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Interagency Meeting on WMO Tenth Congress and UNEP Governing Council Considerations of International Coordination for Greenhouse Gas Evaluation

Ref: April 20, 1987 memo from OES/E - Richard E. Benedick

Venue: OES Conference Room
DoS, Room 7835
Friday, April 24, 1:00 pm

THIS PACKET CONTAINS:

1. Draft position for WMO Tenth Congress on International Coordination for Greenhouse Gas Research, Impact Assessment, and Evaluation of Remedial Measures, 4/23/87.
2. Provisional Agenda for WMO Tenth Congress.
3. Document 32 for WMO Tenth Congress (note Discussion, paragraph 3; Appendix A; and Appendix B, paragraph 3.2.0.4).
4. Conference Statement from Villach, October 1985.
5. National Climate Program Policy Board Statement on the Villach Conference, November 1986.
6. WMO Press Release establishing the Advisory Group on Greenhouse Gases, July 1986.
7. Partial listing of scheduled Global Climate Change meetings.
8. Draft position for WMO Tenth Congress on the World Climate Impact Studies Program, 3/27/87.
9. Document 25 for WMO Tenth Congress (note Discussion, paragraphs 20 to 25).
10. Excerpt from the Second WMO Long Term Plan on the World Climate Impacts Study Program (note especially Project 23.5).
11. UNEP letter (Nov 86) from Golubev to Lee Thomas, EPA and draft response.
12. Memo from William Graham, April 6, 1987, announcing the establishment of a new FCCSET Committee on Earth Sciences.



GENEVA 1987

Cg-X/Doc. 32
(9.I.1987)

ITEMS 3.2 (2),
3.2.0 (2), 3.2.1 (1),
3.2.2 (1), 3.2.3 (1),
3.2.4 (1)

Original: ENGLISH

WORLD CLIMATE PROGRAMME

(Submitted by the Secretary-General)

Summary and Purpose of Document

This document informs Congress of the recent and proposed actions for the implementation of the World Climate Programme (WCP). Included are proposals regarding the overall co-ordination of the WCP and action proposed on the greenhouse gases issue for the consideration of Congress. The relevant sections of the WMO Second Long-term Plan (see reference 1) and the Secretary-General's programme and budget proposals for 1988-1991 (see reference 2) should be considered in conjunction with this document.

ACTION PROPOSED

Congress is invited to:

- (a) Note the information contained in this document;
- (b) Consider sections 2.1, 2.2 and 2.3 of Vol. 2, Part II of the Second Long-term Plan, including the Data, Applications and Impact Studies components of the World Climate Programme (see reference 1) and take into account the respective budget requirements given in sections 3.20, 3.21, 3.22 and 3.23 of the programme and budget proposals for 1988-1991 (see reference 2) when establishing maximum expenditures for the tenth financial period;
- (c) Consider the draft text given in Appendix B for inclusion in the general summary of Cg-X;
- (d) Consider, for approval, draft Resolution 3.2.0/1 (Cg-X) - The World Climate Programme - given in Appendix C.

- References:
1. Cg-X/Doc. 8 - Second Long-term Plan, Part II, Volume 2
 2. Cg-X/Doc. 3 - Consolidated programme and budget, 1988-1991
 3. Resolution 14 (Cg-IX) - World Climate Programme
 4. Resolution 15 (Cg-IX) - World Climate Applications Programme
 5. Resolution 17 (Cg-IX) - World Climate Data Programme
 6. Resolution 18 (Cg-IX) - World Climate Research Programme
 7. Resolution 17 (EC-XXXIV) - Advisory Committee for the World Climate Applications and Data Programmes
 8. Report of the International Conference on the Assessment of the Role of Carbon Dioxide and of other Greenhouse Gases in Climate Variations and Associated Impacts, Villach, Austria, 9-15 October 1985 (WMO-No.661).

- Appendices:
- A. Terms of reference of the Advisory Group on Greenhouse Gases (AGGG)
 - B. Draft text for inclusion in the general summary of Cg-X
 - C. Draft Resolution 3.2.0/1 (Cg-X) - The World Climate Programme.

DISCUSSION

Overall co-ordination of the World Climate Programme

1. Ninth Congress decided to continue the WCP as one of the major programmes of WMO and established a mechanism for the overall co-ordination of the WCP (see references 3 to 7). This mechanism has been reviewed annually by the Executive Council and by the inter-agency co-ordinating bodies involved. The results appear to be satisfactory and have helped in the progress made towards achieving the objectives of the WCP.
2. Objectives of the WCP: The objectives of the World Climate Programme contained in the draft SLTP (Part I and Part II, Vol.2, see reference 1) now include the improvement in understanding climate processes to accelerate the development of long-range weather forecasting, as well as to determine the predictability of climate and the extent of man's influence on climate. The other two main objectives of the WCP - to use existing climate information and to monitor and warn governments of climate variations or changes, both natural and man-made, and their impacts - remain as previously formulated.
3. Advisory Group on Greenhouse Gases: The WMO in conjunction with UNEP and ICSU held an international conference on greenhouse gases (see reference 8). This conference recommended the formation of a joint group to provide on-going assessments of the role of greenhouse gases. In response, WMO/UNEP/ICSU formed the Advisory Group on Greenhouse Gases which has the terms of reference given in Appendix A and which first met in July 1986. Congress is invited to comment on the role of WMO in this area of activity.

World Climate Data Programme

4. The purpose of the WCDP is to ensure timely access to reliable climate data which are exchangeable in acceptable format to support climate applications, impact studies and research. The long-term objectives of the WCDP are detailed in the WMO Long-term Plan as well as the programme organization, scientific and technological advances expected in the 1988-1997 period, and targeted actions formulated in the form of projects to achieve the goals of the programme.
5. Climate data and exchange requirements: CCl-IX concurred with the recommendation of CBS at its extraordinary session in 1985, that "the distribution of stations from which monthly surface climatological data are transmitted should be such that every 250,000 sq.km. is represented by at least one (CLIMAT) station and up to 10 stations where the density of the Regional Basic Synoptic Network permits". EC-XXXVIII approved this recommendation for immediate implementation. Congress is invited to urge Members to make every effort possible to (a) identify stations which are to report data under the improved CLIMAT data exchange system, and (b) initiate the exchange of data as early as possible.
6. Data rescue: A data rescue survey project is planned in 1987 with support from Belgium, while concurrently seeking further support from bilateral, trust or international funds (e.g. UNDP, UNEP). Belgium is considering the establishment of an international data rescue co-ordination centre to continue this activity in the tenth financial period.

7. CLICOM (Transfer of technology in climate data management and user services): The CLICOM project of the WCDP is aimed at achieving computerized climate data management, processing and user services at all meteorological services within 10 years. CLICOM emphasizes a "package" concept, namely, computer hardware, comprehensive software and training. Recent advances in microcomputer technology and associated software support have made it possible for climate data entry, processing and standard user services to be handled in a simple, automated manner. The software required to accomplish this is very simple to use although the development of the computer programs was complex. The development and testing of prototype CLICOM systems have been completed and implementation begun with support from donor countries and other international organizations (e.g. UNDP). During the 1988-1991 period, an accelerated implementation of the CLICOM project is planned. Congress is invited to urge Members to contribute to the implementation of the project by sponsoring the deployment of systems in countries which need them.

8. INFOCLIMA (Referral information on climate data sources, data sets, station networks and station histories): A primary requirement in national, regional and international projects in climate research, applications and impact studies is the need for concise information on the availability of data sources, data sets and summaries (where and in what media), and on stations (including period of operation and other basic station history information). An interim INFOCLIMA catalogue of climate system data sets was distributed to Members as WCP Report No. 101. An updated Catalogue of Climate System Data Sets to be distributed in 1987 will include two new sections: satellite and remote sensing data, and historical and proxy data.

9. Climate System Monitoring (CSM): The CSM project is aimed at providing synthesized information on large-scale climate system anomalies (e.g. El-Niño/Southern Oscillation, drought) having wide social and economic consequences to Meteorological Services and other international organizations. Basic analyzed information will continue to be obtained from international centres (e.g. WMCs) which process global data with facilities that are unavailable in most countries. A CSM Monthly Bulletin has been issued regularly since July 1984. The first scientific review entitled "The Global Climate System - A critical review (1982-1984)", distributed in June 1985, was received with great interest by Meteorological Services, government agencies and scientific institutions. The CSM project is co-sponsored by UNEP/GEMS.

10. Global Climate Data Base Project: Due to the apparent increase in climatic variability over the last 15 years, governments are increasingly asking questions such as "Is drought in Africa related to El-Niño or is it caused by over-grazing and deforestation? What are the effects of increasing CO₂ concentrations on regional temperature and precipitation distribution?" A reliable, accessible global climate data base of sufficient spatial resolution, continuous in time, to even begin answering such basic questions simply does not exist. To remedy this situation, a special effort is planned to (a) identify deficiencies in existing global data sets, (b) collect data from countries to fill these gaps, (c) identify additional CLIMAT reporting stations required (from the existing observing network) to provide a minimum spatial density (e.g. 10 stations per 250,000 sq.km.) for large-scale diagnostic studies, research and applications, and to collect data from those stations, (d) process the data into standard format with assistance from the WMCs and guidance from CCL.

World Climate Applications Programme (WCAP)

11. The purpose of the World Climate Applications Programme (WCAP) is to promote applications of existing climate knowledge. Available climate information is increasing and methods for applying this knowledge are becoming more efficient. In some topics such as energy planning and operations, building design, land use planning, transportation and tourism, applied climatology has already become an operational activity carried out on a routine basis by several national Meteorological Services. For other topics scientists must continue research on the relationship of climate to various activities of mankind with the goal of developing applied operational activities.

12. Promotion of climate applications in national economic development: Most social and economic activities of countries are sensitive to climate variations. The application of climate information in the planning and development of multi-million dollar schemes or projects is presently limited in many countries. Vital components in promoting the optimal use of climate knowledge include an understanding of user requirements and the economic benefit to be derived from various applications. WCAP activities in this area will be directed at demonstrating how climate information can be applied and quantifying the benefits which are likely to result.

13. Climate Application Referral System (CARS): CARS contains abstracts of proven climate application techniques, including referral information on where more details can be obtained. CARS will be expanded in scope and depth so that a potential user can access the tested knowledge base in climate applications. CARS is intended to be a basic reference tool for the implementation of projects.

14. Development of operational applications methodology: A selection of application methodologies and techniques contained in CARS will be further developed and tested as necessary for adaptation to other climate zones and to specific application sites. Priority will be placed, as far as possible, on the requirements of each individual country. Critical subject areas such as food, water, energy, health, transportation and conservation will be handled first. The alleviation of pollution and urban problems will also be included. Food and water applications are to be handled by the Agricultural Meteorology Programme and the Hydrology and Water Resources Programme of WMO, respectively. The development of new climate application techniques will be achieved through symposia, workshops, special projects and case studies.

15. Development of operational activities - transfer of technology: The primary means envisaged for the transfer of technology in climate applications is via CARS, pilot projects, the provision of experts, training events and the preparation of technical guidance material. Particular efforts will be directed towards in-situ training and use of the techniques obtained via CARS and adapted to a country or region. Critical feed-back from projects will enable a distinction to be made between those methods which lead to clear quantifiable benefits and those which do not. This form of pragmatic screening is expected to ultimately benefit all countries.

World Climate Impact Studies Programme (WCIP)

16. The purpose of the World Climate Impact Studies Programme (WCIP) is to introduce climate considerations into rational policy alternatives and to warn governments of the economic and social impacts of climate variations and changes, both natural and man-made. Priority areas include the assessment of the social, economic and political consequences of climate change induced by carbon dioxide and other greenhouse gases; reduction of the vulnerability of food systems to climate; development and application of methods for climate impact assessment; and the assessment of the impact of climate variability and change in climatically sensitive sectors of the human environment. The extent to which this can be accomplished may be limited by available resources.

17. The main long-term objectives of this component along with details of activities foreseen in the coming decade are described in Vol. 2 of Part II of the SLTP (see reference 1). Additional information on WCIP is given in the document submitted by the United Nations Environment Programme under agenda item 3.2.3.

World Climate Research Programme (WCRP)

18. The purpose of the WCRP is to improve our knowledge of climate, climate variations and the mechanisms which bring about climatic change so as to be able to determine to what extent climate can be predicted and the extent of man's influence on climate. To achieve the objectives of the WCRP it is necessary to investigate the complex interactions that take place between the components of the climate system, namely between the atmosphere and the oceans, sea and land ice and the land-surface. In addition anthropogenic influences due to, for example, the increase of greenhouse gases also need to be taken into account. To grasp the range of processes involved, the WCRP focuses on a series of sub-programmes or projects, each dealing with a specific array of interactions with the atmosphere, which are related to specified time scales of climate prediction and climatic variability. Details on the actions proposed under the WCRP are contained in a separate document.

Appendices: 3

TERMS OF REFERENCE OF THE ADVISORY GROUP ON GREENHOUSE GASES* (AGGG)

To ensure follow-up of the International Conference on the Assessment of the Role of Carbon Dioxide and of other Greenhouse Gases in Climate Variations and Associated Impacts (Villach, Austria, 9-15 October 1985) and to strengthen co-ordination of the relevant activities of ICSU, UNEP and WMO, the AGGG should:

- (a) Advise on the adequacy of existing and planned programmes, identify gaps, suggest actions to be taken by appropriate agencies or bodies to fill such gaps, and promote new programmes as necessary;
- (b) Review existing and projected systems for data and information collection, storage and distribution, and provide advice on improvements required;
- (c) Prepare as often as may be useful practical assessments of the rates of increases in the concentration of greenhouse gases and the effects and implications of such increases;
- (d) Examine and advise on possible measures by governments to adapt to or diminish the rate of increase of concentration of greenhouse gases and, as deemed necessary, to initiate consideration of a global convention;
- (e) Prepare every two years a review of appropriate activities and progress for submission to the ICSU General Assembly, the UNEP Governing Council and the WMO Executive Council;
- (f) Provide advice on research priorities and needs for support of scientific programmes.

*Note: The term Greenhouse Gases as used here refers to all radiatively active constituents in the atmosphere, including aerosols.

STATE OF ALABAMA DEPARTMENT OF REVENUE

The change follows up on the International Conference on the Revision of the Rules on Carbon Dioxide and of other Greenhouse Gases in Vienna, Austria, 1992. The purpose of the revision is to strengthen the international activities of the State and to the world.

- (a) State on the adoption of existing and planned programs, including the following:
 - (i) suggest actions to be taken to appropriate areas of the State;
 - (ii) each department and agency to be concerned as appropriate.
- (b) Review existing and proposed programs for data and information collection, storage and distribution, and provide advice on requirements required.
- (c) Prepare as often as may be needed periodic reports, including the following:
 - (i) information on the concentration of greenhouse gases and the effect of activities of such increases;
 - (ii) information on possible measures to be taken by the State to bring the rate of increase of greenhouse gases to a level that is considered necessary; and
 - (iii) any other information that may be relevant to the conclusion.
- (d) Prepare every two years a report of activities, including the following:
 - (i) information on the State's progress for submission to the United Nations Conference on Environment and Development, the World Bank, the Council of Economic Cooperation, and the World Trade Organization;
 - (ii) provide advice on technical matters and other matters that may be relevant to the program.

These provisions are intended to be consistent with the provisions of the Alabama Constitution and the United States Constitution.

DRAFT TEXT FOR INCLUSION IN THE GENERAL SUMMARY OF Cg-X

3.2 World Climate Programme (agenda item 3.2)

3.2.0 World Climate Programme; Report of the president of CCI (agenda item 3.2.0)

3.2.0.1 Congress noted with appreciation the report of the president of the Commission for Climatology (CCI), covering the activities of the Commission in climate data, climate applications and the overall development and co-ordination of the WCP. It noted, in particular, the Commission's role in the World Climate Data (WCDP) and Applications (WCAP) components for which CCI is designated the lead Commission. This role had been accomplished principally through the Advisory Committee for the World Climate Applications and Data Programmes (ACCAD) in which the president of CCI is the chairman and which includes other international agencies as well as WMO bodies. Congress noted that the work plan for the future activities of CCI follows the Second Long-term Plan (SLTP) and that the relevant proposals of the Secretary-General for the programme and budget for the tenth financial period were designed to support CCI in implementing these activities.

3.2.0.2 Congress noted with approval the progress made toward achieving the objectives of the World Climate Programme and decided that the World Climate Programme should continue to consist of four components: WCDP, WCAP, WCIP (being implemented by UNEP), and WCRP (being implemented jointly by ICSU and WMO).

3.2.0.3 Congress decided to continue the mechanisms established by Ninth Congress for the overall co-ordination of the WCP.

3.2.0.4 Congress noted the establishment and the terms of reference of the joint WMO/UNEP/ICSU Advisory Group on Greenhouse Gases and agreed that WMO had an essential role in the co-ordination and promotion of the relevant international activities.

3.2.0.5 Resolution 3.2.0/1 (Cg-X) was adopted, covering the decisions on the overall co-ordination of the World Climate Programme and the future activities under the Data, Applications and Impact Studies components of the programme.

3.2.1 World Climate Data Programme (agenda item 3.2.1)

3.2.1.1 Tenth Congress noted the substantial progress made by the World Climate Data Programme towards achieving its objectives through a series of specific projects designed to lead to results. Congress complimented the technical commissions and the regional associations for their efforts to achieve the objectives of the WCDP.

3.2.1.2 Improving the climate data exchange system by increasing the number of CLIMAT reporting stations from 1 to 10 per 250,000 sq.km. was considered by Congress to be important in order that the climate system and significant anomalies could be operationally monitored with a minimum level of reliability. Noting that the proposed increase did not imply that Members should expand the existing observing system, Congress urged all Members to consider its implementation as early as possible and to inform the Secretariat of the additional stations designated for CLIMAT reporting purposes.

3.2.1.3 Congress expressed support for the Data Rescue Project which was developed for RA I where data were at the greatest risk of irretrievable loss and hoped that it would be possible for Belgium to host the International Data Rescue Co-ordination Centre in Brussels. Congress urged Members and international organizations to consider sponsoring other components of the project.

3.2.1.4 The CLICOM project was strongly supported by Congress. The total cost of approximately \$2,500,000 for an estimated 50 countries was considered to be very modest, when considering the resources expended by countries (funds, manpower, time) in collecting observational data. Congress urged Members to sponsor the deployment of CLICOM systems.

3.2.1.5 Congress noted that the Climate System Monitoring (CSM) Monthly Bulletins were received by all Members and that the information contained therein could be utilized as a reference to the state of the global climate system. Congress recognized the broad interest shown in the Global Climate System Reviews prepared under the CSM project. Congress extended its appreciation to UNEP for co-sponsoring the CSM project under UNEP/GEMS and expressed its hope that UNEP support to CSM activities would continue over the next financial period.

3.2.1.6 Recognizing the serious deficiencies in historical global climate data sets, Congress recommended that remedial action be initiated to improve the global climate data base and urged Members to co-operate through the provision of records to international processing centres when needs were identified.

3.2.1.7 Congress noted with satisfaction the progress made in the preparation and publication of the WMO-sponsored World Weather Records: the last volume of the 1961-1970 series (Volume 5, Africa) had been published in 1985; data collection and editing for the 1971-1980 series was nearly completed for five WMO Regions, and it was expected that all the volumes in this series would be published by 1987. Congress expressed appreciation to all Members who contributed to the project.

3.2.2 World Climate Applications Programme (agenda item 3.2.2)

3.2.2.1 Congress reviewed the activities of the Organization in the field of the World Climate Applications Programme during the ninth financial period and recorded its appreciation to the Secretary-General on the implementation of the activities approved by Ninth Congress.

3.2.2.2 The expansion of the applications areas covered by CARS was considered important in order that countries and users within countries could be aware of and access technologies that were not locally available. Congress encouraged the implementation of proven climate applications methodology, references for which were contained in CARS. It considered that the adaptation and testing of application methods prior to their deployment in countries was an important step which would ensure beneficial results.

3.2.2.3 Congress was informed of the ongoing activities in the preparation of manuscript maps for the regional climatic atlases of several Regions. It noted that for financial reasons it had not been possible to publish several manuscript maps that had been prepared under the WMO regional climatic atlases project following decisions of Regional Associations III, IV and VI. Congress agreed that action for the preparation and publication of regional climatic atlases should continue as set forth in Resolution 10 (EC-XXXVIII).

3.2.2.4 Congress urged Members to utilize their climate data in useful applications in agriculture, water management, energy and other critical areas.

3.2.3 World Climate Impact Studies Programme (agenda item 3.2.3)

3.2.3.1 Congress expressed appreciation to UNEP for its active implementation of the World Climate Impact Studies Programme and supported the proposed future activities.

3.2.4 World Climate Research Programme (agenda item 3.2.4)

(Contained in Cg-X/Doc. 35 - World Climate Research Programme)

Draft resolution

Res. 3.2.0/1 (Cg-X) - THE WORLD CLIMATE PROGRAMME

THE CONGRESS,

NOTING:

- (1) Resolution 14 (Cg-IX) - World Climate Programme,
- (2) Resolution 15 (Cg-IX) - The World Climate Applications Programme,
- (3) Resolution 17 (Cg-IX) - World Climate Data Programme,
- (4) Resolution 18 (Cg-IX) - World Climate Research Programme,
- (5) Resolution 17 (EC-XXXIV) - Advisory Committee for the World Climate Applications and Data Programmes,
- (6) The reports to Tenth Congress on the implementation of the World Climate Programme,
- (7) Report of the International Conference on the Assessment of the Role of Carbon Dioxide and of other Greenhouse Gases in Climate Variations and Associated Impacts, Villach, Austria, 9-15 October 1985 (WMO - No.661),
- (8) The WMO Second Long-term Plan 1988-1997,

RECOGNIZING that the fulfilment of the objectives of the World Climate Programme can provide the basis for significant improvements in the ability of Members to provide services to national economic and social development,

EXPRESSES its satisfaction with the progress achieved in the development of detailed plans for the different components of the World Climate Programme and their implementation with the valuable co-operation of ICSU, UNEP, FAO, Unesco and IOC, the World Energy Conference (WEC), the Consultative Group on International Agricultural Research (CGIAR) and other international organizations;

CONSIDERING:

- (1) That the World Climate Programme (WCP) provides the basis and framework for all scientific and technical aspects of climate and climate system fluctuations including data, applications, research, and impact studies;
- (2) That a need exists for the further elaboration and implementation of the plans for the World Climate Programme contained in the WMO Second Long-term Plan, as well as for a mechanism to achieve co-ordination of the entire programme;

DECIDES:

(1) That the substance of the World Climate Programme be as indicated in Vol. 2, Part II of the Second Long-term Plan of WMO adopted under Resolution 7/1 (Cg-X); and that the WCP consist of the following four components:

World Climate Data Programme (WCDP);
World Climate Applications Programme (WCAP);
World Climate Impact Studies Programme (WCIP) being implemented by UNEP;
World Climate Research Programme (WCRP) being implemented by ICSU and WMO;

(2) That WMO should continue to take the lead in the overall co-ordination of the World Climate Programme;

URGES Members to promote national climate activities and to utilize the World Climate Programme, as appropriate, to strengthen their services in support of the safety and security of life and property and of national economic and social development;

REQUESTS the Executive Council:

(1) To conduct an annual review of the progress and future activities of the WCP;

(2) To make provision, as necessary, for meetings of established co-ordination bodies of the WCP;

REQUESTS the technical commissions to give high priority to the implementation of those aspects of WCP activities which fall within the area of their competence and responsibility;

REQUESTS the regional associations to give particular attention to regional aspects of WCP;

REQUESTS the Secretary-General, within available budgetary resources:

(1) To take necessary actions to assist all bodies concerned in implementing the World Climate Programme in accordance with DECIDES (1);

(2) To report annually to the Executive Council on the progress and future activities of the WCP;

(3) To report to Eleventh Congress on the progress achieved and to submit proposals for the future.

Note: This resolution replaces Resolutions 14, 15, 17 and 18 (Cg-IX), which are no longer in force.



GENEVA 1987

ITEM 3.2 (1)

Original: ENGLISH

WORLD CLIMATE PROGRAMME

Second WMO Long-term Plan, Part II, Vol. 2 -
World Climate Programme

(Submitted by the Secretary-General)

Summary and Purpose of Document

In accordance with the decisions of Cg-IX (see reference), Tenth Congress is invited to adopt the Second WMO Long-term Plan (SLTP) which comprises two parts: Part I containing the overall policies and strategies of the Organization and Part II providing, in seven volumes, detailed plans for the individual scientific and technical programmes. An earlier draft of the complete SLTP was circulated to Members for comment in late 1985. The appendix to this document contains the draft of Part II, Vol. 2 - World Climate Programme which has been prepared with the participation of the Commission for Climatology and the Joint Scientific Committee for the World Climate Research Programme in accordance with the guidance of the Executive Council and its Working Group on Long-term Planning. Members, regional associations and other bodies of the Organization have also contributed to the preparation of the plan. The purpose of the document is to submit the draft of the World Climate Programme SLTP to Tenth Congress. While the discussion on the general long-term policies of WMO and the formal adoption of the SLTP will be dealt with under Agenda item 7, the detailed discussion of Vol. 2 will take place under this agenda item.

ACTION PROPOSED

Congress is invited to review the draft of the SLTP, Part II, Vol. 2, World Climate Programme.

Reference: Resolution 34 (Cg-IX) - WMO Long-term Plan

Appendix: Second WMO Long-term Plan, Part II, Vol. 2 - World Climate Programme.

WORLD METEOROLOGICAL ORGANIZATION

THE WORLD CLIMATE PROGRAMME
1988-1997

SECOND WMO LONG-TERM PLAN

PART II: VOLUME 2

(Draft - July 1986)

THE WORLD METEOROLOGICAL ORGANIZATION

The World Meteorological Organization (WMO), of which 158 States and Territories are Members, is a specialized agency of the United Nations. It was created:

- "(a) To facilitate world-wide co-operation in the establishment of networks of stations for the making of meteorological observations as well as hydrological and other geophysical observations related to meteorology, and to promote the establishment and maintenance of centres charged with the provision of meteorological and related services;
- (b) To promote the establishment and maintenance of systems for the rapid exchange of meteorological and related information;
- (c) To promote standardization of meteorological and related observations and to ensure the uniform publication of observations and statistics;
- (d) To further the application of meteorology to aviation, shipping, water problems, agriculture and other human activities;
- (e) To promote activities in operational hydrology and to further close co-operation between Meteorological and Hydrological Services; and
- (f) To encourage research and training in meteorology and, as appropriate, in related fields and to assist in co-ordinating the international aspects of such research and training."

(Convention of the World Meteorological Organization, Article 2)

The Organization consists of the following:

- o The World Meteorological Congress, the supreme body of the Organization. It brings together the delegates of all Members once every four years to determine general policies for the fulfilment of the purposes of the Organization, to approve the WMO Long-Term Plan, to authorize maximum expenditures for the following four-year financial period, to adopt Technical Regulations relating to international meteorological and operational hydrological practice, to elect the President and Vice-Presidents of the Organization and members of the Executive Council other than the Presidents of the Regional Associations and to appoint the Secretary-General.
- o The Executive Council is composed of 36 directors of national Meteorological or Hydrometeorological Services. It meets at least once a year to conduct the activities of the Organization, to implement the decisions taken by its Members in Congress and to study and make recommendations on any matter affecting international meteorology and related activities of the Organization.
- o The six Regional Associations (Africa, Asia, South America, North and Central America, South-West Pacific and Europe), composed of Member Governments. They co-ordinate meteorological and related activities within their respective Regions and examine from the regional point of view all questions referred to them.
- o The eight Technical Commissions, consisting of experts designated by Members. They are responsible for studying any subject within the purpose of the Organization. Technical commissions have been established for basic systems, instruments and methods of observation, atmospheric sciences, aeronautical meteorology, agricultural meteorology, marine meteorology, hydrology, and climatology.
- o The Secretariat, located at 41 Avenue Giuseppe-Motta, Geneva, Switzerland. It is composed of a Secretary-General and such technical and clerical staff as are required for the work of the Organization. It serves as the administrative, documentation and information centre of the Organization, makes technical studies as directed, supports all the bodies of the Organization, prepares, edits and arranges for the publication and distribution of the approved publications of the Organization, and carries out duties allocated in the Convention and the regulations and such other work as Congress, the Executive Council and the President decides. The Secretariat works in close collaboration with the United Nations and its specialized agencies.

CONTENTS

	<u>Page</u>
WORLD CLIMATE PROGRAMME	1
Introduction	1
Purpose and scope.	1
Overall objectives	2
Programme organization	2
Current status	2
Major influences 1988-1997	2
Needs and opportunities	2
Scientific and technological advances.	3
Existing plans of Members and other organizations	4
Other relevant factors	4
PROGRAMME 2.1: WORLD CLIMATE DATA PROGRAMME	4
Introduction	4
Purpose and scope	4
Main long-term objectives	4
Programme organization	5
Current status	5
Major influences 1988-1997.	5
Needs and opportunities	5
Scientific and technological advances	6
Existing plans of Members and other organizations	6
Other relevant factors	6
Specific objectives and plans 1988-1997	6
Implementation schedule	11
Co-ordination with other programmes and activities: WCDP & WCAP	11
Education and training aspects	11
Technical co-operation aspects	12
Relevant regional activities	12
Time-line charts	13
PROGRAMME 2.2: WORLD CLIMATE APPLICATIONS PROGRAMME	19
Introduction	19
Purpose and scope	19
Main long-term objectives	19
Programme organization	19
Current status	20
Major influences 1988-1997.	20
Needs and opportunities	20
Scientific and technological advances	21
Existing plans of Members and other organizations	21
Other relevant factors	21
Specific objectives and plans 1988-1997	21
Implementation schedule	23
Co-ordination with other programmes and activities	23
Education and training aspects	23
Technical co-operation aspects	23
Relevant regional activities	23
Time-line charts	24

PROGRAMME 2.3: WORLD CLIMATE IMPACT STUDIES PROGRAMME	35
Introduction	35
Purpose and scope	35
Main long-term objectives	35
Programme organization	35
Current status	36
Major influences 1988-1997.	37
Needs and opportunities	37
Scientific and technological advances	37
Specific objectives and plans 1988-1997	37
Implementation schedule	40
Co-ordination with other programmes and activities	40
Time-line charts	41
 PROGRAMME 2.4: WORLD CLIMATE RESEARCH PROGRAMME	 52
Introduction	52
Purpose and scope	52
Main long-term objective	52
Programme organization	52
Current status	53
Major influences 1988-1997.	53
Needs and opportunities	53
Scientific and technological advances	54
Existing plans of Members	54
Specific objectives and plans 1988-1997	55
Implementation schedule	56
Global Climate Analysis and Model Development	56
Research on Climate Processes	57
Study of the Tropical Ocean and Global Atmosphere (TOGA)	58
World Ocean Circulation Experiment (WOCE)	59
Study of Climate Forcings	59
Study of Global Change	60
Coordination with other programmes and activities	61
Time-line charts	63

PROGRAMME 2.3: WORLD CLIMATE IMPACT STUDIES PROGRAMME
(Prepared by UNEP)

Introduction

Purpose and scope

44. The purpose of the World Climate Impact Studies Programme (WCIP) is to introduce climate considerations into rational policy alternatives and warn of the economic and social impacts of climate variations and changes, both natural and man-made. Priority areas include the assessment of the social, economic and political consequences of climate change induced by carbon dioxide and other greenhouse gases; reduction of the vulnerability of food systems to climate; development and application of methods for climate impact assessment; and the assessment of the impact of climate variability and change in climatically sensitive sectors of the human environment. The extent to which this can be accomplished may be limited by available resources.

Main long-term objectives

45. (a) To improve knowledge of the impact of climatic variability and change in terms of the specific primary responses of natural and human systems.
- (b) To develop knowledge and awareness of the interactive relations between climatic variability and change and human socio-economic activities.
- (c) To improve the methodology so as to deepen understanding and improve the simulation of the interactions among climatic, environmental and socio-economic factors.
- (d) To determine the characteristics which make human societies at different levels of development and in different natural environments especially vulnerable or especially resilient to climatic variability and change.

Programme organization

46. At its seventh session the UNEP Governing Council, in noting the complementary nature of the proposed climate impact studies of the World Climate Programme and the environmental assessments of UNEP, requested the Executive Director to bring to the attention of the Secretary-General and the Eighth Congress of WMO the willingness of UNEP to collaborate with WMO and other organizations concerned with the WCP in the implementation of the sub-programme for the study of the impacts of climate on human activities; also, if so requested by WMO, to assume responsibility, within the availability of funds, for the implementation of the sub-programme under the overall co-ordination of WMO.

47. Such a request was made and, accordingly, UNEP held an expert group meeting to develop a plan of action for the WCIP. This was submitted to and approved by the eighth session of the UNEP Governing Council in May 1980.

Consistent with the Plan, a Scientific Advisory Committee (SAC) was set up to advise the Executive Director on the implementation of the Programme. Co-ordination with the other elements of the WCP is effected by regular meetings of the chairman of SAC with chairmen of the advisory bodies of WCAP, WCDP and WCRP. The Executive Heads of WMO, ICSU and UNEP also confer periodically to confirm the direction of the WCP and its components. Day to day organization of the WCIP is carried out by UNEP secretariat staff located in UNEP headquarters, Nairobi.

Current status

48. The WCIP was established in 1981 following a first meeting of the SAC, at which a programme for the first phase of the WCIP was recommended.

49. Concentration in this first phase, which ran from 1981 to 1982, was on reduction of the vulnerability of food systems to climate; development of methodology for climate impact assessment; and assessment of the socio-economic impacts of CO₂-induced climatic change. Other areas recommended for study, relating to the assessment of the climate impacts on climate sensitive sectors additional to agriculture (water and energy resources, health, human settlements, communications, fisheries, etc.), were not fully addressed due to limited financial resources. Phase II of the Programme was implemented from 1983 to 1985 and maintained its concentrations on those areas specified for attention in Phase I, although additional emphasis was placed on improved co-ordination among the various elements of the WCIP with the other components of the WCP and with relevant sectors of the Environment Programme. Attention was particularly focused on the effects of the catastrophic African drought and increased effort was given to addressing the greenhouse gas/climate issue, culminating in the second joint assessment of the role of carbon dioxide and other greenhouse gases in climate variations and associated impacts. Methodologies for climate impact assessment were further developed and refined. Emphasis was placed on those concerned with food production, for example, in marginal agricultural areas sensitive to climatic variability as part of the UNEP/IIASA project, Integrated Approaches to climate impact assessment. The use of remote sensed data to quantify parameters useful for climate impact study was also addressed in the COSPAR/IAMAP//UNEP project 'International Satellite Land-Surface Climatology Project (ISLSCP)'. Although some attempt has been made to address impacts in other climate sensitive sectors, particularly with reference to periodic El Niño and Southern Oscillation (ENSO) events, limited work has been accomplished with regard to energy and water resource management.

50. A third phase of the programme began in 1986. It will logically extend activities began in the earlier phases and in a process of outreach plans to involve national climate impact programmes in the work of the World Climate Programme.

Major influences 1988-1997

Needs and opportunities

51. The earlier phases of the programme have identified the difficulties and constraints in mounting a global programme on climate impacts. Limited attention paid to impacts at the national level and insufficient resources at the international level to promote the need for increased consideration of impact assessments and their relevance for efficient application of climate knowledge is a major hurdle still to be overcome. However, implementation of the WCIP has highlighted the many opportunities which are available, particularly through the encouragement of climate impact study as part of national climate programme plans and of interaction between such programmes and the World Climate Programme.

Scientific and technological advances

52. One reason for the slow start in beginning the WCIP was the lack of suitable methodologies for climate impact study. Thus a primary task for the programme was the development, testing and publication of such methodologies. Three major projects were instituted in order to address this deficiency. The situation improved with the publication of the UNEP/SCOPE Volume on Climate Impact Assessment and the development of climate impact assessment methods for determining the effects of climatic variability and possible change on agricultural processes in high-latitude, high-altitude and semi-arid climate sensitive regions. Work also nears completion on developing methods for employing remote-sensed information in climate impact study. Validation of the algorithms used for quantifying surface parameters using satellite data is the next step in the planned progression towards the routine application of the ISLSCP methods.

53. Understanding of the response of the atmosphere to changing concentrations of its gaseous constituents has now reached the stage where impact assessment and policy-oriented analysis can begin. Refining of the knowledge of regional responses to climate will improve the process of assessment and facilitate the policy decision making process.

Specific objectives and plans 1988-1997

54. Specific objectives for this period are:

(a) The greenhouse gas/climate change issue

Project 23.1: Assessment of the role of CO₂ and other radiatively-active gases in climate variations and their impact. UNEP will place particular emphasis on the socio-economic assessment of climatic change induced by greenhouse gases. The assessment of the effects on the atmosphere of changing greenhouse gas concentrations in the atmosphere and the effects of the resulting climate change on man and his environment is a continuing joint responsibility of WMO, UNEP and ICSU. Such assessments need to be undertaken at about five-yearly intervals thus two assessments will be made within the period. Decisions on future responses to climatic change, either adaptive or preventive, are likely to be based on the assessments, including any

legislative process necessary to protect the atmospheric environment from permanent damaging effects.

Project 23.2: Information dissemination on the greenhouse gas/climate change issue. The project will help sensitise nations and individuals to the importance of the climate change issue. By means of a regular series of UNEP features: the preparation, publication and up-dating of information brochures, fact sheets and posters, UNEP will continue to apprise people of the implications of climate change impacts particularly with regard to possible socio-economic implications.

Project 23.3: Regional assessment of the impacts of climate change. UNEP will promote regional socio-economic assessments of the impacts of greenhouse gas-induced climate change and the analysis of policy response mechanisms as an aid to national decision making. In the planning period, six regional assessments will be encouraged or supported in three developed and three developing regions of the world.

Project 23.4: Assessment of the impact of sea level change. A state of the art report on the impact of sea level rise consistent with greenhouse gas warming on coastal, estuarine and river delta regions will be prepared and distributed to all Members of WMO. Regional assessments of the impacts in specific river basins and coastal areas will be undertaken in four selected areas.

Project 23.5: Advisory Group on Greenhouse Gases. UNEP will continue its support to this recently-established group which will advise WMO, UNEP and ICSU on action that should be taken in response to the climate change issue. Based on such advice, UNEP will initiate the work necessary to determine the need for legislation or other mechanisms to protect the global climate from unacceptable change. By 1991, UNEP will establish ad-hoc working groups to determine the need for, and as necessary elaborate, guidelines for a global framework Convention for the protection of the tropospheric climate.

(b) Application of methods of climate impact assessment

Project 23.6: Dissemination of knowledge and methods of climate impact assessment:

- (i) Methods of climate impact assessment developed during the implementation of the WCIP will be collected, published and distributed in a form suitable for their practical application. Seminars and workshops will be designed and organized to aid the rapid dissemination of knowledge. A follow-up mechanism will ensure the efficient practical application of the methods in assessment processes. 5 workshops and seminars will be held in the period 1989-1997.
- (ii) Practical application of remote-sensed information in climate impact assessment using algorithms developed and validated as part of the ISLSCP project will be supported in selected regions

in Africa, Asia and Latin America, beginning 1990, with particular emphasis on improving water and energy resource management and improving food security in the face of extreme climate variability and change.

Project 23.7: Study of impacts of drought in developing countries. UNEP is supporting the establishment of an African Centre of Meteorological Applications for Development (ACMAD). Future support will be to ensure that the Centre has a capacity to address climate impact issues particularly those related to drought. UNEP will encourage ACMAD to undertake assessments of the socio-economic impact of drought in Africa and develop strategies for the prevention, mitigation or avoidance of adverse impacts of drought. Programme to commence in 1989 with regional case studies and assessments 1990-1997.

Project 23.8: Task force to monitor impacts of ENSO events and other teleconnections. A network of climate impact researchers will undertake the monitoring and assessment of the impacts of climatic events such as El Nino on climatically sensitive sectors (agriculture, fisheries, water resources, etc.) in their own region. Continuing activity 1988-1997.

(c) Co-ordination of climate impact activities

Project 23.9: International network of climate impact studies: UNEP will identify national and regional studies of climate impacts particularly those undertaken as part of national climate programmes. It will invite national climate programmes to co-operate in information exchange on climate impact studies as part of a network of ongoing national climate impact studies programmes co-ordinated by UNEP. Regular publication of the inventory of climate impact studies, a bibliography and directory of scientists and institutions active in the field will be published. Networkshop 1988. Publications biannually 1988-1997.

Project 23.10: Establishment of national climate impact studies programmes. On request by countries not having national climate programmes with impact components, expert consultants to nationally-organized seminars will be arranged in co-operation with WMO with a view to developing national climate programmes for climate applications and climate impact studies. When such programmes become established, they would be invited to join the network of national climate impact studies with a view to furthering their development. 1-2 national seminars to be organized each year.

Project 23.11: Support to national climate impact studies. Climate impact studies necessary to address gaps in knowledge identified by the international network will be undertaken nationally. As required, UNEP will catalyse support for the undertaking of priority studies in regions where sufficient financial and other resources are not available. Impact studies to improve knowledge of effects of climatic variability and change in terms of the specific primary responses of

natural and human systems (agriculture, water resources, energy, ocean resources and fisheries, transportation, human health, land use ecology and environment) will be encouraged.

Note: The above long-term plan for climate impact studies is subject to approval by the UNEP Governing Council and will be implemented to the extent that financial resources are available.

Implementation schedule

55. The implementation schedule to achieve each of the specific objectives are presented in the following time-line charts for the projects of WCIP.

Co-ordination with other programmes and activities

56. The WCIP will be closely co-ordinated with the other three components of the WCP and joint projects will be implemented as appropriate particularly with regard to the greenhouse gas/climate change issue. Also in this regard, the assessment of the impact of climate change on various sectors of the environment will be co-ordinated with planned UNEP activities in the relevant sub-programme areas of the UNEP Environment Programme.

MAJOR PROGRAMME 2 : WORLD CLIMATE PROGRAMME
 PROGRAMME 2.3 : WORLD CLIMATE IMPACT STUDIES PROGRAMME

PROJECT 23.1 - ASSESSMENT OF THE ROLE OF CO ₂ AND OTHER RADIATIVELY ACTIVE GASES IN CLIMATE VARIATIONS AND THEIR IMPACT													
TASKS	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	BY WHOM	RESOURCES	COMMENTS
1. Analysis of research results Determination of research needs		U	M/R				S/U	M/R			UNEP/WMO/ ICSU	UNEP/WMO national contribu- tions	Continuing assessment programme at 5 yr intervals Increasing concentration on socio- economic impacts and recommenda- tions for international action (see project 23.5)
G Publication of guidelines/guidance material J Expert missions K Roving seminar M Technical meeting (or conference, symposium, workshop) P Pilot projects R Report or review S Technical study, survey and activities by Members T Completion of a phase U Update/Upgrade of technical material or contents of inventory/catalogue X Major training activity Y Major technical co-operation activities Z Major regional activity													

Note: "M" indicates that for a given task a technical meeting is required. Several tasks can be covered by one and the same meeting. The number of "M" marks does not therefore give the total number of meetings.

MAJOR PROGRAMME 2 : WORLD CLIMATE PROGRAMME
 PROGRAMME 2.3 : WORLD CLIMATE IMPACT STUDIES PROGRAMME

PROJECT 23.2 - INFORMATION DISSEMINATION ON THE GREENHOUSE GAS/CLIMATE CHANGE ISSUE													
TASKS	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	BY WHOM	RESOURCES	COMMENTS
1. Preparation of fact sheets, audio-visual and other information material	G	G	R	G	G	G	G	R	G	G	UNEP	UNEP/WMO	Based on assessment reports and research results a broad based information programme will be mounted in conjunction with the UNEP Information Service
G Publication of guidelines/guidance material J Expert missions K Roving seminar M Technical meeting (or conference, symposium, workshop) P Pilot projects R Report or review S Technical study, survey and activities by Members T Completion of a phase U Update/upgrade of technical material or contents of inventory/catalogue X Major training activity Y Major technical co-operation activities Z Major regional activity													

MAJOR PROGRAMME 2 : WORLD CLIMATE PROGRAMME
PROGRAMME 2.3 : WORLD CLIMATE IMPACT STUDIES PROGRAMME

PROJECT 23.3 - REGIONAL ASSESSMENT OF THE IMPACTS OF CLIMATE CHANGE														
TASKS	1988	1989	1990	1991	1992	1993	1993	1994	1995	1996	1977	BY WHOM	RESOURCES	COMMENTS
1. Selection of regional case study regions			M						M				National institutions	In co-operation with international organizations
2. Identification of national institutions to implement project				J						J		IIASA WRI	IIASA WRI	
3. Identification of co-operating agency to develop assessment methodology				S						S		National institutions	UNEP	
4. Research programme scenario specification	Z	Z	T/R	M/G	Z	Z	Z	T/R		M/G				Undertaken by nations in conjunction with co-operating agency
5. Regional socio-economic assessment														
G Publication of guidelines/guidance material J Expert missions K Roving seminar M Technical meeting (or conference, symposium, workshop) P Pilot projects R Report or review S Technical study, survey and activities by Members T Completion of a phase U Update/upgrade of technical material or contents of inventory/catalogue X Major training activity Y Major technical co-operation activities Z Major regional activity														

MAJOR PROGRAMME 2 : WORLD CLIMATE PROGRAMME
 PROGRAMME 2.3 : WORLD CLIMATE IMPACT STUDIES PROGRAMME

PROJECT 23.4 - ASSESSMENT OF THE IMPACT OF SEA LEVEL CHANGE													
TASKS	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	BY WHOM	RESOURCES	COMMENTS
1. Identification of case study areas vulnerable to sea level rise	M			J		J					National institutions	UNEP	In co-operation with international organizations
2. Analysis of impacts on environmental sectors and human socio-economic sectors		P	P	S/Z	S/Z	S/G S/Z	S/Z	S/G S/Z	S/Z	S/G			National/regional studies Reports and recommendations to Governments

G Publication of guidelines/guidance material

J Expert missions

K Roving seminar

M Technical meeting (or conference, symposium, workshop)

P Pilot projects

R Report or review

S Technical study, survey and activities by Members

T Completion of a phase

U Update/upgrade of technical material or contents of inventory/catalogue

X Major training activity

Y Major technical co-operation activities

Z Major regional activity

MAJOR PROGRAMME 2 : WORLD CLIMATE PROGRAMME
 PROGRAMME 2.3 : WORLD CLIMATE IMPACT STUDIES PROGRAMME

PROJECT 23.5 - ADVISORY GROUP ON GREENHOUSE GASES													
TASKS	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	BY WHOM	RESOURCES	COMMENTS
1. Meetings of AGGG	M		M		M		M		M		UNEP/WMO/ICSU	UNEP/WMO/ICSU	In co-operation with WMO/ICSU Advice to Int. organizations. Ad hoc legal and technical working groups
2. Recommendations for legislation on greenhouse gases Formulation of guidelines for convention for climate protection	R		R/G		R		R		R/G		UNEP/WMO/ICSU	UNEP/WMO/ICSU	Advice to Governments based on assessments made under Project 23.1
G Publication of guidelines/guidance material J Expert missions K Roving seminar M Technical meeting (or conference, symposium, workshop) P Pilot projects R Report or review S Technical study, survey and activities by Members T Completion of a phase U Update/upgrade of technical material or contents of inventory/catalogue X Major training activity Y Major technical co-operation activities Z Major regional activity													

MAJOR PROGRAMME 2 : WORLD CLIMATE PROGRAMME
 PROGRAMME 2.3 : WORLD CLIMATE IMPACT STUDIES PROGRAMME

PROJECT 23.6 - DISSEMINATION OF KNOWLEDGE AND METHODS OF CLIMATE IMPACT ASSESSMENT													
TASKS	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	BY WHOM	RESOURCES	COMMENTS
1. Distribution of handbook of climate impact assessment methods to developing countries	U/G	G									UNEP	UNEP	Methods developed and published in early phases of programme condensed for easier application
2. Demonstration projects on climate impact assessment		K		K		K		K		K	UNEP/IIASA SCOPE		
3. Application of ISLSCP methodology to climate impact study			S	S	S	T S	S	T	S	T	COSPAR/IAMAP		Validation and application phase III of ISLSCP
G Publication of guidelines/guidance material J Expert missions K Roving Seminar M Technical meeting (or conference, symposium, workshop) P Pilot projects R Report or review S Technical study, survey and activities by Members T Completion of a phase U Update/upgrade of technical material or contents of inventory/catalogue X Major training activity Y Major technical co-operation activities Z Major regional activity													

MAJOR PROGRAMME 2 : WORLD CLIMATE PROGRAMME
 PROGRAMME 2.3 : WORLD CLIMATE IMPACT STUDIES PROGRAMME

PROJECT 23.7 - STUDY OF IMPACTS OF DROUGHT IN DEVELOPING COUNTRIES													
TASKS	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	BY WHOM	RESOURCES	COMMENTS
1. Support to establishment of ACMAD	T	X	X				X	X			WMO/UNEP	UNEP	Training in application of methods of drought impact assessment
2. Research on drought impacts		S	S	S	S/G P	S P	S	S	S/U		National institutions	International funding	Institutional research pilot project for application of guidelines
G Publication of guidelines/guidance material J Expert mission K Roving seminar M Technical meeting (or conference, symposium, workshop) P Pilot projects R Report or review S Technical study, survey and activities by Members T Completion of phase U Update/upgrade of technical material or contents of inventory/catalogue X Major training activity Y Major technical co-operation activities Z Major regional activity													

MAJOR PROGRAMME 2 : WORLD CLIMATE PROGRAMME
 PROGRAMME 2.3 : WORLD CLIMATE IMPACT STUDIES PROGRAMME

PROJECT 23.8 - TASK FORCE TO MONITOR IMPACTS OF ENSO EVENTS AND OTHER TELECONNECTIONS													
TASKS	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	BY WHOM	RESOURCES	COMMENTS
1. Information exchange on ENSO impacts on climate sensitive sectors	S/Z	S/Z	S/Z	S/Z	S/Z M/R	S/Z	S/Z	S/Z	S/Z	S/Z	National institutions	National sources UNEP	Follow-up to WCIP Phase II activities
G Publication of guidelines/guidance material J Expert missions K Roving seminar M Technical meeting (or conference, symposium, workshop) P Pilot projects R Report or review S Technical study, survey and activities by Members T Completion of a phase U Update/Upgrade of technical material or contents of inventory/catalogue X Major training activity Y Major technical co-operation activities Z Major regional activity													

MAJOR PROGRAMME 2 : WORLD CLIMAT PROGRAMME
 PROGRAMME 2.3 : WORLD CLIMATE IMPACT STUDIES PROGRAMME

PROJECT 23.9 - INTERNATIONAL NETWORK ON CLIMATE IMPACT STUDIES													
TASKS	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	BY WHOM	RESOURCES	COMMENTS
1. Establishment of network of ongoing national climate programmes with impact components	M/G										WMO/UNEP	UNEP	Guidelines for establishing national climate programmes input to project 26.10
2. Inventory of climate impact studies	R		U		R		U		R		WMO	WMO/UNEP	
3. Second World Climate Conference		M/R											
G Publication of guidelines/guidance material J Expert missions K Roving seminar M Technical meeting (or conference, symposium, workshop) P Pilot projects R Report or review S Technical study, survey and activities by Members T Completion of a phase U Update/Upgrade of technical material or contents of inventory/catalogue X Major training activity Y Major technical co-operation activities Z Major regional activity													

PROJECT 23.10 - ESTABLISHMENT OF NATIONAL CLIMATE IMPACT STUDIES PROGRAMMES													
TASKS	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	BY WHOM	RESOURCES	COMMENTS
1. Distribution of guidelines to establish programme	M/G										UNEP		National seminars supported on request
2. Support to national seminars for establishing NCPs	J/	J/M	J/M	J/M	J/M	J/M	J/M	J/M	J/M	J/M	UNEP/WMO National institutions	Consultants (UNEP) Meetings (national costs)	

G Publication of guidelines/guidance material

J Expert missions

K Roving seminar

M Technical meeting (or conference, symposium, workshop)

P Pilot projects

R Report or review

S Technical study, survey and activities by Members

T Completion of a phase

U Update/Upgrade of technical material or contents of inventory/catalogue

X Major training activity

Y Major technical co-operation activities

Z Major regional activity

Cg-X Doc 25
Item 3.2.3 (1)

Title: WORLD CLIMATE IMPACT STUDIES PROGRAM (UNEP REPORT)

Reference Doc 25
See also Doc 8 LTP

Problem: This document summaries UNEP plans for the World Climate Impact Studies Programme activities over the last 4 years, and some of the plans for the next biennial period, 1988-89. The emphasis on implementing future WCIP activities involves active participation by national climate programs. Because UNEP has not provided a specific, coordinated program in the impact studies area except through some suggestions in the Long Term Plan, it is difficult at this time to respond specifically.

US Position: UNEP should be congratulated on their past initiatives under the World Climate Impacts Studies Programme. UNEP is putting considerable emphasis on implementation of the Villach report. Even though the report received mixed reviews from US agencies, a general statement by the government has been issued:

"The USG recognizes the importance of the issues covered at Villach. The conference was convened as a non-governmental meeting requiring no official governmental representation and thus its recommendations carry only the weight derived from the personal and professional reputation of the experts in attendance. The USG believes the meeting was important and useful but there is no need to endorse or formally respond to the recommendations of the conference. The USG shares the view of the conference attendees that the study of global climate change due to increases in atmospheric concentration of greenhouse gases should be accorded high priority by national governmental and international organizations."

Discussion:

- Item 4: Complement UNEP and SCOPE for the preparation of SCOPE 27, Climate Impact Assessment Methodology. Agree with UNEP that a simplified version of the book would be useful for many countries beginning climate impact analysis.
- Item 6: UNEP is encouraging member states to establish National Climate Programs and is proposing roving seminars to assist members. The US should volunteer to help UNEP in this activity.

Item 13: UNEP has undertaken a number of activities directed to Africa drought. Their leadership in this area should be acknowledge. UNEP is prepared to participate in establishing ACMAD. The US should support establishing the new center and persist in satisfactorily determining its current status.

Items 20

to 25: A major UNEP activity for 1988/89 is to implement the recommendations of the Villach conference. No details are given on who or how these activities will be implemented. In particular, no budget data are available which makes it difficult to assess the level of commitment UNEP has to its programs. This has always been a major problem with UNEP's management style, i.e., lack of committed funds for the WCIP.

TITLE: World Climate Programme, International coordination for greenhouse gas research, impact assessment and evaluation of remedial measures.

REFERENCE: Cg-X/Doc 32 - World Climate Programme
WMO No. 661 - Report of the International Conference on the Assessment of the Role of Carbon Dioxide and of other Greenhouse Gases in Climate Variations and Associated Impacts, Villach, October 1985

U.S National Climate Program Policy Board statement on the Villach Conference.

WMO Press Release on AGGG

PROBLEM:

WMO, UNEP, and ICSU jointly sponsored the International Conference on the Assessment of the Role of Carbon Dioxide and other Greenhouse Gases in Climate Variations and Associated Impacts, Villach, October 1985. The conference brought together international research communities concerned with the well-documented increase in the levels of greenhouse gases over the past several decades. The conference produced a list of recommendations for further study and international coordination (see Report of Conference).

One of the conference's recommendations was the formation of a small group to provide on-going assessments of the role of greenhouse gases. In response, WMO, UNEP, and ICSU jointly formed the Advisory Group on Greenhouse Gases (AGGG), comprised of experts serving in their individual capacities, which met for the first time in July 1986. (see Doc 32, Appendix A for Terms of Reference). The Terms of Reference basically call for the AGGG to "review" and "advise". However, Term (d) goes beyond what might be expected of an international group of experts, i.e., "examine and advise on possible measures by governments to adapt to or diminish the rate of increase of concentration of greenhouse gases and, as deemed necessary, to initiate considerations of a global convention".

The AGGG is expected to meet every two years to provide to the three sponsoring organizations a review of ongoing activities and progress in the study of greenhouse gases and their probable impact on the global climate. Because the AGGG is basically a small scientific body and meets infrequently, it is not constituted to provide international leadership in addressing international priorities and roles on greenhouse gas issues. It may be timely to give some consideration to another type of mechanism which could actually set priorities and establish roles for international participation in a greenhouse gas program. Experience with the Coordinating Committee on Protection of the Ozone Layer (CCOL) may be useful in this regard.

The proposed draft text regarding the greenhouse gas issue in Doc 32 (Appendix B, paragraph 3.2.0.4) should be changed to provide guidance to the three organizations involved with the World Climate Programme on how to proceed on this issue. An appropriate mechanism will likely be needed over the next four years (before the next Congress) to fix priorities and coordinate an international cooperative program addressing greenhouse gas research, impact assessment, and evaluation of remedial measures. The problem is complex and involves many agencies and groups both intergovernmental and non-governmental. Therefore, the actions of WMO Congress (and the subsequent UNEP Governing Council) should give guidance to the WMO Executive Council on how to proceed, but not be too specific in requesting the organizations to move toward an intergovernmental coordinating mechanism.

US POSITION:

The U.S delegation should seek to amend paragraph 3.2.0.4, Appendix B to include the following points:

(a) Because of the growing international concern over possible changes in the global climate due to alterations in the composition of the atmosphere, the WMO in association with UNEP and ICSU, should emphasize this issue within the context of the World Climate Programme over the next four-year period.

(b) The WMO and UNEP, and possibly other organizations, should undertake to organize appropriate mechanisms and scientific programs to address the issue of greenhouse gases and their impacts. The report of Cg-X should request the WMO Executive Council, in concert with UNEP and other organizations, to consider appropriate actions and mechanisms to address this issue.

(c) The Terms of Reference for the AGGG should be amended to delete Term (d). Under the revised terms, the role of the AGGG in providing scientific advice to WMO, UNEP, and ICSU should be continued as presently constituted until some other mechanism is established.

DISCUSSION:

Because of the almost unanimous scientific agreement that the rise in the levels of atmospheric greenhouse gases will cause significant changes in global and regional climate (estimates are now that the global surface temperature will rise between 1.5 and 4.0 degrees Celsius by the middle of the next century), national and international attention has begun to focus on the problem. ~~The long lifetimes of some of the gases necessitates that some evaluation of actions to ameliorate adverse climate change be initiated within the next few years.~~ The problem of increasing greenhouse gases is multifaceted in that each of the gases which contribute to the global warming, has its own sources and sinks, and its own types of interactions in the atmosphere. Some increases in greenhouse gases are due directly to man's activities (such as the burning of fossil fuels); others are indirectly related (such as changes to natural systems because of land use practices). Some greenhouse gases, such as CO₂, interact little with other atmospheric gases; others are greatly affected by other gases, water vapor, or sunlight. The processes involved are not easily measured or modeled, and are much more complicated than those involved with the ozone issue.

Only during the last few months has an attempt been made, within the U.S national climate program, to organize a coordinated program of multi-agency efforts within the U.S to study and understand all aspects of the greenhouse gas problem.

The WMO Xth Congress meets in May 1987. During its meeting, the WMO Congress sets the general direction for the organization for the next four years. During the interim between Congresses, the Executive Council of WMO meets yearly to oversee the year-to-year operations. Panels, Advisory Groups, Committees, and Commissions of the WMO report to the Executive Council. The Executive Council of WMO, therefore, is the better forum to monitor international activities on the greenhouse gas issue. Since WMO Congress-X takes place before the UNEP Governing Council, June 1987 (which meets every two years), the U.S position at UNEP should refer to the actions taken by WMO.

The U.S position basically agrees to the need for establishing, under the WMO Executive Council, within the

context of the World Climate Programme, an international coordinating mechanism, which may be intergovernmental in nature, but would primarily be scientific. The coordinating mechanism could organize international research, initiate international scientific assessments, conduct impact studies (~~including socio-economic impacts~~), and ~~evaluate remedial measures (including technical innovations)~~. The coordinating mechanism would make recommendations to WMO, UNEP, ICSU, and others as appropriate.

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STATEMENT BY THE POLICY BOARD OF THE NATIONAL CLIMATE
PROGRAM ON VILLACH CONFERENCE

REVISED NOVEMBER 25, 1986

THE USG RECOGNIZES THE IMPORTANCE OF THE ISSUES COVERED AT THE INTERNATIONAL CONFERENCE ON GREENHOUSE GASES HELD IN VILLACH FROM 9-15 OCTOBER 1985. THE CONFERENCE WAS CONVENED AS A NON-GOVERNMENTAL MEETING REQUIRING NO OFFICIAL GOVERNMENTAL REPRESENTATION AND, THUS, ITS RECOMMENDATIONS CARRY ONLY THE WEIGHT DERIVED FROM THE PERSONAL AND PROFESSIONAL REPUTATION OF THE EXPERTS IN ATTENDANCE. THE USG BELIEVES THE MEETING WAS IMPORTANT AND USEFUL BUT THERE IS NO NEED TO ENDORSE OR FORMALLY RESPOND TO THE RECOMMENDATIONS OF THE CONFERENCE. THE USG SHARES THE VIEW OF THE CONFERENCE ATTENDEES THAT THE STUDY OF GLOBAL CLIMATE CHANGE DUE TO INCREASES IN ATMOSPHERIC CONCENTRATIONS OF GREENHOUSE GASES SHOULD BE ACCORDED HIGH PRIORITY BY NATIONAL GOVERNMENTS AND INTERNATIONAL ORGANIZATION.

GLOBAL CLIMATE CHANGE CALENDAR

- April 28 - OECD Meeting - Environment Committee
- May 11 - Canadian Workshop on Impact on Fisheries
- May - WMO - Annual Meeting
- June 8 - UNEP Governing Council
- July - Germany - Climate and Development-Social, Economic and Technological and Policy Options
- August 22 - Canada - "Civilization and Rapid Climate Change"
- November - Italy - Greenhouse Gas Advisory Meeting on Policy Options
- November - OECD Planning Meeting on Potential Role for OECD on Global Climate
- 1987 - USSR - Symposium on the Atmosphere of the Twenty First Century
- 1988 - Canada - Conference on the Global Warming and Atmosphere Pollution
- 1988 - Australia - Potential Host for OECD Meeting on Global Climate
- 1988 - Canada - Workshop on Distribution of Pests and Insects
- 1989 - UNEP/WMO - World Climate Conference



GENEVA 1987

PROVISIONAL AGENDA

1. ORGANIZATION OF THE SESSION

- 1.1 Opening of the session
- 1.2 Establishment of a Credentials Committee
- 1.3 Approval of the agenda
- 1.4 Establishment of committees
- 1.5 Report of the Credentials Committee
- 1.6 Approval of the Minutes

2. REPORTS

- 2.1 Report by the President of the Organization
- 2.2 Consolidated report on amendments to the Technical Regulations

3. SCIENTIFIC AND TECHNICAL PROGRAMMES

3.1 World Weather Watch Programme

- 3.1.0 World Weather Watch Programme; Report of the president of CBS
- 3.1.1 Global Data-processing System
- 3.1.2 Global Observing System
- 3.1.3 Global Telecommunication System
- 3.1.4 WWW Data Management
- 3.1.5 WWW Implementation Support Activity
- 3.1.6 WWW Implementation Co-ordination
- 3.1.7 Tropical Cyclone Programme
- 3.1.8 Instruments and Methods of Observation Programme; Report of the president of CIMO
- 3.1.9 WMO satellite activities

3.2 World Climate Programme

- 3.2.0 World Climate Programme; Report of the president of CCI
- 3.2.1 World Climate Data Programme
- 3.2.2 World Climate Applications Programme
- 3.2.3 World Climate Impact Studies Programme
- 3.2.4 World Climate Research Programme

3.3 Research and Development Programme

- 3.3.0 Research and Development Programme; Report of the president of CAS
- 3.3.1 Programme on Short- and Medium-range Weather Prediction Research
- 3.3.2 Programme on Long-range Forecasting Research
- 3.3.3 Tropical Meteorology Research Programme
- 3.3.4 Environmental Pollution Monitoring and Research Programme
- 3.3.5 Cloud Physics and Weather Modification Research Programme

3.4 Applications of Meteorology Programme

- 3.4.1 Agricultural Meteorology Programme; Report of the president of CAgM
- 3.4.2 Aeronautical Meteorology Programme; Report of the president of CAeM
- 3.4.3 Marine Meteorology Programme, IGOSS and other ocean-related activities; Report of the president of CMM

3.5 Hydrology and Water Resources Programme

- 3.5.0 Hydrology and Water Resources Programme, overall review; Report of the president of CHy
- 3.5.1 Operational Hydrology Programme
- 3.5.2 Applications and services to water resources
- 3.5.3 Co-operation with water-related programmes of other international organizations

3.6 Education and Training Programme

- 3.6.0 Education and Training Programme, overall review
- 3.6.1 Manpower development
- 3.6.2 Training activities
- 3.6.3 Education and training fellowships
- 3.6.4 Support to training events under other programmes

3.7 Regional Programme

- 3.7.1 Regional activities; Reports of presidents of regional associations
- 3.7.2 Antarctic meteorology

4. TECHNICAL CO-OPERATION PROGRAMME

- 4.1 General review of the Technical Co-operation Programme
- 4.2 United Nations Development Programme
- 4.3 Voluntary Co-operation Programme
- 4.4 Organization and funding of the Technical Co-operation Programme

5. PROGRAMME SUPPORT SERVICES AND PUBLICATIONS

- 5.1 Programme support services; Conference programme
- 5.2 Publications Programme
- 5.3 Text-processing and computer support
- 5.4 Public information

6. CO-OPERATION WITH THE UNITED NATIONS AND OTHER ORGANIZATIONS

7. LONG-TERM PLANNING

8. CONSOLIDATED PROGRAMME AND BUDGET 1988-1991

9. ADMINISTRATIVE AND FINANCIAL QUESTIONS
 - 9.1 Financial report of the Secretary-General
 - 9.2 Financial matters
 - 9.3 Proportional contributions of Members
 - 9.4 Staff matters
 - 9.5 Secretary-General's contract
 10. GENERAL AND LEGAL QUESTIONS
 - 10.1 IMO and WMO Prizes
 - 10.2 Questions concerning the Convention
 - 10.3 Revision of the General Regulations
 - 10.4 Review of the previous resolutions of Congress
 - 10.5 Requests for membership of the Organization
 11. ELECTIONS AND APPOINTMENTS
 - 11.1 Election of the President and Vice-Presidents of the Organization
 - 11.2 Election of members of the Executive Council
 - 11.3 Appointment of the Secretary-General
 12. IMO LECTURE AND SCIENTIFIC DISCUSSIONS
 13. DATE AND PLACE OF ELEVENTH CONGRESS
 14. CLOSURE OF THE SESSION
-



GENEVA 1987

Cg-X/Doc. 25
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ITEM 3.2.3 (1)

Original: ENGLISH

WORLD CLIMATE IMPACT STUDIES PROGRAMME

(Submitted by the United Nations Environment Programme)

Summary and Purpose of Document

This document gives a brief account of the implementation of the WCIP during the ninth financial period, and those activities planned during the early part of the tenth financial period.

ACTION PROPOSED

Congress is invited to note the information contained in this document, and comment as necessary on the content and proposals for the 1988/89 biennium.

- References:
1. Annual Reports of the Executive Director of UNEP for 1982, 1983, 1984 and 1985
 2. Report of the International Conference on the Assessment of the Role of Carbon Dioxide and of other Greenhouse Gases in Climate Variations and Associated Impacts, WMO - No. 661.

DISCUSSION

1. The eighth WMO financial period (1980-83) was a phase for the establishment of the institutional machinery essential for the implementation of the WCIP, extensive programme development, and the initiation of a number of projects: phase I the WCIP.
2. During the ninth WMO financial period (1984-87) some new projects were initiated. The most important feature of this period, however, was the coming to fruition of the projects initiated earlier, and the advances made in the science of climate impact assessment. It is natural, therefore, that as the implementation of the WCIP continues during the forthcoming years, advantage will be taken of the advances made to disseminate the application of the techniques of climate impact assessment and the encouragement of planners and policy makers to incorporate climate considerations into their plans and policies.
3. In the implementation of the WCIP, care has been taken to adhere to directives given by the UNEP Governing Council, the Scientific Advisory Committee (SAC), and lately the Advisory Group on Greenhouse Gases (AGGG). Furthermore, UNEP has been active in the activities of other institutional bodies established to co-ordinate implementation of the World Climate Programme (WCP). Some of these include meetings of the executive heads of UNEP, ICSU and WMO, meetings of the chairmen of WCP Advisory Committees, and the Advisory Committee for World Climate Applications and Data Programmes (ACCAD).

Improvement of the science of climate impact assessment

4. From the outset, it was realized by SAC that the science of climate impact assessment was new, and that the success of WCIP will depend on refining the techniques of the science. As the first phase towards this objective, UNEP in conjunction with SCOPE, commissioned the preparation of papers on the methodology of climate impact studies. This was followed by a meeting of the authors concerned. The second phase consisted of the publication by SCOPE of a definitive volume on climate impact assessment. The volume, SCOPE 27, was completed during 1985 and has been widely distributed to scientific institutions for use in climate impact studies.
5. It was realized that in its present form, SCOPE 27 may not completely meet the needs of developing countries, since it is oriented to scientists with advanced computing facilities and considerable experience in modelling. Hence, steps were taken by UNEP during 1986 to produce a simplified version of SCOPE 27 to act as a guideline to those engaged in the science of climate impact assessment. This version was distributed during the first quarter of 1987.
6. The revised version of the SCOPE/UNEP book together with two IIASA/UNEP volumes on climate impacts on agriculture (see paragraph 11) will be most useful as teaching material for seminars and workshops planned for the biennium of 1988/89. These seminars are to be undertaken as a further effort in the dissemination of the wide application of the new science of climate impact assessment and also to take advantage of the achievements made so far in this field. Additional activities planned in this field include the encouragement of member states to establish National Climate Programmes (NCPs) with components that can address climate impact studies. Roving seminars to achieve this objective are planned to take place during the period 1987/89.

7. One of the ways in which the science of climate impact assessment can be improved is the dissemination of information on a global scale of activities on climate impact assessment. It may be recalled that UNEP initiated an inventory on climate impact assessment activities which has been up-dated periodically and distributed to scientists engaged in those activities. It is intended to continue circulation of this publication under a new name "A World Directory of Climate Impact Activities".

Climate impacts on socio-economic systems and economic resource bases

8. Food production is one of the social/economic activities that are most vulnerable to climate and climatic extremes. It is logical therefore, that many of the early projects implemented under the World Climate Impact Studies Programme relate to agriculture and food production.

9. One of the projects initiated in 1982 is "Vulnerability of Food Systems to Climate" undertaken in conjunction with the United Nations Research Institute for Social Development (UNRISD) and implemented by CRESSIDA. A series of papers and manuscripts have been produced as outputs for this project and will soon be published in the World Climate Programme Series. Two publications which were distributed during 1986 are entitled "Agro-ecological Zoning of Eastern India" and "Food, Nutrition and Environment Focus on Gosaba and the Sundarbans".

10. The UNEP/IIASA project: "Integrated Approaches to Climate Impact Assessment" was successfully completed during 1986. This project was concerned with food production in three zones, namely:

- (a) High latitudes where temperature is a constraint;
- (b) High latitudes where both temperature and precipitation are limiting factors;
- (c) Low-latitude, precipitation-deficient areas.

11. The reports for the cold regions were submitted to the publishers towards the end of 1986 and that for the low-latitude precipitation-deficient areas soon afterwards. Both volumes entitled "The Impact of Climate on Agriculture" were distributed during early 1987. In view of the easily applied methodology developed for the case studies, which involved co-operative efforts by meteorologists, agronomists, economists and policy makers, the project results should find early application in national agricultural programmes including agricultural policy development. In this connection, a series of users' meetings in the respective case study regions are now being undertaken. Furthermore, it is planned, as mentioned above, to use these publications in seminars and workshops intended to improve the science of climate impact assessment.

12. UNEP, in conjunction with the Inter-Agency Group on Agricultural Biometeorology (IGAB) (WMO/FAO/Unesco), initiated a study to evaluate the impact of climate on the socio-economic systems in the humid tropics of South America. This project, which is one of the several regional studies undertaken by the group, is the first to include an impact assessment component. The project addressed the different social and economic consequences of the agricultural alternatives provided in each area by the

existing climatological conditions. As part of the project, a regional workshop on operational agrometeorology, supported by UNEP was held in Lima, Peru during November 1985. Opportunity was taken of this meeting to initiate contact between the IGAB consultants and the UNEP/IIASA personnel working on the integrated approaches to climate impacts. This contact facilitated the sharing of views on the methodological approach to climate impact studies. The South American project is expected to be completed by the end of 1987. It is expected from the preliminary results so far that the project outputs will enable decision makers in South America to introduce national climate considerations in planning and policy development.

13. During the past two decades or so the impact of climatic extremes in the form of drought has had disastrous consequences, both social and economic, in many countries of the developing world. Within the framework of the WCIP, UNEP has addressed the problem of drought in several ways:

- (a) During 1983, in conjunction with WMO and the Economic Commission for Africa (ECA), UNEP participated in a Scientific Round Table on Climate and Drought in Africa. The Scientific Round Table adopted a plan of action to combat drought in Africa. As part of this plan of action, it was decided to establish an African Centre for Meteorological Applications for Development (ACMAD), a project in which UNEP together with other international organizations is fully prepared to participate. UNEP, in collaboration with WMO and other UN agencies, has embarked on the implementation of the recommendations of the First African Ministerial Conference on the Environment, Cairo, 1985. Of specific interest is a proposed project to assist many African countries in data rescue and retrieval;
- (b) During August 1985 UNEP participated in a Symposium on Drought and Hunger in Africa organized by the National Centre for Atmospheric Research, Boulder, U.S.A.;
- (c) Support was given to the Kenya National Environment Secretariat to organize a Regional Seminar for Eastern Africa on Drought. The seminar, which was held at the UNEP Headquarters in May 1986, focussed on the regional experiences of the 1984 drought and was attended by participants from Kenya, Uganda, the United Republic of Tanzania and Sudan;
- (d) UNEP co-sponsored with NCAR in Lugano, Switzerland, a Workshop on the Worldwide Climate Anomalies of 1982-83 and their economic and social impacts (November 1985). Climate variations in ten regions were considered at the workshop and the participants constituted themselves into a standing working group on the impact of climatic anomalies with special reference to El Niño, Southern Oscillation (ENSO) and teleconnections. The unit will focus on the socio-economic impact of ENSO-related phenomena and will identify areas of potential research and provide on-going review and assessment of ENSO-related research. The proceedings of the workshop were published in 1986;

- (e) The Centre for Agricultural Meteorology and Climatology, University of Nebraska, organized a Symposium and Workshop on Drought in Lincoln, Nebraska during September/October 1986. The symposium, which was partly funded by UNEP and co-sponsored by WMO, concentrated on drought prediction and Government preparedness.

14. UNEP continued to give support to the holding of training courses in agrometeorology. The latest series, organized by the U.S.S.R. State Committee on Hydrometeorology, took place in Alma-Ata, U.S.S.R. in October 1986. The purpose of the courses is to train agrometeorologists and agronomists from developing countries in agrometeorological forecasting, agroclimatic resource mapping, impact of climate variability on agricultural production and the struggle against desertification. A UNEP consultant has evaluated the course and made recommendations for the publication and wide distribution of the course lectures.

Impact of climate on human health

15. UNEP co-sponsored with WMO and WHO an International Symposium on Climate and Health, held with the support of the Government of the U.S.S.R. in Leningrad in September 1986. Twenty-eight countries were represented at the symposium which considered the various aspects of application of climatology to human health and the assessment of the impact of climate on health. Sixty-six scientific reports were presented and recommendations were made for research, assessment, information exchange and publication of state-of-the-art reports on topics including:

- (a) Use of the heat balance models for assessment of the impact of temperature conditions on the human body;
- (b) Epidemiological studies of climate and diseases in different parts of the world;
- (c) Implications of climate change for populations in different regions including human adaptability to climate change.

16. UNEP, WHO and WMO currently are giving consideration as to how they can best respond to the recommendations of the conference.

UNEP/COSPAR, the International Land Surface Climatology Project (ISLSCP)

17. UNEP's role has been one of catalysis. It has provided the means whereby scientific groups engaged on ISLSCP activities have been brought together to consider results and to discuss progress in the research programme and to develop algorithms for converting satellite-derived data into parameters useful for climate impact studies. A meeting to discuss the first results of ISLSCP was held in Rome in December 1985 and a workshop on algorithms to evaluate such parameters as surface temperature, albedo, evapotranspiration from satellite data was held during February 1987.

18. ISLSCP has been responsible for the mounting of several major international projects including one in the U.S.A., the First ISLSCP Field Experiment (FIFE), and the undertaking of retrospective studies using archived satellite data. A European-African Task Group co-ordinates ISLSCP activities

in Africa and a number of studies have been carried out in Egypt, Tunisia, Côte d'Ivoire, Niger, United Republic of Tanzania and West Africa. Some experiments are also under way in Europe, particularly France, where several ISLSCP projects are supported. An all-Africa meeting is planned for later this year, with the co-operation of the Committee on Space Research (COSPAR). The meeting is expected to concentrate on the application of remote sensing for the study of land-surface climate interrelationships in semi-arid regions.

19. UNEP has commissioned a popular brochure on the ISLSCP programme to ensure a wider audience for this project which has great potential in assisting climate impact studies using remote sensed data.

Socio-economic impacts resulting from greenhouse gas warming

20. A major event during the ninth financial period was the convening in Villach, Austria (1985) of the joint UNEP/WMO/ICSU International Conference on the Assessment of the Role of Carbon Dioxide and other Greenhouse Gases in Climate Variations and other Associated Impacts. This conference, held with the generous support of the Government of Austria, drew extensively on the results of the UNEP funded project: Development of a Scientific Basis for Assessing the Impact of an Increased Concentration of Carbon Dioxide on the Interaction between Climate and the Biosphere, implemented by the International Meteorological Institute, Stockholm. The results of this project were published in a book (SCOPE 29) entitled: "Atmospheric Greenhouse Gases and Changing Climate". The conclusions and recommendations of the conference, which have been published as WMO Publication No. 661, have been widely distributed among the scientific community and decision makers. During 1987/89 UNEP will put significant emphasis on the implementation of the Villach recommendations, in accordance with the recommendations of the AGGG and the SAC.

21. Among the recommendations made was the call for increased public awareness on the issues of greenhouse gases, climatic change and sea-level rise. UNEP has already taken the following steps to increase public awareness:

- (a) Greenhouse gases are addressed in volume I of the UNEP/GEMS Environment Library Series. In this series, scientific topics are explained in a manner easily understood by the layman;
- (b) An audio-visual kit comprising slides, audio and written texts on the issue of greenhouse gases and climate change has been distributed to educational institutions and libraries;
- (c) A television film on the issue has been produced and widely viewed.

22. With regard to sea-level rise and possible increased tropical storm frequency, it is expected that work which commenced during 1986 with UNEP involvement will be completed before the end of 1987. This work is being undertaken by the Climatic Research Unit of the University of East Anglia, U.K. The output will be a scientific state-of-the-art report, together with a simplified version, on sea-level rise and increased tropical storm frequency.

23. The Villach conference recommended increased support for the analysis of policy options related to greenhouse-induced climate change. The candidate regions for the study included the Amazon Basin, the Indian Subcontinent,

Europe, the Arctic, the Zambezi Basin and the North American Great Lakes. UNEP is directly encouraging governments in these regions to initiate suitable studies as their contribution to a better understanding of these problems. Furthermore, UNEP is planning active collaboration with governments in the South-east Asia region to undertake a socio-economic assessment and policy exercise related to possible climate change in India, Thailand and Indonesia, and is seeking support to address other developing regions identified by the conference.

24. With the collaboration of the Beijer Institute in Stockholm, UNEP plans to hold a technical workshop for scientists and decision makers to address the issue of greenhouse gas induced climate change and policy options. The proceedings of the workshop, which are expected to be published in book form, will be distributed before the end of 1988.

Activities related to the WCIP

25. Activities under this category relate to the assessment of ozone layer modification and its impact, as part of a process to elaborate a protocol on chlorofluorocarbons to the Vienna Convention for the Protection of the Ozone Layer. The issue of the ozone layer is closely connected to the risk of climate change caused by greenhouse gases and consequently relates closely to the work of UNEP and its partner organizations, WMO and ICSU, in addressing carbon dioxide and other greenhouse gases' role in climate processes and their impact.

JUL 18 1986

PRESS RELEASE



WORLD METEOROLOGICAL ORGANIZATION
A SPECIALIZED AGENCY OF THE UNITED NATIONS
GENEVA-AVENUE GIUSEPPE MOTTA 41-TEL. (022) 346400

(For use of information media -
not an official record)

WMO/No.409
8.7.1986

ADVISORY GROUP ON GREENHOUSE GASES

jointly established by WMO, UNEP and ICSU

An Advisory Group on Greenhouse Gases* (AGGG) has been jointly established by ICSU, UNEP and WMO, to ensure adequate follow-up of the recommendations of the International Conference on the Assessment of the Role of Carbon Dioxide and other Greenhouse Gases in Climate Variations and Associated Impacts, held in Villach, Austria, in October 1985.

The AGGG, which met at the WMO Headquarters in Geneva on 1-2 July 1986 under the chairmanship of Prof. K. Hare (Canada), strongly supported the statement from the 1985 Villach Conference that the effects of increases in carbon dioxide (CO₂) and other trace gases that cause the greenhouse effect (such as methane, chlorofluorocarbons (CFC), oxides of nitrogen) could produce increases in global mean temperature between 1.5° and 4.5° in the first half of the next century, the corresponding rise of sea level (because of the expansion of ocean water) might reach between 20 and 140 centimetres. The results of ongoing research presented since the Villach Conference (such as the dramatic decreases in the ozone layer over the Antarctic and the asymmetry in the responses of the oceans in the southern ocean around Antarctica and the northern oceans around the Arctic) heightens the urgency of the concern expressed in Villach.

The AGGG will carry out two main tasks: (1) biennial reviews of international and regional studies related to greenhouse gases, and (2) aperiodic assessments of the rates of increases in the concentrations of greenhouse gases and the effects of such increases. The Advisory Group was particularly conscious of the need to develop a mechanism that would provide information on recent developments to a wide audience.

* Greenhouse Gases is an informal term used for all radiatively active constituents in the atmosphere, including aerosols, which collectively tend to increase the temperature of the lower atmosphere.

The AGGG stressed the need to improve our basic understanding of the climate system and its response to both natural and man-made forcing mechanisms. Since the ozone depletion problem and the greenhouse gas problem are interlinked through the impact of the same chemicals, the Group urged that the study of these two questions be combined.

In the light of the Villach recommendations for further studies of the socio-economic impacts of climate change, it was suggested that studies should be carried out in a number of areas such as the monsoon region of S.E. Asia, the Great Lakes region of N. America, Europe and the circum-polar region in the Arctic.

The AGGG suggested that there are two preventive measures that should be considered to alleviate the problem:

(i) Energy conservation measures, especially those increasing the efficiency of energy use;

(ii) Substitution for CFC's in a number of uses for which alternatives are available. This would help because the CFC's have not only become the second most important group of greenhouse gases after CO₂ but they also have deleterious effects on the ozone layer. In this connexion, consideration should also be given to the need for developing international agreements for the control of the CFC's.

The members of the AGGG are Chairman K. Hare (Canada), B. Bolin (Sweden), G. Golitsyn (USSR), G. Goodman (UK), M. Kassas (Egypt), S. Manabe (USA) and G. White (USA). The Chairman of the Villach Conference, J. Bruce (Canada), participated in the first meeting of the AGGG.

Further information can be obtained from: 1. ICSU: Dr. F.W.G. Baker;
2. UNEP (Geneva): Dr. C.C. Wallen; 3. WMO: Dr. T.D. Potter.

CONFERENCE STATEMENT

INTERNATIONAL ASSESSMENT OF THE ROLE OF CARBON DIOXIDE AND OF OTHER

GREENHOUSE GASES IN CLIMATE VARIATIONS AND ASSOCIATED IMPACTS

Sponsored by UNEP/WMO/ICSU

VILLACH, AUSTRIA, 9-15 OCTOBER 1985

A joint UNEP/WMO/ICSU Conference was convened in Villach (Austria) from 9 to 15 October 1985, with scientists from twenty nine developed and developing countries, to assess the role of increased carbon dioxide and other radiatively active constituents of the atmosphere (collectively known as greenhouse gases and aerosols) on climate changes and associated impacts. The other greenhouse gases reinforce and accelerate the impact due to CO₂ alone. As a result of the increasing concentrations of greenhouse gases, it is now believed that in the first half of the next century a rise of global mean temperature could occur which is greater than any in man's history.

The Conference reached the following conclusions and recommendations:

- 1) Many important economic and social decisions are being made today on long-term projects - major water resource management activities such as irrigation and hydro-power, drought relief, agricultural land use, structural designs and coastal engineering projects, and energy planning - all based on the assumption that past climatic data, without modification, are a reliable guide to the future. This is no longer a good assumption since the increasing concentrations of greenhouse gases are expected to cause a significant warming of the global climate in the next century. It is a matter of urgency to refine estimates of future climate conditions to improve these decisions.
- 2) Climate change and sea level rises due to greenhouse gases are closely linked with other major environmental issues, such as acid deposition and threats to the Earth's ozone shield, mostly due to changes in the composition of the atmosphere by man's activities. Reduction of coal and oil use and energy conservation undertaken to reduce acid deposition will also reduce emissions of greenhouse gases; a reduction in the release of chloro-fluorocarbons (CFCs) will help protect the ozone layer and will also slow the rate of climate change.
- 3) While some warming of climate now appears inevitable due to past actions, the rate and degree of future warming could be profoundly affected by governmental policies on energy conservation, use of fossil fuels, and the emission of some greenhouse gases.

These conclusions are based on the following consensus of current basic scientific understanding:

- o The amounts of some trace gases in the troposphere, notably carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), ozone (O_3) and chloro-fluorocarbons (CFC) are increasing. These gases are essentially transparent to incoming short-wave solar radiation but they absorb and emit longwave radiation and are thus able to influence the Earth's climate.
- o The role of greenhouse gases other than CO_2 in changing the climate is already about as important as that of CO_2 . If present trends continue, the combined concentrations of atmospheric CO_2 and other greenhouse gases would be radiatively equivalent to a doubling of CO_2 from pre-industrial levels possibly as early as the 2030's.
- o The most advanced experiments with general circulation models of the climatic system show increases of the global mean equilibrium surface temperature for a doubling of the atmospheric CO_2 concentration, or equivalent, of between 1.5 and 4.5°C. Because of the complexity of the climatic system and the imperfections of the models, particularly with respect to ocean-atmosphere interactions and clouds, values outside this range cannot be excluded. The realization of such changes will be slowed by the inertia of the oceans, the delay in reaching the mean equilibrium temperatures corresponding to doubled greenhouse gas concentrations is expected to be a matter of decades.
- o While other factors such as aerosol concentrations, changes in solar energy input, and changes in vegetation may also influence climate, the greenhouse gases are likely to be the most important cause of climate change over the next century.
- o Regional scale changes in climate have not yet been modelled with confidence. However, regional differences from the global averages show that warming may be greater in high latitudes during late autumn and winter than in the tropics, annual mean runoff may increase in high latitudes, and summer dryness may become more frequent over the continents at middle latitude in the Northern Hemisphere. In tropical regions, temperature increases are expected to be smaller than the average global rise, but the effects on ecosystems and humans could have far reaching consequences. Potential evapotranspiration probably will increase throughout the tropics whereas in moist tropical regions convective rainfall could increase.
- o It is estimated on the basis of observed changes since the beginning of this century, that global warming of 1.5°C to 4.5°C would lead to a sea-level rise of 20-140 centimeters. A sea level rise in the upper portion of this range would have major direct effects on coastal areas and estuaries. A significant melting of the West Antarctic ice sheet leading to a much larger rise in sea level, although possible at some future date, is not expected during the next century.

- o Based on analyses of observational data, the estimated increase in global mean temperature during the last one hundred years of between 0.3 and 0.7°C is consistent with the projected temperature increase attributable to the observed increase in CO₂ and other greenhouse gases, although it cannot be ascribed in a scientifically rigorous manner to these factors alone.
- o Based on evidence of effects of past climatic changes, there is little doubt that a future change in climate of the order of magnitude obtained from climate models for a doubling of the atmospheric CO₂ concentration could have profound effects on global ecosystems, agriculture, water resources and sea ice.

RECOMMENDED ACTIONS

1. Governments and regional inter-governmental organizations should take into account the results of this assessment (Villach 1985) in their policies on social and economic development, environmental programmes, and control of emissions of radiatively active gases.
2. Public information efforts should be increased by international agencies and governments on the issues of greenhouse gases, climate change and sea level, including wide distribution of the documents of this Conference (Villach 1985).
3. Major uncertainties remain in predictions of changes in global and regional precipitation and temperature patterns. Ecosystem responses are also imperfectly known. Nevertheless, the understanding of the greenhouse question is sufficiently developed that scientists and policy-makers should begin an active collaboration to explore the effectiveness of alternative policies and adjustments. Efforts should be made to design methods necessary for such collaboration.
 - (i) Governments and funding agencies should increase research support and focus efforts on crucial unsolved problems related to greenhouse gases and climate change. Priority should be given to national and international scientific programme initiatives such as (a) the World Climate Research Programme (WMO-ICSU), (b) present and proposed efforts on biogeochemical cycling and tropospheric chemistry in the framework of the Global Change Programme proposed by ICSU, (c) National Climatic Research Programmes. Special emphasis should be placed on improved modelling of the ocean, cloud-radiation interactions, and land surface processes.
 - (ii) Support for the analysis of policy and economic options should be increased by governments and funding agencies. In these assessments the widest possible range of social responses aimed at preventing or adapting to climate change should be identified, analyzed and evaluated. These assessments should be initiated immediately and should employ a variety of available methods. Some of these analyses should be undertaken in a regional context to link available knowledge with economic

decision-making and to characterize regional vulnerability and adaptability to climatic change. Candidate regions may include the Amazon Basin, the Indian subcontinent, Europe, the Arctic, the Zambezi Basin, and the North American Great Lakes.

4. Governments and funding institutions should strongly support the following:

- (i) Long-term monitoring and interpretation with state-of-the-art models of:
 - (a) radiatively important atmospheric constituents in addition to CO₂, including aerosols;
 - (b) solar irradiance; and
 - (c) sea level.
- (ii) Study and interpretation of the past history of climate and environment, specially regarding interactions among the atmosphere, oceans and ecosystems.
- (iii) Studies of the effects of atmospheric composition and of changing climate and climatic extremes on sub-tropical and tropical ecosystems, boreal forests, and on water regimes.
- (iv) Investigations of the sensitivity of the global agricultural resource base with respect to:
 - (a) direct effects of increases in atmospheric CO₂ and other greenhouse gases;
 - (b) effects of changes in climate; and
 - (c) probable combinations of these.
- (v) Evaluation of social and economic impacts of sea level rises.
- (vi) Analysis of policy-making procedures under the kinds of risks implied by a significant greenhouse warming.

5. UNEP, WMO and ICSU should establish a small task force on greenhouse gases, or take other measures, to:

- (i) help ensure that appropriate agencies and bodies follow up the recommendations of Villach 1985;
- (ii) ensure periodic assessments are undertaken of the state of scientific understanding and its practical implications;
- (iii) provide advice on further mechanisms and actions required at the national or international levels;
- (iv) encourage research in developing countries to improve energy efficiency and conservation;
- (v) initiate, if deemed necessary, consideration of a global convention.



UNITED NATIONS ENVIRONMENT PROGRAMME
PROGRAMME DES NATIONS UNIES POUR L'ENVIRONNEMENT



Cable Address: UNITERRA, Nairobi
Telex No. 22068
Telephone 333930

P.O. Box 30552,
Nairobi, Kenya

Your Reference

FP/4102-77-03/

10 November 1986

Our Reference

FP/4102-84-05/PU/mzm

Dear Mr. Thomas,

I have recently learned of the requests from the Senate to the Environmental Protection Agency to begin work on an Assessment of Effects of Ozone Layer Modification comparable to that recently undertaken by the National Aeronautics and Space Administration (NASA) on the assessment of our understanding of the processes controlling the present distribution of ozone in the atmosphere and its change.

As you are aware, UNEP and WMO collaborated with NASA in the production of the assessment referred to above which has become the internationally-accepted assessment of the State of the Ozone Layer.

It is desirable that the proposed assessment of ozone layer effects should also become the international authority on the issue and UNEP would be pleased to collaborate with EPA in realizing this. In view of the importance of the issue, I should like to suggest joint EPA/UNEP co-sponsorship of the assessment and I welcome your reaction to this suggestion. The basis for such co-operation has, I feel, already been forged through the joint EPA/UNEP co-sponsorship of the International Conference on Effects held in Washington, D.C. in June, the results of which have generated considerable acclaim.

I also note with satisfaction the United States Government's determination to press ahead with addressing the greenhouse gas issue and the implications of climate change for society and the policy making process. This concern parallels Executive Director's resolve to address this important issue as a matter of urgency.

The formulation of energy strategies to delay the greenhouse warming is, I feel, too important an issue to address entirely within the context of national considerations and needs to be examined at the international level if effective global action is to be realized. It may well be that an international agreement similar to that successfully concluded for the ozone layer in the adoption of the Vienna Convention needs to be negotiated for the greenhouse gas/climate change issue. A decision of this nature would, naturally, have to be based on sound technical and scientific information. UNEP is able to facilitate the co-ordination of the international assessment process necessary to provide effective international response.

Mr. Lee Thomas
U.S. Environment Protection Agency
401 M Street, S.W.
Washington, D.C. 20460
U.S.A.

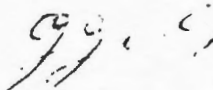
- 2 -

The Executive Director has already written to the State Department of the United States and to other countries encouraging regional climate impact assessments and corresponding policy response exercises as recommended at the Villach Conference on Greenhouse Gases and Climate in October 1985. Such exercises might involve dialogue between scientists and decision-makers to identify and evaluate the range of social responses for preventing or adapting to climate change. I hope that such exercises are undertaken promptly while, at the same time, a parallel international assessment and, global response process is also mounted.

Should you agree with me on the need for a strong and early international approach to the question, then I should like to suggest UNEP/EPA co-operation in the convening of an international conference to consider global energy policies and agree on international plan of action of research and assessment leading to a timely and appropriate global response. Such a conference could meet the needs expressed in the letter from Senators Mitchell and Chafee to you requesting an examination of the policy options that, if implemented, would stabilize current levels of greenhouse gas emissions on both national and global scales.

Kind personal regards.

Yours sincerely,



Genady N. Colubev
Assistant Executive Director
Office of the Environment Programme

Genedy N. Golubev
Assistant Executive Director
Office of the Environment Programme
United Nations Environment Programme
P.O. Box 30552
Nairobi, Kenya

DRAFT

Dear Dr. Golubev,

Thank you for your letter to Lee Thomas of November 10, 1986, proposing EPA and UNEP cooperation on: a) conducting an international assessment of the effects of ozone layer modification and b) assessing the implications of global climate change. Since receiving your letter, we have been reviewing our own research objectives and various alternatives for cooperation. EPA staff have also met with Peter Usher and with Canadian officials to discuss possible modes of cooperation. I would like to share with you our preliminary thinking on your proposal.

We fully agree that an international assessment of the effects of ozone layer modification, comparable to the NASA/UNEP/WMO assessment of atmospheric processes related to ozone layer modification, would be ~~timely and quite~~ useful. However, at the present time we are devoting virtually all of our staff time and resources to support of the international ^{ozone protection} protocol negotiations and the domestic regulatory process. For us, a better time to conduct the kind of comprehensive assessment that you suggest would be after the protocol is adopted. Also, we would want to be sure that such an undertaking is consonant with other activities planned under the Convention ^{and} or protocol. ^{the report on effects of} Perhaps a Diplomatic Conference resolution, citing the need for ^{the COL and the need for additional work in this area, and calling for} an international assessment of effects and ~~calling on governments~~

~~to cooperate in its conduct would be an appropriate means for initiating this activity.~~

Regarding global climate change, we believe that the time is ripe for beginning an international "risk assessment" process similar to what is already well underway for the ozone layer issue. To accomplish this, we propose that a Coordinating Committee on ~~Global Climate Change~~ ^{Greenhouse Gases CC} (CCGG) be established along the lines of the CCOL, under ~~UNEP~~ ^{for} joint UNEP/WMO^h auspices. We believe that such a body is needed in order to institutionalize the concept of periodic review of the science.

Secondly, we propose that UNEP ^{and WMO} initiate a series of international workshops, similar to the ozone layer workshops, to cover selected aspects of the ~~overall~~ climate change issue.

For example, one ^{WMO} workshop might be on predicting and detecting global climate change; ^{one UNEP workshop might be} another on assessing the environmental effects of global climate change; ~~a third on evaluating international strategies for addressing global climate change.~~ The results of these workshops would then be brought together in a major UNEP/WMO conference in 1989 or 1990. ^{The U.S. Government} EPA would, of course, be willing to actively support such a process, as we did the ozone layer workshops.

We believe that the above proposals merit discussion at the upcoming UNEP Governing Council session. ~~If you agree, perhaps global climate change could be put on the agenda.~~ Please let me know if I can be of any further assistance in this regard.

Sincerely,

Fitzhugh Green
Associate Administrator

THE WHITE HOUSE

WASHINGTON

April 6, 1987

MEMORANDUM FOR FEDERAL COORDINATING COUNCIL ON SCIENCE
ENGINEERING AND TECHNOLOGY (FCCSET)

FROM: WILLIAM R. GRAHAM *WRG*
SUBJECT: COMMITTEE ON EARTH SCIENCES

In recent years it has become increasingly evident that mankind's activities have the potential to contribute to significant changes in the global Earth system. To better understand mankind's influence on the global environment, as well as to understand the natural global changes, Federal agencies have intensified their research activities in Earth system science. In the process, it has become clear that the existing FCCSET Committee on Oceans and Atmospheres is not sufficiently broad in scope to deal with the intensified activities. Accordingly, I have terminated the Committee on Oceans and Atmospheres, and have established the Committee on Earth Sciences (CES) of the Federal Coordinating Council on Science, Engineering and Technology. This Committee will coordinate the Federal research efforts on Earth sciences, identify policy and international issues, provide Committee recommendations to the Director of OSTP as appropriate, and report at least annually on the Committee's activities and the status of Earth Sciences to the Director of OSTP.

I am attaching a copy of the charter of the Committee on Earth Sciences. I have designated Anthony J. Calio, Under Secretary of Commerce and NOAA Administrator, to serve as Chairperson, and Richard G. Johnson, Assistant Director for Space Science and Technology, OSTP, to serve as Vice-Chairperson.

Please designate a policy-level representative to serve on the Committee. Working groups or sub-committees to address specific issues or sub-disciplines will be established by the Chairman as needed.

Attachment

CHARTER

COMMITTEE ON EARTH SCIENCES of the Federal Coordinating Council for Science, Engineering, and Technology

The Committee on Earth Sciences (CES) is hereby established by action of the Federal Coordinating Council for Science, Engineering, and Technology (FCCSET). FCCSET derives its current authority for Executive Order 12039 of February 24, 1978.

Purpose and Functions

A goal of Earth sciences is to understand, on a global scale, how the highly interactive system comprised of the solid Earth, the oceans, the atmosphere and magnetosphere and the biosphere has evolved, how it functions today, and how it will evolve in the future. In addition to the basic research, important components of Earth science R&D include continued development of the technology for needed observations of the Earth system and increased emphasis on collection, analysis and archival of data on a global scale from satellite and ground-based measurements needed for long-term research efforts and also needed to address national policy issues which depend on a characterization of humankind's impact, or potential impact, on the global environment. The purpose of the Committee of Earth Sciences is to increase the overall effectiveness and productivity of Federal R&D efforts directed toward an understanding of the Earth as a global system. In fulfilling this purpose, the Committee addresses significant national policy matters which cut across agency boundaries.

Specifically the CES:

- a. reviews Federal R&D programs in Earth Sciences including both national and international programs
- b. improves planning, coordination, and communication among Federal agencies engaged in Earth sciences R&D;
- c. identifies and defines Earth sciences R&D needs;
- d. develops and updates long-range plans for the overall Federal R&D effort in Earth sciences;
- e. addresses specific programmatic and operational issues and problems which affect two or more Federal agencies;
- f. provides reviews, analyses, advice, and recommendations to the Chairperson of FCCSET on Federal policies and programs concerned with Earth sciences R&D, particularly in assessing humankind's impact on the global environment;
- g. develops the Administration's response to the call for a report to Congress, in the NSF Authorization Act of 1987, concerning Federal Government action with respect to the establishment of an International Year of the Greenhouse Effect mandated in calendar year 1991.

Structure

The Chairperson and Vice-Chairperson of the CES are appointed by the Chairperson of FCCSET; the Vice-Chairperson is from an agency other than that which the Chairperson represents. The Executive Secretary is designated by the CES Chairperson. Additional staff assistance is provided by member agencies as required by the Committee. Chairpersons of CES task forces or working groups arrange assistance from their own agencies.

The following departments and agencies are represented on this Committee:

- Department of Agriculture
- Department of Commerce
- Department of Defense
- Department of Energy
- Department of the Interior
- Department of State
- National Science Foundation
- Environmental Protection Agency
- National Aeronautics and Space Administration
- Office of Science and Technology Policy
- Office of Management and Budget
- Council on Environmental Quality

Other Federal agencies participate, as appropriate, upon invitation by the Committee Chairperson or the Chairperson of FCCSET.

The CES Chairperson approves the establishment, continuation, or termination of task forces and working groups as necessary to achieve the Committee's purposes. Membership on such task forces and working groups is not restricted to Committee members and is established as the Committee may determine appropriate.

The Committee meets at the call of the CES Chairperson who also approves the agenda. Meetings are held not less than two times a year. Meetings of task forces and working groups are held as necessary to meet their specific objectives. Minutes of meetings are prepared by the Committee Executive Secretary and distributed to all members of the Committee, the leaders of task forces and working groups, and to the Executive Secretary of FCCSET.

Compensation

All members are full-time Federal employees who are allowed reimbursement for travel expenses by their agencies plus per diem or subsistence while serving away from their duty stations and in accordance with standard government travel regulations.

Documentation

Agendas and records of actions of Committee meetings are prepared and dissimulated to members by the Executive Secretary. Records of actions are submitted to members for approval. Complete records of all Committee activities, including those of task forces and working groups, are maintained in the office of the Chairperson. The Committee prepares a report for the Chairperson of FCCSET not later than 60 days after the end of each fiscal year. The report contains, as a minimum, the Committee's functions, a list of members and their business addresses, the dates and places of meetings, and a summary of the Committee's activities and recommendations during the year.

Termination Date

Unless renewed by the Chairperson of FCCSET prior to its expiration, the Committee on Earth Science of FCCSET shall terminate not later than December 31, 1990.

Determination

I hereby determine that the formation of the Committee on Earth Science is in the public interest in connection with the performance of duties imposed on the Executive Branch by law and that such duties can best be performed through the advice and counsel of such a group.

Approved:

March 6, 1987
Date

William R. Graham
Chairman, FCCSET