

# NASA Disasters Mapping Portal Product Guide

## Introduction

NASA possesses unique geospatial assets and modelling capabilities. The NASA Disasters Program provides partners with data, mapping, and imagery to help to provide situational awareness and inform decision-making before, during, and after disasters.

The NASA Disasters Mapping Portal takes disaster-related data and puts it into understandable, usable formats for use by emergency managers, interagency organizations, and the public. The goal is to bridge the gap between science products and the people who can use the data to assist in preparedness, response, mitigation, and recovery.

All data is free and openly available without any login requirements. Data can also be downloaded or ingested into organizations' own geographic information systems.

## Primary Sensor Types

NASA employs two primary types of sensors to assist with geospatial data collection: Synthetic Aperture Radar (SAR) and Optical. These sensors are used by multiple satellites, each with their own strengths and limitations.

Sensor	Satellite(s)	Strengths	Limitations
<b>SAR</b>	Sentinel-1, ALOS-2, RADARSAT-2, ICEYE-X2	Can see through cloud cover and at night	Requires more processing and technological skillset; Can have issues in dense tree canopy (depends on wavelength); Can have issues differentiating between water and snow/ice
	UAVSAR	Can have daily, targeted overpasses	Aircraft and/or instrument may not be available; requires additional agency funding
<b>Optical</b>	Landsat-7, Landsat-8, Sentinel-2, MODIS, ASTER, ISS, VIIRS	Different band combinations can see different features	Can be obscured by cloud cover; cannot be used at night (unless using Day/Night Band or for hotspots)

## Hazard-Specific Products

The following pages list products and assets that can be utilized for the hazards listed below. There is often overlap, as many products can be utilized for a variety of hazards. Products are event-specific unless noted as near real-time (NRT).

The availability of a final product is determined by the latency (delay) in receiving data, latency of product development, and revisit periods of the satellite. The latencies listed in each table is the estimated time from good overpass to product delivery. [Revisit periods](#) for satellites/sensors can be found on page 17.

Flood .....	2
Tropical Cyclone.....	6
Volcano .....	10
Earthquake.....	13
Wildfire .....	16
Landslide .....	19

## Flood

Product Category	Product Name	Satellite(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications
<b>Damage Detection</b>	Damage Proxy Map (DPM)	ESA Copernicus Sentinel-1	SAR	30 meters	1-2 day after good overpass	Identifies potentially damaged areas of focus	Product requires manual processing, increasing latency/delay/delay. Subject to overpass availability for pre- and post-event
		JAXA ALOS-2					
<b>Feature Detection</b>	International Space Station (ISS)	ISS Camera	Optical	Varies; Low	Variable	Gives large overview of the event	Angle of photos can distort geospatial accuracy
<b>Flood Depth</b>	GFMS Maximum Inundation Estimate	Model, GPM	Satellite + Model	1 kilometer	Multiple times daily		
<b>Flood Extent</b>	Water Extent Map	ESA Copernicus Sentinel-1	SAR	30 meters	1 day after good overpass	Classifies existing water, new water, wetlands, and no water	Subject to overpass availability
		ESA Copernicus Sentinel-2	Optical	20 meters			
	Flood Proxy Map (FPM)	ESA Copernicus Sentinel-1	SAR	30 meters	1-2 day after good overpass	Classifies water and no water	Subject to overpass availability for pre- and post-event
		JAXA ALOS-2					
	Flood Color Map	Sentinel-1	SAR	30 meters	1-2 day after good overpass	Classifies flood water	Can be difficult to identify small areas of flooding
	MODIS Flood Map	MODIS	Optical	250 meters	Twice Daily	Classifies water and no water, near real-time product	Subject to cloud cover blocking view of surface
	DFO Water Extent Map	ESA Copernicus Sentinel-1	SAR	30 meters	1-2 day after good overpass	Classifies water and no water	
MODIS		Optical	250 meters	1-2 day after good overpass			
<b>Flood Extent and Damage Detection</b>	RADARSAT-2 Change Detection	RADARSAT-2	SAR	30 meters	2-5 Days		Not commonly available except during major disasters

Product Category	Product Name	Satellite(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications
<b>Power Outage</b>	Black Marble Blue-Yellow Composite	Suomi NPP VIIRS	Optical	750 meters	Daily	Produced daily (NRT)	Lower resolution than Black Marble HD product
	Black Marble Standard	Suomi NPP VIIRS	Optical	500 meters	Daily	Less latency/delay than HD product	Lower resolution ( <a href="https://blackmarble.gsfc.nasa.gov/VNP46A1_RMS.html">https://blackmarble.gsfc.nasa.gov/VNP46A1_RMS.html</a> )
	Black Marble HD	Suomi NPP VIIRS	Optical	30 meters	2-5 Days	High resolution	Long latency/delay – typically used post event
<b>Rainfall Accumulation</b>	GPM IMERG	GPM	Satellite	0.1x 0.1 degrees	NRT – Every 3 hours	Global product, particularly useful outside of the US; frequently updated: 30 min and 3 hour products	
<b>Risk to Critical Infrastructure</b>	ImageCat Risk to Critical Infrastructure	Various	Optical	~500 meters	As needed for event	Provides context to other products	Must be manually created for each event
<b>Soil Moisture</b>	Land Information System (LIS)	Model, Suomi NPP	Satellite + Model	3 kilometers	Daily	Relatively high resolution, near real-time daily product	Continental United States (CONUS), Only
	SMAP	SMAP, Model	Satellite + Model	0.25 x .0.25 degrees	NRT – Every 3 days	Global product, near real-time 3-day composite product	Relatively long latency/delay (5-10 days after 3 <sup>rd</sup> day of composite), coarse resolution
	Evaporative Stress Index	Collection of Satellites		5 kilometers	NRT – Weekly	Global product, identifies where plants may be drying out, near real-time weekly product	
<b>Water Detection</b>	Sentinel-1 RGB	ESA Copernicus Sentinel-1	SAR	30 meters	1 day after good overpass	Relatively low latency, well developed workflow established	Not a classified image; cannot see through tree canopy and less useful in urban areas
	Modified Normalized Difference Water Index (mNDWI)	Landsat 7	Optical	30 meters	1 day after good overpass	Index that identifies water; can identify more saturated ground	
		Landsat 8	Optical	30 meters	1 day after good overpass		
		ESA Copernicus Sentinel-2	Optical	20 meters	1 day after good overpass		
		MODIS	Optical	250 meters	Twice Daily		

Product Category	Product Name	Satellite(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications	
<b>Water Detection (Cont.)</b>	Normalized Difference Water Index (NDWI)	Landsat 7	Optical	30 meters	1 day after good overpass	Index that identifies water; can identify more saturated ground		
		Landsat 8	Optical	30 meters	1 day after good overpass			
		ESA Copernicus Sentinel-2	Optical	20 meters	1 day after good overpass			
		MODIS	Optical	250 meters	Twice Daily			
	True Color RGB	Landsat 7	Optical	30 meters	30 meters	1 day after good overpass	Shows what the human eye sees.	Features not always as noticeable as other band combinations. Different satellites have different temporal latency based on respective orbit
		Landsat 8	Optical	30 meters	30 meters	1 day after good overpass		
		ESA Copernicus Sentinel-2	Optical	10 meters	10 meters	1 day after good overpass		
		MODIS	Optical	250 meters	250 meters	Twice Daily		
	Natural Color RGB	Landsat 7	Optical	30 meters	30 meters	1 day after good overpass	Band combination can make water more noticeable; can differentiate between more green and less green areas of vegetation (trees, grass, crops, etc.); can point out snow and differentiate between snow/ice and some clouds	Can't see through clouds as well as color infrared
		Landsat 8	Optical	30 meters	30 meters	1 day after good overpass		
		ESA Copernicus Sentinel-2	Optical	20 meters	20 meters	1 day after good overpass		
		MODIS	Optical	250 meters	250 meters	Twice Daily		
Color Infrared	Landsat 7	Optical	30 meters	30 meters	1 day after good overpass	Band combination can make water more noticeable; can differentiate between more green and less green areas of vegetation (trees, grass, crops, etc.); infrared band allows for viewing through some thin/high level clouds; can make it easy to spot snow	Snow/ice can look identical to clouds	
	Landsat 8	Optical	30 meters	30 meters	1 day after good overpass			
	ESA Copernicus Sentinel-2	Optical	20 meters	20 meters	1 day after good overpass			
	MODIS	Optical	250 meters	250 meters	Twice Daily			
Landsat 8 Panchromatic	Landsat 8	Optical	15 meters	15 meters	1 day after good overpass	Higher resolution than other Landsat products	Single band, grayscale image only, no RGB	

Product Category	Product Name	Satellite(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications
	DFO Sentinel-1 Color Composite (RGB)	ESA Copernicus Sentinel-1	SAR	30 meters	1-2 day after good overpass		
<b><i>Watershed Alerts</i></b>	MOM Watershed Alerts	Model of Models (MOM)	Models	Watershed Level	As needed, but relies on model runs	Can identify watersheds that may be prone to flooding based on model outputs	Only available at watershed level

## Tropical Cyclone

Product Category	Product Name	Satellites(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications
<b>Damage Detection</b>	Damage Proxy Map (DPM)	ESA Copernicus Sentinel-1	SAR	30 meters	1-2 day after good overpass	Identifies potentially damaged areas of focus	Product requires manual processing, increasing latency/delay. Subject to overpass availability for pre- and post-event
		JAXA ALOS-2					
<b>Feature Detection</b>	International Space Station (ISS)	ISS Camera	Optical	Varies; Low	Variable	Gives large overview of the event	Angle of photos can distort geospatial accuracy
<b>Flood Depth</b>	GFMS Maximum Inundation Estimate	Model, GPM	Satellite + Model	1 kilometer	Multiple times daily		
<b>Flood Extent</b>	Water Extent Map	ESA Copernicus Sentinel-1	SAR	30 meters	1 day after good overpass	Classifies existing water, new water, wetlands, and no water	Subject to overpass availability
		ESA Copernicus Sentinel-2	Optical	20 meters			
	Flood Proxy Map (FPM)	ESA Copernicus Sentinel-1	SAR	30 meters	1-2 day after good overpass	Classifies water and no water	Subject to overpass availability for pre- and post-event
		JAXA ALOS-2					
	Flood Color Map	Sentinel-1	SAR	30 meters	1-2 day after good overpass	Classifies flood water	Can be difficult to identify small areas of flooding
	MODIS Flood Map	MODIS	Optical	250 meters	Twice Daily	Classifies water and no water, near real-time daily product	
	DFO Water Extent Map	ESA Copernicus Sentinel-1	SAR	30 meters	1-2 day after good overpass	Classifies water and no water	
MODIS		Optical	250 meters				
<b>Flood Extent and Damage</b>	RADARSAT-2 Change Detection	RADARSAT-2	SAR	30 meters	2-5 Days		Not commonly available except during major disasters

Product Category	Product Name	Satellites(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications
<b>Power Outage</b>	Black Marble Blue-Yellow Composite	Suomi NPP VIIRS	Optical	750 meters	Daily	Produced daily (NRT)	Lower resolution than Black Marble HD product
	Black Marble Standard	Suomi NPP VIIRS	Optical	500 meters	Daily	Less latency/delay than HD product	Lower resolution than Black Marble HD product
	Black Marble HD	Suomi NPP VIIRS	Optical	30 meters	2-5 Days	High Resolution	Long latency/delay
<b>Rainfall Accumulation</b>	GPM IMERG	GPM	Satellite	0.1 x 0.1 degrees	NRT – Every 3 hours	Global product, particularly useful outside of the US; frequently updated: 30 min and 3 hour products	
<b>Risk to Critical Infrastructure</b>	ImageCat Risk to Critical Infrastructure	Various	Optical	~500 meters	As needed for event	Provides context to other products	Must be manually created for each event
<b>Soil Moisture</b>	Land Information System (LIS)	Model, Suomi NPP	Satellite + Model	3 kilometers	Daily	Relatively high resolution, near real-time daily product	Continental United States (CONUS), Only
	SMAP	SMAP, Model	Satellite + Model	0.25 x 0.25 degrees	NRT – Every 3 days	Global Product, near real-time 3-day composite product	Relatively long latency/delay (5-10 days after 3rd day of composite), course resolution
	Evaporative Stress Index	Collection of Satellites		5 kilometers	NRT – Weekly	Global product, identifies where plants may be drying out, near real-time weekly product	
<b>Storm Tracking</b>	True Color RGB	MODIS	Optical	Twice daily images	Twice Daily	Low resolution	
<b>Water Detection</b>	Sentinel-1 RGB	ESA Copernicus Sentinel-1	SAR	30 meters	1 day after good overpass	Relatively low latency, well developed workflow established	Not a classified image; can have issues in dense tree canopy
	Modified Normalized Difference Water Index (NDWI)	Landsat 7	Optical	30 meters	1 day after good overpass	Index that identifies water; can identify more saturated ground	
		Landsat 8	Optical	30 meters	1 day after good overpass		
		ESA Copernicus Sentinel-2	Optical	20 meters	1 day after good overpass		

Product Category	Product Name	Satellites(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications
	Normalized Difference Water Index (NDWI)	MODIS	Optical	250 meters	Twice Daily	Index that identifies water; can identify more saturated ground	
		Landsat 7	Optical	30 meters	1 day after good overpass		
		Landsat 8	Optical	30 meters	1 day after good overpass		
		ESA Copernicus Sentinel-2	Optical	20 meters	1 day after good overpass		
		MODIS	Optical	250 meters	Twice Daily		
<b>Water Detection (Cont.)</b>	True Color RGB	Landsat 7	Optical	30 meters	1 day after good overpass	Shows what the human eye sees	Features not always as noticeable as other band combinations
		Landsat 8	Optical	30 meters	1 day after good overpass		
		ESA Copernicus Sentinel-2	Optical	10 meters	1 day after good overpass		
		MODIS	Optical	250 meters	Twice Daily		
	Natural Color RGB	Landsat 7	Optical	30 meters	1 day after good overpass	Band combination can make water more noticeable; can differentiate between more green and less green areas of vegetation (trees, grass, crops, etc.); can point out snow and differentiate between snow/ice and some cloud	Can't see through clouds as well as color IR
		Landsat 8	Optical	30 meters	1 day after good overpass		
		ESA Copernicus Sentinel-2	Optical	20 meters	1 day after good overpass		
		MODIS	Optical	250 meters	Twice Daily		
	Color Infrared	Landsat 7	Optical	30 meters	1 day after good overpass	Band combination can make water more noticeable; can differentiate between more green and less green areas of vegetation (trees, grass, crops, etc.); can point out snow and differentiate between snow/ice and some clouds	Can't see through clouds as well as color IR
		Landsat 8	Optical	30 meters	1 day after good overpass		
		ESA Copernicus Sentinel-2	Optical	20 meters	1 day after good overpass		
		MODIS	Optical	250 meters	Twice Daily		
	Landsat 8 Panchromatic	Landsat 8	Optical	15 meters	1 day after good overpass	Higher resolution than other Landsat products	Single band, grayscale image only, no RGB



Product Category	Product Name	Satellites(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications
	DFO Sentinel-1 Color	ESA Copernicus Sentinel-1	SAR	30 meters	1-2 day after good overpass		
	UAVSAR RGB	UAVSAR	SAR	10 meters	Variable	High resolution, focused overpasses, potential for daily data capture	
<b>Watershed Alerts</b>	MOM Watershed Alerts	Model of Models (MOM)	Models	Watershed Level	As needed, but relies on model runs	Can identify watersheds that may be prone to flooding based on model outputs	Only available at watershed level

## Volcano

Product Category	Product Name	Satellite(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications
<b>Damage Detection</b>	Damage Proxy Map (DPM)	ESA Copernicus Sentinel-1	SAR	30 meters	1-2 day after good overpass	Identifies potentially damaged areas of focus	Product requires manual processing, increasing latency/delay. Subject to overpass availability for pre- and post-event
		JAXA ALOS-2	SAR	30 meters	1-2 day after good overpass		
<b>Feature Detection</b>	True Color RGB	Landsat 7	Optical	30 meters	1 day after good overpass	Changes to volcano, lava, smoke/ash plumes, etc.; Shows what the human eye sees	Features not always as noticeable as other band combinations
		Landsat 8	Optical	30 meters	1 day after good overpass		
		ESA Copernicus Sentinel-2	Optical	10 meters	1 day after good overpass		
		MODIS	Optical	250 meters	Twice Daily		
	Natural Color RGB	Landsat 7	Optical	30 meters	1 day after good overpass	Changes to volcano, lava, smoke/ash plumes, etc.	Can't see through clouds as well as color IR
		Landsat 8	Optical	30 meters	1 day after good overpass		
		ESA Copernicus Sentinel-2	Optical	20 meters	1 day after good overpass		
		MODIS	Optical	250 meters	Twice Daily		
	Color Infrared	Landsat 7	Optical	30 meters	1 day after good overpass	Changes to volcano, lava, smoke/ash plumes, etc.; IR band allows for viewing through some thin/high level clouds and/or smoke	Snow/ice can look identical to clouds
		Landsat 8	Optical	30 meters	1 day after good overpass		
		ESA Copernicus Sentinel-2	Optical	20 meters	1 day after good overpass		
		MODIS	Optical	250 meters	Twice Daily		
		ASTER	Optical	15 meters	1-2 days after good overpass		
Landsat 8 Panchromatic	Landsat 8	Optical	15 meters	1 day after good overpass	Changes to volcano, lava, smoke/ash plumes, etc.; Higher resolution than other Landsat products	Single band, grayscale image only, no RGB	

Product Category	Product Name	Satellite(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications
	International Space Station (ISS)	ISS Camera	Optical	Varies; Low	Variable	Gives large overview of the event	Angle of photos can distort geospatial accuracy
<b>Landslide Risk</b>	Global Landslide Nowcast			0.1 x 0.1 degrees	NRT – Every 3 hours	Updates continuously; considers rainfall, slope, terrain, etc.	Relies heavily on GPM rainfall; simple classification scheme
	Global Landslide Susceptibility Map			1 kilometer	Static Layer	Shows inherent landslide risk of regions	This is a static layer
<b>Lava Detection</b>	FIMRS Active Fire Points	MODIS	Optical	1 kilometer	NRT – Every 3 hours	Near real-time product updated as often as every 3 hours	Hot spot is over entire pixel area which may be larger than actual fire on ground
		VIIRS	Optical	375 meters			
	Hot Spot Detection	ASTER	Optical	90 meters	1-2 day after good overpass		Hot spot is over entire pixel area which may be larger than actual fire on ground
	VIIRS Thermal Anomalies	VIIRS	Optical	375 meters	1-2 day after good overpass		Hot spot is over entire pixel area which may be larger than actual fire on ground
<b>Power Outage</b>	Black Marble Blue-Yellow Composite	Suomi NPP VIIRS	Optical	750 meters	Daily	Produced daily (NRT)	Lower resolution than Black Marble HD product
	Black Marble Standard	Suomi NPP VIIRS	Optical	500 meters	Daily	Less latency/delay than HD product	Lower resolution than Black Marble HD product
	Black Marble HD	Suomi NPP VIIRS	Optical	30 meters	2-5 Days	High Resolution	Long latency/delay
<b>Risk to Critical Infrastructure</b>	ImageCat Risk to Critical Infrastructure	Various	Optical	~500 meters	As needed for event	Provides context to other products	Must be manually created for each event
<b>Smoke/Ash Plume</b>	Brightness Temperature Difference	ASTER	Optical	90 meters	1-2 day after good overpass	Proxy for SO2 absorption	Can show areas of potentially elevated SO2
		MODIS	Optical	1 kilometer	Twice Daily		
		VIIRS	Optical	750 meters	Daily		
	Column Sulfur Dioxide	ASTER	Optical	90 meters	1-2 day after good overpass		Shows areas of elevated SO2
	RGB using VNIR, TIR	ASTER, MODIS	Optical	90 meters	1-2 day after good overpass		Gives false color view and provides hot spot detection

Product Category	Product Name	Satellite(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications
	Column Sulfur Dioxide	OMI/OMPS	Profiler	50 kilometers	Daily	Images come in daily	Resolution varies from overpass to overpass
	3D Plume Height	MISR	Profiler	Horizontal: 1.1 kilometers Vertical: 250-500 meters	Multiple days after overpass	Can show structure of plume in 3D	Narrow swath, long processing times
<b>Surface Change</b>	Interferogram	ESA Copernicus Sentinel-1	SAR	30 meters	1 day after good overpass	Can detect small changes	Difficult to interpret by non-SAR scientists; Needs two identical overpasses
		JAXA ALOS-2			1 day after good overpass		
	Surface Deformation Map	ESA Copernicus Sentinel-1	SAR	30 meters	1 day after good overpass	Easier to understand than interferogram	Likely requires more processing than interferogram; Needs two identical overpasses
	UAVSAR	UAVSAR	SAR	10 meters	Variable	High resolution, focused overpasses, potential for daily data capture	Requires processing by UAVSAR team at JPL, which can increase latency/delay; requires multiple identical overpasses

## Earthquake

Product Category	Product Name	Satellite(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications																																																												
<b>Damage Detection</b>	Damage Proxy Map (DPM)	ESA Copernicus Sentinel-1	SAR	30 meters	1-2 day after good overpass	Identifies potentially damaged areas of focus	Product requires manual processing, increasing latency/delay. Subject to overpass availability for pre- and post-event																																																												
		JAXA ALOS-2	SAR	30 meters				<b>Feature Detection</b>	True Color RGB	Landsat 7	Optical	30 meters	1 day after good overpass	Shows what the human eye sees	Features not always as noticeable as other band combinations	Landsat 8	Optical	30 meters	1 day after good overpass	ESA Copernicus Sentinel-2	Optical	10 meters	1 day after good overpass	MODIS	Optical	250 meters	Twice Daily	Natural Color RGB	Landsat 7	Optical	30 meters	1 day after good overpass	Can differentiate between more green and less green areas of vegetation (trees, grass, crops, etc.);	Can't see through clouds as well as color IR	Landsat 8	Optical	30 meters	1 day after good overpass	ESA Copernicus Sentinel-2	Optical	20 meters	1 day after good overpass	MODIS	Optical	250 meters	Twice Daily	Color Infrared	Landsat 7	Optical	30 meters	1 day after good overpass	Can differentiate between more green and less green areas of vegetation (trees, grass, crops, etc.); IR band allows for viewing through some thin/high level clouds	Snow/ice can look identical to clouds	Landsat 8	Optical	30 meters	1 day after good overpass	ESA Copernicus Sentinel-2	Optical	20 meters	1 day after good overpass	MODIS	Optical	250 meters	Twice Daily	Landsat 8 Panchromatic	Landsat 8
<b>Feature Detection</b>	True Color RGB	Landsat 7	Optical	30 meters	1 day after good overpass	Shows what the human eye sees	Features not always as noticeable as other band combinations																																																												
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Landsat 8 Panchromatic	Landsat 8	Optical	15 meters	1 day after good overpass	Higher resolution than other Landsat products	Single band, grayscale image only, no RGB																																																													

Product Category	Product Name	Satellite(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications
	International Space Station (ISS)	ISS Camera	Optical	Varies; Low	Variable	Gives large overview of the event	Angle of photos can distort geospatial accuracy
<b>Landslide Detection</b>	SALaD Landslide Inventory	Varies	Optical	Depends on Satellite	1-3 days after good overpass	Semi-automated, human-QC'd	Can be slow to deliver particularly for large AOIs, clouds can obscure
<b>Landslide Risk</b>	Global Landslide Nowcast			0.1 x 0.1 degrees	NRT – Every 3 hours	Updates continuously; considers rainfall, slope, terrain, etc.	Relies heavily on GPM rainfall; simple classification scheme
	Global Landslide Susceptibility Map			1 kilometer	Static Layer	Shows inherent landslide risk of regions	This is a static layer
<b>Power Outage</b>	Black Marble Blue-Yellow Composite	Suomi NPP VIIRS	Optical	750 meters	Daily	Produced daily (NRT)	Lower resolution than Black Marble HD product
	Black Marble Standard	Suomi NPP VIIRS	Optical	500 meters	Daily	Less latency/delay than HD product	Lower resolution than Black Marble HD product
	Black Marble HD	Suomi NPP VIIRS	Optical	30 meters	2-5 Days	High Resolution	Long latency/delay
<b>Risk to Critical Infrastructure</b>	ImageCat Risk to Critical Infrastructure	Various	Optical	~500 meters	As needed for event	Provides context to other products	Must be manually created for each event
<b>Surface Change</b>	Interferogram	ESA Copernicus Sentinel-1	SAR	30 meters	1 day after good overpass	Can detect small changes	Difficult to interpret by non-SAR scientists; Needs two identical overpasses
		JAXA ALOS-2					
	Surface Deformation Map	ESA Copernicus Sentinel-1	SAR	30 meters	1 day after good overpass	Easier to understand than interferogram	Likely requires more processing than interferogram; Needs two identical overpasses
	Decorrelation Map	ESA Copernicus Sentinel-1	SAR	30 meters	1 day after good overpass	Can detect changes due to event	Needs two identical overpasses
		JAXA ALOS-2	SAR	30 meters			
Correlation Map	ESA Copernicus Sentinel-1	SAR	30 meters	1 day after good overpass	Can detect changes due to event	Needs two identical overpasses	

Product Category	Product Name	Satellite(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications
		JAXA ALOS-2	SAR	30 meters			
	UAVSAR	UAVSAR	SAR	10 meters	Variable	High resolution, focused overpasses, potential for daily data capture	Requires processing by UAVSAR team at JPL, which can increase latency/delay; requires multiple identical overpasses

## Wildfire

Product Category	Product Name	Satellite(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications
<b>Air Quality</b>	MODIS Aerosol Optical Depth	MODIS	Optical	3km	1 day after good overpass	Monitoring Air Quality and smoke transport, frequent overpasses	Low resolution
<b>Burn Extent</b>	SAR RGB Color map	ESA Copernicus Sentinel-1	SAR	30 meters	1 day after good overpass	High resolution, focused overpasses, potential for daily data capture	Can be difficult to identify small burn areas
	UAVSAR Correlation Image	UAVSAR	SAR	10 meters			Cost of flights and availability of aircraft data capture
	SAR Burned Area	ESA Copernicus Sentinel-1	SAR	30 meters			
<b>Damage Detection</b>	Damage Proxy Map (DPM)	ESA Copernicus Sentinel-1	SAR	30 meters	1-2 day after good overpass	Identifies potentially damaged areas of focus	Product requires manual processing, increasing latency/delay. Subject to overpass availability for pre- and post-event
		JAXA ALOS-2	SAR	30 meters			
<b>Feature Detection</b>	True Color RGB	Landsat 7	Optical	30 meters	1 day after good overpass	Shows what the human eye sees	Features not always as noticeable as other band combinations
		Landsat 8	Optical	30 meters	1 day after good overpass		
		ESA Copernicus Sentinel-2	Optical	10 meters	1 day after good overpass		
		MODIS	Optical	250 meters	Twice Daily		
	Natural Color RGB	Landsat 7	Optical	30 meters	1 day after good overpass	Band combination can make it possible to detect burned area versus green vegetation	Can't see through clouds as well as color IR
		Landsat 8	Optical	30 meters	1 day after good overpass		
		ESA Copernicus Sentinel-2	Optical	20 meters	1 day after good overpass		
		MODIS	Optical	250 meters	Twice Daily		
Color Infrared	Landsat 7	Optical	30 meters	1 day after good overpass	Band combination can make it possible to detect burned area		



Product Category	Product Name	Satellite(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications
		Landsat 8	Optical	30 meters	1 day after good overpass	versus green vegetation; IR band allows for viewing through some thin/high level clouds and/or smoke	
		ESA Copernicus Sentinel-2	Optical	20 meters	1 day after good overpass		
		MODIS	Optical	250 meters	Twice Daily		
		ASTER		15 meters	1-2 day after good overpass		
	Landsat 8 Panchromatic	Landsat 8	Optical	15 meters	1 day after good overpass	Higher resolution than other Landsat products	Single band, grayscale image only, no RGB
	International Space Station (ISS)	ISS Camera	Optical	Varies; Low	Variable	Gives large overview of the event	Angle of photos can distort geospatial accuracy
	MASTER False Color RGB	MASTER (airborne)	Optical	50 meters	Variable	Fire intensity: shows active fire areas, burned areas, can see through some smoke/clouds; Burn Severity: can highlight areas more severely burned, burn extent	Burn Severity: doesn't see through smoke/clouds
<b>Fire Detection</b>	FIRMS Active Fire Points	MODIS	Optical	1 kilometers	NRT – Every 3 hours	Updated as often as every 3 hours	Hot spot is over entire pixel area which may be larger than actual fire on ground
		VIIRS	Optical	375 meters			
<b>Fire Modeling</b>	WRF-SFIRE	Model + Satellites	Model + Satellites	Varies	6-12 hours after model run	Numerous products, high resolution, very targeted	Very targeted to individual fires, can only look at 2-3 fires at a time
<b>Power Outage</b>	Black Marble Blue-Yellow Composite	Suomi NPP VIIRS	Optical	750 meters	Daily	Produced daily (NRT)	Lower resolution than Black Marble HD product
	Black Marble Standard	Suomi NPP VIIRS	Optical	500 meters	Daily	Less latency/delay than HD product	Lower resolution than Black Marble HD product
	Black Marble HD	Suomi NPP VIIRS	Optical	30 meters	2-5 Days	High Resolution	Long latency/delay
<b>Risk to Critical Infrastructure</b>	ImageCat Risk to Critical Infrastructure	Various	Optical	~500 meters	As needed for event	Provides context to other products	Must be manually created for each event
<b>Smoke Plumes</b>	Aerosol Index	OMPS	Profiler	50 kilometers	Daily	Daily overpasses	

Product Category	Product Name	Satellite(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications
	3D Plume Height	MISR	Profiler	Horizontal: 1.1 kilometers Vertical: 250-500 meters	Multiple days after overpass	Can show structure of plume in 3D	Narrow swath, long processing times
<b>Soil Moisture</b>	Land Information System (LIS)	Model, Suomi NPP	Satellite + Model	3 kilometers	NRT – Daily	Relatively high resolution, produced daily	Continental United States (CONUS), Only
	SMAP	SMAP, Model	Satellite + Model	0.25 x 0.25 degrees	NRT – Every 3 days	Global Product, near real-time 3-day composite product	Relatively long latency/delay (5-10 days after 3rd day of composite), coarse resolution
	Evaporative Stress Index	Collection of Satellites	Optical	5 kilometers	NRT – Weekly	Global product, identifies where plants may be drying out, near real-time weekly product	

## Landslide

Product Category	Product Name	Satellite(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications																																																																			
<b>Damage Detection</b>	Damage Proxy Map (DPM)	ESA Copernicus Sentinel-1	SAR	30 meters	1-2 day after good overpass	Identifies potentially damaged areas of focus	Product requires manual processing, increasing latency/delay. Subject to overpass availability for pre- and post-event																																																																			
		JAXA ALOS-2	SAR	30 meters				<b>Feature Detection</b>	True Color RGB	Landsat 7	Optical	30 meters	1 day after good overpass	Shows what the human eye sees	Features not always as noticeable as other band combinations	Landsat 8	Optical	30 meters	1 day after good overpass	ESA Copernicus Sentinel-2	Optical	10 meters	1 day after good overpass	MODIS	Optical	250 meters	Twice Daily	Natural Color RGB	Landsat 7	Optical	30 meters	1 day after good overpass	Band combination can make identifying landslides easier; Can differentiate between more green and less green areas of vegetation (trees, grass, crops, etc.)	Can't see through clouds as well as color IR	Landsat 8	Optical	30 meters	1 day after good overpass	ESA Copernicus Sentinel-2	Optical	20 meters	1 day after good overpass	MODIS	Optical	250 meters	Twice Daily	Color Infrared	Landsat 7	Optical	30 meters	1 day after good overpass	Band combination can make identifying landslides easier; Can differentiate between more green and less green areas of vegetation (trees, grass, crops, etc.); IR band allows for viewing through some thin/high level clouds		Landsat 8	Optical	30 meters	1 day after good overpass	ESA Copernicus Sentinel-2	Optical	20 meters	1 day after good overpass	MODIS	Optical	250 meters	Twice Daily	Landsat 8 Panchromatic	Landsat 8	Optical	15 meters	1 day after good overpass	Higher resolution than other Landsat products	Single band, grayscale image only, no RGB	International Space Station (ISS)	ISS Camera
<b>Feature Detection</b>	True Color RGB	Landsat 7	Optical	30 meters	1 day after good overpass	Shows what the human eye sees	Features not always as noticeable as other band combinations																																																																			
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International Space Station (ISS)	ISS Camera	Optical	Varies; Low	Variable	Gives large overview of the event	Angle of photos can distort geospatial accuracy																																																																				

Product Category	Product Name	Satellite(s)	Sensor Type	Spatial Resolution	Latency	Strengths for Applications	Limitations for Applications
<b>Flood Extent</b>	MODIS Flood Map	MODIS	Optical	250 meters	NRT – Daily	Classifies water and no water, near real-time (daily) product	
<b>Landslide Detection</b>	SALaD Landslide Inventory	Varies	Optical	Depends on Satellite	1-3 days after good overpass	Semi-automated, human-QC'd	Can be slow to deliver particularly for large AOIs, clouds can obscure
<b>Landslide Risk</b>	Global Landslide Nowcast			0.1 x 0.1 degrees	NRT – Every 3 hours	Near real-time product that updates continuously; considers rainfall, slope, terrain, etc.	Relies heavily on GPM rainfall; simple classification scheme
	Global Landslide Susceptibility Map			1 kilometer	Static Layer	Shows inherent landslide risk of regions	This is a static layer
<b>Power Outage</b>	Black Marble Blue-Yellow Composite	Suomi NPP VIIRS	Optical	750 meters	Daily	Produced daily (NRT)	Lower resolution than Black Marble HD product
	Black Marble Standard	Suomi NPP VIIRS	Optical	500 meters	Daily	Less latency/delay than HD product	Lower resolution than Black Marble HD product
	Black Marble HD	Suomi NPP VIIRS	Optical	30 meters	2-5 Days	High Resolution	Long latency/delay
<b>Rainfall Accumulation</b>	GPM IMERG	GPM	Satellite	0.1 x 0.1 degrees	NRT – Every 3 hours		
<b>Risk to Critical Infrastructure</b>	ImageCat Risk to Critical Infrastructure	Various	Optical	~500 meters	As needed for event	Provides context to other products	Must be manually created for each event
<b>Soil Moisture</b>	Land Information System (LIS)	Model, Suomi NPP	Satellite + Model	3 kilometers	NRT – Daily	Relatively high resolution, near real-time daily product	Continental United States (CONUS), Only
	SMAP	SMAP, Model	Satellite + Model	0.25 x 0.25 degrees	NRT – Every 3 days	Global Product, near real-time 3-day composite product	Relatively long latency/delay (5-10 days after 3rd day of composite), coarse resolution
	Evaporative Stress Index	Collection of Satellites	Optical	5 kilometers	NRT – Weekly	Global product, identifies where plants may be saturated, near real-time weekly product	

## Revisit Periods

Revisit periods are the time it takes a sensor to revisit a location to capture imagery. This can be useful to understand when the next overpass is and when new data and products may be available. There are numerous factors that can affect the quality and usability of a product, so the revisit period is not necessarily the time until the next product is available. Some sensors are on board multiple satellites which decreases the revisit period. These sensors are: MODIS, Sentinel-1, and Sentinel-2.

Satellite/Sensor	Revisit Period
<b>ALOS-2</b>	14 days
<b>ASTER</b>	Twice Daily (1 Day, 1 Night)
<b>Landsat 7</b>	16 days
<b>Landsat 8</b>	16 days
<b>MODIS (Aqua, Terra)</b>	4 Times per Day (2 Day, 2 Night)
<b>Sentinel-1</b>	6-12 Days
<b>Sentinel-2</b>	5 Days
<b>VIIRS</b>	Twice Daily (1 Day, 1 Night)