

**BEFORE THE HON'BLE NATIONAL GREEN
TRIBUNAL PRINCIPAL BENCH, NEW DELHI**

IN

ORIGINAL APPLICATION No. 270 of 2025

Petitioner : Suo Motu

Versus

Respondent(s) : Kerala State Pollution Control
Board & Others

**AFFIDAVIT SUBMITTED BY THE SENIOR
ENVIRONMENTAL ENGINEER IN HEAD OFFICE ON
BEHALF OF KERALA STATE POLLUTION CONTROL
BOARD**

Adv. Jogy Scaria

ADDITIONAL STANDING COUNSEL FOR THE RESPONDENT



BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL**PRINCIPAL BENCH, NEW DELHI****IN**

ORIGINAL APPLICATION No. 270 of 2025

Petitioner : Suo Motu

Versus

Respondent(s) : Kerala State Pollution Control
Board & Ors**VOLUME-I****INDEX**

Sl.No.	Description	Pages
1	Status Report submitted by the Senior Environmental Engineer, Head Office, Kerala State Pollution Control Board	1-6

Dated this the 21st day of October, 2025.**Adv. Jogy Scaria****ADDITIONAL STANDING COUNSEL FOR THE RESPONDENT:**

**STATUS REPORT AS PER THE ORDER DATED 30.07.2025 OF THE
HON'BLE NATIONAL GREEN TRIBUNAL PRINCIPAL BENCH IN
OA No. 270/2025**

News Item titled "*Containers from sunken ship likely to drift towards Alappuzha, Kollam Coasts in 48 hours: INCOIS*" appearing in The Hindu dated 25.05.2025.

I, Eby Varghese, Aged 54 years son of late T.V Varghese, residing at Perumbavoor, working as the Senior Environmental Engineer, Kerala State Pollution Control Board, Head Office, Pattom, Thiruvananthapuram, do hereby solemnly affirm and state as follows:

1. I am the Senior Environmental Engineer, Kerala State Pollution Control Board (hereinafter referred to as **Board**), Head Office, Thiruvananthapuram. I am aware of the facts affirmed by me in this report. I am swearing that this is the report based on the best of my knowledge, information and belief and the facts revealed from the records. I am filing this report on behalf of the 1st respondent, as duly authorized.
2. It is respectfully submitted that, this report is filed in continuation to the report filed on 23.07.2025, concerning the incident that occurred on 24th May 2025, involving the sinking of the Liberian-flagged vessel MSC ELSA-3 in the Arabian Sea, approximately 38 nautical miles southwest of Kochi.

Status of Damage Assessment

3. It is respectfully submitted that, as per Government Order G.O. (Rt) No. 363/2025/DMD dated 30.05.2025 and G.O. (Rt) No. 62/2025/DMD dated 11.06.2025, the Government of Kerala authorised the Board to engage the National Institute of Oceanography (NIO) to assess the environmental impact and conduct a long - term study. Incompliance with these directions, from the Government, the Terms of Reference (ToR) were finalized and submitted to the




EBY VARGHESE
 Senior Environmental Engineer

National Institute of Oceanography (NIO) on 17.06.2025. A multi-disciplinary expert technical committee constituted by the Kerala State Pollution Control Board (KSPCB) reviewed the proposal submitted by NIO. Accordingly, Work Order dated 02.07.2025 was issued by the Board to the Director, CSIR-NIO, for conducting the environmental damage assessment and long-term study to evaluate the extent of environmental damage caused by the *MSC ELSA-3* shipwreck incident. An agreement was subsequently signed between the Board and NIO on 16.07.2025. A true copy of the agreement dated 16.07.2025, between the Board and NIO is produced herewith and marked as **Annexure R1 (a)**.

4. It is respectfully submitted that, a preliminary report has been submitted by CSIR-NIO based on the survey conducted on board FORV SAGAR SAMVADA from 25th July to 21st August, 2025 including the visual evidence of oil slicks and sonar image of capsized MSC ELSA.

The findings in the preliminary report are summarized below:

- Scanning images from Sonar SIMRAD/SX90 identified Capsized Ship ELSA-3 and containers
- The ELSA-3 shipwreck site was sampled as per OSPAR guidelines, whereas large patch of oil film was observed on the surface; further, it aligned with the waves towards coastal regions.
- The disintegration of Oil slick in to fragments under the action of heavy monsoonal winds and currents were noticed.
- Dead and deformed marine turtle was spotted at the shipwreck site.
- Intense coastal upwelling was observed along the southwest coast of India, where traces of Arabian Sea High Saline Water masses were noticed.




EBY VARGHESE
 Senior Environmental Engineer

- Off Kanyakumari stations experienced high winds (>20 knots) due to the tunnelling of winds through the Gulf of Mannar/Palk Bay during the break monsoon period.
- The water column of coastal stations T13, T12, T11, T9, and T5 was more oxygen-depleted than other transects, indicating the influence of OMZ in the Southeastern Arabian Sea.
- The gelatinous plankton was abundant in the zooplankton nets from the T7 (Kollam) transect and northward.
- Blooms of gelatinous plankton were observed in the coastal stations (10m, 20m, 30m and 50m) of Kochi, Alappuzha, and Kollam during the Bongo operation.
- Presence of *Noctiluca* bloom and bioluminescence was observed from the Kollam to Kozhikode belt.
- An extensive *Noctiluca* bloom with discolouration of the upper surface waters was found at a coastal location (20 m) off Arthungal

A true copy of the preliminary report prepared by NIO is produced herewith and marked as **Annexure R1 (b)**.

5. It is respectfully submitted that, a letter was sent to the Senior Principal Scientist CSIR-NIO on 26.08.2025 requested to extent the environment damage assessment study to cover the environmental issues such as oil spill or release of any pollutants during the salvage operations. A true copy of the letter dated 26.08.2025 is produced herewith and marked as **AnnexureR1(c)**.

6. It is most respectfully submitted a letter has been issued to NIO to intimate the expected completion date of the study. In response to this letter it has been reported by NIO by letter dated 25.10.2025 that the analysis work are in




EBY VARGHESE
 Senior Environmental Engineer

progress and detailed report based on the first phase field survey will be submitted by 30.12.2025. The detailed report based on the first and second phase field survey will be submitted by 30.05.2026. The detailed final report based on all field surveys will be submitted by 30.07.2026. A true copy of the letter dated 25.10.2025 is produced herewith and marked as **Annexure R1(d)**.

Result of analysis of deep sea water samples collected by the Indian Coast Guard

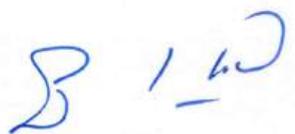
7. It is respectfully submitted that report on the samples collected by the Coast Guard on 25th May 2025 in connection with the MSC ELSA-3 shipwreck incident has been obtained. A true copy of the report dated 12.09.2025 is produced here with and marked as **Annexure R1(e)**. The Details are as follows:

Two deep-sea water samples (IDs 251330 and 251530) collected by Coast Guard on May 25, 2025, were analyzed for pH, conductivity, heavy metals, and petroleum hydrocarbons. Results showed pH and conductivity values consistent with typical marine environments. TPH (Total petroleum Hydrocarbon) concentration observed in sample ID: 251330 and sample ID: 251530 are 0.08mg/L and 0.055mg/L respectively which shows the presence of oil in seawater.

PLASTIC NURDLES

8. It is respectfully submitted that Plastic nurdles were particularly deposited on beaches in Kollam and Thiruvananthapuram districts. The Kerala State Disaster Management Authority (KSDMA) developed a beach clean-up protocol. The salvaging company on behalf of the shipping company, along with volunteers engaged by local self-governments (LSGs), carried out the clean-up under the supervision of various Government Departments, including the Board. Cumulative total weight of nurdles transported from Trivandrum to Kollam Port




EBY VARGHESE
 Senior Environmental Engineer

is 329.079 metric tonnes and total weight of nurdles at Kollam port, including those recovered from Kollam is 357.632 metric tons from 24th June 2025 to 9th October 2025.

The respondent Board is collecting sediment samples in a periodic manner and sent for analysis of heavy metals and micro plastics. The long term effect of the exposure of plastic nurdles in the marine environment could be ascertained only when the analysis report is available and when the report of the NIO is available.

9. It is most respectfully submitted that the short term and long environmental and socio economic damages due to oil and other pollutants from the ship could be evaluated only on submission of the final report by NIO. It is most respectfully submitted that Board has taken all earnest efforts in delivering the duties entrusted as per the Act and Rules in the wake of the possible environmental damages and will continue to discharge its obligations to minimize the pollution threat caused by the ship wreckage.

Status of preparation of Oil Spill Contingency Plan (OSCP)

10. It is most respectfully submitted that, a Work Order dated 27.06.2025 was awarded to M/s Environ for preparing Oil Spill Contingency Plan (OSCP). Consequently, an agreement was signed between the Board and M/s Environ Software Pvt. Ltd on 14.07.2025. True copy of the agreement dated 14.07.2025 issued by the Board is produced herewith and marked as **Annexure R1 (f)**.

11. It is most respectfully submitted this respondent Board is observing the progress of preparation of OSCP to be prepared by M/s Environ Software Pvt. Ltd. First installment for the work was issued on 20.08.2025 and as per the agreement the draft OSCP shall be submitted within 8 months from the date of signing of agreement.



EBY VARGHESE
Senior Environmental Engineer

All the facts stated above are true to the best of my knowledge, information and belief.

Dated this is the 21st day of October, 2025.

For and on behalf of the Kerala State Pollution Control Board (1st Respondent)

EBY VARGHESE
Senior Environmental Engineer


Eby Varghese
Senior Environmental Engineer
Kerala State Pollution Control Board
Head Office - Thiruvananthapuram



BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL**PRINCIPAL BENCH, NEW DELHI****IN**

ORIGINAL APPLICATION No. 270 of 2025

Petitioner : Suo Motu

Versus

Respondent(s) : Kerala State Pollution Control Board & Ors

VOLUME-II**INDEX**

Sl.No	Contents	Pages
1	Annexure R1(a) - True copy of the agreement dated 16.07.2025, issued by the Board to Board to the Director, CSIR-NIO.	7 - 14
2	Annexure R1 (b) - True copy of the preliminary report submitted by CSIR-NIO	15 - 46
3	Annexure R1 (c) - True copy of the letter dated 26.08.2025, sent by the Board to the Senior Principal Scientist CSIR-NIO.	47
4	Annexure R1 (d) - True copy of the letter dated 25.10.2025 from NIO regarding the expected completion date of the study.	48 - 51



5	Annexure R1 (e) - True copy of the report dated 12.09.2025 on the samples collected by the Coast Guard on 25 th May 2025	52 - 55
6	Annexure R1(f) - True copy of the agreement dated 14.07.2025, issued by the Board to M/s Environ Software Private Ltd for preparing Oil Spill Contingency Plan (OSCP)	56 - 65

Dated this the 21st day of October, 2025.

Adv. Jogy Scaria

ADDITIONAL STANDING COUNSEL FOR THE RESPONDENT



നോൺ ജുഡീഷ്യൽ

NON JUDICIAL

₹ 500

₹ 500

കേരള സർക്കാർ
GOVERNMENT OF KERALA

e-Stamp

e-Stamp Serial Number : 202526000002328936

Verification Code : 650158391V

Govt. Reference No.(GRN) : KL017032051202526E
 Purpose : Agreement or memorandum of an agreement - If relating to public works or service level agreements.
 Amount of Stamp Paper Purchased in Numeral : ₹ 500
 Amount of Stamp Paper Purchased in Words : Rupees Five Hundred
 Stamp Paper Purchased on : 10/07/2025 21:10:51
 First Party Name : SCIENTIST IN CHARGE
 First Party Address : CSIR NATIONAL INSTITUTE OF OCEANOGRAPHY REGIONAL CENTRE KOCHI
 Second Party Name : CHAIR PERSON
 Second Party Address : KERALA STATE POLLUTION CONTROL BOARD THIRUVANANTHAPURAM
 Vendor Code & Name : 11102957 - JAYADEVI P B
 Treasury Code & Name : 1110 - Additional Sub Treasury, Ernakulam

Please write or type below this line

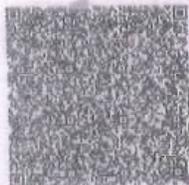
Agreement for conducting Environment Damage Assessment and Long-Term Study to assess the extent of environmental damage caused by the MSC Elsa 3 shipwreck incident as per Govt. order no. G.O.(Rt)No.62/2025/ENVT dated 11.06.2025 and work order no. KSPCB/1052/2025-SEE-2 dated 02.07.2025

This agreement is executed on this the 16th day of July 2025 (hereinafter referred to as 'Effective date') BY AND BETWEEN

CSIR - National Institute of Oceanography (hereinafter called CSIR-NIO), Regional Centre, Kochi, of the one part

AND

Kerala State Pollution Control Board (hereinafter called KSPCB) and having its Head Office at Plamoodu, Pattom, Thiruvananthapuram, Kerala, India, represented by its Chairperson which expression shall where the context so admits includes its successors in



True copy

[Handwritten signature]



This can be verified by Principal Scientist
https://www.csir-nio.gov.in/central-office/kochi/index.php/estamp_search using e-Stamp
 In Case of any discrepancy, please inform the vendor at the following address:
 CSIR-National Institute of Oceanography
 Regional Centre, Kochi-682 015

[Handwritten signature]
SREEKALAN
CHAIRPERSON



[Handwritten signature]
JAYADEVI. P. B.
District Court Vendor
Ernakulam

[Handwritten signature]
E.S.V. VARGHESE
Senior Environmental Engineer

interest and permitted assigns of the second part.

'CSIR-NIO' and 'KSPCB' shall be collectively referred to as 'Parties' and individually as 'Party'.

I. RECITALS

1. About CSIR-NIO

WHEREAS the CSIR-National Institute of Oceanography, Regional Centre - Kochi, a constituent research institute of the Council of Scientific and Industrial Research, New Delhi,

2. About KSPCB

WHEREAS Kerala State Pollution Control Board (KSPCB) is a statutory body constituted as per section 4 of the Water (Prevention and Control of Pollution) Act, 1974, entrusted for the prevention and control of pollution in the state of Kerala.

The headquarters of the KSPCB is located at Plamoodu in Thriuvananthapuram. The KSPCB also has 3 Regional Offices, Central Laboratory at Ernakulam and atleast one District Office within each district of Kerala.

3. Background

AND WHEREAS The Government of Kerala has authorised KSPCB to engage CSIR-NIO for the environmental damage assessment and a long-term study to assess the extent of environmental damage caused by the MSC Elsa 3 shipwreck incident based on the ToR provided. Accordingly, CSIR-NIO prepared a project proposal and submitted it to KSPCB on 23/06/2025 for evaluation. A technical committee of multi disciplinary nature with experts of various departments and agencies was constituted vide order no. KSPCB/460/2022-EE-5 dated 20/06/2025 to evaluate the proposal submitted by CSIR-NIO. Accordingly, a committee meeting was conducted on 25/06/2025 to discuss the proposal submitted by CSIR-NIO, and it was found that the proposal covered all the ToR points with additional information to fulfill the comprehensive aspects of the incident. During the discussion, the committee instructed CSIR-NIO to reduce the project timeline to one year with a reduction in the budget. Further, CSIR-NIO revised the proposal by incorporating a modified timeline and a budget of Rs 10 crore, excluding GST and submitted it to KSPCB on 27/06/2025. The revised proposal was accepted, and KSPCB issued a work order (KSPCB/1052/2025-SEE-2 dated 02/07/2025) to CSIR-NIO to conduct the Environmental damage assessment and a long-term study to assess the extent of environmental damage caused by the MSC Elsa 3 shipwreck incident.

II. OBJECTIVES OF THE STUDY

The objectives of this assessment may include, but are not limited to, the following:

True copy

CSIR-NIO

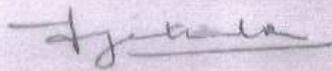
EBY VARGHESE
Senior Environmental Engineer



SREERKALA S.
CHAIRPERSON

KSPCB

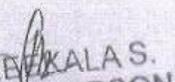
- Assessment of environmental damages & socio-economic Impacts
 - Quantify the extent of environmental damage, including short-term and long-term impacts on marine biota, coastal ecosystems, air, water bodies, sediments, including Ramsar sites, viz, Cochin estuary and Ashtamudi estuary.
 - Assessment of socio-economic consequences, particularly tourism, and coastal livelihoods, agriculture, industries and commerce, the coastal infrastructure sector, including harbours and ports
 - Conduct baseline environmental assessments to compare pre- and post-incident conditions.
- Pollutant Dispersion Modelling
 - Assess the seasonal variations in the dispersion and transport of pollutants released from the ship using hydrodynamic modelling.
 - Evaluate the potential contamination zones and their impact on marine and coastal ecosystems.
- Risk Identification & Long-Term Monitoring
 - Identify and evaluate short-term and long-term risks to marine biodiversity, coastal communities, and ecosystem services.
 - Establish a monitoring framework for tracking ecological recovery and pollutant persistence over time.
- Ecological, Environmental & Economic Restoration Plan
 - Develop a comprehensive restoration strategy, including:
 - Scientific and economic valuation of environmental damage.
 - Environmental compensation mechanisms following the 'Polluter Pays Principle'.
 - Detailed cost estimates for restoration, remediation and recovery efforts.
 - Recommend adaptive management strategies for mitigating ongoing environmental risks.
- Regulatory, Institutional & Preventive Measures
 - Review existing maritime regulations, emergency response protocols, and liability frameworks.
 - Propose institutional improvements for better preparedness and response to future marine incidents.
 - Recommend preventive measures, including strengthening oil spill contingency plans, hazardous cargo handling protocols, and coastal resilience strategies.


CSIR-NIO

True copy


ESY VARGHESE
Senior Environmental Engineer




SREEKALA S.
CHAIRPERSON

KSPCB

✓ Stakeholder Engagement & Public Awareness

- Facilitate consultations with affected communities, fisheries, environmental groups, and policymakers.
- Develop public awareness campaigns on marine pollution risks and response strategies.

III. SCOPE OF WORK

1. Pollutant and Wreck Assessment

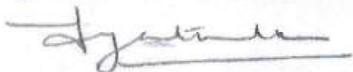
The study aims to assess and delineate the extent of pollution and debris along the Kerala coast using numerical modelling (DHI-MIKE-3) and *in-situ* measurement approaches. Specifically, it will

- Identify, quantify and characterise the types of pollutants released from the sunken vessel, including oil, hazardous chemicals, plastic muddles, major contaminants and any solid debris, and evaluate their dispersion in coastal waters and sediments;
- Map the spatial distribution of pollutants and debris along the coastline, identifying high-risk zones for environmental and socio-economic impacts;
- Analyse pollutant transport mechanisms, considering seasonal variations, ocean currents, and meteorological influences to predict long-term contamination risks;
- Assess the interaction of pollutants with marine biodiversity, coastal ecosystems, and human settlements, integrating biological, chemical, and physical monitoring techniques.

2. Environmental Impact Assessment

- This study aims to assess the impact of the pollutants released from the capsized ship on the air, water, sediment, flora, and faunal diversity of the region, including sensitive, endemic or endangered species. The study should verify the presence of invasive species and microbial pathogens in ballast water, which may disrupt the local marine ecosystem and pose a risk to public health. Similarly, the adsorption or accumulation of organic oil or fuel materials in the fish, shrimps or other marine organisms should be examined, and the environmental threshold value should be compared, especially intended for export or domestic consumption.
- Evaluate immediate and long-term damage to marine and coastal ecosystems (e.g., coral reefs, plankton communities, benthic organisms, fish stocks) and coastal habitats (e.g., beaches, intertidal zones, mangroves, estuaries), including sensitive or endangered species. Ensure compliance with national and international regulations such as IMO, MARPOL, etc.,

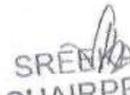
True Copy



CSIR-NIO




EDY VARGHESE
Senior Environmental Engineer


SREENKALA S.
CHAIRPERSON

KSPCB

3. Socio-Economic, Public Health, and Environmental Liability Assessment

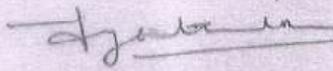
- The study may include the assessment of the socio-economic and public health impacts, which may losses among fish processing business, homestay and tourism operators, economic downturns, and assess and identify public health hazards arising from contaminated seafood, water resources, and airborne pollutants, including potential long-term health risks associated with hazardous material exposure.
- The study will also quantify environmental damage using scientific valuation and estimate the financial cost of ecological restoration. Furthermore, it will recommend environmental compensation (EC) strategies aligned with statutory frameworks and National Green Tribunal (NGT) guidelines, ensuring accountability through the "Polluter Pays Principle" and supporting long-term recovery efforts.

4. Restoration and Mitigation Plan

- The report will recommend short-term (immediate) and long-term (5 years) ecological restoration measures to mitigate the environmental and socio-economic impacts of the MSC Elsa 3 sinking. This will include rehabilitation programs for marine biodiversity, coastal ecosystems, and habitats, such as coral reefs, mangroves, estuaries, and intertidal zones.
- To support affected communities, the study will outline costed interventions for public health and livelihood recovery efforts.
- Furthermore, an adaptive management framework will be developed, integrating scientific monitoring, stakeholder engagement, and policy recommendations to ensure long-term sustainability and resilience.

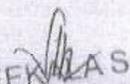
5. Institutional and Policy Framework

- The study will define the roles and responsibilities of line departments and institutions in implementing environmental restoration, marine safety, and disaster response measures. It will propose improvements in marine safety, surveillance, and emergency response protocols, ensuring better preparedness for future maritime incidents. Additionally, the study will recommend capacity-building programs for marine disaster management, focusing on training, resource allocation, and institutional coordination.
- The above Terms of Reference are indicative in nature and not all-encompassing. CSIR-NIO, in consultation with the Kerala State Pollution Control Board and based on field realities and scientific judgment, may include additional parameters or assessments deemed necessary for a comprehensive evaluation of the environmental and socio-economic impacts of the incident. The institute may also collaborate with other reputed institutions as and when necessary.


CSIR-NIO




EBY VARGHESE
Senior Environmental Engineer


SREEKRISHNA S.
CHAIRPERSON

KSPCB

IV. DELIVERABLES

- An environmental assessment report with subsections detailing the pollutant and wreck, the impact of the capsized ship on the coastal and marine environment off Kerala, socio-economic and public health effects, and environmental liability assessment, restoration and mitigation plan and institutional policy framework.
- A soft copy of the report and the data collected under this program, provided on a CD/DVD/USB.
- Five hardcopies of the Final report shall be provided upon approval.

V. RESPONSIBILITIES OF KSPCB

1. KSPCB will facilitate the necessary approval and permission from the Indian Coast Guard, through Government, for entering the owned/hired vessel by CSIR-NIO at the ship wreckage location during the survey period.
2. KSPCB will facilitate transfer of data from agencies engaged by Fisheries Department to NIO in consultation with Government
3. Reports on the results of the samples collected by KSPCB will be shared with NIO.

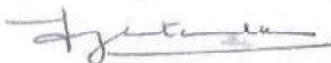
VI. EFFECTIVE DATE AND DURATION OF THE AGREEMENT

CSIR-NIO shall ensure that the work is completed within a period as in the following schedule from the date of signing the agreement:

- The field data measurements will start within 15 days upon receipt of the work order and the first installment of the project fee.
- The data collection will be approximately 20-30 days for each sampling period, and the field survey report shall be submitted within 30 days.
- The detailed report shall be submitted within 3 months of the field survey report.
- The final report for each field survey shall be submitted within 2 weeks after the Board's suggestion on the draft.
- The consolidated report shall be submitted after 3 months of the completion of the last field survey report.

Either party that wishes to terminate the agreement shall give a notice of 30 days to the Other party signifying its intention to terminate the agreement. In the event of termination of the agreement, the right and obligations of the parties hereto shall be settled by mutual consultations; the financial settlement shall take into consideration not only the expenditure incurred but also the expenditure committed by both the parties.

True copy



CSIR-NIO



SREEKANTH S.
CHAIRPERSON


EDY VARGHESE
Senior Environmental Engineer

KSPCB

VII. PROJECT FEES AND TERMS OF PAYMENT

Total Cost of the project will be Rs. 10,00,00,000/- (Rupees ten crore only) (excluding GST), which will be released by the KSPCB as follows:

- i. First Installment: 50 % payment as an advance before the start of the survey/fieldwork.
- ii. Second Installment: 40 % payment after completion of the survey (Field Work / Data Collection)
- iii. Third installment: 10 % payment on submission of the Final report.

It is mutually agreed that KSPCB will not provide any additional fund on account of any further cost escalation in connection with the study.

The fund will be released in favour of the CSIR - National Institute of Oceanography (Account No. : 30267368692, State Bank of India, Dona Paula, Goa – 403004, Branch No. - 3566. IFSC Code : SBIN0003566, MICR No: 403002004)

VIII. CONFIDENTIALITY

Both parties reciprocally guarantee that all technical information and data generated under the agreement shall be treated as confidential and shall not be divulged by either party without prior written consent of the other even after the expiry of this agreement.

IX. ARBITRATION

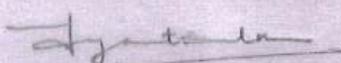
In case, there be a dispute relating to any aspect of academic cooperation, all the parties will resolve the dispute in a spirit of mutual respect and shared responsibility, failing which, the unresolved difference or disputes shall be referred to the arbitration in accordance with the Arbitration and Conciliation Act, 1996 and the seat of arbitration shall be at Thiruvananthapuram by a distinguished authority agreed mutually by all the parties and decision by the authority shall be final and binding.

X. FORCE MAJEURE

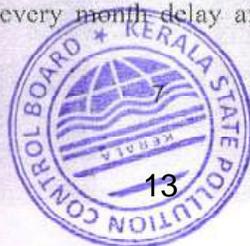
Neither party shall be held responsible for non-fulfillment of their respective obligations under this agreement due to exigency of one or more of the force majeure events such as but not limited to act of God, War, Flood, Earthquakes, Strikes, Lockouts, Epidemics, Riots, Civil Commotion, etc. provided on the occurrence and cessation of any such events, the party affected thereby shall give a notice in writing to the other party within one month of such occurrence or cessation. If the force majeure conditions continue beyond six months, the parties shall jointly decide about the future course of action.

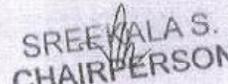
XI. PENALTY CLAUSE

The work shall be completed within the period mentioned in section VI from the date of signing the agreement. CSIR-NIO shall pay an amount equal to 1 percent of the total cost of the work as compensation, for every month delay after the due period, provided that the


CSIR-NIO

True copy




SREEVALA S.
CHAIRPERSON

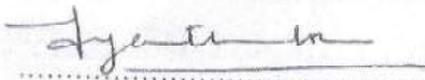
KSPCB

entire amount of compensation to be paid under the provisions of this clause shall not exceed 10 percent of the total cost of the work. After this, the KSPCB may consider terminating the contract at the risk and cost of NIO. In case a dispute arises while work is in progress or after completion, the matter shall be referred to the Chairperson, KSPCB, and the decision will be final.

XI. AMENDMENTS

Except otherwise provided therein, no addition, amendment or modification of any part of the Agreement shall be effective unless done in writing and signed by and on behalf of both parties by their respective Authorized Signatories.

For and on behalf of CSIR-NIO

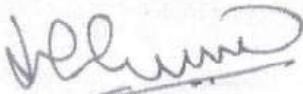


Name: डॉ. आर. ज्योतिबाबू / Dr. R. Jyothibabu
वरिष्ठ प्रधान वैज्ञानिक / Sr. Principal Scientist
प्रभारी वैज्ञानिक (विभाग प्रमुख) / Scientist-in-Charge (HoD)
Title: सी.एस.ई.आर.-राष्ट्रीय समुद्र विज्ञान संस्थान
C. S. I. R.-National Institute of Oceanography
क्षेत्रीय केन्द्र / Regional Centre, कोच्ची / Kochi-682 018

Seal:



WITNESS NO. 1



(Signature)

Full name and official address
(in legible letters)

मुरलीधरन के.आर.
MURALEEDHARAN K. R.
प्रधान वैज्ञानिक / Principal Scientist
सी.एस.ई.आर.-राष्ट्रीय समुद्र विज्ञान संस्थान
C. S. I. R.-National Institute of Oceanography
भारत सरकार / Govt. of India
क्षेत्रीय केन्द्र / Regional Centre
कोच्ची / Kochi-682 018

For and on behalf of KSPCB



Name:

Title:

SREEKALA S.
CHAIRPERSON

Seal:



WITNESS NO. 2



(Signature)

Full name and official address
(in legible letters)

ESY VARGHESE
Senior Environmental Engineer


ESY VARGHESE
Senior Environmental Engineer

True copy

CSIR-NIO



KSPCB

CRUISE REPORT-FORV SAGAR SAMPADA CRUISE No #SS 419

ETD : Chennai (25.07.2025) ETA: Kochi (21.08.2025) - 28 days

Summary of the activities carried out onboard Sagar Sampada

Si No	Activity	Remarks
1	Environmental sampling related to ship wreck locations – 49 Nos. OSPAR stations – 16 Nos.	We have conducted the environmental survey as per the cruise plan.
2	CTD	Ninety-six casts have been carried out during the cruise.
3	ADCP	We have recorded the data at stations and from station to station separately.
4	AWS and Thermo-salino graph	Data was collected till 18.08.2025; after that, error values were reported.
5	Sonar SIMRAD/SX90	Operated at the MSC ELSA3 location on 14.08.2025. We have taken snapshots of the Capsized Ship and containers nearby.
6	Echo sounder 38/120/200/333 KHz	Operated according to the depth ranges during the entire cruise period.
7	Smith Mc-Intyre Grab	Operated 179 times, covering depths ranging from 10 m to 500 m.
8	Bongo	Operated 105 times. One net was damaged during the operation on 16.08.2025 and was replaced by the CMLRE stock.
9	Dredger	Operated at 13 stations along the 50 m depth contour.

True copy



B. Varghese
EDY VARGHESE
 Senior Environmental Engineer

Preliminary findings

- Scanning images from Sonar SIMRAD/SX90 identified Capsized Ship Elsa3 and containers (Evidence 1)
- The ELSA 3 shipwreck site was sampled as per OSPAR guidelines, where a large patch of oil film was observed on the surface; further, it aligned with the waves towards coastal regions. (Evidence 2)
- The disintegration of Oil slick in to fragments under the action of heavy monsoonal winds and currents were noticed. (Evidence 3)
- Dead and deformed marine turtle was spotted at the shipwreck site (Evidence 4).
- Intense coastal upwelling was observed along the southwest coast of India, where traces of Arabian Sea High Saline Water masses were noticed.
- Off Kanyakumari stations experienced high winds (>20 knots) due to the tunnelling of winds through the Gulf of Mannar/Palk Bay during the break monsoon period.
- The water column of coastal stations T13, T12, T11, T9, and T5 was more oxygen-depleted than other transects, indicating the influence of OMZ in the Southeastern Arabian Sea.
- The gelatinous plankton was abundant in the zooplankton nets from the T7 (Kollam) transect and northward.
- Blooms of gelatinous plankton were observed in the coastal stations (10 m, 20 m, 30 m and 50 m) of Kochi, Alappuzha, and Kollam during the Bongo operation.
- Presence of *Noctiluca* bloom and bioluminescence was observed from the Kollam to Kozhikode belt.
- An extensive *Noctiluca* bloom with discolouration of the upper surface waters was found at a coastal location (20 m) off Arthungal.

1. Introduction

A Liberian-flagged cargo vessel, MSC Elsa 3, sank on May 24, 2025, approximately 14.6 nautical miles off the Kerala coast near Thottapally, Alappuzha, while enroute from Vizhinjam Port to Kochi. The ship was carrying 643 containers with various materials, including cotton, polymers, wood, food items, waste and scrap, calcium carbide, hydrazine,

True copy



hydroxylamine, quick lime, and large quantities of diesel and furnace oil. The diesel and furnace oil remain contained, and government agencies are actively working to recover them from the ocean. Additionally, efforts are underway to retrieve plastic and cotton materials that have been released from open containers, as well as those that have reached the shore in floating containers. The incident has raised significant concerns regarding oil spills, hazardous debris, and potential long-term ecological damage, prompting coordinated response efforts from relevant authorities.

Kerala State Pollution Control Board issued a ToR requesting CSIR-NIO to carry out the study of environmental damage caused by the shipwreck of the capsized vessel MSC Elsa3 on the coastal and marine ecosystem off Kerala. Accordingly, CSIR-NIO has prepared a project proposal to study the short-term and long-term impacts on the coastal ecosystem off Kerala. The revised proposal was accepted, and KSPCB issued a work order (KSPCB/1052/2025-SEE-2 dated 02/07/2025) to CSIR-NIO to conduct the Environmental damage assessment and a long-term study to assess the extent of environmental damage caused by the MSC Elsa 3 shipwreck incident. Environmental sampling was carried out as part of onboard research vessel Sagar Sampada (Cruise No: SS419) from 25th July to 21st August 2025.

2. Objectives

- Environmental impact assessment for the MSC ELSA capsized site according to OSPAR regulations.

3. Study area and sampling


EBY VARGHESE
Senior Environmental Engineer



True copy

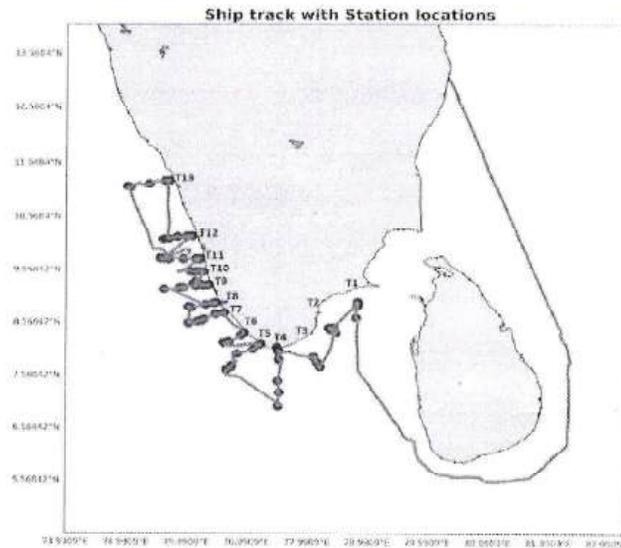


Fig 1. Station location along with the ship track.

Field sampling

The cruise covered ten transects, Cape Comorin (T4), Colachel (T5), Vizhinjam (T6), Kollam (T7), Karunagappalli (T8), Alappuzha (T9), Arthungal (T10), Kochi (T11), Munambam (T12), Kozhikode (T13)] along the 10m, 20m, 30m, 50m, 100m, and 200m, depth contours. In addition to these observation, we will conduct environmental survey as per OSPAR guideline by covering four radial transect at a distance of 500 m, 1 km, 2 km and 5 km distance (16 stations) from the capsized ship location (approximate depth of the location is 50 m). Onboard instrumentation (AWS, Echosounders, CTD, ADCP) was deployed to capture physical oceanographic parameters within the water column. Niskin samplers were used to collect water for subsequent analysis of suspended sediments, dissolved oxygen, chlorophyll, and nutrient concentrations. Plankton samples were collected using Bongo nets, deployed to evaluate the impact on productivity and food web dynamics. Bottom sediment and benthic organisms were collected using a grab and a dredge; sediments were also collected for characterising the sediment texture, biochemistry and quality.

B. L. M.
EBY VARGHESE
 Senior Environmental Engineer

True Copy



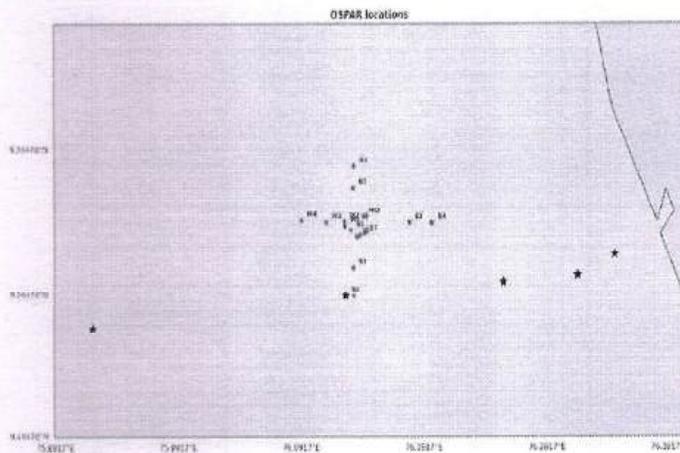


Fig 2. OSPAR locations (red dots) along the Alappuzha(T9) transect (black star).

Table 1. Ship wreck locations sampled during cruise SS 419.

Transect	Station	Depth	Longitude	Latitude
Cape Comorin	2	20	77.4968	8.022
	3	30	77.4968	7.9381
	4	50	77.5003	7.7151
	5	100	77.4896	7.46
	6	200	77.5021	7.2137
Colachel	2	20	77.1564	8.1461
	3	30	77.1281	8.1163
	4	50	76.9984	8.006
	5	100	76.8424	7.8645
	6	200	76.6808	7.7125
Vizhinjam	3	30	76.943	8.3553
	4	50	76.882	8.3152
	5	100	76.6686	8.1682
	6	200	76.6421	8.1537
Kollam/ Varkala	3	30	76.5617	8.7424
	4	50	76.45	8.7052
	5	100	76.279	8.6645
	6	200	76.2316	8.6527
Karunagappalli	2	20	76.4384	8.9965
	3	30	76.3963	8.984
	4	50	76.2886	8.9621
	5	100	76.017	8.8997
Alappuzha/Thottapalli	6	200	75.9592	8.8841
	1	10	76.2631	9.3048

True copy



EBY VARGHESE
Senior Environmental Engineer

	2	20	76.2286	9.2954
	3	30	76.1046	9.2813
	4	50	76.0073	9.2719
	5	100	75.9132	9.2562
	6	200	75.8645	9.2452
Arthungal	1	10	76.2528	9.6674
	2	20	76.1612	9.6558
	3	30	76.1199	9.6506
	4	50	75.9689	9.6519
	5	100	75.8309	9.6183
Kochi	2	20	76.0979	9.9817
	3	30	75.9929	9.9689
	4	50	75.824	9.9433
	5	100	75.624	9.9096
	6	200	75.582	9.9041
Munambam	2	20	76.0645	10.1961
	3	30	75.9608	10.1826
	4	50	75.8413	10.1691
	5	100	75.6767	10.1522
	6	200	75.6553	10.1522
Kozhikode	2	20	75.6739	11.2484
	3	30	75.6461	11.2455
	4	50	75.3479	11.2043
	5	100	75.0593	11.1679
	6	200	75.0075	11.1621

4. Preliminary Observations

4.1. Physical Parameters

True copy



B. L. V.
ESY VARGHESE
 Senior Environmental Engineer

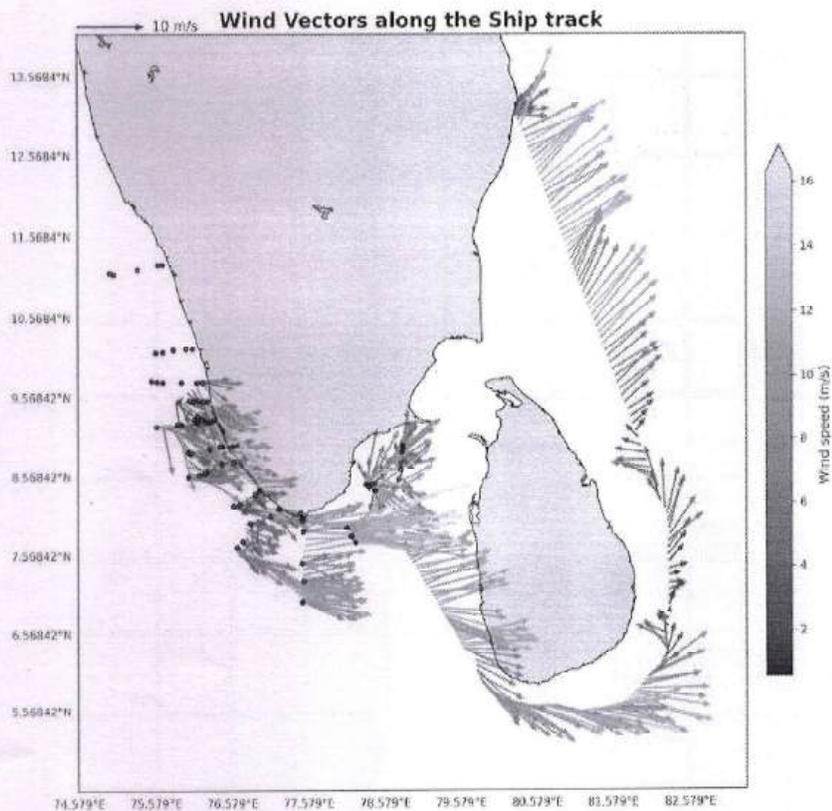


Fig 3. Wind vectors measured along a ship track in the northern Indian Ocean.

Wind speeds (Fig. 3) vary significantly along the ship track, from low (~1–2 m/s) to high (~16 m/s). Strongest winds are observed off the southeastern coast of India and along the southern coast of Sri Lanka, suggesting areas influenced by local coastal effects or monsoon wind jets. Weaker winds are seen near the western side of the track (Arabian Sea side). Highest wind speeds are mostly offshore, particularly in Uvari transects.

True copy



B. V. Varghese
EEY VARGHESE
 Senior Environmental Engineer

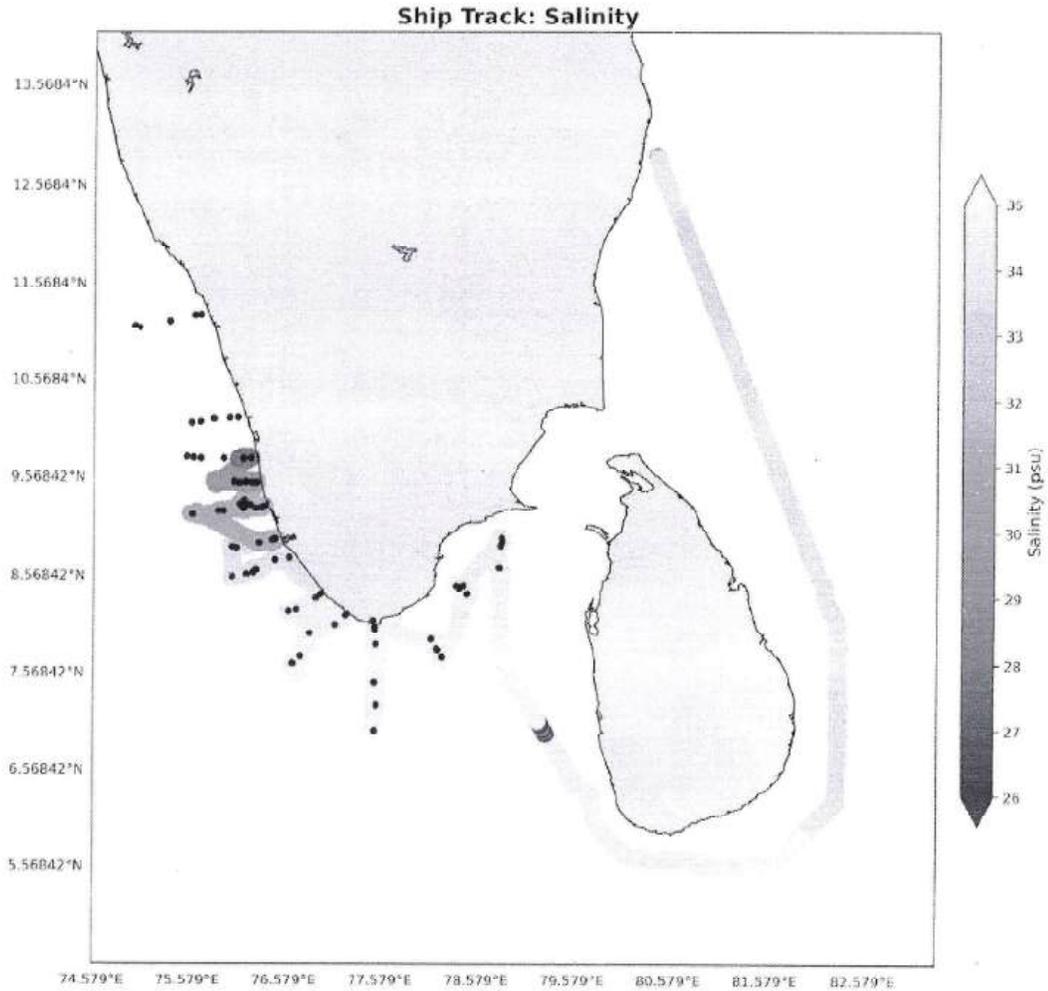


Fig 4. Surface salinity (SSS) distribution along the ship track around the southern tip of India and Sri Lanka.

Fig. 4 reveals the low-salinity water along the southwest coast of India. Salinity drops to 26–29 psu near $\sim 8\text{--}10^\circ\text{N}$, $75\text{--}76^\circ\text{E}$ (Kerala coast). This suggests freshwater input, likely due to monsoonal river discharge (Periyar, Bharathapuzha, etc.) and rainfall influence. Such low-salinity patches are consistent with monsoon-driven stratification in the eastern Arabian Sea.

Salinity remains consistently high along the southern and eastern track (off Tamil Nadu and Sri Lanka), around 34–35 psu. This region is less affected by direct river discharge and is dominated by open-ocean saline waters advected by the monsoon currents. The sampled data captures the signature of monsoonal freshwater input along the west coast of India, with low-salinity waters confined to nearshore zones.

True copy



B. V. VARGHESE
Senior Environmental Engineer

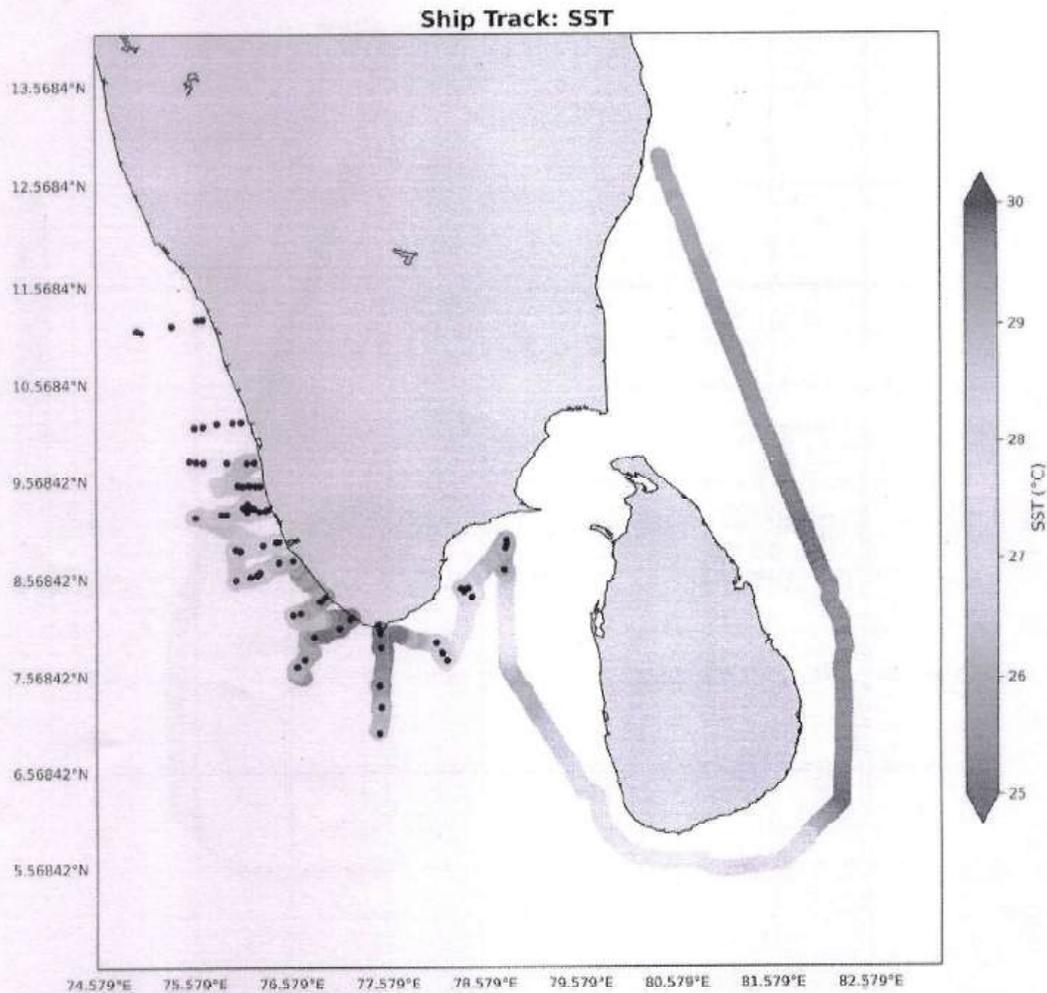


Fig 5. Sea surface temperature(SST) distribution along the ship track around the southern tip of India and Sri Lanka.

SST values (Fig. 5) drop to 25–26 °C near ~7–10°N, 75–77°E (Kerala–Kanyakumari coastal waters). This cooling suggests upwelling-driven processes, typical during the Southwest Monsoon, bringing colder subsurface water to the surface. The SST distribution clearly reflects the influence of monsoon-driven upwelling along the Indian west coast, producing cooler waters nearshore.

True copy



B. V. Varghese
EDY VARGHESE
 Senior Environmental Engineer

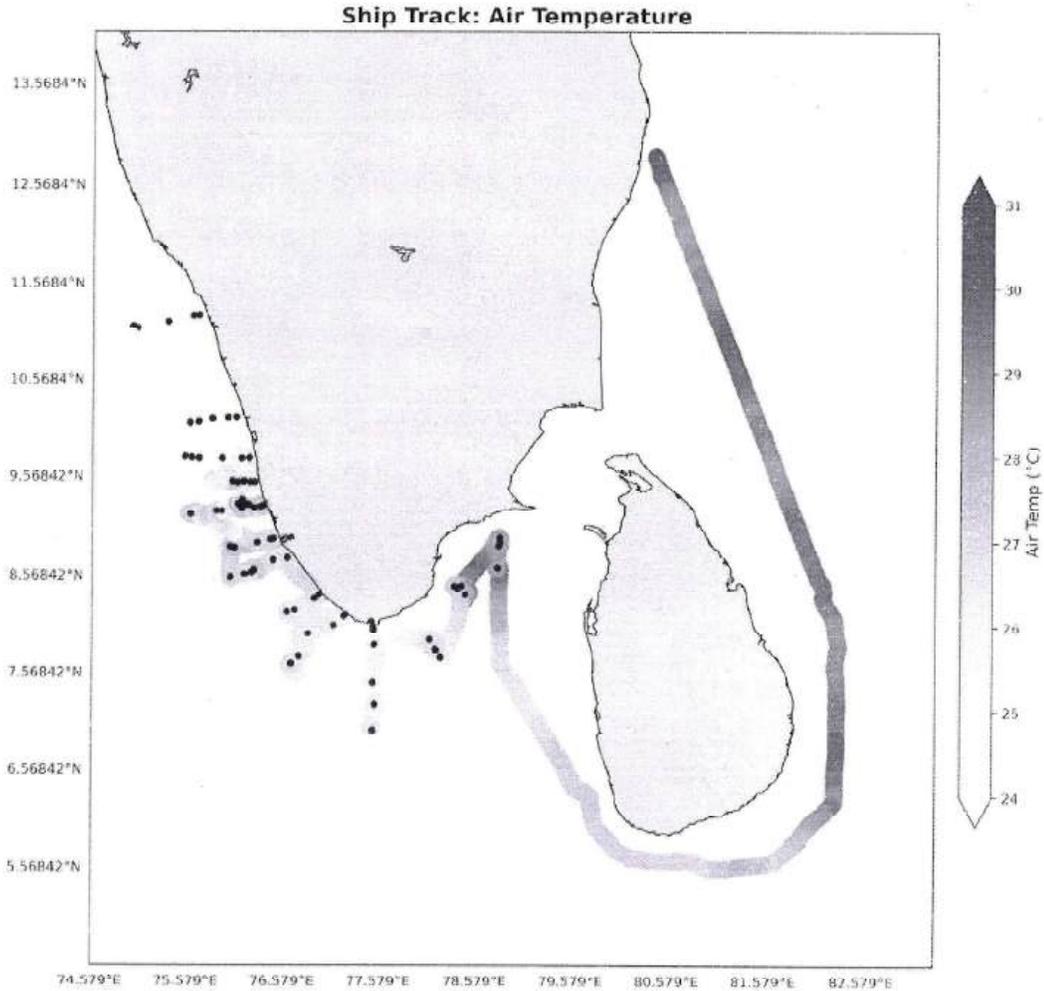


Fig 6. Air temperature distribution along the ship track around the southern tip of India and Sri Lanka.

Fig.6 represents air temperature ($^{\circ}\text{C}$), ranging from $\sim 24^{\circ}\text{C}$ to above 31°C . Maximum air temperature ($>31^{\circ}\text{C}$) was observed near the southeastern coast of India, while the minimum ($\sim 24^{\circ}\text{C}$) was seen along the southwest coast near Kerala. Along the first and second transects (east coast of India), there is an exceptional peak in air temperature.

True copy



B. V. Varghese
EDY VARGHESE
 Senior Environmental Engineer

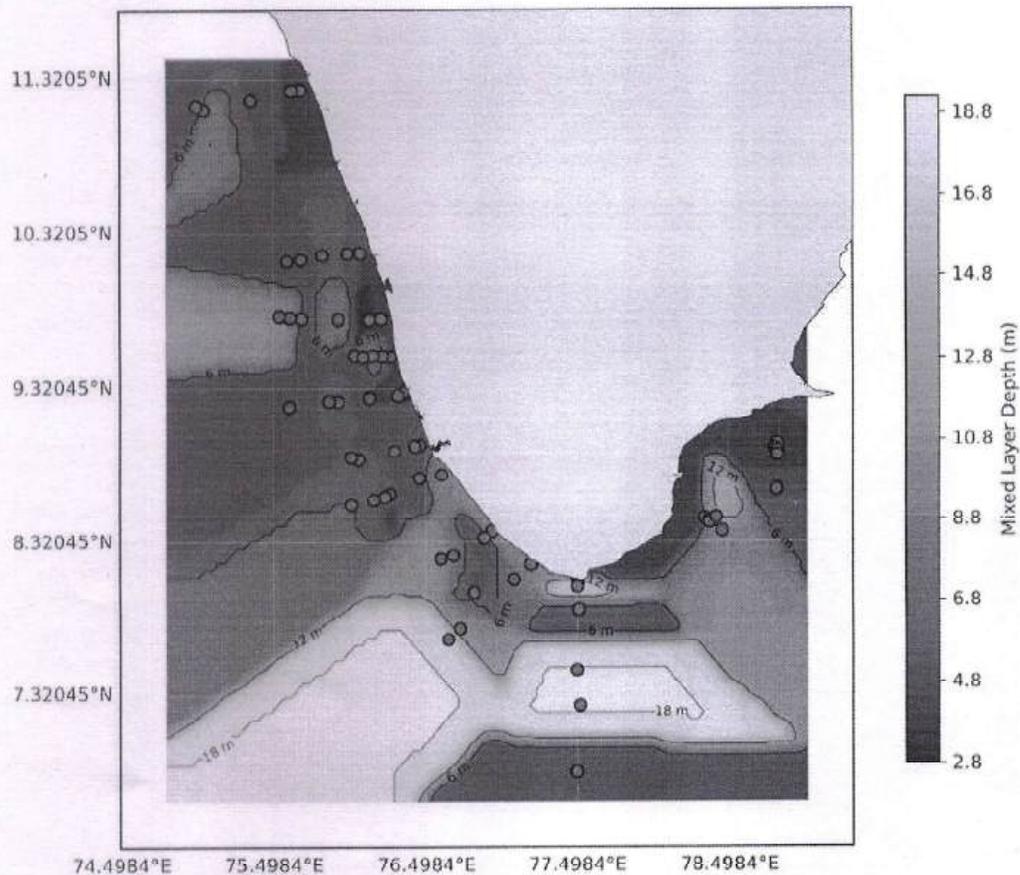


Fig 7. Spatial distribution of Mixed Layer Depth (MLD) along the southeast Arabian Sea and the southern tip of India. Contours (m) represent MLD variation, with red dots indicating observation stations.

The mixed layer depth (MLD) is highly variable across the region, strongly controlled by proximity to the coast (Fig. 7). The shallowest MLD (2.8 – 6 m) is seen near the coastal Arabian Sea, Gulf of Mannar, likely influenced by freshwater influx, stratification, and reduced vertical mixing. Deepest MLD (~18 m) observed in the southern offshore region, suggesting enhanced vertical mixing possibly due to stronger winds and weaker stratification.



B. V. Varghese
 B. V. VARGHESE
 Senior Environmental Engineer

True copy

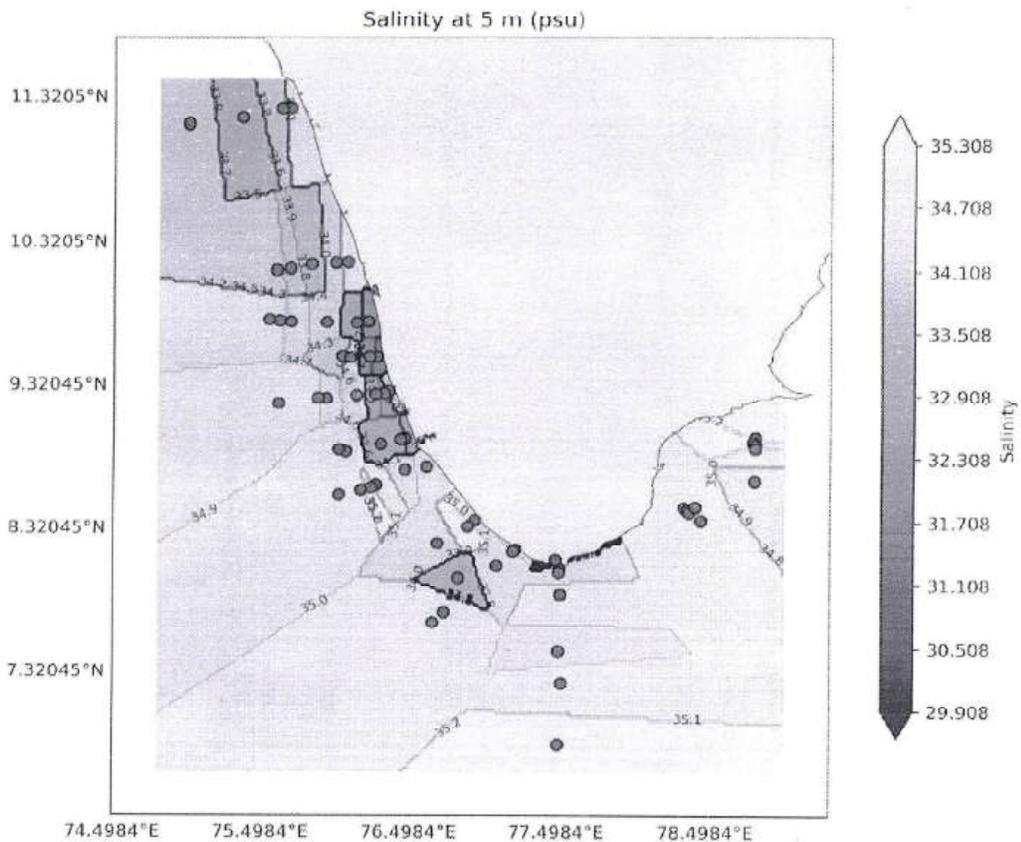


Fig 8. Spatial salinity distribution at 5 m depth along the southeast Arabian Sea and the southern tip of India. Contours represent salinity variation, with red dots indicating observation stations.

The Salinity values vary between 30 psu and 35.3 psu. Lowest values are closer to the coast, while the offshore region shows higher salinity. Along the Kerala coast (8° – 11° N), salinity is much lower (< 33 psu). This indicates freshwater input from rivers and estuaries, combined with rainfall and resulting stratification along the coast. The gradient highlights the influence of freshwater runoff associated with monsoonal rainfall. High salinity (>35 psu) coincides with deepest MLD (15–18 m), denser surface waters and more substantial wind-driven mixing/open-ocean influence.

True copy



B. Varghese
 EDY VARGHESE
 Senior Environmental Engineer

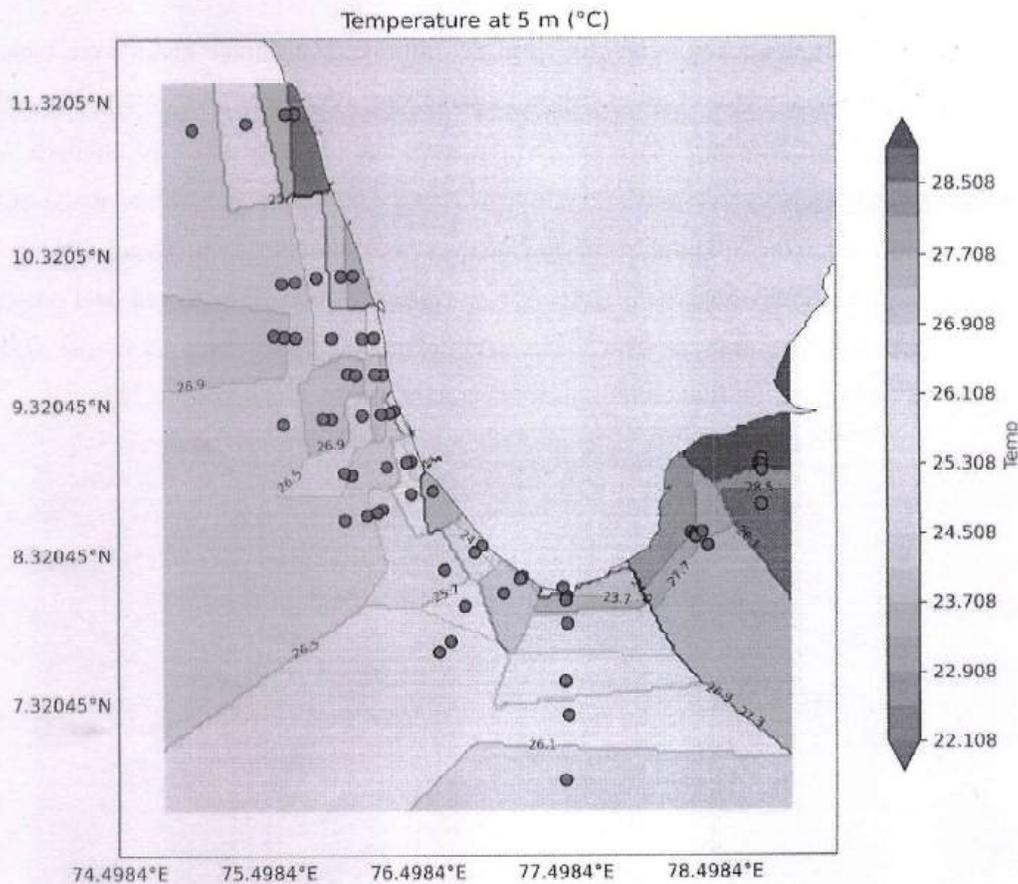


Fig 9. Spatial temperature distribution at 5 m depth along the southeast Arabian Sea and the southern tip of India. Contours represent salinity variation, with red dots indicating observation stations.

The map shows strong spatial temperature gradients between the southwest coast of India and the waters east of Sri Lanka (Fig. 9). Temperatures range from ~23.7 °C (cool patches) to ~28.5 °C (warm waters). A distinct cool patch (23.7–25.7 °C) appears south of India (~77–78°E, 7.5–8.5°N). This is a signature of coastal upwelling and intense mixing during the Southwest Monsoon. The 5 m temperature field clearly shows the monsoon-driven upwelling system near the southern tip of India, especially across the Kerala coast. In contrast, GoM and its offshore waters remained warmer.

True copy



B 10
EDY VARGHESE
Senior Environmental Engineer

4.2. Chemical Parameters

The water samples for dissolved oxygen, pH, nutrients, and trace gases were collected using a Niskin sampler from various depths (surface, 5m, 10m, 20m, 30m, 50m, 75m, 100m, 200m, 500m, 750m, 1000m). Dissolved oxygen (DO) and pH were analysed onboard, while nutrient and trace gas samples (CH_4 , N_2O , and CO_2) were preserved and will be analysed after reaching the laboratory. Samples for the analysis of Phthalic Acid Esters (PAEs) and Polycyclic Aromatic Hydrocarbons (PAHs) were collected, filtered, extracted, and preserved for further laboratory analysis. The ELSA 3 shipwreck site was sampled as per OSPAR guidelines, and a large oil film on the surface characterised the location (Fig. 10).



Fig.10 Photograph showing oil film on the surface waters

The DO concentrations (Figs. 11 and 12) were found to be higher at coastal stations of T10, T4, T2, and T1. The water column of coastal stations T13, T12, T11, T9, and T5 was more oxygen-depleted compared to others, indicating the influence of OMZ in the Southeastern Arabian Sea. Additionally, high oxygen depletion was prominent in the coastal stations of Munambam and Arthungal compared to other regions. Sediment samples were collected from depths of 20m, 30m, 50m, 100m, and 200m across all transects for PAEs, PAHs, and trace metal analysis. The stations of the Uvari transect experienced heavy wind and wave action, so sampling of chemical parameters was not possible at those stations. Samples of zooplankton and benthic organisms were also collected for PAEs, PAHs, and trace



B. L. D.
EDY YARGHESE
Senior Environmental Engineer

True copy

metal analysis. Dredged samples of macro benthos were collected for the PAEs, PAHs, and trace metal analysis.

Moreover, the pH (Figs 12 and 13) shows a decreasing trend through the water column. Upwelling waters have brought low pH water towards the surface at T11, T12 and T13 stations. Comparing all transects, the bottom water of the western coast is slightly more basic than the bottom waters of the eastern coast. The pH at the OSPAR sampling site varies from 7.9 to 8.2.

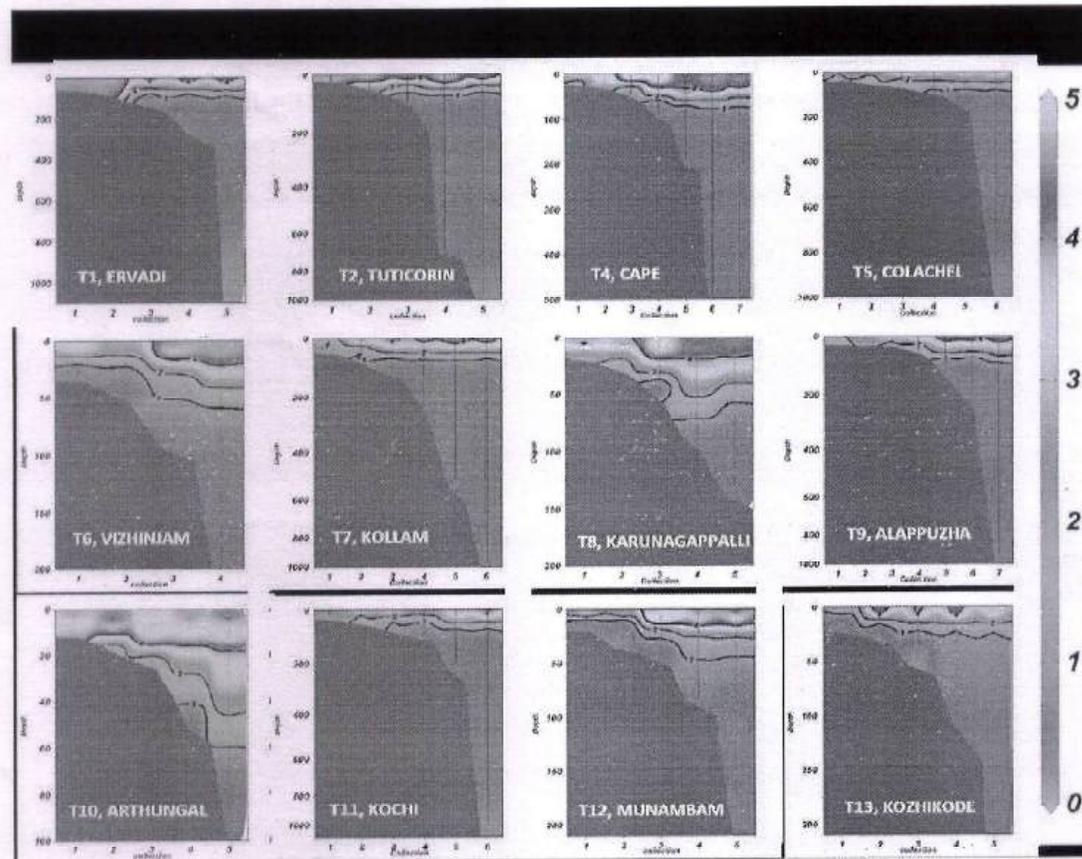


Fig. 11 Cross-shelf variations of dissolved oxygen in the southeast and southwest coast of India

True copy



B. V. Varghese
EDDY VARGHESE
 Senior Environmental Engineer

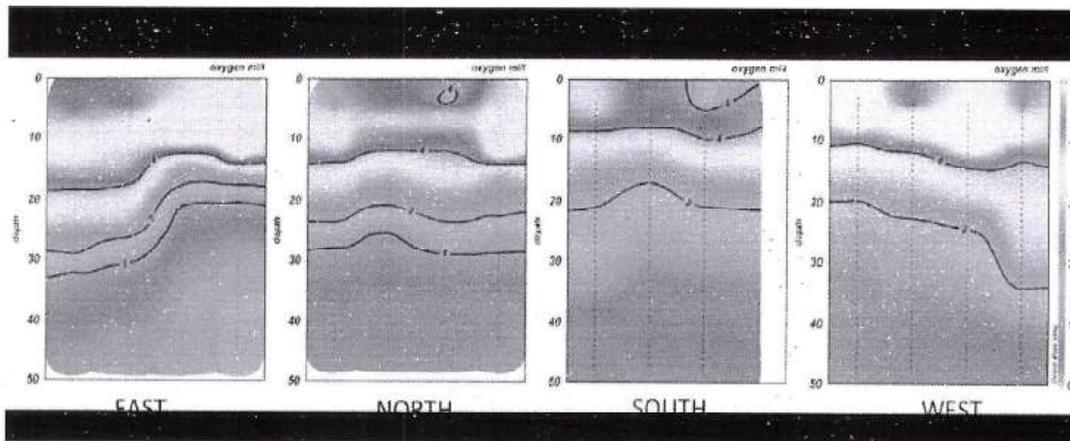


Fig. 12 Vertical variations of dissolved oxygen in the water column of the ELSA3 shipwreck site

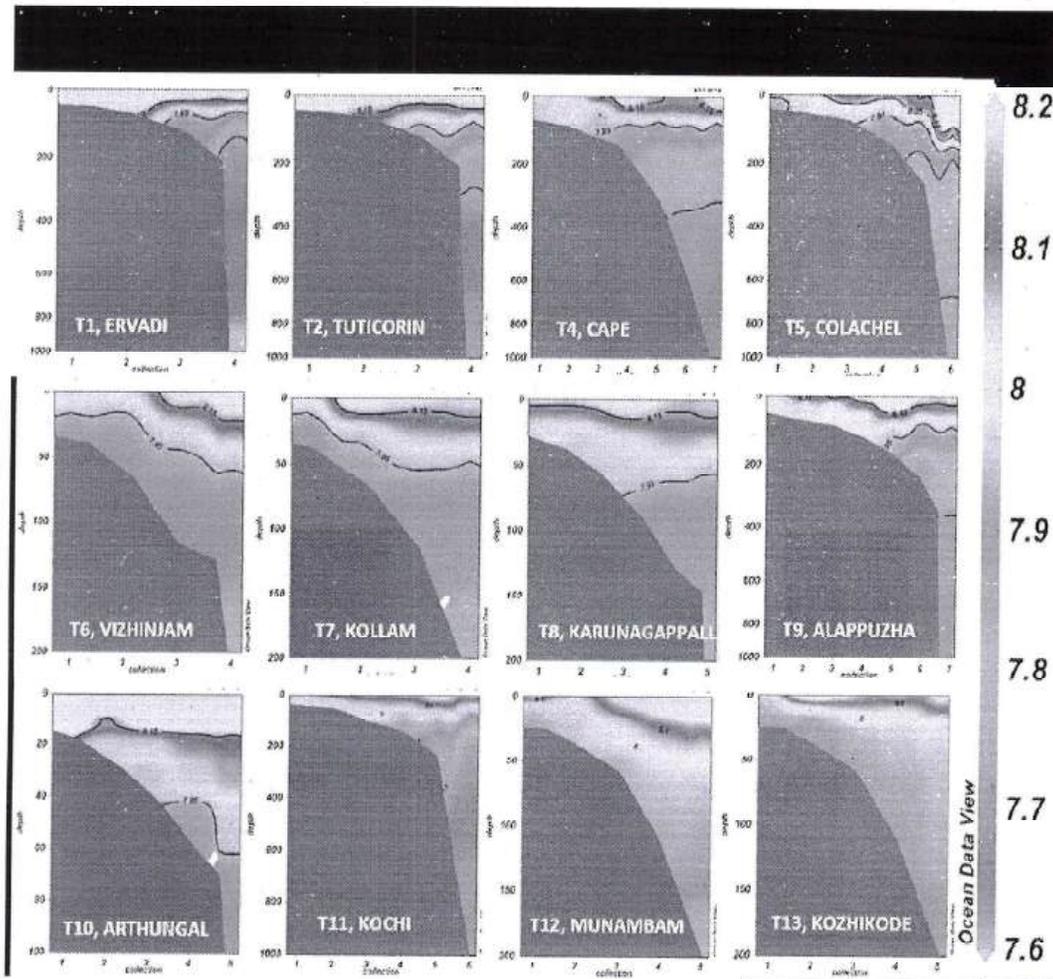


Fig. 13 Cross-shelf variations of pH in the southeast and southwest coast of India

True copy



B. L. V.
 EDY VARGHESE
 Senior Environmental Engineer

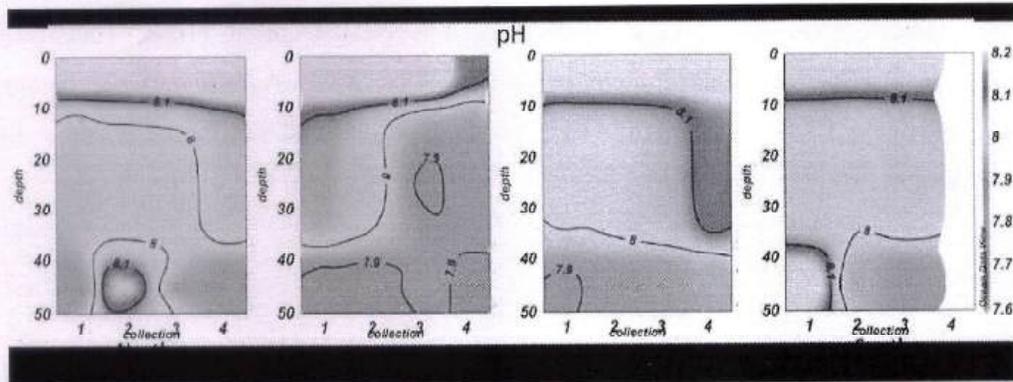


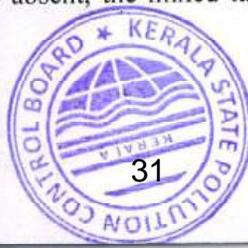
Fig. 14 Vertical variations of pH in the water column of the ELSA3 shipwreck site

4.3. Biological Parameters

4.3.1. Plankton components

The plankton food web components were collected from all the stations covered by the present cruise, using Niskin samplers and plankton nets. The water samples for phytoplankton/microbial biomass, production and diversity were collected using a Niskin sampler. Water samples from discrete depths (surface, 10m, 20m, 30m, 50m, 75m, 100m and SCM) were used for differential analysis of phytoplankton. All plankton components will be quantified using a combination of fluorescence microscopy, flow cytometry and FlowCAM after reaching the laboratory. Phytoplankton on the surface was collected using a 60-micron phytoplankton net. Phytoplankton samples were also collected from standard depths (10m, 20m, 30m, 50m, 75m, 100m and SCM depths) from the water samples obtained from Niskin bottles. Samples were concentrated and preserved in 5% Lugol's solution for further analysis in the laboratory. Zooplankton in the surface waters was collected using a paired Bongo net (200 μ m) and a working party net equipped with a flowmeter. Zooplankton samples from Bongo and working party nets were taken for quantification (preserved in 4% formalin), isotopic studies, and for tracing the presence and quantity of PAE and metals. Multiple casts were done for Bongo when the biomass was too low to get subsamples for PAE, metal analysis, and isotopic studies. Stratified vertical zooplankton collection was done using Multiple plankton net (MPN, 200 μ m), where samples from mixed layer, thermocline and OMZ were collected based on the hydrographic profile obtained from the CTD data. Stations where thermocline and OMZ were absent, the mixed layer and the layer below the mixed

True copy



layer were collected. The plankton pump was operated in selected stations (100m, 1000m) to obtain zooplankton samples from discrete depths (5m, 30m, SCM). A *trichodesmium* bloom was noticed at the 1000 m station on. The abundant presence of gelatinous plankton in zooplankton

Bongo co
gelatinou
50m) of
phenome
bloom w
off Arthu

he
n,
nd
ce
ca
n)

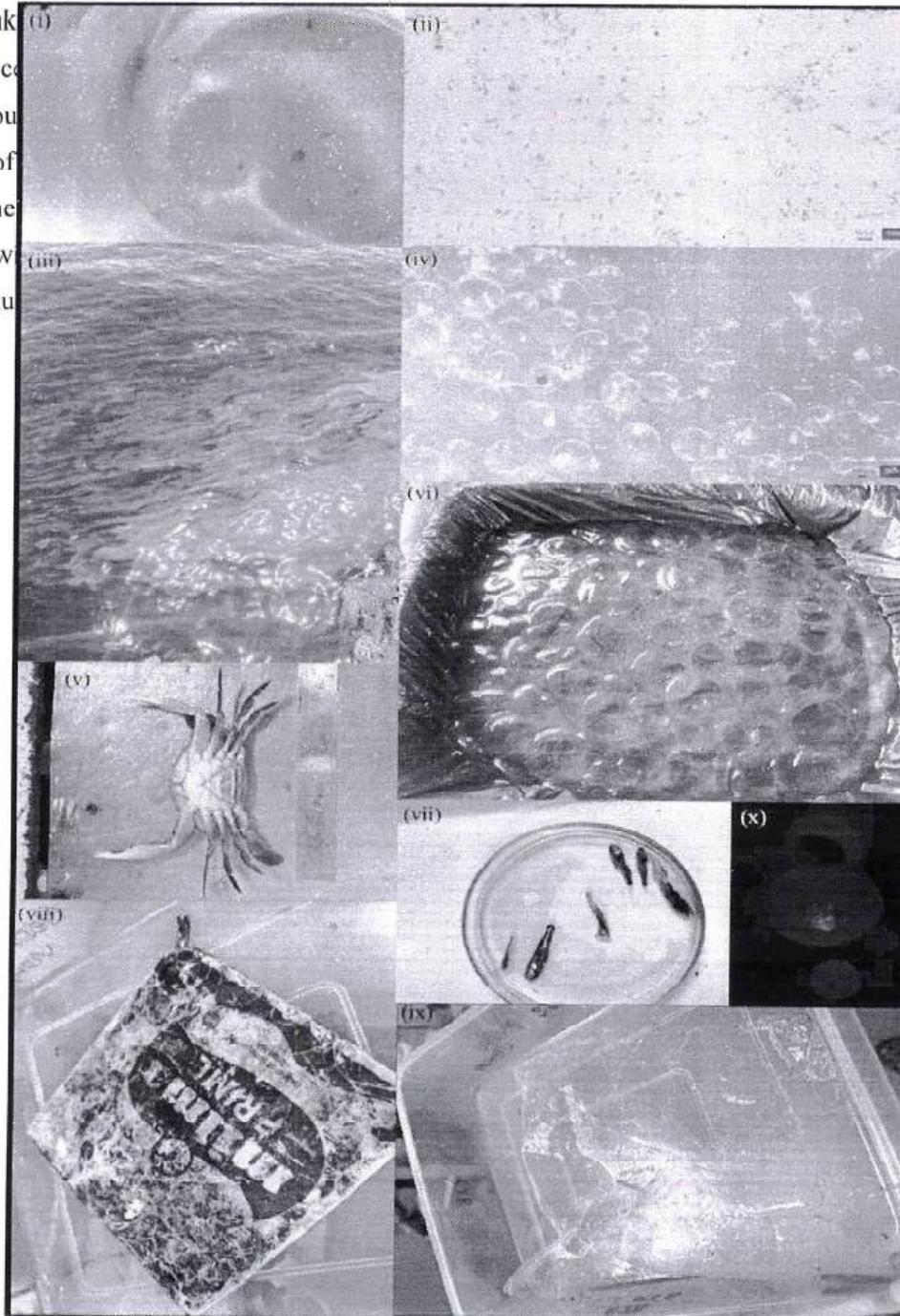


Fig. 15: Pictographs of blooms (I, ii, iii, iv), swarms (v, vi) and other major observations from the cruise

True copy



B V EDY VARGHESE
Senior Environmental Engineer

4.3.2. Benthic Components

Sedimentological parameters

Aliquoted sediment samples were collected from the grab to examine sedimentological parameters, including grain size distribution, total organic matter (TOM), PAE/PAH, heavy metals and bacterial community. To study the quantitative and qualitative characteristics of microplastics in the environmental matrices 10 litres of water were collected from each surface and bottom using Niskin samplers, and filtered through a 20 μ sieving unit. The residues were transferred into the glass bottles with proper labelling for further analysis. Additionally, in duplicates, 20 liters of bottom water were collected from niskin bottles to measure suspended solids and particulate organic matter. They were filtered on Millipore and Whatman filter papers of 0.45 micron using a filtration unit, and the residues were preserved in -20 freezer for further analysis.

Significant variance was observed in textural composition with respect to bathymetry and latitude (Corser sand to clay silt and biogenic coral sediment). All samples were preserved following the standard protocol for further analysis in the shore lab.

Epi-fauna

Epifauna refers to the ecological niche of benthic organisms, which are presences on the surface of the seabed. For the present study we considered larger benthic organisms, usually greater than 10 mm in size, and visible to the naked eye. A naturalist's dredge (100 \times 30 cm) with a 1 cm mesh net was towed for 15 minutes at 50 m depth across all transects. It was observed that hermit crabs and echinoderms were more common in the southern region, while shellfish, gastropods, molluscs, and sole fish were dominant in the northern region.

Macro and meiofauna

Macrofauna which are considered for the present study are organisms >0.5 mm. Sediment samples were collected using a Smith McIntyre grab (area - 0.1 m²) in duplicates. The grab was operated at different depths such as 10 m, 20 m, 30 m, 50 m, 100 m, 200 m and 500 m, in order to collect benthic samples, sampling depth varies from transect to transect as per the requirements of the study. However, due to technical issues, grab operation was not possible at 1000 meters. These samples were sieved through a 500 μ mesh sieve with copious amounts of seawater. After sieving, the fauna was carefully transferred to the sampler bottles. Some samples were retained in 96% ethanol and filtered sea water for molecular and isotopic food

True copy



web analyses. In the laboratory, the sediments were washed again under tap water and the collected organisms were preserved in 5% buffered formalin along with Rose Bengal stain. All samples were labelled and stored for further examination.

Meiofauna offer several advantages for the study of marine benthic ecosystems that can be distinguished from macro fauna by their small sizes. The size range of 45μ – 500μ has considered as meiofauna in the present study. To collect meiofauna, subsample from the grab was taken by corer, followed by serial sieving through 500μ and 45μ mesh as upper and lower limits. samples were preserved in 5% buffered formalin and DNA diluent for subsequent analysis.

Preliminary observations during the sampling period indicate polychaetes dominated the macrobenthic communities across all stations, followed by crustaceans, particularly amphipods. These initial results suggest diverse benthic communities across the studied transects. Further in-depth analysis will provide a detailed macro and meio benthic community structure.

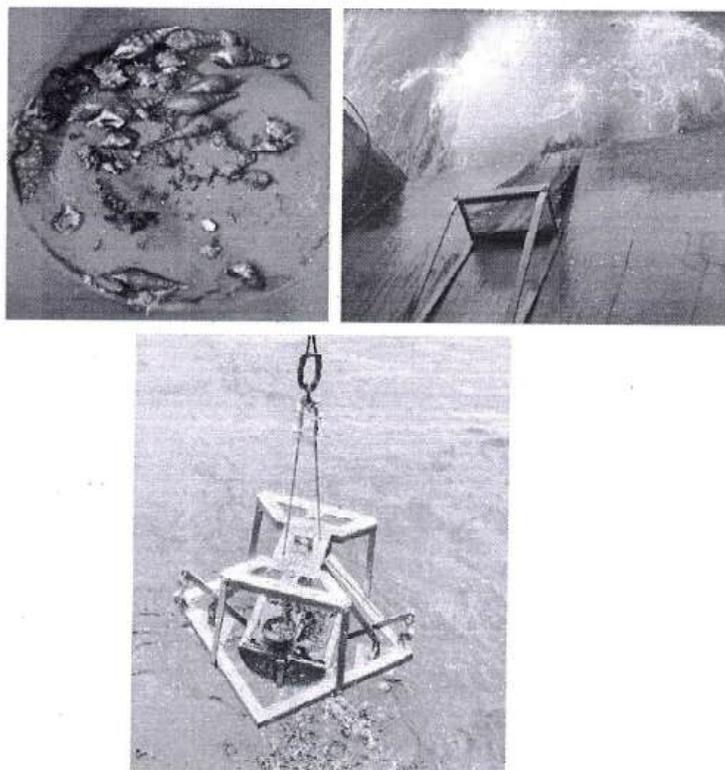
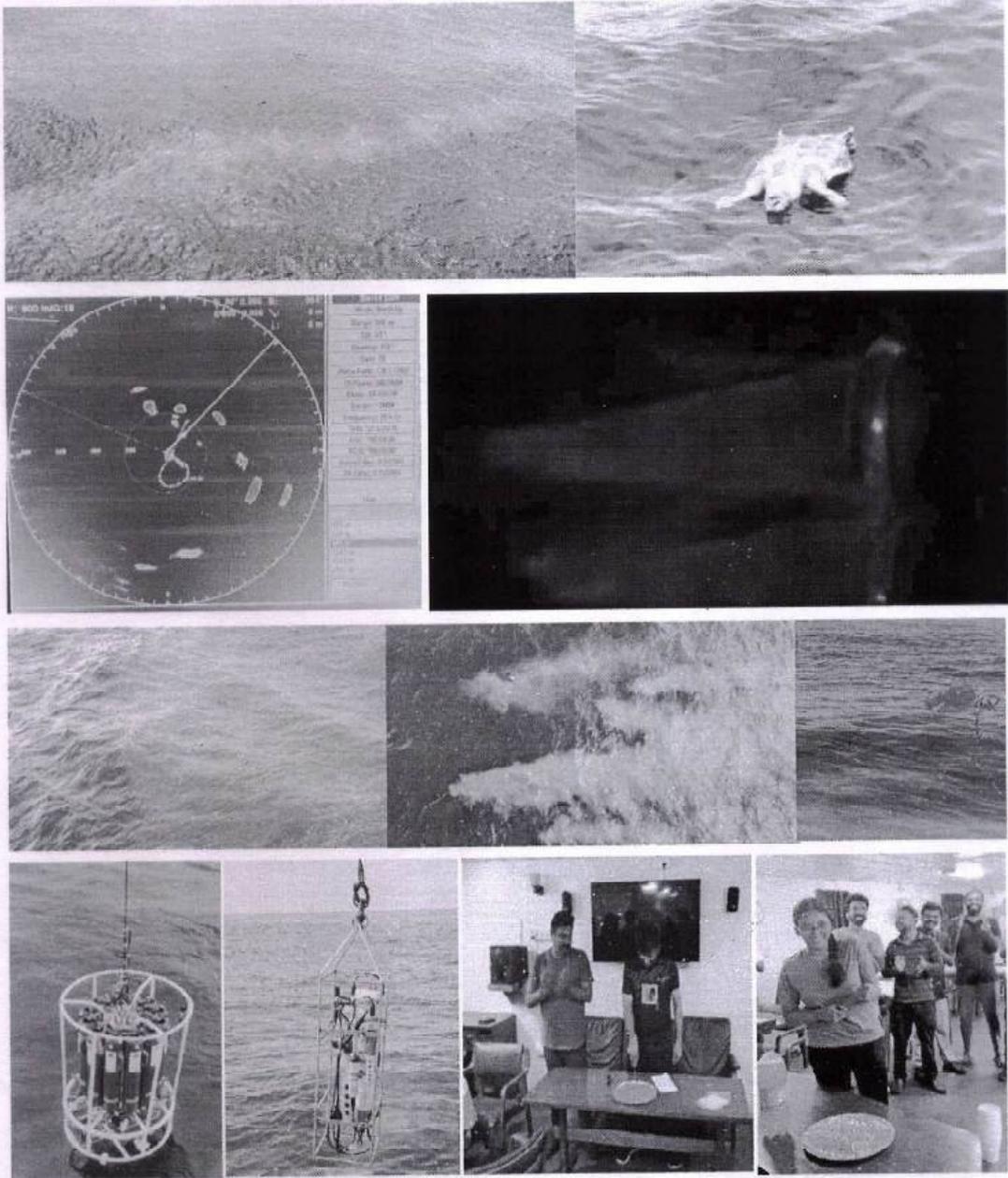


Fig. 16: Pictographs of Benthic operations from the cruise

True copy





Glimpses from the cruise # SS419

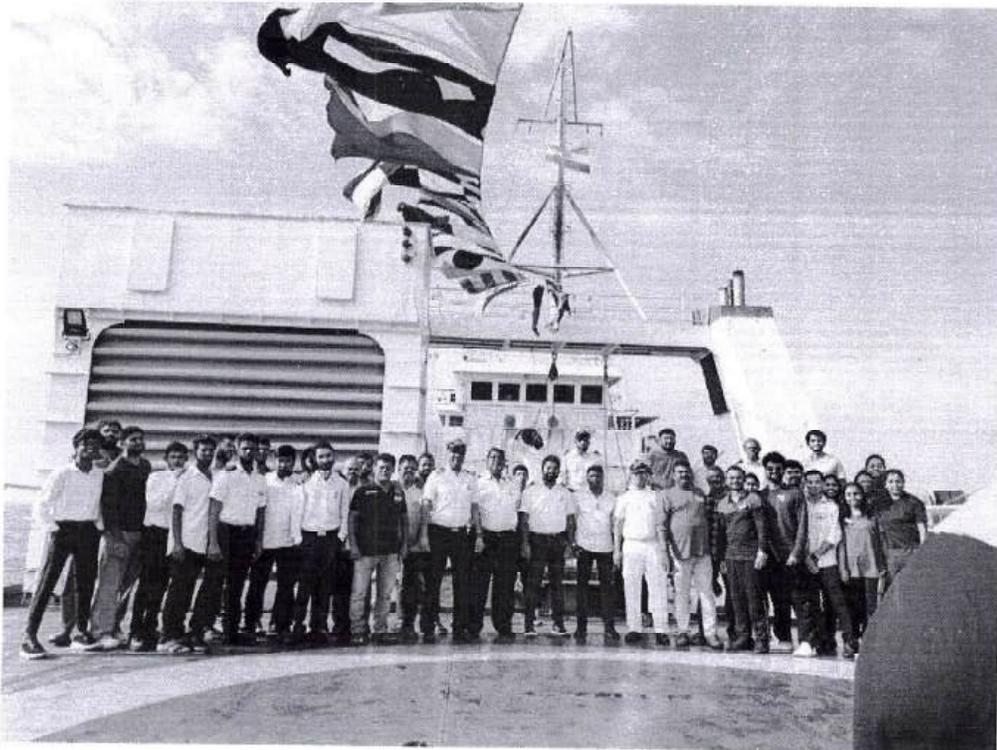
B. V. Varghese
 BSV VARGHESE
 Senior Environmental Engineer

True copy





Scientific Team # SS419



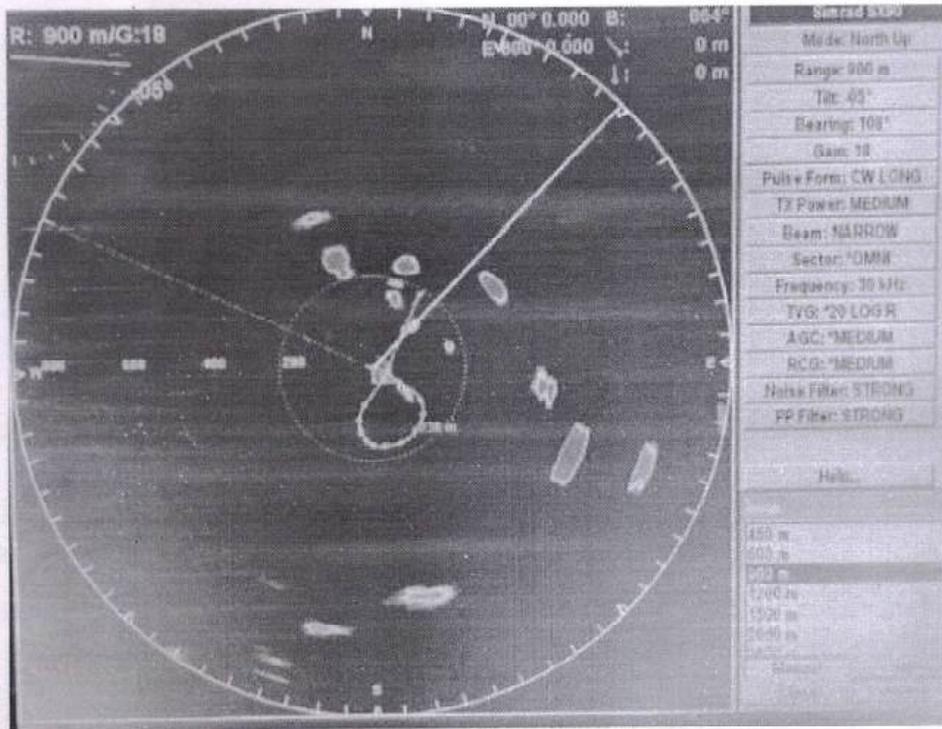
Independence Day Celebration held onboard Sagar Sampada Cruise # SS419

True copy



B V
B V VARGHESE
Senior Environmental Engineer

Evidence 1. Sonar SIMRAD/SX90 Capsized Elsa3 and containers



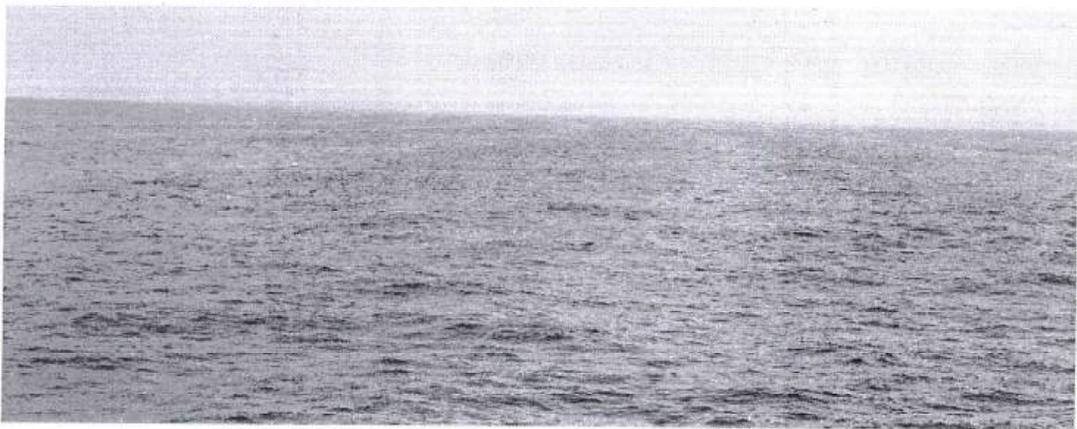
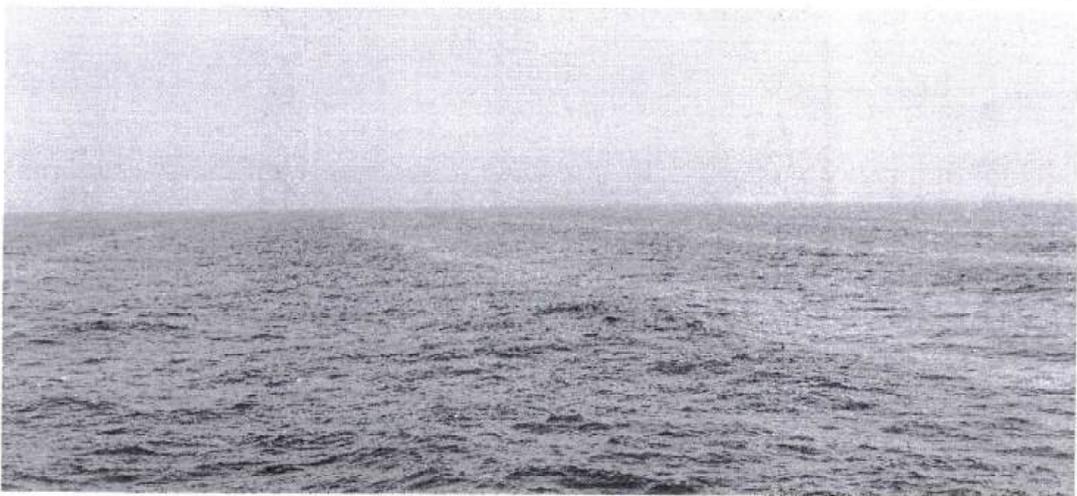
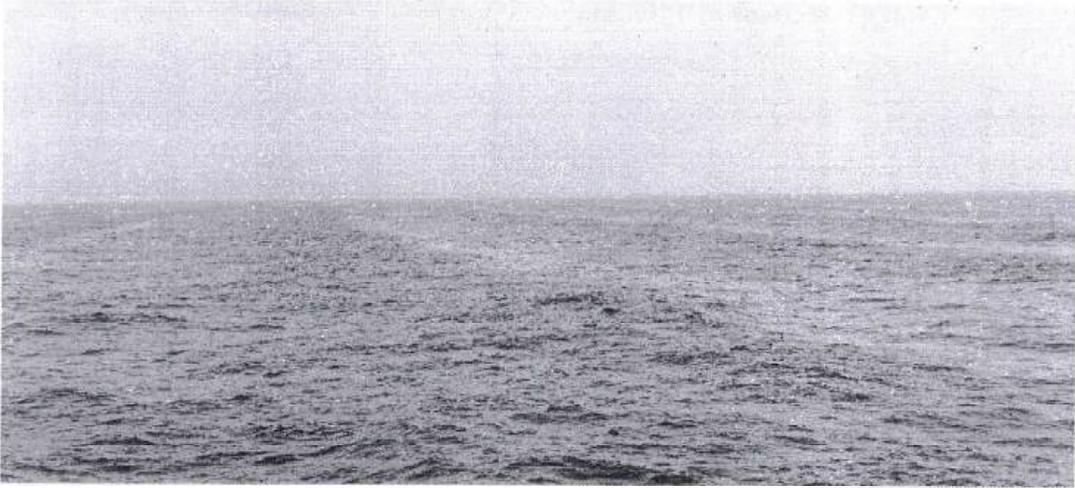
Evidence 2a. Oil Slicks aligned with wave trans observed at Alappuzha-Thottapilly during 14th to 15th August 2025



True copy



B. Varghese
EDY VARGHESE
Senior Environmental Engineer



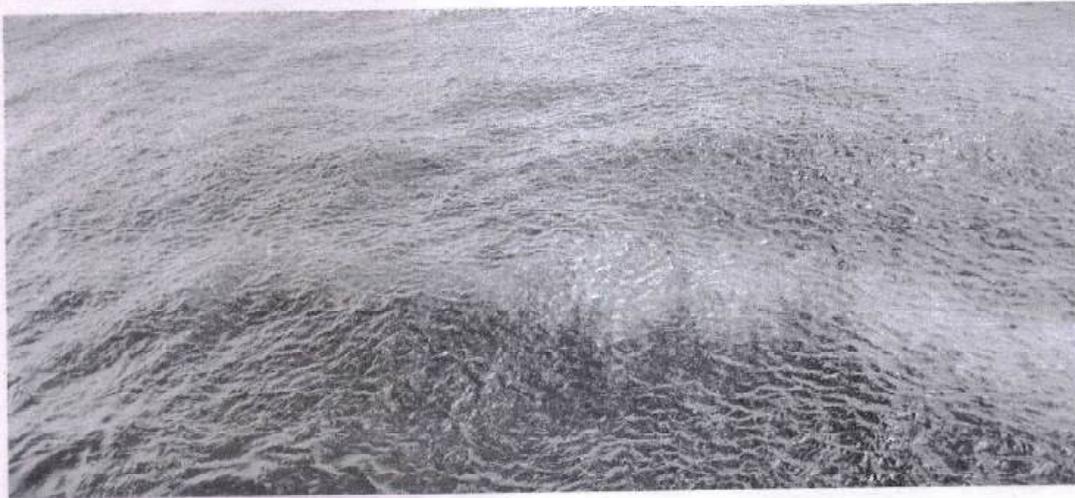
True copy



B. L. D.
B. V. VARMA
Senior Environmental Engineer



Evidence 2b. Large Oil Slicks in the Capsized location



Evidence 2c. Comparison of Slick with ship size



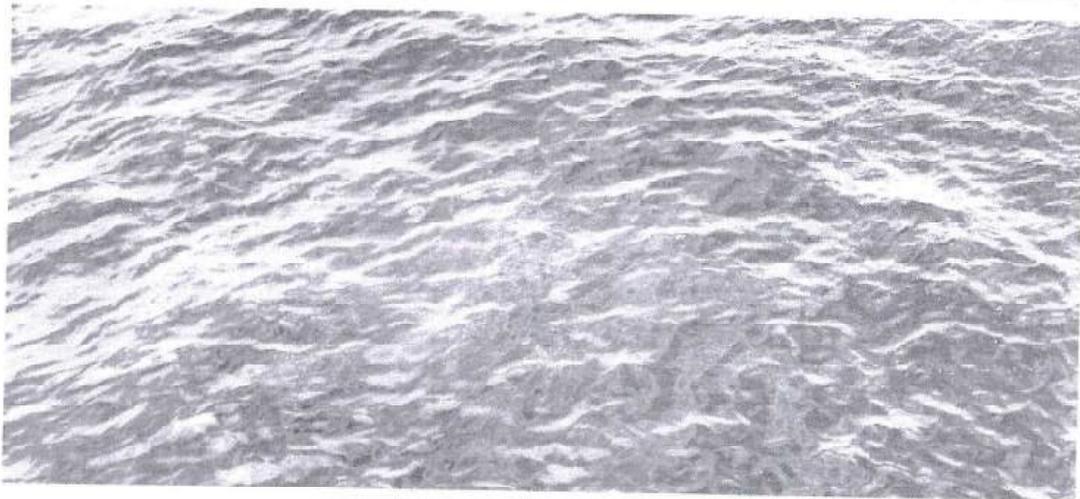
True copy



B L V
EDY VARGHESE
Senior Environmental Engineer



Evidence 2d. Zoom to Oil Slick



True copy



B V V
ESY VARGHESE
Senior Environmental Engineer



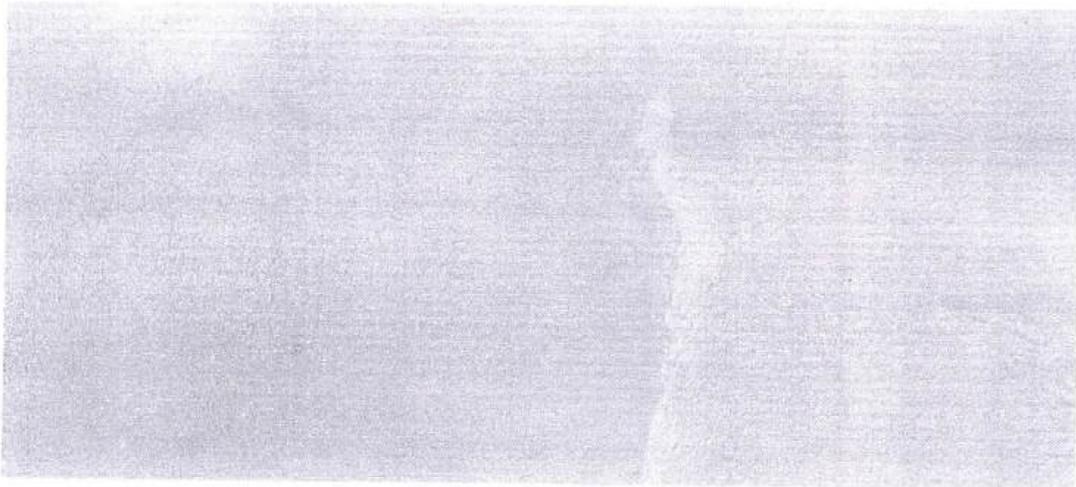
True copy



B L W
EDY VARGHESE
Senior Environmental Engineer



Evidence 3 Breaking of Oil Slicks in to fragments due to heavy winds and currents



True copy



B. D.
B. D. VARGHESE
Senior Environmental Engineer



True copy



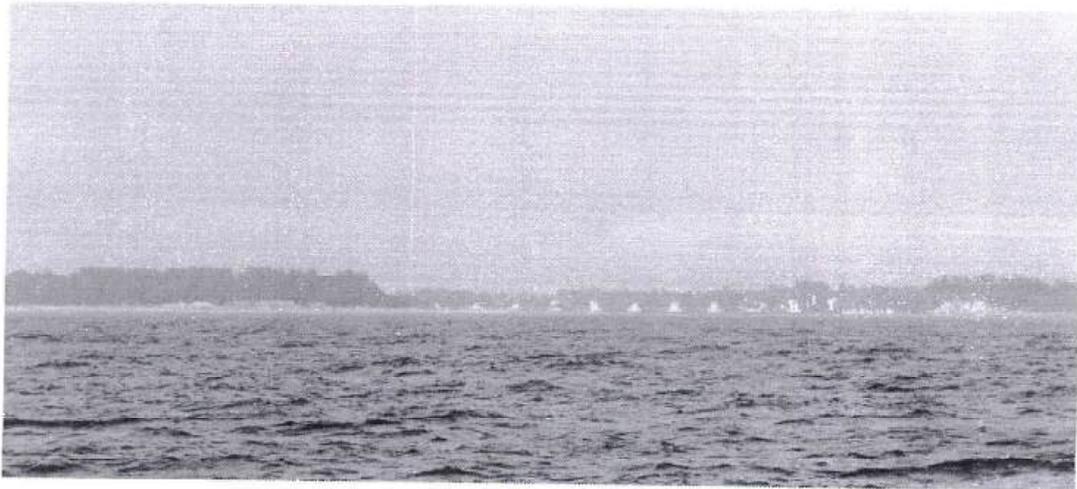
B. V. M.
B V M VARGHESE
Senior Environmental Engineer



Evidence 4. A dead turtle observed in the Capsized location



Thottapilly Spillway



True copy



B L D
EDY VARGHESE
Senior Environmental Engineer

Snaps of Survey conducted using fishing trawler on 29th August 2025

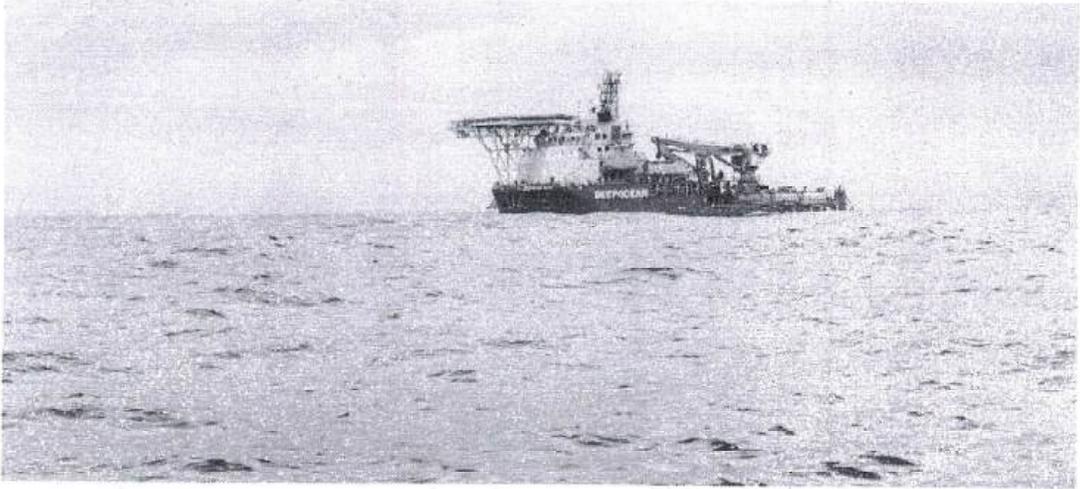


True copy



B V
EDY VARGHESE
Senior Environmental Engineer

Salvage ship in the Capsized location (29th August 2025)



Patrolling/surveillance Vessels



True copy



B. V. V.
B. V. V. VARCHESE
Senior Environmental Engineer

☎: General: 0471- 2312910, 2318153, 2318154, 2318155 Chairman: 2318150 Member Secretary: 2318151
 e-mail: chn.kspcb@gov.in; ms.kspcb@gov.in FAX: 2318152
 web: kspcb.kerala.gov.in



KERALA STATE POLLUTION CONTROL BOARD

കേരള സംസ്ഥാന മലിനീകരണ നിയന്ത്രണ ബോർഡ്

Pattom P.O., Thiruvananthapuram – 695 004

പട്ടം പി.ഒ., തിരുവനന്തപുരം - 695 004



KSPCB/460/2022-EE-5

Date: 26.08.2025

From

Chairperson

To

Senior Principal Scientist
 CSIR-National Institute of Oceanography
 Regional centre - Kochi
 Abraham Madamakkal Road, Kochi - 682018

Sub: - Monitoring of oil spill in the vicinity of the wrecked ship, *MSC Elsa* – reg.

Ref: - 1) Agreement executed on 16.07.2025 between CSIR- National Institute of Oceanography and Kerala State Pollution Control Board
 2) Email from Chief Environmental Engineer, Regional Office, Ernakulam dated 26.08.2025

Sir,

Attention is invited to the subject cited above. It has been informed vide ref.(2) that salvaging operations and oil extraction from the wrecked ship *MSC Elsa* has started on 24.08.2025. In this regard, you are requested to extent the environment damage assessment study to cover the environmental issues such as oil spill or release of any pollutants during the salvage operations.

Yours faithfully,


 CHAIRPERSON

True Copy





सी एस आई आर - राष्ट्रीय समुद्र विज्ञान संस्थान

(बैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)

डोना पौला 403004 गोवा भारत

CSIR - NATIONAL INSTITUTE OF OCEANOGRAPHY

(Council of Scientific & Industrial Research)

Dona Paula 403 004 Goa, India



25 October 2025

Dr Muraleedharan KR

Senior Principal Scientist and Project Leader

To

The Chairperson

Kerala State Pollution Control Board

Ref No: KSPCB/1052/2025-SEE-2

Respected Madam,

Based on the agreement executed on July 16, 2025, between the CSIR-National Institute of Oceanography and the Kerala Pollution Control Board, I am hereby submitting the timeline for executing each work component, along with the respective report submission deadlines.

Thanking You

Yours faithfully

[Dr Muraleedharan KR]

True copy



EBY VARGHESE
Senior Environmental Engineer



सी एस आई आर - राष्ट्रीय समुद्र विज्ञान संस्थान

(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)

डोना पौला 403004 गोवा भारत

CSIR - NATIONAL INSTITUTE OF OCEANOGRAPHY

(Council of Scientific & Industrial Research)

Dona Paula 403 004 Goa, India



Fund received from KSPCB.

Transaction ID	30267368692 Dt. 30/7/2025	Rs. 50000000
Transaction ID	30267368692 Dt. 18/8/2025	Rs. 7820000

Mile stones

Sl. No	Work components	Date
1	First phase field survey during the summer monsoon season.	24 th July - 21 st August 2025
2	Survey during the Oil extraction time.	29 th August 2025
3	The first phase field survey report was submitted.	12 th September 2025
4	The detailed report based on the first phase field survey will be submitted	30 th December 2025.
5	Second phase field survey during the winter monsoon season.	26 th December 2025 - 30 th January 2026
6	The second phase field survey report will be submitted.	30 th February 2026
7	A detailed report based on the first and second phases of the field survey will be submitted.	30 th May 2026.
8	Third phase field survey during the pre-monsoon season.	25 th March 2026 - 30 th April 2026
9	The third phase field survey report will be submitted.	30 th May 2026
10	The detailed final report, based on all field surveys will be submitted	30 th July, 2026



S. EDY VARGHESE
Senior Environmental Engineer

True copy



सी एस आई आर - राष्ट्रीय समुद्र विज्ञान संस्थान

(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)

डोना पौला 403004 गोवा भारत

CSIR - NATIONAL INSTITUTE OF OCEANOGRAPHY

(Council of Scientific & Industrial Research)

Dona Paula 403 004 Goa, India



The key clauses to be remembered based on the agreement.

VI. EFFECTIVE DATE AND DURATION OF THE AGREEMENT

CSIR-NIO shall ensure that the work is completed within a period as in the following schedule from the date of signing the agreement:

- The field data measurements will start within 15 days upon receipt of the work order and the first instalment of the project fee.
- The data collection will be approximately 20-30 days for each sampling period, and the field survey report shall be submitted within 30 days.
- The detailed report shall be submitted within 3 months of the field survey report.
- The final report for each field survey shall be submitted within 2 weeks after the Board's suggestion on the draft.
- The consolidated report shall be submitted after 3 months of the completion of the last field survey report.

Either party that wishes to terminate the agreement shall give a notice of 30 days to the Other party signifying its intention to terminate the agreement. In the event of termination of the agreement, the right and obligations of the parties hereto shall be settled by mutual consultations; the financial settlement shall take into consideration not only the expenditure incurred but also the expenditure committed by both the parties.

VII. PROJECT FEES AND TERMS OF PAYMENT

Total cost of the project will be Rs. 10,00,00,000/- (Rupees ten crore only) (excluding GST). which will be released by the KSPCB as follows:

- First Installment: 50 % payment as an advance before the start of the survey/fieldwork.
- Second Installment: 40 % payment after completion of the survey (Field Work / Data Collection)
- Third installment: 10 % payment on submission of the Final report.

It is mutually agreed that KSPCB will not provide any additional fund on account of any further cost escalation in connection with the study.

True copy

☎ : 91-(0)832 -2450450
Fax : 91-(0)832 -2450 602/03



S. V. Varghese
S. V. VARGHESE
Senior Environmental Engineer

Regional Centres
Mumbai, Kochi, Visakhapatnam



सी एस आई आर - राष्ट्रीय समुद्र विज्ञान संस्थान

(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)

डोना पौला 403004 गोवा भारत

CSIR - NATIONAL INSTITUTE OF OCEANOGRAPHY

(Council of Scientific & Industrial Research)

Dona Paula 403 004 Goa, India



VIII. CONFIDENTIALITY

Both parties reciprocally guarantee that all technical information and data generated under the agreement shall be treated as confidential and shall not be divulged by either party without prior written consent of the other, even after the expiry of this agreement.

IX. ARBITRATION

In case, there be a dispute relating to any aspect of academic cooperation, all the parties will resolve the dispute in a spirit of mutual respect and shared responsibility, failing which, the unresolved difference or disputes shall be referred to the arbitration in accordance with the Arbitration and Conciliation Act, 1996 and the seat of arbitration shall be at Thiruvananthapuram by a distinguished authority agreed mutually by all the parties and decision by the authority shall be final and binding.

X. FORCE MAJEURE

Neither party shall be held responsible for non-fulfilment of their respective obligations under this agreement due to exigency of one or more of the force majeure events such as but not limited to act of God. War, Flood, Earthquakes, Strikes, Lockouts, Epidemics, Riots, Civil Commotion, etc. provided on the occurrence and cessation of any such events, the party affected thereby shall give a notice in writing to the other party within one month of such occurrence or cessation. If the force majeure conditions continue beyond six months, the parties shall jointly decide about the future course of action.

XI. PENALTY CLAUSE

The work shall be completed within the period mentioned in section VI from the date of signing the agreement. CSIR-NIO shall pay an amount equal to 1 percent of the total cost of the work as compensation, for every month delay after the due period, provided that the entire amount of compensation to be paid under the provisions of this clause shall not exceed 10 percent of the total cost of the work. After this, the KSPCB may consider terminating the contract at the risk and cost of NIO. In the event a dispute arises during or after work completion, the matter shall be referred to the Chairperson of the KSPCB, and the decision will be final.

True copy



B. L. V.
ESY VARGHESE
 Senior Environmental Engineer



**KERALA STATE POLLUTION CONTROL BOARD
CENTRAL LABORATORY**

കേരള സംസ്ഥാന മലിനീകരണ നിയന്ത്രണ ബോർഡ്
കേന്ദ്ര പരീക്ഷണശാല

Recognised as an Environmental Laboratory Under E(P)A 1986

PCB/CL/ AR/2025

12.09.2025

From

The Chief environmental Scientist

To

The Member Secretary

Sub: Revised Report based on samples collected on May 25, 2025

Ref: 1. E mail dated 06.08.25 Project section, Head office.
2. Report PCB/CL/AR/2025 dated 14.08.2025.

Madam,

I am forwarding herewith the consolidated report of the samples collected by coast guard (Sample ID:251330 and sample id: 251530) pertaining to the MSC ELSA shipwreck received from Environmental Engineer, District office-1, Ernakulam.

Yours faithfully,

CHIEF ENVIRONMENTAL SCIENTIST

True copy




EDY VARGHESE
Senior Environmental Engineer

GANDHI NAGAR, KOCHI - 682 020 ഗാന്ധിനഗർ, കൊച്ചി - 682 020
Ph : 0484 220 7781, EPABX: 0484 220 7783 - 86, Fax: 0484 - 220 7781, Mob: 9447975741
E Mail: kspebelek@gmail.com, kspebnwmp@gmail.com Web : www.keralapcb.nic.in
Certified for OHSMS (ISO 45001:2018)

Report based on samples collected on May 25, 2025
related to ship wreck incident MSC ELSA

1. Introduction

The samples were received on May 26, 2025 at Central lab for a comprehensive analysis of pH, conductivity, heavy metals and petroleum hydrocarbons.

The Environmental Engineer informed that the samples were collected by the Coast Guard from the deep sea and handed over to District Office, Ernakulam on May 25, 2025.

2. Sample Details

Ref No. PCB/EKM/DO-1 Dated 27/05/2025

- **Sample ID: 251530**
 - **Sampling Date:** May 25, 2025
 - **Sampling Point:** 09°13.57'N, 076°13.04'E
 - **Date Received:** May 26, 2025
- **Sample ID: 251330**
 - **Sampling Date:** May 25, 2025
 - **Sampling Point:** 09°16.96'N, 076°09.49'E
 - **Date Received:** May 26, 2025

3. Analytical Results

The following tables summarize the analytical results for each sample.

Table 1: Results for Sample ID: 251330

Parameter	Result (Units)	Lowest Detection Limit
pH	8.05	1
Electrical Conductivity (EC)	26700 (µmho/cm)	1.0
Manganese (Mn)	BDL	0.05 mg/L
Chromium (Cr)	BDL	0.03 mg/L
Iron (Fe)	0.382 mg/L	0.05 mg/L
Nickel (Ni)	BDL	0.05 mg/L
Copper (Cu)	BDL	0.02 mg/L
Cadmium (Cd)	BDL	0.01 mg/L
Lead (Pb)	BDL	0.05 mg/L

True copy




EBY VARGHESE
 Senior Environmental Engineer

Zinc (Zn)	0.086	0.02 mg/L
Aluminium (Al)	BDL	0.03 mg/L
Mercury (Hg)	BDL	0.01 mg/L
Total Petroleum Hydrocarbons (TPH)	0.08	0.00001 mg/L
Polycyclic Aromatic Hydrocarbons (PAH)	BDL	MDL 0.00001 mg/L
Benzene	BDL	MDL= 0.01 mg/L
Toluene	BDL	MDL= 0.01 mg/L
Ethylbenzene	BDL	MDL= 0.01 mg/L
Xylene	BDL	MDL= 0.01 mg/L

Table 2: Results for Sample ID: 251530

Parameter	Result (Units)	Detection Limit
pH	8.06	1
Electrical Conductivity (EC)	26800	1.0 ($\mu\text{mho/cm}$)
Manganese (Mn)	BDL	0.05 mg/L
Chromium (Cr)	BDL	0.03 mg/L
Iron (Fe)	0.257 (mg/L)	0.05 mg/L
Nickel (Ni)	BDL	0.05 mg/L
Copper (Cu)	0.033 (mg/L)	0.02 mg/L
Cadmium (Cd)	BDL	0.01 mg/L
Lead (Pb)	BDL	0.05 mg/L
Zinc (Zn)	2.62 (mg/L)	0.02 mg/L
Aluminium (Al)	BDL	0.03 mg/L
Mercury (Hg)	BDL	0.01 mg/L
Total Petroleum Hydrocarbons (TPH)	0.055 (mg/L)	0.00001 mg/L
Polycyclic Aromatic Hydrocarbons (PAH)	BDL	MDL= 0.00001
Benzene	BDL	MDL= 0.01 mg/L
Toluene	BDL	MDL= 0.01 mg/L
Ethylbenzene	BDL	MDL= 0.01 mg/L
Xylene	BDL	MDL= 0.01 mg/L

BDL indicates "Below Detection Limit," meaning the concentration of the substance was lower than the instrument's ability to detect it. MDL indicates "Method Detection Limit," which is the lowest concentration of a substance that can be detected and reported with a stated confidence.

True copy



B. Varghese
 Senior Environmental Engineer

4. Interpretation and conclusion.

The analysis reports of both samples indicate that the pH and conductivity values are consistent with those typically observed in marine environment. Since the samples were collected from the Deep-Sea region where the ship wreck incident occurred, a comparison with the water quality standards for coastal waters/ marine outfalls is not relevant.



CHIEF ENVIRONMENTAL SCIENTIST



B VARGHESE
Senior Environmental Engineer

True copy



e-Stamp Serial Number : 202526000002389850

Verification Code : 458085046V

Govt. Reference No. (GRN) : KL017426876202526E
 Purpose : Agreement or memorandum of an agreement - If relating to public works or service level agreements.
 Amount of Stamp Paper Purchased in Numeral : ₹ 500
 Amount of Stamp Paper Purchased in Words : Rupees Five Hundred
 Stamp Paper Purchased on : 14/07/2025 13:49:18
 First Party Name : Managing Director
 First Party Address : Environ Software Pvt Ltd, Environ Towers, 60/4, 4th Floor, Hosur Road, Konappana Agrahara, Electronics City, Bangalore
 Second Party Name : Chairperson
 Second Party Address : Kerala State Pollution Control Board, Head Office Pattom, Tvpm
 Vendor Code & Name : 01022440 - L.Jayalekshmy
 Treasury Code & Name : 0102 - Principal Sub Treasury East Fort

Please write or type below this line

Agreement for preparing Oil Spill Contingency Plan as per the Order No. PCB/HO/TAMS/19/2005 dated 18.11.2016 and order no. KSPCB/127/2022-EE-5 dated 27.06.2025

This agreement is executed on this the 14th day of July 2025 (hereinafter referred to as "Effective date") BY AND BETWEEN

Environ Software Pvt. Ltd (hereinafter called Environ), #60/4, Environ Towers, 4th Floor, Hosur main road, Konappana Agrahara, Electronic City, Bangalore – 560100, of the one part

AND
SREEKALA S. CHAIRPERSON
 Senior Environmental Engineer
 Kerala State Pollution Control Board
 Pattom, Thiruvananthapuram

L. Jayalekshmy
 Vendor, Vanchiyoor
 Thiruvananthapuram

True copy

56



This can be verified by
https://www.estamp.treasury.kerala.gov.in/Index.php/estamp_search using e-Stamp
 Serial Number and Verification Code.

In case of any discrepancy, please inform the competent authority.

Kerala State Pollution Control Board (hereinafter called KSPCB) and having its Head Office at Plamoodu, Pattom, Thiruvananthapuram, Kerala, India, represented by its Chairperson which expression shall where the context so admits includes its successors in interest and permitted assigns of the second part.

'Environ' and 'KSPCB' shall be collectively referred to as 'Parties' and individually as 'Party'.

I. RECITALS

1. About Environ

WHEREAS Environ Software Pvt. Ltd located in Bangaluru, carrying out scientific simulation studies for environmental impact assessment for seas, estuaries and overland rivers and also developing scientific simulation software for prediction of effluent discharges, oil spills, discharge of reject water from the desalination plants and industries.

2. About KSPCB

WHEREAS Kerala State Pollution Control Board (KSPCB) is a statutory body constituted as per section 4 of the Water (Prevention and Control of Pollution) Act, 1974, entrusted for the prevention and control of pollution in the state of Kerala.

The headquarters of the KSPCB is located at Plamoodu in Thiruvananthapuram. The KSPCB also has 3 Regional Offices, Central Laboratory at Ernakulam and atleast one District Office within each district of Kerala.

II. SCOPE AND OBJECTIVES

A review meeting was held by the Additional Chief secretary, Environment Dept. on 16.06.2016 to review the level of preparedness of major accident hazard units to deal with chemical accidents. In the meeting it was decided that KSPCB in association with the Indian Coast Guard shall prepare Oil Spill Emergency Plan for the state and furnish it to the Government for approval. Accordingly, notice inviting Expression of Interest (EOI) from competent parties was published in the dailies on 18.10.2016 and a committee was constituted for verifying the proposals and recommend further course of action by order dated PCB/HO/TAMS/19/2005 dated 18.11.2016. Further, to disseminate the information regarding invitation of e-tender and for wide publicity, the same was given in nation level through newspapers and website of the Board in 2024. The existing committee was reconstituted in May 2025 for evaluating the tenders on Oil Spill Contingency Plan, technically and financially. The committee meetings were held on 02.06.2025, 10.06.2025, 20.06.2025 and 24.06.2025 for the evaluation of bids. The committee decided to approve the proposal submitted by the lowest bidder, M/s. Environ Software Pvt. Ltd. And work has been awarded by order no. KSPCB/127/2022-EE-5 dated 27.06.2025 for the preparation of Oil Spill Contingency Plan (OSCP) for shoreline cleanup for the state of Kerala.

Jade Kead
ENVIRON

For Environ Software Pvt. Ltd.

Managing Director

True copy



KSPCB

B. Varghese
B. VARGHESE
Senior Environmental Engineer

III. RESPONSIBILITIES OF ENVIRON SOFTWARE PVT. LTD.

(i) The OSCP shall include mapping of Environmental Sensitive Index of oil spills at the seacoast of Kerala, preparation of response focused oil spill contingency plans and associated documentation including:

1. Crisis Management Plans
2. Marine Emergency Response Plans
3. State Oil Spill Contingency Plans
4. Oil Spill Contingency Planning Guidelines (Indian Coast Guard, industries)
5. Oil Spill Contingency Plans (site-specific, regional and corporate)
6. Wildlife Response Plans
7. Ship Board Pollution Emergency Plans
8. Tactical Oil Spill Booming/ Site Response Plans

(ii) Environ shall ensure that the contingency plan is approved by the Indian Coast Guard; the changes, corrections, additions and extensions to the plan as directed by the Indian Coast Guard shall be incorporated by Environ.

(iii) A clear definition of hierarchy in initiating actions in the case of a contingency should be there in the plan. A flow chart assigning roles and clarifying responsibilities among stakeholder agencies should be prepared. A clear line of command which shows which agency to initiate and who shall command whom shall be prepared. Following are the aspects that should be highlighted in the Oil Spill Contingency Plan.

1. Incident Reporting - who to report, whom to report
2. Measures to make the locals aware of the incident
3. Mitigation measures to be followed
4. Policy and responsibility of various departments/ agencies and their contact details
5. Oil spill risks and protection priorities
6. Shoreline oil spill response elements
7. Shoreline response operations
8. Administrative action for shoreline clean-up
9. Machines/ Equipments to be kept available in each department

Jade Reddy
 ENVIROM
 For Environ Software Pvt. Ltd.
 Managing Director



KSPCB

B. Varghese
 B. VARGHESE
 Senior Environmental Engineer

True copy

10. Availability of control equipments in ports, harbours, etc. and their contact details
11. Custodian of machines/ equipments and his/her contact details
12. Deployment of machines/ equipments in cleaning operations
13. Compatibility of equipments
14. Database of Authorities to be contacted in case of oil spill
15. Data base of available machinery/ equipments for cleaning
16. Important telephone directory & Institutional arrangements
17. Arrangement of periodic mock drills
18. Necessity to contact Indian Coast Guard (ICG) for advice / assistance
19. Keeping ICG appraised of actions being taken
20. Safety measures to be followed
21. Meeting of Task Force
22. Cleaning on beaches
23. Manual cleaning of waste
24. Transportation of waste
25. Disposal of waste
26. Collection and accumulated oil in breaches, temporary storage and final disposal of the same
27. Inspection at the site
28. Rock boulders cleaning
29. Medical camps
30. Filing case against the accused
31. Formation of volunteer groups
32. To identify the areas along the coast for oil spill that may occur due to the operation of fishing boats, boats, ships
33. To identify all areas along the coast which are environmentally vulnerable, due to bunkering of fuel by numerous numbers of boats, beaches, fishing haven, water intakes, etc.
34. To seek help and assistance from the Nodal agencies like Coast Guard, Navy who will be of assistance if needed, to control the spread of oil spill

Jade Kaddu
 ENVIRON For Environ Software Pvt. Ltd.

Managing Director



KSPCB

E. Varghese
 EDY VARGHESE
 Senior Environmental Engineer

True copy

35. To assess the availability of boats, aerial surveillance, etc., if needed to monitor and control the oil spread.
36. Detailed plan with chain of command, duties and responsibilities, contact details, list of all available resources, useful outside agencies and their field of expertise and how to get their help if needed, etc.
37. Arrangement with private agencies who deal with oil spill cleaning jobs.
38. Decide on the responsible officers in charge to collect information regarding spill, command centre, response team, implementing control measures, availability of resources. Their contact details shall be available.
39. Procure and stock a reasonable amount of shoreline clean up equipment at nearby locations of all vulnerable areas in line with direction with Indian Coast Guard.
40. Decide on the other agencies that will be of assistance if needed, to control the spread of spill and reduce the damages.
41. Indian Coast Guard is the Nodal agency for oil spill response and management in Indian Waters. Point of contact shall be specified. The details of responsible officers shall be included.
42. Bunkering Operation
43. Model Study to analyze the likely impact & develop a mitigation plan
44. KCZMA has prepared the Coastal Zone Management plan with regard to ecologically fragile areas, details of tourist spots, harbour, fishing landing centres, etc. and this plan can be used for preparing the contingency plan
45. The entire area, where the CRZ notification is made applicable shall be included in the plan as CRZ areas are basically the areas having tidal influence.
46. Shoreline Oil Spill response and operations
47. Inland water body oil spill response and operation methodology
48. Administration & funding for coastal and inland ecological profiling including cost for clean up
49. Oil Spill Response Management Team
50. The oil spill contingency plan shall be prepared with due regard to the relevant international best practices, international conventions, and domestic legislations and National Oil Spill Contingency Plan.

Jacob K. K. K.
 ENVIRON For Environ Software Pvt. Ltd.

Managing Director



KSPCB

B. L. V.
 EDY VARGHESE
 Senior Environmental Engineer

True copy

51. The nature of the possible threat including the worst case scenario, and the resources consequently at risk shall be realistically assessed bearing in mind the probable movement of any oil spill.

52. The priorities for protection shall be fixed taking into account the viability of the various protection and clean-up options

53. The strategy for protecting and cleaning the various areas shall be clearly explained.

54. The necessary organizations shall be outlined, the responsibilities of all those involved shall be clearly stated and all those who have a task to perform shall be aware of what is expected of them.

55. The levels of equipment, materials and manpower sufficient to deal with the anticipated size of spill shall be clearly explained. If not, back-up resources shall be identified and, wherever necessary, mechanisms for obtaining their services and entry to the country shall be established.

56. Temporary storage sites and final disposal routes for collected oil and debris shall be identified.

57. The alerting and initial evaluation procedures shall be fully explained as well as arrangement for continual review of the clean-up operation shall be explained.

58. The arrangements for ensuring effective communication between shore, sea and air shall be described.

(iv) Conditions to be followed

1. ERA5 provides horizontal resolution of 39 km. Keep the grid size of 4 km x 4 km or better to ensure the higher accuracy.

2. To do the model calibration minimum 30 days data of spring and neap tides should be used.

3. A minimum number of 10 sampling locations in the offshore and atleast each one sample from the tidal influenced water bodies shall be collected and analyzed.

4. The geodetic datum WGS 84 shall be converted into UTM with orthometric height (with respect to MSL) by applying correction as per the Survey of India Benchmarks.

5. Survey transects shall be planned at 500 m intervals in 12 nautical miles.

6. It is directed to complete the OSCP with the following additional conditions;

Adarsh
ENVIRON

For Environ Software Pvt. Ltd.

Managing Dir



KSPCB

B. V. Varghese
Senior Environmental Engineer

True copy

- The methodology stipulated in the project proposal shall strictly be performed;
- All the conditions specified in the tender document and the Terms of Reference (ToR) issued by the KSPCB shall be complied.
- Both the primary and secondary data used for the preparation of the Oil Spill Contingency Plan (OSCP) shall be shared with KSPCB.
- The model inputs, outputs and expected outcomes, for the modules/software proposed shall be discussed separately in the report.
- Field photographs including details such as latitude, longitude, date and time shall be included in the report.
- No secondary data shall be provided by the KSPCB.
- The total financial commitment of the work study should be limited to the quoted amount of financial bid.
- The draft report shall be submitted within 8 months from the date of signing the agreement.
- Clarifications/ modifications based on the recommendations of Indian Coast Guard in the draft report shall be incorporated by Environ so as to prepare the final report.
- Final report shall be submitted by Environ after getting approval from Indian Coast Guard.

IV. RESPONSIBILITIES OF KSPCB

1. KSPCB will facilitate necessary permission for entry of the personnel of Environ for data collection and discussions to Government owned facilities and establishments as well as establishments under Public Private Partnership upon specific request from Environ.
2. The draft report submitted by Environ will be submitted to the Indian Coast Guard for approval.

V. EFFECTIVE DATE AND DURATION OF THE AGREEMENT

This agreement shall be valid for a period of 8 months from the date of signing. Either party that wishes to terminate the agreement shall give a notice of 30 days to the Other party signifying its intention to terminate the agreement. In the event of termination of the agreement,

For Environ
 ENVIRON For Environ Software Pvt. Ltd.



Managing Director



KSPCB

EDY VARGHESE
 EDY VARGHESE
 Senior Environmental Engineer

True copy

the right and obligations of the parties hereto shall be settled by mutual consultations; the financial settlement shall take into consideration not only the expenditure incurred but also the expenditure committed by both the parties.

VI. PROJECT FEES AND TERMS OF PAYMENT

1. Cost & Fund

Total Cost of the project will be Rs. 23,42,000 /- (Rupees Twenty Three Lakh Forty Two Thousands Only) which will be released by the KSPCB as follows:

- i. First Installment: 40% of the project cost shall be released on signing the Agreement
- ii. Second Installment: 30% of the project cost shall be released on submission of the Utilization Certificate and expenditure Statement
- iii. Third installment: 20% of the project cost shall be released on submission of the draft report to KSPCB.
- iv. Fourth installment: 10% of the project cost shall be released on approval/ acceptance of the final report by Indian Coast Guard. (5 copies + softcopy)

It is mutually agreed that KSPCB will not provide any additional fund on account of any further cost escalation in connection with the study.

The fund will be released in favour of the Environ Software Pvt. Ltd. (Account No. : 0677000701001301, Karnataka Bank Limited, Wilson Garden Branch, Bangalore. IFSC Code : KARB0000067, MICR Code: 560052021)

2. Security deposit

Security Deposit will be 5% of the total cost of the work awarded. The security deposit should be paid on or before the due date fixed by the KSPCB in the form of DD drawn in favour of Kerala State Pollution Control Board payable at Thiruvananthapuram

VII. CONFIDENTIALITY

Both parties reciprocally guarantee that all technical information and data generated under the agreement shall be treated as confidential and shall not be divulged by either party without prior written consent of the other even after the expiry of this agreement.

J. dec K. edd
 ENVIRON
 For Environ Software Pvt. Ltd.

Managing Director



Sreekala S.
 SREEKALA S.
 CHAIRPERSON

KSPCB

B. Varghese
 B. VARGHESE
 Senior Environmental Engineer

True copy



VIII. ARBITRATION

In case, there be a dispute relating to any aspect of academic cooperation, all the parties will resolve the dispute in a spirit of mutual respect and shared responsibility, failing which, the unresolved difference or disputes shall be referred to the arbitration in accordance with the Arbitration and Conciliation Act, 1996 and the seat of arbitration shall be at Thiruvananthapuram by a distinguished authority agreed mutually by all the parties and decision by the authority shall be final and binding.

IX. FORCE MAJEURE

Neither party shall be held responsible for non-fulfilment of their respective obligations under this agreement due to exigency of one or more of the force majeure events such as but not limited to act of God, War, Flood, Earthquakes, Strikes, Lockouts, Epidemics, Riots, Civil Commotion, etc. provided on the occurrence and cessation of any such events, the party affected thereby shall give a notice in writing to the other party within one month of such occurrence or cessation. If the force majeure conditions continue beyond six months, the parties shall jointly decide about the future course of action.

X. PENALTY CLAUSE

The work shall be completed within a period of 8 months from the date of release of first installment. Environ Software Pvt. Ltd. shall pay an amount equal to 1 percent of the total cost of the work as compensation, for every month delay after the due period, provided that the entire amount of compensation to be paid under the provisions of this clause shall not exceed 10 percent of the total cost of the work.

XI. AMENDMENTS

Except otherwise provided therein, no addition, amendment or modification of any part of the Agreement shall be effective unless done in writing and signed by and on behalf of both parties by their respective Authorized Signatories.

XII. RELATIONSHIP OF THE PARTIES

This agreement shall be construed as creating employment, consortium, agency, partnership, distributorship, joint venture or other business relationship between the parties or their representatives.

IN WITNESS THEREOF, the duly authorized representatives of the Parties have caused this

Agreement be executed on the date first written above

A. K. K. K.
ENVIRON



For Environ Software Pvt. Ltd.
Managing Director



KSPCB

S. V.
S. V. VARGHESE
Senior Environmental Engineer

True copy

ENVIRON SOFTWARE PVT. LTD.

Signature: *G. S. Reddy*
For Environ Software Pvt. Ltd.



Name: G. S. Reddy *Managing Director*

Designation : Managing Director

Witness

- 1) C. Revichandran *[Signature]*
- 2) K.K. VIZAYAN *[Signature]*

KERALA STATE POLLUTION CONTROL BOARD

Signature: *[Signature]*
SREEKALA S.
CHAIRPERSON



Name: Er. Sreekala S.

Designation : Chairperson

Witness

- 1) *[Signature]* **EBY VARGHESE**
Senior Environmental Engineer
- 2) *[Signature]*
KRISHNAN M.N
Chief Environmental Engineer

ENVIRON

KSPCB

True copy



[Signature]
EBY VARGHESE
Senior Environmental Engineer

VERIFICATION

I, Eby Varghese, aged 54 years son of late T.V Varghese, now working as the Senior Environmental Engineer, in Kerala State Pollution Control Board, Head Office, Pattom, Thiruvananthapuram, duly authorized to file this reply on behalf of the Kerala State Pollution Control Board do hereby verify on this, the 21st day of October 2025, that all what is stated above is true and correct to the best of my knowledge, information and belief and is borne out from the records maintained in our office.



EBY VARGHESE
Senior Environmental Engineer

Eby Varghese
Senior Environmental Engineer
Kerala State Pollution Control Board
Head Office - Thiruvananthapuram

