

NATIONAL COUNCIL FOR SCIENCE AND THE ENVIRONMENT'S

9th National Conference on Science,
Policy and the Environment:

Biodiversity in a Rapidly Changing World



Lifetime
Achievement
Awards

December 8, 2008



National Council for Science and the Environment
Improving the scientific basis for environmental decisionmaking

AWARD RECIPIENTS

SPECIAL POSTHUMOUS CONGRESSIONAL RECOGNITION

Hon. James H. Scheuer, New York
Presented by David Blockstein, Senior Scientist, NCSE



NCSE LIFETIME ACHIEVEMENT AWARDS

George Rabb, President Emeritus, Chicago Zoological Society
Peter H. Raven, President, Missouri Botanical Garden
Edward O. Wilson, Pellegrino Research Professor Emeritus, Harvard University



MODERATOR:

Rita Colwell, Distinguished University Professor, University of Maryland,
Former Director of the National Science Foundation
Board Member, National Council for Science and the Environment

TABLE OF CONTENTS

CONGRESSIONAL RECOGNITION AWARD

Presented by David Blockstein, NCSE Senior Scientist

4

LIFETIME ACHIEVEMENT AWARDS

Presented by Rita Colwell, University of Maryland Distinguished Professor

6

LIFETIME ACHIEVEMENT AWARDS PANEL: A CONVERSATION AMONG THE AWARDEES

7

BIOGRAPHIES OF THE AWARDEES

17

LIST OF AWARDEES

19

Congressional Recognition Award

As Presented at the
National Council for Science and the Environment's 9th National Conference on Science,
Policy and the Environment: Biodiversity in a Rapidly Changing World

Monday, December 8, 2008

DAVID BLOCKSTEIN, SENIOR SCIENTIST AND CONFERENCE CHAIR,
NATIONAL COUNCIL FOR SCIENCE AND THE ENVIRONMENT



I want to begin with a special award. This is both personal and related very much to the conference theme.

NCSE, in our first few conferences, gave out a congressional leadership award to a number of lead advocates of scientific approaches to environmental decision making in Congress. We haven't done that for a few years for a variety of reasons, not that there aren't worthy people in Congress. But as the conference chair, I want to take this opportunity to give a special recognition to somebody who was a mentor of mine—who, unfortunately, is not here personally to hear it: the late James H. Scheuer, Congressman of New York. We do have a couple of Jim's daughters here.

In 1987 I was a scientist not particularly versed in the policy world and received a Congressional fellowship through the American Institute of Biological Sciences and the then American Society of Zoologists in the AAAS Science Fellows Program.

I had the good fortune of following on the work of our lifetime achievement awardees, who had organized the National Forum on Biodiversity that was co-sponsored by the Smithsonian and the National Academy of Sciences in 1986.

It raised the awareness of the biodiversity issue in a way that had not been done previously. I had the good fortune of coming to Capitol Hill with that Forum in background. Although I wasn't at the Forum, I was motivated to work on biological diversity and I found more than a home, I found a leader in Congress who was passionate about biodiversity along with many environmental issues. That was Jim Scheuer, who at the time chaired the Subcommittee on Natural Resources, Agricultural Research and the Environment of the House Committee on Science, Space and Technology. We can shorten that as the Environment Subcommittee.

This committee's focus and Jim's focus was really on scientific approaches to the environment. Through this subcommittee they raised issues to Congress, science issues like global warming. There was a junior Congressman from Tennessee who was a member of that subcommittee and learned about climate change. Of course, he's recently been awarded the Nobel Prize, but he really did, in a lot of ways, learn not only from Roger Revelle at

Harvard but also learned these issues from Jim Scheuer.

They looked at ozone depletion with our NCSE President, Ambassador Benedick. In the early 1980s, Jim Scheuer was very active in fighting what he saw was a travesty at the Environmental Protection Agency and actually led to the removal of the then-Administrator of the EPA.

And as the biodiversity issue arose, Jim took on with his usual gusto the issue of tropical deforestation. For example, there's a famous, at least locally famous, article that starts with Congressman Scheuer yelling "Wood chips!" as an expletive, and then ranting about how we're taking these beautiful forests and turning them into wood chips.

Jim, as a Congressman from New York City, had much broader interests than his local constituents. He fortunately had a reasonably safe seat, even though there was a lot of jockeying in the Democratic delegation in New York, which led him to actually represent three different districts during his time in Congress. I always refer to Jim as the Congressman from the Global Village, because that's really who he was representing. His issues were people. His issues were biodiversity. His issues were the planet.

Twenty-some years ago, he was talking about concepts like the Law of the Air, which in some ways pre-staged the conversation that we're about to have in terms of climate policy. He held hearings and he introduced a bill that I was privileged to work with him on, a National Biological Diversity Conservation and Environmental Research Act, which was way beyond the jurisdiction of this little science subcommittee, but that never stopped him. Unfortunately it didn't pass because of jurisdictional issues. The legislation followed a report that the subcommittee had commissioned from what was then the Congressional Office of Technology Assessment, on technologies to maintain biological diversity. The National Biological Diversity Conservation and Environmental Research Act would have established a national center for biodiversity research. It would have created a simple national policy statement for conservation of biological diversity, an interagency strategy and amendment of the National Environmental Policy Act to consider biological diversity, all things that 20 years ago were fairly new concepts and none of which has been enacted in the meantime.

We can look to people like Jim Scheuer as leadership from the congressional side, people like our distinguished lifetime achievement awardees as leadership from the science side. What we're really here for today, 20-some years after the National Forum that they put together and the legislation that Jim Scheuer and others put together, is to rededicate ourselves to this cause and to this purpose and to recognize our personal heroes and people who were role models and are role models for all of us.

So I will turn now to Rita Colwell, the former Director of the National Science Foundation, Distinguished Professor at the University of Maryland, and I'm very pleased to say, a member of the National Council for Science and the Environment's Board of Directors, to present our lifetime achievement awards.

Lifetime Achievement Award Presentation

PROFESSOR RITA COLWELL, FORMER DIRECTOR OF THE NATIONAL SCIENCE FOUNDATION; DISTINGUISHED PROFESSOR AT THE UNIVERSITY OF MARYLAND



Thank you very much, David. I'm delighted to have the opportunity to host this evening's event. It's really a time of enthusiasm and hope in Washington, DC. I often give lectures on my topic of research, which is cholera, and discuss how Washington, DC, 100 years ago was considered a miasmatic swamp because of yellow fever and cholera and typhoid fever and that, you know, it still is sort of a miasmatic swamp [laughter].

But I think it's about to change. We have a new Administration waiting in the wings with a sense of hope that the environment will have a place at the table when the really serious issues of our nation are going to be addressed.

But this evening is an evening of celebration for the careers, the lives, the achievements of three wonderful people, and the lifetime achievement awards are being made on behalf of the National Council on Science and the Environment.

I'm really delighted to have this opportunity to present first to George Rabb, who is known to all of you as the hero of the amphibians, if I may say, who has worked hard to study the declining amphibian populations and understand the effects of climate change on those populations.

He is the President Emeritus of the Chicago Zoological Society and he has contributed significantly to the IUCN, especially on species survival and the Species Survival Commission. So this evening, I would like to award George Rabb for a distinguished career as an innovative leader advancing scientific and public understanding in conservation of biological diversity.

Each will have a chance to speak, and I'm sure they will not be shy about speaking.

Now, I'd like to present the lifetime achievement award to Peter Raven. Peter really needs a long introduction. He's a hero for all of us and especially my daughter, who did her PhD at Washington University, St. Louis, and had the good advice of Peter on her PhD thesis. Peter has contributed to the understanding of the biodiversity of the plant world, and his achievements and his devotion—to diversity, to protection of the environment and to that very wonderful and beautiful plant world—have taken him to every continent of the world.

Peter, for a distinguished career as an innovative leader in advancing scientific and public understanding and conservation of biological diversity, I'm really delighted to give you this award on behalf of the Board.

And then Ed Wilson, a genuine hero, a giant, sort of a Leonardo DaVinci, I think, of biodiversity, a man who has done so very much. All of us enjoy the bio-blitzes; if you've not participated in one, it's an event that you really should experience in your lifetime. That is to unleash a whole crew of students to go out and to inventory everything from the ants, his very famous group of organisms, all the way to the trees and even the cosmos.

So for Ed Wilson, a man who has done so very, very much for all of us, for humanity, I'm delighted to be able to provide the award to you for a distinguished career as a truly innovative leader advancing scientific and public understanding in conservation of biological diversity.



Lifetime Achievement Award Panel

PROFESSOR RITA COLWELL: Instead of speeches, we thought we'd have a conversation. So we will move the podium and three of our favorite heroes will have a chance to speak. And as I said, I think the difficulty will be keeping them from speaking too much. (Laughter) Nevertheless, we will have a conversation about biodiversity, the future of protection of species, and the environment in the future. I'm going to ask George, if you would kick off the discussion of how do you really manage biodiversity, especially when you have to deal with declining populations of species that seem to be sort of a canary in the coal mine for the general environment?

DR. GEORGE RABB: Well, we've not responded adequately with respect to that particular challenge. We're losing much of a class of vertebrate animals that have been on this planet for 350 million years.¹ It seems to me that we have an obligation to other living entities that we should respect, and we simply haven't mustered the effort, the commitment that we should.

In respect to this loss in general, this morning there was a call for a millennium assessment in terms of biodiversity.² But if we do that, we also need to pay attention to a long ago call that's been recently repeated in the pages of *Science* by two political scientists.³ That's a call for a millennium assessment of human nature. There is so much information now coming from neurosciences and studies by neuro-economists, et cetera, that we need to examine our behavior in depth, as Dustin Penn did in terms of our evolutionary background as hunter/gatherer peoples.⁴ It's time that we understand ourselves if we're concerned about the sixth mass extinction on this planet of other life. The primary cause we've certainly identified is us. And what do we know about us? What do we know about human nature?⁵

It seems to me it's time that we really undertake a very thorough analysis and try to extend from that base, promote the kinds of activities, the ethical activities, that Ed Wilson has spoken of in terms of the future of life—what are the considerations that we should bring to the fore? What kind of analysis? What kind of determination of the future?⁶

PROF. COLWELL: Well, Ed, what do you think of the future of species on this planet? You've had a long career doing inventories, and what is your prospect? The bio-blitzes that you've innovatively established, how do you think we're going to really get to be able to protect the species on the planet?

DR. EDWARD WILSON: You know, there's a parallel here between the crashing that's begun of species diversity by outright extinction and mitigation as George has correctly helped identify and stated now, on the one side, with the climate change that's occurring on the other. There is a momentum that's going to be hard to stop, and we're going to lose an awful lot even if somehow humanity can adopt a new world-view.

However, I would like to say that from the beginning, we've got to adopt that new world-view, and I can only endorse what George has said there. We really need to address through science the existential questions raised by George and by Paul Gaugin on his Tahitian masterpiece: Where did we come from? Who are we? Where are we going? That then was put into a kind of general activism statement by a writer named Vercors later who said, "All of man's problems come from the fact that we do not know what we are and cannot agree on what we want to become so we live a mythic life." It is based upon mythic origins and grand and erroneous conceptions of ourselves. It's a hard one to break, but somehow we've got to use the strength and the prestige of science and what we can establish firmly about human origins and the nature of human nature in order to gradually move toward a more livable self image that will help bring about the green revolution that we hope for.

I'd like to put it this way: that our peculiar situation on the planet right now can be explained by our slowness of awakening to our own true nature, such that we are a Star Wars civilization at the present time. One reason that the Star Wars series appeals to popular interests is that people recognize that that's, in fact, pretty close to what we have now.

It consists of paleolithic emotions, medieval institutions and god-like technology, and the combination of those three elements are the ingredients of our self-destruction. Somehow we have to start rethinking the whole thing from the base up—not ideologically and not in accordance with any particular given faith, that would be fatal—but on the basis of what we can learn about ourselves here.

PROF. COLWELL: That's profound, and I agree with what you're saying. Peter, we, as a human species, seem to somehow feel that we are privileged and evolved. Yet, when you look at populations, whatever they may be, plants or ants or anything else, when we over-extend in a given environment, there are problems. Could you comment on that?

DR. PETER RAVEN: I'll make a few comments. I do endorse the idea that a profound understanding of human nature and how we got to where we are is fundamental to real advance, and it must come about. But I would also point out that the four of us sitting on the stage have seen the world population triple during our lifetime, which is pretty astonishing. I started collecting plants and thinking about nature in the 1940s. At that time there was no thought of conservation really, except as saving the parks in the western United States, no particular thought of extinction.

By the mid-'60s, when I was on the faculty at Stanford, it had become obvious that the rate of growth of human population was alarming and was, in fact, exceeding the capacity of the planet to support it. Paul Ehrlich and Dick Holm and I began working on that problem. Very quickly it became obvious that we were facing an extraordinary challenge that was leaving us a world not at all like the one we imagined. Instead, we were creating a world that we'd need to deal in novel ways that we had not thought about in the past.

There was no possibility of exporting people into space in sufficient quantity to affect the situation. I think we did some back-of-the-envelope calculations then, figuring out that if one used the entire world economic product for the purpose, that one could ship off about 12 people a year to the nearest planet. I'm sure you all have a list of

12 people that you'd be glad to sign up (laughter). Hopefully, none of us on stage here would be your target! We're going sooner rather than later anyway. But concerning population, consumption, and the use of inappropriate and unsustainable technologies, my hope would be that the realization that we cannot solve the current economic recession without every nation collaborating might provide a model for dealing effectively with the environment. We certainly all need one another if we're going to be able to improve the global economy, and the same remains true of environmental problems as well. I cannot believe, for example, that I live in a country that is so miserly about providing international family planning assistance when no nation in the world has more to lose from the effects of runaway population growth in the rest of the world than we do.

And when I look at countries like India adding a million people every six weeks and Egypt with 85 million people with a country that mostly receives about five millimeters of rainfall annually and takes its water from the Nile adding a million people every nine months, I cannot believe that we allow our government to treat population growth as anything but a central problem. And I hope that that understanding, which must be based on a re-evaluation of human nature, could only lead to love and understanding and an appreciation of what [tropical ecologist] Dan Janzen has said, which is that the entire world is a garden and that we together are the gardeners who are either improving, maintaining, or degrading every square centimeter of it whether we realize it or not. I hope that in our re-evaluation of humanity, in our re-evaluation of the international institutions that we've built, and in our understanding that we have moved far beyond the capacity of the Earth to support us sustainably that we can find new strength to move into this century finding new and enhanced ways to increase, rather than to diminish, global sustainability.

If we don't find ways greatly to enhance our current efforts, we will basically be dooming those who come after us to live in a dull, unhealthy, uninteresting, non-diverse planet that provides for them nothing like the level of privileges that we all enjoy now. It would be an abdication of moral responsibility for us to allow that to happen! Consequently, I hope that the NCSE, everyone here, and all people throughout the world will find ways to work together to improve the situation.

Finally, I would like to emphasize that there's probably nothing more important in achieving these ends than inspiring our children to understand nature, to work with nature, to delight in nature, to pick it apart, and to see how see how nature works. It has been amply shown that such activities will not only help to lead them to be responsible guardians of the environment throughout their lives, but that it will also help them to grow up to be caring, involved citizens who will make the kinds of intelligent choices on which we all depend in many areas of their lives.

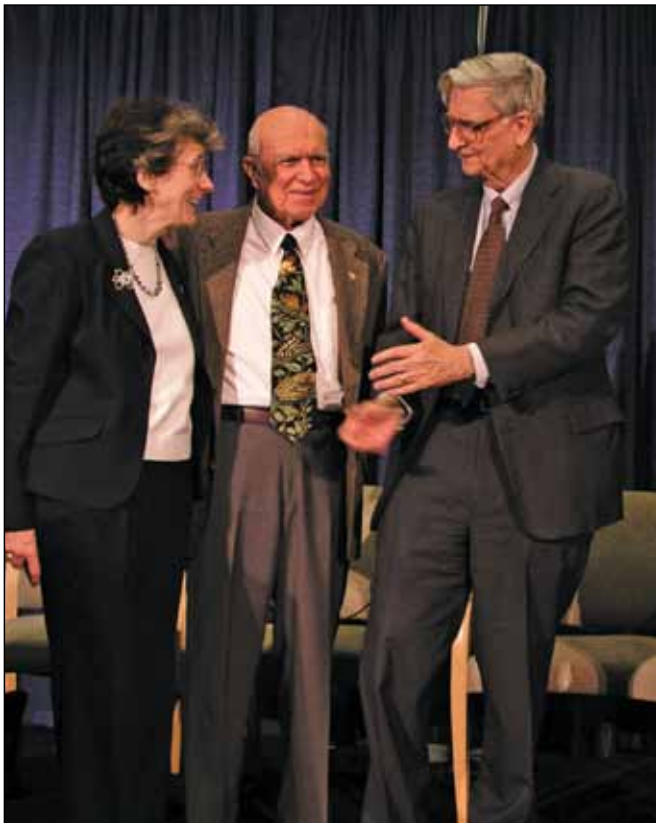


PROF. COLWELL: George, I know that you care a lot about diversity. Peter has sketched a gloomy future. What do you see as the future for biodiversity?

DR. RABB: We're supposed to do something.

PROF. COLWELL: That's right, we want to be proactive and get some things done, so how do we protect and how do we move forward? What's the action agenda?

DR. RABB: One of the things I've been recently involved in is a move by the Environmental Law Commission of the IUCN with respect to supplementing the Earth Charter, which has been adopted as a moral guide by that organization and should be adopted by governments throughout the world.⁷ But really in terms of the earth and its citizenry in all of the biota, it's not really represented in that document. There's only one relevant section and it posits that we have the right to own, manage, and use all of the natural resources on this planet, but if you look at it from nature's standpoint, what are we, this single species, doing? As Peter has indicated, we're already using 40 percent of net primary productivity of this planet. It's incredible. So in terms of thinking about the



relationships that we should have with the rest of the world from an ethical standpoint, and with reference also to the interest of future generations of our species and their quality of life, it seems to me that we should afford Nature a place at the table. This has actually been done in this country in the work of the Community Environmental Legal Defense Fund in Pennsylvania and in New England.

And recently—I don't know whether it's been in any news medium that you picked up—in its new constitution, Ecuador has adopted the notion that Nature should have a place at the decision table. It seems to me that this is something we should promote in this country. We should promote all over and thereby recognize the interest of the other species who have been here and certainly are not welcoming of our presence in terms of their own future, their evolutionary future. And if we're to have an evolutionary future, we've got to live with the rest of the living world in the caring fashion that Peter and certainly Ed Wilson have written about.

And this, I think, is the essence, in my view, of conservation, that is caring, not just caring about, but caring for and practicing such in a fashion that will encourage the stewards of the future, the children of the future.⁸

PROF. COLWELL: Ed, you've instigated the bioblitzes. Can you describe those? Does that really address George's call for getting the kids involved?

DR. WILSON: Yes, it does, but I'd rather spend my little brief piece of time here talking about major trends that give a little bit of light appearing at the horizon in the middle of gloom.

First of all, Peter has correctly pointed out that we're breeding ourselves to the extinction, not of ourselves, but of a lot of other species. However, thanks to the providential tendency of women, once having acquired a little bit of financial independence and freedom, to make a choice of reproducing or not, as a consequence of that, the fertility rate is dropping on every continent. The United Nations' projection has it that we will peak at somewhere around 9 billion people toward the end of the century.

So the problem is, can we manage the planet with 9 billion people? There's almost no way of stopping it

becoming 9 billion, but at least we're not going to become a dying bacterial culture.

Then I want to point out a couple of trends that link the understanding from research to the major concerns of science and humanity. For the past century our field has always been a kind of marginal discipline. The study of biodiversity and systematics is still a starving little orphan out in the edge of the desert, as you know.

PROF. COLWELL: I know too well.

DR. WILSON: Yes, you know very well, Rita, and I salute you. And while I'm at it, I salute all three of my colleagues here, and I salute Rita for having been the first person in a major decision-making position in science and technology who really understood the problem all the way through.

And also, I salute this green warrior sitting to my left (Peter Raven), major scientist, leader, spokesman, and I'll tell you a story about him. Until about 1970, I was just pure science, working on biological diversity, that sort of thing, and as a result, I saw all the evidence myself first-hand across the New World tropics and all across the Pacific of the destruction of habitat. I knew what was happening, but I then said to myself foolishly, scientists are supposed to stay out of public policy. And besides there are all these great institutions like the World Wildlife Fund and Sierra Club that are going take care of the problem. We just need to present the evidence. How wrong I ever was! "The scientists themselves have to get involved," Peter Raven said. That was in the late '60s and early '70s, and it pushed me into action. Peter, you gave a speech, I don't know if you remember it, called "Knock Down, Drag Out" on biodiversity extinction. Do you remember it?

DR. RAVEN: I do. It was a keynote speech at an AAAS meeting in Chicago in the mid-1980s.

DR. WILSON: That's what I read and I said, "Well, he's right, we have to get involved." So a salute to you for many things, but for that especially.

Coming now quickly to trends that should give some hope; although as I said, the momentum of this world-encompassing problem is great, and it's going to take a huge effort to stop it. We're going to lose a lot of species even if we make an all-out effort—the more reason to get started now. One trend is the project underway, some of you might not have heard of it, "The Encyclopedia of Life" headquartered at the Smithsonian with adequate funding for startup. I'm looking at Cristián Samper as I speak, who is overseeing this. It's being run now by a number of institutions collectively. In a nutshell, what it has set out to do and it will do, is to get an electronic encyclopedia on the web, single access on command, accounting for every known species on Earth, now known and still to be discovered. And further, to report everything known about that species into the single database. I believe we'll be able to reach 1.8 million species, all that are known now, in 10 years, and we'll be rapidly adding more and I hope in an exponential manner. This will make everything known about biological diversity instantly accessible anywhere to anybody, anytime, free.

A second enterprise running parallel to it is the Biodiversity Heritage Library, which is the work of a consortium of major research libraries. The aim is to scan and make available to everyone, everywhere, anytime, all of the published literature on all of the species in the world. Those engaged in the effort estimate 500 million pages will be scanned in this effort. It's not impossible either: they've just passed the eight-million mark.

All of this is important because it opens the world of the biodiversity to everyone, professional and amateur. It's going to revolutionize biology, and it's going to revolutionize a lot of biotechnology. I hope we might hear some of this from Craig Venter later.

And in medicine, Eric Chivian has produced with his colleagues the magnificent book *Sustaining Life*, I see quite a few copies around, which, like no other, has shown the immense importance of saving and understanding every bit of biodiversity for personal and public health. So these are promising signs. You asked for action. That's action.

PROF. COLWELL: One of the things that worries me is that we're talking about getting this on the web and all this information available on the computer and I think that's terrific, but Peter, you've built a garden, exquisite garden, in St. Louis. Are we going to see the living specimens only in gardens or in zoos, George, or Peter?

DR. RAVEN: Well, let me return to population just a little bit. If you haven't looked it up, I suggest that everyone look at a website called globalfootprint.org which is a think tank in Oakland, California, which estimates that at present we're using about 125 percent of the world's sustainable productivity. At 125 percent of the world's sustainable productivity, half of the 6.7 billion of us are living on less than \$2 a day and one billion of us are starving, that is, receiving too little food for their brains to develop properly and their bodies are literally wasting away. About 100 million of us are just on the verge of starvation, that is, could starve to death within the next week or two. It's very easy to forget about that in a place like the United States. As much as we all know those facts, do we really care?

When I talk about the paucity of support that the U.S. provides for international family planning assistance, I mean for empowering women, for educating them, for giving other countries around the world greater advantages than they have. I am firmly convinced that unless we do that, we are simply going to make the situation worse and worse and worse. "Our Common Future," the report of the World Commission on Environment and Development, paints a picture of the world in which all the countries in the world will rise up to some kind of national standard of living like we do in the United States. In fact, there's every evidence that it cannot be done with present technologies and with levels of consumption like those that we enjoy now.

It may be and we hope it will be that the world will level off at 9 billion, but on the other hand --that is, if we use anything like the technologies and levels of consumption that we have in the United States and Western Europe—that's way beyond the carrying capacity of the Earth. We simply give evidence over and over again that we don't care about people around the world.

The United States has four and a half percent of the people in the world. We use about 25 percent of the world's economic activity to support our standard of living. I challenge each and every one of you—and you all know this—to remember that that just doesn't work. It means that we're dependent on every other country in the world to support ourselves. How can we get away then with being the lowest contributors on a per capita basis of international development assistance which goes to women and family planning and health and all those other good things.

Somehow, and this may go back to that study of human nature that is so desperately fundamentally important, somehow we've got to spread the love that we feel for our families to the poor and disadvantaged people in our own communities and to the poor and disadvantaged people in our country and around the world. While that may be an esoteric concept, I don't know any other concept or any other attitude that will really allow the world to level out with a reasonable degree of social justice, morality and freedom for one another around the world.

I am convinced that if we believe this individually, we will take those actions, and we do have a good chance of getting to a kind of a level, non-destructive situation. Joel Cohen has shown very well in his great book on population that you could have various numbers of people in the world, but it depends very seriously on how they live. It doesn't suit us to live in sort of a haze that everybody will eventually be as well off as we are unless we're willing to do something about it, and furthermore, unless we're doing something about it, we're not going to be as well off as we are.

I would hate to be a member of the last generation that really gutted the Earth and enjoyed jetting all over the place and eating whatever I wanted and doing whatever I wanted without somehow helping to bring about a change.

PROF. COLWELL: Since we've been speaking about women and their opportunities, let me provide a

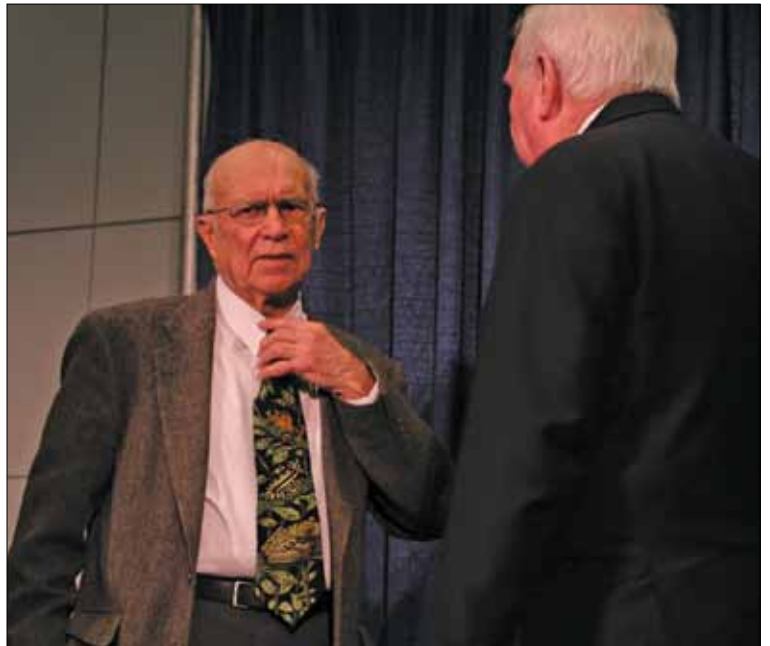
personal experience. Having worked in Bangladesh for nearly 40 years now, I've actually seen the fertility rate drop from 8.4 or so down to 4, and it's a function of educating girls.

DR. RAVEN: That is a relationship that has been demonstrated convincingly throughout the world.

PROF. COLWELL: And providing, as we've already heard, small amounts of investment through the Grameen Bank—sometimes it's just a cell phone that then gets rented or a sewing machine that ends up providing tailoring—makes a woman independent and provides for the family. Educating girls, I think, is the most important factor, and there's plenty of evidence for that in terms of dealing with the population issue. But I think there's another point to be made, and that is that Mother Nature or however you want to phrase it will deal with this population explosion through infectious disease.

As we cut down the forests and expose ourselves as humans to a variety of parasites and infectious agents, we will find that there are the “natural ways,” in quotation marks, of populations being curbed, and this, I think, is an important point to make. That just as ants or amphibians or any of the other species, we human species can also over-populate and create conditions whereby infectious diseases will be uncontrolled and create problems.

But I would like to add that this is a time of hope. It really is. Speaking from a position of having been involved in setting policy and establishing and shaping it, I think this period of time, the next six months, this next year, is truly critical for all of you in attendance. It's a time for addressing transition teams, the new Administration, which in my experience, it essentially takes time before that equilibrium sets



in. During this phase of sort of dis-equilibrium, it's an important time for the NCSE, for the many organizations represented in the audience, to provide those position papers, to provide a unified approach, thoughts, white papers, to the new Administration and to speak out.

I do think there are receptor sites out there for these messages and that it's a time when we can make a difference. But let me ask you, George, I've just finished reading a book about cheetahs and how you can save that population by providing education to the farmers in Africa. Do we really have an opportunity to save some of these wonderful, diverse creatures, some very, very highly intelligent ones on this planet?

DR. RABB: I believe so, and this is being demonstrated right now in Namibia in a very fine way, educating the local agricultural people but also demonstrating in terms of the management of the landscape how you can provide both for the existence of these other marvelous creatures and benefit yourself in the process.⁹ So it's a matter of reaching out, that capacity-building, that extension that Peter was talking about of our conception of aiding other people and assisting them in relating to the natural world.

And it seems to me this is a manifestation of what we have in our human nature in terms of what I call sociophilia. That is what we practice in terms of our own families and those relationships with our close-by friends

and acquaintances in our workplace, neighborhood, et cetera, needs to be extended to the whole world, just as biophilia has got to extend from concern for one's pets or one's garden plants to all the species of the world.

And there's another aspect too, that I think we need to pay attention to in terms of human nature, and it hasn't really been explored except in a casual fashion, and that is locophilia. We are attached to particular places in terms of what pleasures they give, either the aesthetics or the associations with other people that are possible in certain places and in certain scenes of nature.¹⁰

So it seems to me that again we need to pay attention to human nature, from the reproductive aspect that Peter has dwelled on right on through to our natural affiliations with people, places, and the biota if we really care about the rest of nature.



PROF. COLWELL: One of the areas that fascinates me as well is the increasing knowledge in neurobiology and the understanding that animals are far more sentient, far more sensitive and intelligent than we give them credit for. Ed, how do we figure that into the diversity, the responsibility that we, as humans, have for the biology of this Earth?

DR. WILSON: Right, I think that the recent work in animal behavior and socio-biology and into what a complex system it is, even in the brain of an insect, has demonstrated more than any imaginings that we might have about analogies between the human mind and animal behavior, that it is far more complex and interesting than we ever dreamed. In the case of the Old World primates and of course, particularly our closest genetic relatives,

chimpanzees, the work of people like Franz De Waal has illustrated brilliantly how close they are, even up to the levels of intentionality, intrigue of clique formation and so on, deception, so that they certainly are sentient. There is a school of moral reasoning that says that above all, we should preserve those creatures that are closest to us in sensitivity and in moral behavior on their own. But basically, we need to preserve the rest of life to understand how these most complex systems—and even a single eukaryotic cell, still beyond our comprehension—how it's evolved and how it's put together, how they came into existence and when, understanding the systems that they created in such immense diversity, what this means for us in our own understanding of how the world works and where we stand as a species.

PROF. COLWELL: I can't resist bringing up the topic, because it's so critical, and that is evolution, and understanding, as you've just described very beautifully, the evolution of the human nervous system and understanding through study of the animals and protecting them. Peter, you've done a lot of lecturing. Do we have any hope [for the teaching of evolution to] a society that does not seem to be very receptive in many instances, [a topic] that we find so normal but seems so foreign to other components of our society? How do we go about this?

DR. RAVEN: Well, it seems strange that only in the United States to any extent have some fundamentalist religious groups determined over the past 150 years to adopt such a literal view of the Bible that even easily

observable facts like the evolutionary relationship between all organisms on Earth are doubted. The United States is the only country in the world in which a number of people doubt the existence of evolution. We tend to forget that “evolution” has been understood for centuries to be a description of the relationships between different kinds of organisms, and that the “theory of evolution” is actually the “theory of evolution by natural selection,” itself by far the most likely explanation of what we observe. Because the phrase is rendered “the theory of evolution,” many people have gained the misconception that the evolution of life itself is a theory, when it is a fact widely understood long before Darwin and his 19th century writings.

Another semantic problem has arisen, many think deliberately, around the words “intelligent design.” In the hands of the creationists, intelligent design means that there are gaps in the observed patterns of evolution that could have been filled only by the direct intervention of a creator. That is certainly not the case, but the words “intelligent design” to many seem to imply the existence of a creator, and therefore those who do not accept them are said to deny the existence of a creator. In fact, a religious person can readily accept the fact that evolution and the whole unfolding of life on Earth was set in motion by a creator; it does not, however, prove the existence of a creator. Genesis is a description of the origin of the universe and of the appearance and development of life on Earth stated in the best non-scientific terms available about 4,000 years ago; it needs to be understood as such. As Saint Augustine, a father of the Christian church, wrote in about the year 300, “If you are reading the Holy Scriptures and find things that contradict what every person knows, that you should reject them because you will be laughed to scorn if you argue that what it says is literally so.” We really need to move beyond the strange views that are widely held in the United States, understanding that faith and science are not incompatible.

I hope that all of us will do whatever we can to overcome the widely-held misconceptions about evolution, and to encourage respectful discussion between scientists and religious fundamentalists to deal with this area properly. Evolution, as a description of the relationships between organisms, is a fact. Of the millions of observations of molecular relationships made during the past few decades, every single one has been compatible with the existence of evolutionary relationships. Scientists are working to clarify the mechanisms of evolution and test their theories about them; people of faith may view the world and everything in it as a manifestation of the works of a creator.

With respect both to global sustainability and a deep understanding of the Earth, there is much for each of us to do. In that sense, I hope that each of us will strive in their personal lives, their family lives, their professional lives, and around the world diligently to improve our understanding and the sustainability that ultimately rests on it. By doing so, we will earn the right to feel optimistic about the future, and not simply allow ourselves to be buried in the grind of day-to-day activities—something that can distract us from any issue regardless of how important it may be.

PROF. COLWELL: Thank you. I think that’s the last word. I thank the audience for your attention and the three heroes for the discussion this afternoon, and we’re delighted that the National Council for Science and the Environment has been able to recognize your achievements.

For Ed I have a special comment. When I read his book and I paraphrase, the last page said, “If I were to do my career over, I would come back as a microbiologist.” Not bad, not bad.

DR. WILSON: I knew I’d made a friend for life that time.

REFERENCES

1. Confronting amphibian declines and extinctions. J.Mendelson, III, K.R. Lips, et al. *Science* 313:48 (2006)
 Amphibian Conservation Action Plan. Proceedings: IUCN/SSC Amphibian Conservation Summit 2005. IUCN/SSC Amphibian Specialist Group. Gland, Switzerland and Cambridge, U.K. C. Gascon, et al. (eds) (2007). www.amphibianark.org/pdf/ACAP.pdf
 Are we in the midst of the sixth mass extinction? A view from the world of amphibians. D.B. Wake and V.T. Vredenberg. *Proc. Natl. Acad. Sci. U.S.* 105, suppl.1:11466-11473 (2008)
 Threatened Amphibians of the World. S.N. Stuart, et al.(eds). Lynx Ediciones, Barcelona. (2008)
2. Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (2008)
 UNEP/gc.25/15. www.ipbes.net
3. Millennium assessment of human behavior. P.R. Ehrlich and D. Kennedy. *Science* 309:562-563 (2005)
 Biology, politics, and the emerging science of human nature. J.R. Fowler and D. Schreiber. *Science* 322:912-914 (2008)
4. The evolutionary roots of our environmental problems: toward a Darwinian ecology. *D. Penn. Quart. Rev. Biol.* 78 (3):275-301 (2002)
5. On Human Nature. E.O. Wilson. Harvard U. Press (1978)
 In Search of Human Nature. M.E. Clark. Routledge (2002)
6. The Future of Life. E.O. Wilson. *Natl. Council Sci. Environ.* (2001)
 The Future of Life. E.O. Wilson. A.A.Knopf. (2002)
7. The Earth Charter. Values and Principles for a Sustainable Future. (2000) www.earthcharter.org
 Biosphere Ethics Project. (2005-2008) www.humansandnature.org/ongoingprojects/theethicsofbiodiversityconservation/meetingsandmaterials.php
8. The future of zoos and aquariums: conservation and caring. G.B. Rabb and C.D. Saunders. *Intl. Zoo Yb.* 39:1-26 (2005)
 Conservation psychology. C.D. Saunders and O.E. Myers, Jr. (eds). *Human Ecol. Review.* 10 (2):87-193. (2003)
 The Human Relationship with Nature. P.H. Kahn, Jr. MIT Press, Cambridge, MA and London (1999)
 Children and Nature. P.H. Kahn, Jr. and S.R. Kellert (eds) MIT Press, Cambridge, MA and London (2002)
9. Spatial ecology of cheetahs on north-central Namibian farmlands. L.L. Marker et al. *J. Zool.* 274:226-238 (2008)
 Cheetah conservation strategies in Namibia – a model for the future. L. Marker. African Wildlife Conference 2008 Proceedings.www.zoodvurkralove.cz
10. Place and the promise of conservation psychology. S. Bott, J.G. Cantrill, O.E. Myers, Jr. *Human Ecol. Review* 10(2):100-112 (2003)
 The Power of Place. W. Gallagher. Poseidon Press, New York. (1993)
 Space and Place.Y-F. Tuan. U. Minn. Press, Minneapolis and London (1977)
 Topophilia. Y-F. Tuan. Prentice-Hall, Englewood Cliffs, NJ (1974)

BIOGRAPHIES OF AWARDEES



James H. (Jim) Scheuer (February 6, 1920 – August 30, 2005) served 13 terms as a Democratic member of the U.S. House of Representatives from New York City. He received a Bachelor's degree from Swarthmore College in 1942, a Master's degree from Harvard Business School in 1943, and a law degree from Columbia University Law School in 1948. Scheuer was elected to Congress in 1964. He played a key role in protecting the U.S. Environmental Protection Agency's regulatory powers during the Reagan administration. As Chairman of the Environment Subcommittee of the Committee on Science, Space and Technology, he educated Congress through hearings and legislation about biodiversity, air pollution, ozone depletion, climate change, human population growth, and many other environmental issues. In 1986 following the National Forum on Biodiversity, Congressman Scheuer requested that the Congressional Office of Technology Assessment study and make recommendations to Congress on how to advance biodiversity science and conservation.

That report, *Technologies to Maintain Biological Diversity*, formed the basis of the National Biodiversity Conservation and Environmental Research Act that Scheuer introduced in Congress in 1988. The bill would have established a national biodiversity policy, an interagency strategy and a national biodiversity research center. Scheuer was an early advocate for action on climate change. A strong supporter of science, Scheuer was a lead sponsor of legislation to establish a National Institute for the Environment. An internationalist, Scheuer helped to organize and led the Global Legislators Organized for a Better Environment (GLOBE), where he was followed by Al Gore, and was an active member of the Interparliamentary Union. He served as the United States Director of the European Bank for Reconstruction and Development from 1994 until 1996.

Peter H. Raven, Ph.D., is one of the world's leading botanists and advocates of conservation and biodiversity. For three decades, he has headed the Missouri Botanical Garden, an institution he nurtured into a world-class center for botanical research and education, and horticultural display. He is also the Engleman Professor of Botany at Washington University in St. Louis. He completed his undergraduate degree at the University of California, Berkeley, and his Ph.D. at the University of California, Los Angeles.

Described by *Time* magazine as a "Hero for the Planet," Raven champions research around the world to preserve endangered plants and is a leading advocate for conservation and a sustainable environment.

In recognition of his work in science and conservation, Raven is the recipient of numerous prizes and awards, including the prestigious International Prize for Biology from the government of Japan and the U.S. National Medal of Science, the country's highest award for scientific accomplishment. He has held Guggenheim and John D. and Catherine T. MacArthur Foundation fellowships.

Raven was a member of President Bill Clinton's Committee of Advisors on Science and Technology. He also served for 12 years as home secretary of the National Academy of Sciences and is a member of the academies of science in Argentina, Brazil, China, Denmark, India, Italy, Mexico, Russia, Sweden, the U.K., and several other countries.

The author of numerous books and reports, both popular and scientific, Raven co-wrote *Biology of Plants*, an internationally best-selling textbook, now in its sixth edition. He also co-authored *Environment*, a leading textbook on the environment.





George Rabb, Ph.D., is the President Emeritus of the Chicago Zoological Society and served as Brookfield Zoo's director from 1976 until 2003. Rabb's pioneering work led the zoo towards its current position as a conservation center, a concept Rabb has championed for zoos everywhere. Rabb received both Master's and doctoral degrees from the University of Michigan, Ann Arbor, and his bachelor's degree from the College of Charleston, South Carolina. He joined Brookfield Zoo in 1956 as curator of research. Rabb created the zoo's Education Department and was instrumental in the use of naturalistic exhibitry to provide visitors with environmental immersion experiences throughout the zoo. Additionally, under Rabb's direction, the zoo pioneered a new approach to helping children develop caring attitudes towards nature. Rabb has affiliations with conservation organizations worldwide and is a

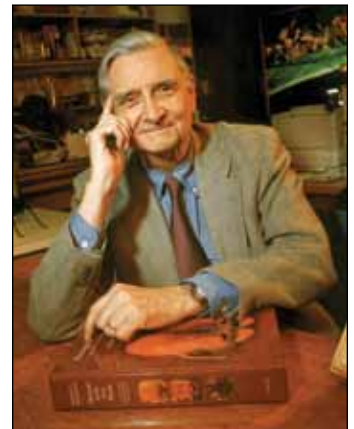
respected spokesman on wildlife conservation issues. Most notably, he is past chairman (1989-1996) of the Species Survival Commission of IUCN, the largest species conservation network in the world, and he founded the Declining Amphibian Population Task Force. Rabb helped found and is still active in Chicago Wilderness, a multi-organizational consortium to maintain the exceptional biological diversity of the metropolitan region, and served as President of Chicago Wilderness Magazine until 2008. He was long a member of the University of Chicago's Committee on Evolutionary Biology. He is a research associate of The Field Museum and is on its board's Science Committee. Rabb is on the Illinois State Museum Board (Chairman until 2008) and is also on the boards of Defenders of Wildlife and The Center for Humans and Nature. Rabb published on the behavior of mammals, reptiles, and amphibians, notably on social behavior of a captive wolf pack, behavioral development in okapi, and breeding behavior of pipid frogs. His other studies have ranged from the evolutionary relationships of viperid snakes to diabetes in tree shrews.

Edward O. Wilson, Ph.D., is Pellegrino Research Professor Emeritus in Entomology for the Department of Organismic and Evolutionary Biology at Harvard University. He earned his B.A. and M.S. at the University of Alabama and his Ph.D. at Harvard University. He joined the Harvard faculty in 1956.

In 1963 his work and his conception of species equilibrium led him to the theory of island biogeography, which he developed with the late Robert H. MacArthur of Princeton University. The theory greatly influenced the discipline of ecology and became a cornerstone of conservation biology. By the late 1970s, Wilson was actively involved in global conservation, adding to both original research and the promotion of biodiversity research. In 1984 he published *Biophilia*, which explored the evolutionary and psychological basis of humanity's attraction to the natural environment. In 1988 Wilson edited the volume *BioDiversity*, based on the proceedings of the first United States national conference on the subject, which also introduced the term biodiversity to the language, now in universal usage.

In 1992 Wilson published *Diversity of Life*, which synthesized the principles and the most important practical issues of biodiversity.

Among his more than 100 awards from around the world, Wilson has won the Pulitzer Prize twice, once in 1979 and again in 1991 for his books *On Human Nature* and *The Ants*, respectively. He received the U.S. National Medal of Science in 1976. In 1995 he was named one of the 25 most influential Americans by Time magazine, and in 2000 one of the century's 100 leading environmentalists by both Time and Audubon magazine. In 2005 Foreign Policy magazine named him one of the world's 100 leading intellectuals.



LIST OF AWARDEES

The NCSE Lifetime Achievement Awards have been presented to

- 2002 Maurice Strong**, Senior Advisor to the United Nations Secretary General; First Executive Director of the United Nations Environment Programme (UNEP)
- 2003 Gaylord Nelson**, Former Governor of Wisconsin; Former U.S. Senator; Founder of Earth Day; Counselor of the Wilderness Society
- 2004 Gordon (Reds) Wolman**, B. Howell Jr. Professor of Geography & International Affairs, Johns Hopkins University
- Ruth Patrick**, Francis Boyer Chair of Limnology, Academy of Natural Sciences, Philadelphia; Adjunct Professor, University of Pennsylvania
- 2005 William Ruckelshaus**, First & Fifth Administrator, U.S. Environmental Protection Agency
- 2006 Russell E. Train**, Second Administrator, U.S. Environmental Protection Agency; Chairman Emeritus, World Wildlife Fund
- 2007 Theo Colborn**, Professor, University of Florida, Gainesville; President, TEDX (The Endocrine Disruption Exchange)
- Herbert Needleman**, Professor of Child Psychiatry and Pediatrics, University of Pittsburgh School of Medicine
- 2008 Robert Corell**, Global Change Program Director, H. John Heinz III Center for Science, Economics and the Environment; Senior Policy Fellow, American Meteorological Society
- 2009 George Rabb**, President Emeritus, Chicago Zoological Society
- Peter H. Raven**, President, Missouri Botanical Garden
- Edward O. Wilson**, Pellegrino Research Professor Emeritus, Harvard University



National Council for Science and the Environment
Improving the scientific basis for environmental decisionmaking

1101 17th Street, NW, Suite 250
Washington, DC 20036

Phone: 202-530-5810

Fax: 202-628-4311

E-mail: NCSE@NCSEonline.org

www.NCSEonline.org

Copyright © 2010 NCSE

Printed on recycled paper