

A Closer Look

How Does **N**itrogen Move?

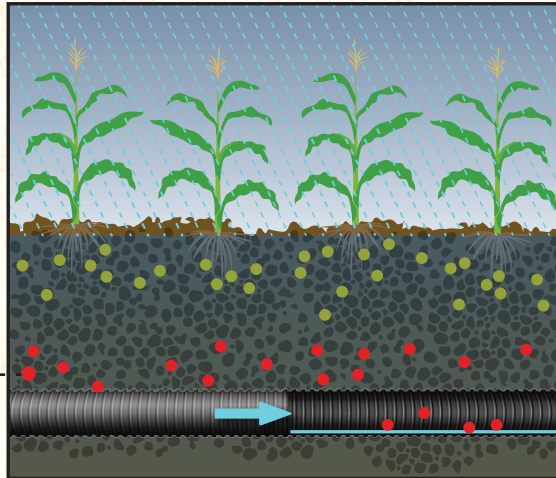


NITROGEN

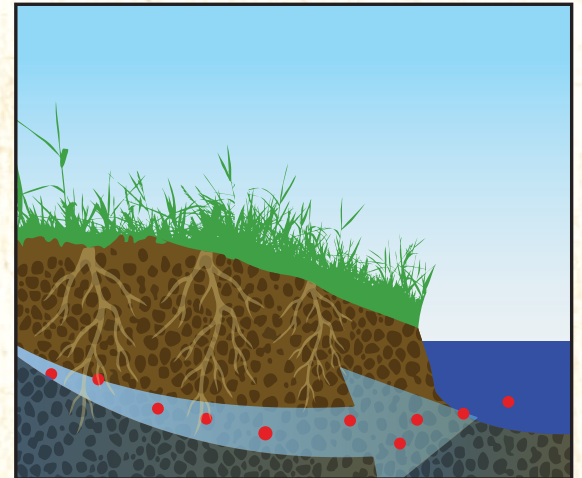
is highly water soluble in the common nitrate (NO_3^-) form.

Nitrate in water readily moves through soils, infiltrating (leaching) into the ground. Much of that water eventually reaches an aquifer—a geological formation, typically made of rock that contains and conducts groundwater.

This water connects with surface water bodies through two different pathways:



Water carrying nitrate moves through **underground tile drainage pipes**, emptying out into ditches, streams and rivers.



Water carrying nitrate also moves through **spaces in the soil, or soil pores**, as shallow groundwater, passing through the plant root zone, eventually seeping into ditches, streams and rivers.

The majority of nitrogen moves through subsurface pathways (tile drainage and shallow groundwater).



DID YOU KNOW?

Nitrogen is present in the nitrate form in all of the world's fresh waterbodies, but humans contribute to the concentration and extent in our water.



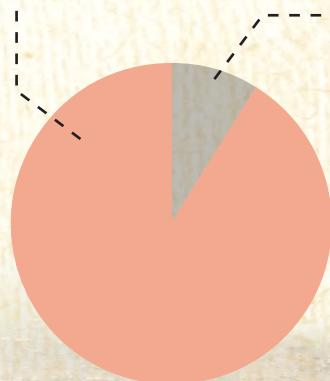
91%
AGRICULTURAL
SOURCES

- Annual cropping systems
- Rich soils
- Nitrogen fertilizer and manure application



9%
URBAN/
OTHER SOURCES

- Wastewater treatment plants
- Industrial facilities
- Lawn fertilizers
- Leaky septic systems



Sources of Nitrogen in Iowa
(Iowa Nutrient Reduction Strategy)

WATER QUALITY MATTERS TO US ALL!

Nutrient pollution threatens our drinking water supply, diminishes water quality in lakes and streams, increases algal blooms that can cause beach advisories, decreases housing values, and diminishes enjoyment for residents and visitors.

**NO
SWIMMING**

A Closer Look

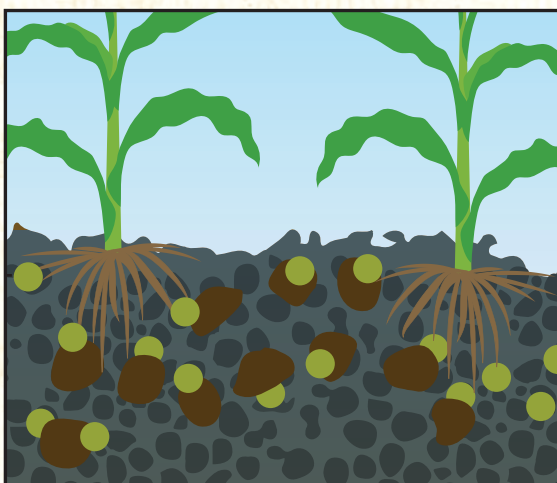
How Does (P)hosphorus Move?

P

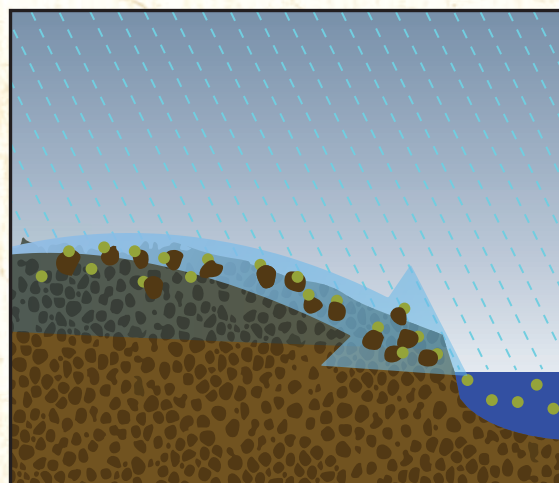
PHOSPHORUS

is found in multiple forms:

- Particulate (sediment-bound) Phosphorus
- Dissolved Reactive Phosphorus



Particulate phosphorus binds closely with sediment. When soil is transported in the process of erosion, particulate phosphorus is also on the move.



Sediment that moves with surface runoff accounts for the majority of phosphorus (P) from Iowa fields delivered to streams.



Recent studies suggest the amount of dissolved P lost from fields and its impact on water quality is greater than often assumed. Dissolved P can infiltrate and move through subsurface pathways – an area of emerging concern.



DID YOU KNOW?

Phosphorus is present in all of the world's fresh waterbodies, but humans contribute to the concentration and extent in our water.



64%

AGRICULTURAL SOURCES

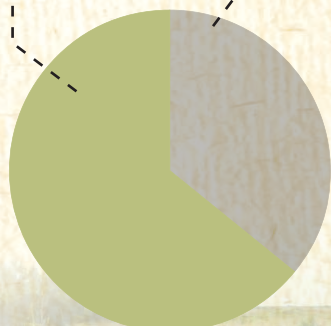
- Annual cropping systems
- Rich soils
- Nitrogen fertilizer and manure application



36%

URBAN/ OTHER SOURCES

- Wastewater treatment plants
- Industrial facilities
- Lawn fertilizers
- Dishwashing detergents



*Sources of Phosphorus in Iowa
(Iowa Nutrient Reduction Strategy)*

WATER QUALITY MATTERS TO US ALL!

Iowa State University researchers estimate that Iowans would be willing to pay about **\$30 million per year** for recreational improvements from the better water quality associated with full implementation of our state's Nutrient Reduction Strategy! The Nutrient Reduction Strategy takes a science-based, voluntary approach to target 45% reductions in nitrogen and phosphorus loads.