CHOOSING OUR COMMON FUTURE

Democracy's True Test

Honorable William D. Ruckelshaus

First and Fifth Administrator • U.S. Environmental Protection Agency

Fifth Annual John H. Chafee Memorial Lecture on Science and the Environment

February 3, 2005

National Council for Science and the Environment

Improving the scientific basis for environmental decisionmaking

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THE NATIONAL COUNCIL FOR SCIENCE AND THE ENVIRONMENT (NCSE) has been working since 1990 to improve the scientific basis of environmental decisionmaking and has earned an impressive reputation for objectivity, responsibility, and achievement.

The Council envisions a society where environmental decisions are based on an accurate understanding of the underlying environmental science, its meaning, and its limitations. In such a society, citizens and decisionmakers receive accurate, understandable, and integrated science-based information. They understand the risks, uncertainties, and potential consequences of their action or inaction.

Endorsed by over 500 academic, scientific, environmental, and business organizations, and federal, state, and local government, NCSE works closely with the many communities that create and use environmental knowledge to shape environmental decisions.

The Council conducts a range of innovative activities in the following areas:

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The Council brings stakeholders together through its Center for Science Solutions to develop and implement science-based solutions to specific environmental problems. The first program under the Center, the National Commission on Science for Sustainable Forestry, supports research to develop a better scientific foundation for assessing and improving forest management practices.

JOHN H. CHAFEE MEMORIAL LECTURE ON SCIENCE AND THE ENVIRONMENT

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Democracy's True Test

Honorable William D. Ruckelshaus

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Sponsored by the

National Council for Science and the Environment (NCSE)

Presented at the

5th National Conference on Science, Policy and the Environment

Ronald Reagan Building and International Trade Center in Washington, DC

February 3, 2005

This volume is the fifth in a series of books documenting the annual John H. Chafee Memorial Lecture on Science and the Environment.

ISBN 0-9710439-8-1

For citation purposes, please use:

Ruckelshaus, William, 2005, *Choosing Our Common Future: Democracy's True Test.* Fifth Annual John H. Chafee Memorial Lecture on Science and the Environment. Washington, DC: National Council for Science and the Environment.

This volume is the fifth in a series of books documenting the annual John H. Chafee Memorial Lecture on Science and the Environment. The lecture was delivered at the 5th National Conference on Science, Policy and the Environment: *Forecasting Environmental Changes* (Craig Schiffries, Conference Chair) on February 3, 2005, in Washington, DC.

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Printed on recycled paper with soy inks.

Manufactured in the United States of America.

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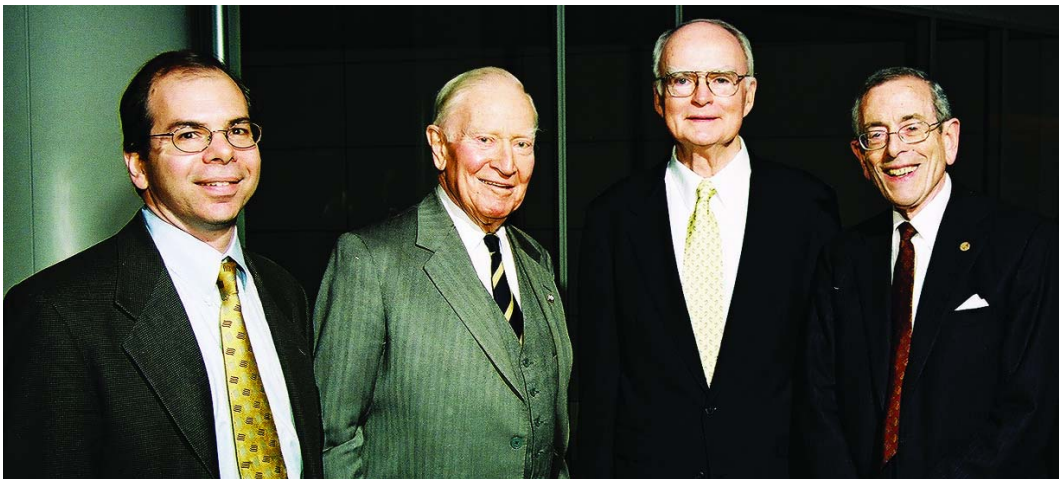
DEDICATION

This book is dedicated to the memory of Senator John H. Chafee who, in his 23 years representing Rhode Island in the U.S. Senate, was a leader in promoting a bipartisan, science-based approach to environmental issues.



Top, from left: *Dr. Craig Schiffries, NCSE, Honorable Russell Train, second EPA Administrator, William D. Ruckelshaus, first and fifth EPA Administrator, and Ambassador Richard E. Benedick, NCSE, gather before Mr. Ruckelshaus' featured lecture.* ***Middle:*** *Mr. Ruckelshaus receives NCSE's Lifetime Achievement Award, presented by Dr. Jeffrey Leonard, Global Environment Fund.* ***Bottom:*** *Mr. Ruckelshaus delivers the Chafee Memorial Lecture at NCSE's 5th National Conference on Science, Policy and the Environment in Washington, DC.*

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OPENING REMARKS

Ambassador Richard Benedick, President, NCSE

Distinguished guests, dear colleagues, ladies and gentlemen, welcome to the Fifth Annual John H. Chafee Memorial Lecture on Science and the Environment. For those of you who are joining us this evening for the first time, my name is Richard Benedick and I have the privilege of being the first President of this unique organization, the National Council for Science and the Environment. I'm actually standing in tonight for our co-founder and Chairman, Dr. Steven Hubbell, who is unfortunately home with a bad cold and didn't want to spread it around.

This is also the 15th birthday party for the National Council. As someone remarked yesterday, we are now entering our adolescence, and you never know what we'll be up to next.

I would just like to recognize in the audience at this time Russell Train, former Chair of the President's Council on Environmental Quality and Administrator of the Environmental Protection Agency; Michael Deland, also a former Chair of the CEQ; and Admiral James Watkins, former Secretary of Energy and now Chair of the U.S. Commission on Ocean Policy.

This morning, we opened our fifth National Conference on Science, Policy and the Environment with the theme of "Forecasting Environmental Changes" — aimed at improving the science of environmental forecasting and strengthening the flow of the best available forecast information to the public and to policymakers at all levels of society.

We began this morning with a passionate keynote speech on climate change by Dean Gustave Speth of the Yale University School of Forestry and Environmental Studies, followed by two superb panels with distinguished scientists from universities, research institutes, and federal agencies.

This morning, Dr. James Baker, former Administrator of the National Oceanic and Atmospheric Administration (NOAA) and now President of the Academy of Natural Sciences, observed that elected political leaders, when confronted by scientific findings and the objections of special interests, often tend to "split the difference" — and this will not necessarily lead to optimal public policy.

OPENING REMARKS

Ladies and gentlemen, the man whom we are honoring this evening — Senator John H. Chafee — was not one to split the difference!

At a time when the U.S. was leading the nations of the world in negotiating the landmark Montreal Protocol on protecting the stratospheric ozone layer, anti-environmental and anti-science ideologues within President Reagan's Cabinet and administration fought to reverse the United States' position for strong controls on the ozone-destroying chemicals CFCs — and incidentally, to fire me as chief U.S. negotiator! Convinced by the science, Senator Chafee became a strong and unwavering ally in mobilizing the U.S. Congress and helping to influence President Reagan to overrule some of his closest political friends and endorse the strong U.S. position and leadership on this critical issue.

And the rest, as they say, is history.

Now it's my special pleasure to introduce my friend and NCSE Board member Jeff Leonard, who will in turn introduce tonight's distinguished Chafee Lecturer, William Ruckelshaus — who is also an old friend of the National Council.

I first met Jeff Leonard when he was Vice-President at World Wildlife Fund and I was there as Senior Fellow to write up the Montreal Protocol story, in what eventually became a book, *Ozone Diplomacy,* published by Harvard University Press.

Dr. Leonard has himself published extensively on environmental issues, and, notably, he served as Bill Ruckelshaus' "sherpa" when Bill was U.S. representative on the famous Brundtland Commission that focused the world's attention on the concept of sustainable development. Currently, Jeff Leonard is founding partner and CEO of Global Environment Fund, a private investment management company focused on promoting technology investments in environment, energy, and human health.

Ladies and gentlemen, please welcome Dr. Jeffrey Leonard.

INTRODUCTION

Dr. H. Jeffrey Leonard, President, Global Environment Fund

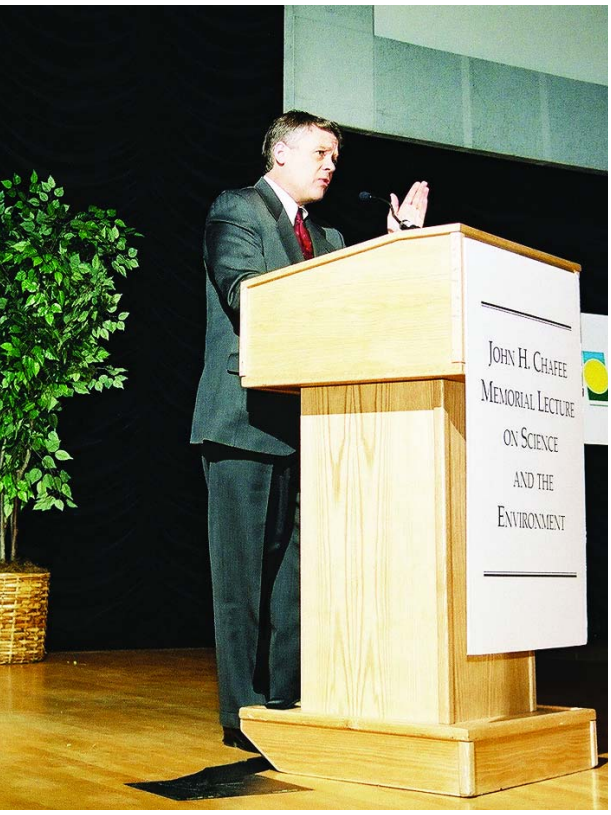
Good evening ladies and gentlemen. My name is Jeff Leonard, and I am CEO of Global Environment Fund, a private equity investment management firm dedicated to investing worldwide in companies that develop clean technologies and operate environmental infrastructure systems to address fundamental environmental challenges.

As a board member of NCSE since 1992, I am especially pleased to see yet another year of record-setting attendance at this conference, and at the Chafee Memorial Lecture.

The way I look at it, there are three critical but inseparable ingredients to addressing major environmental problems:

1) Passion;
2) Objective and long-term scientific analysis; and
3) Stalwart implementation and execution.

Most of you were here this morning for Gus Speth's rousing speech on global challenges. That was *passion*: concern about the problems, commitment to address them. Gus Speth has been at the forefront of the passion agenda on the environment since he helped to found the Natural Resources Defense Council in 1969. The discussion in the panels and sessions today and tomorrow are primarily about *science*: the process of pinpointing problems, collecting data, and formulating objective responses. What we are talking about tonight is *implementation:* developing political consensus and professional capacity to get the job done.



In this context, I am honored this evening to introduce William Ruckelshaus, first and fifth Administrator of the U.S. Environmental Protection Agency; former CEO of Browning-Ferris, previously one of the world's largest solid waste management companies; and former Vice President of Weyerhaeuser Corporation, one of the world's largest forest products companies. More recently, Bill has served as the U.S. envoy on the Pacific Salmon Treaty (appointed by President Bill Clinton) and a member of the U.S. Commission on Ocean Policy (appointed by President George W. Bush). He has also recently stepped down as chairman of World Resources Institute's Board. Now, Bill is a partner in a major private equity investment fund, Madrona Investment Group.

INTRODUCTION

If Gus Speth is the paragon of environmental passion, then Bill Ruckelshaus is the epitome of efficient administration and problem-solving. We need them both, of course. And they each represent something of an endangered species nowadays here in Washington: mainstream party partisans who understand that when it comes to the environment — and the science that takes the temperature of the ecosystems around us — partisanship and ideology should be checked at the door.

The first time I met Bill Ruckelshaus was in 1972, on paper, not in person. As a summer intern in the old Bureau of Executive Manpower, I had the task of helping process applications for departmental transfers and new positions among senior executives of the Civil Service Commission. I encountered a huge pile of transfer requests for executives clamoring to work for a newly formed government agency, the U.S. Environmental Protection Agency. I soon found out why.

As President Reagan said, years later in re-appointing Bill as the fifth EPA administrator:

> EPA was fortunate to have as its first Administrator an extraordinary public servant who gave direction and momentum to the fledgling agency. His assignment was performed with dedication, integrity and a balanced understanding of the Nation's needs. He soon became known — and with good reason — as "Mr. Clean."

Bill's accomplishments and accolades have carried into the arena of international relations, as well.

Eighteen years ago, in 1987, the World Commission on Environment and Development, often called the "Brundtland Commission" because its chair was Norwegian Prime Minister Gro Harlem Brundtland, published its final report, *Our Common Future*.

The report urged governments to take seriously the fact that, left unmitigated, sheer human numbers combined with the prevailing technology for industry and energy utilization had the power to alter the whole planet's life sustaining ecosystems in profound and poorly understood ways.

But after three years of public hearings in 15 countries, the Brundtland Report's real contribution was to focus the world's attention on the apparent conflicts between economic development and the environment. A hallmark of the Commission was to propose a new approach, "sustainable development" — with strategies to improve human well-being in the short term without threatening the local and global environment in the long term.

As many of you here know, the Brundtland Commission was a progenitor of a wide range

of international actions, including two UN "Earth Summits" (Rio de Janeiro in 1992 and Johannesburg in 2002), the International Climate Change Convention, and even the Kyoto Protocol and worldwide "Agenda 21" programs.

But you may be less aware that Bill Ruckelshaus, as the republican (small r) representative appointed by President Reagan, played an absolutely crucial role in bringing about consensus for that report among an extremely disparate group of international representatives appointed by the UN General Assembly.

I shudder to think of what might have become of the Brundtland Report if President Reagan had named virtually any other of his senior-level appointees to serve.

As a relatively young professional I was privileged to serve with Bill, as an aide (or "sherpa" in international diplomatic parlance) on the Brundtland Commission. Over three years of deliberation, I came to see why William Ruckelshaus stands as the ultimate "can-do" guy on environmental policy issues — global, national or local. He maintained this reputation over a career that spans 40 years in government and the private sector.

I believe that Bill was able to succeed in spearheading workable consensus within the Brundtland Commission because he showed great qualities of leadership that all the delegates north or south, east or west, came to respect:

1. Commitment to evidence-based environmental science;
2. Skill in utilizing the political process;
3. Belief in transparency and openness;
4. A willingness to hear other points of view, and especially those of developing country representatives who saw everything the U.S. did as menacing and designed to allow American companies to rape and pillage the world;
5. An abiding, and unapologetic faith in the free enterprise system; and
6. A wry and self-deprecating sense of humor in the face of even the most depressing matters.

Shortly after returning to EPA, Bill gave an interview to *The Washington Post*. "One of the things that strikes me in coming back here again," he said, "is how hard these decisions are, particularly the ones that get up to the Administrator, and how difficult it is to decide how to strike this balance."

I remember this because not too long after, the Brundtland Commission held hearings in Brazil. The Commissioners and their entourage were bused into Cubatao, Brazil, at the time known as one of the most polluted cities on the planet. And I remember Bill — in the midst

of a tour of favelas with barefoot children playing in the muddy streets, juxtaposed against chemical factories pouring toxic effluents from the pipe and pungent gases from the stacks — talking about the issue of trade offs with Paulo Nogueira-Neto, the first secretary of Meio Ambiente (1974-1986) and a fellow Brundtland Commission member. The challenges to balance between regulation and economics in America, as difficult as they are, seemed to all of us to pale in comparison to the challenges confronted in Cubatao.

Then there was the time, also in Brazil, when the three Toms (Brokaw, Cruise, and Lovejoy) were all in the Amazon to call attention to Brazilian rainforest destruction and the shameful decimation of the indigenous people of the Amazon.

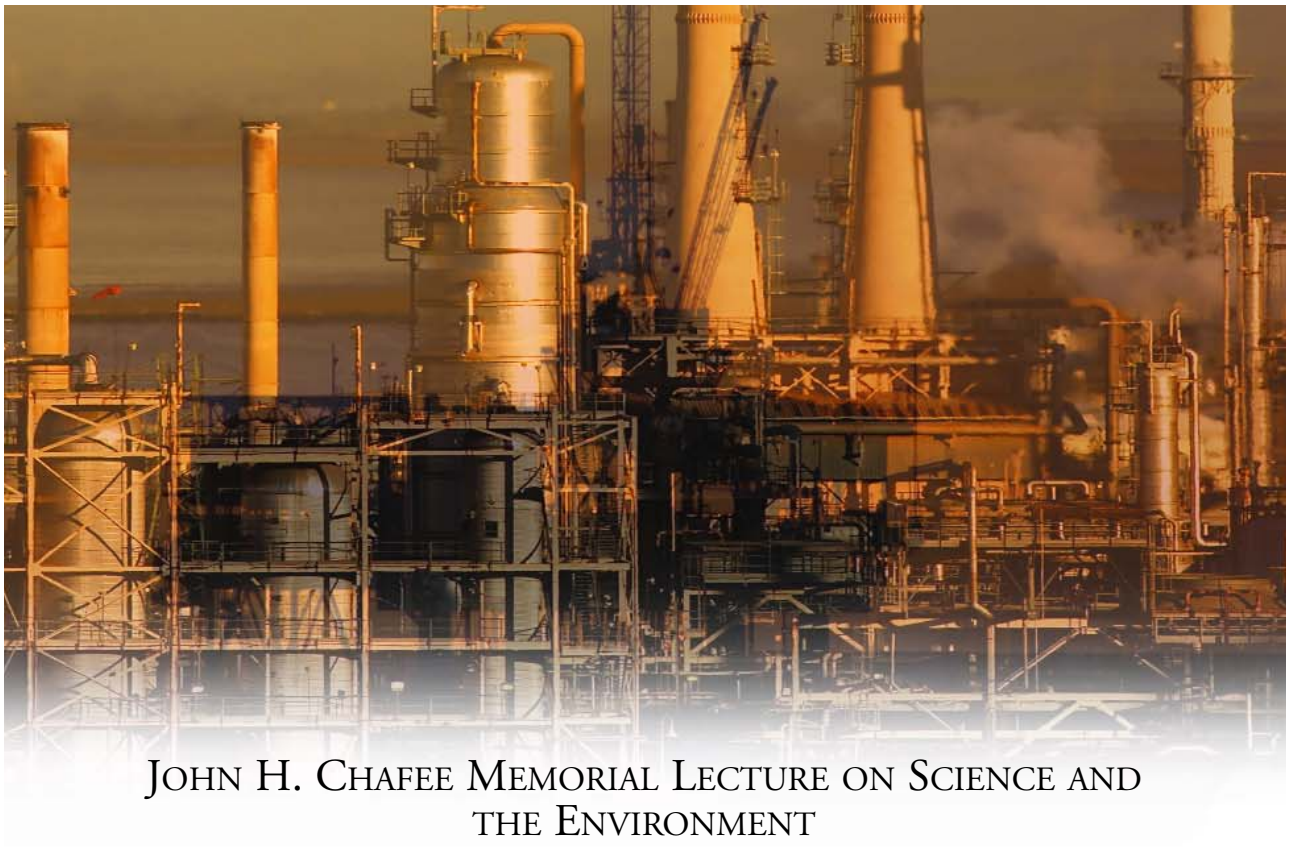
The Brazilian Interior Minister spoke to members of the Brundtland Commission and was obviously incensed by the invasions of Brazilian sovereignty and the hectoring from wealthy Americans. "What right do the Americans have to tell us how to manage our territory?" he asked. "We are going to go to the United States and hold a press conference in the West, on an Indian Reservation, and we're going to ask the Americans: 'What happened to the forests that once stood here? Look at these conditions that your once proud Native Americans now endure.'"

All eyes looked to Bill, as the U.S. Government representative for a response.

Of course, the Minister was right, in a sense, but to concede the point also meant to feed a mentality that condoned some of the worst of Brazilian policies of the 1980s. So Bill, with characteristic aplomb, responded to our translator: "Tell him that if he goes to the United States, he should stay over a Saturday night so he can get a better airfare."

So, with diplomatic skill, strong commitment to democratic process, and more than a little wit and charm, Bill has over many decades been at the forefront of efforts, at home and abroad, to bring rational, science-based thinking to the task of addressing difficult environmental challenges.

Ladies and gentlemen, it is a great honor for me to present to Bill Ruckelshaus the 2005 NCSE Lifetime Achievement Award for his distinguished career, in both the public and private sectors, as a tireless advocate for balanced, pragmatic, broadly supported and sustainable solutions to vital environmental and conservation issues facing this country and, indeed, this planet.



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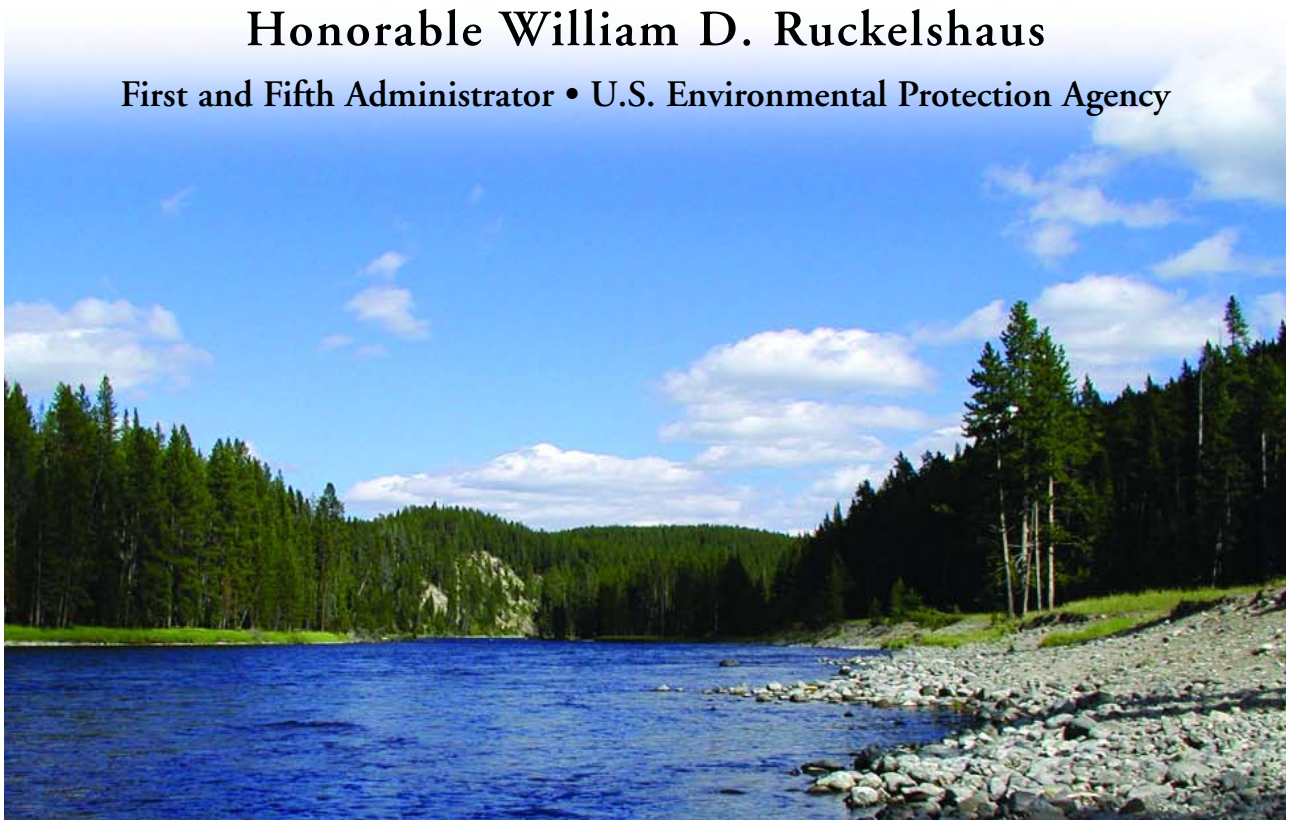

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John Chafee was a fine man and outstanding public servant. There was an aura about him of the rock ribbed New Englander whose opinions and votes were not for sale. That aura was correct. I was in John's presence many times trying to decide the right thing to do about an environmental issue. We didn't always agree, but John's discussion was always on the merits.

His unspoken question always was, "What is in the public interest?" If intelligent and dedicated politicians, and John was both, are asking that question in the pursuit of a solution to America's problems, our Republic will be just fine. It is for that reason that I am honored to deliver a few thoughts tonight in John's memory.

Two weeks ago in his inaugural address, our President sought to commit our country to the ideal of advancing freedom and democracy around the world. Few in this country would quarrel with the desirability of this end. It is always the means to achieve our agreed-upon ends that cause the major disputes. Unless of course you are guided by W. C. Fields' famous dictum, "If the end doesn't justify the means, what the hell does?"

Of course means do matter in our democracy and those chosen in Iraq raise questions like:

- Should we use force to achieve more freedom in the world?
- Will it work?
- Is the use of force consistent with the value of freedom itself?
- Is a call for freedom for all and our offer to help those trying to achieve it consistent with our making common cause with clearly repressive regimes?
- Does the inevitable gap between what we say and what we do diminish the ideals to which all are called?
- To what extent is it valid or advisable to call on a higher being to justify our policies or actions?

These and a host of related questions pro and con have followed the President's speech. I have my own concerns about the way we have pursued our shared ideals of freedom and democracy in the last few years, but those concerns are not the subject of this speech. I know you can't be disappointed. There has been no paucity of speeches on this subject in the last several months nor are there likely to be in the days ahead.

We probably all share the President's desire to see freedom and democracy spread. I agree with him that people who possess freedom and govern themselves consistent with democratic principles are more peaceful, and the chances for peace are therefore greatly increased for all Americans and all citizens of the world.

There are signs that Secretary of State Condoleezza Rice and the President are going to increase the use of diplomacy and what Joe Nye of the Kennedy School of Government calls "soft power" to gain our nation's aims.

In Davos, Switzerland, last week, British Prime Minister Tony Blair urged America to be unified with our European allies in fighting terrorism and global poverty.

In a recent article in *Foreign Policy* magazine, former Secretary of State Colin Powell mentioned the President's commitment to helping the poorest of the world's citizens. He pointed out the connections between extreme poverty and the anger and sometimes violent action it foments. He wrote, "The President has said that he intends to spend the political capital he earned in winning the trust of the American people, and the world can be assured that much of that capital will be spent helping the poorest of its citizens."

Colin Powell doesn't like the term "soft power." He sees the fight against extreme poverty as a core strategy in our struggle against terrorism. I certainly don't believe soft power, or whatever you want to call it, can be a total substitute for military force or economic power where our interests are clearly threatened by the use of aggressive military or economic power. But it has its place. In any event, I applaud the commitment of the administration and its joining in the attack on global poverty. In fact, such commitment is consistent with many little publicized initiatives the administration undertook in the first term such as the 50 percent increase in direct aid to developing countries in the Millennium Challenge Account, which rewards countries that are making progress toward open markets, improved human rights records, and adherence to the rule of law. Likewise, it is important to advance our global interests through domestic policies that square easily with the core American values of democracy and freedom.

Which brings me to the subject of my speech tonight. How do we make freedom and democracy attractive to those in the world living in their absence? According to Joe Nye in his book *Soft Power*, what attracts others to America has to do with our values, culture, poli-

cies, and institutions. He's not claiming all of these attract all people all of the time. In fact, there is considerable evidence that our culture as seen on American television is more of a repellent to the world. Based on the ubiquitous nature of American television, it apparently attracts at the same time. I believe the attract-and-repel elements of our culture are one aspect of what intrigues people about freedom and ultimately draws them to its banner. Many people want to live in a place where they can choose what to be attracted to or repelled by and allow their neighbor to have the same choice.

In any event, if our society is to gain support from others, who admire and want to emulate our system, first, they must be convinced it works for America. And that it works because of freedom and democracy, not in spite of them.

When the first wave of environmental concern swept America in the late 1960s and early 1970s under a Republican President and Democratic Congress, we passed massive laws controlling air pollution, water pollution, pesticides, radiation, toxic substances, and even solid waste — some 10 laws during the 1970s. We put in place a national system of restraints controlling the unwanted actions and substances. Yes, I said a system of restraints — laws, rules, regulations, even cultural restraints. Proper restraints voted on by freely elected officials are the essence of freedom. Let me quote from a speech delivered forty years ago by Chief Judge Barett Prettyman of the U.S. Court of Appeals at the Pentagon in honor of Law Day:

> In an ordered society of mankind there is no such thing as unlicensed liberty, either of nations or individuals. Liberty itself is inherently a composite of restraints. It dies when restraints are withdrawn. Restraints are the substance without which liberty does not exist. They are the essence of liberty...

In one sense, freedom is the *absence* of governmental restraint — unwarranted governmental restraints such as inhibitions of free speech, or the right to worship or to a jury trial for the accused. Those individual freedoms and many more are granted to us under the Bill of Rights.

The freedom our environmental laws are addressing is reflected in our collective obligation to order our activities so that our society will flourish — so that it will work. We collectively, through our Congress, placed restraints on individual, corporate, and government action so it didn't threaten our health or our environment.

This is the system of restraints to which Judge Prettyman referred. Without this ordering of our conduct, things begin to break down and our society and ultimately freedom itself are threatened. The system of restraints is simply the "rule of law" so often cited as necessary for an ordered and free society.

What we fashioned by our environmental laws was a top-down, command-and-control system of restraints.

In spite of some skeptics, this system worked pretty well. Our air and water are appreciably cleaner than when we started over thirty years ago. This is particularly apparent if we imagine where we would be today had we done nothing. Large point sources of pollution such as power plants or industrial emitters are permitted by government agencies and largely under social control. In addition, automobiles emit far less carbon monoxide, ozone, or nitrogen oxides than before controls were put in place. We have identified and eliminated, or greatly mitigated, the effects of many pesticides and toxic substances that were largely uncontrolled prior to the 1970s.

Of course our work is not complete. Protecting the environment is not like building a highway or painting a building. You can't do it and walk away from further work. You must stay everlastingly at it, or things begin to slide. By any measure, we have made enormous progress, and that should give us hope as we tackle the next set of issues.

However, having responded to the first set of environmental concerns — the smell, touch, and feel kinds of problems — that gave rise to the first wave of public outcry, we have been facing a second set of issues where our "system of restraints" and our "essence of freedom" have not been nearly as successful. Let's consider water, for example (we could do this for any medium).

Shortly after I first came to EPA in 1970, the agency published a water report which estimated that 85 percent of the water pollution problems in the United States were caused by point sources of pollution, such as sewage treatment plants or large industrial discharges, and only 15 percent by non-point source pollution, such as combined sewer overflows or run off from farms and city streets. Today, that estimate is just the reverse. The bulk of our threats to water and all of its uses are non-point sources. Non-point pollution sources are caused by all the rest of us. Whether we live on farms, in cities, or in between, our actions are not easily

subject to federal permits. I realize there are those who believe otherwise, but even the strongest adherents of the Patriot Act might worry about a permit for sweeping your driveway or washing your car.

I recently completed a three-year stint on the congressionally created, presidentially appointed U.S. Commission on Ocean Policy. We held hearings all over the country, listened to countless witnesses, and read reams of expert testimony. We found our ocean management system, our system of restraints for managing human interaction with the ocean, a mess. Fifteen separate departments and agencies at the federal level alone are charged with managing a significant piece of our ocean policy. These departments and agencies report to more than 40 committees in the Congress and administer 144 laws which govern their actions. We have laws that are unclear, redundant, overlapping and in some cases in direct conflict. The Commission made more than 200 recommendations to improve our system of restraints. The administration comprehensively responded to those recommendations last December by creating a Cabinet-level council and issuing an ambitious action plan. Only time can tell whether that response will be adequate. We won't know the result until the administrative reforms are put in place and we've had a chance to assess their effectiveness. The importance of funding these reforms cannot be emphasized enough.

My time on the Ocean Commission convinced me that the oceans, which after all cover 71 percent of our shared globe, are a woefully under-addressed resource.

If we take just two examples of domestic issues — non-point sources of pollution and our ocean resources — (and there are many more) that are not being adequately managed within the context of freedom, who cares? After all, we will address water pollution problems if they get bad enough. We won't allow our oceans to completely fall apart. We've always muddled through somehow — look at the more obvious and visible problems we identified and addressed in the 1970s. Someone once described the ocean as just a big hole with water in it. It'll take care of itself as long as we don't interfere too much.

Granting interference of the wrong kind can do more harm than good. Our current system of restraints as they relate to non-point source pollution or ocean management proves that point. Nevertheless, one central question people will ask if they are longing to embrace freedom is, does it work in America? Can we solve chronic problems and grapple with our

own complexities, within the context of freedom? We must answer this question in the affirmative if we are to attract others to our system and our values.

Back in the 1970s, when we made an aggressive effort to address our domestic environmental problems, we led the world. Other countries watched the way our science and public policy reinforced one another and rushed to our shores to marvel at our willingness to tackle tough problems. EPA's offices were full of curious and admiring foreign visitors. They studied our successes, learned from our mistakes, and followed many of our policies. We were clearly showing the way. This is soft power at work. Our sister nations were attracted to our policies and they often sought to emulate our system and adopt our values.

Unfortunately, we have lost some of that attractiveness because our domestic policies are not as enlightened, or innovative, or aggressive as they once were. For instance, we have broken down into squabbling camps on environmental issues. There is not the willingness, as I believe there was in the 1970s, to see problems as challenges that should excite or energize American ingenuity and optimism. We have lost the willingness to experiment, to get the best science and let it inform our discretion, to adjust where the facts warrant and to fail — yes, to fail, because failure is inevitable as we pursue solutions with honest, democratically backed experiments that we hope will enlighten and instruct our next effort.

The principle and practice of adaptive management is just as applicable to social experiments as biological ones. We need to identify problems, be guided by the best science, and not fear to act, because through action we learn. If our action is ill advised or fails, then adapt, adjust our system, and try again. This is precisely what happens in the American private sector all the time. The result is economic success, and it can be success for public policy as well.

One thing we must do if our form of democracy is to work is to holster our political guns and lower our voices. After all, it's easier to listen with our mouth closed.

Whenever EPA comes out with a 200-page rule on a problem, I inevitably get several calls about what I think. The rule is praised by the administration as a bold step forward and denounced by the environmental community as a reversion to a more polluted past. To be honest with you, since I no longer read every 200-page rule EPA puts out, I don't know what I think. What's more, in my 8th decade of life, I have no intention of reading any more 200-page EPA rules. Besides, I am sustained in watching this dance by the observa-

tion of comedian Lily Tomlin, who once said, "No matter how cynical I get, it's hard to keep up."

What I am sure of is this act-and-react process kills innovation, confuses the public, and certainly does not advance our environmental objectives. Furthermore, it makes it unlikely we will convince the world our system is one to which they should aspire.

Cinergy is a large, primarily coal-fired utility in the Midwest. They are devoting this year's annual report to asking the question of their shareholders, rate payers, government officials, and citizens, "What do we need to do to develop a common ground on global warming in this country?" A good, even courageous question for a company in that business to ask. The openness and democratic way they are posing the question is precisely what our democracy should be good at and what we should do when a new rule from any agency is under consideration. My guess is Cinergy will get a willingness to participate, some very innovative answers, and the kind of tolerance in the response to their question that democratic processes generate in its participants.

The value of utter transparency, inclusiveness, and a willingness to listen and adapt is front and center an essential precept of our democracy. I believe people will embrace innovation if they believe the motivation is to solve the problem and there is a willingness to change if the solution falls short. Fortunately, help is on the way.

Increasingly for many of our environment and natural resource problems, we are seeking to resolve them by the use of collaborative processes.

Let me say at the outset that I am not suggesting the processes I am about to describe work for all problems or even some problems all the time. However, as the late John Gardiner, former Secretary of Health, Education, and Welfare in the Johnson Administration and founder of Common Cause, said just before he died, "With all due respect to the ancient arts of law and diplomacy, the recent development of systematic, teachable techniques for getting at the roots of conflict, and engaging multiple parties in disciplined and voluntary collaborative problem solving, represents something new in the 5,000 years of recorded history."

While that may be a bit of rhetorical excess, let me give you a few examples of what he's referring to and then see if we can discover some democratic principles that will advance our environmental solutions and attract others to their use.

Collaborative process can work for traditional regulatory problems. In 1984, while I was at EPA the second time, we confronted a situation in Tacoma, Washington, where the problem had to do with the regulation of a copper smelter and community complaints about the smelter emitting toxic fumes. The community was sorely divided and largely ignorant of the complex scientific and economic issues involved, which did nothing to reduce the intensity of the controversy. We set out to explain all the issues to everyone — to give them the same information we had to use to make the final regulatory decision. And then we asked their advice. In the end, the citizens concluded that the community could preserve 600 jobs and protect its health. With technical help from EPA, the citizens were able to educate themselves, and they found that they did not, in fact, have to choose between jobs or health. A panel of citizens developed a plan that allowed the smelter to continue its operations in a safer way.

In this exercise, I was struck by the ability of local groups and citizens not only to drive to consensus on complex issues, but to invent solutions that had simply not been thought of in the heat of combat. It seems that one answer to democracy's apparent failure may be more democracy. In fact, that is the precise conclusion of a recent book entitled *The Wisdom of Crowds* by James Surowiecki. Using statistical analysis, Surowiecki concludes that a random group of intelligent citizens can, on objective scales, come up with more right answers than one or more experts. This of course is a core assumption of democracy, and it turns out in a surprising number of cases to be demonstrably true.

Since the early 1980s, collaborative decision-making processes have risen spontaneously and in increasing numbers throughout the country. In some cases, the goal was to bypass long-standing deadlocks. People, it seems, want their environmental problems solved and not merely massaged by government officials, and perpetual litigation seems to have limited appeal as a spectator sport. The American West seems to have specialized in this sort of process, probably because it is in the small timber, ranching, and mining communities of the west that the conflicts between livelihood and environmental protection seem particularly sharp.

Let me give you a more contemporary example. In the late 1990s the National Oceanic and Atmospheric Administration (NOAA) listed Chinook salmon in Puget Sound as threatened under the Endangered Species Act. NOAA also listed another species of salmon for a smaller area within the sound. All hell broke loose.

It's worth noting here that conservation biologists are increasingly skeptical about the wisdom of ever attempting to intervene in an ecosystem one species at a time. Since everything is connected to everything else, we must understand everything, or close to it, and everything's connection, before we know what to do to attempt to preserve anything. This could, of course, undermine the central premise of the Endangered Species Act — that humans should not allow even one species to become extirpated.

This is one reason that the previously mentioned Ocean Commission called for ecosystem-based management as a guiding principle to help us manage our oceans more wisely.

The scientific argument over how public policy should incorporate entire ecosystems into a management scheme is unbelievably complex and brings me even closer to embracing *The Wisdom of Crowds*.

As it relates to Pacific salmon, we humans have intercepted their life's journey through increasingly effective fishing techniques and technology. At certain times, we have attempted to replace the wild fish with artificially grown hatchery fish. (There are still 100 hatcheries in Puget Sound.) We have battered, destroyed, and permanently altered much of the fish's habitat, all to the point that some salmon species are utterly dependent on the human species for survival. We got the fish in the mess they are in now, and according to the Endangered Species Act, it's up to our presumably larger brains to get them out.

As the debate heats up about the wisdom of one species at a time, we should bear two things in mind. First, humans are part of virtually all ecosystems, and we must figure out how to maintain the goods and services ecosystems produce for our own well being as well as our fellow critters. Second, scientists such as conservation biologists must inform public policy; they don't make it. In the policy judgments relating to the environment and natural resources, we often have to act in the face of scientific uncertainty. EPA does it all the time. We will make mistakes, but often no action is the least advisable path and is of course a decision in and of itself.

As I've watched the debate and effort to save the salmon in the Northwest, I often thought that if I were a fish and I knew my fate depended on human wisdom and action, I would be very nervous.

In any event, these Chinook salmon swim through every major geographic area of the

sound from urban Seattle/Tacoma/Everett, to agriculturally dominated rivers, to relatively pristine, lightly populated areas of the Olympic Peninsula. Under the Act, any taking, broadly defined, of the fish by anyone was prohibited without a permit and any action taken by, or needing approval of, the federal government was heavily regulated. The fish were all affected by the so-called 4h's — hatcheries, habitat, hydropower, and harvest. Yes, these fish were and still are harvested unlike the bald eagle or the spotted owl. We still eat this endangered species. In fact, Puget Sound Chinook salmon may be the only endangered species sold in local grocery stores. Needless to say, the prosperity of the region, let alone the listed fish, is threatened.

Former Senator and Governor Dan Evans and I invited 250 leaders in Puget Sound to join us at a place called Port Ludlow on the Olympic Peninsula in the fall of 1999. Present were officials from NOAA and the U.S. Fish and Wildlife Service (FWS) plus their state counterparts. They were joined by local government leaders and tribal governments (16 tribes in Puget Sound are entitled by a 150-year-old treaty to one half of the fish harvested in their usual and accustomed fishing grounds). Also present were businessmen, farmers, fishers, environmentalists, and citizens. Eighteen months and 50 meetings later, we hammered out what we called a shared strategy to develop a recovery plan for the fish.

The Endangered Species Act mandates NOAA to prepare a recovery plan. Under that same statute, nothing happens if they don't — and they rarely try because it usually involves federal officials telling local landowners how they can use their land. Roughly the equivalent of telling my grandchildren to lay off the cookies.

Collectively, we seized on the requirement for NOAA to develop a recovery plan as a way to provide a goal for all of us to pursue. We broke Puget Sound down into 14 watersheds. A broad-based scientific review team was appointed by NOAA. Watershed councils were formed where they did not exist. These watershed groups are inclusive of all the interests in their area. All watersheds were given very ambitious fish goals (14,000 spawners for the Skagit River, for instance), and if all these fish roll up into big enough numbers and they begin to show up as a result of the actions committed to by the people of Puget Sound, it will allow NOAA to delist the fish.

Scientists provided tools to help watershed groups translate those fish goals into habitat needs for the fish. Each watershed was asked to submit chapters for the sound-wide plan by

the end of last June. All draft chapters are now in, and a final plan will be submitted to NOAA in June.

In effect, this is a massive experiment involving a vast geographic area. We are attempting to use democratic, even Jeffersonian, means to achieve a societal end (recovered fish) in an extremely complicated human and natural environment.

This entire effort is voluntary. No one is forcing any of the participants to play. It is managed by a not-for-profit, 501(c)(3) entity, funded in part by government and part by the private sector. The Shared Strategy for Puget Sound, the governing regional entity, is overseen by a development committee.

Two elements are crucial to remember. First, the federal government is at the table and helping in the development of the plan. A representative of NOAA and FWS attend every meeting of the development committee. They are not following their usual mantra of "You tell us what you want to do and we'll tell you whether you can do it." A prescription for nothing happening. Instead, federal officials are in the boat and rowing.

Secondly, the plans, and commitments necessary to carry them out, are being made by the people who will be most impacted by their implementation. Their involvement is voluntary and collaborative, and enormous progress is being made. People who would normally see one another only in court are sitting down across the table and harmonizing their interests in a way that two years ago would have seemed like an unnatural act.

When people come to realize that the watersheds they are improving are their place, where they and their children live, they forget about the government.

The democratic process we have chosen has changed the dynamic from a landowner standing on the bank of a river, going through his land, and shaking his fist at the government, to lowering his fist, looking at his feet, and asking himself the question, "What can I do to make this water work for me, my neighbors, and the fish who share it?" Once that question is asked, real progress begins.

My passion on this subject is somewhat colored by my being the Chairman of the Shared Strategy for Puget Sound. Last week we called all the participants together for two days to take stock of where we are. Six hundred and fifty people showed up, including elected officials from all levels of government and our newly minted Governor, Christine Gregoire. The excitement

of their achievement and dedication to proceeding was tangible and very encouraging.

At first, these processes may work only for problems where the alternative (the courts for example) may seem even worse. If the trust builds and they have some initial success, they can then begin to address even more intractable problems. In the Nisqually River in Puget Sound for instance, they have been using collaboration for over 20 years. A state statute created a process that involved all interests: rural, urban, the Army at Ft. Lewis, the National Park Service at Mt. Rainier, the giant timber company Weyerhaeuser, several smaller woodlot owners and, most important, the Nisqually Indian Tribe, whose reservation sits at the mouth of the Nisqually River.

After a rocky start, all interests in the watershed have coalesced around a comprehensive plan that accounts for all uses of water in the Nisqually — drinking water, recreation, irrigation, transportation, energy generation, and fish habitat. Once the people in the watershed realized the Nisqually was their shared place and they were empowered to control it through a democratic process, they exercised that empowerment in a truly remarkable way. It was like magic. The adversarial relations evaporated, and now they are all in lockstep, cooperating to improve their river.

These are just two examples of the power of collaboration with which I am familiar. There are many more. At last count, there were more than 60 of these processes under way in the Colorado River Basin alone. It is essential to understand that each of these efforts is unique to the issues, the locale, even the personalities involved. This approach is absolutely not something you can stamp out with a cookie cutter. Nevertheless, even at this preliminary stage it is possible to derive some general lessons about how to set up a successful cooperative project.

First, these processes need time to work. People must develop trust in an atmosphere where trust has often badly eroded. Be patient, you don't get interest on your trust account unless you make a deposit.

Second, every important stakeholder must be brought in at the very start of the process. Everyone has to be in the boat rowing. You can't leave anyone on shore, because those are the people most apt to roll rocks off the bridges as the boat goes by. When you include all interests you almost guarantee that the result will transcend the sterile posturing of single-interest politics and that people will learn the habit of listening before passing judgment. Involvement

has to be early because, remember, you're operating in an atmosphere of deep distrust. No one wants to feel co-opted by some prior set of assumptions or decisions. The very point of the process is that everyone gets to see the cards dealt to all the players who can affect the outcome; everyone gets to kick the tires on the technical issues.

Third, the sponsor of the process should be a relevant governmental authority and it should signal in unambiguous terms that the process is the only game in town, and that what comes out of the process will more-or-less prevail as public policy. Then everyone must play or risk being left out. The government needs to set the arena — then the process has the best chance to succeed. This is often, but not always, crucial in order to get former opponents around the same table to work together in good faith. If one or another party thinks it can get another bite at the apple in some other forum, they will hold back from the full cooperation necessary for success. Let me note here that these processes are utterly different from the typical public meeting, where people state their positions and afterward are under no obligation to listen to any opposing statements. In collaborative processes you are motivated to listen carefully to the other side — because you need all that information to be able to move forward as a group.

Fourth, it is usually essential that the alternative to collaborative agreement is unacceptable to the parties. There must be a stick along with the carrot. The unknown terrors of the Endangered Species Act drove the parties to the extraordinary efforts in Puget Sound. There the courts had been tried for years, and while useful, people had come to believe they are ineffective at developing a comprehensive solution that adequately reflects the interests of the parties who have something at stake. So even though many have entered into the collaboration with some trepidation, they have been guided by the advice of Mae West who once said, "Whenever I have been faced with the choice of two evils, I always pick the one I haven't tried before."

All of this is not code for no enforcement. In fact, I believe that participation in these processes often sets up the necessary social conditions without which the public will not support enforcement. In the Puget Sound example, the people who have stepped up and committed to taking the right actions for their watersheds are already pressuring the participating government agencies to stomp on the foot draggers. This would absolutely not have happened two years ago.

Fifth, professional facilitation and access to extensive technical advice is essential. We've learned that ordinary citizens have an amazing ability to filter through scientific information that may contain contradictions and come up with reasonable findings. Now, there's a somewhat subtle point about the involvement of government agencies in providing technical support for facilitating these processes. I said you need the backing of government in these things, and you do, but while government can initiate and participate in such processes, it is often best for the actual cooperative decision-making group to operate under the auspices of a non-governmental, neutral, organization. The point, after all, is that lots of people don't trust the government. The government has to let go. Let the citizens decide how to get there.

One approach to providing a neutral venue for assistance in collaborative problem solving is the use of major state universities. At the Institute of Environment and Natural Resources at the University of Wyoming and the Policy Consensus Center of the University of Washington and Washington State University, efforts are underway to assist governments at all levels and citizens in solving intractable problems through the use of collaborative processes. The universities offer scientific and technical help and knowledge about how collaboration can help. In the interest of full disclosure, I have been involved in the creation of both university centers. I know they are providing a real benefit to both states, and the effort is spreading to other centers of learning nationwide. A recent survey by the Policy Consensus Institute at Portland State University counts more than 60 such programs at some stage of development across the country. I am convinced that every state should have at least one university offering its intellectual assets and process expertise to assist citizens and governments in resolving disputes.

Sixth, you have to confront economics in some detail. What you don't want is a trivial 'feel-good' agreement on vague principles that leads to no action. Make no mistake; these processes are ultimately about who gets what. Their real genius lies in discovering that different sides can each get what they need, that the pie can be artfully cut so as to be bigger than we thought. This is known in the facilitation business as going from OR to AND. We stop saying fish *or* irrigation, jobs *or* wildlife, and we start saying fish *and* irrigation, jobs *and* wildlife. From that change, everything else flows. For instance, we have a comprehensive funding analysis on the financial needs of Puget Sound if the fish are to recover. It will be part of the recovery plan submitted to NOAA.

Finally, such a process must have as its goal some deep and meaningful solution. It must, in the words of Donald Snow of Montana's Northern Lights Foundation, "break through the shallow facade of rhetoric and reach to the heart of the issue." Only then, when people are united despite their differences by hard-earned trust, does the astounding political power of collaboration become effective.

Government officials and employees have to be trained to do and say the right thing or these processes can be strangled in the crib. The government needs to be supportive of a sound outcome. One expression of cynicism or non-support by one well-placed bureaucrat can blow up an otherwise hopeful exercise. They need to have the confidence to live by the old saying, "you gain power by spreading it around."

Even where you have all the elements of success and you have carefully tailored your process to the individuals, the situation, and the hoped for outcome, you can fail. But in the kind of areas I outlined a moment ago — non-point source pollution or salmon recovery, and there are many more — we have not succeeded with any *other* approach for a very long time. Also, even where the desired outcome was found to be unreachable, experience shows us that these processes contribute important knowledge, fuel trust building, and enhance problem-solving capacity for those who have participated.

If democracy or freedom is to succeed, we must keep trying. We should try collaboration. This town ought to be sick of its absence by now. We have huge, potentially divisive issues in front of us — from social security to health care, to education, to Iraq. Citizens are utilizing democratic processes to solve problems in their neighborhoods, their communities, and their states. Like true, small d, democrats, we should actively follow their lead. After all, these democratic principles outlined above have stood the test of time, and can be applied to a host of problems.

By participating in democratic solutions to their problems, citizens will learn more about the process of freedom as well as the complexities their public officials must face. Their experiences should improve their understanding of the duties and skills of citizenship and make them more tolerant and supportive of their politicians.

Having said all that, I should emphasize that cooperative decision-making processes are by no means panaceas for every problem. They are extremely difficult to bring off, frustrating

and demanding to participate in, often lengthy and expensive for their members, and they can easily fail. They can fail, for example, when short-term economic interests overwhelm all other factors. Regional land-use planning efforts that call for some property owners to be deprived of a significant fraction of the value of their holdings with no compensation are in this class. After the last election, some compensation for governmentally caused diminished land value is a right in Oregon and could well spread to Washington state and beyond.

And we should also remember that this movement toward collaborative decision-making is growing in poisoned soil. Throughout the nation, among the national environmental groups and industry associations, there are talented, dedicated people who have been trained in a tradition of combat, accustomed to fight for total victory in pursuit of deeply-held beliefs. They like going to court. They will not easily yield their historic leadership or work in good faith with traditional enemies. This characterizes some parts of the Puget Sound effort. Does this mean that cooperative efforts are doomed? No, for ultimately, in my view, American pragmatism will prevail. If cooperative processes are seen to work over the long run, if they really free us from the tyranny of the either-or, if neither side feels co-opted, if they continue to yield creative solutions that allow the extraction of livelihood from natural resources while at the same time preserve environmental values, then they will establish a permanent place among our civic institutions.

Meanwhile, late last summer, the President issued Executive Order #13352 (I can see you are all intimately familiar with Executive Order #13352). In it he ordered the Departments of Interior, Agriculture, Commerce, and Defense and the Environmental Protection Agency to implement laws relating to the environment and natural resources in a manner that promotes "cooperative conservation." By that he means and I quote, "actions that relate to use, enhancement, and enjoyment of natural resources, protection of the environment, or both, and that involve collaborative activity among federal, state, local, and tribal governments, private, for-profit and not-for-profit institutions, other non-governmental entities, and individuals."

The executive order then goes on to spell out how it applies to federal activities and schedules a White House Conference on Cooperative Management this spring.

I think the administration is on the right track. I don't care whether they were politically motivated or not. People often asked me when I was at EPA under Presidents Nixon or

Reagan, whether either President really supported the mission of EPA. My answer was always the same: "He'll support our mission as long as the American people do. As soon as the people forget about it, so will he."

So what? That's the way democracy is supposed to work. What the people say they want from their government is usually what they get. If they want systems of restraint that define their freedom within the need to preserve and protect their environment, their government will respond.

The example of America making democracy work in this and other areas will tempt people to come, to learn, to embrace our system, and not to confront it.

The environment and natural resource problems we face are worth solving for their own sake. If we can solve them by using the processes and pronouncements of democracy and freedom, we will have done the world, ourselves, and our values a great favor.

Thomas Jefferson once pointed out that if the people appeared not enlightened enough to exercise their control of government, the solution was not to take away the control but to "inform their discretion by education." The collaborative processes that are springing up around the country are doing just that, giving to large numbers of citizens a new comprehension of the complexity involved in government decisions, out of which has got to come a heightened appreciation of, and tolerance for, the necessary work of government.

If these processes work, if they spread, if they become an indispensable part of government at all levels, it will hold out hope that, once again, America will be ready for self-government and we will continue to show the way for a world desperately in need of democracy's blessings.

APPENDIX I

Biography of Senator John H. Chafee

Senator John H. Chafee (R-RI) was born in Providence, Rhode Island, in 1922. He earned degrees from Yale University and Harvard Law School. Upon the United States' entry into World War II, Chafee left Yale to enlist in the Marine Corps, and then served in the original invasion forces at Guadalcanal. In 1951 he was recalled to active duty and commanded a rifle company in Korea.

Chafee began his political career by serving for six years in the Rhode Island House of Representatives, during which time he was elected Minority Leader. He was then elected Governor by a 398-vote margin in 1962. He was reelected in 1964 and 1966 — both times by the largest margins in the state's history. In January 1969 he was appointed Secretary of the Navy and served in that post for three-and-a-half years. He was elected to the United States Senate in 1976.

As Chairman of the Environment and Public Works Committee, the Senator was a leading voice in crafting the Clean Air Act of 1990. He led successful efforts to enact oil spill prevention and response legislation and a bill to strengthen the Safe Drinking Water Act. Senator Chafee was a long-time advocate for wetlands conservation and open space preservation and was the recipient of every major environmental award.

As senior member of the Finance Committee, Senator Chafee worked successfully to expand health care coverage for women and children and to improve community services for people with disabilities. In 1990, Senator Chafee spearheaded the Republican Health Care Task Force. He went on to lead the bipartisan effort to craft a comprehensive health care reform proposal in 1994.

Senator Chafee also was a leader in efforts to reduce the federal budget deficit and cochaired the centrist coalition that produced a bipartisan balanced budget plan in 1996. He was an active proponent of free trade and was a strong supporter of the North American Free Trade Agreement (NAFTA). He served as Chairman of the Republican Conference for six years.

The Senator received awards and endorsements from such organizations as the National Federation of Independent Business, the American Nurses Association, the League of Conservation Voters, the Sierra Club, Handgun Control Inc., Planned Parenthood, Citizens Against Government Waste, and the National PTA.

On October 24, 1999, Senator John H. Chafee died from congestive heart failure. He is sorely missed.

APPENDIX II

Biography of the Honorable William D. Ruckelshaus

William D. Ruckelshaus served as Administrator of the U.S. Environmental Protection Agency (EPA) from its inception in December 1970 until April 1973. A decade later he was asked by President Ronald Reagan to return to the agency's helm, where he served as the fifth Administrator until 1985. While the challenges of administering the EPA evolved as the agency matured, Ruckelshaus consistently sought balanced, durable and broadly-supported approaches to environmental and conservation issues.

Ruckelshaus was the U.S. representative to the United Nations World Commission on Environment and Development (commonly known as the Brundtland Commission) from 1983 to 1987. The Commission's 1987 report on sustainable development, *Our Common Future*, led to the 1992 Earth Summit in Rio de Janeiro, which was one of the largest gatherings of world leaders in history.

Ruckelshaus was appointed by President George W. Bush to serve on the U.S. Commission on Ocean Policy. The Commission issued its final report in September 2004, making recommendations to the President and Congress for a coordinated and comprehensive national ocean policy. Previously, Ruckelshaus was appointed by President Bill Clinton in 1997 to serve as the U.S. envoy addressing issues relating to the Pacific Salmon Treaty. He has served as Chairman of the Washington State Salmon Recovery Funding Board since 1999 and has been instrumental in efforts to recover endangered salmon species in the region.

Ruckelshaus is the immediate past Chairman of the World Resources Institute Board of Directors. He is also Chairman Emeritus of the University of Wyoming Ruckelshaus Institute for Environment and Natural Resources, Chairman of the Meridian Institute, and he serves on the board of several other nonprofit organizations.

Currently, Ruckelshaus is a Strategic Director in the Madrona Venture Fund and a principal in the Madrona Investment Group, L.L.C., a Seattle based investment company. He is the director of several corporations, including Cummins Engine Company, Pharmacia Corporation, Solutia, Inc., Coinstar, Inc., Nordstrom, Inc., and Weyerhaeuser Company.

Born in Indianapolis on July 24, 1932, Ruckelshaus graduated cum laude from Princeton University in 1957 with a Bachelor of Arts degree and obtained his law degree from Harvard University in 1960. He was a member of the Indiana House of Representatives and its majority leader from 1967 to 1969. In addition to his service as Administrator of the EPA, Ruckelshaus has held other leadership positions in the federal government including Acting Director of the Federal Bureau of Investigation and Deputy Attorney General of the United States.

APPENDIX III

Agenda: 5th National Conference on Science, Policy and the Environment – Forecasting Environmental Changes

Thursday, February 3, 2005

9:00 am	***Welcome***	**Craig Schiffries,** Conference Chair, NCSE **Amb. Richard Benedick,** President, NCSE
9:15 am-10:00 am	***Keynote Address***	**James Gustave Speth,** Dean, Yale School of Forestry & Environmental Studies; Former Chair, White House Council on Environmental Quality; Recipient, Blue Planet Prize
10:00 am-11:00 am	***Plenary Roundtable***—Lessons Learned from Successful Environmental Forecasting Approaches *Moderator:* **Mohamed El-Ashry,** Former President and CEO, Global Environment Facility *Speakers:* **D. James Baker,** President and CEO, Academy of Natural Sciences; Former Administrator, NOAA **Charles Kennel,** Director, Scripps Institution of Oceanography; Former Associate Administrator, Mission to Planet Earth, NASA **Charles Groat,** Director, U.S. Geological Survey **Margaret Leinen,** Assistant Director, Geosciences, National Science Foundation	
11:00 am-12:15 pm	***Plenary Roundtable—***Designing Ecological Forecasting Systems *Moderator:* **Ronald Pulliam,** Regents Professor, University of Georgia; Former Director, National Biological Survey; Former President, Ecological Society of America *Speakers:* **Ann Bartuska,** Deputy Chief for Research and Development, U.S. Forest Service; Former President, Ecological Society of America **Gary Foley,** Director, National Exposure Laboratory, U.S. EPA **Bruce Hayden,** Professor, University of Virginia; Lead Investigator, National Ecological Observatory Network (NEON) Design Consortium **Thomas Lovejoy,** President, The H. John Heinz III Center for Science, Economics, and the Environment; Former President, American Institute of Biological Sciences **Steven Stanley,** Professor of Paleobiology, Johns Hopkins University; Former President, American Geological Institute	
12:15 pm-1:30 pm	Lunch	
1:30 pm-5:00 pm	***Breakout Sessions—***19 concurrent sessions	
5:30 pm	***Reception and Poster Session***	

APPENDIX III

7:00 pm

5th John H. Chafee Memorial Lecture on Science and the Environment
Introduction: **Jeffrey Leonard,** President and CEO, Global Environment Fund

Choosing Our Common Future: Democracy's True Test
William D. Ruckelshaus, First and Fifth Administrator, U.S. Environmental Protection Agency; Chairman Emeritus, World Resources Institute; Chairman, Meridian Institute

Friday, February 4, 2005

9:00 am-10:00 am

***Plenary Lecture*—Jack Dangermond,** Founder and President, ESRI

10:00 am-noon

Concurrent Symposia—
1. Creating a Global Earth Observation System of Systems (GEOSS): Benefits for Environmental Forecasting
2. Creating a National Ecological Observatory Network (NEON): Developing the Capacity for Ecological Forecasting
3. Environmental Change: An Interactive Discussion About the Future
4. Engaging Users in Environmental Forecasting

Noon-1:30 pm

Lunch

1:30 pm-2:00 pm

***Plenary Lecture*—Arden Bement Jr.,** Director, National Science Foundation

2:00 pm-2:15 pm

***Signing Ceremony*—**NOAA-USGS Joint Memorandum of Understanding
Charles Groat, Director, U.S. Geological Survey
Brigadier General John J. Kelly, Jr., Deputy Undersecretary of Commerce for Oceans and Atmosphere

2:15 pm-3:30 pm

Plenary Roundtable—Applying Environmental Forecasting to Environmental Decisionmaking

Moderator: **Dave Jones,** President and CEO, StormCenter Communications, Inc.

Speakers: **Ray Anderson,** Founder and Chairman, Interface, Inc.; Former Co-chair, President's Council on Sustainable Development
Rita Colwell, Distinguished University Professor, University of Maryland and the Johns Hopkins University Bloomberg School of Public Health; Chairman, Canon U.S. Life Sciences, Inc.; Director Emeritus, National Science Foundation
Brigadier General John J. Kelly, Jr., Deputy Undersecretary of Commerce for Oceans and Atmosphere
Walter Reid, Director, Millennium Ecosystem Assessment

3:30 pm

Adjourn

APPENDIX IU

List of John H. Chafee Memorial Lectures on Science and the Environment

2000 **Sherwood Rowland,** Nobel Laureate, University of California Irvine
Mario Molina, Nobel Laureate, Massachusetts Institute of Technology

2001 **Edward O. Wilson,** Pulitzer Prize recipient, Harvard University

2003 **Rita Colwell,** Director, National Science Foundation

2004 **Jared M. Diamond,** Pulitzer Prize recipient, University of California at Los Angeles

2005 **William D. Ruckelshaus,** First and Fifth Administrator, U.S. Environmental Protection Agency

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Dr. Rita Colwell
Distinguished University Professor, University of Maryland and Johns Hopkins Bloomberg School of Public Health, and Former Director, National Science Foundation

Dr. Mohamed El-Ashry
Chairman and CEO Emeritus, Global Environment Facility

Dr. Malcolm Gillis
President Emeritus, Rice University

Dr. Paul Gilman
Director, Oak Ridge Center for Advanced Studies

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Washington, DC 20006-3918

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E-mail: info@NCSEonline.org
www.NCSEonline.org

ISBN 0-9710439-8-1

Printed on recycled paper