

**WORLD METEOROLOGICAL
ORGANIZATION**



**ORGANISATION MÉTÉOROLOGIQUE
MONDIALE**

COMMISSION FOR CLIMATOLOGY
OFFICE OF THE PRESIDENT

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BUREAU DU PRÉSIDENT

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Annex: 1

Subject: Circular Letter No. 4 of the President of CCI

Dear Colleagues and Friends,

I am pleased to send you the fourth circular letter of the current intersessional period. The CCI Management Group is scheduled to meet in October, which will be our last Management Group meeting before CCI-16 where a new Management Group will be selected. While most of this letter focuses on the future, I will briefly introduce you to two of our key volunteers and touch on a little bit of CCI-related recent science that you may find interesting.

Yours sincerely,

(Thomas C. Peterson)
President
Commission for Climatology

To: Members of the Commission for Climatology
Members of the CCI Management Group and OPACEs

cc: Secretary-General, WMO)
Presidents of technical commissions)
Presidents of regional associations)
Chairpersons of regional associations' working groups) (for information)
and regional associations' rapporteurs dealing with)
CCI-related matters)

WORLD METEOROLOGICAL ORGANIZATION



CIRCULAR LETTER NO. 4 (MAY 2013) OF THE PRESIDENT OF COMMISSION FOR CLIMATOLOGY

I. Transitions

In March while participating in the International Workshop on Climate Data Requirements and Applications in Nanjing, I asked our China Meteorological Administration (CMA) hosts if it would be possible to have a tai chi class some evening. They graciously agreed and, as you can see in the photograph below, it was enjoyed by about 20 scientists from over a dozen countries. After teaching us a few moves, the tai chi instructor focused our attention on creating smooth transitions so we would flow from one position to another. The importance of smooth transitions is not limited to tai chi. Indeed, next year when all the current CCI teams end and new teams are created, it will be important to create smooth transitions from the old to the new.



II. The Best Way to Predict the Future is to Create It

The President of WMO asked all the Commission Presidents to describe their Commissions six years from now when the Global Framework for Climate Services (GFCS) is up and running. To do this requires identification of major trends in climatology. After consultation with the CCI Management Group, particularly William Wright (Australia), Jean-Pierre Ceron (France) and Rodney Martinez (Ecuador), we identified eight megatrends that will not only shape CCI because we will put more focus on them but also will be shaped by CCI. These trends can also help inform the CCI Management Group as we draft a recommended structure for CCI for the next intersessional period which starts in July of 2014. Here are our assessments of these trends and how CCI will be moving to address them in the future.

1. The digital revolution will continue, making telecommunications less expensive and more widespread. In climatology this will likely mean more automated weather stations. Indeed, a friend at CMA told me that China plans to have 100,000 automatic rain gauges in operation by the end of this year. CCI will need to help ensure high standards among a

potential plethora of new observations. We will have an ongoing role to better help individual National Meteorological and Hydrological Services (NMHSs) archive, manage, process and exchange their data, both to fulfill national needs for climate services and to contribute to global climate monitoring. CCI will continue to provide advice, guidelines and training in climate data management systems, especially management systems that will be capable of tracking the different types of in situ observations. Blending of conventional and automated observations, and for that matter remotely-sensed data, will need to be carefully managed. A challenge will be to ensure both conventional and automated observing stations are sustainable, particularly in developing countries and at significant climate stations such as the GCOS Surface Network Stations.

2. Increasing partnerships. Meteorological Services are increasingly seeing that they cannot do everything their citizens need, nor do they have to. For example, of the 100,000 automatic rain gauges in China mentioned in the previous section, CMA will operate 50,000 and the Ministry of Water Resources will run the other 50,000. Over the past decade we have seen increasing collaboration between NMHSs and universities in regions where there used to be a lot of rivalry. WMO Regional Climate Centers (RCCs) and Regional Climate Outlook Forums (RCOFs), along with their associated regional coordination and collaboration, are increasing and within six years will have covered the world. Collaboration with private industry is now probably part of every Met Service's operating plan whether it simply involves assisting in the delivery of information through publishing weather forecasts and warnings in newspapers and broadcasting them on television, or in the generation of information. CCI will continue our focus of support and encouragement for RCCs, regional climate outlook forums, and other international partnerships in addition to the joint teams we already have with CLIVAR, JCOMM, CBS, CAgM and CHy.

3. Increasing openness of data. For those of us working in global climate change analysis this isn't moving as fast as we would like, but changes are clearly underway. More and more NMHSs are realizing that data only have value if people use them and the more useful the data are perceived to be the easier it is to get support for making the necessary observations. Last year Brazil opened its data archive and earlier this year Israel did the same. The WMO Executive Council created a Task Team¹ to address national data policies guided in part by the realization that for the GFCS to succeed it will need more data. While I'm a member of the team, the real importance of this team's work is highlighted by the fact that the WMO President is chairing it. CCI will continue to support efforts to make more data available whether they are real-time data transmitted over the GTS or efforts like the *International Surface Temperature Initiative*,² which focuses on historical data.

4. Increasing diversity of data and tools. Most climatologists still primarily focus on in situ data. But increasingly we rely on a comprehensive spectrum of tools such as climate models, reanalyses, and remote sensing products. Our viewpoints are now often the result of merging information from the past, the present and the future – no single part of this continuum can be removed without losing valuable insights into the problems at hand. CCI addresses historical data management in OPACE I, climate monitoring and assessment in OPACE II, seasonal forecasts and operational systems in OPACE III, and risk assessments in OPACE IV. Already we've seen collaboration between our Panels, for example, with OPACE IV sponsoring an OPACE II workshop in South America. But the future of CCI and global climatology will likely involve much more collaboration and integration between these

¹ See http://www.wmo.int/pages/governance/ec/tor_en.html#cdpe for more information.

² For more information see <http://www.surface temperatures.org/>

domains, particularly in the context of the GFCS. CCI will also have a major role in establishing quality standards and protocols, and supporting capacity development for climate services, especially in developing countries.

5. Increasing citizen scientist participation. No longer satisfied just to be passive consumers of information, more and more people are interested in pitching in to help generate the information. For example, digitizing old weather records is a time consuming and expensive task. Yet through harnessing the contributions of 16,400 volunteer citizen scientists, since October 2010, OldWeather.org has managed to digitize more than 1.6 million observations from the 19th and early 20th Century U.K. ship logs. Another example is precipitation observations. In areas with convective storms, exactly where the rain gauge is located, as illustrated by this photograph³ of a rain shaft, may determine whether it recorded a lot of rain or no rain at all. The cocorahs.org network, using inexpensive plastic rain gauges, has grown in the last decade to 16,000 volunteer observers, mostly in the U.S. but with a few in Canada as well. To help encourage the growth in volunteer observing networks, CCI recently made the two leads of cocorahs.org CCI rapporteurs for volunteer networks. In this role, they will lend their expertise to any NMHS or other organization interested in using this inexpensive way to expand their observing networks and involve citizen scientists.



6. Increasing visibility and appreciation of climate information. The most obvious manifestation of this is the Global Framework for Climate Services itself. But it is more than GFCS. It is the reason why GFCS was created in the first place. Indeed, we would be surprised if an increasing demand for services associated with climate change adaptation and emergency management and response, did not arise. Furthermore, while there is a lot of discussion about adaptation for climate change, every year many parts of the world experience events that clearly indicate that society there is not adapted to the current climate, let alone the future. CCI will continue to encourage and guide NMHSs and RCCs in the generation of the products and data that people need.

7. Increasing demand for tailored information. There is an increasing realization that the agricultural sector, for example, has different climate information needs than the health sector. For both risk management and effective decision making, they need tailored information provided in a timely fashion. Climate scientists will increasingly be required to provide their data in actionable forms, and to truly understand and address the needs of those trying to use climate services. CCI has already started to address this issue with an expert team on climate risk and sector-specific climate indices. But because our stakeholders are learning fast, when GFCS is fully up and running in six years, CCI will need to provide an increasingly wide range of specific guidance on tailored climate information. To accomplish this will require increased efforts to understand the needs of our users. The current task team on user participation in climate outlook forums is an example of one effort to create user feedback.

³ Photograph by Henry Reges, one of CCI's new rapporteurs for volunteer networks.

8. Increasing need for near real-time climate information. Coming full circle, this last item ties back to the first item, the digital revolution. The digital revolution is also making more and more people able and interested in obtaining data that were observed only a few minutes ago. In the past, climatologists primarily focused on after the fact statistical analysis of historical data but we are moving into an era where addressing today's data today are increasingly important. This will require data and information providers to be very reactive and flexible. CCI in turn will need to make sure the tools we provide to NMHSs are designed to be easily updated with the latest climate data and information.

III. Planning for the next Session of the Commission for Climatology

Deutscher Wetterdienst has graciously offered to host the 16th Session⁴ of the Commission for Climatology (CCI-16) in early July of 2014 in lovely Heidelberg, Germany (as a tentative venue subject to formal arrangements). The last time the full commission met was in Antalya, Turkey, in February of 2010. There representatives of 86 WMO Member States spent most of their time editing documents, creating the teams and the structure of CCI for this intersessional term, and deciding on CCI leadership. At the end of the meeting, a friend noted that his country paid for his travel and his salary for the entire meeting while a nearby country did not send anyone. Then he asked me what benefits his country received that the other country did not? Alas, I did not have a good answer for him at the time and that not only frustrated me then but has gone into shaping three thoughts I have about how we could improve the next CCI meeting.

The first is to be sure not to waste anyone's time in group editing of unimportant parts of documents. So unlike last time, a sentence that few people will ever read again would not need to have a more precisely accurate adverb edited into it. This will require us to separate out the action parts of the documents, such as the terms of reference of Expert Teams which do need careful editing and agreement, from general information which we should not bother to spend time editing. Doing this will require us to make sure (a) that there are no commitments hidden in the overview verbiage that might later be used for justification of some endeavor with the words "CCI-16 said it wanted us to . . ." and (b) to make it clear that CCI is only agreeing to the content of the more limited documents that we edit.

The second is to open up CCI team member selection so delegates would have a larger role in shaping the future of CCI (and through CCI, global climatology in general). The President and Vice-President are elected by the delegates. As in past years and probably next year as well, a nominating committee will need to be created to select candidates for the CCI OPACE co-chairs to make sure we have appropriately complementary skills which include diverse perspectives. But actual team membership selection is a different story. In the past the selection has been done two different ways that I know of. One was by the nominating committee at the full CCI session and the other was by the CCI Management Group several months after the meeting. Both approaches suffer from the limitation that only a few individuals are making all the decisions and those few individuals can't possibly know the qualifications of all potential members. So another possibility would be to schedule time during the CCI meeting for members of each regional organization to meet and identify one person from their region for each team. The CCI Management Group would meet later to select the last two members of the 8 member teams and determine the team leads and, in

⁴ It is called a Session but looks a lot like a meeting. See <http://www.whycos.org/WMO/cclxv/slideshow/ccl-xv/index.html> for photographs from CCI-15 to see what I mean.

the case of joint teams where CCI only provides 4 members, determine which 4 of the 6 regional nominations should be on the team and which one is the CCI lead.

The third idea, one that builds on the success the previous meeting, is to create an excellent joint technical conference⁵ with the World Climate Research Program (WCRP) that would provide insights many of the delegates would find useful when they return home. In addition, we should consciously create opportunities for side meetings so delegates can take advantage of colleagues being present to discuss issues of mutual interest.

IV. Profile of two CCI Volunteers: OPACE I: Climate Data Management's Co-Chairs

Dr. William Wright is the current head of the Australian Bureau of Meteorology's Climate Data Management section. He has had a lifelong interest in weather and climate, and has taken his own weather observations since the age of 11. Before becoming a data manager he completed a Ph.D. on factors influencing southeast Australian rainfall variability (undertaking some of the early work linking ENSO, sea surface temperatures and Antarctic sea-ice to Australian climate), followed by stints as a weather forecaster, in climate analysis and prediction, and published a book on major climate events in Australia over the 20th Century. He has undertaken a considerable amount of work on climate data rescue and climate data management system deployment in the South Pacific. William works in Melbourne, but lives with his wife and



three children on a farm in an idyllic rural location well east of Melbourne.



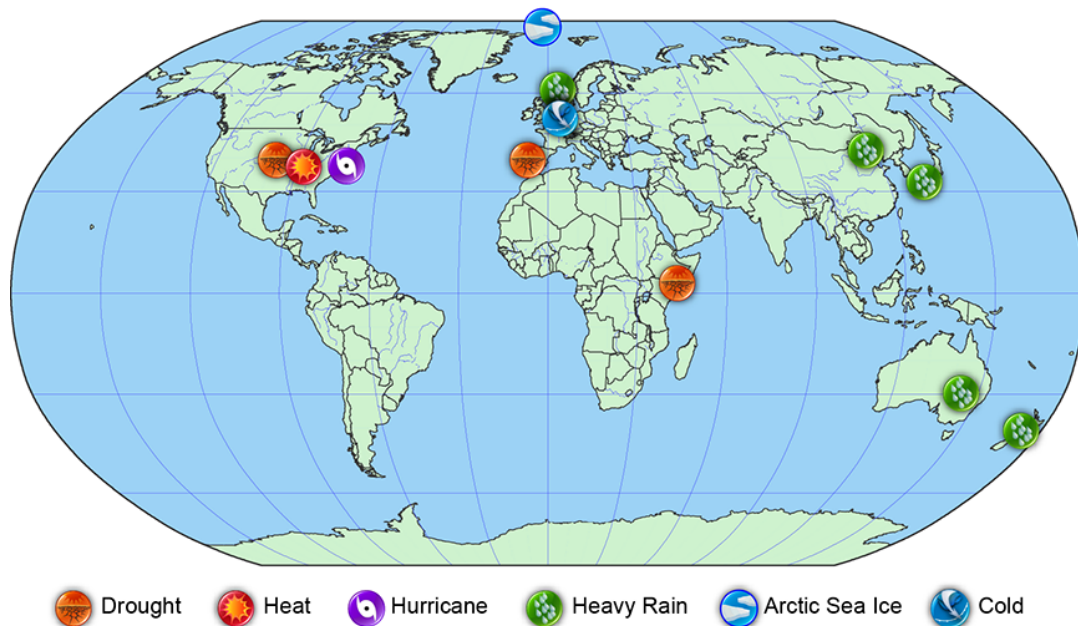
Dr. Lianchun Song is currently the Director-General of the National Climate Center of the China Meteorological Administration (CMA). From 1986 to 1994, he worked in the area of climate impact assessment in the National Meteorological Center of CMA. From 1994 to 1999, he served as the Director of Climate Data Center in National Meteorological Center. From 2001 to 2006, Dr. Song served as the Director-General of the Gansu Meteorological Bureau and then from 2006 to 2007 as the Director-General of the Department of Forecasting Service and Disaster Mitigation in CMA. He was the Director-General of the Meteorological Observation Center of CMA from 2007 to 2010. He has published two books: *Climatological Atlas of China* and *The Meteorological Research in Arid Regions*.

⁵ If you have any recommendations for what the theme of this conference should be, please let me know.

V. CCI Related Science

The American Meteorological Society last year published ~1,850 articles in its 12 journals. It also tracks what the “Top 10 Most Read Articles” are from the previous 12 months from all journals.⁶ As an indication of the high level of interest in the work CCI is engaged in, it is interesting to note that the three most read articles currently⁷ are directly related to CCI.

The single most read paper of the last 12 months is *Explaining Extreme Events of 2011 from a Climate Perspective*.⁸ Now an annual publication, this year’s paper is scheduled to be published in September. In it, 19 different research groups around the world present 20 analyses explaining the causes behind the 12 different extreme events shown in the figure below. While I’m the lead⁹ editor of both last year’s and this year’s papers, I didn’t contribute to any of the research presented. Because Prediction and Attribution of Extreme Events is one of the World Climate Research Programme’s “Grand Challenges”, this paper on attribution of extreme events has a WCRP link as well.



⁶ While it calls them the “most read” articles, the metric really is the most downloaded articles. You can see the current list in the column on the left side of <http://journals.ametsoc.org/>.

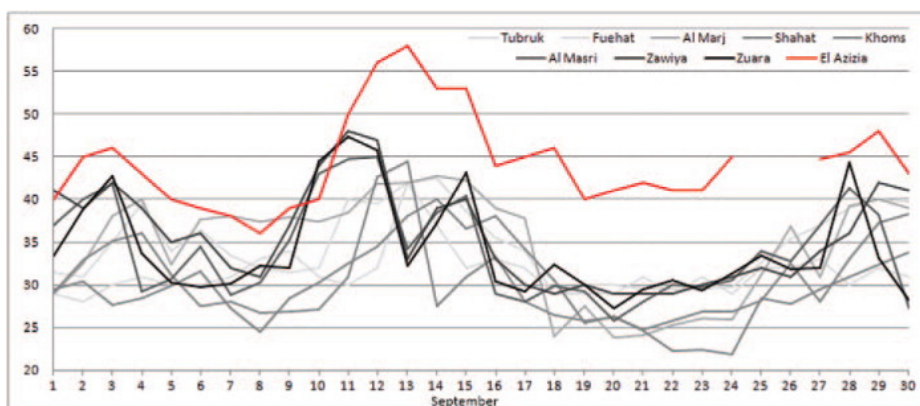
⁷ List accessed 7 May 2013.

⁸ Available here: <http://www.ncdc.noaa.gov/bams-state-of-the-climate/extreme-events/>.

⁹ Being the lead editor and coordinator of this paper, which had an April 15th deadline for submission for peer-review, prevented me from attending the RA-IV meeting in April. It is my biggest single project, but it is definitely not my only project. For example, I led a 28 author team in writing a paper on *Monitoring and Understanding Changes in Heat Waves, Cold Waves, Floods and Droughts in the United States: State of Knowledge*, which is scheduled to be published in the *Bulletin of the American Meteorological Society* in June but is available for early on-line release from <http://journals.ametsoc.org/doi/pdf/10.1175/BAMS-D-12-00066.1>.

The second most read scientific paper is the *World Meteorological Organization Assessment of the Purported World Record 58°C Temperature Extreme at El Azizia, Libya (13 September 1922)*.¹⁰ Up until a few years ago, there were many groups claiming to track global and continental weather and climate records. Probably the most visible one was the U.S. Army Corps of Engineers. Needless to say, not every country in the world thinks it appropriate to defer global record keeping to the U.S. Army. Since CCI decided to become the official record keeper¹¹, many of the world's most visible media (e.g., CNN, New York Times, Times of London) have used our WMO extreme records in their stories. Part of the reason for that acceptance is that we bring open, internationally collaborative, peer-reviewed scientific rigor to our assessments. And that was definitely the case with our recent evaluation of the world record temperature.

While the lead author of the paper is from Libya, the guiding force behind this assessment was Professor Randy Cerveny, one of CCI's Joint Rapporteurs on World Weather and Climate Extreme Records. He put together a first rate team of experts to conduct the evaluation.¹² What we found, in brief, was that (a) the non-standard instrument used at the time was a type of thermometer that had a floating pin which, if read at the wrong end of the pin by an inexperienced observer, would create an observation $\sim 7^\circ\text{C}$ too warm, (b) an inexperienced observer started just before the "record" was observed based on the fact that the original observations show that starting on September 11th the maximum temperature was written in the minimum temperature column and vice versa, (c) starting September 12th the El Azizia temperature suddenly became 7° warmer than the other nearby stations as shown in the figure below.



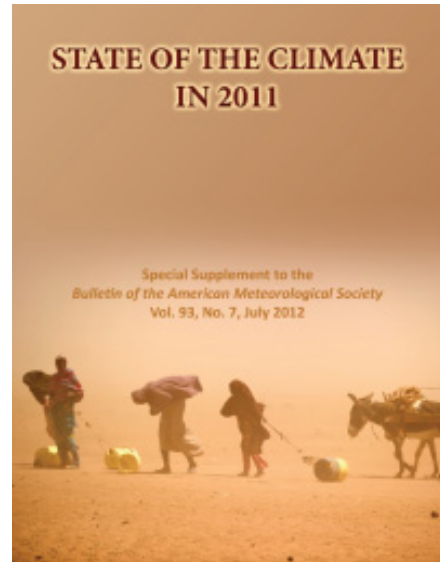
¹⁰ The full paper is available here: <http://journals.ametsoc.org/doi/abs/10.1175/BAMS-D-12-00093.1>

¹¹ See <http://wmo.asu.edu/> for CCI's global, hemispheric, and continental weather and climate records.

¹² The evaluation committee and journal paper author team consisted of Khalid I. El Fadli, Director of the Climate and Climate Change Department of the Libyan National Meteorological Center, CCI's Joint Rapporteurs on extremes, Randy Cerveny from the U.S. and José Luis Stella from Argentina, Christopher Burt, a weather historian from the U.S. whose questions initiated this record's reevaluation, Philip Eden and David Parker from the U.K. who have considerable expertise in meteorological instrumentation, Gianpaolo Mordacchini and Vinicio Pelino from Italy as the purported record was taken by Italians, M. M. Abdel Wahab from Egypt who brought considerable regional weather and climate expertise, and a few generalists including Mathew B. Pace (U.S.), CCI's OPACE II on Climate Monitoring and Assessment Co-Chairs Manola Brunet (Spain) and Fatima Driouech (Morocco), Pierre Bessemoulin (France) who was the past President of CCI, and, of course, me as well.

As a result, the evaluation committee unanimously concurred that the 58°C record at El Azizia was invalid and the official world's hottest observed temperature is 56.7°C taken 10 July 1913 in Death Valley, California, USA. As just a sanity check, which record would you consider more likely to be valid? One taken in autumn or one in the middle of summer? One taken 40 km from the coast or one taken 300 km from the coast? One taken on a hill or one taken in a valley 58 m below sea level? One taken by an inexperienced observer or one taken by an observer who noted that it was so hot that day that he wrapped a wet towel around his head before going out to take the observation and found the towel dry by the time he got back indoors? One taken in what is now a thriving city of over a quarter of a million people or one taken at a remote outpost in a place now called Furnace Creek in Death Valley?

The last bit of CCI related Science that I'll mention is the third most read American Meteorological Society paper: *The State of the Climate in 2011*.¹³ At 264 pages, this document is a truly remarkable example of international collaboration. The 2012 version, which will be published in a couple months, has over 380 authors from over 45 countries. While it is led by my home institution, CCI has been instrumental in encouraging its development, geographic expansion of the author list, and coordination throughout the world.



VI. Always open to suggestions

Speaking on behalf of the entire CCI Management Group, we welcome suggestions for how the CCI structure should change. As illustration, one of our teams came into being at the suggestion of a participant at the technical conference prior to CCI-15. We've identified some key factors that will be influencing how CCI needs to change. If you have any additional insights, we would like to hear them.

During the period leading up to July 2014, members of all the CCI teams will be diligently trying to wrap up their work before their teams end. This, I'm sure, will provide more accomplishments to discuss in the next circular letter and at CCI-16. In the meantime, to keep up with some of what we are doing, you can, as 440 other people have done, "like" CCI's facebook page: <http://www.facebook.com/pages/WMO-Commission-for-Climatology/250818188276296>.

¹³ Available here: <http://www.ncdc.noaa.gov/bams-state-of-the-climate/>.