New Census Bureau Data Product: Monthly State Retail Sales

Rebecca Hutchinson, Economic Directorate
Scott Scheleur, Economic Directorate

March 18, 2021

Census Bureau has reviewed Monthly State Retail Sales product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied. (Approval ID: CBDRB-FY20-356)

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Delivering on data users' request

- More timely state-level retail sales are the among the most requested data by our data users.
- In September 2020, the Census Bureau released the new Monthly State Retail Sales (MSRS) data product.
- First version of these experimental data.
- Invite users to provide feedback on how to improve this experimental product.

Monthly State Retail Sales for October 2020

Released January 29, 2021

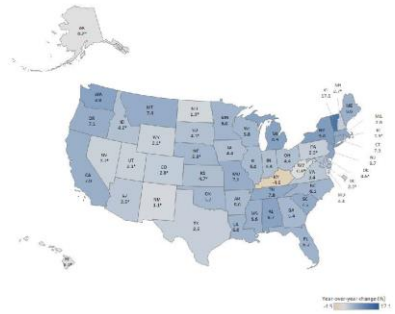
Overview

The U.S. Census Bureau introduced the Monthly State Retail Sales (MSRS) report as an experimental data product in September 2020. The MSRS is a blended data product combining Monthly Retail Trade Survey data, administrative data, and third-party data. Year-over-year percent changes are available for Total Retail Sales excluding Nonstore Retailers as well as 11 North American Industry Classification System (NAICS) retail subsectors. These data are provided by state and NAICS from January 2019 through October 2020. We will publish these data monthly on an ongoing basis and seek ways to improve the methodology whenever possible.

Total Retail Sales

Total U.S. Retail Sales excluding Nonstore Retailers (not seasonally adjusted) in October 2020 were up 5.5 percent (±0.6 percent) from October 2019. Thirty-one states had positive and significant year-over-year percent changes from October 2019 to October 2020.

October 2020 State Year-over-Year Percent Changes
for Total Retail Sales excluding Nonstore Retailers



State retail sales data not adjusted for seasonal variation, trading-day differences, moving holidays or price changes.

* The 90 percent confidence interval includes zero. There is insufficient statistical evidence to conclude that the actual change is different from zero.

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What data are available?

Year-over-year percentage changes by month back to January 2019 for:

- Total Retail Sales excluding Nonstore Retailers
- 11 Retail Subsectors
  - Motor vehicle and parts dealers (NAICS 441)
  - Furniture and Home Furnishing (NAICS 442)
  - Electronics and Appliances (NAICS 443)
  - Building Materials and Supplies Dealers (NAICS 444)
  - Food and Beverage (NAICS 445)
  - Health and Personal Care (NAICS 446)
  - Gasoline Stations (NAICS 447)
  - Clothing and Clothing Accessories (NAICS 448)
  - Sporting Goods and Hobby (NAICS 451)
  - General Merchandise (NAICS 452)
  - Miscellaneous Store Retailers (NAICS 453)
- The state-level data is not adjusted for seasonal variation, trading-day differences, moving holidays or price changes.

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How are the data modeled?

Estimates are created using a composite model that is a weighted average of synthetic estimates and survey data and third-party data based hybrid estimates. The weight used in estimation is based on the ratio of the variance of the synthetic estimator to the total variance of both estimators.

Synthetic State Estimates

=

For each state and 3-digit NAICS combination, national Monthly Retail Trade Survey (MRTS) brick & mortar sales are allocated to states using administrative data (payroll) totals for each NAICS.

$$\begin{aligned} &Estimate\ for\ each\ State\ \&\ NAICS \\ &= National\ MRTS\ Sales\ for\ NAICS \\ &* \frac{Payroll\ for\ State\ \&\ NAICS}{National\ Payroll\ in\ NAICS} \end{aligned}$$

Hybrid State Estimates

=

MRTS brick & mortar sales → For MRTS retailers with more than one store location but all store locations are in the same state.
For MRTS retailers with only one store location.

+

Sum of third-party data brick & mortar sales → For MRTS retailers with more than one store location whose store-location or state-level data is available through a third-party

+

Imputed brick & mortar sales → For MRTS retailers with more than one location who operate in multiple states and are not included in third-party data sales and information from third-party data

+

Adjustment → To account for retailers with only one location that are not in MRTS or in the third-party data

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Limitations of the data

Synthetic Estimator

- Based primarily on total annual payroll and national MRTS estimates, any regional or state seasonal patterns are not reflected in the estimates.
- Does not directly use available establishment level data like the hybrid estimator does.

Hybrid Estimator

- Single store location retailers that are not in MRTS are not directly imputed but are accounted for using a national industry level adjustment ratio.

State sales estimates in each three-digit NAICS are calculated independently each month. Year-over-year percentage changes may exhibit more variation if the coverage or percentage of composite estimator coming from the hybrid model changes between years.

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What are the data quality metrics?

These data are experimental and may not meet all of the quality standards of our official statistical products.

To allow data users to assess the quality of the data, we are providing a variety of quality metrics including:

- **Standard errors** provide measures of variability for the year-to-year percentage changes and can be used to construct confidence intervals when drawing inferences about the data.
- A **Coverage** metric is produced for all monthly estimates, at the individual industry by state-level and at aggregated levels to show the proportion of the estimates that is directly collected either through MRTS or through a third-party data source. This metric also considers the proportion of the composite estimate coming from the hybrid estimate and will be lower the more the composite estimator has to rely on synthetic estimate, which does not use directly reported data. The quality of the model improves with better coverage.

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How good is MSRS coverage?

NAICS	NAICS Description	Average monthly non-imputed MSRS coverage is…
441	Motor Vehicle and Parts Dealers	Greater than or equal to 10% and less than 25% of the NAICS total
442	Furniture and Home Furnishings Stores	Less than 10% of the NAICS total.
443	Electronics and Appliance Stores	Less than 10% of the NAICS total.
444	Building Material and Garden Equipment and Supplies Dealers	Less than 10% of the NAICS total.
445	Food and Beverage Stores	Less than 10% of the NAICS total.
446	Health and Personal Care Stores	Less than 10% of the NAICS total.
447	Gasoline Stations	Less than 10% of the NAICS total.
448	Clothing and Clothing Accessories Stores	Less than 10% of the NAICS total.
451	Sporting Goods, Hobby, Musical Instrument, and Book Stores	Greater than or equal to 10% and less than 25% of the NAICS total
452	General Merchandise Stores	Greater than or equal to 50% of the NAICS total
453	Miscellaneous Store Retailers	Greater than or equal to 10% and less than 25% of the NAICS total
ALL	Total Retail Sales Excluding Nonstore Retailers	Greater than or equal to 10% and less than 25% of the NAICS total

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How are the data validated?

Compared to available external data sources:

Third-party data sources

Publicly available state-provided data

- Typically available from state revenue department
- Small number of states have the data available by month and NAICS

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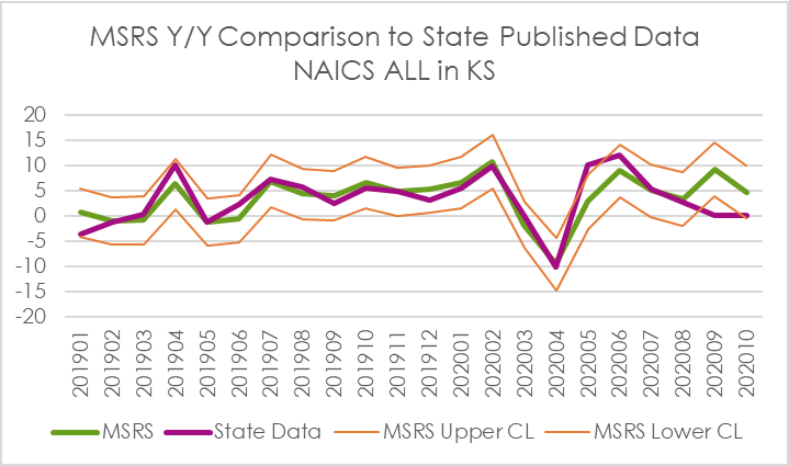
MSRS Sales Comparison at Total

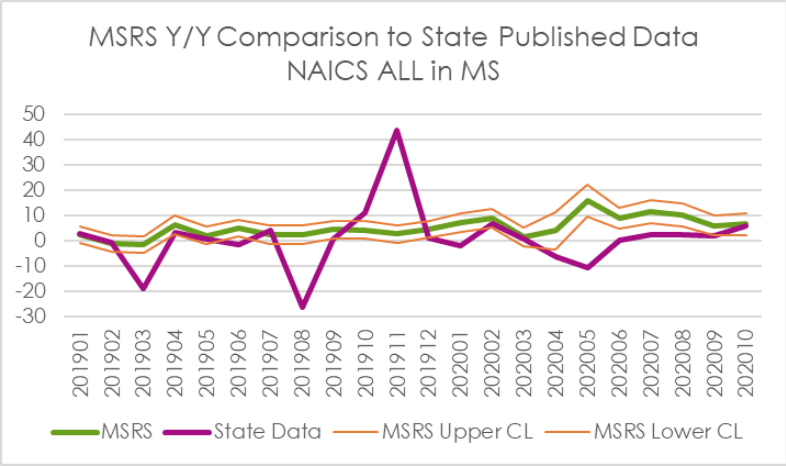
Comparison of state-provided data against MSRS year-over-year percentage changes for Total Retail Sales excluding Nonstore Retailers.

Kansas



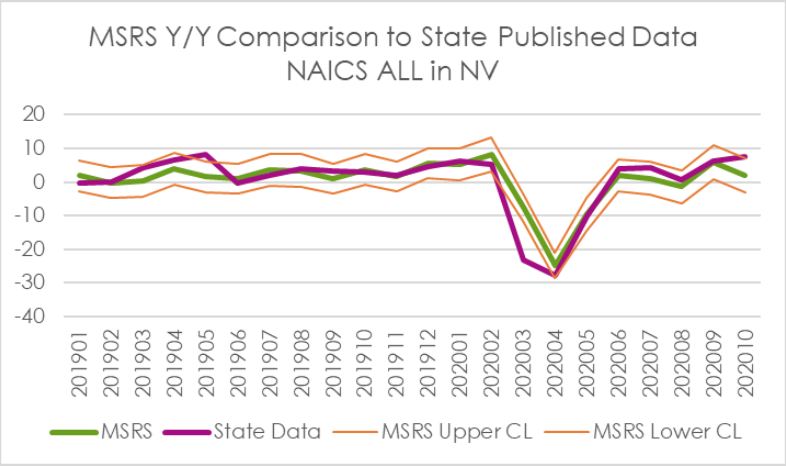
Average monthly non-imputed MSRS coverage for Kansas at the Total Retail Sales excluding Nonstore Retailers is greater than or equal to 10% and less than 25% of the NAICS/State total.

Mississippi



Average monthly non-imputed MSRS coverage for Mississippi at the Total Retail Sales excluding Nonstore Retailers is greater than or equal to 10% and less than 25% of the NAICS/State total.

Nevada



Average monthly non-imputed MSRS coverage for Nevada at the Total Retail Sales excluding Nonstore Retailers is greater than or equal to 10% and less than 25% of the NAICS/State total.

Source: October 2020 MSRS Report, Kansas and Mississippi Departments of Revenue, Nevada Department of Taxation

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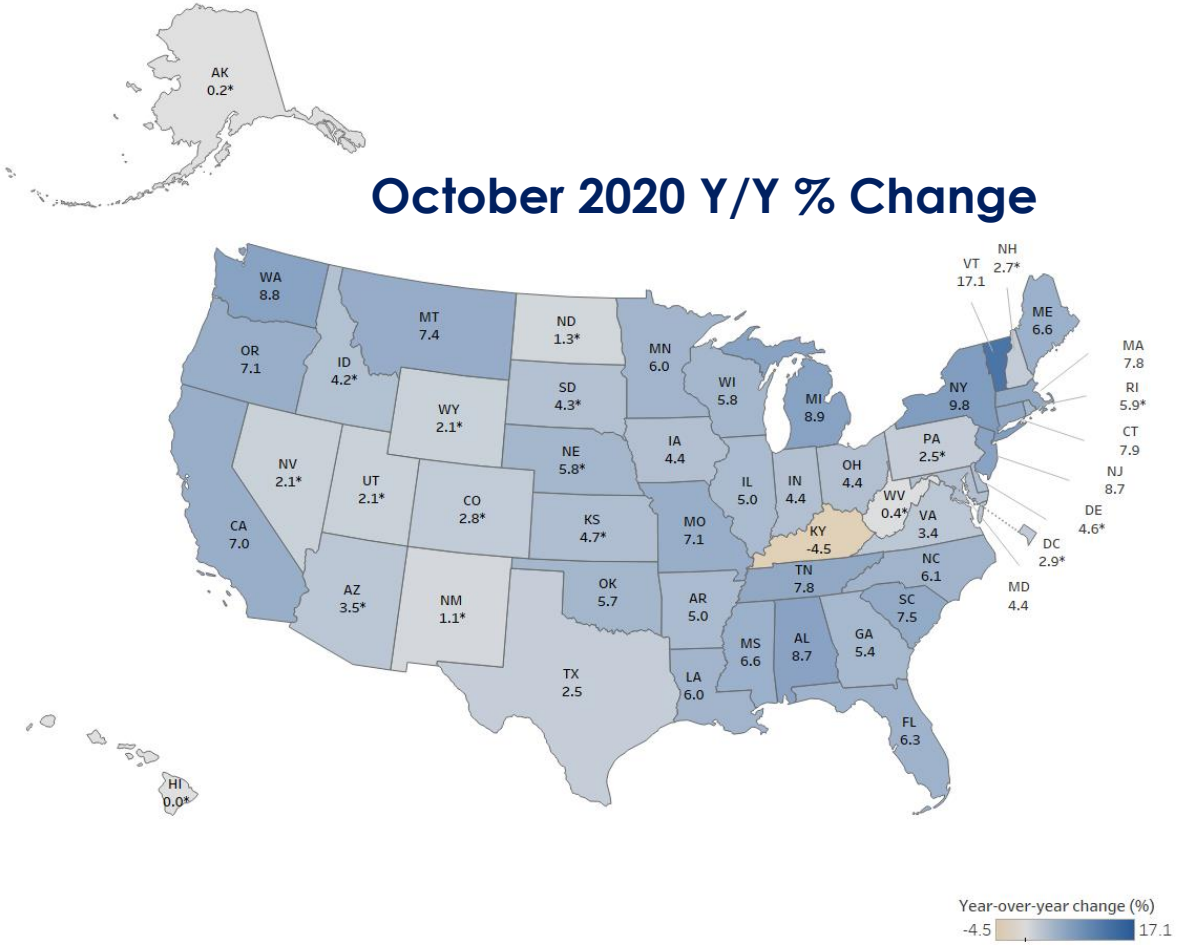
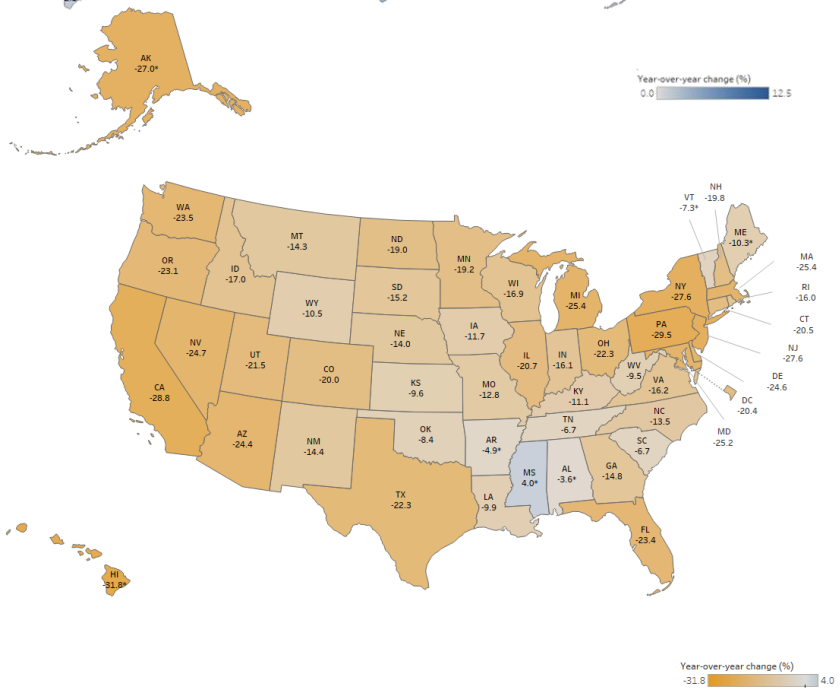
Total Retail Sales Excluding Nonstore Retailers by State

October 2020 Y/Y % Change



January 2020 Y/Y % Change

April 2020 Y/Y % Change



Source: October 2020 MSRS Report
S = Estimate suppressed due to quality concerns
* The 90 percent confidence interval includes zero. There is insufficient statistical evidence to conclude that the actual change is different from zero.
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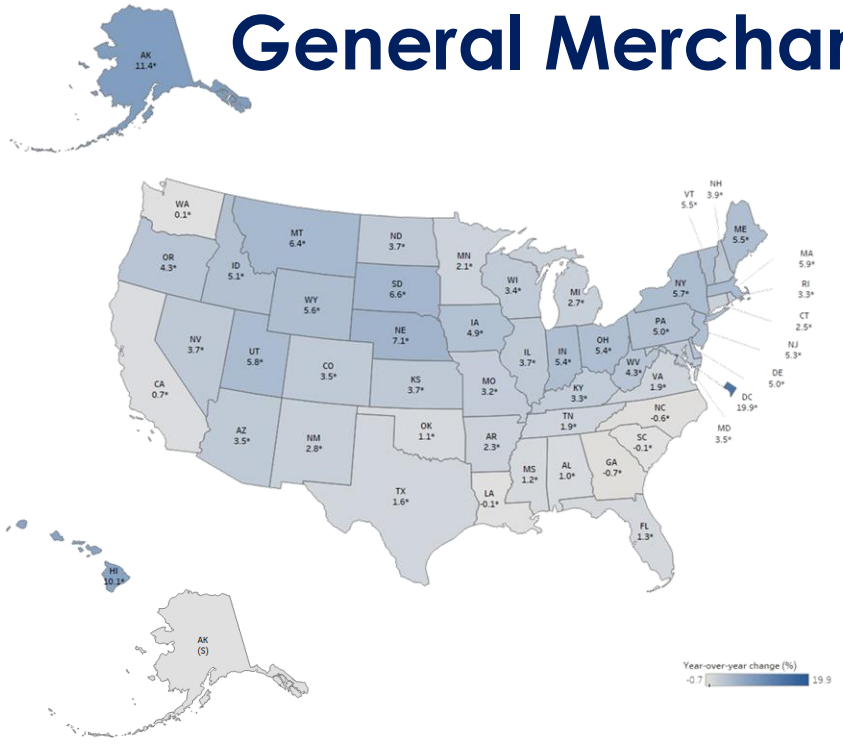
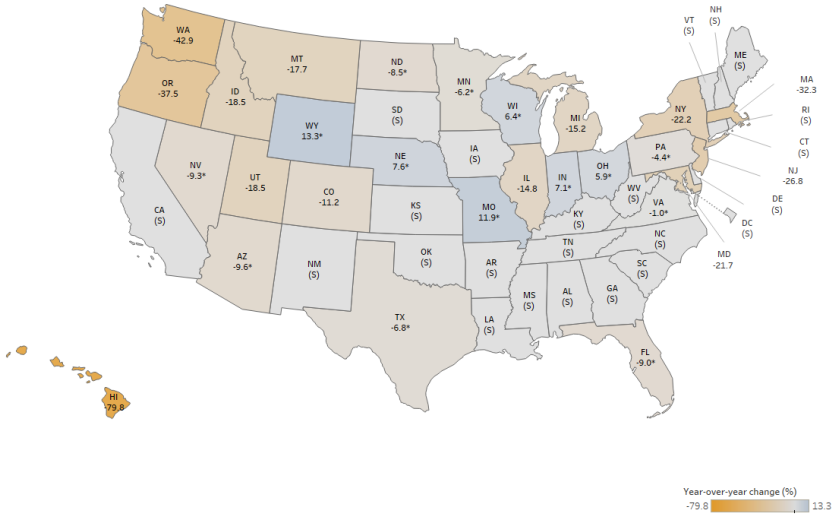
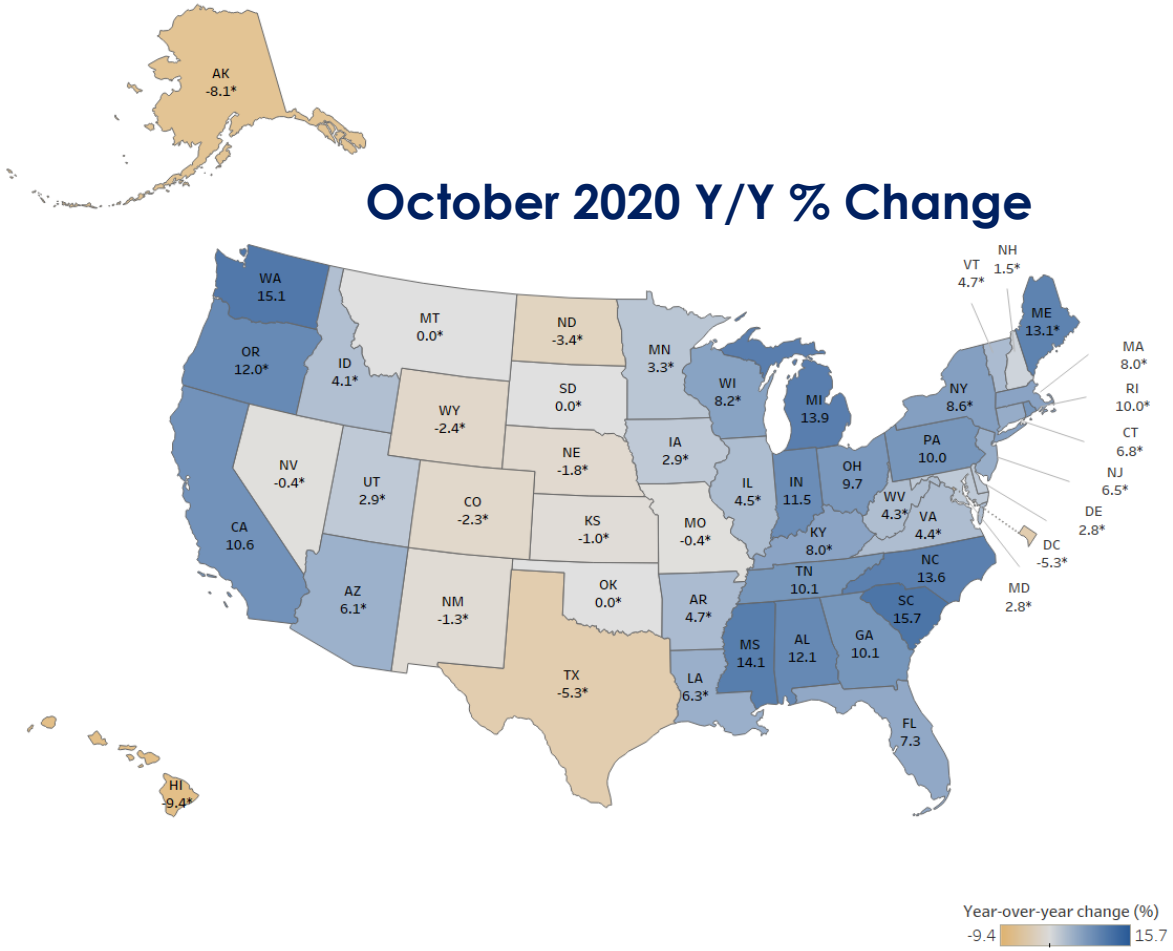
General Merchandise (NAICS 452) Retail Sales by State







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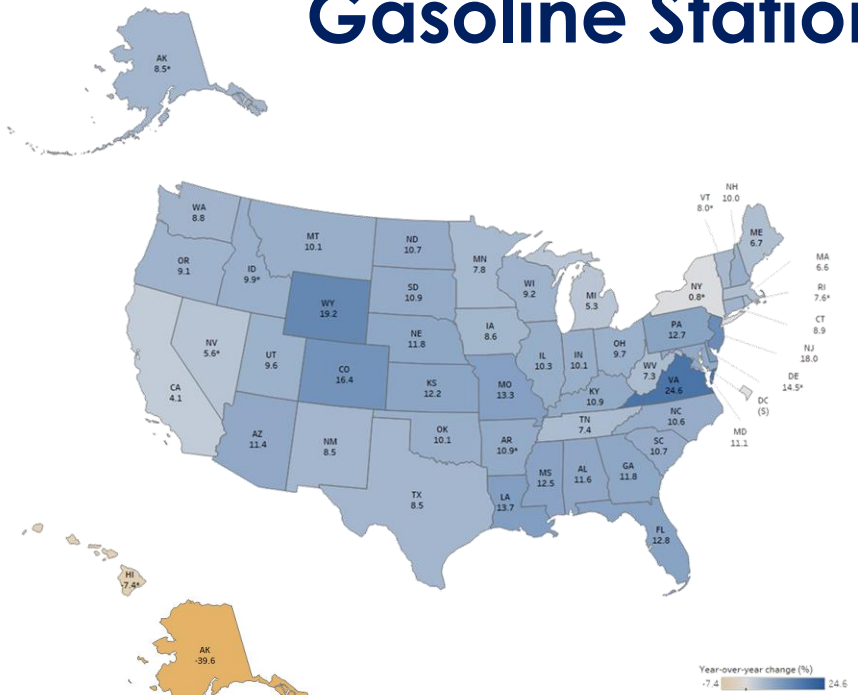
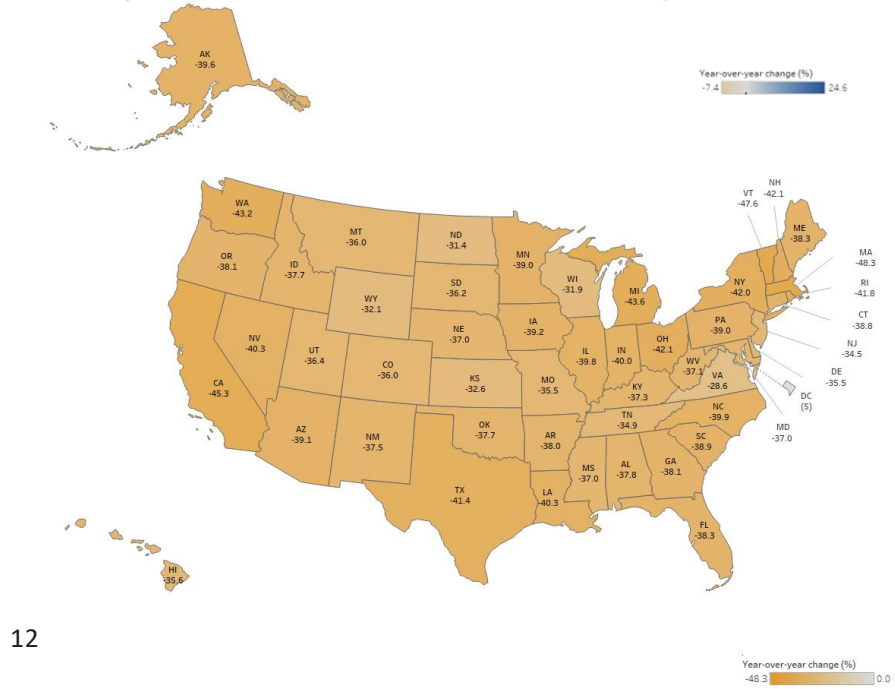
Gasoline Stations (NAICS 447) Retail Sales by State

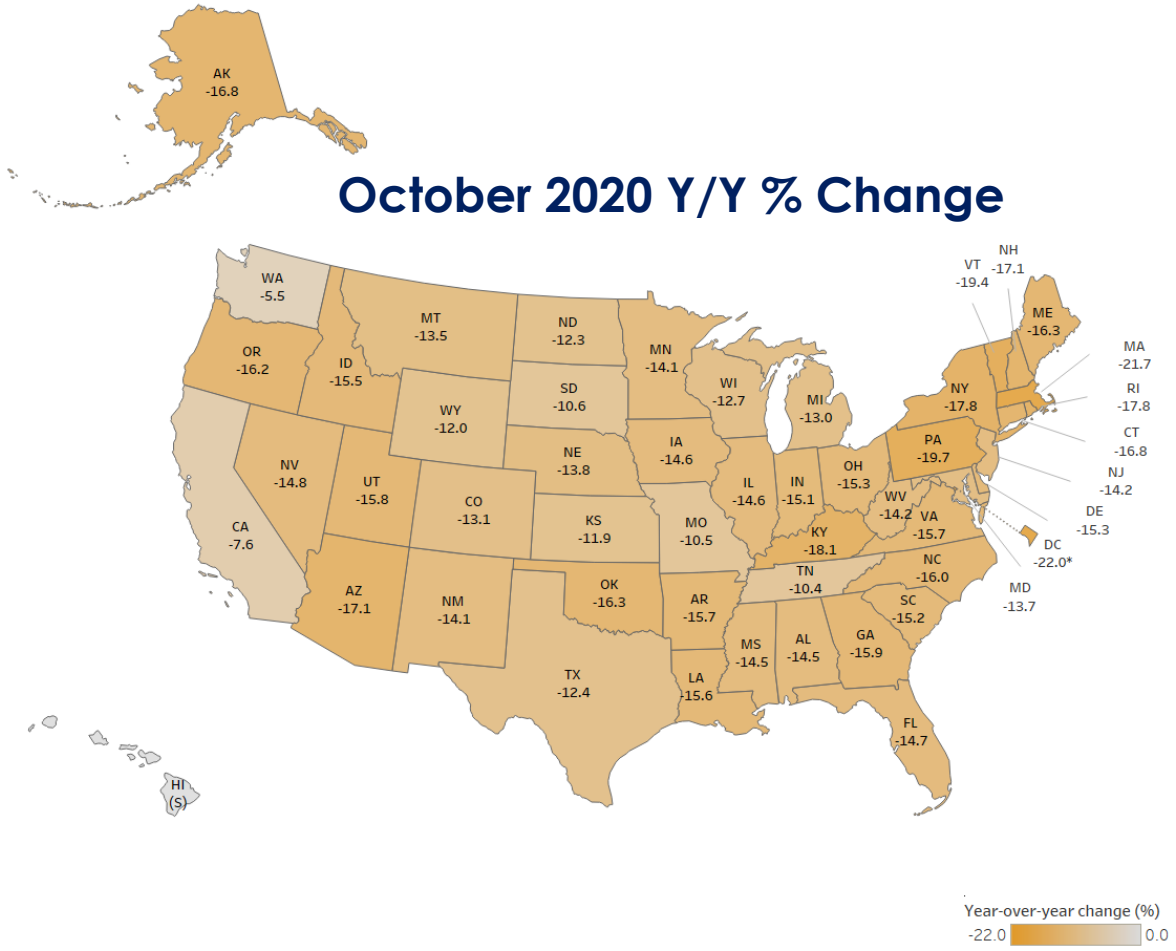
January 2020 Y/Y % Change



April 2020 Y/Y % Change



October 2020 Y/Y % Change



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Feedback from MSRS data users

"I…am already planning on incorporating these data into multiple executive education programs, my capstone undergraduate course, and will be highlighting the data tomorrow to my industry connections on LinkedIn"

"This data is extremely helpful for a general sense of the State's strengths. I would appreciate seeing this on a county-by-county basis as well."

"At our small economics firm, we have been waiting for something like this for a long time."

"I wanted to let you know I really like the monthly retail sales visualization. I can definitely see data users being interested in this product…"

"Are there plans to add NAICS 722 Food services & drinking places to the state-level estimates? Happy to see the development of this new state-level data product."

"I love this idea, and I hope it sticks."

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What's next?

- Determine method to allocate e-commerce sales to states and publish Nonstore Retailer sales by state.
- Publish retail sales levels in addition to year-over-year percentage changes.
- Incorporate more store-location or state-level data that is directly collected either from a survey or third-party data to improve the quality of the data.

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Questions?

- Are there are data sources that you know of that could be used in the MSRS composite model?
- What improvements could we make to the model to make the data more useful to those in your specific expertise/industry/practice?
- Are there groups or organizations that would benefit from this state-level retail data that we should reach out to?

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