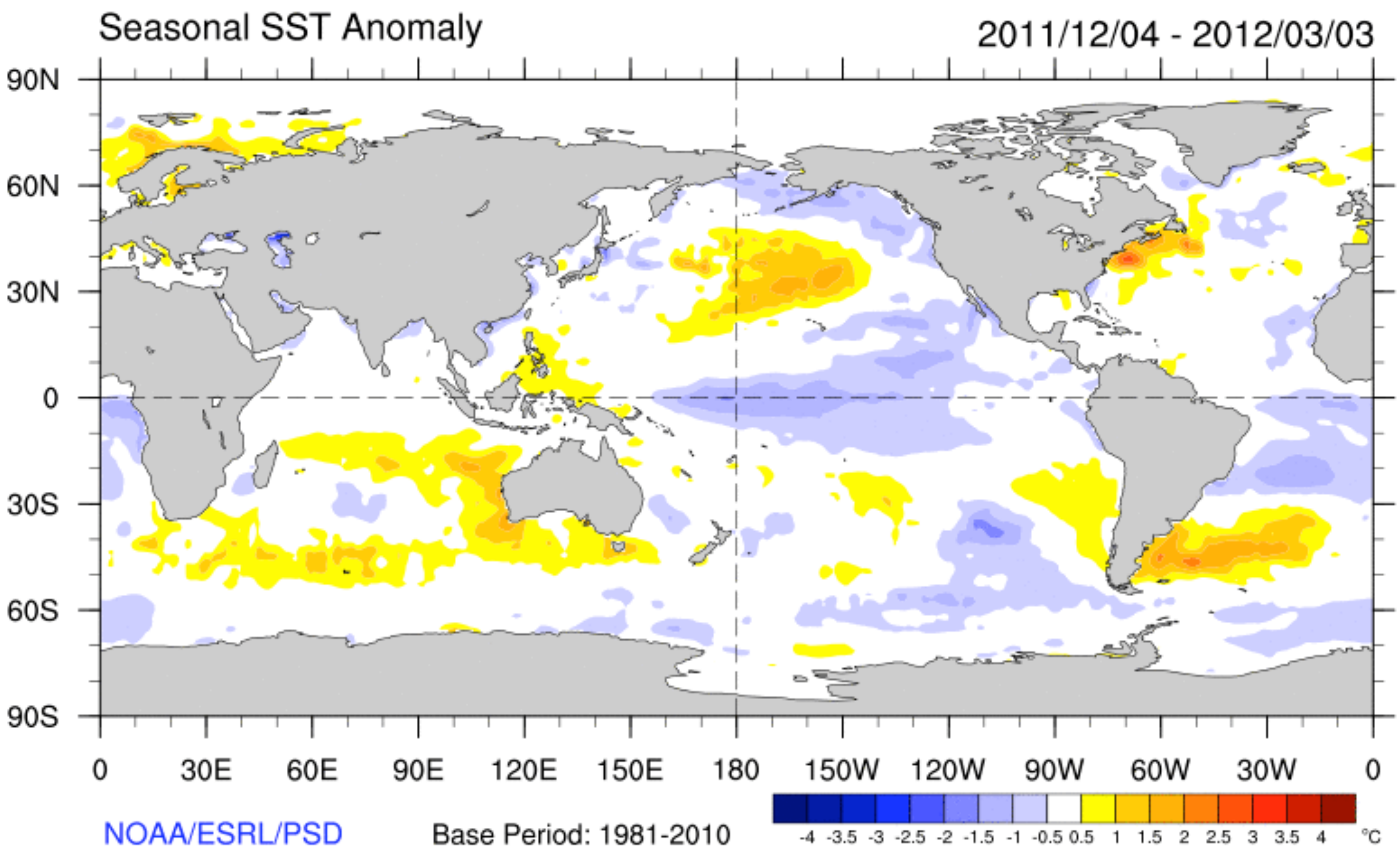
CMIP5 Model Analysis Workshop

March 5-9, 2012
Hosted by the International Pacific Research Center (IPRC) at the University of Hawaii, Honolulu

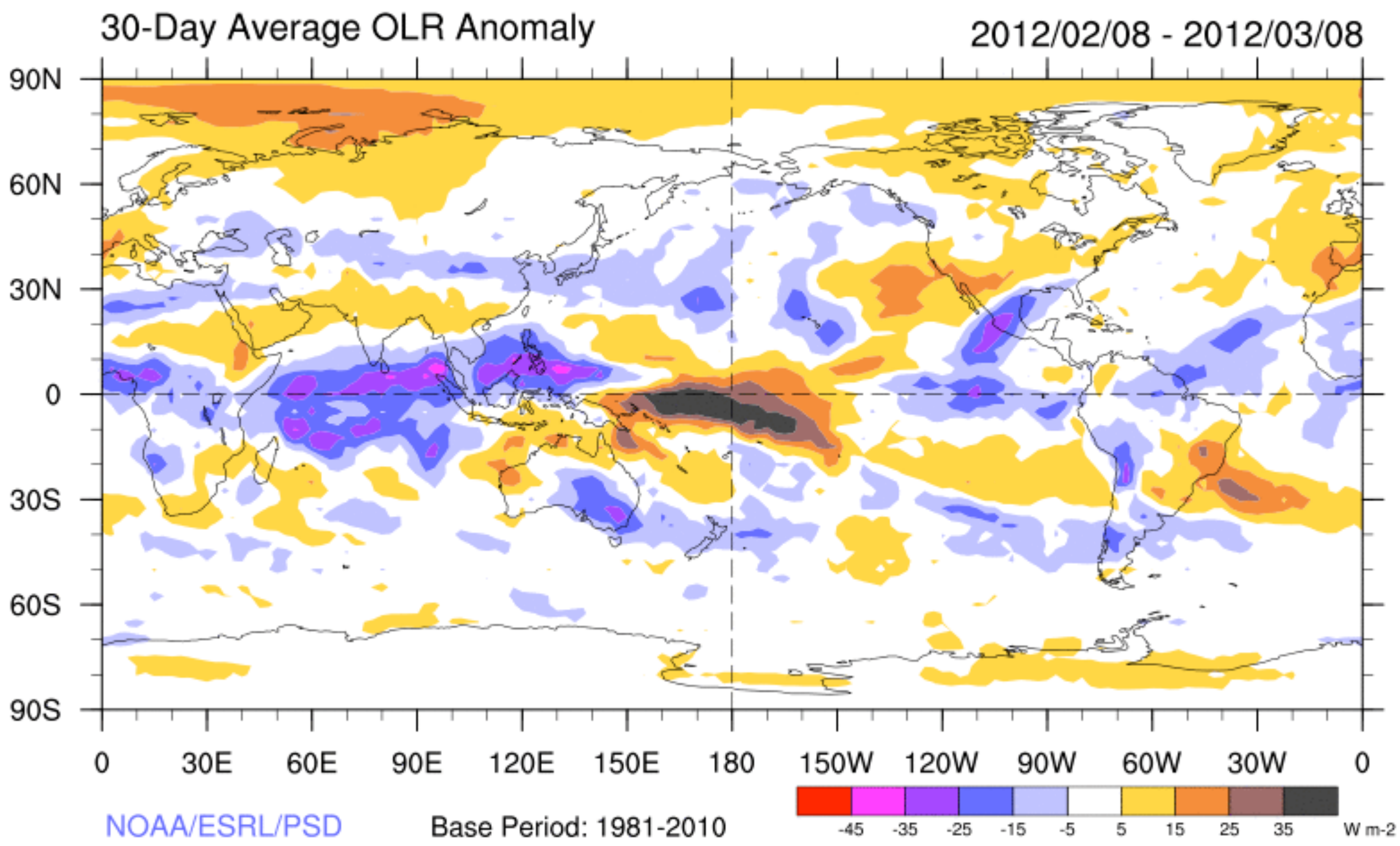
Organized by WGCM
Format of workshop: Short-presentation/poster (following the format of the CMIP3 Model Analysis Workshop in March, 2005)
About 160 participants (out of about 240 abstracts submitted)
The workshop consisted of a series of half-day sessions; each session began with presenters in that session given three minutes to show no more than one powerpoint slide summarizing the main conclusion; the rest of the half day session consisted of viewing that session's posters.

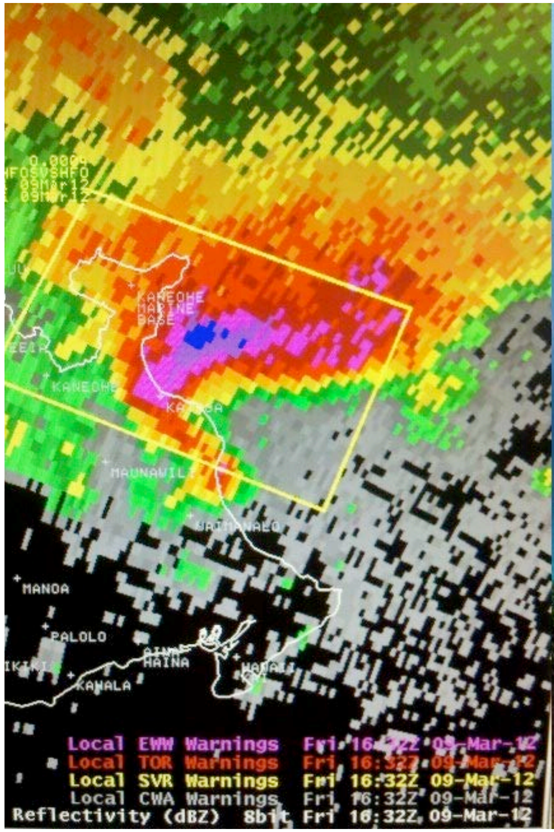
Program Committee (Gerald Meehl, Sandrine Bony, Ron Stouffer, John Mitchell, Karl Taylor, Curt Covey, Mojib Latif)

It was about as close as most of the workshop participants will ever get to a La Niña event



…and a La Niña teleconnection:
it can be wet in Hawaii during a La Niña event





The week of the workshop saw an EF1 tornado and damage, massive hail (at sea level in the tropics), lightning

In spite of some delays in model availability and challenges in downloading model data (though still farther along than in a similar stage for CMIP3), analyses included between 15 and 22 AOGCMs, 4 to 8 decadal prediction simulation sets, about 6 high-top models, and 3 to 8 ESMs

There was considerable interest and excitement in analyzing model data to learn new things about the climate system

The concern that the spread of future projections from the new generation of AOGCMs with more complexity, or from ESMs with coupled carbon cycle, would be wildly greater than from the AOGCMs of CMIP3 was unfounded—spread of projections in CMIP5 AOGCMs comparable to CMIP3, and most first generation ESMs well-behaved and produce comparable first order results to AOGCMs, but with all their additional capabilities

Patterns of future change of temperature and precipitation, equilibrium climate sensitivity, and spread among CMIP5 models similar to previous generations of models and we have the opportunity to better understand the spread; this increases confidence in these results

Characteristics of model simulations in CMIP5 either similar to CMIP3 or improved somewhat; nothing appears to have degraded

Some quantities showed considerable improvement (e.g. rate of sea ice loss in Arctic, reduction in cloud brightness) or decreased model spread (e.g. AMOC, seasonal cycle of precipitation in Caribbean, Greenland ice sheet mass balance from temperature and precipitation, Nino3 standard deviation)

Some things have not significantly improved (e.g. double ITCZ, Arctic clouds and atmospheric circulation, Antarctic sea ice loss, southern ocean too warm, SPCZ too zonal, humidity in subtropical descent

CMIP5 provides many more capabilities and new types of climate change information

-- carbon cycle feedback, quantifying sources and sinks of carbon for land vs ocean, allowable emissions for different levels of mitigation in the RCP scenarios, ocean acidification, physiological effects of vegetation changes
-- high resolution time slices to study tropical cyclones
-- decadal climate prediction for short term climate change and possible climate shifts
--paleoclimate simulations that allow analysis of climate response across past, present and future climates, and that provide "out of sample" insights to build model credibility and provide possible constraints on nature and magnitude of future climate change
--analysis of cloud feedbacks
--revisiting of forcing and feedback better helps to interpret the spread of model projections
--attempts to relate 20th century model biases to projections

New types of results, just a few examples (many more were presented):
--AMO more predictable than PDO
--critical thresholds for Arctic sea ice loss
--regional climate regimes like Indian Ocean Dipole and connections to east African rainfall
--South Pacific Convergence Zone
--ocean wave heights
--changes in monsoon onset characteristics,
--role of salinity and patterns of changes connected to hydrological cycle and ocean response
-- effects of aerosols on Atlantic SSTs
-- tracking regional ocean heat content changes and relation to regional patterns of sea level rise
--better quantification of factors affecting cloud feedback
-- mechanisms for regional precipitation and temperature changes and extremes—Caribbean drying, SE US wetter, drying Amazon, connecting Arctic sea ice loss to European cold extremes, atmospheric rivers and extreme precipitation, importance of circulation changes, blocking,