EMERGE

Evaluation, control and Mitigation of the EnviRonmental impacts of shippinG Emissions

Source: IMO's work to cut GHG emissions from ships

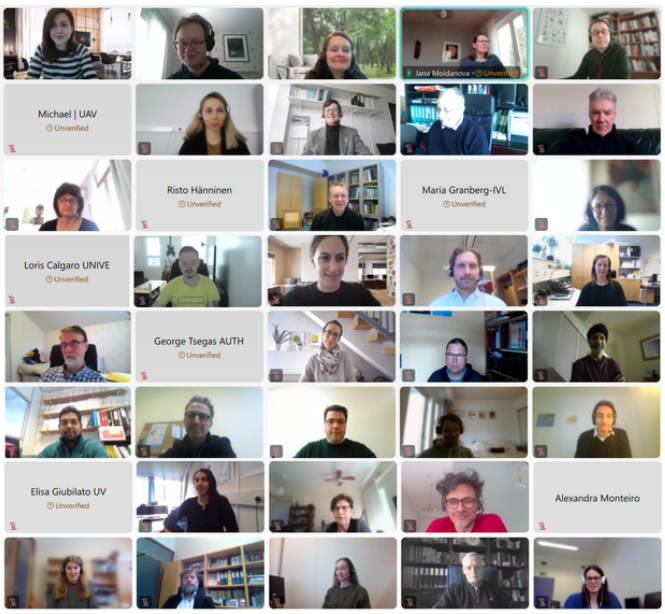
In This Issue

PROJECT UPDATES

The project is running smoothly and all EMERGE partners have been making every effort to minimize the risk of additional delays to the progress of the project and to ensure that the project's objectives are met according to the original plan.

Another face to face meeting is also scheduled to address the remaining issues that require immediate attention such as gaps identified in the health impact assessment and the deliverable D6.1- "Baltic and North Sea report." This meeting will enable us to work collaboratively towards resolving these issues and ensuring the successful completion of our project which will take place in Vienna, Austria, in October 2023 at the International Institute for Applied Systems Analysis (IIASA).

NEWS



Group photo during the EMERGE second mid-term review

SECOND MID-TERM REVIEW

The second reporting period review was held online on the 14th of March, 2023 with our new European Commission Project Officer. The project coordinator Dr. Jukka-Pekka from FMI and each work package leader presented the status of their work for the aforementioned period.

During the meeting was also discussed the progress of the measurement campaigns which was affected by the COVID-19 pandemic which have resulted in delays in data delivery to Work Packages 4 and 5, which in turn impacted the progress of Work Packages 6 and 7.

Overall the review and the project implemantation is considered satisfactory so far with all its activities shown remarkable development.

GENERAL ASSEMBLY MEETING

The Annual General Assembly of the EMERGE project, took place from June 7th to June 9th, 2023. This is marked the first face-to-face meeting since the COVID-19 pandemic began. The General Assembly provided a platform for 42 participants from 18 institutions across 10 European countries to convene and discuss the project's progress and future endeavors. The atmosphere was filled with enthusiasm and excitement as delegates gathered to share their insights and expertise.

The meeting commenced with an engaging ice-breaker party, creating a warm and welcoming environment for attendees to reconnect and establish new connections. The partners enjoyed a delightful spread of drinks and food while exchanging ideas and experiences. On the evening of June 8th, the delegates came together for a memorable dinner at the esteemed Kappeli restaurant.

During the General Assembly meeting, work package and case study leaders took the stage to present the current status of their work and outline their plans for the upcoming period. The spotlight was on water and air quality modeling, health impact assessment, and plans for future publications. These presentations showcased the significant strides made by the EMERGE project in analyzing emissions and concentrations in water, air, and marine biota, with a particular focus on abatement techniques. The insights gained from these studies will undoubtedly contribute to the preservation and protection of sensitive European marine regions.

An invaluable highlight of the General Assembly was the attendance of a member from the Scientific and Advisory Board. His presence added a fresh perspective and provided invaluable insights and feedback on the project's direction. The EMERGE project thrives on collaboration and interdisciplinary cooperation, and the guidance from the Scientific and Advisory Board helps ensure its continued success.

The EMERGE Annual General Assembly of 2023 was a resounding success, uniting experts from various fields and fostering a productive exchange of knowledge and ideas. As the EMERGE project continues its journey, this gathering of minds will undoubtedly propel the research forward, creating innovative solutions and addressing the pressing challenges surrounding pollutant emissions and their impact on the environment.

With renewed energy and determination, the EMERGE consortium sets its sights on the future, confident in its ability to make a lasting and positive impact on our marine ecosystems.

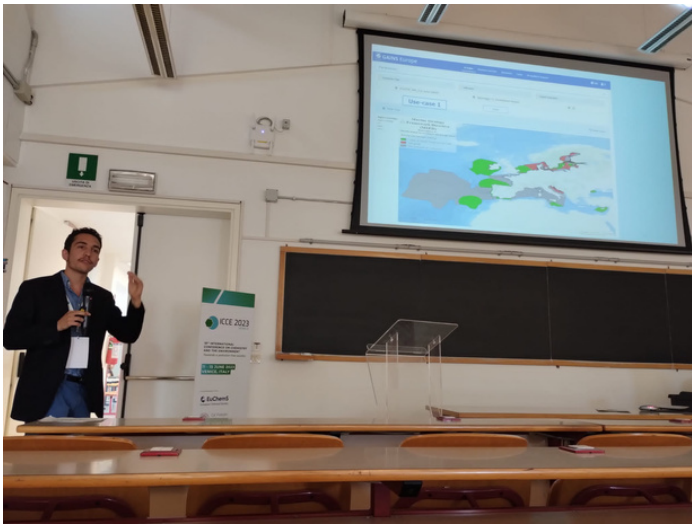
Group photo during the EMERGE annual General assembly 2023

ICCE 2023 CONFERENCE

During the 18th International Conference on Chemistry and the Environment (ICCE 2023), organized in Mestre-Venice (Italy) by the EMERGE partner UV (University of Venice – Dept. Of Environmental Sciences, Informatics and Statistics) in collaboration with the Division of Chemistry and the Environment (DCE) of the European Chemical Society (EuChemS), relevant results of the EMERGE project received visibility.

The Conference hosted, among its 21 thematic sessions, a session focused on the "Integration of experimental and modelling approaches to investigate chemicals behaviour and risk in marine, coastal and transitional environments", where Loris Calgaro (Univ. Ca' Foscari of Venice) and Samuel Guéret (IIAASA) delivered appreciated presentations on EMERGE water modelling and on the development of the EMERGE Decision Support Tool, respectively.

Moreover, we are glad to announce that Samuel Guéret (IIAASA) was one of the six participants awarded for the best poster presentation (award sponsored by IUPAC and EuChems Division of Chemistry and the Environment) for the originality of his poster on "Impact Assessment of Shipping Activities: Applying the Critical Load Concept to both the Atmosphere and Marine Environment".



Samuel Guéret (IIASA) during his presentation at ICCE2023

Loris Calgaro (UV) during his presentation at ICCE2023

University of Venice organizing committee of ICCE 2023

Samuel Guéret (IIASA) awarded for the best poster by Prof. Ester Heath (Jožef Stefan institute and representative of EuChemS) and Prof. Antonio Marcomini (Univ. Ca' Foscari Venice and Conference chair of ICCE 2023)

EUROPEAN MARITIME SAFETY AGENCY

The executive director of EMSA, Ms. Maja Markovčić Kostelac, FMI director general Dr. Jussi Kaurola and representatives of the FMI ship emission modeling team

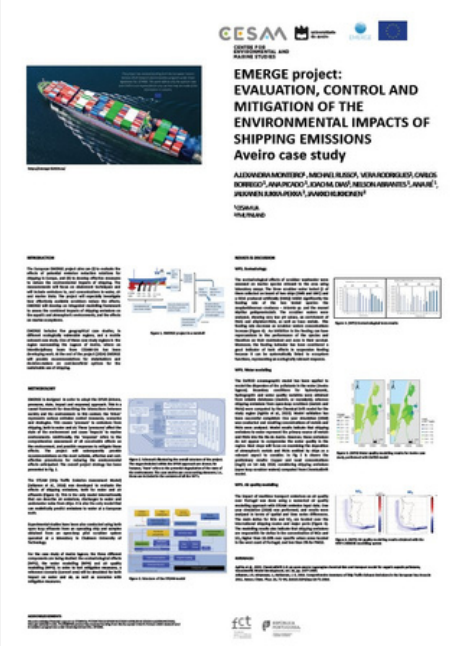
The executive director of European Maritime Safety Agency (EMSA), Ms. Maja Markovčić Kostelac visited FMI and met FMI director general Dr. Jussi Kaurola and representatives of the FMI ship emission modeling team. The two organizations cooperate in various topics, and EMERGE work directly contributes to understanding of environmental impacts of shipping.

SETAC CONFERENCE

A poster on the water modelling activities was successfully presented at the SETAC (Society of Environmental Toxicology and Chemistry) Europe 33rd Annual Meeting, held in Dublin (Ireland) on 30 April – 4 May 2023: ***Environmental Fate Modelling of Organic Pollutants from Land-Based and Shipping Emissions (Including Scrubber Water) In the Northern Adriatic Sea Coastal Areas***, by our project partners; Calgaro L., Giubilato E., Aghito M., Jalkanen J.P., Ferrarin C., Semenzin E., Marcomini A.

PARTICIPATION IN EVENT PRESENTING THE EMERGE PROJECT

Dr. Alexandra Monteiro, an EMERGE partner from the University of Aveiro, participated in a workshop organized by Waterloo University, in Waterloo, Toronto (Canada) about ammonia as new fuel, and she presented EMERGE project.



Poster presenting the EMERGE project during the "Science and Ocean beyond the horizon" event

Dr. Alexandra, also presented the EMERGE project through a poster to the national Scientific Meeting ***"Science and Ocean beyond the horizon"*** which held in the University of Aveiro, from 5-7 July 2023.

PUBLICATIONS

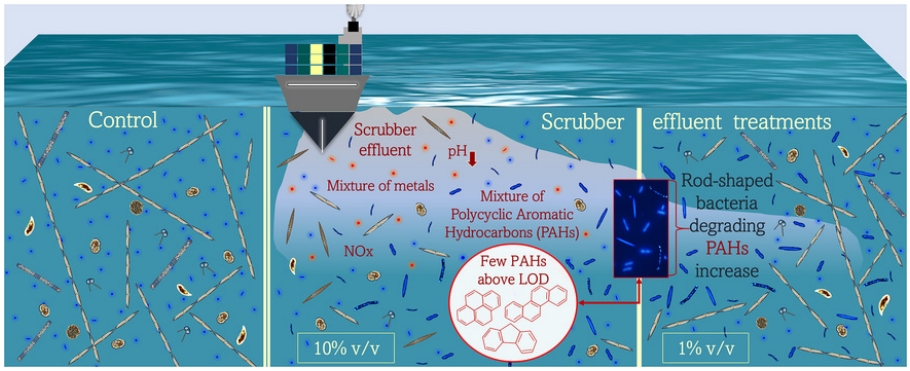
- Aghito, M., Calgaro, L., Dagestad, K.-F., Ferrarin, C., Marcomini, A., Breivik, Ø., and Hole, L. R.

ChemicalDrift 1.0: an open-source Lagrangian chemical fate and transport model for organic aquatic pollutants, Geoscientific Model Development, 16, 2477–2494, 2023
Read here

A new model for transport and fate of chemicals in the aquatic environment is presented. The tool, named ChemicalDrift, is integrated in the open-source Lagrangian framework OpenDrift, and is hereby presented for organic compounds.

- Savvas Genitsaris, Polyxeni Kourkoutmani , Natassa Stefanidou, Evangelia Michaloudi, Meritxell Gros, Elisa García-Gómez, Mira Petrović, Leonidas Ntziachristos, Maria Moustaka-Gouni

Effects from maritime scrubber effluent on phytoplankton and bacterioplankton communities of a coastal area, Eastern Mediterranean Sea, Ecological Informatics, Volume 77, November 2023
Read here

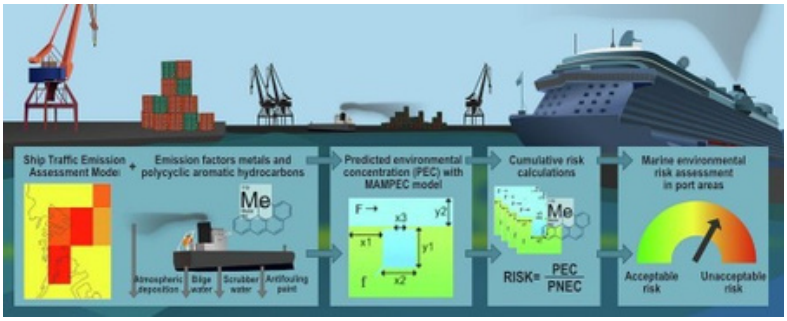


Graphical abstract

- Anna Lunde Hermansson, Ida-Maja Hassellöv, Jukka-Pekka Jalkanen, Erik Ytreberg

Cumulative environmental risk assessment of metals and polycyclic aromatic hydrocarbons from ship activities in ports, Marine Pollution Bulletin, Volume 189, April 2023, 114805
Read here

Marine environmental risk assessments rarely consider the cumulative risk from multiple contaminants and sources. Ships give rise to a range of contaminants, originating from different onboard sources, resulting in contaminant loads to the marine environment.



Graphical abstract

- Heikkilä M, Jalkanen J-P.

The Association between Vessel Departures and Air Pollution in Helsinki Port Area 2016–2021, Atmosphere, 2023; 14(4):757
Read here

" European ports are struggling to install enough shore power connections to follow the European Commission initiative, which insists ships that lie alongside to be plugged in and have their auxiliary engines off in EU ports by 2030".

- C. May, I.D. Williams, M.D. Hudson, P.E. Osborne, L. Zapata Restrepo

The Solent Strait: Water quality trends within a heavily trafficked marine environment, 2000 to 2020, Marine Pollution Bulletin, Volume 193, August 2023, 115251
Read here

This study presents an important long-term historical analysis of water quality in an internationally crucial waterway (the Solent, Hampshire, UK), in the context of increasing adoption of open-loop Exhaust Gas Cleaning Systems by shipping. The pollutants studied were acidification (pH), zinc, and benzo [a] pyrene, alongside temperature.

- Shnelle Owusu-Mfum, Malcolm D. Hudson, Patrick E. Osborne, Toby J. Roberts, Lina M. Zapata- Restrepo and Ian D. Williams

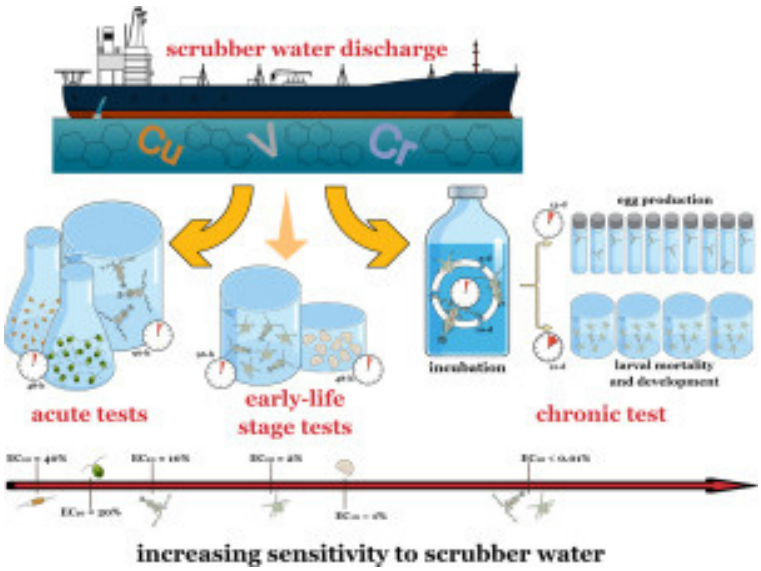
Atmospheric Pollution in Port-Cities, Atmosphere, 2023, 14, 1135.
Read here

This study investigated the long-term trends and drivers of atmospheric pollution in the port cities of Houston, London, and Southampton in 2000–2019.

- Picone, M., Russo, M.; Distefano, G. G.; Baccichet, M.; Marchetto, D.; Volpi Ghirardini, A.; Lunde Hermansson, A.; Petrovic, M.; Gros, M.; Garcia, E.; Giubilato, E.; Calgaro, L.; Magnusson, K.; Granberg, M.; Marcomini, A.

Impacts of exhaust gas cleaning systems (EGCS) discharge waters on planktonic biological indicators, Marine Pollution Bulletin, Vol. 190, pp. 114846.
Read here

This study investigated the effects of the scrubber water from an open-loop system on a suite of planktonic bioindicators typical of nearshore environments. Toxicity tests evidenced significant impairments in planktonic indicators after acute, early-life stage, and long-term exposures to scrubber water produced by a vessel operating with high sulphur fuel. Acute effects on bacterial bioluminescence (Aliivibrio fischeri), algal growth (Phaeodactylum tricornutum, Dunaliella tertiolecta), and copepod survival (Acartia tonsa) were evident at 10 % and 20 % scrubber water, while larval development in mussels (Mytilus galloprovincialis) showed a 50 % reduction at ~5 % scrubber water. Conversely, larval development and reproductive success of A. tonsa were severely affected at scrubber water concentrations ≤1.1 %, indicating the risk of severe impacts on copepod populations which in turn may result in impairment of the whole food web.



Graphical abstract

FUTURE EVENTS

ICES ASC 2023|11-14 September 2023

ICES Annual Science Conference- Bilbao, Spain

TAP and SE|25-28 September,2023

Transport & Air Pollution and Shipping & Environment conference- Gothenburg, Sweden

RELATED ARTICLES

SCIPPER project finds high nitrogen oxides emissions of Tier III vessels from remote measurements in North European seas
Read more in SCIPPER press release here.

''Science for Environment Policy": European Commission DG Environment
Baltic Sea shipping should avoid copper in antifouling paints and open-loop scrubbers to mitigate pollution

The semi-enclosed Baltic Sea suffers high levels of pollution. A new study highlights that mitigation must look to address hull coatings and devices that wash hazardous substances from ship exhausts into the water.
Read article here.

Join the EMERGE Information Network!

EMERGE is open to all stakeholders globally with an interest in marine and maritime technologies, research and innovation as well as environmental protection.

By becoming part of our Information Network you are joining one of the most Innovative projects in the marine and maritime field.

Join here

EMERGE project under the Policy Area Ship was granted a Flagship status

Follow us!

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 874990