



# Indiana Department of Environmental Management

## 2015 Ozone Season Summary Report

*Office of Air Quality*

*(800) 451-6027*

[www.IN.gov/idem/airquality/2391.htm](http://www.IN.gov/idem/airquality/2391.htm)



# 2015 Ozone Season

## Purpose

This Ozone Season Summary Report provides an overview of ozone levels from 2015, as well as ozone trends over the last ten years (2006 through 2015).

## Summary

The 2015 ozone season in Indiana lasted from April 1 through September 30. The duration of the ozone season for each state is mandated by the United States Environmental Protection Agency (U.S. EPA). *(Please note that beginning in 2016 the ozone season will be March 1-October 31 as further explained on slide 9.)*

- 183 total days in Indiana's 2015 ozone season.
- 5 exceedance days in 2015.
- 11 forecasted days (Air Quality Action Days) in 2015.



# Background of Ground-level Ozone

## **What is ground-level ozone?**

Ground-level ozone is a gas composed of three oxygen atoms. The chemical structure of ozone is the same whether at ground-level or above the earth; it is unhealthy to breathe at ground level.

## **Where does ground-level ozone come from?**

Ground-level ozone is not emitted directly into the air. It is created by a chemical reaction between nitrogen oxides ( $\text{NO}_x$ ) and volatile organic compounds (VOCs) in the presence of sunlight. Emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources of  $\text{NO}_x$  and VOCs.

## **Health effects of ground-level ozone:**

- Chest pain, coughing, throat irritation, congestion.
- Can worsen bronchitis, emphysema, asthma.
- Reduces lung function and inflames the linings of the lungs.
- Scars lung tissues.



# National Ambient Air Quality Standards (NAAQS) for Ozone

## Primary Standards

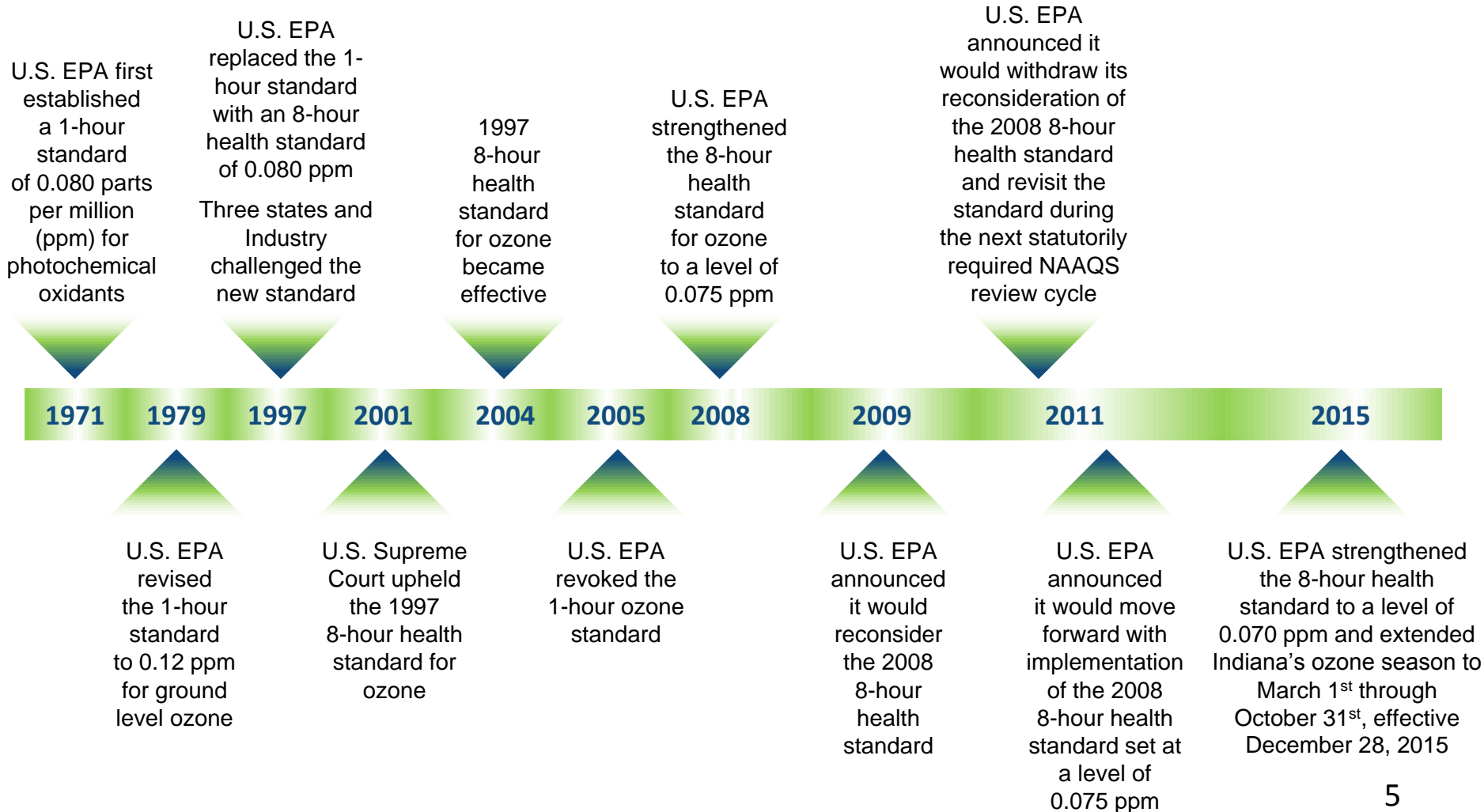
Primary standards, also known as health standards, are limits set to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly.

## Secondary Standards

Secondary standards are set to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.



# History of the Ozone Standard





# Attaining the Standard

## 8-Hour Standard

To attain the 8-hour standard, the three-year average of the fourth (4<sup>th</sup>) highest daily maximum value, the design value for the ozone season must be at or below the standard of 0.075 ppm.

## Exceedance versus a Violation of the Standard

- An ***exceedance*** occurs when a rolling 8-hour average value is measured above the standard.
- A ***violation*** occurs when the three-year average of the 4<sup>th</sup> highest daily maximum value for the ozone season exceeds the standard.
- ***A monitor can exceed the standard without being in violation.***



# Attainment History

## **1997 8-Hour Ozone Health Standard**

U.S. EPA revised the former health standard in 1997 to 0.080 ppm.

- Attainment designations became effective in 2004.
- Initially, 23 counties and one township in Indiana were classified as being in violation of the standard.
- At the close of the 2008 ozone season, all Indiana counties met the standard.
- By May 2010, all areas were officially designated attainment under the standard.

## **2008 8-Hour Ozone Health Standard**

U.S. EPA revised the 1997 health standard in 2008 to 0.075 ppm.

- In March 2009, the Indiana Department of Environmental Management (IDEM) submitted state recommendations to U.S. EPA for attainment status for the 2008 standard.
- Based on monitoring data from 2006 through 2008, IDEM recommended 12 counties be designated as nonattainment.
- In September 2009, U.S. EPA announced it would reconsider the standard.



# Attainment History Continued...

## **2008 8-Hour Ozone Health Standard Continued...**

- In September 2011, U.S. EPA announced it would withdraw its reconsideration of the 2008 standard and revisit the standard during the next statutorily required NAAQS review cycle.
- On September 22, 2011, U.S. EPA announced its intention to fast-track initial area designations and classification rule.
- Initial area designations were based on 2008 through 2010 air quality monitoring data and 2009 state recommendations.
- U.S. EPA also announced it would consider 2011 data if certified early (i.e., by February 15, 2012).
- U.S. EPA completed designations for the Chicago-Naperville, IL-IN-WI area on May 31, 2012 (2008 through 2010 monitoring data for Indiana and Wisconsin and 2009 through 2011 monitoring data for Illinois).
- All other area designations were completed on April 30, 2012.
- Lake and Porter counties and Lawrenceburg Township in Dearborn County were designated nonattainment effective July 20, 2012.
- All other areas of the state were classified as unclassifiable/attainment.





# Attainment Status

## **2008 8-Hour Ozone Health Standard Continued...**

- Indiana is currently assembling a redesignation petition and maintenance plan for Lake and Porter counties with the goal of sending the plan to U.S. EPA in early 2016.
- Indiana is also pursuing redesignation of Lawrenceburg Township in Dearborn County to attainment as evidenced by the “Request for Redesignation and Maintenance Plan for Ozone Attainment in the Indiana Portion of the Cincinnati-Hamilton, Ohio, Kentucky, Indiana (OH-KY-IN) 2008 8-Hour Ozone Nonattainment Area” that was sent to U.S. EPA on September 2, 2015.

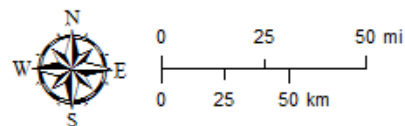
## **2015 8-Hour Ozone Health Standard ...**

- On October 26, 2015, U.S. EPA finalized a rule to strengthen the 8-hour ozone standard to 0.070 ppm, and to extend the ozone season from March 1<sup>st</sup> through October 31<sup>st</sup>, effective December 28, 2015.
- Indiana has one year from the date of promulgation of the new ozone standard, October 1, 2015, to submit designation recommendations to U.S.EPA.

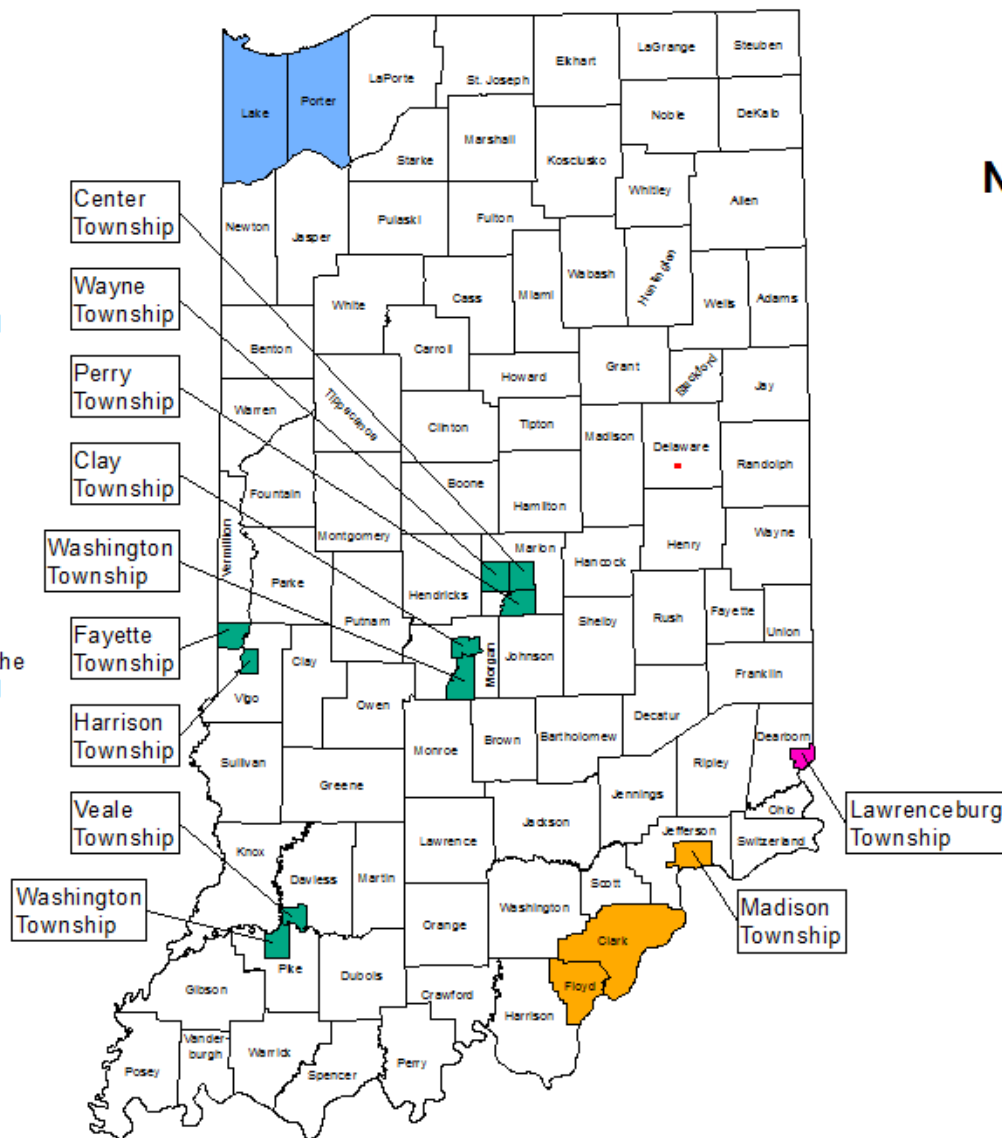


## Legend

- Nonattainment for the 1997 Fine Particle Annual Standard
- Nonattainment for the 2008 Ozone 8-Hour Standard
- Nonattainment for the 2010 SO<sub>2</sub> 1-Hour Standard
- Nonattainment for the 2008 Lead Standard
- Nonattainment for the 2008 Ozone 8-Hour Standard and the 1997 Fine Particle Annual Standard



Mapped By: B. Callahan, OAQ  
Date: 03/18/2015  
Source: IDEM  
Map Projection: UTM Zone 16 N  
Map Datum: NAD83





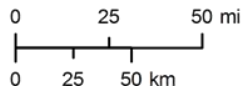
## Current Nonattainment Areas



Office of Air Quality

Legend

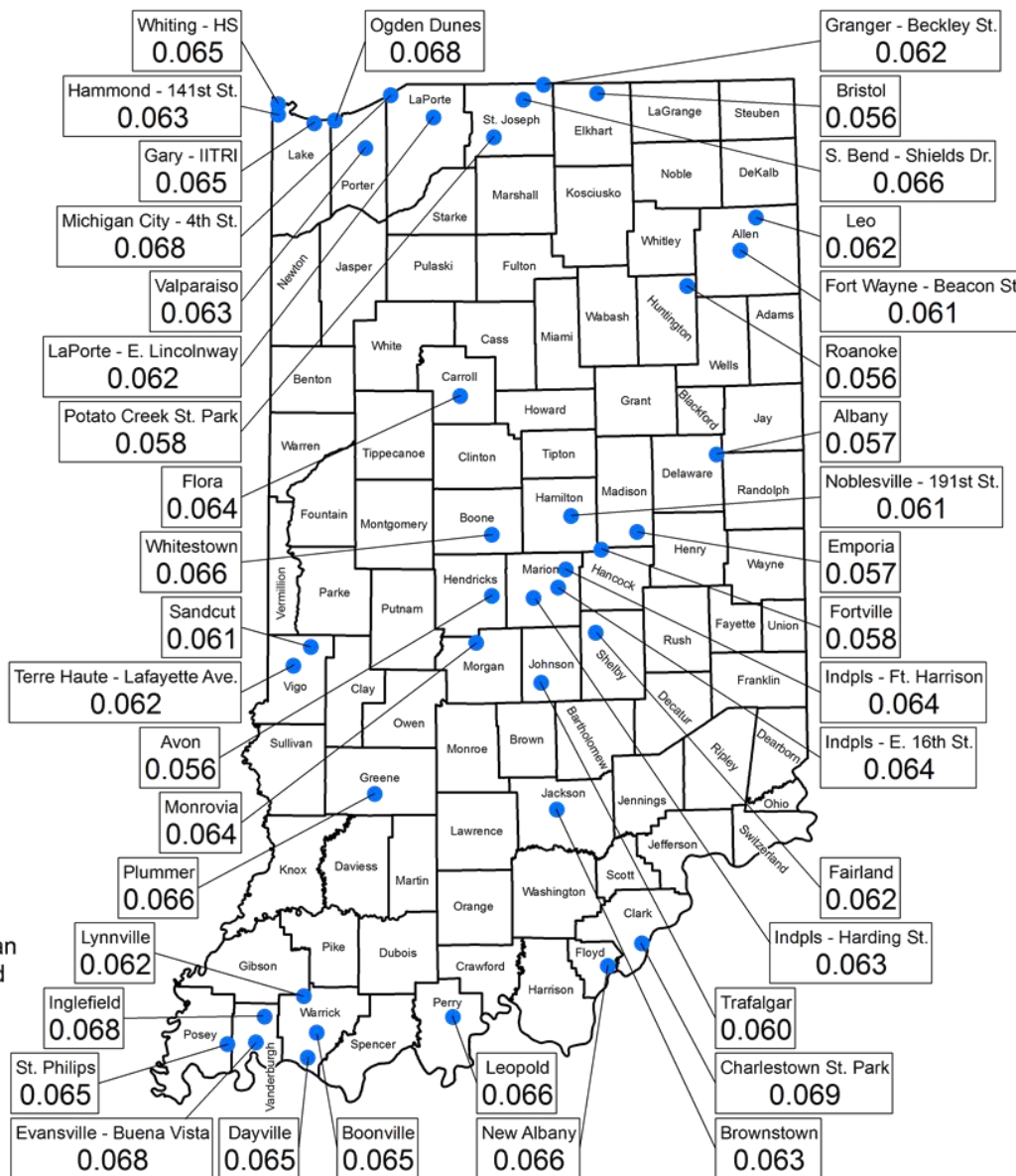
-  Air Monitor
-  County With Design Value Less Than or Equal to 0.075 PPM or No Data



Notes:

- Posted Data Are in Units of Parts Per Million (ppm)
- Additional monitors located in Brown, Bartholomew and Marion counties have less than three years of monitoring data and therefore are not shown.

**Mapped By:** C. Mitchell, OAQ  
**Date:** 11/17/2015  
**Source:** IDEM, Air Monitoring  
**Map Projection:** UTM Zone 16 N  
**Map Datum:** NAD83



**Ozone 8-Hour  
Design Values  
(3-Year Average  
4<sup>th</sup> High Daily  
Maximum)**

**Based on  
2013 - 2015  
Monitoring Data**

*Standard set at  
0.075 ppm*





# 2015 Monitoring Network

## Placement

- U.S. EPA provides guidance on placement of monitors.
- Monitor placement is based on population density and manufacturing levels.

## Monitors

- 44 ozone monitors in 29 counties across Indiana.

## Calculating the Monitoring Data

- Levels are monitored 24 hours per day and rolling 8-hour averages are calculated; the highest 8-hour average is reported for the day.
- A monitor's design value is calculated at the end of each ozone season; design values are calculated for each monitor in the state.
  - Design value: three-year average of fourth highest daily maximum values.



## Ozone Monitors by Area

<u>Area</u>	<u>Counties</u>
Northwest	Lake, LaPorte, Porter
North Central	Elkhart, St. Joseph
Northeast	Allen, Huntington
West Central	Greene, Vigo
Central	Boone, Carroll, Hamilton, Hancock, Hendricks, Johnson, Madison, Marion, Morgan, Shelby
East Central	Delaware
Southwest	Perry, Posey, Vanderburgh, Warrick
Southeast	Clark, Floyd, Jackson

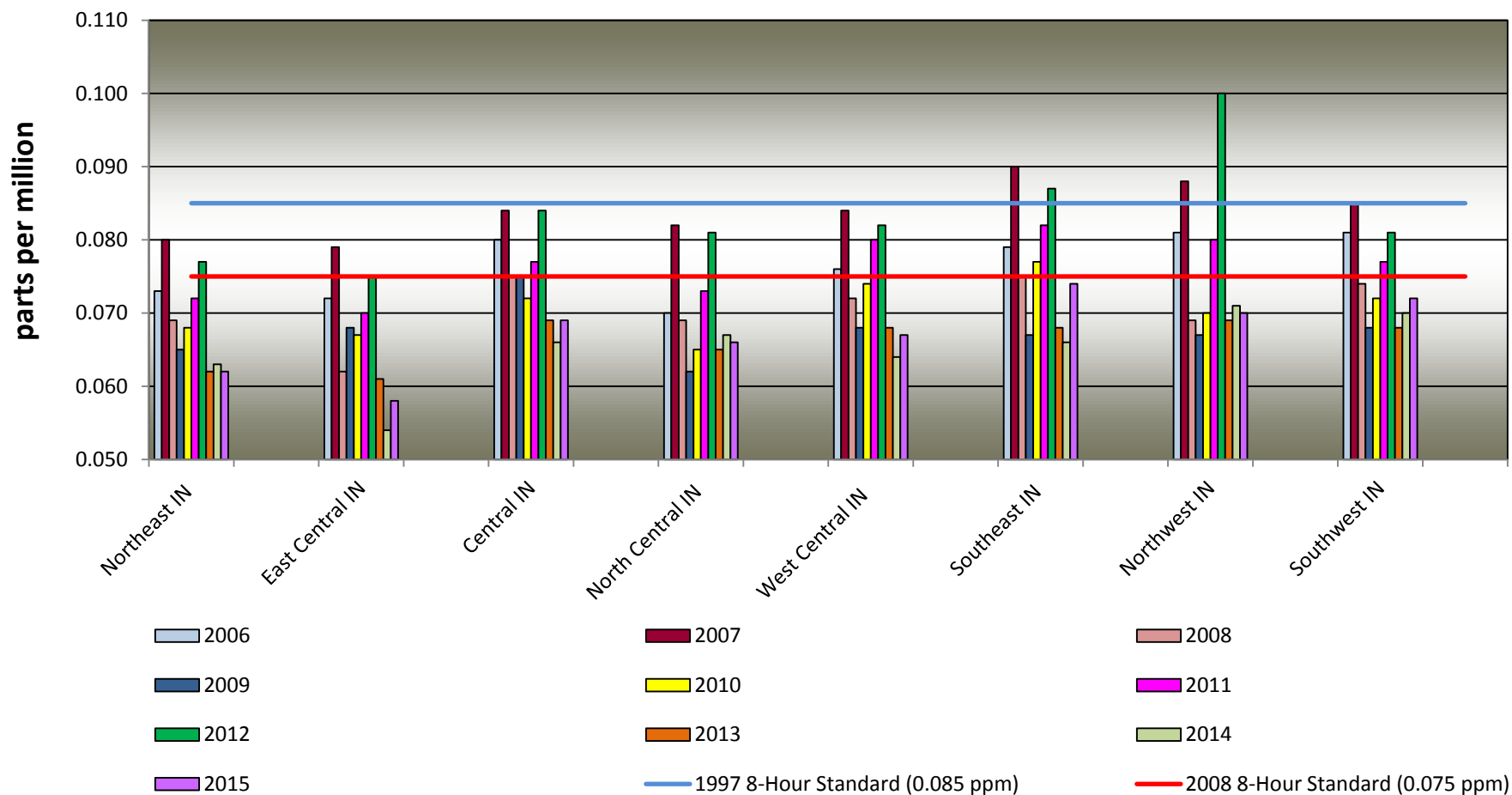


## 2015 Monitoring Summary

- Based on 2015 monitoring data, no monitor in the state's ambient air monitoring network recorded a 4<sup>th</sup> high daily maximum value above the 2008 8-hour health standard, i.e., greater than 0.075 ppm.
- Based on quality assured 2013 – 2015 monitoring data, no monitor in the state's 2015 ambient air monitoring network recorded a three-year average design value that exceeded the 2008 8-hour health standard of 0.075 ppm.



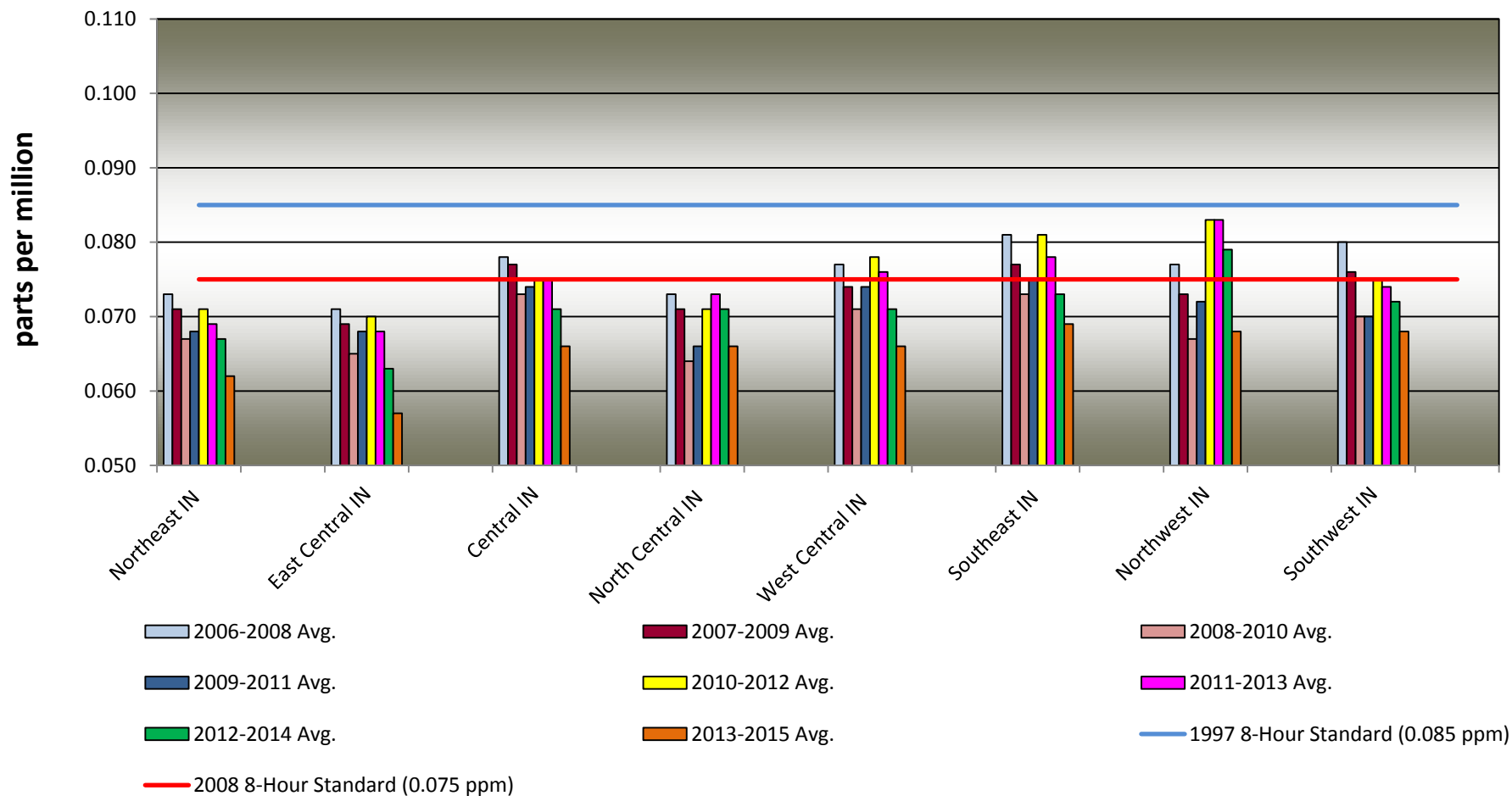
# Annual 4<sup>th</sup> High Trends 2006-2015



\*Additional monitors located in Bartholomew, Brown, and Marion counties have less than three years of monitoring data and therefore are not included.  
In regions where multiple monitors are located, the highest monitored value from the region is depicted on the chart.



# Design Value Trends 2006-2015



\*Additional monitors located in Bartholomew, Brown, and Marion counties have less than three years of monitoring data and therefore are not included. In regions where multiple monitors are located, the highest monitored value from the region is depicted on the chart.





## Additional Information

For additional information regarding the NAAQS for ground-level ozone, please visit U.S. EPA's Ozone (O<sub>3</sub>) Standards website:

[http://www3.epa.gov/ttn/naaqs/standards/ozone/s\\_o3\\_index.html](http://www3.epa.gov/ttn/naaqs/standards/ozone/s_o3_index.html)



## Contact

For more information regarding the ozone designation process or Indiana's redesignation petitions and maintenance plans, visit [www.IN.gov/idem/airquality/2392.htm](http://www.IN.gov/idem/airquality/2392.htm) or contact Ms. Catherine Mitchell of the Office of Air Quality at (800) 451-6027, (317) 234-6530, or [cmitchel@idem.IN.gov](mailto:cmitchel@idem.IN.gov).