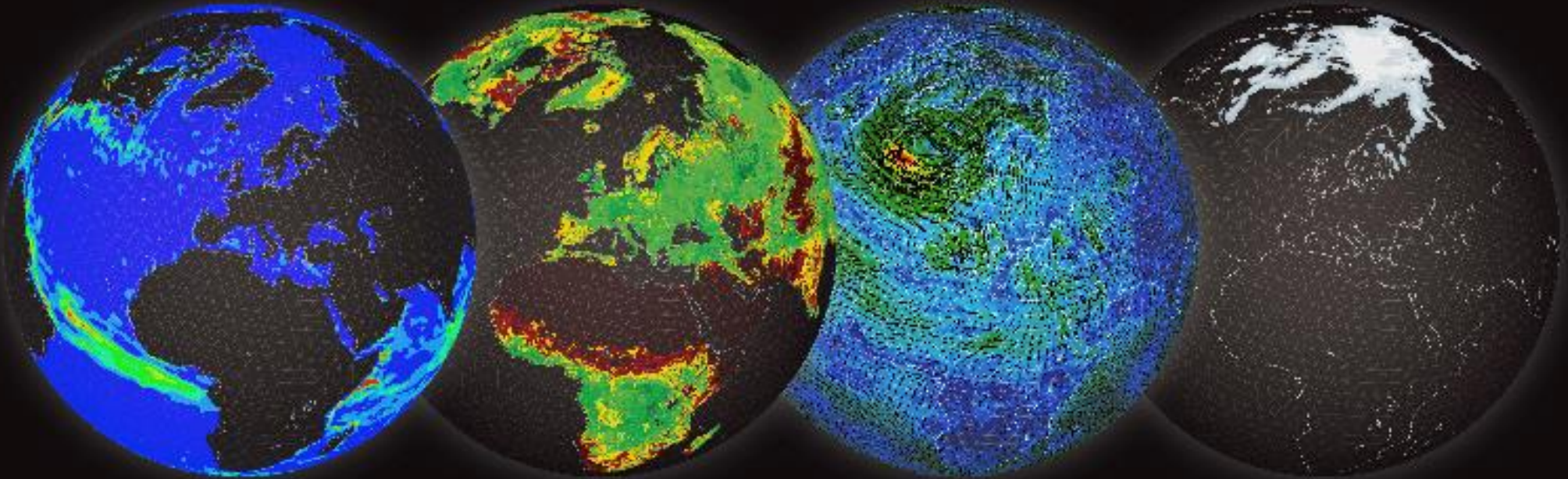


Annual Seminar 2016

Earth system modelling for seamless prediction

Roberto Buizza



Session 1 - Complexity

- Let's challenge ourselves and ask 'what does complexity really bring?' (*A Brown*)
- Aerosols impact at weeks 3-4 is larger than the impact of resolution increases or sea-ice (*F Vitart*)
- The need for complexity increases with increased resolution (*B Kirtman*)
- Improving forecast reliability is crucially important for both weather and climate communities (*T Palmer*)



Session 2 – Atmosphere processes

- We should add numerical and structural flexibility in the effort towards full Earth-system complexity (*N Wedi*)
- Clouds are relevant for predictions across time scales, yet they remain crudely parameterized (*B Medeiros*)
- We still have a long way to go to understanding MJO initiation (*S Woolnough*)
- Heat fluxes at the ocean surface play an important role in teleconnections (*F Molteni*)
- A lack of proper representation of stratosphere processes degrades the potential predictive skill on sub-seasonal to inter-annual time scales in the troposphere (*J Perlwitz*)



Session 3 – Ocean processes

- New emerging concepts/dynamics but still no clear evidence that increased resolution leads to more skilful predictions (*D Ferreira*)
- Tropics and boundary currents requires a minimum of $\frac{1}{4}$ degree resolution; in the vertical allow for enough resolution to resolve the diurnal cycle (*H Hewitt*)
- A system that is more physically based will in the long term bring more benefits (*J Biblot*)
- If a model cannot simulate a phenomenon, it cannot predict it (*S Bouillon*)



Session 4 – Continental surface processes

- Can you imagine what a Global Environmental Monitoring and Prediction system could bring to society? (*G Balsamo*)
- There is a need for better data for initialisation; we should aim to use more of the existing observations to maximize the impact on forecast skill (*R Koster*)
- The carbon cycle is at the heart of climate change; for weather, we should explore the use of dynamic vegetation to link water, energy and carbon (*A Agusti-Panareda*)



Session 5 – Aerosols, GHG and chemical comp

- We have societal demands that go beyond weather forecasting (*D Jakob*)
- There are clear NWP and climate impacts from including aerosols radiative and cloud interactions (*P Colarco*)
- Improved ozone representation helped to reduce upper stratosphere biases in 1-year and 10-d runs (*J Flemming*)



Session 6 – Implementation strategies

- Coupled reanalysis are better capable to reproduce the past Earth-system climate (*P Laloyaux*)
- Coupling: this is not only a science question (*H Tolman*)
- Coupling should be done by ‘shaking hands’ at the initial time (*G Smith*)



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.. thank you!!!!

