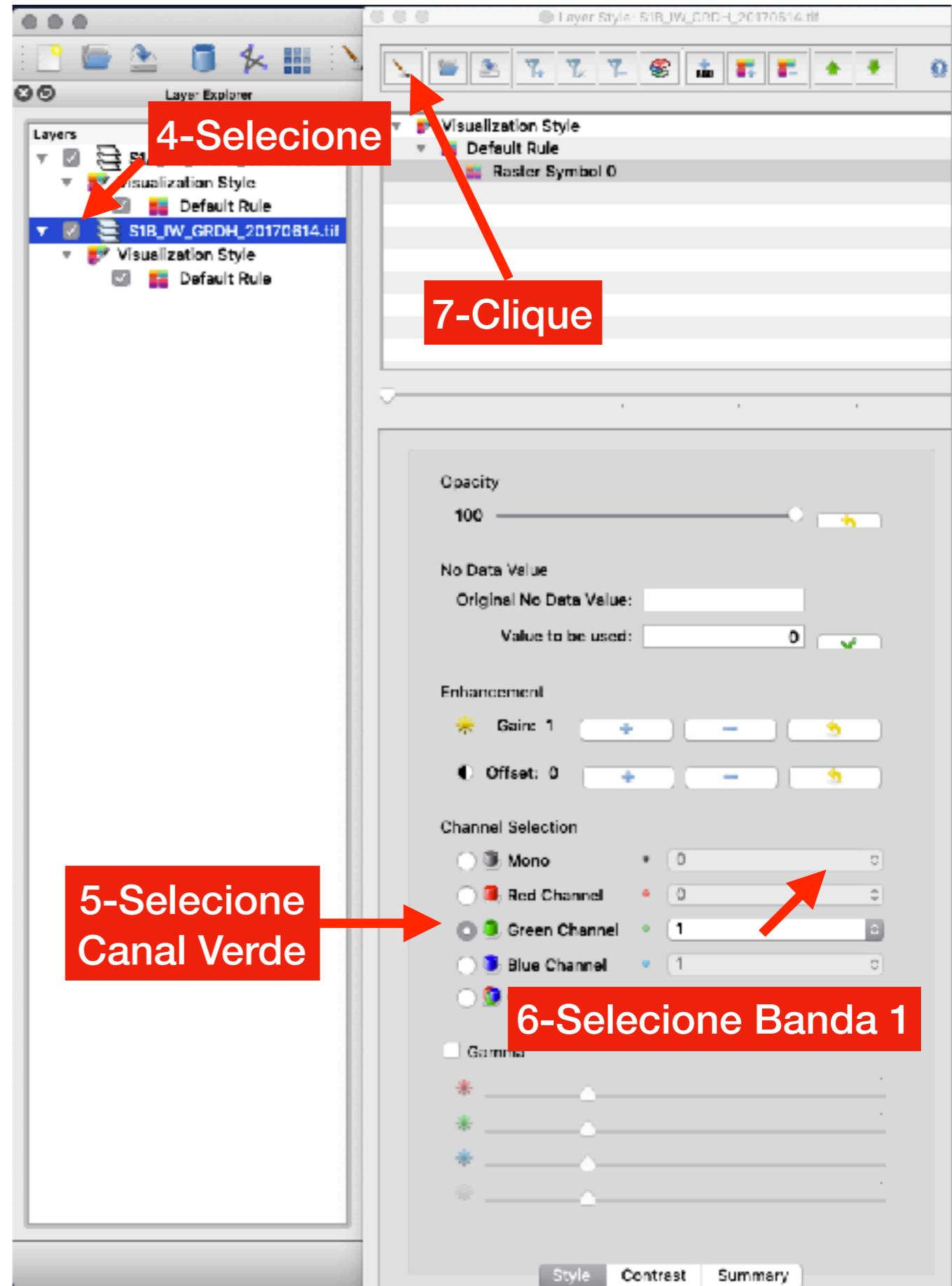
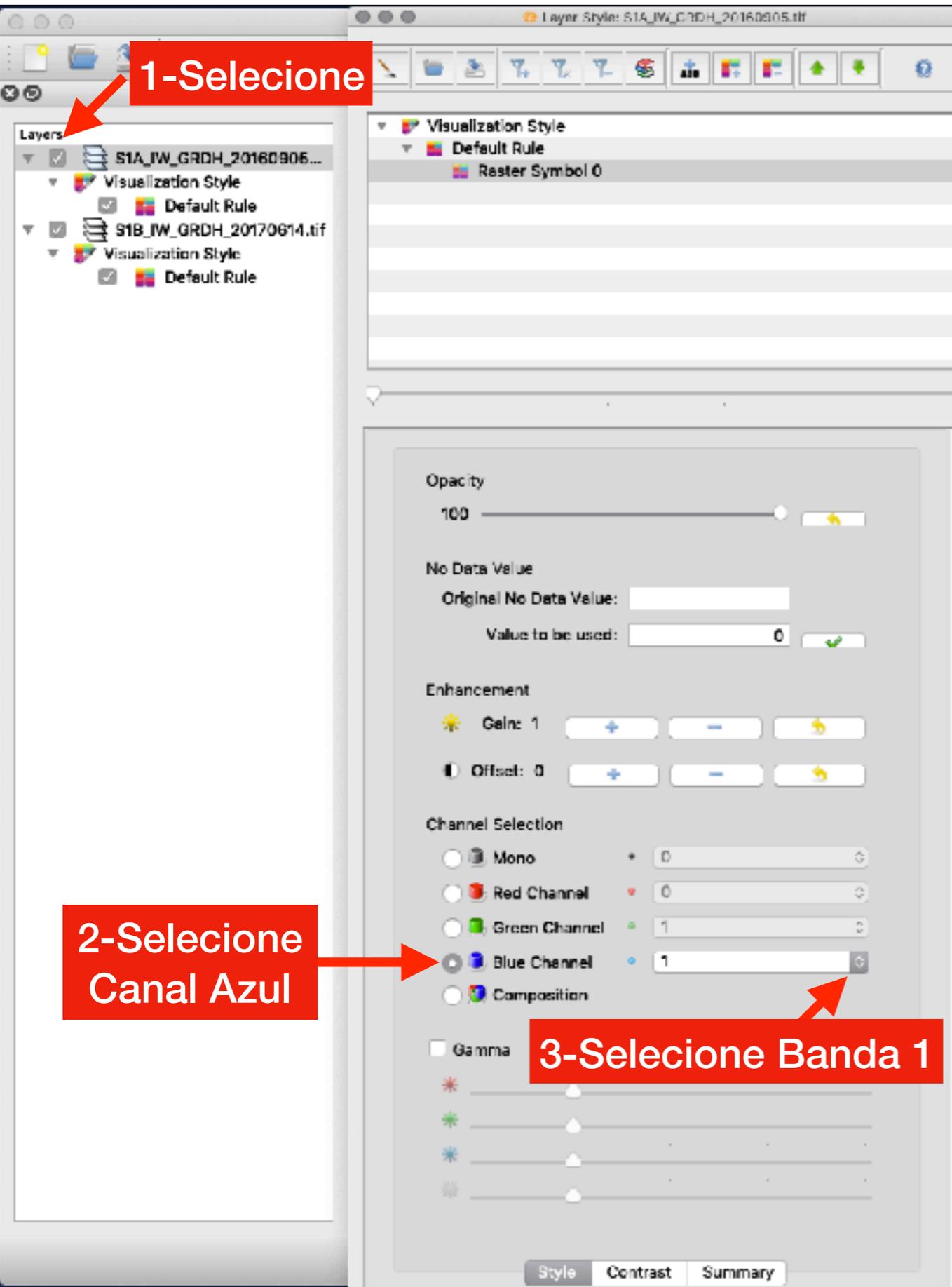
Fit Layer

Inform SRS...

Composition Mode... ▶

- ✓ Default
- Plus
- Advanced...

Repetir para a Banda 1
Sigma0 em dB



Fatiamento da Imagem do Evento

The image shows a screenshot of the QGIS software interface. The main window displays a satellite-style map with a blue and green color scheme. On the left, the 'Layer Explorer' panel is visible, showing a list of layers. A red arrow points to the layer 'S1B_IW_GRDH_20170614.tiff', which is highlighted. Below this, a red box contains the text '1-Selezione'. The 'Processing' menu is open, showing a list of processing tools. A red arrow points to the 'Raster Slicing...' option, which is highlighted. Below this, a red box contains the text '2-Selezione'. The status bar at the bottom of the window shows 'Selected rows: 0', 'EPSG:4326', 'E(X): -57.576555', 'N(Y): -30.207899', 'DMS', and '36559'.

Layer Explorer

Layers

- S1A_IW_GRDH_20160905...
- Visualization Style
 - Default Rule
- S1B_IW_GRDH_20170614.tiff
- Visualization Style
 - Default Rule

Processing Help

- Raster Processing
- DTM Processing
- Attribute Fill
- Cellular Spaces
- Spatial Analysis
- Vector Processing
- Arithmetic Operations...
- Classifier...
- Clipping...
- Cloud Detection...
- Color Transform...
- Compose / Decompose Bands...
- Contrast...
- Filter...
- Fusion...
- Mixture Model...
- Mosaic...
- Converts to palette raster...
- PCA...
- Post Classification...
- Raster Slicing...
- Rasterization...
- Register...
- Segmenter...
- Vectorization...
- Boundary Extraction...

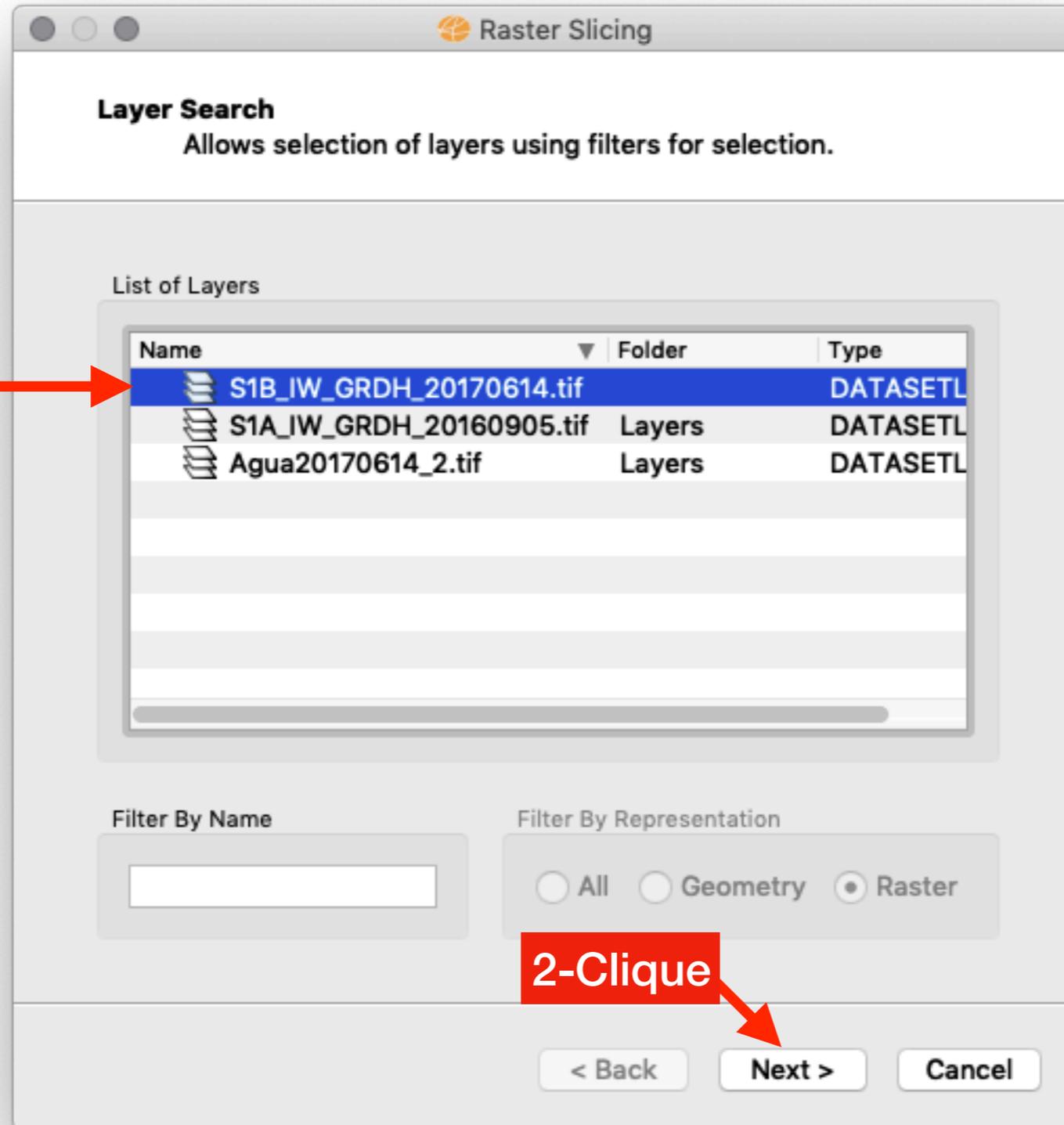
1-Selezione

2-Selezione

Selected rows: 0 EPSG:4326 E(X): -57.576555 N(Y): -30.207899 DMS 36559

Fatiamento

Definindo Imagem Evento para Fatiar

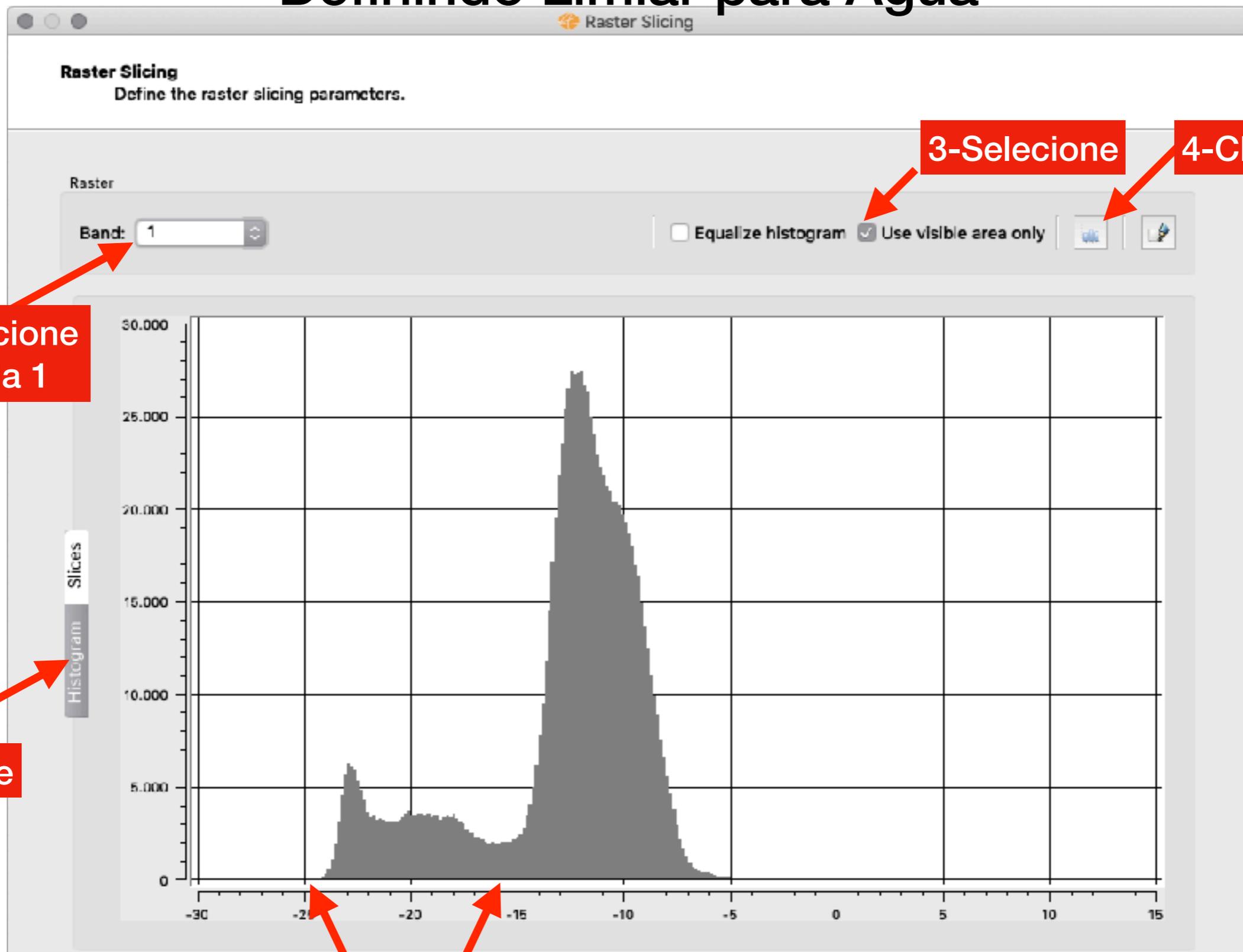


1-Selezione

2-Clique

Fatiamento

Definindo Limiar para Água



Fatiamento Definindo Cor

The image shows a 'Raster Slicing' dialog box with the following fields and controls:

- Raster:** Band: 1
- Parameters:** Min Value: -25.6871, Max Value: -16, Steps: 1, Precision: 2
- Color Bar:** A horizontal bar with a gradient from black to red.
- Color Table:** A table with columns 'Color', 'From', and 'To'. Row 1 shows a blue color swatch, 'From: -25.70', and 'To: -15.99'.
- Buttons:** Apply, Save, < Back, Next >, Cancel, OK

Annotations in red boxes with arrows point to the following elements:

- 1-Selezione:** Points to the 'Histogram' tab in the left sidebar.
- 2-Digite -16:** Points to the 'Max Value' input field.
- 3-Defina:** Points to the 'Precision' input field.
- 4-Clique:** Points to the 'Apply' button.
- 5-Clique Duplo:** Points to the 'Color' column header in the color table.
- 6-Selezione:** Points to the blue color swatch in the color table.
- 7-Clique:** Points to the 'OK' button.
- 8-Clique:** Points to the 'Next >' button.

A 'Colors' palette is open on the right, showing a list of colors. The blue color is selected, indicated by a red arrow from the '6-Selezione' annotation.

Color	From	To
1 [Blue Swatch]	-25.70	-15.99

Fatiamento

Definindo Arquivo de Saída

Raster Information

Defines the parameters of raster creation.

Raster Info

File

/Users/laercio/Downloads/Sentinel/Agua20170614.tif



1-Clique

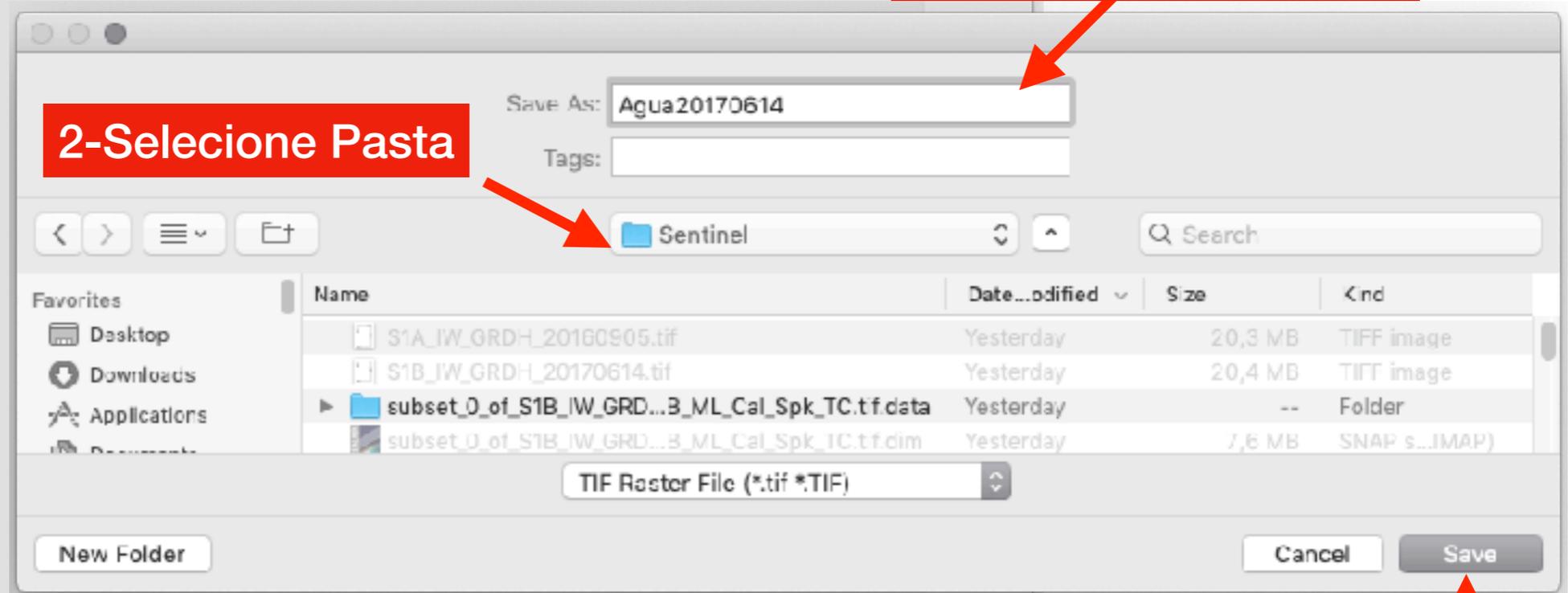
Name

Agua20170614

Extra Parameters

3-Digite Agua20170614

2-Selezione Pasta



4-Clique

5-Clique

< Back Finish Cancel

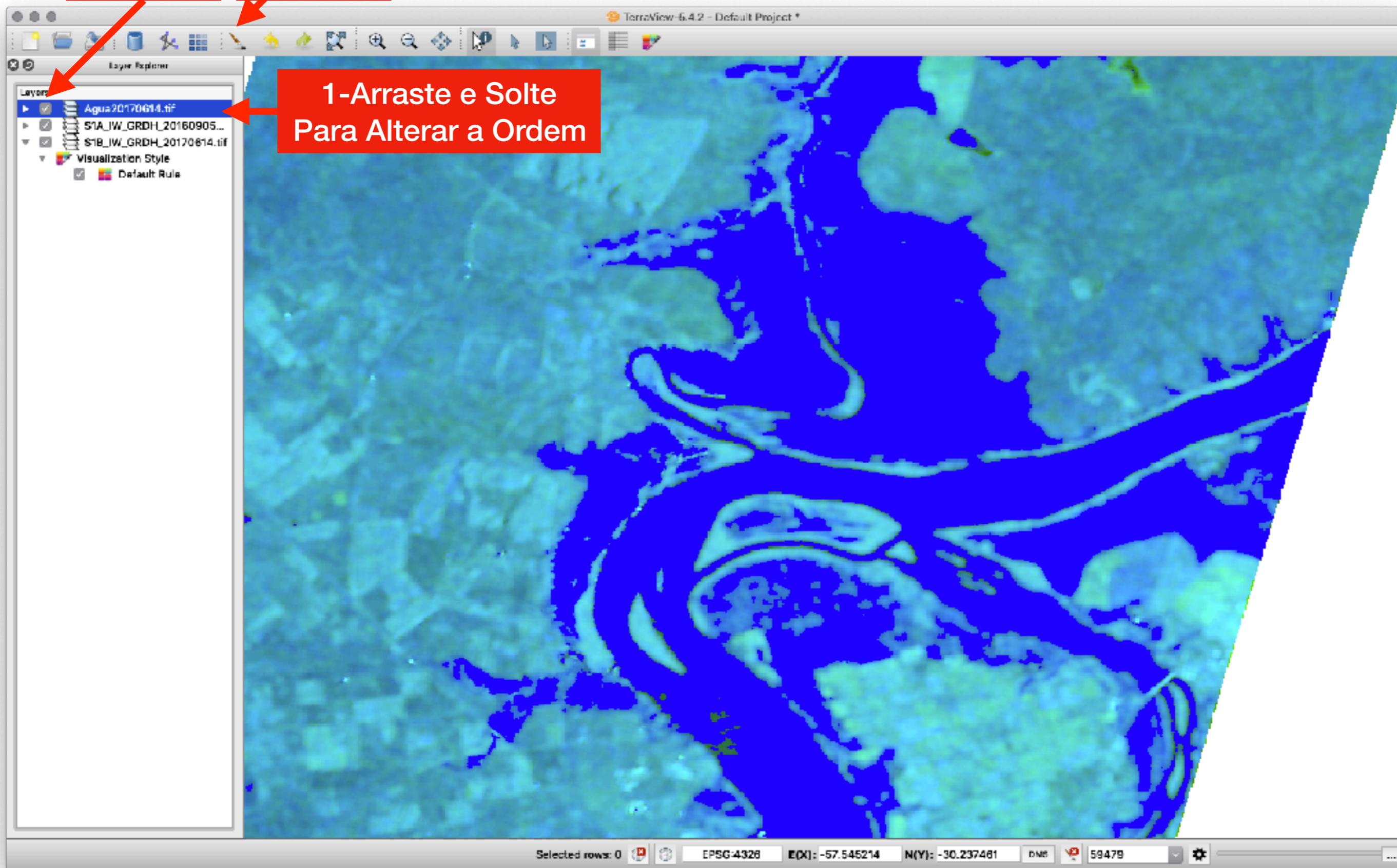
Fatiamento

Visualizando Imagem Fatiada

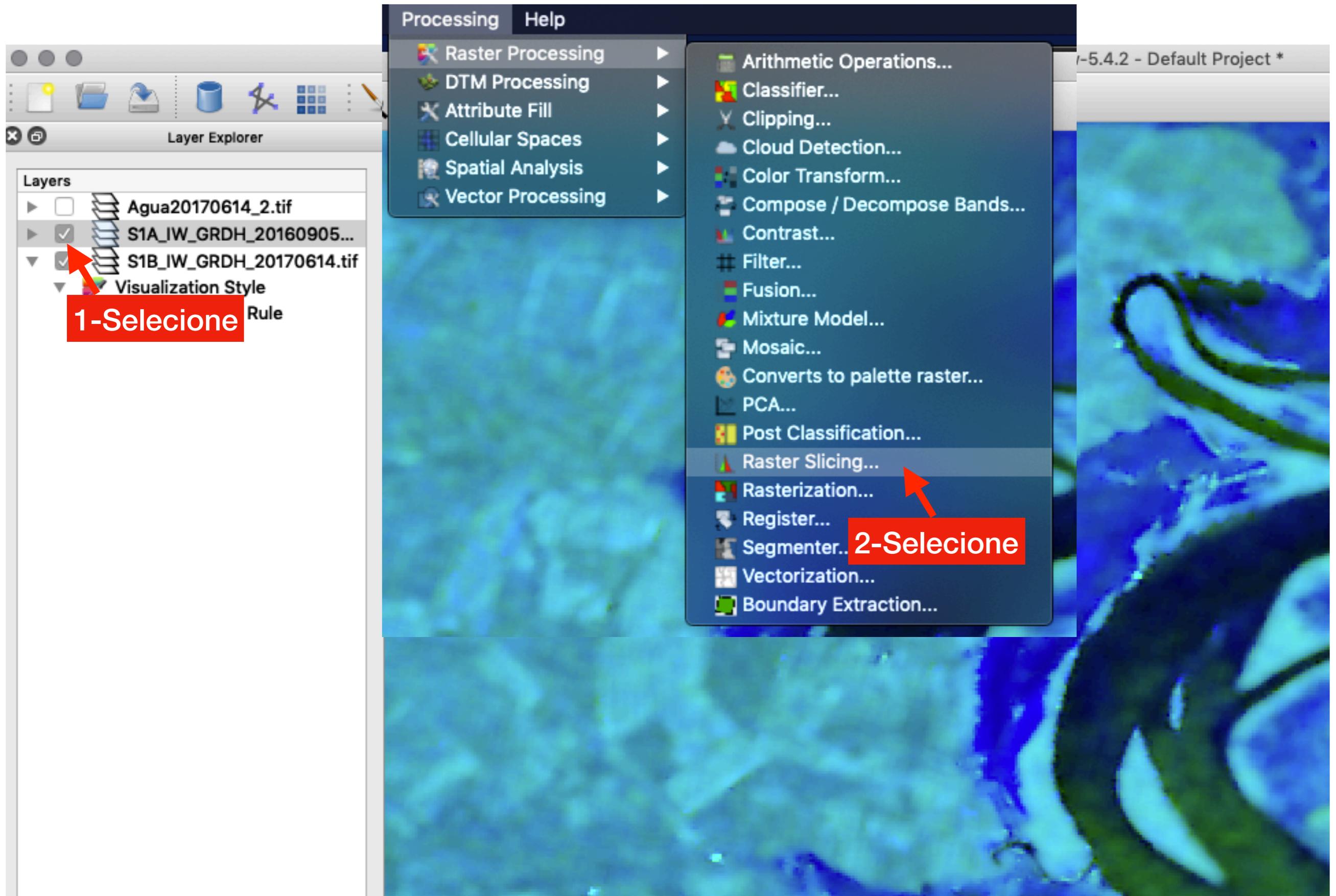
2-Clique

3-Clique

1-Arraste e Solte
Para Alterar a Ordem

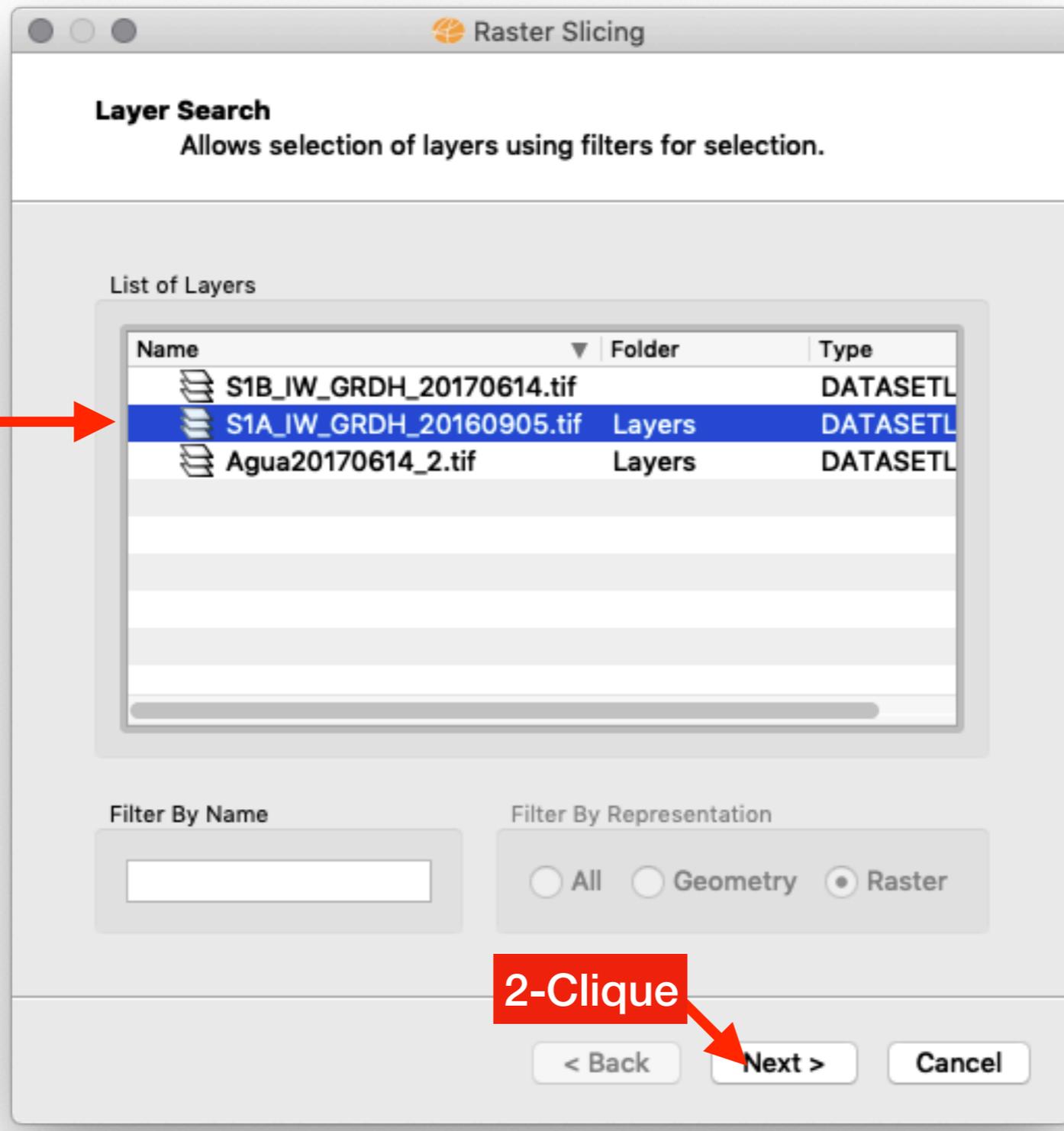


Fatiamento da Imagem Pré Evento



Fatiamento

Definindo Imagem Pré Evento para Fatiar

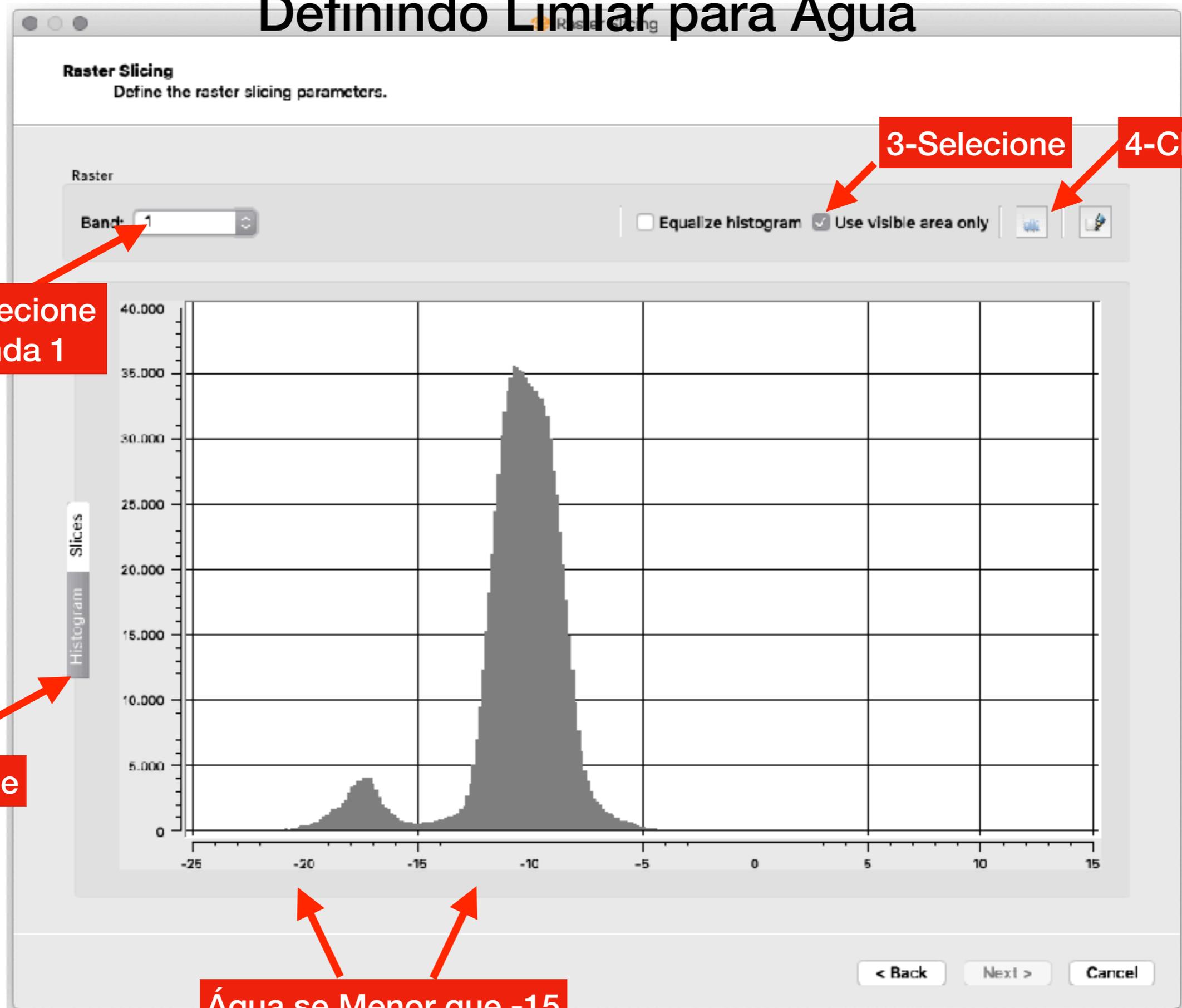


1-Selezione

2-Clique

Fatiamento

Definindo Limiar para Água



Fatiamento Definindo Cor

The image shows a software interface for 'Raster Slicing' with several red annotations and arrows pointing to specific elements. The 'Raster Slicing' dialog box has a 'Raster' section with 'Band: 1' and checkboxes for 'Equalize histogram' and 'Use visible area only'. The 'Parameters' section includes 'Min Value: -25.6871', 'Max Value: -15', 'Steps: 1', and 'Precision: 2'. A 'Color Bar' is shown with a gradient from black to red. A table on the right shows a color mapping for '1' from -25.70 to -14.99. The 'Colors' palette on the right lists various colors, with 'Blue' selected. At the bottom, there are 'Back', 'Next >', and 'Cancel' buttons.

1-Selezione (points to the Histogram tab)

2-Digite -15 (points to the Max Value field)

3-Defina (points to the Precision field)

4-Clique (points to the Apply button)

5-Clique Duplo (points to the Color field in the table)

6-Selezione (points to the Blue color in the palette)

7-Clique (points to the OK button)

8-Clique (points to the Next > button)

Color	From	To
1	-25.70	-14.99

Black	
Blue	
Brown	
Cyan	
Green	
Magenta	
Orange	
Purple	
Red	
Yellow	
White	

Fatiamento

Definindo Arquivo de Saída

Raster Information

Defines the parameters of raster creation.

Raster Info

File

/Users/laercio/Downloads/Sentinel/Agua20160905.tif



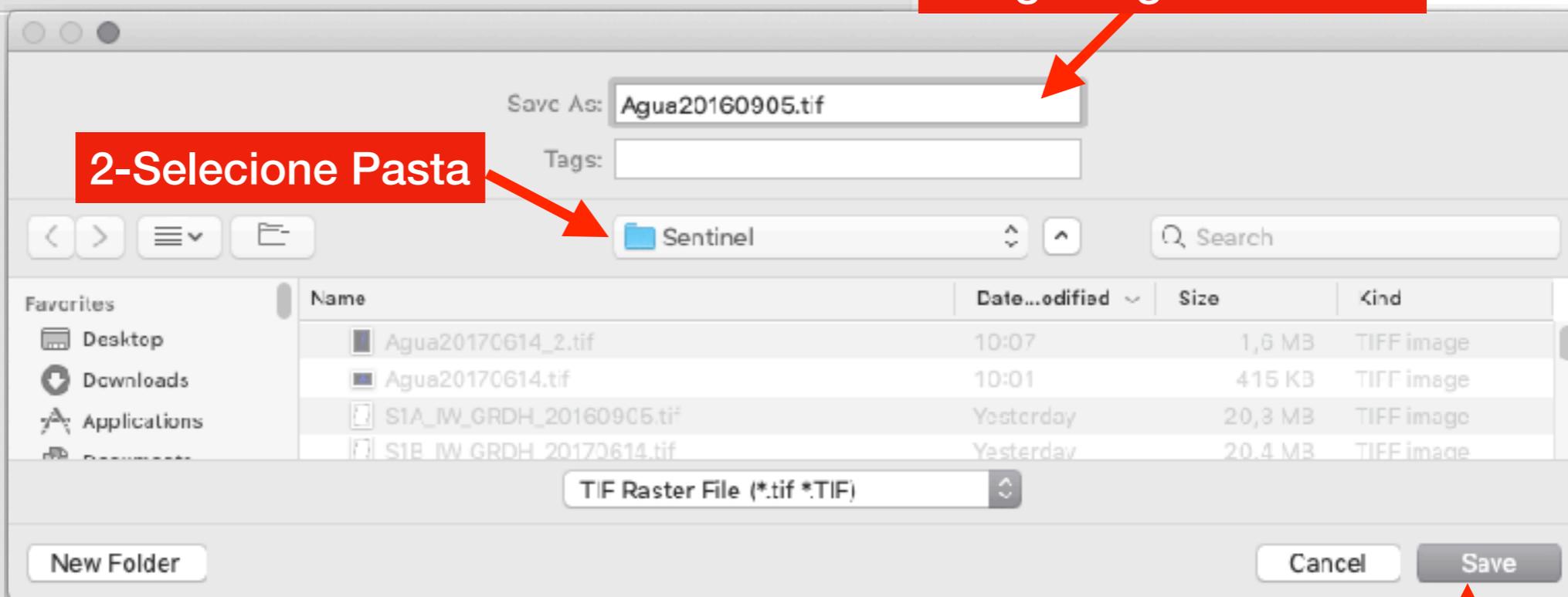
1-Clique

Name

Agua20160905

3-Digite Agua20160905

Extra Parameters



2-Selezione Pasta

4-Clique

5-Clique

< Back Finish Cancel

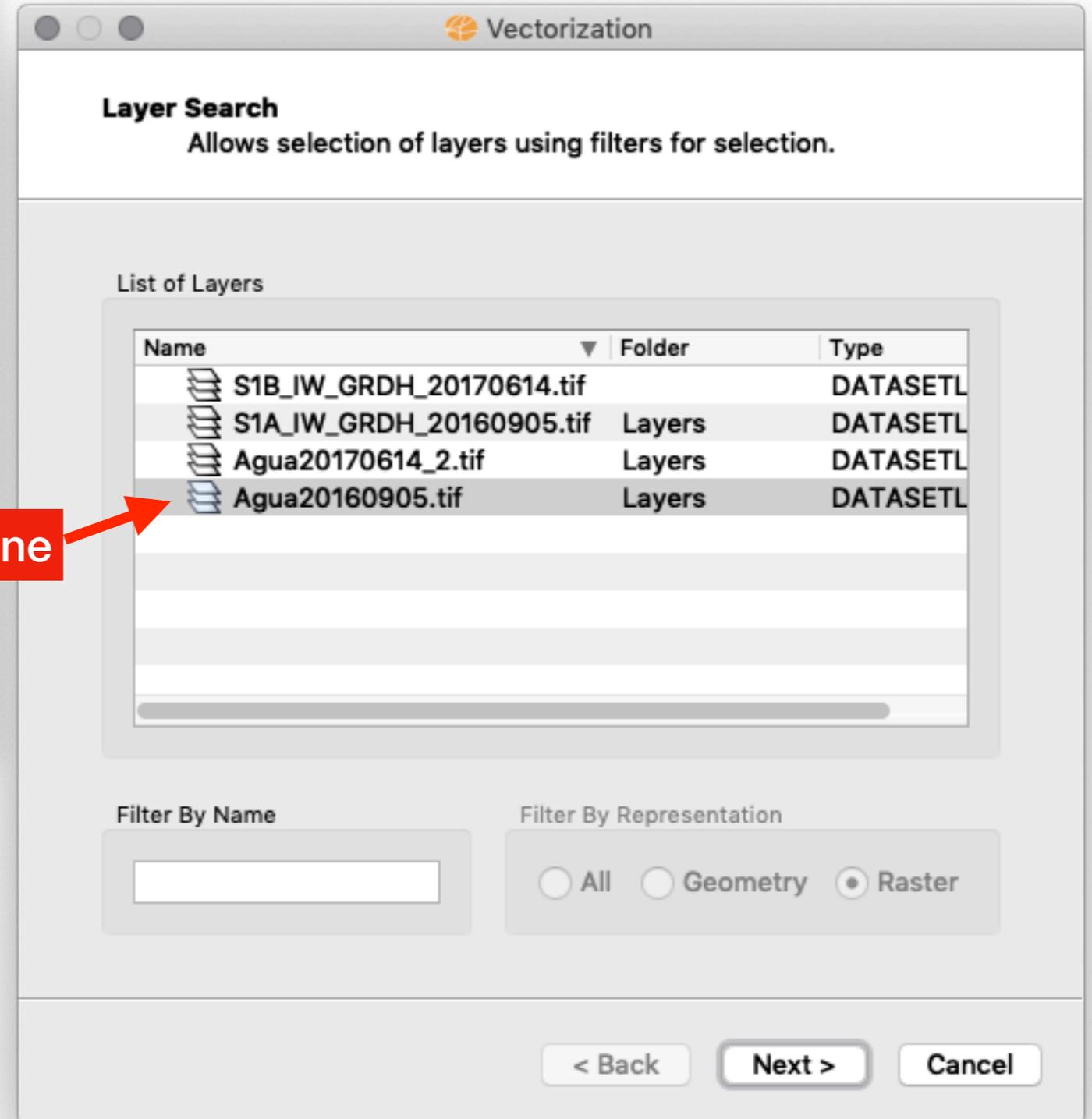
Vetorizando Imagem Fatiada com Água Pré Evento

Raster Processing
DTM Processing
Attribute Fill
Cellular Spaces
Spatial Analysis
Vector Processing

Arithmetic Operations...
Classifier...
Clipping...
Cloud Detection...
Color Transform...
Compose / Decompose Bands...
Contrast...
Filter...
Fusion...
Mixture Model...
Mosaic...
Converts to palette raster...
PCA...
Post Classification...
Raster Slicing...
Rasterization...
Register...
Segmenter...
Vectorization...
Boundary Extraction...

1-Selezione

2-Selezione



Vetorização

Definindo Arquivo de Saída

The image shows the 'Vectorization' tool interface with a file explorer window overlaid. The tool interface includes a 'Parameters' section with 'Layer: Agua20160905.tif' and 'Band: 0', and an 'Output' section with 'Repository: /laercio/Downloads/Sentinel/Agua20160905_SHP.shp' and 'Layer Name: Agua20160905_SHP.shp'. The file explorer shows the 'Sentinel' folder selected, with the 'Save As' field containing 'Agua20160905_SHP.shp'. Red callout boxes with arrows indicate the following steps:

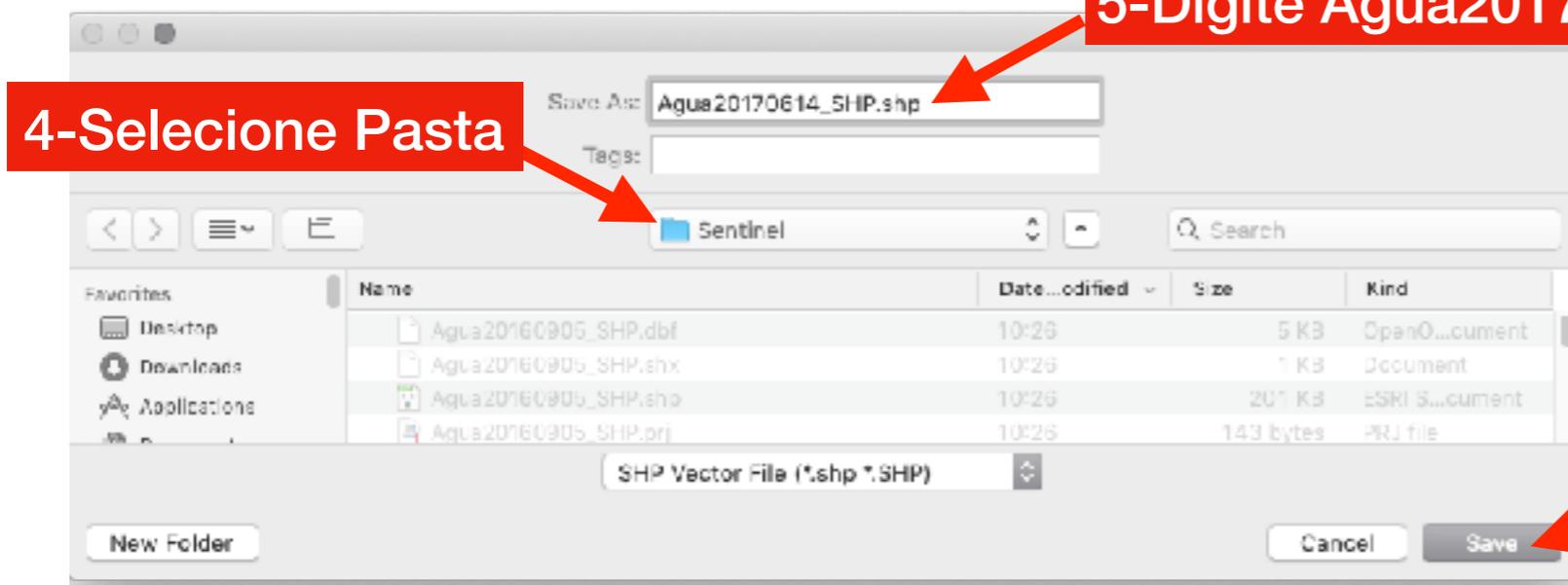
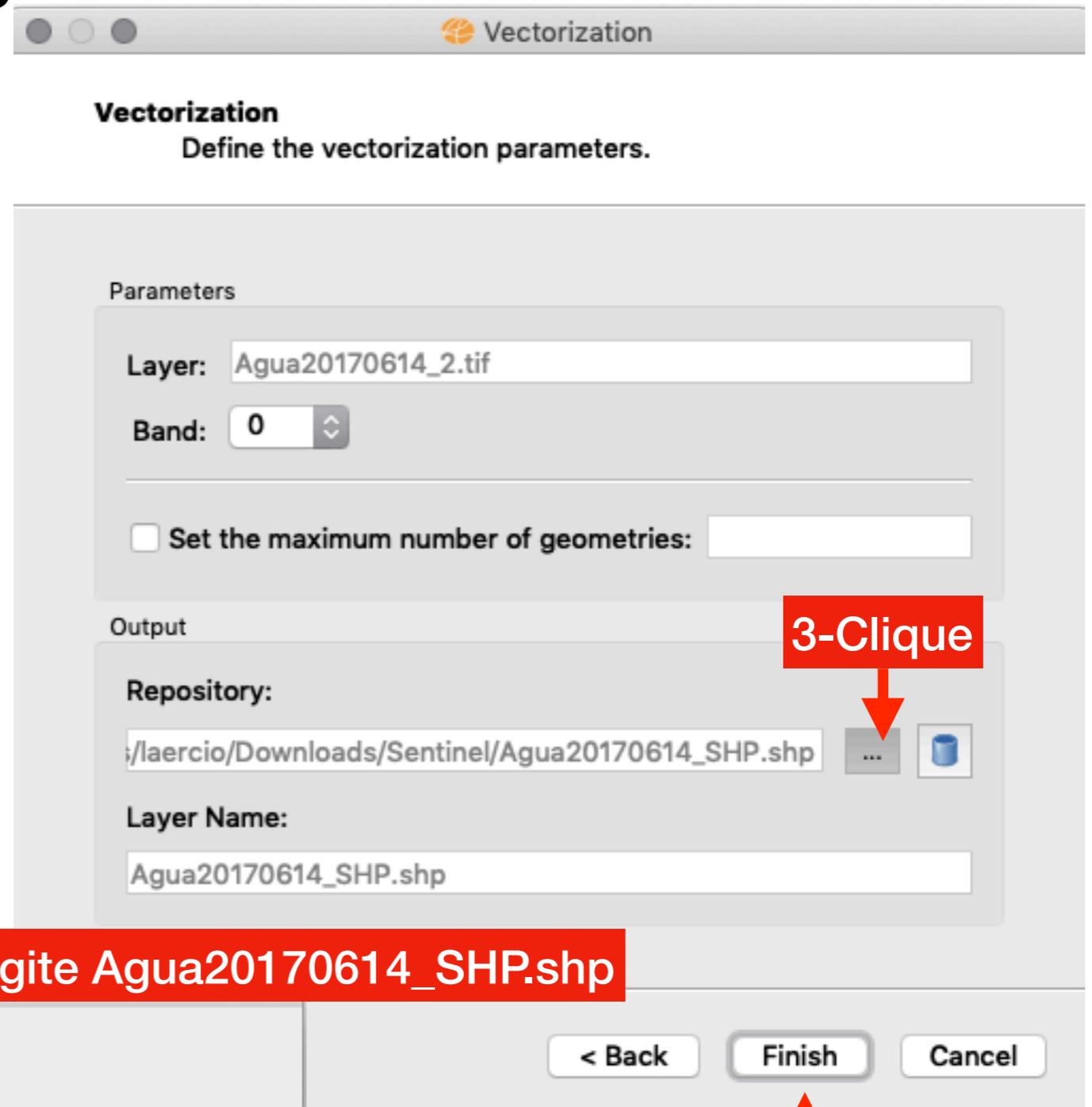
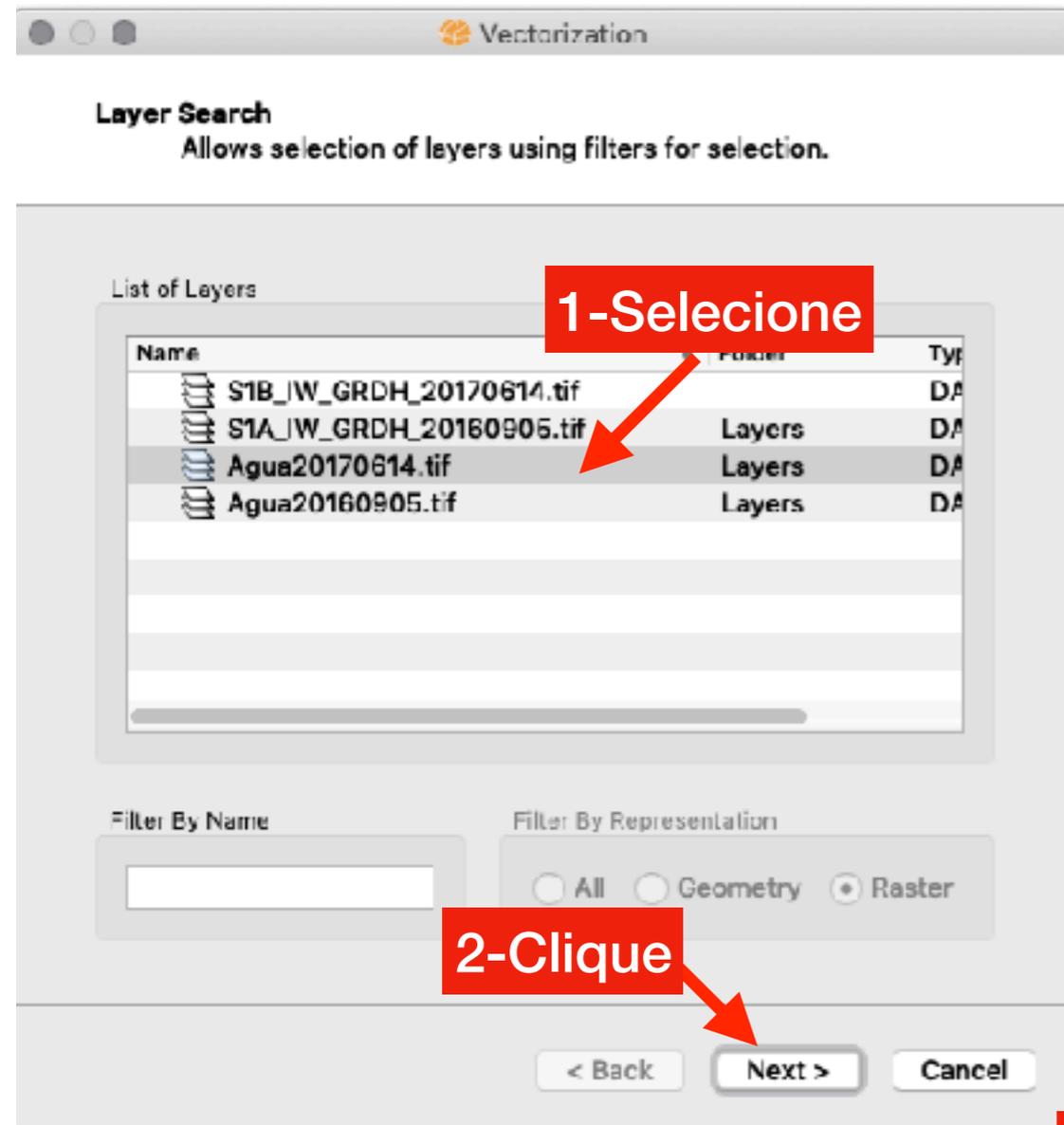
- 1-Clique**: Points to the ellipsis button in the Repository field.
- 2-Selezione Pasta**: Points to the 'Sentinel' folder in the file explorer.
- 3-Digite Agua20160905_SHP.shp**: Points to the 'Save As' text field.
- 4-Clique**: Points to the 'Save' button in the file explorer.
- 5-Clique**: Points to the 'Finish' button in the Vectorization tool.

Visualizando a Vetorização Limites da Água Pré Evento

The image shows a screenshot of the TerraView-5.1.2 software interface. The main window displays a map with a blue and green color scheme, representing water limits. On the left side, there is a 'Layer Explorer' panel with a list of layers. The layer 'Agua20160905_SHP' is highlighted in blue. A red arrow points from a red text box to this layer. The text box contains the instruction '1-Arraste e Solte Para Alterar a Ordem'. The software's status bar at the bottom shows 'Selected rows: 0', 'EPSG:4326', 'E(X): -57.910620', 'N(Y): -30.004819', 'OMS', and '163/159'.

1-Arraste e Solte
Para Alterar a Ordem

Repetir a Vetorização Para Água do Evento



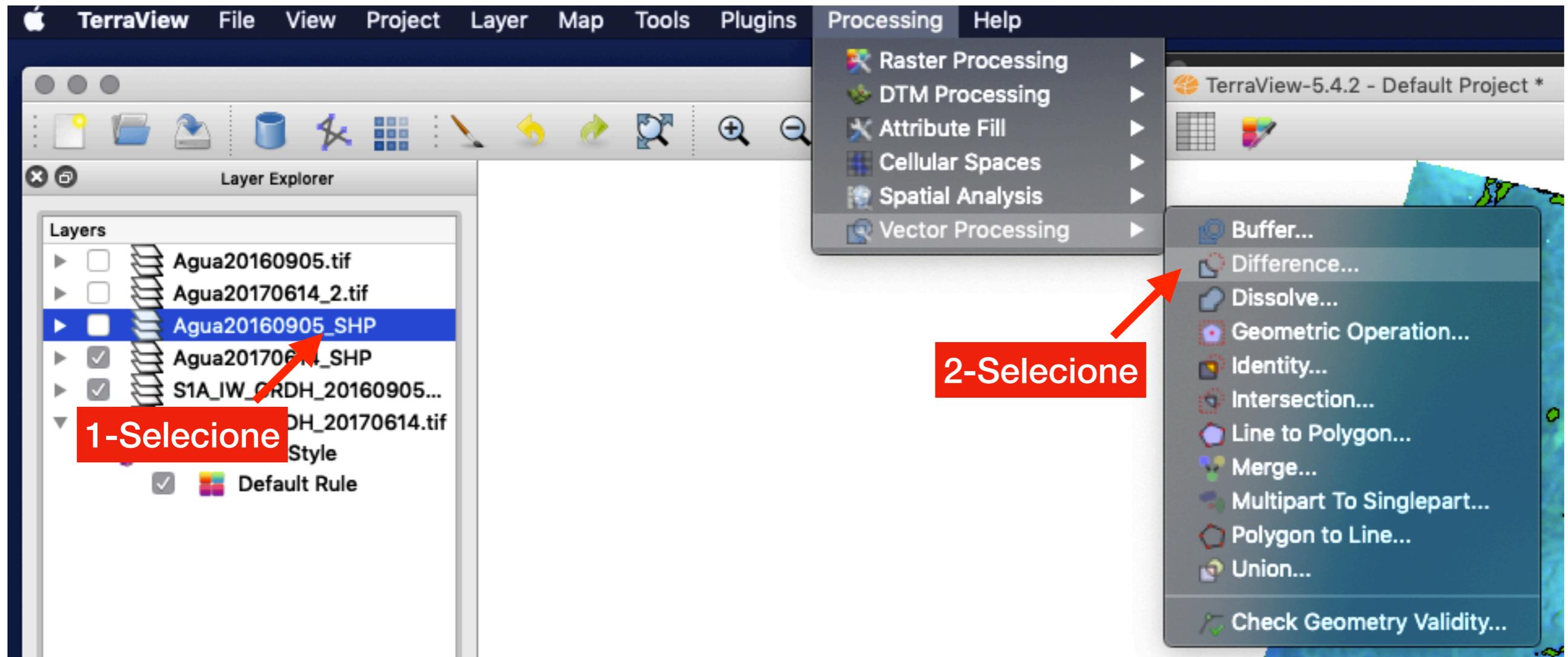
7-Clique (arrow pointing to the 'Finish' button)

Visualizando a Vetorização Limites da Água Evento

The screenshot displays the TerraView 5.1.2 interface. On the left, the 'Layer Explorer' panel lists several layers: 'Agua20160905.tif', 'Agua20170614_2.tif', 'Agua20160905_SHP', 'Agua20170614_SHP', 'S1A_IW_GRDH_20160905...', and 'S1B_IW_GRDH_20170614.tif'. The 'Agua20160905_SHP' layer is selected and highlighted in blue. A red callout box with white text and an arrow points to this layer, containing the instruction: '1-Arraste e Solte Para Alterar a Ordem'. The main map area shows a satellite-style image with a green vectorized overlay representing the water limit. The bottom status bar shows 'Selected rows: 0', 'EPSG:4326', 'E(X): -57.925747', 'N(Y): -30.004619', 'DMS', and '163/159'.

Definir Área Inundada

Diferença entre Água do Pré e do Evento



Definir Área Inundada

Diferença entre Água do Pré e do Evento

The image shows a sequence of steps to use the 'Difference' tool in ArcGIS. The steps are indicated by red callouts:

- 1-Selezione Evento**: Select the 'Evento' layer (Agua20170614_SHP) as the Input Layer.
- 2-Selezione Pré Evento**: Select the 'Pré Evento' layer (Agua20160905_SHP) as the Difference Layer.
- 3-Clique**: Click the 'OK' button at the bottom of the tool dialog.
- 4-Selezione Pasta**: In the file explorer, select the 'Sentinel' folder.
- 5-Digite AguaDiff_20170614_20160905.shp**: Enter the name of the output layer in the 'Save As' field.
- 6-Clique**: Click the 'Save' button in the file explorer.
- 7-Clique**: Click the 'OK' button in the 'Output' dialog.

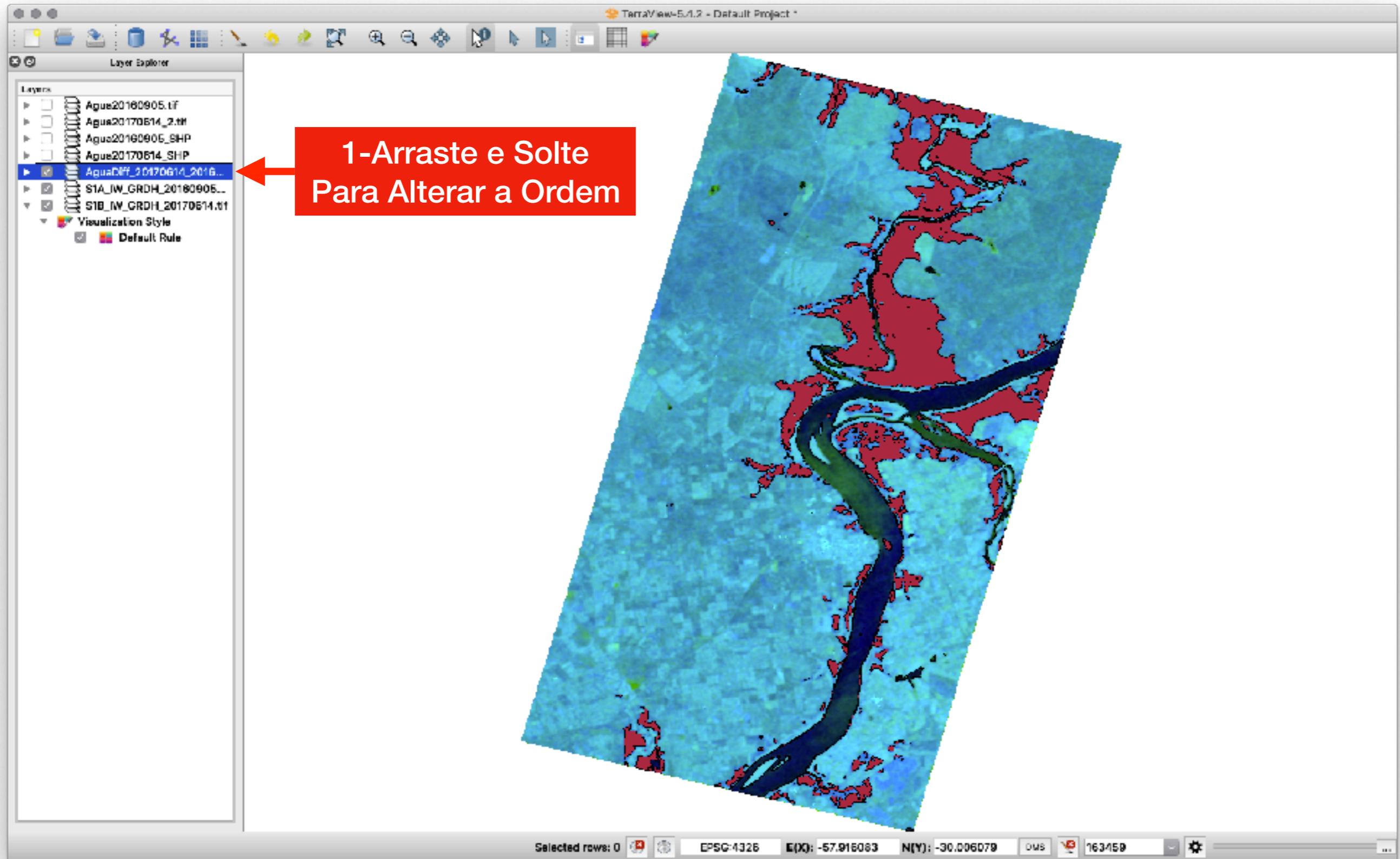
The 'Difference' tool dialog shows the following configuration:

- Input Layer: Agua20170614_SHP
- Difference Layer: Agua20160905_SHP
- Output object type: SHP Vector File (*.shp *.SHP)
- Repository: \\/AguaDiff_20170614_20160905.shp
- Layer Name: AguaDiff_20170614_20160905.shp

The file explorer shows the following files in the 'Sentinel' folder:

Name	Date...odified	Size	Kind
Agua20170614_SHP.dbf	10:28	5 KB	OpenO...ument
Agua20170614_SHP.shx	10:28	2 KB	Document
Agua20170614_SHP.shp	10:28	488 KB	ESRI S...ument
Agua20170614_SHP.prj	10:28	143 bytes	PRJ file

Visualizando a Diferença



The screenshot displays the TerraView 5.1.2 interface. On the left, the 'Layer Explorer' panel lists several layers. The layer 'AguaDiff_30170614_2016...' is selected and highlighted in blue. A red arrow points from a red text box to this layer. The main map area shows a geographical view with a river and surrounding areas colored in shades of blue and red. The bottom status bar shows 'Selected rows: 0', 'EPSG:4326', 'E(X): -57.916083', 'N(Y): -30.006079', 'DMS', and '163/159'.

1-Arraste e Solte Para Alterar a Ordem

Calculando Área Inundada

The image shows the TerraView software interface. The 'Layer Explorer' panel on the left lists several layers, with 'AguaDiff_20170614_2016...' selected. A red arrow labeled '1-Seleccione' points to this layer. The 'Processing' menu is open, showing various tool categories. A red arrow labeled '2-Seleccione' points to the 'Geometric Operation...' option in the menu. The background shows a map with a blue and green color scheme, likely representing water and land.

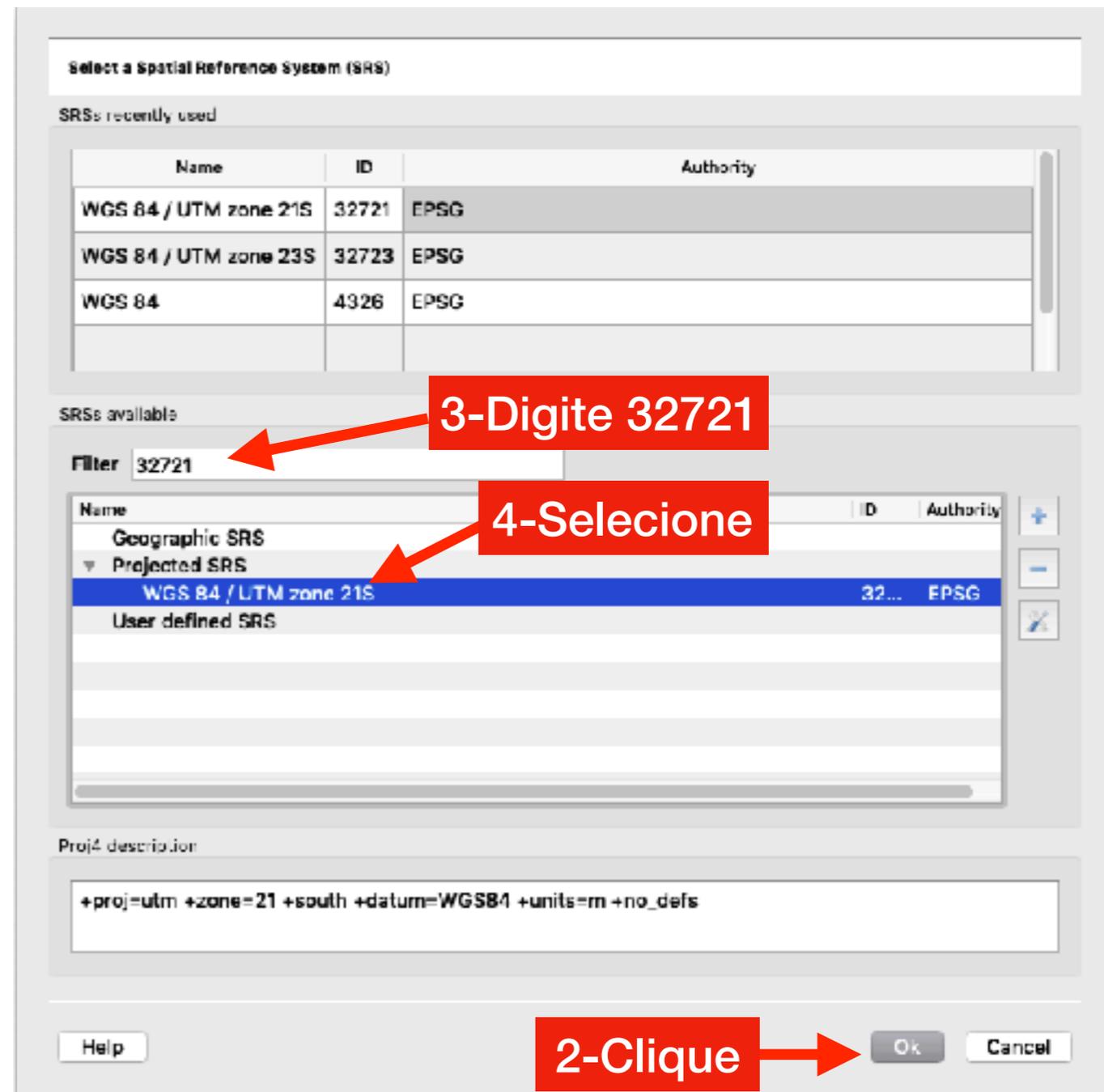
1-Seleccione

2-Seleccione

- Raster Processing
- DTM Processing
- Attribute Fill
- Cellular Spaces
- Spatial Analysis
- Vector Processing
- Buffer...
- Difference...
- Dissolve...
- Geometric Operation...
- Identity...
- Intersection...
- Line to Polygon...
- Merge...
- Multipart To Singlepart...
- Polygon to Line...
- Union...
- Check Geometry Validity...

Calculando Área Inundada

Definindo Projeção para Cálculo



Calculando Área Inundada Definindo Arquivo de Saída

The image shows the QGIS 'Geometric Operations' dialog box with the 'Area' operation selected. A file save dialog is overlaid on top, showing the file name 'AguaDiff_Area.shp' and the destination folder 'Sentinel'. Red arrows and text boxes indicate the following steps:

- 1-Clique**: Points to the ellipsis button next to the 'Repository' field in the Geometric Operations dialog.
- 2-Selecione Pasta**: Points to the 'Sentinel' folder selected in the file save dialog.
- 3-Digite AguaDiff_Area.shp**: Points to the 'Save As' text field in the file save dialog.
- 4-Clique**: Points to the 'Save' button in the file save dialog.
- 5-Clique**: Points to the 'Ok' button in the Geometric Operations dialog.

The Geometric Operations dialog includes the following sections:

- Input Layer:** AguaDiff_20170614_20160905
- Select attributes to output layer:** FID, FID
- Geometric Operation:** Convex Hull, Centroid, Minimum Area
- Tabular Operation:** Area (checked), Line, Perimeter
- Methodology:** By object (selected), All layer dissolved, Dissolve by attribute
- Output:** Repository: Sentinel/AguaDiff_Area.shp, Layer Name: AguaDiff_Area.shp

Name	Date...odified	Size	Kind
AguaDiff_20170614_20160905_UTM.dix	10:42	64 KB	Document
AguaDiff_20170614_20160905_UTM.shx	10:42	9 KB	Document
AguaDiff_20170614_20160905_UTM.shp	10:42	671 KB	ESRI S...cument
AguaDiff_20170614_20160905_UTM.dbf	10:42	14 KB	OpenO...cument

Calculando Área Inundada Área de Polígono

1-Seleccione

The screenshot shows the TerraView 5.4.2 interface. On the left, the 'Layer Explorer' panel lists several layers, with 'AguaDiff_Area' selected. The main map area displays a topographic map with a pink polygon representing a flooded area. A red arrow points from the '1-Seleccione' text to the selection tool icon in the toolbar. Another red arrow points from the '2-Seleccione Polígono' text to the pink polygon on the map. A third red arrow points from the 'Área' text to the 'area' property in the 'Information' panel. The 'Information' panel shows the following properties:

Property	Value
Layer	AguaDiff_Area
FID	20
AguaDiff_A	20
area	28473021.894
OGR_GEOMETRY	multipolygon(((...

Calculando Área Inundada Área de Todos os Polígonos

The screenshot displays the TerraView-5.1.2 interface. The main window shows a map with a pink-shaded area representing a flooded region. On the left, the 'Layer Explorer' panel lists several layers, including 'Agua20160905.tif', 'Agua20170614_2.tif', and 'Visual'. A context menu is open over the 'Visual' layer, showing options like 'Remove Item(s)', 'Remove Selection', 'Invert Selection', and 'Show Table'. Two red annotations are present: '1-Selezione' with an arrow pointing to the 'Visual' layer, and '2-Clique' with an arrow pointing to the 'Show Table' option in the context menu.

Calculando Área Inundada

Área: Estatística



1-Botão Direito

	FID	AguaDiff_A	area
1	0	0	214993.501...
2	1	1	127291.6251...
3	2	2	7761.789601...
4	3	3	2328.535279...
5	4	4	776.169071...
6	5	5	776.168880...
7	6	6	358...
8	7	7	776.162108...
9	8	8	114093.673...
10	9	9	776.150383...
11	10	10	776.146970...
12	11	11	1974474.24...
13	12	12	667 234954...

2-Selezione

Área Total

Statistics: area	
Parameter	Value
1 Minimum value	79.44345160482473
2 Maximum value	29473021.994092792
3 Total number of values	1157
4 Total not null values	1157
5 Mean	72820.473523542139
6 Sum of values	84253287.86673826
7 Standard deviation	983787.72866874968
8 Variance	967838295079.21753
9 Skewness	25.021440314017195
10 Kurtosis	712.31440103735201
11 Amplitude	29472942.550641187
12 Median	724.36707725760118
13 Coefficient variation	1350.9768353136303
14 Mode	

Save Cancel

Exportar KML

2-Clique

8-Digite Arealnundada20170614.kml

1-Seleccionar

6-Selezione Pasta

3-Selezione

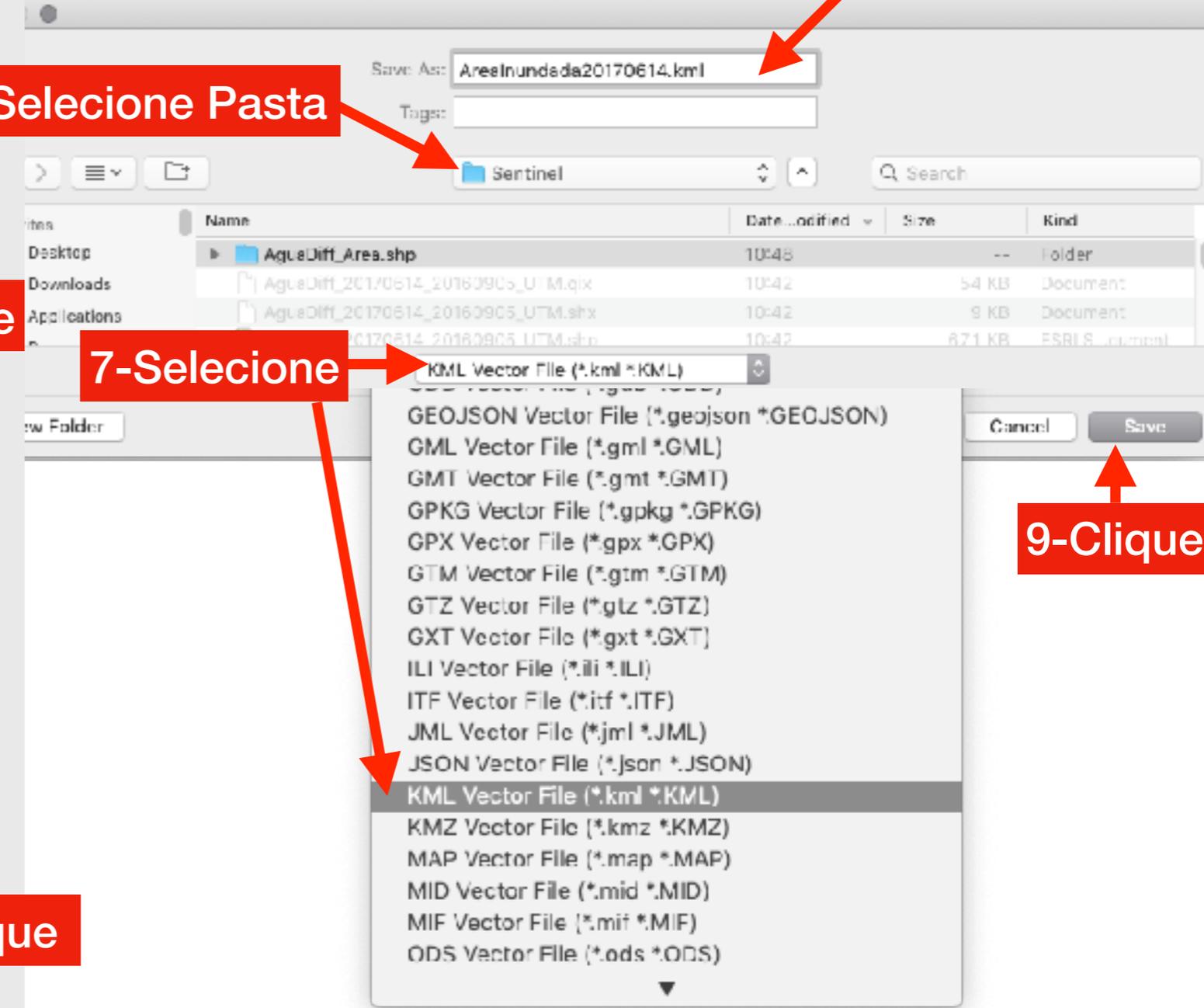
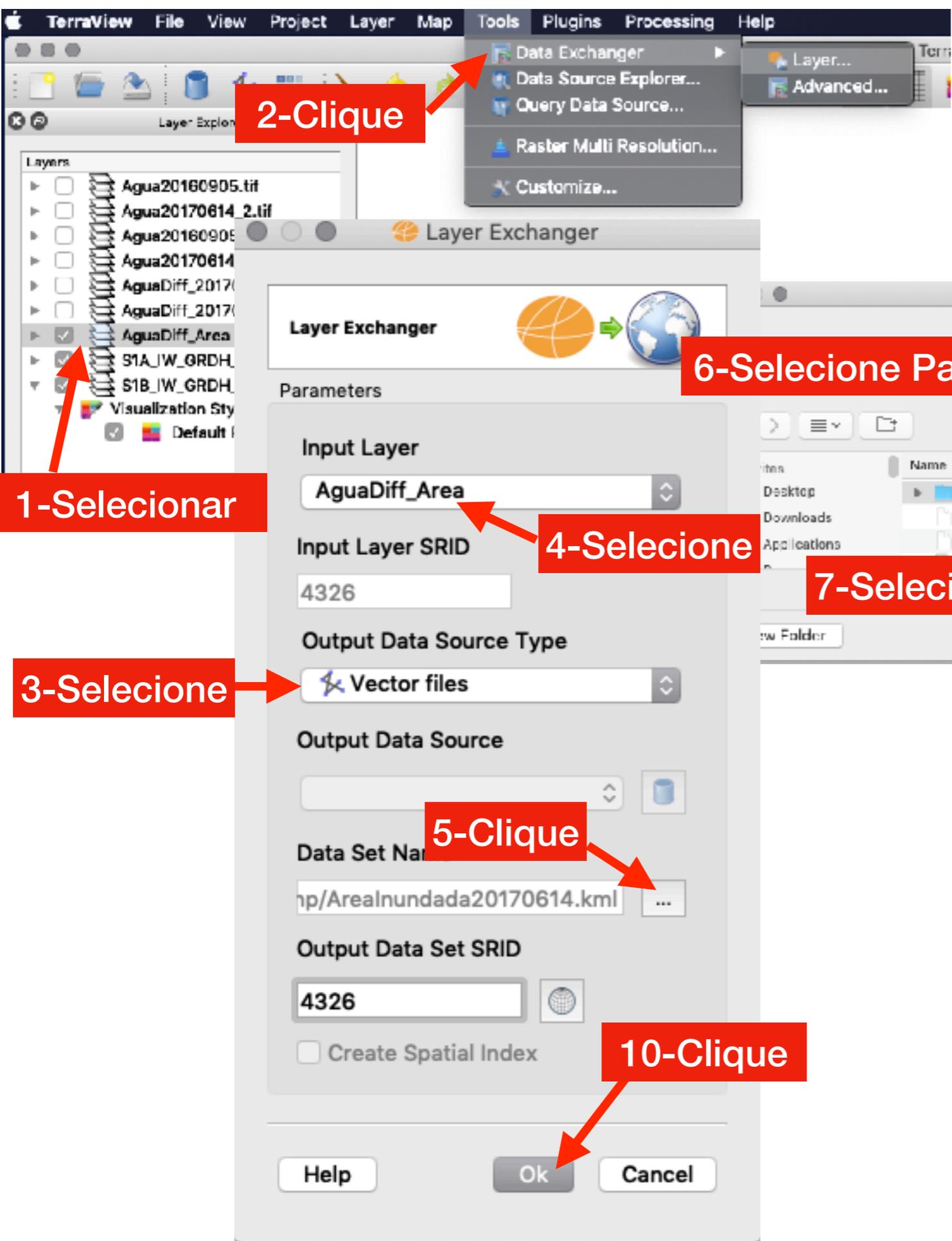
4-Selezione

7-Selezione

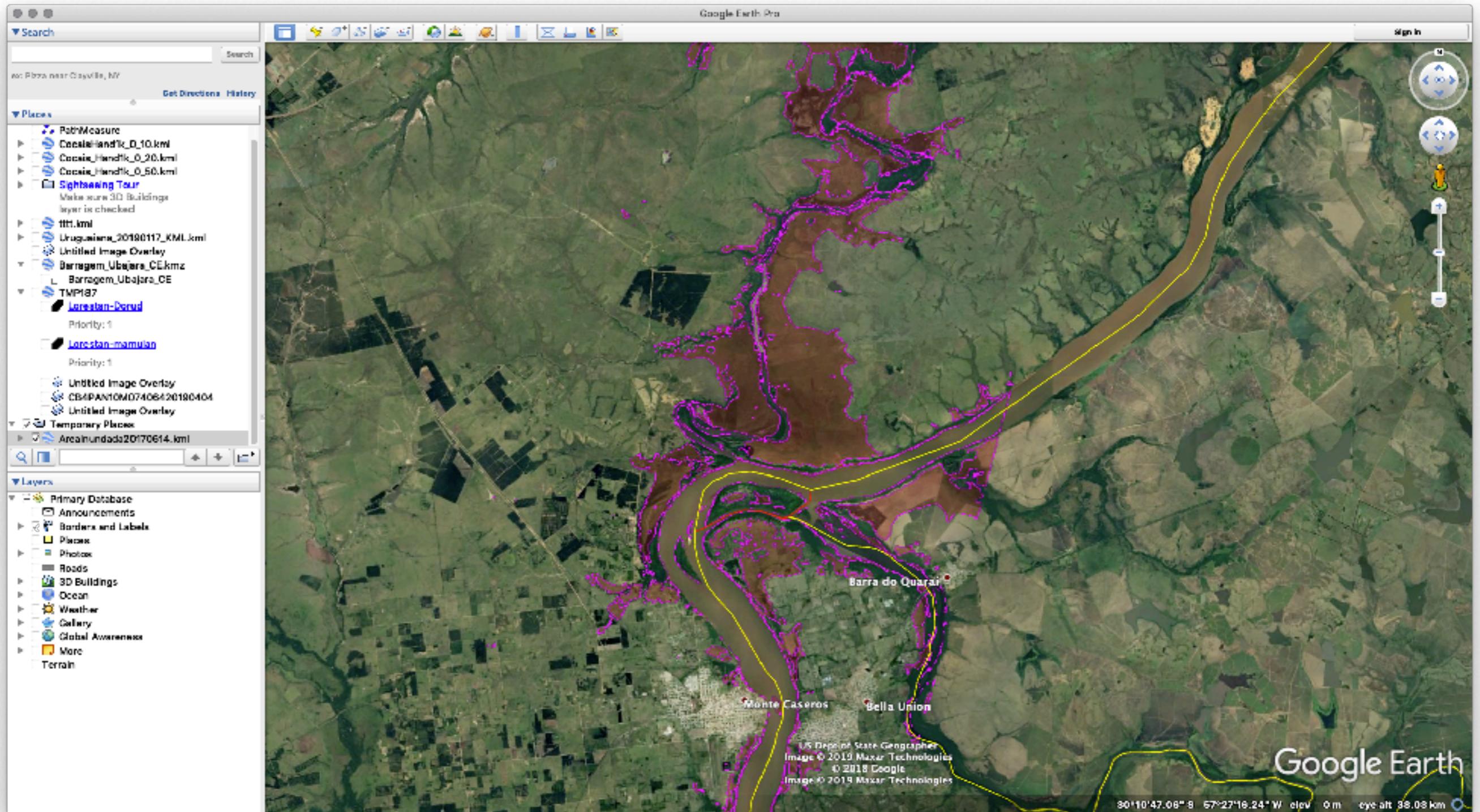
5-Clique

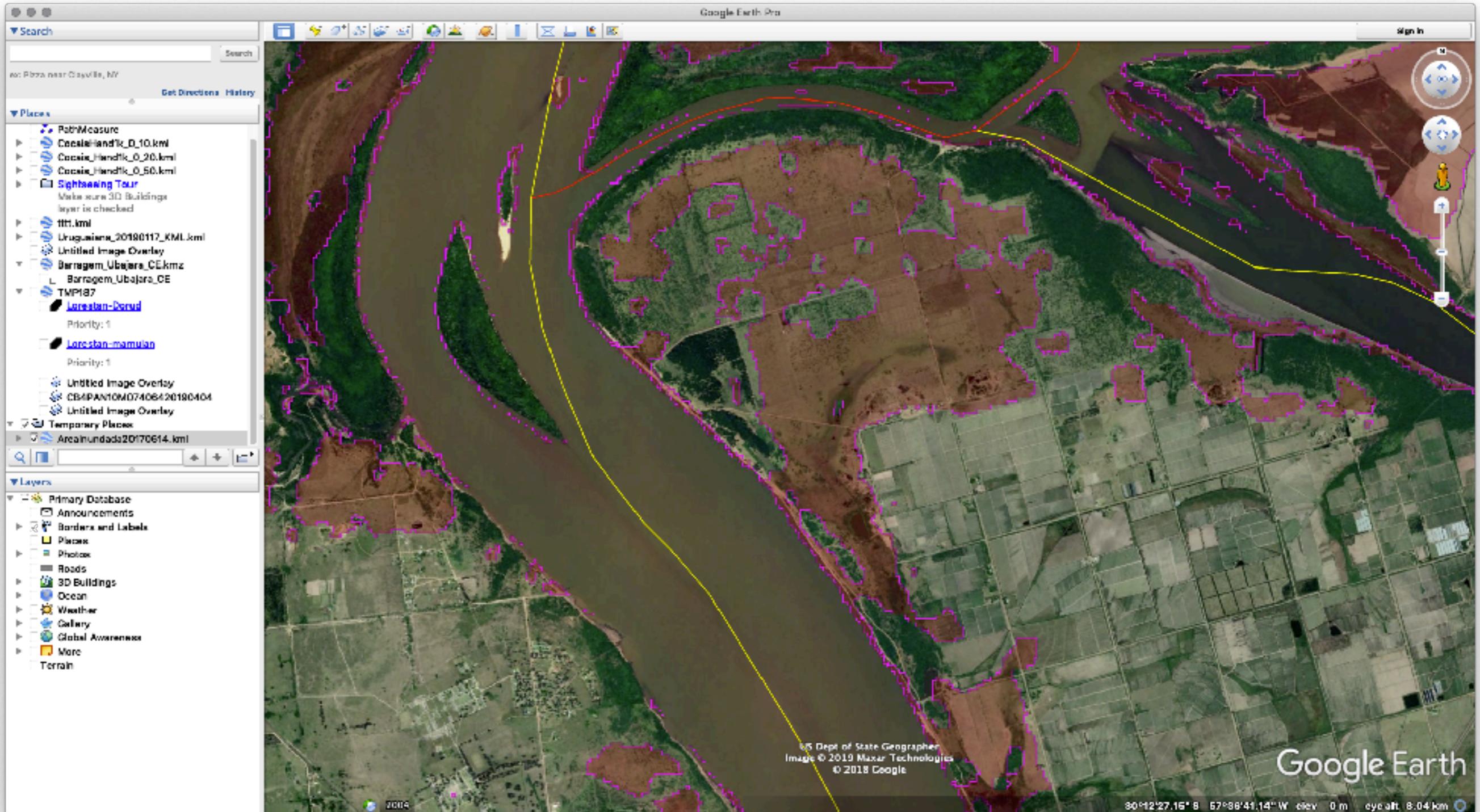
9-Clique

10-Clique



Visualiza KML





Search

Search

no: Plaza near Cayula, NY
Get Directions History

Places

- PathMeasure
- CocaineLandK_0_10.kml
- Cocaine_LandK_0_20.kml
- Cocaine_LandK_0_50.kml
- Sightseeing Tour
 - Make sure 3D Buildings layer is checked
- tit1.kml
- Uruguayana_20190117_KML.kml
- Untitled Image Overlay
- Barragem_Ubajara_CE.kmz
 - Barragem_Ubajara_CE
- TMP187
 - Lorestan-Dorud
 - Priority: 1
 - Lorestan-mamulan
 - Priority: 1
 - Untitled Image Overlay
 - CBMPANTOM07406420190404
 - Untitled Image Overlay
- Temporary Places
- AreaInundada20170614.kml

Layers

- Primary Database
- Announcements
- Borders and Labels
- Places
- Photos
- Roads
- 3D Buildings
- Ocean
- Weather
- Gallery
- Global Awareness
- More
- Terrain

