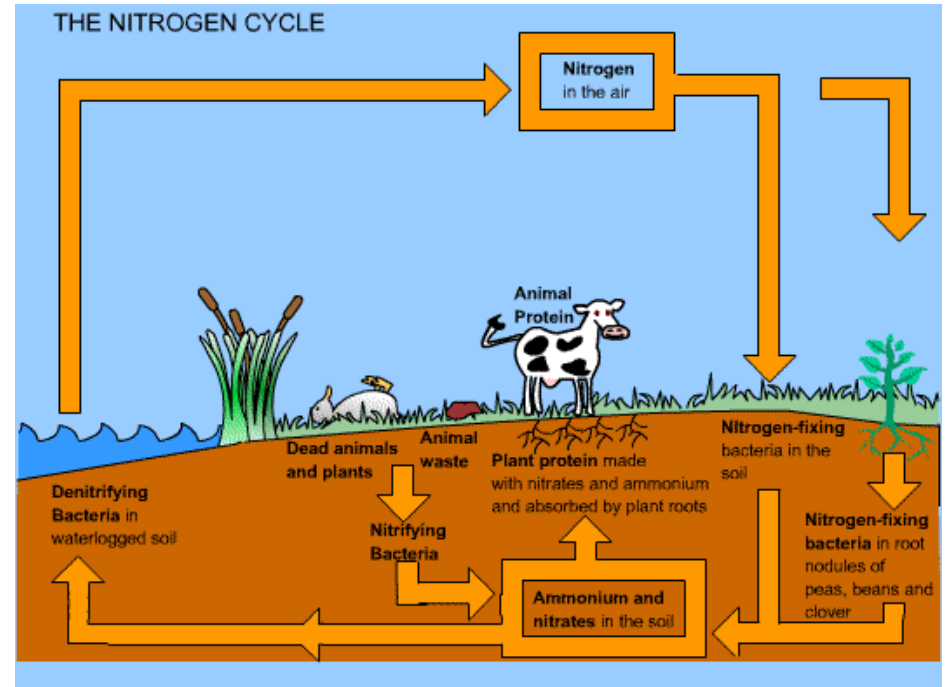


A Few Words About the Nitrogen Cycle

- **What is nitrogen used for?** *Nitrogen is a component of many organic molecules. It forms an essential part of amino acids (which make up proteins) and DNA. Nitrogen is essential for all living cells.*
- **What is the nitrogen cycle?** *Nitrogen makes up 78% of earth's atmosphere.*
 1. *It enters the food chain via nitrogen-fixing bacteria and algae in the soil (remember the soil food web?) and, now 'fixed', is available for plants to absorb. These types of bacteria form a symbiotic relationship with legumes--these types of plants are very useful because the nitrogen fixation enriches the soil and acts as a 'natural' fertilizer. The nitrogen-fixing bacteria form nitrates out of the atmospheric nitrogen which can be taken up and dissolved in soil water by the roots of plants.*
 2. *Then, the nitrates are incorporated by the plants to form proteins, which, when eaten by decomposers and then grazers, can then be spread through the food chain.*
 3. *When organisms excrete wastes, nitrogen is released back into the environment. Also, whenever an organism dies, decomposers break down the corpse into nitrogen in the form of ammonia. A few of these type of bacteria return nitrogen to the atmosphere by a process called denitrification. This nitrogen can then be used again by nitrifying bacteria to fix nitrogen for plants.*



What are the effects of human interference in the nitrogen cycle?

When we cause nitrogen overload in an ecosystem (as in applications of synthetic N in Big AG), there are many drastic effects.

When large amounts of nitrogen collect in a body of water, an accumulation of excess nutrients which causes an algae bloom can result (*eutrophication*). The algae rapidly deplete all of the oxygen in the water, making it inhospitable for fish and other aquatic organisms (google “DEAD ZONES* IN OCEANS”) and also causes deadly red tides.

When plant communities are saturated with nitrogen, the soil can become acidified. This makes the soil inhospitable.

THE CASE AGAINST THE USE OF SYNTHETIC FERTILIZERS:

The use of **inorganic fertilizers over time** alter an ecosystem. According to an article by scientist John Rockstrom in the journal Nature, more active nitrogen is placed into the soil by human activity each year than by all natural processes combined! Although it seems counterintuitive, synthetic fertilizers lead to decreased soil fertility over time. Organic fertilizers -- patterned after fertility sources found in nature -- “build” soil by increasing organic matter and the populations of helpful soil bacteria, both of which help to provide the nutrients plants need to grow. While synthetic fertilizers offer nutrients to plants, they don't build the soil, and organic matter and microbial populations often deplete as a result.

**One dead zone at the mouth of the Mississippi River has covered an area roughly the size of New Jersey.*