Oil Spill Monitoring from Space

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2023 Mindoro Oil Spill

- February 28, 2023
- MT Princess Empress carrying 800,000L of oil
- Environmental damage – Php41.2B

Mindoro oil spill damage valued at P41.2B — report

- Socio-economic damage – Php1.1B

Damage cost, losses due to oil spill in Mindoro near P1-B: BFAR

- Roughly 3 months to clean up

Mindoro oil spill cleanup enters final phase

By Priam Nepomuceno

June 1, 2023, 3:45 pm

2024 Manila Bay Oil Spill

- MT Terra Nova carrying 1,400,000L of oil, and MTKR Jason Bradley carrying 5,500L of oil
- Nearly Php18M income lost daily

OCD: Oil spill affects over 350K people in Cavite; nearly P18M income lost daily

By JOVILAND RITA, GMA Integrated News

Published August 2, 2024 11:43am

- Roughly 2 months to clean up

PCG nears completion of oil spill cleanup

Dominique Nicole Flores - Philstar.com

September 10, 2024 | 6:42pm

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- “For us in Oriental Mindoro, we have lost a year’s worth of income, and our fish catch has yet to return to normal”.

- Moreover, some fisherfolk reported that even after the fishing ban was lifted, their daily catch has not returned to normal. As of the FGDs conducted on November 12 and 13, 2023, fishers who were invited from Naujan, Calapan, Pinamalayan, and Pola expressed that from around five to ten kilos of fish they were catching before the oil spill, their daily yield has fallen to around one to three kilos.

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Oil Spills in Satellite Imagery

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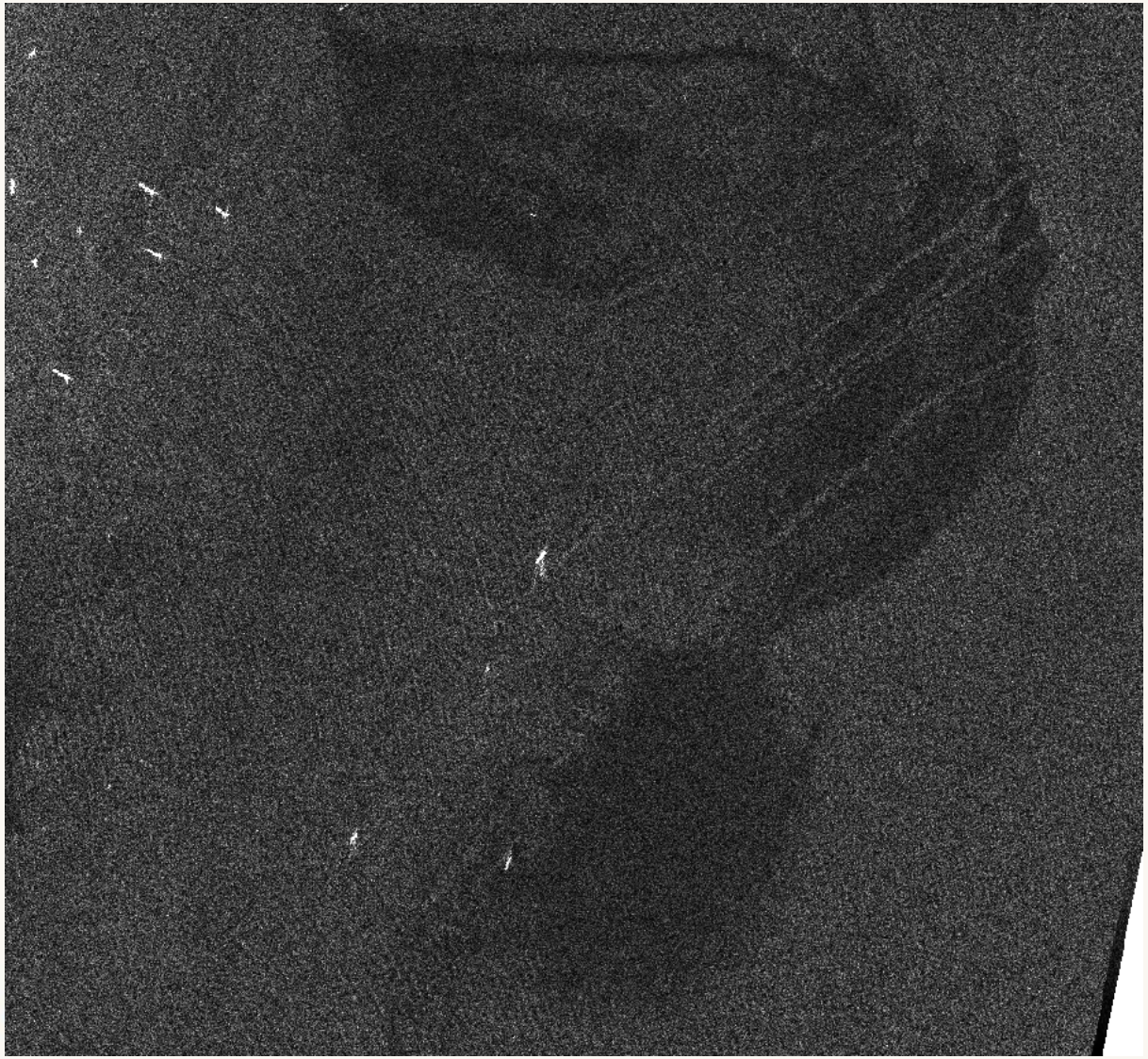
Oil Spills in Satellite Imagery



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Oil Spills in Satellite Imagery

- As a general rule, 90% of the oil is located in 10% of observable oil.
- Diligent mapping of the area affected by thick oil will assist the response teams in planning, guiding skimmers, and positioning booms effectively.

- Oil that is thicker than a sheen is more susceptible to environmental influences, such as wind and surface currents, causing the oil to move across the water’s surface and spread.
- Thus, it's crucial to not only detect but also track the drift and spread.

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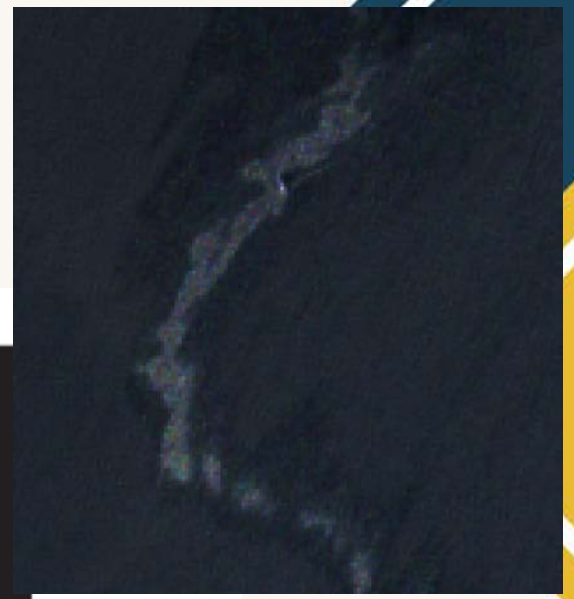
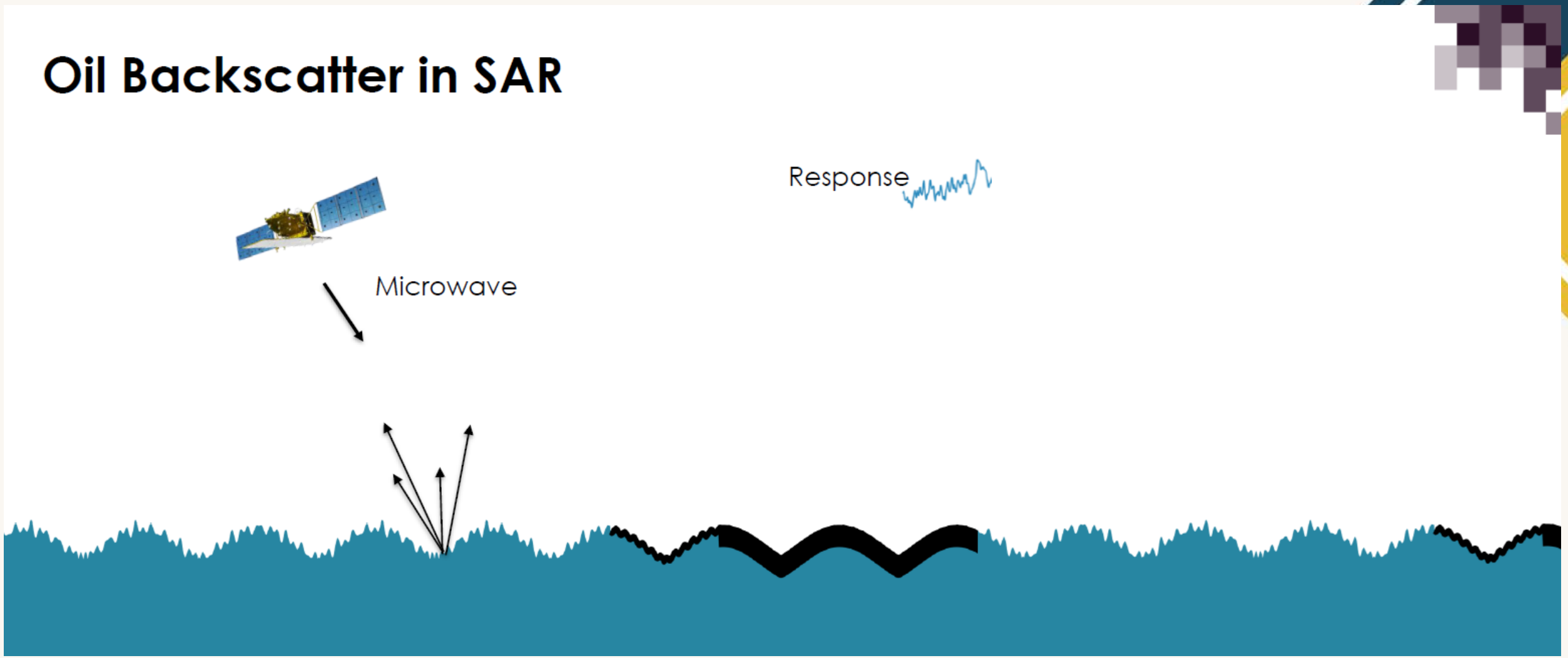
Oil Spills in Optical Satellite Imagery



Oil Backscatter in SAR



Source: NASA's Applied Remote Sensing Training Program

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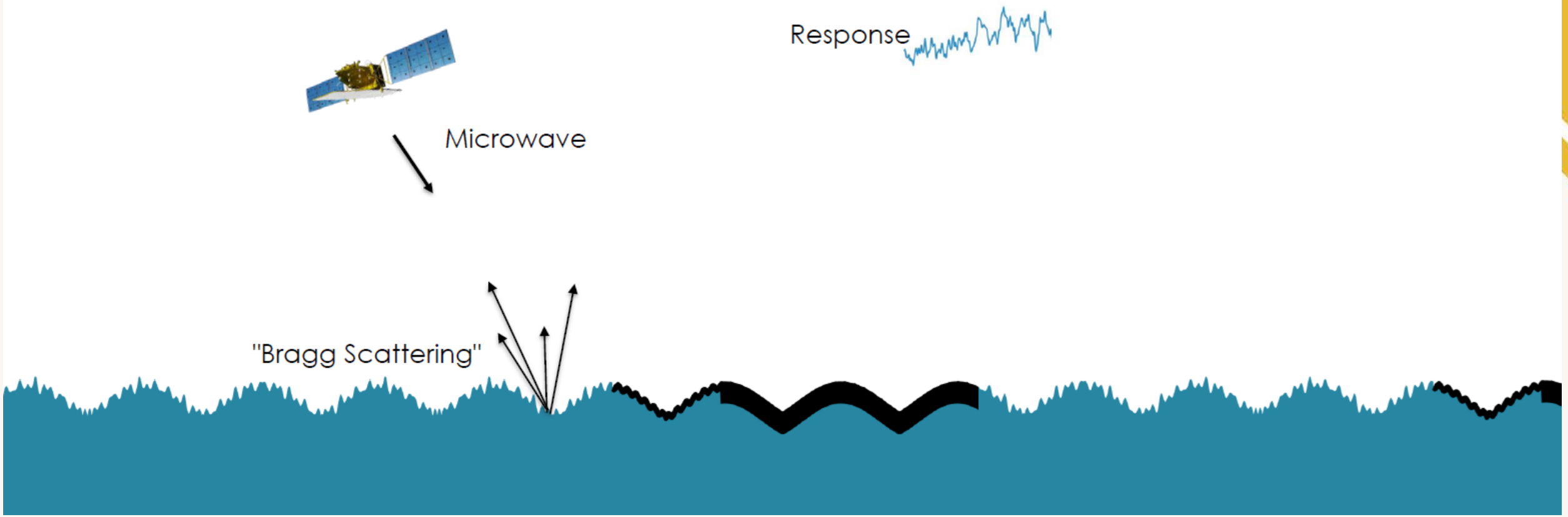
Oil Backscatter in SAR



Source: NASA's Applied Remote Sensing Training Program

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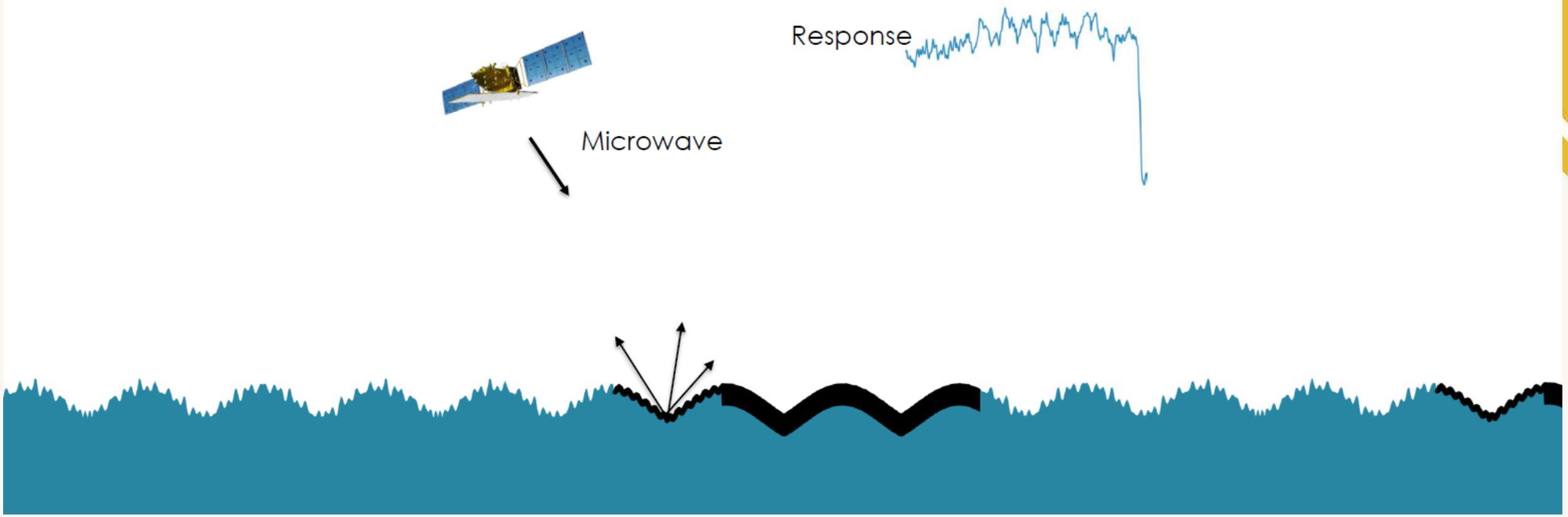
Oil Backscatter in SAR



Source: NASA's Applied Remote Sensing Training Program

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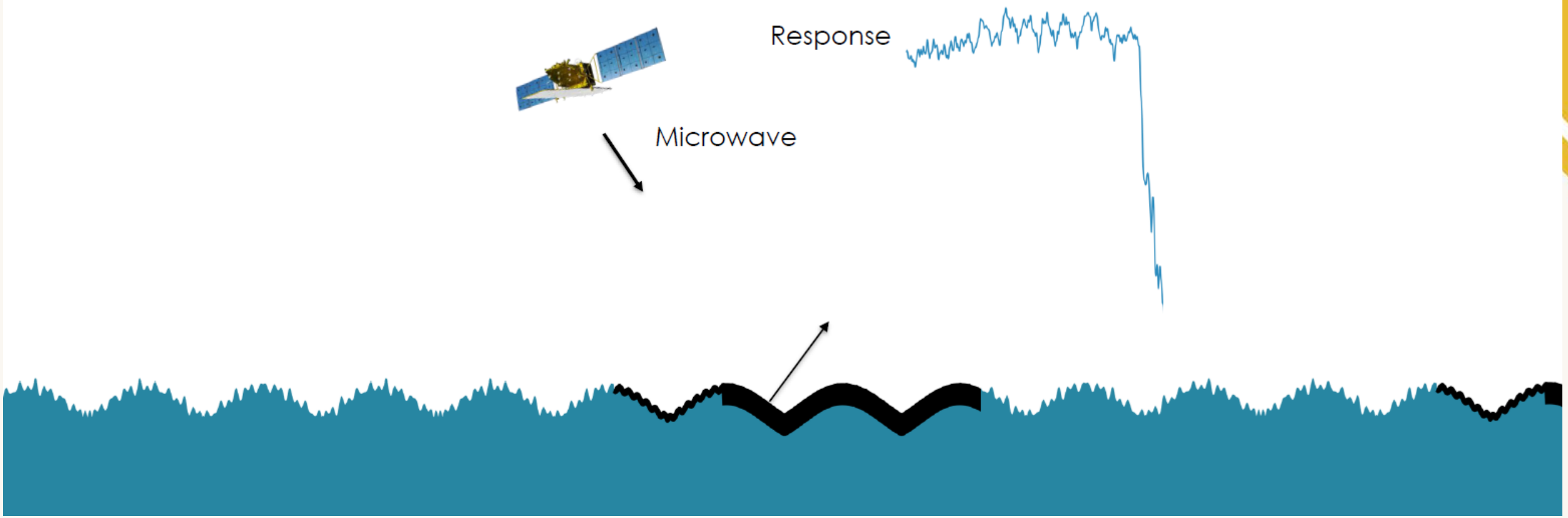
Oil Backscatter in SAR



Source: NASA's Applied Remote Sensing Training Program

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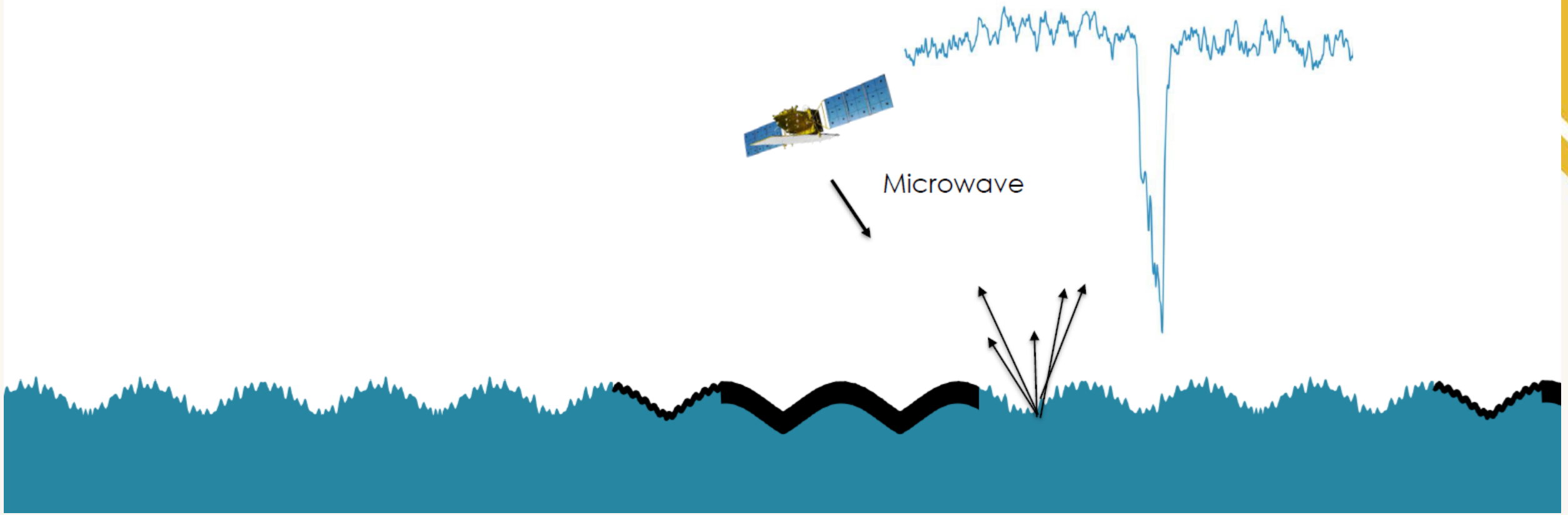
Oil Backscatter in SAR



Source: NASA's Applied Remote Sensing Training Program

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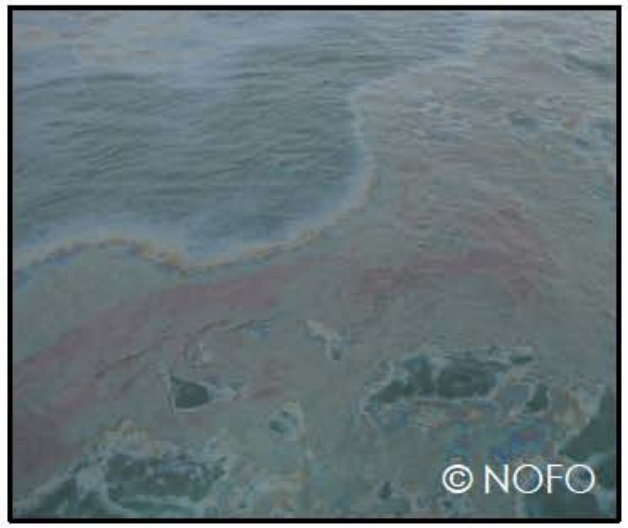
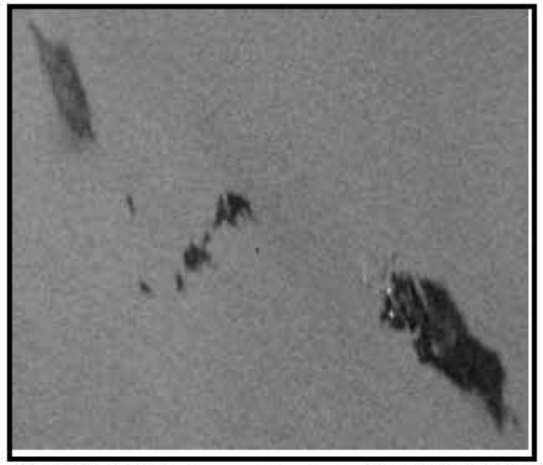
Oil Look-Alikes in SAR

Newly-Formed Sea Ice

Oil Spills





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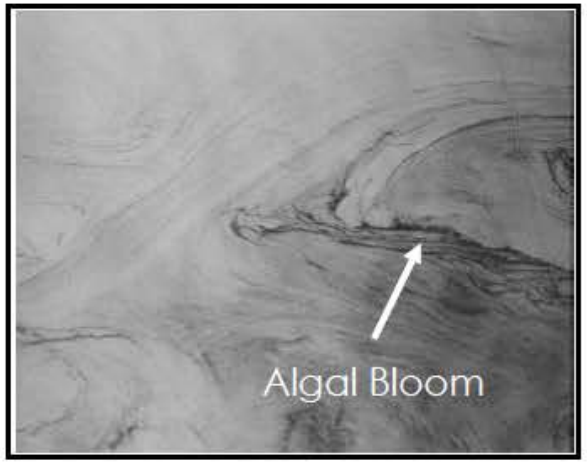
Algal Blooms



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Oil Look-Alikes in SAR

- Natural slicks
- Newly formed sea ice
- Low wind regions
- Internal waves
- Upwelling
- Algae blooms

Be careful with dark area detection!

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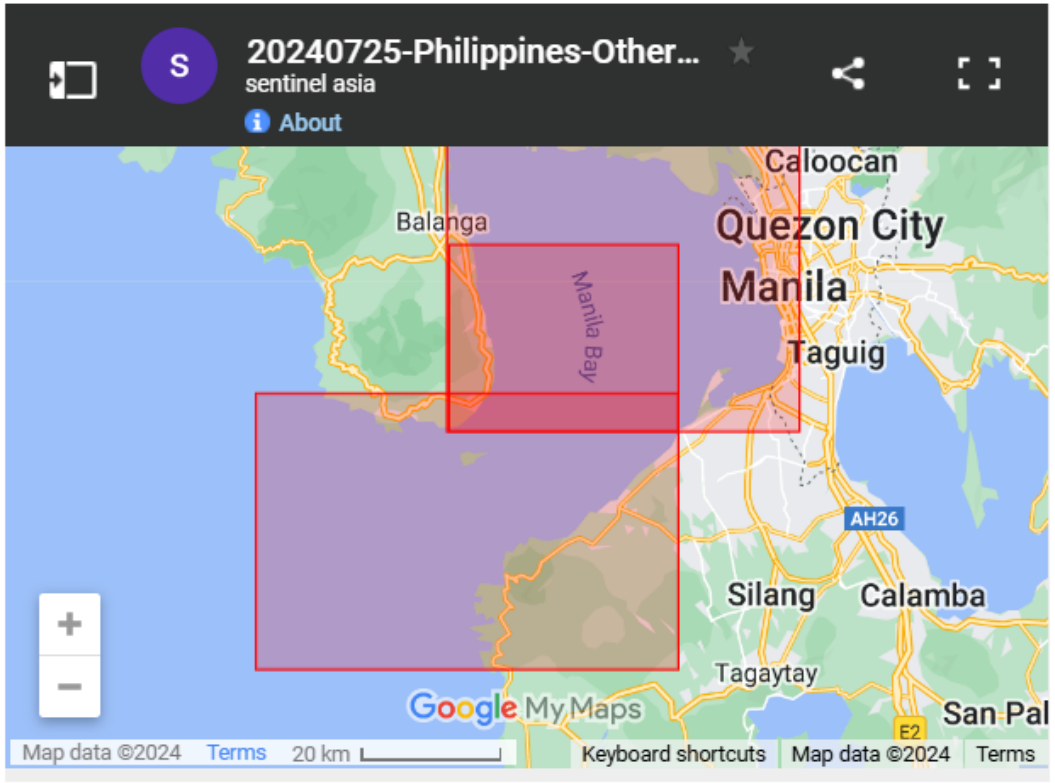
2024-07-25

Oil Spill in Philippines on 25 July, 2024

Emergency Obs. Request Information



Disaster Type: Oil Spill

Country: Philippines

Occurrence Date (UTC): 25 July, 2024

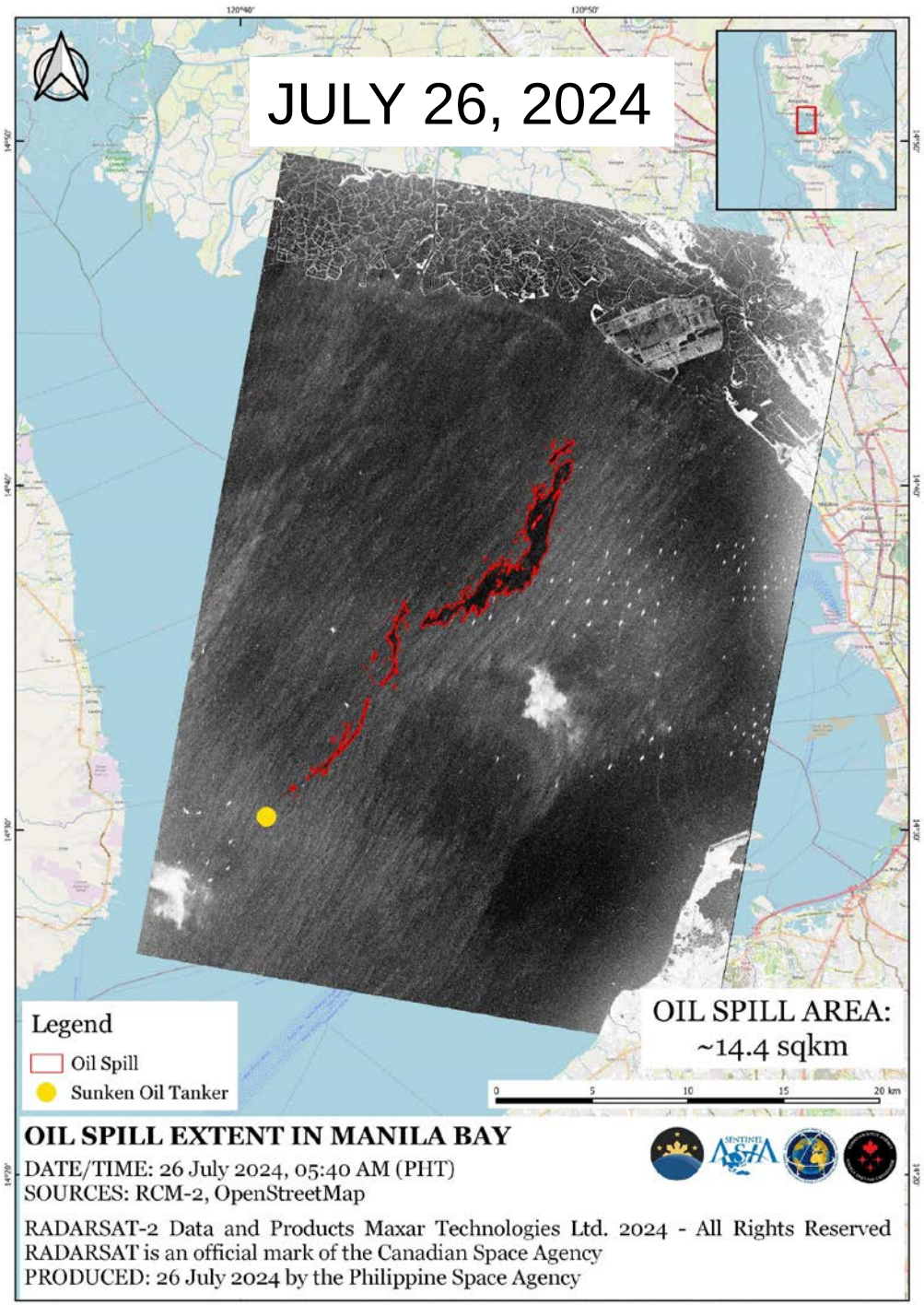
SA activation Date(UTC): 25 July, 2024

Requester: Philippine Space Agency (PhilSA)

Escalation to the International Charter: Yes

GLIDE Number: TC-2024-000127-PHL

JULY 26, 2024

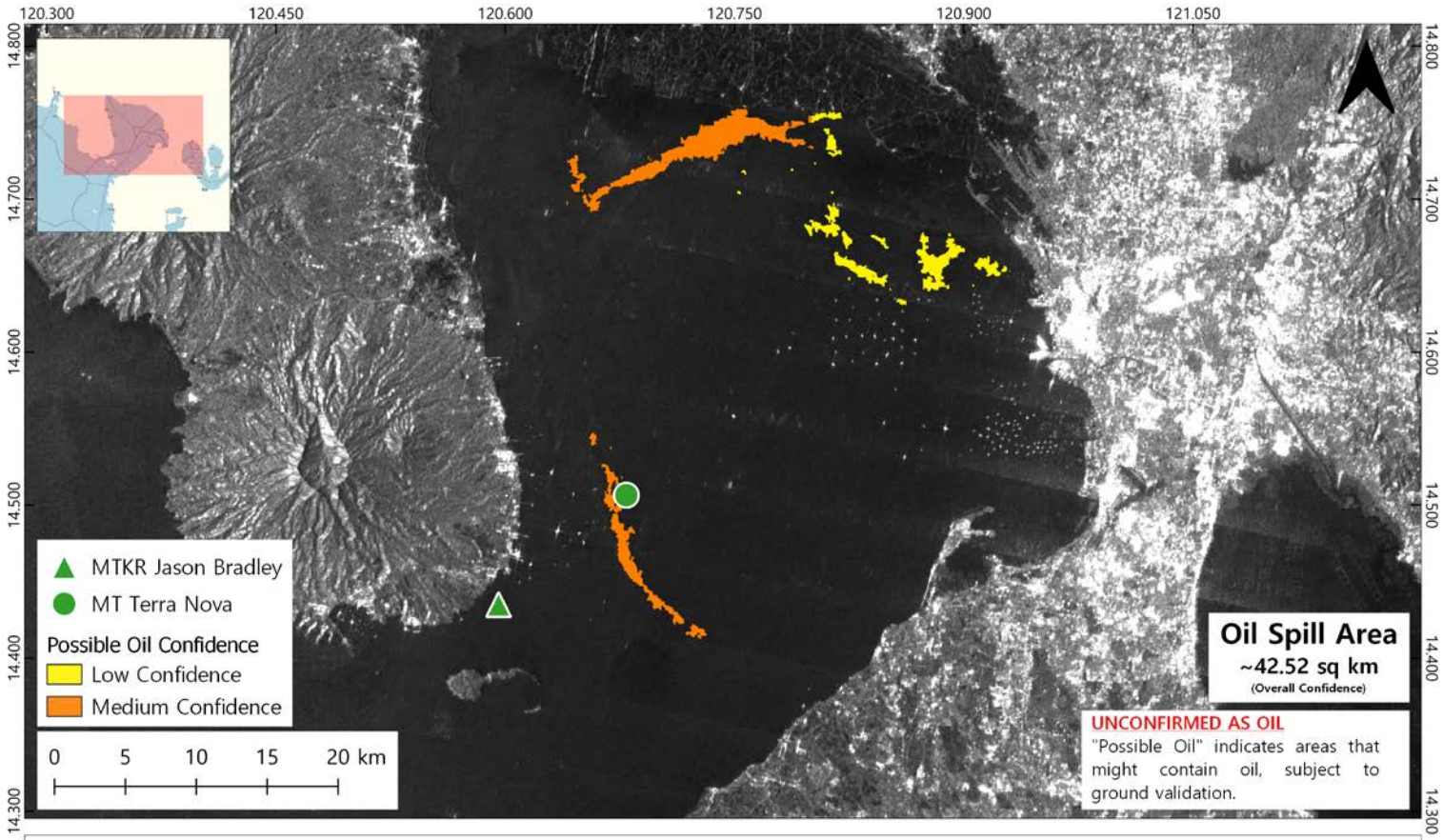


OIL SPILL EXTENT IN MANILA BAY

DATE/TIME: 26 July 2024, 05:40 AM (PHT)
SOURCES: RCM-2, OpenStreetMap

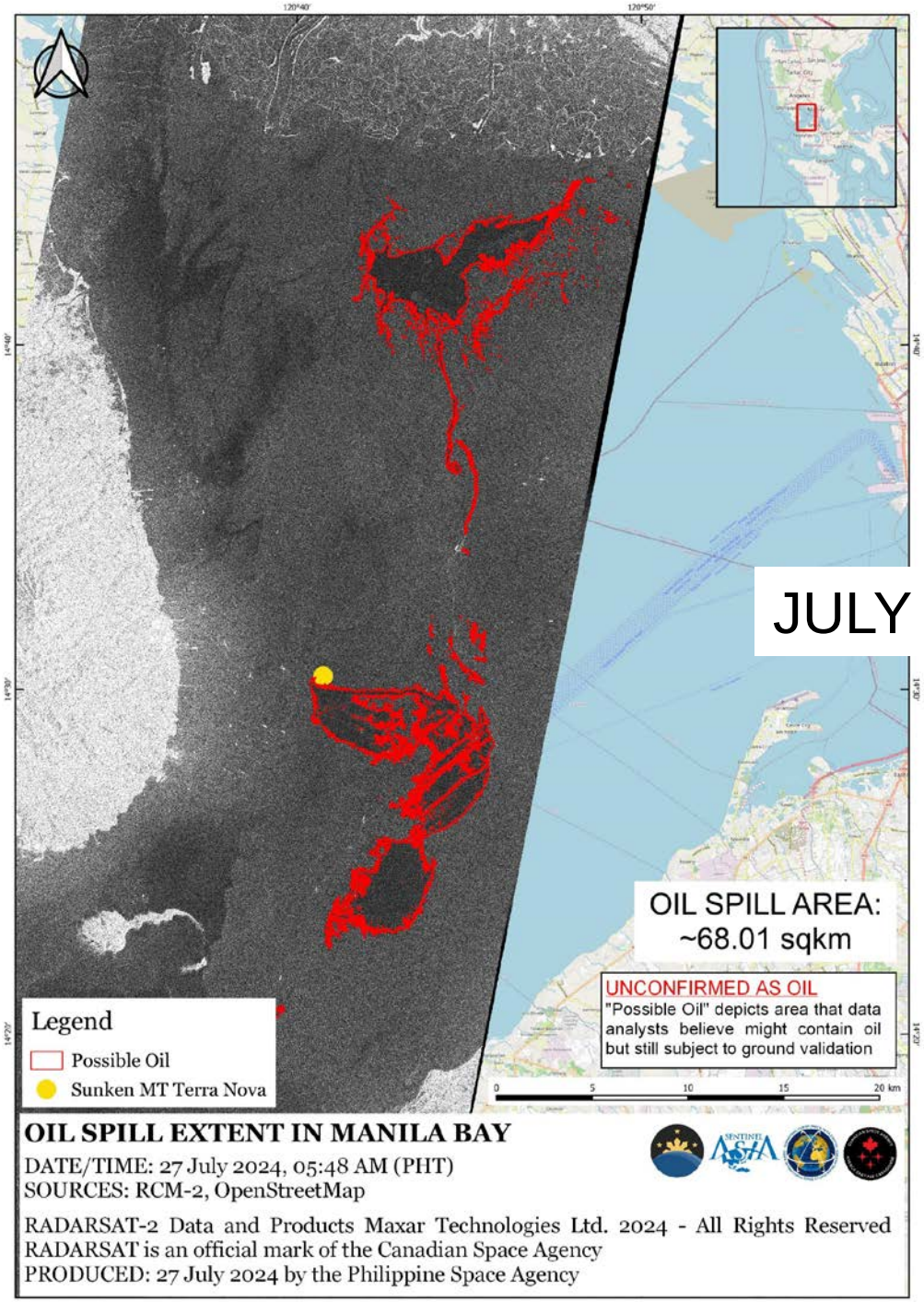
PRODUCED: 26 July 2024 by the Philippine Space Agency

JULY 27, 2024



OIL SPILL EXTENT IN MANILA BAY

Date/Time: 27 July 2024 12:18 PM PHT
Data Sources: ALOS-2, OpenStreetMap
Produced: 05 August 2024 by the Philippine Space Agency



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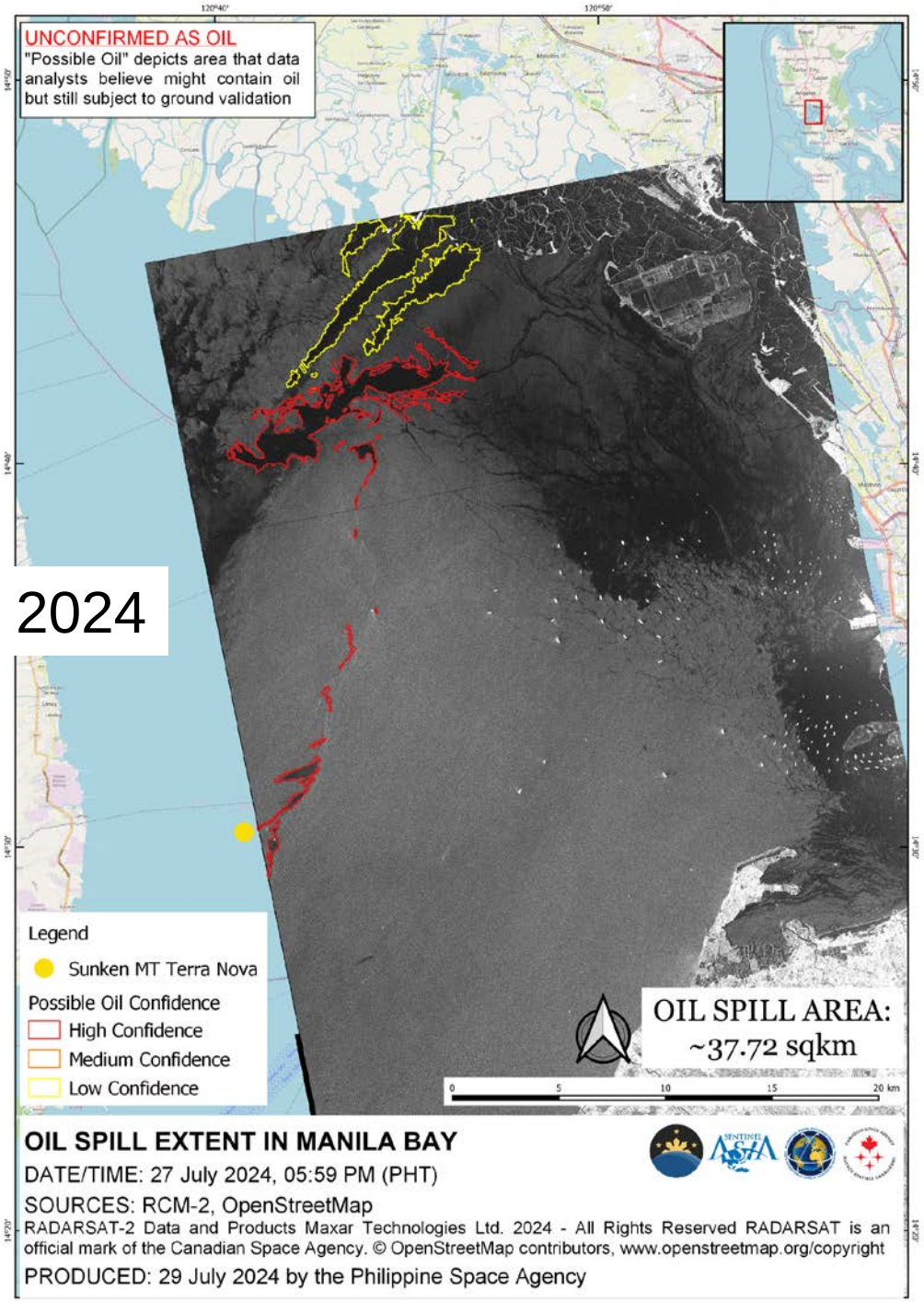

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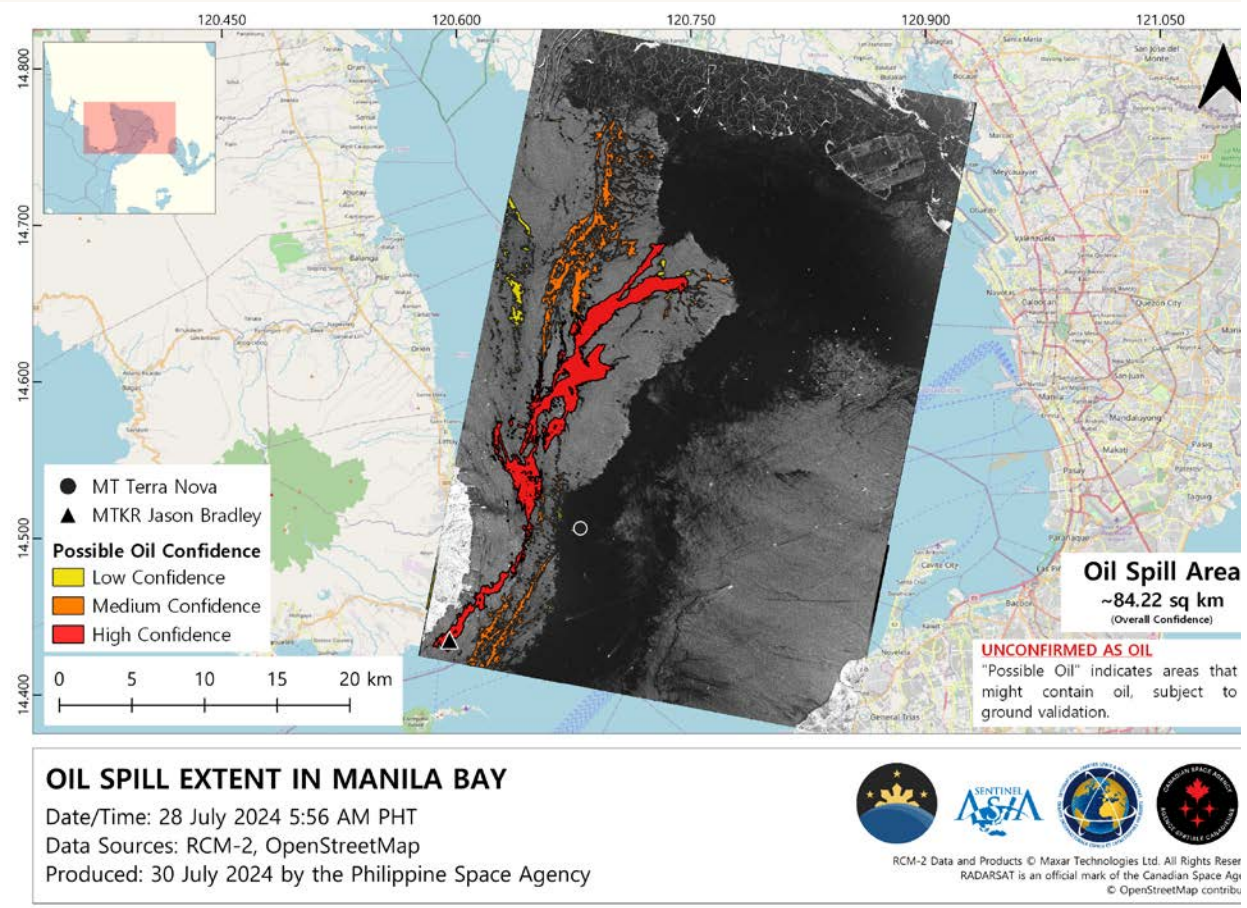
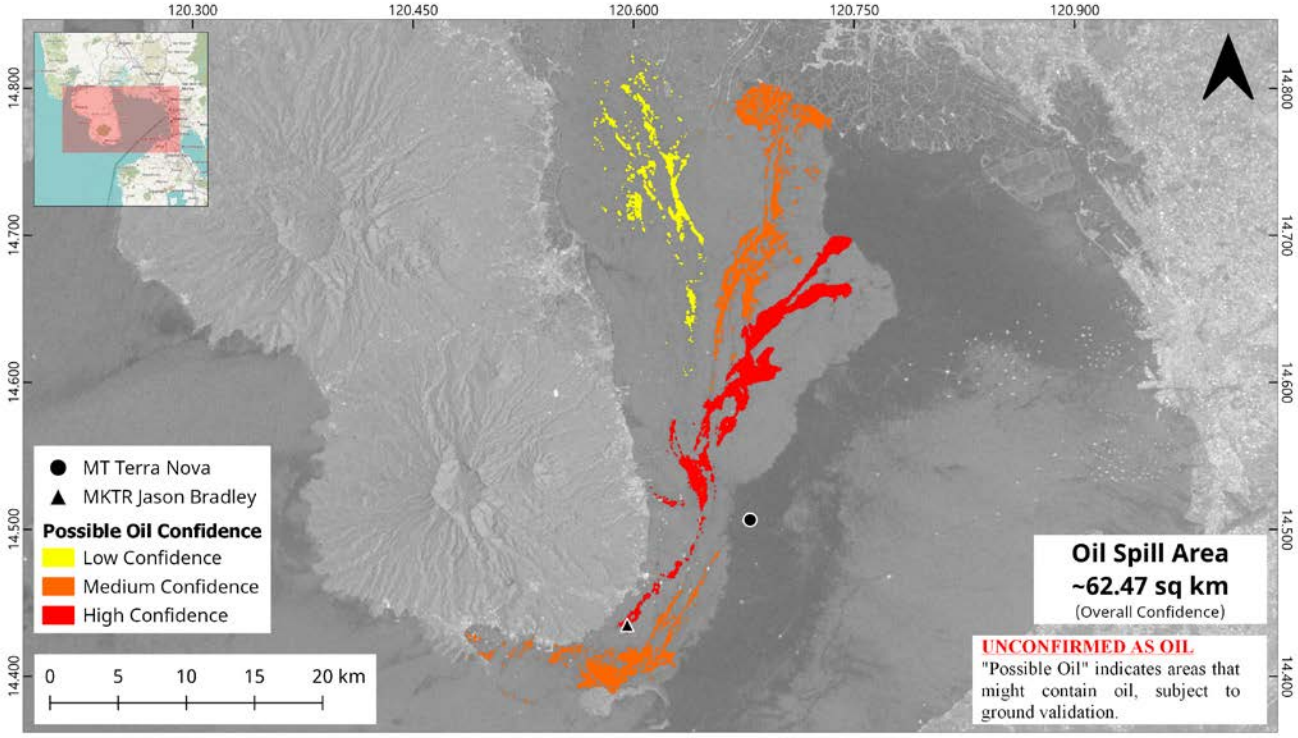


OIL SPILL EXTENT IN MANILA BAY

Date/Time: 28 July 2024 5:56 AM PHT
Data Sources: RCM-2, OpenStreetMap
Produced: 30 July 2024 by the Philippine Space Agency



OIL SPILL EXTENT IN MANILA BAY

Date/Time: 28 July 2024 5:55 AM PHT
Data Sources: Sentinel-1, OpenStreetMap
Produced: 31 July 2024 by the Philippine Space Agency

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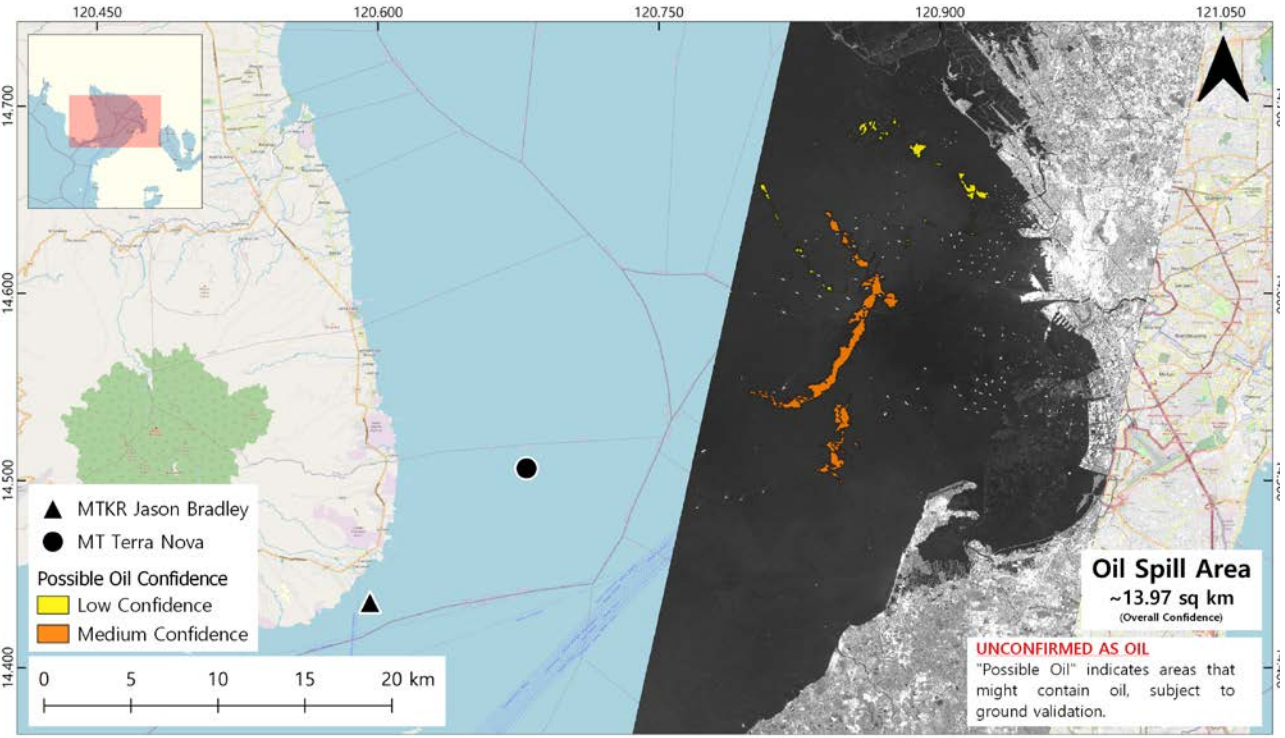
JULY 29, 2024



OIL SPILL EXTENT IN MANILA BAY

Date/Time: 29 July 2024 6:16 AM PHT
Data Sources: EOS-04, OpenStreetMap
Produced: 02 August 2024 by the Philippine Space Agency

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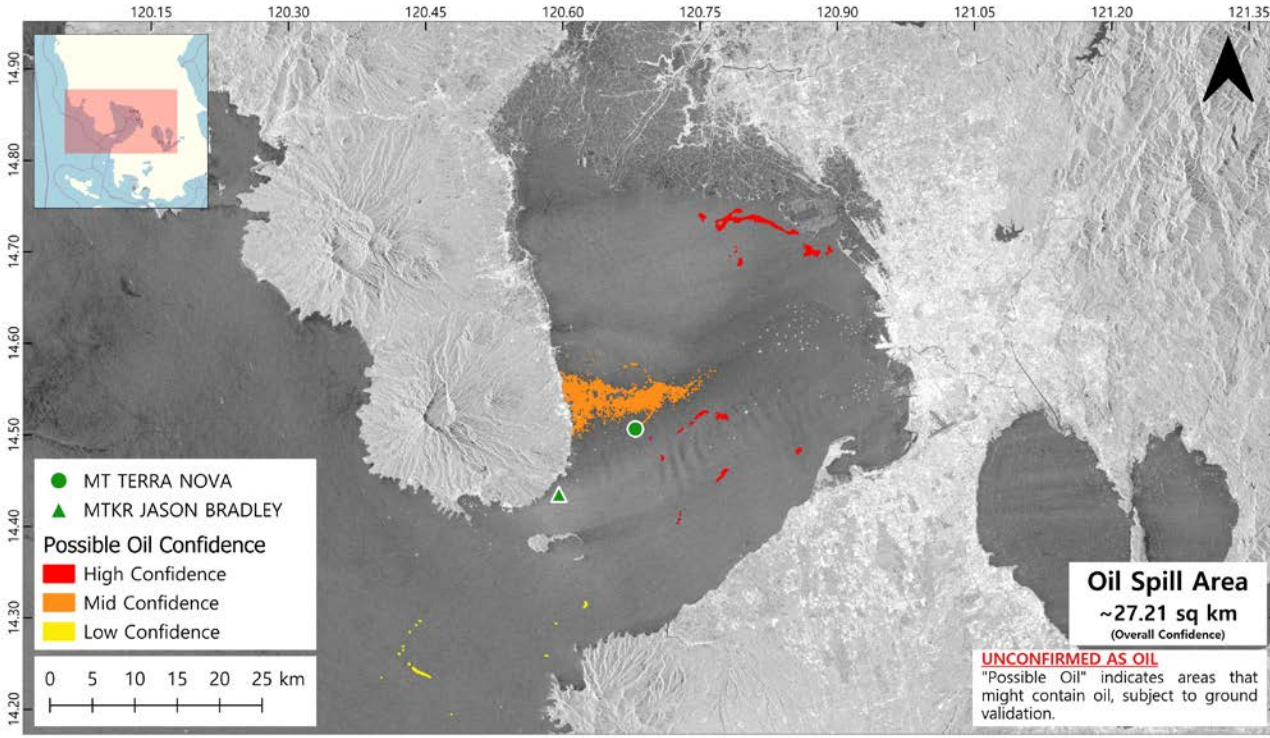
JULY 30, 2024



OIL SPILL EXTENT IN MANILA BAY

Date/Time: 30 July 2024 6:07 PM PHT
Data Sources: Sentinel-1, OpenStreetMap
Produced: 31 July 2024 by the Philippine Space Agency

Contains modified Copernicus Sentinel data 2024
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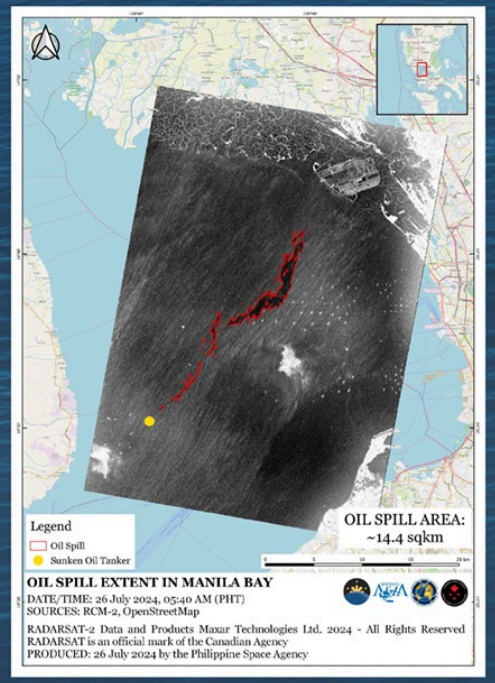
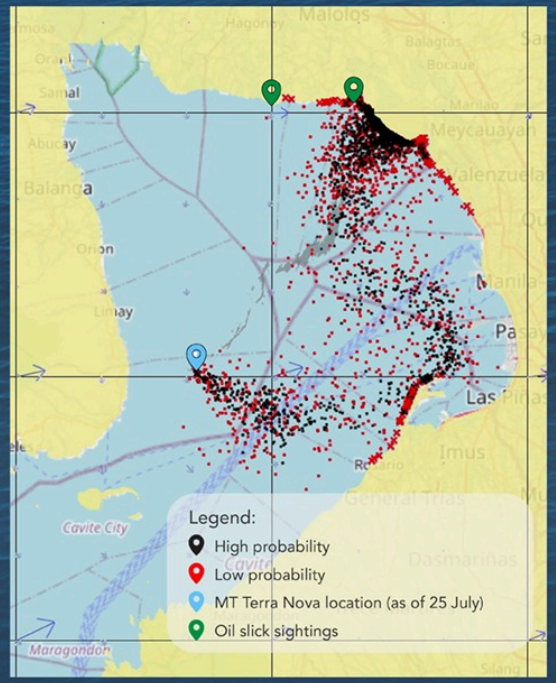
Oil Spill Extent Maps to Oil Spill Trajectory Models

BULLETIN #1
MT Terra Nova Oil Spill

PhilSA Oil Spill Extent Map as of 26 July 2024



Oil Spill Trajectory Model for 28 July 2024



DISCLAIMER

The model results are model forecasts and accuracy is difficult to determine. The model was implemented using the weathering characteristics of Bunker C - IFO-300 [1994] oil and a seepage rate of 100 barrels for three days (for point release) and 452 barrels across the estimated oil slick provided by PhilSA for spatial release. These assumptions used are based on best available information. **PLEASE USE MODEL RESULTS WITH CAUTION.**

BULLETIN #3
MT Terra Nova Oil Spill

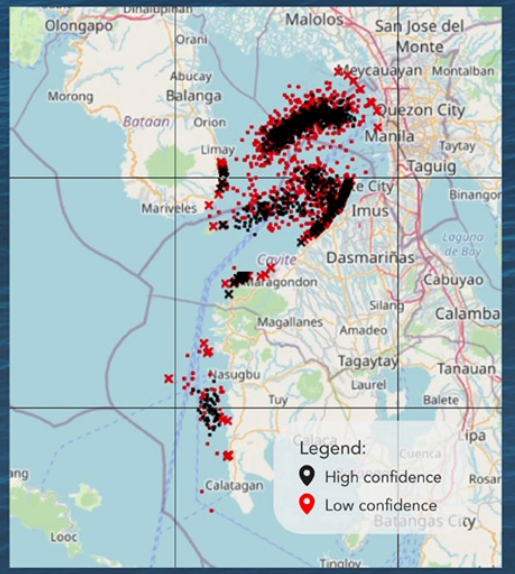
Projected Landfall of Oil

Mariveles, Bataan	**July 31, 7:30AM**
Low Confidence	
Maragondon, Cavite	**July 31, 7:30AM**
Lian, Batangas	**Aug 1, 6:00PM**
Calatagan, Batangas	**Aug 2, 9:00AM**

Where the oil was

Copernicus EMS Oil Spill Extent Map 30 July 2024, 6:07PM

Where the oil might go



Oil Spill Trajectory Model 1 August 2024, 5:22PM PHT

DISCLAIMER

The model results are model forecasts and accuracy is difficult to determine. The model was implemented using the weathering characteristics of Bunker C - IFO-300 [1994] oil and simulated a spatial release of 16.5 barrels of oil across the estimated oil slick provided by Copernicus using 7/30/2024 18:07 PH time image. These assumptions used are based on best available information. **PLEASE USE MODEL RESULTS WITH CAUTION.**

Oil Spill Extent Maps Recipients

Best Practices

- Activate early. Use the most out of every opportunity.
- Be accurate with selecting Area of Interest (AOI). The larger the AOI, the higher chances that some images might not be useful.
- Be familiar with the datasets from other countries/regions.

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Conclusions and Recommendations

- Mapping is possible with open-access and subscription images, but monitoring will be challenging.
- For oil spills, monitoring is important for forecasting, quick response, and recovery.
- Sentinel Asia helps agencies and organizations to be quick to respond to disaster emergencies and to monitor disaster progression frequently.
- We hope to further collaborate with the Asia-Pacific region thru Sentinel Asia.

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info@philsa.gov.ph

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