CMIP5 GCM Simulations, Downscaled Versions, Recommendations, and 1 or 2 Jokes

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PUMA
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CMIP5 GCM Simulations

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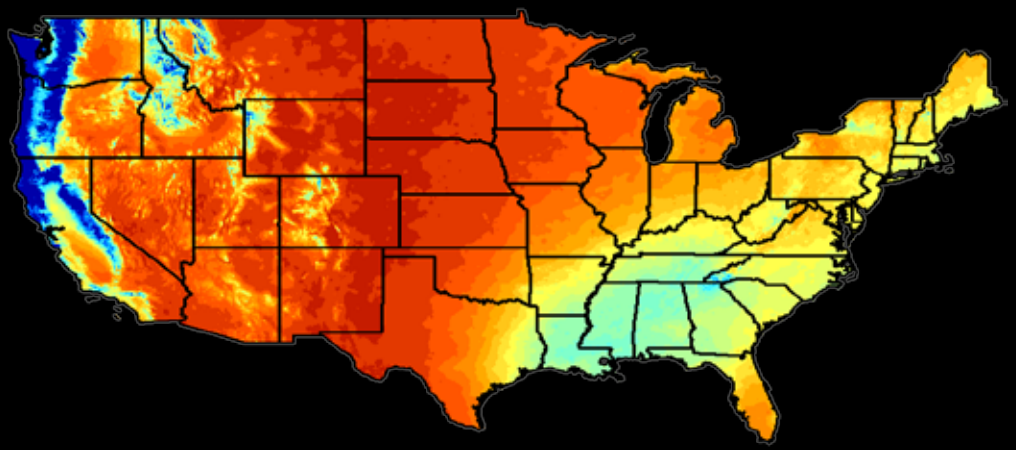
Outline

- Differences vs. CMIP3:
- ones you don’t care about
- ones you might care about
- Schedule/Status
- Downscaling
- Recommendations



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Differences: CMIP5 vs. CMIP3

- Improved model physics
  - Don’t expect dramatically improved results
- Finer spatial resolution
  - Great, but still too coarse for your needs
- “Time-slice” simulations: short simulations at fine resolution
  - Downscaled data provide more results at finer resolutions

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CMIP5 vs. CMIP3...

Different GHG emissions scenarios

RCPs vs SRES: Who cares?

More models with dynamic vegetation types

Vegetation types respond to changing climate

Helpful in principle, but resolutions too coarse

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CMIP5 vs. CMIP3...

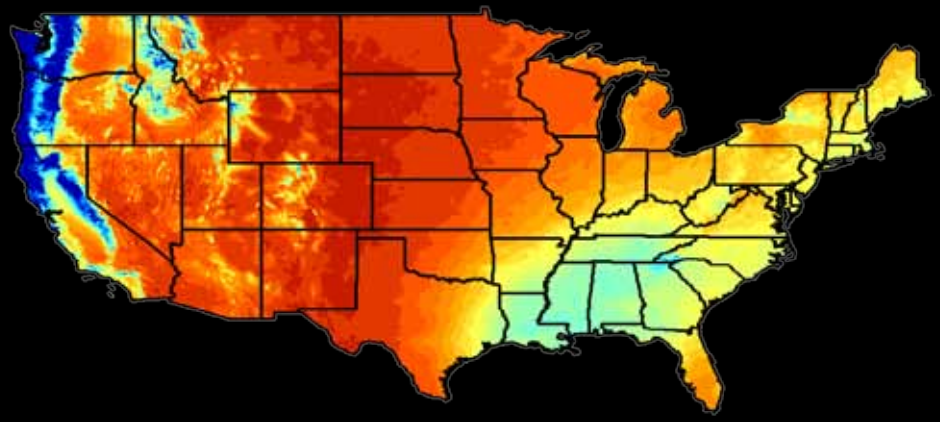
More models: 35 (?) vs 22

Better uncertainty quantification?

In principle, but range of results might well increase

"Decadal Predictions" simulations:

Should reduce uncertainty on short time horizons.



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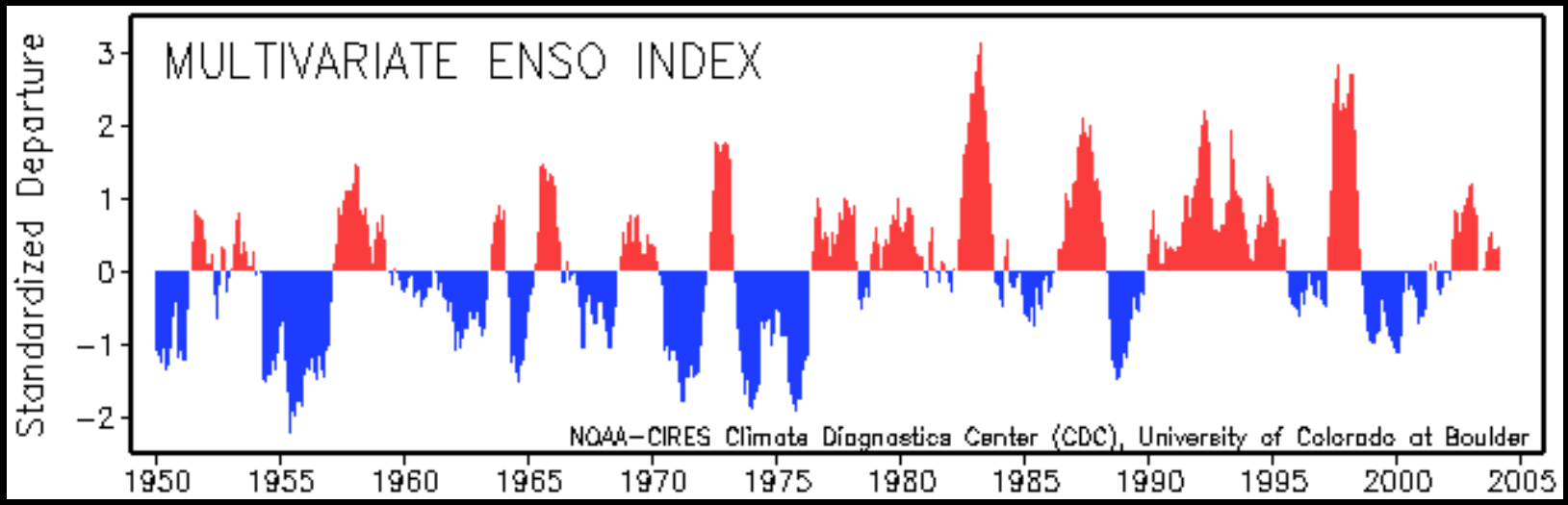
Decadal Predictions…



Traditional climate simulations should reproduce the statistical properties of natural variability, but not the timing.

“Decadal predictions” should reproduce the timing as well.

This should reduce uncertainties on short time horizons.

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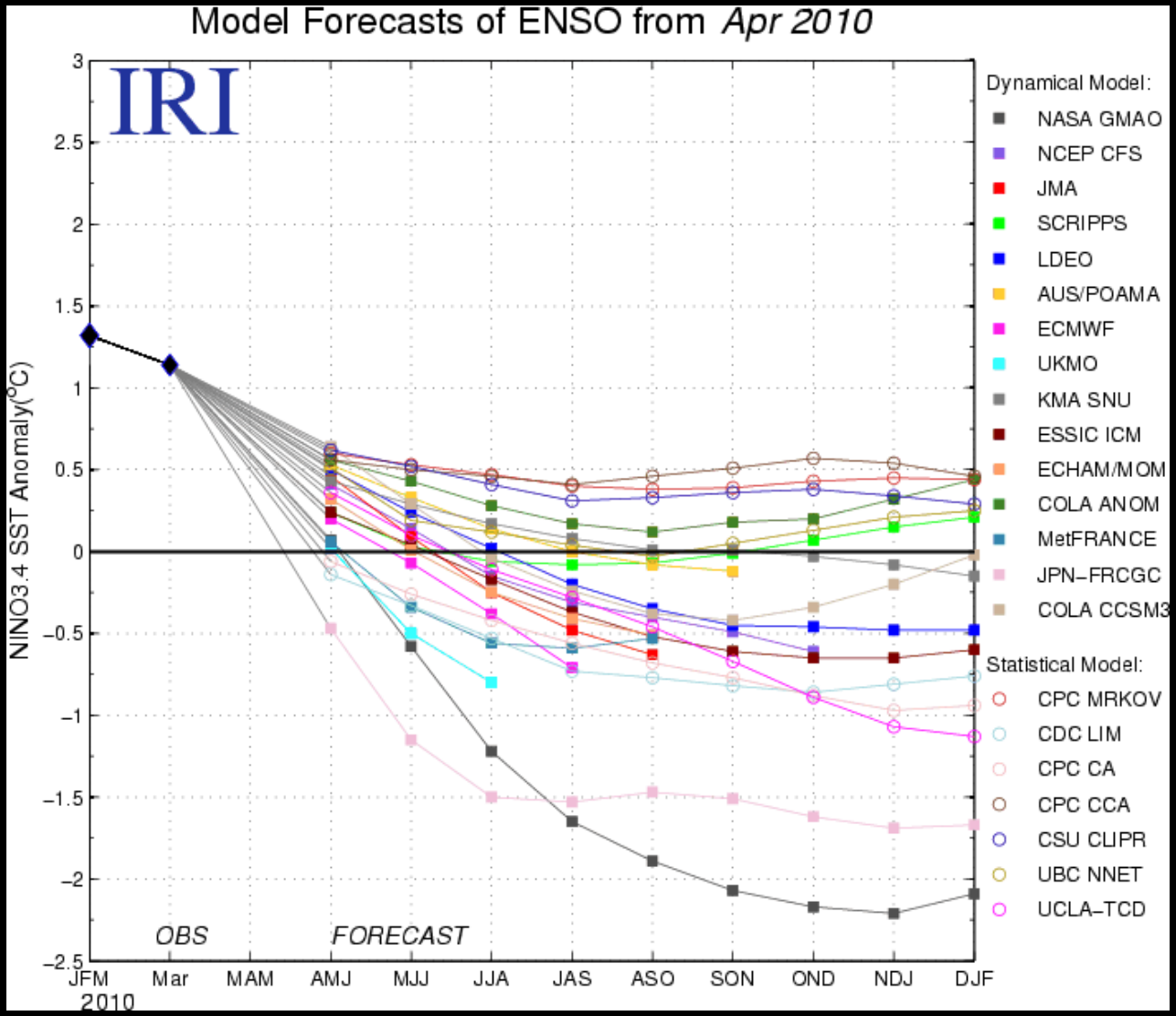
Problem is, decadal predictions don't have much skill!



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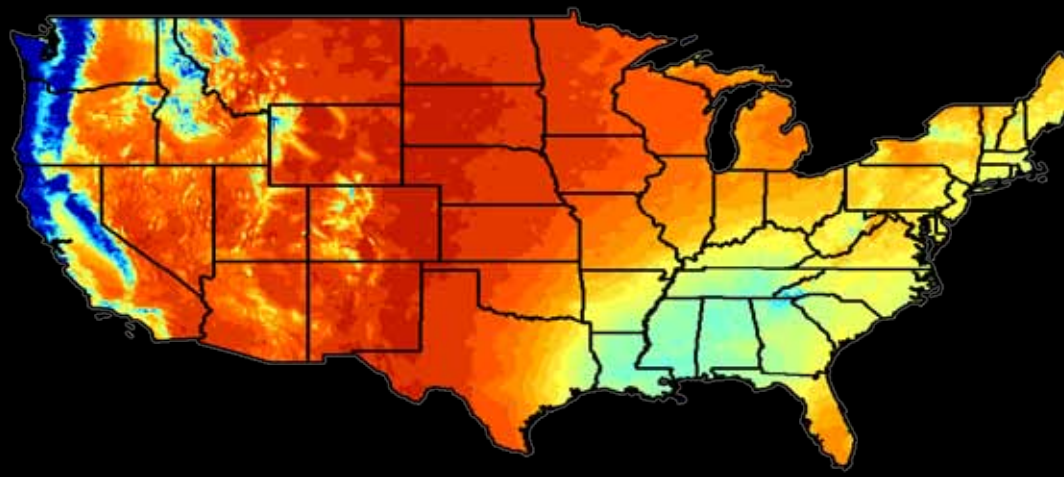
Schedule

First CMIP5 GCM results expected this month

Remaining results expected first half of 2011

Downscaling will add some delay



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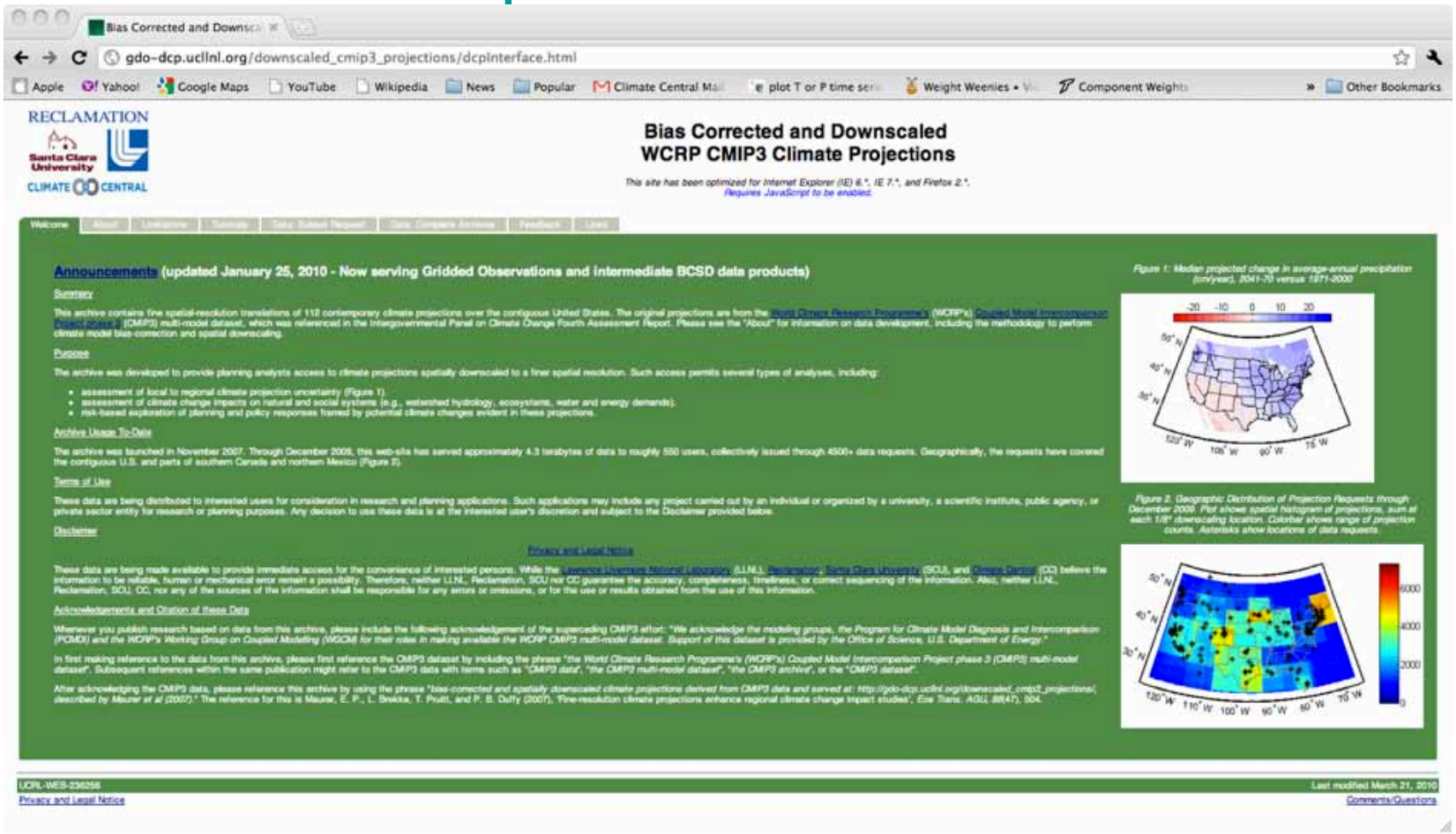
Downscaling

http://gdo-dcp.ucllnl.org/downscaled_cmip3_projections/dcpInterface.html



Monthly-mean results available now;

Daily-mean results available within weeks

http://gdo-dcp.ucllnl.org/downscaled_cmip3_projections/dcpInterface.html

Monthly-mean results (available now):

T and P

16 GCMs, 112 simulations

A2, A1b, and B1 emissions scenarios

Daily-mean results (available January):

Tmax, Tmin, P

10 GCMs, 19 simulations

1961-1999, 2046-2065, 2080-2099 only

A2, A1b, and B1 emissions scenarios

All results at 0.125º grid spacing 48 state domain

Who?

Climate Central

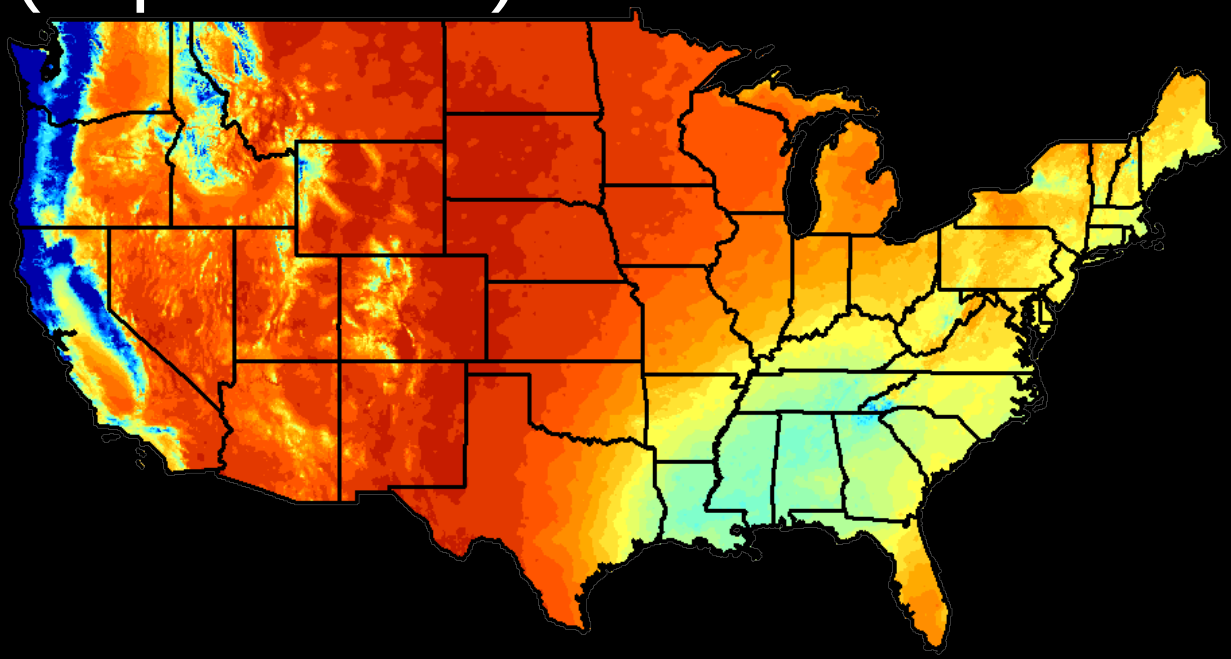
IPCC WG2

Santa Clara U. (Ed Maurer)

Scripps/UCSD (Tapash Das)

LLNL/PCMDI

Reclamation



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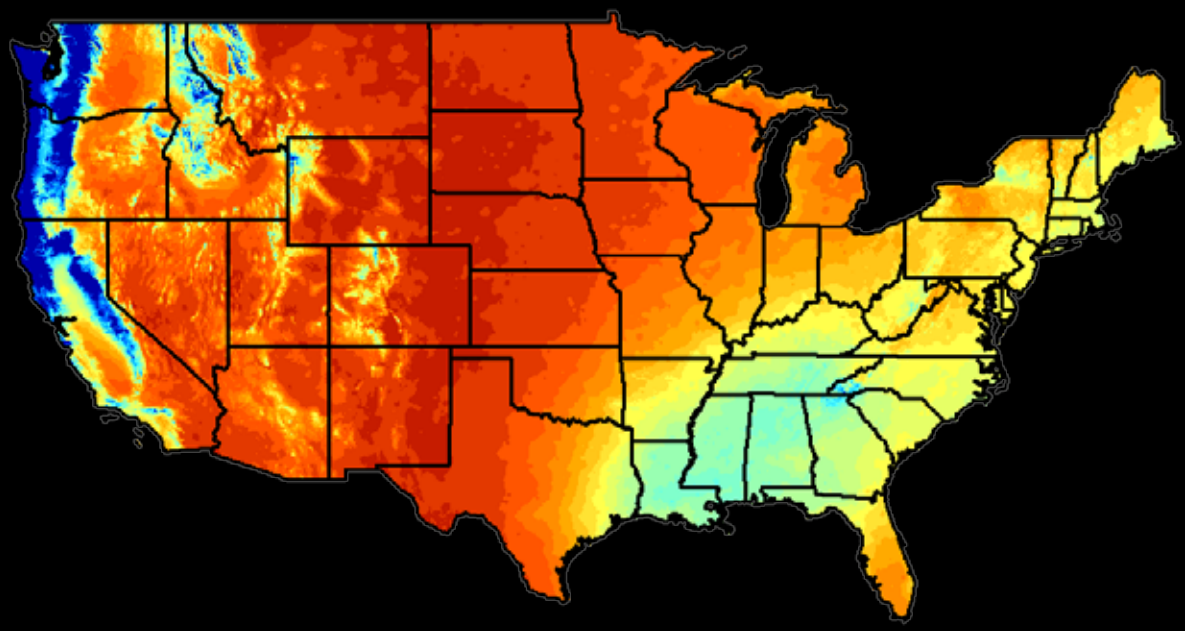
The Big Picture

We will rapidly produce downscaled temperature and precipitation results from CMIP5 GCM simulations.

PCMDI will archive and distribute through same portal and user interface as CMIP5 GCM results.



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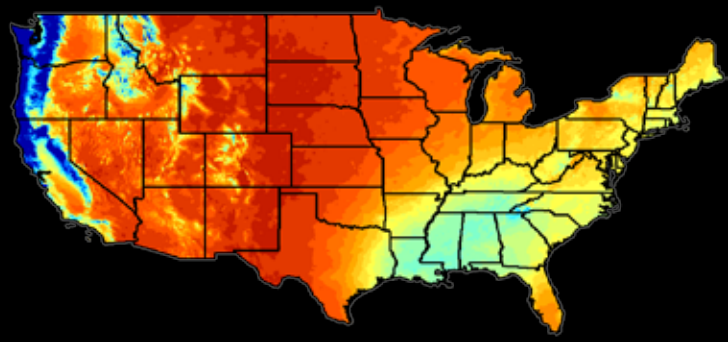
Specifics

	US Domain	Global Domain
BCSD	monthly, daily @ 0.125º	monthly, daily @ 0.5º
BCCA	daily @ 0.125º	X

Text

Also intermediate products like regridded GCM output, Bias-corrected but not downscaled GCM output, etc.

Variables: T_{min}, T_{max}, T_{mean}, P
Simulations: 20 C, RCP 4.5, RCP 8.5, ...



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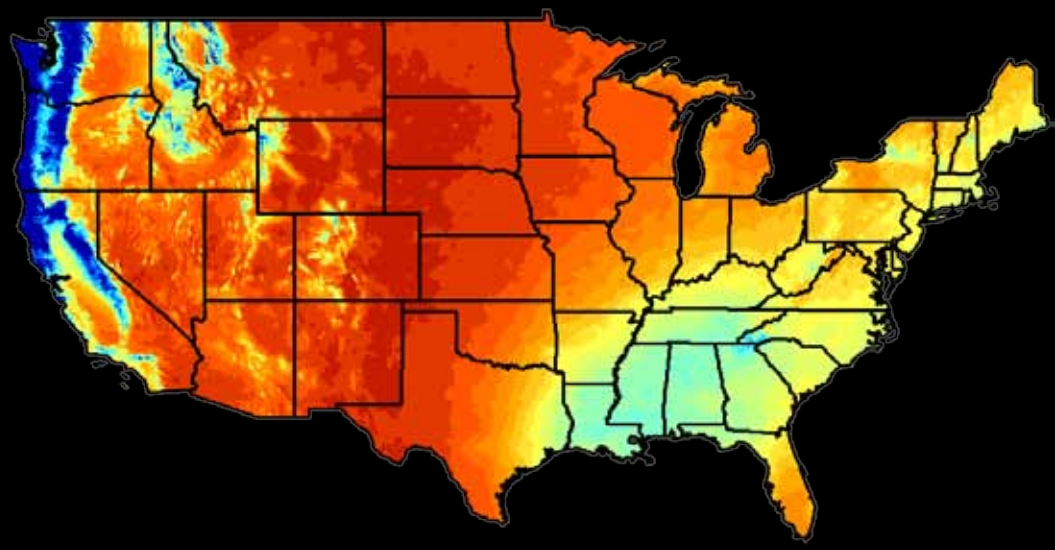
Status

Downscaling codes are installed and tested on cluster attached to LLNL “Green Data Oasis.” This means no data transfers will be needed.

We have exercised codes downscaling CMIP3 results.



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I’m almost done…..

Recommendations

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Recommendations

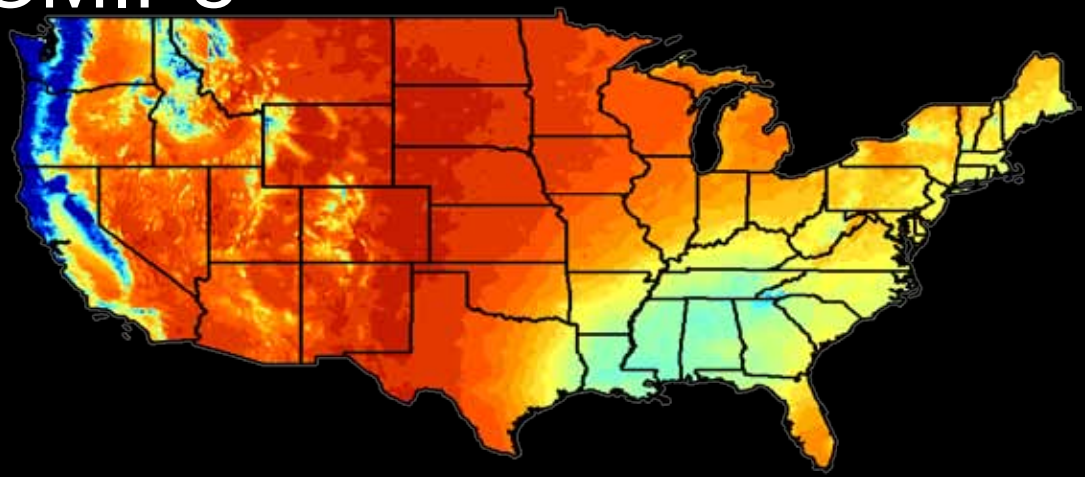
Are you in a hurry?

Then use CMIP3

Do you need daily output?

Then use CMIP5

Consider starting with CMIP3 and then re-doing later with CMIP5



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Science marches on!

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