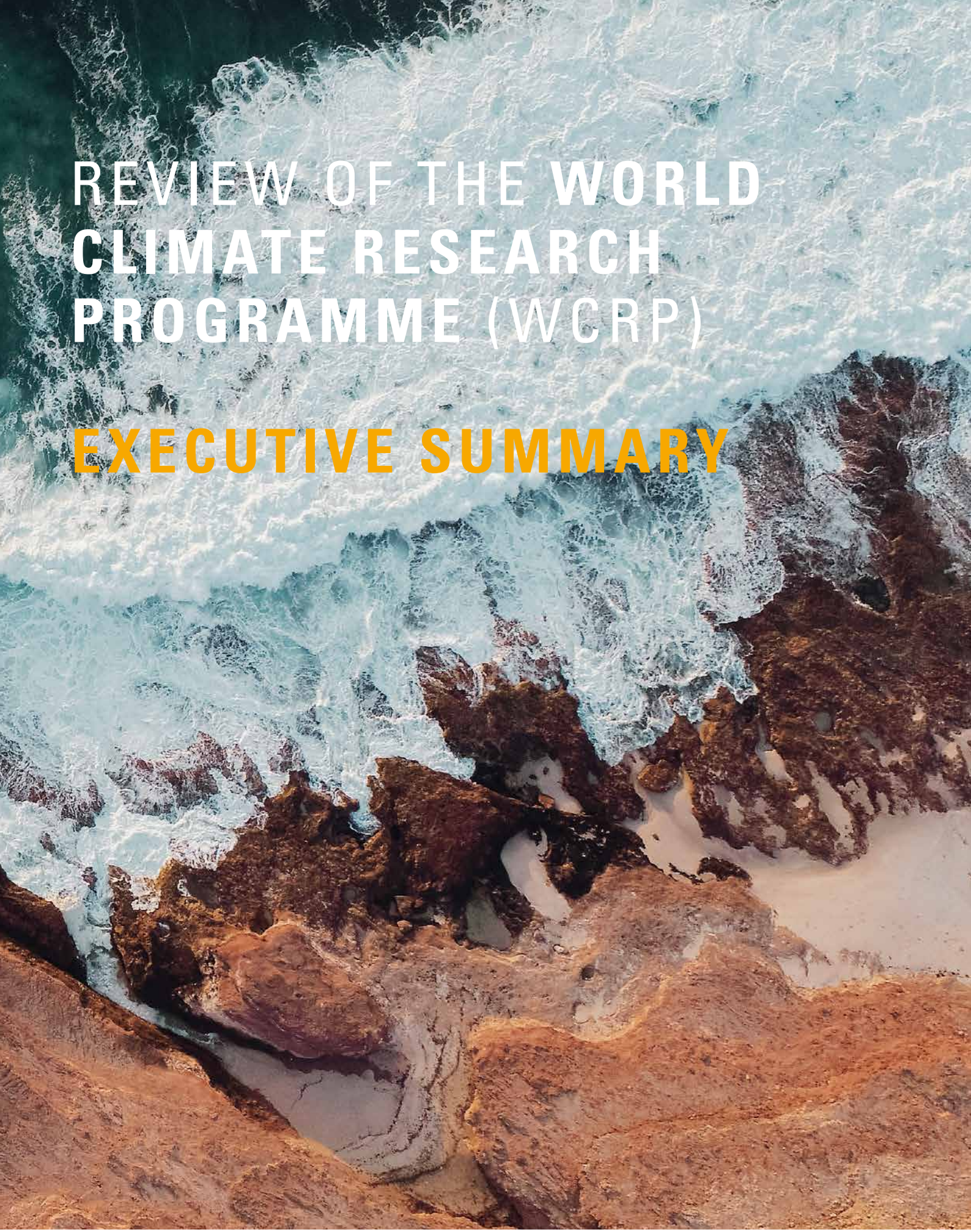

REVIEW OF THE WORLD CLIMATE RESEARCH PROGRAMME (WCRP)

EXECUTIVE SUMMARY

WCRP World Climate Research Programme
International Science Council
WORLD METEOROLOGICAL ORGANIZATION
United Nations Educational, Scientific and Cultural Organization
Intergovernmental Oceanographic Commission

REVIEW OF THE **WORLD CLIMATE RESEARCH PROGRAMME** (WCRP)

Report from an ICSU-WMO-IOC Review Panel:
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ISC

The International Science Council (ISC) is a non-governmental organization with a unique global membership that brings together 40 international scientific Unions and Associations and over 140 national and regional scientific organisations including Academies and Research Councils. The ISC was created in 2018 as the result of a merger between the International Council for Science (ICSU, founded in 1931) and the International Social Science Council (ISSC, founded in 1952). The ISC brings together the natural and social sciences and is the largest global science organization of its type. The vision of the Council is to advance science as a global public good.

WMO

The World Meteorological Organization (WMO) is an intergovernmental organization with a membership of 191 Member States and Territories. It originated from the International Meteorological Organization (IMO), which was founded in 1873. Established by the ratification of the WMO Convention on 23 March 1950, WMO became the specialised agency of the United Nations for meteorology (weather and climate), operational hydrology and related geophysical sciences a year later.

IOC-UNESCO

The Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO), established in 1960 as a body with functional autonomy within UNESCO, is the only competent organization for marine science within the UN system. The purpose of the Commission is to promote international cooperation and to coordinate programmes in research, services and capacity-building, in order to learn more about the nature and resources of the ocean and coastal areas and to apply that knowledge for the improvement of management, sustainable development, the protection of the marine environment, and the decision-making processes of its Member States.

Suggested citation

ISC, WMO, IOC of UNESCO (2018), Review of the World Climate Research Programme (WCRP). 72 pp.
Paris, International Science Council. Available at www.council.science

DOI: 10.24948/2018.03

EXECUTIVE SUMMARY

The World Climate Research Programme (WCRP) was established in 1980 by three sponsors, the World Meteorological Organization (WMO), the International Council for Science (ICSU)*, and the Intergovernmental Oceanographic Commission (IOC) of UNESCO**, to facilitate the analysis and prediction of Earth system variability and change for use in an increasing range of practical applications of direct relevance, benefit and value to society. Since then the WCRP has played a pivotal role in international climate science by initiating and coordinating major collaborative activities that could not have been delivered without the international cooperation which WCRP facilitates. Over the years there have been many notable examples, including WOCE, TOGA-COARE, GEWEX global datasets, and the CMIP archive that has underpinned successive IPCC reports.

WCRP does not fund research directly; it functions by engaging with, and gaining the commitment of, the international climate science community to its programme of work, and in turn ensuring that participants derive benefit from engaging in WCRP activities. Community engagement in WCRP continues to be broad and strong, and WCRP is recognized and valued for providing opportunities to work collaboratively to the greater benefit of the science.

WCRP is led by the Joint Scientific Committee (JSC), which formulates the overall scientific goals and concepts of the programme and organizes the required international coordination and research efforts that underpin it. In turn, the work of WCRP is supported by a Joint Planning Staff (JPS), hosted by WMO and led by the Director of WCRP whose role is to deliver the activities recommended by the JSC.

This review was instigated by the sponsors to ascertain the effectiveness of WCRP in delivering its mandate, how well it works in partnership with other organizations, and to advise on the future structure, governance and resourcing of the programme. A Panel (see page 19 for Review Panel membership) was appointed that reflects the scientific interests of the three sponsors, as well as covering the breadth of climate research, and its links to other organizations and to climate services. The review took place between February and October 2017, during which time the Panel met twice and took oral evidence from a broad range of participants, partners and stakeholders. It also took evidence from the sponsors, the JSC and the JPS on the governance, operational structure, management and resourcing of WCRP. In addition, it received comprehensive, written documents on the programme's activities.

After reviewing all the evidence, the Panel's judgement is that WCRP is at a critical point in its history, and that significant changes are required in its governance, structure and delivery for it to fulfil its mission in the context of 21st Century challenges. Moreover, the Panel is adamant that the core, underpinning climate science which WCRP delivers is needed more than ever, as society seeks solutions to climate change (Paris Agreement), to resilience to disasters (Sendai Agreement), and to sustainable development for the planet (UN Sustainable Development Goals). Without a strong foundation in climate science and prediction, none of these challenges can be addressed in a robust, cost-effective and durable way. However, the Panel is very clear that it is not the role of WCRP to deliver the end products and services, but that it should provide the bedrock knowledge, based on which these can be developed.

Since its inception, the key strength of WCRP has been its focus on cutting-edge physical climate science where international coordination enables scientific advances that would not happen otherwise. This must continue to be its focus, which means prioritizing what it does and recognizing where its unique role as a facilitator and integrator of climate research makes a difference. The Panel stressed that if WCRP does not continue to provide clear leadership, there is a danger of losing the engagement of the scientific community and its funders. WCRP is a strong brand and as such it needs to play an advocacy role, to interact strategically with big funders, and to focus on strategic positioning of WCRP in the climate arena. There is need for an important, recognized, international and collective voice for climate science, and WCRP should continue to meet this need.

The Panel was therefore very concerned to learn that WCRP does not currently operate in the context of an up-to-date overarching strategy; as a consequence, it is struggling to set priorities and to bring to an end less important activities. This must be rectified as soon as possible, with the findings of this review being fully addressed in the process. The current structure of WCRP has become increasingly unwieldy. It has evolved largely by accumulation

*On 4 July 2018, ICSU became the International Science Council (ISC), following the merger with the International Social Science Council. Given that the review took place in 2017, the previous name ICSU is used throughout this report. From 4 July 2018, the ISC is the co-sponsor of WCRP.

** IOC of UNESCO became a co-sponsor in 1993

of new working and advisory groups, and the initiation of the Grand Challenges. It continues to be built around its four Core Projects (GEWEX, CLIVAR, SPARC and CLIC), which have been in existence for a long time. Consequently, the structure and remit of the various elements of WCRP may not be valid in an era where more holistic Earth system and seamless weather-to-climate science approaches are needed, and where society requires science and services from the global to the local scale.

The Panel therefore recommends that WCRP seeks to simplify and re-purpose its core activities around a new structure that takes a holistic view of the climate system, and brings together the separate components of the climate system currently covered individually by the existing Core Projects. Recalling the principal aims of WCRP, which are to determine "to what extent climate can be predicted, and the extent of man's influence on climate", then these should be the fundamental cornerstones, here termed the 'capabilities', of the future WCRP. These capabilities need to be underpinned by a third capability in fundamental research on Earth system processes across timescales. These three 'Capability Themes' should replace the current Core Projects, and should act to frame WCRP's long-term research agenda.

Within and between the Capability Themes should be a small set of high-profile, but time-limited (5-10 years maximum), Cross-cutting Research Projects. Over time there should be an increasing emphasis on these projects as a means of attracting a new generation of scientists, for showcasing cutting-edge WCRP science, and for demonstrating the policy relevance of WCRP. The Research Projects should draw on the Capability Themes, and when appropriate, seek to co-design and implement the plan of work with other major programmes such as the World Weather Research Programme (WWRP) and Future Earth.

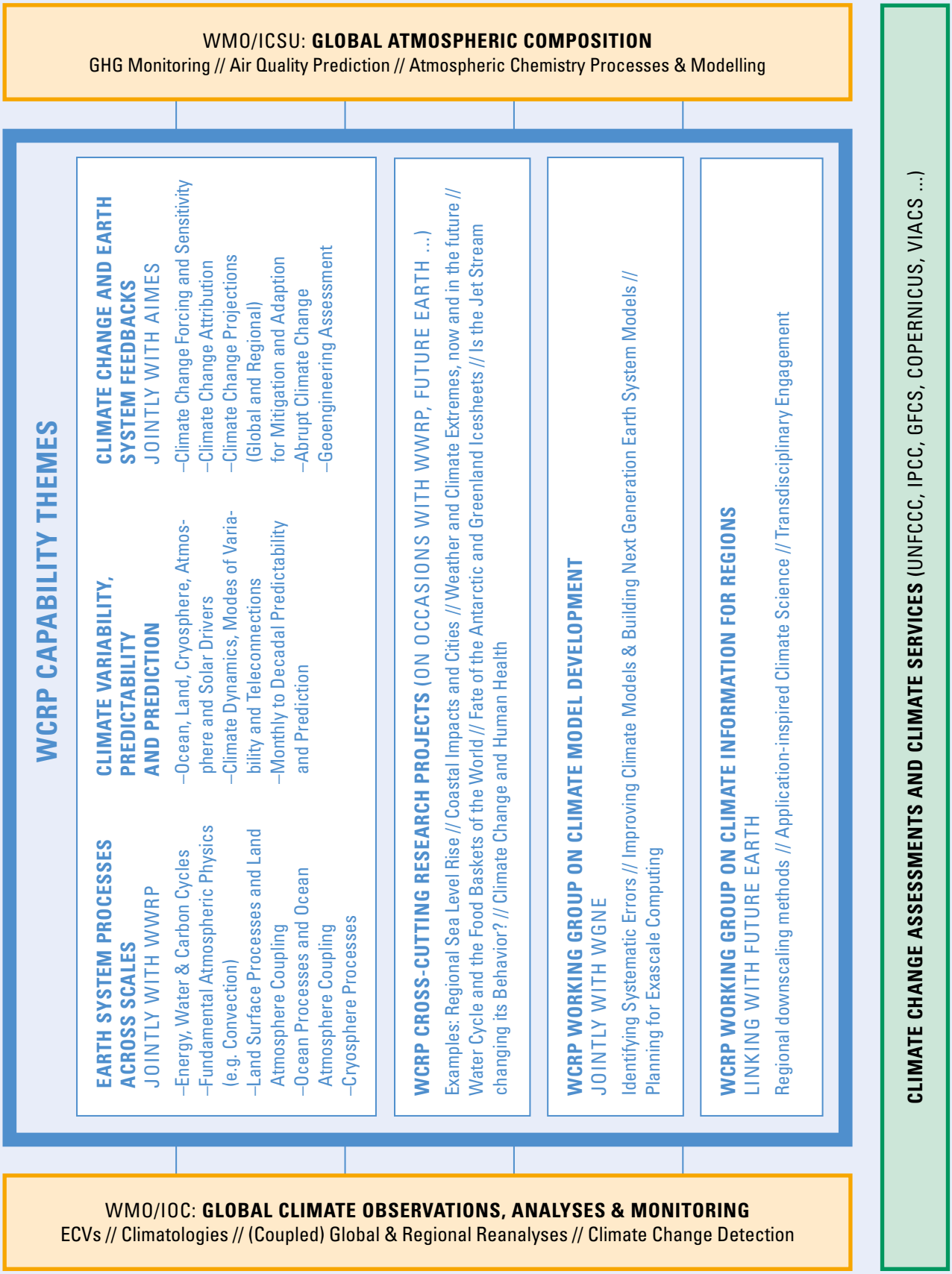
At the same time the Modelling Working Groups should be consolidated within the Capability Themes, to ensure that they are fully integrated with the science. This change recognizes that modelling is now the central plank for delivering science in WCRP, and that therefore the need for separate modelling working groups has passed, although their specific activities are still central to delivering WCRP's mission. However, the Panel is concerned that there is insufficient emphasis on model development, which continues to be hard work to prioritize and energize, yet is vitally important for WCRP and its partners. With the new agendas of seamlessness, of high-resolution Earth system modelling and the advent of exascale computing, with all that that implies in building a new generation of codes, a major push is required in climate model development. The Panel recommends that a new WCRP Working Group on Climate Model Development should be established, which would take the lead in the science for next-generation Earth system modelling and provide a forum for engaging with the vendors on the design of exascale machines.

The Panel also recommends that WCRP's approach to regional climate issues and the links through to applications require further and careful thought. Although WCRP should continue to focus on the fundamental, underpinning science that increasingly addresses regional and local climate on all timescales, it is essential that it formalizes and improves its links to applications and user needs, which involves more interdisciplinary approaches, including linking to the social sciences. These increasingly require information at the regional and even local level, and the panel commends WCRP for its thrust on providing 'Climate Information for Regions' and establishing an International Office to lead in delivering this. This activity should be formalized within a new Working Group that would act as a bridge between WCRP, GFCS and other climate service providers, by promoting applied and translational research and facilitating dialogues between underpinning climate science and customer-relevant services.

The Panel therefore proposes the following as a possible new structure for WCRP, for consideration by the sponsors, the JSC and the climate science community. This structure also seeks to place WCRP in the context of other, related activities on which WCRP will depend and also contribute. Based on the evidence that the Panel heard, the Panel proposes some restructuring of these activities for WMO and its partners to consider, with a view to providing greater coherence across the whole Earth, climate and weather system portfolio, and potentially leading to improved cooperation and more effective use of resources. WCRP is presented in the enclosed blue elements, and linkages with the surrounding boxes are implicit (see graph 1).

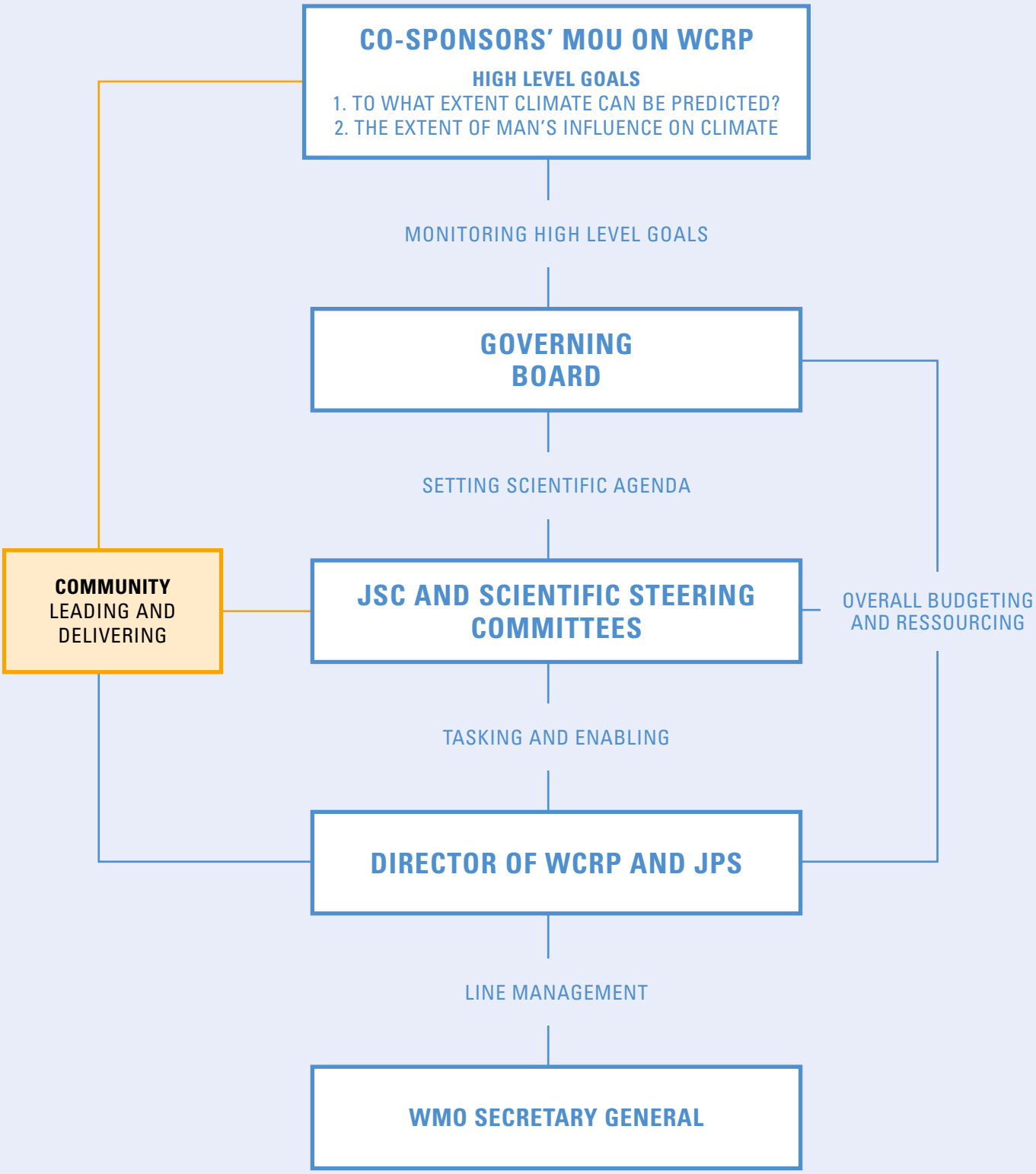
GRAPH 1

Strawman proposal for a new WCRP structure



GRAPH 2

Strawman proposal for a new Governance structure



Alongside the proposed re-structuring, the Panel also recommends stronger governance of WCRP, to address the weaknesses revealed during the review related to governance, management and resourcing, and the engagement of the co-sponsors and research funders in sustaining the programme (see graph 2). A formal, high-level Governing Board should be established by the sponsors, with the overall responsibility for WCRP residing with this Board and its Chairperson. The Board would oversee the implementation of the WCRP MoU and ensure the high-level goals of WCRP are delivered; it would facilitate the interaction with, and engagement of, the sponsors and other key stakeholders; and it would manage high-level risks and change, especially associated with funding. Its first activity should be the development of a new MoU to reflect new research agendas, the roles and responsibilities of the sponsors, the new governance structure, and the functioning of the JPS.

As outlined below, the overall scientific leadership of WCRP and its interactions with the community would continue to reside with the JSC. With the Governing Board in place, the JSC would be freed up to exercise its intended role, which is to provide science leadership, to set the science strategy and oversee its implementation, and to build a strong community of international scientists to work on grand challenge problems that require international coordination. The JSC tasks the JPS and its Director, whose responsibilities are to support WCRP's scientific activities, to facilitate international engagement and partnerships and manage the programme's resources. The sponsors should also consider whether the role of Director, and the JPS in general, should have more day-to-day discretionary executive power, enabling the JPS to be agile and responsive, but always in line with the guidance and direction of the JSC and in consultation with the JSC Chair and Officers as appropriate.

WCRP is at a critical point with regard to funding to support its activities. The current situation of a reducing funding base for the JPS is untenable, but yet the WCRP is one of the most highly regarded and widely recognized of the research efforts supported by the sponsors. Many of the projects that it delivers could not have been achieved without the international coordination and leadership that WCRP provides. The gearing of national investments that can be achieved from a small investment in WCRP is impressive and can be game-changing, and yet the community continues to struggle to find resources and funding from WCRP to support these activities.

The Panel therefore urges that the sponsors redouble their efforts to support the JPS financially at a higher level of enabling funding, so that it can operate more effectively, support the community in coming together to coordinate science, and continue to deliver the research outputs that society increasingly depends on.

In summary, the Panel commends WCRP for its long and vital contribution to international climate research, and intends that this review will help WCRP to plan its future and ensure that fundamental climate research continues to thrive and serve the needs of society as it tackles major 21st Century challenges.

The Panel makes the following recommendations and looks forward to significant progress in implementing these in time for the 40th anniversary of WCRP in 2020:

1 SCIENCE STRATEGY

A new ten-year WCRP science strategy and related five-year implementation plan must be developed as soon as possible in discussion with the sponsors and with wide consultation and community buy-in.

WCRP currently does not appear to operate within the context of an up-to-date, overarching and clearly focused strategy and this must be rectified as soon as possible. A consequence of the lack of a strong, and strongly implemented, strategy is that WCRP is struggling to set priorities and so to stop less important activities. If WCRP does not continue to provide clear leadership, there is a danger of losing the engagement of the scientific community and its funders, so a new strategy is badly needed.

In developing its strategy WCRP needs to reflect how climate science has evolved over recent decades, with the emergence of holistic Earth system modelling, of seamless weather and climate science, of the increasing skill and reliability of climate prediction, and the growing agenda for an increasing number of climate predictions and projections to guide resilience, adaptation and mitigation actions. The new strategy should respond directly to this review and encapsulate the following recommendations:

- It should identify the key societal needs for fundamental climate research to tackle 21st Century problems across climate resilience, adaptation and mitigation;
- It should focus on the scientific priorities where WCRP can make a unique contribution through its international, coordinated and integrative activities;
- It should reflect the recommendations regarding the structure of WCRP;
- It should show where recommendations regarding partnerships will add value to WCRP;
- Although the focus should be on providing the bedrock climate science, the strategy should demonstrate a clear pathway to applications, i.e. climate services;
- A short synthesis of the new WCRP strategy should be produced to enable the WCRP community to engage with potential new sponsors and funders and to act as advocates for fundamental climate research.

2 GOVERNANCE AND THE MOU

A formal high-level Governing Board for WCRP should be established to enable more effective engagement with the sponsors and enable them to fulfil their responsibilities for the programme. A new MoU should be put in place to reflect changes in governance, operations and structure.

The 2009 Review of the WCRP recommended (Recommendation 9) that:"WCRP's sponsors should meet regularly to review their mutual responsibilities for the Programme …". The issues that led to this recommendation remain in place today. The JSC and JPS are struggling to manage upwards and the sponsors are concerned with the responsiveness of the WCRP and its strategic alignment. The terms of the WCRP MoU are not being implemented effectively.

The core (and initial) membership of the Governing Board should include high-level representation from the sponsors, who would also recommend other members and elect an interim Chair. The Review Panel concluded that there is also a need for more explicit identification of key partners, and that a Governing Board would provide a means to recognize such partnerships. The JSC Chair and Vice-Chair should be ex-officio members.

The JPS should provide the secretariat for the Governing Board. Once fully constituted, the Chair should be an independent member. The membership should not exceed eight and, other than the sponsors, should be rotated on a biannual basis.

The terms of reference of the Governing Board should include:

- Overseeing the implementation of the terms of the WCRP MoU;
- Setting the overall aims and managing communication and interaction with, and engagement of, the sponsors and other key stakeholders;
- Approving the high-level science strategy and structure of WCRP;
- Managing high-level risk and change, especially associated with funding;
- Overseeing resource mobilization and garnering enabling support for administration.

The Governing Board would meet at least once per year, either through video-/tele-conference or in association with the JSC if that were convenient. The Board would be self-supporting. A first task of the Governing Board would be to update the MoU to include the changes to governance and any other relevant items needed to refresh it.

The advice of the JSC would be sought on all agenda items. The primacy of the JSC for scientific advice and setting scientific strategy and priorities would remain; the Governing Board would take overall responsibility for WCRP on behalf of the sponsors and in so doing it would provide oversight on matters such as resource mobilization, administrative support and engagement.

The Governing Board should consider appropriate metrics for assessing the performance of WCRP.

3 SCIENTIFIC LEADERSHIP

The JSC should be re-invigorated to focus on providing science leadership, setting the science strategy and overseeing its implementation, including establishing partnerships, and building a strong community of international scientists to work on grand challenge research problems that require international coordination.

The complexity of the WCRP structure, with its Core Projects, Working Groups and now Grand Challenges, means that the JSC meetings tend to be largely taken up by reviewing the activities rather than setting the strategy and overall direction. The JSC meetings need to be more focused on strategy and vision than has recently been the case. Overall the Panel concluded that morale in the JSC is not strong and that this is having a detrimental impact on WCRP as a whole.

With the Governing Board being responsible for managing the interface between the JSC, the sponsors and other external clients, the JSC would be freed up to exercise its intended role, which is to provide science leadership, to set the science strategy and oversee its implementation, and to build a strong community of international scientists to work on grand challenge problems that require international coordination.

→ The Panel recommends that the sponsors consider the constitution of the JSC and how members are nominated. The Panel supports the suggestions for an open call for nominations based on science excellence and leadership, and that the sponsors consider whether the JSC membership could be reduced from 18 to facilitate more effective decision-making.

4 OPERATIONS

Additional clarity should be provided in the terms of reference, structure and functions of the Joint Planning Staff and the Director of WCRP, to ensure that the JPS works effectively with the JSC to support its scientific activities, to facilitate international engagement and partnerships, and to manage WCRP's resources.

The JPS is a vital part of WCRP. Its role is to assist the JSC in implementing their decisions, and to facilitate the collaborative actions of the various elements of WCRP. The JPS is led by the Director of WCRP. His/her role is to lead the staff and be responsible for the scientific and technical tasks discharged by the JPS to the Chair of the JSC, acting on behalf of the sponsors.

→ As part of the recommended improvements in governance (Recommendation 2), the MoU should be revised to provide unambiguous guiddance for the roles of the WCRP Director and the JPS with respect to responsibility and accountability, to the guidance and direction of the JSC, and in terms of representation of the WCRP. The title of the role in itself can lead to confusion as to where decision-making and strategic direction is set within WCRP. The Panel believes the MoU is clear that those functions lie with the JSC (and in future also with the Governing Board).

→ The sponsors should consider whether the role of the Director of WCRP, and the JPS in general, should have more day-to-day discretionary executive administrative responsibility, enabling the JPS to be agile and responsive, but always in line with the guidance and direction of the JSC and in consultation with the JSC Chair and Officers as appropriate. The word "guide" should be avoided in the ToR of the JPS to avoid any confusion with the role of the JSC.

→ The name World Climate Research Programme should be used exclusively for the research enterprise defined in the MoU. In particular, the term should be avoided for administrative units unless the distinction is made clear (e.g. the Joint Planning Staff of WCRP).

→ Depending upon decisions with respect to governance and a Governing Board, the terms of reference should be updated to include support for the Governing Board and its role.

5 STRUCTURE

The JSC, in consultation with the newly created Governing Board, should work with the science community to establish a new structure for the WCRP research effort that best serves its new strategy and involves a simplified set of delivery mechanisms.

The existing structure is not the structure of tomorrow. However, in creating a new structure, it will be important not to destroy the legacy of what has been created – a community of engaged scientists; it will require a willingness from the community to change and for the community to be part of the change process.

The Panel anticipates that the JSC will work with the community and the newly created Governing Board to define a new structure that best serves its new strategy. The following aspects should be considered:

- That the new structure comprises a combination of a small set of top-level scientific problems with explicit societal relevance (which could be called Grand Challenges or cross-cutting Research Projects that are time-limited (e.g. 5 to 10 years) in their delivery), together with a small number of enduring Capability Themes that would nurture the long-term expertise needed to advise on, and contribute to these scientific problems being addressed effectively.

- The Capability Themes would replace the current Core Projects. The existing Core Projects have been in place for a long time and so may not be ideally structured to help deliver the scientific goals of today and the future, to be articulated in the new WCRP Strategy. These Capability Themes should aim to take a holistic Earth system approach, whilst recognizing that research on individual components of the Earth system remains essential.

- The modelling Working Groups should become part of the Capability Themes to reflect the importance of modelling as a tool for delivering WCRP science. The WCRP leadership should consider how best to reinvigorate climate model development in any revised structure.

- The Research Projects should directly address the goals of the new WCRP Strategy (and so they may not necessarily have a strong link to the existing Grand Challenges) and identify high-priority issues that require international partnership and coordination; they should yield "actionable information" for decision-makers.

- Regarding the existing structural elements, the Panel concluded that the case for continuing with WMAC and WDAC in any new structure was not strong. They potentially overlap with other relevant activities within WMO and elsewhere, such as WGNE and GCOS, and that in the future any such advisory councils should cover the breadth of WMO scientific activities. Consequently, the Panel recommends they not be a feature of the new structure.

- The Panel strongly recommends that the concepts of co-design and co-production be exploited as much as possible. This will involve the structural elements within WCRP strongly linking across to other proposed activities outside of WCRP, such as those within WWRP, GFCS, Future Earth, etc. This should be borne in mind as the new structure is being planned.

6 FINANCING

In light of the importance to society of the goals of WCRP and the precarious level of current financial support for the programme, the sponsors should redouble their efforts to support WCRP financially at a higher level of enabling funding so that it can operate more effectively.

WCRP is one of the most highly regarded and widely recognized of the research efforts supported by the sponsors. There are two distinct elements to the funding: that which supports the enabling activities of the WCRP executive ("enabling funding") and that which directly supports the research ("research funding"). This recommendation relates primarily to the enabling fund.

It should be more fully recognized than it is currently, that the different sponsors provide both financial and in-kind support and that the route for the financing is sometimes circuitous and therefore not always made fully visible or recognized. Elements that should help to improve the funding situation are as follows:

- The sponsors should agree to be clear about the financial and in-kind contributions that they make to WCRP. This needs to factor in, and be explicit about, the complex pathways for this funding to flow to WCRP. The WCRP Governing Board should examine the enabling funding annually and be pro-active in making the case for that funding within the sponsoring organizations, in accordance with their capacities.

- WCRP should, via its sponsors, encourage countries to make appropriate national contributions to the enabling funding, such as continuing to support International Project Offices and sponsoring Research Projects; a number of countries currently appear to be reducing rather than increasing their contributions.

- In future, there is a risk that research-funding could be increasingly diverted away from fundamental science. WCRP, through its Governing Board and the JSC, should play an advocacy role in mobilizing research funding for fundamental climate science. There is a need for a more strategic engagement with the research funding communities, and for someone who could talk at the higher level with the funders.

- Engagement with the Belmont Forum of research funders should be at a high level, ideally through a WCRP research funding representative. The Panel recommends that WCRP and its sponsors need to partner with others to influence Belmont Forum research funding. WCRP needs to be seen as a strong partner of Future Earth, and to be at the table. Only in this way can WCRP and its sponsors can continue to influence the research funding community about the need for fundamental science.

7 SCIENCE TO SERVICE

WCRP should take action to ensure its knowledge is brought to the service of society, especially in supporting the development of climate services.

While WCRP should continue to prioritize the advancement of fundamental science, it can and should seek opportunities to establish connections to relevant user communities through programme partnerships. In so doing, WCRP science can serve to inform quality services, and emerging practitioner needs can serve to inform further scientific inquiry.

- WCRP should pursue, in particular, partnering with Future Earth and its Knowledge-Action Networks. There are positive signs emerging of opportunities for productive research partnerships and these should be pro-actively developed by WCRP.

- WCRP should build pro-active bridges to the WMO's Global Framework for Climate Services and other science-to-service initiatives such as the Copernicus Climate Change Service and the Climate Services Partnership, by implementing a formal activity on Climate Information for Regions.

- A variety of other mechanisms for programme engagement should be explored. One option is through representation on the recommended Governing Board of WCRP. A second is to establish a (cross-cutting) working group that serves as liaison to the partner programmes.

- In engaging with climate services, WCRP should explore, and as appropriate pursue, opportunities this may offer for obtaining additional funding for its fundamental science.

8 PARTNERSHIP

WCRP should seek to develop strategic and strong partnerships with other WMO research programmes (specifiically WWRP and GAW), with GCOS, and with Future Earth.

WCRP should be pro-active in establishing a process of full engagement with these partners via the practice of co-design of projects to exploit the synergies that seamlessness offers. A co-designed Roadmap for exploitation of such synergies would be an important first step to draw on a great research constituency. We recommend that:

- WCRP urgently explores the option of the co-design and co-production of projects that address key scientific challenges of common interest to WCRP, WWRP, GAW and Future Earth.

- Future Earth should be brought in as a high-level partner. The linkage between WCRP and Future Earth should be strengthened by a regular and formal set of meetings between the top-level management of the two initiatives to share experience and explore common interests, and also by jointly developing Knowledge-Action Networks, potentially involving other ICSU programmes. The strategy for collaboration, identification of areas of joint interest, and the creation of joint evaluation schemes for the collaboration, should be considered.

- WCRP should be open and dynamic for future opportunities to develop collaboration with new partners.

ACRONYMS AND ABBREVIATIONS

AIMES	Analysis, Integration and Modeling of the Earth System
AMIP	Atmospheric model development and intercomparison
CAMS	Copernicus Atmosphere Monitoring Service
CAS	Commission for Atmospheric Science
CCI	Commission for Climatology
CCMI	Chemistry-Climate Model Initiative
CMIP	Coupled Model Intercomparison Project
COP	Conference of the Parties
ESGF	Earth System Grid Federation
ETCCDI	Expert Team on Climate Change Detection and Indices
GAW	Global Atmosphere Watch Programme
GCOS	Global Climate Observing System
GFCS	Global Framework for Climate Services
ICSU	International Council for Science
IGAC	International Global Atmospheric Chemistry
IGBP	International Geosphere-Biosphere Programme
IGFA	International Group of Funding Agencies for Global Change Research
IHDP	International Human Dimensions Programme on Global Environmental Change
IOC	Intergovernmental Oceanographic Commission of UNESCO
IPCC	Intergovernmental Panel on Climate Change
JCRF	Joint Climate Research Fund
JPS	Joint Planning Staff
JSC	Joint Scientific Committee
MoU	Memorandum of Understanding
NSF	National Science Foundation of USA
SBSTA	Subsidiary Body for Scientific and Technological Advice
SCAR	Scientific Committee on Antarctic Research
SCOR	Scientific Committee on Oceanic Research
ToR	Terms of Reference
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
WCC-3	World Climate Conference 3
WCRP	World Climate Research Programme
WDAC	WCRP Data Advisory Council
WGCM	Working Group on Coupled Modelling
WGNE	Working Group on Numerical Experimentation
WGOMD	Working Group on Ocean Model Development
WGRC	Working Group on Regional Climate
WGSIP	Working Group on Subseasonal to Interdecadal Prediction
WMAC	WCRP Modelling Advisory Council
WMO	World Meteorological Organization
WOAP	WCRP/GCOS panel on observation and assimilation
WOCE	World Ocean Circulation Experiment
WWRP	World Weather Research Programme
YESS	Young Earth System Scientists

LIST OF DOCUMENTS

All documents are available at www.bit.ly/2BBcKZa

Review Panel membership
Terms of Reference for review
Link to WCRP website: www.wcrp-climate.org/
Agreement between WMO, ICSU and IOC of UNESCO, 1993
WCRP review 2009
WCRP Achievements 2009
WCRP Accomplishments 2013
WCRP Strategic Framework 2005-2015
WCRP Implementation Plan 2010-2015
WCRP annual budgets 2012-2016
Scoping a framework for WCRP regional activities, 2016
WCRP structure, reporting lines, staff profile
A self-assessment report, written by the Director of WCRP on the performance of the programme and future plans
Written input on the WCRP achievements prepared by the Chair of JSC
Roadmap for a 2019-2029 WCRP Strategic Plan, prepared by the WCRP Officers
Areas for possible cooperation between WCRP/ WWRP/GAW – Perspectives from the JSC Chair
Directions for WCRP, a presentation by the JSC Chair
A brief history of the WCRP Grand Challenges
A list containing web links to main outcomes of WCRP
Written self-assessment reports submitted by:

- –Advisory Councils: WDAC and WMAC
- –Working Groups: WGCM, WGNE, WGSIP, WGRC
- –Core Projects: CLIVAR, CORDEX, SPARC, GEWEX, and
- –Grand Challenges: NTCP, Carbon feedbacks in the climate system; Clouds, Circulation and Climate Sensitivity; Water for the Food Baskets of the World

Draft CliC implementation plan
Presentations on possible interactions between WCRP, WWRP, GAW and CAS
The list of JSC members and their ToR
JSC Session summaries 2014-2016
Draft minutes of the 38th of the JSC meeting, 2017
Minutes of the "Lessons Learnt for Climate Change Research" meeting in September 2014 to evaluate AR5 and revisit the WCRP Grand Challenges
Brasseur, G., and D. Carlson (2015), Future directions for the World Climate Research Programme
Written input from Vladimir Ryabinin, IOC of UNESCO
Strategies of WMO, ICSU, IOC of UNESCO
IPCC vision paper
WWRP organogram with all projects and reporting lines
WWRP resource mobilization booklet
Future Earth Governing Council
Introduction to the Belmont Forum
GCOS review MoU 2015
GFCS and WCRP, written input prepared by Jens Sunde, chair of the Intergovernmental Board on Climate Services
WCRP Communication Strategy 2017-2020

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PHOTO CREDITS

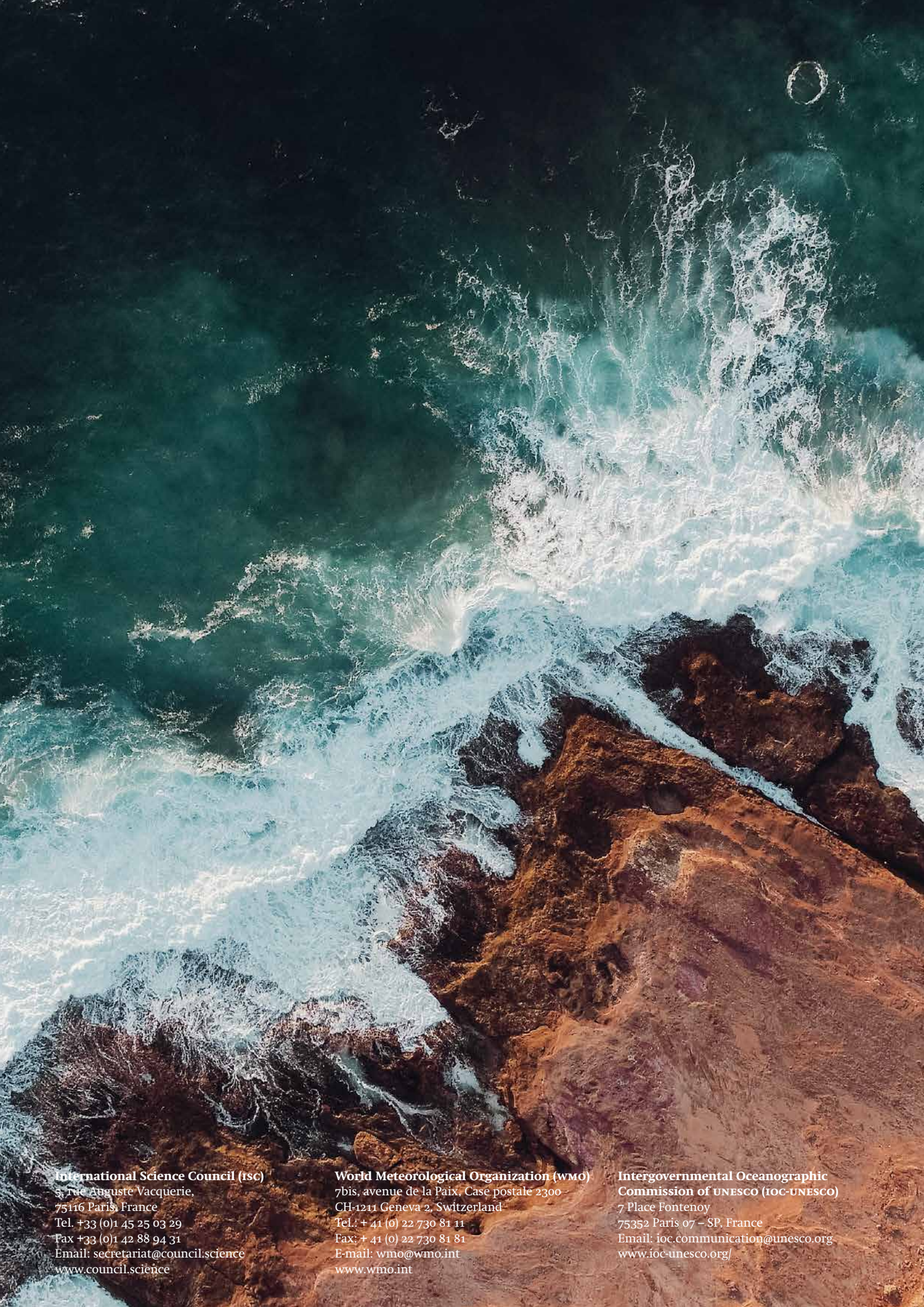
Cover: Stacie Lucas on Unsplash
P. 6: Johnny Chen on Unsplash
P. 15: Future on Unsplash

DESIGN

Public Design Hamburg – www.pblcdsgn.de

PRINT

Oktoberdruck Berlin – www.oktoberdruck.de
validated environmental management



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