

**AGENDA ITEM 5: CONSIDERATION OF DECISIONS OF RA-II-15, CHy-14, CG-16
AND RELEVANT ECs**

Regional Association – II 15th Session

See Doc.4

Commission for Hydrology – 14th Session

**RESOLUTION 7 (CHy-14) –
WORK PROGRAMME AND STRUCTURE OF THE COMMISSION FOR HYDROLOGY**

THE COMMISSION FOR HYDROLOGY,

Noting:

- (1) Resolution 12 (Cg-XVI) – Hydrology and Water Resources Programme,
- (2) The report of the president of the Commission for Hydrology (CHy),
- (3) The reports of the members of the Advisory Working Group (AWG), which the Commission established at its thirteenth session,
- (4) The report of the Secretary-General regarding the activities of the Commission during its previous intersessional period,
- (5) The other resolutions adopted by the Commission during the present session,

Recognizing:

- (1) The valuable role played by the experts of national agencies in implementing the activities of the Commission,
- (2) The benefits of regular communication across all aspects of WMO's hydrological work,

Decides:

- (1) To adopt the five theme areas contained in Annex 1 to this resolution as a priority for the work of the Commission in the next intersessional period, together with the corresponding sets of activities and expected outputs and outcomes contained therein;
- (2) To re-establish the Advisory Working Group of the Commission for Hydrology, acting also as the Steering Committee for the Project for the Assessment of the performance of flow measurement instruments and techniques, with the terms of reference given in Annex 2 to this resolution;

- (3) To continue the four Open Panels of CHy Experts (OPACHE) and update them to cover the areas listed in Annex 2 to this resolution, which can be further divided into sub-themes or otherwise as meets the needs;
- (4) To support and encourage participation of the Advisory Working Group members and relevant experts in Inter-Programme Expert Teams managed by other Commissions where these contribute to the work plan of CHy;
- (5) To establish the following general terms of reference applicable to the Advisory Working Group and other experts:
 - (a) Members of the Advisory Working Group to ensure that the sections of the *Technical Regulations* (WMO-No. 49), the *Guide to Hydrological Practices* (WMO-No. 168), the manuals on hydrology and water resources and other guidance material relevant to their particular areas of responsibility are reviewed, and appropriate proposals for revisions and/or additions are included in future editions of these publications;
 - (b) Members of the Advisory Working Group and experts are to take account of relevant international agreements and conventions and of the activities of other international organizations working in fields related to theirs when fulfilling the tasks specified in their individual terms of reference;
- (6) To invite the following experts to serve as the members of the Advisory Working Group in the capacities indicated therein:
 - Mr Harry Lins (USA) – President of CHy
 - Mr Zhiyu Liu (China) – Vice-president of CHy
 - Mr Paul Pilon (Canada) – Quality Management Framework – Hydrology
 - Mr Tony Boston (Australia) – Data Operations and Management
 - Mr Sung Kim (Republic of Korea) – Water Resources Assessment
 - Mr Antonio Cardoso Neto (Brazil) – Water Resources Assessment
 - Mr Johnson Muturi Maina (Kenya) – Hydrological Forecasting and Prediction
 - Mr Yuri Simonov (Russian Federation) – Hydrological Forecasting and Prediction
 - Mr Jan Danhelka (Czech Republic – Water, Climate and Risk Management
 - Mr Johannes Cullman Chair of the Intergovernmental Council of the International Hydrological Programme of UNESCO (ex-officio member);

Requests the WMO Secretariat to provide short quarterly web updates on the HWRP's activities;

Urges Members to nominate additional experts to OPACHes and to facilitate the voluntary contribution of all members of the OPACHes to the activities of the Commission.

Annexes: 2

Note: This resolution replaces Resolution 7 (CHy-XIII), which is no longer in force.

ANNEX 1 TO RESOLUTION 13/1 (CHy-14)

Theme Areas

The Programme of Work of the Commission for Hydrology will focus on the following five theme areas that fall under the mandate of WMO:

1. Quality Management Framework – Hydrology (QMF–Hydrology);
2. Data Operations and Management;
3. Water Resources Assessment;
4. Hydrological Forecasting and Prediction;
5. Water, Climate and Risk Management.

The activities under each of these Theme Areas include those recommended by the previous Advisory Working Group, together with those added by the session. The contribution of the outcomes within each theme area to the WMO expected results is also identified.

Theme Area 1: Quality Management Framework – Hydrology (QMF–Hydrology)

List of activities

- (a) Continue implementing the project to assess the performance of flow measurement instruments and techniques against WMO standards commenced during the previous intersessional period;
- (b) Compile, develop and disseminate guidance material on methods for evaluating the uncertainty associated with the measurement of hydrological variables;
- (c) Provide background material to National Hydrological Services (NHSs) explaining why they should use standardized methods in their data collection;
- (d) Facilitate the development of policies, frameworks and information sources to promote standardization/guidance of the most suitable equipment and technologies in order to achieve high levels of reliability, user knowledge training effectiveness and other economies of scale;
- (e) Coordinate a review of the International Organization for Standardization (ISO) and other standards as used in hydrology and water resources and specify what the joint ISO/WMO standards will be, and how they will be established;
- (f) Monitor and report on new technologies in hydrology and water resources and make recommendations for future actions in this regard;
- (g) Review of material for the *Technical Regulations* (WMO-No. 49);
- (h) Coordinate and promote the provision of guidance to NHSs for implementation of a Quality Management System (QMS), linked to WMO QMF, including the possible inclusion of case studies;
- (i) Review and revise relevant HWRP documents (with no QMF logo) from a QMF perspective to add basics of operational hydrology; and
- (j) Provide guidance material on the calculation of rating curves.

Expected outputs/outcomes – Contribution to Expected Results 3

- (a) Additional guidance and information on the quality and performance of flow measurement instruments and techniques;
- (b) Identification of hardware and, as appropriate, compilation of software to support the requirements of NHSs in hydrometry, including discharge measurement and estimation;
- (c) Additional guidance material for NHSs in the areas of Quality Management, uncertainty analysis, standardized methods and rating curves;

- (d) Guidance on the development and adoption of joint ISO/WMO standards for hydrological purposes; and
- (e) Up to date CHY *Technical Regulations* that are relevant to the roles and responsibilities of Members.

Theme Area 2: Data Operations and Management

List of activities

- (a) Guide the implementation of CHY-14 Resolution 7/1 - Data Operations and Management;
- (b) Monitor and report on new developments dealing with data management issues, such as observations, data exchange and protocols, data transfer formats, data information, WIS and WIGOS;
- (c) Review progress with respect to the exchange of hydrological data and products, and if required propose additional guidance on data that should be exchanged, including harmonization of exchange practices; and protocols for the provision of information on data use, purposes, suitability and value back to data suppliers;
- (d) Provide guidance, advice and training in regards to the spatial estimation of rainfall and other hydrological parameters, including the use of remote sensing, e.g. radars, satellites.

Expected outputs/outcomes – Contribution to Expected Results 3 and 4

- (a) Internationally agreed standards, formats and protocols for the transfer of hydrological data and information;
- (b) Increased exchange of hydrological and related data at national, regional and international levels; and
- (c) Guidance on improved methods of estimation of areal precipitation and other related hydrological variables.

Theme Area 3: Water Resources Assessment (WRA)

List of activities

- (a) Finalize the WRA Manual (surface and groundwater) including assessment of water availability and use as well as water resources for water deficit regions;
- (b) Compile and document guidance on optimization as applied to hydrological networks (surface water, groundwater, soil moisture, etc.) (e.g. Geospatial Techniques);
- (c) Develop approaches for continuous tracking of current water resources availability using appropriate information technology;
- (d) Monitor and report on methodologies for the calculation of design discharge (including probable maximum flood) for hydraulic structures, taking into consideration climate variability and change, and make recommendations for future actions in this regard;
- (e) Consider producing guidance material for determining adequate ranges of environmental flows that will maintain or achieve good ecological status in all water bodies along with guidance on formulating policies to make these determinations for water ecosystems management;
- (f) Review and provide advice on how the Commission could contribute to the topic of water sharing/allocation, including the advantages and disadvantages of approaches and importantly, in what conditions/environments they may be more widely useful; and

- (g) Undertake an investigation of modelling approaches to the characterization and prediction of water availability and use.

Expected outputs/outcomes – Contribution to Expected Result 3

- (a) The Manual on Water Resources Assessment;
- (b) Provision of National Meteorological and Hydrological Services (NMHSs) with tools and techniques for the optimization of their hydrological data collection and related networks;
- (c) The availability of tools and techniques for continuous tracking of current water resources availability;
- (d) Revised guidance on determining design floods, including flood frequency analysis;
- (e) Preparation of a comprehensive report on environmental flows (e-flows) including case studies;
- (f) Improved guidance and advice on drought monitoring and management and design information for hydrological purposes;
- (g) Guidance of approaches to water sharing/allocation; and
- (h) Guidance on the methods for and benefits of prediction of water availability and use.

Theme Area 4: Hydrological Forecasting and Prediction

List of activities

- (a) Continue to provide guidance on the further implementation of the flood forecasting initiatives, including the Flash Flood Guidance System with Global Coverage (FFGS), the Coastal Flood Inundation Demonstration Project (CFIDP) and the Severe Weather Forecasting Demonstration Project (SWFDP);
- (b) Review and, if required, update approaches to urban flood forecasting and early warning;
- (c) Prepare a comprehensive report on large-scale flood inundation analysis and prediction models;
- (d) Assist in the preparation of a Manual on Flood Risk Mapping (including vulnerability and hazard);
- (e) Assist in the promotion and application of and training in the Low Flow Manual and the Flood Forecasting Manual;
- (f) Compile and provide guidance on streamflow forecasting using hydrological modelling linked to Numerical Weather Prediction products and relevant climate products, including application of ensemble methods, and linked to radar rainfall nowcasting products and satellite estimations;
- (g) Compile case studies and provide guidance on extended hydrological prediction for water resources management including information on related climate drivers;
- (h) Promote and assist in the use of the distance learning and advanced training module on flood forecasting and hydrological prediction;
- (i) Undertake the identification of good practices and make recommendations for ways forward in drought prediction;
- (j) Collect examples of good practice in dissemination of flood and drought information to the public and compile and provide guidance on flood and low-flow warning signal approaches;
- (k) Undertake the identification of good practices and make recommendations for ways forward in hydrological aspects of debris flow forecasting; and(l) Prepare a comprehensive report on the analysis of large-scale inundation caused by floods and related prediction models.

Expected outputs/outcomes – Contribution to Expected Result 3 and 7

- (a) Availability of new techniques and better assimilation of available data into hydrological models to support improved flood forecasting capabilities;
- (b) Assistance to, and guidance in, disaster mitigation and risk management in support of the role and responsibilities of NMHSs;
- (c) Guidance and case studies on the application of extended hydrological prediction capabilities;
- (d) Improved guidance on how to deal with floods and droughts at the national and regional levels, including information dissemination;
- (e) Improved guidance in forecasting droughts at the regional, national and local levels; and
- (f) Increased cooperation and coordination of activities with other relevant groups and agencies that will enable improved effectiveness of CHy activities.

Theme Area 5: Water, Climate and Risk Management

List of activities

- (a) Assist in the implementation of water-related initiatives (including, data and services) within the Global Framework for Climate Services (GFCS) (CHy-14 Resolution 5/1), liaising as appropriate with the Joint Commission for Climatology/Commission for Agriculture Meteorology/CHy Expert Group on Climate, Food and Water (CCI/CAGM/CHy Expert Group on Climate, Food and Water (JCEG-CFW), EC Working Group on Climate and related Water and Environmental Matters (EC-WG-CWE) ECWG-CWE, etc., and beyond WMO;
- (b) Prepare a note/overview guidance material on how to use regional climate modelling (i.e. long-term climate scenarios) in strategic hydrological management;
- (c) Prepare a comprehensive report on downscaling approaches for hydrological applications and their associated uncertainties, including commenting on existing case studies;
- (d) Prepare a state-of-the-art report/bibliography on hydrological analysis and modelling approaches in data sparse conditions;
- (e) Compile guidance and detailed procedures on essential steps in the analysis of vulnerability to water-related impacts, especially in relation to adaptation to climate variability and change; and
- (f) Provide advice and guidance with respect to the availability of climate data and climate model results for undertaking impact studies in support of adaptation to climate variability and change.

Expected outputs/outcomes: Contribution to Expected Result 3

- (a) Improved information on both the water sector contribution to and requirements from the GFCS;
- (b) Guidance material on the use of regional climate modelling and thus improved strategic hydrological management;
- (c) Increased knowledge and guidance on the approaches used in downscaling and the implications for hydrological modelling; and
- (d) Guidance material that will enable improved water resources management in vulnerable situations.

Cross-cutting Issues

While developing the Programme of Work, a number of cross-cutting issues will be taken into account. While implementing the programme activities these cross-cutting issues would have to be kept in view:

(a) Methods for data-sparse areas

Methodologies that will be applicable in data-sparse area must be identified and included under many of the theme areas, for example water resources assessment, flood forecasting, seasonal flow forecasting etc.

(b) World Hydrological Observing System (WHYCOS)

WHYCOS addresses cross-cutting topics as all HYCOS projects cover activities related to data collection and transmission, development of information systems that provide specific services/products and knowledge on water resources assessment, hydrological forecasting, flood management and integrated water resources management. Activities under each of the theme areas assist in general in the development of material in support of the WHYCOS projects. They form the main vehicle for both human and infrastructure capacity development in NHSS.

(c) Capacity-building

Capacity-building is a key expected result of all activities in the CHy Programme of Work and as such all activities would contribute to capacity-building initiatives across all theme areas.

(d) Modelling

The requirement for modelling is implicit in all Theme Areas. AWG members should include consideration of the advantages and disadvantages in modelling approaches in their area of application. This should include not only what hydrological modelling can do for hydrologists directly, and for end-users, but also the value of feedback to atmospheric modelling and others of relevance.

(e) Communication of Uncertainty

The issue of uncertainty is also a cross-cutting issue and AWG members should, where possible, give consideration to methods of determining and communicating uncertainty in their respective activities.

(f) Communication Mechanisms

In all theme areas, data reporting, sharing and dissemination in a timely manner is of great importance. In this regard, the use of appropriate information technology should be considered.

(g) Regional Associations

The activities of Regional Associations, and, in particular the Regional Association Working Groups on Hydrology (RAWGHs), or their equivalent, should be coordinated within overall Theme Area activities and there should be effective communication between the Theme Areas and the RAWGHs, as appropriate.

ANNEX 2 TO RESOLUTION 13/1 (CHy-14)

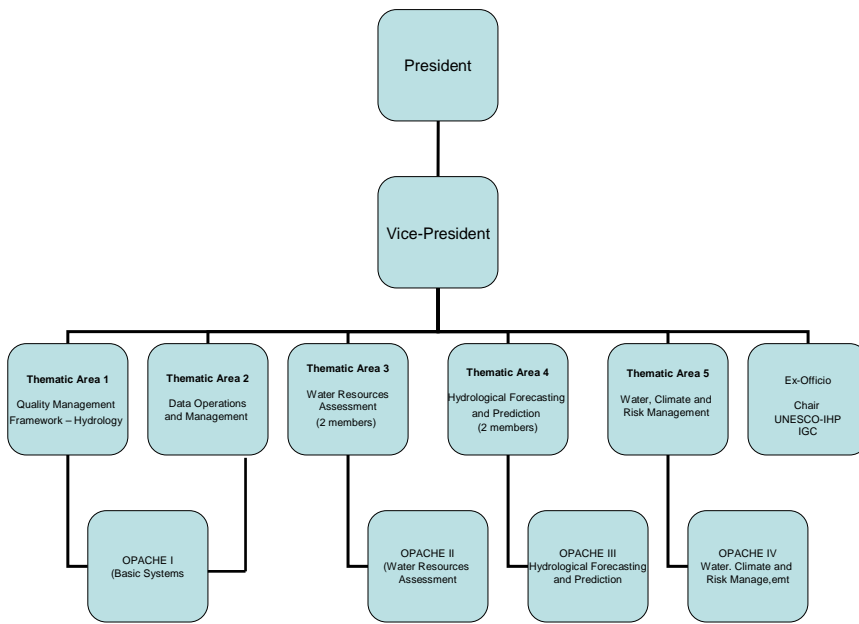
PROPOSED STRUCTURE OF THE COMMISSION FOR HYDROLOGY AND TERMS OF REFERENCE OF THE ADVISORY WORKING GROUP MEMBERS

The Advisory Working Group (AWG) will consist of the following:

1. President (Mr Harry Lins)
2. Vice-president (Mr Zhiyu Liu)
3. Theme Area 1: (Mr Paul Pilon)
4. Theme Area 2: (Mr Tony Boston)
5. Theme Area 3: 2 members (Mr Antonio Cardoso Neto and Mr Sung Kim)
6. Theme Area 4: 2 members (Mr Johnson Muturi Maina and Mr Yuri Simonov)
7. Theme Area 5: (Mr Jan Danhelka)
8. Chair of the Intergovernmental Council of the International Hydrological Programme of UNESCO (ex-officio member): (Mr Johannes Cullman)

The members of the AWG responsible for a particular Theme Area would carry out their activities with support from the relevant Open Panel of CHy Experts (OPACHEs). The OPACHEs established by the Commission at its thirteenth session will continue to provide support to the members.

ORGANIGRAMME



The members of the AWG responsible for a particular Theme Area would carry out their activities with support from the relevant Open Panel of CHy Experts (OPACHES). The OPACHES established by the Commission at its thirteenth session would continue to provide support to the relevant AWG members. It is proposed that the OPACHE on Basic Systems support the activities of both Theme Areas 1 and 2, namely: Quality Management Framework – Hydrology and Data Operations and Management. The OPACHES for the other three Theme Areas would remain unchanged. The Commission urged interested members to join the OPACHES and support the Programme of Work.

TERMS OF REFERENCE

While developing the activities it should be ensured that the cross-cutting issues, that is, methods for data-sparse areas, need and outreach of WHYCOS and capacity building requirements, modelling, communication of uncertainty, communication technology and cooperation with Regional Associations will be taken into account.

President of the Commission for Hydrology

Terms of reference

- (a) To undertake the duties required of a president of a WMO technical commission in accordance with WMO General Regulation 185;
- (b) To chair meetings, as required, within the above duties, including, for example, the CHy AWG, the WHYCOS International Advisory Group (WIAG);
- (c) To represent CHy within the WMO, in cooperation with other United Nations agencies, especially UNESCO, and at a range of other meetings, workshops and conferences ;
- (d) To coordinate the CHy activities towards implementation of the GFCS, or to delegate an AWG member responsible for this coordination (Resolution 5/1 (CHy-14));
- (e) To promote the recognition of, and increase awareness about, the role of WMO in international cooperation in hydrology and water resources;
- (f) To ensure that the activities of regional associations, and, in particular, the Regional Association Working Groups on Hydrology (RAWGHs) are coordinated within overall Commission activities and that there is effective communication between the Commission and the RAWGHs;
- (g) To ensure that the joint activities with the other technical commissions (TCs) are coordinated to the satisfaction of CHy and that there is effective communication between the Commission and the other TCs; and
- (h) To monitor changes in the operation and management of NMHSs, including product delivery and public awareness in hydrology and water resources.

Vice-president of the Commission for Hydrology

Terms of reference

- (a) To assist the president of the Commission in undertaking his Terms of Reference, as and when requested;
- (b) To assist the AWG in fulfilling its duties as outlined in the Implementation Plan for HOMS;
- (c) To coordinate the editing and production of publications prepared on behalf of CHy;
- (d) To identify and lead actions with regard to the education and training requirements of Commission activities under the adopted Strategy on Education and Training for HWR and the QMF–Hydrology;
- (e) To monitor and report on the updating of the Hydrological Information Referral Service (INFOHYDRO);

- (f) To promote data rescue and protection activities in NMHSs; and
- (g) To support the development and promotion of guidance material on the estimation of the economic benefits of NMHSs.

**Member leading activities associated with Theme Area 1:
Quality Management Framework – Hydrology (QMF–Hydrology)**

Terms of reference

- (a) To lead, monitor, report and provide advice on the activities of the Quality Management Framework – Hydrology Theme Area, as indicated in the Draft Programme of Work (Annex Y to Resolution X (CHy-14));
- (b) To liaise, as necessary, with relevant areas of WMO (for example, the Commission for Aeronautical Meteorology and groups working on WMO and related quality management frameworks and systems), the International Organization for Standardization (ISO) and other United Nations agencies with regard to quality management;
- (c) To develop and implement capacity-building initiatives based on the activities undertaken within the Quality Management Framework – Hydrology Theme Area; and
- (d) To report on activities at each AWG meeting and as requested by the president of CHy.

NOTE: While developing the activities it should be ensured that the cross-cutting issues are taken into account.

**Member leading activities associated with Theme Area 2:
Data Operations and Management**

Terms of reference

- (a) To lead, monitor, report and provide advice on the activities of the Data Operations and Management Theme Area, as indicated in the Draft Programme of Work (Annex Y to Resolution X (CHy-14));
- (b) To provide a focal point and liaise, as necessary, with relevant areas of WMO (for example, WHYCOS, WIGOS and WIS, the Open Geospatial Consortium (OGC), and the Global Terrestrial Network – Hydrology (GTN-H));
- (c) To represent the Commission for Hydrology on the WIAG and the Global Runoff Data Centre (GRDC) Steering Committee ;
- (d) To assist in the activities of GPCC, HYDROLARE and IGRAC;
- (e) To develop and implement capacity-building initiatives based on the activities undertaken within the Data Operations and Management Theme Area; and
- (f) To report on activities at each AWG meeting and as requested by the president of CHy.

NOTE: While developing the activities it should be ensured that the cross-cutting issues are taken into account.

**Members (2) leading activities associated with Theme Area 3:
Water Resources Assessment** (the ToR will be distributed between the 2 AWG members at the first AWG meeting)

Terms of reference

- (a) To lead, monitor, report and provide advice on the activities of the Water Resources Assessment Theme Area, as indicated in the Draft Programme of Work (Annex Y to Resolution X (CHy-14));

- (b) To liaise, as necessary, with relevant areas of WMO, United Nations agencies (e.g. UNESCO, the Food and Agriculture Organization (FAO), the United Nations Environment Programme (UNEP)) and other relevant groups with regard to water resources assessment activities;
- (c) To be the focal point for CHy's involvement in Integrated Drought Management;
- (d) To develop and implement capacity-building initiatives based on the activities undertaken within the Water Resources Assessment Theme Area; and
- (e) To report on activities at each AWG meeting and as requested by the president of CHy.

NOTE: While developing the activities it should be ensured that the cross-cutting issues are taken into account.

Members (2) leading activities associated with Theme Area 4:

Hydrological Forecasting and Prediction (the ToR will be distributed between the 2 AWG members at the first AWG meeting)

Terms of reference

- (a) To co-lead, monitor, report and provide advice on the activities of the Hydrological Forecasting and Prediction Theme Area, as indicated in the Draft Programme of Work (Annex Y to Resolution X (CHy-14));
- (b) To liaise, as necessary, with relevant areas of WMO (in particular Disaster Risk Reduction, the Commission for Atmospheric Sciences and the Commission for Basic Systems with regard to the WMO Flood Initiative) and other programmes and organizations (such as UNESCO-IHE (Institute for Water Education), the International Flood Initiative (IFI), the International Centre for Water Hazard (ICHARM)) with regard to hydrological forecasting and prediction and disaster risk reduction activities;
- (c) To represent CHy on the Flood Forecasting Initiative Advisory Group;
- (d) To develop and implement capacity-building initiatives based on the activities undertaken within the Hydrological Forecasting and Prediction Theme Area; and
- (e) To report on activities at each AWG meeting and as requested by the president of CHy.

NOTE: While developing the activities it should be ensured that the cross-cutting issues are taken into account.

Member leading activities associated with Theme Area 5:

Water, Climate and Risk Management

Terms of reference

- (a) To lead, monitor, report and provide advice on the activities of the Water, Climate and Risk Management Theme Area, as indicated in the Draft Programme of Work (Annex Y to Resolution X (CHy-14));
- (b) To liaise, as necessary, with relevant areas of WMO (for example, the Global Framework for Climate Services (GFCS), CCI and other organizations (UNESCO-International Hydrological Programme (IHP), UNEP, IAHR and IAHS) with regard to climate and water activities;
- (c) To represent CHy, as determined by the president of CHy, in water, climate and risk management related groups (e.g. GFCS, joint inter-Commission groups);
- (d) To develop and implement capacity-building initiatives based on the activities undertaken within the Water, Climate and Risk Management theme area; and
- (e) To report on activities at each AWG meeting and as requested by the president of CHy.

NOTE: While developing the activities it should be ensured that the cross-cutting issues are taken into account.

World Meteorological Congress - 16

See Doc.3

Relevant Executive Councils

See Doc.3

CHy Advisory Working Group Meeting – First Session (Geneva, 25 February to March 1, 2013)

(Note that the Member responsible for Quality Management Framework – Hydrology was Paul Pilon, and he has been replaced by Jean-François Cantin).

The material immediately below represents the Work Plans of the members of the CHy Advisory Working Group.

AWG WORK PROGRAMMES (29 APRIL2013)

WORKPLAN: President of CHy

Harry Lins

Activities	Actions	Outputs	Resources	Milestones	Linkages
a. To undertake the duties required of a president of a WMO technical commission in accordance with WMO General Regulation 185	<ul style="list-style-type: none"> • Represent CHy as and when required, (eg at Executive Council) • Attend meetings of Presidents of Technical Commissions • Other duties as required of president of CHy (see General Regulation 185) 	<ul style="list-style-type: none"> • Hydrology and Water Resources issues remain a key aspect of the work of WMO. • NMHSs are assisted in fulfilling their roles and responsibilities. • CHy is adequately represented within the wider WMO environment. 	<ul style="list-style-type: none"> • Resources are provided to meet the needs of the AWG members in doing the work of the Commission.MO Secretariat support 	<ul style="list-style-type: none"> • Meetings and other activities according to the WMO Schedule of meetings. • Report at AWG meetings • Report at EC Sessions • Report to CHy-15 (2016). 	<ul style="list-style-type: none"> • PTC • PRA • EC • Cg
b. To chair meetings, as required, within the above duties, including, for example, the CHy AWG, the WHYCOS International Advisory Group (WIAG), and the “Integrated Drought Management group”	<ul style="list-style-type: none"> • Chair meetings of the AWG • Chair meetings of the WHYCOS International Advisory Group. • Chair or participate in other meetings as required. 	<ul style="list-style-type: none"> • A successful intersessional period for the Commission for Hydrology. 	<ul style="list-style-type: none"> • Resources are provided to meet the needs of the AWG members in doing the work of the Commission. 	<ul style="list-style-type: none"> • AWG meetings are held at agreed schedule. • Other meetings as determined in consultation with the Secretariat. • Report at AWG meetings • Report at EC Sessions • Submit a report to CHy-15 	<ul style="list-style-type: none"> • UNESCO • GWP • Donors
c. To represent CHy within the WMO, in cooperation with other United Nations agencies, especially UNESCO, and at a range of other meetings, workshops and conferences	<ul style="list-style-type: none"> • Chair or participate in meetings, workshops and conferences as required (eg WMO/UNESCO Liaison Committee, Task Team on the International Flood Initiative). • Promote establishment of joint WMO/UNESCO projects on topics of mutual interest and benefit. 	<ul style="list-style-type: none"> • Hydrology and Water Resources issues remain a key aspect of the work of WMO. • NMHSs are assisted in fulfilling their roles and responsibilities. • CHy is adequately represented within the wider WMO environment. • WMO (and CHy) is represented in the wider United Nations system. • Demonstrable 	<ul style="list-style-type: none"> • Resources are provided to meet the needs of the AWG members in doing the work of the Commission. 	<ul style="list-style-type: none"> • Involvement in meetings, workshops and conferences as determined in consultation with the Secretariat. • Report at AWG meetings • Report at EC Sessions • Submit Report to CHy-15. 	<ul style="list-style-type: none"> • UNESCO • FAO • UNECE

Activities	Actions	Outputs	Resources	Milestones	Linkages
		progress in fulfilling Cg-16 Res 12			
d. To coordinate the CHy activities towards implementation of the GFCS, or to delegate an AWG member responsible for this coordination (Resolution 5/1 (CHy-14))	<ul style="list-style-type: none"> • Represent CHy as required, or delegate to appropriate AWG member; • Ensure timely and accurate CHy response to GFCS requests; 	<ul style="list-style-type: none"> • The role of hydrology in general and CHy in particular is recognized in the GFCS. 	<ul style="list-style-type: none"> • AWG Member responsible for Water, Climate and Risk Management • WMO Secretariat • OPACHE 	<ul style="list-style-type: none"> • Involvement in meetings, workshops and conferences as determined in consultation with the Secretariat. • Report at AWG meetings • Report at EC Sessions • Report to CHy-15 	<ul style="list-style-type: none"> • PTC • IB CS
e. To promote the recognition of, and increase awareness about, the role of WMO in international cooperation in hydrology and water resources	<ul style="list-style-type: none"> • Write, review, comment on and contribute to articles associated with Hydrology and Water Resources addressing HWR issues. • Promotion on an opportunity basis. • Input to international initiatives as appropriate. 	<ul style="list-style-type: none"> • WMO (and CHy) is represented in the wider United Nations system. 	<ul style="list-style-type: none"> • Linked to above activities 	<ul style="list-style-type: none"> • Opportunity based, in consultation with the WMO Secretariat. • Report at AWG meetings • Report at EC Sessions • Submit report to CHy-XV 	<ul style="list-style-type: none"> • IFI • UNESCO • IAHS • Others as required
f. To ensure that the activities of regional associations, and, in particular, the Regional Association Working Groups on Hydrology (RAWGHs) are coordinated within overall Commission activities and that there is effective communication between the Commission and the RAWGHs	<ul style="list-style-type: none"> • Establish direct communication with Presidents of RA WGSH; • Transmit work plan of CHy, when finalized, to Presidents of RA WGSH, to incorporate in RA WGSH activities, where applicable; • Obtain programme of activities/work plans and progress reports from Presidents of RA WGSH for feedback into CHy activities; • Participate in RA 	<ul style="list-style-type: none"> • Improved coordination and cooperation with the Regional Associations 	<ul style="list-style-type: none"> • Resources are provided to meet the needs of the AWG members in doing the work of the Commission. 	<ul style="list-style-type: none"> • Involvement in meetings, workshops and conferences as determined in consultation with the Secretariat. • Report at AWG meetings • Report at EC Sessions • Report to CHy-15 	<ul style="list-style-type: none"> • PRAs • RA Has • RA Subsidiary bodies

Activities	Actions	Outputs	Resources	Milestones	Linkages
	<p>WGSH Meetings, where possible;</p> <ul style="list-style-type: none"> • Report to each AWG Session on activities of RA WGSH; • Provide information on AWG decisions and recommendations that relate to or impact on RA WGSH activities; 				
<p>g. To ensure that the joint activities with the other technical commissions (TCs) are coordinated to the satisfaction of CHy and that there is effective communication between the Commission and the other TCs</p>	<ul style="list-style-type: none"> • Communicate directly with Presidents of other TCs; • Provide information on AWG decisions and recommendations that relate to or impact on the other TCs; 	<ul style="list-style-type: none"> • Improved coordination and cooperation with the Technical Commissions 	<ul style="list-style-type: none"> • Resources are provided to meet the needs of the AWG members in doing the work of the Commission. 	<ul style="list-style-type: none"> • Involvement in meetings, workshops and conferences as determined in consultation with the Secretariat. • Report at AWG meetings • Report at EC Sessions • Report to CHy-15 	<ul style="list-style-type: none"> • PTCs • Joint Commission activities
<p>h. To monitor changes in the operation and management of NMHSs, including product delivery and public awareness in hydrology and water resources</p>	<ul style="list-style-type: none"> • Follow the deliberations and output of the EC Group on the Role and Operation of NMHSs and extract decisions and recommendations relating to hydrology and water resources for dissemination to NHSs; • Advise CHy on the role and responsibility of NHSs; • Promote the Hydrology and Water Resources component of WMO's Long Term Plan and Technical 	<p>WMO, and CHy in particular is kept apprised of the direction of hydrology and its role therein.</p>	<p>Opportunity basis.</p>	<ul style="list-style-type: none"> • Opportunity basis. • Report at AWG meetings • Report at EC Sessions • Report to CHy-15 	<ul style="list-style-type: none"> • EC • Cg • Opportunity basis

Activities	Actions	Outputs	Resources	Milestones	Linkages
	<p>Documents on the Role and Operation of NHSs;</p> <ul style="list-style-type: none"> • With the assistance of Secretariat, obtain and disseminate information on water-related new initiatives, programmes, projects and activities relevant to NHSs eg. MDGs on water, etc. 				
<p>i. To report on activities at each AWG meeting</p>				<ul style="list-style-type: none"> • Report at AWG meetings • Report at EC Sessions • Report to CHy-15 	

WORKPLAN: Vice President of CHy

Zhiyu Liu

Activities	Actions([CHy-14 Report Section])	Outputs	Resources	Linkages	Milestones	Secretariat Support
<p>a. To assist the president of the Commission in undertaking his Terms of Reference, as and when requested</p> <p>Priority: A</p>	<p>- Variable as assigned or delegated by the president</p>	<p>- TBD</p>	<p>- As appropriate</p>	<p>- President, - WMO Secretariat - Theme Areas</p>	<p>- Variable and as appropriate</p>	<p>- Variable and as appropriate</p>
<p>b. To assist the AWG in fulfilling its duties as outlined in the Implementation Plan for HOMS</p> <p>Priority: A</p>	<p>- Coordinate development of community of practice solution to priority issues [Res 11- Decides 3]</p> <p>- Assess convenience of developing community of practice on Low Flow Estimation and Prediction</p>	<p>- Open source and Communities of practice established (Database management systems; Training material for Stream Gauging courses; Training material for Flood Forecasting and Warning courses; Decision-support tool for uncertainty analysis of flow measurements (UADAT)</p> <p>- Communities of practice established</p>	<p>- Core Budget - WMO Strategy on Education and Training in HWR for the period of 2013-2016 - CHy-AWG Members</p>	<p>- GFCS; - QMF-Hydrology, - RA WGSH</p> <p>- Johannes Cullmann</p>	<p>- April 2014 (Database management systems) - June 2014 (Training material for Stream Gauging courses) - June 2015 (Training material for Flood Forecasting and Warning courses) - June 2016 (Decision-support tool for uncertainty analysis of flow measurements) - July 2016</p>	<p>C. Caponi and N. Ravalitera</p>
<p>c. To coordinate the editing and production of publications prepared on behalf of CHy</p> <p>Priority: A</p>	<p>- Update information on publications (manuals, technical notes, etc.) under preparation</p> <p>- Monitor and ensure application of approved</p>	<p>- Quality, peer reviewed publications</p>	<p>- Core Budget</p>	<p>- QMF-Hydrology - Water Resources Assessment - other Theme Areas</p>	<p>- Once every year</p>	<p>G. Arduino</p>

Activities	Actions([CHy-14 Report Section])	Outputs	Resources	Linkages	Milestones	Secretariat Support
	CHy review process					
d. To identify and lead actions with regard to the education and training requirements of Commission activities under the adopted Strategy on Education and Training for HWR and the QMF–Hydrology Priority: B	- Review of the WMO Strategy on Education and Training in HWR for the period of 2013-2016 - Implement identified actions based on review	- Organized education and training activities	- CHy-AWG members - Consultant (subject to resources)	- ETR; - IHP/HWRP Office in Germany - UNESCO, IHE, COMET program	- Variable and as appropriate	C. Caponi
e. To monitor and report on the updating of the Hydrological Information Referral Service (INFOHYDRO) Priority: A	-Oversee regular call for contributions, analysis of responses and updating of reports	- Updated INFOHYDRO	-RHAs, -President of CHy	- WMO Secretariat	- April 2013 (next call) - Continuous	C. Caponi and N. Ravalitera
f. To promote data rescue and protection activities in NMHSs Priority: B	Promote data rescue in conflict zones and other relevant areas	- Request of data rescue support	-RHAs, -CHy-AWG members - Guidelines for Hydrological Data Rescue	- Theme on Data operation and management - WMO Secretariat	- Variable and as appropriate	Julius Wellens-Mensah
g. To support the development and promotion of guidance material on the estimation of the economic benefits of NMHSs Priority: B	- Review background material and existing draft document prepared by consultant - Suggest means of distribution if desirable	- From nothing to document on estimation of the economic benefits of hydrological services - Recommendation	- Core Budget - Consultant (subject to resources) - Selected peer reviewers	- OPACHEs - Secretariat HWR - Giacomo Teruggi - Jan Danhelka	- April 2013 - SEB Forum 2013 - April 2014 - November 2015	Julius Wellens-Mensah
h. Provide guidance, advice and training in regards to the spatial estimation of rainfall and other hydrological parameters, including the use of remote sensing, e.g.	- Review background material and draft a technical note on application of remote sensing to hydrology	- Guidance or technical note on application of remote sensing to hydrology - Training material on	- CHy members - Secretariat HWR and SAT (Space Program Office)	- QMF-Hydrology - other Theme Areas	- April 2014 - June 2015	Wolfgang Grabs

Activities	Actions([CHy-14 Report Section])	Outputs	Resources	Linkages	Milestones	Secretariat Support
radars, satellites Priority: C	- Eventually preparation of training material	this topic				
To report on activities at each AWG meeting	As required	Report on actions completed and in progress	- AWG members	President of CHy	Six monthly reports	

Priority: A. Mission Critical; B. Strategic and Desirable; C. Discretionary

WORKPLAN: Leader of activities associated with Quality Management Framework – Hydrology (QMF–Hydrology)

Paul Pilon

Activities	Actions	Outputs	Resources	Milestones	Linkages
<p>a. Continue implementing the project to assess the performance of flow measurement instruments and techniques against WMO standards commenced during the previous intersessional period</p> <p>Priority: A</p>	<ul style="list-style-type: none"> - act as Chair of the Management Committee (MC) - lead MC in the development of detailed work plan based on CHy-14 and AWG-1 including budget estimation - oversee progress against work plan - Report to CHy AWG on Project activities 	<p>- project deliverables as per detailed work plan</p> <ol style="list-style-type: none"> 1) Completion of Project Output 3 d) decision-aid tool and e) examples of its use 2) Completion of PO 4, 5, 6 and 7, including documentation of approaches and examples of UA of discharge determination using stage-discharge curves and index velocity method. - manual on design of regattas - address influence of streamflow gauging site characteristics on uncertainty and environmental factors on operator's uncertainty 	<ul style="list-style-type: none"> - 2 face-to-face meetings of MC - 1 to 2 face-to-face meetings of subset of MC members and invited experts on specific work plan items - potential contract funds to allow the development (acquisition) of a user-friendly, easy-to-use software to perform UA of Q measurements using mechanical and acoustic technologies 	<ul style="list-style-type: none"> - developed revised work plan including identification of expert leads for each PO Task (first face-to-face meeting of MC Sept/Oct 2013) - Availability of a user friendly, easy-to-use decision-aid software and examples - Completed guidelines for conducting and reporting results of instrument calibration and performance test on instruments and techniques - Completed documentation of uncertainty analysis of discharge determination using stage-discharge curves - Completed documentation of uncertainty analysis of discharge determination using index velocity approach 	<p>Primarily achieved through membership on MC</p> <ul style="list-style-type: none"> - IAHS - IAHR - ISO - HMEI - one Regional Association - contributing NHSs (OPACHE and invited experts)
<p>b. Compile, develop and disseminate guidance material on methods for evaluating the uncertainty associated with the measurement of hydrological variables</p> <p>Priority: C</p>	<p>To Be Determined (presume linkages with activity a)), more information required on expectations. Similar request made by CHy-13, and MC on Project x made recommendations to AWG on this. Also does not mesh with project title!</p>			<ul style="list-style-type: none"> - Dependant on milestones of activity a and advice of MC. 	

Activities	Actions	Outputs	Resources	Milestones	Linkages
<p>c. Provide background material to National Hydrological Services (NHSs) explaining why they should use standardized methods in their data collection</p> <p>Priority: A</p>	<ul style="list-style-type: none"> - Assist in the development of a comprehensive strategy and plan on QMF-H for CHy and HWRP. (Activities c and h are strongly linked and should be approached in unison, while activity g provides the recommended practices and procedures (standards) to achieve QMF-H) - assist in the development of a WMO HWRP website for QMS - review, revise and prepare material for assistance to NHSs on implementing a QMS. - link to CHy-14 activity i) review of HWRP documents from a QMF perspective. 	<ul style="list-style-type: none"> - Assistance in the development of a QMF-Hydrology website - Revised and finalized material on guidance to NHSs on approaching quality management (1) the importance of standards in NHS operations, (2) Guidelines for implementing a quality management system in hydrology, (3) provision link on website to the report “a practical guide ...” and (4) case studies NHSs implementing a QMS. 	<ul style="list-style-type: none"> - Assistance of Secretariat staff and President CHy and AWG Member responsible for Data Operations and Management 	<ul style="list-style-type: none"> - Articulated comprehensive strategy and plan is in place. - Launch of WMO QMF-Hydrology website (Sept 2013). - Documents guiding NHSs in the adoption of QMS (Aug 2013). - Posting of QMF-H related material (starting Sept 2013). 	
<p>d. Facilitate the development of policies, frameworks and information sources to promote standardization/guidance of the most suitable equipment and technologies in order to achieve high levels of reliability, user knowledge training effectiveness and other economies of scale</p> <p>Priority: C</p>	<ul style="list-style-type: none"> - table at first meeting of MC the proposal made at Manaus meeting - further action dependant on decisions of MC 	<p>- to be determined</p>	<p>- to be determined</p>	<p>- Sept/Oct 2013</p>	<ul style="list-style-type: none"> - HMEI - NASH - Project MC
<p>e. Coordinate a review of the International Organization for</p>	<p>This should be done under activity g, as the</p>	<p>- Review of ISO and WMO standards</p>	<p>- Secretariat support and assistance of various</p>	<p>- See CHy-14 activity g)</p>	

Activities	Actions	Outputs	Resources	Milestones	Linkages
<p>Standardization (ISO) and other standards as used in hydrology and water resources and specify what the joint ISO/WMO standards will be, and how they will be established</p> <p>Priority: A</p>	<p>Technical Regulations provide the standards for use in hydrology (recommended practices and procedures)</p>	<p>associated with Technical Regulations</p>	<p>experts - See CHy-14 activity g)</p>		
<p>f. Monitor and report on new technologies in hydrology and water resources and make recommendations for future actions in this regard</p> <p>Priority: C</p>	<p>- respond to requests on an ad hoc basis in agreement with AWG</p>	<p>- to be determined</p>	<p>- To be determined</p>	<p>- to be determined</p>	<p>- HMEI</p>
<p>g. Review of material for the <i>Technical Regulations</i> (WMO-No. 49)</p> <p>Priority: A</p>	<p>- develop material in association with the Task Team on WIGOS Regulatory Material - review all existing standards in the Technical Regulations and update as appropriate - Review existing material, revise, seek President CHy approval for posting on QMF-H website by: > developing team of experts to assist in the review of TRs (this is a process similar to revising the Guide to Hydrological Practices) > assigning overall lead to the effort > assigning experts to</p>	<p>- Revised Technical Regulations</p>	<p>- Secretariat support to oversee process - possible meeting of “editorial board” of Technical Regulations - consideration of honorariums for experts to develop revised standards in TRs</p>	<p>- formation editorial board (Jan 2014) - assignment of experts material for review - development of revised material - peer review initiated on revised material as it becomes available - preparation of final version of material post peer-review for consideration by CHy-15</p>	<p>- ISO - OPACHE experts - NHSs</p>

Activities	Actions	Outputs	Resources	Milestones	Linkages
	<p>review specific material in TRs and propose approach for revision (additional experts to prepare revisions)</p> <ul style="list-style-type: none"> > developing and applying peer-review process of all revised material for TRs > providing revised manuscripts on TRs to CHy for its consideration and approval for further consideration of Congress - need to consider proposed CHy-14 activity d) as to how it fits with TRs. 				
<p>h. Coordinate and promote the provision of guidance to NHSs for implementation of a Quality Management System (QMS), linked to WMO QMF, including the possible inclusion of case studies</p> <p>Priority: A</p>	<ul style="list-style-type: none"> - See CHy-14 activity c). - plus develop 2 to 3 case studies of NHSs that have achieved ISO certification - plus see if possible to develop case studies of NHSs that have adopted QMS procedures as special effort without seeking formal ISO certification 	<ul style="list-style-type: none"> - case studies to help guide NHSs seeking to implement QMS 		<ul style="list-style-type: none"> - Develop template for case studies (Jan 2014) - Specific NHSs provide material for case studies (Dec 2014) 	<ul style="list-style-type: none"> - NHSs
<p>i. Review and revise relevant HWRP documents (with no QMF logo) from a QMF perspective to add basics of operational hydrology</p> <p>Priority: B</p>	<ul style="list-style-type: none"> - obtain a list and copy of potential HWRP documents - ascertain if HWRP documents are sufficient for provision of guidance material or as manuals in the provision of 	<ul style="list-style-type: none"> - recommendations on the priority of documents to be revised. - assignment of documents to experts for review and revision - peer review of revised material 	<ul style="list-style-type: none"> - Secretariat support for acquisition of list, reports, views on selection of experts, and conducting peer review process 	<ul style="list-style-type: none"> - selection of experts to review and revise material - submission of material to peer review process - finalized revised documents - recommendations for future actions for consideration by CHy-15. 	<ul style="list-style-type: none"> - OPACHE - NHSs

Activities	Actions	Outputs	Resources	Milestones	Linkages
	standards or use by NHSs in their QMS. - Note important link to CHy-14 activity g) as the Guidance documents and Manuals form the standards within the Technical Regulations.				
j. Provide guidance material on the calculation of rating curves Priority: C	See action a) and consider existing material (e.g., Guide to Hydrological Practices and Manual on Stream Gauging)..				
k. To liaise, as necessary, with relevant areas of WMO (for example, the Commission for Aeronautical Meteorology and groups working on WMO and related quality management frameworks and systems), the International Organization for Standardization (ISO) and other United Nations agencies with regard to quality management	- Represent CHy on: ICG-WIGOS TT-WRM, IPET WIFI on Regulatory Material, IPET WIFI on Quality Management, and WIGOS Task Team on Quality Management	- developed new material for Technical Regulations for consideration by CHy	- Secretariat support - expert advice and assistance	- draft material for ICG-WIGOS TT-WRM (August 2013) - to be determined	- ICG-WIGOS - relevant areas of WMO (e.g., CBS)
l. To develop and implement capacity-building initiatives based on the activities undertaken within the Quality Management Framework – Hydrology Theme Area	-assist in the development of a comprehensive strategy and plan on capacity building in QMF-H - assist in implementation of capacity building initiatives in developing countries for the adoption of QMS practices (e.g. WHYCOS)	- guidance material (see CHy-14 activity c).	- potential short work assignment with Secretariat to assist in development of guidance material and its implementation (e.g. training trainers)	To Be Determined.	- WHYCOS - NHSs

Activities	Actions	Outputs	Resources	Milestones	Linkages
m. To report on activities at each AWG meeting and as requested by the president of CHy	As required.				

WORKPLAN: Leader of activities associated with Data Operations and Management

Tony Boston

Activities	Actions	Outputs	Resources	Milestones	Linkages
<p>a. Guide the implementation of CHy-14 Resolution 7/1 - Data Operations and Management particularly:</p> <ul style="list-style-type: none"> - testing and applying WaterML 2.0 in pilot projects and operational applications by WMO members; and - undertaking processes that see WaterML 2.0 become a WMO standard for information exchange managed by WMO (supported by the WMO/OGC MOU) and registered as a joint WMO/ISO standard. <p>Priority A</p>	<ul style="list-style-type: none"> - Establish a Management Committee (MC) to test WaterML 2.0 through implementations in National Hydrological Services (NHSs) - Undertake processes within WMO towards WMO/ISO WaterML 2.0 standardisation. - Report to CHy AWG on activities. 	<ul style="list-style-type: none"> - Documented tests of WaterML 2.0 data interchange use cases by identified National Hydrological Services (NHSs). - Best practice and other implementation guidance material on use of WaterML 2.0 - Completed documentation and proposal for CHy-15 to adopt WaterML 2.0 as a joint WMO/ISO standard. 	<ul style="list-style-type: none"> - CHy Basic Systems OPACHE; WMO regional associations; OGC Hydrology Domain Working Group (HDWG) - 2 face-to-face meetings of MC - Possible contract funds to allow further development in support of hydrological data interchange using WaterML 2.0 and/or to support testbed implementations in NHSs. - Secretariat support and coordination with CIMO regarding standardisation process. 	<ul style="list-style-type: none"> - Engage OPACHE, regional associations, OGC HDWG inviting participation in testing activities by March 2013 - Developed work plan including identification of expert leads for each project output or task by July 2013 - Completion of testing of WaterML 2.0 at a number of NHSs including developing country example(s) by June 2014 - Establish linkages and process with CIMO regarding WaterML 2.0 standardisation by Dec 2014 - Completed best practice guidelines providing NHSs with options for technical implementation of support for WaterML 2.0 by June 2015 - WaterML 2.0 recommended to CHy as a WMO/ISO standard by June 2016. 	<p>Primarily achieved through:</p> <ul style="list-style-type: none"> - OPACHE and invited experts - OGC HDWG - At least one Regional Association - Contributing NHSs - WMO CIMO and ISO.
<p>b. Monitor and report on new developments dealing with data management issues, such as observations, data exchange and protocols, data transfer formats, data information, WIS and WIGOS.</p> <p>Priority A</p>	<ul style="list-style-type: none"> - Provide guidance to member countries regarding data management principles for hydrological services. - Promote use and uptake of appropriate technology for hydrological data 	<ul style="list-style-type: none"> - Technical report on steps required to establish a hydrological data management system - Provision of National Hydrological Services (NHSs) with guidelines, tools and techniques to participate in a 	<ul style="list-style-type: none"> - GRDC - OPACHE - OGC HDWG - Developers of MCH. 	<ul style="list-style-type: none"> - Ongoing activity - Publish resources on eBoard or article for WMO Bulletin => improved information sharing - Finalisation of outputs by Dec 2015. 	<p>- As required.</p>

Activities	Actions	Outputs	Resources	Milestones	Linkages
	<p>management, such as MCH open source software.</p> <ul style="list-style-type: none"> - Prepare benefits statement for WaterML 2.0 and HY_Features and a glossary of terms for non-specialists - Encourage adoption of HY_Features and promote its implementation, testing and use - Review report on the ISO 19115 Metadata Profile developed by GRDC. 	<p>federated global water data exchange infrastructure compatible with WIS, WIGOS and GEOSS;</p> <ul style="list-style-type: none"> - Explanatory material on HY_Features and WateML2.0 aimed at hydrologists - Finalised Metadata profile for ISO 19115. 			
<p>c. Review progress with respect to the exchange of hydrological data and products, and if required propose additional guidance on data that should be exchanged, including harmonization of exchange practices; and protocols for the provision of information on data use, purposes, suitability and value back to data suppliers.</p> <p>Priority B</p>	<ul style="list-style-type: none"> - Survey hydrological advisors of WMO members to establish their progress with respect to resolution 25 regarding the free and open exchange of hydrological data and provision using web-based services - The Survey will establish to what extent climate data are being exchanged under resolution 25 as a water input into GFCS. - Monitor work of the task team for climate data exchange - Possible workshop on how water managers can assist/benefit from GFCS. 	<ul style="list-style-type: none"> - Increased exchange of hydrological and related data at national, regional and international levels; - Report summarising survey results - Analysis of support for Resolution 25 within member countries - Increased awareness of the use of climate data and information for hydrology and water management. 	<ul style="list-style-type: none"> - Secretariat with respect to previous surveys and survey results - WMO hydrological advisors - OPACHE members - Possible contract funds for survey result compilation and analysis - Core funding for any workshop and associated meetings. 	<ul style="list-style-type: none"> - Survey designed and circulated by July 2013 - Survey results report by February 2014 - Workshop by end 2014. 	<ul style="list-style-type: none"> - Survey, workshops and climate data linkages undertaken in conjunction with the leader of the Water, Climate and Risk Management theme.

Activities	Actions	Outputs	Resources	Milestones	Linkages
<p>d. To provide a focal point and liaise, as necessary, with relevant areas of WMO (for example, WHYCOS, WIGOS and WIS, the Open Geospatial Consortium (OGC), and the Global Terrestrial Network – Hydrology (GTN-H)).</p> <p>Priority C</p>	<p>- Represent CHy on ICG-WIGOS TT-WMD; WHYCOS; WIS; HDWG; and GTN-H.</p>	<p>- As required.</p>		<p>- Convey CHy requirements to GTN-H coordination panel meeting and OGC HDWG meetings in June 2013.</p>	
<p>e. To represent the Commission for Hydrology on the WIAG and the Global Runoff Data Centre (GRDC) Steering Committee.</p> <p>Priority C</p>	<p>- Represent CHy on WIAG and GRDC steering committees.</p>	<p>- As required</p>		<p>- Convey CHy requirements to GRDC steering committee in June 2013 - Attend WIAG meeting.</p>	
<p>f. To assist in the activities of GPCC, HYDROLARE and IGRAC.</p> <p>Priority C</p>	<p>- Maintain close cooperation through GTN-H with GPCC, HYDROLARE and IGRAC.</p>	<p>- As required</p>		<p>- Ongoing activity.</p>	
<p>g. To develop and implement capacity-building initiatives in developing countries based on the activities undertaken within the Data Operations and Management Theme Area.</p> <p>Priority B</p>	<p>- Assist in the development of a comprehensive strategy and plan on capacity building initiatives relating to Data Operations and Maintenance - Identify and promote opportunities to deploy standards for hydrological data exchange within developing countries.</p>	<p>- Systems implemented in selected member countries to test interoperability and other issues concerning use of WaterML 2.0 for data interchange.</p>	<p>- Regional associations - OPACHE members.</p>	<p>- Guidance material available by June 2016.</p>	
<p>h. To report on activities at</p>	<p>- As required.</p>			<p>- Attend and report progress at</p>	

Activities	Actions	Outputs	Resources	Milestones	Linkages
each AWG meeting and as requested by the president of CHy. Priority A				AWG meetings.	

Priority: A. Mission Critical; B. Strategic and Desirable; C. Discretionary

WORKPLAN: Water Resources Assessment (WRA)

Sung Kim and Antonio Cardoso Neto

Activities	Actions	Outputs	Resources	Milestones	Linkages
<p>a. Finalize the WRA Manual (surface and groundwater) including assessment of water availability and use as well as water resources for water deficit regions</p> <p>A (Sung/Antonio)</p>	<ul style="list-style-type: none"> - Review previous CHY outputs and background papers on WRA and develop a plan to finalize the WRA Manual - Prepare and circulate the First Draft to related experts for their comments (e-board, forum) - Finalize the Draft on WRA Manual 	<p>Guidance material that would help NHSs to enter a more modern era of water resources assessment that is more dynamic in nature, reflects advances in real time monitoring and products derived therefrom, and incorporates the needs of the hydrological community and users of water information, particularly with respect to their regulatory and policy-oriented mission responsibilities, improving the generation of information needed for decision making processes</p>	<ul style="list-style-type: none"> - Relevant previous reports with reviewers' comments - Contribution from AWG, experts, OPACHE - Core budget 	<ul style="list-style-type: none"> - Plan for finalizing the WRA Manual (concepts, structure, contents, outlines, contributors, timelines) by June 2013 - Review the plan by AWG and OPACHE Members, and revised Plan by August 2013 - Hold WRA workshop by Sept. 2013 - First Draft by Sept. 2014 - Circulate for review - Hold workshop at WWF7 (Mar. 2015) - Finalized Manual by Mar. 2016 	<ul style="list-style-type: none"> - CHY AWG, OPACHE - UNESCO IHP, IAHS - WMO Secretariat - WWC

Activities	Actions	Outputs	Resources	Milestones	Linkages
<p>b. Compile and document guidance on optimization as applied to hydrological networks (surface water, groundwater, soil moisture, etc.) (e.g. Geospatial Techniques)</p> <p>B (Sung)</p>	<ul style="list-style-type: none"> - Review the previous Background Paper - Compile and document guidance, and prepare the Draft Technical Report - Circulate the Draft documentation to related OPACHE experts for their comments - Finalize the recommendations considering the comments 	<p>Technical Report providing methodologies with case studies on optimization as applied to hydrological networks (surface water, groundwater, soil moisture, etc.) (e.g. Geospatial Techniques)</p>	<ul style="list-style-type: none"> - Relevant previous reports with reviewers' comments - Contributions from OPACHE 	<ul style="list-style-type: none"> - Review Report and plan for finalization by Dec. 2013 - First Draft by Dec. 2014 - Final Technical Report by Sept. 2015 	<ul style="list-style-type: none"> - Chy AWG, OPACHE - UNESCO IHP, IAHS - WMO Secretariat
<p>c. Develop approaches for continuous tracking of current water resources availability using appropriate information technology</p> <p>A (Sung)</p>	<ul style="list-style-type: none"> - Compile and documentation on existing tools and techniques including MCH - Adapt and develop an approach for continuous tracking of current water resources availability using appropriate information technology - Prepare technical report for continuous tracking of current water resources availability using appropriate information technology 	<p>Technical report providing methodology for continuous tracking of current water resources availability using appropriate information technology</p>	<ul style="list-style-type: none"> - RA4, MCH - OPACHE - Republic of Korea (ROK) 	<ul style="list-style-type: none"> - Hold workshop in RA2 (2013) - Compilation: 2014 - MCH module: 2016 	<ul style="list-style-type: none"> - Chy AWG, OPACHE - UNESCO IHP, IAHS - WMO Secretariat - RA2 - ROK

Activities	Actions	Outputs	Resources	Milestones	Linkages
<p>d. Monitor and report on methodologies for the calculation of design discharge (including probable maximum flood) for hydraulic structures, taking into consideration climate variability and change, and make recommendations for future actions in this regard</p> <p>B (Antonio)</p>	<p>Review existing on the subject</p> <p>Prepare technical report</p>	<p>Report on methodologies for calculating design flow that takes into account climate variability and change</p>	<p>Floodfreq COST Action. Bogdan Ozga-Zielinski. AR III Hydrology and Water Resources Tasking Group</p>	<p>Review and report available materials, and circulate OPACHE (Sep. 2013)</p> <p>Feedback from OPACHE, and produce 2nd draft (Jan. 2014)</p> <p>Submit the 2nd draft to the 2nd AWG meeting for decision</p>	<p>OPACHE WMO Secretariat</p>
<p>e. Consider producing guidance material for determining adequate ranges of environmental flows that will maintain or achieve good ecological status in all water bodies along with guidance on formulating policies to make these determinations for water ecosystems management</p> <p>B (Antonio)</p>	<p>Compile and document existing material</p>	<p>A guide on determination of adequate range of environmental flow</p>	<p>Prof. Zalewski (UNESCO IHP Category 2 Center, LODZ, Poland)</p> <p>UNEP</p>	<p>Review and report available material (Nov. 2013)</p> <p>1st draft guidance report (June 2014)</p> <p>Feedback from OPACHE (Oct. 2014)</p> <p>2nd Draft (Dec. 2014)</p> <p>AWG Decision (Feb. 2015)</p>	<p>UNESCO IHP Categorized Center UNEP EU Commission OPACHE</p>
<p>f. Review and provide advice on how the Commission could contribute to the topic of water sharing/allocation, including the advantages and disadvantages of approaches and importantly, in what conditions/environments they may be more widely useful</p> <p>B (Antonio)</p>	<p>Compile and document on approaches for water sharing and allocation</p> <p>Analyze the approaches in respect to hydrological components</p> <p>Investigate impacts from enhanced hydrological processes</p>	<p>Review report with recommendations to advice the Commission on hydrological components for water sharing and allocation</p>	<p>IGRAC GRDC GWP WWC</p>	<p>1st draft report (Apr. 2014)</p> <p>Feedback from OPACHE (June 2014)</p> <p>2nd draft report (Oct. 2014)</p> <p>AWG decision (Dec. 2014)</p>	<p>IGRAC GRDC GWP WWC WMO Secretariat</p>

Activities	Actions	Outputs	Resources	Milestones	Linkages
<p>g. Undertake an investigation of modelling approaches to the characterization and prediction of water availability and use</p> <p>B (Sung)</p>	<p>-Search references for (tools and techniques) to the characterization and prediction of water availability and use through literature DB -Analyze the results to figure out types, purpose, applied, etc. and produce report</p>	<p>Technical material providing information for modeling approaches to the characterization and prediction of water availability and use</p>	<p>-Technology Database -e-board -OPACHE</p>	<p>-Literature list by 2014 -Technical material by 2015</p>	<p>-CHy AWG, OPACHE - UNESCO IHP, IAHS - WMO Secretariat</p>
<p>h. To liaise, as necessary, with relevant areas of WMO, United Nations agencies (e.g. UNESCO, the Food and Agriculture Organization (FAO), the United Nations Environment Programme (UNEP)) and other relevant groups with regard to water resources assessment activities</p> <p>A (Sung/Antonio)</p>	<p>To respond as requested</p>	<p>On going as required</p>			<p>- WMO Secretariat</p>
<p>i. To be the focal point for CHy's involvement in Integrated Drought Management</p> <p>A (Antonio)</p>	<p>To respond as requested</p>				<p>- WMO Secretariat</p>
<p>j. To develop and implement capacity-building initiatives based on the activities undertaken within the Water Resources Assessment Theme Area</p> <p>A (Antonio/Sung)</p>	<p>To consider holding training workshop to road test the draft Manual</p>	<p>Input to Capacity Building activities on as required basis</p>	<p>-WMO CHy -ROK -RA2</p>	<p>-WRA workshop (Sep. 2013) - WRA session at WWF7 (Mar. 2015)</p>	<p>- WMO Secretariat -RA2 -WWC -ROK</p>

Activities	Actions	Outputs	Resources	Milestones	Linkages
<p>. To report on activities at each AWG meeting and as requested by the president of CHy</p> <p>A (Antonio/Sung)</p>	<p>To prepare report for each period</p>	<p>On going as required</p>		<p>Annual report</p>	<p>- WMO Secretariat</p>

WORKPLAN: Hydrological Forecasting and Prediction

Yuri Simonov and Johnson Maina

Activities	Actions	Outputs	Resources	Milestones	Linkages
<p>a. Continue to provide guidance on the further implementation of the flood forecasting initiatives, including the Flash Flood Guidance System with Global Coverage (FFGS), the Coastal Flood Inundation Demonstration Project (CFIDP) and the Severe Weather Forecasting Demonstration Project (SWFDP)</p> <p>Priority: A Simonov/Maina</p>	<p>- represent CHy in FFI-AG</p> <p>contribute to</p> <ul style="list-style-type: none"> - monitoring the status of implementation of the flood forecasting initiatives (including: FFI projects, FFGS, CFIDP and SWFDP) - provide expertise to address operational issues – e.g. effectiveness, accessibility, limitations under different available input data conditions - review and comment on documents and reports as required - input to guidance material on intercomparison of flood forecasting models - provide advice on efficiency of FFW services 	<p>Involvement in FFI-AG meetings</p> <p>Contributions to the discussions and recommendations from FFI-AG meetings</p> <p>Improvements to the projects and activities under the FFI</p> <p>guidance material on intercomparison of flood forecasting models</p>	<p>Attendance at FFI-AG meeting</p> <p>Background material and documents on the FFI and associated activities.</p> <p>Attendance at other relevant meetings as required.</p>	<p>First FFI-AG May 2013</p> <p>Workshop on Intercomparison – June 2013</p> <p>Workshop on efficiency of FFW Services – October 2013</p> <p>Report to CHy AWG 2014</p> <p>Following FFI-AGs</p> <p>Report to CHy AWG 2015-16</p>	<p>OPACHEs</p> <p>International Flood Initiative (WMO, UNESCO, UNU, IAHS, UNISDR, etc)</p> <p>APFM</p> <p>JCOMM, CBS</p>
<p>b. Review and, if required, update approaches to urban flood forecasting and early warning</p> <p>Priority: A Simonov/Maina</p>	<ul style="list-style-type: none"> - review existing material with respect to coverage for approaches to urban flood forecasting and update as necessary - review measures for assessing the effectiveness of flood forecasting in urban 	<p>Additions to the Manual on Flood Forecasting and Warning, as required.</p> <p>Improved guidance for deal with urban floods</p> <p>development of a pilot project</p>	<p>Background material (for ex. doc. “Floods in cities”), UNESCO documents</p> <p>Other AWG members (J. Cullmann)</p> <p>Expert meeting on Urban Flood Forecasting and</p>	<p>Pilot project proposal by second half 2013</p> <p>Expert team meeting, late 2013</p> <p>AWG meeting 2014 – review of manual and proposal for additional guidance</p>	<p>OPACHE</p> <p>UNESCO</p> <p>J Cullmann</p>

Activities	Actions	Outputs	Resources	Milestones	Linkages
	areas - oversight the development of a pilot project on sustainable developments goals with respect to urban flood management		Warning – to review and finalize pilot project		
c. Prepare a comprehensive report on large-scale flood inundation analysis and prediction models Priority: C Simonov	- collect reports on the topic (material from Secretariat, OPACHEs) - review and report on updated techniques of large-scale flood inundation analysis - prepare material for the Manual if required	Material for the Manual on Food Risk Mapping (chapter)	Existing material from Secretariat. Report from Italian group of experts and OPACHEs	Linked to the Manual on Flood Risk Mapping (2013) AWG 2014	APFM Expert compiling the Manual (see d)
d. Assist in the preparation of a Manual on Flood Risk Mapping (including vulnerability and hazard) Priority: A Simonov	- linked to item “c” - prepare material for the Manual if requested - review and comment on drafts of Manual	Improvements to the Manual Material for the Manual on flood risk mapping (chapter) if required	Depends on process for developing the manual, may require attendance at review/expert meeting. OPACHE	Linked to the Manual on Flood Risk Mapping (2013) AWG 2014	APFM Expert compiling the Manual (see d)
e. Assist in the promotion and application of and training in the Low Flow Manual and the Manual on Flood Forecasting and Warning Priority: A Maina	- finalize low flow training material (received from J. Cullmann) - participate in workshop based on training material - assist in the implementation of training material in WMO-RTC training program, as required - review and comment on training material for FFW	Workshops on low flow. Training material disseminated through WMO web site and WMO RTC. Improved training material for Manual on FFW Workshops on Manual on Flood Forecasting and Warning	Training material provided by - J. Cullmann (Low Flow forecasting material), - Secretariat (Flood Forecasting material, Flood mapping manual)	Training material on low flows by June 2013 First training session second half of 2013 Other training sessions to be timetabled	UNESCO Regional Association groups
f. Compile and provide guidance on stream-flow forecasting using hydrological	- compile existing materials on hydrological modelling combined	Report providing guidance on seamless stream-flow forecasting	Support in initial materials from: - J. Cullmann (NWP	OPACHE consultation 2013 and literature review	J. Cullmann

Activities	Actions	Outputs	Resources	Milestones	Linkages
<p>modelling linked to Numerical Weather Prediction products and relevant climate products, including application of ensemble methods, and linked to radar rainfall nowcasting products and satellite estimations</p> <p>Priority: B Maina/Simonov</p>	<p>linked to radar rainfall nowcasting (Secretariat documents, OPACHEs experience)</p> <ul style="list-style-type: none"> - compile existing materials on hydrological modelling combined linked to rainfall satellite estimations (Secretariat documents, OPACHEs experience) - provide guidance and advice on the usefulness of the available models for forecasting and if appropriate how to operationalize the developing technology 	<p>(1-10 days) using hydrological modelling integrated with QPE/QPF from:</p> <ul style="list-style-type: none"> - radars - satellites 	<p>products)</p> <ul style="list-style-type: none"> - Secretariat (existing materials and contacts on the topic) - Literature <p>OPACHE</p>	<p>Progress report to CHy AWG 2014</p>	<p>CAS</p>
<p>g. Promote and assist in the use of the distance learning and advanced training module on flood forecasting and hydrological prediction</p> <p>Priority: B Maina</p>	<ul style="list-style-type: none"> - review the distance learning training module on flood forecasting and recommend improvements as appropriate 	<p>Improvements to distance training module on flood forecasting and hydrological prediction operational</p>	<p>COMET learning program, Secretariat training materials (C.Caponi).</p>	<p>Review of training module creation (2014). Improvements to the module (2015)</p>	<p>Secretariat (C.Caponi), NHSS WMO RTC</p>
<p>h. Undertake the identification of good practices and make recommendations for ways forward in drought prediction</p> <p>Priority: B Maina</p>	<ul style="list-style-type: none"> - study good practices of drought prediction - contribute to Integrated Drought Management Program (IDMP) 	<p>Materials for IDMP</p>	<p>Secretariat support on existing case-studies and publications, information and materials of IDMP, OPACHEs experience</p> <p>Attendance at IDMP meetings, as required</p>	<p>Available information compilation on drought prediction (2014). Contributing to IDMP (2015)</p>	<p>IDMP</p>
<p>i. Collect examples of good practice in dissemination of flood and drought information to the public and compile and provide guidance on flood and</p>	<ul style="list-style-type: none"> - linked to item "i" - study good examples of flood and drought information/warning dissemination 	<p>Materials for IDMP</p>	<p>Secretariat, RA6 task team, FDFC-Nairobi</p>		<p>IDMP</p>

Activities	Actions	Outputs	Resources	Milestones	Linkages
<p>low-flow warning signal approaches</p> <p>Priority: B Maina</p>	<p>- contribute to IDMP with report on low-flow warning signals</p>				
<p>j. Undertake the identification of good practices and make recommendations for ways forward in hydrological aspects of debris flow forecasting;</p> <p>Priority: C Simonov/Maina</p>	<p>- collect information on existing techniques of debris flow forecasting (Secretariat, OPACHE) - prepare materials on good examples of debris flow forecasting</p>	<p>Materials on good examples of debris flow forecasting</p>	<p>OPACHES materials (Japan), existing documents in Secretariat, PROHIMET materials</p>	<p>Report on progress at AWG meetings</p>	<p>Swiss debris flow system – RA VI Japan system – ICHARM – RA II</p>
<p>To liaise, as necessary, with relevant areas of WMO (in particular Disaster Risk Reduction, the Commission for Atmospheric Sciences and the Commission for Basic Systems with regard to the WMO Flood Initiative) and other programmes and organizations (such as UNESCO-IHE (Institute for Water Education), the International Flood Initiative (IFI), the International Centre for Water Hazard (ICHAHM)) with regard to hydrological forecasting and prediction and disaster risk reduction activities</p>	<p>Participation in meetings and representation of CHy as required</p>	<p>CHy's views and opinions are expressed and represented at meetings as required</p>	<p>WMO Secretariat</p>	<p>Meetings as required – WMO Secretariat to advise Report to AWG 2014</p>	
<p>To represent CHy on the Flood Forecasting Initiative Advisory Group</p>	<p>See a.</p>				
<p>To develop and implement capacity-building initiatives based on the activities undertaken within the Hydrological Forecasting and</p>	<p>See d., e., h. Low flow, FFW, Flood Risk Management capacity building as</p>	<p>Application of COMET training modules and other training materials as required.</p>	<p>To be advise by Secretariat.</p>	<p>Report to AWG on activities at each meeting – timetable of activities to be determined by Secretariat</p>	<p>UNESCO COMET</p>

Activities	Actions	Outputs	Resources	Milestones	Linkages
Prediction Theme Area	indicated above and in association with C/CBHR – C. Caponi				
To report on activities at each AWG meeting and as requested by the president of CHy	Review and update work programme	Revised work programme for following period		AWG meetings	

WORKPLAN: Water, Climate and Risk Management

Jan Daňhelka

Activities	Actions	Outputs	Resources	Milestones	Linkages
<p>a. Assist in the implementation of water-related initiatives (including, data and services) within the Global Framework for Climate Services (GFCS) (CHy-14 Resolution 5/1), liaising as appropriate with the Joint Commission for Climatology/Commission for Agriculture Meteorology/CHy Expert Group on Climate, Food and Water (CCI/CAgM/CHy Expert Group on Climate, Food and Water (JCEG-CFW), EC Working Group on Climate and related Water and Environmental Matters (EC-WG-CWE) ECWG-CWE, etc., and beyond WMO</p> <p>Priority A</p>	<ul style="list-style-type: none"> - Assist the president of CHy in activities related to GFCS and JCEG-CFW on his request. - Review of GFCS related documents relevant to CHy activities. - Promotion of CHy-14 resolution on contribution to GFCS. - Survey on GFCS contribution and requirements from water community (together with Tony Boston). - Based on survey evaluation, propose follow up activities including, if appropriate, a workshop on GFCS and water issues (together with Tony Boston) 	<ul style="list-style-type: none"> - Improved information on water contribution and requirements from the GFCS. (Survey evaluation) - Report(s) on hydrological contribution to UIP and Observation and Monitoring pillars - Notes on e-board 	<ul style="list-style-type: none"> - Secretariat support - Participation to relevant meeting - (workshop?) 	<ul style="list-style-type: none"> - Water exemplar to be published (May 22 2013) - IB/GFCS (July 2013) - Survey July 2013 - reports to: <ul style="list-style-type: none"> ▪ AWG-2 ▪ AWG-3 ▪ CHy-15 - documents as required - workshop if needed 	<ul style="list-style-type: none"> - president of the CHy - OPACHE, RA WGH - AWG - Data - AWG - Forecasting - AWG - WRA - GFCS Secretariat - CCI, CAgM, - GWP - WMO-GWP project office on Climate and Water
<p>b. Prepare a note/overview guidance material on how to use regional climate modelling (i.e. long-term climate scenarios) in strategic hydrological management</p> <p>Priority A</p>	<ul style="list-style-type: none"> - Establish a working team. - Define and discuss (e-board, OPACHE) structure and form of the outcome. - Guidance development and review process - Guidance material 	<ul style="list-style-type: none"> - CHy note/guidance on how to use regional climate modelling in strategic hydrological management <p><i>(possibly a single document including outcomes from item c)</i></p>	<ul style="list-style-type: none"> - Secretariat support - Workshop / meeting of the team? - Teleconferences 	<ul style="list-style-type: none"> - Work team established and structure and form of the outcome agreed: end 2013 - Final draft: mid 2015 - Review process completed: early 2016 - Guidance published: mid 2016 	<ul style="list-style-type: none"> - AWG - WRA, OPACHE - IIASA Vienna (Claudio Caponi) - IAHS

Activities	Actions	Outputs	Resources	Milestones	Linkages
<p>c. Prepare a comprehensive report on downscaling approaches for hydrological applications and their associated uncertainties, including commenting on existing case studies Priority A</p>	<p>published</p> <ul style="list-style-type: none"> - Establish a working team. - Define and discuss (e-board, OPACHE) structure and form of the outcome. - Guidance development and review process - Guidance material published 	<p>and g))</p> <ul style="list-style-type: none"> - CHy report on downscaling approaches for hydrological applications <p>(possibly merged with outcome from b) and g))</p>	<ul style="list-style-type: none"> - Secretariat support - Workshop / meeting of the team? - Teleconferences 	<p>As above</p>	<ul style="list-style-type: none"> - IAHS (IUGG Assembly in 2015), Gothenburg assembly...
<p>d. Prepare a state-of-the-art report/bibliography on hydrological analysis and modelling approaches in data sparse conditions Priority C</p>	<ul style="list-style-type: none"> - Analyse PUB outputs and other relevant literature. - Propose future course of action (including discussions with OPACHE on the form of the output e.g. online e-board wiki database of references with introduction note) 	<ul style="list-style-type: none"> - Report on state of the art - (other according to AWG-2 decision) 	<p>-</p>	<p>Report on state of the art to AWG-2 (2014)</p>	<ul style="list-style-type: none"> - IAHS PUB
<p>e. Compile guidance and detailed procedures on essential steps in the analysis of vulnerability to water-related impacts, especially in relation to adaptation to climate variability and change Priority C</p>	<ul style="list-style-type: none"> - Perform a basic review of literature inc. observation and report on flood frequency methods (in variable and changing climate environment) 	<ul style="list-style-type: none"> - Proposal of the outputs of the activity in the future. 	<p>-</p>	<ul style="list-style-type: none"> - Report to AWG-3 (2015) 	<ul style="list-style-type: none"> - AWG - forecasting - AWG - WRA - OPACHE, RA WGH
<p>f. Provide advice and guidance with respect to the availability of climate data and climate model results for undertaking impact studies in support of adaptation to climate variability and change.</p>	<ul style="list-style-type: none"> - Perform a basic review of the existing literature - Set up the team to draft a FAQ material? - Discussion forum (helpdesk within the 	<ul style="list-style-type: none"> - e-board section, FAQ. 	<ul style="list-style-type: none"> - OPACHE - Secretariat 	<ul style="list-style-type: none"> - Preliminary report to AWG-2 (2014) - Later during the period (second half 2015) 	<ul style="list-style-type: none"> - OPACHE, RA WGH, - Links to the GFCS activities a) and b)

Activities	Actions	Outputs	Resources	Milestones	Linkages
Priority C	frame of CHy e-board)				
g. Compile case studies and provide guidance on extended hydrological prediction for water resources management including information on related climate drivers <i>(moved from Hydrological Forecasting)</i> Priority A	<ul style="list-style-type: none"> - Establish a working team. - Define and discuss (e-board, OPACHE) structure and form of the outcome. - Guidance development (including case studies) and review process - Guidance material published 	<ul style="list-style-type: none"> - Guidance material <i>(possibly merged with outcome from b) and c))</i> 	<ul style="list-style-type: none"> - Secretariat support - Workshop / meeting of the team? - Teleconferences - Melbourne and Guayaquil reports 	<ul style="list-style-type: none"> - Work team established and structure and form of the outcome agreed: end 2013 - Final draft: mid 2015 - Review process completed: early 2016 - Guidance published: mid 2016 	<ul style="list-style-type: none"> - AWG – Hydrological Forecasting - OPACHE
To liaise, as necessary, with relevant areas of WMO (for example, the Global Framework for Climate Services (GFCS), CCI and other organizations (UNESCO-International Hydrological Programme (IHP), UNEP, IAHR and IAHS) with regard to climate and water activities	<ul style="list-style-type: none"> - same as a) and as required 	<ul style="list-style-type: none"> - Reports - Notes on e-board 	<ul style="list-style-type: none"> - Secretariat 	<ul style="list-style-type: none"> - AWG-2 - AWG-3 - CHy-15 	<ul style="list-style-type: none"> -
To represent CHy, as determined by the president of CHy, in water, climate and risk management related groups (e.g. GFCS, joint inter-Commission groups)	<ul style="list-style-type: none"> - same as a) 	<ul style="list-style-type: none"> - Reports - Notes on e-board 	<ul style="list-style-type: none"> - Secretariat 	<ul style="list-style-type: none"> - AWG-2 - AWG-3 - CHy-15 	<ul style="list-style-type: none"> -
To develop and implement capacity-building initiatives based on the activities undertaken within the Water, Climate and Risk Management theme area	<ul style="list-style-type: none"> - Explore existing documents and propose the future actions, also on the basis of the outcomes of activities a) to g) 	<ul style="list-style-type: none"> - 	<ul style="list-style-type: none"> - 	<ul style="list-style-type: none"> - 	<ul style="list-style-type: none"> - Claudio and Giacomo will provide materials - UIP
To report on activities at each AWG meeting and as requested by the president of CHy	<ul style="list-style-type: none"> - 	<ul style="list-style-type: none"> - Reports 	<ul style="list-style-type: none"> - 	<ul style="list-style-type: none"> - AWG-2 - AWG-3 - CHy-15 	<ul style="list-style-type: none"> -

WORKPLAN: Chair of the Intergovernmental Council of the International Hydrological Programme of UNESCO

Johannes Cullman

Activities	Actions	Outputs	Resources	Milestones	Linkages
a Represent the interests of the Council, enable coordination of UNESCO-IHP and WMO-HWRP activities	-Guarantee as far as possible the coordination of initiatives like IDI, IFI and related activities -support joint task team on review doc CHY 14 11.8 – 11.14	Joint documentation Mutual understanding of activities	?		
b. contribute to the work of the AWG in line with his/her personal expertise and experience	Support, if required the work of the AWG members for forecasting & climate	Related to the shared tasks			
To report on activities at each AWG meeting and as requested by the president of CHy	Establish structured communication with president CHy				