DATE: March 14, 2019
REGARDING: Metal Theft Claims and from January 1, 2014 through December 31, 2017 (Public)
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This ForeCAST℠ report analyzes copper, aluminum, brass and bronze theft claims identified in Insurance Service Office (ISO) ClaimSearch from January 1, 2014 to December 31, 2017 in order to identify any trends or patterns that may exist in the data.

Executive Summary

There were a total of 27,514 claims for the theft of copper, aluminum, brass, and bronze submitted to ISO ClaimSearch between January 1, 2014 and March 31, 2018 and with a date of loss (DOL) between January 1, 2014 and December 31, 2017. Of the 27,514 total claims, the vast majority (98%) pertained to the theft of copper. Of these claims, 64% were on personal policies, while 36% were on commercial policies. When the number of metal theft claims and copper prices are compared, a positive correlation[1] (0.55) was observed between the values; however, this correlation was found to be less significant than identified in the prior Metal Theft ForeCAST report (0.91). The average copper prices[2] appeared to climb in 2017 while the number of metal theft claims submitted to ISO Claim Search continued to decrease in 2017.

While the number of metal theft claims increased from 2006 through 2011, the number of claims began to level off in 2012 and then progressively decreased each year from 2014 through 2017. When analyzed by month, January (710.5) appeared to have the highest average of metal theft claims by Date of Loss (DOL) between 2014 and 2017; however both 2014 and 2017 deviate from this pattern where October 2014 (1,287) and February 2017 (265) were found to have the most metal thefts for their respective years.

Ohio was identified as the loss state with the most (2,851) metal theft claims in ISO ClaimSearch, with 13% more claims than New Jersey, the state with the 2nd largest number of claims. Connecticut had the highest rate of claims per capita while it only ranked 7th in number of claims.

The New York-Newark-Jersey City, NY-NJ-PA Core Based Statistical Area (CBSA)[3] ranked 1st in ISO ClaimSearch metal theft claims (1,938) from 2014 through 2017.

Metal Theft Overview

Law enforcement agencies across the country and around the globe started seeing increased numbers of thefts of metals such as copper, bronze, brass, and aluminum in the years leading up to the economic crisis from 2008 - 2009. Copper prices were at record highs, increasing the attractiveness of the metal as a target for theft. Thieves have been willing to go to almost any length to obtain the metal. They have stripped sheets of metal from building rooftops, stolen memorial decorations from cemeteries, ripped apart air conditioners for the copper coils within, and stripped homes and buildings of wiring and piping. Construction sites are frequent victims because metal is often left on-site unguarded and relatively unsecured. Farm equipment such as

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[1] The Pearson's correlation coefficient between the number of metal theft claims per month and the average monthly copper price was 0.55 (significant at the .01 level).
[2] The annual average price of copper per pound climbed from $2.20 in 2016 to $2.80 in 2017 according to http://www.iwgcopper.com/price-history
[3] Core Based Statistical Areas (CBSAs) are defined by the United States Office of Management and Budget. CBSAs consist of a core urban area with a population of at least 10,000 and the surrounding communities that have a strong economic and social ties to the core area.

irrigation pipes and fixtures are also targeted. The thieves can endanger the safety of themselves and those in the surrounding community, and weaken the infrastructure vital to our everyday lives. Unoccupied buildings have exploded due to gas lines being stolen. Stretches of highway have been left dark and tornado warning sirens have been rendered inoperable due to wiring being stolen. Thieves have removed wiring from traffic and railway signals and even posed as utility workers in order to remove large sections of thick utility cable from the sewers beneath city streets. Electrical substations are frequently targeted and some thieves have been electrocuted trying to steal live electrical wiring.

The damage caused by such thefts is often several times the value of the metal stolen, leaving the victims with hefty repair costs which are then often passed on to insurance companies. The U.S. Department of Energy has estimated that metal theft costs U.S. businesses around $1 billion a year[4]. Some states and cities have taken measures to combat metal theft, such as requiring scrap yards to check identification of any individual who sells them scrap metal, note the license plate of the vehicle used to transport the metal, maintain the information on file, pay the seller with check instead of cash, or retain the scrap metal for a designated amount of time to allow law enforcement an opportunity to identify stolen materials before it is recycled. However, identifying stolen metal is not always possible and opposition to these laws has made it difficult to get effective measures passed in some areas. Even in areas where such laws exist, some unscrupulous scrap dealers may not abide by them and enforcement of the laws has not always been a major priority until recent years when increases in metal thefts brought more attention to the problem. Some states and local governments have increased the penalties associated with metal theft or are charging thieves with additional crimes if the theft caused damage to infrastructure or created a hazard to the public.

Metal Theft Claims in ISO ClaimSearch

This section of the report analyzes the claims identified in ISO ClaimSearch as involving the theft of copper, aluminum, brass, or bronze. ISO ClaimSearch is a database designed to help insurers, self-insurers, law enforcement agencies, and state fraud bureaus detect and prevent fraud, evaluate risk, and process meritorious claims by providing a central repository of claims. Insurers and agencies with access can query this database to research prior loss histories, identify claims patterns, and detect suspect claims.

A total of 27,514 claims for the theft of copper, aluminum, brass, or bronze were identified[5] in ISO ClaimSearch with a DOL between January 1, 2014 and December 31, 2017. Of the 27,514 total claims, 26,840 (98%) referenced copper in the loss description, 511 (2%) referenced aluminum, 146 (<1%) referenced brass, and 120 (<1%) referenced bronze[6]. There were 9,926 (36%) claims on commercial policies, while 17,582 (64%) were on personal policies[7].

The following tables show the number of claims that referenced the common keywords in the loss description[8] and the number of claims that referenced each metal:

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[4] (US Dept. of Energy, 2007)

[5] There is no exact method for extracting metal theft claims from ISO ClaimSearch. For this report, a claim was determined to be a metal theft claim if the loss description for the claim contained "cop", "brass", "bronz", or "alum", as well as either: a) one of the terms "stole", "theft", "thief", "thieves", "theif", "theives", "took", "steal", "robber", "robbed", "miss", "cut", "rip", "break", "broke", "tore", "gone", "remov", "burg", or "vand" is in the loss description; or b) the loss type is theft, burglary, or vandalism related.   Policy and loss types that were found to be likely to include unrelated claims were examined and cleaned of false positives, as well as claims that contained terms found to likely result in false positives, e.g. "Copperas Cove" or "Copperate".

[6] Some claims identified more than one of the metal terms.

[7] 6 claims listed policy types that could not be identified as either commercial or personal in nature.
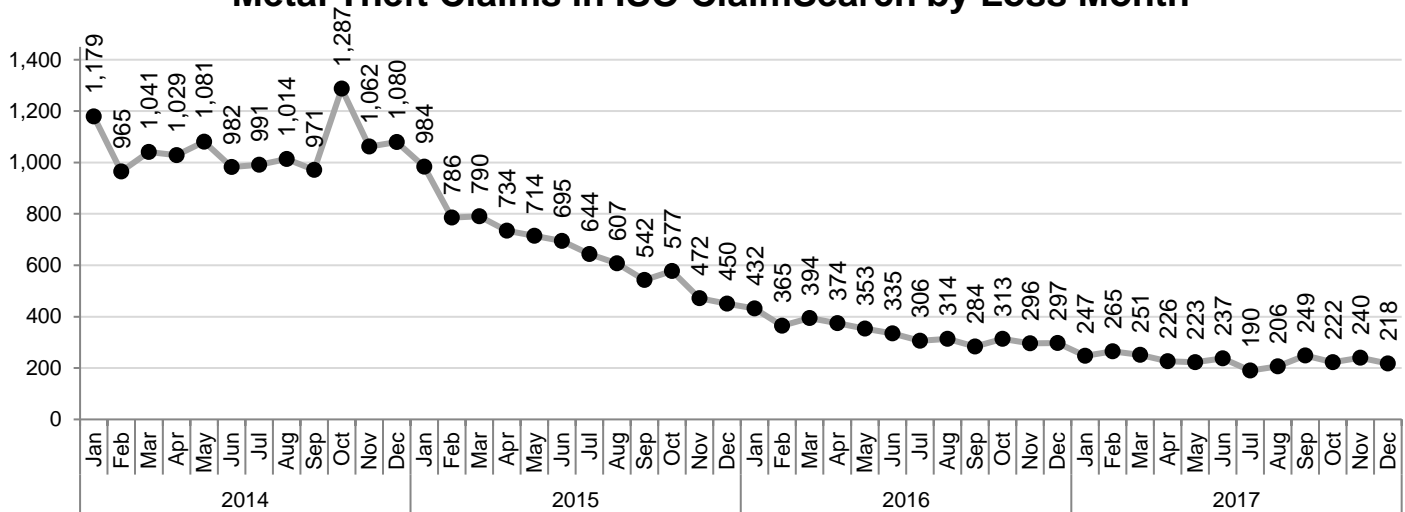
[8] Some claims may contain more than one of the keywords identified, while others may not contain any.

Common Keywords	2014-2017 Claims
"pipe" or "piping"	5,626
"plumbing"	5,641
"a/c" or " ac " or "air cond" or "hvac"	3,715
"wire" or "wiring"	3,527
"line"	1,630
"coil"	387
"tube" or "tubing"	317
"roof"	239
"gutter" or "spout"	197

Metal Type	2014-2017 Claims
Copper	26,840
Aluminum	511
Brass	146
Bronze	120

The following chart shows the number of metal theft claims that occurred per month from January 1, 2014 through December 31, 2017. It should be noted that there is often a delay before claims are entered into ISO ClaimSearch[9]. Claims that occurred in 2017 and earlier but were entered in the 1st quarter of 2018 are included in the following chart to minimize the impact of these delays. However, some months may still be underrepresented in the data, particularly the final months of 2017.

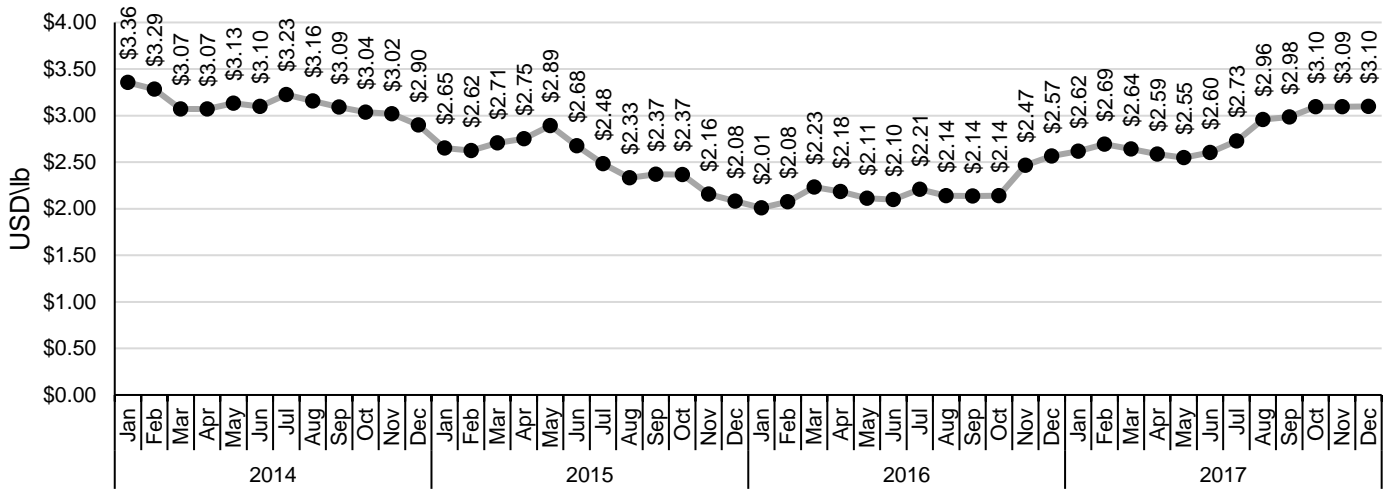## Metal Theft Claims in ISO ClaimSearch by Loss Month

When compared with the graph of copper prices for the same time period there appears to be a positive correlation between the metal prices and the number of metal theft claims (0.55); however, this was found to be less than the correlation observed in the prior Metal Theft ForeCAST report (0.91)[10]. While the number of claims has declined over the time period, the price of copper began to rebound in 2017.

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[9] There was an average of 79 days between a claim occurring and it being entered into ISO ClaimSearch, therefore the last months of the data are likely to be underreported.

[10] Copper price data was obtained from http://www.iwgcopper.com/price-history. The Pearson's correlation coefficient between the number of metal theft claims per month and the average monthly copper price was .55 (significant at the .01 level).
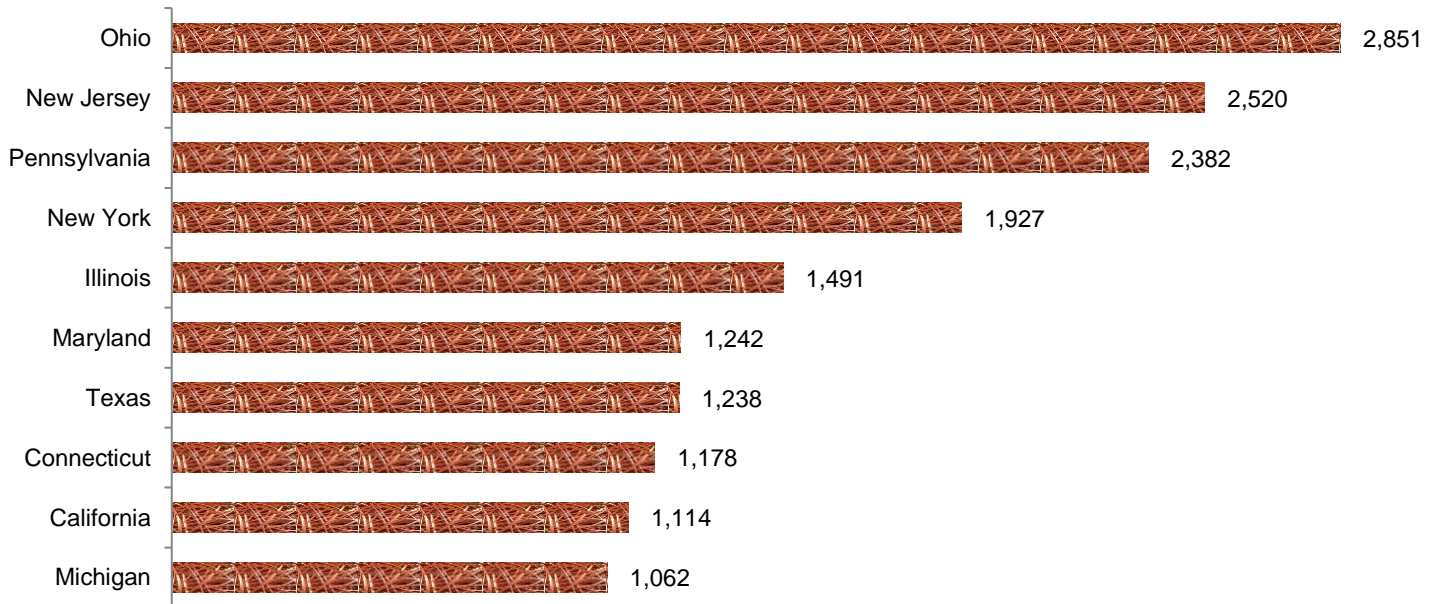
COMEX Copper Price Monthly Averages

Y-axis: USD\lb — $0.00 to $4.00

2014 values: Jan $3.36, Feb $3.29, Mar $3.07, Apr $3.07, May $3.13, Jun $3.10, Jul $3.23, Aug $3.16, Sep $3.09, Oct $3.04, Nov $3.02, Dec $2.90

2015 values: Jan $2.65, Feb $2.62, Mar $2.71, Apr $2.75, May $2.89, Jun $2.68, Jul $2.48, Aug $2.33, Sep $2.37, Oct $2.37, Nov $2.16, Dec $2.08

2016 values: Jan $2.01, Feb $2.08, Mar $2.23, Apr $2.18, May $2.11, Jun $2.10, Jul $2.21, Aug $2.14, Sep $2.14, Oct $2.14, Nov $2.47, Dec $2.57

2017 values: Jan $2.62, Feb $2.69, Mar $2.64, Apr $2.59, May $2.55, Jun $2.60, Jul $2.73, Aug $2.96, Sep $2.98, Oct $3.10, Nov $3.09, Dec $3.10
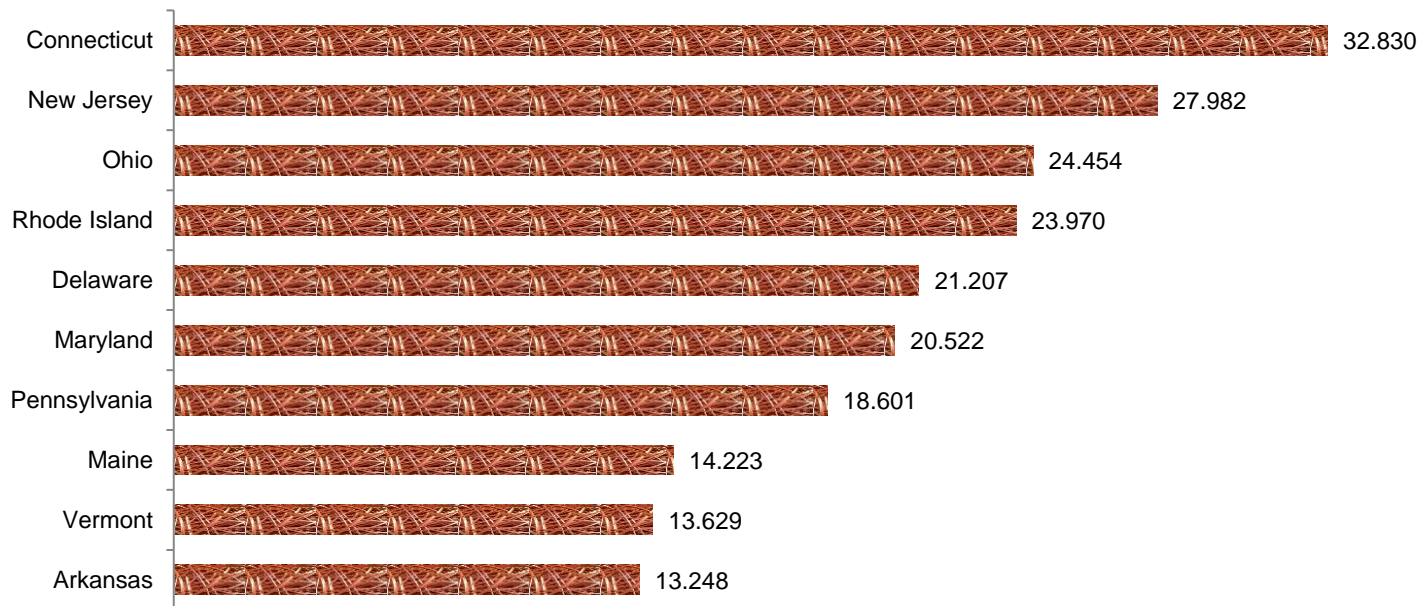
Metal Theft Claims by Loss State

The following charts visualize the 10 Loss States associated with the most metal theft claims in ISO ClaimSearch first by the number of claims and then by the number of claims per 100,000 residents[11].

Ten States with Most Metal Thefts Claims in ISO ClaimSearch (2014-2017)

State	Claims
Ohio	2,851
New Jersey	2,520
Pennsylvania	2,382
New York	1,927
Illinois	1,491
Maryland	1,242
Texas	1,238
Connecticut	1,178
California	1,114
Michigan	1,062

[11] State populations were calculated using the 2017 state population estimates from www.census.gov.

Ten States with Metal Theft Claims in ISO ClaimSearch Per 100,000 Residents (2014 - 2017)

State	Claims per 100,000
Connecticut	32.830
New Jersey	27.982
Ohio	24.454
Rhode Island	23.970
Delaware	21.207
Maryland	20.522
Pennsylvania	18.601
Maine	14.223
Vermont	13.629
Arkansas	13.248

Ohio was the state with the highest number of metal theft claims in ISO ClaimSearch, followed by New Jersey and Pennsylvania. When ranked by claims per 100,000 residents, Connecticut was found to be the top state with 32.8 claims per 100,000 residents, followed by New Jersey and Ohio ranked 2nd and 3rd respectively. Ohio, New Jersey, Pennsylvania, Maryland, and Connecticut appear in both charts.
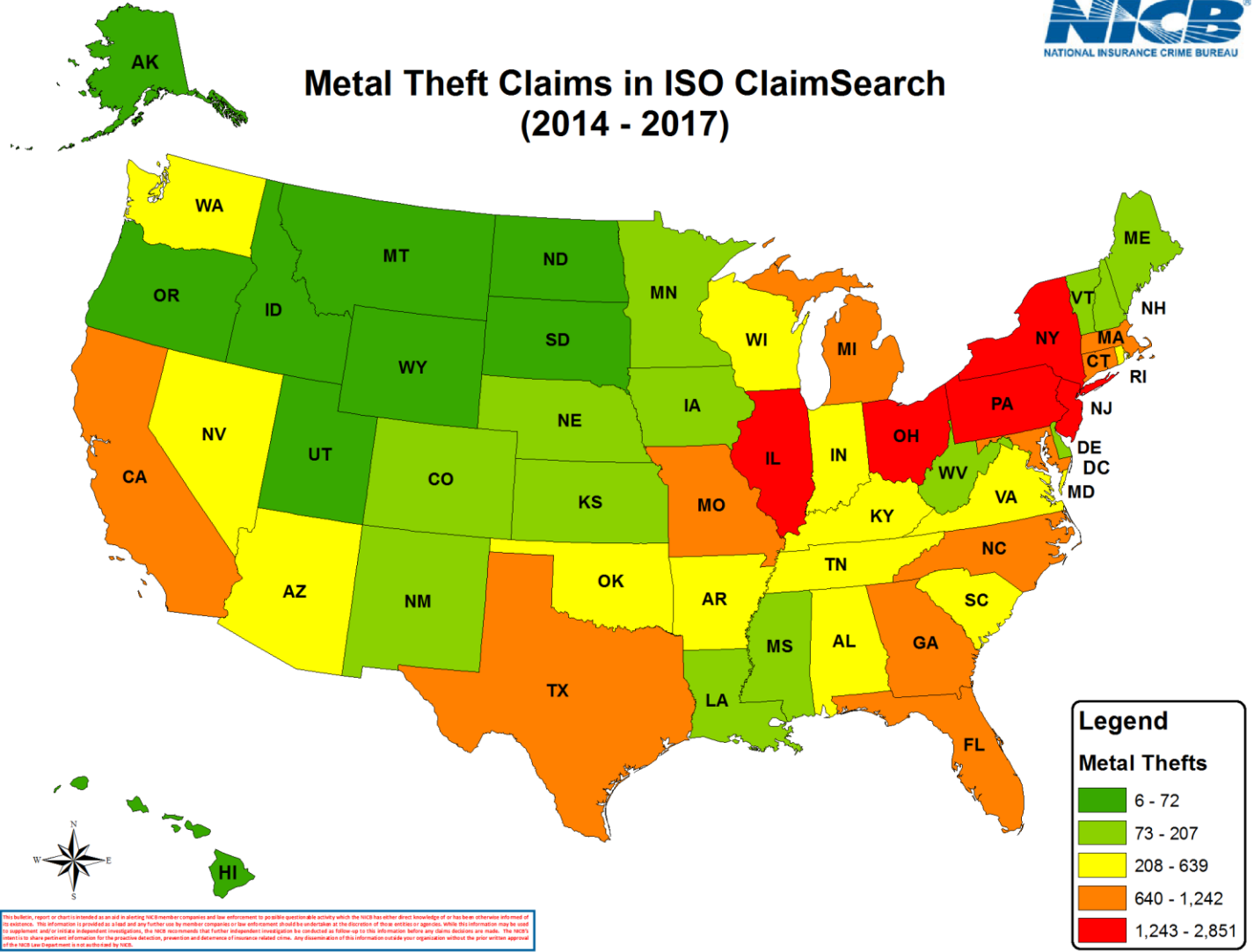
The following table, in alphabetical order by state, shows the number of claims per state for all 50 states and the District of Columbia, as well as the number of claims per 100,000 residents. Following this table are maps displaying the number of metal theft claims by state and by claims per 100,000 residents.

State	Population	Claims	Claims / 100,000 Residents	Rank by Number of Claims	Rank by Claims / 100,000 Residents
Alabama	4,874,747	441	9.0	17	19
Alaska	739,795	8	1.1	48	45
Arizona	7,016,270	242	3.4	25	36
Arkansas	3,004,279	398	13.2	19	10
California	39,536,653	1,114	2.8	9	42
Colorado	5,607,154	164	2.9	34	40 (tie)
Connecticut	3,588,184	1,178	32.8	8	1
Delaware	961,939	204	21.2	30	5
District of Columbia	693,972	83	12.0	42	12
Florida	20,984,400	693	3.3	15	37
Georgia	10,429,379	834	8.0	12	24 (tie)
Hawaii	1,427,538	9	0.6	47	51
Idaho	1,716,943	12	0.7	46	48 (tie)
Illinois	12,802,023	1,491	11.6	5	14
Indiana	6,666,818	574	8.6	16	20
Iowa	3,145,711	154	4.9	35	30
Kansas	2,913,123	203	7.0	31	26
Kentucky	4,454,189	357	8.0	20	24 (tie)
Louisiana	4,684,333	137	2.9	37	40 (tie)
Maine	1,335,907	190	14.2	33	8
Maryland	6,052,177	1,242	20.5	6	6
Massachusetts	6,859,819	810	11.8	13	13
Michigan	9,962,311	1,062	10.7	10	15
Minnesota	5,576,606	207	3.7	29	35
Mississippi	2,984,100	95	3.2	40	38 (tie)
Missouri	6,113,532	802	13.1	14	11
Montana	1,050,493	7	0.7	49	48 (tie)
Nebraska	1,920,076	110	5.7	39	28
Nevada	2,998,039	305	10.2	22	16
New Hampshire	1,342,795	111	8.3	38	22
New Jersey	9,005,644	2,520	28.0	2	2
New Mexico	2,088,070	195	9.3	32	18
New York	19,849,399	1,927	9.7	4	17
North Carolina	10,273,419	836	8.1	11	23
North Dakota	755,393	13	1.7	45	44
Ohio	11,658,609	2,851	24.5	1	3
Oklahoma	3,930,864	241	6.1	26	27
Oregon	4,142,776	30	0.7	44	48 (tie)
Pennsylvania	12,805,537	2,382	18.6	3	7
Rhode Island	1,059,639	254	24.0	23	4
South Carolina	5,024,369	225	4.5	28	32
South Dakota	869,666	7	0.8	50	47
Tennessee	6,715,984	322	4.8	21	31
Texas	28,304,596	1,238	4.4	7	33 (tie)
Utah	3,101,833	72	2.3	43	43
Vermont	623,657	85	13.6	41	9
Virginia	8,470,020	426	5.0	18	29
Washington	7,405,743	239	3.2	27	38 (tie)
West Virginia	1,815,857	154	8.5	36	21
Wisconsin	5,795,483	254	4.4	24	33 (tie)
Wyoming	579,315	6	1.0	51	46

The below map displays the number of ISO ClaimSearch metal theft claims by state between 2014 and 2017.

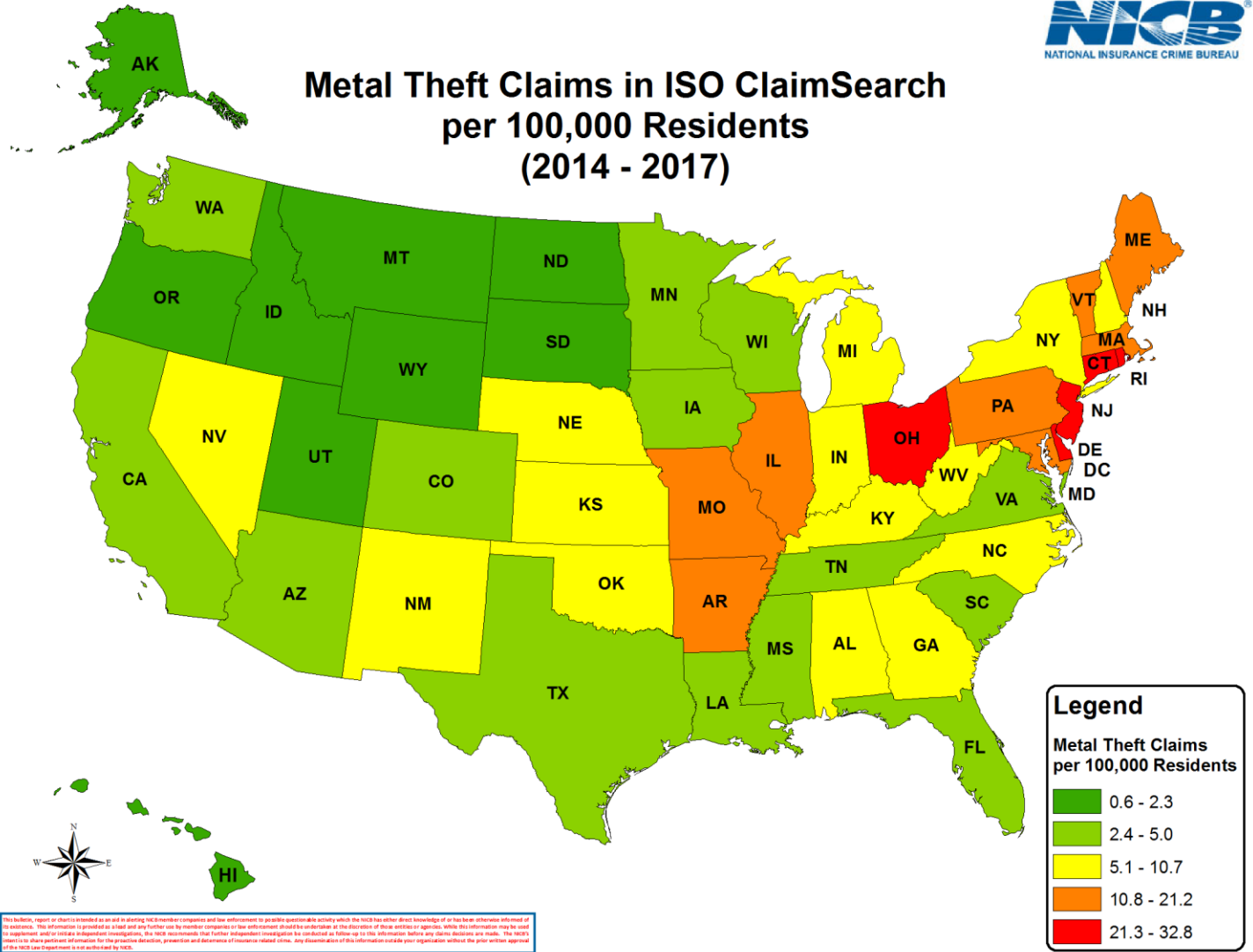**Metal Theft Claims in ISO ClaimSearch
(2014 - 2017)**

Legend

Metal Thefts

- 6 - 72
- 73 - 207
- 208 - 639
- 640 - 1,242
- 1,243 - 2,851

The following map displays the number of ISO ClaimSearch metal theft claims per 100,000 residents by state between 2014 and 2017.

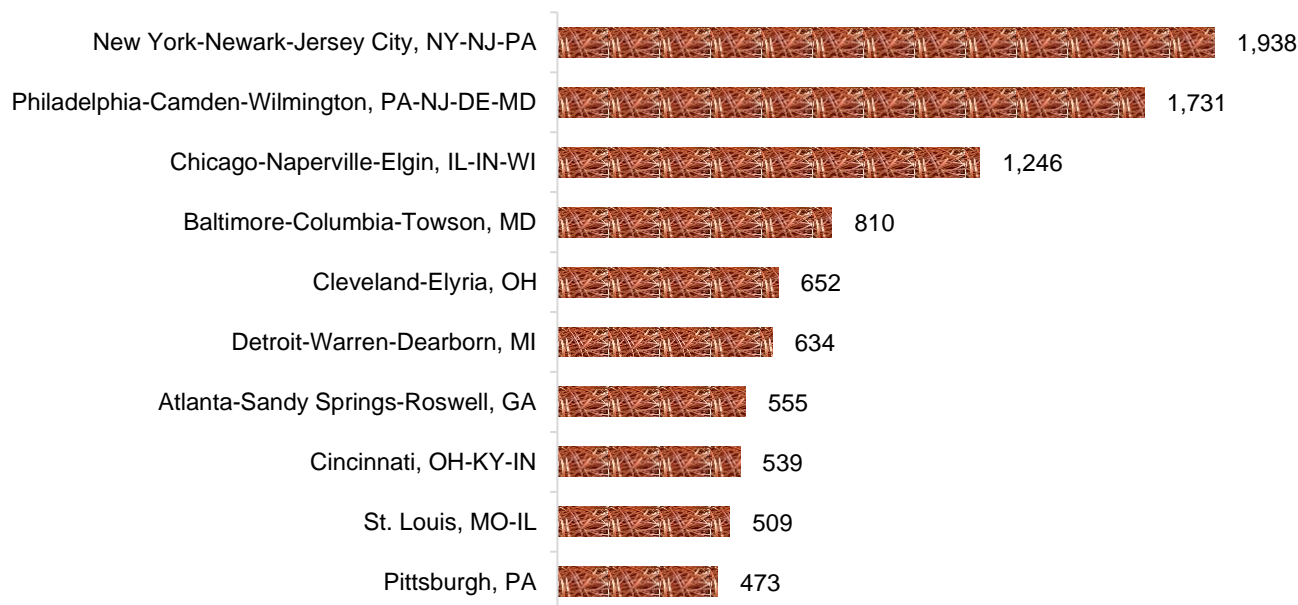## Metal Theft Claims in ISO ClaimSearch per 100,000 Residents (2014 - 2017)

Legend

Metal Theft Claims per 100,000 Residents

- 0.6 - 2.3
- 2.4 - 5.0
- 5.1 - 10.7
- 10.8 - 21.2
- 21.3 - 32.8

Metal Theft Claims by CBSA

The following chart shows the 10 CBSAs with the most metal theft claims in ISO ClaimSearch[12].

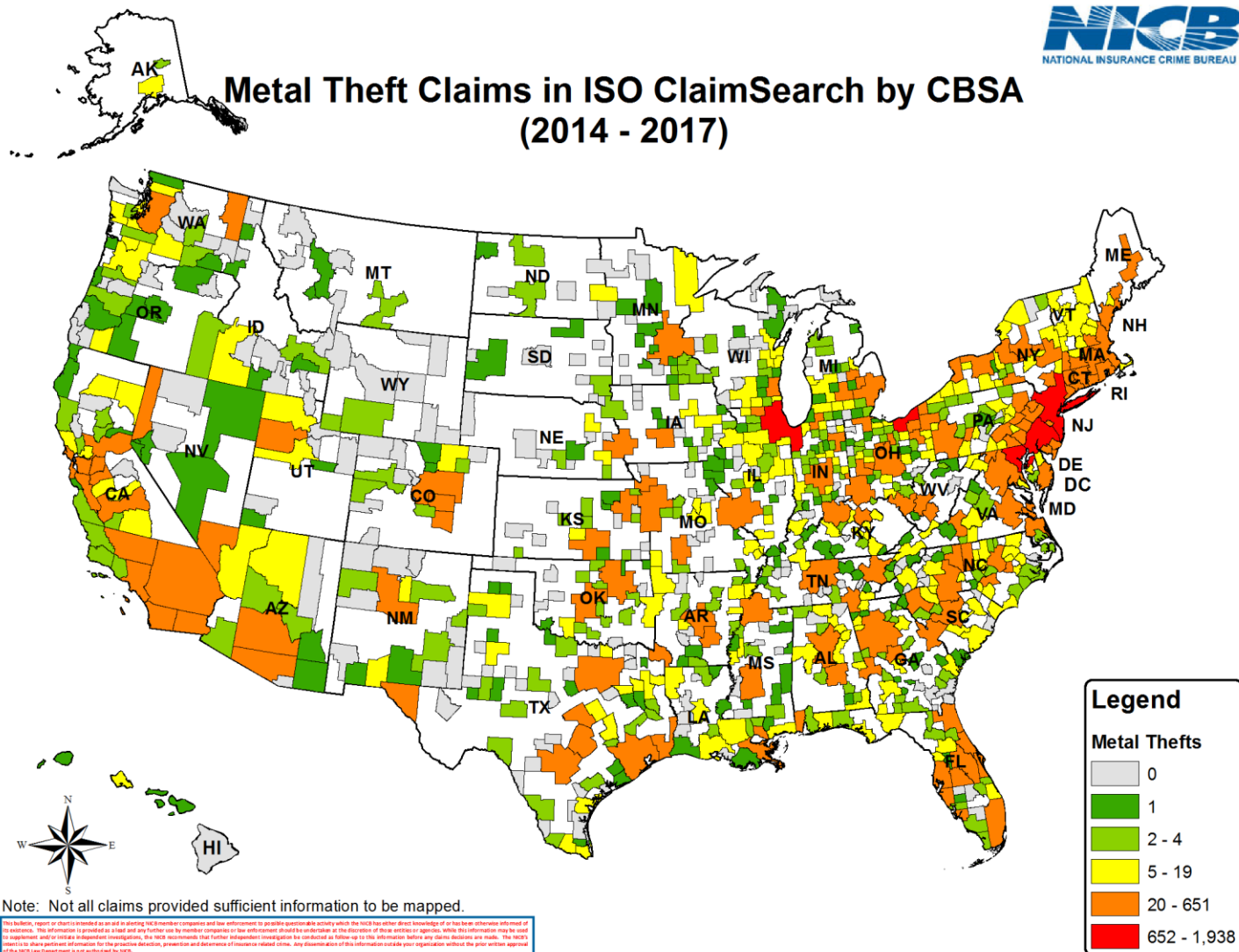### Ten CBSAs with Most Metal Theft Calims in ISO ClaimSearch (2014-2017)

CBSA	Claims
New York-Newark-Jersey City, NY-NJ-PA	1,938
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	1,731
Chicago-Naperville-Elgin, IL-IN-WI	1,246
Baltimore-Columbia-Towson, MD	810
Cleveland-Elyria, OH	652
Detroit-Warren-Dearborn, MI	634
Atlanta-Sandy Springs-Roswell, GA	555
Cincinnati, OH-KY-IN	539
St. Louis, MO-IL	509
Pittsburgh, PA	473

The New York-Newark-Jersey City, NY-NJ-PA CBSA had the largest number of metal theft claims from 2014-2017, followed by Philadelphia-Camden-Wilmington, PA-NJ-DE-MD and Chicago-Naperville-Elgin, IL-IN-WI CBSAs. A map is available displaying the number of metal theft claims by CBSA in the appendices.

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[12] Please note that 2,025, 7% of the total metal theft claims, were either located outside of a CBSA or did not provide sufficient information to be included in a CBSA.

The below map displays the number of ISO ClaimSearch metal theft claims by CBSA between 2014 and 2017.

Metal Theft Claims in ISO ClaimSearch by CBSA (2014 - 2017)

Note: Not all claims provided sufficient information to be mapped.

Legend
Metal Thefts
- 0
- 1
- 2 - 4
- 5 - 19
- 20 - 651
- 652 - 1,938

Conclusions

There were a total of 27,514 claims for the theft of copper, bronze, brass, or aluminum submitted to ISO ClaimSearch between January 1, 2014 and March 31, 2018 and with a DOL between January 1, 2014 and December 31, 2017. Of the 27,514 total claims, the vast majority (98%) pertained to the theft of copper. Of these claims, 64% were on personal policies, while 36% were on commercial policies. When the number of metal theft claims and copper prices are compared, a positive correlation (0.55) was observed between the values; however, this correlation was found to be less significant than identified in the prior Metal Theft ForeCAST report (0.91). The average copper prices appeared to climb in 2017 while the number of metal theft claims submitted to ISO Claim Search continued to decrease in 2017.

While the number of metal theft claims was increasing from 2006 through 2011, in 2012 the number of claims leveled off, and from 2014 through 2017 the number of metal theft claims has been decreasing. In general, the number of metal theft claims was seen to decrease since 2014. In contrast, the average price of copper was observed to be decreasing until 2017 where the average prices appear to have slightly increased. The

divergence of these 2 values may be attributed to scrap metal legislation, at the state level, along with the continued efforts of Law Enforcement.

Ohio was identified as the loss state with the most metal theft claims in ISO ClaimSearch, with 13% more claims than New Jersey, the state with the 2nd largest number of claims. Connecticut had the highest rate of claims per capita.

The New York-Newark-Jersey City, NY-NJ-PA CBSA ranked 1st in ISO ClaimSearch metal theft claims and from 2014 through 2017.

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Metal Theft Resources

- http://stopmetalstheft.org/ or http://www.isri.org/stop-metals-theft

Institute of Scrap Recycling Industries website that has information and tools for law enforcement, prosecutors, recyclers, and legislators; including a database of state laws related to metal theft.

- http://www.scraptheftalert.com/

Institute of Scrap Recycling Industries website that "is a tool for law enforcement that allows you to alert the scrap industry of significant thefts of materials in the United States and Canada. Upon validation and review, alerts you post are broadcast by email to all subscribed users within a 100 mile radius of where the incident occurred."

- http://www.popcenter.org/problems/metal_theft/1

Center for Problem-Oriented Policing webpage with information on metal theft and possible responses to reduce its occurrence.