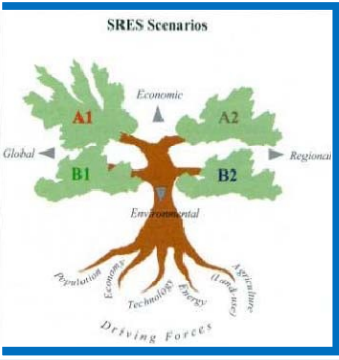
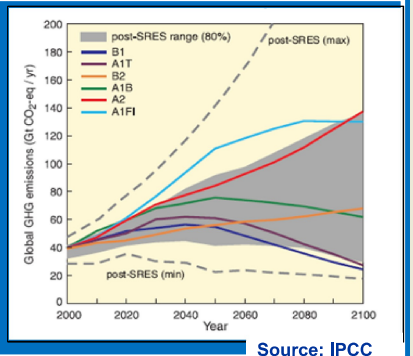
Downscaled Climate Projections

- 112 downscaled climate projections
  - PCMDI CMIP3 DCP archive
  - BCSD downscaling method
  - 16 GCMs included in IPCC AR4
  - SRES A2, A1b, and B1 scenarios to bracket range
  - Multiple realizations

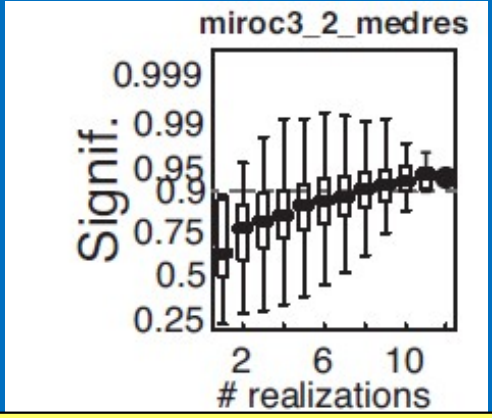




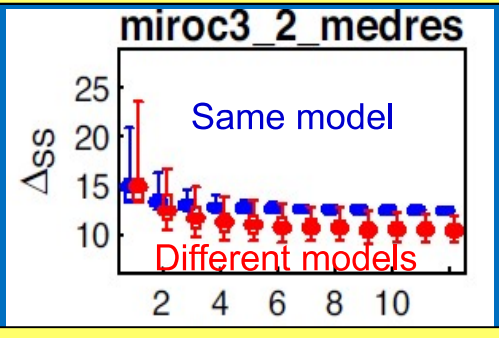
Source: IPCC 2007

Modeling Group, Country	WCRP CMIP3 I.D.
Bjerknes Centre for Climate Research	BCCR-BCM2.0
Canadian Centre for Climate Modeling & Analysis	CGCM3.1 (T47)
Meteo-France / Centre National de Recherches Meteorologiques, France	CNRM-CM3
CSIRO Atmospheric Research, Australia	CSIRO-Mk3.0
US Dept. of Commerce / NOAA / Geophysical Fluid Dynamics Laboratory, USA	GFDL-CM2.0
US Dept. of Commerce / NOAA / Geophysical Fluid Dynamics Laboratory, USA	GFDL-CM2.1
NASA / Goddard Institute for Space Studies, USA	GISS-ER
Institute for Numerical Mathematics, Russia	INM-CM3.0
Institut Pierre Simon Laplace, France	IPSL-CM4
Center for Climate System Research (The University of Tokyo), National Institute for Environmental Studies, and Frontier Research Center for Global Change (JAMSTEC), Japan	MIROC3.2 (medres)
Meteorological Institute of the University of Bonn, Meteorological Research Institute of KMA	ECHO-G
Max Planck Institute for Meteorology, Germany	ECHAM5/ MPI-OM
Meteorological Research Institute, Japan	MRI-CGCM2.3.2
National Center for Atmospheric Research, USA	CCSM3
National Center for Atmospheric Research, USA	PCM
Hadley Centre for Climate Prediction and Research / Met Office, UK	UKMO-HadCM3

Multi-model Ensemble is Superior to Any Individual Model Projection

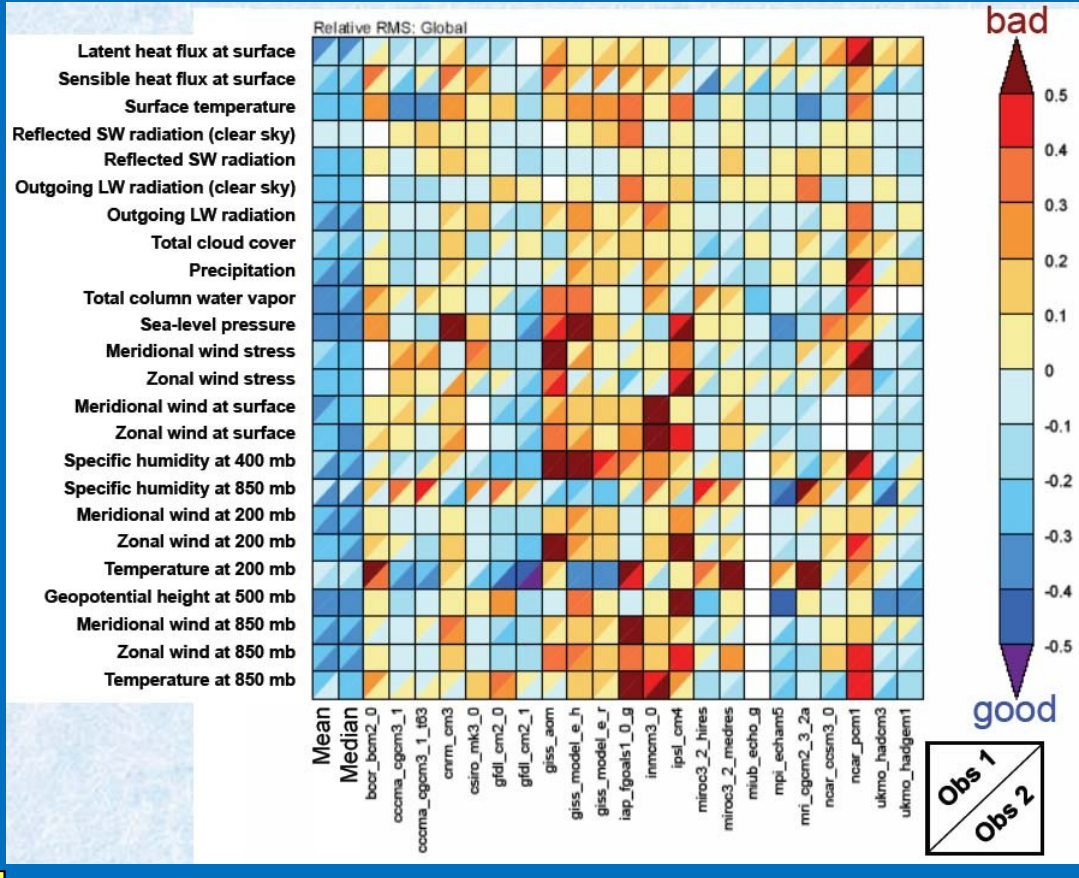


Statistical significance of model trend in JFM Tmin for western U.S. with increasing # of realizations



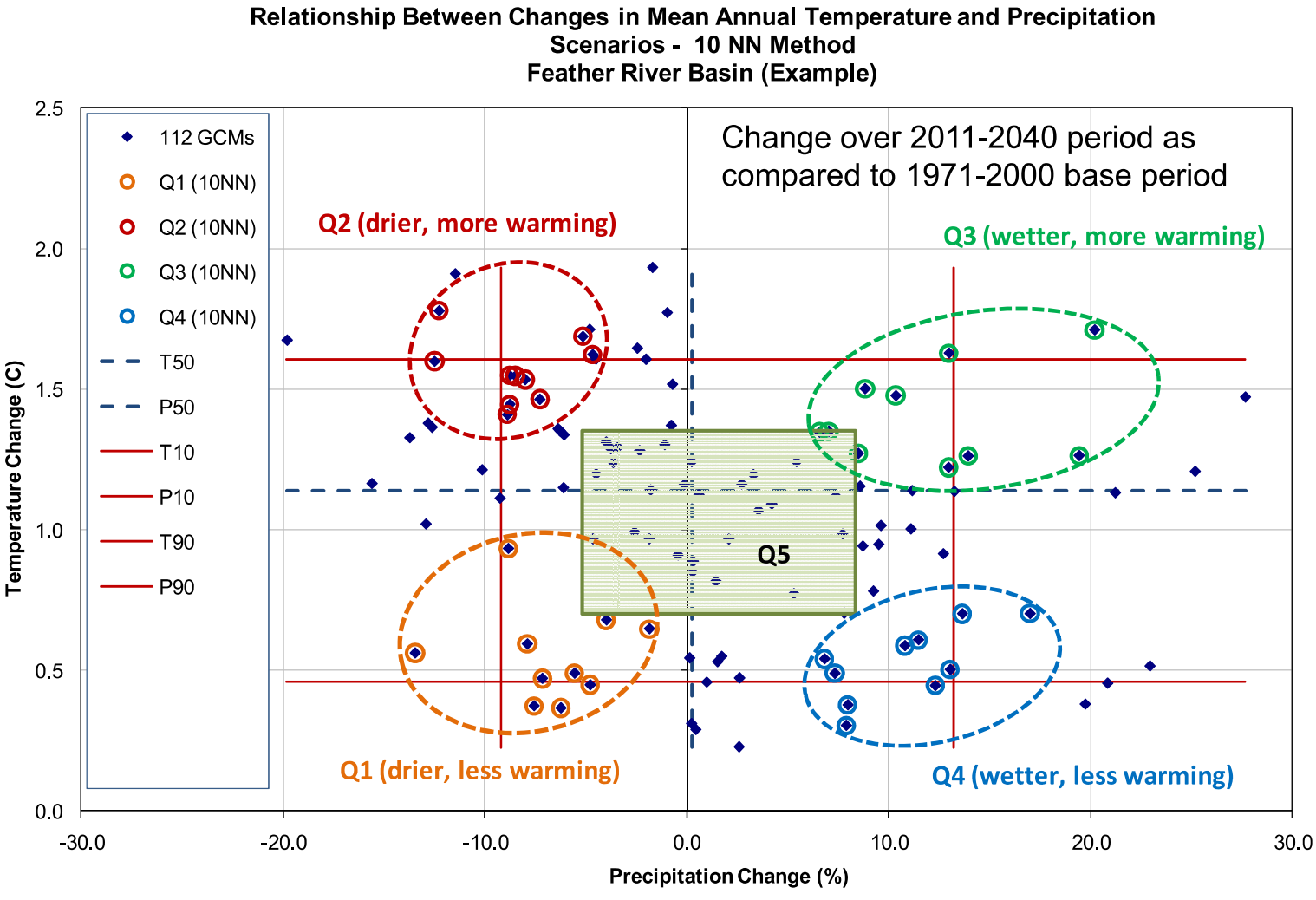
Change in model "skill score" with increasing # of realizations

Source: Pierce et al, 2009



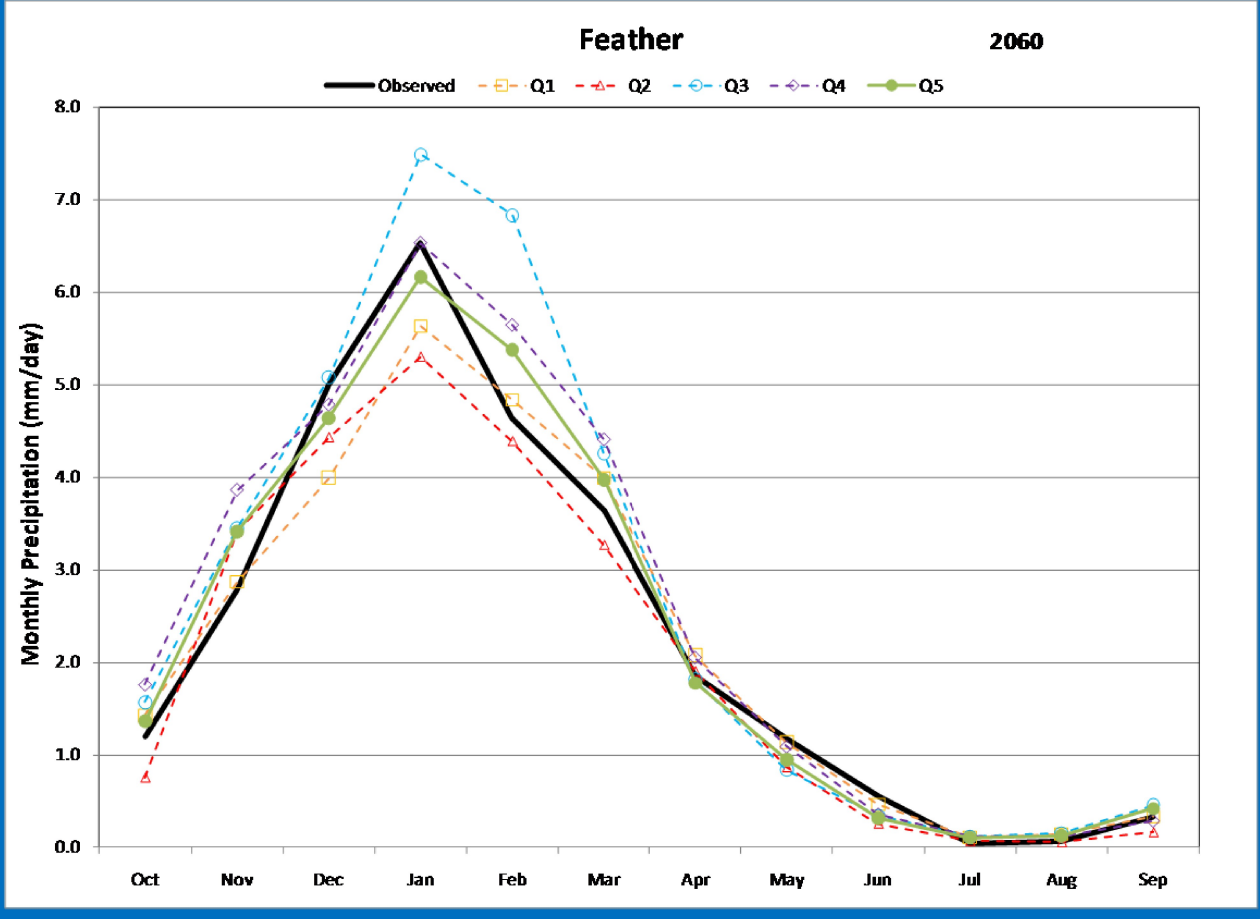
Source: Gleckler et al, 2008

Climate Scenarios – Nearest-Neighbor Method



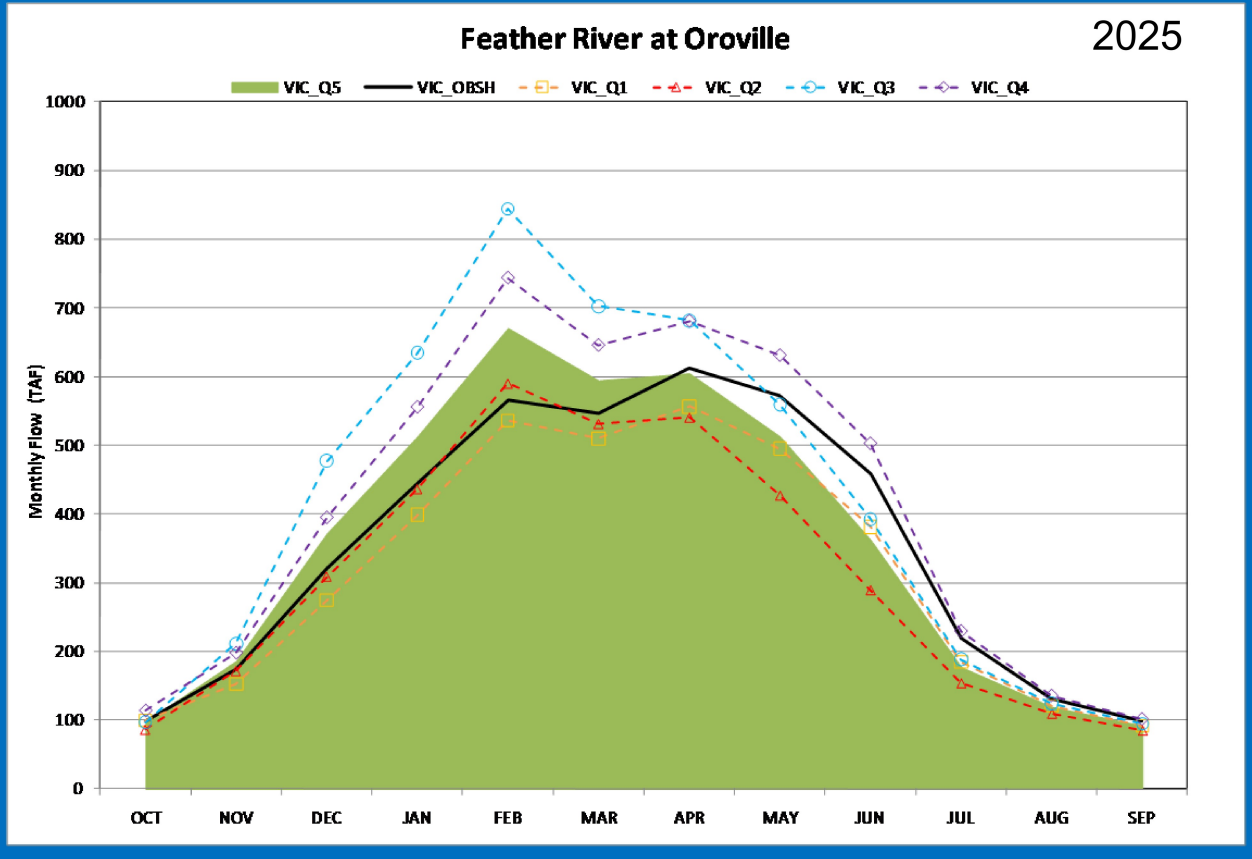
Precipitation Projections

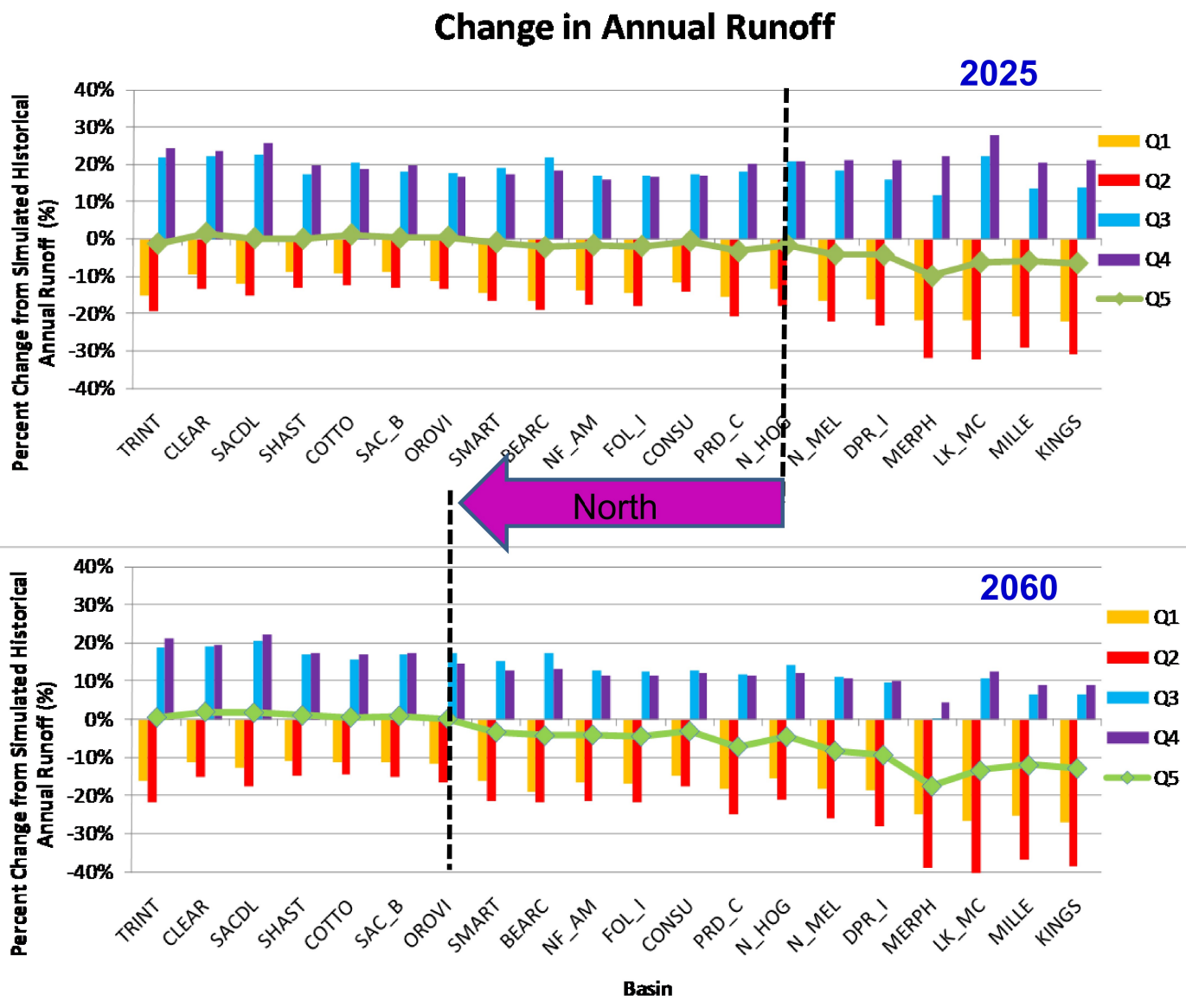
Feather River location @ 2060



Projected Streamflow

Feather River at Oroville @ 2025



Simulated Changes in Annual Runoff

North-South Transect