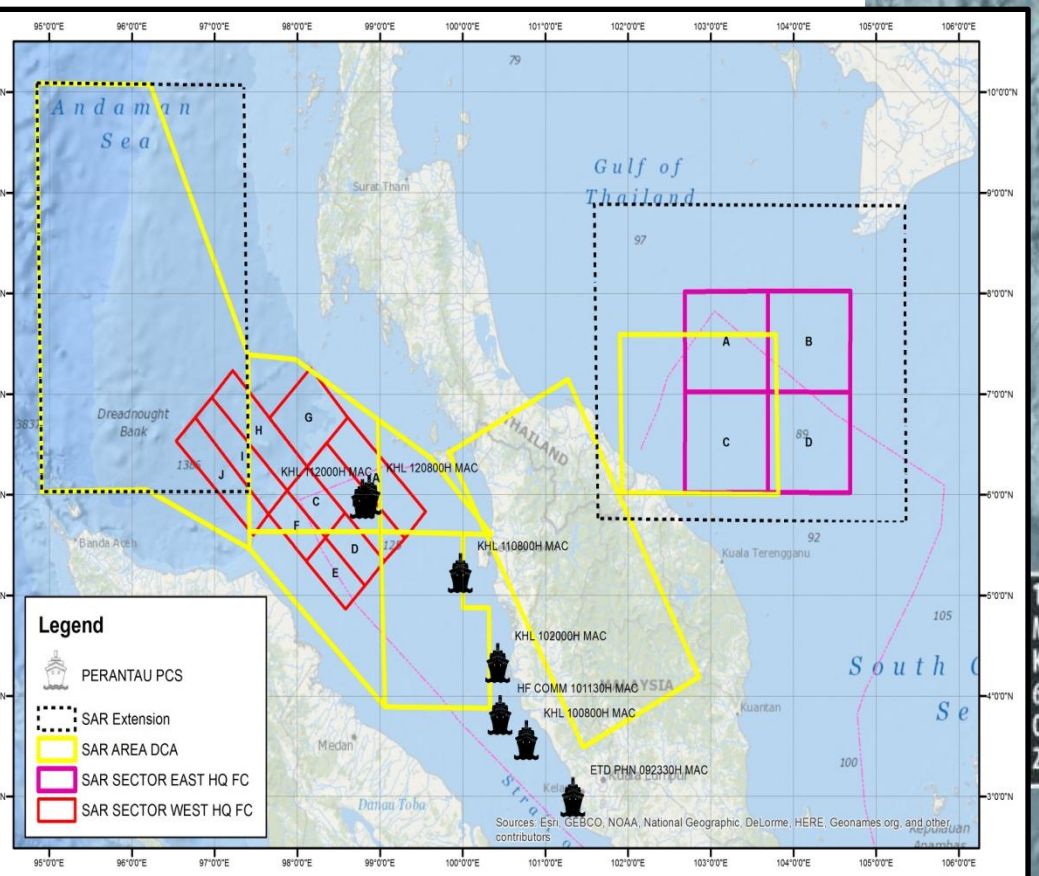
NHC EXPERIENCE BASED ON ACTIVITIES UNDERTAKEN IN SEARCH CONDUCTED FOR MH370

Background


Andaman Sea
Gulf of Thailand
Dreadnought Bank
THAILAND
MALAYSIA
Surat Thani
Banda Aceh
Kuala Terengganu
Kuantan
Medan
Danau Toba
KHL 112000H MAC
KHL 120800H MAC
KHL 110800H MAC
KHL 102000H MAC
HF COMM 101130H MAC
KHL 100800H MAC
ETD PHN 092330H MAC
A
B
C
D
E
F
G
H
J
Legend
PERANTAU PCS
SAR Extension
SAR AREA DCA
SAR SECTOR EAST HQ FC
SAR SECTOR WEST HQ FC
Sources: Esri, GEBCO, NOAA, National Geographic, DeLorme, HERE, Geonames.org, and other contributors

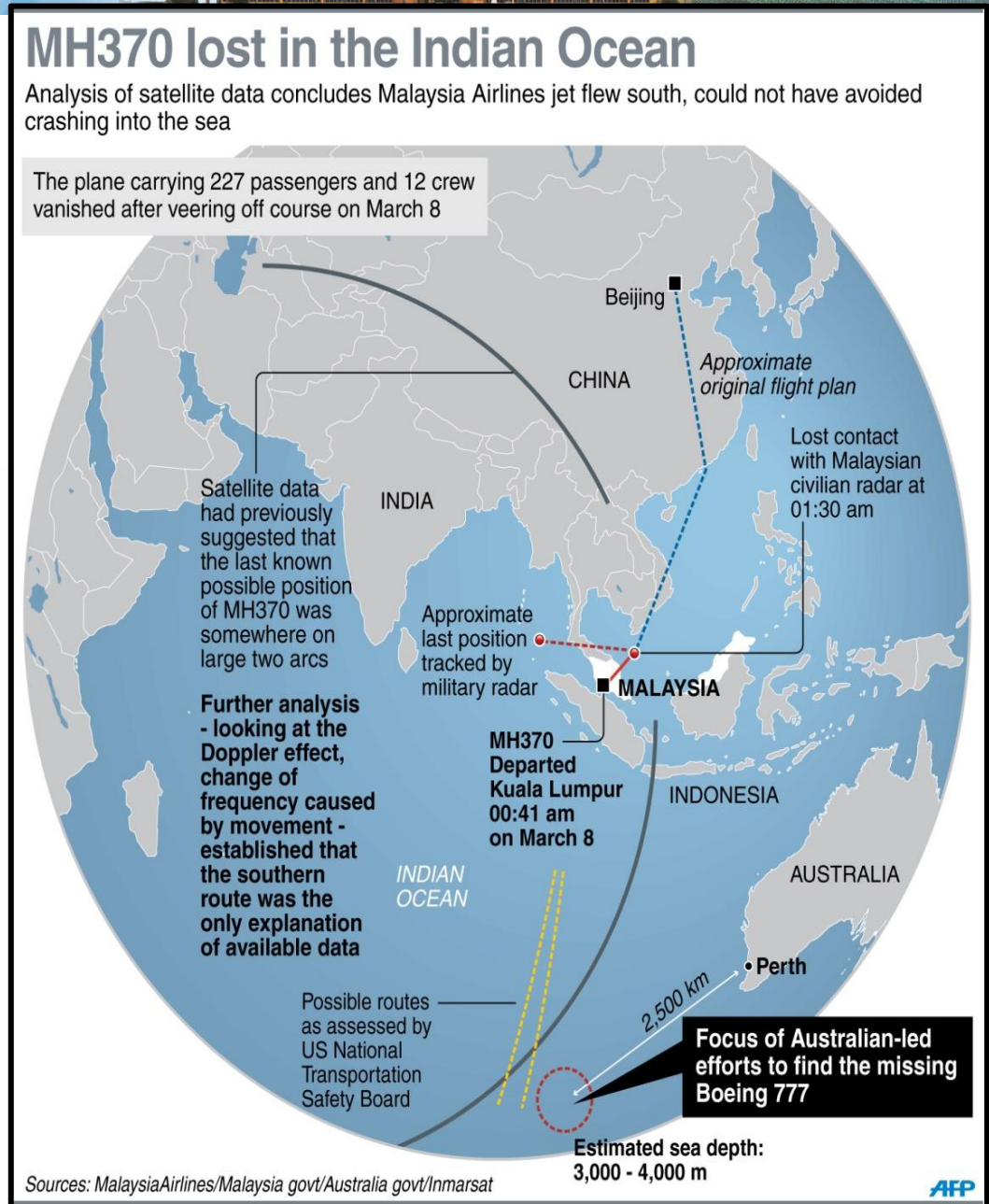

LAOS
THAILAND
CAMBODIA
VIETNAM
Andaman Islands
Intended flight path to Beijing
2:15 a.m
Northern Malacca Strait
Military radar detects what could be the jetliner 200 miles north west of Penang Island.
The military track suggests it turned northwest towards the Andaman Islands
Ho Chi Minh City
Gulf of Thailand
South China Sea
Area where plane was tracked on military radar after apparent U-turn
1:21 a.m
Last recorded sighting with air traffic control
Plane last seen on civilian radar above the waters where the South China Sea meets the Gulf of Thailand
Malacca Strait
MALAYSIA
Kuala Lumpur
Singapore
12:21 a.m Saturday 8 March
Malaysia Airlines Flight MH370 Flight departs Kuala Lumpur, due to land in Beijing at 6:30 a.m. the same day.
On board the Boeing 777-200ER are 227 passengers and 12 crew

Inmarsat Satellite Deduction

- Malaysia formed 4 ministerial committees
  - The Next of Kin (NOK)
  - The Communications, Coordination and Media
  - The Assets Deployment
  - The Technical Committee

- In April 2014, search started in Indian Ocean,

- NHC involve with the Assets Deployment Committee



Hydrographic Surveyor Involvement

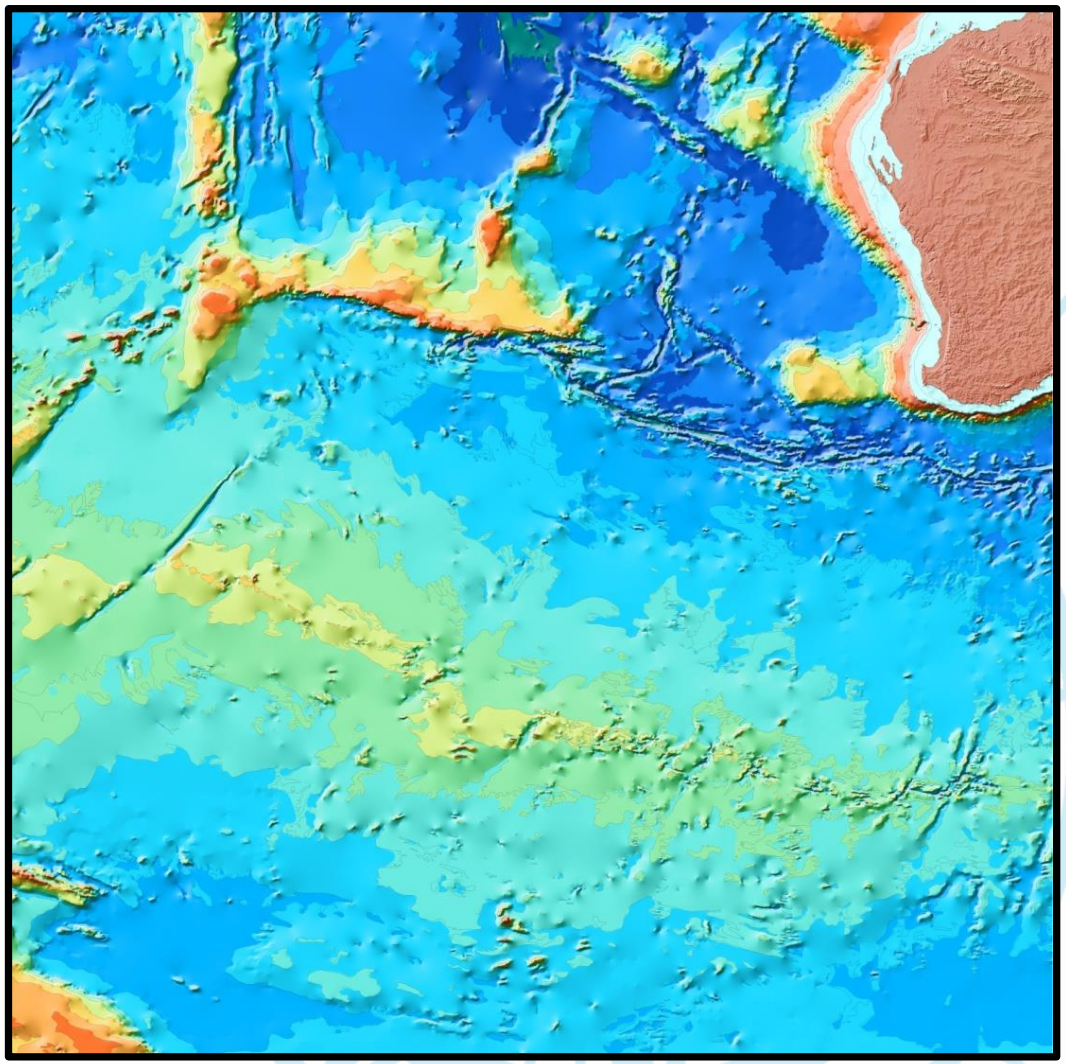
- Representative from NHC was required to assist Malaysia government
- Appointed as Malaysia Head of Team in Joint Agency Coordination Centre (JACC), Canberra, Australia
- His duties is to determine the measurement and bathymetric data collected which can be implemented effectively and efficiently.
- He is also tasked with advising and determine the needs of the assets to be used to fulfil the search mission.
- In addition, he acts as an intermediary between the teams Technical High Level Task Force (HLTTF) Malaysia and Australia.

Search Concept

- The bathymetric survey will provide crucial knowledge of the seafloor terrain to begin the actual underwater search

- Analysis of all available data to refine the best search area

- Sub-surface search of an agreed search area.



System Used

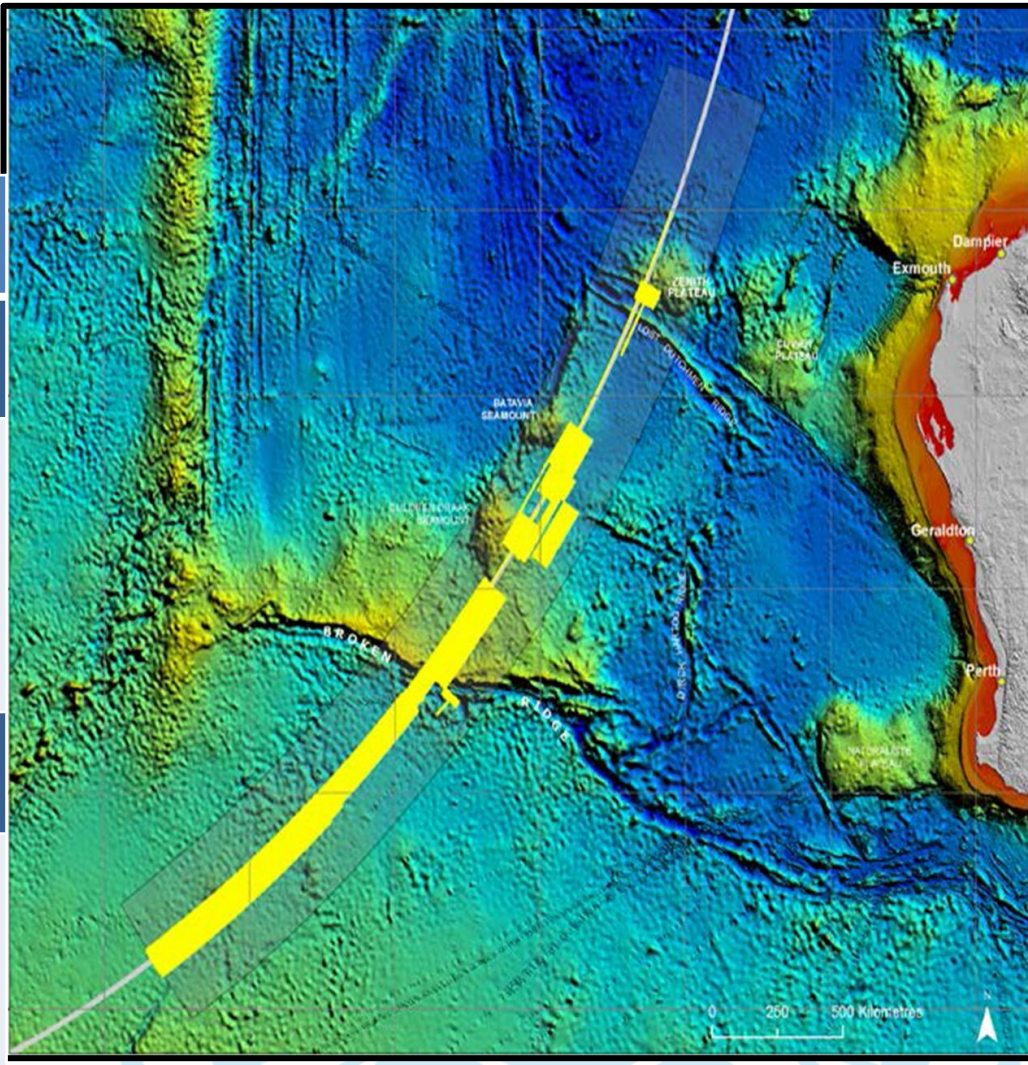
Asset Deployment	System
Bathymetric Survey	
Zhu Kezhen	Seabat 8150 (Max Depth : 12,000 m)
Fugro Equator	Kongsberg EM 302 (Max Depth : 7,000 m)
Fugro Supporter	Kongsberg EM 122 (Max Depth : 11,000 m)
Underwater Search	
GO Pheonix	Raytheon Prosas PS60 Synthetic Appeture Sonar
Fugro Equator	Edgetech 2400 Sidescan Sonar and Sub Bottom Profiler
Fugro Supporter	Kongsberg HUGIN Autonomous Underwater Vehicle
Fugro Discovery	Edgetech 2400 Sidescan Sonar and Sub Bottom Profiler

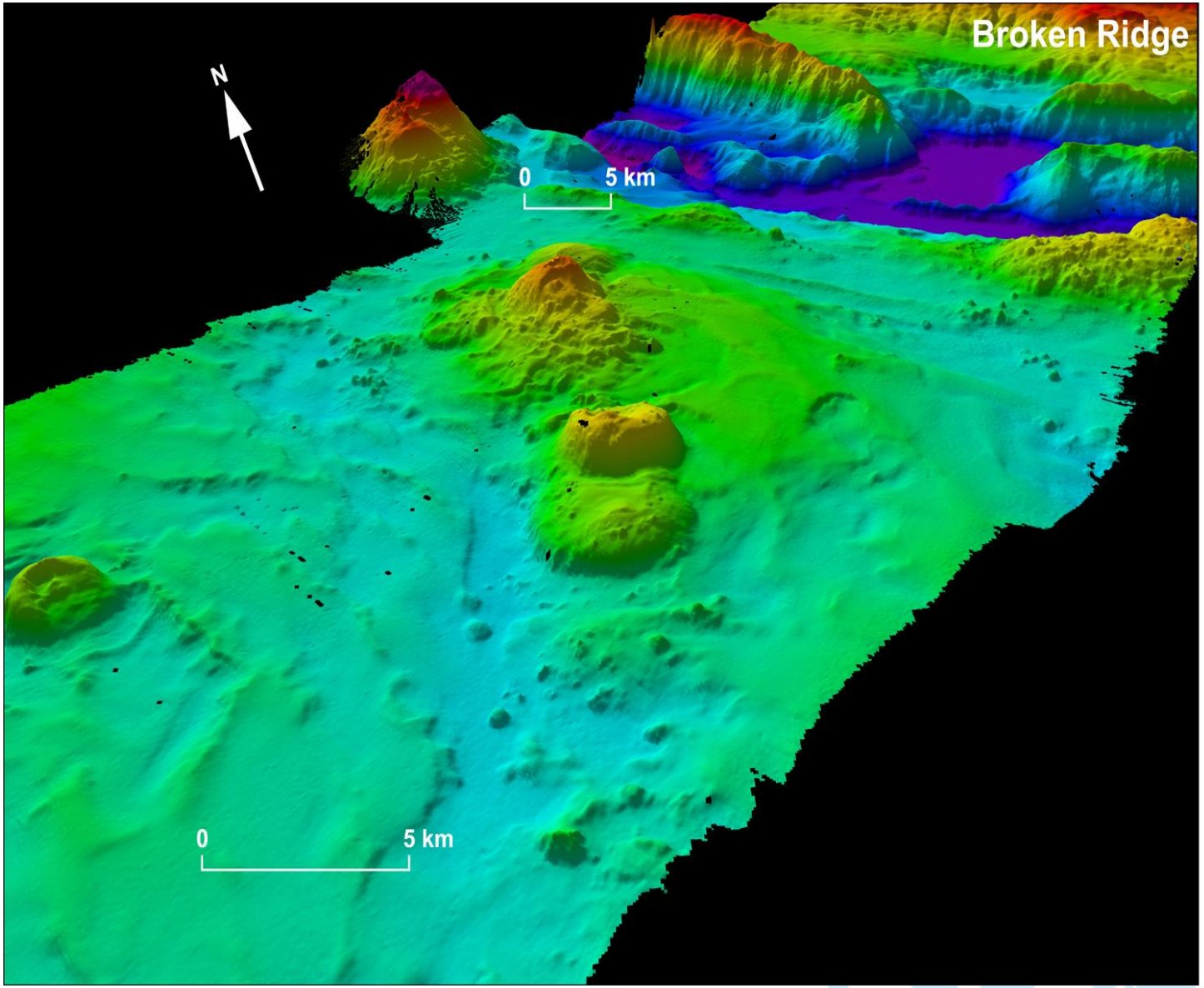
Challenges

- Area too large to locate aircraft
- The depth and topography of the seafloor
- The prevailing weather in the search area
- The efficiency and effectiveness of the available proven search methods
- Operational risk

Area Too Large

	Asset Deployment	Achievement
Bathymetric Survey		
	Zhu Kezhen	232,000 kmsq (1.1mil kmsq).
	Fugro Equator	
	Fugro Discovery	
Underwater Search		
	GO Pheonix	110,000 kmsq of 120,000 kmsq.
	Fugro Equator	
	Fugro Supporter	
	Fugro Discovery	





Australian Government

Australian Transport Safety Bureau

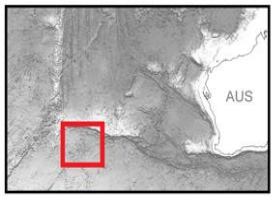
Geoscience Australia

Three-dimensional model of sea floor terrain

Depth (m)

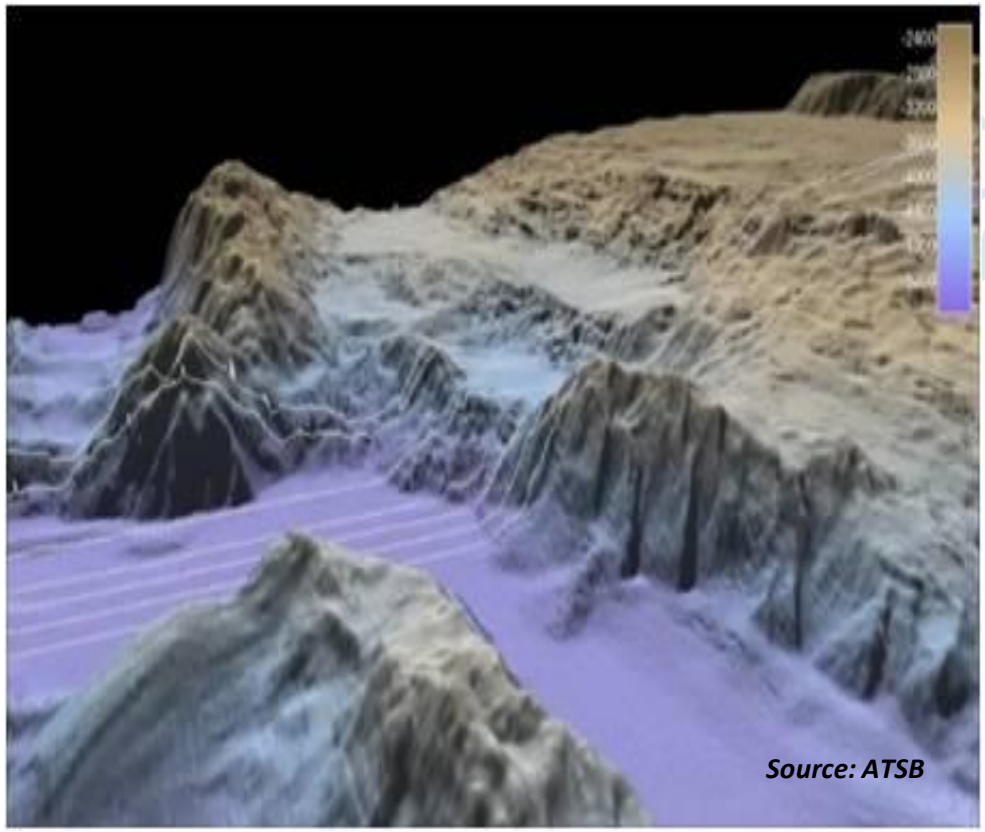
-2500

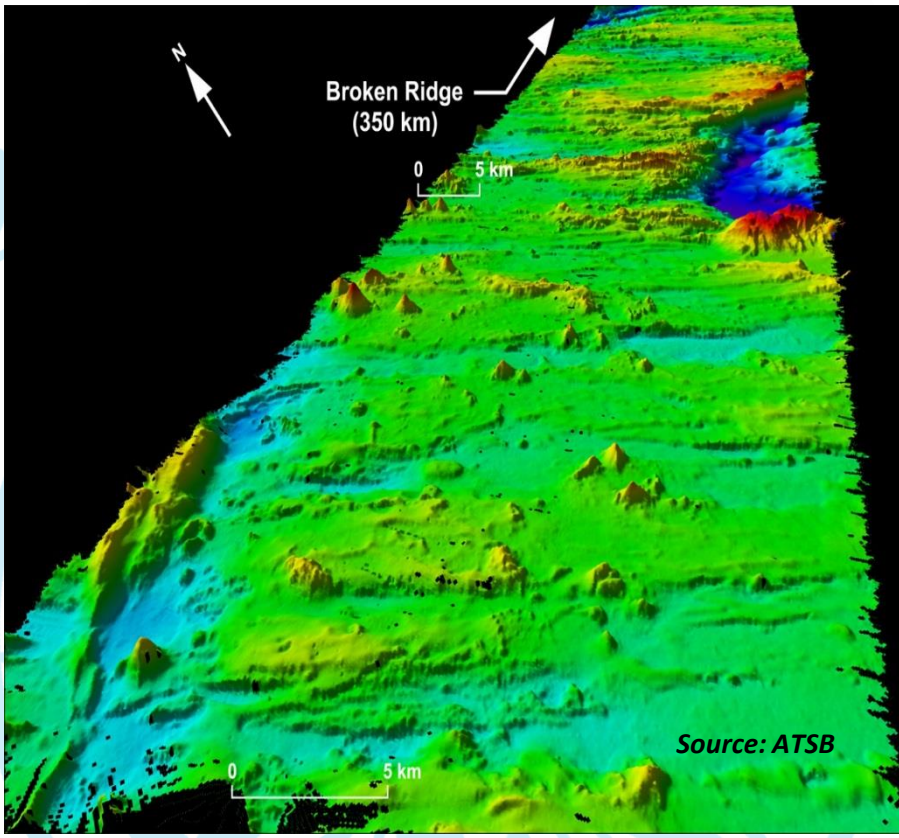
-5300



14-8592-1

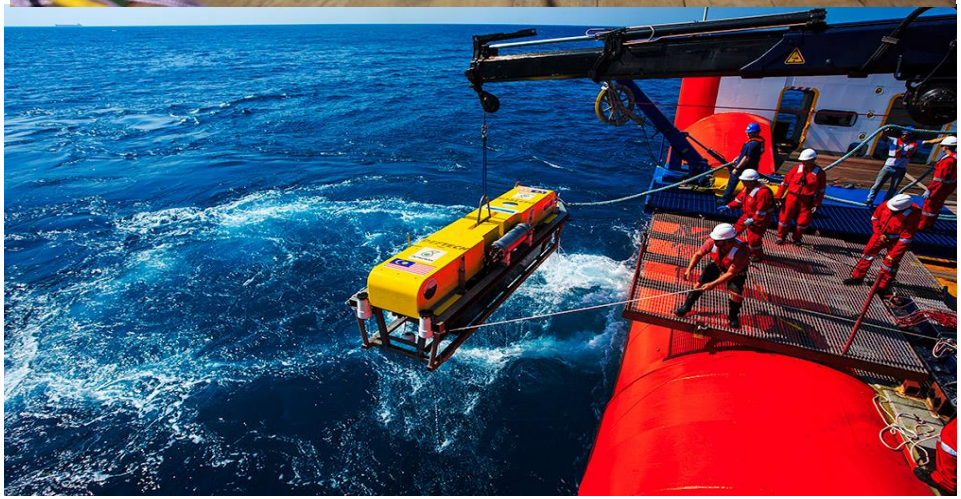
The Depth and Topography of the Seafloor

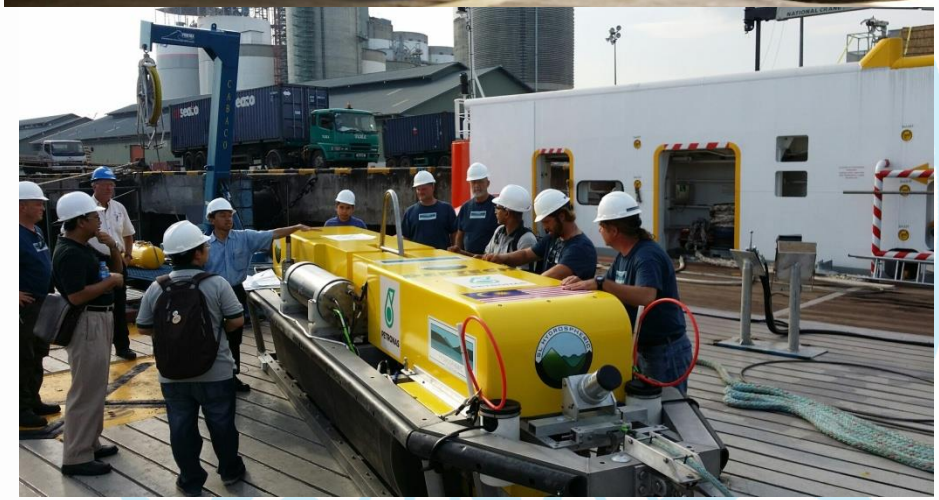




The Prevailing Weather in the Search Area

The Efficiency and Effectiveness of The Available Proven Search Methods





Operational Risk

Conclusion

- It is an advantage to have a coverage of our waters with multibeam data
- Utilization of multibeam data such as sea bottom map (backscatter)
- The requirement to study the surface current and underwater current for prediction
- Hydrographic survey cooperation among Member States for emergency respond on search

THANK YOU