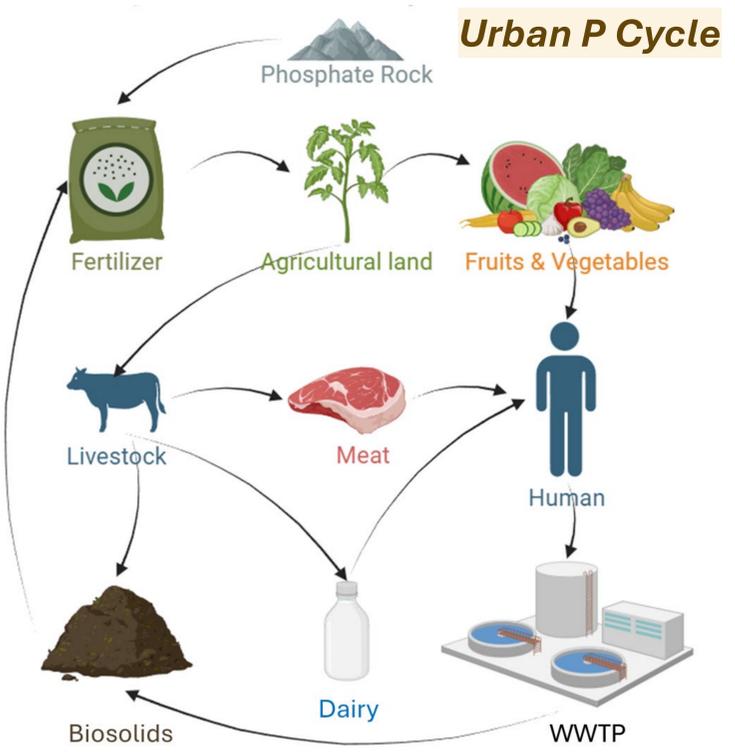


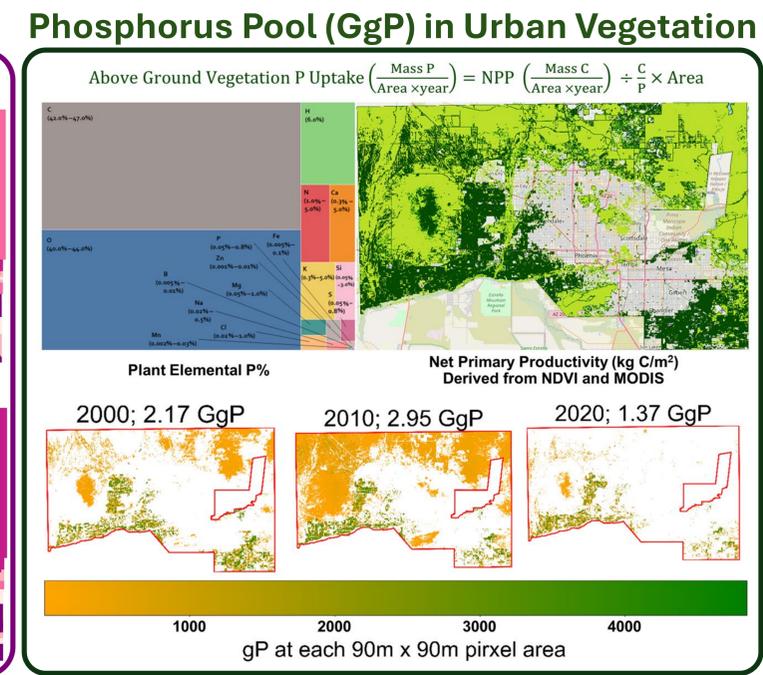
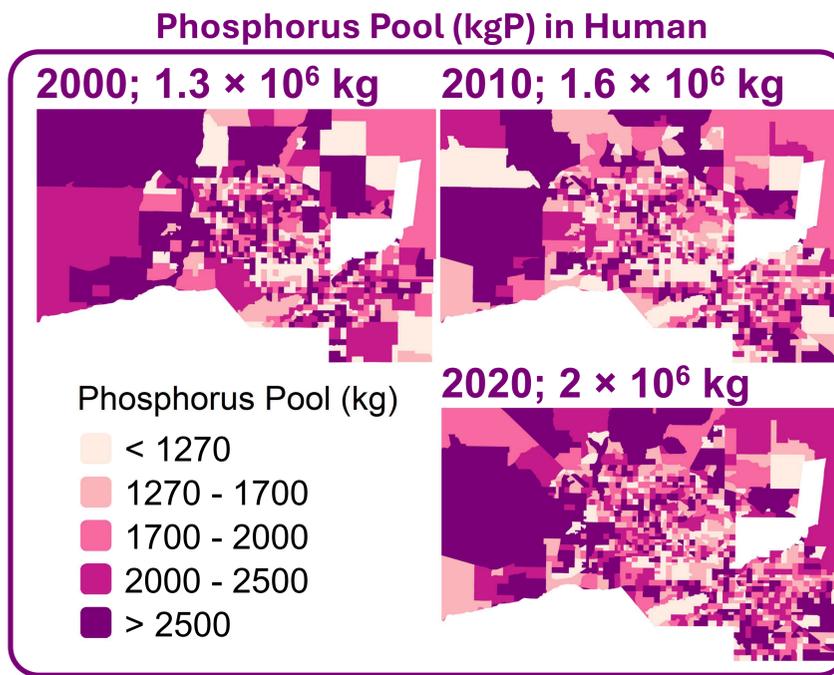
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## BACKGROUND

- Phoenix is one of the top 5 largest cities in the US. As phosphorus is a limiting nutrient in this urban landscape, there is a **need for a circular economy for this critical element**.
- CAP LTER is a long-term research site in Phoenix where a previous study found that **90% of the P influx accumulates in this closed urban system**.
- As the city expanded, and the population increased from **3 to 4.2 million** resulting in increase in P flux.
- So, there is a need to **identify the P hotspots and study how the P flux changes to maximize its recovery and efficient reuse in an urban system**.
- By understanding the driving factors behind urban P flux and sources, we can chart a course toward phosphorus resilience and achieve broader **sustainability goals for big cities across the United States**.



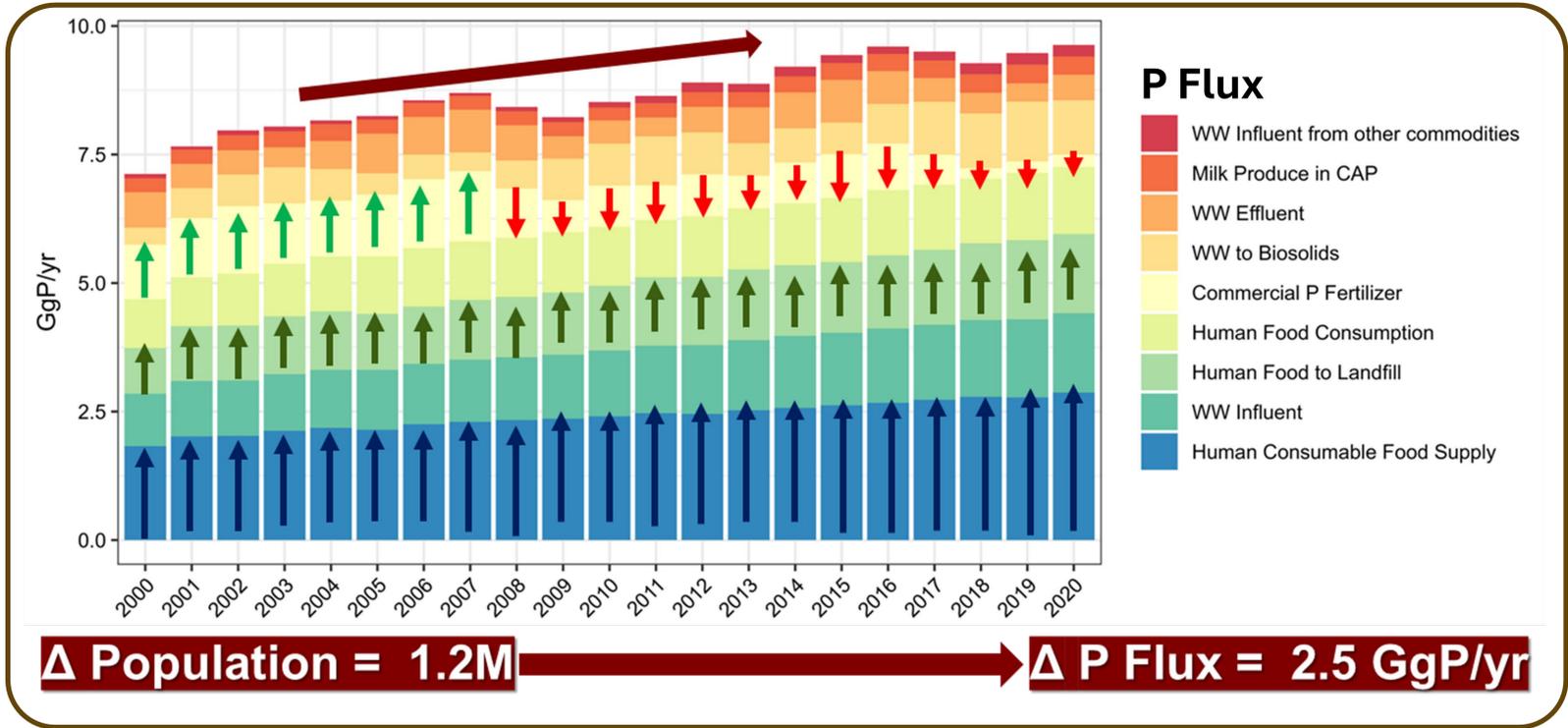
## KEY RESULTS



## APPROACH

$\text{Pool} = \text{Mass of material} \times \text{P Conc.}$   
 $\text{Flux} = \frac{\text{Mass of material}}{\text{time}} \times \text{P Conc.}$

United States Census Bureau



## SUMMARY

- Declining agricultural phosphate fertilizer consumption due to reduced farmland and urban expansion
- Increasing food-related phosphorus inputs driven by rapid population growth
- Stable wastewater effluent phosphorus levels, suggesting potential accumulation of phosphorus in biosolids
- Shift from cotton to alfalfa production for local dairy farms, reshaping phosphorus cycling to dairy milk and manure.

## REFERENCES

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