# Initiatives Affecting New York State and the Region: Local/Regional Initiatives and Emerging Opportunities

Environmental Monitoring, Evaluation, and Protection in New York:
Linking Science and Policy
Albany, NY – October 7-8, 2003



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#### Got an Hour?

#### Multiple initiatives under each category:

- Climate Change
- Electricity
- Diesels
- Fuels
- Light Duty Motor Vehicles
- Monitoring & Evaluation
- Low Income / Environmental Justice
- Multi-Pollutant Legislation

#### **CLIMATE CHANGE**

- RGGI (Gov. Pataki's Cap & Trade Initiative)
- NEG-ECP Climate Commitment & Process
- Northeast GHG Registry Infrastructure essential for cap-and-trade
- Region-Specific Climate & Economic Modeling "Umbrella" for policy makers
  - PRECIS, NE-MARKAL + NY + CA, REMI
- Impacts of climate change on air quality
  - Georgia Tech / MIT / NESCAUM

#### **ELECTRICITY**

- DG (NESCAUM study in Metro-NYC area)
- CHP (NECHPI; new Northeast CHP Center; NY Rule; NYSERDA leadership & support)
- Mercury MACT
  - "Floor = average of top 12% performing utilities
  - EPA to propose by 12/15/03, finalize by 12/15/04, compliance by 12/15/07 (unless multi-p legislation changes MACT)

#### **DIESEL ENGINES**

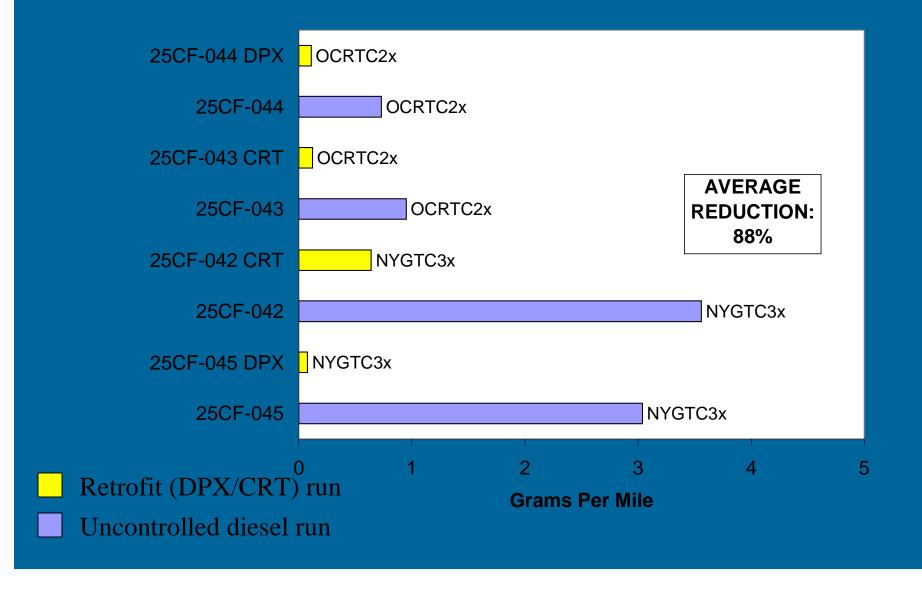
- Retrofits; Sanitation Fleets, Buses, and Ferries
  - NESCAUM/EPA Retrofit Workshop,
     October 21-22 in NYC
- Truck Stop Electrification (Hunts Point, Syracuse, soon NJ)
- NESCAUM Nonroad Occupational Exposure Studies

# Mack Truck SEP: NYC DOS SCR & DPF Combination

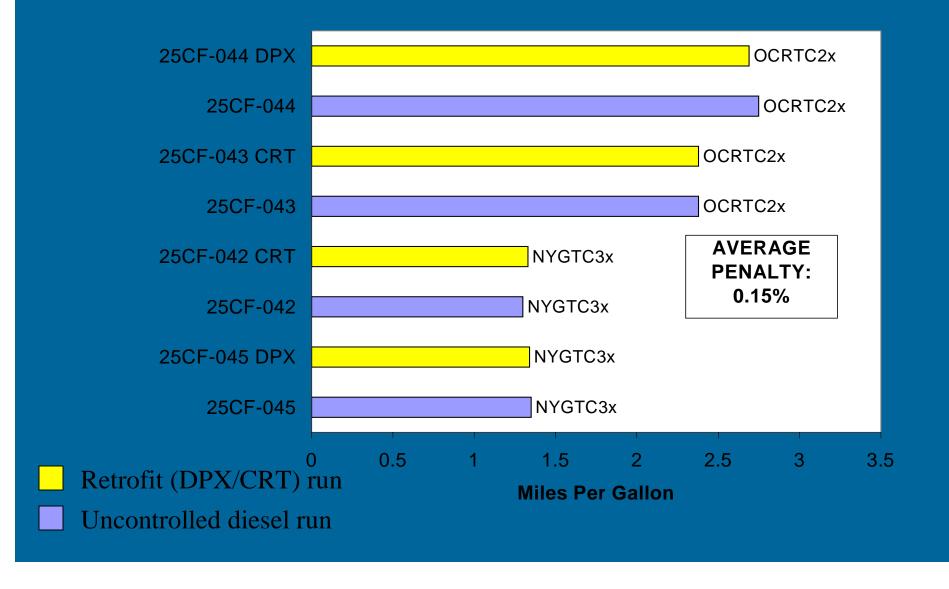




# Refuse Collection Truck Test Results: Particulate Matter



# Refuse Collection Truck Test Results: Fuel Economy



# Hunts Point TSE project





Sustainable South Bronx and NYPA have installed a 30-bay truck electrification system at the Hunt's Point Market in the South Bronx.

Adopting a system from IdleAire Technologies will create a zero-idling zone, eliminate diesel exhaust, and provide needed health benefits to this community.

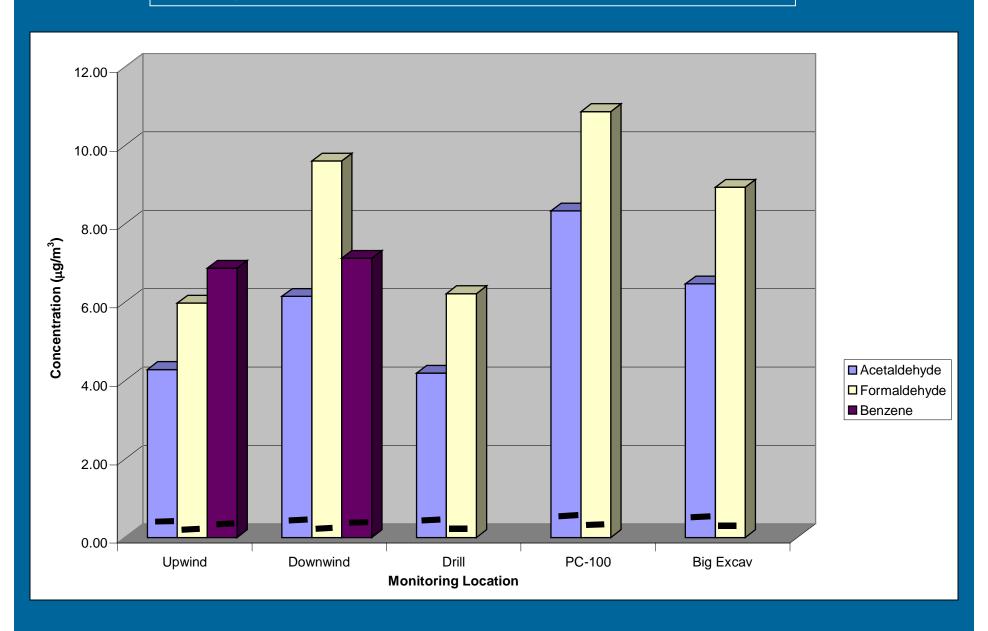
# PM<sub>2.5</sub> & Estimated Diesel PM Exposure

#### New York City #7 Construction Activity PM<sub>2.5</sub> Integrated Sampling Results Estimated Diesel Particulate Matter Exposure

	Workday	Low Estimated	High Estimated		Low Estimated	High Estimated
	1		· ·		DPM	Ŭ
	Average	DPM	DPM			DPM
	Concentration	Concentration	Concentration	24-hour Average*	Concentration	Concentration
Sampling Location	$(\mu g/m^3)$	$(\mu g/m^3)$	range (μg/m <sup>3</sup> )	Concentration (µg/m <sup>3</sup> )	$(\mu g/m^3)$	range (μg/m <sup>3</sup> )
	Day 1	,, ,	., .	, 0	,, ,	,, ,
Perimeter Site #1	49.272	1.97	26.11	31.09	1.24	16.48
Perimeter Site #2	76.574	3.06	40.58	40.19	1.61	21.30
Excavator A	66 250	2 65	35 11	36.75	1 47	19.48
Excavator						<b>3</b> 1
PC-100						34
Drill CAM	PN12 5	Stand	ard? (	e.g., 15-2	5 u/m37	2) 26
	1 1012.0	Otaria	aru: (	J.y., 10 Z	J WITTO	
Now	lower o	v co co ci	na tima	00 /00	2 hours	2)
Perimeter INCW,	iower a	averagii	ng ume	es? (e.g.,	3 nours	6
Perimeter		O	O	\ \ \ \ /		<b>*</b> }1
Excavator						)7
Excavator B	60.26	2.41	31.94	34.75	1.39	18.42
PC-100	44.37	1.77	23.52	29.46	1.18	15.61
Drill	-0.86	-0.03	-0.45	14.38	0.58	
						7.62
	Day 3					
Perimeter Site #1	Day 3 34.503	1.38	18.29	26.17	1.05	
Perimeter Site #1 Perimeter Site #2		1.38 0.83	18.29 11.06	26.17 21.62	1.05 0.86	7.62
	34.503			=		7.62
Perimeter Site #2	34.503 20.864	0.83	11.06	21.62	0.86	7.62 13.87 11.46
Perimeter Site #2 Excavator A	34.503 20.864 45.434	0.83 1.82	11.06 24.08	21.62 29.81	0.86 1.19	7.62 13.87 11.46 15.80

<sup>\*</sup>Assumes ambient average concentration is 22 µg/m<sup>3</sup>

# Target Gas Concentrations, NYC



# Nonroad Diesel Study Preliminary Results

- Diesel equipment activity substantially increased PM<sub>2.5</sub> exposures for workers and nearby residents, by as much as 16 times.
- Individual workers' estimated 24-hour exposures exceed current air quality standards by nearly 2 to 3.5 times – substantially increasing workers' health risk.
- The most potent portion of PM<sub>2.5</sub> diesel particulate matter was estimated to exist at levels that pose risk of chronic inflammation and lung damage in exposed individuals.
- As many as 200,000 workers may be exposed to these harmful concentration levels of nonroad equipment emissions in the Northeast.
- Concentrations of acetaldehyde, benzene and formaldehyde around nonroad equipment operations were as much as 140 times the federally established screening threshold for cancer risk.
- Concentrations of metals known to cause inflammatory responses and damage in pulmonary cells, such as iron, nickel and vanadium, were elevated in samples collected around nonroad equipment.

#### **FUELS**

- Low-Sulfur Diesel Fuels
- MTBE:
  - NY moving ahead in 60+ days
  - Renewable Fuel Standard (Ethanol)
     Compromise is in 2003 Energy Bill
- Home Heating Oil Opportunity!

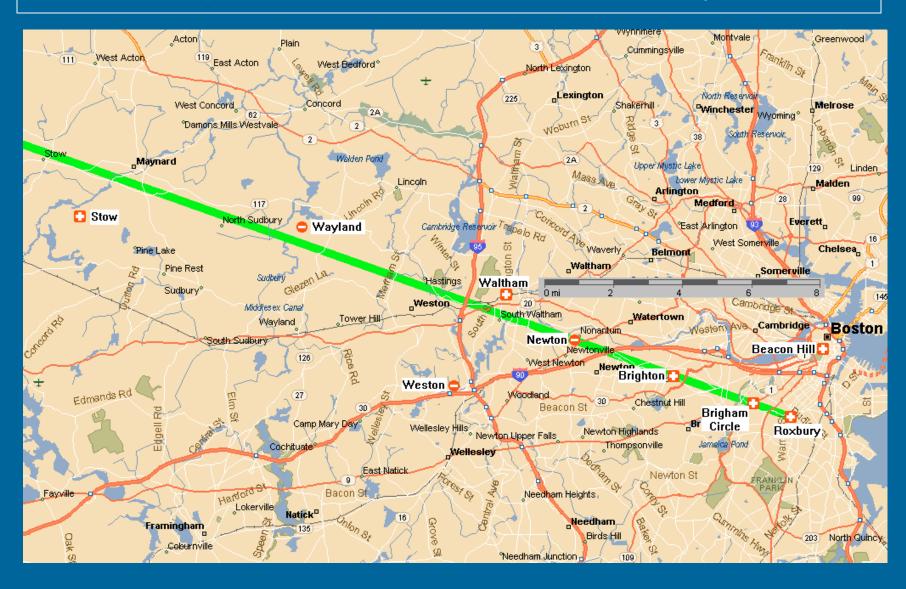
#### LIGHT DUTY MOTOR VEHICLES

- California LEV II (AB 1492 Pavley)
  - Gov. Pataki's Inaugural Speech
- Regional LEV II
  - Four states now (NY, MA, VT, ME)
  - -CT, NJ, RI all considering joining

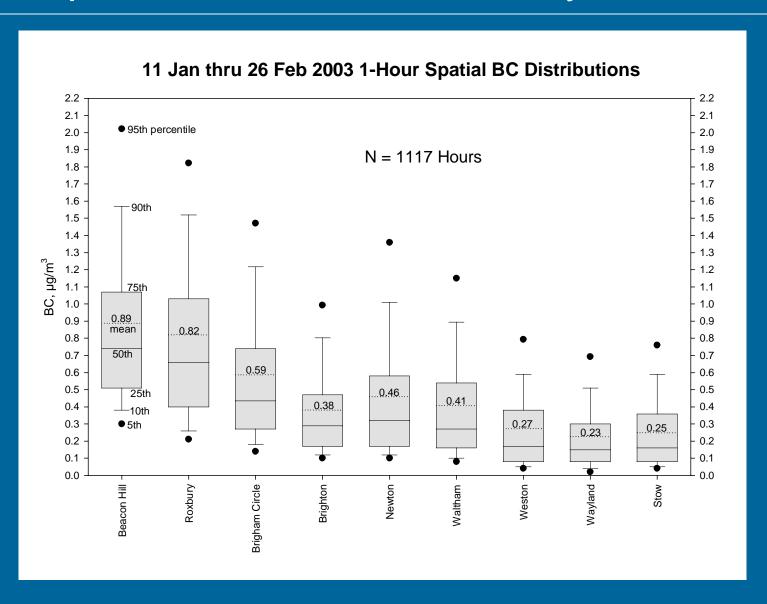
#### **MONITORING & EVALUATION**

- NESCAUM Black Carbon Characterization Study (Spatial Distribution)
- Rural "Transport Supersites"
- Diesel Occupational Exposure Studies
- Source apportionment work underway in NJ

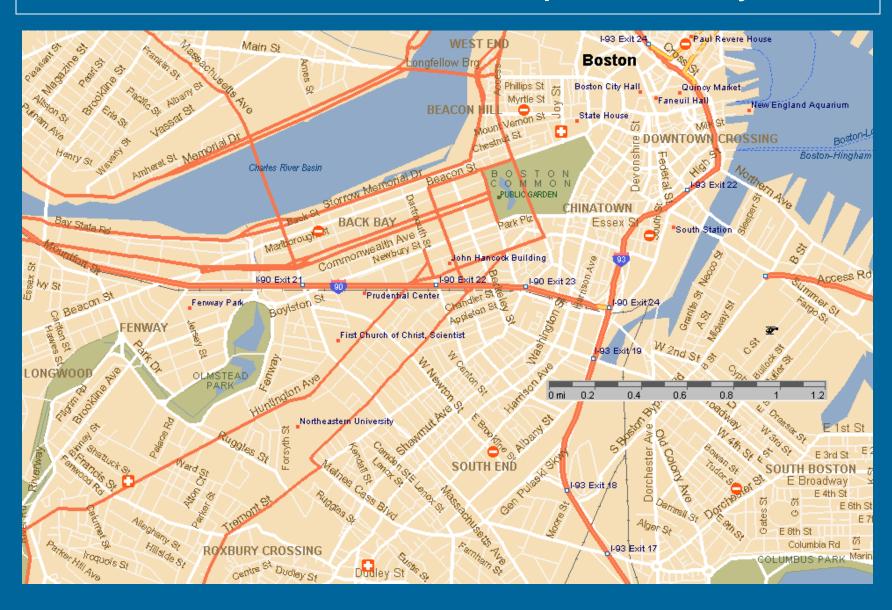
# Spatial BC Distribution Study



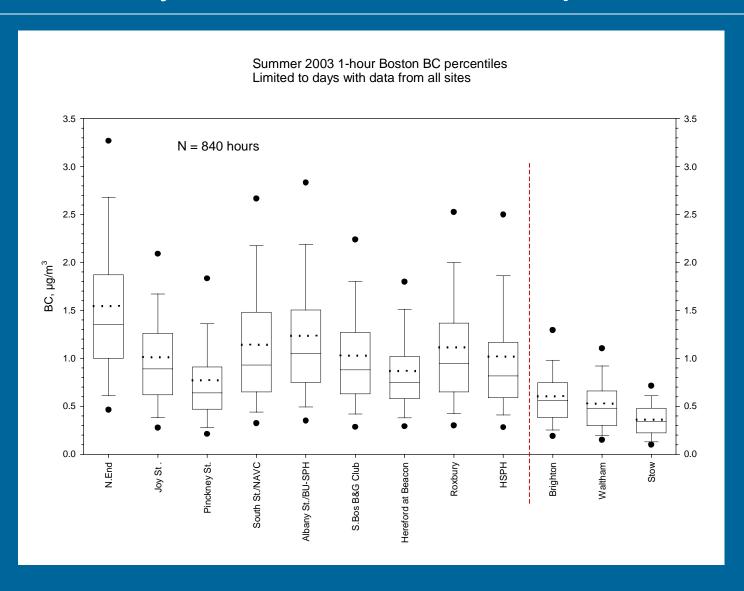
## Spatial BC Distribution Study Results



# Micro-Scale Follow-Up BC Study



# Preliminary Results of Follow-Up BC Study



# PM/Haze Rural "Transport Supersites"

- Multiple sites (3 or more) with detailed PM and visibility-related measurements
  - → high-elevation (1000 3000 ft), rural, transport characterization ==> contrast "Fresh" vs. Aged secondary aerosols
  - → highly time-resolved (1-h) aerosol composition measurements
- Hourly aerosol composition data provide enhanced insight into:
  - → regional aerosol generation and source characterization
  - → factors that drive short-term visibility
  - → aerosol model performance and evaluation

# Planned "Transport Supersites"

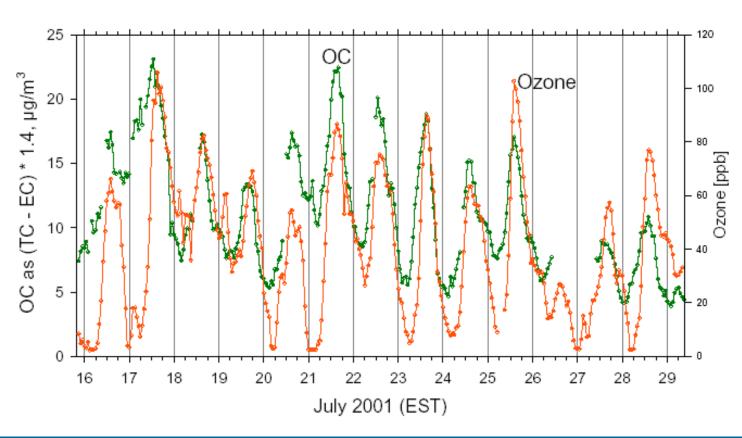
Planned MANE-VU and potential other non-Mane-VU site locations:



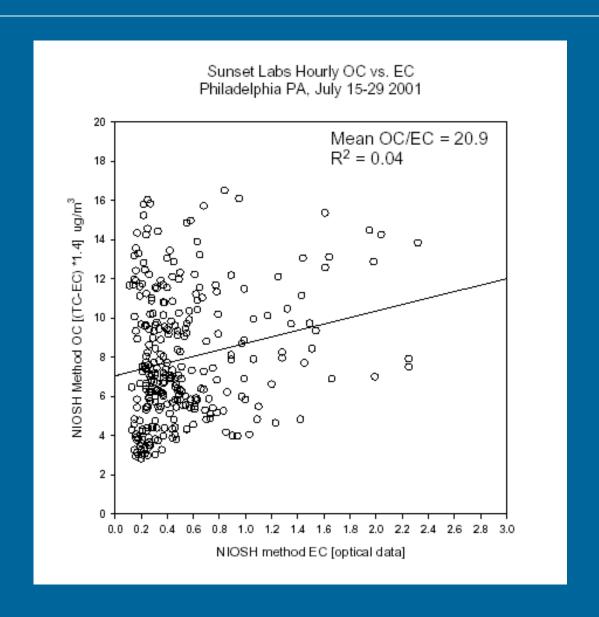
[Athens and Shenandoah are only concepts at this time]

# OC Peaks with Ozone => Secondary Regional Component

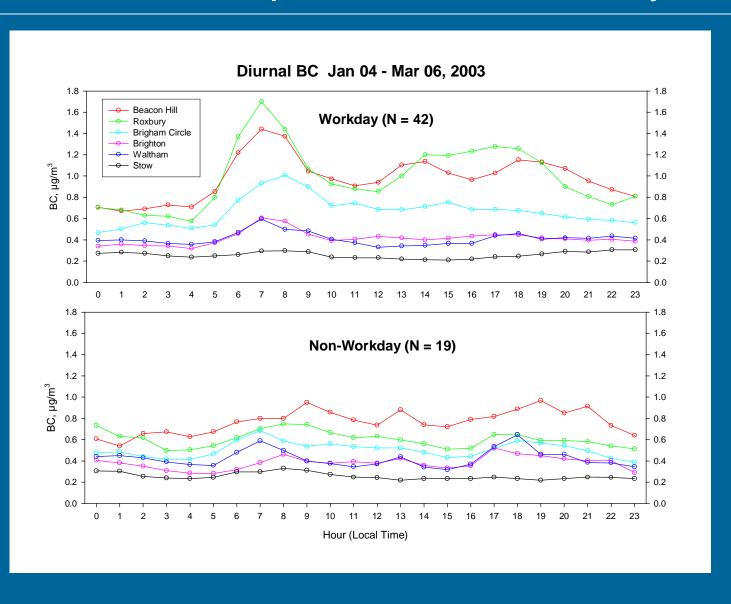




#### OC Unrelated to EC



# Motor Vehicle Impact Shows in Hourly Data



## Possible Future "Transport Supersites"

- Other Possible "far-source" sites in MANE-VU domain:
  - → Pinnacle St. Park, Addison NY (ASRC/NY-DEC)
  - → Brigantine NJ coastal, Class I
  - → Underhill VT (Mt. Mansfield), northern VT
  - → Whiteface MT (northeast NY)
  - → Northern NH: Mt. Washington or Cannon Mt.
  - → Pack Monadnock, southern NH (AIRMAP leverage?)
  - → AIRMAP site in central NH Castle Springs
  - → Quabbin Reservoir (central MA)
- Other potential non-MANE-VU upwind sites:
  - → Athens OH (Ohio University) [Quaker City?]
  - → Shenandoah NP (existing Big Meadows IMPROVE site)

Nova Scotia: Env. Can. site in Kejimkujik National Park in southern NS

#### LOW INCOME / ENVIRONMENTAL JUSTICE

Clean Air Communities



- Teams disadvantaged
   community partners with technology partners, funding, and assistance
- Consolitdated Ed
  - Hunts Point TSE, GMDC, Seward Park, etc.
- NYPA Queens Clean Air Project

# CAC Projects Co-Funded by NYSERDA

- **GMDC:** 115kW solar installation on 2 commercial buildings in Greenpoint, Brooklyn.
- Cherry Tree Association: 15kW solar installation on community building in Mott Haven, Bronx.
- **Seward Park Housing Corp**: FlexTech grant to identify return on investment based energy efficiency control measures at 1700 unit housing cooperative in lower East Side, Manhattan.
- Clinton Hill: Combined heat and power (CHP) project utilizing micro-turbine technology at large, multi-building residential housing complex in Clinton Hill, Brooklyn.

#### **MULTI-POLLUTANT LEGISLATION**

- S.843 Carper / Chafee / Gregg
  - Alexander now too
- S. 485 Administration's Clear Skies Act
  - Attach to Energy Bill?

#### CONCLUSION

#### Whew!

 "All scientific work is incomplete – whether it be observational or experimental. All scientific work is liable to be upset or modified by advancing knowledge. That does not confer upon us a freedom to ignore the knowledge we already have, or to postpone the action that it appears to demand at any given time."

Hill, Bradford. The environment and disease: association or causation. Proceedings of the Royal Society for Medicine. 1965; 58; 295-300.