

SAOCOM MISSION/SIASGE

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Buenos Aires, ARGENTINA



- ↳ Organismo del **Estado Nacional** con competencia para proponer las políticas que permiten **promover y ejecutar** en la Rep. Argentina las **actividades en el área espacial** con fines pacíficos (Decreto de Creación: 995/91)
- ↳ Se le asigna a la CONAE proponer e implementar un **Plan Nacional Espacial** como Política de Estado de prioridad nacional

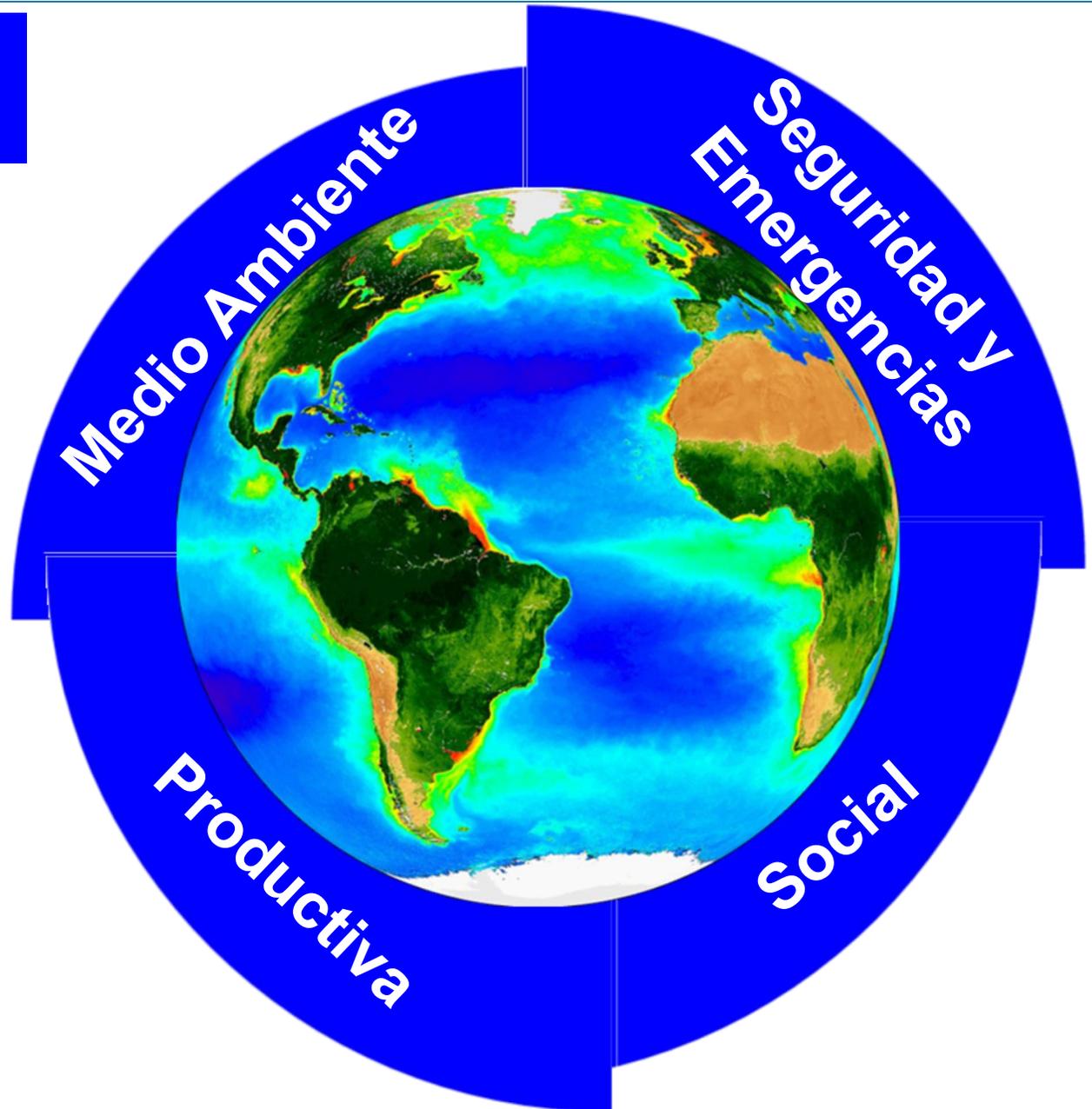


Objetivos Principales de la CONAE (PNE)



- ✓ **Desarrollar** conocimiento y tecnología en el área espacial para los sectores sociales, económicos y productivos
- ✓ **Impulsar** el desarrollo de la industria nacional
- ✓ **Satisfacer** las **demandas** y **necesidades** de los sectores **económicos** y de la **sociedad** en lo que hace a la información de origen espacial, ofreciendo la **capacitación** necesaria

Áreas Estratégicas





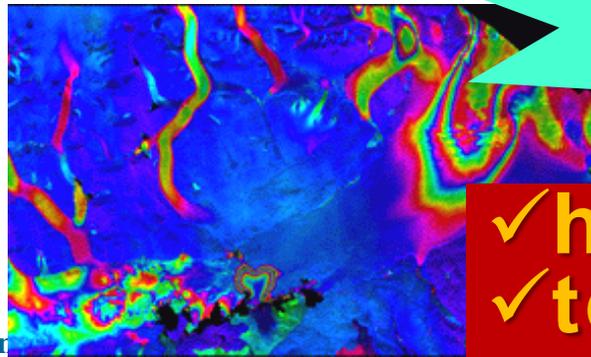
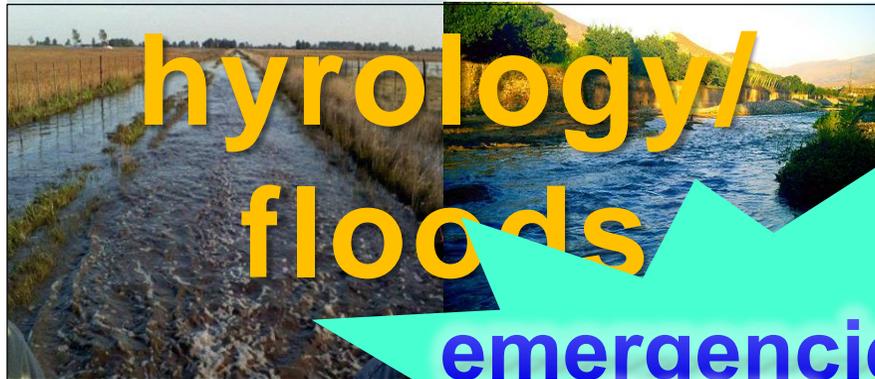
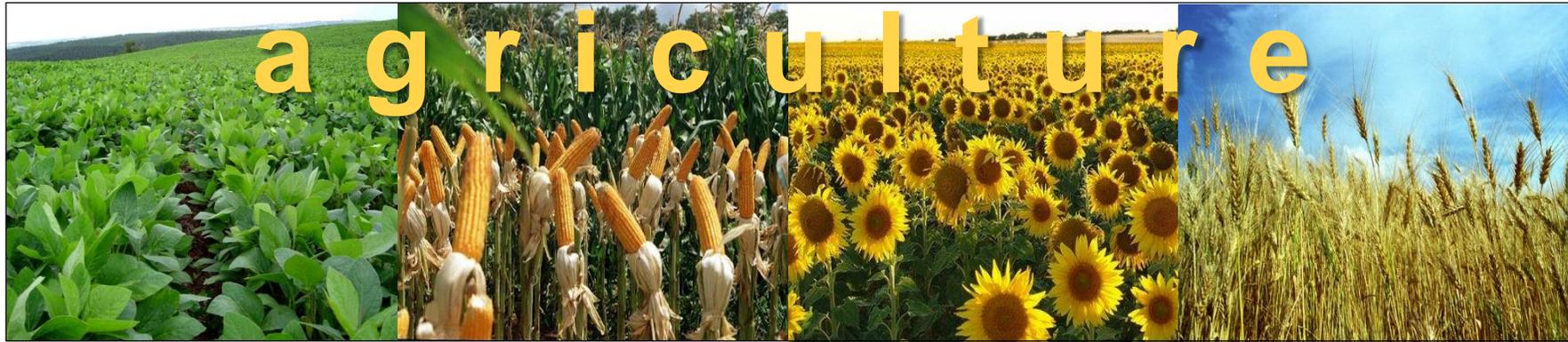
To satisfy **user needs**



To satisfy Space Information Sectors-**National Space Program**



To operationally integrate **SIASGE** composed by the **SAOCOM Constellation** and the **COSMO-SkyMed Constellation**

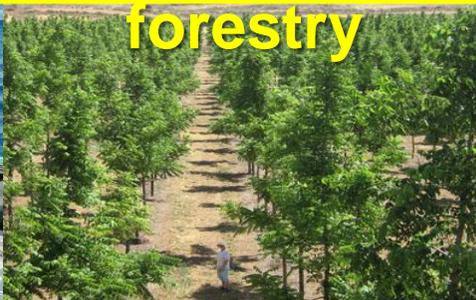
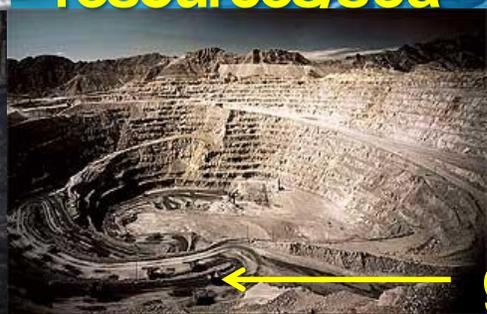
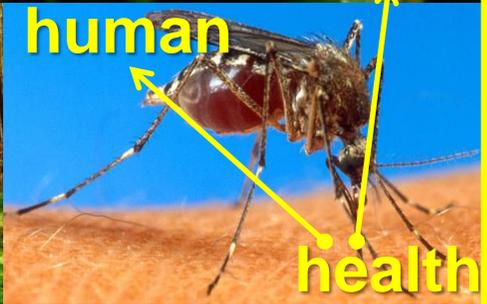


- ✓ heights
- ✓ terrain displacements



Information Sectors of the National Space Program



<p>agriculture</p>  <p>✓</p>	<p>fishing</p> 	<p>forestry</p> 	<p>climate</p> 
<p>hydrology</p>  <p>✓</p>	<p>oceanography</p>  <p>environment and natural resources/sea</p>	<p>emergencies</p>  <p>✓</p>	
<p>emergencies</p>  <p>✓</p>	 <p>←</p>	 <p>geology &</p>	 <p>vegetable</p>
<p>cartography and territorial planning</p> 	 <p>←</p> <p>environment and natural resources/land</p>		<p>human</p>  <p>↑</p> <p>health</p>

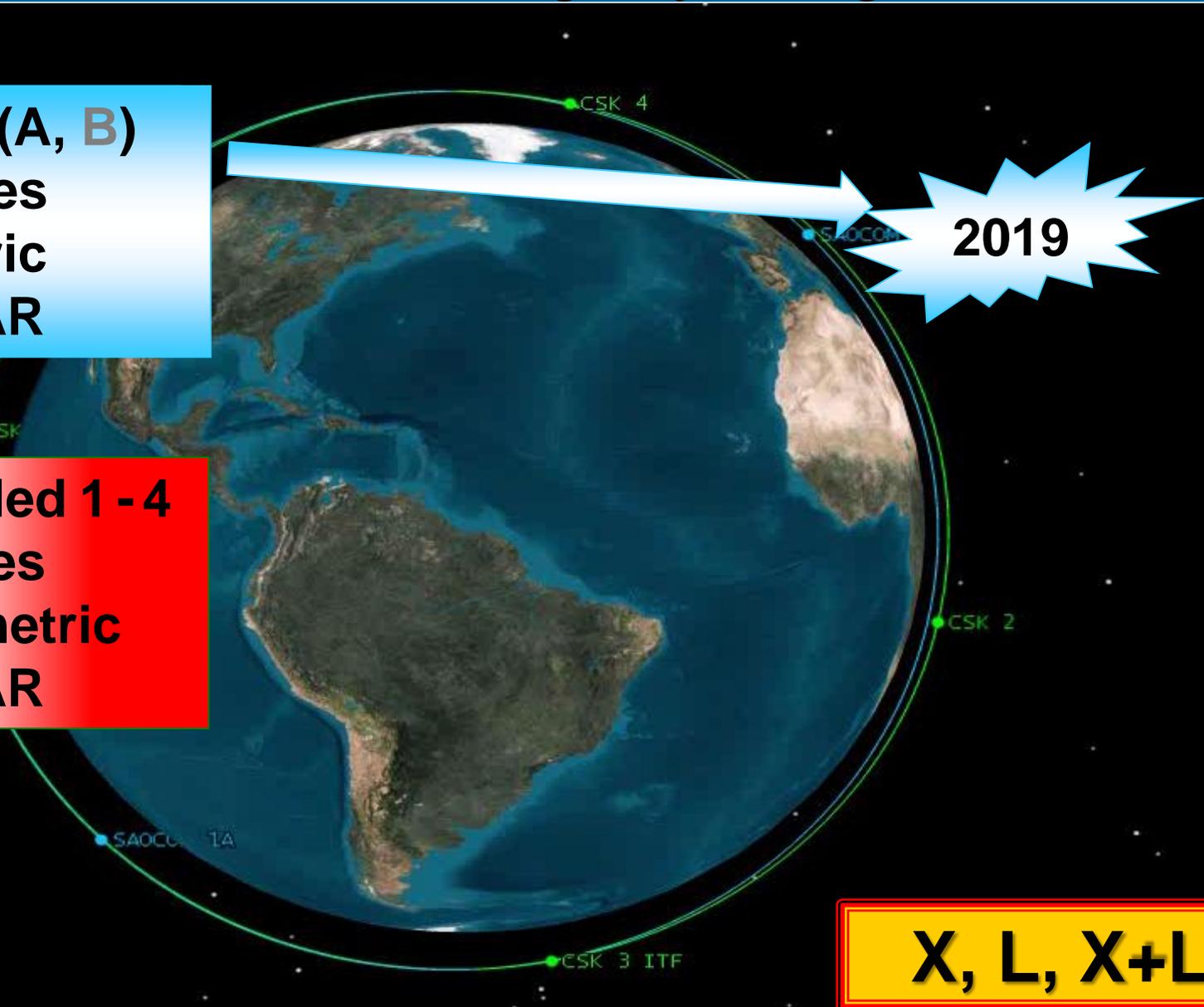


SIASGE: Italian-Argentinian System of Satellites for Emergency Management



2 SAOCOM 1 (A, B)
microwaves
polarimetric
L band SAR

4 COSMO SkyMed 1 - 4
microwaves
cuasi-polarimetric
X band SAR



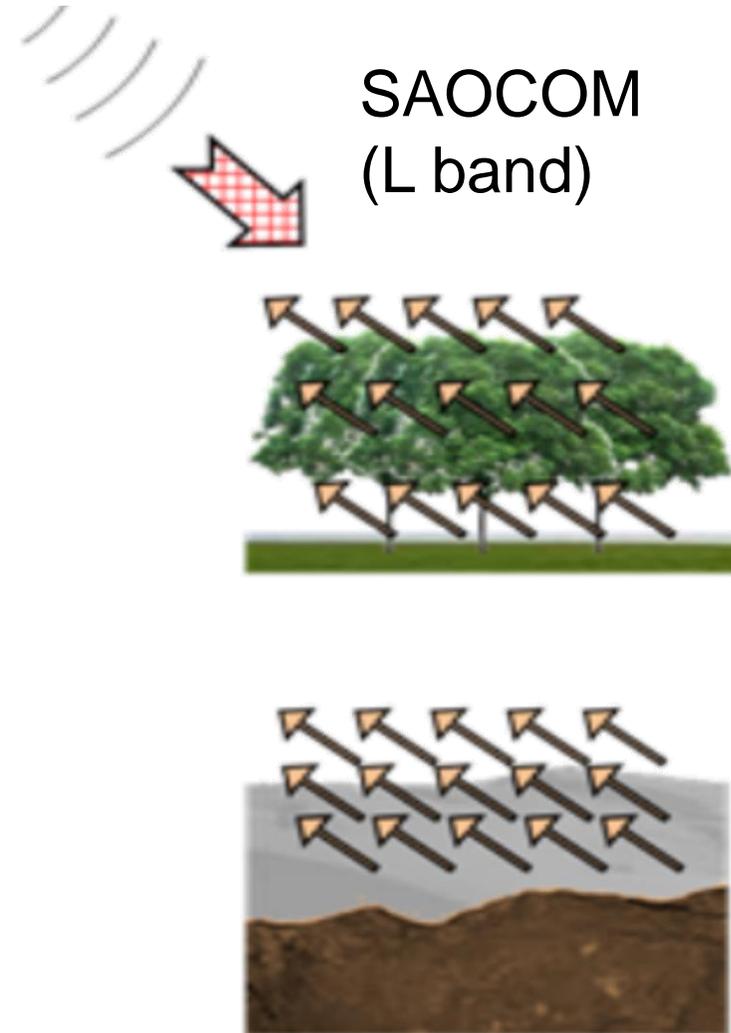
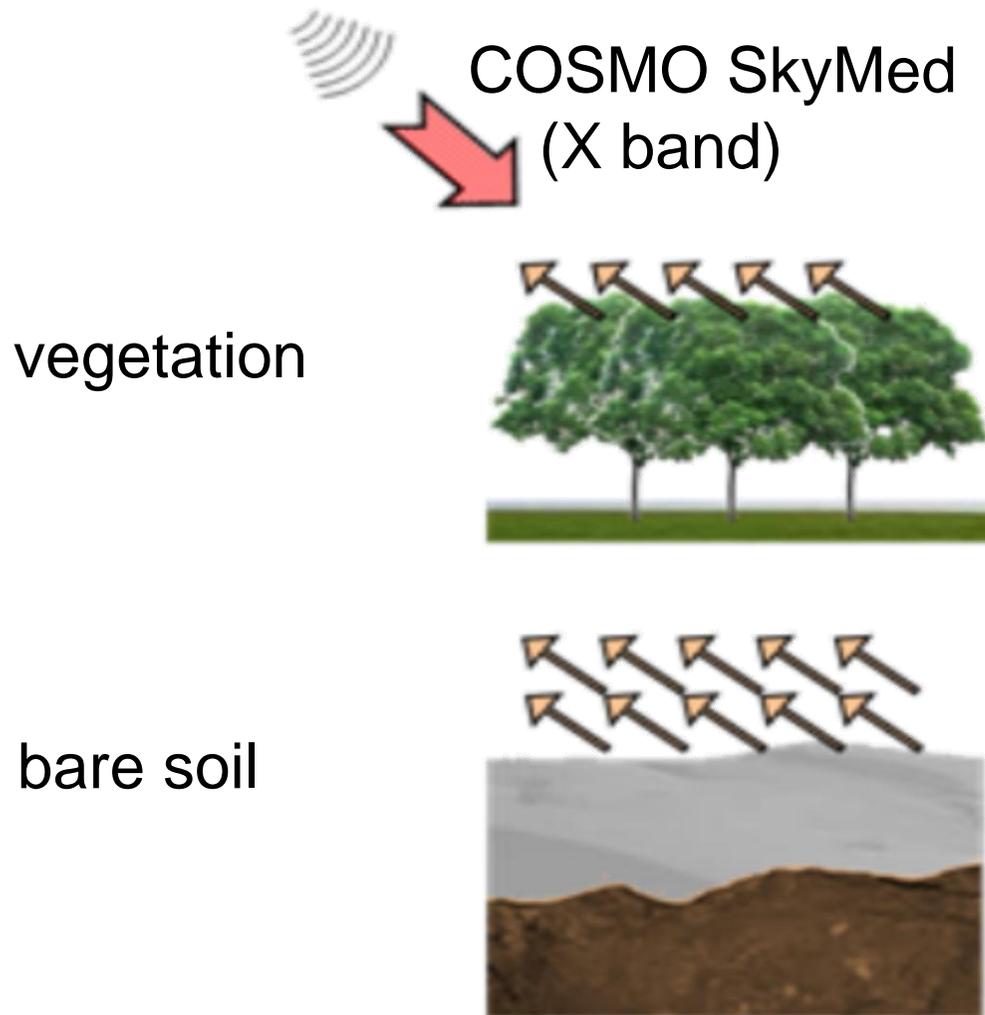
X, L, X+L



Benefits of SIASGE^(1/5)



penetration capability according to the surface type



➤ images of the same place acquired:

↪ cuasi-simultaneous → **10 min**

↪ different spatial resolutions → **1 - 100 m**

↪ different swaths → **10 - 350 km**

↪ revisit → **12 hours/8 days**

↪ two bands, **X** and **L** (polarimetric)

*** different penetration capability for X and L ***
Santa Fe city and surroundings



ALOS-1 PALSAR – L band
FBS Mode – HH Polarization
February 14th, 2010
© JAXA/METI 2010



COSMO-SkyMed – X band
Himage Mode –HH Polarization
February 19th, 2010
COSMO-SkyMed - ©ASI (2010) Product. Provided by ASI to
CONAE in the frame of SIASGE

**** synergy between X and L bands **** Santa Fe city and surroundings

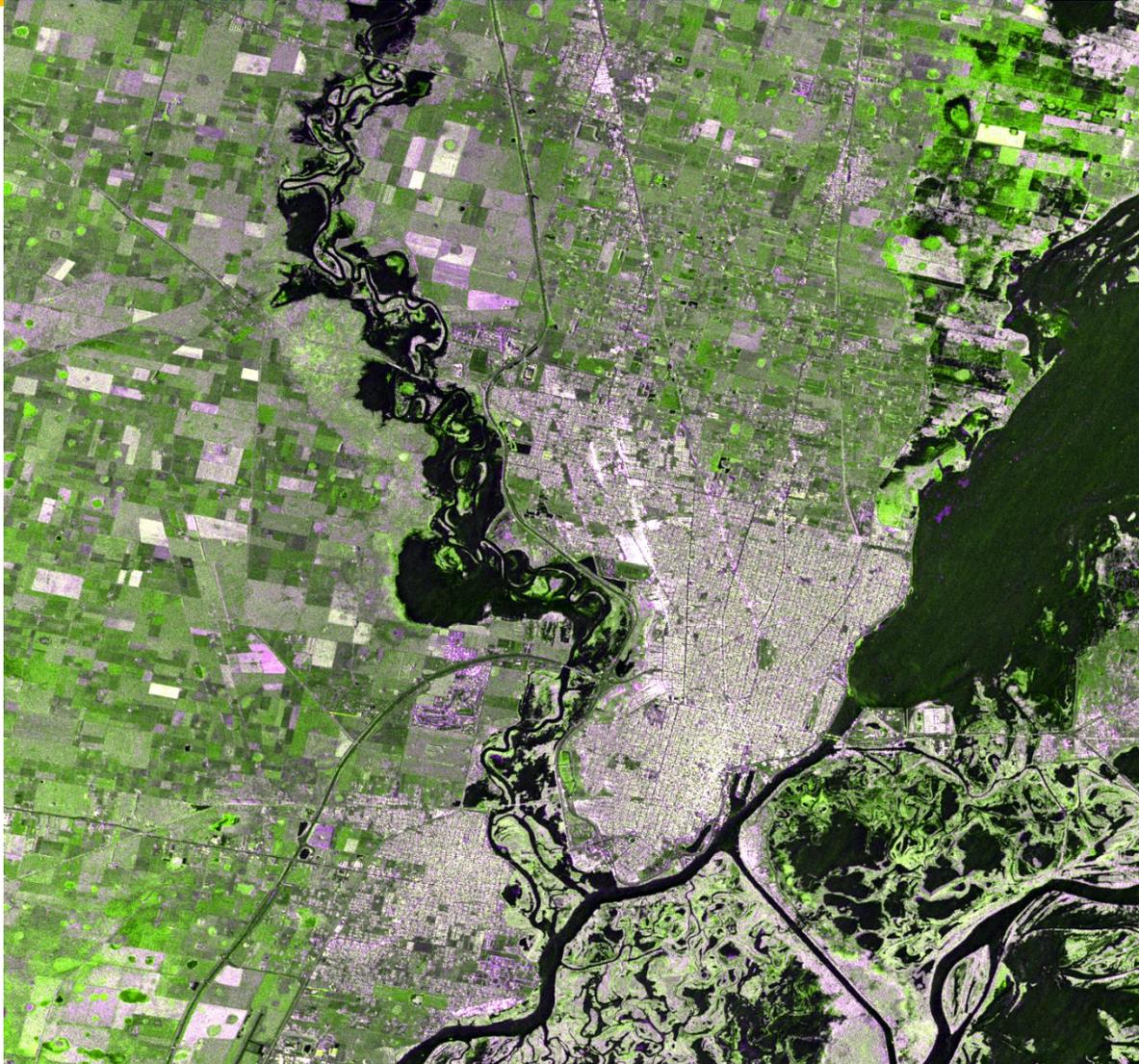


image fusion:

ALOS-1 PALSAR
and
COSMO-SkyMed

B: ALOS-1 PALSAR
G: COSMO-SkyMed
R: Re-escalado y Promedio



Nominal Modes



acquisition mode	polarization mode	swath width	spatial resolution	minimum incidence angle range
StripMap	SP: HH or VV	> 40 km	< 10 m	21° - 50°
	DP: HH/HV or VV/VH	> 40 km	< 10 m	21° - 50°
	QP: HH/HV/VH/VV	> 20 km	< 10 m	20° - 35°
TOPSAR Narrow	SP: HH or VV	> 150 km	< 30 m	25° - 45°
	DP: HH/HV or VV/VH	> 150 km	< 30 m	25° - 45°
	QP: HH/HV/VH/VV	> 100 km	< 50 m	20° - 35°
TOPSAR Wide	SP: HH or VV	> 350 km	< 50 m	25° - 45°
	DP: HH/HV or VV/VH	> 350 km	< 50 m	25° - 45°
	QP: HH/HV/VH/VV	> 220 km	< 100 m	20° - 35°
	CL-POL: R or L circular (transmission) H and V linear (reception)	> 350 km	< 50 m	25° - 45°

Compact Pol Mode

SARAT SAR-L



Transmission:
right circular

Reception:
H&V linear

RH-RV

RH

RH+RV



Experimental site and surroundings at CETT



- ✓ 2012 –
- ✓ 65 in-situ stations
- ✓ 108 sensors:
 - soil moisture
 - temperature
 - permittivity
 - salinity



Baseline mission

(fixed acquisitions)

- soil moisture over Pampas (agriculture/cattle production)



- maritime over Argentina

- calibration purposes:
 - ↳ the rain forest
 - ↳ specific point targets



Foreground mission

(mix: fixed acquisitions in a time window, and variable acquisitions)

- users
- over Argentina:
 - ↳ emergencies

Background mission

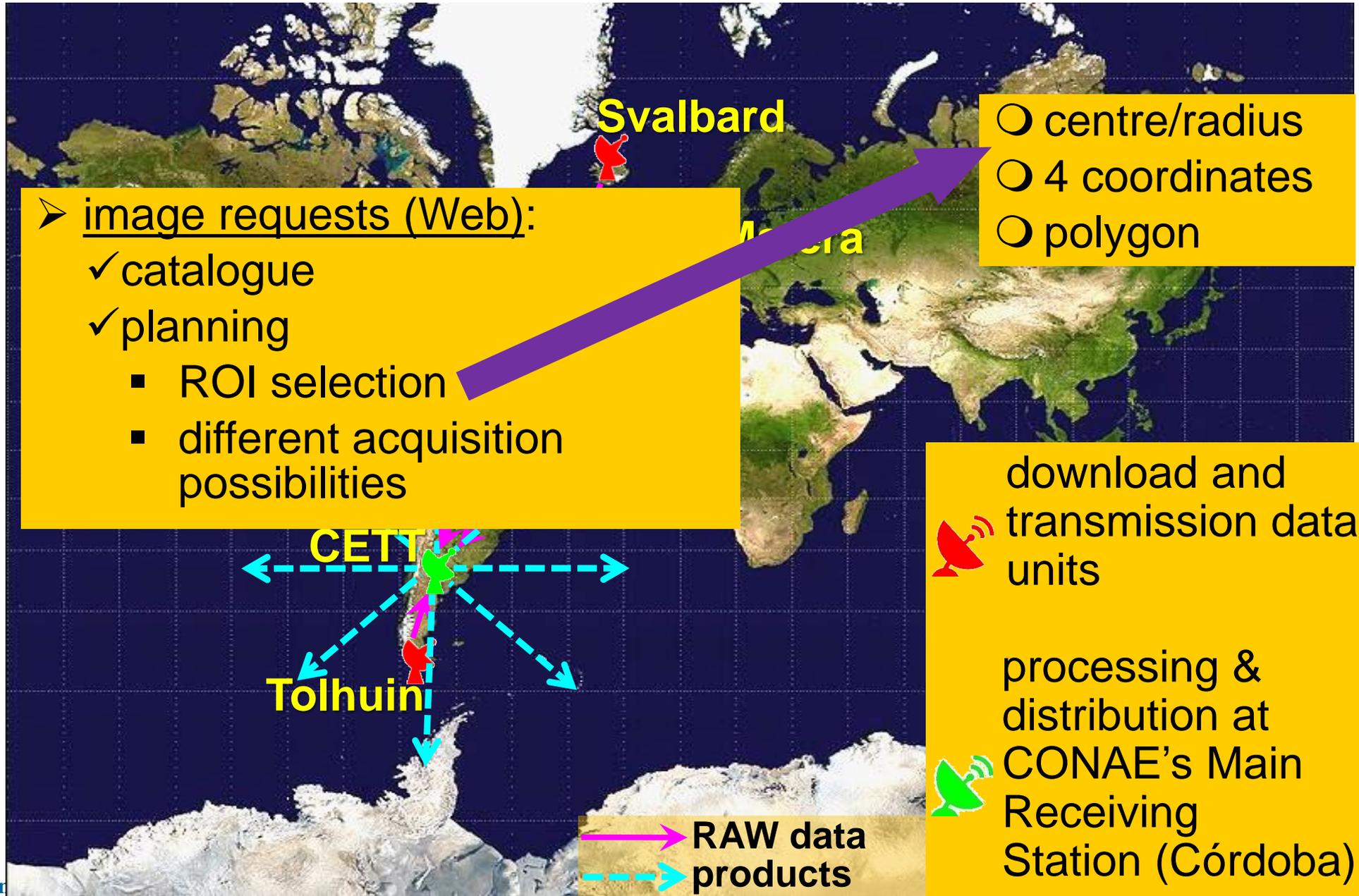
(useful data base)

- Over Argentina:
 - ↳ forest biomass
 - ↳ the mountain chain at the West (the Andes): plates and glaciers movement
- Over Latin America and the rest of the world:
 - ↳ forest biomass
 - ↳ polar regions





Data Download and Distribution





- ✓ **Level 0**: Annotated Raw Data – AR

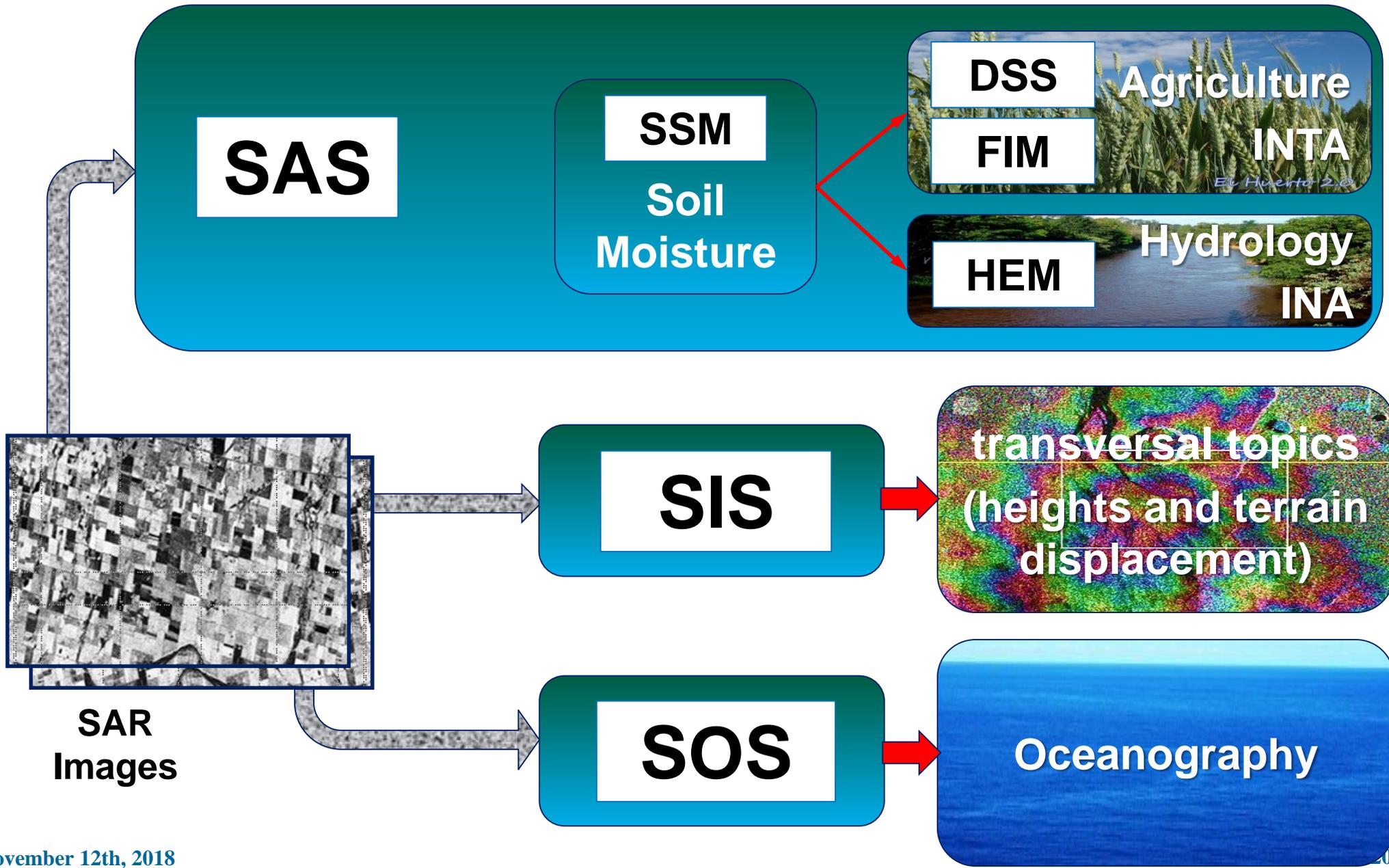
- ✓ **Level 1** (distributed)
 - ↪ **Level 1A**: Single Look Complex – SLC
 - ↪ **Level 1B**: Detected Image – DI
 - ↪ **Level 1C**: Ground Ellipsoid Corrected – GEC
 - ↪ **Level 1D**: Geocoded Terrain Corrected – GTC

- ✓ **Level 2**: Derived products of Higher Level
(on demand, case by case)

	Format: <ul style="list-style-type: none">✓ GEOTIFF + XML (SAO case)✓ HDF5 (SAO/CSK-SIASGE case)
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Level 2: Higher Level Processors

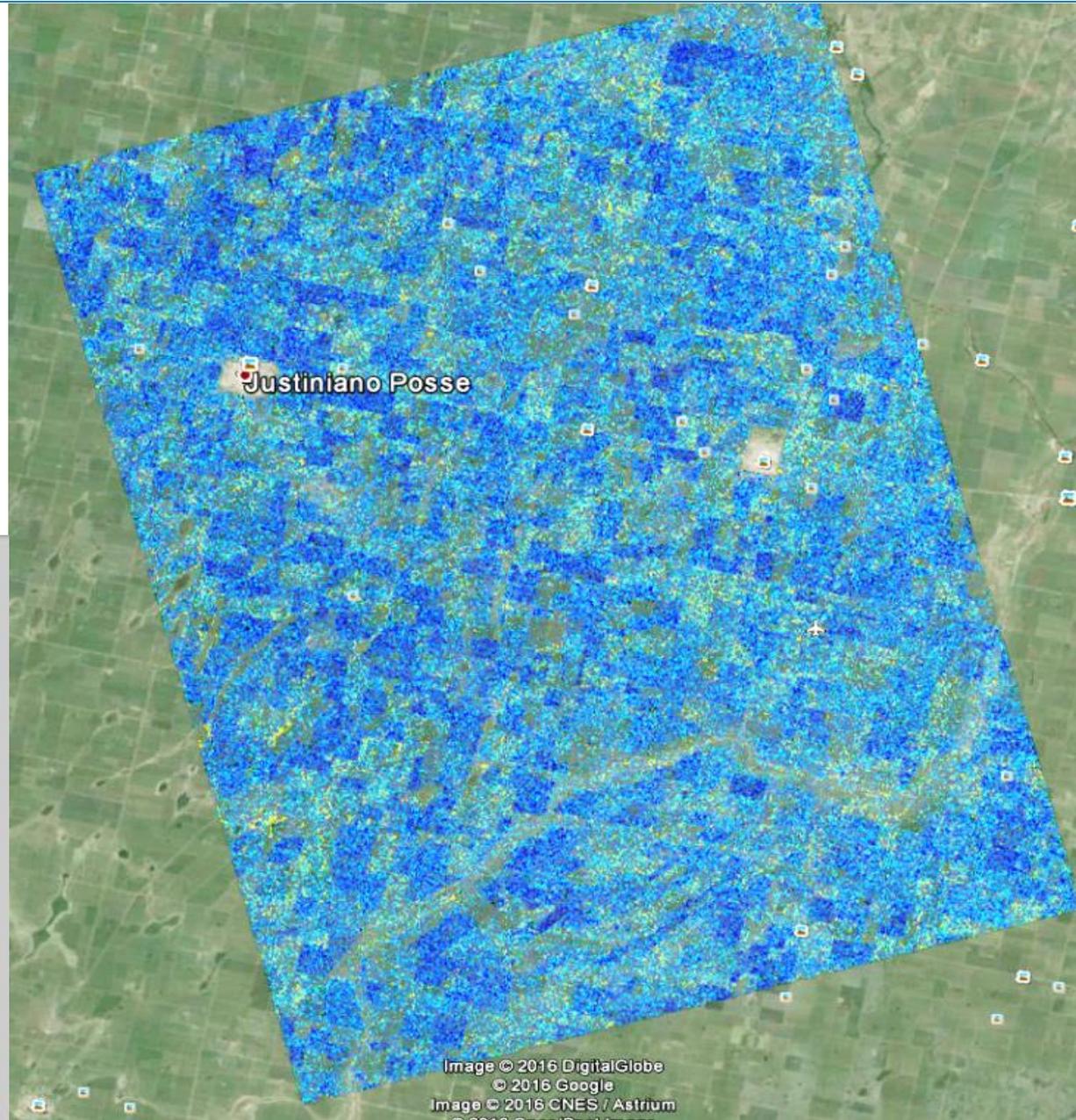




SAS-SSM: Soil Moisture Product



COSMO SkyMed April
2016

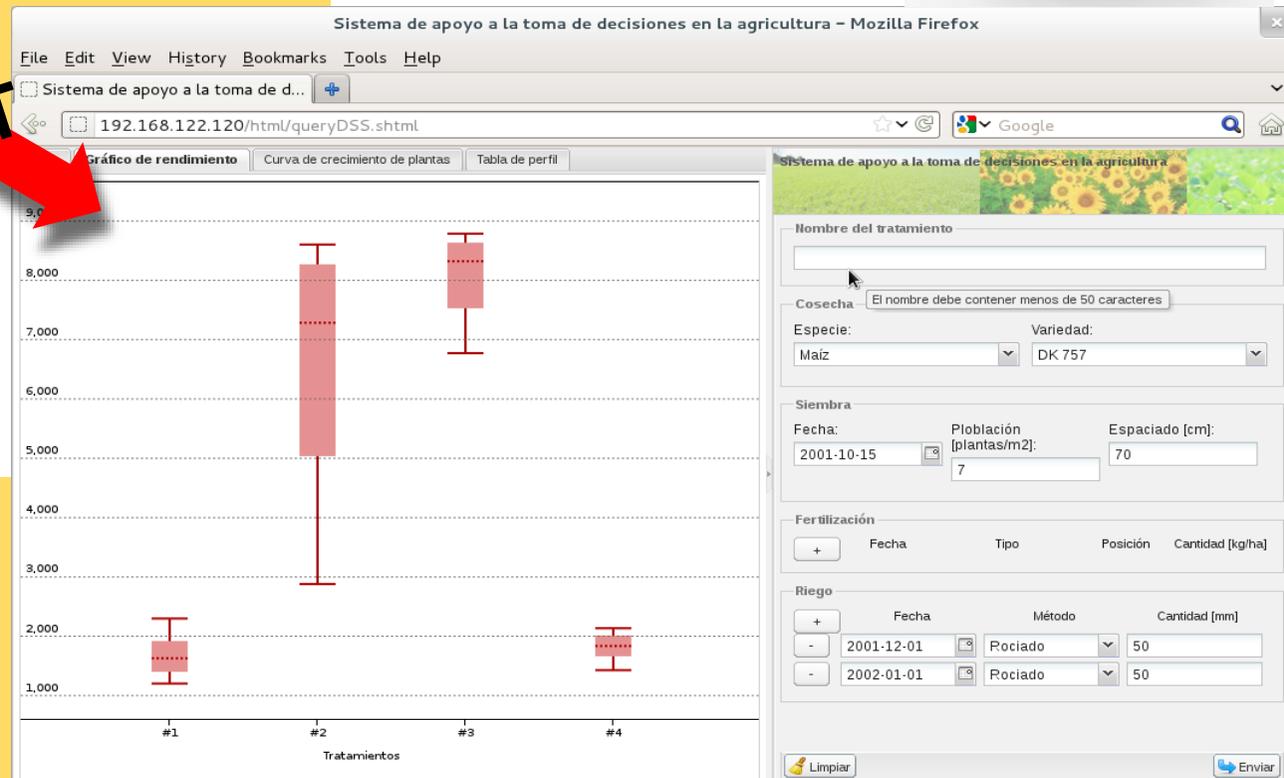




- ✓ different crop yield scenarios
- ✓ geographical coordinates
- ✓ species type
(maize, wheat, sunflower, soybean)
- ✓ seed type
- ✓ timeframe

INPUT

OUTPUT



- Decision support:**
- sowing
 - fertilization
 - watering
 - crop yield estimation
 - soil moisture profile

up to 2 m
in depth



SAS-FIM: Processor for Agriculture



- ✓ geographical coordinates
- ✓ meteorological data
- ✓ sowing data
- ✓ timeframe

Fusarium disease

INPUT



OUTPUT

Map date: 2001-10-30

Location

Latitude: Longitude:

Crop

Species: Variety:

Sowing

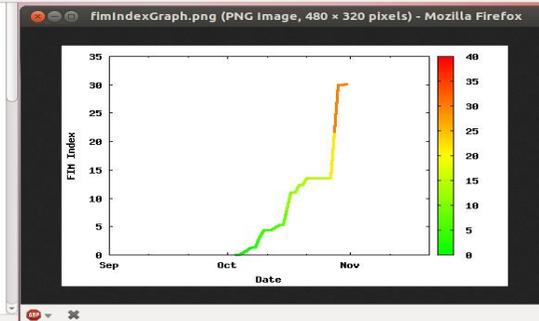
Date:

Plant population [pl/m²]:



Experiment Table - Mozilla Firefox

VARIETY	SOWING DATE	PLANT POPULATION	ROW SPACING	FERTILIZATION DATE	FERTILIZATION TYPE	FERTILIZATION POSITION
ESCORPION	2001-05-29	300	21	2001-05-29	UREA	B...



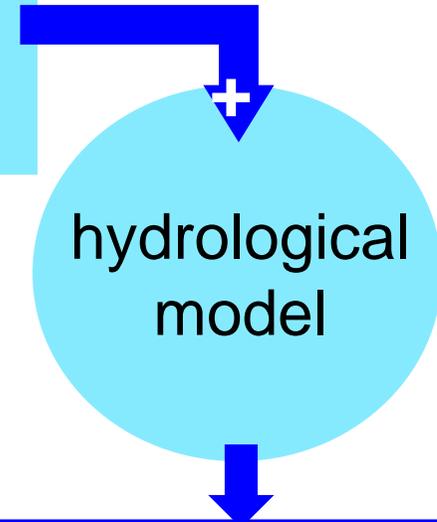
Support :

- affection index
- *fusariosis* status
- optimization in the agrochemical use
- estimation of the progress affection

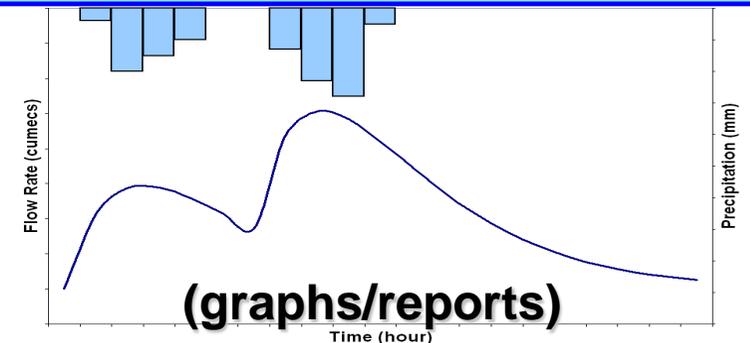
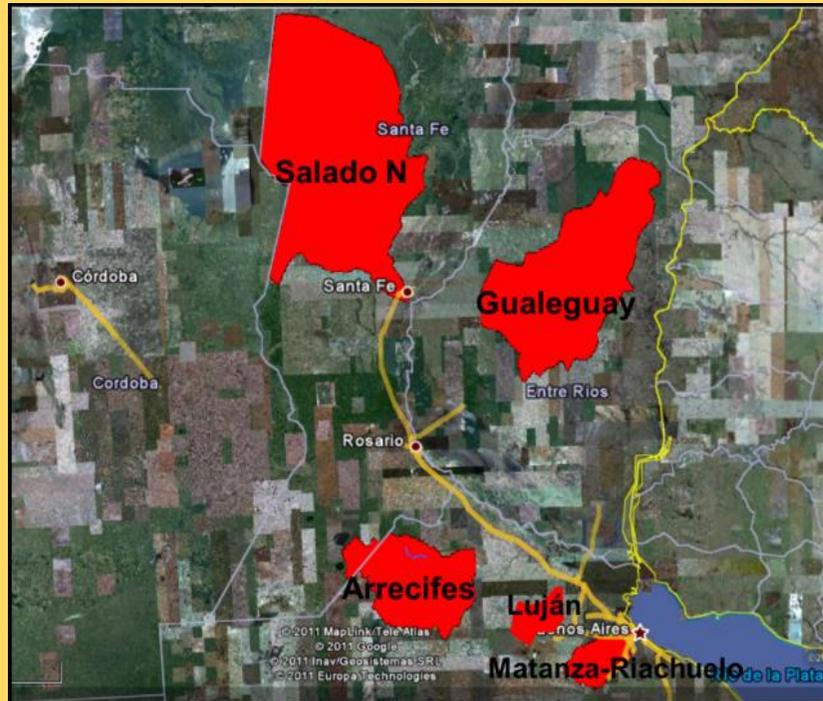
basins:

- ✓ Salado Norte
- ✓ Gualeguay
- ✓ Arrecifes
- ✓ Luján
- ✓ Matanza-Riachuelo
- ✓ Areco

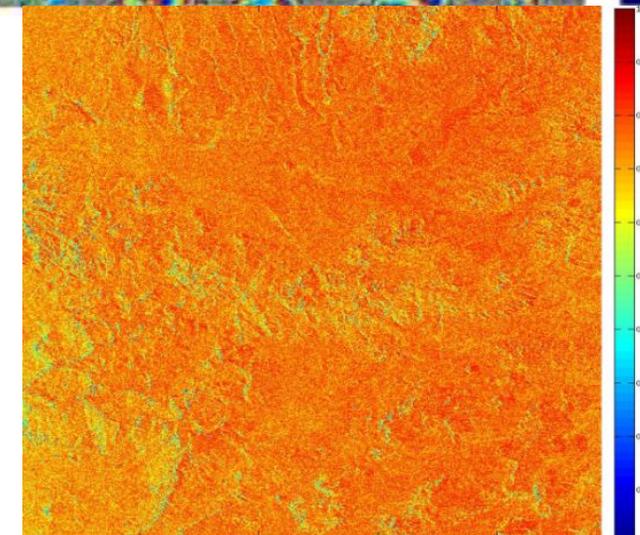
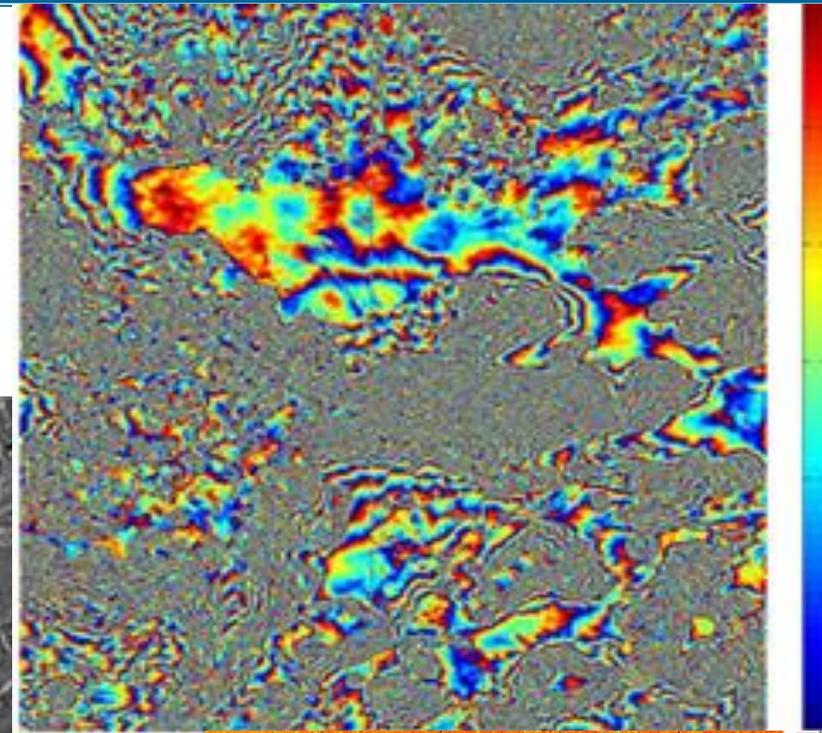
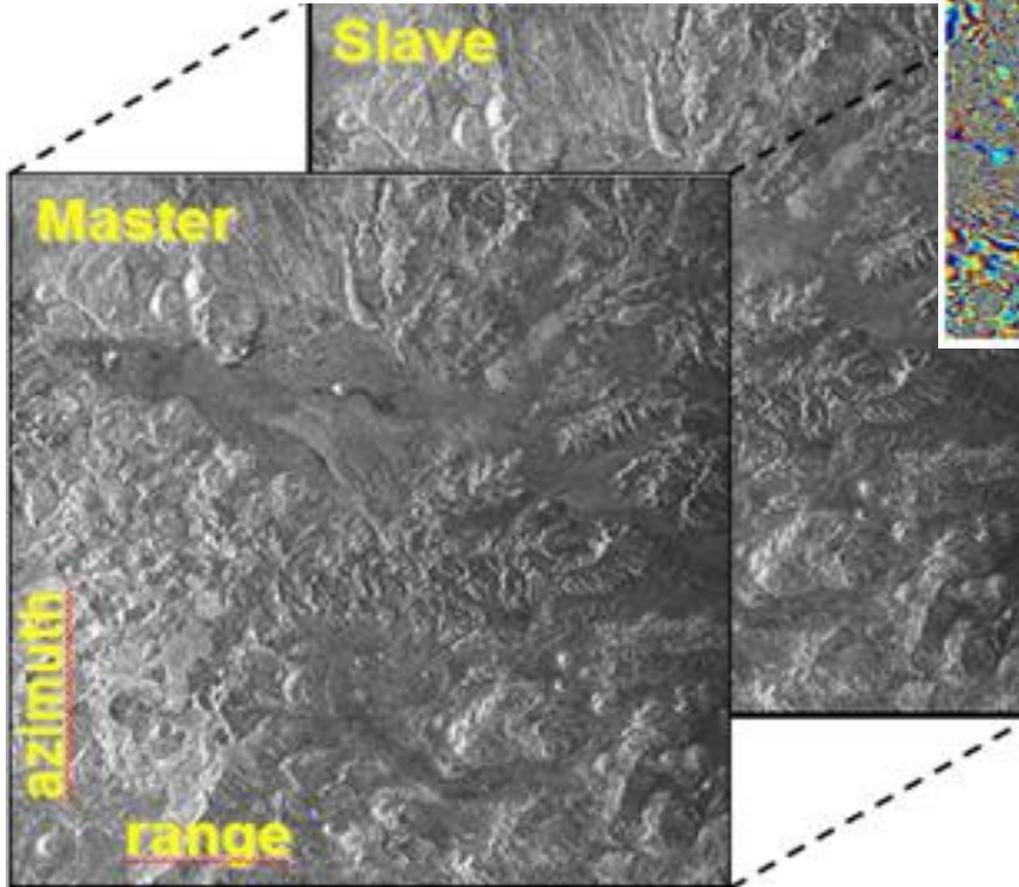
- ❖ precipitation
- ❖ evapotranspiration
- ❖ SM (SAR)



- ✓ deterministic forecast
- ✓ medium and long term probabilistic forecast
- ✓ flood guidance



- ✓ coregistered images pair
- ✓ coregistered interferometric pair
- ✓ interferometric phase image
- ✓ interferometric coherence





Ship detection

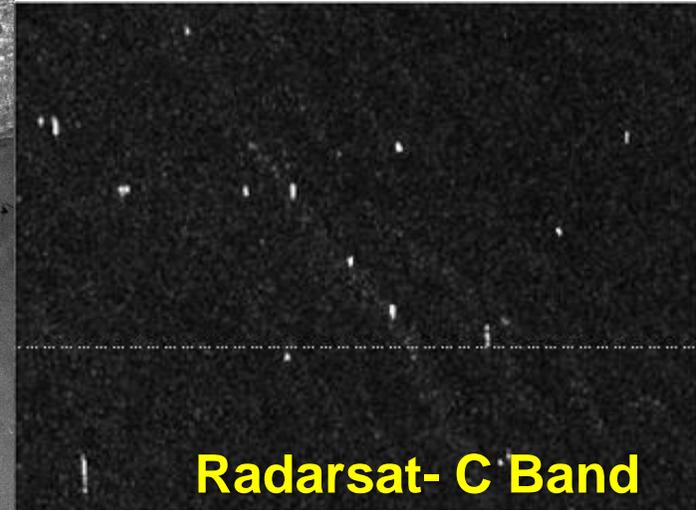


Operative
(COSMO SkyMed)

ERS 1- C Band

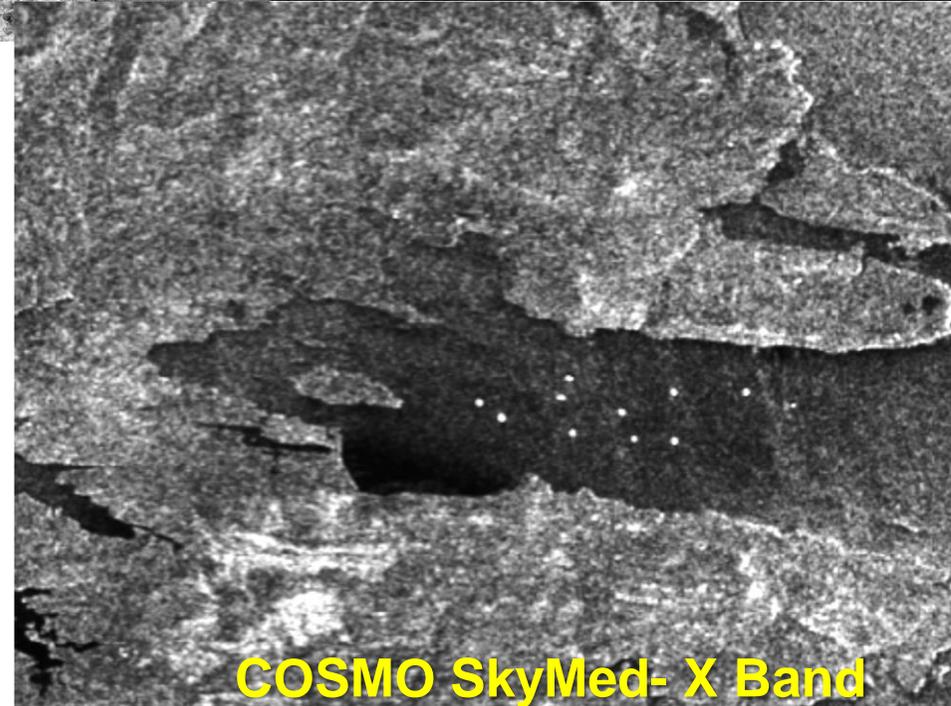


Radarsat- C Band



ships location and size reports

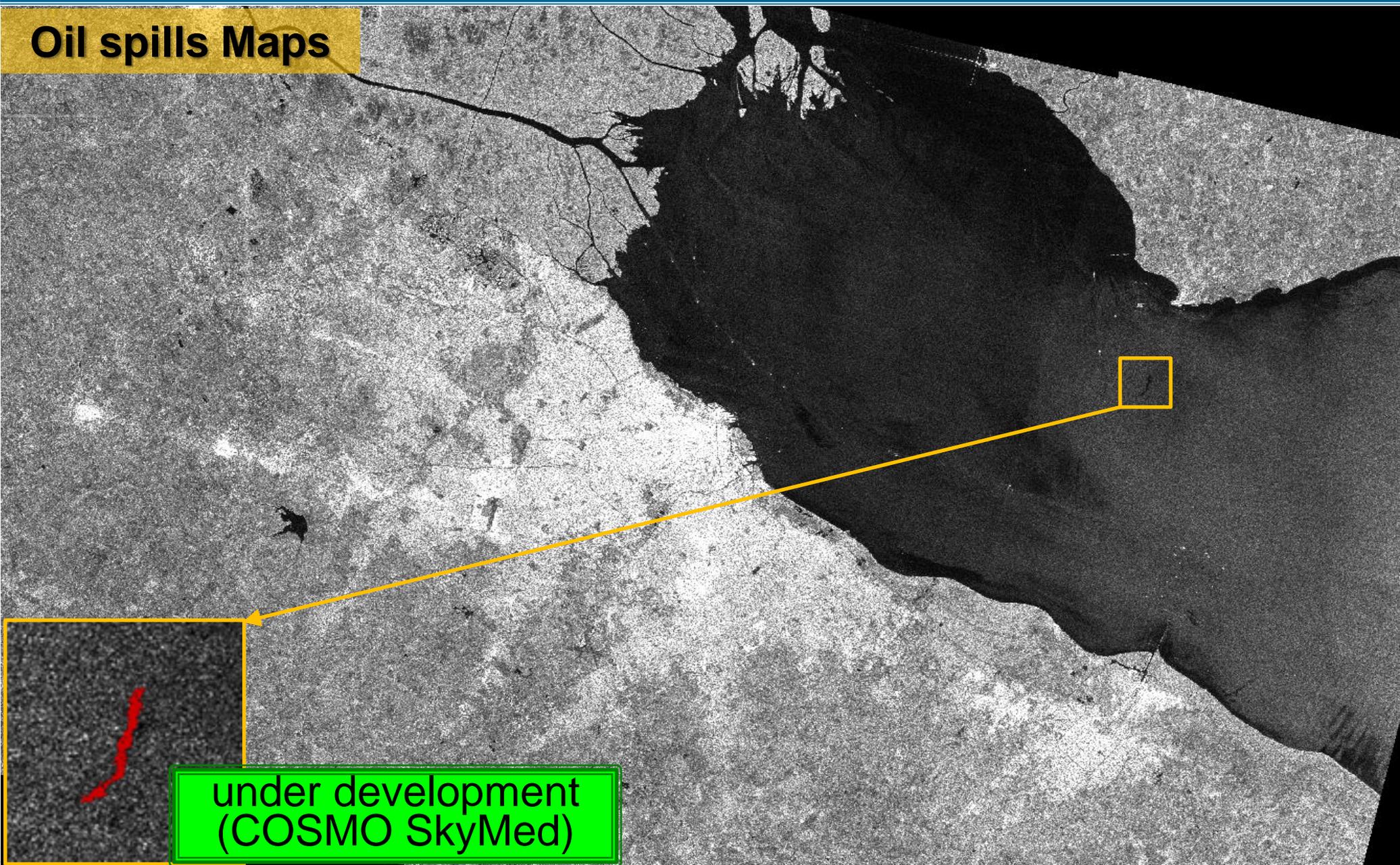
	latitude	longitude	length	beam	length diagonal
12	-35.2742615	-54.7364311	200	250	320
	-35.2724228	-54.7073631	50	50	71
	-35.2636986	-54.8476791	50	50	71
	-35.2580185	-54.4874916	50	50	71
	-35.2278557	-54.6537209	50	50	71
	-35.2243729	-54.5761261	100	100	141
22	-35.2141075	-54.6535683	100	150	180
	-35.2131386	-54.1542015	100	200	224
21	-35.2047997	-54.4666405	150	150	212
7	-35.1942444	-54.256443	250	200	320
	-35.1795384	-54.5922026	250	50	71



COSMO SkyMed- X Band



Oil spills Maps



under development
(COSMO SkyMed)



- ✓ Anuncios de Oportunidad
(incluyen entrenamiento específico)



- ✓ Cursos de entrenamiento específicos y genéricos
(para usuarios con conocimientos y capacidades en general)



- ✓ Espacio y temas de trabajo para ejecución de becas otorgadas por otras instituciones (CONICET, Universidades, etc.)

AO-DEM



BASES

ANUNCIO DE OPORTUNIDAD PARA EL DESARROLLO DE MODELOS DIGITALES DE ELEVACIÓN Y SU USO EN APLICACIONES SAR

- ↪ técnicas de procesamiento para desarrollo de **DEMs**
- ↪ metodologías para su **generación y validación**
- ↪ **técnicas interferométricas**
- ↪ desarrollo de **productos derivados**

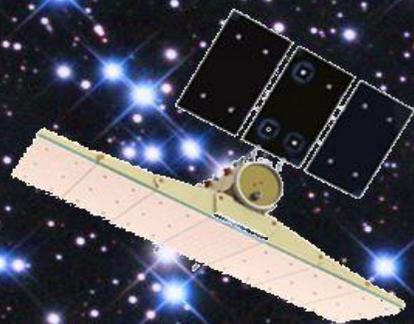
COMISION NACIONAL DE ACTIVIDADES ESPACIALES
BUENOS AIRES - ARGENTINA





1 mes

444 órbitas!!!!



Thank you!!!

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