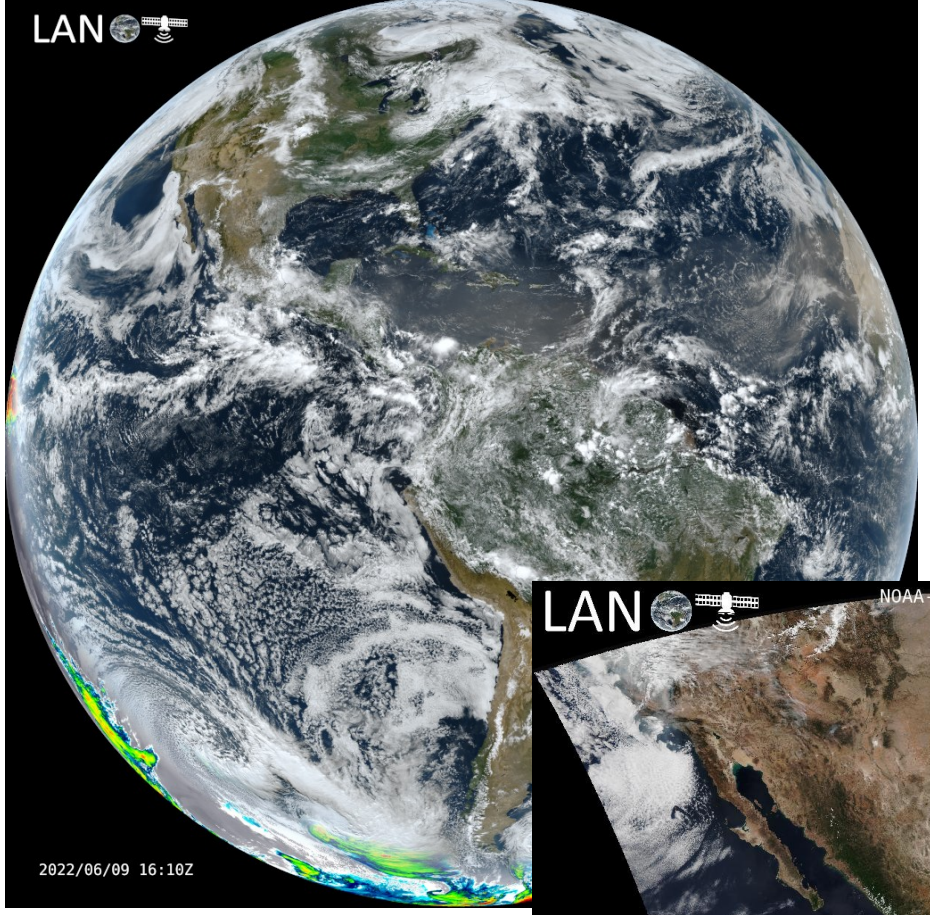
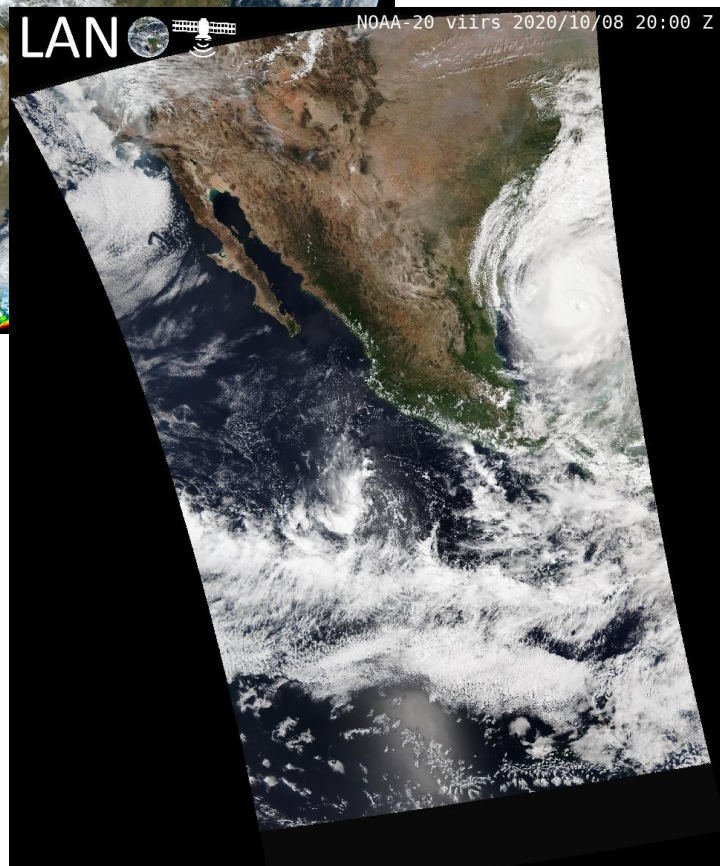
CSPP GEO and LEO use at the National Laboratory for Earth Observation (LANOT), Mexico

Alejandro Aguilar Sierra

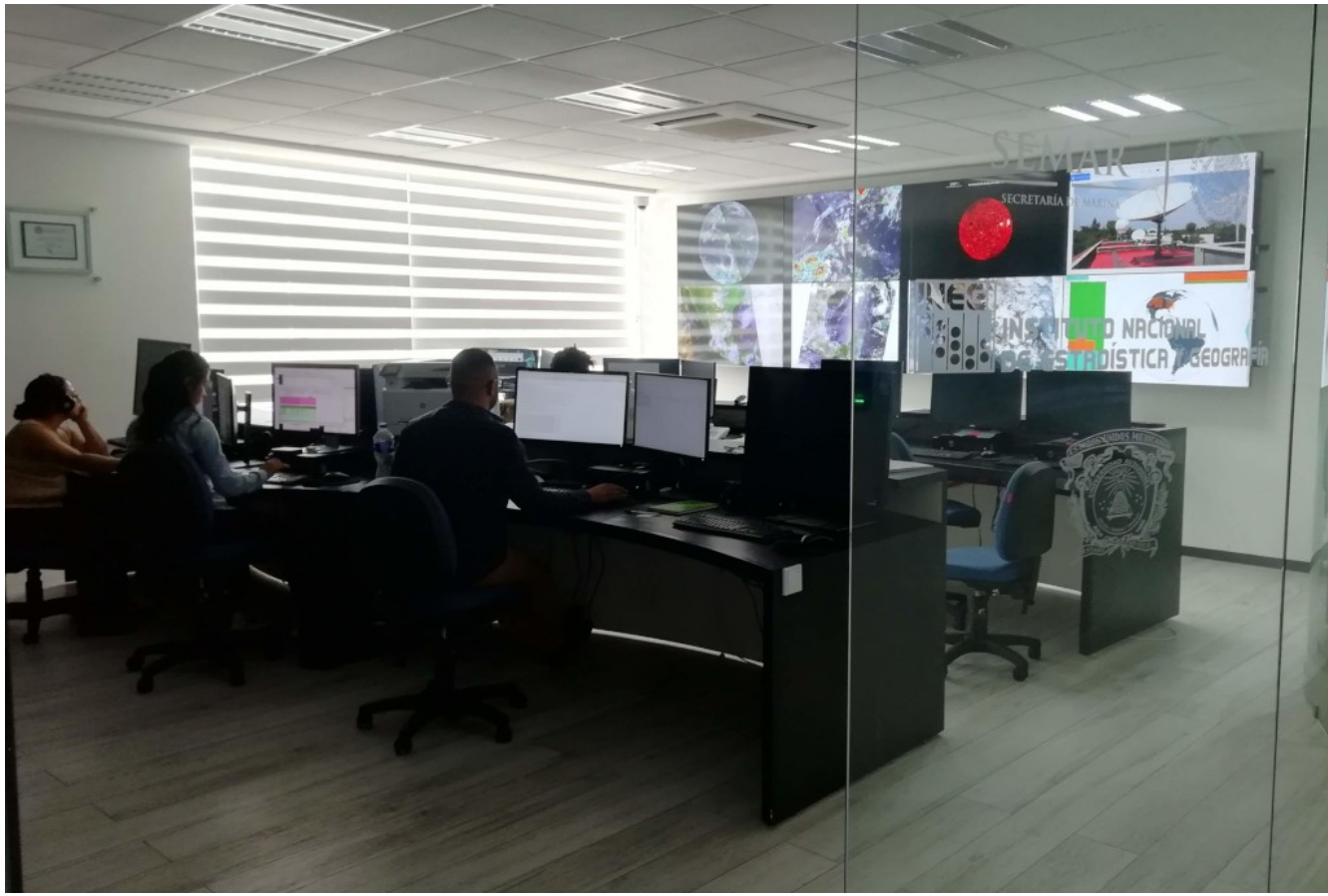
and Victor Jiménez Escudero



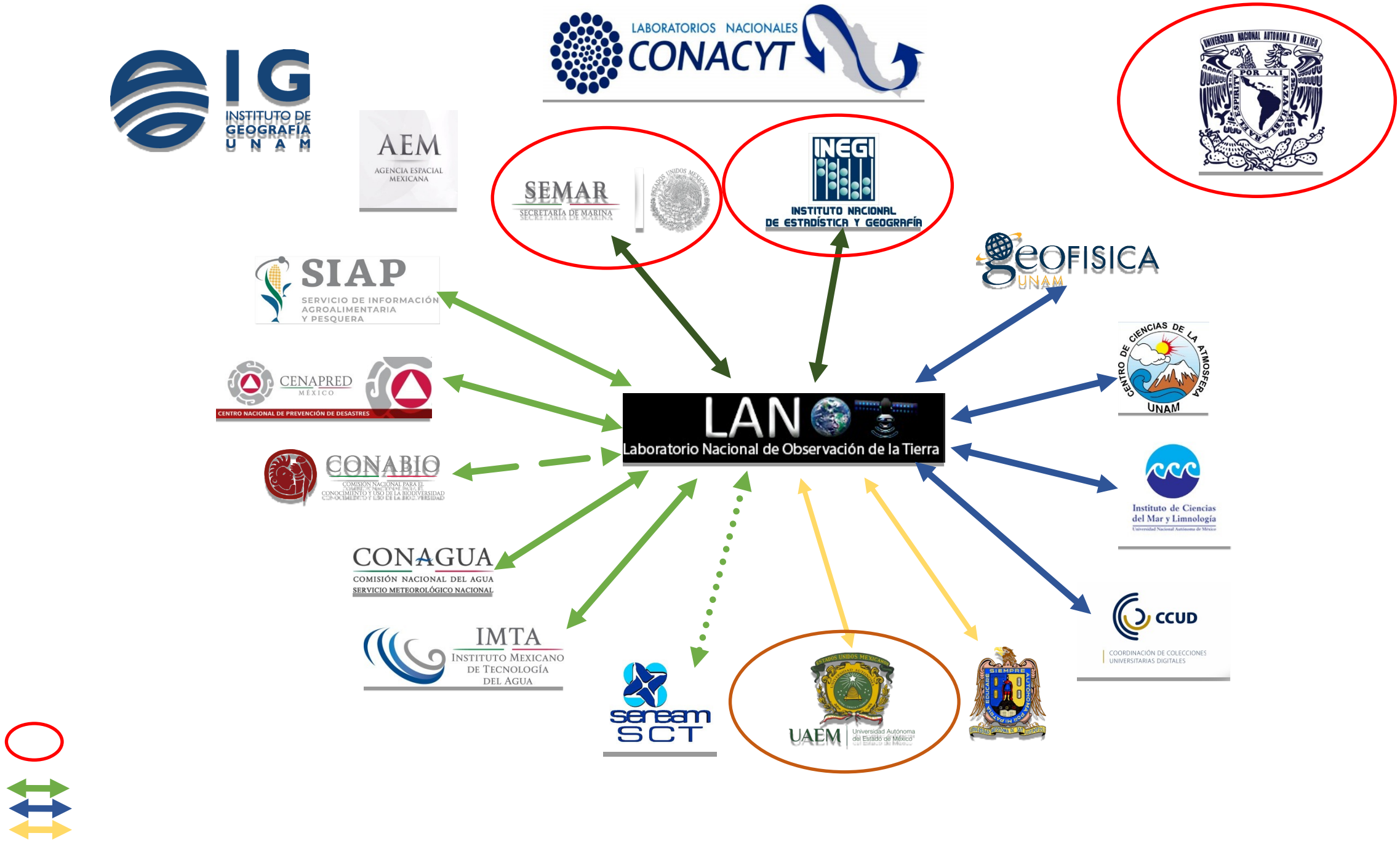


Laboratorio Nacional de Observación de la Tierra (LANOT)

Receive, store, process and distribute remote sensing data and images for issuing early alerts on storms, wild fires, volcanic emissions as well as continuous surface and atmospheric monitoring and studies.

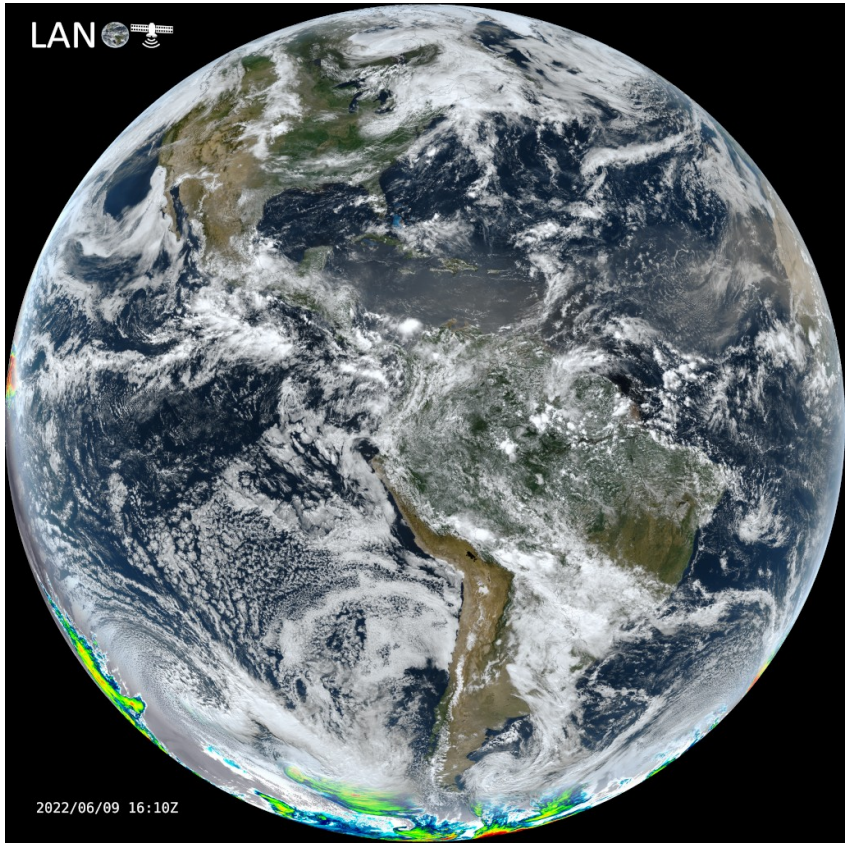


Antennas on our roof

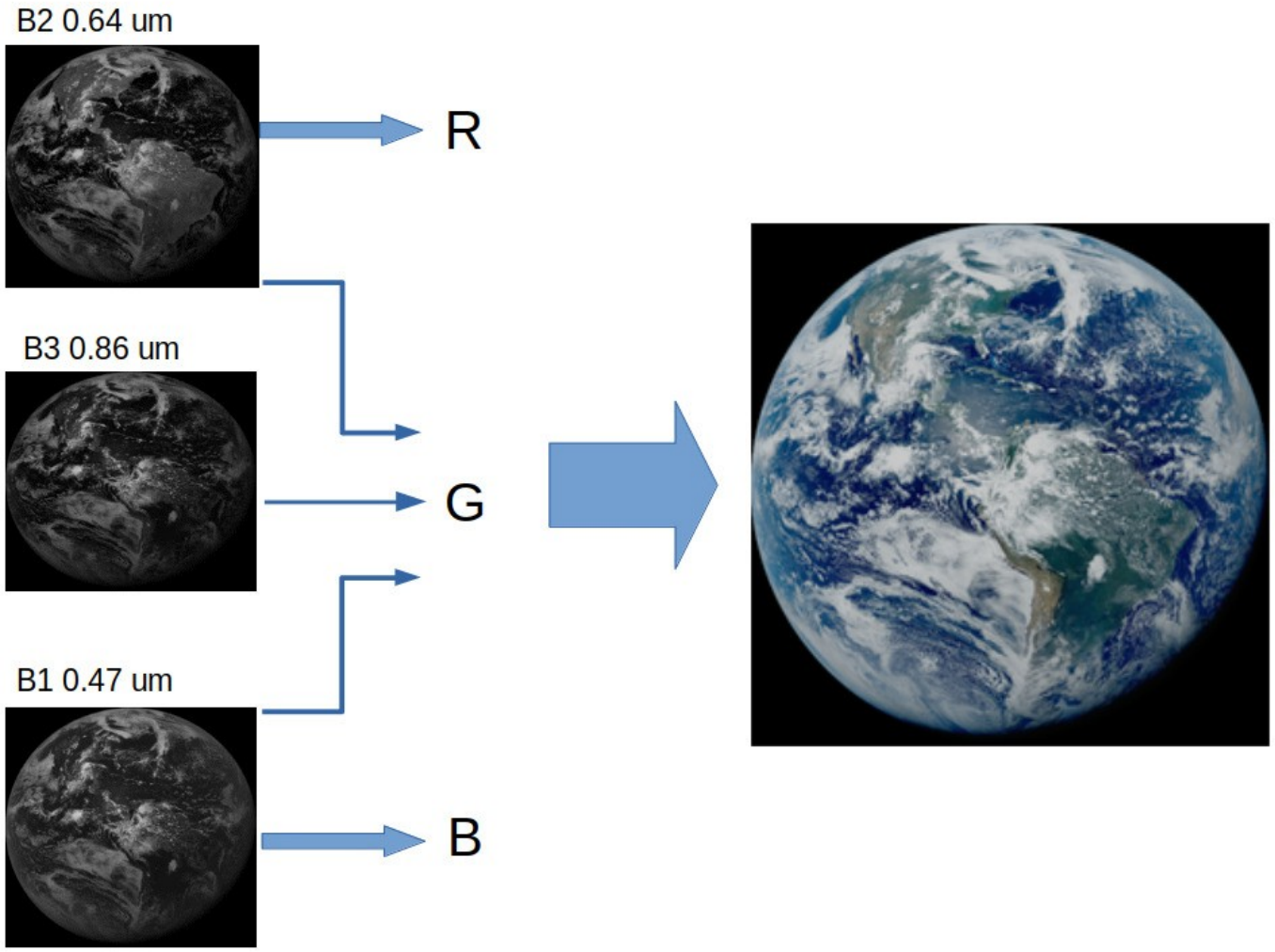

IG
INSTITUTO DE GEOGRAFÍA
UNAM
LABORATORIOS NACIONALES
CONACYT
AEM
AGENCIA ESPACIAL MEXICANA
SEMAR
SECRETARÍA DE MARINA
INEGI
INSTITUTO NACIONAL DE ESTADÍSTICA Y GEOGRAFÍA
UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO
POR MI RAZA HABLARÁ EL ESPÍRITU
SIAP
SERVICIO DE INFORMACIÓN AGROALIMENTARIA Y PESQUERA
GEOFISICA
UNAM
CENAPRED
MÉXICO
CENTRO NACIONAL DE PREVENCIÓN DE DESASTRES
CENTRO DE CIENCIAS DE LA ATMÓSFERA
UNAM
LAN
Laboratorio Nacional de Observación de la Tierra
CONABIO
COMISIÓN NACIONAL PARA EL CONOCIMIENTO Y USO DE LA BIODIVERSIDAD
Instituto de Ciencias del Mar y Limnología
Universidad Nacional Autónoma de México
CONAGUA
COMISIÓN NACIONAL DEL AGUA
SERVICIO METEOROLÓGICO NACIONAL
CCUD
COORDINACIÓN DE COLECCIONES UNIVERSITARIAS DIGITALES
IMTA
INSTITUTO MEXICANO DE TECNOLOGÍA DEL AGUA
seream
SCT
UAEM
Universidad Autónoma del Estado de México
SIEMPRE
EDUCARE

Using CSPP GEO at LANOT

- True Color + Night view
- Hot spots (Fire)
- Lightning Monitoring
- Saharan dust
- Volcanic Ash



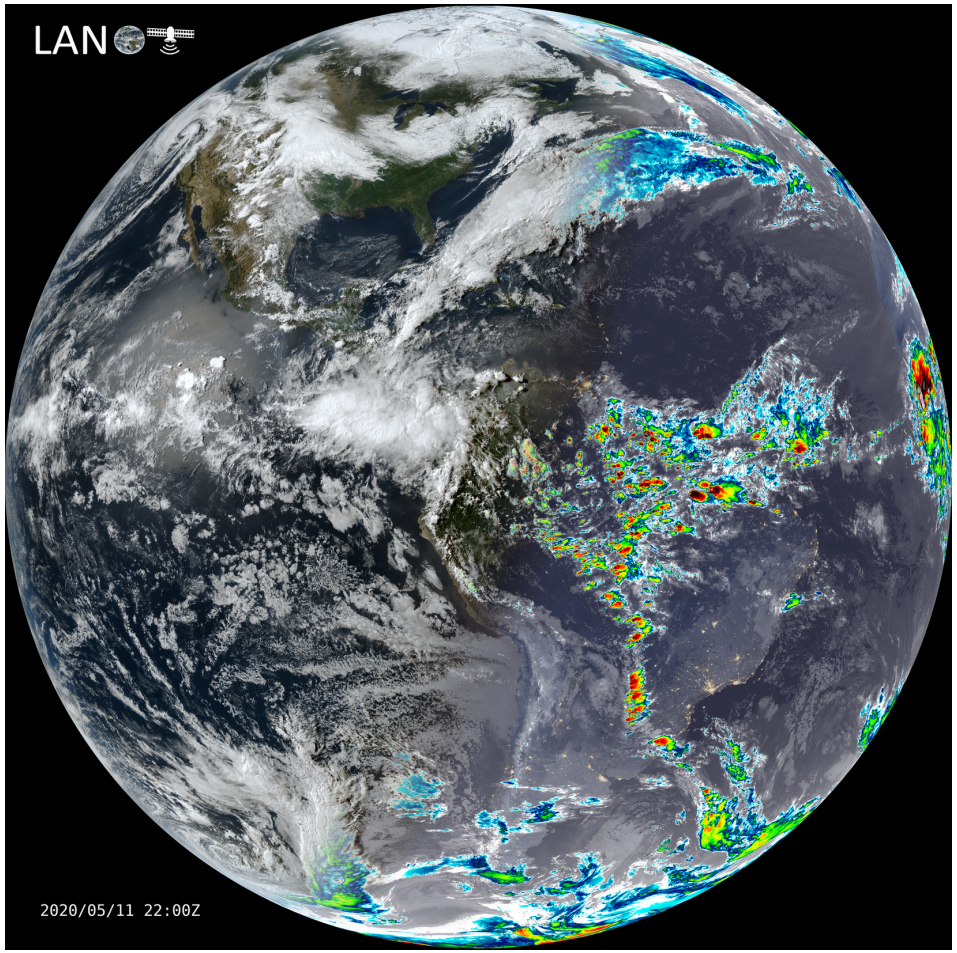
Full Disk Daytime True Color



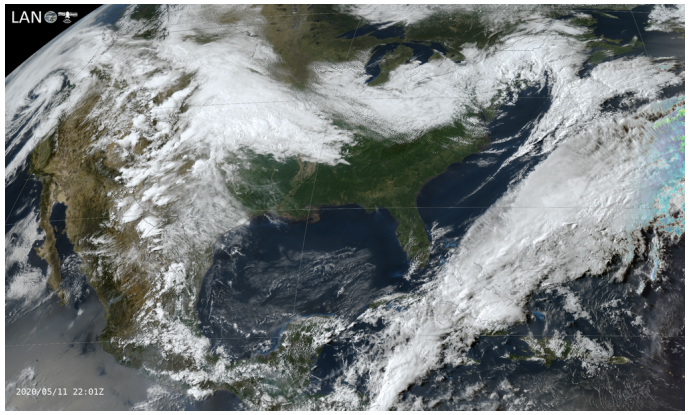
Full Disk Nighttime Pseudcolor

B13 – 10.35 nm

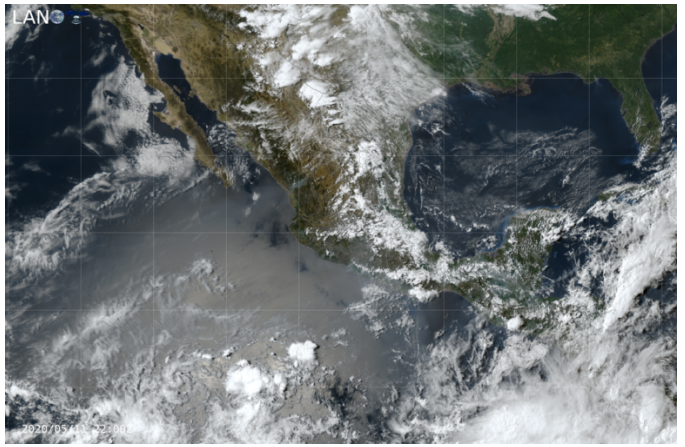
RGB Composite and cuts



Disco completo

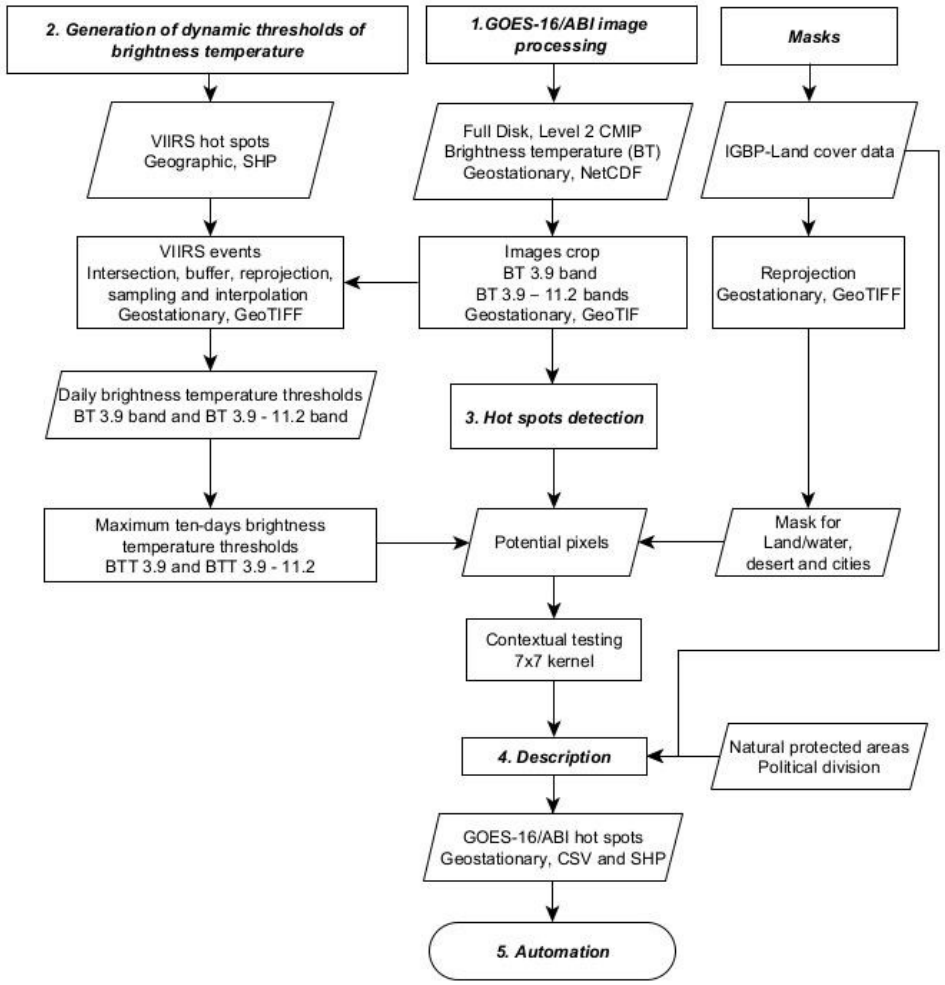


Conus

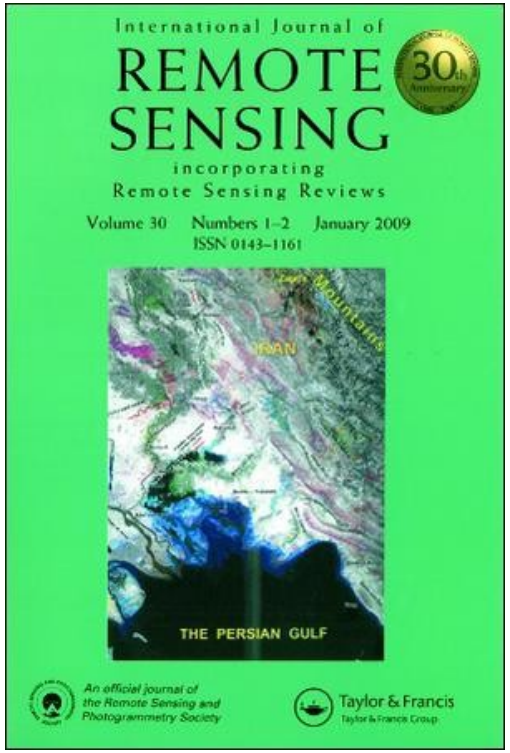


México

Detection of vegetation fires

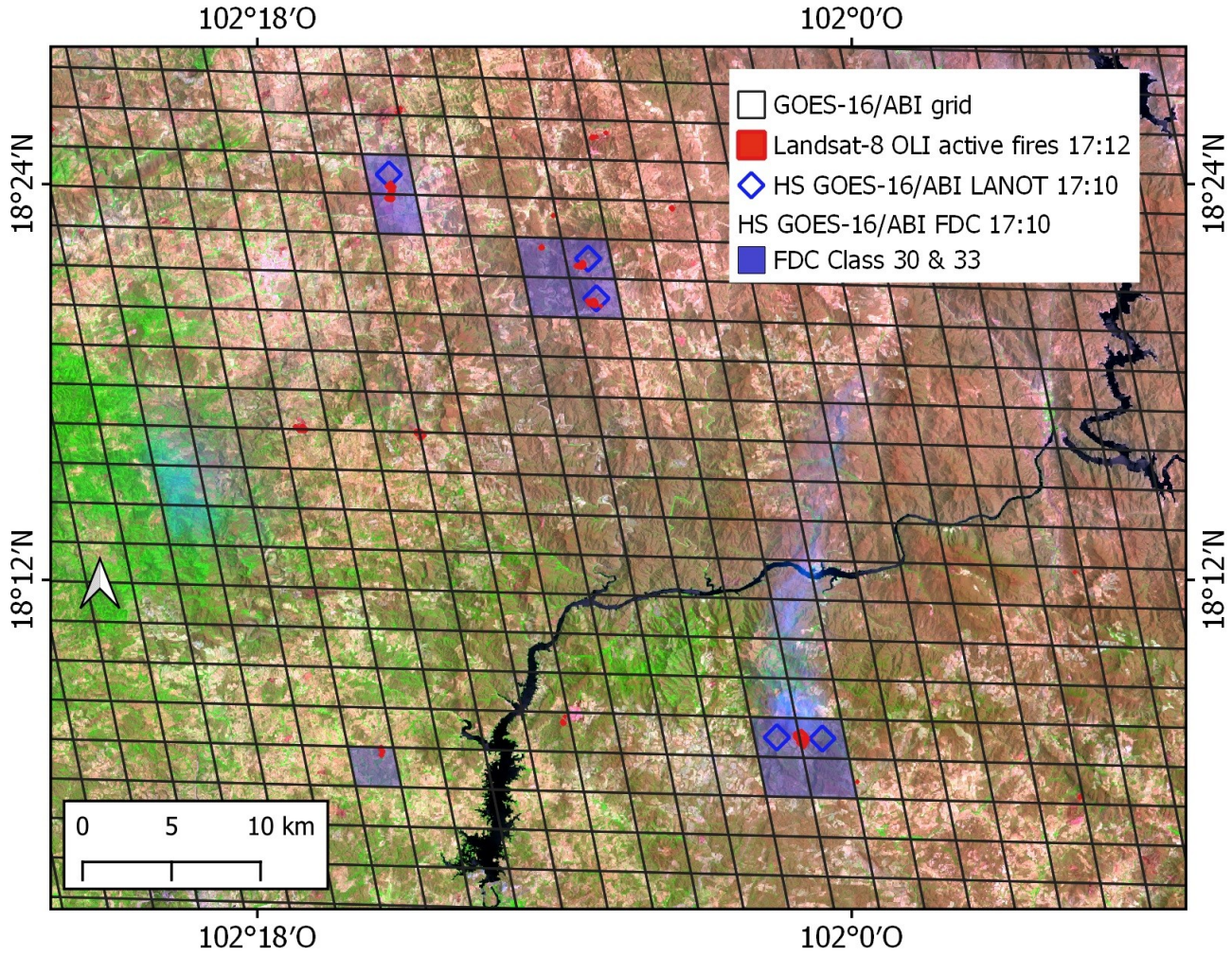


Flowchart of GOES-16/ABI hot spots algorithm, bands 7 and 14, CMI brightness temperature.



Manzo-Delgado Lilia et al. Detection of vegetation fires in Mexico using GOES-16/ABI images: algorithm description and preliminary assessment. Submited to the International Journal of Remote Sensing.

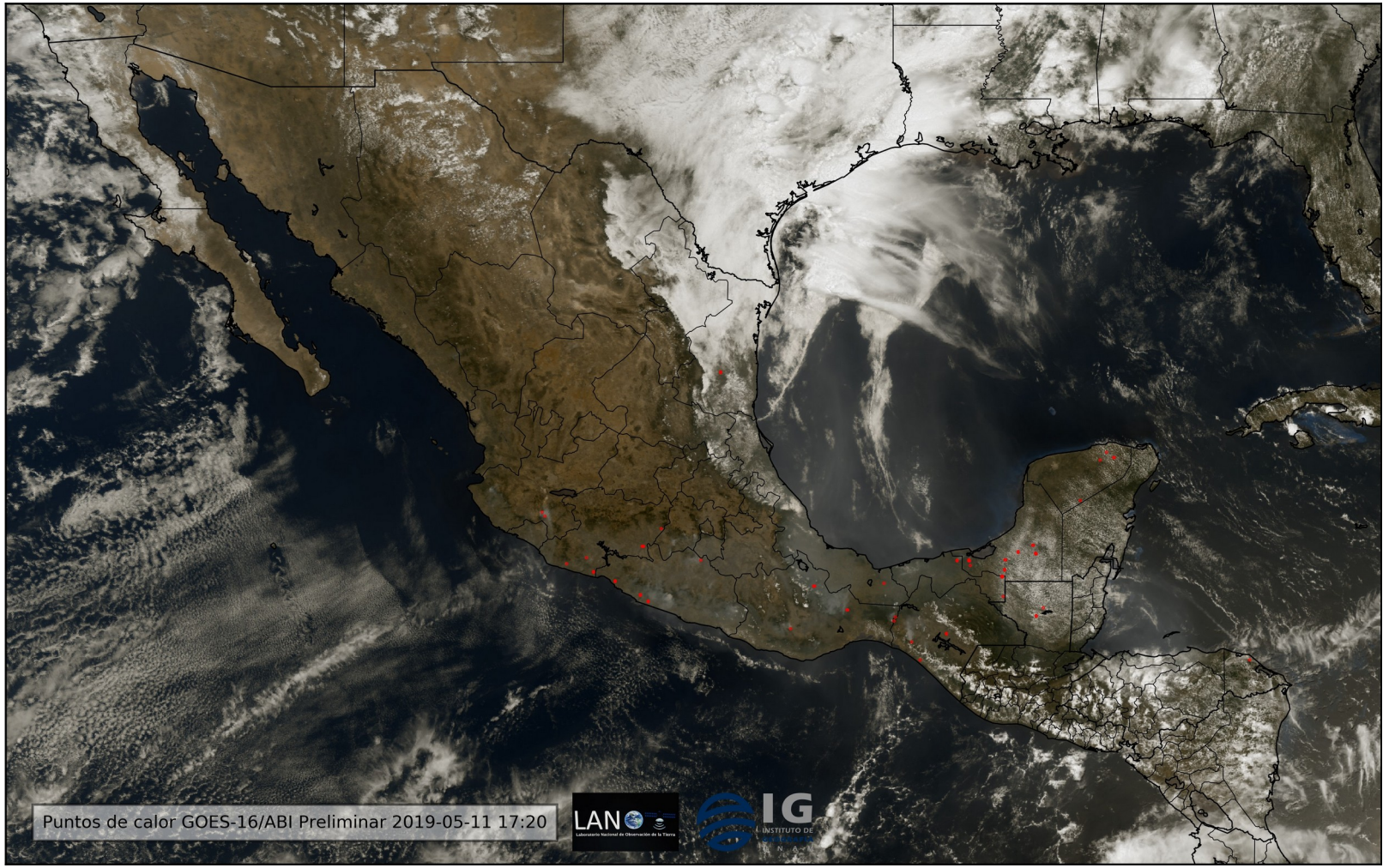
Detection of vegetation fires



Visual example of the hot spots (HS) assessment, GOES-16/ABI FDC on Landsat-8 OLI image, from 5 May 2020. Landsat-8 OLI active fire (red) and HS GOES-16/ABI FDC (purple squares). HS GOES-16/ABI LANOT (blue diamond) also included.

Manzo-Delgado Lilia et al. Detection of vegetation fires in Mexico using GOES-16/ABI images: algorithm description and preliminary assessment. Under revision at International Journal of Remote Sensing.

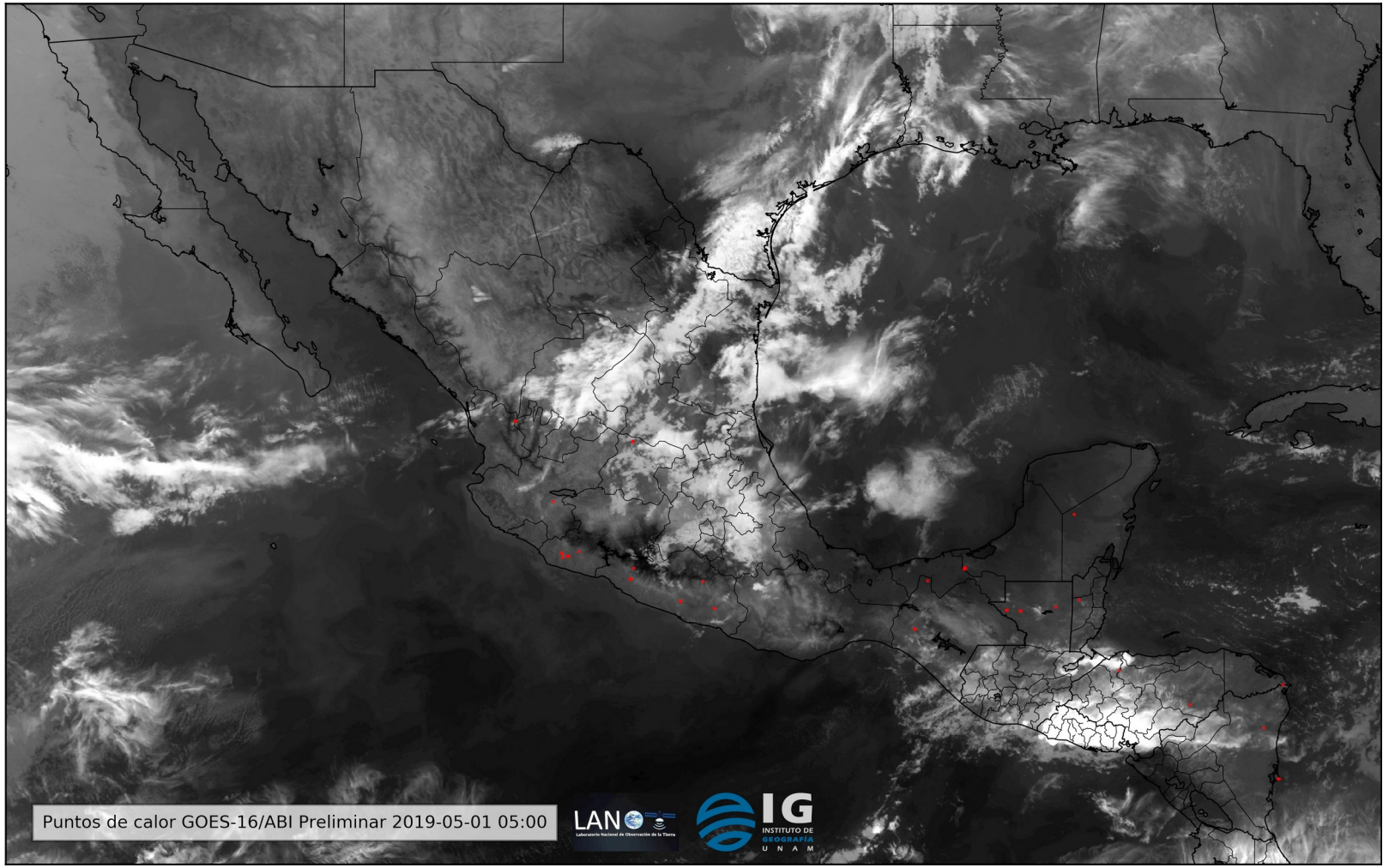
Detection of vegetation fires



Quick visualization of daytime hot spots (red dots) detected by the algorithm GOES-16/ABI over a true-colour composite.

Manzo-Delgado Lilia et al. Detection of vegetation fires in Mexico using GOES-16/ABI images: algorithm description and preliminary assessment. Under revision at International Journal of Remote Sensing.

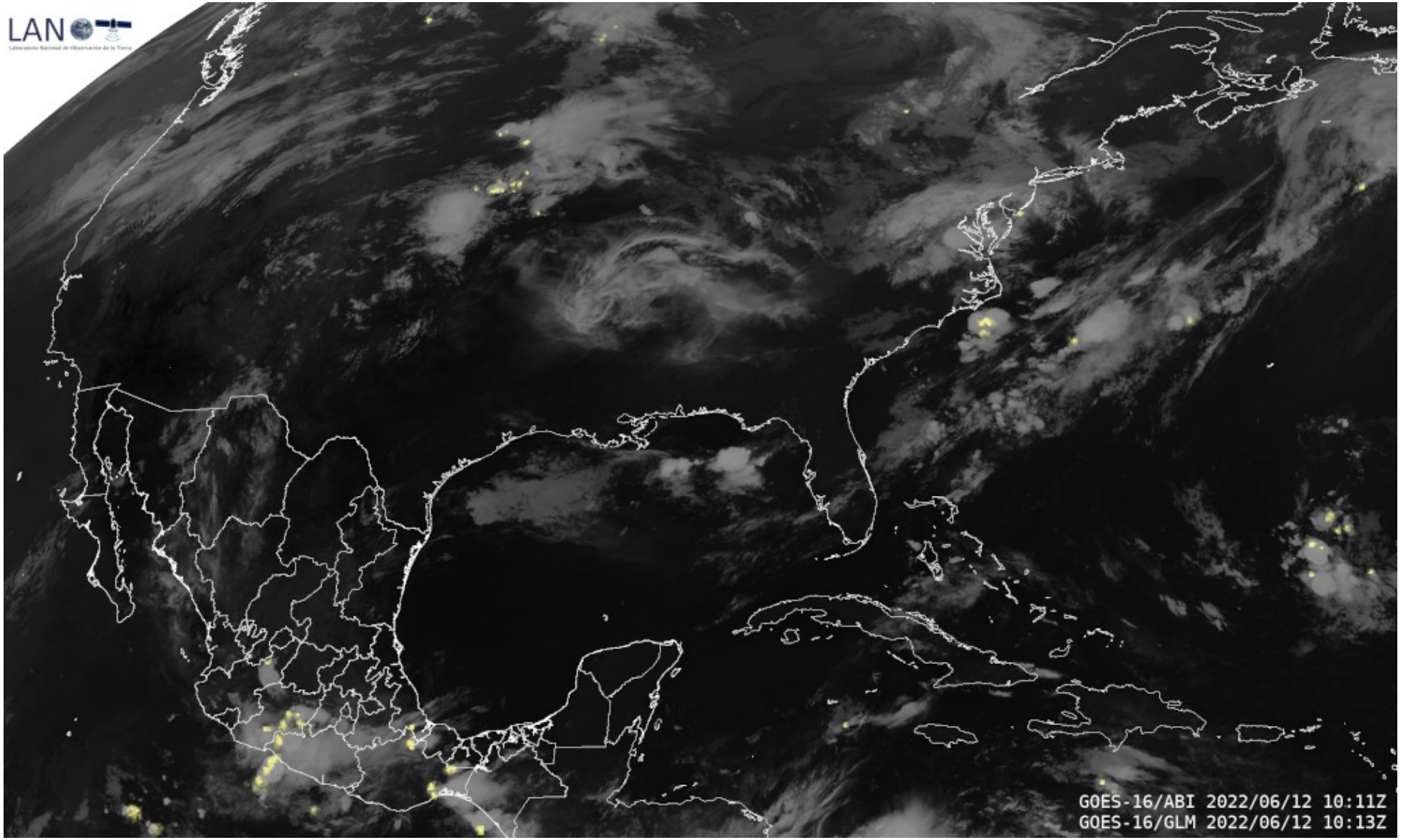
Detection of vegetation fires



Quick visualization of night-time hot spots (red dots) detected by the algorithm GOES-16 / ABI over band 13 (10.3 μm).

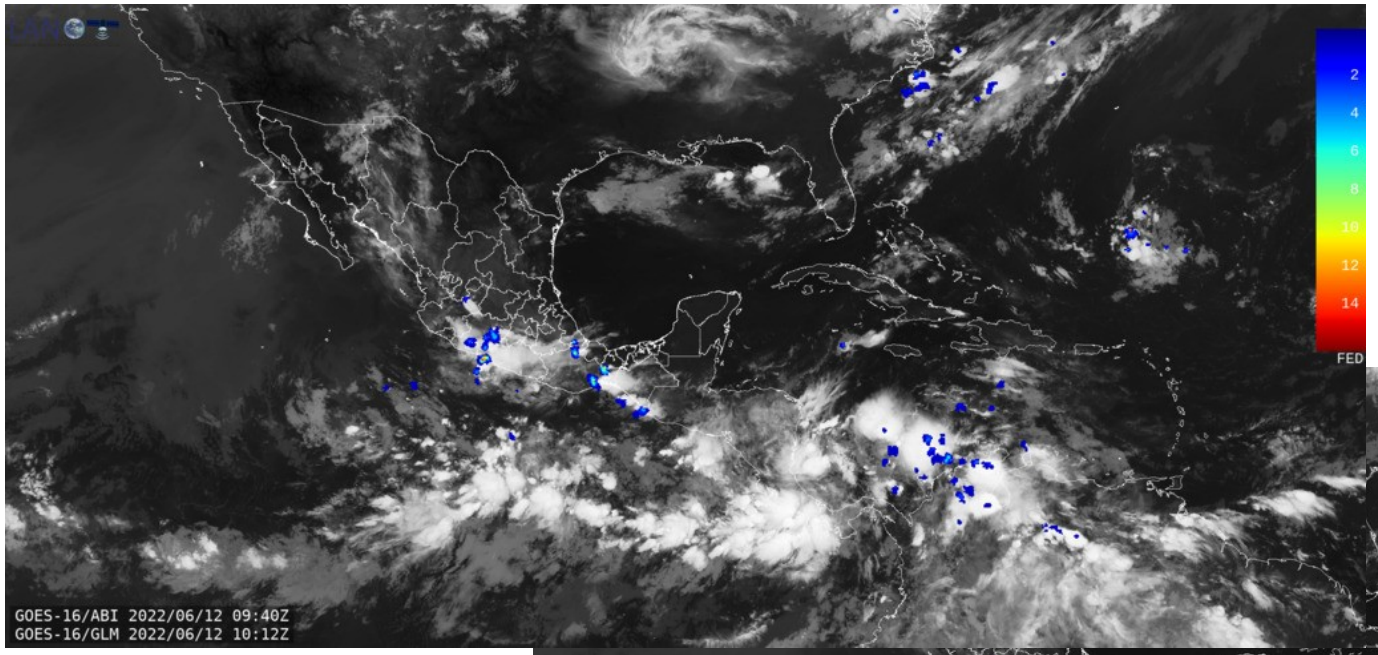
Manzo-Delgado Lilia et al. Detection of vegetation fires in Mexico using GOES-16/ABI images: algorithm description and preliminary assessment. Under revision at International Journal of Remote Sensing.

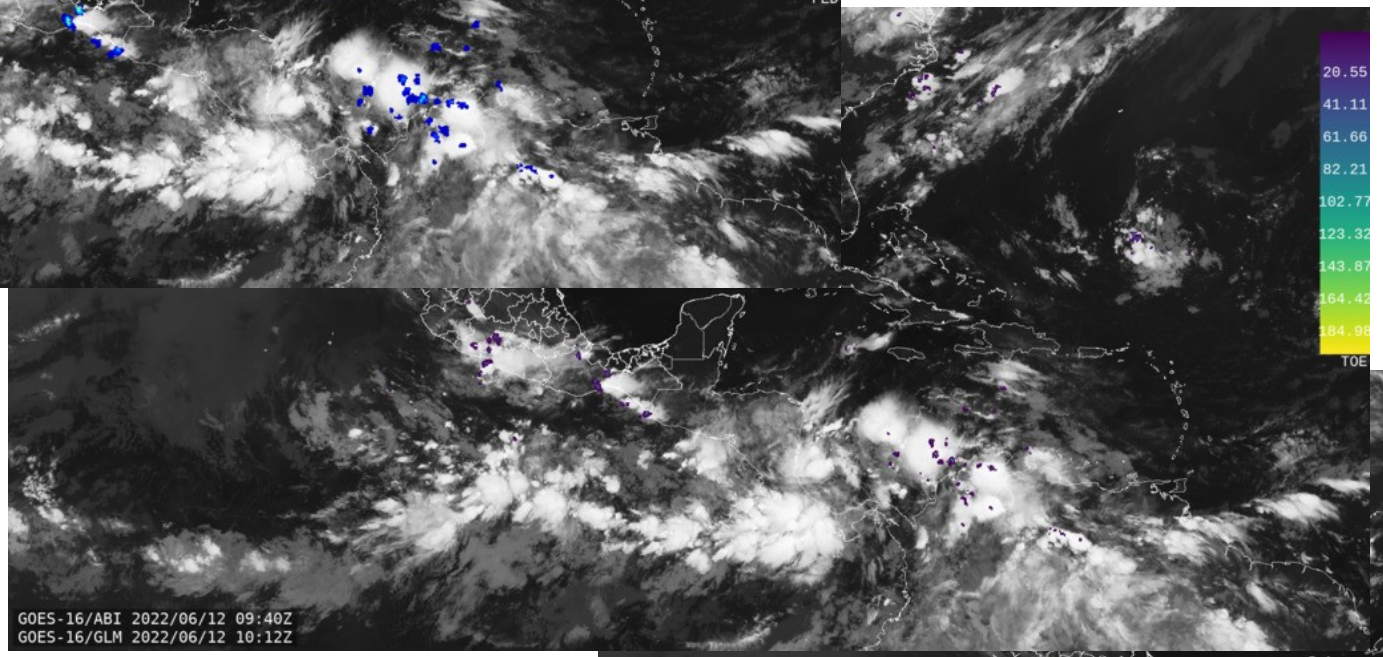
Lightning Monitoring, Qualitative

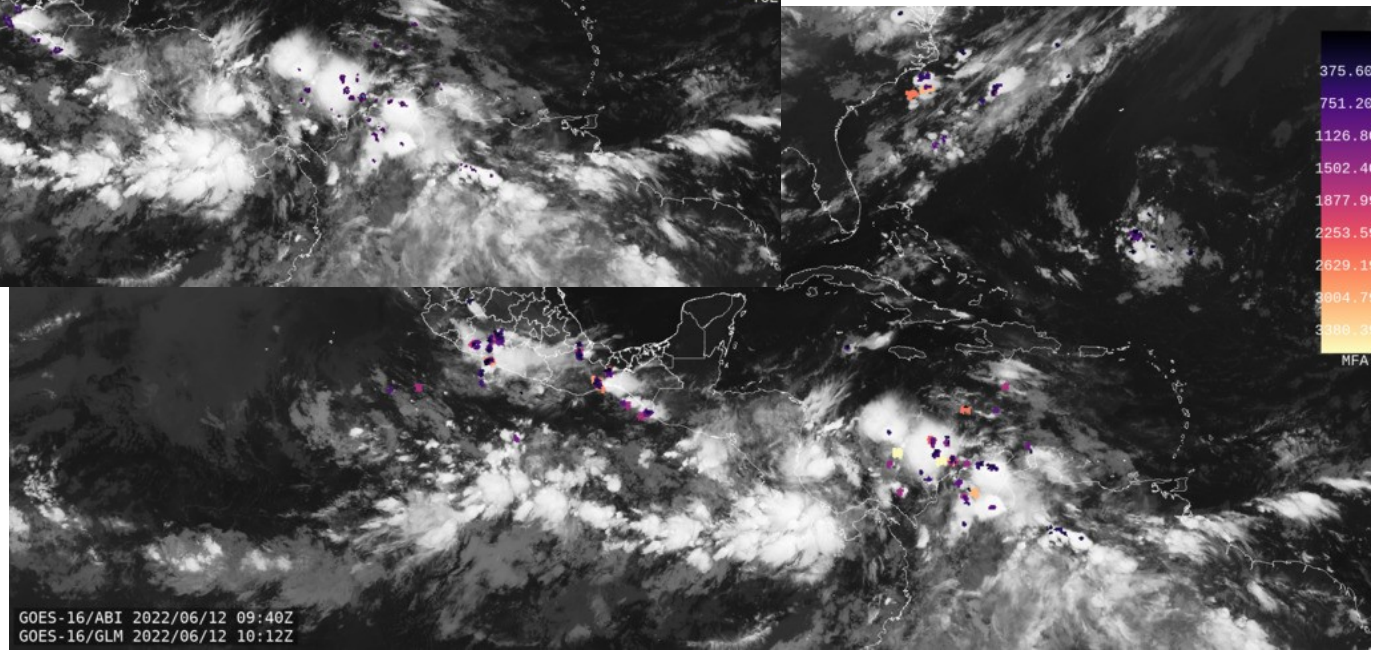


Lightning Monitoring Gridded Products

ATIF 2.0 B4

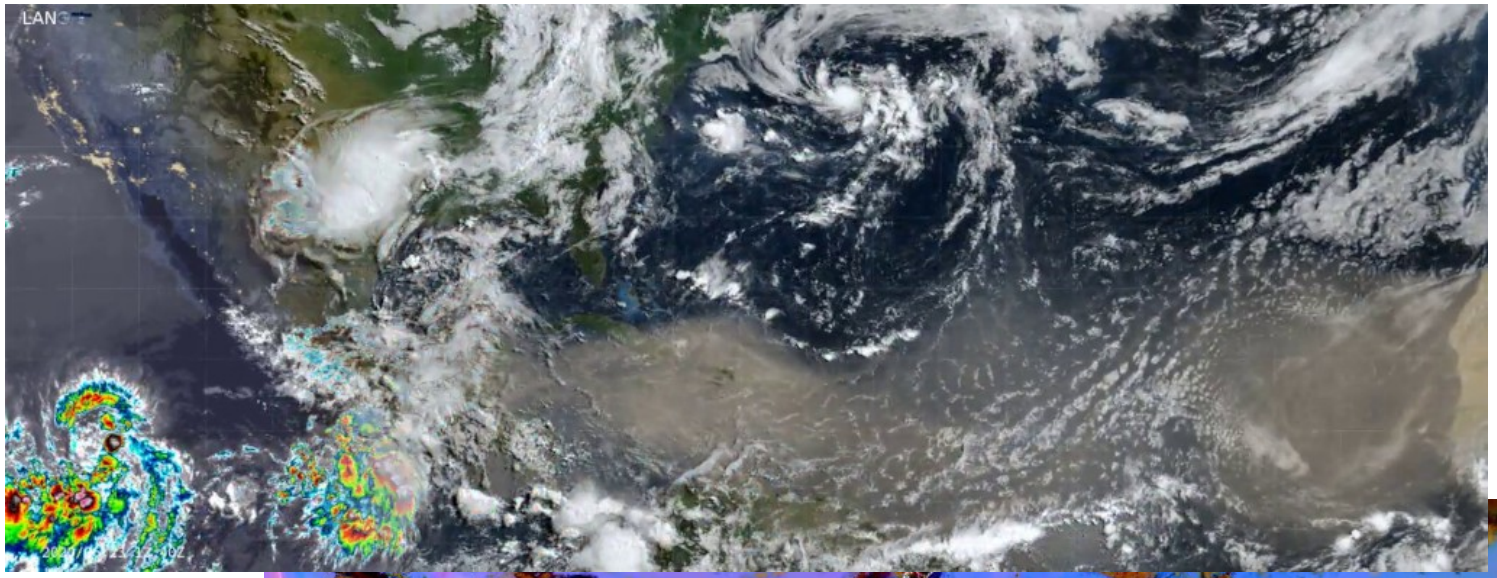


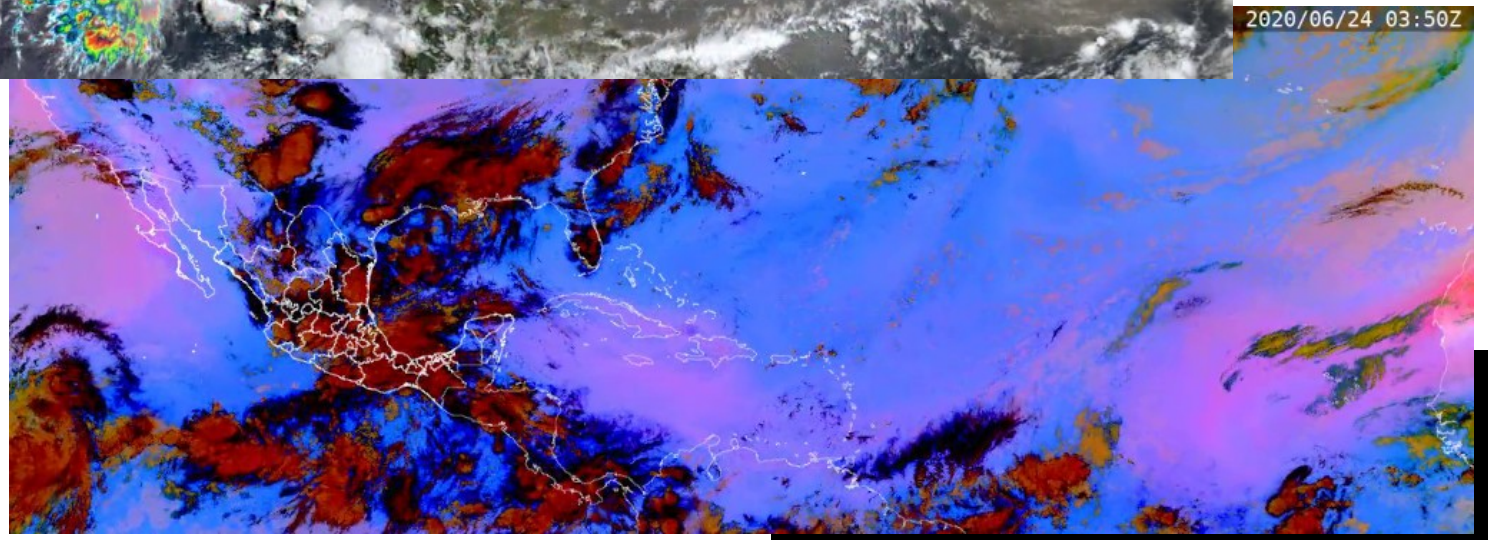


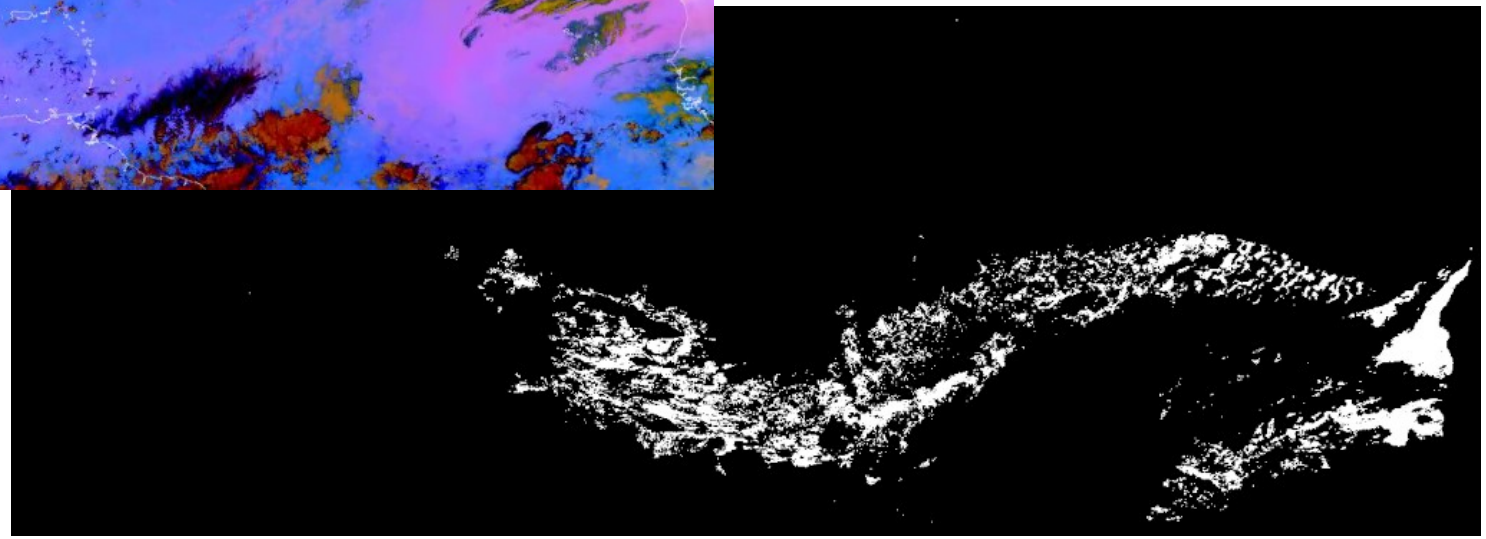


Saharan dust

Saharan dust







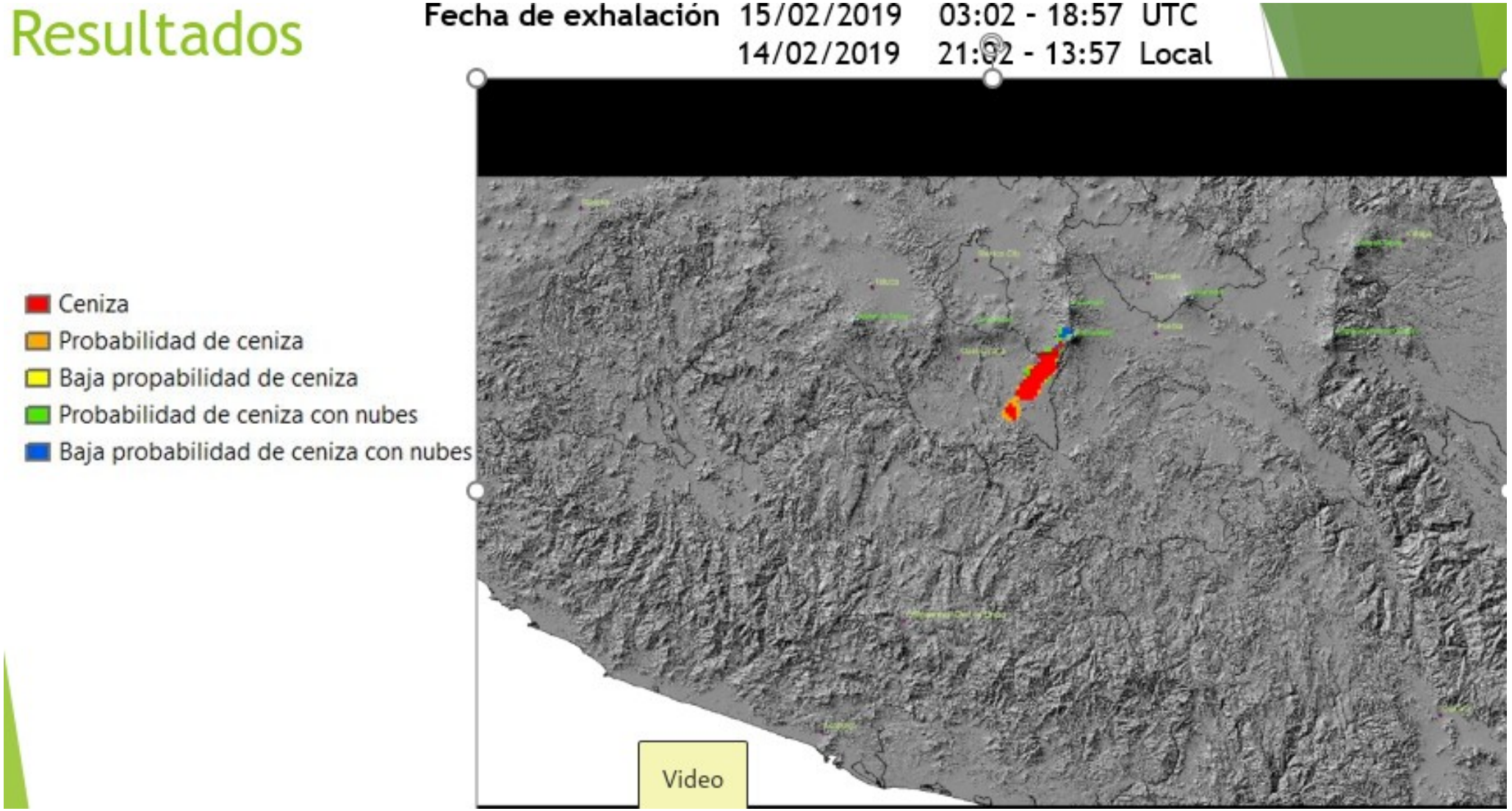
http://132.247.103.145/goes16/abi/vistas/dust/

Volcanic ash

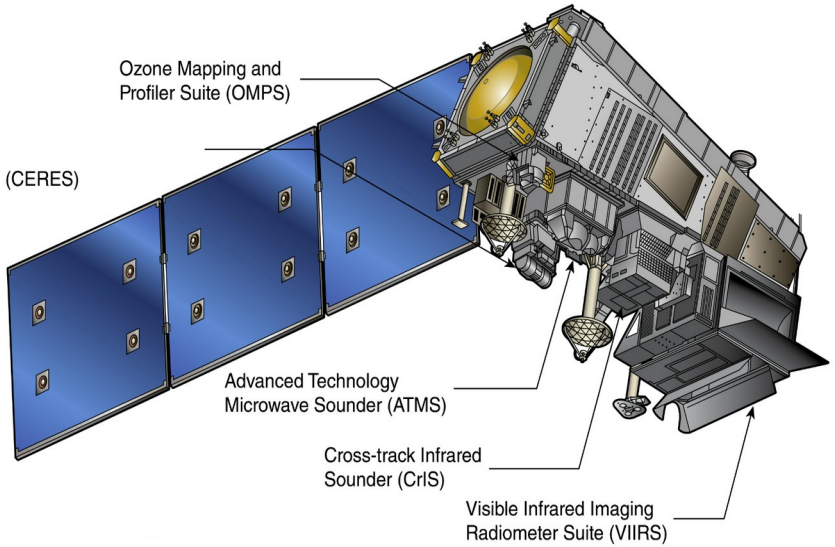
http://132.247.103.145/goes16/abi/vistas/ash/

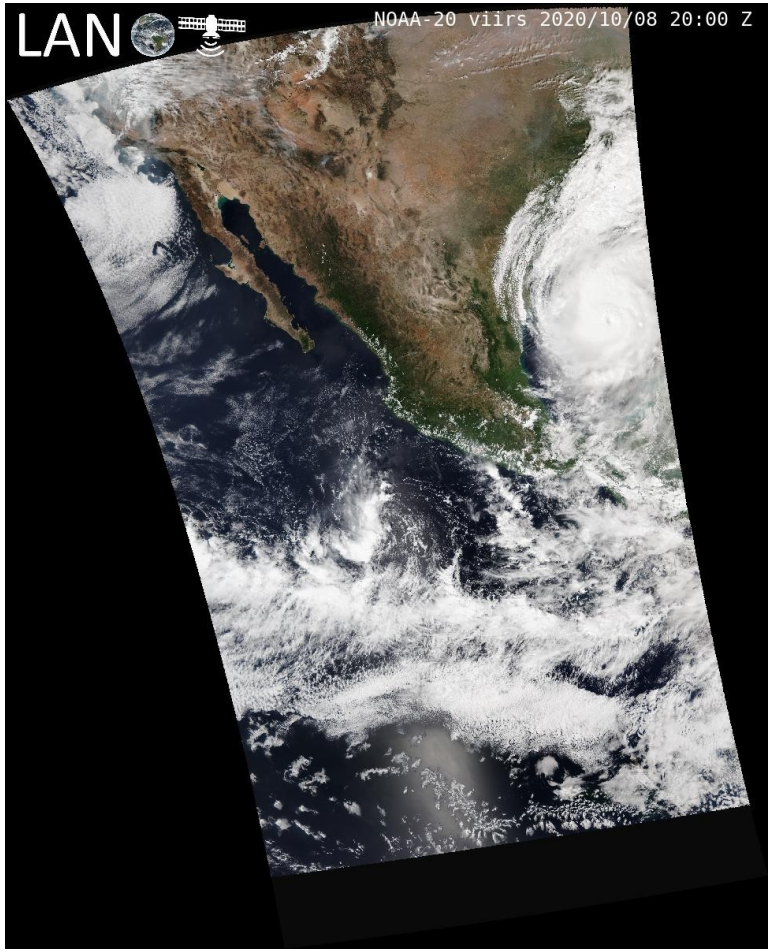
Volcanic ash

Resultados



Using CSPP LEO at LANOT





S-NPP y NOAA-20

RT-STPS

Real-time Processing

Simulcast Viewer

IPOPP-NASA

(International Planetary Observation Processing Package)

Science Data

Ancillary File Cache

Real-time

Archived

DRL Ancillary Repository (is.sci.gsfc.nasa.gov)

SPAs (algorithms) 16 programas

Science Data Products: **SDR** (L1)

Science Data Products: **EDR** (L2)

Archive Reprocessing

CLASS
DAAC
LAADS
LANCE
LANOT

CSPP-NOAA

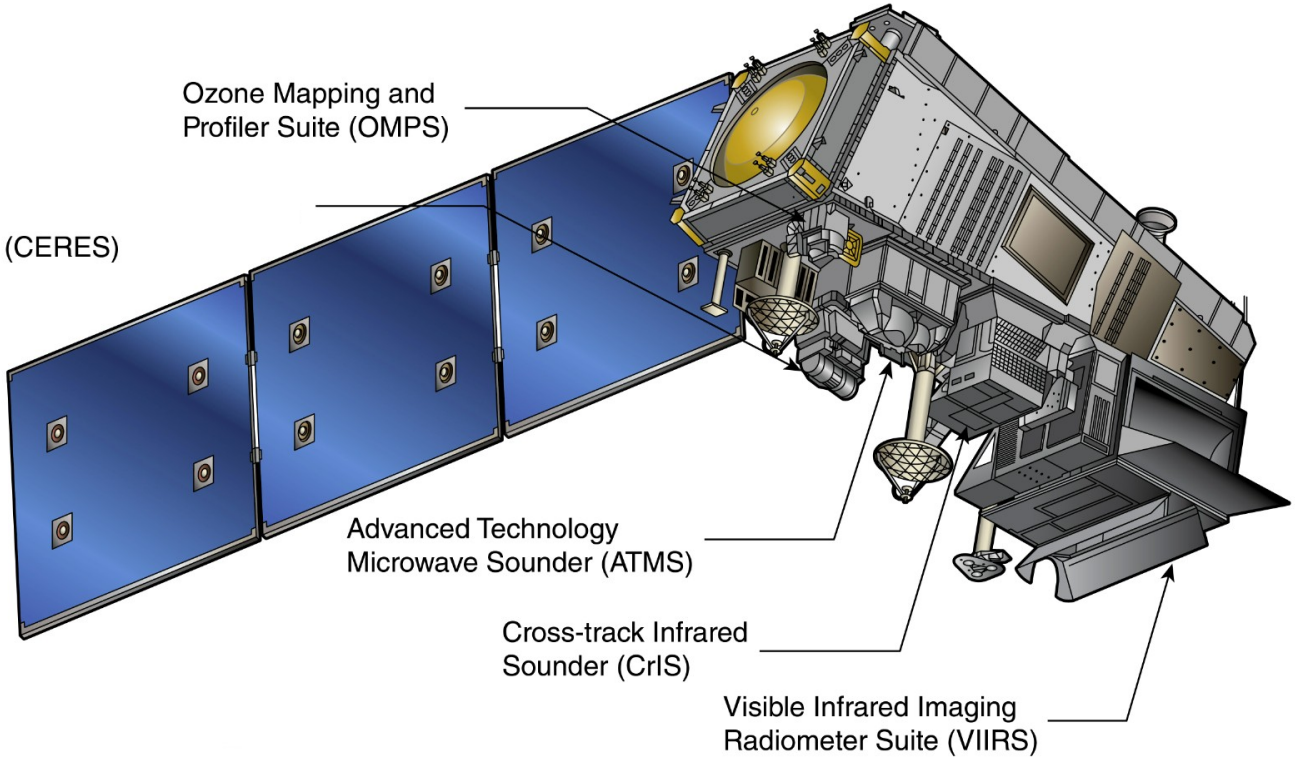
CLAVRx L2

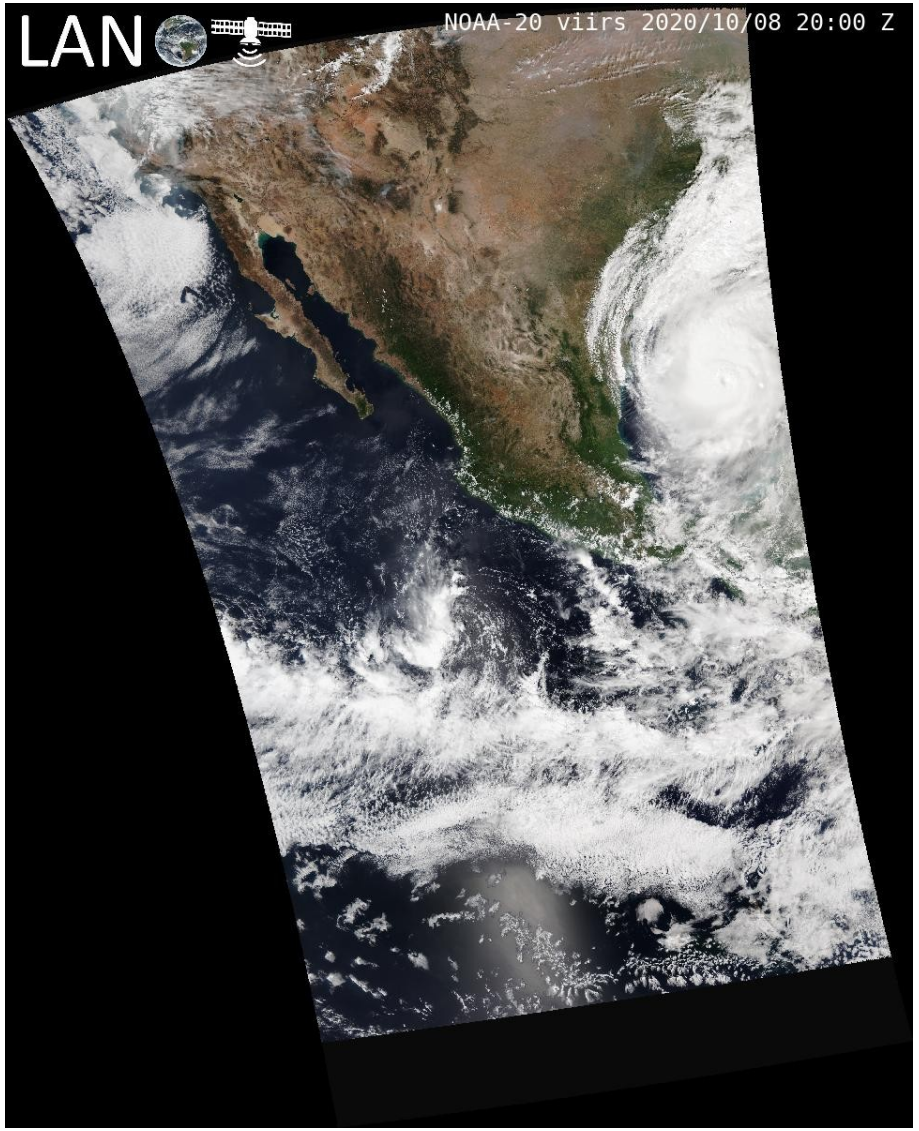
ASCI L2

FLOOD DETECTION L2

ACSPO L2

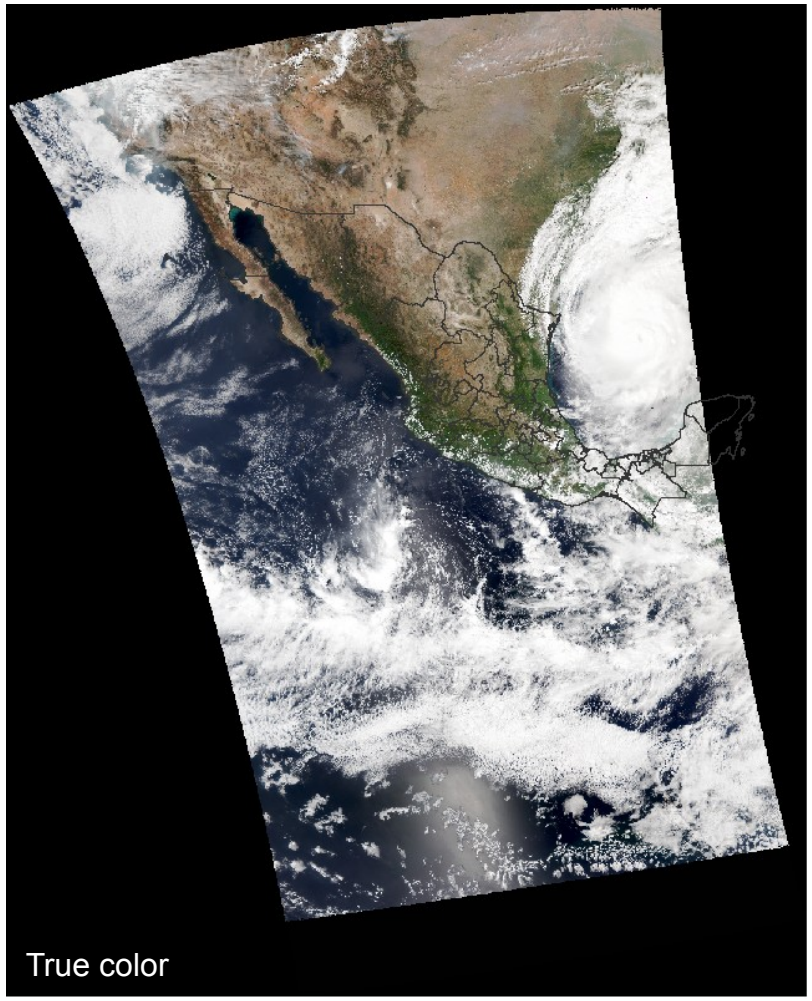
POLAR2GRID L2

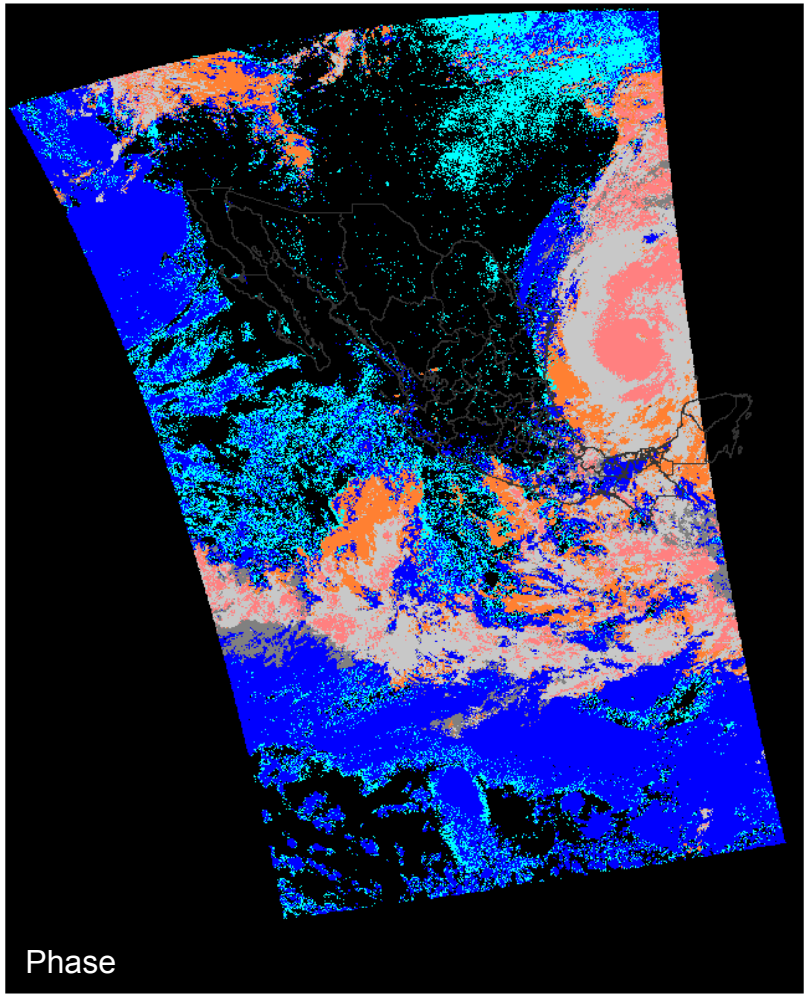


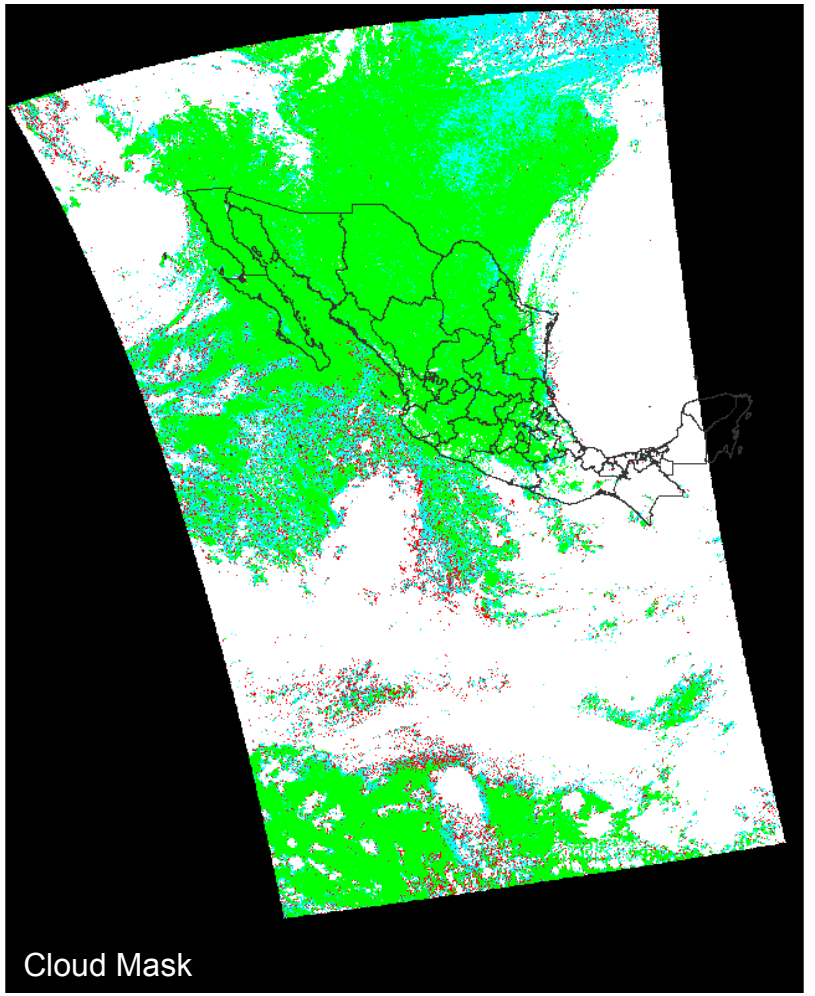


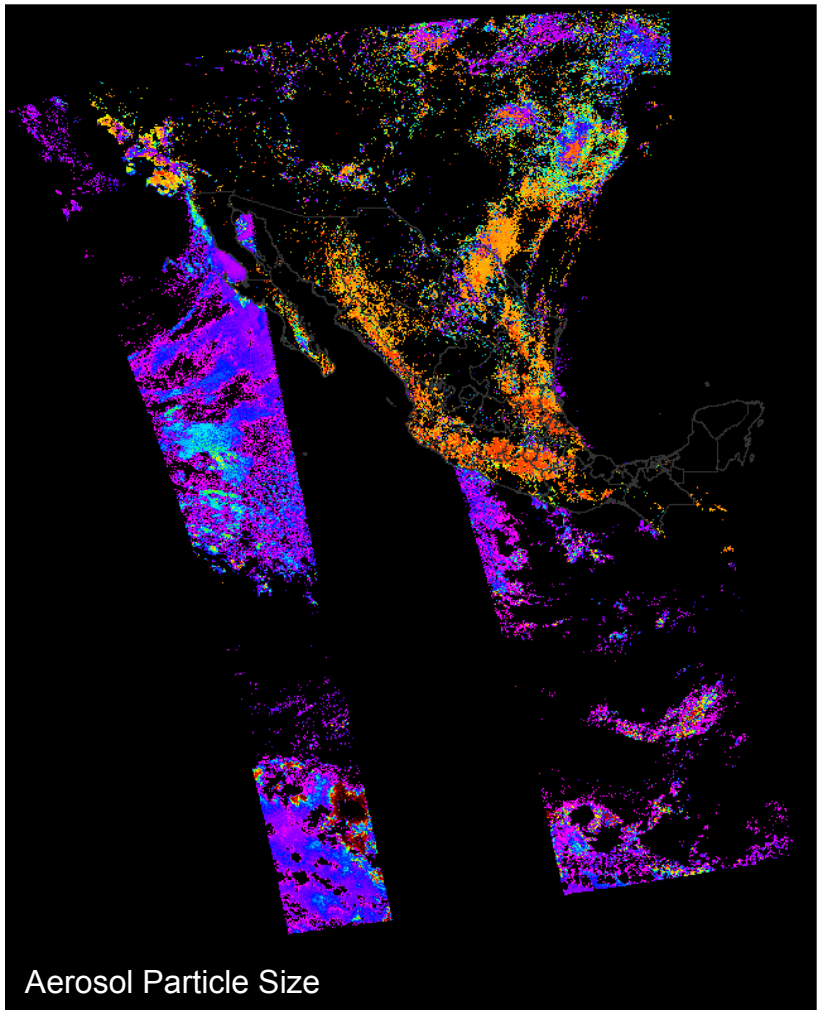
SENSOR	VIIRS	CrIS	ATMS	OMPS
Productos L1	11	2	2	4
Productos L2	62			2

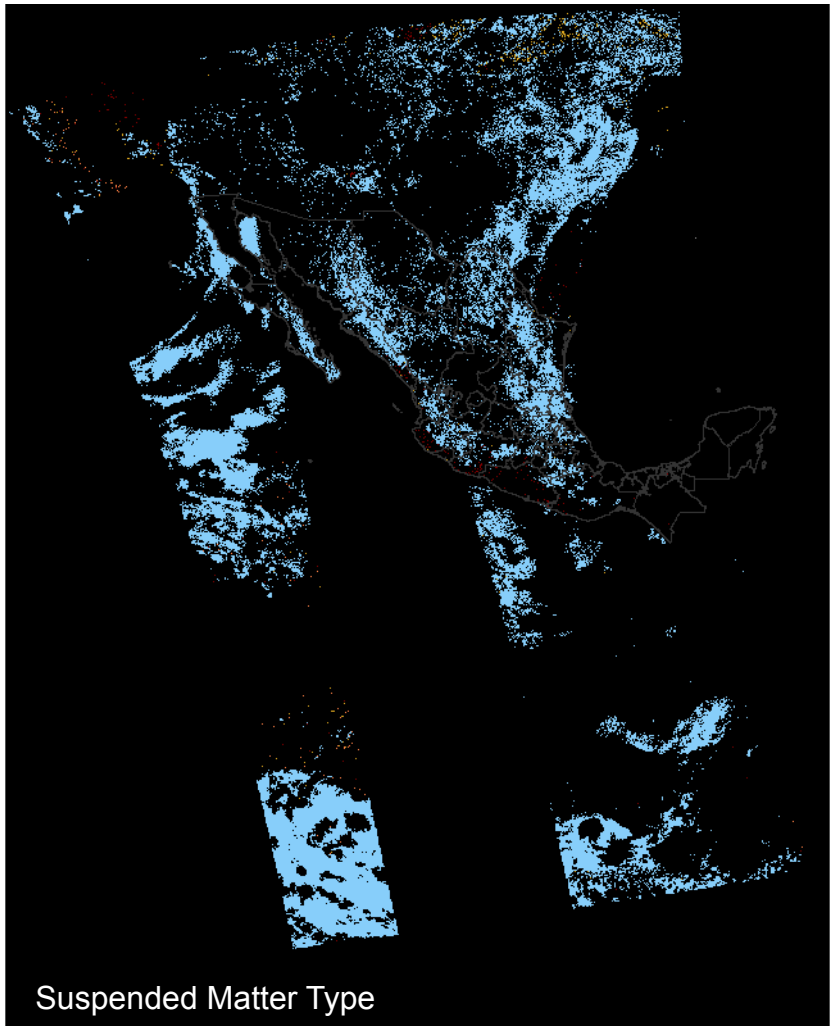
ATMÓSFERA

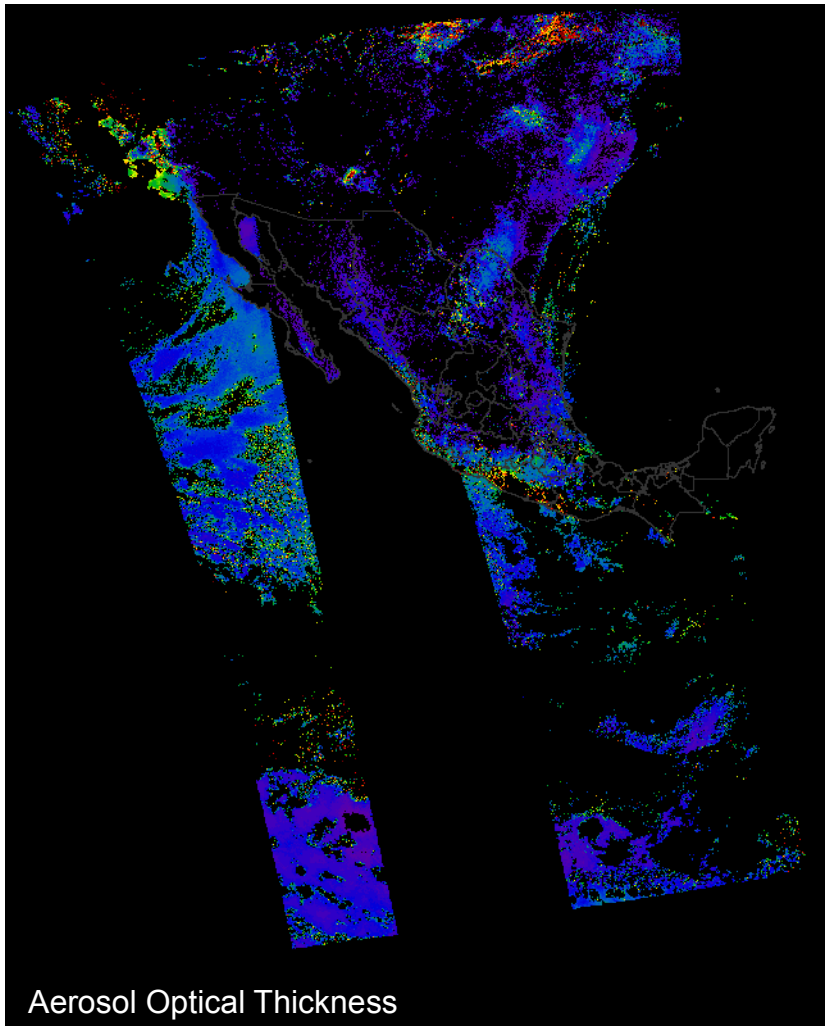


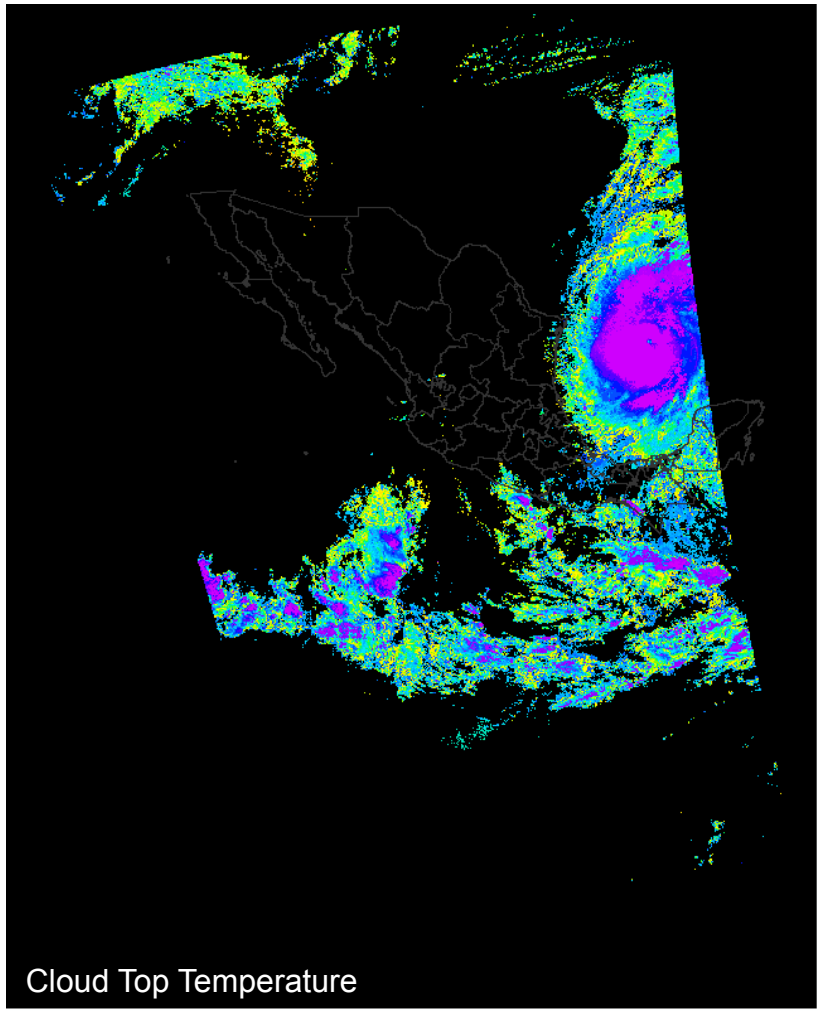


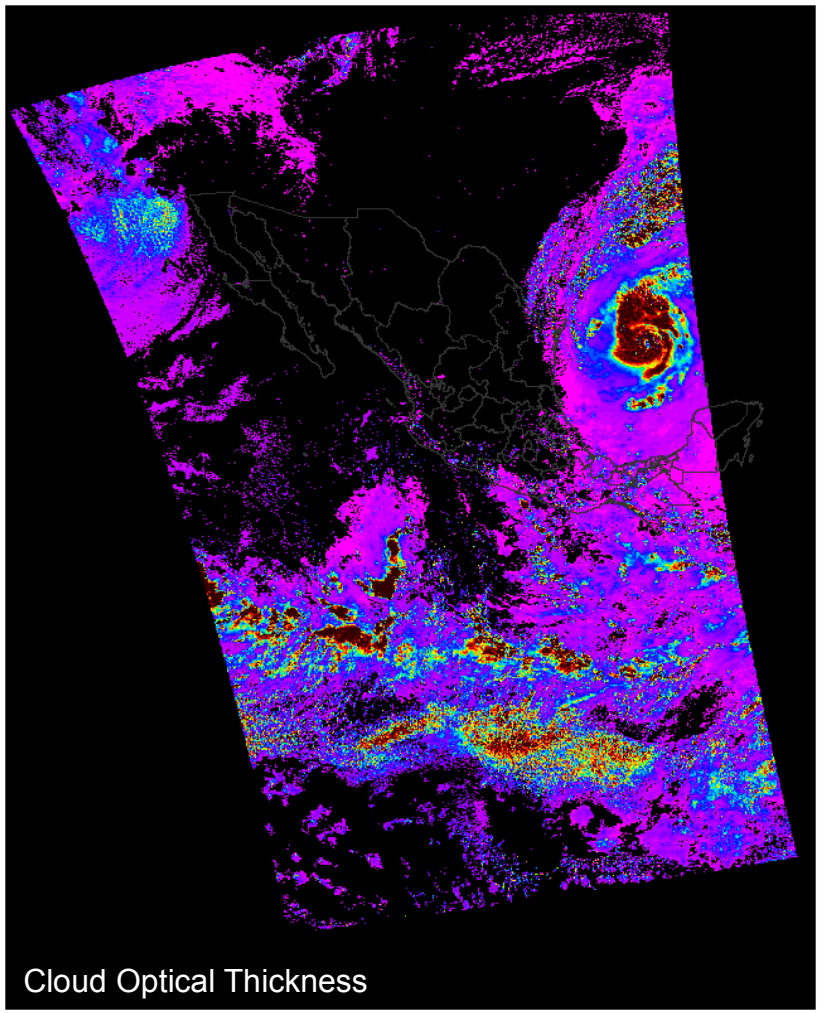


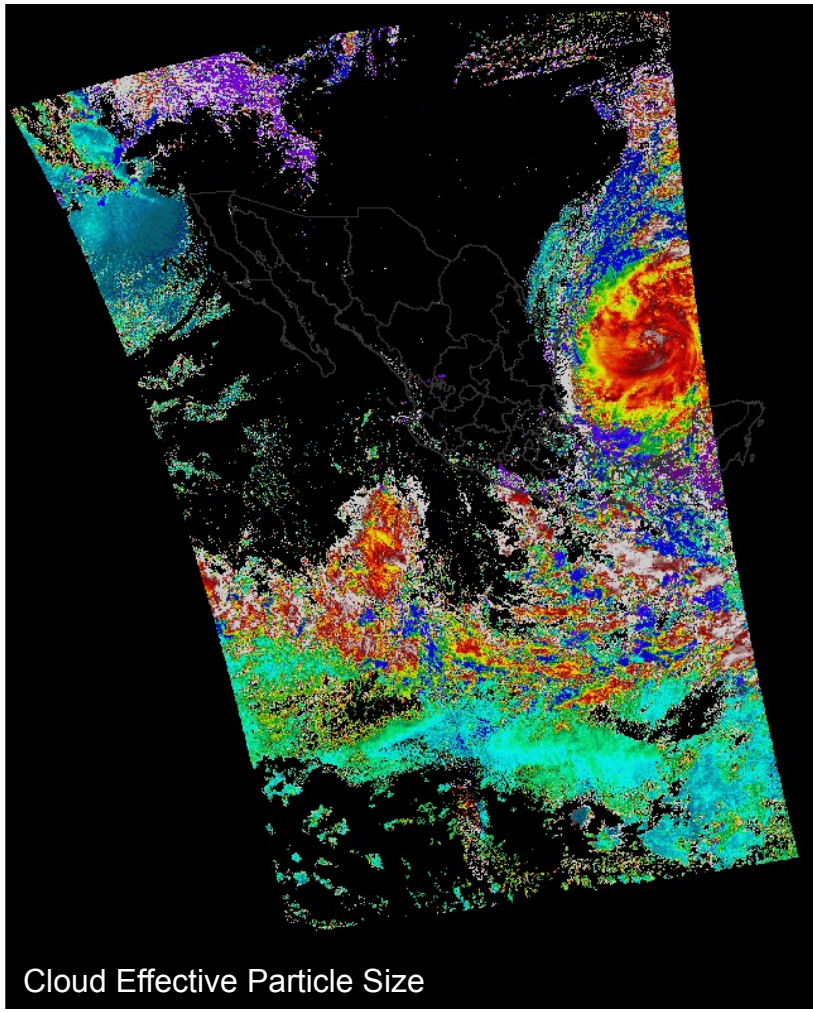

Aerosol Particle Size


Suspended Matter Type

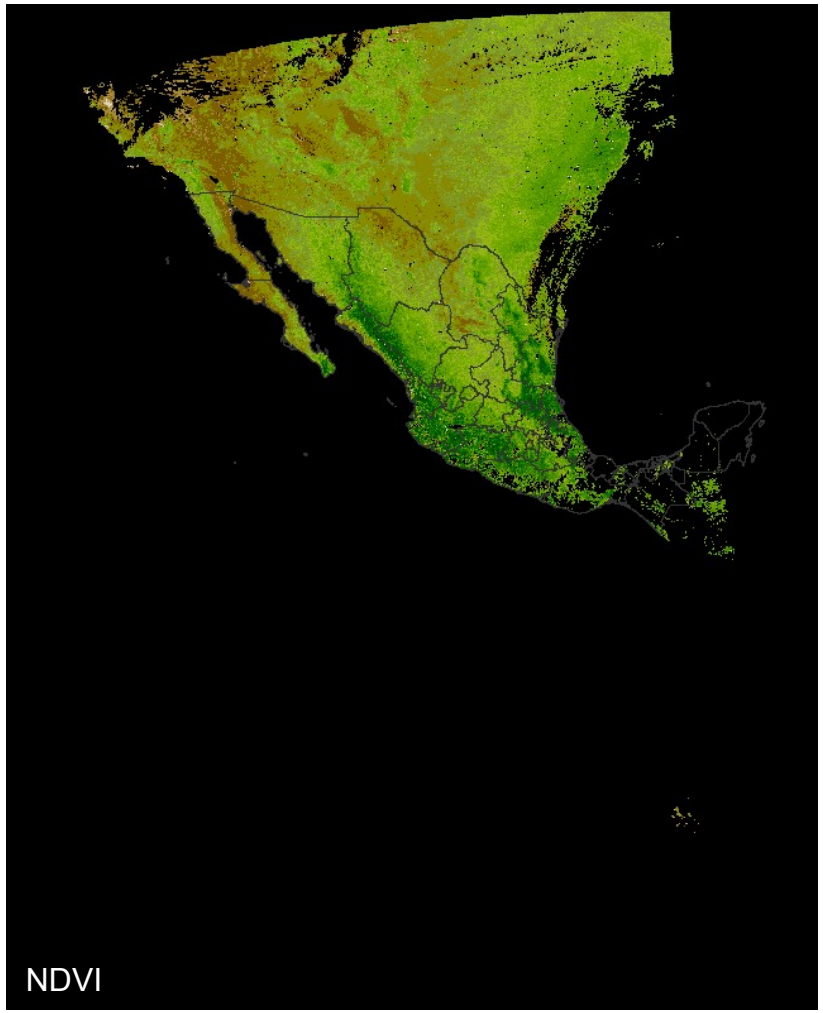

Aerosol Optical Thickness

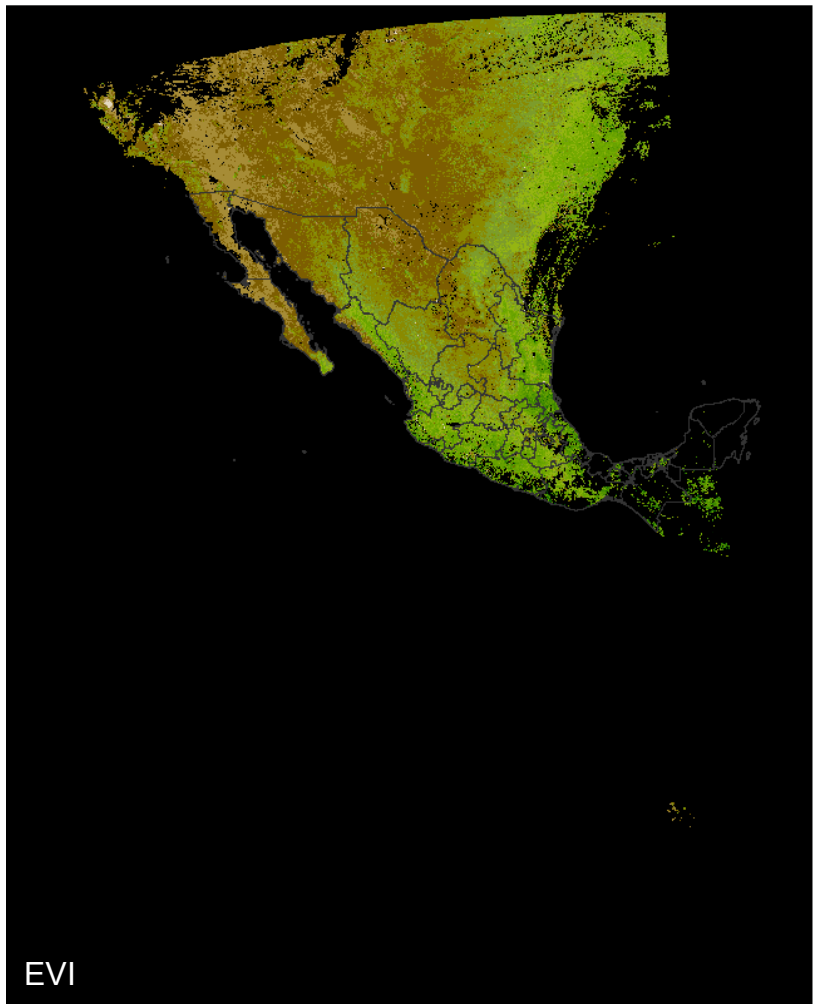

Cloud Top Temperature

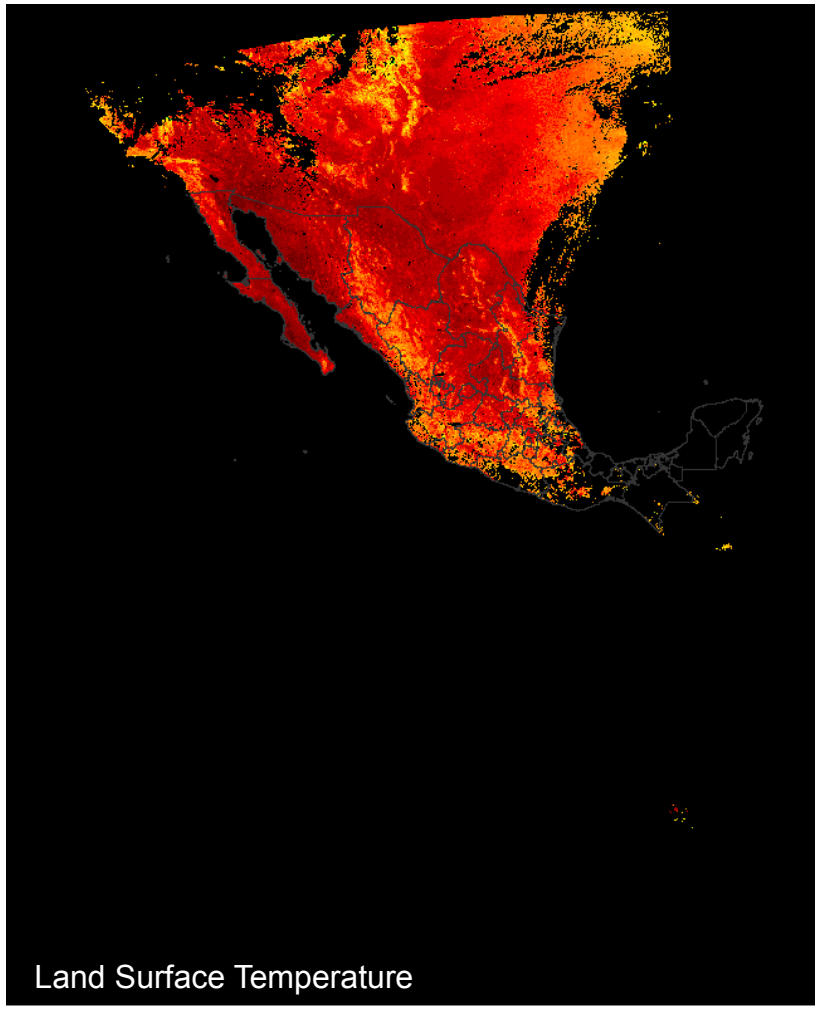

Cloud Optical Thickness

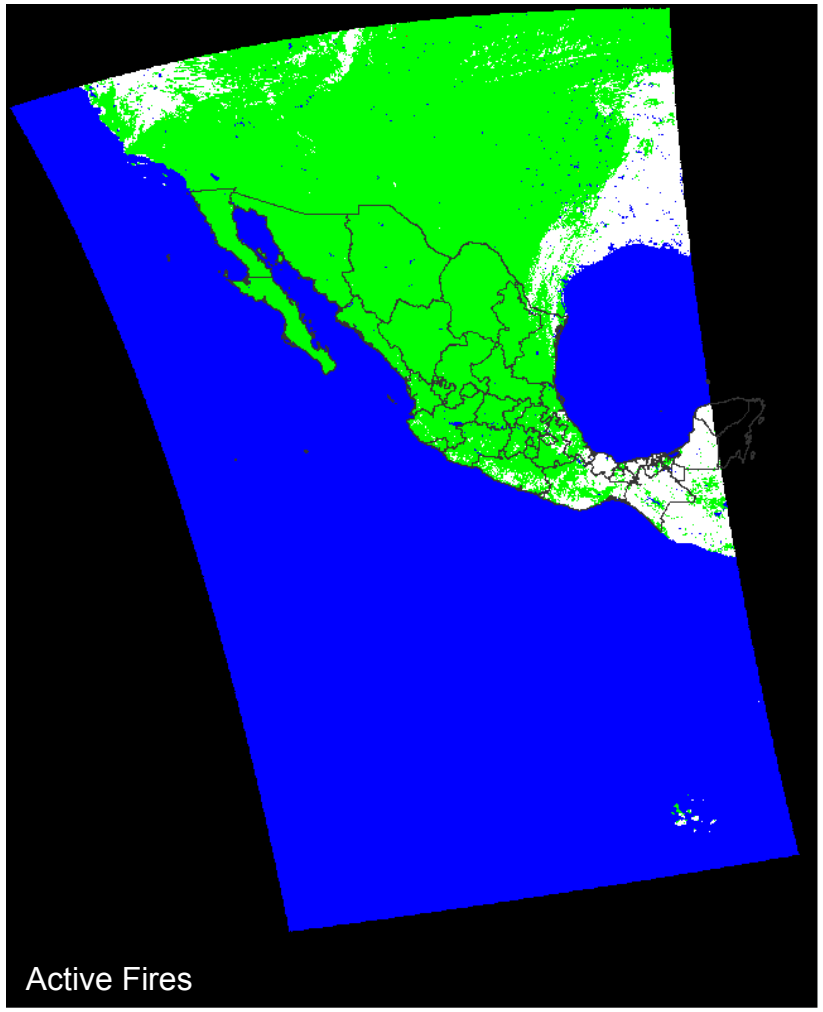

Cloud Effective Particle Size

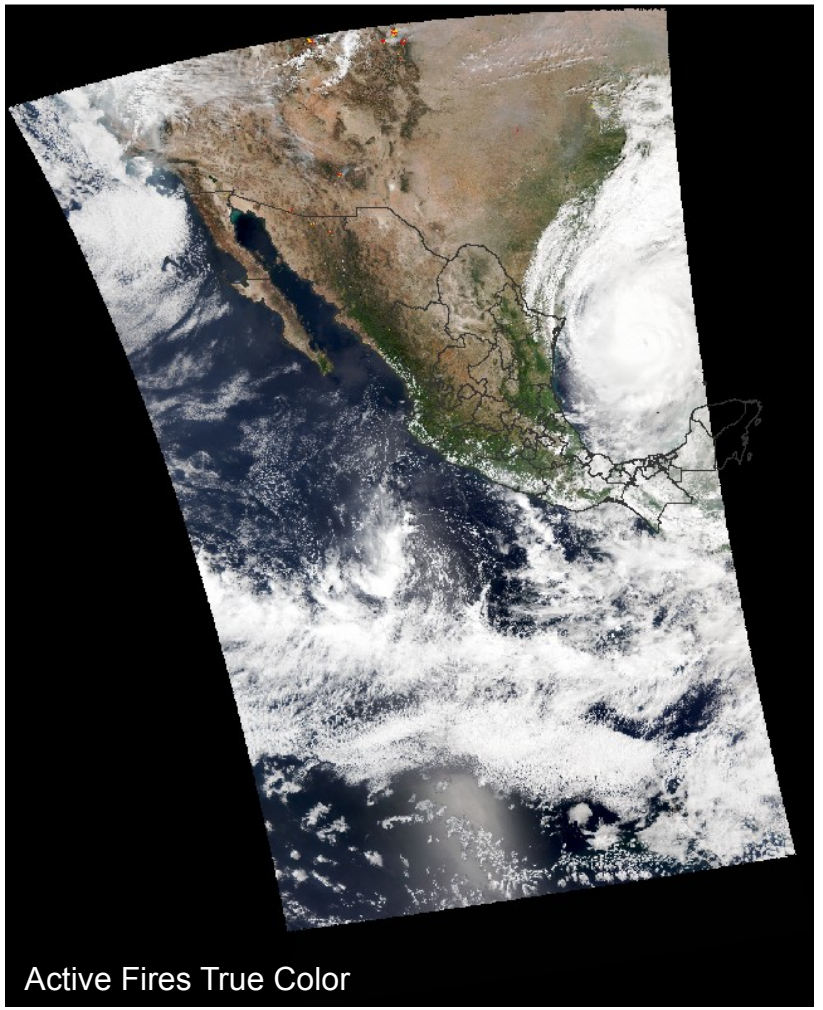
TERRESTRE

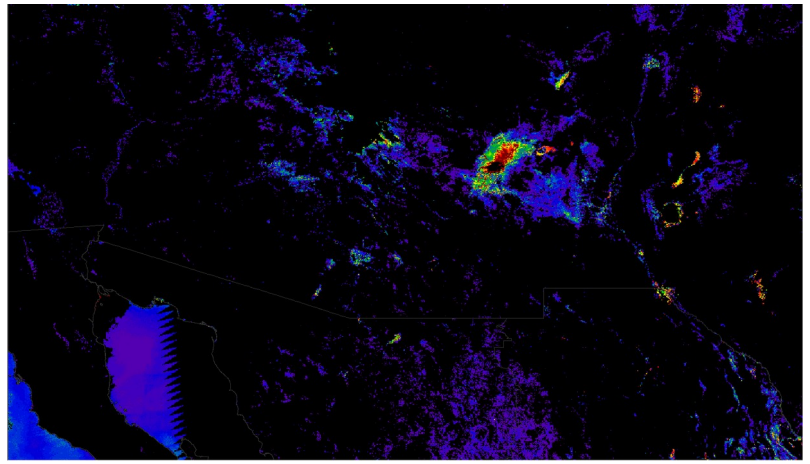


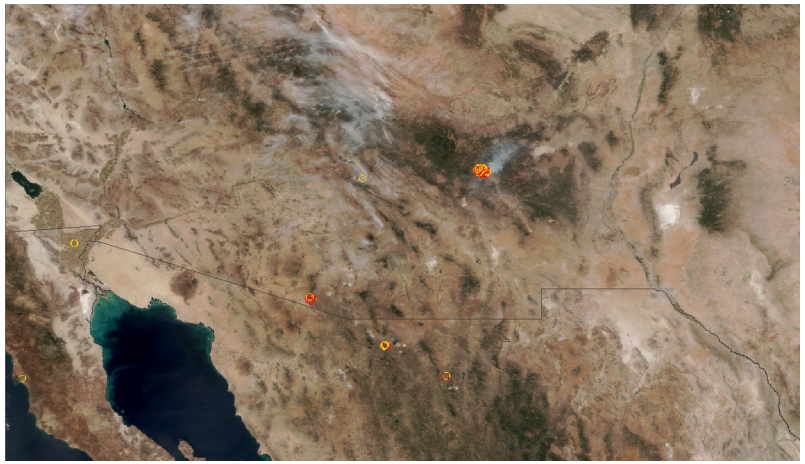





Active Fires

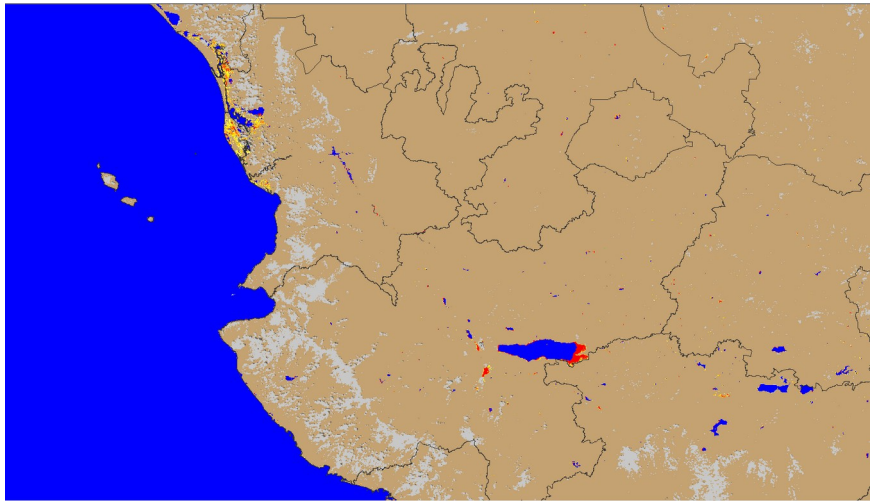

Active Fires True Color



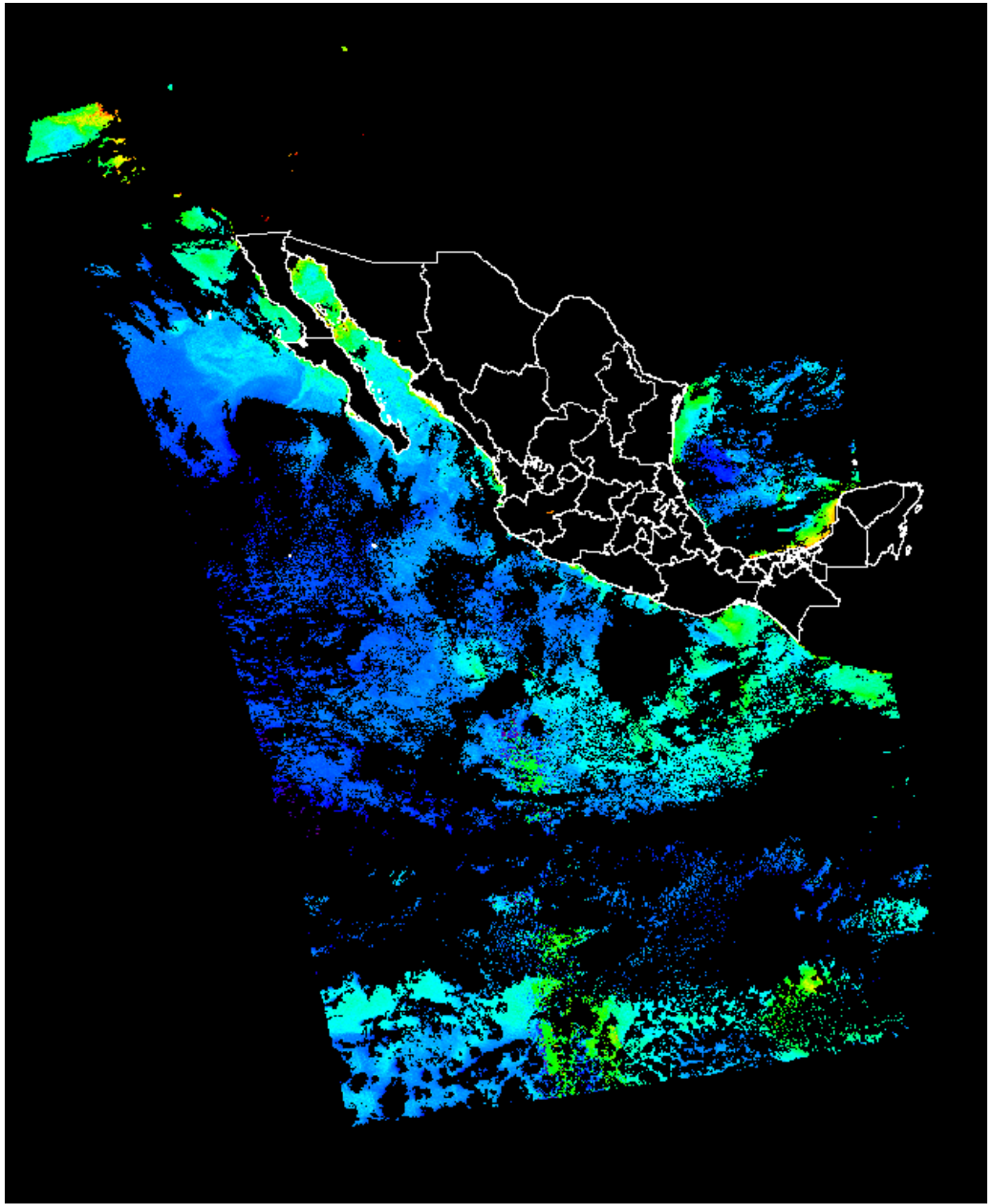


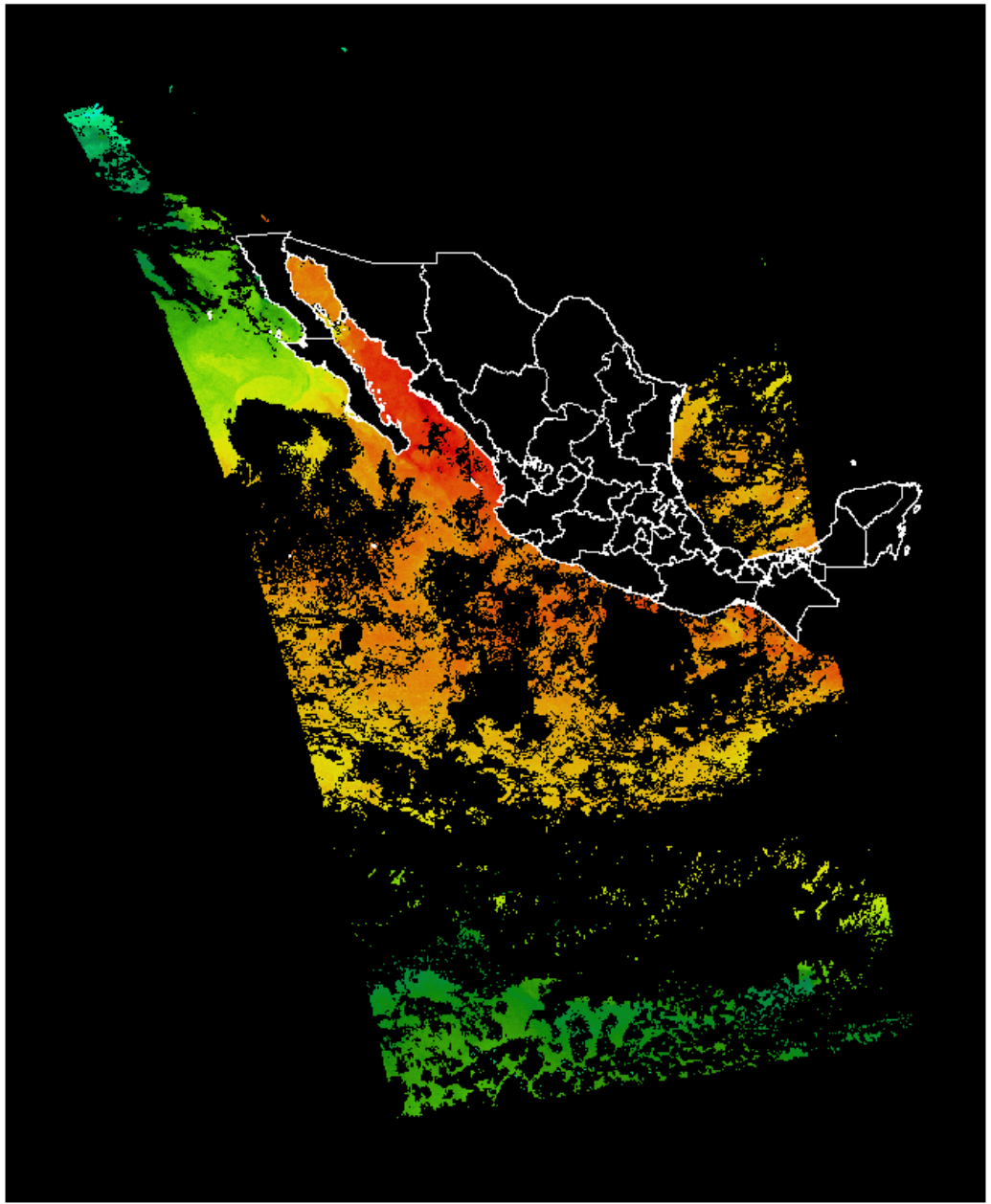

Surface reflectance


Flood



OCÉANO





AQUA y TERRA

RT-STPS

Real-time Processing

Simulcast Viewer

IPOPP-NASA

(International Planetary Observation Processing Package)

Science Data

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Real-time

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SPAs (algorithms) 13 programas

Science Data Products: **SDR** (L1)

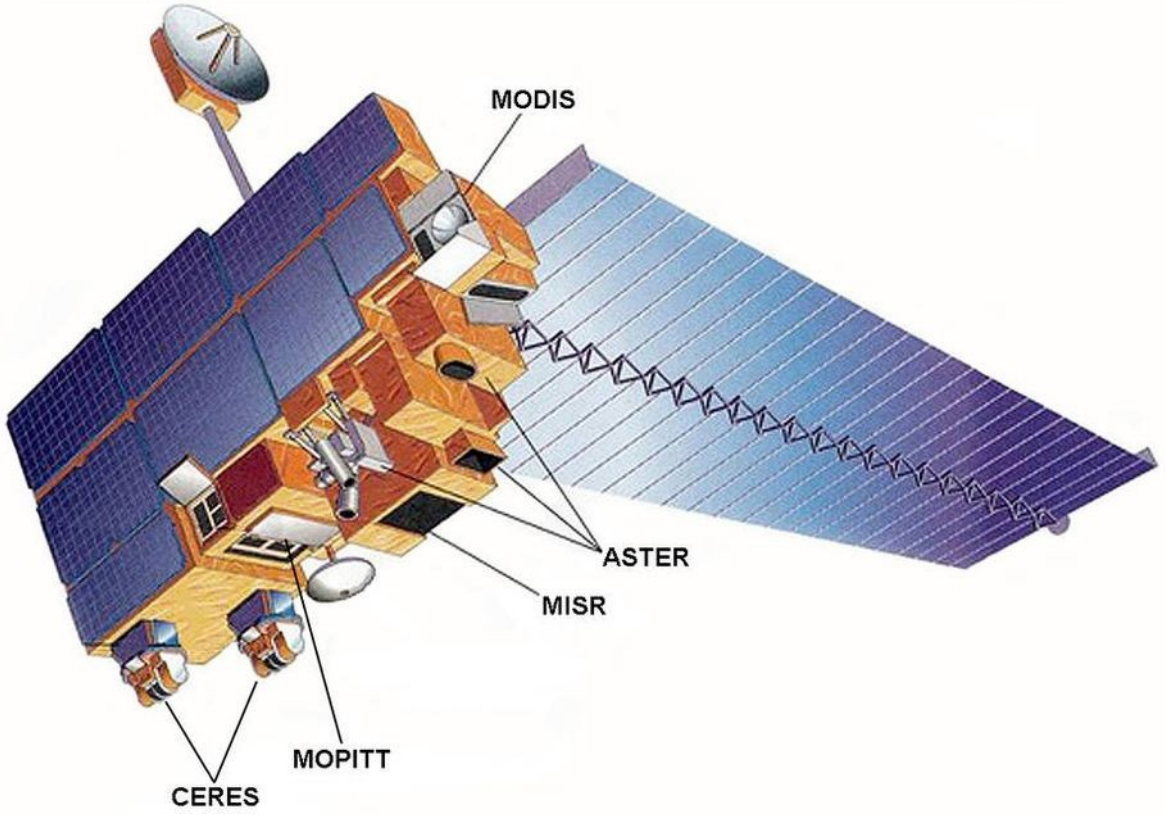
Science Data Products: **EDR** (L2)

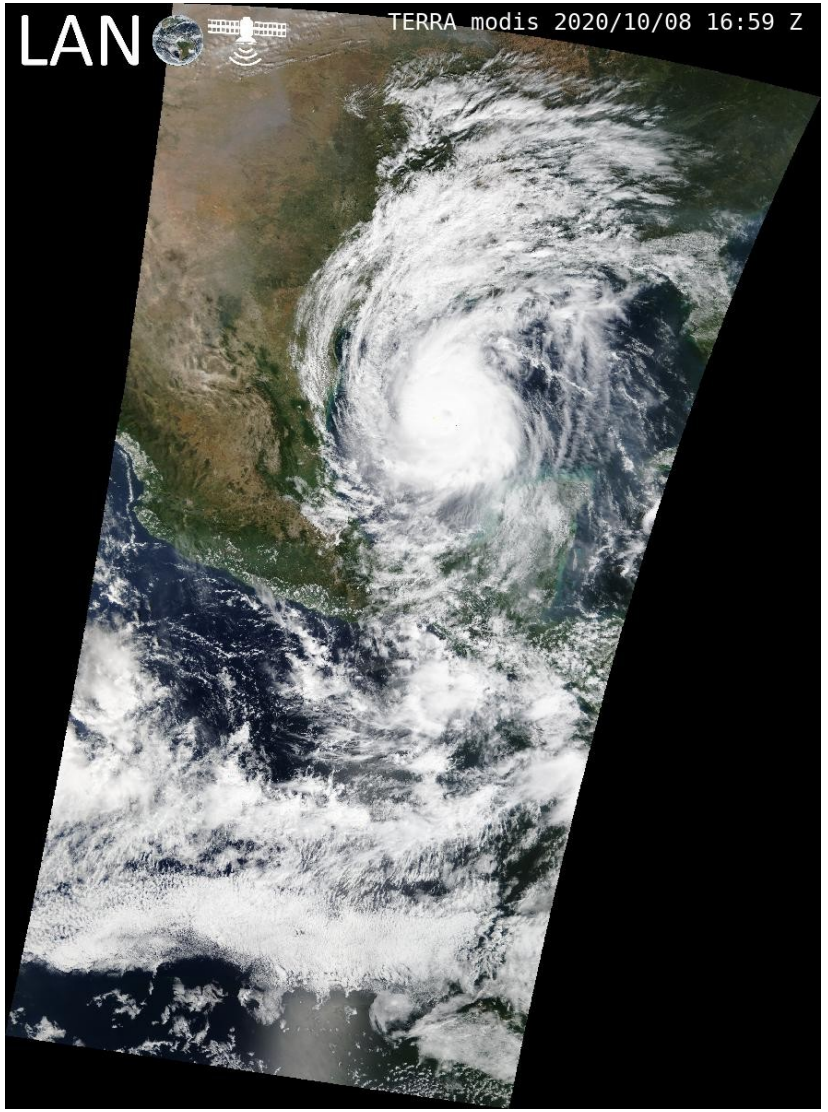
CLASS
DAAC
LAADS
LANCE
LANOT

Archive Reprocessing

CSPP-NOAA

POLAR2GRID L2





Sensor	MODIS
Productos L1	4
Productos L2	12

NOAA-15, 18,19

CLASS
DAAC
LAADS
LANCE
LANOT

Archive
Reprocessing

Real-time
Processing

AAPP 8.5

CADU packets to L1b

Ancillary File
Cache

Real-time

Archived

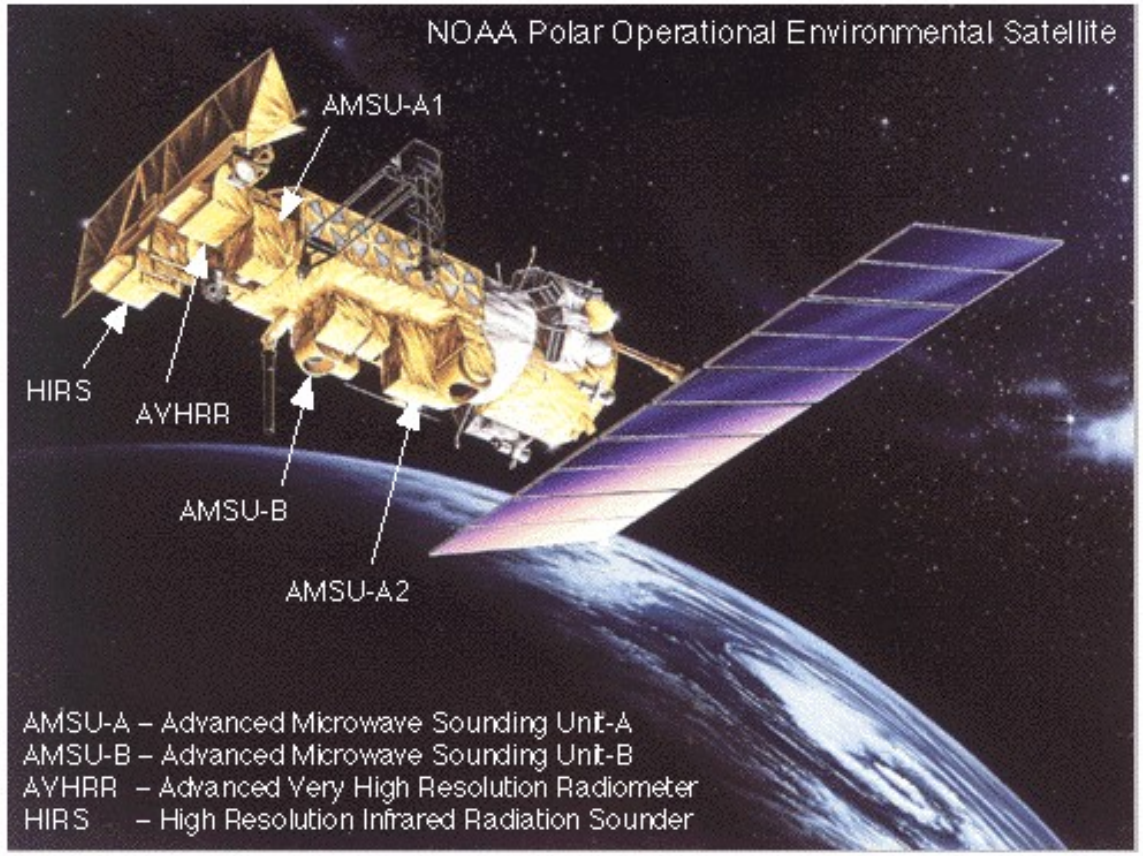
Ancillary
Repository
(oiswww.eum
etsat.org)

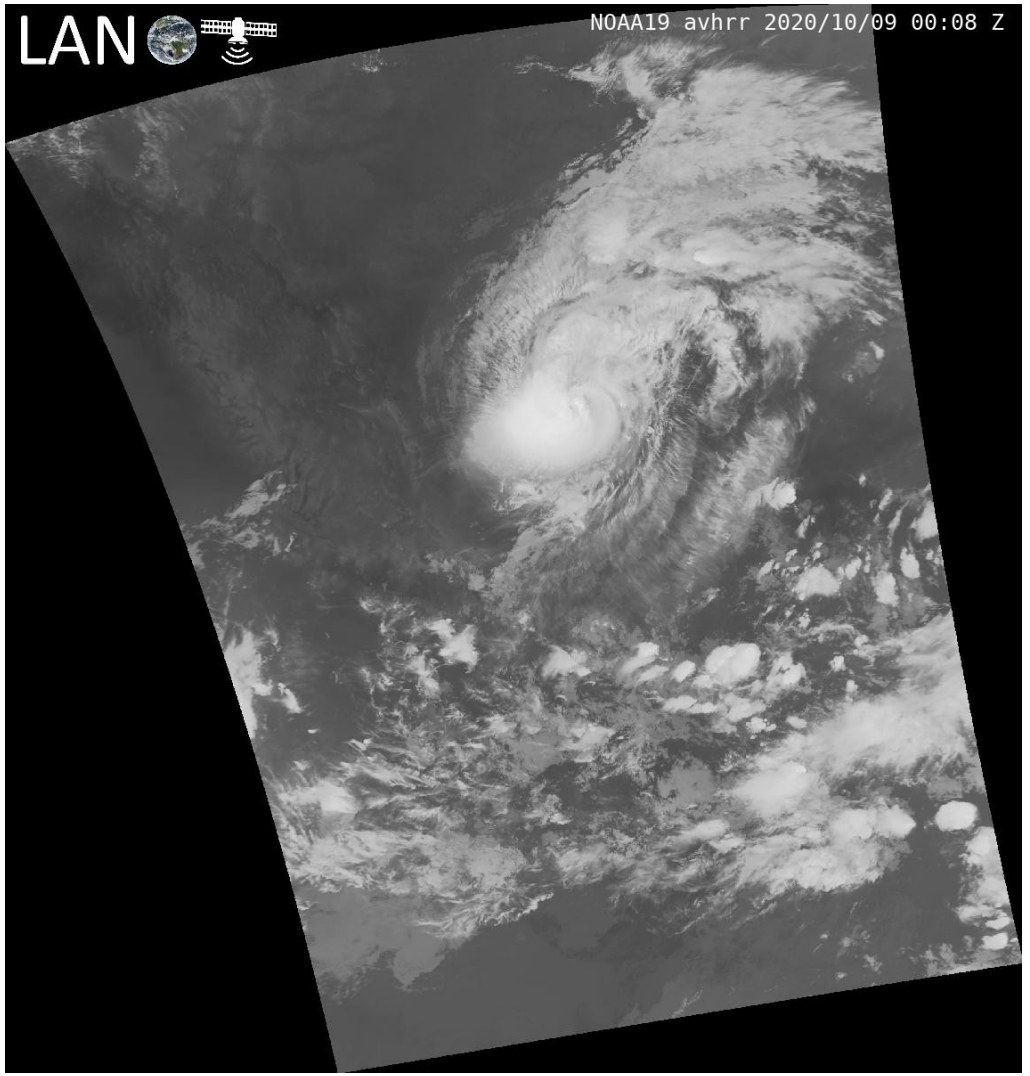
CSPP-NOAA

CLAVRx
L2

ACSPO
L2

POLAR2GRID





SENSOR	AVHRR	AMSU-A	AMSU-B (MHS)	HIRS
Productos L1	1	2	2	3
Productos L2	12			

METOP-1, 2 y 3

CLASS
DAAC
LAADS
LANCE
LANOT

Archive
Reprocessing

Real-time
Processing

METOPIZER

CADU packets to L0 packets

Ancillary File
Cache

Real-time

Archived

Ancillary
Repository
(oiswww.eum
etsat.org)

AAPP 8.5

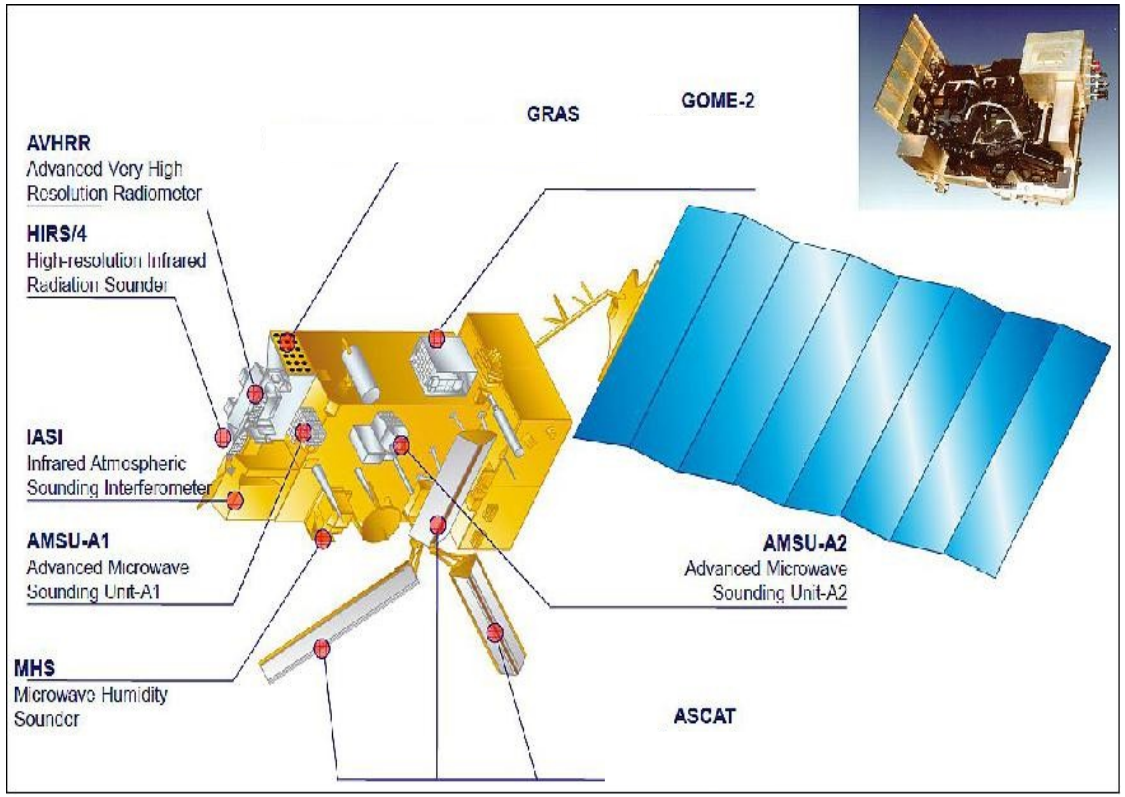
L0 packets to L1b

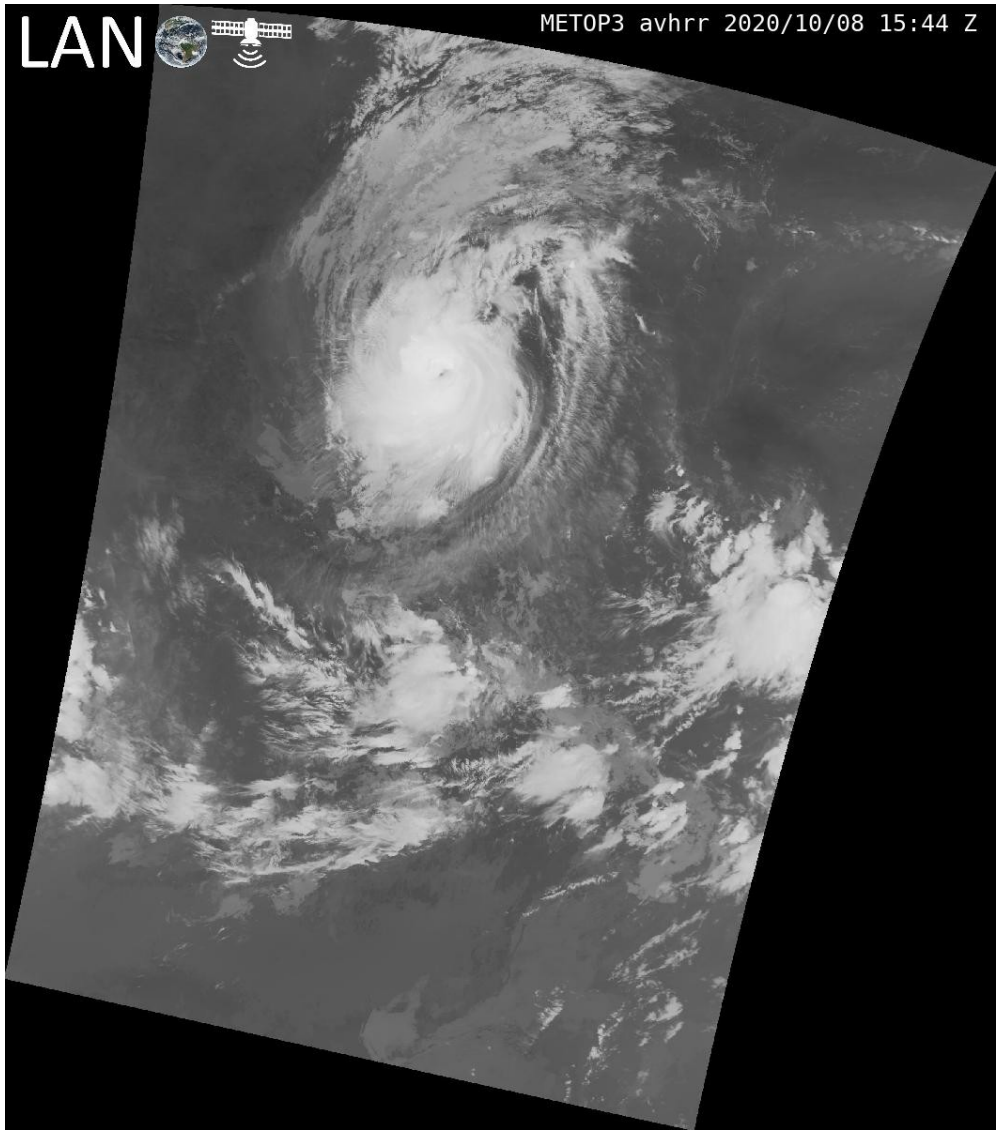
CSPP-NOAA

CLAVRx
L2

ACSPO
L2

POLAR2GRID





SENSOR	AVHRR	AMSU-A	MHS	HIRS	IASI
Productos L1	1	2	2	3	
Productos L2	12				

Productos de los satélites NOAA-15, 18 y 19 procesados con software de código abierto AAPP y CSPP

Category	Software Name	Products
Level 1	AAPP 8.5	**AVHRR (Advanced Very High Resolution Radiometer)** AVHRR Level 1B Geo-referenced and calibrated data (5 channels in the visible and infra-red between 0.63 and 12.0 µm)
Level 2	CSPP ACSPO	Sea Surface Temperature Skin
		Wind speed
Level 2	CSPP CLAVRX	ACHA Cloud Emissivity
		ACHA Cloud Top Height
		DCOMP Cloud Optical Depth (Daytime)
		ACHA Cloud Top Pressure
		DCOMP Cloud Effective Radius (Daytime)
		ACHA Cloud Top Temperature
		Cloud Mask
		Cloud Phase
		Cloud Probability
		Cloud Type
		Rain Rate (Experimental Product)
Level 1	AAPP 8.5	**AMSU (Advanced Microwave Sounding Unit)** AMSU-A Level 1B Geo-referenced and calibrated data (15 channels between 23.8 and 89 GHz) AMSU-A Level 1C Geo-referenced and calibrated brightness temperatures and albedo MHS (AMSU-B) Level 1B Geo-referenced and calibrated data (5 channels between 89 and 190.31 GHz) MHS (AMSU-B) Level 1C Geo-referenced and calibrated brightness temperatures and albedo
Level 1	AAPP 8.5	**HIRS (High Resolution Infrared Radiation Sounder)** HIRS Level 1B Geo-referenced and calibrated data (20 channels between 668.5 and 2660 cm^{-1}) HIRS Level 1C Geo-referenced and calibrated brightness temperatures and albedo HIRS Level 1D Mapped and filtered data. Several instruments may be mapped to a common instrument grid

Conclusions

- We use CSPP Low Earth Orbit (LEO) and Geostationary (GEO) for the generation of important products needed by our users nation wide.
- We will continue using and updating the CSPP packages in our processing servers and developing derivative products.

GRACIAS

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