Preview

CCSM3.0 Simulation of the 100ma Cretaceous World

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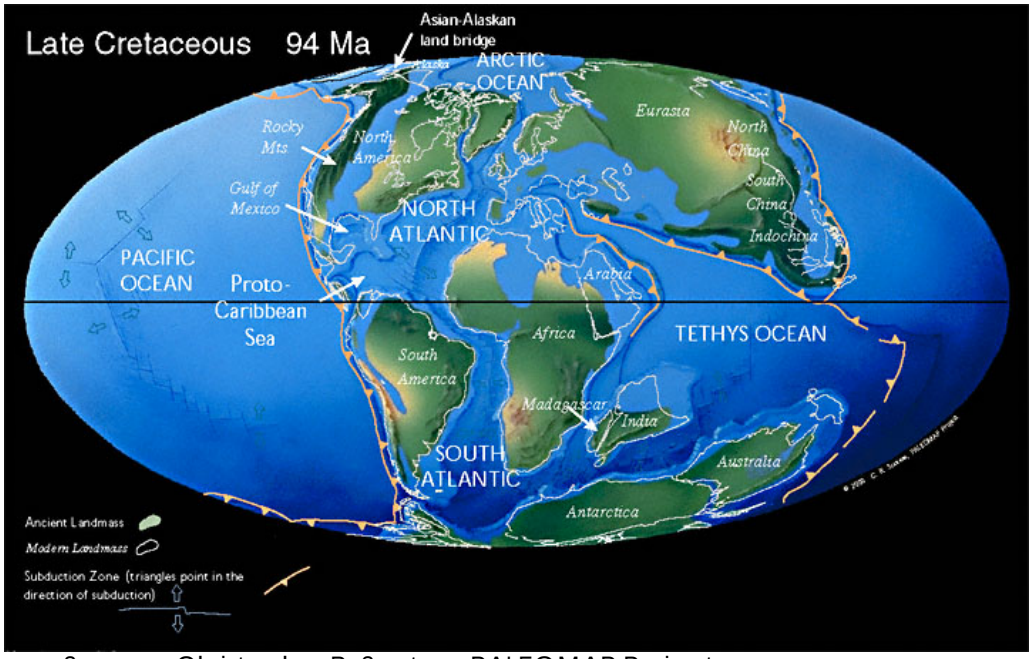
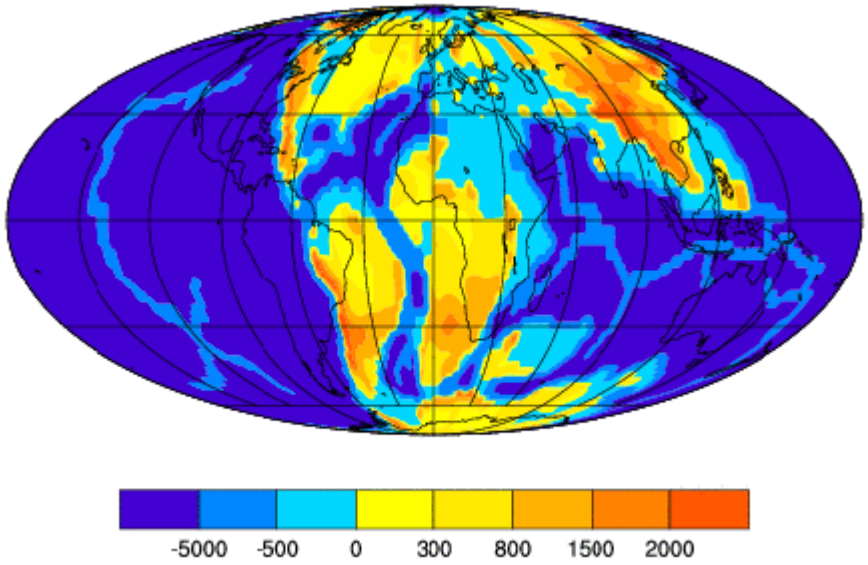
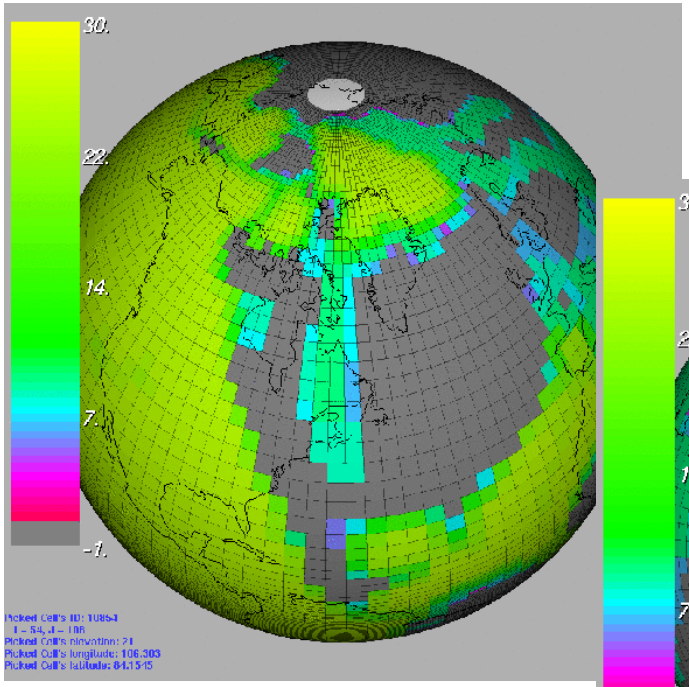
CAUTION: preliminary results ahead

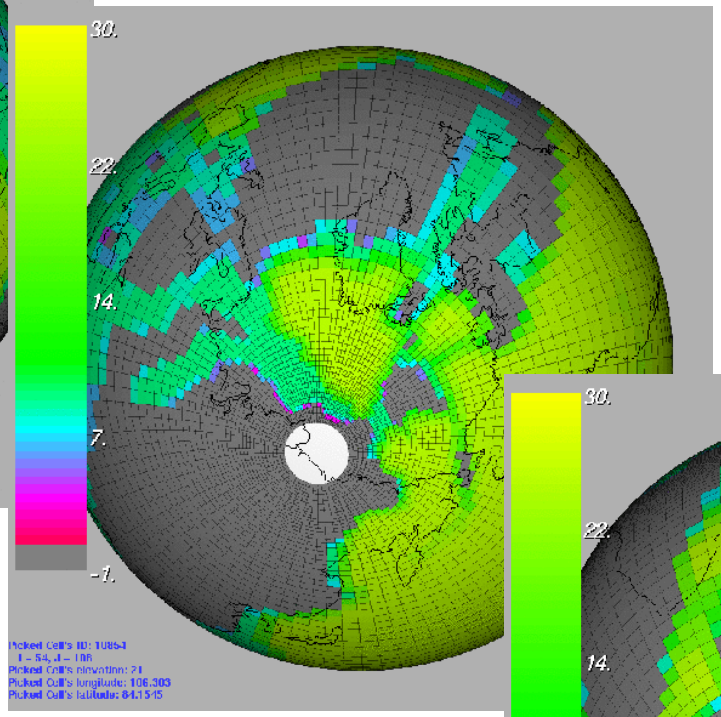


Source: Christopher R. Scotese PALEOMAP Project

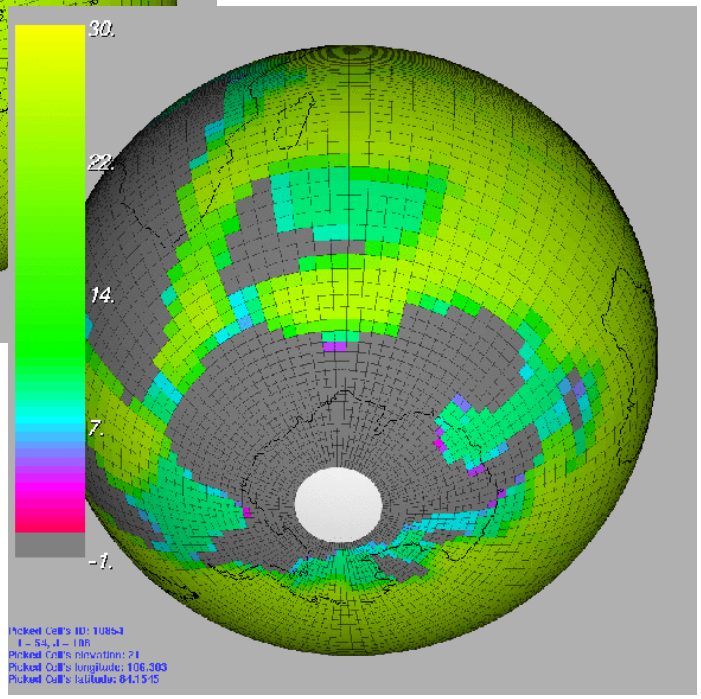




North America



North Pole

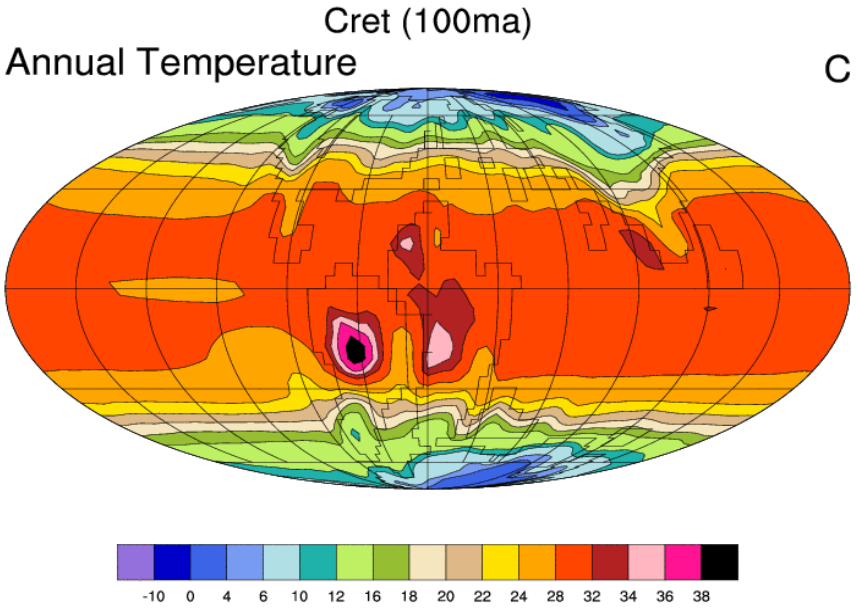


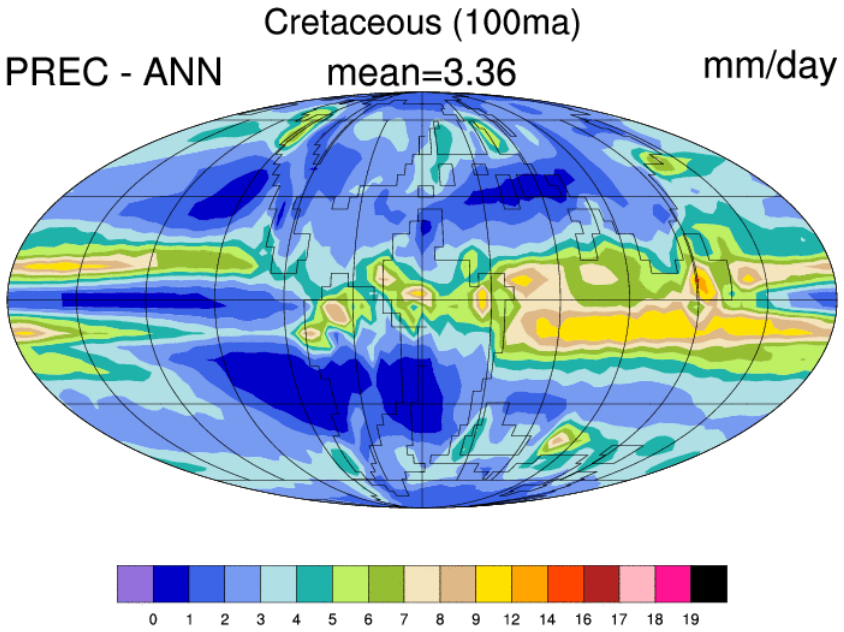
South Pole

CAUTION: preliminary results

b30.140n Setup Complete: years 1-116

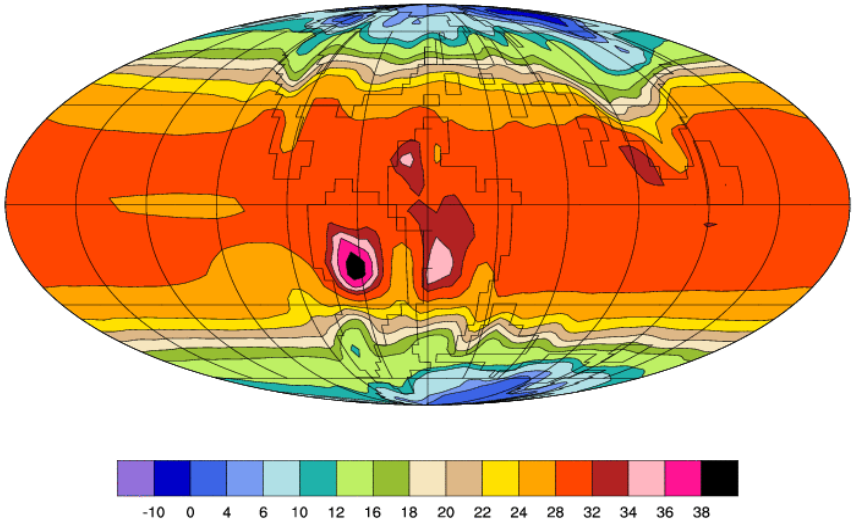
- CCSM3_0_1_beta24
- T31 Atmosphere
- 3x3 degree Ocean (timestep = 23)
- CO_2: 10 x Pre-Industrial (280e-5)
- Vegetation: Bareground
- Orbital parameters (~Permian)
- Aerosols - Present day
- Ocean Color - present day


Cret (100ma)
Annual Temperature
C
-10 0 4 6 10 12 16 18 20 22 24 28 32 34 36 38


Cretaceous (100ma)
PREC - ANN
mean=3.36
mm/day
0 1 2 3 4 5 6 7 8 9 12 14 16 17 18 19

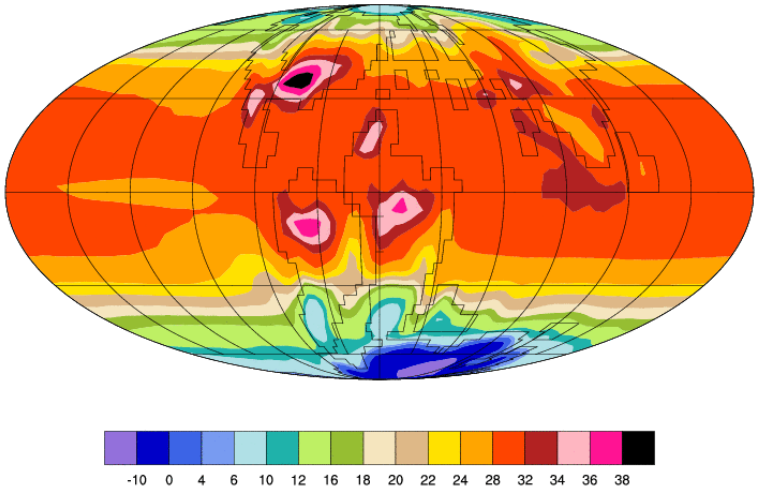
Cret (100ma)

Annual Temperature C



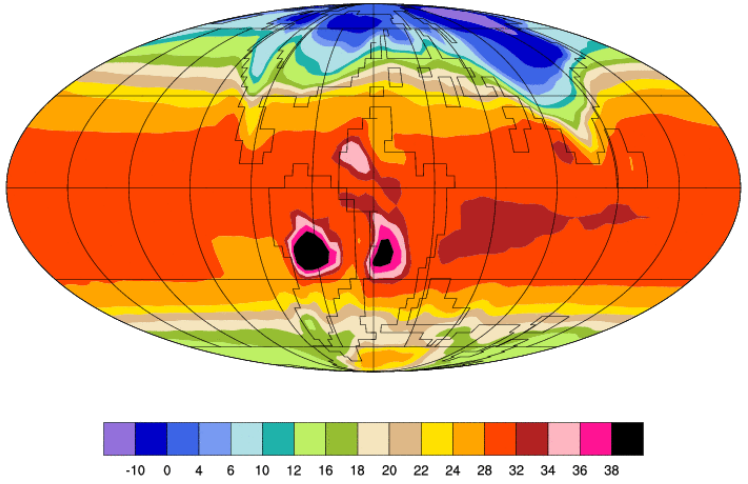
Cretaceous (100ma)

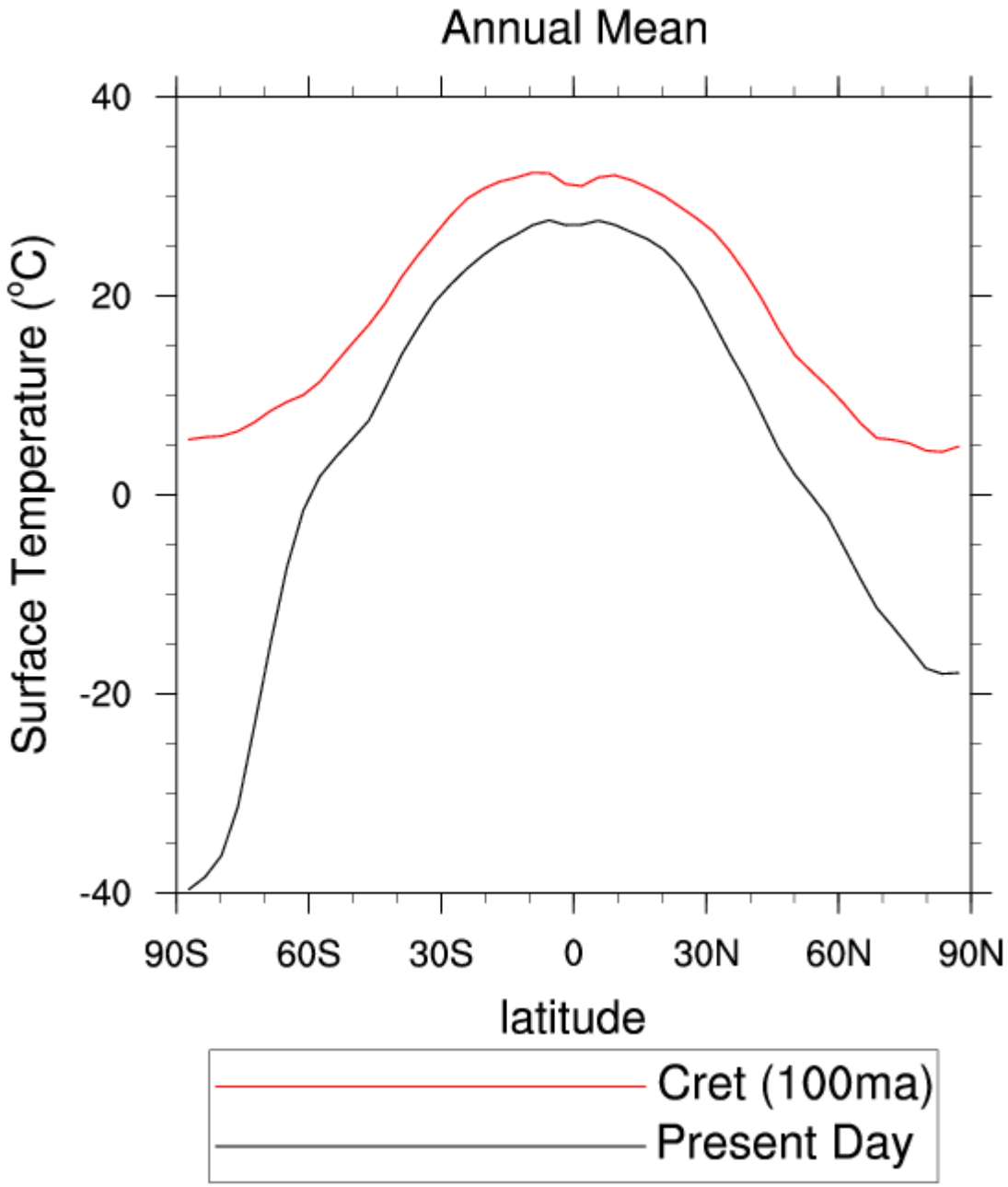
T - JJA mean=23.04 C



Cretaceous (100ma)

T - DJF mean=22.31 C





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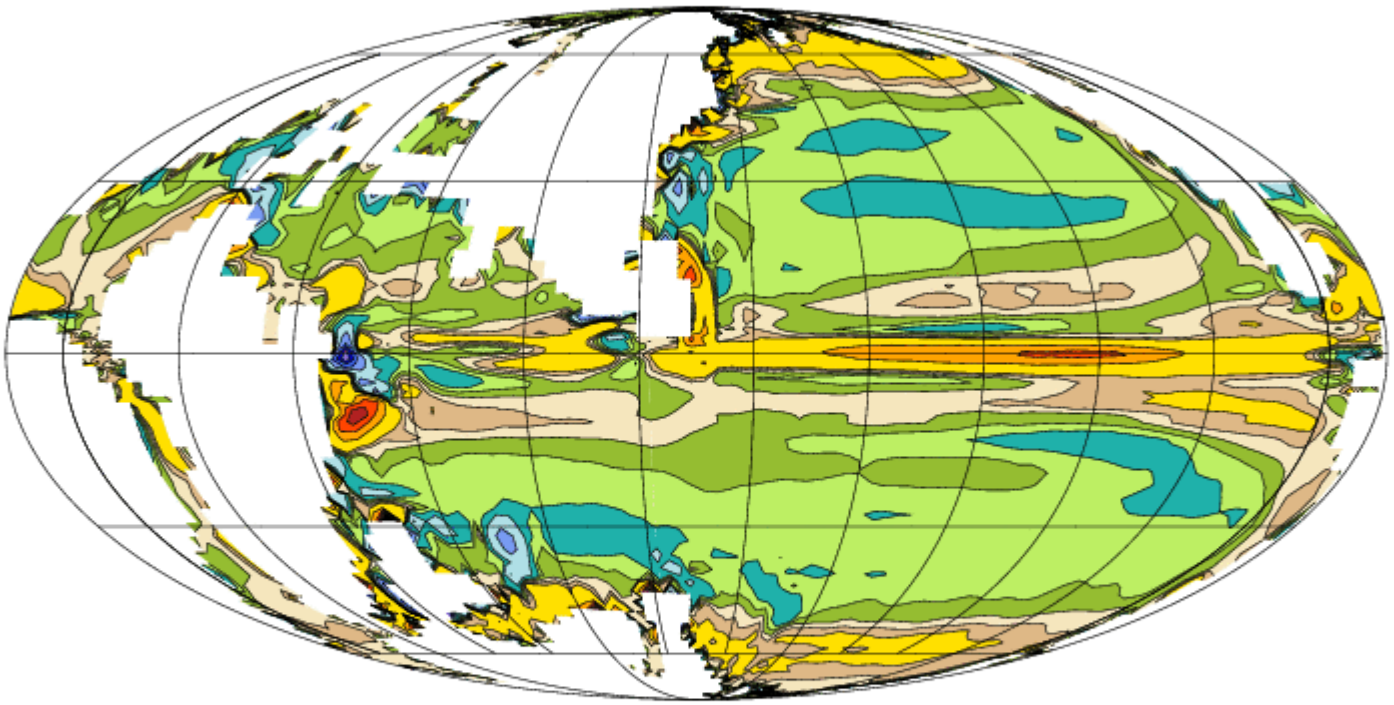
Cret (100ma)

100m Vertical Velocity

10^{-4}x cm/s



Configuration Changes

What's Next?

- Dynamic Vegetation
- Aerosols:
  - Current: present day
  - Future:
    - Pre-Industrial
    - Pre-Industrial zonal average
- Ocean color:
  - Current: Present day
  - Future possibilities
    - zonal average
    - Estimate ocean color as a function of Temperature and Salinity.

Proposed Experiments

What's Next?

1. 16x Pre-Industrial CO_2
2. 1x Pre-Industrial CO_2 (deep-time archive)
3. 4x (8x??) Pre-Industrial CO_2

http://www.cgd.ucar.edu/ccr/paleo/100maCret/100ma_cret.html

Pitfalls

- Procedural order in setting up grid
- Grid reference frame:
  - (0:360:2) vs (-180:180:2)
- CCSM3 Documentation essential

Generating CCSM3 input files for Paleo Simulations

(in prep 2007)

Nan Rosenbloom, Esther Brady, Christine, Shields,

Steve Yeager, Sam Levis, Bette Otto-Bliesner

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