

work check
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Which Method of Oil Spill Clean-Up is More Effective Absorbent Materials or Skimming????

The largest accidental marine oil spill in the history of the United States occurred on April 20, 2010 in the Gulf of Mexico. Deepwater Horizon, exploded, killing 11 people and injuring many more. This explosion caused a massive oil leak, leaking an estimated 2.6 million gallons of oil into the gulf *per day*. In about five days, the oil covered an estimated 580 square miles. It was finally capped by September 19th, spilling out approximately 390 million gallons of oil in about 150 days. Although it's been capped, the oil still continues to cause massive amounts of damage to the ocean and surrounding coastline.

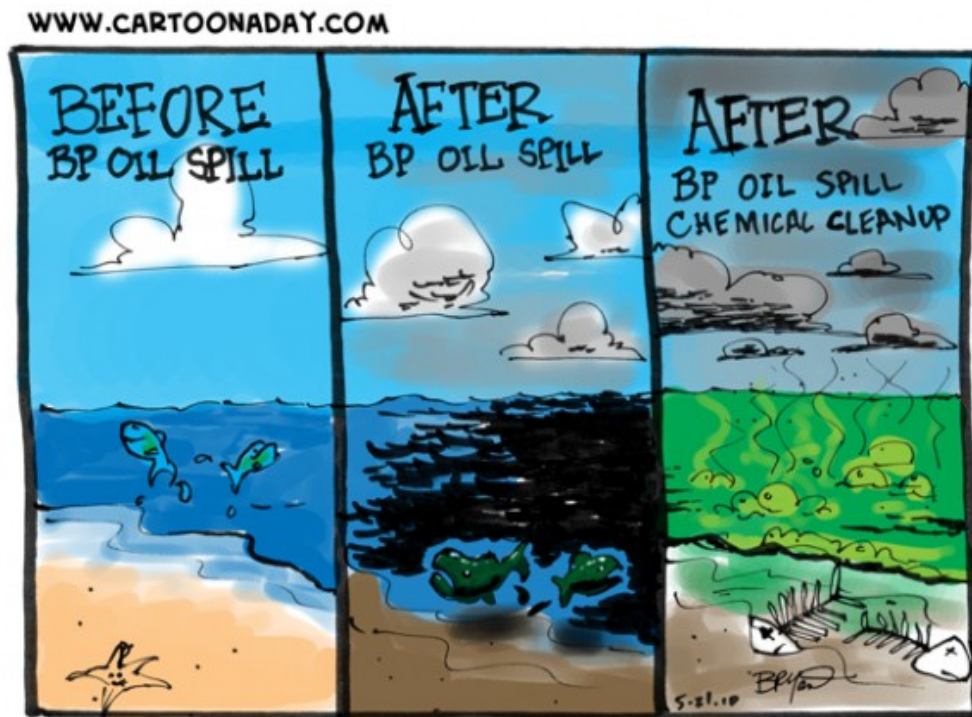
Many of the Gulf's sea life was affected by this spill. An estimation of about 205.8 million gallons of oil spilled out into the ocean throughout three months. Over 8,000 birds, sea turtles, and marine mammals were found dead and injured due to the oil spill. Oil is damaging to birds because it destroys the natural chemistry that makes them able to float, stay warm, and able to fly. The National Oceanic and Atmospheric Administration eventually closed down 86,985 square miles of ocean to fishing, resulting in an estimated cost of \$2.5 billion. Countless citizens who were previously fishermen and shrimpers are now unemployed. It's clear that the spill has had severe impact on the economy in various ways.

Not only has the oil spill affected the animals, but it affected the people economically. The Gulf coast relies on fishing and shrimping as their means of income. The oil spill has also caused seafood to become contaminated with oil in the area's surrounding, threatening the economic stability of fishermen in the area. Fisheries in Alabama, Louisiana, Texas, Florida, and Mississippi are threatened from the effects of the disaster. A price increase in crawfish, shrimp, oysters for seafood lovers because these states combined were accounted for $\frac{1}{3}$ of seafood production. Since there has been bans put in place because the water has been deemed contaminated and left the fishermen on land. Another thing that has been affected by the spill is B.P themselves. They lost a lot of money with the million of gallons of oil that spilled out.

Many people's health was affected by the oil spill now people see the government as a let down. Instead of working for the people of the United States they are working in favor of B.P, censoring all the harm that is being done to the Gulf. The only thing these people know is fishing. Now that this has hit they have nothing else to fall back on leaving them left waiting till all the oil to be cleaned up. And even when all the oil is

cleaned up they are not guaranteed they will still have populations of fish. They might not even be able to keep up with the demand they would have been able to before the spill. So now when all that is gone they still be in the same position or even worse.

I feel that the Gulf oil spill is important because it did damage to the environment, the people, and the animals. Each time something like this happens it shortens the life of the planet. This is a place were we all live and need to conserve for the future generations to live successfully. This could have been prevented if the government would've payed more attention to the regulation they put in place to um safely drill oil. This shows that the government isn't doing there jobs and isn't in-forcing what they put in place.





This is what the water looked like after the oil spill.



The poor pelican has oil all over it. && is dying slowly.

Hypothesis:

If we use absorbent materials and skimming then skimming will be the more effective method because absorbent materials soak up more water than oil and skimming picks up only oil.

Materials and Methods

Materials and Equipment:

For Skimming Trials:

- 400ml of water
- 100ml of oil
- 1 clear tray
- 1 cup
- 1 graduated cylinder
- 1 funnel with filter
- 2 popsicle sticks
- Coffee filter
- Gloves

Procedure:

1. Once all the materials are gathered, measure 400ml of water and weigh 100ml of oil to find the weight of it by using a scale.
2. Place oil in the container with the water and let it spread for a minute.
3. Using a Popsicle stick, skim the surface of the oil/water solution 15 times and using your second Popsicle stick scrape oil into the plastic cup by using one Popsicle stick to scrape the oil off of the other
4. Measure the amount of oil you have salvaged and placed into the cup.
5. Pour the remaining oil/water solution in the clear tray into the funnel that has a coffee filter placed inside of the funnel so the remaining oil can stay in the coffee filter.
6. Measure the mass of the remaining oil in the coffee filter by pouring the water/oil mixture into the funnel. This will cause the oil to stay in the coffee filter and the water to filter into the cup.
7. Record the mass of the oil you have managed to save, and record the mass of the oil that you didn't manage to save.
8. Repeat twice more

For Absorbent Materials Trial:

- 400ml of water
- 100ml of oil
- 1 clear tray
- 1 cup
- 1 timer
- 1 graduated cylinder
- 1 funnel
- 1 coffee filter
- 20g of absorbent material (sawdust)
- Gloves

1. Get materials
2. Pour your 400ml of water and your 100ml of oil into the clear tray
3. Pour in sawdust
4. Let the sawdust sit for 2 minutes
5. Remove sawdust with your Popsicle stick. Hold the Popsicle stick horizontally and aim to get the sawdust out of the water until as much sawdust as possible is removed.
6. Filter remaining oil/water solution by pouring it through the coffee filter allowing the oil to remain in filter and water to fall into the cup. Measure mass of oil in the coffee filter using a scale.
7. Record result of experiment: the start mass and the end mass of each trial
8. Repeat twice more

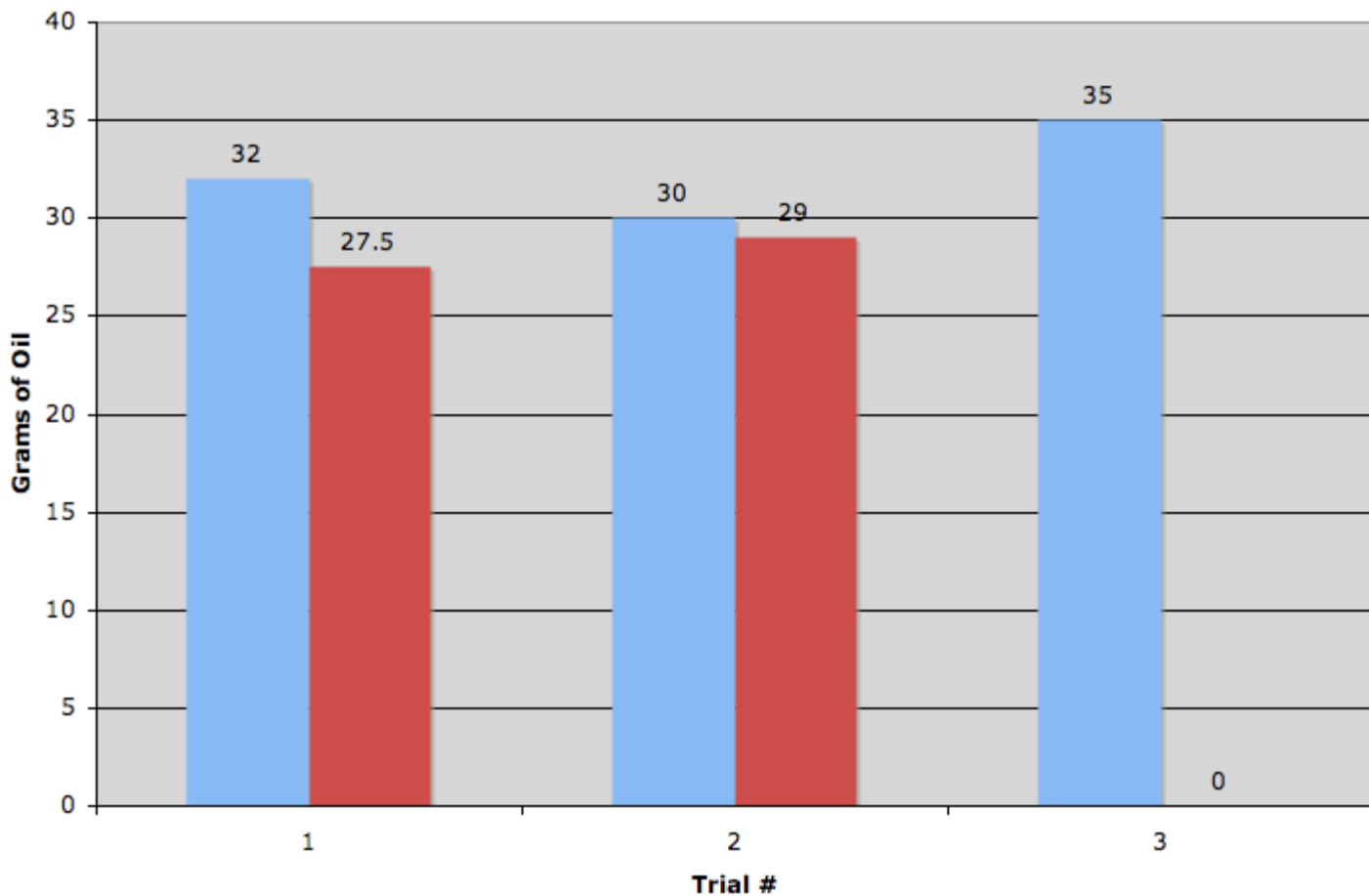
Results:

DATA	1st Test	-----	2nd Test	-----	3rd Test	-----
-----	Start Mass	End Mass	Start Mass	End Mass	Start Mass	End Mass
Absorbent Materials	100g	32% (32g)	100g	30% (30g)	100g	35% (35g)
Skimming	100g	27.5% (27.5g)	100g	29% (29g)	100g	N/A

Although we only had two tests for skimming, it's still pretty easy to tell that Absorbent Materials did better, contrary to my expectations.

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Absorbent Material VS. Skimming: Which one cleans up oil best?



The results from the chart and graph above prove that my hypothesis is correct. Skimming is the better method of oil spill clean up.

Conclusion:

My group hypothesized that, skimming would be the better technique to use when cleaning up an oil spill, over using absorbent material. Throughout the experiment, my group made many errors which makes the data inconclusive. When doing a trial for absorbent material, there was some spilling which could have caused there to be either more/less oil in our data sample. In trial 1, there was 32% of oil left over when using absorbent materials, while skimming only left about 27% of oil and in trial 2, there was 30% of oil left over when using absorbent material, while skimming left 29% of oil. My

group wasn't able to conclude a third trial for skimming which makes it hard to conclude whether or not skimming is actually better than using absorbent materials. If you look at our data chart, you may notice that while the percentage of oil left over by absorbent material decreases, the percentage of oil left over by skimming increases which makes our third trial very important but because we were unable to complete that trial, we are unable to conclude whether or not skimming is a better method of cleaning up an oil spill. Would it be easier to notice a difference between the two methods if we were given a larger test sample? Would skimming prove to be a more efficient way of cleaning up the oil if we had better/more resources?

Errors that I ran across while cleaning up oil was while skimming, the oil would spill out of the sides of the Popsicle sticks and it would just take longer to clean up. Other errors were not coming on time and putting in the wrong data. But other than that my group was great. I wonder if things would've changed if we used bigger sticks or something different than sawdust (kitty litter). I also wonder would motor oil be more easier than crude oil? I think solving these questions could help in finding better solutions to cleaning up the oil.

Sources:

1. <http://www.nytimes.com/2010/05/01/us/01gulf.html>
2. <http://www.time.com/time/health/article/0,8599,1986323,00.html>
3. <http://e360.yale.edu/content/feature.msp?id=2284>