



HIWeather

30th December 2016

This newsletter comes at the end of the second year of HIWeather and with my very best wishes to you all for 2017. It looks as though 2017 is going to be a very busy year both for HIWeather and for the wider disaster risk reduction community. For HIWeather, many of the projects identified in Exeter in April are taking shape and gaining momentum. Some will come to fruition in 2017, including three reviews that should lead to publication in 2018. In the broader community, the UNISDR Global Platform in May provides opportunities for HIWeather to raise the profile of its work and to develop partnerships with other players in this field. Prior to that, in January, the AMS annual meeting will provide an opportunity to re-invigorate links with some of the key US programmes that are relevant to HIWeather.

Several of the task teams have held teleconferences recently. It was good to share in the Communications task team meeting and to receive the minutes of the Multi-Scale Forecasting and Evaluation meetings. These outputs should soon start to appear on the newly expanded web site (<http://bit.ly/1RKapbc>), so I would encourage you to visit there from time to time. Meanwhile, the steering committee teleconference in December heard of progress with the Communications Web Platform, under development in New Zealand, which will provide a range of collaboration tools to complement the main web site.

The WWRP Scientific Steering Committee meeting in October was a valuable opportunity for me to share progress with other projects and with the working group leads. This was facilitated by speed dating sessions on the first day when everyone met everyone in pairs for 5 minutes to identify points of common interest. This was definitely worth doing and led to several longer discussions outside the meeting.

Apart from the task team research activities, it is planned to offer two opportunities for HIWeather task team members to meet in 2017. The first is the International Verification Methods workshop in Berlin on 8 - 11 May, where it is planned to hold a mini-workshop to develop the value chain concept that was discussed at the kick-off meeting in Exeter in April. The HIWeather steering group will also meet during this workshop, probably on 7th May. It is hoped that aspects of this meeting will prove attractive to scientists involved in all of the task teams. Secondly, a workshop on predictability and prediction of high impact weather will be held, probably at Landshut in southern Germany on 9-12 October. Although focused on physical science aspects of HIWeather, this meeting will also potentially have wider interest. In addition to these, WMO is planning a conference on early warning systems prior to the UNISDR Global Platform in Cancun in May. It is hoped that this will provide an opportunity for those who can attend to meet with HIWeather stakeholders.

Wishing you all every success in your HIWeather activities

A handwritten signature in black ink, appearing to read 'Brian Golding', written over a horizontal line.

Brian Golding

Met Office
FitzRoy Road
Exeter EX1 3PB

Tel: +44-7767-438583

brian.golding@metoffice.gov.uk

The Project

Steering Group

Co chairs: Brian Golding, UK and David Johnston, New Zealand

Theme 1, Processes & Predictability – lead: George Craig, Germany; members: Thomas Knox, Peter Knippertz, Jeff Keppert, others tbc.

Theme 2, Multi-Scale Coupled Forecasting – lead: Jenny Sun, USA; members: Paul Joe, Peter Steinle, Sharan Majumdar, Jianjie Wang, Jim Dudhia.

Theme 3, Impacts, Vulnerability & Risk – lead: Brian Mills, Canada; members: Joanne Robbins, Jeff Lazo, Michael Kunz, Isabelle Ruin.

Theme 4, Communication – co-leads: Sally Potter & Shannon Panchuk (currently on leave); interim co-leads: Linda Anderson-Berry, Kiernan McGill; members: Abi Beatson, Greg Carbin, Melanie Harrowsmith, Julie Demuth, Amber Silver, Rutger Dankers, Andrea Taylor, Thomas Kox, Alasdair Hainsworth, Claudia Adamo, Jose Galvez. Julia, Chasco.

Theme 5, Evaluation - Beth Ebert, Australia; members: Julia Chasco, Barb Brown, Anna Scolobig, Manfred Dorninger, Pertti Nurmi, Martin Goeber, Helen Titley, Marion Mittermaier, Jing Chen.

Funding. The Trust Fund is able to provide only limited support for project meeting attendance at present.

International Coordination Office: Discussions continue regarding the setting up of an ICO.

Secretariat: We are delighted that Julia Keller has joined the WMO secretariat to provide support to HIWeather.

Web site: The HIWeather web site can be reached at <http://bit.ly/1RKapbc>. A communications web platform for the project is being set up by Abi Beatson at Massey University, New Zealand. An outline structure for the platform was agreed at the December 2016 steering group teleconference.

Meetings: Steering Group meetings are held approximately quarterly by teleconference. The next such meeting is planned for March 2017 and will be followed by a physical meeting at the JWGFVR workshop in Berlin in May. The co-chairs meet with Paolo Ruti and Julia Keller monthly by teleconference in the intervening months report to the annual WWRP Scientific Steering Group in Geneva in October. The task teams meet by teleconference at intervals to suit their work and progress.

Related Meetings

1st UK Alliance for Disaster Research (UKADR) annual conference, London, 9-10 January 2017, <http://www.ukadr.org/>

AMS Annual Meeting, Seattle, 22 - 26 January 2017, <https://annual.ametsoc.org/2017/>

UNISDR Global Platform, Cancun, 22 - 26 May 2017, <http://www.unisdr.org/conferences/2017/globalplatform/en> preceded by WMO symposium on Early Warning Systems

Seventh International Verification Methods Workshop (7IVMW), Berlin, 8-11 May 2017, https://www.wmo.int/pages/prog/arep/wwrp/new/documents/FirstAnnouncementJWGFVR_v3.pdf preceded by Tutorial on 3-5th May and HIWeather Steering Group meeting on 7th May

IAPSO - IAMAS – IAGA Joint Assembly, Cape Town, 27 August – 1 September 2017, including session on High-impact Weather and Climate Extremes, <http://iapso-iamas-iaga2017.com/>

European Meteorological Society Annual Meeting 4 – 8 September 2017, <http://www.ems2017.eu/ems2017-first-announcement.pdf>. Proposed session on impact forecasting and hazard impact modelling.

WMO Data Assimilation Symposium, Florianopolis, Brazil, 11 - 15 September, 2017, <http://www.cptec.inpe.br/das2017/>

International Conference on The Impact of Hazard, Risk and Disasters on Societies, Durham, UK, 19 - 22 Sep 2017. <https://www.dur.ac.uk/ihrr/10th-anniversary/ihrr10/>

Workshop on Predictability and Nowcasting of High Impact Weather, Landshut, Germany, 9-12 October 2017

HIWeather Research

- a. **HIWeather Multi-Hazard Early Warning System Demonstration Project (FDP):** Demonstrate / evaluate a state-of-the-art, end-to-end, multi-hazard warning system based on km-scale coupled ensemble impact predictions & advanced communication methods in one or more developing countries in collaboration with existing SWFDP(s).
Leads: Peter Steinle, co-chairs, task team leads.
Objectives: Demonstrate benefits of advanced weather & coupled modelling; measure value chain & identify causes of biggest losses; build capacity through participation & training; transfer capability to academic, private & government institutes in the region; establish on-going capability that can be maintained locally.
Actions: Develop concept paper (early 2017)
Identify participants and funding for trial FDP - possibly Lake Victoria (2017)
Execute and evaluate trial FDP (2018-9)
Execute and evaluate full FDP (2022-3)
- b. **Review the state of wind hazard forecasting**
Lead: George Craig
Objectives: Clarify the wind metrics that relate to impacts; describe the state-of-the-art in observing and predicting these metrics; identify processes that lead to high impacts; make recommendations for targeted work to address weaknesses in understanding, observing and prediction.
Actions: Identify participants (2016)
Carry out review (2016-7)
Document and publish (2017-8)
- c. **Review current state of nowcasting & forecasting high impact weather**
Leads: Sharan Majumdar and Jenny Sun
Objectives: Document current state of high impact weather nowcasting/forecasting with an emphasis on flood and high wind warnings; Identify gaps
Actions: Draft review (2017)
Workshop (October 2017)
Publication (2018)
- d. **Intercomparison of km-scale DA & nowcast/forecast systems**
Leads: Sharan Majumdar and Jenny Sun
Objectives: Demonstrate state-of-the-art of km-scale DA & nowcast/NWP systems for HIW warning with an emphasis on floods & high winds
Actions: Develop concept paper (2017);
Identify interested participants, datasets & funds (2017)
- e. **Intercomparison of impact models for a particular hazard against a common impact dataset; optimal combination of impact data**
Leads : Martin Goeber, Joanne Robbins, Isabelle Ruin
Action: Develop concept paper (2017)
- f. **Review & classification of impact modelling**
Leads: Brian Mills & HIVR task team
Action: Develop paper (end 2017)
- g. **Research Demonstration Project (RDP) focused on the Value Chain**
Leads: Jeff Lazo, Barb Brown, Brian Mills, Manfred Dorninger, Anna Scolobig, Mark Bevan
Actions: Concept paper (2016)
Scoping workshop (May 2017)
- h. **Factors that affect warning-related decision-making including legal & institutional frameworks.**
Leads: Anna Scolobig, Julia Chasco
Action: Project funded, PhD student appointed
Framework intercomparison: PhD student (2019)
- i. **Communication along the value chain in different cultures/contexts**
Lead: Isabelle Ruin, Julia Chasco, Tom Kox
Action: Concept paper (2017)
- j. **Probabilistic forecasting and evaluation of Tropical Cyclones**

Leads: Helen Titley, Sharan Majumdar, Munehiko Yamaguchi, David Richardson, Barbara Brown, Linda Anderson-Berry

Objectives: Increase use of *probabilistic* ensemble forecast information in operational tropical cyclone forecasting; link to multi-scale modelling through, e.g., storm wind structure, precipitation (incl. orographic effects), storm surge and impact forecasting.

Actions: Review best practice in producing, evaluating & using probabilistic TC forecasts

Targeted HIWeather session at WMO/WWRP International Workshop on Tropical Cyclones. (2018)

k. Unconventional data sources for impact modelling, evaluation & communication

Leads: David Johnston, Abi Beatson

Action: Research network formed

Literature review and synthesis: Abi Beatson, PhD student. (2019)

k. Mesoscale Verification Inter-comparison over Complex Terrain (MesoVICT).

Lead: JWGFVR through Evaluation task team.

The project held a session at the 2016 EMS conference in Trieste followed by a 3-day workshop in Bologna to share initial findings (https://www.arpae.it/dettaglio_evento.asp?idLivello=32&id=2415). A session is being planned for the 2017 EMS conference in Dublin.

l. User-oriented metrics challenge.

Lead: JWGFVR through Evaluation task team.

The JWGFVR organised a competition for innovative evaluation metrics that are relevant to end users. The seventeen entries from ten countries are currently being evaluated.

m. Review of approaches to communicating high impact weather.

Lead: Andrea Taylor, Communication task team.

A Call for Papers has been issued for a special issue of the International Journal of Disaster Risk Reduction – see call at end of this newsletter. Deadline for titles is January 31st. Publication planned for 2018.

n. NAWDEX (North Atlantic Waveguide and Downstream Impacts Experiment):

Lead: Processes & Predictability task team.

The field phase is complete and acquired some good data including the extratropical transition of Tropical Cyclone Karl. Further information can be found at <http://nawdex.ethz.ch/news.html>. Flight data are currently being curated ready for release to the analysis and modeling groups.

o. HIGHWAY (Lake Victoria Basin Nowcasting project)

A prospective source of funding for a pilot study has been identified and a proposal submitted under the title HIGHWAY

National Programmes

US Contribution

Part of the special session on International Partnership opportunities at AMS2017 will be dedicated to the post-THORPEX projects, including HIWeather, with the aim of identifying the basis for a US post-THORPEX project proposal. The US has a wide range of relevant work underway including the Hydrometeorology Testbed (HMT), focusing on rainfall and flood forecasting, and the Hazardous Weather Testbed, focusing on tornado, wind and hail forecasting. CAPS is running 3-km CONUS-domain cycled EnKF data assimilation, including radar data, for selected periods and discussing coupling with hydrology/river stream models for HMT. The National Weather Service FACETS project (<http://www.nssl.noaa.gov/projects/facets/>) is closely aligned with several aspects of HIWeather.

UK Contribution

A summary of Met Office contributions to HIWeather has been prepared, which it is planned to extend to include NCAS, and potentially other UK partners. Key areas of work include unconventional data sources, km-scale data assimilation and ensemble prediction, km-scale coupled modelling for the UK, hazard impact modelling and risk communication. The impacts work is largely carried out in partnership with other members of the Natural Hazard Partnership (<http://www.naturalhazardpartnership.org.uk/>). The NERC/Met Office funded FfIR (Flooding from Intense Rainfall) project is addressing several aspects of HIWeather, including new radar observations, km-scale data assimilation and coupling with rural & urban inundation models. See <http://www.met.reading.ac.uk/flooding/>

German Contributions

W2W (Waves to Weather) is a Collaborative Research Center delivering the underpinning science needed to identify the limits of predictability in different weather situations so as to pave the way towards a new

generation of weather forecasting systems. See <http://w2w.meteo.physik.uni-muenchen.de/>. The research programme is listed under the headings of Upscale Error Growth, Cloud-Scale Uncertainties and Predictability of local Weather. WEXICOM (Weather warnings: from EXtreme event Information to COMunication and action) is an interdisciplinary collaborative research project aimed at facilitating transparent and effective communication of risks and uncertainties for individual user groups. See <http://www.geo.fu-berlin.de/en/met/wexicom/index.html>.

Australian Contribution

The Australian Bureau of Meteorology is running a project to evaluate and inter-compare different fire spread simulators driven by weather input. Results from this project will assist in developing routine predictive services for wildfire behaviour. A 2-day workshop on fire weather and risk was held 11-12 April 2016 in conjunction with the 5th International Fire Behaviour and Fuels Conference (<http://www.firebehaviorandfuelsconference.com/>).

Related Projects

RELAMPAGO (Remote sensing of Electrification, Lightning, And Meso-scale/micro-scale Processes with Adaptive Ground Observations)

See last year's newsletter for an outline of the main components. The main field campaign is planned for 2018.

SURF (Study of Urban Rainfall and Fog/Haze)

The Institute of Urban Meteorology is carrying out the SURF field experiment to study urban pollution and extreme precipitation in Beijing. A RDP proposal is being prepared for submission to WWRP.

PC-2018 (The Pyeongchang Winter Olympic Games in Korea, <http://www.pc2018.com/>) is the venue for a WWRP RDP in 2018. The objectives of the RDP/FDP are similar to SNOW-V10 and FROST-2014, but with stronger emphasis on high-resolution data assimilation and modelling. The RDP/FDP is currently being referred to as ICE-POP2018.

I-REACT – EU Horizon2020 3-year project on Improving Resilience to Emergencies through Advanced Cyber Technologies (I-REACT) involving a consortium of 20 partners will integrate multiple existing systems and European assets to facilitate early planning of disaster risk reduction activities. The focus will be on natural disasters triggered by extreme weather. I-REACT will cooperate with the European Flood Awareness System (EFAS), European Forest Fire Information System (EFFIS), European Global Navigation Satellite System (E-GNSS), Copernicus, etc. Within this project FMI will develop methodology and provide information on forecast occurrence risk of relevant high-impact weather variables, covering time scales from hours to couple weeks, utilizing probabilistic approaches and ensemble prediction systems.

ANYWHERE – EU Horizon2020 project aimed at producing a Europe-wide early warning system for weather-related hazards. <http://www.anywhere-h2020.eu/>

Aristotle

Aristotle will deliver multi-hazard capability to the Emergency Response Coordination Centre (ERCC) of EU DG ECHO, which is responsible for the coordination of human aid upon request of the government of a country affected by natural (and other) hazards. It has been designed to offer a flexible and scalable scientific network including 24/7 services that can provide new hazard related services to the ERCC and to create a pool of experts in the field of Hydro-Meteorology and Geophysics of Europe that can support the ERCC with regard to situation assessments in crisis situations worldwide. A website is being built at <http://aristotle.ingv.it/>

European Disaster Risk Management Knowledge Centre – The new centre will work at the science-policy interface to help EU Member States respond to emergencies, prevent and reduce the impact of disasters. See <http://drmhc.jrc.ec.europa.eu/>, <https://ec.europa.eu/jrc/en/news/new-knowledge-centre-help-eu-minimise-risk-disasters>

Related Programmes

S2S (Sub-seasonal-to-Seasonal Prediction):

The Extreme Weather sub-project, which has direct links to HIWeather, held a teleconference in January. See <http://www.s2sprediction.net/static/news> for news, including the latest S2S newsletter for download.

PPP (Polar Prediction Project):

Latest news is available at <http://www.polarprediction.net/news.html>.

Call for papers to Journal Special Issue

Working Title: Communicating High Impact Weather: Improving warnings and decision making processes

Editors: Andrea Taylor, Thomas Kox, David Johnston

Summary: Across the world high impact weather events pose a threat to life, livelihoods, health, wellbeing, property and infrastructure. This is especially evident in developing countries with more fragile economies and infrastructure. Indeed, the need to find effective ways to mitigate the harm caused by these events is embedded within the Sendai Framework for Disaster Risk Reduction's core goal of bringing about a "substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries". Effective weather forecasts and warning systems can play an important role in this by helping policy makers, members of the public, emergency responders, and decision makers across multiple sectors take appropriate action. However, in order for these forecasts and warnings to have value, the information created must be appropriately communicated to people at risk, received, understood, and used. Recognising the importance of identifying and developing good practice in the area, the World Meteorological Organisation has made communication as a core theme of its HIWeather framework, which has been undertaken to address user needs "for better forecast and warning information to enhance the resilience of communities and countries in responding to a carefully selected set of hazards".

This special issue, which is being pitched to the International Journal of Disaster Risk Reduction, will bring together state of the art knowledge in this area from academic research and operational practice within meteorological services and emergency management; highlighting both successes and areas requiring further development. We will welcome empirical studies examining the effectiveness of specific communication tools and strategies with users groups, articles reporting on operational practice, and conceptual papers reviewing existing literature on the communication of weather warning and setting out frameworks for developing effective communication strategies. Case studies drawn from operational practice will be especially encouraged, as will papers that have been coproduced by forecast providers, end-users, and academic partners. The emphasis is on events of urban flooding, wildfire, localised extreme wind, disruptive winter weather and heat waves, their impacts and the actions taken in response. This special issue aims to be agenda setting with respect to both the HIWeather framework and the field of weather risk communication more broadly.

Action Plan

As a first step we are seeking titles and 2-3 sentence abstracts for proposed papers by **January 30th 2017**, which we will incorporate into a special edition prospectus for the journal editors to review (decision expected in February 2017). If we receive a favourable response, then the submission deadline for papers will be **August 31st 2017**. Papers will then be peer reviewed. For those papers submitted by the July deadline the first round of reviews will take place in September-October 2017, although papers submitted before the deadline will be sent for review as they are received, and published online as soon as they are accepted. It is our goal to publish the special issue in early 2018. Please submit proposed title and 2-3 sentence abstracts to Heather Gunn (H.M.Gunn@massey.ac.nz) by **January 30th 2017**.