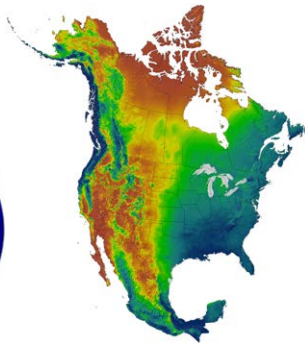
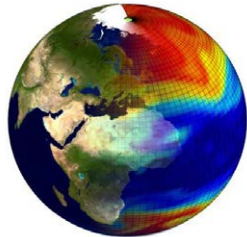




Associated
Engineering



Platinum
member



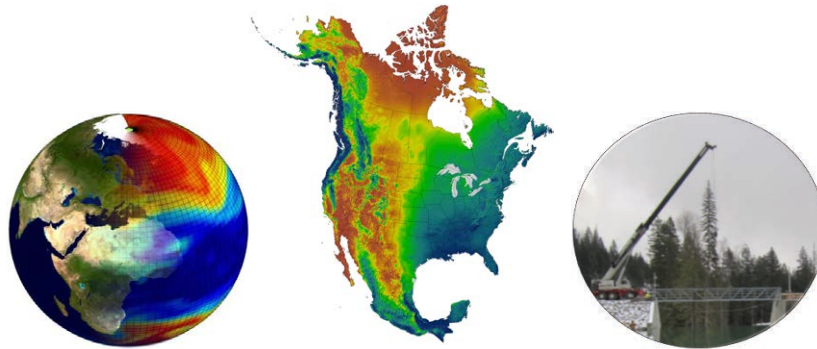
What are global climate models and how do they work?

Understanding the tools behind future climate projections

Dr. Jeremy Fyke
December 13, 2018

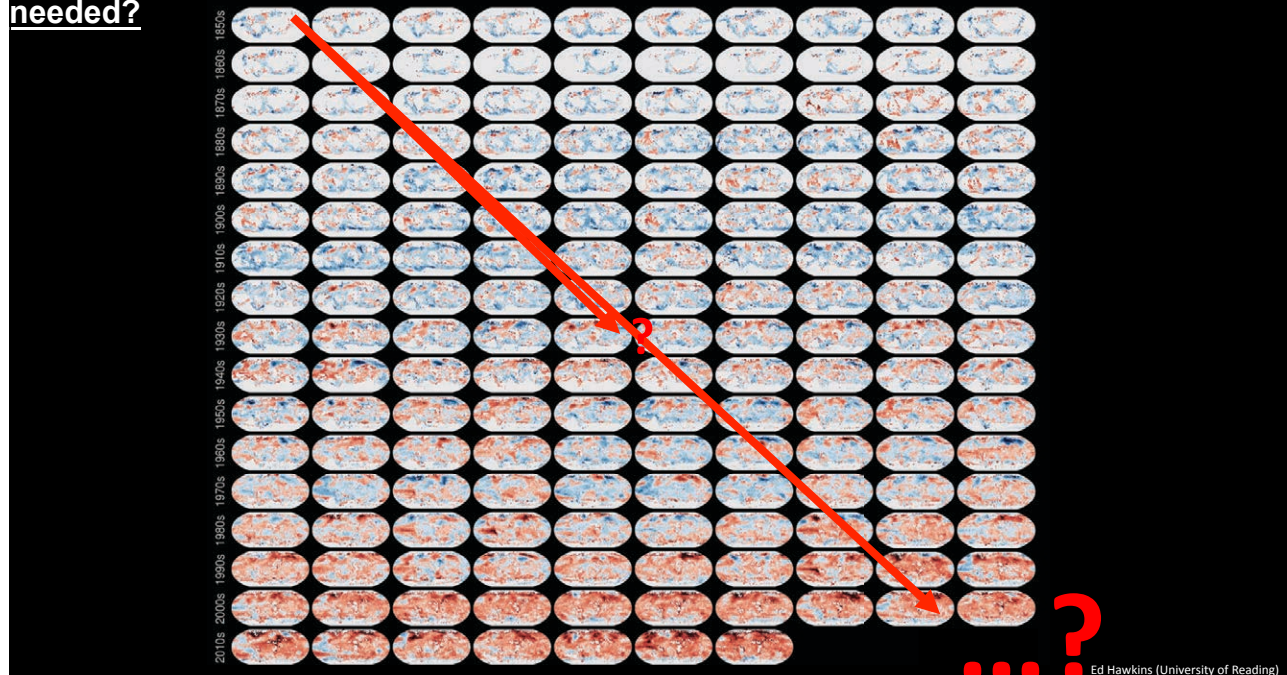
About myself!

- B.Sc., Geology, UVic
- M.Sc., Climate Modelling Lab, UVic
- Ph.D., Climate Modelling Lab, UVic and Antarctic Research Centre, Wellington NZ
- Research staff position, Los Alamos National Laboratory (*climate dynamics, Earth system model development*)
- **Climate Specialist, Associated Engineering/Associated Environmental**



Why are global climate models needed?
What are global climate models?
How are global climate models tested?
How can global climate models be applied locally?

Why are global climate models needed?



Why are global climate models needed?



What are global climate models?

Climate models represent the important aspects of the climate system, using *chemistry, physics, biology, geology, math, statistics, economics, social science...*
...so that we can...

Answer questions about how the system works
 Understand why climate change has/is occurring
Project future climate

What are global climate models?

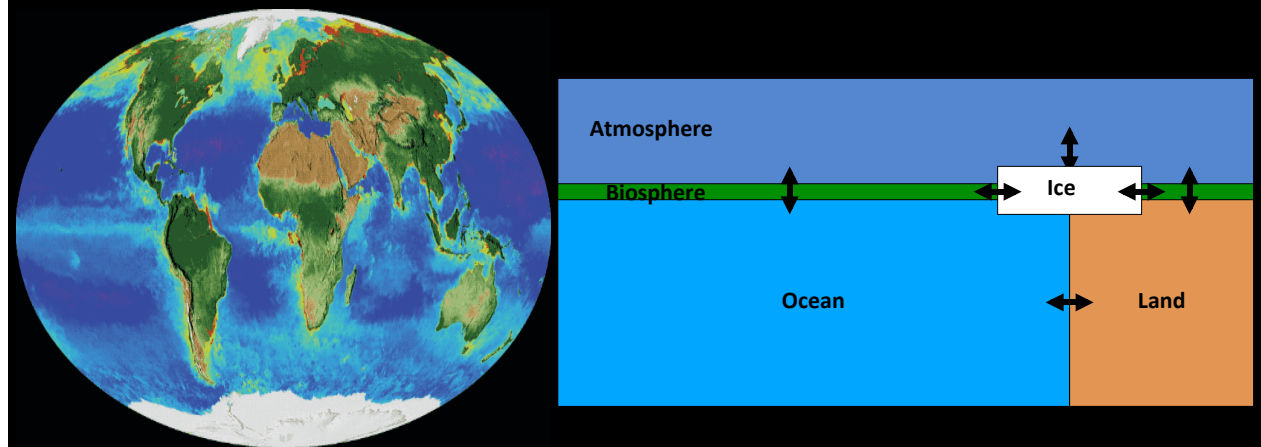
Noun: **Model** (*plural models*):

One who is employed to display clothes or other merchandise

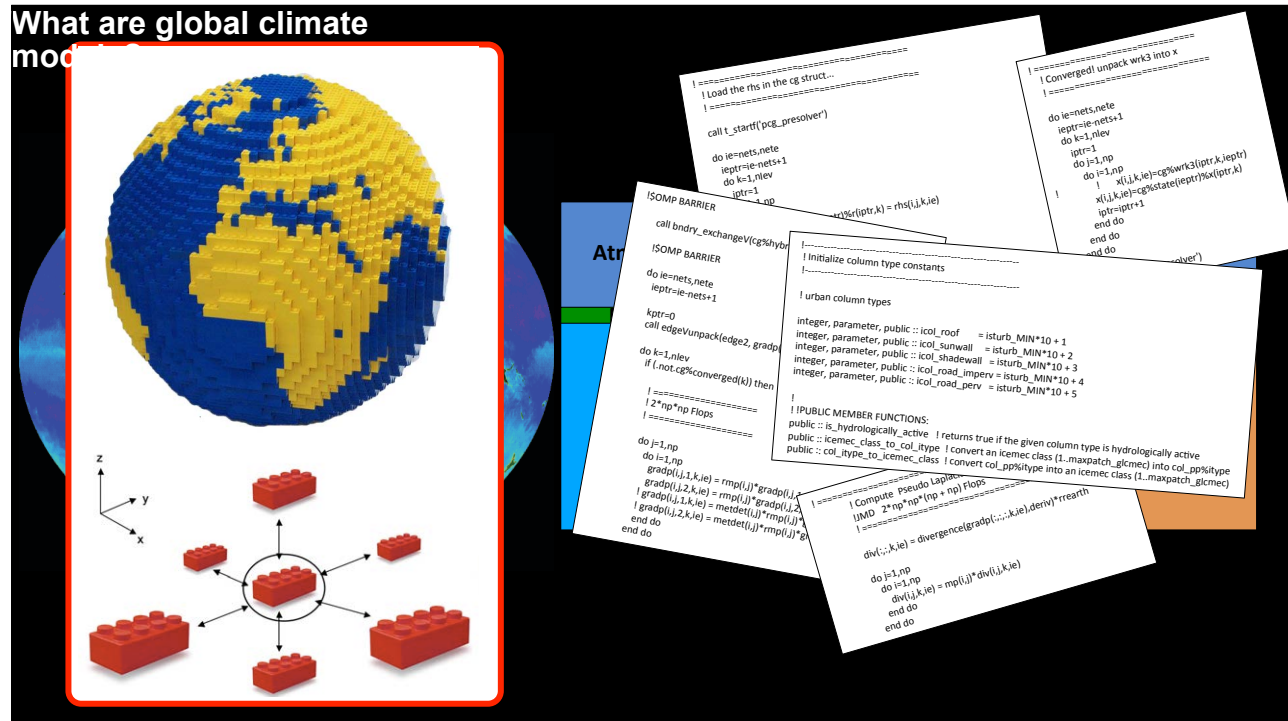
✓ A simplified representation (usually mathematical) that explains the workings of a real world system.



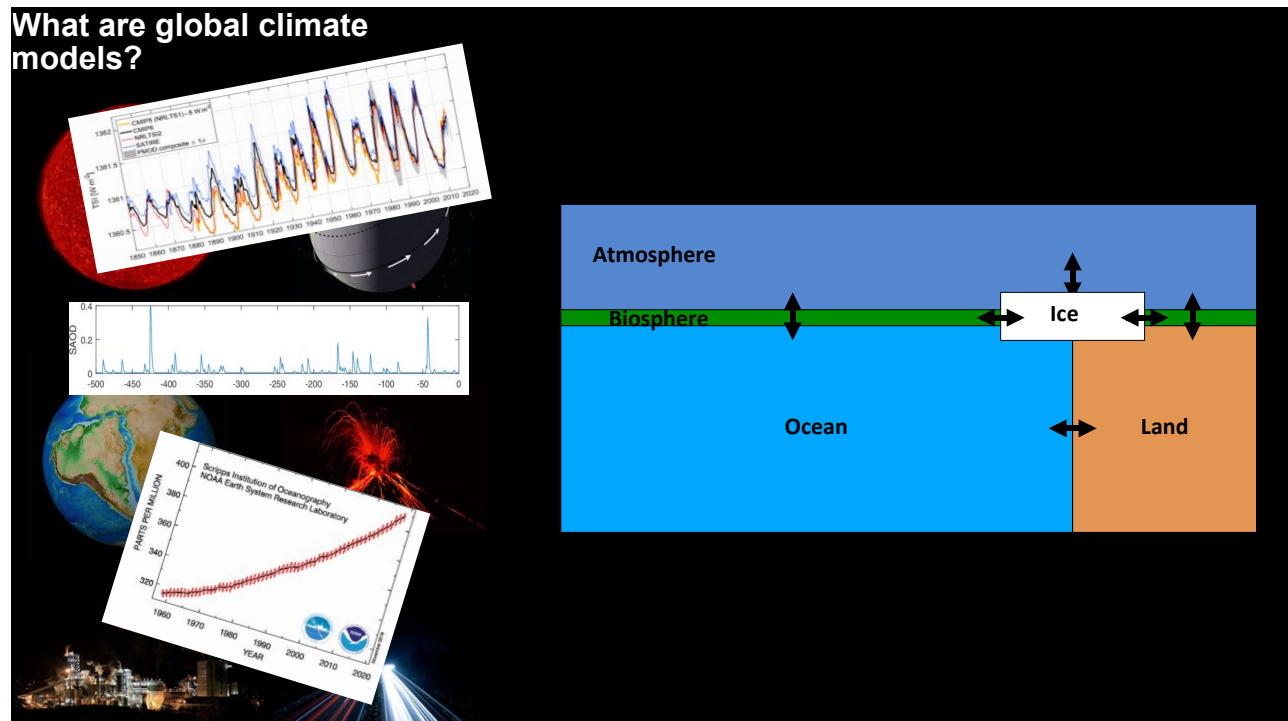
What are global climate models?



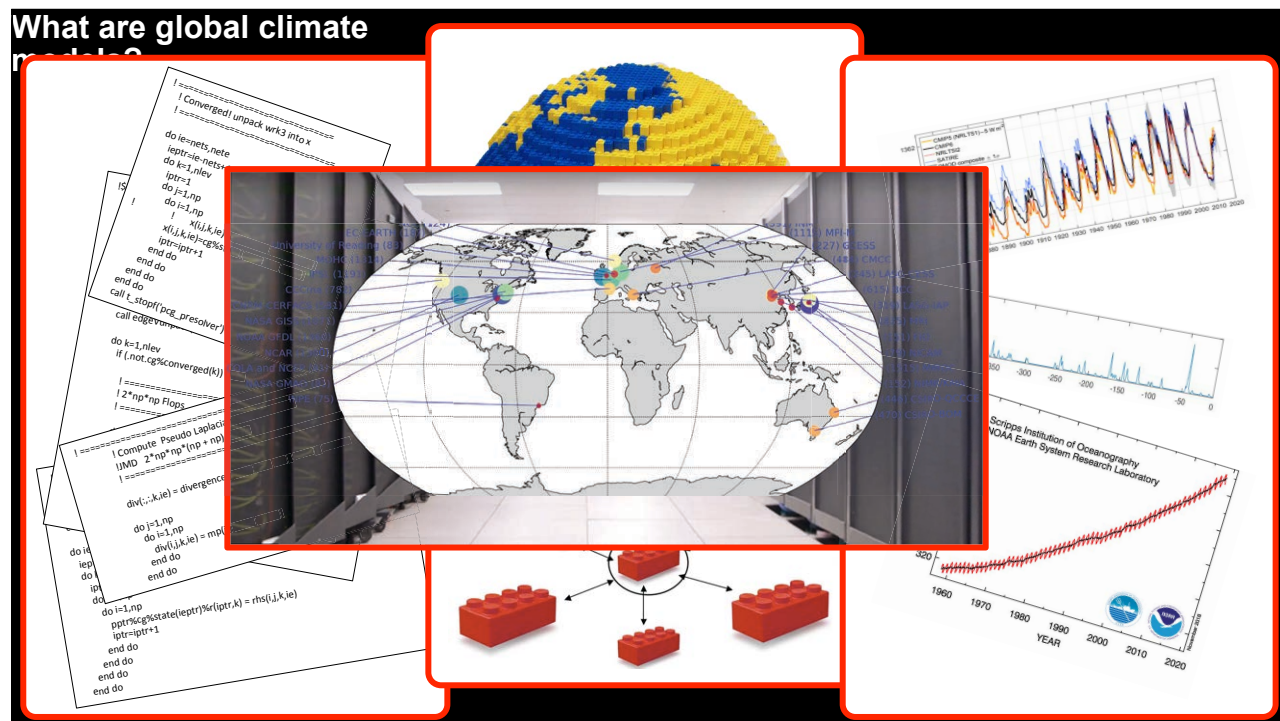
What are global climate models?



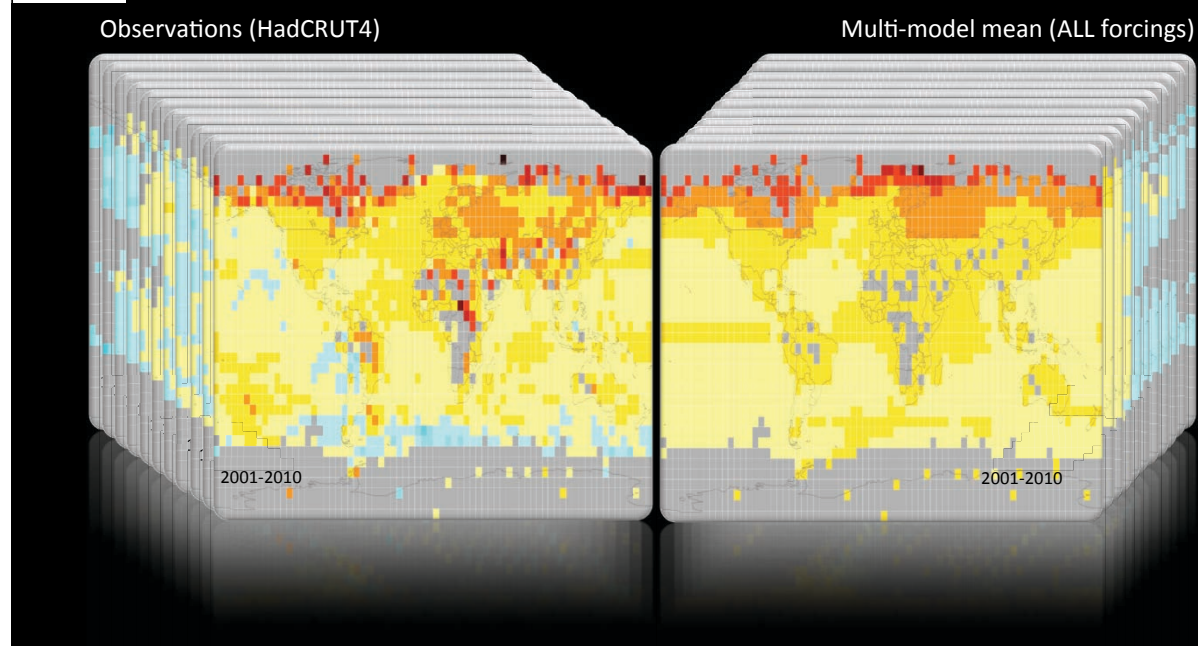
What are global climate models?



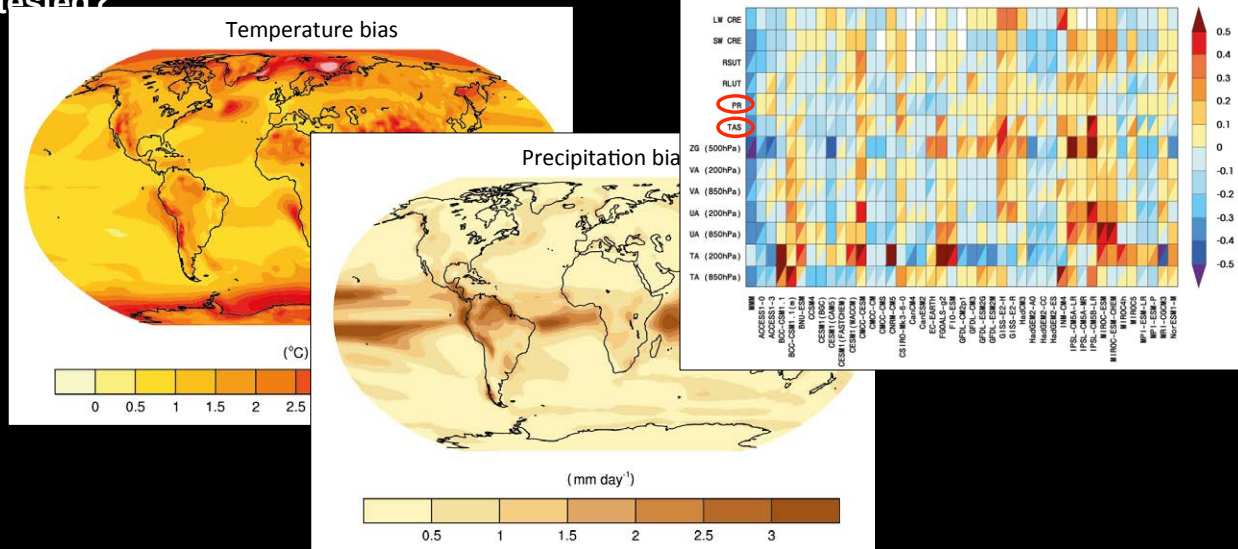
What are global climate models?



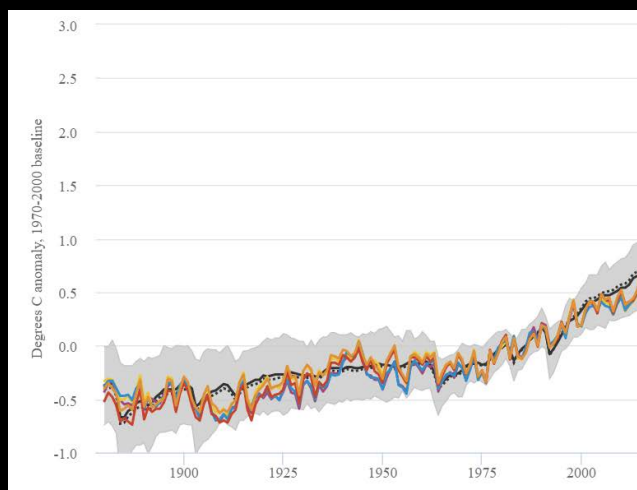
How are global climate models tested?



How are global climate models tested?

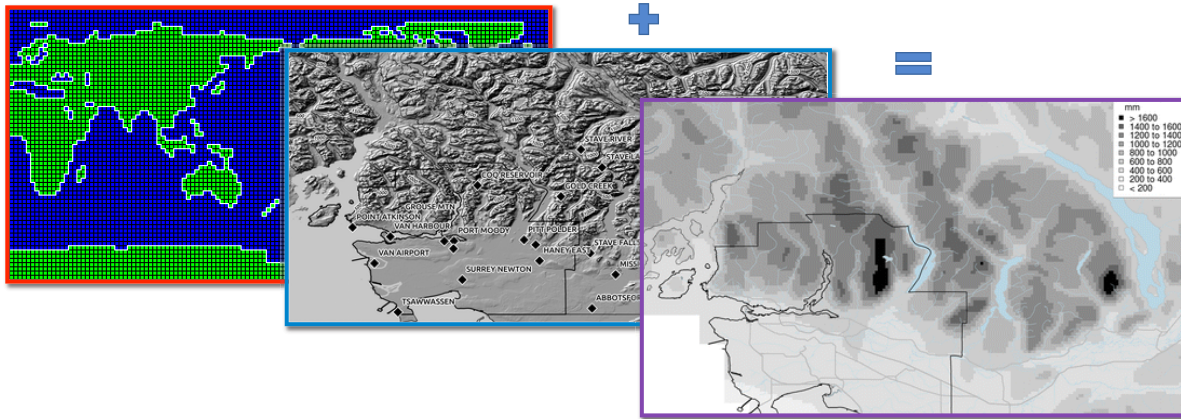


How are global climate models tested?



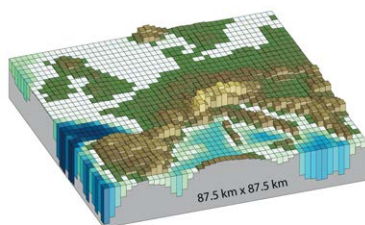
How can global climate models be applied locally?

Downscaling: ways to move from predictions at large scales to predictions at local scales.

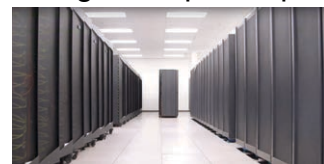


How can global climate models be applied locally?

Downscaling: ways to move from predictions at large scales to predictions at local scales.



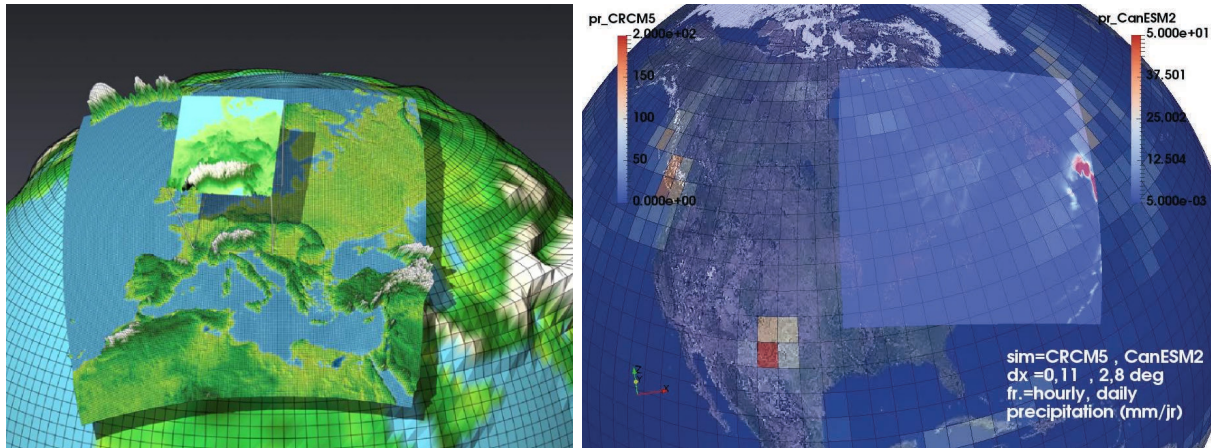
Niagara: 3 petaflops



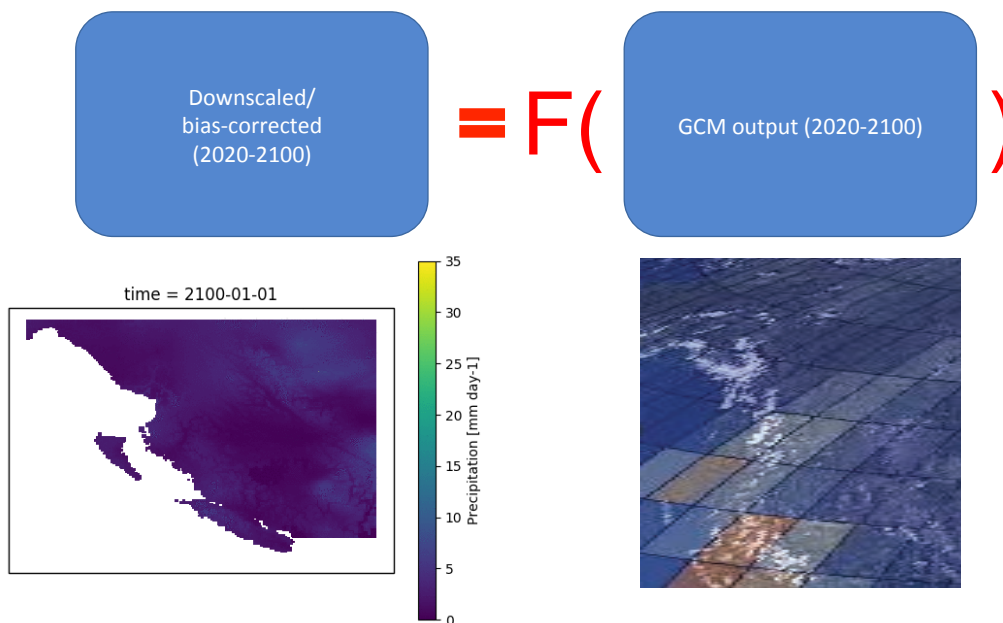
Summit: 200 petaflops

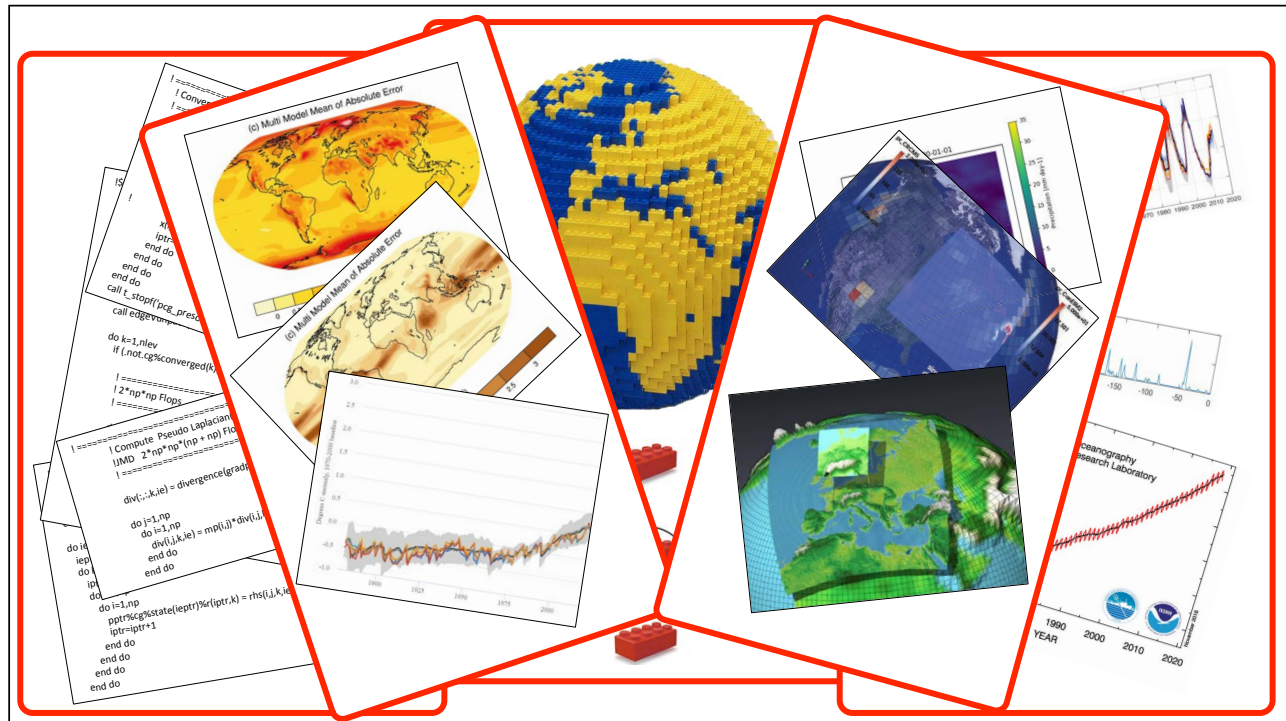


How can global climate models be applied locally?



How can global climate models be applied locally?





In summary...!

Why are global climate models needed?

Global climate models needed to predict climate for decision making

What are global climate models?

1. Computer code to represent components of climate system
2. Earth on a grid
3. 'Boundary condition' datasets

3. *'Boundary condition'* datasets

Run for the past and compared to the real world

How can global climate models be applied locally?

Downscaling methods important for predictions at local scales