Open Burning: Fire, Ice, Earth and Water

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Health and Accidents

- North America began addressing 1950's to prevent wildfires: "managed" burns (prohibitions under dry conditions)
- Addressed in current EU members piecemeal during 1980's and 1990's, health and soil fertility
- Near-total ban in EU around 2000 under NEC directives (not directly addressed)
- In U.S., accidents in 1990's (visibility) led to some state bans on burning
- Decreases soil fertility and crop yields by 25-30%
- Corresponding 25-35% greater need for fertilizer
- More brittle soils and fertilizer use → More run-off and water pollution; and secondary air pollution (?ammonia?)

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Black Carbon in the Arctic

3rd largest warming agent globally
Speeds the melting of snow and ice
Short-lived = Near-term climate benefits
Immediate health benefits from reductions

Impacts: Crop Yields, Higher Fertilizer Costs

- **Long known impacts on humus (Soviet studies from 1930's)**
- **Only more recent: decreases soil fertility and crop yields by 25-30%**
- **Corresponding 25-35% greater need for fertilizer (UC-Davis studies during trandtion to no-burn early 2000's)**
- **More brittle soils and fertilizer use → More erosion, run-off and water pollution; and secondary air pollution (?ammonia?)**

Impacts: Better Data on Health

- **Burning a PRIMARY source of air pollution as other sources (energy, diesel transport) come under greater control**
- **Despite its EPISODIC or SEASONAL NATURE**
- **In a rapidly changing, more extreme climate**

  - ✓ **Higher mortality from respiratory or cardiac illness, especially among young and elderly**
  - ✓ **Higher morbidity INCLUDING LONG AFTER FIRE EVENT from respiratory illness (asthma, pneumonia)**
  - ✓ **Increased mortality/morbidity due to accidents**
  - ✓ **Also in cities!**

Impacts: Climate

- **Emissions and impacts travel (regional/hemisphere)**
- **Largest single BC source globally (36%),close to cryosphere = more intense regional warming/glacier and snow melt**
- **Wildfires spread from set agricultural fires lead to additional pollution and climate impacts.**
- **Set fires, AND the fires that spread from them, release methane, CO, CO2, black carbon**
- **Not (really) carbon neutral due to wildfire spread**
- **Not carbon-neutral due to humus C loss**

Combined Benefits: Adaptation + Mitigation

- **Low-till and especially, no-till essential to adaptation**
- **Holds moisture during drought, holds soil during extreme rains**
- **Preserves water resources and less water pollution from fertilizer and erosion in time of water scarcity**
- **More reliable yields in changing climate**
- **“Negative emissions” and carbon drawdown (IPCC SR on Lands)**
- **Some controversy role of lands – but NOT of formerly burned lands**

= Carbon financing (national, GCF, GEF, NEFCO, EIB etc.)

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