

Ocean Frontiers Educator's Guide:

Ocean Frontiers is a unique documentary about conservation, solutions and community. The stories in *Ocean Frontiers* help audiences understand key principles of ecosystem-based management and coastal and marine spatial planning, which are the cornerstones of the National Ocean Policy. These complex concepts come to life and are easy to grasp through the stories and people featured in *Ocean Frontiers*.

The Ocean Frontiers Educators guide is designed to help teachers blend the stories in the documentary into their curriculum and expose students to positive examples of conservation and complementary science concepts. Teachers should view the documentary to be familiar with the stories and science concepts highlighted. Lists of various activities are provided for teachers to consider using in their classrooms. Ocean Frontiers would easily fit into many subject areas; please share with us how you have used this film in your classroom.

"It is widely agreed that education is the most effective means that society possesses for confronting the challenges of the future. Indeed, education will shape the world of tomorrow."

Chapter 3 Iowa Farmers and the Gulf of Mexico

Essential Questions:

- What are some human activities that impact our environment?
- What role do wetlands play in the environment?
- What is a dead zone?

Video Summary: Iowa Farmers & Gulf of Mexico

The Mississippi Delta—terminus of America's mightiest river, nursery of one of the nation's premier fisheries, and lately an unfortunate poster child for ecological disaster—is getting help from an unlikely team of people, in an unlikely place. More than a thousand miles upstream, in the cornfields of Iowa, farmers are changing their ways to send cleaner water and new life to the nation's beleaguered Delta.

Ocean Literacy

The video and activities support:

- Essential Principle # 5: The ocean supports a great diversity of life and ecosystems.
- Essential Principle # 6: The ocean and humans are inextricably linked.

Teaching Tips

Engage:

Where in the River does it go? Try this activity with your students; place

sticky notes around your classroom with the following rivers, one per sticky note. Ohio River, Missouri River, Colorado River, Crow Wing River, Gull Lake River, Rum River, St. Croix River, Blue Earth River, Root River, Minnesota River, Red Cedar River, Chippewa River, Black River, Kickapoo River, Wisconsin River, Turkey River, Upper Iowa River, Maquoketa River, Wapsipinicon River, Cedar River, Iowa River, Skunk River. Have students walk around the room and search for all the notes, then have them stick all the notes in a central location at the front of the room. Tell the students that all these rivers have something in common and ask the students if they can guess what it might be. If you have the means to quickly locate them on a map, you might do this as well, or students might use laptops, Ipad, etc to quickly look them up.

Explain/Explore:

All these rivers empty into the Mississippi River. The Mississippi ranks as the fourth longest and tenth largest river in the world. The river either borders or cuts through the states of Minnesota, Wisconsin, Iowa, Illinois, Missouri, Kentucky, Tennessee, Arkansas, Mississippi, and Louisiana. With so many rivers emptying into the Mississippi River what might you expect is transported in these different waters? Probe for understanding by asking questions about how watersheds fit together and where the mouth of the Mississippi River is. Now show the video, and implement one or more of the following activities.

Suggested Activities

The following activities would be complementary to Ocean Frontiers Chapter 3: Iowa Farmers & Gulf of Mexico. There are several concepts in this video segment worth exploring in depth with students and making a connection to the real world examples of the Iowa Farmers & Gulf of Mexico dead zone.

1) CONCEPT: Watershed Runoff

ACTIVITY: Runaway Runoff

<http://water.ci.lubbock.tx.us/pdf/EDU/RunawayRunoffLP.pdf>

Description:

Students will be able to describe what runoff is, how it can become polluted and this can effect our environment.

1) CONCEPT: Wetlands

ACTIVITY: Building a wetlands filter

<http://www.ngwa.org/Fundamentals/teachers/Pages/Building-a-wetland-filter.aspx>

Description:

Students will create a simulated wetland to understand how wetlands actually filter and clean the water as it travels through the wetland.

2) CONCEPT: The Dead Zone

ACTIVITY: On Again, Off Again — The Dead Zone: Hypoxia

<http://www.lamer.lsu.edu/deadzone/index.htm>

Description:

The purpose of the following series of activities is to help students visualize the dead zone and to provide them with dissolved oxygen (DO) data to analyze and interpret.

EXPAND/ADAPT/CONNECT

Here are some other links you might also explore.

The Dead Zone

<http://serc.carleton.edu/microbelife/topics/deadzone/educators.html>

NOAA Ocean Service Education

http://oceanservice.noaa.gov/education/lessons/wheres_the_point.html

The Bridge

<http://web.vims.edu/bridge/?svr=www>

The Importance of Wetlands

<http://www.ngwa.org/Fundamentals/teachers/Pages/The-importance-of-wetlands.aspx>

Oregon Coast Dead Zone

<http://ocean-frontiers.org/hypoxia-dead-zone/>