Integrated modelling at CICERO: A macroeconomic perspective on adaptation

Adaptation in current IAM: Adjust estimated damage costs for net benefits of adaptation to provide more realistic comparisons of the costs of mitigation and damage costs.

Poorly addressed: The choice of adaptation strategy: The relationship between adaptation and damage is unaffected by a change of relative prices spurred by climate change → A lost opportunity.
Approach in the CGE-model GRACE:

Step 1: *Integrated assessment of impacts*

Impact functions for:

- Loss of natural capital (agriculture, fisheries, forests)
- Loss of real capital (extreme events)
- Loss of human capital (health effects)
- "Technology" (input of energy, transport by sector)
- Preferences (energy and transport demand, tourism)
Step 2: **Split into “local” markets to allow for variability of impacts and vulnerability**

- Technology and preferences are invariant across sub-regions in basis
- Split activities into sub-regions according to main indicators (GDP)
- Include impacts by sectors and sub-regions
- Put constraints on mobility across sub-regions
Example: Variability of impacts in Iberia
Applications:

- Addresses possible needs for national strategies for adaptation
- Consistency between economic behaviour and adaptation to climate change
- Enables analysis of the fact that adaptation takes time: Sudden changes are more costly than smooth changes

Current projects: Ensembles, ADAM, IMPLICC, NorClim