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## A WCRP tanel Tasked to identify and promote performance metrics for climate models

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The WCRP's Working Group on Numerical Experimentation (WGNE) and Working Group on Coupled Modeling (WGCM) have jointly established a panel to identify a well-defined set of performance metrics for climate models to objectively gauge the strengths and weaknesses of different models and to track model improvement as models are further developed. The panel members have been selected according to their relevant scientific contributions and membership or liaison efforts in key WCRP and related efforts (P. Gleckler, WGNE; B. Ebert, Joint Working Group on Forecast Verification Research, JWGFVR; V. Eyring, WGCM and Stratospheric Processes and their Role in Climate, SPARC; P. Friedlingstein, International Geosphere Biosphere Programme, IGBP; H. Hewitt, Working Group on Ocean Model development, WGOMD; R. Pincus, Global Energy and Water Cycle Experiment, GEWEX; K. Taylor, WGCM/CMIP5). The WGNE/WGCM metrics panel is working to coordinate the development of a hierarchy of climate model performance metrics. At the most basic level will be a limited set of traditional "broad-brush" statistical measures of large-scale performance. The panel's extended set will focus on more targeted metrics (e.g., modes of variability and key processes), and will necessitate that the metrics panel engage with other WCRP working groups and activities. Over the course of the next year, this panel will promote its standard set of metrics that are: based on comparison with carefully selected observations; easy to calculate, reproduce and interpret; established in the peer-reviewed literature; covering a diverse suite of climate characteristics; emphasizing large- to global-scale measures of mean climate (and limited variability) for the atmosphere, oceans, land surface, and sea-ice. The panel will oversee the development of software and collection of observational datasets to calculate these metrics and make them publicly available. The resulting capability will be applied to the next phase of the Coupled Model Intercomparison Project (i.e., CMIP5) and results will be compared with earlier model versions, and made publically available. One goal of this activity is to ensure that any new climate model simulation introduced in the scientific literature or made available to the research community will be tested against an expected set of routine benchmarks. The panel will define its suite of metrics for well-established WCRP benchmark experiments such as the CMIP5 historically forced "20th Century" experiment, prescribed SST (AMIP) simulations, the WGNE/WGCM transpose-AMIP, and Earth System Model (ESM) simulations. The quest for a defensible approach to weight projections from individual models in a multi-model ensemble remains elusive, and is beyond the purview of the metrics panel. This panel may however choose to identify a set of minimum performance standards, or make broad recommendations regarding the weighting of model projections. Furthermore, depending on the success of research related to multi-model projections in the coming years (e.g., exploring the relationship between well-observed features of climate to key physical feedbacks), it may be appropriate at a later date to incorporate climate-change related performance metrics into the WGNE/WGCM metrics hierarchy.