

Reducing non-point source pollution through nutrient management BMP adoption

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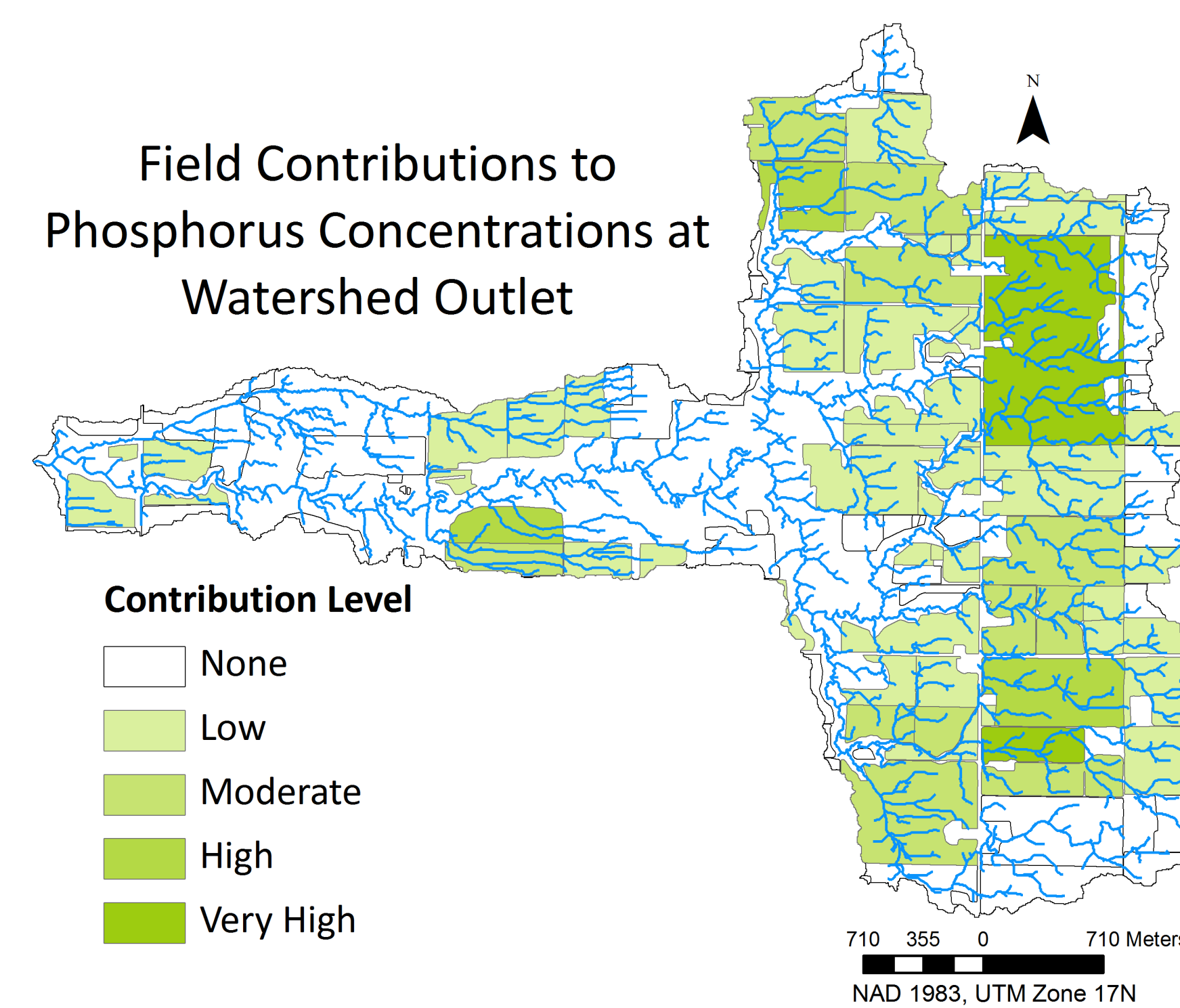
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Phosphorus pollution from agriculture is a major contributor to algal blooms

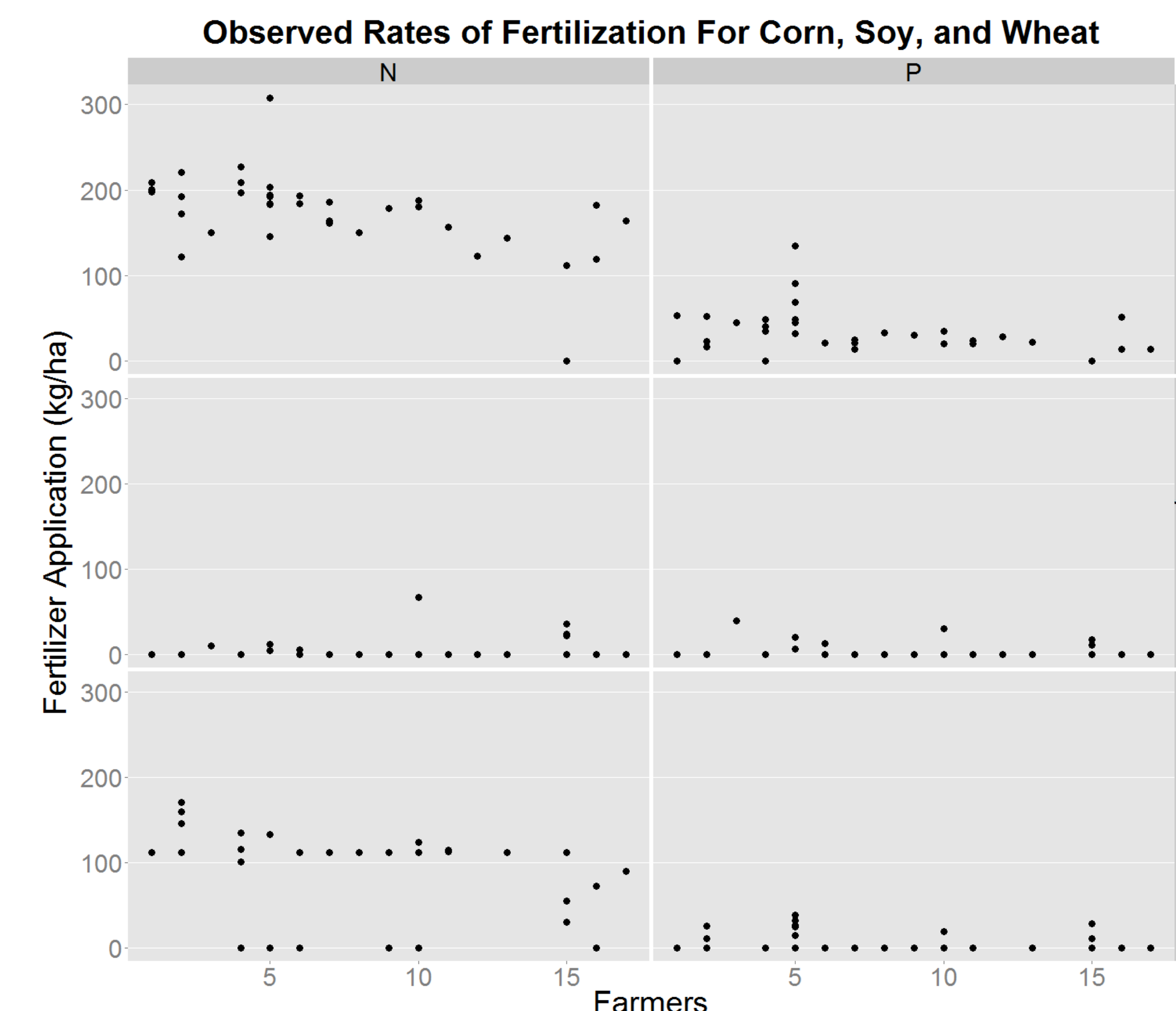
- Small amounts released from every field add up to high concentrations in lakes and rivers.
- Farmers can use **best management practices (BMPs)** to reduce this pollution.
- We simulate how farmers adopt BMPs under different policy scenarios, to estimate both program costs and pollution reduction.

Here is what we know so far:

1) Fields impact the watershed outlet differently.

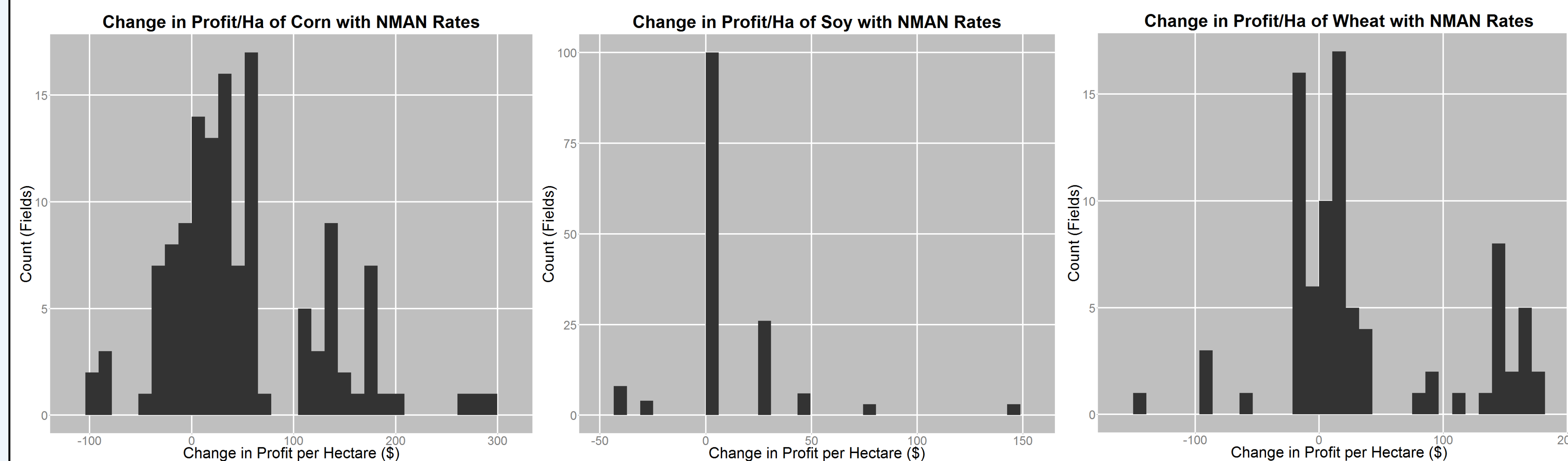


2) Farmers apply fertilizer differently.



- The same BMP applied to one field will not have an equivalent impact when applied in another.
- Therefore, the value of the BMP is unique to the field in which it is used.
- For the same fertilizer type, crop type, and soil type, farmers may still apply fertilizer differently.

3) Switching to the calculated optimal fertilizer rates (NMAN) can save money for the major crops:



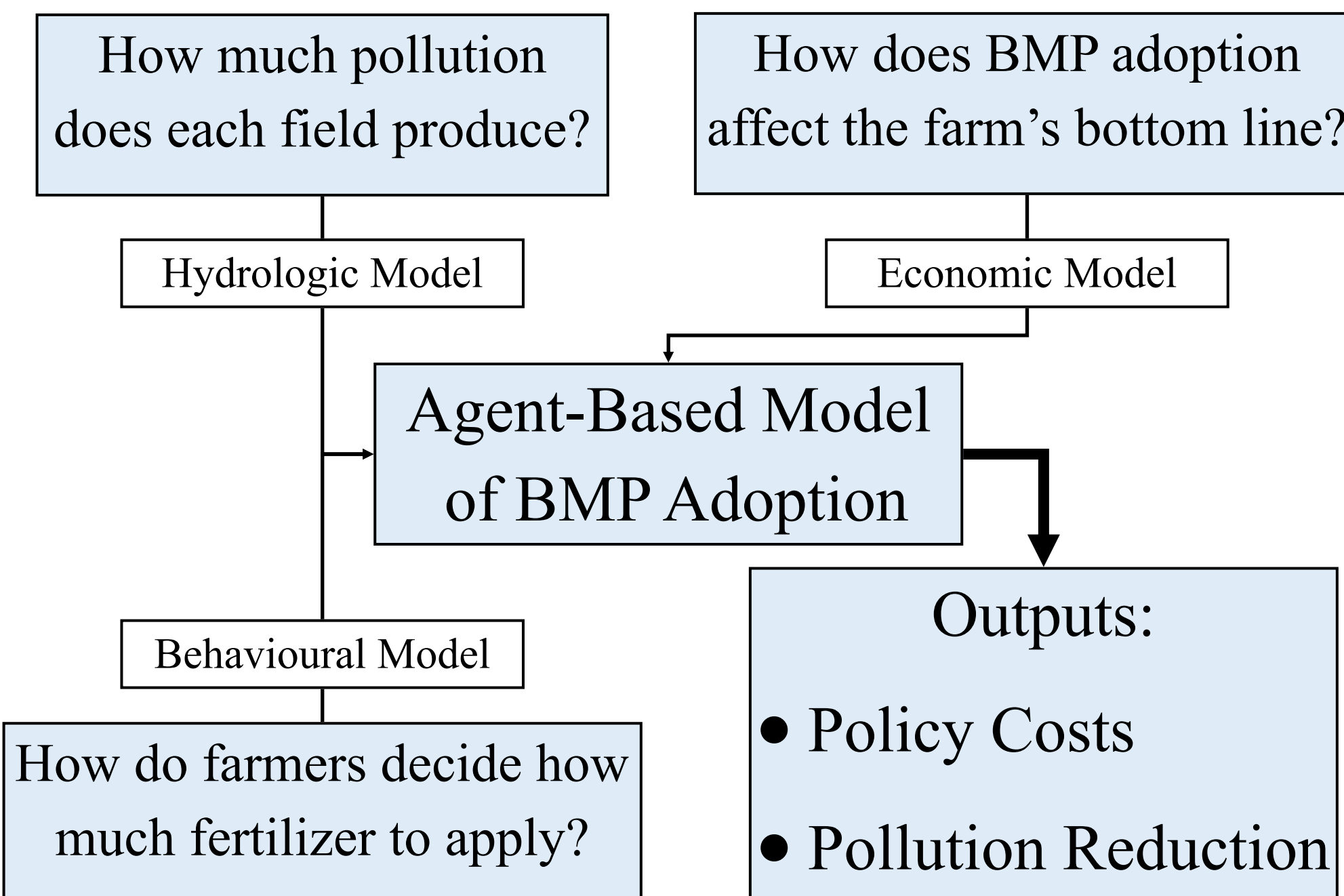
And what this tells us:

- Despite potential economic gains, farmers can be reluctant to adopt recommended fertilization rates for their farms.
- Therefore, any policies that offer economic gains alone are not enough to ensure BMP adoption.
- The effectiveness of a policy to reduce phosphorus pollution will depend on how many farmers decide to adopt new behaviours.
- Using an agent-based model, we take economic, social, and environmental factors into account to estimate policy effectiveness.
- Combining a simple human behaviour model with economic and geospatial data allows us to study this complex system.

Our goal is to use an agent-based model to help policy makers understand how to create policies that will effectively reduce non-point source pollution.

- **Results** will demonstrate how the simulated farmers respond to social interaction, education, and communication. We will attempt to replicate observed patterns, and then test new policies and scenarios to deepen our understanding of how people respond to policy.

Key Questions



- Farmers in the study area are simulated over a 15 year period.

Major References

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For Further Information

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