A History of CESM

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“No matter how carefully records are kept and filed and computerized, they grow fuzzy with time. Stories grow by accretion. Tales accumulate - like dust. The longer the time lapse, the dustier the history - until it degenerates into fables.”

Isaac Asimov

“To give an accurate description of what has never occurred is not merely the proper occupation of the historian, but the inalienable privilege of any man of ... culture.”

Oscar Wilde
The Early Days
~ 1993 - 1995
Building Infrastructure
~ 1995 - 2000
CSM
Atmosphere Model
Land Model
Ocean Model
Sea-Ice Model
Land Model
Building a Complex Model
TRANVERSE SECTION OF A TYPICAL GOTHIC CATHEDRAL (AMIENS)
Managing Complexity
~ 2000 - 2005
A True System Model
~ 2005 - 2015
Science & Nature
Tools to Understand Nature

Microcosm

Macrocosm

“The same organizing forces that have shaped nature in all her forms are also responsible for the structure of our minds.”

Werner Heisenberg
CESM Mesocosm

- Biogeo-Chemistry
- Land Model
- Software Engineering
- Chemistry Climate
- Atmosphere Model
- Ocean Model
- Whole Atmosphere
- Land Ice
- Paleoclimate
- Polar Climate
- Climate Variability and Change
- Societal Dimensions
What Does History Teach Us?
“... however complex and solid it seems, it is actually quite fragile. It can be destroyed. What are its enemies? ... fear of [conflict] that makes it simply not worthwhile constructing things ... fear ... that you daren’t question anything ... and then exhaustion, the feeling of hopelessness...”

Kenneth Clark (1969)
What is Necessary for Success

“Of course, [it] requires ... a modicum of material prosperity... but far more it requires confidence in the society in which one lives, belief in its philosophy, belief in its laws, and confidence in one’s own mental powers.”

Kenneth Clark (1969)
“... the field of science ... shows that where some way of thought or human activity is really vital to us, internationalism is accepted unhesitatingly”

Kenneth Clark (1969)
Thank You