



Purpose

To characterize climate variability and predictability, including major events, of the past ~130 years associated with the slowly-varying forcing Initially focused on atmospheric general circulation models (AGCMs)



Experimental Protocol

Phase 1: Sea surface temperature (SST) and sea ice forcing Hadley Centre provides HadlSST1.1 SST and sea ice da AGCMs integrated over 1871-2003 (at least 1949-2003) Ensembles of at least 4 members Phase 2: Atmospheric composition forcing Greenhouse gases: Co₂, O₃, etc. Aerosols (volcanic); some groups include sulfate aerosols. Solar variability Ideally, ensemble of 6 members 1871-2003; 10 1949-2003. Phase 3: Variability of land surface conditions • Specified evolution of regional surface vegetation

Contributions to CLIVAR

- Seasonal to interannual predictability Decadal to interdecadal variability & predictability
- Special focus on observed events: US Dust Bowl of 1930s; European extremes of 1962-63, 2000 and 2003; decadal modulation of response to ENSO in Australia, India
- Simulations of climate trends e.g., NAO; Asian monsoon rainfall; Sahel rainfall; Interannual to decadal Nordeste, Brazil, rainfall; Madden-Julian Oscillation
- Model evaluation
- C20C became an official CLIVAR activity in January 2003
- Also reports to Working Group on Numerical Experimentation (WCRP/CAS/WGNE)

Participating Groups

Bureau of Meteorology, Australia (www.bom.gov.au) China Meteorological Agency, China (www.cma.gov.cn) Center for Ocean-Land-Almosphere Studies, USA (www.cjec.sorg) Centro de Previsió de Tempo e Estudos Climáticos, Brazil (www.cptec.inpe.br) Department of Natural Resources, Mines & Energy, Queensland, Australia

- Department of Natural Resources, Mines & Energy, Queensiand, Australia (<u>www.mm.did.gov.au</u>) NASA Goddard Space Flight Center, USA (<u>gmao.gisfc.nasa.gov</u>) Hadley Centre, Med Office, UK (<u>www.mtgto.file.com/research/hadleycentre</u>) International Centre for Theoretical Physics, Italy (<u>www.itgt.orfise.tit</u>) MetooFrance, France (<u>www.mtgto.file.gov</u>) Main Geophysical Observatory, Russia (<u>www.mtgo.file.gov</u>) National Institute of Environmental Studies, Japan (<u>tww.mtles.gov</u>) University of California at Los Angeles, USA (<u>twww.atmos.ucla.edu</u>)

Multi-Model Themes

- Interannual variability and predictable patterns
- Trends in extremes of daily surface air temperature and precipitation
- Predictability of leading circulation patterns, mainly in boreal winter
- Tropical large-scale circulation and precipitation
- Decadal variation of ENSO response

Other seasons and sub-monthly phenomena (e.g., blocking, MJO, ISO etc.) considered later





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rs (0-380, 30-85) b) N. Pacific (150-300, 30-85) c) N. Atlantic (90%-60), 30

No.











Future Plans

- Explore links to World Climate Research Programme Working Group on Seasonal to Interannual

- Explore links to World Climate Research Programme Working Group on Seasonal to Interannual Prediction (WCRP/CLIVAR/WGSIP) and Working Group on Coupled Modeling (WCRP/CAS/WGCM) WGSIP interaction has already been initiated at Third C20C Workshop A joint workshop of C20C and WGSIP is tentatively being planned for July 2005 The 4th C20C Workshop is tentatively being planned for July 2005 There is strong interest in evolving the project toward coupled models A proposal for a "Pacemaker" experiment was endorsed at the 3rd Workshop: Specified observed SST only in the tropical Pacific (or tropical Pacific and Tropical Atlantic, or entire tropical strip) with simulated SST in the rest of the world ocean (e.g., dynamical ocean model or thermodynamic mixed layer model) A new SST and sea icc data set HadISST2 is under development using the new ICOADS data set, and several C20C themes will be revisited with experiments using this new Idata set from autumn 2006 The results of Phase 3 experiments, Pacemaker experiments and changes associated with HadISST2 will be discussed at the 5th C20C Workshop in late 2008

Jin and Kang PRCP - P1(1921 $\frac{1}{N-1}\sum_{i=1}^{N} (\vec{X}_i - \vec{X}_i)^2 - \epsilon$

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