

SDR MEMBER UPDATES

ARGENTINA

Diana Marina Rodríguez

National Meteorological Service (SMN)



WMO OMM

World Meteorological Organization
Organisation météorologique mondiale

5th RA-III-IV-SDR Meeting

Madison, Wisconsin

6 and 7 August 2022

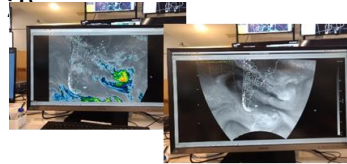
Satellite Data Requirements

- **Please specify any satellite data required by your institution that is still not being received**

There is no satellite data required by any of the institutions that were contacted

Available Satellite resources at SMN

- **GOES-16** Rebroadcast (GRB) (Level 1B) and (level 2)
- **PDA** (Internet 2)
- **GNC-A** (Receive Station)
- **Amazon** (AWS)
- **FTP**



SMN (VISUALIZACION SOFTWARE)



SMN GOES-16 Antena



GNC-A SMN

Satellite Data Usage

- **Are the received products being used in applications?**
 - Yes, many institutions use LEO and GEO satellite data in different applications,
- **What do you need to use them better?** - No specific needs were identified.

Satellite Data Usage

National Meteorological Service (SMN)

DCMC: Climate Monitoring Direction

- ❑ **OLR Anomaly SST Anomaly (NOAA/PSL)**
- ❑ **IMERG precipitation and precipitation anomaly data**
- ❑ **Aura/OMI, MOPPIT/TERRA, SCHIMACHY data**



USE: Status of the Pacific Ocean, Madden-Julian phenomenon and ENSO.



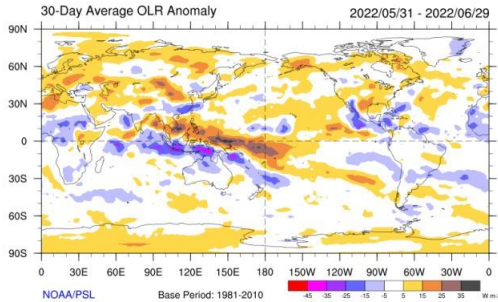
USE: La Plata Basin region monitoring



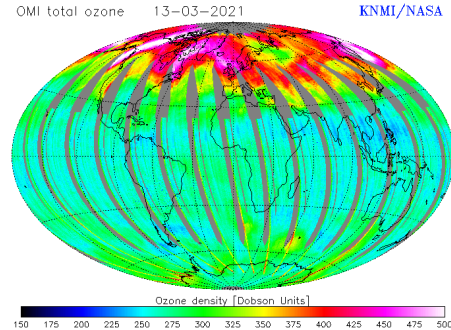
USE: Greenhouse Gases Monitoring (GEI)

Regional Climate Center Network for Southern South America RCC - Network – SSA

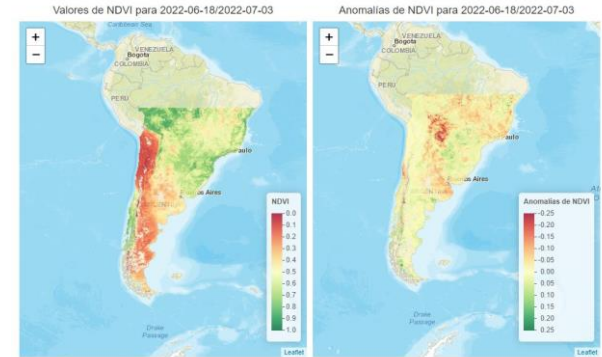
<https://www.crc-sas.org/es/>



Product: 30- Day Average ORL Anomaly
Satellite: NOAA/PSL



Product: OMI Total OZONE
Satellite: Aura /OMI



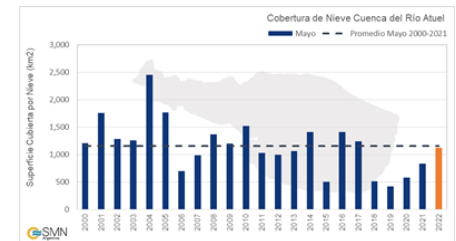
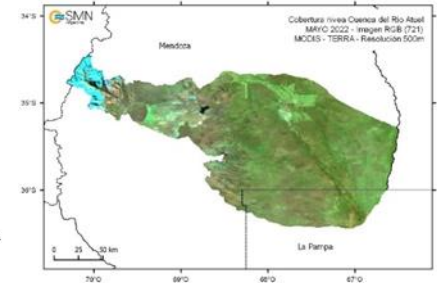
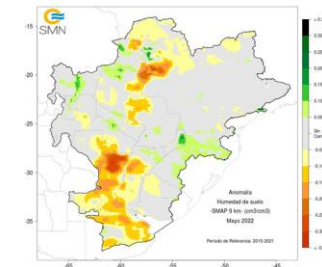
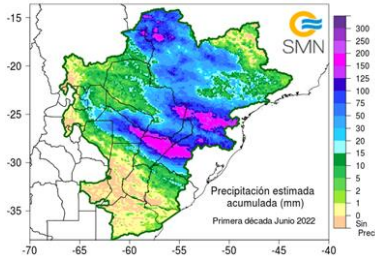
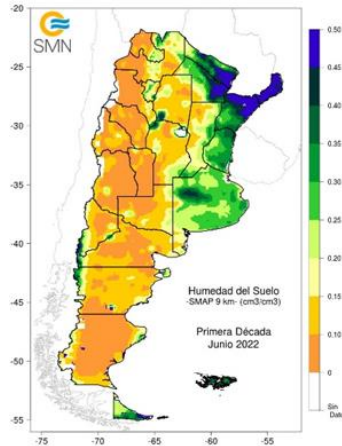
Product: NDVI and EVI
Satellite: (MODIS/ TERRA) **Resolution:** 3 KM

Satellite Data Usage

DSS: Sector Services Direction

Applications and satellite data:

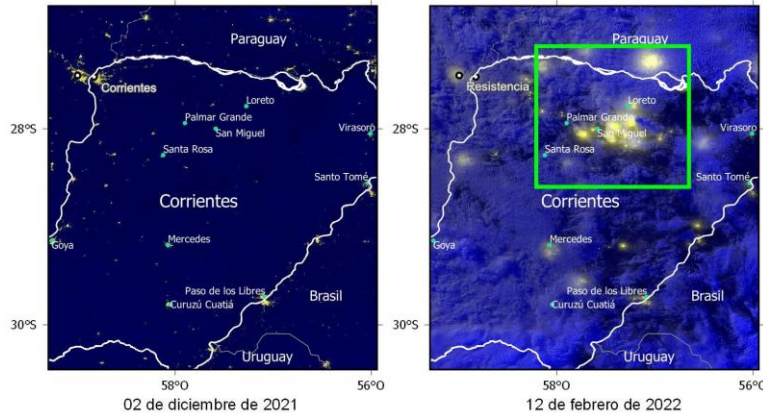
- NDVI and EVI (**MODIS**)
- Soil moisture (**SMAP**)
- LST (**GOES-16 and MODIS**)
- SST (**NOAA**)
- Hot spots and RGB images of fires (**VIIRS**)
- Snow cover (**MODIS**), graphs and RGB images
- Soil Moisture Anomaly (**SMAP**)
- Estimated accumulated precipitation (**IMERG**)



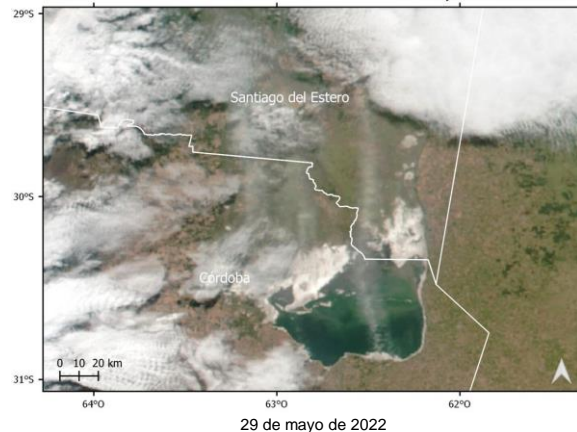
Satellite Data Usage

DSS: Sector Services Direction

- Environmental Applications <https://www.smn.gob.ar/clima/sensores-remotos>



Application: Night Active Fires
Data: DNB (VIIRS) Suomi NPP
Resolution: 500 Meters



Application: RGB (True Color)
Salt clouds at Mar Chiquita Lagoon (Córdoba, Argentina)
Data: AQUA/MODIS
Resolution: 500 Meters

Satellite Data Usage

DMSR: Environmental Modeling and Remote Sensing Products Direction

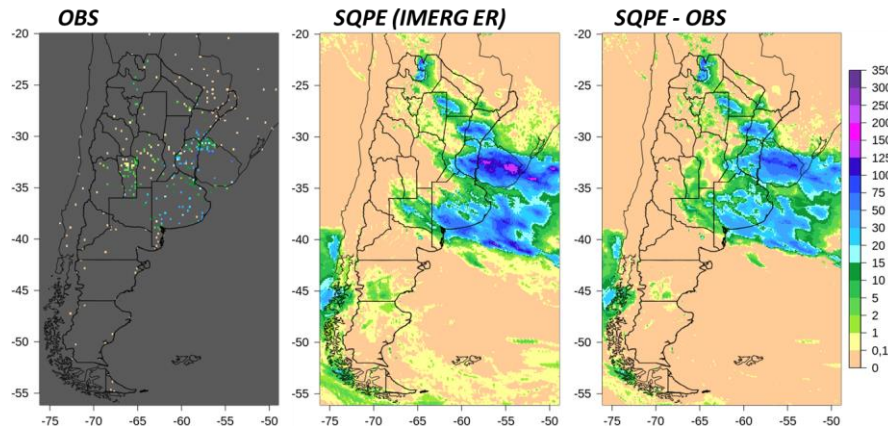
☐ Gauge-corrected satellite precipitation product at SMN

Historical PDF-matching Correction ([Gudmundsson et al., 2012](#)): match between distributions by region and three-month period, using daily **IMERG Early Run** ([Huffman et al., 2020](#)) and reference high-quality network since 2001.

Daily Local BIAS Correction ([Zhang et al., 2011](#)): IDW technique by region, using correlation distances for BIAS interpolation, daily **IMERG Early Run** ([Huffman et al., 2020](#)) first corrected with PDF-matching, the complete rain gauge network, and a spatial consistency method.

Satellite data:

- ☐ **GPM MISSION**
- ☐ **Product: IMERGE Early Run**



Precipitation (mm/day) for April 10, 2021

For more details (Spanish)

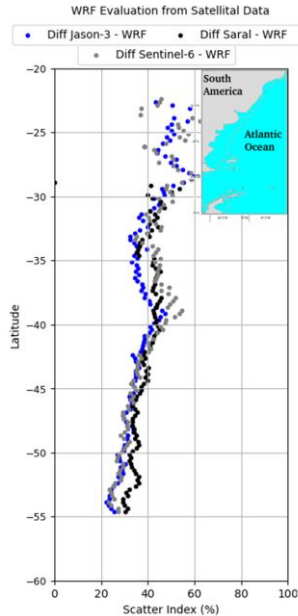
Hobouchian, M. P., G. Díaz, L. Vidal, Y. García Skabar, L. Ferreira, M. Maas, M. S. Rossi Lopardo, H. Veiga y M. Rugna, 2021: Ajuste de la estimación de precipitación satelital IMERG con observaciones pluviométricas en Argentina.

<http://hdl.handle.net/20.500.12160/1694>

Satellite Data Usage

DMSR: Environmental Modeling and Remote Sensing Products Direction

WRF Verification with Satellital Data

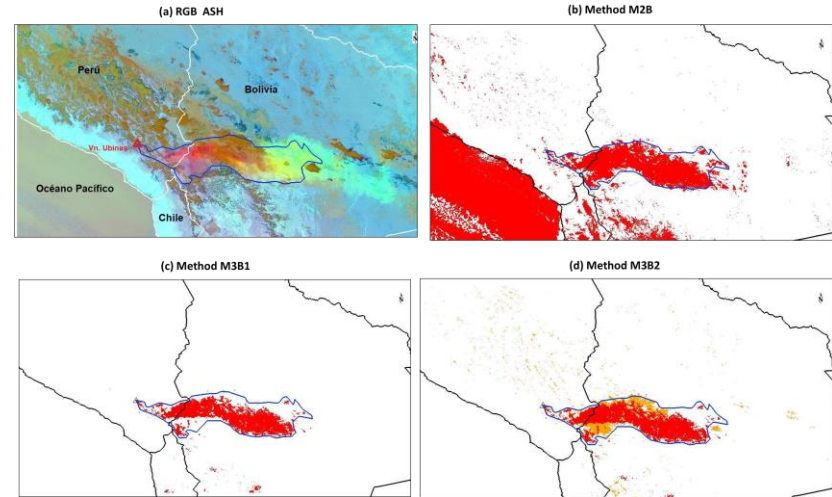


Meridional performance of surface ocean wind speed (WS) obtained by the WRF model executed at the National Meteorological Service of Argentina. The Scatter Index (left panel) was computed using information of three altimeters (Jason-3, Saral and Sentinel-6) over the entire 2021 period. WS was pooled in bins of 0.25° and the zonal mean was performed between 40°W and 70°W (see map on the top).

Satellite Data:

- Jason-3
- Saral
- Sentinel-6

Classification of Volcanic Ash using VIIRS sensor Data



Classification for volcanic ASH using 3 - Band method. 19/7/2019 at 17:56 UTC.
Ubina Volcano Case.

Satellite Data:

- NOAA-20/VIIRS. M Bands



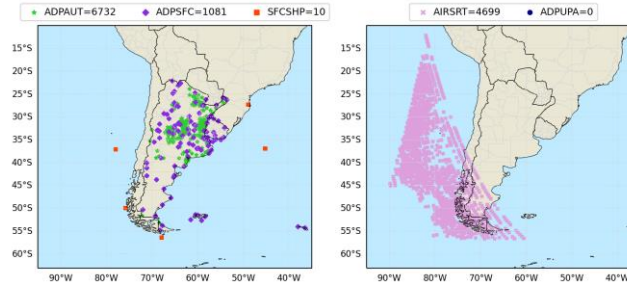
Satellite Data Usage

DMSR: Environmental Modeling and Remote Sensing Products Direction

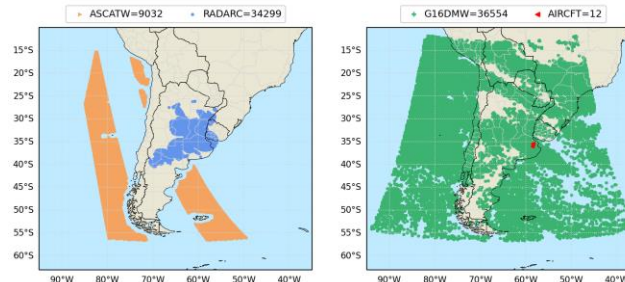
❑ Experimental data Assimilation System (2022)

Data source	Assimilated variables
Conventional sfc stations	PSFC, T, U, V, HR
Automatic sfc stations	PSFC, T, U, V, HR
Ships, buoys	PNMM, T, U, V, HR
Soundings	T, U, V, HR
Aircraft (AMDAR, AA)	T, U, V
Aqua (AIRS)	T, Q
Metop-B (ASCAT)	U, V
GOES-16	U, V
C-band Radar	Z

2022-07-10 20 UTC



2022-07-11 03 UTC



- ❑ 4D-LETKF method coupled with the WRF model.
- ❑ HM-NMS computational resources.
 - Hourly analysis with 4 km horizontal resolution
 - Assimilation of conventional and radar observations (10 minutes slots).
 - 40 multi-physics ensemble members.
 - Real-time data flux and associated scripts

Satellite Data Usage

USE OF SATELLITE DATA AT THE NAVAL HYDROGRAPHIC SERVICE



Satellite	SENSOR	MODE	APPLICATION	PRODUCTS
SAOCOM-1	SAR (L-BAND)	TOPSAR – STRIPMAP	Sea ice and icerberg detection / Sea ice stage of development and concentration	Ice charts / Iceberg charts / Ice edge charts / Operational assesment for ships
SENTINEL-1	SAR (C-BAND)	EXTRA WIDE (EW) – INTERFEROMETRIC WIDE (IW)	Sea ice and icerberg detection / Sea ice stage of development and concentration	Ice charts / Iceberg charts / Ice edge charts / Operational assesment for ships
COSMO-SkyMed	SAR (X-BAND)	PINGPONG – WIDE REGION	Sea ice and icerberg detection / Sea ice stage of development and concentration	Ice charts / Iceberg charts / Ice edge charts / Operational assesment for ships
TERRA	MODIS	CORRECTED REFLECTANCE: TRUE COLOR BANDS 7 – 2 – 1 BANDS 3 – 6 – 7	Sea ice and icerberg detection / Sea ice concentration	Ice charts / Ice edge charts
AQUA	MODIS	CORRECTED REFLECTANCE: TRUE COLOR BANDS 7 – 2 – 1 BANDS 3 – 6 – 7	Sea ice and icerberg detection / Sea ice concentration	Ice charts / Ice edge charts
SUOMI	VIIRS	CORRECTED REFLECTANCE: TRUE COLOR BANDS M3 – I3 – M11 BANDS M11 – I2 – I1	SATELLITE	Ice charts / Ice edge charts
NOAA 20	VIIRS	CORRECTED REFLECTANCE: TRUE COLOR BANDS M3 – I3 – M11 BANDS M11 – I2 – I1	Sea ice and icerberg detection / Sea ice concentration	Ice charts / Ice edge charts

General Issues, Findings and Updates

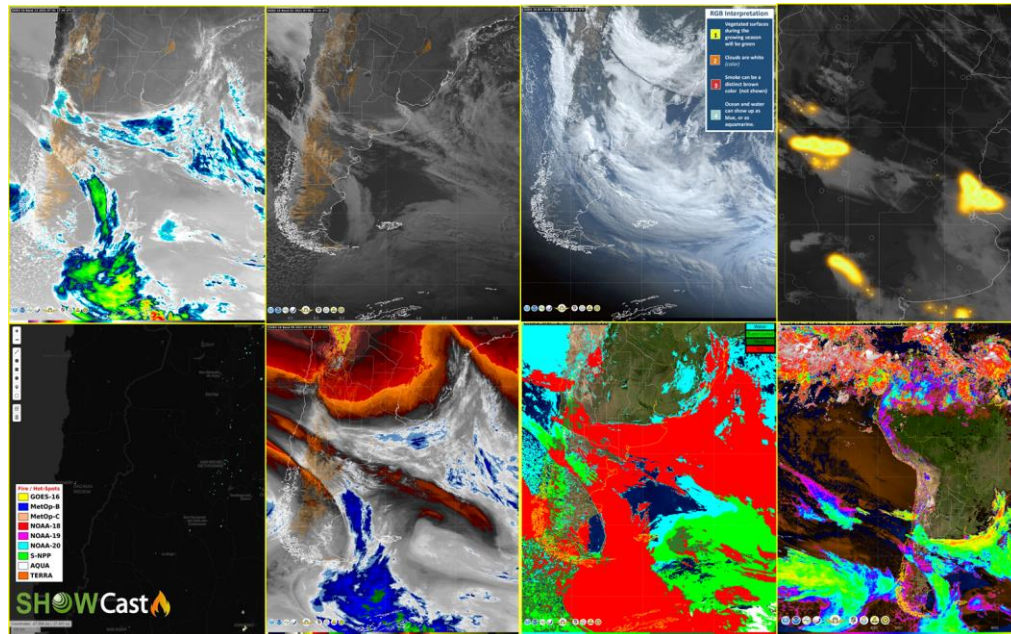
Update



**GEONETCAST STATION N° 92
- Mobile**

Utilization:

- Safety of the Aeronautical Operations
- Support to Antártica operations



General Issues, Findings and Updates

- Other technical needs, challenges and requirements

CHALLENGES (SMN)

- Data assimilation using Dbnnet Data
- Increase real-time polar satellite reception in the Argentina Antarctic Sector.
- Improvement of automatic identification of convective clusters algorithm (ForTRACC).

REQUIREMENTS (SMN)

- Training on CALIOP data analysis and processing. (Python)

CALIPSO <https://www-calipso.larc.nasa.gov/>

Application: Aerosols and clouds- classification and altimetry

https://www-calipso.larc.nasa.gov/resources/calipso_users_guide/browse/index.php

Contact: msosores@smn.gob.ar

Update (CONAE)

Installation: Antenna systems (2).

Place: One at each continental bases.

Reception and processing satellites : TERRA, AQUA, S-NPP, JPSS-1, JPSS-2, NOAA-18/19 ,METOP B/C, METOP-SG, FY-3/4.

Projected : Before the end of the year 2022.



WMO Coordination Group on Satellite Data Requirements for RA III and RA IV



WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

Thank you

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