



# MERGE impacts modeling

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**(representing the MERGE team)**

**Snowmass 2013**

# Impacts

- **Category of impacts covered?**
  - Market: ag, forestry, coastal resources, energy, water
  - Non-market: WTP to avoid (non-market damages associated with) temperature increase by income level and temperature change (current calibration: 2% of consumption at 2 deg C)
- **Valuation techniques?**
  - Impacts valuation studies (econometric, WTP)
  - Model influence: damages are a claim on income or utility
- **Regional and intertemporal coverage?**
  - 22 regional calibration resolution. 2200 socioeconomic horizon.
- **Treatment of adaptation?** Implicit in calibration
- **Treatment of uncertainty?** Sensitivities and stochastic modeling

# Market damages based on Mendelsohn et al. (2000)

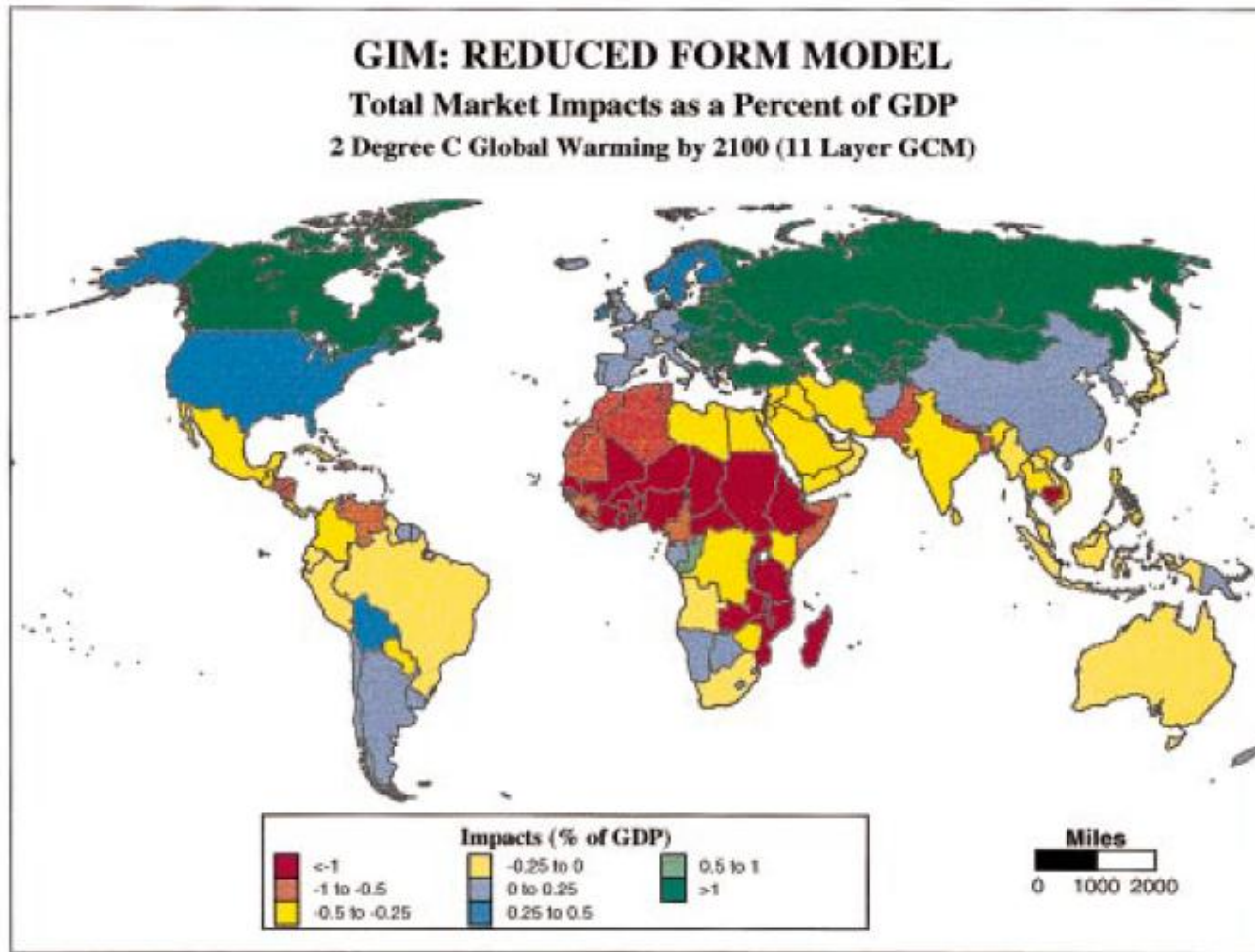


Figure 1. Market impacts as a percent of GDP for a 2°C warming by 2100 using the reduced-form model.

# Policy making inputs

- **Show marginal costs and marginal benefits?** Yes
- **Simulation or optimization?** Optimization
- **Tradeoff between mitigation and adaptation?** No

# What have the organizers missed?

- Adaptation
  - Characterizing and uncertainties about autonomous and non-autonomous adaptation
  - Preventive vs responsive adaptation
- Tipping points and catastrophes – what do we know?
- Robustness of inputs
- Modeling beyond observed variability

# Modeling teams' strategy for the future

- Reconsider market and non-market damage characterizations
- Explore climate feedback processes
- Explore tipping point and catastrophe processes
- Explore risk management options and responses

# (What have we learned to inform the next round of modeling efforts) Where do we want to be in 5 years?

- More coherent assessment of impacts
- Better characterization of uncertainties (vs. ensembles) – historic first and foremost, then projected
- Clearer characterization of climate change risks, and attribution
- Beginning to evaluate trade-offs between mitigation, adaptation, impacts (and geoengineering)