United Nations Institute for Training and Research

Unitar Online Catalogue

Training on the Utilization of Satellite Imagery and Space-Based Data for Emergency Mapping and Maritime Security Enhancement

United Nations Satellite Centre UNOSAT

Deadline: 19 Sep 2025

Type:	Course
Location:	Kuantan, Malaysia
Date:	22 Sep 2025 to 26 Sep 2025
Duration:	5 Days
Programme Area:	Satellite Imagery and Analysis
Website:	https://unosat.org/
Price:	$0.00
Event Focal Point Email:	khaled.mashfiq@unitar.org

BACKGROUND

This training is part of an initiative to strengthen maritime security and coastal emergency management through the use of satellite imagery and geospatial technologies, implemented by UNITAR-UNOSAT in collaboration with the Malaysian Maritime Enforcement Agency. The programme aims to build national capacity in applying space-based data for real-time monitoring, rapid emergency mapping, and evidence-based decision-making.

Malaysia’s strategic location along major shipping routes, together with its extensive coastline and growing coastal populations, creates significant exposure to both human-driven and natural challenges. These include piracy, illegal fishing, smuggling, and environmental hazards such as oil spills, storm surges, and tsunamis. Rapid urbanisation in coastal zones further increases vulnerabilities, while limited access to reliable geospatial information and analytical expertise has constrained preparedness and response efforts.

EVENT OBJECTIVES

The training equips participants with practical skills in satellite image acquisition, baseline geospatial data collection, oil spill detection and monitoring using Sentinel-1 SAR imagery, vessel detection and tracking, and coastal impact assessment. The course concludes with a simulation exercise, enabling participants to integrate hazard, exposure, and risk information into map products and decision-support tools for operational use.

By enhancing technical capacity and promoting data-driven approaches, the programme supports Malaysia’s national objectives for maritime security, environmental protection, and coastal resilience. It contributes to the broader vision of strengthening surveillance, safeguarding maritime resources, and protecting vulnerable coastal communities.

LEARNING OBJECTIVES

At the end of the course, participants should be able to:

- Explain key concepts and terminology related to satellite imagery and geospatial technology and explore core functionalities within GIS software.
- Demonstrate techniques for collecting and pre-processing satellite imagery and baseline geospatial data for coastal and maritime applications.
- Analyse Sentinel-1 SAR imagery to monitor vessel activity and enhance maritime domain awareness.
- Detect and map oil spill extents using Sentinel-1 SAR imagery to support rapid response efforts.
- Integrate and evaluate hazard, exposure, and vulnerability datasets to model coastal inundation risk
- Produce maps to aid decision support for coastal emergency management and maritime security operations.

CONTENT AND STRUCTURE

The course introduces the application of satellite imagery and geospatial technology to support emergency mapping, coastal risk management, and maritime security operations. It begins with foundational modules on satellite image acquisition, Earth Observation (EO) data pre-processing, and the collection of baseline geospatial datasets from open data platforms. Participants then learn to apply GIS and remote sensing tools to analyze coastal hazards, including tsunamis and storm surges, as well as to detect and map oil spills for rapid environmental response. Practical sessions include vessel detection and monitoring using Sentinel-1 SAR data, along with the integration of hazard, exposure, and vulnerability information to model coastal risks. The course concludes with the design and production of operational maps and decision-support products, culminating in a simulation exercise that reinforces the skills gained throughout the training.

METHODOLOGY

This is a full-time, in-person training program that combines lectures, interactive discussions, and intensive hands-on lab exercises. Participants will work with open-source GIS and remote sensing software, applying real-world datasets relevant to maritime security and coastal emergency management. The program is designed to be highly practical, with approximately 60% of the time dedicated to lab-based exercises and case studies, while the remaining 40% focuses on lectures, demonstrations, and group discussions.

The course is organized into six interconnected modules, progressing from foundational concepts of satellite data and geospatial analysis to more advanced applications, including oil spill detection and mapping, vessel detection and monitoring, and coastal hazard risk modeling for events such as tsunamis and storm surges. The training methodology emphasizes experiential learning, featuring live demonstrations, guided hands-on exercises, scenario-based simulations, and the development of operational maps and decision-support products for real-world coastal and maritime emergency scenarios.

TARGETED AUDIENCE

The course is designed for selected officers and technical staff from the Malaysian Maritime Enforcement Agency with responsibilities in maritime surveillance, emergency response, and coastal security operations. Participants should ideally have a basic understanding of GIS, remote sensing, or related geospatial tools; however, the training is structured to accommodate varied technical backgrounds.
This training is recommended for individuals motivated to apply geospatial and satellite methods in their operational duties. Selected participants are expected to integrate the skills gained into ongoing maritime security, emergency preparedness, and environmental monitoring efforts, thereby strengthening institutional capacity and inter-agency coordination.

ADDITIONAL INFORMATION

Lab exercises will be based on open-source software and tools.