

Executive Summary

Overview

The National Air and Radiation Indicators Project (NARIP) is a cooperative agreement between the Office of Air and Radiation (OAR) of the Environmental Protection Agency (U.S. EPA) and the Florida Center for Public Management (FCPM) of Florida State University. The overall objective of NARIP is to establish a process in which parties with differing views (i.e. stakeholders) identify and develop a national set of environmental indicators for air and radiation. These environmental indicators can be used by states, tribes, nongovernmental organizations, the private sector, as well as U.S. EPA and its regions to describe the conditions and trends of air and radiation resources.

To maintain consistency with ongoing environmental planning efforts by U.S. EPA, states, and tribes, NARIP adopted issue areas identified in the draft *Environmental Goals for America* report as a structure for indicator development. Of the 12 currently-proposed goals, six goal areas relating to air and radiation issues formed the basis of indicator development. The six goal areas are:

1. Clean Air;
2. Reducing Global and Transboundary Environmental Risks;
3. Safe Homes, Schools, and Workplaces;
4. Preventing Accidental Releases;
5. Safe Waste Management; and
6. Restoration of Contaminated Sites.

Four working groups composed of state, tribal, nongovernmental, private industry and EPA members were established to develop environmental indicators. Three of the six goal areas (Preventing Accidental Releases; Safe Waste Management; and Restoration of Contaminated Sites) were combined into one working group. Workshops were conducted in September and November, 1996 and January, 1997.

The Context

Increasingly, greater accountability has been placed at the federal and state level to determine how well a program corresponds to its intended purpose and objectives. At the federal level, the Government Performance and Results Act of 1993 requires Federal departments and agencies to prepare strategic plans that include performance information regarding the effectiveness of programs. The development of national goals and milestones that require supporting indicators focuses EPA's efforts on the measurement of explicit environmental results. The emergence of EPA's Office of Planning, Budgeting, and Accountability (PBA) further emphasizes the use of measurement to assess environmental and program results.

The development and use of indicators at the state level has dramatically increased in the last several years. Presently, over 30 states have completed or are in the planning or process stages of indicator projects. Furthermore, states have developed or are in the process of completing environmental reporting documents supported by environmental indicators. The National Environmental Performance Partnership System (NEPPS) process provides the greatest potential for indicators in structuring state agreements with EPA. In addition, the Core Performance Measures process is a cooperative effort by EPA and the states to establish common terminology and measures related to the achievement of national goals and milestones. Environmental indicators provide an additional management tool to assist managers at the federal and state level in focusing on environmental results rather than on traditional administrative, process, and program measures. While the indicators are an important outcome of NARIP, the process undertaken that involves different individuals and agencies is equally as important.

The Process

The issues areas defined in the draft "Environmental Goals for America" report are very broad. To assist in the identification of suitable environmental indicators to measure these broad issue areas, the areas were separated into environmental components or subissues. A subissue should directly reflect the environmental components of the issue area. For example, the issue *Clean Air* does not provide specific direction regarding what indicators should be developed. After extensive discussion by working group members, four subissues for Clean Air were

identified: criteria air pollutants, air toxics, atmospheric deposition, and visibility. These subissues became the framework for the development of indicators.

After identifying the subissues for each issue area, the working groups initiated discussion on indicators that measure the environmental result of the subissue. The definition of an environmental indicator used in this project is: *a direct or indirect measure of environmental quality that can be used to assess status and trends in the environment's ability to support human and ecological health.* An indicator must be explicitly measurable, reliable over time in order to establish trends, and represent the larger issue that is being directly measured. Each indicator selected by the working groups was assessed according to established qualification standards such as geographic scope, and data availability. The final selection of indicators presented in this document is largely a result of decisions made by the working groups and the staff of FCPM.

The environmental indicators selected by the four working groups best describe the status and trends of air and radiation issues in the United States. The indicators provide a useful tool for various management and planning purposes. More specifically, these indicators can serve as a basis for measuring environmental achievements, monitoring the health of an ecosystem within a state, and disseminating environmental information to the public. This indicator system is the beginning of a evolving process of providing the best measures for air and radiation issues. As our knowledge and understanding of these issues changes, indicators will be added and others replaced or deleted, contributing to the continuing improvement of the system.

Indicators Selected by the NARIP Working Groups

National Environmental Goal Project Issue Area: Clean Air

NARIP Subissue Area: Criteria Air Pollutants

- Carbon Monoxide Emissions
- Ambient Concentrations of Carbon Monoxide
- Number of Unhealthy Days for Carbon Monoxide
- Lead Emissions
- Ambient Concentrations of Lead
- Nitrogen Oxide Emissions
- Ambient Concentrations of Nitrogen Dioxide
- Volatile Organic Compound and Nitrogen Oxide Emissions
- Ambient Concentrations of Ozone
- Number of Unhealthy Days for Ozone
- Particulate Matter (PM-10) Emissions
- Ambient Concentrations of Particulate Matter (PM-10)
- Number of Unhealthy Days for Particulate Matter (PM-10)
- Sulfur Dioxide Emissions
- Ambient Concentrations of Sulfur Dioxide
- Number of Areas with Significant Upward or Downward Trends in Ambient Air Quality
- Number of Days with Pollutant Standard Index (PSI) Values Greater Than 100
- Number of People Living in Areas with Air Quality Levels above the National Ambient Air Quality Standards (NAAQS)
- Number of People Living in Areas with Multiple Exceedances of the National Ambient Air Quality Standards (NAAQS)
- Number of Nonattainment Areas
- Vehicle Miles Traveled (VMT)
- Area and Percent of Forest Land Impacted by Ozone Pollution

NARIP Subissue Area: Air Toxics

- Toxic Releases to Air
- Toxic Releases of Selected Toxics (OAQPS Chemical List)
- Toxic Releases of Selected Toxics (33/50 Program Chemical List)
- Relative Hazard of Toxic Releases to Air per Capita
- Ambient Concentrations of Air Toxics

NARIP Subissue Area: Atmospheric Deposition

- Emissions of Sulfur Dioxide
- Emissions of Nitrogen Oxides
- Average Concentrations and Deposition of Sulfur
- Average Concentrations and Deposition of Nitrogen
- Average Concentrations and Deposition of Hydrogen Ion in Precipitation
- Releases of Mercury to Air
- Ambient Concentrations of Mercury
- Area and Percent of Forest Land Impacted by Nitrogen and Sulfur

NARIP Subissue Area: Visibility

- Average Concentrations of Fine Aerosols
- Annual Average Light Extinction
- Annual Average Visibility in Visual Range and Deciview
- Number of “Dirty” Days

National Environmental Goal Project Issue Area: Reducing Global and Transboundary Environmental Risk

NARIP Subissue Area: Climate Change

- Global Carbon Emissions
- U.S. Carbon Emissions
- Atmospheric Concentrations of Carbon Dioxide
- U.S. Methane Emissions
- Atmospheric Concentrations of Methane
- U.S. Nitrous Oxide Emissions
- Atmospheric Mixing Ratios of Nitrous Oxide
- U.S. Emissions of Hydrofluorocarbons, Perfluorocarbons and Sulfur Hexafluoride
- Greenhouse Climate Response Index
- Changes in Sea Level

NARIP Subissue Area: Stratospheric Ozone Depletion

- U.S. Emissions of Selected Ozone-Depleting Substances
- Atmospheric Concentrations of Selected Ozone-Depleting Substances
- U.S. Production of Selected Ozone-Depleting Substances
- Stratospheric Ozone Concentrations
- Stratospheric Chlorine Concentrations
- UV-B Radiation Levels

NARIP Subissue Area: Critical Pollutants

No Indicators Selected

NARIP Subissue Area: Ambient Radiation

- Global Concentrations of Gross Gamma Radiation
- Concentrations of Gross Beta in Airborne Particulates
- Concentrations of Gross Beta and Specific Gamma in Precipitation
- Concentrations of Radionuclides in Milk
- Concentrations of Tritium in Surface Water and Drinking Water

National Environmental Goal Project Issue Area: Safe Homes, Schools and Work Places

NARIP Subissue Area: Residential Radon

- Number of Homes Built with Radon Resistant Features
- Number of Radon Mitigations
- Number of Homes Tested for Radon

NARIP Subissue Area: Environmental Tobacco Smoke (ETS)

- Number of Children Exposed to ETS in Their Homes
- Number of People Exposed to ETS in Their Homes
- Percent of Workers Covered by Workplace Smoking Policies
- Number of Local Smoking Ordinances

NARIP Subissue Area: Asthma

No Indicators Selected

NARIP Subissue Area: Carbon Monoxide

- Number of Deaths Attributable to Unintentional Exposure to CO

NARIP Subissue Area: Biologicals

- Number of Reported Cases Of Legionnaires' Disease

NARIP Subissue Area: Lead

- Blood Lead Levels in Children

NARIP Subissue Area: Large Buildings

- Notice of 1st Injury Related to Indoor Air Quality in Large Buildings

NARIP Subissue Area: Schools

- Notice of 1st Injury Related to Indoor Air Quality in Schools

NARIP Subissue Area: Volatile Organic Compounds (VOCs)

No Indicators Selected

National Environmental Goal Project Issue Area: Preventing Accidental Releases

NARIP Subissue Area: Accidental Releases

- Number of Annual Accidental Releases to Air
- Annual Quantities Accidentally Released to Air
- Annual Deaths, Injuries, and Evacuations Reported from Accidental Releases to Air
- Number and Quantity of Accidental Releases of Radioactive Materials to All Media

National Environmental Goal Project Issue Area: Safe Waste Management

NARIP Subissue Area: Waste and Materials Management

Environmental Issue Context

- Volume and Radioactivity of Low-level Waste
- Cumulative Volume and Radioactivity of High-level Waste, Excluding Spent Nuclear Fuel
- Volume and Radioactivity of Spent Nuclear Fuel Discharged
- Volume and Radioactivity of Transuranic Waste Stored
- Quantity of Hazardous Waste Incinerated

- Emissions from Waste Incinerators
- Releases of Methane from Landfill Facilities

National Environmental Goal Project Issue Area: Restoration of Contaminated Sites

No Indicators Selected