

National Aeronautics and Space Administration

EXPLORE EARTH

NASA Disasters Mapping Portal Jeremy Kirkendall October 10, 2019

https://maps.disasters.nasa.gov



ISS Instruments

CLARREO-PF (2020)

OMPS-Limb (2019)

LIS (2020), SAGE III (2020)

JPSS-2 Instruments

TSIS-1 (2018), OCO-3 (2018),

ECOSTRESS (2018), GEDI (2018)

NASA Earth Science

Missions: Present through 2023

Sentinel-6A/B (2020, 2025) NI-SAR (2021) 15 SWOT (2021) **TEMPO (2018)** GRACE-FO (2) (2018) ICESat-2 (2018) CYGNSS (8) (2019) NISTAR, EPIC (DSCOV (2019)SMAP Suomi NPP (>2022) (NOAA) (>2022) QuikSCAT SORCE,

Landsat 7 (USGS) (~2022)

Aqua (>2022)

CloudSat (~2018)

(2017)

CALIPSO (>2022)

TCTE (N

(2017)

Aura (>2022) OSTM/Jason-2 (NOAA)

1

Landsat 9 (2020)

MAIA (~2021)

TROI

InVEST/CubeSats

PACE (2022)

oCARB (~2021)

12) (~2021)

RAVAN (2016) IceCube (2017) MiRaTA (2017) HARP (2018) TEMPEST-D (2018) RainCube (2018) CubeRRT (2018) CIRIS (2018*) CSIM (2018)

* Target date, not yet manifested

GPM (>2022)

Landsat 8 (USGS)

(>2022)

OCO-2 (>2022)

La B

(>2022)

Disasters Program Mission and Goals



 <u>Program Mission:</u> The Disasters Program mission is to use Earth observation to inform disaster risk reduction and resilience across the disaster cycle from local to global scales.

Program Goals:

- Harness NASA Capabilities for Disaster Risk Reduction (DRR) and resilience.
- Engage stakeholders in the use of Earth Observations (EO) throughout the disaster lifecycle.
- Demonstrate the value and impact of EO to support decision making and actions.
- Grow as a trusted source for delivering useful results.



What is the NASA Disasters Mapping Portal?

- The hub of geospatially enabled NASA disaster products
- Uniform format allows easy ingestion by emergency managers and the public
- All data is free and openly available without any login requirements.
- Every product has REST and WMS endpoints
- Two types of products:
 - Event-based Products
 - Near Real-Time Products

Portal Home

- Featured Maps & Apps
 - Story Maps for recent or prominent events
- Near Real-Time Dashboard
 - Most recent image displayed



Disaster Category Tiles and Recent Responses

- **Disaster Category Tiles**
 - Event specific products by disaster type
 - **Risk Reduction** •
 - External resources
 - Near Real-Time (NRT) Products •
- Recent Responses •
 - Direct link to event's product gallery



Volcanoes

Winter Weather







Severe Weather

Recent Responses	Rece	ent Re	spons	es
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Tropical Storm Karen 2019 Hurricane Dorian 2019 Alaska Wildfires 2019 Hurricane Barry 2019 Southern California Earthquakes July 2019 Uruguay Floods 2019 Central US Flooding and Storms Spring 2019 Cyclone Fani 2019 Cyclone Kenneth 2019 Quebec Flooding 2019 Midwest Flooding March 2019 Cyclone Idai 2019

Tropical Cyclones Earthquakes Floods Wildfires

Industrial



Risk Reduction

NRT Products

Landslides

External Resources



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Product Gallery

Search



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Item Details Page

- Date of Image(s)
- Summary
- Suggested Usage
- Satellite/Sensor
- Credits
- Esri REST Endpoint For all Esri software
- WMS Endpoint For open source software
- Terms of Use Open to all users

Home Gallary Map Scene Groups

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ARIA Flood Proxy Map produced using Copernicus Sentinel-1 for the Uruguay Floods on June 18, 2019

Overview



AltiA Flood Proxy Map produced using Copernicus Sentinel-1 on June 18, 2019

Crusted: Jun 28, 2019 Updated: Oct 7, 2019 View Count: 13

Description

Date of Image: 6/18/2019

Date of Next Image:

Unknown

Summary:

The Advanced Rapid Imaging and Analysis (ARIA) team at NASA's Let Propulsion Laboratory in Pasadena, California, created these Fixed Proxy Maps depicting areas of Uniguay that are likely flooded as a result of heavy rain, shown by light blue pixels. The maps were devised from synthesis spectrum rader (SAR) data acquired on June 18, 2019 by the Copernicus Sentinel-1 setellities operated by the European Space Agency (ESA).

Suggested Usage:

Potentially flooding is shown by blue pixels. This flood proxy map should be used as guidance to identify areas that are likely flooded, and may be less reliable over urban and vegetated areas.

Satellite/Sensor: Southate Anautras Radia (SAR) on Eur

Synthetic Aperture Radar (SAR) on European Space Agency's (ESA) Copernicus Sentinel-1A satellite Resolution: 30 meters

Credits:

Contains modified Copernicus Sentinel data (2019) analyzed by the NASA-JPL/Caltech ARIA team. This task was carried out at JPL funded by NASA Disasters Program.

ESRI REST Endpoint: See URL section on right side of page

WMS Endpoint: https://maps.disasters.nasa.gov/app05/services/unguay_floods_201906/sentinel1_anafpm_20190618/mageServer/WMSServer

Layers

sentinel1_arlafpen_20190618.

Terms of Use

NASA data and products are freely available to federal, state, public, non-profit and commercial users. This information can be experimental- or research-grade data products and may not be appropriate for operational use. These NASA data products, services, and the Disasters Mapping Portal are intended to aid decision makers and enhance structorial awareness, but these data are not guaranteed to be consistently available or notifiely updated. Please cite the information according to the direction provided in the metadata. Use of this product should include: "Currains modified Copernicus Sentinei date (2019) processed by NASA-JPU/Catech ARIA Team, ESA."

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NASA Disasters Program, Uruguay, Flood, Flooding, ABA, Sentrial-1, SAR, ESA, Copernicus

Credits (Attribution)

Contains multified Copernicus Sentinel data (2019) analyzed by the NASA-JPU/Cahach ARM team. This task was carried out at JPL funded by NASA Disasters Program.

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https://waps.disasters.nass.gov/ega03	

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Web Map



Story Maps

- Tell the disaster's story
- Show what's possible with NASA products
- Highlight notable products and disaster impacts



Interactive widgets and web apps



Demonstrating What's Possible



California Earthquake July 2019

 3D enabling select datasets to better communicate impact







Near Real-Time Products

- FIRMS Active Fire Points (MODIS, VIIRS)
- Global Landslide Nowcast
- Flood Detection 1, 2, 3 Observations (MODIS)
- Precipitation Accumulation 30 min, 3 hour, 1 day (Global Precipitation Measurement)
- Soil Moisture 3 day composite (SMAP)
- Evaporative Stress Index weekly



Limitations

- Timing of satellite ٠ passes
- Sensor type ٠ Optical, SAR, IR
- Resolution •
- Ground truthing ٠ data improves product accuracy

NASA Products for th	ne California Atmospheric River	and Flooding 201	9	n y 2	
Home Optical vs SAR Detected	Flooding MODIS 1 Day 1 Observation Flood Map	Sentinel-1 Water Extent	Sentinel-1 RGB Flood Map	Optical vs SAR RGB	Composites
Dates of Imagery: Optical 2/28/2019 SAR 3/4/2019	Optical vs SAR Detected Flooding MODIS Optical vs Sentinel-1 SAR				n y e
Summary: Optical imagery and Synthetic Aperture Radar (SAR) are both useful tools for detecting changes such as flooding. Optical imagery however cannot see through clouds, so SAR can be more accurate during cloudy weather. The optical imagery covers a larger area at a lower resolution of 250 meters allowing for most of the Earth to be observed on a daily basis. The SAR imagery is at a higher resolution of 10 meters but is acquired less frequently, resulting in a delay in detecting the flooding.			Enthetian Generation		

Open Data

ArcGIS Online

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North America 😰	Disasters Mapping Portal
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AmeriGEOSS Agriculture	INTERN.
AmeriGEOSS Biodiver 🕕	NASA Hurricane Florence Group
AmeriGEOSS Disasters 🕕	The NASA Disasters Mapping Portal contains derived products for disaster response. The Disasters Applications area promotes the use of Earth observations to improve prediction
AmeriGEOSS Week 2018 (1)	ITTAL THE REFE



Questions? Portal Feedback?

NASA Disasters Mapping Portal: https//:maps.disasters.nasa.gov

Portal Questions:

HQ-Disasters-GIS@mail.nasa.gov

Request Disaster Support:

HQ-Disasters-EM@mail.nasa.gov