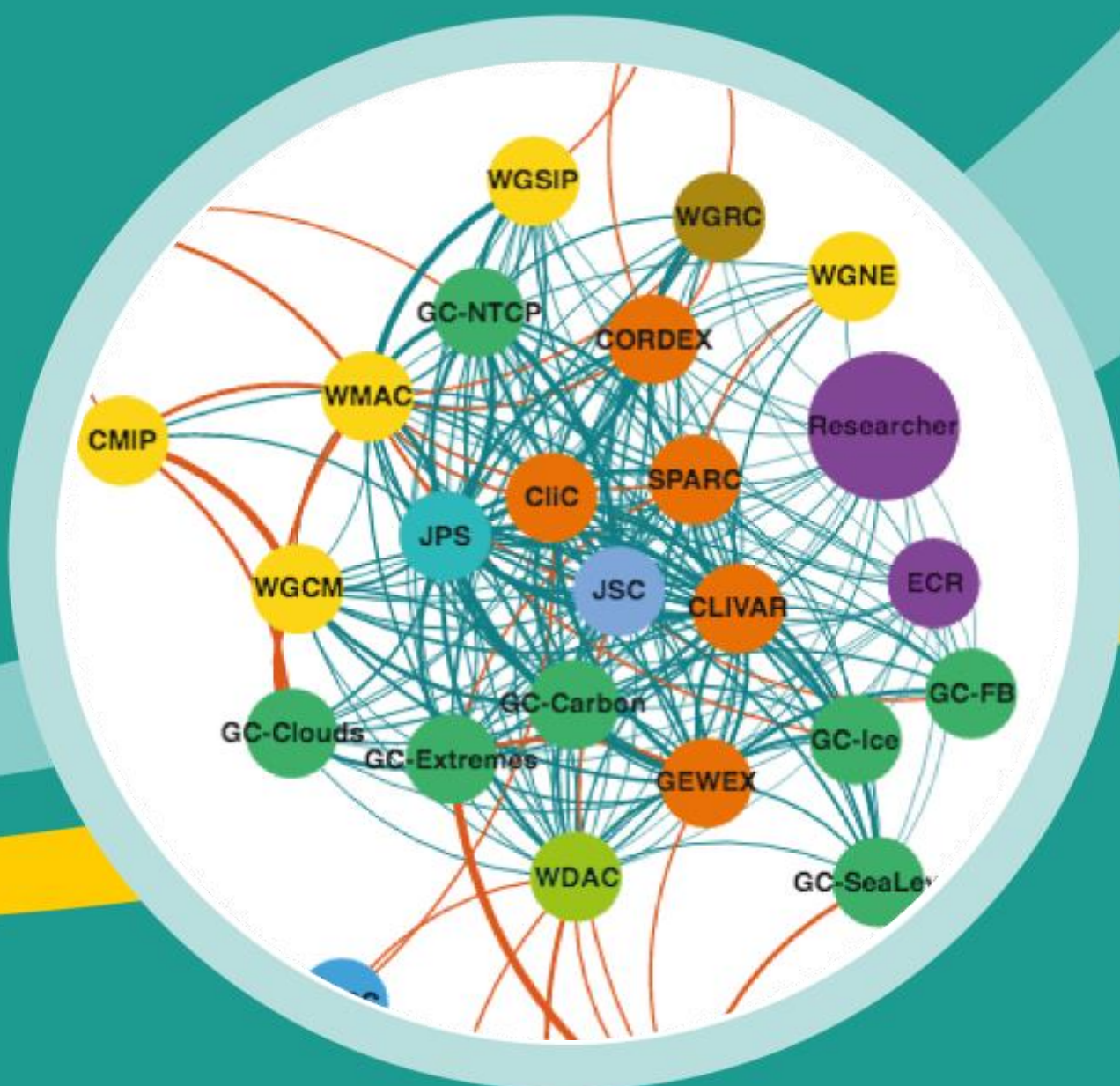


WCRP Communication Survey Response Overview



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Executive Summary

The World Climate Research Programme (WCRP) Communication Survey was conducted between 2 November 2016 and 20 January 2017. The 196 responses gave insights into internal communication within the WCRP community and external communication with the wider science community, stakeholders and the public.

The survey results show that there communication within the Programme is predominantly infrequent, with many groups listing quarterly to annual or less frequent communication with other groups and annual or less frequent contact with researchers who identify as 'internal'. Most communication within the WCRP Community was reported as being by email, with the Joint Scientific Committee Session, teleconferences and other meetings also rating as important methods of communication. Overall, internal communication was rated at 3.5 out of 5 stars, suggesting that the communication that does occur is reasonably efficient but with room for improvement.

Responses from individuals from outside of WCRP provide insights regarding the methods and effectiveness of Programme outreach. The WCRP Newsletter was identified as a useful asset, as overall it ranked highest in terms of where external respondents accessed news and information about the Programme. This was despite the fact that 42 percent of respondents were not subscribed to the newsletter. The WCRP and Core Project websites were not as highly ranked, suggesting that referrals from newsletters and social media could be used more extensively. Considering both internal and external responses, it was reported that the WCRP website is mainly used for specific searches on a monthly to annual basis. Comments were made that the website could be more up to date, well structured and clear – showing the need for improvements in this area. While there was no dominant reason why visitors use the WCRP website, events, Programme news and the latest WCRP initiatives were favorable motivations. Overall, 82 percent of respondents said that the WCRP website meets their needs.

The survey indicates that WCRP should aim to improve the visibility of the Programme by more effectively connecting with the wider science community and the general public. WCRP research and products should be better highlighted, to show the importance of the Programme and the high caliber of the research community. Clearer mechanisms for Programme involvement and transparency of leader selection are also needed

Consideration of the survey responses resulted in recommendations to: increase Programme visibility; showcase WCRP science findings; provide greater transparency of leadership selection criteria and clearer mechanisms for Programme involvement; communicate more effectively with members of the WCRP community; continue to make improvements to the WCRP website structure and content; and to publicize how to subscribe to the WCRP newsletter more widely. Overall respondents gave WCRP Communication a rating of 3.5 out of 5 stars.

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1. Introduction

In order to determine the effectiveness of World Climate Research Programme (WCRP) communication, a public survey was conducted between 2 November 2016 and 20 January 2017 (Figure 1). The aim of the survey was to obtain feedback from the WCRP research community and external stakeholders that can feed into the official WCRP Communication Strategy 2017-2020. All survey questions and an overview of survey structure are given in Annex 1.

There were 232 responses to the WCRP Communication Survey, of which 196 provided data beyond the initial questions that established the respondent category. Of these 196, a further 15 responses were incomplete, but were considered for the questions that were completed. This report will outline the results of the survey.

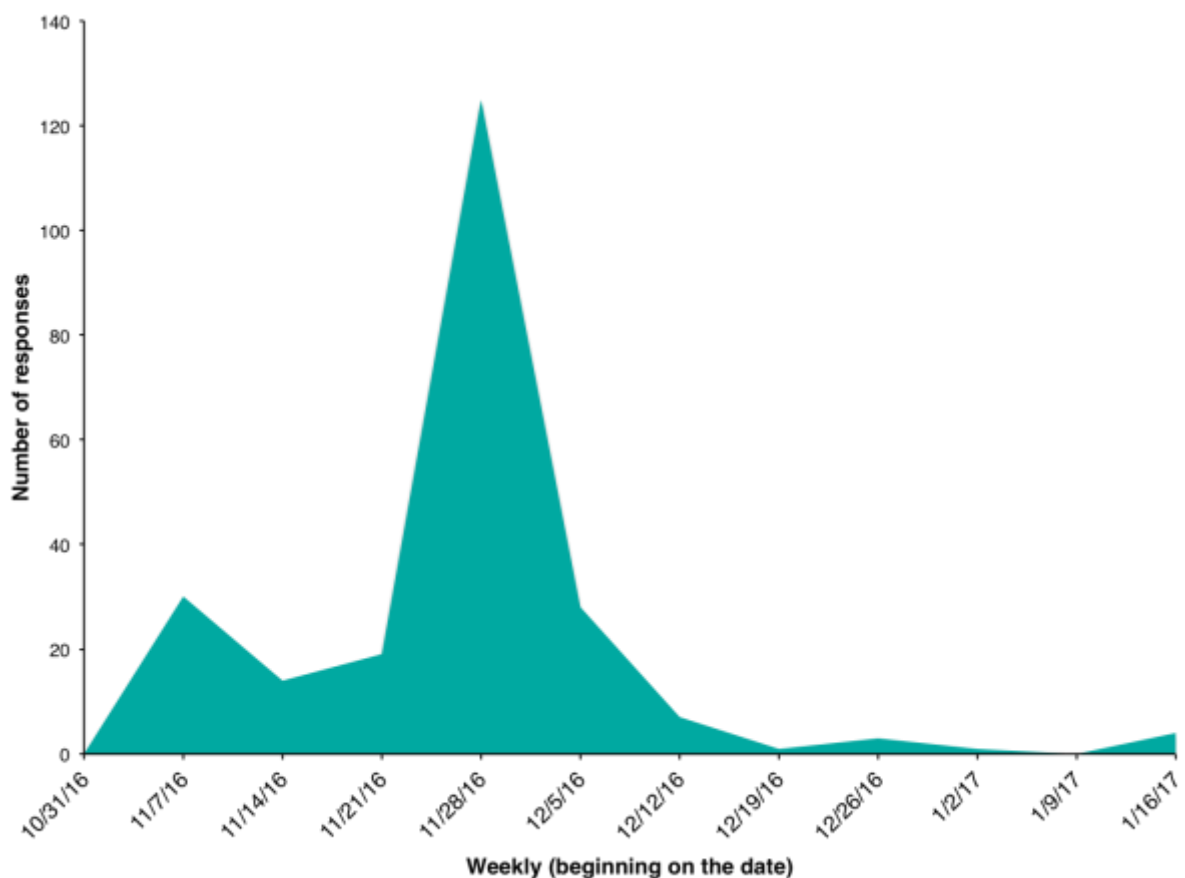


Figure 1. Communication survey responses by week, from 2 November 2016 and 20 January 2017. Data spike due to advertising campaign to the WCRP mailing list on 22 November 2016. Total of 232 respondents.

2. Results

The WCRP Communication Survey first established the affiliation of the respondent, with particular importance placed on whether the respondent was involved in internal or external communication. Internal respondents are members of the WCRP Community outlined in Table 1, as well as researchers working on projects that fall under these groups and activities. For the purpose of this survey, external respondents are staff members of WCRP sponsor organizations, staff or community members of WCRP partner organizations, staff or community members of organizations or services that have an interest in world climate, researchers and early career researchers not specifically involved in WCRP projects or activities and members of the public with an interest in world climate.

Of the 196 respondents, 96 were classed as internal and 100 as external. Internal respondents were asked about their WCRP network – with whom they are connected to in WCRP and how strong those connections are – the communication tools that they use and their views on the effectiveness of internal communication within WCRP. External respondents were asked about how they receive information regarding WCRP and to comment on overall effectiveness of those communication.

In addition to questions relating to internal and external communication, all respondents were asked to give feedback on the WCRP website and newsletter and to provide comments on the overall effectiveness of WCRP communication.

2.1. Internal communication

Of the 96 internal respondents who completed the survey, the majority were WCRP community researchers. The ‘researcher’ and ‘Early Career Researcher’ (ECR) categories together made up over half the respondents (Figure 2). When compared to actual WCRP community numbers, we see that the survey represented 55 percent of the Joint Planning Staff (JPS), 44 percent of the Joint Scientific Committee (JSC), 29 percent of International Project Offices (IPOs), 14 percent of members of Core Project Scientific Steering Groups (SSGs) or the Coordinated Regional Climate Downscaling Experiment (CORDEX’s) Scientific Advisory Team (SAT), 9 percent of the members of WCRP Working Groups and 6 percent of the leaders and steering groups of the WCRP Grand Challenges (GC) (Figure 2). Tables 2 and 3 show the affiliation of respondents related to the WCRP Core Projects and to the WCRP Advisory Councils and Working Groups. Note that all affiliations were counted, so the numbers do not correspond to the totals in Figure 2 due to multiple affiliations. There were four respondents who identified primarily as Grand Challenges members.¹

¹ There were two respondents from the leadership of and two researchers affiliated with the Grand Challenge on Understanding and Predicting Weather and Climate Extremes, one respondent from the leadership of the Grand Challenge on Near-Term Climate Prediction and one respondent from the leadership of the Grand Challenge on Carbon Feedbacks in the Climate System.

Table 1: WCRP Groups

No.	Group name	Short name
1	Joint Scientific Committee	JSC
2	Joint Planning Staff and WCRP Director	JPS
3	Cryosphere and Climate	CLiC
4	Climate and Ocean Variability, Predictability and Change	CLIVAR
5	Global Energy and Water Exchanges	GEWEX
6	Stratosphere-troposphere Processes And their Role in Climate	SPARC
7	Coordinated Regional Climate Downscaling Experiment	CORDEX
8	WCRP Modelling Advisory Council	WMAC
9	WCRP Data Advisory Council	WDAC
10	Working Group on Coupled Modelling	WGCM
11	Working Group on Subseasonal to Interdecadal Prediction	WGSIP
12	Working Group on Numerical Experimentation	WGNE
13	Working Group on Regional Climate	WGRC
14	Grand Challenge on Melting Ice and Global Consequences	GC-Ice
15	Grand Challenge on Clouds, Circulation and Climate Sensitivity	GC-Clouds
16	Grand Challenge on Carbon Feedbacks in the Climate System	GC-Carbon
17	Grand Challenge on Understanding and Predicting Weather and Climate Extremes	GC-Extremes
18	Grand Challenge on Water for the Food Baskets of the World	GC-FB
19	Grand Challenge on Regional Sea-Level Change and Coastal Impacts	GC-SL
20	Grand Challenge on Near-term Climate Prediction	GC-NTCP

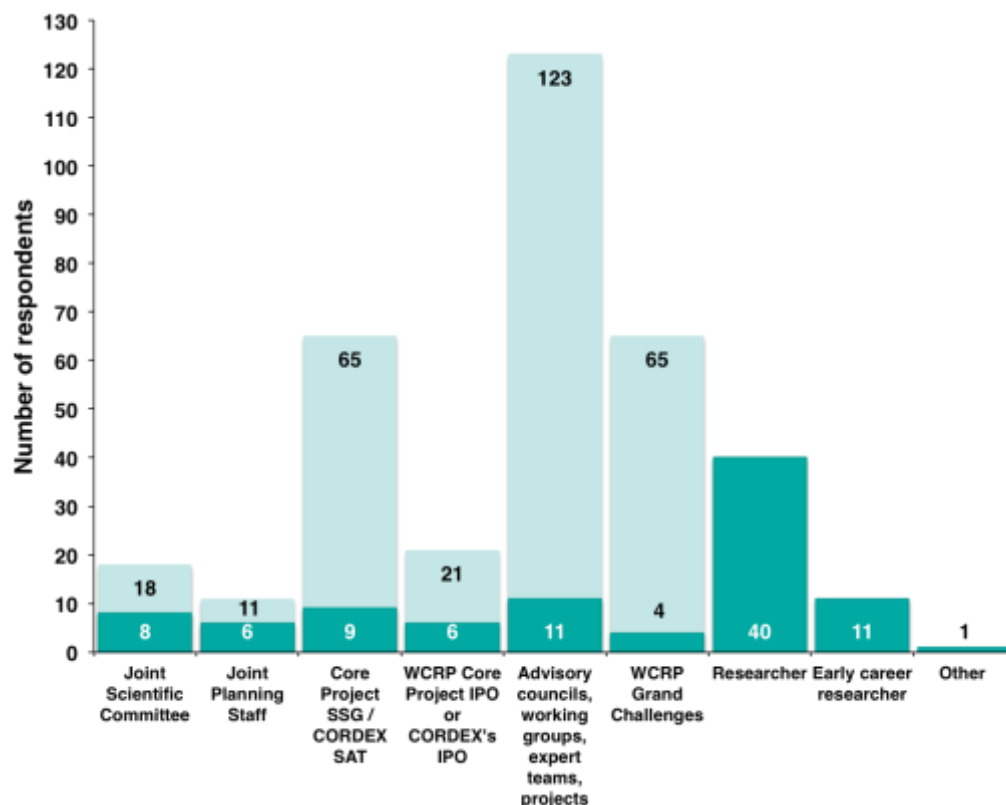


Figure 2. Internal respondent categories (dark teal) compared to actual number of members of each group in the WCRP Community (light teal). Note that the actual numbers for the Grand Challenges may be underestimated due to limited reporting of full group memberships. SSG – Scientific Steering Group, SAT - Science Advisory Team, IPO – International Project Office (number of respondents = 96) Long name for CORDEX given in Table 1.

Table 2: Core Projects (and CORDEX Projects) with whom respondents are affiliated

Projects	CLiC	CLIVAR	SPARC	GEWEX	CORDEX	Other
Core Projects SSGs and CORDEX SAT ¹	5	1	1	6	2	
Core Project and CORDEX's IPOs	2	1	2	1	0	
Early Career Researchers ²	0	4	4	4	0	2
Researchers ³	11	15	13	10	3	18

1. One joint CLiC-GEWEX affiliation. 2. Two joint CLIVAR-GEWEX and one joint CLIVAR-SPARC affiliation 3. Considers all groups mentioned. Long names for groups given in Table 1.

Table 3: WCRP Advisory Councils and Working Groups with whom respondents are affiliated

Groups	WMAC	WDAC	WGCM	WGNE	WGSIP	WGRC	CMIP	S2S	DCPP	ETCCDI
Respondents	2	3	1	2	3	0	2	0	1	0
Researchers	0	0	0	0	0	0	5	0	0	0

Long names for groups given in Table 1.

2.1.1. Frequency of communication and natural links

Survey respondents were asked how often they interact with the WCRP groups listed in Table 1, including with their own group, with responses of 'daily to weekly', 'monthly', 'quarterly', 'annual' and 'no interaction' possible. It was noted on the survey question that this does not necessarily reflect the quality of the communication, as all groups do not need to be in contact with the same frequency. Overall, respondents rated the frequency of communication as low, with only the JPS and the Climate and Ocean Variability, Predictability and Change (CLIVAR) Core Project having a rating over 1 (annual) (Figure 3). This means that for most respondents communication with other members of the WCRP community is either non-existent or on an annual basis. The maximum frequency rating of communication with the different groups is also given in Figure 3. The JPS, all Core Projects, the Working Group on Coupled Modelling (WGCM), the Working Group on Subseasonal to Interdecadal Prediction (WGSIP) and all of the Grand Challenges except the Grand Challenge on Clouds, Circulation and Climate Sensitivity (GC-Clouds) and the Grand Challenge on Water for the Food Baskets of the World (GC-FB) had at least one respondent that communicates with the group on a daily to weekly basis. All of the other groups had at most monthly interaction, except for GC-FB, which had at most quarterly interaction.

To analyze which WCRP groups are communicating most frequently, we can visualize the responses as a network diagram. To do so we used Polinode², which is an online tool for analyzing and visualizing network data. Figure 4a gives an overall impression of the frequency of WCRP communication and can be broken down into two components – what we call 'natural links' (orange lines), shown in Figure 4b, and the survey responses (teal lines), shown in Figure 4c.

² <https://www.polinode.com>. The layout selected for analysis in this report is force directed with standard settings (regular mode, repulsion = 1, gravity = 1, regular gravity, overlap allowed).

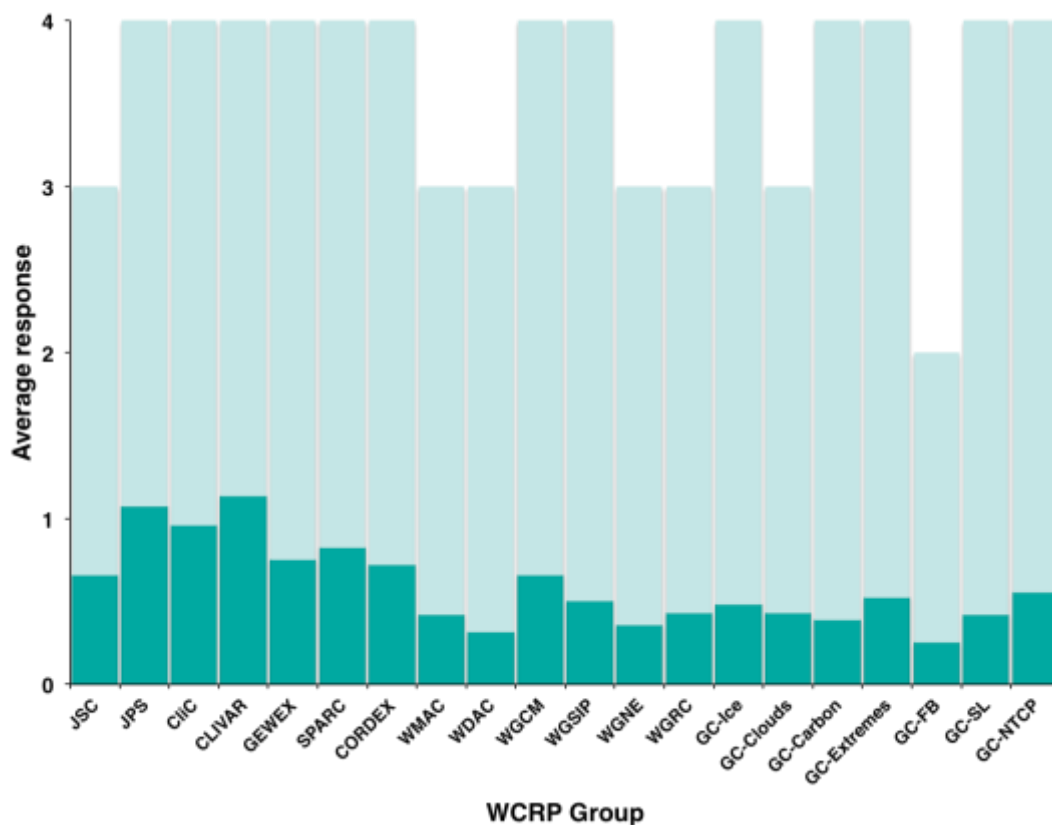


Figure 3. How often internal respondents interact with WCRP groups. Average response of 4='daily to weekly', 3='monthly', 2='quarterly', 1='annual' and 0='no interaction' is given in dark teal. Maximum rating per group is given in light teal. Group long names are listed in Table 1. (number of respondents = 96)

Natural links are where WCRP leaders are involved in more than one group, thus providing a link between them without the need for additional liaisons. This is important to consider because those involved in multiple groups may not have been able to show it in the survey and not all WCRP leaders involved in multiple groups will have responded to the survey. The line thickness (weight) for natural links depicts the number of natural links between groups (eg if an individual is a member of both the WCRP Modelling Advisory Council (WMAC) and WGCM, there is one natural link between the two groups). The maximum number of links between groups is four.

In the survey data shown in Figure 4c, every line in the network diagram represents the average frequency of communication between respondents and groups. The line weight is the frequency rating, ranging from thin, annual, to thick, daily/weekly, communication (no communication results in no line). To provide clarity, the single 'other' respondent was removed for this analysis and responses from respondents from the Core Project SSGs and IPOs were combined to represent individual core projects.

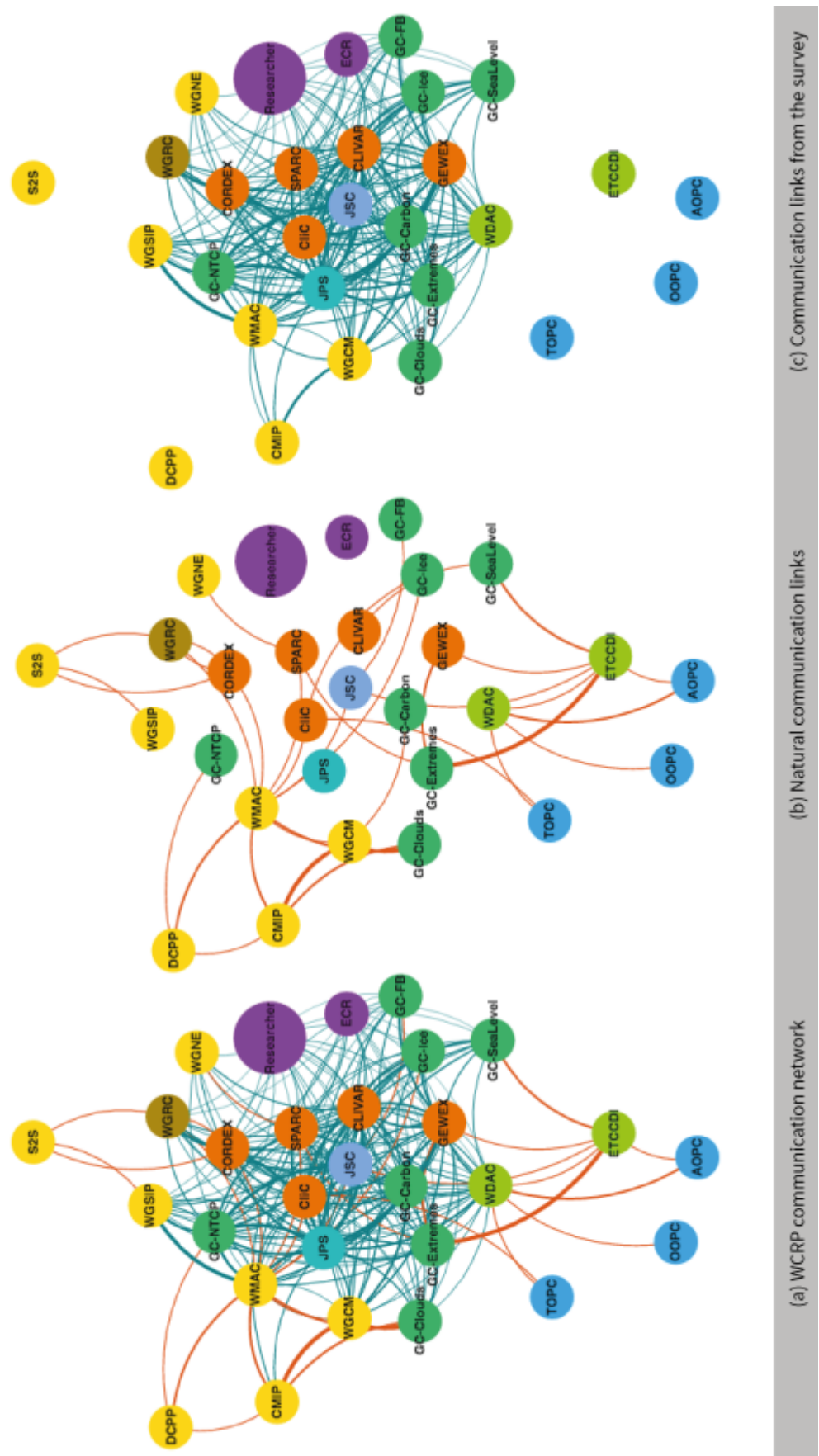


Figure 4. (a) WCRP communication network (internal), as determined by the (b) natural communication links (where individuals are involved in more than one group or committee) and (c) communication links established by the survey. Line thickness reflects the number of links between groups for the natural links and the average frequency of communication for the survey respondents (number of survey respondents = 96). Long names are listed in Table 1.

While natural links and survey data cannot be directly combined, since they are not the same thing, they are used here with the idea that natural links draw nodes closer together when researchers work in more than one group. As such, the natural links only alter the position of nodes and the links should be considered separately to those of the survey data.

To further investigate the communication frequency ratings of the survey, communication ratings from (a) 0 – 1 (communication annually or less) (b) 1 – 2 (quarterly to annual), (c) 2 – 3 (monthly to quarterly) and (d) 1 – 2 (daily/weekly to monthly) were plotted (Figure 5). Only a few groups had on average daily/weekly to monthly connections between groups (Figure 5d). These were between:

- JPS and CLIVAR
- JPS and the Global Energy and Water Exchanges (GEWEX) Core Project
- JPS and the Grand Challenge on Near-Term Climate Prediction (GC-NTCP)
- JPS and CORDEX
- JSC and GC-NTCP
- Working Group on Regional Climate (WGRC) and CORDEX
- WGSIP and WMAC

2.1.2. Internal communication methods

The communication methods employed in a given situation have a direct impact on how effective the messages are disseminated – depending on how well the method works for the individuals involved and what is trying to be achieved. Figure 6 shows that overall most internal respondents use email as their principal communication method. The second most important method of communication given by respondents is the annual JSC Session, where once a year leaders within the WCRP Community meet face to face. Teleconferences and other face-to-face meetings are also notable communication methods, whereas telephone conversations and online messaging are not extensively used.

It is also useful to know whether the methods used depend on the actors (those initiating the communication) and audiences (those receiving the communication) involved. This is complicated, as internal communication is often two-way and the methods used depend on the preferences of all parties involved. Figure 7 shows communication methods used by respondents with each of the following individuals or groups:

- WCRP Director
- JSC Chair or members
- Members of the WCRP Core Project SSGs or CORDEX's SAT
- Members of WCRP Advisory Councils, Working Groups, Expert Teams or other projects
- Grand Challenges leaders/steering groups
- Staff members or consultants working for the core projects or CORDEX's IPOs
- Staff members or consultants working for the JPS

More respondents stated that they use email with the advisory council and working groups (66 respondents) than with all other groups and individuals (range from 39-47 respondents). In a similar way less respondents said that they had no communication with the advisory council

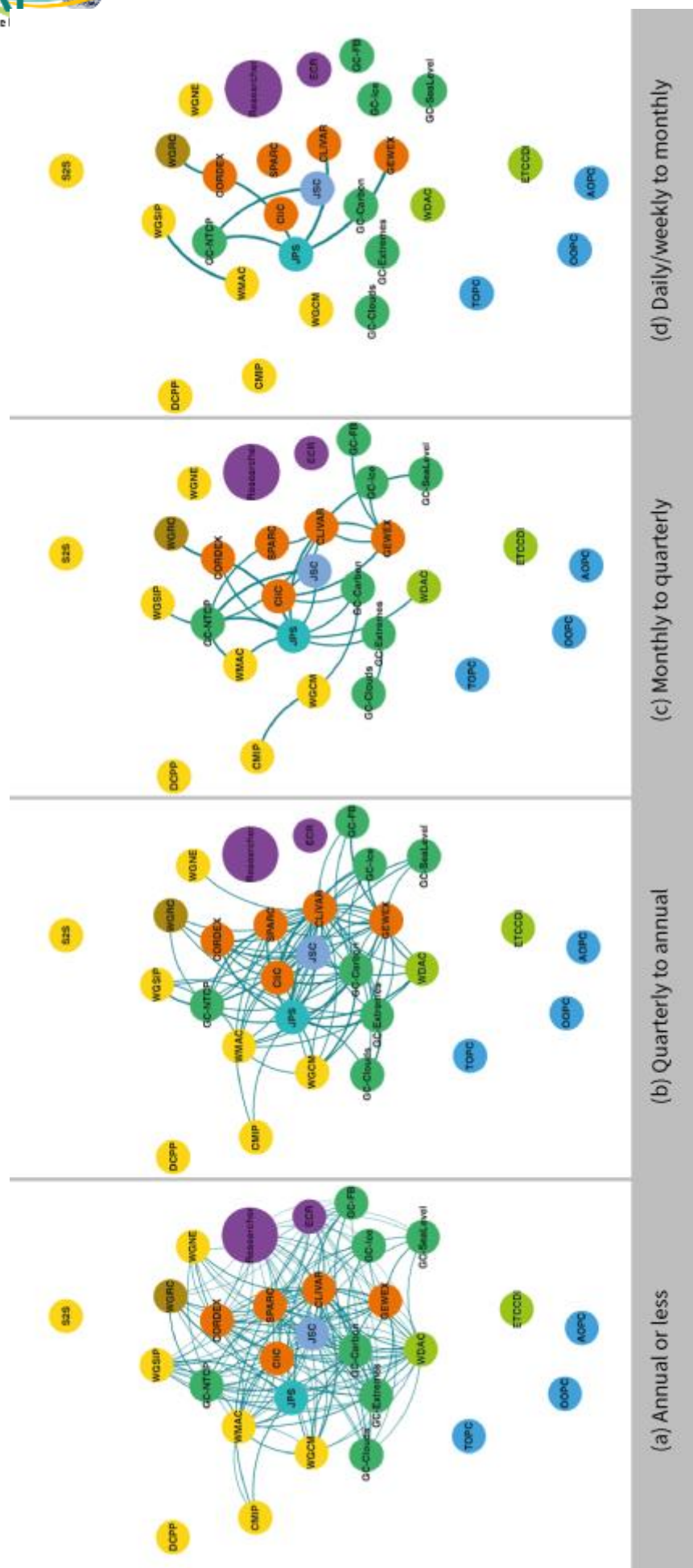


Figure 5. WCRP communication network (internal) showing (a) annual or less, (b) quarterly to annual, (c) monthly to quarterly and (d) daily/weekly to monthly. Line thickness reflects the average frequency of communication (number of survey respondents = 96). Long names are listed in Table 1.

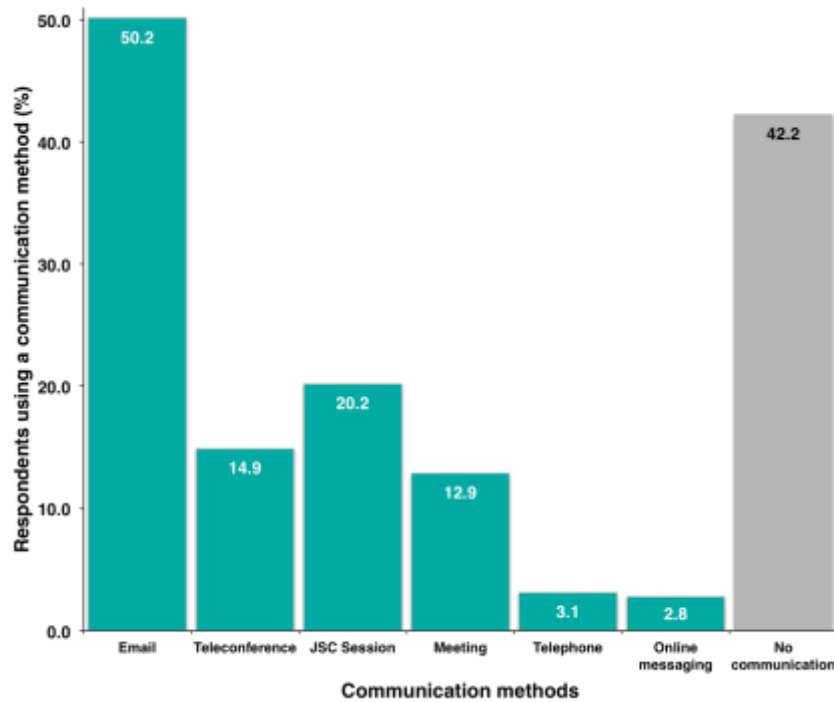


Figure 6. Communication methods of internal respondents. JSC – Joint Scientific Committee. Percentages do not add up to 100, as respondents use more than one communication method (number of respondents = 91)

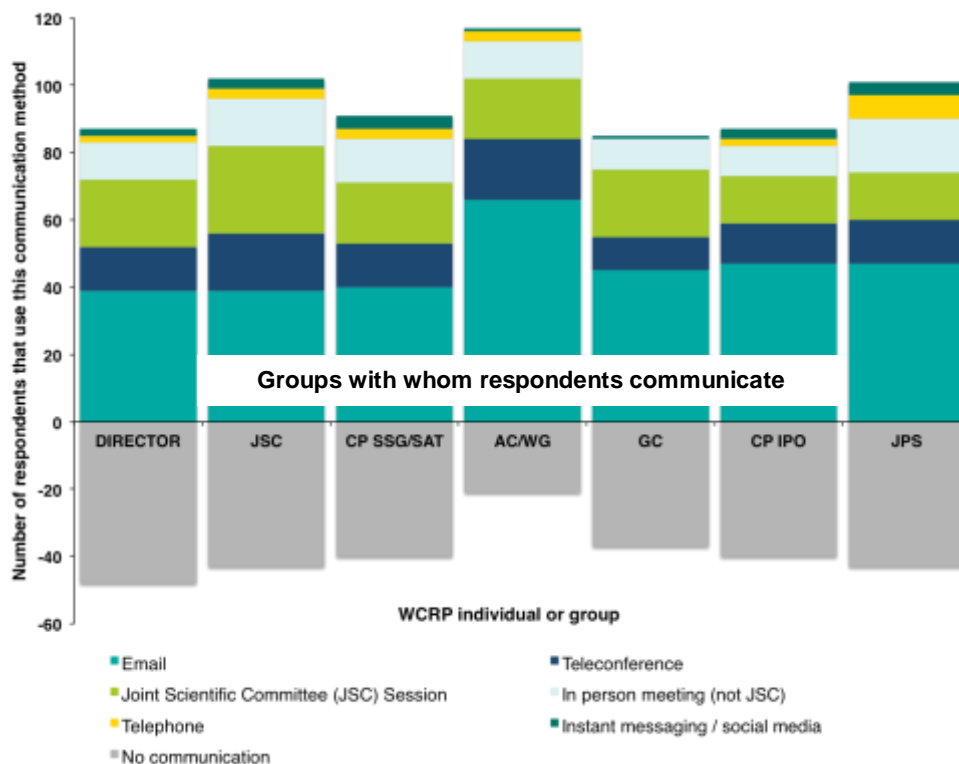


Figure 7. Communication methods of internal respondents, with individuals/groups listed on the x-axis. JSC – Joint Scientific Committee, CP SSG/SAT – Core Projects SSG and CORDEX's SAT, AC/WG – Advisory Councils and Working Groups, GC – Grand Challenges, CP IPO - Core Projects International Project Offices (including CORDEX's IPO), JPS – Joint Planning Staff (number of respondents = 91, but multiple responses allowed). Note that the negative values for 'no communication' are for display purposes only.

and working groups (21 respondents compared to a range of between 37 and 48 respondents for other groups and individuals).

Comments by respondents regarding communication methods are given in Annex 2, Question 11. Other methods of communication mentioned in the comments are interactions with other scientists, reading email attachments, bulletins and workshop/conference documents.

2.1.3. Communication effectiveness

Respondents were asked about the overall effectiveness of WCRP internal communication, rating communication with the individuals and groups identified in Figure 7 from highly effective (5 stars) to not effective (1 star). As shown in Figure 8, the majority of respondents found communication with the JPS (37.8 percent) and WCRP Director (33.3 percent) highly effective (5 stars). The majority of respondents rated communication with the JSC (39.5 percent), Advisory Councils and Working Groups (39.1 percent) and Core Project IPOs (38.3 percent) with 4 stars. Communication with the Core Project SSGs (32 percent) and the Grand Challenges (35.4 percent) was awarded 3 stars.

To further investigate the effectiveness of communication, network visualization is again used. In this instance the nodes are the respondent's affiliation, with researchers and early career researchers combined into one category. Figure 9a shows the overall effectiveness of communication as a network diagram (link color and thickness show the average effectiveness rating) and Figures 9b-f break this down to ratings between 0-1, 1-2, 2-3, 3-4 and 4-5 stars, respectively. Most notable is that the most effective communication (4-5 stars) is shown to occur between the WCRP Director and the JPS and between the JPS and the Grand Challenges (Figure 9f). The most ineffective communication (0 to 1 stars) was reported as being between the researchers and the WCRP Director, JPS, JSC, and Core Project IPOs (Figure 9b).

Comments by respondents regarding the effectiveness of WCRP Communication are given in Annex 2, Question 12. No specific themes were identified.

2.1.4. Overall rating

Overall, internal communication at WCRP was given a 3.5 star rating (average), with 33 percent of respondents giving a four star rating, 27 percent giving three stars, 23 percent giving five stars and 9 and 8 percent of respondents giving the lower one and two star ratings, respectively.

Comments on internal communication within WCRP are given in Annex 2, Question 13. The general themes are given in Table 4. Note that some responses suggest that respondents should have been in the 'external' category.

Table 4: Themes of comments on internal WCRP communication

Reports could be more widely distributed
Quarterly teleconferencing to all those at JSC Session
WCRP group membership and how members are chosen could be more transparent
Address communication issues raised at JSC meeting
Greater communication between Core Project Co-chairs needed
Greater communication between Grand Challenges and Core Projects needed
Common web based tools, calendar and other services for planning purposes needed
Greater transparency and participation in the production of documents and proposals needed
Communication and access to documents improving
Groups and projects should have defined sunset dates
Communication is not always clear
Communicate progress made in Grand Challenges better
How do I get involved?
General feeling that communication works well

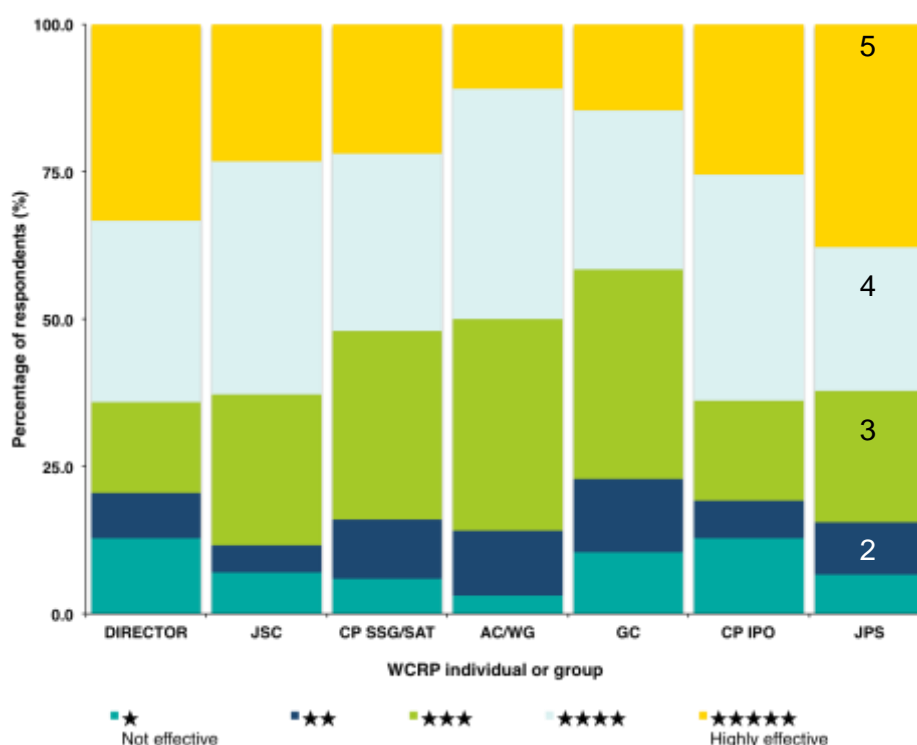


Figure 8. Rating of the effectiveness of WCRP internal communication, not taking into account responses of ‘no communication’ shown in Figure 5. Star ratings are one star for ‘not effective’ to 5 stars for ‘highly effective’. JSC – Joint Scientific Committee, CP SSG/SAT – Core Projects SSG and CORDEX’s SAT, AC/WG – Advisory Councils and Working Groups, GC – Grand Challenges, CP IPO – Core Projects International Project Offices (including CORDEX’s IPO), JPS – Joint Planning Staff (number of respondents = 87).

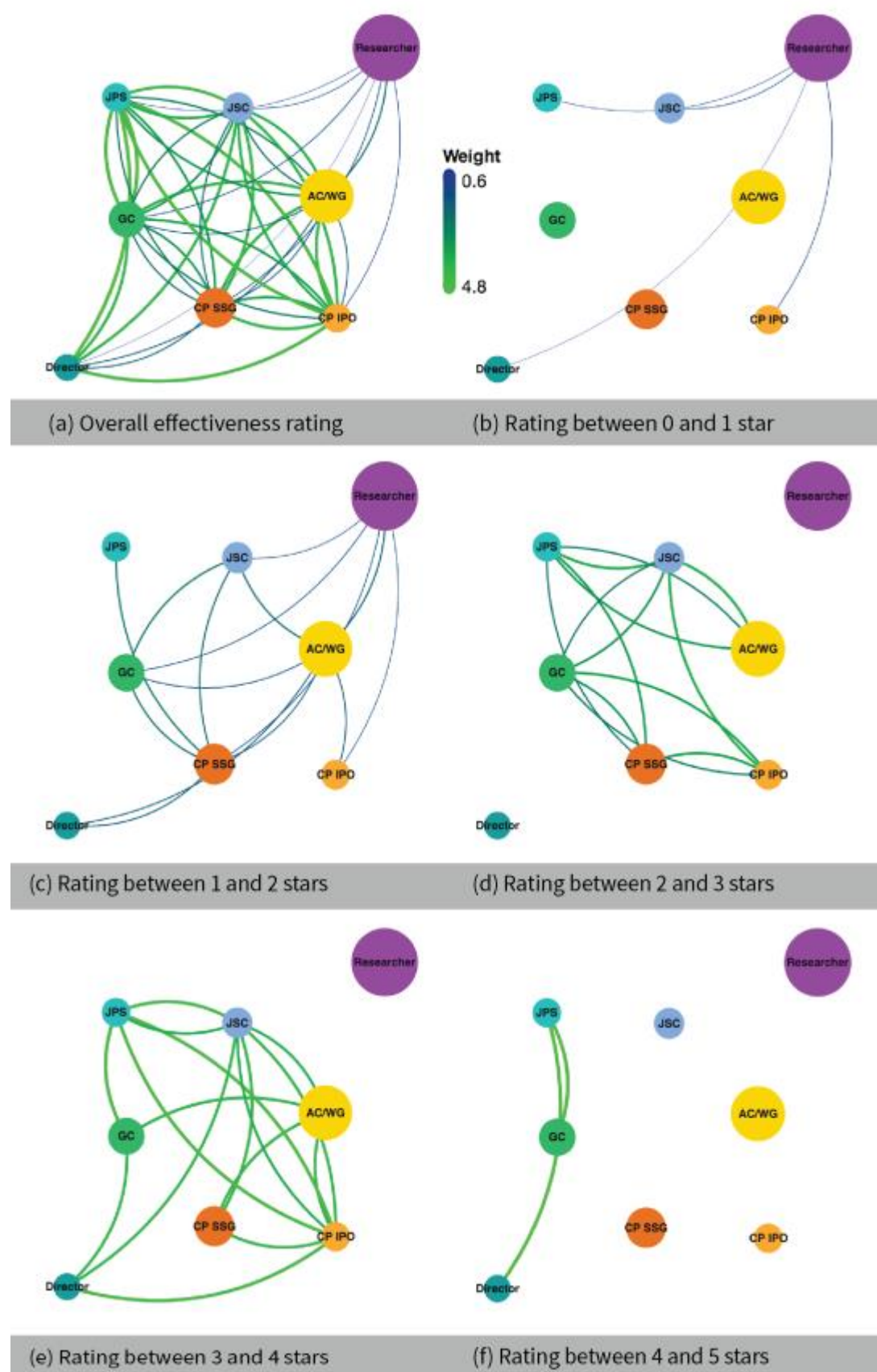


Figure 9. Effectiveness of WCRP internal communication as a force directed network diagram (number of respondents = 87). Long names are given in Table 1. Average ratings range from 0.6 to 4.8 stars. Note: In (f) there are two lines, one between the Director and JPS and the other between the JPS and GC.

2.2. External communication

Of the 100 survey respondents who identified as 'external' to WCRP, 40 were researchers (including early career researchers), with the rest making up the categories shown in Figure 10. The 'other' category included students (2), those that had previously served on the WCRP JSC (2), retirees who were previously involved in the climate community (4), a finance specialist (1), and several respondents who probably should have been in the WCRP internal category (1), in a WCRP sponsor organization (2), in an organization with an interest in climate (1) or in the external researcher (1) categories (Annex 2, Question 3).

2.2.1. Sources of WCRP information

Respondents who identified as external to WCRP were asked how they find out the latest news from WCRP and to comment on how WCRP communicates its messages. Figure 11 shows how communication methods with stakeholders external to the WCRP community were ranked. Respondents ranked the methods they use from one to five, one being that they use the method seldom and five that they use it often³. Overall the Newsletter had the top rating, with an average of 3.5 out of 5. Information and presentations at conferences and meetings and published articles were rated next, both with 2.7 out of 5. The Core Project newsletters were rated at 2.5 out of 5, followed by the WCRP website, rating 2.4 out of 5. Email correspondence with WCRP members rated 2.3 out of 5, social media 2.2 out of 5 and the Core Project websites 2.1 out of 5.

Methods of obtaining information about WCRP varied by respondent affiliation. All respondents besides early career researchers listed the WCRP Newsletter as the preferred way in which they find out WCRP's latest news, whereas early career researchers listed conferences and emails above the WCRP newsletter. The general public also preferred the WCRP newsletter and social media to find out the latest information, with the WCRP and Core Project websites rating much lower.

2.2.2. Overall comments

Comments made by external respondents are listed in Annex 2, Question 6. The overall feeling of the comments is that while people are generally happy with the current methods that they use to access information about WCRP, there is also room for improvement. Several respondents suggested that communication from WCRP could be more regular (newsletter, social media) and could do more to stand out from other climate organizations. There is also a feeling that WCRP communication could better present key research findings – products, achievements and a vision for the future. Other suggestions included building partnerships with institutes, increasing the number of events, a mailing group for scientists, working with partners and sponsors to share updates and versioning webpages with the date of publication.

³ It should be noted that not all respondents rated all of the communication methods. Gaps were treated as missing data and were not included in the analysis.



Figure 10. Categories of external respondents (number of respondents = 100)

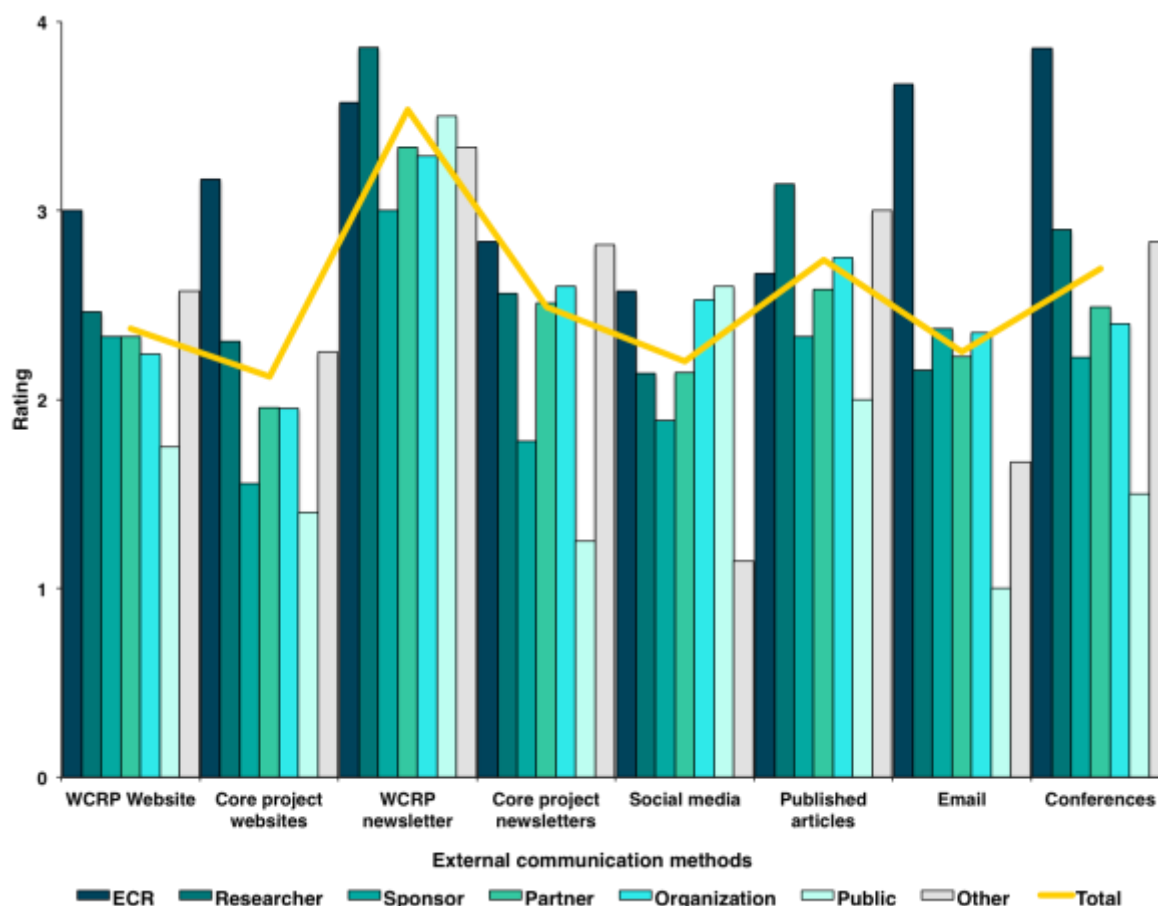


Figure 11. How external respondents find out the latest information about WCRP. Ratings are from 1 (seldom use) to 5 (often use). Yellow line shows average rating across all respondents (number of respondents = 100). Colored bars correspond to the categories in Figure 10. Sponsor – Staff member of a WCRP sponsor organization, Partner – Staff or community member of a WCRP partner organization, Organization – Staff or community member of an organization or service that has an interest in world climate, Public – Member of the public with an interest in world climate.

2.3. The WCRP website

All respondents, both internal and external, were asked how often they visit the WCRP website, reasons that they do so and whether it meets their needs. By this stage of the survey there were 87 internal respondents and 97 external - a total of 184.

The majority of respondents visit the WCRP website on a monthly to annual basis (Figure 12, Table 5). Seven internal respondents had never visited the website, compared to 16 external respondents. Only 3 respondents visited the website on a daily basis, with a further 16 visiting it weekly.

Table 5: How often respondents visit the WCRP website

	Daily	Weekly	Monthly	At least once a year	Never
Number of external respondents	1	5	33	42	16
Number of internal respondents	2	11	40	27	7
Total number of respondents	3	16	73	69	23
Percentage of total respondents (percent)	1.6	8.7	39.7	37.5	12.5

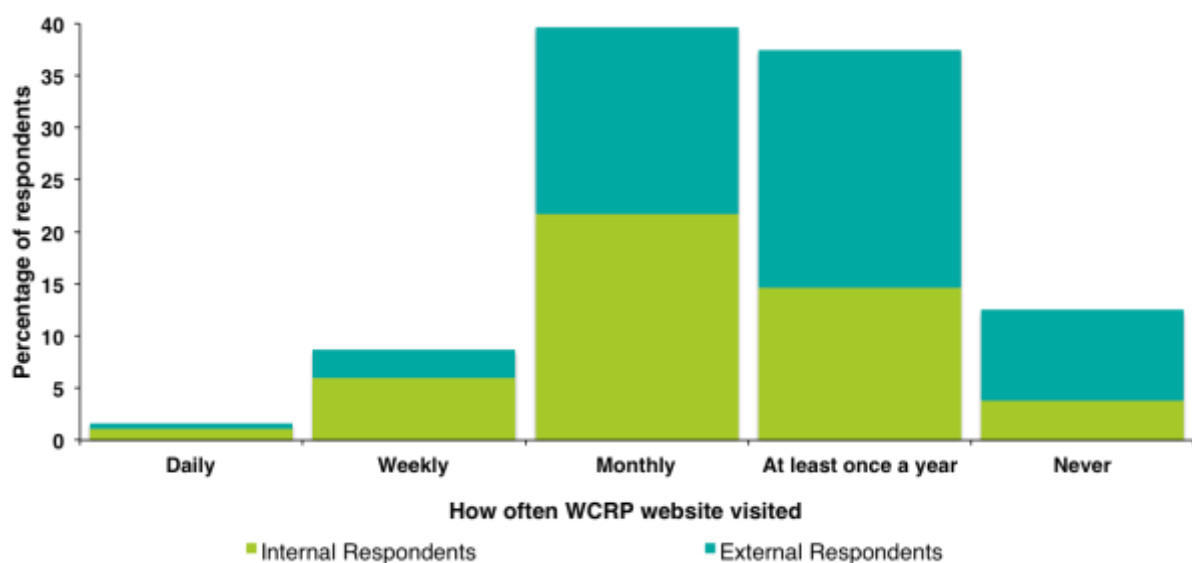


Figure 12. How often respondents visit the WCRP website (number of respondents = 184)

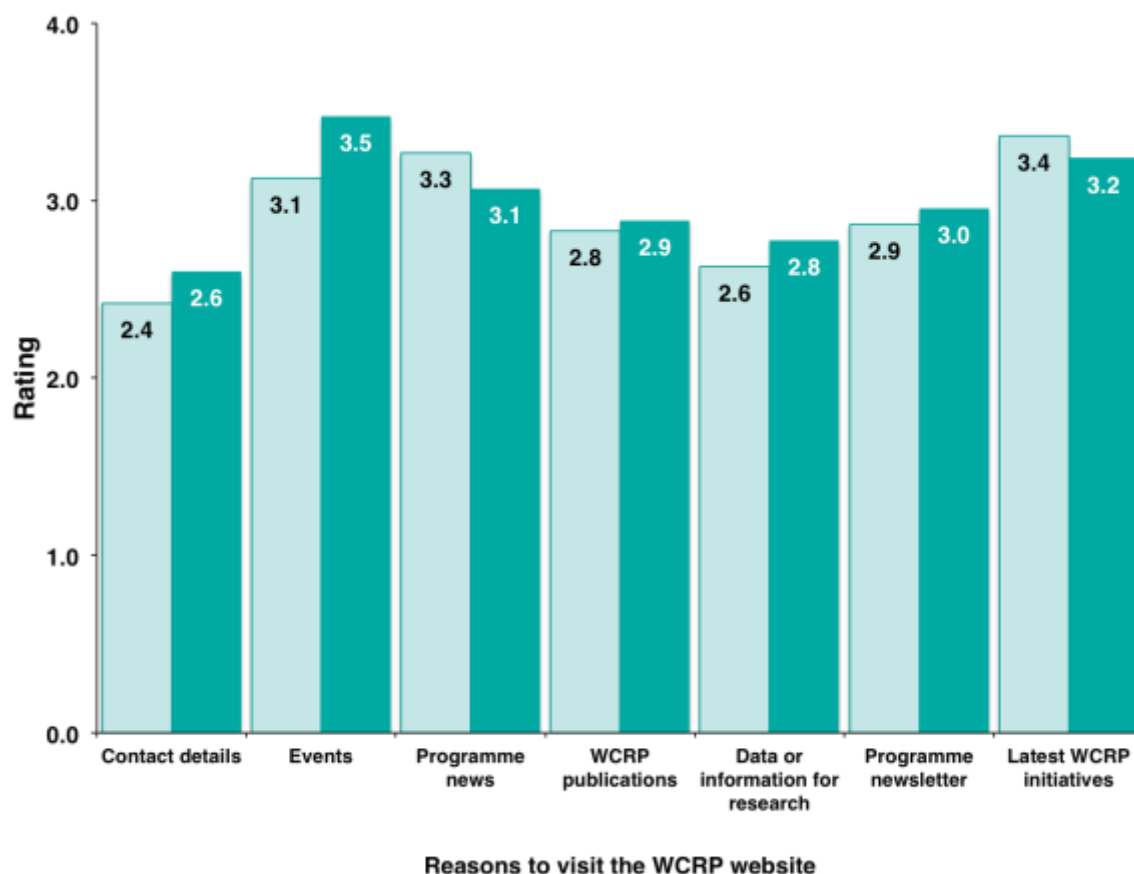


Figure 13. Reasons why respondents visit the WCRP website. Dark teal is internal respondents and light teal is external respondents (number of respondents = 158, as removed those that answered 'never' to visiting the WCRP website)

When considering why people visit the WCRP website, respondents were asked to rate a list of reasons from 1 (reasons least likely to visit the website) to 5 (reasons most likely to visit the website) (Figure 13). There was not a lot of difference in the overall rankings, with access to contact details ranking 2.5, events ranking 3.3, Programme news ranking 3.2, WCRP publications ranking 2.9, data or information for research ranking 2.7, Programme newsletter ranking 2.9 and latest WCRP initiatives ranking 3.3 out of 5, respectively. In Figure 13 we see that events, Programme news and latest WCRP initiatives had slightly higher rankings. Corresponding comments by respondents are available in Annex 2, Question 15. Comments reflect that the WCRP website is used to access specific information, either after being directed to by another information source (newsletter etc.) or because of a specific research need.

Respondents were asked whether the WCRP website meets their needs. As shown in Figure 14, 82 percent responded that it did. Those that indicated that improvements could be made were asked to comment on what could be changed. Comments are available in Annex 2, Question 17. Themes are that the website pages could be more up to date, the structure could be tidier and more logical, links between groups could be clearer and that research findings could be more accessible to the public.

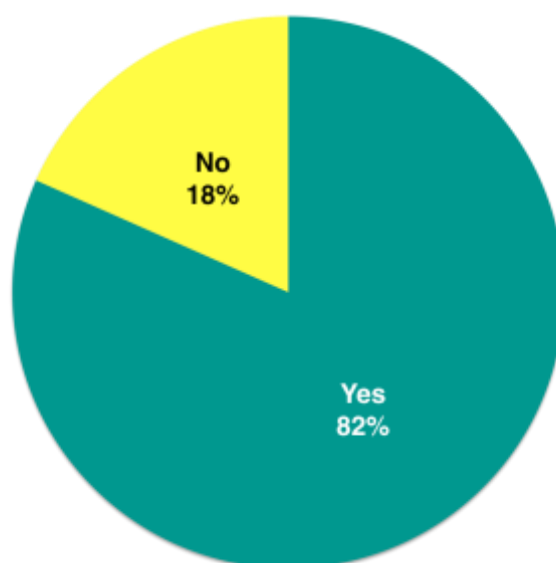


Figure 14. Percentage of respondents that answered yes or no to the question ‘does the WCRP Website meet your needs?’ (number of respondents = 158, as those that answered ‘never’ to visiting the WCRP website were not included)

2.4. The WCRP newsletter

The WCRP Newsletter was revamped in 2016. It generally goes out quarterly to a mailing list of around 2000 addresses. The mailing list is not limited to those within the WCRP community, but is open access with subscription available via the WCRP website.

Survey respondents were asked whether they had subscribed to the WCRP Newsletter. Those that had not were asked for the reason why not. Those that had were asked what they thought of it, what they like best and least about it and how it could be improved. There were 180 respondents at this stage in the survey.

Over half of all respondents were subscribed to the WCRP Newsletter (Figure 15a). Of those not subscribed, over half were unaware that there was a WCRP newsletter (Figure 15b). The remaining respondents had either not got around to subscribing or did not do so for other reasons. In the comments the main reasons given were lack of time, too much information not directly relevant to the respondents needs, preference to obtain information when needed, unintended unsubscription and a general dislike of receiving emails (Annex 2, Question 19). Of the respondents that were subscribed to the WCRP mailing list, 92 percent either really liked it or mostly liked it, but had a few ideas for improvement (Figure 15c). Six percent of respondents very honestly said that they never opened the email and only 2 percent did not like it.

A full list of comments outlining what respondents liked about the newsletter and also a number of things that could be improved is given in Annex 2 (Questions 21-24). The main themes are provided in Table 6.

Table 6: Overall themes of comments on the WCRP Newsletter

Like

Concise, well formatted
Good source of new information about WCRP
Good summary of and updates on activities
Upcoming deadlines are useful
Simple and easy to read
Good structure and length
Good to give attention to early career researchers
Contains original material

Suggested improvements

Needs more science results
Should be more regular and frequent
Community calendar could be improved
Images often feel too large
No recent literature highlights
Sections can be too short, should link to longer text
Unoriginal
Some information does not feel relevant
Not very current
Needs to include details on how to get involved
No sense of community
No coverage of decision making

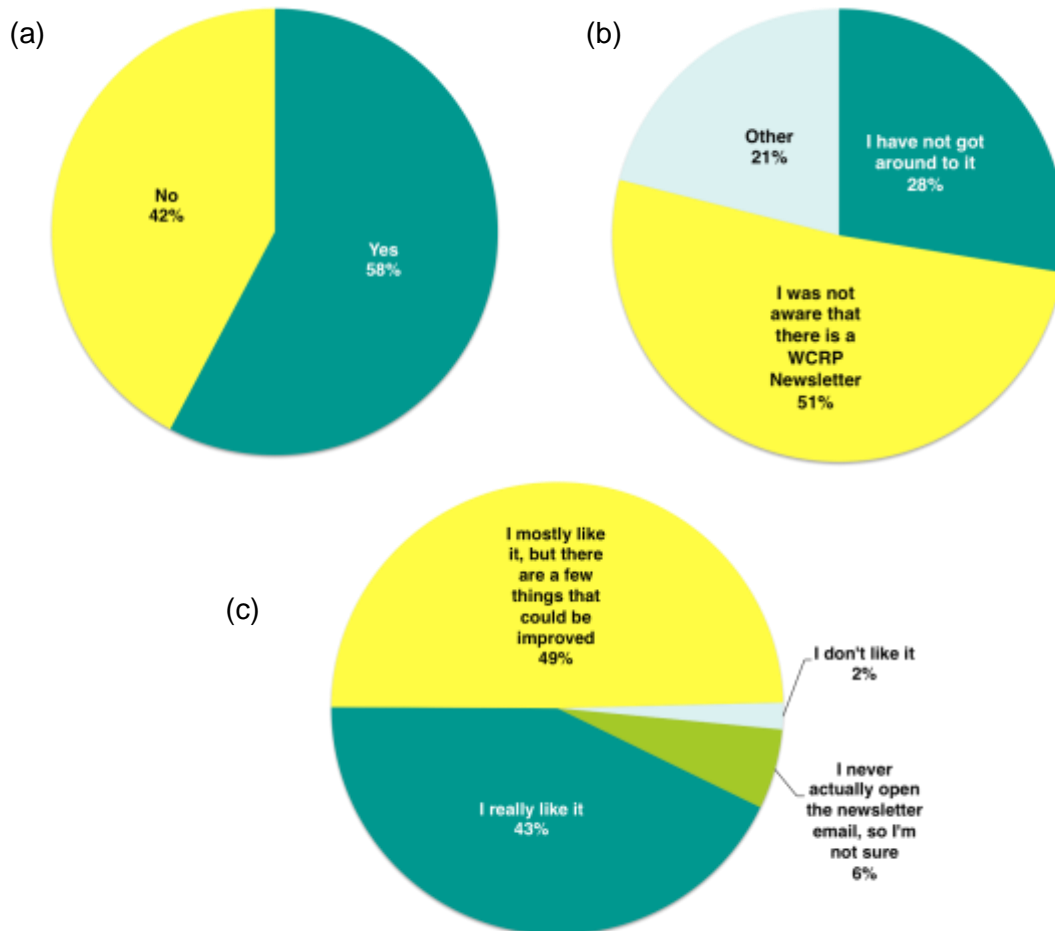


Figure 15. (a) Percentage of respondents who are subscribed to the WCRP Newsletter (number of respondents = 180). (b) Of those who answered 'no' to (a), the reasons why not (number of respondents = 76). (c) What respondents think of the WCRP Newsletter (number of respondents = 105, includes only those subscribed).

2.5. WCRP communication rating

The final questions in the WCRP survey asked respondents to comment on any other aspects of WCRP communication not otherwise discussed in the survey and to give an overall rating of WCRP communication. All comments are given in Annex 2 (Question 25), with the general themes listed in Table 7.

Overall the WCRP Communication was given an average star rating of 3.3, where 1 was rated as poor and 5 as excellent. The majority of respondents rated WCRP communication as either three or four stars (Figure 16).

Table 7: Themes of final comments on WCRP communication

Visibility of the Programme could be improved, both within the science community and to the public
Use independence and legitimacy to provide a trustworthy source on climate information to the public
Work more with external partners
Clarity needed on how to get involved in WCRP
A greater focus on science findings is needed
Information about data releases would be useful
JPS group meeting to disseminate information would be welcomed
Travel support document would be welcomed
Transparency needed for funding/placement selection
An archive of graphics that scientists can use would be useful
Communication via blog and video would be welcomed
Too many acronyms
Web meetings work well

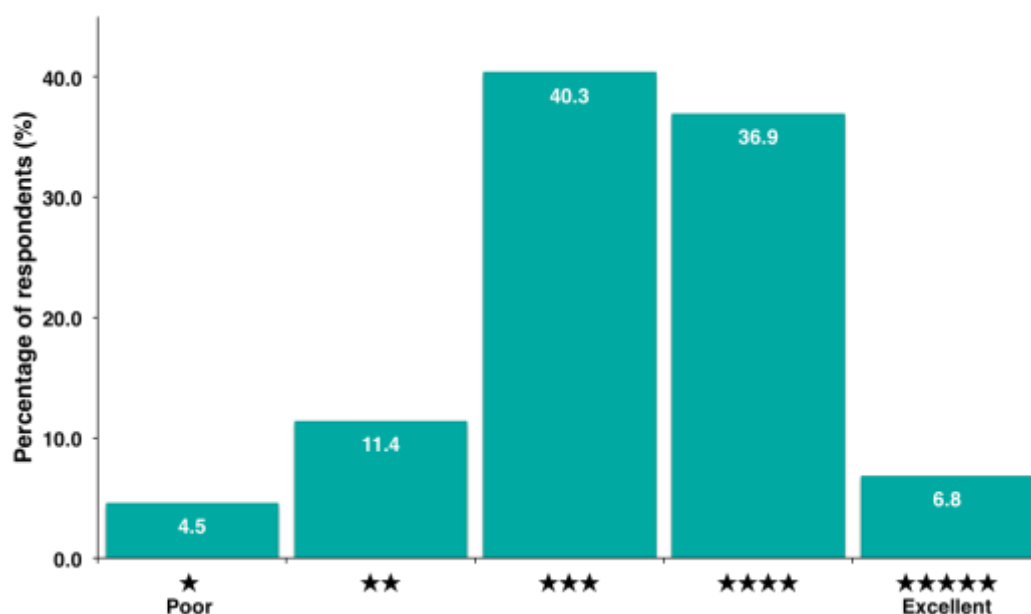


Figure 16. Percentage of respondents that awarded the 5 different star ratings to WCRP Communication (number of respondents = 176).

3. Discussion

The WCRP Communication Survey gives many insights into how WCRP communicates internally and externally, and gives good ideas for improvements. It must be kept in mind that the survey only reflects the views of the respondents, who form a small number of the WCRP community (in particular the Grand Challenges and Working Groups are not well represented (Figure 2)) and an even smaller sample of those WCRP communicates with outside of the Programme. As such, the results presented here should be seen as indicative, rather than representative, of WCRP Communication. This discussion will pick out the general patterns found in the survey results rather than examine the finer detail.

What we learn from the survey is that communication between internal WCRP groups is infrequent (Figure 3), either because more frequent interaction is not warranted or because communication is ineffective. The network diagram in Figure 4 shows that there are many natural links between groups, where individuals are members of more than one group. Such links between groups facilitates good communication. However, it does not replace communication of key developments and decisions to the wider community.

The survey results show that the Core Projects are at the center of WCRP Communication, along with the Joint Planning Staff and Joint Scientific Committee (Figure 4,5). Figure 5 also shows that all WCRP groups have annual or even less frequent contact with researchers (and early career researchers) who identify as 'internal'. Perhaps this is a reflection of sample size or possibly WCRP leaders communicate less with researchers with whom they are not directly involved.

The responses regarding internal methods of communication yielded little in the way of surprises (Figure 6). Emailing is the principle method of communication, as it is quick and efficient and can give clarity if the right language is used. The JSC Session, as the main face-to-face meeting between WCRP leaders and the WCRP Secretariat and IPO staff, is also unsurprisingly seen as an important method of communicating, with teleconferences and other face-to-face meetings also relevant. What is most interesting is that 42 percent of internal respondents had no communication with the WCRP groups and individuals discussed. In addition, more respondents communicate with the WCRP Advisory Councils and Working Groups than with other groups (Figure 7). This may be because of a larger number of individuals involved in this category (Figure 2), providing more people to communicate with. However, it may also be because they communicate more effectively or due to the overarching nature of the work that they do, which is Programme-wide.

The overall rating of effectiveness for internal communication shows that those that do communicate internally are reasonably effective (3.5 stars), but that there is room for improvement across all WCRP groups (Figure 8). This rating does not take into account the number of internal respondents who said they had no communication with key WCRP groups, which would take the average score much lower. This suggests that the connections that exist are for the most part good, but they need wider coverage within the Programme. The network analysis in Figure 9 shows that the most effective communication, as perceived by internal survey respondents, is between WCRP groups (as in Figure 9d) and the least effective between these groups and researchers (as in Figure 9c).

Responses from those who identified as being external to WCRP covered a good cross section of the wider science community and general public (Figure 10). Their responses show that the WCRP Newsletter is a valuable communication asset, as it was rated highest as a source of WCRP information (Figure 11). It also raises the question of whether the WCRP and Core Project websites need to become more public friendly. Another view is that the higher rating

given to the newsletter and social media by the public is a reflection of how we now interact with the internet – the newsletter and social media posts provide snippets of information that are brought to the attention of the individual concerned without them having to seek it out. This suggests that if we want to connect with the public that perhaps using snippets in the WCRP newsletter and social media posts that then connect to non-technical web pages on the WCRP website could be the best approach. Comments suggest that more frequent communication from WCRP would be welcome, particularly with original content. It was also apparent that WCRP could do a better job of presenting its research findings and overall vision.

The survey makes it apparent that the WCRP website is mainly used to search for specific information on a monthly to annual basis (Figure 12). Although the content management system and website templates were updated in 2016, there is still much work to be done to optimize older pages for responsiveness and for search engines and to update older content. That the website could be more up to date, well structured and clear are valid concerns. It seems that there is not a dominant reason why individuals visit the WCRP website, although events, Programme news and latest WCRP initiatives were slightly favorable motivations (Figure 13). It is encouraging, however, that despite its limitations 82 percent of respondents said that the WCRP website meets their needs.

The WCRP Newsletter was revamped in 2016 and undergoes further improvements with each issue. The survey shows that we should publicize how people can sign up to the newsletter, since 42 percent of respondents were not subscribed and over half of those were not aware of the newsletter's existence (Figure 15). It is encouraging that the majority of respondents liked the newsletter, with many respondents offering constructive potential improvements. In common with the comments from external respondents, it was suggested to include more science results. It was also suggested that the WCRP newsletter could be dispatched more frequently with more current content.

The final survey comments on WCRP communication (Table 7), together with earlier responses, show that WCRP should aim to improve the visibility of the Programme by more effectively connecting with the wider science community and the general public. The Programme must also improve how it disseminates its science findings, so that the importance of its research and products is emphasized. Programme involvement criteria and opportunities should be publicized and communication with the community as a whole should be streamlined and regularly carried out. Improvements to the website should be continued and how to subscribe to the WCRP newsletter should be publicized more widely.

Overall WCRP Communication was given a rating of 3.5 stars (out of 5 stars). While this is a good rating, it could be much improved by considering many of the points raised by this survey.

4. Recommendations

This survey was conducted in order to determine the views of the WCRP and wider communities on WCRP communication. These recommendations will feed in the WCRP Communication Strategy, which is currently in preparation. While in an ideal world we would immediately implement all of the excellent suggestions made in this survey, reality dictates that budget and time constraints will require prioritization of improvements - many that will have to be made over a longer than ideal time frame. There are many details in the survey responses that will be useful for developing WCRP communication. There are also several major themes that will be considered as the main recommendations of this report. The main recommendations from the survey are:

1. Increase Programme visibility

Raising the profile of WCRP, both with the science community and the general public, is a priority. How to do this will be explored in the WCRP Communication Strategy, but the survey suggests that in its simplest form a combination of the WCRP website, social media and the WCRP Newsletter would be welcome. Website pages should be available in non-technical language.

2. Showcase WCRP science findings

Communicating science findings in a more visible way should be high on WCRP's list of priorities. Science findings are generally reflected in published papers, which are numerous and are often published as lists in reports or on the Core Project websites. Maintaining a list of WCRP related publications was trialed and was found to be overly time consuming. The WCRP Communication Strategy will discuss possible avenues for addressing this issue.

3. Provide greater transparency of leadership selection criteria and clearer mechanisms for Programme involvement

WCRP has many excellent scientists involved in the Programme and it is important to show that they are selected for this expertise as well as to achieve a good disciplinary, national and gender balance. The 'how to get involved' section of the website is vague and outdated and information provided is not streamlined across the Core Projects. It would also help to put in place some clear processes to enable participation. This will be discussed further in the WCRP Communication Strategy.

4. Communicate more effectively with members of the WCRP community

Engagement with researchers in WCRP's community is a priority. WCRP prides itself on being a bottom-up Programme, but this relies on having good connections with a large base group, not just the leaders. The WCRP Communication Strategy will look at ways in which this can be achieved, to the benefit of the entire Programme.

5. Continue to make improvements to the WCRP website structure and content

Website improvements are underway and will be ongoing. New pages are set up in an optimal way and when pages are updated they are made responsive, with appropriate metadata tags for search engine optimization. At this stage there is no plan to change the website structure, but websites are dynamic and change in response to new content and new technologies.

6. Publicize how to subscribe to the WCRP newsletter more widely

The survey has shown that many were not aware of the WCRP newsletter or did not get around to subscribing to it. This indicates that the newsletter should be more widely publicized, along with how to subscribe to it. Possible methods include using social media or publicizing through WCRP partners.

These recommendations will be included in the WCRP Communication Strategy and will help WCRP to plan its communication priorities for 2017-2020.

Annex 1 – Overview of survey questions

1. **What position best describes yours (select only one primary role)?**
 - Member of the Joint Scientific Committee
 - Member of a core project scientific steering group or CORDEX's Science Advisory Team
 - Member of an advisory council, working group, expert team or other project
 - WCRP Grand Challenge (GC) leader or member of a GC steering group
 - Staff member or consultant working for a core project or CORDEX's international project offices
 - Staff member or consultant working for the Joint Planning Staff
 - Researcher
 - Early career researcher
 - Staff member of a WCRP sponsor organization
 - Staff or community member of a WCRP partner organization
 - Staff or community member of an organization or service that has an interest in world climate
 - Member of the public with an interest in world climate
 - Other (please specify)
2. **Is your research connected to a WCRP group, project or activity? Yes/No**
3. **If yes (to Q2), which WCRP groups, projects or activities is your research connected to (list all). Comment**
4. **You selected 'Other' in the previous question (Q1). Does your role involve internal communication within WCRP? Yes/No**
5. **How do you find out the latest news from WCRP?**
 - The WCRP website
 - Core project websites
 - WCRP newsletter
 - Core project newsletters
 - Social media
 - Published articles
 - Email
 - Correspondence with WCRP members
 - Information and presentations at conferences and meetings
 - Other (please specify)

Rate all from 1 seldom to 5 often or select not applicable (N/A)
6. **This page gives you the opportunity to comment on how WCRP communicates its messages to you. What do we do well? Where can we improve?**
Your comments will be taken into consideration when planning communication priorities for the future. Comment.
7. **Which project(s) are you associated with?**
 - Climate and Cryosphere (CliC)
 - Climate and Ocean Variability, Predictability and Change (CLIVAR)
 - Global Energy and Water Exchanges (GEWEX)
 - Stratosphere-troposphere Processes And their Role in Climate (SPARC)

- Coordinated Regional Climate Downscaling Experiment (CORDEX)

8. Which group(s) are you a member of?

- WCRP Modelling Advisory Council (WMAC)
- WCRP Data Advisory Council (WDAC)
- Working Group on Coupled Modelling (WGCM)
- Working Group on Numerical Experimentation (WGNE)
- Working Group on Subseasonal to Interdecadal Prediction (WGSIP)
- Working Group on Regional Climate (WGRC)
- Coupled Model Intercomparison Project (CMIP)
- Subseasonal to Seasonal Prediction project (S2S)
- Decadal Climate Prediction Project (DCPP)
- Expert Team on Climate Change Detection and Indices (ETCCDI)

9. Which WCRP Grand Challenge(s) are you working on?

- Melting Ice and Global Consequences
- Clouds, Circulation and Climate Sensitivity
- Carbon Feedbacks in the Climate System
- Understanding and Predicting Weather and Climate Extremes
- Water for the Food Baskets of the World
- Regional Sea-Level Change and Coastal Impacts
- Near-term Climate Prediction

10. This rather long question is very important, as it will help us to build a WCRP communication network map.

It does not reflect effective or ineffective communication, but rather identifies information pathways within the Programme.

In relation to your own group(s), select how often you interact with other members of the group.

How often do you interact with the following groups?

- Joint Scientific Committee
- Joint Planning Staff and WCRP Director
- Cryosphere and Climate (CliC)
- Climate and Ocean Variability, Predictability and Change (CLIVAR)
- Global Energy and Water Exchanges (GEWEX)
- Stratosphere troposphere Processes And their Role in Climate (SPARC)
- Coordinated Regional Climate Downscaling Experiment (CORDEX)
- WCRP Modelling Advisory Council (WMAC)
- WCRP Data Advisory Council (WDAC)
- The Working Group on Coupled Modelling (WGCM)
- The Working Group on Subseasonal to Interdecadal Prediction (WGSIP)
- The Working Group on Numerical Experimentation (WGNE)
- The Working Group on Regional Climate (WGRC)
- Grand Challenge on Melting Ice and Global Consequences
- Grand Challenge on Clouds, Circulation and Climate Sensitivity
- Grand Challenge on Carbon Feedbacks in the Climate System
- Grand Challenge on Understanding and Predicting Weather and Climate Extremes
- Grand Challenge on Water for the Food Baskets of the World
- Grand Challenge on Regional Sea-Level Change and Coastal Impacts
- Grand Challenge on Near-term Climate Prediction

Rate al from 0 no interaction, 1 annual interaction, 2 quarterly interaction, 3 monthly interaction and 4 daily to weekly interaction.

11. Which communication methods do you use with whom?

Please select all methods that apply. We realize that you will have to generalize. Feel free to add comments in the box below.

- WCRP Director
- Joint Scientific Committee Chair or members
- Members of the core project scientific steering groups or CORDEX's Science Advisory Team
- Members of advisory councils, working groups, expert teams or other projects
- Grand challenge leaders/steering groups
- Staff members or consultants working for the core projects or CORDEX's international project office
- Staff members or consultants working for the Joint Planning Staff
- Comments
- Tick the box in a matrix to select the following methods for each:
- Email
- Teleconference
- Joint Scientific Committee (JSC) Session
- In person meeting (not JSC)
- Telephone
- Instant messaging / social media
- No communication

12. How effective is internal communication between yourself and these individuals or groups?

We realize that you will have to generalize. Feel free to add comments in the box below.

1 = not effective and 5 = highly effective

- WCRP Director
- Joint Scientific Committee Chair or members
- Members of the core project scientific steering groups or CORDEX's Science Advisory Team
- Members of advisory councils, working groups, expert teams or other projects
- Grand challenge leaders/steering groups
- Staff members or consultants working for the core projects or CORDEX's international project office
- Staff members or consultants working for the Joint Planning Staff
- Comments

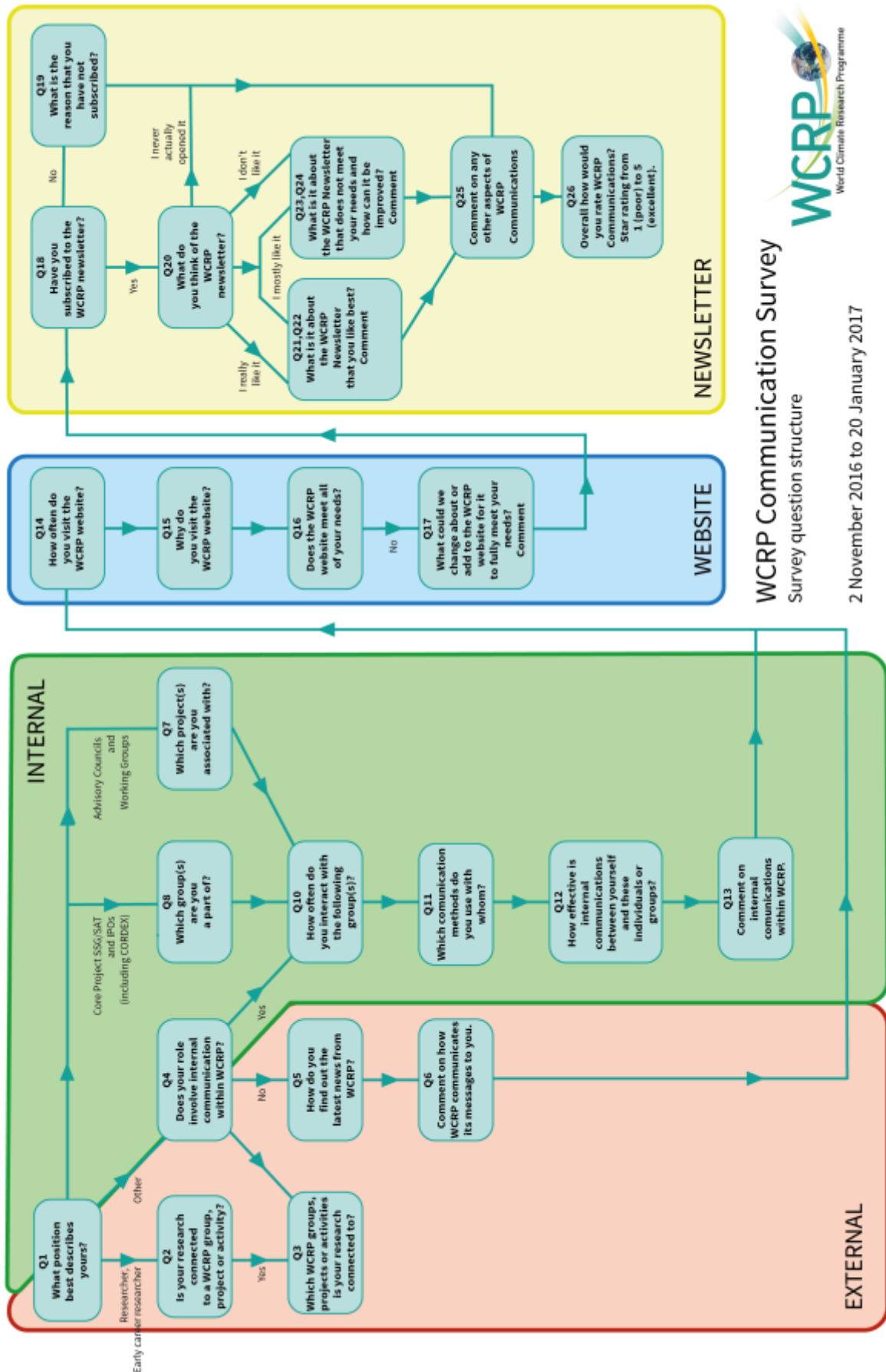
13. This page gives you the opportunity to comment on internal communication within WCRP. Your comments will be taken into consideration when planning communication priorities for the future. Comment.

14. How often do you visit the WCRP website?

- Daily
- Weekly
- Monthly
- At least once a year
- Never

15. Why do you visit the WCRP website?

- To access the contact details of individuals or of WCRP
 - To find out details about events (including to view the WCRP Community Calendar)
 - To read the latest Programme news
 - To access WCRP Publications
 - To access data or information for research
 - To read the Programme newsletter
 - To read about the latest WCRP initiatives
 - Other (please specify)
- Rate from 1 seldom visit to 5 often visit or select 'never visit'
- 16. Does the WCRP website meet all of your needs? Yes/No**
- 17. What could we change about or add to the WCRP website for it to fully meet your needs? Comment.**
- 18. Have you subscribed to receive the WCRP Newsletter? Yes/No**
- 19. What is the reason that you have not subscribed?**
- I'm not interested
 - I have not got around to it
 - I was not aware that there is a WCRP Newsletter
 - Other (please specify)
- 20. What do you think of the WCRP Newsletter?**
- I never actually open the newsletter email, so I'm not sure
 - I don't like it
 - I mostly like it, but there are a few things that could be improved
 - I really like it
 -
- 21. What is it about the WCRP Newsletter that you like best? Comment.**
- 22. What is it about the WCRP Newsletter that you like best? Comment.**
- 23. What is it about the WCRP Newsletter that does not meet your needs and how can it be improved? Comment.**
- 24. What is it about the WCRP Newsletter that does not meet your needs and how can it be improved? Comment.**
- 25. This is your opportunity to comment on any other aspects of WCRP Communication that have not been mentioned in this survey. These comments will be considered when planning the future of WCRP communication.**
- 26. Overall how would you rate WCRP Communication? Star rating from 1 (poor) to 5 (excellent).**



WCRP Communication Survey Survey question structure

2 November 2016 to 20 January 2017

Annex 2 – Survey comments

Comments:

3. If yes (to Q2), which WCRP groups, projects or activities is your research connected to (list all).

Other

- M.Sc Student
- working for CMIP6
- METEOROLOGIST-OMM
- CEO Ocean Frontier Institute (Canada)
- student
- Researcher, past member of the Joint Scientific Committee
- retired staff member and scientist
- Former president of WMO Commission for Climatology
- Finance Professional. HSBC Global Banking and Markets
- Ex JSC member
- Retired but was JSC member etc
- Retired Meteorologist
- staff of data centre under auspices of WMO
- Physical Science researcher, and interest in world climate
- NASA emeritus retiree who still teaches about climate

6. This page gives you the opportunity to comment on how WCRP communicates its messages to you.

Early career researcher	Communication from WCRP in general is not bad but there should be an improvement in using social media and the emailing list.
Member of the public with an interest in world climate	As a retired Australian Meteorologist I am satisfied that I am alerted to issues/outcomes through email of WCRP advice which allows me to research topics further through provided links/references etc.
Member of the public with an interest in world climate	As I'm new to WCRP, I find this difficult to answer. I'm very interested in engaging in political action and would like to hear about WCRP's efforts in that regard.
Member of the public with an interest in world climate	I am very new to your site. I am impressed by what I read and any videos I am lucky enough to receive.
Member of the public with an interest in world climate	Not yet read very often
Member of the public with an interest in world climate	The newsletter is quite helpful.

Other	Communication would be improved if attention were focussed more on the relevance of activities to better understanding the climate system rather than contrived attempts to justify as to its relevance to anthropogenic climate change.
Other	Does well
Other	I am happy with the way WCRP communicates. It is useful, precise, and efficient
Other	I only follow PAGES. Its newsletter can be long and complex to get through, esp. the long section on meetings which, unfortunately, gives the impression that climate scientists go to too many meetings, often in resorts like Interlaken.
Other	I think WCRP must at least one month by year, held some event to make the publicity, and send to each Meteorological Direction a review to give their activities done.
Other	I've just registered for newsletter.
Other	It seems that WCRP behaves spasmodically in its communication
Other	More on social media
Other	Partnership with Institution Bodies and organisation of workshops in Institutions.
Other	the web pages should be versioned with date or the like in that that one can quickly see whether a re-read is worthwhile
Other	This is the first communication I have had from WCRP in years
Other	WCRP does not succeed in educating a reluctant, non-scientific public, about the rock-solid reality of climate change - and its projected physical and financial impacts on Society . Sadly, WCRP needs to engage public relations institutions who will be both meticulous and widely heard, understood, and respected.
Researcher	CLIVAR Newsletter is good
Researcher	Edited outlet are best to minimise 'scientific noise'
Researcher	Existing methods are OK
Researcher	I am first time communicate with this website and organisation
Researcher	I find WCRP communications do not stand out in the very crowded field of global change research.
Researcher	I just quickly scan the WCRP Newsletter when it arrives.
Researcher	I more periodically presentation of WCRP activities
Researcher	I suggest you have a mailing group that scientists can subscribe
Researcher	Newsletter is useful I don't use social media
Researcher	Not often enough
Researcher	The more directed, relevant the better. For a more general audience a line of communication with a personal voice is missing.
Researcher	This is the first and only communication I recall having.
Researcher	Your newsletter on email suits me fine.
Staff member of a WCRP sponsor organization	Newsletters

Staff member of a WCRP sponsor organization	Quite pleased at the moment. Keep up the good work!
Staff member of a WCRP sponsor organization	WCRP's social media work has much improved in the past months, that's great. Equally, the website is becoming more accessible, too. I'd love to see WCRP do user-centric, tailored communications projects around key research findings that go beyond the day-to-day sharing of news.
Staff or community member of a WCRP partner organization	I don't recall seeing much on WCRP products/achievements as of late - or upcoming initiatives, plans, etc.
Staff or community member of a WCRP partner organization	Twitter and Facebook accounts are helpful
Staff or community member of a WCRP partner organization	WCRP has no clear vision, it has lost its societal and political relevance. No coherent vision leads to a communication confusion. WCRP needs to rethink its directions
Staff or community member of an organization or service that has an interest in world climate	Enlisting your partners/funders in sharing WCRP updates increases the reach of your communications.
Staff or community member of an organization or service that has an interest in world climate	I like having the explanations not only of what is happening where, but also why--and with some historic context.
Staff or community member of an organization or service that has an interest in world climate	I often only hear about WCRP activities because somebody else call it to my attention. I think something like what AMS (weekly "news that you can use" or AGU's EOS get my attention more often
Staff or community member of an organization or service that has an interest in world climate	No special observations
Staff or community member of an organization or service that has an interest in world climate	social media as teaser is fine

Staff or community member of an organization or service that has an interest in world climate	Stop HAARP
Staff or community member of an organization or service that has an interest in world climate	The WCRP communicates its messages using its web site or newsletter and other core projects. It is useful to consider in future climate mailing list for example.
Staff or community member of an organization or service that has an interest in world climate	Very active on social media without being overbearing. Active across platforms. Share interesting news and updates from other organisations
Staff or community member of an organization or service that has an interest in world climate	You've made great achievements in climate and climate change researches. In the future, the inter-discipline scientific conferences or assemblies were expected.

11. Which communication methods do you use with whom?

JSC	Also through my interactions with scientists in Australia involved in the Working Groups and Grand Challenges
Researcher	Have not had the need to talk to them.
Researcher	I am participating in the following new projects: 1. 2017. Collaborative and research work with Prof. Peter Kuhry, University of Stockholm, Sweden. Topics: a) to assess soil organic carbon storage in current mountain permafrost environments and b) to assess soil organic carbon storage in the Patagonian Andes at the times of the LGM. 2. 2016. Collaborative and research work between the Research Unit of Geocryology, CONICET, Mendoza, directed by Dr. Dario Trombotto Liaudat, and Prof. Ronald Sletten from the "University of Washington" and the "Quaternary Research Center" of Seattle, USA. Topic: Cryogenic Phenomena in South America, an analogical approach with the cryogenic Martian environment. 3. 2016-2018. PIP CONICET. 1122015 0100913. Distribution and characteristics of the periglacial environment and periglacial ice as well as the study of its cryoforms and associated processes in a specific region of the Central Andes of San Juan. Con participación de la Dra. Ana-Lía Ahumada (Fundación Miguel Lillo, S.M. de Tucumán). Researcher in charge: D. Trombotto. 4. Deutsche Forschung Gemeinschaft 2015. Rock glacier permafrost in the Central Andes of Argentina (PermArg): regional distribution ice content hydrological significance. En conjunto con la Universidad de Bonn (Germany, Prof. Lothar Schrott). Researcher in charge in AR: D. Trombotto
Researcher	I don't communicate directly with any but read the email attachments to keep roughly up to date.

CP-IPO	I have only attended one JSC Session but I have taken it into account when answering this question.
Researcher	I read the monthly bulletin and in case of interest I read workshop/conference documents and related papers
Researcher	I receive some news by email; that's about it.
CP SSG	If it was not for the OSE conference I would not have seen anybody in person outside the CP this past year outside the JSC meeting
Other (CP activity lead)	Most of the interaction is f2f only because these groups have a presence at international meetings.

12. How effective is internal communication between yourself and these individuals or groups?

JSC	Email that are longer than one page and have not action items are ineffective.
CP-IPO	I am really happy with my communications with the WCRP JPS. My work tasks don't require me to communicate very frequently with the other groups since this happens at a higher level so it is a bit difficult for me to answer this question.
AC-WG	I only got involved in WCRP recently. My answers are not very representative yet.
Researcher	idem as before
CP-SSG	It's a little difficult being in Australia, with the time differences making the timings of video conferences less than ideal. PLEASE NOTE that there is no substitute for face-to-face meetings and workshops. It is very difficult to participate remotely and in an effective manner in a meeting.
Other	Project Office staff are generally effective with communication. Steering group communication, beside that from co-chairs, is wholly absent from my experience.
Researcher	Tried working with CORDEX group - it seems like they have their team and not interested in new additions.

13 This page gives you the opportunity to comment on internal communication within WCRP. Your comments will be taken into consideration when planning communication priorities for the future.

Researcher	There used to be better dissemination of meeting reports from the various committees but that is no longer the case. Since these reports are electronic, they could be more widely distributed.
Member of an advisory council, working group, expert team or other project	The WCRP should consider quarterly teleconferencing of group who participates in the annual JSC Meetings - this would provide improved follow through as well as accountability.
Researcher	The format for various contacts changes (or at least have changed) to frequently; it is hard to keep up. The population of the various groups has also been a bit of a mystery; I have the impression that a few individuals sit on many different groups, which doesn't foster good communication.

Researcher	Suggestion: WCRP should arrange more link to scientists, such as workshops, e-mails.
Early career researcher	regular communication about the meetings and workshops are very essential.
Researcher	rather effective!
Member of a core project scientific steering group or CORDEX's Science Advisory Team	Nothing has been done to address the communication issues raised by the core projects' chairs at the last JSC meeting. Hard to imagine communication is a priority
Member of an advisory council, working group, expert team or other project	No problems to report.
Researcher	no comments
Early career researcher	NA
Staff member or consultant working for a core project or CORDEX's international project offices	More communications between the project co-chairs would be good, as would more communication between the GCs and the projects (what form that would take, I'm not sure, but it should be encouraged more).
Staff member or consultant working for a core project or CORDEX's international project offices	Might be nice to have some common web based tools, calendars, other services, available for planning purposes.
Researcher	Long time has passed since I retired from JSC. And I am semi – retired. Therefore I am satisfied at the current level communication.
Member of the Joint Scientific Committee	It has improved, but definitely more interaction is needed in the elaboration of documents and proposals. I sense there is not enough opening to suggestions and new ideas. A lot of regional aspects are proposed, discussed and agreed without enough participation from representatives from the regions.
Staff member or consultant working for a core project or CORDEX's international project offices	I'm appreciative of the greater transparency for things like sending out project Scientific Steering Group/Committee confirmation letters and letting the project office know that this is being done. Things like this give me information that I didn't have access to before, like the new members' term dates.
WCRP Grand Challenge (GC) leader or member of a GC steering group	I think there are a lot of groups and projects and now also grand challenges so it would be nice to occasionally shut some things down and stop doing them to prevent too much proliferation
Member of a core project scientific steering group or CORDEX's Science Advisory Team	I think the communication works excellent within CliC!

WCRP Grand Challenge (GC) leader or member of a GC steering group	I find working with the WCRP very opaque and communication in the expert team and with WCRP was not super efficient. I feel we spend a lot of time on these challenges and its not always clear how helpful they are
Member of an advisory council, working group, expert team or other project	I find it a bit hard to separate effectiveness and frequency of communication. There is something to be said for communication on a "need to know" basis rather than receiving frequent communications from core projects etc. that one is not closely engaged with. The WCRP and associated web sites if kept up to date provide a means for accessing information on such activities when the need arises.
Member of a core project scientific steering group or CORDEX's Science Advisory Team	I am active in a the CORDEX component of the WCRP where I serve on the SAT. Interaction with other groups is largely through the co-chairs in this context.
Early career researcher	I am a research scholar, I am so much eager to work with the WCRP. But i don't know how could I can involve?
Member of the Joint Scientific Committee	Communications are generally good. However, given the complex nature of WMO structures, it is sometimes hard to keep track of everything or to be sure that all relevant parties are "in the loop".
Researcher	Communication has become poor
Researcher	Can't comment as I am not inside the WCRP
Researcher	As my field of interest and expertise is Andean permafrost, I suggest more interaction with the International Permafrost Association
Member of a core project scientific steering group or CORDEX's Science Advisory Team	PLEASE NOTE that there is no substitute for face-to-face meetings and workshops. It is very difficult to participate remotely and in an effective manner in a meeting or workshop. This is particularly true for me being based in a very different time zone. In spite of advances in teleconferencing technology, it remains difficult to hear what is being said around the table, let alone add to the conversation. Please do not do away with annual workshops of WCRP working groups.

15. Why do you visit the WCRP website?

Researcher	While I realize there is a lot of information on the web page, much of it new or updated, I seldom get around to have a look unless pushed by email summary, newsletter or similar. I'd like to but it doesn't happen. For that reason, email summaries or newsletter, however primitive, vital for the more general communication. If I need specific information, I'll find it...
AC-WG	To access meeting & project information for own working group and check on need for any updating of project info, etc.
Researcher	thats for teaching, I cover what WCRP does in my lecture 'global change monitoring'
JPS	As webmaster, after updating pages, I check the result on the front-end of the website
OTHER	I have an idea how to solve climate change. I am looking for scientists to share my insights.
Sponsors	When I prepare talks about CLIVAR, WCRP, etc and its relationship to our research organisations.

Org	To find out details about the structures: WGs, relation of WCRP to IPCC/WMO...
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17. What could we change about or add to the WCRP website for it to fully meet your needs?

AC-WG	A more regular update An interactive diagram that shows the WCRP structure and the links between the different core projects and working groups
CP-IPO	Better hierarchy and structure in information provided. Explanation: my last visit was also my first "serious" visit, dedicated to finding arguments justifying a research proposal. I was eventually able to find this, but I had a general impression that the web site was rather messy, with some topics ("Grand Challenges"?) much richer in content and more up-to-date than other ones
CP-SSG	Probably a more obvious, coherent linkage to the core project + GC websites. More information about the working groups
ECR	update of current climate news and conferences updates
JSC	Navigation lacks clarity and efficiency.
Org	Apply Drought projects in Rejoin II
Org	For example, the coupling of the integrated models to account for the various communities of climate system
Org	Make the findings more accessible to a public audience through the use of infographics
Org	Not all abbreviations of groups, councils, etc are known. Explain them not only by full name but also by "where do they come from and what are their siblings/offsprings to make the organisation of this part of science more clear. Perhaps just link to a glossary page which should go further than just writing the name in full.
Org	Probably if the WCRP was less of a closed shop it would be more useful.
Other	It is a bit prehistoric in its design and ease of use!
Other	mark new content
Partners	its much improved from the content on the previous version - but some of the info on projects seems to be out of date.
Partners	the WCRP webpage has not changed much in the last 5 years. It is old and obsolete. Cosmetic changes are not sufficient, it needs a total revamp
Public	Political action.
Researcher	Hard to find information. Typically there is only 1 path to the info. It is often hard to find that 1 path.
Researcher	Hardly anything fully meet my needs; for you to adjust it to meet my specific needs would be unreasonable
Researcher	I am not sure how one joins this 'club'
Researcher	with more information about South America and Southern Hemisphere
Researcher	I just use the CLIVAR website after email notifications - at least once a month
Researcher	It could never "fully" meet my needs

19. What is the reason that you have not subscribed?

ECR	got it forwarded
JPS	I am a JPS staff member
Researcher	I did but must have been disconnected...
Researcher	I do not like to receive emails
JSC	I don't have time to read a newsletter that is more general than my primary interests.
Researcher	I get so much relevant information by other means such as seminars
Researcher	I have had other access to it
Researcher	I have no time to read all the newsletters that are send around by every organization. So I prefer tom read none of them
Researcher	I have periodically received WCRP Newsletter, though I did not actively subscribe. Lately, however, I have not received one.
Other	I prefer to actively go and read newletters instead of receiving mails when I do not have the time to read it. The volumes on the 'Newletters' page could come with a short 'content'; this would help.
Researcher	I was suscribed and after a while I stopped receiving it... I don't know why
Other	Just lack of time for extra reading
Researcher	My needs are catered for by CLIVAR comms
Researcher	No time to read so many newsletter
Other	Too much information not directly related to my teaching activities.

21-24 What is it about the WCRP Newsletter 21 that you like best?

What is it about the WCRP Newsletter that does not meet your needs and how can it be improved?

Respondent	Like best	Improve by
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Respondent	Like best	Improve by
AC-WG	Quick at-a-glance source for new information from WCRP	Mostly reads as a collection of announcements, which isn't inherently bad, although some occasional more in-depth perspectives about what is going on in WCRP and its components could make the newsletter a bit more substantial overall. The flip side of course is that the time and effort it takes to write original content might not be the best use of limited resources. I noticed recently the June 2016 item "David Carlson shares his thoughts on climate models and temperature targets" leads to a broken link.
AC-WG	The short vision texts	
CP-IPO	I found it concise and well formatted	If I remember well, there was no section about "recent literature highlights". Since this would have to be very short, there is an editorial risk in selecting such papers and there could be lots of "politics" involved. But it would still be quite useful for topics which are outside our main area of expertise - i.e. this would promote awareness of key advances across disciplinary "boundaries".
CP-IPO	I like the new email format of the newsletter and the upcoming deadlines, always useful :)	
CP-IPO	It gives a very nice idea of what the programme is currently up to.	The sections are very short, and sometimes I'd prefer to read a longer text with more information (or at least have links to more information elsewhere).
CP-IPO	Simple layout and easy to read.	Would like to see more results of science and more joint outcomes from multiple core projects.

Respondent	Like best	Improve by
CP-IPO	There's more original material, like the short-and-sweet piece by David Carlson in the latest issue. The attention given to ECS is a healthy focus. From a structural and formatting perspective, the blurbs describing the articles have just the right amount of information. The layout is solid but the images often feel too large. Starting the newsletter with a little less text at the top, or having the preview text all on one line and then skipping straight to the header, would be a little more visually appealing. It can be quite difficult to make a newsletter look the way you want it to, though, so I understand if there are limitations to the format.	
CP-SSG	Programme informations	A bit more science would be appealing. But then, what science to choose?
CP-SSG	summary of activities	little content addressing science directions/questions
CP-SSG	Updates on WG and GC activities.	
ECR	Comprehensive details of issues.	News letters are not issued regularly.
JPS	Short information, pictures	Community calendar could be improved, mainly the design.
JSC	Concise, attractive, well designed.	
JSC	The compilation of the available WCRP info and news	Could improve in delivering WCRP calendar
Org	It is important to have this orientation - gives information about WGs, new structures, ...	
Org	Explanatory articles and news	Does not come out quite often enough
Org	keeps me up to date	
Org	Research news	
Org	Researches	
Org	The layout is reader friendly (logically organized and the text is concise).	
Org	The WCRP Newsletter must be the voice of any development of any climate topic especially global change.	
Other	Its structure, its length	
Other	keeping me up-to-date	nothing specific

Respondent	Like best	Improve by
Other	Up to date information about research activities	Surprise me!
Partners	Important information in one place	
Partners	It is informative	With such a large organization it is difficult to determine what should be included and what shouldn't be included. Sometimes some information is included that isn't really relevant.
Public	content and links/references	
Public	Current research activities on Climate Change.	
Public	I haven't read it enough yet to answer this question.	
Public	It's well written	It could be more frequent and more informative to general public
Researcher	Concise information	
Researcher	Events and report of activities/projects	
Researcher	Informative	Needs to be more eye catching and demand ones interest
Researcher	it exists, and provides some updates	Not very informative or current
Researcher	It is easy to get the highlights and then delve deeper if required.	
Researcher	latest developments and events	
Researcher	Latest news	
Researcher	List of interesting events and news on publications	
Researcher	News on recent topics	
Researcher	One-stop shop of latest news.	
Researcher	overview of program updates	details on getting involved
Researcher	Research articles and updates on various activities	
Researcher	Some new research and workshops, as well as WCRP projects.	
Researcher	that I receive it without being asked	most of the items seem distant. I don't have the sense of a community with people with whom I have contact.
Researcher	The breadth of its content.	
Researcher	the gist of new research	slightly more elaboration
Researcher	The opportunities posted	
Researcher	Upcoming meetings.	Make it easier to find the parts that are relevant to me.
Researcher	useful summary of what is going on	
Researcher	Useful updates on WCRP activities.	Hard to find time to read it.

Respondent	Like best	Improve by
Researcher		It does not really cover what is being decided very well.
Researcher		Perhaps, monthly newsletter
Sponsors	Quite a great deal.	

25. This is your opportunity to comment on any other aspects of WCRP Communication that have not been mentioned in this survey. These comments will be considered when planning the future of WCRP communication.

ECR	being a early career researcher I tried few times to attend workshop or training activities by wcrp. but so far I have not been selected or got any assistance in spite of high relevance to the events and my strong background. Therefore, a feeling comes to us, the selection for grant or participations is being made just on basis of recommendations of the committee members or to the known persons of the committee members. which should be rather neutrally selected...
CP-SSG	I think the web meetings we have within the CliC SSG works surprisingly well.
JSC	More communications with JSC. Some leadership to encourage members to propose, discuss and interact is urgently needed.
Researcher	I want to receive the WCRP newsletter
Researcher	There should be a process for joining these councils and groups beyond the self organizing concept that seems to drive them
Researcher	I now work very much as an individual within a university but have been retired (formally) for 17 years. Working very much on past climate issues as they are relevant to the Antarctic and Southern Ocean.
Researcher	WCRP should guidance scientists on hot point of climate change research.
CP-IPO	I think that WCRP is doing great on social media. I think that the internal communications are good but it may be good to try to advertise WCRP more towards those in the Climate Research community who know little about it or don't know it at all.
CP-IPO	You should do your best to improve awareness about your existence within the science community at large, especially w.r.t. early career scientists. You could be surprised how little you are known outside the research teams listed in the previous questions. These teams comprise heavily involved and brilliant senior scientists but this could lead to social "bubbles". I have noticed your importance only in the past few years as I was getting away from post-doc research tasks and into management of research projects. You should also try to communicate directly with the general public, aiming at publicizing your existence and your independence from national/political/partisan organizations. You have an important role to play in the fight between climate scientists and conspiracy "theorists", especially because you can put media buzz and "news" into proper context. I recommend hiring/consulting/teaming up with "soft" scientists (social sciences/humanities, even philosophers) on how to achieve this best.
CP-IPO	A document outlining WMO travel support procedures would be helpful. We usually get lots of questions from travel support recipients that I can't answer. A timeline of when WCRP will get in touch with travel support recipients as the funding requests are first submitted would be

	appreciated, too. Overall, communications have been improving, and I appreciate the greater procedural transparency.
JPS	There could be occasional group meetings within JPS (and/or other instruments to that effect) to allow more efficient dissemination of information.
JPS	Good improvements have been made already for the general look and communication on website etc. Advancements could be still made in visibility of the programme, well-designed outreach products to show outside community and communicate the WCRP science to show relevance of the programme.
GC	Acronyms are rife and should be banned unless they are spelt out in full when first used
ECR	Regular updates on websites and email lists
Researcher	Do you have a blog. If not that would be nice.
Researcher	I have only been exposed to WCRP Newsletter. I find it moderately useful and interesting.
Researcher	I will check out the WCRP web site if I can find it.
Researcher	I do not know the answer to question 9. But without giving one I cannot end the survey. So I say "poor", but that does not mean anything.
Researcher	I have to communicate the first time.
Public	Video's impact is immediate and appreciated. .
Public	none
Public	I'm too new to WCRP to answer this question.
Other	communications and Partnership with institutions especially Global south Institution, setting up a mini organization or society in such institute would help.
Other	i'm satisfaction to this initiative but it must be take place each year.
Other	I am not certain why I received this. Previously, I was head of the IOC which is a sponsoring organization. However, as I said, this survey is the first communication I have had from WCRP in years...
Other	The finance community needs more data - I would like to get more information on data releases
Other	The WCRP is an important program laying the foundation for improved community welfare as societies become more resilient in the face of climate extremes and a naturally changing climate. It is terrific to be able to read about the work being done and those involved.
Other	WCRP is vitally important for the world. It often must reveal inconvenient truths for many powerful political or financial institutions, whose investment horizon is short. Perhaps one approach to gain their interest and support is to focus reports on the numerous short-term opportunities for well-informed creative planning and investment, in which the reality of climate change is accepted as a fruitful tool for new, genuinely beneficial enterprises. Too many people expect to receive benefits for their actions within a few years, (not decades), and if they don't get some instant gratification, they will lose interest in the longer-term (but vitally basic) long-term horizons and targets. .
Other	A news email like AGU and AMS have, which is very selective to feature only real discoveries not progress reports.

Sponsors	I would love to find out more about who WCRP considers to be its key target audiences and what would be the right communications products/the right custom content to reach them. Also, I thought this survey was very well designed.
Partners	It would be nicer to have closer ties with the Comms team at WCRP.
Partners	If you can clone Dave Carlson so he can talk to more people about the importance of climate change research, that would be ideal! An archive of current graphics/illustrations/etc that scientists could use in presentations would be very helpful.
Partners	Before planning the future of WCRP communication it is important to have a clear idea of WCRP future
Org	The closer connections of different IPCC Assessment Reoprt groups
Org	Get more people to subscribe the newsletter
Org	Is important to share research findings frequently to increase interest around the programmes.

Annex 3 – Acronyms and abbreviations

AC/WG	Advisory Councils and Working Groups
CLiC	Cryosphere and Climate
CLIVAR	Climate and Ocean Variability, Predictability and Change
CORDEX	Coordinated Regional Climate Downscaling Experiment
CP	Core Project
ECR	Early Career Researcher
GC	Grand Challenge
GC-Carbon	Grand Challenge on Carbon Feedbacks in the Climate System
GC-Clouds	Grand Challenge on Clouds, Circulation and Climate Sensitivity
GC-Extremes	Grand Challenge on Understanding and Predicting Weather and Climate Extremes
GC-FB	Grand Challenge on Water for the Food Baskets of the World
GC-Ice	Grand Challenge on Melting Ice and Global Consequences
GC-NTCP	Grand Challenge on Near-term Climate Prediction
GC-SL	Grand Challenge on Regional Sea-Level Change and Coastal Impacts
GEWEX	Global Energy and Water Exchanges
ICSU	International Council for Science
IOC	Intergovernmental Oceanographic Commission
IPO	International Project Office
JPS	Joint Planning Staff and WCRP Director
JSC	Joint Scientific Committee
SAT	Science Advisory Team
SPARC	Stratosphere-troposphere Processes And their Role in Climate
SSG	Scientific Steering Group
UNESCO	United Nations Educational, Scientific and Cultural Organization
WCRP	World Climate Research Programme
WDAC	WCRP Data Advisory Council
WGCM	Working Group on Coupled Modelling
WGNE	Working Group on Numerical Experimentation
WGRC	Working Group on Regional Climate
WGSIP	Working Group on Subseasonal to Interdecadal Prediction
WMAC	WCRP Modelling Advisory Council
WMO	World Meteorological Organization

**The
World Climate
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(WCRP)**

*facilitates analysis and
prediction of Earth system change
for use in a range of practical
applications of direct relevance,
benefit and value to society.*

