Breakout Group on Impact Modelling

Jakob Zscheischler & Stephan Thober

Helmholtz Centre for Environmental Research – UFZ

Goals

- Identify areas of common interest at the interface ESM/impact modelling across sectors
- Identify most promising directions to improve impact modelling within the realms of natESM
- Networking
- Possibly: Form working groups to coordinate advances on specific topics over the next years (e.g. using natESM sprints)

Impacts considered

- Hydrology/water resources
- Vegetation
- Fire
- Agriculture/crops

Themes

1. Useful ESM configuration for impact modelling

2. Bias adjustment and downscaling

3. Model coupling

4. ESM improvements most relevant to impacts

1. Useful ESM configuration for impact modelling

- Research question dependent, requires harmonization
  - Large ensembles to study extremes
  - High resolution for floods,…
  - …
- Nudged simulations useful for many impact assessments → nudging is already available for ICON, usable for a larger community?
- ICON training useful for impact modellers/data users
- Community to agree on/design common experiments

2. Bias adjustment and downscaling

Tradeoff between

- Tailored bias adjustment to impact model at hand (challenging)
- Commonly used bias adjustment approach for many impact models (easier but not necessarily scientifically rigorous)

3. Model coupling

- For many impacts one-way coupling enough
- Coupling directly to ESM can improve impact simulations due to access to higher temporal resolution during the simulation
- When substantial feedbacks: coupling should be bi-directional
- Develop formalized approach towards finding relevant feedbacks
- natESM could help with scaling up working examples, or retuning coupled model after adding new processes

4. ESM improvements most relevant to impacts

- Sensitivity analysis to identify relevant feedbacks
- High-resolution simulations needed for some impacts, e.g. land management effects
- Common interests across domains: improve representation of soil processes
- Would be nice to reduce precipitation biases

Next steps

- Organize a Focus Workshop on impact modelling with a smaller group to continue the discuss and agree on some key points
- Form a Working Group on impact modelling