RESPONDING TO THE CLIMATE CRISIS: ASKING THE RIGHT QUESTIONS
16th International Conference on Health and Environment: Global Partners for Global Solutions

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THE FREQUENCY OF WEATHER-RELATED DISASTERS

Growth and changing composition of natural disasters.

Your Excellencies, Distinguished Delegates, Honored Speakers and Ladies and Gentlemen, founders of organizations are like good parents. Both do everything they can to nurture their creations and make the right decisions to help the new life thrive. Like good parents, an organization’s founders and its leaders must stay grounded and flexible in their thinking, and attentive to the organization’s changing needs as it grows.

In the toxic dust of Chornobyl, WIT was founded with one overarching goal: to provide accurate, science based information on the inter-relationship between human health and an increasingly contaminated natural environment. Over its two decades of life, WIT developed programs and projects to further scientific knowledge in this area.

Even though it is the primary responsibility of governments to protect public health, we believe that an active civil society with informed citizens has a responsibility to keep public officials accountable for doing their job. In the absence of accurate evidence based information affecting public health, citizens must take corrective action. And indeed they have. WIT has taken this approach within the context of the UN to encourage science based decision making, especially affecting human health.

In the past 15 years, since we held our first conference on April 26th 1992, just previous to the Rio Earth Summit in Brazil, we can report that not only does health hold a higher place on the international agenda, but the interconnections between our natural resources and human health have achieved significant attention. Policies and programs grounded in science have come into existence to address the protection of oceans, forests, land, air, fresh water sources, mountains and the global climate. Although the process of establishing binding agreements takes a long time, the movements towards environmental protection for the security of human health seems to be solidly underway.

Health has grown to encompass a great number of factors and their complex inter-relationships. Health is no longer thought of as simply the absence of disease, rather, it contemplates complete mental and physical well-being. Since different factors have greater and lesser impacts on our health at different stages of our lives, identifying and assessing those factors and their inter-connected functions is vital for our awareness of the effect of our environment on our health.

Pollutants impact health directly and indirectly, and no place in our world is entirely free of contamination. Pollution can be looked at as a precursor to certain illnesses, including asthma and some cancers. The direct effects of air pollution are compounded by problems stemming from its indirect effects for respiratory illness which has been shown to increase vulnerability to other infections. Additionally, there are thousands of new chemical substances in the environment, very few of which have been tested to determine what impact they might have on health.

As a health professional, I am most interested in avoiding diseases and the current information concerning climate change brings up increased risks to human health across the globe. The average global temperature in 2005 was 14.6 degrees Celsius, the warmest year ever recorded, according to NASA’s Goddard Institute for Space Studies. Some illnesses affected by a warming climate are vector-borne diseases. Malaria, dengue fever, yellow fever and Encephalitis, are all spread by mosquitoes which thrive in a warmer, wetter climate. Massive, destructive bursts of precipitation contribute to the increased occurrence of cholera and other water borne illness, particularly in crowded, poverty stricken urban areas. Droughts in growing arid lands contribute to food shortages and thus malnutrition. Now that the global warming genie is out of its bottle, it has taken on a life of its own and we need to prepare ourselves with knowledge and foresight to sustain a healthy population.

WIT has also kept an international focus on the long range health effects from the Chornobyl nuclear tragedy, by addressing the science based evidence derived from credible studies and presenting that information at each annual conference. The initial raison d’etre for WIT was the Chornobyl catastrophe with its multitude of physical and psychological ramifications. Over the past 20 years of WIT’s life, we have been challenged by stories of Chornobyl’s health effects that lacked scientific grounding but appealed to the heart. Each anniversary of the Chornobyl tragedy presented a developmental opportunity for WIT. We could incorporate the emotional
elements of the world’s worst nuclear accident - perhaps at the expense of science or we could deepen our intellectual focus on scientific knowledge at the expense of some emotional connection. We chose the latter time and again because we believe that ultimately only reliable knowledge can prevent catastrophes.

In the 21 years since the Chornobyl nuclear accident, we have presented only scientific information related to the effects from Chornobyl intentionally omitting the mythology that has evolved around the event. Taken together, the body of Chornobyl related knowledge included in our Conferences has delineated what we know from what we do not know, has recognized the changing limits to scientific research, and ultimately has helped to demystify radiation exposure.

We try to excite our audiences - especially our young Conference participants - about the important role science plays in political decision-making. Our Conferences demonstrate the importance of a forum for sharing information and ideas among the experts, policy makers, educators, concerned citizens and students many of whom will become the next generation of leaders.

Thank you.

H.E. Mrs. Mirjana Mladineo
Permanent Representative of Croatia to the UN

It is my honor to be here today, at the opening of the 16th International Conference on Health and Environment that has been organized by World Information Transfer. Croatia has now been cosponsoring the conference for the fifth year and providing eminent speakers from Croatia because we strongly believe that we need to do more in the area of the environment and how it affects our health. It is especially important that those countries that are more advanced in this area and have more resources, help those with fewer advantages in order to preserve the environment for future generations.

Croatia is an emerging donor and in this context, this year’s theme, “Responding to the Climate Crisis, Asking the Right Questions,” is very relevant. If only we had followed the media reporting, we would have known that climate change is a very “hot” topic, and that opinions are offered from lay people, on the street, to scientists and politicians. For years it was mostly the subject of scientists and some policy makers but UNEP’s Intergovernmental Panel on Climate Change (IPCC) has clearly stated there is new and stronger evidence that most of the warming observed over the past 50 years is attributed to human activities.

Our human activities have come under scrutiny. For the next few days a number of competent scientists and policy makers will engage in this discussion and consider how we can further look for solutions. We are, therefore, very happy that the Croatian Assistant Minister for the Environment, Dr. Daniel Schneider, is with us today. He will talk about the health impact of climate change in Croatia. We were all reminded last year of the terrible consequences of Chornobyl that were felt in our area of Eastern and South Eastern Europe, and therefore, are very conscious of what human activities may cause.

I’m very happy that Climate Change has commanded such attention and that it’s on the very top of the UN environmental agenda. However, let me conclude with words of caution. We should not unduly politicize the issue, but should find the right way to respond to the challenges put in front of us by scientists.

Ambassador Jiro Kodera
Permanent Mission of Japan to the UN

Let me begin by expressing my sincere appreciation to World Information Transfer and its Chair, Dr. Christine Durbak, for making such a strong commitment to promoting knowledge about health and environment around the world. It is a great pleasure to participate in this important meeting and have an opportunity to share Japan’s experience in this field.

With the rapid advances that have been made in research on climate change by the Intergovernmental Panel on Climate Change, (IPCC) the Stern Review, and others, international awareness of climate change has been increasing more than ever. It is one of the main issues that need to be addressed by the entire UN system, and it was discussed in the Security Council just this Tuesday. I, therefore, believe that today’s discussion is timely and meaningful.
We mainly focus on the reduction of greenhouse gas emissions, promotion of the use of cleaner energy and adaptation when we discuss the issue of climate change. We are fully aware that it is absolutely essential to undertake these tasks. Indeed, many ideas have been put forward about how to reduce greenhouse gases emissions, develop technology, and promote adaptation.

For its part, Japan has been cooperating with developing countries to support them in tackling climate change. Let me share with you two examples of this cooperation:

1. In 1997, we launched the "Kyoto Initiative," which aims at helping developing countries build the human resources necessary to combat global warming. We have also been providing assistance with a view to reducing vulnerability and promoting adaptation by means such as forestation, training in land resources management, and improvement of irrigation systems.

2. By holding a Ministerial Conference in Nairobi last month, we have promoted the Tokyo International Conference on African Development (TICAD) process, which has given greater attention to issues of energy and the environment as well as adaptation to the effects of global warming in the context of sustainable development in Africa.

The potential human toll of climate change is of grave concern. For example, heat waves and natural disasters such as hurricanes and floods cause serious damage to people’s lives. People are also affected indirectly through vector-, water- and food-borne diseases, and by a lack of clean water and food. Indeed, the IPCC warned in its recent report that climate change can lead to increased deaths, disease and injury as a result of heat waves, floods, storms, fires and droughts, and increases in malnutrition and consequent disorders, and have serious implications for child growth and development.

The international community has been actively trying to address the issues of impact on human health at the national and international levels. The private sector and civil society, including NGOs, have also been playing a major role in this area. Japan believes that the impact of climate change on human health is a serious matter of human security. The concept of human security should be reflected in whatever measures we adopt to deal with this issue.

Water and sanitation is one area in which Japan has been striving to make a difference based on human security. It goes without saying that water is essential for human life, as is clear from the fact that the major ancient civilizations flourished near great rivers. However, people living in dry regions, especially in parts of Africa, are having increasing difficulty maintaining access to clean water because of decreases in rainfall. On the other hand, heavy rainfall can be a cause of water contamination because it leads to flooding. And the suffering is more intense in regions where economic and social conditions are less than robust. It is a major challenge for communities in such areas to maintain a clean water supply.

Japan has taken various actions in the area of water and sanitation because it was confronted throughout its history with numerous water-related problems such as floods, droughts and water contamination. We believe, therefore, that the techniques established through our experiences will contribute to improving water resource management in developing countries.

Accordingly, at the Fourth World Water Forum held in Mexico last year, Japan announced the “Water and Sanitation Broad Partnership Initiative,” abbreviated as “WASABI,” which is a Japanese variety of horseradish that grows only in clean water. Through “WASABI,” Japan has been providing assistance for the development of groundwater and sewage systems, and capacity-building for water resource management. In the interest of human security, we also introduced a method of promoting community participation in programs that we believe will contribute to maintaining sustainable water supplies.
Here at the UN, in March of 2004, the Advisory Board on Water and Sanitation was established by then Secretary-General Kofi Annan. Former Japanese Prime Minister Ryutaro Hashimoto served as the first Chairman of the Board. Although Mr. Hashimoto passed away last July, his strong dedication to water and sanitation is shared by his successor, His Royal Highness Willem-Alexander, the Prince of Orange, and the board members. The “Hashimoto Action Plan” issued last March made recommendations in the six vital areas to help ensure that we meet the MDG water and sanitation target. One of the initiatives put forward in the plan has already been implemented. Last year, the General Assembly decided to designate 2008 as the “International Year of Sanitation” in order to facilitate the international and national efforts to improve the access to clean water and sanitation, especially in the countries which are vulnerable. Japan took a leading role in the push for this resolution.

Our efforts to cope with the health-related consequences of climate change are just symptomatic treatments, and they will not eliminate its root causes. It is essential to address the challenge of global warming so as to effectively reduce the negative impact by climate change. In this regards, it is of the utmost importance to control the emission of greenhouse gases. However, it is hard to say that the current Kyoto Protocol framework covers most of the global greenhouse gas emissions. Therefore, we must create a new, effective post-Kyoto framework in which the maximum number of countries participates.

Climate change is a global challenge, and it will require the concentrated action of the entire international community, developed and developing countries alike. It is time to move forward from the stage of knowledge to that of action. In this regard, in Japan, we are waging a national campaign called “Team Minus 6%” aimed at reducing CO₂ emissions by 6%, the target set for Japan in the Kyoto Protocol. For example, the Japanese government is encouraging businessmen not to wear jackets and ties in the summer-the so-called “COOL BIZ” style—so that office thermostats can be kept at 28 degrees Celsius. Likewise, there is a winter version called “WARM BIZ.” Major efforts by individuals are needed to obtain a substantial reduction of CO₂.

The UN should play a leading role in facilitating the reduction of greenhouse gas emissions by involving the entire system. Furthermore, it will be able to contribute to reduction of the emissions by encouraging Member States to engage in national campaigns to raise awareness and inspire individuals to action. The lesser the effort we make now, the greater the impact we will face. We must take action now.

It is important that during this two-day forum we discuss vital issues which are on the international agenda. Among them let me particularly highlight the themes “Human Health in a Changing Climate” and the “Legacy of the Chornobyl Disaster”.

Next week on April 26th we will solemnly commemorate the 21st anniversary of the Chornobyl catastrophe, the most horrible nuclear disaster in history. The accident at the Unit 4 of the Chornobyl Nuclear Power Plant in April of 1986 caused widespread radioactive contamination in southern and eastern Belarus, southwestern Russia and northern Ukraine. Even now after 21 years, the consequences of one of the world’s worst technological catastrophes - the Chornobyl disaster- still adversely affect the lives of people in the region.

For Ukraine, it is not only a pain of the past, but also a problem of the present and a challenge for the future. Our government takes every opportunity to address and deal with the accident’s consequences. Special attention is given to the completion of a new safe shelter for the wrecked Unit 4 of the Chornobyl power plant in cooperation with our partners from the international donor community.
Acknowledging the difficulties faced by the region in minimizing the consequences of the Chornobyl disaster, the United Nations General Assembly in its resolution 60/14 “Strengthening of international cooperation and coordination of efforts to study, mitigate and minimize the consequences of the Chornobyl disaster,” takes note with satisfaction of the progress made by the Governments of the affected countries in implementing national strategies to mitigate the consequences of the Chornobyl accident.

It also calls upon United Nations agencies and multilateral and bilateral donors to continue to align their assistance with the priorities of the national strategies of the affected states, and stresses the importance of working together on their implementation in a common effort in the spirit of cooperation. The cooperation with the UN on this issue is still on the high move, in particular with its main operational arm - the United Nations Development Programme, which coordinates Chornobyl-related programmes to ensure smooth recovery and long-term development of the affected territories, displaced population and local communities.

Ukraine particularly welcomes the appointment of Maria Sharapova, the world’s top-ranked tennis player, in her capacity as Goodwill Ambassador for UNDP as she has agreed to put special emphasis on Chornobyl recovery efforts.

In conclusion, I would like to express my best wishes for a successful conference. We are confident that these deliberations will further strengthen our awareness on today’s challenges, which our planet is facing, and contribute to the noble task of bringing people together to help and support each other.

Governor
Christine Todd Whitman
Board of Directors of the Council of Foreign Relations, former Administrator of the US Environmental Protection Agency

Thank you very much for the kind invitation, I am delighted to be here today, especially on such a glorious afternoon. I am particularly delighted to be part of this organization because there’s no doubt that as the world seeks to address the issues of the environment, the one that seems to be most on people’s minds these days is climate change. This organization, from all that I know of it, is well suited for the task of asking the right questions since it was formed twenty years ago in response to the Chornobyl disaster. World Information Transfer has done vital work in educating people about how best to respond to disasters that carry threats to the environment and it is providing invaluable insight to people on how to manage their lives when they are faced with this kind of disaster, and what it means to them. I am especially grateful to learn about the scholarships, and having looked at some of the resumes of the recipients, it is clear that these are going to be the kind of young people who are going to continue the progress that we so desperately need to make. It is only through enabling future leaders, the most talented minds of the next generation, that we are going to be able to solve the issues that confront us in the twenty-first century.

There’s no doubt that many people today believe that the greatest of those environmental challenges is climate change. I believe that it is now beyond dispute that the Earth’s climate is changing and that human activity has a very real impact on the rate of that change. I have often argued with my fellow environmentalists to say, don’t use the short hand to say humans cause climate change, because that’s too easy an out for those who don’t want to believe. The earth is changing and has been changing since it was formed, and human activity is exacerbating that change to a point where nature can no longer accommodate it. We can no longer adapt; it’s happening too fast for us today. I also believe that it falls to every responsible government policy maker, whether state or national heads, to take actions to address the issue of green house gas emissions on whatever levels they can and in the best ways they can.

As I look at the evolution of the policy debate on global climate change over the past ten years, there really isn’t any doubt that what was once seen as the focus of a few environmentalists - and maybe a former Vice President of the United States - has grown enormously. Global climate change has become a common concern for people from all walks of life, from business leaders, scientists, government officials, religious leaders, NGOs, the United States Supreme Court and most recently, the United States military. I am sure that many of you saw and read last week the stories about the report from the US Army War College, called the National Security Implications of Global Climate Change. I have to admit that last year when a number of evangelical leaders came together in this country and called on the Bush Admin-
istration to pursue a more aggressive policy on climate change, I was surprised. And then when I read last week that some of America’s top military commanders are now calling climate change a threat to America’s security, I knew we had really turned the corner on the debate in this country.

I think General Gordon R. Sullivan, the former Army Chief of Staff, captured what many other policy makers, including myself, have experienced in our own thinking about this particular issue. As the Washington Post reported last Sunday, General Sullivan said that as recently as last September, he had had some doubts about the issue of climate change, but as he looked at the science, learned more about it, and by seeing with his own eyes what was happening to the area where he grew up in New England, he became convinced that climate change is now a grave challenge for America.

The question that still has not been fully answered by the United States is of course, how will we achieve reductions in green house gas emissions, especially carbon. The Bush Administration has pursued a policy that is based on two principles: the first is promoting voluntary action by businesses to reduce their carbon footprint, and the second is by investing in research that leads to the development of new technologies that either substantially reduce or have the potential to eliminate green house gas emissions. When I was at the Environmental Protection Agency, for example, we inaugurated a program called Climate Leaders, which was a voluntary program and promoted voluntary efforts by the corporate sector to reduce green house gas emissions. Today, not quite five years later, there are some 110 businesses that are a part of Climate Leaders, and who are in the process or have already developed long-term strategies for reducing their green house gas emissions.

Climate Leaders can be found in virtually every economic sector of this country. They run from companies one might expect, Green Mountain Power, Green Mountain Energy and Whole Foods to some that many would not expect such as Frito Lay and Miller Brewing Company, companies in this country that are not necessarily seen at the forefront of environmental concerns. The Climate Leaders partners represent a substantial number of America’s largest companies; in fact, more than half can be found on the Fortune 500 list. And their annual revenues from all of the partners in climate change represent almost 10% of the United States total Gross Domestic Product. Their efforts are producing real and measurable results. In total, the planned reduction in carbon emissions by Climate Leaders, as of today, would be equivalent to the reduction we would get if we eliminated seven million cars from our roads. In addition, the administration has invested some 12 billion dollars to research cleaner, cheaper and more reliable energy, including the development of an affordable hydrogen fuel cell technology.

Truly we all hope that these investments will work. We hope that these initiatives will lead us to a cleaner environment in this nation. But the question that we have to ask is, is it enough? Increasingly, leaders from every segment of our society are saying no. They believe that more needs to be done in this country. Let me give you just one telling illustration of what I mean. A few weeks ago, the New York Times had a special insert, a ten page section, talking about the business of green. It discussed the tremendous growth in this trend of the private sector to tap into the economic opportunity behind doing the right thing environmentally. For a paper like that to devote a section like that to the environment and to the importance of being green, and what it means to the economy, would have been unthinkable ten years ago. It was followed up just yesterday by a four page article in USA Today on the very same subject of how doing right by the environment can actually be a good thing for the bottom line of any business.

To many in the environmental area, we are now looking at business people being at the forefront of moving us along. In fact, its visionary leaders are some of America’s biggest corporations who are taking the lead and actually advocating for federal action to regulate them, to put some restraints on their behavior and to regulate their competitors as well. What’s especially interesting is that this current state of play is almost an exact role-reversal of what it was thirty-seven years ago. Back in 1970, when Richard Nixon established the Environmental Protection Agency, the federal government proceeded with a very heavy hand to establish regulations to protect the environment over the objection of a great number of business leaders, who felt this was the absolute wrong thing. Today, in a very real sense, the opposite is true.

We now have major business leaders objecting to the federal government’s lack of mandatory standards, and calling on them to take action. Many of you remember this past January, just two days before President Bush...
ultimately, the world’s response to our changing climate will be driven by those who empower themselves to make a difference

was scheduled to give his State of the Union address, leaders from ten of America’s largest businesses in the energy, manufacturing and financial services, held a press conference with leaders from the environmental community to call for the mandatory establishment of regulations on green house gases. That would have been unimaginable a decade ago. Those people couldn’t have gotten together in the same room, and now we have them coming together in a press conference calling for joint action, calling for the federal government to do something positive. But what forward thinking business leaders today know that they didn’t know thirty-five years ago, is that environmental behavior is not just socially responsible, it’s also good business.

A company on whose board I serve, United Technologies, offers just one example. Over the past ten years, United Technologies has reduced its absolute energy consumption by 19%. It’s done that even as its revenue was growing by more than 80%. Let’s not forget that United Technologies does a lot of manufacturing of big engines and things that are not exactly in the carbon neutral sector of the society. Yet, they have been able to demonstrate this kind of economic model, that you can move forward. If the leaders of United Technology can reduce their energy costs, and therefore their carbon emissions, others clearly can as well. Furthermore, at a time when energy crises are increasing, you don’t have to be a financial genius to understand that if you reduce your energy use, you are actually going to help your bottom line. As United Technologies and so many others have found, the fact that your companies are growing does not mean that your energy demands have to grow as well.

Those who argue that a mandatory action on carbon will lead automatically to economic disaster are just being proven wrong everyday, and yet that for a very long time this viewpoint has been the basis for a large part of the opposition to the United States taking action, relative to green house gas emissions and carbon reduction. In fact, it was my experience as Governor of New Jersey that hasn’t changed much, many years ago, to conclude that tough environmental standards with the flexibility and latitude for how businesses meet those standards, is the best way to get economic progress. A combination of putting in strict standards with a very real consequence to business for not enacting them, coupled with the latitude to achieve those standards in a way that keeps the business economically competitive, is a powerful formula for improvement.

Of course, we also have to ask the question, who has the major responsibility for reducing green house gas emissions? Is it just the countries of the developed world? Or does the developing world have a role to play in this issue? I thought British Prime Minister Tony Blair said it very well two years ago when he said that, in addition to participating in reducing green house gas emissions by the nations of the developed world, we must also include those of developing nations, China and India in particular, without whom it would be difficult to see how we are going to make progress. I agree with the Prime Minister, I am convinced that without the nations of the developing world on board, whatever efforts the United States, Europe or Japan choose to make, we will fall short of what must be done.

We know, for example, that within fifteen years, China will become the world’s greatest producer of green house gases. We also know that many parts of the world are experiencing significant and sustained economic growth. That growth is coupled with changes in land use, which also has an enormous impact on climate change. In the fifty years between 1950 and 2000, the portion of people living in cities in the developing world has more than doubled from 18% to 40%. Currently, urban areas in the developing world are growing at a rate that is six times faster than those in the developed world.

So the combination of economic growth and the movement into cities is increasing the developing worlds’ proportion of global green house gas emissions and their impact on climate change. Clearly, without the commitment of these nations to reduce their own green house gas emissions, overall global reductions are not realistically achievable. I do not believe, however, for one moment that we should expect those countries to reduce those emissions by sacrificing their economic growth; that is not the alternative. Instead, we should be encouraging the transfer of technology and expertise that will help them to improve their environmental performance even while they expand their economies.

I believe the imperative for action here in the United States on global climate change has reached a tipping point. I predict that within the next five years we will have a cap on carbon in this country, we will see mandatory action taken. I don’t expect it to happen in the current administration, but I do believe that it will happen in the next administration; no matter who is in the White House or which party controls the Congress. Even if that prediction does come to pass, however, it doesn’t mean the end of what we need to do. We have to remain engaged in this issue. Science will continue to expand its knowledge about our global climate and how and why it’s changing. Technology innovation will continue to develop new ways to reduce carbon emis-
visions and decrease the human impact on the earth’s climate. And governments will continue to set policies for better or worse that seek to respond in some fashion to what the public ultimately wants to see their governments do.

That’s why each of us must continue in our own ways to ask the right questions, even as the climate, both natural and political, continues to evolve. Ultimately, the world’s response to our changing climate will be driven not only by those in power, but by those who empower themselves to make a difference, and that is each and every one of us. It will only happen so long as people continue to educate and inform themselves about this most pressing environmental challenge of our time.

I thank you very much for inviting me here today, and I thank you for your commitment to these issues and for your commitment to educating future generations, who will be the ones that will find the best answers for us all.

As you probably know, the earth’s climate has always changed. Its position and orbit in space are regularly alternating so, the difference between the elliptical and circular orbits means the difference between warm periods and ice ages. Also, certain shifting in the inclination of the earth’s axis, together with those changes in the orbit, affect the sunlight distribution across the earth’s surface and temperature itself. But what scientists have observed in the last century or so is a sudden increase, in CO$_2$ concentration as well as average temperature itself, which is now scientifically proven to be connected. It cannot only be attributed to natural causes but should also be connected to human activities. I am not only talking about the burning of fossil fuels and CO$_2$ from heavy industry, but also forest clearing and cattle breeding. The fact is also that human activities have always been affected by nature’s climatic cycles. The IPCC estimated that the global average temperature will rise by several degrees in this century and evidently, this will have a profound impact on the earth’s biosphere.

People used to think that those changes would take a longer time to appear, but as we are all witnessing now, this already is happening; it affects the health of humans as well as the ecosystems and other species on which we depend. Climate change affects human health in two different ways: directly through impacts of extreme weather events and indirectly through changes in disease patterns, by a shift in disease vectors, like mosquitoes, ticks, mice, waterborne pathogens and also by the quality and availability of our food, water and air. Those indirect effects such as disturbance of our natural and managed food-producing ecosystems, rising sea levels or population displacements due, for example, to physical hazards, land loss, economic disruption, civil strife, may not become evident for up to several decades. WHO estimates that climate change contributes to 150,000 deaths and 5,000,000 illnesses each year.

We talk about the increasing frequency and severity of such weather events as heat waves, droughts and intense rainstorms. In the European region, different studies show that the southern coastal part, where Croatia partially belongs, will become much drier while the northern part of Europe will become warmer and wetter. This increase in the average temperature will also increase the number of heat waves in the summer and decrease the number of cold spells in winter. Different climate scenarios for Croatia suggest a higher incidence of hot and dry summers with maximum daily and night temperatures of about 25 degrees Celsius. Probably, the
more frequent occurrence of heat waves poses a serious threat to human health, especially for older people, the very young and chronic patients. There is a certain temperature threshold above which this number rapidly increases and a direct relationship has been established between thermal stress and death rates due to heat-stroke, cardiovascular, renal, respiratory and metabolic disorders. Increases in the earth’s temperature will also increase the ozone at the ground level. Ozone in the upper atmosphere protects us from harmful ultraviolet radiation reaching the earth’s surface, but in the lower atmosphere, it is a harmful pollutant which damages lung tissue and causes problems for people with asthma and other lung diseases.

Since we are in New York I would also like to mention the particular problems of big cities due to the so-called effect of the “urban heat island,” which emphasizes the negative consequences of air pollution. Some measures for adaptation include: how to mitigate or reduce the negative effects, for example, by preparing our health systems and giving them the ability of providing early heat wave warning systems and giving practical information and advice to citizens.

Not all effects of global climate change will be negative. The projected decrease in winter cold spells will also reduce winter-related mortality, particularly that relating to cardiovascular diseases and asthma. The IPCC projected that climate change will lead to increases in intensity of precipitation events. The most common type of natural disaster in Europe that causes loss of life and economic damage is flooding. I would just like refer to Croatia, where we have had a recent increase in local floods since 2005, and also to the record waves of the Danube River that flooded many of the central European countries in 2003, also recorded in Croatia.

Adaptation measures include building stronger houses and dams as well as non-structural measures, like early warnings, increased communication during floods and improving the reconstruction process.

The frequent occurrence of droughts also disturbs natural and managed food producing ecosystems, as I said in the beginning. This leads to a decrease in crop yields and drinking water shortages and could lead countries towards malnutrition and starvation. It can also cause population displacement and lead to social and political disturbances. In Croatia, only 0.86% of total arable land is irrigated, so during periods of drought we experience substantial crop losses. There are ambitious plans for the construction of irrigation systems. For example, by the year 2020, 65,000 hectares, or 6%, of the total arable land will be irrigated. Unfortunately, this will have some negative effects on the ecosystem and its species.

On rising sea levels, the projected estimate is a 50 centimeter rise by the year 2100, which could flood many coastal regions, like Bangladesh, Asian cities, the Netherlands, South Sea islands, etc. More than 100,000,000 people live in zones up to one meter above the sea-level where flooding could cause migration and damage infrastructures, which could also increase the risk of infectious diseases and mental disorders. Croatia does not belong to those parts of the world seriously in danger of the rising sea levels because its coast is mainly steep and rocky, but there are certain shallow regions which are densely populated which could be threatened by the projected rising of 65 centimeters. This could also, as I said, as the damage infrastructure like harbors, buildings, roads, communications, energy cables, sewage systems, but maybe what is more important is that the infiltration of salt water could increase salinity of coastal freshwaters, which could affect agriculture and the water supply.

The most obvious effect of climate change on human health is in disease patterns. As I said, climate change stimulates the spread of diseases outside their natural boundaries, for example, from the tropical regions to the more moderate regions. The expected warming will lead to an increase in the occurrence of vector borne diseases like malaria, tick-borne viruses and meningeal encephalitis. I am mainly referring to Croatia, where there is a clear indication of malaria in the coastal region of the country where it was previously eradicated. Also, in recent years we have experienced the occurrence of some tropical in-
sects and parasites which have never been found before, like the tiger mosquito from Asia and Oceania. This is a known viral vector causing dengue hemorrhagic fever and was found in Croatia in October 2004. A couple of months ago we had the first occurrence of a parasitic worm, suffered by a lady on the northern coastal part of the country, also never found before in Croatia. Disease-specific measures include diagnosis and treatment, vaccination, vector control, disease surveillance and monitoring, information and health education. In Croatia there is also a particular problem of tick-borne viral meningeval encephalitis, borne by forest ticks. Climate change actually caused warmer and longer autumn periods, extending tick activities while mild winters favor tick survival; so it is also the rise of the annual mean temperature that shifts the altitudinal limit for tick occurrence.

Little is known about the distribution of Lyme borreliosis, because this disease has been monitored for only ten years in Croatia. Major risk areas include preventive action, such as vaccination for workers in the forest industry and protective behavior. There is also greater risk of Leishmaniasis, carried by the vector sand fly. There have been found new endemic areas in Northern Croatia, as well as in Italy, Switzerland and Germany. Major initiatives have begun including local control of sand flies, insecticide-impregnated dog collars, provision of information to the public, and also naturally active cooperation between veterinary health services.

Warmer and wetter conditions also favor the spread of diseases carried by food and water, like diarrhea and dysentery. This demonstrates the relationship between environment temperature and salmonella infections, as there has been a rise in incidents by five to ten percent for each one-degree Celsius increase in weekly temperature. To fight this we must control and monitor the food chain, and also it is crucial to adopt legislation, particularly on food storage and refrigeration. Warmer summers and an extended vegetation season increase the number of people affected by respiratory allergies: seasonal allergic rhinitis and allergic asthma caused by pollen from the trees, grasses and weeds. The allergic diseases are related to the length and intensity of the pollen season, the frequency and height of pollen peaks and the allergen load. Also, it is projected that the pollen season in the European region extended for about ten to eleven days on average for the past thirty years. Measures include public information about preventive action and treatment.

Finally, I come to my conclusion. I would say that there is a close link between climate change and the occurrence or severity of extreme weather events, and of some diseases and other threats to human health.

The unindustrialized world, the poorest countries, will suffer more than the industrialized world due to the fact that they are less equipped to deal with these issues, and are geographically more likely to encounter them. A significant indirect adverse health effect of climate change for richer countries may be the surge of migrants, unfortunately some of them carrying diseases across borders. Migrants resulting from some catastrophic climate event, such as intense droughts, floods or storms, could overwhelm the public health resources of recipient countries. There are a number of different studies and reports offering numerous possible adaptation options for responding to climate change which could reduce adverse effects and enhance beneficial impacts. But all these actions will incur substantial costs.

Since I am coming from the energy background, I would like to finish with one thought from the Climate Change Futures report: “The challenge of climate change presents grave risks and enormous opportunities, and the clean energy transition may be just the engine that takes us into a healthier, more productive, stable and sustainable future.” Thank you very much for your attention.
curred since the 1970’s is already causing over 150,000 additional deaths per year. Those with the greatest risk for climate related diseases are children in poor countries, who have contributed the least to greenhouse gas emissions. For all of this evidence, it is only within the past few years that we have actively worked on defining the public health response. In the process of asking the right questions, we need to move from “What should we be concerned about?” to “What do we need to do?” It is becoming more and more clear that environmental protection has to work hand in hand with protection of human lives and livelihoods. The health sector is at the front line of protecting human well being from the effects of climate change.

Many of the most effective actions are basic preventative public health actions. Strengthening health sector response to natural disasters, increasing investments in surveillance and response systems for infectious diseases and improving provision of water and sanitation. These basic health functions are already essential to protect health security, and will become more so as environmental stresses intensify. WHO is now working with a range of national governments and UN partner agencies in new projects to identify and strengthen the most critical points in preventive health measures to deal with the increased risks from climate change. These range from additional support for detection and response for Malaria epidemics in the East African highlands to addressing increased risks of climate related areas in central Asia, to ensuring safe use of waste water as reduced rainfall increases water stress in the Middle East. At the same time it is clear that the health sector cannot simply continue to adapt to environmental degradation. The health sector needs to lend its voice to support environmental protection, not to just aid the victims of polluting and unhealthy development.

In many cases the same policies can serve both to promote a cleaner environment and to bring immediate health benefits. For example, promotion of cleaner and more sustainable healthy transport and energy systems is essential to cut emission of green house gases which cause climate change. But these same policies can also help to cut the huge number of global deaths from outdoor air pollution, 800,000 per year, indoor air pollution, 1.5 million per year; traffic accidents, 1.2 million per year, and physical inactivity, 1.9 million per year. Each of the aforementioned figures is similar in scale to the annual number of people dying from malaria, which is approximately 1.3 million per year. We need to ensure that the protection of the natural environment and the protection of human lives are not seen as competing priorities, but as mutually reinforcing priorities. This conference is an important opportunity to share experience and expertise to meet the challenge of responding to the climate crisis.

WHO estimates that climate change that has occurred since the 1970’s is already causing over 150,000 additional deaths per year

First of all I would like to thank World Information Transfer and Dr. Durbak particularly, for the invitation to come here and speak at such an interesting conference. I am also pleased because it is very nice to see so many young people in the audience. In the European process on Environment and Health, we are trying to establish - in collaboration with young people - a youth process which accompanies and stimulates the course of action regarding environment and health carried out by government agencies. It is very nice to see that initiatives taken on the other side of the ocean are progressing very well and that young people are participating more and more in these initiatives. My task here today is to present to you evidence, with respect to the health impacts of climate change, and also what we know about adaptation strategies. It is also a timely moment to discuss these issues because just two weeks ago the International Panel for Climate Change released the conclusion of the chapter including health impacts and climate change. And this gives us the possibility to draw some conclusions on what is now widely recognized at the
governmental level, not only at the scientific level, of the scientific evidence on climate change, health, and other aspects of the environment. I would say that the most important conclusion that comes out of this particular process is that we are no longer warning about the impacts of climate change, we are witnessing them.

This seems to be an obvious conclusion, but, up until only a few months ago, people continued to argue as to whether or not we are facing climate change right now on our planet. Several things have happened in the last several months and years for example Hurricane Katrina, Al Gore’s movie, the heat wave in Europe, and in addition, new scientific evidence has allowed us to come to this conclusion. And among the scientific evidence, I would like to show you something you have already seen in part, the trend in the concentration of CO2 in the atmosphere has grown very rapidly in the last decades, more than has been documented in the last 800,000 years.

Other evidence that we have seen, and that you have seen in the lay press, is the increase in the surface temperature of the planet. The movie that we have seen this morning, regarding the situation in the Arctic was quite illuminating in regards to this issue, and indeed the Arctic region is one of the regions most affected by the increasing temperature.

In summary, what kinds of new certainties do we have from the IPCC in 2007? First of all we have evidence from all continents and most of the oceans showing that natural systems are being affected by regional climate changes, particularly temperature increases. Secondly, scientists conclude and the governments basically endorse this conclusion, that it is likely that anthropogenic warming has had a discernible influence on many physical and biological systems. Other effects of regional climate changes on natural and human environments are also emerging, although many are difficult to discern due to adaptation and non-climatic drivers. There is more specific information now available across a wide range of systems and sectors concerning the nature of future impacts, including new information in some fields not addressed in previous assessments. And finally, some large-scale climate events have the potential to cause very large impacts, especially after the 21st century. It was mentioned today that a two degree increase in average temperature by the end of the
century would have tremendous consequences on the overall system and climate.

Within this overall framework, what can we actually conclude on the basis of this evidence, about the future and the present impact of climate change? The way in which climate change interacts with health is quite complicated. There are different aspects of climate change which have to be clarified. Number one is the long term changes in the climate which have an important influence. There are inter-annual climate variability, short term climate variability, particularly high flooding or other events and extreme events. These types of climate related situations influence health in basically two ways, directly and indirectly: indirectly through changes in vector ecology, food yields etc., and through social and economic change which can accompany climate change, particularly in low income and vulnerable countries. All of these factors can influence, by varying degrees, environmental conditions other than the climate related ones, by socio economic conditions and by the capacity of the health systems to react. Now all of these types of issues determine direct health effects such as hot weather health impacts, air pollution related health effects, morbidity rates increase in malnutrition and food safety, changes in distribution of the range of vector borne disease, water stress and migration.

Some data has already shown that so far this year 2000, the burden of climate change on health resulted in approximately 160,000 deaths all around the planet—particularly, as you can see on the lower part of the slide, in the most vulnerable areas, like Africa. This was an estimate made in 2000 when not all of the issues had been manifested, and we are now undergoing a similar data collection, and I am sure that the burden will grow resulting in a substantial increase.

Now, I mentioned before the issue of extreme events, so here we have empirical evidence, no more speculations or scenarios. And empirical evidence comes from some very clear events such as the heat wave in some areas of Europe in 2003. Many deaths arose due to a complex series of factors in particular the effects on vulnerable populations such as the elderly and socio-
economically disadvantaged. In addition, the world climate is also associated with other effects such as the increase of salmonella related to increase in temperature. And also there are complex emergencies that can arise when temperatures are particularly high such as water stress and power failure.

Another way in which climate change can actually impact the health of people is through flooding on one end and drought on the other end. The frequency and intensity of flooding in recent years has been attributed to climate change. So we are having an increase in water that arises in certain areas at certain times of the year, but also a drought at other times in the year, each having their own particular problems associated to them.

In summary, what we can conclude about this is there are some effects for which we have very high confidence, where climate change is accompanied by a geographic change or incidence of malaria. Where there is negative impact and paradoxically positive impact because some of the conditions of climate change, for example drought, provides an adverse situation for mosquito breeding. Then following we have events of high confidence and medium confidence.

Now, I would like to speak to you about what measures, policies and strategies are needed and can be proposed. Human beings need to adapt somehow to climate change. The best scenario, will result in maintaining the current increased temperature, even if we have a dramatic cut in emissions because the CO2 is already in the atmosphere. There are some species such as the Yukon Red Squirrel, the pitcher-plant mosquito, and the European Blackcap who have shown evolutionary responses to rapid climate change. Some animals and plants are already adjusting to the climate change.

So how can we humans act and modify? We can act on the modifying dimensions such as socio economic conditions, environmental conditions, health systems and prevention and adaptation to do something to reduce the impact of climate change.

There has been an ideological discussion in the literature of the scientific and public health community regarding the balance between mitigation, meaning those measures that will decrease emissions and therefore in the long term are the thing to do, and adaptation meaning those measures that in the face of climate change actually allow the people to survive or to live in a reasonable way partly contrasting the effects of climate change. The best way is to have a balance between adaptation and mitigation.

The IPCC 2007 has drawn important conclusions on adaptation: Some adaptation is occurring now, to observed and projected future climate change, but on a limited basis. Adaptation will be necessary to address impacts resulting from the warming which is already unavoidable due to past emissions. A wide array of adaptation options are available, but more extensive adaptation than is currently occurring is required to reduce vulnerability to future climate change. There are barriers, limits and costs, but these are not fully understood. Vulnerability to climate change can be exacerbated by the presence of other stresses. Future vulnerability depends not only on climate change, but also, on development pathways. Sustainable development can reduce vulnerability to climate change, and climate change could impede nations’ abilities to achieve sustainable development pathways. A portfolio of adaptation and mitigation measures can diminish the risks associated with climate change.

In public health we have already identified some areas which can be examples of adaptation options. An example of these type of projects is called Euroheat which gives a guidance on heat prevention including accurate warning, effective actions: reduce exposure and sensitivity, during heat-waves target the most vulnerable, health and social system preparedness, and real time feedback. I have tried to summarize some things that can be done, and some that have already been done in certain countries.
Public health options in general, require certain prerequisites that need to be met in order to start action, besides just the knowledge or the understanding from the scientific community. Here are five criteria that have been summarized by Last, a major public health scientists from the US: (1) awareness that the problem exists; (2) a sense that the problem matters; (3) understanding what causes the problem; (4) finding available effective solutions; (5) political will. (Adapted from Last, 1998). Regarding climate change health effects, the time to act is now, not tomorrow, because this is the moment that something can be done.

So, public health actions in preventing health effects require a number of changes in attitude from the public health community and the policy community as well: shifting from a reactive to a proactive attitude and learning to anticipate risks; raising awareness and informing the population on how to avoid risks; action on local, regional, national and international level; getting the health sector together with other sectors, exercising stewardship by collaborating with climatologists and planners in land use and urban design; research, surveillance and monitoring, systematically collecting information, combining mitigation (Energy conservation) with immediate and long term adaptation and finally, strengthening existing activities for disease control and health protection and promoting synergy effects.

Finally, with regards to the climate change issue, critically important will be factors that directly shape the health of populations such as education, health care, public health prevention and infrastructure and economic development. Today we have the knowledge, the instruments, and perhaps the political will at this point in time, at least in some places, to react properly and protect people from the severe consequences of climate change.

adaptation will be necessary to address impacts resulting from the warming which is already unavoidable due to past emissions

health sector together with other sectors, exercising stewardship by collaborating with climatologists and planners in land use and urban design; research, surveillance and monitoring, systematically collecting information, combining mitigation (Energy conservation) with immediate and long term adaptation and finally, strengthening existing activities for disease control and health protection and promoting synergy effects.

Mr. Werner Obermeyer
Head - Inter Agency Affairs and Policy Coordination, UN Environment Programme

Last year when I spoke at this event I said it was a privilege for UNEP to be a part of a discussion on the linkages between health and environment with radiation. This year we are focusing on an ever more important issue, the effects of climate change on health. Let us briefly have a look at what we understand climate change to be. When the average increase in the earth’s temperature remains within the parameter of 0.5 - 1.0 degree centigrade, as it has been measured over the past 100 years, we have a stable situation.

However, with the measured increase in carbon dioxide equivalent greenhouse gas emissions, we are looking at an increase of between 1.8 - 4.0 degrees centigrade over the next 100 years. Recent reports by the IPCC, Sir Nicolas Stern and others, conclude that an increase of 2.0 degrees centigrade puts us at a tipping point - that is the threshold above which catastrophic climate change is highly probable.

In this scenario, which more and more countries are accepting as a serious risk - as evidenced by the discussion on climate change in the Security Council just two days ago - we face threats to the basic elements of life for all people around the world. Access to water, food, health and the use of land will become limited and as such undermines the achievement of basically all the Millennium Development Goals. The poor and vulnerable in developing countries will suffer most. The security implications of large numbers of displaced populations, uninhabitable cities and economic losses are of obvious concern. Rapid movement of displaced people to urban centers would impact air pollution, waste management and put serious strains on infrastructure and transportation networks.

But the effects of climate change will be felt even more severely in terms of an increase in the burden of diseases. This is of course linked to the environmental triggers that would be released by changing weather patterns, resulting in more severe floods, heat waves, cyclones and tropical storms. Altered weather patterns also disturb life supporting natural systems, and evidence is already building that this may have a bearing on the re-emergence of ebola, yellow fever and the spread of the West Nile virus and other infectious diseases to parts of the globe where it has not been witnessed before.

Clearly the spread of water and vector borne diseases such as diarrhea, cholera and malaria will increase through flooding and in tropical areas dengue fever will also be spreading as warmer weather allows more favorable conditions for this disease, as well as parasitic infections. Bear in mind that 262 million people in Latin America live in tropical or sub-tropical regions and we realize the serious potential of such a scenario.

Increased drought, crop failure and disease will also fall heavily on struggling populations in Africa and South
East Africa. In Africa between 75 and 250 million people are projected to be exposed to water stress due to climate change by 2020. While in Asia the mega deltas would become breeding grounds for diarrhea related diseases and staple crop yields may drop by 30 percent. In the longer term predictions, by 2080, climate change induced water shortages could threaten 1.1 to 3.2 billion people, and between 200 and 600 million would be hungry or suffer from chronic malnutrition. Even if these scenarios are not accurate, it is clear that existing health systems in particularly developing countries are not equipped to deal with even a scaled down version of such calamities.

Negative health impacts can be lessened through a range of social, institutional, technological and behavioral adaptations. These include bolstering disaster preparedness, managing water better, strengthening public health services, surveillance systems, designing more drought tolerant crops and focusing on public education and awareness. Such responses would need to be integrated into national poverty reduction and sustainable development strategies.

While there are many examples of how disease burdens would increase as a result of climate change, one must also reflect on the illnesses that can be avoided, or alleviated, by using cleaner energy and by being less reliant on solid fuels. Energy remains essential for meeting our basic needs, for cooking, heat and lighting; but more that 3 billion people still rely on burning of wood, dung, coal or other traditional fuels inside their homes. The resulting indoor air pollution is responsible for more than 1.5 million deaths a year through mainly respiratory diseases.

He emphasized that health, development and global security are inextricably linked. This is evidenced by the spread of the H5N1 (Avian Influenza) virus, which many scientists have linked with warmer temperatures influencing the migratory patterns of wild birds.

In conclusion, while I mentioned earlier the parameters within which we look at climate change, we should also do likewise for how we perceive health. The World Health Organization defines health as a state of complete physical, mental and social wellbeing, not merely the absence of disease or infirmity. If we use this universally accepted definition, it is clear that climate change will have a direct link with declining health standards in the world. The sooner we address this challenge with the urgency it requires, the better.

Ms. Donna Goodman
Focal Point, Children’s Environmental Health, Program Advisor, UNICEF

Thank you to Dr. Balk, Dr. Durbak and distinguished colleagues. In UNICEF our work relating to climate change is very specifically related to the survival, health, development, education, and protection of children in developing countries. So, our section in UNICEF basically focuses on water, sanitation and hygiene. I’m going to begin by showing you a short film about the world’s water, sanitation and hygiene situation, and then we will go on from there.

“Water: fundamental to human life, yet more than 1 billion people do not have access to safe drinking water. Another 2.6 billion live without basic sanitation. Under Millennium Development Goal Seven, the world has pledged to halve, by 2015, the proportion of people without sustainable access to these essential services. While progress is slow, and population and urbanization are increasing, we are on target to meet that goal for safe water. But for sanitation, we must double our efforts. The impacts on children are immense. Of all babies born in the developing world each year, about half live without basic sanitation and one in five without access to safe drinking water. Each year, this situation, combined with poor hygiene, contributes to the death of more than 1.5 million children under five due to diarrhea.

Beyond the impact of health, is the impact of the time it takes, particularly in sub-Saharan Africa, for women
and young girls who are primarily the ones employed in having to carry water, sometimes 2 hours in the morning and 2 hours at night as well, as their water supply is so far from their community.

The daily journey to fetch water or a lack of hygienic facilities at school, keep all the children, particularly the girls, out of class and without an education, perpetuating the cycle of poverty. The urban/rural divide reveals some of the largest disparities, most obviously in sub-Saharan Africa, where less than half of rural community has access to safe drinking water. In South Asia, it is a similar story with basic sanitation, less than one-third of the rural population has access. But this region is on track to meet the target for water. The East Asia pacific region as a whole is on track to meet both water and sanitation goals. There is a similar hope in other regions as well. If we have any hope of reaching this millennium development goal on a global level, more money and political will are needed to bring these essential resources and this basic right to all.” UNICEF Television

We are working to ensure that all schools have adequate child-friendly water and sanitation facilities, hygiene education programs, and environmental education. The second thing that we are doing is to build capacity of children and youth at community levels as key stakeholders in development. The population under the age of 18 in Africa and other developing countries is at or over 50%.

These are maps from the UNICEF and WHO joint monitoring system on the progress of meeting the water and sanitation goals and it shows where we are behind on fulfilling these goals. This is also very interesting, the map of climate change. If you put this against the water and sanitation maps you see that the place where climate change is having the most effects are the places where they are already lacking water and sanitation.

It is visually apparent that the same regions which are lagging behind in water and sanitation are also the most challenged by climate change. Limited resources are stretched and very often development efforts are interrupted by emergency situations caused by natural disasters. Africa contributes least to global climate change, with the lowest levels of carbon dioxide and other greenhouse gas emissions, but it is bearing the brunt of the phenomenon. It is a cruel irony therefore that IPCC predicts that Africa will suffer more than the rest of the world from global warming.

Climate change could degrade or destroy part of the assets fundamental to the livelihoods of the poor, such as health, access to drinking water sanitation facilities, housing, infrastructure and arable land. With climate change there is an increase in health problems such as malaria, meningitis, and dengue fever. Malaria is turning up in places in Africa where it has never existed before. It means that the few resources African countries have, that would have been channeled into essential projects to further economic development, must instead be put toward multiple health crises. Climate change is also suspected in influencing extreme weather patterns, which can lead to drought, and trigger deepening food shortages in Africa where most people rely on rain-fed crops to survive. Droughts have particular effect in the heart of Africa, the Sahara, southern Africa, since the end of the 60s. By 2025 approximately 480 million people may be living in water scarce and water stressed areas.

A new report on impacts, vulnerability and adaptation in Africa, released by the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC), and based on data from bodies including the UN Environment Programme (UNEP) and the World Meteorological Organization (WMO), indicates that the continent’s vulnerability to climate change is even more acute than had previously been supposed. The report calls for mainstreaming climate change considerations into development and sectoral plans and programs, education and awareness-raising for Governments, institutions and individuals, as well as better forecasting and early-warning systems. This is the place where UNICEF can make a difference; in the educational programs and awareness raising efforts with our colleagues and other agencies. One of the things that are concerning us at UNICEF is the drowning deaths of children under age 5 due to flooding. In Bangladesh UNICEF is working with some partners to teach young children how to swim, because we are learning now that more children are dying due to vulnerability to floods simply from drowning in many situations.
There are great vulnerabilities in high land areas, some of these we have talked about, in fact I was in Patagonia last week and was very surprised to see not only some of the glaciers melting but some of the rivers very dry. There are also vulnerabilities in water stressed areas, with the largest impacts being poor water, sanitation and malnutrition.

Small island developing states are really at risk; the hurricanes, flooding, water and vector borne diseases, water scarcity through drought, salination of water resources, as the decrease in food supply and toxic poisoning are just some of the things that we’re helping these nations deal with. Children’s bodies do not function the same as adults, so climate change affects children much more tragically and rapidly. Diarrheal disease positively correlates with temperature; hot weather favors bacteria, entamoeba and protozoa. Deaths from gastrointestinal infections are high in children: 3-4 million deaths annually. Future climatic changes are likely to significantly affect the incidence of diarrheal disease in children.

In terms of food security and malnutrition, many of Africa’s poor are very highly dependent on climate-related factors for their livelihoods. Undernourishment is a well-studied cause of stunted physical and intellectual development and increased disease susceptibility in children. Climate change, by altering local weather patterns and by disturbing life-supporting natural systems has significant implications for human health. Models suggest that higher temperatures will enhance the geographic range and transmission rates of vector-borne diseases. As I mentioned, in many countries malaria is a serious risk in high land areas. We had the minister of Uganda here a few weeks ago, and she described how malaria is becoming an increasing problem in Ugandan highlands where it had never been seen before. I was pleased to hear today though, that in dry areas it was positively going away. I hadn’t heard that before.

Strategies for action between the three agencies include bringing in regional advisors in the areas most at risk, child-centred environmental education and participation, and natural disaster preparedness policies. I have already talked about our strategic alliance, and this is very much about system wide coherence within the UN. We are all moving toward one UN. There are eight countries now that are working on joining country programs and the environment is one of the key issues in system wide coherence of UN reform.

Our project partners are the national governments, ministries of health, environment education, and other agencies including UNEP, meteorology, agricultural agencies, NGO’s in health, youth participation, education and the environment fields, researchers, health practitioners, and representatives of vulnerable com-
munity groups. We’re promoting the use of renewable energy solutions for schools, such as solar panels, solar water pumps, and wind energy.

Measurable increase in adaptative capacity is what we’re looking toward; reducing the burden of climate sensitive diseases, the effect of climate change on human health and better integration, planning and implementation across sectors. Our expected, hoped for, global benefits are to improve knowledge of links between climate, health and adaptation in the most vulnerable countries. We know that if people have secure access to water and sanitation their health will be better, their lives more secure and they will be better able to adapt to the impacts of climate change. Adaptation strategies that other countries can use to protect human health from the impact of climate change are critically important to this. Thank you.

Dr. William Rom
Will Steger Foundation, Professor of Medicine and Environment, New York University

World Information Transfer Inc is pleased to bring you a video clip from a dog sled in the arctic. This clip was e-mailed over the past few days and hopefully this will work. Baffin Island is part of Nunavut, a new province of Canada that is run by the Inuit. We just saw headlines in the New York Times saying that global warming is unequivocal and that this is very likely due to us, man made warming. Our temperature has gone up 0.7 Centigrade over the past millennia and it may go up 1.7 to 4.4 centigrade in the 21st century. This is due to CO$_2$ and our measurements since 1959s international geophysical year has shown it going from 320 to 380 parts per million. Over the last 600,000 years it’s been at 250 parts per million from Antarctic ice cores. There are 28 billion tons of CO$_2$ emitted every year, and that is for every one of you students to realize that we release four tons per person per year - 25% of that is from the United States. To solve this we have to sequester CO$_2$ from our power plants underground and switch from oil to ethanol. We have to have solar and wind and we have to change our light bulbs from incandescent to florescent and pay attention to this huge problem that’s probably the largest problem facing us in the 21st century. Will Steger, our polar explorer, is from Ely, Minnesota: that’s the furthest Northern town in the lower 48 states. He took a dog sled to the North Pole in 1976 with Paul Shirky. He has set up a foundation to educate high school students and others about global warming called the Will Steger foundation. You can go to his website globalwarming101.com every single night to see what he is doing with his dog sled, traveling to the Inuit communities in Baffin Island.

The Inuit use a fan system with their dogs. Will Steger uses the traditional harnesses for his dogs. Even though it’s warm in NY it’s still pretty chilly up there in the Arctic. There was one expedition that several people had to be evacuated due to frost bite, but there are a lot of changes happening in the Arctic. The Arctic Ocean is covered by ice, and the ice has diminished by about 25% in the Arctic over the last three decades, due to global warming. Former Vice President Al Gore actually got some secret data released about the naval submarines who patrol under the Arctic Ocean; they were shooting sonar up at the ice to measure its thickness, and the ice thickness changed from 3.1 meters in about 1960 to 1.8 meters currently.

The polar bear is threatened because of the loss of ice. It has a harder time hunting for the seals, and the US Fish and Wildlife is considering making the polar bear a threatened species under the Endangered Species Act.

Film: Global Warming - Impact to Indigenous Communities of Baffin Island, Will Steger Foundation

Hello this is Will Steger from Baffin Island. I would like to thank the World Information Transfer that
Every environment is such that we can be traveling with certain constraints. Is it possible that we are not in the correct environment to grow up in? Maybe not. And with those things, the future is quite bleak for them as they won't have the stories of the elders and of the hunters and the livelihood and to travel are being impacted. We want to talk to people who are living on the front lines of climate change, whose lives and ability to make a living are being impacted by global warming.

My name is Kumbak. I look at the youth that we have today. The future is quite bleak for them as they won't have the same environment to grow up in. For example, ice might even be a thing of the past. Are the glaciers going to be here? Maybe not. And with those things, the environment is such that we can be traveling with certain traditions and customs.

Dr. William Rom:
I think Baffin Island is a beautiful place and this is a focal target of the increased temperatures, because as you saw it is all snow, ice and glacier. This will be one of the canaries in a coal mine for the effects of global warming. Will Steger will be circumambulating all around Baffin Island stopping at the various Inuit villages to interview the Inuit and see the effects of global warming on their lives. During the week of earth day, which is Monday of next week, he is going to have several additional people join his dog team expedition. Richard Branson and his son, who will be flying in from London and representing British Virgin Airways, will be joining them for two weeks on the dog sleds. Also, Ed Viesturs will be joining them.

Ed Viesturs is a renowned mountain climber from Seattle who has climbed all of the 8,000 meter peaks in the Himalayas and has recently written a book on this. They are all trying to provide personal experiences that they can relate to high schools, colleges, churches and what have you when they get back to the United States. They are all trying to provide personal experiences that they can relate to high schools, colleges, churches and what have you when they get back to the United States. So global warming is an issue that affects all of us. It probably is more than just increasing temperature because energy and how we develop and use it is directly involved, and to change our lives we have to change how we deal with energy.

We have limited amounts of oil left in the earth. We have about 1.2 trillion barrels of recoverable oil and maybe a little bit more than that in places where it is more difficult to recover. We utilize 80 million barrels of oil per day throughout the world, and that is increasing to 85, to 90, to 95, to 100 over the next decade. If you take your calculator and take 80 million barrels of oil per day for 365 days and look at 1.2 trillion, you will come out with forty-one years of oil left. That's not a very far time into the future, and the competition for this diminishing resource is going to become more and more intense, and what that means is that there will be wars and unstable governments will. We will have increasing levels of conflict over this diminishing resource. Everybody throughout the world is going to have to switch to nontraditional sources of energy. We are going to have a huge increase in diabetes, heart problems and cancers, where they never had cancer twenty or thirty years ago.
to figure out how to produce ethanol inexpensively, not only from corn and sugar cane, but also switch grass and the studies have to become commercially viable in the next few years.

We have to get into a different format of bio-diesel and bio-fuels. We have to switch our automotive transport to more battery powered vehicles. The hydrogen vehicle is decades off, so we have an interim period in which we can switch to hybrid technology. Conservation is a huge effort when you buy the next dryer or dishwasher or refrigerator you have to buy not the cheapest, but the most energy efficient. We all have to buy those little scraggly florescent light bulbs to replace our incandescent light bulbs. I was at the light shop last week and they actually have some fairly nice florescent light bulbs that you can screw in. They’re about fifteen dollars a piece compared to three or four dollars for an incandescent bulb, but Christine tells me they’re cheaper at Costco. However this technology of a florescent light bulb that you can screw into the socket is available, so you can buy these bulbs and they apparently last much longer than the incandescent bulbs.

global warming is an issue that affects all of us

We have to change our energy production and we really have to get wind power moving in the United States and increase it from about 0.2% up to 20% over the next decade or two. The lands of North Dakota South Dakota, western New York, the offshore areas of Long Island, Fire Island and, unfortunately for Senator Kennedy also off Hyannis Port, Massachusetts are prime offshore sites for wind farms. So wind farms have to become commonplace. If you want to buy a windmill you have to buy it from Germany or Denmark, there is very little commercialization of windmills in the United States. This would be an incredible investment opportunity one would think. Solar panels should be on everybody’s roof. I looked into solar panels last summer for a garage I was building and they’re 200 watt solar panels are about $1200 each, and then when you put on the electrical hook ups to put the power back into your own home you end up spending about five or six thousand dollars just for three panels. I’m going to give it a try. They give you back 30% if it is your primary residence. Solar has to be promoted.

I think a word needs to be said about nuclear energy. Nuclear energy does not produce CO₂, so that’s good. The bad as you all know, is risk of accidents. You have nuclear waste to deal with, but that can be reprocessed, but it is still dangerous as you reprocess it into plutonium. You have to mine uranium, and mining uranium also has dust effects and exposure to miners. And then you have insurance, and nobody in their right mind will insure a nuclear power plant, so the government has to subsidize the nuclear power industry extensively by federal mandated insurance for these plants.

Good afternoon everyone, it’s a privilege to be here. As Dr. Durbak told you, I’m a pediatrician so that means most of the time I have the privilege of being with children; newborns, infants, toddlers, school-aged kids, and even young adults; and I work in a community health center based in the Bronx. When I take care of my patients, I monitor their growth and development, I make sure they’re eating right and deliver immunizations. And I see all kinds of healthy kids but increasingly pediatricians such as myself are seeing more and more kids with health conditions such as asthma, developmental disabilities including autism, and obesity. Many of these conditions are related to the environment. For example, we heard over lunch that the average child spends roughly seven hours watching television during the day, and I bet that’s related to the obesity epidemic that were seeing in this country. As Dr. Durbak said, I am very interested in environmental influences on children’s health. We know that kids are often more susceptible to environmental health hazards and those are toxicants that are in the air they breath and the water they drink and the food they eat. Children are more susceptible for a number of reasons: they have rapid growth and development, their organ systems are very susceptible to such things as lead and mercury, their lungs are susceptible to tobacco smoke and second hand smoke. Kids also have what we call a “longer shelf life.” They have a long life span ahead of them during which the effects of certain types of toxicants can be manifested. But also they’re going to be living in the world many many years after we adults are. So I often wonder and worry about what kind of world we are leaving them. Along those lines, this afternoon’s presentation is titled “Health
Security of the Next Generation. “So we will be focusing on health effects, our speakers will be focusing on health effects and discussing children.

Dr. Philipp Schmidt-Thome
Senior Researcher,
Geological Survey of Finland

Good afternoon. I want to thank World Information Transfer for the great work they’re doing and organizing such an interesting conference where I have learned a lot already. I will be talking about sea level rise and floods, in Europe, and I am going to focus on climate change health related issues. I have to say right from the start that I am going to talk on adaptation to climate change and not on mitigation. Mitigation means what can we do to prevent the human impact on global warming. The project we’ve been carrying out and the research we’ve been focusing on is how can you adapt to climate change because as we have just recently heard from Dr. Bertollini, whatever we do even right now if we change to zero emissions of carbon dioxide, we will continue to see warming of this planet. We focused on giving recommendations to the European Commission, to national governments, to municipalities, as well as to cities and even small villages. The main focus that we have identified as of the highest importance is stakeholder communication. We’re focusing on regional development perspectives, and I’m going to focus mainly on two examples: one is a continental perspective in Europe, and the other is our local perspective from the Baltic Sea region.

We have seen many graphs today, and I’m really happy that we haven’t seen this one yet. This is the frequency of weather-related disasters from 1950 to 2001. [See Front Cover]. The numbers are not important, what is important is the trend that these disasters are increasing. Now if you take a closer look at where I found this information, there is of course the UNDP, but also there is a Swiss reinsurance company, which is one of the biggest global players in the reinsurance business.

We know the climate is changing, we can see the climate is changing and we have enough records to prove that the climate is changing. What are the main health impacts of climate change? Can we somehow group the health impacts we can expect from climate change? The main problem is that we often focus on only one issue, which leads people to look through binoculars and lose sight of the big picture. I just tried to group this a little bit, and the ones that are underlined and in bold are the ones that I’m going to give you examples of. I’m going to focus on the heat waves quickly, then we have the indirect impact discussed already like air pollution and droughts. We have changes in the living environment, which has also been mentioned briefly, such as rising sea level and seawater intrusion into aquifers, which can be a large problem, and then of course we have vector borne diseases.

Now this is from the third session of the IPCC. We can see that the climate that is now slowly changing will lead to more hot weather and more record hot weather events, and probably less cold weather, but I’m not so certain if this can really hold. What we can see is a trend that would shift towards more extreme weather events. The Commission identified among all the economic and human factors that they studied that natural hazards can play a role. We tried to map natural hazards in Europe on comparable data and just seeing Europe from an ecological aspect, you can see that the further you go to the East and the North, you have a tendency to have more extreme temperatures. Extreme temperatures above or below the average.

There is a project called Finadapt. Finland is probably one of the first countries in Europe to have national adaptation programs, and we also have a national adaptation strategy for climate change. What is interesting is you can see the daily mortality age, 65 to 74, in relation to temperatures and north of Finland you can see that you have a sharp increase as soon as the temperatures go above 20 degrees Celsius. It is a very cold place, and actually there is a known term in Finnish that is attributed to temperatures that are over 25 degrees. The lowest mortality in this age group is somewhere between 10 and 20. If you go to London, you can see that the lowest mortality is when you go to twenty degrees, and then in Athens, which is hotter, the lowest mortality is way above twenty degrees, which means that human beings adapt somehow to the climate they’re living in. I show this to say that there’s always some hope, and we don’t have to see everything from such a catastrophic perspective.

Now the local perspective that I just mentioned is from two projects, which are funded under the European Regional Development Fund, and they’re focusing on the Baltic Sea region. One of these, now terminated, was called Sea Rig where we studied sea level change affecting the Baltic Sea region, and the other one, which is
running still, is developing policies and adaptation strategies for climate change. The main problem that we can see in the Baltic Sea region is the winter storm hazard affecting Europe, mostly in the North Sea region, but also strongly represented in the Baltic Sea region. The other one is storm surges, which is certainly the highest hazard in the North Sea region, but we also have it in several parts of the Baltic Sea region.

We took the largest range of scenarios we could find to show that the climate will change. We have records in the Baltic Sea region for one hundred years showing that sea level is rising slowly but steadily. We decided to take the most modest model that we could find and one of the most extreme models just to show the range of possibilities.

But the latest trends of the newest assessment report of the IPCC have shown that the most probable scenario is the A2 scenario. What is the A2 scenario? There is the A1, A2, B1 and B2. There are four scenarios. The A scenarios generally say that there will be no change in carbon dioxide emission and the B scenarios say that there will be a change in carbon dioxide emission. If we look at the politics that are happening right now in this world, we can say that the A scenarios are more probable because there’s not going to be any large change or reduction of carbon dioxide emission, and the A2 scenario is the most probable. This is the one that is widely used now. So taking this for the Baltic Sea region, you can see that we have a general increase in any country you look at in temperature and we also have an increase in the precipitation.

First of all, the Fins said, “Wow great, our country is going to get warmer, this is really nice. We can sell it to tourism; we can plant different crops that we’ve never planted before.” It was actually a Finnish issue of the Economist news magazine that had a pineapple on its cover and said welcome climate change. Now, fortunately, this can be taken as some kind of a joke because there are many downsides to this.

What you can see here is the mean summer temperature in the upper three pictures (June, July August) and then you can see 2000, 2050 and 2099, and here you can see the difference of the A2 scenarios. What you can observe is that you have the highest change of temperature along the coast. Now just focus on these coastal areas, don’t focus too much on the pictures because they are very colorful. If we look at the precipitation we see a general increase in precipitation, but if we look at the change between 2000 and 2099, we see nearly no change of precipitation along the coast. Thus, we have higher temperatures, but we do not have increased precipitation, which could lead to droughts. And we have had droughts in Finland, especially this year. This can be attributed to the geography of Finland, which I am not going to explain in detail, but we have very shallow aquifers, so once the water is used up and is not being restored during summer rain, for example, we simply experience droughts.

There is another big problem in the Baltic Sea region which we are experiencing. Algae are blooming, and these algae are highly poisonous. You cannot use the water anymore to swim in, fish are dying out, and there is an overall decay of water quality. If you look at the coastal areas where you have the highest population density centers, which are also the highest producers of GDP per capita in the Baltic Sea region, these will be the areas that are mostly affected by the changes I just discussed. What we’re trying to do in our project is to make adaptation cost calculations over the next 100 years. How can the cities, the states, the municipalities get ready for climate change, and at what cost? What kind of investments can we recommend and which ones can we not recommend?

Now, coming to local examples, this one is from Poland, the city of Gdansk. Where does the flooding come from in Gdansk? You have the Baltic Sea region and the Baltic Sea, where there are storm surges and also highlands where there are flash floods. We have had several flash floods hitting Gdansk causing several deaths, and then we have another problem. This area, which is actually dry, lies below sea level. The river, formerly flowing parallel to the coast and discharging into in the town center of Gdansk, was changed one hundred years ago, but the river valley still exists. What happens in the case of the flood? The water just jumps back into the old riv-
erbed. This map shows that we will have problems along the coast. Along the coast we have the most important aquifers of the city of Gdansk, so we will have sea and rapid water intrusion there. We have several waste deposits that are lying in flood prone areas, which is a big health risk if you have seawater intrusion. Poland is now the first country in the Baltic Sea region that has taken decisions on what coastal areas to protect under climate change. They have identified 30% of their coast that will be protected and the other 70% of the coast, which can be left to the sea. This is a very important decision because it is also a financial decision. You cannot protect the entire coast of Poland because it is simply too long and it is too low-lying. We have an additional geological problem because we have land subsiding so there is both the rising sea level and the subsiding land.

The second one that I wanted to discuss is a very small town in Estonia facing south to the Baltic Sea, lying in a bay. We produced a map first of a worst-case scenario showing areas that will be continuously underwater in the next one hundred years and the areas that would be hit by extreme storm surges. In 2005, water was standing after the winter storm. Unfortunately, it matched perfectly with our worst-case scenario. When the water was standing that high and all this area in the city was flooded, suddenly our telephones were ringing. If we look into the further assessment of this town, you can see that the sea levels nowadays calculate land subsidence, then you have 88 cm of sea level rise, and you have 300 cm of sea level rise according to floods. This means that since the winter storm of 2005, it is now calculated that water will run up over the entire city in the future. So we already have a decision from the town council that says they will take into account the results of our project.

Just briefly, the recommendations we have put forward to the European Commission and to the European Union is that planning can do a lot. Our recommendation is to fit risk into its elements, which is the hazard potential, damage potential, and coping capacity. We also said there should be a framework for monitoring not only the risk, but also the elements of risk; and finally to have risk monitoring as a major role in defining and deciding on actions like mitigation and reaction, talking about preparing a response and recovery.

We believe you need the maps, the modeling and geographic information applications, but you also need a vulnerability assessment, you need a knowledge base where you store all your data, and most importantly you need a discussion platform. A discussion platform means basically stakeholder communication because we scientists speak one language, a planner speaks a different language, a stakeholder speaks a different language, and the politician talks a very different language. So what we did in this discussion platform was to bring them all together to find out what information we can give, what information others want, and what is the language that we have to communicate in.

What is most important is that this decision focus on communication. We don’t want something automatic where you just feed stuff into a computer to calculate and get a printout that tells a city this is what you have to do because nobody understands this. We have tried to make risk maps understandable for planners, which is basically impossible. You need discussion, you need to explain the problem and you need to have an understanding of the vulnerabilities and of the results and risks in order to be able to get into action.
It’s been challenging to study health effects of climate change in the US over the last five to ten years. It really hasn’t been on the radar screen of any of the Federal agencies until now. Let’s move into the research project called the “New York Climate and Health Project.” The project that was started about 5 or 6 years ago for the New York metropolitan region to try to assess the potential impacts of global climate and land use change on air quality and on heat stress related health impacts. We took a scenario based modeling approach to look at potential impacts of heat stress and air quality impacts in the 2020’s, 2050’s, and 2080’s and compared that to the historical data from the 1990s. The research was funded by the US EPA. We were trying to answer this general question: can we assess potential future health impacts of air quality and heat changes resulting from global climate change.

If we look historically in the NY region, we see that there has been an increase in temperatures over the past century of about one degree Celsius or two degrees Fahrenheit. If we look at models of climate change for the NY region, depending on which model you look at, they all show an increase that’s going to occur over the next century. We expect this warming trend to continue in the NY region and as well as in the rest of the world. But, what about air pollution?

As things are warming up, ozone at the ground level can be affected by temperatures. Ozone is actually a secondary pollutant that is formed through chemical reactions in the atmosphere from pollution that comes from both urban and rural areas. You need to have a variety of input pollutant including VOCs (volatile organic compounds) and nitrogen oxides, some of which are emitted at higher amounts when the temperature goes up, especially VOCs from both human and vegetative sources. Reactions that form ozone in the atmosphere, are much more rapid and efficient at higher temperatures. So there’s good reason to think that as the climate warms, the ozone will become a more severe issue around metropolitan regions. If we look at historical trends in ozone, this is going back to 1982 when the network of monitoring became very extensive in the US, we see that things have tracked pretty steadily over this time. There hasn’t been that much improvement, especially in the last ten years or so.

From data on NYC, we see that for temperatures of about 70-75 degrees Fahrenheit there’s a big increase in mortality. Also, in addition to causing acute respiratory problems for children ozone has been linked to acute mortality in large cities.

We looked at couple of different scenarios, in other words different possible futures for green house gas growth over the century. Part of what we did is take the global climate model and try to make them relevant to regional and local decision makers, the kind of scale they need. Looking at 31 counties, we ended up with scenario-based estimates that we scaled down. What do we see from the results of the study?
Depending on what part of the eastern US you look at there can be as much as 50-80 day increase in the number of “exceedences” by the 2020s. The situation gets worse in the 2050s and the 2080s. We took results and then translated them into health impacts. We looked at mortality rates and found that increases in mortality due to ozone range from about half a percent up to about seven percent increase by the 2050s. These are absolutely small, but important changes for people living in the metropolitan region. We also did the same thing for temperature and heat related mortalities. By the 2050s we have a 100% increase, in other words a doubling of the heat related mortality.

Even in highly developed places like New York City, we expect there to be important health effects from a warming climate. I hope I’ve shown that integrating modeling can be a useful tool for anticipating future impacts and to begin planning for those impacts and adapting to them. Let’s be aware that we focus where we have a magnifying glass tool that we can use, we should not ignore the potentially big impacts that we do not have the tools to address.

Mr. Michael Flaherty
Co-founder and President, Walden Media

Roland, thank you so much for the introduction. We are all here at the United Nations. This is a place where history is made, and I think history was just made. That was certainly the first time I’ve ever been mentioned in the same sentence as President Kennedy. My Irish Catholic parents thank you for that and they can now die happy that I am in such great company. I got a call from my business partner Cary Granat, who is very good friends with Dr. Durbak, and he said, “Would you like to speak at the United Nations?” I said “Well yea, I’d like to go to the moon too...what other things on my wish list can I run down for you?” He told me that he couldn’t make it next week and could I go make a speech. I said, well sure, what’s the topic? And he said, well we are talking about climate change. I said Cary, “We both went to a safety school and I dropped every single science standard that we ever had, I don’t think I’m really qualified to speak about this” I went home and told my wife, “I have to speak about climate change, what are we going to do about this?” And she said “Well, when we think about climate change, obviously we can think about the physical environment, which is critical, but as someone who works in the entertainment industry, why don’t you talk about the cultural climate?”

Media, particularly films and television, are becoming almost as important to our children as the air we breathe. The average child in the US now spends about seven hours in front of the television each day. That’s almost as much time as they spend at school, and certainly far less time than they spend with parents or leaders. At the same time as this is happening, screen time is only increasing.

Films and movies have an incredible capacity to change the way we think, look and feel.

For the first time a great study was taken on our nation’s literacy, not illiteracy, but among people who can read. And for the first time, since tracking these habits, it has been found that fewer than half of the people in the United States have read a single book in the last year. And without any type of embarrassment, but just to show this shift in terms of how people are getting information, and how people are being influenced, can I have just a show of hands for how many people have read Al Gore’s book, Earth in the Balance? Now a show of hands for how many people saw Al Gore’s movie, An Inconvenient Truth?

Films and movies have an incredible capacity to change the way we think, we look, and we feel. And in an even stranger way, films can actually encourage people to read more and to learn more about the world that surrounds them. I think that in just the first four or five weeks after An Inconvenient Truth was released, probably ten million people in the US alone, for two hours, sat and learned about the condition that our environment is in. And our company, Walden Media, as Roland mentioned is dedicated to creating media that will spark the imagination of young children, particularly kids that are in grades two through eight. We take our name Walden from one of the great naturalists and great environmentalists, Henry David Thoreau. I live next door to Walden Pond, and it’s always a great place for me. It’s one of those last great refuges
we have in Massachusetts where we can go and think and reflect. And Thoreau gave great advice which was, “Always march to the beat of a different drummer.” And that is what we are trying to do at Walden Media.

At a time when people are cynical and raise their hands in despair and say “Can you believe it? Kids are spending six hours a day in front of a television screen,” rather than curse the darkness, we thought, well if they are spending six hours a day in front of the television, lets create some media that will really stimulate them, get them thinking, and really get them to change things. It was seven years ago that my business partner Cary was speaking here about that idea. We were in New York and we went and spoke to every single investment banker, Roland I wish I had known you seven years ago, and they all laughed at us when we said we wanted to create movies that got kids excited about reading and learning. Not a single person would invest, and in fact at one investment bank, a guy completely fell asleep in the middle of our presentation, and I plotted to go into his office, find his checkbook, and wake him and say, “Hey thank you so much for this investment, I’m so happy you liked it!” Luckily we were able to find an investor in Denver, who went along with our counterintuitive model of making movies that would encourage kids to read.

We did something different than, I think any other film company out there. Which was, rather than talk to agents in Hollywood and all the producers in Hollywood, we spent a year talking to librarians and school teachers. We talked to them and we asked them what stories really captivated their students’ imagination, what were the great people that they would like to learn about? From there we got a great list of books we have adapted. Books like Holes, Because of Winn Dixie, The Chronicles of Narnia and most recently Charlotte’s Web, Bridge to Terabithia, and we have a film that is still out right now called Amazing Grace. Now, Amazing Grace isn’t a story about a great book, it’s a story about a great man, and a great group of men. And this is the year that we celebrate the two-hundred year anniversary of one of their greatest accomplishments. I am speaking of a great parliamentarian whose name was William Wilberforce. Somebody who I had never heard of before my boss decided he wanted to make a movie about him. And Wilberforce was a member of parliament who decided he was going to tackle something that everybody at the time said was absolutely impossible, and that was the abolition of the slave trade. At the time, slavery represented over ten percent of the gross domestic product of Great Britain. And by just challenging the mindset that it could be changed, he was laughed almost out of parliament. So Wilberforce did something interesting, said that “The only way he would be able to do it was if he worked with people from every political stripe, from every religious affiliation, and if we put all that judgment away and I continue to drive hard.

But as I’m driving in the legislature, I’m going to go out and change hearts and minds. Because if we are going to change laws, the first thing we have to do is change the way people think about these things.”

So he got a group of people together and they called themselves informally, the Clapham Circle. They got together, like any other group of idealists, and as Margaret Meade always tells us, all it takes is a group of really committed citizens to get together to change the world. And the Clapham group got together, and they said, “We are going to abolish slavery. We don’t care what the votes are, or about the situation in the rest of the world, we are going to change people’s hearts and minds, and while we are alive we are going to be able to see this change.” And year after year, defeat after defeat, they kept going strong, and slowly they started to change hearts and minds. One of the people who was a member of this Clapham Circle, whose heart and mind was changed, was a man named John Newton. John Newton was one of the more notorious slave traders of the day; he traded over twenty thousand slaves. People he had stolen from Africa and sold.

One day his ship entered a storm, and in the middle of that storm he said a prayer. He said “God, if you can save me, I will change my life.” And sure enough the storm subsided and slowly John Newton’s heart began to change, and he decided that he would no longer trade slaves, and that he would dedicate his life to the abolition of slavery. One day, sitting in his study and thinking about the great change that had happened in this place, he wrote the song “Amazing Grace.” It’s a song that I think we are all familiar with, we’ve heard the lyrics our whole life. But if you think about the lyrics, “I once was blind, but now can see,” “How amazing the grace that saved a wretch like me,” it goes to show us that even the hardest of hearts can be changed. Not just have their minds changed, but dedicate their lives to doing something completely different.

Two days before William Wilberforce died, the abolition of the slave trade was accomplished in Great Britain, something everybody said was completely impossible decades earlier. But in addition to the abolition of the slave trade, over seventy different voluntary organizations were founded by the Clapham Circle. These included the first society for the prevention of the cruelty towards animals and the first organization for prison reform, great legislation abolishing child labor began to pass, all from a group of dedicated individuals who had the courage and bravery to work with people who though differently than them, who were from different political parties than them. So I look around, completely intimidated, at all the people who are here and the one message I would love to give, from our crazy world of Hollywood, is please, do not get discouraged, we can turn this around, and I know, coming in here every day, as someone who went to Catholic school, we learned about something called medias res “in
the middle of things." You never really think you can make great change when you are in the middle of things, but you can. And hopefully we can continue this great alliance, between storytellers and film makers, and all the great work and the great research that is being done here, to really do something about climate change. And Roland, you were smart to talk directly to the students. And I order the students to think not only in terms of politics and legislation and diplomacy, but also think in terms of storytelling. I always grew up listening to great Irish music, that was a way I learned a lot of my Irish history, granted it was a little slanted. I have learned to love my friends in Great Britain, though they are certainly not heroes of many Irish songs. But you can do that.

Roland and I were talking about the amazing change we are having in media right now. Just as John F. Kennedy said, never before has anything been more in people’s control, never before has the ability to tell stories to an international audience been more in your control. I will leave you with one funny anecdote and then a little more serious line from an idol of mine. One of the hottest things to happen on Madison Avenue right now is to see if people can create their own commercials. And it will create all of this great interest, and people will create their own commercial and put it on the internet, and the reward is, that that commercial will be nationally aired across the country. A large car manufacturer decided that they were going to tap into this and that they were going to have somebody submit over the internet and ad for one of their big gas-guzzling SUVs. What happened over the next few weeks completely shocked them because they started to receive all these ads that said things like “Destroy the planet and buy our car!” And they realized that they had totally lost control of their message. Others read: “Men- do you want to compensate for all of your insecurities? Buy this enormous car!” And they couldn’t stop it- all of this just started to come in and that never would have happened before. I don’t say that to get too political, but it is interesting to think that, what is happening now is a revolution in terms of who people are who are telling the stories.

Now, we have a somber anniversary. Tomorrow April 20th, which is the anniversary of the twelve students and one teacher who lost their lives at Columbine. And we began the month with another somber anniversary, of the great Dr. King. But Dr. King wrote something in the Letter to Birmingham Jail, which is sort of the manifesto that we have at Walden Media, and I think it applies to all the great work that World Information Transfer is doing here and what all the great delegates and scientists and everyone working here at the United Nations is doing. Dr. King sat in that jail room, discouraged, wondering if he wanted to go on, and he said, “Basically if we want to make great change in life, we can do two things. We can be a thermometer and take the temperature and complain about it. Or we can be a thermostat and we can take the temperature and do everything we can to adjust it and get it to exactly where it needs to be for us to live our lives.”

So I thank you guys, and sorry for the heavy handed metaphor, for doing everything you can to literally fix the temperature of this environment, a place for myself and my children to live in. I applaud you. Again keep heart, don’t get discouraged. Thank you very much for your time.

21st Anniversary of Chornobyl
Dr. Christine K. Durbak

I would like to welcome you to the commemorative session of the 21st anniversary of Chornobyl. The first session will focus on the historical and current legacy of Chornobyl, the sarcophagus and the second under the leadership of Dr. Igor Branovan, Director of the Thyroid Center at NYEE will be an update on the latest research techniques and treatment modalities of radiation-induced thyroid cancer.

Dr. Igor Branovan

On behalf of the New York Eye and Ear Infirmary, I would like to welcome you to our session on “Living with Radiation: Update on Current Research Techniques and Treatment Modalities.”

Twenty one years have elapsed since the worst nuclear accident in the history of mankind erupted in Chornobyl on April 26th, 1986. Previously unimagined amounts of radioactive contaminants were ejected from the doomed reactor and within a few weeks spread around to cover almost the entire Northern hemisphere. The regions closest and downwind from the reactor sites in Ukraine, Belarus and Russia received the greatest amounts of ra-
nuclear explosion were aired by a Swedish monitoring station. Soon after, the Soviet government acknowledged that an accident did occur at the Chornobyl Nuclear Power Plant.

Many offers of help were made to the Soviet Government: Robert Gale attempted to save the most severely injured firemen, Arman Hammar had organized a meeting in Los Angeles, National Academy of Sciences and NIH made early overtures - none amounted to much. There were other smaller attempts by humanitarian and scientific groups but the only practical end point was the result of the Soviet request to the IAEA in 1989 to organize a comprehensive survey “The International Chornobyl Project” to assess the radiological consequences of the accident and to evaluate possible protective measures. Dr. Fred Mettler was in charge of the medical and public health aspects. An extensive array of intrinsic health problems was found that should have been addressed by the Soviet Public Health authorities. They saw no evidence of thyroid disease that could be attributed to the accident: the sample was too small and timing provided no opportunity to observe any cancer. To my knowledge this report, although reviewed officially, was never published in scientific literature. The offers of assistance by the US Agencies were ignored or refused by the Soviet Government.

DOE turned to NCI to take over the management in the field of thyroid cancer among children and leukemia among liquidators.

Meanwhile, the US President Reagan suggested cooperation in the field of civilian reactor safety in January 1987, and there was no reaction until December 1988 when finally Secretary Gorbachev agreed with his proposal. Documents were signed to assess the radiological consequences of the accident and to evaluate the protective measures. Nuclear Regulatory Commission (USA) and the USSR State Committee for Utilization of Atomic Energy signed an official agreement forming the International Committee for Civilian Nuclear Reactor Safety (ICCNTS), which included studies of health effects of nuclear operations and accidents. NRC and the US Department of Energy (DOE) assumed responsibility for environmental and health issues.

DOE, while retaining the overall responsibility for research on health effects, turned to NCI to take over management in the field of thyroid cancer among children and leukemia among the liquidators. Collaboration was thus initiated between NCI and organizations in Belarus and Ukraine. More committees were formed, new meetings were held, negotiations followed, development of protocols were initiated, reviewed, agreed upon (certainly regarding the funding issues) and signed by...
respective government authorities to permit collaborative studies. Initially, all activities were under the overall direction of the USSR: guidance regarding relocation policies, dose reconstruction operations, study designs. Negotiations on the practical operational level were carried out between NCI and the three selected scientific entities:

The Institute of Endocrinology and Metabolism in Kyiv, Ukraine the Clinical Research Institute of Radiation Medicine in Minsk, Belarus for the thyroid cancer studies, and the Research Center for Radiation Medicine in Kyiv - for the leukemia project.

Then came the dissolution of the USSR, and emergence of new independent countries, requiring renegotiations of the projects with new governments.

The new tasks envisioned for the proposed programs were staggering. Efforts to establish new relationships to overcome scientific and cultural differences between future collaborators, to assess needs for study implementation regarding personnel, equipment, supplies; development of research protocols and training in computer technology, epidemiology and data management took extraordinary amount of time and patience.

In the grand scheme of things, the agreements between NCI and the Soviet Union covered the work in the most contaminated areas around Chernobyl, and a group of early liquidator workers were identified for the leukemia project. Today I will concentrate on the Ukrainian-American thyroid cancer project; the Belarusian work was carried out concurrently and indeed the protocols in both countries were practically identical so that from the beginning plans were anticipated for eventual combination of the results from both arms in a unified overall analysis.

In Ukraine, the research protocol was peer-reviewed by and approved in 1994. Attempts were made to reconstruct the radiation dose received to the thyroids, because the early measurements were inaccurate or missing.

The aim of the project was to carry out medical examination of the thyroid gland to investigate possible thyroid pathology and to evaluate the role of radiation from I-131 in causation of thyroid cancer and other thyroid diseases. The dose-effect was to be investigated along with the various modifying factors: sex, age at the time of the accident, and the effect of possible protective use of stable KI.

A decision was made to use the cohort approach in these projects to avoid possible bias by taking a random sample from among those living in Chernyhiv, Zhytomyr and Kyiv Oblasts and fitting the following criteria:

- the subjects were to be 0-18 years of age at the time of the accident;
- they had to have direct measurement of the thyroid dose received in the first few weeks after the accident;
- they had to be residents of the most exposed communities around Chernobyl.

Initial selection to the cohort included all individuals with >1 Grey (roughly 50% of the entire cohort) and 25% each of those in the <0.3 Grey and 0.3-1 Grey.

Calculations indicated that a cohort of 12,000 would satisfy the requirements for statistical power. The Ukrainian project started with 13, 220 participants with the following composition:

- Residence-wise 53.3% were from Chernyhiv Oblast, 27.6% from Zhytomyr and 19.1% from Kyiv City and Oblast. Gender-wise there were about evenly divided between boys and girls.

For three examination cycles the compliance was maintained at a remarkable level of 90%.

The old medical system inherited by the new countries differed from that in the USA. Mutual education process took time, required unforced participation on both sides leading to development of “collegiate” management style. Politics, diplomacy, and personal attitude all played roles in establishing good working relationship and effective interaction on an international level.

Even though the project was carried out in Ukraine, all American requirements for human research protocols had to be honored. All of the participants were fully informed about the procedures offered. All were given their initial results upon completion of the screening and all had to sign informed consent document before starting the examination.

All the subjects were to be examined every other year (one half of the cohort per year, alternating the examination year). There was a stationary examination center in Kyiv and several mobile teams that covered outlying locations of greater concentration of the subjects.

The examination consisted of registration, ultrasound scanning and palpation by an ultra-sonographer and independently a clinical exam and palpation by an endocrinologist. Then blood and urine were collected for analysis of thyroid hormones and urinary iodine. All individuals were interviewed by dosimetrists to establish their thyroid dose (questions relating to their residence, relocation, their nutritional intake and life style during post-accident period). Mothers were responding for their children who were less than 10 years old at the time of the accident as their recollection was rather poor. FNA aspirations were recommended when indicated to evaluate suspicious nodes. By mutual agreement, the project’s end point was reaching a diagnosis in suspected thyroid disorders, with special accent on thyroid cancer. Treatment was relegated to local medical care institution.

Serious problems were encountered with “no shows” or actual refusals to participate. The project personnel turned to local Public Health staff with request for their
One of the interesting subjects in the health of children affected by radiation concerns the inutero exposure to the fallout. A case control study was undertaken in 2003 of children who were in utero at the time of the accident or during the two months following and whose mothers had thyroid activity measurements. This group consisted of 1,411 women. The goal was to estimate the risk of malignant and benign thyroid nodules as a function of exposure to Chornobyl fallout during the prenatal period, comparing the dose response curves obtained to those of the 0-5 year old group of the main project. Since it was not possible to determine the dose to the fetus, mother’s doses were recorded as the unifying factor in selection of this cohort. An additional selection of around 1,300 cases was made from women who did not have individual dose determination, but fell into a group with an average dose for a given location (ecological doses). For each study case, 5-7 controls were selected from non-irradiated mothers.

This sub-study was carried out essentially the same way as the main project in tracing the mothers and their children and the problems were of the same kind. The cases came from the Oblasts of Zhytomyr, Kyiv, Chernyhiv and Vinnytsia. The controls - primarily from unexposed raions of Zhytomyr and Chernyhiv. The single exception from the protocol was that the mothers were interviewed and the children were only examined. The study is still in progress. Many examinations have still to be completed. About 50% of candidates for FNA either did not show up or actually refused the procedure.

Preliminarily so far four cancers were identified: three from the group of exposed mothers and one from the control group. Two more cases from the exposed group await final results from FNA.

In conclusion, this thyroid cancer project is in many ways unique: it is the largest cohort study maintained now for four consecutive screening cycles; individual thyroid doses have been recalculated for everybody with potential of estimating doses due to internal and external radiation sources providing a wide range of radiation doses. Pathology on individual cancers were verified by an international body of experts.

And carrying out this study in two countries by analogous protocols, the catchment of subjects was doubled to 25,000 individuals.

Initial donation of one million dollars from NRC for the purchase of necessary equipment and laboratory reagents, followed by contributions primarily by NACI and to a smaller extent by DOE assured continuous supply of computers, modern equipment, reagents and salary support for the participants with no forwarding addresses, and occasionally temporary absenteeism due to higher education, military duty and incarceration.

The results of the first screening cycle yielded 45 newly diagnosed thyroid cancers. Gender-wise, there were 30 females and 15 males. Most cancers were papillary with only two follicular carcinomas. A history of thyroid goiter seemed to double the risk for cancer but this was not statistically significant and did not extend to goiters among relatives. Urinary iodine levels showed no association with thyroid cancer risk. A strong positive and approximately linear relationship was noted between thyroid dose and subsequent risk of thyroid cancer, which essentially could not be due to chance. The second examination cycle yielded 28 more thyroid cancers and the third cycle - 15. The fourth and the final cycle of active screening is currently nearing completion and so far four positive cases were identified plus two are still pending the FNA data. Obviously, the first finding was a prevalence of thyroid cancers reflecting to some extent the combination of screening effect and possible accumulation of cases over previous time. The next cycles provided true incidences which dropped in time. The fourth cycle is being watched closely.

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participating staff. Annual program reviews provided oversight and direction from independent groups of expert scientists, and as already mentioned, the small remuneration to the participants helped in their recall.

This massive undertaking in terms of the participating subjects alone (close to 25,000 of screened individuals), involvement of hundreds of scientific cadres on both sides of the ocean during more than a decade of active commitment provided a cross-fertilization of ideas and experience. Furthermore, it resulted in unprecedented effort in recalculation of individual radiation does recorded while the use of impartial expert committees with on going scientific advice and review assured a strict scientific management and control of all facets of these unique studies.

I would be remiss not to acknowledge the input from the three Institutes involved in Ukraine and Belarus, the effort of the American cadres at NCI, and Columbia University and the oversight and review guidance of the advisory groups.

Ms. Marta Ruedas
Deputy Regional Director for Europe & CIS, UNDP

I am very pleased to represent UNDP on this panel. I know that the conference agenda describes this morning’s topic as the sarcophagus and it is a crucially important issue, but I think you have already heard my colleagues on the panel giving us a lot of food for thought on this.

I will be discussing not the sarcophagus itself, but the millions of people, who at least figuratively, continue to live in its shadow. People in communities are really the focus of UNDP’s mission in the region. We often argue that if even one tenth of the one billion dollars that is being spent to build the safe containment for the damaged reactor, were dedicated to the recovery of the local communities, then our problems would be over. As you know, this conference does coincide with the anniversary of the Chornobyl Disaster next week. In the tradition of anniversaries, particularly one as painful as Chornobyl, we tend to look backward and to commemorate the pain and the suffering that was caused by the world’s worst nuclear power accident, and it is clearly important to acknowledge this legacy. However it is also crucial to look ahead and to focus on the very real prospect of recovery for the people and the communities in the affected areas. The main message that I would like to leave with you today is that solutions are within reach, and are in fact being put into practice already, to allow the people living in the Chornobyl affected areas to retain control, or regain control of their destinies and to lead fully normal lives.

This is a region that is on its way to recovery, and a region that is already coming back to life. I understand that in the film that you will be seeing, you will be watching this very process. You may know that the United Nation agreed several years ago on to take a forward looking approach to Chornobyl, and it was agreed that the top priority was to promote the social and economic development of the affected communities, and to provide local residents with the tools they need to regain self reliance, to create new livelihoods and secure a return to normalcy.

The UN since then has been speaking with a single voice on the challenges and the solutions affecting the Chornobyl area. This was most apparent in the UN Chornobyl forum, a consortium of eight UN agencies that in September of 2005 reached what we consider our definitive findings on the impact of radiation on health and environment. Building on what we consider our very reassuring messages and what the forum found in its report, UN agencies and the governments of the region, are increasingly voicing, as well a consistent message, and focusing on recovery for the affected region.

So this new forward looking approach to Chornobyl helped us this year to enter into partnership with one of the world’s top ranked women tennis players, Maria Sharapova. She was appointed as UN Goodwill Ambassador at a ceremony in New York on Valentine’s Day, and although her role is global, including promotion of international efforts to achieve the millennium development goals. She will also focus on the challenge of bringing the prosperity to the Chornobyl affected area where her family has roots and where her grandmother still lives in Gomel, in Belarus. We’re very pleased to welcome Ms. Sharapova as our ambassador, and we are especially pleased that she is targeting a region that is often overlooked by donors. At her appointment ceremony, Ms. Sharapova made a $100,000 donation to eight youth oriented projects in rural Chornobyl affected communities, in the three countries affected in Belarus, in the Russian Federation and in Ukraine. She will be funding projects aimed at computer and internet access, educational awareness of the environment, restoring sports facilities and hospitals, and a number of other projects that build on UN work already existing. This is aimed at helping
the communities regain a sense of self sufficiency and to build new livelihoods. What helped Maria Sharapova win her support for these projects was the fact that the local communities, the local authorities and other contributors had already committed nearly $100,000 of their own resources to these projects. We are hoping that this is just the beginning of a very fruitful partnership. We are counting on Maria Sharapova’s commitment to draw attention to the promise of development work at the community level in this region.

I’d like to point out that there is a lot happening in development in the region. I’d like to start with Belarus. The C.O.R.E. program, which is short for Cooperation for Rehabilitation continues to be the main framework for assistance in the four worst hit districts of Belarus. It’s an umbrella program, which is designed to mobilize and to coordinate efforts by international, national and local donors and partners, and it has 34 participating agencies and organizations. There have been a lot proposals so far, 124 project proposals, with around eight and a half million euros that have been approved and funding has been committed for over half of that amount. It’s going relatively well. One of the biggest success stories is C.O.R.E. Agri which is an agricultural development project that provides small business loans to farmers, and offers training in modern farming technologies and clean production methods. I’d like to point out again, its not obvious for those who don’t know anything about Chornobyl to fund farming projects and agricultural businesses, but it is something that is absolutely possible in the region, and in fact necessary to help it to recover.

We also have results to show from the Russian Federation. The UNDP has supported the creation of the Micro Credit Fund called “New World”. Work has just been started, but many novice entrepreneurs have already received training and 13 microcredits have been approved and issued, and some of them have already been paid back in full. We’ve already got sample projects supported, including mushroom production, and the breeding of poultry and rabbits. Future initiatives are likely to include forestry and the most unlikely of all, tourism. The work of the local development agency has inspired the Briyinsk regional administration to establish a business incubator and to launch its own regional program of micro credit for urban small enterprises. The projects objectives are being met by helping people to find new livelihoods, buy building strengthened partnerships between the public administration, the private sector and civil society.

In Ukraine, UNDP continues to work through its steadily expanding Chornobyl recovery and development program. The program covers seventeen regions in Ukraine’s four most affected oblasts. Under this program, 256 community organizations have been created, and have completed more than 160 community based recovery projects, for a total of around $3.3 million of which the local authorities and community organizations contribute over 70%. So it’s really their project. And these projects work first to tackle priority infrastructure needs of the affected communities. Typically this will include efforts to improve the local water supply, to connect villages to gas networks, to refurbish schools and health clinics and to create community youth centers. But because it is the community itself that selects and plans the projects and does most of the work, the most important impact is the restoration of the sense of self reliance and self confidence to the communities that live in the Chornobyl affected area instead of fruitless passive waiting for salvation to come from outside.

One project usually leads to another and another. What we find is communities inspired by their neighbors successes to give this approach a try. So, I think that we are really building momentum towards self-development in the region. UNDP is also active at the regional and national level in efforts to improve the climate for business and investment in the Chornobyl region, and address out dated zoning policies that in some places do inhibit entrepreneurship and infrastructure investment needs to stimulate growth. We are also trying to bring to the affected populations the information they need to understand the lasting impact of Chornobyl on their lives, particularly, how to cope with the far more dangerous health risks entailed in some of the more common practices, including excess consumption of alcohol and tobacco, which can affect their lives much more than the radiation risks.

Working with the Chornobyl Forum is our scientific foundation. We aim to build on UN partnership with the World Health Organization and other agencies to provide credible up to date information in a comprehensible format, and in a way we hope will actually affect people’s behavior. A major UN wide initiative called the International Chornobyl Research and Information Network will work in all three countries to disseminate the information. Ladies and Gentleman, going from village to village to respond to the Chornobyl challenge may seem like a small-scale response to a giant disaster, but in
our view, the worst legacy after Chornobyl is in people’s heads. It’s a legacy of fear, and of perceptions that are out of all proportions to the real risks experienced. It is a legacy of economic and social disadvantages that we are convinced that communities can overcome with only modest assistance, and an awareness that confidence and motivation are at least as important as money. We have seen this approach work first hand, and we aim to apply it as widely as possible in Chornobyl, and beyond. We look forward to working with all interested partners to help bring a region back to life that is so rich in history and potential. Thank you very much for your attention.

What I would like to begin this particular conference with is the emergency planning aspects of future of Chernobyl. We’re going to have some highly qualified speakers after me talking about the new structures that will be built around Chornobyl in the future, so I will spend a limited amount of time on that. Instead, I will begin talking about the focus on the entire gamut of emergency planning. That’s what I am doing in the United States right now, is the emergency planning for the health response from the use of weapons of mass destruction here in the United States, as a function of one of the CDC centers. Our center have developed medical curriculum for mass causal incidents. We have medical training now in 43 of the United states and will have it in all 50 states. The curriculum we have developed has now been adopted by the American Medical Association as their national standard for the medical response particularly to nuclear weapons and radiological exposure. We also do medical resource utilization for mass causality crisis. For instance, we handled the mass casualty planning for the AIDs summit, which occurred in 1994 in the United States. Now we’re doing this for all of the major cities in the United States, in the event of a terrorist attack. These are the curriculum that the American Medical Association has now adopted and has been given to over 50,000 medical care personnel in the United States. We intend to reach all of them, hopefully in the next 5 years. So how does this square with what’s going to be done after Chornobyl. Chornobyl of course was the largest airborne dispersion of radio nuclides in the history of the world. Over 100 times as much radioactive dispersion there as Hiroshima and Nagasaki atomic bombs combined.

I always use this photograph. Dr. Durbak has seen it many times, because the individual that took this photograph paid for it with his life. I use this photograph in honor of him. After the dispersion of the radio nuclides, they went through Western Europe which resulted in great panic as these clouds moved through the countryside.

Now, what will we do in the future?

The key is planning, planning ahead and education.

The public in the United States and the other 95% of the world is uneducated about radiation events. In general people tend to overestimate what radiation will do. We need to educate in conjunction with any planning. We don’t have any control over the education, but we do in the planning aspect. After the last event, now 21 years ago, there were a lot of sacrificial efforts made in the cleaning effort. But in the future, if we were to have additional releases, we need to do better. By planning ahead, by having highly trained personnel with the equipment they need we have rapid response. The key is speed. When you’re dealing with airborne release of radio nuclides you must react very quickly. You also need to avoid putting people in harms way, particularly the familiar story of the Chornobyl liquidators. Many thousands of individuals were utilized; I may say brave individuals, who served the rest of us by rapidly responding to the accident, some of whom paid a high price for that.

This is a familiar sign now across Ukraine, Belarus and Russia. Signs indicating areas where there is a still detectable level of radioactivity. We are going to see a film about the zone. This is a sign that will be appearing in many places in the world, I believe, with the proliferation of nuclear weapons going the way they are.
However, right now we’re centered on Chornobyl. How can we plan for any future releases that may occur? What will we do in the future, if there is another release? This is from the Chornobyl report, which I know Dr. Durbak has shown during these conferences, of the actual radionuclide dispersions that occurred. There were very high levels of activity there right around the reactor. It goes down three levels of magnitude by the time you reach the city of Pripyat. The city, where 50,000-70,000 people used to live, which was the crown jewel of the Soviet Union’s plan for nuclear power, now completely abandoned. This is the largest abandoned city in the world. The United States held that distinction briefly when New Orleans was evacuated, but people are back in the city.

This is a CNN photo. This photograph may call into question my sanity, but you see my geiger counter, and you’ll notice the needle is completely pegged all the way down to the end. This was in an area called the “red forest”, all the pine trees have been killed, and you’ll see there is still a great deal of radioactivity. In a few minutes you will hear a description of what will be done with the Chornobyl sarcophagus. There are areas of the sarcophagus, where water’s getting in because there is a breakdown and there’s water damage. There’s a general decrease in the ability of the sarcophagus to contain this in the future. So there’s going to have to be additional measures made to stabilize it.

This is a drawing of the encasement, the sarcophagus, which I fully support and hope the funding can be found for to protect us in the future. These are the kinds of panels that have to be done, and types of large beams, piping roofs, that have to be moved into place and still protect the people that are there now. There has been an enormous amount of construction around Chornobyl, in addition to the sarcophagus that’s only one of the aspects; there are schools, kindergartens and health centers.

I’d like to conclude by discussing the human element as numbers can be very sterile. Sergiy was a pilot, who was dropping sand on the reactor. How do you put out a nuclear reactor fire? We were pouring sand on it. It was a very effective way. Sergiy paid dearly, because he is in extremely declining health. He said he had nothing left. His wife abandoned him. His family abandoned him. His children didn’t want to talk to him, because they thought he’d give them radiation, which of course is not true. This exemplifies the difficulties we face in education, and getting education out to the public.

This is chilling data, I have many of these slides and I’ll only show you this one. I’d like to show a classic U-shaped curve in toxicology. The two lines going across the top are the low dose people and the controlled. The U-shaped curve is when you start with a population of people and their health declines, with treadmill testing, and then goes back up. Why is that? Because the weaker individuals have died, and so Sergiy and others like him survived.

What we are doing in the United States is calculating where the casualties would be if a nuclear weapon would be detonated here, which we believe is likely. This is the measurement you see, with just one simple medium sized nuclear weapon. We would lose all the health care professionals in both Washington and Baltimore. My friends in Washington looked immediately to see where their house is when I showed this. This is the kind of emergency planning that we also need to do for Chornobyl.
Thyroid cancer went up explosively because we didn’t get the radio stable iodine to these people in time. These are the recommendations for the future. I agree with the Chornobyl Forum that a comprehensive safety and environmental impact assessment is necessary for the entire Chornobyl exclusion zone. We need an integrated reactive waste management place and an evolving monitoring sector, because as you do these processes you’ll be covering up some of the wells you had before. The shelter needs to be dismantled, and the new safe confinement needs to be put over the top, with an emergency response plan for worker safety included.

In the emergency response plan there needs to be rapid simulation of the plume dispersion, a tie to the emergency action plan. Speed is of the essence. We need to be able to make decisions very quickly, whether or not people need to be given the incorporation agent. A good communication network is highly important. I did an exercise in Atlanta with 23 hospitals, and I can tell you that

- Now, the dispersions are likely to be much less from the existing encasement. What you see is these red crosses, they are pharmaceutical distribution plants we have planned. When there is a release of radioactivity from a nuclear weapon or radiological device, we will within minutes pick areas that are the most efficacious to distribute medicines in order to flush the radio-nuclides out of the body.

- We need to get the framework for the way it was in 1986. I have many of these simulations. I am only showing one, of where we are going, in let’s say 2008. The levels are much lower, but we still have to plan for them. These are examples of Chornobyl liquidators. You can see in the months after the accident very significant levels of radio nuclei are present in these individuals. The levels would be several orders of magnitude lower the next time, even if there were to be a release. The good news is that since 1986, there have been dramatic advances in ability to flush radio nuclei out of the body. De-corporation of these agents, DTPA, can flush 90% of plutonium out of the body if administered in the first few hours. Speed is the key. The individuals have to be informed and identified, and it should not be administered to those who don’t need them in a panic response. The experimental agents that the United States is buying, that are newer, show a great deal of promise. These agents will protect the bone marrow suppression and other actual radiation toxicity after exposure, while flushing radionuclei out of the body. The good news is that we have made significant advances in the last twenty years. These have been extensively used on cows in Russia, Ukraine and Belarus to flush radio nuclei out using insoluble plexus blue. We have some very interesting data now from that. But the key is speed.
the number one thing that breaks down is always communication. We need to get the resources to evacuate people, including the geriatric population—a very important group of people who keep getting left behind. The key is education, and this is an area where there is less of an effort right now. I think that with enough effort we can get better results. Thank you very much.

Dr. Andrew Sowder
Nuclear Energy, Safety and Security, U.S. State Department

Well first I’d like to thank the conference organizers, World Information Transfer for inviting me to speak today on the Chornobyl Shelter Project, and for giving me the opportunity to inform you all of the ongoing efforts to mitigate the aftermath of the Chornobyl accident.

I want to give you an overview and context for the international effort to mitigate and hopefully solve some of the challenges posed by the remains of the Unit Four Reactor that was destroyed as well as the deteriorating sarcophagus that was built to entomb it.

The reason we are here today is the events of April 26th, 1986. Steam explosions destroyed the Chornobyl Unit Four Reactor. And in addition to the severe and lasting impacts on the people in the three affected republics, these consequences reverberated worldwide. I would note that as a direct result of Chornobyl, two conventions or treaties were established to provide early notification in the event of such accidents and incidents, as well as to facilitate international cooperation in the future.

Along with these challenges, because this was done largely at a distance using cranes and novel assembly techniques, the protection of the individual components was often epocheal, such as welding, and again you’re looking at a house of cards instead of a firm mechanical connection. So from day one the sarcophagus was susceptible to collapse especially in the event of an earthquake.

As was alluded to, intrusion of water remains a concern. I’ve seen estimates up to 1000 sq. meters of openings in the sarcophagus shell. That’s a very large area through which water, wind, birds, rodents, you name it, can enter the structure. So it’s less than hermetically sealed.

Another fact of concern is that once the site was stabilized the other reactors were brought online again in order to meet the critical energy demands of the USSR. Consequently, nuclear safety remained a paramount concern given the fact that Unit Three, which was still operating, shared many of the same physical structures as well as systems with Unit Four. And in general the three remaining operational reactors were all of the same general design, namely RBMK, which had some sarcophagus, or object shelter commenced, and was completed in a remarkable 6 month time frame. Again I think this is incredible for something of this scale and magnitude, and the fact that it was constructed under such adverse conditions, pretty much at arm’s length.

The situation at Chornobyl nuclear power plant remained of grave concern because the sarcophagus was established and directed as a temporary measure and again that’s due to the fact it was built quickly and under less than ideal conditions. Furthermore it was built largely on top of what was left behind by the explosions and so these structures were of unknown stability. I think most of us would agree that if you were to build your house on such a foundation you too would be concerned about its future stability. But again there was no choice.

So I will start with May 6th 1986, when the end of the majority of the releases from the burning reactor occurred. The reactor essentially burned uncontrolled for ten days. Soon after, the construction of the
serious limitations and design issues which contributed significantly to the accident.

This is a picture taken in 2003 at age 17. Again, you’ll note the ventilator stack is one of the shared systems, and that actually had to be repaired because it continued to be in use since, even after the shut down of Unit Three fuel remains in the reactor and still required some level of cooling. Another thing to point out is that you’ll notice on the other side of the sarcophagus you can see Unit Three’s building, so you can see how close in proximity the two Units are.

And again reiterating the way this sarcophagus was constructed contributes to our concerns today. You can see that the roof components are being dropped into place remotely by cranes and are not necessarily physically attached to each other, and you have large gaps in between. On the right is a view from inside the sarcophagus right on top of the destroyed reactor, taken I believe, with a remote camera. You can see sunlight streaming in—clearly you’ve got a lot of water coming into the area.

In recognition of the acute need for long term solutions to the problems that stemmed from the Chornobyl accident, the group of seven industrialized nations, the EU, and Ukraine, signed a memorandum of understanding in 1995 that laid the groundwork for broad and continuing international cooperation to improve nuclear safety and to eventually lead to the closure of all reactors at Chornobyl in 2000.

To accomplish this, the MOU also mobilized a combination of loans as well as grants totaling close to three billion dollars. And another important outcome of this MOU has been the established ongoing close relationship with Ukraine on these matters. The reason why I’m dwelling on the memorandum of understanding is, as was mentioned earlier, immediately following the accident there were many offers of assistance not accepted by the Soviet Union, however, following the breakup of the USSR, I think this memorandum of understanding became a cornerstone of all subsequent cooperation on Chornobyl.

I want to go into some of the elements because the MOU is broader than just the Chornobyl facility itself. Paramount was the closure of all Chornobyl reactors by the year 2000; this was a very bold step along the part of Ukraine given their acute need for the energy that they would agree to shut down such a critical resource. As it happened, by the year 2000 all three reactors were in fact shut down. Also as components of the MOU were broader initiatives to reform the energy sector in the Ukraine as well as to improve and enhance energy investments. This really made possible the shut down of the three reactors. There was also assistance given for nuclear safety and decommissioning activities. This was the seed for the establishment, in 1997, of the Shelter Implementation Plan.

What is the SIP, the Shelter Implementation Plan? Well in essence, it is a strategy for transforming the remains of Unit Four and the sarcophagus that encapsulates it to a long
term environmentally safe condition. What this really entails is, first of all, reducing the risk of the collapse of the sarcophagus in the first place, as well as limiting the consequences if it were to collapse. Secondly, providing a new shelter to the old shelter from the elements, the wind and the rain, for a medium term; I believe the lifetime for this new safe confinement is envisioned for approximately 100 years. And finally, providing a safe platform for future deconstruction work. Again, the SIP does not itself cover disassembly of the sarcophagus and removal of the material inside, but what it does provide is the capacity, the capability and the tools, to do this safely. Of course such a project costs a lot of money, and another key element of SIP is the funding and financial support, which comes from the Chernobyl Shelter fund.

The initial price tag was set at 758 million dollars, which was really the best professional guess, because there was no design in mind at the time. There was no specific plan for this new safe confinement, so again it’s very difficult to come up with firm numbers when you don’t know what the final product is going to look like. There were a number of candidate designs and concepts, but it was not until 2003 that a final design was selected. This allowed for the first true cost estimate. And that came in at 1.1 billion dollars. This sounds like a major increase from that original cost estimate, but I would point out that the first estimate again was not attached to any specific design. It did not include things that typically go with large construction projects such as risk, inflation, and contingency costs. So we compare apples to apples, in some ways it’s surprising just how close the two compare if you look at it in 1997 dollars. And in 2003 because of project delays the completion date had slipped from 2005 two years ago, to 2008.

Now, I just want to leave you with a sense of the complexity of the task. One of the challenges with this sort of long-term project is that it is like a long car ride where your child may keep asking you “are we there yet?” The problem with the shelter project is that the visible part of it, the shelter, comes at the end, just like in a good mystery. But that’s not to say that a lot of progress has not been made to date, and that’s one of the things I want to focus on. Because before you can get to construction of this new safe confinement, a lot of tasks have to be completed. So under the SIP, Shelter Implementation Plan, you need to include the extensive project management necessary to manage all these complex tasks; substantial construction and improve-

| **the initial price tag of the new sarcophagus (see page 36)** | was set at 758 million dollars |

ment of site infrastructure; site preparation, again, we’re not starting off with a nice pristine site. We have a destroyed reactor a large amount of contamination, a lot of unknowns in the soil around that, because we’ve got to remember that in the days following the accident whenever fuel containing material was encountered, or contaminated equipment rendered useless, a lot of that was buried right in the vicinity of the sarcophagus. I wish I had the picture, but there was one picture I’ve seen of workers coming across a contaminated bulldozer that was buried right there. This makes the construction project that much more complex. Basically the sarcophagus and the destroyed reactor are almost like a living organism, they groan, move and change with the conditions, such as barometric pressure etc. All these aspects are monitored and will continue to be monitored in real time with temperatures etc., because this is a critical concern. Other things are included such as site access control for security, safety, and finally of paramount importance is the concept of stabilizing the existing sarcophagus, because you don’t want to initiate construction and then have the shelter collapse.

Let us look at the progress to date. Essentially all the key support facilities are complete, and the major site infrastructure projects are ready. These include work areas, worker change facilities, administration buildings, training facilities for all the workers coming onsite, as well as the critical need for maintaining hygiene when going in and out of the site due to the contamination. Finally, I would note that in 2006 stabilization was complete, and again this is no small feat because it represents the largest task of its kind completed on the Chernobyl power plant site to date. Furthermore, in and of itself, I think it represents a major accomplishment for the Shelter Implementation Plan, and with out this the rest of the project cannot proceed.

One visible outcome is this external support for the western buttress wall. One of the concerns in the event of an earth quake was that this wall would simply fall away, again, because of the lack of mechanical connections. So as one of many remedies, this eliminates that problem. I’ll just quickly go through some other tangible evidence that progress has been made. A worker change facility, you’re going to have 1000 to 15000 workers on site at peak, so that’s going to require a lot of showers, places to change, go to the bathroom etc. that had to be built. Training facilities, if you want your workers to not make mistakes, not spend too much time in the work areas where there is a radiation field, practicing ahead of time does a lot of good. So the training facilities have been built or refurbished. Again I mentioned the site infrastructure: piping, electricity, work areas, all of that have been finished.
Finally getting to the meat of the topic, the end of the story is the new safe confinement. Now, I wish I had some more interesting news to tell at this point, because we’ve certainly been waiting for some good news. But the problem is that since this is a commercial venture, you have commercial entities bidding on this. The interim discussions with the European Bank for Reconstruction and Development are confidential until concluded, so we have to wait and see just like everyone else. But this new safe confinement, which is essentially this new shelter over the old, is the most visible and complex element of the SIP and the bidding for this was started back in 2004 first quarter. Two final bidders qualified and really the two competing bids were opened late 2005. Now all of 2006 was essentially consumed with ongoing discussions between the parties, but again this is a major commitment on the part of these commercial entities as well as the customers and all those involved. So, perhaps that’s to be expected for such a complex and risky venture. As we speak those discussions are inching towards their final phase, and construction is expected to commence in 2007.

For the conceptual design we are talking about arch structure much like an airplane hangar, except in the way it’s going to be built; adjacent next to the destroyed reactor and slid into final position once it’s completed. This will be the largest movable structure ever built. I actually asked the question myself “is this feasible?” and it is in many ways a low tech issue, it just has to be scaled up, and that’s the least of the concern, in moving it. But just for some scale, it will be 100 meters high, I’ve seen images where the statue of liberty would fit under it, and have a 260 meters span, three 747s would fit nose to tail underneath it, so that gives you an idea of the dimension.

I’ll just quickly go through this, but to give you an idea of the complexity of the management of this project, you’ve got a lot of people involved. For the US as a donor, our role is a high level oversight role. We do not deal with the day to day affairs of the project. The European Bank for Reconstruction and Development based in London is essentially the agent for the donor community and acts as the go between for us, the government of the Ukraine, and the project managers. Another important component of this is the Nuclear Regulator in Ukraine. When this is done, it will be a nuclear facility and must be licensed as such.

Let me just summarize by saying today the Shelter Fund stands at 1 billion dollars. We are very close to the amount that has been identified as needed, and this was achieved by G7 and European community leadership. The US is the largest single party donor but the European community is the largest over all. These are the donors, the contributors are 24, and these are the voting members in the assembly.

I’ll just wrap up by saying the Shelter Implementation Plan is not the only game in town. It does not exist in isolation. There are a number of other prior and ongoing activities funded by the US Department of Energy, as well as a whole other nuclear safety account administered by the European bank to address such things as waste management on site. The European community and European Union have funded projects as well and also given extensive regulatory support to finish this task.

I’ll just leave with an ongoing laundry list of challenges. Things like changes in material price, the price of steel can change the cost of this project dramatically. It’s not a static issue, but hopefully with the next few weeks we’ll have good news and be able to move forward on breaking ground on this monumental task. Thank you for your attention.
FIRST SESSION -
Ambassador Jiro Kodera,
Mr. Werner Obermeyer,
Dr. William N. Rom,
Dr. Christine K. Durbak,
Dr. Claudia Strauss.

SECOND SESSION -
Dr. Patrick Kinney,
Dr. Philipp Schmidt Thome,
Dr. Roberto Bertolliini,
Dr. Christine K. Durbak,
Dr. Sophie Balk and
Ms. Donna Goodman.

H.E. Mrs. Mirjana Mladineo at the opening session of the Conference

Dr. Claudia Strauss, Dr. Daniel R. Schneider

Roland DeSilva,
Executive Vice Chair of WIT introducing luncheon speakers.

From left to right H&E Amb. Valeriy Kuchinski, Governor Christine Todd Whitman and Dr. Christine Durbak at the Chornobyl luncheon.

World Information Transfer Conference Interns with Governor Whitman, Mrs. Carolyn Comitta and Dr. Claudia Strauss.
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with the United Nations, 
Promoting Health and Environmental Literacy.

World Information Transfer

Mission Statement

World Information Transfer, Inc. (WIT) is a not-for-profit, non-governamental organization in General Consultative Status with the United Nations, promoting environmental health and literacy. In 1987, inspired by the Chornobyl nuclear tragedy, WIT was formed in recognition of the pressing need to provide accurate actionable information about our deteriorating global environment and its effect on human health. WIT exercises its mandate through:

• World Ecology Report (WER). Published since 1989, the World Ecology Report is a quarterly digest of critical issues in health and environment, produced in four languages and distributed to thousands of citizens throughout the developing and developed world.

• Health and Environment: Global Partners for Global Solutions Conference. Since 1992, WIT has convened what we believe to be one of the world’s premier forums for the presentation of scientific papers by international experts on the growing clinical evidence supporting the link between degrading environments and diminished human health. The conference has been convened as a parallel event to the annual meeting of the UN Commission on Sustainable Development. The scientific papers presented at the conference are available on WIT’s web site.

• Health and Development CD ROM Library. This project consists of a library of CDs each of which focuses on a subject within the overall topic of Development and Health information. Our Human Information CD ROM Library offers one bridge across the “digital divide” for both developed and developing countries. The project is continuous with future topics being developed.

• Health and Development CD ROM Library for Ukraine. In conjunction with UNDP, WIT has developed a country specific library disc for distribution in schools and centers in Ukraine.

• Humanitarian Aid. WIT provides humanitarian relief to hospitals and orphanages in areas devastated by environmental degradation. Our shipments have included medical equipment for pediatric medical facilities, computer and telephone systems, clothing, toys, prosthetic devices for gifted children.

• Internship Program. WIT provides an internship program for young people interested in international diplomacy, international health, and sustainable development.

• Scholarship Program. With the support of the K. Kovshevych Foundation, WIT offers scholarships to intellectually gifted university students in need of financial assistance to continue their studies in areas related to health and environment.

• www.worldinfo.org WIT provides through its web site up to date science based information on the relationship between human health and the natural environment, including the papers from the WIT’s annual conference, the archived World Ecology Reports, and our new Ecology Enquirer, an e-newsletter written by our Interns targeted to young people.

• Centers for Health & Environment. The aim of the Centers is to promote research, education and solutions. The first center was opened in Ukraine in 1992, and the second center opened in Beirut, Lebanon in 1997 at Bir Hasan, United Nations Street, Al-Salaam Building.

World Ecology Report

Summer/Fall 2007
I would like to thank Dr. Durbak and World Information Transfer for inviting me to this conference. As a film director I think it is very important for a created work to be shown on big screens like television but also in forums like this one. I have made a special 20 minute editing especially for this occasion which provides a summary of the documentary “Lazona, the Unnamed Zone”. “The Unnamed Zone” is a documentary that shows the problem of Chornobyl not from a general or a scientific point of view but from a humanistic perspective seen from the eyes of three Ukrainian children. Sometimes when people talk about knowledge they are reduced to talking about data where there are fertilities and curable illnesses of contamination ladders. In discussing the data, it is forgotten that beyond these figures there are millions of people who have to deal with these problems in their daily lives who live in a contaminated lands and who have real problems that are difficult to reflect and quantify in a report. This documentary provides a response to a series of questions. How do people live from day to day in a place that is contaminated by radiation? How do they shop, go to school, or walk around their neighborhoods? Is it possible to live a normal life? How do parents explain the problem of Chornobyl to their children/how does it influence the way these children think, write, draw, play, or even dream? The children in our film were born years after the disaster but their lives are conditioned by Chornobyl. They live in the main zone (zone number 4) and although these areas have supposedly low radiation levels, their problems have profoundly affected the social culture and physiological life of the population. I think that the words that best describe these people’s lives are fear and uncertainty. Fear because they face an invisible evil that they don’t understand and have no way to fight against. Uncertainty because the lack of information or the contradiction between different information sources has overwhelmed and myths and legends have taken the place of the truth. We have only found one optimistic element in this entire tragedy and that is that thousands of these children spend their summers every year in different destinations around the world from Australia, Spain, Ireland, the United Kingdom, Cuba, Italy, Canada, US, etc. These children have wonderful opportunities that in the future might help change the way we face our environmental problems. We owe this to all those in the international associations who devote their efforts to these children. This documentary is dedicated to them. Thank you very much.