

This report summarizes the items discussed and presentations prepared for the fourth full meeting of the Societal and Economic Research and Applications Working Group (WG SERA) of the World Weather Research Programme (WWRP), an Open Programme Area Group (OPAG) of the World Meteorological Organization (WMO). The meeting was held at the Biosphere offices of Environment Canada in Montréal, Canada from 21-22 September 2014, in conjunction with the World Weather Open Science Conference.

## **1. ORGANIZATION OF THE MEETING**

Brian Mills opened the meeting, welcomed members and guests (Appendix A) and acknowledged newly appointed members (or alternates): Adriaan Perrels (Finnish Meteorological Institute), Jane Rovins (Disaster Reduction & Resilience Solutions, Ltd.), Jan Eichner (Munich Reinsurance Company AG), Ben Jong-Dao Jou (APEC Research Center for Typhoon and Society) and Sally Potter (Joint Centre for Disaster Research, Massey University). Ben Jou unfortunately could not attend due to a sudden and urgent ministerial commitment.

The agenda (Appendix B) was approved after amending to accommodate presentations from representatives of the Subseasonal to Seasonal (S2S) (Andrew Robertson) and High Impact Weather (Brian Golding) projects, and the working arrangements for the meeting were discussed.

## **2. MEMBER ROUND TABLE**

Following a brief round table where participants briefly introduced themselves and highlighted recent activities, Brian introduced the generic World Weather Research Program terms of reference for working groups, confirmed his intent to step down as Chair of WG SERA, and recommended that the WG adopt a co-chair model given the breadth and relevance of the subject for WWRP and WMO. He will remain a regular WG SERA member for at least 1 year.

A general call for candidates was made with Linda Anderson-Berry and Jane Rovins offering to take on a co-chair role. Brian asked that others consider expressing their interests in becoming the WG co-chair and give notice within a couple of weeks in order to move the process forward. A vote would be held to nominate two individuals if more than the minimum required expressed interest. Nanette confirmed that the remainder of the WMO process would be as follows:

- 1) Current WG SERA chair to recommend co-chair model, candidates and forward supporting documentation (short CV) to the Chair, WWRP Scientific Steering Committee (SSC) (Sarah Jones);
- 2) WWRP SSC Chair to report and receive approval at next SSC meeting in November;
- 3) WWRP SSC Chair to recommend new co-chair model and acceptance of nominations to CAS President
- 4) Terms of new co-chairs officially commence immediately following approval of CAS President in consultation with the CAS Management Group

***Action: WG SERA members to inform Brian Mills and Nanette Lomarda if they are interested in being considered for the role of WG co-chair (15-September).***

***Action: Brian Mills and Nanette Lomarda to prepare co-chair model and candidate recommendation and send to Sarah Jones for consideration and approval at November 2014 WWRP SSC meeting. Candidates to provide recent short CV. (30-September)***

A general discussion ensued regarding the role of WG SERA and current challenges as summarized below:

Communication. Members noted the need to find better and more frequent means of communication—annual meetings (sometimes 1.5 years) cannot facilitate and sustain substantive involvement in WWRP projects and activities. Greater use of social media and an interactive Internet presence to store documentation (resource clearing house) and to develop two-way exchanges, receive feedback and communicate outwards was identified as being needed. The use of WMO member surveys and coordination with other parts of WMO interested in user/client evaluation and social science applications (e.g., Public Weather Services) was also recognized as important—a dedicated web site could be used to bring all of the information and meta-data (i.e., descriptions/links to resources) into one public portal was discussed.

***Action: Brian Mills, Nanette Lomarda and co-chair candidates to confirm Web, Skype, or teleconference options available through WMO or WG members to facilitate regular quarterly meetings of available members. (ASAP)***

***Action: Linda Anderson-Berry and Nanette Lomarda to identify and assess options to develop a SERA-dedicated web-space for linking to projects and resources. (November 2014)***

***Action: WG SERA and Secretariat to review recent surveys of WMO members, assess the need (and execute if needed) for a complementary survey or scan to canvass their involvement in conducting socio-economic research. (December 2014)***

Methods to expand both depth and reach. Participants noted the great range of disciplines and organizations currently or potentially involved in weather-related social science and applications—and the difficulty in representing them on the WG SERA in sufficient numbers to stimulate joint activities, proposals, projects, etc. This contrasts other working groups where virtually everyone has training in atmospheric science, is familiar with National Meteorological and Hydrometeorological operating centres, attends the same national and international society conferences and meetings, and year if not decades of experience working on joint projects/research areas. While such an environment is impossible to recreate within WG SERA, the participants recommended seeking other means of developing depth, for example through establishing specific panels (e.g., on economics).

Funding, coordination, and supporting infrastructure. Clearly the need for developing and conducting social science and research applications has grown considerably over the past 10 years and, with the recent emphasis on impact forecasting, will undoubtedly continue to grow. However, aside from occasional or ad hoc national activities, this has not resulted in a commensurate and sustained increase in the number of funding opportunities and available resources. WMO and NMHSs are unlikely to offer more than 'seed' resources and have expressed little desire to meet the data collection and processing challenges required to sustain a long-term R&D commitment to impact forecasting and evaluation. Participants noted a few ways to address this challenge, including:

- Clarify exactly what we require to support WWRP projects through WG SERA
- Utilize available resources from WMO and NMHSs to consolidate efforts, perhaps concentrating on engaging people to develop proposals for various foundations or granting agencies;

- Piggy-back on related continental and national research programs such as those oriented to climate change; and
- Coordinate and leverage within and outside WMO on projects, activities, and advice related to hazard and disaster risk reduction, for example through the Hyogo Post-2015 Framework for Disaster Risk Reduction and national-level programs (e.g., Australian actions related to increasing resilience).

### **3. WWRP RESTRUCTURING AND ROLE OF SERA WORKING GROUP**

Brian provided perspective on the WWRP and its transition into a post-Thorpex era. The leadership has changed over the past couple of years with a new Director of the WMO Research Department (Deon Terblanche), new Chief of Weather Research (Paolo Ruti taking over from Tetsuo Nakazawa) and new Chair of the SSC (Sarah Jones taking over from Gilbert Brunet). While the broad intent of the WWRP strategic plan remains valid through 2017, the clear direction to the 6<sup>1</sup> WWRP working groups that have emerged through the transition is to have a strong presence within and make contributions to the 3 Thorpex legacy projects:

- Subseasonal to Seasonal (S2S) prediction project
- High Impact Weather (HIW) project
- Polar Prediction Project (PPP)

The first two of these projects were discussed at length during the meeting while discussion on the third was deferred due to time constraints and the general lack of polar expertise on the WG.

***Action: Brian Mills to provide the WG with an update on the Polar Prediction Project (PPP) (October 2014).***

#### **Subseasonal to Seasonal (S2S) prediction project**

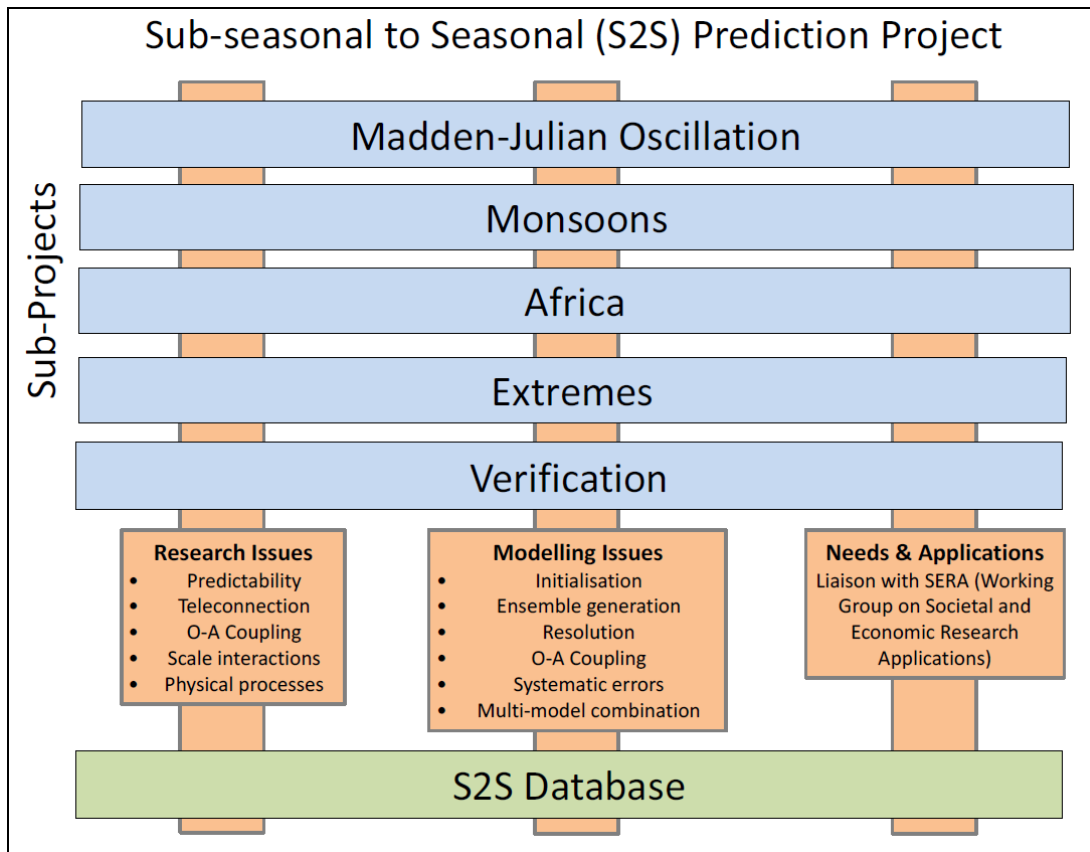
Andrew Robertson, co-chair of the S2S project, provided a thorough overview of the initiative, summarizing many of the important aspects outlined in greater detail in the implementation plan<sup>2</sup> that was provided to members prior to the WG meeting. The scale of the predictions and underlying research targeted by the project is aimed at early warnings of high impact weather events which will inform decisions requiring relatively long lead times when compared to traditional short-term weather forecasts, i.e., the “Ready” (seasonal) and “Set” (subseasonal) in a ready-set-go system or call to action. A database of subseasonal forecasts is in development and expected to be on-line in early 2015, starting with a subset of models. The database will facilitate involvement from the research and applications communities and operational centres which currently or potentially wish to issue forecasts.

General support for the S2S project was expressed by meeting participants. As noted in the “Needs and Applications” pillar of the organizational figure presented by Andrew and reproduced below, WG SERA is involved in S2S through a liaison member, Joanne Robbins, who actively participates in project steering group meetings. The WG has also contributed a draft bibliography of relevant application literature.

***Action: Brian Mills, co-chairs “elect”, Joanne Robbins, and Nanette Lomarda to recommend to S2S co-chairs and WWRP-SSC that a third co-chair be defined on “social science” for the project. (October 2014)***

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<sup>1</sup> Societal and Economic Research and Applications (SERA), Joint WG on Forecast Verification Research (JWGFVR), proposed merger of Nowcasting and Mesoscale Research (NMR), Tropical Research (TR), Data Assimilation and Observation Systems (DAOS), proposed Prediction-Ensembles (PE)



Source: S2S Prediction Project (<http://s2sprediction.net/documents/reports>)

The difficulty often is taking the project framework and developing specific, well-bounded new projects/proposals or finding the appropriate connection to on-going activities. To aid in this task, members are encouraged to review the current descriptions of the five “sub-projects” which are now posted on the S2S website <<http://s2sprediction.net/documents/reports>>. It was recommended that members assess their on-going activities and re-examine the bibliography with the aim of identifying potential key areas (research questions or application topics) for SERA contributions, if not actual projects. “Low-hanging” fruit might be picked, for example associated with the “Recast” climate change project and Northwest program on multi-hazard preparations in Finland.

***Action: WG SERA members to review S2S subproject information and the partially annotated bibliography in order to identify potential areas (research questions, application topics, specific projects) for SERA contributions. Send ideas and comments to Joanne Robbins (15-October).***

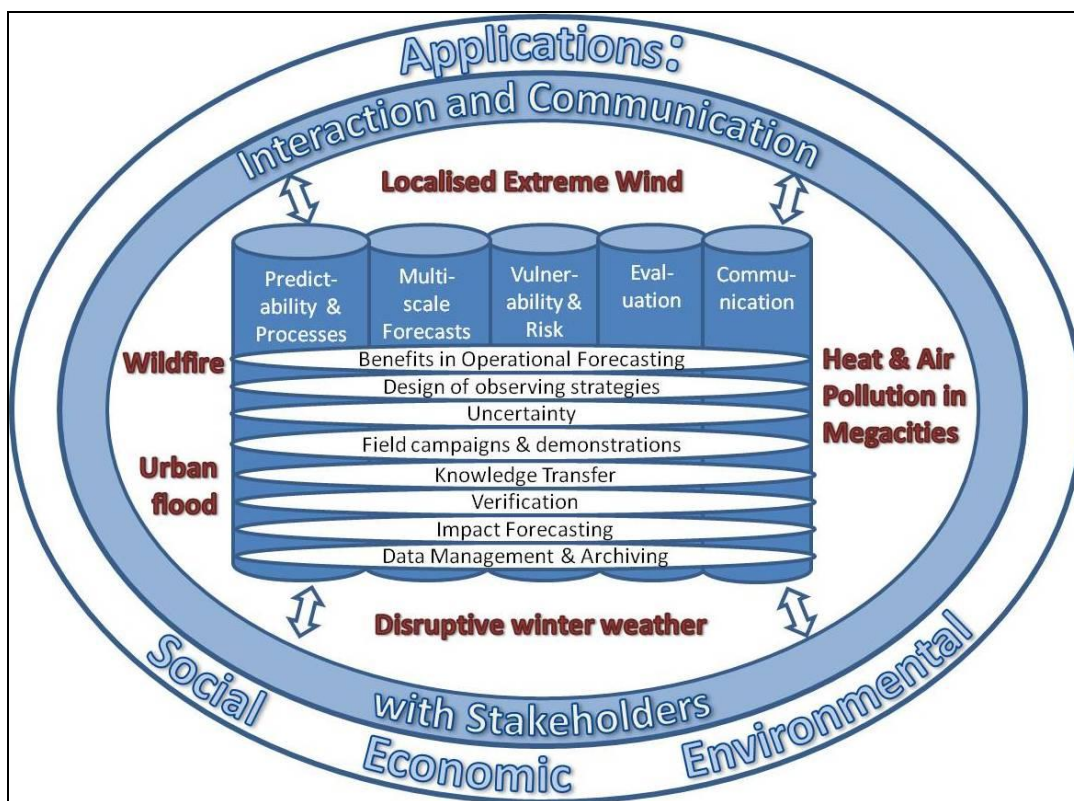
Other areas where WG SERA could assist or at least provide some input:

- Definitions of common but often misunderstood terms such as “high impact weather event” and/or “forecast” or “value”
- Approaches to better plan, develop, prioritize, and coordinate user and practitioner engagement (perhaps begin with other UN agencies and decision needs such as programs for disease vector spraying; also key international organizations such as the International Emergency Management Association)
- Methods to conduct impact-based verification (and/or evaluation) in collaboration with WG JWGFVR
- Identify, increase project awareness, and solicit involvement of social scientists (i.e., through use of existing distribution lists and networks such as those developed through the Integrated Research on Disaster Risk (IRDR) Risk Interpretation and Action and Data Working Groups and WAS\*IS)

Other recommendations for S2S included adopting the HIWeather model of having Scientific and Social Scientific co-chairs, or at least leads for each of the 3 cross-cutting pillars. Members strongly encouraged the project proponents to avoid the “product-driven” approach adopted in the 1990s when seasonal prediction began. As noted in the case of monthly ENSO Outlooks offered internally to Munich Re underwriters, even services that are of high quality do not guarantee their use and application in decision-making. In other cases, assumptions by service developers about needs can be misplaced; an example from Sydney 2000 revealed that hindcasts identifying areas that likely received damage following a storm were more important than forecasts to emergency managers. Emphasizing the intended use or type of decision problem faced by users before committing to a particular product or service path will lead to better outcomes.

**High Impact Weather (HIWx) prediction project**

Brian Golding, WMO consultant and co-proponent of the project, summarized the primary elements of the current proposal which will be reviewed for approval at the next WMO WWRP SSC meeting in November and WMO Executive Council in 2015. As with S2S, organizational and administrative functions will be supported by an international trust funded by WMO members. Complementing the S2S project, HIWx focuses on shorter forecasting and decision scales, ranging from minutes to weeks, for a subset of hazardous or extreme weather phenomena as defined in the organizational figure below. Additional details are found in the proposal distributed to WG members.



Source: Golding, B. and S. Jones 2014. HIWeather Prediction Project presentation to WWRP WG SERA, 21-August-2014, Montréal.

Participants see the great potential in HIWx project to go well beyond what was originally envisioned and eventually realized through Thorpex. The project should have a large involvement from WG SERA. It will capitalize on the greater willingness among atmospheric science and operation forecast community to work with social scientists and represents an incredible opportunity to demonstrate the value of impact forecasting and adding this element of knowledge development, evaluation, communication, and service into the

forecast process. While exciting as presently conceived, the project is very ambitious and its goals may be difficult to achieve in a 5-10 year timeframe—it may be important to focus on most vulnerable and/or where the potential to transfer results to actual implementation is greatest (similar to the disaster community’s movement from response to prevention and related need to target a different, or an additional, set of actors).

WG SERA members expressed a number of salient considerations for the project, including the following:

- Depending on the intended audience, concerns were expressed about the language used in the project mission statement, specifically “dramatic increase in resilience to high impact weather”. The overall loss of life due to weather-related disasters has substantially decreased in the developed world for the weather hazards prioritized in the proposal (e.g., urban flooding).
- Some additional problem-defining context would be useful along with additional precision in the mission statement (i.e., hazard-specific objectives). ‘Fluffy’ (vague) phrases like “saving lives” should be replaced or complemented with goals/objectives that can be baselined, measured, and reached. It will be important to include and explain the evaluation mechanisms that will be employed to measure stated goals. These might be better defined for individual studies or subprojects where specifics will be evident.
- Separating 3 highly integrated pillars seems odd (risk and vulnerability; evaluation; communication) though it serves to emphasize the importance of social science within the proposal.
- It may be useful to develop a complementary flow diagram for each hazard example that captures the entire system from a sector/user perspective rather than from a weather problem perspective—this would lead to greater appreciation of the relative importance of weather as compared to the myriad of other influences on the decisions, actions, and activities of impacted organizations.
- More generally it might be wise to prioritize and focus HIWx forecasting and project activities to where there is the most potential to improve outcomes, health or otherwise, or on regions with the greatest/least vulnerability/resilience.
- It would be helpful to clarify the terminology of several multi-faceted terms that may have different meanings to different audiences (i.e., hazard, risk, vulnerability, exposure, resilience, warnings, etc.)
- Biggest problem often is not the content of the products but rather the capacity to respond; perfect information has no value if it cannot be acted upon thus significant attention should be given to the characterization of user or decision-maker capacity.
- Huge potential to develop and assess evaluation methodologies through this project by going well beyond the traditional scope of forecast verification through the use of user and social science-driven measures.
- Lessons from other non-weather risk and hazard projects suggest it will be important to emphasize capturing what has and does actually work instead of focusing exclusively on “forecast failures”.
- Be wary of potential duplication with other international and national efforts; need to canvass and identify what is already under way in IRDR, etc.
- Acquiring and managing disparate sources, formats, and quantities of impact and outcome data may be a significant challenge. Advanced efforts to secure support from high-level officials in data-holding agencies may facilitate greater and quicker access to important social and economic data sets.
- In terms of project management, there was general support for the 2 co-chair model, one representing scientific and the other social scientific aspects, as well as pillar leaders, and a strategic advisory board composed of stakeholders. It was suggested that all contributing studies involve users and have activities that address each pillar where feasible—acquiring funding will be easier in most countries if the subproject is applied or user goal-driven as opposed to pure social science research.

***Action: Members to review the latest version of the HIWeather Project proposal and provide comments to Brian Mills who will collate and send to Brian Golding (29-September 2014)***

***Action: Nanette (Secretariat) to advise HIWeather co-chairs of WG SERA's support and intention to become involved in the project and identify options for representation on the current task team and/or other roles. (October 2014)***

***Action: Members to provide ideas/discuss potential activity to compare risks across HIWx priority (and other?) hazards, beginning with mortality/morbidity and damage. (October 2014)***

### **On-going role and collaborative activities with WMO/partners**

#### **Economic studies in Ghana**

Kwabena Anaman reviewed key aspects of a paper and study recently completed to analyze the economic value of environmental capital used to generate the Gross Domestic Product (GDP) of Ghana over the period 1993 to 2012. With the specification of this fundamental model, it will be possible to extend or adapt the analysis to assess the sensitivity of Ghana's economy to weather. Other research has focused on the agricultural sector in Ghana with plans to develop further studies in other sectors if funding can be obtained. This research makes use of survey-based techniques to examine the benefits of outreach programs (for agriculture) and the method is readily adapted to examining the potential value of improved weather services. Discussion centred around developing studies and comparing results with similar studies done in other countries, including the economic sensitivity study conducted for the U.S. by Lazo et al<sup>2</sup>.

#### **Coastal Flood Inundation Demonstration Project (CIFDP)**

Linda Anderson-Berry summarized the intent and status of this WMO-lead project which aims to integrate and apply existing models, tools and knowledge to improve coastal flood hazard forecasting in particularly vulnerable countries. The process involves bringing hydrologic and atmospheric expertise together with forecasters and key users. Originally piloted in Bangladesh and Dominican Republic cases, the project has broadened to include Fiji, Indonesia, Southern Africa, Philippines, and the Caribbean. Funding and capacity are not commensurate with the demand especially for the SERA elements of engagement, communication and system evaluation—while Linda's input has been complemented with an additional contracted social scientist (Khan Rahaman), the project has requested additional support from WG SERA. It may be possible to tie this activity into efforts to support the HIWx Project or other international efforts such as the Canadian-led Coastal Cities at Risk effort.

#### **WMO/WB/CSP<sup>3</sup> Guidance Document on Assessing the Socio-economic Benefits of Meteorological and Hydrological Services**

Jeff Lazo described this WMO Public Weather Services initiative designed to aid WMO members, especially developing countries, in understanding and making sound choices with respect to designing and contracting studies to assess the socio-economic costs and benefits of services as well as communicating and making use of the results of such

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<sup>2</sup> Lazo, J.K., M. Lawson, P.H. Larsen, and D.M. Waldman, 2011. U.S. economic sensitivity to weather variability, Bulletin of the American Meteorological Society, 92(6):709-720.

<sup>3</sup> World Meteorological Organization/World Bank/Climate Services Partnership



research. WG SERA is represented by Jeff, Adriaan Perrels, and Brian Mills—others have been recommended to be chapter reviewers but this decision is up to the management team. The World Bank and Climate Services Partnership are equal partners in the project with most of the funding for non-government expert participation and production coming through a US AID project. While the document is expected to be available in early 2015, the intent is to solicit country or service-level applications to use and test the effectiveness of the document. Such applications could be executed as joint activities with WG SERA.

#### Disaster Risk Reduction Focal Points of WMO Technical Commissions and Technical Programmes (DRR FP TC-TP)

Paul Kovacs represents WG SERA (actually the larger WWRP and Commission of Atmospheric Science) on this very recently established coordinating committee which is intended to provide guidance for hazard monitoring and impact analysis. Attempts have been made to survey and assess related program and activities within WMO, however bureaucracy seems to be a limiting factor thus far. Discussion revealed that the country surveys on DRR have yielded good information about risk-related activities and that these should be available to the Focal Points. The need for collaboration with UNIDNR was also noted.

#### Severe Weather Forecast Demonstration Projects (SWFDPs) and South Africa Flood Forecasting System

Eugene Poolman outlined the SWFDP program, its objectives and status. The original demonstration project in Southern Africa is in its final year, Eastern Africa and South Pacific SWFDPs are in progress, plans are being made for projects in Southeast Asia and the Bay of Bengal, and potential activities in South America and Central America are being considered. The Nowcasting The SWFDP involves building the capacity (training, infrastructure) of under-resourced weather services in developing countries through partnering with WMO and Service organizations in developed countries. As the program matures and benefits realized, discussions about how to sustain the support in an operational sense, for example through the World Bank or other development agency, are becoming increasingly important. While there has always been a door left open for WG SERA involvement in the SWFDPs, for example by joining the annual training sessions, limited capacity and local/regional knowledge of institutions, communities, networks, etc., and the presence of other organizations with related interests (e.g., Lake Victoria project) have kept WG SERA participation to simply observing.

Eugene also touched on the South Africa Flood Forecasting System which involves applying technologies first pioneered in the U.S. to Africa using financial support from US AID. The intent is to integrate this activity with the SWFDP and end users. There is also a requirement to determine the socio-economic benefits of these programs and this is where WG SERA might become more fully engaged, perhaps through an application of the guidance book developed to assess socio-economic benefits of meteorological and hydrological services.

***Action: Eugene Poolman to identify the US AID contact for the South Africa Flood Forecasting System project and share with WG members (October 2014).***

Eugene also noted his involvement as the sole meteorological expert on the Commission of Hydrology Flood Forecasting Advisory Group. Composed largely of hydrologists, the group provides guidance with respect to hydrology but also is tasked with promoting awareness of the societal value of hydrological services—the potential link to WG SERA is obvious.

***Action: Eugene Poolman to identify potential areas of collaboration between WG SERA and the WMO HyCom Flood Forecasting Advisory Group (January 2015).***



ICSU/ISSC/UNISDR<sup>4</sup> Integrated Research on Disaster Risk (IRDR)

Sally Potter, with input from Jane Rovins, highlighted changes and progress that has been made over the past couple of years in the IRDR program. A new executive director, Rudiger Klein, has taken over from Jane in the Beijing office. New national or regional committees have been established in Austria, Columbia, and Latin American and the Caribbean while new International Centers of Excellence, including ones for community resilience, understanding risk and safety, and vulnerability and resilience metrics have been added. A second international science conference was held in June and the IRDR working groups most closely aligned to WG SERA (Forensic investigations of disasters, Risk interpretation and action, Disaster loss data), have been active holding seminars and workshops and publishing reports and case studies.

IRDR is intent on expanding collaborations with WG SERA and WMO through the existing MOU, including sharing and deliberating progress IRDR has made on hazard classifications, socio-economic impacts, and communication issues related to warning and alert systems for a variety of hazards. As terms for many members of the IRDR Science Committee end in 2015, there will be new opportunities for expanding WG SERA representation within IRDR, subject to their terms of reference. IRDR encourages the identification of WG SERA and WWRP programs and projects that could become affiliated with both organizations. A WG SERA representative is invited to join IRDR as a delegate in a forward-planning session at the IRDR global science committee meeting in Paris, 13-15 November.

**Action: Nanette Lomarda to update WMO/WWRP website with links to IRDR projects (September 2014)**

**Action: Brian Mills, Nanette Lomarda and co-chairs “elect” to obtain WMO support and identify a WG SERA or WWRP representative to participate in the forward-planning session at the IRDR global science committee meeting in Paris, 13-15 November, and the 3<sup>rd</sup> UN World Conference on Disaster Reduction in Sendai, Japan, 14-18 March (September 2014).**

**Action: Sally Potter, Jane Rovins, Brian Mills, and Nanette Lomarda to identify specific IRDR and WWRP/WG SERA programs and projects that could be candidates for cross-affiliation, including exploring a potential project in the Caribbean that involves collaboration between economists and local agencies associated with WMO (November 2014).**

**Action: Sally Potter/David Johnston to distribute annual IRDR report to WG SERA members (October 2014).**

**Action: New co-chairs to allocate significant time during the next WG SERA teleconference and in-person meetings (December 2014, 2015).**

Munich Reinsurance NatCat Service

Jan Eichner reviewed activities of the NATcat Service provided by Munich Re, a substantial database of historical natural disaster event impact statistics for variables such as fatalities, displaced population, insured and uninsured losses. Significant progress has been made to normalize historic loss data to facilitate more robust comparisons and analyses through time. An interesting finding based on some preliminary analysis of standardized data is that earthquake losses seem to be increasing at a much faster rate than those for weather or

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<sup>4</sup> International Council for Science/International Social Science Council/ United Nations International Strategy for Disaster Reduction

climate-related perils—possibly an indication of the greater emphasis and ability to design for safety rather than for property loss for seismic perils.

Other projects focus on hazard-specific losses and regions, including an evaluation of convective storms and a North American study on hail losses. Munich Re is also interested in evaluating the benefits of adaptation and disaster mitigation projects, such as major flood protection works or policies and comparable actions targeting other perils. Jan and others noted the difficulties associated with correlating hazards with loss data, something presently impossible at global scales due to the many factors that introduce noise to the analysis. There appears to be some correlation at the regional scale, for instance with Pacific temperature phases and land-falling typhoon frequency which produces substantial losses, and there are other cases where meteorological data or predictions are already used as a proxy for losses. It was noted that relying exclusively on past losses as a proxy for the future, as seems to be occurring in certain countries (e.g., Risk Frontiers project for Australian bushfire risk) ignores the dynamic social and physical features of risk.

Discussion also touched on the limited penetration of insurance in the developing world and how efforts in the Caribbean, Ghana, and elsewhere were showing the benefits of micro-insurance as a tool for both short-term weather and long-term climatic change.

#### UK Met Office activities

Joanne Robbins updated the working group about several UK Met Office projects. As highlighted in several presentations during the World Weather Open Science Conference, the Met Office is advancing into hazard and impact forecasting as part of its portfolio of services. In part this has been achieved through the Hazard Partnership where expertise in forecasting, for example surface water flooding, is coupled with vulnerability knowledge from the Health and Safety Lab to produce new predictive models of risk and associated services. Other hazard and impact areas in development include landslide event susceptibility and a wind package that covers transportation (roll-over potential), tourism and recreation (e.g., camping suitability), and buildings. While these activities are oriented towards short-term phenomena, the Met Office also has a number of stakeholder-driven projects aligned with seasonal and climate scales (e.g., rail slope stability). Discussion following the update raised a few of the issues associated with impact modelling, such as limited data availability and problems encountered when attempting to scale up or down or develop multi-hazard models.

#### **4. STRATEGIES AND OPPORTUNITIES TO ADVANCE AND FUND RESEARCH, APPLICATIONS, AND TRAINING**

The final session of the meeting was intended for examining next steps but evolved into broader discussion about WG SERA and overcoming challenges in fulfilling its stated role within WWRP. In large part, this was due to the fortuitous arrival of the new WMO WWR Chief, Paolo Ruti, who entered his new position only in August, at the meeting.

The general opinion of the members was that we were at a critical and exciting point in time in the evolution of WG SERA within WWRP and of social and interdisciplinary science and its relation to the weather enterprise more broadly. The many demands and potential opportunities that are on the table, including those related to the Thorpex legacy projects, require careful treatment and a guarded optimism if we are to move beyond simply providing a liaison or 'advisory' service to WWRP and WMO.

The desire for greater involvement of WG SERA, beyond the chair, in WWRP strategic planning, project development, and proposal writing (e.g., S2S, HIWx, PPP) was unanimous. To some extent this should be facilitated with decisions taken to hold more frequent

(quarterly) meetings between annual face-to-face gatherings as well as moving to a co-chair WG model. It will also be aided through commitments by members to review project documentation and actively participate in WWRP meetings and projects.

The WMO WWRP Secretariat and Management can assist by making meetings more amenable to involvement from WG SERA members who are not part of, or necessarily well-versed in, the internal matters of National Meteorological and Hydrometeorological Services (NMHS)—this means supporting additional involvement of social scientists and sector or user specialists in all meetings and projects, not just those of WG SERA. Selective use of trust fund resources from the primary projects for proposal-writing sessions (as opposed to just supporting member travel to meetings) and seed funding of post-doc positions should be entertained through the international coordination offices—this may be the only way to encourage social scientists outside of the WG membership (and not continuously exposed to the NMHS world) to commit to becoming involved in a meaningful way.

It will also be important to establish strategic links within and outside of WMO. Collaborations with the Global Framework for Climate Services (GFCS) and Disaster Risk Reduction streams in WMO and with leading international organizations like the UN IDNDR and IRDR will be important to leverage our limited capacity. Lacking enabling resources to do all of the above, it would be important to establish a set of priority activities, users, or locations, as opposed to attempting to cover everything with little depth.

## **5. REVIEW OF ACTIONS AND DECISIONS**

A list of actions is noted below. The item was deferred; members will review the draft report and suggest changes at that time.

<b>LIST OF ACTIONS AND DECISIONS</b>
<i>Brian Mills and Nanette Lomarda to prepare co-chair model and candidate recommendation and send to Sarah Jones for consideration and approval at November 2014 WWRP SSC meeting. Candidates to provide recent short CV. (30-September)</i>
<i>Brian Mills, Nanette Lomarda and co-chair candidates to confirm Web, Skype, or teleconference options available through WMO or WG members to facilitate regular quarterly meetings of available members. (ASAP)</i>
<i>Linda Anderson-Berry and Nanette Lomarda to identify and assess options to develop a SERA-dedicated web-space for linking to projects and resources. (November 2014)</i>
<i>WG SERA and Secretariat to review recent surveys of WMO members, assess the need (and execute if needed) for a complementary survey or scan to canvass their involvement in conducting socio-economic research. (December 2014)</i>
<i>Brian Mills to provide the WG with an update on the Polar Prediction Project (PPP) (October 2014).</i>
<i>Brian Mills, co-chairs “elect”, Joanne Robbins, and Nanette Lomarda to recommend to S2S co-chairs and WWRP-SSC that a third co-chair be defined on “social science” for the project. (October 2014)</i>
<i>WG SERA members to review S2S subproject information and the partially annotated bibliography in order to identify potential areas (research questions, application topics, specific projects) for SERA contributions. Send ideas and comments to Joanne Robbins (15-October).</i>
<i>Members to review the latest version of the HIWeather Project proposal and provide comments to Brian Mills who will collate and send to Brian Golding (29-September 2014)</i>
<i>Nanette (Secretariat) to advise HIWeather co-chairs of WG SERA’s support and intention to become involved in the project and identify options for representation on the current task team and/or other roles. (October 2014)</i>
<i>Members to provide ideas/discuss potential activity to compare risks across HIWx priority (and other?) hazards, beginning with mortality/morbidity and damage. (October 2014)</i>
<i>Eugene Poolman to identify the US AID contact for the South Africa Flood Forecasting System project</i>

<i>and share with WG members (October 2014).</i>
<i>Eugene Poolman to identify potential areas of collaboration between WG SERA and the WMO HyCom Flood Forecasting Advisory Group (January 2015).</i>
<i>Nanette Lomarda to update WMO/WWRP website with links to IRDR projects (September 2014)</i>
<i>Brian Mills, Nanette Lomarda and co-chairs “elect” to obtain WMO support and identify a WG SERA or WWRP representative to participate in the forward-planning session at the IRDR global science committee meeting in Paris, 13-15 November, and the 3<sup>rd</sup> UN World Conference on Disaster Reduction in Sendai, Japan, 14-18 March (September 2014).</i>
<i>Sally Potter, Jane Rovins, Brian Mills, and Nanette Lomarda to identify specific IRDR and WWRP/WG SERA programs and projects that could be candidates for cross-affiliation, including exploring a potential project in the Caribbean that involves collaboration between economists and local agencies associated with WMO (November 2014).</i>
<i>Sally Potter/David Johnston to distribute annual IRDR report to WG SERA members (October 2014).</i>
<i>New co-chairs to allocate significant time during the next WG SERA teleconference and in-person meetings (December 2014, 2015).</i>

## **6. CLOSURE OF MEETING**

The meeting closed at 16:00.

**APPENDIX “A” - PARTICIPANTS**

MEMBER/GUEST	ORGANIZATION AND ADDRESS
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<p>Dr. Jane Rovins</p>	<p>Disaster Reduction &amp; Resilience Solutions, Ltd. c/o 5/12 Majoribanks St., Mt. Victoria, Wellington, New Zealand 6011 E-mail: jane.rovins@gmail.com Tel: +64 (0) 27 304 7665 Skype: jane.rovins Twitter: @DRRSolutions</p>
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WORLD METEOROLOGICAL ORGANIZATION  
COMMISSION FOR ATMOSPHERIC SCIENCES  
(CAS)  
**4th Meeting of the Societal and Economic  
Research and Applications Working Group of the  
World Weather Research Programme**

CAS/WWRP-WG-SERA-Meeting  
4/DOC1.1  
(updated 5-August 2014)

Item: Draft Agenda, Documentation  
Plan, Participants list

Montreal, Canada (21-22 August 2014)

## LOCATION

Biosphere, 160, Chemin Tour-de-l'Isle,  
Île Sainte-Hélène, Montréal  
Rooms 201 and 217

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## BACKGROUND DOCUMENT/WWOSC REFERENCE LIST *(attached to e-mail and indicated in RED alongside appropriate agenda item)*

- 1.1 WWRP-WG-SERA-Mtg4-Montreal\_Doc1.1\_AGENDA.pdf
- 3.1 HIW\_proposal\_v9.docx (also see WWOSC Session UAS-PA404, SCI-SPL01, SCI-PL03)
- 3.2 S2S\_Implem\_plan\_en.pdf (also see WWOSC Session SCI-PS133, SCI-PL03)
- 3.3 Final\_WWRP\_PPP\_Science\_Plan.pdf (also see WWOSC Session SCI-PS111, SCI-PL03)
- 3.4 Anaman & Agyei-Sasu\_World Economy Journal Paper in Environmental Macroeconomics.pdf
- 4.1 final\_WWRP\_SP\_6\_Oct.pdf (section 4.6 in particular)

For references to the WWOSC program, please see: WWOSCProgramGuide.pdf

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## AGENDA

### THURSDAY, AUGUST 21

***\*Meet at the WWOSC Conference Registration Desk at 1:45pm and depart for the Biosphere as a group (transit or taxi TBD)***

***Refreshments will be available throughout meeting***

#### **4. ORGANIZATION OF THE MEETING (1430-1500)**

- Opening of the meeting and welcome
- Review and adoption of the agenda (*Doc1.1*)
- Working arrangements for the meeting

#### **5. MEMBER ROUND TABLE (1430-1600)**

- Round table introduction and brief description of recent activities (5 minutes/member; 10 minutes for new members)
- Review of WG terms of reference
- Search for next working group chair(s)

#### **6. WWRP RESTRUCTURING AND ROLE OF SERA WORKING GROUP (1600-1730)**

- Overview and “reality check” from the prerogative of the Chair
- Introduction of post-Thorpex legacy projects:

- High Impact Weather (HIW) Project (Brian) (*Doc 3.1*)
  - Subseasonal to Seasonal (S2S) Prediction project (Joanne) (*Doc 3.2*)
  - Polar Prediction Project (PPP) (Brian) (*Doc 3.3*)
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## **FRIDAY, AUGUST 22**

***Refreshments will be available throughout meeting***

### **7. WWRP RESTRUCTURING AND ROLE OF SERA WORKING GROUP (CONT'D) (0900-1200)**

- On-going role and collaborative activities with WMO/partners:
  - Economic approaches to measure the value of meteorological services and impacts of extreme weather events in Ghana and other nations in West Africa (*Kwabena*) (*Doc 3.4*)
  - Coastal Flood Inundation Demonstration Project (CIFDP) (Linda)
  - WMO/WB/CSP<sup>5</sup> Guidance Document on Assessing the Socio-economic Benefits of Meteorological and Hydrological Services (Jeff/Adriaan) (*see WWOSC UAS-PA402*)
  - Disaster Risk Reduction Focal Points of WMO Technical Commissions and Technical Programmes (DRR FP TC-TP) (Paul)
  - Severe Weather Forecast Demonstration Projects (SWFDPs) (Eugene) (*see WWOSC UAS-PS332*)
  - ICSU/ISSC/UNISDR<sup>6</sup> Integrated Research on Disaster Risk (IRDR) (Jane/Sally) (*see WWOSC UAS-PS332*)
  - OTHER COLLABORATIONS (all)

### **Lunch (1200-1330)**

### **8. STRATEGIES AND OPPORTUNITIES TO ADVANCE AND FUND RESEARCH, APPLICATIONS, AND TRAINING (1330-1600)**

- Open discussion facilitated by Brian (*Doc 4.1*)
- Plan of action
- Immediate next steps

### **9. REVIEW OF ACTIONS AND DECISIONS (1600-1625)**

### **10. CLOSURE OF MEETING (1630)**

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<sup>5</sup> World Meteorological Organization/World Bank/Climate Services Partnership

<sup>6</sup> International Council for Science/International Social Science Council/ United Nations International Strategy for Disaster Reduction