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AND RELATED WEATHER, WATER AND
ENVIRONMENTAL MATTERS
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**REVIEW OF MAJOR CLIMATE AND RELATED WEATHER,
WATER EVENTS AND THEIR OUTCOMES**

REFERENCES:

1. Outcomes of the World Climate Conference-3 (WCC-3)
2. WCRP Implementation Plan 2010-2015, August 2009 (WMO/TD-No.1503)
3. 31st session of IPCC Plenary and AR5 process
4. Report of the Seventeenth Session of the WMO-IOC-UNEP-ICSU Steering Committee for GCOS- Paris, France, 27-30 October 2009 (GCOS-137)

ACTION PROPOSED:

It is recommended that the EC Working Group consider the progress report of major climate-related activities.

CONTENT OF THE DOCUMENT:

APPENDICES:

- Appendix 1: Progress Report to the EC-WG on Climate and Related Weather, Water and Environmental Matters on major climate related matters
- Appendix 2: Joint Session of WMO Commission for Climatology and Joint Scientific Committee for the WCRP – Statement

2. REVIEW OF MAJOR CLIMATE AND RELATED WEATHER, WATER EVENTS AND THEIR OUTCOMES

This document provides briefing on a number of major events, such as CCI-XV and Technical Conference on Changing Climate and Demands for Climate Services, GCOS Steering Committee meeting, WCRP JSC meeting, 31st session of IPCC Plenary and AR5 process and COP15 that WMO has been represented. The meeting will also consider progress report of 'Research Task Team (EC-RTT).

2.1 WMO at the UNFCCC Climate Change Conference (COP-15)

2.1.1 As in previous years, WMO participated in the annual (fifteenth) session of the Conference of Parties to the United Nations Framework Convention on Climate Change (COP 15). WMO through a statement in the opening plenary session of the thirty-first meeting of the Subsidiary Body of Scientific and Technical Advice (SBSTA) reported the outcomes of the World Climate Conference-3 (WCC-3) and its decision to establish the Global Framework for Climate Services (GFCS).

2.1.2 Mr Mama Konaté, Director-General of the Mali Meteorological Service and Permanent Representative of Mali with WMO, was elected Chairman of SBSTA for the next two years. WMO and the meteorological community welcomes this development and congratulate Mr Konaté on this occasion.

2.1.3 In preparation for the COP 15, the WMO Secretary-General, along with his message to National Meteorological and Hydrological Services (NMHSs), circulated a position paper on "Improved Decision-Making for Climate Change Adaptation" to help the NMHSs provide appropriate inputs to their respective national delegations on matters related to observations, research, early warnings, climate predictions and climate services. More than 160 delegates from NMHSs attended COP 15. An informal meeting organised for the representatives from NMHSs to, share information and discuss the position paper and the role of science in the ongoing negotiations. Representatives expressed keenness to move forward with WCC-3 outcomes and improve climate services offered by NMHSs at national level.

2.1.4 WMO organized a side event along with UNESCO as its partner under "climate knowledge base" in the United Nations delivering as one initiative. The side event entitled, "Observation, monitoring and prediction: Essential elements of climate knowledge", brought together scientists, the WMO community and senior managers from UNESCO and the International Telecommunications Union (ITU).

2.1.5 The WMO Secretary-General was invited as keynote speaker to many side events organized by ITU, the United Nations Environment Programme, the United Nations Development Programme and Green Cross International. He also attended the United Nations high-level meeting, which brought together the Secretary-General and Chief Executives of the United Nations System. On the sidelines of the Conference, the WMO Secretary-General had constructive meetings and discussions with various delegations and in particular with the Vice-President of Gambia, the Prime Minister of Namibia, the Prime Minister of Vanuatu and other Senior Government Officials

2.1.6 WMO press conferences were organized in which the WMO Secretary-General and other members of the delegation informed the media about the global climate in 2009, WMO future climate initiatives, such as the GFCS, and a standardized drought monitoring system. An exhibition booth was established where various WMO information materials were displayed. The booth was at a strategic location and attracted many visitors. WMO wishes to thank close cooperation and support rendered by the Danish Meteorological Institute.

2.2 Brief Report on Technical Conference “Changing Climate and Demands for Climate Services for Sustainable Development”

2.2.1 WMO, in collaboration with the Turkish State Meteorological Service and the World Climate Research Programme, organized the Technical Conference on Changing Climate and Demands for Climate Services for Sustainable Development from 16-18 February 2010 in conjunction with the Fifteenth session of the Commission for Climatology (CCI), in Antalya, Turkey. A special joint session with the Joint Scientific Committee (JSC) for the World Climate Research Programme (WCRP) was held on February, 18th as an integral part of the Technical Conference. Active participation of more than 170 experts, including the members of the JSC for the WCRP, from 73 countries from all WMO Regions and 32 high-level lectures and 18 posters, made this Conference very successful. In terms of ‘fact findings’, the Conference:

- (a) Discussed extensively the demands for climate services for sustainable development under a changing climate regime;
- (b) Recognized the need for an integrated climate-society system including an early and sustained understanding, collaboration and partnership amongst all partners concerned;
- (c) Recognized the growing demand for decadal climate information;
- (d) Highlighted the importance and societal benefits of operational climate system monitoring, climate predictions and projections and underlined the critical issue of climate data as the ultimate baseline for related activities and services;
- (e) Acknowledged important issues of common interest to the WCRP and CCI in order to address comprehensively the rapidly emerging societal needs for climate information and services for adaptation and risk management; and
- (f) Acknowledged the high level of satisfaction of the participants to have received, at the beginning of the Conference, a high-value abstract document. The Turkish State Meteorological Service also compiled all presentations in a much appreciated CD-ROM which was distributed at the end of the Conference.

2.2.2 The experts provided a set of specific recommendations to the Fifteenth Session of CCI. In particular, the Conference recommended that CCI consider:

- (a) Ways of engagement with partners including trusted information brokers to integrate climate information, services and knowledge successfully into end user decision systems;
- (b) Making efforts to assist users in understanding probabilistic products and information including uncertainties;
- (c) Assisting in strengthening the whole process of climate data from observations to its exchange;
- (d) Strengthening the development and use of climate-related WMO infrastructure and mechanisms including Global Producing Centres, Global Seasonal Climate Updates, Regional Climate Outlook Forums and Regional Climate Centres and encouraging the implementation of complementary National Climate Outlook Forums;
- (e) Action to start the coordination and exchange of decadal predictions;
- (f) Seeking extended collaboration with producers and holders of ‘climate impact data’ to facilitate the development and exchange of applicable data sets for services in support to risk management and adaptation;
- (g) Exploring ways to further improve cross-sectoral coordination for awareness raising and effective services;
- (h) Focusing capacity building on measures to enable developing countries to efficiently uptake and use regional and global climate products; and
- (i) Continuation of the successful work of the joint Expert Team on Climate Change Detection and Indices as well as the development of sector-focused indices for applications.

2.2.3 The Conference adopted a joint WCRP-CCI Statement on Working Together Towards Strengthened Research and Operations Linkages for Enhancing the Use of Climate Information. Recognizing the decision of the World Climate Conference-3 to establish a Global Framework for Climate Services (GFCS) and the respective potential roles for the WCRP and the CCI, the participating experts agreed to closely collaborate, through appropriate mechanisms, to address the following topical issues of direct relevance to climate adaptation, mitigation and risk management in general and the GFCS in particular:

- (a) Strengthen research observations to serve as prototypes for future climate observing systems, in cooperation with existing observing systems (e.g., Global Climate Observing System and WMO Integrated Global Observing System);
- (b) Establish predictability and develop climate prediction systems with lead times from seasons to centuries;
- (c) Develop reliable high-resolution products needed for climate adaptation, mitigation and risk management at local to global levels;
- (d) Promote interdisciplinary research to develop sector applications, tools and tailored information;
- (e) Facilitate flow of user requirements to the research community and climate services providers through user feedback;
- (f) Support the operational mechanisms of Global Producing Centres for Long-range Forecasting, Regional Climate Centres, National Climate Services and Climate Outlook Forums and their linkages as well as the associated consensus assessments;
- (g) Foster links between WMO Regional Associations, National Meteorological and Hydrological Services, CCI and WCRP, in support of regional and national activities; and
- (h) Help improve the availability of high-skilled talent, particularly in the developing countries, to undertake research, operational climate services and communication with users.

2.3 Brief Report on the Fifteenth Session of the Commission for Climatology (CCI-XV), Antalya, Turkey, 19-24 February

2.3.1 The fifteenth Session of CCI, which brought together representatives from 88 countries, including representatives from the National Meteorological and Hydrological Services as well as experts from academia and international organizations, was held in Antalya, Turkey from 19 to 24 February 2010. In the opening session, further to the President of the Commission, Dr Pierre Bessemoulin (France), WMO Secretary General, Dr Veysel Eroglu, Minister for Environment and Forestry of Turkey and Mr Mehmet Çağlar, Director General of Turkish State Meteorological Service delivered speeches.

2.3.2 The session discussed an action plan for providing improved climate services to the global community, which includes the establishment of four Open Panels of CCI Experts (OPACEs) that will focus on thematic areas including:

- Climate data management,
- Global and regional climate monitoring and assessment,
- Climate products and services and
- Climate information for adaptation and risk management.

2.3.3 The Commission adopted a new vision, mission statement and Terms of Reference (to be confirmed by EC-LXII and adopted by Cg-XVI). At operational level, the session assigned special emphasis to the establishment of Climate Watch Systems at NMHSs and RCCs, in order to produce timely and reliable climate advisories. It was noted that those mechanisms were increasingly being linked to assist user communities in proactively mitigating the impacts of climate anomalies and related extremes.

2.3.4 The Commission for Climatology, unanimously elected Dr Thomas Peterson, Chief scientist, National Climatic Data Center/NOAA, USA, and Mr Serhat Sensoy, Chief of the Climatology Division, Turkish State Meteorological Service (TSMS), as the president and vice-president of the Commission for Climatology, respectively, for the next four years.

2.4 GCOS Steering Committee meeting

2.4.1 The GCOS Steering Committee held its 17th Session (SC-XVII) at the UNESCO Headquarters in Paris on 26-30 October 2009 with the participation of 16 Committee members (including all three Chairs of the GCOS/WCRP Atmospheric Observation Panel for Climate (AOPC), the GCOS/GOOS/WCRP Ocean Observation Panel for Climate (OOPC) and the GCOS/GTOS/WCRP Terrestrial Observation Panel for Climate (TOPC)), representatives of the four sponsors WMO, UNESCO-IOC, UNEP and ICSU, eight partner and participating organizations, three invited experts, and five members of the GCOS Secretariat.

2.4.2 Following reports from the Director of the GCOS Secretariat, the then Chairman of the GCOS SC, Prof John Zillman, and the Chairs of the three Scientific Panels, and after receiving feedback and guidance from the Sponsors, the session addressed the following major policy issues:

- (a) The role of the main observing systems contributing to GCOS;
- (b) The way forward after the World Climate Conference 3 (WCC-3);
- (c) User views on how GCOS can serve their needs in the light of the outcome of WCC-3;
- (d) The GCOS contribution to the Global Earth Observation System of Systems (GEOSS) and
- (e) GCOS Governance.

2.4.3 The Steering Committee agreed on a list of 47 'Actions and Recommendations' from the Session and on a work programme leading to SC-XVIII in September 2010. The discussion on the major issues can be summarized in the following paragraphs.

2.4.5 The Steering Committee members discussed the WMO Integrated Observing System WIGOS and noted, that WIGOS makes up a significant portion of GCOS with the WMO Global Observing System (GOS) its largest component. The SC, in general, encouraged WMO to put more emphasis on representing the totality of observing systems that contribute to climate in WIGOS and also when designing the new GFCS. The SC requested the Director to work closely with the WMO Observing and Information Systems Department on the future development of the climate component of WIGOS, especially regarding observing system coordination mechanisms, collaboration on standards development, requirements for climate observations, and improving access to climate observation information.

2.4.6 The SC found that the many statements supporting the need for enhanced and improved observing systems for climate made during the Expert Segment of the WCC-3 underpin the findings summarized in the Conference Statement. Of the 12 parallel working sessions held during the conference, the one most relevant to GCOS was the one on climate observations. This session took stock of progress with the planning and implementation of the Global Climate Observing System since the Second World Climate Conference and addressed issues to guide its further development in support of climate prediction and information for decision-making. Dr Adrian Simmons, who was the theme leader for the observations working session, provided a detailed summary of the session. He drew upon paragraphs 61 to 64 of section 4.1 of the final Conference Statement which, as it is both important and short, is reproduced in its entirety in Appendix 3. The Chairman noted that the Conference Statement had called for major

strengthening of what it identified as the five essential elements of a GFCS. These included:

- The Global Climate Observing System and all its components and associated activities; and provision of free and unrestricted exchange and access to climate data;
- The World Climate Research Programme, underpinned by adequate computing resources and increased interaction with other global climate relevant research initiatives;
- Climate services information systems taking advantage of enhanced existing national and international climate service arrangements in the delivery of products, including sector-oriented information to support adaptation activities;
- Climate user interface mechanisms that are focussed on building linkages and integrating information, at all levels, between the providers and users of climate services, and that are aimed at the development and effective use of climate information products, including the support of adaptation activities; and
- Efficient and enduring capacity building through education, training, and strengthened outreach and communication.

2.4.7 The SC found that it is particularly important to ensure that the Sponsors of GCOS contribute effectively to the elaboration of the observations element.

2.4.8 The SC asked the Chairman, Panel Chairs, and Secretariat Director to draft a Concept Paper on the GCOS role in the proposed GFCS and to coordinate GCOS input to the proposed GFCS Task Force, keeping the full SC informed on progress as appropriate.

2.4.9 The SC encouraged the Chairman and Secretariat to work closely with the GEO process to ensure maximum harmonization and alignment of GCOS and the Climate Societal Benefit Area (SBA) of GEOSS.

2.4.10 The SC requested the GCOS Secretariat to provide, at its 18th session, an updated version of the 1995 GCOS Plan. This document should outline the GCOS science, service, and communication strategies and include a statement of work on the most important issues on which the Secretariat should focus in the next five years. An annex assessing what has been achieved and compiling the status of existing observing networks could be included.

2.4.11 As from the 1st January 2010 the Chairmanship of the Steering Committee turned over to Dr Adrian Simmons, also current Chair of the AOPC.

2.5 WCRP JSC meeting

2.5.1 In 2008 the WCRP sponsors (ICSU, IOC of UNESCO and WMO) organized an independent review of the Programme. An international panel of experts was appointed to evaluate the extent to which international global change research programmes such as WCRP add value to their respective areas of research and to the national programmes that contribute to them. The panel has completed its review and the final report can be found at <http://www.icsu.org>.

2.5.2 The review recognized the many important achievements of WCRP and its role in helping society meet the challenges of global climate change. The panel concluded that WCRP should maintain the rigor of its science and remained focused on core physical science, addressing new science areas in partnerships with others. The main function of WCRP should be to provide the science that underpins understanding and predicting of climate leading to societal benefits. A rapidly emerging demand is the need to provide climate information on regional scales whilst, from a scientific perspective, pursuing the research necessary to get the global scales right.

2.5.3 In addition the Review recommended to:

- Introduce clear priorities into WCRP as a whole, collaborating with other Global Environmental Change (GEC) programmes to take into account urgent science required for IPCC and other societal demands;
- Consolidate and strengthen its focus as a user and promoter of observations as well as its support of the components of the Global Climate Observing System;
- Set specific strategy and goals for building its scientific capacity in diversity of age and gender and or participation of developing country scientists in planning and research.

2.5.4 In response to this review, WCRP is devoting considerable resources to strengthen its relationship with key end-users of climate information and has developed an Implementation Plan for the next five years to guide it in this direction. The WCRP Implementation Plan 2010-2015 was published in August 2009 (WMO/TD-No.1503), it describes the major research activities and initiatives that WCRP will promote and undertake during the next several years. These activities/initiatives are based on the scientific challenges and opportunities of interest identified by the scientists involved in the Programme, as well as on the national and international scientific priorities that would most benefit from the coordination and integration that can be uniquely provided by the WCRP Projects and the Working Groups. In addition to the interdisciplinary research and modelling initiatives identified, the themes of regional climate assessments and climate information for decision-makers emerge with special emphasis as key activities for both intermediate- and long-term.

2.5.5 The World Climate Research Programme (WCRP) convened its annual Joint Scientific Committee (JSC) in Antalya, Turkey, 15-19 February 2010 (<http://www.wmo.int/wcrpevent/jsc31/>). The meeting had two main foci: the programme's long-term strategy and the role of WCRP research in the Global Framework for Climate Services (GFCS).

2.5.6 The agenda of the JSC Session in Turkey included a joint symposium on the role of Research in Climate Services with the WMO Commission for Climatology (CCI) as a part of the Technical Conference on Changing Climate and Demands for Climate Services for Sustainable Development (<http://www.wmo.int/pages/prog/wcp/TechnicalConferenceAntalya.html>) The main outcome of the joint symposium is to further strengthen collaboration between climate research and services in order to address the urgent needs for regional and national climate prediction systems with lead times from season to decades and longer towards meeting the need for climate information for adaptation and risk management. A joint statement was developed and approved by the participants (http://wcrp.wmo.int/documents/Resolution_CCI_WCRP_2010.pdf)

2.5.7 A joint session with the representatives of the National Meteorological, Hydrological and Climate Services organizations of Canada, France, Germany, Japan, United Kingdom, and United States of America provided valuable insight to the differing approaches being taken by these nations in developing their respective National Climate Services programmes and organizations. This dialogue helped in facilitating a some very productive discussions on how research activities coordinated by WCRP and its partners can be organized to have the optimum and timely impact on fast emerging needs for a variety of climate information for different economic sectors of interest in different regions around the world.

2.5.8 WCRP is organizing an Open Science Conference (OSC), with active engagement of the international climate research community to be held in 24-28 October 2011, in Denver, Colorado, USA. The OSC will offer an important forum to assess our current state of knowledge on climate variability and change, identify the most urgent scientific issues and research challenges, and ascertain how the WCRP can best facilitate research and develop partnerships critical for progress in science that can serve Climate Services of

the nations and regions around the world. More information on the conference can be found at: (<http://www.wcrp-climate.org/conference2011/>)

2.6 31st session of IPCC Plenary, AR5 process and Special Reports

2.6.1 The decision to prepare a Fifth Assessment Report (AR5) was taken by the IPCC at its 28th Panel Session in April 2008. The IPCC has started work on the preparation of the AR5 and has currently opened the nomination period for experts to act as authors and review editors for the contributions of the three Working Groups to the AR5. At the 31st Session of the IPCC (26-29 October 2009 • Bali, Indonesia), the outlines and schedule for the three Working Group contributions to the AR5 were agreed. The outlines were developed through a scoping process involving climate change experts from all relevant disciplines and users of IPCC reports, in particular representatives from governments, who gathered for the Scoping Meeting in July 2009 in Venice, Italy.

2.6.2 IPCC has invited governments and participating organizations to nominate experts who can act as Coordinating Lead Authors (CLA), Lead Authors (LA) and Review Editors (RE) for the AR5. The nomination period is open from: 15 January to 12 March 2010.

AR5 timing

2.6.3 The Working Group I report is scheduled to be finalized in September 2013, the Working Group II report in March 2014 and the Working Group III report in April 2014. The scope and content of the AR5 Synthesis Report will be developed in the course of the year 2010. The Synthesis Report is scheduled to be finalized in September 2014. A short summary description of the AR5 outline, as well as of new features and areas of emphasis is provided in the following link: <http://www.ipcc.ch/pdf/ar5/ar5-leaflet.pdf>

Special reports

2.6.4 Two Special Reports are currently under preparation, following the same procedures as for the Assessment Reports. The Special Report on “*Renewable Energy Sources and Climate Change Mitigation*” is carried out under the leadership of the IPCC Working Group III and will be released in 2010. The first Lead authors meeting has been held in January 2009 in San Jose, Brazil, and a second one will convene at the end of August.

2.6.5 This Special Report aims to provide a better understanding and broader information on the mitigation potential of renewable energy sources: technological feasibility, economic potential and market status, economic and environmental costs and benefits, impacts on energy security, co-benefits in achieving sustainable development, opportunities and synergies, options and constraints for integration into the energy supply systems and in the societies. It will also assess resources by region and impacts of climate change on these resources.

2.6.6 The report is structured with technology chapters - bio-energy, direct solar energy, geothermal energy, hydropower, ocean energy and wind energy - which will feed into the overarching chapters. A system integration chapter will be a key one, bringing all different aspects of energy demand and supply together. The report will finally consider the policy options, outcomes and conditions for effectiveness, and how the accelerated deployment could be achieved in a sustainable manner. Capacity building, technology transfer and financing in different regions will be assessed.

2.6.7 The preparation of the Special Report on “*Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*” commenced as its outline was approved by the Panel at its 30th Session last April. This Special Report will consider three types of extreme events: the ones for which climate change has or will amplify occurrence - as floods and droughts; the ones in which trends outside the domain of climate will increase exposure or vulnerability to

climate-related extremes - for instance coastal development increasing exposure to storm surges; and new kinds of potentially hazardous events and conditions that may occur as a result of climate change - such as glacial lakes outburst. The report will include 9 chapters. Three of them will focus on managing the risk at different levels in the society: community based responses; national scale and international responses. Two main case studies will be carried out throughout all chapters, while the last chapter will be entirely dedicated to case studies. The UN International Strategy for Disaster Reduction (ISDR) will participate in the preparation of the report which is planned to be released in 2011.

IPCC First Newsletter

2.6.8 The IPCC has issued its first newsletter on the web and has widely distributed it by e-mail. The newsletter includes a message from the Chairman of the IPCC, latest developments on AR5, calendar of AR5 related meetings, call for nominations for AR5 authors, news on the IPCC Special Reports, Task force on National Greenhouse Gas Inventories, Statements on the hacking of the East Anglia University email Communications, and finally Statements issued in January 2010 about specific findings in the AR4. The newsletter can be viewed at the following link: http://www.ipcc.ch/pdf/Newsletter/IPCC_newsletter_2010_issue_1.pdf

2.7 Progress report of 'Research Task Team (EC-RTT)

(to be submitted by President of CAS and AREP)



**Working together towards strengthened Research and Operations Linkages for
Enhancing the use of Climate Information**

**Joint Session of WMO Commission for Climatology and
Joint Scientific Committee for the WCRP**

STATEMENT

Antalya, Turkey, 18th February, 2010

We, the experts representing the World Climate Research Programme¹ (WCRP) and the WMO Commission for Climatology (CCI), having met in a Joint Session on 18 February 2010 at Antalya, Turkey, have deliberated on a number of issues of common interest and agree that our joint efforts are critical to comprehensively address the rapidly emerging societal needs for climate services for adaptation and risk management.

The World Climate Conference-3 (WCC-3), held from 31 August to 4 September 2009 in Geneva, decided to establish a Global Framework for Climate Services (GFCS) to strengthen the production, availability, delivery and application of science-based climate monitoring and prediction services. GFCS is designed to mainstream climate science into decision making at all levels and help ensure that every country and every climate-sensitive sector of society is well equipped to access and apply the relevant climate information. GFCS is proposed to have five major components: (i) Observations of the Climate system; (ii) Climate research, modelling and prediction; (iii) a Climate Services Information System; (iv) a Climate User Interface Programme; and (v) Capacity Building.

WCRP has successfully laid the scientific foundation for the current and future climate services. Its research projects, particularly those pursuing the coupled climate and Earth system models, are poised to push the frontiers of climate predictability further. It is recognized that while climate science has advanced significantly during the past three decades, many scientific challenges still remain. Climate research, including understanding, modelling and prediction aspects, helps characterize climate variability and change and to generate quantitative climate predictions and climate projections, on a range of time and space scales, providing a key pillar for the GFCS.

CCI has worked over the years through the World Climate Programme (WCP) and its components (WCASP: World Climate Applications and Services Programme; WCDMP: World Climate Data and Monitoring Programme) to support provision of climate services, including WMO's Climate Information and Prediction Services (CLIPS) project. Climate Services

¹ co-sponsored by the World Meteorological Organization (WMO), the International Council for Science (ICSU) and the Intergovernmental Oceanographic Commission (IOC) of the United Nations Educational, Scientific and Cultural Organization (UNESCO)

Information System (CSIS), as a component of GFCS designed to deliver the climate information that users need, will be based on the three-tiered structure of entities at global, regional and national levels that have been initiated, developed and promoted through collaborative efforts of CCI and Commission for Basic Systems (CBS). They include Global Data Centres and Global Producing Centres of Long Range Forecasts (GPCs) and other global climate prediction centres, Regional Climate Centres (RCCs) and other regional institutions, National Meteorological and Hydrological Services (NMHSs) and National Climate Services (NCSs), and would be required to be expanded and strengthened under GFCS.

To support the successful implementation of GFCS, WCRP and CCI agree to closely collaborate to address the following topical issues of direct relevance to climate adaptation and risk management in general and the GFCS in particular:

1. Strengthen and mainstream research observations to serve as prototypes for future climate observing systems, in cooperation with GCOS and WIS;
2. develop climate prediction systems with lead times from seasons to centuries;
3. ensure development of reliable high-resolution products needed for climate adaptation and risk management;
4. promote interdisciplinary research to develop sector applications, tools and tailored information;
5. facilitate flow of user requirements to the research community and climate services producers through user feedback;
6. support the RCCs, NCSs and the Climate Outlook Forums (COFs) mechanism as well as consensus assessments (Annual State of the Global Climate);
7. foster links between WMO Regional Associations (RAs), NMHSs, WCP, CCI and WCRP, for regional and national activities
8. improve the availability of highly-skilled talent to undertake climate research, operational prediction, and communication, particularly in the developing countries;

Having benefited from collaboration between WCRP and CCI in the past and in order to further strengthen this collaboration to achieve the above objectives, the WCRP and CCI agree to establish a joint collaborative mechanism and will seek further partnership with other WMO Technical Commissions, Programmes, co-sponsored Programmes, and other Research entities. The cooperative mechanism will include e.g. attendance to respective high level bodies of each entity (WCRP JSC, CCI sessions), organization in common of climate-related events (CCI Technical Conferences, WCRP Open Science Conferences), Joint Expert Teams on issues of common interest (such as the successful existing Joint CCI/CLIVAR/JCOMM ETCCDI), joint publications, etc.

Extract from WCC-3 Conference Statement, paragraphs 61 to 64 of section 4.1 "The essential role of climate observations"

WCC-3 Conference Statement, paragraphs 61 to 64 of section 4.1 "The essential role of climate observations":

61. Long-term observation of the atmosphere, land and ocean is vital for all countries, and must be funded for the public good as economies and societies become increasingly affected by climate variability and change. The climate-relevant components of the various global, regional and national observing networks that have been incorporated under the auspices of the GCOS since 1991 have provided most of the data used for climate analysis, prediction and change-detection. They have demonstrated that warming of the global climate system is unequivocal and have provided information on climate patterns and trends at regional and national scale.

62. The networks must be strengthened and sustained in order to monitor climate variability and change, and to evaluate the effectiveness of the policies implemented to mitigate change. Observations are needed to support improvement of climate models, to initialise and enable effective use of model predictions to decades ahead and to guide the use of models for longer-term scenario-based projections. Observations are needed to assess social and economic vulnerabilities and develop the many actions that must be taken to adapt to climate variability and unavoidable change. They must be recognised as essential public goods where the value of global availability of data exceeds any economic or strategic value of withholding national data.

63. Full implementation of GCOS is essential for supporting both the adaptation and the mitigation objectives of the UNFCCC, and for ensuring that all countries will be able to manage their response to climate variations and change through the 21st Century.

64. The observational experts at the Conference accordingly agreed on the following recommendations:

- *Long-term sustenance of observing systems.* The established in-situ and space-based components of GCOS should be sustained and operated with continued attention to data quality and application of the GCOS Climate Monitoring Principles (4.1.a);
- *Improvement of operation and planning.* The operation and planning of observing systems should be improved, so as better to identify deficiencies, achieve resilience, and assure reliable and timely delivery of good-quality data, traceable to international standards (4.1.b);
- *Enhancement of observing systems.* Enhancements to observing systems should be implemented wherever feasible, filling gaps in spatial coverage and in the range of variables measured, improving measurement accuracy and frequency where needed, increasing use of operational platforms for satellite sensors, ensuring adequate monitoring of urban and coastal conditions, and establishing key high-quality reference networks (4.1.c);
- *Improvement of data services.* Improvements should be made to the rescue, exchange, archiving and cataloguing of data, and to the recalibration, reprocessing and reanalysis of long-term records, working towards full and unrestricted access to data and products (4.1.d);
- *Observations for adaptation planning.* All countries should give high priority to the observational needs for adaptation planning, identifying their needs in National Adaptation Programs of Action where applicable (4.1.e); and

- *Regional implementation of GCOS.* Developed countries should commit to assist developing countries to maintain and strengthen their observing networks through support for updating, refining and, most importantly, implementing the GCOS Regional Action Plans and other regional observational and service initiatives such as ClimDev Africa, GOOS Africa, and Pacific Islands GCOS (4.1.f).”