WORLD METEOROLOGICAL ORGANIZATION

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MEETING OF THE EXPERT TEAM ON
CLIMATE AND HEALTH

LONDON, UNITED KINGDOM
20 – 22 NOVEMBER 2006

EXPLANATORY MEMORANDUM

NB1: keywords below are hyperlinked to relevant embedded documents in this file.
NB2: Actions required of the participants prior to the meeting are written in bold red text.

1. OPENING OF THE MEETING

The Meeting of the Expert Team on Climate and Health will take place from 20 – 23 November 2006 in London, UK. The meeting will be opened at **0900 on Monday, 20 November** at King's College London, London, UK on the Stand Campus (Pyramid Room, Department of Geography, South Range, King's Building, King's College, Strand, London). The members of the Expert Team on Climate and Health, invited experts and observers will meet to review progress of ongoing climate and health activities that were initiated under CCI-XIII (2001) and to discuss the future work of the Team. **The WMO Secretariat, the president of the Commission for Climatology and the ET lead expert, Prof. Glenn McGregor, will deliver opening and welcoming remarks**, and will provide an overview of the objectives and anticipated outcomes of the meeting.

2. ORGANIZATION OF THE MEETING

Participants will be introduced. The meeting will then agree on a Chairperson (e.g. the ET lead), who will invite the meeting to consider the provisional agenda, with a view to its adoption. Participants will agree on details concerning the organization of the work, including working hours and breaks, and will nominate rapporteurs for keeping the record of the sessions. Participants will be requested to present a brief summary, for the text of the final report, of the key points in any reports or presentations they make. The rapporteurs will keep a record of the decisions and actions from the discussions, and will provide these to the chair during the meeting, so that the meeting can review and approve them prior to closure of the session (agenda item 10). The working language of the meeting will be English.

Prof McGregor will describe the change of venue for days 2 and 3 of the meeting (info note).

3. ASSESSMENT OF GLOBAL AND WMO/CCI CLIMATE AND HEALTH ACTIVITIES

3.1 Presentations on areas of expertise of participants

Each participant is requested to give a brief (5-10 minute) overview of their areas of expertise including priorities and existing areas of partnership and collaboration in climate and health in their regular work. In addition, **Larry Kalkstein, Glenn McGregor and Pierre Bessemoulin will each discuss their accomplishments with respect to development of Heat-health Warning Systems (HHWS) and progress made in writing the WMO/WHO Guidelines on HHWS. Bettina Menne or her representative will present WHO perspectives including the activities of Euroheat and cCASH. Gerd Jendritzky will inform the ET on progress with development of the Universal Thermal Climate Index (UTCI)**. (If possible, provide materials to Secretariat by 15 Nov)

3.2 Discussion on potential areas of collaboration and development of a global network of climate and health experts

The group will build on existing and discuss potential partnerships, with a view to (eventually) identifying a global network of climate and health experts who would be willing to assist the Secretariat and the Commission develop a virtual library of published literature, outreach products (print, Internet-based, etc) for raising public and NMHS and health sector awareness of climate-related health risks and technical documents (Guidelines, technical Notes, articles for the WMO Bulletin, etc.).

3.3 Review of the Terms of Reference of the ET, discussion on key priorities

The president of the Commission will provide a brief review of the CCl structure established at the fourteenth session of the Commission for Climatology (CCl-XIV, November 3-10 2005, Beijing China), introduce the Terms of Reference for the team, and then will describe the development of a workplan of SMART objectives, based within the broad ToRs. **Mr Bessemoulin will introduce the initiative to work with WMO's Disaster Prevention and Mitigation Programme to take the HHWS concept into implementation phase**, through a number of field tests, demonstration projects, intercomparisons and evaluations. **The Chairman** will lead the preliminary discussion of the priorities for the team (**annotated ToRs** may be presented).

4. GUIDELINES ON HEAT-HEALTH WARNING SYSTEMS

The meeting will review of the available draft chapters of the Guidelines, discuss any revisions needed to the original outline proposed at the Freiburg meeting in 2004, steps needed to complete the draft, deadlines for its completion, and identify who will be responsible for each task. Note that at the Freiberg meeting, many of these tasks were assigned, but the constituency of the team was changed at CCl-XIV. The meeting will also discuss the CCl/WCP and DPM regional field-testing/demonstrations and will identify in which ways the ET would interact with and support this activity. Note that the final version of the Guidelines, the high-level overview on issues of heat and health and on HHWS, is required by end March 2007, for presentation to Congress (May 2007). The meeting will be informed of WCP activities to develop and publish a booklet on heatwaves.

5. POTENTIAL APPLICATIONS OF SEASONAL FORECASTS IN HEALTH PLANNING AND DECISION MAKING

Medium to long-range climate forecasts (10-30 day to one season ahead) provide the opportunity to identify in advance the possible occurrence of anomalous climate conditions that may have discernible health impacts. Compared to assessments of the utility of this type of information for other sectors, such as agriculture and water, health has received little attention. The meeting will therefore discuss a programme of work, leading to a review paper, focused on assessing the utility of seasonal climate forecasting for planning and decision making in the health sector. Although not exhaustive, topics to be covered in the discussions will include realistic target health outcomes and regions; the status of seasonal climate forecasting for target countries, including an overview of activities in the area of seasonal prediction of disease outbreaks; data set availability for developing seasonal climate forecasting models, likely barriers to the uptake of seasonal climate information by the health sector and possible authors of the review paper. The WHO publication (provided to all ET members by mail, and available at: http://www.who.int/globalchange/publications/infectdiseases/en/index.html) may serve as one reference document for this discussion. Further sources of background

information include:

- a short review on seasonal climate forecasting with a tropical focus: http://www.cru.uea.ac.uk/tiempo/portal/archive/issue33/t33a3.htm

- some information on Malaria Early Warning Systems: http://iri.columbia.edu/impact/project/MalariaEarlyWarn/ http://www.cru.uea.ac.uk/tiempo/portal/archive/issue33/t33a3.htm

- M. Thomson et al, (2005) Am. J. Trop.Med.Hyg. (malaria index)

- M Thomson PowerPoint presentation at the LWCVC Conference available at: http://www.livingwithclimate.fi/linked/en/Thomson.pdf

6. STRATEGIES FOR ASSESSING ATTRIBUTION OF OBSERVED HEALTH TRENDS TO OBSERVED CLIMATE CHANGE

The majority of the climate science community now accepts that anthropogenic activity over the last century has had a discernible impact on global climate. However what is less clear is how observed climate change may have had an impact on trends in the global burden of disease. Recently one estimate (Patz et al., 2005), based on standard epidemiological approaches, has put the annual toll attributable to climate change over the past 30 years at over 150,000 lives. The meeting will discuss the current methods used for assessing the contribution of climate to the global burden of disease from a climate perspective and assess whether climate change and health experiments could be designed to shed light on the association between trends in observed climate and a variety of health outcomes.

Patz JA, Campbell-Lendrum D, Holloway T, Foley JA. (2005): Impact of regional climate change on human health. *Nature* **438**, 310-317. doi:10.1038/nature04188

7. UNCERTAINTIES ASSOCIATED WITH CLIMATE CHANGE HEALTH IMPACT ASSESSMENTS

In applying and interpreting climate change scenarios for health impact assessment, the inherent uncertainty in the scenarios needs be acknowledged. Sources of uncertainty are the climate models themselves (model physics), assumptions about future levels of Greenhouse Gas emissions (influenced by global fossil fuel consumption, economic and population growth rates) and the robustness of the climate health transfer functions forced by variables derived from climate change experiments. Notwithstanding these concerns, many climate change health impact assessments use the output from climate change experiments unquestioningly. The meeting will discuss the potential sources of uncertainty in climate change related health impact assessments with a view to formulating a position paper on this topic for distribution to the climate impacts community.

8. DEVELOPMENT OF CLIMATE/HEALTH OUTREACH MATERIALS

Although climate has both direct and indirect impacts on a range of human activities its role as a health stressor remains poorly understood not only by many in the broad health science community but also by the public in general. This is of concern because a perquisite for a society prepared for the vagaries of climate is a good understanding of the role that climate plays in determining health outcomes at a variety of spatial and temporal scales. Outreach therefore has an important role to play in the “climate education” of society from the political to individual level. Accordingly, the meeting will identify priority areas for beneficial outreach

materials and propose a timeframe for producing materials, with assigned tasks. One useful product will be a banner, similar to one developed for climate and energy. One banner will be developed for each of the applications sectors CCl is working in.

9. ESTABLISHMENT OF A WORKPLAN (2006-2009)

The meeting will summarize requirements for completion of any outstanding work from the thirteenth intersessional period of the Commission for Climatology, and will establish a Workplan with SMART goals, along with assignments of tasks and deadlines, for those and any new work to be undertaken. Work to be reported to the fifteenth session of the Commission (2009) must be completed by April 2009.

NB3: This present meeting is the only one scheduled in the fourteenth inter-sessional period for the Commission (i.e. 2005-2009). However if the proposed CCl/WCP/DPM project is funded, there will be additional opportunities. As well, teleconferences can be arranged as needed.

10. REVIEW AND APPROVAL OF DECISIONS AND ACTIONS

The meeting will review the decisions and actions from the session and will approve these. Copies of these key results, as well as copies of all presentations made during the session and the minutes from each rapporteur, will be provided to participants before the end of the session (Memory sticks are useful for this procedure, but all materials will be posted on the meeting web site as well).

The participants will decide on the process and timeframe for development and review of the meeting report.

11. OTHER BUSINESS

Any other issues pertinent to the meeting or to the work of the ET can be discussed.

12. CLOSURE OF THE MEETING

The meeting is scheduled to end at 16h00 on Wednesday, 22 November 2006.

Terms of Reference (ToRs) for ET 4.1
http://www.wmo.int/web/wcp/ccl/opags/opag4/ET4.1/ET4.1_Members_ToRs.htm

Note that in the General Summary Text of the proceedings of the fourteenth session of the Commission for Climatology (3-10 November 2005, Beijing China) it is noted (item 11.2.6(g)) that the Terms of Reference are broad, long-term goals that constitute a framework to guide the work of the Expert Team (ET), and that each ET will set workplans with **S**pecific, **M**easurable, **A**chievable, **R**ealistic and **T**ime-bound (**SMART**) goals consistent with that framework (see 4.1.3 below)

(a) To improve the knowledge of relationships between environmental factors (meteorological parameters, air pollution, housing, …) and reactions of the human organism;
(b) To complete and distribute the WMO/WHO Guidelines on Heat-health Warning Systems and health-related assessments of the thermal environment which will include procedures that could be used worldwide by both climate and health specialists to develop and operate heat/health and cold-spell/health warning systems, and to make recommendations on regional workshops for implementation of the new procedures;
(c) To recommend further actions to make health-related warning systems a fully integrated part of CLIPS operations, Climate Watch and Disaster Prevention and Mitigation (DPM) systems;
(d) To identify the needs of the health sector for climate information including monthly to seasonal predictions (for planning and in early warning systems) and considerations of climate change, particularly focusing on climate information relevant to increased risks of infectious diseases (e.g. Yellow Fever, Cholera, West Nile Fever, Malaria, Dengue Fever, Influenza, meningitis and possibly Severe Acute Respiratory Syndrome (SARS) and Avian Influenza);
(e) To consider possible coincidences between temperature extremes and air quality extremes in the different climate regions, and to study health effects of these multiple stress events;
(f) To develop, in partnership with NMHS climate services programmes, the WMO Regional Associations and relevant partners in the health sector, useful and understandable tailored climate products for application to health, including specific attention to high latitudes (role of climate variability and change on health of people and in communities in Polar Regions);
(g) To identify the international and national groups (e.g. the World Health Organization, the International Society of Biometeorology, the International Association of Urban Climatology, and including programmes within NMHSs and in WMO such as Public Weather Services on biometeorology, and the AREP GURME project) with active programmes in climate and health, to gather information on their areas of interest and expertise, and then to investigate potential synergies and projects with these groups;
(h) To incorporate the WMO cross-cutting themes (on Disaster Prevention and Mitigation, Space/GEO and Least Developed Countries) into planning and activities of the ET, and to collaborate as needed with experts (across all related disciplines) in other CCl ETs, in ETs of other WMO Technical Commissions, and in relevant external Organizations;
(i) To provide guidance on, and make recommendations for, the design and conduct of specific demonstration and pilot projects, including the calculation of cost/benefits and value of climate predictions from the user point of view;
(j) To explore, document and make recommendations for addressing the needs for capacity building in each region, pertinent to this topic;
(k) To submit reports in accordance with timetables established by the OPAG chair and/or Management Group.

Outline of the HHWS Guidelines (extract from the Freiburg meeting, April 2004)
(full report: http://www.wmo.int/web/wcp/clips2001/html/HHWS_docs/HHWS_%20FinalReport.doc)

The CCl joint meeting on HHWS (Freiburg, Germany, April 2004) developed and approved the following outline for the Guidelines on HHWS (agreements on assignments/responsibilities for development of the Guidelines and deadlines for the work are embedded). The meeting further noted that section 5 'Approaches to and data requirements for HHWS' is the key one for the Guidelines. All approaches must be discussed in reasonable detail. The simple techniques included should have enough information for full implementation. The more complex/sophisticated systems described could be elaborated on (and technology shared) through capacity-building training workshops.

It was further noted by the meeting that WMO guidance must be useful to all Members, regardless of the socio-economic status of the country. Intervention strategies must therefore cover a range of options for both developed and developing nations.

Guidelines for Heat/Health Warning Systems - Outline

1. Introduction
(Abdel Maarouf → max. 1500 words)

- Global issue, spatial and temporal distribution of heat waves all over the world; India, South America etc.; WMO Bulletin?
- Refer to climate change as a risk factor, however, these guidelines are not about climate change but "normal" climate variability
  → it's important now, and will be even more important in the future
- Introduction of the guidelines
- Introduction about CCL and Expert Team (reference to PWS guidelines Chapter about heat waves; Background to guidelines (how we got here?)
- Seamless Service (all time scales; etc.); cross-cutting activity; emphasise the fact that heat and health is a cross cutting issue; cutting also across major agencies (WMO; WHO)
- Raising awareness of health problems during heat waves
- Tasks of National Meteorological and Hydrological Services (NMHSs) → single voice principle (NB: only NMHSs can issue weather/climate warnings)
- Interagency benefits; collaboration with other sectors (e.g. WHO) and programmes
- Focus: guide the Public Weather Service up to the interface to the public health part; then facilitate the interface
- How to use these guidelines
- Benefits to the users and end-users
- HHWS is part of the service (value added)

2. Heat as a health problem: impact of heat on human health, thermophysiology (WHO/WMO; Bettina Menne → 4000 - 5000 words)

- Direct and indirect heat-related deaths → risk factors of heat-related mortality/morbidity/well-being
- Vulnerability, sensitivity (socio economic factors, demographics (health status), other confounding factors)
- Symptoms of heat illness
- Centre for Disease Control guidelines; International Federation of Red Cross and Red Crescent Society (etc.) homepage(s) (McGeehin et al. (B. Menne to add names)
- Other impacts of heat waves

3. What is a HHWS?
(Suresh Boodhoo → 1500 - 2000 words)

- Parts of a warning system:
  - Detection of warning; Communication; Response
- Kind of events (Refer to section 5.4 of PWS doc)
  - Fast moving, slow onset
- Where HHWS are in place now
- Purpose of HHWS
- Definitions
- Benefits of HHWSs (refer to section 2.3 of PWS doc)

4. Potential users or stakeholders
(Jianguo Tan → 1000 words)

→ Refer to chapter 4 and 9 of PWS document

- Engaging users and stakeholders (WHO to help to identify users; stakeholders)
- Communication
- Identification of users and end-users and their needs
- System should not be developed in isolation
- Timeliness of the warning

5. Approaches to and data requirements for HHWS; Development of HHWS (Gerd Jendritzky; Glenn McGregor; Larry Kalkstein
→ min. 10 000 words)

→ broad overview; general principles behind the approaches; main pros and cons of each approach; description in general terms
→ decision which approach to be taken by the NMHSs
→ criteria for issuing warnings; offer options (based on approach selected)
→ technology transfer (workshops)

- Simple met. indices (e.g. Ta, rh)
- Simple human biometeorological indices (AT)
- Human energy balance based indices; heat budget models (Gerd)
- Synoptic approaches, air mass based approaches (Larry)

6. Implementation and dissemination of Heat/Health Warnings
(Tanja Cegnar → 5000 words)

- What to do with the information after the computer has produced the numbers
- Relates also to the criteria of issuing a warning
- How to implement a warning; contact stakeholders
- Include different lead times (general public; stakeholders)
- Interface definition
- Operational questions
  - → refer to chapter 7 of PWS document

7. Intervention strategies
WHO → relevance; applicability and effectiveness;
Larry Kalkstein → max. 5000 words (1. Draft))

→ address the issues so that people start to think about it

→ case studies in boxes

- Making a HHWS work
- Mention explicitly long-term intervention measures (climate-related design)
- Locally adjusted interventions
- What is possible; interventions

8. Risk communication; Awareness
(Tanja Cegnar → 3000 words)

→ Refer to chapter 9 of PWS doc

- Perception of people what would be a credible source of information
- How to get a message across
- Language to be used in the message creation
- Lead time of the warning
- Start of the heat wave season
- Raising public awareness (e.g. a WMO world heat wave day)

9. Evaluation; Effectiveness
(Paola Michelozzi → 3000 words

→ Refer to Chapter 10, PWS doc
→ Evaluation of the public response necessary;
no detailed advice
by an independent "group"

- Feedback loops
- Evaluation of the performance of the system
- Evaluation of the "effectiveness"

10. Policy and resource implications of HHWSs
(Wolfgang Kusch; Tom Kosatsky (WHO regional Office for Europe, Rome) → 2000 - 3000 words)

- Technical resources; human power resources; financial resources; needed infrastructure
  → for both meteorological and health questions and others (fire, social, emergency...)

11. Future trends / outlook
(Glenn McGregor, Gerd Jendritzky → 1000 words)

→ Refer to Chapter 11 PWS doc

- Seasonal, medium to long-range forecasting
- Heat wave climatology
- Distribute information by special centres
- Health surveillance systems

BIBLIOGRAPHY

APPENDIX

- Examples of HHWS (Showcase; ICARO)
  → Please ensure political and institutional correctness (if possible show regional balance/coverage in the examples used).