

# LESSONS LEARNT OF BORNEO OIL SPILL

**Oil Spill Response Thailand Conference - 28 May 2019**  
**Yodi S., B.Sc MSc EDM**

**2019**





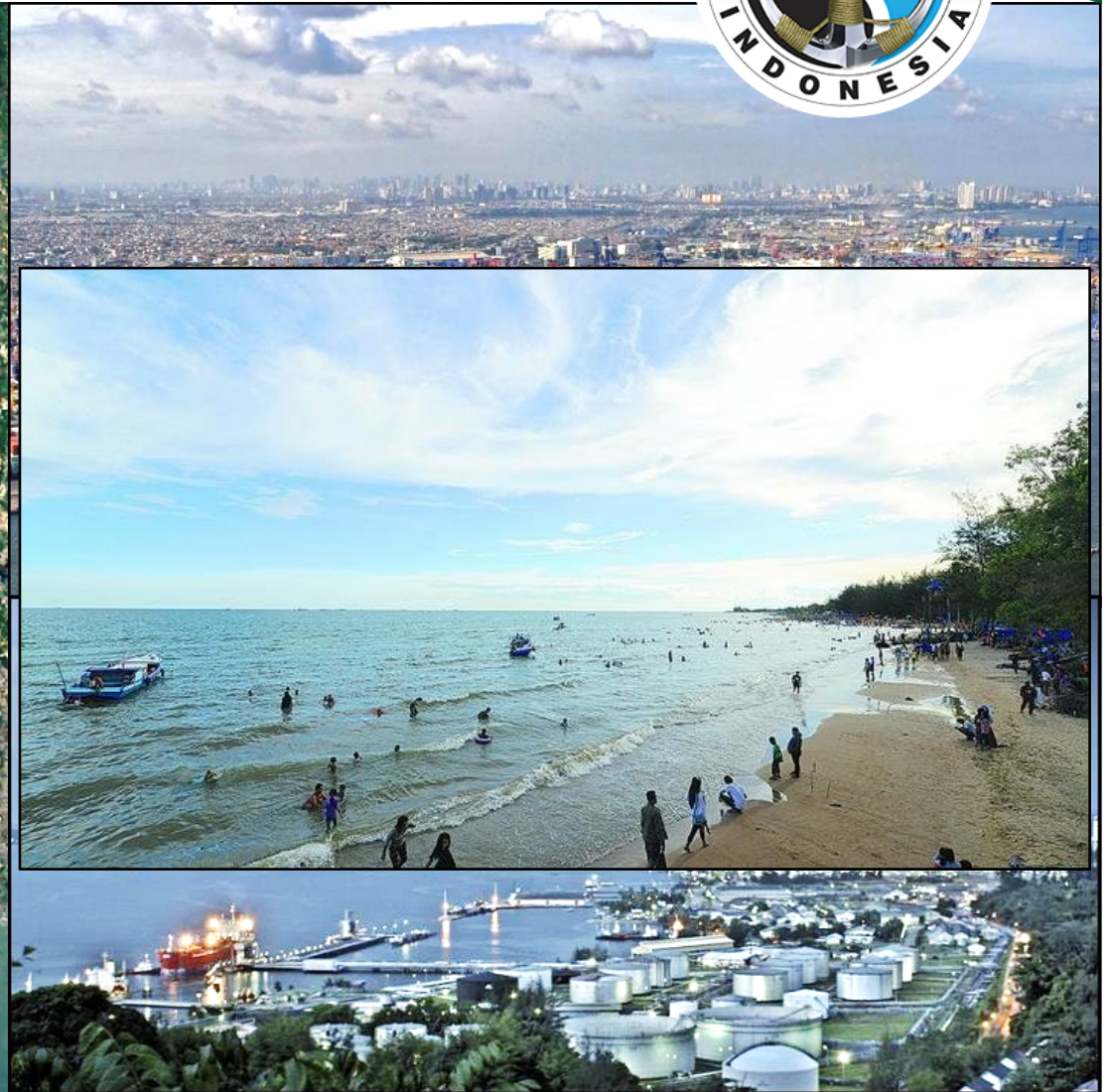
Map Legend



**OIL SPILL COMBAT  
EXPERIENCES**

Oil Spill Combat Team (OSCT) Indonesia is Tier-2 National Oil Spill Response Organization and have combated over 64 oil spills around the World. Most Recent is Borneo/Balikpapan Pipeline Incident and last month in Port Kelang, Malaysia. From every spill, we review our preparedness & capability.





Balikpapan Bay has many activities of vessel, port, terminal, oil and gas company, subsea pipeline, refinery, SBM. Shoreline of Balikpapan bay consist of sensitive area such as settlement, mangrove, industry, fisherman area, tourism. Oil spill combat for Balikpapan spill is very extensive operation Involving many Government agencies and stakeholders due to wide area and operational diversity

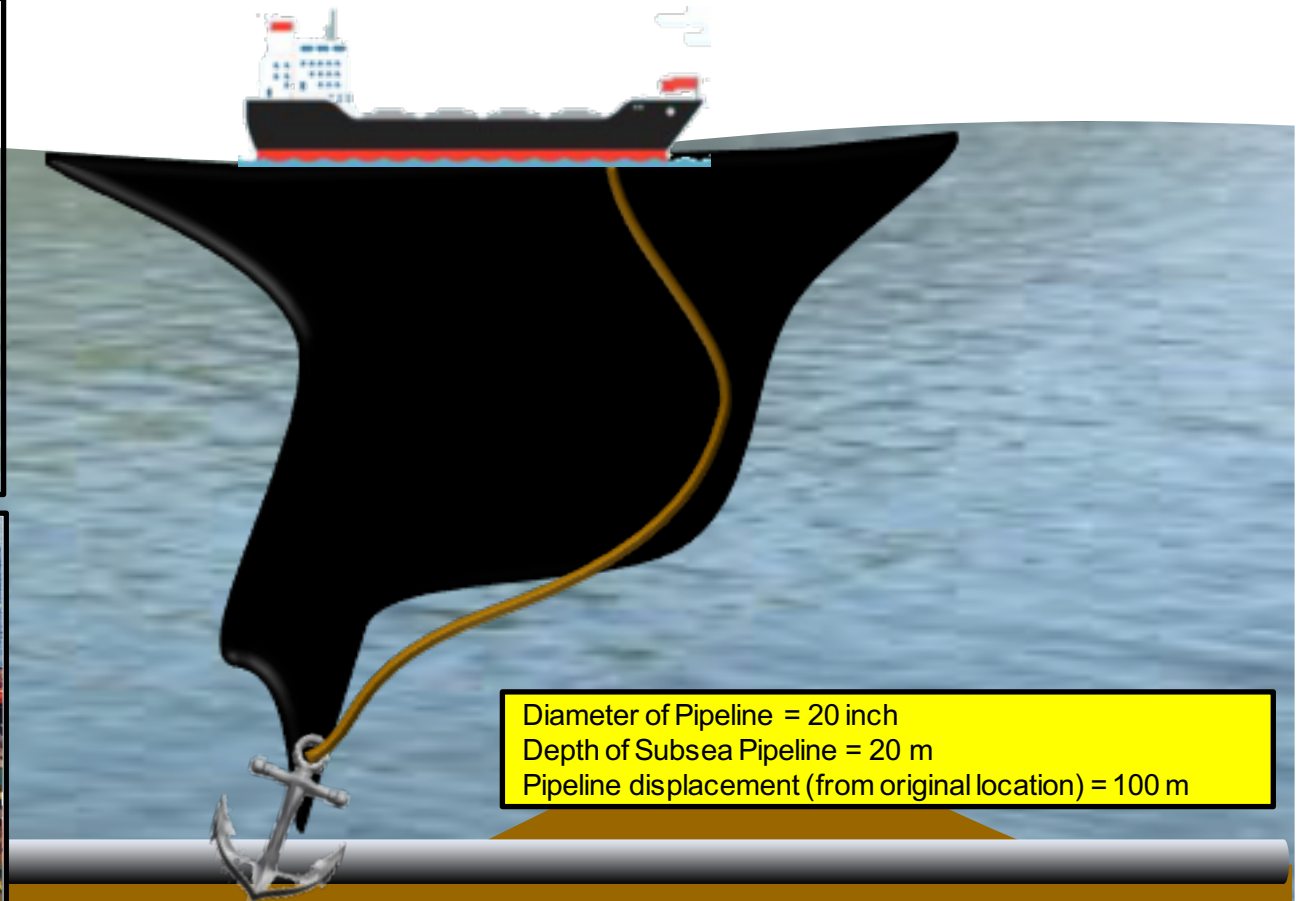
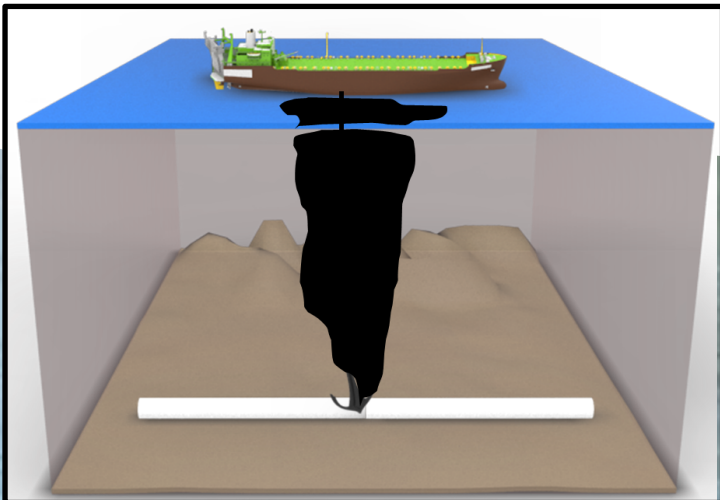


## 4 Balikpapan Spill Incident



Saturday, March 31<sup>st</sup> 2018 – 03:00 AM

*Illustration of Incident*



Diameter of Pipeline = 20 inch  
Depth of Subsea Pipeline = 20 m  
Pipeline displacement (from original location) = 100 m

Spill Incident occurred due to pipeline ruptured by MV Ever Judger Vessel anchor  
Spill volume estimates 40.000 bbls and spread impacting over 12.987 ha of Balikpapan Bay Waters and 60 km of shoreline.







## 6 Fire Incident



Saturday, March 31<sup>th</sup> 2018 – 11:00AM



Fire accident occurred at 11.00 am until 12.00 pm. Tier-2 Response was conducted with neighboring fire fighting vessel and fire was put out about 1 hour after the incident. Oil was ignited by accident causing five casualties, there was no in-situ burning of oil allowed

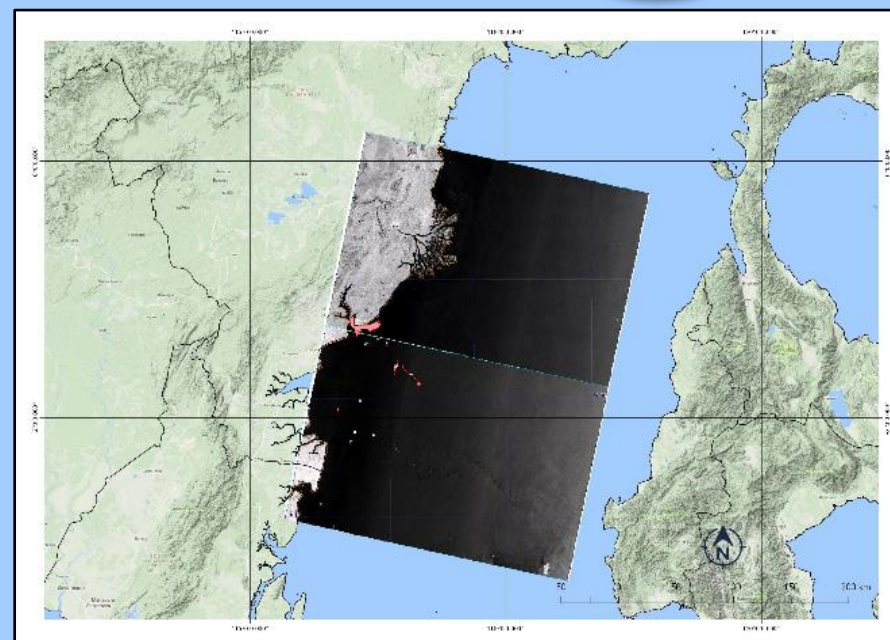
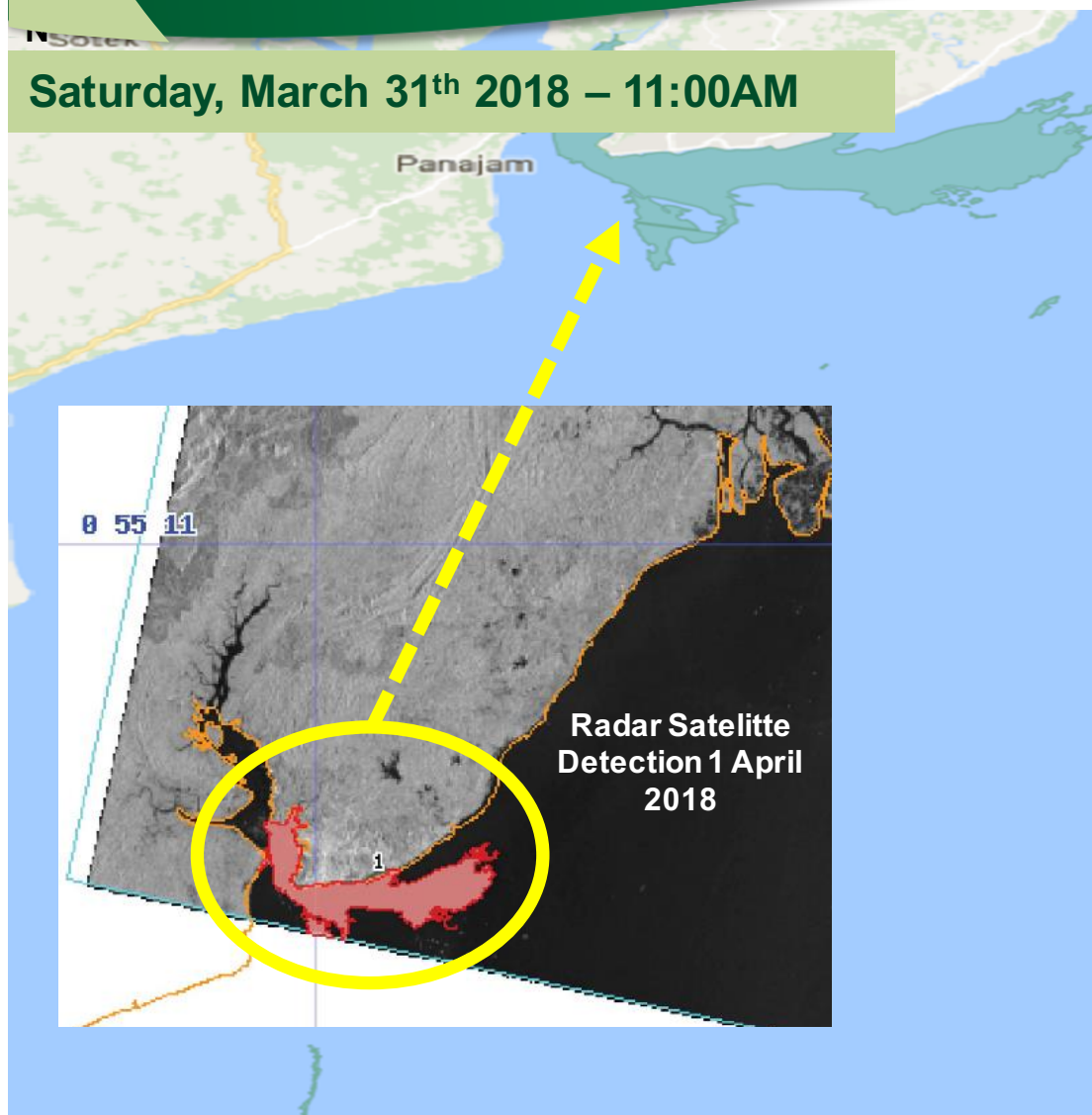


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# Oil Spill Incident in Balikpapan Bay



Saturday, March 31<sup>th</sup> 2018 – 11:00AM



## SPILL INFORMATION

Spill Source	<i>Pipeline Rupture</i>
Location	Balikpapan Bay - Balikpapan
Date	Saturday, March 31st, 2018

On March 31<sup>st</sup> 2018, Oil Spill Combat Team (OSCT) Indonesia received an oil spill notification and immediately acquired radar detection due to size of major spill. Team Deployed same day with equipment preparation in Balikpapan Base & West Java





Sunday, April 1<sup>st</sup> 2018 – Aerial Surveillance



Aerial Surveillance was used to verify radar detection results for major oil spill. Shoreline impact was within 24 hours, and within 7 days before oil spreads outside Balikpapan bay, impacting more sensitivities and towards Makassar Strait



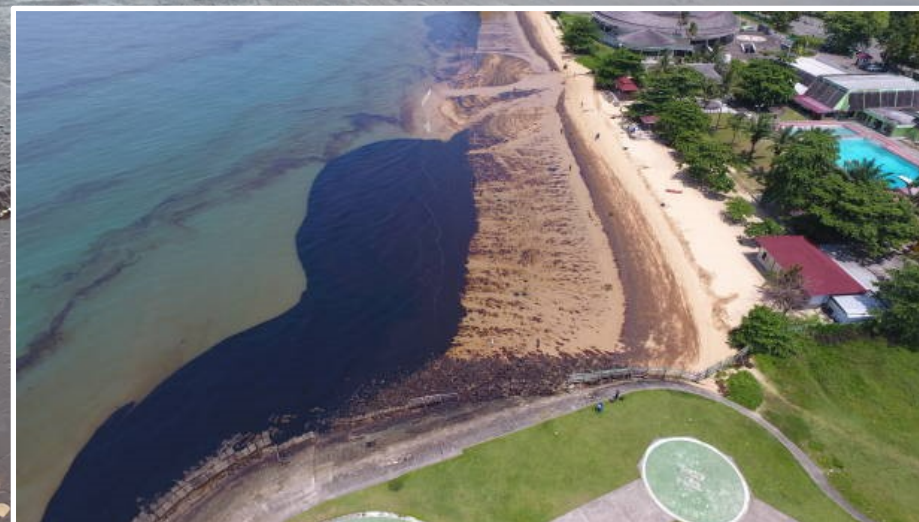


**Monday, April 2<sup>nd</sup> 2018 – Shoreline Assessment**

**Benoa Patra Beach**



© photos by OSCT Indonesia



**Shoreline Assessment around Balikpapan Bay was conducted by OSCT Indonesia and oil spill response operation for shoreline protection / clean-up conducted in few areas. During the assessment, One carcass of oiled Irrawaddy dolphin was found**



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## Irrawaddy Dolphins – Sensitive Wildlife impact



Monday, April 2<sup>nd</sup> 2018 – Wildlife Impact



Irrawaddy Dolphins that was impacted at Klandasan Beach from Balikpapan spill is one of critically endangered species (Protected on IUCN Red List). Wildlife impact from oil spill started to be seen on 2 April 2018 there are various birds, fish, marine life impacts.



## 11 Coordination Meeting with Coastguard

Monday, April 2<sup>nd</sup> 2018 – Balikpapan Coastguard Coordination Meeting



© photos by OSCT Indonesia

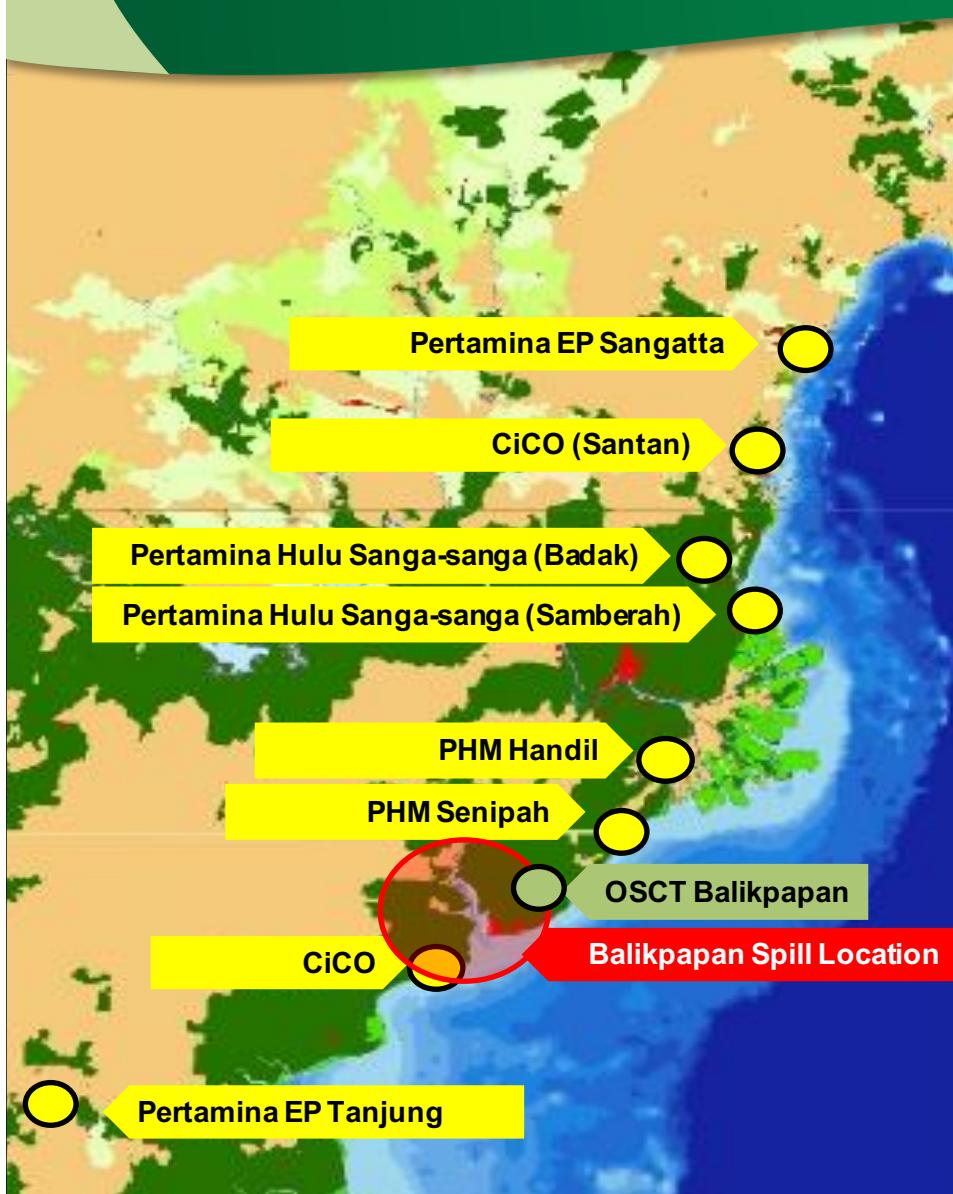
OSCT attended coordination meeting for Balikpapan spill lead by Balikpapan Port Authority / Coastguard with members of all stakeholders in the area to coordinate unified oil spill response strategy and reporting to be conducted by all stakeholders

## 12 Tier II Resources For Balikpapan



Qty.	Oil Spill Combat Equipment
<b>Pertamina EP Tarakan</b>	
200 m	Offshore Boom
300 m	Solid Floatation Boom
265 m	Solid Floatation Boom
1 set	Offshore Skimmer
1 set	Dynamic Inline Skimmer
1 set	Interchangeable Disc And Brush Skimmer
4 unit	Temporary Floating Storage 20-25 M3
1 unit	Temporary Onland Storage
5 set	Dispersant Sprayer
<b>Pertamina EP Sanga Sanga</b>	
200 m	Offshore Boom
400 m	Solid Floatation Boom
1 set	Interchangeable Skimmer
1 set	Dynamic Inline Skimmer
2 unit	Skimmer Truck
2 set	Disc Skimmer
1 set	Brush Skimmer
1 set	Rope Mop Skimmer
2 set	Onland Skimmer
1 unit	Temporary Floating Storage Kap. 5 M3
<b>Pertamina EP Tanjung</b>	
100 m	Semi Permanent Boom
100 m	Compact Boom
1 set	Interchangeable Weir And Brush Skimmer
1 set	Interchangeable Disc And Brush Skimmer
1 set	Rop Mop Skimmer
2 unit	Temporary Onland Storage

Qty.	Oil Spill Combat Equipment
<b>Chevron Indonesia Company</b>	
400 m	Offshore Inflatable Boom
250 m	Shore Guardian Boom
60 m	Harbor Boom
40 m	Tidal Sea Boom
1 unit	Weir Skimmer
2 unit	Offshore Skimmer
1 unit	Powerpack
<b>Pertamina Hulu Mahakam (PHM)</b>	
500 m	Permanent Onshore Boom
200 m	Semi Permanent Boom
200 m	Offshore Solid Floatation Boom
200 m	Offshore Inflatable Boom
150 m	Water Curtain Boom
2 set	Skimmer Stopol 120
2 set	Skimmer Sirine 20A
1 unit	Disc Skimmer T-Disc 10
2 unit	Disc Skimmer Komara 12
2 unit	Disc Skimmer Komara 20
1 unit	Helispray Simplex
10 unit	Onshore Storage Tank 2 m <sup>3</sup>
1 unit	Floating Storage Tank 50 m <sup>3</sup>
<b>OSCT Balikpapan</b>	
1,600 m	Onshore Boom and Offshore Boom
400 m	Semi permanent Solid detachable flotation boom
8 sets	Onshore and Offshore Skimmer
8 Sets	Temporary Storage Tanks
2 set	Dispersant Sprayer and chemicals



Tier-2 Resources in the bay activated however most companies was protecting their own ports hence Additional Resources came from outside the bay (Regional Resources) and National OSRO OSCT mobilized in coordination with Coastguard



## 13 Major Response Arrangements Summary



Each Tier level in Indonesia have sources of oil spill response equipment to mitigate risk of oil spill incident. Tier-1 is the key to rapid response, supported with Tier-2

## 14 Major Oil Spill Response Strategy



Spill Detection  
& surveillance

Containment and  
recovery

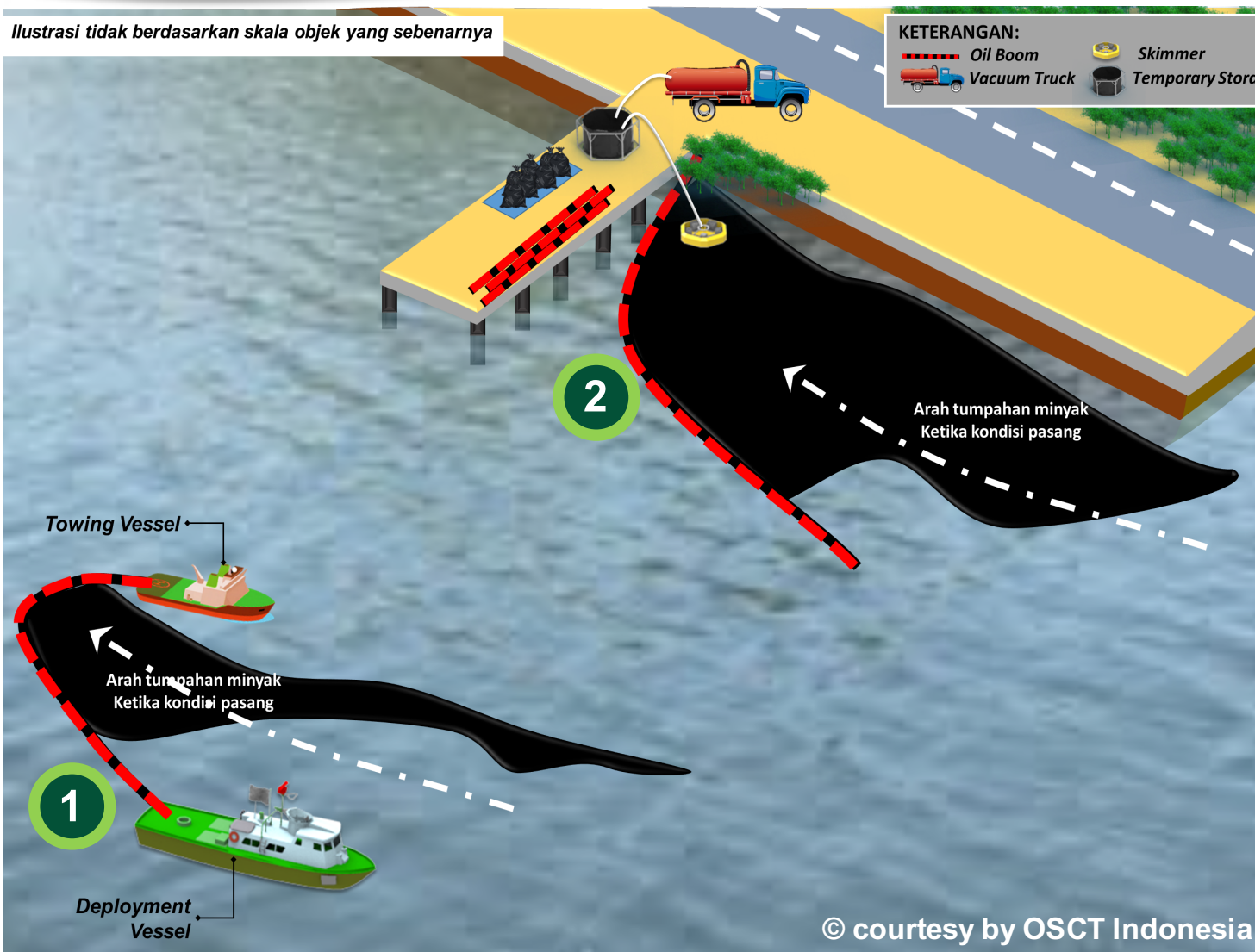
Shoreline Assessment,  
protection, cleanup

Dispersant Spraying  
and Fluorometer  
monitoring

**Oil Spill Response Strategy consist of four primary aspects which is assessment/surveillance, containment and recovery, shoreline protection/cleanup and dispersant spraying & monitoring**



Ilustrasi tidak berdasarkan skala objek yang sebenarnya



OSCT Indonesia conducted containment and recovery strategy, wherein oil spill was directed from the bay to the collection point, and localized immediately by using oil boom and recovered with oil skimmer before stored in the temporary storage, then transferred into vacuum truck.

## 16 Offshore Response

3 ~ 15 April 2018 – Containment & Recovery



BALIKPAPAN, KALIMANTAN TIMUR

KANDUNGAN GAS DALAM AMBANG BATAS NORMAL

Offshore containment strategy conducted to divert the spilled oil to jetty collection points and recover the spilled oil using skimmer. For oil spreading offshore with depth > 20 meters, dispersants was used with fluorometry monitoring



## 17 Offshore Response



3 ~ 15 April 2018 – Containment & Recovery



Shoreline containment and cleanup conducted with over 60 boats and 1000 personnel all around collection points at the Bay



## 18 Containment & Recovery Strategy



3 ~ 15 April 2018 – Containment & Recovery



© Pictures from Pertamina RU V

**24/7 Continuous Containment & Recovery Operation was completed less than 2 weeks with over 1000 personnel from companies in the region and government stakeholders & 60 OSCT Responders**



## 19 Containment & Recovery Strategy



3 ~ 15 April 2018 – Containment & Recovery

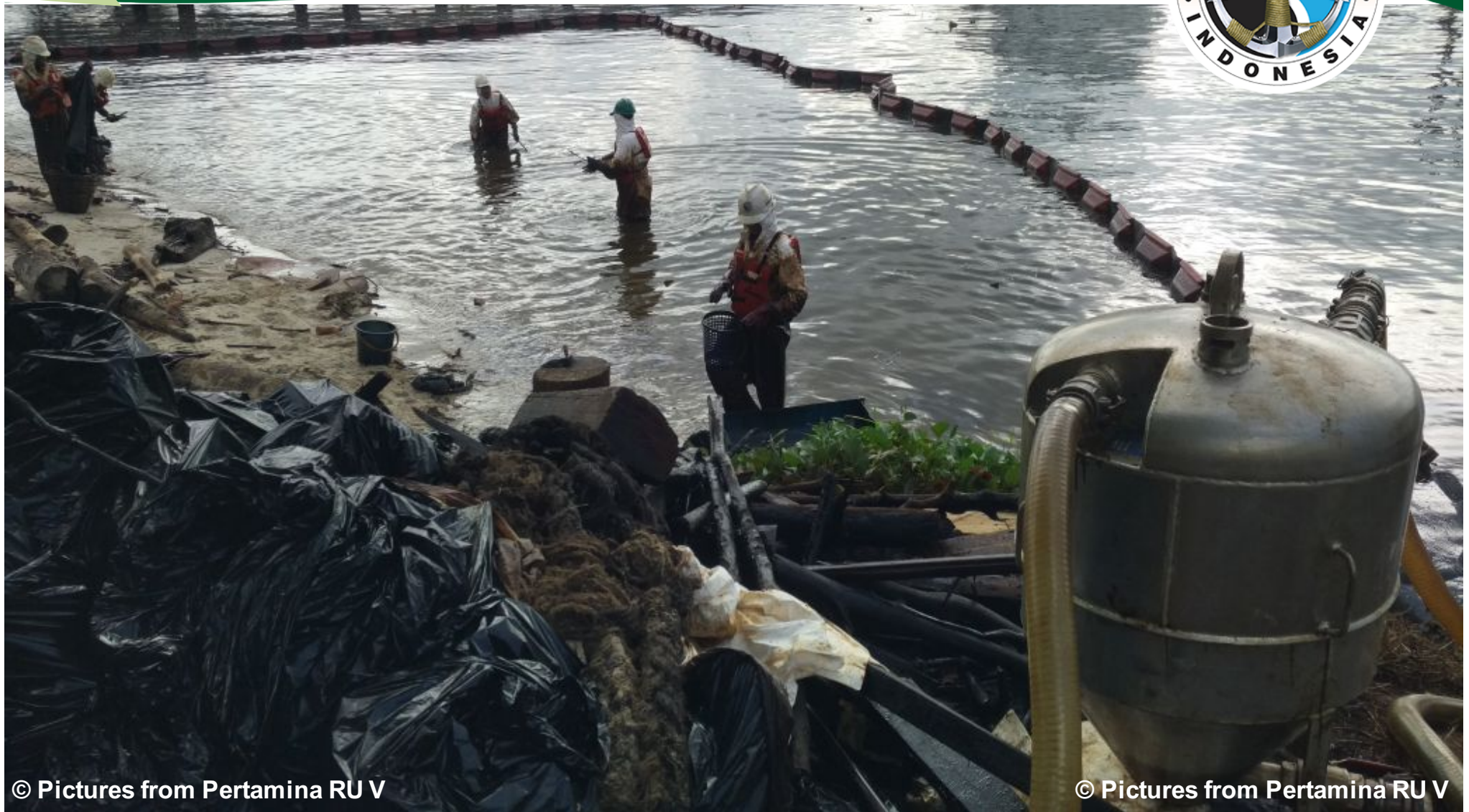


© Pictures from Pertamina RU V

Before and after spill cleanup condition. Each Area is cleaned within 2-3 days simultaneously with extensive resources covering over 60km and 12.987 hectares of impacted area



## 20 Containment & Recovery Strategy



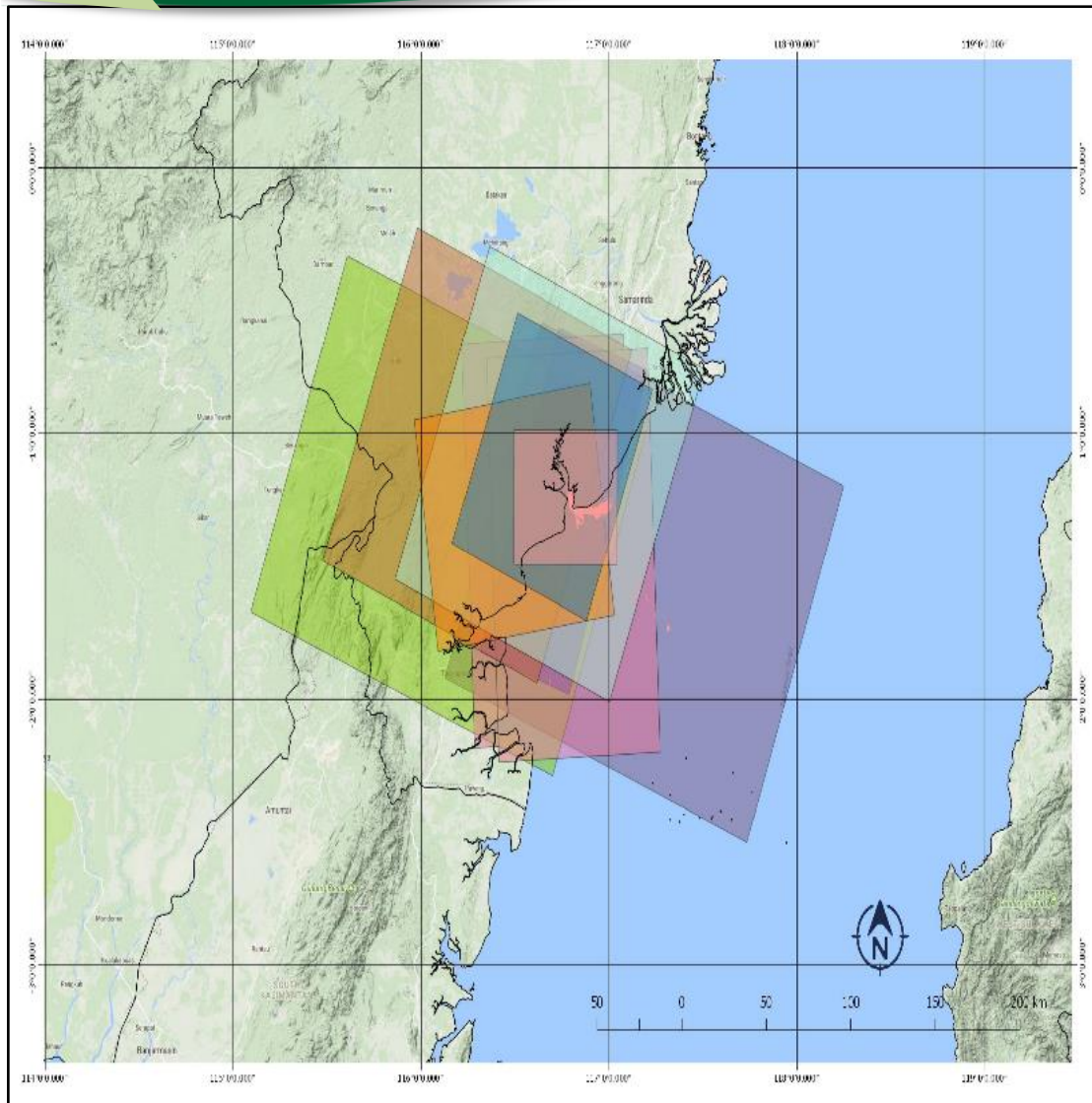
© Pictures from Pertamina RU V

© Pictures from Pertamina RU V

**final stage of Shoreline cleanup and waste removal using  
vacuum skimmers and absorbents**



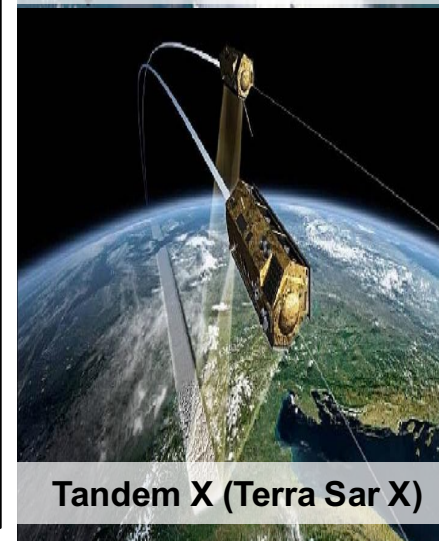
## 21 Radar Detection



**Radarsat  
(Extra & Wide Fine)**



**Cosmo Skymed  
(Wide-Region)**



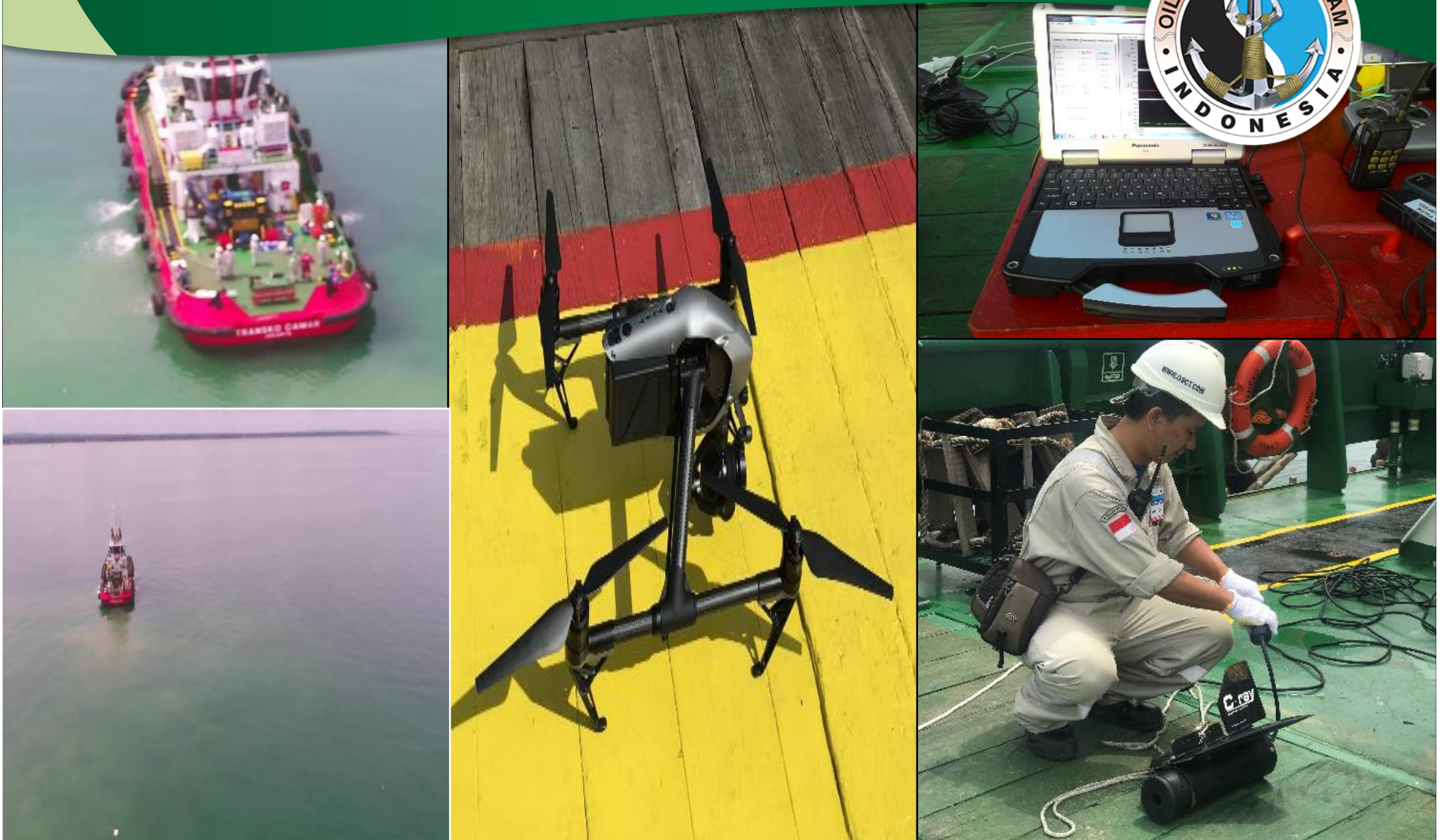
**Tandem X (Terra Sar X)**



**Sentinel (S1A)**

**According to surveillance report to monitor oil movement and ensure no further impact radar satellite detection was used using four different satellites producing daily detection reports that determine the location of vessel & drone surveillance to be deployed**





Fluorometer is operated within 0 – 20 meters depth, and live results are recorded and witness by independent surveyors combined with oil spill monitoring and surveillance using drones

## 23 Fluorometer Monitoring

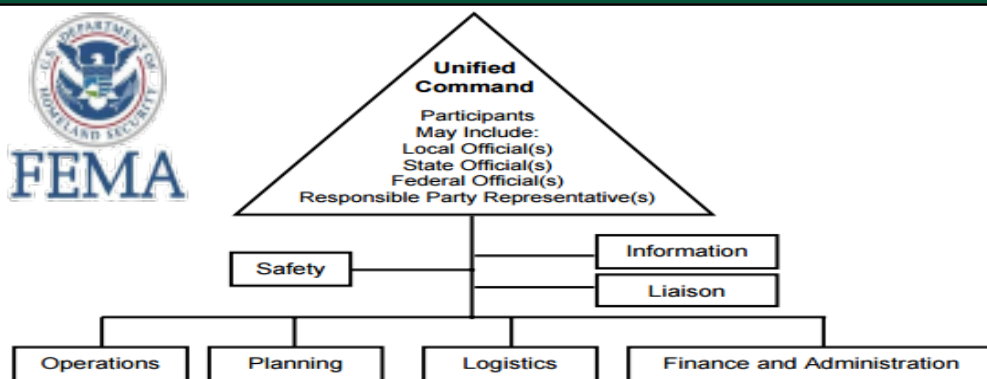






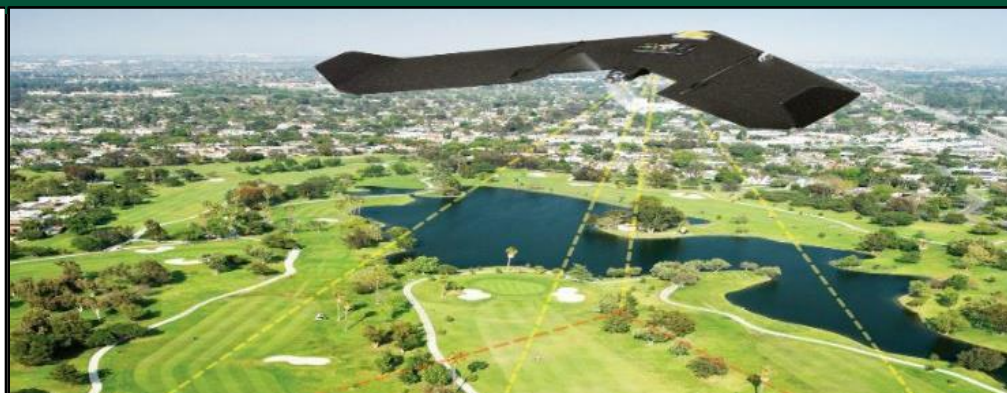
## COORDINATION & PLANNING

Major spill incident involving combined stakeholder coordination from private sector and government, important to apply **Unified Command System** to make coordination easier.



## OIL SPILL DETECTION, SURVEILLANCE & MONITORING

Oil spill monitoring is difficult to be conducted by vessel and not efficient if using helicopter. UAV (Unmanned Aerial Vehicle with IF) is instrument to monitor for wide ocean can be conducted for 24/7 continuously



## TIER-2 RESPONSE CAPABILITY REVIEW

Oil Spill response containment and recovery conducted rapidly in 2 weeks at Balikpapan Bay. Due to different risk across Indonesia, tier-2 capability requirement varies depending on risk assessments / contingency planning.



## TIER-2 SPILL WILDLIFE RESPONSE & MITIGATION

Wildlife response plan was difficult to due to diverse wildlife impact and lack of trained experts. Pre-determined wildlife response kits is being evaluated that can be deployed with experts and personnel







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**PREPAREDNESS** IS KEY TO  
A SUCCESSFUL RESPONSE

