

Tropical Biases Workshop Agenda

DAY 1 (Wed 28 May)

TOPICS/ISSUES: What do we know about biases in the current climate models? How similar are the biases seen in these models? What strategies/parameterization improvements have proved effective in improving tropical climate over the oceans in these models (i.e. history of model biases in individual models)?

- 0845-0900: Introduction and Workshop Goals, P. Chang/C. Bretherton

SESSION 1 NCAR and GFDL Models (Session Chair: P. Chang): Comprehensive presentation of tropical over-ocean biases on seasonal and longer timescales in AGCM, OGCM and CGCM model in NCAR and GFDL models.

- 0900-0945: Status of the CCSM Tropical Simulation with a Focus on Atmospheric Processes, J. T. Kiehl and J.J. Hack
- 0945-1030: Atmospheric and coupled model development at GFDL: the double ITCZ and cumulus momentum transport, I. Held
- 1030-1045: Break

SESSION 2 Global Model I (Session Chair: Leo Donner): Tropical biases in other global models.

- 1045-1103: Tropical Rainfall Biases in Coupled Models, K. Sperber
- 1103-1121: CSIRO MK3 Climate Model: Tropical Aspects, H.B. Gordon
- 1121-1139: Errors over the tropical oceans in Hadley Centre GCMs, W. Ingram
- 1139-1157: Biases in the MPI climate model, and their (in)sensitivities, N. Keenlyside
- 1157-1215: Tropical biases and their sensitivities in the BMRC AGCM and CGCM, H. Hendon
- 1215-1345: Lunch

SESSION 3 Global models II (Session Chair: Paul Schopf): Presentations based on other models or interesting sensitivity studies. Emphasis on what makes a difference to the distribution of tropical convection and near-equatorial SST.

- 1345-1403: INGV Coupled Model, A. Navarra
- 1403-1421: Tropical performance of the CCSR coupled GCM, M. Kimoto

- 1421-1439: The Coupled General Circulation Modeling Activity at CVRP/FRSGC in Collaboration with the Earth Simulation Center, Swadhin Behera, Sebastien Masson, Jingjia Luo and Toshio Yamagata
- 1439-1457: Sensitivity of the tropical precipitation distribution in the NSIPP AGCM, J. Bacmeister and M. Suarez
- 1457-1515: Tropical Biases in the COLA Coupled Model, B. Kirtman and E. Schneider
- 1515-1533: Why are coupled GCMs in such a hurry? Exploring the factors leading to the short period of interannual variability in the tropical Pacific of coupled GCMs, D. Dewitt
- 1533-1551: Coupled modeling activity at IPRC and monsoonal impacts on Pacific cold tongue climate, Bin Wang, Tim Li and Xiouhua Fu
- 1551-1610: Break

GROUP DISCUSSION: Which processes make the biggest difference and how do we diagnose how well we are doing?

- 1610-1740: AGCM Discussion (Chairperson: Leo Donner), Topics include: deep convection, boundary layer/shallow convection, cloud/radiation interaction, surface turbulent fluxes, land/convection interactions, horizontal, vertical, temporal resolution.
- 1610-1740: OGCM Discussion (Chairperson: Paul Schopf), Topics include: surface energy/salinity budgets, distribution of wind stress and upwelling, vertical mixing processes, penetration of solar radiation, diurnal cycle, horizontal, vertical resolution.

RECEPTION: A cash bar and hors d'oeuvres reception in the Holiday Inn.

- 18:00-19:30: Reception

DAY 2 (Thur 29 May)

TOPICS/ISSUES: How important is observational uncertainty in creating current biases or process errors? Are particular process studies called for? What new long-term observations (e.g. ARGO, enhanced TAO) would have maximal impact? To what extent do mean and seasonal biases impact our ability to forecast ENSO and ENSO related variability on SI timescales with CGCMs?

GROUP REPORT: General discussion of which processes control tropical ocean biases in coupled models.

- 0845-0900: AGCMs, Leo Donner
- 0900:0915: OGCMs, Paul Schopf
- 0915:0925: General Discussion

SESSION 1: Using observations and small-scale models to reduce biases (Session Chair: Paul Schopf):

- 0925-0942: Biases in surface heat flux products diagnosed from in situ flux measurements, Lisan Yu
- 0942-1002: Exploration of the causes of CCSM-2 Pacific biases, Peter Gent
- 1002-1022: Boundary condition override experiments with the GFDL coupled model, Tony Rosati
- 1022-1040: Lateral mixing schemes in OGCMs: a new parameterization to solve the cold tongue bias, Kelvin Richards

- 1040-1055: Break

- 1055-1123: Lessons learned from EPIC2001 about the east Pacific ITCZ, David Raymond
- 1123-1141: Simulation of marine stratocumulus, C. Roberto Mechoso
- 1141-1159: Simulating eastern Pacific climate with regional atmospheric/coupled models, Shang-Ping Xie
- 1159-1217: MJO-like coherent structures in aquaplanet simulations with Emanuel's convective parameterization and with super-parameterization, Wojciech Grabowski
- 1217-12:35 Mean state biases, intra seasonal and diurnal variability in 500-day T42 global simulations using a super-parameterization of clouds, Marat Khairoutdinov

- 1235-1405: Lunch

SESSION 2: Biases in Pacific ENSO/Tropical Atlantic (Session Chair: Jeff Kiehl):

- 1405-1423: Effect of Tropical Biases on ENSO Simulation and Prediction, Schneider and Kirtman

- 1423-1441: Forecast model bias in ocean data assimilation, J. Carton
- 1441-1456: SODA POP: Using assimilation to estimate bias in the tropical Pacific, B. Giese
- 1456-1511: Impact of biases in ocean mean state on seasonal-to-interannual simulation, Seidel
- 1511-1529: The simulation of tropical Atlantic ITCZ and related atmospheric features: A model-data comparison, Yochanan Kushnir and John Chiang
- 1529-1550: Tropical Atlantic biases and their remote influence, P. Chang and R. Saravanan

- 1550-1610: Break

DISCUSSION: (1) How important is observational uncertainty in creating current biases or process errors? Are particular process studies called for? What new long-term observations (e.g. ARGO, enhanced TAO) would have maximal impact? (2) To what extent do mean and seasonal biases impact our ability to model and forecast ENSO and related variability?

- 1610-1740: General Discussion (Chairperson: Jeff Kiehl) Topic includes: Hypothesis, New Observations needed, ..., etc.

DAY 3 (Fri 30 May)

TOPICS/ISSUES: : What have we learned from idealized or reduced physics models about tropical biases in real models? Are there promising avenues to pursue in future?

SESSION 1 Idealized models (Session Chair: Max Suarez): Role of idealized models in understanding C/A/OGCM dynamics and of new diagnostics.

- 0845-0903: Moisture-convection feedback in the tropics, Wojciech W. Grabowski
- 0903-0921: Some very simple tropical models, and the bulk parameters that control their behavior, Adam Sobel
- 0921-0939: Validating and understanding feedbacks in climate models: Results for the Pacific cold-tongue region, Dezheng
- 0939-0957: Boundary-layer dynamics and cross-equatorial Hadley circulation, Olivier Pauluis
- 0957-1015: Energy dissipation rates in the tropical ocean, Alexey Fedorov
- 1015-1030: Sensitivity of the equatorial Pacific to the mid-Lat processes using an ocean GCM and its adjoint, Eli Galanti
- 1030-1045: Role of biological feedbacks in coupled system, Hezi Gildor

- 1045-1100: Break

DISCUSSION: What have we learned from idealized models about tropical biases in real models? Are there promising avenues to pursue in future?

- 1100-1230: General Discussion (Chairperson: Max Suarez) Topic includes: New diagnostics, Climate Process Experiments, Organized plan or recommendations for CLIVAR activities to fellow,..., etc.