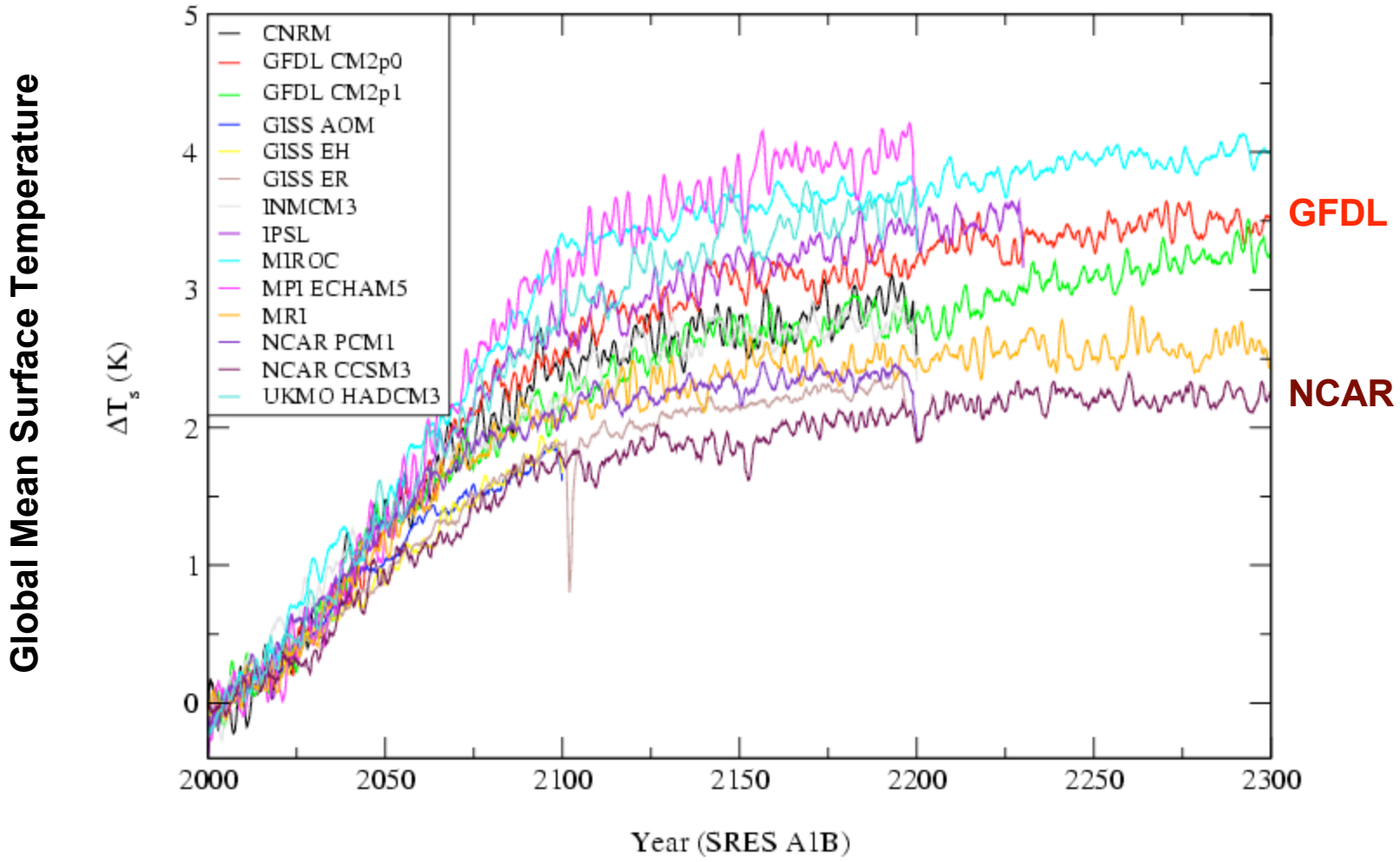
Radiative Damping and Climate Sensitivity

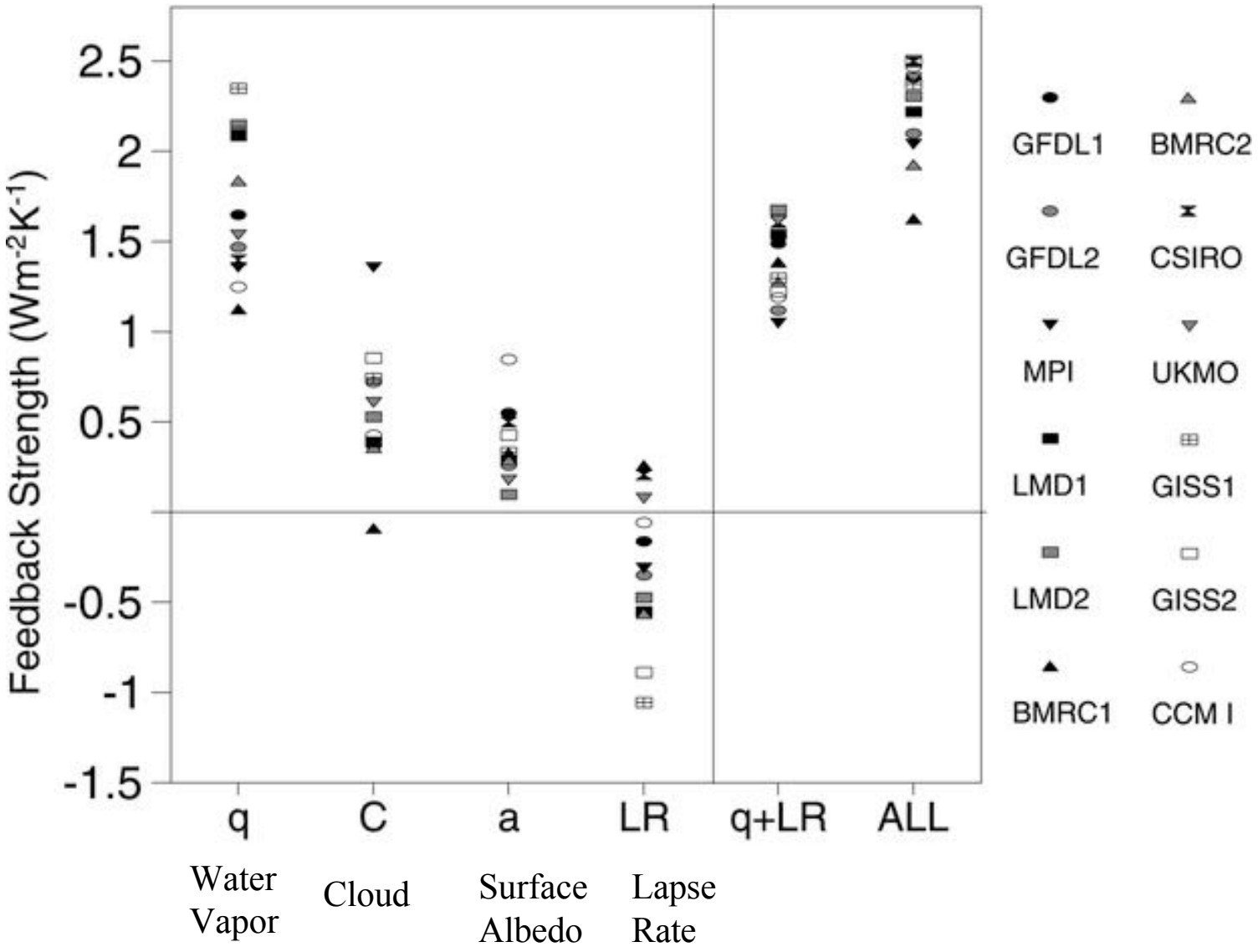
Brian Soden

Rosenstiel School for Marine and Atmospheric Science
University of Miami

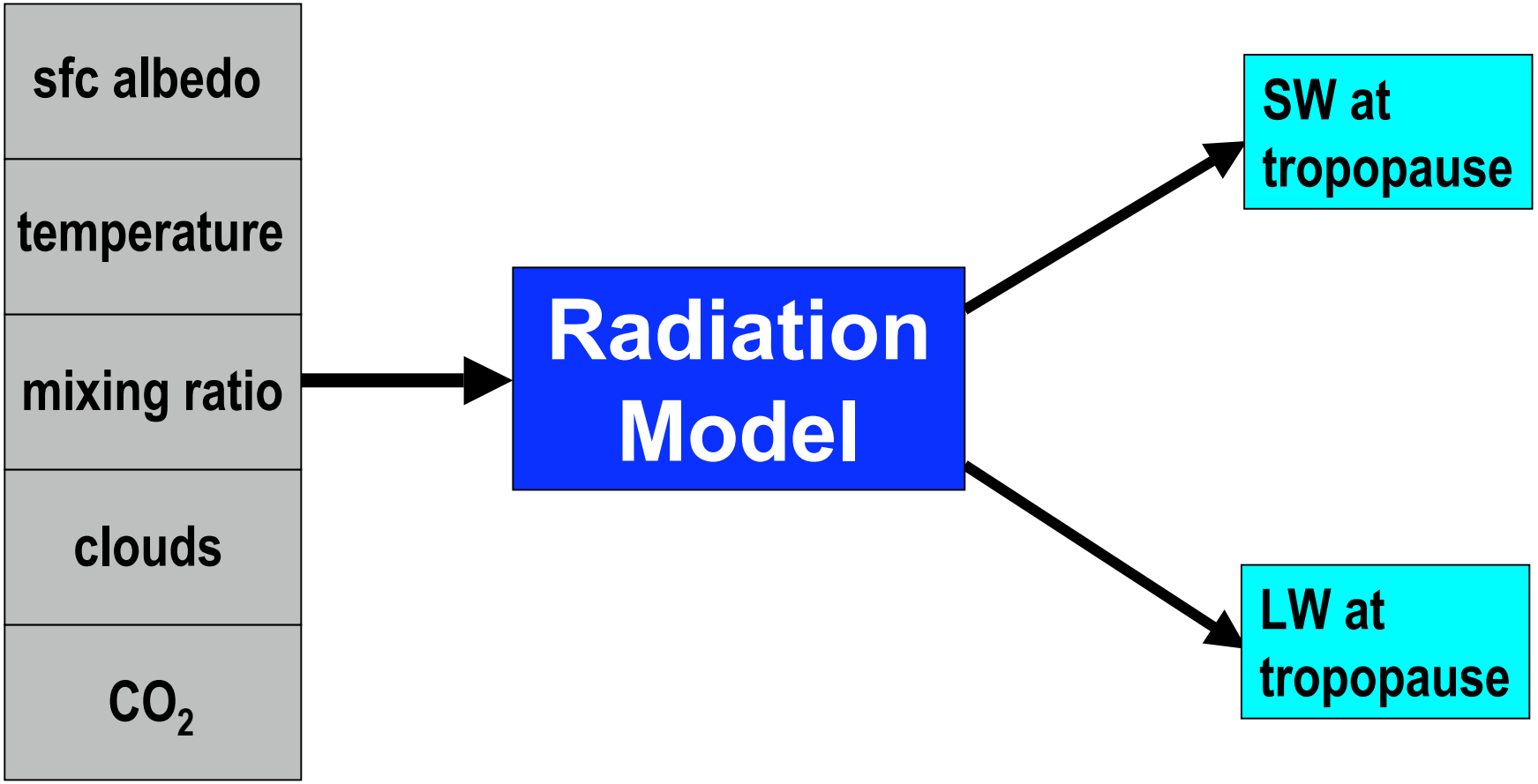
Climate Sensitivity of IPCC AR4 Coupled Models



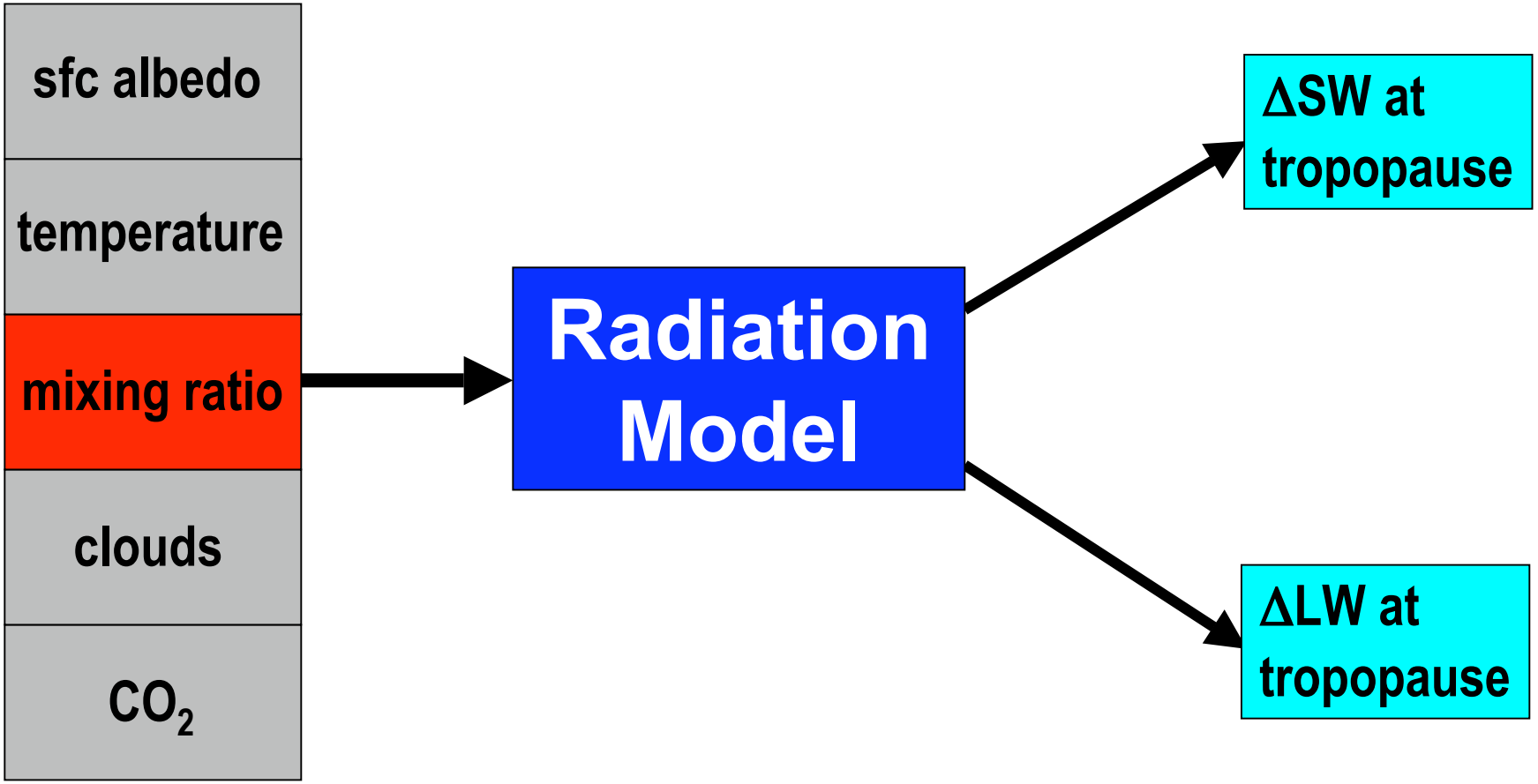
Survey of Climate Model Feedbacks (Colman, 2003)



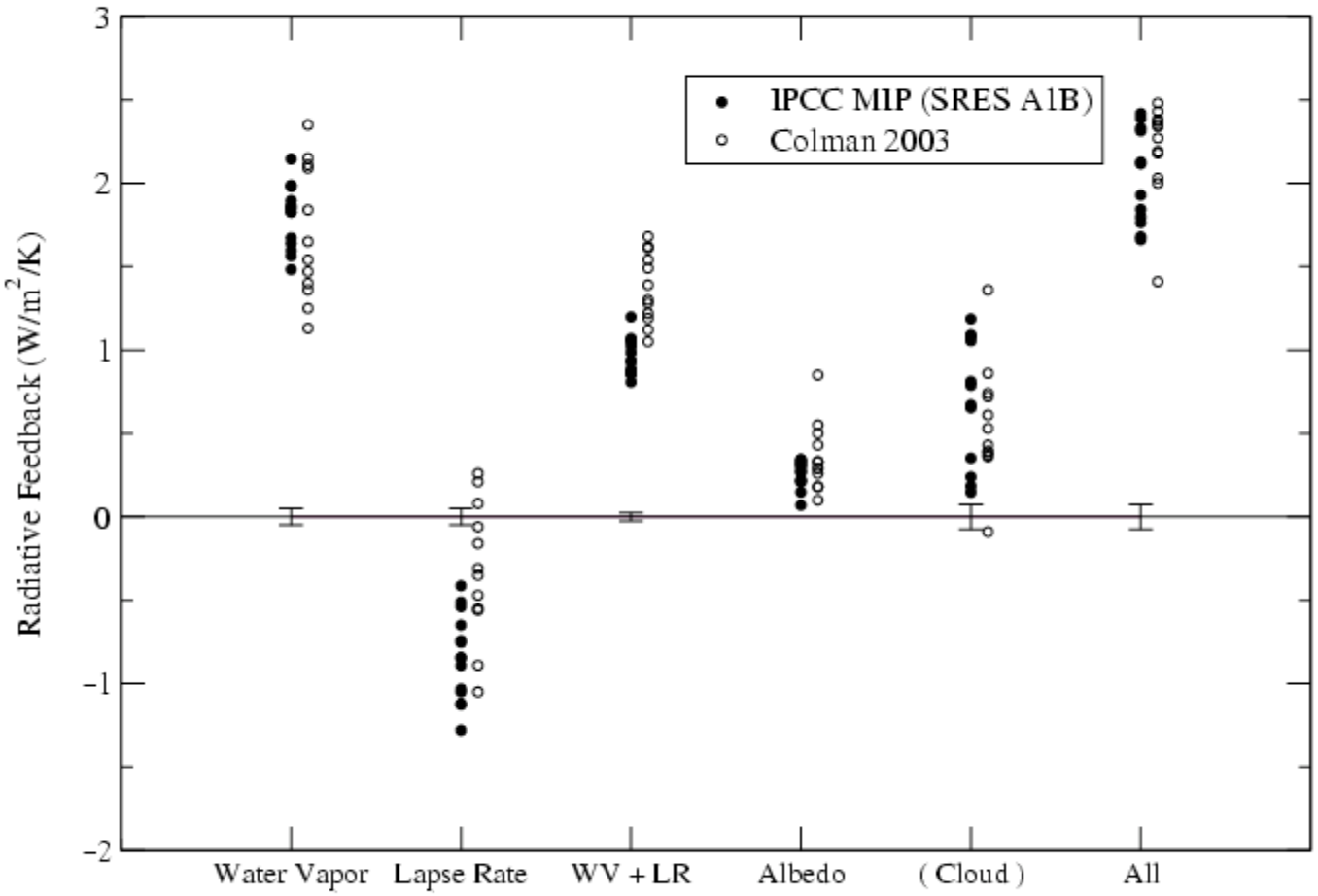
Offline Radiation Calculations



Calculating Water Vapor Feedback

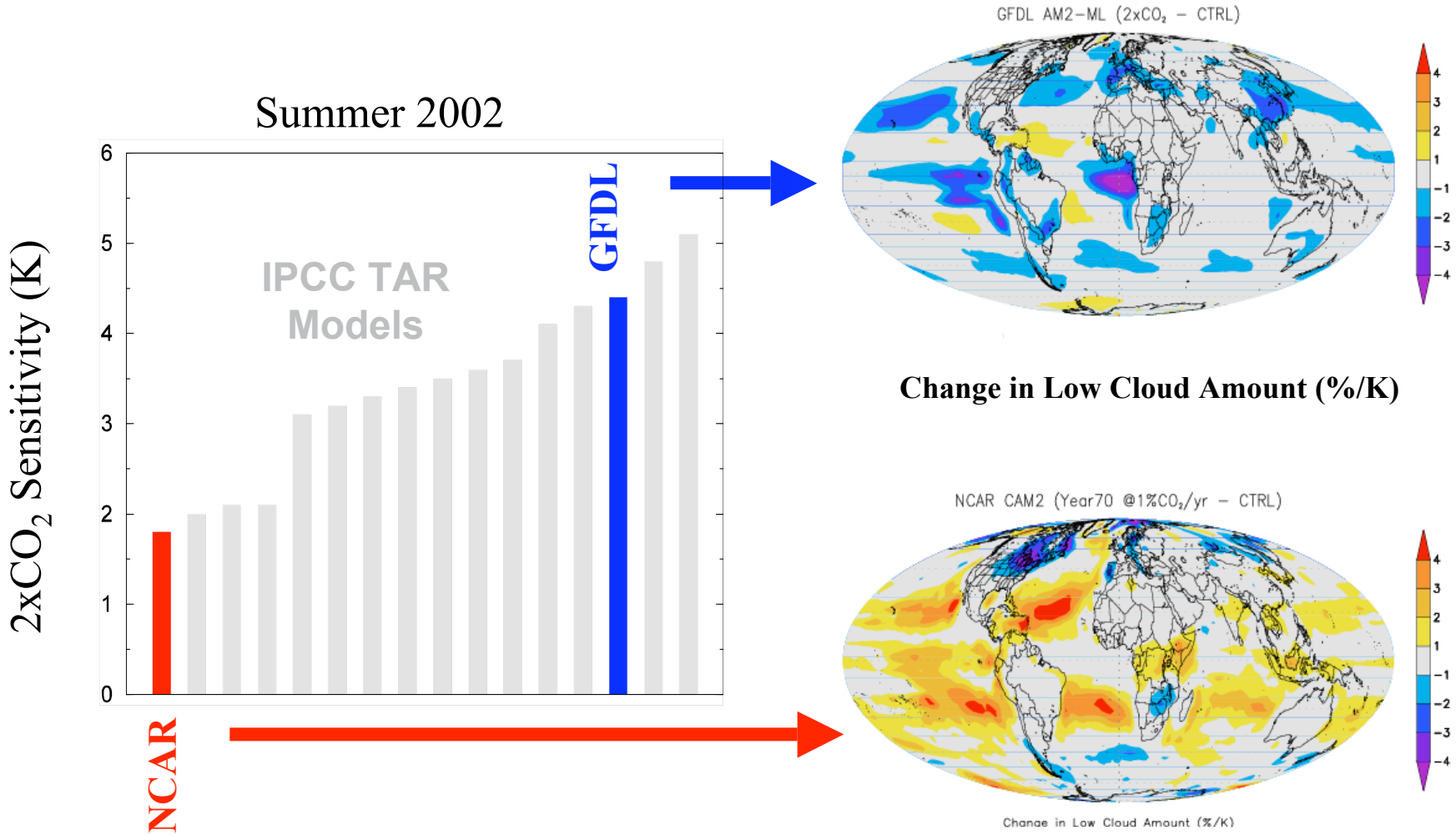


Climate Feedbacks in IPCC Models

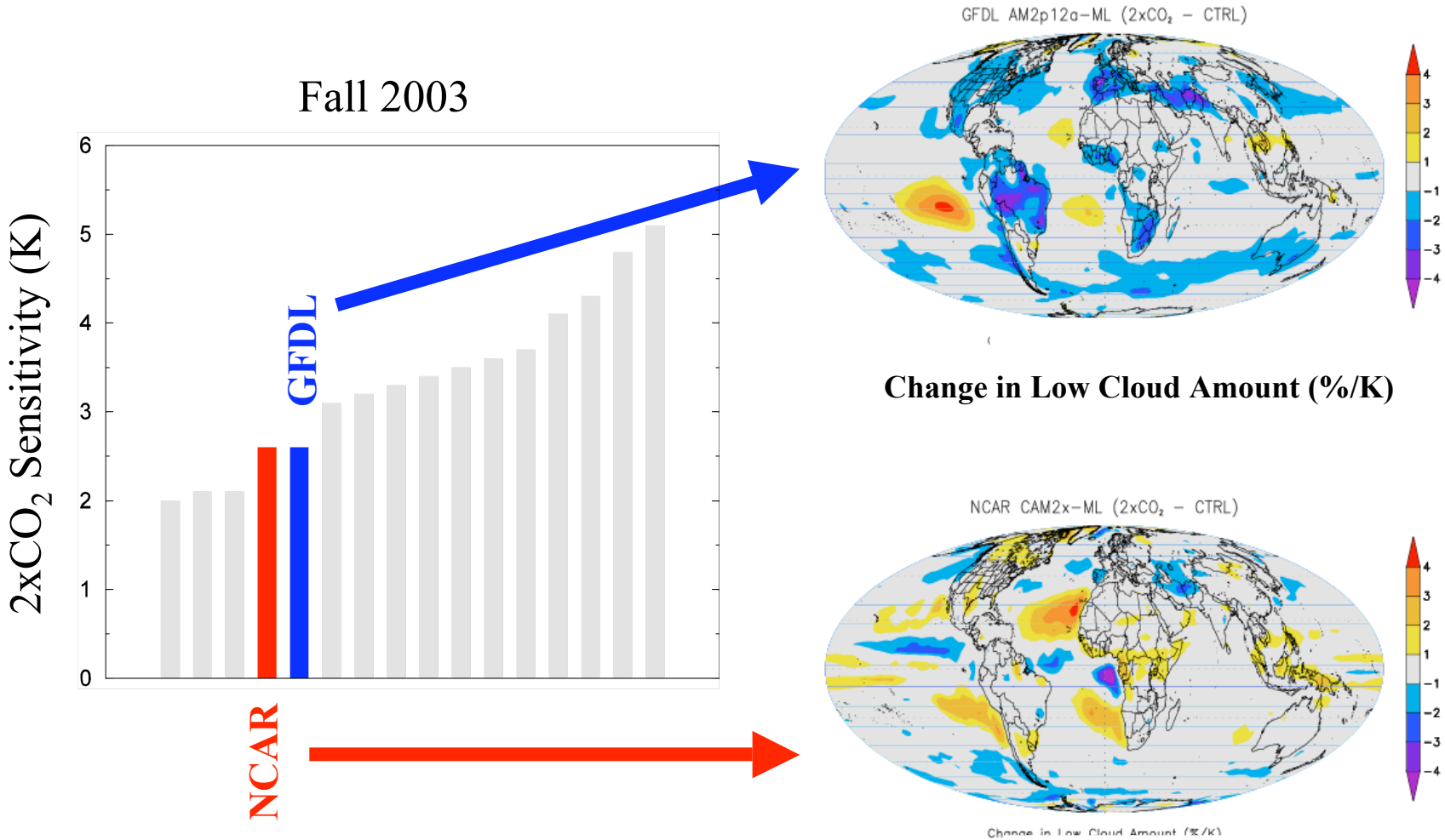


Planck = -3.3W/m^2/K

Climate Sensitivity and Low Cloud Feedback

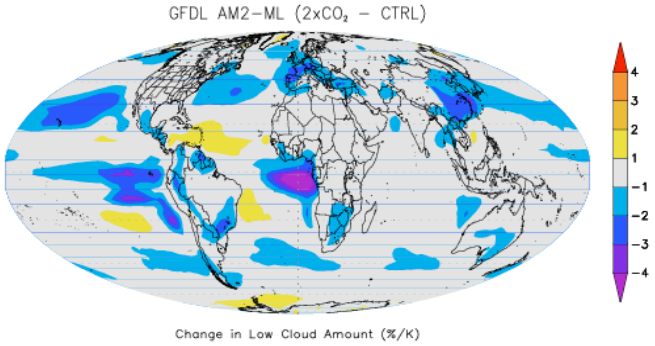


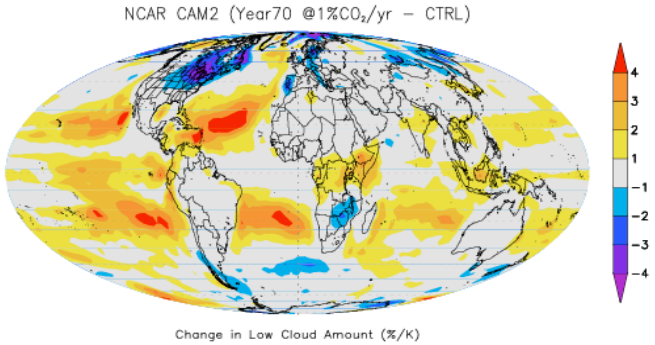
Climate Sensitivity and Low Cloud Feedback



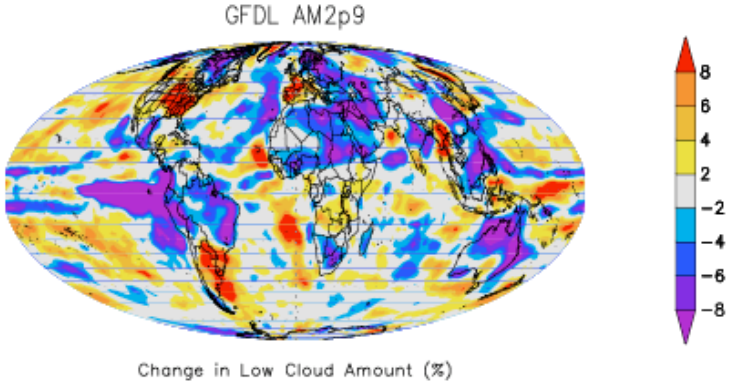
Cloud Feedback vs Cloud Variability

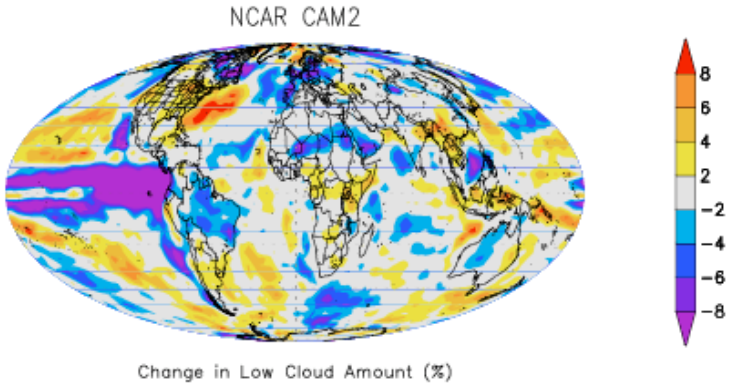
Global Warming



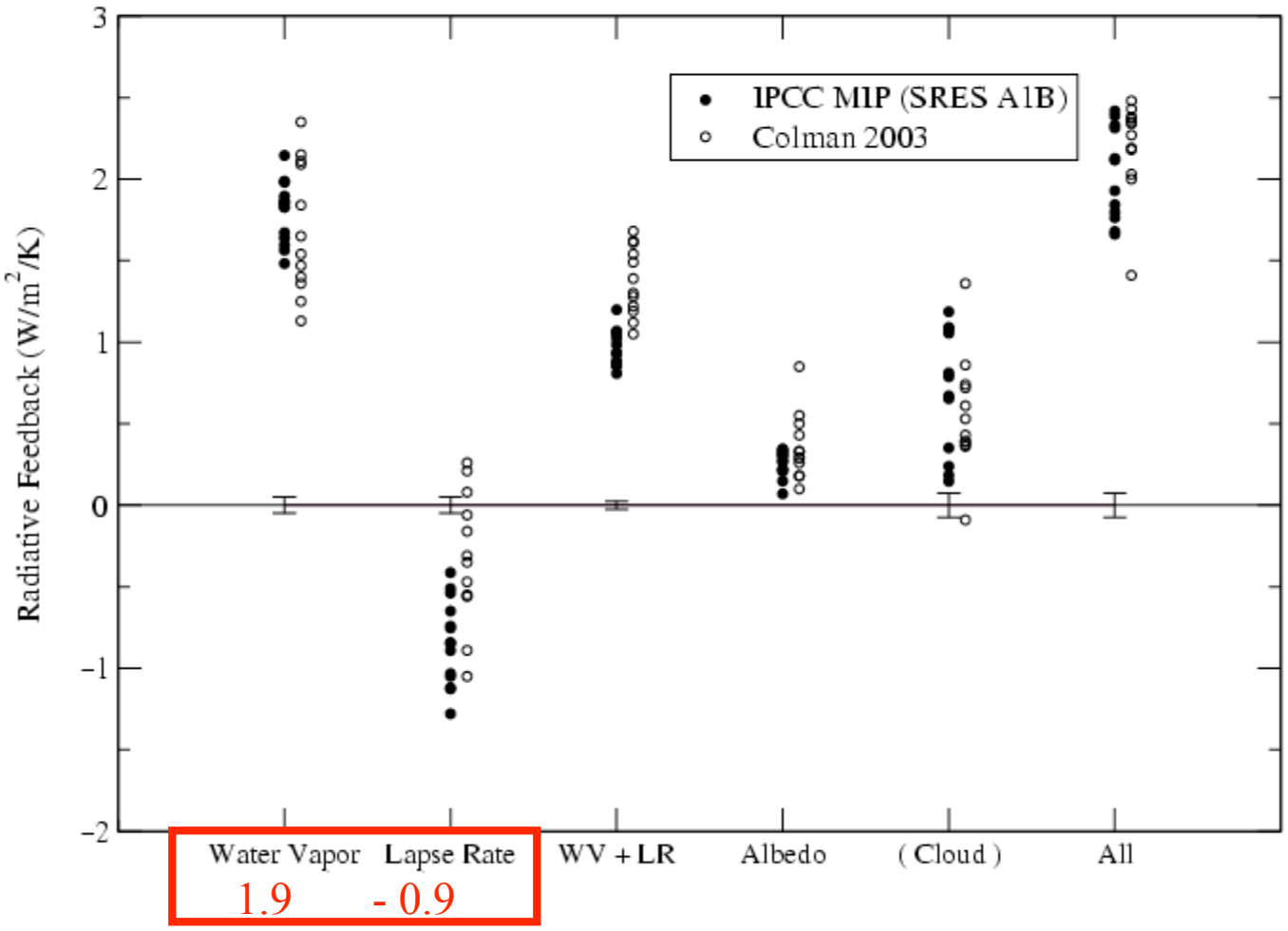


ENSO: Warm-Cold





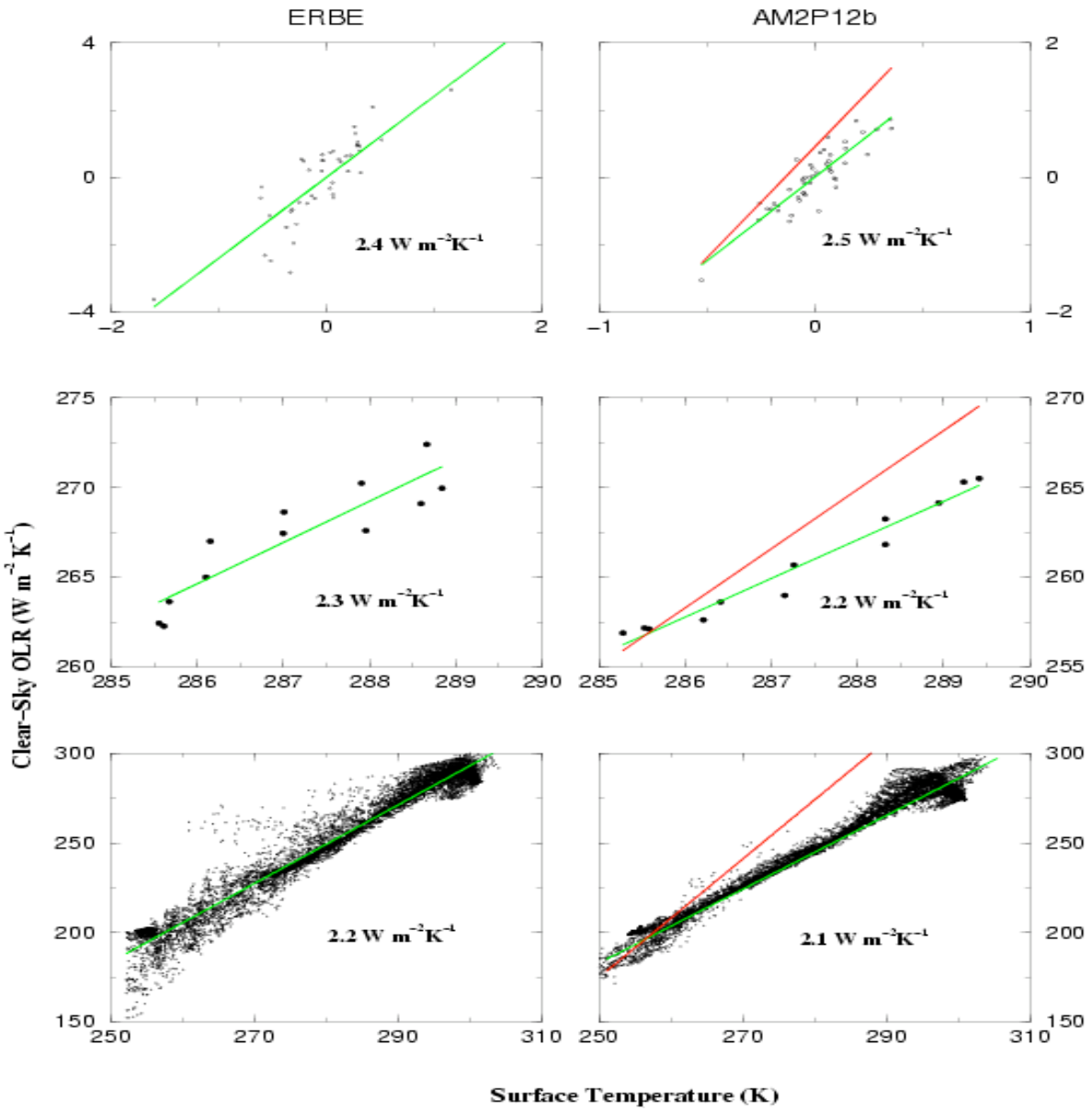
Climate Feedbacks in IPCC Models



Planck = -3.3W/m²/K

Clear-Sky Radiative Damping: 3.3 + 0.9 -1.9 = 2.1 W/m²/K

Observable Radiative Damping Rates

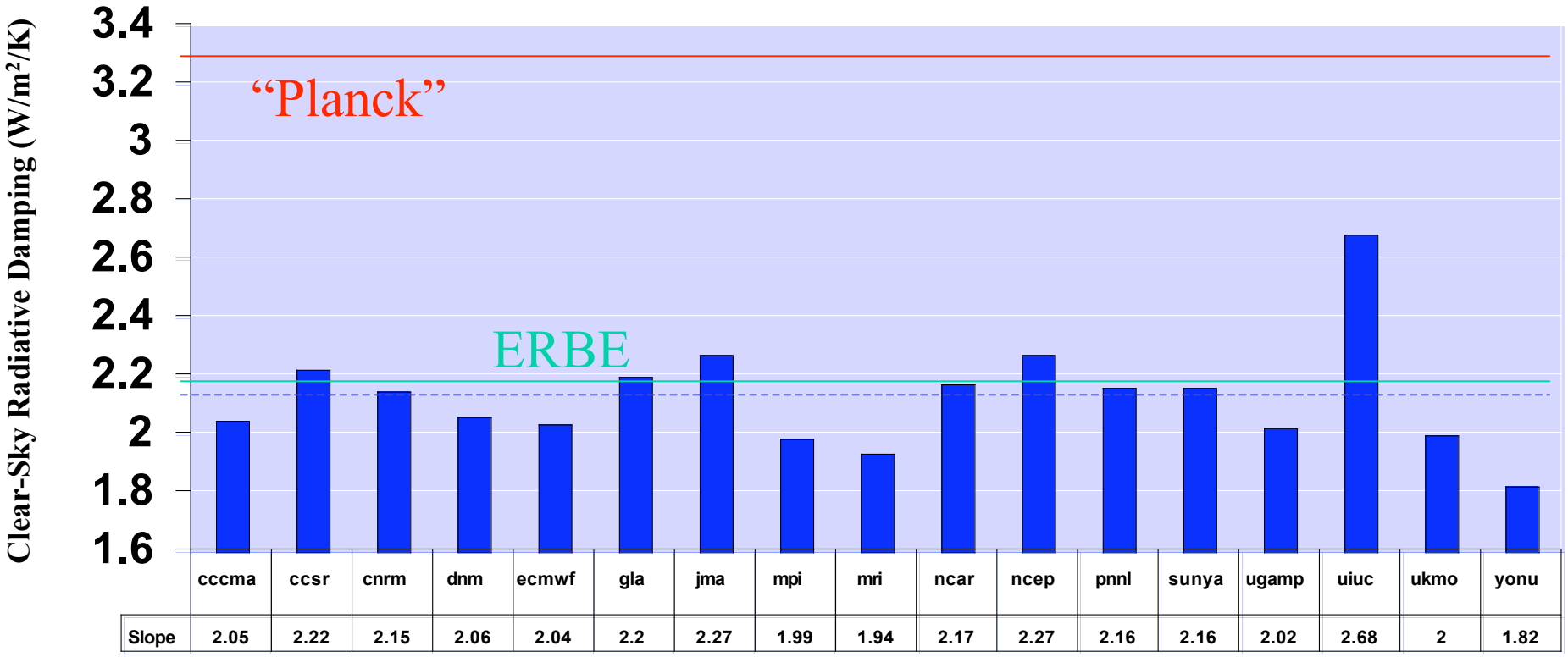


Interannual

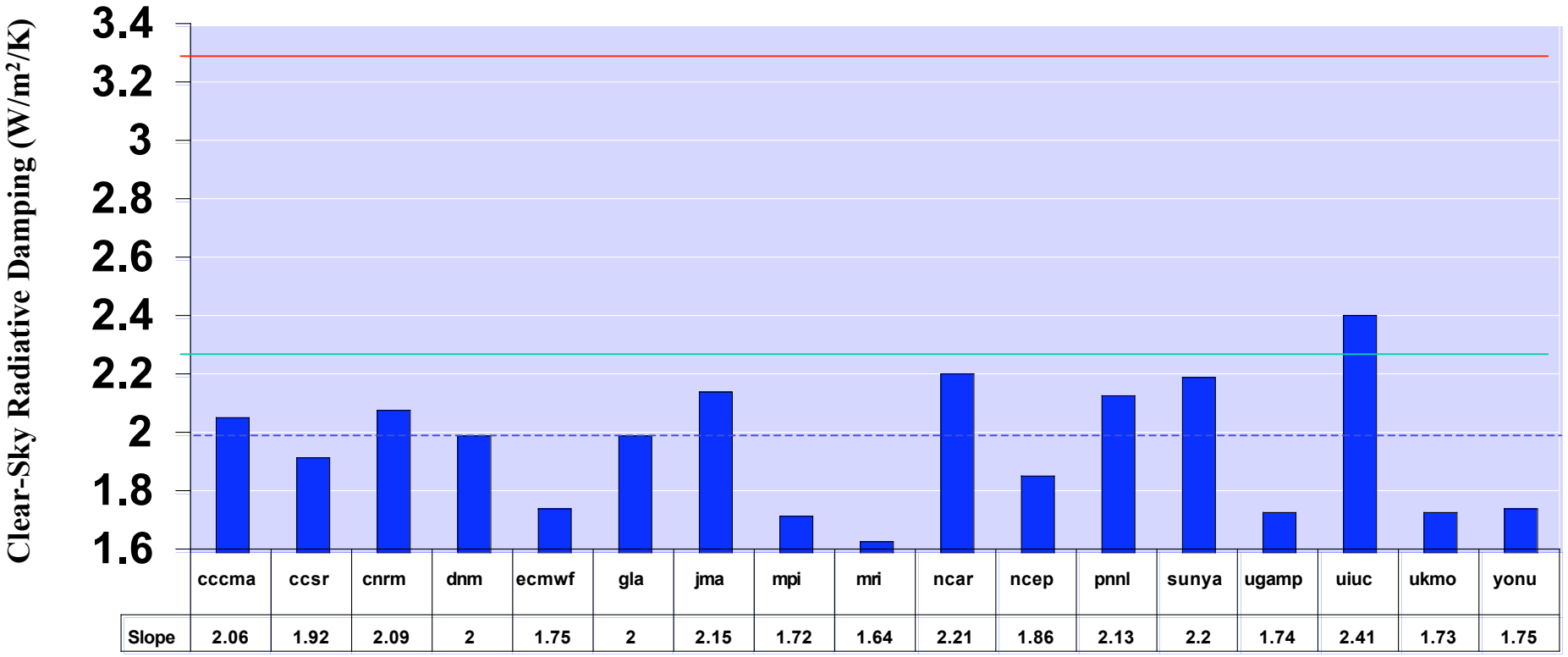
Seasonal

Regional

Regional Radiative Damping Rates: AMIP II GCMs



Seasonal Radiative Damping Rates: AMIP II GCMs



	cccma	ccsr	cnrm	dnm	ecmwf	gla	jma	mpi	mri	ncar	ncep	pnnl	sunya	ugamp	uiuc	ukmo	yonu
Slope	2.06	1.92	2.09	2	1.75	2	2.15	1.72	1.64	2.21	1.86	2.13	2.2	1.74	2.41	1.73	1.75

Interannual Radiative Damping Rates: AMIP II GCMs