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# MARITIME INTELLIGENCE DOSSIER

Area of Interest Report — GULF OF KUTCH



FIGURE 1 — Full-scene SAR false-colour composite.  $R=VV \cdot G=VH \cdot B=Depol \text{ ratio}$ . Circles mark all SAR detections.

|                  |                                       |
|------------------|---------------------------------------|
| MISSION ID       | MISSION_GULF_OF_KUTCH_20260329T232056 |
| AOI              | GULF OF KUTCH                         |
| SCENE TIME       | 2026-03-29 23:20 UTC                  |
| TOTAL DETECTIONS | 10                                    |
| DARK VESSELS     | 0                                     |
| UNCERTAIN        | 0                                     |
| AIS MATCHED      | 0                                     |

|          |                      |
|----------|----------------------|
| PRODUCED | 2026-05-26T16:21:12Z |
|----------|----------------------|

SECTION 01

Detection Summary

Scene acquired over **GULF OF KUTCH** on **2026-03-29 at 23:20 UTC**. Sentinel-1A IW GRD processed through the Dark Ships 5-phase calibration and YOLO detection pipeline. 10 vessel(s) resolved above confidence threshold.

| ID                      | LAT    | LON      | CONF | STATUS                   | MMSI |
|-------------------------|--------|----------|------|--------------------------|------|
| DET-2026032923-GULF-000 | 4.7230 | 99.4748  | 65%  | Dark Vessel (H3 Missing) | —    |
| DET-2026032923-GULF-001 | 4.1663 | 100.6406 | 56%  | Dark Vessel (H3 Missing) | —    |
| DET-2026032923-GULF-002 | 5.5081 | 100.3746 | 46%  | Dark Vessel (H3 Missing) | —    |
| DET-2026032923-GULF-003 | 5.6913 | 100.3552 | 45%  | Dark Vessel (H3 Missing) | —    |
| DET-2026032923-GULF-004 | 4.5260 | 100.6265 | 45%  | Dark Vessel (H3 Missing) | —    |
| DET-2026032923-GULF-005 | 5.4580 | 100.3093 | 44%  | Dark Vessel (H3 Missing) | —    |
| DET-2026032923-GULF-006 | 5.4766 | 100.2535 | 42%  | Dark Vessel (H3 Missing) | —    |
| DET-2026032923-GULF-007 | 6.2610 | 100.1936 | 39%  | Dark Vessel (H3 Missing) | —    |
| DET-2026032923-GULF-008 | 5.2526 | 100.2696 | 39%  | Dark Vessel (H3 Missing) | —    |
| DET-2026032923-GULF-009 | 5.4551 | 100.3219 | 38%  | Dark Vessel (H3 Missing) | —    |

SECTION 02

Per-Vessel Intelligence

Each vessel card below shows the SAR chip, AIS status, and fused confidence score.

Vessel #1 · Dark Vessel (H3 Missing) · DET-2026032923-GULF-000

|                      |                                                                                               |
|----------------------|-----------------------------------------------------------------------------------------------|
| [chip not available] | Lat: 4.7230°N<br>Lon: 99.4748°E<br>Conf: 65%<br>MMSI: —<br>Det ID:<br>DET-2026032923-GULF-000 |
|----------------------|-----------------------------------------------------------------------------------------------|

**Vessel #2 · Dark Vessel (H3 Missing) · DET-2026032923-GULF-001**

[chip not available]

Lat: 4.1663°N  
Lon: 100.6406°E  
Conf: 56%  
MMSI: —  
Det ID:  
[DET-2026032923-GULF-001](#)

**Vessel #3 · Dark Vessel (H3 Missing) · DET-2026032923-GULF-002**

[chip not available]

Lat: 5.5081°N  
Lon: 100.3746°E  
Conf: 46%  
MMSI: —  
Det ID:  
[DET-2026032923-GULF-002](#)

**Vessel #4 · Dark Vessel (H3 Missing) · DET-2026032923-GULF-003**

[chip not available]

Lat: 5.6913°N  
Lon: 100.3552°E  
Conf: 45%  
MMSI: —  
Det ID:  
[DET-2026032923-GULF-003](#)

**Vessel #5 · Dark Vessel (H3 Missing) · DET-2026032923-GULF-004**

[chip not available]

Lat: 4.5260°N  
Lon: 100.6265°E  
Conf: 45%  
MMSI: —  
Det ID:  
[DET-2026032923-GULF-004](#)

**Vessel #6 · Dark Vessel (H3 Missing) · DET-2026032923-GULF-005**

[chip not available]

Lat: 5.4580°N  
Lon: 100.3093°E  
Conf: 44%  
MMSI: —  
Det ID:  
[DET-2026032923-GULF-005](#)

**Vessel #7 · Dark Vessel (H3 Missing) · DET-2026032923-GULF-006**

|                      |                         |
|----------------------|-------------------------|
| [chip not available] | Lat: 5.4766°N           |
|                      | Lon: 100.2535°E         |
|                      | Conf: 42%               |
|                      | MMSI: —                 |
|                      | Det ID:                 |
|                      | DET-2026032923-GULF-006 |

Vessel #8 · Dark Vessel (H3 Missing) · DET-2026032923-GULF-007

|                      |                         |
|----------------------|-------------------------|
| [chip not available] | Lat: 6.2610°N           |
|                      | Lon: 100.1936°E         |
|                      | Conf: 39%               |
|                      | MMSI: —                 |
|                      | Det ID:                 |
|                      | DET-2026032923-GULF-007 |

Vessel #9 · Dark Vessel (H3 Missing) · DET-2026032923-GULF-008

|                      |                         |
|----------------------|-------------------------|
| [chip not available] | Lat: 5.2526°N           |
|                      | Lon: 100.2696°E         |
|                      | Conf: 39%               |
|                      | MMSI: —                 |
|                      | Det ID:                 |
|                      | DET-2026032923-GULF-008 |

Vessel #10 · Dark Vessel (H3 Missing) · DET-2026032923-GULF-009

|                      |                         |
|----------------------|-------------------------|
| [chip not available] | Lat: 5.4551°N           |
|                      | Lon: 100.3219°E         |
|                      | Conf: 38%               |
|                      | MMSI: —                 |
|                      | Det ID:                 |
|                      | DET-2026032923-GULF-009 |

SECTION 03

Technical Methodology & Chain of Custody

ACQUISITION

Sentinel-1A IW GRD downloaded from Copernicus Data Space Ecosystem (CDSE).

CALIBRATION

ESA SNAP GPT 6-step chain: orbit → thermal noise removal → radiometric calibration → multilook → terrain correction (SRTM 1Sec) → dB conversion. Output: Sigma-0 dB GeoTIFF, 10 m GSD.

DETECTION

YOLOv8 ship detector (xView3-SAR + SARFish training set). Conf threshold 0.35. CFAR secondary validation (128×128 guard, 5 dB above local mean).

AIS FUSION

Cross-reference within 2 km / ±30 min of scene midpoint. Dark = no AIS. Uncertain = AIS gap at acquisition time.  
Matched = confirmed transponder.

FALSE COLOUR

Chip extraction: VV→R, VH→G, (VV–VH)→B, 300×300 px per vessel, 10 m native resolution.

|                   |                                                  |
|-------------------|--------------------------------------------------|
| MISSION ID        | MISSION_GULF_OF_KUTCH_20260329T232056            |
| REPORT PRODUCED   | 2026-05-26T16:21:12Z                             |
| PIPELINE          | Dark Ships v1.0 · Phase 3 Validated (2026-04-13) |
| VESSELS IN REPORT | 10                                               |
| CLASSIFICATION    | SENSITIVE — INTELLIGENCE PRODUCT                 |