

North Pacific meet
the Islands. "The
area is exceptional,"
something like 150
have been identified
the chilly, deep-
water islands, they
nutrients they
with at the sun-
sides of the food
creates the area's
fishes, and great
number of fishermen.

These associated
days is diving
is are prized in
most is by inde-
pendent nearby Santa
Although the
lake is limited
the number of
have been in
s. But a bur-
is still unreg-
boats in the
cano told me.
of a large part
such as Risso's
What are the
ge quantity?
caught in the
ing with other

checkfish ranks
of industries,
leading to sea
rowing busi-
larger ships
(,000 tons of
a day) giant
apound that
help bind and
products from
the American
rather about
never have
ces are you

commercial use
by the state,
the coast or
(on page 18)

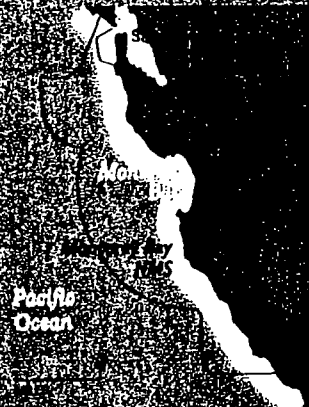
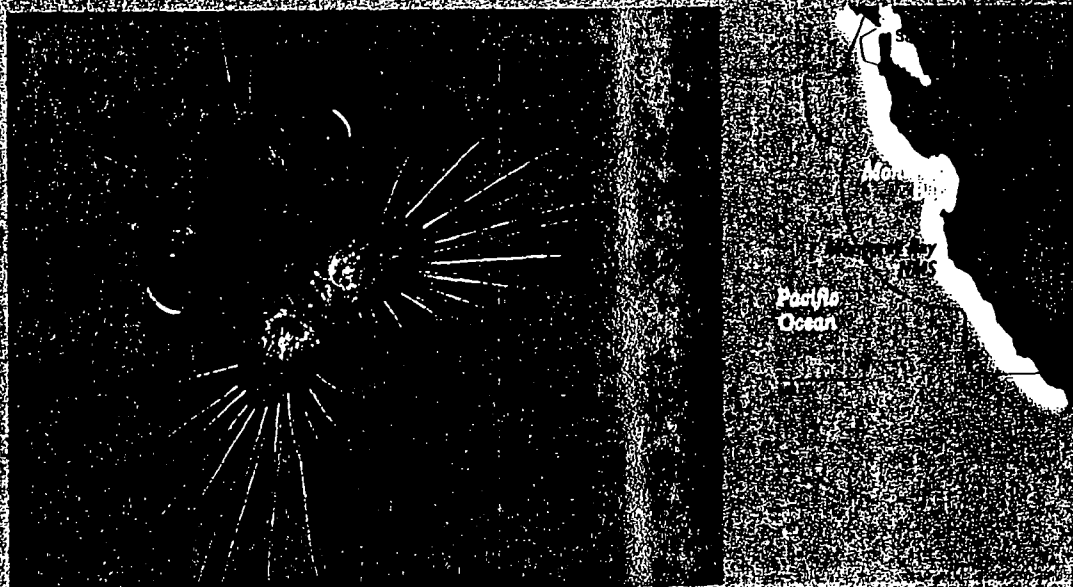
MARCH 1998



KENNETH / HAWKHO (BELOW); DAVID DOUBILET

MONTEREY BAY

Surprise takes many forms at the nation's largest marine laboratory—in the startled face of a harbor seal caught unawares underwater (below), in the bulk of an anchored aircraft carrier emerging from the mist (above), in the blue haze of the place. Spanning more than 450 miles of California coast and reaching east to the Golden Gate, Monterey Bay is the nation's largest deep-sea laboratory. It is a place where scientists from the Monterey Bay Aquarium Research Institute are using a new generation of deep-sea vehicles to explore the depths, study water chemistry, and discover new species. "Because this is such a quiet, we'll be able to get a more accurate picture of where animals live and how they behave," says biologist Judith Connor. "It's really exciting."



federally protected lands and waters. Yet it has the greatest potential to reshape our view of the world, whose surface is, after all, nearly three-quarters salt water.

As Sylvia Earle, former chief scientist for NOAA, observed, "To understand what makes Earth different from any other place, and why life can thrive here, it would be logical to focus on the part of the biosphere that supports most of the action—that is, the sea, of course." America's oldest national park, Yellowstone, was established in 1872. A full century would go by before lawmakers turned to safeguarding the nation's maritime treasures. Even as technology was rapidly advancing our understanding of the underwater realm, it boosted the potential for offshore development, notably mining and drilling. Headlines about disastrous oil spills and vanishing whale populations were making people increasingly uneasy about modern civilization's impact upon the sea. Thus, the Marine Protection, Research and Sanctuaries Act joined a flurry of environmental legislation making its way through Congress in 1972.

Monitor National Marine Sanctuary was the system's first entry, put in place in 1975 around the wreck of that famous ironclad vessel from the Civil War, which lies in 230 feet of water off Cape Hatteras, North Carolina. The entire reserve covers less than one square mile. By contrast the 3,696 square miles of Florida Keys sanctuary encompass the world's third largest barrier reef. Then there is Monterey Bay sanctuary, running for more than 350 miles along the California coast and as much as 53 miles seaward. Its northern boundary adjoins the Gulf of the Farallones, a sister reserve that is connected in turn to the Cordell Bank sanctuary farther north.

In all, the 12 units of the system take in some 18,000 square miles. That sounds huge. But the U.S. claims jurisdiction over ocean acreage nearly equal in size to the 50 states; marine sanctuaries make up barely half of one percent of it. However, two more sites—Northwest

Straits, in the Puget Sound area of Washington, and Thunder Bay, a freshwater reserve focused around a cluster of shipwrecks in Lake Huron—may be included in the near future, and many more are being considered.

Although resource protection is the major purpose, marine sanctuaries are by no means underwater parks. They are multiple-use areas, not surprising given that NOAA is a branch of the Department of Commerce. As a rule, you cannot drill, mine, dredge, dump waste in, or remove artifacts from a sanctuary, but shipping traffic is merely restricted to certain lanes to minimize the possibility of wrecks and spills. Commercial fishing, diving for edible species, and setting traps for crabs and lobsters are generally permitted. So are sportfishing, spearfishing, boating, and other types of recreation.

But sanctuary officials and visitors alike are beginning to wonder how many human activities may safely be allowed, and at what level, before they undercut the purpose of a marine reserve. On the other hand, at what point would tighter rules begin to strangle people's ability to wrest a living from the sea or simply enjoy traditional outings? What are the best uses of the natural resources that belong to every American, including the generations yet to come?

With more than half the U.S. population now living in coastal states, the young and growing sanctuary system inevitably finds itself being drawn into the kinds of debates that have long swirled around national forests and wildlife refuges. A key difference is that we have only a blurry idea of what's out in those salty depths, much less how their ecosystems work. Sanctuary managers list research as an urgent priority, for they are dealing with our planet's last and least explored frontier.

DURING THE YEAR I spent discovering the sanctuary system, I did a lot of my breathing through a snorkel and often headed deeper with scuba tanks. Water is 800 times as dense as air. The human sense of wonder can get multiplied by about the same amount beneath the waves. No matter how tidy and domesticated things may have become on shore, as soon as you stroke a few feet out, you are in wilderness. As in any good, untamed place, you also slip down the food chain a bit.

DOUGLAS H. CHADWICK, a wildlife biologist, took scuba lessons to prepare for this coverage. He is the author of *A Beast the Color of Winter* and *The Fate of the Elephant*. DAVID DOUBILET began making underwater photographs at age 12. This is his 44th byline in NATIONAL GEOGRAPHIC. A frequent contributor to the magazine, FLIP NICKLIN most recently photographed bearded seals for the March 1997 issue.



UNESCOPRESS

DIRECTOR GENERAL EXPRESSES SORROW AT DEATH OF JACQUES-YVES COUSTEAU

Paris, June 25 {No. 97-99} - UNESCO Director-General Federico Mayor expressed sorrow at news of the death of pioneering oceanographer Jacques-Yves Cousteau in Paris yesterday.

Extending his condolences to Mr Cousteau's family and colleagues, the Director-General declared: "Jacques-Yves Cousteau taught us more than almost anyone about the oceans he loved and understood at a time when few were aware of their essential role in maintaining the ecological balance of our planet. His pioneering scientific work and talents as a communicator have had an inestimable impact on our understanding of the risks facing the environment. His work and films informed many generations of people all over the world."

The Director-General also expressed regret at the loss of "a great friend of UNESCO. His invaluable intellectual contribution to our work will be particularly missed as UNESCO prepares to mark 1998 as the **International Year of the Ocean**."

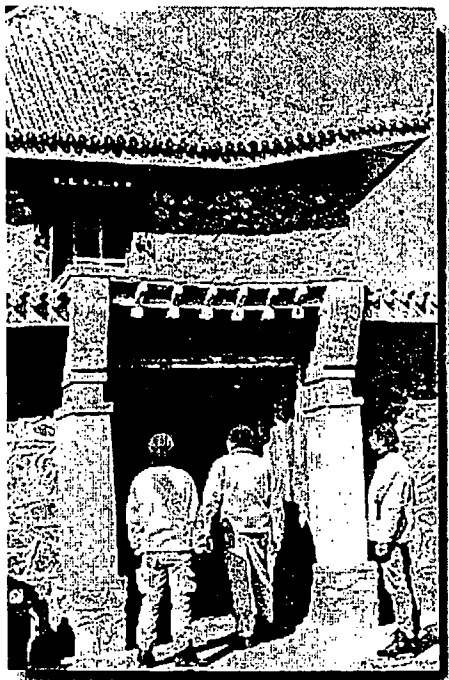
Mr Cousteau played a guiding role in developing the UNESCO-Cousteau Ecotechnie Programme (UCEP), founded in 1994 to train researchers and decision-makers through transdisciplinary curricula combining ecological, economic, social, cultural and technological studies. To date, five UCEP Chairs have been established at universities and research institutions in Europe and Asia, and additional chairs are under preparation in Africa, Asia and Latin America.

Mr Cousteau initiated and led a major campaign in which he collected more than five million signatures from around the world in support of an international declaration on the rights of future generations. He worked closely with UNESCO on the draft Declaration on the Safeguarding of Future Generations, which will be submitted for adoption at the Organisation's upcoming General Conference this November. The French oceanographer also collaborated in the work of UNESCO's youth programmes as well as with the Intergovernmental Oceanographic Commission, notably to highlight scientific solutions to ocean problems.

Visit [UNESCOPRESS On-line](http://www.unescopress.org)

- his son will be at Conf.
- Jacques-Yves Cousteau died one year ago this month.

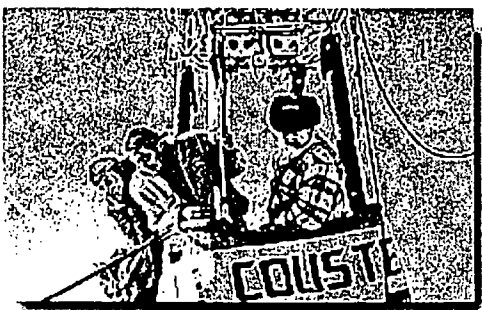
- ABOUT THE COUSTEAU SOCIETY -



► The Cousteau Society is a nonprofit, membership-supported organization dedicated to the protection and improvement of the quality of life for present and future generations. Founded in 1973 by Captain Jacques-Yves Cousteau, the Society now has more than 150,000 members worldwide. The Society believes that only an informed and alerted public can best make the decisions necessary to protect and manage the world's natural resources.

► The Cousteau teams have explored the water system throughout the world for over forty years. Their unique explorations and observations have been documented in over forty books, eight sets of filmstrips, four feature films and more than one hundred television documentary films that have helped millions of people to better understand and appreciate the fragility of life on our Water Planet.

► In the recent nine-year "Rediscovery of the World" series produced for global television distribution, its two research vessels, Calypso and Alcione, circumnavigated the Earth. The Society produces four hours of television each year. Films to date have included studies of Haiti, Cuba, the Marquesas Islands and the Tuamotu Archipelago, New Zealand, Australia, Papua New Guinea, Thailand, the Andaman Islands, Borneo, Indonesia, Madagascar, South Africa and the Mekong and Danube rivers among others. Currently, Cousteau teams are on expedition in Siberia. The Society's commitment to education is further demonstrated through its publications Calypso Log for adults and its award-winning children's magazine, Dolphin Log



► Its scientific research has involved a wide spectrum of activities. Beginning with the co-invention of the Aqualung, Cousteau teams have led in the development of underwater technology with systems ranging from underwater habitats to submarines and imaging systems. Cousteau engineering teams developed the windship, Alcione, and its unique wind-propulsion system of Turbosail(TM) cylinders. Through cooperation with independent scientists, expedition research includes projects that range from measuring the contribution of nutrients in rivers to the global ocean system, to developing new methods to measure primary productivity in the sea, to using new resource management techniques to assess the sustainability of development projects.

► The Society speaks in testimony and counsel to governing bodies and leaders on issues of global concern and extends its support to other environmental protection efforts, such as the Marine Mammal Stranding Network. In 1990, the Society launched a petition drive to protect Antarctica, the last vast pristine expanse on Earth, as a natural reserve dedicated to peace and science and was at the forefront of efforts that culminated in the international protocol which guarantees the prohibition of mineral activities for at least fifty years and implements a number of environmental protection measures.

► In the 1980s, working with the Society's Council of Advisors, Captain Cousteau defined a new approach to decision-making, named Ecotechnie, that integrates the environment with technology, and natural and social sciences. With UNESCO, the Society is establishing chairs of Ecotechnie studies at universities around the world.

► In keeping with its commitment to future generations, the Society is presently working toward having the United Nations

adopt a "Bill of Rights for Future Generations." A global petition campaign was launched in May 1991, and has generated more than 8 million signatures to date. The text has been approved by the Executive Committee of UNESCO and is expected to be submitted to the General Assembly at an upcoming session.

► The accidental sinking of renowned research vessel Calypso while in port in Singapore has accelerated a fund-raising campaign to build a new Calypso II. One of the first truly ecological ships in the world, Calypso II's innovations will include not only the shape of her hull but also her TurbosailTM propulsion system and advanced electronic equipment.

Why explore?

By Priit J. Vesilind

NATIONAL GEOGRAPHIC SENIOR WRITER

WE ARE A DIM and lonely star in the darkness of the deep-sea floor, where no other light has shone. I am on my belly in a submarine, 2,800 feet down—where the water pressure would crush the lungs of an unprotected human being—peering through a porthole. Our lights pick up mostly sediment across the antheavens of the Mediterranean Sea. Only the occasional grouper peers back.

I am on the NR-1, a U.S. Navy research submarine. Jules Verne's *Nautilus* come to reality. Nuclear powered, it can stay submerged indefinitely. A robotic arm with steel fingers protrudes from its bow. Retractable wheels emerge to let the vessel roll along the bottom like a slow and silent midnight train.

This summer the Navy has leased the NR-1 and its 11-man crew to a team of techno-archaeologists who have been exploring 2,000-year-old trade routes for shipwrecks. As I watch through the porthole, we reach the remains of a Roman-era cargo ship: silt-covered piles of amphorae—graceful clay pots for shipping wine or oil—copper kettles, an anchor.

Back on the nearby *Carolyn Chouest*, a surface support ship for the NR-1, Robert D. Ballard, of the Institute for Exploration in Mystic, Connecticut, savors this latest offspring of antiquity and high tech. Dr. Ballard, leader of the expedition, seems wired with an impatient and playful energy, as if born with an extra battery pack.

He and a cadre of technicians, computer scientists, and archaeologists are operating the

expedition's other underwater vehicle, the unmanned *Jason*, which is equipped with sonar, television, still cameras, and excavation tools and driven through fiber-optic cables from the *Carolyn Chouest*. The team has already discovered and mapped eight wrecks. Archaeological exploration has never been attempted this deep, on such a scale, and with such a multidisciplinary team.

"The limit of scuba divers and most marine archaeologists is 200 feet," Ballard told me when I returned to the mother ship. "But 97 percent of the ocean lies below 200 feet. Some 10,000 ships have sunk in this area of the Mediterranean alone. Most shallow-water wrecks have already been looted, but the wrecks we're finding here are pristine."

Archaeology is a new discipline for Ballard, who pioneered journeys to the Mid-Atlantic Ridge, discovered new life forms around hydrothermal vents in the Galápagos, and located the *Titanic*. He describes his work as a series of quests, like the ones undertaken by the original Jason in pursuit of the Golden Fleece.

"Exploration is still the epic journey," he said, "to dream, to prepare yourself, to assemble your team of argonauts, to go forth to be tested mentally and physically by the gods. To pass the test, be given the truth, and then come back and share the new wisdom."

For Ballard the spirit of exploration is an integral part of being human. "Everyone is an explorer," he said. "How could you possibly live your life looking at a door and not go open it?"

But meaningful exploration today takes more than courage and ambition. It often requires specialized education and expensive hardware—not an undertaking for everyman.

Since Galileo the things that we've been seeing are beyond

"The key is science," said Ballard. "Science gives legitimacy and worth to exploration. You see a lot of stunts today, but if you're not doing worthwhile science, you're not an explorer. You're just wandering around."

Is there still a place for argonauts, or have they been supplanted by machines and a technical elite? And if exploration still carries personal glory and national prestige, what journeys are legitimate? Why do we explore?

To take stock, I visited four professionals who have come to symbolize achievement in the three arenas of exploration: Ballard in the sea, Richard and Meave Leakey, paleoanthropologists on land, and Neil Armstrong, former astronaut and lunar pioneer in air and space.

I found that exploration is a passion that is intertwined with our search for origins and destiny. It demands good science, and it celebrates the human spirit.

A THOUSAND YEARS ago the world known to Western civilizations centered on this Mediterranean Sea. It extended to China in the east, the Baltic Sea to the north, Saharan Africa and India to the south. Westward lay the vast and dreaded "green sea of darkness," and farther south smoldered a semi-mythical terra incognita, a land where, it was said, men turned permanently black.

Societies lived in mutual ignorance of one another. The French did not know of the Incas, and the Songhai of Africa had no inkling of the Inuit. "The unknown and the forbidden were thought to be the same," writes historian Daniel Boorstin, and better left to priests and wizards. The explorer stood apart as someone with a touch of madness.

Norseman Leif Eriksson reached North America around the year 1000, but the momentum to explore built slowly. It would be five centuries before other Europeans landed on that continent.

Why were Europeans the ones to push to the Americas? The Chinese and Arabs had the resources and technology to leap the seas, and both plied the Indian Ocean and the Asian

Pacific for trade. But exploration? By the mid-15th century China had withdrawn into traditional Confucian isolationism. The Arabs, with access to the minerals and spices of Africa and the Far East, saw no need to journey into the unknown.

Europe, on the other hand, needed gold and silver; its mines could not keep pace with the demand for coinage. Ottoman Turks blocked the overland routes to Asia. Only the sea held the promise of new wealth.

Christianity reconciled profit with piety. God had commanded the human race to subdue the Earth, and Christianity valued individual action; exploration would glorify God. The Portuguese and Spanish, when they tested the Atlantic, were still imbued with medieval chivalry and the fervor of the Crusades. If Africans or Native Americans were killed or enslaved in the process of their conversion, it was a small price to pay for eternal life.

With the return of Magellan's ship in 1522 from its circumnavigation of the globe came the confirmation that the oceans were interconnected, boosting the age of discovery. National rivalries propelled the brave and ambitious. The English, as well as the Spanish, Portuguese, and French, became obsessed with finding the "river of the west" through North America to the Orient.

It was not until the 1700s that intellectual curiosity emerged as a primary motivation for European explorers. From 1768 to 1779 English Captain James Cook charted the waters of the Pacific and upgraded the standards of exploration forever. By 1800 most of the seas had been explored and roughly mapped.

The voyage of the British Navy's H.M.S. *Challenger* from 1872 to 1876 was the first devoted to studying the world's oceans, but 120 years later oceanography, like astronomy, has touched only the fringes of its science.

"It's mind-boggling," said Bob Ballard. "It's almost the year 2000, and we're probing the moons of Jupiter, but most of the ocean floor remains totally unexplored."

"The land surface beneath the sea is 71 percent of the Earth," he said, "and the

life form
a meter
found it
vents m
our plan

In
Eq
ac
wo
so trans
each po
lar dust
tant star
Lions
says my
outside
awestr
in the A
years ag
strod
ley. Fron
and ever

Richa
yan pal
Leakey;
and beca
humans
family h
work of
tions des

Since
explorat
who loo
archaeol
layers of

to m
backwan
said: "To
we need

Richa
Gessna
knees as
ago. A fi
nuisance
Valley w
million;
theses to

are beyond

human understanding or comprehension.

—NEIL ARMSTRONG

ration? By the mid-19th century, drawn into trade with the Arabs, with the spices of Africa, they had to journey into

needed gold and keep pace with the man. Turks blocked. Only the sea held

profit with piety. Human race to subvert, valued individual glorify God. The then they tested the with medieval chivalry. If Africans killed or enslaved in Africa, it was a small

lan's ship in 1522 of the globe came.ceans were interlarded of discovery. and the brave and all as the Spanish, me obsessed with through North

that intellectual many motivation in 1768 to 1779 charted the waters the standards of most of the seas mapped.

Navy's H.M.S. 1766 was the first oceans, but 120 astronomy, has science.

Bob Ballard. "It's are probing the the ocean floor

the sea is 71 said, "and the

life-form they think they may have found in a meteorite from Mars is similar to one we found in the vents around the Galápagos. Such vents may be the site of the origin of life on our planet."

IN THE ARID SAVANNA of Kenya, near the Equator, the sun plummets behind the acacia trees and the stars explode like fireworks. Mars glows amber, and the sky is so transparent that even the blackness between each point of light is sprinkled with a fine stellar dust, each grain another unfathomably distant star.

Lions don't come around the camp much, says my host, Richard Leakey, so I drag my bed outside the tent and lie beneath the stars, too awestruck to sleep. The light from those stars in the Andromeda galaxy left some two million years ago, when the hominid called *Homo erectus* strode two-legged across this very river valley. From Africa the first explorers reached out and eventually populated the Earth.

Richard Leakey is the maverick son of Kenyan paleoanthropologists Louis and Mary Leakey, a man who refused a college education and became one of the world's experts on early humans. He and his wife, Meave, sustain a family legacy of research that is now, with the work of their daughter Louise, three generations deep.

Since the continents have been mapped, exploration of the Earth is largely left to those who look inside—geologists, paleontologists, archaeologists—scientists traveling through layers of time instead of distance.

"To me it's a question of being able to look backward and give the present a root," Richard said. "To give meaning to where we are today, we need to look at where we've come from."

Richard, who flew me here in a four-seat Cessna from Nairobi, lost both legs below the knees as a result of an airplane crash four years ago. A fearless man, he regards this as just a nuisance. As we circled the site in the Great Rift Valley where Meave has been excavating four-million-year-old fossils, he adjusted his prostheses to make sure the shoes sat firmly on the

brakes before we roared down to the crude earthen strip and rattled to a halt.

He looked over and grinned: "Bet you've never been flown by a double amputee before!"

Grandson of missionaries, Richard explores in part to bring credit and dignity to Africans. Since his work has been validating the theory of evolution, he has problems with some religious views, particularly with regard to the issue of our origins.

"This is an enormously important issue for me," he said. "It seems so totally wrong that the African people are lacking the real sense of being important to the planet. Here is a continent that should be looking at its prehistory and saying, 'This is where everyone began.'"

The irony is that religion and scientific exploration attract equally ardent disciples. "In both, if you have total belief in the righteousness of your cause," said Richard, "you will do extraordinary things and take enormous risks. As a scientist you can do it because you desperately want to know. That is what is driving Ballard to the bottom of the sea and people into space, and people to live in really rough conditions year after year, digging in the ground, because they want the truth. They want to know what is there."

Said Meave Leakey, "Exploration is an obsession. The more I discover, the more I want to know. Unfortunately I will not discover everything I want. One can never, never find all the answers."

Most of the world was finally linked in the 19th century, as technological advances energized the expansion of the United States and the colonization of Africa by Great Britain, France, Germany, and Belgium.

European explorers knew they were not "discovering" these lands that others had occupied for centuries but bringing knowledge of them into a shared record. "Unknown to science" was the new criterion for discovery, and scientific explorers felt they were assembling an inventory of Earth.

The polar regions were last to be defined, and their mapping ended the era of nationalistic land exploration. The Antarctic Treaty of

1959 turned that continent into an international scientific preserve, shared today by 43 nations. The Poles still attract adventurers eager to test their endurance, but scientists there proceed systematically, using the most advanced technology. The answer is their Golden Fleece.

BYOND THE HAZE of atmosphere, astronauts say, stars do not twinkle—they remain constant—their steadiness mocking the paltry distances humans have traveled. Stars are in fact unspeakably hostile to life, immense and rav- enous. But to explorers, from Argonauts to astronauts, they have been a comfort. Michael Collins, who was the navigator on Apollo 11, man's first landing on the moon, wrote of the stars, "Even today, when I fly in the night sky, I look up and experience an almost physical wave of nostalgia. There are my old friends with friendly yet mysterious names."

Collins's Apollo 11 crewmate Neil Armstrong has never written a book about himself or the flight, humankind's most significant journey. Nor has he publicly philosophized about the heavenly bodies. His passion was to meet the technical challenge. "There was plenty of romance for everybody," he told me, "but not everybody could make it happen." He chose to be a doer.

Armstrong is careful to protect his privacy, so I met the first man on the moon in a hotel room near Cincinnati's international airport, a world of thundering jet engines, his kind of world. "I'm an explorer but not a discoverer," he said bluntly. "I've gone to places, but I haven't found anything that was previously unknown."

NASA astronauts are explorers of a different ilk, tethered to a vast bureaucracy for which the unknown is anathema. All uncertainties are to be avoided, or planned for.

Armstrong is an unassuming man from a small town in Ohio. He is armed with a crooked, boyish grin but suffers no fools. He deflects most publicity with an engineer's cool logic. "I was trying to follow NASA's stated mission:

Investigate the problems of flight and seek solutions to those problems. I was trying to find methods of making craft that would expand the human envelope."

But the motivation to send humans into space was not primarily technical or scientific. It was national pride, part of a high-stakes Cold War battle of ideologies.

The first man to orbit Earth, on April 12, 1961, was Russian cosmonaut Yuri Gagarin, followed in August by cosmonaut Gherman Titov. Titov tweaked American sensibilities when he told an interviewer, "I looked around and didn't see... God or angels."

So President John F. Kennedy's exhortation that year to land a man on the moon before the end of the decade could be compared to the Spanish call to rise against the Moors.

In December 1968 Frank Borman, Jim Lovell, and Bill Anders finally broke free of Earth's gravity in Apollo 8 and moved into lunar orbit. On Christmas Eve, while circling the bleak satellite, the U.S. astronauts answered Titov by reading from Genesis. Anders began: "In the beginning God created... And Borman finished, "and God saw that it was good."

"It's often been said, I think correctly," said Armstrong, "that Apollo 8 was the spirit of Apollo—leaving the shackles of Earth and being able to return." The moonwalk, he said, was simply another element of that concept.

Apollo 11 came the next year, and only 66 years after the Wright brothers at Kitty Hawk. Lunar scientists hoped that manned exploration would resolve competing theories about the origins of the moon and of Earth itself.

Some critics charged that the costs were unacceptable while economic disparity still plagued the U.S., but most of the world hailed the achievement. Despite the two-nation struggle, the Outer Space Treaty of 1967, patterned after the Antarctic Treaty, stipulated that "The exploration and use of outer space... shall be carried out for the benefit and in the interests of all countries... No one could own the moon."

"We came in peace for all mankind," reads the plaque that Armstrong and Buzz

It's almost the year 2000, and we're probing the moons of Jupiter, but most of the ocean floor remains totally unexplored.

—ROBERT BALLARD

light and seek
was trying to
aft that would

and humans into
ical or scientific
of a high-stakes

th, on April 12,
ut Yuri Gagarin,
monaut Gherman
rican sensibilities
,"I looked around
ngels."

edy's exhortation
he moon before the
e compared to the
the Moors.

k Borman, Jim Lov-
broke free of Earth's
yed into lunar orbit

le circling the bleak
ts answered Titov by
nders began: "In the

." And Borman fin-
hat it was good."

"think correctly," said
g, "that Apollo 8 was
of Apollo—leaving
les of Earth and being
aim." The moonwalk,
was simply another
f that concept.

"It came the next
only 66 years after the
fishers at Kitty Hawk.
entists hoped that
exploration would
competing theories
origins of the moon
all itself.

gies charged that the
while economic dis-
S, but most of the
lent. Despite the two-
ter Space Treaty of
Antarctic Treaty, stip-
ion and use of outer
ut for the benefit and
untries. . . ." No one

for all mankind,"
nstronaut Buzz

Aldrin left on the moon's surface.

"Do you feel you went for all mankind?"
Tasked Armstrong.

"I think so," he answered, after rolling the
question over in his mind. "The information
gathered, scientific and general interest, was
returned to all countries, friend and foe. NASA
never held anything back. That's about as close
to 'for all mankind' as one
could reasonably hope."

FIVE HUNDRED YEARS
before space flight,
learned men thought
the sun and planets
revolved around the Earth—
the center of the universe—
until astronomer Nicolaus
Copernicus advanced the as-
tounding idea that the Earth
rotates on its axis and revolves
around the sun.

The theory made sense to
Galileo Galilei, an Italian
mathematician. He constructed a 20-power
telescope in 1609 and lifted it to the heavens.

When Galileo attempted to reinterpret the
Bible using Copernican theory, the Roman
Catholic Church condemned the theory. In
1633 the Inquisition sentenced Galileo to life-
long house arrest for attempting to prove the
theory to be true. But it could not stem the
ascent of logic that spurred a revolution in
science. Scientific exploration elevated human-
kind but toppled us from the center of the uni-
verse. Our struggle ever since has been to
understand where and how we fit.

"Since Galileo the things we've been seeing
are beyond human understanding or com-
prehension," said Armstrong. "No question.
A cloud that's three light-years tall? Human
beings don't like to be considered small."

Today's most profound destinations are the
infinitesimal or the infinite: Biologists explore
microworlds, and the Hubble telescope, our
bright eye beyond the atmosphere, sends back
vivid and stunning images.

Now a new program has revived enthusi-
asm for on-site space exploration. Last July 4
NASA landed the three-foot-high Pathfinder
on Mars. Cushioned with air bags, it bounced
like a basketball, dribbled to a halt in freezing
darkness, and opened like a tulip. When the

sun energized its solar panels, out rolled a wag-
onlike vehicle called *Sojourner*, named for
Sojourner Truth, the 19th-century abolitionist.

On July 8, I turned my computer to the
Internet, put on cardboard 3-D glasses,
gripped the mouse, and embarked on a Mars
walk. My visit was one of nearly 47 million hits
on the Mars site that day. For one giddy week
we all became explorers.

Why were we on Mars again
after 21 years? To see if there is
evidence of life. The mystery of
genesis runs wistfully but pow-
erfully through exploration.
Pathfinder landed in a region
once swept by catastrophic
floods, where layers of rocks
are exposed as clearly as those
in the Great Rift Valley.

In September another NASA
probe—the Mars Global
Surveyor—went into orbit
around the planet for a two-
year mapping mission. The

agency plans to send pairs of spacecraft to
Mars every two years and foresees a manned
mission early in the 21st century. Maybe a hu-
man being, feet planted firmly on the planet,
can determine if Mars indeed hosted life.

And if life once thrived on that dusty planet
and died, what of life on Earth? Can we expect
to be overtaken someday by the natural evolu-
tion of heavenly bodies—to have been just a
wink in time? Humans are egocentric, fearing
extinction as much as cosmic loneliness.
Driven by reason from the center of the uni-
verse, we still search for who we are, exploring
deep-sea vents, the valleys of prehistoric rivers,
the floodplains of distant planets.

"Are we alone in the universe?" I asked Neil

Armstrong.

"Well," he answered, "we've seen a substan-
tial change in the confidence that there are
planetary systems outside our own. It was
strictly a hypothesis when I was a child."

Even if we are alone, the Apollo explorations
showed that Earth need not be the final
tomb for humankind. If we can reach beyond
our planet, we may ensure survival. We can
dream of immortality. We can strive to touch
the stars.

Priit Vesilind reports further on sea exploration
at www.nationalgeographic.com.

SYLVIA EARLE QUOTATIONS / CITATIONS

Introduction

xiv

us: every breath we take is linked to the sea. Clouds of freshwater are lofted from the sea surface to the atmosphere as vapor and return there, via the land, as fog, rain, sleet, and snow. Swirling hurricanes, billowing thunderheads, wispy cirrus clouds, are born in the ocean. This vast, three-dimensional realm, accounting for 97 percent of Earth's water, also makes up more than 95 percent of the biosphere, the planet's "living space." NOAA-biologist Nancy Foster says it succinctly: "Earth is a marine habitat."

Sometimes I try a poetic approach and describe how luminous, rainbow-colored jellies, starlike planktonic creatures, giant squid, translucent pink prawns, gray dolphins, brown lizards, spotted giraffes, emerald mosses, rustling grasses, every leaf on every tree and all people everywhere, even residents of inland cities and deserts who may never see the sea, are nonetheless dependent upon it.

Often I quote the eloquent bard of science Loren Eiseley in *The Immense Journey*:

If there is magic on this planet, it is contained in water. Its substance reaches everywhere; it touches the past and prepares the future; it moves under the poles and wanders thinly in the heights of air. It can assume forms of exquisite perfection in a snowflake, or strip the living to a single shining bone cast upon the sea.

Occasionally I draw upon Ogden Nash's "A Beginner's Guide to the Ocean":

*It is generally understood to be the source of much of our rain,
And ten thousand fleets are said to have swept over it in vain.*

Sometimes, I am tempted to leave oceanography to Ogden, but thoughtful questions posed about the significance of the sea to human survival and well-being demand deeper probing. To do so, I touch familiar pillars of my understanding of how things are, and peer over the edge of many great unknowns. Common sense forces me to consider first the incredible sweep of time that preceded this moment and the

worldly woman Clare Booth Luce, a congresswoman, playwright, former ambassador to Italy—and also an avid scuba diver. I was meeting with her to talk about our mutual interest in the fate of a vocal group of Hawaiian winter residents: the singing, spouting—and endangered—humpback whales. While we discussed ways to ensure their survival, it was natural to consider the broader issues of human attitudes toward the ocean.

"All the reasons for justifying going into space can be applied to the ocean, from basic curiosity and the pleasure of being there to scientific, commercial, military, and even lofty philosophical goals," I said. "You know, finding answers to the *big* questions: Where did we come from? Where are we going? How did life come to be? What has kept humankind from exploring the sea?" I asked. Is it something basically human, such as the fact that we are land-dwelling, air-breathing mammals, blessed with lungs, not gills, and feet, not flippers? Lack of wings has not kept us from flying, but many seem more comfortable with the idea of going to the moon or Mars than descending into the depths of the ocean. Why do you suppose this is so?"

Before answering, she gently lifted a large, pink prawn from her salad (one of those extraordinary creatures whose ancestry precedes ours by nearly half a billion years), paused, and looked out at the blue Pacific beyond the shore of her stately beachside villa.

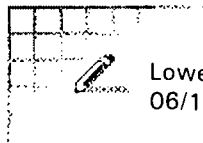
"Look, it's simple," she said. "I've thought about this a lot and am quite sure that it relates to human culture more than human nature." Casting her eyes toward a radiant bank of fluffy white Hawaiian clouds she said, "After all, *Heaven* is up there . . . and you know what's in the other direction!"

We laughed and began thinking of other everyday attitudes that serve to direct humans' interest skyward.

I said, "Yes, you often hear, Onward and upward! Never . . . Onward and downward!"

Looking pleased, she said, "*Nobody* wishes on a starfish. . . ."

It was my turn. "It's okay to feel as though you're flying—but who wants to be in over her head?"



Lowell A. Weiss
06/11/98 11:24:13 AM

Record Type: Record

To: Linda Lance/CEQ/EOP, Linda Ricci/OMB/EOP, Eli G. Attie/OVP @ OVP, Christine N. Macy/WHO/EOP

cc:

Subject: POTUS oceans remarks -- 11:10 am draft

Draft 6/11/98 11:10am

Lowell Weiss

**PRESIDENT WILLIAM J. CLINTON
REMARKS AT THE NATIONAL OCEAN CONFERENCE
MONTEREY, CA
June 12, 1998**

I have been an admirer of John Steinbeck, Monterey's favorite son, since I was a child. But it wasn't until I was preparing for this trip that I came to realize what a serious student of the seas he was. In fact, in his masterful account of his 4,000-mile collecting expedition that started about a half-mile from here, Steinbeck summed up, for me, precisely what our work at this conference is all about: "Most of the feeling we call religious is really the understanding that man is related to the whole, inextricably related to all reality.... This is a simple thing to say, but the profound feeling of it made a Jesus, a St. Augustine, a Charles Darwin, and an Einstein."

I suspect that all of us have had that profound feeling -- the abiding sense that we are inextricably linked with the whole of nature and, of course, with our majestic and mysterious seas. That is why we have convened this historic ocean conference. That is why it is so important that we leave Monterey not only with an appreciation for the divine beauty of this patch of coast, but also with a renewed sense of responsibility for helping to maintain living, thriving oceans all over the world.

When astronomers study the heavens for signs of life, they search for water, because water is the single nonnegotiable ingredient of life. Earth is blessed with, and defined by, its enormous oceans. They are the key to the life-support system for all the creatures on this planet -- from the giant tubeworms in deep-sea vents to saguaro cactuses in the most arid deserts.

In our daily lives, the oceans play a crucial role. Our oceans drive our climate and weather -- and El Nino's storms and droughts this past winter made that point loud and clear. Fish from the sea are one of the most important and most healthful staples of diets around the world -- and will become even more so as world population continues to grow. The oceans allow us the global mobility required by our armed forces around the world. Through fishing,

shipping, and tourism, the oceans sustain one in six American jobs.

The oceans are so vast and so powerful that we sometimes blithely assume that we can not affect them. We assume our actions represent a mere “drop in the ocean.” But as many of you have highlighted over the past day and a half, we can affect the chemistry, and therefore the biology, of our seas -- and we have.

Two-thirds of the world's people live within 50 miles of the coast, and far too much pollution from the land runs straight to the sea. One large city can release more than 9 million gallons of petroleum products a year, roughly the amount that spilled from the Exxon Valdez. Polluted runoff from watersheds has led to deadly red tides, brown tides, and has even helped to spawn new pathogens, like *Pfiesteria*, that devastate fisheries. Runoff from thousands of miles up the Mississippi River has been so severe that there is now a dead zone the size of New Jersey in the Gulf of Mexico. Ten percent of the world's coral reefs have been destroyed and another 30% will all but disappear within the next 20 years. It is estimated that medical waste that washed up onto Long Island and New Jersey beaches in the summer of 1988 cost as much as \$3 billion in lost revenue from tourism and recreation. And we have not yet learned the lesson of Monterey's Cannery Row; more than two-thirds of the world's fisheries are over-exploited; more one-third are in steady decline.

And as the Vice President highlighted at the White House earlier this week, we are also changing the physics of our seas. We've just learned that our oceans are warmer than they've ever been in the 104 years we've been taking their temperature -- more evidence that our emissions of greenhouse gases are heating the planet.

In all these ways, we have shown once again that we are inextricably linked to nature. We do, indeed, have the ability to harm. Fortunately, we have also learned that with innovative environmental efforts, we also have the power to heal. We have shown that we can clean the water we drink and the air we breath, protect marine sanctuaries and wildlife refuges, phase out deadly pesticides and ozone-eating chemicals -- and we have done it while producing the strongest, most competitive economy in the world.

With partnerships and persistence, we can extend this record of success to our oceans. If we want our children to inherit the bounty we have today, we must work together to make sure that the 21st century is the greatest century of stewardship of our seas.

First, we must save our shores from oil drilling. Here in California, you know all too well how oil spills from off-shore drilling can despoil our coasts -- causing not just the death of marine life and the destruction of fragile ecosystems, but also economic devastation in the tourism, recreation, and fishing industries. Even under the best of circumstances, most off-shore drilling is simply not worth the risk. All the oil in proven reserves off the coast of California would fuel our oil needs for a mere 38 days. In a few moments, I will sign a Directive that will extend the nation's moratorium on off-shore drilling for an additional ten years, while protecting all of our precious marine sanctuaries from drilling forever. I thank Sen. Boxer, Lt. Gov. Davis, Rep. Farr, and Rep. Capps for their leadership on this vital

issue. By standing firm against off-shore oil drilling here in California and around the nation, they have helped protect some of the most beautiful shores anywhere in the world.

Second, we must restore precious marine resources. To help create sustainable fisheries, I propose to help rebuild fish stocks within 10 years, work with industry to develop new technologies to net only targeted species of fish, and protect essential fish habitats. To protect and restore coral reefs, I will sign an Executive Order to speed our efforts to map and monitor reefs, research causes of their degradation, revive damaged reefs, and promote worldwide efforts to do the same. To reduce land-based pollution that threatens marine life, I call on Congress once again to fund my \$2.3 billion Clean Water Action Plan to reduce the diffuse pollution that has been running, unchecked, into our rivers, lakes, streams, and oceans.

Third, we must enhance our understanding of our seas. To help researchers track marine mammals, predict deadly storms, detect illegal fishing, and gain new insight into the complexities of climate change, the U.S. military will release previously classified data once used to hunt submarines. By the year 2002, we will complete an advanced ocean monitoring system that will also provide data for climate change studies. And, as the Vice President announced yesterday, we will provide new submersibles and other advanced tools for mapping and exploring the world's last great frontier.

Fourth, we must create sophisticated, sustainable ports for the 21st Century. International trade will nearly triple over the next two decades -- and more than 90% of this trade will move by ocean. Therefore, I propose a new Harbor Services Fund to help enhance our existing ports and provide state-of-the-art navigation tools to prevent marine accidents.

Finally, we must join the world in ratifying, at long last, the Convention on the Law of the Sea. The United States has achieved its economic success by championing the rule of law at home and abroad. The Convention on the Law of the Sea extends the rule of law to the world's oceans. It assures open seaways that our shippers, fishers, and military require. This is the year that the U.S. should -- and must -- assume its leadership role in the community of nations by becoming a full party to the Convention on the Law of the Sea.

In these ways, we will enhance the health of our oceans -- while expanding ocean opportunities in environmentally responsible ways.

During his marine expedition in the Gulf of Mexico, John Steinbeck called hope -- the idea that tomorrow can be better than today -- the defining human trait. I think we are also defined -- and blessed -- as a species with two other crucial traits: creativity and imagination. Hope, creativity, and imagination. These are the traits that enabled and inspired the very first explorers to take to the seas in search of more fertile shores. These are the traits that have allowed us to look at our inextricable tie to our environment and invent new ways to protect our natural wonders from harm. And in the 21st Century, these are the traits that will allow us to preserve our living oceans as a sacred legacy for all generations to come. Thank you for your hope, creativity, and imagination. God bless you all.

#

REMARKS BY VICE PRESIDENT AL GORE
NATIONAL OCEANS CONFERENCE
Friday, June 12, 1998

Five hundred years ago, the great Portugese explorer Vasco de Gama drew distant lands a little closer when he began the very first ocean voyage, around the Cape of Good Hope. Today, we can communicate across that great distance instantly, and cross it in a matter of hours. Yet the great ocean depths remain largely unexplored -- their natural wonders barely glimpsed, their potential bounty unknown.

That is why this historic Oceans Conference is so long overdue. And it is why President Clinton's commitment to protect, harvest, and explore our oceans is so important.

Oceans are critical not just to our economy, not just to our food supply, not just to America's trade and security -- but also to the fabric of life itself. They are perhaps the greatest natural treasure on God's Earth. We have a profound obligation to protect our oceans -- so that all generations can reap their benefits, and marvel at their deep blue majesty.

We call our planet the "Earth," but in truth, it holds a lot more saltwater than soil. Oceans cover 71 percent of the Earth's surface -- and contain 99 percent of all its living space.

If those statistics seem surprising, here are a few that hit even closer to home: Oceans sustain one out of every six American jobs, and coastal areas produce 85 percent of all our tourism dollars. In fact, beaches are the leading tourist destination in America. That may be why almost half of all construction in the United States during the 1970's and 1980's took place in coastal areas.

Fish and marine life are increasingly used for path-breaking medicines, including new cancer treatments and anti-inflammatory drugs.

Then there is the simple matter of quality of life. It is estimated that within thirty years, a billion more people will be living along the coasts than are alive today.

Given those statistics, it is surprising that we know so little about our oceans. Until recently, we knew more about the surface of the moon than about the ocean floor.

Here is what we do know: more and more, we are polluting coastal waters, exhausting important fisheries, and threatening the rich coral reefs that are the rain forests of the sea. Poor stewardship of the oceans is bad for the environment -- but it is also bad for our future, because it contaminates our beaches, compromises

our food supply, and robs us of a precious resource that depend upon.

For 5 ½ years, I have been proud to serve with President Clinton, who is not just one of the greatest environmentalists in modern times; he also understands the need for balanced, sustainable development -- the need to protect our natural resources so we can continue to use them and enjoy them.

President Clinton's record on these issues is clear: thanks to his leadership, we have formed creative new partnerships to protect water quality in the Florida Keys and in the San Francisco Bay Delta -- and a bold new plan to restore the glorious Florida Everglades. Thanks to his concern for fisherman and their families, we took emergency action save New England's cod, haddock, and yellowtail flounder from near-extinction. Because of his commitment to marine science and exploration, we're working to protect and restore large sections of damaged coral reef off the coast of Florida. And because he knows that our environment and our economy must go hand in hand, we are helping states dredge important ports and harbors in ways that are good for both the environment and the economy.

Mr. President, history will record that you are the very first President to chart a clear course for our oceans and waters -- to expand exploration and research; to protect fisheries and fishermen; to promote marine-based commerce; and to expand trade and security by preserving freedom of the seas. To use the language of the sea, America is proud to have you at the helm. This is the day we move full speed ahead.

In yesterday's plenary sessions, we learned a great deal about the challenges we face in protecting our oceans for the 21st Century. Today, we look forward to hearing President Clinton's vision for how we meet those challenges. I know he is determined to help us seize the opportunities our oceans offer, so that their glistening waters can keep inspiring all Americans -- in this year of the ocean, and every year. President Bill Clinton...

**FIRST LADY HILLARY RODHAM CLINTON
NATIONAL OCEANS CONFERENCE
MONTEREY, CALIFORNIA
JUNE 12, 1998**

Thank you, Senator Boxer, for that kind introduction. I'm very pleased to be joining you, the President, the Vice President, so many of you here today, for this national conference on the future of the world's oceans. I want to especially thank Commerce Secretary William Daley and Navy Secretary John Dalton, who have been the guiding forces behind this important gathering -- which helps celebrate the International Year of the Ocean.

We stand here today by the shores of one of the world's greatest oceans -- and surely one of its most beautiful coastal areas. Since the beginning of time, these vast waterways have helped spread commerce and ideas around the globe; linked nations and people together; and stirred our imaginations. Yet we have yet to fully explore their depths -- or map their contours, or harvest their wonders. The oceans truly are the planet's last frontier.

As we approach the next millennium, the President and I are hoping that all Americans will begin to think about what gifts to give to the future, and to decide what is so uniquely precious to our heritage, and so irreplaceable in our lives, that we must preserve them for future generations. The oceans, and particularly our coastal areas, are clearly such treasures. They play such a critical role in every aspects of our daily lives, and through the expansion of science and technology, they have the potential to yield even greater benefits to mankind in the years to come. Yet our oceans are as fragile as they are vast. Sustaining and protecting them will be one of the most enduring gifts we could possibly give to future generations. And I want to thank everyone here today is contributing to that gift.

It is my pleasure today to introduce one of the people who is playing a pivotal role in exploring and preserving this last great frontier -- Dr. Sylvia Alice Earle. She has a title that I think many of us would covet -- Explorer in Residence -- at the National Geographic. She also heads up Deep Ocean Exploration and Research Inc.

Ms. Earle is one of the nation's most highly regarded marine explorers and oceanographers -- who believes in the need to map and explore the oceans before they are further damaged. She is developing a "Sustainable Seas" program, which is designed to help us understand what resources exist in the National Marine Sanctuaries, and she's deeply committed to preserving those resources for future generations. Her work is supported by both the National Geographic Society and the Ruth and Bob Goldman Foundation.

It's a pleasure to introduce a scientist; engineer; teacher; and explorer: Sylvia Alice Earle.

22
190

EDUCATION, EXPLORATION, RESEARCH

CHAIRS **Katie McGinty**
Chair, Council on Environmental Quality
White House

Neal Lane
Director, National Science Foundation

Sylvia Alice Earle
Owner, Deep Ocean Exploration and Research, Inc.
Explorer in Residence, National Geographic

Ms. Earle is one of the nation's most recognized marine explorers and oceanographers. Her view is there is a strong need to map and explore the oceans before they are exploited. She is developing a "Sustainable Seas" program, designed to understand what resources exist in the National Marine Sanctuaries. She is also a strong believer in utilizing state-of-the-art technologies to observe the ocean and its resources. She is president of a marine technology company, but also is deeply committed to marine resource preservation.

Ms. Earle is part scientist, engineer, teacher, and explorer. She currently is leading a five-year exploration of the country's National Marine Sanctuaries as scientist in residence to the National Geographic Society and through a grant from the *Ruth and Bob Goldman Foundation*.

Robert Berj Gagosian
Director, Woods Hole Oceanographic Institution

With science degrees from MIT, Columbia, and California at Berkeley, and a subsequent career at a leading marine research institution Dr. Gagosian brings a wealth of knowledge in oceanographic, marine geochemistry, and marine engineering to this panel. His multiple research-cruise experiences also brings a practical understanding of conducting scientific investigations in an often inhospitable marine environment.

He has diverse and solid scientific credentials backed up by a 22-year career at one of the world's leading marine research institutions.

W. Thomas Mitchell
President and CEO, Genencor International

Mr. Mitchell represents the interests of private marine explorers who seek to invest, research and develop marine and deep sea products. He will note the potential value of new, and often untapped, marine resources to businesses and the economy.

Interdependence

from symbols of our tradition history

get a good

FIRST LADY HILLARY RODHAM CLINTON
NATIONAL OCEANS CONFERENCE
MONTEREY, CALIFORNIA
JUNE 12, 1998

Thank you, Senator Boxer, ^{and} for that kind introduction. I'm very pleased to be joining you, the President, the Vice President, so many of you here today, for this national conference on the future of the world's oceans. I want to especially thank Commerce Secretary William Daley and Navy Secretary John Dalton, who have been the guiding forces behind this important gathering -- which helps celebrate the International Year of the Ocean.

We stand here today by the shores of one of the world's greatest oceans -- and surely one of its most beautiful coastal areas. Since the beginning of time, these vast waterways have helped spread commerce and ideas around the globe; linked nations and people together; and stirred our imaginations. Yet we have yet to fully explore their depths -- or map their contours, or harvest their wonders. The oceans truly are the planet's last frontier. ~~from our last frontier~~

As we approach ^{then} the next millennium, the President and I are hoping that all Americans will begin to think about what gifts to give to the future, and to decide what treasures we should preserve for future generations. The oceans, and particularly our coastal areas, ^{play such an} critical role in every aspect of our daily lives. And through the expansion of science and technology, they have the potential to yield even greater benefits to our health and well being in the years to come. Yet our oceans are as fragile as they are vast. ^{Sustaining} Preserving them and protecting them will be one of the most enduring gifts we could possibly give to future generations. And I want to thank everyone here today ^{for} ~~is contributing to that gift.~~

It is my pleasure today to introduce one of the people who is playing a pivotal role in exploring and preserving this last great frontier -- Sylvia Alice Earle. She has a title that I think many of us would covet -- Explorer in Residence -- at the National Geographic. She also heads up Deep Ocean Exploration and Research Inc.

Ms. Earle is one of the nation's most highly regarded marine explorers and oceanographers -- who believes in the need to map and explore the oceans before they are further damaged. She is developing a "Sustainable Seas" program, which is designed to help us understand what resources exist in the National Marine Sanctuaries, and she's deeply committed to preserving those resources for future generations. Her work is supported by both the National Geographic Society and the Ruth and bob Goldman Foundation.

It's a pleasure to introduce a scientist; engineer; teacher; and explorer: Sylvia Alice Earle.

What is so precious and irreplaceable in our lives that we must preserve them

who is committed to preserving

are irreplaceable and so uniquely that are

as a part of our American experience

June 5, 1998

6-8-98

MEMORANDUM FOR THE PRESIDENT

FROM: MICHAEL WALDMAN *MW*

SUBJECT: SPEECHES IN THE UPCOMING WEEK

This memorandum lays out the themes of the speeches that will be coming up in the next week, as well as what we *hope* will be the headline. Please let us know if you have any concerns or guidance.

5/8 **UN Special Session on Drugs**
Goal: "President takes fight against drugs to UN"

This speech to the UN (approximately 10 minutes) will focus on both sides of the counternarcotics fight -- demand at home and supply. It will discuss our success to date in reducing demand at home, as well as highlighting the success that supplier-countries have had (with our help) in cutting off the flow of drugs. It will include several initiatives, most prominent of which will be a proposal to extend the anti-drug education campaign, extending the public service advertisements with a 5 year, \$2 billion initiative.

5/9 **Korean State Visit -- press conference opening statement**
Goal: "President praises Korean democracy"

The opening statement will stress how democracy has strengthened Korea as it has faced economic difficulty. It will refer to the need to pass IMF funding to help stabilize the world economy and secure America's prosperity. *NOTE:* We expect the Q&A, rather than the statement, to be the most newsworthy part of the press conference.

Signing of the highway bill
Goal: "President signs highway bill"

This statement will praise the highway bill for its support of rebuilding our infrastructure, and its support for welfare reform and the environment. It will note that this bill is a compromise, which includes more investment than we had sought, but that in all it maintains fiscal discipline and is good for America. *NOTE:* We expect this to receive only regional press coverage.

5/10 **Equal Pay event**
Goal: "President prods Congress to pass equal pay law"

This speech will mark the 35th Anniversary of the Equal Pay Act, signed by President

Kennedy. Family incomes are now rising, which has helped lift the incomes of both men and women. You will release a new CEA study showing that while the pay gap between women and men has shrunk over the years, it is still too large. You will call on Congress to pass legislation, introduced by Sen. Daschle, that strengthens the Equal Pay Act by increasing penalties for pay discrimination, and takes other steps.

5/11 **Foreign policy speech**

Goal: "Clinton answers China critics; says policy advances America's interests, security"

Events of recent weeks make plain that as we enter the 21st Century, America's relationship with Asia will be increasingly important [*Indonesia, India/Pakistan, stability on Korean peninsula*]. We are seeing more than ever that in all these areas, the relationship between the United States and China is a key to stability, peace and security. The President's policy of engagement -- and the trip to China -- are advancing the national interest, producing results in areas that matter to Americans: stability in Asia ... combating international crime ... protecting the environment ... preventing the spread of weapons of mass destruction ... improved human rights. America faces a choice: we can lead and work with China in the many areas important to our national interest, or we can go fools errand and try to isolate one quarter of the world's population.

5/12 **Oceans Conference**

Goal: "President bans offshore oil drilling in California, calls for action to save oceans"

The Oceans Conference in Monterey, where you will appear with the Vice President, will be an opportunity to broadly discuss efforts to protect the environment. To pass the Earth on to future generations, we must act now, in this moment of prosperity, to safeguard our natural treasures. The most newsworthy policy announcement will be a ban on offshore oil drilling along the California Coast.

5/13 **Portland State University Commencement Address**

"The New Immigration: Building One America in the 21st Century"

Radio address (same topic)

The central theme of the Portland State Address will be immigration -- how it is essential to the American experience, how it has shaped our values and our culture, and how it can continue to strengthen and enrich our nation to this day. We are in the midst of the greatest wave of immigrants since the turn of the last century. This new wave of immigrants, just as previous waves did before, once again raises fundamental questions -- Is this immigration a good thing? And as our people become more ethnically and culturally diverse, what does it mean to be an American?

First, the speech will make a forceful case for why the new immigration is good for

Why
Depends
Speech
This seems
like a waste
unless there's
nothing else
to do

America -- as immigrants renew our cities, **start new businesses**, refresh our culture. It will make a strong case against the anti-immigrant backlash.

Second, at the same time, it will argue that to maintain a strong nation in the face of unprecedented demographic change, we must all redouble our commitment to our shared values and ideals -- America's 'civic religion' -- which has helped absorb every generation of immigrants. Immigrants must **open themselves** to the culture they find here, recognizing that fully participating in the broader community of their country of choice is not at odds with respect to the country of birth. And native-born Americans should treat the new immigrants as we would have wanted our grandparents to be treated.

National Ocean Conference
June 11 - 12, 1998

Message Overview

President Clinton and Vice President Gore continue to make the environment a top priority for this Administration. Their work on tough new air quality standards and enforcement of the Safe Drinking Water Act assures families a healthier and safer environment in which to live. By preserving and restoring precious natural resources like the Florida's Everglades, Yellowstone Park and California's ancient redwoods, they are working to safeguard these treasures for future generations. The United States is leading international efforts to address global warming. And in 1998, the International Year of the Ocean, the President and Vice President are devoting special attention to protecting the oceans.

Oceans sustain nearly half of all life on Earth and provide us with many vital resources. They are a source of food, energy, commerce, medicine, and recreation. They shape our weather, link us to other nations, and are critical to our national security. In the 21st century, we will look increasingly to the oceans to meet our everyday needs.

At the National Ocean Conference, government experts, business executives, scientists, environmentalists, elected officials, and the public will come together to examine the opportunities and challenges we face as we work to restore and preserve our irreplaceable ocean resources, from the following four perspectives:

- Environment - Only through careful stewardship can we maintain the health of our oceans and the economic opportunities they provide, such as fishing and tourism. With many marine resources already over-stressed, we must increase efforts to prevent over fishing, coastal pollution, and other threats to our beaches and the ocean environment.
- Commerce - Oceans help sustain 1 of every 6 jobs in the United States through fishing, shipping, tourism, research, etc. With growing international trade and rising demand for ocean resources, our ports, coasts and ocean waters become ever more vital to our economic future.
- Exploration and Research - We must expand scientific efforts to catalog marine species and other ocean resources, identify promising new medicines and other materials, understand how the oceans regulate our climate, and gain the insights needed to restore and sustain marine ecosystems.

- Global Security - Freedom of the seas is vital to national security and international trade, and the presence of our naval forces around the world promotes peace and stability. We must work with other nations to ensure that our oceans remain free and open.

EXPLORING THE LAST U.S. FRONTIER: THE COASTAL OCEAN

The President/Vice President will announce expanded efforts to explore and map the U.S. domestic ocean using advanced underwater technology. Exploration will allow us to discover new sources for life-saving drugs and mineral deposits; find undersea volcanoes (precursors to new islands); locate historical artifacts (like the Titanic); better understand the balance of nature in the sea; and assess the economic value of the ocean to the domestic economy. The President/Vice President will highlight the Sustainable Seas partnership with the Goldman Foundation, National Geographic Society, NOAA, the Navy and NASA to explore the biodiversity and ecology of the nation's twelve marine sanctuaries.

New resources: The President's budget requests an additional \$ million for exploration activities. In addition, the President/Vice President will announce an additional \$4 million per year in 2000, 2001 and 2002 for the expansion of existing shallow water observatories – the Leo in New Jersey and the Aquarius in Florida, developing two new sea floor observatories one in the San Juan le Fuca Ridge and one in the Gulf of Mexico to monitor the deep ocean and its sea floor, leasing a state of the art autonomous vehicles for research and exploration missions.

Background

Although we derive vast environmental and economic benefits from our coastal waters, the potential and limits of these resources are not well understood. More exploration is required to discover and assess the unique resources of our coastal waters. Using advanced technologies, the U.S. must launch a coordinated effort to map biologic communities, understand the balance of nature in ocean environments--particularly protected or stressed areas, identify historical artifacts, and discover potential new sources of mineral deposits and life-saving pharmaceuticals. In addition, efforts to inventory fish populations will provide information on their ability to sustain themselves in the face of over-fishing, assess human impacts on biologic communities, and allow us to better manage, protect, and utilize marine resources in a more effective and environmentally-sound manner.

Thorough exploration and analysis of ocean and coastal environments require modern tools such as manned submersibles, unmanned vehicles, and a sea floor observing system that allow long-term underwater monitoring. Scientific data collected from these sources reveals a wealth of information with both environmental and economic implications. Ultimately, this information will need to be analyzed from an interdisciplinary standpoint to determine how ecosystem and economic health are related, as well as to assess the potential contributions of marine resources to

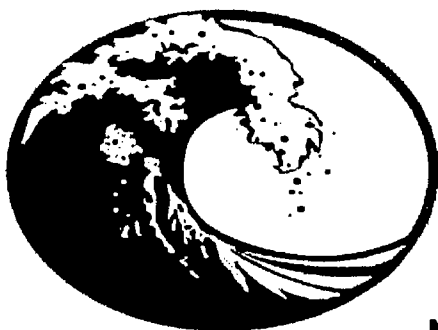
PSalm 24
 "The Earth is the
 Lord's." That is
 how we
 must view
 the way we
 live in
 this world.

the economy and their value as part of a complex and vital natural environment.

The President's budget expands the VENTS research program through which scientists have developed unique capabilities to detect and explore undersea volcanic activity. During eruptions, previously unknown life forms are blasted from below the sea floor. Scientists working with this program have just discovered exciting new life forms living at extremely high temperatures. The industrial, commercial, and medical applications of these newly discovered bacteria are expected to yield faster production of useful compounds or breaking down waste materials and toxic pollutants more efficiently.

The President/Vice President will highlight the partnership with Goldman Foundation and the National Geographic Society's Sustainable Seas Expedition, which will use submersibles to explore and map the coastal areas in the 12 National Marine Sanctuaries.

Finally, the Administration will conduct a comprehensive, 3-year assessment of the overall value of ocean resources and their contribution to the national economy.



National Ocean Conference

**Naval Postgraduate School
Monterey, California
June 11 - 12**



Conference Program

The National Ocean Conference will be a major U.S. contribution to the celebration of the International Year of the Ocean. It is being held in Monterey, California, June 11 & 12.

The conference will highlight the important role the ocean plays in the daily lives of people. The attendance of President Bill Clinton and Vice President Al Gore demonstrates the Administration's commitment to addressing critical ocean issues.

Organized by Commerce Secretary William Daley and Navy Secretary John Dalton, the conference will include representatives of academia, environmental groups, business and industry, and local, state and federal government.

Oceans sustain life on Earth and provide us with many vital resources. They are a source of food, energy, commerce, medicine, and recreation. They shape our weather, link us to other nations, and are critical to our national security. In the 21st century, we will look increasingly to the ocean to meet our everyday needs.

Our lives are inextricably linked to the ocean. One of every six jobs in the United States is marine-related, and one-third of our Gross Domestic Product is produced in the coastal zone through fishing, transportation, recreation and other industries. Our national security and foreign trade are dependent on preserving freedom of navigation on the high seas for military and commercial vessels worldwide.



Live Internet Broadcast



Conference Goals



Community Events



Year of the Ocean



Media Information



Regional Conference Program



Federal Agency Partners



Discussion Papers



Conference Program



Main Page

NATIONAL OCEAN CONFERENCE Oceans of Commerce, Oceans of Life US Naval Postgraduate School - 11 & 12 June 1998

Thursday morning

Discussions at the Conference will begin with forums organized into four concurrent sessions:

- I. Oceans and Commerce
- II. Oceans and Global Security
- III. Ocean Environment and Health, and
- IV. Ocean Exploration, Education, and Research.

During the forums, discussions will focus on the four subject areas and five crosscut topics:

1) ecosystem health; 2) sustainable use of ocean and coastal resources; 3) research; 4) law of the sea; and 5) ocean management.

Following the issue forums, a plenary session will convene during which highlights of the four subject areas from the morning sessions will be presented. Discussion during the plenary will then move to and center on the five crosscut issues.

Thursday afternoon

Plenary moderated by Vice President Gore. Forum chairmen will give brief report of highlights of general discussion. The Vice President will then lead a discussion of the four issue forums and the five crosscutting issues to begin building an ocean agenda for the 21st century.

Friday morning

Ocean programs and Policies for the 21st century. Remarks by Secretary of Commerce William Daley, Navy Secretary John Dalton, Vice President Al Gore and keynote address by President Bill Clinton

Conference Results

The National Ocean Conference is designed to:

- ☐ demonstrate the interlinked nature of ocean issues;

- ☐ bring together various interest groups to work on common ocean interests;
- ☐ encourage greater public awareness and environmental support for coastal ocean issues;
- ☐ initiate the development of a shared vision of America's Ocean Agenda for the 21st Century; and
- ☐ contribute an official message to the world community as it celebrates the International Year of the Ocean.

Products of the Conference will be a summary report of issue forums and plenary discussion of crosscut issues, and the President's remarks.

Highlights of these will be presented to an international audience on U. S. Day (14th June) at the Expo 98 oceans-focused World's Fair in Lisbon.



Conference Goals



Main Page

The National Ocean Conference is designed to:

- ☐ **demonstrate the interlinked nature of ocean issues;**
- ☐ **for the first time, bring together all ocean interest groups to identify common ocean goals;**
- ☐ **encourage greater public awareness and environmental support for coastal ocean issues;**
- ☐ **initiate the development of a shared vision of America's Ocean Agenda for the 21st Century; and**
- ☐ **contribute an official message to the world community as it celebrates the International Year of the Ocean.**

Products of the Conference will be a summary report of issue forums and plenary discussion of crosscut issues, and the President's remarks.

Highlights of these will be presented to an international audience on U. S. Day (14th June) at the Expo'98 oceans-focused World's Fair in Lisbon.



[Just for You -- Free Stuff!](#)

[National Ocean Conference](#)

[Reporters' Resources](#)

[In Your Neighborhood](#)

[Kids' & Teachers' Corner](#)

[Logo Information](#)

[Ocean Related Links](#)

[Federal Agency Links](#)

[Discussion Papers](#)

[Search this Web Site](#)

International Year of the *Ocean*



The Ocean is vital to life on earth. From the life-giving rain that nourishes crops, to life-saving medicines; from the fish that come from the ocean floor, to the goods that are transported on the sea's surface - the ocean plays a role in your life in some way every day.

In recognition of the importance of the marine environment, the United Nations has declared 1998 the International Year of the Ocean (YOTO). This designation provides individual organizations and governments with an important opportunity to raise public awareness and understanding of the ocean and related issues.

The United States is participating in YOTO activities through the Ocean Principals Group, an informal group of federal agencies with ocean interests.

Learn more about Year of the Ocean activities and opportunities on this Web site.

Year of the Ocean
Get Into It!

**The International Year of the Ocean is a publication of
the NOAA Home Page Design and Construction Company**

Ann Lewis: we should tie millennium themes; oceans last great frontier on earth; part of american spirit is spread of exploration; need to preserve these environments for future generations; by doing so, we are honoring previous generations; introducing real person;

HRC: introducing a real person: wonderful woman who is very well known in ocean community: Sylvia Alice Earle; explorer in redicne with national geographic magazine;

issue: one of deliverables: exploration of the sea into the 21st century; invovling special places; (millennium work); this will become more detailed; language;

1-2 minutes;

congressman Farr; to senator boxer; to first lady; first lady to sylvia; sylvia to vp; vp to potus;

DRAFT

190

Exploring the Last U.S. Frontier

X An additional \$4 million/year in 2000, 2001, 2002 to expand two existing shallow-water observatories (Leo in New Jersey, Aquarius in Florida); develop two new deep-ocean observatories (in San Juan de Fuca Ridge and the Gulf of Mexico); develop two new submersible vehicles that can go deeper than any before (this will be done in partnership with others); contribute \$250,000/year to a partnership with National Geographic Society and the Goldman Foundation to map and explore biodiversity in the 12 national marine sanctuaries; and assess the economic value of U.S. marine resources. **Strengthen marine protected areas:** complete an inventory of marine sanctuaries, and revise sanctuary management plans by 2002.

Protecting Coral Reefs

The President will sign an executive order to protect and restore coral reefs, and announce an additional \$2 million/year in 2000, 2001 and 2002 to speed implementation. NOAA and Interior will restore 20 damaged reefs by 2002. A task force, co-chaired by the Interior Secretary and the NOAA administrator, will work with others to map and monitor reefs, research causes of their degradation, restore damaged reefs, and assess U.S. role in loss of non-U.S. reefs. These efforts build on the International Coral Reef Initiative begun by the U.S. in 1994 to promote worldwide efforts to protect reefs.

Building Sustainable Fisheries

The President's budget proposes an additional \$185 million over five years to increase the frequency and accuracy of fish stock assessments; reduce overfishing (plans in place by October to rebuild stocks within 10 years); reduce bycatch (work with industry to develop new technologies) and protect essential fish habitat (management plans revised by October to identify essential habitat). The sale or import of undersized Atlantic swordfish will be banned. An additional \$3 million/year for 3 years to develop environmentally sound aquaculture. [The President will call on other nations to also implement strong measures to ensure sustainable fisheries and to join the U.S. in strengthening fisheries protections.]

Public Access to Military Data

As a result of the Environmental Task Force originated by Vice President Gore while in the Senate, the Navy will release Arctic under-ice data collected by submarines that will enhance our understanding of the climate system. The Navy will also work with the private sector to release previously classified data once used to hunt

submarines. These data can be used to track whale migrations, predict tsunamis, detect illegal fishing and support climate change research. Over the next five years, DOD will complete and release to the public computer-based nautical charts for most international waters.

Ports for the 21st Century

The President will propose a new Harbor Services Fund to raise \$800 million by 2002 to finance harbor dredging and port modernization. The funds could also be used for state-of-the-art navigation tools to prevent marine accidents by providing ships with accurate nautical data, such as water depth and current speed.

Protecting Our Coastal Waters

As part of the President's Clean Water Action plan: EPA will launch a web site to inform the public of beach closings and advisories; Federal agencies will work with states to research, predict and control toxic algae blooms; Federal agencies will help states develop plans to reduce polluted runoff to coastal waters. The President will call on Congress to fully fund the \$2.3 billion (over five years) Clean Water Action Plan.

Climate Forecasting

An additional \$4 million/year over three years will complete an ocean monitoring system by 2002. This system will complement satellite measurements and provide a better understanding of the relationship between oceans and long-term climate change and predict regional impacts of climate change.

Protecting, Exploring and Sustaining Ocean Resources

The President will direct Cabinet Secretaries and agency heads to assess the state of coastal oceans and make recommendations for protecting, exploring and managing them in the 21st century. The report to the President will be submitted by the Secretaries of Commerce and Navy by June 1999. The agencies would work closely with the Ocean Commission proposed under the Oceans Act of 1998.

LAW OF THE SEA.

Oil

Farr

1998 Year of the Ocean

THE LEGENDARY OCEAN¾ THE UNEXPLORED FRONTIER

Contents

1. EXECUTIVE SUMMARY	L-2
2. SEAS OF LEGENDS, LIFE, AND DISCOVERY	L-3
3. A LONG HISTORY OF OCEANIC EXPLORATION	L-3
4. TECHNOLOGY FOR DISCOVERY	L-5
5. THE WEALTH AND WONDER OF THE OCEANS	L-7
6. NAVIGATING THE FUTURE	L-9
7. THE FUTURE	L-12
8. REFERENCES	L-12

This Year of the Ocean document was prepared as a background discussion paper and does not necessarily reflect the policies of the U.S. Government or the U.S. Government agencies that participated in its preparation.

EXECUTIVE SUMMARY

The ocean remains as one of Earth's last unexplored frontiers. It has stirred our imaginations over the millennia and has lead to the discovery of new lands, immense deposits and reservoirs of resources, and startling scientific findings. The presence of the human eye and the human ability to sample and to conduct experiments from the coastal regions to the deep ocean abyss has provided answers to questions on such critical issues as global change, waste disposal, mineral deposits, and the creation of life itself. In spite of the development of new technologies, comparatively little of the ocean has been studied. The leadership role of the United States has been eroded by a gradual decrease in funding support in spite of public opinion polls that indicate that ocean exploration is more important than space studies. As

public opinion polls that indicate that ocean exploration is more important than space studies. As exciting and enlightening as ocean discoveries have been, they will likely pale in comparison to future discoveries.

SEAS OF LEGENDS, LIFE AND DISCOVERY

The ocean stirs the imagination. Covering more than 70 percent of the surface of the earth, the ocean's beauty and power has long been a source of awe as well as suspicion for many cultures. Legends were developed to help explain both the ocean and our own existence. The Greeks named Poseidon the god of the sea to help protect their seafarers and fishermen. The Eskimos told the story of a sea goddess Sedna, whose lost fingers filled the oceans with marine fish and mammals. In pursuit of meaning¾ both material and spiritual¾ many cultures have turned to the sea for inspiration as well as survival. Although few explorers discovered the riches they initially sought, they found not only new lands, but also unexpected, bizarre, and dazzling deep-sea creatures inhabiting an alien world.

Within the past few decades, ocean explorers have uncovered evidence of plate tectonics. These are global geological processes fundamental to the basic understanding of the Earth upon which we live. As exciting and promising as discoveries such as these have been, however, they may pale in comparison to what future exploration may uncover. It must again be noted that these discoveries, some of which shake the very foundations of centuries old beliefs about the basic nature of the Earth, are very recent. As a result of the tools now becoming available, the pace of discovery is escalating rapidly. In the past 25 years, mankind has learned more about the ocean and what lies beneath its surface than had been learned throughout all of previous human history.

A LONG HISTORY OF OCEANIC EXPLORATION

Early Explorations

The ocean was a highway for early explorers. As early as 2000 B.C., Phoenicians sailed the waters of the Mediterranean, the Red Sea, and the Indian Ocean. There is some evidence Phoenicians even ventured beyond the Strait of Gibraltar. Scandinavian sailors apparently reached North America around 1000 A.D. During the period 1492-1522, known in the culture of the Western world as the Age of Discovery, mankind began to fully realize the vastness of the earth's water-covered surface. During this period, the world was first circumnavigated, North and South America were discovered, and human cultures began to develop a modern view of geography.

Following this period, exploration became a tool of empire-building for European nations, and was often associated with the pursuit of scientific interests. Between 1772 and 1779, Captain James Cook made several extraordinary voyages that added greatly to the scientific understanding of the ocean, geography, and anthropology. In addition to discovering Australia, New Zealand, and Hawaii, he sampled subsurface temperatures, measured winds and currents, conducted soundings, and collected important data on coral reefs.

The earliest successful explorers of the deep ocean were Sir John Ross and Sir James Clark Ross. In 1817 off Baffin Bay, Canada, Sir John collected samples of bottom dwelling organisms including starfish and worms from a depth of 1.8 km. Sir James conducted soundings with a 7-km line during several voyages to the Antarctic from 1839-1843. Their results spurred scientific interest in deep-sea life. In the mid-19th century, scientific exploration of deep waters was further encouraged by the Azoic Theory of Edward Forbes, which held that life did not and could not exist below about 300 fathoms (1,800 ft). The desire to test this hypothesis has led to further exploration until, eventually, no depth has been completely unstudied.

been completely unstudied.

The history of oceanography and deep-sea research has been one of cyclic fluctuations, each cycle involving more sophisticated research as it builds on previous knowledge. These research cycles have always included significant government support, because oceanographic research is very expensive, requires long-term commitments of personnel and assets, and does not necessarily provide information that can be of immediate or specific commercial use.

Modern Oceanography

Modern oceanography can be considered to have started with the voyage of HMS Porcupine in 1869. However, it is the voyage of HMS Challenger (1872-1876) that is most famous. In both cases, these expeditions were made possible because of government support for exploration and scientific research. During the 127,500-km voyage, the Challenger scientists plotted the first systematic contour lines of ocean basins, currents, and temperatures. Although they labored under conditions much more primitive than those of modern oceanographers, they obtained some remarkable information, including a depth measurement of over 8,000 meters in the Mariana Trench in the western Pacific Ocean.. This measurement was made using piano wire for a sounding line. The Azoic theory was subsequently rejected; abundant life occurred at most depths. More than 4700 new species were collected with nets and bottom dredges.

World War II provided another set of strong reasons for developing a better understanding of the seas. While wars fought at sea were not new, what was new was a major thrust by maritime powers to understand the medium they were using as a battleground in order to improve their fighting and defense capabilities. Thus the U.S. Navy, as well as navies of other developed nations, devoted sizable resources to understanding the oceans and to developing capabilities to improve this understanding. Wartime requirements resulted in improved oceanographic instrumentation, surface and bottom charts, long-range weather prediction, submarine detection equipment and an enhanced understanding of underwater sound.

The past 50 years have seen milestone developments in technologies and capabilities that have greatly contributed to oceanography. Some of these include research submersibles, satellites, sonar technology, surface platforms and, of course, the computer.

TECHNOLOGY FOR DISCOVERY

Exploring the Deep Sea

Humans first explored the ocean by directly observing it or by placing samplers and instruments into the sea from their ships. These techniques were limited by the relatively shallow depths then attainable by humans and the relative opaqueness of the sea. Light is rapidly absorbed by sea water, making visibility with conventional techniques virtually impossible beyond shallow depths. Sunlight doesn't penetrate below 300 meters, and relatively few places in the ocean have visibility greater than 30 meters. Thus, observations from the surface are severely limited as are observations by divers alone. In recent years, however, capabilities for ocean exploration have been greatly enhanced by major technological developments that enable seeing far beneath the waves to the seafloor itself.

Although there had been attempts even in antiquity to work underwater, humans had never been able to penetrate very far into the depths until the 1930s. It was then that William Beebe, an American ichthyologist, succeeded in reaching a depth of 1,000 meters in his "bathysphere," and providing exciting reports (by live radio broadcast) of life at those depths. Although there were many limitations to his diving platform, Beebe was overwhelmed by the chance to observe marine life in its own environment. A quarter century later, the bathyscaphe Trieste took two men to a depth of 35,800 ft, the deepest spot in the ocean, the Mariana Trench near Guam, in the western Pacific. Although the Trieste

deepest spot in the ocean, the Mariana Trench near Guam, in the western Pacific. Although the Trieste lacked manipulators or samplers, it allowed unprecedented observations from the water surface down to the benthos (organisms that live on or in the ocean bottom) and provided a tantalizing glimpse of future discoveries.

Modern Equipment for Undersea Exploration

Even when wearing diving gear, humans are limited to relatively shallow depths and short periods of submergence. SCUBA (Self-Contained Underwater Breathing Apparatus), invented in 1943 by French naval engineers Jacques Cousteau and Emile Gagnan, allows excursions to well below 100 feet for significant durations. The ability to live and work underwater has been greatly expanded through advances in diving physiology and technology. Through the use of saturation diving, scientists can live under the sea in "Aquarius," the only undersea habitat devoted to scientific research. (Aquarius is currently located at the base of a South Florida coral reef.) Through techniques such as saturation and mixed-gas diving, scientists can extend their underwater depth and time limits. Yet, while SCUBA has allowed millions of people to become undersea explorers, it still only allows humans the ability to spend relatively short times at comparatively shallow depths.

The development of the occupied research submersible from the late 1950s to the present allows scientists and explorers access to undersea depths of up to 6,500 m (21,326 ft), although most submersibles have much shallower diving capabilities (300 m to 3,000 m). Modern research submersibles generally have manipulators, lighting, cameras, and sensors allowing detailed observations and experiments. Among the most notable submersible discoveries have been the finding of chemosynthetic life at hydrothermal vents, studies of undersea volcanoes and their eruptions, and hundreds of previously unknown species of deep-sea animals. Worldwide, an estimated 1,000 submersible dives per year have taken place since 1970.

Remotely operated vehicles (ROVs), which are tethered, unoccupied robots, have been highly developed and provide some significant advantages over occupied submersibles. They have almost unlimited bottom time, their damage or loss endangers no human lives, and their telepresence capability allows a broader audience to be "present." Vehicles range from the small and portable, capable of working at only a few tens of meters, to the large and somewhat cumbersome (11,000 pounds), capable of working at 10,000 meters while carrying many different sensors and tools. Since the early 1970s, more than a 1,000 ROVs have been placed into service worldwide in support of various tasks including oil exploration and operations, offshore development, and undersea research. In 1966, an ROV was used to find a hydrogen bomb lost at sea after an accident off the coast of Palomares, Spain. Using the ROV Kaiko, Japanese scientists revisited the Mariana Trench in 1995 and documented observations of shrimp, a scale worm, and a sea cucumber at 10,911 m (35,800 ft).

Autonomous underwater vehicles (AUVs) have been recently developed to augment occupied submersibles and ROVs as exploration vehicles. Most of the AUVs now in service are experimental test platforms, although several have been used for scientific purposes. Because AUVs are untethered they can have a much greater horizontal excursion capability than an ROV. Long-range AUVs are currently limited by the lack of cost-effective power supplies. Nevertheless, the future for computer-guided, unoccupied, untethered vehicles appears promising.

Technological advances notwithstanding, humans are still an important part of exploration. Divers are better at working around delicate undersea communities and archeological excavation sites than are robots, and trained observers remain the best detectors of many phenomena, i.e., they do not need to be programmed to identify unexpected discoveries.

Acoustic technology, including sonar (sound navigation and ranging), has become an essential tool for marine exploration. Sound penetrates the ocean much as light penetrates the atmosphere. Sound is carried through water much more readily than it is through air; depending upon frequency, volume, and water characteristics, sounds can be heard thousands of kilometers from their origin. Acoustic technologies are used to explore the distribution of animals in the water, the nature of the sea bottom, to locate objects, discover natural resources, provide undersea navigation, detect submarines, and to improve our understanding of the nature of the ocean itself. With the development of side scan sonars and deep towed echo sounders in the 1960s, detailed sea bottom mapping, which is essential to

and deep towed echo sounders in the 1960s, detailed sea bottom mapping, which is essential to understanding plate tectonics and other geological processes, has become possible. The recent marriage of computers with acoustic technologies has resulted in the introduction of mapping systems that can provide wide area images of the seabed in real time.

With the end of the Cold War, declassified technologies and resources developed for military purposes have become available to civilians. Among these major resources are formerly classified military oceanographic data, deep-sea submersibles, nuclear submarines, and the Integrated Undersea Surveillance System (IUSS), a listening system developed for submarine detection and location. The availability of these resources has had a significant impact on ocean exploration. A cooperative agreement between the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Navy provides access for civilians to Navy deep submersibles and ROVs, allowing exploration and research to 6,000 m below the surface. Several scientific cruises to the Arctic Ocean using the Navy's nuclear-powered submarines have been made since 1993. These missions have demonstrated the utility of such vessels for oceanographic and geophysical studies of polar oceans. Another dual-use application known as acoustic thermometry uses listening systems to measure whether the ocean is cooling or warming by measuring the speed of sound transmission between two fixed points. Data such as this can provide evidence concerning the status of global climate change. Other cooperative uses for U.S. Navy vessels include mapping and seismic exploration of the ocean floor, tracking and study of whales, retrieval of environmental information from remote instrumented buoys and observatories, and enforcement of fishing regulations.

Remote sensing technologies, such as satellites and radar, are relative newcomers to the toolbox of the ocean explorer. They are capable of providing synoptic information over large surface areas^{3/4} information previously unobtainable from surface-based platforms such as ships and buoys. Pictures from satellites orbiting the earth provide some of the most valuable^{3/4} and often, unexpected^{3/4} information about the ocean. Recently, a satellite found what may be the world's second largest lake beneath Antarctica's thick icecap. Data released within the past year shows the Pacific Ocean may contain more than 50 percent more seamounts than previously thought. This means that more than 25,000 undersea volcanos taller than 1 km are largely unknown and remain uncharted because of sparse bathymetric coverage. (Seamounts are submarine volcanos that can provide information about geological history. Because they often support highly diverse and abundant marine life, they may also provide significant new fishing grounds.) Finally, satellite images can be used to follow pollution discharged from rivers into the sea, locate coral reefs and provide information on their health, measure heat flow from the sea surface, and study the effects of wind and tides on the transportation of sediments. A myriad of possible applications abound.

THE WEALTH AND WONDER OF THE OCEANS

Oceans continue to arouse some of our most noble and basic instincts. In just a few short decades, research has opened doors to ocean exploration and exploitation that our ancestors could only have imagined. The seas have much to offer of economic importance. Some resources like fisheries and mineral resources are well recognized today. Others offer promise for the future.

Marine mineral resources are extensive and (in deeper waters) poorly known. The exploitation of these resources will require an expansion of geological knowledge in order to locate them. If severe damage to the seas is to be avoided, it will also require a better understanding of the ecosystems with which these mineral resources are associated and the development of technology to extract them without causing significant damage.

Oil use has increased dramatically in recent times, and the seabed holds unexploited reserves. The ocean also has deposits of gravel, sand, manganese crusts and nodules, tin, gold, and diamonds. Many of these deposits are located in coastal areas where potential environmental problems associated with their exploitation may be so serious that they cannot now be mined in a responsible manner. Many of the mineral deposits about which little is known occur in the deep ocean on underwater volcanos and ocean ridges, or on the flanks of the more than 50,000 seamounts in the Pacific Ocean.

Perhaps more important than the search for minerals is the search for medications. Marine plants and animals have biotechnological potential in the treatment of a wide variety of human illnesses. Coral reefs, sometimes denoted as the rainforests of the sea, contain novel chemicals that can be used to fight cancer, AIDS, diabetes, and other diseases. Since the discovery of penicillin in mold more than 60 years ago, scientists have looked for potential drugs in soil microbes, and more recently, in marine microbes. While chemicals from land-based plants and microbial fermentation are on the decline, scientists have barely scratched the surface of the sea's molecular potential.

"Extremophiles", micro-organisms with the ability to thrive in extreme environments such as hydrothermal vents, hold promise for genetically based medications and industrial chemicals and processes. Their unique enzymes, called "extremozymes," enable them to function in such forbidding environments. Last year, the biomedical industry was foremost among industries worldwide which spent more than \$2.5 billion searching for potentially useful enzymes. The newest frontiers for this search are the extreme ocean environments.

Some of the most critical exploration is happening closer to home in the shallow waters that surround us. While likely to have been unnoticed at the surface, scientists are working just below the waves to understand the coastal ocean and how human populations interact with it. An example is the underwater observatory, LEO-15, located in 15 meters of water just 10 km off the coast of Atlantic City. Using it, scientists can study estuaries and coastal waters, which are nursery grounds for some of the most important commercial fisheries, now under stress. The disposal of agricultural, industrial, and domestic waste, pressures from overfishing, and shipping are putting the coastal ocean at risk. Scientists are studying the effects of coastal development and the natural processes that circulate material from land into rivers, bays, lakes, and the ocean to determine the fate of contaminants in the environment, the critical role that chemical constituents play in the production of organic matter, and their impact on marine life. For example, scientists are trying to determine what changes in the environment, both natural and man-made, might be promoting the expansion of harmful algal blooms, the demise of coral reefs, the loss of fisheries, global warming, and other problems. Developments in the understanding of ocean chemistry, which are enhanced by rapid advancements in technology such as using molecular techniques to screen seawater samples for microbial populations, mean that researchers may eventually be able to forecast events in the coastal ocean, just the weather can be forecast now.

Perhaps the ocean's greatest unappreciated potential for humans has little to do with new medicines and products, oil, gold, or food. It is the chance to ponder, explore, and enjoy this realm. Recreational activities along waterfront communities such as clamming, crabbing, fishing, swimming, and iceboating are cultural traditions that have been handed down from one generation to another. Surfing is not a recent phenomenon, but a 1,000 year old tradition born in Hawaii. Water skiing, invented in the French Alps by a group of soldiers skilled at skiing the Alps, now has enthusiasts worldwide. Since the invention of the aqualung, millions of SCUBA divers have been given access to the earth's last frontier. Tourist submarines operating at more than 18 sites around the world for the past decade have carried more than six million passengers. Each participant considers himself to be an ocean explorer.

NAVIGATING THE FUTURE

Exploring and improving our understanding of the ocean and its influence on global events are among the most important challenges today. With the approach of the next millennium, the Earth's ocean and the underlying seabed remain one of our planet's last frontiers. What lies ahead? Clues can be found in recent trends:

- *The United States is no longer the principal nation with interests and capabilities in exploring the oceans.*

While France and the European Community have growing capabilities, over the past decade Japan has taken the global lead in deep ocean technology. Japan's Marine Science and Technology Center (JAMSTEC) has some of the world's most capable

research vessels, including deep submersibles. JAMSTEC operates the world's deepest diving occupied submersible (6,500 m) and the deepest diving ROV (11,000 m). It recently placed into service the 8,600 ton Mirai, the world's largest oceanographic vessel. JAMSTEC's most ambitious project yet planned is a ship capable of drilling 3,500 m into the seafloor, to be launched early next century. In Japan, the ocean sciences enjoy broad popular and political support; their budget has grown at 15 percent per year during the past five years. JAMSTEC has expanded its research program to include life in extreme environments and climate change, and has used international collaboration to develop impressive research programs. The United States is not investing adequately to maintain its expertise, and this will have scientific and economic effects.

- *An end to the Cold War and cutbacks in defense spending have decreased development of new ocean technologies.*

Large-scale development of ocean technology for military purposes has been reduced. As a consequence, the non-military sector is losing the sizable benefit it enjoyed for many years resulting from military development and operation of expensive ocean technology^{3/4} i.e., the tools for ocean exploration. On the other hand, many of the expensive devices once not available outside the military community are now open for wider use. The bad news, however, is that civilian budgets in large part cannot afford to operate these capable but costly systems.

- *The need for manned presence under the sea is decreasing.*

New technologies make it possible for humans to work beneath the waves without actually physically being there. For example, seafloor observatories, like the Long-term Ecosystem Observatory (LEO-15) off the coast of New Jersey, linked electronically to satellites and land-based stations, are being developed. Currently, our opportunities to know what's occurring in the ocean are limited. By combining submersible vehicles and sensors communicating acoustically to a network of moorings equipped with surface buoys and satellite links, scientists are getting a better idea of what's occurring at the seafloor in real time. Satellites like the Geosat and ERS-1 spacecraft, which were used to detect seamounts in the Pacific plate, will be used in combination with conventional seafloor mapping techniques. Assessments done via a number of technologies, including submersible vehicles, will become increasingly important. For many applications, remotely operated systems, which can perform more reliably and cost effectively, are superior to manned systems. Nevertheless, there will continue to be a role for the presence of humans under the sea as divers and in submersibles, especially when the mission is exploration.

- *The high cost of working in the oceans is forging partnerships between organizations that have not traditionally worked together.*

Partnerships are being formed to support ventures that previously were the sole domain of government. For example, Aquarius, the world's only underwater laboratory, was removed from operation in the summer of 1996 because of lack of sufficient funding. Through an innovative partnership with private industry, the university community, and a private foundation, it was reconfigured and modernized to reduce operational costs, and returned to service in the fall of 1997. Additional partnerships to advance ocean interests are being encouraged and supported through the Congressionally created National Oceanographic Partnership Program.

The Government Role

Exploration of new ocean frontiers holds the promise to enhance the future of the United States in a myriad of ways, and continued support for this endeavor is considered a vital national need (*Undersea Vehicles and National Needs*, 1996, National Research Council). How might this be accomplished? Japan has now taken the definitive lead in development of undersea capabilities. If the United States wants to retain its status in undersea science, a longer term commitment to support of ocean science and exploration is necessary. Some of the issues that need to be addressed are :

- ❑ Government support has always been critical for oceanographic research. The United States cannot maintain its expertise in ocean research unless and until adequate support is provided. Since the early 1980s, funding for ocean sciences, as a percentage of the total U.S. federal basic research base, has been reduced by nearly half.
- ❑ As responsible stewards of the environment, ocean exploration must be recognized as an important role within the missions of U.S. agencies charged with ocean-related responsibilities.
- ❑ A plan for undersea research that includes better access to assets, refinement and integration of existing systems, development of a strategic plan for future needs, and stable multi-year funding for ocean exploration is needed.
- ❑ The oceanographic community must capture the public's attention and imagination. While many space satellites have been launched, nothing comparable can be proclaimed for the ocean. Plans have been proposed for the first attempt of a self-powered autonomous undersea vehicle (AUV) to voyage between North America and Europe this year. Properly promoted, this AUV project could raise general public awareness about the value of marine exploration, and foster continued public interest and support.
- ❑ Teaching children about the wonder and science of the ocean may be the best investment for the future. In this new age of science and education technology, students can exchange the confines of the classroom and traditional textbooks for hands-on discovery and real time learning. In 1996, internet history was made when the only undersea laboratory devoted to science became the world's first underwater website. More than two million students had a virtual porthole via video screens to swim with sharks and reef fish, submerge in a nuclear submarine, and live in the underwater habitat Aquarius. This effort, which was part of the Jason Project, transported students via satellite to remote sites where scientists are engaged in research, enabling them to directly observe ongoing investigations of the biological and geological development of Earth. Other innovative examples exist for bringing the ocean into the classroom. Rutgers University has partnered with a number of other organizations to begin a program in New Jersey this past year using the underwater observatory, LEO-15. More innovative approaches such as these are needed to assure the next generation will be well informed stewards and explorers of the ocean.

Fantastic voyages to the planet's inner space are happening close to home in the waters that surround us, and are reminders that the ocean is still brimming with life that scientists are only just discovering. The ocean has been navigated for thousands of years, but exploration of the deepest parts of the ocean is just beginning.

Public opinion polls indicate that Americans care strongly about the ocean and are prepared to support ocean exploration over space exploration. According to a recent survey, eighty percent say that the

condition of the ocean is a matter of personal importance. A full 55 percent give priority to funding ocean exploration over space exploration. The survey participants, nearly three quarters (72 percent), also see the health of the ocean as intimately connected to the future well-being of humankind.

THE FUTURE

Ocean exploration gives mankind a sense of human progress and heritage. It provides the experience and knowledge necessary to undertake stewardship of the ocean and its resources, and thus sets a course for future generations to navigate. What lies ahead is still unknown. Whatever it is, however, will be influenced by what is found through tomorrow's exploration^{3/4} and, will likely be different than today's predictions!

REFERENCES

Achenbach, Joel, "The Genesis Problem," *The Washington Post Magazine*, November 2, 1997, pp.13-40.

Attaway, David H., *A Report on Marine Biotechnology in the National Sea Grant College Program*, December 31, 1996.

Broad, W., *The Universe Below*, Simon & Schuster, 1997.

Consortium for Oceanographic Research and Education (CORE), "Oceans 2000: Bridging the Millennium Partnerships for Stakeholders in the Oceans," Leveraging National Oceanographic Capabilities, Joint Hearing, January 25, 1996, pp. 682-719.

Carson, R., *The Edge of the Sea*, Houghton Mifflin Company, Boston, MA, 1955.

"Japan Plunges into Ocean Science," *Science*, Vol. 277, No. 5323, 11 July 1997, pp. 170-172.

Madigan, Michael T. and Marrs, Barry L., "Extremophiles," *Scientific American*, Vol. 276, No. 4, April 1997, pp. 82-87.

Marshall, N. and Marshall, O., *Ocean Life*, The Macmillan Company, 1971.

Smith, Walter H.F. and Sandwell, David T., "Global Sea Floor Topography from Satellite Altimetry and Ship Depth Soundings," *Science*, Vol. 277, No. 5334, 26 September 1997, pp. 1956-1962.

Stone, G. (ed.), "Military Assets for Environmental Research," *Marine Technology Society Journal*, Vol. 27, No. 4, 1994.

"The Global Abyss: An Assessment of Deep Submergence Science in the United States," UNOLS DESSC Committee, September 1994, 53 pp.

The Mellman Group Survey, "Americans Continue to Worry About the Decline of the Oceans," 1997.

Thurman, Harold V., *Essentials of Oceanography*, Charles E. Merrill Publishing Co., Columbus, OH, 1983.

Undersea Vehicles and National Needs, The National Research Council. National Academy Press,

Washington, DC, 1996.

Weber, M. and Gradwohl, J., *The Wealth of Oceans*, W.W. Norton & Company, 1995.

Wessel, Paul, "Sizes and Ages of Seamounts Using Remote Sensing: Implications for Intraplate Volcanism," *Science*, Vol. 277, No. 5327, 8 August 1997, pp. 802-805.

Wilson, E. , Eisner, T, et al., *Life on Earth*, Sinauer Associates, Inc., 1973.

**NATIONAL
OCEAN
CONFERENCE**



List of Potential Topics

Working Draft

Point of Contact

**Sally Yozell
Deputy Assistant Secretary
National Oceanic and Atmospheric Administration
U.S. Department of Commerce**

May 13, 1998



NATIONAL OCEAN CONFERENCE

Oceans of Commerce, Oceans of Life

US Naval Postgraduate School - 11/12 June 1998

Draft 5/13/98

Draft Conference Schedule

Wednesday, 10 June

6 pm - 8 pm Registration in Herrmann Hall Lobby, Naval Postgraduate School (conference attendees only)

Thursday, 11 June

7:00 am - 8:00 am Registration at Herrmann Hall, Naval Postgraduate School (NPS)

8:00 am - 8:30 am Opening Remarks, Ballroom, Herrmann Hall, NPS - Navy Secretary John Dalton & Welcome Address - Commerce Secretary William Daley (taped)

8:30 am - 9:00 am Move to Breakout Sessions

9:00 am - 12:00 pm Breakout Sessions

- Oceans and Commerce
- Oceans and Global Security
- Ocean Environment and Health
- Ocean Education, Exploration, and Research

12:00 pm - 1:15 pm Lunch (video program)

1:30 pm - 4:00 pm Plenary I: Cross-cutting Issues in Ocean Programs and Policy (venue TBD)

- Ecosystem Health
- Sustainable Use of Ocean and Coastal Resources
- Research
- Law of the Sea
- Ocean Governance

4:00 pm Adjourn for evening

7:30 pm - 10:30 pm Evening reception at Monterey Bay Aquarium

Friday, 12 June

9:00 am - 9:15 am Introduction to Congressional Panel - Secretary William Daley

9:15 am - 11:30 am Congressional Panel (proposed)

11:30 am - 1:00 pm Plenary II: Ocean Programs and Policies for the 21st Century
Outdoors; venue TBD

1:00 pm - 1:30 pm Closing Remarks - Commerce Secretary William Daley

NATIONAL OCEAN CONFERENCE

Proposed Deliverables

A. Exploration and Economics

1. Exploring the Last Frontier – the U.S. Coastal Ocean
2. Safe Oil and Gas Development in Deep Water
3. The Sustainable Seas Expedition

B. Transportation

1. Ports for the New Millennium

C. Environment

1. Healthy Coastal Waters
2. Rainforests of the Sea
3. Restoring and Sustaining America's Fish Supplies and Fishing Communities
4. Special Places in Alaska

D. Education

1. The Ocean as a Tool for Math and Science Education

E. National Security

1. Public Access to Military Data and Technology
2. Law of the Sea

F. Climate Change

1. Ocean and Climate Forecasting

A.1. EXPLORING THE LAST U.S. FRONTIER – THE COASTAL OCEAN

Primary Federal Departments and Agencies

DOC - National Oceanic and Atmospheric Administration

DOD - U.S. Navy

DOI - US Geological Survey and Minerals Management Service

National Science Foundation

Other Partners and Interests

U.S. private industry

Deliverables

Under the principle “explore before you develop”, the President can announce a comprehensive effort to explore, characterize, map and assess the physical, biological and economic resources unique to our coastal oceans including:

- Resource assessments will include new life-saving pharmaceuticals, minerals, historical artifacts, fish stocks, and biologically diverse marine life. It will also provide the knowledge base to support all U.S. coastal activities, including ocean industries, coastal development, and marine environmental protection.

To replace the aging oceanographic infrastructure, the President can announce new, state-of-the-art ocean exploration technologies and initiatives to support the study of the coastal oceans including:

- A new “man in the sea” program with the commissioning of an undersea laboratory.
- The development of public/private partnerships to operate manned and unmanned submersibles.
- A special program focused on how newly-discovered life forms survive in the deep sea vents, the harshest environment on earth.

In order to fully comprehend the value of our oceans, the President can announce the commissioning of a comprehensive assessment of the overall value of ocean resources and activities to the nation’s economy.

Background

Ninety percent of the oceans are unexplored. Although we derive vast economic benefits from our coastal waters, the potential and limits of these resources have not been estimated in a comprehensive manner. Under the principle "explore before you develop," the U.S. must launch a new coordinated effort to discover and assess the unique resources of our coastal waters. A preliminary survey of our 200-mile Exclusive Economic Zone was completed by the Federal Government in the 1980s to assess potential offshore oil and gas and mineral resources. A more complete assessment is now required in specified areas along our coast to discover new mineral deposits, map biologic communities; understand the natural balance in our marine sanctuary and protected areas, identify historical artifacts, and discover potential new sources of life-saving pharmaceuticals. Such an effort is needed to inventory the fish populations of our coastal waters and their ability to sustain themselves in the face of over-fishing, assess human impacts, and ultimately be able to manage and utilize marine resources more efficiently.

We need new tools to replace the aging U.S. oceanographic infrastructure for this effort, and a full assessment will require a mix of manned submersibles to discover completely new things, unmanned vehicles for searching, mapping and photographing underwater areas, and a sea floor laboratory to allow long-term underwater presence. The Defense Department will share much of its engineering and practical experience in the areas of underwater exploration to support these efforts.

To conduct the economic assessment, the President will name a panel of renowned economists and ocean policy experts which will complete its work by the year 2000. The assessment will focus on both the direct and indirect contribution of ocean resources and activities to the nation's economy, as well as the effects of marine environmental and ecological health on the contribution of marine-dependent activities to the economy.

Funding Implications

The National Science Foundation has committed \$1.0M in FY98 to the study of deep sea vents with \$1.3M proposed for FY99. A joint venture with the private sector (drug or biotechnology firms) may also be pursued.

The US Geologic Survey proposes \$2 million per year from base for mapping of marine sanctuaries and other key coastal areas.

The undersea laboratory and manned and unmanned vehicles are currently unfunded, but are expected to require \$_____ Federal investment over the next 5 years.

The economic assessment will require FY98 \$250K FY99 \$1.0 M FY00 \$750K

NO

A.2. SAFE OIL AND GAS DEVELOPMENT IN DEEP WATER

Primary Federal Agency

DOI - Minerals Management Service and U.S. Geological Survey

Other Partners and Interests

Oil and Gas Industry
National Ocean Industries Association
State and Local Governments in Gulf of Mexico

Deliverables

- Engage the MMS multi-stakeholder Outer Continental Shelf Policy Committee, OCS Scientific Committee and others with interests in deep water oil and gas production in the Gulf of Mexico to focus on reaching consensus on deep water development in the Gulf.
- Accelerate completion of the Minerals Management Service's assessment of deep water oil and gas development and the deep water environment of the Gulf of Mexico. additional support will be provided by the USGS.

Background

Offshore oil and gas activity in the US Outer Continental Shelf provides between \$3-4 billion in direct revenues to the federal treasury each year. About 27 percent of the natural gas and 18 percent of oil produced in the US is produced from the OCS. Development of OCS oil and gas resources is expected to increase over the next several years, especially in deep water areas of the Gulf of Mexico.

Deep water development is made possible in part by significant advances in safety, environmental protection, and other technologies during the last generation. In addition, deep water exploration has been spurred by passage of the Deep Water Royalty Relief Act. The Minerals Management Service's Safety and Environmental Management Program and efforts by the US Coast Guard have helped to promote improved human and environmental safety of offshore oil and gas activities. However, deep water exploration and production of oil and gas resources also presents unique and complex challenges to industry and the government. To meet these challenges the Minerals Management Service is in the process of conducting a comprehensive assessment of the deep water environment of the Gulf of Mexico. The assessment will support informed decision making and identify mitigation strategies to assure deep water development proceeds in a safe and environmentally sound manner.

Funding Implications

MMS: \$ 200K for initiative

USGS: \$ 500K/year from base

A.3. THE SUSTAINABLE SEAS EXPEDITIONS

Primary Federal Agencies

DOC - National Oceanic and Atmospheric Administration
DOD - U.S. Navy
National Aeronautics and Space Administration
National Science Foundation

Other Partners and Interests

National Geographic Society
Richard and Rhoda Goldman Fund
Jason Foundation
Monterey Bay Aquarium Research Institute
Mote Marine Laboratory
Center for Marine Conservation
Woods Hole Oceanographic Institution

Topics

The President can announce an exciting five-year private-public partnership to explore the huge underwater rim of the U.S. embraced within the Exclusive Economic Zone.

Emphasis will be on the nation's twelve National Marine Sanctuaries--- the aquatic counterpart of the U.S. National Parks.

- Special deep water research techniques using new submersibles will link at-sea observations to a communications network among various institutions and classrooms across the country.
- Benefits: While the Sustainable Seas Expedition may produce stunning scientific discoveries and extraordinary educational experiences for millions of people and data that will provide stronger foundations for ocean policy, research and conservation, the most important benefit will be to focus public attention on the importance of the ocean to all of us, and thus inspire a national commitment to understand and care for the natural systems that sustain us.

Background

Despite increasing exploitation of the ocean's living and mineral resources and growing concerns about pollution, less than five per cent of the sea has been fully explored, and a fraction of one per cent has been designated for protection. The 1997-98 El Niño phenomenon confirmed the powerful influence that the sea has on the planet. In recent years, awareness has grown of the

significance of the ocean as the driving force behind climate, weather, planetary chemistry, and fundamental life support functions. The Sustainable Seas Expedition is a public and private alliance already forged by the urgent need for a national commitment to assess and understand the nature of the sea in ways that fully complement this nation's commitment to the exploration of space.

The goals of this program are to explore the nation's underwater realms, to create awareness about the inextricable link between human health and ocean health, and to inspire an ethic of care and protection for the natural aquatic systems that are vital to human needs, with special focus on marine sanctuaries as young counterparts of the nation's national parks.

Since the announcement of this program on April 22, 1998, several leading institutions have indicated their willingness to support the Expeditions, including the U.S. Navy, NASA (through the Mission to Planet Earth program), the Jason Foundation, the Monterey Bay Aquarium Research Institute, Mote Marine Laboratory, the Center for Marine Conservation, and Woods Hole Oceanographic Institution. Discussions are underway with the National Science Foundation and other government agencies, private foundations, and industry to add their support and resources to these Expeditions.

Funding Implications

In this public-private initiative, most of the financial burden will be met through contributions from private foundations and industry. Support from the U.S. government involves primarily reallocating existing resources to facilitate the effort. An initial grant of \$5M from the San Francisco-based Goldman Fund has been complemented by a \$775,000 commitment from the National Geographic Society, plus significant in-kind communications and outreach resources. NOAA will contribute in-kind personnel, ship support and other in-kind services and expertise totaling approximately **\$2.5M**.

B.1. PORTS FOR THE NEW MILLENNIUM

Primary Federal Departments and Agencies

DOT - US Coast Guard and Maritime Administration

DOC - National Oceanic and Atmospheric Administration

DOD - US Army Corps of Engineers, US Navy, National Imagery and Mapping Agency

DOI - US Geological Survey

Other Partners and Interests

US Treasury - US Customs Service

State and local governments

Port authorities

Industry - pilots, shippers, merchant marine organizations, and navigation systems design

Deliverables

The development of a model port for the 21st century that would include new technology for guiding ships through shipping lanes with lasers, providing computerized, real-time information regarding water height and weather conditions, global positioning systems for ships, and electronic information exchange to relay load data between shippers, carriers, and the Customs Service, and automated cargo-handling facilities.

- An interagency effort based on partnerships with states, local governments, and the private sector aimed at supporting sustainable development of the nation's port and maritime economy.
- The research, development, transfer and implementation of technologies that will lead to safer, more efficient maritime commerce; to improve accident and pollution prevention and spill response; to eliminate the introduction and adverse impacts of invasive species; and to streamline procedures for the transfer and tracking of cargo.
- The transfer of surplus developed federal property, including former defense installations, to support commercial port activities, create jobs, revitalize communities, and ensure a capability to accommodate projected increases in maritime trade.
- The active promotion and support for the expansion of passenger ferry service in appropriate port communities to relieve highway congestion, reduce auto emissions, and increase road safety.
- Assessment of impacts from port development and dredging on coastal sedimentation.

Background

More than 95 percent of U.S. foreign trade (by weight) passes through U.S. ports and harbors. Unless U.S. ports can keep up with the growth in international trade, U.S. consumers will pay more for the goods we import and U.S. businesses will have higher export costs thereby decreasing their competitiveness in the world market. In the United States, an affiliation of federal, state, local, and port agencies together administer the various aspects of shipping, both domestic and foreign, in our waters.

This conglomerate of infrastructure is known as the Marine Transportation System (MTS). Its authority embraces commercial, private, legal, law enforcement, navigational, and environmental aspects of trade and transportation. Coordination of a safe and efficient MTS is hampered because overall responsibility is fragmented. Furthermore, like the national air traffic control system, the infrastructure of our nation's ports has not yet benefitted from advances in technology to maximize the safe and efficient movement of goods. Finally, many ports will not be large enough to handle the volume of traffic projected to enter and leave their facilities in the 21st century. These inefficiencies will impede efforts to compete in the global economy and will result in increased pollution, accidents, and loss of business. Ultimately this will place stresses on our trade-dependent economy, the ocean environment, and result in higher prices on the goods and services paid for by the American people.

The Department of Transportation, with the participation of other federal agencies, has completed a series of listening sessions at ports around the country to learn of the priorities to be considered in the updating of the MTS. The MTS managing agencies and organizations are interested in coordinating future activities in a nationwide, multifaceted effort to develop new navigational aids and systems, expand port facilities, reduce pollution, and prepare for projected increases in foreign trade.

This integrates the Conference on port and waterway enhancement, surplus federal property, revitalization of MTS, vessel traffic management technology, passenger ferries, electronic charts for navigation, national workshop on the transfer of ocean technology.

Funding Implications

No significant funding for study phase. Continued and expanded funding for mapping services. Funding for the expansion and upgrade of ports would be partially absorbed by states and industry.

USGS proposes to provide \$ 1M for assessment fo port development on coastal sedimentation.

C.1. HEALTHY COASTAL WATERS

Primary Departments and Agencies

DOC - National Oceanic and Atmospheric Administration

EPA

DOD - Navy

USDA

DOI - US Geological Survey, US Fish and Wildlife Service

Other Partners and Interests

State and local governments

Conservation organizations

Tourist industry

Recreational and commercial fisherman

Deliverables

Building from the Clean Water Action Plan (CWAP), the President can announce strategies for the management of pollutants and other threats to coastal regions. This will include:

- Develop a toxic algae action plan designed to predict, monitor, control and mitigate the sources of toxic algae and their health affects on humans.
- Increase marine monitoring and assessment of threatened areas to determine clean-up strategies.
- Further reduce polluted runoff from industrial and agricultural sources to prevent future outbreaks.
- Circulate public advisories regarding coastal water contamination to better protect public health.
- Facilitate the development of procedures to slow the spread of nuisance species in ships' ballast and include marine species as an integral part of forthcoming action by the Administration to address invasive alien species.
- Develop the environmentally sound naval ship of the 21st Century with innovative technologies to handle solid, liquid, plastic and other wastes aboard our U.S. Navy ships.

Background

The American people affect the 95,000 miles of U.S. coastline everyday. With the majority of the Nation's residents living on or near the coast, projected population increases will magnify our

long-range influence on the ocean. Current threats to the health of our coasts include bacterial contamination near public beaches, nutrient and pesticide runoff, the transportation of aquatic nuisance species to new habitats, and toxic algal blooms

In the last few decades, increased coastal water pollution has resulted in beach closures and fish kills. The public is now more concerned about toxic algal blooms because it threatens their food supply, disrupts area economies, and generally disturbs the quality of life for millions of Americans who depend on the ocean everyday. Naval operations and environmental protection are compatible missions, and the U.S. Navy is investing increasing funds and attention to these issues. The Year of the Ocean presents an excellent opportunity to focus public attention on these issues to create a more coherent coastal policy regarding pollution and other threats to the commercial and recreational uses of the sea.

Funding

The U.S. Navy is investing \$550 million over the next five years in environmentally sound naval ship operations. The DOC, EPA, DOI, and USDA funding will be added.

USGS is investing \$ 1M/yr for marine ecosystem studies and impacts on coastal water quality and biota.

UFWS is investing \$3.2M/year for aquatic alien species including marine and expects to propose a significant increase beginning in FY 2000.

USGS is investing \$250k/year for research on aquatic alien species, including marine, and expects to propose a significant increase beginning in FY 2000.

C.2. RAINFORESTS OF THE SEA

Primary Federal Departments and Agencies

DOI - Office of Insular Affairs, US Fish and Wildlife Service and National Park Service
DOC - National Oceanic and Atmospheric Administration
EPA

Deliverables

The President can announce the development of a comprehensive coral reef protection effort for the United States and the U.S. territories building on efforts already underway by NOAA, DOI and state and local governments. This will include:

- Assessing and mapping the location, composition and the health of coral reefs within the U.S. jurisdiction.
- Issuing and implementing an Executive Order to preserve, protect and restore the health of U.S. coral reef ecosystems.
- Announcing a "no net loss" of coral reefs in U.S. waters.

Background

The marine equivalent of the terrestrial rainforest ecosystems, coral reefs are an important resource in terms of their biological diversity and productivity. They are the most productive marine habitat on Earth. They are the foundations of coastal protection, tourism, fish populations, and in many areas serve as focal points for cultural and community heritage. Like the jungles of the Amazon, many of the thousands of species which constitute the reef ecosystem have yet to be catalogued and their potential uses remain undiscovered. Chemical extracts derived from corals have demonstrated potent anti-viral and insecticide characteristics and have been used in bone medicine and surgery. Yet coral reefs world-wide are threatened with destruction from pollution, sedimentation, coastal development, and unsound management practices.

The coral reefs in the U.S. territorial waters represent a significant portion of the world's reefs and drive the coastal economies with access to these resources. Therefore, it is vital that the survival of these unique habitats is ensured for future generations. The Department of the Interior is undertaking this effort for populated and uninhabited islands under its jurisdiction. It will be expanded to include all coral reefs which are found in the United States for which the U.S. has special responsibility.

Funding

DOI - Insular Affairs: FY 98, \$200k to be continued and possibly increased through FY 2002

FWS: \$200k/yr from base

NPS: \$200k/yr from base

USGS: \$1.5M/yr from base

C.3. RESTORE AND SUSTAIN AMERICA'S FISH SUPPLIES AND FISHING COMMUNITIES

Primary Federal Departments and Agencies

DOC - National Oceanic and Atmospheric Administration
Economic Development Administration
USDA
HHS - Food and Drug Administration
NSF
DOL

Other Partners and Interests

Commercial fishing industry
Aquaculture industry
State and local governments

Deliverables

Announce a strategy to ensure the long-term viability of America's fishery resources, fishing communities and the nation's food supply including:

- In order to make more informed fishery management decisions, increase scientific monitoring and assessment of wild fish stocks.
- Develop a Fishing Community Loan Guarantee Program to reduce excess fishing capacity through a fishing vessel and license buy-back program. Develop a retraining program for dislocated fishers. Initiate community development grants to mitigate the impacts of fishery collapses by the promotion of aquaculture, and other economies not wholly reliant on commercial fishing.
- Initiate a public/private partnership to develop environmentally sound marine aquaculture technologies and support expansion of environmentally safe commercial aquaculture.

Background

World population is expected to increase by one billion people during the next decade, which has resulted in global concern about food security and the implications major food shortages may have on world stability.

In the past, oceans were thought to be inexhaustible sources of protein. But today most of the world's commercial fisheries are being exploited at or beyond their natural ability to sustain themselves. The collapse of the major U.S. fisheries in New England is a domestic example of the economic and social impacts of over-fishing. At the same time, degraded fish habitat and

declining water quality have contributed to the decline of wild fish stocks in many coastal areas.

Increasingly, the world is moving from commercial fishing of wild species to producing farmed crops of fish and seafood products. According to UN statistics, worldwide aquaculture production nearly doubled during the past decade. It now accounts for 25 percent of world food fish supplies, with China, India, Taiwan, and Thailand among the leaders in this field. The US produces less than 3 percent of the world's farmed-raised fish products.

Research is needed to evaluate and mitigate the environmental and other impacts of commercial aquaculture. Furthermore, communities and individuals devastated by a collapse in their commercial fishing economies could be assisted by funding a reduction in the commercial fishing capacity in their region. Aquaculture could provide an alternative, but related, economic base for many such communities.

Funding Implications

(To be provided)

C.4 REVITALIZE GLOBAL FISHERIES

Primary Federal Departments and Agencies

DOS

DOC - National Oceanic and Atmospheric Administration
National Marine Fisheries Service

DOT U.S. Coast Guard

Other Partners and Interests

Commercial fishing industry

Conservation organizations

State governments

Academic institutions

Topics

Lead the international community in reversing the decline of key fish stocks by:

- implementing stronger conservation rules in all ocean fisheries, particularly the precautionary approach to fisheries management;
- reducing fishing capacity worldwide;
- cracking down on fishing by flag-of-convenience vessels and other rogue operators;
- minimizing waste, discards and bycatch, especially of endangered species and marine mammals; and
- using modern technology to improve monitoring and enforcement.

Background

The UN Food and Agriculture Organization estimates that 70 percent of fish stocks worldwide are either fully exploited, overexploited or depleted. World harvests of wild fish actually began to decline in the late 1980's, for the first time in history. The declines have continued, causing the collapse of numerous key fish stocks, including cod in the North Atlantic, pollock in Bering Sea and bluefin tuna in Western Atlantic.

The United States has led the international community in responding to this crisis. Together with other nations, we have fashioned the tools to reverse the declines, particularly two new global treaties that provide for stronger conservation rules and better enforcement. We must now put these tools to use – we must bring these treaties into force and ensure their vigorous

implementation. We must bring existing international fisheries institutions into the 21st century. Where no such institutions exist, we must hold to create them and so prevent the epidemic of overfishing from spreading.

Funding Implications

The initiatives described above can all be funded within existing resources.

Draft Ocean Deliverable and Challenge

The oceans cover 2/3 of our planet, and have a tremendous influence on the global environment and on human health and well-being. The last several decades have seen a vast increase in our store of knowledge about the ocean. We have at our disposal an unprecedented array of tools with which to study, perform research, and monitor change. Yet in many respects the seas remain mysterious, and much of what we have discovered merely serves to illuminate the true depth of our ignorance. And even as we realize how much we have left to learn, we are faced with a challenge that increases our need for understanding.

- We know that the interaction of the oceans and atmosphere is among the most significant driving forces of the global climate.
- We also now that ocean is closely coupled with the atmosphere, that significant changes in one will lead to changes in the other, and that precise prediction of climate change and its impacts will not be possible without improved inclusion of ocean processes in our calculations. Over long time periods the ocean may be the major driver of climate change.
- The reaction of the ocean to global warming will be one of the most significant factors in determining the future climate of our Earth. The ocean is a major sink of carbon dioxide, the major greenhouse gas climate change may also affect the productivity of the ocean, productivity upon which we depend and which is already stressed in many instances.

But the fact is that we don't know nearly as much about the ocean as we do about the atmosphere. Our observations and data are inadequate; we need finer scale measurements to understand ocean process, we have to monitor significant areas of the oceans on a regular basis, and we need to put this information into models for prediction.

- I stand before you today committed to meet this challenge. I am directing the research agencies of the U.S. Government to work together to create a global ocean observing system that will provide the comprehensive, fine scale and accurate measurements we need to understand how the ocean is changing, the role of the ocean in climate change, and how these changes might affect us.
- This system begins with measurements of global reach: NASA, NOAA and US Navy satellites, NOAA networks of sea level and surface temperature measurements, and NSF research programs and models.
- But this is not enough. We need finer scale and more comprehensive information from surface or deeper level observations on a regular and routine basis. I am directing NOAA and NSF to work with other relevant agencies and the academic community to deploy array of moored and drifting buoys in the North Atlantic and North Pacific oceans by

2002, and to develop the global models necessary to use this data for better understanding and prediction.

Challenge to the Scientific Community

Creating an observing system will be impressive technical feat in and of itself, but the real value of such an endeavor is to use such a system to increase our knowledge of the oceans and their role in the climate system. I challenge the scientific community to use this system to answer a series of fundamental questions over the next decade:

1. What cause El Nino, and how will it be affected by future climate change? Is there a relationship between long-term climate change and short-term climate variability?
2. Can we understand and predict the other ocean cycles of variability, like the North Atlantic Oscillation and the Pacific Decadal Oscillation? Can we improve our predictive capabilities and this contribute to sustainable management of natural resources.
3. It is possible that climate change will affect the existing broad-scale patterns of ocean circulation? How might such changes affect the atmosphere and the regional patterns of weather and climate around the world, including the frequency and severity of extreme events?
4. How vulnerable is marine life to climate change? How is climate change likely to affect fisheries, coral reefs, and marine mammals, especially when considered in the context of the numerous other stresses they already experience?
5. How might climate change affect the biological productivity of the oceans?

Background

Today we understand and monitor the atmosphere well, and our models for weather forecasting are improving rapidly. But our predictive models for climate use only crude representations of the ocean based on inadequate observations and data. Knowledge of ocean-atmosphere-climate interactions is critical to meeting the challenges posed by the Kyoto Conference and to predicting and preparing for El Nino and similar, but less well known, cycles in the earth/ocean climate system. The Kyoto Conference moreover noted the need for verification of treaty goals, and it is likely that the Buenos Aires conference will call for accurate monitoring of climate change and impacts. More ocean observations and a better understanding of ocean processes will benefit everyone, in areas that include weather predictions, energy production, agriculture, recreational and commercial fishing, ocean transportation, and natural resource management.

U.S. Ocean scientists have developed ocean and atmospheric monitoring and forecasting systems which provide benefits to everyone – from the Midwest farmer who depends on accurate seasonal forecast information for agricultural planning, to the millions of residents of U.S. coastal areas, and the thousands of lives saved in recent years due to advances in hurricane

prediction. The central lesson is this: everyone benefits from increased ocean observation and improved ocean science.

Having just completed a major “World Ocean Circulation Experiment” oceanographers are confident that enough is known to put in place the first pilot experiments leading to the Global Ocean Observing System (GOOS). The system has three major components: (1) buoys that are fixed in key locations around the world; (2) satellites; and (3) buoys that drift with the currents. All these observing methods will measure the ocean surface for among other things temperature, surface height, surface winds, salinity and chlorophyll for the biology. Data from the satellites and buoys will be used to update continually computer models of the ocean so that its state and future can be predicted. With this accurate model of the ocean, it is then possible to build a coupled model of the climate system that will have the best possible accuracy for climate forecasts.

Funding Implications

(To be determined)

D.1. THE OCEAN AS A TOOL FOR MATH/SCIENCE EDUCATION

Primary Federal Departments and Agencies

NOPP
DOEd
DOC - National Oceanic and Atmospheric Administration
DOD - U.S. Navy
NSF
USAID
DOI - USGS

Other Partners and Interests

Consortium for Oceanographic Research and Education (CORE)
Coastal Learning Centers
State and local educators

Deliverables

Many programs are being developed using an inherent public interest in the sea as a tool for expanding and improving math and science education in this country. Ocean studies also cut across many of our public policy issues, such as food for a growing population, global climate change, and the balancing of development vs. environmental protection interests.

- Establish an Education Partnership Program with nine Historically Black Colleges and Universities in the U.S. and similar institutions in South Africa to promote and increase the number of professional and technical staff in ocean, atmospheric, and environmental sciences among underrepresented communities in both the United States and South Africa. The development of this was announced by Vice President Gore and Deputy President Mbeki in July, 1997.
- DOEd programs such as Improving Middle School Mathematics; High School Hopes for College; Safe Havens for Learning; Lighthouse Partnerships; Preparing Teachers for Using Technology; Educational Opportunity Zones; and Research for Raising Student Achievement can all be applied to the ocean.
- Over 200 "Year of the Ocean" ocean drifting buoys are being deployed to gather data from remote ocean locations. The data is radioed back to land via satellites. It will be used to study ocean currents, climate, fisheries and pollution. The data will also be made accessible to educators for integration into classroom science and math instruction.
- Federal agencies have worked with CORE to establish the National Ocean Science Bowl competition to promote awareness and active study of the ocean among the nation's high

school students and their teachers. The President can announce that the Bowl will be continued as an annual event, and introduce the Monterey Bay regional winners.

- Establish a Marine Learning Center as a national facility for the interpretation, education, and exploration of the world's oceans. The Center (based in San Francisco) will increase the visitors' awareness of the nation's coastal and marine environments through a variety of programs. In addition, the center will house and maintain a national ocean planning system for both desktop computers and the Web for comprehensive ocean management and public decision-making.
- The recently created and already successful Consortium Oceanographic Activities for Students and Teachers (COAST) initiative will be expanded. COAST is a new program funded by the National Ocean Partnership Program that combines three regional programs. The focus is on providing improved ocean studies information to K-12 teachers and teachers-in-training. It is estimated that the three COAST programs can reach over a million high school students in the U.S. in a year.
- Further, the oceanography education partnership of the JASON project and NOAA in order to bring oceanography to students throughout the United States

Background

The ocean is a vast, relatively unexplored frontier whose mystery and diversity of marine life inspires a deep fascination within the public, young and old alike. Explorers such as Jacques Cousteau and Dr. Robert Ballard, as well as literary giants like Herman Melville, have captured the imagination of students worldwide with their real and legendary adventures on and under the sea. In this context, the oceans by their nature provide an exciting, tool to actively engage students in math and science, fostering an increased understanding of modern technology. Following recent survey results (TIMSS, 1997), the Department of Education is committed to improving student achievement in math and science so that we can continue to participate and compete in the increasingly sophisticated, global technological society.

Knowledge of the ocean is important in other ways. Public awareness of how the ocean makes life on the planet possible is key to personal understanding of the human condition, as well as a prerequisite for good citizenship in terms of responsible public actions involving the marine environment. Ultimately, continuing advances in practical know-how (applied science and technology) will be the engine that will drive government, industry, and individual citizens to use and protect the ocean to greater national benefit in the 21st century.

Funding Implications

(To be provided)

E.1. PUBLIC ACCESS TO CLASSIFIED MILITARY DATA AND TECHNOLOGY

DOD continues to turn over defense technologies and data for public use

Primary Federal Departments and Agencies

DOD - US Navy and National Imagery and Mapping Agency

Other Partners and Interests

CIA

Environmental Task Force

Medea

Scientific Environmental Research Foundation (SERF)

Deliverables

- The Vice President can announce new results from the Navy's continuing efforts to declassify databases and increase civil access to classified Navy systems in order to support environmental research and other non-military ocean activities. These will include a number of oceanographic and seafloor mapping databases to which U.S. academics have long requested access. Also included is a cooperative new program between Navy and industry to "sanitize" data from the Navy's SECRET underwater listening systems. These seafloor surveillance arrays monitor submarine movements, but can also show whale and marine mammal migrations, as well as underwater earthquake activity and other useful scientific information. The Navy declassification review is in response to the Environmental Task Force originated by Mr. Gore while he was still in the Senate.
- The President can announce release to the public of DOD's new worldwide computer-based nautical charts. Electronic charts are replacing the centuries-old nautical charts that have carried mariners across the oceans. The world's first global marine navigation database to support these computer-based charts is being built by the National Imagery and Mapping Agency (NIMA), U.S. private industry, and foreign defense partners. This defense innovation known as the Digital Nautical Chart (DNC) is also being released to the private sector for civil use. DNC, when used with the Global Positioning System (GPS), is considered by many to be the greatest advance in safety at sea since the introduction of radar. This new technology will allow mariners to minimize environmental risk while moving commerce more efficiently through ports worldwide, significantly improving U.S. trade
- The President or Vice President can announce the release of formerly classified (non-military) information to assist the Global Disaster Information Network in assessing and mitigating against natural disasters.

Funding Implications

No funding impacts are foreseen. Declassification reviews in response to changing world threat requirements are part of the Navy's on-going responsibilities and are funded by normal Navy operational funding. The sanitizing of underwater surveillance data is funded by non-Federal users who want access to the data. This effort is funded by Navy Operation and Maintenance funds. DNC support is planned as a part of the NIMA budget. Approximately \$70 million has been programmed by NIMA for FYs 1998-2002.

E.2. LAW OF THE SEA

Importance of the Convention to All Sectors of Ocean Activity

Primary Federal Departments and Agencies

DOD
DOS
DOC
DOT
DOI - USGS

Other Partners and Interests

NSF
EPA
US Industry

Deliverables

- The Vice President can report to the President that all ocean interests represented at the National Ocean Conference unanimously endorse the importance of the United States joining the Law of the Sea Convention.
- The President can announce redoubled efforts to secure U.S. accession to the 1982 Law of the Sea Convention in the next few months.

Background

A widely accepted Law of the Sea Convention remains a long-standing bipartisan priority of our nation's oceans policy. U.S. leadership in the area of maritime affairs is at stake in our becoming a party because it provides an international legal basis for all our activities at sea. It underpins the very important navigation and overflight rights which our military forces and Coast Guard rely upon to protect national security. It also has strong provisions to protect the marine environment and marine life. This National Ocean Conference has demonstrated that every sector of ocean activities in this country-including the military, fishermen, offshore oil and gas companies, marine transportation, cable-layers, and deep-sea mining interests, as well as environmental groups-all strongly support Law of the Sea. Since U.S. provisional membership in the reformed International Seabed Authority lapses in November it is important that we move now to ratify the convention because we must be on the ground floor as that organization takes shape. The U.S. is the only major maritime nation that has not ratified the Convention, and our leadership in this area of maritime affairs is at stake.

Funding Implications

For the foreseeable future, U.S. contributions to the International Seabed Authority and the law of the Law of the Sea Tribunal will be approximately \$2.6M. Funding will come from existing DOS funding for contributions to international organizations.

F.1. OCEAN AND CLIMATE FORECASTING

Primary Departments and Agencies

DOC - National Oceanic and Atmospheric Administration

DOD - U.S. Navy

NSF

NASA

DOE

NOPP

Deliverables

- The President can announce a multi-agency initiative to improve ocean observation and prediction to diminish the impacts of severe weather events and extreme climate on U.S. agriculture, industry, and the general public. An international effort is necessary to support an improved global observation network, but a U.S. commitment will galvanize international planning and reinforce U.S. leadership in oceanography.

Elements of this initiative will include across-the-board improvements in ocean observations in remote locations from ships, aircraft, buoys, and satellites, as well as increased focus on improving the communications required to share data quickly.

- It will include worldwide expansion into key new areas of the moored buoy observing system that has been so successful in explaining and predicting the El Nino phenomenon.

It will also feature improved satellite tools for ocean observation, including:

- An historical new cooperation between NOAA, NASA, and DOD to launch a new generation of ocean and weather observing satellites to address both military and civil needs.
- A new Navy-developed WINDSAT sensor for global ocean wind speed and direction, sea surface temperature, soil moisture, and snow/ice cover.
- A NASA developed "QUICKSAT", the first of a new generation of single-purpose, quick-to-develop and less expensive environmental satellites.

Improved cooperation in using the increased global ocean data and forecasting abilities to support ocean policy decisions. Examples include:

- A NOAA/NSF partnership called Global Ocean Ecosystem Dynamics Project (GLOBEC) to understand and predict the effects of climate change on commercial fish stocks.

- Programs such as the legislatively-mandated National Ocean Partnership Program will be used as a means to produce incentive funding to establish new collaborations among Federal agencies, academic institutions, and private interests.

Background

Knowledge of ocean-atmosphere-climate interactions is critical to meeting the challenges posed by the Kyoto Conference and to predicting and preparing for El Nino and similar, but less well known, cycles in the earth/ocean climate system. More ocean observations and a better understanding of ocean processes will benefit everyone, in areas that include weather predictions, energy production, agriculture, recreational and commercial fishing, ocean transportation, and natural resource management. U.S. Ocean scientists have developed ocean and atmospheric monitoring and forecasting systems which provide benefits to everyone – from the Midwest farmer who depends on accurate seasonal forecast information for agricultural planning, to the millions of residents of U.S. coastal areas, and the thousands of lives saved in recent years due to advances in hurricane prediction. The central lesson is this: everyone benefits from increased ocean observation and improved ocean science.

Funding Implications

(To be determined)