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Communication Strategies That Promote Ocean Stewardship Action: A Booklet for Interpreters and Educators

Prepared by
National Park Service Northeast Region Office of Interpretation and Education
National Park Service Conservation Study Institute

In cooperation with
Shelburne Farms National Historic Landmark

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Workshop conveners:

- National Park Service
    - Northeast Region Office of Interpretation and Education
    - Conservation Study Institute
    - Gateway National Recreation Area
    - Salem Maritime National Historic Site
    - Boston Harbor Islands National Recreation Area
    - Natural Resource Program Center
- U.S. Fish and Wildlife Service
    - National Wildlife Refuge System
    - Rachel Carson National Wildlife Refuge
    - National Conservation Training Center
- National Oceanic and Atmospheric Administration
    - Office of National Marine Sanctuaries, Northeast and Great Lakes Region
    - National Estuarine Research Reserve System
    - Jacques Cousteau National Estuarine Research Reserve
- Shelburne Farms National Historic Landmark

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Preface

In 2006, recognizing that their effectiveness would be enhanced through cooperative efforts such as shared resources and expertise, the National Park Service, U.S. Fish and Wildlife Service, National Marine Sanctuary Program, and National Estuarine Research Reserve System agreed to a goal of creating among themselves a "seamless network." Subsequent workshops held in Maine and New Jersey served to advance this collaboration.

Among the outcomes of these workshops was a focus on the importance of developing broad, shared messages to raise public awareness, literacy, and action regarding critical ocean issues. Another outcome was recognition that other partners, such as nonprofit organizations, also share this common goal of engaging the public in ocean stewardship. Given the urgency and scientific complexity of contemporary ocean stewardship issues, effective communication to foster public commitment must be an important part of any ocean conservation strategy.

Toward this end, a June 2009 workshop on "Ocean Literacy and Stewardship Messages" brought together scientists and educators from a variety of ocean, coastal, and lake "protected areas" (parks, sanctuaries, refuges, reserves, etc.) in the Northeast, mid-Atlantic, and beyond. The goals of the workshop were to advance this collaboration in support of ocean protection, literacy, and stewardship and to:

- develop a shared science-based understanding of critical ocean stewardship issues and agree on the highest priority issues for joint work;
- examine common messages on selected ocean stewardship issues; and
- explore and apply current knowledge about strategic communication approaches to reach key audiences and identify common messages that would support each organization's efforts to encourage ocean stewardship action.

The workshop was a deliberate experiment in collaborative message development—a first step toward building and using common messages about ocean stewardship issues across many agencies and organizations. It intentionally brought together communication experts and marine scientists, educators, and interpreters to explore the application of innovative, community-based messages and engagement strategies to promote ocean stewardship.

This booklet is a direct result of the workshop. Its purpose is to share key lessons learned and key concepts developed, thereby helping agencies and their partners shape effective communications to foster public awareness and ocean stewardship. It is not meant to be a final, definitive work, but rather a foundation for further collaboration and development of more-refined programs to engage and motivate people to take action on behalf of our oceans.

Executive Summary

The world's oceans—encompassing marine, coastal, and estuarine ecosystems—are at risk. While current science shows severely deteriorating conditions, fortunately media attention and public concern are increasing. Even so, there are significant challenges to encouraging citizen action on behalf of our oceans. Protected areas—with their professional staffs and opportunities to offer firsthand encounters with the ocean resource—offer ideal locations to cultivate understanding of the value of oceans and engage people in ocean stewardship. Government agencies and their nongovernmental partners share a common goal of public engagement. A June 2009 workshop on "Ocean Literacy and Stewardship Messages" sought to encourage collaboration among these partners and develop effective, shared approaches.

Scientific knowledge about the state of our oceans reveals many detrimental human impacts. The highest-priority issues include sea level rise, habitat degradation/restoration, fisheries depletion, pollution/nutrient enrichment, and other climate change effects. Of these, sea level rise and habitat degradation/restoration were chosen during the workshop to test development of new communication strategies that could be widely used to promote effective citizen engagement and action.

Communication experts observe that development of memorable public messages requires more than just dissemination of scientific information. The message must engender a deep personal connection, convey a hopeful sense of the outcome, and describe a relevant and achievable action that can lead to behavioral change. Sea level rise is a particularly challenging concept to address because it is occurring incrementally and is therefore harder to observe, and it requires adaptation along with mitigation efforts. Messages on habitat degradation/restoration must emphasize the positive potential for preservation and restoration, not simply the alarming extent of damage. For any communication to be effective in fostering change, it must focus carefully on specific audiences and consider their inherent knowledge, beliefs, and cultural values.

A "road map" for developing interpretive and educational programs that lead to both awareness and action requires translating global problems into realistic local efforts. A long-term investment is required and includes thoughtful identification of audiences, messages, and activities before gradual incorporation into programs. Ongoing evaluation and revision are necessary to achieve optimal results.

Using the road map as a foundation for developing ocean stewardship messages, a public engagement strategy can be developed and expanded over time among multiple government and nongovernmental entities. Staff members may require further training and skill development; program templates can be designed and made widely available; and a pilot program can provide a starting point for experimentation and learning, program improvement, and broader dissemination and collaboration.

I. Introduction

The status of our world's oceans is tenuous. Current science presents a compelling picture of severely deteriorating conditions in marine, coastal, and estuarine ecosystems. Fortunately, there is growing media awareness of these problems and a corresponding shift in public awareness and attitudes. Polls show that a majority of citizens now seek ways to shift their behavior to better support ocean health. Yet there are large barriers to behavioral change. Ingrained habits, cultural values, distrust of science, apathy, and cost can all prevent individuals and groups from making significant changes in their lifestyles. Even people who understand the pressing need for action and accept that changing their behavior will make a difference to ocean health have significant barriers to overcome.

Coastal parks, sanctuaries, reserves, refuges, and other types of protected areas are ideal settings to actively engage people in ocean stewardship. These places offer vivid and fascinating firsthand encounters with biodiversity, beauty, productivity, and cultural heritage. In addition to conserving natural and cultural resources, protected areas convey a community's history and identity. Skilled scientists, interpreters, and educators can build on these assets to model sustainable practices and engage visitors in ocean stewardship to spark significant shifts in their behaviors and values.

The National Park Service, U.S. Fish and Wildlife Service, National Marine Sanctuary Program, National Estuarine Research Reserve System, and many nongovernmental partners working to study, protect, and restore our oceans share a common goal of engaging the public in stewardship. Given the negative trend in our oceans' well-being and the positive trend of public concern, these agencies must find ways to build effective interpretation and education strategies to inspire individual and community stewardship practices. Social science has much to offer in terms of successful, contemporary communication strategies and messages that can be applied to efforts to encourage ocean stewardship action. Using carefully crafted words and images targeted at specific audiences, interpreters and educators can connect people to new concepts, information, ideas, and actions. Programs that build public awareness can also incorporate long-term engagement strategies that motivate individuals and communities to undertake specific stewardship activities.

This booklet reflects the work accomplished by representatives of federal agencies and nonprofit partners who participated in a June 2009 workshop on "Ocean Literacy and Stewardship Messages." Their goal was to collaborate in designing effective communication strategies to not only increase public awareness about ocean health but also foster public involvement in ocean stewardship. As a foundation for developing these approaches, the booklet first provides scientific background on critical ocean stewardship issues. It goes on to consider key messages about two of the most important issues—sea level rise and habitat degradation/restoration—and then to discuss possible audiences and the specific actions they could take to address these issues. It then presents a road map for educators and interpreters seeking to incorporate ocean stewardship messages into their programming. Finally, the booklet looks at next steps: actions that can be taken now to align ocean stewardship messages among agencies and partners and to expand the collective capacity to promote effective behaviors across diverse communities.

II. The State of the Oceans:
Current Scientific Knowledge about Stewardship Issues of Highest Concern

A. Identifying Key Ocean Issues

In attempting to improve ocean literacy and develop stewardship messages, workshop participants felt it was important to focus on the most compelling stewardship issues. Two important studies: *America's Living Oceans: Charting a Course for Sea Change* (Pew Oceans Commission, 2003) and *An Ocean Blueprint for the 21st Century* (U.S. Commission on Ocean Policy, 2004) provide current information on the state of our oceans. These, along with a growing body of international scientific research, show that oceans are being negatively affected by human activities. For example:

- Fisheries are highly stressed, with 29 percent of open ocean fisheries in a state of collapse.
- Urban infrastructure development, invasive species, and recreational overuse are significantly degrading both protected and unprotected marine and coastal landscapes.
- With nearly 60 percent of the Northeast's population living in the coastal zone, natural processes have been disrupted by urbanization.
- Pollution and watershed degradation have produced severe declines in salt marsh and estuarine health. Ignoring the net loss of coastal habitat, the impact of nutrient enrichment alone has reduced natural values and ecosystem services in nearly 70 percent of harbors, estuaries, and shallow coastal bays, thus adversely affecting biodiversity, recreational water quality, sport and commercial fishing, shellfishing, and other economic values.
- Loss of coral reefs through global warming, acidification, and other factors is causing serious declines in commercial fisheries and biodiversity.

Based on the information contained in these reports and their own experience, workshop participants met in small groups to generate a list of 12 ocean issues. These are listed below, in no priority order:

- Sea level rise
- Invasive species
- Land and sea habitat connection
- Fisheries depletion
- Pollution/nutrient enrichment
- Loss of biodiversity
- Other climate change effects
- Adaptation/resilience
- Economic impact
- Habitat degradation/restoration
- Groundwater contamination
- Strategies for public action

Through a consensus process, participants then winnowed this list to what they felt were the five highest-priority ocean issues:

- Sea level rise
- Habitat degradation/restoration
- Fisheries depletion
- Pollution/nutrient enrichment
- Other climate change effects

In a final effort to prioritize their work, participants considered three criteria:

- The potential impact of the issue on ocean protected areas in the Northeast.
- Its potential collaborative value among agencies and organizations; and
- Its potential for remediation through citizen action.

These criteria provided guidance for selection of two topics around which to develop initial ideas for the development of stewardship messages that all participants could use at their sites. The topics chosen were Sea Level Rise and Habitat Degradation/Restoration. (Section III, Developing Effective Communication Strategies for Stewardship Action, details these specific ideas.)

B. Science Briefs on Top Ocean Issues

The remainder of section II consists of science briefs on the five highest-priority ocean issues identified by workshop participants. Sources of information include the two major reports cited above as well as others listed in the *Annotated Ocean Literacy and Stewardship Resource Guide for Educators and Interpreters* (available at www.nps.gov/csi).

1. Sea Level Rise

Since the beginning of the 20th century, mean sea level has risen four to eight inches. About half of this rise results from the increased volume of the world's ocean, a combination of snow and ice melt and the thermal expansion of heated water. The remaining half is caused by sinking coastal lands. Unless action is taken, the scientific community has projected sea level rise to be between seven and twenty-three inches by the end of this century.

With one-tenth of the world's population living on coastlines within about 30 feet of sea level, its rise threatens massive human population displacement. In addition, global warming increases the frequency and intensity of storms, which in turn disrupt coastal natural resources, human populations, and the built environment.

What effects of sea level rise can be observed today? Many salt marshes are declining, and sand dunes are shifting inland and breaking down. Storm damage to roads, beach systems, and low-lying communities is increasing. Since almost 60 percent of the Northeast's population lives in the coastal zone, the potential for significant economic costs, especially in the most susceptible areas, is high. Cape Cod and the Islands, Long Island, barrier beaches, and low-lying estuarine areas throughout the region from Maine to New Jersey are most vulnerable. These lands harbor highly significant ecosystems and cultural heritage resources, support economically valuable fisheries, offer a wide range of recreational opportunities, and provide an important biogeochemical buffer between urbanized landscapes and productive shallow coastal seas.

Tools such as LiDAR (airborne laser used to generate topographic and other data) help communities understand the social, economic, and environmental impacts of sea level rise and prompt them to begin effective mitigation and adaptation strategies. Relocating seawalls, protecting and expanding natural barriers, safeguarding dune systems, preserving and restoring wetlands, shifting development away from expanding flood zones, elevating homes, and making adjustments to roads and bridges will all be necessary. As flood zones move inland, communities will need to take more extreme measures, e.g., relocating buildings, roads, and other components of infrastructure.

2. Habitat Degradation/Restoration

Urbanization has transformed and degraded coastal zones. Since European colonization of America, nearly 50 percent of our coastal wetlands have been lost. Development of headlands, harbor fronts, beaches, and bay shorelines has destroyed or damaged marine riparian habitat, including freshwater and marine wetlands and important dune and barrier beach buffers.

Shorelines are among the most sensitive, diverse, and productive environments in the world. Estuaries are important fish nurseries. It is estimated that 95 percent of commercially harvested fish and 85 percent of sport fish spend a portion of their lives in shallow coastal wetlands and estuaries. Runoff pollution in the form of heavy metals, petrochemicals, and fertilizers has severely degraded aquatic systems. Sewage treatment plants, septic tank nitrate plumes, runoff from lawns and agriculture, and atmospheric deposition (10–20 percent of nitrogen added to aquatic systems is atmospheric) produce excess nutrients that have negatively impacted nearly 70 percent of the world's harbors, estuaries, and shallow coastal bays.

A broad range of protection and restoration responses invite public behavioral changes and voluntary actions. These include restoring salt marshes and natural tidal flows, expanding and linking protected landscapes, adopting critical habitat protection zoning tools, removing coastal barriers to longshore drift, stemming the flow of surface and groundwater pollutants, removing exotic plants and animals, changing and managing recreational use patterns, and establishing sustainable household practices. It is also important to promote the concept of disaster-resistant ("resilient") communities, as well as alternative energy development.

3. Fisheries Depletion

According to recent major studies, by 2003 29 percent of open sea fisheries were in a state of collapse, defined as a decline to less than 10 percent of their original yield. The global catch fell by 13 percent between 1994 and 2003. Most marine ecosystems, with the exception of polar seas, are affected by anthropogenic activity, and 41 percent are considered seriously impacted. The 1992 destruction and closure of the Grand Banks cod fishery and the loss of the Gulf of Maine cod population are stark reminders that it is possible to harvest an abundant marine species into extinction relatively quickly. More than 40,000 jobs were lost when the Grand Banks fishery collapsed, and Maine's groundfishing industry has shrunk by half since 1987.

Growing fishing pressure and new fishing technologies result in unsustainable harvests. Deep-water trawling technologies, developed as the industry moved from depleted inshore stocks to

deep-water populations, led to the reduction of pelagic stocks and the destruction of seabed habitat.

Overfishing is only one cause of fish stock declines. The loss of biodiversity in inshore and pelagic environments has also played a role, as has pollution. Bycatch (fish caught unintentionally while other fish are intentionally caught) can also reduce biodiversity. Studies show that marine biodiversity loss is increasingly impairing the ocean's capacity to provide food, maintain water quality, and recover from disturbance. Other factors include dead zones from chemical pollution, ocean acidification from global warming, and habitat loss resulting from destructive bottom-fishing practices.

The establishment of marine reserves is a critical solution. Temporary closures, enforcement of existing laws, new regulations, public education, and a greater role for science in policy making may also play important roles.

4. Pollution/Nutrient Enrichment

Scientists first used atmospheric nitrogen to develop synthetic fertilizers in the early 1900s. Since then, widespread fertilizer production and use, along with fossil fuel combustion, an exploding human population, and other factors have together generated a nitrogen glut in the biosphere. This excess creates havoc in coastal aquatic ecosystems.

Shallow coastal bays and estuarine systems are extremely sensitive to nitrate inputs. Nitrogen loading causes algal blooms that reduce water clarity and therefore the amount of sunlight reaching eelgrass beds. The resulting decline in eelgrass in turn reduces populations of scallops, other invertebrates, and many nursery-aged finfish species. More than 20 species of economically important vertebrate and invertebrate species are directly affected by nutrient enrichment.

Nutrient enrichment also may be contributing to salt marsh dieback. Salt marshes are exceptionally valuable ecosystems that provide several vital services: they export excess energy into deeper water in the form of fish, and they buffer terrestrial biogeochemical flows, trapping and transforming agricultural, suburban, and urban runoff. But salt marshes, for reasons not completely understood, are declining. Theories include nutrient loading, changing rates of tidal sedimentation, disease, and toxic inputs.

Nutrient enrichment is a relatively easy problem to address. Ocean-friendly lawn campaigns, new sewage treatment technologies that capture nitrogen, and salt marsh and wetland buffer strips are highly effective. Communities have also protected landscapes, constructed wetlands, reduced the burning of fossil fuels, and created food waste recycling programs in restaurants and schools. Other effective actions include composting, reducing agricultural use of synthetic fertilizers, improving urban surface runoff capture systems, and buffering nonpoint source pollution to directly reduce nutrient impacts on aquatic systems.

5. Other Climate Change Effects

Seawater absorbs as much as one-third of the atmospheric CO_2 produced by burning fossil fuels. Oceans hold 65 times more carbon dioxide than the atmosphere and 20 times more than

terrestrial biomass. Once it is absorbed by seawater, CO_2 is converted to carbonic acid. Increased carbonic acid levels in seawater are making the oceans more acidic; the pH of ocean water has dropped .6 pH units since 1900. As CO_2 levels in the atmosphere continue to rise, carbonic acid levels in the seas are expected to increase.

The oceans have maintained a remarkably stable, slightly basic, pH over millions of years. Marine life has evolved in this stable environment. The sudden decrease in pH levels is new, and scientists don't yet understand how it will affect ocean biodiversity or ocean ecosystem functioning. Scientists predict n additional drop of .4 pH units by 2100, with an accompanying 60 percent reduction in the concentration of calcium carbonate. According to some models, this could lead to a decrease in shell-producing ocean invertebrates as early as 2050. Acidification is likely one of the culprits related to coral reef bleaching and dieback as well. Coral reefs, making up only .2 percent of the oceans, are a primary source of the ocean's biodiversity, fish stocks, and fisheries habitat. They are also sensitive environmental indicators.

Other climate change effects on oceans include the loss of marine biodiversity and storm intensity and frequency. Both have economic, social, and economic ramifications. Reduction of the global carbon footprint is the main response to the suite of climate change effects.

III. Developing Effective Communication Strategies for Stewardship Action

"The ocean takes care of us; let's return the favor."
— Thank You Ocean Campaign (www.thankyouocean.org)

"One protects what one likes and one likes what enchants us."
— Jacques Cousteau

A. Developing Memorable Messages

Message development is the art and science of connecting people to new information, concepts, ideas, actions, and products. Messages prompt us to try new things and change behaviors such as buying habits. Messages can be used to persuade people to adopt stewardship behaviors, from the simple (switching to efficient light bulbs) to the more difficult (significant reductions in personal energy consumption or changes in transportation habits). Stewardship messages can simply provide information or can be incorporated into long-term, community-based efforts designed to help a large number of people shift to new, sustainable behaviors.

Given the scale, complexity, and severity of ocean issues, how do educators begin to develop programs that successfully encourage audiences to adopt ocean-friendly behaviors? To explore this question, workshop participants focused on two of the Northeast's most pressing ocean issues, Sea Level Rise and Habitat Degradation/Restoration. With communication experts, they constructed a draft framework of messages, audiences, and actions to support the development of future programming. Several key concepts were helpful during this work:

- Scientific information alone is not sufficient to persuade people to change. Rather, inspiration and deep caring come from personal connections. Jacques Cousteau captured this idea in the quote above. Science is part of the equation: the information provided must be current, sound, and trustworthy. But to capture the attention of the public, enchantment is also necessary.
- Messages about ocean stewardship must provide grounds for hope. Alarmist language can lead to denial and inertia, rather than motivation to action. Successful messages empower people to act for their own good and for the broader good of the ocean.
- The scale of the ocean presents a challenge to stewardship action. Messages that break down large problems to an achievable local level are most effective. Begin with what people care most about: home, family, work, and community.
- Give target audiences clear ideas for actions that can make a difference. Even small-scale efforts can lead to behavioral changes. Ideally, actions will offer rewards, including the "feel good" benefit of doing the right thing. Once actions are adopted, they must be reinforced, and progress toward sustainability goals must be monitored and celebrated.

1. Messages on Sea Level Rise

The issue of sea level rise presents some challenges in developing messages because, for the general public, the annual increments of change may seem insubstantial. Unfortunately, too, the media has often presented the issue in sensational terms as a future problem with potentially dire consequences.

Sea level rise messages can seem conflicting. On the one hand, sea level has risen and will continue to do so, and communities need to adapt. On the other hand, the future *rate* of the rise is in question. By significantly reducing CO_2 and other greenhouse gas inputs to the atmosphere, humans could dramatically slow the rate of the rise. Therefore, workshop participants felt the issue of sea level rise required messages about both adaptation and slowing the rate of the rise.

Workshop participants devised several positive messages focused on the potential ways to deal with the problem through planning, adaptation, mitigation, and actions to reduce carbon footprints. For example:

- Sea level is rising and we can adapt to preserve our coastal communities.
- Sea level rise is not just a future problem. We can see its impacts today on our coastal communities. Communities can begin addressing sea level rise now. In addition, they can plan for the future in addressing continuing sea level rise.
- Individual and community actions to reduce carbon footprints can make a difference by reducing the rate of sea level rise. Data available today shows the collective impact of personal actions on improving environmental quality.

Workshop participants were asked to develop ideas for easy-to-remember messages, and several of these are included here as illustrations for possible future development. The messages focused on the value of personal action. For example:

- Your change can change climate change.
- Here's our change: [give example]. What's yours? (posted at a publicly accessible place)
- Drops in a bucket add up to a sea of change.
- You can slow the rise.

Workshop participants also explored linking positive action to economic benefits like protecting property values and recreational opportunities at beaches. Examples include:

- Preserve your children's economic future by [insert recommended action].
- Five dollars spent today will save fifteen future dollars.
- Be a smart coast dweller and [insert recommended action]. (as part of a potential "smart coast" program)

Other short messages focused more specifically on adapting to sea level rise:

- There's a sea change going on.
- Adapt to the rise.
- Arrange for change.
- Rise to the challenge of sea level rise.

2. Messages on Habitat Degradation/Restoration

Rather than focusing on the extent of degraded ecosystems, workshop participants felt that messages should emphasize the benefits of preservation and restoration. Coastal resource restoration efforts offer citizens a way to contribute to economic vitality and to the natural health

of their communities. As an exercise, workshop participants developed messages about the problem of nutrient enrichment. They noted the importance of the linkage between land and sea in preserving human health, fishing-related livelihoods, food security, and recreational opportunities:

- Restoring degraded coastal upland habitats improves ocean health.
- What happens on land affects the sea.
- We protect the places that protect the ocean.
- Preserve the "yum" factor: save our scallops! Don't fertilize in summer.
- Protecting and restoring natural ecosystems provides social benefits: human health, jobs, economic well-being, food, air quality, and recreational opportunities—for yourself, your children, and future generations.

B. Audiences and Actions

In interpretive and educational programs designed to foster behavioral change to restore ocean health, it is important to consider the knowledge, beliefs, and cultural values of the specific audiences that can have the greatest impact on the problem you are trying to address. Workshop participants brainstormed audience segments and considered sets of stewardship actions that these groups could take, as shown in the two tables below:

Table 1: Sea Level Rise

Audience	Action
Visitors	Reduce carbon footprint (make available a menu of actions).
Shoreline property owners, farmers, communities, states	Support the creation of wetland buffers.
Homeowners	Reduce home and transportation use of fossil fuels.
Protected areas	Model change and lead by example: abandon roads too close to the coast, enact energy conservation measures, construct green buildings.
Visitors, website visitors, municipalities, nonprofit partners	Support carbon offsets and credits; donate savings to habitats, refuges, and reserves.
Visitors, municipal leaders	Support local "coast-smart" development practices; create a list of actions communities can take to become more resilient in the face of sea level rise.
Homeowners, shoreline and homeowner associations	Reduce fertilizer/nitrate inputs.

Table 2: Habitat Degradation/Restoration

Audience	Action
Visitors	Reduce carbon footprint.
Visitors, fishermen, garden clubs, bird watchers, plant nurseries	Remove exotics; plant native species.
Builders, farmers, homeowners	Create natural wetland buffers.

Hikers and other recreational users	Initiate “stay off dunes/stay on trails” campaign; respect wildlife.
Youth and others	Go fishing; get involved in coastal clean-ups; volunteer at parks; encourage parents’ engagement and awareness.
Local boards, nonprofits	Create and implement zoning ordinances, town master plans, conservation strategies, and other local laws aimed at achieving sustainability.
Visitors	Provide financial support for wetland restoration.
Large boat operators	Reduce speed, sound, and the use of airplane spotters, whose ability to pinpoint desired species contributes to overfishing.
Homeowner associations, municipal sewage treatment facilities	Reduce fertilizer inputs; upgrade septic systems; upgrade sewage treatment plants to remove nitrates from groundwater.
Boaters	Use pump-out stations; stay in channels; clean boat hulls and propellers; use anchoring areas.
Government agencies	Expand the system of marine protected areas.
Commercial and sport fishermen, policymakers	Support the creation of marine protected areas; reduce bycatch; support “catch and release” practices; observe boundaries/restricted zones.
Visitors, restaurant chefs	Buy fish from healthy, sustainably harvested populations.
Conservation commissions, homeowner associations, town officials, developers	Restore salt marshes by increasing water flows and creating buffers.

IV. A Road Map for Developing Interpretive and Educational Communication Strategies That Promote Ocean Stewardship Actions

The "road map" laid out in this section guides the development of programs that lead not only to awareness but also to action. These sustained educational programs can be referred to as "community-based communication," which works effectively when global problems can be translated into manageable, realistic actions taken at the local level. This type of communication strategy focuses on specific audiences, their cultural values, and their barriers to change. It favors face-to-face contact, works with opinion leaders, and secures personal commitments. By harnessing the power of community social patterns, this approach fosters positive environmental behavior.

- **Plan.**
- A successful community-based communication strategy starts with careful planning.
- Identify the problem: work with scientists, agencies, and other sources of reliable information to clarify the most pressing stewardship issues and the actions needed to address them.
- Engage knowledgeable local partner organizations, recruit the necessary human resources, and establish relevant community connections to help develop and implement the program.

- **Develop a timetable of program phases that incorporates the long-term investment required to move from building awareness to promoting action.**
- Phase 1: Share knowledge to help people understand the problem, believe it exists, and care about it.
- Phase 2: Build the will to act.
- Phase 3: Reinforce positive public actions so people will continue to do good things.
- Phase 4: Monitor the resulting changes in human behavior and evaluate success.

- **Choose specific and effective actions that you are encouraging the public to take.**
- A general goal, like "saving the ocean," doesn't provide a concrete suggestion. Identify tangible actions people can reasonably carry out.
- Rather than list multiple actions, keep it simple by asking audiences to do just one thing.
- Start small: first steps can lead to larger actions.
- Don't ask audiences to do what they are already doing. Push the envelope.

- **Identify key audiences.**
- Understand your audience(s) by conducting research (literature searches, focus groups, and surveys) on local and regional core values, attitudes, incentives to act, barriers to action, perceived benefits, and desired rewards. People reject information that threatens their beliefs or doesn't line up with their values. As interpreters and educators, it is important to start with a deep cultural understanding.
- Find trusted advocates and spokespeople to bring your message(s) to the community.

- Work with opinion leaders; communication strategies don't need to target an entire group. When opinion leaders adopt change, other groups follow. People don't change behavior alone—they move in groups.
- Segment audiences in order to target messages as effectively as possible.
- Focus program efforts on audiences where you can have the greatest impact. Some people are ready to act and just want to know what to do. Some are highly resistant to change. Most people are somewhere in between. Targeting those who are ready to change and those who are in between can lead to powerful shifts.

➢ **Identify benefits and barriers to action.**

- Perceived benefits to community members can be economic, social, or psychological. They can enhance a sense of good feeling or self-esteem or provide a badge of honor. The more immediate and direct the benefit, the better.
- Barriers to behavioral change can include financial or time costs or other personal sacrifices. A person's values, beliefs, and perceptions of truth can be powerful barriers—but also powerful incentives—to change.
- An effective strategy for addressing values barriers is to offer educational programs that bring community members together in order to build community trust, openmindedness, and a sense of shared concerns.
- People need to feel the benefits outweigh the price of taking action in order to embrace change.

➢ **Develop effective messages.**

- Messages must be grounded in an understanding of the problem and in knowledge of the audience.
- Messages and actions that move audiences a moderate amount out of their comfort zones are more likely to be adopted. It is not worth your effort to distribute messages that already have audience support. Conversely, messages far outside of a group's norm will probably not be adopted.
- Develop a suite of messages for different program phases.

➢ **Determine how you will incorporate the messages into your educational/interpretive programming.**

- Determine the optimal time and location to make your case, place the materials, publicize the campaign, and air the messages.
- Develop a new education or interpretation program that incorporates the messages, or design a way to incorporate the messages into existing programming.
- Keep in mind that promotional techniques depend on the target audience and the goals of the communication strategy. In communication, the more direct and simple the approach, the better the chance the message will be received. Less is more. Research successful efforts and adopt a range of techniques that work well.

➢ **Test and evaluate the approach**.

- Seek feedback from a small pilot group before offering the program to a broader audience.

- Adjust messages and apply lessons learned from small groups before working with a larger audience.

➢ **Implement the program.**

- Carry out the program based on lessons from the pilot effort.
- Seek commitments to make change from individuals and groups (clubs, associations, organizations). Obtaining personal pledges is a powerful way to increase public participation rates in stewardship behaviors.

➢ **Reinforce, reward, and celebrate actions taken.**

- Consider including prompts—signs or reminders of the desired change—that can play an important part in helping people to remember and practice a new behavior. For example, a decal designed for a lawnmower can remind homeowners to raise the cutting bar; signs at a boat landing can remind boat owners to remove weeds from propellers; and stickers on fertilizer bags can remind homeowners of recommended ocean-friendly application rates and times.
- Publicize successful results to reinforce and reward the positive actions that people are taking; this can lead to more widespread action and to behaviors that become the new norm. People want to be part of a winning team. When they see how their personal actions lead to tangible environmental improvement, a sense of partnership and collaboration with managing organizations grows.

➢ **Monitor and evaluate.**

- Stewardship agencies and partners who are already monitoring the natural environment can also measure changes in human behavior that result from educational efforts. Over time, they can also measure the link between human actions and environmental improvements.
- Continue to evaluate the program and make changes to improve its effectiveness over time.
- Measure success in terms of stewardship outcomes. Conduct formative (as you go along) and summative (at the conclusion) assessments and adjust your strategies accordingly.
- If the program is not working, find out why and change it.

V. Ideas for Next Steps

The development of interpretation and education programs that incorporate ocean stewardship messages will require the acquisition of new skills, experimentation, and evaluation over time. The overall campaign will be part of a multi-year, multi-agency effort aimed at improving the stewardship of ocean resources.

Workshop participants proposed the following possible next steps:

- Create a web-based toolkit to support field interpreters and educators including such components as:
    - A compendium of common ocean stewardship messages
    - Information for staff on techniques for developing effective communication messages that promote stewardship action
    - Templates for PowerPoint presentations and brochures about key ocean issues such as sea level rise caused by climate change. These templates could be designed to be modified for use in educational and interpretive programs at individual sites.

- Hold a series of webinars for interpretation and education staff on developing effective communication messages that promote ocean stewardship.
- Plan a pilot program that encourages public stewardship of ocean and coastal areas. The plan should include identification of pilot sites in the Northeast along with proposed outcomes, materials, a timeline, benchmarks, evaluation tools, etc. Create a database and map of participating sites and contact information.
- Building from the above, identify opportunities for developing stronger linkages between interpretation and education program staff and scientists at individual parks, sanctuaries, reserves, refuges, protected areas, and partner sites.
- In addition to building on the preliminary messages and approaches developed in this workshop, it might prove fruitful to replicate this workshop elsewhere and broaden the cooperation, organizational alignment, and overarching messages.

Selected Ocean Stewardship Resources

Intergovernmental Panel on Climate Change. Summary for Policymakers. In *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, S. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor, and H.L. Miller, eds. Cambridge: Cambridge University Press, 2007.

National Park Service Conservation Study Institute. *Annotated Ocean Literacy and Stewardship Resource Guide for Educators and Interpreters*, 2010. Available on www.nps.gov/csi.

Pew Oceans Commission. *America's Living Oceans: Charting a Course for Sea Change.* A Report to the Nation: Recommendations for a New Ocean Policy, 2003.

U.S. Commission on Ocean Policy. *An Ocean Blueprint for the 21st Century.* Final Report. Washington, DC, 2004.