

Welcoming Remarks

by Mario Molina

Welcome to the first issue of the Newsletter of the Mexico City Program.

The Integrated Program on Urban, Regional, and Global Air Pollution: Mexico City Case Study—or the Mexico City Program (MCP), for short—is now about three years old, although intensive work has been ongoing for the last two years only. Results of this first phase of research have now appeared in a book, “Air Quality in the Mexico Megacity: An Integrated Assessment.” A collaborative effort between our Mexican and U.S. colleagues, the research presented in the book served as the scientific foundation for “PROAIRE 2002-2010”; (Program to Improve Air Quality in the Metropolitan Area of the Valley of Mexico), a rather ambitious and yet essential set of guidelines to protect the public over the next decade from the harmful health effects of air pollution.

Thanks to the collaboration of our coworkers, the second phase of the Mexico City Program has gotten off to a very good start. In January 2002 we held the MCP’s Fifth Annual Workshop in Ixtapan de la Sal in the State of Mexico. Jointly organized by the Mexico City Program and the Metropolitan Environmental Commission (CAM), and hosted by the Secretary of Ecology of the State of Mexico, the workshop brought together more than 160 participants from the US, Mexico and Canada. Among other topics, the opportunities and challenges for the implementation of PROAIRE III program were dis-



Welcoming reception for the Fifth Mexico-US Workshop on Air Quality: Mario Molina chatting with Martha Hilda Gonzales, Exequiel Ezcurra, and Adolfo Mejía. (Photo provided by L.Molina.)

cussed with government officials and stakeholders. It is clear that considerable work must be done to effectively implement the new PROAIRE’s various proposals and guidelines, and we expect to contribute significantly to that effort.

One of the major activities of the MCP’s second phase is a Field Measurement Campaign to update and improve the emissions inventory of the Mexico City Metropolitan Area (MCMA), and to improve the current knowledge of the chemistry, dispersion and transport processes of the pollutants emitted to the MCMA atmosphere.

In February, we had a successful exploratory field measurement campaign. Its main goal was to determine how well our instruments and measurement systems work in the MCMA environment, and to learn enough about the concentration ranges, temporal and spatial variability, and emissions sources of key gaseous pollutants and aerosol components to allow us to plan the most effective intensive campaign to be performed early in 2003.

The exploratory campaign utilized state-of-the-art instrumentation such as a single particle spectrometer, tunable diode



Dr. Carlos Santos Burgoa speaking at the presentation of “Air Quality in the Mexico Megacity” (M. Molina and L. Molina, eds.)

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lasers coupled to long-path absorption cells, a proton-transfer mass spectrometer, and a fine particle monitor that selectively samples soot particles. We monitored in real time not only standard pollutants such as ozone and nitrogen dioxide, but also key intermediate species such as formaldehyde and acetaldehyde, as well as the chemical composition of atmospheric particulates as a function of their size.

The field measurement campaign is a joint effort of the MIT Mexico City Program and the Metropolitan Environmental Commission. It was planned and executed under the direction of Dr. Luisa Molina and included key scientists and researchers from the US (Aerodyne Research Inc., Washington State University, Montana State University, and MIT) and Mexico (Universidad Nacional Autónoma de México (UNAM), Universidad Autónoma Metropolitana - Azcapotzalco (UAMA), Universidad Autónoma Metropolitana - Iztapalapa (UAMI), Instituto Nacional de Salud Pública (INSP), Instituto Mexicano del Petróleo (IMP), Instituto Nacional del Ecología (INE), Secretary of the Environment of the Government of the Federal District, and the Secretary of Ecology of the State of Mexico). The logistical support of RAMA (Red Automática de Monitoreo Atmosférico) and CENICA (Centro Nacional de Investigación y Capacitación Ambiental) was invaluable for the success of this campaign. The data will be analyzed over the next few months, but the preliminary results already look extremely interesting.



During one of the field campaign measurements, the mobile laboratory was parked at Escuela Primera “John F. Kennedy” where the RAMA monitoring station at Pedregal is located. Above, Gene Allwine, Gustavo Sosa, and Luisa Molina explaining research techniques to curious students. (Photo provided by L.Molina.)

We are eager to continue developing the second phase of our Program with our collaborators, and look forward to activities scheduled for this summer such as the Mid-Career Workshop that will take place in Mexico City in August, as well as several working group meetings at MIT.

Honors and Awards

TRB Distinguished Service Award

The 2001 Transportation Research Board's (TRB) Roy W. Crum Distinguished Service Award was presented to Joseph M. Sussman, J.R. East Professor of Civil and Environmental Engineering at MIT and a collaborator of the Mexico City Project since its inception. Professor Sussman was honored for his significant contributions to research on railroads, intelligent transportation systems, and other large integrated systems.

The Distinguished Service Award, which recognizes outstanding achievements in the field of transportation research, was named after Roy W. Crum, who served as executive director of TRB from 1928 until his death in 1951.

Medallo al Merito

Professor Mario J. Molina was awarded the “Medalla al Mérito Ciudadano 2002” (Medal to the Citizen Merit 2002) by the Congress of the Distrito Federal. The honor was in recognition of Dr. Molina's scientific research, which provided the scientific basis for the Mexican government's new guidelines to reduce air pollution, Proaire 2001-2010. After receiving the award, Prof. Molina said he was grateful to accept this distinction on behalf of his Mexican and American colleagues who have focused their research on the problem of air pollution in Mexico City.

The medal was established in 1990, and its distinguished list of recipients include writer and poet Octavio Paz, writer and journalist Fernando Benitez, and Enrique Beltrán, a pioneer in the effort to conserve Mexico's natural resources.

Metropolitan Environmental Commission (CAM) unveils new air quality program

On February 11, 2002, the Metropolitan Environmental Commission (Comisión Ambiental Metropolitana, or CAM) announced PROAIRE III, a \$12 billion program aimed at improving the air quality of the Mexico City Metropolitan Area (MCMA) over the next eight years.

Dr. Adolfo Mejía, Technical Secretary of the Metropolitan Environmental Commission, made the announcement in a public meeting attended by Lic. Victor Lichtinger, Federal Environment Minister; Lic. Martha Hilda Gonzales, Secretary of Ecology of the State of Mexico; Dr. Claudia Sheinbaum, Secretary of the Environment of the Federal District; Dr. Carlos Santos Burgoa, Director General for Environmental Health of the Federal Health Ministry; and Drs. Mario and Luisa Molina, who led a multidisciplinary collaborative study that served as the scientific foundation for this program.

The Program to Improve Air Quality in the Valley of Mexico 2002-2010 (PROAIRE III) includes more than 80 measures that affect transportation, industry, the service sector, natural resources, health, and education. It focuses on the reduction of ozone and particulate matter, and emphasizes environmental education and citizen participation.

At the public meeting that took place in a hotel in Tlal-nepantla, Dr. Carlos Santos-Burgoa remarked that they [officials] would be satisfied when they are able to reduce the ozone level to below 100 IMECA and control the fine particulates.

Dr. Claudia Sheinbaum stressed that the implementation of the measures described in the Program depends on the

political will of the participating institutions and the coordination of the institutions involved.

Lic. Martha Hilda Gonzales added that society should get involved and contribute individual solutions to pollution reduction.

Lic. Lichtinger mentioned that one of the pending issues is the restructure of CAM, which should be independent from political influence and with a permanent Technical Secretariat.

Dr. Mario Molina said that although the Program was based on solid scientific knowledge, economic and political factors would be critical for its successful implementation. He concluded, "Our hope is that the Program will help improve the quality of life of the inhabitants of the Valley of Mexico."



Panel: (from left): Adolfo Mejía, Raúl Arriaga, Mario Molina, Víctor Lichtinger, Martha Hilda González, Claudia Sheinbaum, César Reyna & Carlos Santos Burgoa. (Photo provided by CAM)

Molina Fellowship in Environmental Science

The Molina Fellowship in Environmental Science was established to bring postdoctoral fellows and young scientists from emerging nations to MIT to pursue studies in environmental sciences. Molina Fellows will then return to their home countries better able to address complex environmental concerns. Individuals holding a Ph.D. degree in science or engineering and interested in pursuing work in environmental science are eligible for the one-year Fellowship with an annual stipend of \$40,000.

Qualified scientists are encouraged to apply by sending a Curriculum Vitae with a list of publications, names and addresses of three professional references and a brief statement of research interest to the attention of

In addition, applicants should arrange for the three letters of recommendation to be sent directly by referees to the same address. All materials must be received by September 6, 2002.

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Notes from the Fifth Annual Workshop on Mexico

After the long trip to Ixtapan de la Sal in the States of Mexico, two hours from Mexico City, the participants, some of whom had come from as far away as Switzerland, were pleased to hear Nobel Laureate Professor Mario Molina begin the conference on a light note, following the welcoming remarks from government officials.

"The formal part of this conference is over," announced Professor Molina as he loosened his shirt and removed his tie. After an ice-breaking laugh, most of the participants followed suit.

It is the rare scientist who can command the attention of a room full of such powerful men and women. But the levity of the moment did not undercut the importance of why this group of policy makers, scientists, and students had gathered together.

The Fifth Annual Workshop on Mexico City Air Quality, organized by Dr. Luisa Molina of MIT, in conjunction with the Metropolitan Environmental Commission (Comisión Ambiental Metropolitana or CAM) had before it an almost unthinkable task: improving the air quality in Mexico City, the world's largest, and arguably one of the most polluted, megapolis while retaining economic growth.

Participants from US academic institutions including the Harvard School of Public Health (HSPH), Boston University, Emory University, and MIT, as well as the US EPA, the California Air Resources Board, Aerodyne Research, and US Northeast State for Coordinated Air Use Management. International participants included colleagues from Swiss Federal Polytechnic Institute in Zurich and Lausanne, our partner from the Alliance for Global Sustainability (AGS).

Mexican participants could count among their ranks academics from El Colegio de México, Universidad Nacional

Autónoma de México (UNAM), Universidad Autónoma Metropolitana (UAM), Universidad Autónoma del Estado de México (ITESM), Instituto Tecnológico y de Estudios Superiores de Monterrey, and Universidad de las Américas-Puebla; government agencies including member institutions of CAM, Instituto Nacional de Salud Pública (INSP), Secretaría de Energía, Instituto Mexicano del Petróleo (IMP), Petróleos Mexicanos (PEMEX), and industrial organizations including Asociación Mexicana de la Industria Automotriz and Consejo Nacional de Industriales Ecologistas. The gathering provided an opportunity for research groups to present and discuss their work on issues ranging from atmospheric science to transportation modeling, to debate the provisions of the new Proaire III pollution control guidelines, and, time allowing, to enjoy one of the world-famous spas in Ixtapan de la Sal.

Optimism, questions dominate Proaire presentation

Dr. Adolfo Mejía, Technical Secretary of CAM, headed off the first plenary session, entitled "Implementation of Proaire 2001-2010: Opportunities and Challenges." His keynote address touched on the guidelines and goals established in PROAIRE III, which address many of the aims that had not been achieved with the first two documents. As expected for a city where nearly 80% of emissions are from transportation and mobile sources, many of the measures focus on traffic and automobile controls, including inspection and maintenance, fleet renewal, and stricter standards. Other provisions focus on public health, conservation, and emissions from non-mobile sources.

Regulatory framework and political feasibility are issues of note – areas that present some of the greatest challenges to a comprehensive solution to the problem. An educational initiative, introduced by Dr. Luisa Molina, is also a core part of the program.

Other presenters during the first plenary session discussed topics related to Proaire, including PEMEX's production of a low-sulfur gasoline and its introduction of alternative fuels such as compressed natural gas (CNG), the renewal of the taxi and bus fleets, controlling emissions from industrial sources, and methods of financing the new initiatives.

During the panel discussion, moderated by Professor Molina, the conference participants expressed guarded optimism for the proposals, while questioning why many of the provisions that had been included in the first two documents had not been realized. It became clear that implementation of Proaire III would be a challenge. All agreed, however, that the groundwork had been laid for realistic, long-term goals for improving air quality and hence public health in the Mexico City.

Research groups demonstrate progress, need for more information

The following four plenary sessions focused on technical aspects of the air pollution problem, including energy and climate change, health impacts, transportation and urban development, and atmospheric modeling.



PROAIRE Panel discussion: from left to right: Cesar Reyna, Víctor Hugo Páramo, Carlos Santos-Burgoa, Francisco Barnés, Adolfo Mejía, Carlos Sandoval, and Adrián Fernández. Moderator: Mario Molina. (Photo provided by CAM).

Dr. Francisco Barnés, the Sub-Secretary of Energy (for Energy Policy), delivered the Workshop's second keynote address, "Energy and the Environment: Historical Evolution and Perspectives," in which he documented the challenges and achievements of energy policy in Mexico and North America. Much of the energy session, moderated by Ing. Carlos Mena, was devoted to discussing cooperation between the United States and Mexico, and focused on formulating a global energy policy. Speakers included the US EPA attaché to Mexico, Mr. Lawrence Sperling, who addressed coordination of Mexican and US policies regarding global climate change.



Informal discussion at the Scenarios Workshop.

During the Health Effects session moderated by Dr. Mauricio Hernández of INSP, researchers from UNAM, INSP, the Harvard School of Public Health, and Emory University presented their findings on the linkage between emissions and quantifiable effects on the population, focusing on PM_{2.5} particles. Speakers acknowledged a lack of sufficient data, but nonetheless presented studies with foci as broad as students in Mexico City and truckers in the United States.

Professor Joseph Sussman of MIT moderated the session on Transportation and Urban Planning, which included a presentation from Dr. Alberto Ayala of the California Air Resources Board on his study of vehicle emissions in California, and a discussion by Dr. T.R. Lakshmanan of Boston University on the comparisons between Mexico City and Delhi. Some of the session's debate focused on the proposed construction of a second level on the Periferico and Viaducto roadways in Mexico City – a controversial measure which some claimed would increase rather than decrease congestion. Professor Sussman also presented his ideas on representing Mexico City as a Complex, Large-scale, Integrated, Open System (CLIOS).

The final session on Emissions Inventory, Atmospheric Measurements and Modeling, moderated by Dr. Luisa Molina, included a presentation by Dr. Charles Kolb of Aerodyne Research, a company with a mobile laboratory scheduled to perform detailed emissions measurements in the MCMA as part of the MCP's field measurement campaign. Other presenters, including Ing. Rafael Ramos and Ing. Jorge Sarmiento of GDF-SMA, described the progress in modeling and data gathering, but emphasized the gap that existed between the information that was needed to make accurate predictions and what was available.

From there, the conference was divided into smaller breakout sessions, focusing on health effects, transportation and urban development, atmospheric measurements and modeling, and integrated scenario analysis. The presentation by the MIT scenario analysis team provided an overview of a year of research and modeling, during which different strategies for air quality management were considered across future stories or scenarios. All of the smaller groups provided better opportunities for networking between organizations and for more detailed presentations and discussion than was possible in the larger sessions.

The participants reconvened on Thursday morning for the final plenary session that included reports from the breakout sessions and future research agenda; education and outreach activities introduced by Dr. Luisa Molina and include the participation of Amelia Garza, a high school teacher from ITESM; and the activities of the Mexican Research and Development Network on Air Quality in Large Cities (RED) summarized by Jorge Bustamante of the US-Mexico Foundation for Science.

On Thursday afternoon, after four days of nine-to-nine sessions of science and policy debate, the weary participants bid goodbye to the beautiful valley of Ixtapan. Communication networks had been established, results validated, and new questions posed. Many stayed in Mexico to do more research, and others took a few days off to enjoy the sun.

Confident in a job well done, Mario and Luisa Molina and the other organizers have already begun to plan next year's conference.

Reported by Jed Horne, with contributions from A. Mostashari.



Welcoming sign at the Hotel Del Rey Ixtapan de la Sal, at the Fifth Mexico-US Workshop on Air Quality. (Photo provided by L.Molina.)

In the words of the participants...

"As this was my first involvement with the project, the January workshop helped me understand the institutional context of air quality problems in Mexico City. This is why participation by representatives of various levels of government was helpful. An excellent overview of emissions scenarios was also provided."

-Bill Anderson, Boston University

"The Mexico City January Workshop was a great opportunity to learn about the complexities of a megalopolis. For three days we discussed about the city's current situation, it's potential improvements, ongoing projects and their relationship to human health. We got the opportunity to interact with officials and researchers from Mexico City and establish collaboration agreements"

-Alejandro Bracamontes, MIT

"One of the most important achievements of the workshop was that we had a chance to sit together with Mexican collaborators and discuss the current research status and propose future research recommendation."

-Yeora Chae, MIT

"At the 5th Mexico-US Workshop on Mexico City Air Quality the scenarios team presented their research to-date which combined the group's bottom up modeling of activities and emissions reduction options, with long-term uncertainties or "Future Stories" regarding possible growth paths for the Mexico City Metropolitan Area. The MIT scenarios team is now working more closely with colleagues in Mexico to refine both the Future Stories and the characterization of air quality options for future evaluation."

-Stephen R. Connors, MIT

"The workshop was very interesting. It covered many different topics so we were able to learn from each other. Education should be a very important part of the project because it is the fastest and maybe the only way to achieve sustainable development."

-Amelia Garza, Instituto Tecnológico de Monterrey



"The January workshop provided a unique opportunity to plan collaborative projects with researchers from different fields and institutions. It provided the bases to integrate our research needs and agendas in order to solve problems by using a multidisciplinary approach."

-Fernando Holguin, Emory University

"I believe that the sessions related to health impacts were quite interesting. Additionally to presenting new and important results, a future research agenda was defined as well as a schedule. This may lead to a more consistent development of this area of the project."

-Maria Eugenia Ibarra, Universidad de las Américas

"The plenary sessions and workgroups scheme allows, on one hand, to obtain first hand information from the speakers, and on the other hand, to participate in discussions with experts that make important proposals and questions that must be taken into account for the MCMA Air Quality Program."

-Hilda Martinez Salgado, Instituto Nacional de Ecología



"I feel that the interest in the educational activities has increased a lot within the group. Several professors from MIT, Harvard and Mexico had shown interest in participating. After the education presentation, Ms. Martha Hilda Conzález, Secretary of Ecology of the Estado de México, told me that she was very interested in this activity. About modeling, I feel that now we have a list of questions that can be addressed and linked with other activities in the group. The session was very rich in comments and allowed the participants to identify controversial issues, like the realibility of the emission inventory and the size of the domain, that must be studied to obtain better understanding of the air quality problem and its regional impact."

-Gerardo Manuel Mejía, Instituto Tecnológico de Monterrey

"I think that the January workshop allowed the researchers and scientists to get in touch with the air quality managers, which is very important as the managers translate the findings and results in concrete actions in their daily tasks, and on the other hand, the scientists receive an input from the air quality policy makers and with that they evaluate the real uses of their research."

- Víctor Hugo Páramo, Gobierno del Distrito Federal

"I consider the January Workshop very productive since it gathered most of the people working on air quality management in Mexico and give us the opportunity for four full days to share direct experiences and to know about the current work of each one in a quiet environment away from the daily busy office."

-Rafael Ramos-Villegas, Gobierno del Distrito Federal

"The workshop provided the opportunity to renew existing contacts and make new ones for continued modeling efforts. It also allowed us to move beyond the quantitative modeling efforts and discuss less well-defined issues such as policy approaches and societal issues."

-Kellyn Roth, MIT

The most important achievements we got on the last January Workshop, at least on the Atmospheric Science group, is that both Mexican and US teams are more mature on modeling the air quality

and a more robust group seems to be growing up. Now we have experts on meteorology that will allow us to improve scenarios to better understand how air pollutants affect the Mexico City air quality and its effects outside the basin. Further improvements on coupling meteorology and photochemical models are required, but a close coordination is also needed.

-Gustavo Sosa, Instituto Mexicano del Petróleo

"The development of a extended set of professional relationships with specialists in Mexico and especially the EM was one of the major accomplishments in this workshop"

-Joseph Sussman, MIT

"I think there were great scientific discussions in the sessions, and all of the set will help us to improve the results of our project. After all, the gathering of so many investigators interested in a common field is very helpful."

-Miguel Zavala, MIT

"We are getting to the point where the collaboration among the Mexican and US researchers can be more results-oriented. The workshop was a good opportunity to meet and connect with other researchers who are working on related areas, and to learn about their work."

-Chizuro Aoki, MIT

US- Mexico workshops organized by the MIT's Integrated Program on Urban Regional and Global Air Pollution has played an important role in bringing together the Mexican and US researchers working in the area of Air pollution. This has also led to capacity building in Mexico, which was evident in the excellent quality of presentations during the workshop. In my opinion, there has been significant improvement in our understanding of the air pollution in the MCMA and the role that various sources play in emissions.

- Samudra Vijay, MIT

"Greatest and most diverse attendance. Fresher and interesting research on health impacts and modeling. Intense discussion on new Proaire measures"

-Alejandro Villegas-Lopez, MIT



Mario and Luisa Molina with the Mexico-MIT Scenarios Analysis Team.

Air Quality in the México Megacity: An Integrated Assessment

On March 19, 2002, in an event at El Colegio Nacional in Mexico City's historic downtown center, Drs. Mario and Luisa Molina presented the book, *Air Quality in the México Megacity: An Integrated Assessment*, published by Kluwer Academic.

Dr. Pablo Rudomin, noted Mexican scientist and a member of El Colegio Nacional, introduced the book, followed by Dr. Octavio Novaro, also a member of El Colegio Nacional, and Dr. Exequiel Ezcurra, President of the National Institute of Ecology, who presented a careful review. Members of the Metropolitan Environmental Commission—Lic. Martha Hilda Gonzales, Dr. Claudia Sheinbaum, Biol. Raul Arriaga, and Dr. Carlos Santos Burgoa—also spoke.

In his comments, Dr. Ezcurra said, “to evoke a landscape of Mexico with clean air and a view of its famous volcanoes in the background should be an incentive for the city to improve its air quality. The scientific integration developed by Mario and Luisa Molina should instigate an effort enabling a new generation of researchers to unravel the pending question surrounding the air pollution issue and for policy makers to formulate clear decisions.”

Dr. Novaro highlighted some of the book's recommendations, which include improving the efficiency of public transport, unifying inspection and maintenance programs, controlling mobile emissions sources, particularly diesel emissions from heavy-duty trucks, strengthening the Metropolitan Environmental Commission and the Metropolitan Commission for

Transport and Roadways, supporting environmental education and capacity building activities, improving understanding of atmospheric science and health impacts, and reactivating the Environmental Trust Fund to finance environmental projects.

These recommendations are the result of the multidisciplinary findings of over 50 researchers coordinated through the Massachusetts Institute of Technology's Integrated Program on Urban, Regional and Global Air Pollution, initiated and directed by Drs. Mario and Luisa Molina. “Perhaps more importantly,” wrote columnist Talli Nauman for *The News*, “they come with an overarching message: Air quality can be improved simply based on science and systematic evaluation of options, but only if public officials make strong commitments.”

Contributors to the book include Drs. Claudia Sheinbaum and Carlos Santos-Burgoa, Mexico's Secretary of the Environment of the DF and General Director of Environmental Health, respectively. Both were participants of the Project while working in the private sector and before joining the government agencies.

The event, organized by Sergio Sanchez and Laura Chapa and the staff of El Colegio Nacional, was attended by several hundred academics, government officials, and members of the general public eager to hear what Mexican and American scientists had to say about one of Mexico City's greatest problems. Since its publication, the book has been quickly recognized as an important tool in the effort to restore to Mexico City the clear skies for which it was once famous.

Contributed by J. Warman, with material from *The Reforma* (3/20/2002 and 3/21/2002).



Panel: (from left) Exequiel Ezcurra, Luisa Molina, Pablo Rudomin, Mario Molina, and Octavio Novaro. (Photo provided by the Coordinación General de Comunicación Social, Semarnat.)

The Mexican Research and Development Network on Air Quality in Large Cities (RED)

The Mexican Research and Development Network on Air Quality in Large Cities (Red de Desarrollo e Investigación de la Calidad del Aire en Grandes Ciudades, or RED) was created in 2000 following an agreement between the Integrated Program on Urban, Regional, and Global Air Pollution based at the Massachusetts Institute of Technology, and the Consejo Nacional para la Ciencia y la Tecnología (CONACYT, the Mexican Science and Technology Council), with initial funding provided by the two institutions. The purpose was to provide support for the activities of the US-Mexico Binational Group on Mexico City's Air Quality, led by Drs. Mario and Luisa Molina. RED currently supports a number of research projects in Mexico that are complementary to the Integrated Program, organizes periodic meetings to promote collaboration and discussions on air pollution issues, and maintains a website to facilitate the exchange of data and references between the academic and public communities.

Although initially focused on the MCMA, RED is currently expanding its efforts to other large Mexican cities. Activities during this phase will focus on education, capacity building, exchange of research ideas, and air quality management. Support for academic, governmental, and non-governmental institutions for air quality research and management is being planned, mainly in large cities in the northern border, central and gulf regions, as well as urban areas with severe air pollution problems.

Within this framework, RED is proposing various activities to reinforce the impact of scientific and technical progress resulting from the scientific research produced within the US-Mexico Binational Group on Mexico City's Air Quality and unveil the scientific contributions. Three activities are planned at a regional level:

1. Conference on the Importance of Air Quality Management: Progress In Research and Emerging Issues

Goal: Bring inter- and multidisciplinary perspectives to bear on air pollution problems, its causes and consequences.

Benefits: Unveil scientific progress in governmental and civil research institutes and link them to regional institutions and strengthen the relation among them at a national level.

Integration: Scientific research institutions focused on air quality would be invited. Environmental planning efforts that have or need resources and collaboration would be highlighted for better human and technical resources.

2. Seminars on Different Aspects of Air Pollution

Goal: Discuss on how to improve air quality programs that support the formation and consolidation of initiatives with a scientific and technical background linked to regional academic institutions.

Benefits: The linkages between research groups will create a discussion on how to detect problems and issues yet to be analyzed.

Integration: Create networks with academic institutions involved in the formation of management specialists, in the states in the central, gulf and northern border region.

3. Workshops on Air Quality Research and Management

Goal: Train local authorities on air quality planning, measuring and monitoring tasks.

Benefits: Research groups involved in subjects related to the US-Mexico Binational Group on Mexico City's Air Quality, headed by Dr. Mario Molina, will be invited to train specialists and strengthen expert groups that have an influence at the state level.

Integration: Participate in the collaboration, which means linking the research tasks to decision-making. The Network will publish a biannual Newsletter to announce its achievement. This publication will include proposals developed by the people who attended this meetings and also articles on scientific findings stemming from the research of the Network members. It is expected to involve all Network members in this kind of collaboration.

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MCP Newsletter, Volume 1, Spring 2002

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