SPARC Project

Stratosphere-troposphere Processes And their Role in Climate

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SPARC Approach

- Targeted activities
- Bite-sized timely goals
- Focus on deliverables

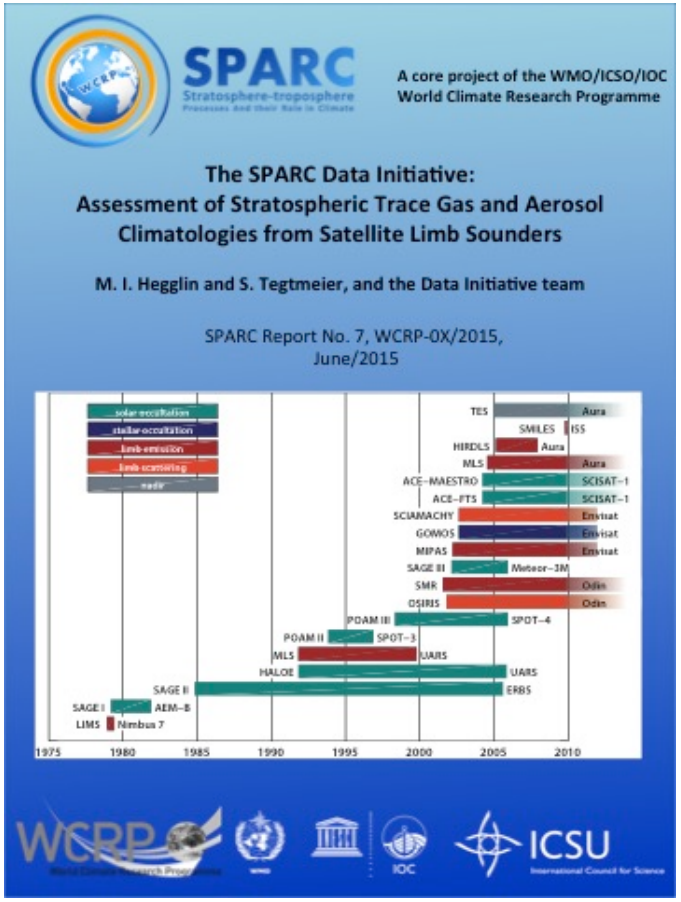
Our Annual Report summarizes 2014 accomplishments and plans

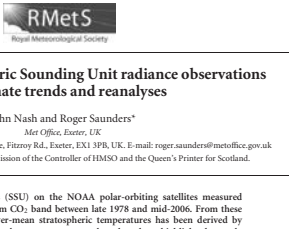
http://www.sparc-climate.org/publications/programme-plans/

Sun-setting Activities in 2014

Temperature Trends, Ozone Profile, Trace Gas Climatologies, and Water Vapor II

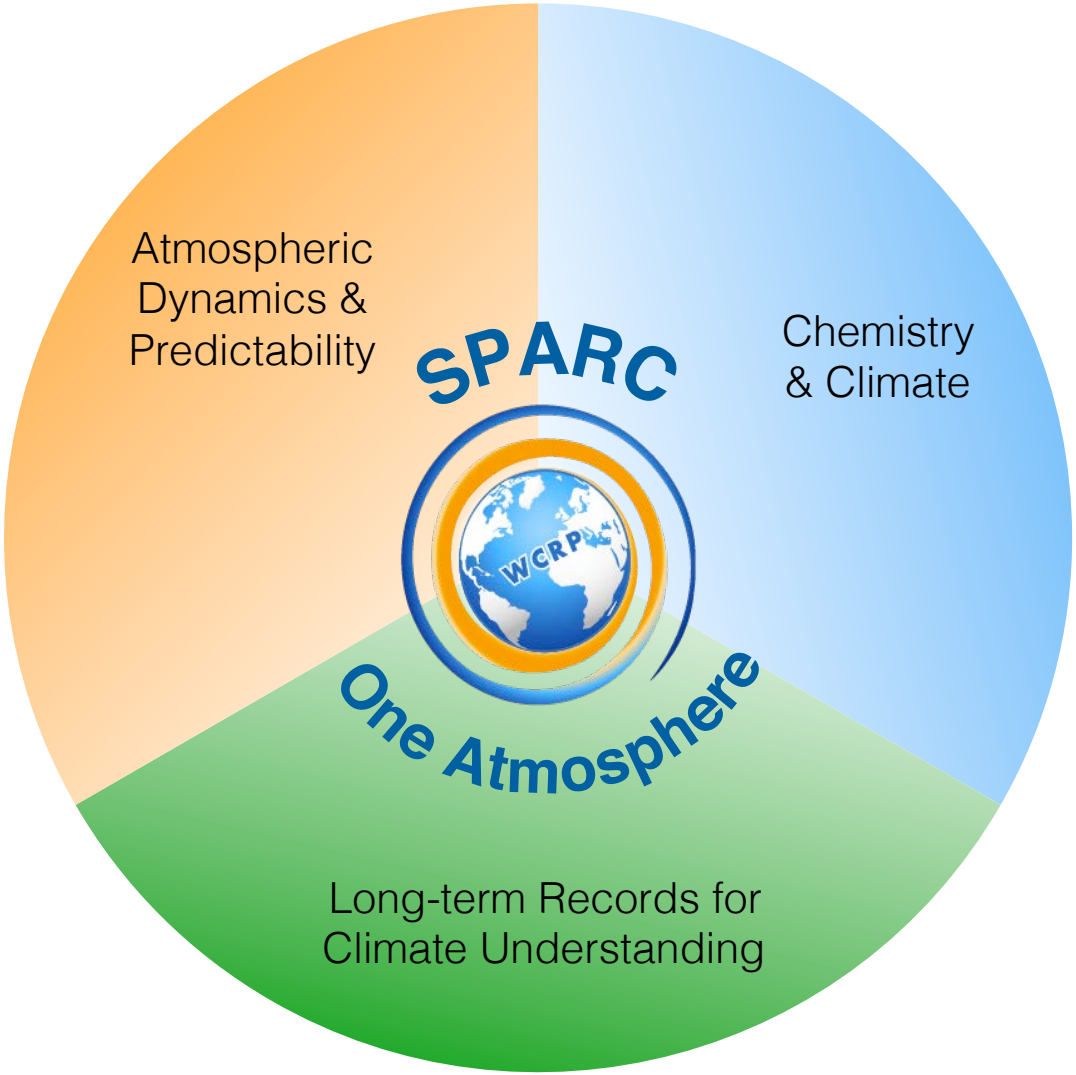
Products from these Activities include SPARC Reports, published articles, reviews, and datasets.



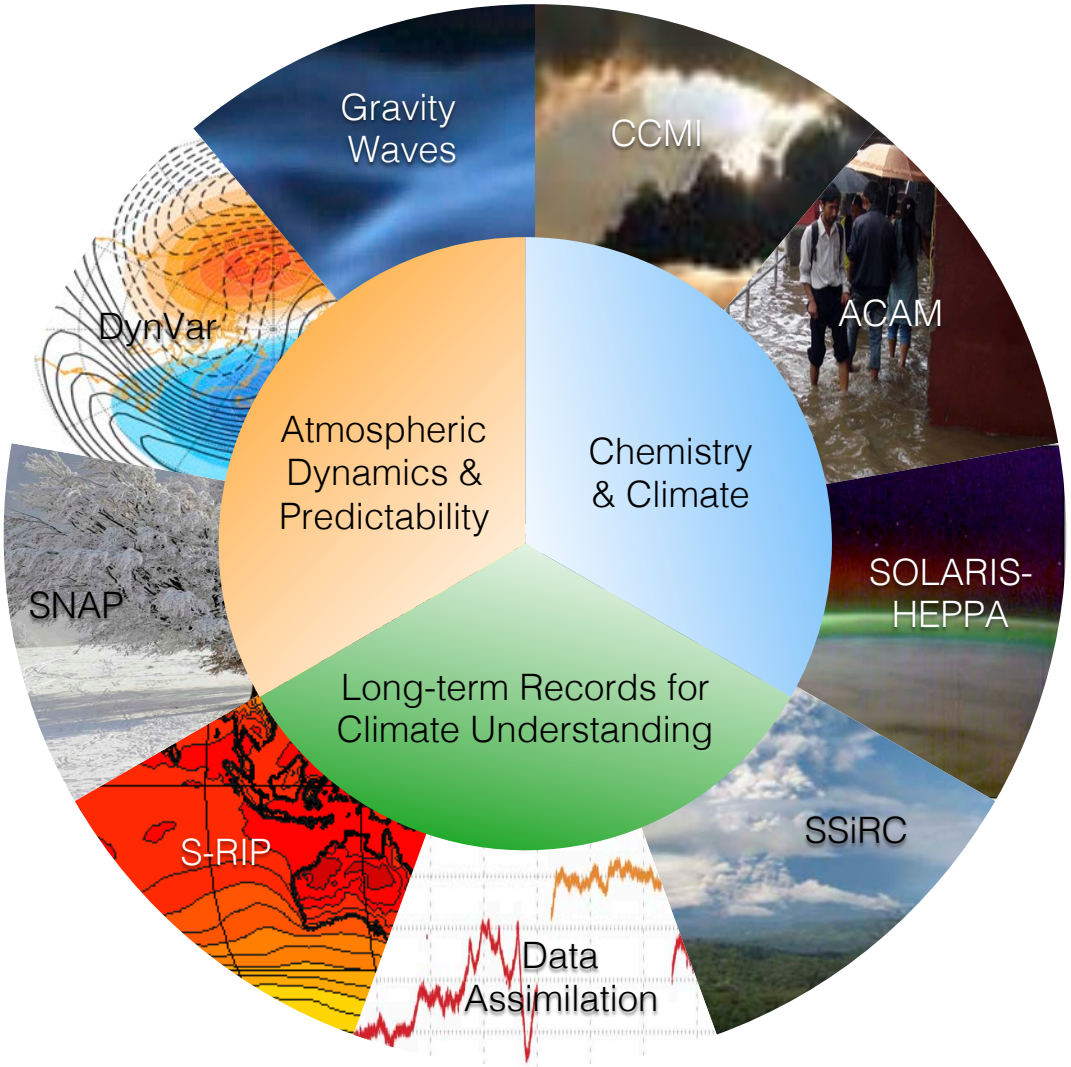


Implementation Plan 2015

SPARC Themes



Map of SPARC Activities to Themes



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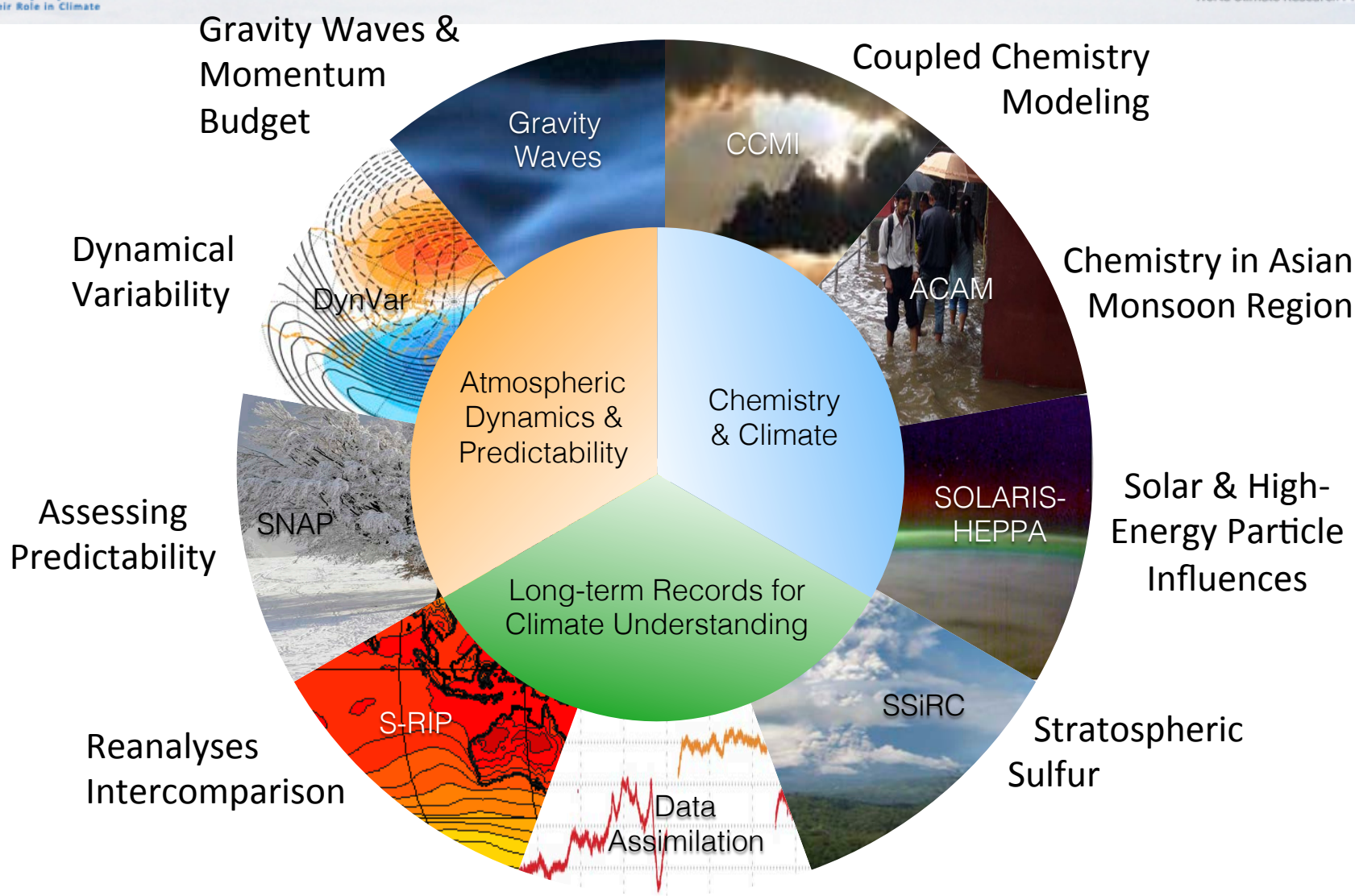
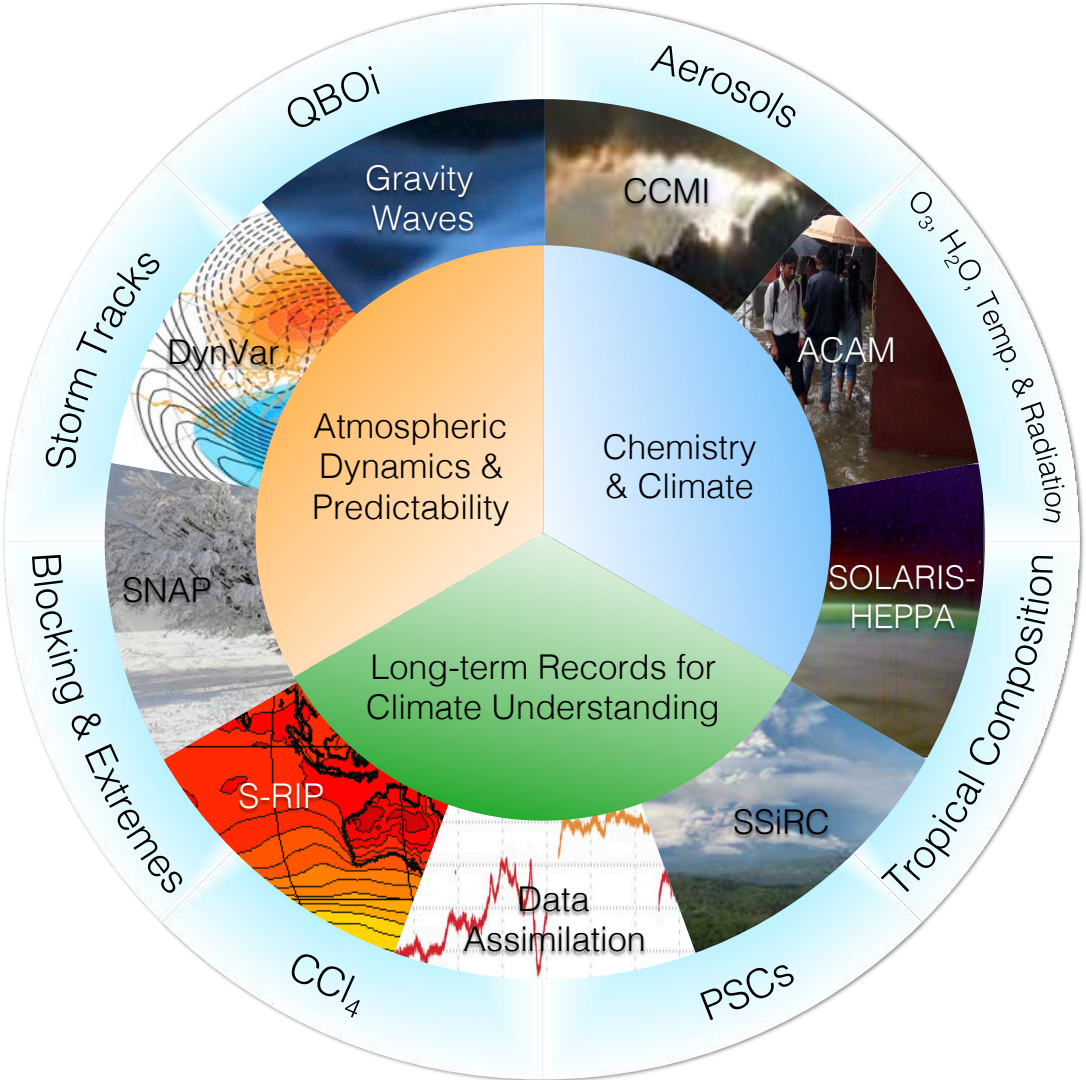


Emerging Activities and Links to Other Programs



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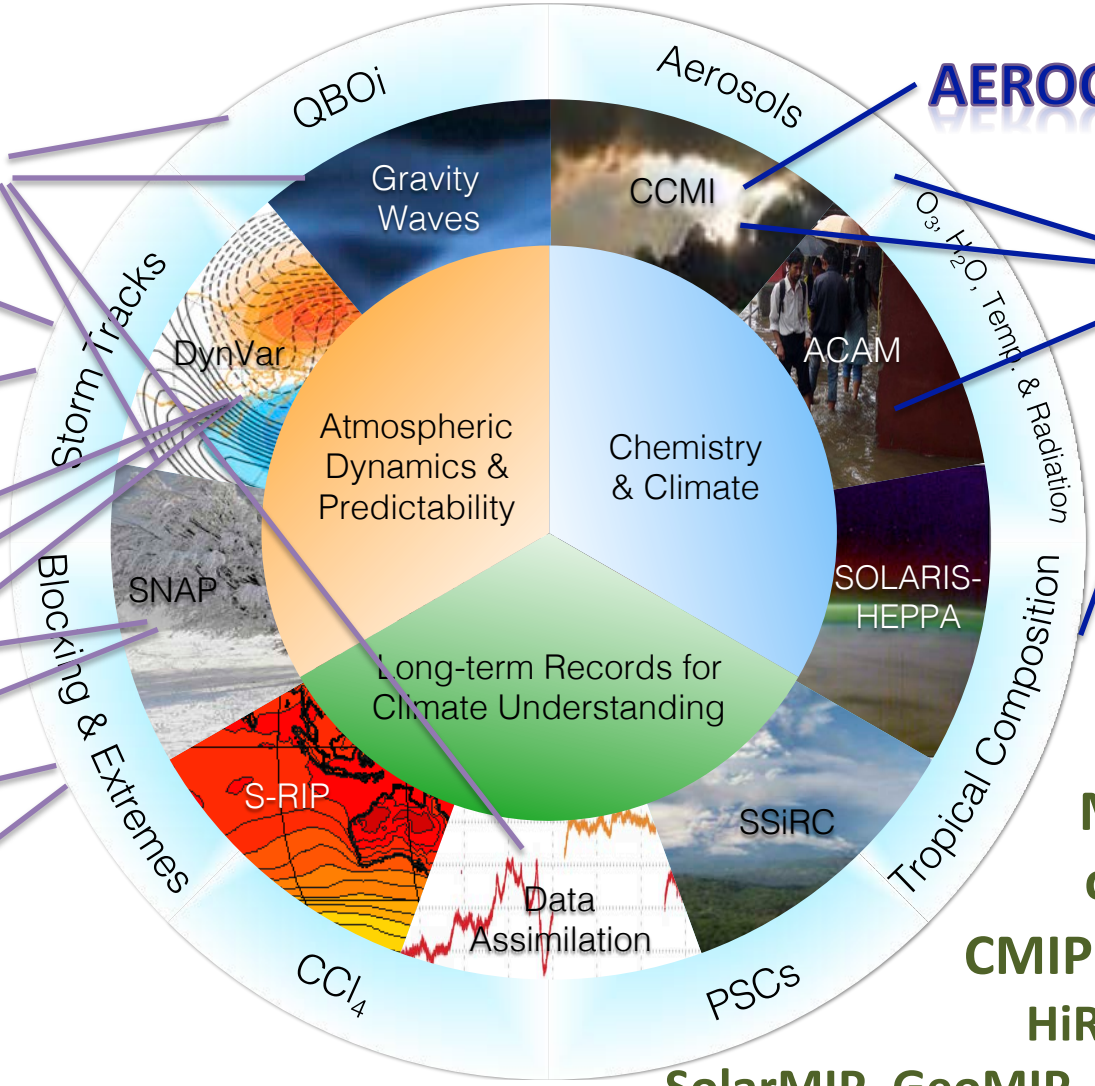

WGNE

CLOUDS & CIRCULATION GC

CLIC

CLIVAR

WGCM

WGSIP

S2S

EXTREMES GC

GEWEX

AEROCOM

IGAC

Many in SPARC contributing to CMIP6: AerChemMIP HiResMIP, GMMIP, SolarMIP, GeoMIP, VolMIP, DynVar

Some New Directions

Focused Efforts within these Topics

- Teleconnections: Robustness in observations, fidelity in models, and mechanisms
- Predictability: Across time scales (season-decade-century), absolute limits due to internal variability, current status in models, and dynamics of unprecedented events
- Aerosol/cloud/chemistry interactions
- Stratosphere-troposphere exchange of O_3 & H_2O under climate change – implications for air quality/radiative forcing.
- Quantitative methods for defining the consequences of measurement gaps

new Implementation Plan drafted – discussions at meetings this year to finalize contents

Model Development Needs

Overall –

1. **Continued model development needed for integrated chemistry, deep atmospheric domains and associated in-line diagnostics.**
2. **Specific training needs: Capacity development and science community.**

Specific –

- *Need for development of in-line atmospheric momentum/radiation diagnostics – becomes crucial for high-resolution simulations and higher-top models.*
- Continued development of Earth-system models with integrated chemistry – development of new simplified chemistry schemes?
- Definition of minimal requirements needed for radiative and photochemical schemes to adequately represent the solar signal
- *Training need for more science-users of reanalyses to become familiar with the modelling aspects of assimilation systems*
- Lack of technical capability to provide data to the ESGF
- Training in WRF/WRF-Chem needed for ACAM monsoon region participants

Data Needs/Requirements

Overall

1. **Continued improvement in meteorological reanalyses and past records**
2. **Continuation of existing core measurements – real funding pressure**

Specific

- *Lack of planned satellite observations (esp. limb) of UTS composition*
- Need up-to-date AMSU and merged SSU-AMSU climate data records
- Reanalysis diagnostics needed for momentum budget studies (MERRA example)
- *Need for more reference-quality global & long-term observations, particularly for reanalysis intercomparisons*
- No planned continuation of mesospheric radiance for temperatures
- 44 year stratospheric aerosol record at Laramie may stop
- Need for quick response field campaigns after volcanic eruptions
- Data sharing is a challenge in the 'Asian Monsoon region'

For more please browse a copy of the SPARC Annual Report

www.sparc-climate.org