**Lecture 2:**

1990 at least 179 confirmed air toxicants. Today it is at least 250.

If they are produced (more than 10 tons a year PER air toxicant). There are legislations on how to dispose them, how to transport them, etc.

This was not good enough, so they added: If the COMBINED emission is more than 25 tons a year. Then

EPA created a second list. […]

Acid rain in Sweden source is England, Germany, Poland meaning acid rain can travel long distances. Acid rain = NOx + SO2

Great lakes were affected by the acid rain. Main source was coming from Canada.

Lots of lakes were affected in Ontario the source was Pennsylvania.

After number of years the Protocol of the great lakes was signed by USA and Canada.

Legislation was not good enough, so they redone it 2000.

Ozone layer 30-40 km from surface very, very thin 1 molecule of ozone per 100 000 molecules. Protects against sun radiation.

32% of radiation is immediately reflected upon entering the atmosphere called Albedo

In the last centuries the temperature of earth was stable +- 0.5 degrees

Ozon layer destruction was caused CFCs

**Water pollution:**

Ground water :

* Aquifers
* Springs

Municipal water (drinking, cooking, washing)

Priority water Pollutants: (Page 43 book)

1. **Pathogens**: micro-organisms
   1. Virus: 1 cell smallest pathogen
   2. Bacteria: has tail and “mouth” so it can grow
   3. Protozoa
   4. Parasitic worms
2. **Organics** **matter**: water has around 12 ppm dissolved oxygen. Organics matters reduce the oxygen in the water
3. **Nutrients (Nitrogen, Phosphorus):** Coming from fertilizers and detergents
4. **Toxic** **chemicals**: e.g. Oil (oil spils)
5. **Toxic** **metals**: Pb, As, Hg
6. **Sediments**:
7. **Acidity**:
8. **Salts**:
9. **Heat**:

**Chapter 7:**

**Life cycle analysis**:

A study done for any thing produced or built. Go and study what raw material do I need to produce. Are they best to use? Is there a possibility to change to something better for the environment? Also study the other end, how will the product be wasted?

Life cycle also includes the price of wasting product in the product price.

* **Disadvantages**: Expensive, consumes resource time.
* **Advantages**: it is used in any kind of

Step 1:

* Listing of all inputs and outputs
* Qualification of each input and output

Step 2:

* Listing of effects on the environment for each input and output identified in inventory analysis.
* Qualitative and/or quantitative description of impacts: adverse effects on human health and welfare, ecosystems, and material as well as resource depletion.

Step 3:

* Listing of needs and opportunities to reduce adverse effect identified in impact analysis and inventory analysis.
* Qualitative and/or quantitative description of improvements.

**Chapter 15:**