

WCRP Implementation and Transition Meeting

Responses to the online survey and the three questions:

1. What needs to be expanded upon in the WCRP Strategic Plan in terms of specific activities? What are the key steps, tasks and actions (and approximate timeline) that are needed for the Strategic Plan to be implemented? (Q4 in survey)
2. What would be an ideal WCRP structure to implement the new strategy? How fit for purpose are the current suite of Core Projects, Working Groups, Grand Challenges etc.? What works well and what should be changed? (Q5 in survey)
3. What is needed to successfully transition from the present state to the new WCRP? (Q6 in survey)

Summary of responses:

Q1: What needs to be expanded upon in the WCRP Strategic Plan in terms of specific activities? What are the key steps, tasks and actions (and approximate timeline) that are needed for the Strategic Plan to be implemented? (Q4)

1. All science areas are roughly covered in the Strategic plan, but there are some things not mentioned:
 - Climate information for regions, regions
 - Framework for WCRP Regional Activities
 - The need to identify physics issues of numerical models by comparing observations and numerical outputs
 - Education on climate science and climate change
 - Environmental footprint of climate research and activities
 - Inclusion, equity and diversity in research and climate science
2. The structure of WCRP needs to be fit for purpose
3. Clear links to the new basic research programme goals with critical societal concerns about near-term prediction and response to climate change.
4. Facilitating coordination of research activities across time scales is important - particularly at finer time scales.
5. CMIP and the associated MIPs are perhaps the flagship activity of WCRP so this should be outside WGCM and an activity in its own right.
6. Initialized climate predictions on seasonal and decadal scales is a mechanism for connecting WCRP to the rest of WMO.
7. Partnerships, collaboration, consultation and funding mechanisms need to be identified and implemented.

8. Areas of joint science/social science research could be identified.
9. WCRP communication and social engagement should be expanded so that it is more visible and newsworthy. Education and outreach activities need to be at the core of future activities.
10. The Implementation Plan needs to identify specific activities to pursue the SP objectives and capacity building. See responses 7,8, and the SPARC response for some suggested examples.
11. Scientific reports and papers with WCRP leadership of interest to IPCC.
12. Prioritization of WCRP activities and clear leadership mechanisms should be put in place.

Q2: What would be an ideal WCRP structure to implement the new strategy? How fit for purpose are the current suite of Core Projects, Working Groups, Grand Challenges etc.? What works well and what should be changed? (Q5)

1. Some believe that there are too many legacy groups, projects and panels and that WCRP must evolve, while others believe that the existing structure can fit the Implementation Plan.
2. There is agreement that there could be much better coordination and leveraging of expertise across projects and working groups and with external partners.
3. There is a lack of representatives from the policy and decision-making communities.
4. A possible structure could be where core groups take on science challenges and working groups the enabling infrastructure.
5. A matrix structure with clear tasks and linkages between groups would focus and join forces.
6. The core projects and working groups function well, but there could be much better coordination and leveraging of expertise across them - possibly through periodic large scale meetings.
7. WCRP should have a stronger nucleus for model development.
8. The structure should avoid overlap and competition for resources.
9. A closer collaboration with WWRP would be advantageous.
10. The current funding model and partnering is concentrated in the northern hemisphere, making WCRP almost non-existent in middle and low income countries in Africa, South America and SW Asia.
11. See proposed structure (diagram) in the SPARC submission.
12. See proposed structure in Michaela Hegglin's submission.

Q3. What is needed to successfully transition from the present state to the new WCRP? (Q6)

1. Funding, resources and a willingness to change.
2. Maintain the vibrancy and strength of the existing community.
3. Using past expertise and knowledge
4. Strong leadership to facilitate change with transition period and consultation
5. Clear partnership arrangements
6. Clear structure, strategy and implementation of that strategy
7. Clear mapping of research directions and mechanisms (see response 5)

8. Propose an integrated/broader view on how to tackle the objectives of the Strategic Plan, including financing.
9. Ensure support for the community, embracing diversity (including inclusion of scientists from developing countries) and capacity building.

Q4 What needs to be expanded upon in the WCRP Strategic Plan in terms of specific activities? What are the key steps, tasks and actions (and approximate timeline) that are needed for the Strategic Plan to be implemented?

Answered: 12 Skipped: 1

#	RESPONSES	DATE
1	<p>Whilst the Strategic Plan briefly notes some issues relating to scale (e.g., 'a range of scales' in Objective 1, 'regional climate hotspots' in Objective 2, 'downscaling' and 'regional and extreme phenomena' in Objective 3, 'local to global' and 'all regions of the globe' in Objective 4) it does not explicitly refer to the issue of 'climate information for regions' or the extensive WCRP discussions on a 'Framework for WCRP Regional Activities' which took place in 2016 and 2017. However, these issues must be part of the Implementation Plan if the WCRP is to satisfy its goal under Objective 4: "We will support innovation in the generation of decision-relevant information and knowledge about the evolving Earth system." In this context, we urge participants in the WCRP Implementation and Transition Meeting and JSC40 to revisit the Recommendations on a Framework for WCRP Regional Activities which were tabled at JSC38 (a longer report from the scoping meeting held in Hamburg October 2016 which developed these Recommendations is also available). Assuming that the recommendations of the 2016 meeting are considered adopted, it would be important for the Transition Meeting/JSC40 to consider how the three proposed Legs to support regional activities fit with the four objectives of the WCRP Strategic Plan. For convenience the 3 proposed Legs are: • Leg 1: Foundational Climate Science (Curiosity-driven knowledge/Fundamental research) • Leg 2: Application-inspired Climate Science (Research for 'actionable' knowledge) • Leg 3: Trans-disciplinary Engagement For example, Leg 3 clearly maps to objective 4, while Leg 1 maps to objectives 1, 2 and 3, and Leg 2 would sensibly map to objectives 2 and 3.</p>	4/25/2019 12:23 PM
2	<p>I think climate science research has moved on a lot since the initial set up of the WCRP structure. The structure is now out of date and probably not fit for purpose. Unfortunately, the inertia in the research community means that it is difficult to change and even the name of groups is subject to large amounts of fruitless discussion. Similarly, there are many many projects, working groups and a multitude of panels, many of which are only partially effective. This is no criticism of the people involved, it is just difficult to close things down and move forwards when things have been running for so long. I would therefore expand on two areas in particular: 1) CMIP and the associated MIPs are perhaps the flagship activity of WCRP so this should be outside WGCM and an activity in its own right. 2) Initialised climate predictions on seasonal and decadal scales. This is newer, very active and can easily deliver on the promised climate services so it is THE mechanism for connecting WCRP to the rest of WMO. Both of these topics involve climate predictability and so the new research structure needs to represent this important topic much more explicitly.</p>	4/24/2019 11:21 AM
3	<p>I think the science areas are roughly covered in the Strategic plan. What now needs to happen is to identify those issues, that only through WCRP can be addressed. I.e. they must be of significance in scale (no one large lab can do) in impact (climate science will significantly advance, change) and implementation (the world needs to come together to collaborate). 1) This requires a deep consultation with the members of WCRP, scientist and users of climate information 2) Needs to be consulted with potential funders of the activity 3) Needs to be supported by an implementation mechanism. In my estimate this will take at least 12 months before an implementation document can be delivered.</p>	4/24/2019 11:18 AM
4	<p>The plan is well developed, but misses the role of the regions, regional knowledge and the feedback of regional systems to the global climate change is still not fully clear and missing in the plan. Regional climate is the bridge to the social system. How to build the bridge is not outlined in the plan and needs to be developed with the Core projects. A synthesis workshop with participants from all Core groups, WG and more would be helpful to design the scientific roadmap for the implementation and to develop from the grand challenges a prioritisation for tasks and actions.</p>	4/22/2019 7:58 AM

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5	<p>WGSIP, through its internal planning and in the context of the WCRP Strategic Plan, has been aiming increasingly to - facilitate coordination of research activities across time scales, from subseasonal to decadal, recognizing that common challenges exist across in terms of initialization, verification, extraction of information from forecast ensembles and model errors - develop potentialities for predicting more components of the earth system - broaden its engagement with the WMO operational prediction community, both in order to identify research needs on the operational side, and to communicate research developments having the potential to improve services. In terms of specific activities beyond its ongoing research projects including the Climate-system Historical Forecast Project (CHFP) and contributions to the organization of conferences, workshops, and schools for young scientists, WGSIP is considering two possible extensions to its role within WCRP that address and extend the above aims, as well as objective 2 in the Strategic Plan: (i) Developing a sub-annual prediction MIP under the CMIP framework that would align with CMIP's DCPD decadal prediction component except that ~12-month hindcasts would be initialized several times per year as under the CHFP protocol. This would represent a relatively modest extension of what modelling groups already are doing under the DCPD, and besides expanding the range of models and experiments informing research on sub-annual prediction, it would provide a pathway for further growing the CHFP and leveraging infrastructure developed for CMIP such as the ESGF. This in turn would greatly increase the breadth, uniformity and availability of data available for research in this area. Additional benefits would include enabling a common platform and data management framework for sub-annual prediction projects under WCRP which are largely disconnected from each other (see example under answer to question 2 below), and better aligning research activities in sub-annual and decadal prediction (and indeed earth system simulation and projection as well). (ii) Engaging, with WMO's Inter-Programme Expert Team on Operational Predictions from Sub-seasonal to Longer-time Scales (IPET-OPSLs), in a periodic assessment of prediction skill and model biases in WMO operational prediction models, possibly facilitated through the CHFP; this is currently being discussed with the IPET and TPOS2020. There are clearly potential synergies between these two concepts, which will be developed further at WGSIP's upcoming meeting. Together with the existing CHFP and DCPD, they could be leveraged to address specific components of Objective 2 including evaluating prediction capabilities across all climate system components, and for extremes including unprecedented extremes. The approximate time frame for fully realizing these developments would be 3-4 years, with pilot activities in place within 1-2 years.</p>	4/21/2019 6:11 AM
6	<p>No specific activities are actually outlined in the draft of the WCRP SP, so one of the discussions for the IP should be focused on describing specific activities to pursue the objectives. Specific activities may be brought up by means of Concept Case Studies, identifying possible ways forward focused on each of the Scientific Objectives. Specific activities for each of the main objectives should involve in an integrated and collaborative framework all core projects, working groups, CORDEX and CMIP, and grand challenges so as to identify in an integrated context the key steps, task and actions needed for the IP. Another important ingredient that should be included in all proposed tasks and key steps in the IP is the capacity building block. WCRP has shown throughout its history its great imprint in pushing towards new science frontiers and in disseminating and informing these new scientific challenges to the community by means of capacity building activities throughout the world. One last consideration regarding Question 1 and, in particular, due to the specific inclusion of the development of decision-relevant information for society, is the need for a regional focus, for which decisions are needed. In this regard, the close synergies among modelling groups that are able of providing the necessary actionable climate information for tackling the better understanding, prediction and projection of climate-driven impacts is needed. This includes the global and regional modelling communities.</p>	4/20/2019 9:27 PM
7	<p>Specific activities: (1) To advance our current understanding and predictive capabilities of the role of climate change on the hydrological cycle of the global and regional monsoons (eg. South and East Asia, West Africa, Australia / Maritime Continent, North and South America) (2) Identify new sources of predictability of droughts associated with regional monsoons in a changing climate (eg., anthropogenic aerosols, landuse / landcover changes, land-ice and sea-ice changes, ...). Key steps, tasks and actions would include organization of coordinated model inter-comparison experiments, workshops / summer schools. The approximate timeline is 3-5 years.</p>	4/20/2019 9:50 AM

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8	<p>There are three words that encapsulate my thoughts: robust, relevant, responsive. They are a reflection, in my mind, of the three “Legs” identified in the Hamburg 2016 workshop, “Scoping a Framework for WCRP Regional Activities” (WCRP Publication No.: 23/2016) and in the report to JSC-38, “Recommendations on a Framework for WCRP Regional Activities” (JSC-38/Doc. 11). Although the titles focus on regional activities, the presentation and recommendations, in my mind, encompass much of what the WCRP needs to do in implementing the new strategic plan. ROBUST in that the WCRP should continue, as it always has, to promote and coordinate leading-edge science geared toward understanding the climate system in both its individual processes and, especially important, as an integrated whole. This factor aligns with Leg 1 of “Scoping a Framework.” There are multiple ways the WCRP should be helping to advance climate-system science. - First, of course, is encompassing more and more thoroughly all the physical, chemical and biological processes that maintain and evolve Earth’s climate system. The WCRP should continue to push strong coordination in research contributing to this effort. - Second, as part of such activity, the WCRP should continue to promote and coordinate efforts to bring finer scales into climate-system modeling, both through high resolution global modeling (e.g., HiResMIP) and through more focused climate modeling for regions (e.g., convection-permitting RCM and variable-resolution global modeling). - Third, the WCRP should promote and coordinate integrated assessment modeling that brings the interactive human element into climate-system modeling. There needs to be a stronger blending of earth-system modeling and human decisions that affect land-use, urban development, GHG emissions, aerosol emissions, etc. - Fourth, advance climate prediction, in part with modeling that blends needs of short-term and long-term (decadal) prediction but that also, importantly, recognizes that some elements of climate system evolution are relevant only for certain time scales (e.g., human decisions do not appear to be highly relevant for interannual predictability). RELEVANT in that the WCRP needs to make sure the rest of the world understands and values the contributions of WCRP science. This factor aligns with Leg 2 of “Scoping a Framework.” With climate change becoming more and more visible and newsworthy, the WCRP has to promote its place in the world’s response to climate change. Some of this can be accomplished by more organized and greater communication beyond our supporting institutions (i.e., WMO and partners) to the broader public, which I believe the WCRP is already doing. To accomplish this more effectively, however, the WCRP should establish closer links between its programs and its communication efforts. One specific example would be to have WCRP programs communicate storylines (a concept being explored in the IPCC AR6) of impactful climatic behavior under climate change. RESPONSIVE in that the WCRP needs to make sure it is responding to the human society’s climate needs and questions. This factor aligns with Leg 3 of “Scoping a Framework.” A key factor is that the WCRP needs to listen to climate concerns of others outside the climate-research community and then translate, in dialogue with the broader community, those concerns into both fundamental and applied research goals. All three concepts support and inform each other. Robust research is the foundation for communicating relevant climate information. The responsiveness WCRP research ultimately rests on robust research that fosters confidence in the results communicated. Being responsive and relevant can inspire and promote robust analysis.</p>	4/16/2019 11:54 PM
9	<p>We need to identify physics issues of numerical models by comparing observations and numerical outputs. Adding more components into numerical models does not mean that we have considered all aspects of physical processes in numerical models. This is a key activity in improving weather as well as climate models. The WCRP Strategic Plan lacks emphasis on this important activity in the first objective, Fundamental Understanding of the Climate System.</p>	4/16/2019 7:57 PM
10	<p>I think overall the strategic plan looks quite good.</p>	4/9/2019 3:23 AM
11	<p>Societal engagement is perhaps the area that has seen less development over the past decades and one that needs significant improvement if WCRP's goals are to be achieved. Educational and outreach activities need to be at the core of future activities, as improved understanding and modelling of the Earth System may be meaningless without societal and political uptake.</p>	4/5/2019 2:57 PM
12	<p>I think that 3 main ideas / projects are missing and should be implemented as transverse projects for the whole strategic plan and during all the 2019-2028 period: 1. education on climate science and climate change 2. environmental footprint of climate research and scientific activities 3. inclusion, equity and diversity in research and climate science First action is to perform a state-of-art about what is existing, second step would be to create a chart about that matters and to put in all research actions, and last action to support projects / research / working groups aiming to address those subjects.</p>	4/4/2019 10:10 AM

Q5 What would be an ideal WCRP structure to implement the new strategy? How fit for purpose are the current suite of Core Projects, Working Groups, Grand Challenges etc? What works well and what should be changed?

Answered: 13 Skipped: 0

#	RESPONSES	DATE
1	<p>The Working Group on Regional Climate (WGRC) was set up in 2013 with the broad mission to 'co-ordinate regional climate research and science-based knowledge development for decision makers' but essentially stopped work when resourcing for WGRC was suspended in 2015/2016. A document submitted to JSC37 by the WGRC includes a useful summary of the WGRC activities and lessons learnt about information for regions – the first two sections of the document provide useful background material for the Transition Meeting/JSC40. We strongly promote the view that the WGRC, or a similar Working Group on Information for Regions (WGIR) as proposed in the Recommendations on a Framework for WCRP Regional Activities (see response to Question 1), should be a high priority and incorporated prominently in the revised WCRP structure. For the WCRP to transition to the realities of current climate science agendas and remain relevant, visible, and well supported, the WGRC must be well linked into the regional issues of information and knowledge needs in the societal decision space. This requires an explicit engagement as intended for the WGRC or the proposed WGIR. The original WGRC Terms of Reference were overly lengthy and wide ranging and initially caused issues in what activities to prioritise. A new ToR for the WGRC/WGIR would need to be reviewed and revised, taking into account the setting up of CORA and changes in CORDEX (including the now well-established IPOC). The membership of WGRC was deliberately diverse and broad encompassing early career scientists and social scientists. This is essential in order to bridge the foundational science of the WCRP to the broader community. Such diversity needs to be retained, and even expanded further, particularly with respect to objective 4 of the WCRP Strategic Plan. To be effective, any WG needs to properly resourced with funding available, for example, to hold face-to-face meetings and in the case of the WGRC/WGIR to engage with the external points of connection required to effect the engagement of the WCRP with regional activities and organizations. Virtual meetings can be productive to some degree when a WG is well established (and help reduce carbon emissions), yet they are not well suited to discussion on complex and nuanced issues. In the case of the WGRC, the past withdrawal of resourcing and support meant that the WG effectively ceased operation. A recurrent problem in the WCRP discussions on climate information for regions has been lack of focus and appropriate implementation mechanisms. As a way to develop mechanisms to advance the research on developing information for regions, JSC36 requested the WGRC to take responsibility as an implementing agent of FoCI (Frontiers of Climate Information) Projects with a city/regional focus. The WGRC subsequently tabled an Implementation Framework for Frontiers of Climate Information (FoCI) Projects at JSC37. The Recommendations on a Framework for WCRP Regional Activities endorsed by JSC38 include recommendations relating to the development and organization of calls for FoCI Projects. It is important that the Transition Meeting/JSC40 revisit the FoCI Project concept and consider how it could be incorporated in a revised WCRP structure (ideally under the auspices of the WGRC/WGIR).</p>	4/25/2019 12:23 PM
2	<p>There are far too many legacy groups, projects and panels. I recommend a complete overhaul, a restructure as stated above to reflect the new strategy and a reduced number of panels, groups and projects starting under the two timescales of centennial scale projection and seasonal to decadal scale prediction.</p>	4/24/2019 11:21 AM
3	<p>Depending on the ambition it seems to me, the priority issues to be addresses will be to many for one WCRP to execute in a fair, open and inclusive way. Thus some division of labor will be needed. Core Projects have the advantage of an identity and community behind them. A large more integrated activity might loose that because of the shear size and breadth of the issues. Working groups and Grand Challenges are confusing. We could imagine a structure where core projects take on the science challenges and working groups the enabling infrastructure. Grand Challenges are part of the science and should be part of the Core project or what ever science organisation we choose.</p>	4/24/2019 11:18 AM

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4	<p>A matrix structure with more clear tasks and role to understand the linkages between the CP, WG and GC better, to focus and join forces. Infrastructure, tools, methods and modelling could be more seen as 'common tools' and foster networking across CP, WG and GC. The connection between WG and CP is still unclear in some case and I wonder if both are needed. the WG meeting in fall 2017 in Exeter worked very well and provided the opportunity to talk across scales, regions and methods with members of different CP. An evaluation of the WG could be good. Clarification is needed in the roles of WGRC and CORDEX and the new opportunity of CORA support.</p>	4/22/2019 7:58 AM
5	<p>In WGSIP's view the current Core Projects, Working Groups, etc. function reasonably well within themselves, but there could be much better coordination and leveraging of expertise across them. For example, WGSIP, GEWEX, S2S and WGCM/CMIP (through endorsement of LS3MIP) all have projects addressing various impacts of land initialization on S2S forecasts but with different experimental protocols, requested outputs, etc.; clearly much value could be added if common protocols, outputs, data formats, participating models, etc. could be realized. In particular, all four Core Projects have great expertise and research capacities relating to earth system components that are increasingly important for subseasonal to decadal prediction, either through their influence on the troposphere or in their own right (CliC for sea ice and snow; CLIVAR for oceans, GEWEX for land; SPARC for the stratosphere). There should be considerable potential for leveraging this expertise with that in WGSIP, DCP, GC-NTCP and S2S to develop a more integrated approach to earth system prediction research in WCRP. The same applies, at least potentially, for CORDEX and the Grand Challenges on Weather and Climate Extremes, Regional Sea-Level Change and Coastal Impacts, and Carbon Feedbacks in the Climate System. One approach to such coordination could be to have, every few years, a relatively large-scale meeting somewhat akin to the Pan-WCRP Modelling meeting in 2014, but oriented specifically toward advancing Objective 2 of the Strategic Plan. (One could imagine separate but similar undertakings addressing Objectives 1, 3 and 4.) The meeting could involve WCRP's prediction-oriented groups (currently WGSIP, DCP, GC-NTCP and S2S) in their entirety, plus other groups' representatives whose expertise aligns or potentially aligns with prediction. It would have a specific deliverable of mapping out coordinated research activities and plans for the next several years to fulfill the various aspects of Objective 2. As in 2014, such 'grand' meetings could be combined with regular meetings of individual groups to reduce travel, etc. A further structural consideration is that WCRP could have a stronger nexus for model development. WGSIP itself has generally not engaged directly in model development, since models applied for subseasonal to decadal prediction usually are developed either at operational or climate research centres, for application to prediction and simulation/projection respectively. (Similarly, WGCM is now mainly active in model evaluation and applications rather than development.) Thus, while activities of WGSIP and other WCRP prediction groups can inform model development by enabling intercomparisons of skill, biases, etc. in initialized predictions, these groups have little model development capacity themselves. One approach could be to create a Working Group for Model Development populated by active model developers across the different earth system realms (potentially including some members of Clivar's Ocean Model Development panel, for example). Extending certain activities of WGNE to longer time scales could provide an initial basis, whereas WMAC's leadership and functions could be absorbed into this new group and the JSC.</p>	4/21/2019 6:11 AM
6	<p>The current suite of Core Projects, Working Groups, Grand Challenges and major initiatives is fine and can be adapted to fit into the IP. However, a better integration and collaboration among these groups is highly recommended. Moreover, there is a lack of representatives from the policy and decision-making communities, that may be relevant in the context of the new WCRP SP.</p>	4/20/2019 9:27 PM
7	<p>The suggested specific activities fit well with the CLIVAR and GEWEX Core Projects. The specific activities are also consistent with the following Grand Challenges (a) Water for the food basket of the world (b) Weather and climate extremes (c) Near-term climate prediction</p>	4/20/2019 9:50 AM
8	<p>The current Core Projects, Working Groups, Grand Challenges, etc. may be able to handle the implementation effort, but the key is fostering greater communication among them and with groups external to the WCRP. The WMO could help with this. Some of the thoughts on structuring coming out of the WGCM/WMAC discussions in Barcelona in March 2019 might be a better way forward, but those ideas need much further discussion.</p>	4/16/2019 11:54 PM
9	<p>No comments on this one as I am not familiar with the current structure. Based on my observation, there are many working groups and core projects. We need to reduce overlap of some interagency projects, and have focused international groups to improve our fundamental understanding of the climate system. Without the fundamental understanding, we may waste our time, energy, and money on the other objectives.</p>	4/16/2019 7:57 PM

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10	<p>In the past years I have been actively involved in both a Core Project and a Grand Challenge. What I noticed was that there was a big difference between the perception of the GC by the Core Project (GC seen as a competition for resources) and the understanding of the role of the GC by the GC as a bridge across CoreProjects for relevant topics. I still believe that a structure that is oriented along topics and across the CoreProjects is important and useful but it needs to be set up in a way that it is not perceived as competition but rather as support for the core projects. I see the closer collaboration with WWRP through joint working groups as a very important and fruitful development that should be continued and strengthened in the future.</p>	4/10/2019 10:53 AM
11	<p>I think a simpler structure would work better. The core projects appear to work well but maybe integration across core projects is a problem. Also some GCs worked better than others and there was no clear template for how they should work or how they should integrate into the core projects (I feel there was a bit of a feeling that the GCs had lots of funding (not true) and that they took money from the core projects (possibly true)). We want to avoid an 'us and them' within the WCRP structure.</p>	4/9/2019 3:23 AM
12	<p>The current funding model and partnering is concentrated in the north hemisphere, and this means that the entire WCRP seems to be almost inexistent in middle and low income countries in South America, Africa and soutewestern Asia. This makes WCRP a program with little impact and relevance outside the north Hemisphere.</p>	4/5/2019 2:57 PM
13	<p>I think Working Groups are working well.</p>	4/4/2019 10:10 AM

Q6 What is needed to successfully transition from the present state to the new WCRP?

Answered: 12 Skipped: 1

#	RESPONSES	DATE
1	Use should be made of the considerable expertise and knowledge that has developed through earlier WCRP activities. In the context of climate information for regions, and objective 4 of the WCRP Strategic Plan, we urge the Transition Meeting/JSC40 to draw on the written material from earlier discussions on the WGRC, the recommendations on a Framework for WCRP Regional Activities which were tabled at JSC38, as well as the Frontiers of Climate Information (FoCI) Projects that are all still available on the WCRP website (see, in particular, documents tabled at JSC37 and JSC38).	4/25/2019 12:23 PM
2	A strong leadership to lead on a restructure which will receive resistance. A group of energetic individuals to design a new structure with everyone slotted in to the new plan. I would be happy to help do this but it needs to be done top-down or it will diffuse into endless discussions.	4/24/2019 11:21 AM
3	Properly executed change management. This usually takes consultation, overlapping periods and closure opportunities. Moreover, WCRP would benefit from clearly articulated and executes partnership arrangements.	4/24/2019 11:18 AM
4	The current strategy plan is still vague in defining WCRPs role in supporting science towards better understanding the Grand challenges. Fully unclear is WCRP's role in bridging to society beyond understanding regional climate and regional climate change. Outreach to a constructive dialogue with FE is needed.	4/22/2019 7:58 AM
5	Suggestion: for each objective of the Strategic Plan, task a subset of the JSC along with co-chairs of aligned groups (WGSIP, DCP, GC-NTCP, S2S for Objective 2) with formulating a plan for its implementation through mapping out research directions and mechanisms, infrastructure needs, and possible restructuring of the WCRP in consultation with the entireties of those groups. Then, the JSC as a whole plus ~2 others representing each objective would be tasked with coordination and integration. This process might go through a couple of iterations and potentially could incorporate modelling, infrastructure and observations as additional foci.	4/21/2019 6:11 AM
6	In my perspective the key is to propose an integrated view of how to tackle the main questions posed in the SP. It would also be important if WCRP can have an active role in drafting specific calls in coordination with financing agencies around the world to include these community driven strategies and key issues to better understand how society may prepare to adapt to climate variability and change.	4/20/2019 9:27 PM
7	This point will require further discussions with the WCRP and JSC colleagues	4/20/2019 9:50 AM
8	The key in my mind is that the WCRP has to take a broader view of where it fits in the world. This requires leadership of WCRP activities to think in terms of what the US NSF calls "Broader Impacts" in its proposal requirements, and actively engage in communicating those broader impacts to the world. Back when human-cause climate change was largely a hypothetical concept that needed further research, to make sure there were not key unknowns missing in our understanding of climate change, the WCRP could largely focus on fundamental, curiosity-driven research. The world needs more than that now, and the WCRP is very well-positioned to be responsive to the broader community's need for robust, relevant climate information.	4/16/2019 11:54 PM
9	Not sure what the transition is about. I see researchers have to spend lots of their valuable time to keep track various funding opportunities. Big international groups should help them on this.	4/16/2019 7:57 PM
10	Funding, resources and a willingness to change (not saying any of this will be easy!). Also the commitment that WCRP really will commit to "enhanced support for a WCRP research community which embraces diversity, demands equality and builds capacity for the future. This support must be interwoven with every implementation blueprint, every scientific activity, and every infrastructure enhancement as we take the strategic plan forward". If we look at the make up of some of the existing high level steering groups then we are already falling far short of this mark.	4/9/2019 3:23 AM
11	Include scientists from developing countries in the decision-making and development, not simply as users of the knowledge and tools developed by others.	4/5/2019 2:57 PM
12	Probably more man power and more diverse funding.	4/4/2019 10:10 AM

Responses to Survey on the WCRP Strategic Plan from the WGRC

C. Goodess, B. Hewitson, W. Gutowski, J. Polcher - 25 April 2019

Our general view is that in order for WCRP to sustain a visibility and relevance in the changing landscape of climate research, and especially in light of the substantial acceleration in linking science to society and developing knowledge for decision needs, it is imperative that the WCRP proactively engages with and supports an explicit effort on regional research and information. This was the initial intent of the WGRC, which due to circumstances was never adequately enabled, and as a result contributed to the present need for the WCRP's new strategic plan.

Response to survey questions:

1. What needs to be expanded upon in the WCRP Strategic Plan in terms of specific activities? What are the key steps, tasks and actions (and approximate timeline) that are needed for the Strategic Plan to be implemented?

Whilst the Strategic Plan briefly notes some issues relating to scale (e.g., 'a range of scales' in Objective 1, 'regional climate hotspots' in Objective 2, 'downscaling' and 'regional and extreme phenomena' in Objective 3, 'local to global' and 'all regions of the globe' in Objective 4) it does not explicitly refer to the issue of 'climate information for regions' or the extensive WCRP discussions on a 'Framework for WCRP Regional Activities' which took place in 2016 and 2017. However, these issues must be part of the Implementation Plan if the WCRP is to satisfy its goal under Objective 4: "We will support innovation in the generation of decision-relevant information and knowledge about the evolving Earth system."

In this context, we urge participants in the WCRP Implementation and Transition Meeting and JSC40 to revisit the [Recommendations on a Framework for WCRP Regional Activities](#) which were tabled at JSC38 (a longer report from the [scoping meeting](#) held in Hamburg October 2016 which developed these Recommendations is also available).

Assuming that the recommendations of the 2016 meeting are considered adopted, it would be important for the Transition Meeting/JSC40 to consider how the three proposed Legs to support regional activities fit with the four objectives of the WCRP Strategic Plan. For convenience the 3 proposed Legs are:

- Leg 1: Foundational Climate Science (Curiosity-driven knowledge/Fundamental research)
- Leg 2: Application-inspired Climate Science (Research for 'actionable' knowledge)
- Leg 3: Trans-disciplinary Engagement

For example, Leg 3 clearly maps to objective 4, while Leg 1 maps to objectives 1, 2 and 3, and Leg 2 would sensibly map to objectives 2 and 3.

2. What would be an ideal WCRP structure to implement the new strategy? How fit for purpose are the current suite of Core Projects, Working Groups, Grand Challenges etc.? What works well and what should be changed?

The Working Group on Regional Climate ([WGRC](#)) was set up in 2013 with the broad mission to ‘co-ordinate regional climate research and science-based knowledge development for decision makers’ but essentially stopped work when resourcing for WGRC was suspended in 2015/2016. A document submitted to JSC37 by the WGRC includes a useful [summary of the WGRC activities and lessons learnt about information for regions](#) – the first two sections of the document provide useful background material for the Transition Meeting/JSC40.

We strongly promote the view that the WGRC, or a similar Working Group on Information for Regions (WGIR) as proposed in the [Recommendations on a Framework for WCRP Regional Activities](#) (see response to Question 1), should be a high priority and incorporated prominently in the revised WCRP structure. For the WCRP to transition to the realities of current climate science agendas and remain relevant, visible, and well supported, the WGRC must be well linked into the regional issues of information and knowledge needs in the societal decision space. This requires an explicit engagement as intended for the WGRC or the proposed WGIR.

The original [WGRC Terms of Reference](#) were overly lengthy and wide ranging and initially caused issues in what activities to prioritise. A new ToR for the WGRC/WGIR would need to be reviewed and revised, taking into account the setting up of CORA and changes in CORDEX (including the now well-established IPOC).

The [membership of WGRC](#) was deliberately diverse and broad encompassing early career scientists and social scientists. This is essential in order to bridge the foundational science of the WCRP to the broader community. Such diversity needs to be retained, and even expanded further, particularly with respect to objective 4 of the WCRP Strategic Plan.

To be effective, any WG needs to properly resourced with funding available, for example, to hold face-to-face meetings and in the case of the WGRC/WGIR to engage with the external points of connection required to effect the engagement of the WCRP with regional activities and organizations. Virtual meetings can be productive to some degree when a WG is well established (and help reduce carbon emissions), yet they are not well suited to discussion on complex and nuanced issues. In the case of the WGRC, the past withdrawal of resourcing and support meant that the WG effectively ceased operation.

A recurrent problem in the WCRP discussions on climate information for regions has been lack of focus and appropriate implementation mechanisms. As a way to develop mechanisms to advance the research on developing information for regions, JSC36 requested the WGRC to take responsibility as an implementing agent of FoCI (Frontiers of Climate Information) Projects with a city/regional focus. The WGRC subsequently tabled an [Implementation Framework for Frontiers of Climate Information \(FoCI\) Projects](#) at JSC37. The [Recommendations on a Framework for WCRP Regional Activities](#) endorsed by JSC38 include recommendations relating to the development and organization of calls for FoCI Projects. It is important that the Transition Meeting/JSC40 revisit the FoCI Project concept and consider how it could be incorporated in a revised WCRP structure (ideally under the auspices of the WGRC/WGIR).

3. What is needed to successfully transition from the present state to the new WCRP?

Use should be made of the considerable expertise and knowledge that has developed through earlier WCRP activities. In the context of climate information for regions, and objective 4 of the WCRP Strategic Plan, we urge the Transition Meeting/JSC40 to draw on the written material from earlier discussions on the WGRC, the [recommendations on a Framework for WCRP Regional Activities](#) which were tabled at JSC38, as well as the Frontiers of Climate Information (FoCI) Projects that are all still available on the WCRP website (see, in particular, documents tabled at JSC37 and JSC38).

“Isn’t the responsibility of scientists, if you believe that you have found something that can affect the environment, isn’t it your responsibility to do something about it, enough so that action actually takes place?” F.S. Rowland

How can WCRP provide a necessary base of basic research and meet this challenge?

Background

The SPARC General Assembly coincided with the release of the IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels. The IPCC findings made clear the urgency of rapid and deep reductions in the emissions of all greenhouse gases, as well as the need for accurate climate information to support strategies for adaptation and mitigation. Recent studies have only added to the urgency of providing policy-relevant research outcomes. Implementation of the new WCRP Strategic Plan is a great opportunity to make a real contribution to that end while promoting the critical need for a fundamental research base. However it is still unclear whether the new strategy will involve a complete make-over of WCRP or whether WCRP will evolve to meet the new challenges. *SPARC’s strongly held view is that WCRP must evolve, as a root and branch reform aimed at producing a theoretically logical structure could set back scientific progress in WCRP by several years and leave it side-lined in the public climate debate.* An evolutionary approach would allow the currently thriving communities in the core projects, grand challenges and other parts of WCRP to use their expertise to work out how best to implement the new, more integrated strategy. An increase in the number of collaborative activities that build on existing strengths and develop new ones is essential, and discussions with colleagues within SPARC and beyond indicate that there is a general willingness to make this happen. Maintaining core strengths is also required.

Lessons from SPARC experience

SPARC’s basic research incorporates understanding long-term atmospheric changes, composition, and atmospheric dynamics and their interactions. This has covered evaluation of trends in O₃, aerosols, H₂O and temperature in the upper troposphere and stratosphere, as well as datasets of their radiative forcing required for past climate change attribution studies as input to the IPCC assessment reports. Long-term activities on gravity waves, QBO, and stratosphere-troposphere dynamic coupling are now providing a valuable basis for the SPARC-related work in the WCRP/WWRP S2S project as well as on turbulent mixing in the critical tropopause region. The joint ACAM activity with Future Earth’s IGAC on the transport of pollutants in the Asian Monsoon is now looking to coordinate more with the CLIVAR-GEWEX Monsoon panel – in addition it has built a vibrant research community across SE Asia.

In addition to this fundamental, climate-related research, SPARC has made a series of important contributions to the WMO-UNEP O₃ assessments and the Montreal Protocol process. Chemistry-climate model comparison methodologies to challenge our understanding of atmospheric chemistry and dynamics have been developed and applied in CCMI in collaboration with IGAC. Recent contributions, initiated after discussion with the WMO-UNEP Scientific Assessment Panel and carried out in collaboration with WMO-GAW, include SPARC reports on ozone trends and ozone recovery, and coordinating research activity on the recent and unexpected emissions of CFC-11. Ozone depletion and climate change are closely linked: indeed the Montreal Protocol has led to radiative forcing reductions larger than any climate agreement. *A balanced portfolio of critically reviewed long-term and short-term research activities underpins the past successes of SPARC in the field of atmospheric chemistry and dynamics and their interactions.*

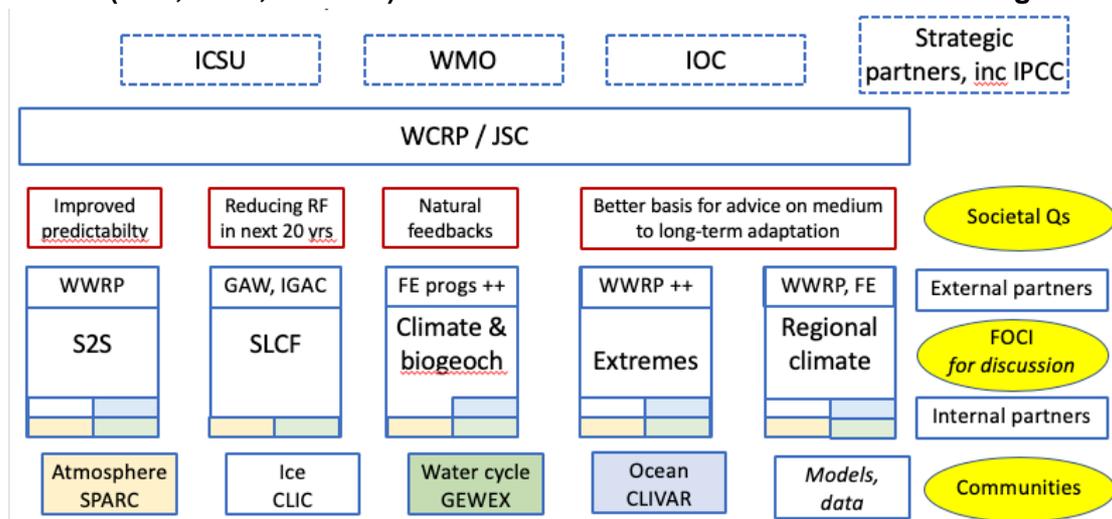
There is clear value in maintaining a strong community of atmospheric scientists. At the same time the community must be looking to ensure that the research is cutting edge (SPARC activities have work-plans for <4 years with the opportunity for renewal as well as closure. These opportunities can be either ‘internal’ (involving just SPARC scientists) or ‘external’ (involving others from inside and outside of WCRP and WMO). The balance between these is changing, as climate issues increasingly requires collaborations across multiple specialisms and this trend will increase in future. One clear example is regional climate change, the subject of so much recent discussion, where global models run at high resolution will become increasingly important. Another is sub-seasonal to decadal prediction for which S2S is an excellent exemplar. *Continuing to develop communities through bottom-up and top-down initiatives while addressing more multi-disciplinary issues is a critical challenge for the implementation of the new WCRP strategy.*

What needs to be expanded on in the Strategic Plan (specific activities)? What key steps, tasks and actions are needed for the Strategic Plan to be implemented?

- It is important to clearly link the new basic research programme goals with critical societal concerns about near-term prediction and response to climate change.
- WCRP’s role in promoting basic research can then be defined along with the roles of partners (international, national and local government; industry; finance; individuals). Co-organisation of conferences (e.g. cities) is a valuable way.
- Identify areas of research for joint science/social science research, e.g. better assessment methods of different technologies, impact of extreme weather events, climate mitigation using geo-engineering.
- Identify focussed scientific reports and papers with WCRP leadership which can help IPCC. This an on-going activity and topics typically need to be identified significantly ahead of time.

These should be used to identify priorities for WCRP activities. Once priorities are selected, a clear leadership mechanism involving all stakeholders should be developed. This need not be ‘one size fits all’ as was arguably the case with Grand Challenges. A funding mechanism needs to be developed that encourages collaboration across WCRP activities and so encourages advances in understanding across different aspects of the climate system (interaction of composition and climate, atmosphere-ocean interactions, linkage of dynamics to regional climate change and extremes, etc.). Aim for 5 year implementation presentation at AGU.

What would be an ideal WCRP structure for the new strategy? How fit for purpose is the current suite (CPs, WGs, GCs etc)? What works well and what should be changed?



- This proposal is a start but is not ideal – we need to decide if these foci are more appropriate than general societal topics such as water security, energy security, food security, etc
- Providing a better basis for assessing the climate impact of geoengineering needs to be properly addressed as separate focus
- Each community will contain smaller, ‘internal’ activities
- Use this as template for 5 years and assess value and definition of communities
- Not sure about how to coordinate data and model issues – WCRP needs a voice but should also have an underlying panel/activity on climate analytics for measurements and models
- Improved communication between groups – must be better electronic, ethically and for efficient use of time – WMO/WCRP to invest (w. UN?)

What is needed to successfully transition us from the present state to the new WCRP?

- Maintain the vibrancy and strength of existing communities within the Core projects
‘Our communities provide the energy and enthusiasm that are foundational to a successful WCRP.’ Letter from CP co-chairs to WMO DG, 2/3/17
- Ensure the communities can continue to evolve and provide new homes, e.g. S2S, ACAM, possibly Monsoon panel / regional climate
Requires cooperative input from all of WCRP – use incentives to encourage this
- New foci easier to agree when direction of travel / new structure agreed in outline

My vision for WCRP

Michaela I Hegglin, University of Reading – 13 October 2018

WCRP leadership has been tasked to reinvent WCRP. However, the vision put forward by the review committee is (in my opinion) not visionary enough, since it is simply trying to make WCRP adopt a structure that currently works for weather forecast centres and the meteorology side of WMO (attribution and detection, seasonal to decadal prediction, and future projections). This structure however is not conducive as umbrella for the entirety of the science that WCRP is encompassing and that is needed to provide actionable knowledge on the complexity of the changes in the climate system we are experiencing. The recent IPCC special report has underlined the urgency of this need. To be able to respond to the questions that politicians and stakeholders will have towards science, **a working structure that is based on both disciplinary fundamentals and interdisciplinary understanding is needed**. Much research is still needed on the best ways forward, which requires active engagement of the University community. This task cannot simply be delegated to climate services. A key aspect here is that WCRP is not only sponsored by WMO, but also by ICSU and IOC, and is a partner of Future Earth. **What WCRP should do is to take a fresh look at what the (near) future needs for climate information are and where the science itself is developing.**

A new structure for WCRP was attempted in the previous reorganisation of WCRP 10 years ago. However, the changes were not drastic enough to break the rigid power structures, which is needed to bring real change. Keeping the core projects and linking them through grand challenges would have been a brilliant idea, but many of the grand challenges were led by the same people that led the core projects, and thus did not lead to new paradigms. We should not be surprised that many of the grand challenges were made in the image of the core projects. Thus the change was not sufficiently radical.

The **basic societal needs** for which our research will have to provide knowledge on climate-induced impacts are generally agreed to be:

- **Water availability**
- **Food security** (includes biodiversity)
- **Energy security**
- **Resilience** (security from natural hazards)
- **Health**

The WCRP has to work backward from these, if it is to be societally relevant. For example, one might imagine the underpinning WCRP science needed to address these challenges to be grouped in the following areas (or **science themes**):

- **Water cycle**
- **Energy cycle**
- **Carbon cycle** (including N-cycle feedbacks)
- **Climate dynamics and regional change**
- **Natural hazards** (storm, storm surges, and flooding)
- **Sea level change**
- **Chemistry-climate coupling** (e.g., ozone and climate sensitivity)
- **Geoengineering and other mitigation strategies**

There is a strong overlap in topic with many of the current grand challenges. However, if 'grand challenges' are meant to be time limited then these are not grand challenges because they will not go away. Rather grand-challenges should be identified within these underpinning science themes by identifying knowledge, tool, and methodology gaps that could be filled with a major effort on a short time scale.

So how to map this onto a structure for WCRP? To answer all of the above, a **place for basic fundamental research for all the Earth system components** should be established. These are: atmosphere, hydrosphere, cryosphere, soil/land (the upper layer of the lithosphere) and biosphere. The current core projects could be mapped onto these domains, but with the obligation to make them focus on both the physics and (relevant) chemistry/composition of the Earth system component in question. **The new WCRP Climate System Science Themes** would be the place where the science of the core projects could then be synthesised to create new understanding in a multidisciplinary way, while duplication of research efforts (across core projects) could be avoided more effectively. This structure would allow a gradual transition from the core projects to integrated Earth system science, which is already seen to be happening in the wider community (reflected also in a growing number of early career scientists in this interdisciplinary research field). However, it is essential not to destroy the core projects quite as of yet since a space for fundamental research must be maintained. Also, they still provide natural scientific communities for early career scientists working in the core (or fundamental) research fields. The relative importance of the core projects to the new integrated science themes would shift over time to the latter. Finally, the creation of a **WCRP Climate Information Forum** would guarantee that the science within WCRP is responding to societal needs and regional concerns by enhancing communication and involvement of policy makers and other stakeholders.

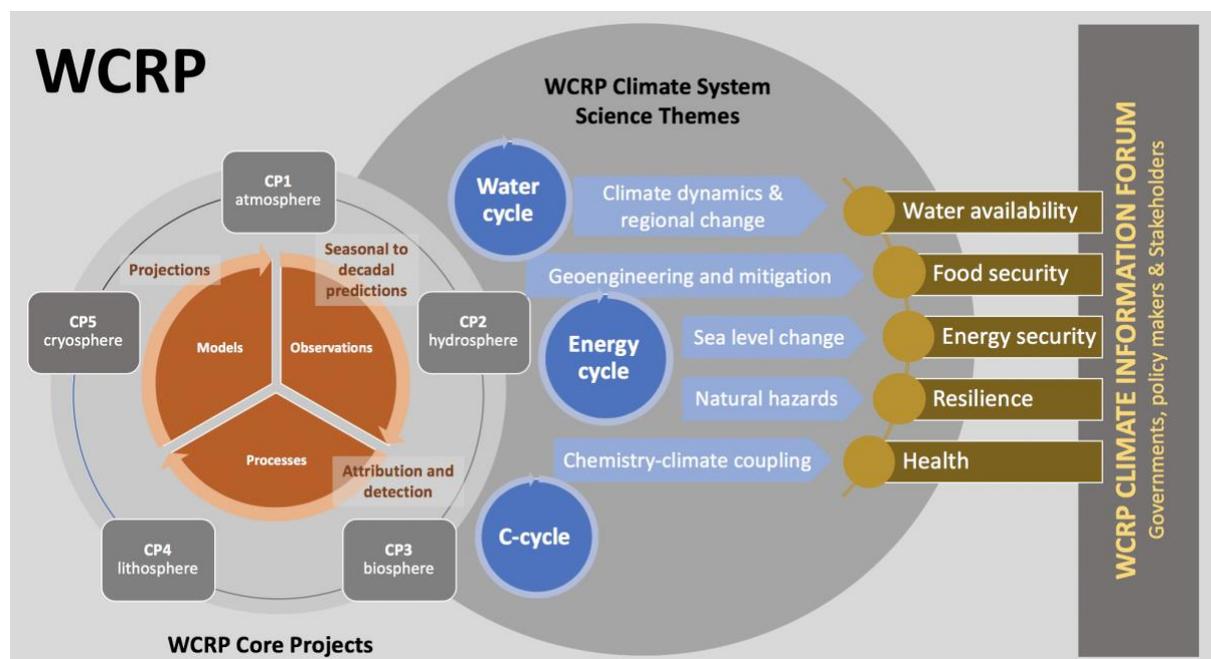


Figure: The new WCRP. The left hand side serves the core needs of WMO, while the right hand side links to Future Earth, the Belmont Forum, ICSU, and other more Earth-system and social science oriented entities. Note, the climate information forum is not equal to climate services, but is a place where needs can be articulated and feedback to climate information provided.