



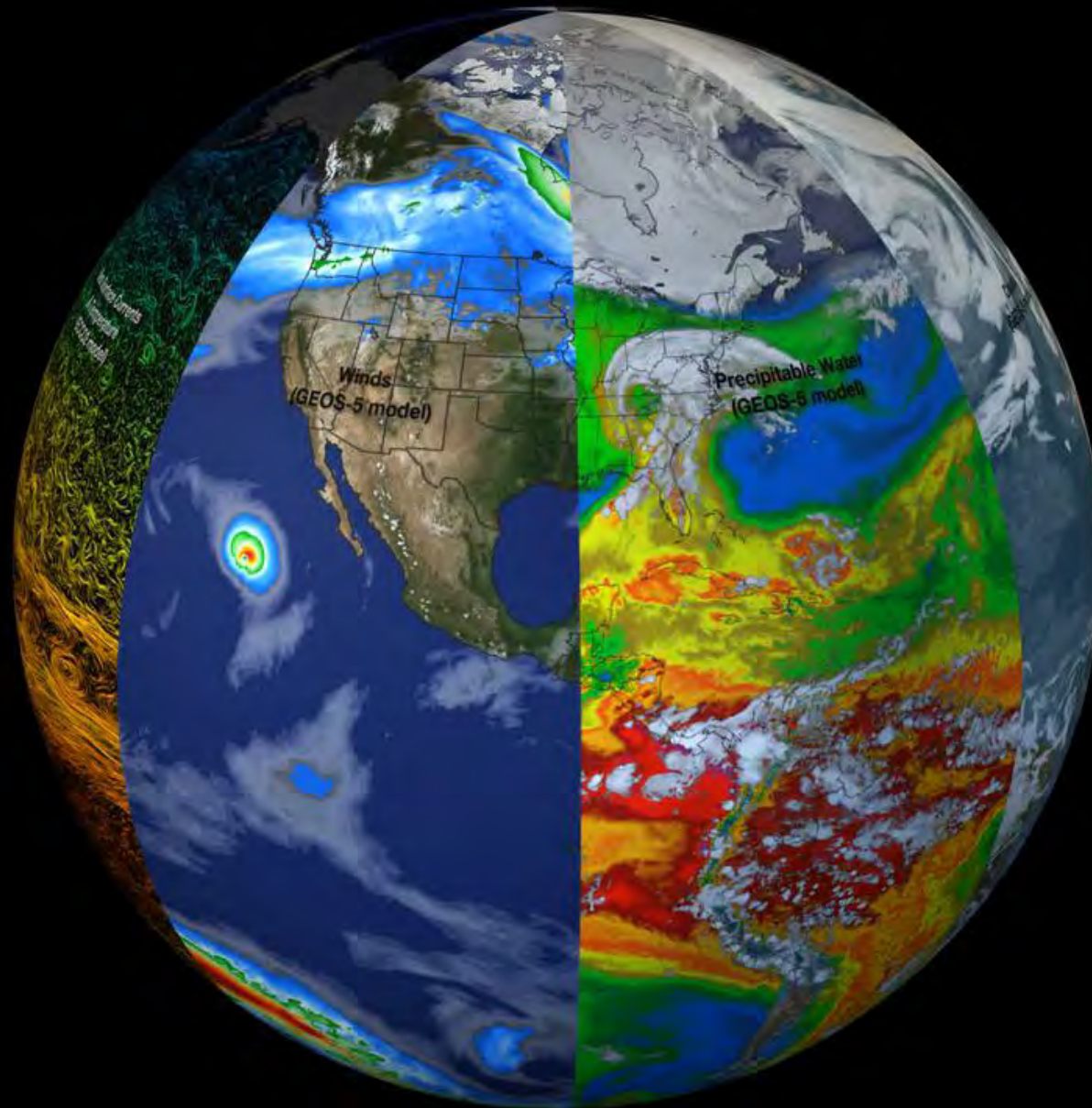
Datos y Modelos de la NASA Para la Reducción del Riesgo de Desastres y la Resiliencia

Selper, Noviembre , 2021

Ricardo Quiroga ricardo.quirogavanegas@nasa.gov

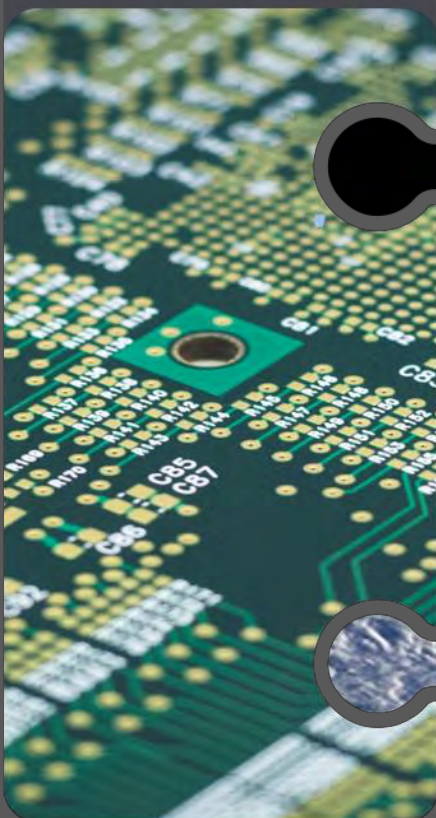
NASA Langley Research Center





Avance de la ciencia del sistema de la Tierra de extremo a extremo

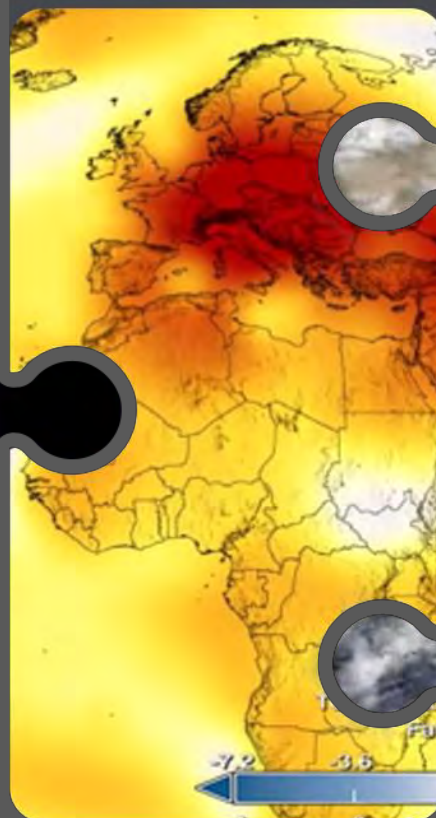
TECHNOLOGY



FLIGHT



RESEARCH
AND ANALYSIS

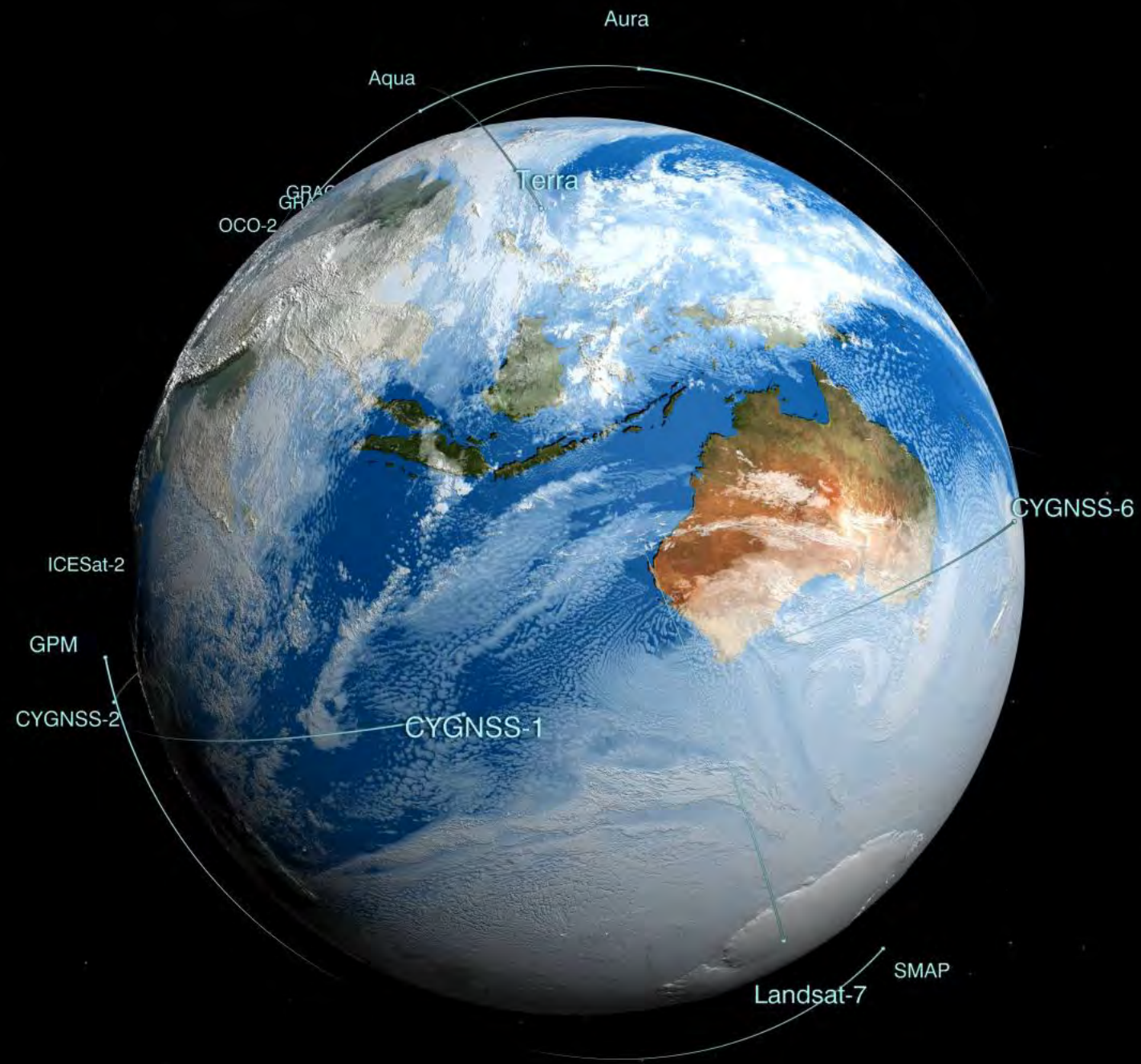


DATA
AND COMPUTE



APPLICATIONS





Aura

Aqua

Terra

OCO-2

GPM

ICESat-2

GPM

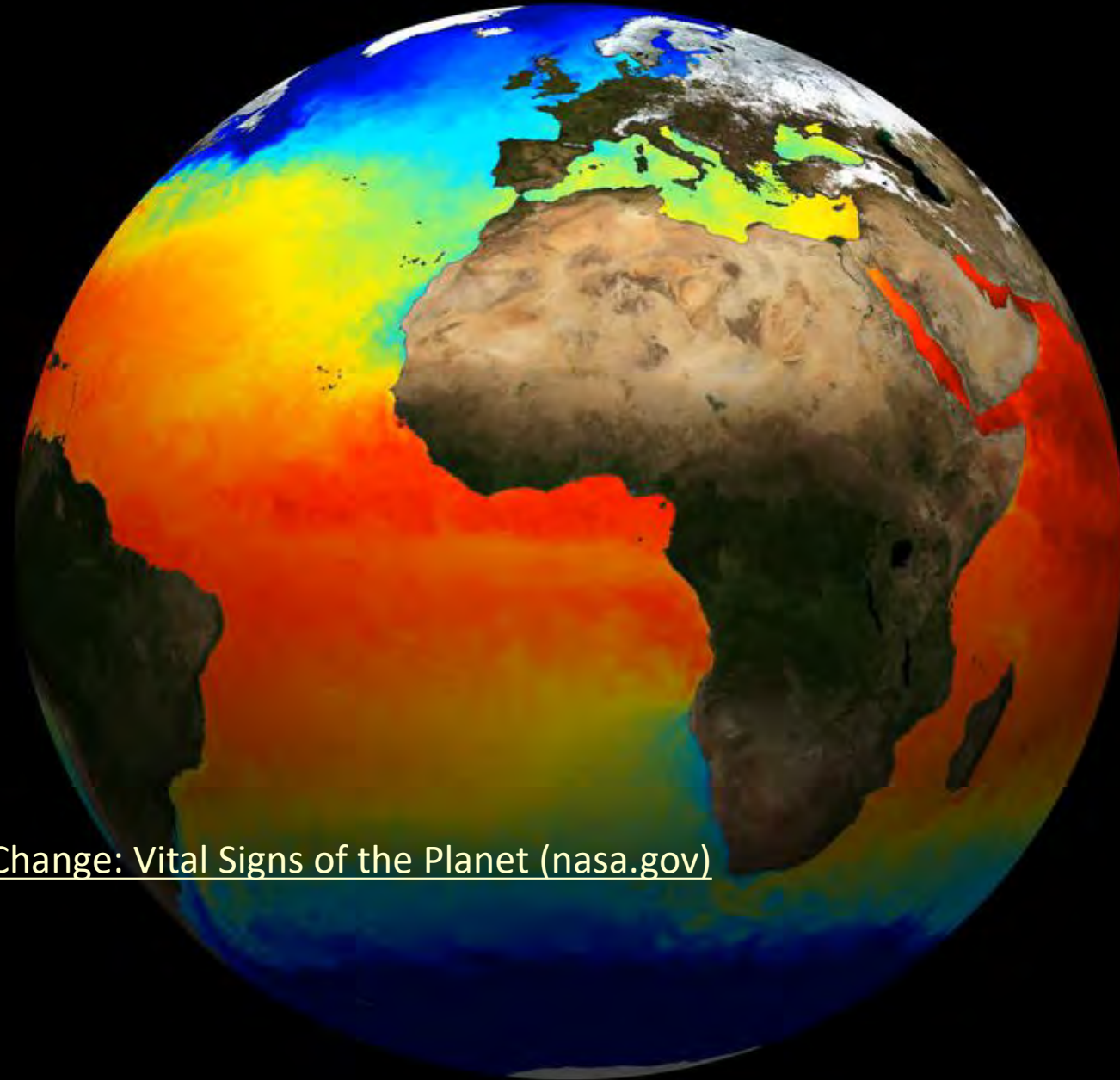
CYGNSS-2

CYGNSS-1

CYGNSS-6

Landsat-7

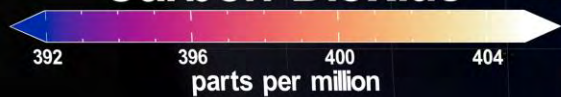
SMAP



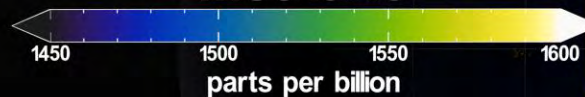
[Earth Now – Climate Change: Vital Signs of the Planet \(nasa.gov\)](https://climate.nasa.gov/evidence/)



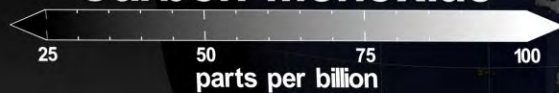
Carbon Dioxide



Methane



Carbon Monoxide



Solar Induced Fluorescence



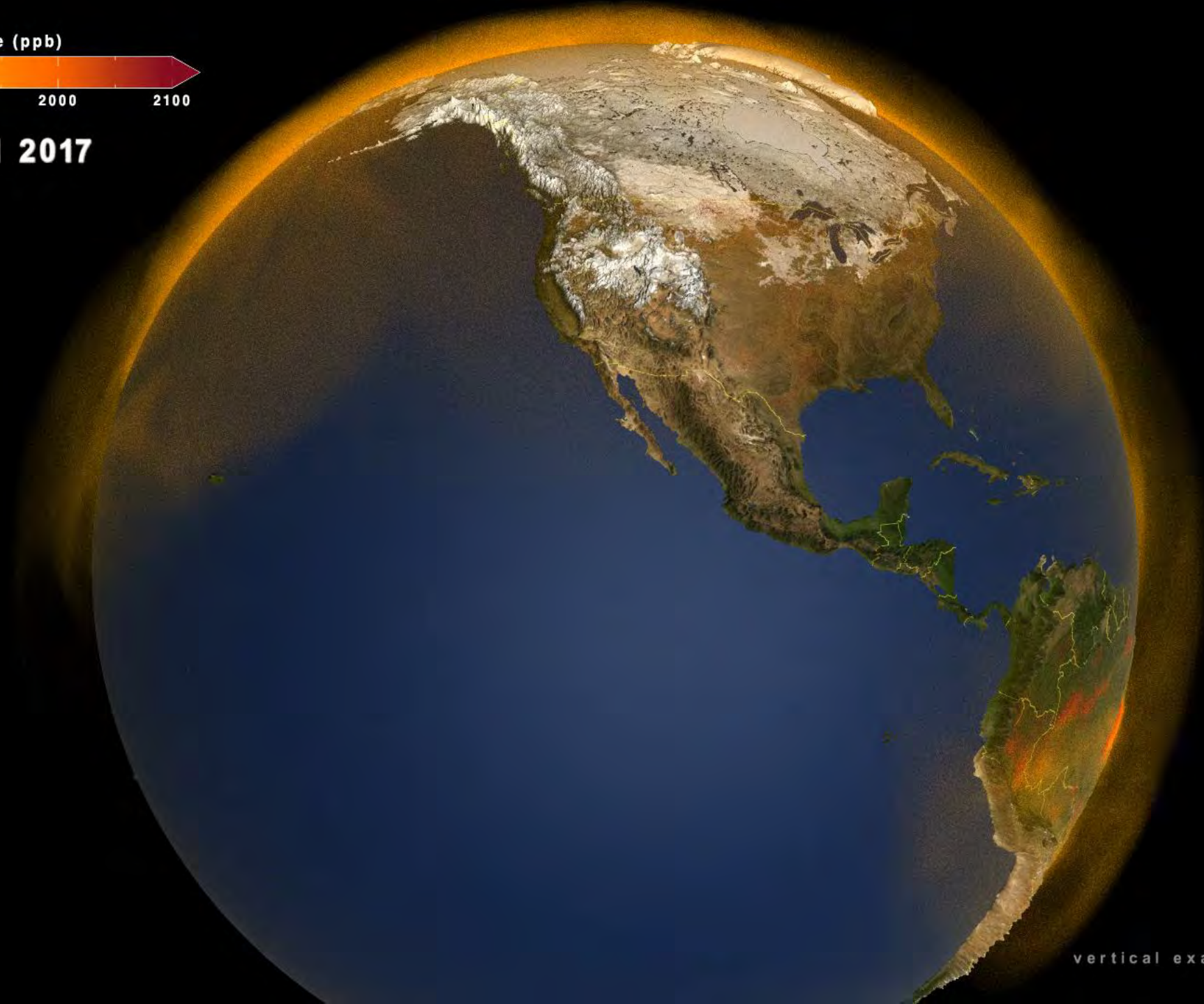
The Greenhouse Effect

Atmosphere

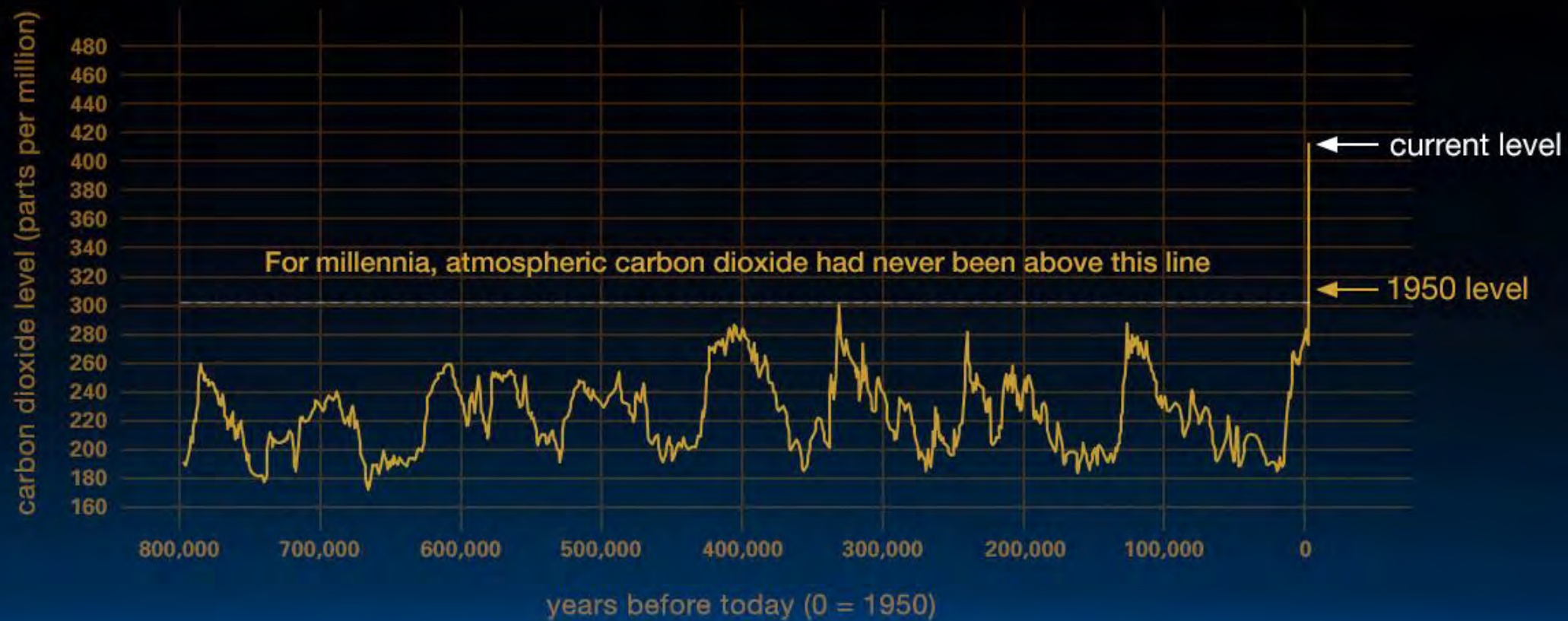
climate.nasa.gov

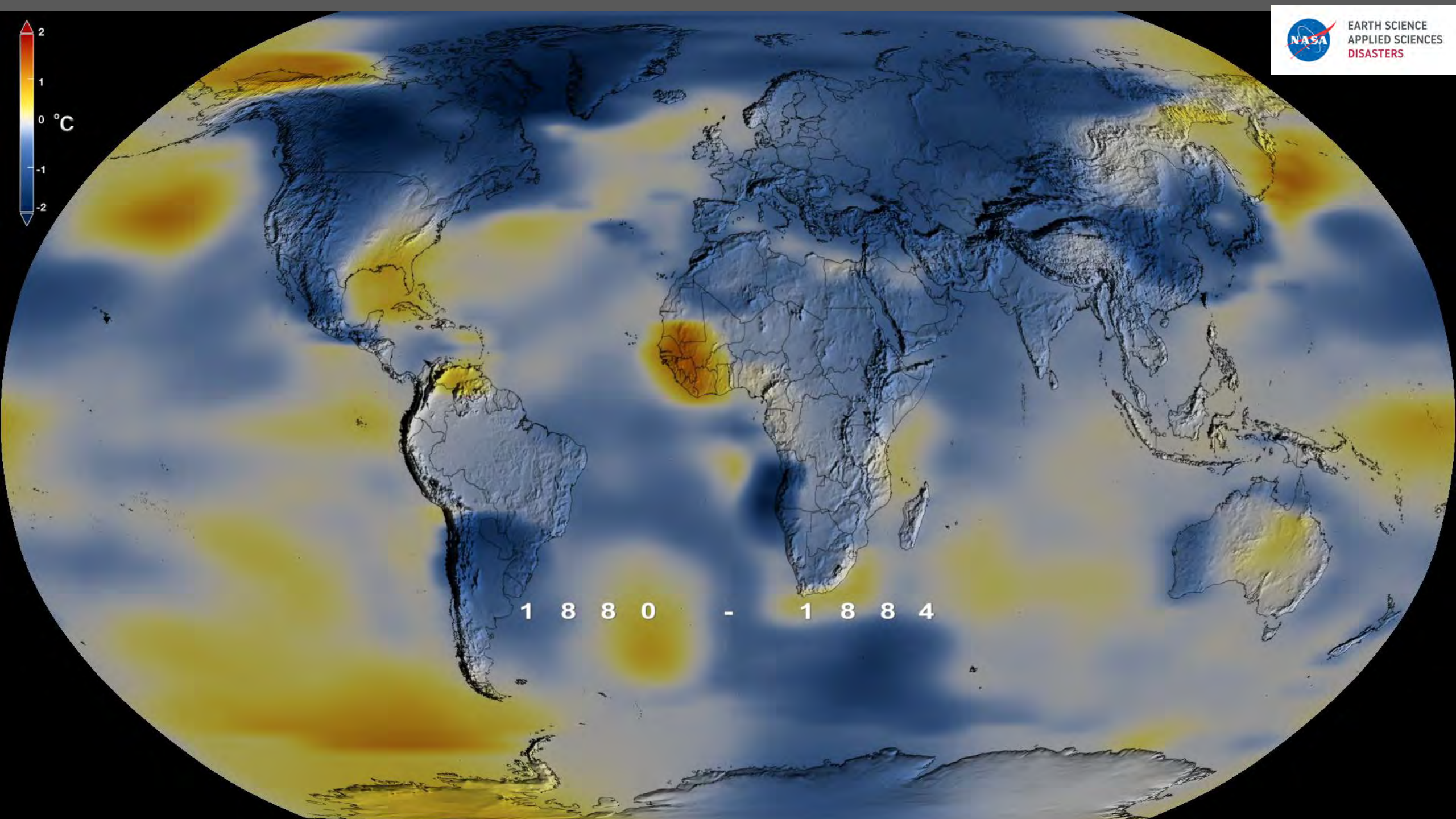


Jan 01 2017

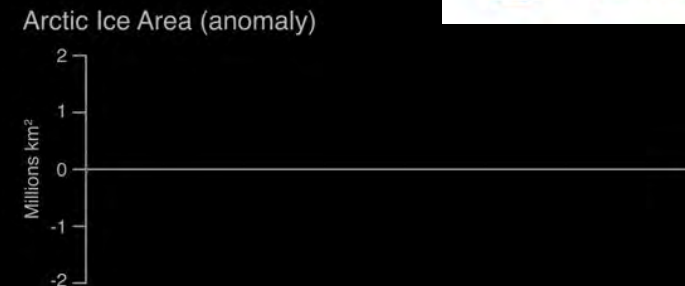
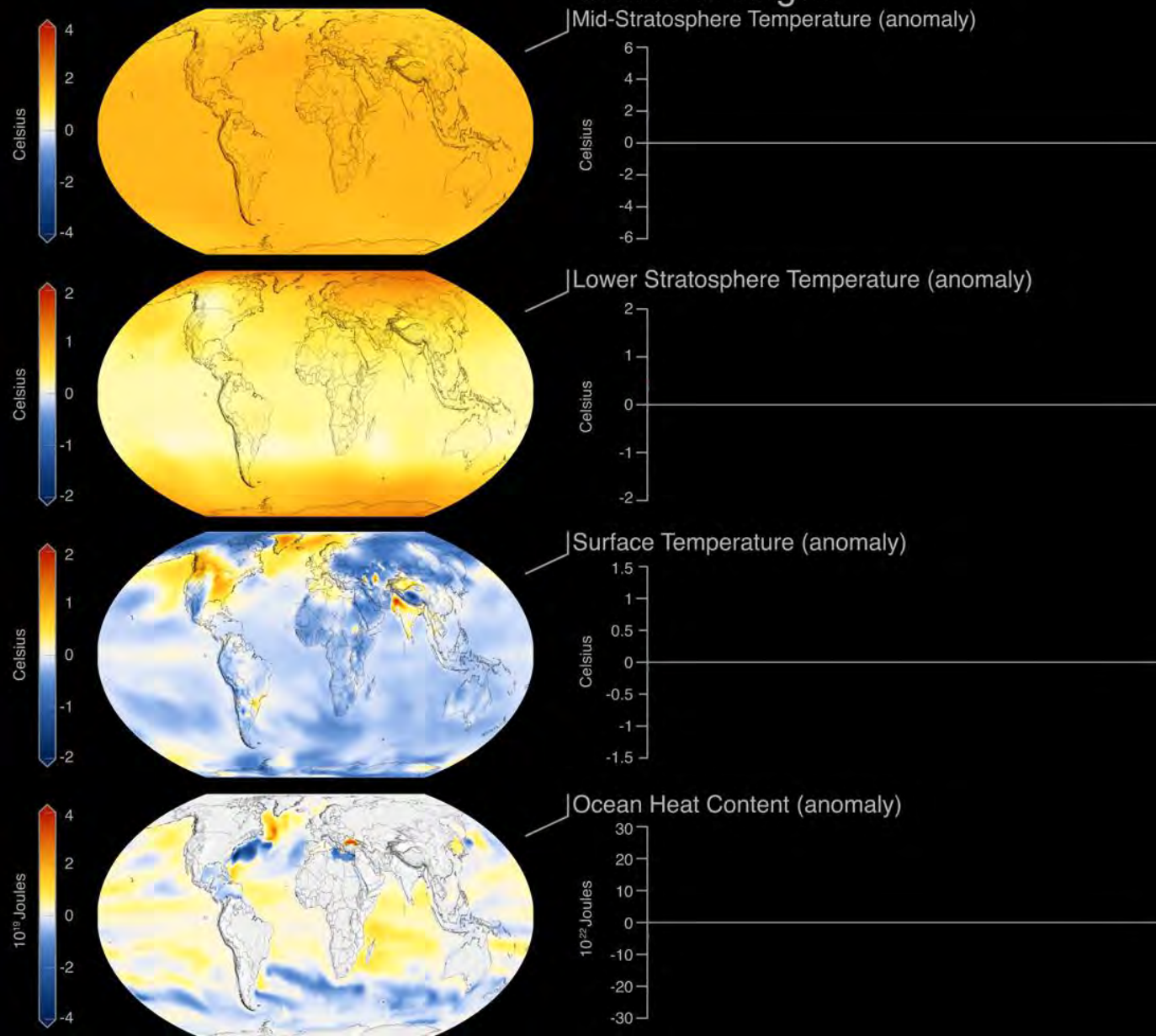


vertical exaggeration: 50x





Global Changes



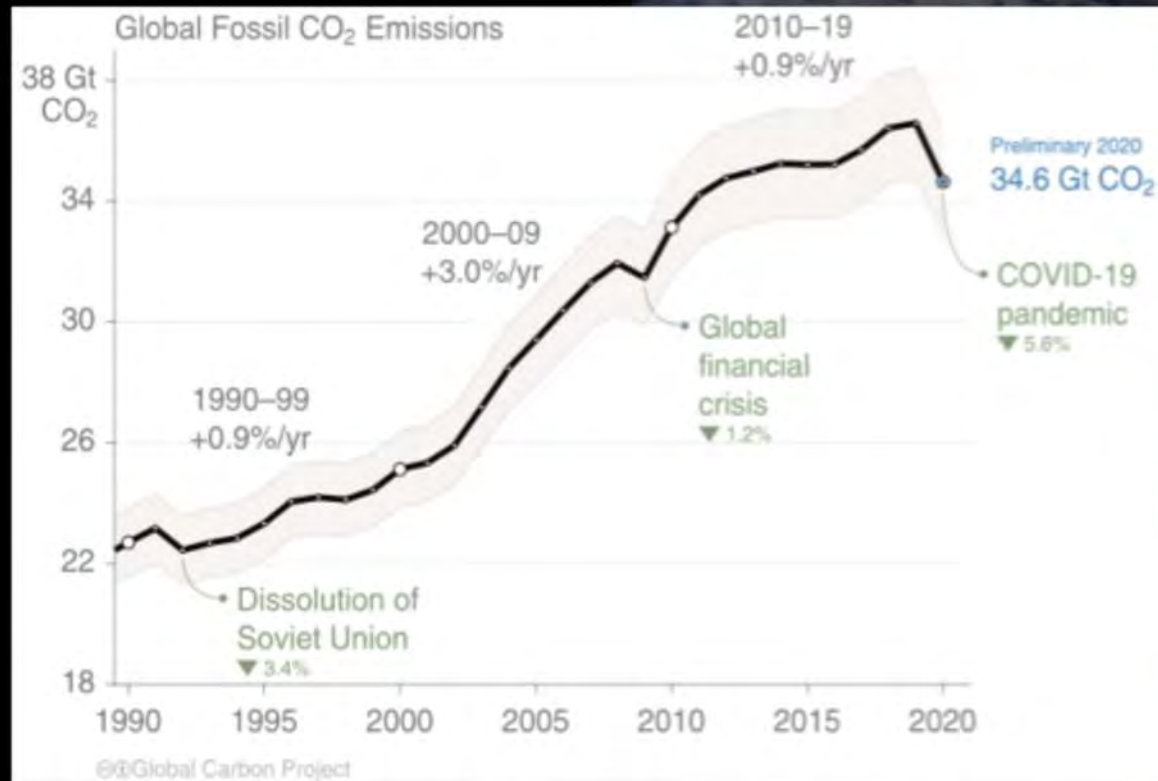
Year
1850

Human and Natural Drivers
of Climate Change

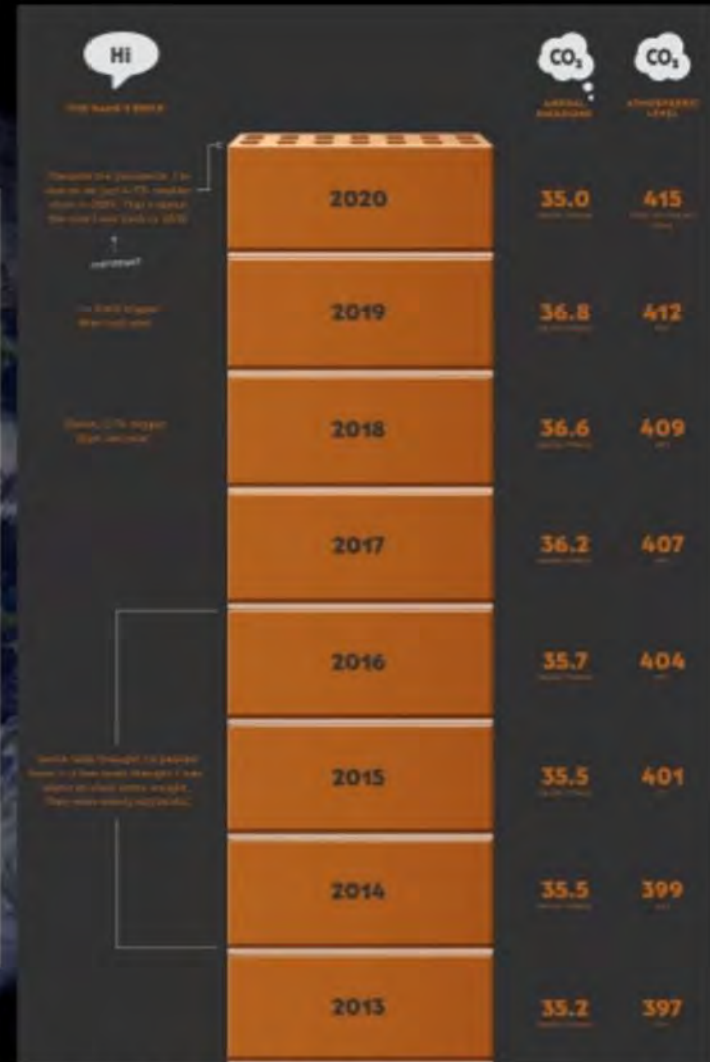
GISS ModelE 2.1-G



Climate Change and COVID



https://public.wmo.int/en/resources/united_in_science



<https://eciu.net/analysis/infographics/covid-19-climate>

Los efectos del cambio climático



Los posibles efectos futuros del cambio climático global incluyen incendios forestales más frecuentes, períodos más prolongados de sequía en algunas regiones y un aumento en la cantidad, duración e intensidad de las tormentas tropicales. Crédito: Izquierda - Mellimage/Shutterstock.com, Centro - Montree Hanlue/Shutterstock.com

Un grado de diferencia

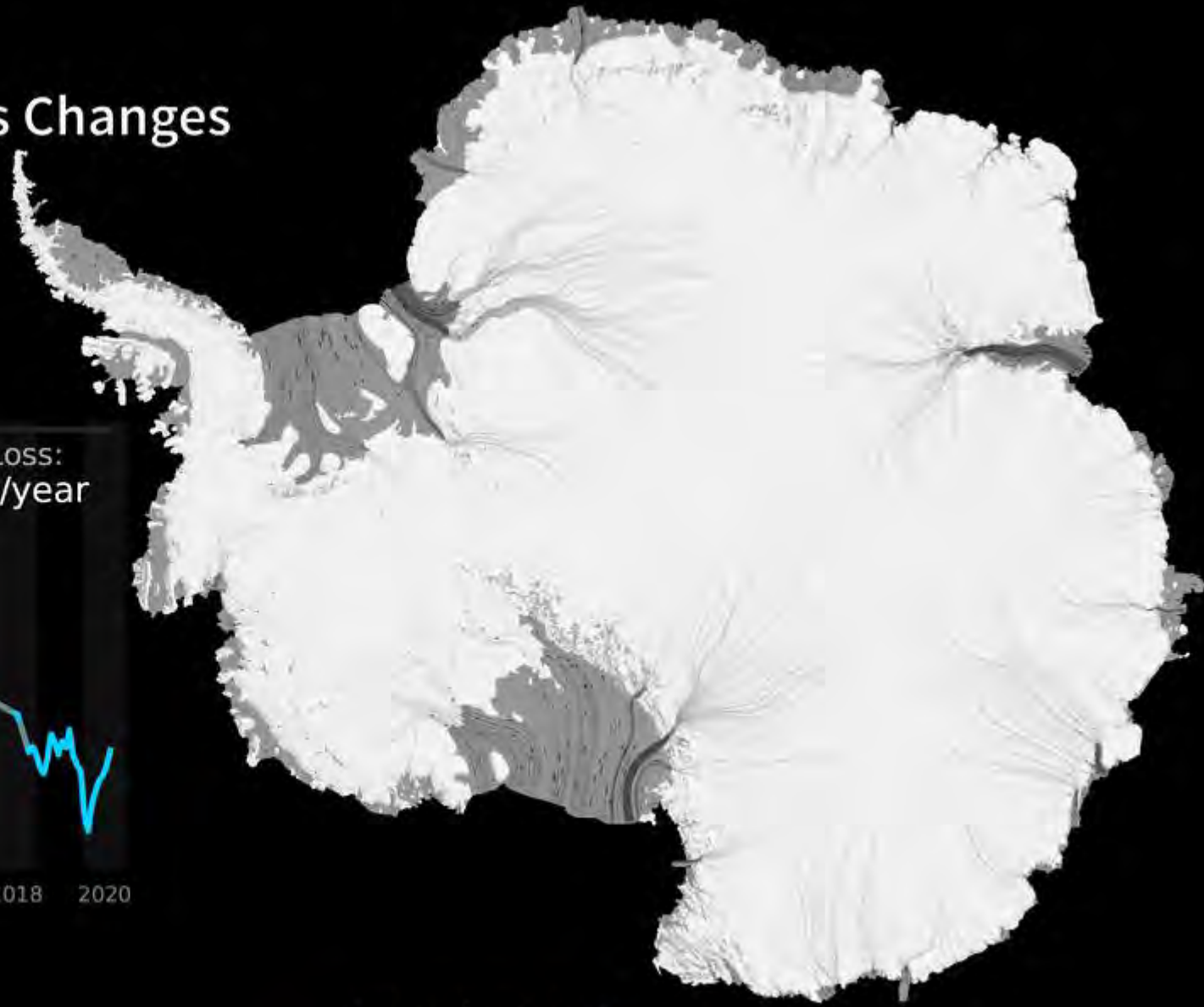
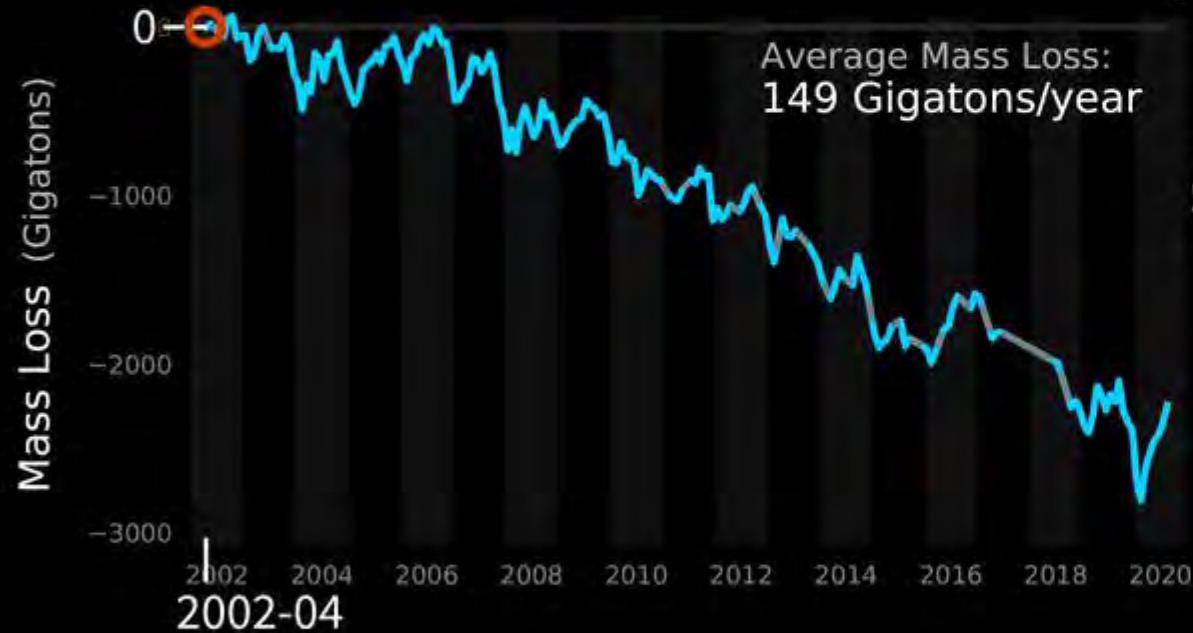


Crédito: VladisChern/Shutterstock.com

La temperatura promedio de la Tierra ha aumentado aproximadamente 2 grados Fahrenheit durante el siglo XX. ¿Cuál es el problema?

GRACE AND GRACE-FO

Observations of Antarctic Ice Mass Changes



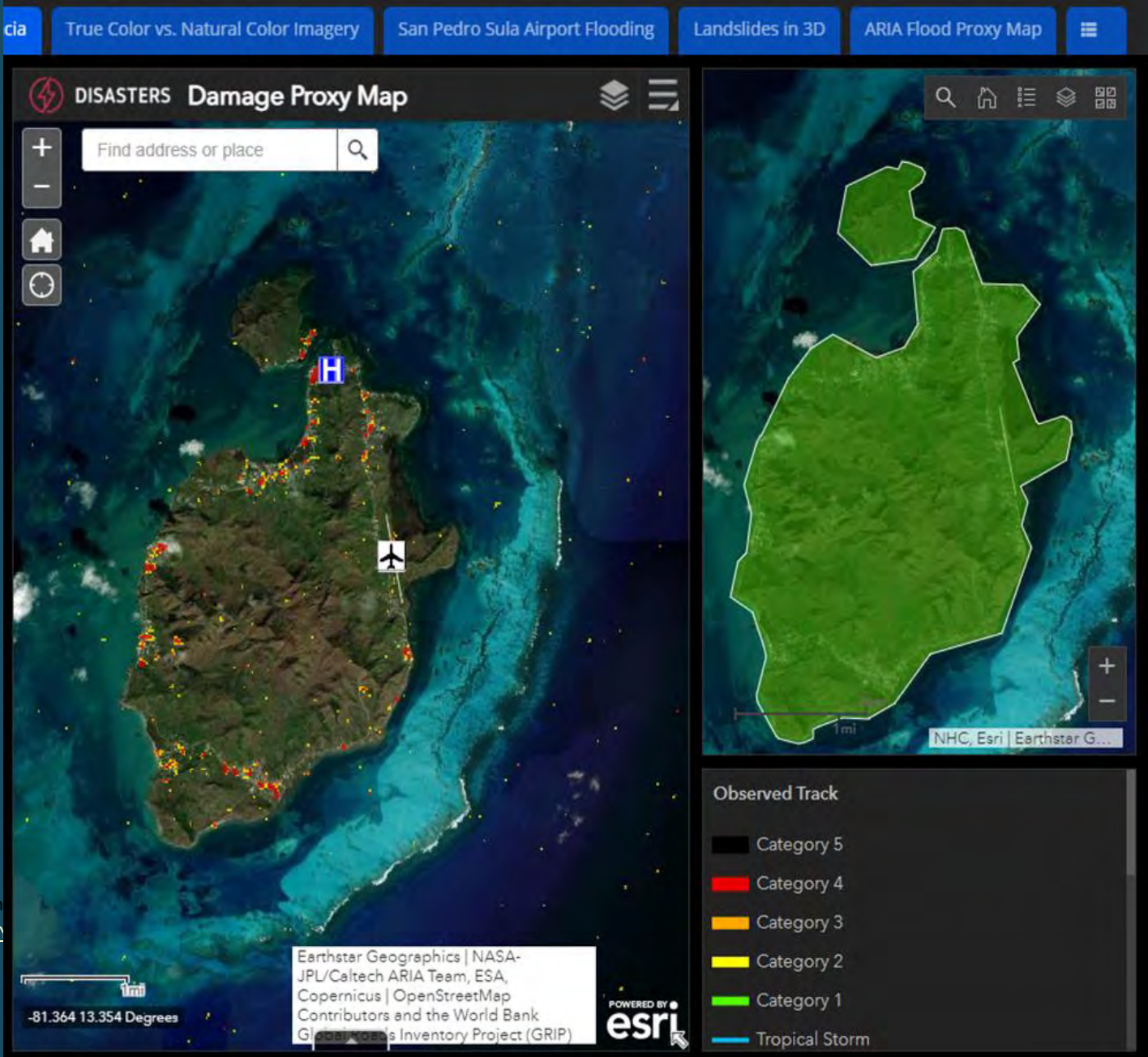
Incremento de eventos Atmosféricos

May 01
2020



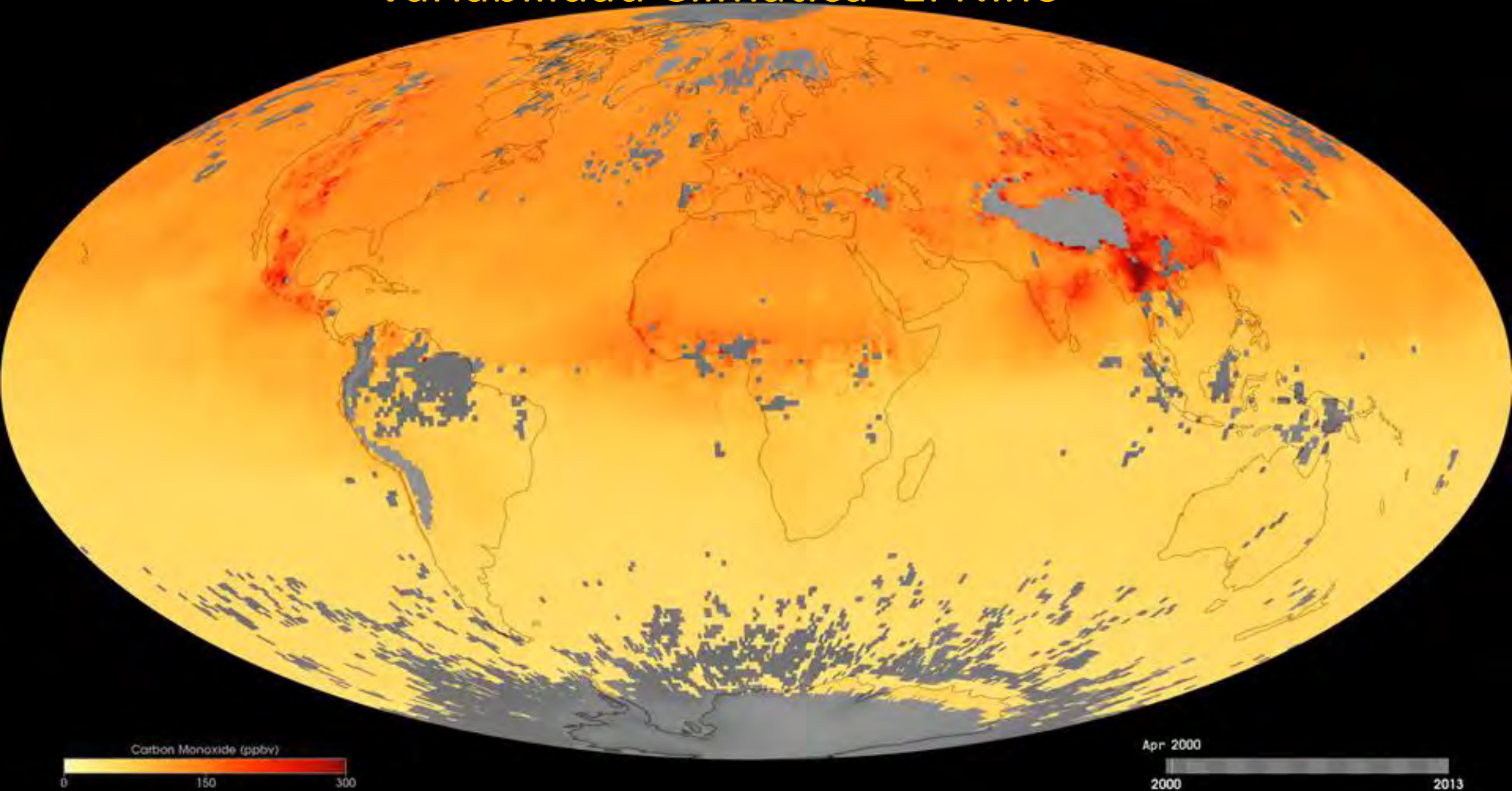
Aaron
Hanna
Isaias
Josephine
Kyle
Laura
Marco
Nana
Omar
Paulette
Rene
Sally
Teddy
Vicky
Wilfred
Alpha
Beta
Gamma
Delta
Epsilon
Zeta
Eta
Theta
Iota

Mapa de Destrucción de Huracán IOTA Isla Providencia

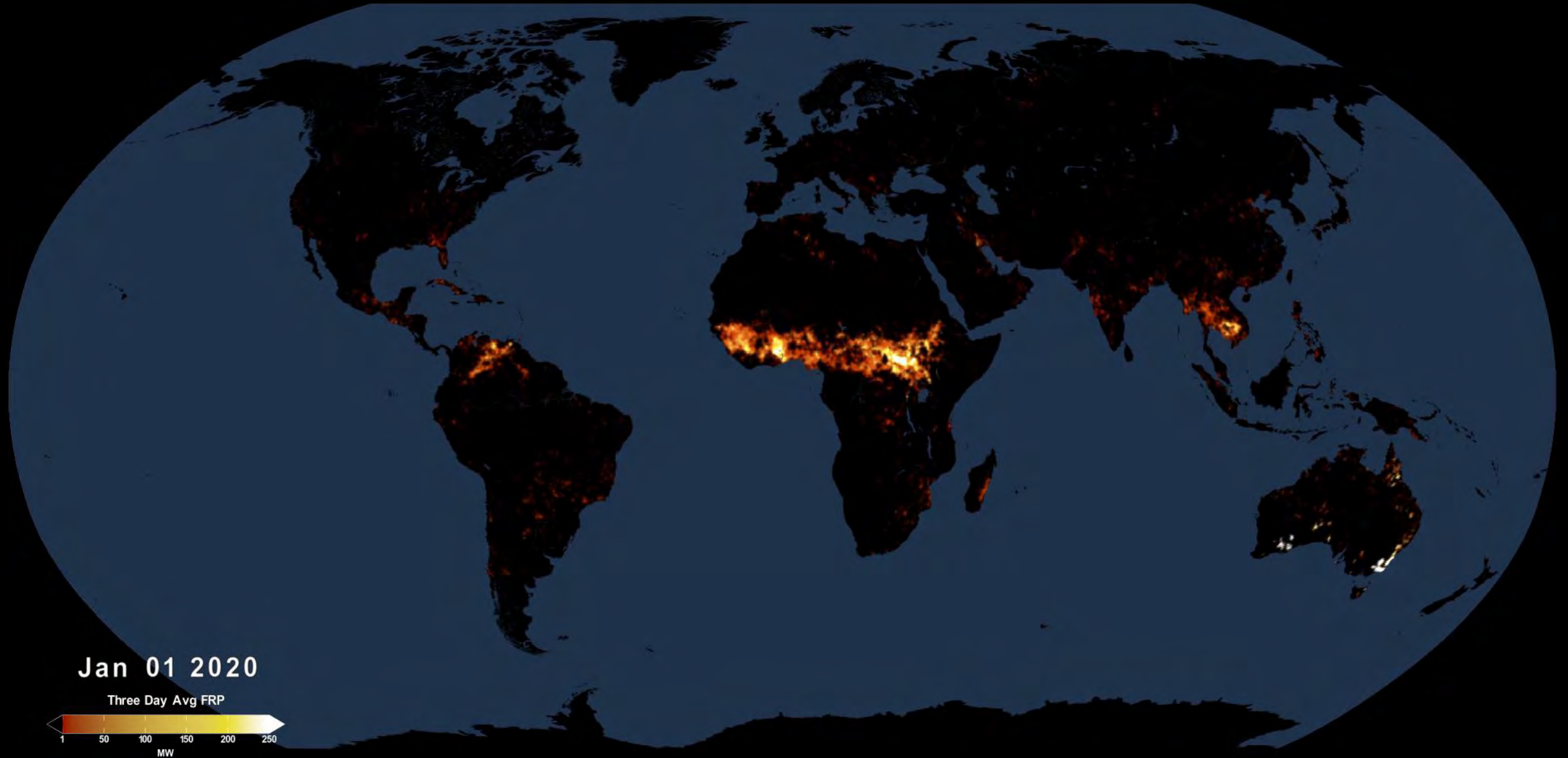




Variabilidad Climática- El Niño



Incremento en los incendios



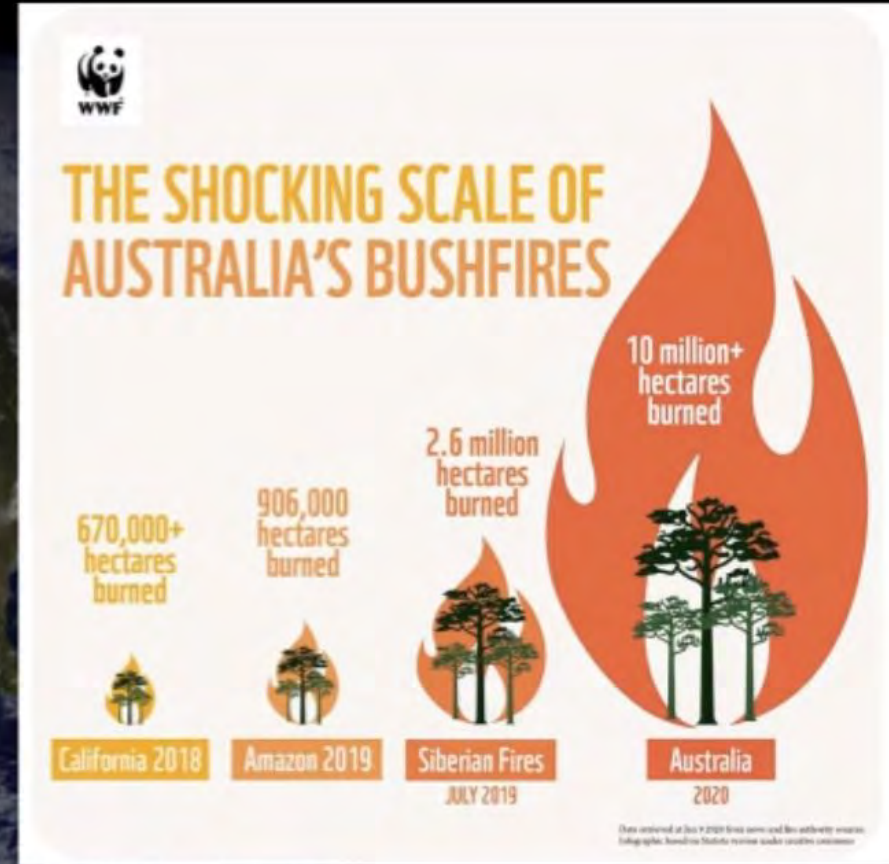
<https://gwis.jrc.ec.europa.eu/>

Jan. 2020: Australian Bushfires



© ADAM STEVENSON

Taylor, Patrick C. (LARC-E302)

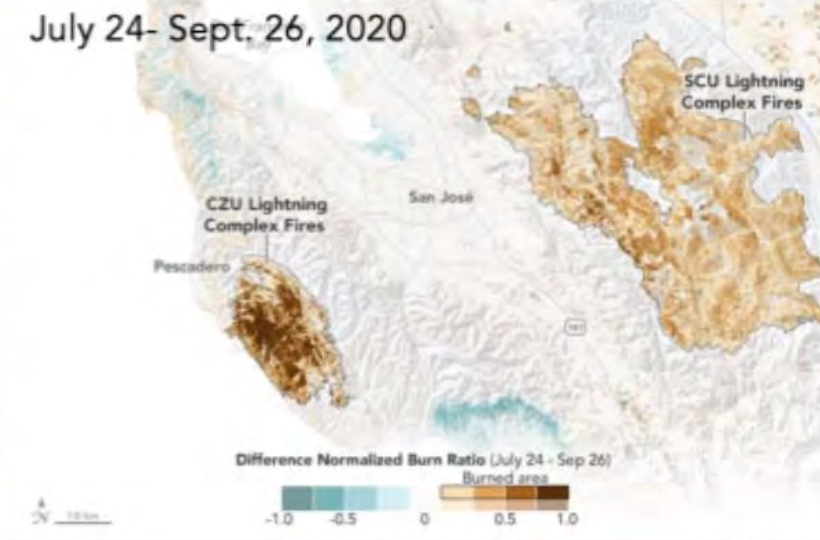


In the unprecedented Australian Bushfires, More than 19 million hectares were burned.

California wildfires



More than 4.1 million acres of CA burned in 2020, containing five of the ten largest fires in CA history, 17 or the 20 largest fires on record have occurred in 2020.



Brazilian Drought 2020/2021



June 12, 2019



June 12, 2019

June 17, 2021

June 17, 2021

The drought, worst in 100 years, has driven coffee bean yields down by 20-30%, coffee prices up by ~30%, and threatened the availability of hydroelectric power in the region.



Fire Map - NASA | LANCE | FIRMS

<https://firms.modaps.eosdis.nasa.gov/map/#d:2021-03-24..2021-03-25;@0.0,0.0,3z>

FIRMS
Fire Information for Resource Management System

Fires: Last 24hrs

2000 km
1000 mi

QUICK VIEW **ADVANCED**

today 24 hrs
my location

Fires (Near Real-Time)

☒	VIIRS 375m / NOAA-20	
☒	VIIRS 375m / Suomi NPP	
☒	MODIS / Aqua	
☒	MODIS / Terra	

Orbit Tracks and Overpass Times +

Overlays +

Backgrounds -

	Blue Marble	
	Streets	
	VIIRS S-NPP Corrected Reflectance (true color)	
	VIIRS NOAA-20 Corrected Reflectance (true color)	
	MODIS/Terra Corrected Reflectance (true color)	

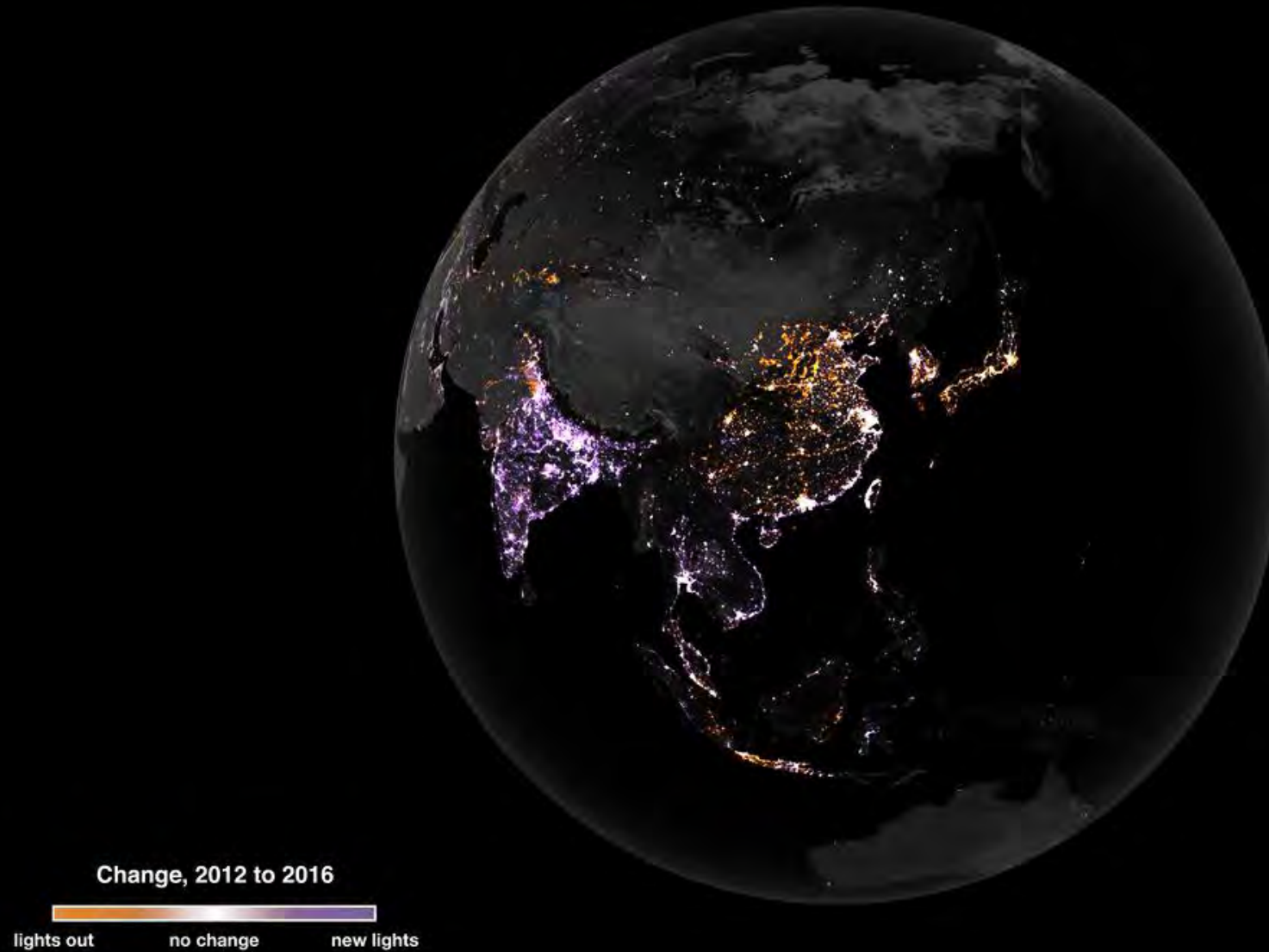
+ show all

NOTE: CLOUD COVER MAY OBSCURE ACTIVE FIRE DETECTIONS

PAN MEASURE LAYERS TIMELINE SHARE SCREENSHOT HELP

NASA Official: Robert E. Wolfe Web Privacy Policy Data & Information Policy Communications Policy Freedom of Information Act USA.gov

NASA's Black Marble



[EOSDIS Worldview \(nasa.gov\)](https://worldview.nasa.gov/)



Monitoring Restoration of the Electrical Grid



[EOSDIS Worldview \(nasa.gov\)](https://worldview.nasa.gov/)

https://earthdata.nasa.gov

EARTHDATA
OPEN ACCESS FOR OPEN SCIENCE

ABOUT DATA COLLABORATE LEARN

Search datasets, news, articles, and information

Nighttime Lights Backgrounder

Remote sensing of nighttime light emissions offers a unique perspective for investigations into human activity and the impact of natural disasters. Learn about the collection of nighttime lights data, how these data are used, and NASA sources for acquiring these data in the new Nighttime Lights Backgrounder.

ACCESS NASA EARTH SCIENCE DATA

GET STARTED VISUALIZE DATA FIND DATA

NASA's data policy ensures that all NASA data are available fully, openly, and without restrictions. [Here's what this means to you.](#)

ATMOSPHERE CALIBRATED RADIANCE & SOLAR RADIANCE CRYOSPHERE HUMAN DIMENSIONS LAND OCEAN

OPEN SCIENCE

ARTIFICIAL INTELLIGENCE

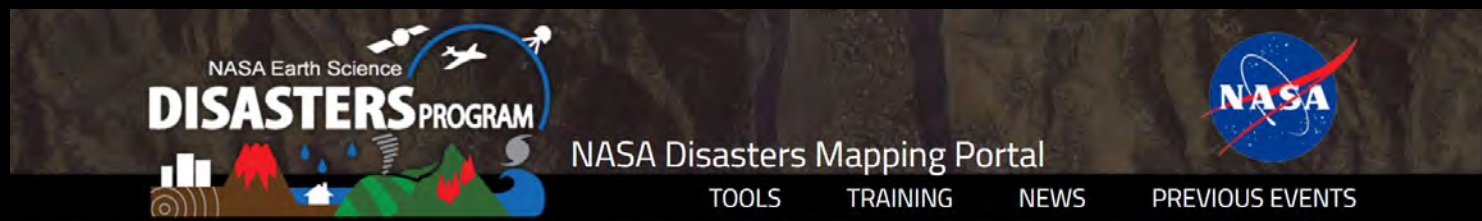
SEA LEVEL CHANGE

[Earthdata \(nasa.gov\)](https://earthdata.nasa.gov)

[NASA Earth Observations \(NEO\)](#)

<https://search.earthdata.nasa.gov/search>

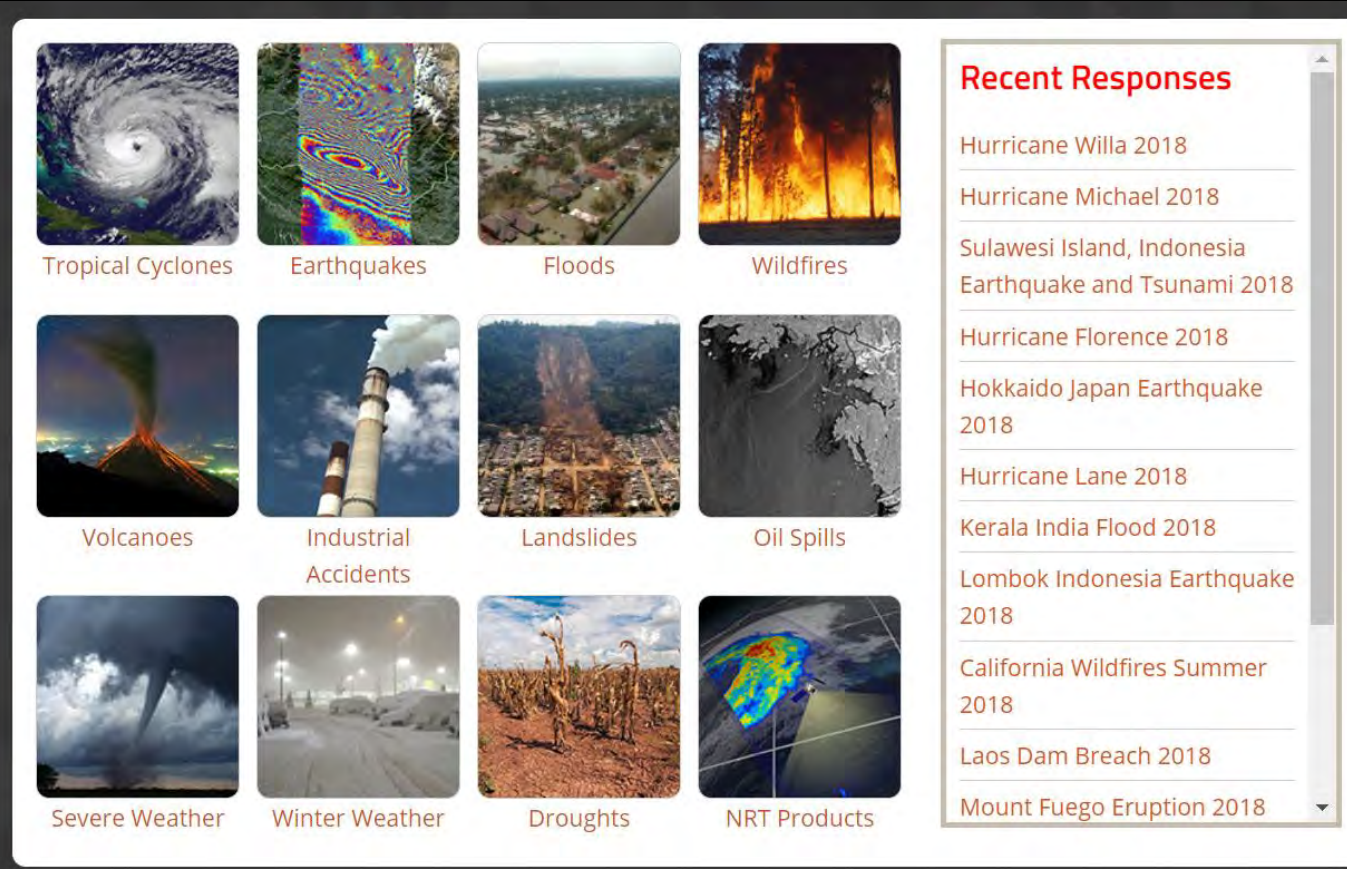
Intercambio de conocimientos Para hacer una diferencia



<https://maps.disasters.nasa.gov/arcgis/home/>



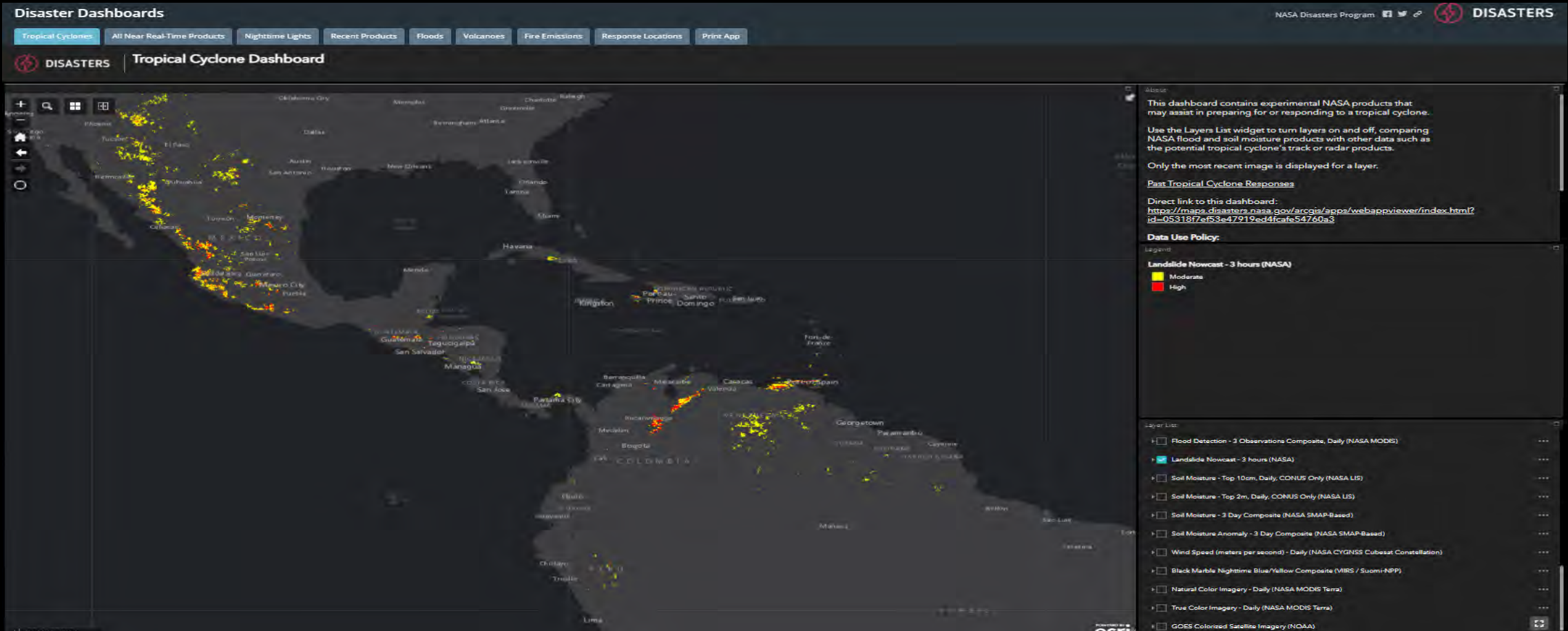
[NASA Earth Science Disasters Mapping Portal](https://maps.disasters.nasa.gov/arcgis/home/)



Satisfacer las prioridades geoespaciales
Listo para el ancho de banda y listo para el análisis

<https://gpm.nasa.gov/landslides/projects.html#LHASA>

<https://gpm.nasa.gov/applications/landslides#modelingandreportinglandslides>



Disaster Dashboards (nasa.gov)

NASA Disasters Program



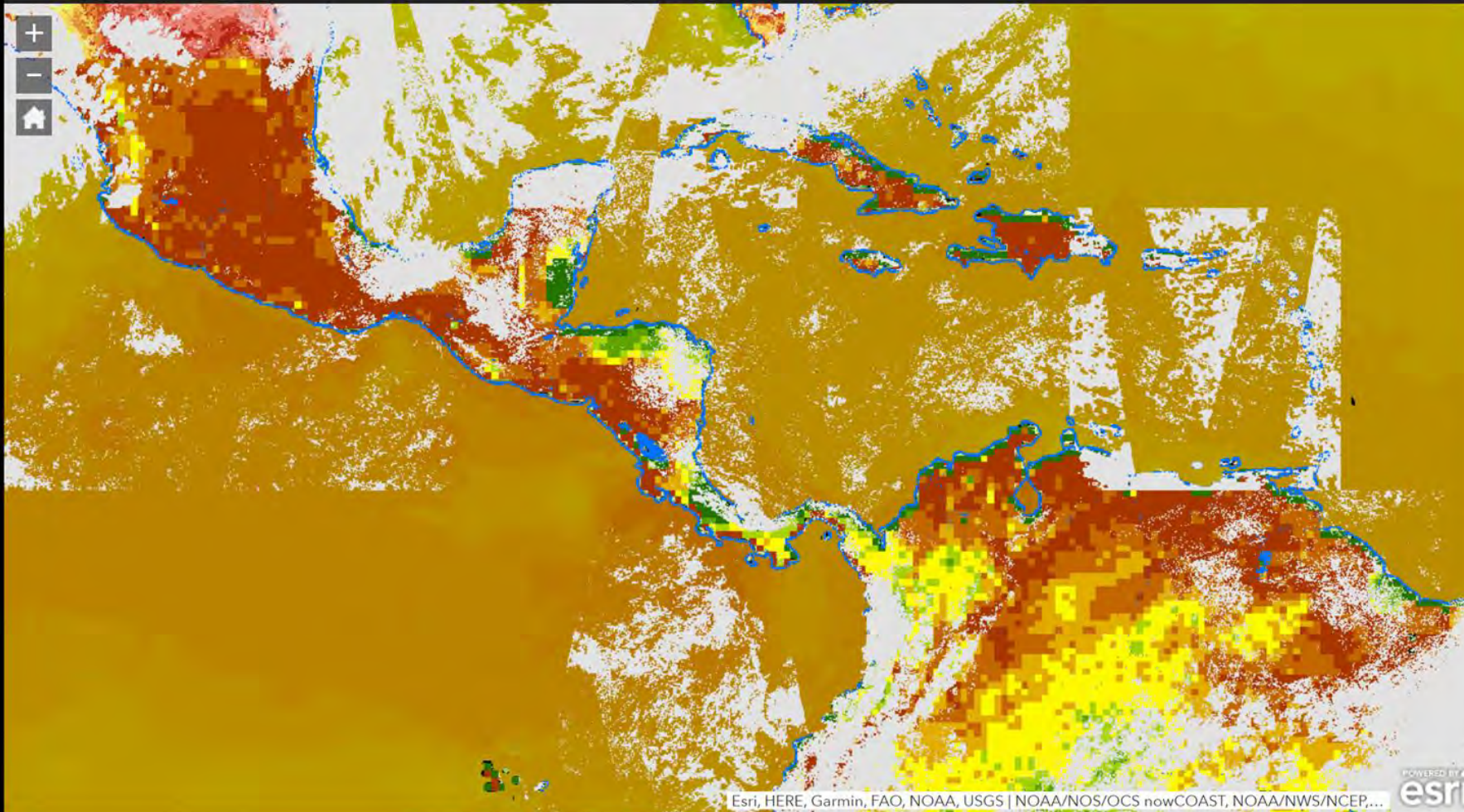
Near Real-Time Dashboard

Recent Products

Tropical Cyclone Dashboard

Response Locations

Print App



Layer List

- ☒ Flood Detection 3 Observations Composite, Daily, MODIS ...
- ☒ Relative Soil Moisture, Top 10cm *CONUS Only* - Daily (NASA SPoRT) ...
- ☒ Relative Soil Moisture: Top 2m *CONUS Only* - Daily (NASA SPoRT) ...
- ☒ SMAP-Based Soil Moisture Product, 3 Day Composite ...
- ☒ Evaporative Stress Index - Weekly (NASA SERVIR) ...
- ☒ Ocean Sea Surface Temperature (NOAA and NASA SPoRT) ...
- ☒ MODIS AQUA Daily Imagery (Corrected Reflectance True Color) ...

Legend

Global Landslide Nowcast (updated every 3 hours)

- Moderate
- High

Flood Detection 1 Observation Image, Daily, MODIS

- Clouds
- Reference Water
- Current Flood Water

About



← → ↺ https://earthdata.nasa.gov/eosdis/daacs/sedac

 **EARTHDATA**
OPEN ACCESS FOR OPEN SCIENCE

ABOUT DATA COLLABORATE LEARN

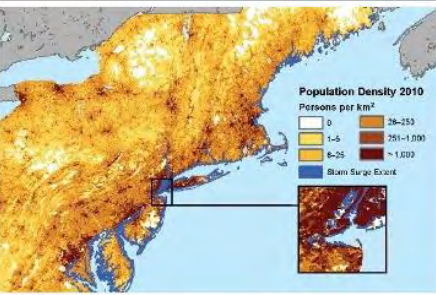
SOCIOECONOMIC DATA AND APPLICATIONS CENTER (SEDAC)

Search datasets, news, articles, and information 

Earth Observing System Data and Information System (EOSDIS) 
EOSDIS Distributed Active Archive Centers (DAACs) 
Socioeconomic Data and Applications Center (SEDAC)

NASA's Socioeconomic Data and Applications Center (SEDAC) is operated by the Center for International Earth Science Information Network (CIESIN ) a unit of the Earth Institute at Columbia University based at the Lamont-Doherty Earth


Population Density 2010
Persons per km²
0 1-5 6-25 26-250 251-1,000 >1,000
Storm Surge Extent

This map shows the storm surge from Hurricane Sandy in October 2012, as estimated by the Federal Emergency Management Agency, coupled

Discover

Get Data 

Learn About Data 

[SEDAC Global COVID-19 Viewer: Population Estimates by Age Group and Sex \(columbia.edu\)](#)

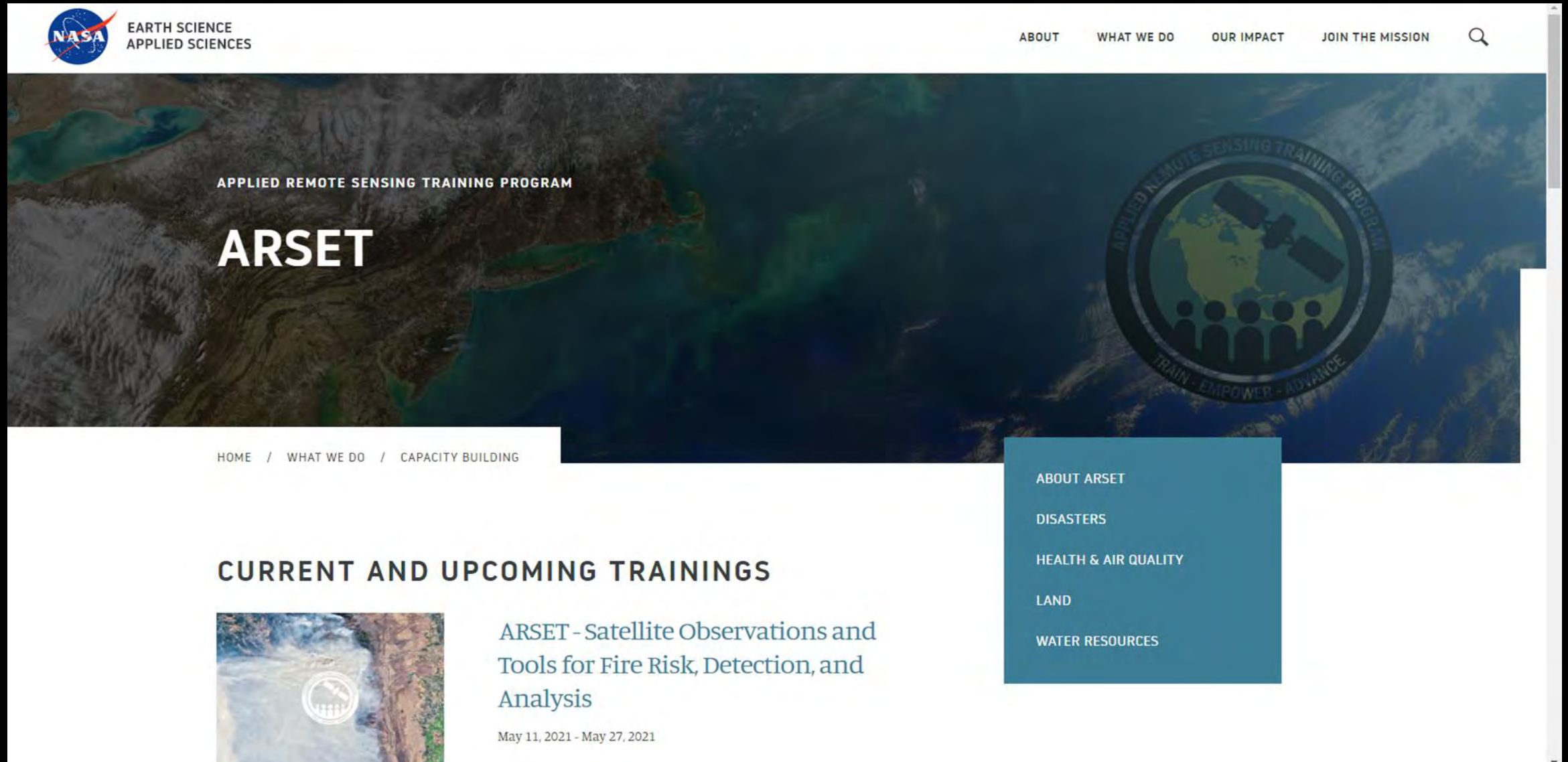
[NASA SEDAC Hazards Mapper \(columbia.edu\)](#)

[NASA SEDAC Population Estimator \(columbia.edu\)](#)

[Socioeconomic Data and Applications Center \(SEDAC\) | Earthdata \(nasa.gov\)](#)

Programa ARSET

ENTRENAMIENTO EN APLICACION DE SENSORES REMOTOS.

The image is a screenshot of the NASA Applied Remote Sensing Training Program (ARSET) website. The header features the NASA logo and the text "EARTH SCIENCE APPLIED SCIENCES" on the left, and a navigation menu with "ABOUT", "WHAT WE DO", "OUR IMPACT", and "JOIN THE MISSION" on the right, along with a search icon. The main banner shows a satellite view of Earth with the text "APPLIED REMOTE SENSING TRAINING PROGRAM" and "ARSET" in large white letters. On the right side of the banner is a circular logo for the ARSET program, which includes a globe, a satellite, and silhouettes of people, with the text "APPLIED REMOTE SENSING TRAINING PROGRAM" and "TRAIN - EMPOWER - ADVANCE". Below the banner, there is a breadcrumb trail: "HOME / WHAT WE DO / CAPACITY BUILDING". The main content area is titled "CURRENT AND UPCOMING TRAININGS". It features a card for a training titled "ARSET - Satellite Observations and Tools for Fire Risk, Detection, and Analysis", which includes a small satellite image and the dates "May 11, 2021 - May 27, 2021". To the right of this card is a teal sidebar menu with the following links: "ABOUT ARSET", "DISASTERS", "HEALTH & AIR QUALITY", "LAND", and "WATER RESOURCES".

NASA EARTH SCIENCE APPLIED SCIENCES

ABOUT WHAT WE DO OUR IMPACT JOIN THE MISSION

APPLIED REMOTE SENSING TRAINING PROGRAM

ARSET

HOME / WHAT WE DO / CAPACITY BUILDING

CURRENT AND UPCOMING TRAININGS

ARSET - Satellite Observations and Tools for Fire Risk, Detection, and Analysis

May 11, 2021 - May 27, 2021

ABOUT ARSET

DISASTERS

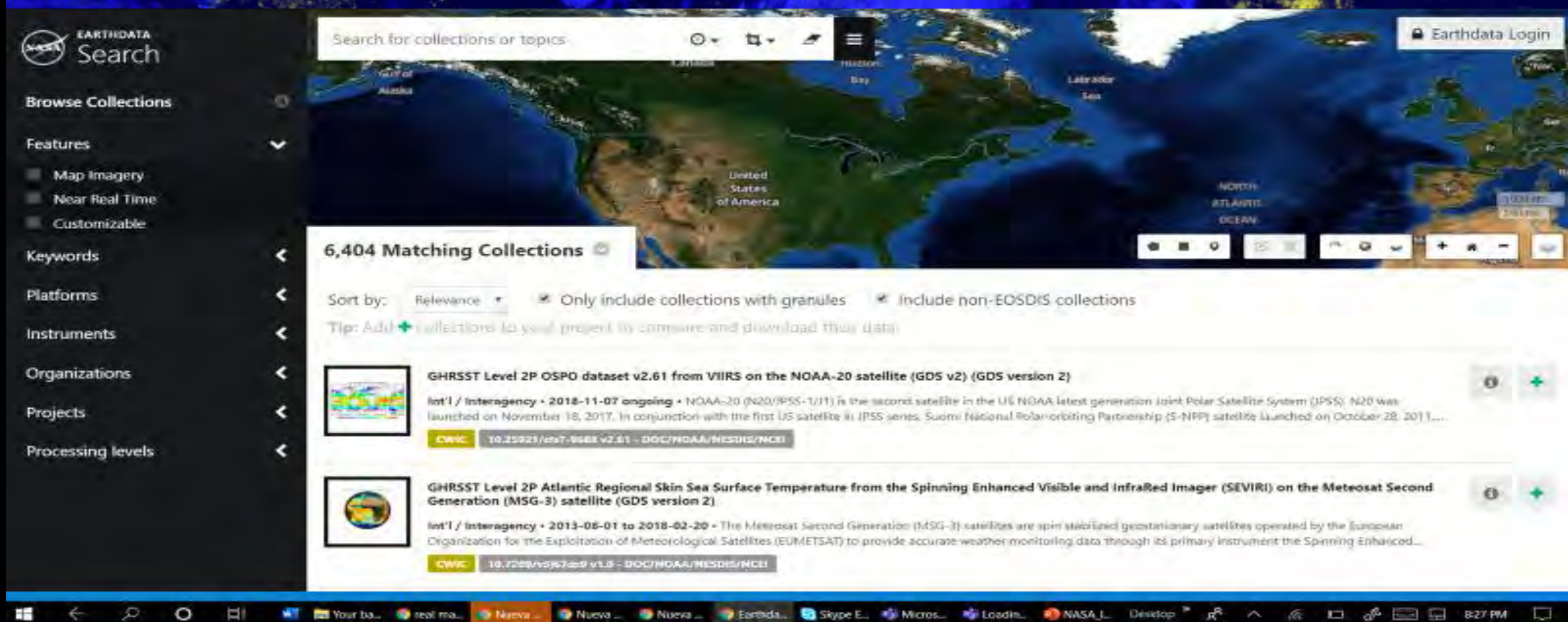
HEALTH & AIR QUALITY

LAND

WATER RESOURCES

[Applied Remote Sensing Training Program | NASA Applied Science](#)

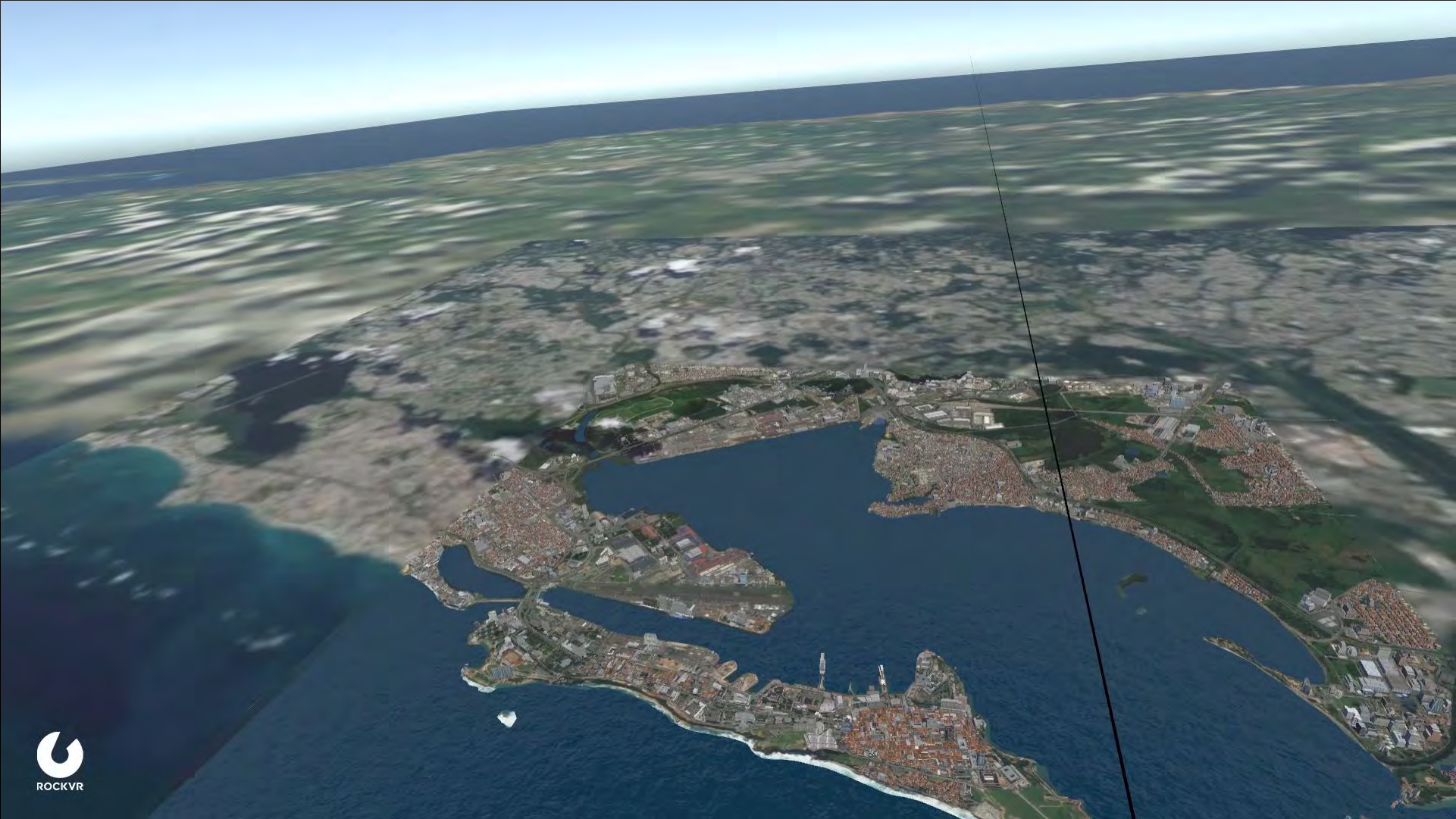
LANCE: NASA NEAR REAL-TIME DATA AND IMAGERY

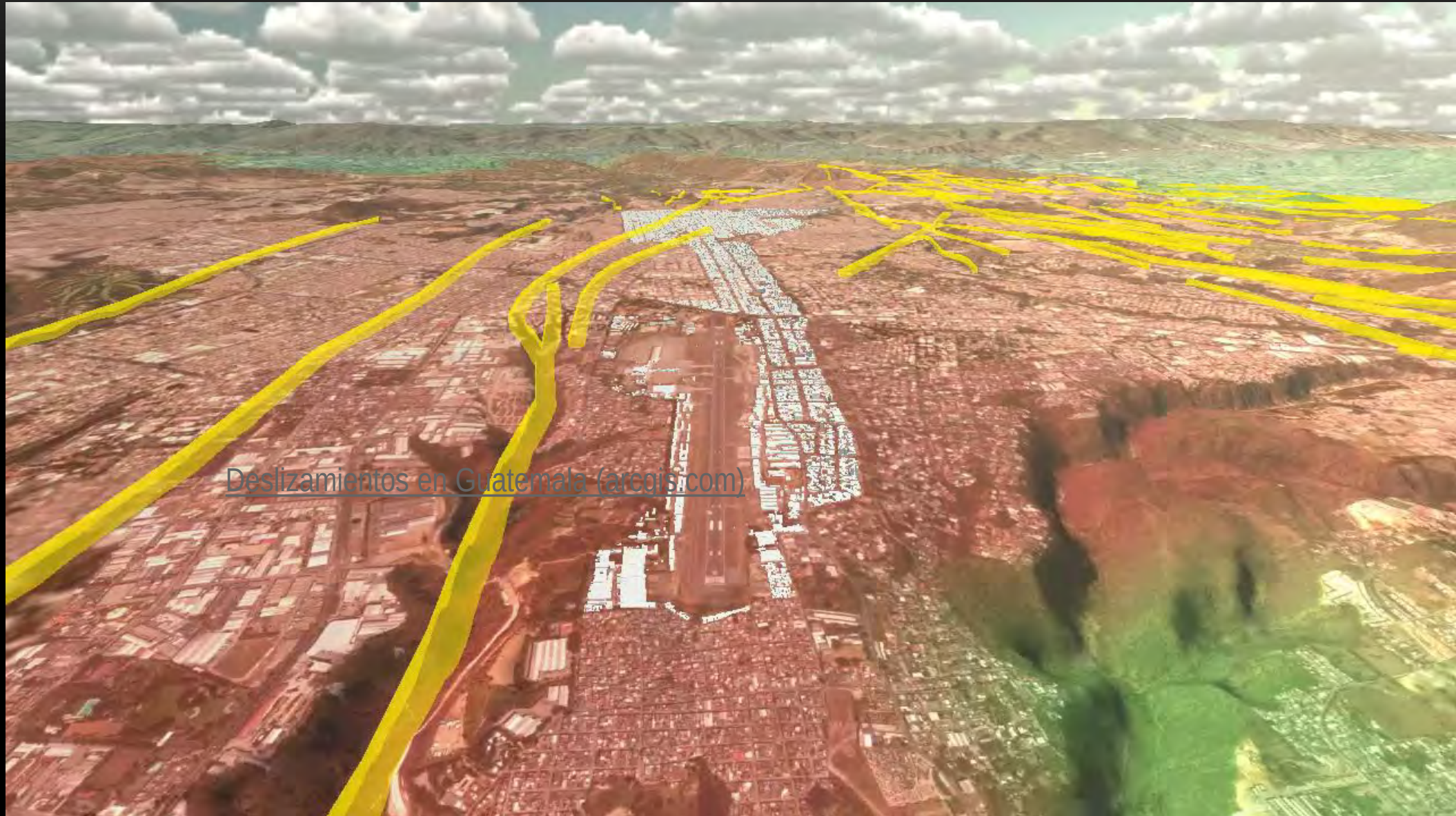


The screenshot displays the Earthdata Search web application. On the left is a dark sidebar with navigation links: **Browse Collections**, **Features** (with sub-links for Map Imagery, Near Real Time, and Customizable), **Keywords**, **Platforms**, **Instruments**, **Organizations**, **Projects**, and **Processing levels**. The main content area features a search bar at the top with the text "Search for collections or topics". Below the search bar is a map of the United States and surrounding regions. A search results box indicates "6,404 Matching Collections". Below this, there are filters for "Sort by: Relevance" and checkboxes for "Only include collections with granules" and "Include non-EOSDIS collections". A tip suggests adding collections to a project. Two data collection entries are visible:

- GHRSSST Level 2P OSPO dataset v2.61 from VIIRS on the NOAA-20 satellite (GDS v2) (GDS version 2)**
Int'l / Interagency • 2018-11-07 ongoing • NOAA-20 (N20/JPSS-1/11) is the second satellite in the US NOAA latest generation Joint Polar Satellite System (JPSS). N20 was launched on November 18, 2017, in conjunction with the first US satellite in JPSS series, Suomi National Polar-orbiting Partnership (5-NPP) satellite launched on October 28, 2011....
DOI: 10.25921/est-968x v2.61 - DOI/NOAA/NEOSIS/NCEI
- GHRSSST Level 2P Atlantic Regional Skin Sea Surface Temperature from the Spinning Enhanced Visible and InfraRed Imager (SEVIRI) on the Meteosat Second Generation (MSG-3) satellite (GDS version 2)**
Int'l / Interagency • 2013-05-01 to 2018-02-20 • The Meteosat Second Generation (MSG-3) satellites are spin stabilized geostationary satellites operated by the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) to provide accurate weather monitoring data through its primary instrument the Spinning Enhanced...
DOI: 10.7202/1057429 v1.0 - DOI/NOAA/NEOSIS/NCEI

The bottom of the image shows a Windows taskbar with various open applications including "Your ba...", "real ma...", "Naveo...", "Nueva...", "Earthda...", "Skype E...", "Micros...", "Loadin...", "NASA_L...", and "Desktop". The system clock shows 8:27 PM.





[Deslizamientos en Guatemala \(arcgis.com\)](http://arcgis.com)



!Gracias!

Ricardo Quiroga ricardo.quirogavanegas@nasa.gov

NASA Langley Research Center