

SHIPPING POLLUTION

- Pollution in general and its sources. Pollution categories. Climate change.
- Atmospheric pollution and its effects. The transport sector and air pollution. Carbon footprint of transport means.
- Shipping and air pollution. Reduction of CO₂ emitted by ships. SEEMP and EEDI. Lower S fuels. Scrubbers. Techniques for preventing the NO_x formation during combustion. Alternative fuels. Cold ironing. Alternative energy sources. Polar shipping roads.
- Oil pollution: major causes and impacts. Major marine oil spills. Fate of marine oil spills. Cleaning up oil spills. Bioremediation. Natural recovery.
- Port reception facilities: MARPOL Annex I-VI. The collection of ship wastes. Oily wastes. Sewage. Garbage. Residues of cargo. Hydrocarbons cargo in bulk waste. Chemical cargo in bulk waste. Garbage disposal. Management and treatment of wastes.
- Marine biofouling: Effects on unprotected ships. Anti-fouling technologies. Anti-fouling coatings. Biocidal antifouling paints and Biocide-free foul release coatings. Total biofouling removal. Environmental impacts.
- Marine pollution from ballast water. IMO ballast water convention. Precautionary practices in BWM.
- Hazardous materials within a ship's structure. The Basel Convention. The Hong Kong Convention. EU ship recycling regulation. Green Ship recycling.
- The Green Passport. The Green Award. Clean shipping. The future of shipping. Green coastal shipping program.
- Seaport environmental priorities. The Sustainable-Green port. Case study of a port using biomonitoring for EMS. Smart port. 1st-5th generation port. Smart port-cities.