



EPA Tools and Resources Webinar: US EPA's Report on the Environment (ROE)

Presented By Scot Hagerthey

Sustainable & Healthy Communities Research Program
National Center for Environmental Assessment (NCEA)
US EPA Office of Research and Development

June 12, 2019

Program and Purpose

The ROE Program provides environmental policy decision makers and others with scientifically defensible, up-to-date, objective and relevant indicator-based *products* that are of *national importance* for protecting human health and the environment.

Report Trends

- Status and trends of the environment and human health represented by 80+ indicators

Develop Indicators

- Develop indicators on important issues to EPA

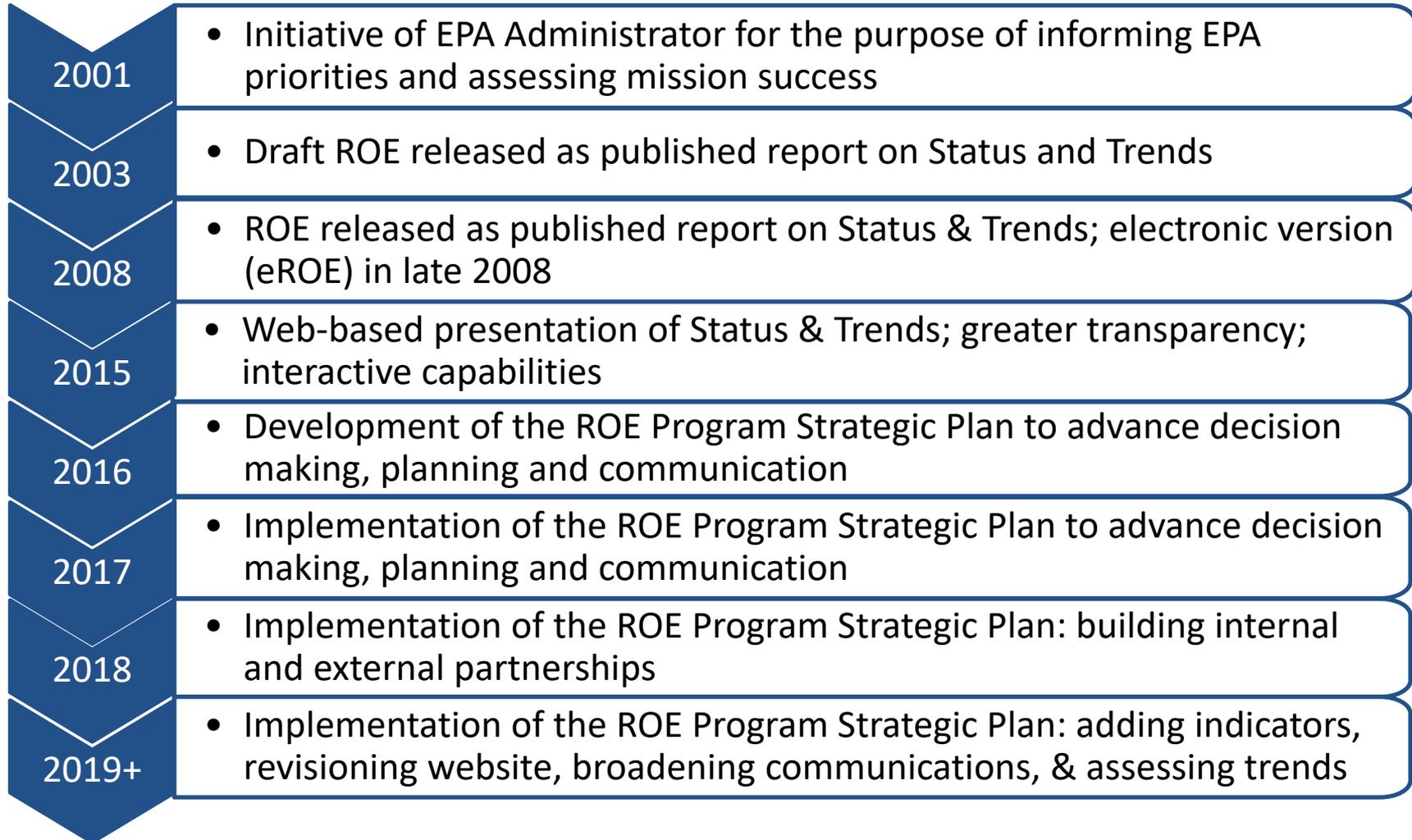
Inform EPA Priorities

- Inform development of Agency activities and priorities

Communicate with Public

- Communicate the state of the nation's environment in an accessible way to the general public

Timeline

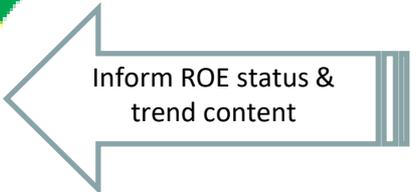
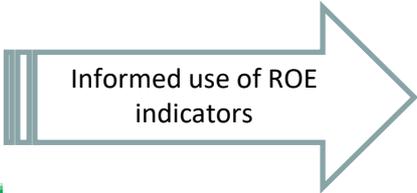
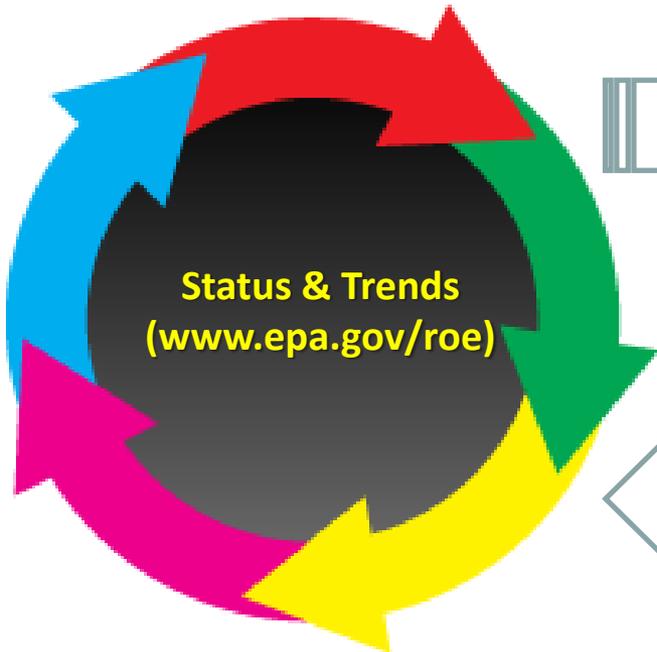


Program Goals

REPORT

PARTNER

ASSESS & COMMUNICATE



Assess and Develop indicators

Assess why trends are happening

Assess the trajectory of trends

Communications

Governance and management



Web Content

Status & Trends, Communications

REPORT ON THE ENVIRONMENT (ROE)

www.epa.gov/roe

- Dynamic web-based platform that describes the national and regional **status and trends** of the environment and human health in the United States
- Currently presents 80+ indicators from EPA, federal agencies and other sources that represent the best available science representative of EPA's mission

Environmental Topics | Laws & Regulations | About EPA | Search EPA.gov

EPA's Report on the Environment (ROE)

CONTACT US | SHARE

What is an ROE Indicator?

EPA's Report on the Environment (ROE) indicators are simple measures that track the state of the environment and human health over time. [Learn about ROE indicators](#)

What's New?

- Find and explore the ROE indicators
- Check out the most recently updated indicators
- Sign up to receive ROE email updates

What is the Report on the Environment?

EPA's Report on the Environment (ROE) shows how the condition of the U.S. environment and human health is changing over time. The purpose of the [ROE indicators](#) is to help answer [22 questions](#) critical to EPA's mission of protecting the environment and human health. Thus, it is a priority of the EPA to provide updates to the ROE indicators frequently to provide the public with the latest available data. The ROE represents the best available indicators of national trends in five theme areas:

Air

- Air in the ROE
 - Outdoor Air Quality
 - Greenhouse Gases
 - Indoor Air Quality

Water

- Water in the ROE
 - Fresh Surface Waters
 - Ground Water
 - Wetlands
 - Coastal Waters
 - Drinking Water
 - Recreational Water
 - Contaminated Sediment

Land

- Land in the ROE
 - Land Cover
 - Land Use
 - Chemicals Used on Land
 - Soils
 - Greenhouse Gases

Human Exposure & Health

- Human Exposure & Health in the ROE

Ecological Condition

- Ecological Condition in the ROE

Learn About the ROE

- Home
- About the ROE
- Sign Up for Updates



Web Content

Indicators: Definition & Criteria

ROE indicators are **numerical values derived from actual measurements of a pressure, state or ambient condition, exposure, or human health or ecological condition**, over a **specified geographic domain**, whose **changes over time** represent or draw attention to underlying trends in the condition of the environment or human health.

- ROE indicators are
 - **Useful, Objective, Transparent and Reproducible**
 - **Vetted through internal and external scientific peer review**

- The underlying data are
 - **Characterized by sound collection, management, and quality assurance (QA) procedures**
 - **Timely and describe changes or trends**
 - **Comparable across time and space**
 - **Representative of the target population**



- Web Content developed in partnership with EPA program and regional offices, federal agencies and other entities
 - EPA programs and others own & curate their data sets
 - EPA ORD manages the web presence and QA

- Maintain strong relationships with partners to ensure timely updates of ROE indicators

- Several new indicators are under review or development for inclusion into the ROE
 - Trends in surface waters - EPA Office of Water, National Aquatic Resource Survey
 - Trends in algal blooms - EPA ORD
 - Trends in pesticides residues in food - EPA Office of Pesticides Program



Web Content Page Content

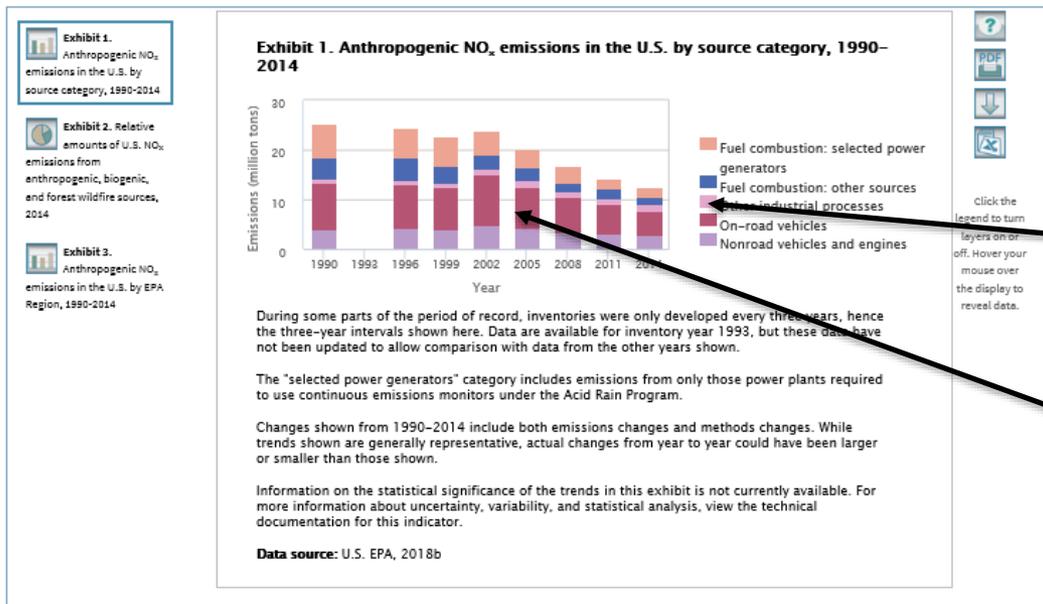
ROE Indicator → Nitrogen Oxides Emissions

Different data displays

Basic data discussion

In depth data discussion

Where to go to get into the weeds



Get the data

Category Toggle

Hover-over data display

Introduction	+
What the Data Show	+
Limitations	+
Data Sources	+

[View Technical Documentation](#) [View References](#)

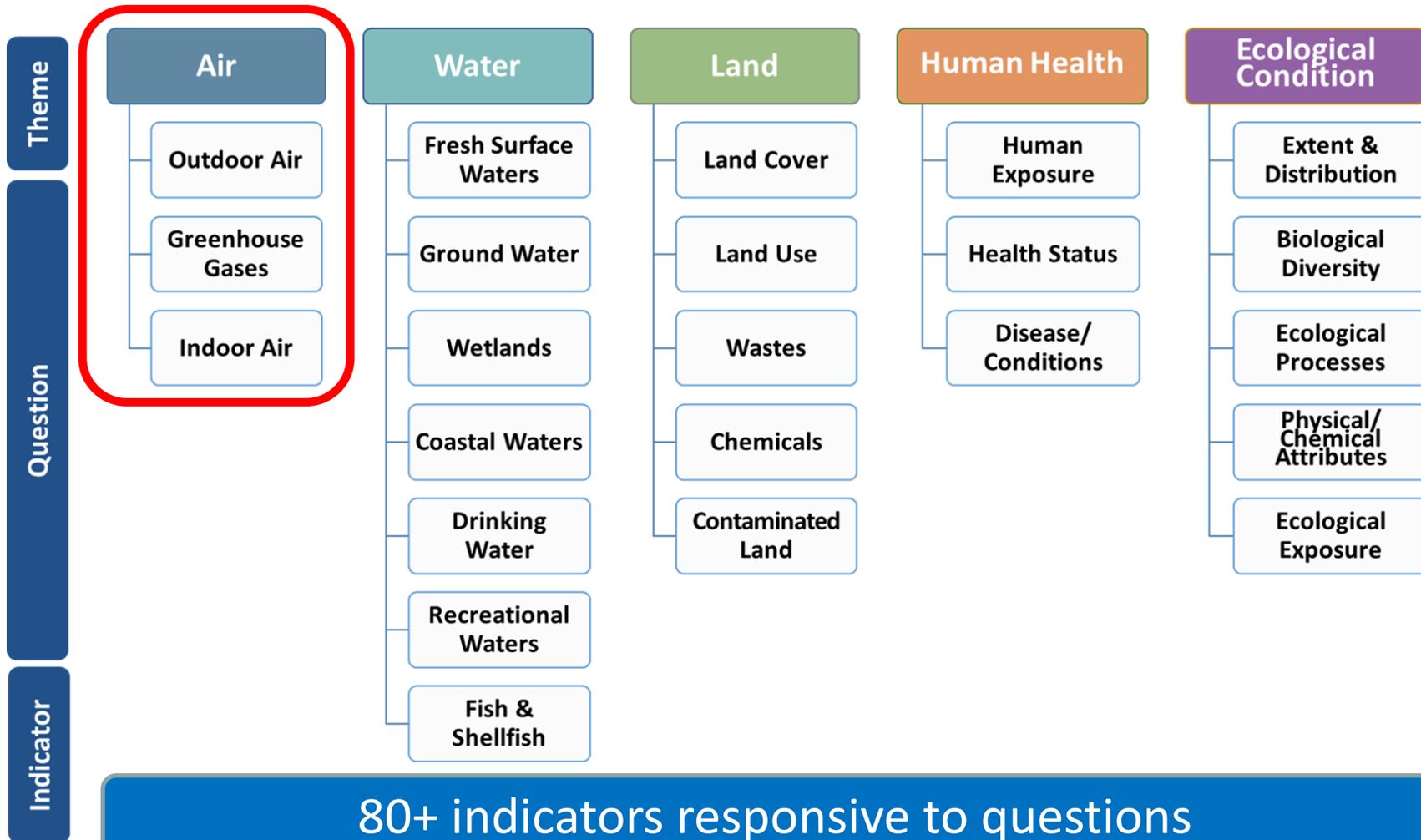
For More Information

- [EPA Emission Inventories](#)
- [EPA Nitrogen Oxides Information](#)
- This indicator relates to the ROE question on [Outdoor Air Quality](#)

This page provides links to non-EPA websites that provide additional information about this topic. You will leave the EPA.gov domain, and EPA cannot attest to the accuracy of information on that non-EPA page. Providing links to a non-EPA website is not an endorsement of the other site or the information it contains by EPA or any of its employees. Also, be aware that the privacy protection provided on the EPA.gov domain (see [Privacy and Security Notice](#)) may not be available at the external link. [EXIT Disclaimer](#)



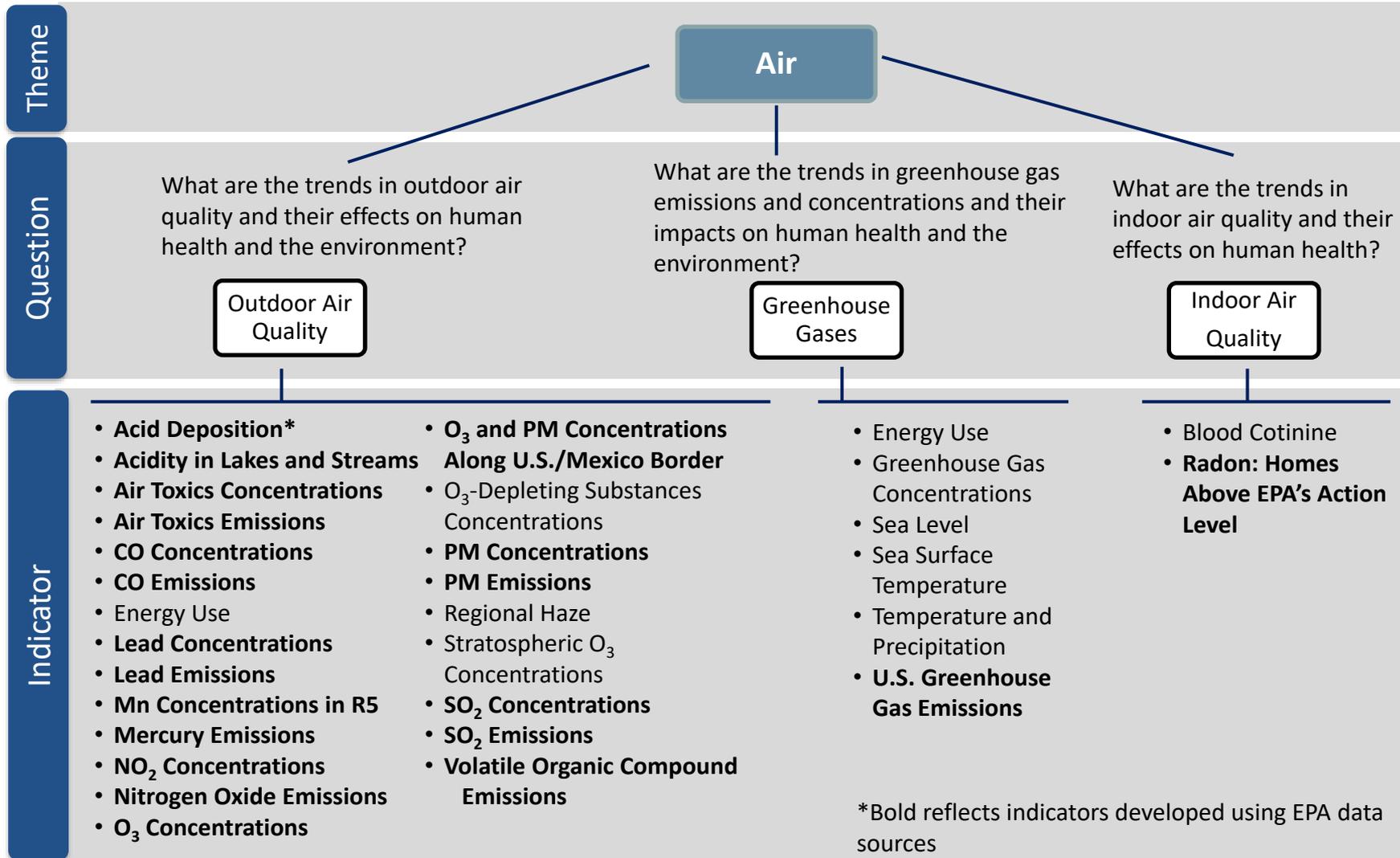
Web Content Indicator Organization



80+ indicators responsive to questions



Web Content Indicator Organization



*Bold reflects indicators developed using EPA data sources



Web Content

2019 Summary Within Theme Trends

	Number of Indicators*	Trend Improving	Trend Worsening	Indeterminate /Same
Air	29	20	6	3
Water	19	3	2	14
Land	12	5	0	7
Human Exposure & Health	20	9	3	8
Ecological Condition	26	4	7	15

Some National Scale Key Takeaways:

- Air quality continues to improve with increases in economic growth
- For streams, rivers and lakes, nutrient levels at the national scale are not decreasing and biological conditions and hypoxia events are not improving
- Lake acidity has decreased in association with reductions in acid deposition and improvements in air quality
- Resource management continues to improve even with increases in resource use

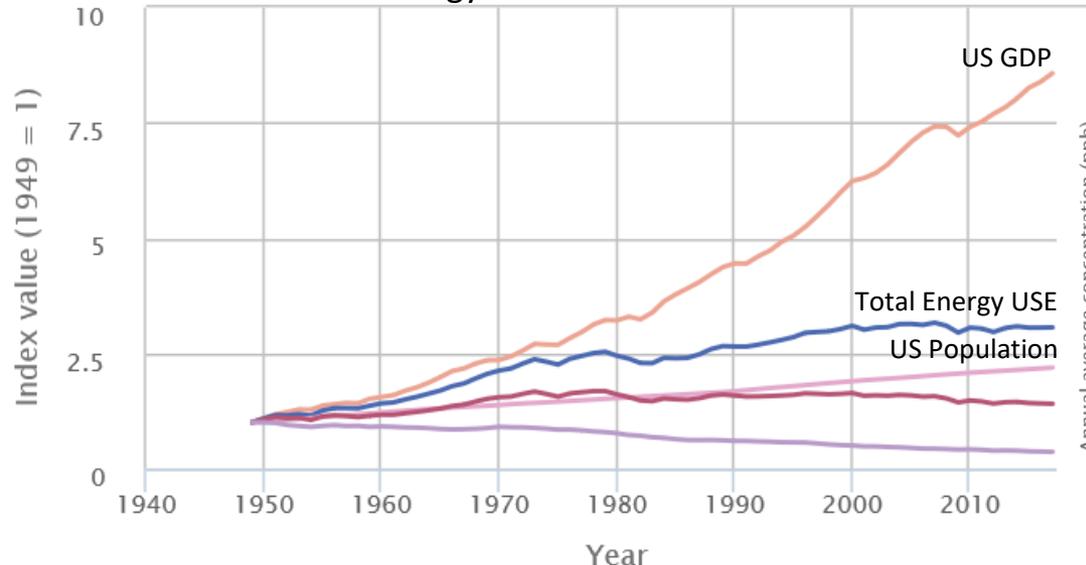


Web Content

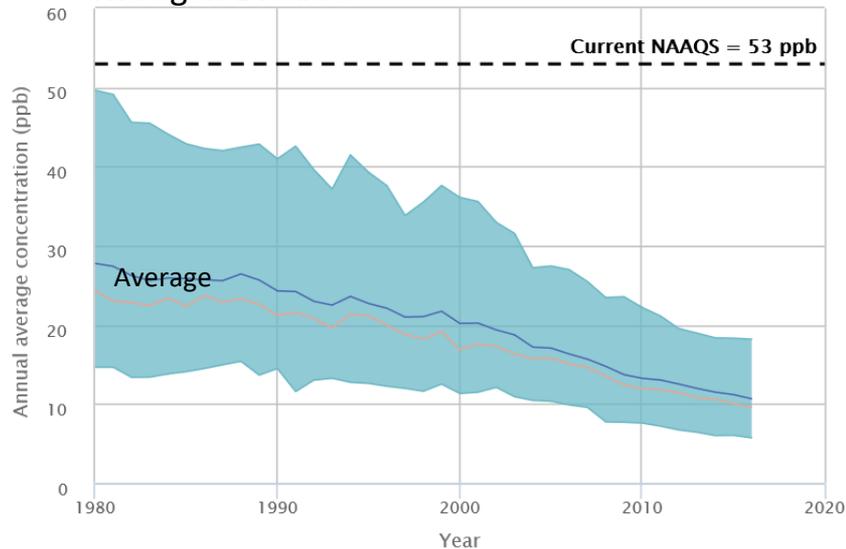
Trends in Air Quality

Air quality continues to improve with increases in economic growth

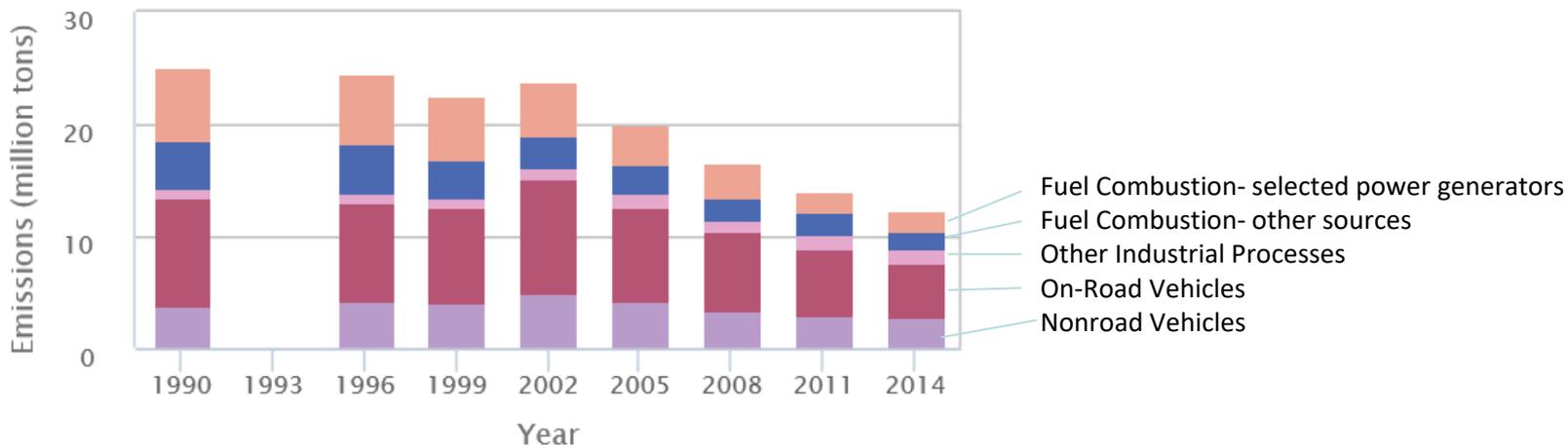
ROE Indicator- Energy Use



ROE Indicator- Ambient Concentrations of Nitrogen Dioxide



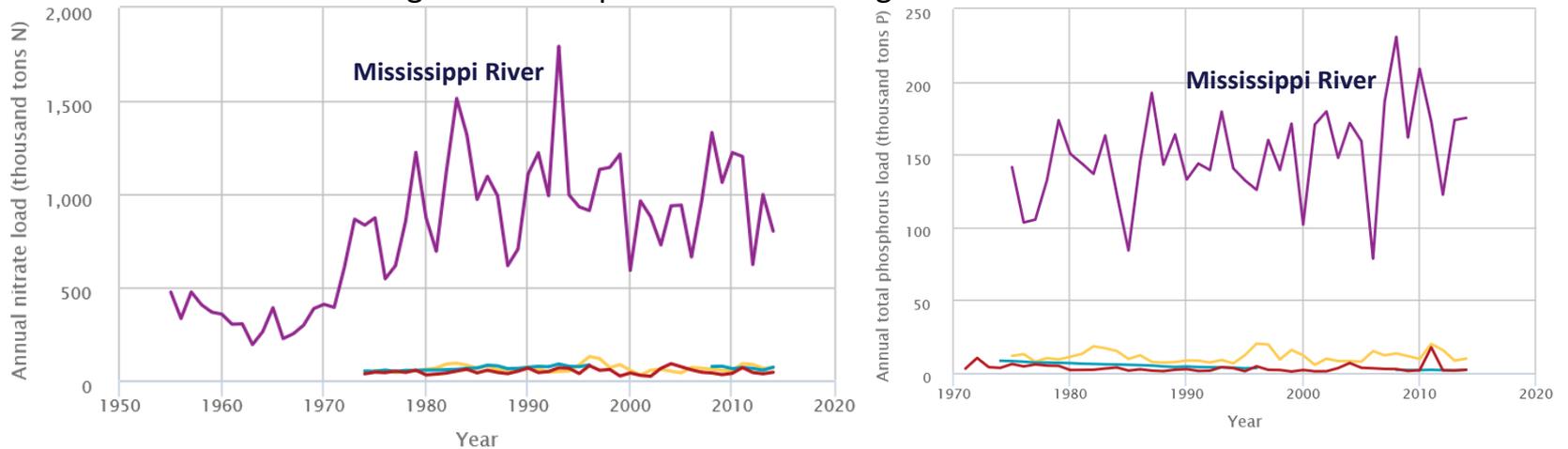
ROE Indicator- Nitrogen Oxides Emissions



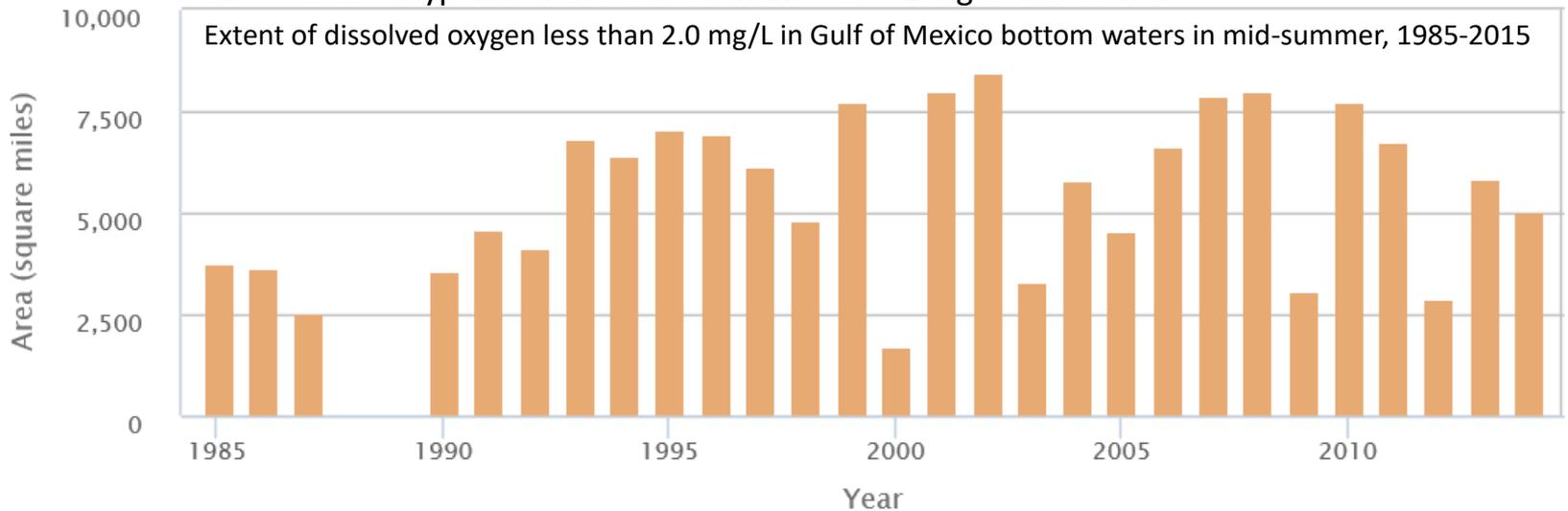


Nutrient levels in large rivers are not decreasing and Gulf of Mexico hypoxia is not improving

ROE Indicator- Nitrogen and Phosphorus Loads in Large Rivers



ROE Indicator- Hypoxia in the Gulf of Mexico and Long Island Sound



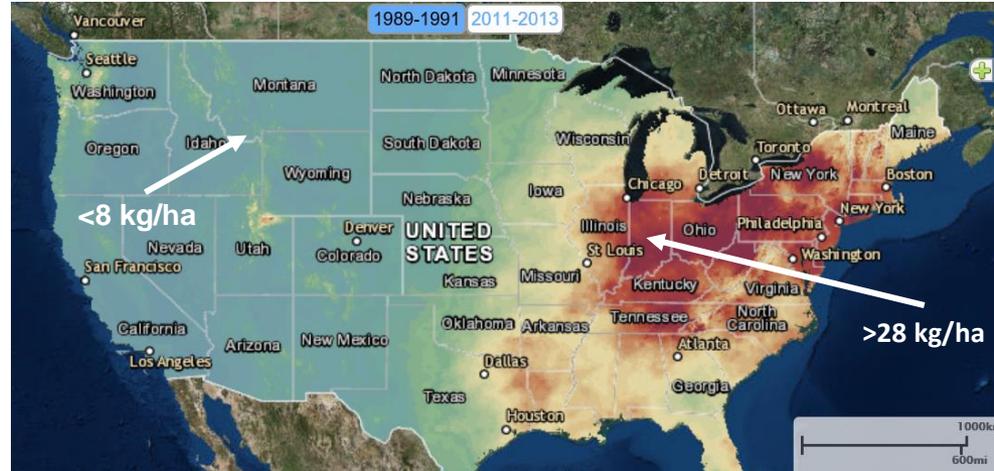


Web Content

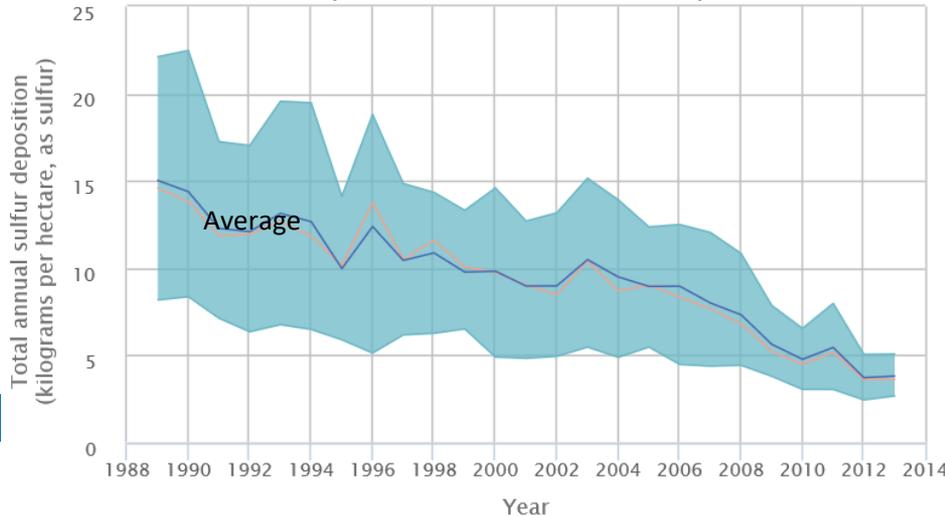
Trends in Water

Lake acidity has decreased in association with reductions in acid deposition and improvements in air quality

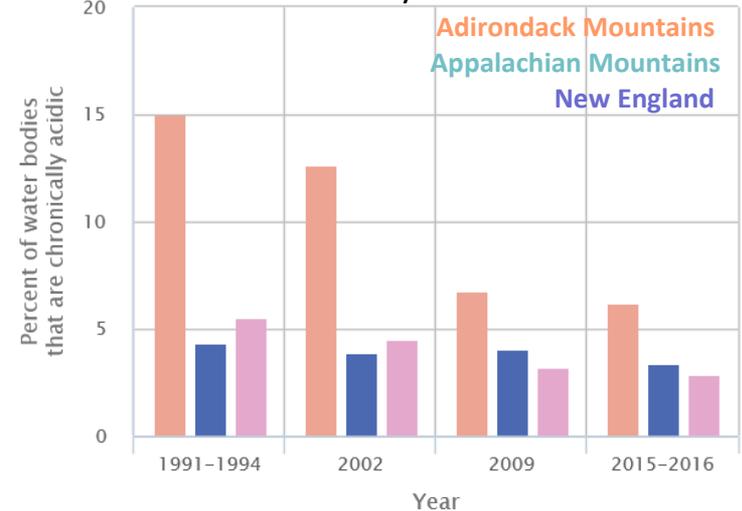
ROE Indicator- Acid Deposition: Wet Sulfate Deposition (1989-1991)



ROE Indicator- Acid Deposition: Total Sulfur Deposition in Eastern US



ROE Indicator- Acidity in Lakes and Streams



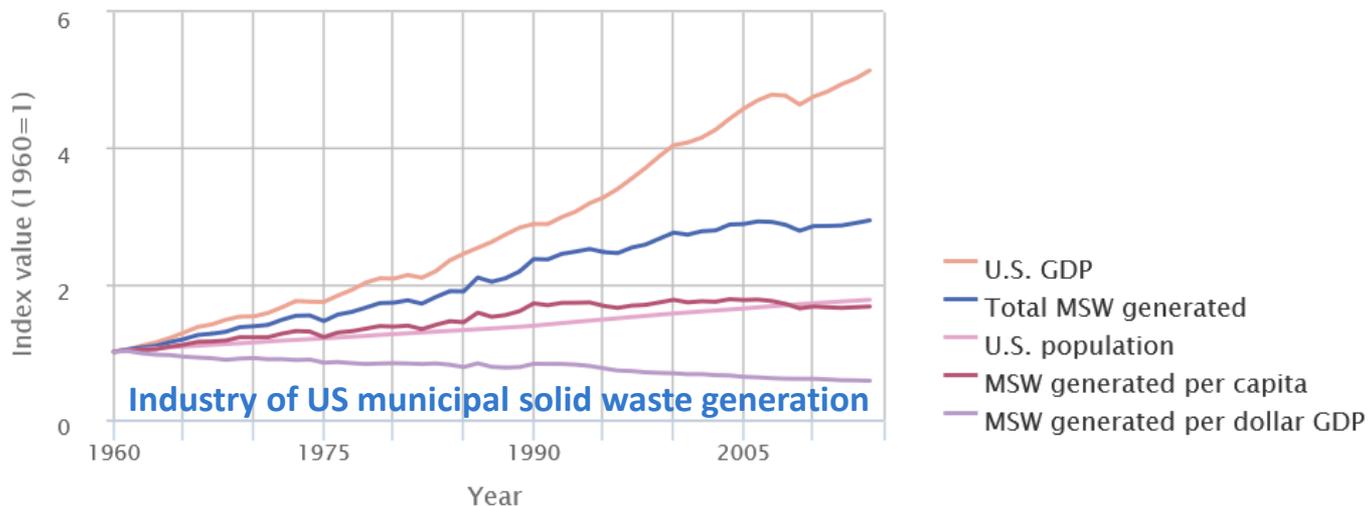


Web Content

Trends in Land

Resource management continues to improve even with increases in resource use

ROE Indicator- Quantity of Municipal Solid Waste Generated and Managed



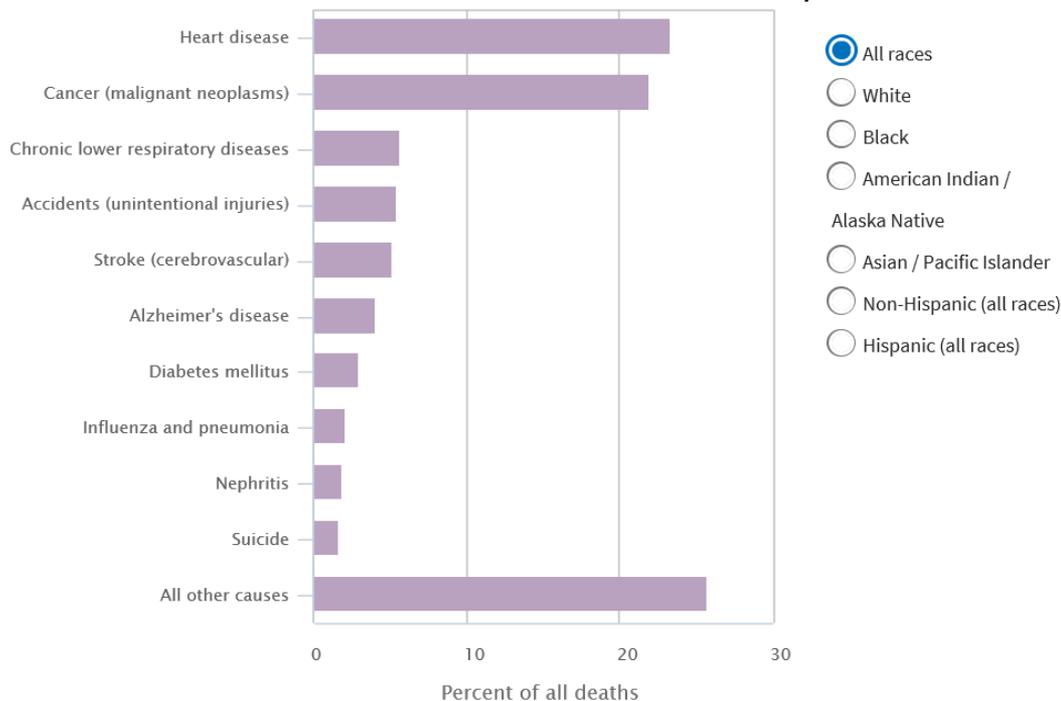


Web Content

Trends in Human Exposure & Health

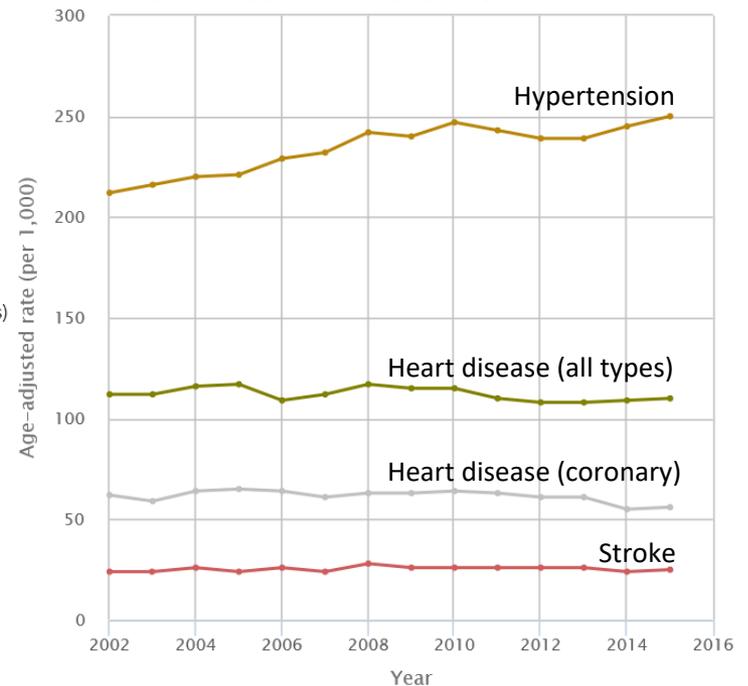
Heart disease is a leading cause of death in the U.S.

ROE Indicator- General Mortality



Leading causes of death in the US

ROE Indicator- Cardiovascular Disease Prevalence and Mortality

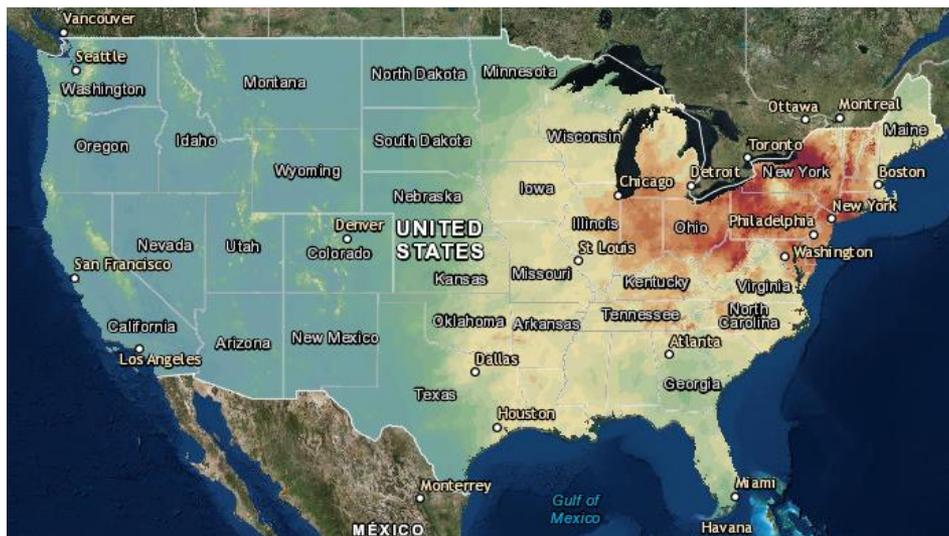


Cardiovascular Disease Prevalence in US Adults (18+ years)



Indicators with State Information

- Acid Deposition (map)
- Acidity in Lakes and Streams (map)
- Fish Faunal Intactness (map)
- Land Cover (map)
- US Homes At or Above EPA's Radon Action Level (map)
- Sea Level (map)
- US and Global Mean Temperature and Precipitation (map)



Wet nitrate deposition in the contiguous US, 1989-1991

Indicators with EPA Regional Info

- Fertilizer Applied Agricultural Purposes
- Air Toxics Emissions
- Ambient Concentrations of Carbon Monoxide
- Carbon Monoxide Emissions
- Cardiovascular Disease Prevalence and Mortality
- Chronic Obstructive Pulmonary Disease Prevalence and Mortality
- Population Served by Community Water Systems with No Reported Violations of Health-Based Standards
- Forest Extent and Type
- Forest Fragmentation
- Land Use
- Nitrogen Oxides Emissions
- Ambient Concentrations of Ozone
- Ambient Concentrations of Particulate Matter
- Particulate Matter Emissions
- Ambient Concentrations of Sulfur Dioxide
- Sulfur Dioxide Emissions
- Volatile Organic Compounds Emissions



Partnerships

Status & Trends, Communications

- Environmental Council of States (ECOS, the national association of state environmental agency leaders) - Environmental Dashboard
- European Environment Agency- State of the Environment Report
- United Nations Environment - Global Environmental Outlook
- United Nations & Department of State - Sustainable Development Goals
- Indicator & Metric Communities of Practice

Engagement with ECOS

- Establish a format for discussing topics of joint interest
 - Indicators
 - Data visualization
 - Product improvement



Engagement with the European Environment Agency

- Establish a format for Webinars on topics of joint interest
- Explore options for use of Citizen Science for Status & Trend reporting
- Development of methods for integration of sustainability assessments
- Development of case studies that illustrate systemic transformations
- Visiting scientists
- Improved translation of science to format useable by decision makers
- Improved global reporting





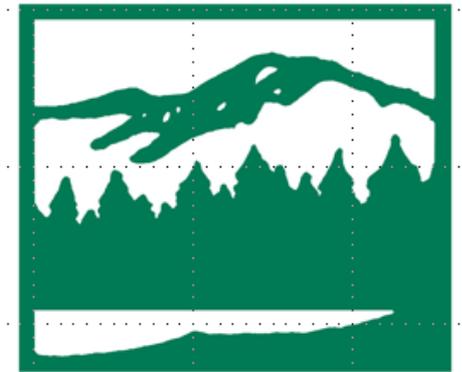
ECOS Results

- State-led effort that illustrates the outcomes of states' efforts to improve public health and the environment
- An interactive web tool displaying state-identified common measures

www.ecosresults.org

Measures

- **Air Healthy to Breathe:** Ambient Air Pollution, Point Source Emissions, Economic Indicators*
- **Less and Properly Managed Waste:** Brownfields, RCRA I Compliance, RCRA C Compliance, RCRA Facilities in Corrective Action, LUST Cleanups
- **Water Clean and Available for All Uses:** Drinking Water, Waterbodies Monitored, Nitrogen and Phosphorus Discharged from Major NPDES Facilities, Wastewater Dischargers Without Significant Non-Compliance, Reduction in Nonpoint Source Pollutants, Investments in Water Infrastructure



E C O S



Moving Forward 2019-2022

- Expand indicator development
- Interpretative – explain reasons for trends
- Ongoing outreach and communication
- Collaboration with national and international partners



Indicator Status & Trends Resources

A Non-Comprehensive List

GLOBAL-Comprehensive Indicator Reports

UN Environment-Global Environment Outlook (GEO)

<https://www.unenvironment.org/global-environment-outlook>

NATIONAL-Comprehensive Indicator Reports

US EPA-Report on the Environment

<https://www.epa.gov/report-environment>

European Environment Agency-State of the Environment Report

<https://www.eea.europa.eu/>

NATIONAL, REGIONAL, STATE, COMMUNITY-Specific Media or Other Indicator Reports

US EPA-AirNow

<https://gispub.epa.gov/airnow/>

US EPA-National Air Toxics Assessment

<https://www.epa.gov/national-air-toxics-assessment>

US EPA-Climate Indicators

<https://www.epa.gov/climate-indicators>

US EPA-America's Children and the Environment

<https://www.epa.gov/ace>

US EPA-National Aquatic Survey

<https://www.epa.gov/national-aquatic-resource-surveys>

US EPA- How's My Waterway

<https://watersgeo.epa.gov/mywaterway/>

US EPA-EnviroAtlas

<https://www.epa.gov/enviroatlas>

US EPA-SmartSectors

<https://www.epa.gov/smartsectors>

US EPA-Safe Drinking Water Information System

<https://www.epa.gov/ground-water-and-drinking-water/safe-drinking-water-information-system-sdwis-federal-reporting>

US EPA-Toxic Release Inventory (TRI) Program

<https://www.epa.gov/toxics-release-inventory-tri-program>

Environmental Council Of States- ECOS Results

<https://www.ecosresults.org/>

CDC-National Center for Health Statistics

<https://www.cdc.gov/nchs/index.htm>

CDC-National Report on Human Exposure to Environmental Chemicals

<https://www.cdc.gov/exposurereport/>

NOAA-National Centers for Environmental Information

<https://www.ncdc.noaa.gov/>

USGS-National Water Information System

<https://waterdata.usgs.gov/nwis/sw>

US Energy Information Administration

<https://www.eia.gov>



Takeaways

- The only resource in the US that provides national status & trends across multiple themes and media
- Interactive, flexible and modular
- Agency resource for scanning outcomes across programs, assessing performance, strategic planning, and interpreting trends
- Public resource that presents outcomes factually without interpretation
- Well-established partnerships with EPA, federal, state and international indicator platforms and assessment organizations



Questions and Feedback

We're interested in learning about your...

- Approaches that utilize indicators to assess status and trends at different scales
- Efforts and approaches that utilize sustainability indicators
- Efforts that incorporate indicators in environmental decision making



Contact Information

Engage with EPA's ROE at
www.epa.gov/report-environment

Michael Slimak, PhD

Director, Sustainable & Healthy Communities Research Program

US EPA Office of Research and Development

slimak.michael@epa.gov

919- 541-1406

Scot Hagerthey, PhD

ROE Project Coordinator

National Center for Environmental Assessment

US EPA Office of Research and Development

hagerthey.scot@epa.gov

202-564-5553

Acknowledgements: NCEA ROE Team Members

Britta Bierwagen; Anna Champlin (communications); Meridith Fry; Janet Gamble; Susan Julius; and Pat Murphy (website)

