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Module 03: Energy & Climate Change

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## PowerPoint - The Carbon Cycle

Center for Urban Resilience

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# Urban EcoLab Curriculum

<http://www.urbanecolabcurriculum.com>



## The Carbon Cycle

Equilibrium within a System

**Module 3, Lesson 4**



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# Forms of Carbon in the Environment



- Two Forms
  - Organic
    - Contain carbon and hydrogen with other elements sometimes present (for example, oxygen or phosphorous)
    - Building blocks that make up all organisms
  - Inorganic
    - Carbon compounds that lack hydrogen
    - Most common forms: carbon dioxide and carbon monoxide



# Carbon Reservoirs

- Carbon compounds exist in many forms on Earth
  - Carbon Dioxide dissolved in the air and the ocean
  - Organic molecules that make up organisms
    - Carbohydrates
    - Lipids
    - Proteins
    - Nucleic Acids
  - Deposits in the ground such as coal, oil, limestone and dolomite

# Movement of Carbon Among Reservoirs



- Carbon compounds can change from one form to another by
  - **Photosynthesis** – carbon dioxide (inorganic) is taken in by plants to make sugars (organic)
  - **Cellular Respiration** – sugars (organic) are broken down, releasing carbon dioxide (inorganic)
  - **Diffusion** of carbon dioxide between the ocean and the atmosphere
  - **Combustion (Burning)** of organic matter releases carbon dioxide into the air
  - **Decomposition** – break down of dead organic material that is either released into the atmosphere or stored in the soil as humus



# The Carbon Cycle

- The amount of carbon on Earth is constant  
(except for a small amount that radioactively decays to form Nitrogen)
- The movement of carbon from one reservoir to another is therefore very important.
  - Too much could build up in one location
  - Not enough could be present in another



# Carbon Dioxide in the Atmosphere

