A History of the Clean Air Act

MMC Environment Committee Meeting

February 19, 2019

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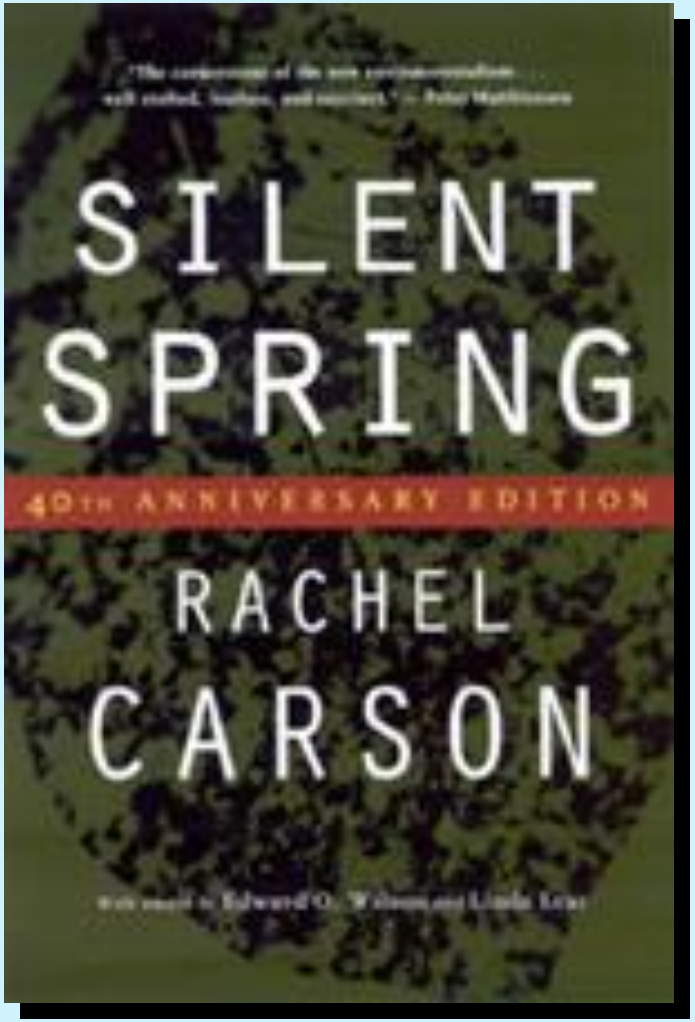
US EPA
Region 5 Air and Radiation Division

Congress' First Authorization

Air Pollution Control Act of 1955

"An Act to provide research and technical assistance relating to air pollution control"



1962

US FWS

The First Clean Air Act

1963 Clean Air Act

"An Act to strengthen,
and accelerate programs for the
prevention and abatement of
air pollution"

Clean Air Act Amendments

1965 Amendments

Motor Vehicle Air

Pollution Control Act

Clean Air Act Amendments

1967 Amendments
The Air Quality Control Act

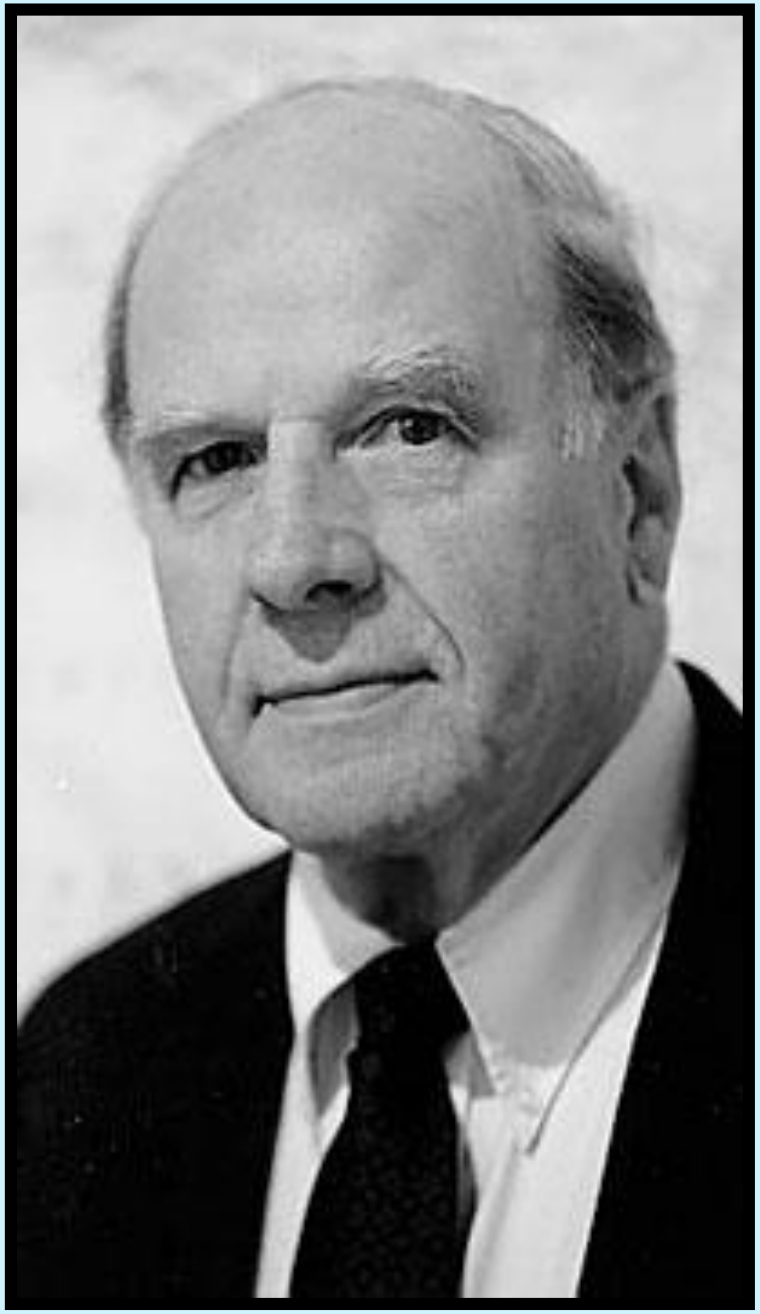
Required the Designation of Air quality Regions and Allowed for the Development of Standards

Beginning of the State Implementation Plan (SIP) Program

Nationwide Environmental Teach-in

“..to shake up the political establishment, and force this issue onto the political agenda.”

1970



Senator Gaylord Nelson (WI)

1970

Clean Air Act Amendments

1970 Amendments

"An Act to amend the Clean Air Act to provide for a more effective program to improve the quality of the Nation's air"

1970 CAA Amendments and the Introduction of "Air Toxics"

Distinguished between:

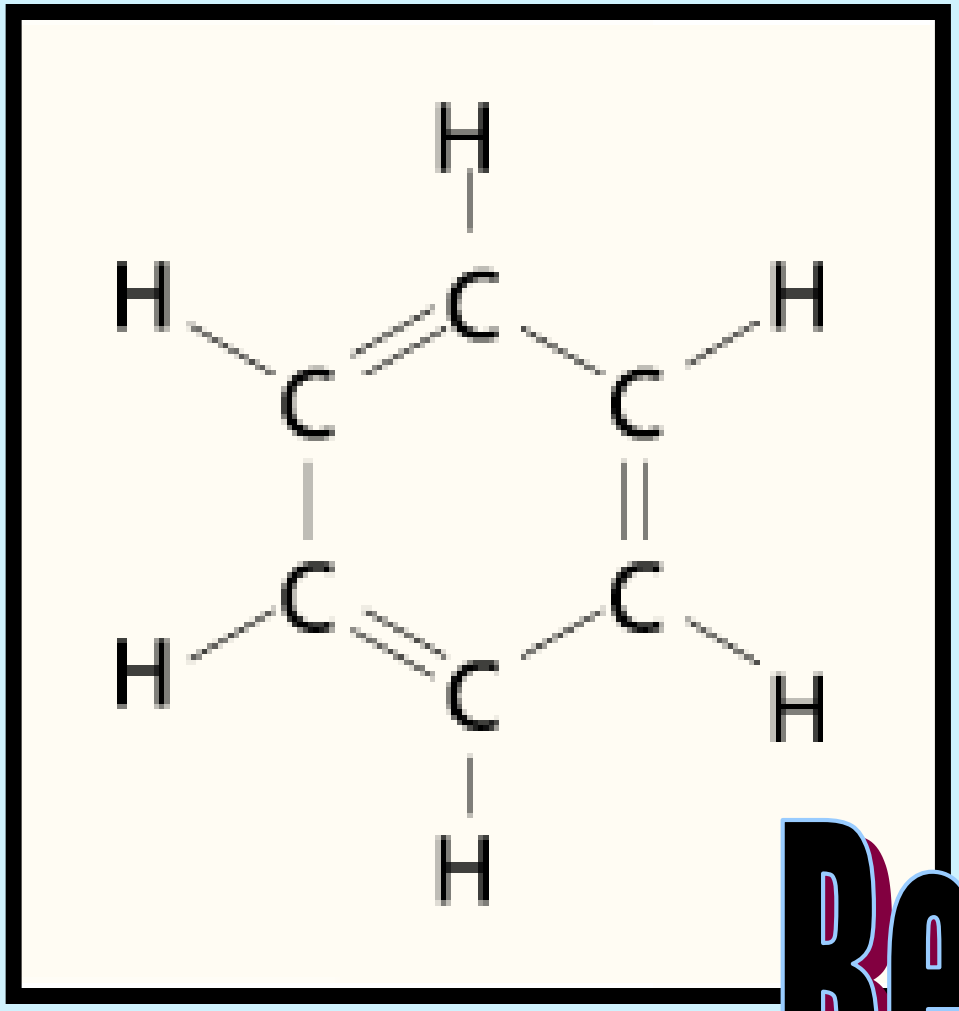
- *Air Toxics* (also called Hazardous Air Pollutants or HAPs)
  - "Chemicals which may reasonably be anticipated to cause adverse effects"
  - Focus on Cancer
- *Criteria pollutants*, such as ozone and particulate matter

1970 Amendments & Air Toxics

Required EPA to:

- Decide what chemicals are HAPs and put them on a list
- Regulate emissions of HAPs with an "Ample Margin of Safety"
- Identify, take public comment, list and regulate in 1 year

And then there was …



Benzene

Benzene NESHAP Risk Ranges

Risk is acceptable with ample margin No further action needed	Risk may be Acceptable Look at Health Issues Then consider costs/ technical feasibility before deciding if emissions reductions are needed	Risk is unacceptable Take action to reduce risks Can only consider health

$1x10^{-6}$ $1x10^{-4}$

Risk →

1989

The Clean Air Act Amendments of 1990

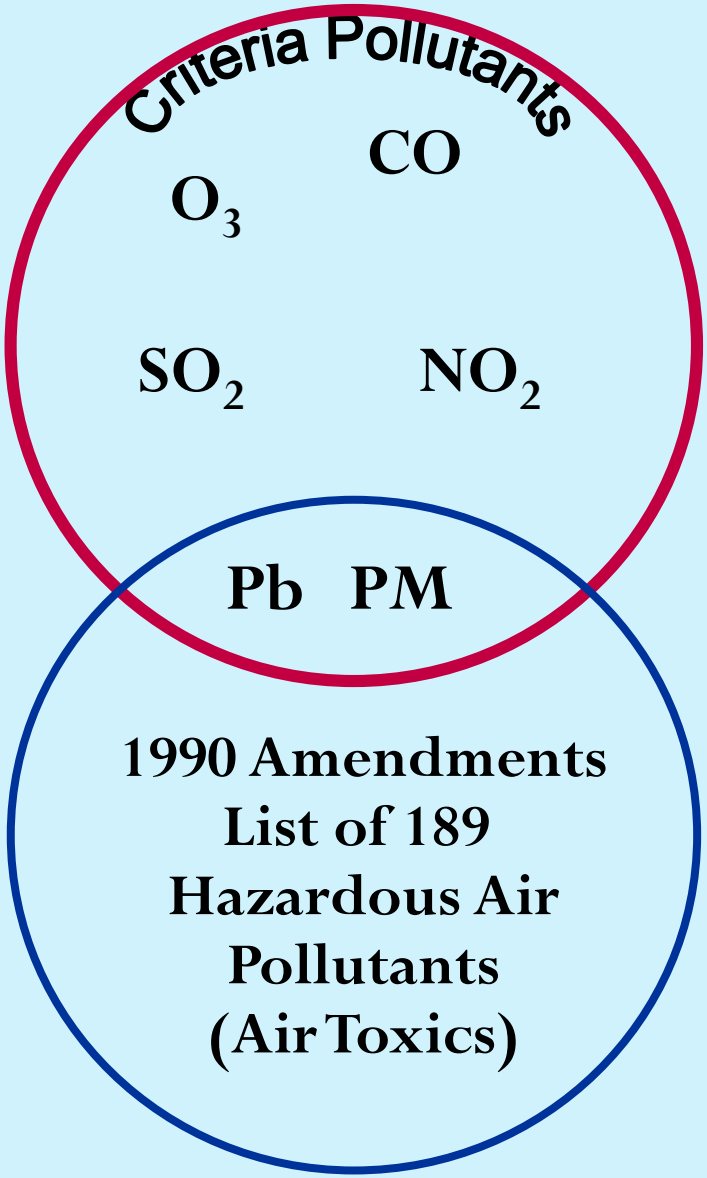
1990

1990 Amendments & Air Toxics

The 1970 Amendments regulated individual chemicals based on human health effects

The 1990 Amendments:

- First, regulate source categories based on existing technology
  - Maximum Achievable Control Technology = MACT
- Motor vehicle and fuel standards



Titles of the Clean Air Act

- Title I—National Ambient Air Quality Standards, Hazardous Air Pollutants
  - SIP, NSR and Technology Standards
- Title II—Mobile Sources
- Title III— Emergency Powers and Tribal Authority, Public Involvement
- Title IV—Acid Deposition
- Title V—Operating Permits
- Title VI—Stratospheric Ozone

Different Types of Sources

- **Major source** means any stationary source that emits or has the potential to emit >=10 tons per year (tpy) any or >=25 tpy of any combination HAPs
- **Area source** means any stationary source emitting HAP that is not a major source
- **Mobile sources**

Questions EPA Considers….

- How much is a problem?
- Where is the risk?
- What is the toxic endpoint?
- What about the chemicals not on the list?

And….

- Carbon dioxide is not a listed pollutant under CAA

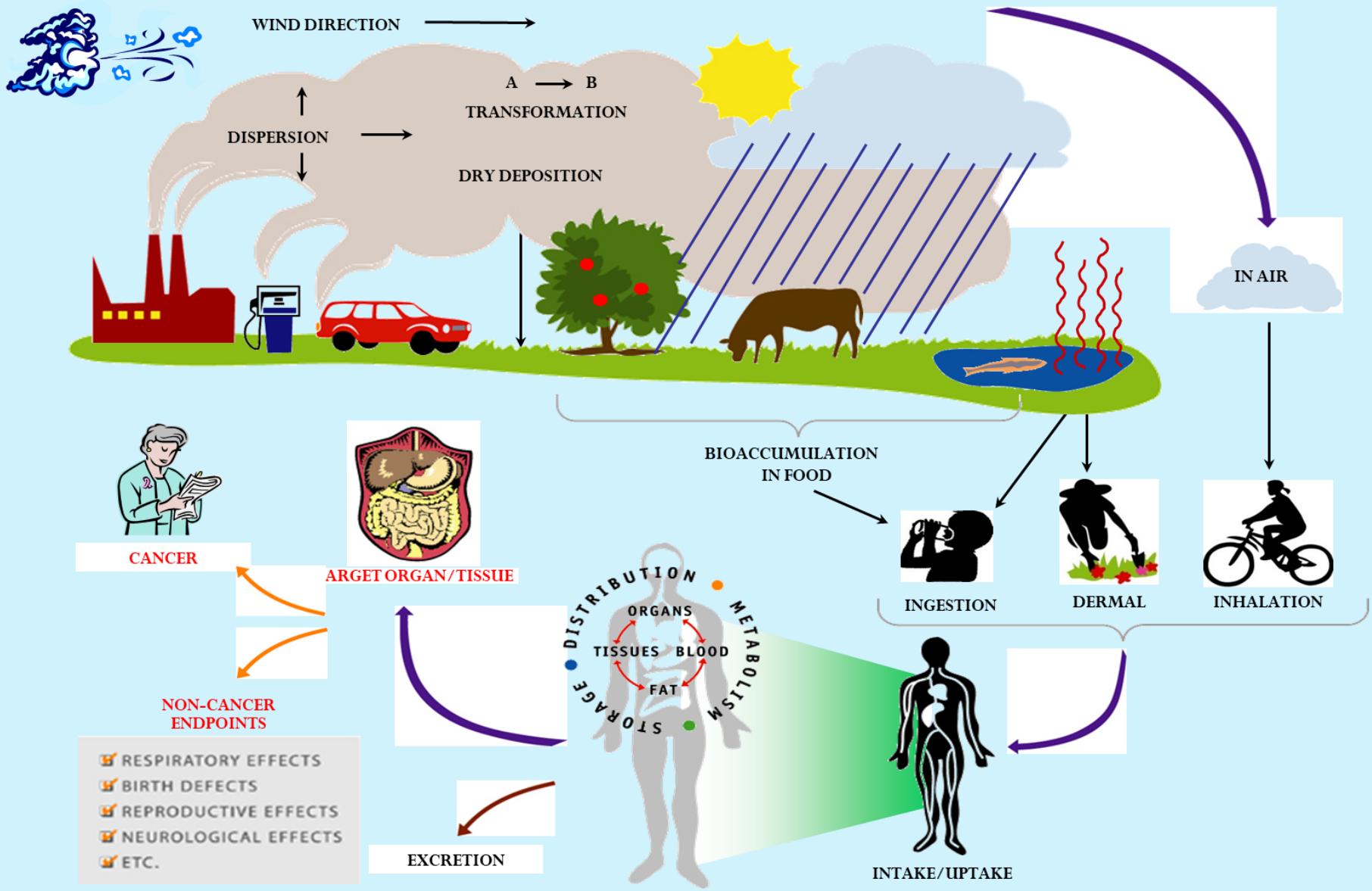
So, Where are we now?

- Ancient History: We came from a time where there was no law regarding air toxics, to…
- 1970: An air toxics provision which was impossibly difficult to implement, to…
- 1990: A new provision designed to give us time to hone our risk assessment methods, to…
- TODAY: Conducting/reviewing source-specific and community-level and national risk assessments

Air Toxics

Margaret Sieffert
Air and Radiation Division
Air Toxics and Assessment Branch

Pollution & Health Impacts



All substances are poisons

There is none which is not a poison. The right dose differentiates a poison and a remedy.

- Paracelsus

The Right Dose, over the Right Time Period, through the Right Route makes the poison.

-Paracelsus *(Updated)*

Air Toxics Requirements

The Clean Air Act (CAA) requires:

- **Set technology-based** Maximum Achievable Control Technology (MACT) standards
- **Residual risk assessment** to determine need for additional emission reductions
- **Technology reviews** to determine emission control approaches

Risk

Risk = f[(Measure of Exposure), (Measure of Toxicity)]

The basic equation for calculating risk from breathing a carcinogenic air toxic is:

Risk = EC x IUR

Where:

EC = concentration of the chemical in air at the point of exposure (ug/m^3)

IUR = Inhalation Unit Risk ($risk/ug/m^3$)

The basic equation for calculating hazard from breathing an air toxic that causes a noncancer effect is:

Hazard Quotient = EC/RfC

Where:

EC = concentration of the chemical in air at the point of exposure (mg/m^3)

RfC = Reference Concentration (mg/m^3)

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