

OCEAN FRONTIERS

THE DAWN OF A NEW ERA IN OCEAN STEWARDSHIP



POST-SECONDARY
DISCUSSION GUIDE

www.ocean-frontiers.org



INTRODUCTION

Ocean Frontiers: The Dawn of a New Era in Ocean Stewardship takes audiences on an inspiring voyage to seaports and watersheds across the country—from the busy shipping lanes of Boston Harbor to a small fishing community in the Pacific Northwest; from America’s coral reefs in the Florida Keys to the nation’s premier seafood nursery in the Mississippi Delta. Here we meet an intermingling of unlikely allies, of industrial shippers and whale biologists, farmers and wetland ecologists, sport fishers and reef snorkelers and many more, all of them embarking on a new course of cooperation, to sustain the sea and our ocean economies.

The stories in *Ocean Frontiers* help audiences understand key principles of coastal and marine spatial planning, also known as ocean planning, and ecosystem-based management. Unlike traditional approaches to natural resource management that view ecosystems and species in isolation, ocean planning and ecosystem-based management see the world as a system instead of a collection of independent pieces, and recognize people and our activities as part of the environment. These complex concepts come to life and are easy to grasp through the stories and people featured in *Ocean Frontiers*.

This discussion guide was produced for Green Fire Productions by the National Sea Grant Law Center with the assistance of the Ocean and Coastal Law Committee of Vermont Law School’s Environmental Law Society. It was developed to help educators incorporate *Ocean Frontiers* into post-secondary classrooms and

facilitate discussions on collaborative ocean planning and the future of our oceans.

Ocean Frontiers: The Dawn of a New Era in Ocean Stewardship was produced by Green Fire Productions. The film can be downloaded at no cost at <https://ocean-frontiers.org/resources>. Three lengths are available: 80, 60 and 20 minutes, as well as 60 minutes with Spanish subtitles. To learn more about the film series, explore the *Ocean Frontiers* website at <https://ocean-frontiers.org>. The series, including short clips, is also on Green Fire’s YouTube channel: <https://www.youtube.com/user/GreenFireMedia>

Additional post-secondary discussion guides, as well as secondary school lessons, are available for the entire *Ocean Frontiers* film series at: <https://ocean-frontiers.org/educator-resources>



“BIG PICTURE” ISSUES

Ocean Planning

Ocean planning has been identified by scientists, policy makers and stakeholders around the globe as a practical approach to manage both conflicts and compatibilities in the marine environment in the face of both increasing development pressures and increasing interest and understanding of human interdependence on healthy ecosystems. It is a comprehensive, ecosystem-based planning process, built on sound science to analyze and plan for current and anticipated uses of the ocean. Pioneered in Western Europe, ocean planning is underway in more than 60 countries.

In the early 2000s two bi-partisan ocean commissions, the Pew Oceans Commission and the U.S. Commission on Ocean Policy, articulated a vision for comprehensive ocean governance in the United States, seeing a growing need to support stewardship,



Whale Center of New England, Photo taken under NOAA Fisheries Permit #981-1707

multiple use management and science-based decision making. Initial U.S. ocean planning efforts were local and state-based, with Massachusetts, Rhode Island, Oregon, Washington, New York and Connecticut creating state ocean plans for their coastal waters. Ocean planning has been used to reduce ship strikes on endangered whales outside of Boston Harbor by more than 80%, and the Florida Keys National Marine Sanctuary developed ocean plans to reduce conflicts among ocean stakeholders and to protect their coral reefs.

Ocean planning on a regional scale began as a result of the National Ocean Policy, established in 2010 by President Obama. This policy was the result of more than 10 years of work by scientists, policy makers and stakeholders, including ocean industries, coastal residents and conservationists. To implement ocean planning, nine ocean planning areas were designated in the U.S., mostly along large marine ecosystems. In 2016 the Northeast and Mid-Atlantic completed regional ocean plans and began implementing them in 2017. Other regions now have ocean plans in development.

In 2018 the White House revoked the National Ocean Policy, replacing it with one that emphasizes security and commerce over conservation and stewardship. The new policy shifts leadership of regional ocean planning to the states and allows for federal participation and data sharing to continue. With state leadership, ocean planning continues to move the U.S. away from an overly-simplistic issue-by-issue management approach toward comprehensive, informed and strategic ocean management.

“BIG PICTURE” ISSUES

Ecosystem-Based Management

Traditionally, management of ocean and coastal resources focused on a particular resource (e.g., fisheries) or issue (e.g., wetlands loss). With this type of management, the interconnections between species, habitat and other systems can be lost. Managers focusing on increasing the numbers of a target species might not notice the habitat degradation caused by the increase in population. Efforts taken to save one endangered species may increase predation on another, as seen with Steller sea lions and salmon in the Pacific Northwest.

Ecosystem-based management (EBM) is an integrated approach to management that considers the entire ecosystem, including humans. EBM shifts the focus away from managing the resource (sea lions or salmon) in isolation to managing the human uses (fishing or energy production) of the ecosystem in an integrated way, recognizing the complex and interconnected environmental, economic and social impacts of management decisions. In addition, by broadening the scope of decision-making beyond a

single resource or issue, EBM facilitates the consideration of the cumulative impacts of multiple human uses of the environment.



Discussion Questions

1. What are the different human activities that affect our coastal resources? Who are the stakeholders?
2. How are humans part of the ocean ecosystem? How might changes in the ocean ecosystem affect the economy or society and vice versa?
3. What types of information do managers need to effectively engage in ocean planning and ecosystem-based management? Is this information readily available? How might managers obtain it?
4. How might regional ocean planning help reduce conflicts over ocean uses? How might it help encourage compatible uses?
5. National policy for coastal management was set forth by Congress in the Coastal Zone Management Act of 1972. In 2010, President Obama laid out a national policy for our oceans through an executive order. Discuss the advantages and disadvantages of establishing national policy through the Executive Branch (as opposed to the Legislative Branch).
6. Discuss how stakeholder and local communities' voices are included in regional ocean planning processes. How successful might the plans be without stakeholder input?
7. Discuss the likelihood of success of collaborative ocean planning. Research the current status of U.S ocean planning efforts to discover recent changes in ocean policy.

“BIG PICTURE” ISSUES

Resources

- [Pew Oceans Commissions Report, America’s Living Ocean](#)
- [U.S. Commission on Ocean Policy Report, An Ocean Blueprint for the 21st Century](#)
- [National Ocean Policy / National Ocean Council \(Obama archives\)](#)
- [National Ocean Policy, Executive Order 13,547 \(July 19, 2010\)](#)
- [Executive Order 13840 \(June 21, 2018\)](#)
- [NOAA - Coastal and Marine Spatial Planning](#)
- [Ecosystem-Based Management Tools Network](#)
- [Keep the Ocean Working](#)

Regional Ocean Planning

- [Northeast Ocean Planning | Northeast Ocean Plan](#)
- [Mid-Atlantic Ocean Planning | Mid-Atlantic Ocean Plan](#)
- [Mid-Atlantic Regional Ocean Assessment](#)
- [West Coast Regional Ocean Planning](#)
- [Pacific Islands Regional Ocean Planning](#)
- [Caribbean Regional Ocean Partnership](#)



SAVING WHALES AT STELLWAGEN BANK

In the bustling shipping lanes of Boston Harbor, what was once a recurring collision of giant vessels and endangered whales, has become a model for conservation in a crowded sea. Marine biologists, shipping executives and an energy company have come together, taking cues from the great whales' travelways and finding room for both commerce and wildlife.

Overview

The Gerry E. Studds Stellwagen Bank National Marine Sanctuary (NMS), established in 1992, sits at the mouth of Massachusetts Bay. This 842-square mile marine protected area is extremely productive, providing feeding and nursery grounds for dozens of cetacean species, numerous seabird species and many important fish and invertebrates such as Bluefin tuna, cod, lobsters and scallops.

Due to its proximity to the Port of Boston, boat traffic in and around the Stellwagen Bank NMS is quite heavy. Over 200 large commercial vessels pass through Stellwagen Bank NMS each month, posing a significant challenge to some of the oldest residents on Stellwagen – the critically endangered North Atlantic right whales, humpback whales and finback whales. An analysis of ship strikes along the East Coast from 1979-2002 indicated that Massachusetts Bay, including the Stellwagen Bank NMS, was a hotspot for lethal collisions between whales and vessels. With such low population levels, the death of only a few females can give rise to the real possibility of extinction.

To manage the multiple, and at times conflicting, uses of Stellwagen Bank, the Sanctuary scientists, Massachusetts Port Authority and



NOAA, Photo taken under NOAA Fisheries permit #14245

the shipping industry engaged in marine spatial planning. They began by collecting data on vessel traffic patterns and whale locations. Their research revealed that the shipping lanes ran right through prime whale habitat, which increased the chance for ship strikes. To reduce the risk, Stellwagen Bank NMS proposed shifting the shipping lanes 12 degrees to the north into an area used less frequently by the whales. The United States submitted this proposal to the International Maritime Organization (the international body responsible for navigational safety), which approved the change in 2006. The shift in the shipping lanes is estimated to reduce the risk of ship strikes to large whales by more than 80 percent.

SAVING WHALES AT STELLWAGEN BANK

Discussion Questions

1. In addition to commercial shipping, what are some of the other human uses of Stellwagen Bank? How might they conflict with the conservation goals of the National Marine Sanctuary? Could those conflicts be resolved in a similar fashion?
2. Why might marine protected areas be beneficial for marine biodiversity?
3. What factors do you think contributed to the success of the planning effort in Stellwagen Bank?
4. Discuss why it was beneficial for the liquid natural gas company to finance the acoustic whale detection system.
5. How might a collaborative decision-making process like this one build a foundation for future collaborations?

Resources

- [Stellwagen Bank National Marine Sanctuary](#)
- [Marine Sanctuaries and Marine Planning](#); Dr. David Wiley et al
- [International Maritime Organization - Ships' Routing](#)
- [Social Complexity and Scientific Validity](#): Dave Wiley at TEDxNewBedford



Stellwagen Bank National Marine Sanctuary

AN OCEAN BLUEPRINT FOR FLORIDA KEYS

The coral reefs of the Florida Keys are America’s most popular marine destination, home of myriad sea creatures, magnet of sport fishers, divers and sightseers. Lately they are also America’s showcase of marine conservation zoning, providing refuge, recreation and livelihoods through a collaborative ocean plan developed by all concerned.

Overview

Congress established the Florida Keys National Marine Sanctuary (NMS) in 1990 through the Florida Keys National Marine Sanctuary and Protection Act. The Sanctuary covers 2,900 square nautical miles surrounding the Florida Keys, including the productive waters of Florida Bay, the Gulf of Mexico and the Atlantic Ocean. After years of planning, design and public input, the Florida Keys National Marine Sanctuary established the nation’s first comprehensive network of marine zones in 1997. The sanctuary’s five zone types are designed and strategically positioned to protect

sensitive ecosystems, while allowing recreational and commercial activities in the sanctuary that are important to the Florida Keys economy. The designated zones are: ecological reserves, sanctuary preservation areas, wildlife management areas, existing management areas and special-use areas.

Today, a network of 24 fully protected, “no-take” zones cover approximately 6 percent of the Sanctuary, protecting 65 percent of shallow bank reef habitats and 10 percent of coral resources. Although ocean planning and the designation of zones can be quite contentious, as Billy Causey, the sanctuary’s first superintendent, discovered in the early days of the Florida Keys NMS, it is an effective tool for reducing user conflicts.

Through the Sanctuary’s Marine Zone Monitoring Program, scientists conduct research projects to provide up-to-date information on, among other things, the abundance and health of marine species and habitats. Managers use this information to adjust management techniques for specific zones. In 2003, the Pew Oceans Commission concluded that marine zoning and the Florida Keys NMS’s adaptive management approach has substantially improved management of the Florida Keys coral reef ecosystem.



Jeremy Sterk

AN OCEAN BLUEPRINT FOR FLORIDA KEYS

Discussion Questions

1. What was necessary to change the fishing community's perspective on protecting coral reefs in the Florida Keys?
2. How did the establishment of no-take zones benefit charter boat captains and recreational fishermen?
3. Consider the following quote from the film – "... ironically in separating the people, [the planning process] brought them together." In what ways? How?
4. Local community members and businesses affected by the designation of a National Marine Sanctuary are given a voice in sanctuary management through a stakeholder advisory council. How do these councils improve sanctuary management?
5. The primary industry in Key West is tourism. Do you think this type of management structure would be compatible with a different region where the economy relies more heavily on commercial fishing?
6. Changing circumstances, such as an economic recession or shift in the dominant industry in the next decades, could impact the resources and uses of the Florida Keys NMS. How do you think the advisory council should go about making a determination to change a management scheme due to changing circumstances?

Resources

- [Florida Keys National Marine Sanctuary](#)
- [Florida Keys National Marine Sanctuary Management](#)
- [Florida Keys National Marine Sanctuary Advisory Council](#)
- [National Marine Sanctuary Act, 16 U.S.C. §§ 1431-1445c](#)
- [Florida Keys National Marine Sanctuary and Protection Act, Public Law 101-605 \(H.R. 5909\)](#)



IOWA FARMERS & THE 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.

Overview

A zone of low oxygen, referred to as the “Dead Zone,” forms every summer in the Gulf of Mexico. This occurrence of low oxygen, known as hypoxia, can be caused by a variety of factors, including excess nutrients. The Mississippi River carries nitrogen and phosphorus from agriculture fields and sewage treatment plants into the Gulf of Mexico. These excess nutrients promote algal growth. As the algae dies and decomposes, this process uses up oxygen leading to decreased oxygen levels in the water. If the levels become too low, animals that cannot move to other waters with more oxygen will

die. Hypoxia, therefore, results in severe decreases in marine life within the hypoxic zone.

The Mississippi River/Gulf of Mexico Watershed Nutrient Task Force was formed in 1997 to reduce and control hypoxia in the Gulf of Mexico. The Task Force’s membership includes representatives of 5 federal agencies, 12 states and the tribes within the Mississippi/Atchafalaya River Basin. In 2001, the Task Force released its “Action Plan for Reducing, Mitigating and Controlling Hypoxia in the Northern Gulf of Mexico.” The action plan was revised and updated in 2008.

Under the Clean Water Act, responsibility to address non-point sources of pollution (i.e., runoff from fields and parking lots) falls to the states. Few states regulate non-point sources directly, choosing instead to encourage voluntary reductions in nutrient runoff through alternative farming techniques, wetlands conservation, education and other best stewardship practices. As Iowa’s wetland program demonstrates, voluntary measures can be successful if the right incentives are in place. For instance, the USDA sponsors a program that provides state and federal matching funds for farmers to preserve and/or create wetlands.



IOWA FARMERS & THE GULF OF MEXICO

Discussion Questions

1. Explain the significance of Dr. Bill Walker's quote, "We not only need to do things differently, but we also need to think differently." How do all of us need to be thinking differently to protect and enhance ocean resources?
2. What constitutes a dead zone? How is it formed? What are the impacts?
3. The film portrays effective voluntary actions that build a strong commitment from individuals to reduce their impact on the Gulf of Mexico. What motivated the farmers to participate in the wetland creation program and implement nutrient reduction practices on their farms? What are the benefits of taking a voluntary approach vs. a top-down government approach?
4. A primary goal of the federal Clean Water Act is to restore and maintain the quality of the nation's waters. How might federal regulators address environmental impacts from nutrient discharges?
5. Beyond reducing nutrient discharges to the Mississippi River and Gulf of Mexico, what else needs to be done in the Gulf coastal region to restore resilience and resources to those areas? Are there other incentives besides the ones mentioned, such as tax incentives, that could be used to motivate people?

Resources

- [Iowa Conservation Reserve Enhancement Program \(CREP\)](#)
- [Mississippi River/Gulf of Mexico Hypoxia Task Force](#)
- [Gulf of Mexico Hypoxia](#)
- [Gulf of Mexico Alliance](#)



PORT ORFORD FISHERMEN PROTECT OCEAN & WAY OF LIFE

In a small fishing community on the coast of Oregon, the people of Port Orford are taking control of their destiny by conducting their own brand of conservation. They are using local science to inform their fishery management and protecting upstream forests to save their salmon—a farsighted perspective that considers both their links to the land and the future of their children.

Overview

The fishing community of Port Orford, Oregon is a model of a “bottom-up” approach to environmental management. The Port Orford Ocean Resource Team (POORT) has helped the community organize and develop a vision for the long-term sustainability of their ocean resources. POORT focused its efforts on the community-designated Port Orford Community Stewardship Area. The Community Stewardship Area covers 1,230 square miles – 385 square miles of terrestrial habitat and 935 square miles of ocean habitat – and seeks to protect the community’s traditional fishing grounds and the upland watersheds that feed into them.

This farsighted perspective has been successful on numerous fronts. In September 2008, POORT submitted a local proposal for a marine reserve and marine protected area, the Redfish Rocks Research Reserve, under Oregon’s statewide marine reserve planning process. The State of Oregon formally designated the Redfish Rocks Marine Reserve and Marine Protected Area in 2009. The upland watersheds within the Community Stewardship Area were awarded permanent protection in 2009 when the U.S. Congress designated the Copper Salmon Wilderness Area. The Wilderness Area includes 13,700 acres of new wilderness and 9.3



miles of rivers at the headwaters of the Elk River designated as “Wild and Scenic.” Local science research continues to inform their conservation and fishery management.

PORT ORFORD FISHERMEN PROTECT OCEAN & WAY OF LIFE

Discussion Questions

1. Successful community-based ocean management initiatives, such as POORT, are rare. Why do you think that is? What might be some of the regulatory and social barriers to effective local management of ocean resources?
2. Why did the local fishermen feel disenfranchised from the U.S. fisheries management system? Discuss how managers might do a better job of listening to and addressing the concerns of this stakeholder group.
3. POORT was successful over time in obtaining legal protections for the Port Orford Community Stewardship Area. Why was their project successful when often enacting new laws and regulations can fail due to inability to reach agreements on controversial topics? What are some other ways the community's management goals could have been achieved?
4. As seen in the film, our activities on land can affect the health of our oceans and coasts. Local governments can help protect the oceans and coasts by requiring developers to use best management practices, such as preserving habitat, integrating green infrastructure and buffer zones to control runoff. What are some other actions communities could take to protect oceans and coasts from land-based activities?

Resources

- [Port Orford Sustainable Seafood](#)
- [Redfish Rocks Marine Reserve](#)
- [Fishtracker Research in Redfish Rocks Marine Reserve](#)

