S-RIP activities in 2018

Masatomo Fujiwara[1], Gloria Manney[2,3], Lesley Gray[4,5], Jonathon Wright[6], and Sean Davis[7]

[1]Hokkaido University, Japan, (**fuji@ees.hokudai.ac.jp**), [2]NorthWest Research Associates, USA, [3]New Mexico Institute of Mining and Technology, USA, [4]University of Oxford, UK, [5]NERC National Centre for Atmospheric Science, UK, [6]Tsinghua University, Beijing, China, [7]NOAA Earth System Research Laboratory, USA.

Dates:
25 - 29 June 2018
&
5 October 2018

Organisers (chapter-lead meeting):
Masatomo Fujiwara (Hokkaido University, Japan), Gloria Manney (NorthWest Research Associates; New Mexico Institute of Mining and Technology, USA), Lesley Gray (University of Oxford; NERC National Centre for Atmospheric Science, UK), Jonathon Wright (Tsinghua University, Beijing, China), Sean Davis (NOAA Earth System Research Laboratory, USA)

Host Institution:
NorthWest Research Associates (NWRA), Boulder, CO, USA
&
General Assembly side meeting
at Miyakomesse in Okazaki, Kyoto, Japan

Number Of Participants: **~20 & ~25**

Sponsors:

SPARC Stratosphere-troposphere Processes And their Role in Climate
WCRP World Climate Research Programme
NWRA NorthWest Research Associates Excellence in Basic & Applied Research
(chapter-lead meeting)

Activity Website:
http://s-rip.ees.hokudai.ac.jp/

We have made excellent progress towards completion of the S-RIP report in this past year, and would like to say a big 'thank-you' to all our chapter-leads and contributors for their hard work – we are almost there! As of writing this article, in mid-November 2018, we are finalising the full S-RIP report manuscript ready for review submission, with plans for publication by the end of 2019 following the review process and necessary copy-editing.

In 2018, there were two meetings of the SPARC Reanalysis Intercomparison Project (S-RIP, **https://s-rip.ees.hokudai.ac.jp**): (1) the S-RIP chapter-lead meeting hosted by and held at the NorthWest Research Associates (NWRA), Boulder, USA during 25-29 June 2018 (organised by the authors of this article); and (2) the side-meeting on 5 October 2018 during the SPARC General Assembly (GA) in Kyoto, Japan. There were several S-RIP related publications in 2018 (see, *e.g.*, the inter-journal special issue on "The SPARC Reanalysis Intercomparison Project (S-RIP)" in Atmospheric Chemistry and Physics (ACP) and Earth System Science Data (ESSD)). One key publication was by Martineau *et al.* (2018), who presented S-RIP zonal mean data sets based on various reanalysis products. The aim of S-RIP had originally been to publish an interim report before the full report in the SPARC report series; it has been decided that, because there are three overview papers already published in ACP (Fujiwara *et al.*, 2017; Long *et al.*, 2017; Davis *et al.*, 2017) that can be regarded as an interim activity report, the interim report would have been needless duplication.

S-RIP Chapter-lead Meeting

There were ~20 participants at the meeting, including 14 chapter co-leads and 2 reanalysis-centre representatives (Figure 6). The first three days consisted of presentations on the status and potential issues for Chapters 1-11 (Figure 7), and general discussion on the content of Chapter 12 (Synthesis Summary). The rest of the week was set aside for break-out sessions for individual chapters.

Figure 6: *Participants at the S-RIP Chapter-lead Meeting at the NorthWest Research Associates (NWRA), Boulder, USA, 25-29 June 2018.*

One of the important decisions during the general discussion was to include a table of recommendations, evaluations, and ratings for selected diagnostics for all reanalysis products at the end of each chapter and in Chapter 12. The following five ratings have been defined: (1) Demonstrated suitable (*i.e.*, the reanalysis product could be directly validated using observational or physical constraints and was found to be in close agreement with expectations); (2) suitable with limitations (*i.e.*, the reanalysis product could be directly validated using observational or physical constraints and exhibited limited agreement; or, suitable constraints were unavailable but reanalysis products were consistent beyond specific limitations as described in the text); (3) use with caution (*i.e.*, the reanalysis system contains all elements necessary to provide a useful representation of this variable or process, but that representation has evident red flags); (4) demonstrated unsuitable (*i.e.*, the reanalysis system is unable to represent processes that are key for this diagnostic); and (5) unevaluated (not examined).

S-RIP Side Meeting at the SPARC General Assembly

The S-RIP side meeting was held during lunchtime on the final day of the SPARC GA. There were ~25 participants including 10 chapter co-leads and 4 reanalysis centre representatives. After an overview of past S-RIP activities including the results from the S-RIP chapter-lead meeting, most of the time was spent on the discussion of potential future activities of the S-RIP after the publication of the S-RIP Report (*i.e.*, in 2020 and beyond).

Several planned new reanalysis products are expected in the coming years: ERA5 (1950-present will be available by the end of 2019), a Chinese reanalysis CRA-40 (probably around 2020), "MERRA-3" (around 2021), JRA-3Q (in 2022), and CFSv3 (around 2020-22). Therefore, it may be reasonable to re-start the full activity around 2022. During 2020-2021, we will keep the S-RIP website up-to-date and maintain a scaled-down formal group to monitor, communicate, and coordinate S-RIP-related activities; it is also noted that Masatomo Fujiwara will continue to be a part of the WCRP Task Team for Intercomparison of ReAnalyses (TIRA, **https://reanalyses.org/atmosphere/wcrp-task-team-intercomparison-reanalyses-tira**) as the liaison of S-RIP and SPARC. We will also seek more direct connections with the modelling (*e.g.* CCMI, CMIP) and observational (*e.g.* NDACC) communities by organizing side meetings or sessions with an S-RIP focus. There was also a request to hold capacity-building type regional

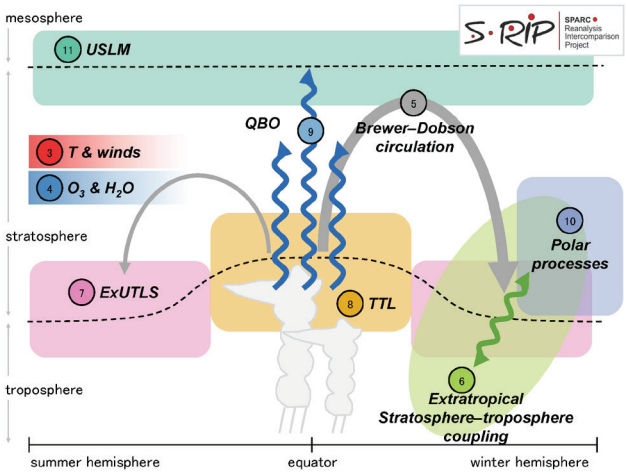

Figure 7: *The latest version of the S-RIP schematic illustration showing the processes and regions that will be covered by chapters in the planned S-RIP report. The number indicates the chapter number. Other chapters include the Introduction (Chap. 1), Description of the Reanalysis Systems (Chap. 2), and Synthesis Summary (Chap. 12). Revised from Figure 1 of Fujiwara et al. (2017).*

workshops, *e.g.*, in India. During the Scientific Steering Group (SSG) meeting that followed the GA, there were some suggestions for new diagnostics such as the Madden-Julian Oscillation, including its interaction with the stratosphere; tropospheric circulations; and weather systems (*e.g.*, storm track, blocking, extremes, and other near-surface weather features). There is as yet no fixed plan for the period after 2020. We welcome everyone's comments and suggestions.

Acknowledgments

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References:

Davis, S. M., *et al.*, 2017: Assessment of upper tropospheric and stratospheric water vapor and ozone in reanalyses as part of S-RIP, *Atmos. Chem. Phys.*, **17**, 12743-12778, **https://doi.org/10.5194/acp-17-12743-2017.**

Fujiwara, M., *et al.*, 2017: Introduction to the SPARC Reanalysis Intercomparison Project (S-RIP) and overview of the reanalysis systems, *Atmos. Chem. Phys.*, **17**, 1417-1452, **https://doi.org/10.5194/acp-17-1417-2017**.

Long, C. S., *et al.* 2017: Climatology and interannual variability of dynamic variables in multiple reanalyses evaluated by the SPARC Reanalysis Intercomparison Project (S-RIP), *Atmos. Chem. Phys.*, **17**, 14593-14629, **https://doi.org/10.5194/acp-17-14593-2017**.

Martineau, P., *et al.*, 2018: Zonal-mean data set of global atmospheric reanalyses on pressure levels, *Earth Syst. Sci. Data*, **10**, 1925-1941, **https://doi.org/10.5194/essd-10-1925-2018**.