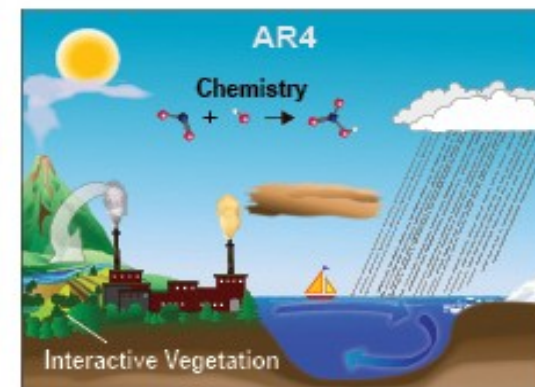
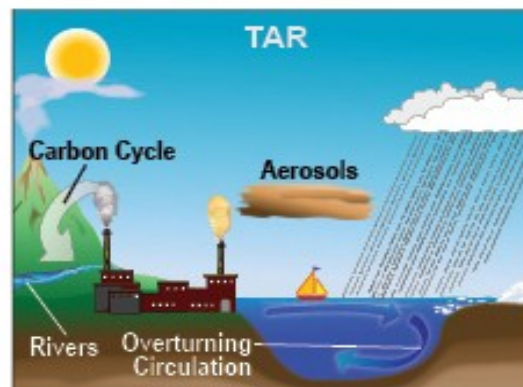
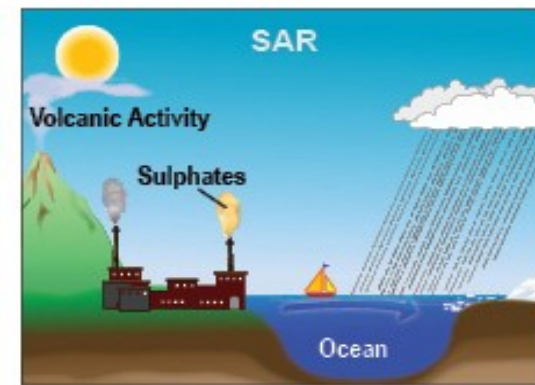
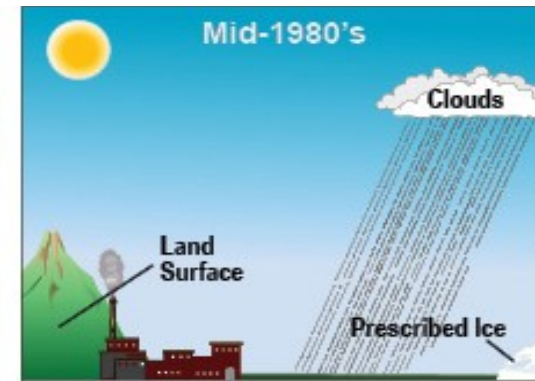
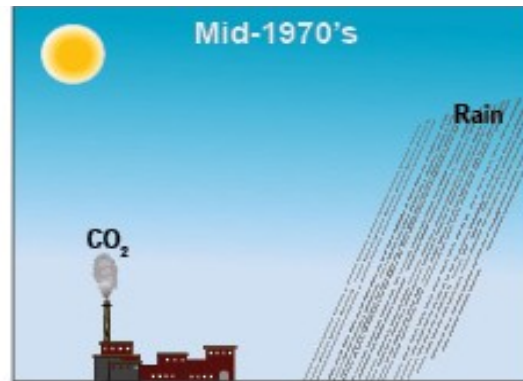
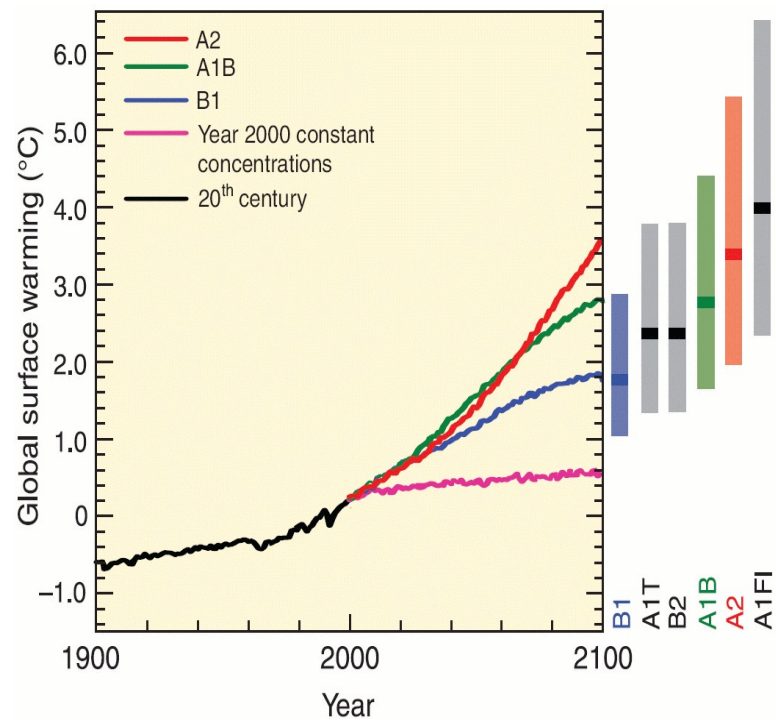
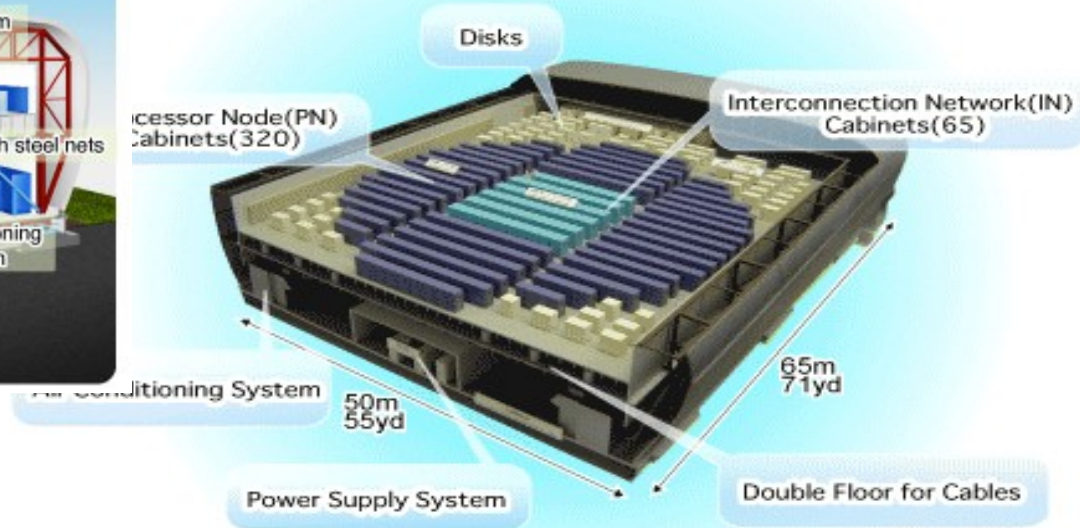
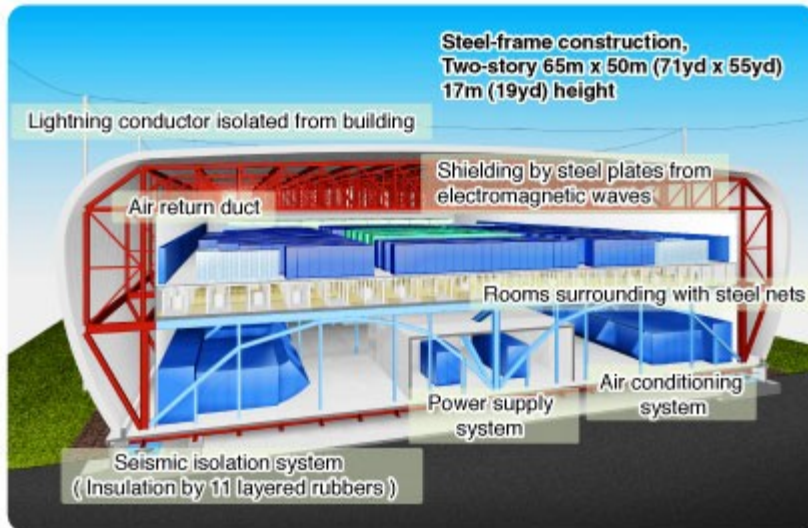


Simulation de l'atmosphère sur GPU



Earth simulator (Japan)

5120 procs * 7 Gflops = 36TFlops



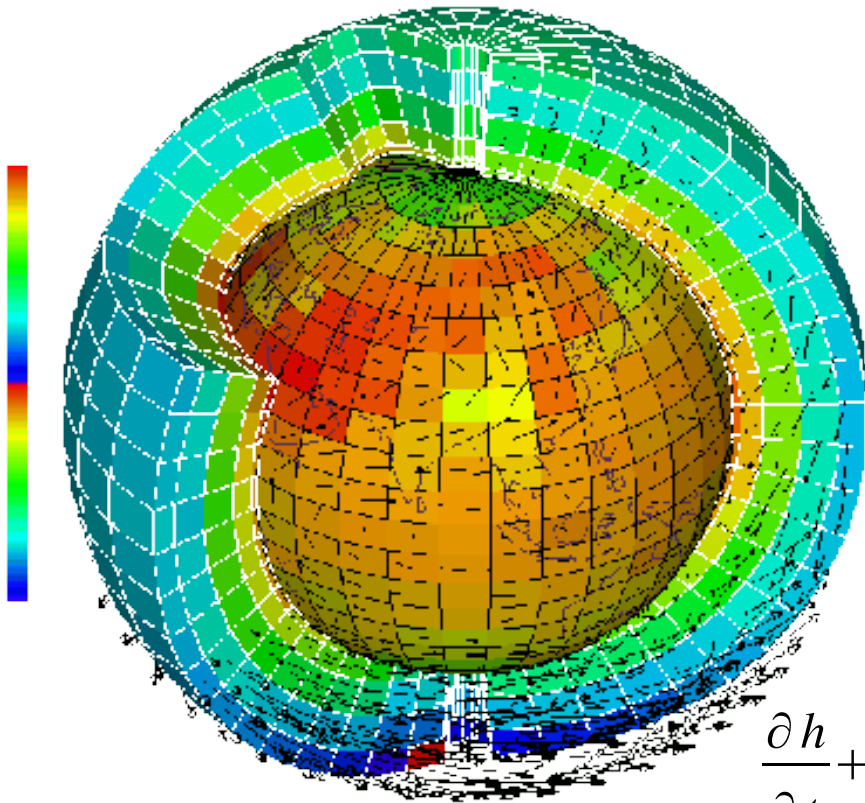
IDRIS (France)

80 procs * 16 Gflops = 1,3 Tflops

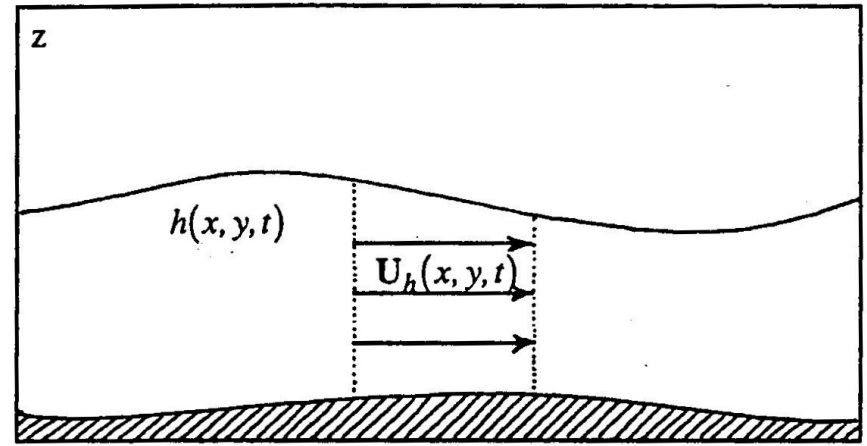
CCRT (France, mi-2009)

48 noeuds GPU * 4 Tflops = 192 TFlops

Météo = mécanique des fluides 3D sur la sphère

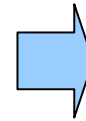


Modèle simplifié plan, en couches



$$\frac{\partial h}{\partial t} + H \frac{\partial u}{\partial x} = 0$$

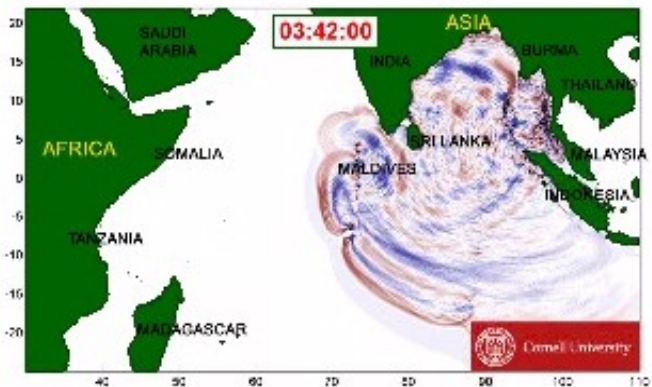
$$\frac{\partial u}{\partial t} + g \frac{\partial h}{\partial x} = 0$$



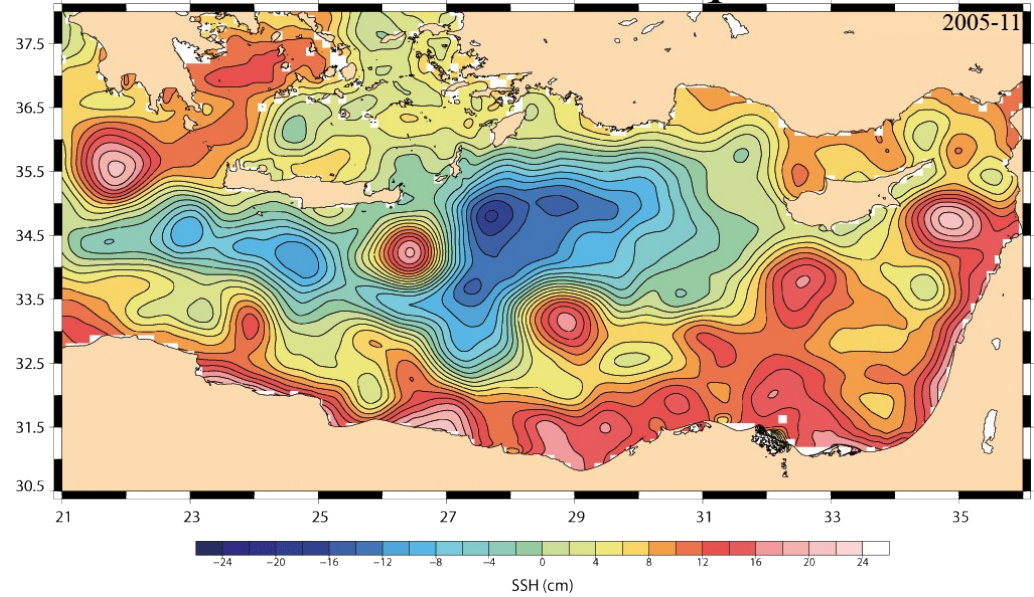
$$\frac{h_i^{n+1} - h_i^{n-1}}{2 \delta t} = -H \frac{u_{i+1}^n - u_{i-1}^n}{2 \delta x}$$

$$\frac{u_i^{n+1} - u_i^{n-1}}{2 \delta t} = -g \frac{h_{i+1}^n - h_{i-1}^n}{2 \delta x}$$

Tsunami

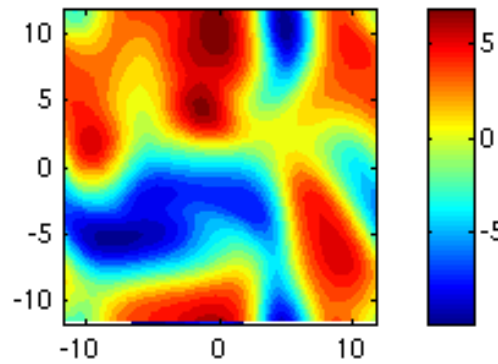


Tourbillons océaniques



Formation des tempêtes

Haute troposphère, t=300.009297



Basse troposphère, t=300.009297

