

OSU's Sustainability Institute: Perspectives on Human- Environmental Systems and the Carbon Cycle

C-MASC Earth Day Event: Restore Earth's Carbon Cycle
April 22, 2021

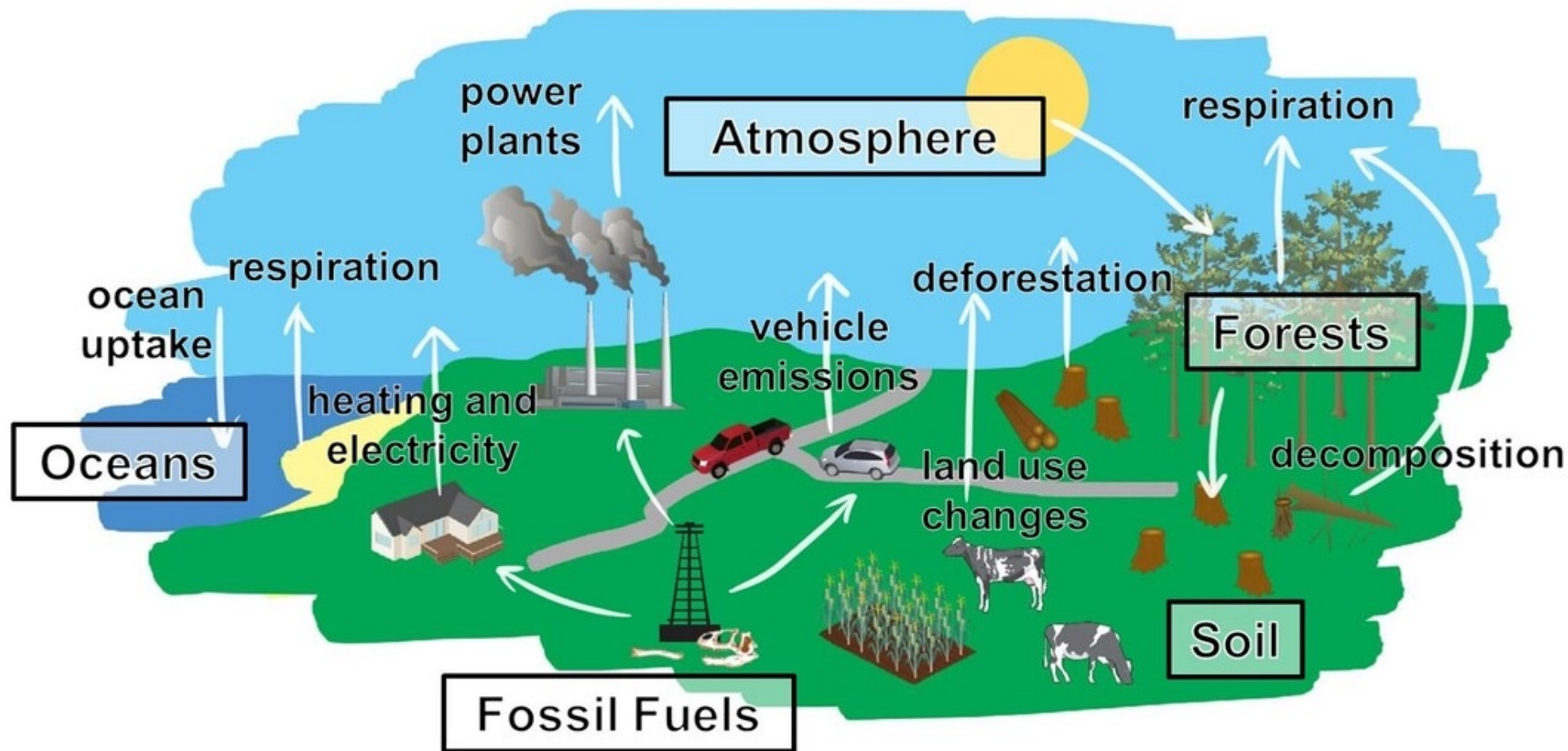
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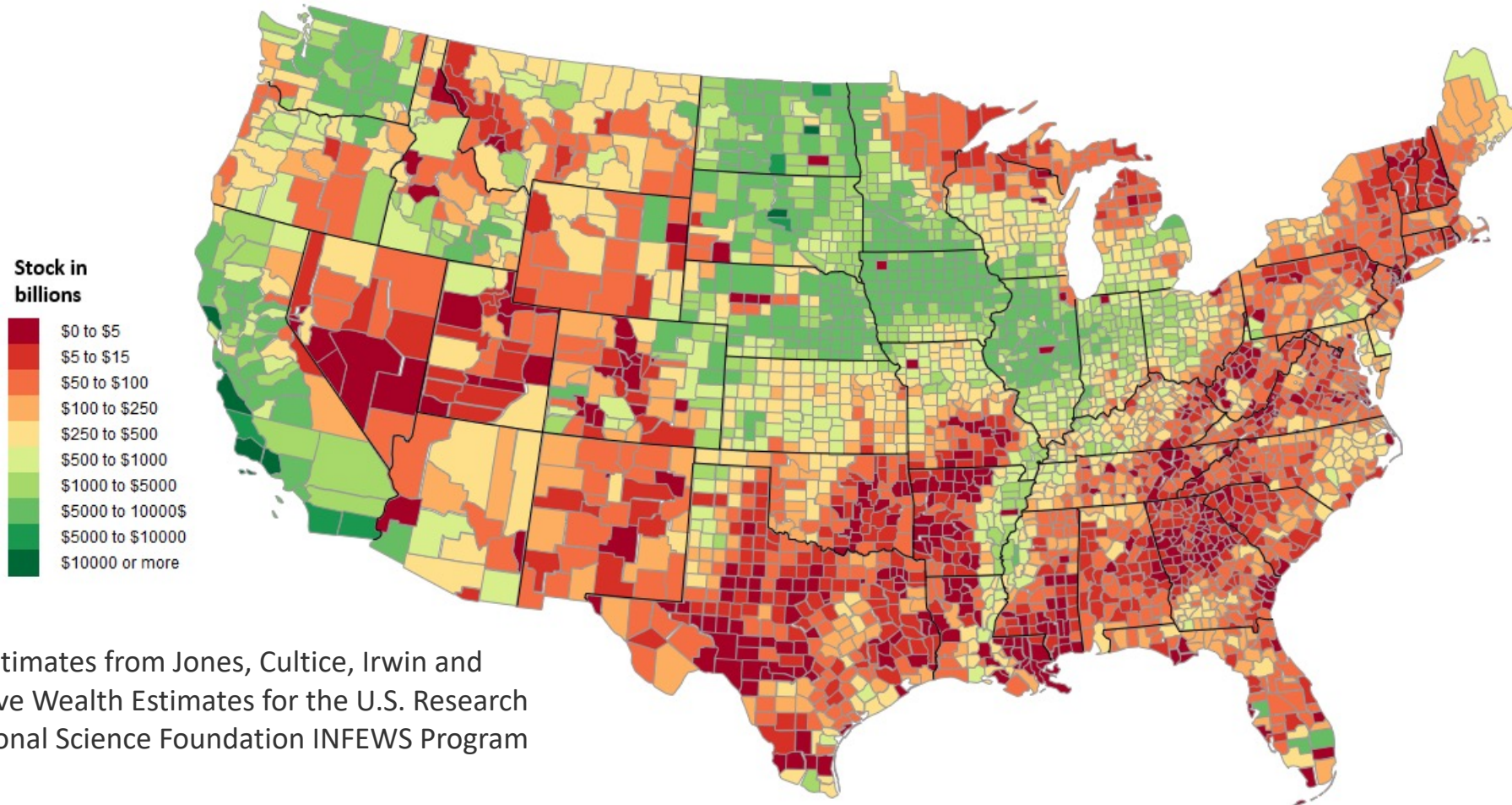
The Carbon Cycle Is a Complex Human-Natural System





Estimated Value of Land-Based Natural Capital Assets

Aggregate market value of natural resources + cropland, pasture, forest lands + forest C sequestration services*



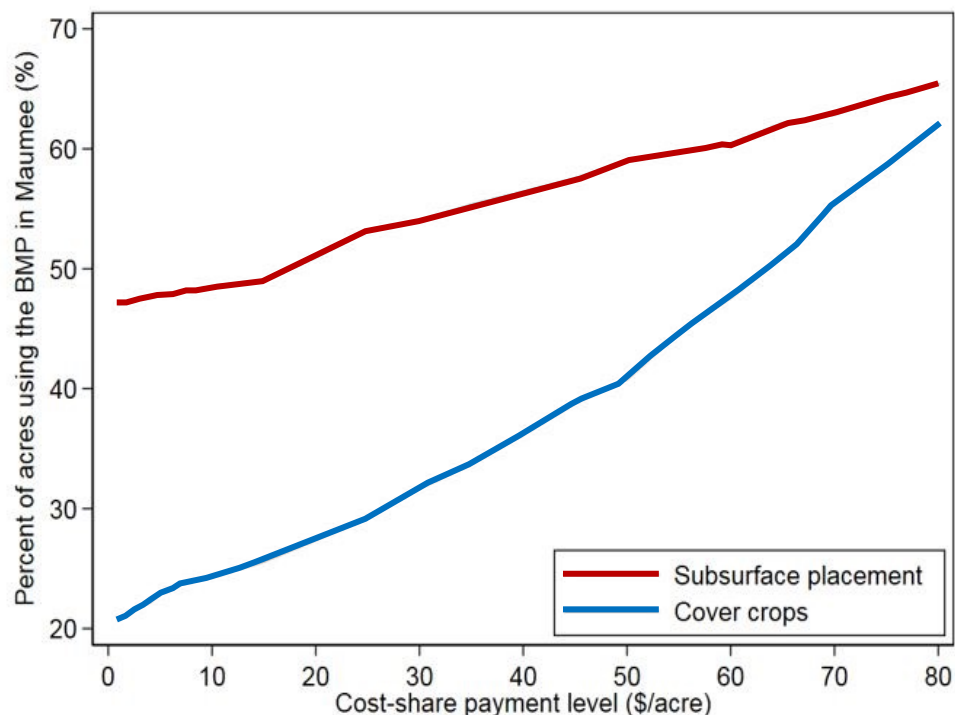
*preliminary estimates from Jones, Cultice, Irwin and Randall. Inclusive Wealth Estimates for the U.S. Research funded by National Science Foundation INFEWS Program





Ohio and Midwest Survey Results: Agricultural Land Use Decision Making and Modeling

Farmers are profit-maximizers ...but other factors also matter



%Acres in BMP for given cost-share payment per acre

- Size of operation
- Risk tolerance of operator
- Expectations about the future
- Conservation identity
- Age & education level

Sources: Burnett, E, R.S. Wilson, A. Heeren and J. Martin. 2018. *Journal of Soil and Water Conservation*, 73(2): 143-155.

Doidge, M., RS Wilson, et al. Manuscript in Preparation. 2020

Liu, H, W Zhang, EG Irwin, N Aloysius, J Martin. 2020. *Land Economics* 96(4).

Zhang, W., R.S. Wilson, E. Burnett, E. Irwin, J. Martin. 2016. *Journal of Great Lakes Research*, 42(6): 1343-1356.





Human-Natural Systems and the Carbon Cycle

- **Complex systems:** human behavior and feedbacks (at all levels)
- **Targeting:** what's the policy goal? Costs and benefits, opportunity costs
- **Sustainability assessment:** potential for many unintended consequences



Thank You!

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