Socio-economic solutions in local communities for preventing and controlling phosphorus releases from municipal wastewater

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Rationale

P
Phosphorus

- Essential for food production
- Non-renewable material
- Might contribute to nutrient pollution

Few global legal frameworks enforcing P recovery & recycling e.g.:

Switzerland
P recovery & recycling from sewage sludge and slaughterhouse waste

Germany
P recovery from sewage sludge at wastewater treatment plants (WWTPs) larger than 50,000 population equivalent

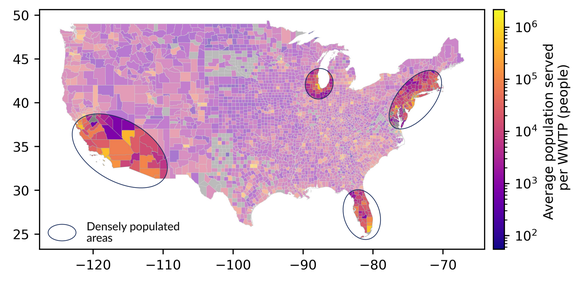
What is the economic impact of enforcing P recovery in WWTPs?

Demographics and WWTPs in the U.S.

Economies of scale

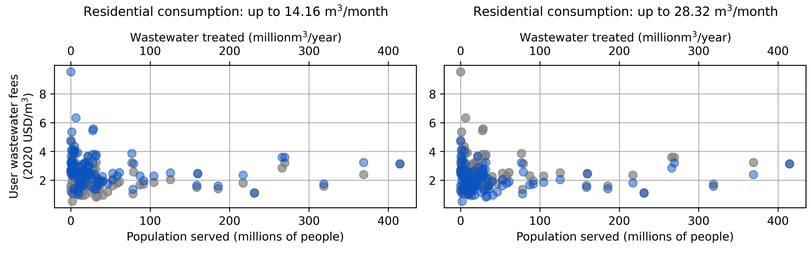
WWTP size spatial distribution:

Densely populated areas benefit from the economies of scale



WWTP user fees:

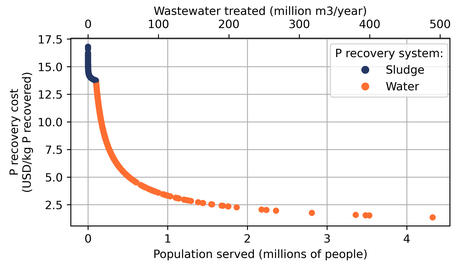
User fees show economies of scale



Economics of P recovery systems

Estimation of P recovery cost at US WWTPs

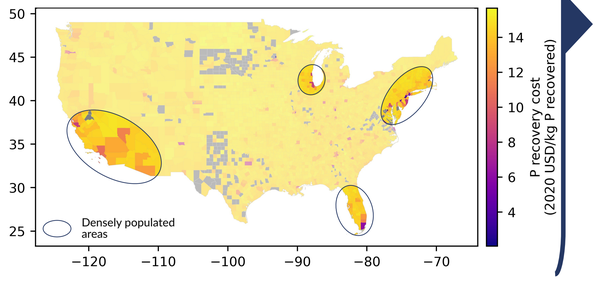
- 5 technologies for P recovery from effluent
- 5 technologies for P recovery from sludge



Economic impact of P recovery in WWTP users

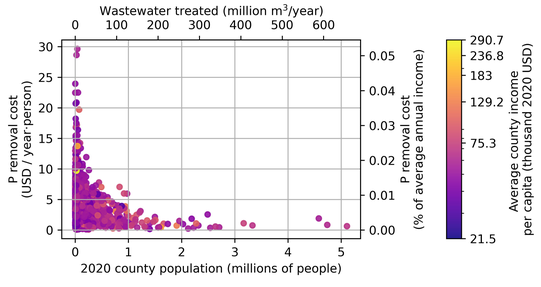
P recovery cost at U.S. WWTPs:

Strong effect of economies of scale on the cost of P recovery. Densely populated areas benefit from lower recovery costs.



Economic impact of P recovery in the population served by WWTPs:

- Costs are higher in the less populated counties
- Low economic impact in high per capita income counties



Limited but uneven economic impact of P recovery, more significant in the less populated areas

Need of policies to lead a fair transition to the Water Resource Recovery (WRR) paradigm

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