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

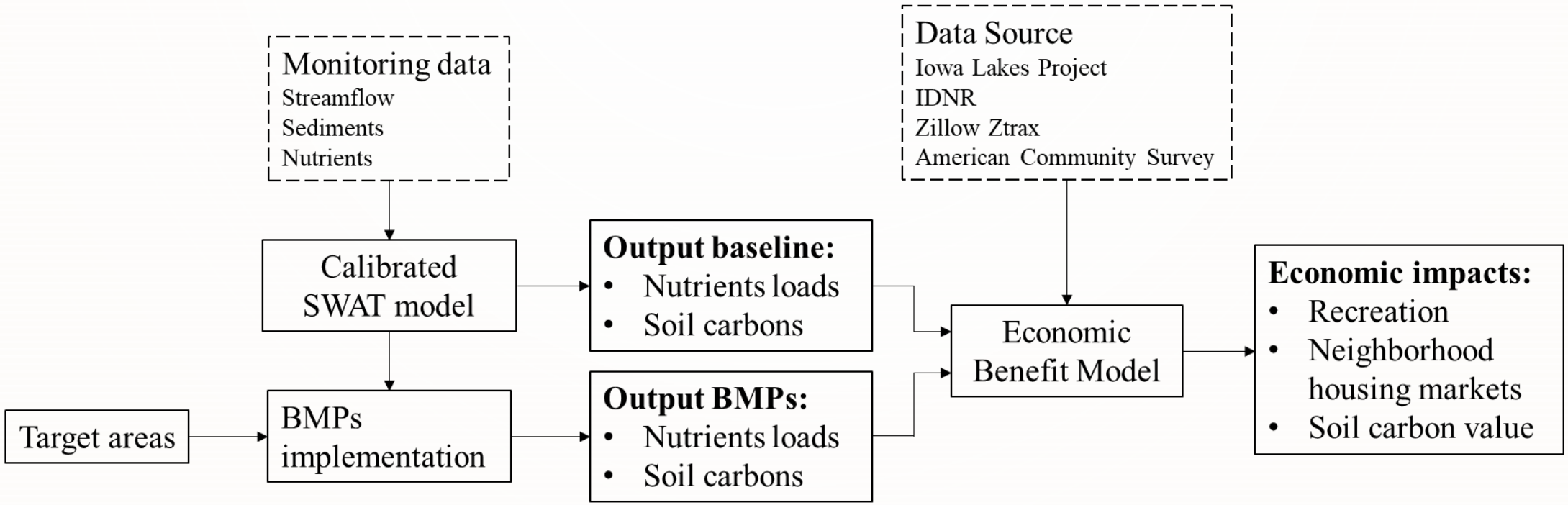
Iowa State University

Center for Agricultural and Rural Development

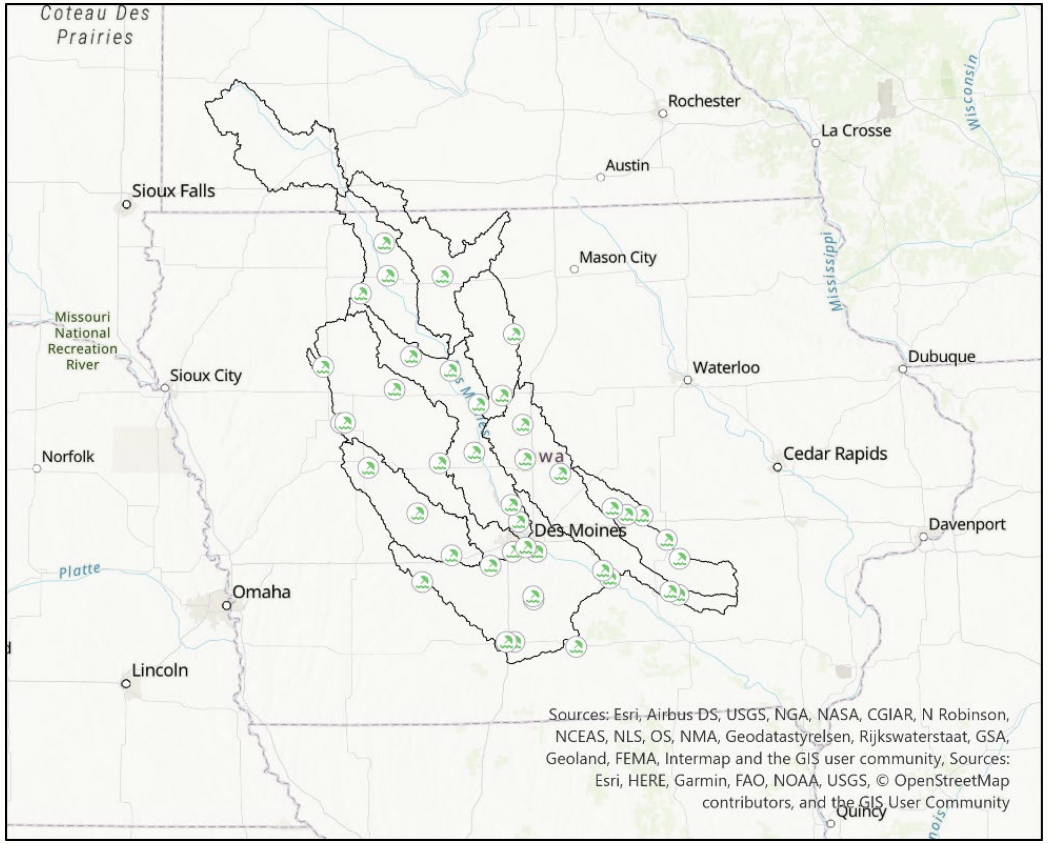
Background and Research Proposal

- 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!