

Global Climate Models

climate fueled by the nonuniform spatial distribution of incoming solar radiation.

Stute et al., PNAS 2001

Climate models are systems of partial differential equations (PDE) derived from the basic laws of physics, chemistry, and fluid motion.

They describe the state of the ocean, land, ice atmosphere, biosphere, and their interactions.

The equations are solved on 3-dimensional grids of the air-ice-ocean-land system (with horizontal grid size ~ 100 km), using very powerful computers.

key challenge :

incorporating sub - grid scale processes

linking scales

