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OA/ID Number: 2613
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Rick Stokarski - Ozone

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**NASA**OFFICE OF SPACE & SCIENCE APPLICATIONS
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5

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4/5/91

TO: (Name, Company/Affiliation, Fax Line)

KATIE MCGINTY
(Sen. Al. Gore)

FROM:

BOB WATSON
NASA

Office Phone: (202) 453-

MESSAGES:

FAX 224-0580

PHOTOCOPY
PRESERVATIONKATIE

Thought you and Sen. Al. Gore
might find this O₃ summary
useful. Best wishes

Bob Watson

5 April, 1991

OZONE OBSERVATIONS

R. Watson

NASA Headquarters

PHOTOCOPY
PRESERVATION

KEY RESULTS FROM 1989 INTERNATIONAL OZONE ASSESSMENT

- o Antarctic Ozone Hole: The weight of scientific evidence strongly indicates that chlorinated (largely man-made) and brominated chemicals are primarily responsible for the recently discovered substantial decreases of stratospheric ozone over Antarctica in springtime.
- o Long-Term Ozone Decreases: The analysis of the total-column ozone data from ground-based Dobson instruments show measurable downward trends from 1969 to 1988 of 3 to 5% (i.e., 1.8 - 2.7% per decade) in the northern hemisphere (30 to 64°N latitudes) in the winter months (December through March) that cannot be attributed to known natural processes, and that are larger than predicted by gas-phase photochemical models. 95% confidence limits were between 0.6 and 1.2% depending upon latitude and season.
- o Model Limitations: These findings have led to the recognition of major gaps in theoretical models used for assessment studies. Assessment models do not simulate adequately polar stratospheric cloud (PSC) chemistry or polar meteorology. The impact of these shortcomings for the prediction of ozone layer depletion at lower latitudes is uncertain.
- o Arctic Chemistry: The surface-induced, PSC-induced chemical reactions that cause the ozone depletion in Antarctica also occur in the Arctic and thus represent additional ozone-depleting processes that are not included in stratospheric ozone assessment models. Hence, future ozone layer depletions in the northern hemisphere could well be larger than predicted from current gas-phase models.

RECENT SCIENTIFIC FINDINGS

- o Antarctic Ozone Hole: In 1990, the spring-time depletion of the ozone layer over Antarctica was as severe as in 1987 and 1989, but persisted even longer than in these two years and did not disappear until late December.
- o Long-Term Ozone Decreases: Provisional results from a new analysis of 11 years and 7 months of TOMS satellite data, supported by ground-based Dobson observations in the northern hemisphere, indicates:

total ozone between 65 N and 65 S has been decreasing at an average rate of about $2.6 \pm 1.4\%$ per decade (3.0% over 11 years and 7 months), after correction for known natural influences on the abundance of ozone. Error limits represent 95% confidence limits.

- * statistically significant ozone depletions have been observed at all latitudes in winter north of 30 N, with maximum depletions slightly greater than 8% per decade (95% confidence limit of $\pm 3\%$) centered at 45 N in February and March;

5 April, 1991

- * a 3-5% ozone depletion is observed at all latitudes north of 35 N in springtime (April and May);
- * a 4% or greater ozone depletion is observed at all latitudes south of about 40 S throughout the year.
- * no statistically significant ozone depletions are observed between 30 N and 30 S at any time throughout the year, nor between 30 N and 50 N during summer.
- o Comparison of Satellite Trends with Trends from Ground-Based Observations: This provisional analysis of the satellite ozone record indicates that the decreases observed in the northern hemisphere over the last decade are greater than those reported in the 1989 international scientific assessment averaged over the time period 1969 to 1988.
- o Comparison of Observations with Theoretical Models: The observed ozone depletions are substantially greater (e.g., factors of 2 - 5, depending upon season and latitude) than the decreases predicted by standard gas-phase photochemical models that do not include heterogeneous processes.
- o Cause and Effect: Cause and effect has not been established for these observed decreases of ozone in the northern hemisphere. However, they are possibly consistent with transport of chemically perturbed air from the arctic. NASA and NOAA are mounting a major scientific aircraft campaign between October 1991 and April 1992 to attempt to establish the cause of the observed depletion of ozone in the northern hemisphere (30 N to 70 N).

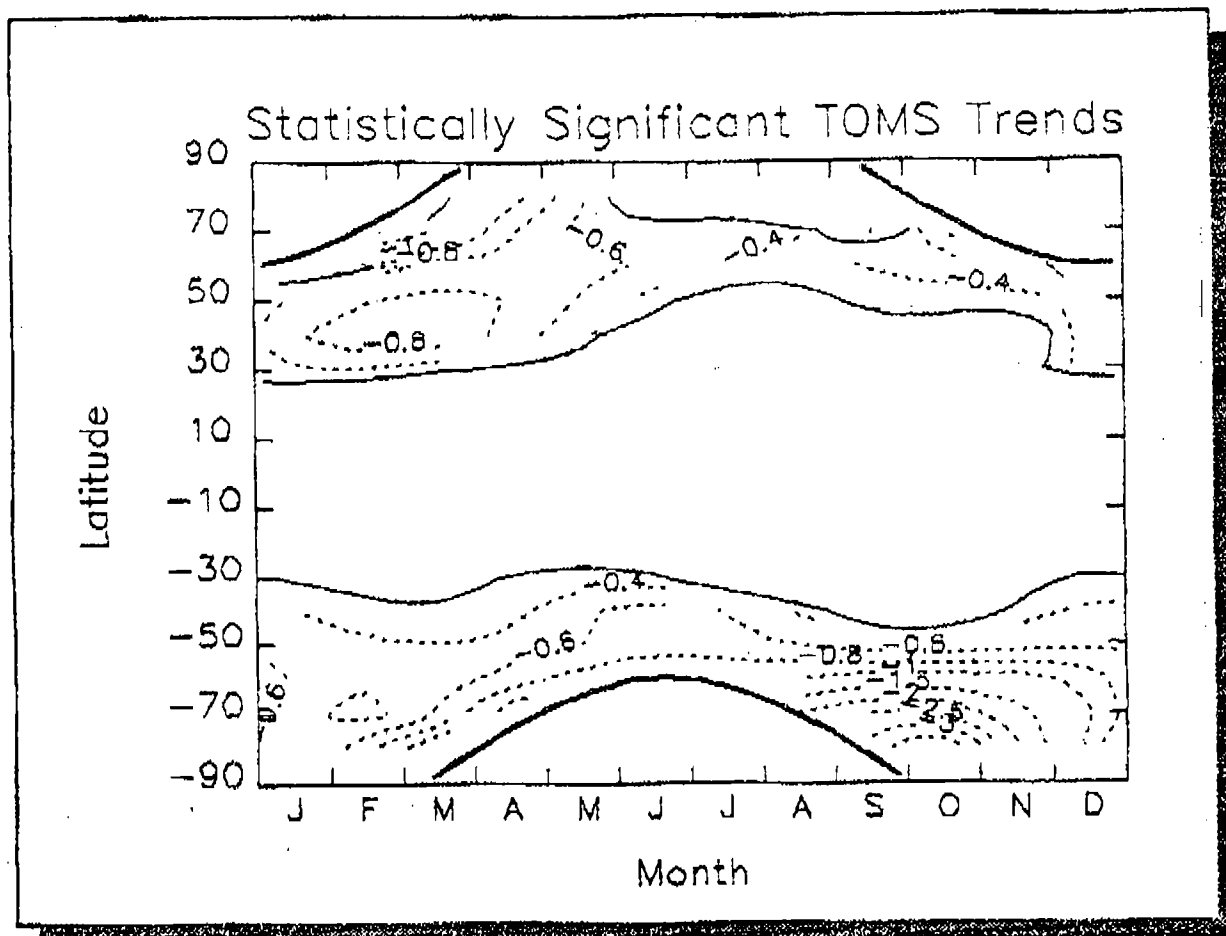
STATUS OF SATELLITE DATA:

- o Data, including calibration procedures and trend analysis techniques, critically reviewed at a scientific workshop;
- o Paper on calibration methodologies already accepted for publication;
- o Paper on ozone trends to be submitted to scientific journal next week.
- o Research performed by R. Stolarski and co-workers at NASA Goddard Space Flight Center.

will do this?

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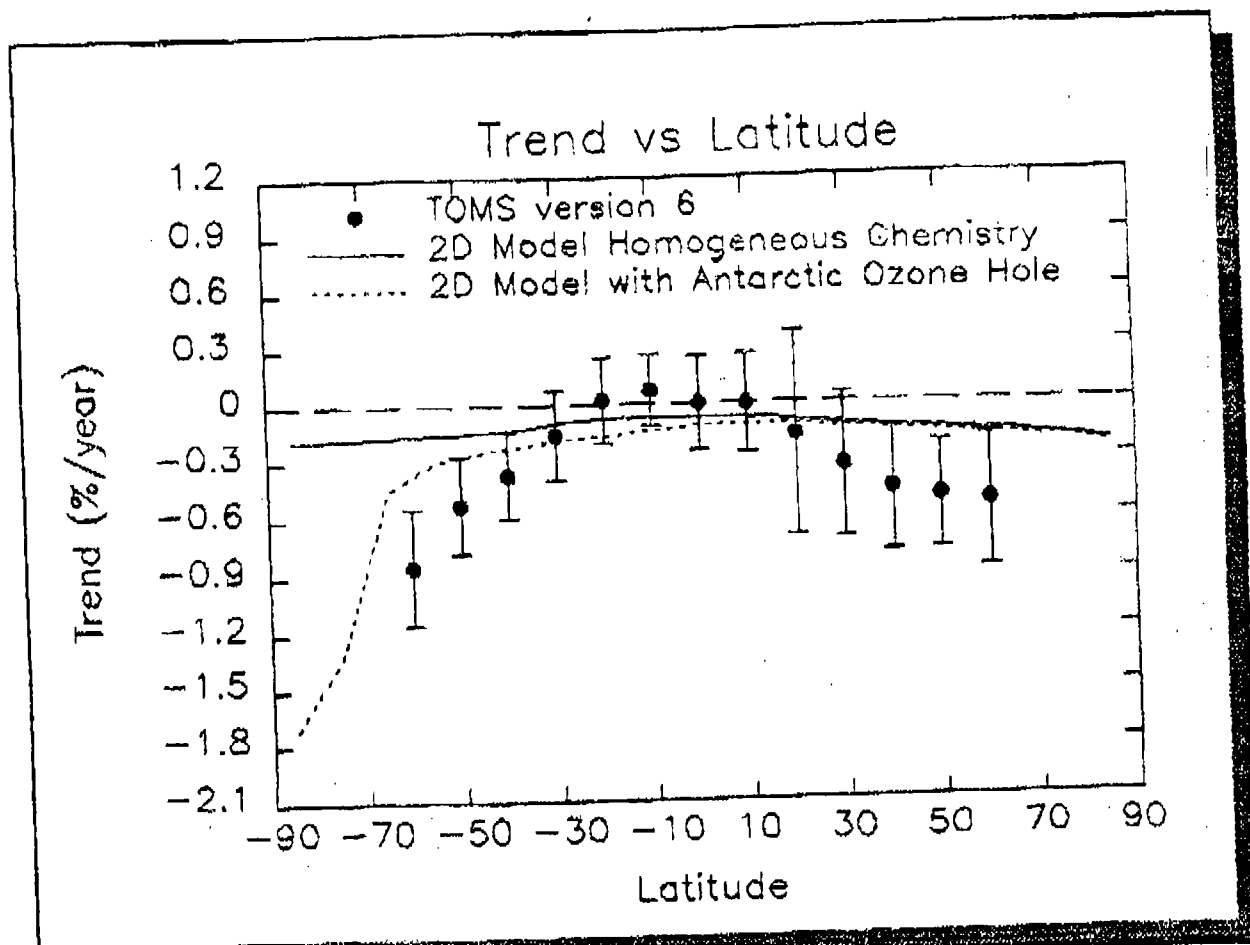
R.S. Stolarski NASA/Goddard Space Flight Center



Total ozone trend deduced from TOMS data as a function of latitude and season. Only those contours for which the trend is statistically different from zero by 2σ are shown. The contour intervals are 0.2%/year. Poleward of the heavy solid line is polar night where no TOMS measurements are possible.

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R.S. Stolarski NASA/Goddard Space Flight Center



Seasonally-averaged trend in total ozone deduced from TOMS data as a function of latitude. The TOMS data set is 11 1/2 years in length, extending from November, 1978 through May, 1990. The error bars shown are the 2σ statistical uncertainties combined with an absolute trend uncertainty of $\pm 0.12\%/year$. The solid line shows a 2D model calculation for the expected trend using only homogeneous gas-phase chemistry. The dashed line shows a similar 2D model calculation with an imposed ozone hole in the Antarctic spring.

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PRESERVATION

Draft.

102nd Congress
1st Session

S.RES. _____

Urging the Administrator of the Environmental Protection Agency to to accelerate the scheduled phaseout of production of ozone-destroying substances in the United States as required pursuant to the Clean Air Act Amendments of 1990 and calling on the President to urge the United Nations to call a special session of the Contracting Parties to the Montreal Protocol in order to conclude an agreement accelerating the the scheduled phaseout of such substances and for other purposes based on recent scientific findings concerning the degradation of the stratospheric ozone layer and increased atmospheric concentrations of substances that lead to the degradation of the stratospheric ozone layer.

IN THE SENATE OF THE UNITED STATES
April , 1991

RESOLUTION

WHEREAS the stratospheric ozone layer, which protects all living things from harmful ultraviolet radiation from the sun, has been severely depleted in many areas of the globe;

WHEREAS recent scientific data show that the ozone layer over densely populated areas of the United States has thinned twice as fast as had been previously projected;

WHEREAS the recent data also show that the depletion is extending farther south than earlier studies had predicted, and the period of depletion is enduring longer and persisting into the warmer months of the year;

WHEREAS Europe, the Soviet Union, and most of Asia are experiencing similarly accelerated rates of ozone depletion;

WHEREAS the ozone layer is being depleted even more rapidly in the Southern Hemisphere than it is in the Northern Hemisphere, and the period of depletion is even more extensive than it is in the Northern Hemisphere;

WHEREAS further recent scientific evidence shows that chlorine monoxide, a chemical that is derived from such manmade compounds as chlorofluorocarbons and hydrochlorofluorocarbons, and that is known to

destroy the ozone layer, has reached a concentration over the temperate latitudes of the Northern Hemisphere that is five times the normal level;

WHEREAS for every percentage point of ozone depletion, the number of skin cancer cases increases 5 to 7 percent;

WHEREAS the recent data indicate that Americans face a near doubling of skin cancer cases and deaths over the next 40 years due to increased exposure to ultraviolet radiation;

WHEREAS increased exposure to ultraviolet radiation, in addition to increasing the incidence of cancer, weakens the immune system and increases the risk of cataracts and other diseases, threatens food crops and some wild plants, and interferes with the ability of phytoplankton, the microscopic organisms that are at the base of the oceanic food chain, to reproduce;

WHEREAS the scientific evidence shows that chlorofluorocarbons, hydrochlorofluorocarbons, and other halogenated chemicals undergo reactions in the stratosphere that lead to the rapid destruction of the ozone layer;

WHEREAS the Administrator of the Environmental Protection Agency is required under the Clean Air Act Amendments of 1990 to accelerate the scheduled phaseout of ozone-destroying substances if it is determined in the light of scientific evidence that a more stringent schedule is necessary to protect human health and the environment;

WHEREAS the production of chlorofluorocarbons and carbon tetrachloride will be halted by the year 2000 pursuant to the amendments to the Montreal Protocol concluded in London in June of 1990;

WHEREAS the elimination of hydrochlorofluorocarbons is not mandated under the London amendments to the Montreal Protocol;

WHEREAS developing countries are not required to comply with the terms of the Montreal Protocol until the year 2010;

WHEREAS the European Community has already committed to halting the production of chlorofluorocarbons in 1997, three years earlier than required under the London amendments to the Montreal Protocol;

WHEREAS ozone-destroying substances are also potent greenhouse gases and contribute to global climate change, and the recent scientific data demonstrate the need to avoid taking risks with the atmosphere's delicate chemical and climactic balance;

WHEREAS the recent scientific findings make necessary a reappraisal of both domestic and international policy on the control of ozone-destroying chemicals; Now, therefore, be it

RESOLVED by the Senate of the United States of America in Congress assembled,

That the Administrator of the Environmental Protection Agency shall accelerate the scheduled phaseout of production of ozone-destroying substances in the United States as required pursuant to Section 606 of the Clean Air Act Amendments of 1990, and shall provide for complete phaseout as early as possible, but in no event later than 1997 for CFCs and methyl chloroform, in order to protect human health and the environment;

That the Administrator of the Environmental Protection Agency shall promptly issue regulations, as required pursuant to Title VI of the Clean Air Act Amendments of 1990, providing for the recapture and recycling of ozone-destroying substances as used in appliances and motor vehicle air conditioners, and for the elimination of such substances as used in non-essential consumer products;

That the President of the United States should urge the United Nations to call a special session of the Contracting Parties to the Montreal Protocol in order to conclude an agreement accelerating the scheduled phaseout of production of ozone-destroying CFCs and methyl chloroform, and providing for such phaseout as early as possible, but in no event later than 1997;

That the President should urge the Contracting Parties, at the special session called by the United Nations to include hydrochlorofluorocarbons within the terms of the Montreal Protocol, and provide for the phaseout of the production of such substances as early as possible, but in no event later than 2010;

That the President should urge the Contracting Parties, by providing technical assistance and through other measures as appropriate, to accelerate the compliance of developing countries with the terms of the Montreal Protocol.

April 8, 1991

To Enviro LA's:

In light of the recent satellite data concerning ozone depletion, Senator Gore will be sending the attached letter to Bill Reilly and dropping in the attached resolution TOMORROW (yeah--I had a terrific weekend!).

Pursuant to the Clean Air amendments, Reilly is required to accelerate the phaseout of CFC's if scientific evidence shows a more stringent schedule is necessary to protect human health and the environment. The letter urges him to accelerate the schedule and to speed efforts to implement the CFC recycling programs required under Clean Air and the elimination of non-essential uses of CFC's.

The resolution puts the Senate on record as calling for Reilly to accelerate the schedule, and urges the President to call on the Montreal Protocol contracting parties to speed international phaseout of CFC's. It is my understanding that the contracting parties intend to meet in 1992 to call for a phaseout in 1997 (in accord with actions already taken by the European Community). The resolution puts the Senate on record as also calling for this acceleration.

If you have any questions or would like to sign on, please call me or Pam McElwee (44944). Thanks!!

A handwritten signature in cursive script, appearing to read "Kate", is centered below the text.

102nd Congress
1st Session

S.J.RES. _____

Noting recent scientific findings concerning the degradation of the stratospheric ozone layer and increased atmospheric concentrations of substances that lead to the degradation of the stratospheric ozone layer, and calling for appropriate actions.

IN THE SENATE OF THE UNITED STATES
April , 1991

JOINT RESOLUTION

WHEREAS the stratospheric ozone layer, which protects all living things from harmful ultraviolet radiation from the sun, has been severely depleted in many areas of the globe;

WHEREAS new scientific data show that the ozone layer over densely populated areas of the United States has thinned twice as fast as had been previously projected;

WHEREAS the new data also show that the depletion is extending farther south than earlier studies had predicted, and the period of depletion is enduring longer and persisting into the warmer months of the year;

WHEREAS Europe, the Soviet Union, and most of Asia are experiencing similarly accelerated rates of ozone depletion;

WHEREAS the ozone layer is being depleted even more rapidly in the Southern Hemisphere than it is in the Northern Hemisphere, and the period of depletion is even more extensive than it is in the Northern Hemisphere;

WHEREAS further new scientific evidence shows that chlorine monoxide, a chemical that is derived from such manmade compounds as chlorofluorocarbons and hydrochlorofluorocarbons, and that is known to destroy the ozone layer, has reached a concentration over the temperate latitudes of the Northern Hemisphere that is five times the normal level;

WHEREAS for every percentage point of ozone depletion, the number of skin cancer cases increases 5 to 7 percent;

WHEREAS the new data indicate that Americans face a near doubling of skin cancer cases and deaths over the next 40 years due to increased exposure to ultraviolet radiation;

WHEREAS increased exposure to ultraviolet radiation, in addition to increasing the incidence of cancer, weakens the immune system and increases the risk of disease, threatens food crops and some wild plants, and interferes with the ability of phytoplankton, the microscopic organisms that are at the base of the oceanic food chain, to reproduce;

WHEREAS the scientific evidence shows that chlorofluorocarbons, hydrochlorofluorocarbons, and other halogenated chemicals undergo reactions in the stratosphere that lead to the rapid destruction of the ozone layer;

WHEREAS the production of chlorofluorocarbons (and carbon tetrachloride?) will be halted in the year 2000 pursuant to the amendments to the Montreal Protocol concluded in London in June of 1990;

WHEREAS the elimination of hydrochlorofluorocarbons is not mandated under the London amendments to the Montreal Protocol;

WHEREAS developing countries are not required to comply with the terms of the Montreal Protocol until the year 2010;

WHEREAS the European Community has already committed to halting the production of chlorofluorocarbons (and ccl4?) in 1997, three years earlier than required under the London amendments to the Montreal Protocol;

WHEREAS ozone-destroying substances are also potent greenhouse gases and contribute to global climate change, and the new scientific data demonstrate the need to avoid taking risks with the atmosphere's delicate chemical and climactic balance;

WHEREAS the new scientific findings make necessary a reappraisal of both domestic and international policy on the control of ozone-destroying chemicals; Now, therefore, be it

RESOLVED by the Senate and House of Representatives of the United States of America in Congress assembled,

That the United States should call a special session of the Contracting Parties to the Montreal Protocol in order to conclude an agreement accelerating the scheduled phaseout of production of chlorofluorocarbons (and ccl4?), and providing for such phaseout as early as possible, but in no event later than 1997;

That the United States should urge the Contracting Parties to include hydrochlorofluorocarbons within the terms of the Montreal Protocol,

and to provide for the phaseout of the production of such substances as early as possible, but in no event later than _____ (2010??);

That the United States should urge the Contracting Parties, by providing technical assistance and through other measures as appropriate, to accelerate the compliance of developing countries with the terms of the Montreal Protocol;

That the Administrator of the Environmental Protection Agency shall invoke the authority vested in him pursuant to Section 606 of the Clean Air Act Amendments of 1990, to accelerate the scheduled phaseout of production of ozone-destroying substances in the United States, and shall provide for complete phaseout as early as possible, but in no event later than 1997;

That the Administrator of the Environmental Protection Agency shall issue regulations, as required pursuant to Title VI of the Clean Air Act Amendments of 1990, providing for the recapture and recycling of ozone-destroying substances as used in appliances and motor vehicle air conditioners, and for the elimination of such substances as used in non-essential consumer products.

April 8, 1991

Honorable William K. Reilly
Administrator, Environmental
Protection Agency

Washington, D.C.

Dear Administrator Reilly,

The satellite data released last week by Richard Stolarski and his colleagues at the National Aeronautics and Space Administration shows that the stratospheric ozone layer has been severely degraded. Human health and the environment are in the balance, and it is imperative that we take action now to prevent further damage.

As a critical first step, the phaseout of chlorofluorocarbons and hydrochlorofluorocarbons must be accelerated. Pursuant to Section 606 of the Clean Air Act Amendments of 1990, you have the authority to impose a more stringent schedule if scientific evidence demonstrates that more vigorous measures are necessary. Clearly we now have that evidence in hand: the rate of ozone depletion is twice what we had understood it to be, and the extent and duration of the ozone thinning is significantly more expansive than was previously known. Increased incidence of cancer death, cataracts, and other disease are likely; marine life and agricultural crops will also be adversely impacted.

Judging from your comments on this matter as reported in the press, it is apparent that you agree with our assessment of the situation. We therefore urge you immediately to invoke your authority to speed the phaseout of ozone destroying chemicals.

We have also prescribed several other measures in the Clean Air Amendments that we believe to be of the utmost importance in minimizing the threat posed by halogenated chemicals. Recycling of CFC's and HCFC's used in appliances and auto air conditioners, and the elimination of these chemicals in nonessential consumer products, are critical components of our campaign. Through rulemaking, you are charged with implementing these requirements. While we appreciate the many demands on your time and resources, we urge you to prioritize your efforts in this regard.

Thank you very much for your prompt attention to this matter. We look forward to your response and to working with you to ensure that our best efforts are expended in protecting our environment, and our children, from the harmful effects of ozone depletion.

NEWS FROM

U.S. Senator Al Gore



(D - Tennessee) SR 393 Russell Building, Washington, D.C. 20510 (202) 224-4944

DATE 4/7/91

TO David Doniger

FROM Katie McGinty

PAGES including cover 5

SUBJECT Letter & Resolution re: Ozone.

Would appreciate it if you
could read over & comment. On the
resolution I have a couple of
questions with regard to coverage of
CCly in Protocol. Also, should I
mention methyl chloroform?? Anything
else I missed?
Thanks -
Katie.

Draft

Dear Administrator Reilly:

There is disturbing news in the latest satellite data released by Richard Stokarski and his colleagues at the National Aeronautics and Space Administration: the stratospheric ozone layer protecting the earth from the sun's deadly ultraviolet rays is being destroyed more than twice as fast than had been projected. The ozone layer has been severely degraded, not just at higher latitudes or over Antarctica, and not just in winter months, but in the atmosphere over our own backyards in the spring months when we, and our children, are outdoors.

The scientists are predicting that this much-faster-than-expected depletion of the ozone layer will produce massive increases in cases of skin cancer and deaths from skin cancer -- almost twice as many during the next 40 years -- and dramatic impacts on climate and crops. The results are startling. They must move us to immediate action. Human health, human lives, and our environment are at stake.

As a critical first step, the phaseout of chlorofluorocarbons and hydrochlorofluorocarbons must be accelerated. Under the Clean Air Act Amendments of 1990 (Sec. 606), you are required to impose a more stringent phaseout schedule if scientific evidence demonstrates that more vigorous measures are necessary to protect human health and the environment. Clearly, we now have that evidence: the rate of ozone depletion is more than twice what we had expected; and the extent and duration of the damage is significantly more expansive.

Your recent public comments in response to the new satellite data make it apparent that you agree with our assessment of these findings. "The implications for policy are unavoidable," you were quoted as saying in The Washington Post. The policy choice before you is clear. We urge you to make it and immediately speed the phaseout of ozone destroying chemicals.

The Clean Air Act Amendments of 1990 also include other measures we believe to be of the utmost importance in minimizing the threat posed by ozone-destroying chemicals. Recycling of CFCs and HCFCs used in appliances and auto air conditioners, and the elimination of these chemicals in nonessential consumer products are critical components of those amendments. By crafting the rules for these provisions, you are charged with their implementation. We urge you to make this rule-making a top priority.

Thank you, in advance, for your prompt attention to these very urgent issues.

QUENTIN N. BURDICK, NORTH DAKOTA, CHAIRMAN
DANIEL PATRICK MOYNIHAN, NEW YORK
GEORGE J. MITCHELL, MAINE
MAX BAUCUS, MONTANA
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DAVID M. STRAUSS, STAFF DIRECTOR
STEVEN J. SHIMBERG, MINORITY STAFF DIRECTOR AND CHIEF COUNSEL

Al on 4/22/91 *File in Ozone/Stolarski*
United States Senate

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
WASHINGTON, DC 20510-6176

April 18, 1991

Dear Colleague:

On Tuesday, April 23, we will be sending the attached letter to the President for his consideration in anticipation of the scheduled June meeting of the Contracting Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer. We invite you to join us as signatories of the letter.

The reason for our concern is the recently released satellite data by Richard Stolarski and his colleagues at the National Aeronautics and Space Administration. Dr. Stolarski's data shows that the earth's protective ozone layer is being destroyed at a rate two to three times faster than previously predicted. The ozone layer is being diminished over all latitudes and its depletion extends into the spring months, a time when people begin to spend more time outdoors and plants begin to grow.

The ozone layer is a natural shield that protects all living things from the sun's harmful ultraviolet radiation. Destruction of the ozone layer is caused primarily by the release into the atmosphere of chlorofluorocarbons (CFCs) and similar manufactured substances -- compounds used primarily as refrigerants, fire extinguishers and solvents. These gases are also greenhouse gases and contribute to global warming.

The likely effects of a thinning of the ozone layer are an increase in skin cancers and cataracts, a potential suppression of the immune system and damage to crops and marine resources.

The challenge of reducing this threat is ongoing. Already some 70 nations have signed the Montreal Protocol on Substances that Deplete the Ozone Layer. The new data from NASA raises the question of the adequacy of the current version of the Protocol. We are urging that the United States take a leadership position on this issue by proposing strengthening amendments to the Protocol when the Contracting Parties meet in July in Nairobi.

If you are interested in joining as a signatory to this letter, please have a member of your staff contact Cliff Rothenstein at 4-9097, Jennifer Hess at 4-7010 or Janet Coit at 4-9134 by noon, Monday, April 22.

Sincerely,



Max Baucus



John Chafee

PRINTED ON RECYCLED PAPER

HOWARD M. METZENBAUM, OHIO
DAVID M. STRAUSS, STAFF DIRECTOR
STEVEN J. SHIMBERG, MINORITY STAFF DIRECTOR AND CHIEF COUNSEL

United States Senate
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
WASHINGTON, DC 20510-6176

April 23, 1991

=
The Honorable George Bush
The White House
1600 Pennsylvania Avenue
Washington, D.C. 20500

Dear Mr. President:

We are writing to urge that you adopt a four point plan to demonstrate United States leadership on the international environmental problem of protecting the Earth's ozone layer. The plan involves specific proposals to strengthen the Montreal Protocol as soon as possible.

As you know, the current version of the Montreal Protocol as modified by the June 1990 London agreement, requires that industrialized nations implement: 1) a step-wise reduction in production and consumption of chlorofluorocarbons (CFCs), leading to a complete phase-out by the year 2000; 2) a step-wise reduction in production and consumption of halons, leading to a phaseout by the year 2000 (except for essential uses); and 3) a step-wise reduction, leading to a phase-out of carbon tetrachloride and methyl chloroform by the years 2000 and 2005, respectively. Our four-point plan includes a number of provisions to modify and strengthen the Protocol.

First, the interim phase-out schedules and the final phase-out dates for all of the ozone depleting chemicals currently covered by the Protocol should be accelerated. Simply moving the final phase-out dates to the year 1997 is not sufficient. The step-wise percentage reductions for the interim years should be increased.

Second, recapture and recycling provisions should be added to the Protocol. These will achieve significant reductions in the release of ozone depleting substances.

The Honorable George Bush
4/23/91
Page 2

Third, while the current version of the Protocol will allow unlimited production and use of other ozone depleting chemicals such as HCFCs, a revised, strengthened Protocol should place limits on the production and use of such chemicals. The limits should be designed to discourage the production of HCFCs that have relatively long atmospheric lifetimes, high ozone depletion potentials, or high global warming potentials.

Finally, the Parties to the Protocol need to continue financial aid and technical assistance to developing countries to accelerate their participation and compliance with the terms of the Montreal Protocol.

The ozone layer is under significant attack.

Scientists have already concluded that man-made chlorinated and brominated chemicals are largely responsible for the "Antarctic Ozone Hole" - the large decrease in stratospheric ozone over Antarctica in springtime.

In 1989 scientists confirmed that the same ozone depleting chlorine species found in the Antarctic are also present in the Arctic stratosphere. Thus the Arctic is primed for an ozone depletion event similar to that in Antarctica. Whether or not any future Arctic ozone depletion occurs will depend on the particular meteorology of each Arctic winter.

Most recently, NASA scientists have shown that ozone depletion is not confined to the polar regions of the globe. In fact, there has been a world-wide depletion of the protective ozone column. Specifically, new data shows a significant downward trend of three to five percent in the ozone column over the past twelve years in the northern hemisphere. This actual, measured decrease is larger by a factor of two to three than the decreases predicted by current theoretical models.

The ozone layer cannot tolerate more abuse.

Thinning of the ozone layer allows more high energy ultraviolet radiation to strike the earth's surface, increasing the incidence of skin cancers and cataracts, and potentially suppressing the immune system. Increased ultraviolet radiation has also been shown to damage crops and marine resources.

The Honorable George Bush

4/23/91

Page 3

The new ozone losses measured by NASA raise serious questions about the adequacy of the control measures set forth in the Montreal Protocol to protect public health and the environment. For these reasons, we urge you to place the United States in a position of world leadership and to adopt our four-point plan for strengthening the Montreal Protocol.

We look forward to working with you on this important issue.

Sincerely,

John H. Chafee
United States Senate

Max Baucus
United States Senate