

Physical Geography The physical landscape (natural environment) sets the stage for human use (cultural landscape). We need to be aware of - geologic processes (tectonic/gradational) - geologic processes (tectonic/gradational) - atmospheric processes (Any questions on weather or climate?) > Water resources (surface/underground) > soils (formation/fertility) > natural vegetation (a result of all of above)

Definitions

- **Hydrogeology** the study of surface and groundwater in relation to local geology.
- Hydrology the study of water movement.
- Surface waters water in rivers, streams, and lakes.
- **Groundwater** water that has been absorbed by the earth. It is stored in **and** moves through <u>aquifers</u> (porous layers of rock material).

















Texture: Determines its ability to hold water and air.







Permafrost

A permanently frozen subsurface layer of soil associated with the tundra.

- It ranges in thickness from 3 feet to nearly 1,000 feet.
- Most of Canada and Alaska is underlain with permafrost.



Permafrost

- During the short summer the surface layer melts (subsurface remains frozen), creating a bog-like environment allowing millions of mosquitoes and black flies to hatch and reproduce.
- Thawed layer reduces support of roadbeds and building foundations.





Dealing with Permafrost

 Foundations must be anchored deeply into the permafrost.
 Road beds must be thickened.
 Heated structures must be raised and insolated to prevent thawing the ground.







- carbon was trapped and frozen in layers of soil and glacial debris. These layers of permafrost now contain twice as much carbon as the entire atmosphere.
- Carbon escapes when organic material in permafrost thaws and decomposes. Carbon dioxide is released at the surface, but in lakes and wetlands carbon bubbles up as methane, an especially potent greenhouse gas. *NY Times* article 12/16/2011





Natural Vegetation

Climax vegetation

- Final stage in the plant community succession.
- Populated by the best species for <u>existing</u> habitat conditions.
- Results from stable climate and soil conditions and protection from human disturbance.
- Once conditions change, new species enter and local vegetation evolves until stability returns.
- **Tree line:** The limit of normal tree growth determined by latitude, altitude or moisture. It marks limit of the area beyond which it is too cold or too dry for trees to grow.





