

Tropical Cyclone Idai

Storm of the Week

ATMS 103 Hurricanes And Thunderstorms: Their Science And Impact

April 5, 2019



What is tropical cyclone?

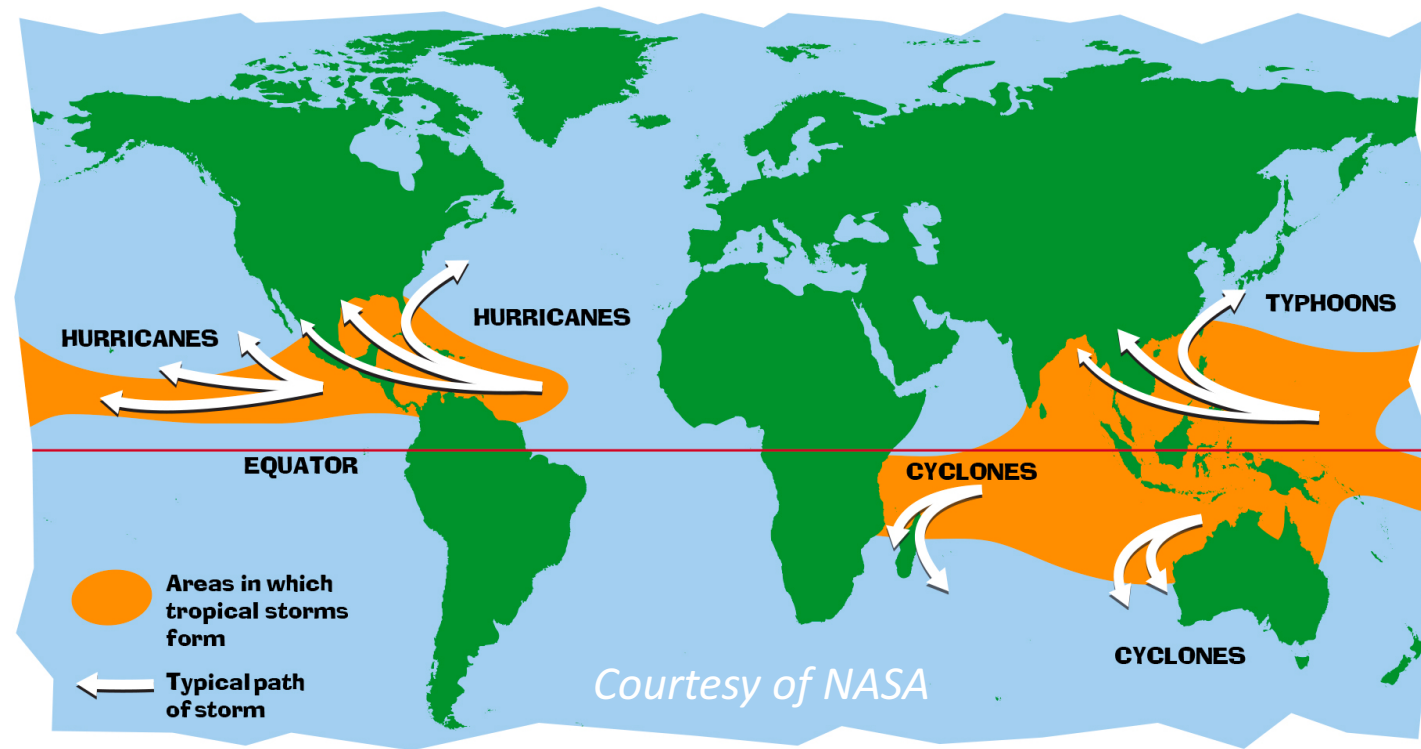
*NOAA-20 satellite
March 10, 2019*

A tropical cyclone is a rapidly rotating storm system characterized by:

- a low-pressure center
- strong winds
- a spiral arrangement of thunderstorms



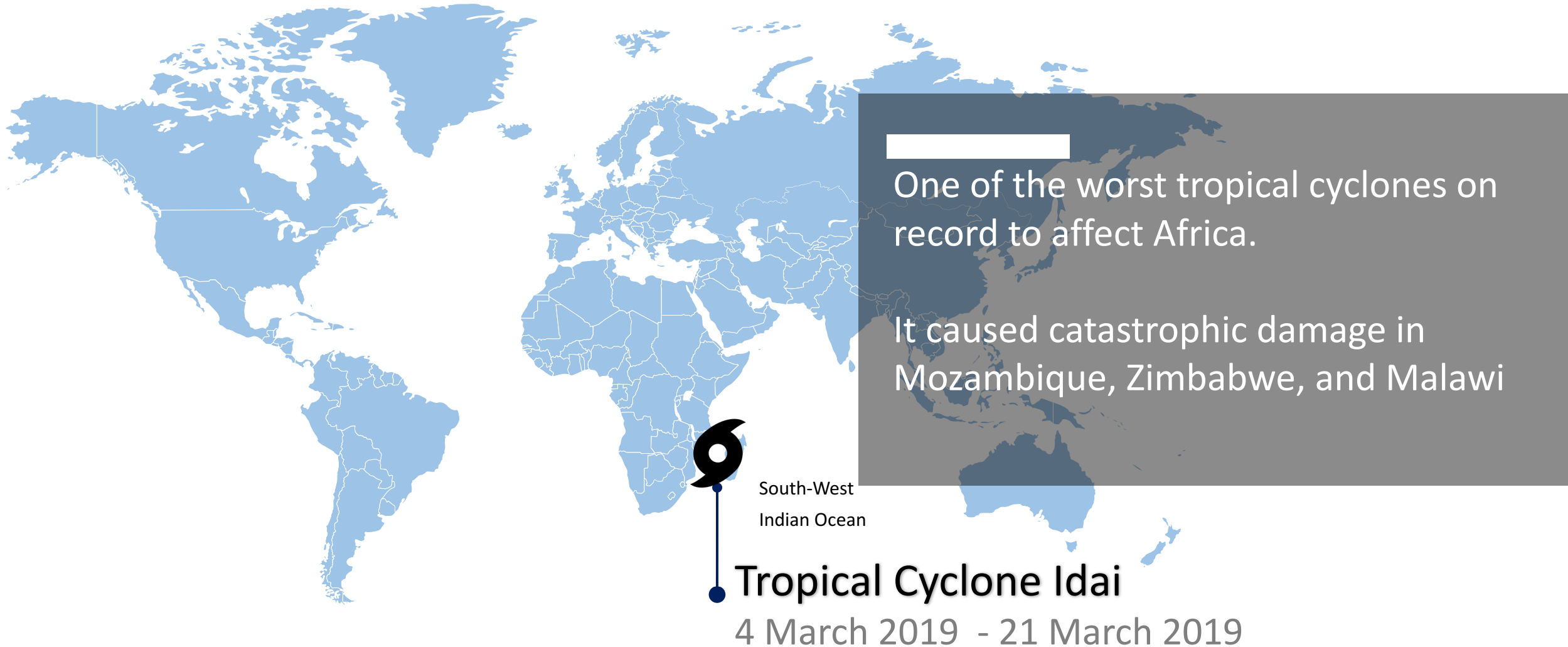
What is tropical cyclone?



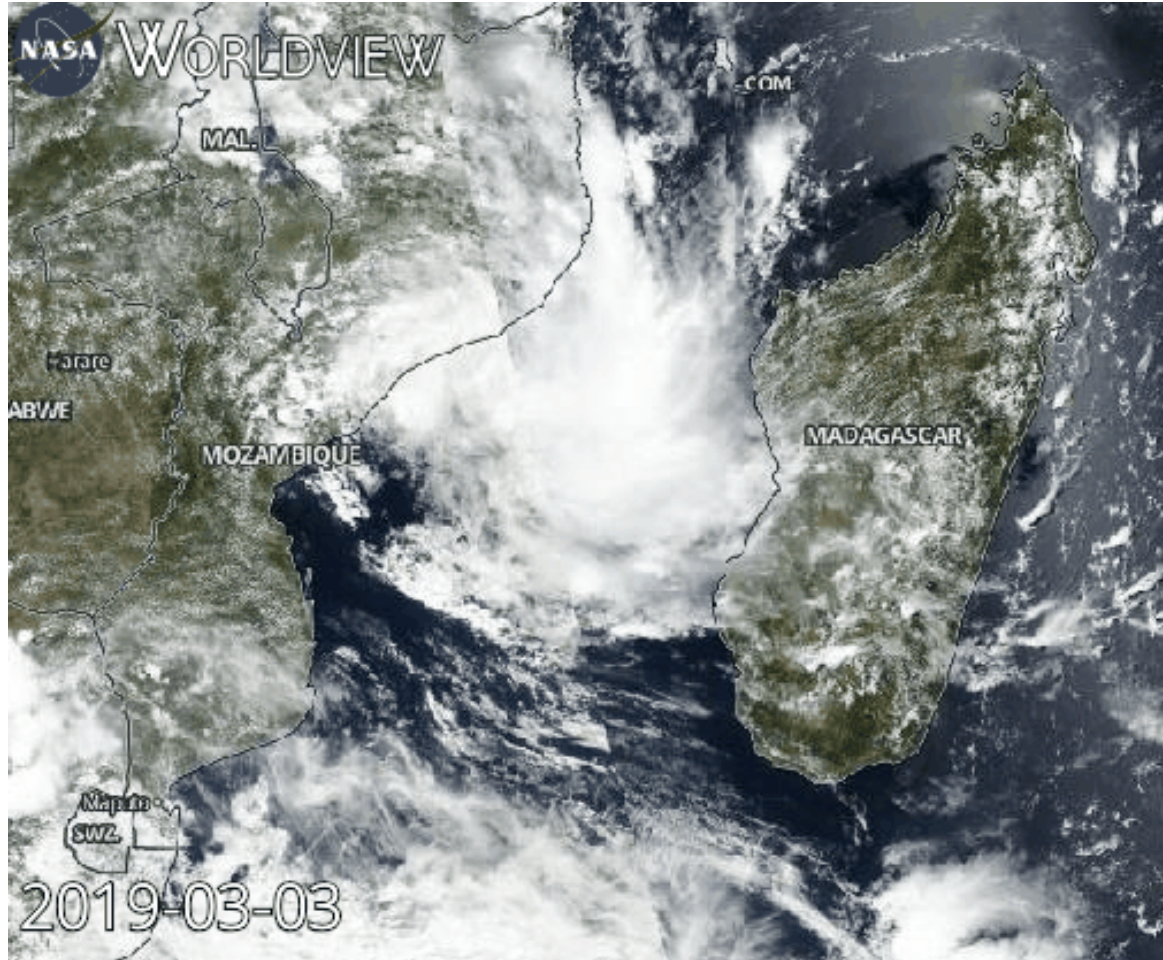
The general term for a cyclone that originates over the tropical oceans.

This term encompasses tropical depressions, tropical storms, hurricanes, and typhoons.

Overview



Timeline



Made using NASA Worldview

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

- **4 March**

Idai originated from a tropical depression that formed off the east coast of Mozambique

- **5-8 March**

Tropical Depression 11, made landfall in Mozambique

- **9-10 March**

Re-emerged into the Mozambique Channel and strengthened into a Tropical Storm

- **11 March**

Intensified into tropical cyclone

- **14 March**

Reached its peak intensity

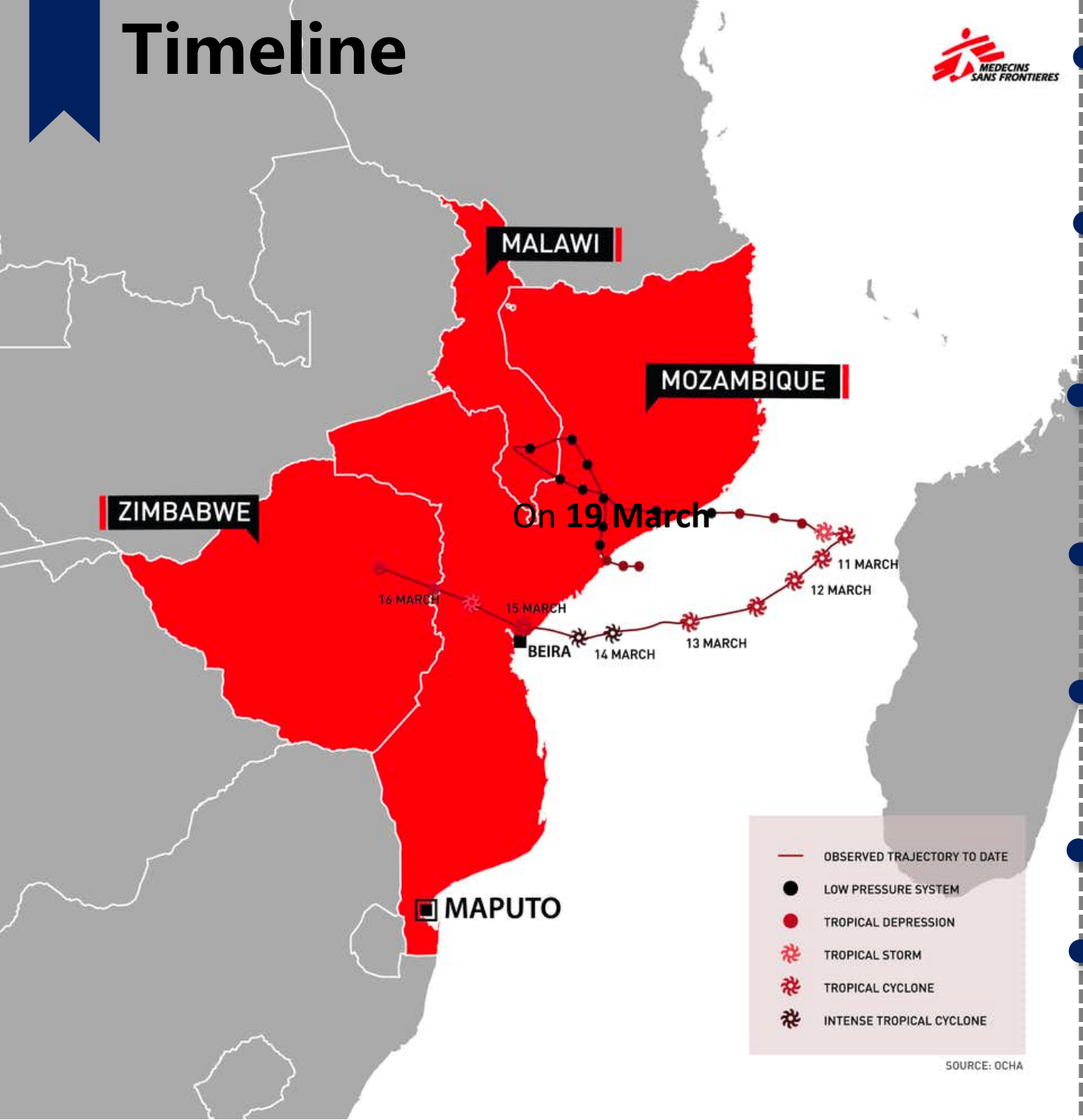
- **15-16 March**

Made landfall near Beira, Mozambique

- **19-21 March**

re-emerged into the Mozambique Channel and eventually dissipated on 21 March.

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A satellite image of a tropical cyclone, showing a well-defined eye and spiral cloud bands over the South-West Indian Ocean basin. The landmasses of Africa and Madagascar are visible in the upper left.

How strong is it?

Highest winds

10-minute sustained: 195 km/h
(120 mph)

Lowest pressure: 940 hPa

March 14

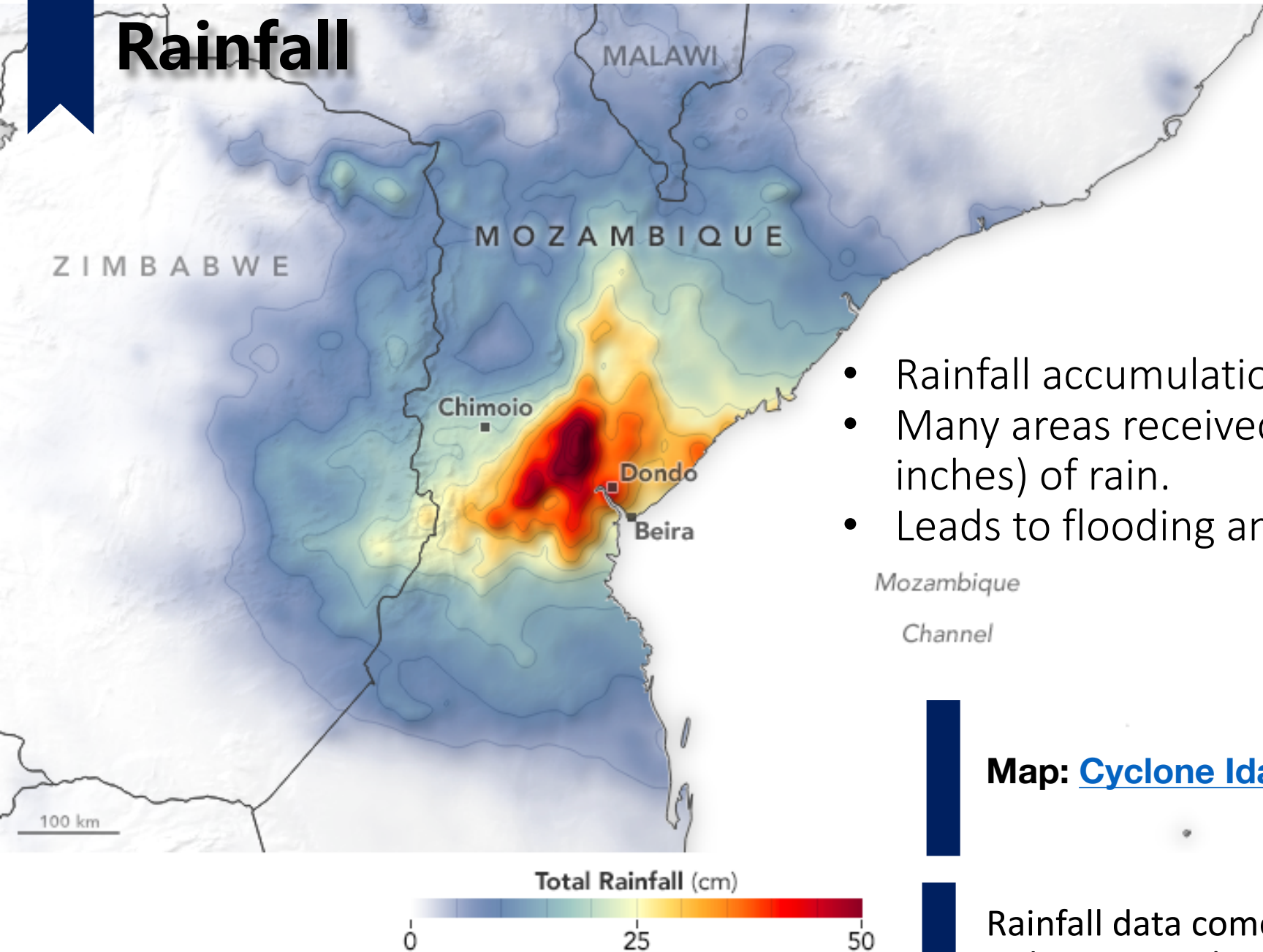
2019

Source: MODIS

3rd deadliest tropical cyclone in the
Southern Hemisphere

2nd deadliest tropical cyclone in the
South-West Indian Ocean basin

Rainfall



- Rainfall accumulation from March 13 to March 20
- Many areas received as much as 50 centimeters (20 inches) of rain.
- Leads to flooding and landslides in many area

Mozambique

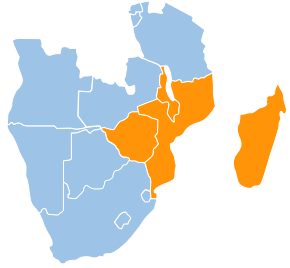
Channel

Map: [Cyclone Idai Population Impact](#)

Rainfall data come from IMERG and GPM mission
Video: Tropical Cyclone Idai Rainfall Measurements
<https://www.youtube.com/watch?v=u9WtvYzbXsQ>

Source: NASA Earth Observatory

How much damage did Cyclone Idai cause?



4

Countries affected

Mozambique
Malawi
Madagascar
Zimbabwe



1,074

Death



+600,000

People Directly
Impacted by the
Cyclone



+\$1 billion

Cost



+400,000

People Displaced



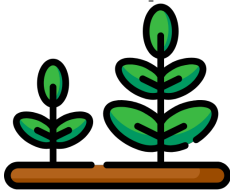
+1 million

People Without
Electricity



+17,400

Houses Damaged or
Destroyed



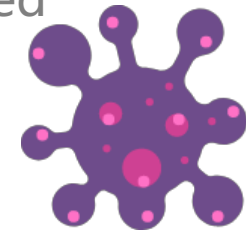
+951,000

Acres of Crops Damaged
or Destroyed



+2,800

Classrooms Destroyed



+1,400

Cholera cases

Impact



City of Beira approximately 90 percent destroyed, with no road access available.



February 24, 2019

March 25, 2019



Impact

Beira, Mozambique
Before and after Cyclone Idai

The aftermath of Cyclone Idai left many of buildings with serious structural devastation.

Impact Darkness in the Wake of Idai

Manga

Beira's nighttime lights are based on data captured by the Suomi NPP satellite

Beira Airport

Munhava

Matacuane

Macuti

Beira

March 9

Manga

Beira Airport

Munhava

Matacuane

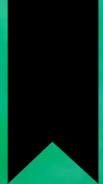
Macuti

Beira

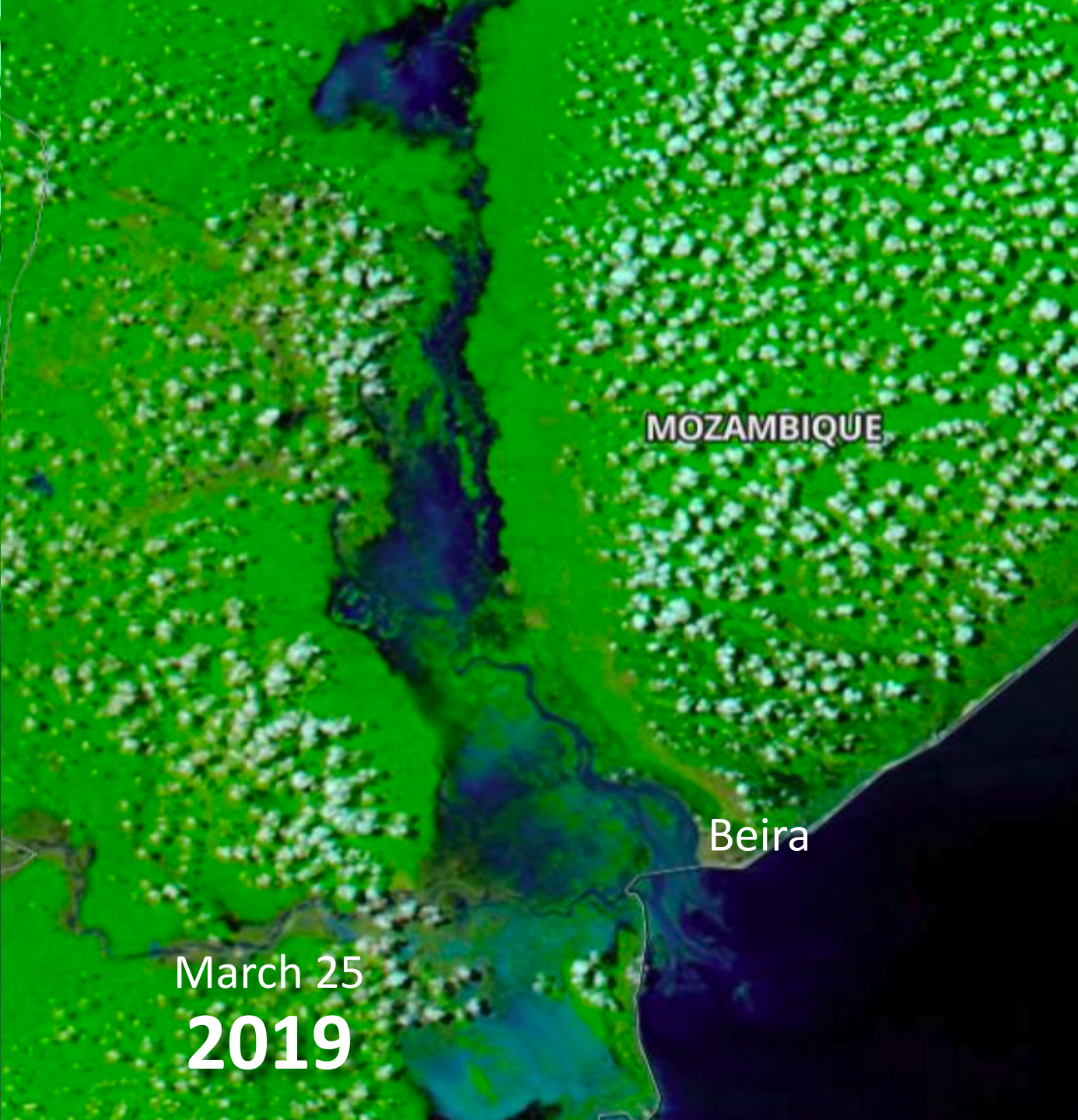
March 24

2 km

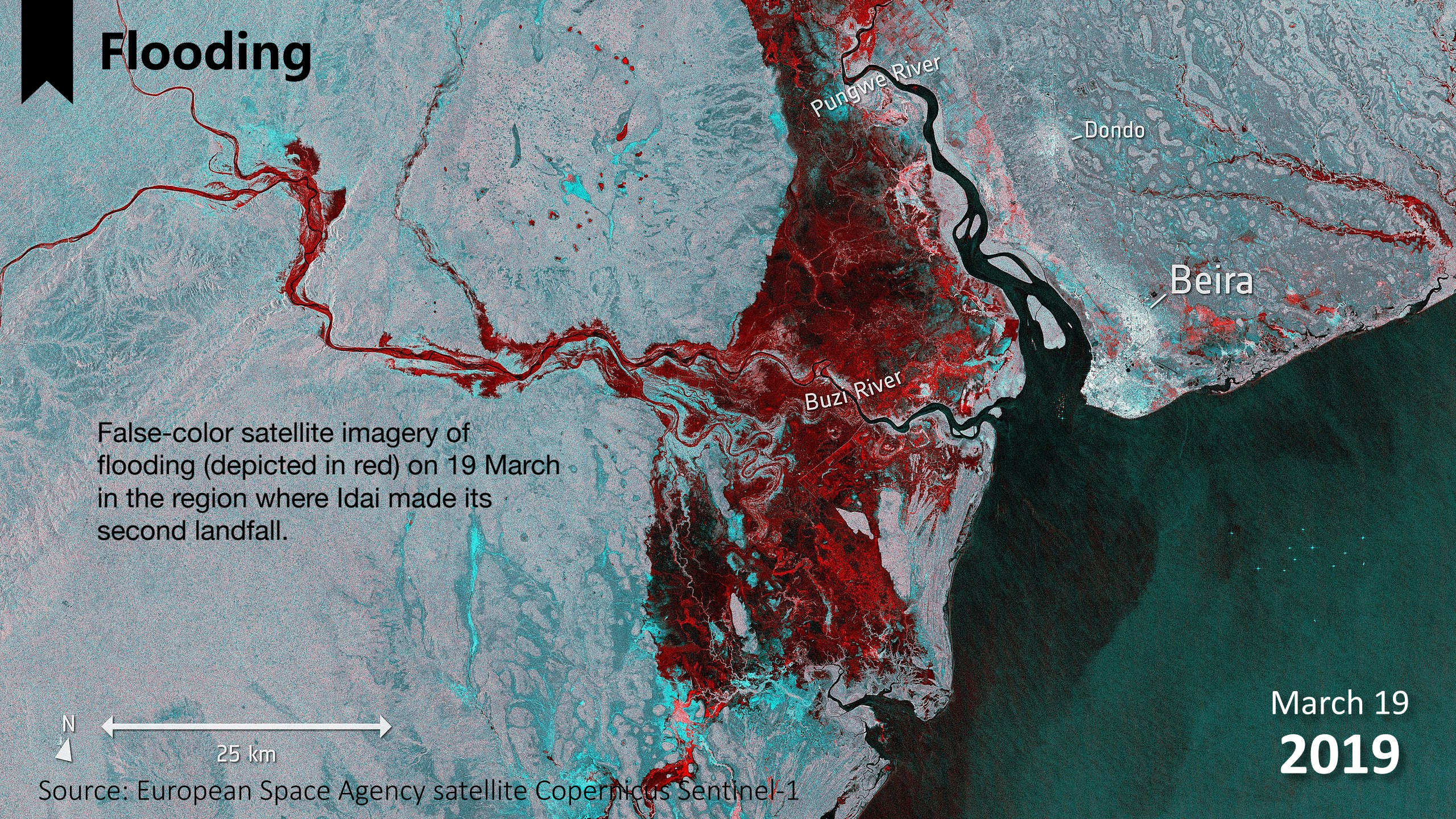




Flooding



Flooding



Pungwe River

Dondo

Beira

Buzi River

False-color satellite imagery of flooding (depicted in red) on 19 March in the region where Idai made its second landfall.



25 km

March 19
2019

Source: European Space Agency satellite Copernicus Sentinel-1

Flooding



Source: USA Today

Landslide

Chimanimani

March 26
2015

Source: NASA Earth Observatory, Landsat 8 acquired the images.





Landslide

Chimanimani

March 21
2019

Source: NASA Earth Observatory, Landsat 8 acquired the images.

Landslide



Source: NYtimes

A family digging for their son, who was buried in the mud when Cyclone



Further Links



[MOZAMBIQUE: Cyclone Idai & Floods Situation Report No. 1](#)



[UN Environment, Cyclone Idai why disaster awareness and preparedness matters](#)



[Nature, Why Cyclone Idai is one of the Southern Hemisphere's most devastating storms](#)



[The New York Time, How to Help: Aid Groups On Ground After Cyclone.](#)



[NASA Products for Cyclone Idai 2019](#)