



**Department of  
Environmental  
Conservation**

# **Clean Power Plan Implementation**

## **Considerations for Environmental Justice & Vulnerable Communities**

**May 26, 2016**

**Low-Income Forum on Energy**

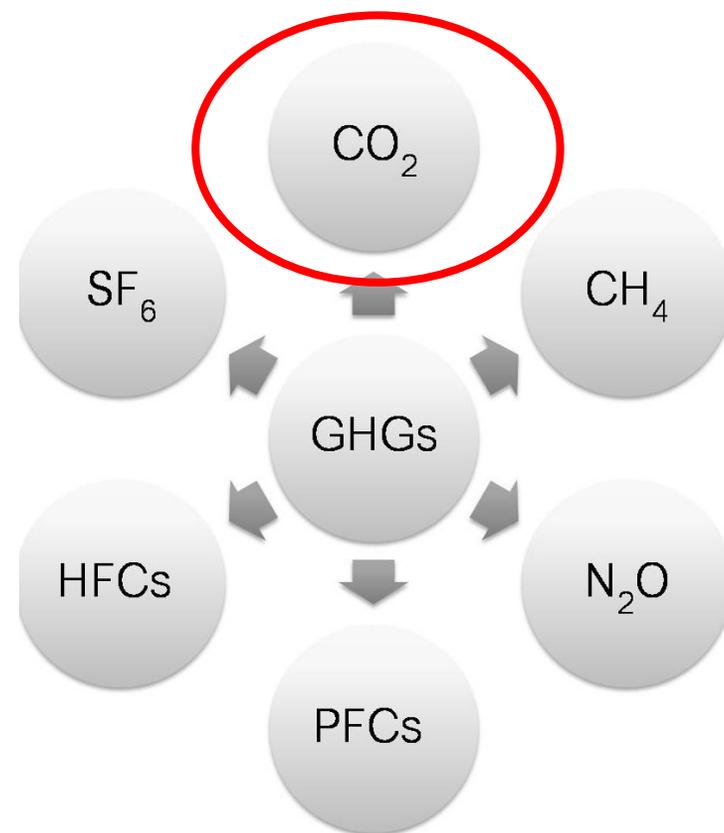
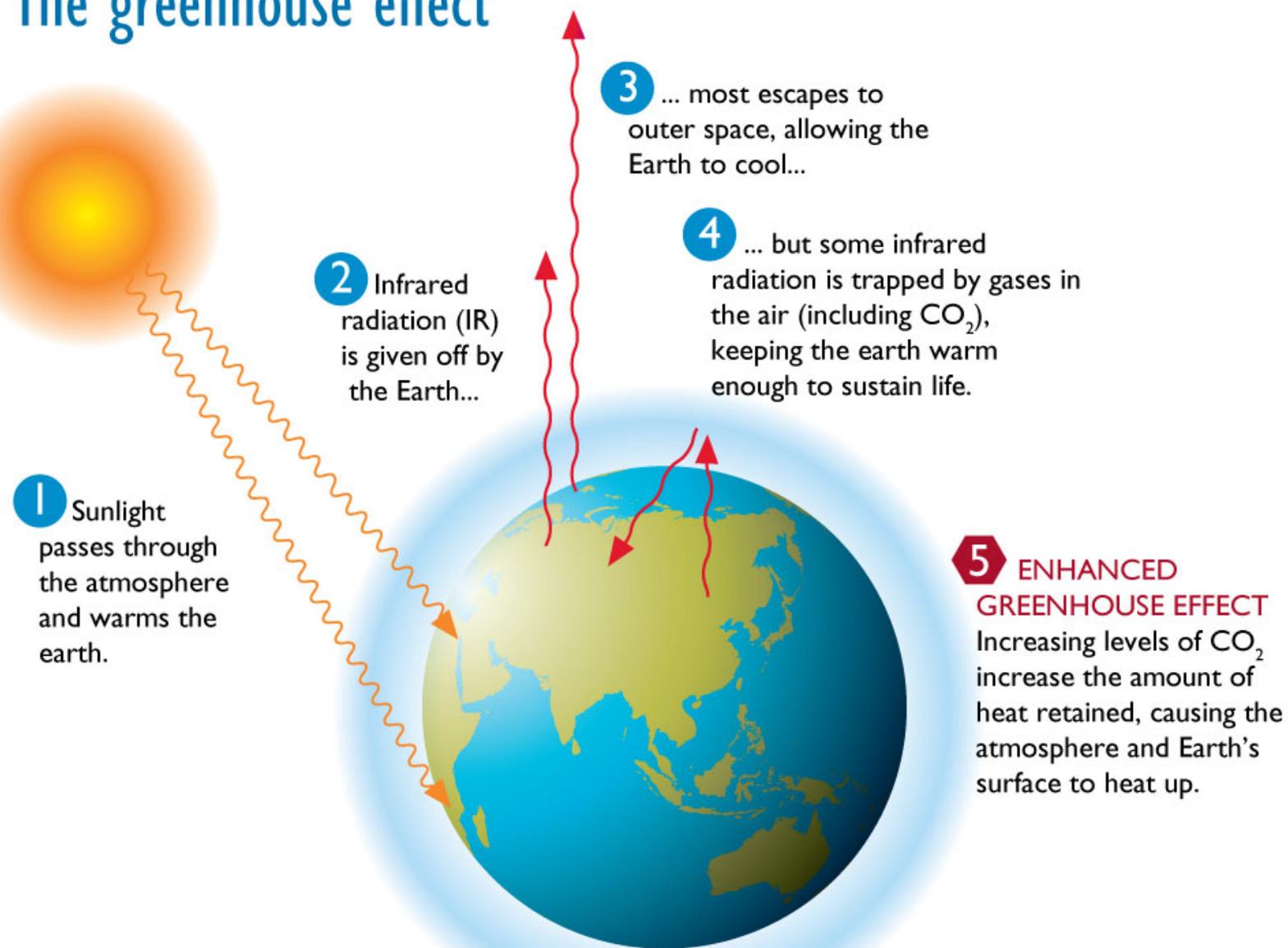
# Welcome

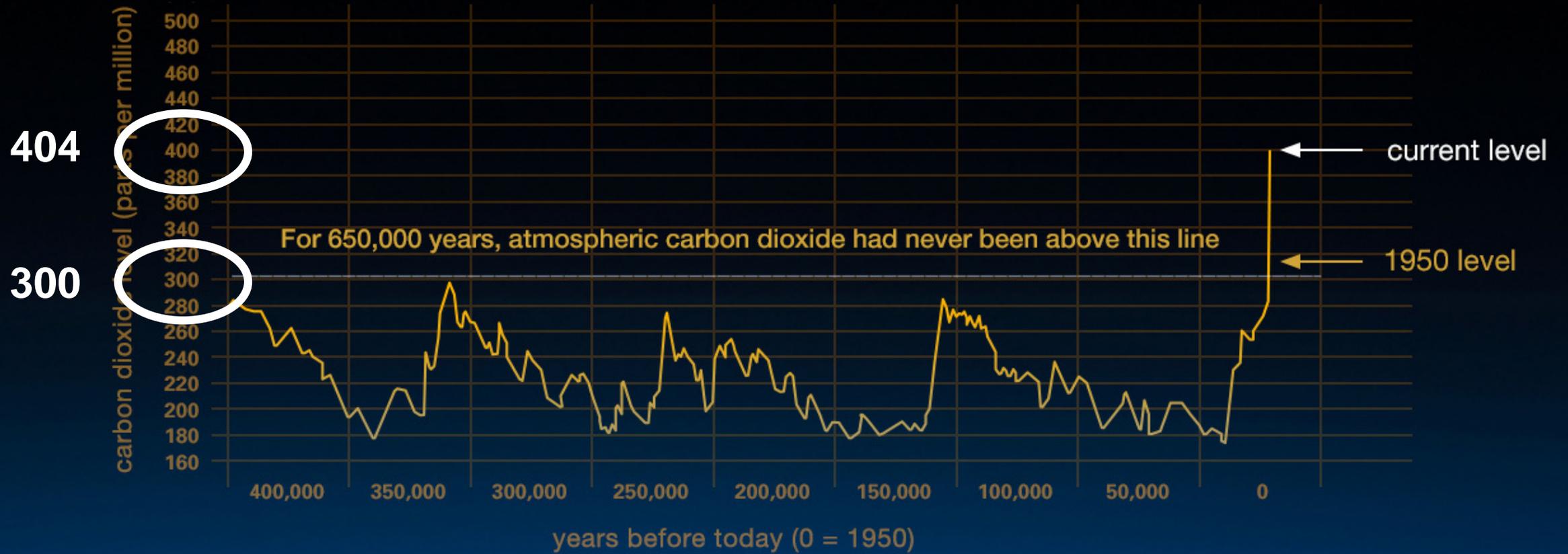
# Agenda

- Welcome, Overview
- Climate Change
- Air Quality
- Clean Energy
- Clean Power Plan Program Design

# Climate Change

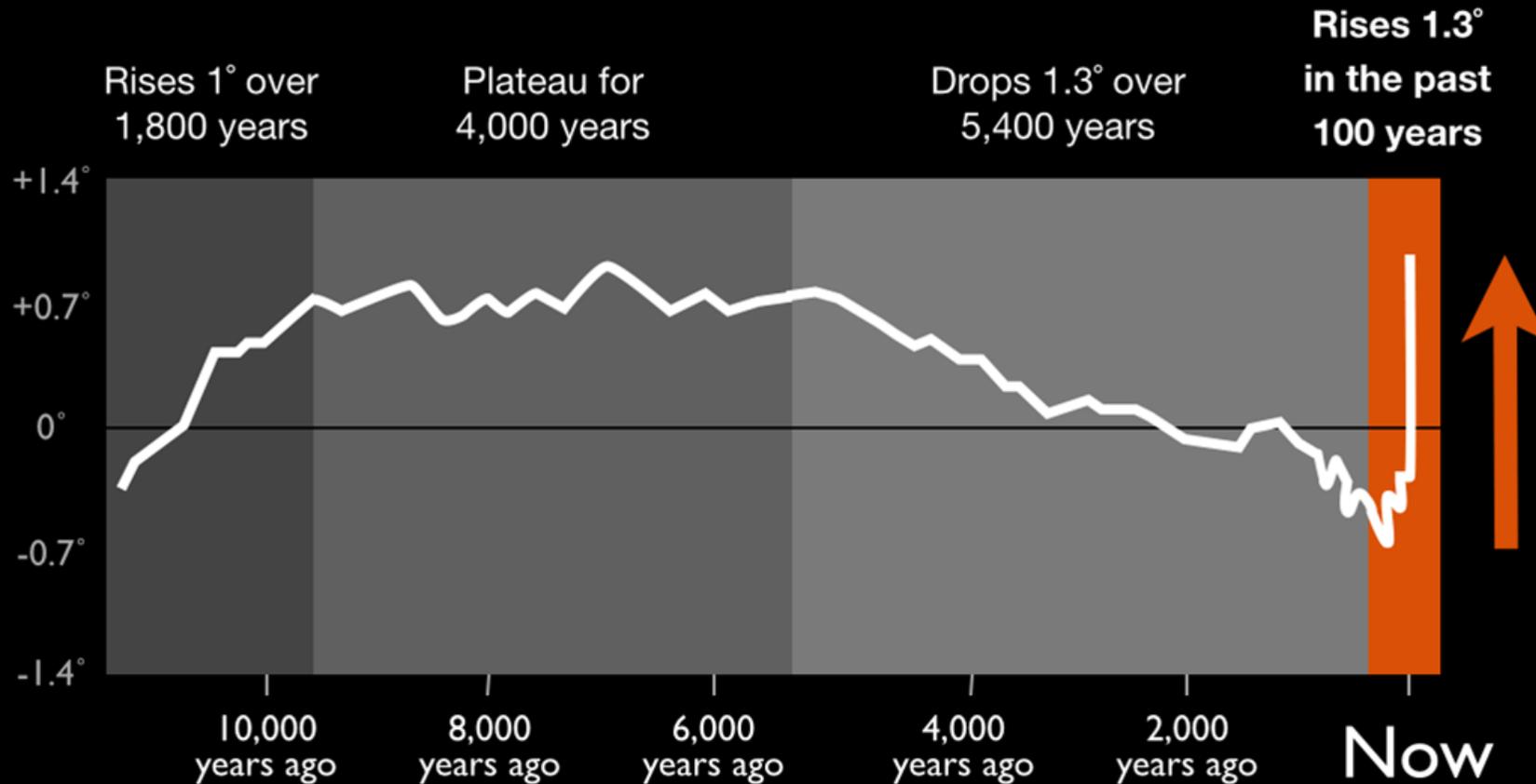
# The greenhouse effect





Credit: Vostok ice core data/J.R. Petit et al.; NOAA  
Mauna Loa CO2 record.

# Change in Global Temperature Over 10,000 years



Source: Marcott et al. 2013

Source: Marcott et al., 2013

# The Earth is warming NOW

- In February 2016 - CO<sub>2</sub> is **404 ppm**
- This is a 30% increase in atmospheric CO<sub>2</sub> since 1880
- 1°C (1.8°F) global temperature rise since 1880
- It's been warming ~0.15 - 0.20°C per decade since 1975
- With no decrease in CO<sub>2</sub> emissions, **at least +2°C**, **possibly +5°C** (3.6 - 9°F) by 2100 (*relative to 1986-2005*)



# New York is warming, too

- Average warming across New York State (1900-2012) = 0.25°F per decade
- Since 1970, +2.4° F warmer annually, +4.4° F warmer in winter
- Increases in annual precipitation in most regions
- More precipitation in winter, less precipitation in summer



## Annual average temperatures, *baseline 1971-2000*

- 2 - 3°F warmer within a decade
- ~10°F warmer by late century
- Most warming in northern NYS
- Summers get intense, winters get mild
- Growing season gets longer



## ***New York State Projections***

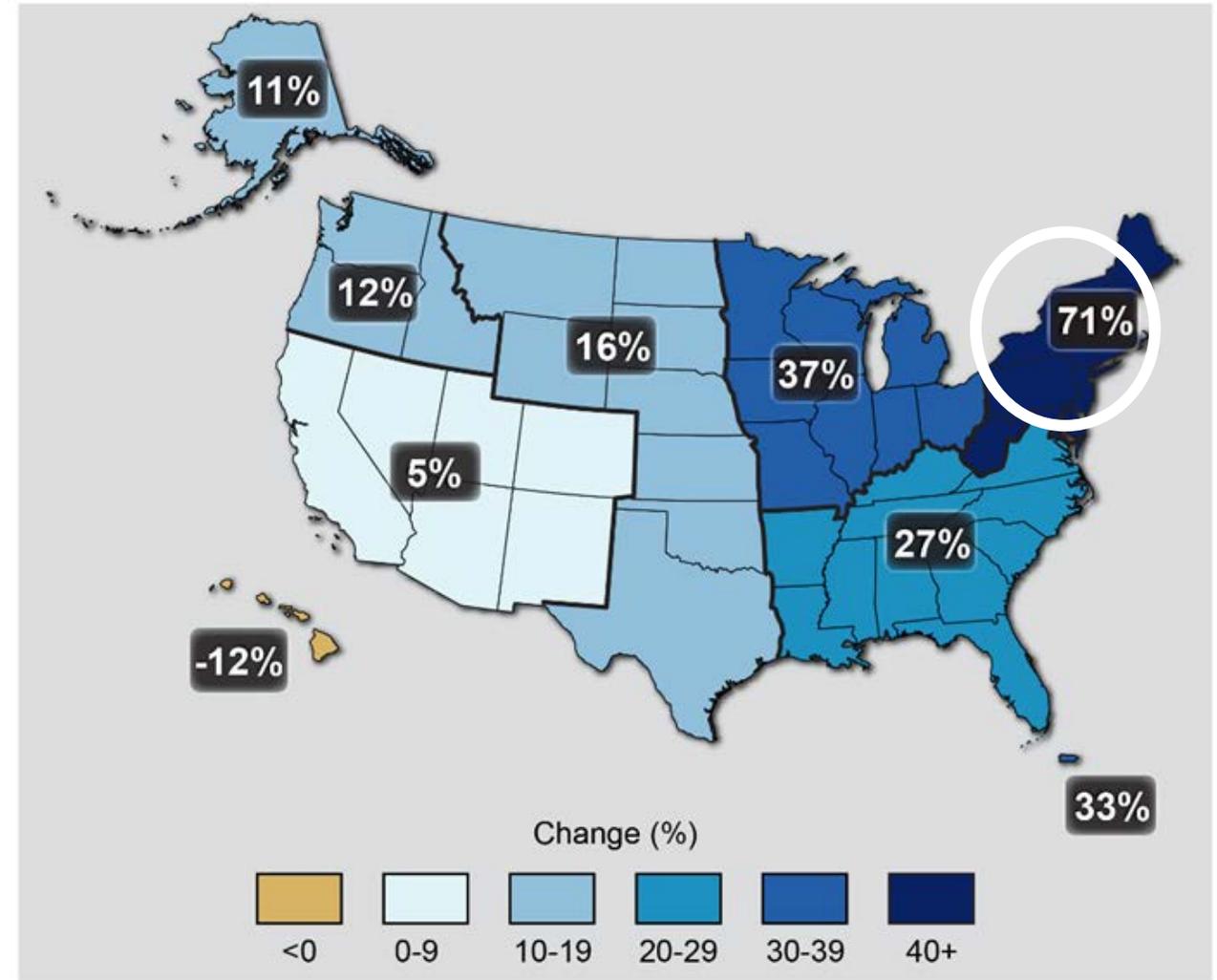


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## Annual regional precipitation, *baseline 1971-2000*

- 1 - 8% more precipitation within a decade
- ~15% more precipitation by late century
- Biggest precipitation increases happen in northern NYS
- Precipitation will happen mostly in winter

Observed Change in Very Heavy Precipitation



# ***New York State Projections***

# Downstate

- Extreme Heat (**days >90°F**)
  - Up to 33 days per year (+83%) within a decade
  - Up to 87 days per year (+300%) by late century
- By mid-century, **days >100°F** are up 1600%; 7 heatwaves per year, averaging 6 days each
- Sea-level Rise (NYC & LI)
  - Up to +10 inches within a decade
  - By 2100 –
    - **6.0 ft (LI)**
    - **6.3 ft (NYC)**



### Climate Change Projected to Worsen Asthma

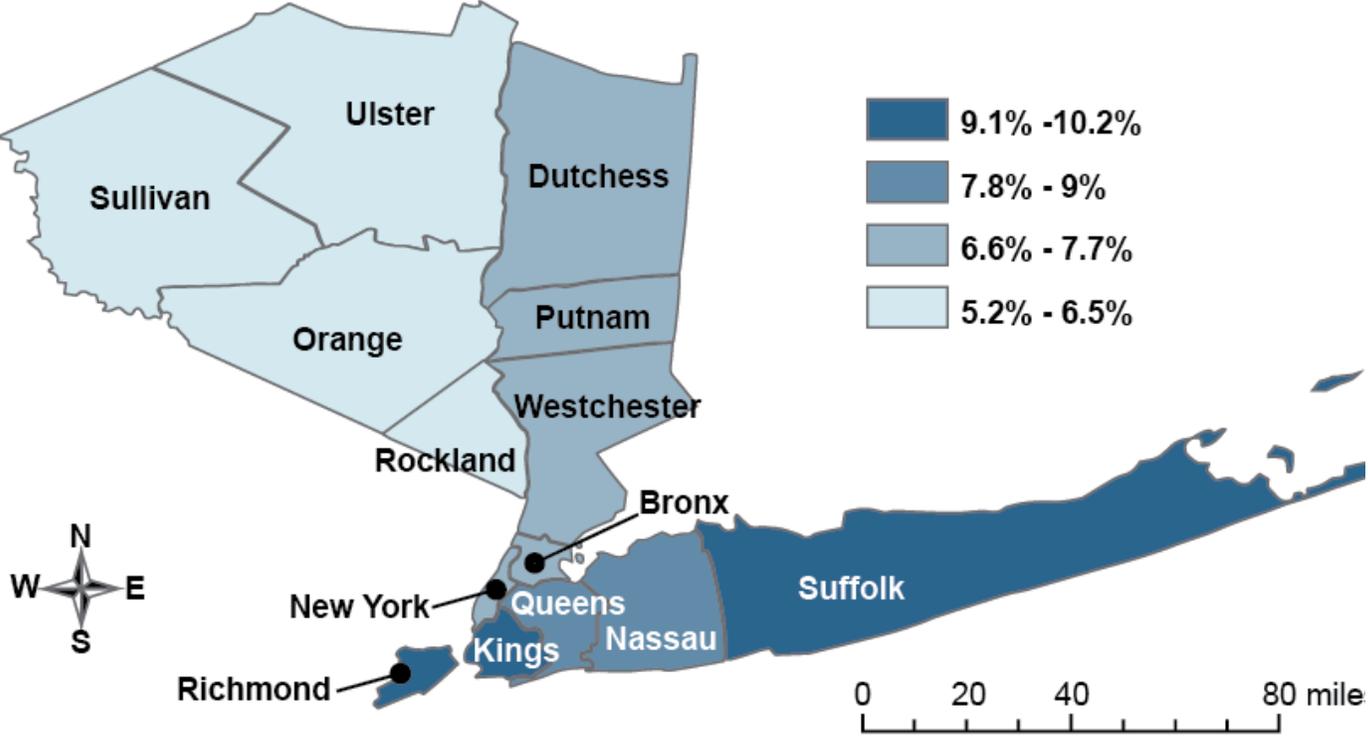
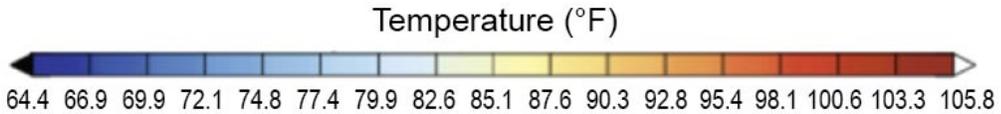
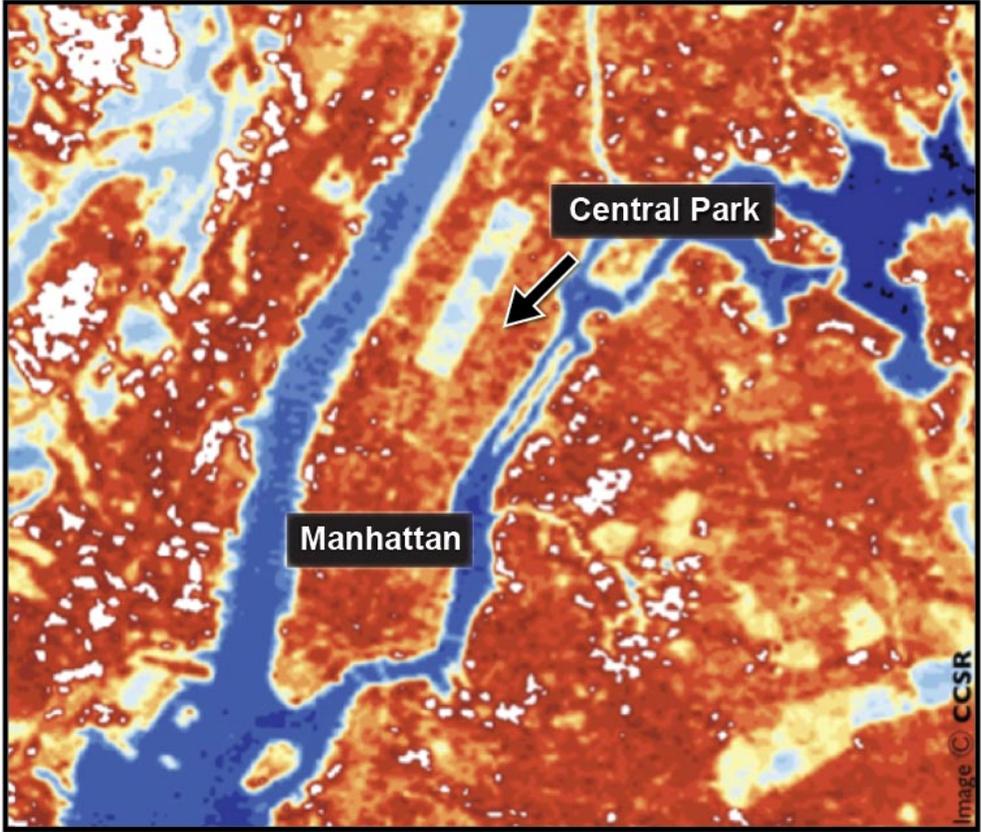


Figure source: Sheffield et al. 2011

Estimated increases in ozone-related emergency room visits for children in the 2020s (compared to the mid-1990s) resulting from climate change-related increases in ozone concentrations

### Urban Heat Island



# Capital District

- Sea-level Rise (SLR) in the Mid-Hudson
  - 2020s – up to 9 inches
  - 2100 – up to 5.9 feet
- Albany w/ 6.0 ft SLR = 1000+ households, 1900+ people with increased flooding
- Troy w/ 6.0 ft SLR = 4000+ households, 7100+ people with increased flooding





Troy, NY



Troy, NY



Albany, NY



Scotia, NY

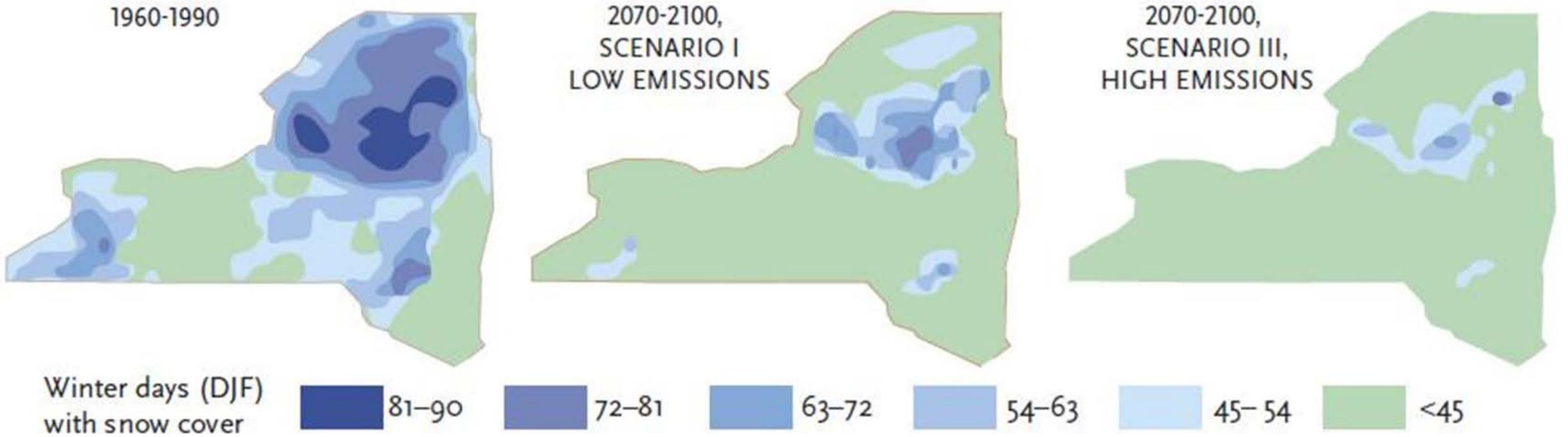
# Upstate

- Less snow cover, more precipitation
- Extreme heat ( $>90^{\circ}$  F)
- Watertown - up to 57 days per year (up from 3) by late century
- Indian Lake - up to 27 days per year (up from 0.3) by late century



East Branch Ausable River watershed

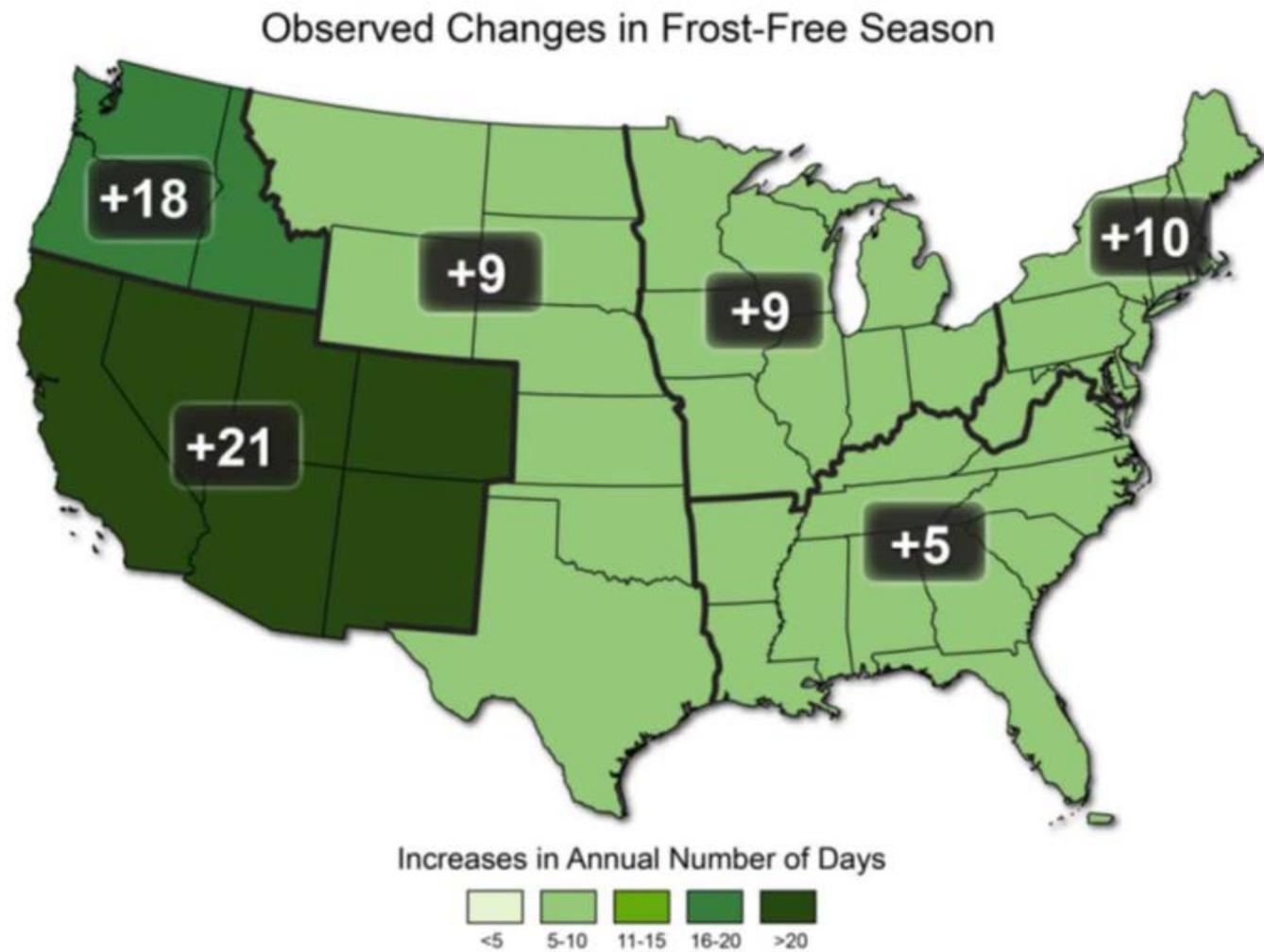
### PREDICTED CHANGES IN WINTER SNOW COVER

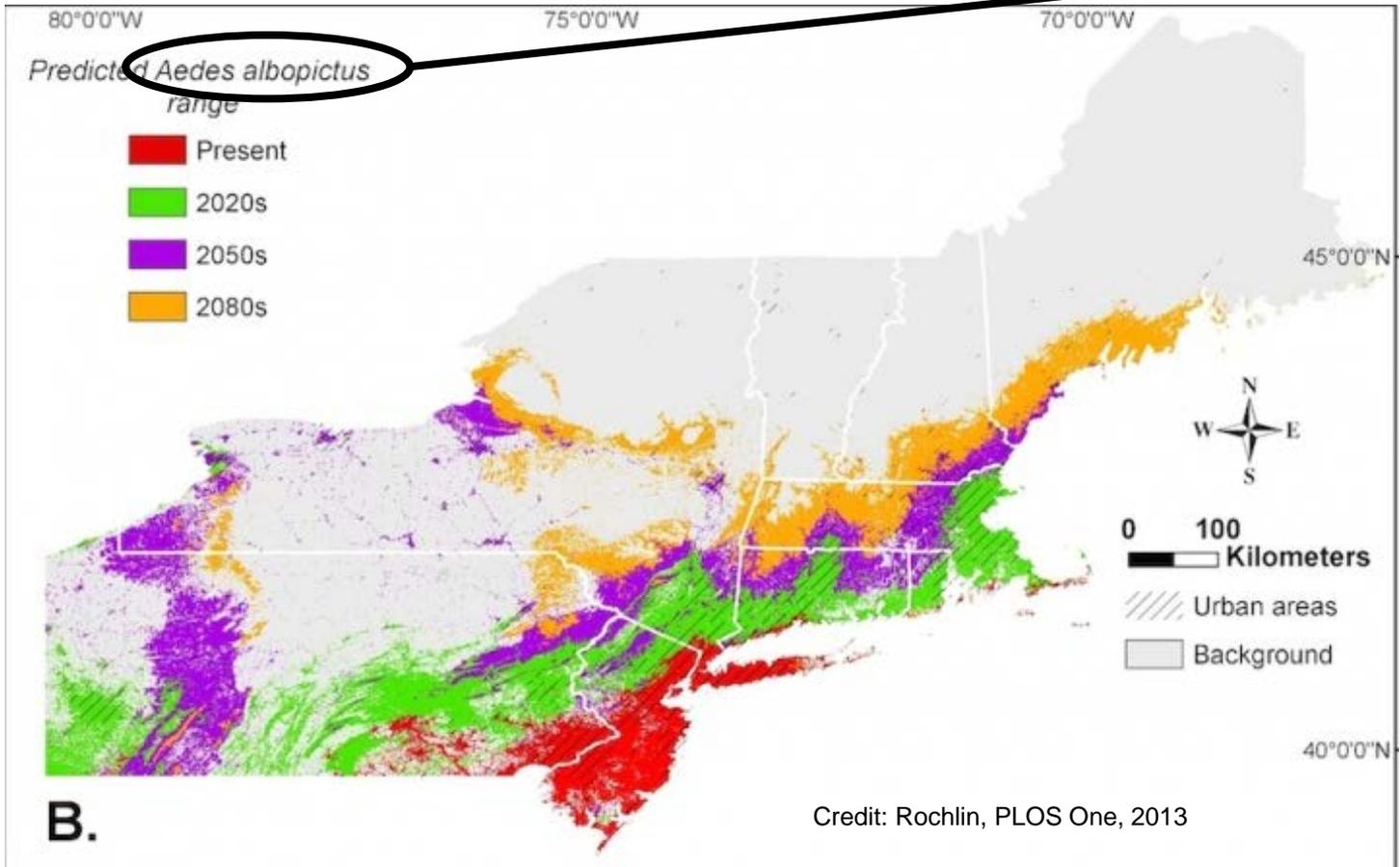


# Western New York

- Effects on agriculture –
  - Heat stress on animals
  - Delayed planting and harvest
  - Reduced yields
  - Early springs = vulnerable plants exposed to frost
- Spread of disease-carrying insects with warmer temperatures
- Lake effect snow is increasing







**Asian tiger mosquito** – a potential vector of encephalitis, dengue (all four serotypes), yellow fever, dog heartworm, and West Nile virus



# Air Quality

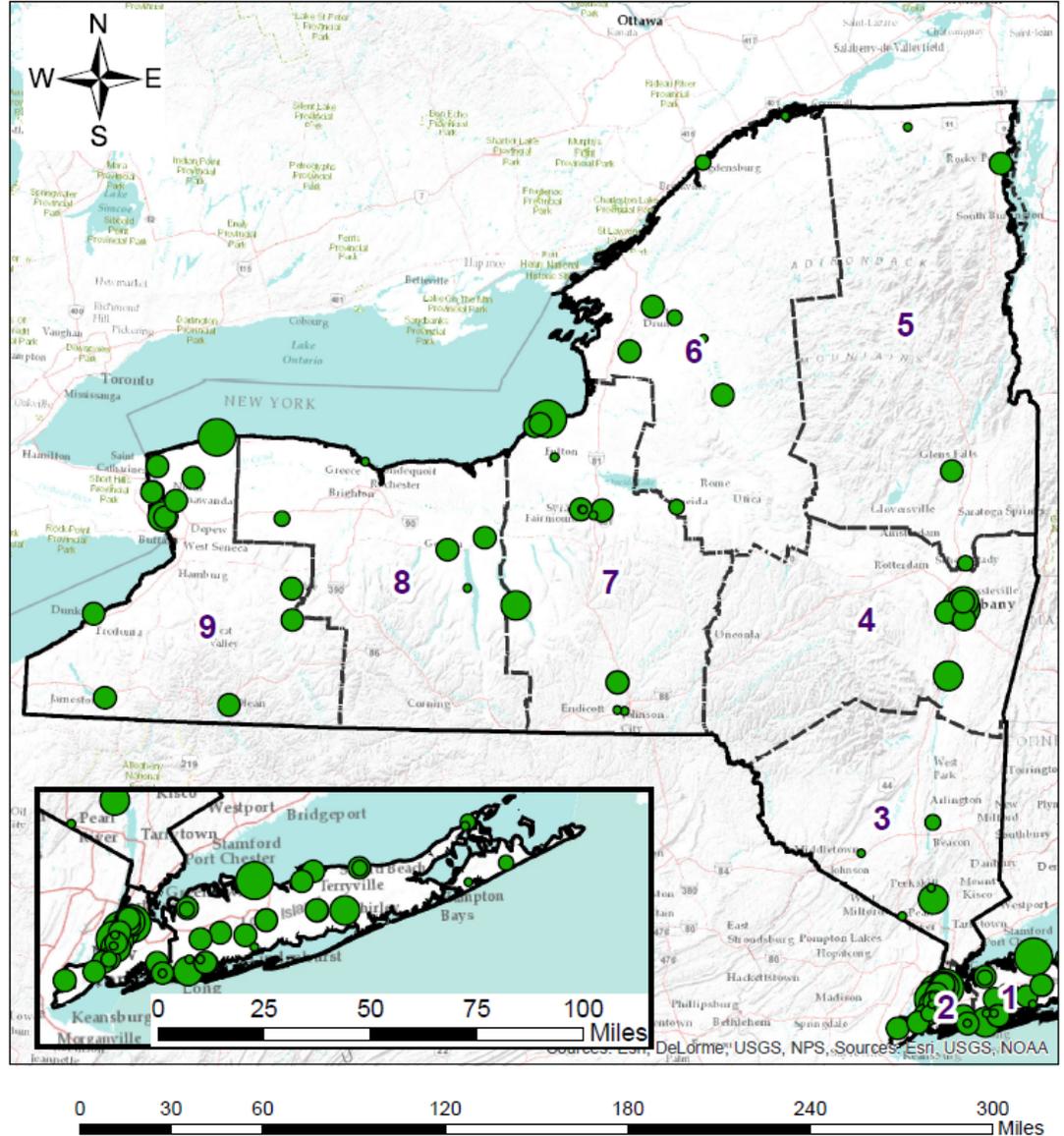
# A Suite of Programs

- Clean Power Plan focuses on carbon dioxide (CO<sub>2</sub>) from power plants
  - RGGI is one in a suite of programs in New York
  - CO<sub>2</sub> has been reduced 45% since 2005 in New York
- Other air programs are reducing “criteria” pollutants
- Opportunities to discuss other air issues.

# Air Quality Perspective

- Reducing CO<sub>2</sub> is helping people worldwide
  - EJ communities are the most vulnerable to heat and storm impacts, so the CO<sub>2</sub> reductions we are achieving are helping these communities
- Reducing criteria pollutants such as nitrogen oxides, sulfur dioxide and particulate matter can have local and regional benefits

# New York State Powerplants Carbon Dioxide Emissions (2014)



**Department of Environmental Conservation**

This map shows the located of power plants and the amount of CO<sub>2</sub> emitted during 2014, the last year for which NYSDEC has data.

New York State has been regulating CO<sub>2</sub> pollution from power plants through a program called the Regional Greenhouse Gas Initiative (RGGI). RGGI is an effort by nine states to work together to promote clean energy, lower greenhouse gas emissions from electric power plants and create savings for electricity customers. Under RGGI and complementary clean energy programs, New York has reduced power plant CO<sub>2</sub> emissions more than 45 percent since 2005.

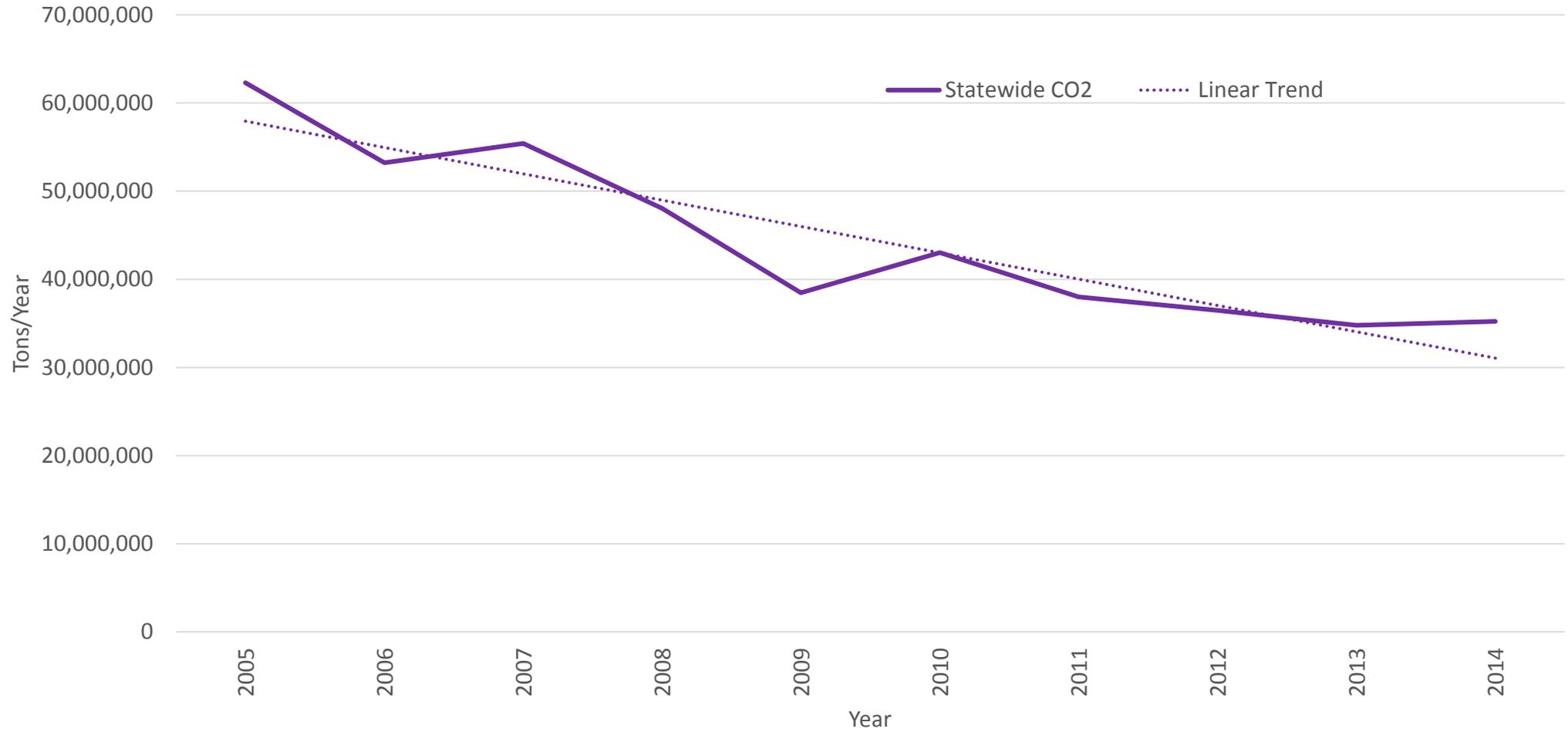
### Legend

- Power Plants**
- 2014\_CO2**
- < 5,000 tons
- 5,000 - 20,000 tons
- 20,000 - 75,000 tons
- 75,000 - 1,500,000 tons
- > 1,500,000
- ▭ DEC Regional Boundary
- ▭ State Boundary

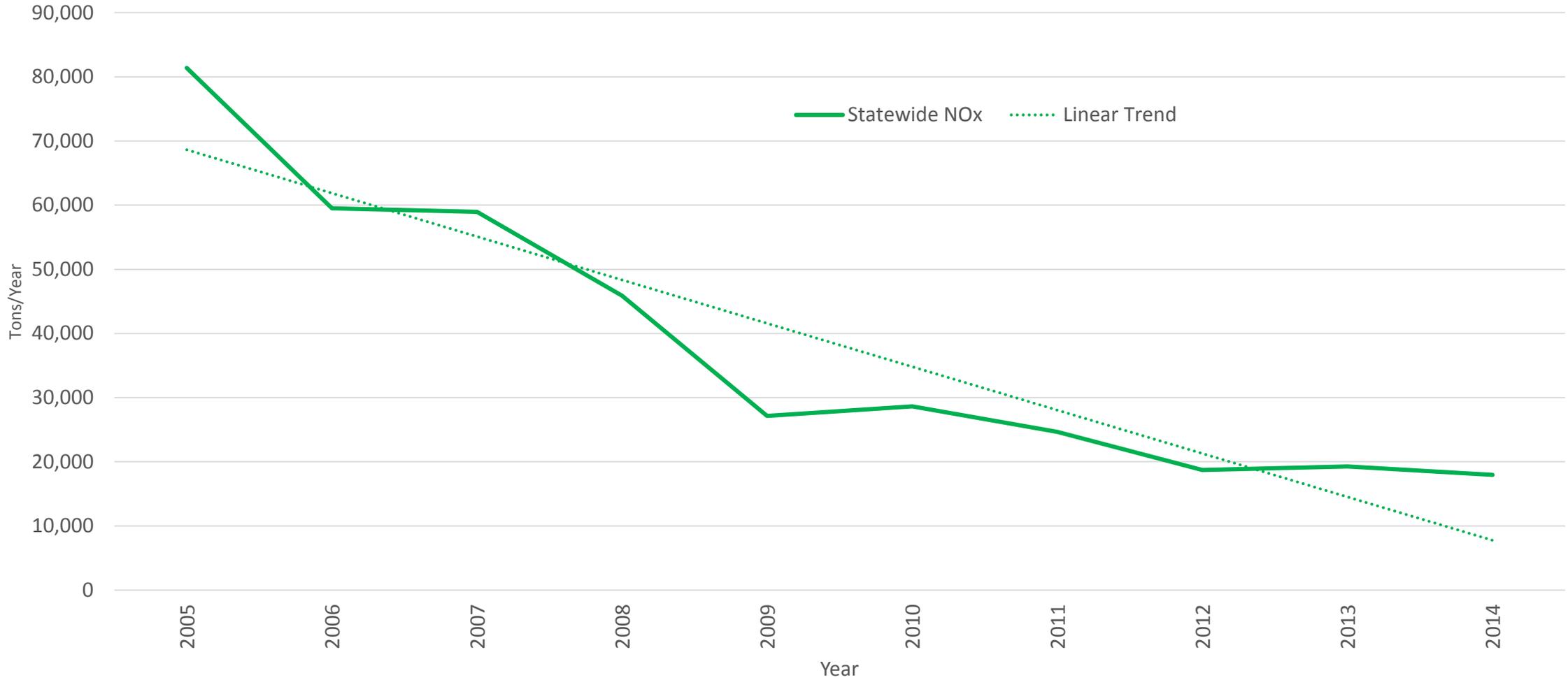


**Department of Environmental Conservation**

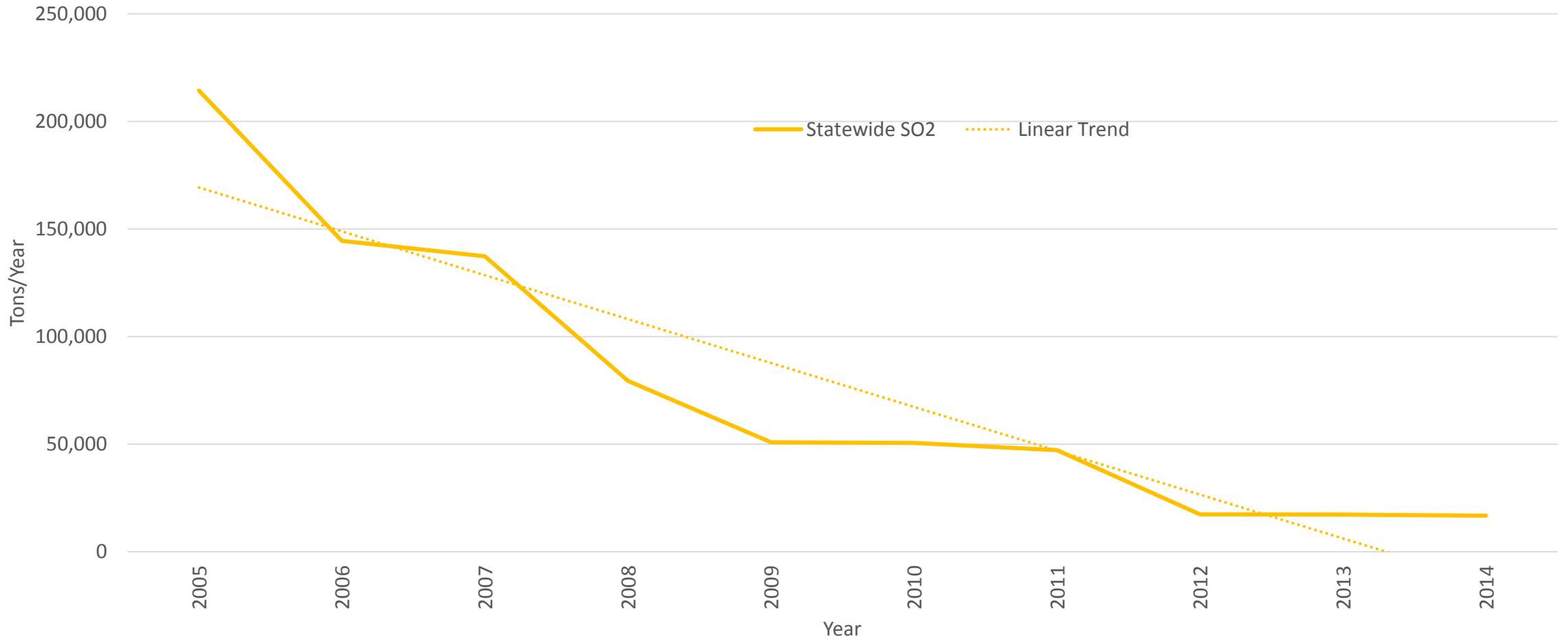
### Statewide CO<sub>2</sub> Emissions (Tons)



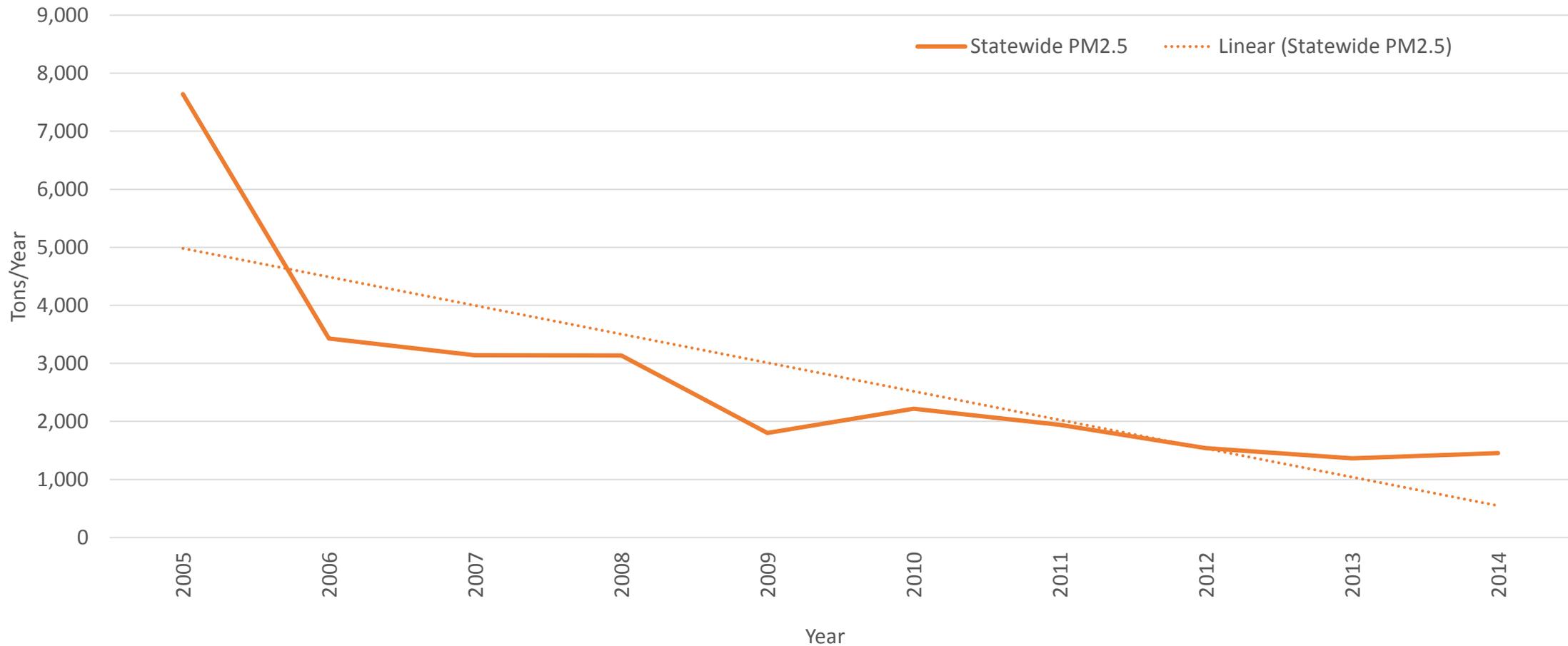
### Statewide NOx Emissions (Tons)



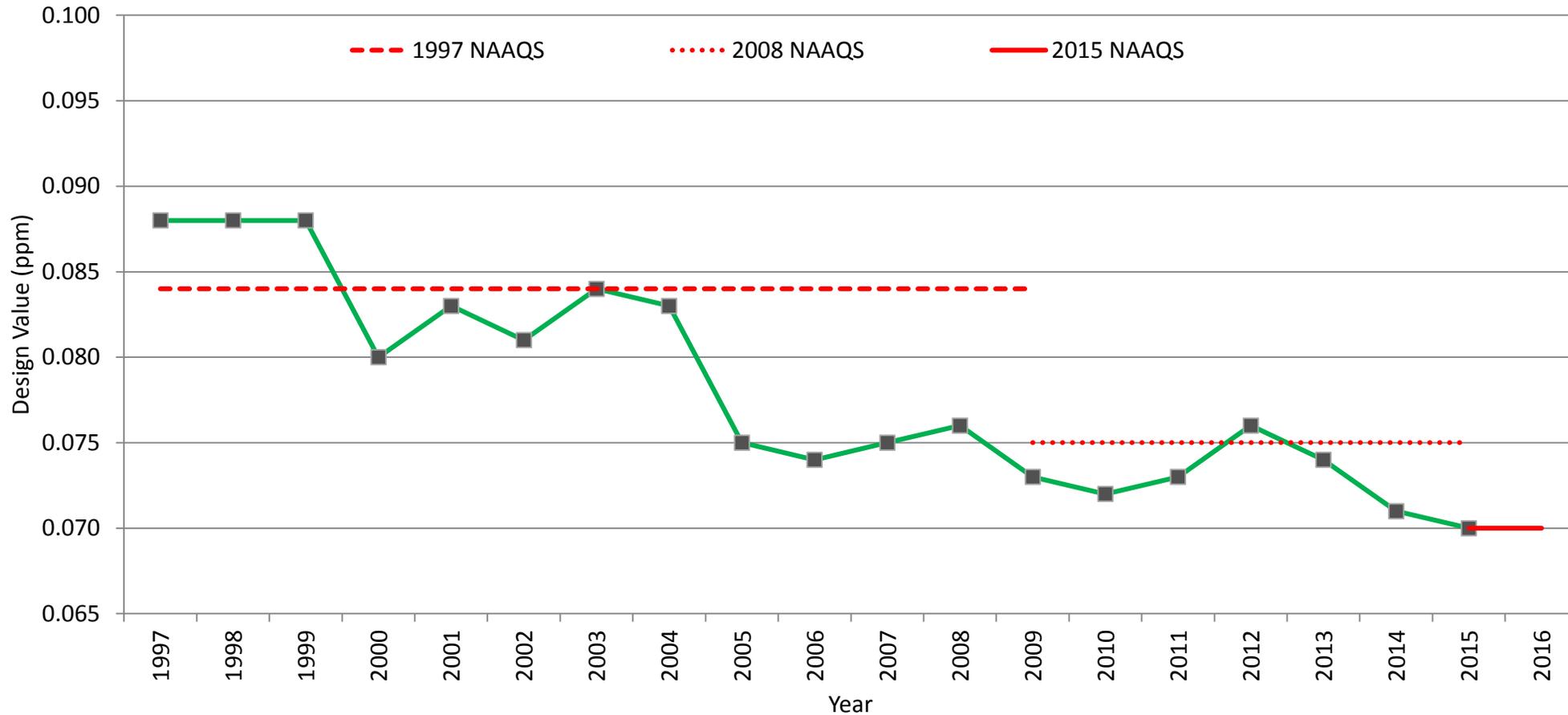
### Statewide SO<sub>2</sub> Emissions (Tons)



## Statewide PM2.5 Emissions (Tons)



### Ozone Trend 1997-2016: Bronx- Pfizer Laboratory



# Clean Energy

# New York Energy Policy and EJ

## The NYS Energy Plan

- Recognizes the potential disproportionate impact on EJ communities from fossil fuel energy generation and transportation infrastructure
- Recognizes LMI consumers potentially pay a disproportionate share of income for energy
- Will increase the State's emphasis on improving energy affordability, and increased deployment of DG in LMI communities

## NYS Energy Policies and Programs serving EJ and LMI

- SBC, EEPS, RPS, Weatherization Assistance Program, transportation programs
- Clean Energy Standard (CES), Reforming the Energy Vision (REV)
- Clean Energy Fund (CEF)
- RGGI



# Energy Policies in NYS

## Clean Energy Standard (CES)

- 50% renewable energy by 2030
- Together with nuclear ensuring NYS gets cleaner power

## Reforming the Energy Vision

- Transforming NY's Energy Market
- Encouraging growth of RE and EE
- Increasing customer choice and participation
- Increasing customer bill savings

# REV programs benefit EJ communities

- Community Choice Aggregation
- Community Net Metering
- Large-Scale Renewables
- Low Income Affordability



# Clean Energy Fund – other statewide programs benefit EJ communities

- \$234.5 million in funding commitment to Low- to- Moderate Income initiatives over the first 3 years
- Includes current incentive programs
  - Single family existing homes (EmPower NY, Assisted HPwES)- \$107.4 million
  - Multifamily existing buildings (Multifamily Performance Program)- \$33.9 million
  - New construction (NY ENERGY STAR Certified Homes and MPP)- \$15.1 million
- Additional activities will include incentives for rooftop and shared solar, the provision of technical assistance, pilots and demonstrations, awareness and education, and a focus on increasing coordination with other state agencies



# Use of RGGI Proceeds

# RGGI Proceeds Support Other Programs

RGGI funds a diverse set of programs, and invests in 5 key approaches to deliver benefits to NYS:

- 1) Reduce GHG's through RE and EE
- 2) Build capacity for long term CO2 reduction
- 3) Empower communities to reduce CO2 and transition to cleaner energy
- 4) Simulate entrepreneurial growth of companies focused on clean energy and CO2 reduction
- 5) Create new financing solutions to encourage CO2 reduction and clean energy adoption



# RGGI Benefits EJ Communities

## Reaching LMI and EJ communities:

GJGNY: engaging LMI and EJ through Constituency Based Outreach Organizations (CBOs) – acting as the point of entry across the suite of RGGI funded Residential Efficiency Services Programs

Empower: Participant referrals come from a variety of sources close to LMI and EJ communities

Community Solar under NY-Sun: developing LMI solar program that will impact EJ communities, Solarize is leveraging GJGNY CBOs to engage EJ communities



# RGGI Benefits EJ Communities, cont.

## Reaching LMI and EJ communities:

Climate Smart Communities/Cleaner Greener Communities: provide technical assistance, and preferential scoring resulting in 25+ projects in EJ communities to date

Climate Research: review of heat wave cooling center locations & flood zone mapping relative to vulnerable populations; studies in progress for 2016 incorporate vulnerable communities concerns

Transportation Research: results in measureable air quality improvements in EJ communities.

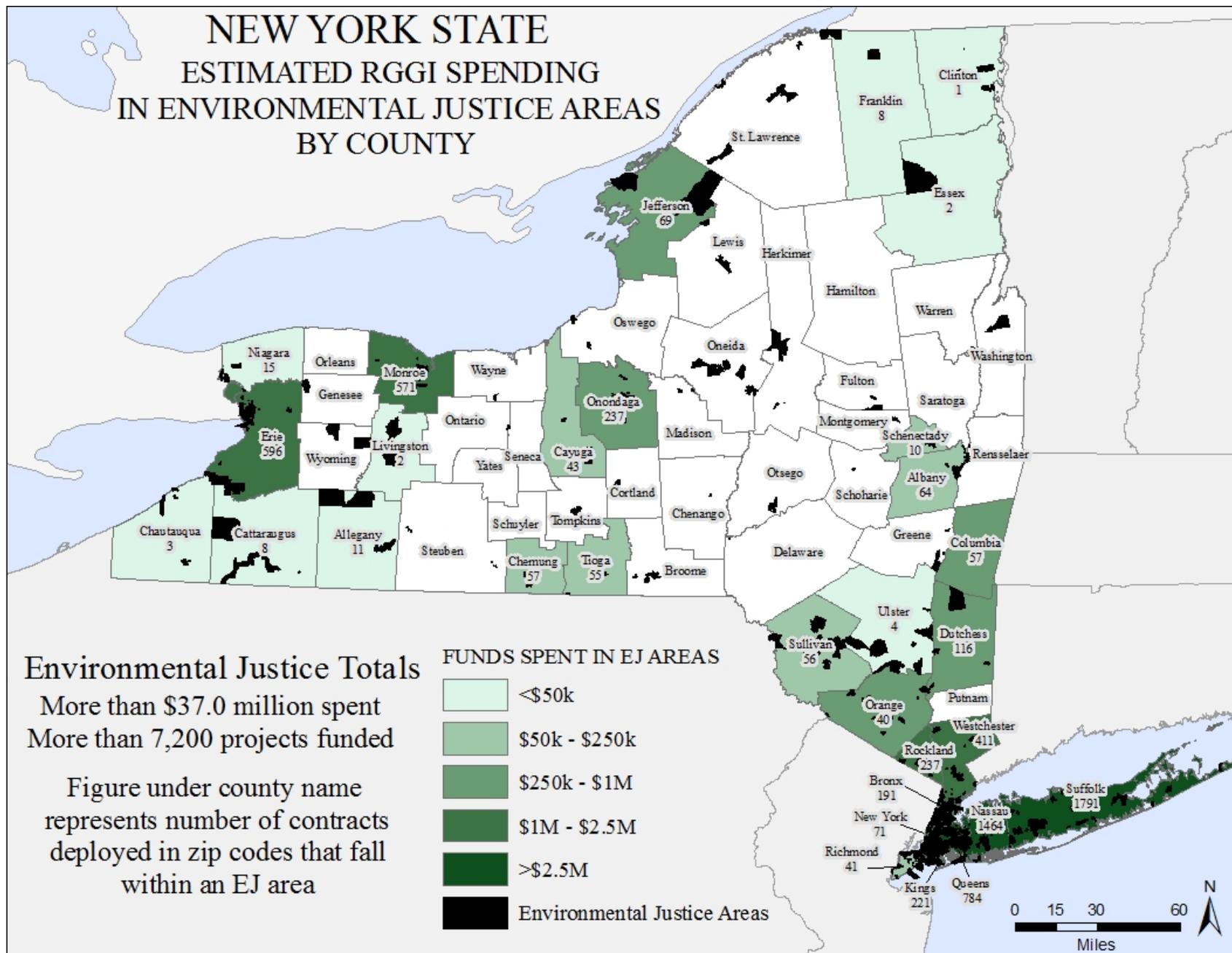


# Estimated Benefits

- Funded more than 7,200 deployment projects in EJ areas
- EJ area projects account for:
  - More than 20% (54,000 MWh) of installed electricity savings,
  - More than 25% (661,000 MMBtu) MWh of of fuel savings , and
  - Approx. 10,000 MWh of renewable energy.
- Significant additional benefits are realized through non-deployment programs



# NEW YORK STATE ESTIMATED RGGI SPENDING IN ENVIRONMENTAL JUSTICE AREAS BY COUNTY



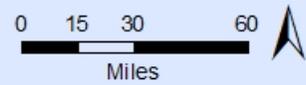
### Environmental Justice Totals

More than \$37.0 million spent  
More than 7,200 projects funded

Figure under county name  
represents number of contracts  
deployed in zip codes that fall  
within an EJ area

FUNDS SPENT IN EJ AREAS

- <\$50k
- \$50k - \$250k
- \$250k - \$1M
- \$1M - \$2.5M
- >\$2.5M
- Environmental Justice Areas



# Clean Power Plan Program Design

# Implementing the CPP in New York

- Carbon dioxide (CO<sub>2</sub>) from large power plants – same as RGGI
- EPA sets goals for each state – New York's goals are similar to RGGI goals
- Different options for plan design – RGGI would be allowed
- Benefits will depend on program design, the energy mix, and other state policies

# Elements of Program Design

- Mass-based, emission standards plan approach
- Other compliance plan approaches
- EPA's goal compared to RGGI
- Expanding emissions trading
- Simple cycle turbines and biomass units
- Existing flexibility mechanisms
- Allocation methodologies
- Including the CEIP



# Clean Energy Incentive Program (CEIP)

- Awards allowances to Renewable Energy projects and Energy Efficiency projects in Low or Moderate Income Communities.
- Allowances can be sold to offset the costs of projects.
- Allowances are intended to equal the amount of CO<sub>2</sub> emissions displaced by the project so there is no net change in CO<sub>2</sub>.

# Key Design Questions

- **How stringent the program should be; should the cap be lowered?**
  - A lower cap means less CO<sub>2</sub> is emitted, and generally would result in burning less fossil fuels overall.
- **Should we continue to include a cost containment reserve (CCR) and/or offsets?**
  - These are flexibility mechanisms that are believed to decrease the volatility of the allowance price. When they are used they allow additional fossil fuels to be burned region-wide.
- **What might be the advantages of broadening the trading market through linking with other programs or expanding to cover additional sources such as transportation?**
  - Trading may increase the stability of allowance prices throughout the trading system. It may allow a more stringent cap to be accepted across the trading region which would result in less fossil fuel burning across the region.



# Thank You

- Comments can be sent to:
- Mike Sheehan
- Chief, Mobile Source and Climate Change Planning, Division of Air Resources
- 625 Broadway, Albany, NY 12233
- [NYCleanPowerDEC@dec.ny.gov](mailto:NYCleanPowerDEC@dec.ny.gov)
- (518) 402-8396

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