



An Integrated Assessment Framework To Evaluate Conservation Practices' Environmental and Economic Benefits: *A Case For Three Central Iowa Watersheds*

Yongjie Ji , Tássia Mattos Brighenti, Phillip W. Gassman

Iowa State University

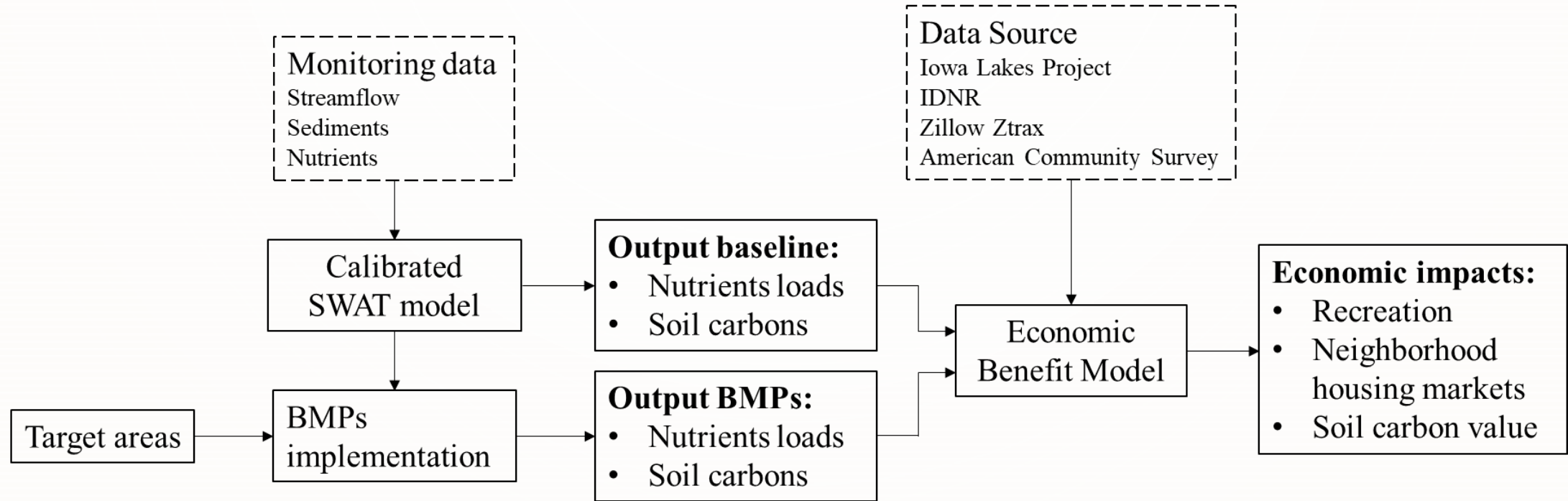
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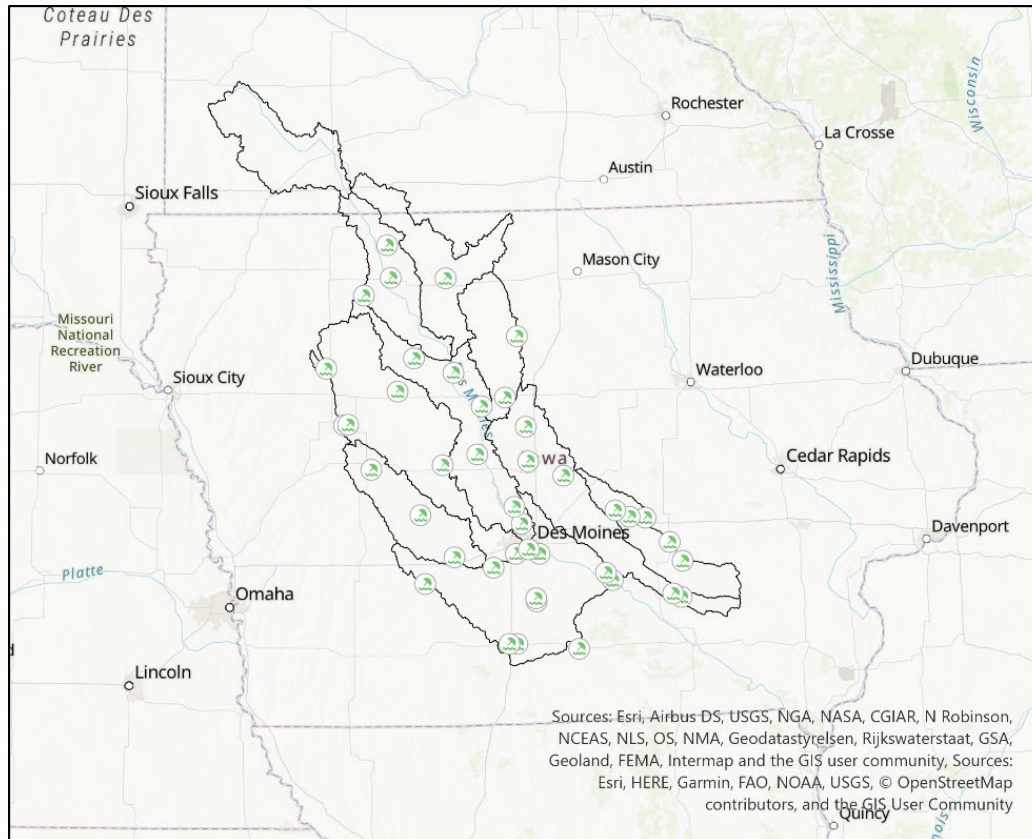
Background and Research Proposal

- Ambitious nutrient reduction goals in Iowa nutrient reduction strategy
- More resources are allocated to achieve water quality goals, e.g. Iowa legislature allocated \$590 million in funding to support water quality efforts through 2039
- Not enough benefit cost analysis, especially for gradual, granular and regional efforts
- Propose a framework linking SWAT model with economic evaluation models, currently with recreation and housing markets.

Methodology Roadmap



Study Area



- SWAT model was built for three basins: des moines (31,892 km²), south (4,593 km²) and north (2,259 km²) skunk.
- 42 lakes covered in [Iowa Lake Project](#). Est. 90K trips per lake in 2019. The RUM model with 2019 data is used.
- Most lakes are local, and small lakes, around 7k SFHs within 500 meters from lakes. Benefit transfer approach based on Guignet et al. 2021 is used.

An Illustration Example – 10% Reduction in Fertilizer Application

Model	Variable	Pseudo Change	10% reduction in fertilizer
SWAT	TN	-	8.5% ▼
	TP	-	~0.0%
Recreation	Secchi	10% ▲	0.04% ▼
	CV change		
	State	1.5M ▲	79K ▼
	Local	0.4M ▲	24K ▼
	Non-local	1.1M ▲	55K ▼
Housing	Secchi	10% ▲	0.04% ▼
	Price Change per housing unit	0.26% ▲	0.001% ▼
	Total Price Change	5.2M ▲	0.2M ▼
	TN: total price change	-	18.4M ▲

~100X!