Iowa Fine Particulate Monitoring Network Design Values

2000-2002

Iowa DNR
Ambient Air Monitoring Group

What are National Ambient Air Quality Standards?

The EPA uses six "criteria pollutants" as indicators of air quality, and has established for each of them a maximum concentration above which adverse effects on human health may occur. These threshold concentrations are called National Ambient Air Quality Standards (NAAQS). When an area does not meet the air quality standard for one of the criteria pollutants, it may be subject to the formal rule-making process which designates it as nonattainment. The six criteria pollutants are:

Ozone	**Sulfur dioxide**
Lead	**Carbon monoxide**
Nitrogen Dioxide	**Particulate Matter**

The particulate matter standard encompasses two classifications according to the size of the particulate, **PM10** and **PM2.5.**

What is Particulate Matter?

The term “particulate matter” (PM) includes both solid particles and liquid droplets (excluding water droplets) that are found in outdoor air. Particulate matter may be emitted directly into the air or can form from pollutants that react in the atmosphere. Small particles tend to pose the greatest health concern because they can be inhaled into and accumulate in the respiratory system.

Particles of less than 10 microns in diameter are referred to as PM10. Particles of less than 2.5 microns in diameter are are referred to as fine particulate or PM2.5.

Sources of PM2.5 include all types of combustion (motor vehicles, power plants, wood burning, etc.) and some industrial processes. Sources of particles that are smaller than PM10 but larger than PM2.5 include crushing or grinding operations, and dust from paved or unpaved roads.

How is Particulate Matter Measured?

Iowa operates two distinct types of PM samplers. One type collects the aerosol by drawing ambient air through a filter over a 24-hour period. The filters are then returned to an analytical laboratory where they are weighed. This process provides accurate concentrations, but the data is not available to the public until the analytical work is complete, usually about a month after the sampling date. In order to provide more timely information, Iowa operates continuous samplers that measure PM10 and PM2.5 in real-time.

The continuous PM10 samplers used in Iowa have been designated by EPA as equivalent to filter based methods and either may be used for determining attainment with the NAAQS. However, there are currently no continuous PM2.5 samplers designated by EPA as equivalent to filter based methods for determining attainment. EPA encourages use of continuous PM2.5 monitors for reporting 'real-time' values when the data can be shown to be well correlated with the data from filter samplers. This report does not include data from continuous PM2.5 samplers.

What is the Fine Particulate Matter Standard?

Two primary PM2.5 standards were established by EPA in 1997 for the protection of public health. The annual standard is met when the 3-year average of a site's annual mean concentration is 15.0 µg/m^3 (micrograms per cubic meter) or less. The 24-hour or daily standard is met when the 3-year average of a site's annual 98th percentile values is 65 µg/m^3 or less. The secondary PM2.5 standards, established for the protection of public welfare and the environment, are the same as the primary standards. The 3-year averages (of annual means or 98th percentiles) are called design values. A design value is only valid if minimum data completeness criteria are met.

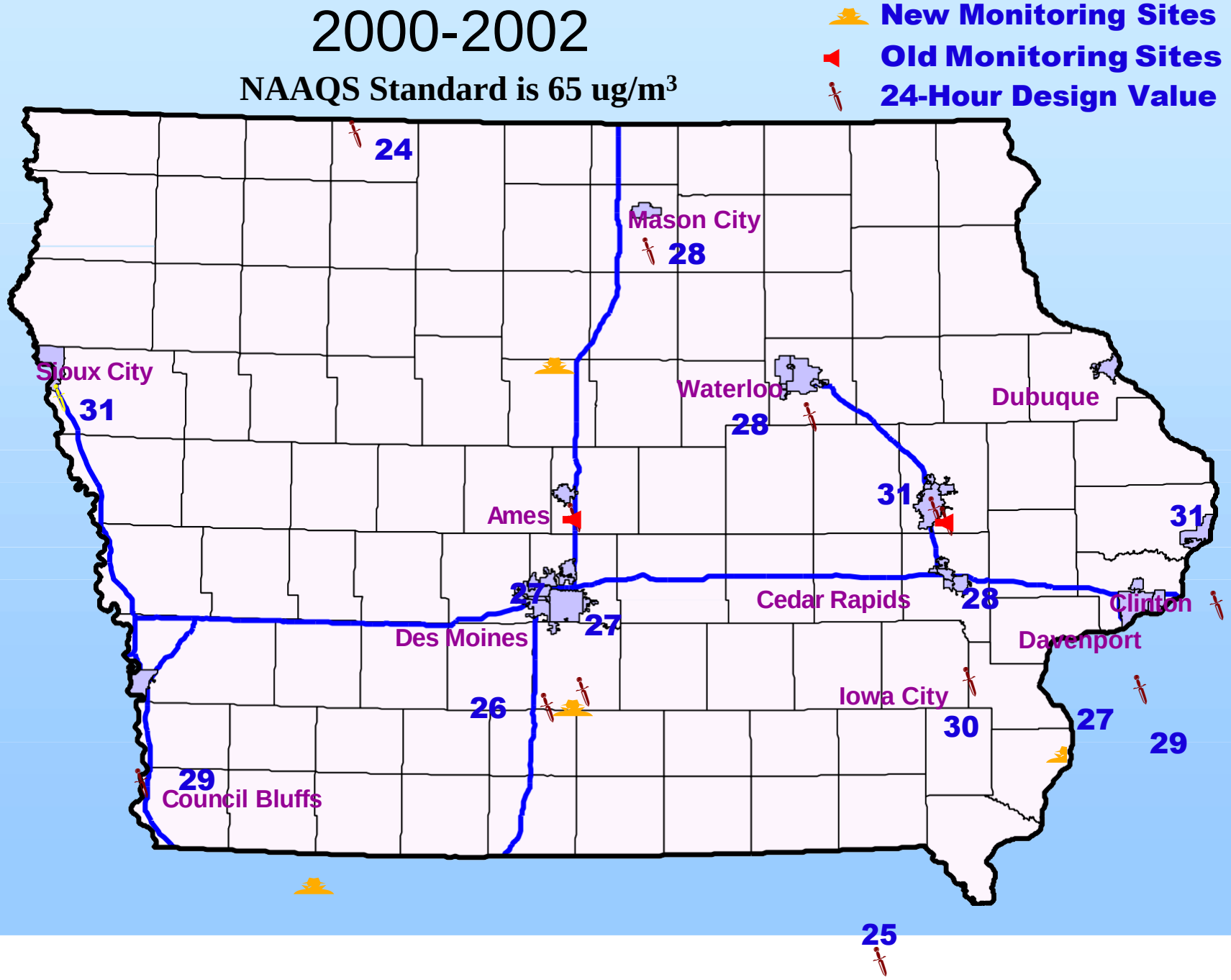
What is the Design Value?

A design value is a tool that can be used to understand pollution levels in a specific location. A design value may be set for any pollutant. The U.S. EPA's official definition is explained this way: "a design value is the mathematically determined pollutant concentration at a particular site that must be reduced to, or maintained at or below the National Ambient Air Quality Standard to assume attainment." The design value number tells us how a particular site or area compares with the National Ambient Air Quality Standards (NAAQS).

Iowa design values and the level of the standard for both averaging periods are included on the following pages.

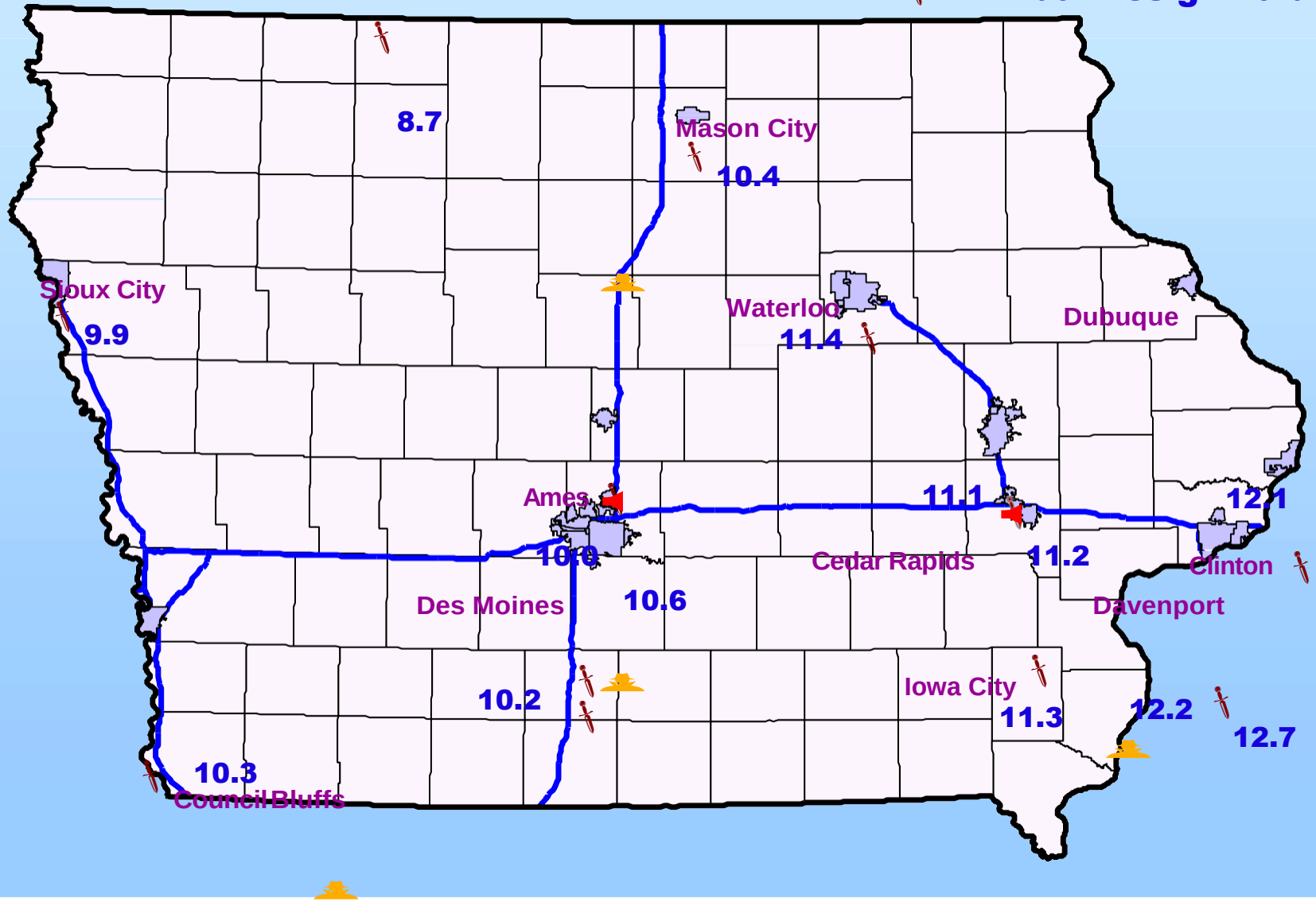
Iowa PM2.5 24-hour Design Values 2000-2002

NAAQS Standard is 65 ug/m^3



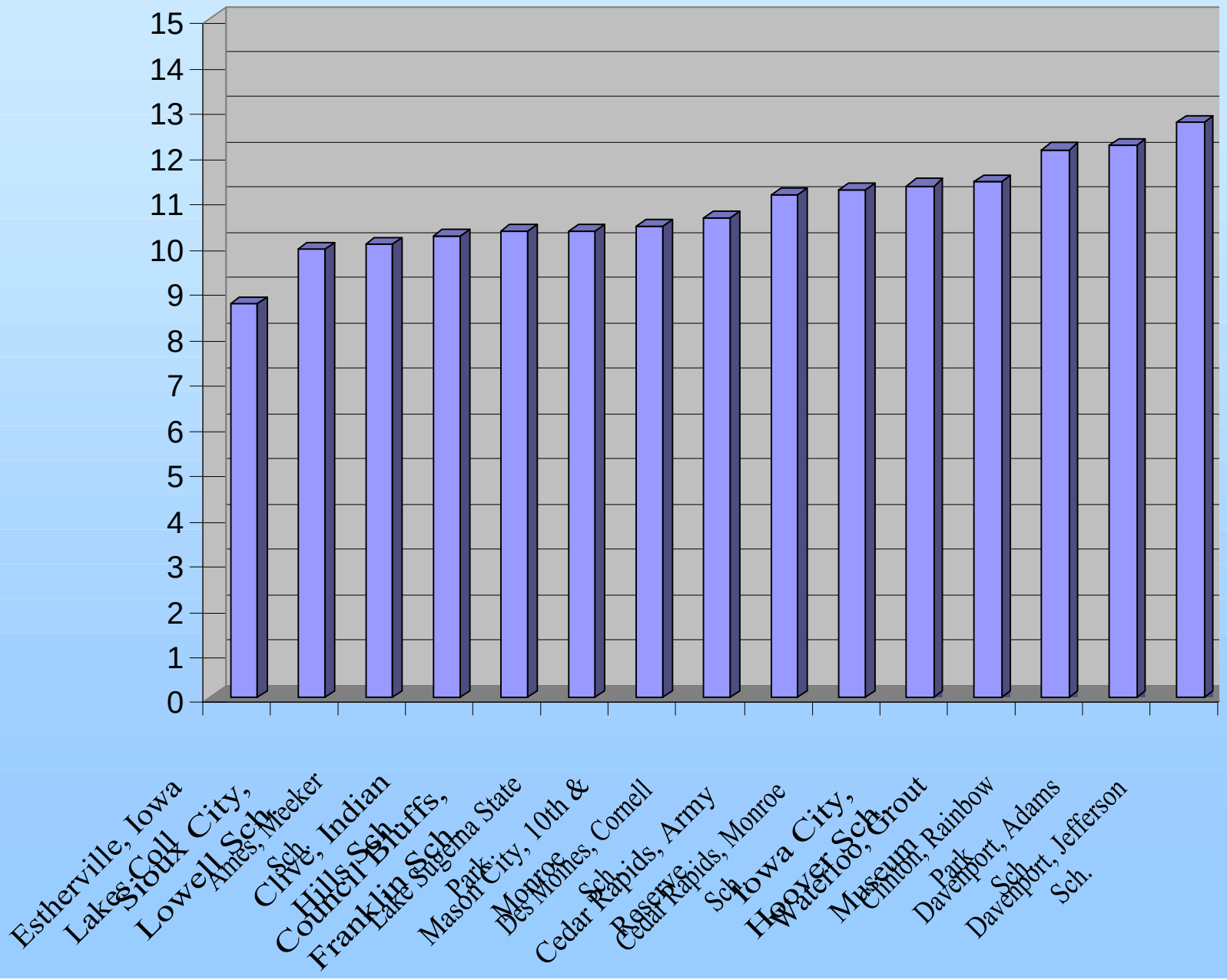
Iowa Annual PM2.5 Design Values 2000-2002

NAAQS Standard is 15 ug/m^3

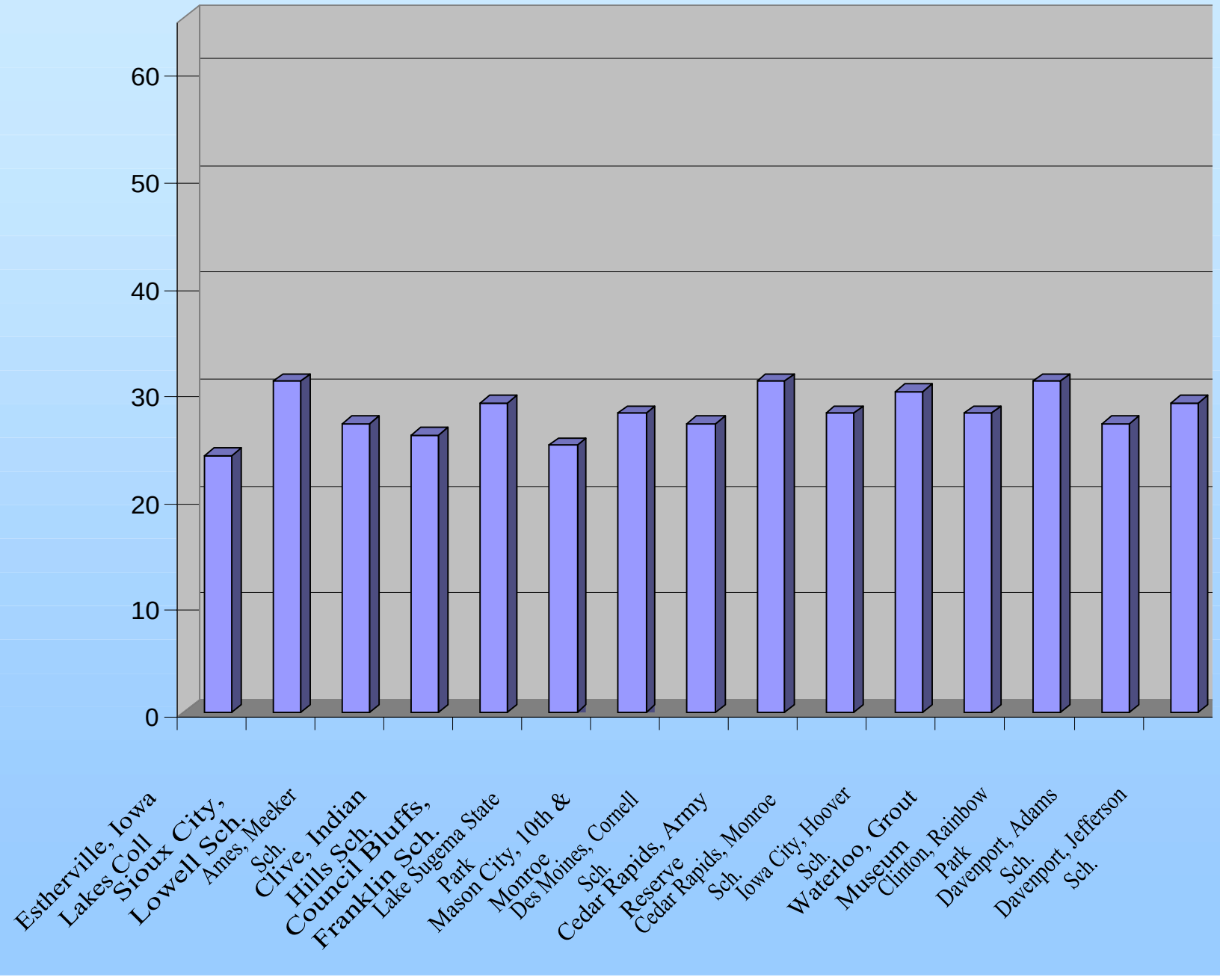


10.3

Annual PM2.5 Design Values 2000-2002



24-hr. PM2.5 Design Values 2000-2002



Web Resources

Iowa Real-time Data Reporting :

In Polk County:

http://www.airquality.co.polk.ia.us/AQI.asp

In Linn County:

http://www.air.linn.ia.us/

Outside Polk and Linn Counties:

http://www.uhl.uiowa.edu/Services/ambientAir.html

Design Values for All Pollutants Nationwide:

http://www.epa.gov/airtrends/values.html

Ozone Maps:

http://www.epa.gov/airnow/index.html

Historical Air Pollution Data for Iowa and Other States:

http://www.epa.gov/air/data/