Unique Methodology to Detect and Dispose Oil Spill from Sea Water

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Abstract: **Oil spills are a very dangerous occurrence. for marine ecosystem which is affected and the marine life-forms' existence gets unnecessarily threatened. Oil destroys the water repellency thus exposing these creatures to the tough elements. Without the ability to repel water and insulate from the cold water, birds and mammals will die from hypothermia, as a result, it becomes important to employ various oil spill cleanup methods. In our system we may automatically detect & cleaning the oil in the sea water by using modern techniques.**

Keywords: **Detection and removal of oil spill, Electromagnetic force, IoT, Iron powder tank, LDR, Motor mechanism.**

1. Introduction

Oil spills are different in their severity and extent of damage. This is because the result of the variation in oil types, location, and weather involved. The spread and behavior of spilled oil within the sea or marine environment is governed by physical, chemical, and biological processes. These processes depend on the oil properties, hydrodynamics, meteorological and environmental conditions. The physical processes include advection, diffusion and spreading, the chemical processes are evaporation, dissolution and emulsification, while the major biological process is biodegradation. These processes begin to transform the oil by a process called weathering. Over a long period of time the combined action of weathering and biodegradation can eliminate most of the spilled oil. The rate at which these processes occur and the extent to which they proceed depends: (1) the chemical and physical properties of the original crude oil, (2) the prevailing environmental conditions, (3) the condition of the oil that is spilled. These factors are interrelated and it is their combination that causes different crude oils to behave in different ways at different oil spills.

2. Existing method

Skimmers is a device that collects and removes oil from the surface of water. It sucks the oil up from the water surface and store in a tank like a vacuum bag. Oil skimmer is a machine that removes floating oil and grease from liquid, the floating oil adheres to skimming media, such as a belt, tube, rope, mop, or disc. The media then runs back to the machine to be wiped clean. In these systems, methodologies that can be adopted for the purpose of cleaning up oil spills are not effective. As the name suggests, skimming involves the removal of the oil spillage with the help of tools and equipment from the surface of the water. The most important aspect to be noted that only light weighed oil spills can be separated and removed from the water in this method of cleaning up oil spills. The process of removing the oil from the water is difficult to workers, requires more time for removing the oil. Sometimes the workers also affected by bacteria's in the sea. To avoid this, we are going to deal with the new techniques.

3. Proposed methodologies

In this system, we use LDR to detect the presence of oil on the surface of water. Based on the intensity of light we detect the presence of oil. The GPS value is updated using IOT. On receiving the location, the navy approaches to the location for clearing the oil spill. The navy can continuously monitor any happening on the sea. An iron powder is used to suck out the oil from the water surface. Whenever it detects the oil spills the system starts the motor to pour the iron powder into the water. And then it starts to retrieve the iron powder from the water by applying electromagnetic force. Now the iron powder is absorbed by the electromagnetic rod. Now after sometimes, the navy arrives to monitor the contamination in the sea.
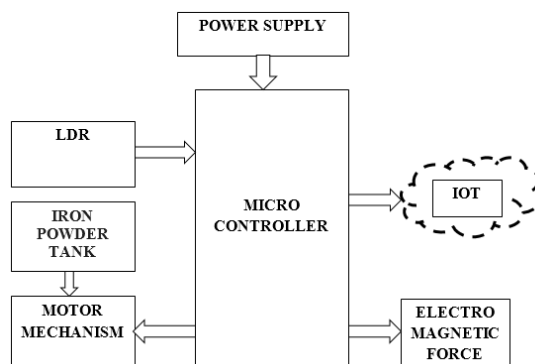
4. Block diagram

Fig. 1. Block Diagram

International Journal of Research in Engineering, Science and Management
Volume-3, Issue-2, February-2020
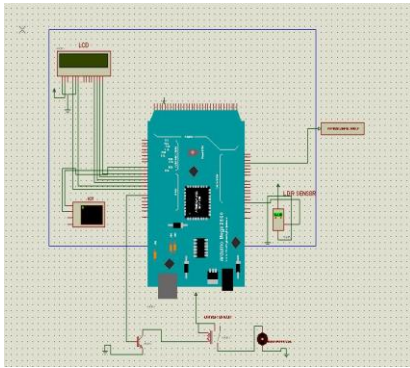**www.ijresm.com | ISSN (Online): 2581-5792**
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5. Circuit diagram

Fig. 2. Circuit Diagram

6. Software used

A. Embedded C

Embedded C is meant to bridge the performance match between traditional C and thus the embedded hardware and application style. The Embedded C specification extends the C language to support detached embedded processors in exploiting the multiple address area practicality, user-defined named address areas, and direct access to processor and I/O registers. These options are common for the tiny, embedded processors employed in most client product.

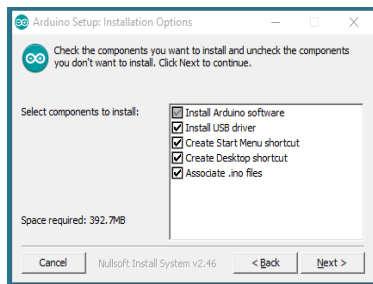*Arduino Software (IDE)*
Installation of Arduino IDE

Fig. 3. Installation Option

- Choose the components to install
- Choose the installation directory (we suggest to keep the default one)
- The process will extract and install all the required files to execute properly the Arduino Software (IDE)

Step to upload the code in Arduino mega

- Step 1: Use your Arduino mega 2560 on the Arduino web IDE
- Step 2: Connect your board. Connect your mega 2560 board with an USB cable, sometimes this cable is called a USB printer cable
- Step 3: Select your board type and port
- Step 4: Upload the program.

7. Location update and monitoring

Role of IoT in the System

1. Once the oil presence on the surface of water is detected using LDR, the GPS value is updated using IoT.
2. On receiving the location, the navy approaches to the location.

Location details

We are updating the location details using
- IoT Application
- By creating IoT webpage

Creating IoT Application

1. First login into the app by username and password
2. Now the App will open as fig.
3. Then, set up the profile details like project title, mobile number, etc.
4. Click GPS to view the location

Fig. 4. IoT Application

A. Creation of Webpage

We are creating a webpage for IOT updates and monitoring for oil detecting location. It displays the location details with latitude and longitude with time and updates the location to registered mobile number.

- Login into iot.iotweb.in and then enter
- Type the username and password
- Now the page will open as shown

Fig. 5. Web page for monitoring

International Journal of Research in Engineering, Science and Management
Volume-3, Issue-2, February-2020
www.ijresm.com | ISSN (Online): 2581-5792

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8. Output

Fig. 6. Working Model

9. Conclusion

This concept could work well in several arrangements. This method has the added advantage of employing a number of the spilled oil from the surface as a component of the solution for forming the mandatory colloidal mixture. This also provides a solution to contain, control the oil leakage. It is non-toxic, safe, and efficient manner. By utilizing this method, we are enhancing effective removal of oil from sea water. we are ready to remove the oil with the help of robots in an efficient manner

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