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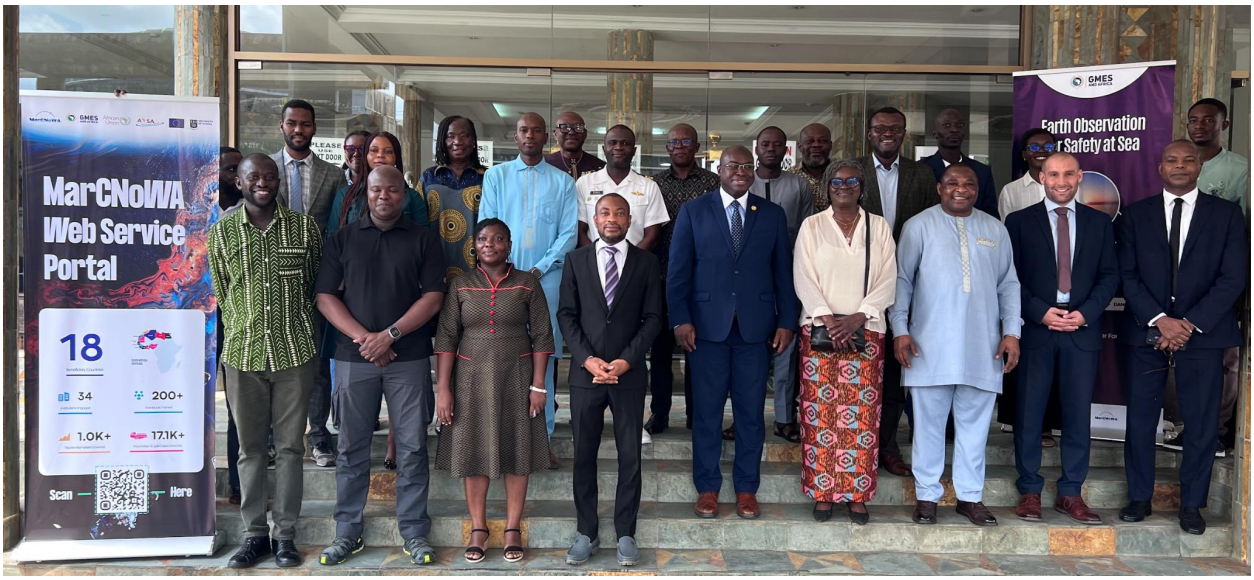

Regional Workshop on Oil Spill Monitoring and Response in West Africa

11 – 13 November, 2025

Accra, Ghana

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1. Executive Summary

Oil spills continue to pose a significant threat to marine and coastal ecosystems, livelihoods, maritime safety and regional stability in West and Central Africa. Increasing offshore petroleum activities, dense shipping traffic and transboundary ocean dynamics mean that effective oil spill preparedness and response can no longer rely solely on patrols, ad hoc reporting or post-incident assessments. In this context, Earth Observation (EO)–based monitoring and predictive modelling provide a critical capability for early detection, objective evidence generation and informed decision-making. The Regional Workshop on Oil Spill Monitoring and Response brought together national authorities, regional institutions and technical partners to strengthen the operational use of EO tools, with particular emphasis on the MarCNoWA Oil Spill Detection and Drift Modelling Service, and to align these capabilities with obligations under the Abidjan Convention.

The workshop demonstrated how the MarCNoWA web portal operationalizes satellite-based monitoring through automated ingestion of Sentinel-1 SAR imagery, near-real-time oil slick detection, and the integration of GNOME-based drift modelling. Participants were introduced to the full workflow, from accessing detections and reviewing slick characteristics to exporting standardized datasets and running short- to medium-term drift forecasts. These capabilities were widely recognized as addressing critical gaps within existing National Oil Spill Contingency Plans (NOSCPs) and POLMAR frameworks, particularly in the areas of early warning, spill characterization, forecast-based planning and systematic archiving of incident information.

Country presentations and technical discussions highlighted varying levels of institutional readiness across the region, but a shared recognition of the need for harmonized approaches. National teams identified specific legal, institutional and data-sharing gaps that currently limit the routine use of EO-derived information in oil spill monitoring and response. At the same time, the workshop confirmed that existing legal mandates under environmental protection, maritime safety and pollution control laws—when viewed alongside the Abidjan Convention and its Emergency Protocol—provide a sound basis for adopting EO-based monitoring tools. The MarCNoWA service was therefore seen not as a parallel system, but as an enabling layer that strengthens national and regional compliance with agreed marine pollution obligations.

A major outcome of the workshop was the developing action plans for the integration of EO driven tools and information in oil spill monitoring efforts, and training manuals to support NOSCP. These documents outline practical steps for embedding MarCNoWA products into national SOPs, clarifying inter-agency roles, establishing focal points, and defining notification and escalation pathways. Participants also received hands-on technical training on the operational use of the portal and drift modelling tools, improving confidence among environmental agencies, maritime administrations, navies, coast guards and fisheries authorities in applying EO-derived information within their daily monitoring and emergency response functions.

The workshop further secured concrete commitments towards operational uptake. Notably, Ghana, through its Environmental Protection Authority, volunteered to integrate the MarCNoWA oil spill detection tool into a planned simulation exercise under the Obangame Express framework in 2026. Obangame Express is a major multinational maritime exercise in the Gulf of Guinea focused on enhancing regional maritime safety and security, and its use as a testbed for EO-driven oil spill monitoring represents an important step towards mainstreaming these tools within real-world, multi-agency operations. In addition, discussions on stakeholder engagement underscored the potential value of involving coastal communities and schools through citizen science approaches, complementing satellite-based monitoring with local awareness and reporting mechanisms.

Based on the workshop outcomes, a set of forward-looking recommendations was agreed. These include embedding EO spill detection and drift analysis into national SOPs; harmonising data-sharing standards and reporting procedures under the Abidjan Convention; expanding technical and operational training across the region; and strengthening systems for real-time cross-border notification and coordination. Together, these actions provide a coherent pathway for sustaining the use of EO-based oil spill monitoring beyond project cycles and for enhancing regional preparedness and cooperation.

2. Background and Rationale

West African coastal states face growing risks from offshore petroleum activities, maritime traffic, and accidental discharges.

The MarCNoWA Oil Spill Monitoring Service (MOSM) provides early detection and drift forecasting using Sentinel-1 SAR, Copernicus Marine data, and machine-learning detection models. MOSM is developed with fast-processing tools that steps through SAR imageries. An adaptive thresholding technique is employed to differentiate between ocean clutter and pixels with slicks. The detection are then served on a web portal which can be filtered queried by a user. This capability supports obligations under the Abidjan Convention Emergency Protocol and contributes to UNEP–GEMS Ocean Programme's mandate for enhanced ocean monitoring and early warning systems.

3. Workshop Objectives

1. The workshop sought *to build national capacity in the operational use of the MarCNoWA oil spill detection and drift modelling tools*, ensuring that officers are equipped to interpret satellite-derived information and apply it effectively within their monitoring

and response mandates. A key objective was to support the integration of Earth Observation (EO) products into existing National Oil Spill Contingency Plans (NOSCPs), enabling countries to incorporate modern surveillance and forecasting capabilities into their preparedness and response frameworks.

2. The workshop also aimed *to strengthen inter-agency cooperation by bringing together environmental authorities, maritime administrations, navies, coast guards, and fisheries institutions to foster a shared understanding of how EO-based systems can enhance national incident management workflows*.
3. Finally, the workshop sought *to establish clear pathways for regional data sharing and collaboration, recognizing that oil spill events often have transboundary dimensions and require coordinated action* among neighbouring coastal states.

4. Participation

The workshop convened representatives from Environmental Protection Agencies, Maritime Authorities, National Navies, Coast Guards, Fisheries Commissions, Hydrographic Services, academic institutions, and regional bodies across West Africa.
Technical experts from UNEP–GEMS Ocean, Abidjan Convention Secretariat, and the University of Ghana's MarCNoWA Project facilitated the sessions.

5. Summary of Proceedings (Day-by-Day)

Day 1

Opening statements and keynote addresses.

Opening statements and keynote addresses were delivered by senior representatives to set the strategic tone of the workshop and reaffirm institutional commitment to strengthening marine pollution preparedness in West Africa. The Provost of the College of Basic and Applied Sciences (CBAS) welcomed participants and underscored the role of academia and regional centres in delivering practical EO-enabled services that support national mandates, capacity development, and long-term sustainability. UNEP highlighted the broader environmental and governance imperative of improving oil spill readiness, emphasizing coordination, evidence-based decision-making, and alignment with regional obligations under the Abidjan Convention framework. A representative of the Regional Seas Programme reinforced the importance of regional coherence, timely information-sharing, and harmonized procedures to manage transboundary spill risks across the Gulf of Guinea. The President of the African Space Agency (AfSA) emphasised the growing relevance of African-led space and Earth observation capabilities for operational environmental services, encouraging strengthened partnerships and uptake of EO and geospatial tools to support national response systems and regional cooperation.

Presentation of the MarCNoWA web portal

The workshop featured a detailed presentation of the MarCNoWA Web Portal, the central online platform developed under the GMES & Africa Programme to operationalize satellite-based marine monitoring services across West and North Africa. The portal brings together multiple Earth Observation (EO) applications—ranging from oil spill and ship detection to transshipment monitoring—within an accessible interface designed for environmental, maritime and security agencies across the region.

Developed by the University of Ghana's Regional Marine Centre in collaboration with eleven consortium partners, the portal serves the 18 coastal countries from Nigeria to Egypt, providing tools that complement national surveillance mechanisms and strengthen regional situational awareness. It is accessible through a lightweight, browser-based interface, ensuring usability across institutions regardless of their computational capacity or bandwidth constraints.

Core Features and Functional Modules

The presentation highlighted the portal's modular architecture, with each section corresponding to a key MarCNoWA EO service area:

- **Oil Spill Detection and Dissipation Modelling**
  The portal hosts an automated workflow that ingests Sentinel-1 SAR imagery every three hours via Linux-based cron jobs. Processing pipelines built using Python,

dask_image and optimised geolocation routines generate cleaned, masked and georeferenced detection outputs. These detections, including pixel-level targets and classified slick extents, are then uploaded to the portal in near-real time. Users can visualise slick locations, review associated metadata and generate dissipation forecasts using GNOME (https://response.restoration.noaa.gov/gnome-desktop).

- **Ship Detection from SAR Sensors**
  The portal integrates both active (radar) and passive (optical) vessel detection products, enabling agencies to identify ships even under cloud cover or at night. Detection layers include target position, vessel footprints, and confidence scores. This supports maritime domain awareness and helps identify vessels in proximity to oil slicks.
- **Transshipment Monitoring**
  A dedicated module processes AIS data to detect potential transshipment events. Using a pairwise distance-computation algorithm that evaluates proximity between vessels for every minute of the day, the system flags suspicious interactions, displays duration of close vessel encounters, and generates CSV outputs for enforcement agencies. The portal also integrates Spire-derived "shipview" data for enhanced coverage.

Operational Relevance and User Engagement

The presentation underscored how the portal supports national and regional agencies responsible for environmental protection, maritime security, and fisheries management. By combining EO-based detection with drift modelling and cross-checking with vessel movements, the system provides a powerful evidence base to support:

- pollution response units,
- environmental compliance authorities,
- coastguards and navies,
- fisheries departments, and
- regional coordinating bodies.

Participants noted that real-time access to oil spill evidence, vessel tracks, and transshipment alerts could significantly strengthen monitoring, reporting, and enforcement actions under the Abidjan Convention's Emergency Protocol.

Support from UNEP – GEMS project for oil spill monitoring

The UNEP–GEMS Ocean Programme was established to provide a unifying framework for global, regional and national efforts to observe, understand and manage the marine environment. At its core, GEMS seeks to ensure that countries and regional organizations have reliable access to high-quality ocean and coastal data, analysis tools and information services that can directly support environmental protection, sustainable resource management and informed decision-making. By promoting interoperable data systems, shared methodologies and open access to

Earth Observation (EO) products, GEMS plays a central role in strengthening the capacity of nations to address transboundary challenges such as marine pollution, climate-driven ecosystem change and biodiversity loss.

GEMS' mandate is particularly relevant to regions like West and Central Africa, where coastal ecosystems are highly productive yet vulnerable, and where effective monitoring requires coordinated action across multiple jurisdictions. The Programme's commitment to building partnerships, harmonising data streams and supporting early warning systems provides an essential platform upon which regional initiatives can anchor their operational work. Through this approach, GEMS helps to ensure that EO-derived information is not only available but also organized in a way that enables regional institutions to collaborate, respond promptly to environmental threats and integrate scientific evidence into policy processes.

Within this context, the collaboration between GEMS and the MarCNoWA Project has emerged as a practical demonstration of how global frameworks can support regional operational needs. Working together, both initiatives have advanced the co-design of EO-driven monitoring services that address specific priorities of West and North African coastal states—most notably the detection and prediction of oil spills, a major transboundary hazard. GEMS provides the overarching architecture for data interoperability, access to global EO products and alignment with international standards, while MarCNoWA contributes regional expertise, user engagement and operational service development tailored to national institutions.

A key dimension of this collaboration is capacity strengthening. Through joint training activities, stakeholder engagement processes and hands-on demonstrations, GEMS and MarCNoWA have equipped national agencies with the knowledge and tools required to interpret satellite-derived indicators, use drift modelling outputs, and integrate EO data into routine monitoring and emergency response workflows. This partnership model has reinforced national ownership of EO services while ensuring their consistency with broader regional and global initiatives.

As the region continues to face complex environmental pressures—from offshore industrial expansion to climate-related risks and biodiversity decline—the role of UNEP–GEMS as a coordinating mechanism becomes even more important. Sustaining and deepening this collaboration with MarCNoWA will be essential for ensuring that EO-based monitoring systems remain operational, accessible and relevant to national institutions, and that regional cooperation on marine environmental management continues to strengthen over time.

Abidjan Convention Obligations for the Protection of the Marine and Coastal Environment

Obligation to Prevent, Reduce and Control Marine Pollution

The Abidjan Convention places a clear obligation on Parties to adopt all necessary measures to prevent, reduce, control and eliminate pollution affecting the marine and coastal environment. This responsibility encompasses both chronic pollution pressures and acute hazards such as oil spills, which can cause significant ecological and socio-economic damage. Effective fulfilment of this obligation requires not only national preparedness but also the ability to detect pollution events early, track their evolution and respond before impacts intensify or spread to neighbouring jurisdictions.

The MarCNoWA Oil Spill Detection and Drift Modelling Service provides a practical and operational mechanism for Parties to act on this obligation. By integrating Sentinel-1 SAR imagery, automated detection algorithms, and near-real-time modelling, the service enables authorities to identify oil slicks that would otherwise remain unnoticed, especially offshore or in periods of low visibility. The dissipation and drift forecasts support the prioritization of risk areas, the planning of containment actions, and the mobilization of national contingency resources. In doing so, the service equips Parties with the technological capacity needed to transition from episodic response to continuous, evidence-driven pollution surveillance, directly strengthening compliance with the Convention's preventive and control measures.

Training and institutional support form an integral part of this obligation. Capacity building on the interpretation of satellite detections, understanding spill morphology, and applying drift model outputs ensures that national officers can confidently incorporate EO-derived insights into operational workflows. The development of harmonized SOPs across countries further enhances regional coherence, ensuring that the Convention's pollution control commitments are met through sustained, coordinated practice.

Emergency Protocol – Early Warning, Reporting and Mutual Assistance

The Emergency Protocol to the Abidjan Convention requires Parties to establish early warning mechanisms, maintain functional national contingency plans, and ensure timely reporting of marine pollution incidents to neighbouring states and the Secretariat. These provisions recognize that oil spills are inherently transboundary threats whose impacts often exceed national boundaries, requiring rapid information exchange and coordinated response.

The MarCNoWA monitoring service is uniquely aligned with these obligations. It serves as a regional early-warning platform, offering a shared operational picture of oil spill events across West and Central Africa. Satellite detections provide objective, time-stamped evidence of pollution incidents, while drift forecasts allow national authorities to evaluate potential cross-border movement and determine when regional alerts should be triggered. By standardizing how slicks are identified, mapped and characterized, the service enhances the consistency and credibility of notifications issued through national and regional channels under the Emergency Protocol.

Capacity building around notification workflows, incident validation, and the integration of MarCNoWA outputs into national contingency plans is essential for strengthening implementation. Training exercises that simulate cross-border spill scenarios can help agencies practice escalation procedures, clarify roles and ensure that information-sharing processes function effectively. These activities reinforce mutual assistance obligations and promote a coordinated regional posture for emergency marine pollution management.

Monitoring, Assessment and Information Exchange

The Convention also obliges Parties to cooperate in scientific and technical fields related to environmental monitoring, data exchange and joint assessment of marine and coastal conditions. A major goal of this cooperation is the establishment of harmonised monitoring programmes that allow countries to track pollution trends, understand environmental pressures and collectively address shared risks.

The MarCNoWA oil spill service is a foundational component of such a monitoring system. It provides routine, standardised detection products and long-term time-series data that enable Parties to quantify the frequency, distribution and characteristics of oil slicks across their waters. These outputs can be integrated into national environmental reporting frameworks, regional assessments and thematic analyses on pollution pressures. By offering a common data standard and analysis environment, MarCNoWA supports the Convention's commitment to coordinated, evidence-driven environmental governance.

To operationalise these monitoring responsibilities, Parties must strengthen their national capacities in data management, metadata standards, archiving, and spatial analysis. Training on the use of MarCNoWA analytics—such as time-series graphs, hotspot density maps and seasonal trend summaries—will enable agencies to produce regular monitoring reports. The establishment of a regional data-sharing protocol under the Abidjan Convention will further ensure that information is exchanged transparently and consistently, fulfilling the Convention's objectives on scientific cooperation.

Protection of Sensitive Habitats and Biodiversity

Central to the Abidjan Convention and its related protocols is the safeguarding of sensitive ecosystems, including mangroves, wetlands, estuaries, seagrass beds, coral communities and Marine Protected Areas (MPAs). Oil pollution poses a significant risk to these habitats, degrading ecosystem functions, undermining fisheries productivity and threatening species such as marine mammals, seabirds and marine turtles.

By linking oil spill detections and drift forecasts with ecological and socio-economic layers, the MarCNoWA service enhances a country's ability to assess risks to biodiversity and prioritise protection measures. Authorities can quickly identify which habitats lie in the forecast path of a spill, estimate exposure windows and plan interventions to reduce impact. This capability is particularly critical for protecting fisheries nursery grounds and coastal livelihoods, ensuring that ecosystem conservation objectives under the Convention are operationalised in real time.

Strengthening biodiversity protection requires building national capacity in GIS integration, sensitivity mapping and ecological risk assessment. Training officers to overlay MarCNoWA outputs with national habitat inventories, MPAs and coastal infrastructure enhances their ability to produce vulnerability assessments and inform policy decisions. This approach supports not only pollution control but also broader commitments on sustainable resource management and biodiversity conservation.

Institutional Coordination and Capacity Strengthening

The effective fulfillment of Abidjan Convention obligations depends heavily on strong institutional coordination across environment, maritime, naval, fisheries and emergency response agencies. Oil spill response, in particular, involves multiple institutions with complementary roles, making clarity of responsibilities and seamless information flow essential.

The MarCNoWA platform provides an opportunity to reinforce this coordination by serving as a central operational interface accessible to all mandated agencies. By standardising procedures for monitoring, validation, drift modelling and reporting, the service facilitates collaboration and reduces institutional fragmentation. Countries can use the platform to support inter-agency decision-making, simulate response scenarios and align national operational practices with regional expectations under the Convention.

Training, joint exercises and the development of harmonised SOPs form the backbone of institutional strengthening. A structured programme focused on portal use, incident workflows, notification chains and emergency simulation will help agencies institutionalise these practices. Moreover, embedding MarCNoWA-based procedures within national contingency plans

ensures long-term continuity and alignment with regional frameworks, establishing the sustained capacity needed for ongoing compliance with the Abidjan Convention.

Country presentations on oil spill incidents, monitoring capacity, and institutional mandates.

Country	Recent Oil Spill Incidents / Exposure	Monitoring Capacity & Tools	Lead Institutions & Framework	Priority Capacity-Building Needs (EO & Modelling)
Nigeria	Egina FPSO spill (Nov 2023); large offshore incident, managed without shoreline impact.	Space-borne sensors (Sentinel-1, NigerSat), Drones, Gas Flare Tracker, Aerial surveillance, NIMASA Deep Blue C4i.	NOSDRA as lead; NOSCP; OPRC 1990, Merchant Shipping Act, Abidjan Convention; strong but complex multi-agency set-up.	Advanced SAR interpretation; operational drift modelling; SOPs for using MarCNoWA outputs; inter-agency data-sharing protocols.
Sierra Leone	No major recorded oil spill to date, but high risk from tanker traffic along the coast.	Some level of at-sea field monitoring (minimal aerial/satellite surveillance) but no fully developed operational EO system yet.	SLMA leads; cooperating agencies: EPA, Navy, Port Authority, NDMA; NOSCP in place, regulations under development.	Training on spill modelling software, satellite data interpretation; design of real-time monitoring and alert system; clearer institutional roles and data-sharing.

Country	Recent Oil Spill Incidents / Exposure	Monitoring Capacity & Tools	Lead Institutions & Framework	Priority Capacity-Building Needs (EO & Modelling)
Togo	SKS DARENT ship-to-ship incident (2018) with ~10 m^3 spilt; coastal contamination but controlled through POLMAR activation.	Aerial patrols; national alert network using all maritime actors (navy, gendarmerie, operators, fishers) under Plan POLMAR.	National Plan POLMAR; strong “Action de l’État en Mer” framework; Prefect Maritime coordinates operations; multiple ministries involved.	Modern EO and modelling tools; more equipment and trained teams; detailed protection plans for sensitive sites; regular exercises incorporating satellite detection and drift models.
Mauritania	In 2020, fishing vessel with IFO 350 sank off Cap Blanc; POLMAR Tier 2 response and exclusion zone; Earlier “orphan slick” event with 170 km oiled coastline.	Use of satellite images from providers, aerial surveillance (Air Force, operators), naval assets (Navy, Coast Guard, fishers).	National POLMAR Plan (Decree 2018-023); lead ministries for maritime and environment; Coast Guard MRCC as 24/7 alert center.	Real-time detection models; training on satellite data interpretation and spill modelling; joint exercises; regional agreements for transboundary response and harmonized dispersant policies.

Country	Recent Oil Spill Incidents / Exposure	Monitoring Capacity & Tools	Lead Institutions & Framework	Priority Capacity-Building Needs (EO & Modelling)
Senegal	2020 pollution event near Mbour/Somone lagoon; reddish slick observed along several coastal sites; coordinated by HASSMAR.	National oil spill surveillance system; national maritime information system (SNIM) under development; establishment of CENPOLMAR.	HASSMAR leads; multiple agencies under a national marine pollution response structure; emphasis on MPAs and sensitive sites.	Training on spill-modelling software; additional anti-pollution equipment; harmonized regional alert and intervention procedures; strengthened legal enforcement.

Country	Recent Oil Spill Incidents / Exposure	Monitoring Capacity & Tools	Lead Institutions & Framework	Priority Capacity-Building Needs (EO & Modelling)
Côte d'Ivoire	Major FPSO spill (Espoir, 2006) and multiple recent EO-detected slicks (32 cases 2021–2022 in territorial sea, contiguous zone, EEZ).	CIAPOL/CIPOMAR runs surveillance via drones, satellite remote sensing (Copernicus, MarineTraffic, etc.), GIS/RS tools (ArcGIS, QGIS, ENVI, SNAP), and modelling tools (ADIOS, OILMAP).	Plan POLLUMAR (1985, updated 2015) under Environment Ministry; CIAPOL as operational authority; strong inter-ministerial crisis committee (CIL).	Advanced training on SAR analysis and spill-modelling (OILMAP, WITOIL, MOTHY, etc.); real-time detection platforms; updated contingency plan and maritime surveillance procedures; enhanced regional data-sharing.

Country	Recent Oil Spill Incidents / Exposure	Monitoring Capacity & Tools	Lead Institutions & Framework	Priority Capacity-Building Needs (EO & Modelling)
Benin	No significant oil spill reported; new risk from Niger–Benin export pipeline and WAPCO terminal.	National oil spill monitoring system still “in progress”; current capacity limited.	Benin Navy engaged; broader legal/institutional framework for pollution yet to be fully developed around pipeline export context.	Foundational capacity-building to design and operationalise a national oil spill monitoring system, including EO detection, drift modelling and contingency planning.

Day 2

Country presentations on Legal, Institutional & Data-Sharing Considerations

Country	Legal Considerations	Institutional Setup	Data-Sharing Status / Gaps	How UNEP-GEMS / Abidjan Convention / MarCNoWA Can Help
Côte d'Ivoire	POLLUMAR plan (updated 2015) and environment code already allow use of EO, modelling and remote sensing in surveillance and response.	CIAPOL/CIPOMAR leads operational monitoring; inter-ministerial crisis committee (CIL) activates during major incidents.	EO data used, but no unified regional-standard data model; sharing mainly via ad hoc reports.	Support formal inclusion of MarCNoWA layers in POLLUMAR; standardise formats/metadata; use GEMS/Abidjan to promote regional data protocols and joint exercises led by CIAPOL.
Mauritania	Decree 2018-023 on POLMAR and Abidjan Convention obligations provide legal basis for marine pollution monitoring and response; EO use is compatible but not yet formalised.	Coast Guard MRCC is 24/7 alert centre; AMAM and environment authority coordinate POLMAR activation.	Data flow centred on MRCC; limited regional SOPs for sharing satellite-derived alerts and model outputs.	Help embed MarCNoWA alerts/drift products in POLMAR annexes; develop Abidjan-branded cross-border notification SOPs; GEMS to assist in designing archive and access rules for MRCC-held EO data.
Nigeria	NOSDRA Act, NOSCP, Merchant Shipping Act, OPRC '90 and Abidjan Convention already endorse	NOSDRA leads; NIMASA, NPA, Navy, NIOMR and others support within ICS/NOSCP framework.	Several platforms (OSM, Deep Blue, etc.); data fragmented across	Use GEMS/Abidjan to convene an inter-agency data task force; adopt MarCNoWA as common EO backbone for OSM; develop shared SOPs and

Country	Legal Considerations	Institutional Setup	Data-Sharing Status / Gaps	How UNEP-GEMS / Abidjan Convention / MarCNoWA Can Help
	monitoring, evidence collection and use of modern technologies.		MDAs; EO outputs not yet harmonised under one schema.	"polluter-pays evidence packs" based on portal outputs.
Senegal	POLMAR plan and Decree 2006-322 (Action de l'État en Mer) provide mandate for prevention and response; compatible with Abidjan Convention Emergency Protocol.	HASSMAR and MRCC Dakar coordinate national maritime safety and pollution response; CENPOLMAR to become dedicated pollution centre.	MRCC holds key data; integration of EO/spill layers into a national information system still under development.	Support MRCC/CENPOLMAR to act as national MarCNoWA hub; GEMS to assist in building WMS/WFS services and regional sharing; Abidjan to frame MarCNoWA use in revised POLMAR guidance.
Sierra Leone	NOSCP and marine environmental strategy define responsibilities, but EO not yet explicitly referenced (though allowed in practice).	SLMA leads; EPA, Navy, Marine Police, fisheries and ONS contribute to verification and response.	Data sharing is largely manual (phone, radio, reports); no structured EO data policy or archive yet.	Provide model wording for including MarCNoWA/EO in NOSCP; GEMS to help design simple national data governance (custodian, archive, formats); Abidjan to support regional drills using the portal.
Togo	Decree 2014-174 on Préfecture Maritime and national POLMAR plan define legal basis; EO is not excluded but not formally integrated.	Préfet Maritime heads maritime action; national alert network links navy, gendarmerie, ports and operators.	Need clearer rules on data protection, storage and security for new EO/portal products.	Help Togo revise POLMAR to reference MarCNoWA; GEMS/Abidjan to provide a template data-sharing MoU; targeted training on secure use of portal outputs across maritime/security agencies.

Country	Legal Considerations	Institutional Setup	Data-Sharing Status / Gaps	How UNEP-GEMS / Abidjan Convention / MarCNoWA Can Help
Cross-cutting (all countries)	NOSCP/POLMAR frameworks and Abidjan Convention are technology-neutral, so EO/spill portal data can be legally recognised once referenced in plans and SOPs.	Each country has a clear lead authority but multi-agency workflows are complex and sometimes fragmented.	Fragmented data systems; inconsistent formats and metadata; weak regional SOPs for sharing EO-derived incident information.	UNEP-GEMS and Abidjan Convention can provide a **regional data and SOP framework**, while MarCNoWA supplies the common EO platform. Joint actions: model legal clauses, regional data standards, role-based access policies, and regular capacity-building and simulation exercises.

Hands-on technical training on detection portal and drift modelling.

The hands-on session provided participants with practical experience in using the MarCNoWA Oil Spill Detection Portal to support routine monitoring, incident documentation, and operational decision-making. Participants were guided through secure portal access, navigation of the Oil Spill Detection module, activation of the Sentinel-1 SAR detection layer, and interpretation of map symbology. They practised applying filters to narrow detections by area of interest, time period, and relevant spatial boundaries such as EEZ limits, buffer zones around petroleum infrastructure, and marine protected areas. The session also demonstrated how to interrogate individual slick polygons to retrieve key attributes (centroid coordinates, footprint geometry, surface area, acquisition time, sensor details, and confidence indicators) and how to export these characteristics as CSV files for offline analysis and official reporting. In addition, participants explored the portal's analytical tools for generating time-series and trend outputs (including recurrence patterns near offshore fields and shipping corridors), with results exportable as images and spreadsheets for inclusion in enforcement reports, briefings, and national early-warning products.

A complementary practical component introduced participants to the GNOME graphical interface for oil spill trajectory modelling. Facilitators explained GNOME's role as a decision-support tool for forecasting spill movement under winds and currents and guided participants through the key interface components, spill scenario creation (instantaneous versus continuous releases, location, timing, and oil properties), and the loading of environmental forcing datasets. Participants observed model execution and interpretation of outputs, including trajectory animations, uncertainty envelopes, and identification of potential landfall zones and exposure pathways. The session reinforced the value of combining EO-derived detections with drift forecasting to support timely response planning over 24–72-hour windows, while emphasising the need to treat model outputs as indicative guidance subject to data quality and uncertainty.

Day 3

Full-scale simulation exercise using MarCNoWA tools.

A full-scale simulation exercise was conducted to demonstrate how EO-derived spill detection and drift forecasting can be integrated into operational decision-making and environmental prioritisation during an oil spill incident. The exercise used geospatial outputs from the MarCNoWA oil spill monitoring tools as the initial evidence base for the incident—defining the spill location, time of observation, and spatial extent—before progressing through validation, forecasting, and response planning steps consistent with national contingency arrangements.

Following detection, the spill footprint and associated metadata were exported for operational use and then used to initialise a drift simulation. The modelling outputs were generated for successive forecast windows (e.g., 24–72 hours), producing trajectory envelopes and likely shoreline interaction zones. These forecast products were treated as decision-support evidence to guide response priorities, including identifying where containment, shoreline protection, and surveillance resources should be directed first under constrained operational capacity.

To assess ecological exposure and likely environmental damage, the exercise incorporated coastal and nearshore sensitivity information alongside the modelled trajectories. Participants overlaid predicted drift pathways and potential landfall zones with mapped beach segments, coastal vegetation types, and sensitive habitats, including fringing ecosystems such as estuaries and lagoon systems. In addition, Google Maps was used to support a rapid visual assessment of the alongshore distribution of sensitive ecosystems and key coastal features, helping participants to contextualise predicted impact zones against recognisable coastal landmarks and access routes. This spatial overlay approach was used to identify areas of heightened vulnerability, where oiling could affect nursery grounds, coastal biodiversity, and critical ecosystem services that support fisheries and community livelihoods. The inclusion of coastal vegetation and habitat layers strengthened the response planning process by enabling more targeted prioritisation of protection measures, as well as early identification of locations requiring rapid environmental assessment and sampling.

The simulation also reinforced the value of integrating biodiversity considerations into response coordination. By linking likely impact zones to sensitive ecological receptors, the exercise enabled participants to anticipate environmental consequences beyond shoreline staining alone—such as smothering of vegetated intertidal zones, contamination risks in estuarine environments, and disruption of habitats important for fish and invertebrate recruitment. Outputs from the spill detection and drift simulation were therefore used not only to inform operational response actions, but also to support evidence-based environmental impact assessment, documentation of potential damages, and preparation of structured situation reports for national authorities and, where relevant, regional notification mechanisms.

Drafting of national integration action plans and SOP alignment.

National representatives participated in an in-depth discussion on developing a Standard Operating Procedure (SOP) to guide the use of the MarCNoWA Oil Spill Detection and Drift Modelling Portal within their national monitoring and response systems. This discussion formed an essential step in drafting the national integration action plans, ensuring that operational procedures for using the portal are aligned with existing national frameworks and the requirements of the Abidjan Convention. Participants emphasised the need for a coherent and harmonised procedural structure that clearly defines how authorised officers from environmental agencies, maritime administrations, navies, coast guards, fisheries monitoring centres, and pollution response units should interact with the portal in support of their operational

responsibilities. It was stressed that any new SOP must address secure access protocols, user authorisation, and the central role of national focal points in managing accounts, validating detections, and communicating with the Abidjan Convention Secretariat when required.

The group explored the operational value of the portal and identified areas where national SOPs must be adapted or strengthened. Participants noted that the SOP should include clear guidance on how officers review satellite-based detection alerts, interpret slick characteristics, and assess drift model outputs. Discussion highlighted that users need a structured approach for activating detection layers, applying spatial and temporal filters, and accessing key metadata such as coordinates, slick area estimates, detection timestamps, and confidence levels. SOP alignment will also need to address procedures for exporting detection results, map snapshots, and other supporting information for integration into national archives, operational briefings, and incident reports.

A major focus was the role of drift modelling in national contingency planning. Participants agreed that national SOPs must instruct response officers on how to interpret forecast trajectories, identify potential landfall points, and assess ecological and socio-economic risks. Delegates also recognised the importance of including analytical functions—time-series analysis, trend summaries, and density mapping—to strengthen national reporting and improve situational awareness over extended periods.

The notification chain was identified as a critical procedural element requiring harmonisation. Participants agreed that the SOP should define clear national alert pathways and escalation criteria when a spill is detected, including which institutions must be notified and in what sequence. The need for regional communication—particularly when drift forecasts indicate possible transboundary movement—was also highlighted as a mandatory component, in line with obligations under the Abidjan Convention Emergency Protocol.

Participants discussed the importance of establishing robust data archiving and file management practices. SOPs must require consistent naming conventions, secure storage of exported files, and reliable retrieval procedures to ensure full traceability of all detections and modelling outputs. Delegates acknowledged that both the SOP and national integration action plans should be subject to regular review, ideally annually or following significant spill events or upgrades to the MarCNoWA system.

6 Results and Achievements

The workshop resulted in tangible progress towards the operational integration of Earth Observation–based oil spill monitoring within national and regional frameworks. National teams worked collaboratively to draft policy briefs and preliminary integration action plans, outlining how the MarCNoWA Oil Spill Monitoring Service can be embedded within existing institutional arrangements and contingency planning processes. These drafts provide an initial roadmap for aligning national practices with regional obligations under the Abidjan Convention and for translating technical capabilities into actionable policy instruments.

A key outcome of the discussions and country presentations was the identification of gaps within existing National Oil Spill Contingency Plans (NOSCPs) and related POLMAR frameworks that can be addressed through EO technologies. Participants highlighted areas where early detection, objective evidence generation, drift forecasting, and systematic data archiving are currently limited or absent. The MarCNoWA service was recognised as a practical solution to fill these gaps by providing near-real-time satellite-based detection, standardised spill characterisation, and predictive modelling to support decision-making and escalation procedures.

The workshop also significantly strengthened human and institutional capacity. Stakeholders from environmental agencies, maritime authorities, navies, coast guards, and fisheries institutions were trained on the operational use of the MarCNoWA detection portal and drift modelling tools, gaining hands-on experience in accessing detections, interpreting spill characteristics, exporting analytical products, and using GNOME-based forecasts to assess potential impacts. This practical exposure improved confidence in applying EO-derived information within routine monitoring and emergency response workflows.

Importantly, the workshop secured explicit commitments from national agencies to embed MarCNoWA products into their existing monitoring systems. Several countries indicated their intention to formally reference the portal within revised SOPs and contingency plan annexes, designate national focal points for portal coordination, and participate in regional data-sharing and joint exercises facilitated by UNEP–GEMS and the Abidjan Convention Secretariat.

A notable national commitment was made by Ghana, where the Environmental Protection Authority (EPA) volunteered to integrate the MarCNoWA oil spill detection tool into a live simulation exercise planned for 2026 under the Obangame Express (OE) framework. Obangame Express is an annual combined Central and West African multinational maritime exercise in the Gulf of Guinea that strengthens regional cooperation in maritime safety and security, bringing together West and Central African navies and maritime stakeholders in partnership with United States and Euro-Atlantic naval partners. This commitment provides a credible and operational pathway for testing the portal and drift forecasting workflow under realistic inter-agency conditions.

Finally, the workshop broadened stakeholder engagement by highlighting the value of community participation. The involvement of coastal communities—particularly school children—generated strong discussion around the potential role of citizen science in observing and reporting oil slicks. Participants noted that community-based reporting mechanisms, linked to national focal points and validated using EO products, could strengthen early warning, improve local awareness, and reinforce preparedness at the coastal level.

7 Recommendation

Embed EO spill detection and drift analysis into national SOPs

Countries should formally integrate satellite-based oil spill detection outputs and dissipation/drift forecasts into their national operational procedures, including routine monitoring schedules, verification steps, escalation thresholds and decision points for activating NOSCP/POLMAR arrangements. This should be supported by designating national focal points, clarifying inter-agency roles (EPA, maritime authority, navy/coastguard, fisheries MCS, MRCC/VTS), and adopting standard incident-report templates that incorporate portal exports (maps, CSV metadata and forecast products).

Harmonise data-sharing standards and oil spill reporting under the Abidjan Convention (Oil Spill Protocol)

UNEP-GEMS Ocean and the Abidjan Convention Secretariat should lead the development of a regional data-sharing and reporting guideline for EO-derived oil spill information. This should standardise minimum datasets (coordinates, extent, timestamp, confidence, scene ID), file formats (CSV, GeoJSON/GeoPackage, PNG, NetCDF outputs where relevant), naming conventions, metadata requirements, and access levels (public/restricted/confidential). The guideline should align with national legal mandates and establish a consistent reporting pathway to the Secretariat and neighbouring states during transboundary incidents.

Expand technical and operational training across the region

A structured capacity-building programme should be implemented to scale skills beyond initial workshop participants. Training should cover (i) portal use and interpretation of detections, (ii) drift modelling set-up and forecast interpretation, (iii) data export, archiving and reporting, and (iv) simulation exercises and after-action review. A tiered approach—basic, intermediate and advanced—should be adopted, supported by training-of-trainers to build sustainable national capability within lead agencies and regional centres.

Improve systems for real-time cross-border notification and coordination

Countries should establish a clear, time-bound notification protocol for incidents with potential transboundary impact, linked to Abidjan Convention mechanisms. This should include defined triggers for regional escalation (e.g., proximity to borders, forecasted landfall in neighbouring waters), 24/7 contact rosters for MRCCs and focal points, and the use of agreed channels for rapid communication (secure email groups, dedicated messaging channels, and shared dashboards where feasible). Regular joint simulation exercises should be conducted to test notification timelines, information quality and inter-operability between national systems.

ANNEXES

Annex 1 – List of Participants

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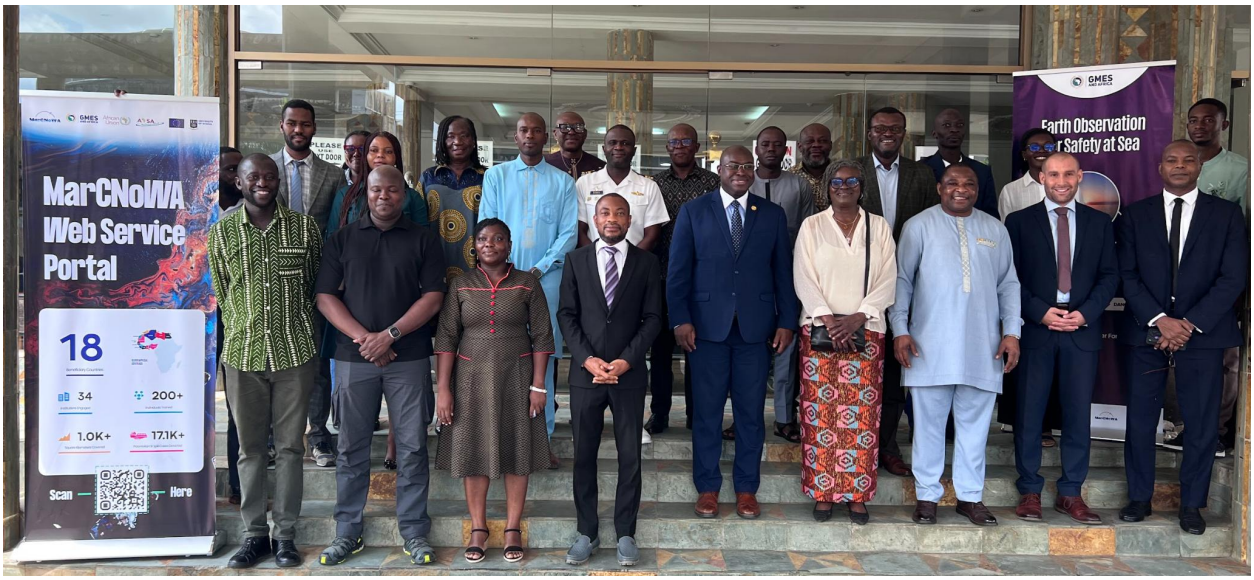
Pictures



Group Photo

H.E Dr Tidiane Quattara – President AfSA

Group Presentations

Joana Akrofi – Coordinator UNEP/GEMS Ocean

More pictures

https://drive.google.com/drive/folders/1ImnAdj061MWIl-CM5jIjrlPtpFT3Ct-H