



Global Trade Analysis Project

GTAP-InVEST and GTAP-NatCAPTEEMs Collaboration

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GTAP Virtual Seminar Series, Vol 7, No 3 (2026)
Gross Ecosystem Product (GEP) and Connections to GTAP-InVEST
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GTAP-InVEST: Earth Economy model

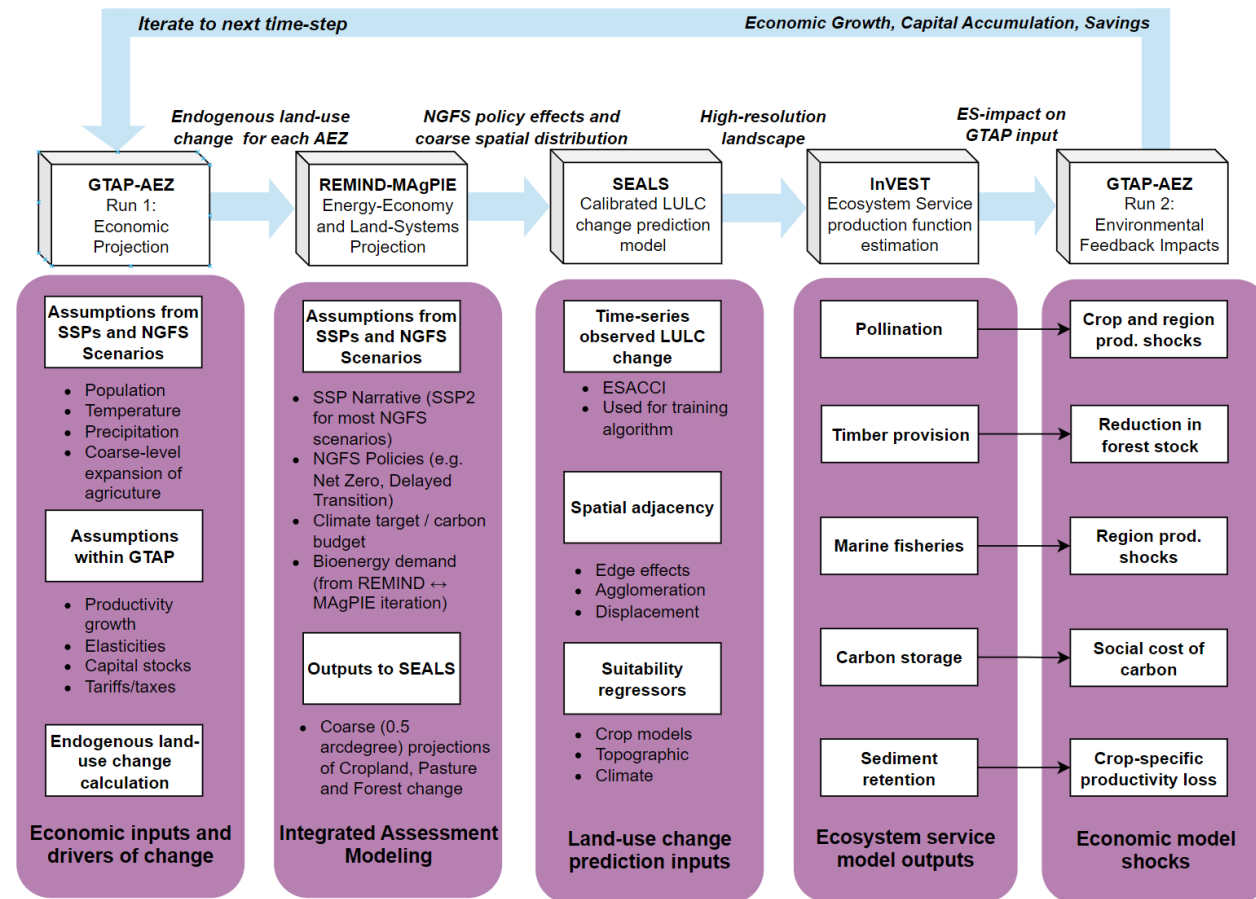
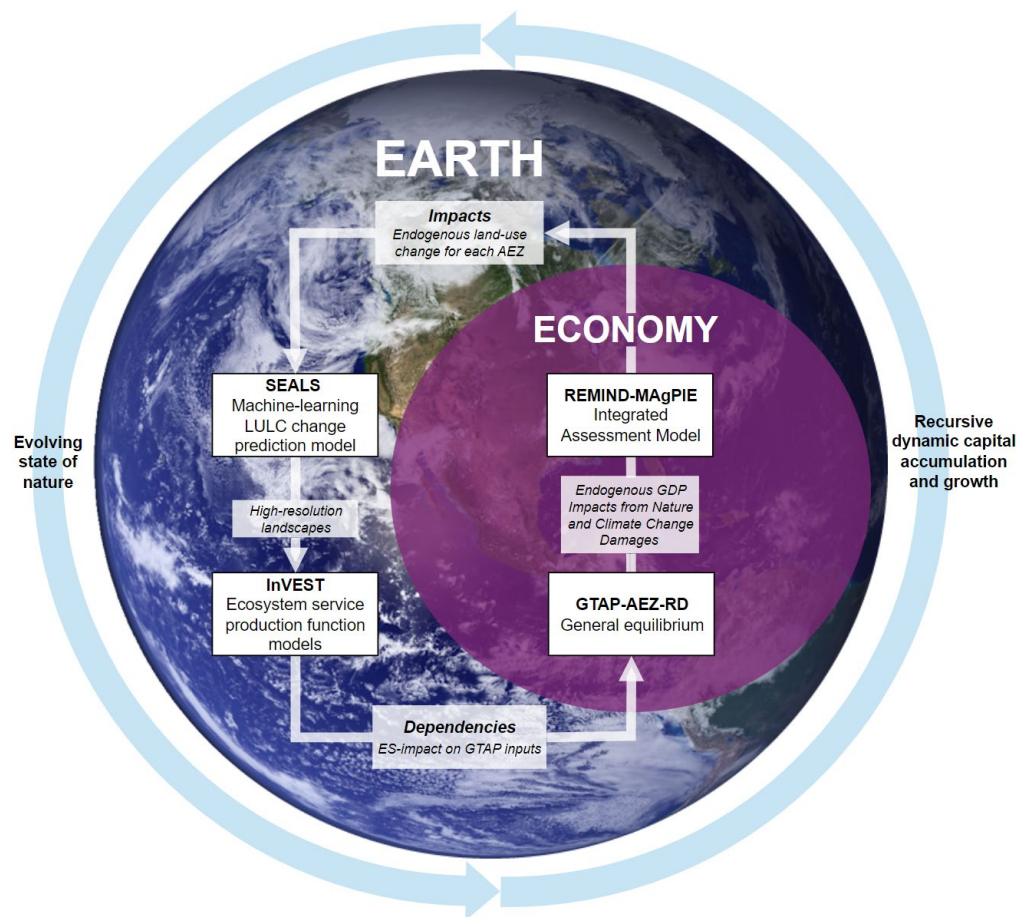
- **GTAP-InVEST**

- GTAP-AEZ-RD linked to InVEST via REMIND-MAgPIE and SEALS to project high-resolution (300 m) global land-use, land-cover (LULC) maps
- Integrates NGFS climate scenarios with spatially explicit ecosystem service dynamics

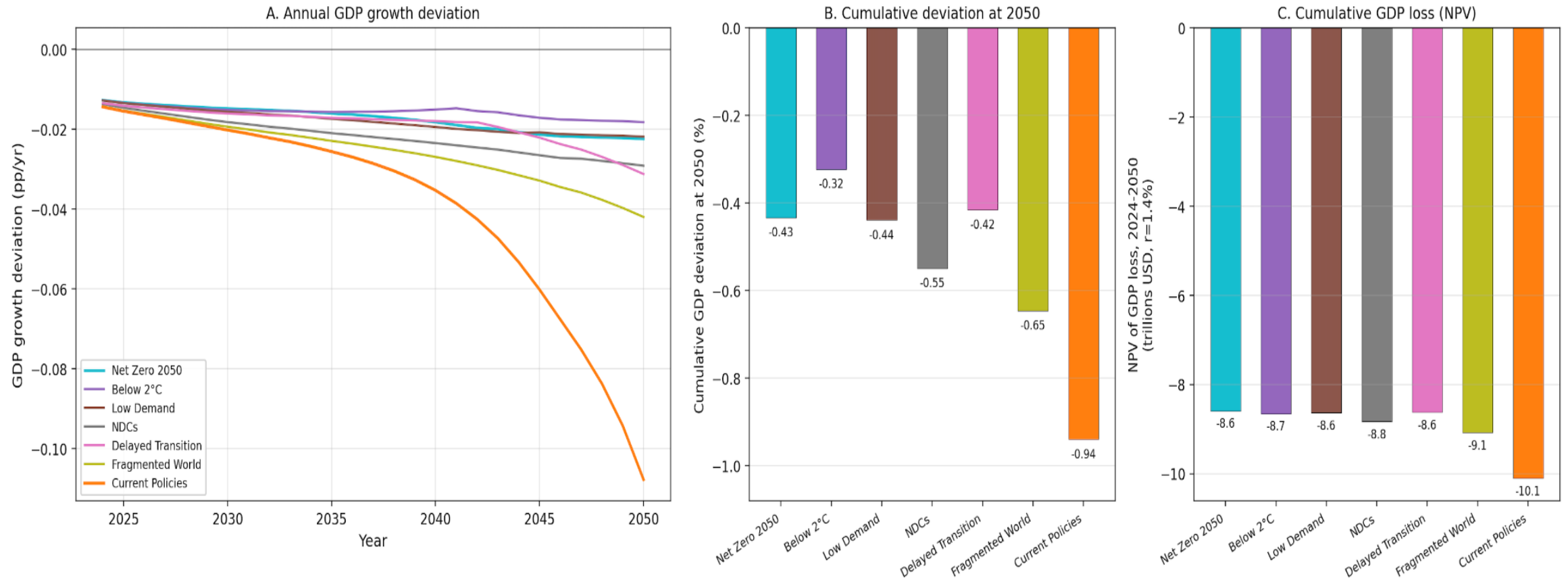
- **Dynamic coupling allows us to quantify**

- Short and long run economic effects of ecosystem degradation
- Persistence, amplification, and interaction with climate and socio-economic transition pathways

GTAP-RD-InVEST Framework

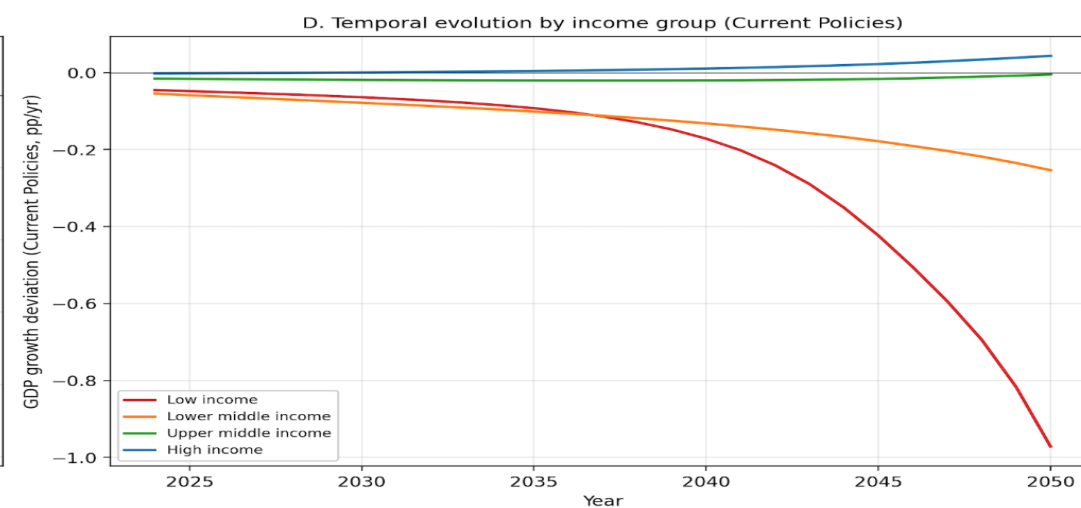
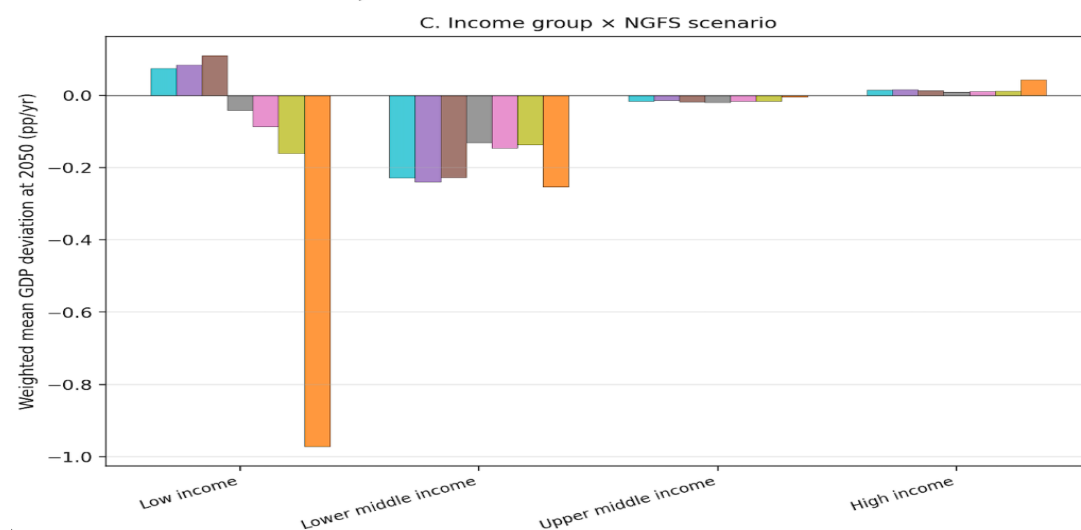
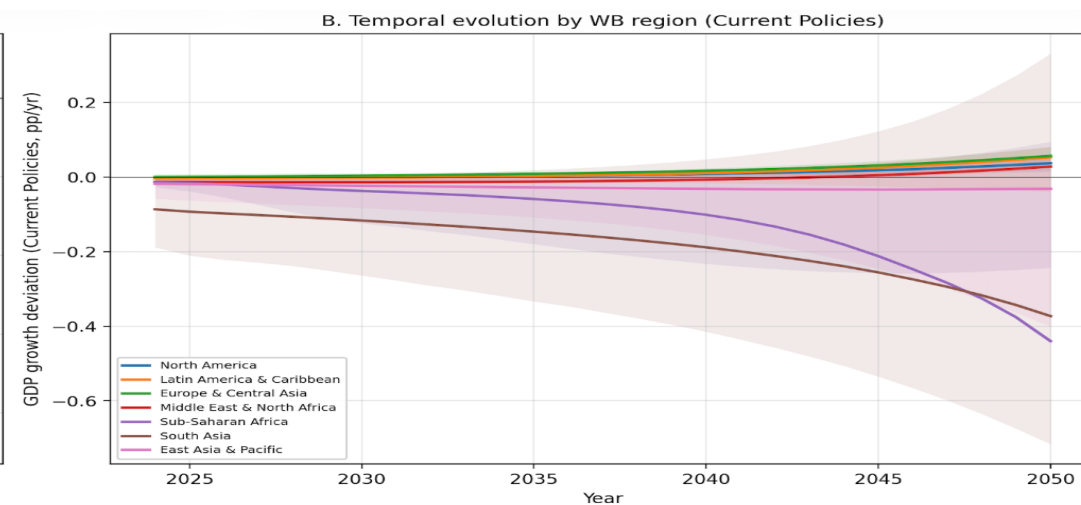
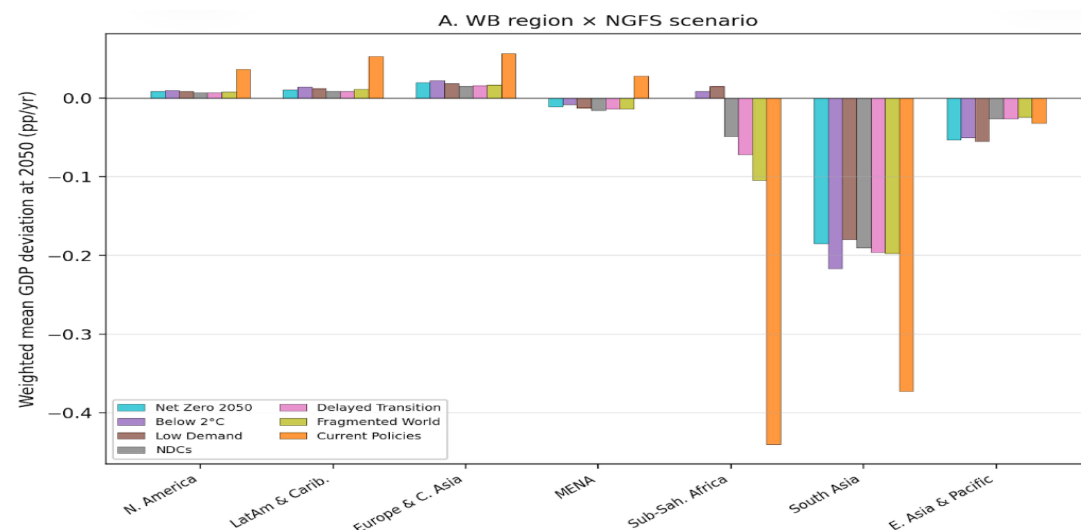


Macroeconomic Impacts

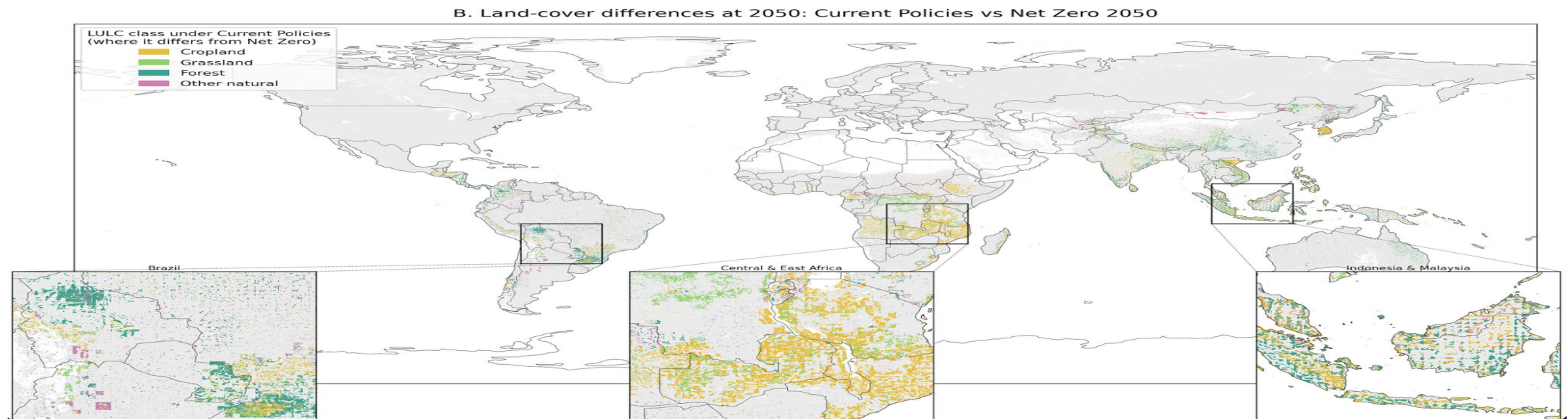
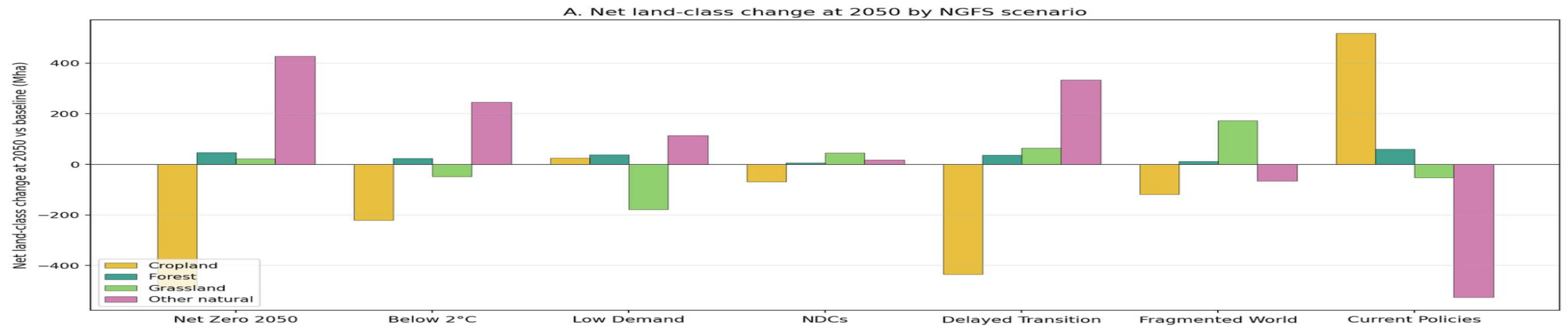


Johnson et al. (under review). Systemic Risk from Nature Loss and Climate Change.

Regional Impacts



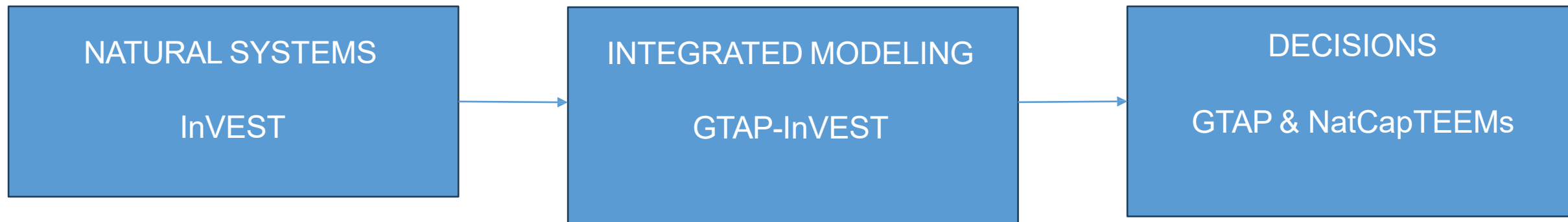
Land Use Impacts



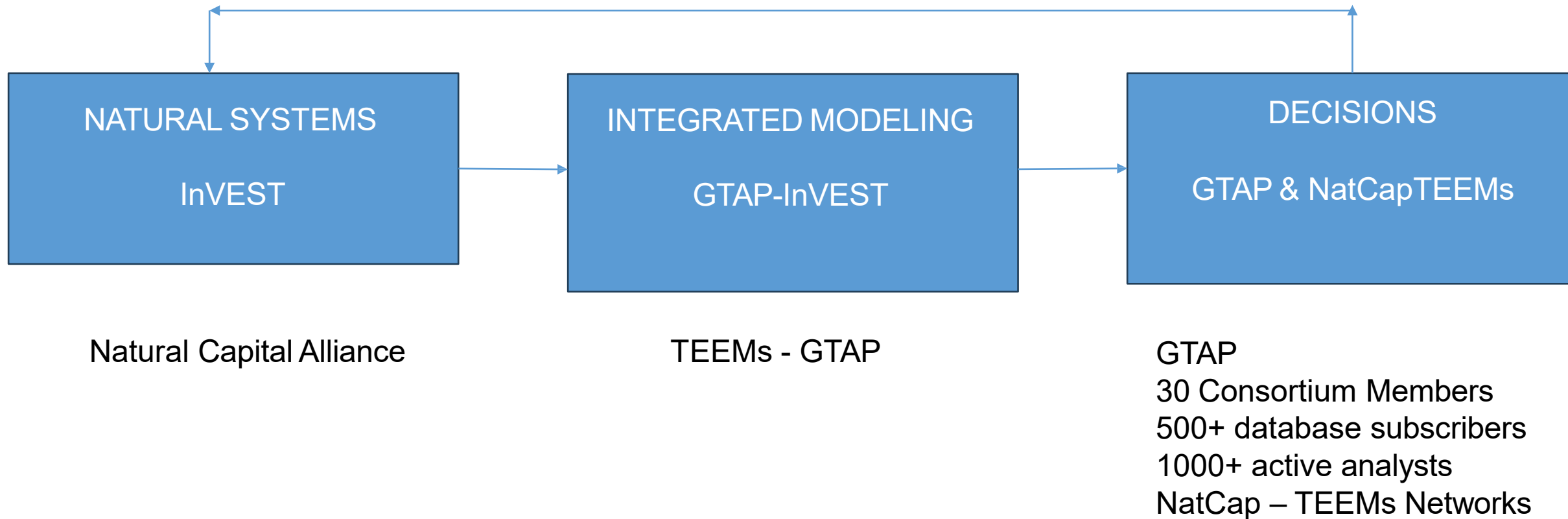
GTAP-TEEMs (The Earth Economy Modelers)

- **Gross Ecosystem Product (GEP)**
 - Analogous to GDP
 - Provides tangible evidence of the value of nature in economic terms
 - 37 accounts for more than 200 countries
 - Already a key decision-making tool in China
- **Earth Economy models**
 - Integrate earth system models (ecosystem services) with general equilibrium models to analyze integrated socio-economic-ecological systems
 - Principal mode is via linkage of the GTAP model of the world economy with the InVEST suite of biophysical models developed and maintained via the Natural Capital Alliance.
- **TEEMs is a core member of Natural Capital Alliance**

GTAP-TEEMs Collaboration



GTAP-TEEMs Collaboration



Takeaways messages

- Global economy depends on nature, but the scenarios used by central banks and financial institutions to assess long-term risk exclude nature
- We extend GTAP-InVEST with a dynamic global economic model, incorporating climate change, land use, ecosystem and the economy to evolve together through 2050
- Accounting for ecosystem services deepens projected economic damages, and a stress-test of nature loss roughly triples losses in low-income countries
- Ignoring nature systematically understates climate-related financial risk and obscures who bears it
- Ongoing and more intensive collaboration for GTAP-NatCAPTEEMs



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Thank you!

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