

38th WCRP JSC
April 2017



SPARC
Stratosphere-troposphere
Processes And their Role in Climate

**Neil
Harris**
Co-Chair



**Judith
Perlwitz**
Co-Chair



Boram Lee
WCRP Liaison

The SSG



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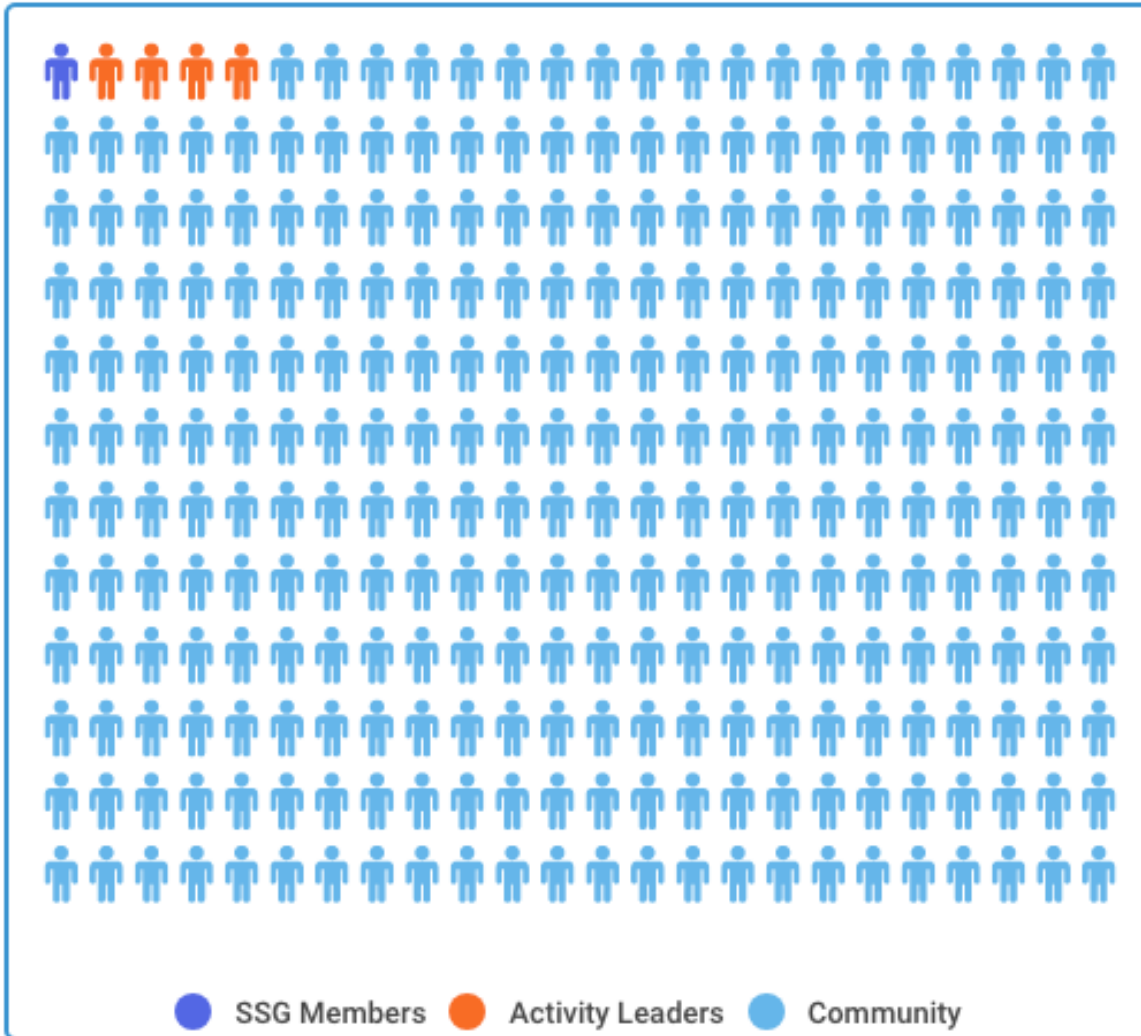
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Community



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Themes



Atmospheric Dynamics + Predictability

Chemistry + Climate



Long-term Records for Climate Understanding

Themes



Atmospheric Dynamics + Predictability

How can the impact of weather and climate be reduced?

Chemistry + Climate

How can we limit the future impacts of air quality and climate?



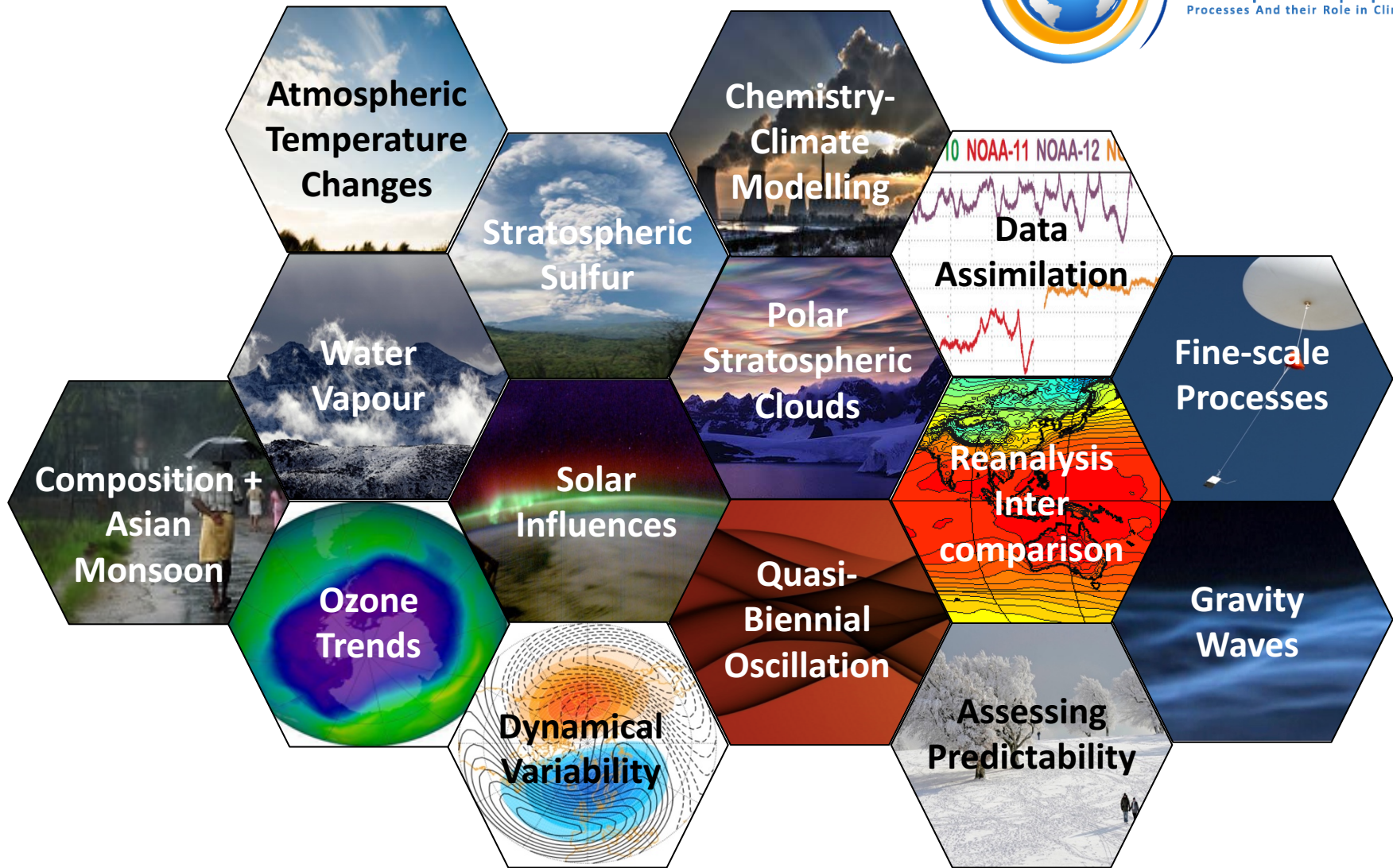
Long-term Records for Climate Understanding

What is happening and how sure are we of that?

Activities



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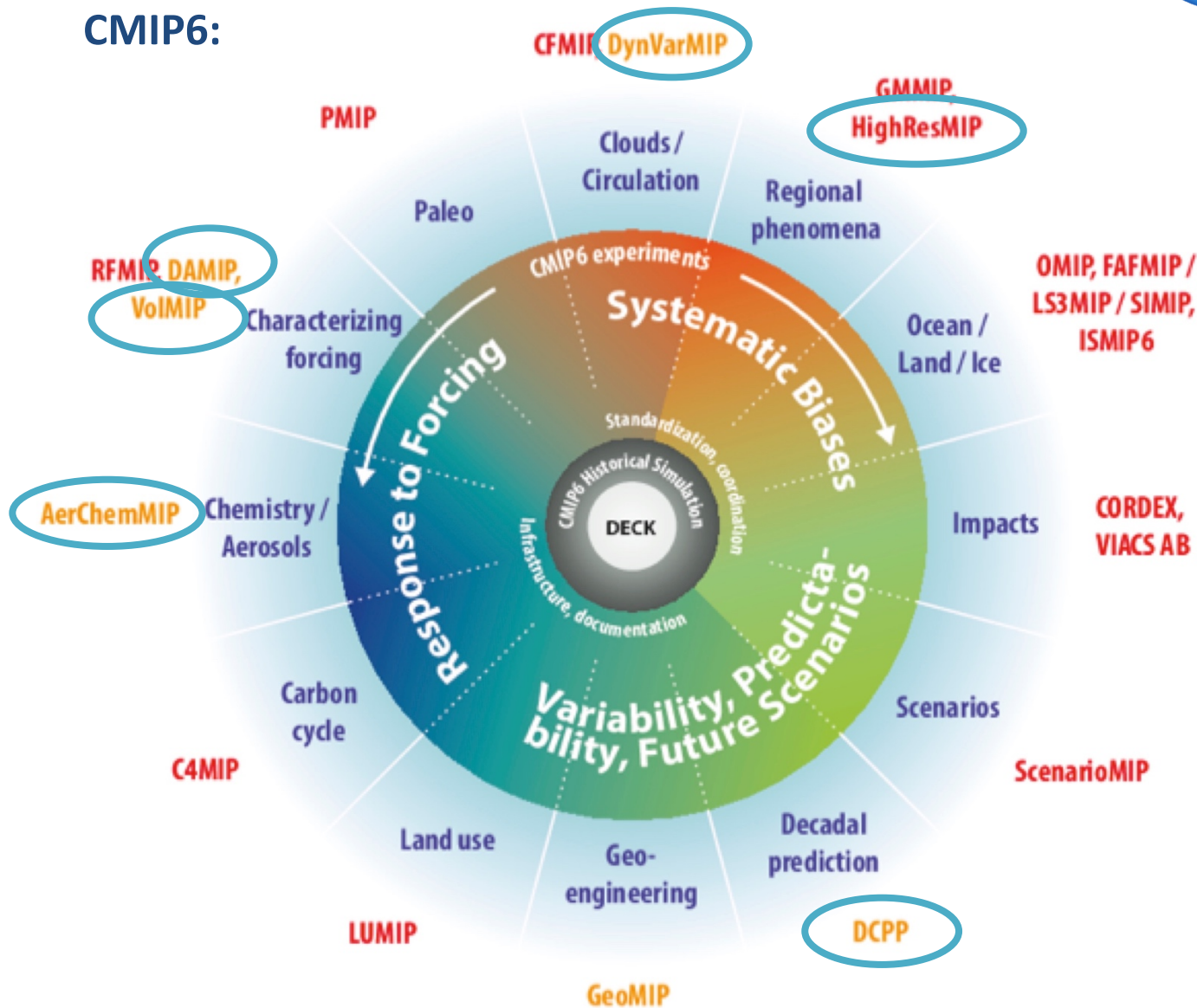


Highlights



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CMIP6:



+ Forcing Datasets:

- Ozone
- Volcanoes
- Solar

Highlights

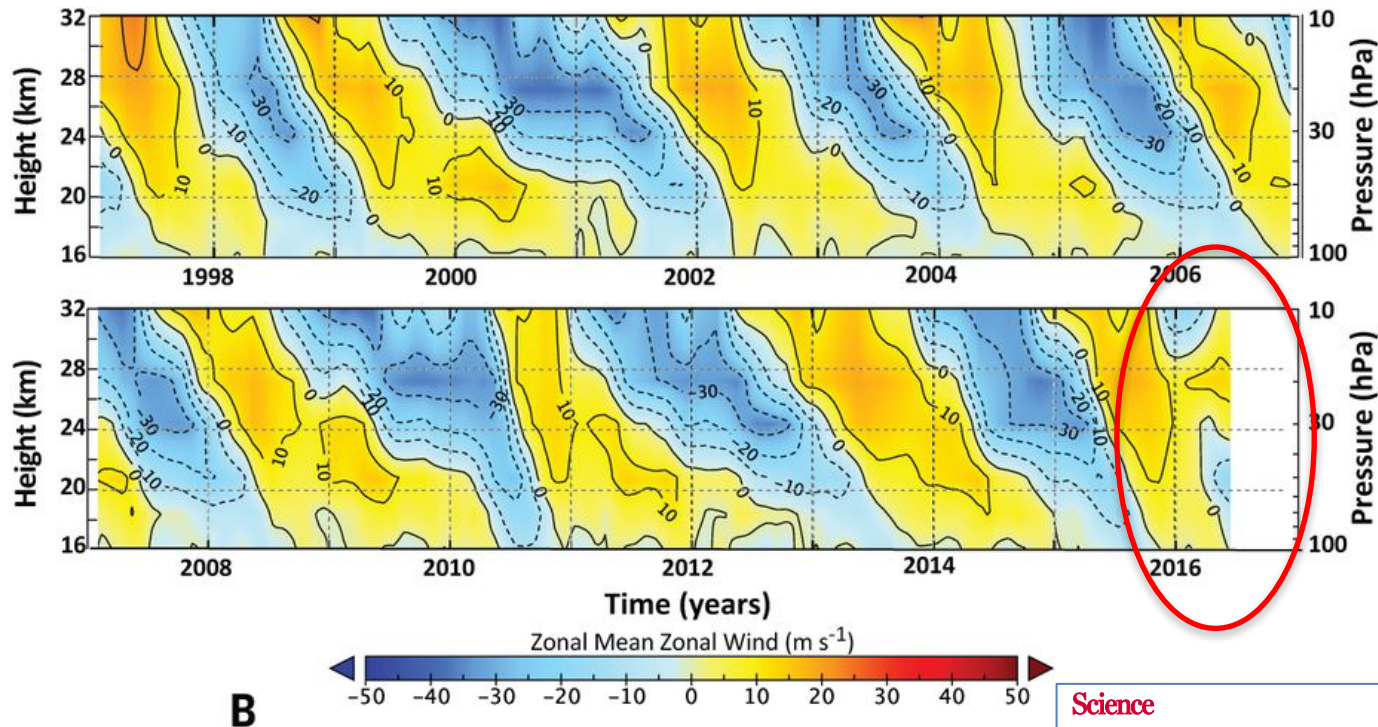


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QBO disruption

Normally the most predictable phenomena...

Reversal of flow due to northern mid-latitude wintertime disturbance – harbinger of more?



Science

REPORTS

Cite as: S. M. Osprey *et al.*, *Science*
10.1126/science.aah4156 (2016).

An unexpected disruption of the atmospheric quasi-biennial oscillation

Scott M. Osprey,^{1*} Neal Butchart,² Jeff R. Knight,² Adam A. Scaife,^{2,3} Kevin Hamilton,⁴ James A. Anstey,² Verena Schenzinger,¹ Chunxi Zhang⁴

¹NCAS-Climate, University of Oxford, Atmospheric, Oceanic and Planetary Physics, Clarendon Laboratory, Parks Road, Oxford, OX1 3PU, UK; ²Met Office Hadley Centre, FitzRoy Road, Exeter, Devon, EX1 3PB, UK; ³Department of Mathematics and Computer Science, University of Exeter, Exeter, UK; ⁴International Pacific Research Center, University of Hawai'i, Honolulu, USA; ⁵Canadian Centre for Climate Modelling and Analysis, University of Victoria, Victoria, British Columbia, Canada.

Highlights

Solving the Mystery of Carbon Tetrachloride

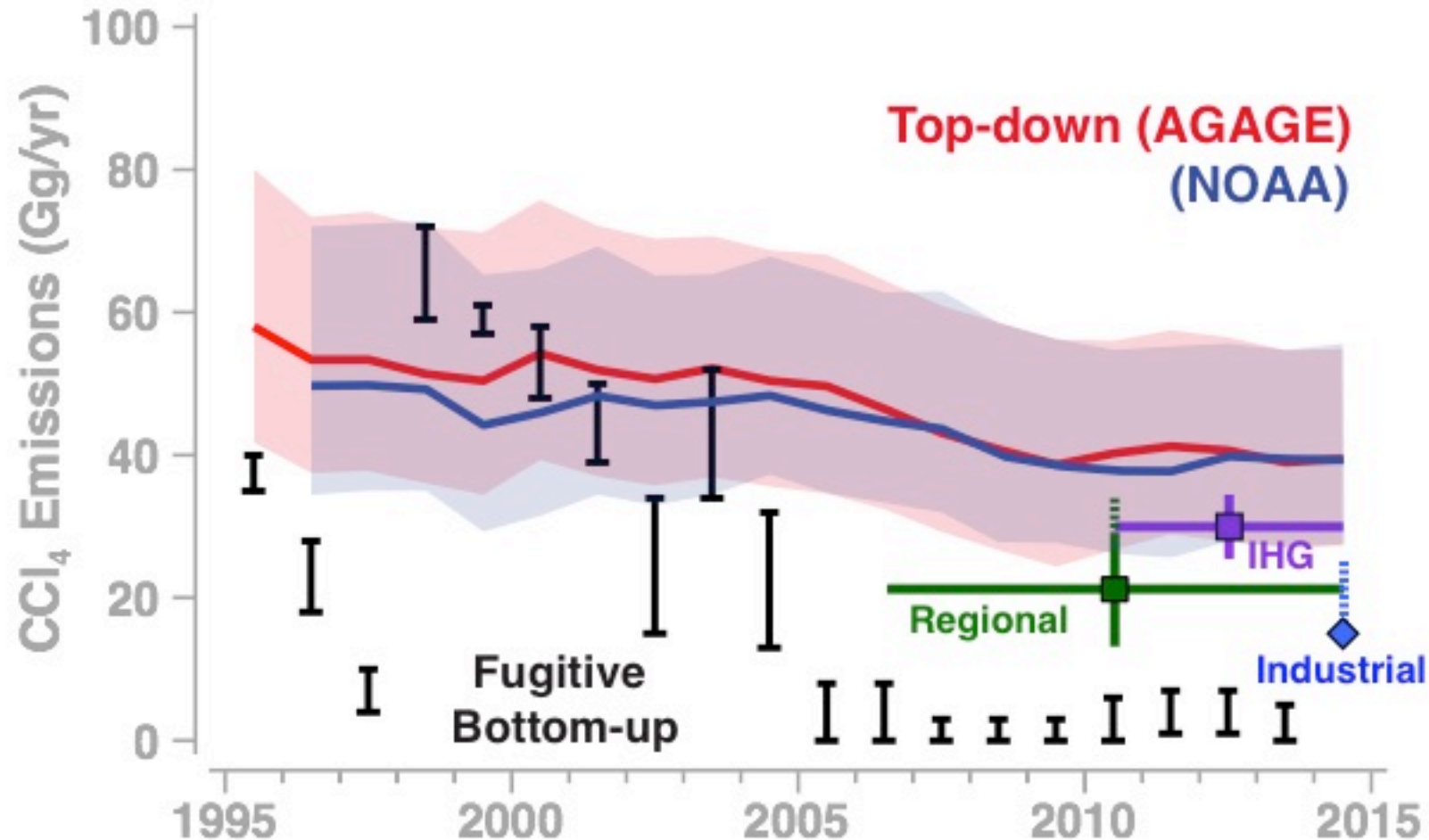


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Imbalance between reported emissions and atmospheric concentrations (WMO 2014):

Better agreement – agree at edge of estimated uncertainties....

Report submitted to Parties of Montreal Protocol



Highlights

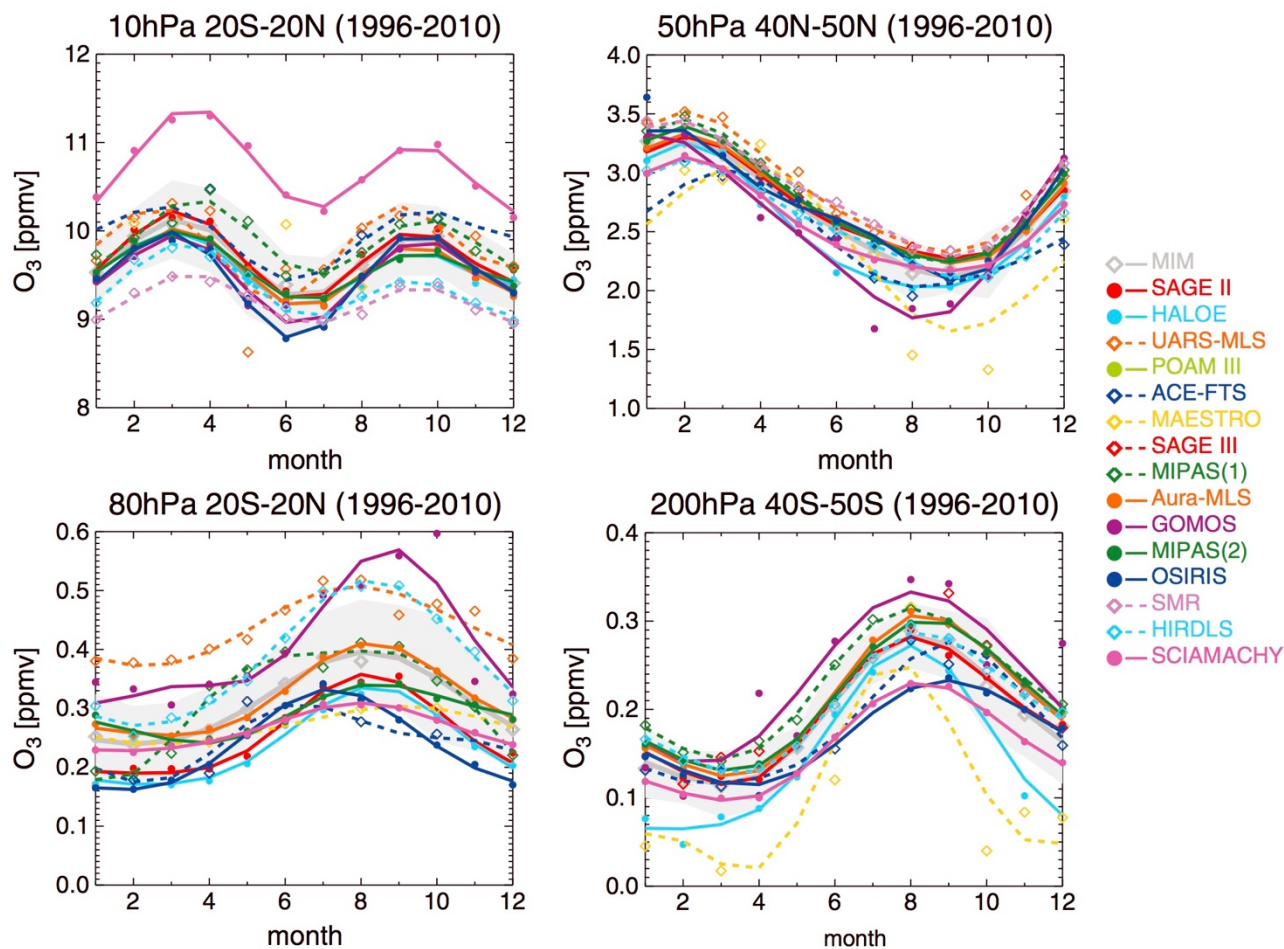


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SPARC Data Initiative – Satellite Intercomparisons

Last 15 years - golden age of atmospheric satellite measurements

Critical to know if measurements agree

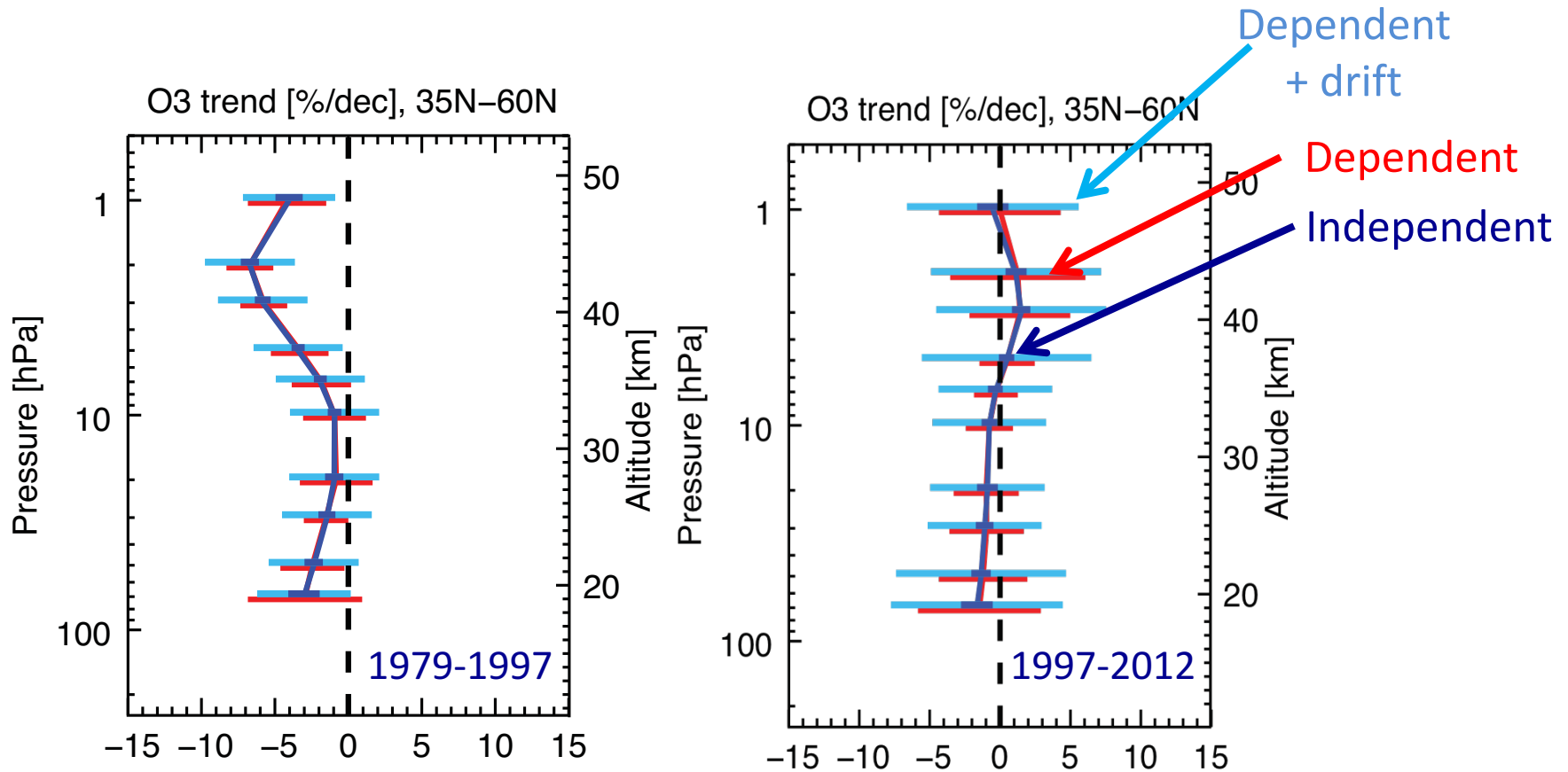


Highlights

Trends from multi-instrument records

Trend uncertainties depend on assumptions of independence of data sets and derived trends

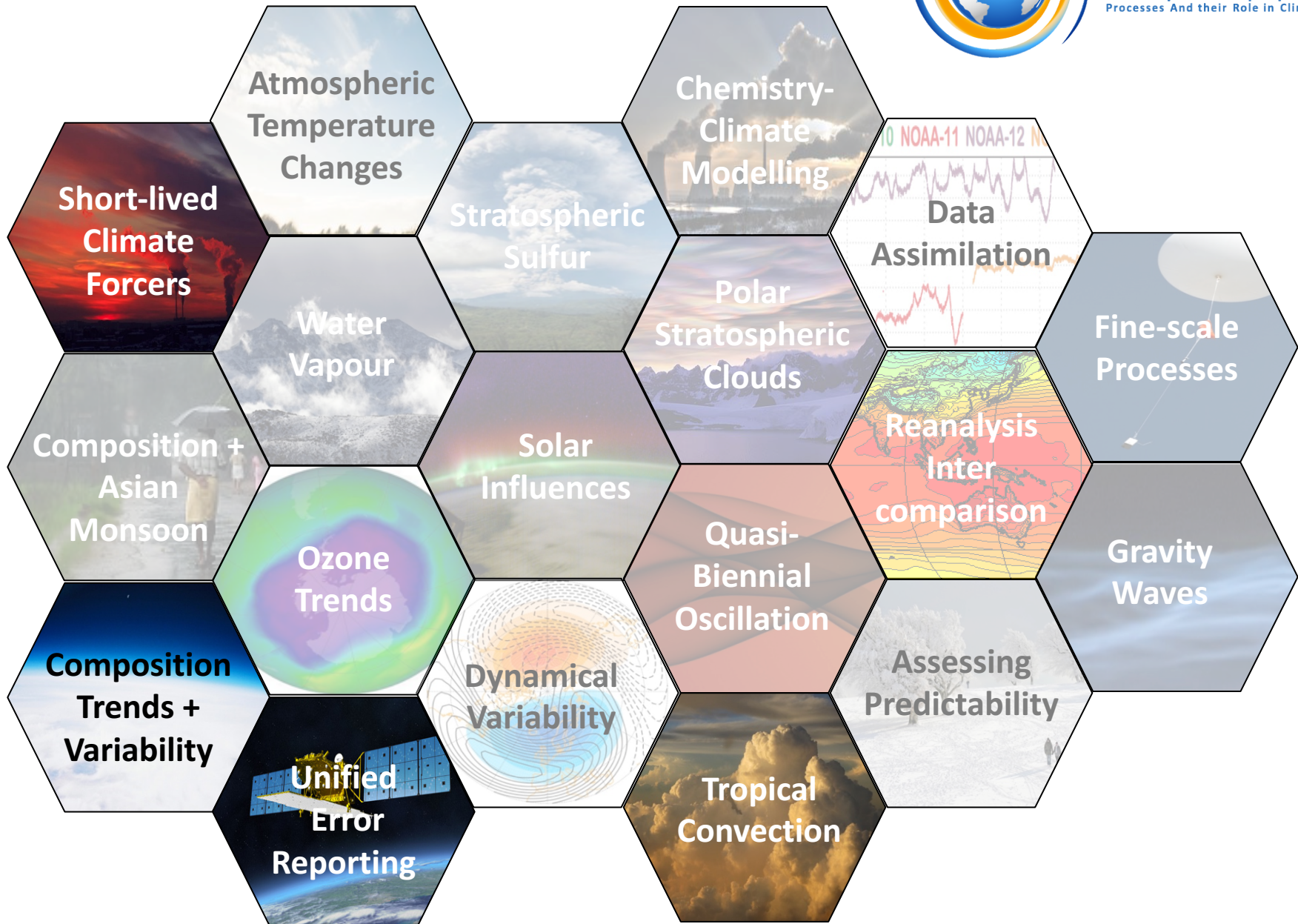
Ozone from SI2N – could easily have used T, H₂O or aerosols as example instead



Emerging Activities



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Highlights



Co-organisation of the workshop on:
“Drag Processes and their Links to Large-scale Circulation”



ECMWF, Reading, UK
12-15 September

WCRP/SPARC workshop on:
“Grand Challenges in Climate Science”



+ increasing emphasis on tropospheric
composition and dynamics

Berlin, Germany
31 October

Future Aims

Mainly internal business, on-going



- Provide guidance for next-generation reanalysis systems with the S-RIP report.
- Assess data sets for model validation, with careful quantification of uncertainties
- Enhance understanding of troposphere-stratosphere coupling in the tropics and effects on convection
- To better understand the impact of the monsoon convection systems on the composition, radiation, and dynamics of the troposphere.
- Promote research in preparation of various assessment reports (IPCC AR6, WMO/UNEP 2018 Ozone Assessment).
- Contribute to model development by identifying model requirements to resolve strat-trop teleconnection pathways,
- Help facilitate the new Grand Challenge on Carbon and Climate and develop a complementary SPARC initiative on the short-lived climate forcers.
- Lead the new focus on “How will storm tracks change in a future climate?” within the Grand Challenge on Clouds, Circulation, and Climate Sensitivity.
- Enhance understanding on the role of the stratosphere in tropospheric prediction on the S2S time scale.

Plans



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Kyoto, Japan, 2-6 October 2018

Plans



SPARC Office will transition to DLR, Germany



Hans Volkert, Office Director



For discussion here



- SPARC uses its funding only to cover travel to activity workshops (and training schools), with the aim of providing support for early career researchers and researchers from developing countries mainly. **The reduced funding means a much reduced ability to get these people to our activity workshops.**
- **A further major issue in terms of the reduced funding is support of the 2018 SPARC general assembly.**
- **Working with existing groups on tropospheric composition and defining a clear WCRP/SPARC contribution. (IGAC, ILEAPS...; HTAP;...)**
- **A high level promotion of the value of WCRP coordination of international climate research would greatly help raise profile in national agencies (as well as direct finance).**

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South
America



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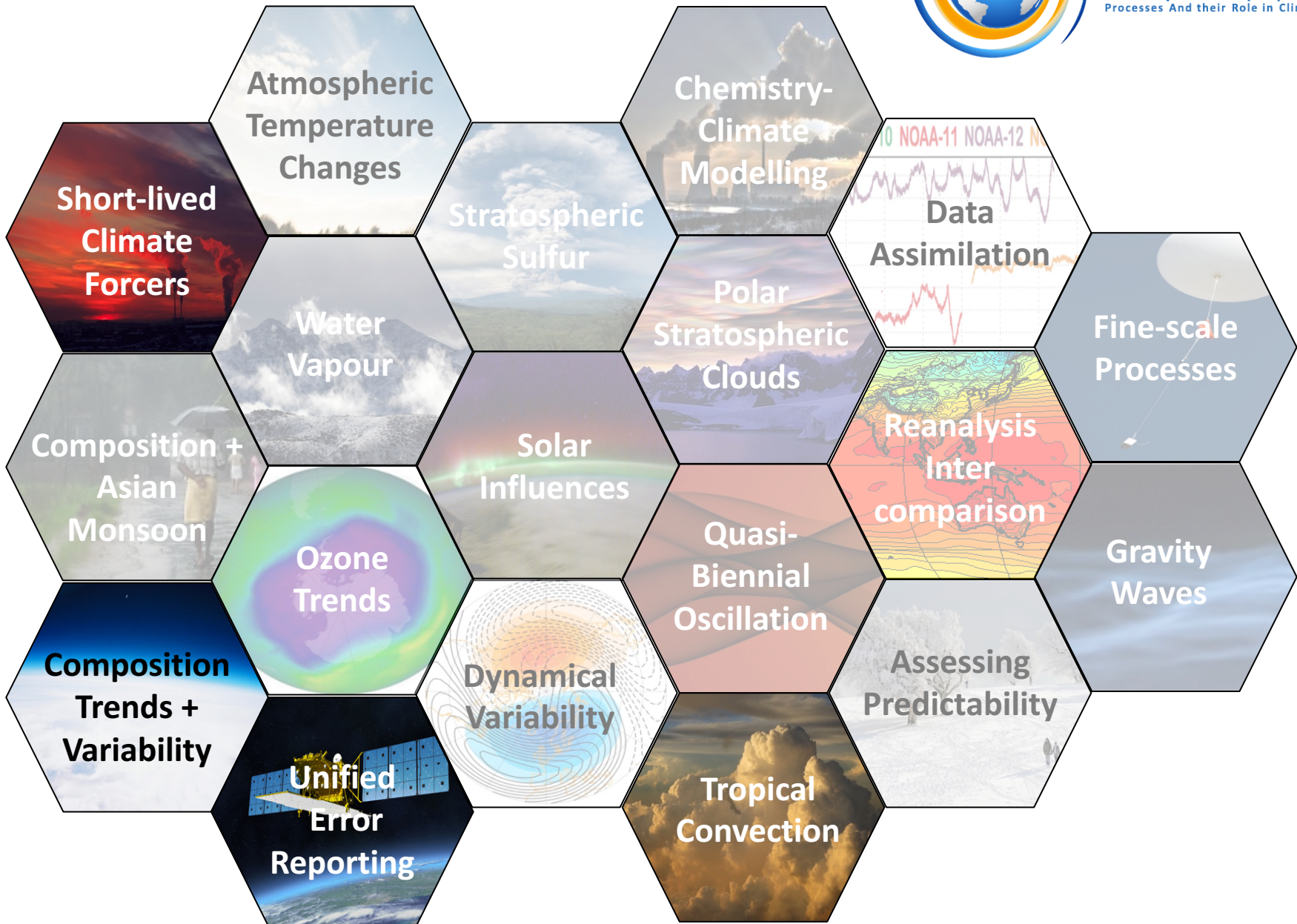
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Thank You!



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