



## **Phosphorus reactions in agricultural soil and catchments are complicated. How detailed model we need to cover them?**

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Phosphorus is an essential plant nutrient, and it regulates crop growth in terrestrial environments but also causes algal growth in water ecosystems. Conservation practices to reduce phosphorus losses in agriculture do not show any effect in 20-30 years. It may take decades for phosphorus to travel from source (field) to measurement point (at catchment outlet). Phosphorus is transported largely in association with eroded soil, when only part of it is algal available. Soluble reactive phosphorus is totally algal available. Erosion control methods give in measurements fast and effective response to reduce total phosphorus loading from agricultural fields, but it may increase soluble reactive phosphorus loading. Decrease of soil phosphorus pool by having higher output than input shows slower response. We studied how well the physically based, dynamic eco-hydrological model (INCA-P) was able to respond to the past agri-environmental management measures in an agricultural catchment in south western Finland. Water quality measurements there indicate that while total phosphorus was decreasing, soluble reactive phosphorus was increasing.