

Emissions Reduction Market System

Annual Performance Review Report - 2015

Illinois Environmental Protection Agency
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

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List of Acronyms

ACMA	Alternative Compliance Market Account
AER	Annual Emissions Report
ATU	Allotment Trading Unit
BAT	Best Available Technology
CAA	Clean Air Act
CAAPP	Clean Air Act Permit Program
EPA	Environmental Protection Agency
ERG	Emission Reduction Generator
ERMS	Emissions Reduction Market System
FESOP	Federally Enforceable State Operating Permit
HAP	Hazardous Air Pollutant
LAER	Lowest Achievable Emission Rate
MACT	Maximum Achievable Control Technology
NAA	Nonattainment Area
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standard for Hazardous Air Pollutants
RACT	Reasonably Available Control Technology
ROP	Rate of Progress
SER	Seasonal Emission Report
TPD	Tons Per Day
TRI	Toxic Release Inventory
VOM	Volatile Organic Material

Executive Summary

Northeastern Illinois – the Chicago area – is designated as a nonattainment area (NAA) for the eight-hour ozone National Ambient Air Quality Standard (NAAQS). Under provisions of the Clean Air Act (CAA), as amended in 1990, the area was considered “marginal” in 2015 and was supposed to be in attainment of this eight-hour standard by July 2015. Due in large part to an extremely hot, dry year in 2012, the Chicago area did not attain by the deadline and was bumped up to a classification of “moderate.”

Ozone is formed by the photochemical reaction of volatile organic materials (VOM) and nitrogen oxides (NO_x) on very warm summer days. Extensive air quality modeling has shown emissions of both VOM and NO_x must be reduced in order to meet air quality standards.

VOM emissions come from a wide variety of industrial activities, from painting and printing to chemical manufacturing and even some types of food production. Most VOM emissions are already controlled by technology-based rules, which are typically applicable year-round, irrespective of air quality conditions. In the late 1990s, further reductions in emissions using such “command and control” measures were viewed as being potentially very costly and would have involved the State of Illinois determining how each individual industry could reduce emissions even further. Instead, Illinois became the first state in the nation to adopt and operate a market-based cap and trade program for emissions of VOM, the Emissions Reduction Market System (ERMS). The ERMS program was designed as an emission trading program to reduce overall VOM emissions in the Chicago NAA while allowing sources to best determine how to reduce their own emissions in the most cost-effective manner.

The ERMS program operates from May 1 through September 30, correlating with the time of the year when ozone formation is most significant in Illinois. The program allows trading among participating sources in order to meet a reduced cap on their overall VOM emissions. Each participant is given a baseline according to what they actually emitted in previous years, adjusted for their compliance or noncompliance with existing rules. It is important to note that ERMS participants must still adhere to all other state and federal emission limitations. From that baseline, sources were given a number of allotment trading units (ATUs) corresponding to an overall area-wide reduction of 12 percent, with some exceptions for units with emissions that could not be further reduced.

ATUs, each of which represents 200 pounds of VOM, are retired by the Illinois EPA after each trading season to account for all of a source’s emissions during that season. Sources may either reduce their emissions by the use of emission controls or process changes, or they may buy ATUs from other sources to account for any emissions in excess of their initial allotment. Any source that reduces its VOM emissions below the allotment level may sell its excess ATUs to another source. Such trading is aided by the Illinois EPA’s ERMS website, which provides an area for buyers and sellers to post their needs. Furthermore, trading between sources can be accomplished over the Internet.

As sources make reductions or buy ATUs from those who have, overall VOM emissions in the Chicago NAA are reduced while providing a variety of mechanisms for sources to use in

achieving their individual reductions. For the 2015 season, sources in the ERMS program emitted 68.6 percent less VOM than their baselines would have allowed them to emit and 65.3 percent less than their actual ATU allotments. The ERMS program was designed to ensure companies could not accumulate ATUs indefinitely, which would have left open the possibility of a source having more emissions than anticipated in a single season. Instead, ATUs have a limited life and expire at the end of two years if they are not utilized.

Illinois EPA is required by the ERMS rule to prepare an Annual Performance Review Report addressing the effect of ERMS on VOM emissions, reviewing trends and patterns that have emerged in the operation of ERMS, and looking at nine specific areas of the program for the previous seasonal allotment period. The structure for this report was originally developed in consultation with industry, environmental groups, USEPA, and economists from the University of Illinois at Chicago, all of whom participated in an open dialogue that helped to frame the information reported.

The 16th year of ERMS market operation produced 17 seasonal trades with 35 active long-term transfer agreements. These trades involved a total of 36 sources as sellers and 51 as buyers, with 11,837 ATUs changing hands. This amounted to 11.8 percent of the total ATU allotment for the area and 34.0 percent of the ATUs retired for compliance purposes.

In studying the available data, Illinois EPA finds the ERMS program is continuing to operate successfully. Emissions are significantly lower than baseline and allotment levels, both locally and in the overall region. Indeed, the allotment itself is 9.5 percent below the baseline level, indicating that even if every company used its entire allotment, the area would still see a significant reduction from the baseline. Furthermore, ATUs have been readily available for sources needing to buy and the market has operated effectively.

Key Findings

- The allotment shows a 9.5 percent reduction from the original baseline.
- Sources were able to find trading partners, there was a sufficient supply of available ATUs and market prices were conducive to trading.
- Alternative ATU generation did not play a role in market performance.
- The reconciliation and compensation processes performed as designed and operated in a timely and effective manner.
- Overall, sources in the ERMS program emitted 68.6 percent less VOM than their baselines would have allowed them to emit and 65.3 percent less than their actual ATU allotment for 2015.
- Trading does not appear to influence HAP emissions.
- ATUs equivalent to 62.9 percent of those allotted to participating sources in 2015 expired without being used.

Conclusions

- The ERMS program continues to achieve the desired emission reductions.
- ERMS participants are emitting significantly below the baseline and allotment levels.
- The Market System operated in an effective manner.
- No relationship is apparent between market activity and hazardous air pollutant levels.

1 Introduction

1.1 Nonattainment in the Chicago Area

Northeastern Illinois, including the counties of Cook, DuPage, Kane, Lake, McHenry, and Will, plus the townships of Aux Sable and Goose Lake in Grundy County and Oswego in Kendall County, had been designated as a marginal nonattainment area (NAA) for the eight-hour ozone National Ambient Air Quality Standard (NAAQS). Under the provisions of the Clean Air Act (CAA), as amended in 1990, the area was supposed to be in attainment with the eight-hour standard by July 2015. However, due in large part to an extremely hot, dry 2012, attainment was not reached by that timeframe, causing the area to be bumped up to a classification of “moderate.” Extensive air quality modeling over a number of years has shown that emissions of volatile organic material (VOM), a component involved in the formation of ozone, needed to be reduced. In the late 1990s, VOM emissions were already controlled by technology-based rules, and further reductions in emissions using such “command and control” measures were viewed as being potentially very costly. As such, the Illinois EPA proposed the Emissions Reduction Market System (ERMS) VOM emission trading program that would reduce these emissions overall in the Chicago NAA. The Illinois Pollution Control Board adopted the ERMS program as a rule in November 1997 and the rule appears in Title 35 of the Illinois Administrative Code, Subtitle B (Air Pollution), Part 205 (35 Ill. Adm. Code 205).

1.2 Basics of ERMS

The ERMS program is designed to operate on a seasonal basis, from May 1 through September 30, to correlate with the time of year when ozone formation is most significant in Illinois. The program allows trading among participating sources in order to meet a reduced cap on their overall VOM emissions. Each participant has been given a baseline according to what they were actually emitting in specified previous years, adjusted for their compliance or noncompliance with existing rules. ERMS is the first cap-and-trade system in the United States for VOM. Unlike the situation in some open market trading systems, sources must continue to adhere to all other state and federal emission limitations.

Based on their baseline emissions, sources were given allotment trading units (ATUs) corresponding to a reduction of 12 percent, with some exceptions for units with emissions that could not be reduced further. Section 205.405 provides that units falling into one of the following categories at the time baselines were determined are not required to reduce their emissions by 12 percent:

- Units subject to a Maximum Achievable Control Technology (MACT) or National Emission Standard for Hazardous Air Pollutants (NESHAP)
- Units that have demonstrated Lowest Achievable Emission Rate (LAER)
- Units that have demonstrated Best Available Technology (BAT)
- Space heaters and fuel combustion units
- Internal combustion engines

The baseline is the emissions from the units required to make a reduction plus the emissions from the units not required to make a reduction as exempted above. When these exemptions are factored into the area-wide allotment, the actual aggregate allotment has been calculated to be 9.5 percent less than the baseline.

ATUs are retired by the Illinois EPA after each trading season to account for all of a source's emissions during that season. Sources may either reduce their emissions by the use of emission controls or process changes, or they may buy ATUs from other sources to account for any emissions in excess of their initial allotment. Any source that reduces its VOM emissions below the allotment level may sell its excess ATUs to another source. In this way, overall VOM emissions in the Chicago NAA are reduced while providing another mechanism for sources to use in achieving their individual reductions.

ERMS contains a number of features that distinguish it from traditional command and control programs and other market systems:

- Most command and control rules are in force for the entire year. However, since ozone is a problem in Illinois only during the summer season, and this program was not mandated by USEPA as “Reasonably Available Control Technology” (RACT) rules, the ERMS program is seasonal and restricts emissions only during May 1 through September 30, when the ozone problem exists.
- Many regulations limit emission rates rather than actual emissions. The ERMS program places a cap on sources based on their actual emissions, which ensures it reduces VOM in the nonattainment area.
- The ERMS program, as noted above, is separate from RACT. Unlike other emission trading systems across the country, Illinois does not allow sources to avoid other emission limits by participating in ERMS. Sources must comply with the ERMS rule *and* all other applicable limits.
- Some trading programs have created trading units with an unlimited life, which allow those units to be accumulated for long periods of time. The ERMS rule provides that ATUs have a limited two-year life. This allows some saving for companies, but prevents excessive accumulation of active trading units.
- Because the ERMS rule is associated with the Clean Air Act Permit Program (CAAPP) and Federally Enforceable State Operating Permit (FESOP) program, monitoring and recordkeeping provisions are linked to avoid duplicative efforts for sources to ensure the use of standardized methods for determining emissions.
- Illinois EPA has created a specific reduction requirement in the ERMS rule, requiring most units to reduce VOM emissions by at least 12 percent. This provides Illinois with a specific, creditable VOM reduction in the Chicago NAA.
- Sources that fail to reduce their emissions or obtain the proper number of ATUs are held accountable for their actions as a part of the ERMS rule itself. Indeed, such sources are penalized at a higher rate for repeated failure to hold the required ATUs. This discourages noncompliance on the part of participating sources and provides the Illinois EPA with some certainty the VOM reductions will be achieved.

2 Scope of the Annual Performance Review Report

Section 205.760 of the ERMS rule directs the Illinois EPA to prepare an Annual Performance Review Report addressing the effect of ERMS on VOM emissions, reviewing trends and patterns that have emerged in the operation of ERMS, and looking at nine specific areas of the program for the previous seasonal allotment period. These areas, all of which are included in later parts of this report are:

1. Total aggregate VOM emissions from all ERMS sources.
2. A breakdown of the number of ATUs retired for compliance purposes or air quality benefit, number currently banked, and the number used by new participating sources.
3. Evaluation of trading activities, including those sources who were net buyers, those that were net sellers, and those that did not trade.
4. The use of the Alternative Compliance Market Account (ACMA), including its balance and all transactions into or out of the account.
5. Summary of emission reduction generator (ERG) and inter-sector proposals.
6. Distribution of transactions by geographic area or character of source.
7. Availability of ATUs for purchase.
8. Average market price for ATUs.
9. Trends and spatial distributions of hazardous air pollutants (HAPs).

The Annual Performance Review Report must be prepared by June 15 of every year. This report covers the 2015 ERMS season and all transactions pertaining to that season up to March 1, 2016.

Many of the terms and technical information referred to in this document are based on the requirements in the ERMS rule. Readers who are unfamiliar with that rule should review it first for a better overall understanding of the program and the terminology used in this report.

3 Area-wide Emission Status

3.1 Source Types

There are several different types of sources involved in the ERMS program as described below:

- **Participating sources** are those that have baseline or actual emissions of at least 10 tons during the season, are required to have a CAAPP permit or potential to emit of 25 tons per year, were operating prior to May 1, 1999, and are located in the Chicago ozone NAA. These make up the vast majority of sources in the ERMS program. They are required to hold ATUs for all of their VOM emissions during the season.
- **New participating sources** have actual seasonal emissions of at least 10 tons, are required to have a CAAPP permit or potential to emit of 25 tons per year, but were not operating prior to May 1, 1999. They must hold ATUs for all of their VOM emissions during the season, but are not given baselines. They must acquire their ATUs through trades or long-term transfer agreements.
- **Exempt sources** are those which would otherwise need to be participating sources, but have restricted their emissions in one of two ways. They may have used their CAAPP permit or FESOP to limit seasonal VOM emissions to under 15 tons/season or they may have already reduced their seasonal emissions by at least 18 percent of their baseline.
- **General participants** are entities other than participating sources or new participating sources who have obtained a transaction account and are allowed to trade ATUs. Examples may include brokers or companies that were participating sources but who shut down their operations and still want to retain control of their ATUs. For the purposes of this report, there are two different types of general participants. There are those who used to be participating sources and therefore continue to receive an allotment. The second group includes those who were not previously classified as participating sources and who never received allotments.
- **Special participants** are entities that register with the Illinois EPA to purchase and retire ATUs, but not sell ATUs. Any ATUs given or sold to a special participant are automatically retired.

3.2 Total Aggregate VOM Emissions

Table 3-1 below summarizes the seasonal VOM emissions from each of the source categories.

Table 3-1: Source Emission Breakdown

Category	Number of Sources	Seasonal VOM Emissions (tons)
Participating Sources	140	3,391.6
New Participating Source	5	82.1
Exempt due to 15 ton/season limit	82	196.2
Exempt due to 18% reduction	0	0.0

As a subset of participating sources and new participating sources, some emissions may be covered by variances, consent orders, or CAAPP compliance schedules. Others may come from contingent units, which are those units for which a construction permit was issued prior to 1998, but for which three years of data is not yet available to determine a baseline – a situation that is unlikely to occur now that many years have passed. A third subcategory is units that had an emergency condition approved by the Illinois EPA as described in Section 205.750. Emissions from the affected units are not included in the total for which ATUs are required in all of these situations. Thus, they are subtracted out before reconciliation.

Other units may be part of a major modification to the source. Such a situation requires the source to provide an additional reduction. This reduction is based upon the nonattainment status at the time of the modification. Areas classified as severe, moderate and marginal nonattainment require 1.3, 1.15 and 1.1 times the emissions from the applicable units, respectively, in order to account for new source review requirements. Table 3-2 shows the emissions from these types of units.

Table 3-2: Special Unit Emission Breakdown

Special Unit Type	Number of Sources	Seasonal VOM Emissions (tons)
Contingent Units	0	0.00
Emergency	0	0.00
Variance, Consent Order, etc.	0	0.00
Major Modifications	2	0.92

Overall, there was a total of 11,075.1 tons of seasonal VOM emissions in the baselines of all sources. These sources had an allotment of 100,255 ATUs (10,025.5 tons). This represents an area-wide 9.5 percent reduction from the baseline VOM total to the allotment total before actual emissions are taken into account.

3.3 Breakdown of ATU Use

ATUs are retired by the Illinois EPA to account for VOM emissions from participating and new participating sources during the season. ATUs have a two-year life (except for some special circumstances) and can be retained if they are not used or traded during the year in which they are allotted. An ATU that is not used during this two-year period automatically expires. ATUs may also be donated or sold to a special participant for air quality benefit (immediate retiring) should a source so choose.

New and participating sources used 34,727 ATUs for compliance purposes, which does not include ATUs from excursions (357 ATUs). Sources are retaining 100,433 ATUs, or approximately 100.0 percent of the 2015 allotment, for the 2016 season.

3.4 Expired ATUs

At the end of the 2015 season, 60,604 ATUs expired from non-ERG sources. This represents 60.4 percent of the number of ATUs allotted in 2015. Table 3-3 identifies the source of these expirations. General participants have been further split in this table to show those that have received ATUs from ERGs/Inter-sectors separate from those that did not. For more information on ERGs, see Section 5.

Table 3-3: Expired ATUs

Source Type	Number of Sources with Expired ATUs	Total Number of Expired ATUs
Participating Source	112	35,536
General Participants (non-ERG)	7	4,263
New Participating Sources	2	27
Shutdowns	51	20,778
Out of Program	0	0
Total non-ERG	172	60,604
ERGs	7	2,429
Inter-sector	0	0
Total ERG/Inter-sector	7	2,429
Total	179	63,033

3.5 ATU Vintage Summary

While some companies allowed year 2014 issued ATUs to expire without using them, other companies were retiring year 2014 issued ATUs for compliance purposes. Of the 34,805 ATUs retired for compliance purposes after the 2015 season, 32,427 were originally issued in 2014.

Since ATUs with different expiration dates could be traded, the average price by ATU vintage was analyzed. There were 1,770 ATUs traded in the 2015 season that were issued in 2014 (and thus would have expired at the end of the 2015 season). These trades averaged \$19.21/ATU. Two trades, involving 254 ATUs that were issued in the 2015 season (which would have expired at the end of the 2016 season) averaged \$20.00/ATU. From this, it can be seen that remaining ATU lifetime had little to no effect on price.

3.6 Findings

The initial design target for the ERMS program was a 12 percent reduction from the baseline, made up of 9 percent for ROP, 1 percent for ACMA and 2 percent contingency. The resulting allotment for 2015 was 9.5 percent below the baseline, which satisfies the needed reduction for achieving ROP, given the net effect of exemptions, opt-outs, and contingency measures.

ATUs equivalent to a total of 62.9 percent of those allotted to participating sources expired at the end of 2015 without being used.

4 Evaluation of Trading Activities

4.1 Account Officers

All sources required to participate in the ERMS program must have at least one account officer designated to represent their transaction account. Designated account officers are ultimately responsible for all information contained in each transaction account. Many sources have at least two account officers so that one individual can be the primary and the other can be designated as the alternate.

The ERMS rule specifies all prospective account officers must participate in account officer training sponsored by the Illinois EPA prior to representing a transaction account. As of February 25, 2016, there are a total of 511 trained account officers.

The Agency has now made the training available online, which precludes the need for trainees to come to Springfield. The training agenda included sections covering Title V permitting, ERMS program overview, ATU creation review, seasonal emission reporting, emission compensation process, functioning in the ERMS marketplace, transaction account, ACMA, and the ERMS website.

Accessing and working with an assortment of information via the ERMS website is large part of many account officers' duties. Not only is the information on the website convenient to access, it also provides the most up-to-date data available in the ERMS program.

4.2 Website Access

No additional issues regarding the web site were identified. As operating systems and browsers continue to change, the Agency attempts to ensure proper access to the web site. In December 2014, the Illinois EPA web page was redesigned. The ERMS website can be found at www.epa.illinois.gov/topics/air-quality/planning-reporting/erms/index.

4.3 Transaction Summary

During the 2015 season, the program generated 17 seasonal trades. There are currently 35 active long-term transfer agreements. Transactions involved a total of 36 sources as sellers and 51 as buyers (including excursion compensation sources). Two participating sources and five general participants both bought and sold ATUs in 2015. Some of the sources that were both buying and selling were shuffling ATUs to account for multiple locations. Most sources sold to other participating sources or general participants, but two sources provided ATUs to a special participant(s). Tables 4-1 and 4-2 list the total selling and buying of each source. Sources not listed in the following two tables had no trading activity.

Table 4-1: ATU Sellers

Name	ATU Sold on Market	ATUs to Special Participants	ATUs to ACMA
Transfer Agreements			
Acme Packaging Corp	468		
Acme Steel Co	221		
American NTN Bearing Mfg	30		
AMPAC Flexicon Inc	200		
Berlin Industries	80		
Bluegreass Labels	242		
Brown Printing Co (Account 1907)	88		
Brown Printing Co (Account 3388)	162		
BWay Packaging	398		
Color Communications		185	
Equilon Enterprises LLC	2		
Loparex			38
Marathon Ashland Petroleum LLC	177		
Meyer Steel Drum	100		
Palex Container Systems	862		
Rexam Release	191		
Rock-Tenn Co (Account 1675)	611		
Rock-Tenn Co (Account 8728)	611		
Silgan Closures, LLC	1,313		
Silgan Containers	100		
Sleepeck Printing Co	233	10	
St. Clair Pakwell	100		
Viskase Corp	920		
Zenith Electronics	302		
<i>Transfer Agreement Subtotal</i>	<i>7,411</i>	<i>195</i>	<i>38</i>

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Table 4-1: ATU Sellers (continued)

Name	ATU Sold on Market	ATUs to Special Participants	ATUs to ACMA
Trades			
ACMA	1,676		
Abbott Laboratories	165		
Chicago Baking	252		
Equilon Enterprises	34		
Fleischmann's Vinegar Co Inc	167		
General Mills Cereals Properties LLC	2		
Greif Industrial Packaging & Services	5		
Meyer Steel Drum	100		
Pactiv Corporation	253		
The Segerdahl Corp	37		
Senior Flexonics	118		
U of I at Chicago (Account 10348)	36		
Viskase Corp	1,348		
<i>Trades Subtotal</i>	<i>4,193</i>	<i>0</i>	<i>0</i>
Total	11,604	195	38

Table 4-2: ATU Buyers

Name	ATU Bought on Market	ATUs Bought for Excursion Compensation
Transfer Agreements		
ACMA Account	38	
Acme Packaging Corp	221	
Air Products and Chemicals	230	
American Litho Inc	80	
Aux Sable Liquid Products	250	
Brown Printing (Account 3388)	70	
Brown Printing (Account 22984)	250	
Buckeye Terminals LLC	2	
BWAY Corp	398	
Captive Plastics LLC	242	
Caterpillar	100	
Dart Container Corp of Illinois	711	
ECC Ltd (Account 3272)	233	
ECC Ltd (Account 10183)	10	
Graphic Packaging	100	
Illinois EPA	185	
KNS Companies Inc	250	
Law Office of Katherine Delahunt	302	
Loparex Inc	191	
Marathon Petroleum Co LLC	177	
Meyer Industrial Container	100	
Meyer Steel Drum Inc (Account 1618)	431	
Meyer Steel Drum Inc (Account 1750)	431	
Prairie State Group	120	
Rock-Tenn Co/Waldorf Corp	611	
S & C Electric	130	
Signode Corp	468	
Silgan Containers Corp	1,313	
<i>Transfer Agreement Subtotal</i>	<i>7,644</i>	<i>0</i>

table continued on next page

Table 4-2: ATU Buyers (continued)

Name	ATU Bought on Market	ATUs Bought for Excursion Compensation
Trades		
AbbVie	165	
Alpha Baking (Account 1706)	216	
Alpha Baking (Account 1710)	25	
Campagna-Turano Bakery Inc	97	
Chicago Steel Container	82	
Diago North America Inc	13	
East Balt Commissary Inc	354	
Equilon Enterprises LLC	34	
Fort Dearborn Lithographic Co	2	
Georgia Nut Co	100	274
Greif Packaging Inc LLC	5	
Gold Standard Bakery	252	
Highland Baking Co	167	
Hunter Panels		228
Interlake Mecalux Inc	60	
Kerry Ingredients	138	
Kerry Ingredients & Flavors	69	
Knead Dough Baking Co Inc	184	
KNS Companies		1,062
Lake Book Manufacturing	36	
New WinCup Holdings	192	
Pactiv LLC	253	
Pepperidge Farms	63	35
Prairie State Group		14
Segerdahl Corp	37	
University of Illinois-Chicago (Account 10345)	36	
<i>Trades Subtotal</i>	<i>2,580</i>	<i>1,613</i>
Total	10,224	1,613

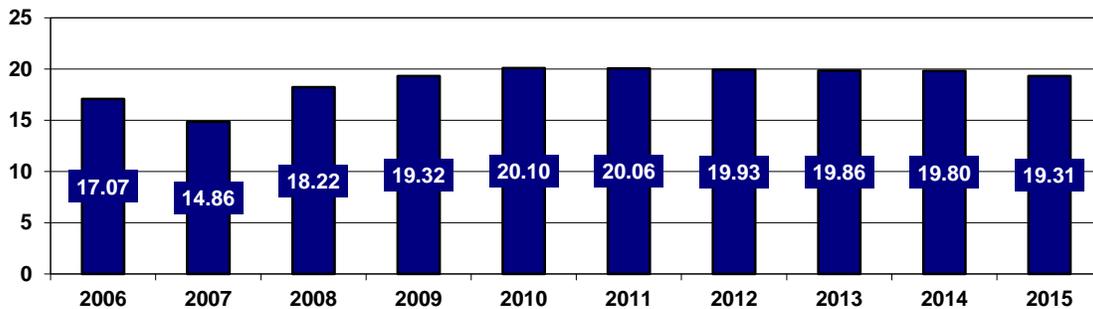
Trades accounted for 11,837 ATUs. Trading activity comprised 11.8 percent of the total allotment of 100,255 ATUs and 34.0 percent of the 34,805 ATUs that represent the emissions reported for compliance purposes. These values are higher than usual due to some sources buying from ACMA to rectify noncompliance that occurred in previous seasons.

4.4 ATU Availability

There are several indicators of how accessible ATUs are to ERMS participants. One indicator is the relative number of “buy” and “sell” postings to the ERMS bulletin board. There were a total of two “sell” postings which showed 2,655 ATUs available for sale. There were two postings for sources looking to buy a total of 502 ATUs. The fact that there was such a high ratio of ATUs for sale as compared to those attempting to buy indicates ATUs were readily available to those looking for them.

A second indicator is the average price. If ATUs are difficult to obtain, their price should rise as a function of supply and demand. If they are readily available, the price should generally decline. Prices declined in the early years but have steadied in recent years. Figure 4-1 shows the average ATU prices since ERMS began.

Figure 4-1: Average ATU Price (\$/ATU)



A third indicator is that no source requested regular access to ACMA during the reconciliation period. Sources would likely request such access if they could not find the ATUs they need on the market. Thus, it can be concluded sources who were looking to acquire ATUs found the ATUs they needed in the market.

A fourth indicator is the number of sources that went into excursion compensation because they did not have enough ATUs to account for their emissions. Three sources went into excursion compensation after the 2015 season. Only one of these three sources did not receive an allotment. Circumstances regarding these excursions cannot be attributed to unavailability of ATUs. The sources simply did not undertake the necessary actions to obtain required ATUs. There has been no indication that any source that was actively looking for ATUs was unable to obtain the needed amount.

A final indicator is the number of ATUs that expire. As discussed above, after the 2015 season, 63,033 ATUs expired without being used. This represents 62.9 percent of the ATUs allotted in 2015. If ATUs were in high demand, it is unlikely so many would have expired.

4.5 Average ATU Market Price

The market price of an ATU is determined through trading among the ERMS participants. The Illinois EPA uses information submitted with each trade to calculate the average market price by dividing the total price of all included transactions by the number of ATUs traded. Trades may not be included if the participants indicated special considerations were involved – for example, if one branch of a company trades ATUs to another branch without charging a price. Long-term transfer agreements are not included in the calculation of the average market price.

Using this method, the average market price for each ATU in the 2015 season was calculated to be \$19.31. ATUs ranged in price from \$15 to \$20 each with most of the trades being \$20. When calculating the average ATU prices, 17 trades were included in determining this average.

There was no effect on price related to expiration date of an ATU. Out of the 17 trades used to determine the average, two included ATUs that expired in a future year with the average price of those trades being \$20/ATU. The expiration date price of those ATUs being traded was not a factor in establishing a price.

4.6 Findings

- Sources were able to find trading partners
- There was a sufficient supply of available ATUs
- Market prices were conducive to trading

5 Alternative ATU Generation

5.1 Summary of Emissions Reduction Generator (ERG) Proposals

An emissions reduction generator (ERG) is a source that has achieved reductions in VOM emissions but is not a participating source in ERMS. The reductions must be certified in a permit and a participating source, new participating source, or general participant must propose the reductions.

There were no new ERG proposals during 2015. In previous years, nine ERGs were approved. Table 5-1 shows the ERGs that received ATUs in 2015.

All ERG proposals to date have been shutdowns for which facilities have forfeited their permits to operate the affected units in order to receive ATUs. It is possible for sources to apply to become ERGs using other methods, but all must show actual reductions in VOM emissions. Any source wishing to receive ATUs on a continuing basis must modify its permit to incorporate the limits, thus ensuring that actual reductions are achieved. Sources wishing only to get a single issuance of ATUs must prove actual VOM reductions for that season.

Table 5-1: ERGs Receiving ATUs

Name	ATU Allotment	ATUs Expiring at the Source	ATUs to ACMA
Alumax Extrusions	63	63	
CCL Custom Manufacturing	147	147	36
General Mills	19	0	
Industrial Coatings	82	82	
Metal Box International	90	90	
Pactiv	1,317	1,064	329
Sherwin-Williams	884	884	221
Solo Cup	99	99	
Total	2,701	2,429	586

ATUs for ERGs equates to 2.7 percent of the total allotment to all sources in the ERMS program.

All of the ATUs allocated for ERGs in 2015, with the exception of General Mills, went into general participating accounts. One general participant, Pactiv (Account 2654), traded 253 ATUs to a new participating source, Pactiv (Account 13689 – formerly Prairie Packaging). All of these ATUs were retired. A total of 2,429 ATUs expired from these accounts after the 2015 season. The 253 ATUs retired are a small percentage of the allocation and the number of ATUs that expired so ATUs generated from ERGs did not play a significant role in increasing emissions.

5.2 Summary of Inter-Sector Proposals

There were no Inter-Sector proposals for the 2015 season.

5.3 Findings

- ATU generation from ERGs played an extremely minor role in market performance during the 2015 season
- ATU generation from inter-sectors did not play a role in market performance during the 2015 season

6 Performance Accountability

6.1 Seasonal Emission Reports

Illinois EPA identified 193 sources that were required to submit seasonal emissions reports (SERs) for the ERMS program. These reports are based on federally enforceable permit conditions for recordkeeping, reporting, monitoring, and calculation methodology. Of these, 144 SERs were expected from permitted participating/new sources. Follow-up calls were made to 11 facilities that did not submit their SERs by the deadline. One source who did not respond to the call was issued a Violation Notice.

Illinois EPA deemed 5.7 percent of the SERs received from participating sources as unacceptable because of a variety of errors. This percentage is much lower than previous years due to the fact that the seasonal reporting form found on the ERMS web page is now a fillable form and performs the calculations for the user. However, many sources do not use this capability. Reasons for determining reports to be unacceptable continue to include items from previous years:

- Not reporting operating rate data
- Mathematical or rounding errors (for those not using the online form)
- Failure to include all significant emission units covered by the permit
- Failure to sign the report

Sources are required to report VOM HAP emissions on their SERs if they are subject to MACT, report to TRI, or are major for HAPs. Some sources continued to report pollutants that were not HAPs, or that were HAPs but were not VOM. Information pertaining to these pollutants was not considered in this evaluation.

6.2 Alternative Compliance Market Account (ACMA)

The purpose of ACMA is to serve as a secondary source of ATUs for participants. Unlike ATUs allocated to sources, those in ACMA have an indefinite life as long as they remain in ACMA. Once they are bought, they must be used to account for either the preceding or subsequent seasonal allotment period.

ACMA may receive ATUs in several ways. ACMA is given ATUs in an amount equal to one percent of each year's allotment to the participating sources. Sources that choose to become exempt from ERMS by taking an 18 percent reduction have six percent of that reduction allotted to ACMA. ATUs are also deposited in ACMA as a result of participating source shutdowns and ERG shutdowns. Additionally, sources may donate ATUs to ACMA.

There were no expenditures from the ACMA account in 2015.

A total of 7,817 ATUs were deposited into ACMA, as detailed in Table 6-1 below. Of these, a total of 38 ATUs were donated to ACMA by a source as part of the settlement of a compliance issue.

Table 6-1: ACMA Account Balance

	2011	2012	2013	2014	2015
Regular Allotment	1,000	1,001	1,001	1,003	1,003
Allotment from 18% Reduction	0	0	0	0	0
ERG Shutdowns	586	586	586	586	586
Participating Source Shutdowns	5,355	5,364	5,339	6,068	6,190
Donations to ACMA	38	38	38	38	38
ATUs Bought from ACMA	-17	-381	-1,189	-862	-1,676
Previous Year's Balance	22,920	29,882	36,490	42,265	49,095
Balance	29,882	36,490	42,265	49,095	55,236

Sources may buy ATUs from ACMA during the reconciliation period or, if necessary, in excursion compensation. One source purchased 63 ATUs from ACMA during the reconciliation period. Of the 1,676 ATUs purchased from ACMA, 228 were for excursion compensation for the 2015 season and were traded before March 1, 2016. Recent ACMA purchases by year can be seen in table 6-2.

Table 6-2: ACMA Purchases

	2011	2012	2013	2014	2015
Sources	2	3	7	3	1
ATUs purchased	17	381	1,189	467	228
Total cost (nearest dollar)	\$512	\$11,461	\$35,519	\$13,870	\$6,605

6.3 Excursion Compensation

Three sources went into excursion compensation for the 2015 season. For these sources, lack of action to purchase ATUs seemed to be the apparent cause of going into excursion rather than being unable to obtain ATUs on the market. One of the sources in excursion was in excursion for at least the second year in a row and was thus required to provide 1.5 times the ATUs of their excursion. The other sources were required to provide 1.2 times the ATUs of their excursion.

Sources in excursion compensation have their ATUs withdrawn from ACMA unless they instruct Illinois EPA to take them from the next year's allotment. All sources in excursion for 2015 bought from ACMA.

6.4 Source Inspections

In order to make sure appropriate ERMS reporting and compliance is maintained, the Field Operations Section includes conducts inspections of ERMS sources during the year. For 2015, 42 full compliance evaluations, which include ERMS Master File reviews, were performed at participating/new participating sources. Master File inspections add a further level of review of the source's ERMS Compliance Master File to make sure all recordkeeping, HAP information, and other ERMS related items are being properly maintained.

6.5 Findings

- The same errors continue to be made on the SERs each year. These errors are satisfactorily resolved once the company is notified.
- Establishing a seasonal report form on the ERMS web page that performed the calculation for the users greatly reduced math errors if they chose to use the form.
- No requests for regular access to ACMA were received during the reconciliation period.
- The reconciliation and compensation processes performed as designed and operated in a timely and effective manner.
- Inspections by the Illinois EPA found sources to be complying with the ERMS requirements.

7 Distribution of Emissions

7.1 Geographic Distribution of Transactions

Table 7-1 summarizes the number of ATUs traded for each county. It should be noted the total number of ATUs that appear to be leaving the nonattainment area is much higher than the total coming in. This is mostly due to ATUs sold to general participants who do not reside in any particular county and who have not then traded those ATUs back into the area for use by a participant. In addition, ATUs traded to special participants are counted as being “sold” but not “bought” because all such ATUs are immediately retired without being used in a particular county. ATUs donated to ACMA would have a similar result as they are also not used in any particular county. Similarly, the ATUs for excursion compensation did not come from any county.

Table 7-1: ATUs Traded by County

County	# of ERMS Sources	ATUs Sold	ATUs Bought	Excursion ATUs	Net
Cook	127	8,544	5,133	318	-3,093
DuPage	14	2	659	35	692
Grundy	5	0	250	0	250
Kane	14	272	0	0	-272
Kendall	1	0	0	0	0
Lake	12	289	165	0	-124
McHenry	8	450	70	0	-380
Will	24	0	814	4	818

Cook County shows the largest differential in ATUs transfers with approximately 3,100 ATUs leaving the county. Counties that show an increase may also include sources purchasing ATUs to cover past compliance problems. The history of ATUs traded by county can be found in Section 8.4.

During the 16 years of the program, no pattern or trend in trading has emerged in terms of ATU flow among the counties.

Table 7-2 provides a comparison by county showing baselines, allotments, and actual reported ATU use.

Table 7-2: ATU Comparison by County

County	Baseline (tons)	Allotment (ATUs)	Reported (ATUs)	Difference from Baseline	Difference from Allotment
Cook	7,440.1	66,604	19,008	-74.5%	-71.5%
DuPage	472.6	4,189	1,773	-62.5%	-57.7%
Grundy	509.1	4,623	2,700	-47.0%	-41.6%
Kane	475.2	4,409	2,139	-55.0%	-51.5%
Kendall	61.4	542	281	-54.2%	-48.2%
Lake	436.3	4,122	289	-93.4%	-93.0%
McHenry	194.9	1,770	235	-87.9%	-86.7%
Will	1,485.6	13,996	8,380	-43.6%	-40.1%
Total	11,075.1	100,255	34,805	-68.6%	-65.3%

The overall actual emissions in the nonattainment area and in each county were substantially lower than allotted emissions.

Table 7-3 shows how many ATUs have expired and are being retained by county. The percent expired and percent retained is calculated based upon the 2015 allotment.

Table 7-3: Total ATUs Expired and Retained by County

County	Allotment (ATUs)	ATUs Expired	Percent Expired	ATUs Retained	Percent Retained
Cook	66,604	39,152	58.8	62,697	94.1
DuPage	4,189	3,889	92.8	3,740	89.3
Grundy	4,623	2,173	47.0	4,623	100.0
Kane	4,409	2,525	57.3	4,323	98.1
Kendall	542	261	48.2	542	100.0
Lake	4,122	3,139	76.2	3,995	96.9
McHenry	1,770	1,106	62.5	1,682	95.0
Will	13,996	6,296	45.0	13,644	97.5
Total	100,255	58,541	58.4	95,246	95.0

Illinois EPA has utilized townships to look at ATU trading activity in more detail. Specifically, the Public Land Survey System township locations were used. Survey townships were chosen for a number of reasons, including their generally uniform size, unchanging historical borders, and readily available population data. The borders of other possible geographic units such as ZIP codes or census tracts could change due to factors not involved in ERMS. A listing of the townships is given in Appendix A.

There are 62 townships with ERMS participants and a total of 118 townships in the nonattainment area. Tables 7-4 and 7-5 summarize the number of sources in townships and the area of townships.

Table 7-4: Number of Sources per Township

Number of Sources	Number of Townships
1	28
2-3	17
4-6	8
>6	9

Table 7-5: Township Areas

Area (square miles)	Number of Townships
30-39	100
20-30	7
<20	11

Table 7-6 summarizes trading at the township level.

Table 7-6: ATUs Traded by Township

Township	Allotment (ATUs)	ATU Increase	ATU Decrease	Net	Change from Allotment
3408	4,623	250	0	250	5.4%
3409	7,991	230	0	230	2.9%
3510	629	100	0	100	15.9%
3609	97	13	0	13	13.4%
3610	143	34	0	34	23.8%
3710	2,948	437	0	437	14.8%
3713	3,243	0	5	-5	-0.2%
3714	6,698	221	468	-247	-3.7%
3715	608	0	221	-221	-36.4%
3809	0	5	0	5	-----
3812	22,818	470	2,445	-1,975	-8.7%
3813	5,780	711	802	-91	-1.6%
3814	2,981	100	419	-319	-10.7%
3909	164	0	2	-2	-1.2%
3912	2,524	160	654	-494	-19.6%
3913	2,672	1,907	385	1,522	57.0%
3914	2,776	390	898	-508	-18.3%
4008	420	0	242	-242	-57.6%
4009	145	192	0	192	132.4%
4010	634	330	0	330	52.1%
4011	1,437	69	0	69	4.8%
4012	2,518	294	700	-406	-16.1%
4013	1,743	25	1,313	-1,288	-73.9%
4109	1,932	0	118	-118	-6.1%
4110	300	242	80	162	54.0%
4111	4,214	277	36	241	5.7%
4113	222	2	0	2	0.9%
4114	220	130	0	130	59.1%
4208	603	0	30	-30	-5.0%
4211	187	37	0	37	19.8%
4212	0	167	0	167	-----
4308	88	0	88	-88	-100.0%
4309	332	0	200	-200	-60.2%
4407	74	70	162	-92	-124.3%
4409	127	0	124	-124	-97.6%
4411	537	165	165	0	0.0%

Tables 7-7 and 7-8 summarize the ATUs expired and retained at the township level of the entire nonattainment area. The percentage given is for the number of ATUs that expired as compared to the number of ATUs allotted to the township in 2015. See Appendix B for full details by township number.

Table 7-7: Expired ATUs by Township

Percent of ATUs Expired	Number of Townships
0	7
0.1 - 20	5
20.1 – 40	3
40.1 – 60	13
60.1 – 80	17
80.1 – 100	12
=100	0
>100	1

Table 7-8: Retained ATUs by Township

Percent of ATUs Retained	Number of Townships
0	5
0.1 - 20	1
20.1 – 40	1
40.1 – 60	2
60.1 – 80	1
80.1 – 100	8
=100	38
>100	3

To get a full picture of how the ERMS program works at a township level, it is necessary to look at the actual emissions rather than simply at trades. Some companies had excess ATUs they could have sold if a buyer had been located. Others may have chosen not to sell even if their emissions were lower than their allotments. Illinois EPA compared the actual emissions reported by participants in each township to the baselines and allotments for those townships and used this approach throughout the remainder of the analysis.

In this analysis, Illinois EPA found six townships, or 5.1 percent of the 118 townships in the entire Chicago NAA, showed increases in emissions over their baselines, as shown in Table 7-9.

Table 7-9: Townships with Emissions Over Baseline Level

County	Township	Number of Sources	VOM Increase (tons)	Increase from Baseline
Cook	4211 – Wheeling	1	1.1	5.3%
DuPage	3811 – Downers Grove	1	1.1	2.7%
DuPage	3909 – Winfield	2	0.1	0.5%
DuPage	4009 – Wayne	1	17.3	105.6%
Will	3609 – Plainfield	1	0.3	2.8%
Will	3610 – Lockport	1	1.5	9.0%

Figure 7-1 shows all participating sources and the six townships highlighted in yellow with an increase over their baselines. Each township with an increase over its baseline has at most two participating sources.

Table 7-10 identifies the townships that had 2015 seasonal emissions exceeding their allotment level. These six townships represent 5.1 percent of the total number of townships.

Table 7-10: Townships with Emissions Over Allotment Level

County	Township	Number of Sources	VOM Increase (ATUs)	Increase from Allotment
Cook	4211 – Wheeling	1	37	19.8%
DuPage	3811 – Downers Grove	1	63	16.7%
DuPage	3909 – Winfield	2	23	14.0%
DuPage	4009 – Wayne	1	192	132.4%
Will	3609 – Plainfield	1	16	16.5%
Will	3610 – Lockport	1	34	23.8%

Figure 7-2 shows all participating sources in the NAA and highlights in yellow the six townships which show increases over their allotments. Figures 7-3 and 7-4 show the highlighted townships for both baseline and allotment comparisons and flag only those sources that traded. Both of these maps show most often a single buyer in each of the affected townships put that township over its baseline or allotment.

Each county and the nonattainment area overall showed emissions significantly less than both the baseline and allotment. Appendix B contains the data from which all of the above information was obtained and a map showing actual emissions compared to the allotment.

7.2 Type of Source

Table 7-11 identifies sources by their two-digit SIC code for each source that took part in a trade.

Table 7-11: Transactions by SIC Code

SIC and Description	ATUs Bought	ATUs Sold	Net
13 – Oil and Gas Extraction	250	0	250
20 – Food Products	1,615	695	920
26 – Paper Products	347	1,187	-840
27 – Printing & Publishing	345	952	-607
28 – Chemicals and Allied Products	645	165	480
30 – Rubber & Plastic Products	445	2,268	-1,823
32 – Stone, clay, glass & concrete prods.	0	124	-124
33 – Primary Metals	0	221	-221
34 – Fabricated Metal Products	2,371	2,384	-13
35 – Industrial & Commercial Machinery	100	148	-48
36 – Electronic & Electrical Equipment	130	302	-172
42 – Motor Freight Transportation	2	0	2
46 – Pipelines (except natural gas)	34	0	34
51 – Wholesale Trade – Nondurable	177	213	-36
76 – Miscellaneous Repair Services	531	862	-331
82 – Educational Services	36	36	0

Figure 7-1: Difference from Baseline

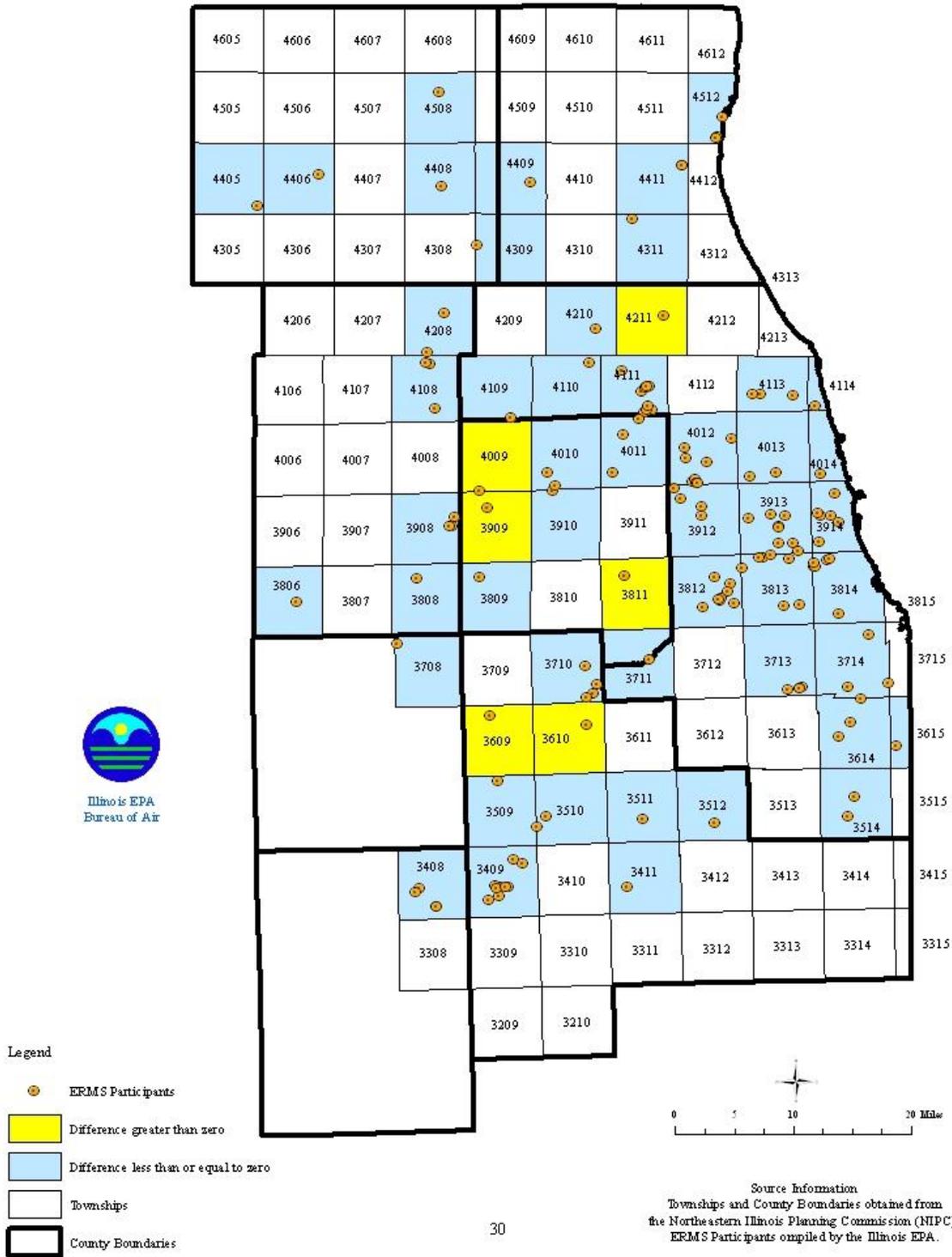


Figure 7-2: Difference from Allotment

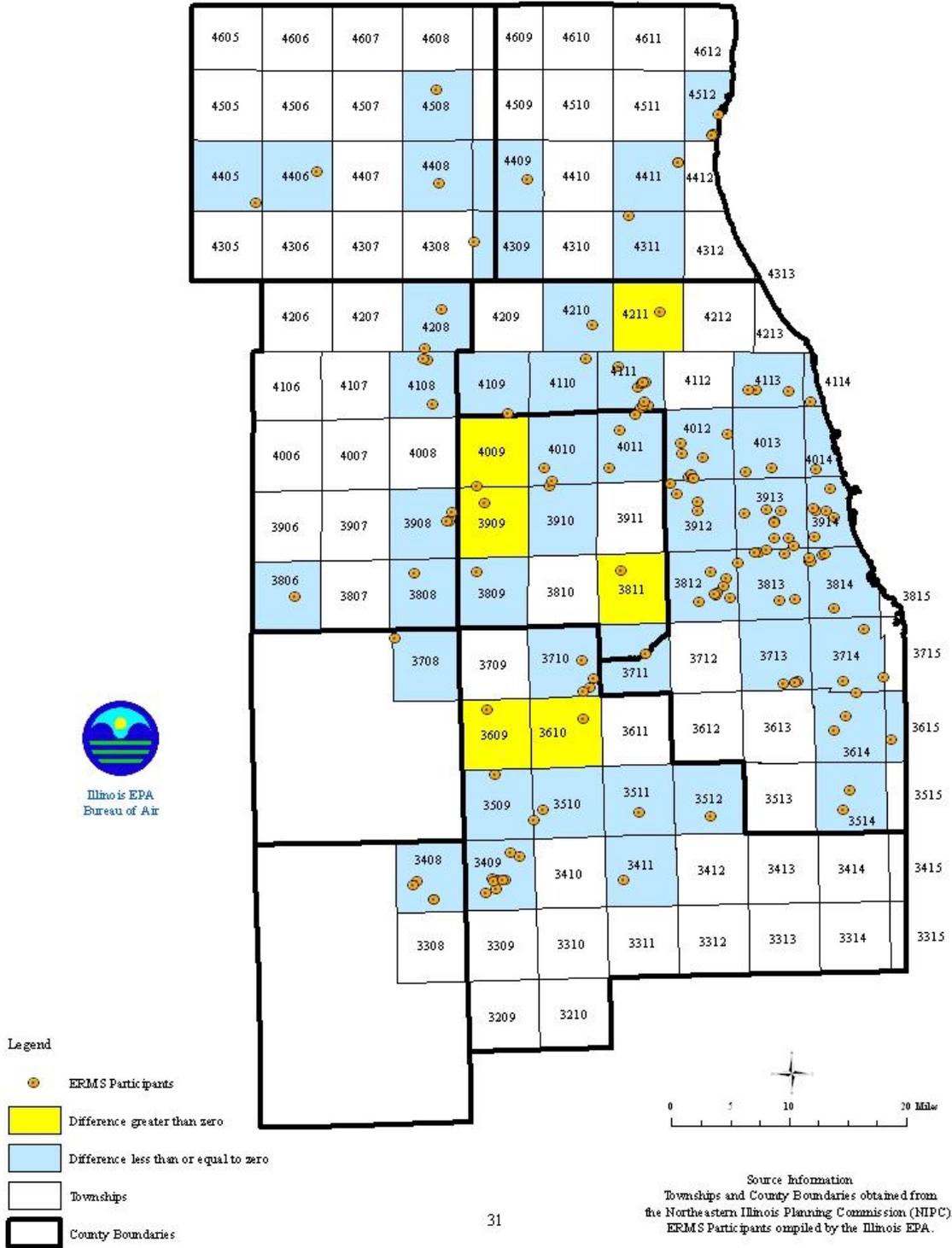


Figure 7-3: Difference from Baseline and Traders

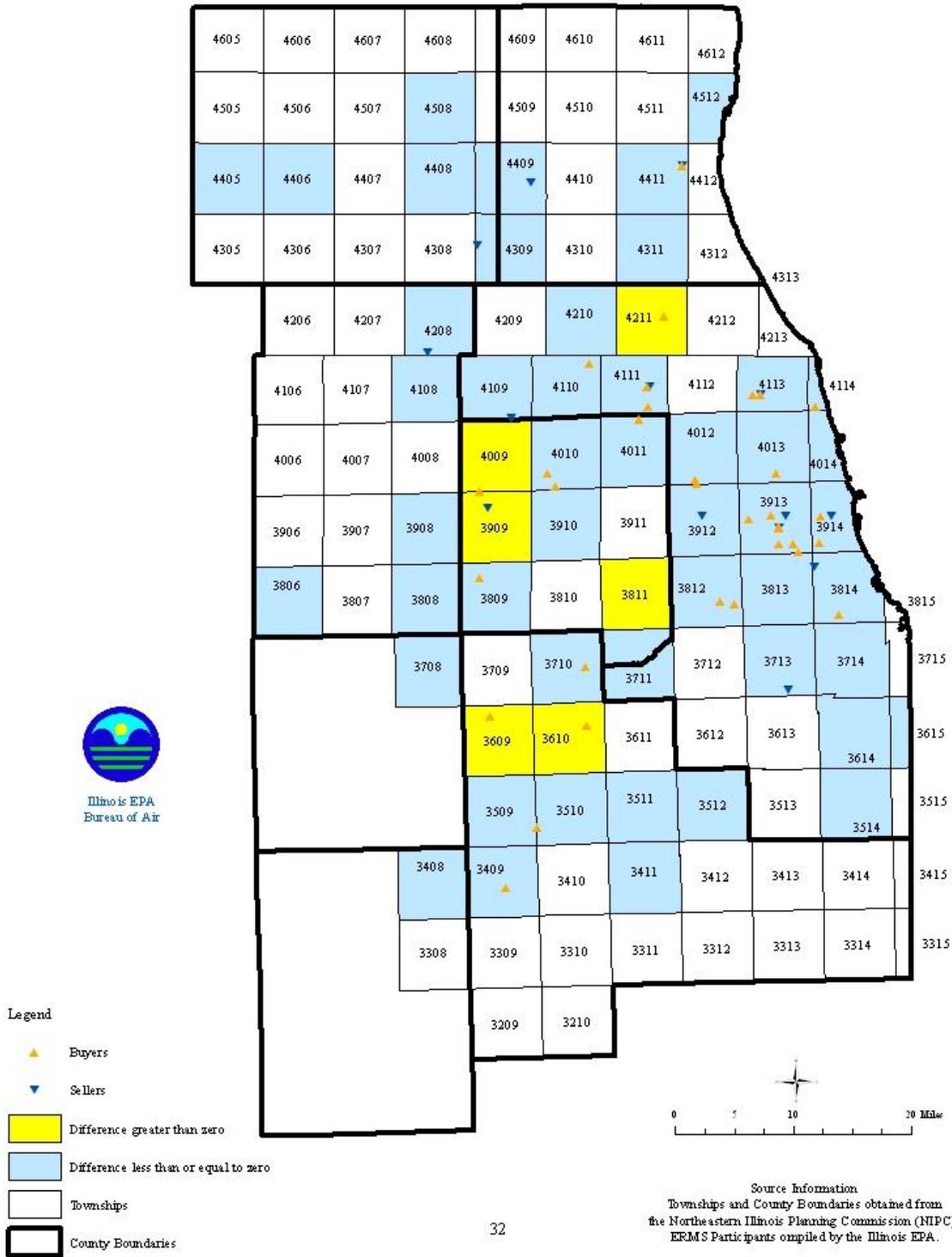


Figure 7-4: Difference from Allotment and Traders

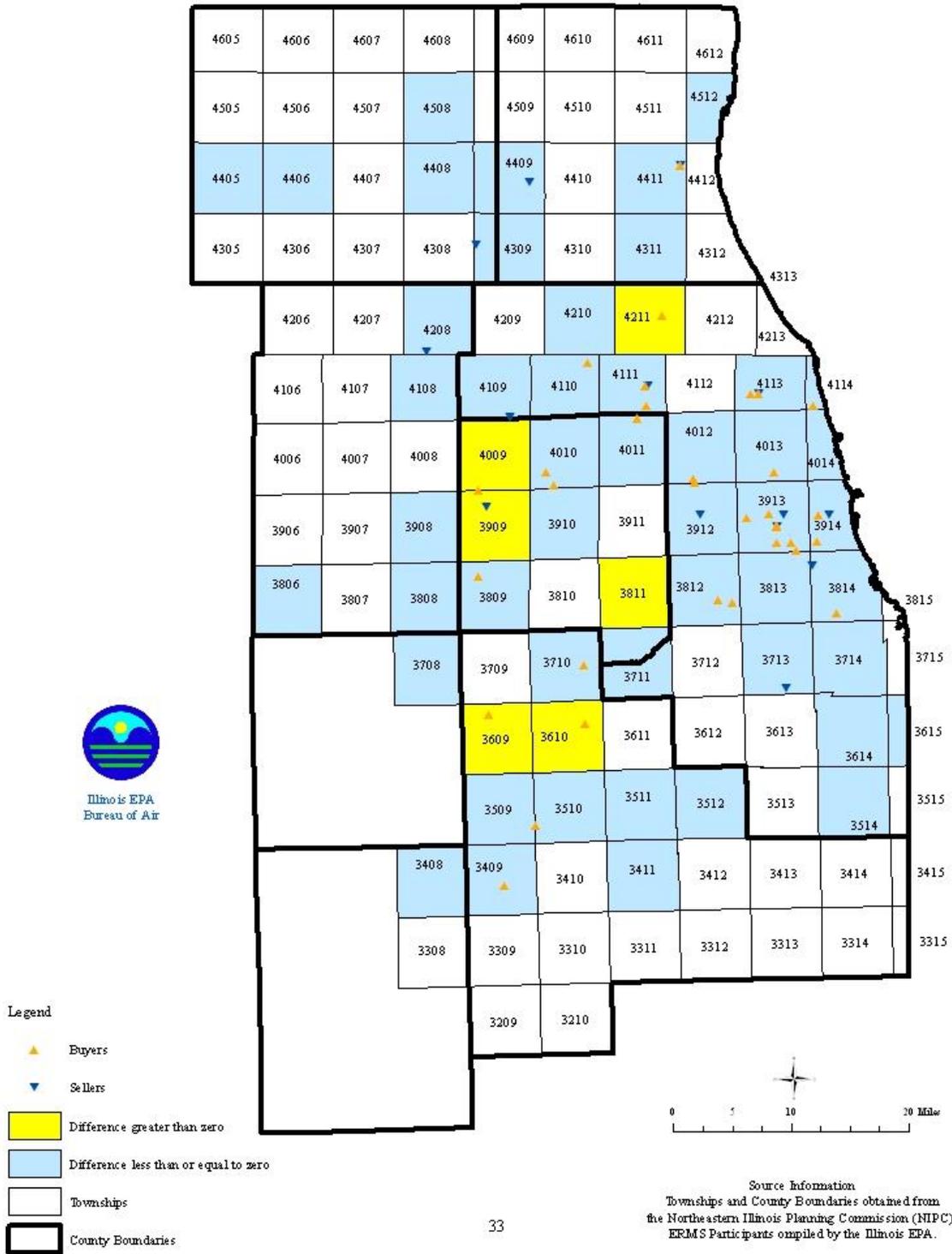


Table 7-12 provides the allotments for every SIC code which has a participant and that are being retained by sources in that industrial category.

Table 7-12: Total ATUs Expired and Retained by SIC Code

SIC	Allotment (ATUs)	ATUs Expired	Percent Expired	ATUs Retained	Percent Retained
13 – Oil and Gas Extraction	0	14	-----	0	-----
20 – Food Products	9,402	4,056	43.1	7,848	83.5
22 – Textile Products	272	218	80.1	272	100.0
24 – Lumber/Wood	386	221	57.3	386	100.0
25 – Furniture	1,653	1,193	72.2	1,653	100.0
26 – Paper Products	17,784	12,838	72.2	16,982	95.5
27 – Printing/Publishing	4,526	2,500	55.2	4,228	93.4
28 – Chemical Products	16,194	10,826	66.9	16,194	100.0
29 – Petroleum	4,992	1,470	29.4	4,992	100.0
30 – Rubber/Plastic	8,807	3,331	37.8	8,662	98.4
31 – Leather Products	281	183	65.1	281	100.0
32 – Stone/Clay/Glass	127	0	0.0	0	0.0
33 – Primary Metals	5,702	3,584	62.9	5,702	100.0
34 – Fabricated Metals	11,227	7,331	65.3	10,217	91.0
35 – Industrial Machinery	3,060	2,414	78.9	3,060	100.0
36 – Electrical Equipment	766	407	53.1	464	60.6
37 – Transportation Equip.	6,836	3,425	50.1	6,836	100.0
39 – Misc. Manufacturing	172	139	80.8	172	100.0
42 – Motor Freight Transport	1,637	629	38.4	1,637	100.0
46 – Pipelines	898	345	38.4	740	82.4
49 – Elec./Gas Services	480	310	64.6	480	100.0
51 – Nondurable Goods	3,174	2,153	67.8	2,992	94.3
73 – Business Services	219	121	55.3	219	100.0
76 – Misc. Repair Services	1,261	498	39.5	830	65.8
82 – Educational Services	316	268	84.8	316	100.0
87 – Engineering/Research	83	67	80.7	83	100.0

7.3 Trends and Spatial Distributions of Hazardous Air Pollutants (HAPs)

This is the 15th year sources have reported their HAP emissions. Area-wide emissions of HAPs show a downward trend since the first reporting year of 2001. VOM emissions show a generally downward trend. Emissions of HAPs by county can be found in Section 8.

Figures 7-5 and 7-6 show the previously mentioned townships and those ERMS sources that reported VOM HAPs in their SER. While most of the townships in question do contain sources that reported HAPs, there is no geographic concentration of such sources.

To further examine any possible relationship between HAP emitters and those townships which saw an increase, Figures 7-7 and 7-8 show those sources which are both HAP reporters and also participated in a trade during the 2014 season. As can be seen on those figures, there were two ATU buyers that reported HAPs in the highlighted townships. Both buyers had decreases in HAP emissions from 2014 to 2015. The total of this decrease was approximately 0.4 tons.

Table 7-13 shows the total HAPs reported for each township. It also shows the relative HAP emission density by looking at the percentage of HAP emissions compared to the total reported HAPs for the entire nonattainment area by ERMS sources and the net result of trading that took place in those townships.

Once again, the areas with the highest HAP emissions were not buying ATUs and increasing HAP emissions. The township, 3409, that had a large contribution of HAPs had a decrease, 800 pounds, in HAPs for the one source that traded. Furthermore, overall HAP emissions have typically been decreasing over the years for which data had been collected. There was a decrease of 39.6 tons of HAP emissions from 2014 to 2015. The largest HAP increase from a source that bought was 0.8 tons. Trading does not appear to influence HAP emissions.

Table 7-13: Reported HAP Emissions by Township

Township	HAP Emissions (tons)	Percent of Total HAPs (%)	Net ATU Change
3408	16.3	3.9	250
3409	120.7	28.8	230
3411	0.3	0.1	0
3509	2.5	0.6	0
3510	0.2	0.1	100
3511	0.8	0.2	0
3514	5.7	1.4	0
3610	0.5	0.1	34
3614	23.1	5.5	0
3615	3.9	0.9	0
3708	2.1	0.5	0
3710	23.0	5.5	437
3713	1.7	0.4	-5
3714	38.8	9.3	-247
3806	0.4	0.1	0

table continued on next page

Table 7-13: Reported HAP Emissions by Township (continued)

Township	HAP Emissions (tons)	Percent of Total HAPs (%)	Net ATU Change
3811	2.2	0.5	0
3812	72.1	17.2	-1,975
3813	39.8	9.5	-91
3814	8.8	2.1	-319
3908	2.2	0.5	0
3910	2.1	0.5	0
3912	3.2	0.8	-494
3913	15.9	3.8	1,522
3914	0.7	0.2	-508
4010	0.7	0.2	330
4011	5.7	1.3	69
4012	1.0	0.2	-406
4014	0.4	0.1	0
4108	0.3	0.1	0
4110	0.1	0.0	162
4111	15.0	3.6	241
4113	1.0	0.2	2
4208	1.4	0.3	-30
4211	1.2	0.3	37
4212	0.0	0.0	167
4309	0.8	0.2	-200
4406	0.0	0.0	0
4408	0.1	0.0	0
4409	0.3	0.1	-124
4411	0.8	0.2	0
4508	0.0	0.0	0
4512	3.9	0.9	0

Figure 7-5: VOM HAP Reporting Sources
(Difference from Baseline)

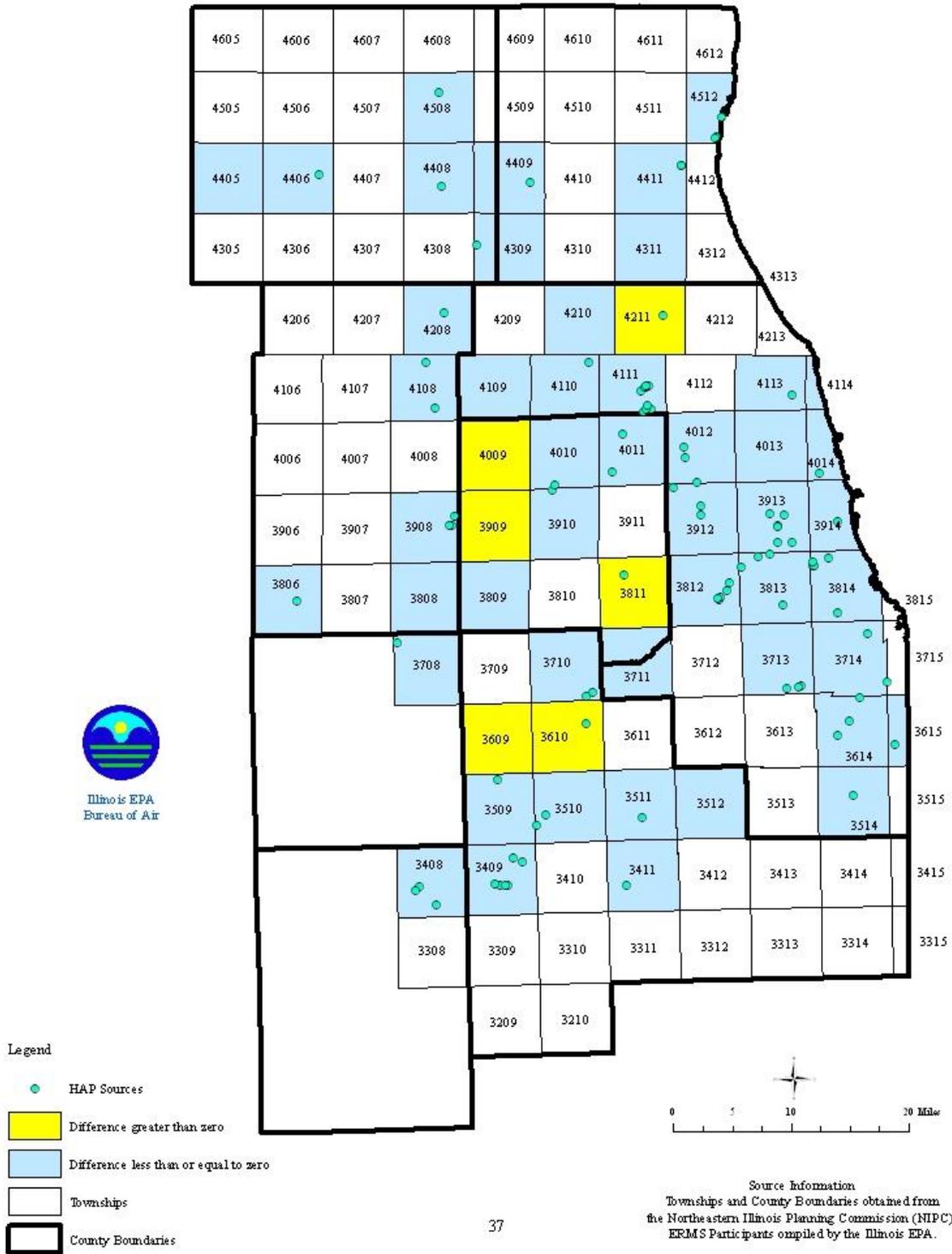


Figure 7-6: VOM HAP Reporting Sources
(Difference from Allotment)

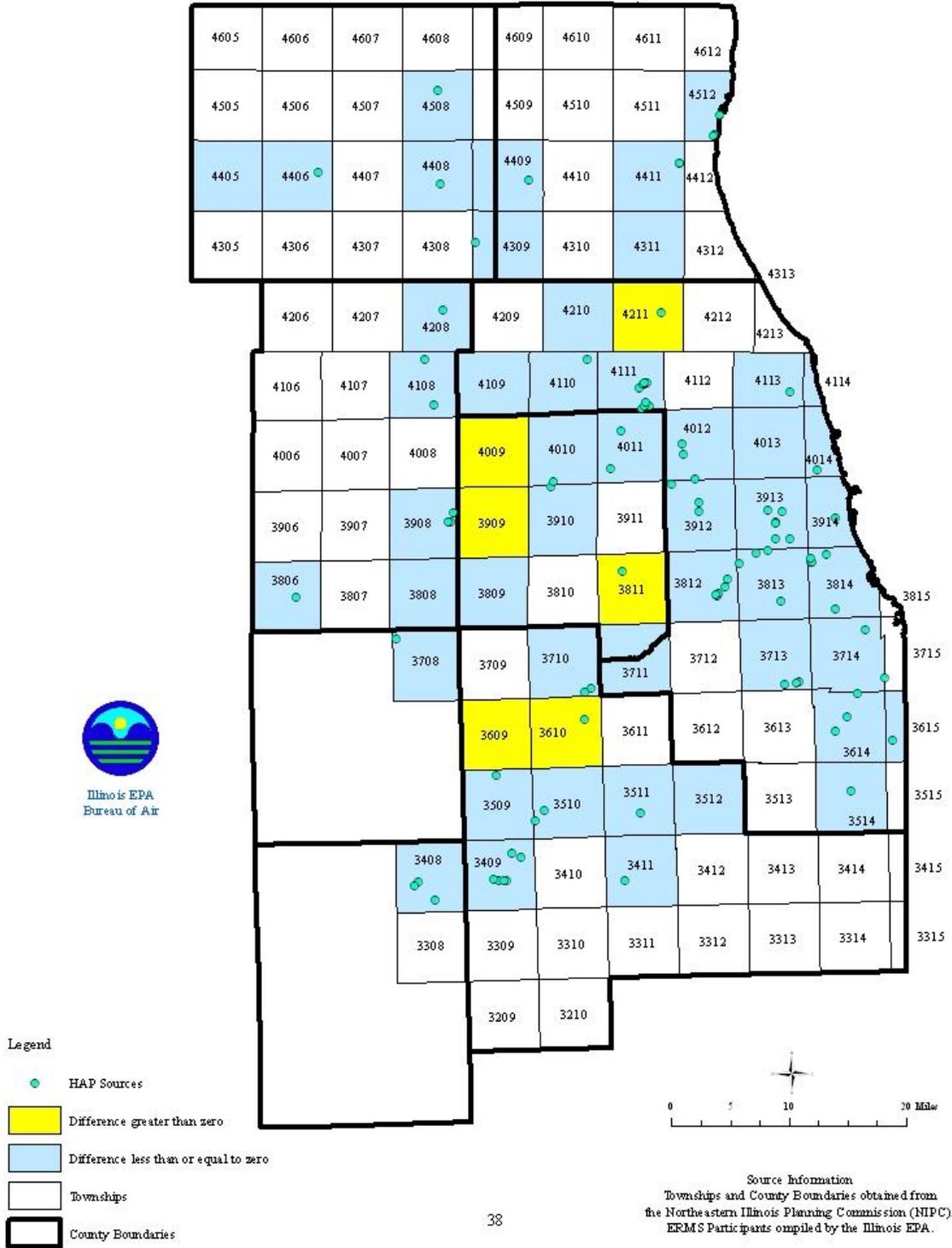


Figure 7-7: Traders with VOM HAP Reporting Sources
(Difference from Baseline)

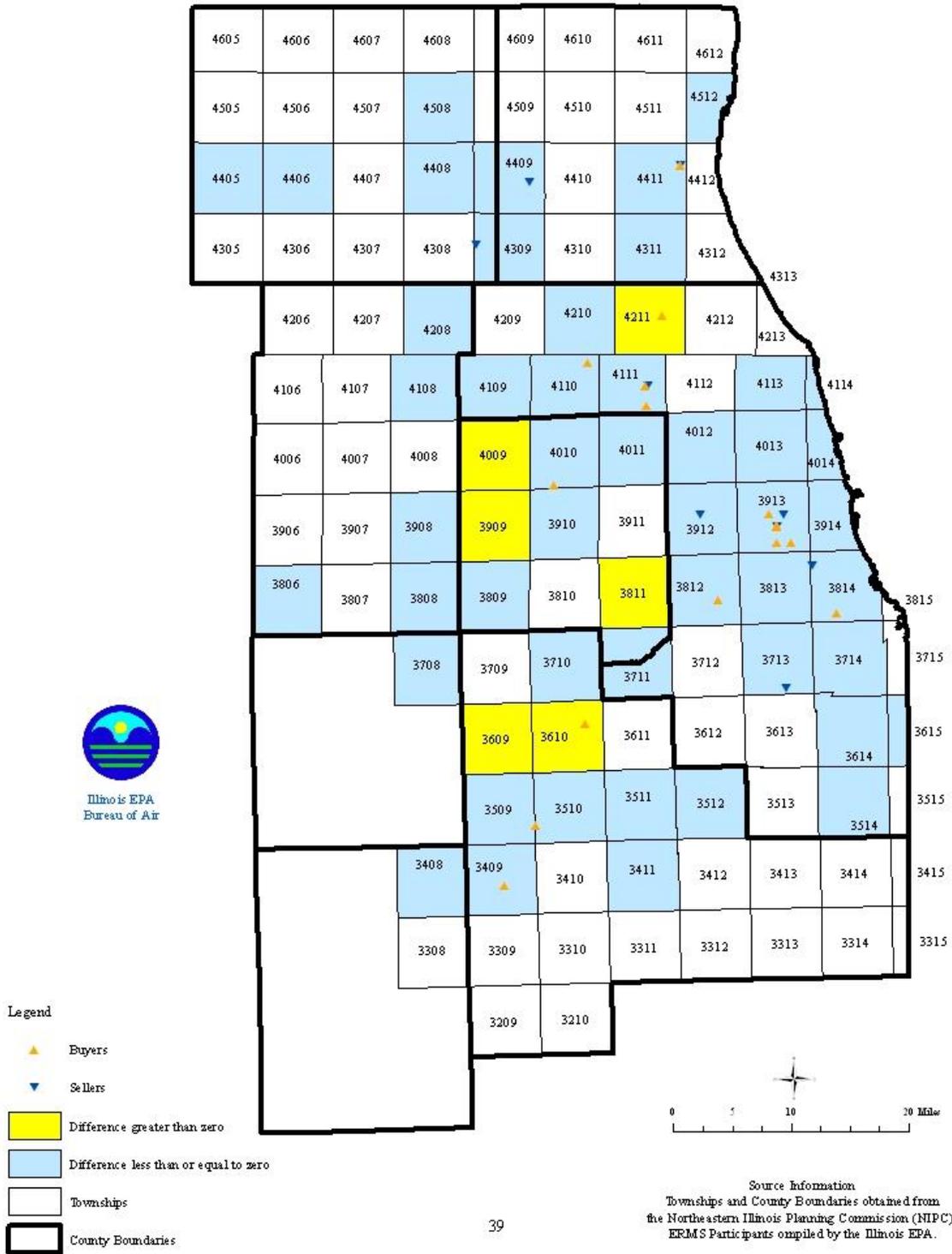
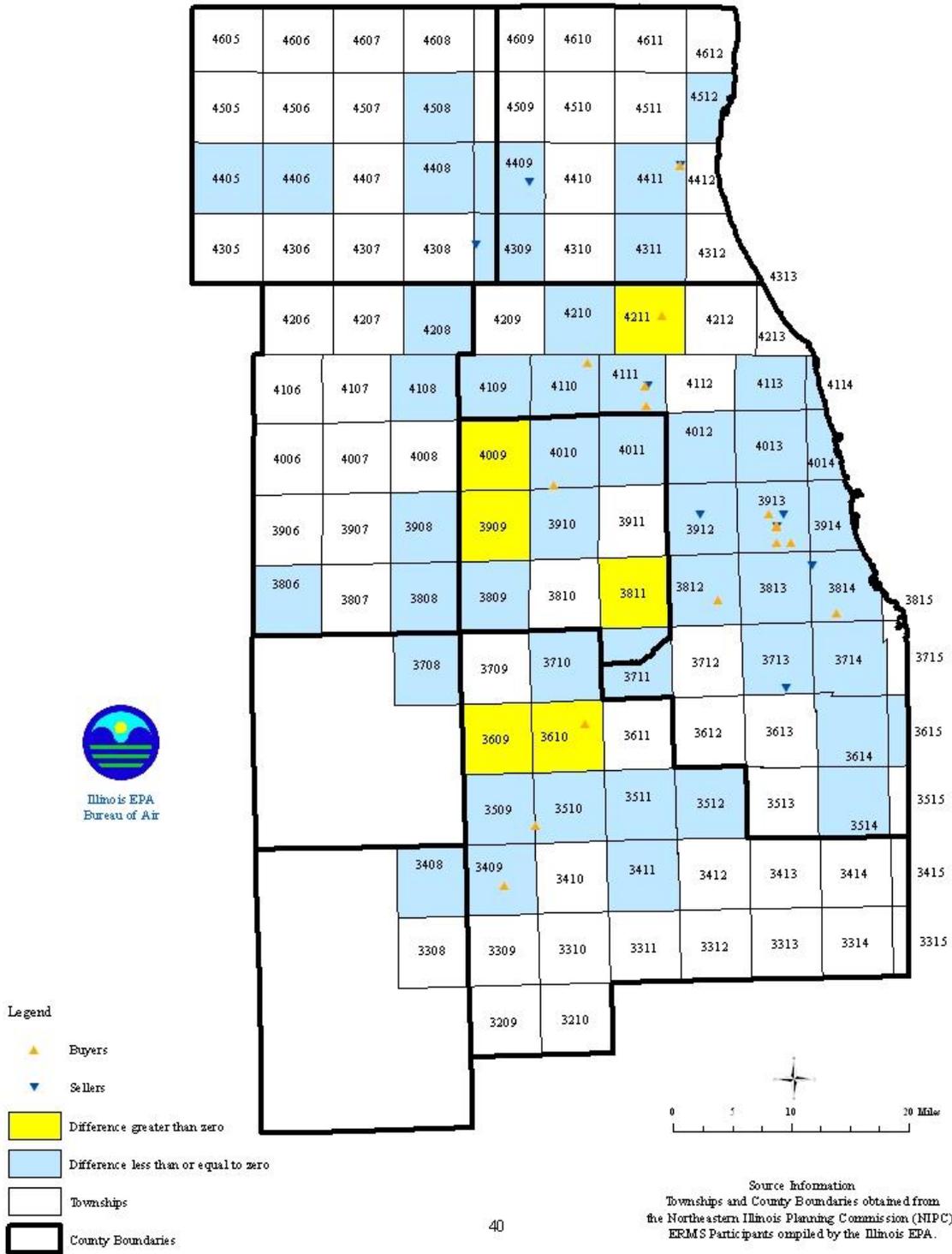


Figure 7-8: Traders with VOM HAP Reporting Sources
(Difference from Allotment)



Figures 7-9 and 7-10 compare changes in HAP emissions on both a source and on a township basis. For 2015, the number of sources with decreases, 59, in HAP emissions outweighed the number of sources with increases, 38, in HAP emissions with a slight preference to decreases. Overall, HAP emissions decreased 39.6 tons for the area. This decrease was after two prior years of slight increases. The sources with the largest increases were not in the areas of interest.

Illinois EPA also looked at population densities relative to HAP sources to determine if trading activity might be affecting the more densely populated areas. Population densities, rather than actual populations, were used to normalize the emissions as the population might be distributed over a wide area.

Figures 7-11 and 7-12 show the sources which reported HAPs on a map that is color-coded for population density. The two higher-density areas, 3811 and 4211, each have a single HAP reporter who had a decrease in HAP emissions.

It should be noted that all of the sources that increased their HAP emissions could have done so without the ERMS program and would have been less restricted in doing so because the ERMS program holds them accountable for those emissions as with any other VOM emissions.

Table 7-14 summarizes the key results from evaluating Figures 7-9 through 7-12.

Table 7-14: Key Results on HAPs for Six Highlighted Townships

Township	HAP Source Present?	Trading HAP Source?	Population Density Level	Percent of VOM that are HAPs
3609 – Plainfield	No	No	3	0.0
3610 – Lockport	Yes	Yes	3	2.8
3811 – Downers Grove	Yes	No	4	4.9
3909 – Winfield	No	No	3	0.0
4009 – Wayne	No	No	3	0.0
4211 – Wheeling	Yes	Yes	4	5.4

7.4 HAP Information Request Letters

Illinois EPA's Annual Emissions Report rule allows the gathering of additional HAP information that may not have already been reported for the following three cases:

- Emissions of HAPs increased due to trading
- More than 1,000 pounds of any HAP that was not otherwise required to be reported
- A VOM is replaced with a HAP that is not a VOM

If a source identifies one or more of these cases, the Illinois EPA may send a HAP Information Request Letter. The main goal of acquiring additional information is to ensure the levels set for HAP reporting are adequate to catch any potential problems related to both HAPs and the ERMS program. For the 2015 season, the Illinois EPA did not have cause to send out any such letters.

The Illinois EPA's analysis indicates the ERMS program does not affect changes in HAP emissions. The reporting levels in place within the AER rule are considered to be appropriate.

7.5 Findings

- Overall, the Chicago NAA and each county within the NAA showed emissions that are significantly less than both the baseline and allotment.
- No trend is detectable in terms of ATU flow among the counties.
- Using a township basis to look more closely at smaller areas shows six townships with emissions higher than their baselines and six townships with emissions higher than their allotment.
- Trading does not appear to influence HAP emission levels.

Figure 7-9: Changes in 2014 - 2015 Reported HAP Emissions
(Difference from Baseline)

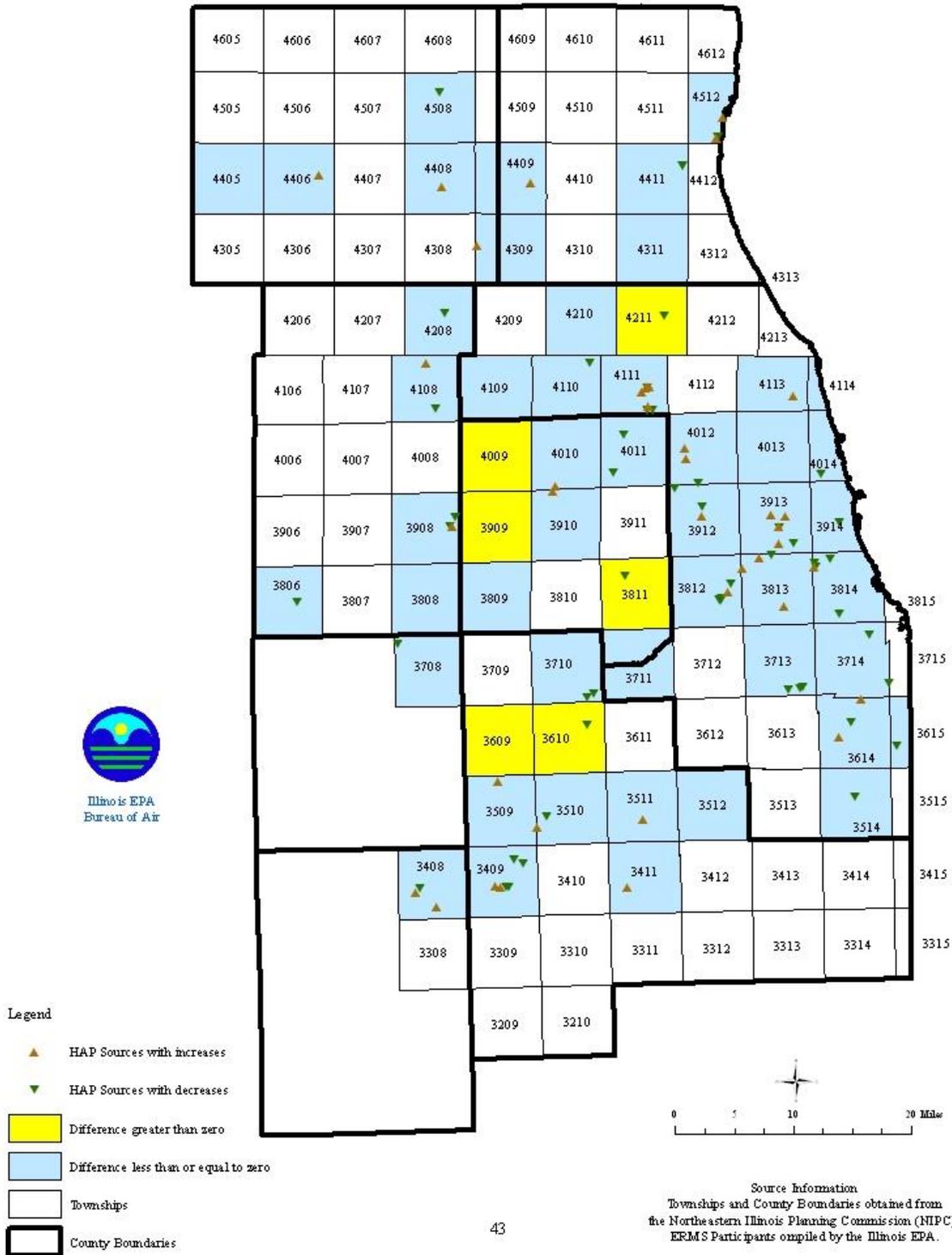


Figure 7-10: Changes in 2014 - 2015 Reported HAP Emissions
(Difference from Allotment)

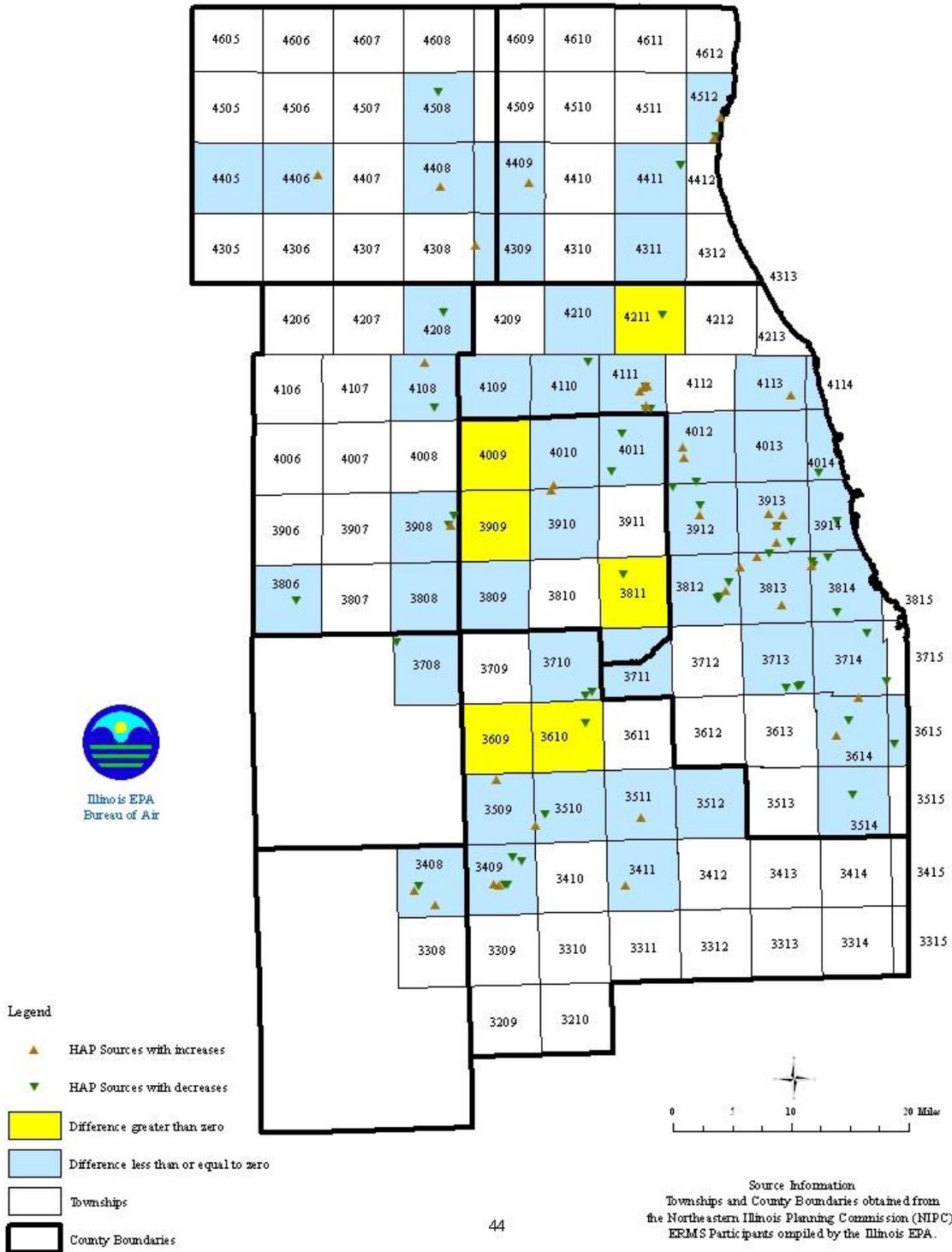


Figure 7-11: VOM HAP Reporters with Population Density
(Difference from Baseline)

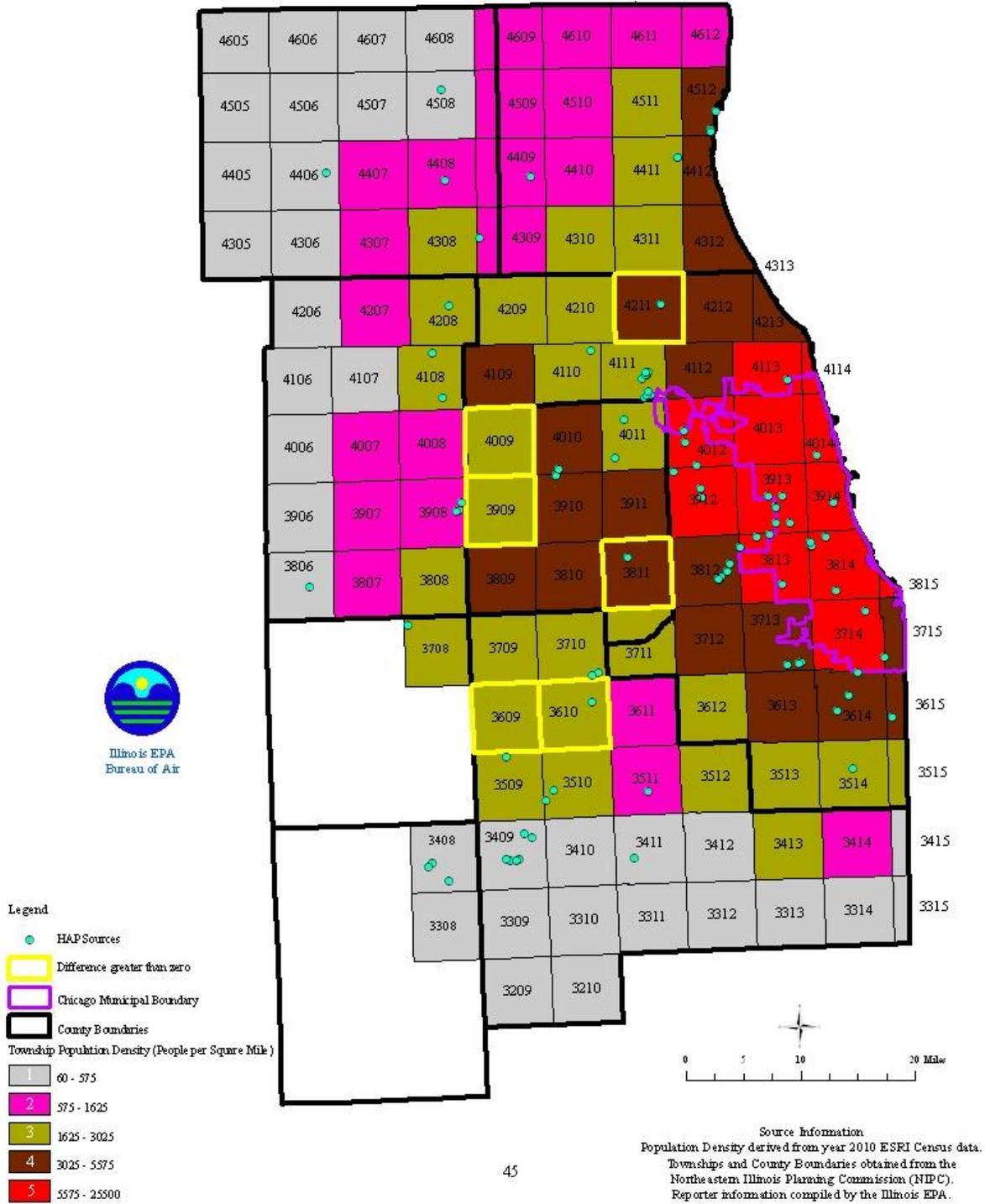
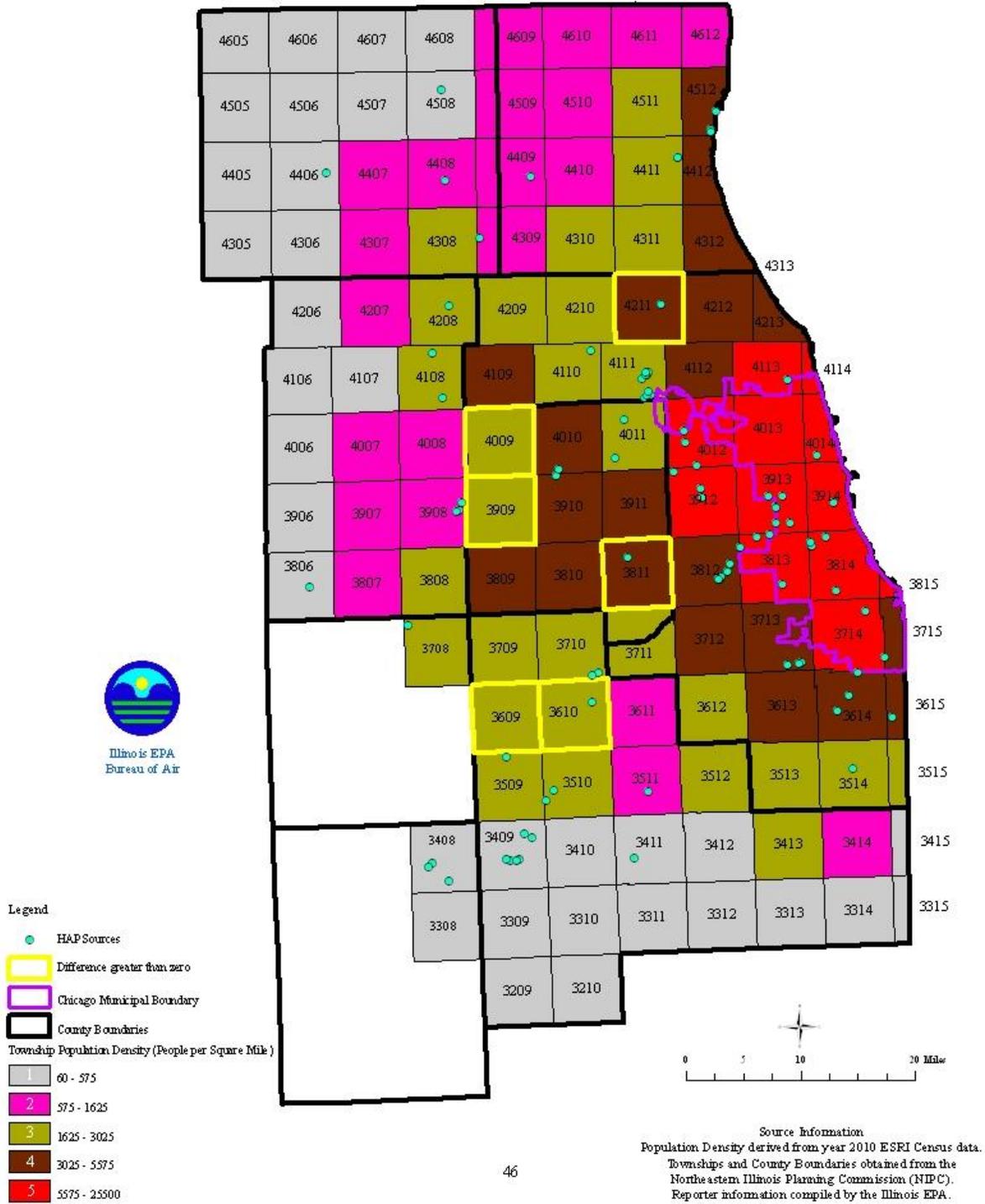


Figure 7-12: VOM HAP Reporters with Population Density
(Difference from Allotment)



8 Historical Regional Data

Figure 8-1: Allotment and Compensation by Year

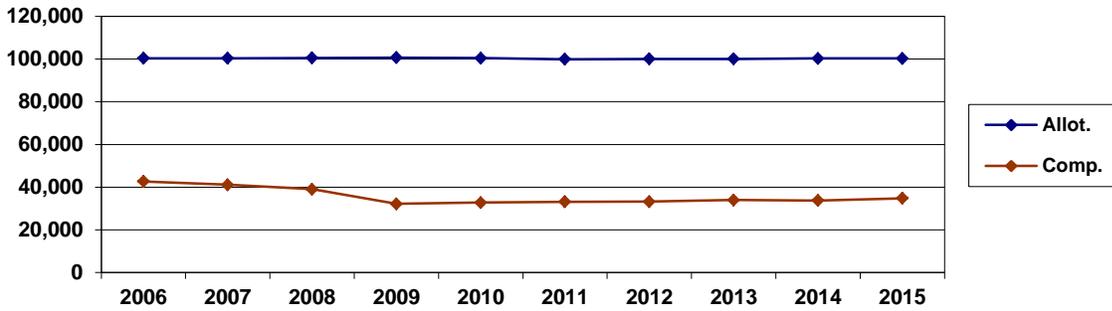


Figure 8-2: Allotment and Expired ATUs by Year

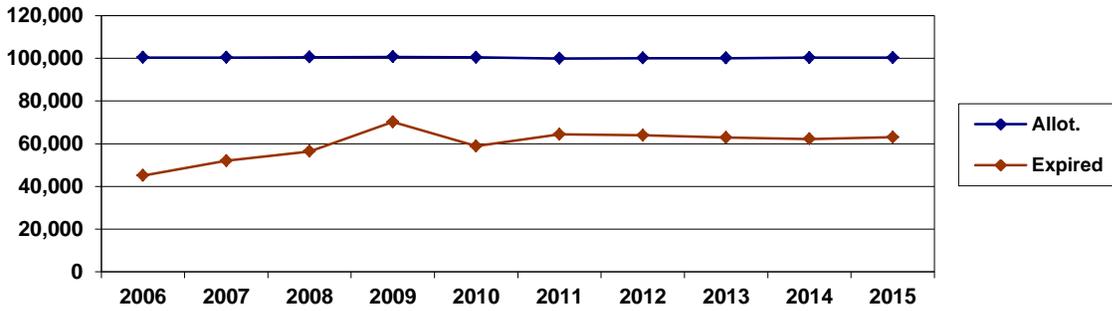


Figure 8-3: Allotment and Retained ATUs by Year

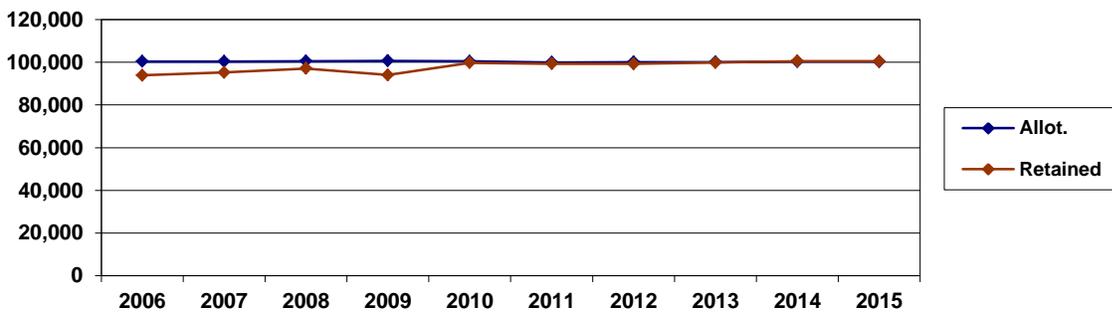


Figure 8-4: Emissions and Reported HAPs (tons)

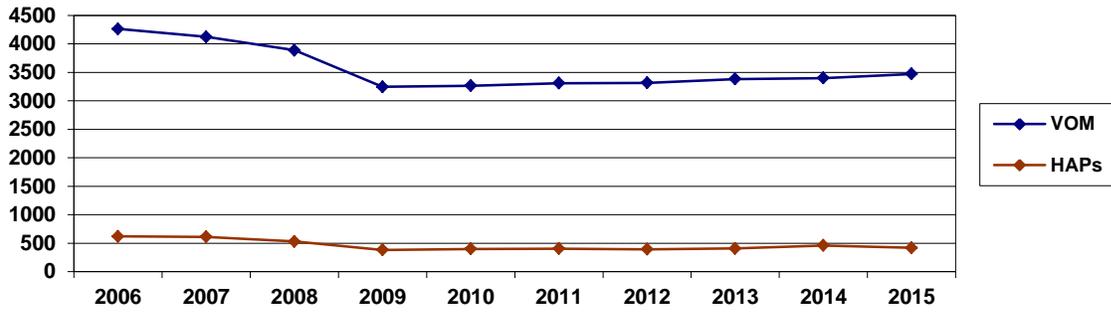


Figure 8-5: Reduction from Baseline and Allotment (%)

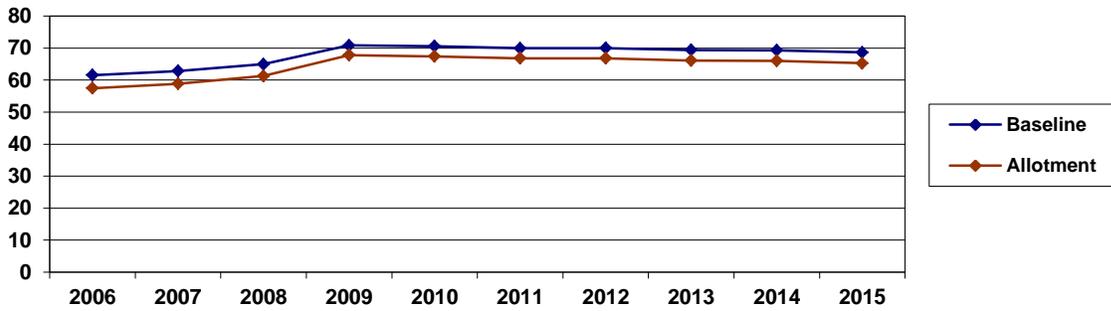
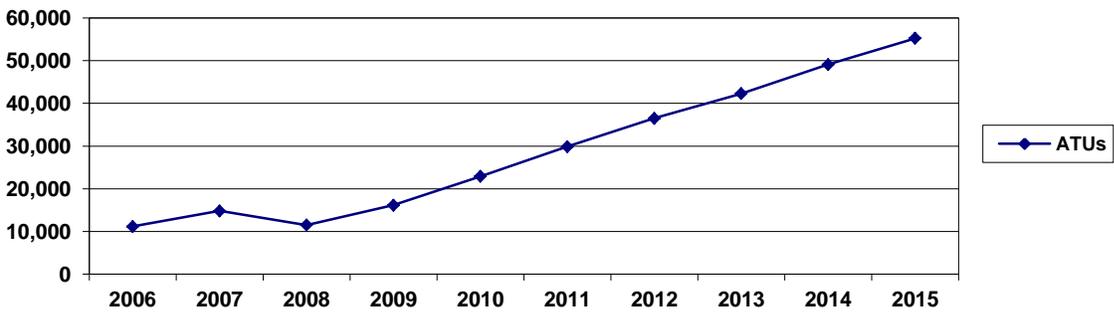


Figure 8-6: ACMA Balance by Year



9 Conclusions

As required by Section 205.760, Illinois EPA has documented the performance of ERMS for the 2015 season and evaluated these data for trends or patterns emerging from the ERMS program. Illinois EPA believes the ERMS program is working as intended and is achieving VOM emission reductions included as part of the State's ozone SIP for Chicago. Illinois EPA's conclusions are:

- **The ERMS program continued to achieve the desired emission reductions.** The allotment shows a 9.5 percent reduction from the original baseline and exceeded the necessary 9 percent reduction for the 16th year in a row. Thus, even if every allotted ATU was used, there would still be a significant reduction from the VOM baseline in the area.
- **ERMS participants are performing significantly below the baseline and allotment levels.** The ERMS program was created to help reduce VOM emissions from the Chicago NAA and to aid in bringing that area into attainment with the NAAQS for ozone. A review of the emission data for ERMS participating sources shows these sources have, as a whole, reduced VOM emissions by a substantial amount compared to their baselines and allotments. Sources emitted 68.6 percent less VOM than their baselines would have allowed them to emit and 65.3 percent less than their actual ATU allotments for 2015.
- **The Market System operated in an effective manner.** Sources were able to find trading partners, there was sufficient supply of available ATUs, and market prices were conducive to trading. Alternative ATU generation did not play a role in market performance during the 2015 season. Reconciliation and compensation processes performed as designed.
- **No relationship is apparent between market activity and HAP levels.** The 15th year of HAP reporting by ERMS participants did not indicate trading had any influence on HAP emissions.

Appendix A
***Township Names and Id Numbers**

Township ID	Township Name	County
3209	Custer/Reed	Will
3210	Wesley	Will
3308	Goose Lake	Grundy
3309	Wilmington	Will
3310	Florence	Will
3311	Wilton	Will
3312	Peotone	Will
3313	Will	Will
3314	Washington	Will
3315	Washington - East	Will
3408	Aux Sable	Grundy
3409	Channahon	Will
3410	Jackson	Will
3411	Manhattan	Will
3412	Green Garden	Will
3413	Monee	Will
3414	Crete	Will
3415	Crete - East	Will
3509	Troy	Will
3510	Joliet	Will
3511	New Lennox	Will
3512	Frankfort	Will
3513	Rich	Cook
3514	Bloom	Cook
3515	Bloom - East	Cook
3609	Plainfield	Will
3610	Lockport	Will
3611	Homer	Will
3612	Orland	Cook
3613	Bremen	Cook
3614	Thornton	Cook
3615	Thornton - East	Cook
3708	Oswego	Kendall
3709	Wheatland	Will
3710	DuPage	Will
3711	Lemont	Cook/DuPage
3712	Palos	Cook
3713	Worth	Cook

Township ID	Township Name	County
3714	Calumet	Cook
3715	Chicago - 3715	Cook
3806	Big Rock	Kane
3807	Sugar Grove	Kane
3808	Aurora	Kane
3809	Naperville	DuPage
3810	Lisle	DuPage
3811	Downers Grove	DuPage
3812	Lyons	Cook
3813	Berwyn	Cook
3814	Chicago - 3814	Cook
3815	Chicago - 3815	Cook
3906	Kaneville	Kane
3907	Blackberry	Kane
3908	Batavia/Geneva	Kane
3909	Winfield	DuPage
3910	Milton	DuPage
3911	York	DuPage
3912	Proviso	Cook
3913	Cicero	Cook
3914	Chicago - 3914	Cook
4006	Virgil	Kane
4007	Campton	Kane
4008	St. Charles	Kane
4009	Wayne	DuPage
4010	Bloomington	DuPage
4011	Addison	DuPage
4012	Leyden	Cook
4013	Chicago - 4013	Cook
4014	Chicago - 4014	Cook
4106	Burlington	Kane
4107	Plato	Kane
4108	Elgin	Kane
4109	Hanover	Cook
4110	Schaumburg	Cook
4111	Elk Grove	Cook
4112	Maine	Cook
4113	Niles	Cook
4114	Evanston	Cook
4206	Hampshire	Kane
4207	Rutland	Kane
4208	Dundee	Kane

Township ID	Township Name	County
4209	Barrington	Cook
4210	Palatine	Cook
4211	Wheeling	Cook
4212	Northfield	Cook
4213	New Trier	Cook
4305	Riley	McHenry
4306	Coral	McHenry
4307	Grafton	McHenry
4308	Algonquin	McHenry
4309	Cuba	Lake
4310	Ela	Lake
4311	Vernon	Lake
4312	West Deerfield	Lake
4313	Moraine	Lake
4405	Marengo	McHenry
4406	Seneca	McHenry
4407	Dorr	McHenry
4408	Nunda	McHenry
4409	Wauconda	Lake
4410	Fremont	Lake
4411	Libertyville	Lake
4412	Shields	Lake
4505	Dunham	McHenry
4506	Hartland	McHenry
4507	Greenwood	McHenry
4508	McHenry	McHenry
4509	Grant	Lake
4510	Avon	Lake
4511	Warren	Lake
4512	Waukegan	Lake
4605	Chemung	McHenry
4606	Alden	McHenry
4607	Hebron	McHenry
4608	Richmond	McHenry
4609	Burton	McHenry
4610	Antioch	Lake
4611	Newport	Lake
4612	Zion	Lake

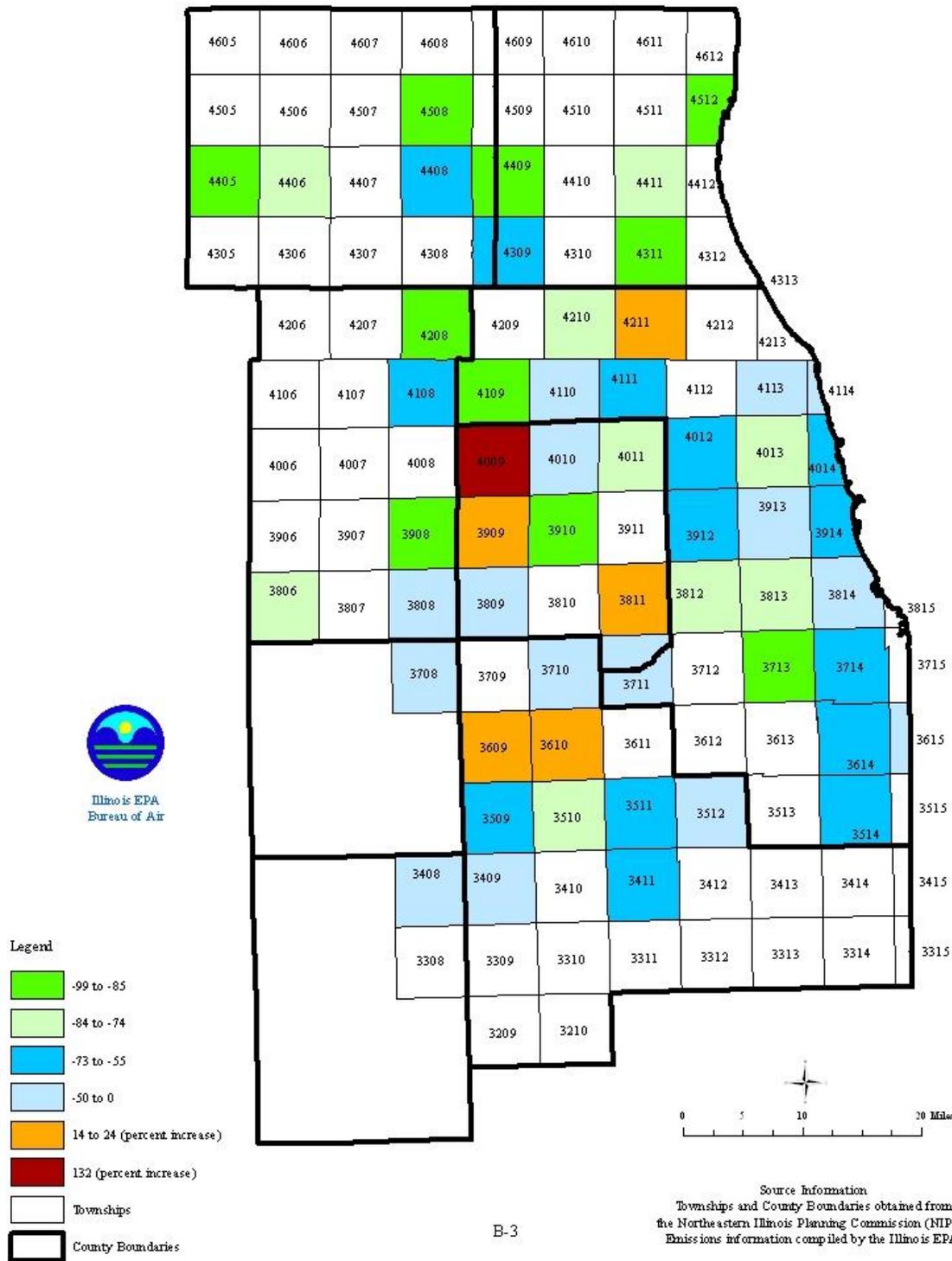
*Since some political townships do not share exact borders with surveyed townships, this table represents Illinois EPA's best correlation.

Appendix B: Township Data

Twp	# of Sources	Baseline (tons)	Allotment (ATUs)	Reported Emissions (tons)	Reported Emissions (ATUs)	ATUs In	ATUs Out	Excur. In (ATUs)	Expired (ATUs)	Available (ATUs)	HAPs (tons)	Diff. from Baseline (%)	Diff. from Allotment (%)
3408	5	509.1	4,623	269.8	2,700	250	0	0	2,173	4,623	16.3	-47.0	-41.6
3409	9	858.9	7,991	401.2	4,016	230	0	0	4,205	7,991	120.7	-53.3	-497
3411	1	48.3	472	15.7	157	0	0	0	315	472	0.3	-67.5	-66.7
3509	2	36.4	347	9.3	93	0	0	0	228	347	2.5	-74.5	-73.2
3510	2	71.3	629	14.1	142	100	0	0	587	629	0.2	-80.2	-77.4
3511	1	16.8	169	7.1	72	0	0	0	97	169	0.8	-57.5	-57.4
3512	1	120.0	1,200	111.0	1,110	0	0	0	90	1,200	0.0	-7.5	-7.5
3514	3	193.2	1,721	51.8	520	0	0	0	1,039	1,721	5.7	-73.2	-69.8
3609	1	10.9	97	11.2	113	13	0	4	0	0	0.0	2.8	16.5
3610	1	16.2	143	17.7	177	34	0	0	0	37	0.5	9.0	23.8
3614	4	274.4	2,423	82.4	825	0	0	0	1,466	2,423	23.1	-70.0	-66.0
3615	1	23.8	210	20.6	207	0	0	0	3	210	3.9	-13.1	-1.4
3708	1	61.4	542	28.0	281	0	0	0	261	542	2.1	-54.4	-48.2
3710	6	306.7	2,948	249.8	2,500	437	0	0	774	2,799	23.0	-18.6	-15.2
3711	1	13.4	118	6.3	64	0	0	0	54	118	0.0	-52.9	-45.8
3712	1	19.5	172	0.0	0	0	0	0	138	172	0.0	-----	-----
3713	6	350.3	3,243	27.3	275	0	5	0	2,816	3,243	1.7	-92.2	-91.5
3714	4	760.6	6,698	299.8	2,998	221	468	0	3,453	6,230	38.8	-60.6	-55.2
3715	2	63.3	608	0.0	0	0	221	0	266	608	0.0	-----	-----
3806	1	21.4	188	3.3	33	0	0	0	155	188	0.4	-84.6	-82.4
3808	2	183.2	1,755	155.7	1,558	0	0	0	780	1,755	0.0	-15.0	-11.2
3809	1	0.0	0	0.5	5	5	0	0	0	0	0.0	-----	-----
3811	1	42.9	378	44.1	441	63	0	35	0	0	2.2	2.7	16.7
3812	14	2,543.0	22,818	396.0	3,965	470	2,445	0	13,918	23,286	72.1	-84.4	-82.6
3813	12	643.3	5,780	108.8	1,091	711	802	0	3,497	4,978	39.8	-83.1	-81.1
3814	8	336.5	2,981	156.2	1,566	100	419	0	1,257	2,729	8.8	-53.6	-47.5
3908	3	64.4	609	9.0	91	0	0	0	518	609	2.2	-86.1	-85.1
3909	2	18.5	164	18.6	187	0	2	0	0	158	0.0	0.5	14.0
3910	1	162.6	1,431	20.5	205	0	0	0	1,226	1,431	2.1	-87.4	-85.7
3912	9	286.3	2,524	91.5	918	160	654	0	1,304	2,524	3.2	-68.1	-63.6
3913	11	302.9	2,672	212.1	2,126	1,907	385	0	1,895	3,065	15.9	-30.0	-20.4

Twp	# of Sources	Baseline (tons)	Allotment (ATUs)	Reported Emissions (tons)	Reported Emissions (ATUs)	ATUs In	ATUs Out	Excur. In (ATUs)	Expired (ATUs)	Available (ATUs)	HAPs (tons)	Diff. from Baseline (%)	Diff. from Allotment (%)
3914	9	310.7	2,776	87.9	881	390	898	0	1,163	1,623	0.7	-71.7	-68.3
4008	2	476	420	0.0	0	0	242	0	143	420	0.0	-----	-----
4009	1	16.4	145	33.7	337	192	0	0	0	0	0.0	105.6	132.4
4010	3	71.9	634	37.0	371	330	0	0	1,566	714	0.7	-48.5	-41.5
4011	6	160.3	1,437	22.6	227	69	0	0	1,097	1,437	5.7	-85.9	-84.2
4012	14	281.4	2,518	67.4	678	294	700	228	1,462	2,216	1.0	-76.0	-73.1
4013	5	197.7	1,743	35.7	357	25	1,313	90	149	338	0.0	-82.0	-79.5
4014	1	28.9	281	9.7	98	0	0	0	183	281	0.4	-66.2	-65.1
4108	3	90.3	834	36.6	368	0	0	0	487	748	0.3	-59.4	-55.9
4109	2	204.9	1,932	2.5	26	0	118	0	1,614	1,932	0.0	-98.8	-98.7
4110	2	34.0	300	20.2	202	242	80	0	240	200	0.1	-40.6	-32.7
4111	13	478.3	4,214	146.7	1,470	277	36	0	2,768	4,032	15.0	-69.3	-65.1
4113	3	25.0	222	15.6	157	2	0	0	67	118	1.0	-37.5	-29.3
4114	1	23.0	220	13.9	139	130	0	0	211	220	0.0	-39.7	-36.8
4208	3	68.3	603	8.8	89	0	30	0	442	603	1.4	-87.1	-85.2
4210	1	24.4	243	5.4	54	0	0	0	189	243	0.0	-77.9	-77.8
4211	1	21.2	187	22.4	224	37	0	0	0	187	1.2	5.3	19.8
4212	1	0.0	0	16.6	167	167	0	0	0	0	0.0	-----	-----
4308	1	10.0	88	0.0	0	0	88	0	0	0	0.0	-----	-----
4309	1	37.6	332	8.9	90	0	200	0	42	332	0.8	-76.3	-72.9
4311	1	15.8	139	1.4	15	0	0	0	124	139	0.0	-91.0	-89.2
4405	2	48.8	430	1.2	13	0	0	0	348	430	0.0	-97.5	-97.0
4406	1	22.4	225	5.8	58	0	0	0	167	225	0.0	-74.3	-74.2
4407	1	7.4	74	0.0	0	70	162	0	2	74	0.0	-----	-----
4408	1	16.2	157	4.4	44	0	0	0	113	157	0.1	-73.0	-72.0
4409	1	14.4	127	0.3	3	0	124	0	0	0	0.3	-98.0	-97.6
4411	3	60.4	537	9.2	93	165	165	0	390	537	0.8	-84.8	-82.7
4508	1	52.6	464	3.0	30	0	0	0	434	464	0.0	-94.4	-93.5
4512	5	315.0	3,048	17.6	178	0	0	0	2,407	3,048	3.9	-94.4	-94.2
4612	2	30.7	271	0.0	0	0	0	0	218	271	0.0	-----	-----

Figure B-1: Actual Emissions Compared to Allotment



B-3

Appendix C Historical County Data

C.1 Allotments and Compensation

Figure C-1: Cook County Allotment and Compensation

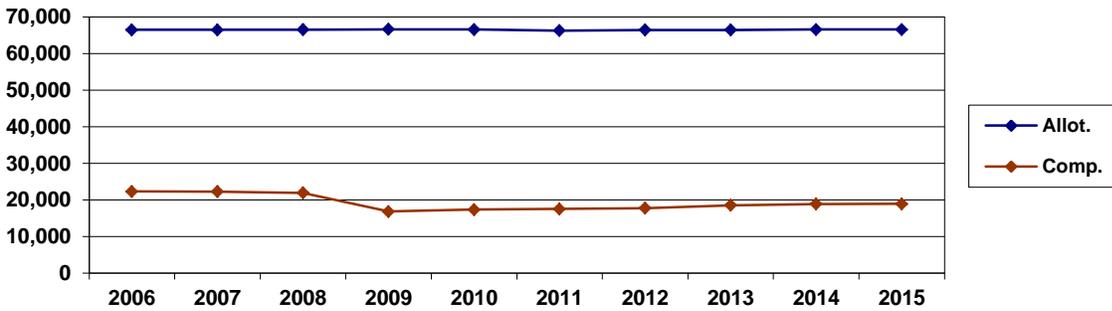


Figure C-2: DuPage County Allotment and Compensation

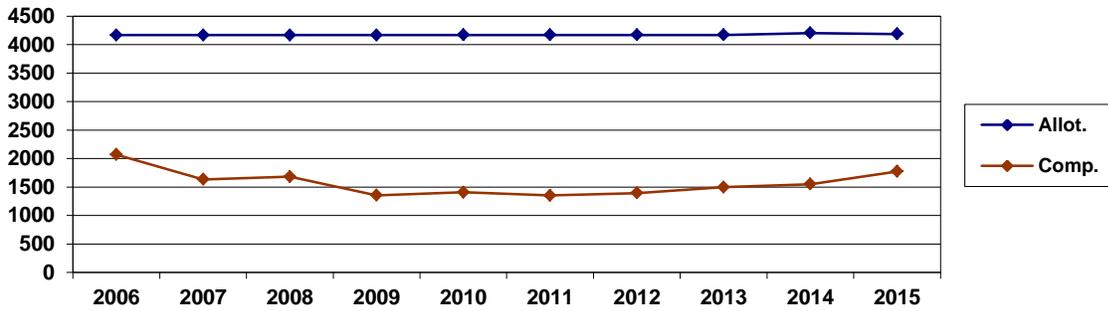


Figure C-3: Grundy County Allotment and Compensation

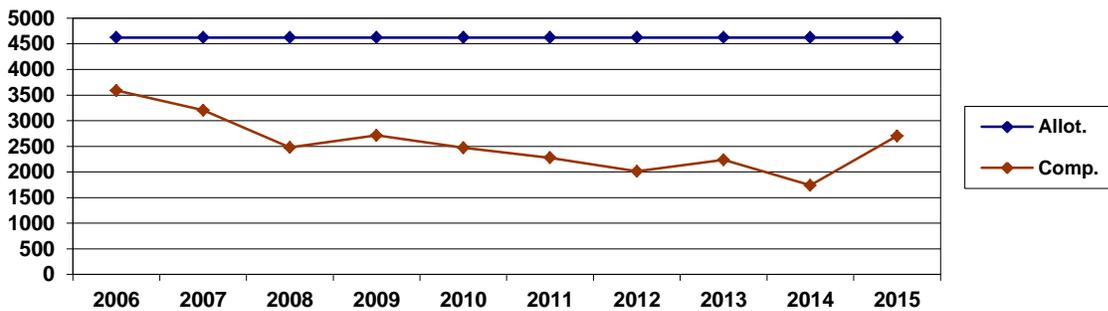


Figure C-4: Kane County Allotment and Compensation

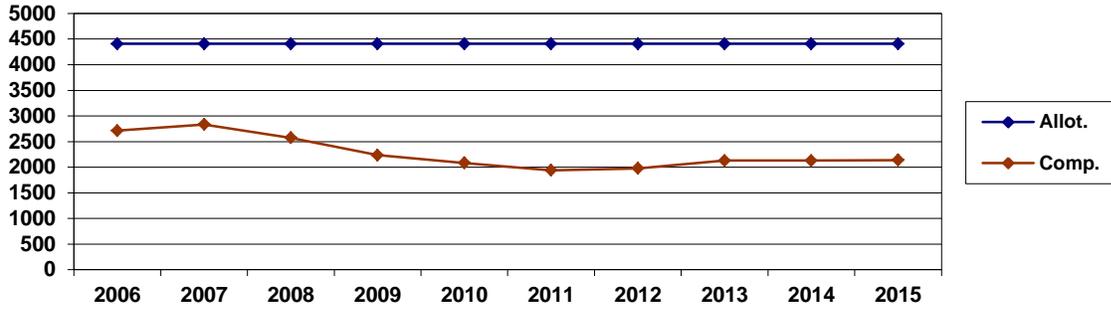


Figure C-5: Kendall County Allotment and Compensation

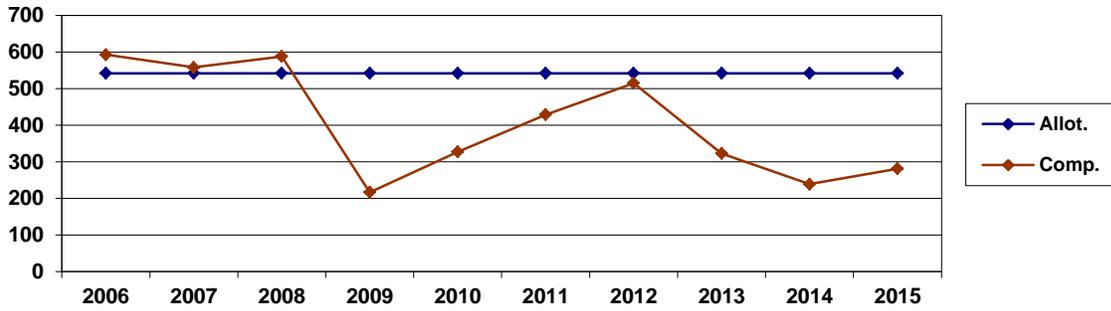


Figure C-6: Lake County Allotment and Compensation

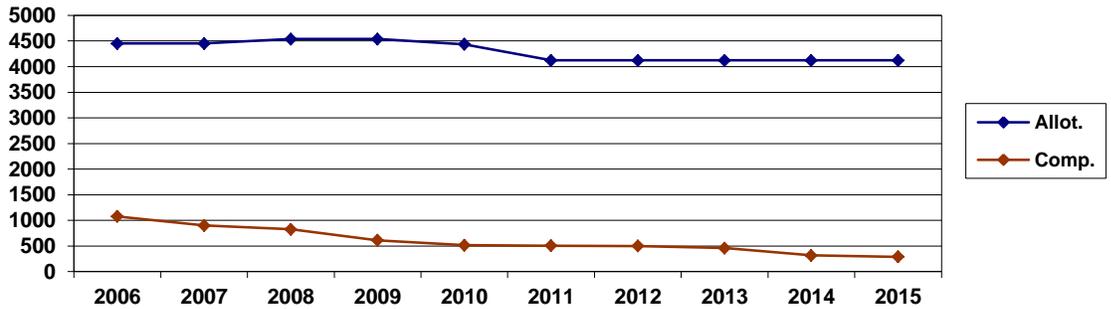


Figure C-7: McHenry County Allotment and Compensation

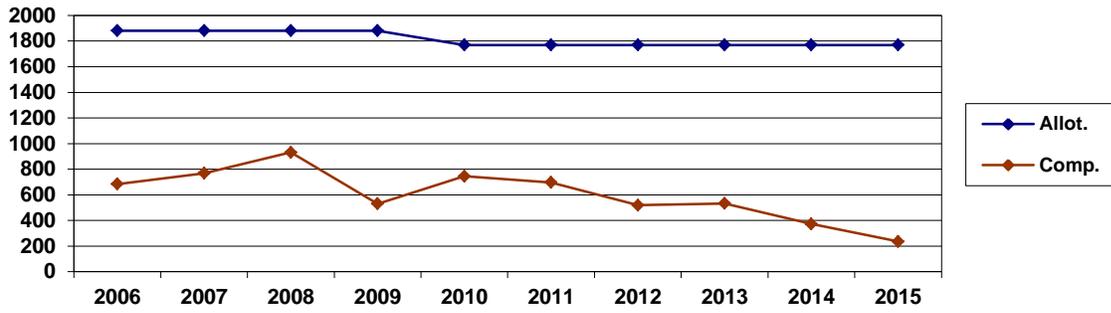
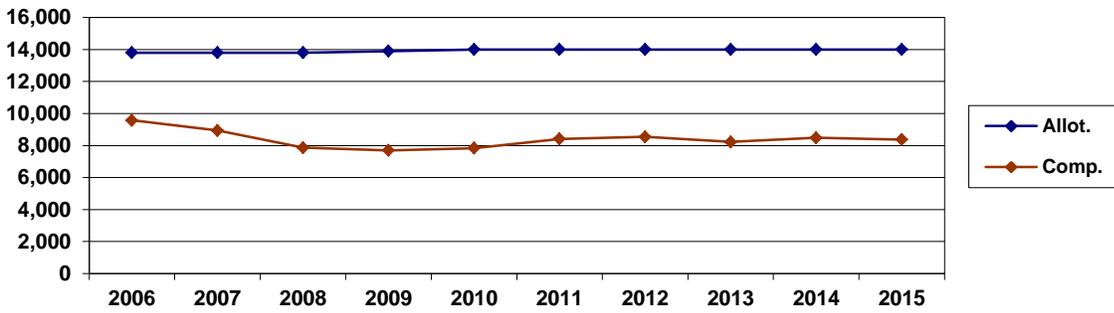


Figure C-8: Will County Allotment and Compensation



C.2 Allotments and Retained ATUs

Figure C-9: Cook County Allotment and Retained ATUs

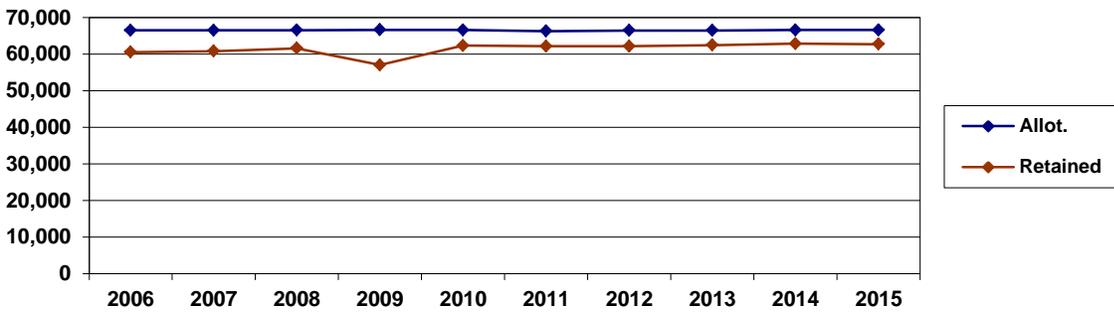


Figure C-10: DuPage County Allotment and Retained ATUs

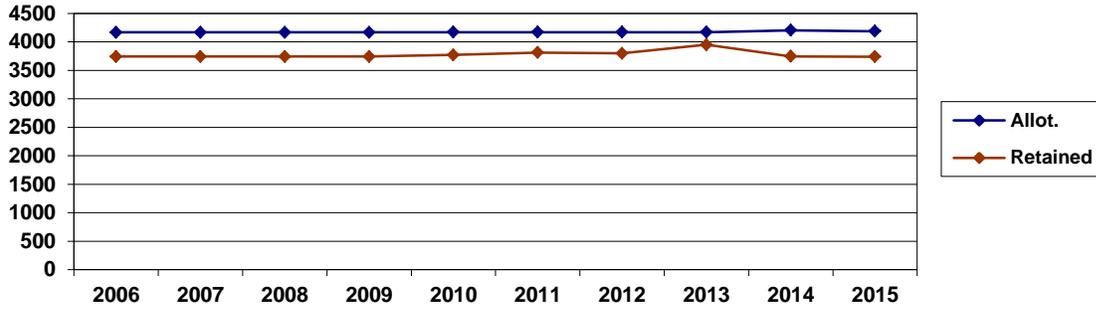


Figure C-11: Grundy County Allotment and Retained ATUs

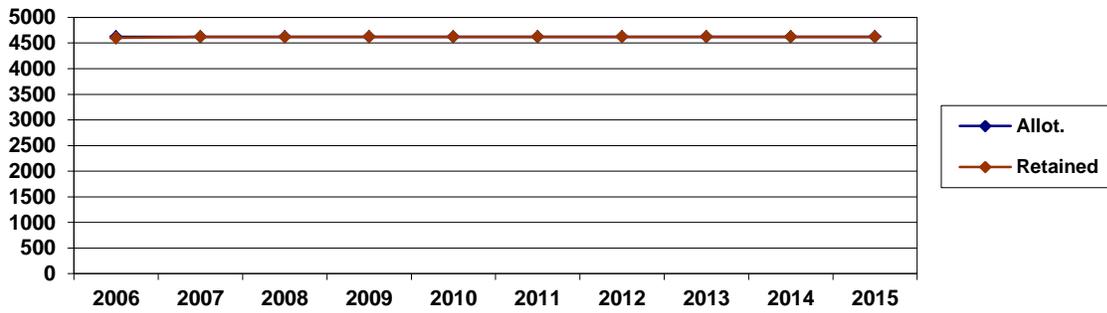


Figure C-12: Kane County Allotment and Retained ATUs

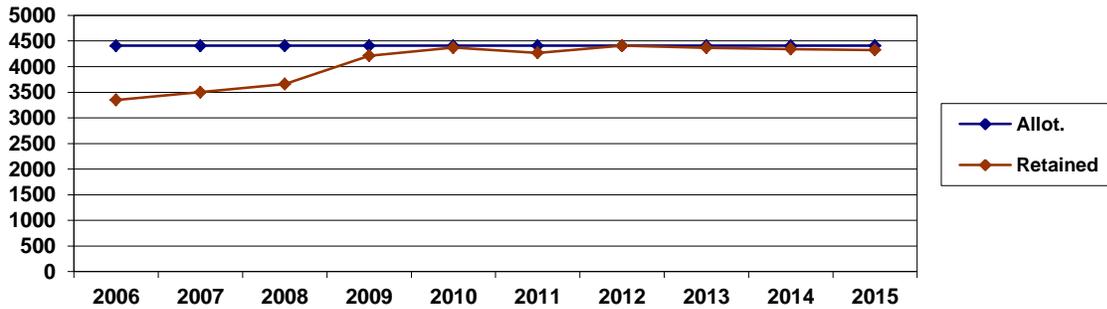


Figure C-13: Kendall County Allotment and Retained ATUs

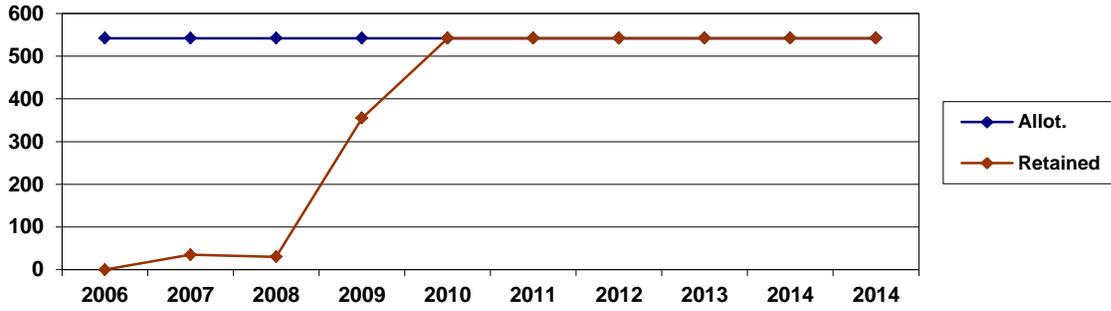


Figure C-14: Lake County Allotment and Retained ATUs

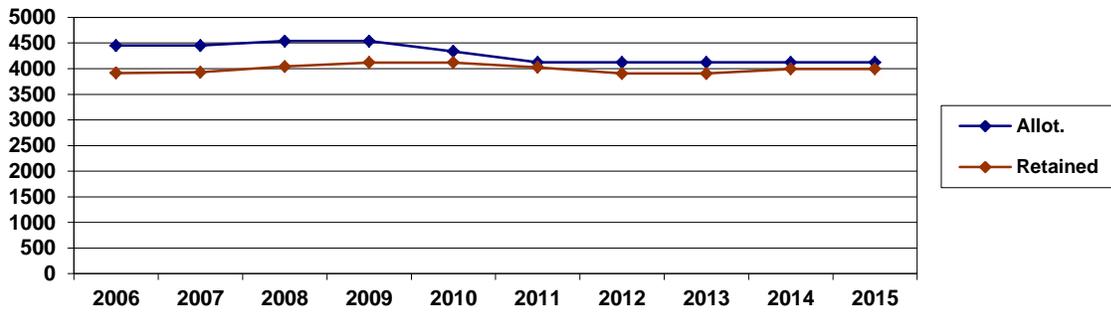


Figure C-15: McHenry County Allotment and Retained ATUs

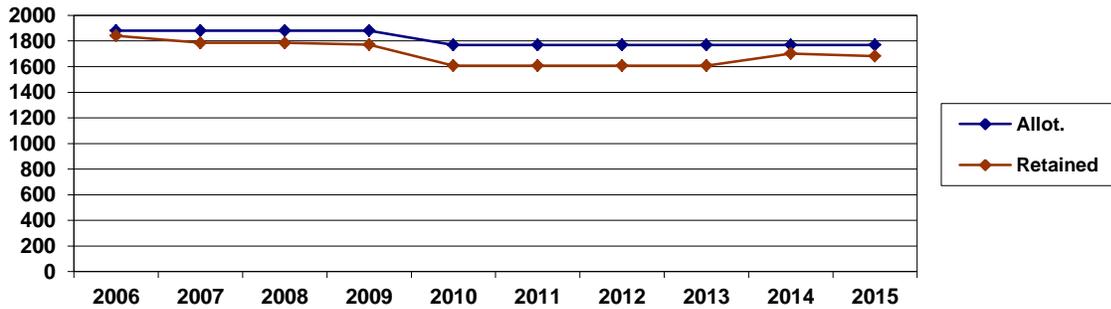
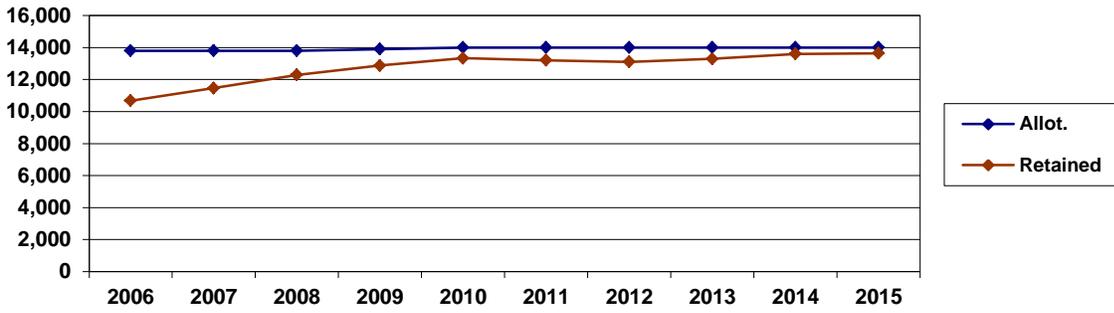


Figure C-16: Will County Allotment and Retained ATUs



C.3 Allotments and Expired ATUs

Figure C-17: Cook County Allotment and Expired ATUs

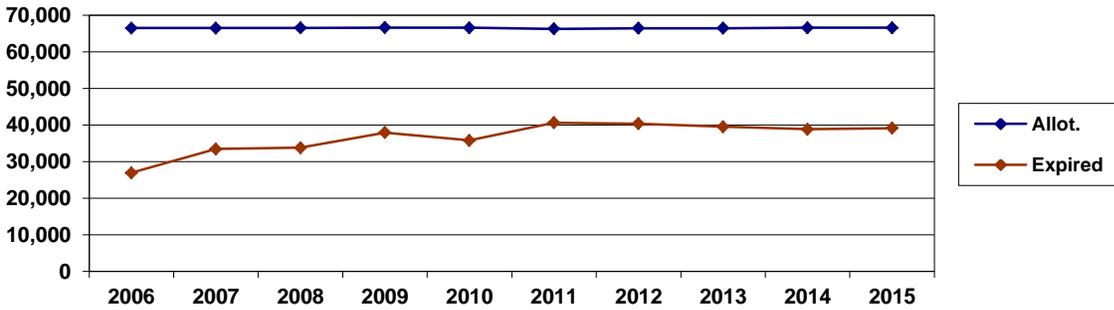


Figure C-18: DuPage County Allotment and Expired ATUs

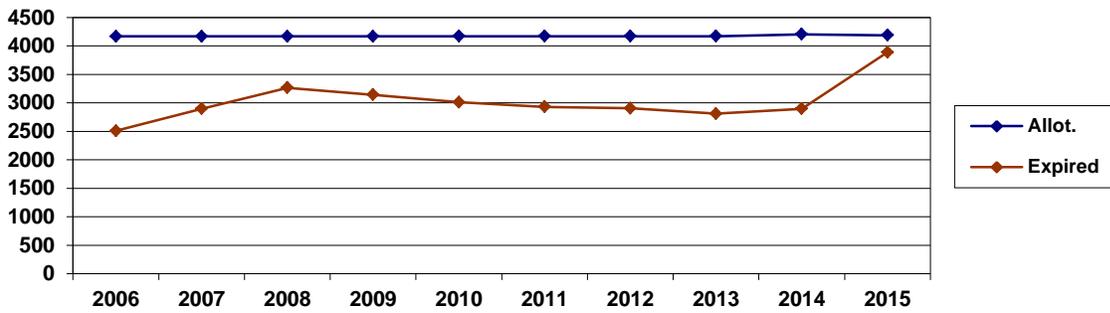


Figure C-19: Grundy County Allotment and Expired ATUs

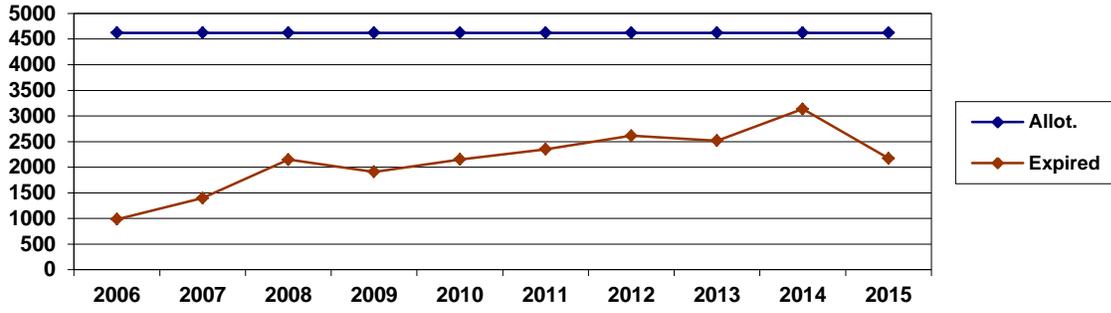


Figure C-20: Kane County Allotment and Expired ATUs

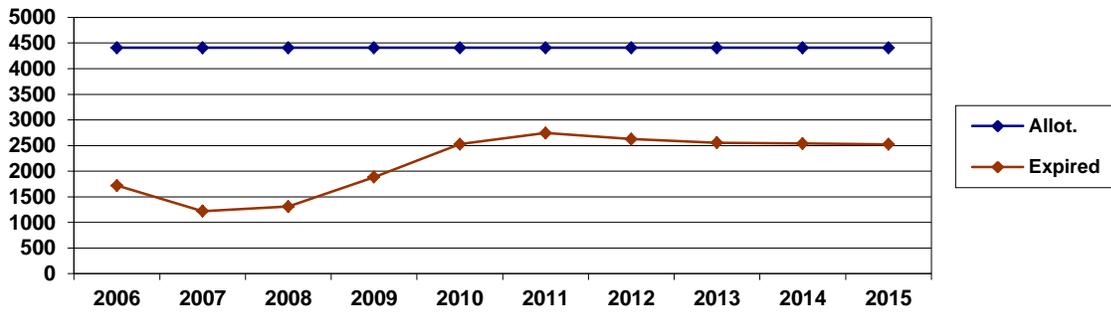


Figure C-21: Kendall County Allotment and Expired ATUs

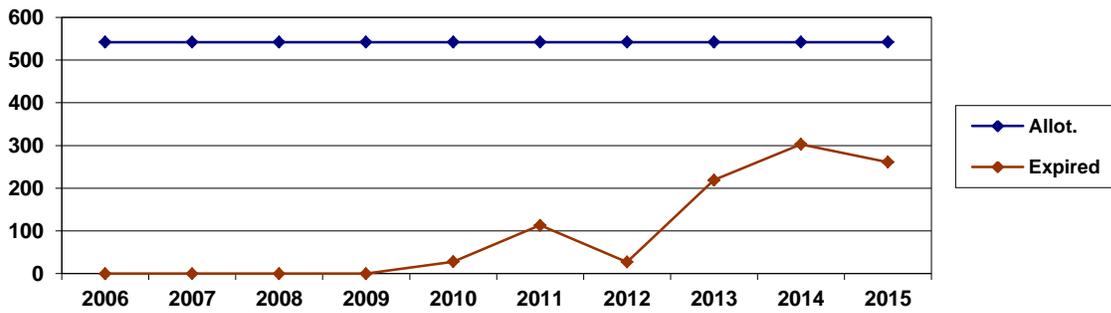


Figure C-22: Lake County Allotment and Expired ATUs

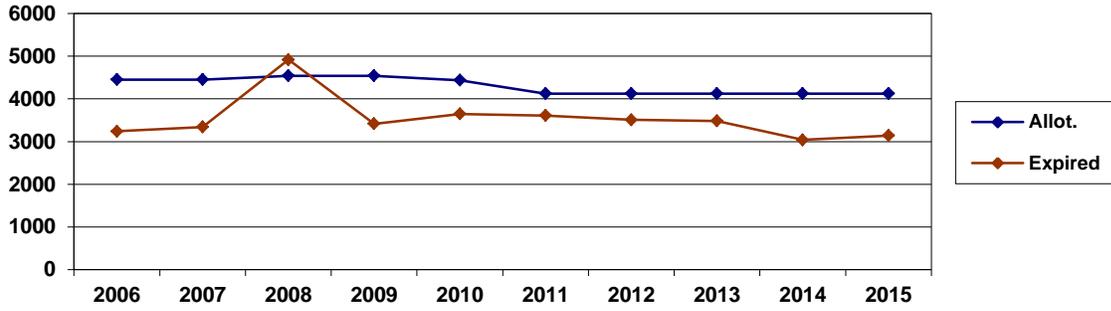


Figure C-23: McHenry County Allotment and Expired ATUs

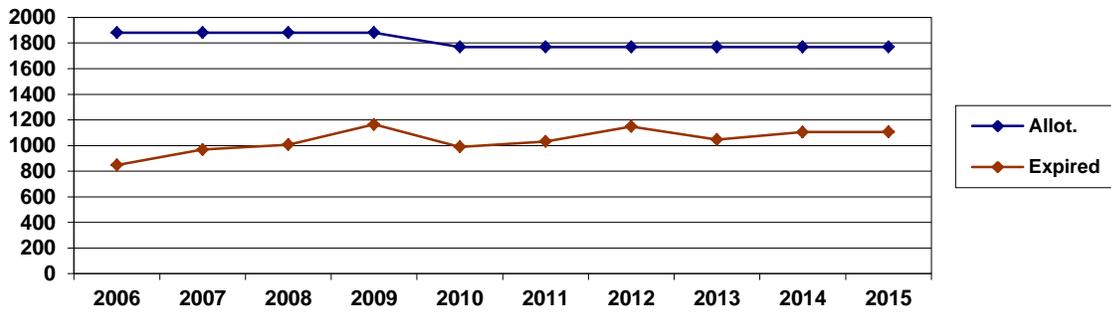
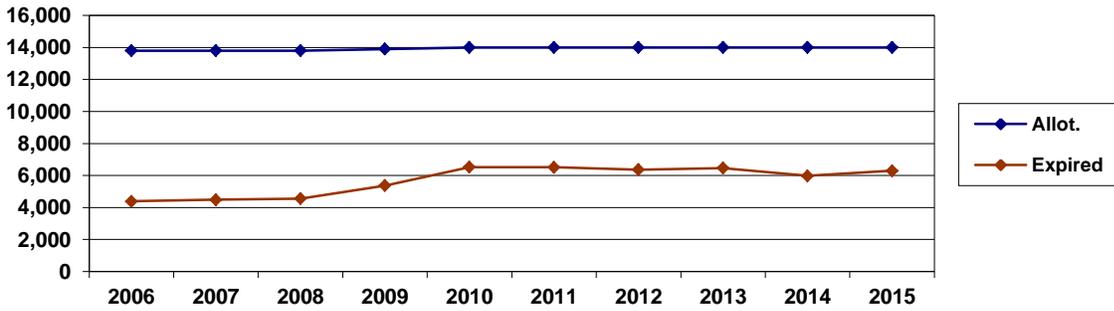


Figure C-24: Will County Allotment and Expired ATUs



C.4 Net ATUs Traded

Figure C-25: Cook County Net Traded ATUs

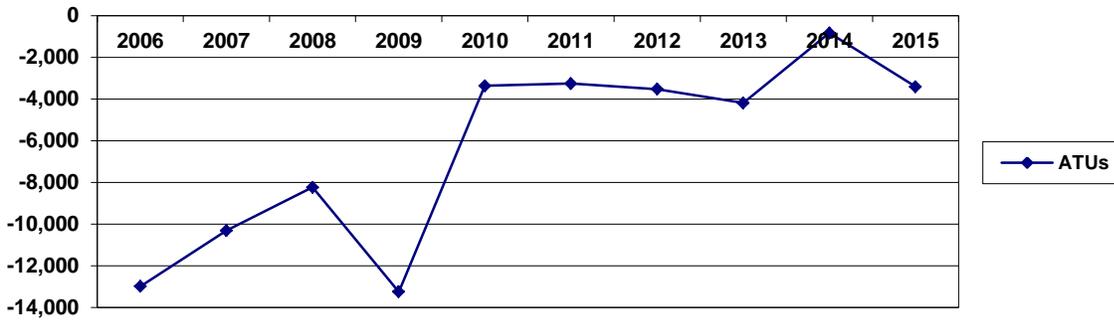


Figure C-26: DuPage County Net Traded ATUs

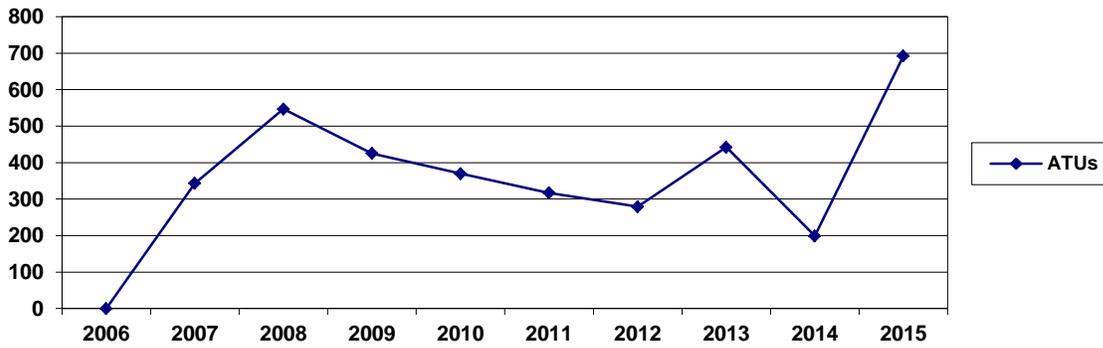


Figure C-27: Grundy County Net Traded ATUs

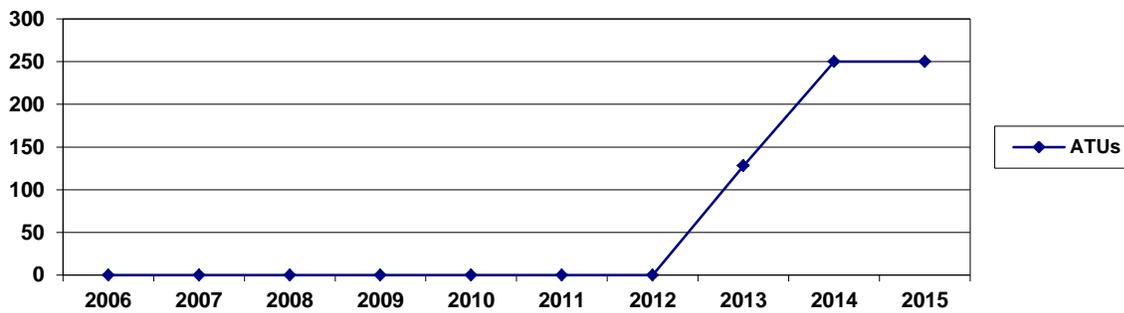


Figure C-28: Kane County Net Traded ATUs

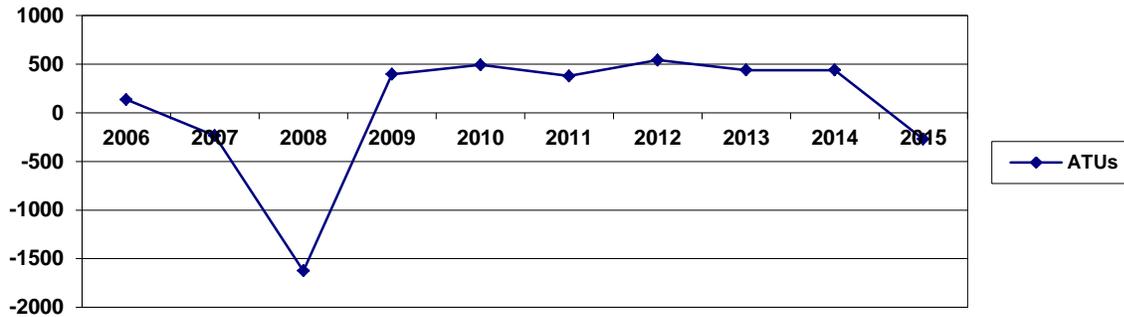


Figure C-29: Kendall County Net Traded ATUs

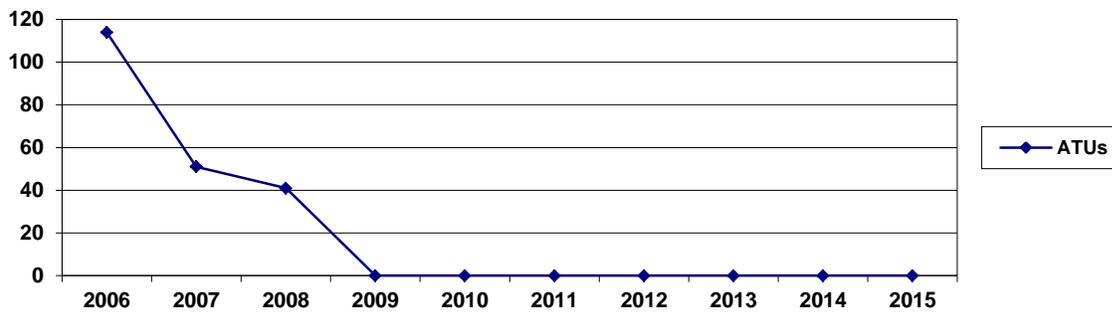


Figure C-30: Lake County Net Traded ATUs

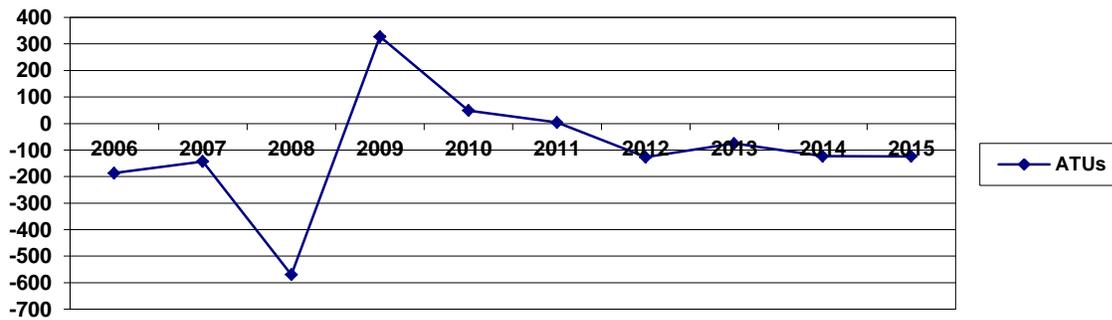


Figure C-31: McHenry County Net Traded ATUs

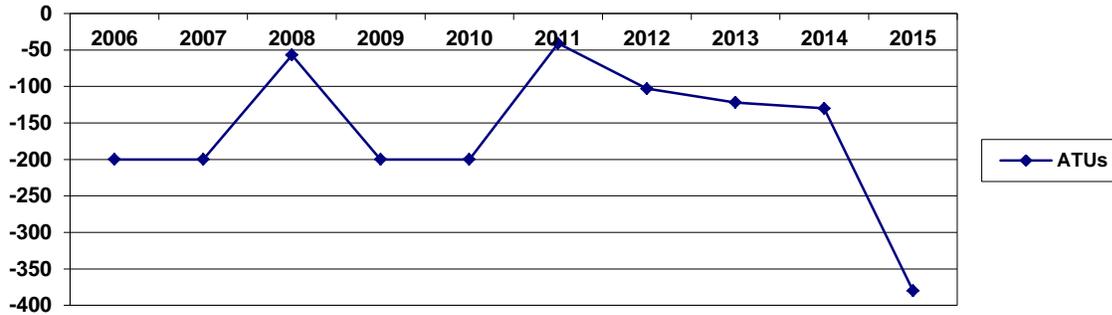
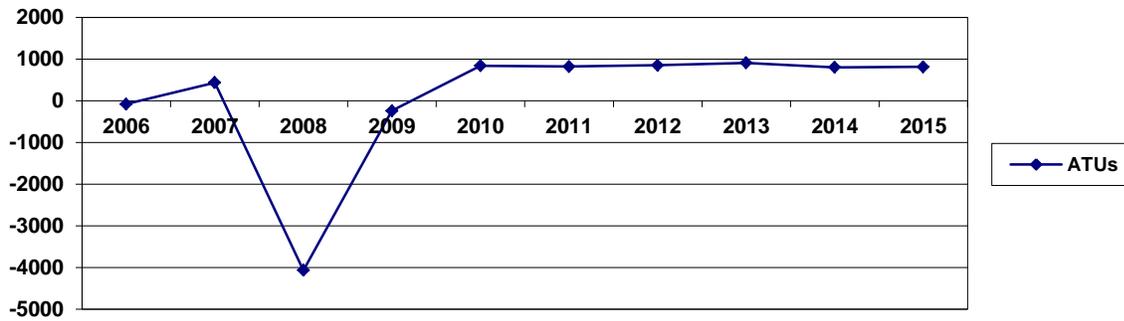


Figure C-32: Will County Net Traded ATUs



C.5 VOM Emissions and Reported HAPs

Figure C-33: Cook County Emissions and Reported HAPs (tons)

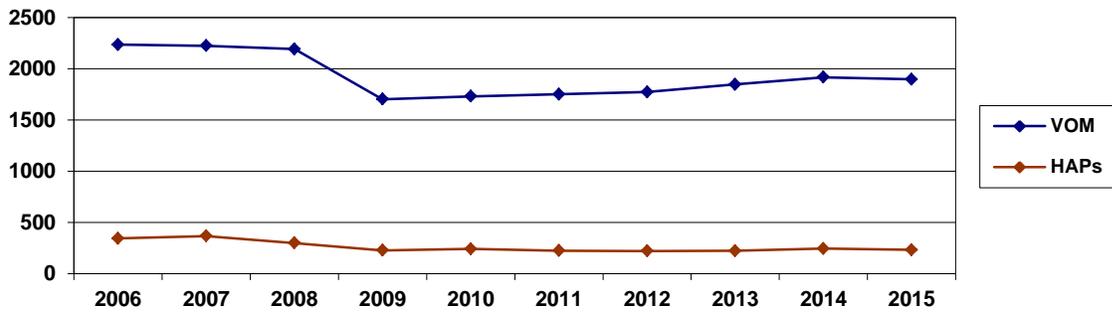


Figure C-34: DuPage County Emissions and Reported HAPs (tons)

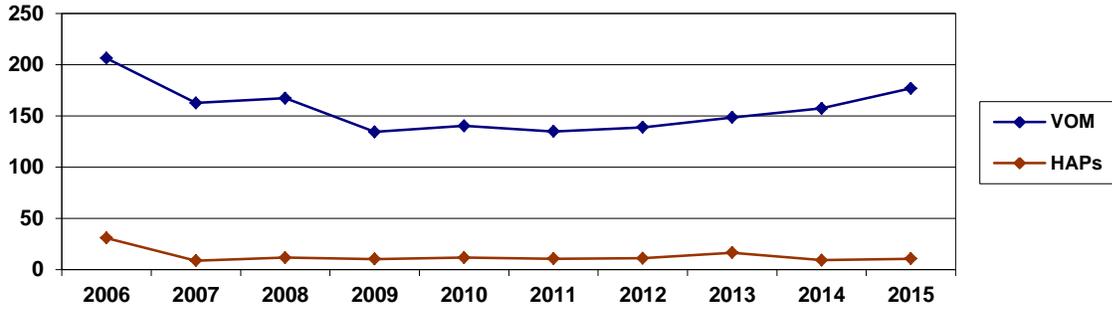


Figure C-35: Grundy County Emissions and Reported HAPs (tons)

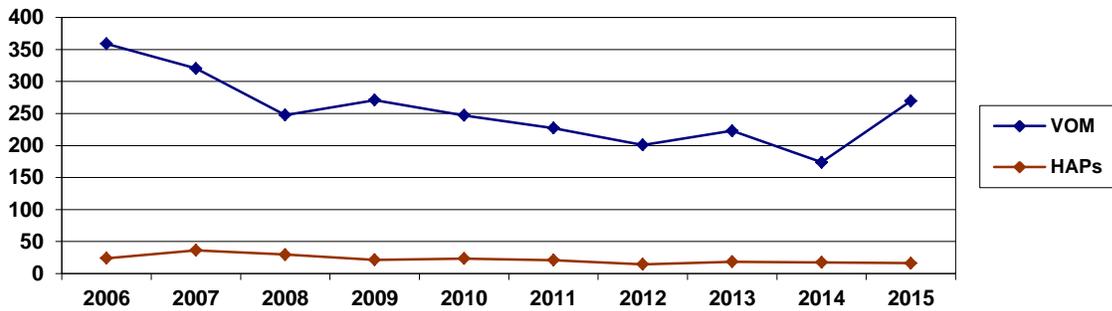


Figure C-36: Kane County Emissions and Reported HAPs (tons)

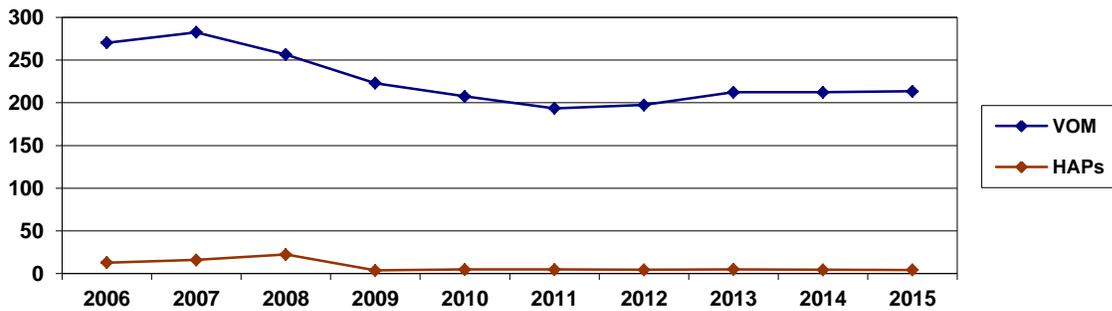


Figure C-37: Kendall County Emissions and Reported HAPs (tons)

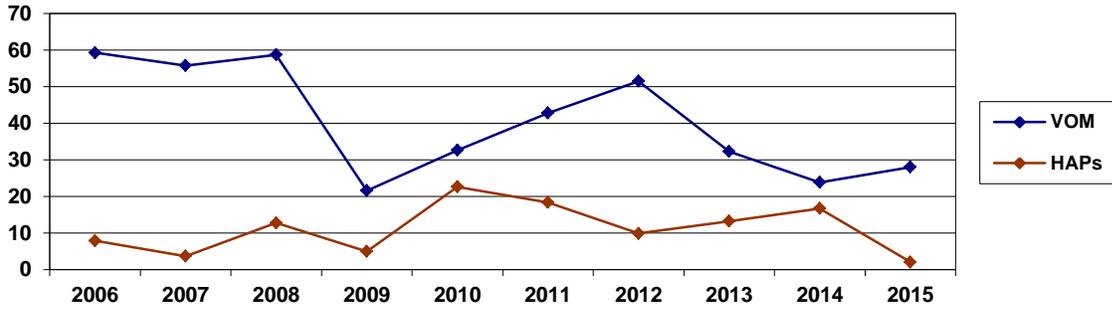


Figure C-38: Lake County Emissions and Reported HAPs (tons)

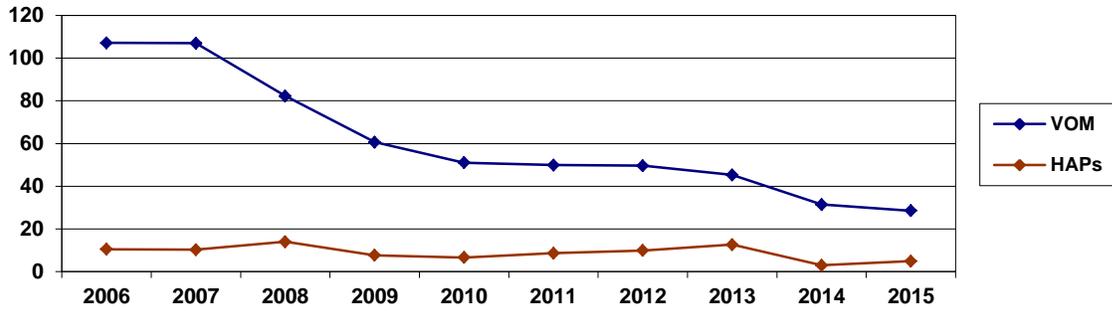


Figure C-39: McHenry County Emissions and Reported HAPs (tons)

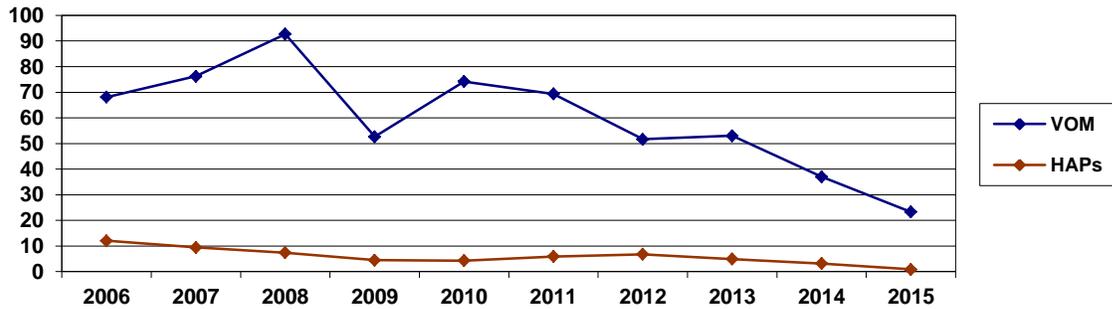
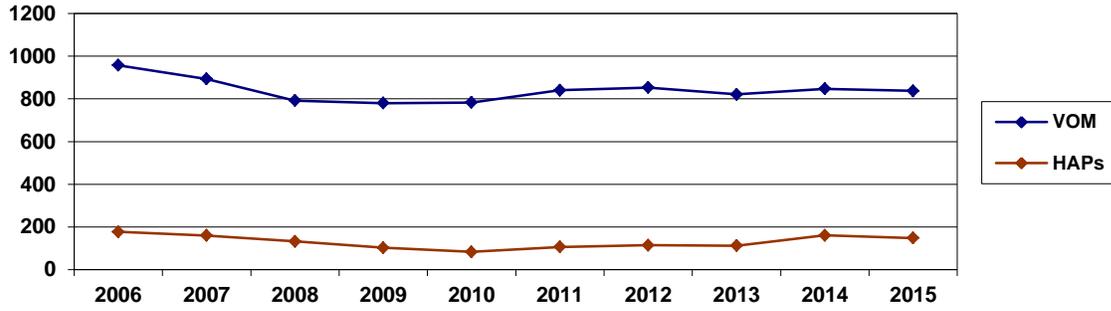


Figure C-40: Will County Emissions and Reported HAPs (tons)



C.6 Reduction from Baseline and Allotment

Figure C-41: Cook County Reduction from Baseline and Allotment (%)

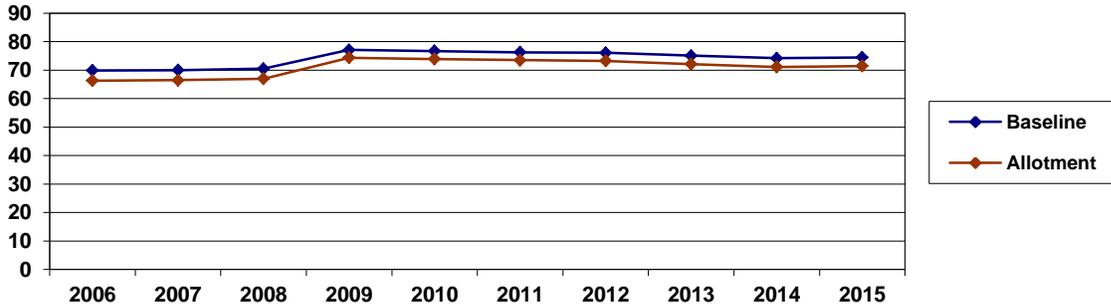


Figure C-42: DuPage County Reduction from Baseline and Allotment (%)

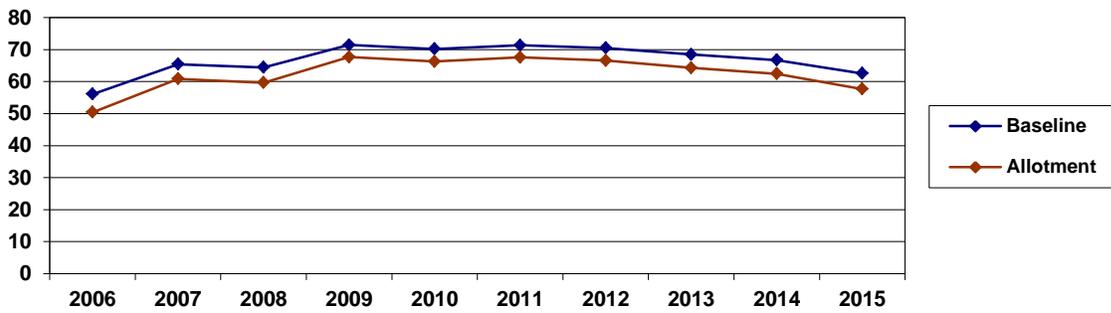


Figure C-43: Grundy County Reduction from Baseline and Allotment (%)

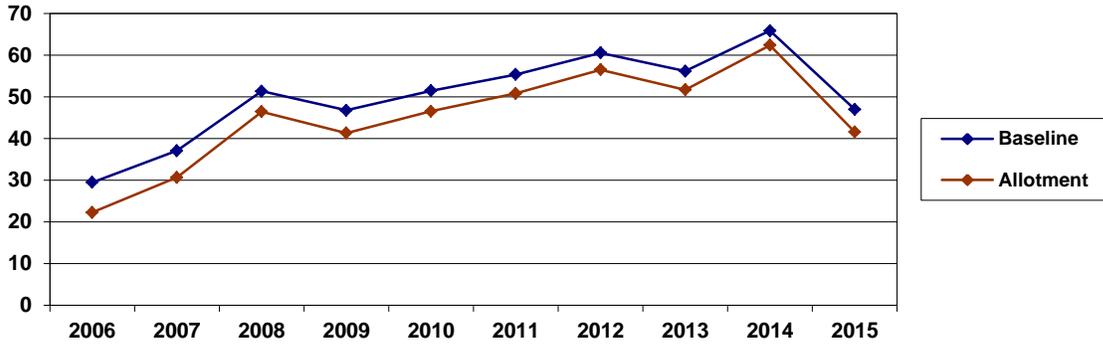


Figure C-44: Kane County Reduction from Baseline and Allotment (%)

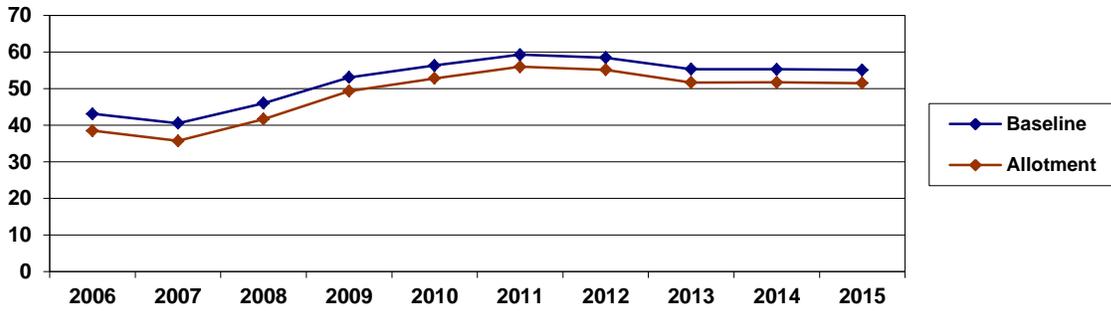


Figure C-45: Kendall County Reduction from Baseline and Allotment (%)

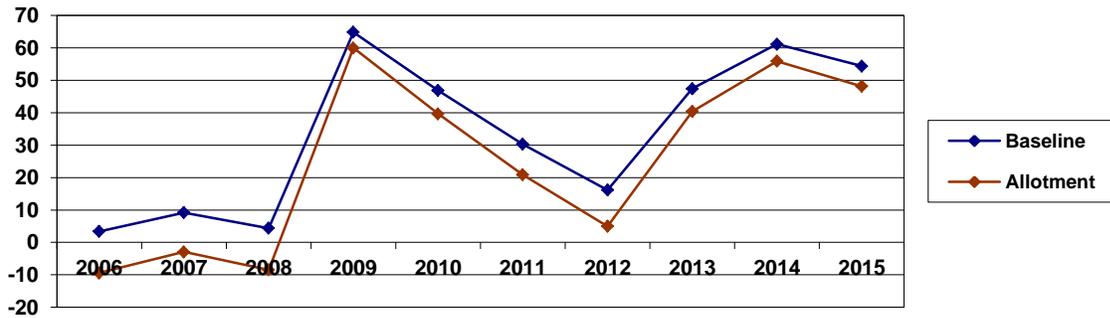


Figure C-46: Lake County Reduction from Baseline and Allotment (%)

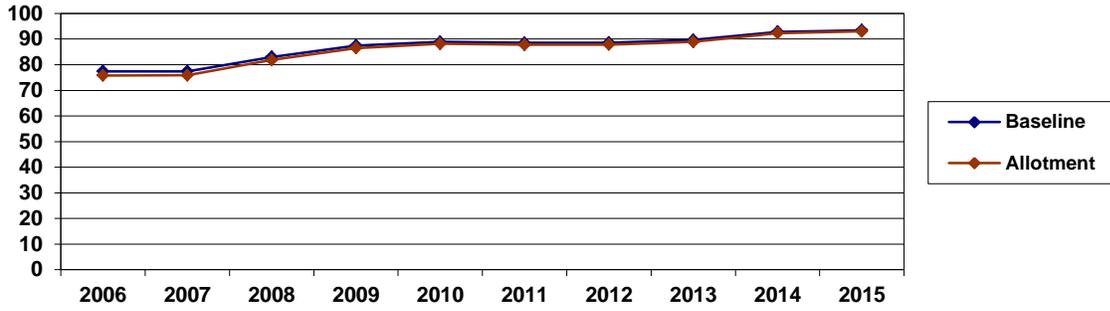


Figure C-47: McHenry County Reduction from Baseline and Allotment (%)

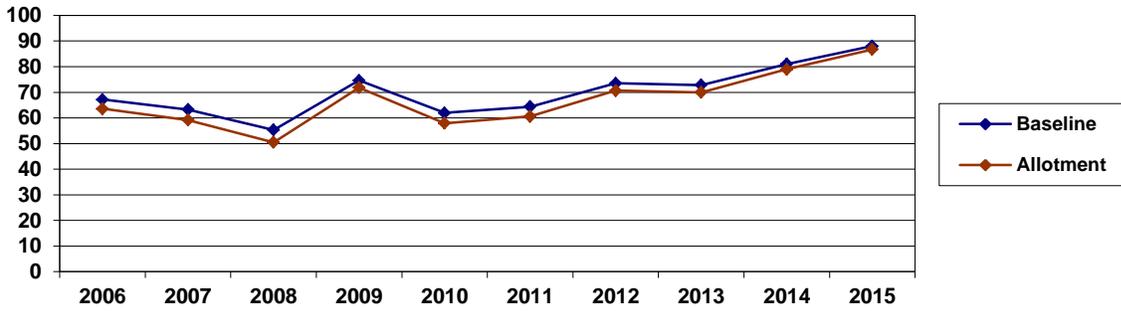


Figure C-48: Will County Reduction from Baseline and Allotment (%)

