European Commission

Future Directions for European Impact Assessments (PESETA)

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Snowmass, July 28th 2015

Outline

1. EU Adaptation Policy

2. Experience and Lessons
   The PESETA projects

3. Current Research
   PESETA III project
   Other studies

4. Conclusions

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1. EU Adaptation Policy

The EU Adaptation Strategy

2013. The objective of the EU adaptation strategy is to contribute to a more climate-resilient Europe

Action 4 of the strategy aims at bridging the knowledge gaps; one of them is 'information on damage and adaptation costs and benefits'.

> “In particular, the Commission will promote EU-wide vulnerability assessments, notably by supporting the Joint Research Centre in its work on estimating the economic implications of climate change, and *will undertake a comprehensive review of what global climate change will mean for the EU*”

2017. Report on implementation

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2. Experience and Lessons

The PESETA projects

The PESETA Approach

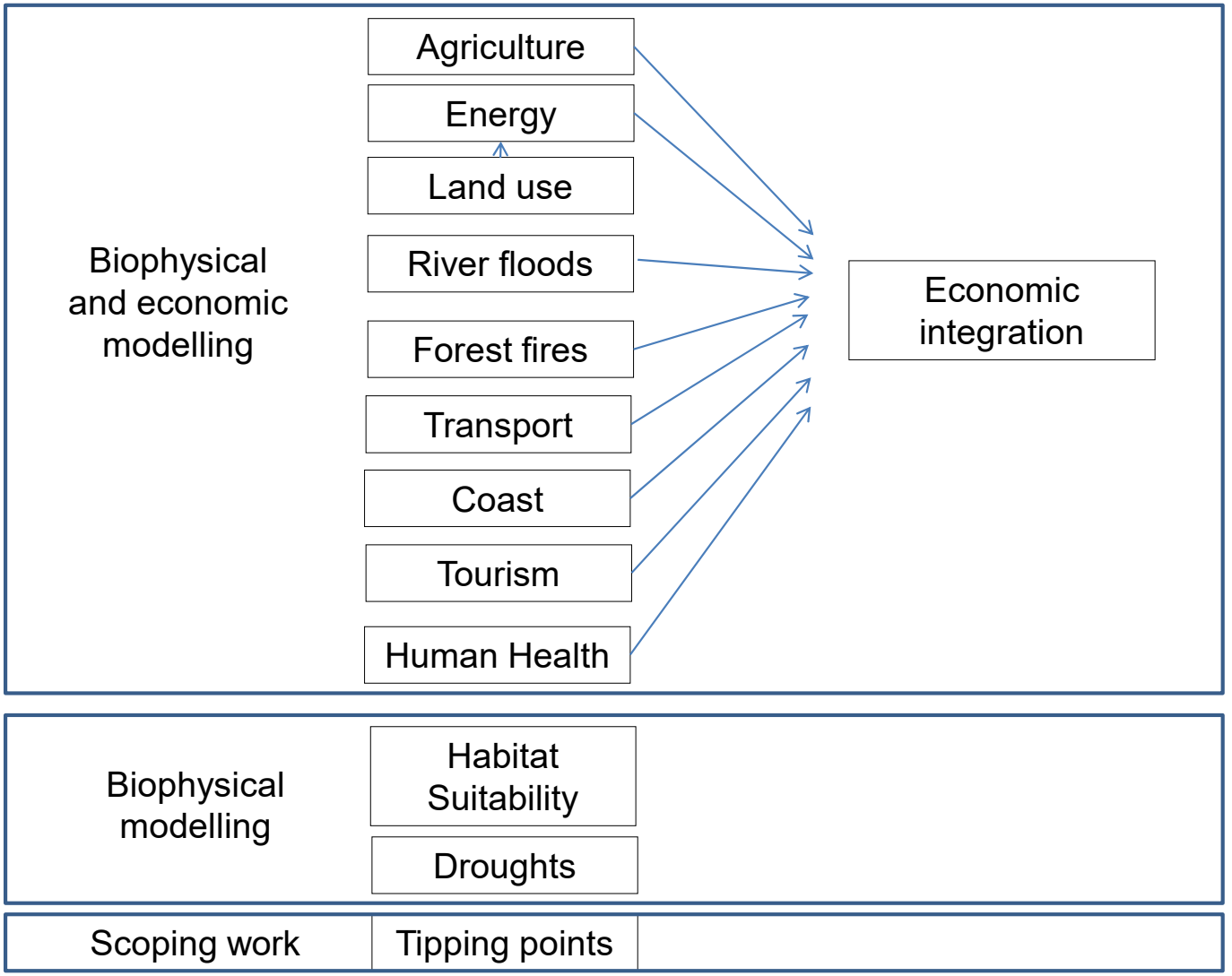
What, why? Building climate impact modeling capabilities within JRC to support the EC services on adaptation policy

- Existing data and models within JRC
- Learning-by-doing within JRC

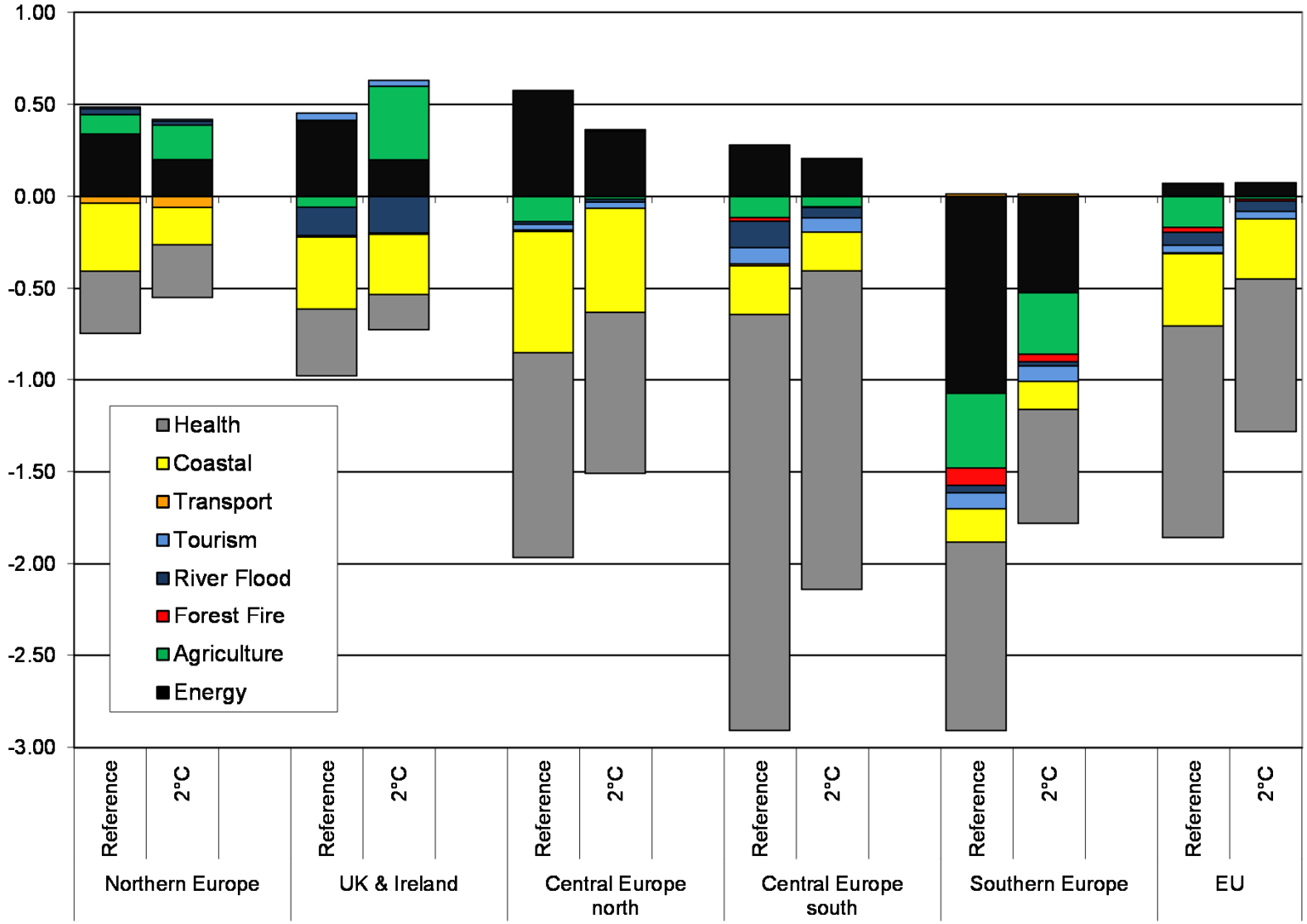
How? 3 steps in granular, consistent modelling

1. Start with high space-time resolution of climate data, common to all impacts
2. Use of bottom-up biophysical impact models
3. Integration of market impact results under an economic model

PESETA II Framework



Welfare change (%GDP), Reference and 2°C
EU and regional breakdown



Some lessons

Framework and methodology

- Limited modelling of (private) adaptation
- Static CGE economic analysis

Scope

- 2080s focus, but also interest in next few decades
- Extreme events not broadly captured
- Absence of cross-impact effects
- Only one non-market impact
- Catastrophes, tipping points out of the analysis

Results

- Focus on aggregated economic results
- Do not refer to ‘benefits of mitigation’

The GAP-PESETA project

Complements the PESETA II project by the analysis of:

- Drought impacts
- Coastal impacts
- Impacts on ecosystem services
- Impacts in the EU due to climate impacts in rest of the world, through:
  - Agriculture
  - Coasts
  - Energy
  - Labour productivity
  - Might consider other sectors (e.g. migration)

Ends in September 2015

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3. Current Research

PESETA III project

Other studies

JRC PESETA III

Questions of interest

- Modelling of costs/impacts due to extreme events and adaptation is a priority
- Assessment of non-monetary damages
- Impacts on vulnerable groups
- 2030s time horizon

JRC PESETA III

- Project focus
  - Adaptation policies and measures
  - Extreme events
  - 2030s
- 15 teams
- 10 impact areas
- Impacts on vulnerable groups
- October 2015 + 18 months

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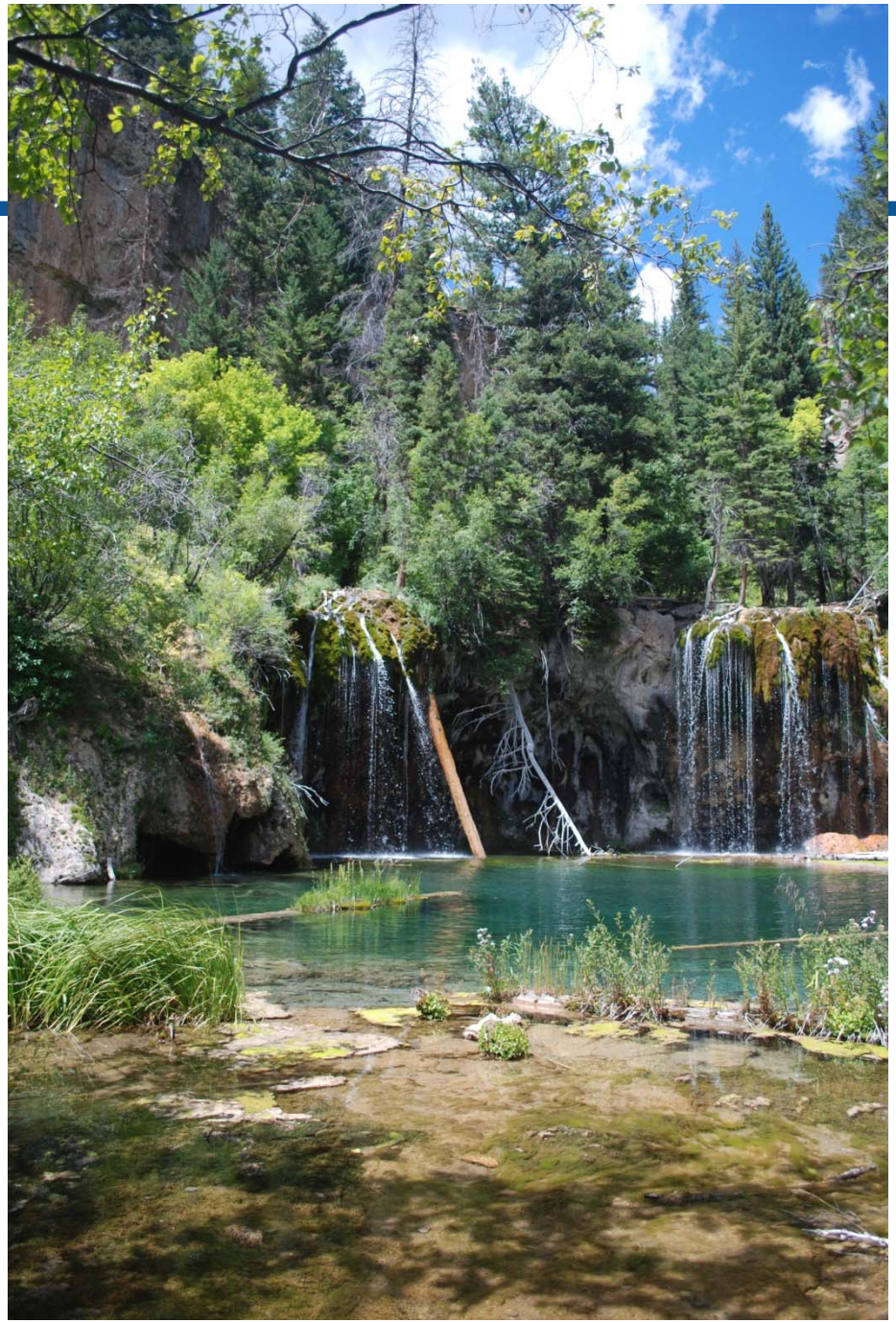
4. Future research



FP7 HELIX Project

High-End cLimate Impacts and eXtremes (HELIX), 4 years (to October 2017)

- What do 4ºC and 6ºC worlds look like compared to 2ºC?
- What are the consequences of different adaptation choices?

Global impacts and adaptation at 2, 4, 6 *ºC*

- Global, and Europe, Sub-Saharan Africa and the South Asia

16 partners, coordinated by MetOffice, UK

Selection of SSPs-RCPs matches, close coordination with IMPRESSIONS and RISES AM FP7 projects

Use of macroeconometric model output (MaGE, from CEPII)

Global-scale Impacts (JRC leads)

- Objective: Perform a comprehensive global-scale socio-economic assessment of climate impacts of 2°C, 4°C and 6°C scenarios, related to key sectors

- Impacts coverage (CGE GEM-E3 and FUND models)
  - River floods
  - Water availability
  - Agriculture
  - Ecosystems
  - Coastal flooding
  - Energy
  - Transport
  - Human health
  - Food security
  - Migration (tipping points)

Other research

- Global assessment of human health impacts (outsourced)
  - Temperature (heat and cold) related mortality
  - Diarrhoeal disease (related to temperature exposure)
  - Extended list of impacts in 2nd study
- Improve empirical foundation of climate damage functions (Forum, series of workshops)

Further research in Ag, Energy

Agriculture

- Validation of the bottom-up models (ISI MIP)
- Connection with the water sector
- Need of cost-benefit analysis of adaptation; better understanding the effects of climate extremes; climate change, adaptation and the CAP

Energy

- Clear connection with water and infrastructures
- Better understanding of the relationship power plant efficiencies and climate change

Further research in Water

Water

- Validation of the bottom-up models (ISI MIP)
- Few studies have actually looked at the related socio-economic impacts
- Clear connection with energy (water availability for hydro, cooling in thermal power plants)
- Need of cost-benefit analysis of adaptation
- Extrapolations of water use (and quality) in the future are highly uncertain

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4. Conclusions

Some items for the long view

- Ecosystem services
- Climate catastrophes, tipping points
- Risk, stochastic, integrated approach
- Economic modeling

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Thanks for your attention!

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http://peseta.jrc.ec.europa.eu/

Damage functions?

A tool to integrate knowledge from different disciplines

- Based on literature review, but inconsistency problems
- From historical observations (statistical analysis), but extrapolation beyond sample, instability of the function
- From process model simulations, but can be complex functions