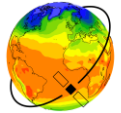


New scientific diagnostics in the ESMValTool – an overview



ESMValTool

Earth System Model Evaluation Tool

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*International development team

17 funded projects, 63 institutions,
203 developers

Easier and faster evaluation of complex Earth system models, Improved quality standard for model evaluation, easily expandable, coupling to Earth System Grid Federation (ESGF)

Eyring et al., GMD, 2020

Large-scale diagnostics

- **Large scale:** atmosphere, ocean, cryosphere, land processes, biogeochemical processes
- **Integrative measures of model performance**, e.g. performance metrics for essential climate variables

Lauer et al., GMD, 2020

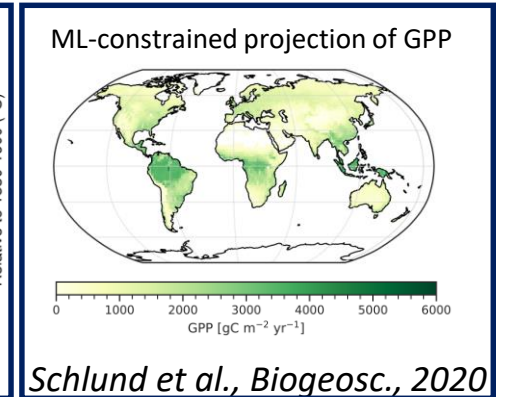
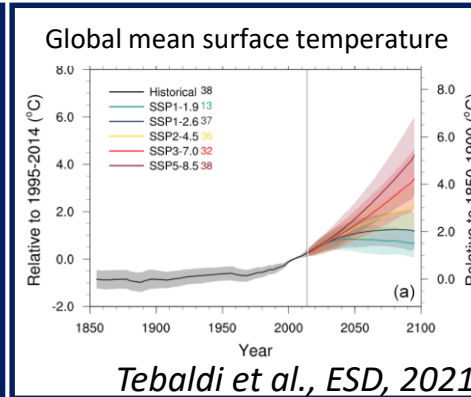
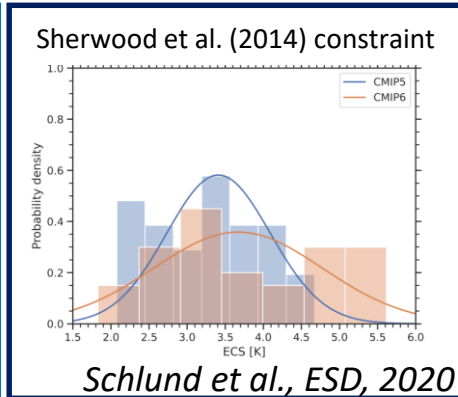
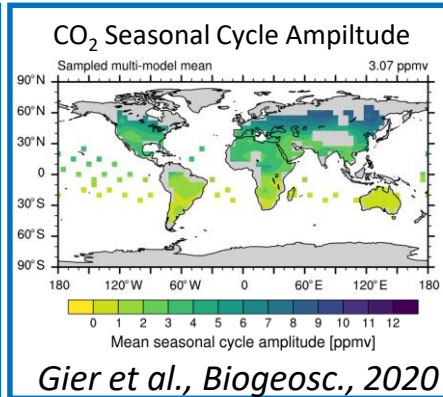
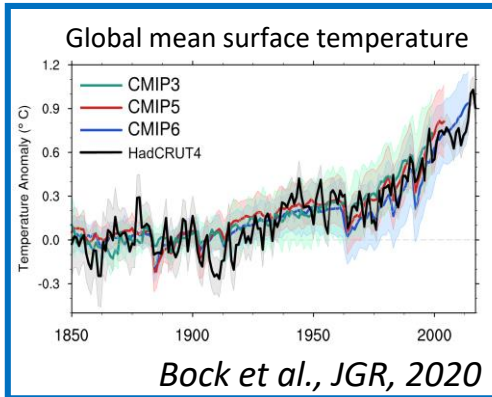
Diagnostics for emergent constraints and future projections

- **Effective climate sensitivity (ECS) and transient climate response**
- **Emergent constraints**, e.g. carbon cycle, hydrological cycle, ECS
- **Climate model projections**, e.g. sea ice

Weigel et al., GMD (accepted)

Diagnostics for extreme events, regional and impact evaluation

- **Hydrological cycle**
- **Extreme events**
- **Evaluation for impact assessments**, e.g. heat and cold wave duration, combined climate index
- **Regional features**



Website: <https://www.esmvaltool.org/>

Code: <https://github.com/ESMValGroup/ESMValTool>

Documentation: <https://docs.esmvaltool.org/>

Tutorial: https://esmvalgroup.github.io/ESMValTool_Tutorial/

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