Connecticut Local Assessment Resources in Science (LARS)

NGSS Assessment Task

Deep Horizon Oil Spill

Version 3.0*
3/16/22

About this Task
This task was developed by science educators for use in the Connecticut Local Assessment Resources in Science (LARS) project. Task development was guided by Aneesha Badrinarayan from The Learning Policy Institute. The LARS project is a collaborative effort among the CT State Department of Education, CT Science Supervisors Association and science educators from local school districts in Connecticut to develop and share NGSS-aligned assessment resources for use in classrooms. This task may be used and distributed with proper attribution.

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Task Reviewers:

*Version 1: Initial development, Version 2: Revision based on reviews, Version 3: Revision based on pilot testing

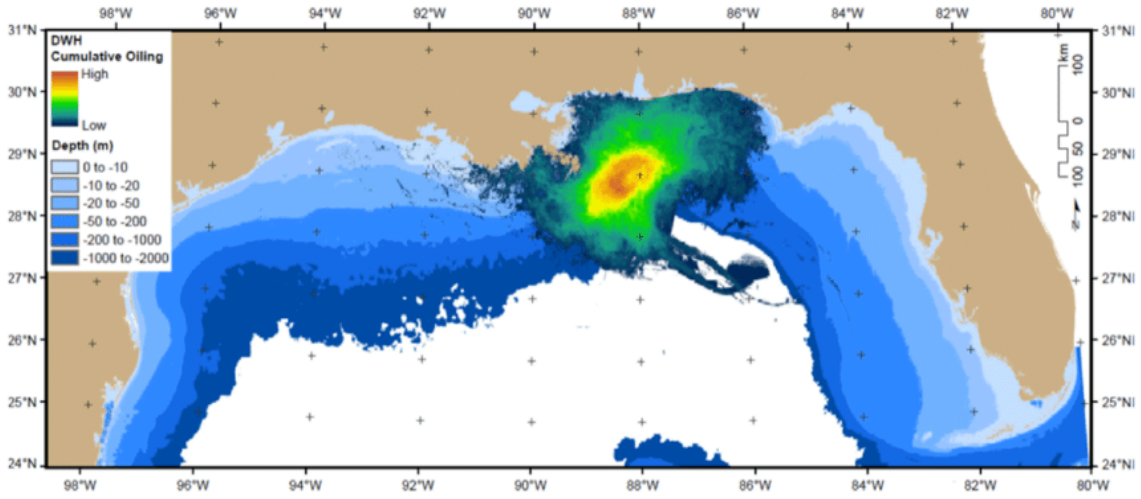
Deep Horizon Oil Spill

Background Information for Teachers

Grade Band: Elementary School	**Domain:** Earth and Space Science	
NGSS Dimensions Assessed by this Task		
Science and Engineering Practice(s)	**Disciplinary Core Idea(s)**	**Crosscutting Concept(s)**
Developing and Using Models Develop a model using an example to describe a scientific principle.	**ESS2.A Earth Materials and Systems** Earth's major systems are the geosphere (soil and molten rock, soil and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms. (5-ESS2-1)	**Systems and System Models** A system can be described in terms of its components and their interactions. **Cause and Effect** Cause and effect relationships are routinely identified, tested, and used to explain change.
Task Summary: Students obtain information about factors about Deep Horizon Oil Spill that affect a shoreline ecosystem. They use the provided information to develop a model to explain how Earth's system interactions affect the ecosystem.		
Equipment and Materials Needed: None outside of what is provided in this task.		
Notes on this Task/Suggestions for Use: ● Students are expected to use their understanding of an ecosystem in this task. If students have not had an opportunity to learn 5-LS2-1, provide a definition. Students have an opportunity in this task to demonstrate their understanding of 5-PS1-1.		
Resources/Modifications/Extensions: https://www.youtube.com/watch?v=_tq91E9WRRY https://www.pbs.org/video/a-decade-after-deepwater-nof5ng/ https://www.nap.edu/catalog/25161/the-use-of-dispersants-in-marine-oil-spill-response https://www.nap.edu/catalog/13047/interim-report-on-causes-of-the-deepwater-horizon-oil-rig-blowout-and-ways-to-prevent-such-events		

Deep Horizon Oil Spill

The Deepwater Horizon Oil Spill was the worst offshore oil spill in history. On April 20, 2010 there was an explosion on the Deepwater Horizon offshore drilling platform in the Gulf of Mexico. Oil was leaking 5,000 feet below the surface of the **ocean**. The first tries to fix the leak did not work.



Map of Deepwater Horizon Oil Spill

Source: Institute of Data Science and Mining - The Effect of the Deepwater Horizon Oil Spill on two Ecosystem Services in the Northern Gulf of Mexico
https://idsc.miami.edu/the-effect-of-the-deepwater-horizon-oil-spill-on-two-ecosystem-services-in-the-northern-gulf-of-mexico/

The spill damaged animal and plant habitats as well as the Gulf's fishing and tourism businesses. Scientists found oil underwater that could not be seen from the surface. **Animals** and **plants** were hurt by the Gulf Oil Spill. Scientists found dead, oil-covered animals such as birds, fish, shrimp, and oysters. Large, decaying fish covered in the thick, dark oil washed up on some beaches. People worked to protect hundreds of miles of beaches along the northern Gulf coast.

Image: Oiled Pelican

Fishing was stopped. Many small fishing supply stores could not make money. The fishing companies did not have enough fish and lost customers. Normally, lots of people travel to this area to fish for fun. Because of the oil spill, fewer people traveled there.

One way the oil was cleaned up was to burn it. This sent massive amounts of **smoke** and harmful gasses into the **air**. The oil slicks floated until they reached the **coastline**. They sank into the sand. In some areas, there is still oil on the beach even ten years after the spill. The oil slicks traveled many miles away and destroyed some undersea habitats.

Image: Deepwater Horizon offshore drilling unit on fire 2010

87 days later the oil well was finally capped. By then, almost 5 million barrels of oil had been spilled into the Gulf. The oil spill harmed wildlife along the large coastal areas of Louisiana, Mississippi, Texas, Alabama, and Florida. Fish, turtles, and other animals and plants that live in the Gulf were hurt or killed by the spilled oil. Birds that landed in the water became covered in oil and could not fly. Fishing boats could not collect fish from the oily water. Oil washed up on **beaches** and into **marshes**.

Image: Oiled Marsh at Bay Jimmy, Plaquemines Parish

Your Task:

You will be creating a model identifying spheres (geosphere, biosphere, atmosphere, and hydrosphere) and their interactions caused by the Deep Horizon Oil Spill.

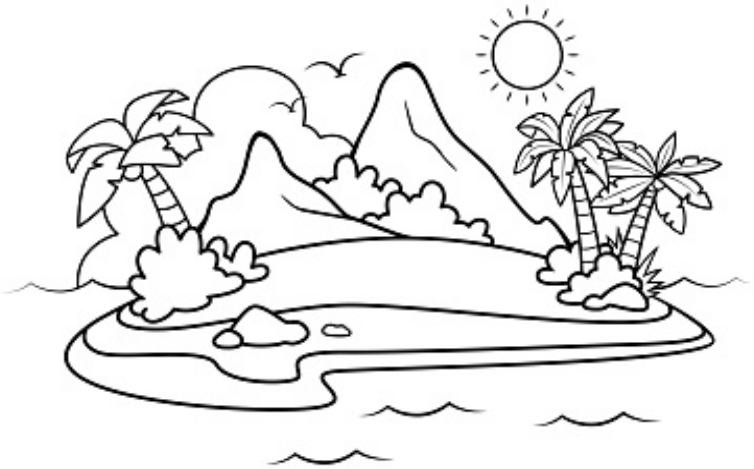
1. Review the article about the Deep Horizon Oil Spill. Write the names of the **highlighted** words in the text in the correct spheres below.

Biosphere	Hydrosphere	Geosphere	Atmosphere

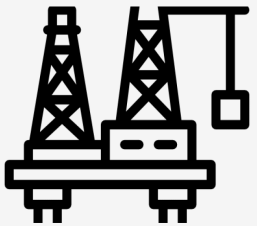
2. You will create a model that includes interactions between two spheres. Circle the two spheres you will be using in your model.

Biosphere **Hydrosphere** **Geosphere** **Atmosphere**

3. Create a model in the space below to explain the interaction of spheres that are involved in an oil spill. Your model should include the two spheres circled in question 2.



Oil Rig



Oil Spill

4. Use your model to describe how the two spheres you identified in your model interacted with each other.

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5. Explain how an additional sphere is impacted by the two spheres you showed in your model? Explain your thinking.

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DCI - Earth's Systems - Grade 5

ESS2.A: Earth Materials and Systems Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1)

Student Name	1	2	3	4
	- Cannot identify two spheres	- Identification of at least two spheres	- Interaction of spheres - *One part of system causes changes to other parts in system*	- Interaction of systems in multiple ways, multiple spheres

SEP - Earth's Systems - Grade 5

Developing and Using Models Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. Develop a model using an example to describe a scientific principle. (5-ESS2-1)

Student Name	Below	Approaching	Grade Level	Above
	- Create a model	- Create a model about the related phenomena	- Create a model identifying at least two spheres and their interactions	- Identify cause and effect relationships - Explains limitations of model

CC - Earth Systems - Grade 5

Systems and System Models: A system can be described in terms of its components and their interactions. (5-ESS2-1)

Student Name	Below	Approaching	Grade Level	Above
	- Identifies components	- Identifies components and their functions	- Describes components and function, and how they are part of a system	- Identify and explain parts and their function in order to predict outcomes

Examples of Scored Student Work

To be added.