

To discuss the new SPARC strategy 18 November 2020 – 12:00 UTC – 15 UTC



Participants

The meeting was attended by 37 participants in the video room as well as in the stream chat room. More may have followed the stream anonymously.

The invited participants of this meeting include the current and designated SPARC SSG members, the JSC liaisons from WCRP, a representative from the WCRP Secretariat, and the current Activity leaders., including representatives from CEDA.

List of participants in the main video & the stream chat room:

Neil Harris (SPARC co-chair), Seok-Woo Son (SPARC co-chair), Amanda Maycock (Task Team lead)

Tercio Ambrizzi (JSC liaison), Tom Peter (JSC liaison),
Mike Sparrow (WCRP Secretariat), Mareike Heckl (IPO)

Gufran Beig (SPARC SSG), Wen Chen (SPARC SSG), Nili Harnik (SPARC SSG), Harry Hendon (SPARC SSG), Takeshi Horinouchi (SPARC SSG), Nathaniel Livesey (SPARC SSG), Karen Rosenlof (SPARC SSG), Hauke Schmidt (SPARC SSG), Don Wuebbles (SPARC SSG), Tianjun Zhou (SPARC SSG), Michael Prather (SPARC SSG; design.), Viktoria Sofieva (SPARC SSG; design.)

Neil Butchart (QBOi), Amy Butler (SNAP), Andrew Charlton-Perez (SNAP), Daniela Domeisen (DynVar), Quentin Errera (DAWG), Bernd Funke (SOLARIS-HEPPA), Chaim Garfinkel (SNAP), Sophie Godin-Beeckmann (LOTUS), Peter Hoor (OCTAV-UTLS), Martin Juckes (CEDA), Alexey Karpechko (DynVar), Scott Osprey (QBOi), Charlotte Pascoe (CEDA), Irina Petropavlovskikh (LOTUS/OCTAV-UTLS), David Plummer (ccmi), Riwal Plougonven (Gravity Waves), Andrea Steiner (ATC), Gabi Stiller (WAVAS II), Shigeo Yoden (SATIO-TCS).

Meeting Agenda

12:00	Welcome & introduction to the purpose of the meeting	co-chairs	10 min
12:10	Update on WCRP plans, including Q&A	Mike Sparrow (WMO secretariat)	30 min
12:40	Update on new SPARC strategy		30 min
	<i>Presentation of discussion results from the SPARC Strategy Task Team</i>	Amanda Maycock	20 min
	<i>Short Q&A for clarification</i>		10 min
13:10	--- <i>short break</i> ---		5 min
13:15	Open discussion	session lead: Seok-Woo	45 min
	a. SPARC structure – <i>needs for action?</i>		
	b. SPARC science – <i>Where are the gaps?</i>		
14:00	--- <i>short break</i> ---		5 min
14:05	Open discussion	session lead: Neil	45 min
	a. <i>Emerging ideas</i>		
	b. <i>Next steps</i>		
14:50	Wrap up / Summary	co-chairs	10 min

Summary of important topics and action items

 WCRP plans:

- Core projects remain in new WCRP structure; they are essential for the way forward.
- Space for fixed-term cross-cutting projects outside specific homes/core projects in new structure
- Light House activities currently outlined and open for discussion by the community.
 - opportunity for SPARC to feed in, how they contribute, whether some activities are already in SPARC or make suggestions.
- concept notes of LHAs [available on the WCRP webpage](#)
- [article in last WCRP newsletter](#) explaining about the WCRP structure and the ideas going forward

- Timeline:
 - By end of 2020: Agreement on the overall structure
 - Still room for improvements on geographical/gender/etc representation in committees, activity/home names & structures, etc.
 - Next JSC meeting (May/June 2021): Structure fully in place & Implementation plan written down
 - The Implementation is a document that should be updated regularly as WCRP moves forward.
 - Some current activities not in the new structure, e.g. grand challenges, to sunset by end of 2022
 - Need discussion on activities from GCs to be continued and if so, how
- For upcoming JSC all core projects were asked to fill in the same template to facilitate discussions on the community level, and communicate and coordinate the way forward
- Information on the implementation process and the new structure [available online](#)
- New homes will all have an international project office; additional project office for CMIP currently debated
- Light House activities will be cross-cutting within WCRP but also outside, linking to WWRP, Future Earth and others.

Update from the Strategy Task Team

- As part of the WCRP reconstruction the core projects were asked to review themselves, and develop a plan/strategy for their future within the “new” WCRP.
 - The task team is only one element to this, apart from the SSG meetings and reports from Activities, as well as future discussions with the community.
 - The group was selected with respect to geographical balance, gender balance, but also links to external groups; e.g. WGCM; CMIP, some of the Light House activities, the other core projects, other external groups like IGAC
- Already over 10 hours of discussion with a lot of useful output
- First of two discussion elements: **Review** of things that do/do not work well in the current SPARC; review of the SPARC model
 - Many positives: friendly and open SPARC community with engaged scientists; broad range of expertise, the strong bottom-up approach that allows the community to develop; SPARC opportunities for early career scientists to grow into leadership roles
 - Communication was seen to be well working, but opportunities for improvements are clearly there in the future.
 - Room for improvement: *capacity building*; *improving outreach* (→ specific idea: “regional ambassadors” to communicate SPARC science to governments, policy makers and other end users); *need for support during times of high work-loads* (production of deliverables); being conscious of the *number of activities* at any given time; to ensure that the value and wider use of SPARC science is clear
 - Transition to a whole-atmosphere perspective so far “only partly successful” – opportunities to broaden views in all three current SPARC themes:
 - Dynamics still very much focussed on stratosphere-troposphere coupling; strong links to S2S projects provides opportunities to include tropospheric topics.
 - Composition: has brought in some experts in tropospheric chemistry (ccmi steering committee); cooperation with IGAC (as a home for tropospheric chemists) needs to be carefully considered –
→ SPARC expertise: linking composition to climate.
 - Long-term records: Some progress through inclusion of upper-tropospheric trends in assessments, and recent cross-core project assessment on Earth’s Energy balance
 - not all SPARC activities should shift to broader views; some topics rightly have a stratospheric focus (e.g. those linking to the Montreal Protocol). Activities like this are needed as well.
 - SPARC still seems to be “the stratosphere” for many; transition to whole-atmosphere perspective could help improve SPARC’s visibility.
 - The activities-model is perceived as very successful
 - large range of activities → supports a wider range of topics being supported;
 - This might also make it harder to present to the outside what SPARC is doing.
 - Strong bottom-up structure should be preserved, but some top-down guidance might be necessary to identify potential collaboration or science priorities.
- Second discussion element: **future ideas** including science ideas, needed infrastructure & platforms; collaborations within and outside WCRP
 - SPARC science should be extending downwards to the troposphere but also up to high altitudes.
 - important to remain agile and ready to lead on emerging topics
 - identified gap: SPARC needs to be working more on the composition side

- Local impacts of climate change:
 - Arctic climate change and its impacts: opportunity to expand towards tropospheric-oriented themes
 - Very broad SPARC core expertise: Rossby-wave dynamics; spans many areas of our research, including teleconnections (arctic, MJO, and ENSO, storm tracks).
 - would help to bring together different parts of the SPARC community.
 - Links to the LH activities “My climate Risk” & “Digital Earths”: Changes to weather patterns, extreme events
 - SPARC has expertise to contribute to the dynamical and the composition impacts
 - From recent work on tropical topics: encompass broader aspects of tropical climate change, e.g. tropical circulation, tropical expansion, cloud-circulation coupling
- Attribution & detection: important for policy makers and climate information for governments.
 - important role here for observations (sustaining data records, make use of existing data, monitoring, especially if geoengineering was to be attempted)
 - Compound events and their impacts, including composition extremes (e.g. air quality) and heat extremes.
 - SPARC has expertise to tackle understanding the role of atmospheric dynamics in these events.
 - use of large ensembles and grand ensembles for studying extreme events, looking at risk and attribution of events, and understanding the role of model biases and internal variability on different time scales
 - dynamical attribution: Thinking about extreme seasons or months that might be related to specific atmospheric patterns
 - already much expertise, e.g. on teleconnections
- Geoengineering (Radiation management): is written in the WCRP strategy as one topic that they identify as needing strong scientific research to inform any discussions that take place.
 - SPARC has huge expertise in connecting composition and dynamics, so there is a lot we can contribute.
 - ccmi already preparing runs to investigate the impact of geoengineering on Ozone recovery (explicitly requested by the parties for upcoming Ozone Assessment).
 - There are already community efforts going on, e.g. the GeoMIP activity
 - need to think about how to collaborate with those groups and how to contribute our expertise
- Predictability and seamless prediction: Identifying windows of forecast opportunity; the role of composition for predictability; Untapped sources of predictability; Compound events teleconnections; and the role of atmospheric dynamics
 - There need to be strong links between the observation and the predictability communities
 - SPARC expertise in dynamics has a lot of relevance to this topic.
 - Seamless prediction: consistency between models and across time scales; ability to predict the time-variations; Impacts of climate change
 - Using new tools like machine learning and data science applications
 - links into the WCRP goal of “Science for Society”
 - SPARC provides a natural home for S2S topics in WCRP
- Summary of key points:
 - SPARC positioned at the interface of the weather and climate community
 - a strong community and success of reaching out beyond SPARC to work with other groups.
 - The role of SPARC: facilitating good research within the community, but also advocating on behalf of the community towards funding agencies or policy makers
 - engaging with Early Career Scientists and other communities
 - Ensuring that the future members of our community are equipped with the tools and knowledge to contribute and to develop as they move on in their careers
 - Looking for new ways to engage, inspired by what’s happening during COVID-19
 - Re-name SPARC?
 - Please go back and look at the details of the summary slides (No time to discuss all the details here)
- Q&A:
 - Shipra Jain, who is involved with YESS is part of the task team (ECS involvement)
 - Neil will discuss with GAW on potential collaborations
 - Growing the links with IGAC and TOAR will be key; identifying science topics to bring together the SPARC and IGAC communities (e.g. Ozone topic)
 - For regional engagement (“Regional Ambassadors”) there may be a connection to the WCRP regional consultations (and the Climate Research Forums that are planned to come out of this...)

Open discussion

- Amanda's presentation did not show the final form of the work of the task team. It will keep working on the SPARC strategy for the next few months; **comments and feedback are welcome**

Machine learning (ML):

- Certainly, also part of other WCRP homes, (e.g. new model & data home), or the "Digital Earths" lighthouses.
- Not meant to be a dedicated activity, but to be part of SPARC science:
 - methods are already being used, and proven to be powerful applications in some cases.
 - SPARC must not miss this development and stay responsive.
 - Relates to the new light house activities, → SPARC needs to recognise its use and application in climate science.
- SPARC's approach should be using ML for understanding complex models and problems, rather than for improving prediction skill.
- There are opportunities (e.g. gravity wave research) to use it and lead some of the exploration work on how to use it, both for understanding but also how to improve our models

Collaboration with other projects (within and outside WCRP):

- Several representatives from IGAC on the task team
- there could be a nice link from SPARC's expertise with IGAC on tropospheric chemistry processes (composition effects on climate, radiative forcing, regional climate change)
- By holding training schools together (especially for ECS), we could strengthen the connection between SPARC and IGAC / other projects
- SPARC as the natural home for S2S topics within WCRP seemed obvious to the task team
 - might need more thought on what we might actually have to do to make SPARC the home of S2S in WCRP
 - There are already existing subgroups working on topics mentioned by the Task Team, which could become part of SPARC.
 - S2S is broader than topics covered by SPARC → more of a joint cooperation rather than an integration
- A strength of SPARC from the past is: unifying and cross-cutting themes
- ccmi already has good links to other projects, → should be maintained and strengthened.
 - Looking to get into Methane life times, and have links to AerChemMIP, Aerocom
 - have started communication with TOAR.
- GAW: Neil will talk to Greg Carmichael (chair of GAW) and help identify scientists involved with GAW to be involved the same way IGAC scientists are.

Implementation needs:

- Need to be rethinking/redefining our relationship with CEDA
 - For IPCC CEDA publishes the data sets that are in the Assessment report (small data sets of the plotted data) those could be linked to the larger data sets, and this could be done for SPARC data sets as well.
- Need for a SPARC depository of products (data sets, trend models, SPARC "labelled" tools, tutorials...)

Geoengineering:

- Huge topic, really WCRP overarching, but SPARC plays a role in radiation management
- Maybe have committee within SPARC?
- Aware that groups already exist – how to reach out to and interact with them?
- already a lot of relevant expertise within SPARC (stratospheric aerosol; stratosphere-troposphere interaction, strong knowledge concerning observational needs to monitor geoengineering attempts)
- possible SPARC science topic: dynamical response: regional changes due to geoengineering efforts
- ccmi is already working on simulations for the 2022 Ozone Assessment, and LOTUS and OCTAV will be able to contribute to the topic.

SPARC structure:

- Task team comments were all in favour of keeping the activity structure
 - If there might be too many activities already, having more due to including more topics would not be sustainable anymore
 - Now is a good time to reflect: Do we need all the activities we have got? And are they addressing what we consider the interesting future science questions?
 - Smaller, focused groups/themes can work well to achieve specific deliverables
- Rationalising (rather than streamlining) the structure would help us address the issues
- Possibility to have a few overarching activities that spawn short-term, focussed activities (like dynamics activities already do – ccmi could be the tropospheric composition one)

- We should be open about this and not be too tied to our current names.
- Suggestion: efforts from activity leaders to discuss enhancing collaboration, or even merging / reorganizing some activities and on a timescale of a couple of years evolve to new activities more structured around the lighthouse activities
- the success of any activity comes with the people involved. → in a more top-down approach: need to think whether there are people, who are willing to tackle the topics we identified as important, and how to reach out to those people
- New structure should look welcoming to new groups we want to integrate.
 - That's more important than looking nice on paper.
- Make sure we don't lose expertise in "traditional" SPARC realms for the sake of "making room" for science focused different regions of the atmosphere
 - ccm: Given that there is a limited set of chemistry climate modelling groups that are asked to produce simulations, providing resource-intensive long-term scenarios to support Assessments does mean other priorities are pushed back. Should the structure change to have a chance to look at other science topics and not keep pushing back new ideas? → **Task Team should take a look**

Science currently done in the Grand Challenges (GCs).

- Science ideas for SPARC relate to some GCs, especially [Clouds, circulation and climate sensitivity](#), [Near-term predictions](#) and [weather and climate extremes](#).
 - The sunset of GCs is an opportunity to take that science in.
- If we take on a certain science question, how can we structure that well?
 - Not just "throwing" it into some existing activity, but create new structures, if necessary.
- Taking in the forcing topic from the climate sensitivity GC will be important. Those are primarily atmospheric.

diversity and linking in with early career scientists:

- has to happen, because of two reasons:
 - 1) to train the best scientists who are available to work on the problem and
 - 2) to reflect the changing interest a lot of the younger scientists have
- Andrew Charlton-Perez will be a co-chair to the new "Academy" Lighthouse. Vision: A "marketplace" for the training that needs to happen and the people who could provide that training – connect core projects to communities they would not normally engage; find out what training is actually required, and connect users to training providers
- [SPARC capacity building plan](#) a couple of years ago did not work well, because many issues were pan-WCRP – may be worth revisiting.
- Idea: SPARC to have small 'seed funding' pot for ECSs to design interesting new initiatives.
 - Open call each year?
 - Might require additional budget
 - WCRP centralised staff and platform would be helpful
- SPARC could have ECS representatives, like IUGG
- Task Team members have "grown up" in SPARC; ECS feedback is always positive (possibility to connect to community)
- give ECS an opportunity to create new things within SPARC and encourage them to organise themselves in new ways
- There are good examples of "young" communities that have formed through webinars

Should we re-name SPARC?

- Quick survey among participants: 9 in favour, 3 neutral, 1 against
- Only with careful consideration and consultation
- Suggestion: "ARC" has received some agreement
- New name should be found when community is restructured – should be representative of the scientists actually working for
- New name should emphasize whole-atmosphere approach
- Make sure we remember our strengths and core expertise, and not try to appeal to everyone in an attempt to maintain relevance.
- May be useful to be discussed for all WCRP pillars

Find more detailed notes (not a transcript!) including chat messages and the slides shown in the talks on the following pages.

Discussion notes

(mainly summary, **not exact transcript**)

1) Welcome & Introduction

SPARC SSG co-chairs Seok-Woo Son and Neil Harris

Neil Harris: [SPARC co-chair] Thanks to everyone personally for making the effort to join from so many places around the world! For, what I do think, is an important meeting. The background is the WCRP review of its activities, which has been ongoing for 2-3 years now. And in response to this, SPARC is updating its own strategy to be consistent with that. In this meeting, Mike Sparrow will give an overview of where WCRP is going to, and then Amanda Maycock, who we have asked to lead the strategy task team, will give an update on where they've got to. After that we will have an open discussion to see how those ideas should develop from here. The date by which we want to have these **plans developed is May 2021**, right before the next full Joint Steering Committee (JSC) meeting. So, we need to make progress, and have some interim steps, but that's the key date.

I would like to thank

- all activity leaders, who are here, and thank them for doing their reports. We've read all of those carefully. While we will discuss the main parts of the activity reports at the next SSG meeting, there were a lot of good ideas for collaboration and the way forward, which are very useful.
- The SSG members, who's role it is to review the progress of what we are doing
- The JSC liaisons Tercio and Tom, who will keep an eye on how our plans link to the WCRP scientifically, in addition to Mike.

Mareike: [IPO, on meeting protocol] Points out that the meeting is being recorded, which is necessary to run the live-stream. The room is limited to 23 video participants, if anyone has trouble connecting, please do use the stream. The chat in the stream is monitored, and comments and questions from there will be copied into the main room.

2) WCRP update

Mike Sparrow, head of the WCRP Secretariat and of the WMO World Climate Research Division – Presentation available at the [SSG meeting webpage](#)



Introduction to the “new” WCRP and how we move into the new implementation. And how the restructuring that is going on will affect SPARC. I will refer to Tercio Ambrizzi and Tom Peter from the JSC here as well, as they may wish to say something themselves, or may help answer any questions.

WCRP's main function is to address the large-scale scientific frontier questions that can't be tackled by a single institution or a single nation.



We have **a new strategic plan that covers the period from 2019 to 2028**. Apart from the strategic plan we need a plan how to implement this. This has been the focus of what we have been doing for the last year or so.

For those, who might want to know more about WCRP: There is a nice video that is about 8 minutes long – this gives a nice overview of what WCRP has been doing over the last 40 years and how we are moving ahead.

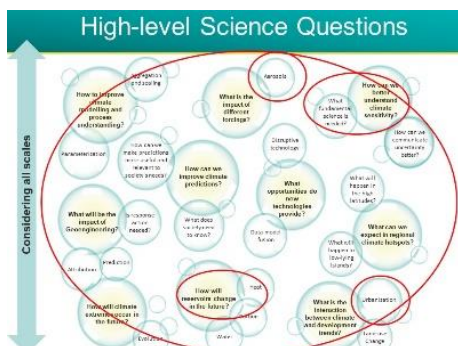


The **mission and the vision remain very similar** to what they have been in the last 40 years. The text has been updated to reflect our new priorities, and linking across the fact that we input into process like the UNFCCC process the framework for disaster risk reduction and the sustainable development goals.



The strategic plan is formed around those **4 scientific objectives**. The first one on fundamental science really is what WCRP does and is: Trying to improve our fundamental knowledge of the climate system. On the next two goals, and why they have a dotted line in between: That is also what WCRP does: Trying to improve predictions of the near-term evolution of the climate system (sub seasonal through annual to even decadal forecasts). At the same time the CMIP feeds directly into the IPCC reports, so we are also interested in projections of climate changes over many decades and longer. The **fourth objective has much more of an emphasis**

than previously: Bridging climate science and society. That includes science advice to policy making, e.g. the process of the Montreal Protocol or those kinds of environmental assessments or policy forums; the Antarctic treaty, etc. It's also about the link between fundamental science and services as well – Something our co-sponsors; the International Oceanographic Society and the International Science Council are also very interested in.



We had a **workshop**, when we were still allowed to meet face-to-face, where we tried **to look at what these high-level science questions really are**. This is **not a complete list**, but gives an example of the kind of questions WCRP will be focussed on as we move forward. There are some areas here, that obviously link to SPARC (smaller red circles) along with the fundamental science that SPARC does. But when you really look at where SPARC feeds into in these areas, then the circle should cover all of these, because **SPARC is a remit of stratospheric and tropospheric processes, so it really feeds into everything that we need in**

order to move forward.



As part of how to move forward, WCRP has started these – what we call “Light House” activities (LHA). So, as well as a support of fundamental research of which the core projects are part of, we are spinning up these light house activities as **cross-cutting and really major themes**. In a way the grand challenges were not always able to do so. More about the LHAs in a moment.



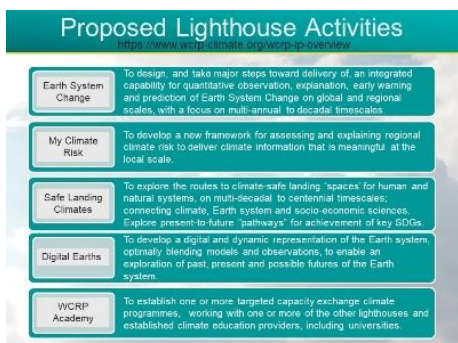
This is a first draft of the new WCRP structure. **SPARC and the other core projects are still within this system**, because **they are really the fundamental communities, where the fundamental science and everything else that makes WCRP a success is actually done**. This is an essential part and this is needed in the way forward.

We have asked **all the core projects to do an internal review** about their priorities, how they feed into the new light house activities, etc. These are being done on different levels. Example: GEVEX underwent an internal review only a couple of years ago, so they are probably having a fairly light-handed touch, whereas CLIVAR are looking far more in depth

at their own structure and their way forward.

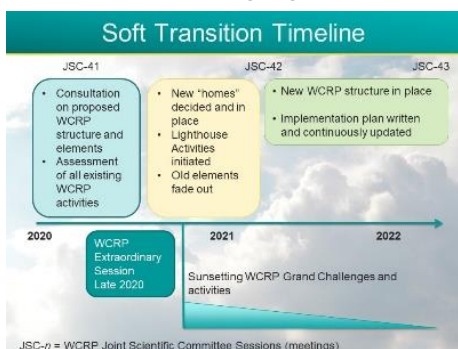
You also see that there are **two new homes**, or core projects, in the new structure. One is on the **Earth System Modelling an Observational Capabilities** – that is to bring in all of what we currently have in forms of the advisory councils and all these other working groups and putting them together to try and improve the linkages between models and observations and to pull them into a sort of single- community group in a similar way to how the core projects work at the moment. The other new home is on **Regional information for society**. When you read the WCRP strategic plan, there is a much bigger influence now on climate information for regions. The regional and local scale is far more in emphasis in what WCRP is doing, going forward.

About the **right-hand side**: Within the new structure it is recognised that there will be **things that don't fit under the core projects or the LHAs, or are cross-cutting themes** or activities that we may want to take forward. The important thing here is that there are **fixed-term projects**, for example If SPARC wanted to have a coordinated project together with CLIVAR on the Tibetan Plateau on a specific topic of scientific understanding that needs to be improved, and there is a four-year time-frame, then there is capability for this to sit outside the current structure. All of this will be discussed in the upcoming “extraordinary” JSC meeting between 30 November and 3 December, and the chairs of SPARC are invited to that.



At the meeting at the end of this month, all the reviews of the core projects, the plans for the new homes, and the outlines for these light house activities will be presented. The idea is that these won't be final white papers describing the exact look of the LHAs in the future, but to present ideas for the way forward, so that **the whole community can have a discussion about how these LHAs and how these homes will function**. So, it is completely feasible that the community decides that one of these light houses isn't the way forward and may suggest new light house activities. So, this is still open for discussion by the community. These five activities all have planning teams that are meeting currently and

will come forward to the JSC meeting with an outline of what these activities should look like. This is the **opportunity for SPARC to feed in, how they contribute, whether some activities are already in SPARC or make suggestions**. Neil and Seok-Woo have been involved in some of these discussions. There are concept notes [available on the WCRP webpage](#) and the last [WCRP newsletter has an article](#) explaining in a little more detail about the WCRP structure and the ideas going forward.



About the way forward: We already had the JSC-41 this year, and we will have the extraordinary meeting at the end of November/Beginning of December. The idea is that **by the end of this year we will have, ideally, agreements on what the new structure will look like**. Detlef and Helen like to make this analogy: It's a bit like a new house that we will have in place, but we won't have the furniture and wallpaper and the painting done. We want to have agreement on the homes and perhaps 5 Light House Activities, and what WCRP will look like going forward, but there is **still more work to be done to determine how these homes**

and activities will function: Having the steering groups of the Light Houses, improve in geographical representation and gender, etc., and any changes to the structure or names of the core projects/ homes, etc. **By**

the next JSC meeting in May/June next year, the new structure should be fully in place. That's also when the Implementation plan should be written down. That's a document that should be continuously updated as we move forward.

In order to implement the new structure, **some current activities need to sunset**; the grand challenges, for example, are set to finish by the end of 2022. So, one of the things SPARC and the other core projects need to **discuss with the Grand Challenge leaders is: Which activities in the current GCs need to continue, and if they continue, how?**

Questions – for JSC “Extraordinary” meeting

1. Briefly outline the nature of the review and what you hope to achieve?
 - What steps are you taking to do the review?
 - What stage are you at?
 - When will the task be complete?
 - How has the CP community have been involved?
2. Are there any preliminary recommendations to share with the JSC?
 - Will there be changes in structure or governance?
 - How will you ensure better participant diversity?
 - Are there any resourcing implications, e.g. increased budget required, additional staff....
3. Any discussion with key partners / collaborators within and outside WCRP?
 - Who are these groups?
 - Any key information to share with the JSC?

Our Climate Future – Key Contacts

If you want to know more, or wish to be involved in any of our new activities, then you can:

1. Email us with questions or ideas:
climatefuture@wcrp-climate.org
2. Join or start a discussion on Slack: bit.ly/WCRPClimate
3. Register for email updates:
www.wcrp-climate.org/wcrp-ip-connect
4. Check the WCRP website for updates:
www.wcrp-climate.org/wcrp-ip-overview

We sent around a template for the extraordinary meeting, which outlines the questions we would like the core projects to consider: The nature of the review itself, and the depth that you are going into, what may need to be changed. Also: preliminary recommendations on structure or governance and discussions going on within and outside WCRP.

This will **be the same for all the core projects** and the new homes: This gives the **opportunity to have a discussion on a community level** in terms of what works, what doesn't work, and how things may change. This should come from the community, so the SSG and heads of activities within SPARC, you are going to make these decisions on how things are being done and may change as we move forward.

If you have any questions, you can go to the WCRP website the WCRP newsletter is a good source of information, you may email myself or the WCRP co-chairs.

Narelle has also set up a specific email address and webpages about the implementation process and possible changes to structure. The information is all here, but I'm also happy to answer any questions at this point.

A version [of this presentation is on the WCRP webpage](#), which goes into a bit more detail, as well.

Q&A after presentation

🐘 Quentin Errera: Question about “Digital Earth” Light House and Model Data home: What is the difference between these two?

→ **Mike:** The Digital Earth steering group is meeting for the first time this evening. I'm sure you are familiar with the concept of the digital Earth: There are several, e.g. the “Digital Twin” activity by the European Union; so, this is looking at a way of a super-high-resolution model that simulates observations, looking at changes in the Earth System with different scales; from weather to climate and others. The people leading this are Peter Bauer (ECMWF, UK), who is involved in the European initiative, and Christian Jakob (Monash Univ., Australia), in terms of planning. The homes are meant to be more of a community, where the people are that are actually doing the work. So, the homes initially will include the Working Groups on Numerical Experimentation (WGNE), on Seasonal and Interdecadal Prediction (VGSIP) – CORDEX, at the moment is mostly going to be in the regional home. The home will be very closely linked to the Digital Earth and it may be that the home will take responsibility for the Light house activity. **Certainly, they are linked, but they are not quite the same thing.** The homes are more like the core projects: A community of several activities. The Digital Earths light hose is more a cross-cutting activity. The idea is that all of these homes, similar to the core projects, will be associated with international project offices. The regional home already has the CORA office, and at the moment we are in discussions in choosing a new CMIP project office, and it may be that after that comes the home for the modelling and observations, as well.

→ **Quentin:** It will be more to present the results from model, data, observations; while the model home is more dealing with the input data?

→ **Mike:** To a large extend: Yes. – We don't have a full science plan for the Digital Earth, so it's not yet defined what will be the outcomes, etc. One of the things about the Digital Earth is: Peter Bauer is or was on the steering committee of the World Weather Research Programme, for example. A lot of these Light House activities will

be in partnership with the WWRP or Future Earth or other. So, it's meant to be not only cross-cutting within WCRP, but also involving partners from different organisations.

☛ **Quentin Errera:** different question: What is the horizon of the other groups and panels like WGNE, WDAC etc.? Are they going to cease?

➔ **Mike:** All of those will be part of the new models and observations new home. How they organise that will be part of a presentation at the extraordinary JSC by the chairs of these groups, and how they will see the new model and data home working. We will not disband those groups – there may be some changes, and the councils will probably dissipate or change in some way – perhaps as new steering group of this new home – that still has to be decided. But we realise how important activities such as WGNE are, so they will continue. It perhaps will be like in SPARC with activities under the steering group.

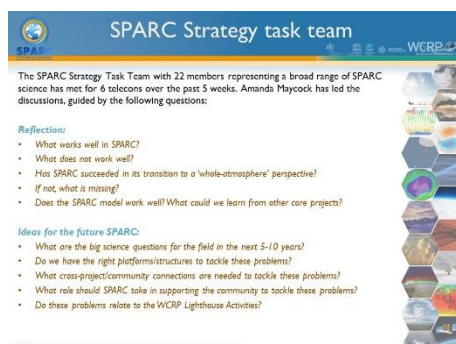
3) Update on the new SPARC strategy

Amanda Maycock, Univ. Leeds, lead SPARC Strategy Task Team – Presentation available at the [SSG meeting webpage](#)



SPARC SSG Meeting, 12:00-15:00 UTC, 18 November 2020

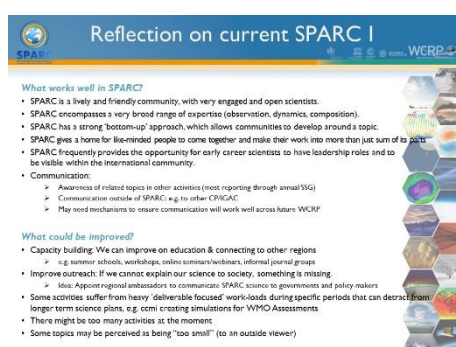
As a part of the WCRP major changes that Mike outlined, the **SPARC community was asked to review their own structures and develop their own strategy** for the way forward in the lights of the reorganisation of WCRP. There are **several elements to this development** of the new SPARC strategy; one of them is the task team that is assembled to discuss SPARC science and ideas for the future SPARC science. This is not the only element; the meeting today is part of this process, of course: Getting feedback from the SSG and the activities (also through the Activity reports). There will also be future discussions, and mechanisms to involve everyone in this process.



SPARC Strategy Task Team summary, SPARC SSG meeting, November 2020

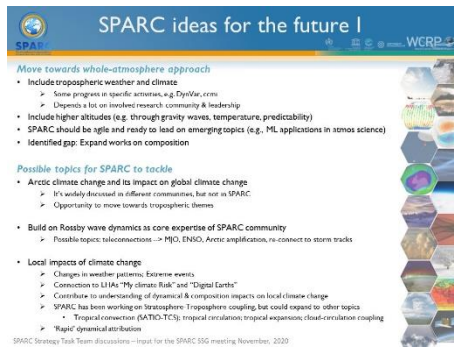
This presentation is to talk you through the interim results from the first task team discussions, starting with thanks to the 22 members (listed on the slide), who have volunteered their time to be involved in these discussions. **The group was selected with respect to geographical balance, gender balance, but also to provide links to external groups, e.g. WGCM and CMIP, some of the Light House activities, the other core projects, and other external groups like IGAC.** The aim was to have a broad group that can provide varied perspectives on a possible evolution of SPARC.

There have been **over 10 hours of discussion** already, of which this talk is providing an overview. The discussions have been grouped around **two main elements: One on the current form of SPARC**; what works well; what could be improved; the transition to a more whole-atmosphere position, which was brought on the way a few years ago; and a review of the current SPARC model. The **second element was focused on ideas for the future**; science topics, necessary platforms and infrastructure to tackle those; possibilities for cooperation within and outside of WCRP.

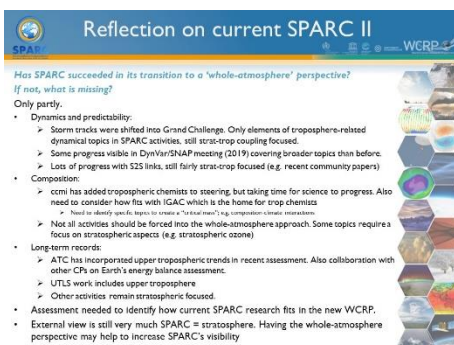


First the review: There were a lot of positive things about SPARC with a wide recognition of **the friendly and open SPARC community with engaged scientists**. Further, positive points are the **broad range of expertise, the strong bottom-up approach** that allows the community to develop. **SPARC opportunities for early career scientists** to grow into leadership roles was mentioned. **Communication** was seen to be well working, but opportunities for improvements are clearly there in the future.

*detailed notes (page 6 ff) are not a word-by-word transcript of the discussions! *



With regards to improvements and future-proofing SPARC and its community, there were discussions around: **capacity building** (improving education and connecting across regions, as well as the important aspect of connecting science with society, so **improving outreach** was seen as a key thing to develop. Here, a specific idea was to install “regional ambassadors” to communicate SPARC science to governments, policy makers and other end users to make sure SPARC science is recognised and being used outside of the community. Concerning current activities, **need for support during times of high work-loads** due to production of deliverables was identified. **Being conscious of the number of activities** at any given time, and whether the individual topics might be perceived as being “too small” to an outside viewer was raised: It must be **ensured that the value and wider use of SPARC science is clear**.

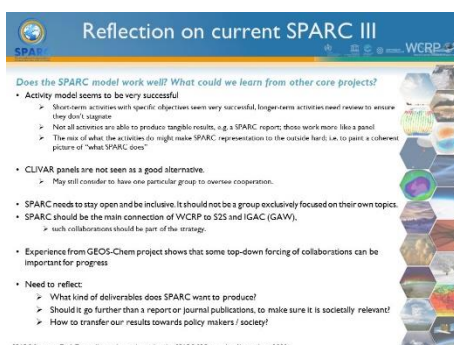


The **transition to a whole-atmosphere perspective** so far was clearly seen as **“only partly successful”**. Opportunities for more growth in this transition can be found in all three current SPARC themes. In dynamics, the current SPARC activities still seem very focussed on stratosphere-troposphere coupling, although recently there have been developments towards broader topics, e.g. within the DynVar/SNAP meeting last year. The strong links to S2S provide some opportunities, there.

In the composition theme, ccmi has already brought in tropospheric scientists to their steering committee. Here, cooperation with IGAC (as a home for tropospheric chemists) needs to be carefully considered, but SPARC can clearly add expertise, e.g. in linking composition to climate. In the discussions it was clearly recognised that not all SPARC activities should shift to broader views; there some topics that rightly have a stratospheric focus (e.g. those linking to the Montreal Protocol). Activities like this are needed as well.

In the long-term records theme there has been progress, too, e.g. ATC incorporating tropospheric trends in recent assessments, as well as good collaboration across the core projects on the recent Earth Energy balance assessment.

There is still an assessment needed how SPARC research fits into the new WCRP picture; the external view seems to be that SPARC still is “the stratosphere” – **having the whole atmosphere perspective might help increase SPARC's visibility**.



The **activities-model is perceived as very successful**. There is a **large range of activities**, some very long-lived ones, some short-term activities with specific objectives; some with specific deliverables (e.g. a report), some acting more like a panel. That **supports a wider range of topics** being supported. This **might also make it harder to present to the outside what SPARC is doing**. The bottom-up approach should stay in place, but opportunities for top-down “prescription” of priority science areas should still be possible, and might be needed in some cases.

First, on the whole-atmosphere approach: **SPARC science should be extending downwards to the troposphere but also up to high altitudes**. It will be important to remain agile and ready to lead on emerging topics (for example machine learning in atmospheric science). Before going into more detail on the future ideas, a gap was identified, which is that **SPARC needs to be working more on the composition side**.

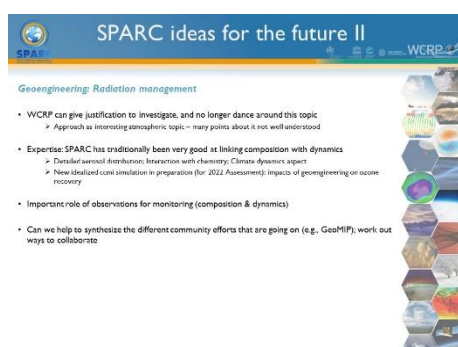
In the discussion specific topics have come up, which are summarised on this and the next slides. Here, it was felt, that there is expertise within SPARC, and other groups can be brought in. One is **Arctic climate change and its impacts** – a topic that is being widely discussed at the moment, but not really within SPARC. This would be an opportunity to expand towards tropospheric-oriented themes, but would also built on SPARC expertise,

like **Rossby-wave dynamics**, which spans many areas of our research, including teleconnections – not only in the arctic, but also MJO, and ENSO, as well as affecting storm tracks. That is a topic that would have a very **broad core-expertise and would help to bring together different parts of the SPARC community**. Linking into the Light house activities (“My climate Risk” and “Digital Earths”), Mike described, there is interest in **local impacts of climate change**: Changes to weather patterns, extreme events... SPARC has the expertise to contribute to both, the dynamical and the composition impacts on local climate change. In recent years SPARC has expanded more into the tropical climate: stratosphere-troposphere coupling in the tropics through convection. This expertise that we develop could also encompass **broader aspects of tropical climate change**, for example changes to tropical circulation, the topic of tropical expansion, which has had a lot of traction in recent years, and topics like cloud-circulation coupling. This might have been part of the GC on cloud circulation but could now be incorporated into SPARC science. Another aspect of local impacts of climate change is this idea of “rapid dynamical attribution” – more on that in a moment.

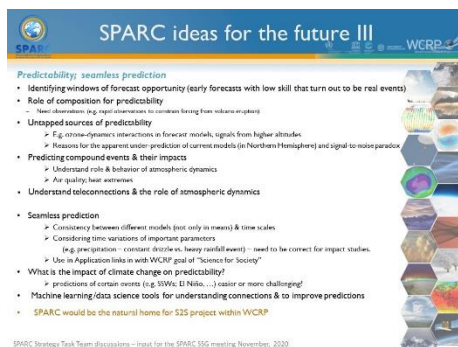


A bit more on detection and attribution of change. This is **important for policy makers and climate information for governments**. Of course, there is an **important role here for observations** (both, composition and dynamics), so sustaining data records, making sure that existing data sets are used effectively, and expanding their use in the community. This also links in to the expertise of data assimilation within SPARC. This also links in with other topics; whether or not geoengineering might come up in the future – there would be a very important role for observations, if that would be done. Another topic that is societally important is

compound events and their impacts, including composition extremes (e.g. air quality) and heat extremes. Here SPARC has expertise to tackle understanding the role of atmospheric dynamics in these events. Another emerging area is the **use of large ensembles and grand ensembles** for studying extreme events, looking at risk and attribution of events as well as understanding the role of model biases and internal variability on different time scales. The other point is **dynamical attribution**: Thinking about extreme seasons or months that might be related to specific atmospheric patterns. We will become more used to extreme event attribution (e.g. heat wave occurrences), but there is a clear role for atmospheric dynamics to be able to say: “that is a consequence of specific climatic conditions” (e.g. the Australian fires 2019/20 resulting from a strong Indian dipole influencing circulation patterns around Australia that fed into the risk of fires in that season). Here SPARC has a good amount of expertise that we could develop.



We had quite a bit of discussion around **geoengineering**. This is **written in the WCRP strategy** as one topic that they identify as needing strong scientific research to inform any discussions that take place. **SPARC has huge expertise in connecting composition and dynamics**, so there is a lot we can contribute. ccmi is already preparing runs for the upcoming Ozone Assessment to investigate the impact of geoengineering on Ozone recovery (that has been explicitly requested by the parties). We are aware that there are already community efforts going on, e.g. in CMIP, around the GeoMIP activity, which help to mobilise the community on radiation management. We need to think about how to collaborate with those groups and help to contribute our expertise.



On the topic of **predictability and seamless prediction**: The topics that were discussed here were things like: **Identifying windows of forecast opportunity** (what are key periods at which events are highly predictive and why?); the **role of composition for predictability** (linking to observations again: If a volcanic eruption were to go off tomorrow, we would need to have the observational network to characterise the forcing to incorporate that into our prediction systems). There need to be strong links between the observation and the predictability communities.

Untapped sources of predictability: there are many things to talk

about here, but most-recent is the issue of predicting the NAO. Clearly, the **SPARC expertise in dynamics has a lot of relevance to this topic**. **Compound events** come up here, again, as well as **teleconnections** and the **role of atmospheric dynamics**.

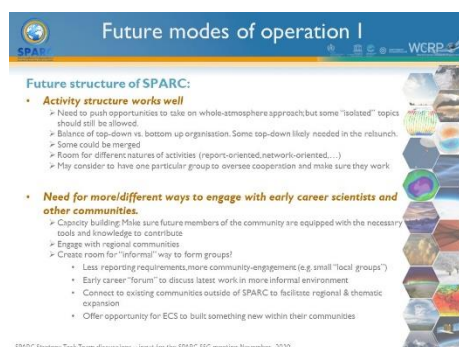
In terms of seamless prediction, discussion as around **consistency between models and across time scales**, considering how we are able to **predict the time-variations** (e.g. distinguishing between persistent drizzly conditions vs. heavy rainfall events) – again important for impacts. Obviously, there are applications here, that will **link into the WCRP goal of "Science for Society"**. **Impacts of climate change** need to be considered, and **new tools** like machine learning and data science applications, which are already being deployed for predictability studies. This is seen as an area that is going to grow substantially.

The links of SPARC to S2S are really successful and **SPARC provides a natural home for S2S in WCRP**, which is something we can continue to develop in the future.



This is now a summary of the **key points** that the task team has covered: **SPARC is positioned somewhat at the interface of the weather and climate community** – bridges between WCRP and WWRP gives us a unique position to lead on projects and science areas. We have a **strong community and success of reaching out beyond SPARC** to work with other groups. Those characteristics pave a good path for us in the future within the new WCRP structure to link with the other core projects and to link to the Light Houses.

The role of SPARC in terms of **facilitating good research within the community**, but also **advocating on behalf of the community** towards funding agencies or policy makers is very clear – SPARC has this role, and there are some ideas here, on the slide, how we can continue that in the future.



I want to finish by bringing up this point at the bottom of the slide about **engaging with Early Career Scientists** and other communities. It comes back to the issue about capacity building: **Ensuring that the future members of our community are equipped with the tools and knowledge to contribute and to develop as they move on in their careers**. There has been progress in recent years, and some successes in engaging with regional communities – particularly through activities like ACAM and others. We should continue to build on that. In the time of COVID, and this period of working from home there is a new discussion

about ways that we interact with each other – whether we have more informal ways for the community to come together (e.g. local groups or Early Career Forums). There is an idea of providing Early Career Scientists with an opportunity to develop something themselves from the bottom up within their communities. For example, there is a webinar series at the moment, on large ensembles, that has been set up by some early career scientists, and which is very successful. Those are activities that SPARC could support.



Future modes of operation II

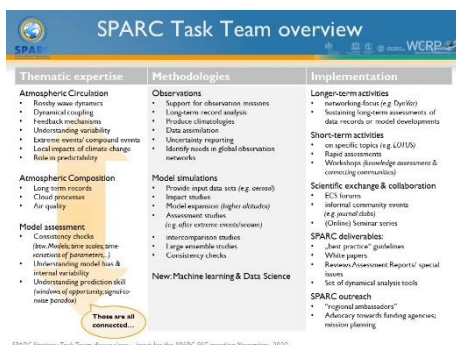
Future functions of SPARC:

- Facilitate scientific exchange & collaboration**
 - Practical workshops on specific topics
 - Cloud example: best practice in the field, system publications outcome of SPARC/STRAT/CRACK
 - Use case model runs on chemical impacts of geoengineering to connect to other geoengineering communities
 - Online seminars platform to share latest research results/informal workshops with no dedicated output
 - Write reviews (e.g. as workshop output)
 - Supports knowledge exchange in geoengineering/machine learning/cosmosky study tools and methods
 - Hosting code bases in style of, or cooperation with, Jupyter
 - Create a catalogue where you can find useful tools online as a (quality controlled) reference point for people looking for tools and diagnostics
- New forms of SPARC "products"**
 - Write guidance documents / white books
 - Conduct surveys to identify needs
 - Define guidelines of "best practices"
 - Reach out to society & policy makers (requires different forms of deliverables than for science community)
- What will be a good new name to reflect the "new" SPARC?**
 - Adding "troposphere" a few years ago did not prove very successful, people still think SPARC = "stratosphere"
 - Argument: Name based without a clear reason
 - Something "fiery"?

SPARC Strategy Task Team discussions – input for the SPARC SSG meeting, November, 2020

Due to time, please go back and look through these slides again.

We did discuss the name of SPARC: SPARC was renamed a couple of years ago, in connection to a transition to a more whole-atmosphere theme – the acronym was kept, but the “-troposphere” was added. The general perception is that this was not very successful in terms of changing the external perception of SPARC from being strictly stratospheric science to whole-atmosphere. There was strong support within the task team to think about the name again and looking at whether we should re-brand in some way and whether we should come up with some kind of “fiery” name to reflect what we do in SPARC.



SPARC Task Team overview

Thematic expertise	Methodologies	Implementation
Atmospheric Circulation <ul style="list-style-type: none"> Rosby wave dynamics Dynamical coupling Feedback mechanisms Understanding variability Extreme event compound events Local impacts of climate change Role in predictability 	Observations <ul style="list-style-type: none"> Support for observation missions Long-term record analysis Produce climatologies Data assimilation Uncertainty reporting Identify needs in global observation networks Model simulations <ul style="list-style-type: none"> Provide input data sets (e.g. aerosol) Impact studies Model experiments (higher altitudes) Assessment studies (e.g. after extreme events/seasons) Intercomparison studies Large ensemble studies Consistency checks New Machine learning & Data Science	Longer-term activities <ul style="list-style-type: none"> networking forum (e.g. Dynfor) Sustaining long-term assessments of data records or model developments Short-term activities <ul style="list-style-type: none"> on specific topics (e.g. LOTUS) Rapid assessments Workshops (knowledge assessment & connecting communities) Scientific exchange & collaboration <ul style="list-style-type: none"> ICOs forums Informal community events (e.g. journal clubs) Online/Summer series SPARC deliverables: <ul style="list-style-type: none"> “best practice” guidelines White papers Review/Assessment Reports/ special issues Set of dynamical analysis tools SPARC outreach <ul style="list-style-type: none"> “regional ambassadors” Advocacy towards funding agencies/mission planning

SPARC Strategy Task Team discussions – input for the SPARC SSG meeting, November, 2020

The final slide is a summary, to be left up for discussion. This tries to bring together the different thematic expertise we have discussed, the different methodological tools and the changes in the way that we work as a community that SPARC needs to be aware of and keep on top of. And then the implementation and the way we connect with other groups.

So, this will stay up as a summary slide, and I’m happy to take questions. Any points of clarification?

Q&A after presentation

Neil: I want to thank Amanda and her task team very much for doing that. It is an impressive bit of work; especially given the short notice, we gave her.

Mike: Re Early Career scientists I assume you would engage with YESS?

→ **Amanda:** Indeed, **we are connecting to YESS**. Shipra Jain is on the task team, and she is also involved with YESS. We are talking to Shipra about the issues I have raised about the Early Career Scientists.

Quentin: About renaming SPARC: I would be in favour of doing that, because WCRP acronyms of every working group/core projects/activities all have names defined decades ago; so currently is a good opportunity to rename all of them. For example, calling SPARC “atmospheric home” and CliC the “Cryospheric home”, ... something that is more readable from the outside.

→ **Neil:** We will come back to that later. [Not too seriously:] Personally, I think it should be “ARC” – that just shows the survival nature of what we are doing. – You can go in the ark and survive.

Sophie Godin-Beekmann: [chat message] For stratospheric ozone, we still need the whole atmospheric approach considering the use of total ozone data that includes tropospheric partial columns. So, a stronger link with the TOAR activity will be needed

→ **Seok-Woo:** [chat message] Agreed.

→ **Irina Petropavlovskikh:** [chat message] Is there a plan to connect with IGAC activities, and how it might be done? In LOTUS 2 we discussed collaboration with TOAR and found common area of interest through the use of the same datasets that link troposphere and stratosphere.

→ **Amanda:** [chat message] I think **growing the links with IGAC and TOAR will be key**. Also, scientifically, identifying science topics to bring together the SPARC and IGAC communities around.

Mike: [chat message] The Polar Climate Predictability Initiative is joint between CliC and SPARC, but perhaps this group hasn't been very active.... Also, strong connections to the Arctic Council's AMAP group

Mike: [chat message]: I have a general question **re interactions with GAW**.... for instance, with ozone ... Is there potential to do more together?

→ **Neil:** [chat message]: I agreed to discuss with Greg (Carmichael, chair of GAW) after this Task Team had produced their preliminary ideas.

🐼 **Mike:** [chat message]: Re **Regional Ambassadors** there may be a connection to the WCRP regional consultations (and the Climate Research Forums that are planned to come out of this...)

→ **Mareike (IPO):** [chat message]: I have this in mind, also to see what will be done in the regional home and science for society LH... That's probably all interacting somehow...

4) Open discussion on the future of SPARC (I)

Session lead: Seok-Woo Son

🐼 **Seok-Woo:** This is the start of the open discussion, which according to the agenda is split in two sessions. This first session will focus on the structure of SPARC, and the next session will focus on emerging ideas. Amanda's presentation is a great starting point for the open discussion. While this is a very nice and comprehensive view of the task team, **this is not the final form of the work of the task team. It will keep working on the SPARC strategy for the next few months.** So, in this meeting SSG members and activity leads can give comments and feedback to the task team – that is the starting point of the discussion. There are already a couple of questions from the last session and posted during the break.

→ **Amanda:** [chat message] Thanks, Seok-Woo, yes this is very much an interim report. We welcome feedback from the SSG and Activity leads

🐼 **Quentin:** **Machine learning** was mentioned to be a SPARC activity at some point. I am wondering if it would be better to have it in the model home?

→ **Amanda:** It is not about having a specific activity exclusively on machine learning, but rather **recognising machine learning and data science methods as becoming increasingly applied** across a whole range of science areas. The given examples are on predictability and prediction, but of course there are other applications emerging. SPARC could take a leadership not only by supporting the science areas, where these new techniques are being applied, but also **how we, as a community, work and use tools; share code... facilitate our own research.** We could think about whether SPARC would be positioned to endorse the sharing of tools – that might be around machine learning, for instance.

I agree that **machine learning will be part of other pillars of WCRP;** the modelling and observations home, but also in the "Digital Earths" light house. But the recognition was that for the SPARC science topics these tools are becoming increasingly used and are demonstrated to have powerful applications in some cases. **SPARC needs to be agile and responsive to those changes in how we do our research.**

→ **Andrew Charlton-Perez:** One important point about machine learning is that there is a **distinction between using machine learning for understanding and using it for improvement of skill.** I think a clear angle for SPARC would be to use machine learning for understanding the complex models and complex problems we are all interested in

→ **Scott Osprey:** [chat message] New techniques must show success in their applications. They must show clear and new applications for pursuing our science.

→ **Amanda:** I agree, it relates to Andrew's comment: it depends to which extend those approaches may or may not help us improve our understanding. Obviously, there are a lot of scientific questions to address there, and it was felt that SPARC could play some role in that.

→ **Seok-Woo:** SPARC is supposed to address all the lighthouse activities. Even if machine learning is very technical, that could be one component of the light house activities. Presumably, SPARC needs to have some recognition of the application to climate science, focussing on atmospheric processes. It is a new topic, but does not need to be an independent SPARC activity.

→ **Viktoria Sofieva:** I also support this. Machine learning is an emerging methodology and can be used when it is useful and important. The main questions will be the scientific questions, not machine learning only as methodology.

→ **Participant:** I agree that it is important to include machine learning and take it as a methodology which will be an important part of how we take models and observations for understanding. It may take very different forms. **There are opportunities, for instance in gravity wave research to use it and lead some of the exploration work on how to use it, both for understanding but also how to improve our models.** It should definitely be on our radars.

→ **Scott:** [chat message] perhaps machine learning approaches need to show their application through existing projects (e.g. Gravity Waves). Then we can better understand likely advances.

🐼 **Neil:** **CEDA** are on this call. We should be **rethinking how we want the relationship with them to be in the future**. They have contacted us about moving ahead. Charlotte Pascoe may want to say something on what they are planning to do; not only being a data base, but providing some degrees of computation as part of the data base.

🐼 **Seok-Woo:** At the beginning of the session Irina raised the topic of **collaboration with other projects**, like IGAC. Amanda already mentioned that collaboration with other projects will be strengthened (within and outside of WCRP). We need more discussion how this can work.

➔ **Amanda:** Specifically, on the collaboration with IGAC: We have **several representatives from IGAC at the task team**, which was intentional. That has been useful so far, even though there is more to discuss. There is some thinking needed around how SPARC could evolve into more tropospheric composition-related work – historically IGAC is the home of tropospheric chemistry. The areas that we are seeing for closer work is around the **links of composition into climate**, where SPARC has significant expertise. There was an effort a couple of years ago to start an activity on short-lived climate forcers, which links the composition and climate very strongly. At that time other factors (including MIP work) prevented this activity from getting off the ground. But that is an area where there could be a **nice link from SPARC's expertise with IGAC on tropospheric chemistry processes** (composition effects on climate, radiative forcing, regional climate change)

➔ **Seok Woo:** Thanks. Hiroshi Tanimoto (IGAC co-chair, who joined the SPARC task team) mentioned scientific collaboration as well as some sort of training schools. By **holding training schools together**, especially for early career scientists, we could maybe strengthen the connection between SPARC and IGAC. But that could also be applicable to other projects.

➔ **Amanda:** Yes. Hiroshi brought up the SOLAS summer school as an example, which brought together Ocean and atmosphere communities and helped to train the next generation scientists with this interdisciplinary aspect. I agree that there is potential to think about something similar for SPARC and IGAC.

➔ **Participant:** **In the task team it seemed obvious that SPARC could be the natural home for S2S in WCRP**, but I don't know if we actually thought about what that actually means in practice. So far, we have SNAP, which is very successful, but pretty narrowly focussed. If we do want to become the new home for S2S, in practice, what are we going to do? Are going to spin up new activities? How to strengthen the ties to WWRP? I think S2S is one of their pillars. We **might need more thought on what we might actually have to do to make SPARC the home of S2S in WCRP**.

➔ **Seok-Woo:** Obviously that is a possibility. SPARC does not need to be the home, but we can still take the lead.

➔ **Daniela Domeisen:** *[chat message]* for S2S, I'm on the S2S steering group, happy to bring this up and get the discussion started. <http://s2sprediction.net/static/people>. Maybe Andrew CP is interested in helping?

➔ **Andrew:** *[chat message]* @Daniela - very happy to help if I can

➔ **Mike:** *[chat message]* S2S also covers ocean etc. now. S2S is jointly sponsored by WCRP and WWRP

➔ **Participant:** On Mike's comment: As far as I know, S2S does not report to WCRP in a very meaningful fashion. The home of S2S is really WWRP. That might be because of the strong tie to the operational centres. That's really the heart of S2S. Developing operational seasonal prediction. We may need to work on a better establishment of S2S within WCRP, and SPARC seems to be the place to make this happen.

➔ **Mike:** *[chat message]* S2S reports to WCRP JSC directly....in the same way as to WWRP SSC

➔ **Chaim Garfinkel:** Both the S2S project and the seasonal prediction project have subgroups on some of the topics already mentioned, Rossby waves, teleconnections, ENSO, MJO and those kinds of tropospheric teleconnections. I'm not part of that and don't know what they are actually doing. But groups already exist. So, the question might be how to connect to those groups. Bringing them into the SPARC tent would be desirable.

➔ **Seok-Woo:** The SNAP chair can propose new issues to S2S.

➔ **Chaim:** There could be a stratosphere sub-project, as well as Ocean, Land ... We would be the stratosphere part, although we could also look at other things. The real question is: groups already exist. Should SPARC liaison to these groups, or could they be just independent, as they are now?

➔ **Participant:** To comment on the subprojects: S2S just had its annual meeting 2 or 3 weeks ago. I think there is a push by the co-chairs, Frederic Vitart and Andrew Robertson: one of the most **important things that can happen in the project is that the database gets used**. There are the hindcasts from the contributing

models and the real-time hindcasts. Some projects are tightly tied to the database. So other, more focussed on dynamics (e.g. MJO teleconnections) report almost no usage of the database. They are more like a “standard” SPARC project: People use a whole variety of data and models. There is quite a variety of S2S projects.

The Ocean project I’m involved with is interesting, as we did not have the Ocean output before. This is an emergent area. By now, almost exclusively coupled models are used for sub-seasonal prediction, but nobody has really done anything with the Ocean output. Currently it is about getting the data in the database and coordinate some of the obvious work that needs to be done with this essentially new resource.

Not sure, how much SPARC needs to do. SNAP has clearly embraced S2S, but there are other subprojects (teleconnections, extremes, verification, ensemble generation) ...

- **Mike:** *[chat message]* Closer connections with S2S I would totally agree with, but S2S is broader than SPARC....
- **Daniela** *[audio problems, therefore as chat message]* I'll write the summary here instead: the S2S project has grown significantly, and has several sub-projects, including the stratosphere (led by Andrew CP) and machine learning. So, I think it might be a joint operation rather than an integration
<http://s2sprediction.net/#> showing the sub-projects
- **Mike:** *[chat message]* Land, Ocean, Stratosphere, Ensembles, Machine Learning.... etc.
- **Seok-Woo:** I understand that S2S is quite a big project. We could also work with other WWRP projects, e.g. the polar prediction project and extreme prediction project, both within WWRP.
- **Neil:** *[chat message]* It is important to maintain a strong link with WWRP apart from S2S. SPARC should be open to all opportunities to collaborate.
- **Mike:** *[chat message]* Agree with collaboration with WWRP...
- **Scott Osprey:** *[chat message]* We should not lose sight of what has made SPARC a success in the past: unifying and cross-cutting themes.
- **Seok-Woo:** On the topic of composition: David Plummer mentioned the ccmi project.
- **David Plummer:** *[chat message]* I think very high on CCMI list of priorities is looking deeper into the methane lifetimes in models and we have had discussions with some of the people involved in AerChemMIP - as well as some work that has come out of CCMI-I. And while we do not have any formal links to TOAR, Martin Schultz was at the CCMI 2019 workshop and presented TOAR so we are very aware of each other. On the aerosol side, it is more complicated. Aerocom is a long running and very successful (IMO) activity that brings together aerosol models.
- **Seok-Woo:** So, the bottom-line is ccmi is very active in collaborations with other programs. And we need to strengthen our collaborations with other projects – that’s one of the key points in WCRP.

☛ **Sophie Godin-Beekmann:** *[chat message]* Looking at Implementation on the slide, I would like to add that we need a SPARC depository of data products that are produced by the activities, as well as the SPARC “labelled” tools that were produced, such as for instance trend models, and tutorials for the use of these models.

- **Amanda:** *[chat message]* thanks, good suggestion.
 That is something we can take up in the discussion with CEDA

☛ **Seok-Woo:** Another topic from the task team talk is: **geoengineering**. I understand there was a lot of discussion on this topic within the task team. Are there comments from SSG members?

- **Karen Rosenlof:** It was already mentioned that ccmi is doing runs for the Ozone Assessment. So, the topic of geoengineering has been requested by the Montreal Protocol parties to be included in the next Ozone assessment. It might be useful for SPARC to have committee to help provide input to the Ozone Assessment regarding geoengineering. This is about stratospheric aerosol injection and how it affects chemistry. But geoengineering really is huge topic, really WCRP overarching, but SPARC can make a contribution to what the Ozone Assessment is looking for.

Currently there are a lot of things going on internationally: A national academies report looking on research needs and government needs, some reports a few years ago on societal considerations...

SPARC may not be able to cover geoengineering as a whole, but there might be niches that SPARC can address.

- **Seok Woo:** People understand it is a very big topic that SPARC alone cannot address. But the point is: we need to address the issue and in the coming months the task team will further develop a plan how SPARC can contribute.

- **Amanda:** We were really focussing on the solar radiation management aspect. There is SSiRC within SPARC with a lot of expertise on stratospheric aerosol, there is expertise on stratosphere-troposphere coupling – **there is already a lot of relevant expertise within SPARC**. An important question will be: How to reach out to and interact with already existing groups. As said in the presentation: **observational needs** (in case geoengineering is attempted) are important here, too.
- **Mike:** *[chat message]* Agree SPARC would make a useful and key contribution to Geoengineering
- **Mareike (IPO):** *[chat message]* The task team agreed to name the science topic Geoengineering: Solar Radiation management
- **Neil:** This might be picked up by the “Safe landing climates” light house on a broader level. SPARC needs to be working out what it contributes to that. Solar radiation management is certainly the main topic. An important SPARC topic would be **dynamical response: regional changes due to geoengineering efforts**. This will be an important question for policy makers, as we approach more dangerous levels of climate change. At some point WCRP needs to have some answers (yes/no/maybe) on different suggestions.
- **Mike:** *[chat message]* A good question to JSC meeting is how to handle the Geoengineering issue... Could be in the Lighthouse activity as Neil suggests... There are other groups such as GESAMP (www.gesamp.org) working on this
- **David Plummer:** *[chat message]* There is a proposal for a geoengineering (led by Simone Tilmes) simulation to support WMO (2022) as there is a chapter in the 2022 report devoted to geoengineering. This experiment is very focused on the stratospheric response, using constrained SSTs/sea-ice.
- **Irina Petropavlovskikh:** *[chat message]* Both LOTUS and OCTAV can contribute to geoengineering through trend analyses

🐼 **Seok-Woo:** We also need to talk about attribution and detection. I like the “dynamical attribution” aspect. SPARC has been working on topics like this, but we have not highlighted these issues. This is an important topic, especially in the “new” WCRP.

→ *[no further comments on this topic]*

🐼 **Seok-Woo:** SPARC structure: **Does SPARC need to change the structure?** SPARC has a different structure from other core projects; CLIVAR and GEWEX have research panels. We could consider if that is good or not.

- **Hauke Schmidt:** I was part of the task team, and all comments that were made there were in favour of keeping the activity structure. And I agree. However, with SPARC becoming broader and covering the whole atmosphere that might not be easily sustainable. **Some comments were that there might be too many activities already, having more due to including more topics would not be sustainable anymore.**
- **Seok-Woo:** At the moment, most SPARC activities do not directly address the possible light house activities. That is the reason we may need to address the structure. I personally like the bottom-up approach that strengthens the SPARC community. **We may need something specific for addressing the light house activities.**
- **Andrea Steiner:** *[chat message]* streamline activities along research themes
- **Neil:** Similar to Andrea’s comment: There is a lot of support for the bottom-up structure. **Now is a good time to reflect: Do we need all the activities we have got? And are they addressing what we consider the interesting future science questions?** With fixed budget and the amount of effort available from the people within SPARC we do have to prioritize, so we do have to think about some streamlining or re-structuring. That would be the SSG’s responsibility, taking in any comments from the Task Team. **Rationalising (rather than streamlining) the structure would help us address the issues.** Example: ccmi at the moment is “the tropospheric composition” activity within SPARC. It currently has three themes and the model comparisons. Is that the right way to structure it? Or should it be spawning composition activities (with limited lifetimes) like some of the dynamics activities do? I think we can restructure, and should not get too tied up to our names.
- **Participant:** *[chat message]* efforts from activity leaders to discuss enhancing collaboration, or even merging / reorganizing some activities (some topics are quite connected...) and on a timescale of a couple of years evolve to new activities more structured around the lighthouse activities... such efforts are welcome I suppose

5) Open discussion on the future of SPARC (II)

Session lead: Neil Harris

🐼 **Neil:** I'd like to start with the **future of the Grand Challenges (GCs)**. We still need to identify topics that relate to SPARC.

→ **Amanda:** Many of the topics we have identified with the task team relate to the Grand Challenges, so this is an opportunity to see where their work fits in with SPARC science in the future.

[Clouds, circulation and climate sensitivity](#) is one that is related to tropospheric processes and dynamics. [Near-term predictions](#) and [weather and climate extremes](#) also fit. **The winding-down of the GCs offers a potential for SPARC to take on some of those topics.** It would be good to get perspectives from the SSG and the activities on that.

→ **Neil:** After the meeting we will ask for further comments, once people had a chance to think through the presented plan. I would not want to have a decision, saying “everything just goes into [DynVar] – that’s where we need to think about the structure: **If we take on a certain science question, how can we structure that well?**”

I think the climate sensitivity one is very important, because of the forcing contribution, which is primarily atmospheric.

→ **Amanda:** *[chat message]* Our perspective in the task team are there are topics like cloud-circulation coupling (both tropics and extratropics), stationary waves etc which could be taken up in SPARC more explicitly

🐼 **Neil:** The task team presented various ideas of “Regional Ambassadors” and **diversity and linking in with early career scientists**. That has to happen, because of two reasons: 1) **to train the best scientists who are available to work on the problem** and 2) **to reflect the changing interest a lot of the younger scientists have.** On top of that there are interests from other groups – SPARC does not have natural links into large parts of the world. This may change with taking on more tropospheric topics (composition, including air quality; working together with IGAC & GAW) There will be some natural development through the regional working groups IGAC has, if we can link to them.

→ **Andrew Charlton-Perez:** Will be **one of the co-chairs of the Academy Lighthouse**. My vision for what WCRP can do very well here is to act as a “marketplace” for the training that needs to happen and the people who could provide that training. That seems a missing piece at the moment. Hoping that the Academy will help SPARC connect with communities they would not normally connect to. The academy will work to actively find out what it is that people need training in and connect end-users with training providers.

→ **Neil:** SPARC did a [capacity building plan](#) a couple of years ago, but it did not work well, because many issues were pan-WCRP. It may still be worth re-visiting.

→ **Andrew:** *[chat message]* One idea is for SPARC to have a **small 'seed funding' pot for ECSs to design interesting new initiatives.** Open call each year?

→ **Amanda:** *[chat message]* yes having some funding behind it would be great

→ **Andrew:** *[chat message]* Things like a webinar series take very little funding, but some small amount of support can facilitate them happening; Where support = funding + admin

→ **Amanda:** *[chat message]* agree, this is something Mareike could hopefully help with

→ **Mareike (IPO):** *[chat message]* that might come back to the question of funding... ;-) But yes, I agree that sounds like a good idea. Need to be **careful to not increase the workloads of the offices** (any, really) with those ideas. WCRP might have to think about additional staff, here and a **centralised platform**, which may increase visibility of such initiatives, too

→ **Seok-Woo:** *[chat message]* SPARC could have **ECS representatives** - IUGG is doing this

→ **Andrew:** *[chat message]* Key aspect: seed funding doesn't come with expectations longevity/reporting. It's a quick-win, get going and then see what happens kind of thing

→ **Amanda:** *[chat message]* Given the ambitions of the new WCRP strategy is there any prospect of a budget boost to deliver the plans? Or is it just more for less?

→ **Amanda:** In the task team we recognised that for many of us SPARC has had an important role in our personal career developments, often described as: **“having grown up in SPARC”**. Early Career Scientist

feedback (e.g. after a GA or workshops) is always very positive: That it is a good way to communicate and engage with the community. Now, in these times of working at home we thought about new ways to interact, and ECS could develop new types of interactions within SPARC that don't necessarily fall within the traditional structures, but may complement the activity structure and link across. For Example: Alison Ming runs a journal club that grew out of a DynVar/SNAP meeting or the [SMILE](#) webinar series (outside SPARC) successfully run by early career scientists.

We would like to **give ECS an opportunity to create new things within SPARC and encourage them to organise themselves in new ways.**

- ➔ **Neil:** Our experience with YESS is that it tended to focus on organisational issues, so we should do our best to encourage on the scientific topics and overall aims.

👤 **Neil:** I would like David Plummer to talk about ccmi more; rather than posting about it in the chat. Would be good to hear his view more. Please comment on the **composition, particularly in the troposphere.**

- ➔ **David Plummer:** *[chat message]* From the top-down I can see lots of reasons to think that CCMI is trying to cover too broad of a subject area. But looking from the bottom up it is the same modelling groups that have to come together to produce the simulations. We are trying to move away from the large century-long like the kind produced for CCMI-I and that needs to be part of the evolution of CCMI if we are going to address a larger range of issues.

- ➔ **David:** ccmi has SSC members that are stratosphere-focussed and some that are very troposphere-focused, e.g. Amos Tai, who is interested in biosphere-atmosphere interactions. He is patiently waiting for the Ozone Assessment simulations to be done... He has some interests, that ccmi at the moment does not have space for. So, from top-down perspective, ccmi is a place of different scientists to come together and work at some science topics. But looking from bottom-up: **If you want to propose a new experiment, there are a lot of complaints about the requested resources. We regularly come back to the same modelling groups to do the work, due to the limited number of groups in the world.**

Ccmi has discussed a real phase-II to discuss scientific questions and going into a different direction. That was interrupted by the Ozone Assessment request – but we want to come back to that. We want to develop a new set of questions and a new way of working. Ccmi-I was a set of century-scale simulations from 1950 to 2100; data request was onerous – modelling groups tried to address as much as they could, but a lot of things fell off the table because of the large data request. As a result, for particular requested quantities there was poor representation across the groups. The new approach needs to be more targeted at particular questions.

Maybe that fits into the idea that ccmi tries to address too broad of a question, and maybe there should be more autonomous working groups to organise the chemistry-climate modelling community – there has to be more organisation to it, since you always come back to the same modelling groups with requests, independent from the individual focus of the science topic.

- ➔ **Neil:** Your point about being diverted raises the question whether the structure is completely right. – It might be good to have a small group that does not get diverted. Ideas like looking into the Methane lifetime always keep being pushed back. So, could we evolve the structure of ccmi to put less emphasis on the models for assessments, and focus more on other science? It does not need to be another activity, could be within ccmi. **If the task team could look at this, that could be valuable.**

👤 **Neil:** Coming back on **GAW:** I've had some discussions with them, but they are organising themselves, so it's hard to exchange plans. We **should involve them more in the next step.** Try to identify scientists involved in GAW, who could contribute the same way as the IGAC scientists are. I'm happy to lead on that and talk to Greg Carmichael (chair of GAW) – he knows the background and won't be upset about not being involved so far.

- ➔ **Amanda:** *[chat message]* Thanks, Neil. Yes, would be good to have GAW input.

6) Wrap-up & Summary

SPARC SSG co-chairs Seok-Woo Son and Neil Harris

🐼 **Neil:** I would like to go around the table and ask everyone to comment on a) what they have heard. Whether you support this, etc. and b) the name. This discussion can go on not only for minutes or hours, but really for months. So, I'd like people to just say "yes" or "no" to changing the name. But please focus on the plans, and whether there are missing topics.

→ **Nathaniel Livesey:** *[chat message]* Months may be optimistic

→ **Amanda:** *[chat message]* It would be interesting to know if people think there are key science topics that we have not discussed.

→ **Andrea:** Agree on changing the name, the suggestion was good (ARC). I'm not missing topics, but we have to decide what the main topics are and how they connect to the Light House Activities. We should think about reorganising around those main topics.

→ **Daniela:** In favour of changing name. We should be seen as a new thing. Two points to comment on: 1) Diversity: Increasing diversity will be crucial for expertise as well as for regions. I like the webinar discussion from the chat. There are a lot of examples of young communities that started with webinars and this helps young scientists to get involved. 2) Guidance from the SSG on the S2S would be welcome, I'm happy to help (with Andrew's help) to connect to the S2S community.

→ **Neil:** On S2S: That's a topic we need to address at the JSC meeting. If you raise it internally within S2S that would help. Last time I spoke to Andrew Robertson, he was not sure where S2S was going, just that it would keep working. We need clarification for the way ahead.

→ **Chaim:** Work on Extremes as well as on large-scale effects on small-scales are within SPARC science (e.g. in DynVar). There is a community already. Those people can keep doing what they are doing already. Also, focussing more on these topics feeds into the Light House Activities.

→ **Neil:** Yes, a key question for all of us is working out what we do, once it is clear what roles WCRP and SPARC within it are playing. That's about the international collaboration.

→ **Hauke:** Yes, on the name change. Agree with Andrea that "ARC" sounds good. Comment on revisiting activity structure: We are all aware that the success of any activity comes with the people involved. So, in a more top-down approach, we always need to think whether there are people, who are willing to tackle the topics we identified as important, and how to reach out to those people.

→ **Neil:** A question will be, whether we can restructure to look more welcoming to those people, feeling they fit into SPARC. That should be the guiding principle in forming the new structure rather than it looking nice on paper.

→ **Karen:** Fine with changing the name. Please consider how the whole-atmosphere theme fits in with CLIVAR, that also has a lot of atmospheric themes. We may need to start more close relationships there. I would not want to see middle-atmosphere and stratosphere topics becoming smaller for the sake of including troposphere. On Early Career Scientists: As Activity lead I have seen funds becoming smaller. I like the idea of webinar series to engage with ECS without them needing funding.

→ **Mike:** *[chat message]* I can't give figures now but we have had some success in fund raising. I am working with the JSC Chairs on the next years budgets... We can confirm more next month. More involvement with SPARC, fantastic. S2S reports directly to WWRP and WCRP steering committees and will be part of new modelling and observations "home"
Agree with all comments on the need for diversity.

→ **Viktoria:** More cautious about changing name. Make sure we don't use our identity.

→ **Quentin:** Yes, on the name change. Find some consistency between WCRP pillars. E.g. If we are "ARC" Ocean should be "ORC" ...

→ **Tercio:** No comments. Changing the name would be a good idea. Having the name reflect the broader science would be good

→ **Wen Chen:** Good idea to change the name. Also think about including near-space and upper atmosphere in the whole-atmosphere approach.

→ **Scott:** If we are going to change the name, we will need more consultation. The name should represent those that are doing the science for SPARC, not just where we want to be, but also where we are at the moment. We may first try to bring in new groups, then take a look at where we are and choose a name to

- represent this community. Changing the name and identity with a community staying the same does not make sense. I'm in favour of a full consultation on changing the name.
- **Amanda:** *[chat message]* @Scott: absolutely we can't alienate the strong community within SPARC, but we also need to adapt to the changes in WCRP
 - **Mike:** *[chat message]* Name Change: Agree with comment that it would be good to see what comes out of discussions at JSC meeting end of this month... needs to be consistency.
 - **Seok-Woo:** "SPARC" is well-recognised in the community, but we should emphasise the whole-atmosphere in the new name, not just "atmosphere"
 - **Amy Butler:** *[chat message]* I support a name change (I like ARC), but agree with comments that we need to make sure we have focused topics so that things don't get too broad to actually accomplish anything... Smaller focused groups/themes can work really well to achieve specific deliverables.
 - **Alexey Karpechko:** *[chat message]* Yes to the name change! Concerning SPARC outreach, regional ambassadors is good idea, but the difficulty maybe more not in lack of information about SPARC but in lack of possibilities to work on fundamental science problems represented by SPARC... ...Getting more to applied problems, like "My climate risks" lighthouse may be good way to reach to more people.
 - **Daniela:** *[chat message]* "WARC" for whole atmosphere, but "ARC" is more elegant
 - **Seok-Woo:** *[chat message]* WPARC? not sure...
 - **Nathaniel:** I'm neutral on the name, with some reluctance to change. It seems to be trying to connect to everything to maintain relevance. We may need to focus more on our strengths.
 - **Neil:** On groups to be involved with: We have already been strongly involved with IGAC and want to strengthen this. Other connections would go through other structures, such as the lighthouses.
 - **Amanda:** *[chat message]* @Nathaniel: we haven't progressed enough to what might become future activities and where there might be opportunities for SPARC to contribute to the LHAs. The LHAs are still very early days
 - **Nili:** I agree with Seok-Woo on name. Think about it before changing, and if changing it, then have "whole atmosphere" in it. I'm open to changing. There was a question whether Chaim or I have thoughts about new topics for SPARC. I think for the stationary waves - topic, stratospheric scientists have to be involved. Not sure what "SPARC taking it on" really means.
 - **Amanda:** Some of the topics from the task team were more directly tropospheric than SPARC has done before. We were thinking about ways to engage with the tropospheric dynamics community to connect SPARC to those more whole-atmosphere topics. Winding down of the GCs gives SPARC opportunity to engage with those communities.
 - **Nili:** *[chat message]* I have to leave for another meeting also forgot to say I like the SPARC webinar idea. Amanda- thanks for your clarification- we can discuss more via email
 - **CEDA Representative:** There seems to be a problem with data sets that are not used much. CEDA might be able to help: For IPCC CEDA publishes the data sets that are in the Assessment report (small data sets of the plotted data) those could be linked to the larger data sets, and this could be done for ccma data sets as well.
 - **Neil:** This should be discussed in the task team. Might be useful for other activities, too. Renewing the agreement with CEDA has come up, and this will be part of the discussion.
 - **Amanda:** *[chat message]* @Charlotte: this is excellent and very good that IPCC is moving towards greater traceability. Not sure if this is something the WMO Assessments are thinking of too.
 - **Participant:** Generally, I'm reluctant about changing the name. But in present case I find it timely and fits to the reorganisation of WCRP. It needs to be considered on the scale including other core projects. I retain the idea about evolving activities, and see where more collaborations are possible. We will think about this for gravity waves.
 - **Takeshi:** I'm neutral on the name change, but agree with Seok-Woo's view. On Early Career scientists: I like the ideas presented. Maybe SPARC can host a series of Early Career Workshops organised by Early Career Scientists, and broadcast online for the whole SPARC community.
On Geoengineering: Not sure what the state-of-the art understanding is on the ocean acidification, which cannot be solved by increasing albedo by aerosol injection. We would need collaborations beyond SPARC and the atmospheric sciences.
 - **Neil:** Please keep on raising this point, so we keep thinking on it.

🗣️ **Neil:** To wrap up: We will send an email asking everyone for further thoughts. We will use this input on coming meetings, using input after digesting the talks from today and what you have heard. There will be a talk based on what Amanda has shown, at the JSC to show what we are doing. We will update from this discussion, but this will not be a huge modification.

Thank you all for your time!

Feedback on how the strategy is developing is important. Further feedback on the meeting format is welcome.