



GCSS/WGNE Pacific Cross-section Intercomparison (GPCI): the physics of weather and climate prediction models

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The main goal of the GCSS/WGNE Pacific Cross-section Intercomparison (GPCI) is to evaluate and improve the representation of tropical and sub-tropical cloud and precipitation processes in weather and climate prediction models. In GPCI, a model intercomparison and evaluation is proposed where weather and climate prediction models are analyzed along a cross-section in the Pacific Ocean, from California to the equator. This new approach aims at complementing the more traditional efforts in GCSS by providing a simple framework for the evaluation of large-scale models that encompasses several fundamental cloud regimes such as stratocumulus, shallow cumulus and deep cumulus, as well as the transitions between them. At this stage GPCI has collected output from nine models from the following organizations: GFDL, NCAR, UKMO, MeteoFrance, JMA, KNMI, ECMWF, DWD, and NCEP. Instantaneous model output is collected every 3 hours for the periods of June-July-August 1998 and 2003. Some preliminary results will be presented. A comparison of monthly mean properties between models and observations shows that although most models often suffer from similar problems (e.g. negative stratocumulus cloud bias) they also have quite different characteristics (e.g. the depth of the boundary layer evolving from a low to a high SST region). The fact that the data is collected with a 3-hour frequency allows for studies on time variability of cloud properties. In particular, histograms of cloud cover along the cross-section differ from model to model. Some models exhibit a quasi-bimodal structure with low cloud cover being either close to 100% or close to 0, while other models show a more continuous transition from high stratocumulus values to low values closer to the equator.