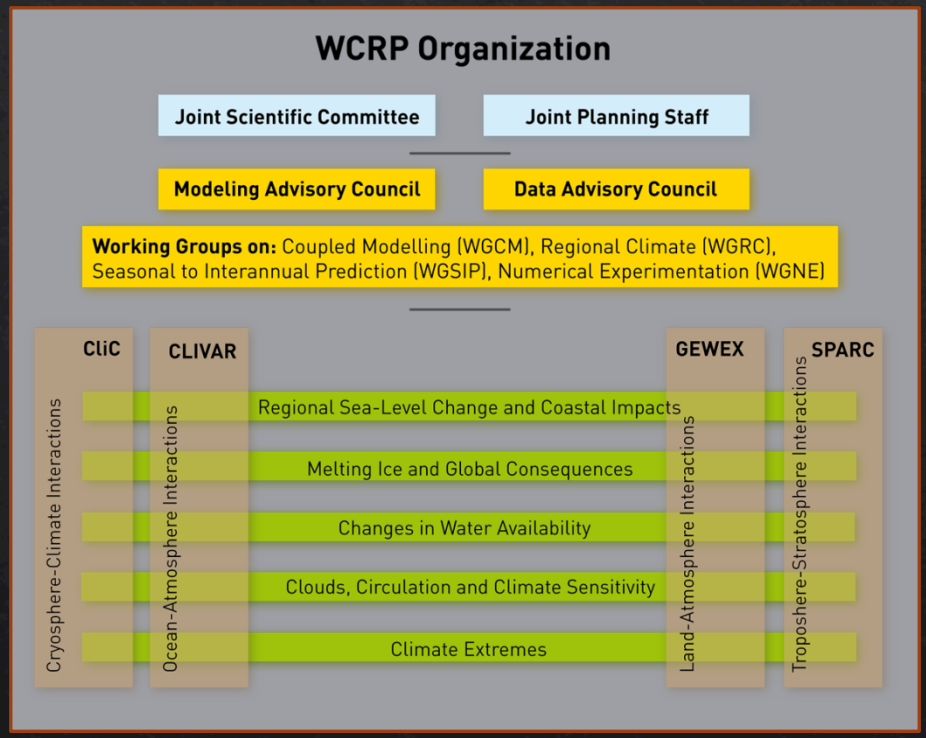
SSiRC Activity: Status and Future Directions

Larry Thomason and a Cast of Thousands

SPARC's place in the universe

- Stratosphere-troposphere Processes And their Role in Climate (SPARC) is a core project of WCRP
- SPARC is known for its assessments including the 2006 Assessment of Stratospheric Aerosol Properties (ASAP) as well as those related to ozone, water vapor, etc.
- Sponsors a number of workshops (including this one) and SPARC General Assemblies (next in Kyoto, October 2018)
- SPARC interest's always included in the UTLS but that focus has become more explicit in recent years and is reflected in the new SPARC implementation plan (2016-2020)
- http://www.sparc-climate.org/publications/programme-plans/

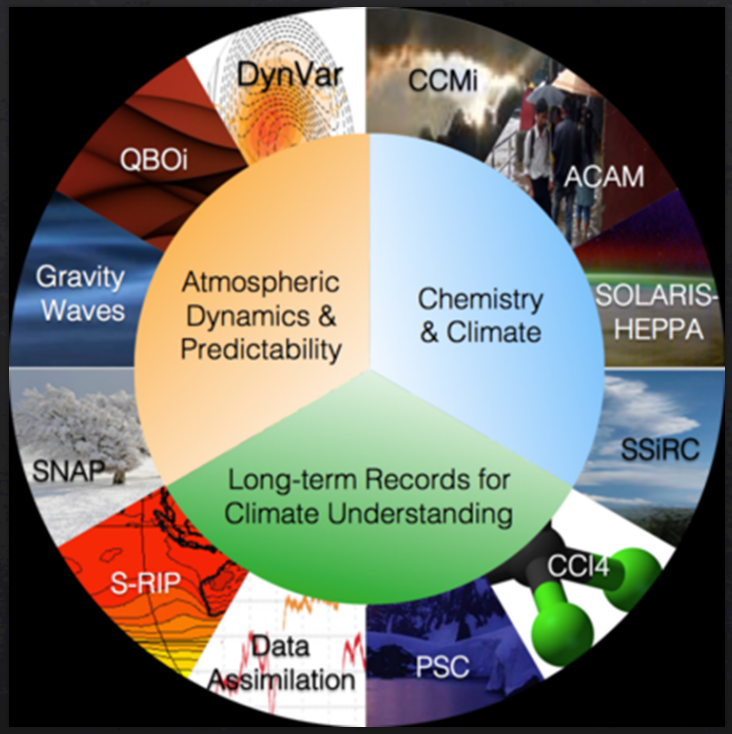


Young - Earth System - Scientists

- YESS (Young - Earth System - Scientists) community is an interdisciplinary network for early career scientists in which World Climate Research Programme (WCRP) and SPARC are participating organizations
- YESS is committed to:
  - Providing a valuable communication platform for early career researchers across all disciplines of Earth System science seeking to enable collaborations across the globe
  - Focus on on-line presence is a commitment to enabling early career collaborations across diverse regions, cultures, and disciplines
  - Creating opportunities for networking at diverse levels (large conferences/regional workshops)
  - Provide a collective voice for young scientists with international organizations
- Primarily aimed at graduate students, post-docs, and those at an early stage in their career but anyone can join. Within YESS, become a member of the SPARC interest group to keep up-to-date on all the latest news from the SPARC project. http://www.yess-community.org/
- See Stefanie Kremser for additional information

SSiRC's Science Themes

- SSiRC as a SPARC activity coordinates international research activities on:
  - Observing, understanding and modeling the processes that control the stratospheric sulfur and aerosol budget
  - Observing stratospheric sulfur and aerosol and reconciling the data sets from different instruments, compilations
  - Development of an interactive aerosol layer for global chemistry climate modeling
  - Modeling the climate feedback from the stratospheric aerosol layer from the small eruptions of the 2000s to historic and potential future major volcanic events
- SSiRC coordinates with other SPARC and WCRP activities as appropriate



SSiRC Timeline

- SSiRC is a descendant of the effort that produced the Assessment of Stratospheric Aerosol Properties (ASAP) which began in November 2001 with a meeting at CNES in Paris and which concluded in February 2006 with the release of the ASAP SPARC Report (No. 4)
  - Essentially all over but the typesetting in the Summer of 2005 (SPARC, 2006)
- SSiRC was the concept of Markus Rex (AWI) and Claudia Timmreck (MPI) joined with Larry Thomason (NASA), Stefanie Kremser (BSI), and Jean-Paul Vernier (ORAU to SSAI) to produce a proposal to ISSI-Bern to host a SSiRC International Team (March 2012) and develop a SSiRC implementation plan
- First SSiRC ISSI meeting October 2012 at which the basic form of a SPARC activity was defined
- SSiRC was accepted by the SPARC SSG as an emerging activity in November 2013
- First Workshop was held in October 2013 in Atlanta, Georgia (hosted by Ray Wang of GT)
- SSiRC activities also include associated activities (ISA-MIP) and direct products including reviews and coordinated science studies (often outcomes from ISSI and workshop discussions)

SSiRC SSG

- Coordination Team
  - Markus Rex (Germany)
  - Claudia Timmreck (Germany)
  - Larry Thomason (USA)
  - Stefanie Kremser (NZ)
  - Jean-Paul Vernier (USA)
- SSiRC web site
  - http://www.sparc-ssirc.org/*
- Additional Team member
  - Juan-Carlos Antuña (Cuba)
  - John Barnes (USA)
  - Terry Deshler (USA)
  - Suvarna Fadnavis (India)
  - Markus Hermann (Germany)
  - Graham Mann (UK)
  - Thomas Peter (Switzerland)
  - Fred Prata (Norway)
  - Alan Robock (USA)
  - Marc on Hobe (Germany)

**always looking for new material for the SSiRC web site, feel free to suggest new pages and/or links to related projects*

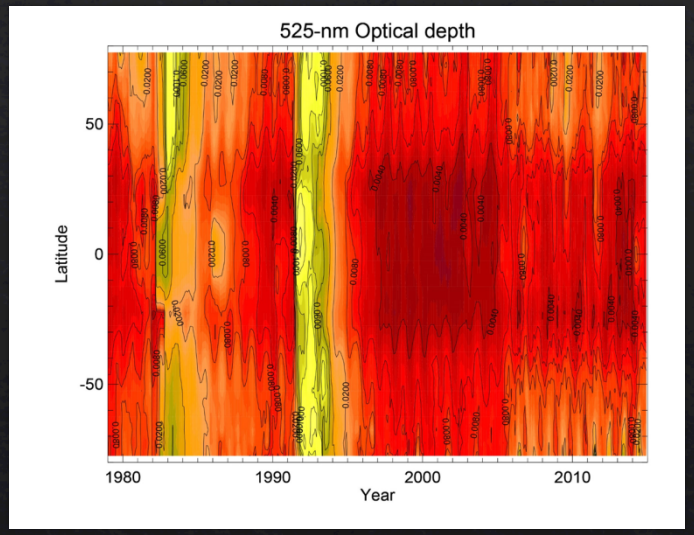
SSiRC Accomplishments

- Review paper
  - Kremser, S., et al. (2016), Stratospheric aerosol - Observations, processes, and impact on climate, Accepted by Reviews of Geophysics.
  - Electronic draft available on the AGU web site (linked from SSiRC web site)
  - http://onlinelibrary.wiley.com/doi/10.1002/2015RG000511/full
- SSiRC-themed Publications
  - The 2015 SSiRC query for SSiRC-related publications yielded over 50 author-identified publications since 2013
- New ISSI proposal to host SSiRC coordination meetings submitted (3/21)

SSiRC Activities

- A SSiRC-sponsored stratospheric sulfur budget study is underway (led by Terry Deshler, talk)
- Role in understanding stratospheric aerosol on climate
  - ISA-MIP/VolMIP
  - Workshop: Timmreck et al. (talk), Mann et al. (poster), Timmreck et al. (poster) and a break-out group
- Role in Maintaining the Stratospheric Aerosol Climatology
  - CCMI and CMIP6
  - Subject of a workshop break out group
- Preparing for the next major volcanic eruption (group discussion)
- Capacity database (https://www.ssirc.info/)
- Of course, SSiRC has access to extremely limited resources (mostly courtesy of SPARC); the success of SSiRC is thanks almost entirely to our funding agencies

CMIP6 Measurements Period Stratospheric Aerosol Optical Depth Records 1979-2014



SSiRC-Related Field Activities

- KLaSH – Rapid response to volcanic Eruption (Kelud) - J.-P. Vernier (talk)
  - Australia (June 2014)
- BATAL – Balloon characterization of the Asian Tropopause Aerosol Layer - J.-P. Vernier
  - India, August 2014, summer 2015, 2016?
- SWOP – Sounding water vapour, ozone, and aerosol particle campaign - Bian Jinchun
  - China, 2009 through 2014
- StratoClim – Stratospheric & tropospheric processes for better climate predictions – Markus Rex (talk)
  - South Asia, 2016

SSiRC-Related Modelling Activities

- Compilation of volcanic forcing data sets
  - CCMI and CMIP6 data set (L. Thomason , B. Luo, et al)
  - Breakout group Tuesday afternoon
  - Related posters by A. Schmidt, M. Toohey, L. Thomason
- ISA-MIP – Interactive Stratospheric Aerosol Model Intercomparison Project
  - 2016-2017
  - Breakout group Wednesday afternoon
  - Specific posters by C. Timmreck, G. Mann, several related contributions
- VOLMIP – Model Intercomparison Project on the climatic response to Volcanic forcing
  - CMIP6-endorsed activity
  - Talk (C. Timmreck)

Future Meetings

- Future Workshops
  - Chapman Conference (early 2018) application to be submitted in May 2016
  - Need for other workshops is under consideration (2017 and 2019)
    - Generally feeling is that general workshops at the 2-3 year interval is appropriate
    - Limited-focus workshops can be considered
- Exploring the potential for expanding the global reach of SSiRC
  - Workshop in Latin America
  - Summer school in south Asia

A SSiRC-themed Chapman Conference

- Chapman Conferences are a small, series of conferences sponsored by the American Geophysical Union focused on a specific scientific question. They are initiated through a proposal process
- We are planning to submit a SSiRC-themed proposal focused on two key science questions:
  - *What are the mechanisms that control stratospheric aerosol levels during volcanically quiescent periods?*
  - *What role do the observed variations in stratospheric aerosol have on the composition of the stratosphere and on climate?*
  - The proposal is about half or 2/3rds complete at this time but there is still opportunity to have an impact on subject matter, key speakers, etc.
  - Still scoping for potential meeting sponsors (not necessarily financial commitment)
- Plan for the meeting to occur in January/February 2018 in Tenerife (Canaries), Spain. Markus Rex and Larry Thomason are conveners (may add a 3rd). Program committee will mostly be from the SSiRC SSG but open to volunteers as well
- Your input is very valuable to us; it is a good time (now) to have an impact on the scope of this meeting. Contact Larry Thomason or Stefanie Kremser if you are interested in participating in meeting organization.

Feedback

- The final session on Thursday will be an opportunity for attendees to provide the SSiRC Science Steering Group with feedback on all aspects of the SSiRC Activity
- Aim is to focus SSiRC activities on where would our efforts yield the highest value to our community
- Things to think about include
  - SSiRC Science Themes
  - The workshops themselves including the potential Chapman conference idea (timing, focus, locations, etc.)
  - Future SSiRC reviews activities
  - SSiRC leadership