

# US Department of Energy High Resolution Climate Modeling

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# Current Fully Coupled Simulations

*all pre-industrial using CESM*

	Atm dycore	Atm physics	Ocean	Sea Ice	Land	Duration
#1	Spectral T341	CAM4 ↓	POP2 0.1 tripole 42 levels ↓	CICE4 0.1 tripole ↓	CLM4 ↓	64 years
#2	Spectral Elements 0.25 ↓					32years
#3		CAM5				22 years

# Scientific Questions

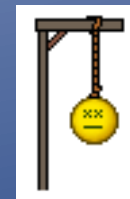
- Role of ocean mesoscale
- Effect of tropical cyclones
- Mechanisms of internal variability
  - Hiatus
  - AMOC
- Lots of others already mentioned

# Challenges

- Reduction of big data with minimal loss of ability to explore output after a run is finished
- Sustained effort, buy-in from participants
  - Distributed science
  - “One and Done”
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    - Sometimes elation becomes despair
      - Wrong atmospheric parameters for the 64 year T341 run
      - Sea ice shortwave setting modified due to computer change



# Questions to be addressed

- Initialization strategies/sensitivities
  - Not just ocean
- Coupling frequency/stability
  - Ocean/sea ice
  - Wind stress
- Use of interesting passive tracers