

# 2021 Chesapeake Bay Watershed Report Card

## *Economic Indicators*

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Bill Dennison, Caroline Donovan, Alexandra Fries, Steven Guinn,  
Heath Kelsey

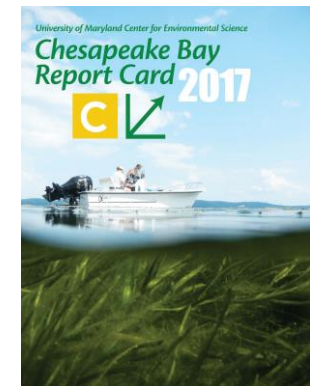
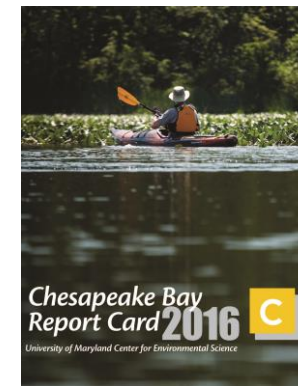
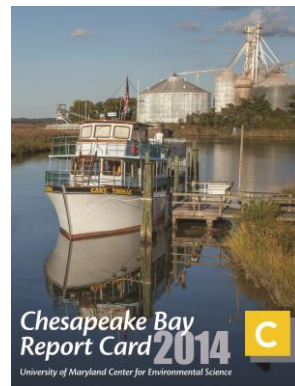
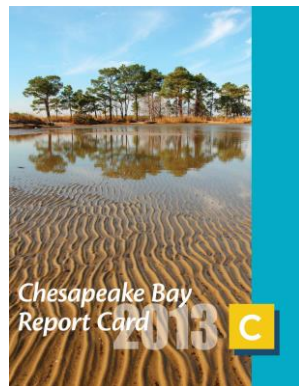
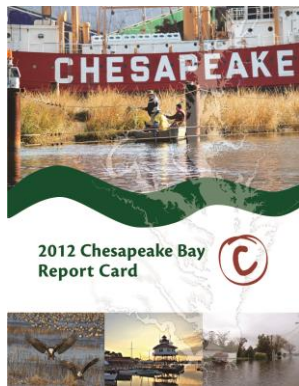
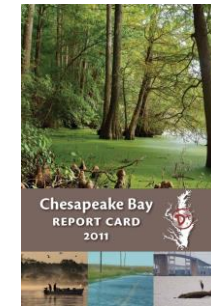
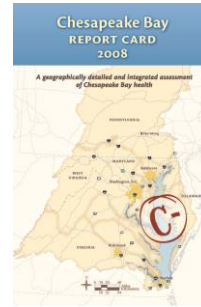
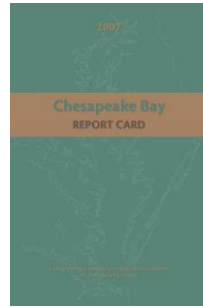
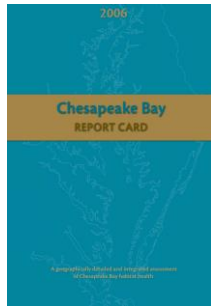


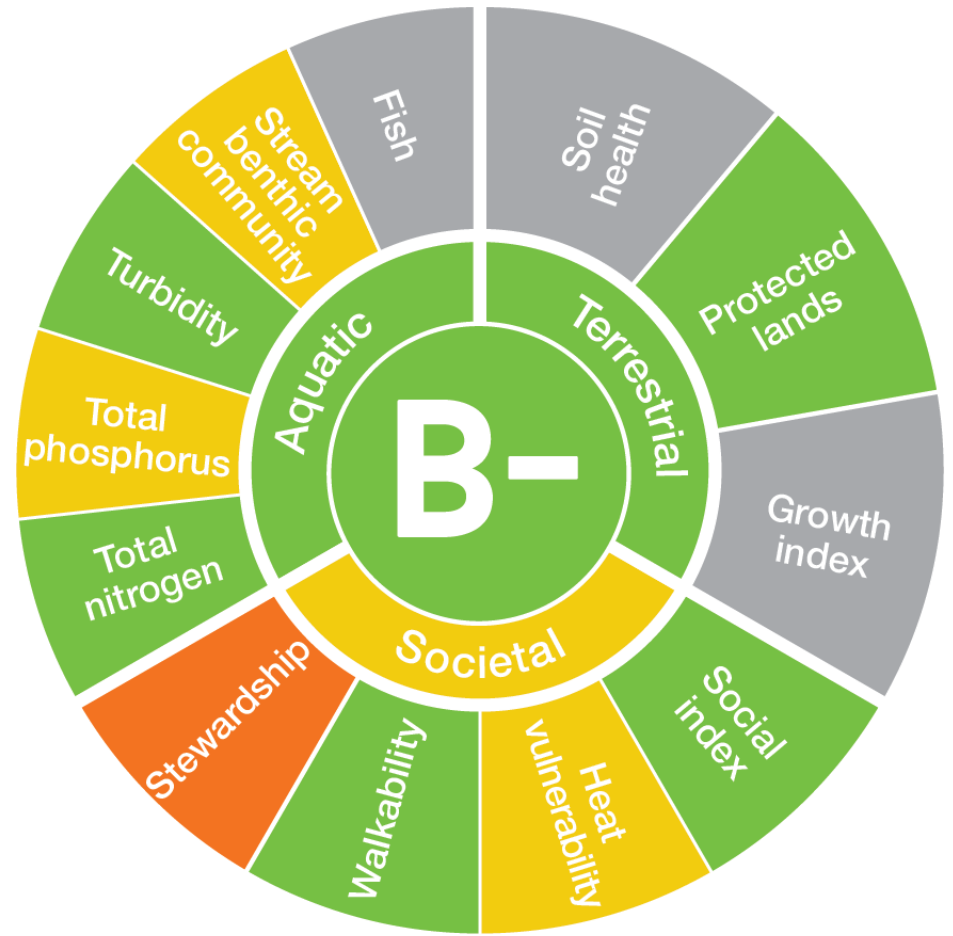
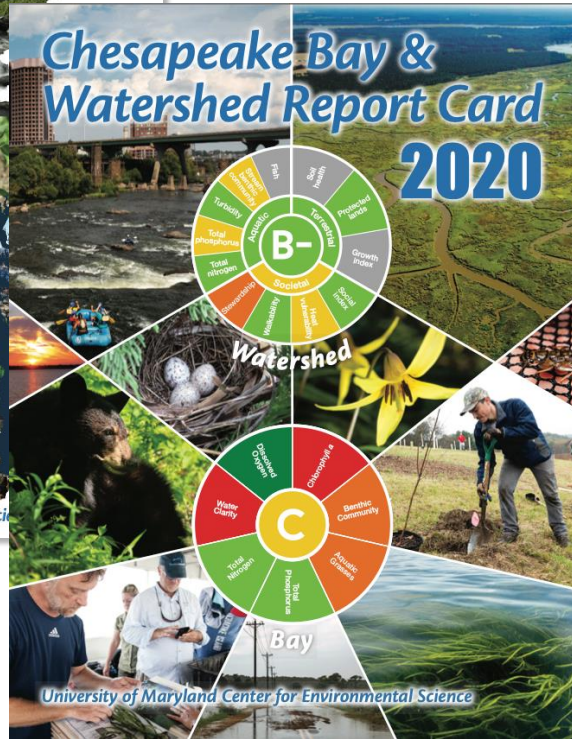
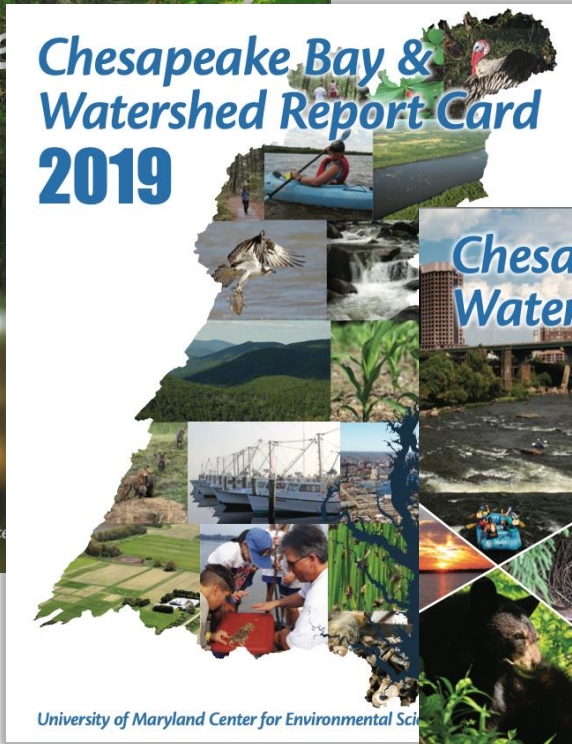
University of Maryland  
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# UMCES has been producing the Chesapeake Bay report card annually since 2007







## Local economy indicators coming next year

In 2020, UMCES entered into a long-term partnership with Council Fire, a global management consultancy to develop social and economic indicators, with a focus on local economic well-being, for the Chesapeake Watershed.

Unlike most economic indicators, which tend to focus on value added (e.g., through Gross Domestic Product) or employment, these new indicators integrate five cutting-edge elements of local economic strength:

**Household Income**—Has average household income risen or fallen?

**Equality**—Has the rate of income equality increased or decreased? This compares the top 20% of income earners to the bottom 20%.

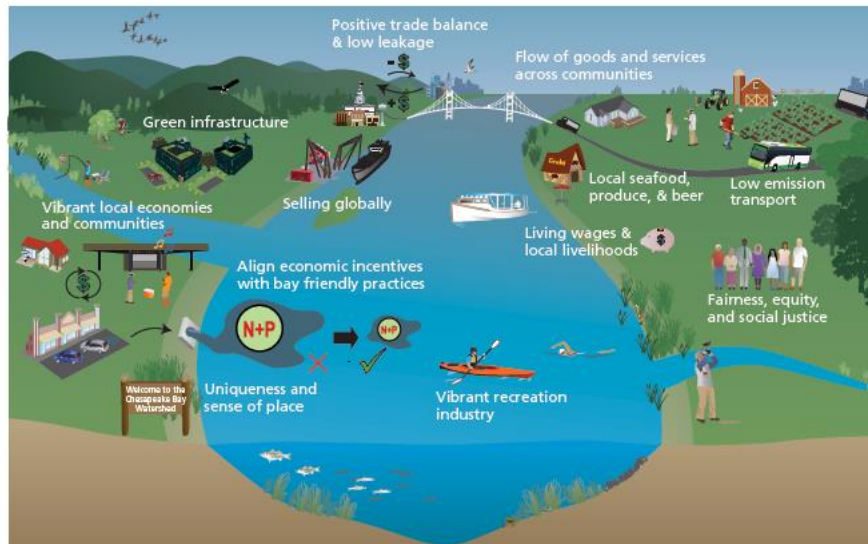
**Ownership**—Is the percentage of jobs in locally owned enterprises increasing or decreasing? This looks at the jobs in public, nonprofit, and smaller private enterprises.

**Diversification**—Are jobs spread across a wider or narrower range of sectors? This compares local diversification with national diversification and provides a rough sense of “economic leakage.”

**Entrepreneurship**—Are the number of net new jobs per capita growing or contracting? This provides a measure of local innovation, growth, and expansion.



Indicators of local economy, like local ownership of businesses, combine several facets of ecosystem, social, and economic health. Photo: Chesapeake Bay Program.



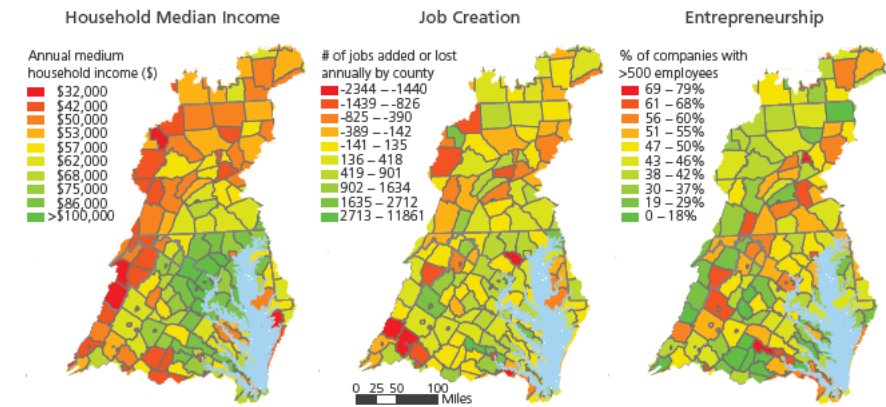
Values of local stakeholders, such as aligning economic incentives with bay friendly practices and vibrant local communities, are illustrated in this diagram of potential ways to measure economic health of the Chesapeake watershed.

## A strong local economy benefits people and communities

Our upcoming indicators will provide data on each of these five components of local economic health for every county in the Chesapeake watershed. This first-of-its-kind local economy index will combine all five individual economic indicators.

The five elements are derived from a growing body of research about what contributes to local economic strength. Specifically:

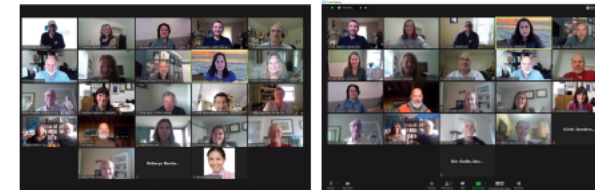
- Rather than look at total regional income, which can be artificially inflated by a sudden influx of people, average household income shows whether the overall economic well-being for the average household is improving.
- Adding a measure of equality also ensures that the success of those at the top of the income ladder does not come at the expense of those at the bottom.
- There is significant evidence that a higher degree of local ownership of businesses and institutions in a community is correlated with greater job growth and social stability, more equality, higher environmental performance and higher levels of voting and civic engagement.
- Economic developers increasingly acknowledge that the most successful economies are diverse and enjoy a robust base of local purchasing and investment transactions. As the base of local businesses grows, imports go down and exports rise, which improves the local balance of trade.
- Finally, an important part of a thriving economy is a strong entrepreneurial ecosystem. The more an economy can grow new enterprises, and lower rates of failure, the more dynamic it will be.



These maps show some of the data that could be incorporated into next year's indicators. The data is at the county level and are provided by the American Community Survey (<https://www.census.gov/programs-surveys/acs>). Data are available at regular intervals and can be assessed against previous year's information or watershed-wide averages.

Thank you to all the participants during our Economic Indicators workshop in Fall 2020. From the workshop, these broad indicators were chosen to pursue analysis. Additional indicators that were enumerated at the workshop have the potential for future inclusion in the report card. Follow up workshops and meetings will occur throughout 2021 so that these indicators can be incorporated in the 2021 Chesapeake Bay and Watershed report card.

For more information, visit [ian.umces.edu](http://ian.umces.edu) and [chesapeakebayreportcard.org](http://chesapeakebayreportcard.org).



Go to [www.menti.com](https://www.menti.com) and use the code 8278 3604

**What parts of the economy are the most important in the Chesapeake Bay watershed (1–2 words each)?**

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**What is the connection between a healthy Bay and a vibrant economy?**



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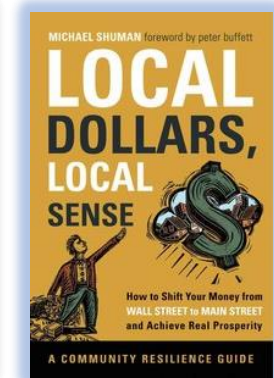
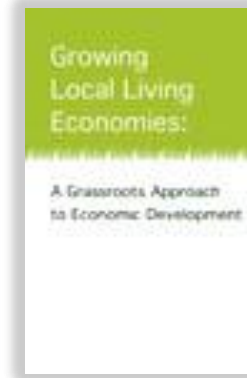
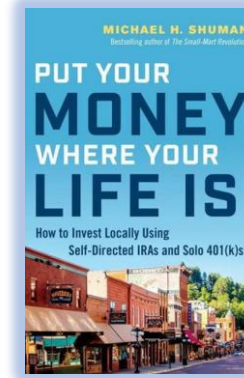
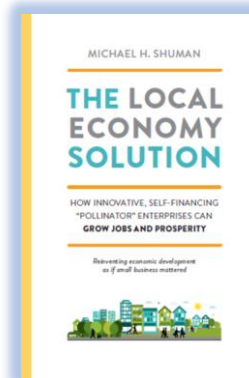
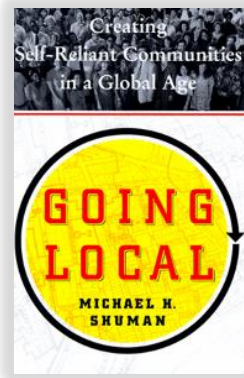
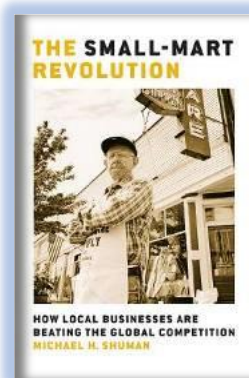


Economist, attorney, author, and entrepreneur, and a leading visionary on community economics.

Director of Local Economy Programs for Neighborhood Associates Corporation

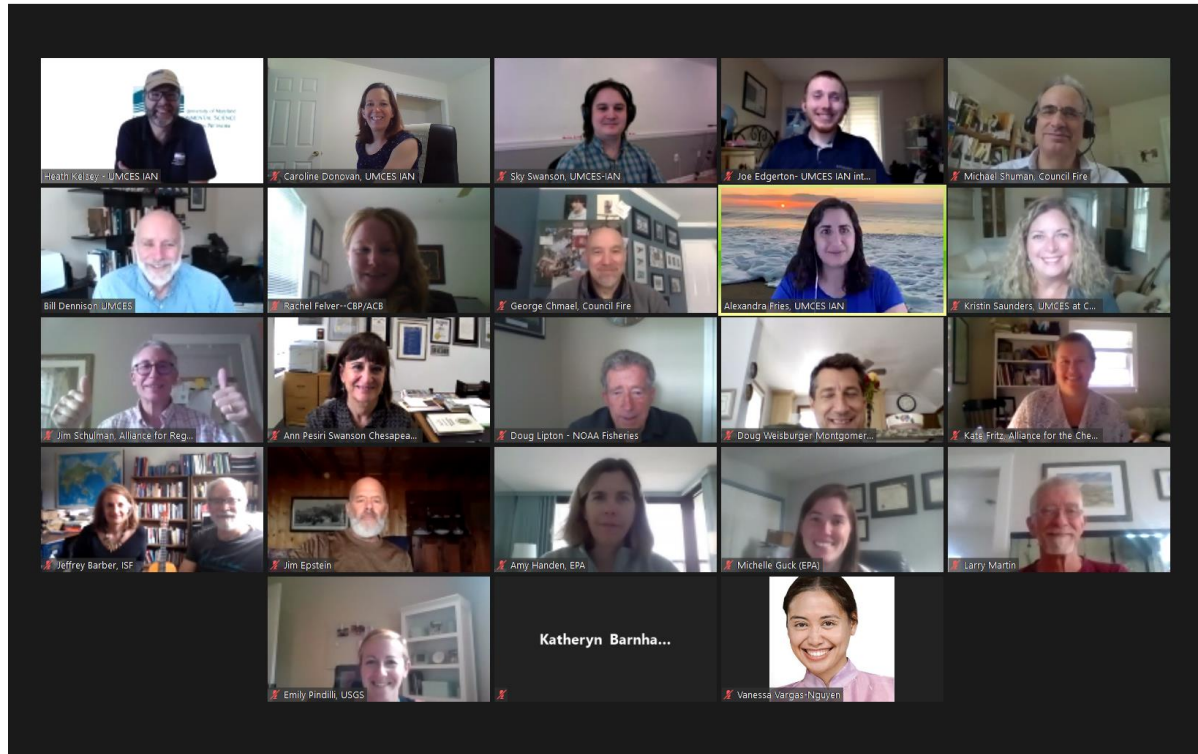
Adjunct Professor at Bard Business School in New York City.

**Michael Shuman**  
Community Economy  
Specialist





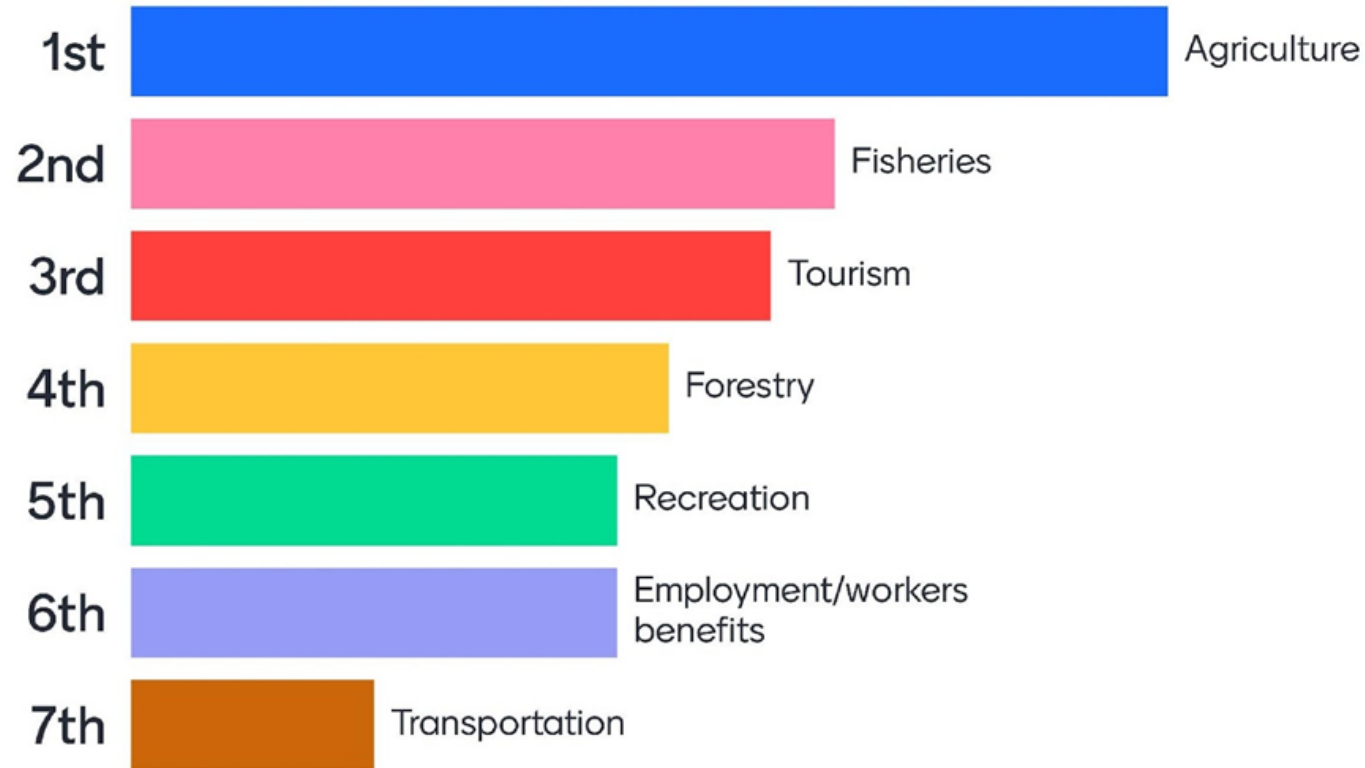
# Workshops to develop the economic indicators were conducted in 2020



# What parts of the economy are the most important in the Chesapeake Bay watershed?



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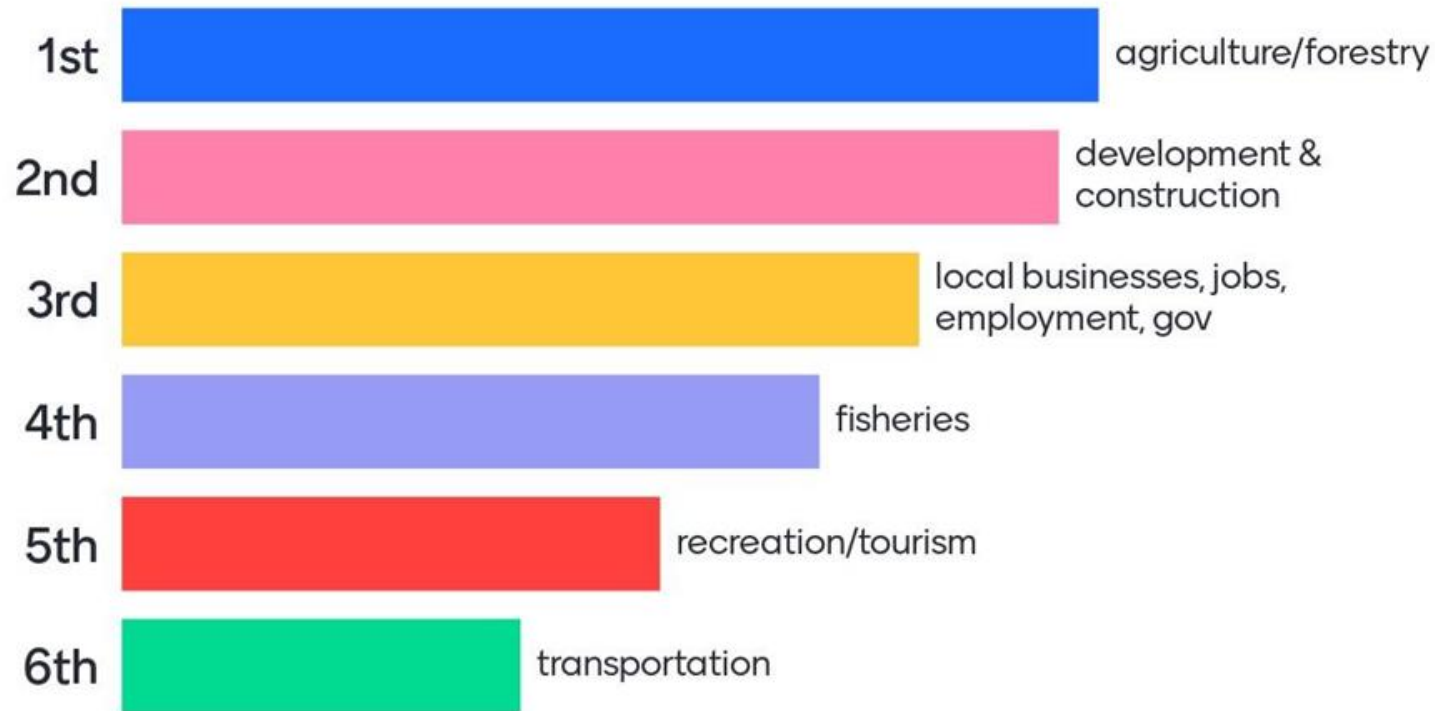


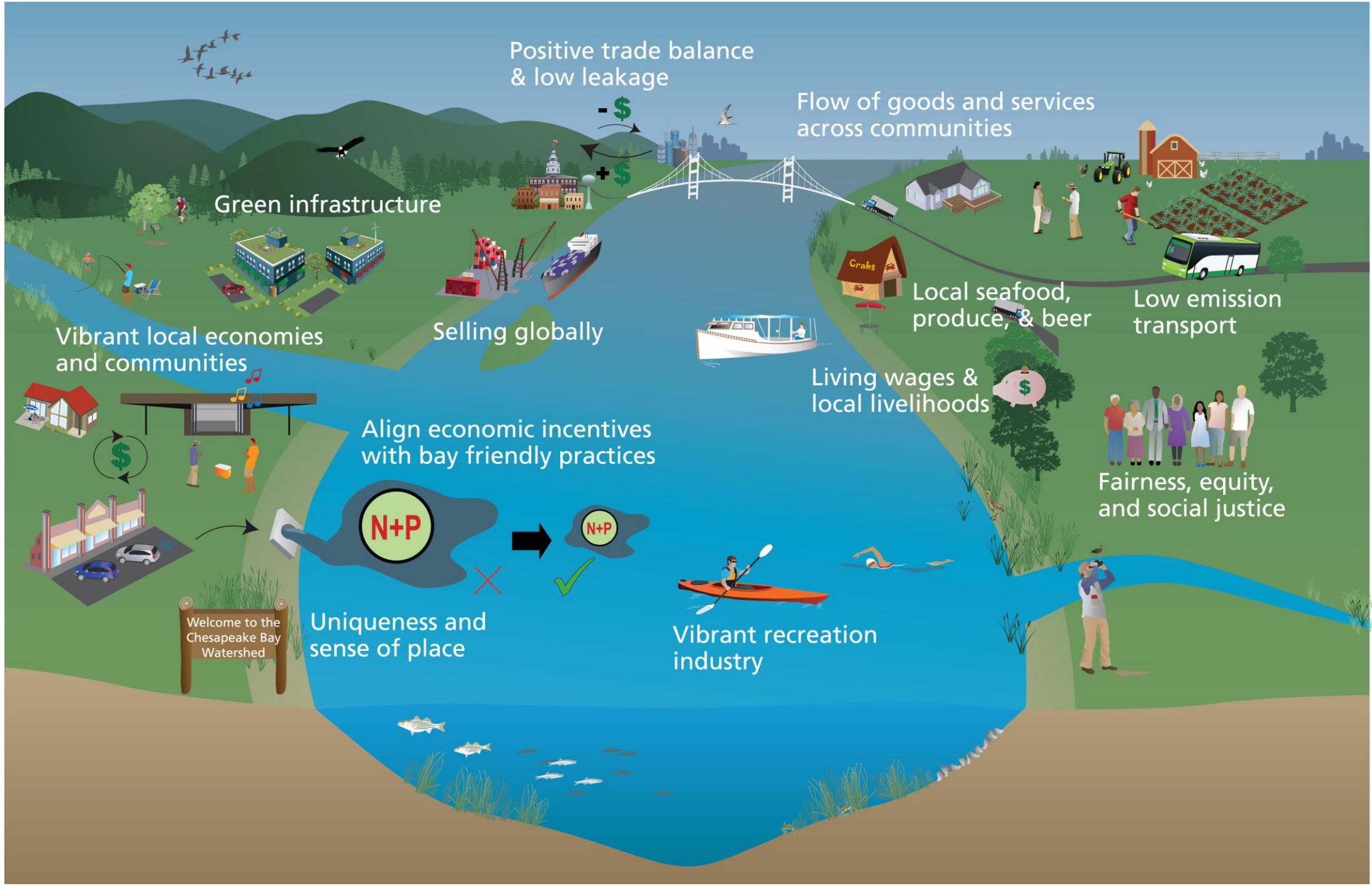
# What categories (e.g. recreational activities) of economic indicators do you think are linked to Chesapeake Bay Watershed health?





# What categories (e.g. recreational activities) of economic indicators do you think are linked to Chesapeake Bay Watershed health?





Positive trade balance & low leakage

Flow of goods and services across communities

Green infrastructure

Vibrant local economies and communities

Selling globally

Local seafood, produce, & beer

Low emission transport

Living wages & local livelihoods

Fairness, equity, and social justice

Align economic incentives with bay friendly practices

Uniqueness and sense of place

Vibrant recreation industry

Welcome to the Chesapeake Bay Watershed

N+P

N+P

# Economic indicators overview

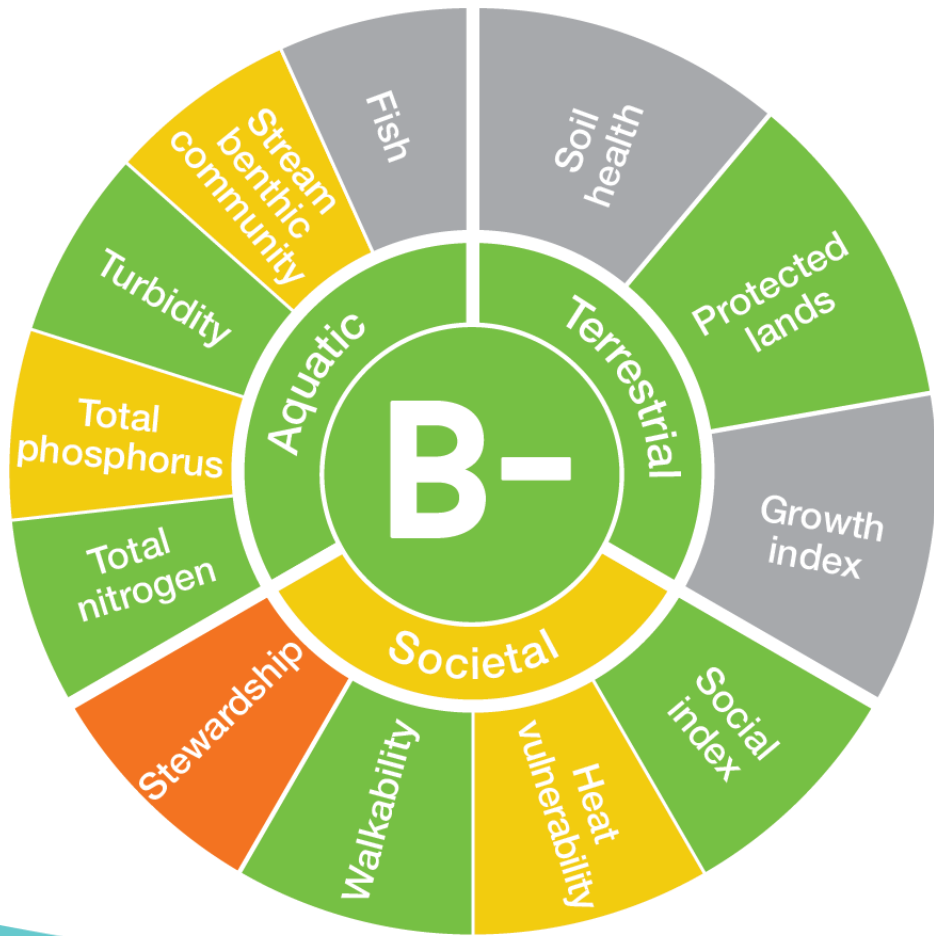
1. **MEDIAN HOUSEHOLD INCOME** – This is traditional, robust measure of economic vitality. Greater income is a necessary (if insufficient) condition for greater economic prosperity. (Source: U.S. Census)
2. **AFFORDABLE HOUSING** – This indicator captures the percentage of households that can find affordable housing. The rising cost of housing has required more attention to this variable as a measure of economic well-being. (Source: U.S. Census)
3. **INEQUALITY** – This indicator responds to growing attention, nationally and globally, to income inequality. High levels of inequality are correlated with, among other things, life expectancy, infant mortality, crime, and social instability. (Source: U.S. Census)
4. **JOBS GROWTH** – This indicator, the percentage of jobs gained or lost (net) per capita over the previous year, suggests whether the economy as a whole is growing. (Source: U.S. Census)

# Economic indicators overview – *coming soon*

1. LOCAL OWNERSHIP – This indicator reflects the percentage of jobs in locally owned or locally controlled businesses. A growing body of evidence suggests that economies with high levels of local ownership have higher levels of job growth, income equality, public health, smart growth, volunteering, and voting.  
(Source: U.S. Census & YourEconomy)
2. DIVERSIFICATION – The indicator reflects the degree of local self-reliance and resilience. It specifically measures the local balance of trade. As the economist Jane Jacobs originally articulated, a high trade deficit means that dollars are leaking out the community and weakening the long-term prospects for economic growth. A high trade surplus opens opportunities for business investment and diversification.  
(Source: IMPLAN)



# 2020



# 2021



# Economic indicator: Household Income

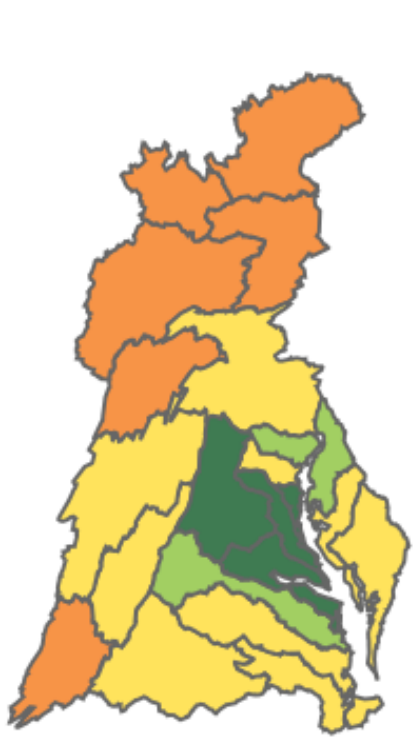
- Source: U.S. Census, 2015–2019 ACS 5-year estimates
- Indicator: Median household income
- Scoring:
  - Z-score\* = (Median income of a CB county – mean(\_\_\_\_))/sd(\_\_\_\_)
- Weighting:
  - County level ---(% pop of region)--> region level
  - Region level ---(% pop of Bay)--> Overall Chesapeake Bay score

\*z-score from  
either US or  
Chesapeake Bay  
total counties

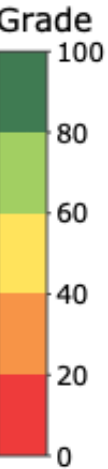
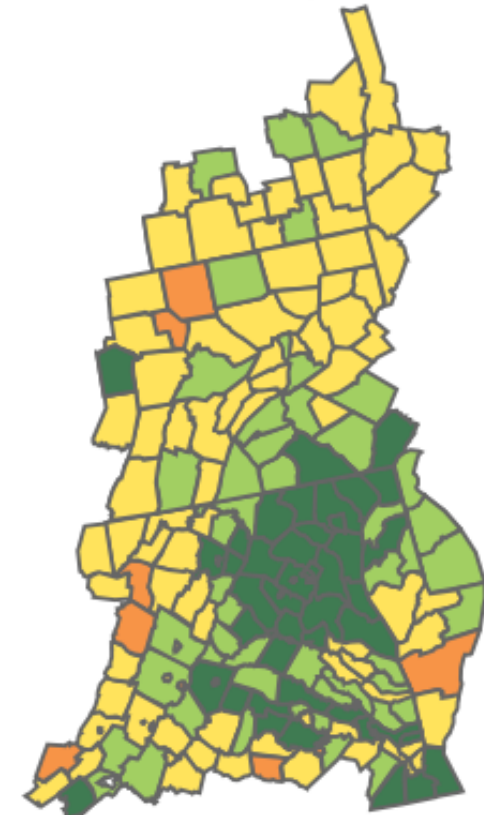
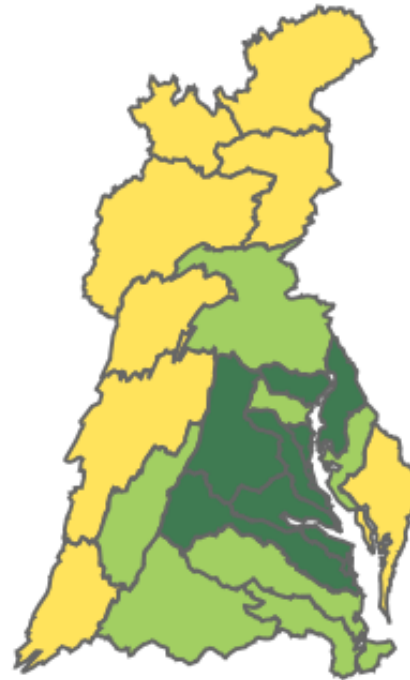
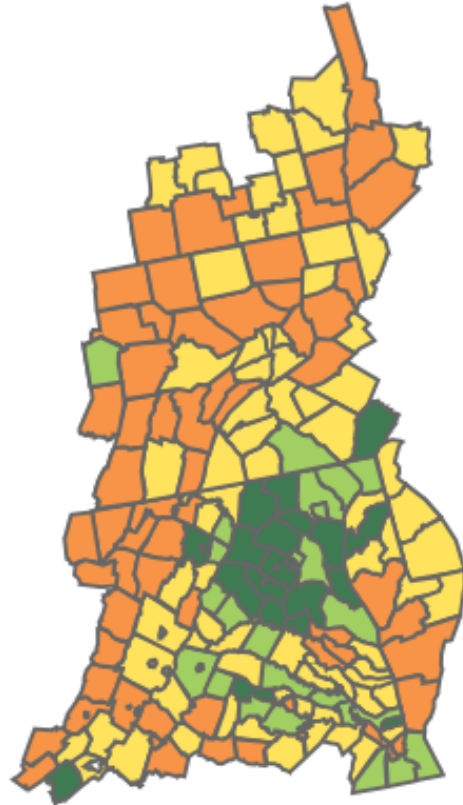


# Economic indicator: Household Income

Household Income scores for regions and counties from CBWS comparison



Household Income scores for regions and counties from US comparison



# Economic indicator: Housing Affordability

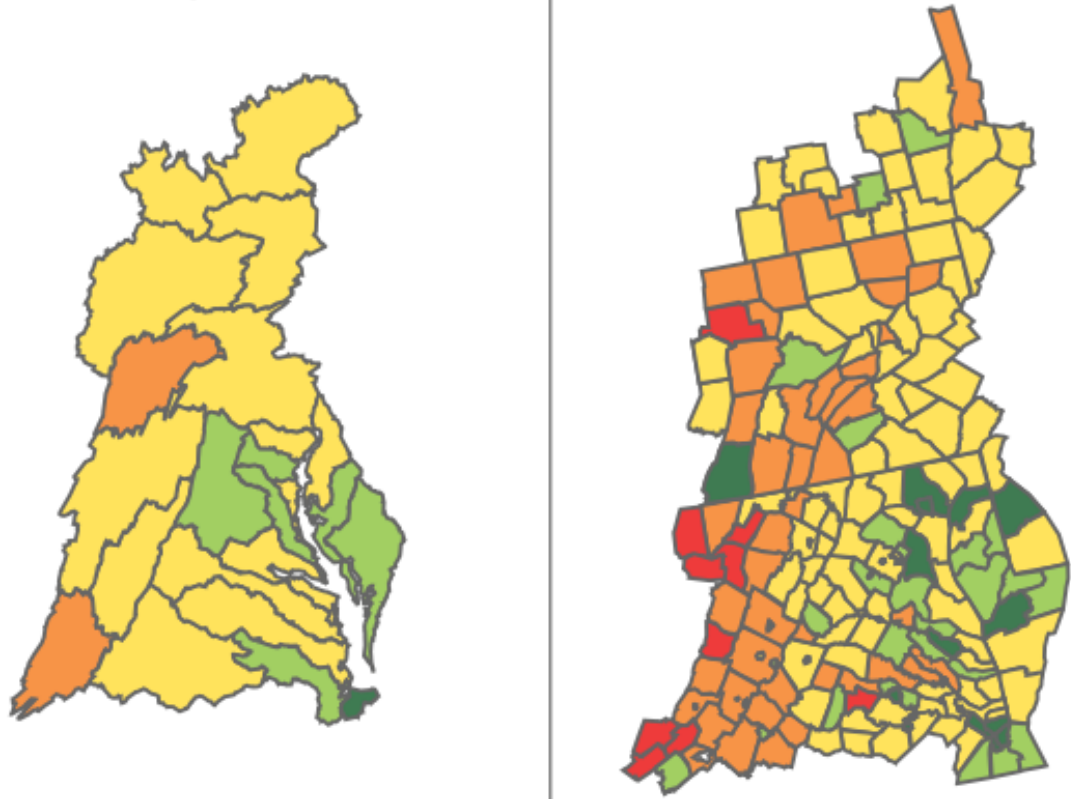
- Source: U.S. Census, 2015–2019 ACS 5-year estimates
- Indicator: Median number of households spending 30% or more of household income on housing
- Scoring:
  - Z-score\* =  $(\text{Median \% households of a CB county} - \text{mean}(\underline{\hspace{1cm}}))/\text{sd}(\underline{\hspace{1cm}})$
- Weighting:
  - County level ---(% pop of region)--> region level
  - Region level ---(% pop of Bay)--> Overall Chesapeake Bay score

\*z-score from either US or Chesapeake Bay total counties

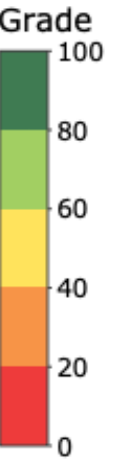
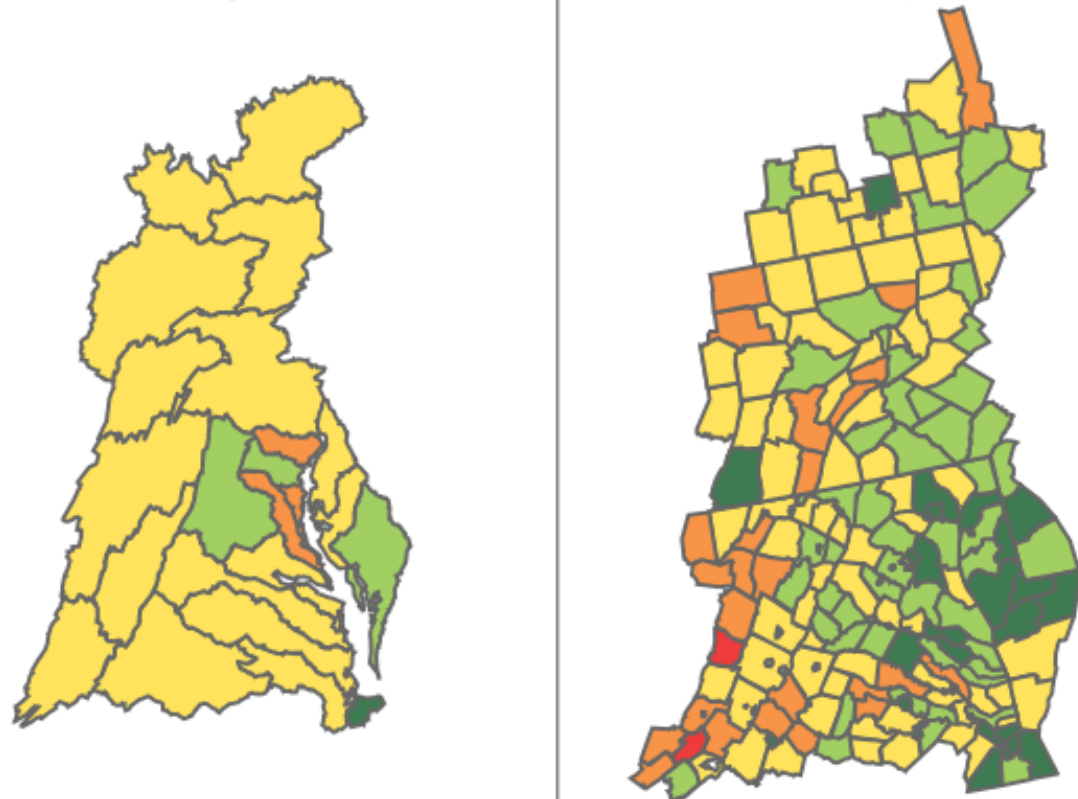


# Economic indicator: Housing Affordability

Household Affordability scores for regions and counties from CBWS comparison



Household Affordability scores for regions and counties from US comparison



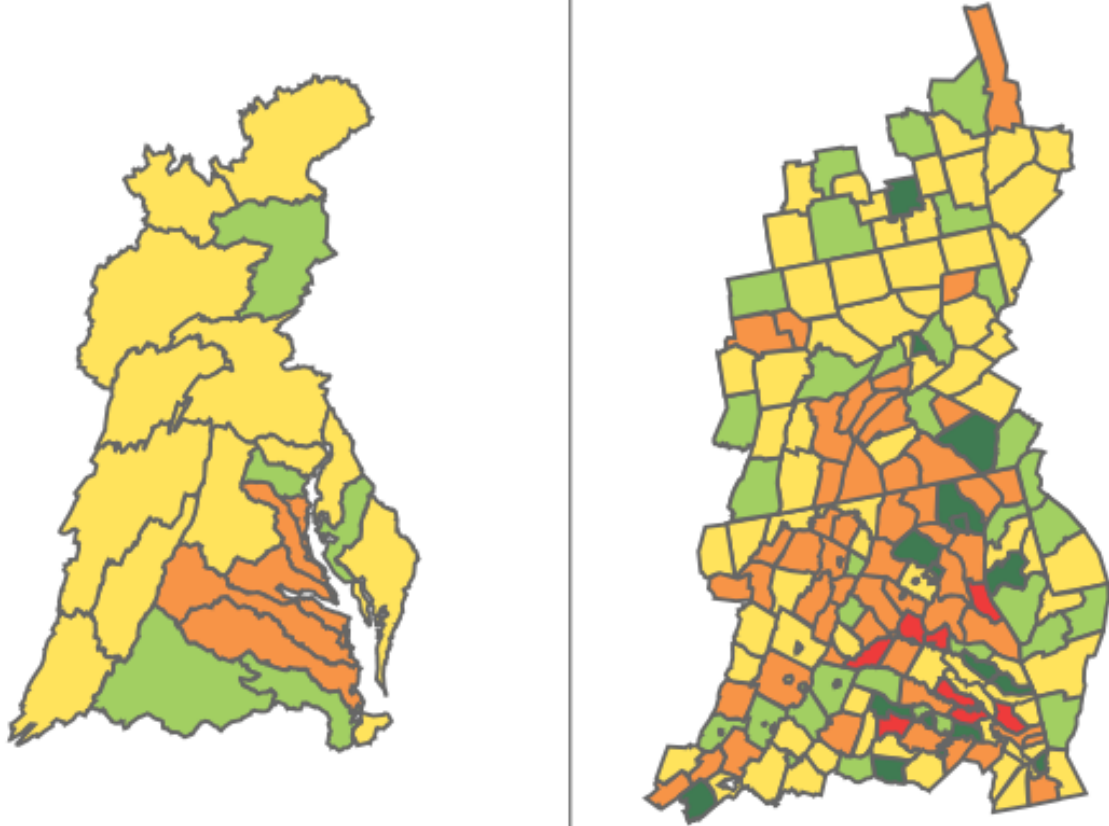
# Economic indicator: Income Inequality

- Source: U.S. Census, 2015–2019 ACS 5-year estimates
- Indicator: GINI Index (0 = equal share of income, 1 = one person/group has all income)
- Scoring:
  - Z-score\* =  $(\text{GINI Index of a CB county} - \text{mean}(\text{_____})) / \text{sd}(\text{_____})$
- Weighting:
  - County level ---(% pop of region)--> region level
  - Region level ---(% pop of Bay)--> Overall Chesapeake Bay score

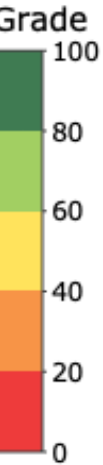
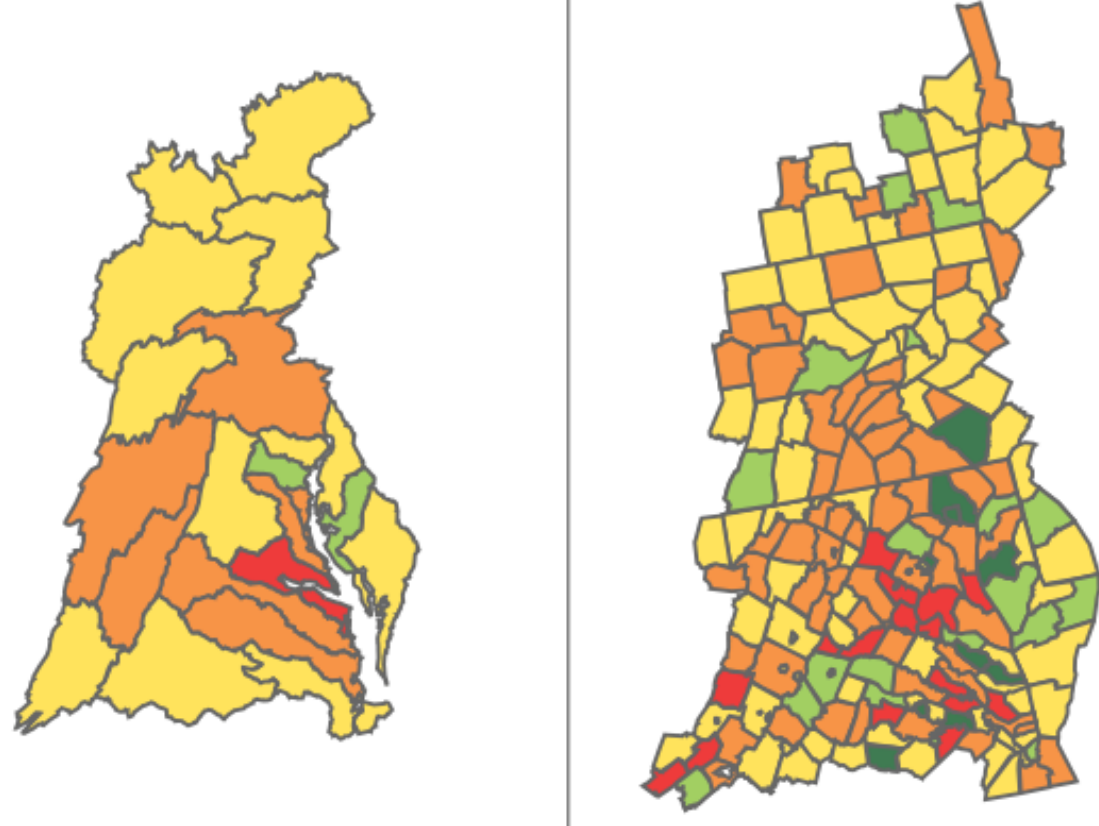
\*z-score from either US or Chesapeake Bay total counties

# Economic indicator: Income Inequality

Income Inequality scores for regions and counties from CBWS comparison



Income Inequality scores for regions and counties from US comparison



# Economic indicator: Net Job Growth

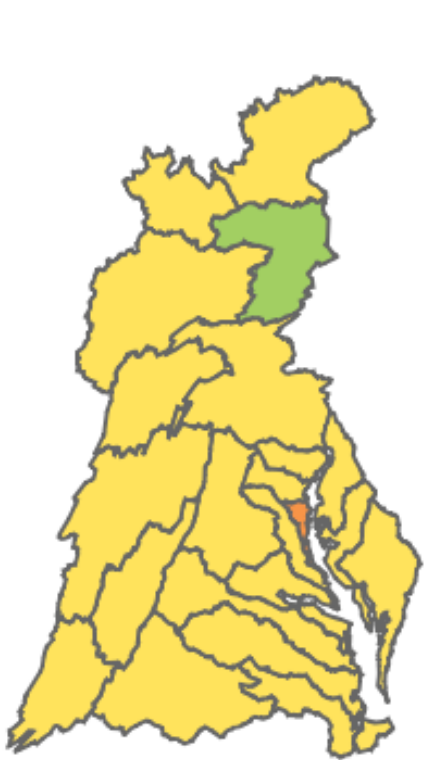
- Source: U.S. Census, 2015–2019 Business Dynamics Statistics
- Indicator: 2019 new jobs per capita – 2015 new jobs per capita
- Scoring:
  - Z-score\* = (job growth county difference – mean(\_\_\_\_))/sd(\_\_\_\_)
- Weighting:
  - County level ---(% pop of region)--> region level
  - Region level ---(% pop of Bay)--> Overall Chesapeake Bay score

\*z-score from  
either US or  
Chesapeake Bay  
total counties

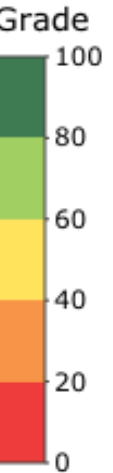
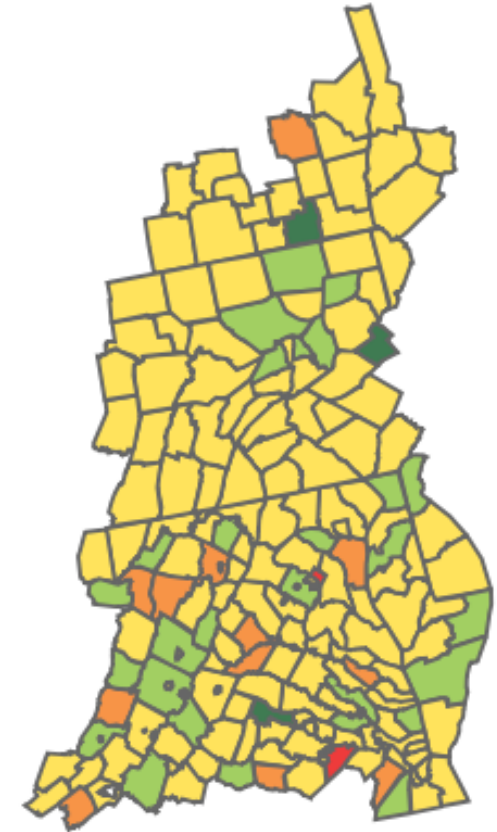


# Economic indicator: Net Job Growth

Job scores for regions and counties from CBWS comparison

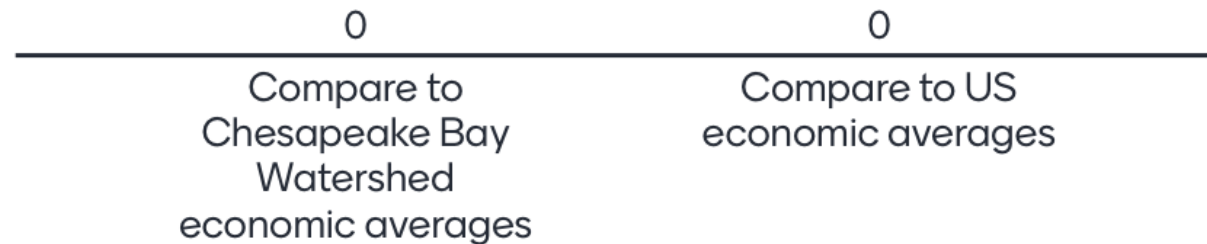


Job scores for regions and counties from US comparison



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# Which score comparison seems more appropriate/useful?





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**How do these economic indicators help address Environmental Justice?**


# Symbols are needed for economic indicators


## Bay indicators

 **Total phosphorus** measures the amount of phosphorus in bay waters. Too much phosphorus can lead to algae blooms, which cause poor dissolved oxygen conditions and stress bay organisms.


 **Total nitrogen** is a measure of the amount of nitrogen in bay waters. Too much nitrogen can lead to algae blooms, which cause poor dissolved oxygen conditions and stress bay organisms.

 **Dissolved oxygen** is critical to the survival of Chesapeake Bay's aquatic life. The amount of dissolved oxygen needed before aquatic organisms are stressed, or even die, varies from species to species.

 **Water clarity** is a measure of how much light penetrates through the water column. Water clarity plays an important role in determining aquatic grasses and phytoplankton distribution and abundance.


 **Chlorophyll a** is used as a measure of phytoplankton (microalgae) biomass. High phytoplankton levels lead to reduced water clarity, and decomposing phytoplankton result in reduced dissolved oxygen levels.


 **Benthic community**, or the Benthic Index of Biotic Integrity, measures the condition of the organisms living in or on the bottom areas of the bay. These organisms are a key food source for fish species.


 **Aquatic grasses**, or submerged aquatic vegetation, are one of the most important habitats in the bay. They provide habitat to key species like blue crab and striped bass and can improve water clarity.

 **Striped bass, bay anchovy, and blue crab** make up the Fisheries Index, which is not included in the Bay Health score. Bay anchovy are a schooling fish, providing an important food source for predators. Striped bass is a key top predator and uses the bay as a spawning and nursery area. Blue crabs are predator and prey in the food web and use aquatic grasses as habitat. There is no score in the report card for 2020 as the striped bass data were not available.


## Watershed indicators

 **Total phosphorus** measures the amount of phosphorus in rivers and streams. Nutrients are important for the growth of organisms, but as nutrient levels increase in rivers and streams, they negatively impact the environment. Data are from 2013–2018.


 **Total nitrogen** measures the amount of nitrogen in rivers and streams. Nutrients are important for the growth of organisms, but as nutrient levels increase in rivers and streams, they negatively impact the environment. Data are from 2013–2018.

 **Stream benthic community** measures the condition of the benthic community living in streams. Benthic macroinvertebrates are freshwater organisms like snails, mussels, worms, and insects that live in and on the stream and river bottom. Data are from 2012–2017.


 **Protected lands** measures the amount of valuable lands protected in the watershed. Conserving land maintains water quality and habitat; sustains forests, farms, and communities; and protects lands with cultural value. Data are from 2018.

 **Walkability** measures how many people can walk to a park in 10 minutes. It includes two metrics, one for the total population and one for diverse groups, including people who are Black, Asian, Native American, Hispanic, Pacific Islander, two or more races, and other races. Data are from 2019.

 **The Heat Vulnerability Index** is an indicator of climate-safe neighborhoods that includes metrics for tree canopy, impervious surface, land surface temperature, and households in poverty. Data are from 2018.

 **Turbidity** is a measure of water clarity that expresses how much light passes through the water column. It is dependent upon the amount of suspended particles and colored organic matter present. Data are from 2013–2018.

 **The Social Index** uses data about social vulnerability from the U.S. Census. Social vulnerability measures how a community can respond to hazardous events. Some of the metrics include socioeconomic status, diversity, minority status, and language. Data are from 2018.

 **The Stewardship Index** examines citizen stewardship in the watershed in categories of behavior, volunteerism, and civic engagement. Data are from 2017.



2

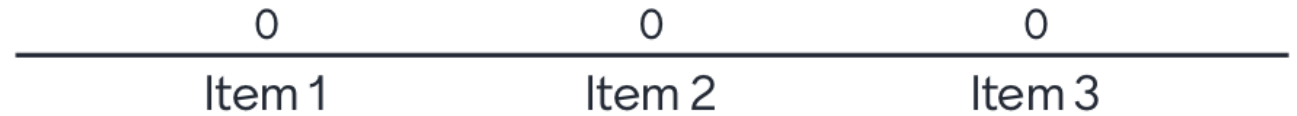
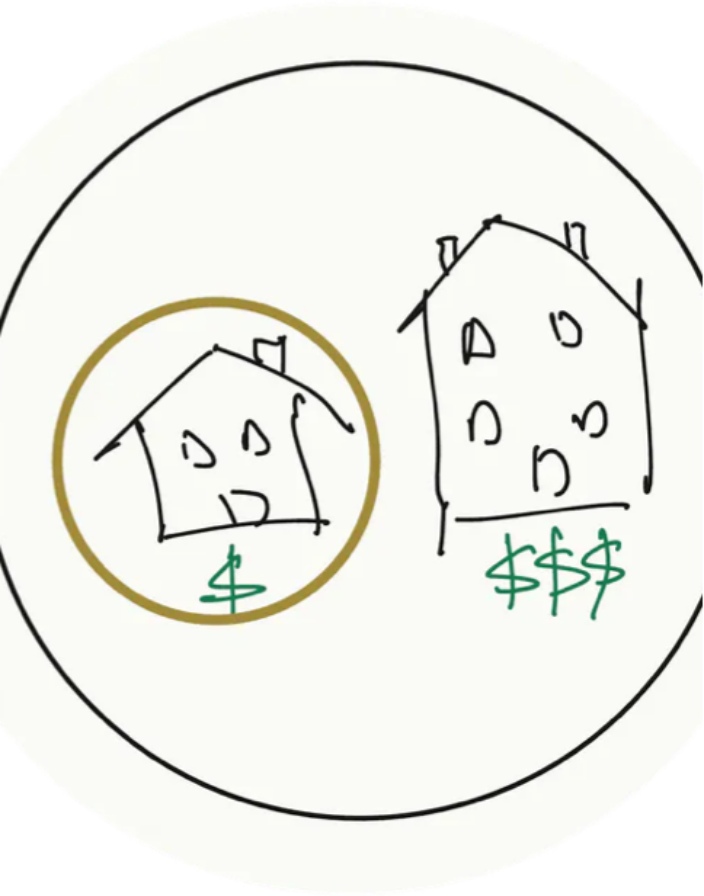
Which sketch best represents the Household Income indicator?



0                      0                      0  
Item 1                      Item 2                      Item 3

2

Which sketch best represents the Housing Affordability indicator?



Go to [www.menti.com](http://www.menti.com) and use the code 8278 3604

2

Which sketch best represents the Income Inequality indicator?



0

Item 1

0

Item 2

0

Item 3

Press S to show image

Go to [www.menti.com](http://www.menti.com) and use the code 8278 3604

2

Which sketch best represents the  
Net Job Growth indicator?



0

Item 1

0

Item 2

0

Item 3

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# Thank you!

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