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Global-Coupled Climate Models Approaching the Regional Scale

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With today's computing power we can run climate simulation at 25km global uniform resolution; with variable resolution meshes we can reach finer resolutions locally

Example from the atmospheric component of NCAR's CESM (Community Earth System Model)

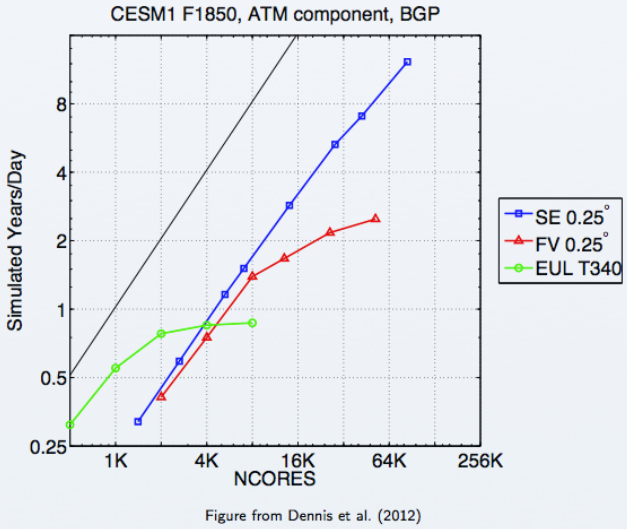
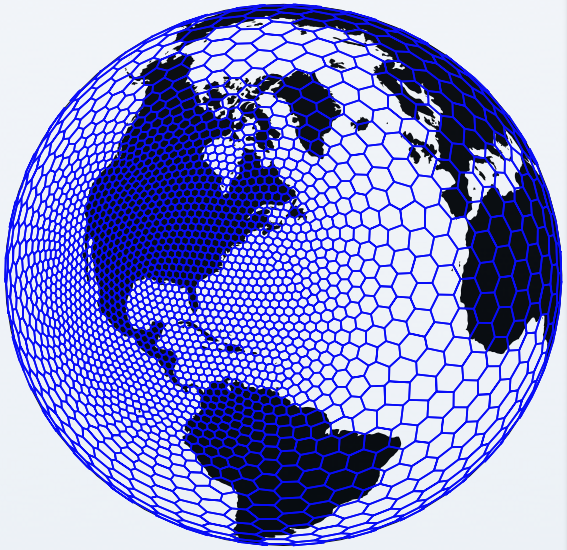


Figure from Dennis et al. (2012)

SE = Spectral Element model



MPAS = Model for Prediction across scales

⇒ Produce climate data for end users at unprecedented scales, without statistical or dynamical downscaling, in one consistent framework

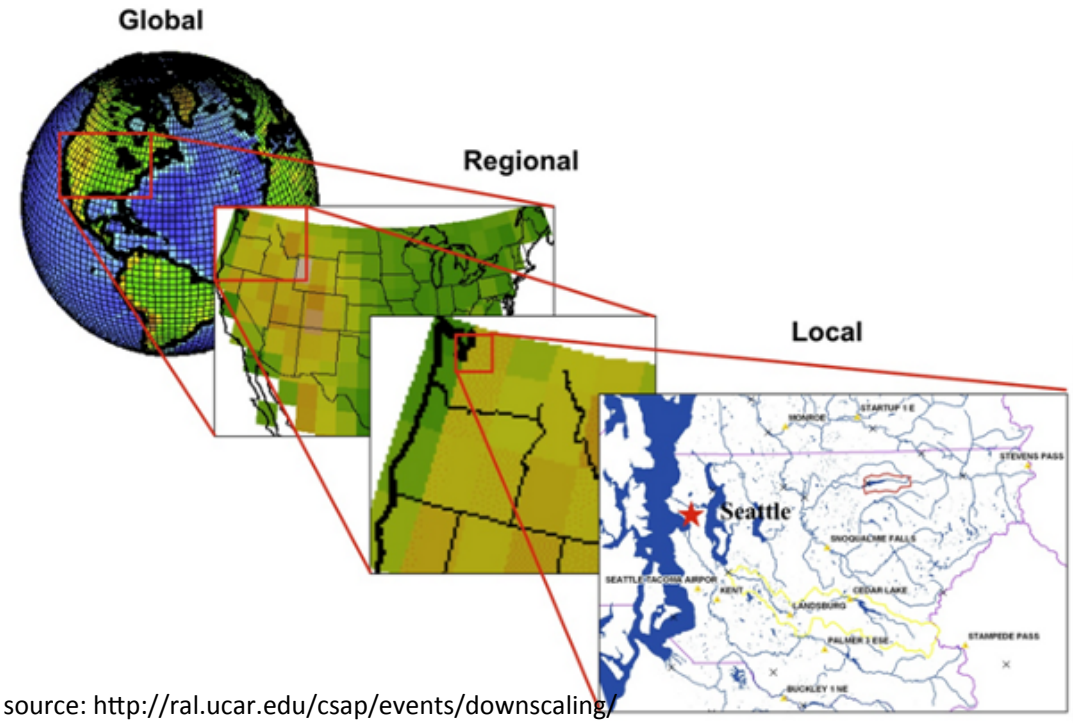


Image source: http://ral.ucar.edu/csap/events/downscaling/

Watershed model

Crop model

Socio economic model

Decision making

Policy Planning

Infra-structure planning

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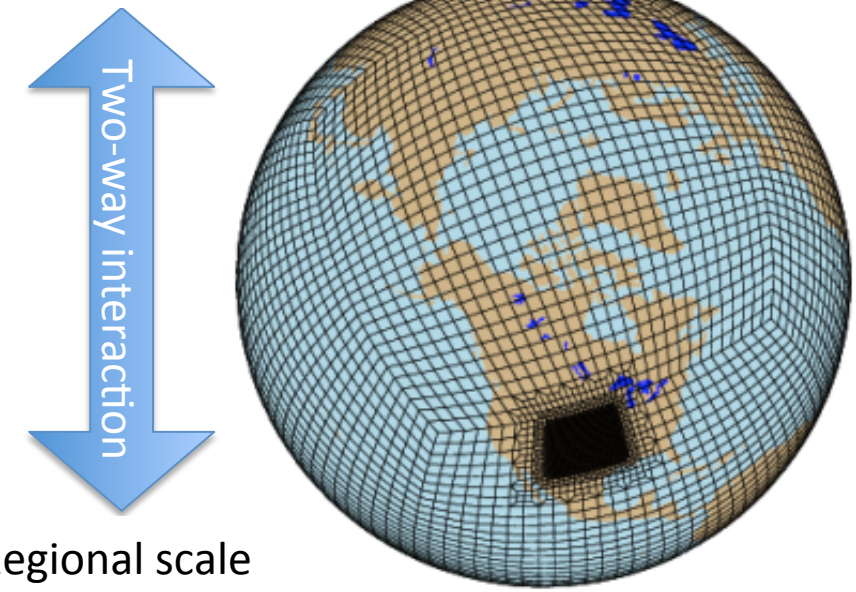
Global scale



Regional scale

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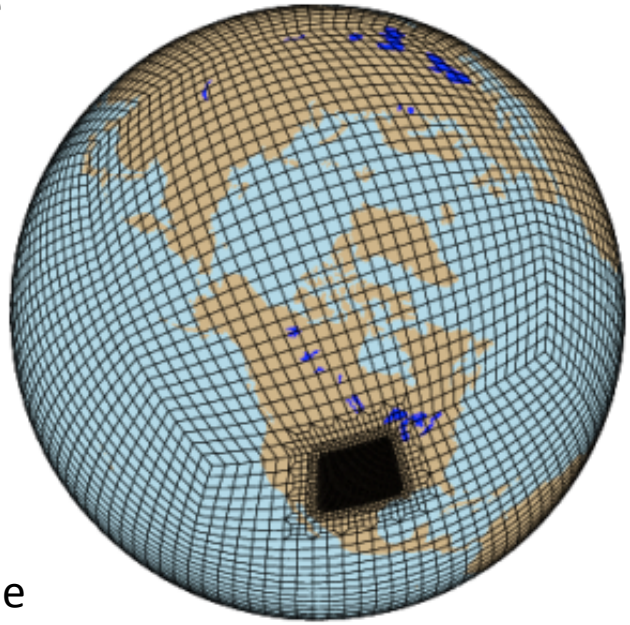
⇒ Produce climate data for end users at unprecedented scales, without statistical or dynamical downscaling, in one consistent framework

⇒ Do climate and weather modeling within the same framework!
- Exploit synergy in weather and climate model development

Global scale

Two-way interaction



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