As more frequent and intense climate change disasters imperil food supplies around the world, where our food comes from matters more than ever.

A regional approach to food system resilience is both an investment in our shared future and an insurance policy against future risks. A regional approach to food system resilience means that we work collectively to adapt, expand, and fortify New England’s food production and distribution systems to ensure the availability of adequate, affordable, and culturally appropriate food for all who call New England home.

Can the six New England states provide 30% of their food from regional farms and fisheries by 2030?

New England Feeding New England explores this question and what it will really take to grow, raise, produce, harvest, and catch more regional food and move it through a complex supply chain to our homes and other places where we eat. Our research presents an opportunity for the region: significant changes in diet (e.g., dramatically reducing consumption of ultra-processed foods and increasing fruit and vegetable consumption), a significant increase in land in agriculture, stopping the decrease in farmers and fishermen, and finding a way to actually get local/regional food in the places people shop are daunting challenges, but addressing them will leave our food system stronger and more resilient.

Through 7 research Volumes, New England Feeding New England lays out the case for a regional approach to food system resilience.

https://nefoodsystemplanners.org/
How self-reliant is our region?

The New England Feeding New England Volume 2 estimates regional food self-reliance (RSR)—how much food we produce compared to how much food we consume—for the five major food groups. RSR percentages varied widely from food product to food product, showing a rather lopsided capacity for self-reliance. A small number of foods were produced in large quantities relative to consumption and had self-reliance ratios near or exceeding 100% (e.g., dairy, maple syrup, potatoes, lobster, clams). Most foods, however, had self-reliance ratios of less than 10% (e.g., beef, lettuce, wheat).

New England Regional Self-Reliance for Major Food Groups

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Servings</th>
<th>Calories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grains</td>
<td>1.6%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Vegetables</td>
<td>28.3%</td>
<td>41.0%</td>
</tr>
<tr>
<td>Fruits</td>
<td>8.7%</td>
<td>6.9%</td>
</tr>
<tr>
<td>Dairy</td>
<td>50.0%</td>
<td>47.4%</td>
</tr>
<tr>
<td>Proteins</td>
<td>3.2%</td>
<td>2.6%</td>
</tr>
</tbody>
</table>

Source: Volume 2: Estimating Production for 30% Regional Self-Reliance. Note: vegetables consists of a significant amount of calorie-dense potatoes grown in Maine; dairy includes a significant amount of production in Vermont.

What can each New England state do to increase food security and access while building resilience for the whole region?

What strengths does Rhode Island’s food system possess and what opportunities can be pursued? What weaknesses persist and what threats loom?

This State Brief contextualizes important characteristics of Rhode Island’s food system for consideration.

For example, unlike many other places, Rhode Island has a statewide food system plan and a strong and growing support system. Rhode Island has a strong network of food system, agriculture and seafood partners working collaboratively across the state to drive investments and policies that strengthen the local food economy. Rhode Island’s model of cross-agency communication, planning and coordination that also includes robust engagement with nonprofit and community-based organizations, can be a model for neighboring states to follow.

As the smallest state with the highest cost of agricultural land, Rhode Island may have limited land for agricultural production, but the crops it does produce are primarily consumed within the state, Rhode Island farmers enjoy one of the highest rates of direct selling in the country, and Rhode Island’s emergency food system has successfully incorporated local food into its distribution system. For these reasons, Rhode Island needs to continue to protect and support its small but impactful agricultural lands.

Dollar stores are by far the most common type of major grocery chain in Rhode Island, but the state also has a significant number of independent grocery stores, like Dave’s Fresh Marketplace, and many Hispanic/Latino owned markets. These smaller stores have the ability to facilitate access to regional food.
Rhode Island Food Strategy

The Relish Rhody food strategy was established in 2017 to create a vision and roadmap for a more equitable, accessible, economically vibrant, and environmentally sustainable food system. Relish Rhody has five focus areas, with many strategies attached to each step:

» Preserve and Grow Agriculture, Fisheries Industries in Rhode Island
» Enhance the Climate for Food and Beverage Businesses
» Sustain and Create Markets for Rhode Island Food and Beverage Products
» Ensure Food Security for All Rhode Islanders
» Minimize Food Waste and Divert it from the Waste Stream

An update to Relish Rhody is underway, supported by strong state collaboration and community engagement.

State Snapshot

» Top Agricultural Products by Sales, 2017

46.2% ($25,301,009) of the value of agricultural sales was generated by floriculture, bedding, and nursery products (i.e., non-food crops), including a limited amount of greenhouse vegetable production.

NURSERY CROPS 19.1%
includes ornamentals, shrubs, shade trees, flowering trees, evergreens, live Christmas trees, fruit and nut trees and plants, vines, etc.

SOD 14.9%

BEDDING/GARDEN PLANTS 12.2%
includes bedding/garden plants, cut flowers, florist greens, foliage plants, potted flowering plants, etc.

» Top Seafood and Aquaculture Products by Sales, 2022

In 2022, squid accounted for 32.1% ($37,035,668) of the combined value of seafood and aquaculture sales, followed by sea scallops (15.9%, $18,307,749), and lobster (7.0%, $8,099,716).

LONGFIN + SHORTFIN SQUID 32.1%

SEA SCALLOPS 15.9%

AMERICAN LOBSTER 7.0%

» Top Manufactured Products by Sales, 2017

ANIMAL PROCESSING 31.1%

OTHER PRODUCTS 26.2%

BAKERIES 24.1%

» Top Retail Food Sales by Market Channel, 2017

GROCERY STORES 41.3%

RESTAURANTS/FAST FOOD 40.8%

LIQUOR STORES 7.6%

DIRECT SALES 0.2%
Food System Economy

How big is Rhode Island’s food system? What sectors are growing? What sectors are contracting?

Rhode Island’s food system employs over 66,000 people and generates over $11.9 billion in sales. Agriculture and fisheries employment and sales were flat or declined from 2007 to 2017. Employment and sales at grocery stores decreased slightly. Food manufacturing employment decreased slightly, while sales were up. The reverse was true in beverage manufacturing, where employment increased and sales decreased. Employment and sales in wholesaling and distribution and food services all increased.

Economic Impact of Rhode Island’s Food System, 2017

<table>
<thead>
<tr>
<th>Sector</th>
<th>2017 Employment</th>
<th>% of Total</th>
<th>Growth from 2007-2017</th>
<th>2017 Sales</th>
<th>% of Total</th>
<th>Growth from 2007-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>3,726</td>
<td>5.6%</td>
<td>0.1%</td>
<td>$62,873,200</td>
<td>0.5%</td>
<td>-3.8%</td>
</tr>
<tr>
<td>Fisheries</td>
<td>988</td>
<td>1.5%</td>
<td>-2.0%</td>
<td>$109,856,000</td>
<td>0.9%</td>
<td>-0.6%</td>
</tr>
<tr>
<td>Food Manufacturing</td>
<td>2,359</td>
<td>3.6%</td>
<td>-0.5%</td>
<td>$645,825,000</td>
<td>5.4%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Beverage Manufacturing</td>
<td>367</td>
<td>0.6%</td>
<td>0.6%</td>
<td>$83,628,900</td>
<td>0.7%</td>
<td>-16.1%</td>
</tr>
<tr>
<td>Wholesaling + Distributing</td>
<td>3,477</td>
<td>5.2%</td>
<td>2.5%</td>
<td>$5,119,564,200</td>
<td>43.0%</td>
<td>8.4%</td>
</tr>
<tr>
<td>Stores</td>
<td>11,265</td>
<td>17.0%</td>
<td>-0.3%</td>
<td>$3,118,531,100</td>
<td>26.2%</td>
<td>-0.8%</td>
</tr>
<tr>
<td>Food Services + Drinking Places</td>
<td>44,151</td>
<td>66.6%</td>
<td>0.9%</td>
<td>$2,774,747,000</td>
<td>23.3%</td>
<td>1.5%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>66,333</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>0.6%</strong></td>
<td><strong>$11,915,025,300</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>2.5%</strong></td>
</tr>
</tbody>
</table>

Source: Volume 3: Economic Impact of New England’s Food System. Note: Agriculture sales in this table includes support activities. Sales values are adjusted for inflation to 2020 dollars. Agricultural sales are adjusted using producer price indices for crops and livestock.

Food System Employment Multiplier

The employment multiplier calculated in Volume 3 shows that for each additional job created in Rhode Island’s food system, total employment in the state’s economy will increase by 1.49 jobs (i.e., the 1 additional food system job, we will have 0.49 jobs spun-off those).

Source: Volume 3: Economic Impact of New England’s Food System

The additional one-half job (in aggregate) is actually a set of fractional jobs spread over the entire economy, the result of linked activity in other food system and nonfood system sectors. These include jobs in transportation, utilities, finance, trade, and government.
Food System Wages

How much do food system workers in Rhode Island earn?

Wages/salaries are the most common source of income for the majority of Americans. Unfortunately, Rhode Island’s food system workers, particularly food service workers, receive some of the lowest wages of any occupational category in the state. Rhode Island has the second lowest minimum wage of the New England states, and median hourly wages for many food system jobs are below living wage levels.

» Median Hourly Wages by Major Occupational Category, 2022

The U.S. GAO found that restaurants and other eating places employed the largest percentage of working adult Medicaid enrollees and SNAP recipients in states that provided employer data.

» Median Hourly Wages by Selected Food System Occupations, 2022

The U.S. GAO found that restaurants and other eating places employed the largest percentage of working adult Medicaid enrollees and SNAP recipients in states that provided employer data.
Do Rhode Islanders have equitable access to food stores?

Hispanic/Latino, Black, Asian, Indigenous, Native Hawaiian/Pacific Islander, and Rhode Islanders of two or more races or some “other” race—made up 31.3% of the state’s population, but 50.7% of its population living in low income/low access (LILA)* census tracts.

A higher percentage (i.e., a more purple census tract) means that residents are more likely to be non-White, Hispanic, and low income with limited access to grocery stores.

**EXAMPLE**
Tract 6, which spans Upper and Lower South Providence, is 84% non-White or Hispanic. More than 44% of the population lived below the poverty level.

### % Non-White or Hispanic by LILA Census Tract

<table>
<thead>
<tr>
<th>Category</th>
<th>% of Population</th>
<th>% Living in LILA Tracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>68.7% (754,050)</td>
<td>18.2% (136,994)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>16.6% (182,101)</td>
<td>42.0% (76,507)</td>
</tr>
<tr>
<td>Black</td>
<td>5.0% (55,386)</td>
<td>49.3% (27,301)</td>
</tr>
<tr>
<td>2 or More Races</td>
<td>4.8% (52,250)</td>
<td>21.0% (10,978)</td>
</tr>
<tr>
<td>Asian</td>
<td>3.5% (38,367)</td>
<td>29.5% (11,331)</td>
</tr>
<tr>
<td>Other Race</td>
<td>1.0% (11,392)</td>
<td>28.7% (3,275)</td>
</tr>
<tr>
<td>Indigenous</td>
<td>0.3% (3,513)</td>
<td>28.9% (1,014)</td>
</tr>
<tr>
<td>Hawaiian/PI</td>
<td>0.03% (320)</td>
<td>21.9% (70)</td>
</tr>
</tbody>
</table>

* Low Income/Low Access (LILA) = Where a large proportion of the residents have low-incomes and are more than 1/2 mile from a food source for urban populations, and over 10 miles for rural populations.

### Food Insecurity

In the past 20 years, food insecurity was highest in 2011, as a result of a slow recovery from the Great Recession. The COVID-19 pandemic also triggered economic hardship across the country, but USDA estimates of food insecurity were not noticeably higher in 2020 and 2021. What explains this? The federal government rapidly fortified the social safety net to fight the pandemic.

The COVID-19 pandemic also triggered economic hardship across the country, but USDA estimates of food insecurity were not noticeably higher in 2020 and 2021. What explains this? The federal government rapidly fortified the social safety net to fight the pandemic.

However, the Rhode Island Community Food Bank estimated that 18.4% of Rhode Island households were food insecure in 2021, including 34.1% of Hispanic households.

**Sources:**
- USDA Economic Research Service, KFF (SNAP Benefits)
- USDA Food Research Atlas, American Community Survey
- USDA Economic Research Service, KFF (SNAP Benefits)
- Rhode Island Community Food Bank
Food Expenditures

How much do Rhode Islanders spend on food? Where do they shop?

Rhode Islanders spent over $5.9 billion at stores and restaurants in 2017. Grocery stores (41.3%) and restaurants (40.8%)—which includes full-service and fast food restaurants—accounted for 82.1% of total sales, followed by liquor stores (7.6%). Direct sales from farmer to customer made up only 0.2% of total retail sales.

» Food Stores and Services Sales, 2017

TOTAL = $5.9 BILLION

Grocery Stores/Supermarkets
$2.4 billion
41.3%

Restaurants
$2.4 billion
40.8%

Liquor Stores
$453 million
7.6%

Food Service Contract.
$221 million
3.8%

Bars
$122 million
2.1%

Specialty Store
$122 million
2.1%

Conven. Stores
$101 million
1.7%

Mobile Food Services
$2.6M, 0.05%

Direct Sales
$10.7M, 0.2%

Source: Economic Census

Count of Food Stores in Rhode Island

Rhode Island has over 100 independent stores, including many specialty stores (e.g., ethnic meat markets), corner stores, and small grocery stores like Roch’s Fresh Foods in West Greenwich. A Rhode Island dollar chain store, Ocean State Job Lot has 16 locations, while Dave’s Fresh Marketplace has 10 locations.

Dollar stores are by far the most common type of national grocery stores in Rhode Island. It has historically been challenging for local and regional food producers to get their products stocked in national chains.

Note: this estimate does not include gas station convenience stores or pharmacy chains like Walgreens and CVS.
Rhode Island had the fifth highest per capita food expenditures ($5,606) of any state in the country in 2020. With an average annual food expenditure growth rate of 2.7% from 1997 to 2020—and population decrease to 1,152,940 by 2030—per capita food expenditures may reach $6,950 by 2030. About $2,085 per capita would then have to be spent on regional food to meet our 30% goal.

Northeast consumer expenditure data indicates that ultraprocessed food products make up the top 3 food expenditure categories, followed by fresh fruit.
Climate Change

How will climate change impact Rhode Island’s food system?

Food system activities like cultivating crops, raising livestock, and land use changes, are major drivers of climate change and food systems are particularly vulnerable to climate change. July 2023 was the warmest month on record and major changes are already underway across Rhode Island and New England:

» **Loss of Seasonality**: less distinct seasons, milder winters, earlier spring conditions, and more unpredictable weather are expected to impact agricultural production. For example, drought in 2022 harmed the yield and quality of crop production, leading to a [USDA natural disaster declaration](https://www.usda.gov) for the entire state. **Long term estimates suggest that the overall climate in Rhode Island will become wetter, in addition to warmer, in coming decades.**

The average temperature in Rhode Island in 2022, 52.1°F, was 3.5°F higher than the average temperature during the previous century. **This was the largest temperature anomaly of any state in the country in 2022.**

**Temperature Anomaly**

![Temperature Anomaly Graph](chart.png)

*Source: NOAA National Centers for Environmental Information*

» **Threats to Health**: increases in heat and humidity, ground-level ozone pollution, air pollution from wildfires, mold, pollen season, vector-borne diseases (e.g., Lyme disease), and gastrointestinal illnesses from waterborne and foodborne contaminants can lead to more illness and death.

**Projected Climate Risks**

- **Hurricanes**: Hurricanes Ida (2021), Isaias (2020), Sandy (2012), Irene (2011), Floyd (1999), Bob (1991), Gloria (1985), and Tropical Storm Elsa (2021) were all billion-dollar disasters that impacted Rhode Island.

- **Water Stress**: Rhode Island has experienced more abnormally dry days during the past 10 years than it did in the early 2000s. This includes an extreme drought in 2020 and 2022.

- **Sea Level Rise**: Sea level increased by 10.1 inches over the last century in Newport. Sea level is likely to increase by more than 1 foot in the Northeast by 2050.

» **Ocean Under Threat:** the Atlantic Ocean supports tourism, recreation, and economic activities, including fisheries. Warmer ocean temperatures—the Northeast Continental Shelf is warming much faster than the global average—sea level rise, acidification, and increased storm frequency and intensity all threaten marine ecosystems and the communities that depend on them. For example, some evidence shows that cold-water iconic fishery species like cod, winter flounder, hake, and lobster are migrating out of Rhode Island waters, while warm-water species like scup, butterfish, black sea bass, and winter squid are moving in.

About 29% of Rhode Island’s seafood catch in 2020 was classified as having very high or high vulnerability to changes in abundance or distribution due to climate change.

» **Climate Vulnerability of Rhode Island Catch**

![Climate Vulnerability of Rhode Island Catch](image)

Source: NOAA Fisheries, Northeast Vulnerability Assessment

» **Risks to Cities:** the Northeastern U.S. is home to densely populated cities, including Providence, critical transportation corridors and infrastructure, and culturally and historically significant sites. Climate change impacts, including from sea level rise, flooding, and hurricanes damage infrastructure, displace populations, strain our emergency response system, and disproportionately affect historically marginalized and low-income communities.

» **Projected Climate Risks**

- **Extreme Rain:** Annual precipitation and extreme precipitation events in Rhode Island have been above average in recent years.

- **Wildfire:** Wildfires are not very common in Rhode Island but several brush fires broke out in April 2023 due to dry conditions.

- **Heat Stress:** The observed number of hot days in Rhode Island has increased compared to the long-term average since the 1990s.

Agriculture

What kinds of agricultural products does Rhode Island grow/raise?

Due to its small size, Rhode Island had the lowest amount of land in agriculture and agricultural sales of any state in 2017.

Land in Agriculture

TOTAL
56,864 ACRES

- Cropland decreased from 81,000 acres in 1945 to 17,000 acres in 2017 (-79%)
- Pastureland decreased from 41,000 acres in 1945 to 8,100 acres in 2017 (-80%)

Harvested cropland: 14,302 acres

Vegetables
2,242 acres
15.7%

Sod
2,018 acres
14.1%

All forage
6,519 acres
45.6%

Corn: Silage
1,121 acres
7.8%

Nursery stock
949 acres
6.6%

END USES

ANIMAL FEED
EDIBLE
LANDSCAPING

Acreage for vegetables, fruits, berries, and corn for grain equaled 21.7% (3,106 acres) of harvested cropland and 5.5% of total land in agriculture. Boosting produce production—whether in the open or indoors—is one way Rhode Island could help the region.

Agricultural Sales, 2017

TOTAL $54,799,246

With its limited landmass, Rhode Island is heavily invested in inedible products. Greenhouses/nurseries/floriculture accounted for 20.8% of farms and 49.6% of sales.

Rhode Island had 2nd highest direct sales as a percent of total ag sales of any state (17.5%)

Note: Agriculture sales in this figure do not include support activities. Sales values are adjusted for inflation to 2020 dollars using producer price indices for crops and livestock.
An analysis from the American Farmland Trust (AFT) estimates that Rhode Island could lose an additional 8,100 acres by 2040 under a “Business as Usual” development scenario and 9,900 acres under a “Runaway Sprawl” scenario.

AFT projects that Providence, Washington, and Newport counties will experience the biggest decreases in land in agriculture.

A consequence of Rhode Island’s relatively small land base coupled with intense development pressure is that it has the most expensive farm land in the country: $17,500 per acre. Source: USDA Land Values 2022 Summary
What kinds of seafood products does Rhode Island harvest?

More than 100 species are caught or harvested by Rhode Island fishermen, but 15 species account for the majority of sales and 13 species account for the majority of sales. RI has the second largest and most diversified fishing port in the region—Point Judith—supported by a state-owned port infrastructure that prioritizes the needs of the commercial fishing industry. Currently, most of RI’s catch is shipped overseas for processing, a situation that makes it difficult for New England consumers to access RI’s fresh local fish.

Source: NOAA Fisheries and the Atlantic Coastal Cooperative Statistics Program.
**Aquaculture**

In 2022, Rhode Island had 84 aquaculture sites covering 374 acres. About 11 million oysters—the top aquaculture product—were sold for consumption. Total sales equaled $8.3 million.

**Food Waste**

How much food waste is landfilled in Rhode Island?

A 2015 “Waste Characterization” study found that food waste (vegetative and protein) is the top single material in Rhode Island’s municipal waste stream at 100,000 tons (9.6%), or 2 million pounds.

**Landfilled Food Waste**

- **Vegetable food waste**: 84,827 tons (8.1%)
- **Protein food waste**: 15,203 tons (1.5%)
- **Cardboard boxes**: 41,244 tons (3.9%)
- **Bulky waste**: 37,394 tons (3.6%)

**Source:** DSM Environmental Services, 2015, Rhode Island Solid Waste Characterization Study
Key Rhode Island Strengths, Weaknesses, Opportunities, and Threats

<table>
<thead>
<tr>
<th>STRENGTHS</th>
<th>WEAKNESSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong collaboration and shared planning across the food system</td>
<td>Smallest state by area in the country</td>
</tr>
<tr>
<td>Experience with indoor food production</td>
<td>Significant decrease in land in agriculture</td>
</tr>
<tr>
<td>Significant seafood and aquaculture production</td>
<td>Most expensive farm land in the country</td>
</tr>
<tr>
<td>Growing food and beverage processing and manufacturing capacity</td>
<td>Relatively limited edible agriculture production</td>
</tr>
<tr>
<td>Strong support system for urban and small-scale farmers</td>
<td>Low minimum wage ($13.00)</td>
</tr>
<tr>
<td>Home to major food distributor (UNFI)</td>
<td>Significant disparities in healthy food access based on race/ethnicity</td>
</tr>
<tr>
<td>High percentage of direct agricultural sales</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OPPORTUNITIES</th>
<th>THREATS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invest in long-term food production: increase controlled environment agriculture at existing farms and new ventures; invest in food processing/manufacturing and distribution infrastructure for small and midsize operations</td>
<td>Extreme weather—hurricanes and water stress/drought—will affect farms, fisheries, and infrastructure</td>
</tr>
<tr>
<td>Increase aquaculture production, including kelp</td>
<td>Warming ocean has already altered species composition in fisheries</td>
</tr>
<tr>
<td>Increase the viability of local farms, fisheries, and food businesses through increased state investment and business support</td>
<td>Aging population, including the population of fishermen and farmers</td>
</tr>
<tr>
<td>Protect and preserve active agricultural land and working waterfronts</td>
<td>Intense land development pressures</td>
</tr>
</tbody>
</table>

Next Steps: What Can Rhode Island do to Meet the 30% by 2030 Goal?

To help meet the region’s 30x2030 goal, Rhode Island is currently working to update the state’s food strategy, Relish Rhody. Developing the next phase of Relish Rhody will include extensive data collection, listening sessions with Rhode Island food system stakeholders, and public forums for Rhode Islanders to share their perspectives and aspirations. Short-term next steps in Rhode Island include:

» Identifying ways to align town plans with the 30% by 2030 regional food goal
» Contacting the Rhode Island Food Policy Council and the Director of Food Strategy to ask us for data and presentations to support community planning processes
» Joining a Rhode Island effort to conduct a ‘local food count’ in each New England state.

Funding for this project has been made possible by the Henry P. Kendall Foundation and the Angell Foundation.