FUERZA AÉREA
COLOMBIANA

ASÍ SE VA A LAS
ALTURAS

100 AÑOS
PROTEGIENDO LA NACIÓN

Sub direction of Aeronautical Meteorology

Lieutenant Colonel ANDRÉS CÉSPEDES ÁVILA
Vice principal of Aeronautical Meteorology

INTEGRIDAD - HONOR - VALOR - COMPROMISO - SEGURIDAD

Sub direction of Aeronautical Meteorology

Mission

- Manage the supply of Applied Meteorological Products, with human talent capable of appropriating and developing technological advances that contribute to the planning and development of the operations of the Public Force and State Aviation.

Vision

- In 2030, the meteorological area will have managed to meet the strategic, operational and tactical needs of the Public Force and will be a fundamental part of the national aeronautical meteorological service, contributing to the research and development processes in the knowledge of the meteorological and spatial conditions that affect the weather in the Colombian territory and its area of influence.

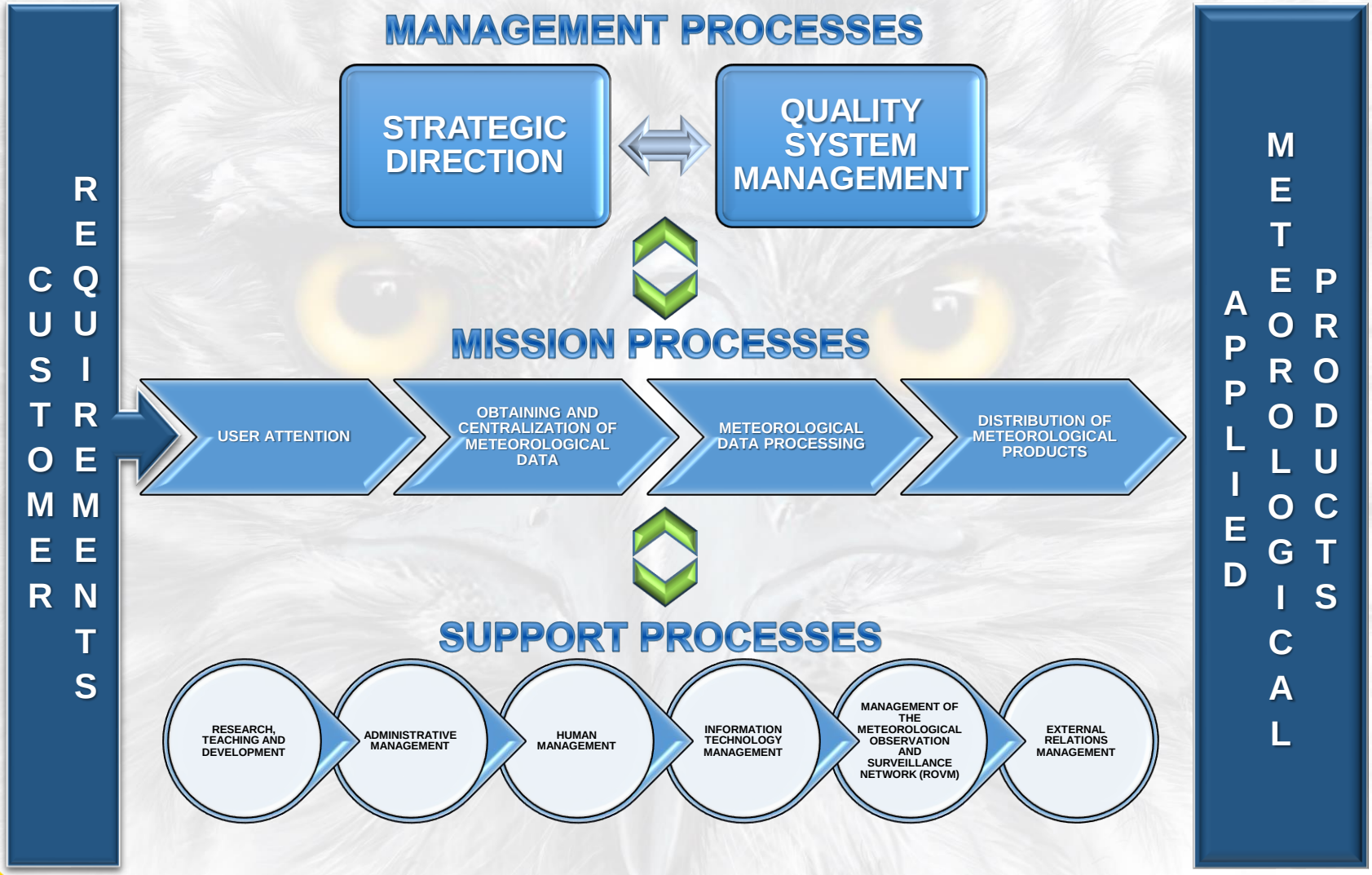
APPLIED METEOROLOGICAL PRODUCTS

Definition

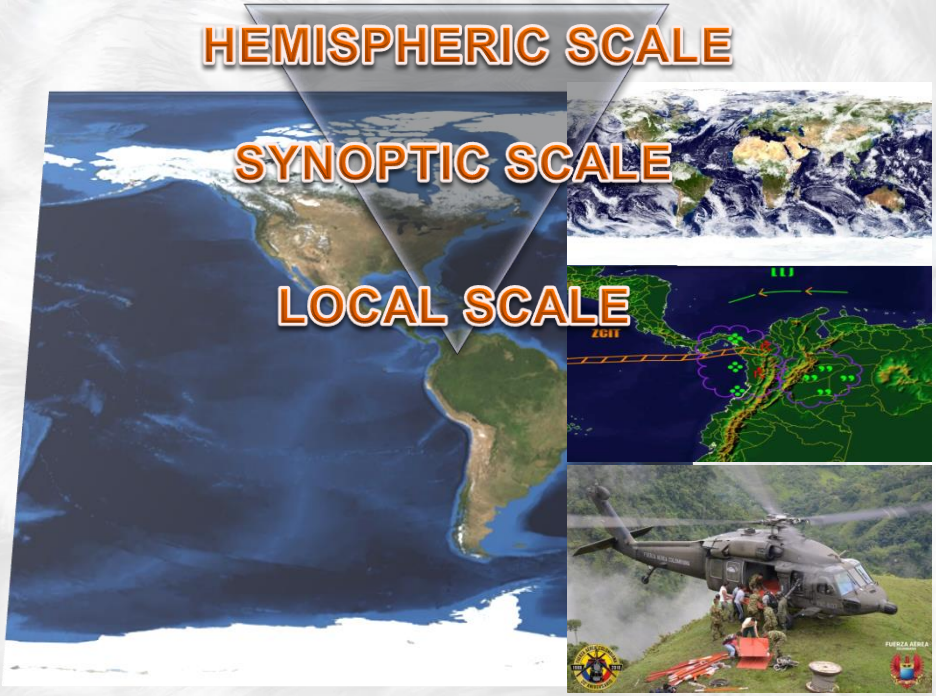
- Meteorological information scientifically analyzed to meet the particular needs of the Public Force and State Aviation, in the knowledge of the past, current or future state of the atmosphere.

- The meteorological information being a graphic or textual representation, which describes the spatial and temporal distribution of the elements (Temperature, humidity, etc.) and meteorological phenomena (storms, hailstorms, strong winds, fog, mist, icing, etc.).

APPLIED METEOROLOGY PROCESS



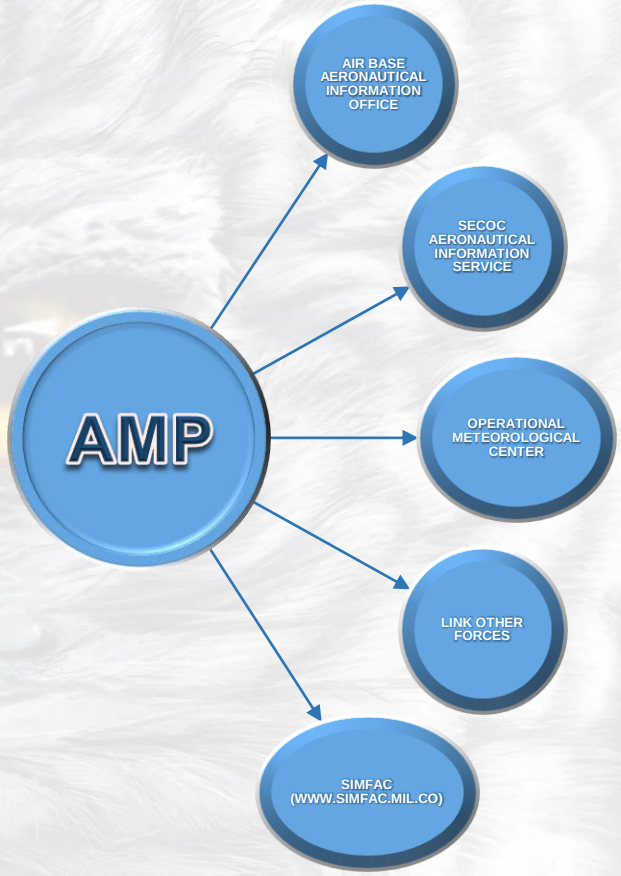
COLOMBIAN AIR FORCE METEOROLOGICAL SERVICE



STRATEGIC LEVEL

OPERATIONAL LEVEL

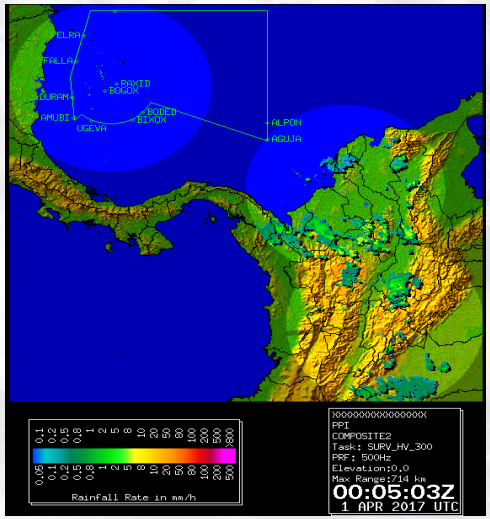
TACTICAL LEVEL



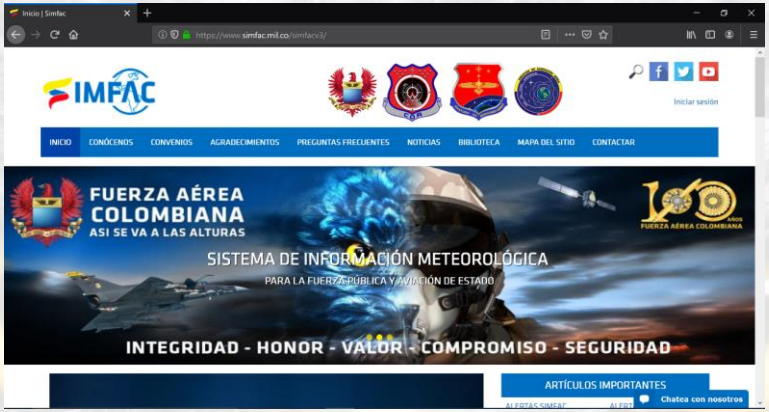
OPERATIONAL DOCTRINE ALIGNMENT

COLOMBIAN AIR FORCE METEOROLOGICAL SERVICE

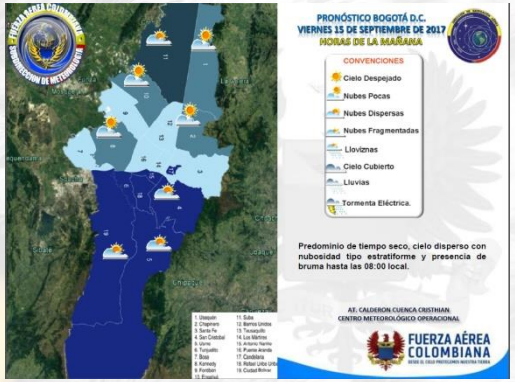
Imágenes compuestas de Radares Meteorológicos (SNRM)

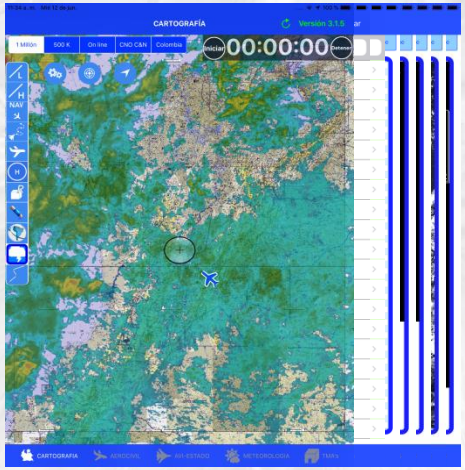


SIMFAC 3.0

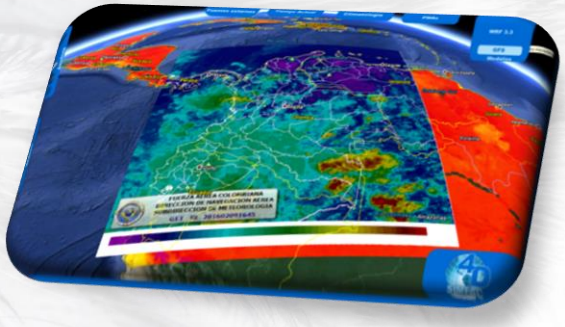


Centro de Meteorológico Operacional (CMOP)





Plataforma informática "Visor 4 D".

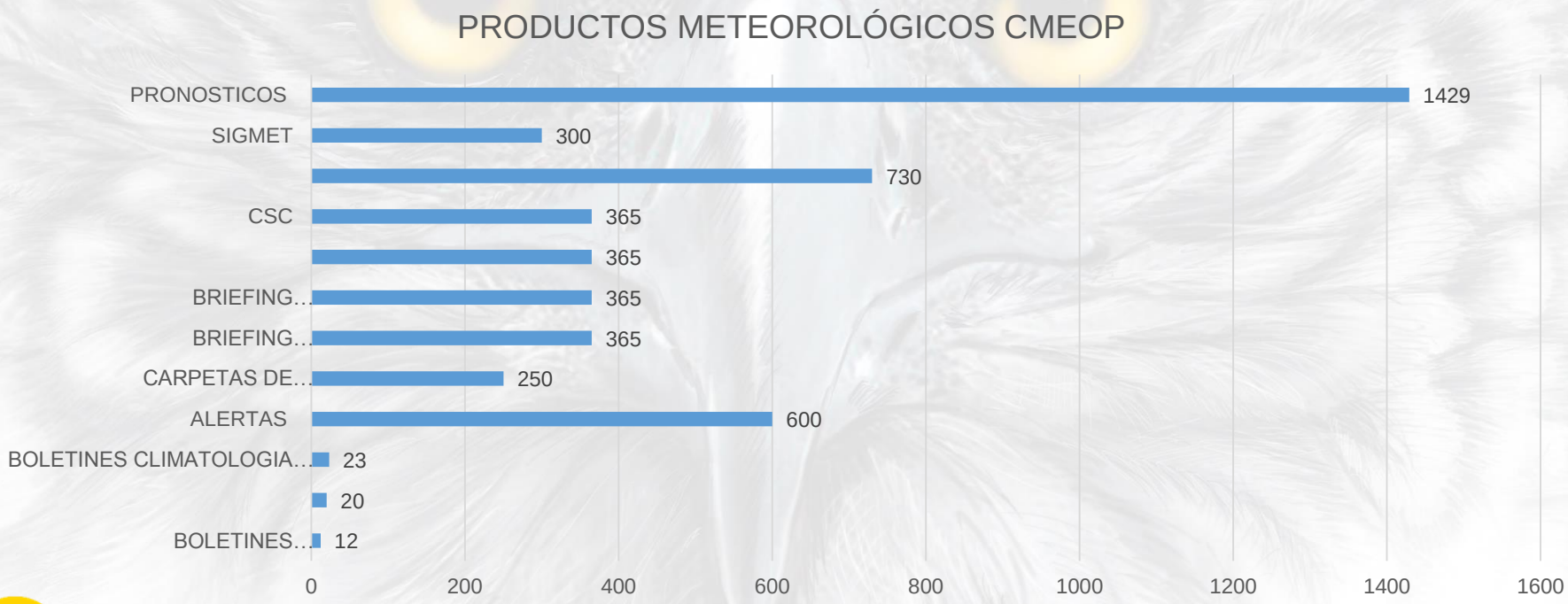


INTEGRIDAD - HONOR - VALOR - COMPROMISO - SEGURIDAD

AVERAGE YEARLY PRODUCTION

MONTHLY CLIMATOLOGY BULLETINS	SAFETY EVENTS	SPECIAL CLIMATOLOGY BULLETINS	WARNINGS	SPECIAL FLIGHT INFORMATION	BRIEFING SUMET	BRIEFING CCOFA
12	20	23	600	250	365	365

SATENA	CSC	BOGOTA	SIGMET	FORECASTS ON DEMAND	TOTAL PRODUCTS
365	365	730	300	1429	4824



INTEGRIDAD - HONOR - VALOR - COMPROMISO - SEGURIDAD

METEOROLOGICAL PRODUCTS DISTRIBUTION

FORECASTS ON DEMAND	
FAC	1102
EJC	20
ARC	30
ONU	7
PRESIDENCIA	270
SATENA	365

SPECIFIC FLIGHT INFORMATION	
FAC	1102
EJC	12
ARC	0
PNC	3

SAFETY EVENTS	
FAC	17
EJC	2
ARC	0
PNC	1
SATENA	3

SPECIAL CLIMATOLOGY BULLETINS	
FAC	14
EJC	2
SATENA	7

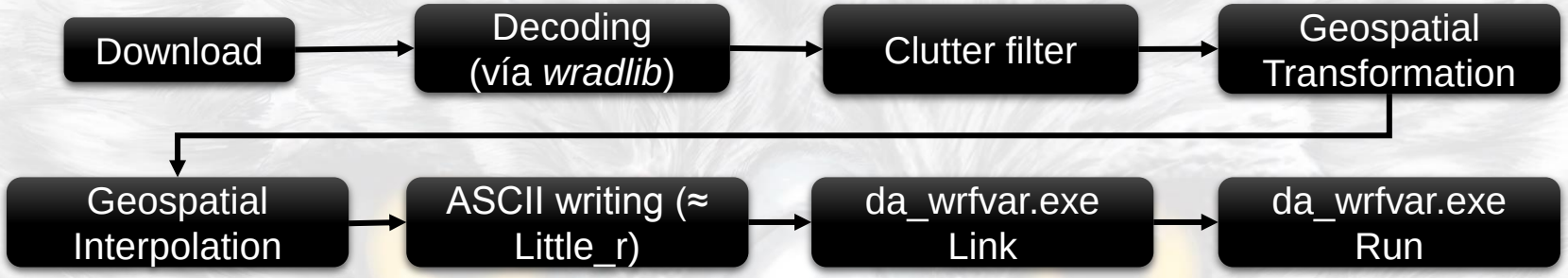
SPREADING THE KNOWLEDGE

	CURSO PRONOSTICO OPERACIONAL DEL TIEMPO	DIPLOMADO EN OBSERVACION DEL TIEMPO	DIPLOMADO EN PRONOSTICO DEL TIEMPO	DIPLOMADO EN PRODUCTOS MET DE AERÓDROMO	DIPLOMADO EN METEOROLOGIA AVANZADA	MAESTRIA UNAL	CURSO GOES 16	CURSO MET AERONAUTICA IDEAM	CURSO MET III	TOTAL
FAC	139	75	47	27	6	13	9	4	3	323
EJC	0	16	0	0	6	0	0	0	0	22
ARC	0	4	0	0	0	0	0	0	0	4
PNC	0	13	0	0	0	0	0	0	0	13
SATENA	0	6	1	1	1	0	0	0	0	9
IDEAM	0	4	0	4	3	0	0	0	0	11
IGAC	0	2	0	0	2	0	0	0	0	4
UAEAC	0	3	0	10	3	0	0	0	0	16

323 22 4 13 9 4 11 16

WRF 3.7 – 4.1 ACTUALIZATION

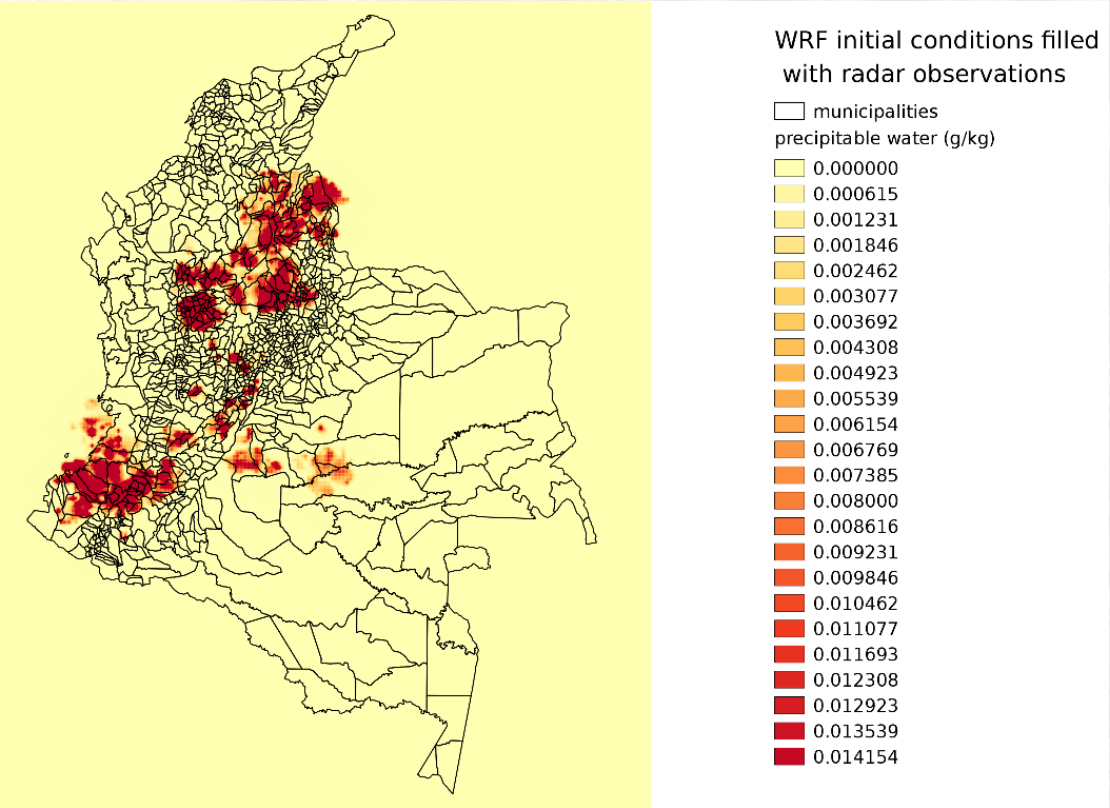
RADAR data assimilation



- **Data assimilation time used: preprocess ≈ 13 min & da_wrfvar.exe running 5 min (total ≈ 18 min)**
- **Radar types: Vaisala Meteorological Radar (Vaisala Sigmet IRIS): 6 Radars (AND, BAR, CAR, CEM, GUA y TAB)**
- **WRFDA-4 created with developments property of FAC (Developer: Nikolas Cruz-Camacho, Meteocolombia SAS)**

WRF 3.7 – 4.1 ACTUALIZATION

RADAR data assimilation



Precipitable Water adjusted with radar data for WRF initial conditions

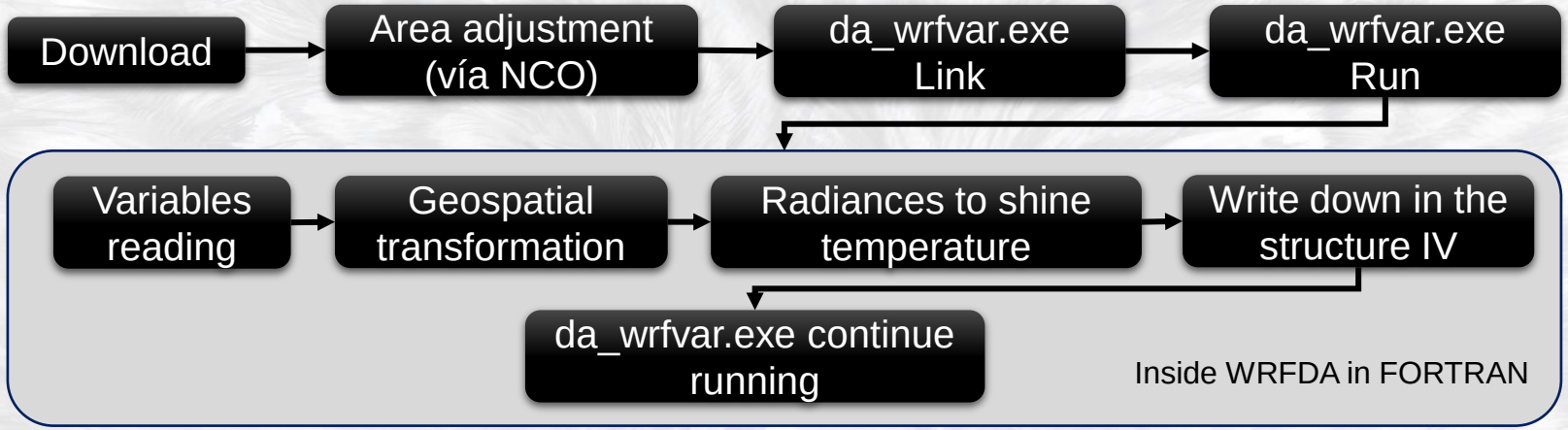
- Initial conditions for domain 2 (res. 3 km)
- Fecha: 2019-09-20 06Z

Según rsl.out.000:

```
Observation summary
   ob time  1
      synop                    2 global,
      metar                   28 global,
      radar                 3362 global,
```

WRF 3.7 – 4.1 ACTUALIZATION

Satellite Images GOES-16 assimilation



- **Data assimilation time required by the system: preprocess ≈ 2 min, running da_wrfvar.exe + 9 min (total = 11 min)**
- **Channels assimilated: 7 to 16 (Infrared channels)**

WRF 3.7 – 4.1 ACTUALIZATION

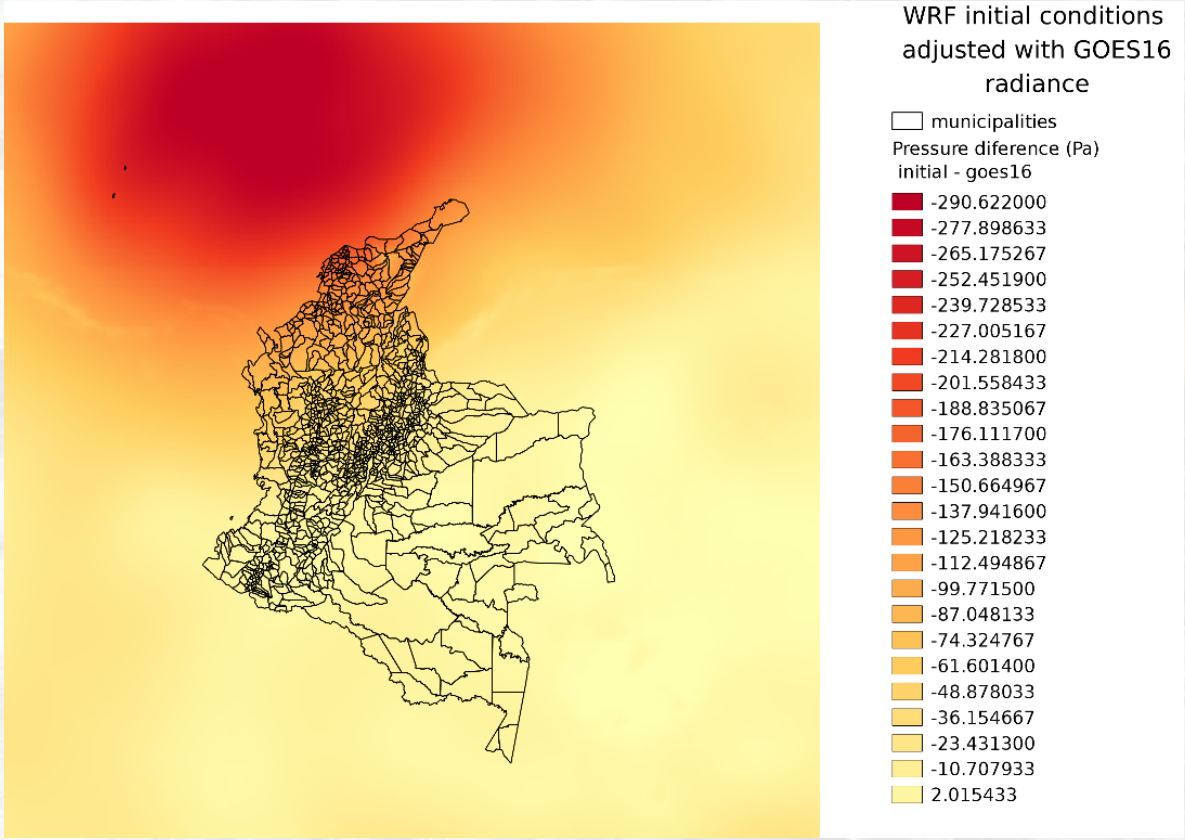
Satellite Images GOES-16 assimilation

- FORTRAN codes modified for a new version of WRFDA-4:
  - da_control.f90
  - da_radiance_init.inc
  - da_setup_radiance_structures.inc
  - da_read_obs_ncgoesimg.inc
  - da_get_satzen.inc
  - da_qc_rad.inc
  - da_qc_goesimg.inc

- WRFDA-4 created with developments property of FAC (Developer: Nikolas Cruz-Camacho, Meteocolombia SAS)

WRF 3.7 – 4.1 ACTUALIZATION

Satellite Images GOES-16 assimilation



Differences between initial pressure and adjusted with GOES16 data for WRF initial conditions

- Initial conditions for domain 1 (res. 9 km)
- Data: 2019-09-05 00Z
- Differences for level Sigma 2

Según rsl.out.000:

```
Observation summary
   ob time  1
      radiance          1834416 global,
```

RESEARCHING PROJECTS

Antartic Project

- “Identification and characterization of the meteorological phenomena dangerous for air navigation, associated with the mesoscale cyclonic systems”

WORKING TOGETHER

Durante la conmemoración, el Instituto de Hidrología, Meteorología y Estudios Ambientales (Ideam) recibió, en cabeza de la directora, la Medalla Militar "Marco Fidel Suárez", Categoría Especial al Honor y la Integridad, en reconocimiento al instituto por los eficientes servicios y apoyo prestados a la FAC en el trabajo de la protección del medioambiente, y de combatir la deforestación en beneficio del desarrollo sostenible y crecimiento económico del país.

IDEAM

Soundings:	Marandúa AFB
	Tres Esquinas AFB
Weather Radars:	Carimagua
	San José del Guaviare
	Cerro Munchique

NATIONAL WEATHER SERVICE INTERNATIONAL DESK

Colombian Air Force paid for tickets and travel expenses for his officers in duty commissions – don't take IDEAM positions

Yadira Cardenas (Colombia)
8/1/2005 - 11/30/2005, Tropical Desk

Vice principal of Meteorology at IDEAM (2016-2017)

Jorge Jiménez Sánchez (Colombia)
12/1/2008 - 3/31/2009, Tropical Desk

PhD Meteorology and Atmospheric Sciences
"Jet Stream over Orinoco Region"

Luis Sánchez Vargas (Colombia)
12/1/2011 - 3/31/2012, Tropical Desk

Major (RA) – Specialist in Aeronautical Meteorology and Environment in the Regional Office ICAO (Mexico)

NATIONAL WEATHER SERVICE INTERNATIONAL DESK

South American

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service

Captain Mauricio Jiménez García

Has been awarded

The Senior Meteorologist Badge

The Senior Meteorologist Badge is awarded for meritorious service while on attachment to the Weather Prediction Center/International Desks of the United States National Weather Service. During his period of training, **1 May – 31 August 2019**, the service member distinguished above his peers, excelling in the analysis and forecast of environmental conditions over the Caribbean Basin and South America. His service and dedication brings credit and great honor to your organization.

MICHEL DAVISON
Chief, International Desks

30 August 2019

tment of Commerce

OF TRAINING

énez García

ICCESSFUL COMPLETION OF

sks Training
ronmental Prediction
n, D.C.

st 31, 2019

David R. Novak
Director, WPC

Michel Davison
Chief, International Desks

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