

An aerial photograph showing a dense urban area with a large farm in the foreground. The farm features several large greenhouses and rows of crops. The city skyline is visible in the background under a clear blue sky.

URBAN ABUNDANCE

Wilson Farms in Lexington, Massachusetts, 10 miles from Boston, has 20 acres of planted fields and five adjacent greenhouses that help supply an on-site storefront. The farm also grows produce on 500 acres of cropland 35 miles northwest, along the Merrimack River in southern New Hampshire. Together, the properties produce over 125 varieties of fruits, vegetables, and herbs.

GUIDANCE

An Aerial Survey of Metro Boston
Reveals a Regional Food System on the Rise

By Alex MacLean

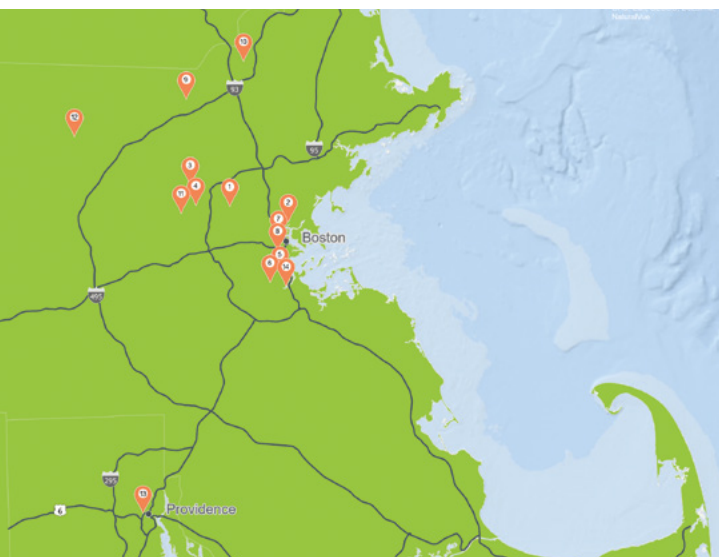
ACROSS FOUR DECADES as an aerial photographer, I have been drawn to documenting agriculture for the way it reveals important clues about region, climate, topography, soil, and the passage of seasons and time. This work has increasingly focused on the connections between land use and climate change, as attention to shortening food miles—reducing the distance between producers and consumers, with the goal of lowering carbon emissions and minimizing supply chain disruptions—visibly plays out across rural–urban transects. The images in these pages represent the first steps in an inquiry into how food production in and around urban areas in the United States is changing.

In recent years, the intensification of small-scale growing in the region around Boston, Massachusetts, has been increasingly apparent. From the air, I’ve seen hoop houses spring up on small farms seeking to meet demand and expand productivity; I’ve seen drab commercial and residential rooftops become vibrant gardens; I’ve seen historically nonproductive urban land like vacant lots and lawns become cultivated spaces.

When added up, these small-scale operations seem to hold real potential for productivity gains through the power of increments. Green spaces in and near urban areas don’t just provide people with fresher, more accessible food; by filtering stormwater, absorbing carbon dioxide, and providing other environmental benefits, they can also make cities healthier, more resilient places.

Despite these promising changes, what is commonly understood as the locavore movement has done more to create a sense of place, build community, and educate around food than it has to increase food security or shorten food miles at the scale necessary to confront climate change. While demand and enthusiasm for local food has grown over the last decade, an estimated 90 percent of food in the Boston metro area comes from outside the region, according to Food Solutions New England (FSNE), a regional network based at the nearby University of New Hampshire. But policy makers, investors, farmers, and entrepreneurs in the area are working to change that, and FSNE is advocating for “50 by 60”—referring to the percentage of food that could be regionally sourced by 2060.

One trend that could help reach that goal, also visible from the air, is indoor farming. Most commonly located in undervalued industrial neighborhoods, indoor farms use technologies like hydroponics and LED lighting to enable year-round cultivation. The companies behind them are increasingly demonstrating that a lack of open space does not have to be a constraint on food production. The indoor farming industry attracted \$1.9 billion in global venture capital in 2020, three times the amount committed in 2019.



The locations on this map and in these pages represent just some of the places where urban agriculture is sprouting in the Boston area. Credit: Center for Geospatial Solutions.



The Boston metro region imports 90 percent of its food from outside the region. Above, box trucks and refrigerated trailer units line the New England Produce Center warehouses in Chelsea, just north of downtown Boston. Among the largest wholesale produce markets in the world, the complex receives shipments from across the United States and internationally. Produce is then redistributed to food outlets throughout New England and southeastern Canada.

Boston is home to some of the companies gaining the most momentum. Freight Farms, for instance, further democratizes proximity to production through the use of retrofitted shipping containers that can be tucked beneath elevated highways or squat next to school cafeterias. In 320 square feet, these containers yield as much produce as two cultivated acres. Such innovative solutions give insight into what alternative growing can look like as climate change degrades farmland and shrinks water supplies. However, indoor farming has its drawbacks; it can be energy intensive and, although its yields are often marketed as “local,” in some senses it replicates the centralization and corporate influence against which local and regional agriculture advocates have long chafed.

As an aerial photographer, I hope some form of outdoor food production will always be

integrated into our landscapes. Whether viewed from the ground or from the air, farms and fields help us understand the key elements of the natural world that sustain us, providing a connection to the planet and an impetus to protect these places. But from above, it is increasingly apparent that a reimagining of agricultural systems is underway, and that we will need many different approaches for “local food” to evolve into an equitable model of regional food sovereignty. □

Alex MacLean is a pilot and internationally exhibited photographer whose work has appeared in *Land Lines* and the Lincoln Institute book *Visualizing Density*. He specializes in documenting changes to the land brought about by human intervention and natural processes.



The renowned Fenway Victory Gardens along the Muddy River in Boston's Back Bay are made up of over 500 plots that remain on land that was dedicated to food production during World War II. Fenway was one of over 20 million victory gardens across the country that contributed to growing roughly 40 percent of the nation's produce at the height of the war. The history speaks to the potential to adapt and to grow local produce on a large scale.



The community garden at the First Parish Church in Lincoln, Massachusetts, seen in four seasons. Changes in the garden throughout the year are a time marker that affirms our awareness as we transition through seasons. Parishioners grow individual plots and collectively grow a donation plot that provides an average of 600 pounds of food each year to Boston-area homeless shelters and soup kitchens.



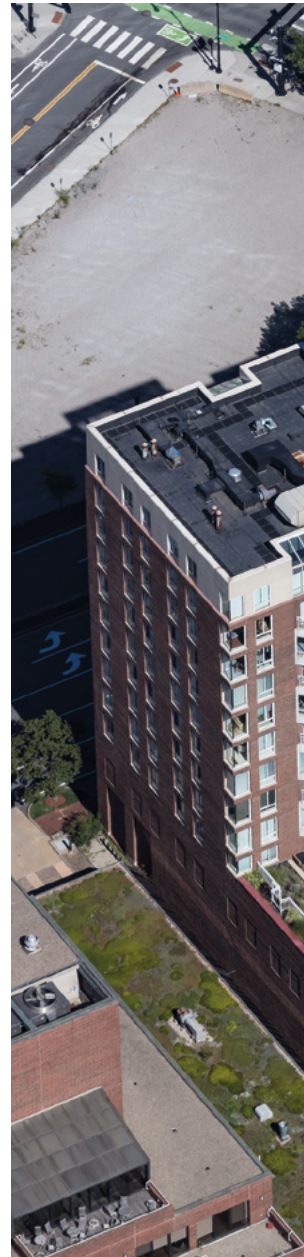


POSTINDUSTRIAL AGRICULTURE

In postindustrial cities like Lawrence and Lowell, urban agriculture provides healthy produce for the community. Mill City Grows manages four farms, including 2.8 acres leased from the city of Lowell (top), and distributes produce through mobile markets, a Community Supported Agriculture program, and donations. In nearby Lawrence, the city helped establish the Cross and Cedar Street Garden (middle) in 2011. The garden, which is tended by local residents, occupies two vacant lots where dilapidated housing once stood. Raised beds help protect against the hazards of contaminated soil.



The Nightingale Community Garden in Dorchester, Massachusetts, owned by statewide conservation organization The Trustees, is part of a citywide initiative to increase access to local produce, and to make community gardens a prominent feature of unbuilt urban spaces.



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Planted terraces on top of The Esplanade, a condominium complex in Cambridge, Massachusetts, demonstrate the potential for commercial roof spaces to accommodate urban agriculture.



COMMON PLACE

Boston's community gardens have created a stronger sense of place within city neighborhoods. The Worcester Street Community Garden in Boston's South End is one of 56 community gardens owned by The Trustees. Managed by volunteers, the Worcester Street garden has over 130 plots available to Boston residents on a first-come-first-serve basis.





Chicken tractors and containment pens are moved each day at Codman Community Farms in Lincoln, Massachusetts, one of the sustainable practices that goes into producing 800–1200 eggs per week. Located 15 miles northwest of Boston and dating back to 1754, the farm sits on 18 acres. An additional 120 acres of fields and pastures scattered throughout the town provide hay for livestock and open spaces for those living in the surrounding area.



SCALABLE SUCCESS

Over 95 percent of greens consumed on the East Coast come from California and Arizona, often spending over a week in transit. Little Leaf Farms is working to disrupt reliance on West Coast produce through year-round hydroponic growing in a 10-acre greenhouse in Devens, Massachusetts, 40 miles west of Boston. The growing process is entirely automated; greens are planted and harvested without touching human hands. The company's success thus far has brought in \$90 million in debt and equity financing to expand operations down the East Coast, beginning in Pennsylvania and North Carolina.



Freight Farms manufactures vertical hydroponic greenhouses inside 40-foot shipping containers. Equipped with precise climate control and optimized lighting for select plants, the containers can yield up to two acres of conventionally grown produce in 320 square feet. The mobile greenhouses can be placed anywhere, such as beneath highway underpasses or adjacent to schools.



Built on what was once a contaminated brownfield site in Providence, Rhode Island, Gotham Greens—the white structure at bottom left of image—provides New England with year-round hydroponically grown greens and herbs. The greenhouse is powered by renewable electricity and uses 95 percent less water and 97 percent less land than conventional agriculture.



PHOTO ESSAY

CHANGES OVER TIME

Gaining Ground Farm in Concord, Massachusetts, grows produce for Boston-area shelters and food pantries. Using high tunnels, hoop houses, row covers, and soil nourishment, Gaining Ground has increased production by over 100 percent over a four-year period. In 2020, Gaining Ground grew and donated 127,429 pounds of produce, compared to 61,764 in 2016. The top photograph, taken in 2016, shows the farm's early adoption of hoop houses; the bottom photograph, taken in 2020, shows the intensification of production.

Opposite: This community garden in Allston-Brighton, Massachusetts, is on land owned by the state Department of Conservation and Recreation. The mid-October foliage foretells the end of the growing season and the onset of winter.

