



# SPARC: quo vadis?

Tom Peter & Ted Shepherd  
Co-chairs of SPARC SSG



## Background

- All WCRP core projects (including SPARC) are supposed to wind down in about 5 years' time
- They will be replaced by a new WCRP structure that is yet to be determined
- The goal is to position the WCRP (more precisely, the community it represents) to be more responsive to societal needs



## Why should we care?

At their best, international projects can significantly enhance the quality of our science by

- Filling gaps and crossing boundaries
- Providing scientific leadership
- Creating synergies and fostering collaborations
- **Creating funding opportunities**  
e.g. by creating 'pipelines' from research to international science assessments



## Motivation

- The world of climate science has changed dramatically since the WCRP structure was set up in the early 1990's
  - Governments seem to feel that climate science is “done” and we need only to work on impacts and adaptation
  - There is increasing emphasis from funding agencies on demonstrating the tangible benefits of research
- *The status quo does not appear to be viable in the long term*



## The role of WCRP

- WCRP's core mission is two-fold
  - To determine and improve the predictability of climate (i.e. quantify the uncertainty in climate predictions)
  - To quantify and mitigate the impact of anthropogenic activity on climate
- This mission is felt to still be relevant
  - However there will need to be increasing cooperation with partners (e.g. IGBP)



## The role of SPARC

- SPARC has been developing an increasingly close relationship with IGAC
  - Should allow a long-term home for chemistry-climate interactions
- However the dynamical aspects of SPARC need to be better integrated with relevant tropospheric activities
  - Also data assimilation/seamless prediction



## SPARC Legacy

- Beyond 2013, we anticipate that certain SPARC functions will need to be maintained:
  - Chemistry-climate model validation (CCMVal)
  - Assessment of key uncertainties in measurements
  - Linking various scientific communities
    - measurement and modeling communities
    - stratospheric research community and the climate modeling (as in IPCC) community
    - synergy between organizations (WCRP, IGBP, ...)



## Key science questions

Scientific themes that we might envisage to remain relevant post-2013:

- Quantify the interaction between ozone recovery and climate change
- Foster stratospheric science in climate accountability, mitigation and adaptation
- Investigate air quality aspects of the troposphere-stratosphere system
- Quantify the impact of solar variability (on all time scales) on climate
- Elucidate role of polar regions in global climate





## Example of a possible model for WCRP restructuring

- Long-term climate change (joint with IGBP) – input into mitigation needs
- (Multi-)decadal predictability – input into impacts needs
- Regional climate downscaling – direct input to users
- Improving the models (joint with WWRP) – “connecting climate physics to climate modelling” (cf. P. Morel article in GEWEX Newsletter)
- Air quality and biosphere impacts (joint with IGBP)



## What next?



- We seek your feedback to carry back to the WCRP
  - This cannot just be imposed from above
- The right structure must resonate with
  - the scientific community
  - funding agencies

*because that is how the work gets done*

- We especially want to hear from the younger scientists
  - This will affect the landscape of your careers!









- Improve climate models via data assimilation
- Improve climate models via use of mesoscale/cloud-resolving models
- Quantify the impact of vertical domain and resolution in the middle atmosphere in climate modelling
- Improve decadal stratospheric ozone predictability
- Improve seasonal climate predictability



- Improve understanding of climate variability in the stratosphere
- Improve modelling of chemistry-climate coupling in the stratosphere-troposphere system
- Quantify the role of the polar regions in global climate
- Quantify effects of future stratospheric change on the global carbon cycle
- Critically assess Geoengineering