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LECTURE 3

INTEGRATED MARINE POLLUTION MANAGEMENT

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CONTENT

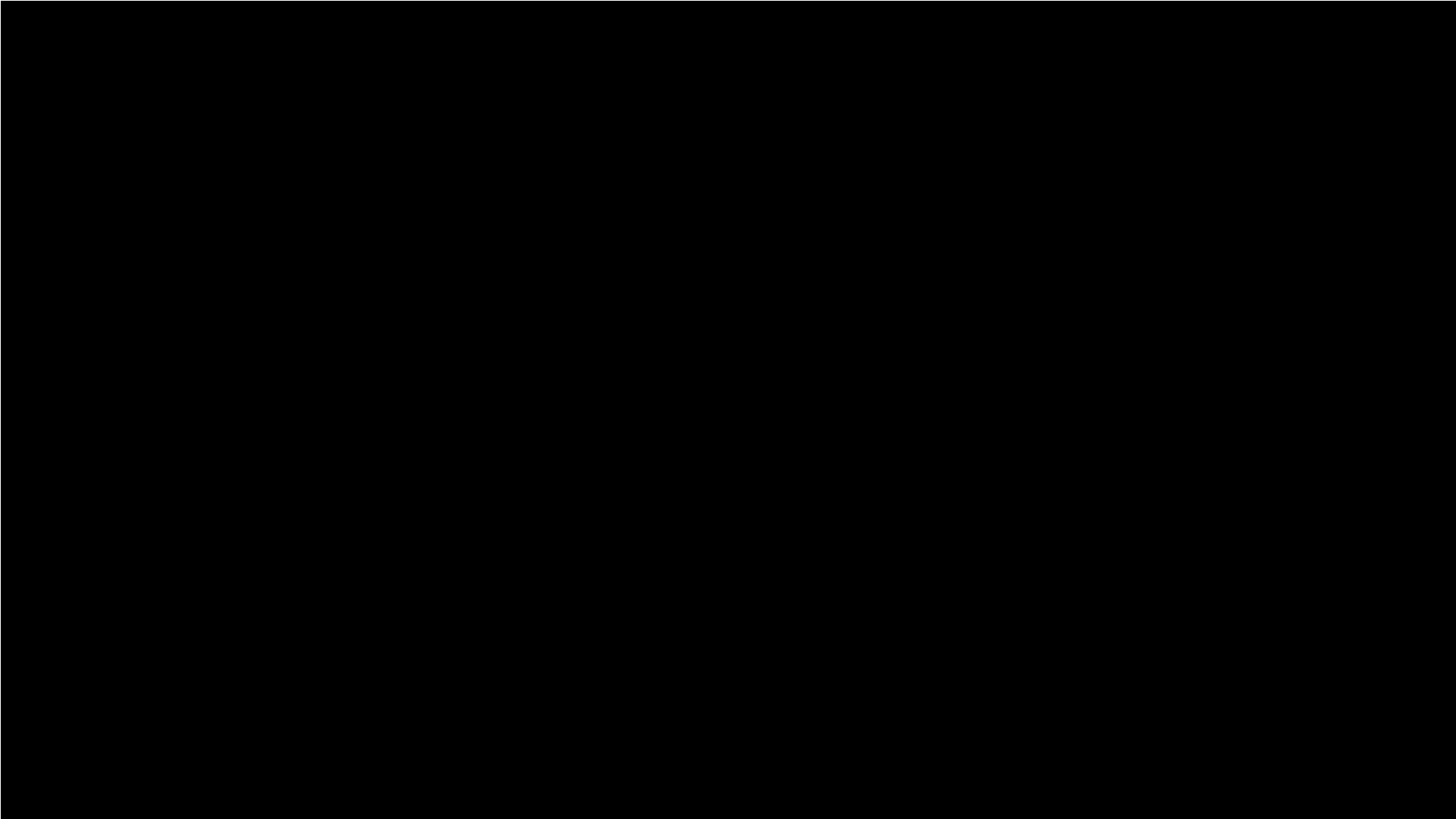


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1. CAUSES AND EFFECTS OF MARINE POLLUTION

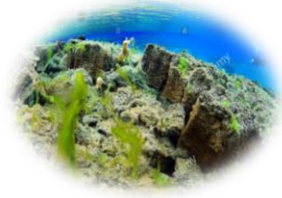
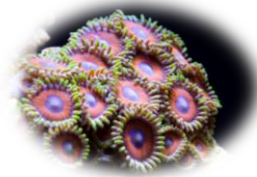
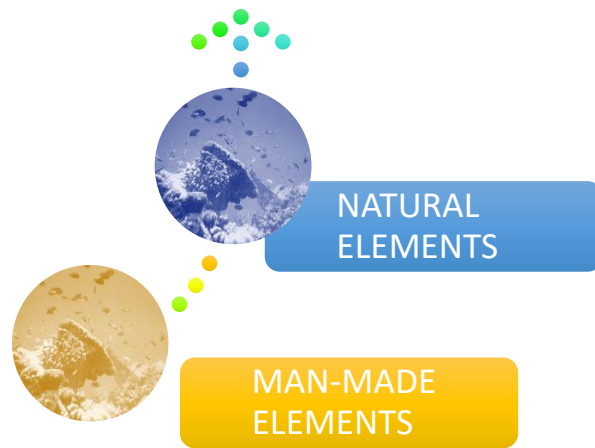
2. INTEGRATED MARINE ENVIRONMENTAL POLLUTION MANAGEMENT

Video 1



Nguồn: Marine pollution, 1st theme of the 2014 [#OurOcean](#) conference

CAUSES AND EFFECTS OF MARINE POLLUTION



CAUSES AND EFFECTS OF MARINE POLLUTION

The impact of marine pollution

Reducing marine biodiversity - loss of natural resources



Damage to the fishing industry



Impact on the tourism industry



Fees for pollution control, incident prevention, and corrective work are increased.



Human health risk



INTEGRATED MARINE ENVIRONMENTAL POLLUTION MANAGEMENT

CONCEPT

- The concept of environmental control first appeared in 1971 by the Scientific Committee of Problems of the Environment (SCOPE)
- Then in 1972, the Union of Environmental Issues (Stockholm) developed into the Global System for Environmental Control (GSME).
- Since 1975, UNEP has been developing a control system-oriented development, having established a program-based work centre (CWP) in Nairobi (Kenya).
- Integrated global control over the ocean includes ecological control and physical control (Izrael, Shban, 1985).
- Ocean ecosystem control is a system for analyzing, evaluating and forecasting the state of marine ecosystems.

INTEGRATED MARINE ENVIRONMENTAL POLLUTION MANAGEMENT

CONCEPT

- The most important component of ecological control is the biological control of the marine environment (figure 1).
- Biological control is combined with geochemical control system, carrying out inspections of sources and levels of marine environmental pollution (figure 2)

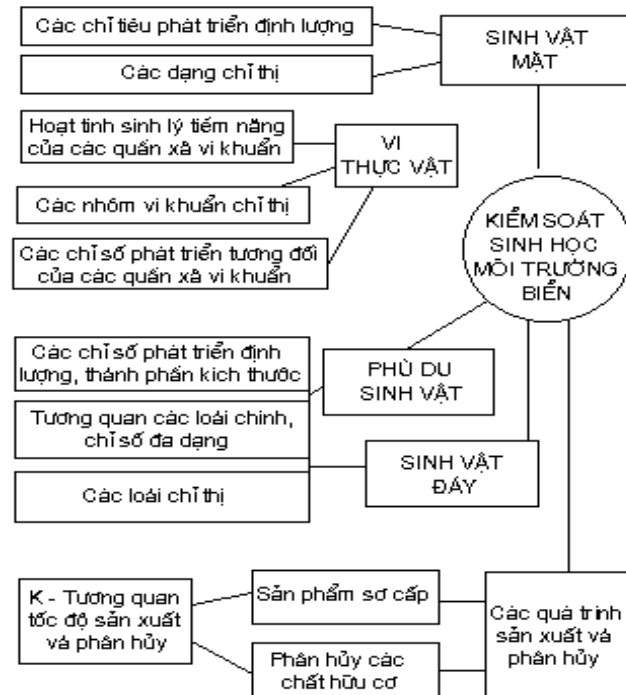


Figure 1. System of marine environmental biological control indicators

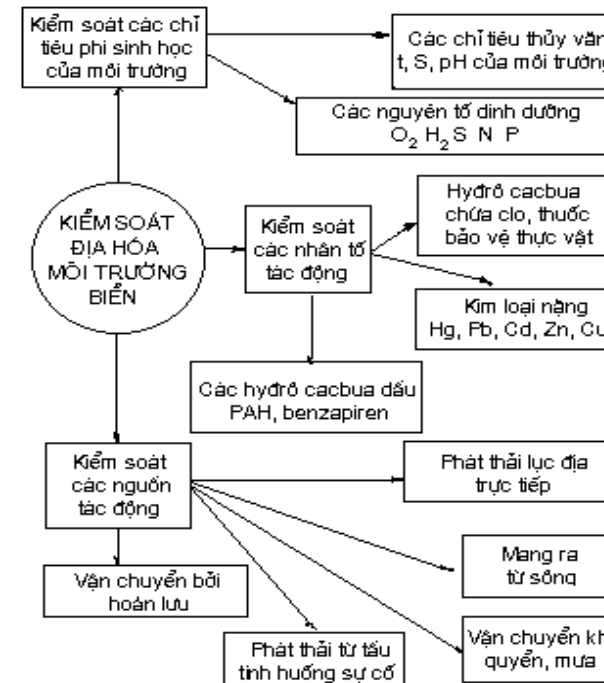


Figure 2. System of indicators to control the geochemicalization of the marine environment

INTEGRATED MARINE ENVIRONMENTAL POLLUTION MANAGEMENT

PRINCIPLES OF CONTROLLING MARINE ENVIRONMENTAL POLLUTION

- Regular pollution control of the marine and island environments is required, with a focus on prevention. Pollution, marine environmental incidents, and marine and island environmental degradation must all be dealt with immediately and successfully.
- Garbage from land-based operations, sea and island activities, unknown origins and across borders must all be controlled. It is important to take into account the environmental load capacity of marine and island areas while controlling waste sources and trash.
- Close coordination between sectors, levels, organizations and individuals involved in controlling marine and island environmental pollution.

(Article 42 of LAW ON MARINE AND ISLAND RESOURCES AND ENVIRONMENT, 2015)

TASKS AND SCIENTIFIC BASIS OF INTEGRATED CONTROL OF MARINE POLLUTION

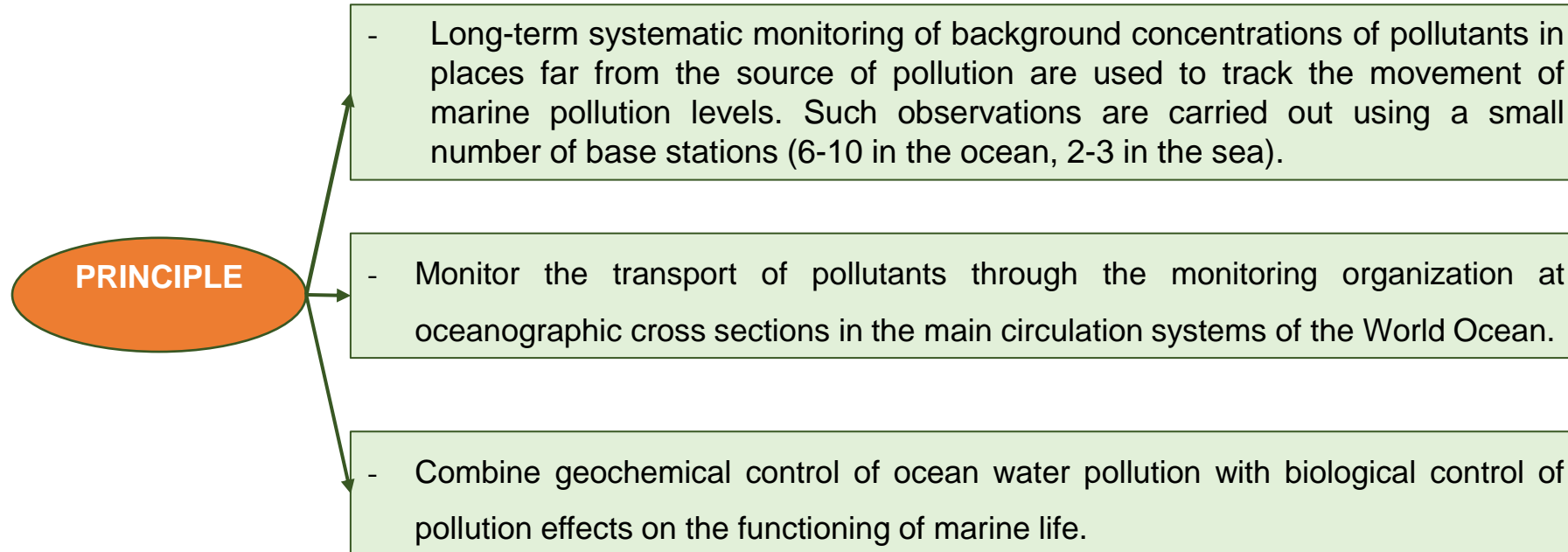
Objective

- Xác định trạng thái các hệ sinh thái quan trọng nhất của Biển và Đại dương Thế giới
- Predict the transformation that takes place in ecosystems under the influence of causal factors.

Mission

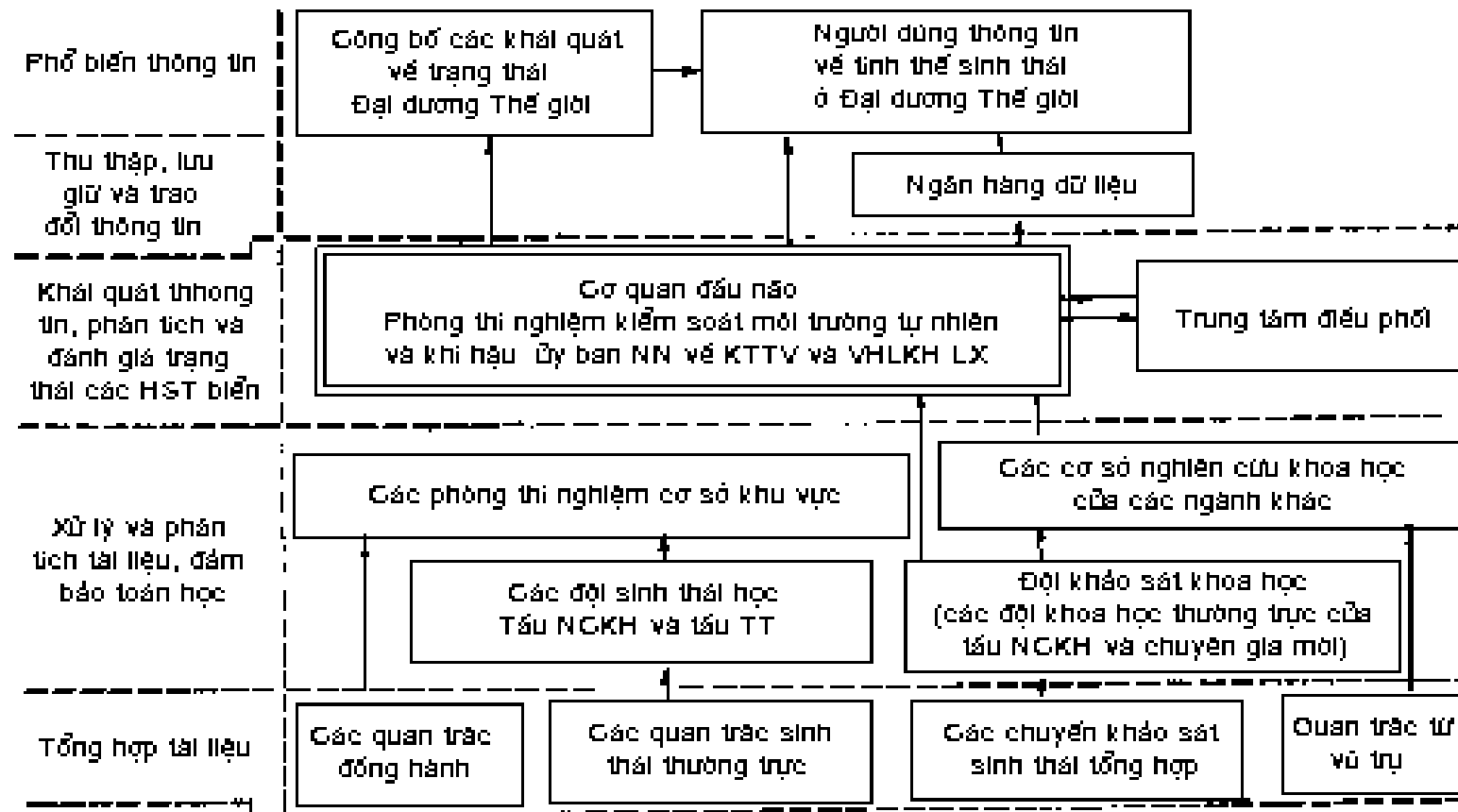
1. Identify channels of intrusion and evaluate the flow of pollutants in the rich and vulnerable ecosystems of the World Seas and Oceans
2. Study the consequences of marine pollution on ecosystems
3. Study the physical, chemical, and biological processes that determine the harmonized capacity and evaluate the harmonized capacity of marine ecosystems in the most studied regions of the World Ocean
4. Build mathematical models for separate ecological processes to predict ecological situations in the ocean at regional, regional and global scales

MARINE POLLUTION CONTROL SYSTEM



MARINE POLLUTION CONTROL SYSTEM

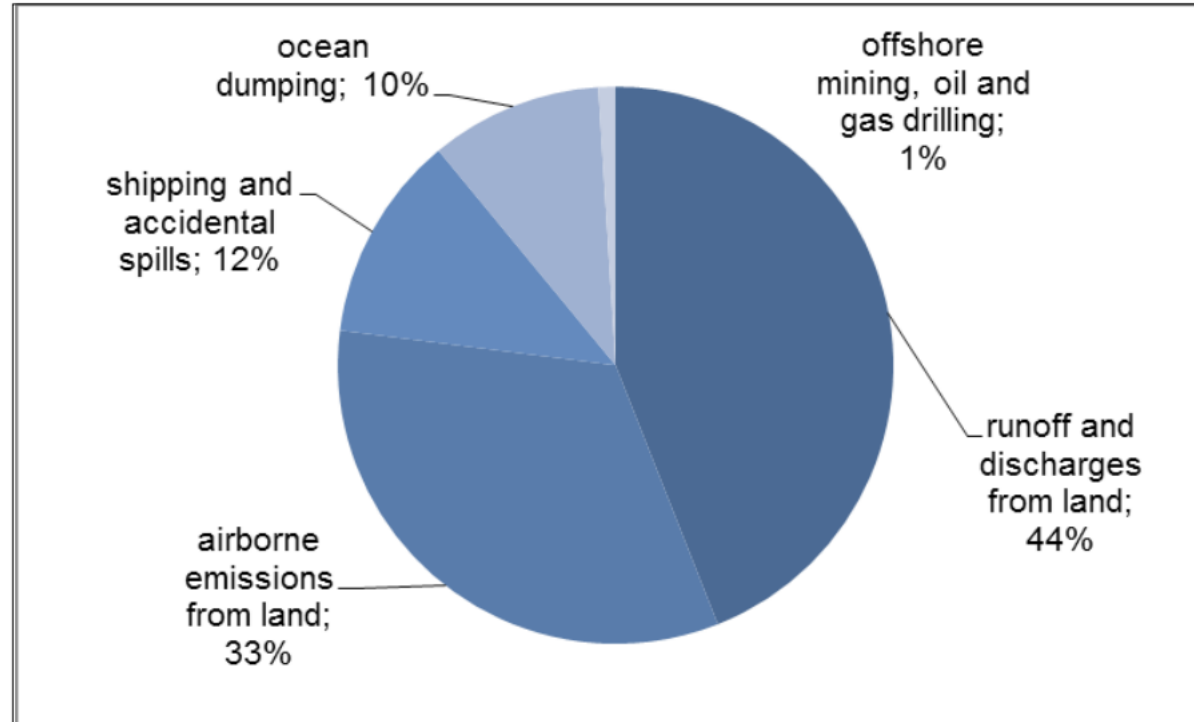
- In 1974 UNEP implemented the Global Integrated Control Program on oceans, which covers 11 ocean regions, more than 120 countries have participated in this program.
- Plan to plan the organizational structure and information assurance of the ocean control program



MARINE POLLUTION CONTROL SYSTEM

- Statistics of the International Maritime Organization show that marine pollution comes from the following sources:

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Source: After IMO (2012)

MARINE POLLUTION CONTROL SYSTEM

To prevent marine pollution, it is possible to apply advanced technologies, clean technologies, cleaner production to exploit marine resources. Techniques can be applied such as:

Waste-free technology

- In the energy sector, converting thermal power plants to non-sulfur and liquid fuel; cleans smoky air from nitrogen oxides, sulfur dioxide, synthetic recycling of smoke residues and smog waste dumps.
- In the mining industry, the problem of underground synthetic mining needs to be geared towards perfecting enrichment methods with the aim of getting all the useful components, cleaning the mine water and using them properly, renovating the soil.
- In the metallurgical industry proceeds to establish scientific arguments - theories for closed water rotation schemes

MARINE POLLUTION CONTROL SYSTEM

Waste-free technology

In the chemical and petrochemical industry, in order to ecologicalize the industry, apply filtration membrane methods, absorb and extract, develop methods of making clean ecological fertilizers and means of improving harvesting, substitutes for chemicals that harm the environment as well as biodegradable substances that are fast and easy to assimilate in the natural environment.

In the senlulo- paper industry today emerges the problem of building organic solvent solubility technology and other methods of wood synthesis recycling, dry paper and carbide production methods, switching to closed water rotation schemes.

PROTECTING THE MARINE ENVIRONMENT FROM SHIPS

A huge source of pollution in the marine environment:

Oil pollution

Pollution caused by liquid chemicals carrying buckets on board

Pollution caused by dangerous goods

Pollution caused by waste

Pollution caused by toxic materials used to build ships

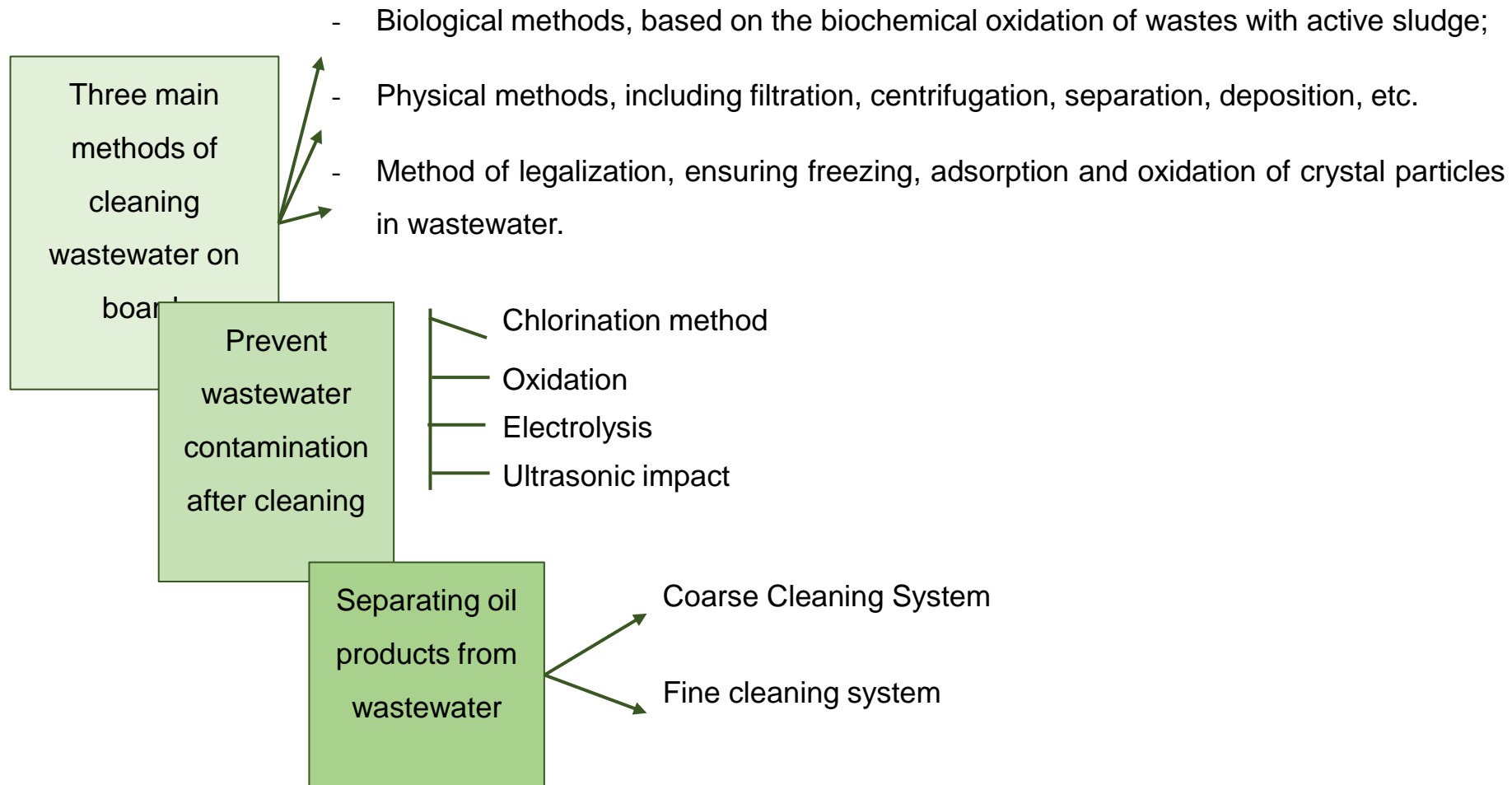
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**Resolution
direction**

- Building closed cycle systems reuses a major amount of waste
- Clean and minimize the calculation of waste that definitely enters the marine environment.

PROTECTING THE MARINE ENVIRONMENT FROM SHIPS

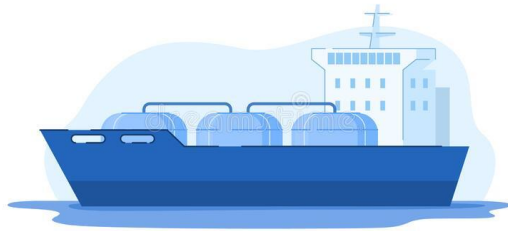


PROTECTING THE MARINE ENVIRONMENT FROM SHIPS

Method of washing oil tankers

Before

- Use hot water to wash and then pour large amounts of water out of the vessel.
-



Now

- Emulsification method
 - This method avoids the dumping of oil pollutants into the sea while washing metal surfaces, storage compartments, plunger, tanks, tanks, containers on oil tankers.
 - The emulsification method ensures the cleaning of the containers in a closed cycle without discharging washing water.

PROTECTING THE MARINE ENVIRONMENT FROM SHIPS

Oil collection methods

- Collect oil using specialized pumps to suck and filter the oil and then put it in storage tanks placed on board or on land and then process the oil separation for reuse.
- Collect oil with materials that cause oil accumulation floating on the water surface: natural materials (straw, bushes, sawdust, plants ...) and synthetic substances (plastics, foams, powders)
- Method of decomposition of oil by chemicals: Using dispersants capable of decomposing oil sprayed on the surface of the oil layer, these substances will break down the oil to reduce the toxins of the oil.
- Method of burning oil: It is possible to burn the oil patch as soon as the oil spills on the sea surface, but this method pollutes the air, does not recover the oil ... It should be used less.



PROTECTING THE MARINE ENVIRONMENT FROM SHIPS

Oil spill remedies

- Circle the oil patch with mechanical and physical barriers (buoys) to prevent the oil from spreading.
- Fold the oil with glue: the essence of this method is to glue the oil spill layer by spraying into the oil layer of glues (isocyanat amines, aliemimum chocolate ...) then recovering the oil in solid form and further processing to recover the oil.

Vietnam

- Set up oil spill response centers in Vung Tau, Da Nang and Hai Phong.
- These centers are equipped with specialized oil spill response vessels that can operate in all weather conditions and are equipped with state-of-the-art oil collection and treatment equipment.



ASSIGNMENT

[1] Explain the causes of marine pollution

[2] Presenting the mission and scientific basis of integrated control of the marine environment

[3] What is waste-free technology?



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THANK YOU

