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I. ORGANIZATION OF THE CONFERENCE

A. Terms of reference

1. The Fifth United Nations Regional Cartographic Conference for the Americas, convened in accordance with Economic and Social Council decision 1989/116 of 22 May 1989, was held at United Nations Headquarters from 11 to 15 January 1993.

B. Opening of the Conference

2. On behalf of the Under-Secretary-General for Economic and Social Development, the Director of the Statistical Division of the Department of Economic and Social Development welcomed the participants and noted that they represented many Governments, not only from the region but also from other parts of the world. After reviewing the activities of the Department since the Fourth Conference, he stated that the Fifth Conference was taking place in a rapidly evolving international context in which global partnership had succeeded the cold-war era.

3. He noted that a new, integrated approach was emerging in the consideration of developmental, social and environmental issues. Such issues as population growth, poverty alleviation, employment and human resources development, and national capacity-building should now be addressed in a comprehensive and cohesive manner.

4. The Executive Secretary of the Conference thanked the representative of the Under-Secretary-General for his opening address and added his welcome.

C. Attendance

5. The Conference was attended by representatives or observers from 35 countries, 2 specialized agencies and 8 intergovernmental and international scientific organizations. The list of participants is contained in annex I to the present report.

D. Agenda

6. The Conference adopted its agenda as contained in document E/CONF.86/1 and Corr.1. The agenda as adopted is contained in annex II to the present report.

E. Adoption of the rules of procedure

7. At its 1st plenary meeting, the Conference adopted its rules of procedure as contained in document E/CONF.86/2.

F. Election of officers

8. The Conference elected the following officers:

President: Myriam Ardila (Colombia)

First Vice-President: Gaspar Reza Maqueo (Mexico)

Second Vice-President: Carol Beaver (United States of America)

Rapporteur: Kim Lockhead (Canada)

G. Organization of work

9. The Conference adopted the organization of work as proposed by the Secretariat.

H. Credentials of representatives to the Conference

10. The Credentials Committee, composed of the President, the two Vice-Presidents and the Rapporteur, with the Executive Secretary ex officio, reported that the credentials of all representatives had been found to be in order.

I. Establishment of technical committees

11. The Conference established three technical committees and the following officers were nominated and subsequently elected to the technical committees:

Committee I. Cartographic Data Acquisition

(Agenda items 5 (b), (c), (d), (e), (g))

Chairman: Francis L. Charles (Trinidad and Tobago)

Rapporteur: Ricardo Montaner (Chile)

Committee II. Cartographic Data Manipulation

(Agenda items 5 (j), (k), (l))

Chairman: D. R. F. Taylor (International Cartographic Association)

Rapporteur: Denis Genest (Canada)

Committee III. Cartographic Data Storage and Presentation

(Agenda items 5 (a), (f), (h), (i), (m))

Chairman: René González (Guatemala)

Rapporteur: Susana Arciniegas (Ecuador)

The Conference decided not to nominate Vice-Chairmen for the technical committees.

J. Closing of the Conference

12. The Conference, at its final meeting, on 15 January 1993, expressed appreciation to the President for the excellent manner in which she had conducted the meetings. The Conference also expressed its thanks to the other officers of the Conference and to the staff of the United Nations, who had contributed to the smooth progress of the Conference.

13. In a short closing statement, the President communicated her deep appreciation for the active and fruitful participation of the representatives in the deliberations of the Conference, which had made it possible to demonstrate the importance of cartography for sustainable development and environmental protection. The Conference had reconfirmed that the United Nations should continue to provide guidance and direction in the international transfer of modern technology and to provide technical assistance to developing countries in surveying, mapping, geographic/land information systems and cartography.

14. On behalf of the Under-Secretary-General for Economic and Social Development, the Executive Secretary of the Conference voiced his contentment at the successful completion of the Conference and, in particular, the fruitful exchange of information concerning cartography, a field that had witnessed many advances in recent years. He also stated that the Department would spare no effort to centre its activities within the framework provided by the resolutions adopted by the Conference.

II. SUMMARY OF THE PROCEEDINGS OF THE PLENARY MEETINGS

Agenda items 4 and 6-8

15. The Conference considered in plenary meetings agenda items 4 (Country reports), 6 (Review of the latest developments relating to policies and management of national mapping and charting programmes, 7 (Technical assistance and transfer of appropriate and affordable technology and 8 (Provisional agenda for the Sixth United Nations Regional Cartographic Conference for the Americas).

A. Country reports

16. The representative of Brunei Darussalam presented a report covering activities related to map production on request, town and village tourist maps, geodetic surveys, digital mapping, the national house-numbering project and developments concerning land and geographic information systems (LIS/GIS). In response to a question regarding the status of the conversion of conventional maps to digital form, the representative from Brunei Darussalam stated that the work was to be completed in 1996.

17. The report presented by the United States of America covered cartographic activities since the Fourth United Nations Regional Cartographic Conference for the Americas, including advances in the application of computer technology to mapping, remote sensing, geographic information systems and inertial and satellite positioning systems. The report described activities in the following eight areas: geodesy, image mapping, topographic mapping, hydrography and oceanography, aeronautical charting, geographic names, digital cartography and global change. The report also included a detailed description of the activities of the following agencies, which had produced various maps: the Unites States Geological Survey, the United States Department of the Interior, the United States National Ocean Service of the National Oceanic and Atmospheric Administration, and the Defense Mapping Agency of the Department of Defense.

18. The representative of Spain presented a report on geodetic activities, topographic mapping, national GIS development, digital terrain models and the national atlas of Spain. It was noted that Spain had emphasized public and private sector cooperation in surveying and mapping projects. In a response to a question regarding user interest in digital data, the representative of Spain indicated that there was already considerable interest and the demand was expected to grow.

19. The report presented by Germany concentrated on the re-establishment of the geodetic reference system in the eastern region of Germany, as well as the development of a cadastral system for that region, which was under way. It was noted that gravity surveys would also be carried out. The representative emphasized the need for a unified reference system for all those cartographic activities. International projects in various South American countries and Antarctica were mentioned.

20. In the report presented by Oman, it was noted that the National Survey Authority had been founded in 1985 to improve geodetic and topographical survey data, provide contractual and quality control between mapping contractors and ministries, act as custodian for all maps and geographical data, and operate all security aspects of mapping and aerial photography within the Sultanate. Following the recent publication by the National Survey Authority of a four-sheet map of Greater Muscat, the capital, the Authority intended to produce high-quality maps of other urban areas using its own resources. For the past

several years, all maps have been produced in both hard copy and digital format. Activities had also commenced on the development of a national geographic information system. A pilot scheme was currently under way to test data conversion and further refine and develop a full geographic information system specification at appropriate scales.

21. Argentina presented a paper describing various national cartographic activities. The Government was currently mapping the country's coastline, as well as that of Antarctica. The goal was to obtain greater knowledge of the sea and its subsoil and to provide the navy and shipping interests with more information about the coastline. The Naval Hydrographic Service was engaged in updating symbols and place names. The Military Geographical Institute was drawing up maps for the entire Republic of Argentina, the surrounding islands and Antarctica. Those maps were being developed on scales of 1:50,000 and 1:250,000. Studies were also under way on the environmental impacts on Antarctica. The Institute planned to cover Argentina's portion of Antarctica with a satellite observation network. The maps made by the Air Traffic Administration included maps for visual flights and maps for instrumental flights. In addition, maps were being made for operations within airports.

22. The representative of China introduced a report entitled "Development of surveying and mapping in the Peoples Republic of China", which had been prepared by the National Bureau of Surveying and Mapping and dealt with the development of surveying and mapping in China between 1989 and 1992. Since the Fourth Cartographic Conference for the Americas, there had been great progress in China in those areas. Priority had been placed on the completion of a 1:10,000 scale topographic map, as well as maps for land resources investigation. Among the important surveying and mapping projects, the following had been completed: the national second-order levelling network, the national first-order gravity network and the 1:1,000,000 scale national topographic information system.

23. The representative of the United Kingdom of Great Britain and Northern Ireland introduced a report on the cartographic activities of the United Kingdom in the region of the Americas. The report contained an account of the contributions made by government agencies of the United Kingdom to the surveying, mapping and charting of the countries and seas of the Americas since the Fourth Conference. According to the report, the main contributions to cartographic activities in the Americas had been made by such agencies as OS International (the Overseas Surveys Directorate had been renamed OS International in April 1991); and the Defence Ministry's Military Survey and Hydrographic Office. OS International had undertaken mapping and surveying projects in 13 countries in the region, often as part of the United Kingdom's aid programme. The Military Survey's activities had been concentrated on its North American training areas and Belize. The Hydrographic Office had continued its work of updating the Admiralty Charts in those parts of the region for which it was responsible, and the Royal Navy had completed a number of surveys in the Caribbean. Topographic surveying and mapping projects had been undertaken in collaboration with local survey departments in the following countries of the region: Barbados, Belize, British Virgin Islands, Cayman Islands, Dominica, Falkland Islands (Malvinas), Grenada, Guyana, Jamaica, Montserrat, Saint Kitts and Nevis, Saint Lucia, and Saint Vincent and the Grenadines.

24. In presenting the report of Panama: the representative said that during the past four years, activities in cartography had developed notably in Panama, resulting in increases in map production and the introduction of new technologies. The trend was towards developing a geographic information system that would not abandon traditional techniques. Panama had been using global positioning systems (GPS) in its cartography for one year. Topographic maps on a scale of 1:50,000 had been updated using SPOT images. LANDSAT images were

being employed in studies to cover marsh and forest areas. The fourth edition of the national atlas of Panama was about to be produced. Panama was also developing a national digitally based cartographic database for research and planning for various projects. In the area of hydrography, a survey employing the GPS Pathfinder system had been planned. Panama had hosted the nineteenth Central American Cartographic Week, which had brought together Central American institutes to discuss and compare their programmes.

25. The representative of Romania introduced a report on national activities and future trends in the areas of astronomy, triangulation, levelling and satellite geodesy. Topographic mapping activities, photogrammetry and remote sensing were also described. In the section on trends and needs, the report outlined various technologies (e.g. GIS, computer hardware/software and GPS) being considered or developed for use in Romania. Papers published by Romania in recent years were listed.

B. Review of the latest developments relating to policies and management of national mapping and charting programmes

1. Managerial and technical aspects of national development programmes

26. The United Nations Secretariat presented a paper entitled "Mapping for development (A priority for development projects)", which dealt with the issue of financial losses caused by the lack of mapping in many development projects. The problem reflected a lack of training in the type of cartography necessary for specific projects.

27. The paper presented by Mexico described the process of modernizing the geographic activities of the National Institute of Statistics, Geography and Informatics (INEGI). Eventually the Institute should be able to produce 300 topographic maps and 200 thematic maps and to satisfy the increasing demand for cartographic data through magnetic methods.

28. The International Federation of Surveyors presented a paper on its work plan for 1992-1995. It discussed the relevance of the work of surveyors to environmental issues, the need for the countries of the North to support those of the South and the importance of understanding basic issues before applying technological solutions. The work plan included workshops in developing countries to foster international cooperation.

29. Germany presented a paper concerning the possible establishment of a European topographic information system that would enable the user to obtain information about any country.

30. The representative of Germany also presented a report describing Geokart, a German association formed to promote activities in the private surveying and photogrammetry sector in Germany. Member companies provided such services as consulting and technical assistance, planning and management of projects, production, quality control and financing. The members included surveying and mapping companies, consulting and planning companies and hardware and software companies.

2. Human resources development: education, training and research

31. The United Nations Secretariat presented a paper based on a survey conducted by the Science, Technology, Energy, Environment and Natural Resources Division of the Department of Economic and Social Development concerning the status of education and training facilities and programmes in surveying and mapping throughout the world. The study was intended to provide guidance to developing countries in selecting appropriate education and training programmes in surveying and mapping and to provide information on education grants. The study had begun in 1990, when a questionnaire was sent to United Nations Member States. Since only 34 countries had responded, the data had been supplemented by information from Laval University's surveying and mapping data bank. The study provided information on the following:

(a) Surveying and mapping manpower throughout the world, presented by country;

(b) Educational levels of the world's surveying and mapping manpower;

(c) Surveying and mapping manpower, presented according to specialization;

(d) Cost of surveying and mapping education;

(e) Research and development in surveying and mapping.

The study concluded that it was urgent to give immediate attention to planning the education and training of the world's future surveyors and cartographers. It was recommended that all national surveying and mapping organizations should begin serious planning of future educational and training requirements.

32. The representative of the International Cartographic Association (ICA) presented a paper entitled "The role of women in surveying and mapping". ICA had set up a task force to study the issue. The study was based on a survey of women's organizations and ICA members. It examined the various levels and types of work being done by women in the field of surveying and mapping: professional, technical, auxiliary, administrative, and managerial. It covered women in the surveying and mapping discipline from the public sector as well as the academic and private sectors. A working group would continue to study the question by conducting seminars on GIS and by preparing a directory of women in surveying and mapping. The question was also to be discussed at the Congress of the International Cartographic Association, to be held in Cologne, Germany, in 1993.

C. Technical assistance and transfer of appropriate and affordable technology

33. The United Nations Secretariat presented a paper on technical assistance and the transfer of appropriate technologies. It was noted that, to ensure the suitability of the technology being transferred to developing countries, foreign scientists should carefully analyse the needs and problems of the requesting countries and take into account the training and education of the nationals so that mapping technology could continue to develop in the recipient countries. The paper emphasized the need for developing countries to have a group of specialists who would be able to continue to utilize the technology on their own. Attention should also be paid to the financial problems experienced by the recipient countries.

34. The United Nations Secretariat also presented a paper describing the activities of the United Nations in the area of surveying, mapping and remote sensing. It was reported that the Secretariat had participated in organizing and financing technical cartographic workshops and had implemented technical assistance programmes in several developing countries, since cartography was considered to be central to all national planning.

D. Provisional agenda for the Sixth United Nations Regional Cartographic Conference for the Americas

35. The Conference discussed and approved the following agenda for the Sixth Conference:

1. Opening of the Conference.

2. Election of the President and other officers of the Conference.

3. Organizational matters:

   (a) Adoption of the rules of procedure;

   (b) Adoption of the agenda;

   (c) Establishment of technical committees;

   (d) Organization of work;

   (e) Credentials of representatives to the Conference.

4. Country reports.

5. Review of the latest technology in cartographic data acquisition, manipulation, storage and presentation, with special emphasis on potential applications in developing countries:

   (a) Automated mapping projects: development and application of digital cartographic databases, including digital terrain modelling;

   (b) Geographic information systems: definition, formation and application;

   (c) Surveying and mapping, geodesy, map updating and generalization;

   (d) Cadastral surveying and land reform;

   (e) Remote sensing in cartography;

   (f) Thematic mapping of natural resources development and environment;

   (g) Hydrographic surveying and nautical charting;

   (h) Aeronautical charting;

6. Technical assistance and transfer of appropriate and affordable technology.

7. Provisional agenda for the Seventh United Nations Regional Cartographic Conference for the Americas.

8. Adoption of the report of the Conference.

III. WORK OF COMMITTEE I: CARTOGRAPHIC DATA ACQUISITION

36. Committee I considered the following topics: conventional and satellite geodesy, including global positioning systems (item 5 (b)); remote sensing in cartography (item 5 (c)); hydrographic surveying and nautical charting (item 5 (e)); and cadastral surveying and mapping (item 5 (g)). No papers were submitted on topographic and large-scale surveying and mapping (item 5 (d)).

A. Conventional and satellite geodesy

37. The United States of America submitted a paper entitled "Marine applications of the global positioning system". The paper described the various possible applications of the NAVSTAR global positioning systems (GPS), with special emphasis on marine navigation, mapping and charting, geodetic and geophysical applications. The paper also included 12 tables showing current applications of GPS.

38. Ecuador presented a paper describing in detail the establishment of the national geodetic control network based on GPS. Work had started in 1991 and was being performed by the Military Geographical Institute. Special problems deriving from the topography of Ecuador that were affecting the performance of GPS were also addressed.

39. Canada submitted a paper on the changing focus of the Geodetic Survey of Canada. It described the current activities of the Geodetic Survey Division and the products and services offered to domestic and foreign clients. It also discussed the definition and readjustment of survey control networks referenced to the North American Datum 1983 (NAD ’83).

40. Germany presented a paper entitled "EUREF: a modern geodetic approach to establish an all-European reference system". It included a detailed discussion of the need for a new European terrestrial reference system capable of satisfying the needs of geodesy and digital cartography. Earlier systems were also reviewed and the densification campaign devised to establish EUREF stations was described. The stations would be approximately 300 km to 500 km apart, and 92 GPS observation sites would be required. The EUREF design would provide several transformation parameters.

B. Remote sensing in cartography

41. The United Nations Secretariat presented an overview of the basic concepts of geographic information, digital images and spatial applications. The particular problems of resolution and location, according to the type and nature of various objects analysed, were also addressed, making it clear that currently no civil satellite fully satisfied the specifications for classic maps. Emphasis should therefore be placed on spatial applications, such as thematic cartography.

42. The United States of America submitted a paper entitled "The North American vegetation index map, using advanced very high resolution radiometer data sets". It described the methodology used to prepare a vegetation map of North America using satellite data. The map had proved useful in controlling insect damage to crops, in monitoring fire danger conditions in forests and grasslands and in forecasting the potential impact of climate change. The paper also discussed the need for application of such maps in developing countries.

43. Canada presented a paper entitled "Canada's Tropical Forestry Initiative in Latin America - An Airborne Synthetic Aperture Radar (SAR) Programme", which outlined the aims and objectives of the Tropical Forestry Initiative research programme in Brazil, Costa Rica and Venezuela and highlighted the preliminary results of some of the data, their interpretation and their comparison with ground-verification information. C-Band airborne radar was used mainly to test SAR airborne data capability in differentiating types of tropical vegetation classes through visual analysis and digital-image processing and in determining reservoir land-water boundaries under forested areas. It was also used to evaluate the ability of SAR data in different configurations to discriminate between different types of rock and geological structures.

44. Canada presented another paper entitled "Cartographic applications of remote sensing for the Americas at the Canada Centre for Remote Sensing". It described the many projects being managed at the Centre, several of them in cooperation with other countries of the region. The projects highlighted were the topographic mapping project in Costa Rica, which used the digital video plotter to extract planimetric and altimetric features from stereo SAR data; RESORS, a bibliographic database devoted to remote sensor data; and the project on cartography and remote sensing orbital systems, which used multispectral scanners to scan the ground in linear strips across the orbital path, independent of solar illumination and clouds.

C. Hydrographic surveying and nautical charting

45. The United States of America submitted a paper entitled "The Coast and Geodetic Survey's Nautical Chart Rescheming Plan", which described the need to standardize the scales of charts in accordance with international specifications, to standardize chart paper sizes, using AO or derived sizes, and to standardize chart projections. It also discussed the incorporation of requests for changes to nautical charts by mariners in the private and government sectors and the international standardization and cartographic simplification proposed by the International Hydrographic Organization.

D. Cadastral surveying and mapping

46. The International Federation of Surveyors presented a paper entitled "Cadastral reform: building the infrastructure for sustainable development", which highlighted the broad role that the cadastre played in land management and the need for cadastral reform. The following challenges for the future were identified: (a) incorporating new types of tenure interests, which would require that the focus of the cadastre be the land itself rather than the legal procedures; (b) building an information infrastructure, seeking the coordination of jurisdictional cadastral projects in order to proceed incrementally in the development of effective land administration and land management; and (c) developing more effective land administration arrangements aimed at the management of the entire land tenure system in order to reduce the cost and delays arising from fragmented land administration.

IV. WORK OF COMMITTEE II: CARTOGRAPHIC DATA MANIPULATION

47. Committee II considered the following topics: automatic cartography: development and application of digital cartographic databases, including digital terrain modelling (item 5 (j)); land/geographic information systems (item 5 (k)). No paper was submitted on map updating (item 5 (l)).

A. Automatic cartography: development and application of digital cartographic databases, including digital terrain modelling

48. The United Nations Secretariat presented a paper entitled "Spatial data quality standards: a necessity for effective use of digital cartographic databases". The paper described five criteria for data quality: lineage, positioned accuracy, attributive accuracy, completeness and logical consistency. The paper also included information on the work of the Commission on Spatial Data Quality, created by the International Cartographic Association in 1990.

49. Finland presented a paper explaining how the National Land Survey had upgraded its methods of topographic map production. The paper described the topographic data system, the collection and updating of topographic data, and the topographic database and its products.

50. The United States of America presented a paper on the United States Geological Survey standards for digital 4 orthophotos. The paper described the characteristics and methods of producing orthophotos. It stressed their role as a source of geographic information as a tool for revision of data and as a digital layer in a geographic information system.

51. The United States of America presented another paper entitled "The generation of a prototype USGS 1:24,000 scale topographic map from digital line-graph data". The paper described the processes that had led to the production of a fully symbolized colour composite proof of a 1:24,000 scale quadrangle from digital line-graph data.

52. The United States of America also presented a paper entitled "Toward a feature-based world: making the transition from DLG to DLG-E". The paper described how the United States Geological Survey was making the transition from its spatial data model (DLG) to its new feature-based model (DLG-E). The paper explained the enhancements contained in DLG-E and the methods being developed to convert existing DLG holdings to a DLG-E level of content.

53. Another paper presented by the United States of America, entitled "Bridging the gap: creating near-shore bathymetric maps from multibeam swath sonar systems and conventional data", explained how additional in-shore data sources were being used to supplement multibeam survey data and provide complete map depiction.

54. Canada presented a paper on the process of updating the national topographic database. The paper described the revision process, which was based on overlaying the old file (vector data) and on ortho-images generated from SPOT imagery (recent raster data). Data preparation, ortho-image creation, field completion and the updating steps were discussed.

55. Another paper presented by Canada, entitled "Development of the digital cartographic process at Energy, Mines and Resources, Canada", described how

paper maps were being generated from the national topographic database through fully computerized methods.

56. Canada also presented a paper on the data standards for the national topographic database, which described the characteristics of the data standards and, more particularly, the data model, data structure and data dictionary.

57. Canada presented a paper entitled "Digitizing system for existing topographic maps at the Canada Centre for Geomatics". The paper described the methods used to produce digital data from existing maps and how that technology had become the chief data acquisition method for the national topographic database.

58. Chile presented a paper describing the implementation of the National Cartographic Information System at the Military Geographical Institute. The conceptualization and implementation processes were outlined.

B. Land/geographic information systems

59. The United Nations Secretariat presented a paper on the latest developments in land/geographic information systems (LIS/GIS), as well as the work still to be accomplished. The paper touched on key issues in various LIS/GIS activities and briefly assessed the role and nature of GIS.

60. The United States of America presented a paper on the Spatial Data Transfer Standard (SDTS), which was to serve as the national spatial data transfer mechanism for all federal agencies. The paper stressed the importance of its acceptance by data users and systems vendors and described the implementation strategy.

61. The United States of America also presented a paper on the implementation status of the Digital Geographical Information Exchange Standard (DIGEST). The paper provided background information and discussed current implementation of DIGEST, compliant datasets and future activities.

62. The United States of America presented another paper entitled "A product exchange format for the Defense Mapping Agency’s vector products, which described the Vector Product Format (VPF) standard and the various VPF products, including the Digital Chart of the World (DCW).

63. Spain presented a paper describing the implementation phases of the geographical information system at the National Geographical Institute of Spain. The paper covered the definition of concepts, modelling of reality and creation of databases.

V. COMMITTEE III: CARTOGRAPHIC DATA STORAGE AND PRESENTATION

64. Committee III considered the following topics: aeronautical charting (item 5 (f)), small-scale mapping, national and regional atlases (item 5 (h)); and thematic mapping of natural resources development and the environment (item 5 (i)). No papers were submitted on map specifications (item 5 (a)) or on reproduction and printing (item 5 (m)).

A. Aeronautical charting

65. The United States of America submitted a paper entitled "The impact of the implementation of the North America Datum of 1983 (NAD '83) on aeronautical navigation in the United States". It dealt with the application of NAD '83 in the national aerospace system, the impact brought about by users and changes made in maps.

B. Small-scale mapping, national and regional atlases

66. The United Nations Secretariat submitted a paper entitled "Technical and organizational approaches to national and regional atlas production". It was argued that although the importance of national and regional atlases had decreased recently, there was a need to resume production of such atlases. New technologies should be used, and appropriate electronic means and new formats should be sought for producing national and regional atlases that were easily accessible to the user and that could be quickly reproduced and revised.

67. Japan presented a paper proposing that, since environmental problems were world wide, global maps should be available to record environmental changes so that it would be possible to determine where the environment must be protected without delay.

C. Thematic mapping of natural resources development and the environment

68. A paper presented by Mexico described advances in conventional and magnetics methods of cartographic production. Reference was made to cadastral cartography in communal lands (ejidos).

VI. RESOLUTIONS ADOPTED BY THE CONFERENCE

A. List of resolutions

1. Sixth United Nations Regional Cartographic Conference for the Americas

2. Advisory service in modern mapping technology

3. Attendance

4. Cooperation with coordinating committees on environmental issues

5. Cooperation with international scientific organizations

6. Land and geographic information systems

7. Land and geographic information systems for development

8. New technology

9. Training and cooperative assistance

10. Women in cartography

11. Vote of thanks

B. Texts of resolutions

1. Sixth United Nations Regional Cartographic Conference for the Americas

The Conference,

Noting that the participants in the Fifth United Nations Regional Cartographic Conference for the Americas considered it desirable to continue to hold cartographic conferences for the region,

Noting further the general desire to increase the effectiveness of the conferences and realizing the need for the active involvement of all countries of the region in the preparation of the agenda for each conference and in the conferences themselves,

1. Recommends that the Sixth United Nations Regional Cartographic Conference for the Americas be convened in early 1997 for five working days;

2. Further recommends that the Secretariat urge every country to provide papers for the Sixth Committee well in advance of the Conference and, whenever possible, in the three official languages of the Conference.

2. Advisory Service in Modern Mapping Technology

The Conference,

Noting the importance of technology transfer in the mapping sciences,

Recommends:

(a) That the United Nations, together with the international scientific community, examine the feasibility of establishing an international advisory group available to developing countries wishing to acquire modern technologies in the mapping sciences;

(b) That, to establish such an advisory group, the United Nations convene a small meeting among all interested parties, including the World Bank Advisory Group, the European Community advisory group and other international scientific organizations active in the mapping sciences.

3. Attendance

The Conference,

Recognizing the financial and communication problems facing many developing countries that should be participating fully in the United Nations regional cartographic conferences for the Americas,

1. Recommends that the United Nations seek to provide early and continuous advice on forthcoming events to allow States to make budgetary provision to attend the conferences;

2. Further recommends that, where possible, the United Nations seek sponsorship for the attendance of the representatives of developing countries at United Nations regional cartographic conferences for the Americas and encourage those countries to submit papers on their special problems, together with their country reports.

4. Cooperation with coordinating committees on environmental issues

The Conference,

Recognizing the need to establish environmental information systems and to update global, regional and national geographic information for sustainable development using geographic information system technology,

Recognizing further that the surveying and mapping disciplines can make fundamental contributions to the establishment of such systems,

Noting that a number of coordinating committees exist - namely, the Advisory Committee to the World Bank on Environmental Information Systems for Sub-Saharan Africa and the Comité pour l'observation du Sahel et du Sahara, consisting of members from France, Germany and the Organization africaine de la cartographie et de la teledetection,

1. Recommends that the Secretariat take initiatives to promote cooperation with these committees and suggest effective means of overcoming the institutional, financial, educational and technical problems involved in introducing environmental information systems in developing countries;

2. Further recommends that the United Nations encourage countries to prepare up-to-date digital geographic information which would be useful for the global environment;

5. Cooperation with international scientific organizations

The Conference

1. Congratulates the United Nations for inviting international scientific and professional organizations to the Fifth United Nations Regional Cartographic Conference for the Americas;

2. Recommends that the United Nations:

(a) Continue to cooperate with scientific and professional organizations in the fields of surveying, mapping, geographic information systems and cartography;

(b) Continue to select authors for background papers in collaboration with those organizations;

(c) Support the provision of training courses in the application of modern technologies in the fields of surveying, mapping, geographic information systems and cartography to development issues in collaboration with international organizations;

(d) Allocate financial resources for the purposes specified above.

6. Land and geographic information systems

The Conference,

Recognizing the needs of the smaller countries of the Americas in developing land and geographic information systems,

1. Recommends that the United Nations provide advice on this subject through regional seminars;

2. Further recommends that the United Nations collect and disseminate available information in this field.

7. Land and geographic information systems for development

The Conference,

Recognizing the following conclusions of the United Nations Conference on Environment and Development:

(a) That the human impact on the biosphere continues to cause its degradation;

(b) That all countries are affected, in particular those which are experiencing poverty;

(c) That, in order to assist the countries experiencing poverty, the developed countries must continue their own development and the creation of wealth;

(d) That land and geographic information is a vital resource for environmental monitoring, analysis and control, as well as for planning and creating sustainable development;

Further recognizing that any constraint on the availability of land and geographic information to the conservation or development communities is in conflict with the clear aims and spirit of the United Nations Conference on Environment and Development;

1. Recommends that the States Members of the United Nations make available, without restriction and at the least possible cost, publicly funded land and geographic data sets when such information is available;

2. Further recommends the production of self-teaching packages using microcomputer and multimedia technologies to promote the training of technicians in cartography and geo-information, preferably in the country of origin.

8. New technology

The Conference,

Recognizing the need for efficient data acquisition methods for mapping and geographic information systems,

Noting that new possibilities for decreasing costs and increasing efficiency have resulted from the recent availability of the following:

(a) Aerial triangulation, controlled by global positioning systems, which minimizes the need for ground control points;

(b) Image motion compensation aerial survey cameras, which raise attainable photographic resolution by at least a factor of two;

(c) The use of digital technology in orthophotography;

1. Recommends to developing countries the use of such technology, where appropriate;

2. Further recommends that aerial survey specifications be adapted to reflect the technology, where appropriate.

9. Training and cooperative assistance

The Conference,

Recognizing that there are substantial needs for training and cooperative assistance, as determined by Laval University, the International Maritime Organization, the International Hydrographic Organization and other organizations concerned with mapping and charting within the Americas,

Noting that training courses and countries with advanced capabilities exist and are willing to be involved in technology transfer,

Recommends that the United Nations support, within existing resources, training and cooperative assistance, including fellowships to developing country personnel, and conduct, in conjunction with technical organizations, workshops pertaining to surveying and mapping.

10. Women in cartography

The Conference,

Noting the efforts of the International Cartographic Association to further the participation of women in all areas of cartography,

Recommends that the United Nations collaborate with all organizations dealing with issues relating to women in cartography to increase the participation of women in all areas of cartography.

11. Vote of thanks

The Conference

1. Expresses its heartful thanks to the Secretariat for the excellent arrangements and services provided for the Fifth United Nations Regional Cartographic Conference for the Americas and for the hospitality extended to all participants;

2. Expresses its appreciation to the President of the Conference and the Chairpersons of the technical committees for the excellent manner in which the Conference was conducted;

3. Expresses its thanks to the other officers of the Conference and to the staff of the United Nations, including the editors, interpreters and translators, for their dedicated work.

Annex I

List of participants

A. States Members of the United Nations

ALGERIA

Representative

Mr. Rabah HADID, Ambassador Extraordinary and Plenipotentiary, Deputy Permanent Representative to the United Nations

Alternates

Mr. Abdallah LAOUARI, Counsellor, Permanent Mission of Algeria to the United Nations

Mr. Mourad AHMIA, Second Secretary, Permanent Mission of Algeria to the United Nations

ARGENTINA

Representative

Mr. Roberto MIGLIORINI, Chief, Cartographic Division, Air Force

BAHAMAS

Representative

Mr. Charles WILSON, Cartographer, Lands and Surveys Department

BAHRAIN

Representative

Mr. Muhammad ABDUL GHAFFAR, Ambassador Extraordinary and Plenipotentiary, Permanent Representative of Bahrain to the United Nations

Alternates

Mr. Ebrahim Mubarak AL-DOSARI, Third Secretary, Permanent Mission of Bahrain to the United Nations

Mr. Ahmed Mohamed Yousif AL-DOSARI, Third Secretary, Permanent Mission of Bahrain to the United Nations

BRAZIL

Representatives

Mr. Fernando RODRIGUES, Geodetic Engineer, Ministry of Planning

Ms. Vera Regina TELLES, First Secretary, Permanent Mission of Brazil to the United Nations

BRUNEI DARUSSALAM

Representative

Mr. Dato Paduka Hj Yunos Bin MOHD NOH, Surveyor-General, Survey Department, Ministry of Development

Alternates

Ms. Mas Suriaia Wati Binti Hj ABDUL HAMID, Mapping Officer, Survey Department, Ministry of Development

Mr. YAHYA Bin Idris, Second Secretary, Permanent Mission of Brunei Darussalam to the United Nations

CANADA

Representatives

Mr. Frederick CAMPBELL, Senior Adviser, Canada Centre for Remote Sensing, Ministry of Energy, Mines and Resources

Mr. René GAREAU, Director, Canada Centre for Geomatics, Ministry of Energy, Mines and Resources

Mr. Kim LOCKHEAD, Geodetic Survey Division

Mr. Denis GENEST, Project Manager, Canada Centre for Geomatics, Ministry of Energy, Mines and Resources

Mr. Douglas O'BRIEN, Application Scientist, Canada Centre for Remote Sensing, Ministry of Energy, Mines and Resources

CHILE

Representatives

Mr. Ricardo MONTANER, Systems Analyst, Chilean Hydrographic and Oceanographic Service

Mr. José Ricardo Cifuentes PINTO, Assistant Director, Military Geographical Institute

CHINA

Representative

Mr. YANG Kai, Deputy Director General, National Bureau of Surveying and Mapping

Deputy Representative

Mr. BAI Bo, Director, Division of International Cooperation, National Bureau of Surveying and Mapping

Alternates

Mr. MA Ya'ou, Second Secretary, Department of Treaties and Law, Ministry of Foreign Affairs (Adviser)

Mr. JIAN Fengmin, Director, Shanghai Institute of Surveying and Mapping (Expert)

COLOMBIA

Representatives

Ms. Myriam ARDILA, Assistant Director, National Geographical Institute

Mr. Alvaro ESPINEL, National Geographical Institute

Mr. Navio Juan Manuel SOLTAU OSPINA, Chief, Hydrographic Division, Centre for Oceanographic and Hydrographic Research, National Army

CUBA

Mrs. Margarita VALLE CAMINO, Third Secretary, Permanent Mission of Cuba to the United Nations

Mr. Alexis BANDRICH VEGA, Third Secretary, Permanent Mission of Cuba to the United Nations

ECUADOR

Representative

Mr. Julio AROSLAGUI-CACERES, Assistant Director, Military Geographical Institute

Alternate

Ms. Susana ARCINIEGAS, Chief, Geodesy Department

EL SALVADOR

Representatives

Mr. Reynaldo Antonio MEDINA GUZMAN, Assistant Director-General, National Geographical Institute

Mr. Enrique DE LA O'LEMUS, Chief, Cartography Division, National Geographical Institute

FINLAND

Representative

Mr. Jarmo RATIA, Director-General, National Survey Board

Alternates

Mr. Juhani KAKKURI, Professor, Finnish Geodetic Institute

Mr. Matti JAAKKOLA, Director, National Survey Office of Finland

FRANCE

Representative

Mr. Alain COUZY, Director, National Geographical Institute

GERMANY

Representative

Mr. Hermann SEEGER, President and Professor, Institute for Applied Geodesy

Alternates

Mr. Karl BORCHARD, Minister Plenipotentiary, Permanent Mission of Germany to the United Nations

Mr. Gottfried KONECNY, Institute for Photogrammetry and Surveying, Hanover University

Mr. Gunter HERZFELD, Ministry of the Interior

Mr. Dierk HOBBIE, Carl Zeiss Company

Mr. Bernhard C. WEICHEL, Head, Cartography Department, Institute for Applied Geodesy

Ms. Susanne KASTEN, Second Secretary, Permanent Mission of Germany to the United Nations

GUATEMALA

Representative

Mr. Julio MARTINI HERRERA, Ambassador Extraordinary and Plenipotentiary, Permanent Mission of Guatemala to the United Nations

Deputy representatives

Mr. Rene GONZALEZ, Assistant Director, Military Geographical Institute

Mr. Joaquin H. MALDONADO, Director, Military Geographical Institute

Alternates

Mr. Marco PALACIOS, First Secretary, Permanent Mission of Guatemala to the United Nations

Mr. Rony TOLEDO, Technical Supervisor, Military Geographical Institute

HOLY SEE

Observers

Archbishop Renato R. MARTINO, Permanent Observer of the Holy See to the United Nations

Mr. Stephen NORRIS (Adviser)

HONDURAS

Representative

Ms. Nora VIVAS, Civil Engineer, Ministry of Foreign Relations

Mr. Raul ANDINO TORES, Civil Engineer and Director, Cartographic Section, Committee on Sovereignty and Borders

JAPAN

Representative

Mr. Hiroshi MURAKAMI, Deputy Director, International Affairs Division, Economic Affairs Bureau, Ministry of Construction

LIBYAN ARAB JAMAHIRIYA

Representative

Mr. Amara A. ELBATEL, Counsellor, Permanent Mission of the Libyan Arab Jamahiriya to the United Nations

MALAWI

Representatives

Mr. Stanley Brown LUMWIRA, Cartographic Superintendent

Mrs. Grace Ng'ong'ola, Senior Cartographer

MEXICO

Representative

Mr. Gaspar Reza MAQUEO, Director, Western Region, National Institute of Statistics, Geography and Informatics

Alternate

Ms. Patricia A. BELMAR BUSTAMANTE, Second Secretary, Permanent Mission of Mexico to the United Nations

OMAN

Representative

Mr. Taimur BIN KHALIFA BIN SAID, Director, National Survey Authority, Office of the Deputy Prime Minister for Security and Defence

PANAMA

Representative

Mr. José A. SAENZ GARCIA, Director, National Geographical Institute

PARAGUAY

Representative

Mr. Ceferino VALDEZ PERALTA, Counsellor, Permanent Mission of Paraguay to the United Nations

PERU

Representative

Mr. Fernando GUILLEN, Ambassador Extraordinary and Plenipotentiary, Permanent Representative of Peru to the United Nations

Alternates

Mr. Félix DENEGRI, First Secretary, Permanent Mission of Peru to the United Nations

ROMANIA

Representative

Mr. Marian ROTARU, Ministry of National Defence

Alternates

Mr. Calin-Daniel NITU, Ministry of National Defence

Mr. Ioan BARAC, Minister Counsellor, Permanent Mission of Romania to the United Nations

RUSSIAN FEDERATION

Representative

Mr. S. B. SHESTAKOV, First Secretary, Permanent Mission of the Russian Federation to the United Nations

Alternate

Mr. Ilya ROGACHEV, Second Secretary, Permanent Mission of the Russian Federation to the United Nations

SPAIN

Representatives

Mr. Angel AREVALO BARROSO, Director-General, National Geographical Institute

Mr. Ramón LORENZO MARTINEZ, Director, National Centre for Geographical Information

Mr. Rafael ANDUJAR TOMAS, Assistant Director-General, National Institute for Geodesy and Topographic Mapping

Mr. Rafael FERNANDEZ-PITA, Counsellor, Permanent Mission of Spain to the United Nations

Ms. Ana María MENENDEZ, First Secretary, Permanent Mission of Spain to the United Nations

TRINIDAD AND TOBAGO

Representative

Mr. Francis L. CHARLES, Director, Land and Surveys, Hydrographic Unit

UKRAINE

Representative

Mr. Oleksandr F. MOTSYK, First Secretary, Permanent Mission of Ukraine to the United Nations

UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND

Representatives

Mr. R. Michael WRIGHT, Ordnance Survey International

Mr. Keith A. CONNAL, British Liaison Officer, (Geographic) at the United States Defense Mapping Agency

UNITED STATES OF AMERICA

Representative

Mr. Roy MULLEN, Associate Chief, National Mapping Division, United States Geological Survey, Department of the Interior

Deputy representative

Mr. Bradford THOMAS, Chief, Cartography Division, Office of the Geographer, Bureau of Intelligence and Research, Department of State

Alternates

Mr. Charles HALL, Deputy Director, International Programs and Operations, Defense Mapping Agency, Department of Defense

Ms. Carol BEAVER, Acting Chief, Aeronautical Charting Division, Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service

Mr. Hugh T. DUGAN, Adviser, Permanent Mission of the United States of America to the United Nations

Mr. John V. HURLEY, Adviser, Permanent Mission of the United States of America to the United Nations

URUGUAY

Representative

Ms. María del Luján FLORES, Minister, Deputy Permanent Representative to the United Nations

B. Specialized agencies

INTERNATIONAL CIVIL AVIATION ORGANIZATION

Mr. Aleksandar PAVLOVIC, Chief, Aeronautical Information and Charts Section

UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION

Mr. Gustavo LOPEZ OSPINA, Director, New York Office

Mr. Somar WIJAYADASA, Liaison and Documentation Office

C. International scientific organizations

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

Mr. Christian ANDREASEN, Chairman, Directing Committee

INTERNATIONAL CARTOGRAPHIC ASSOCIATION

D. R. F. TAYLOR, President, ICA Faculty of Graduate Studies, Carleton University, Ottawa

INTERNATIONAL FEDERATION OF SURVEYORS

Mr. Peter BYRNE, Vice President

Ms. Sue NICHOLS, University of New Brunswick

INTERNATIONAL HYDROGRAPHIC ORGANIZATION

Mr. Christian ANDREASEN, President

INTERNATIONAL UNION FOR SURVEYING AND MAPPING

D. R. F. TAYLOR, President, International Cartographic Association,

Mr. R. GAREAU, Director, Canada Centre for Geomatics, Surveys, Mapping and Remote Sensing, Ministry of Energy, Mines and Resources

D. Other organizations represented by observers

ORGANIZATION OF ISLAMIC CAPITALS AND CITIES

Mr. Ayad HUSSAIN

PAN AMERICAN INSTITUTE OF GEOGRAPHY AND HISTORY

Mr. José Sáenz GARCIA

WORLD CONFERENCE OF MAYORS

Mr. A. F. HADI, Executive Director

Ms. Suzanne HARVEY, Director of Public Relations

Mr. Ayad HUSSAIN, United Nations Representative

E. United Nations Secretariat

Department of Economic and Social Development

Mr. William SELTZER, Representative of the Under-Secretary-General and Director, Statistical Division

Physical Infrastructure and Transport Branch, Science, Technology, Energy, Environment and Natural Resources Division

Mr. Hans-Knut STABE, Surveying and Mapping Unit

Mr. Goran FEJIC, Office of the Director

Mr. Sven WIK, Surveying and Mapping Unit

Consultants

Mr. Jean GATEAUD, National Geographical Institute, France

Mr. Jean-Claude MULLER, International Institute for Aerospace Survey and Earth Sciences, Netherlands

F. Secretariat of the Conference

Executive Secretary

Mr. Ousmane GUEYE, Chief, Physical Infrastructure and Transport Branch, Science, Technology, Energy, Environment and Natural Resources Division, Department of Economic and Social Development

Deputy Executive Secretary

Mr. Valeri MOSKALENKO, Physical Infrastructure and Transport Branch, Science, Technology, Energy, Environment and Natural Resources Division, Department of Economic and Social Development

Annex II

AGENDA

1. Opening of the Conference.

2. Election of the President.

3. Organizational matters:

   (a) Adoption of the rules of procedure;

   (b) Adoption of officers other than the President;

   (c) Election of officers other than the President;

   (d) Organization of work;

   (e) Credentials of representatives to the Conference;

   (f) Establishment of technical committees.

4. Country reports.

5. Review of the latest technology in cartographic data acquisition, manipulation, storage and presentation, with special emphasis on potential applications in developing countries:

   (a) Map specifications;

   (b) Conventional and satellite geodesy, including global positioning systems;

   (c) Remote sensing in cartography;

   (d) Topographic and large-scale surveying and mapping;

   (e) Hydrographic surveying and nautical charting;

   (f) Aeronautical charting;

   (g) Cadastral surveying and mapping;

   (h) Small-scale mapping, national and regional atlases;

   (i) Thematic mapping of natural resources development and the environment;

   (j) Automatic cartography: development and application of digital cartographic databases, including digital terrain modelling;

   (k) Land/geographic information systems;

   (l) Map updating;

   (m) Reproduction and printing.

6. Review of the latest developments relating to policies and management of national mapping and charting programmes:

   (a) Managerial and technical aspects of national development programmes;

   (b) Policies and practices concerning cartographic products distribution;

   (c) Management and standardization of geographical names;

   (d) Human resources development: education, training and research.

7. Technical assistance and transfer of appropriate and affordable technology.

8. Provisional agenda for the Sixth United Nations Regional Cartographic Conference for the Americas.

9. Adoption of the report of the Conference.
