



***SECOND WORKSHOP ON
INTERNATIONAL COORDINATION
FOR SPACEBORNE SYNTHETIC
APERTURE RADAR
SAOCOM MISSION UPDATE***

***CONAE SAR Activities
and Future Plans***

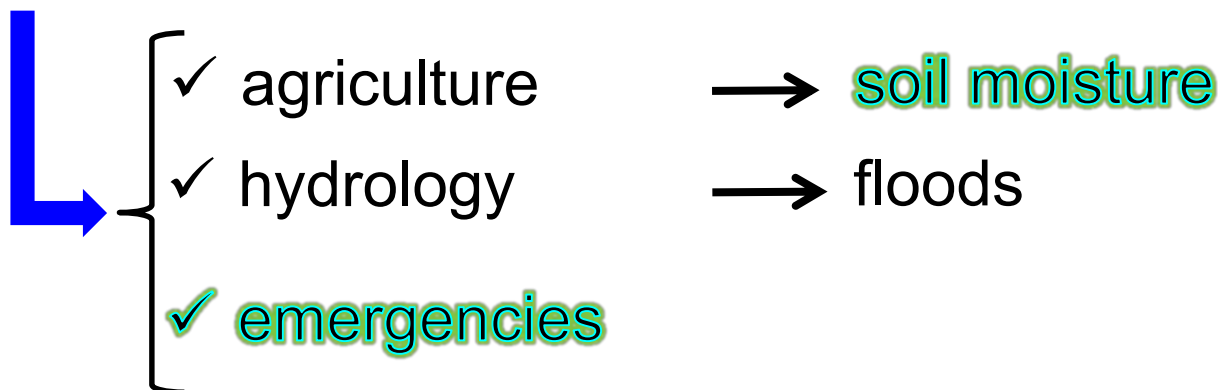
L. Frulla

lfrulla@conae.gov.ar

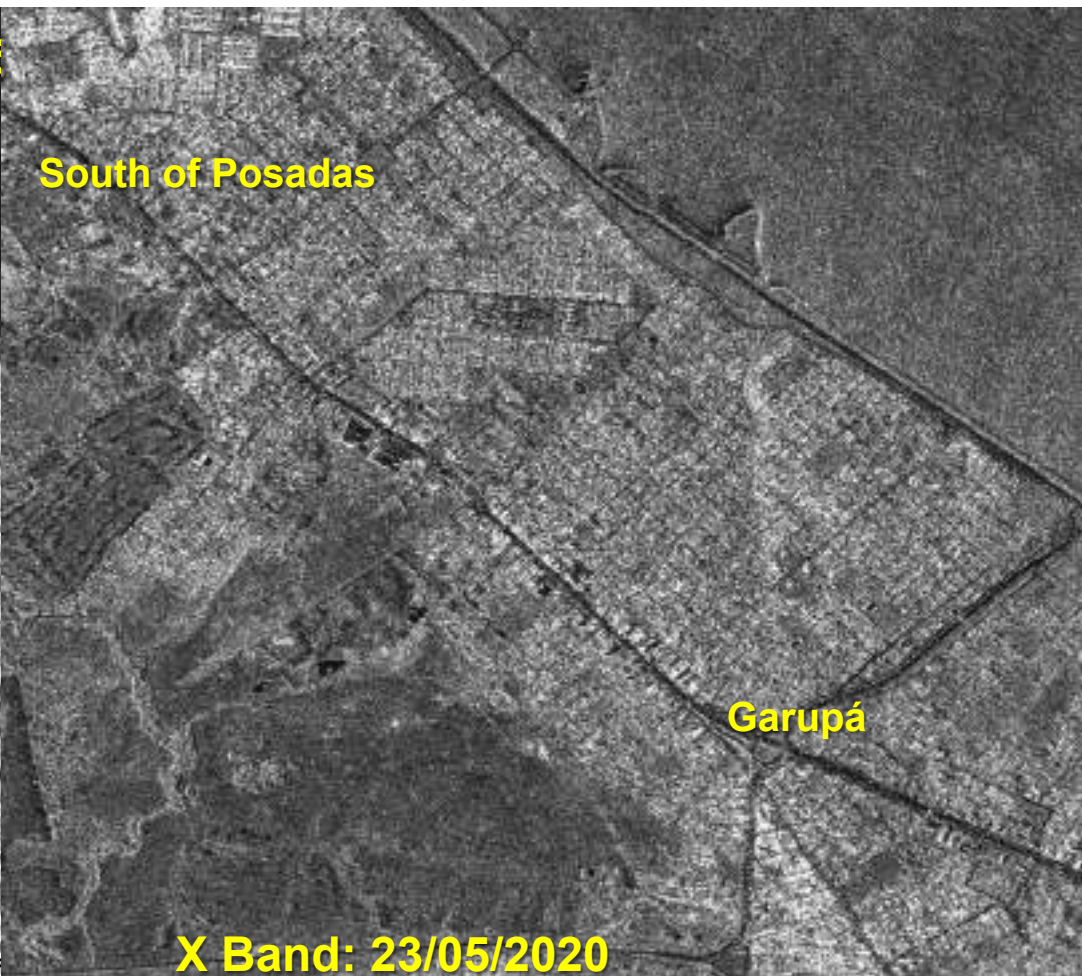
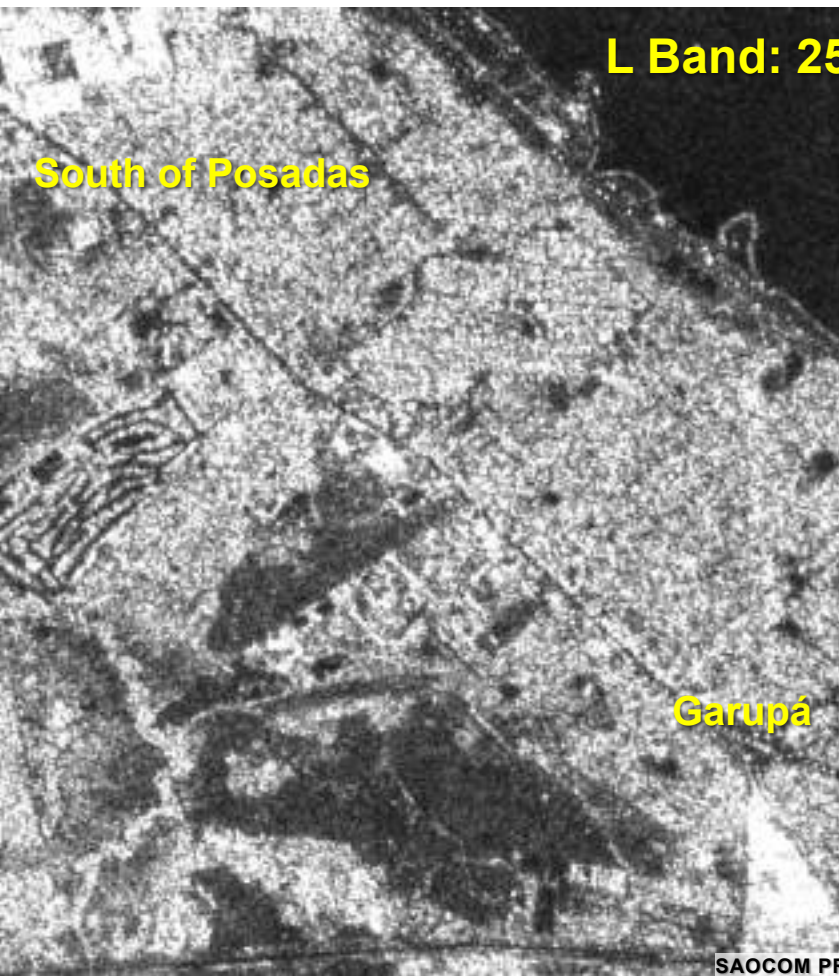
September 28th, 2022

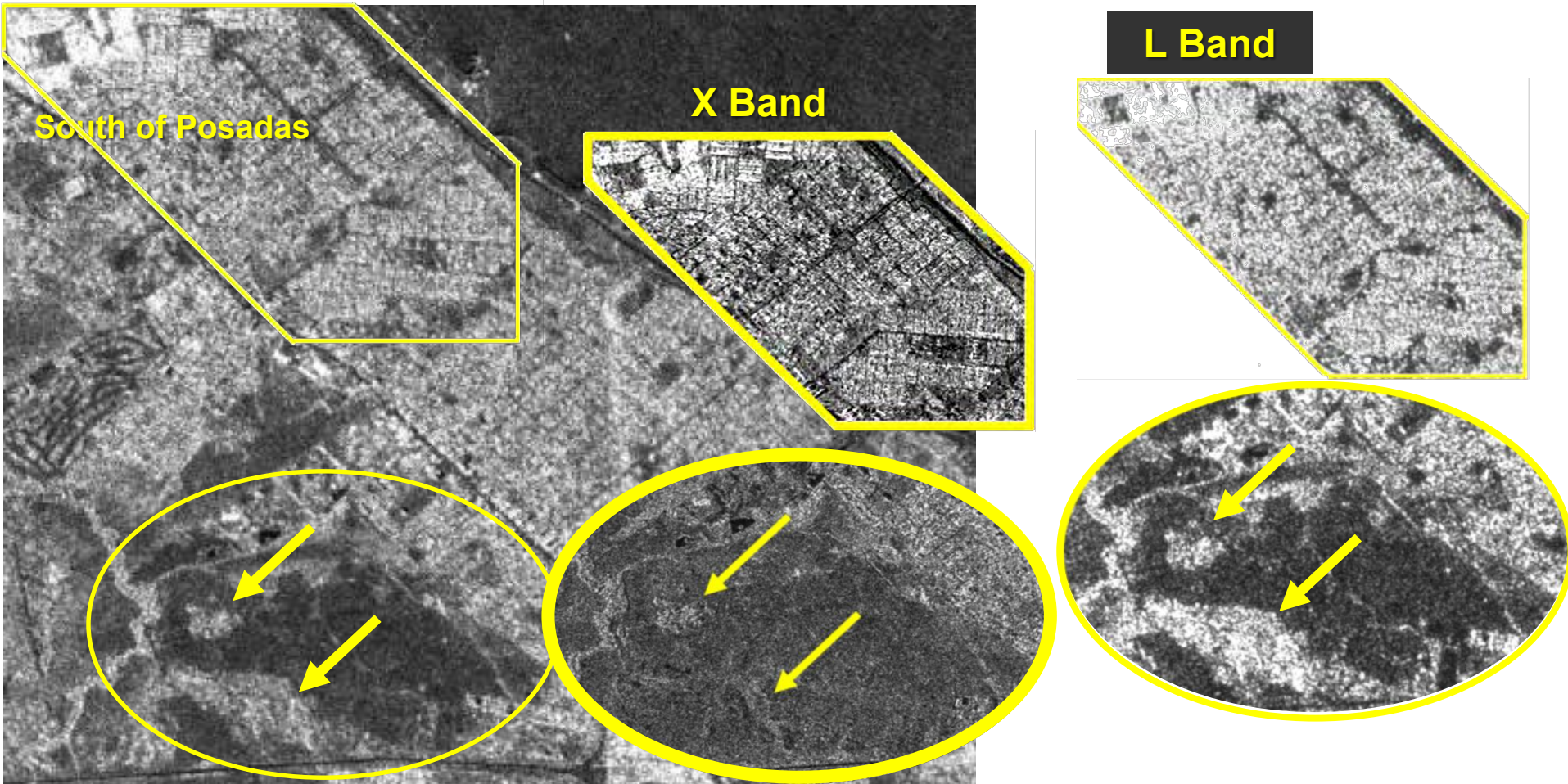


To satisfy **user needs** and the Space Information Sectors-**National Space Plan**

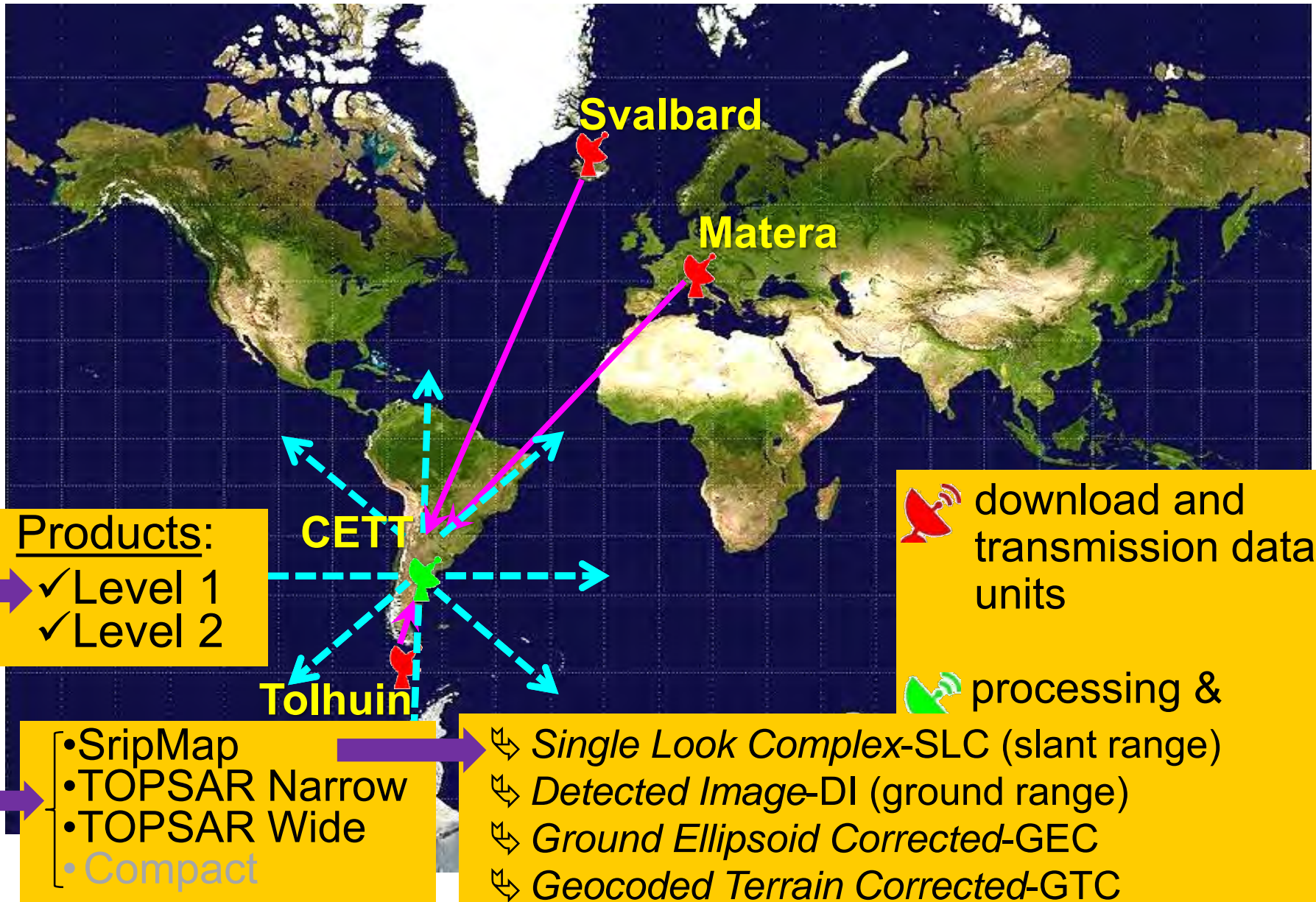


To operationally integrate **SIASGE** (Italian-Argentinian Satellites System for Emergencies Management) composed by the **SAOCOM Constellation** and the **COSMO-SkyMed Constellation**






constellation	2 twin satellites located at 194° , launched: October 7th 2018 August 30th 2020 (both operational)
✓ SAOCOM-1A ✓ SAOCOM-1B	
repetition cycle	16 days (1 satellite)/ 8 days (constellation)
satellites lifetime	5 years (each satellite)
acquisition modes	real time/stored
coverage	world wide
looking direction	right looking (nominal)/left (capability)
spatial resolution [m]	10 - 100 m
incidence angle	$18 - 50^\circ$



➤ **Products:**
✓ Level 1
✓ Level 2

 download and transmission data units

 processing &

- SripMap
- TOPSAR Narrow
- TOPSAR Wide
- Compact

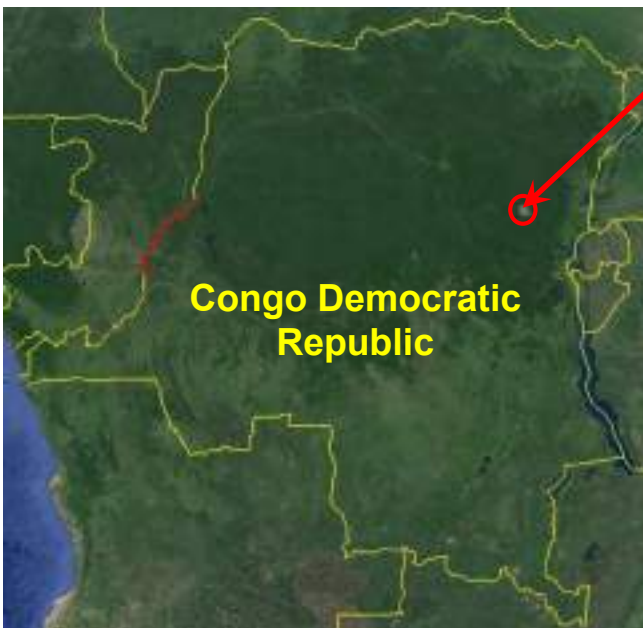
- ↔ Single Look Complex-SLC (slant range)
- ↔ Detected Image-DI (ground range)
- ↔ Ground Ellipsoid Corrected-GEC
- ↔ Geocoded Terrain Corrected-GTC

catalogue	no registration (thumbnails) / free navigation registration (quicklooks) agreements/projects: reprocessing, product download, acquisition request ↴ ✓ area of interest: lat, lon, radio / polygon / shapfile, kml ✓ acquisition conditions
type of use	✓ institutional, atencion.usuario@conae.gov.ar one-click over Argentina (in progress) ✓ commercial, www.saocom.com.ar (VET) licence to use
data format	GeoTIFF (image data) + xml (metadata)
products bit depth	L1A (SLC): distributed as I (32 bit) + Q (32 bit) L1B (DI), L1C (GEC) and L1D (GTC): distributed as float (32 bit)
products calibration	all products (StripMap, TOPSAR Narrow and TOPSAR Wide) are calibrated in Sigma0 no need to apply a calibration constant products are generated and delivered in amplitude

One Click Possibility

		non-commercial users		commercial users	
PERMISSIONS	REGIONS	argentinés and residents	foreigners	argentinés and residents	foreigners
<ul style="list-style-type: none"> archived: - L1, L2 download - L1 reprocess - interferometric products 	Argentina	via One-click, check that the area is within Argentina			
<ul style="list-style-type: none"> - L1, L2 download - L1 reprocessing - interferometric products - acquisition request 	Argentina (included)	atencion.usuario@conae.gov.ar (under some cooperation type)	atencion.usuario@conae.gov.ar (under some cooperation type)	via VENG www.saocom.com.ar (free access)	via VENG www.saocom.com.ar (comercial agreement)

in progress



SAOCOM-1A
June 20th, 2020
Compact Pol LH-LV
Asc.

R: LV
V: $(LV+LH)/2$
A: LH

technological mode

Baseline Mission (fixed acquisitions)

- **soil moisture**
(Pampas)



- SAR calibration:
 - ↳ **rain forest**
 - ↳ **specific point targets**



Foreground Mission (variable acquisitions)

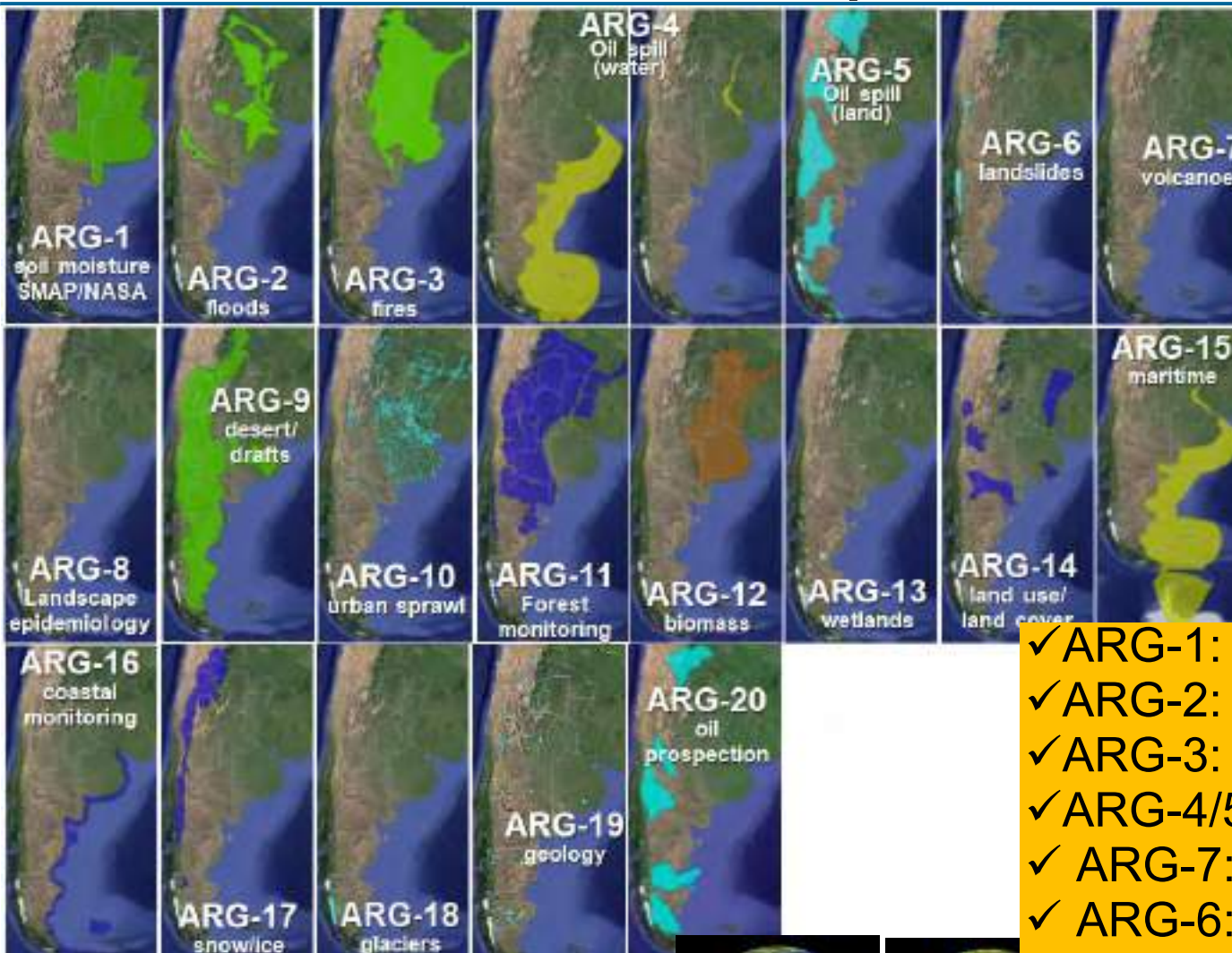
- users

Background Mission (useful data base)

- **Argentina:**
 - ↳ emergencies
 - ↳ maritime control
 - ↳ biomass
 - ↳ Los Andes
(tectonic plates
and glaciers
movement)
- **Latinamerica and the
rest of the world:**
 - ↳ biomass
 - ↳ polar zones

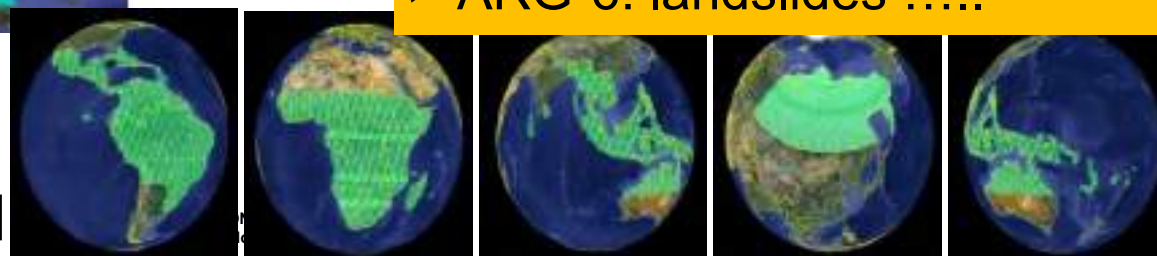


Background Mission-IMAS (Integrated Mission Acquisition Strategy)

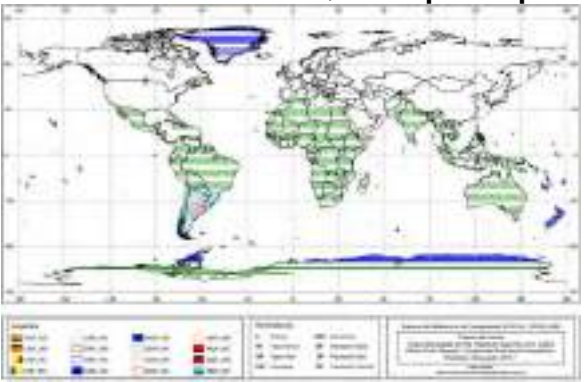


- ✓ ARG-1: soil moisture
- ✓ ARG-2: floods
- ✓ ARG-3: fires recovery
- ✓ ARG-4/5: oil spills (ocean/land)
- ✓ ARG-7: volcanic eruptions
- ✓ ARG-6: landslides

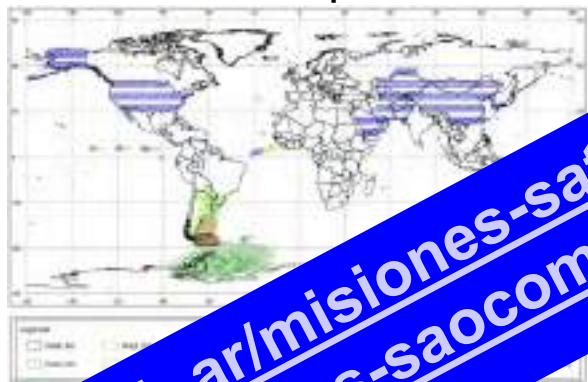
Rest of the world



SAOCOM 1A, StripMap



SAOCOM 1A, TopSAR Narrow



SAOCOM 1A, TopSAR Wide



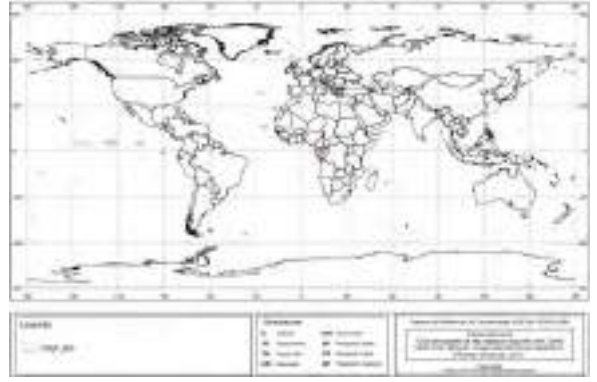
SAOCOM 1B, StripMap



SAOCOM 1B, TopSAR Narrow

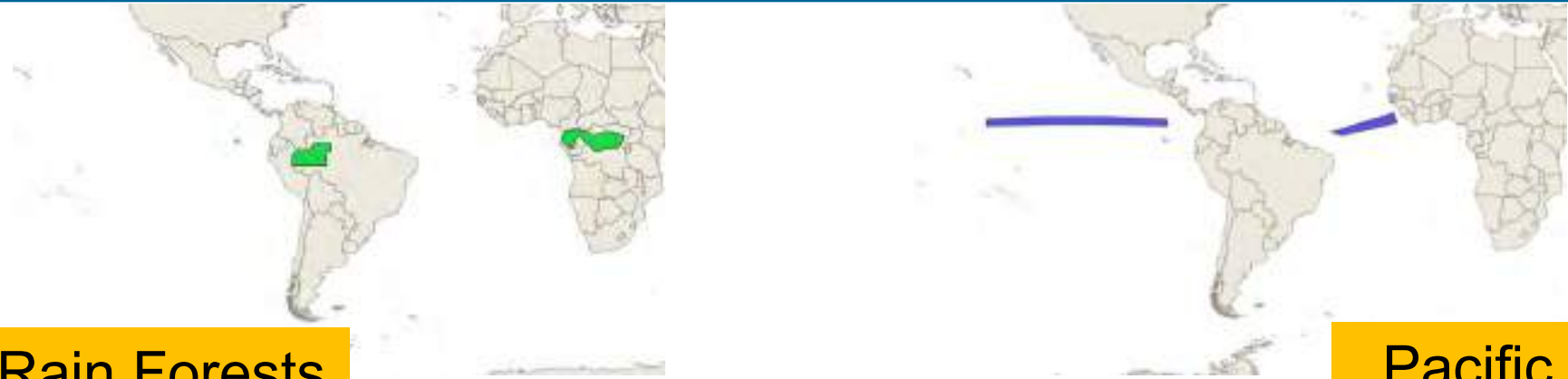


SAOCOM 1B, TopSAR Wide



<https://www.argentina.gob.ar/misiones-satelitales/planes-de-adquisiciones-saocom-1>

Acquisitions over Extended and Point Targets



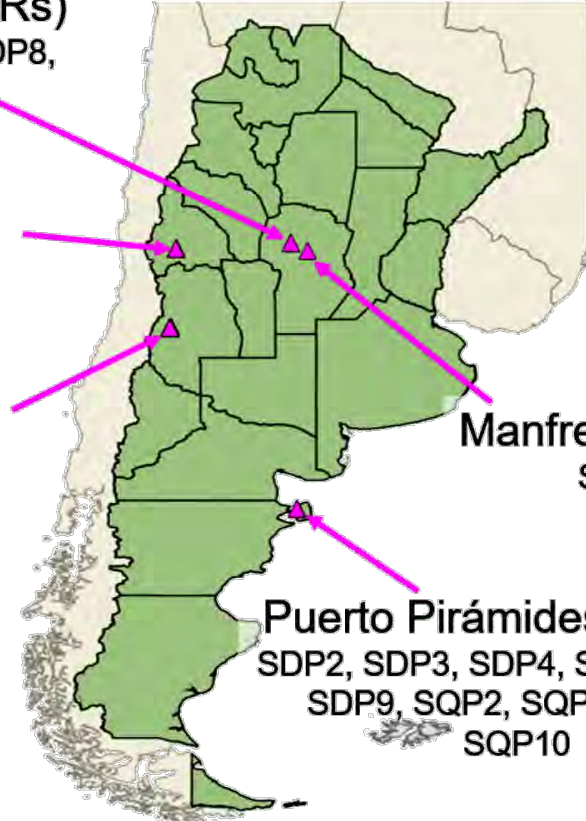
**Rain Forests
(Amazon
and Congo)**

**Pacific and
Atlantic
Doldrums**

CETT (1 PARC and 2 CRs)
SDP3, SDP4, SDP5, SDP7, SDP8,
SQP5, SQP6, SQP7,
All TOPSAR Modes

CASLEO (8 CRs)
SDP2, SDP4, SDP7,
SQP5, SQP6

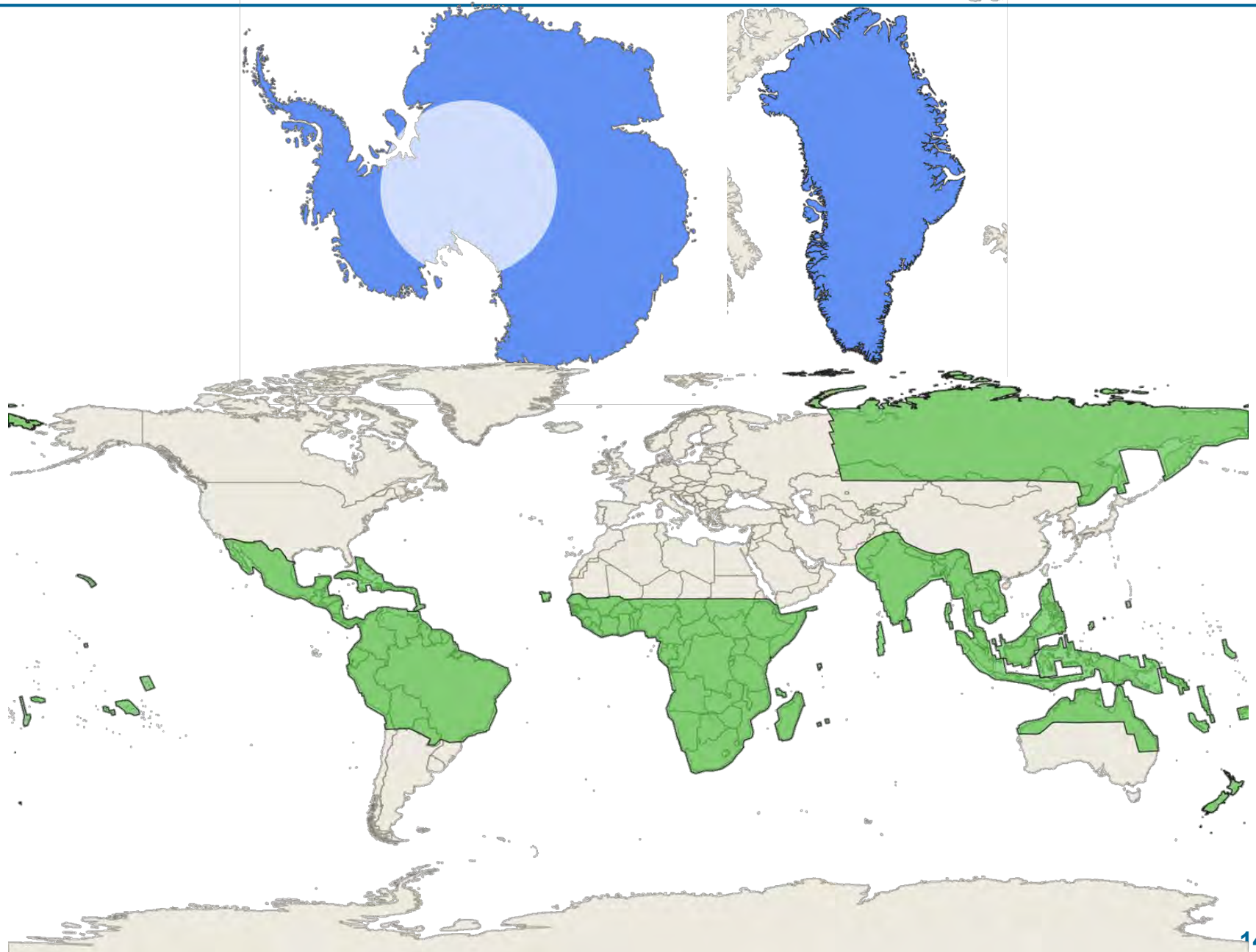
El Sosneado (14 CRs)
SDP1, SDP2, SDP3, SDP4,
SDP5, SDP6, SDP7, SDP9,
SQP3, SQP6, SQP8

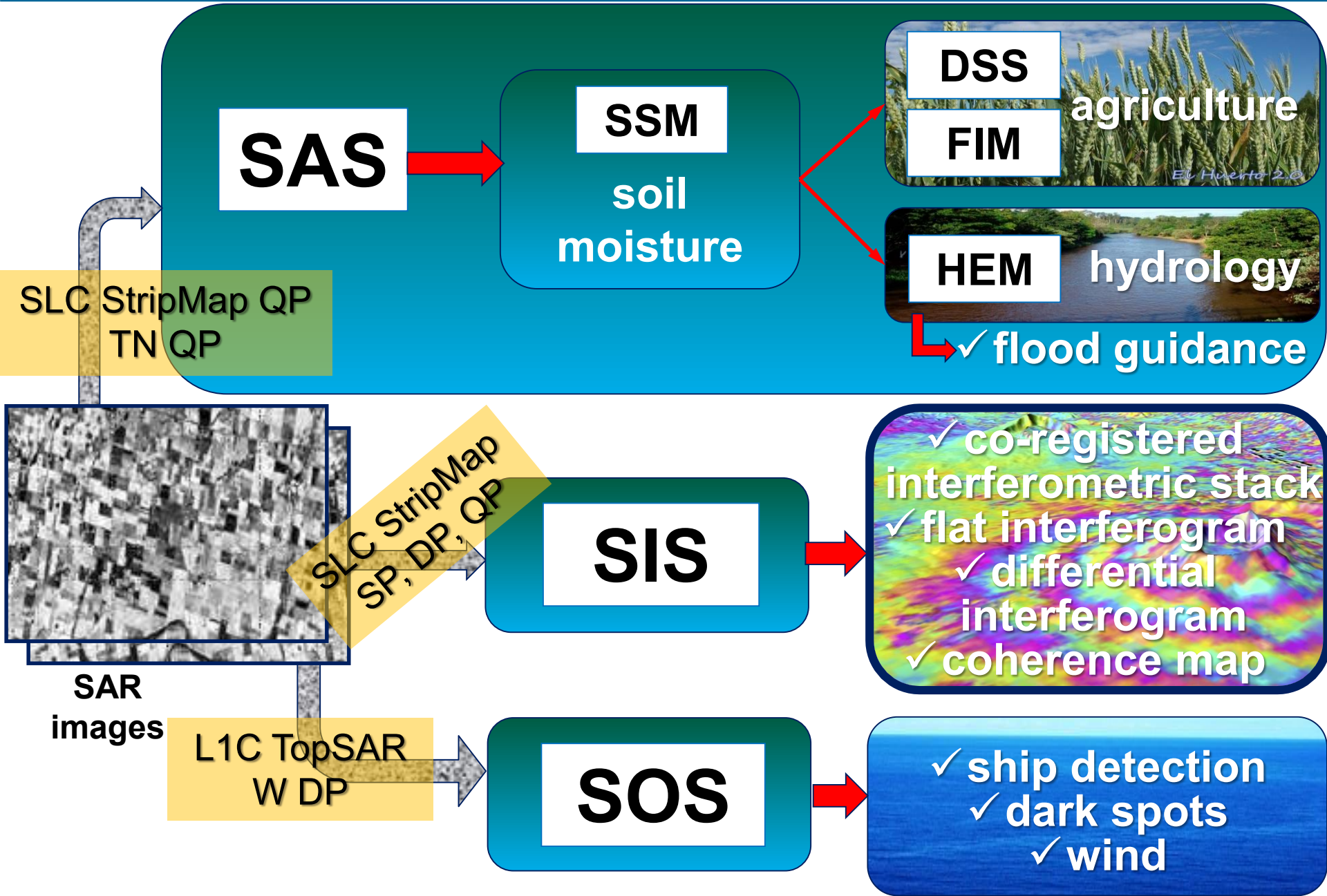


Manfredi (2CRs)
SQP9

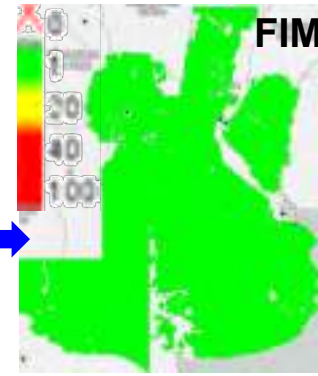
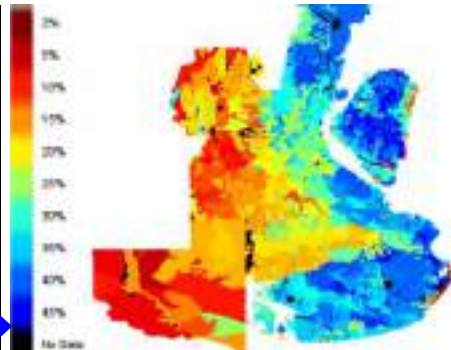
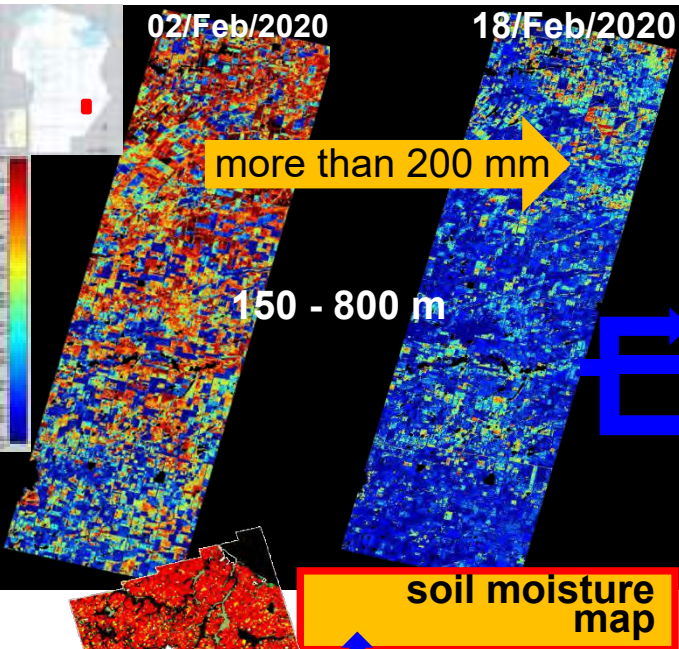
Puerto Pirámides (5 CRs)
SDP2, SDP3, SDP4, SDP6, SDP7,
SDP9, SQP2, SQP5, SQP7,
SQP10

Acquisition Regions Supporting Polar and Biomass Studies

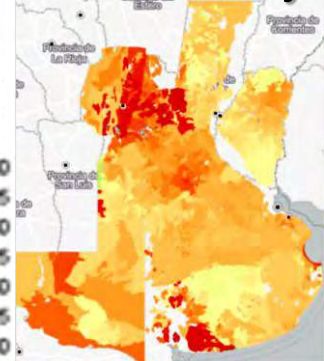




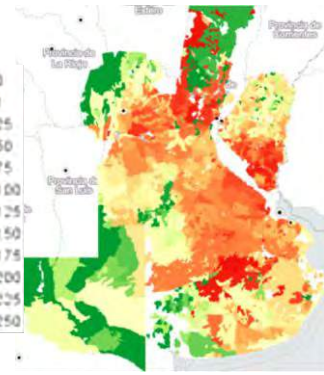
soil moisture profile map



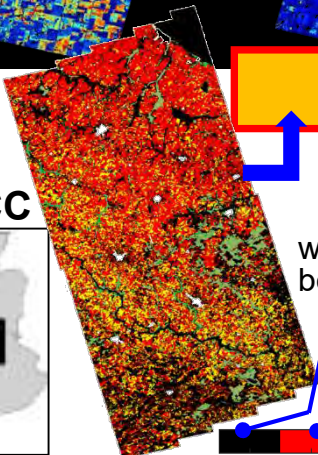
yield map (wheat) anomaly



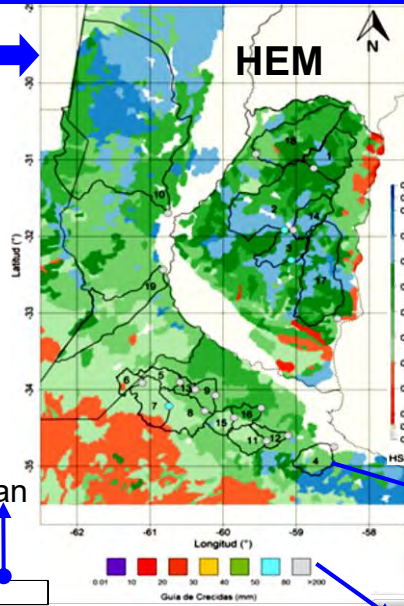
production



LCC



- water bodies
- pasture
- scrubland
- stubble
- soybean
- corn
- PASTIZAL
- MATORRAL
- forest
- urban
- MONTE



Clase	Descripción
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19

>200mm

4 Matanza - Riachuelo @ Ricchieri

- ✓ measurements from 2012 to present
- ✓ > 70 stations
- ✓ > 110 instruments:
 - Soil moisture (some up to 2 m depth)
 - temperature
 - salinity
- ✓ hourly



El Leoncito – San Juan Province

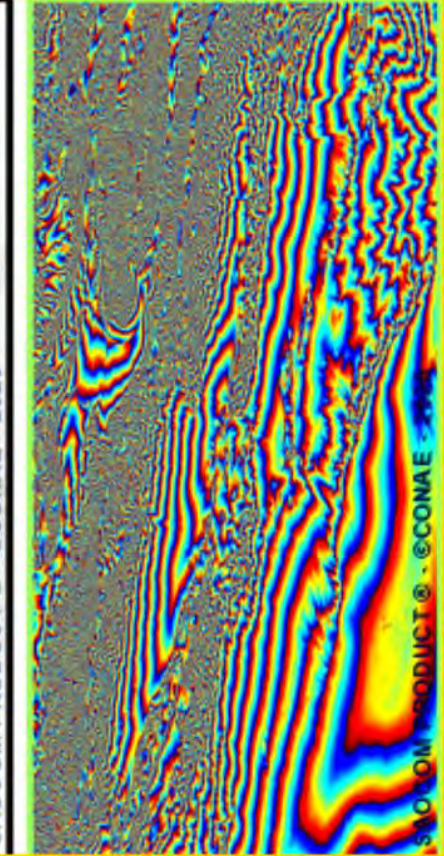
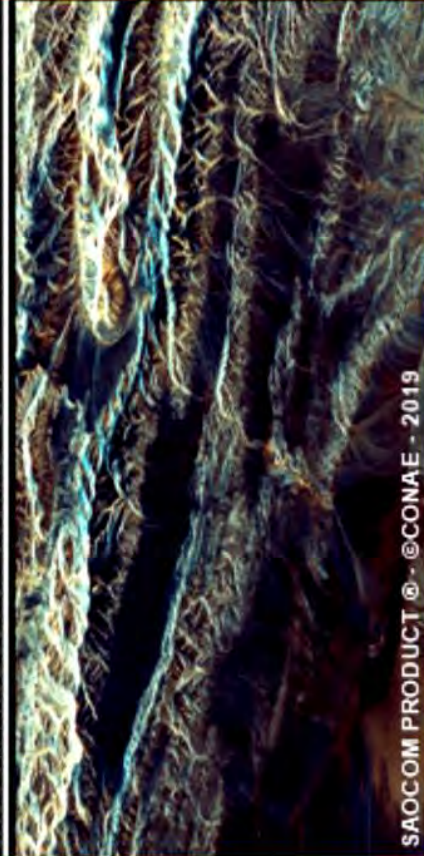
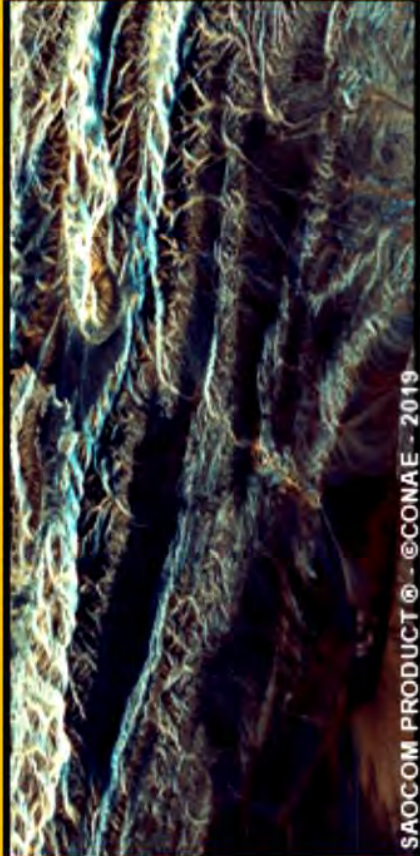


Reference

Secondary

Coherence

Interferogram



Reference: 16-feb-2019

StripMap S7

Descendent

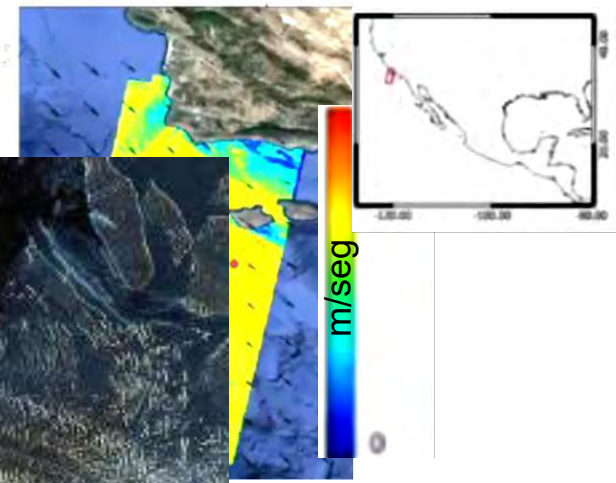
Secondary: 04-mar-2019

Dual Pol VV-VH

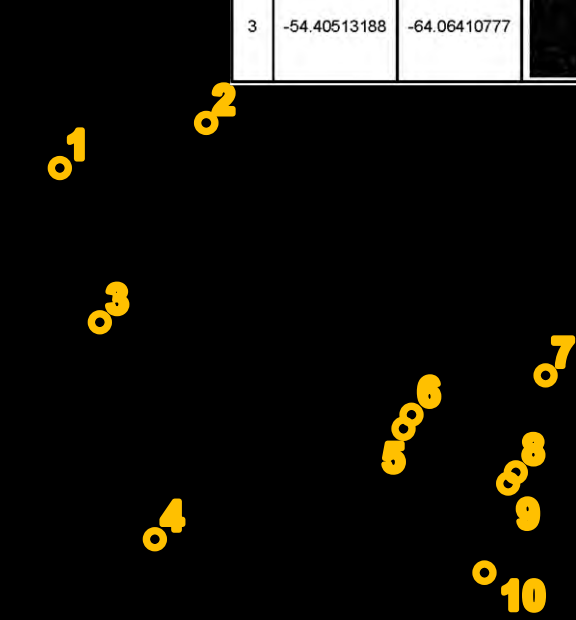
Levels L1A (SLC) and L2

ID	Latitud	Longitud	
1	-53.92536597	-63.71809618	
2	-53.62447192	-63.73136879	
3	-54.40513188	-64.06410777	

✓ wind maps



✓ floes monitoring (A74, Dual Pol HH-HV)



✓ ship detection

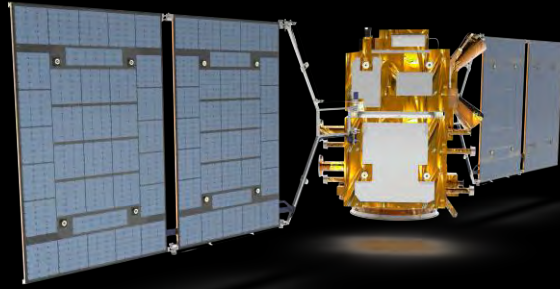
✓ dark regions



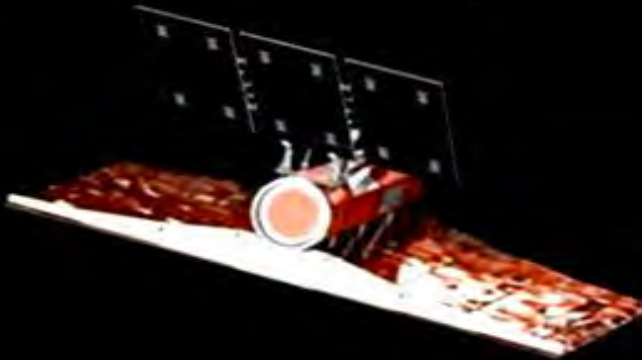
VV, Asc. Sri Lanca coast



Future Plans



SABIA-Mar, 2024/2025



SAOCOM 2, ~ 2028



SARE, ~ 2025 —

Thank you for your attention

e-mail: lfrulla@conae.gov.ar

www.argentina.gob.ar/ciencia/conae