The Cost of Policy Inaction: Insights From the COACCH Project

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TOWARDS A CLIMATE NEUTRAL ECONOMY- WHAT ROLE FOR ECONOMIC POLICIES

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 776479

COACCH intro

- *Name*: **COACCH CO-designing the Assessment of Climate Change costs**
- *Starting date*: **01.12.2017**
- *Duration:* **42 months → extended 6 months**
- *Partners:* **14;**

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COACCH aims, features and challenges

Advancing the knowledge on climate change impacts

Spatially explicit assessment of climate change impacts and «regionalized» assessment of macro-economic consequences in the EU (138 regions)

Analysis of climate-driven environmental and socio-economic tipping points

This presentation: focus on macro-economic effects

- **The impact** *Agriculture, infrastructure an level rise and labour supply, he*
- **Macro-economic approaches: IAMS and CGE models** *Impact interaction, complex impact chains*

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tipping points *to identify environmental triggers, favouring climatic conditions and likelihood under different RCPs-SSPs combinations.*

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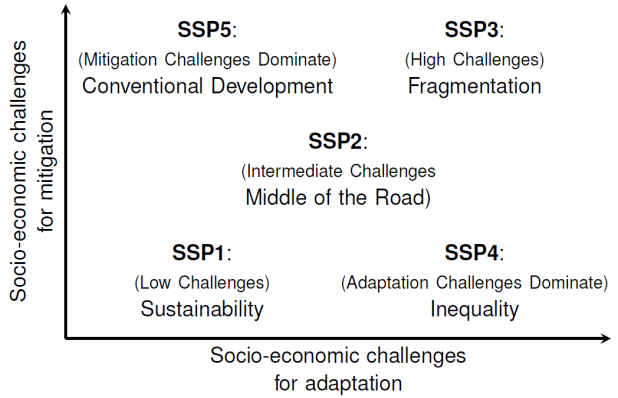
COACCH the scenario framework

Socio-Economic scenarios



Climate scenarios

	SSP1 (Green Growth)	SSP2 (Middle of the road)	SSP3 (Regional rivalry)	SSP4 (Inequality)	SSP5 (Fossil fuel development)
RCP8.5					X
RCP6.0		X			
RCP4.5	X	X	X		X
RCP2.6	X	X	X		

And, for each:

- a ***high-medium-low*** damage characterization to account for «impact model uncertainty» and, given the sub-national description of the EU

- different assumptions on interregional capital/investment mobility across EU regions, high and low

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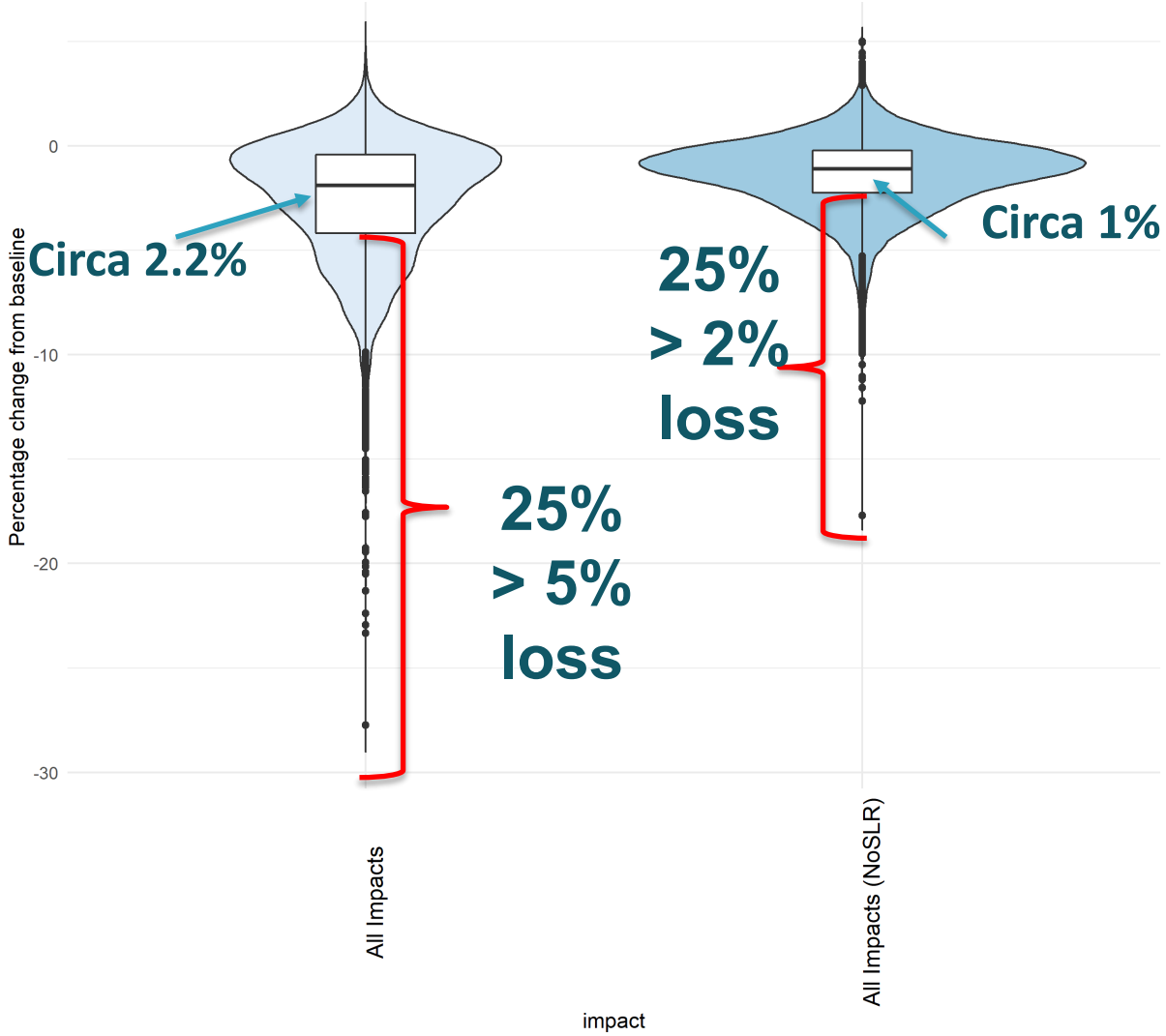
The overall picture of the cost of inaction against CC

EU28 pooled (all scenario comb.) macroeconomic impacts (Gross Regional Product % ch. wrt baseline) in 2070



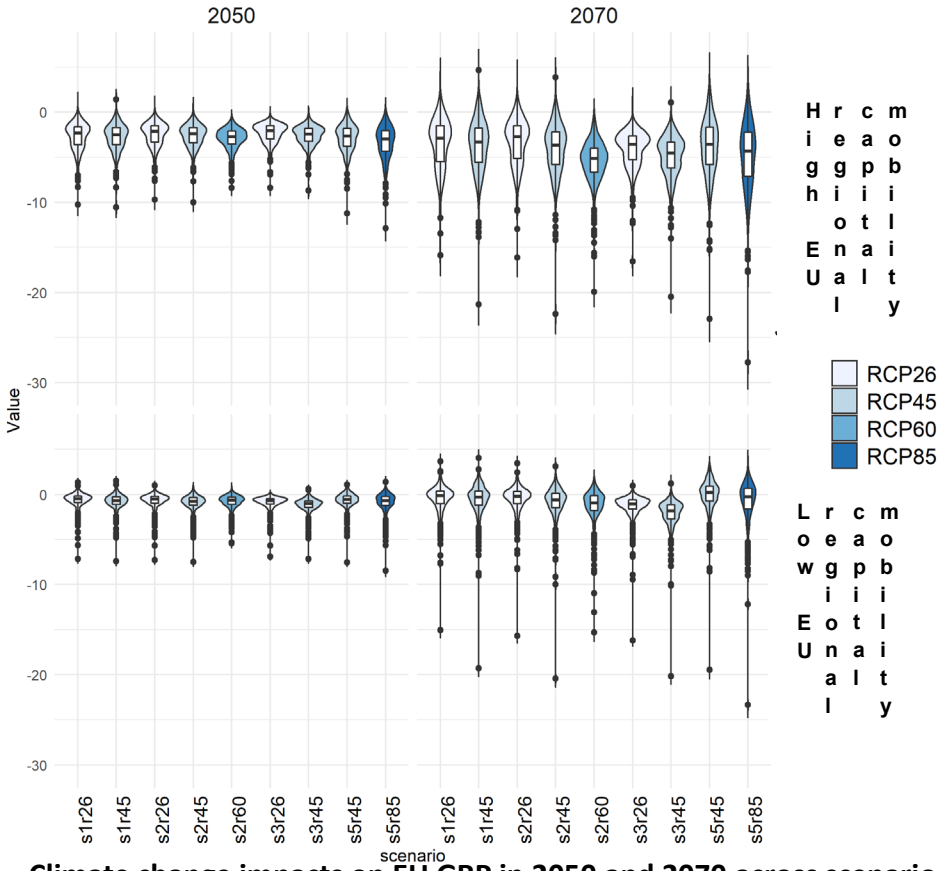
What is in there:

- Agriculture, fishery, forestry,
- infrastructure and transportation (river & Sea-level rise flooding),
- Energy supply and demand, labour supply

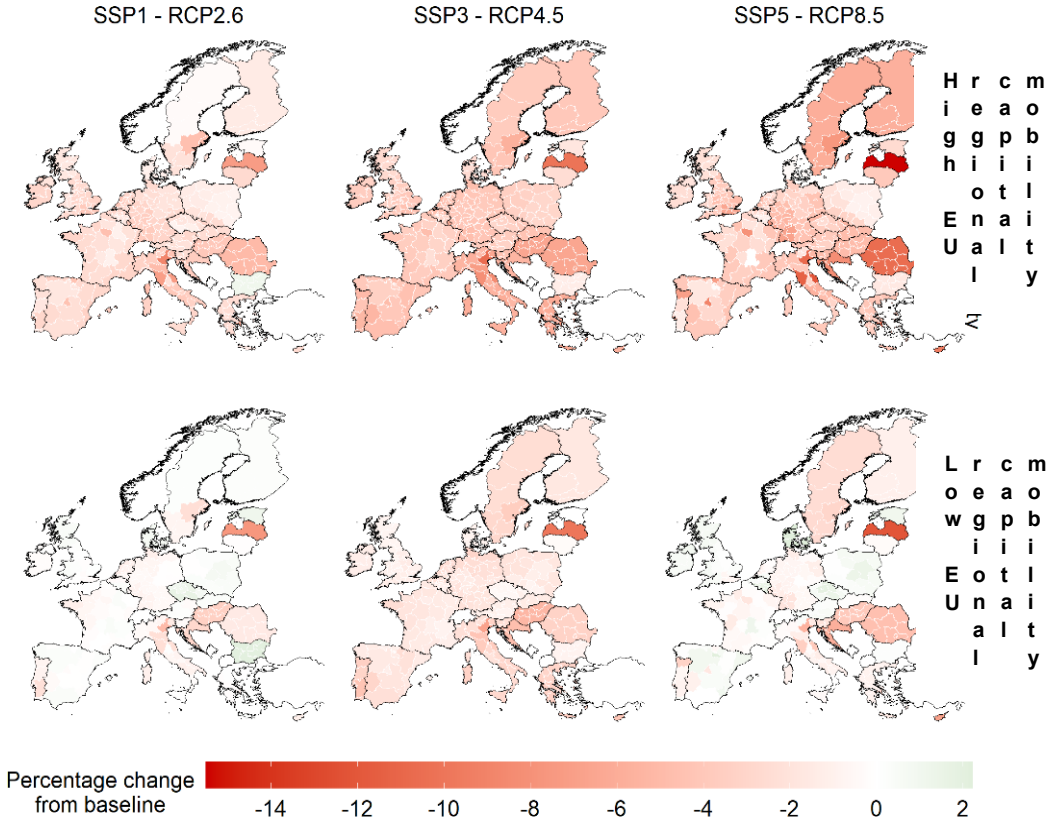
What is not:

- Health costs (mortality, morbidity)
- Ecosystem-Biodiversity loss
- Extreme sea-level rise and other TP.

The loss distribution (across time, scenarios, regions)



Climate change impacts on EU GRP in 2050 and 2070 across scenario combinations. % change from the baseline.



Climate change impacts on EU GRP in 2070 across regions. Medium impact case. % change from the baseline.

Not «large average» deviations across scenarios (time matters); role of trade (smoothens, look at the fragmented SSP3); of capital movement (amplifies); «some» North/South divide.

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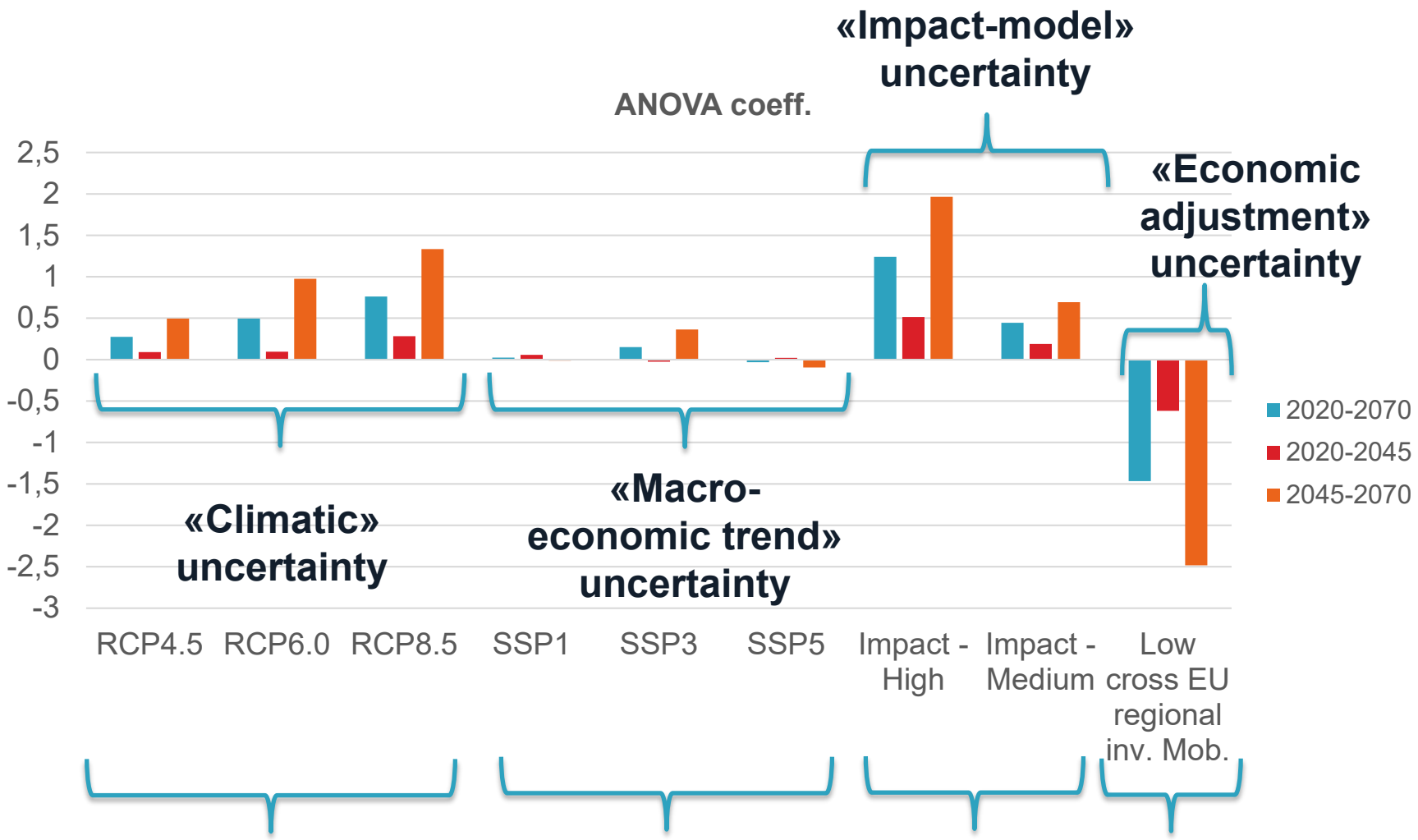
The uncertainty sources: what drives what



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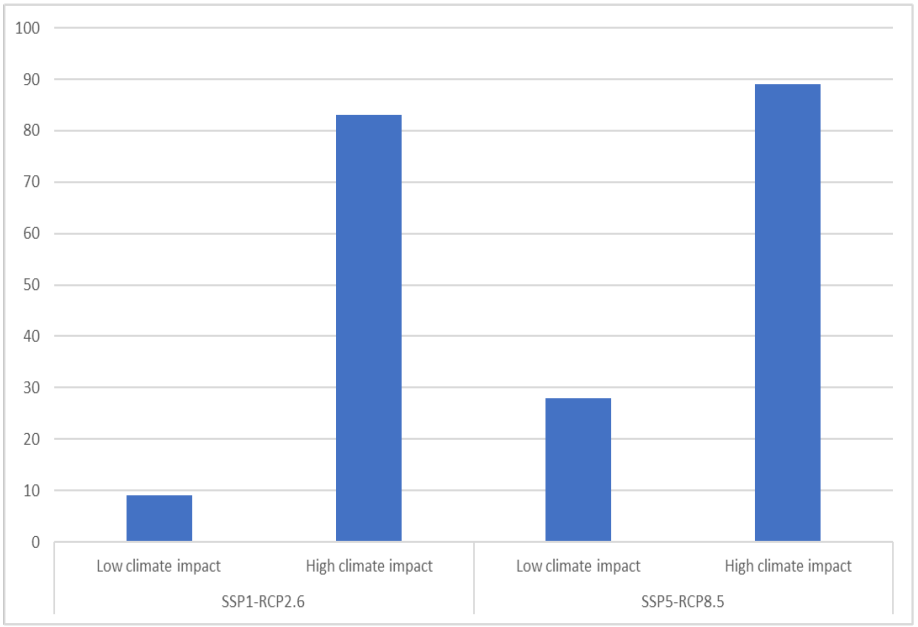
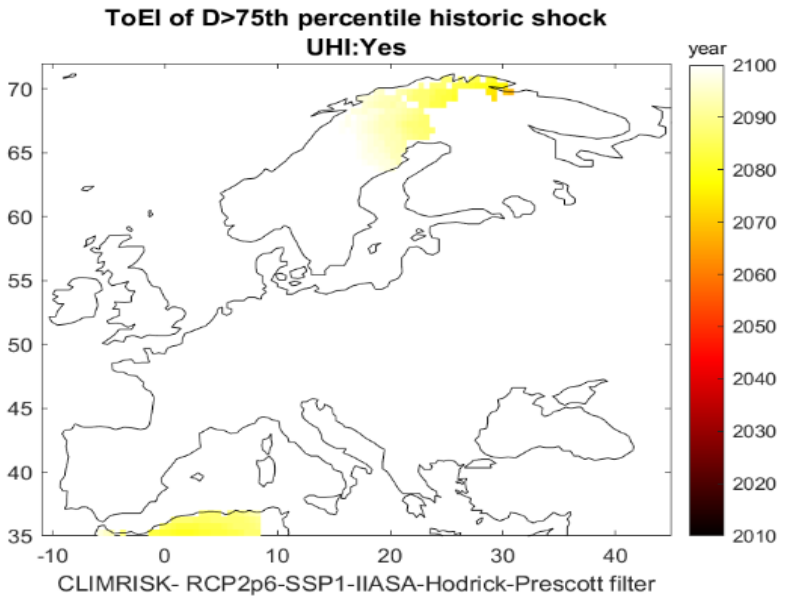
A 2-way look at the «extremes»

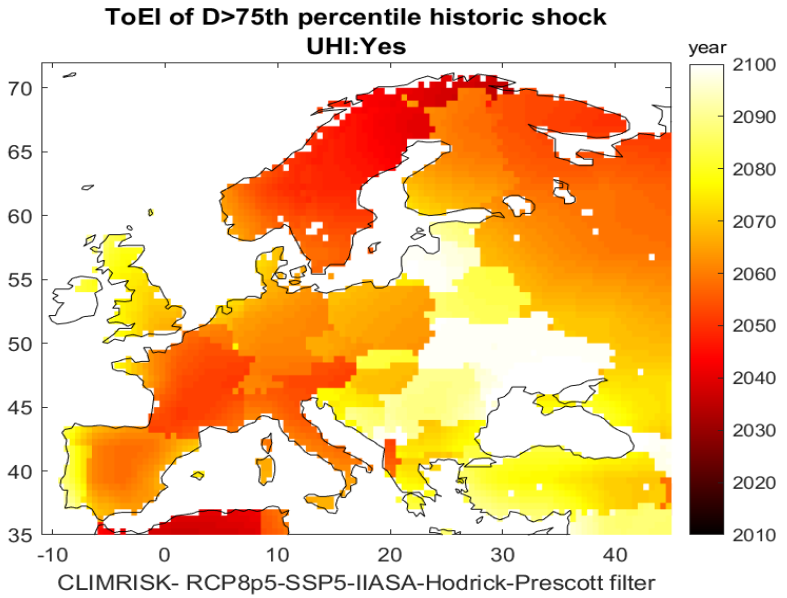
Number of EU regions* (138) with loss > 2.5% of gross regional product wrt baseline in 2070



(*) average across high and low interregional capital mobility cases

More and earlier «extreme losses» under strong climate signal scenarios





Source: COACCH D3.4 Botzen et al. (2020)

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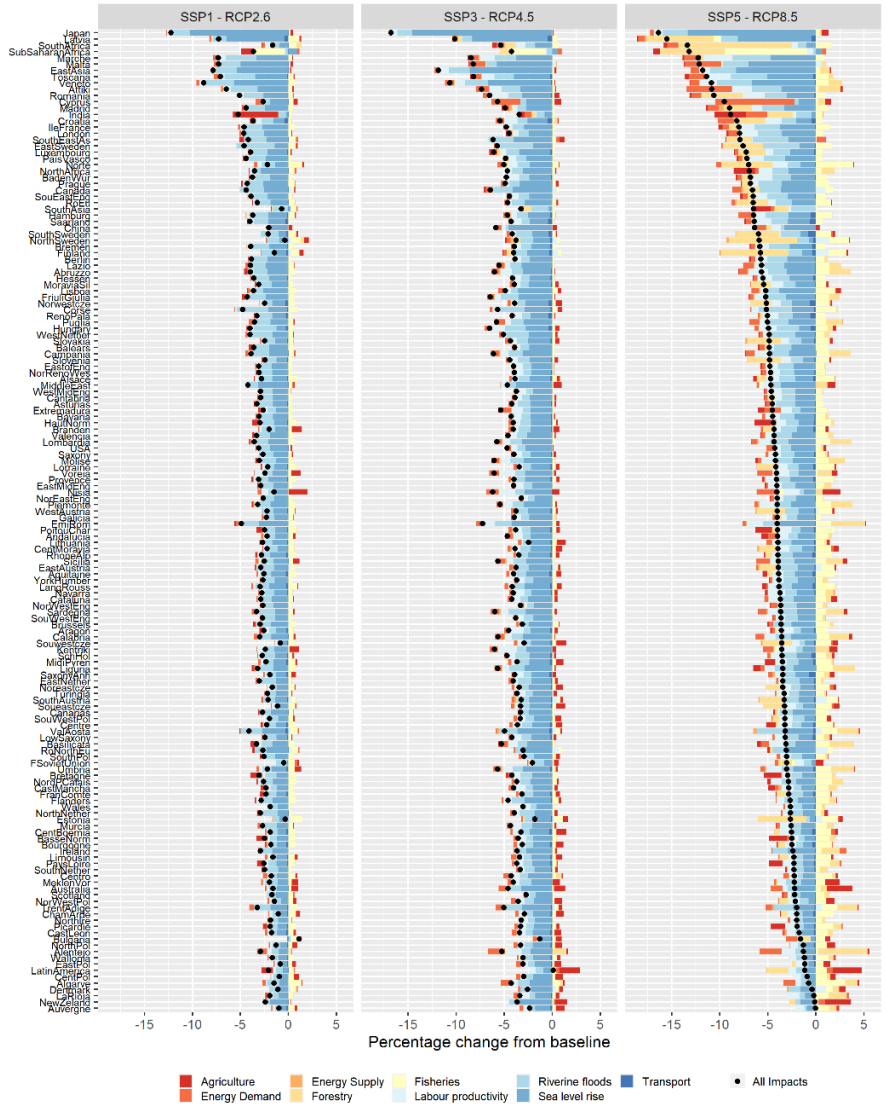
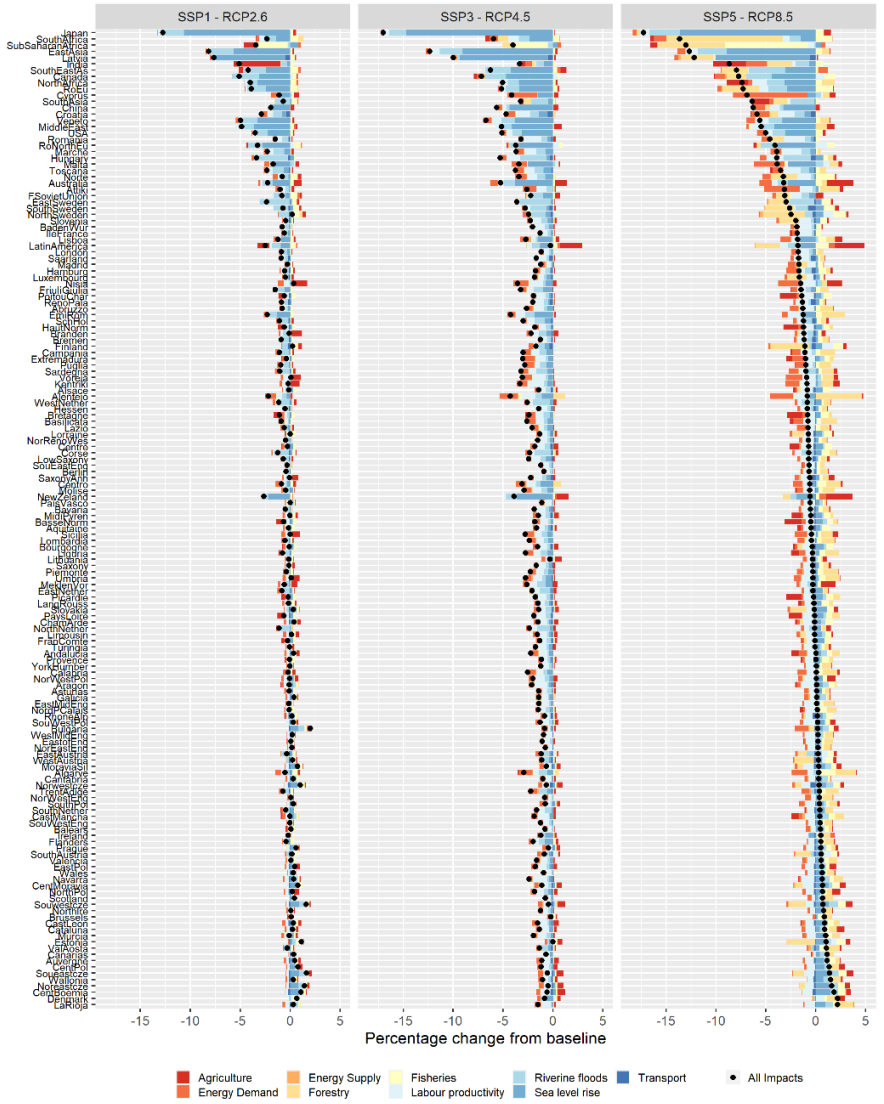
The loss distribution across impacts, scenarios, regions





GDP cost of climate change by impact, in 2070, "medium" impact realization. All expressed in % change from the baseline (high capital mobility left, low right).

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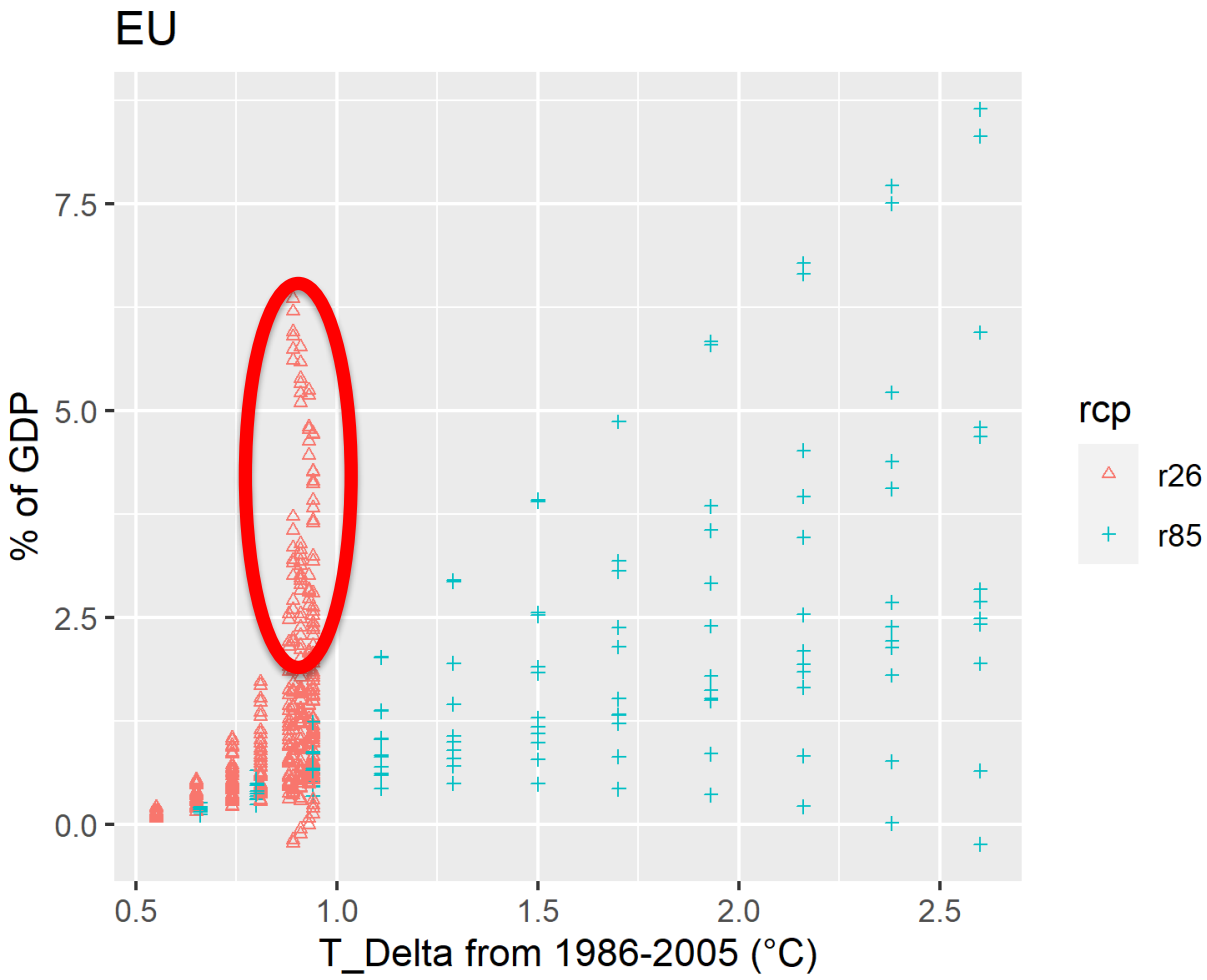
Beware of inertias!



Also low temperature increases in RCP2.6 can be associated to high damages «just» because they occur «late» into the future (2070). There are economic inertias linked to growth processes that persist => any degree or fraction matters! Still adaptation will be needed.

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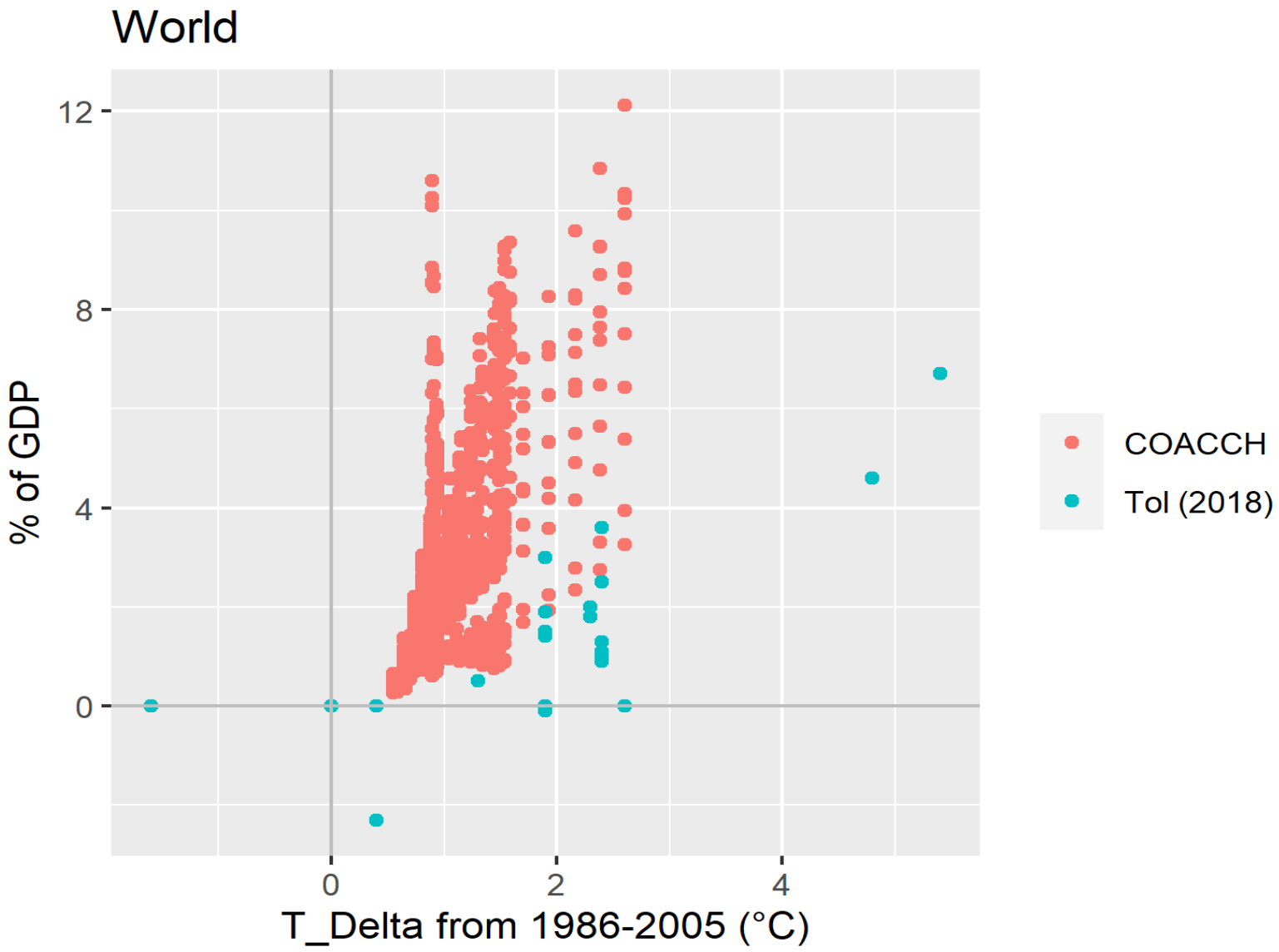
COACCH and the literature



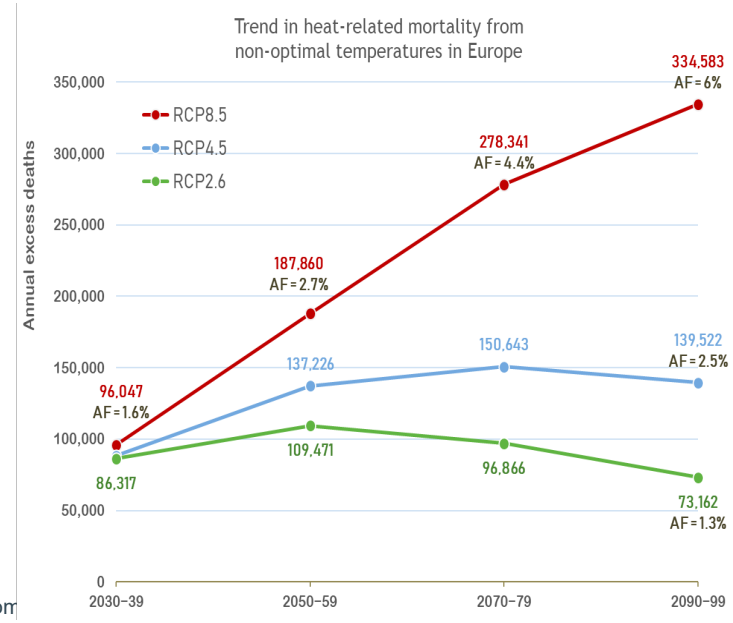
A note on «direct» costs

Coastal adaptation €/yr	RCP2.6-SSP2	RCP4.5-SSP2	RCP8.5-SSP5
2050s / mid century	€14-16 Bill/yr	€15-17 Bill/yr	€17 Bill/yr
2080s / end century	€15-17 Bill/yr	€16-19 Bill/yr	€33 Bill/yr

River flood cost / yr	RCP2.6-SSP2	RCP4.5-SSP2	RCP8.5-SSP5
2050s / mid century	€33 Bill/yr	€32 Bill/yr	€66 Bill/yr
2080s / end century	€75 Bill/yr	€75 Bill/yr	€225 Bill/yr

Transport costs / yr	RCP4.5-SSP2	RCP8.5 SSP2
2050s / mid century	€954 Mill/yr	€1147 Mill/yr
2080s / end century	€1469 Mill/yr	€2286 Mill/yr

Trend in annual excess deaths attributable to heat in Europe



Source: https://www.coacch.eu/wp-content/uploads/2019/11/COACCH-Sector-Impact-Economic-Cost-Results-22-Nov-2019-Web.pdf

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Conclusions

Macro-economic costs of climate change are relevant «on average» in the EU BUT looking at averages is highly misleading also in a «smoothly changing world» as the one considered.

- ✓ Non negligible number of regions with «high» losses
- ✓ Important role of inertias
- ✓ Huge direct costs

All this calls for an ambitious climate policy.

It is possible to describe uncertainty and identify uncertainty sources, but it is not yet possible to associate probabilities, this calls for an even more precautionary climate policy!

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COACCH

CO-DESIGNING THE ASSESSMENT OF CLIMATE CHANGE COSTS

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