

A globe of Earth is shown on the left side of the image, resting on a blue, textured surface that resembles water or a similar material. The globe is tilted, showing the Americas and parts of Europe and Africa. A long, soft shadow is cast from the globe towards the right side of the frame. The background is a gradient of blue, with the texture becoming more pronounced as it moves away from the globe.

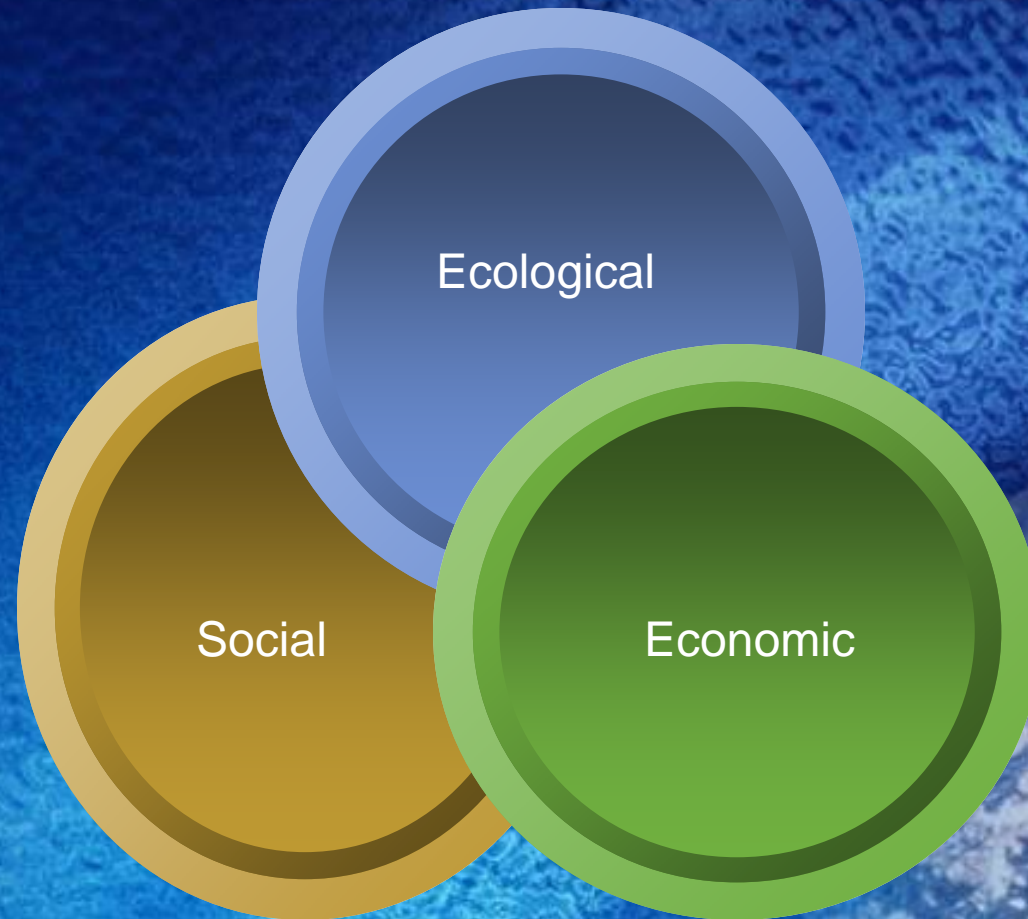
# **Sustainability and Economics**

Jeffrey M. Peterson

Department of Agricultural Economics

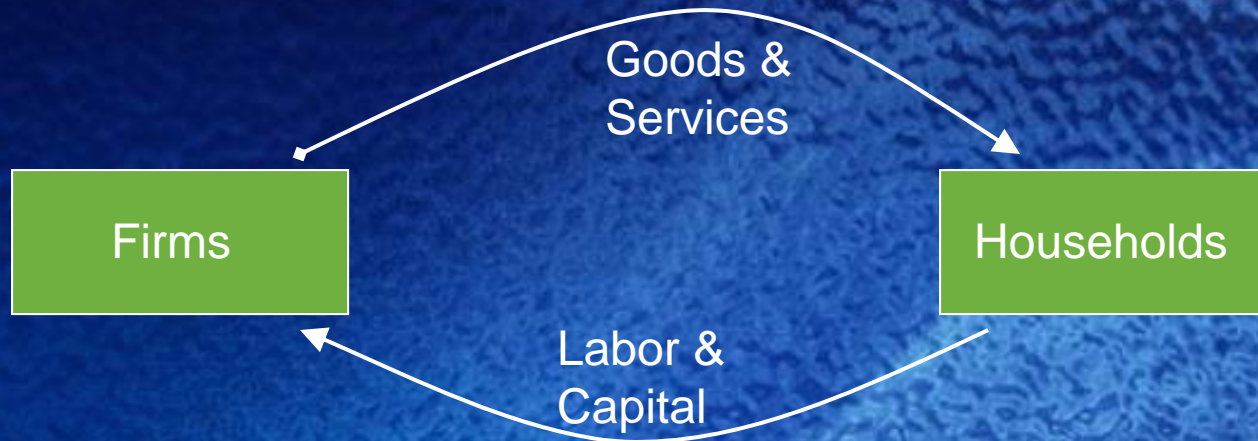


# Dimensions of Sustainability





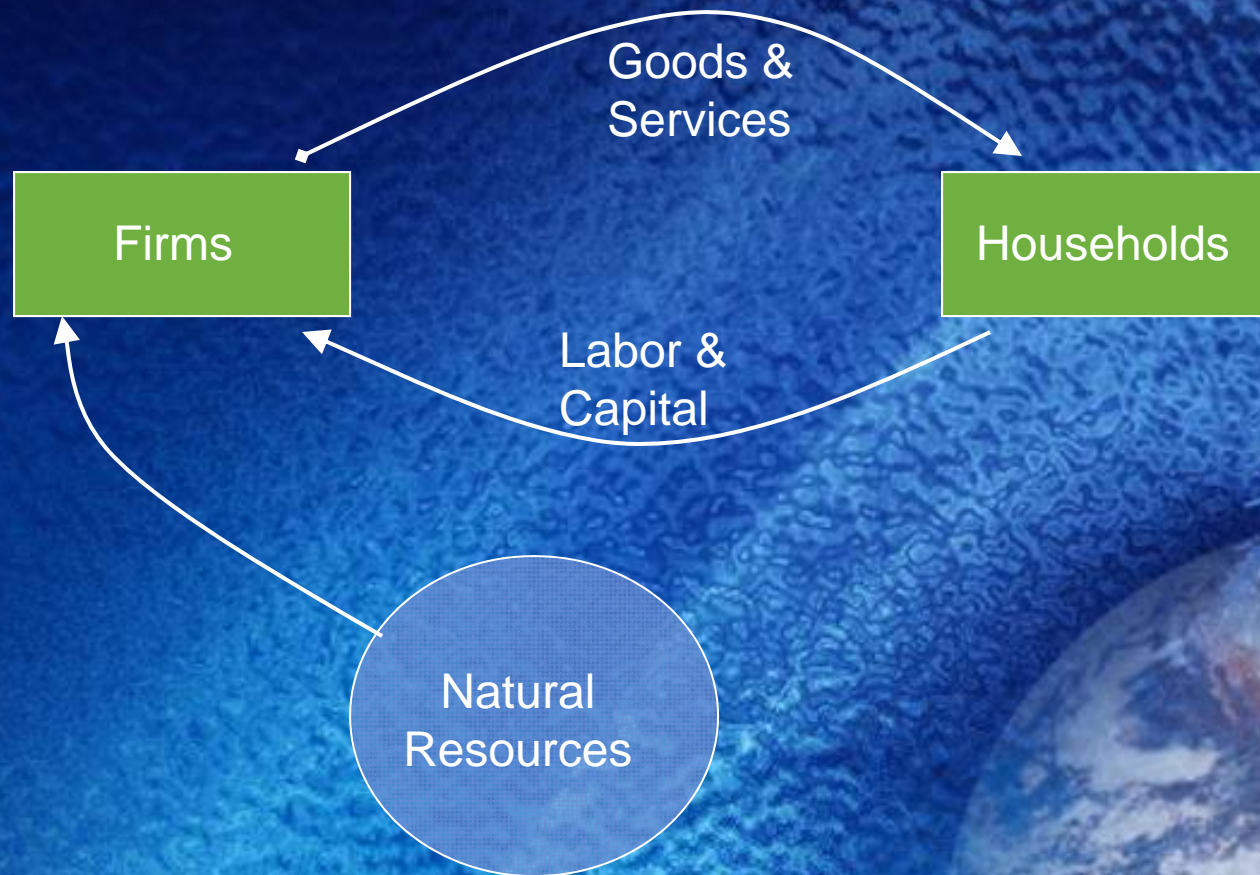
# Economy-Environment Interactions



Adapted from Hanley, N, J. Shogren and B. White. *Environmental Economics in Theory and Practice*. Oxford University Press, 1997.



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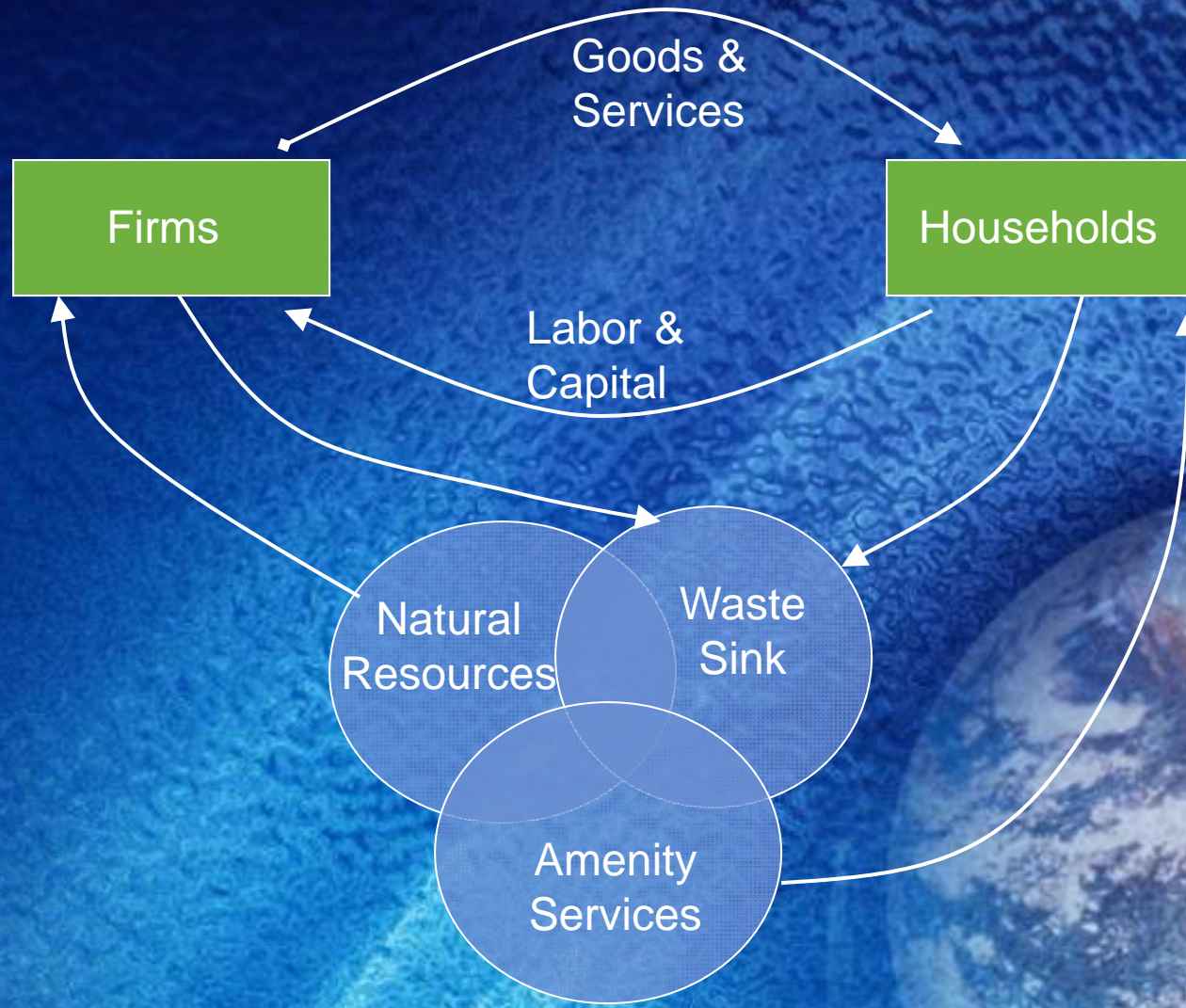
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# Contributions of Economists to Understanding Sustainability

## 1. Sustainability Indicators

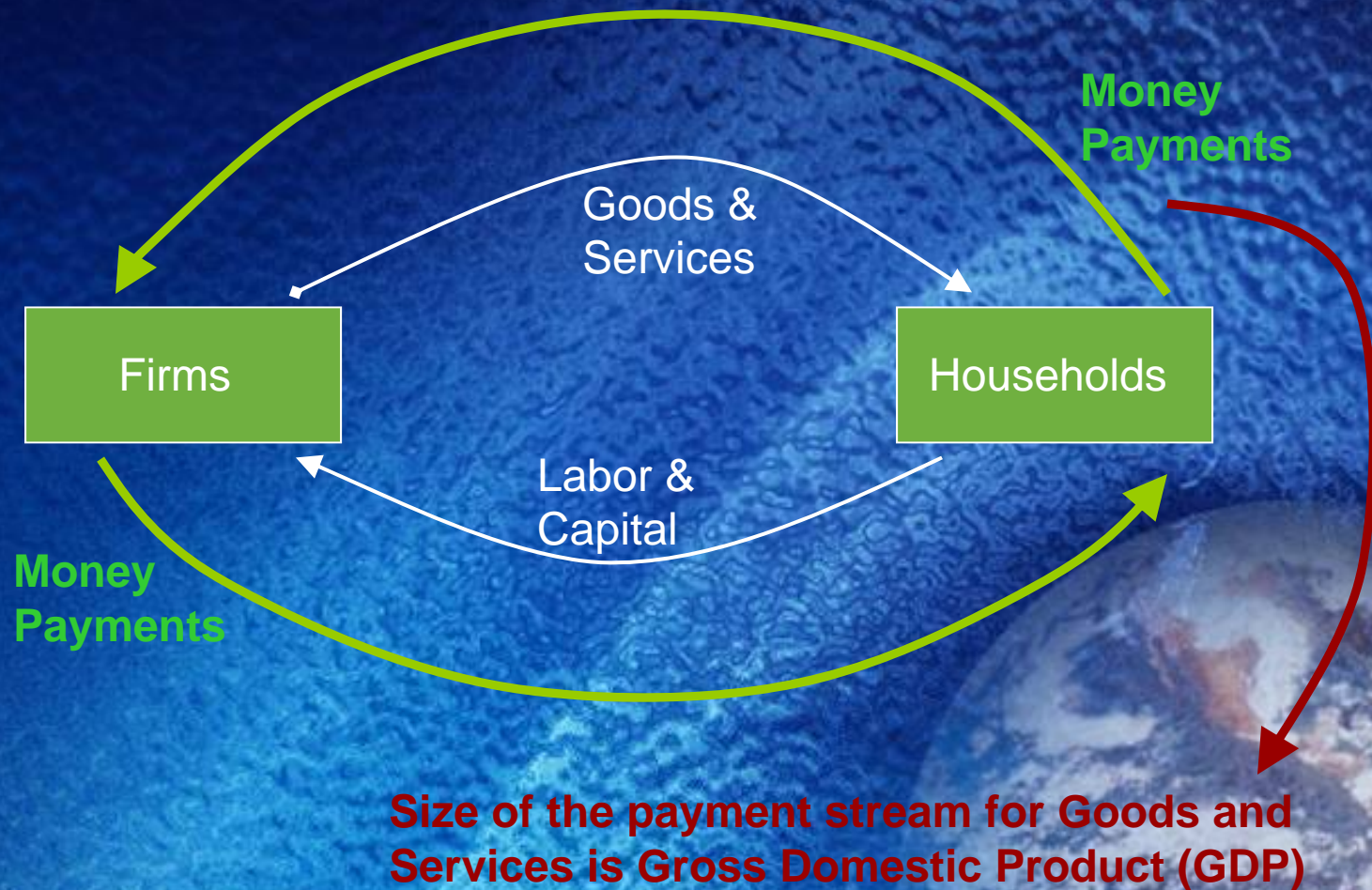
For example, “Green GDP”

## 2. Coupled human-natural system models

Account for the interaction between economic decisions and natural system dynamics



# GDP is an Indicator... Of What?





# Limitations of GDP

- Does not measure wealth accumulation
- Does not account for economy-environment interactions:
  - Costs of depletion of natural resources
  - Costs of pollution (health risks, biodiversity loss)
  - Unpriced benefits of amenity services
- Environmental harm actually *raises* GDP
  - Cleanup costs and health treatment expenses generate economic activity

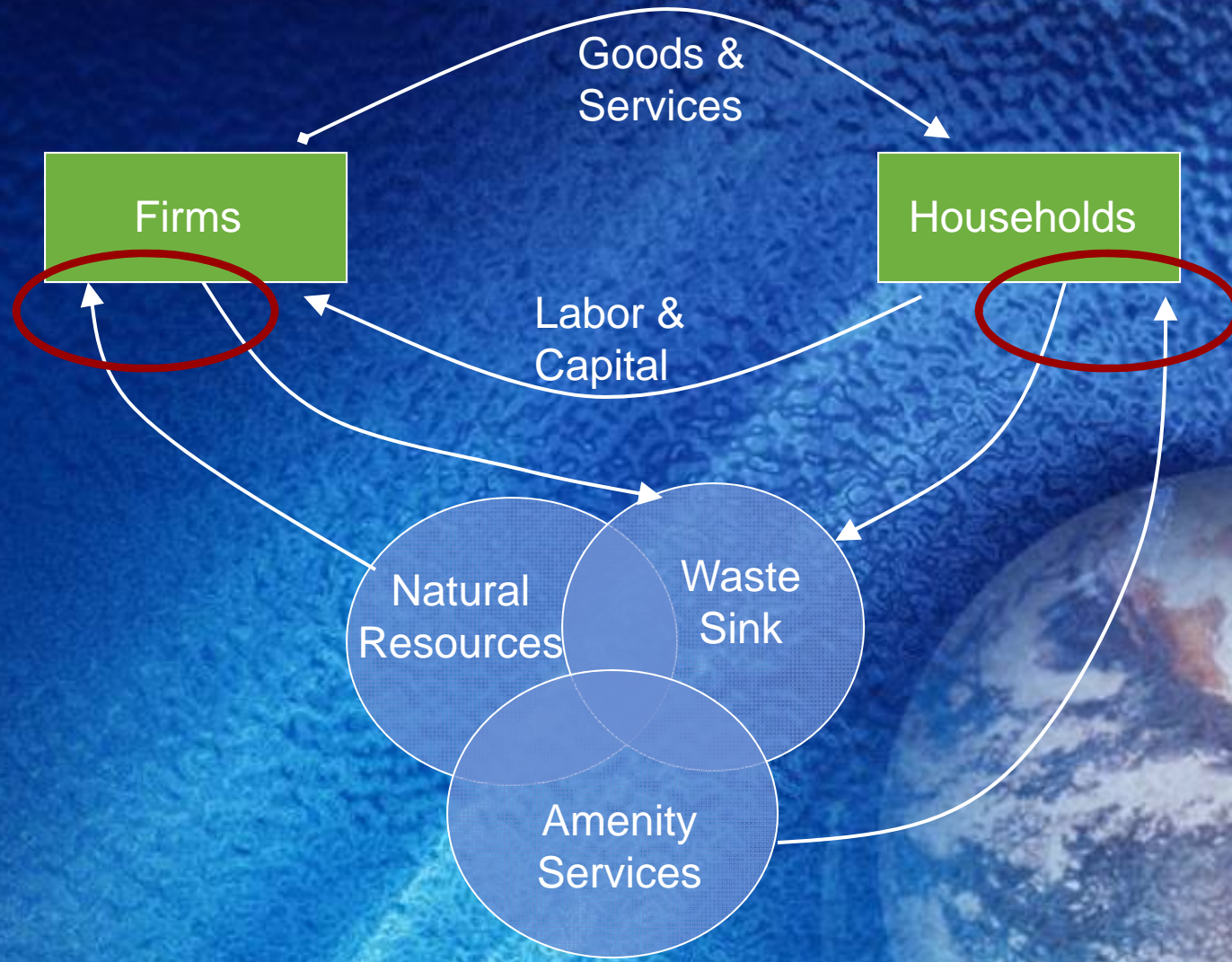


# “Green” National Accounting

- Adds “adjustment” accounts to GDP for
  - Costs reflecting the value of natural resources extracted
  - Costs of pollution
  - Gains from the “amenity” value of ecosystem services
- Methodological difficulties
  - The “adjustments” are not readily observable and must be calculated
- US Official “Green” accounting efforts were killed by Congress in 1995.



# Microeconomic Decisions: The Membrane Between Human and Natural Systems





# Decision Boomerangs

- Decisions now have environmental effects, which in turn affect future opportunities and decisions
- Examples abound
  - Soil Erosion
  - Aquifer depletion
  - Food choices
- To change the boomerang effect, decision incentives must be changed (or regulated)



# “Sustainable” Tasks For Economists

- Develop sustainability indicators
  - Micro, meso, or macro scales
- Determine the economic value of environmental changes
- Collaboratively “model the membrane”
  - Model the micro- decisions driving ecological or social changes, integrate them with models from other disciplines



Questions?

