1. Executive Summary

MOB Alert - North Atlantic

Launched by: Eysteinn Sigurðsson

Analyst Interpretation

The leeway run shows a steady, southeastward drift from the last known position, with a clear most-likely final location that suggests a consistent trajectory over the 23-hour window. The movement implies a roughly uniform pace, and the modeled footprint expands over time, with the 50- and 90-km2 areas growing to reflect increasing uncertainty about where the spill could spread. The dominant outcome remains a southeast-directed drift, and there is no shoreline contact indicated within the horizon, as shoreline impact timing and stranded probabilities remain null.

Operationally, this implies shoreline interaction is unlikely within the current horizon, reducing near-term beaching risk for incident command. The strength of the dominant modeled outcome is supported by a zero stranded probability and a well-defined most-likely endpoint, indicating a strong single-mode drift under this scenario. Nonetheless, the footprint uncertainty expands across the forecast, so planners should maintain situational awareness for potential changes in the spread even while the non-beaching trajectory remains the leading expectation.

Incident Inputs

- Last Known Position (WGS84): 53.500000°, -32.000000°
- Last Known Time (UTC): 2026-03-15 23:19:00
- Initial Uncertainty Radius: 100.0 m
- Object Type: Person-in-water (PIW), unknown state (mean values)
- Ensemble Size: 10,000 particles

Key Results

- Most Likely Position (Centroid): 53.348221°, -31.617745°
- Time of Estimate: 2026-03-16 22:19 UTC
- Drift Distance: 30.51 km
- Average Drift Speed: 1.33 km/h
- Mean Drift Direction: 123.5° True

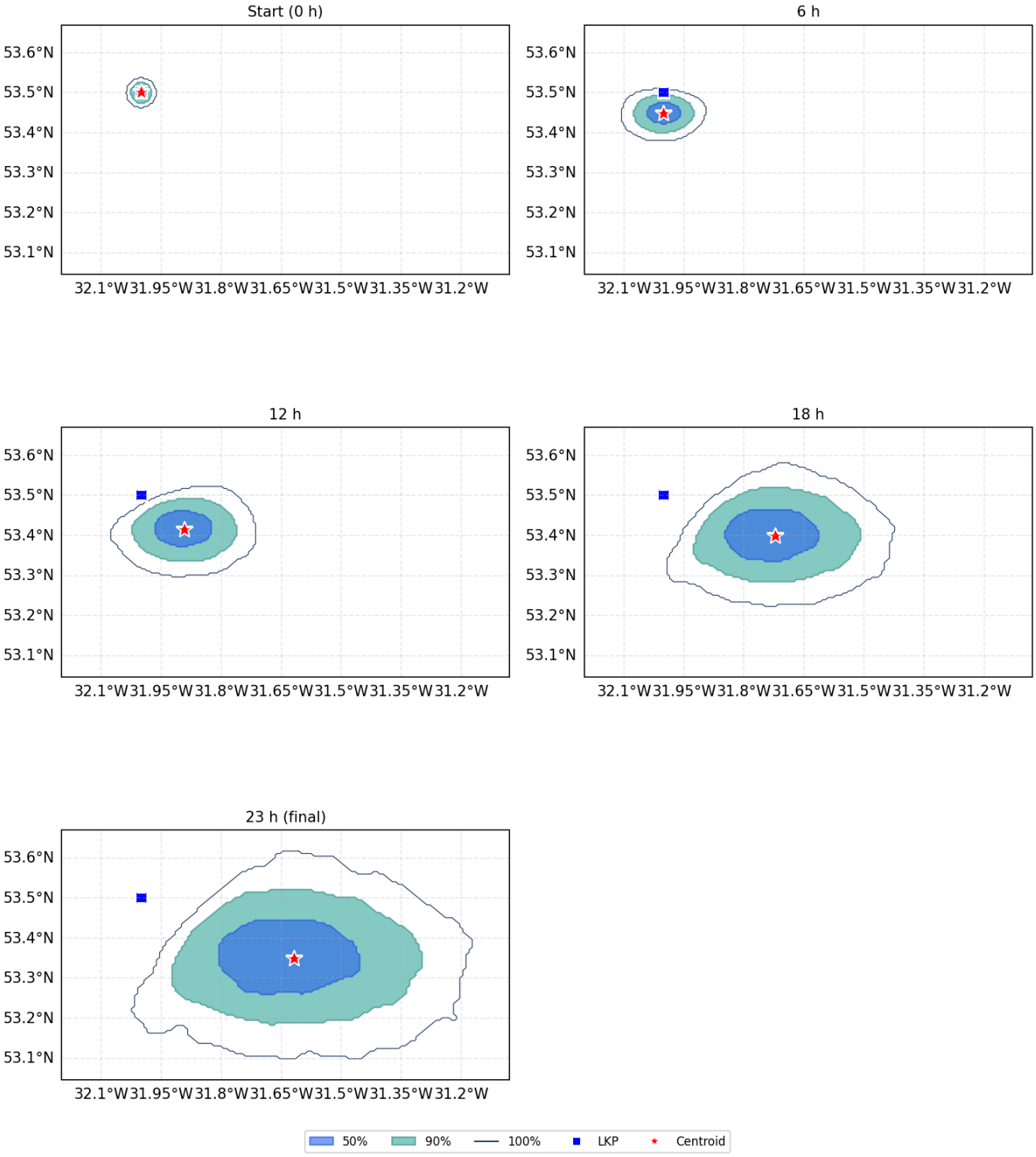
Probability Areas

- 50% Probability Area: 387.09 km²
- 90% Probability Area: 1200.38 km²

Operational Note: The 50% contour contains half of modeled outcomes and represents the highest-probability search region.

2. Probability Map

Probability Map — Start, every 6 h, and Final



3. Summary by Time Slice

Time (UTC)	Hours	Centroid Lon	Centroid Lat	50% Area	90% Area	Dist. from LKP	Stranded %
2026-03-15 23:19	0.0h	-32.000082°	53.499925°	4.80 km²	15.98 km²	0.01 km	0.0%
2026-03-16 05:19	6.0h	-32.001205°	53.448194°	25.52 km²	82.94 km²	5.77 km	0.0%
2026-03-16 11:19	12.0h	-31.891169°	53.414190°	74.36 km²	238.09 km²	11.98 km	0.0%
2026-03-16 17:19	18.0h	-31.721715°	53.397972°	176.67 km²	556.93 km²	21.70 km	0.0%
2026-03-16 22:19	23.0h	-31.617745°	53.348221°	387.09 km²	1200.38 km²	30.51 km	0.0%

4. Simulation & Forcing Details

Model Declaration

- Model Engine: OpenDrift — Leeway v1.14.8
- Numerical Method: Lagrangian particle tracking
- Ensemble Size: 10,000 particles
- Time Step: 60 minutes
- Coastline Interaction: Stranding on land
- Stranding Treatment: Particles marked stranded, excluded from active count

Environmental Forcing Data

- Wind: NOAA GDAS/GFS — NCEP Global Data Assimilation System
- Ocean Currents: Copernicus Marine Service (CMEMS) — GLOBAL_ANALYSISFORECAST_PHY_001_024
- Ocean Physics (SST/Salinity): Copernicus Marine Service (CMEMS) — GLOBAL_ANALYSISFORECAST_PHY_001_024

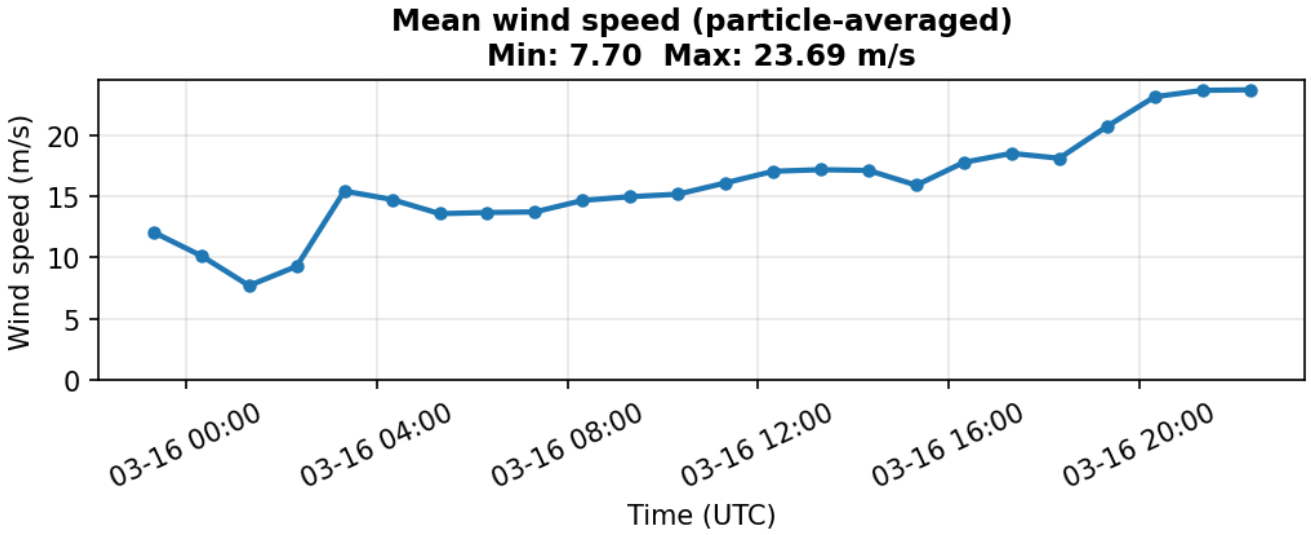
Simulation Summary

- Simulation duration: 23.0 hours
- Requested forecast: 24.0 hours
- Active Particles: 10,000
- Stranded Particles: 0 (0.0%)
- Spatial Spread (Std Dev): 12.94 km
- Drift Direction: 123.5° True

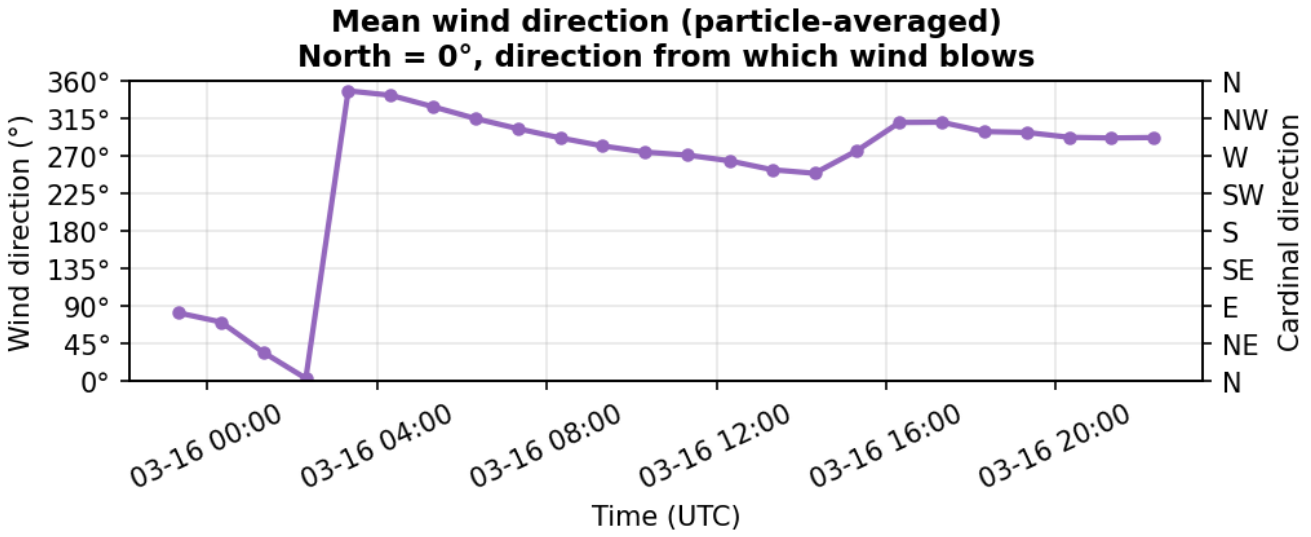
5. Environmental Forcing During Simulation

Time series of wind speed, wind direction, ocean current speed and sea surface temperature (when available) averaged over particles at each time step.

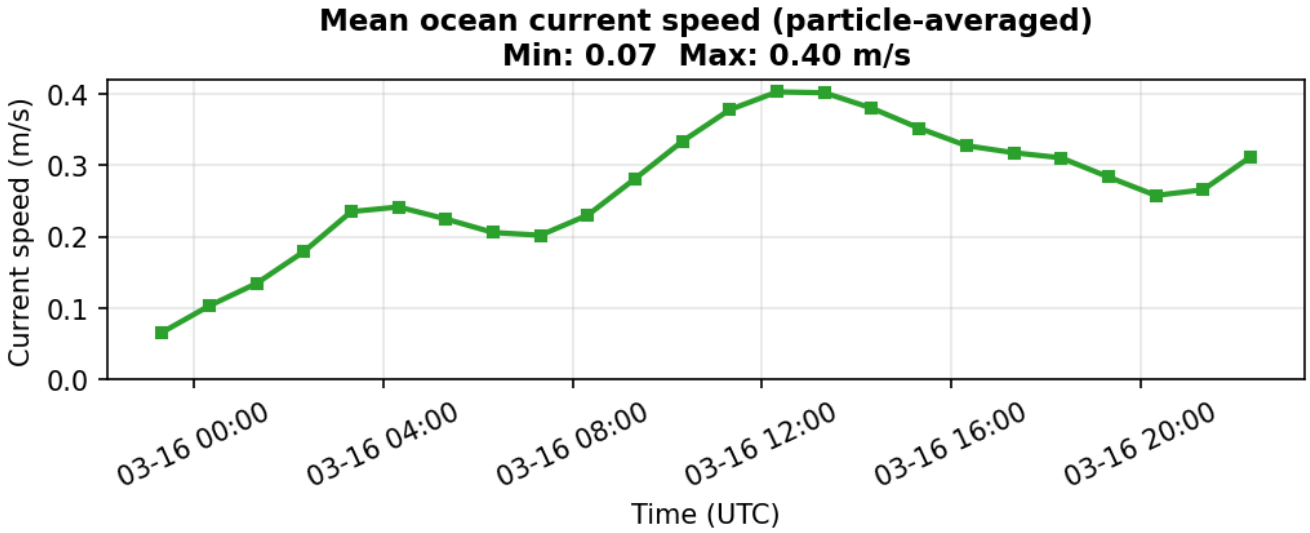
Mean wind speed



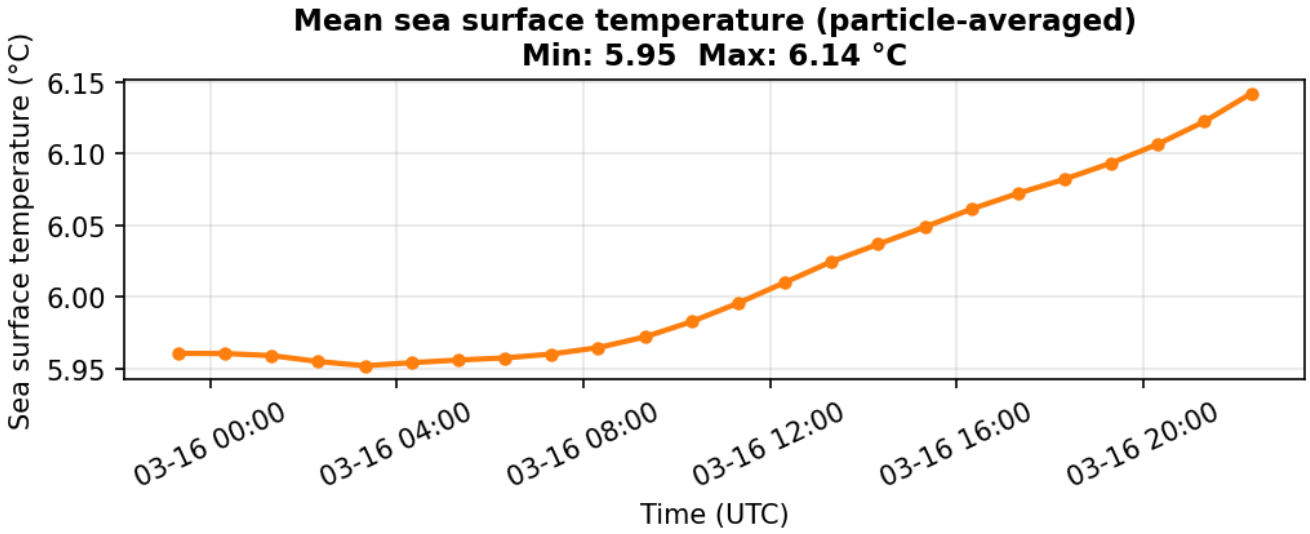
Mean wind direction



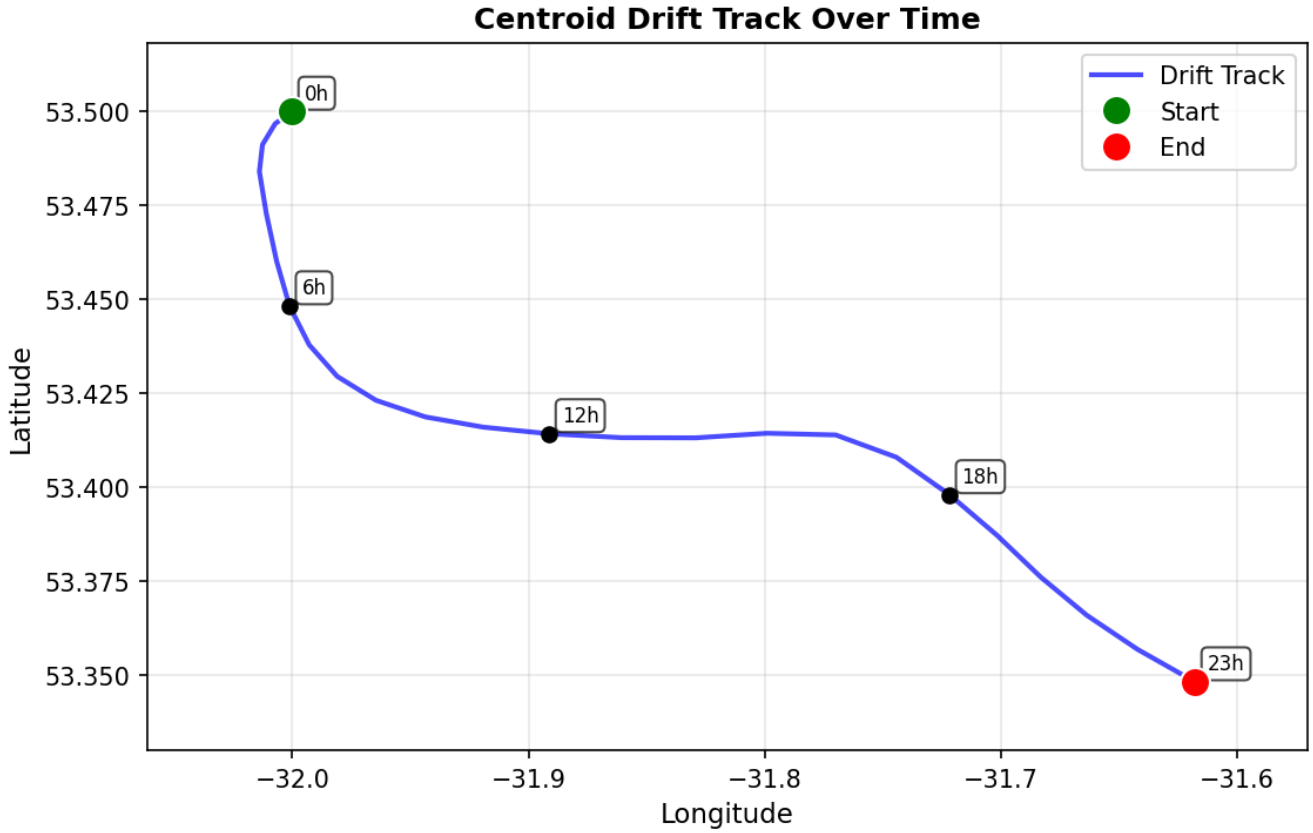
Mean ocean current speed

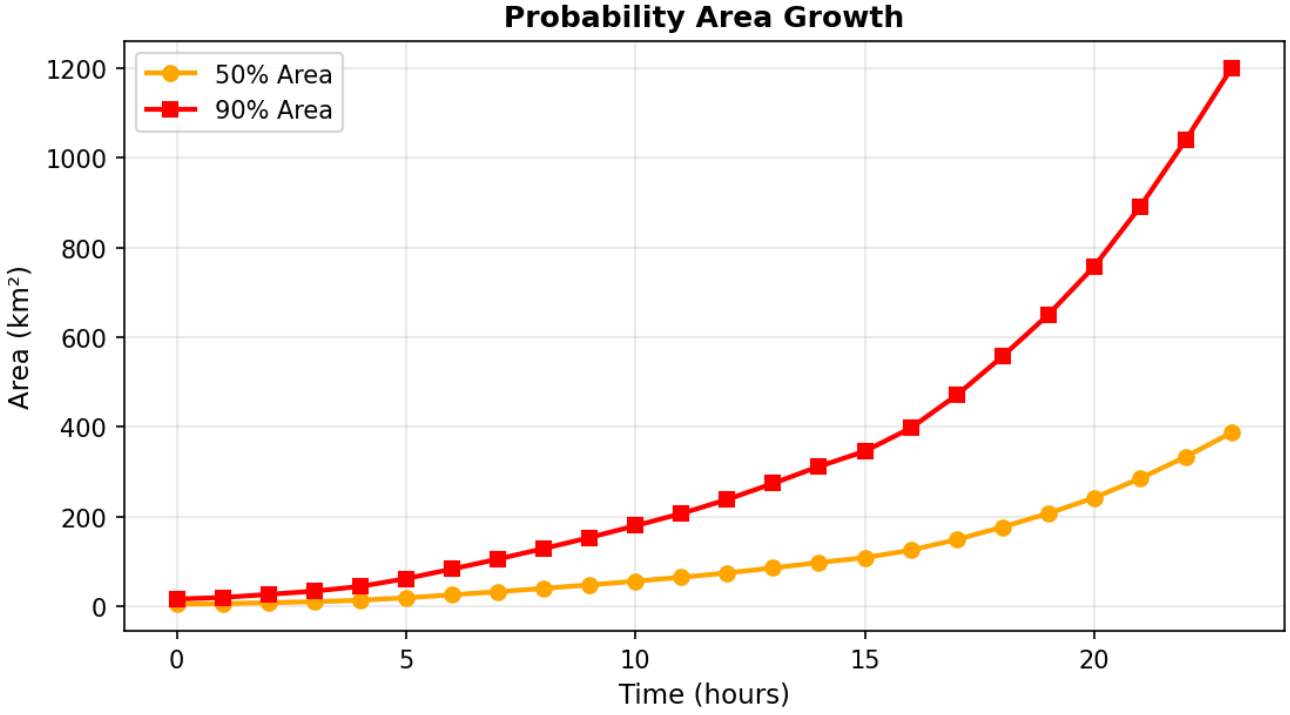


Mean sea surface temperature



6. Drift Evolution





7. Drift & Forcing Analysis

The drift trajectory shows a persistent southeastward progression. The centroid moves southward while trending eastward, yielding a steady offshore displacement with no reversals or major directional shifts. The distance from the reference shoreline increases steadily, indicating continued offshore transport rather than coastal recapture.

Dispersion grows monotonically, with the spatial footprint expanding from near-field to broader scales over the 24-hour window. An inflection in the dispersion growth rate appears in the mid-to-late period, as outer-area measures begin to widen more rapidly than earlier. This pattern reflects an accelerated spreading of the affected zone rather than a simple uniform translation.

Environmental forcing rises in intensity and complexity over time. Wind speeds increase to higher values and wind direction traverses a broad arc, while current speeds strengthen gradually. The timing suggests the dispersion rate responds to the intensifying forcing, with the rate of footprint expansion increasing as wind and current metrics intensify.

Coastal interaction remains inactive within the forecast horizon: the stranding percentage stays at zero throughout. The system remains in open-water transport, with no observed transition to shoreline-dominated behavior. The offshore drift continues alongside the steadily increasing distance to shore, consistent with sustained offshore transport rather than beaching.

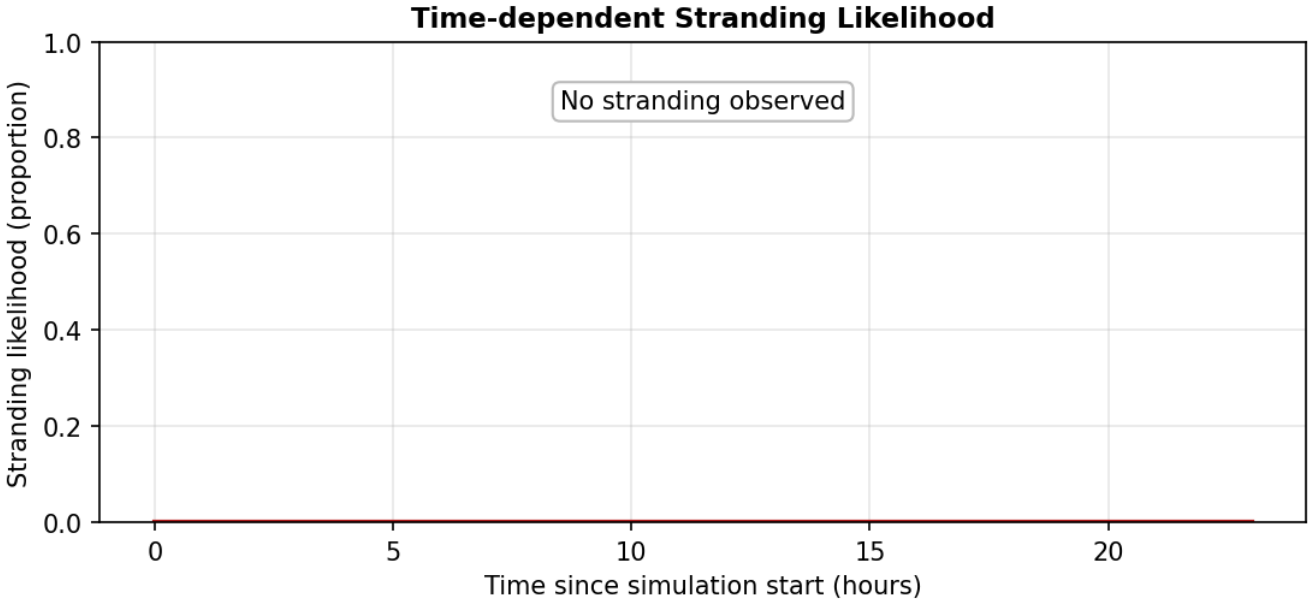
8. Stranding Impact Assessment

8.1 Time to First Shoreline Impact

No stranding occurred during this simulation.

8.2 Stranding Likelihood Over Time

No stranding occurred during this simulation. Stranding likelihood remained 0.0000 at all timesteps.



Stranding Probability Milestones

Time is measured from simulation start.

Event	Time	Probability
First grounding	Not reached	0%
10% probability reached	Not reached	<10%
50% probability reached	Not reached	<50%
Final grounding probability	+23h	0%

8.3 Spatial Distribution of Shoreline Impact

No stranding occurred; spatial distribution is not applicable.

8.4 Uncertainty Envelope

Stranding estimates are derived from a Monte Carlo ensemble of **10,000** particles. Uncertainty is represented by the ensemble spread and probability contours; no additional parametric confidence intervals are applied.

9. Operational Implications

Search prioritization — 50% area is 387.09 km2 and 90% area is 1200.38 km2. The 50% footprint is about 32% of the 90% footprint, representing the core search target. With no stranding observed and no shoreline impacts within the 23-hour horizon, prioritize the 50% area first and prepare to extend to the 90% area if resources allow to broaden coverage.

Offshore vs shoreline balance — final stranded percentage is 0.0% and there are no shoreline contacts reported. Open-water search remains the primary posture given the sizeable active footprint (both 50% and 90% areas) and the absence of shoreline progression within the horizon. Extend coverage to the 90% area only as needed to conserve resources while maintaining open-water tracking.

Shoreline focus — not identified in this run; no shoreline segments are reported as having elevated modeled stranding probability.

Time sensitivity — within the 23-hour window there is no progression toward shore; no time-to-shoreline metric is provided. The absence of shoreline progression suggests stabilization relative to this horizon.

Uncertainty framing — ensemble size is 10,000. Areas remain 50%: 387.09 km2 and 90%: 1200.38 km2 from peak to final, with no strandings and no shoreline impacts observed. Time dispersion metric is not provided. Uncertainty is represented by the spread between the 50% and 90% area bounds and the lack of observed stranding within the horizon.

10. Appendix — Polygon coordinates (audit/GIS)

Start (0 h)

Point	50% Longitude	50% Latitude	90% Longitude	90% Latitude
1	-31.992490°	53.514071°	-31.992490°	53.526203°
2	-32.000625°	53.514071°	-32.008760°	53.526203°
3	-32.006726°	53.512049°	-32.016894°	53.518115°
4	-32.010793°	53.508004°	-32.025029°	53.510027°
5	-32.014861°	53.503960°	-32.027063°	53.495872°
6	-32.014861°	53.495872°	-32.020962°	53.485761°
7	-32.010793°	53.491828°	-32.012827°	53.477673°
8	-32.006726°	53.487784°	-32.000625°	53.473629°
9	-32.000625°	53.485761°	-31.988422°	53.477673°
10	-31.994523°	53.487784°	-31.978254°	53.483739°
11	-31.988422°	53.489806°	-31.974186°	53.495872°
12	-31.986389°	53.495872°	-31.976220°	53.510027°

6 h

Point	50% Longitude	50% Latitude	90% Longitude	90% Latitude
1	-31.985558°	53.475451°	-31.975731°	53.493409°
2	-32.005211°	53.475451°	-32.015037°	53.493409°
3	-32.019950°	53.470962°	-32.046973°	53.486675°
4	-32.034690°	53.466473°	-32.066626°	53.468717°
5	-32.042060°	53.455249°	-32.076453°	53.441781°
6	-32.039603°	53.439536°	-32.061713°	53.419334°
7	-32.029777°	53.430558°	-32.037147°	53.405866°
8	-32.015037°	53.426068°	-32.005211°	53.399132°
9	-32.000298°	53.421579°	-31.970818°	53.403621°
10	-31.985558°	53.426068°	-31.946252°	53.417089°
11	-31.970818°	53.430558°	-31.929056°	53.437292°
12	-31.960992°	53.439536°	-31.929056°	53.464228°

12 h

Point	50% Longitude	50% Latitude	90% Longitude	90% Latitude
1	-31.880369°	53.462162°	-31.845362°	53.492334°
2	-31.918294°	53.459647°	-31.912459°	53.489820°
3	-31.947467°	53.449590°	-31.964971°	53.474734°
4	-31.964971°	53.429475°	-32.002896°	53.447076°
5	-31.959136°	53.399302°	-32.023317°	53.404331°
6	-31.938715°	53.381702°	-31.997061°	53.366616°
7	-31.909542°	53.371644°	-31.953302°	53.343986°
8	-31.874535°	53.376673°	-31.892038°	53.336443°
9	-31.845362°	53.386731°	-31.827858°	53.341472°
10	-31.824940°	53.404331°	-31.787016°	53.366616°
11	-31.827858°	53.437018°	-31.760760°	53.404331°
12	-31.851196°	53.452104°	-31.775346°	53.452104°

18 h

Point	50% Longitude	50% Latitude	90% Longitude	90% Latitude
1	-31.681622°	53.463833°	-31.688160°	53.519946°
2	-31.740467°	53.463833°	-31.789504°	53.511529°
3	-31.792773°	53.458222°	-31.858157°	53.475055°
4	-31.828734°	53.438582°	-31.907194°	53.421748°
5	-31.848349°	53.404914°	-31.920271°	53.348802°
6	-31.832003°	53.368441°	-31.854888°	53.309523°
7	-31.799312°	53.345996°	-31.773158°	53.284272°
8	-31.750274°	53.337579°	-31.668545°	53.289883°

9	-31.701237°	53.340385°	-31.583546°	53.312328°
10	-31.662007°	53.357219°	-31.527970°	53.360024°
11	-31.622776°	53.374052°	-31.518163°	53.430165°
12	-31.616238°	53.413331°	-31.573739°	53.477861°

23 h (final)

Point	50% Longitude	50% Latitude	90% Longitude	90% Latitude
1	-31.567269°	53.444710°	-31.575082°	53.521591°
2	-31.661028°	53.444710°	-31.739160°	53.515185°
3	-31.739160°	53.431897°	-31.832919°	53.451117°
4	-31.793853°	53.399863°	-31.903238°	53.367829°
5	-31.805573°	53.332592°	-31.903238°	53.258914°
6	-31.762600°	53.290948°	-31.789946°	53.210864°
7	-31.704001°	53.262118°	-31.661028°	53.188440°
8	-31.621962°	53.265321°	-31.496950°	53.194847°
9	-31.555549°	53.274931°	-31.371938°	53.233287°
10	-31.493043°	53.300558°	-31.305525°	53.319778°
11	-31.453977°	53.345406°	-31.336778°	53.422287°
12	-31.485230°	53.396660°	-31.434444°	53.483151°

11. Assumptions, Limitations & Reproducibility

Scope Statement

This report presents a probabilistic drift simulation based on user-provided inputs and forecast environmental forcing data. It does not constitute a full incident investigation.

Model Assumptions

- No active propulsion modeled
- No survivor behavior modeling
- No manual environmental correction
- No real-time search data assimilation
- Environmental forcing limited to forecast resolution

Known Limitations

- Sub-grid variability not resolved
- Wind/current forecast uncertainty
- Object-specific drift variability
- Coastal boundary discretization effects

Automated Analytical Summaries

This report includes automated analytical summaries generated from the underlying simulation metrics. These summaries are designed to support operational interpretation and do not modify or replace the probabilistic results of the drift model.

Reproducibility Metadata

- Mission ID: 43b8874b-a096-4cc0-b329-c07c4b423803
- Model Engine: OpenDrift — Leeway v1.14.8
- Object Type: Person-in-water (PIW), unknown state (mean values)
- Simulation duration: 23.0 hours
- Requested forecast: 24.0 hours
- Report Generated: 2026-03-16 18:33 UTC
- Dataset Versions: Not recorded in results
- Software Build Version: See deployment

Closing Statement

Results represent probabilistic model estimates and should be interpreted within the stated assumptions and environmental uncertainties.