

# America's Living Oceans

CHARTING A COURSE FOR SEA CHANGE



**A Report to the Nation**  
Recommendations for a  
New Ocean Policy  
*May 2003*

FRONT AND BACK COVER

*Light of the setting sun bathes battered sea stacks shrouded by summer fog at McClure's Beach, in Point Reyes National Seashore, California. Here, pounding Pacific waves have carved a shoreline of white crescent beaches and rocky cliffs.*

FOLDOUT MAP

*The United States' oceans span nearly 4.5 million square miles, an area 23 percent larger than the land area of the nation.*

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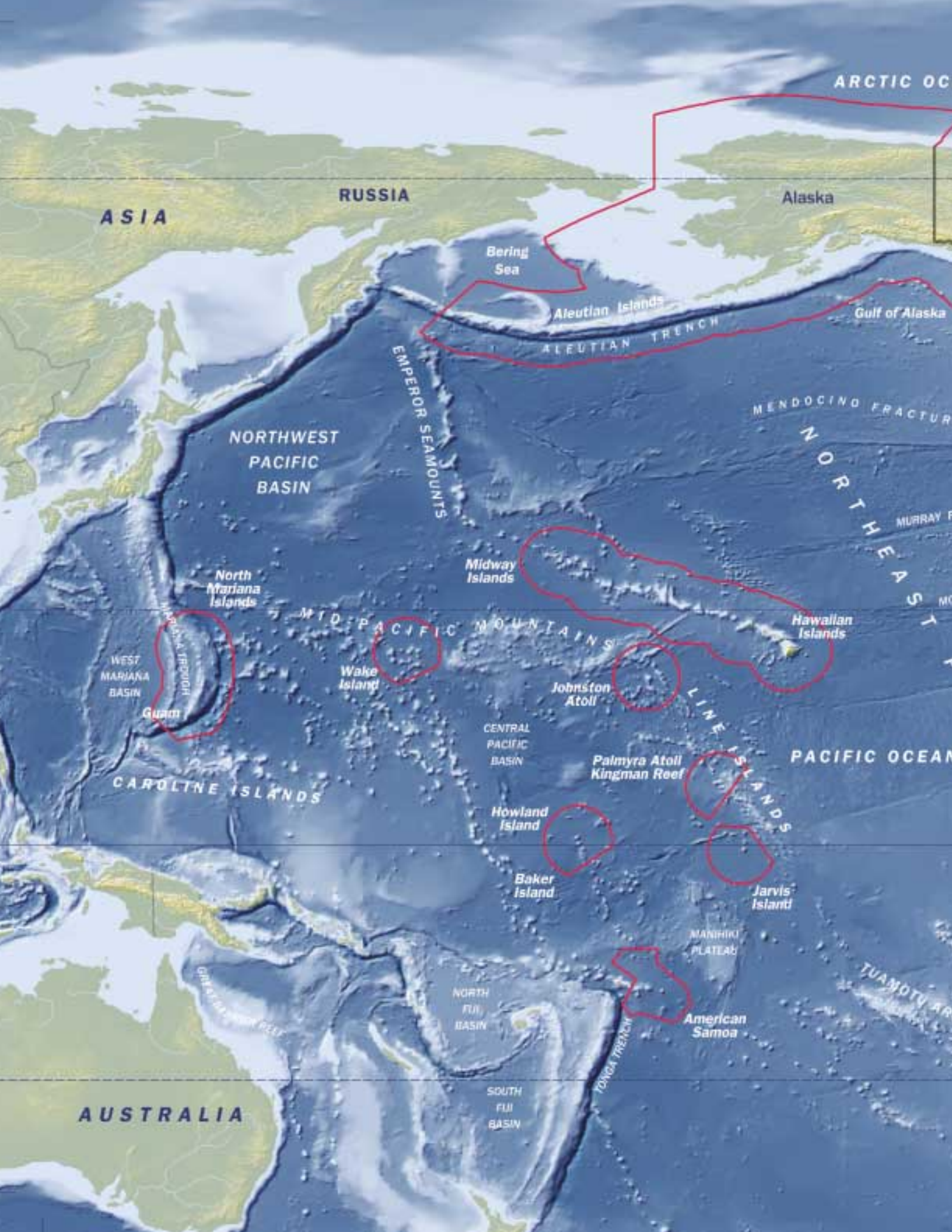
**A Report to the Nation**

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**Leon E. Panetta, Chair**



# AMERICA'S OCEAN REALM



 — Boundary of the United States Exclusive Economic Zone  
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*Sea otter with starfish, Central California coast*  
Tom & Pat Leeson

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Steve Simonsen/Marine Scenes

*Cushion sea star, Hurricane Hole, U.S. Virgin Islands*



© Chuck Davis/www.tidalfilmsphoto.com

*California garibaldi in a kelp forest, Santa Catalina Island, California*



*Cushion sea stars, Virgin Islands  
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# Foreword

Oregon Dunes National Recreation Area, Florence, Oregon  
© Dave Welling

At the heart of the American Dream is a desire to secure a better future for our children.

That is what my grandfather sought as he sailed the oceans in great sailing ships and fished off California and Alaska. That is what my immigrant parents worked for when they moved their family from Italy to central California. And, that is the commitment my wife and I have made for our children.

There can be no legacy without caring for those things most important to us. In our family, preserving the oceans' beauty and bounty for future generations is an obligation to be honored.

I grew up and live in Monterey, California—a community made famous by John Steinbeck's *Cannery Row*—where boundless catches of sardines, bustling canneries, large fishing fleets of purse seiners, and busy wharves and shops served and supported fishermen and their families. When the sardine industry collapsed, the lives and businesses that depended on that seemingly endless resource also collapsed.

My goal has been to end this kind of devastation, which threatens other fishing communities along our coasts. For 16 years, I represented coastal residents in Congress, fighting to protect the oceans and those whose livelihoods depend upon them. One of my proudest accomplishments is the creation of the Monterey Bay National Marine Sanctuary to restore, protect, and sustain the living resources so vital to the beauty and economy of this coast.

Nearly three years ago, my love for the oceans brought me to the Pew Oceans Commission. I am joined in this effort by a distinguished group of individuals, each with a special connection to the oceans. They bring many lifetimes of leadership and accomplishment from the worlds of science, fishing, conservation, government, education, business, and philanthropy. They are bipartisan and independent, hailing from the North Atlantic to the South Pacific.

Based on our careful review of the laws, policies, and institutions affecting life off our shores, we advocate a fundamental change in this nation's posture toward its oceans. The recommendations presented here reflect the testimony of hundreds of individuals who joined us in public hearings and other gatherings across the country. We also solicited the best thinking of leading scientists and the firsthand experiences of fishermen, conservationists, and businesspeople.

There is consensus that our oceans are in crisis and that reforms are essential. In the 1960s, the Stratton Commission reviewed U.S. ocean policy, found it lacking, and the nation responded. Much has changed in the ensuing years, and once again a commitment is needed to protect and preserve this national trust.

A century ago, President Theodore Roosevelt committed the nation to the critical objective of preserving our land. Today, we have a similar responsibility to the seas that cover about 71 percent of our planet. These recommendations provide an opportunity and the means to meet our obligation and provide for our children a bountiful ocean legacy.

**Leon E. Panetta**  
*Chair, Pew Oceans Commission*



Jeff Sedlitz/Workbookstock.com

*The oceans are a national trust we must preserve for this and future generations.*

# Preface

## DEEP WATER: AMERICA'S OCEANS IN TROUBLE

Digital Vision

Americans have always loved the ocean. Half of us live in coastal communities and the other half come to visit. Perhaps, as President John F. Kennedy once suggested, it is “the salt in our veins.”

When we stand at the water's edge, we stare longingly out to sea—for the boat to return, for the tides to shift, for the winds to arrive, for the fish to bite, for the sun to rise or set—beyond the far horizon.

Inspired by their majesty and mystery, we depend on our oceans and their coasts, not just for pleasure and food—although these uses are central—but also as a counterweight to extremes of heat and cold on land, as a sponge for absorbing excess carbon, and as a generator of life-giving oxygen. Although we often view the ocean as starting where the land ends, that separation is arbitrary. Land and oceans are part of the same global system. Activities on one profoundly affect the other.

Just as the 20<sup>th</sup> century brought us into knowledgeable contact with outer space, the 21<sup>st</sup> will almost certainly connect us more intimately to our oceans. In fact, it is imperative because—as much as we love our oceans—our ignorance has been destroying them. We love clean beaches, but what we discharge into the oceans befouls them. We destroy the very coastal wetlands we need to buffer storms and filter fresh water. A nation of seafood lovers, we are careless about how we treat the ocean's “nurseries” and brood stocks that replenish our fish supply.

Furthermore, the size of the world's human population and the extent of our technological creativity have created enormously damaging impacts on all of the oceans. We are now capable of altering the ocean's chemistry, stripping it of fish and the many other organisms which comprise its amazingly rich biodiversity, exploding and bleaching away its coral nurseries, and even reprogramming the ocean's delicate background noise.

We love our freedom to move about the ocean surface where no streets, signs, or fences impede us, yet our sense that no one owns this vast realm has allowed us to tolerate no one caring for it.

During the 20<sup>th</sup> century our nation has come to regard the air we breathe, the fresh water we drink, and the open lands as “common goods,” part of our public trust. Now we must acknowledge that the oceans, too, are part of our common heritage and our common responsibility.

The report of the Pew Oceans Commission outlines a national agenda for protecting and restoring our oceans. It is a vision that projects an equilibrium of goods withdrawn from and goods regenerated within the ocean. It is a vision that abhors the careless—no less the systematic—extinction of vital sea species. It is a vision of clean water and clear horizons. Both comprehensive and detailed, the report presents a new direction for governing our oceans. From identifying the nonpoint pollutants that rush down our waterways into our coastal bays to proposing protected zones for critical marine life, the Commission has confronted the most challenging aspects of ocean policy. If its recommendations are accepted and acted upon, we can anticipate a future when fish will again be plentiful and fishing communities will thrive, when beaches will be clean again, and now-impooverished coral reefs will teem with life.

We invite the American public to embrace this vision and to join with us to launch a national effort in behalf of future generations—to understand and protect our vast and bountiful, fragile and mysterious seas.

### David Rockefeller, Jr.

Vice Chair, National Park Foundation  
Member, Pew Oceans Commission



Steve Simonsen/Marine Scenes

*Pacific double-saddle butterfly fish, Western Shoals, Agana Harbor, Guam*



# Members OF THE PEW OCEANS COMMISSION

*Kenai Fjords National Park, Alaska*  
Deb Antonini/Pew Oceans Commission



**The Honorable Leon E. Panetta, Chair**

He is director of the California State University Panetta Institute for Public Policy. He served in Congress for eight terms. He chaired the House Budget Committee and served as White House chief of staff.

**John H. Adams**

He is the founder and president of the Natural Resources Defense Council —one of the nation’s leading environmental organizations. In 1998, he was named one of Audubon’s 100 Champions of Conservation.



**The Honorable Eileen Claussen**

She is president of the Pew Center on Global Climate Change. She is a former assistant secretary of state for oceans, environment, and science.

**The Honorable Carlotta Leon Guerrero**

She is a former member of the Guam Senate where she chaired committees with jurisdiction over transportation, telecommunications, and Micronesian affairs. She is currently co-director of the Ayuda Foundation, a nonprofit health care organization in Guam.



**The Honorable Mike Hayden**

He is the secretary of the Kansas Department of Wildlife and Parks. The former governor of Kansas served as president and CEO of the American Sportfishing Association, a recreational fishing group.

**Geoffrey Heal, Ph.D.**

He is the Garrett Professor of Public Policy and Corporate Responsibility and professor of economics and finance at the Graduate School of Business at Columbia University. One of his major research interests is the interaction of human societies and their natural resources.



**Charles F. Kennel, Ph.D.**

He is director of the Scripps Institution for Oceanography and the author of more than 250 publications in plasma physics, planetary science, and astrophysics. He has been both a Fulbright and Guggenheim Scholar.

**The Honorable Tony Knowles**

He recently completed his second term as governor of Alaska. He was the mayor of Anchorage and served on the North Pacific Fishery Management Council, where he was instrumental in efforts to reduce bycatch.



**Jane Lubchenco, Ph.D.**

She is an Oregon State University professor of marine biology, a MacArthur Fellow, and past president of both the American Association for the Advancement of Science and the Ecological Society of America. She is president-elect of the International Council for Science, and recipient of the 2002 Heinz Award for the Environment.





**Julie Packard**

She is the founder and executive director of the Monterey Bay Aquarium and vice chair of the David and Lucile Packard Foundation. She is the 1998 recipient of the Audubon Medal for Conservation.

**The Honorable Pietro Parravano**

He is a commercial fisherman and owner of the *Anne B.* He is the president of the Pacific Coast Federation of Fishermen’s Associations and an elected member of the San Mateo County Harbor Commission.



**The Honorable George E. Pataki**

He is currently serving his second term as governor of New York. After graduating from Columbia Law School, he served ten years in the state legislature and was mayor of the city of Peekskill, his hometown.

**The Honorable Joseph P. Riley, Jr.**

He is serving his sixth term as mayor of Charleston, South Carolina. He has served as the president of the U.S. Conference of Mayors and has received many awards, including the Outstanding Mayors Award from the National Urban Coalition.



**David Rockefeller, Jr.**

He is director and former chair of Rockefeller Co., Inc., and is an active participant in the nonprofit fields of art, philanthropy, and the environment. He is a vice chair of the National Park Foundation and trustee of the Rockefeller Brothers Fund.

**Vice Admiral Roger T. Rufe, Jr., U.S. Coast Guard (Retired)**

He is the president and CEO of The Ocean Conservancy. While in the U.S. Coast Guard, he led offices responsible for marine conservation in Alaska and the Southeast U.S.



**Kathryn D. Sullivan, Ph.D.**

She is the president and CEO of COSI, a hands-on science center in Columbus, Ohio. As a NASA astronaut, she was the first U.S. woman to walk in space. She served as NOAA’s chief scientist from 1992 to 1996. She has a Ph.D. in geology.

**Marilyn Ware**

She is the chairman of the board of American Water Works Company, the nation’s largest private drinking water utility. She is a former newspaper editor and publisher, and currently serves on the board of the American Enterprise Institute.



**Patten (Pat) D. White**

He is a commercial fisherman and CEO of the Maine Lobstermen’s Association. He is a member of the Atlantic States Marine Fisheries Commission, and serves on the editorial board of *National Fisherman*.





# Executive Summary

Bocaccio, Channel Islands National Marine Sanctuary, California  
Richard Herrmann

America's oceans are in crisis and the stakes could not be higher. More than half the U.S. population lives in coastal counties. The resident population in this area is expected to increase by 25 million people by 2015. More than 180 million people visit the shore for recreation every year.

Though a price tag has never been assigned to our coastal economy, it is clear that it contributes significantly to the nation's overall economic activity. Tens of thousands of jobs in fishing, recreation, and tourism depend on healthy, functioning coastal ecosystems. Now, thousands of jobs and billions of dollars of investment have either been lost or are jeopardized by collapsing fisheries. Pollution and sprawl threaten ocean-related tourism and recreation, far and away the largest component of the coastal economy.

But more than jobs are at stake. All Americans depend on the oceans and affect the oceans, regardless of where they live. Ocean currents circulate the energy and water that regulate the Earth's climate and weather and, thus, affect every aspect of the human experience. Our very dependence on and use of ocean

resources are exposing limits in natural systems once viewed as too vast and inexhaustible to be harmed by human activity. Without reform, our daily actions will increasingly jeopardize a valuable natural resource and an invaluable aspect of our national heritage.

In the midst of crisis, there are expressions of hope and signs of success. Striped bass, severely depleted along our Atlantic shores, made a striking comeback when given a chance. North Atlantic swordfish recently did the same in response to lower catch limits and closed nursery areas. Seabirds, kelp beds, and fish communities returned to the coastal waters off Los Angeles after waste discharges were reduced. Proven, workable solutions to the crisis in our oceans exist but such successes will remain the exception rather than the rule until we chart a new course for ocean management.

## THE EVIDENCE

The evidence that our oceans face a greater array of problems than ever before in our nation's history surrounds us. Marine life and vital coastal habitats are straining under the increasing pressure of our use. We have reached a crossroads where the cumulative effect of what we take from, and put into, the ocean substantially reduces the ability of marine ecosystems to produce the economic and ecological goods and services that we desire and need. What we once considered inexhaustible and resilient is, in fact, finite and fragile.

The crisis confronting our oceans has many dimensions.



Ron Niebrugge/wildnatureimages.com

Fishing figures prominently in the economies of many coastal communities, including Seward, Alaska, where anglers fish for salmon in Resurrection Bay.



- Coastal development and associated sprawl destroy and endanger coastal wetlands and estuaries that serve as nurseries for many valuable fishery species. More than 20,000 acres of these sensitive habitats disappear each year. Paved surfaces have created expressways for oil, grease, and toxic pollutants into coastal waters. Every eight months, nearly 11 million gallons of oil run off our streets and driveways into our waters—the equivalent of the *Exxon Valdez* oil spill.
- More than 60 percent of our coastal rivers and bays are moderately to severely degraded by nutrient runoff. This runoff creates harmful algal blooms and leads to the degradation or loss of seagrass and kelp beds as well as coral reefs that are important spawning and nursery grounds for fish. Each summer, nutrient pollution creates a dead zone the size of Massachusetts in the Gulf of Mexico. These types of problems occur in almost every coastal state\* and the trends are not favorable. If current practices continue, nitrogen inputs to U.S. coastal waters in 2030 may be as much as 30 percent higher than at present and more than twice what they were in 1960.
- Many ecologically and commercially crucial fish species, including groundfish and salmon populations along the Atlantic and Pacific Coasts, face overfishing and numerous other threats. Thirty percent of the fish populations that have been assessed are



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*Nutrient pollution of coastal waters causes excessive algae growth on coral reefs, such as this one off Hawaii. Other major threats to reefs include climate change, overfishing, and sediment runoff resulting from development and agriculture.*

- overfished or are being fished unsustainably. An increasing number of these species are being driven toward extinction. Already depleted sea turtle, marine mammal, seabird, and noncommercial fish populations are endangered by incidental capture in fishing gear. Destructive fishing practices are damaging vital habitat upon which fish and other living resources depend. Combined, these aspects of fishing are changing relationships among species in food webs and altering the functioning of marine ecosystems.
- Invasive species are establishing themselves in our coastal waters, often crowding out native species and altering habitat and food webs. More than 175 introduced species thrive in San Francisco Bay alone. Nearly one million Atlantic salmon escaped from farm pens on the western coast of North America in the last 15 years. The species is now successfully

\*As used in this report, the terms “state” or “states” mean any or all of the fifty states, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, American Samoa, the Virgin Islands, Guam, and any other commonwealth, territory, or possession of the United States.

reproducing in British Columbia rivers and diluting the gene pool of native species by hybridizing with Pacific salmon. New species are regularly finding a home around our coastlines as hitchhikers in ship ballast water or on ship hulls, escapees from fish farms, and even as discarded home aquarium plants and animals. Of the 374 documented invasive species in U.S. waters, 150 have arrived since 1970.

In addition to these varied threats, climate change over the next century is projected to profoundly impact coastal and marine ecosystems. Sea-level rise will gradually inundate highly productive coastal wetlands, estuaries, and mangrove forests. Coral reefs that harbor exceptional biodiversity will likely experience increased bleaching due to higher water temperatures. Changes in ocean and atmospheric circulation attributable to climate change could adversely affect coastal upwelling and productivity and have significant local, regional, and global implications on the distribution and abundance of living marine resources.

These are just some of the signs that our interactions with the oceans are unsustainable. Our activities, from those that release pollutants into rivers and bays to the overfishing of the seas, are altering and threatening the structure and functioning of marine ecosystems—from which all marine life

springs and upon which all living things, including humans, depend.

## **SEEDS OF CRISIS**

The root cause of this crisis is a failure of both perspective and governance. We have failed to conceive of the oceans as our largest public domain, to be managed holistically for the greater public good in perpetuity. Our oceans span nearly 4.5 million square miles,\* an area 23 percent larger than the nation's land area. Similarly, we have only begun to recognize how vital our oceans and coasts are to our economy as well as to the cultural heritage of our nation. Finally, we have come too slowly to recognize the interdependence of land and sea and how easily activities far inland can disrupt the many benefits provided by coastal ecosystems.

The foundation of U.S. ocean policy was laid in a very different context than exists today. The principal laws to protect our coastal zones, endangered marine mammals, ocean waters, and fisheries were enacted 30 years ago, on a crisis-by-crisis, sector-by-sector basis. Much of what exists of an ocean governance system in this country can be traced to recommendations of the Stratton Commission—the nation's first review of ocean policy in 1969. Driven by the need to ensure the "full and wise use of the marine environment," Stratton focused on oceans as a frontier with vast resources, and largely rec-

\*This is the approximate area (in square statute miles) of the United States Exclusive Economic Zone (EEZ)—the area of the oceans over which the United States exercises exclusive environmental and economic jurisdiction. The U.S. EEZ was established by Presidential Proclamation in 1983. The establishment of an EEZ extending 200 nautical miles from the shoreline of a coastal nation is recognized and accepted under the United Nations Convention on the Law of the Sea.



*Commissioners tour a cannery in Kodiak, Alaska, home port for more than 700 trawl, longline, and crab vessels.*

ommended policies to coordinate the development of ocean resources.

Reflecting the understanding and values of this earlier era, we have continued to approach our oceans with a frontier mentality. The result is a hodgepodge of ocean laws and programs that do not provide unified, clearly stated goals and measurable objectives. Authority over marine resources is fragmented geographically and institutionally. Principles of ecosystem health and integrity, sustainability, and precaution have been lost in the fray. Furthermore, the nation has substantially underinvested in understanding and managing our oceans. The information we do have in hand is often underutilized. Plagued with systemic problems, U.S. ocean governance is in disarray.

### **A 30-YEAR REVIEW OF OCEAN POLICY**

More than 30 years after the Stratton Commission issued its recommendations, the state of our oceans and coasts is vastly altered. Although some of the problems that were considered 30 years ago remain with us today, new environmental, economic, and policy challenges have emerged. These challenges exceed the capacity of today's governance framework and management regimes.

Our perspective on ocean resources and policy has also changed over 30 years. We are increasingly aware that development activities can change marine environments. We are learning more about complex interactions in marine ecosystems and the need to maintain the diversity and resilience of those complex and adaptive natural systems. Today, there is a

clear sense that we must do a better job of protecting the oceans if we hope to continue to enjoy their benefits.

The Pew Oceans Commission, a bipartisan, independent group of American leaders, was created to chart a new course for the nation's ocean policy. Our mission is to identify policies and practices necessary to restore and protect living marine resources in U.S.



*Senator Ernest Hollings (D-SC) welcomes Leon Panetta, Dana Beach of the South Carolina Coastal Conservation League, and Deb Antonini of the Pew Oceans Commission at the release of Mr. Beach's report on coastal sprawl.*

waters and the ocean and coastal habitats on which they depend. The Commission was also charged with raising public awareness of the principal threats to marine biodiversity and of the importance of ocean and coastal resources to the U.S. economy.

The Commission brought together a diverse group of American leaders from the worlds of science, fishing, conservation, government, education, business, and philanthropy. It secured the help of leading scientists to determine priority issues and to write reports summarizing the best scientific information available on those subjects (see list of publications on page 136). The Commission organized into four committees to review the core issues of governance, fishing, pollution, and coastal development. It also investigated marine aquaculture, invasive species, ocean zoning, climate change, science, and education.

For more than two years, the Commission conducted a national dialogue on ocean issues. We convened a series of 15 regional meetings, public hearings, and workshops to listen to those who live and work along the coasts. From Maine to Hawaii, Alaska to the Gulf of Mexico, we spoke with hundreds of citizens, fishermen, scientists, government officials, tourism operators, and business leaders. Commissioners held a series of 12 focus groups with fishermen, including one in Kodiak, Alaska, which is among the nation's oldest and largest fishing communities. Believing that experience is the best teacher, Commissioners went lobster fishing in Maine, toured a pineapple plantation in Hawaii to learn about ways to control polluted runoff, and visited coastal habitat restoration projects in New York and South Carolina.

By speaking with those who live and work along the coasts and around the country, and by collecting the best scientific information available, the Commission learned a great deal about the problems facing our oceans, the consequences to coastal communities and the nation if we fail to act, and actions needed to overcome the crisis facing our oceans. The status quo is unacceptable. Future generations will judge this generation on whether it shoulders its responsibility.

## **CONCLUSIONS AND RECOMMENDATIONS**

The fundamental conclusion of the Pew Oceans Commission is that this nation needs to ensure healthy, productive, and resilient marine ecosystems for present and future generations. In the long term, economic sustain-

ability depends on ecological sustainability.

To achieve and maintain healthy ecosystems requires that we change our perspective and extend an ethic of stewardship and responsibility toward the oceans. Most importantly, we must treat our oceans as a public trust. The oceans are a vast public domain that is vitally important to our environmental and economic security as a nation. The public has entrusted the government with the stewardship of our oceans, and the government should exercise its authority with a broad sense of responsibility toward all citizens and their long-term interests.

These changes in our perspective must be reflected in a reformed U.S. ocean policy. National ocean policy and governance must be realigned to reflect and apply principles of ecosystem health and integrity, sustainability, and precaution. We must redefine our relationship with the ocean to reflect an understanding of the land-sea connection and organize institutions and forums capable of managing on an ecosystem basis. These forums must be accessible, inclusive, and accountable. Decisions should be founded upon the best available science and flow from processes that are equitable, transparent, and collaborative.

To embrace these reforms and achieve our goal, the nation must realize five priority objectives:

1. Declare a principled, unified national ocean policy based on protecting ecosystem health and requiring sustainable use of

ocean resources.

2. Encourage comprehensive and coordinated governance of ocean resources and uses at scales appropriate to the problems to be solved.
  - a. The regional scale of large marine ecosystems is most appropriate for fisheries management and for governance generally.
  - b. Coastal development and pollution control is most appropriately addressed at the watershed level.
3. Restructure fishery management institutions and reorient fisheries policy to protect and sustain the ecosystems on which our fisheries depend.
4. Protect important habitat and manage coastal development to minimize habitat damage and water quality impairment.
5. Control sources of pollution, particularly nutrients, that are harming marine ecosystems.

The Commission recommends the following actions to achieve these objectives.

#### **Governance for Sustainable Seas**

1. Enact a National Ocean Policy Act to protect, maintain, and restore the health, integrity, resilience, and productivity of our oceans.
2. Establish regional ocean ecosystem councils to develop and implement enforceable regional ocean governance plans.
3. Establish a national system of fully protected marine reserves.
4. Establish an independent national oceans agency.



5. Establish a permanent federal interagency oceans council.

### **Restoring America's Fisheries**

1. Redefine the principal objective of American marine fishery policy to protect marine ecosystems.
2. Separate conservation and allocation decisions.
3. Implement ecosystem-based planning and marine zoning.
4. Regulate the use of fishing gear that is destructive to marine habitats.
5. Require bycatch monitoring and management plans as a condition of fishing.
6. Require comprehensive access and allocation planning as a condition of fishing.
7. Establish a permanent fishery conservation and management trust fund.

### **Preserving Our Coasts**

1. Develop an action plan to address non-point source pollution and protect water quality on a watershed basis.
2. Identify and protect from development habitat critical for the functioning of coastal ecosystems.
3. Institute effective mechanisms at all levels of government to manage development and minimize its impact on coastal ecosystems.
4. Redirect government programs and subsidies away from harmful coastal development and toward beneficial activities, including restoration.

### **Cleaning Coastal Waters**

1. Revise, strengthen, and expand pollution laws to focus on nonpoint source pollution.

2. Address unabated point sources of pollution, such as concentrated animal feeding operations and cruise ships.
3. Create a flexible framework to address emerging and nontraditional sources of pollution, such as invasive species and noise.
4. Strengthen control over toxic pollution.

### **Guiding Sustainable Marine Aquaculture**

1. Implement a new national marine aquaculture policy based on sound conservation principles and standards.
2. Set a standard, and provide international leadership, for ecologically sound marine aquaculture practices.

### **Science, Education, and Funding**

1. Develop and implement a comprehensive national ocean research and monitoring strategy.
2. Double funding for basic ocean science and research.
3. Improve the use of existing scientific information by creating a mechanism or institution that regularly provides independent scientific oversight of ocean and coastal management.
4. Broaden ocean education and awareness through a commitment to teach and learn about our oceans, at all levels of society.

This nation must decide how it will choose to meet the crisis in our oceans. Fundamentally, this is not a decision about us. It is about our children, and actions we must take to bequeath them thriving oceans and healthy coastlines.

This is our challenge. To meet this challenge, the nation must substantially increase its investment in understanding and managing its oceans. We need a much greater financial commitment to strengthen governance and management infrastructure, to improve our scientific understanding of marine ecosystems and human impacts, and to educate all

Americans about the oceans.

If properly executed, this investment will be paid back manyfold in the form of abundant living ocean resources for centuries ahead. Without this investment, we risk further decline in ocean ecosystem health and serious consequences for human well-being far into the future.



Justin Kenney/Pew Oceans Commission

*Commissioner Carlotta Leon Guerrero (above) joined Hawaiian schoolchildren for a taping of KidScience, produced jointly by the Hawaii Department of Education and Hawaii Public Television, during the Commission's visit to Hawaii in February 2001.*

