



DWR CCTAG Scenarios Subgroup Meeting



January 17, 2013

**California Department of Water Resources
Climate Change Technical Advisory Subgroup Meeting
10am-noon, January 17, 2013
DWR IRWM Conf Room, 2nd floor, Bonderson**

Aschwarz, Climate1

Topic: WebEx CCTAG Subgroup

Date: Friday, Jan. 17, 10am-noon Pacific time

Meeting Number: 746 523 887

Meeting Password: (This meeting does not require a password.)

<https://resources.webex.com/resources/j.php?ED=222844867&UID=491358787&RT=MiM0>

Call-in toll-free number (Verizon): 1-877-923-1522 (US)

Host access code: 679 474 0

Attendee access code: 295 056 7

MEETING GOALS and OBJECTIVES:

Recap past progress and full CCTAG meeting

Schwarz

Discussion inclusion of other metrics

Lynn

CCTAG Scenario recommendations documentation/wrap-up (for end 2014)

Lynn

Discussion of potential study/comparison culled multi-model mean vs. full ensemble multi-model mean

Schwarz

Other Topics (Time permitting)

Adding extreme/stress test scenarios

Downscaling

Flood analysis

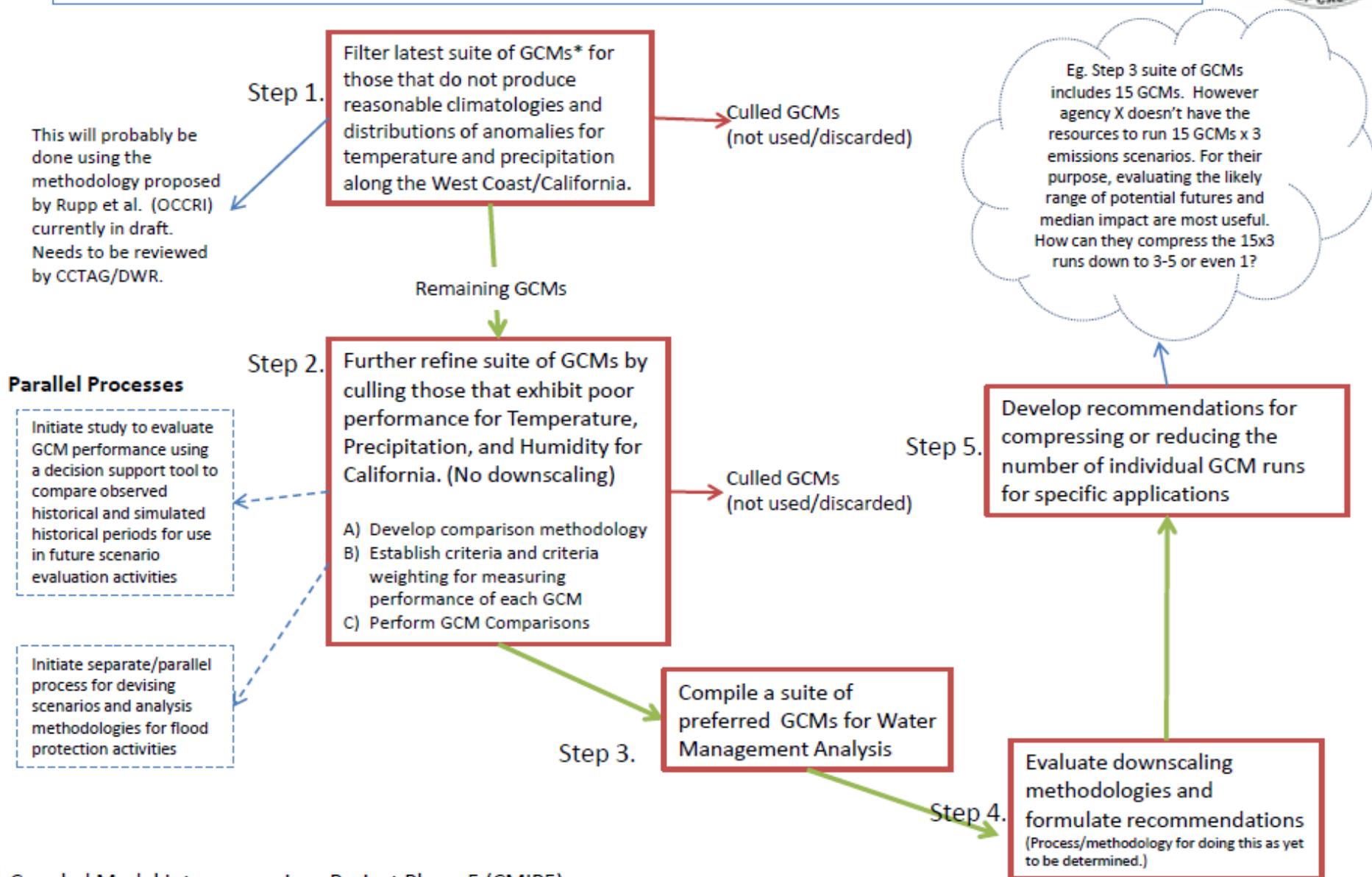
Scenario Selection for Water Management in California

California Department of Water Resources – Climate Change Technical Advisory Group

September, 2013



Objective: Select a manageable suite of climate change scenarios for water management purposes in California.



Identifying GCMs for California Water Managers

For many purposes, an ensemble of global models is required
Using all 40+ available Global Climate Models (GCMs) isn't practical
Remove (cull) GCMs that don't adequately represent historical conditions

40+ GCMs

Global Climatology Assessment

Gleckler et al IPCC 5th Assessment Report evaluated modeled historical

- Radiation
- Temperature
- Pressure, wind

~20
GCMs

Regional Assessment

Rupp, Mote et al Southwestern U.S.

- Temperature & Precipitation
- Pressure patterns, El Niño structure

~15 GCMs

CA/NV Extremes Assessment

Cayan et al CNAP, SW CSC Group

- Dry and Wet Precipitation extremes
- Heat waves and cold snaps
- El Niño spatial & temporal patterns

~11 GCMs

Numbers of GCMs to be retained after Global, Regional Mean and Regional Extremes Assessments are a preliminary estimate

**A subset of GCMs for
California Water Resources Assessment**

GCM Evaluation

climate scenarios for California assessment, planning

Metrics at global scale

P. Gleckler (PCMDI, LLNL) evaluation of GCMs at global scales

Gleckler is member of international team conducting GCM evaluation

Metrics at Regional Scale for Southwest U.S.

David Rupp, Phil Mote, OSU Southwest U.S. evaluation

metrics are scalar measures comparing GCM historical to observed historical climatology.

“it remains largely unknown what aspects of observed climate must be correctly simulated in order to make reliable predictions of climate change.” Gleckler et al 2008

Further diagnostics to Evaluate GCM at California/Nevada scale
based upon prior CCTAG discussions, examples shown here

California Water Resource Evaluation Metrics

- Correlation between El Nino 3.4 temperatures and water year precipitation
- Multi-year dry spell statistics [what is definition of dry year?]
 - Number of consecutive dry years per 10 year period
 - Number of dry years per 10 year period
 - Median water year precipitation
 - Average water year precipitation
 - 25th percentile water year precipitation
- 3 day precipitation/annual total
 - Max
 - Median
 - Standard Deviation

❖ All models also tested for temporal and spatial fidelity of seasonal temperature and precipitation patterns

Cull the 15 CMIP5 GCMs to 11 GCMs

rm#	model name	#dry yr σ	3dy max pr	pat corr n34	JJA tdel	n34 ts
	ACCESS-1.0	1.11	0.24	0.52	9.39	
26	bcc-csm1-1	1.59	0.12	0.20	9.46	
2	CCSM4	1.24	0.19	0.51	7.62	
5	CESM1-BGC	1.16	0.20	0.38	7.68	
6	CESM1-CAM5	1.60	0.26	-0.47	10.59	
12	CMCC-CM	0.95	0.22	0.46	10.51	
	CMCC-CMS	1.04	0.19	0.58	9.95	
3	CNRM-CM5	1.32	0.15	0.30	8.51	
4	CanESM2	1.69	0.19	0.28	12.07	
15	GFDL-CM3	1.14	0.17	0.31	10.33	
10	GFDL-ESM2M	1.90	0.16	0.18	7.95	
11	HadGEM2-CC	1.45	0.27	0.43	9.69	
8	HadGEM2-ES	1.08	0.25	0.52	10.39	
1	MIROC5	1.54	0.17	0.44	7.46	
16	MPI-ESM-LR	1.02	0.18	0.10	9.08	

California Water Resources Evaluation Metrics

Additional Metrics to consider:

- Spectral analysis, cyclic patterns of California precipitation.
- Others?

Adoption of final set of metrics and set of plan for completion of analysis and documentation

CCTAG Scenarios Recommendations Subgroup Tasks

CCTAG Term ends December 2014

“Detailed recommendations on a suite of climate scenarios appropriate for DWR’s planning activities” –March 2012 Scope letter

Potential Study:

Comparison of MMM of Culled ensemble vs. MMM full ensemble

- Validate work done to cull the larger ensemble
- Determine whether use of full ensemble or culled ensemble should be recommended when either would be feasible

Other Topics

Downscaling

Extreme/Stress test scenarios

Flood analysis



THANK YOU!

