21 December 2021

TROPICAL CYCLONE RAI-21

PRELIMINARY SATELLITE-DERIVED BUILDING DAMAGE ANALYSIS

Dinagat Islands & Socorro municipality of Region XIII (Caraga), Cebu province of Region VII (Central Visayas), and Palawan province of Region IV-B (Mimaropa); Philippines

Status: Widespread damaged structures including damaged health and education facilities observed.

Further action(s): Continue monitoring
AOI 1-1: SAN JOSE TOWN, DINAGAT ISLAND, REGION XIII (CARAGA)

Widespread damaged structures and damaged school

Image center:
125°3'32.811"E
10°0'52.605"N

Don Ruben E. Ecleo Sr. Memorial National High School damage

Widespread damaged structures
AOI 1-2: SAN JOSE TOWN, DINAGAT ISLAND, REGION XIII (CARAGA)

Widespread damaged structures and damaged school

Before

Sta. Cruz Elementary School damage

Widespread damaged structures

Aftre

Damaged structure

Image center:
125°34'15.82"E
10°14.199"N

ESRI Basemap / Worldview 3 / 7 Aug 2018

Worldview-3 / 17 December 2021
AOI 1-3: SAN JOSE TOWN, DINAGAT ISLAND, REGION XIII (CARAGA)

Widespread damaged structures and damaged school

BEFORE

SAN JOSE TOWN, DINAGAT ISLAND
REGION XIII (CARAGA)

AFTER

San Jose

SAN JOSE TOWN, DINAGAT ISLAND
REGION XIII (CARAGA)

San Jose

San Jose Central Elementary School

Widespread damaged structures

ESRI Basemap / Worldview 3 / 16 June 2018

Worldview-3 / 17 December 2021
AOI 1-4: PLARIDEL VILLAGE, DINAGAT ISLAND, REGION XIII (CARAGA)

Damaged structures

BEFORE

AFTER

Image center:
125°29'54.031"E
10°7'53.777"N

Dinagat Island

ESRI Basemap / Worldview 2 / 2012

Worldview-3 / 17 December 2021
AOI 1-5: SANJOES VILLAGE, DINAGAT ISLAND, REGION XIII (CARAGA)

Before:

Damaged structures and damaged school

Image center:
125°33'58.122"E
10°10'29.448"N

Google Earth / June 2020

AFTER:

Worldview-3 / 17 December 2021

Damaged structures and damaged school

Debris

San Jose National High School

Widespread damaged structures
AOI 1-6: SANJOES VILLAGE, DINAGAT ISLAND, REGION XIII (CARAGA)

Damaged structures

Google Earth / June 2020

Worldview-3 / 17 December 2021
AOI 2-1: SOCORRO TOWN, SOCORRO MUNICIPALITY, SURIGAO DEL NORTE PROVINCE, REGION XIII (CARAGA)

Damaged hospital and damaged structures
Standing water and widespread damaged structures
AOI 2-3:, SOCORRO MUNICIPALITY, SURIGAO DEL NORTE PROVINCE, REGION XIII (CARAGA)

Widespread damaged structures

Google Earth / June 2021

Worldview-3 / 17 December 2021
AOI 3-1: SAN FERNANDO MUNICIPALITY
CEBU PROVINCE, REGION VII (CENTRAL VISAYAS)

Damaged structures

ESRI Based map / WorldView-3 / 1 April 2020

Pléiades / 21 December 2021
AOI 3-2: SAN FERNANDO MUNICIPALITY
CEBU PROVINCE, REGION VII (CENTRAL VISAYAS)

Damaged structure along the shoreline

BEFORE

ESRI Based map / WorldView-3 / 1 April 2020

AFTER

Pléiades / 21 December 2021
AOI 3-3: CITY OF NAGA, CEBU PROVINCE, REGION VII (CENTRAL VISAYAS)

Damaged industrial structures

ESRI Based map / WorldView-4 / 17 March 2018

Pléiades / 21 December 2021
AOI 3-4: CEBU CITY, CEBU PROVINCE, REGION VII (CENTRAL VISAYAS)

Damaged structures

BEFORE

AFTER

Image center:
123°50'56.373"E
10°14'57.966"N

ESRI Based map / WorldView-4 / 17 March 2018

Pléiades / 21 December 2021

Damaged structure

Roof damaged
AOI 4-1: ROXAS MUNICIPALITY, PALAWAN PROVINCE, REGION IV-B (MIMAROPA)

Agricultural area damaged

ESRI Based map / GeoEye-1 / 18 May 2019

Pléiades / 21 December 2021
AOI 4-2: ROXAS MUNICIPALITY, PALAWAN PROVINCE, REGION IV-B (MIMAROPA)

Damaged structures along the shoreline

BEFORE

ESRI Based map / GeoEye-1 / 18 May 2019

AFTER

Pléiades / 21 December 2021
AOI 4-3: ROXAS MUNICIPALITY, PALAWAN PROVINCE, REGION IV-B (MIMAROPA)

Damaged structures

ESRI Based map / GeoEye-1 / 18 May 2019

Pléiades / 21 December 2021
AOI 4-4: ROXAS MUNICIPALITY, PALAWAN PROVINCE, REGION IV-B (MIMAROPA)

Inundated agriculture area

ESRI Based map / GeoEye-1 / 23 August 2018

Pléiades / 21 December 2021
AOI 4-5: DUMARAN MUNICIPALITY, PALAWAN PROVINCE, REGION IV-B (MIMAROPA)

Potentially damaged structures in Dumaran
AOI 4-6: DUMARAN MUNICIPALITY, PALAWAN PROVINCE, REGION IV-B (MIMAROPA)

Damaged structures

Pleiades image acquired on 21 December 2021
Image Center : 119°40'1.173"E 10°30'4.01"N

Damaged structure

Inundated agricultural area

Palawan Island
SUMMARY OF FINDINGS

- Widespread damage observed in Dinagat Islands, Region XIII (Caraga) as of 17 Dec 2021.
- Widespread damage observed in San Jose town, Dinagat Islands, Region XIII (Caraga) as of 17 Dec 2021.
- Widespread damage observed in Plaridel village, Dinagat Islands, Region XIII (Caraga) as of 17 Dec 2021.
- Damaged education facilities of Don Ruben E. Ecleo Sr. Memorial National High School, Sta. Cruz Elementary School, San Jose Central Elementary School, and San Jose National High School in Dinagat Islands, Region XIII (Caraga) observed as of 17 Dec 2021.
- Widespread damage observed in Socorro municipality, Region XIII (Caraga) of 17 Dec 2021.
- Damaged Socorro District Hospital in Socorro municipality, Region XIII (Caraga) observed as of 17 Dec 2021.
- Damaged industrial structures observed in Cebu province, Region VII (Central Visayas) as of 21 Dec 2021.
- Widespread damage observed in Cebu province, Region VII (Central Visayas) as of 21 Dec 2021.
- Damaged agricultural areas observed in Palawan province, Region IV-B (Mimaropa) as of 21 Dec 2021.
- Widespread damage observed in Palawan Province, Region IV-B (Mimaropa) as of 21 Dec 2021.
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Data sources:

(1) Satellite Image (Post-event)
Worldview-3: 17 Dec 2021
Resolution: 50 cm
Copyright: Digital Globe, Inc. (2021)
Source: HDDS/USGS
Pléiades: 21 December 2021
Resolution: 50 cm
Copyright: CNES (2021), distribution Airbus D&S
Source: Airbus Defense and Space

(2) Satellite Image (Pre-event)
ESRI Basemap
Google Earth

(3) Ancillary data
Administrative boundaries: National Mapping and Resource Information Authority (NAMRIA), Philippines Statistics Authority (PSA)
Populate place: OpenStreetMap
Analysis: United Nations Satellite Centre (UNOSAT)
Production: United Nations Satellite Centre (UNOSAT)