Oil Spills and Their Effects upon the Mediterranean

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ABSTRACT
When liquid petroleum hydrocarbons are released into the environment it leads to a hazardous condition called as Oil Spills. Oil spills have caused tremendous negative effect on the marine ecosystem. It is an anthropogenic activity which is one of the major sources of pollution. Spill oil has not only created problems for the fishes and plants inhabiting the underwater but has also penetrating the plumage of birds and the fur of mammals. This disaster has created in extinction of the organism and the ability to insulate has been reduced to a great extent. Mediterranean Sea is most vulnerable and the potential effects of an oil spill being far more damaging in this marine region alongside many of its other coastal regions when compared to other comparable geographic regions.

Keywords: Oil Spills, Pollution, Human Activities, Mediterranean.

I. A DISCUSSION OF OIL SPILLS AND THEIR POLLUTION

Oil spills are phenomena that happen when ‘liquid petroleum hydrocarbon’ is released into the environment. However, the most notable spills have occurred across water, or a more appropriate term of ‘marine ecosystem’, which is mostly referred to as a ‘human activity’, and is a source of pollution (Alves et al., 2016). Generally speaking, the exact nature of an oil spill is essential to address, as well as the duration of the spill that persists in the environment affecting the flora and fauna (Adler & Inbar, 2007). One of the most essential points of discussion about the pollution impact of oil spills is the lack of clear distinction on how the persistence of oil in a marine environment would affect life. Seasonal changes and sensitivity towards maintaining biodiversity balance are important as they could lead to consequences worse than what many predictions might say. However, it is clear that spilled oil in such an environment could lead into penetrating the plumage of birds and the fur of mammals (Al Shami et al., 2017). This causes a great reduction of such creatures’ abilities to insulate themselves, and could also lead to being less buoyant on the water, which takes away the basic notion of their survival.

As a manmade phenomenon, the responses that have been instituted also mostly comprise manmade actions and measures. Cleanup and recovery are nevertheless dependent upon the state of conditions in which spillage has occurred, and upon the factors like the type of spillage, temperature or the type of shorelines and beaches. There are actually quite a few methods are actually used, including bioremediation, controlled burning, dispersants etc. (Al Shami et al., 2017). However, the extent to which these methods could actually work is dependent upon the circumstances and factors as they have been stated before. There is an actual need to focus upon authority to instigate and implement proper measures into ensuring that appropriate results are reached. Oil spills impact as a way of pollution goes beyond the marine ecosystem, and it affects complete human made constructs like the economy (Coppini et al., 2011). It is also possible that it would cause a great deal of harm to the air quality, simply on the basis that crude oils can emit gas based hydrocarbons and derivatives of such materials like benzene, toluene, poly-aromatic hydrocarbon etc. (Alves et al., 2015) Therefore, the entire state of an oil spill and its pollution requires proactive measures to prioritize its prevention because the point of cleanup and recovery is a matter that involves a lot of challenges.

Source Image: Two critical steps when dealing with oil spills | DHI Reservoir, 2020
II. VULNERABILITIES OF THE MEDITERRANEAN SEA

The Mediterranean Sea has some unique characteristics that are completely specific to its own geological formation and history. One of the most notable among this is the fact that is almost completely enclosed by landmass, which is the most notable for being significant continental pieces that give the sea its characteristic identity (Adler & Inbar, 2007). Overall, historical data and findings that much of Mediterranean’s climate and state had followed human activities that were derived from the close ecological relationship that led from human civilization around its coastal areas. Following such human patterns has actually exposed its state of diversity for hundreds and thousands of years (Adler & Inbar, 2007). The diversity accounts for all the widespread human usage patterns like agriculture, intense transport and trade relations, as well as interactions that occurred between different settlements (Al Shami et al., 2017). The interchange and exchange that has busily continued attributed to changes, which would make it vulnerable to a wide number of events and invasive forces.

Human activities and land usage patterns have certainly exposed the Mediterranean Sea to some natural hazards, which are most commonly geological in nature. Archaeological as well as geological history has shown many different examples of such crises happening throughout the entire coastal regions, mostly taking shape in the form of earthquakes, floods and volcanic eruptions (Al Shami et al., 2017). It is also important to mention that large scale human activities like opening of the Suez Canal in 1869 has led to great ecological disturbances, and has led many invasive species from the Red Sea to arrive (Coppini et al., 2011). These effective transformations to Mediterranean marine ecosystem have happened for quite an extended period of time (Alves et al., 2015). However, the most pressing challenges to the entire geographic region is the effects of rising sea levels and all possible implications of human pollution shall actually indicate or depict.

It has been predicted cross the board that the rise in sea levels for the Mediterranean could range from 3cm to 64 cm in total by the year 2100. Undoubtedly, it is the coastal parts that are going to be most affected by this change, and this shall be felt more significantly than in other parts of the world (Alves et al., 2016). The high margins of manmade pollution, however, only intensifies the condition that permeates the state of conditions all across the board. They shall all essentially imply and portray some of the most notable outcomes in the form of the ‘materials’ that end up in the Mediterranean Sea, which comprises sewage, mercury, and of course, oil extracted from a great variety of minerals (Alves et al., 2015). The prevalence of the shipping industry in the area has also signified some notable implications, which have evidently contributed to the wide extent of pollution that actually takes place (Coppini et al., 2011). It is the primary reason why coastal management has experienced a genuine enhancement of interests with time.

III. SPECIFIC THREATENED AREAS AROUND THE MEDITERRANEAN SEA

The circumstances that the many vulnerabilities as elicited in the previous section has shown reflect that the most threats would be experienced by the coastal regions specifically. Since the sea encompasses landmass boundaries to such a great extent over such a comparatively small area when compared with other larger bodies like the Atlantic Ocean, it actually makes sense why its coastal regions are so specifically threatened by any pollution upon the water body (Adler & Inbar, 2007). The context that these ‘land regions’ shall be affected due to pollution has already been well-established. However, it is also important to mention and highlight how it actually exposes to the focus pollutions threat, which is in the form of oil spills. It has already been established that such events often implies different impacts upon the specific marine ecosystem, as well as other state of conditions at large (Alves et al., 2016). Under these cases, therefore, it would be important to elicit what exact areas in the Mediterranean would be so significantly affected and why.

Source Image: ESA - Satellites plus software equal best-ever Mediterranean heat map, 2020

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The Adriatic Sea forms the part of the Mediterranean, but it is arguably the most threatened region out of all on account of its own specific and characteristic geographic detail. This is primarily characterized by a coastal area that is 1/20 of the Mediterranean, but is notable as there is only 1/125 of the entire water supply present in the area (Coppin et al., 2011). This is a very prominent factor altogether in terms of impacts that could be received from something as catastrophic as oil spills (Alves et al., 2015). Overall, the oil spills would generally greater effects in a negative state because of the low availability of water volume in that specific part of the sea. There is also the areas off the coast of Slovenia and the Gulf of Trieste that has been characterized with the loss of major marine flora and fauna due to a process known as eutrophication (Bovio et al., 2017). Although this implies damages or impacts that would have occurred at a far lower extent than in the Adriatic, it is important to highlight it in anticipation of what future impacts may look like.

French and Spanish coasts are also generally considered to be existing at a higher threat than many other parts of the Mediterranean. These areas have opened up such significant vulnerabilities because of the large amounts of run-offs that have been created by rivers flowing out into the sea, as well as because of different manmade constructions that aid such processes (Ferraro et al., 2009). The eastern Mediterranean is also affected by wide scale eutrophication, which has happened because of the influx of algae species, which have all but invaded the ecosystem from the Red Sea (Martínez-Gómez et al., 2010). Therefore, this is the entire account of all the different places in the Mediterranean that have been most threatened on the account of its characteristic vulnerabilities.

IV. THE HARM THAT HAS ALREADY HAPPENED IN THE MEDITERRANEAN DUE TO OIL SPILLS

The significant extent of an oil spill in actuality is dependent upon the type in conditions, and the duration by which the oil is allowed to be remained in that very ecosystem. Both these factors vary quite heavily across Europe’s proximal large scale water bodies, implying that the extent of harm has also been quite variable as well. The amount of oil spill has also varied over the years as well (Alves et al., 2016). For instance, the recent oil spill in Turkey accounted for almost 15,000 tons of crude oil, while in 1994, there was 33,000 tons affecting the Black Sea (Bovio et al., 2017). There has most definitely been a downward trends in the entry of the substance because of the oil spill over the decades, but the harm upon the ecosystem and biodiversity factors have only intensified over time (Martínez-Gómez et al., 2010). However, these lone incidents have indicated some notable actions being taken by all considerations.

Source Image: Ask the experts: Oil slick sensors for drones?, 2020

There has been a loss of fish populations by almost 43% since the 1990s off the coast of Italy, which has witnessed some of the worst oil spills disasters over time. However, in light of the oil spill by the ship known as ‘Haven’, the 1444,000 tons of crude oil that entered into the Mediterranean ecosystem caused a great deal of
This meant that the oil cleanup and recovery procedures continued to take place for many years, and the long term effects had far greater significant impacts. These are mostly characterized with the typological discussion of the effects of oil spill in general. Affecting birds has been a pronounced effect as one of the prominent outcomes, but only close to 100 birds were actually rescued from such a scenario (Ferraro et al., 2009). The case that prevented the removal of coating either through their plumage, or the fur in case of animals certainly would increase the extent of moss in fauna to only become intensified further (Martínez-Gómez et al., 2010). A similar correlation could be actually drawn up with respect to marine flora, which were a part of highly diverse and different marine ecosystems in the Mediterranean Sea.

V. ORGANIZATIONS WORKING TO CONTROL MEDITERRANEAN OIL SPILLS

There has been a significant reduction in the level of oil spills that has taken place in the Mediterranean Sea over the last several years, and this even extends across several decades. This is reflective of a scenario in which various organizations have contributed greatly in different yet specific ways by which the oil spillage could be controlled (Cucco et al., 2012). These generally comprise many different organizations, which present some of the most obvious and effective results that one could possibly imagine.

International Oil Pollution Compensation (IOPC) Fund

This international body is essential for the purposes of handling oil spill incidents, as well as oil accidents in general. Its main purpose is to identify the main parties that are actually affected by the accidents, and to seek proper funds as compensation in order to serve the former parties and groups (Bovio et al., 2017). They all imply that there must be equivalency in the actions and factors that apply to oil businesses and enterprises respectively (Cucco et al., 2012). Through them, it is possible to actually attain some truly helpful result across the board.

European Maritime Safety Agency (EMSA)

EMSA offers a wide range of services in presenting many different details about the entire state by which all possible results could be received and implemented to ensure a great deal of safety. They all offer some of the most helpful and realizable ways both through implementation and observational focus upon any event, which might potentially pose some kind of harm to those areas (Cucco et al., 2012). Accident investigation, port state control, ship safety standards, vessel reporting services etc. are all important offering that seemingly highlight and uphold the desirable state of control for such accidents.

VI. MEDITERRANEAN ACTION PLAN

Established in 1975, Mediterranean Action Plan has dedicatedly worked towards ensuring the multilateral environmental agreement as an institutional frame work for cooperation. They must appropriately indicate and highlight the way of overcoming common challenges that are causing environmental degradation of the whole Mediterranean region (Bovio et al., 2017). Institutional,
legal and implementing frame work is at the forefront of being associated and related with the maximum possible realization of its implications.  

**Regional Marine Pollution Emergency Response Center for the Mediterranean Sea (REMPEEC)**

This organization specifically affords and supposes the assistance necessary to Mediterranean coastal states in ratification, transposing, implementing and enforcing the necessary maritime conventions (Bovio et al., 2017). It is primarily dedicated for prevention, preparedness and response to pollution that may come from ships or other vessels.

**What Actions are being taken against the Offenders?**

The general viewpoint about those organizations who are actually responsible for the transport of oil across the maritime passageways need to be regulated as well as implemented in order to derive some truly significant results. Most of these are supposed to represent on the basis of ratified and enforced regulations and conventions, which would exceptionally provide some actions being taken (Cucco et al., 2012). This is perhaps nowhere as evident as in the case IOPC as it specifically aims at compensating all those have been affected by the event of an oil spill. However, for this to properly happen, there actually needs to be proper cognizance about the extent of damage that has been exactly caused (Martínez-Gómez et al., 2010). EMSA does this by the way of its many operational task, which are carried regularly to ensure that there is no dearth of data and information (Bovio et al., 2017). There are nevertheless some helpful regulations, which have been set up by the European Union that exceptionally aids in their enforcement at a uniform and helpful pace all across the board.

**Is there any Change after some Serious Action has been taken?**

All circumstance seems to highlight and present with the notion that effectiveness in results need to be derived with respect to a great deal of awareness and realization about the circumstances. There must be quite a significant degree of enforcement of prominent actions, which would not just deter the future occurrence probability, but also lead organizations to actually enforce them so as to assure effective policies and strategies to those ends by themselves (Alves et al., 2015). By all understandings, all prominent and significant instances have led to the gradual decline of the figures or margins related to an oil spill (Cucco et al., 2012). These include both measurements about the volumes as well as the frequency of those spills at large.

**VII. CONCLUSIONS**

All indicators point to the fact that the Mediterranean Sea is certainly vulnerable in the face of it history and geological characteristics. This has led to ruminations about the potential effects of an oil spill being far more damaging in this marine region alongside many of its other coastal regions when compared to other comparable geographic regions. All in all, the efforts that has been accomplished by so many important organizations certainly place a sort of relative factor of determinants, which actually show some of the most notable events taking place.

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