

California Department of Water Resources, Climate Change Technical Advisory Group, Subgroup on Climate Scenarios

DRAFT Strengths/Weaknesses and Criteria for Climate Model Scenarios – 5/7/12

	12 CAT Scenarios	5 BDCP Scenarios	CVP-IRP Modified BDCP Scenarios
Strengths	<ul style="list-style-type: none"> • Scenario selection based on GCMs using criteria developed by CAT • Climate evolves; dynamic future • Thoroughly peer reviewed in published literature. • Used extensively in past statewide impact evaluations. • Preserves variability displayed in projections, doesn't rely on historical observations to incorporate inter-annual/inter-decadal variability. • Provides individual realizations of the future projection distribution. 	<ul style="list-style-type: none"> • May capture wider range of possible potential future climate using a smaller set of scenarios • Climate is static, then mapped onto historic • Includes 3 emissions scenarios • Includes information from the available 112 CMIP3 projections • Aggregation method de-emphasizes technical inconsistencies associated with individual climate projections 	<ul style="list-style-type: none"> • Climate dynamically evolves through time. • Same strengths as BDCP
Weaknesses	<ul style="list-style-type: none"> • Bias toward drier side of projections • 30 year running averages don't appear to represent historic variability. • Does not capture full range of uncertainty as described by the full CMIP3 archive of projections. • Has not been reevaluated since completion in 2008—new methods, research are available. • Does not provide a single central tendency or most likely outcome that can be used for detailed/project level decision making • Unsure if selection of models provides the appropriate sampling needed for given DWR studies. 	<ul style="list-style-type: none"> • Does not capture extreme temp and precip unless mapped to a historical pattern • Computationally complex—requires considerable resources and expertise to modify in any way. • Scenarios are currently only available at two time periods; 2025, 2060 • Not thoroughly peer reviewed. • Collapses variability of multiple projections into ensemble average, potentially masking a more realistic representation of hydrologic variability. • Difficult to maintain spatial continuity of the desired projection distribution realization that is run. 	<ul style="list-style-type: none"> • All scenarios follow same sequence of wet and dry years as historical record (i.e. driest years on record are followed by very wet- 1976-79) • Provides relatively limited representation of extreme precipitation/drought years when compared to GCMs. • Most of the same weaknesses as BDCP.

Technical Criteria for Selecting Climate Scenarios

- Capturing precipitation variability is important
- Select among CAT, BDCP, or GCM scenarios using approach that yields the types of water-management-related cc changes most important
- Want to capture extremes, including extended dry periods, and observe 30 year running average precipitation
- Matching historical record is not a predictor of confidence of future projections
- Mimic historical variation
- Select scenarios that can be used for multiple planning purposes; that are inter-comparable to other agencies and institutions