

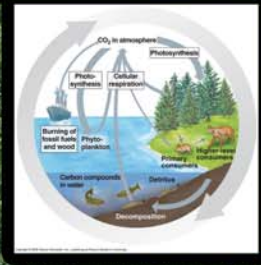
# COLLEGE OF MENOMINEE NATION SUSTAINABLE DEVELOPMENT INSTITUTE

The College of Menominee Nation Sustainable Development started a Carbon Sequestration research project with USDA/Natural Resources Conservation Service. Student interns, Henry Dodge and Timothy Waupoose, had a goal for the research portion of this project; to enhance the learning experiences about carbon sequestration. Throughout the project the SDI department and the student Interns studied and learned about the different methods of carbon sequestration, while evaluating the pros and cons of those various methods of carbon sequestration.

## WHAT IS CARBON SEQUESTRATION?

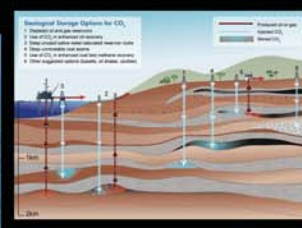
Carbon Sequestration is the long term storage of carbon dioxide (CO<sub>2</sub>) or other forms of carbon in order to diminish negative effects of climate change. It is proposed as a way of slowing the atmospheric and marine accumulation of greenhouse gases. Carbon dioxide is naturally captured from the atmosphere through:

- Biological Processes
- Chemical Processes
- Physical Processes



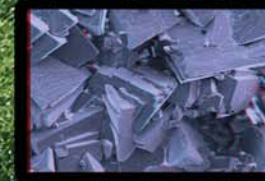
## PHYSICAL PROCESSES

Biomass in power stations and boilers that use carbon capture and storage. The carbon sequestered by the biomass would be captured and stored, thus removing carbon dioxide from the atmosphere. This technology is sometimes referred to as bio-energy with carbon storage, BECS, though this term can also refer to the carbon sequestration potential in other technologies (Bio-energy with carbon capture and storage)



## CHEMICAL PROCESSES

Carbon, in the form of CO<sub>2</sub> can be removed from the atmosphere by chemical processes, and stored in stable carbonate mineral forms. This process is known as 'carbon sequestration by mineral carbonation' or mineral sequestration. The process involves reacting carbon dioxide with abundantly available metal oxides—either magnesium oxide (MgO) or calcium oxide (CaO)—to form stable carbonates. These reactions are exothermic and occur naturally.



## BIOLOGICAL PROCESSES

Biosequestration or carbon sequestration through biological processes. Trees and other green plants such as grass convert carbon dioxide into carbohydrates during photosynthesis, releasing oxygen in the process. Plants naturally store carbon in their cells, tissues, and roots.



## WHAT ARE GREENHOUSE GASSES?

A greenhouse gas (sometimes abbreviated GHG) is a gas in an atmosphere that absorbs and emits radiation within the thermal infrared range. This process is the fundamental cause of the greenhouse effect. The primary greenhouse gases in the Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone.



## CARBON MARKET

Carbon markets can be either voluntary or mandatory. In a voluntary carbon market, an entity (company, individual, or another "emitter") volunteers to offset its carbon emissions by purchasing carbon allowances from a third party, who then takes this money and uses it towards a project that will reduce carbon in the atmosphere. These projects include planting trees (natural carbon sequestration) or investment in renewable energy generation (the additional renewable capacity reduces fossil fuel use from a traditional carbon-emitting energy source).

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