

## Planning for Resilience: Urban Density

Hi, I'm Tom Beery and you are listening to The Sea Grant Files. I'm guest-hosting today's episode because I have an idea I want to share with you about how a renewed look at urban density might benefit America's future. I'm Minnesota Sea Grant's resiliency specialist, a job that has me working with communities on ways they might adapt to changes in regional climate and weather patterns.

Let's talk urban density!

73% of Minnesota's population lives in urban areas [1] and one of these urban places is Duluth! For some it may sound odd to label Duluth as urban given the expanse of water and woods, not to mention the lake and river views. Not many cities have shoreline on the greatest of the Great Lakes. But, let's consider how a little urban density might actually serve Duluth. Let's challenge the idea that urban density is inherently a bad idea.

When I say "urban density" I'm talking about the number of people per square mile. The Twin Cities' population-weighted density is about 3,400 people per square mile. That's compared to about 4,800 people per square mile in the Denver area and over 31,000 people per square mile in New York City [2].

The notion of urban density as undesirable often comes from perceptions of heavy traffic, noise, lack of green space, and pollution. We have been encouraged to think of cities as a source of horrible environmental problems [3]. We need to examine these perceptions in a frame of sustainability and community resilience.

In 2009 at a time when Vermont had just been labeled the "Greenest State" by Forbes magazine, the green title was challenged by a staff writer for The New Yorker [4] who proposed that NYC was actually a far greener place than all of Vermont in terms of carbon footprint. Using that definition, he showed how the average New York City resident consumes only about a quarter as much gasoline as the average Vermonter — and the average Manhattan resident consumes even less, just 90 gallons a year, a rate that the rest of the country hasn't matched since the mid-1920s. New Yorkers also consume far less electricity — about 4,700 kilowatt hours per household per year, compared with roughly 7,100 kilowatt hours in Vermont and more than 11,000 kilowatt hours in an average home in the United States as a whole.

This assessment reminds us to broaden how we think about our urban areas. If our measures are sustainability oriented, then cities are hard to beat, as transportation, utilities, and other resources are often shared in efficient ways. OK, I'm not proposing that northern Minnesota should aim to

emulate Manhattan, but I'm suggesting that increasing urban density can serve cities like Duluth in important ways.

Reducing our consumption of fossil fuels is just one possible benefit of living closer together, but let's consider another aspect that may feel more relevant to Duluth... the idea that density may be able to help protect communities from flooding and other negative outcomes of severe precipitation—a trend that is projected to increase in this region [4].

A US EPA study [4] showed how density of homes can reduce the amount of stormwater runoff in a community. The study found that 1000 houses on 1000 acres produce almost 19 million cubic feet of stormwater runoff per year, while 1000 houses on 250 acres produce a third of that amount. The reason for such an extreme difference in stormwater management is that in most situations low-density neighborhoods mean more impervious space (such as roads), less natural vegetation cover (in Duluth this often means less forest cover), and less space for water storage (such as wetlands).

Beyond the potential to slow the flow of stormwater, higher-density housing may also be able to protect prized things, like brook trout, hiking trails and forests! Careful development in the upper reaches of Duluth's 16 trout streams will help protect them from warming water temperatures and turbidity. It is really unique to have 16 trout streams within the city limits! [6] and, assuming we want to keep such things in our community, we need to think creatively about where people live.

Duluth has a lot of space below the hill that could be converted into new neighborhoods with condos, apartments, townhouses, and small lot single dwelling units.

However, Duluth and, frankly anywhere, with an urban renewal plan that includes high-density housing needs good public transport connections. People choosing to live in high-density housing need grocery and shopping options and easy access to normal aspects of daily living—like schools and doctor offices. Great cities have housing opportunities for people of differing economic abilities. And, super important, great cities make sure that residents in these densely populated neighborhoods have access to park space, trails, bikeways, and noise buffering greenery, all in an effort to reduce the negative aspects of high urban densities...

To recap, I approach the idea of urban density in my work from three points:

1. Nature access for all
2. Protection of water resources, and
3. Climate-based risk reduction

More densely populated urban centers might actually mean more resilient coastal communities in many ways, not least stormwater management. We can make great cities next to the Great Lakes even greater.

Thanks for joining me today on The Sea Grant Files.

This episode of the Sea Grant Files was produced by Sharon Moen, Kristian Erickson, Maija Jenson, KUMD, and me, Tom Beery. To find the references to the articles I mentioned or to listen to more episodes of The Sea Grant Files and to subscribe to our podcast, visit the Minnesota Sea Grant website at [www-dot-seagrant-dot-umn-dot-edu](http://www-dot-seagrant-dot-umn-dot-edu). You can also follow Minnesota Sea Grant on Facebook and Twitter. Thanks for listening.

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