A crop modeling response to economists' wish lists

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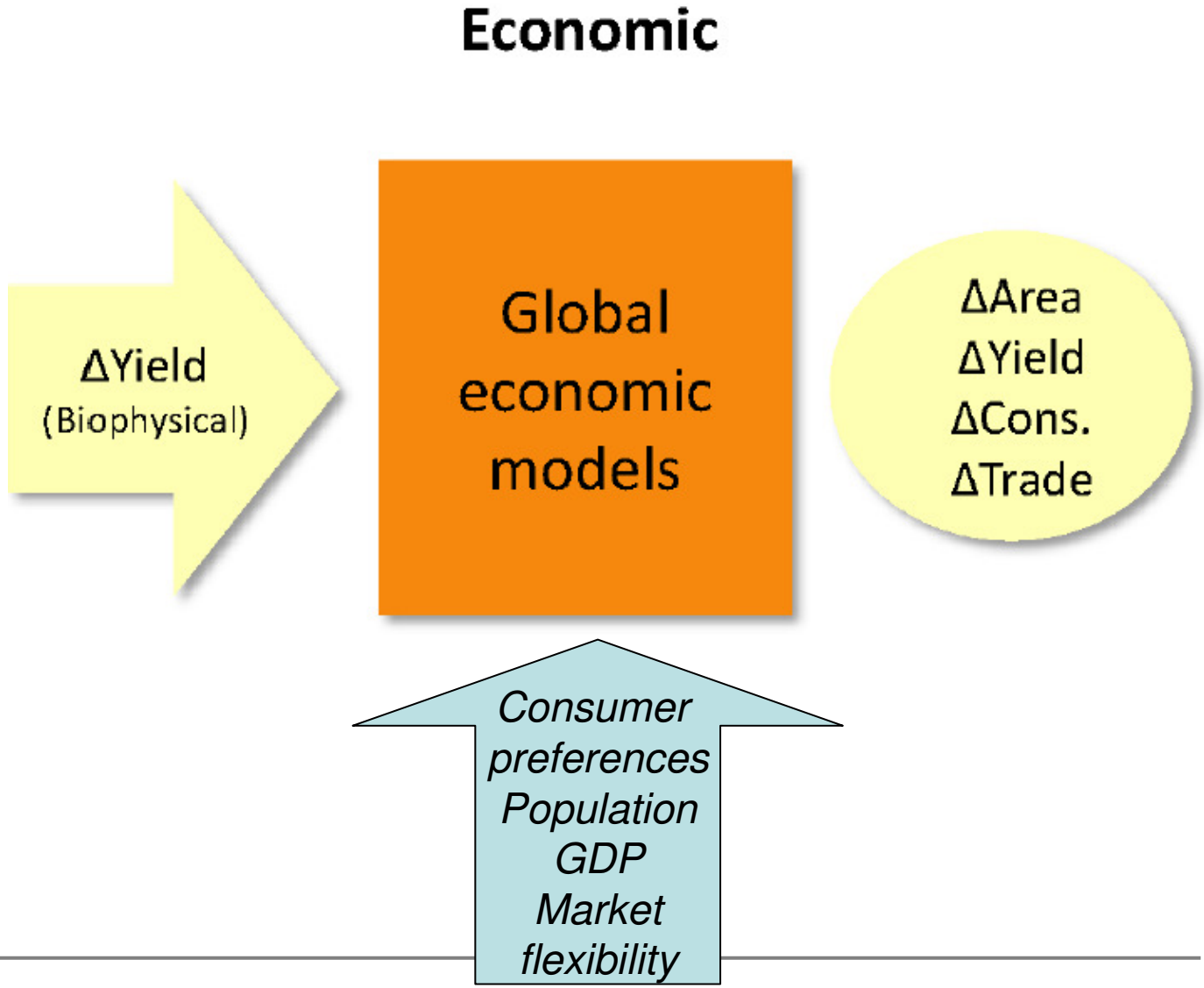
Climate change impacts on agriculture

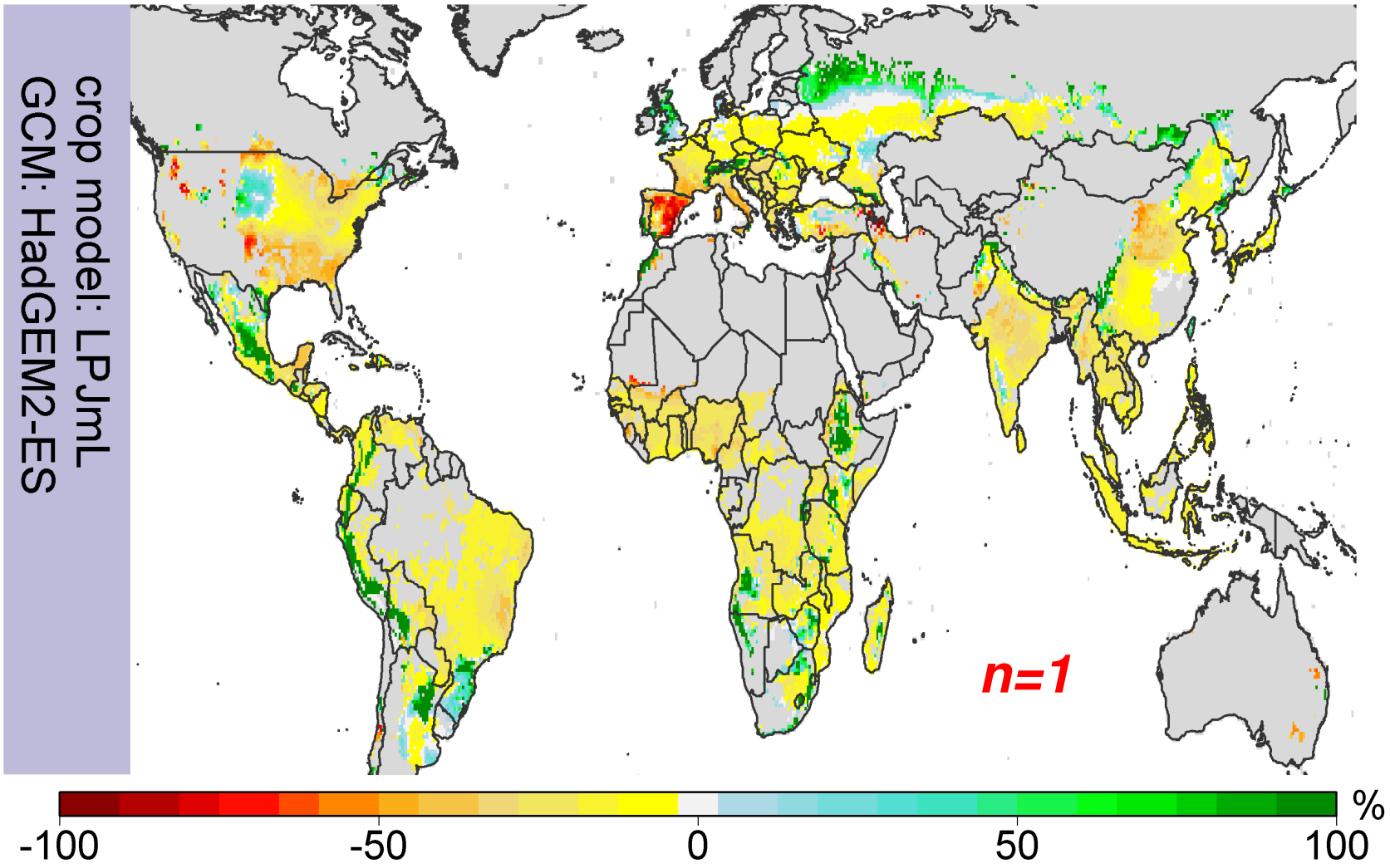


Nelson et al. 2014a

An economist's wish list for crop modeling (as e.g. in Oslo)

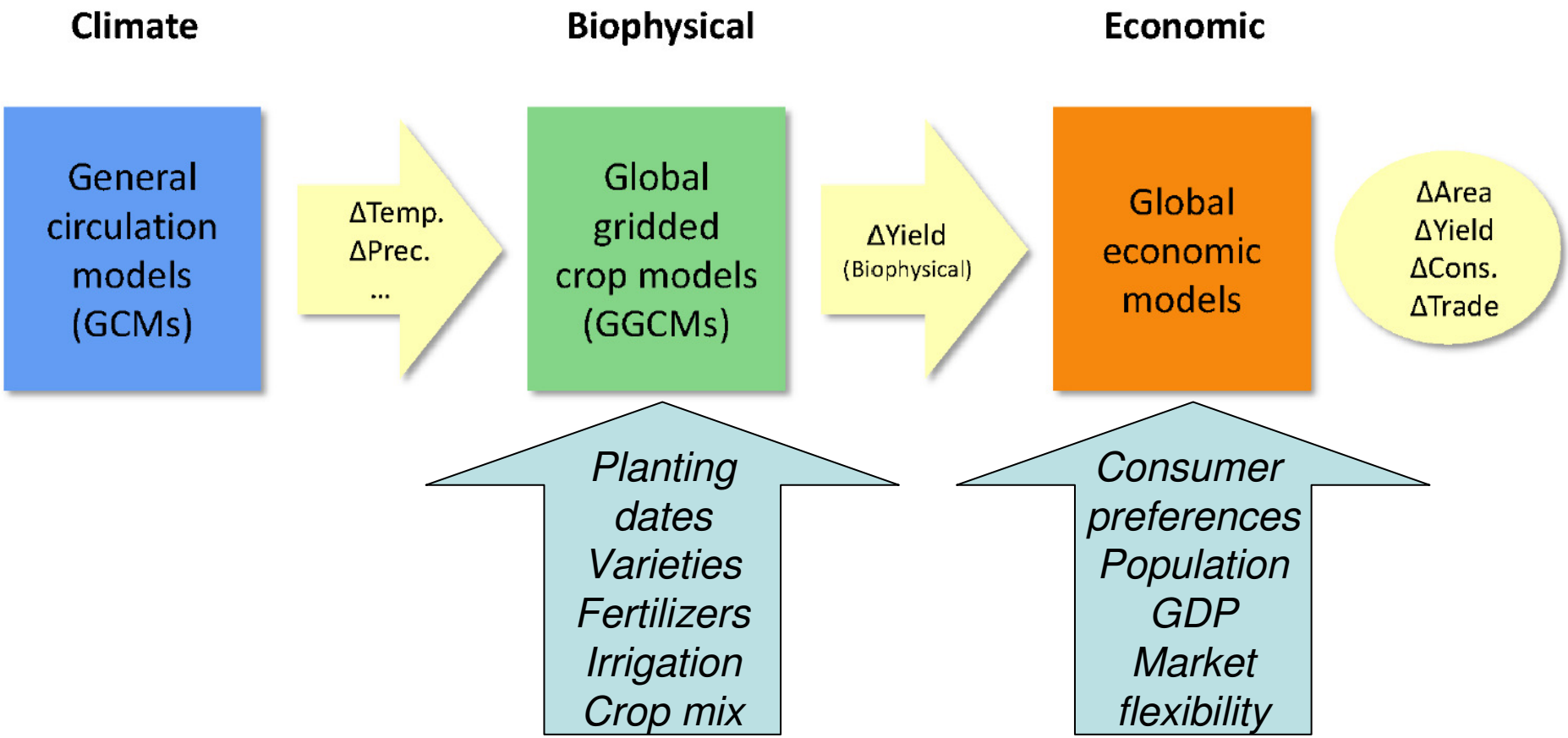
- **Agronomic models are easier than economic models, so get your act together**
  - **Use only the good/best (n=1)**
  - **Harmonize parameters**
- **Improvement of crop models through competition**
- **Cooperation of crop modelers with economists**

Expectations & believes



Müller & Robertson 2014

Climate change impacts on agriculture



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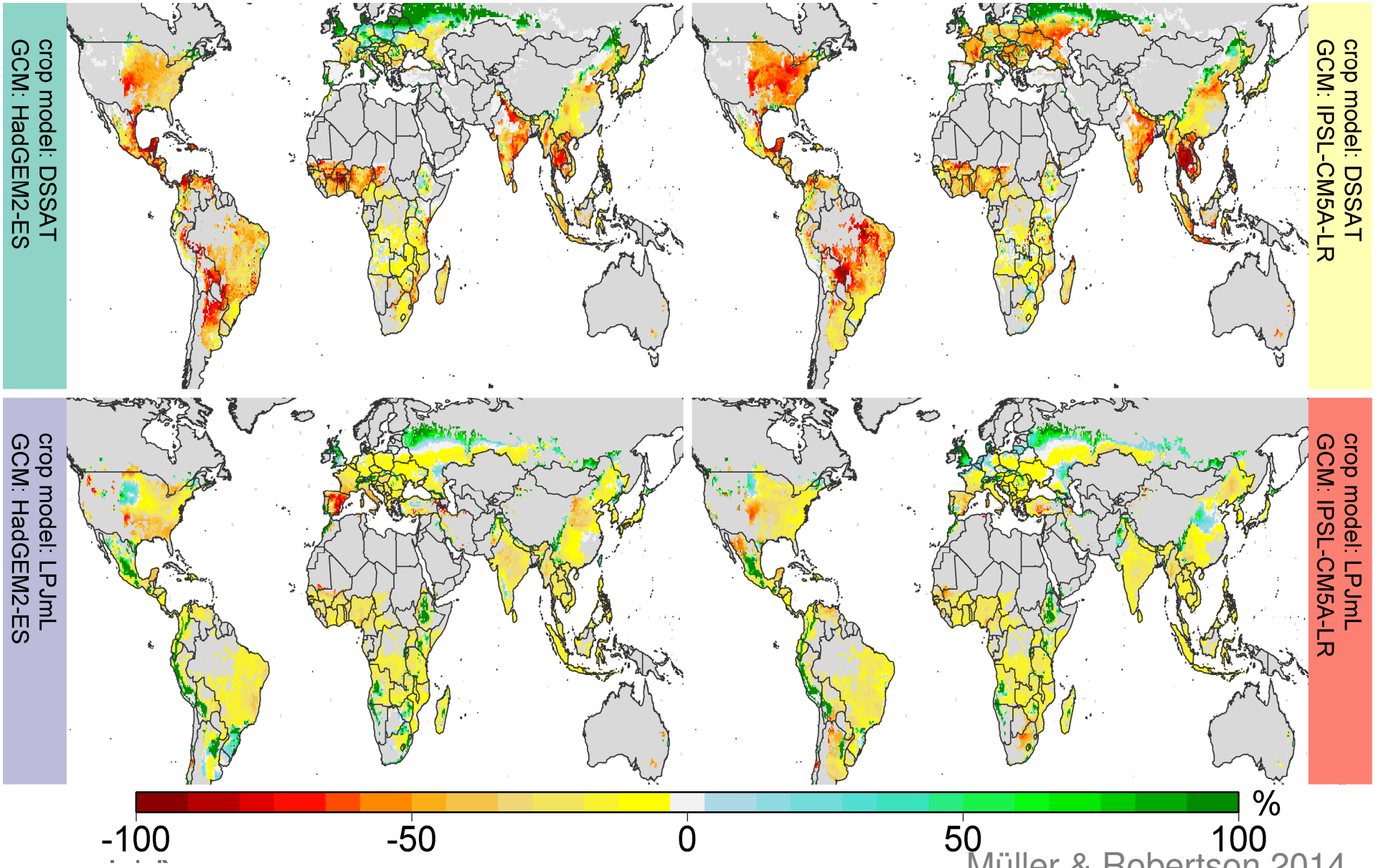
Nelson et al. 2014a

ISI-AgMIP fasttrack

- 7 GGCMs
  - EPIC, GEPIC, IMAGE-AEZ, LPJ-GUESS, LPJmL, pDSSAT, PEGASUS
- ~500 scenarios
  - 5GCM * 4 RCP * 2 irrig * 2 CO_2 *7GGCM
- 3-16 crops
- Rain-fed & fully irrigated
- With and without CO_2 fertilization
- 67420 locations (0.5°*0.5° grid)

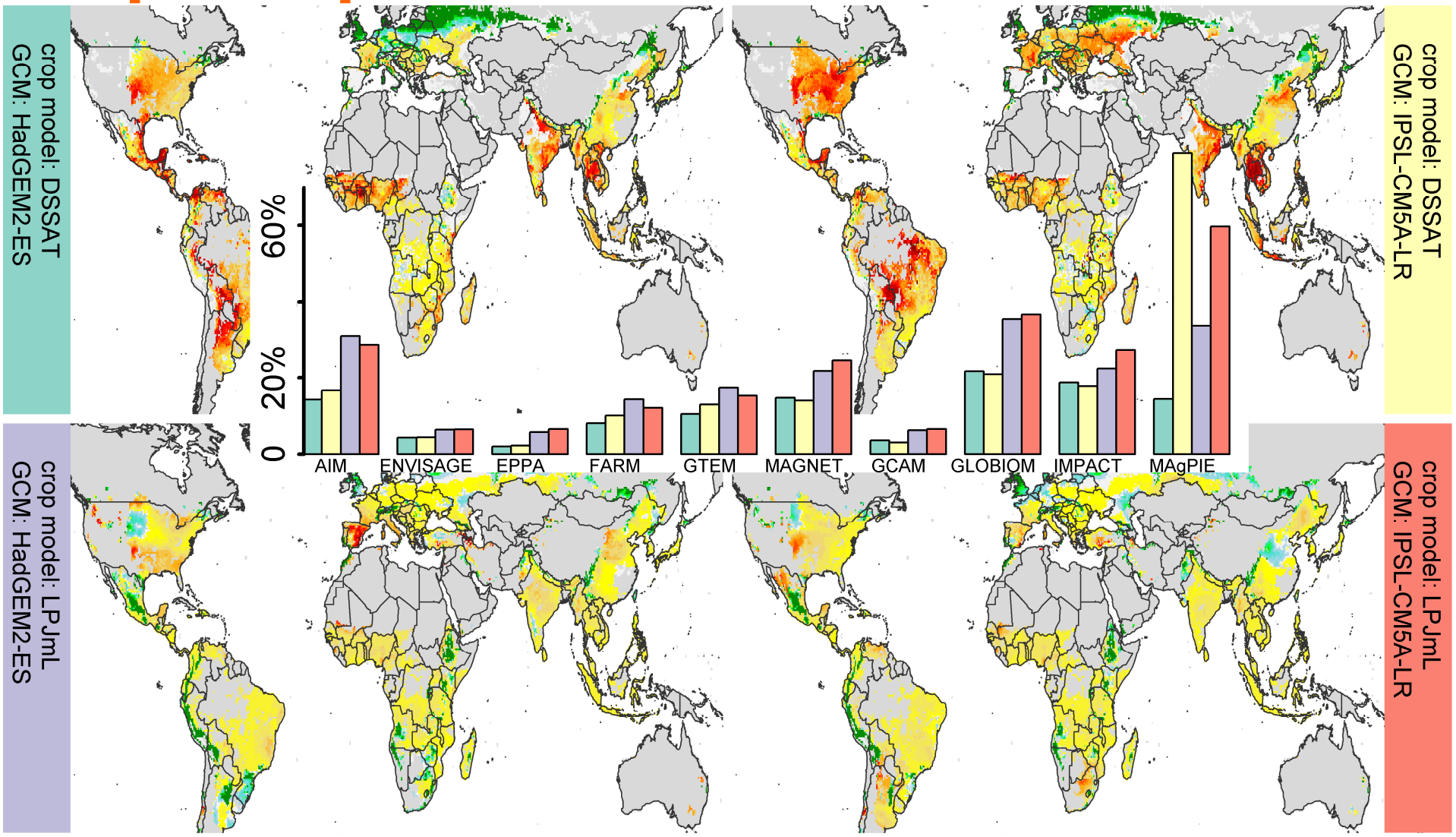
Rosenzweig et al. 2014

Spatial patterns



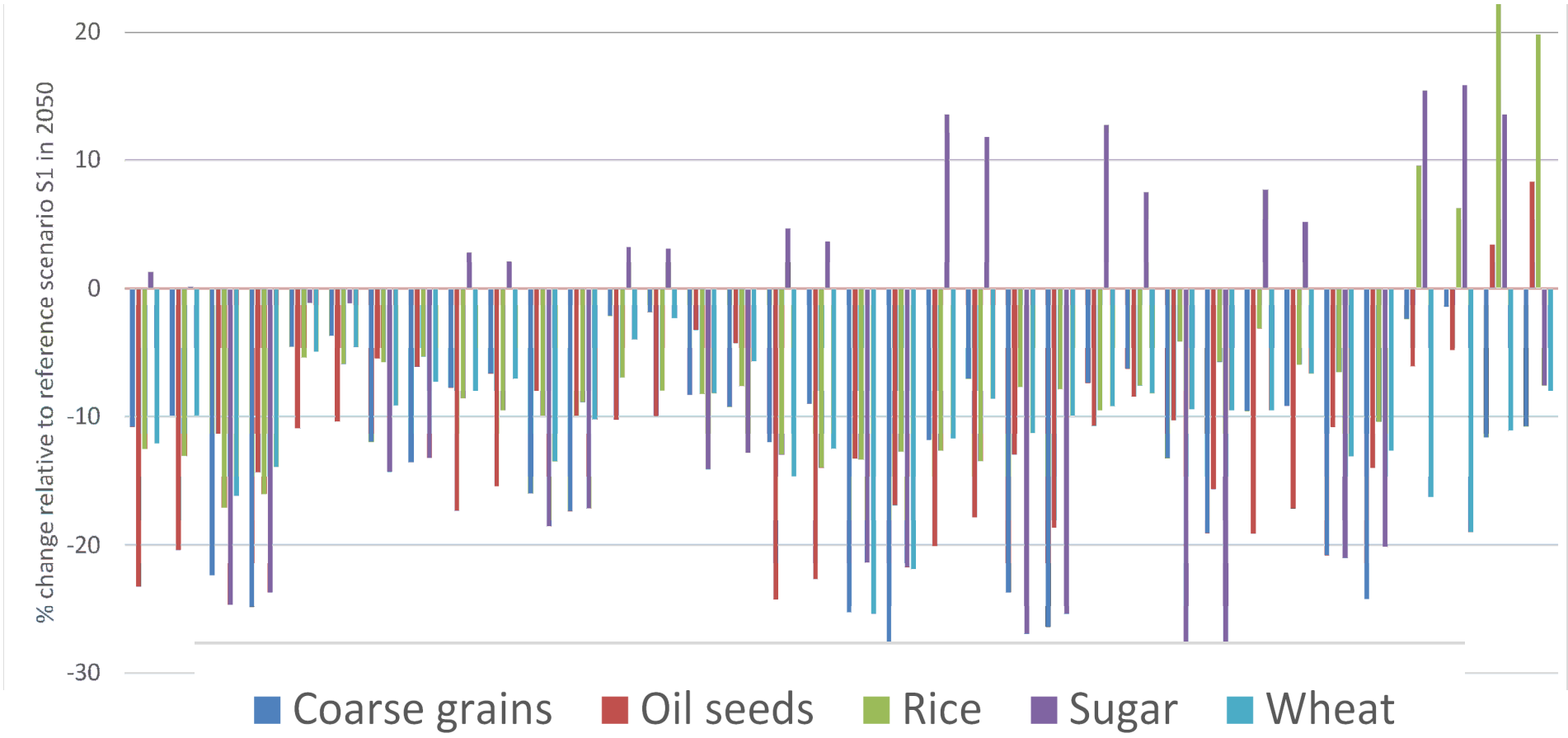
Müller & Robertson 2014

Spatial patterns



von Lampe et al. 2014, Müller & Robertson 2014

3C: coverage, commodities, crops



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Nelson et al. 2014b

Integration challenges

- **Substantial uncertainty in all levels of analysis**
- **Consistency across disciplines**
  - **adaptation and management**
- **Thematic coverage**
  - **Crops covered (e.g. sugarcane vs. maize)**
  - **Management options covered**
- **Common gaps across disciplines**
  - **Extremes**
  - **Other drivers (pests, ozone, …)**

An economist's wish list for crop modeling (as e.g. in Oslo): Response

- **Agronomic models are *as difficult as* economic models, so *we all keep on trying hard***
  - **Use *ensembles to understand uncertainties (large n)***
  - **Harmonize *assumptions***
- **Improvement of crop models through *cooperation and comparison***
- **Cooperation of crop modelers with economists** ***Yes please! Let's jointly identify the common questions!***

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Thanks

- **http://esg.pik-potsdam.de/esgf-web-fe/**

References

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