

Report

WP 3 CAPACITY BUILDING THROUGH STAFF TRAINING AND EQUIPMENT PURCHASE. THE AIM OF WP2 IS TO ENHANCE CAPACITIES RELATED TO FIELD OF MEP&M AND E-LEARNING.

DEV 3.4.1: KNOW-HOW TRANSFER RELATED TO THE LATEST TOPICS ON MARINE AND COASTAL POLLUTION AND EMISSION OF GHG FROM SHIPPING, NAUTICAL TOURISM, COASTAL TOURISM AND OFF-SHORE ACTIVITIES

Development of Regional Joint Master Program in Maritime Environmental Protection and
Management – MEP&M

Project no. 619239-EPP-1-2020-1-ME-EPPKA2-CBHE-JP

**REPORT ON KNOW-HOW TRANSFER RELATED TO THE LATEST TOPICS ON
MARINE AND COASTAL POLLUTION AND EMISSION OF GHG FROM SHIPPING,
NAUTICAL TOURISM, COASTAL TOURISM AND OFF-SHORE ACTIVITIES**

Overview of MSc programs in field of MEP&M at EU HEIs

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1. Introduction

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1.1. Objectives

In the project, the main objective of DEV.3.4.1 was to provide to Montenegrin and Albanian HEIs' teaching staff additional know-how with research activities in topics on marine and coastal pollution and emission of GHG. Training addressed various topics including shipping, nautical tourism, coastal tourism and off-shore activities influence on GHG emission and marine and coastal pollution.

Based on this, the specific objectives to be achieved in DEV.3.4.1 are the following:

- Obj. 1 To be introduced to tools for the limitation of marine pollution
- Obj. 2 To know the main legal mechanisms in the European Union related to marine pollution
- Obj. 3 To advance on the concepts of blue growth and ecosystem services in relation to pollution in the marine environment
- Obj. 4 To increase knowledge on the main pollutants in the marine environment, paying special attention to the activities that generate them

1.2. Format

The objectives allowed specific topics to be obtained, which were developed in the training sessions. Thus, the topics proposed for DEV.3.4.1 are as follows:

- **Topic 1.** Environmental Sensitivity Maps: a tool to limit beach oiling pollution (Obj. 1)
- **Topic 2.** Marine Pollution generated by shipping industry: UE legal instruments to reduce and prevent it (Obj. 2)
- **Topic 3.** Sustainable development, from Hippies to Ecosystem services (Obj. 3)
- **Topic 4.** The Blue Growth, a Mediterranean focus (Obj. 3)
- **Topic 5.** Impacts of oil and gas activities on the marine environment (Obj. 4)
- **Topic 6.** Land and shipping-based effluents as sources of marine pollution: Technologies for his minimization (Obj. 4)



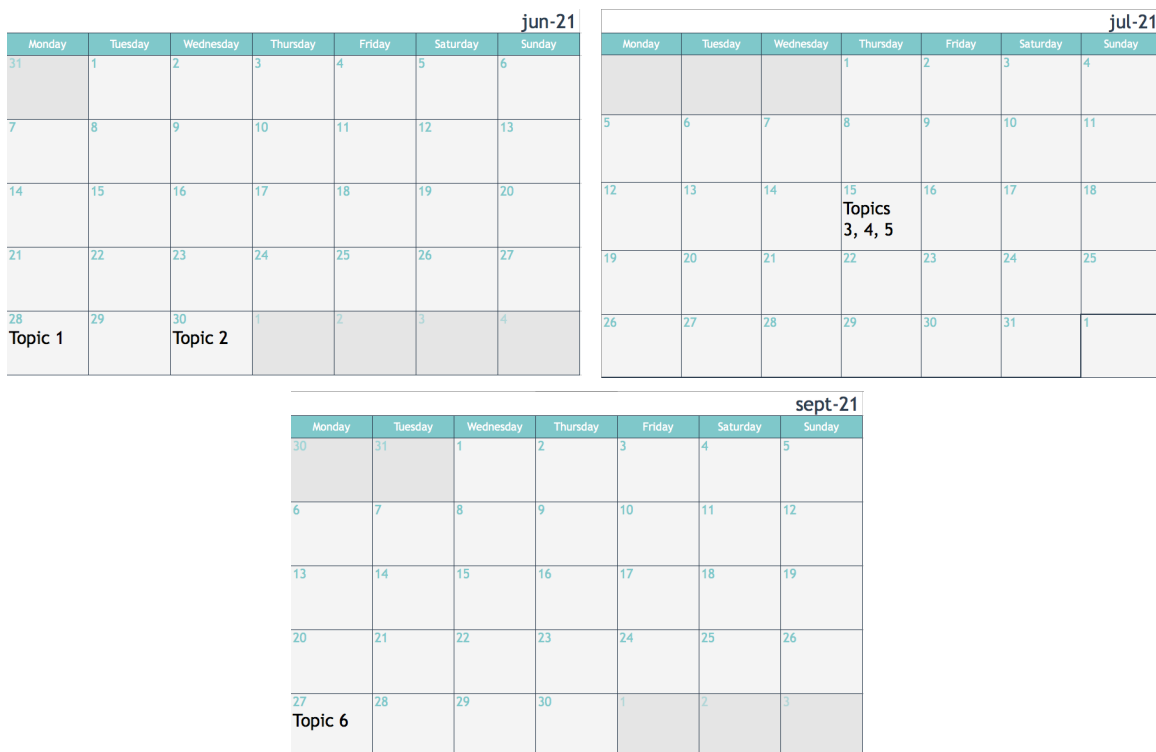
The topics were developed by professors from the University of Cadiz, Spain (UCA-S) and the University of Cote D'Azur, France (UCA-F); they are researchers and specialists in the areas of knowledge proposed. Specifically, the University of Cadiz addressed topics 1, 2 and 6, while the Cote D'Azur University developed topics 3, 4 and 5.

On the other hand, the format of the conference initially planned to be developed in person, during two days at the University of Montenegro. However, due to the restrictions arising from the covid-19 pandemic, it was agreed at the Kick-off meeting that the sessions related to DEV.3.4.1 would be held in an online format.

The online format made it easier for both teachers and participants to conduct the sessions independently. A professor to develop a specific topic addressed each session. To this end, a Doodle was created for each of the proposed sessions in which the participants could show their availability. Based on the results obtained in the Doodles, the dates of the sessions were established (Figure 1). The Agenda shows the days and times set for each of the training sessions.

In terms of participants, as shown in the project, there should be at least 15 representatives of teaching staff from Montenegrin and Albanian partners. Accordingly, the different dates set in the Agenda were circulated by UCA-S to WP3 contact people for dissemination to interested professors.

Figure 1. Calendar for DEV.3.4.1 training sessions





1.3. Agenda

The special characteristics of the online format sessions led to the creation of a Dynamic Agenda. It consisted of an agenda in which the dates were updated according to the Doodle results of each training session. All updates of the Dynamic Agenda were sent to the partners, as well as updated in the project's Google Drive. Table 1 shows the final Agenda for the DEV.3.4.1 sessions.

Table 1. Agenda for DEV. 3.4.1 training sessions

Monday 28nd June 2021. University of Cadiz (UCA-S)

9:15- 9:30	Entry and welcome Link for the meeting: https://meet.google.com/qyi-oxct-tdt
9:30 – 10:25	Giorgio Anfuso Melfi, PhD. Topic: Environmental Sentitivity Maps: a tool to limit beach oiling pollution (Part 1)
10:25-10:35	Break
10:35- 11:30	Giorgio Anfuso Melfi, PhD. Topic: Environmental Sentitivity Maps: a tool to limit beach oiling pollution (Part 2)
11:30-12:00	Discussion and questions

Wednesday 30nd June 2021. University of Cadiz (UCA-S)

9:15- 9:30	Entry and welcome Link for the meeting: https://meet.google.com/jqr-trxj-wxw
9:30 – 10:25	Emilio Rodríguez Díaz, PhD Topic: Marine Pollution generated by shipping industry: UE legal instruments to reduce and prevent it (Part 1)
10:25-10:35	Break
10:35- 11:30	Emilio Rodríguez Díaz, PhD Topic: Marine Pollution generated by shipping industry: UE legal instruments to reduce and prevent it (Part 2)
11:30-12:00	Discussion and questions



Thursday, 15nd July 2021. University Côte d'Azur (UCA-F)

9:45– 10:00

Entry and welcome

Link for the meeting:

<https://univ-cotedazur.zoom.us/j/85867739079?pwd=L3A1Y1lyT0VSRDJMak1NTTJ1dmtVdz09>

10:00 – 10:55

Christophe Mocquet, PhD

Topic: Sustainable development, from Hippies to Ecosystem services (Part 1)

Break

10:55 – 11:00

Christophe Mocquet, PhD

11:00 – 11:50

Topic: Sustainable development, from Hippies to Ecosystem services (Part 2)

Discussion and questions

11:50 –12:00

Lunch break

12:00 -- 13:00

Christophe Mocquet, PhD

13:00 – 13:55

Topic: The Blue Growth, a Mediterranean focus (Part 1)

Break

13:55 – 14:00

Christophe Mocquet, PhD

14:00 – 14:50

Topic: The Blue Growth, a Mediterranean focus (Part 2)

Discussion and questions

14:50 – 15:00

Juliette Gilloteaux, MSc

15:00 – 15:55

Topic: Impacts of oil and gas activities on the marine environment (Part 1)

Break

15:55 – 16:00

Juliette Gilloteaux, MSc

16:00-16:50

Topic: Impacts of oil and gas activities on the marine environment (Part 2)

Discussion and questions

16:50- 17:00



Monday, 27th September 2021. University of Cadiz (UCA-S)

9:15- 9:30

Entry and welcome

Link for the meeting:

<https://meet.google.com/aza-dsbt-sss>

9:30 – 10:25

Javier Moreno-Andrés, PhD.

Topic: Land and shipping-based effluents as sources of marine pollution:

Technologies for his minimization (Part 1)

10:25-10:35

Break

10:35- 11:30

Javier Moreno-Andrés, PhD.

Topic: Land and shipping-based effluents as sources of marine pollution:

Technologies for his minimization (Part 2)

11:30-12:00

Discussion and questions

2. Overview of University of Cadiz training sessions

2.1. Topic 1. Environmental Sensitivity Maps: a tool to limit beach oiling pollution

Author(s) of topic 1: María de Andrés García and Giorgio Anfuso Melfi, Universidad de Cádiz (Spain)

Date: Monday, 28th Jun 2021

Organized by: University of Cadiz, Spain

Professor: Giorgio Anfuso Melfi, PhD.

Contents taught:

The first training was entitled "Environmental Sensitivity Maps: a tool to limit beach oiling pollution" and was developed by Giorgio Anfuso Melfi from the University of Cadiz (Spain). The activity was attended by a total of 15 participants from the host universities.

Oil spill accidents have a great ecological and economic impact on ecosystems and human coastal activities linked to tourism, industry and on the exploitation of marine resources.

Oil spill accidents have a great ecological and economic impact on ecosystems and human coastal activities linked to tourism, industry and on the exploitation of marine resources. Main causes of oil spill are Human errors, Mechanical errors, Natural disasters, Planned actions (wars, illegal spills, vandalism).

A contingency plan is a course of action designed to help an organization to respond effectively to a significant future event or situation that may or may not happen. Contingency planning is a component of disaster recovery and risk management. When an oil spill takes place several institutions and national and international organizations are involved to control the accident, repair the damages and help, assist and refund affected entities in a short time. All information regarding coastal resources sensitivity, areas that have to be protected, etc. are contained in the Environmental Sensitivity Maps that are a first step for the preparation of the Contingency Plan. It is possible to establish which areas analysing the different activities at risk by analysing the different activities links to oil transportation, bunkering operations, etc. There is a simulation of oil dispersion from the realise point; this is according to oil typology and the meteorological and oceanographic conditions.

Environmental Sensitivity Maps contain three types of information, which has to be depicted using symbols or colors in maps. The interpretation of such maps has to be simple and easy:



- Coastal Typology: has to be classified according to its sensitivity, persistence of oil and facility of cleanup operations. Geomorphological criteria are essentially used.
- Biological resources
- Human resources

The lecture was centered especially on Coastal typology. Different coastal environments were described from lower (1) to higher (10) sensitivity.

(1,2): Cliff and rock shore platforms. They are energetic areas usually with an impermeable substrate. Problems are observed when the rocks are fractured and hence permeable - the oil can penetrate into the substrate. Usually are remote and very difficult to access areas.

(3, 4, 5 and 6): From fine sand beach to gravel/cobble beaches. Sandy –gravel coasts present medium sensitivity depending on the grain size. Sediment permeability, and hence oil penetration potential, depends on grain size and sediment classification (standard deviation), coarse and well-classified sediments are very permeable. Mixed sediments usually have a lower permeability because are usually poorly classified and oil is able to penetrate to a maximum depth of 50 cm. And other aspect to be considered is the velocity/modalities of beach morphological changes; if changes are rapid the oil can be easily buried. So these are aspects of great relevance. Coarse-grained beaches record rapid changes respect to fine grained sediments. The substrate characteristics determine the transitivity too. Fine grained beaches present best transitivity characteristics.

(6): Groins, breakwaters and revetments. Exposed protection structures present medium-high sensitivity according to the level of porosity they have Oil penetration potential depends on coastal structures characteristics. Breakwaters and revetments show great porosity respect to flat seawalls – which are impermeable. Such structures are located in very energetic areas so approaching waves hit them and reflected waves transport oil offshore.

(7): Tidal flats. Tidal flats present fine sediments and meso or macrotidal regime and very smooth slopes (1‰). Waves have not a great importance and tidal currents determine erosion/accretion processes. Exposed tidal flats have a high sensitivity Sediments have very low permeability but cleanup operations are complex due to the low transitivity. They have relevant biological interest because of birds and invertebrates. Waves break far from the shore and push oil landward.

(8): Sheltered coastal structures. High sensitivity. There are different types of structures, with a great porosity (and hence permeability, e.g. breakwaters, etc.) or almost



impermeable ones (e.g. docks, etc.). Natural cleanup is almost null since structures are in sheltered environments.

(9 and 10): Saltmarshes and Mangrove swamps. Salt marshes have the highest sensitivity. They have a great interest from a biological point of view and often host human activities (salt harvesting areas, fishing, etc.). Sheltered areas where oil is accumulated. Sediments consist of clay, silt or very fine sand and are almost impermeable but the presence of vegetation makes cleanup operations very difficult and transitivity is very low.

After the presentation of such conceptual background examples of Environmental Sensitivity Maps for the Gibraltar Strait area were presented.

Discussion and questions:

Some general questions were made and one about the importance of Environmental Sensitivity maps – their relevance and utility in case of a beach oiling accident related to offshore oil platform. This was linked to the future installation of oil platforms offshore the coast of Montenegro – such issue raised concerns regarding potential coastal oil pollution. The teacher explained that Environmental Sensitivity Maps are very useful in that case and studies should be carried out in Montenegro to characterize most sensitive coastal sectors.

Main conclusion:

The topic is of great relevance for the university involved in the meeting, is multidisciplinary and of interest for future students.

2.2. Topic 2. Marine Pollution generated by shipping industry: UE legal instruments to reduce and prevent it

Author(s) of Topic 2: María de Andrés García and Emilio Rodríguez Díaz, Universidad de Cádiz (Spain)

Date: Wednesday, 30th Jun 2021

Organized by: University of Cadiz, Spain

Professor: Emilio Rodríguez Díaz, PhD.

Contents taught:

The main objective of this task was to provide the teaching staff of Montenegro and Albania with additional knowledge with research activities on marine and coastal pollution and GHG emission issues. The second training was entitled "Marine pollution generated by the



shipping industry: EU legal instruments to reduce and prevent it". This training was developed by Emilio Rodríguez Díaz and was attended by a total of 16 participants from the host universities.

During the first part, the contents were about the Port State Control (PSC), that is the inspection of foreign ships in national ports to verify that the condition of the ship and its equipment comply with the requirements of international regulations and that the ship is manned and operated in compliance with these rules.

Marine pollution generated by ships has a great ecological and economic impact on ecosystems and human coastal activities linked to tourism, industry and on the exploitation of marine resources. Main causes of oil spills produced by ships are related with a lack of maintenance and the default of flag states on the procedural safety inspections.

For this reason, the European Union had to create a serial of legal instruments in order to prevent marine oil spills, divided in three different plans: Erika I, Erika II and Erika III.

Erika I plan collects three important measures:

- Homogenise the safety inspections and procedures, carried out in European ports.
- Regulations addressed to enhance of the main actors of the shipping industry related with the safety of ships.
- Accelerate the replacement of single hulls tankers to double hull tankers.

Erika II:

- Established a maritime-vessel monitoring, control, and information system (Directive 2002/59/EC)
- A proposed regulation would set up the COPE Fund, a compensation fund for victims of oil spills in European waters.
- Setting up of a European Maritime Safety Agency

The Erika III plan is a consequence of the Prestige disaster that showed the amendment that European Union had to make to its own regulation, since the Erika I and II was not enough to prevent oil spills disasters. The Erika III collects:

- A proposal for a Directive on the conformity requirements of flag states
- Amendment of the Directive on classification societies
- Amendment of the Port State Control Directive
- An amendment of the Traffic Monitoring Directive
- A proposal for a Directive on accident investigations
- Regulation on liability and compensation for damage of passengers in the event of maritime accidents.

Then, during the second part of the training, some tips about the EU rules were treated:



The EU leadership in Sustainable Development going beyond International Obligations. In consequence, is necessary the development of its Integrated Maritime Policy and through specific Directives.

The EU has strong influence and the ability to change policy externally with non-EU actors. EU as maritime region and the importance as a market for goods from countries such China, India and the US. Measures taken by the EU can have a global impact (China, India and US).

EU is directly influenced the timetable for bringing in those same standards internationally. Accelerated international timetable in order to have a direct and positive influence in international conventions.

To summarize and conclude the lecture, I taught the European Union is a leadership in Sustainable Development going beyond International Obligations, has a strong influence and the ability to change policy externally with non-EU actors.

If we need a sentence to summarize the lecture is: EU is a global leader in the protection of the marine environment.

Discussion and questions:

The training was of great interest to the participants as it addressed issues related to the EU legal framework on maritime pollution, so that researchers and professors from the universities of Montenegro and Albania will be able to deepen in these issues of regulation by the EU in the marine environment.

Main conclusion:

The topic is of great relevance for the university involved in the meeting. They know perfectly the situation that Albania and Montenegro have in the maritime industry and the steps that they have to do in order to improve the safety inspections on ships.

2.3. Topic 6. Land and shipping-based effluents as sources of marine pollution: Technologies for his minimization

Author(s) of Topic 6: María de Andrés García and Javier Moreno Andrés, Universidad de Cádiz (Spain)

Date: Monday, 27th September 2021

Organized by: University of Cadiz, Spain



Professor: Javier Moreno Andrés, PhD

Contents taught:

In this training session, the main goal was to identify potential sources of marine pollution, derived either from land-based activities or shipping-based activities.

Land-based activities were deeply analysed in terms of wastewater effluents (both urban and industrial ones). Key parameters based on non-persistent organic & inorganic pollution, microbial pollution, or household chemicals & Contaminants of Emerging Concern were explained. An update of different policies and legal requirements in these activities were also summarized. Finally, some technologies to remove these contaminants were explained.

Regarding maritime transport, a similar outlook was exposed by further developing topics such as sewage (cruise tourism), ballast waters (cargo vessels) or scrubber waters (cargo & cruise vessels). A general overview of the impacts of these effluents and remediation technologies were presented.

Aquaculture activities were also analysed as potential source of pathogenic microorganisms and contaminants of emerging concern, including the water treatment systems that could minimize this type of pollutants.

In part 1 the following topics were discussed: Sustainable Development Goals and Ocean Decade: Goals, targets, and actions. Wastewater effluents and one of the main sources of marine pollution. Organic and inorganic pollution, microbial pollution, and Contaminants of emerging concern.

In part 2 (after a 10-minute break) the following topics were discussed: Maritime transport as source of diverse effluents that can cause impacts on marine environments. Sewage from cruise industry, as well as effluents with particular features such as ballast water discharges and exhaust gas-cleaning systems. Water treatment in aquaculture facilities was also briefly discussed.

The main conclusions of the session were that a movement forward minimize marine pollution is currently being developing. Policies such as Sustainable Development Goals or the Ocean Decade are currently going on. These types of policies are the basis for the development of legal requirements. In fact, European Directives and different IMO Conventions are recently launched, e.g., Watch List of priority substances, ballast water management convention, etc. To meet these legal requirements, technologies for water



remediation are also needed. In the case of seawater scenario, strategies and technological development should be implemented for minimize marine pollutants at the source.

Discussion and questions:

In the discussion and question part, the participants asked about the pollutants of aquaculture. Specifically, the differences between freshwater and seawater aquaculture. Javier comments that in terms of regulation, there is no difference between freshwater and seawater aquaculture, but the restrictions are in terms of the concentration of pollutants. In seawater, everything is more complicated in terms of pollutant control technologies, for example. Discussion lasted a total of 15 minutes.

Main conclusion:

The main conclusions of the session were that a movement forward minimize marine pollution is currently being developing. Policies such as Sustainable Development Goals or the Ocean Decade are currently going on. These types of policies are the basis for the development of legal requirements. In fact, European Directives and different IMO Conventions are recently launched, e.g., Watch List of priority substances, ballast water management convention, etc. To meet these legal requirements, technologies for water remediation are also needed. In the case of seawater scenario, strategies and technological development should be implemented for minimize marine pollutants at the source.



3. Overview of University of Cote D'Azur training sessions

3.1. Topic 3. Sustainable development, from Hippies to Ecosystem services

Author(s) of Topic 3: Christophe Mocquet, University Côte d'Azur

Date: Thursday, 15th July, 2021

Organized by: University Côte d'Azur

Professor: Christophe Mocquet, PhD

Content taught:

The main objective of this task was to provide teaching staff from Montenegro and Albania with additional knowledge with research on the impact of marine and coastal pollution from oil and gas activities on the marine environment. The training was entitled "Sustainable Development: from Hippies to Ecosystem services" and was developed by Christophe Mocquet from University Côte d'Azur (France). The activity was attended by a total of 17 participants from the host universities.

Dr. Christophe Mocquet gave a presentation on the sustainable development concepts, tools and application for blue growth. After an historical review of sustainable development points of views, focus was provided on the Sustainable Development Goals (SDGs) of United Nations (UN) and applied instruments such as green finance, blue carbon, and ecosystem services.

The content addressed in the training was related to the sustainable development concepts, tools and application for blue growth. After an historical review of sustainable development points of views, focus was provided on the Sustainable Development Goals (SDGs) of United Nations (UN) and applied instruments such as green finance, blue carbon and ecosystem services.

Discussion and questions:

Dr. Christophe Mocquet answered to the question of the audience. The questions focused mainly on carbon market instruments in Europe, particularly those currently being implemented by Montenegro as part of a process of accession to the European Union.

The aspects of carbon offset and carbon efficiency were addressed, particularly in the context of industries that are still largely net emitters of CO₂, such as maritime transport. On the other hand, there was a discussion on the concept of ecosystem services and their



implementation in conservation and sustainable development methods, particularly in relation to studies underway in Montenegro.

Main conclusion:

The points most highlighted by the discussion were the implementation of the carbon market in Montenegro in the first instance, and in the wider region in the longer term. The strengths and obstacles of such an instrument and its effective implementation were discussed. It remains an important issue in the process of Montenegro's accession to the EU.

The already ongoing implementation of the ecosystem services assessment process at different levels in Montenegro was also pointed out, highlighting a leading position in the field.

3.2. Topic 4. The Blue Growth, a Mediterranean focus

Author(s) of Topic 4: Christophe Mocquet, University Côte d'Azur

Date: Thursday, 15th July, 2021

Organized by: University Côte d'Azur

Professor: Christophe Mocquet, PhD

Content taught:

The main objective of this task was to provide teaching staff from Montenegro and Albania with additional knowledge with research on the impact of marine and coastal pollution from oil and gas activities on the marine environment. The training was entitled "The Blue Growth: A Mediterranean focus" and was developed by Christophe Mocquet from University Côte d'Azur (France). The activity was attended by a total of 17 participants from the host universities.

The content addressed in the training was related to the general context of blue growth, through its scientific, environmental, and socio-economic aspects. After a first part linking the good health of our coasts and oceans for a sustainable development of our societies, the definition of this multifaceted concept and the different sectors of blue growth were discussed (fisheries & aquaculture, maritime transport, blue energy, bioprospecting, deep sea mining).



Discussion and questions:

Christophe Mocquet answered to the question of the audience. The discussion that followed focused first on blue energy, particularly based on microalgae, and the challenges linked to this industry. In particular, the fact that the horizon for broad implementation of this technique has been pushed back several decades due to various reasons, including the variation in the price of crude oil and investment decisions that have instead focused on other opportunities, such as the production of molecules of interest, such as bioactive molecules in pharmaceuticals and cosmetics.

Other issues included microplastics, including measurement techniques, both in the sea and in accumulating animals. Finally, the idea of exploiting minerals from the seabed created a discussion around the technical and environmental challenges, raising the question of whether this future industry should be recognised as "blue".

Main conclusion:

The presentation and the ensuing discussion should have given a clear idea of what blue growth is, its different industry sectors, as well as an idea of the technical, socio-economic and environmental opportunities and challenges. It was recalled several times that blue growth is intended to create economic value for the development of communities, while respecting environmental protection and social justice. Some sectors were discussed more than others, such as fishing/aquaculture and tourism during the presentation, and energy and deep-sea mining during the questions.

3.3. Topic 5. Introduction to the impacts of oil and gas activities on the marine environment

Author(s) of Topic 5: Juliette Gilloteaux, University Côte d'Azur

Date: Thursday, 15th July, 2021

Organized by: University Côte d'Azur

Professor: Juliette Gilloteaux, MSc

Content taught:

The main objective of this task was to provide teaching staff from Montenegro and Albania with additional knowledge with research on the impact of marine and coastal pollution from oil and gas activities on the marine environment. The training was entitled "Impacts of oil and gas activities on the marine environment" and was developed by Juliette Gilloteaux



from University Côte d'Azur (France). The activity was attended by a total of 17 participants from the host universities.

This training explored the risks and consequences to marine life and human communities associated with offshore oil and gas exploration and development activities. It first detailed the physical properties of oil and the fate of spilled oil in the aquatic environment. Participants received information on the chemical composition and mass properties of spilled oil, and associated weathering reactions, govern its behaviour and impact in marine environments.

Then the presentation explored the various impacts of these oil spills on marine fauna, which can range from minimal to large-scale faunal mortality. A focus on the Mediterranean region was made with a brief review of historical data, sources and volumes of oil pollution in the Mediterranean Sea. A summary of the data on the development of the exploitation of these hydrocarbons as well as their inputs from sources such as maritime transport and land-based sources was proposed.

The presentation highlighted that shipping is the sector that is the main cause of oil pollution in the Mediterranean Sea, while oil and gas production and exploration are not so important. Excluding major oil spills from ships, we found that total volumes of oil pollution that vary widely among the proposed reports.

The presentation concluded by emphasizing that oil spills are of great concern because of their short- and long-term impact on marine flora and fauna, and that they generate economic loss as well as significant long-term damage to coastal communities and economies.

Discussion and questions:

Discussion was in the first part launched with the pedagogical tool "Wooclap". This is a tool can be integrated into the teachers' work environment by inserting questions into Moodle for example and presentations. Using Wooclap for the first discussion, we saw that tourism, fisheries and aquaculture are the activities and sectors of society that are the most impacted by oil spill in the marine environment according to the participants.



www.wooclap.com/OILSPILL

What activities or sectors of the human communities do you think are impacted by the release of oil into the marine environment?

BOATING FOOD
SWIMMING TOURISM FISHERIES
AQUACULTURE FISHING DIVING SEA

Discussion after the presentation were directed towards the management of oil exploitation and exploitation in France which represents a strong signal to respect the Paris Agreement and encourages other countries to join it in its commitment to fight against global warming.

Participants discussed also other oil spills event other than the ones presented in the training, showing that we observe a large number of other spills every year. Information was also shared regarding the status and regulations related to oil exploration and exploitation and in Montenegro, as well as the identification of the companies carrying them out.

The participants also discussed the tools for repairing oil spill damages and the tools for detecting them, exposing the satellite tool for detecting spills that are made by consulting companies. The companies and research sections in the Côte d'Azur region as well as those in the area of the University were exposed.

The discussion ended up with the types of damage done to marine life depending on the physical and chemical characteristics of the oil.

Main conclusion:

Oil spills at sea have many effects on the environment and its ecology that depend largely on the parameters governing the oil. The properties of the oil and the environmental weathering processes determine the extent of the damage caused. The key to dealing with future oil spills in the environment is prevention; understanding the effects of oil once it is released into the environment and the effects of oil on marine biota and ecosystems, as well as structural features such as the coastline and seabed; and identifying the human impact that is a function of the above, particularly expressed as economic and social damage. Limited efforts have been devoted to the ecological, social and economic impacts of offshore



oil spills, which require further study to develop a more complete picture of how affected communities suffer from spills and to improve their work with affected communities.



4. General conclusions

The activities developed within the framework of DEV.3.4.1. have allowed the achievement of the general objective and, therefore, have enabled the teaching staff of the universities in the project to increase their knowledge on topics related to coastal and marine pollution.

Specifically, the training and experience of the different professors has made it possible to approach the problem of pollution from different perspectives, from a completely scientific vision to legislative concepts.

Moreover, as regards the development of the training, it is worth highlighting the positive side of the online sessions, in the sense of being able to be more flexible with the availability of both professors and participants. This has led to a dynamic agenda that has made it possible to extend the training sessions during the months of June, July and September.

Finally, it is essential to point out the involvement and active participation of the attendees, which has allowed to go deeper into those aspects that were of most concern, as well as to comment on relevant issues in each session.