How urban sprawl has fragmented farms in the Edmonton-Calgary corridor since the 1980s

Jonny Wakefield | Published on: June 9, 2017

David Wedman and his family have had a front-row seat to Edmonton’s urban sprawl.

For decades, the grain farmer on the city's southwestern border has watched subdivisions and other urban development creep onto some of the province’s best cropland.

“As a kid growing up, there used to be 25 farms in this area. Now there’s only half a dozen,” said Wedman, who’s farmed for almost 50 years on property that's been in his family for more than a century.

A new study, which appeared in the April edition of the journal Land Use Policy, used satellite data to track 30 years of changing land use in the Edmonton-Calgary corridor.

“I had heard a lot about development taking over farms and things of that nature, but it was interesting to have a concrete way to look at that happening,” said lead author Kayla Stan, a PhD student at the University of Alberta who used similar techniques to track deforestation in Brazil.

“You can watch these cities grow, (or) you can watch the Amazon being deforested,” she said. “Having that sort of visual information has a lot of impact.”

City, country, city

The Edmonton-Calgary corridor covers 100 km to the east and west of the Queen Elizabeth II Highway — an area slightly smaller than Nova Scotia — in Alberta’s heartland.

The region contains some of the best farmland in the province and its three largest urban areas, including two of Canada’s fastest-growing cities.

In satellite images Stan compiled for the study, Edmonton and Calgary appear as blobs at either end of a dark rectangle.
They’re white in the centre — each city’s footprint in the 1980s — surrounded by yellow, orange and red bands representing each successive decade. Smaller blobs dot the highway between the two and encircle a string of blue dots — urban growth around the region’s lakes.

Stan, who specializes in modelling land cover change, classified thousands of “patches” of land from NASA’s Landsat satellite. An algorithm marked land as urban, farmland or natural area, and tracked how those patches changed between 1984 and 2013.

Three decades of urbanization and farmland loss were tracked in a new study from University of Alberta PhD student Kayla Stan. The images show how Edmonton, Calgary and other municipalities have expanded each decade.

Brent Swallow, a professor of agricultural, life and environmental sciences at the U of A, said the study is the first to look at land-use change in the entire region over such a long period of time.

“That’s what I get out of that study in particular: that historical perspective that helps us to see the problem in a longer term,” he said. “As pressing as the problems (of sprawl) seem now, we planted the seeds for them with development patterns that probably started in the ‘60s.”

The study shows that cities, for the most part, have expanded onto farmland. Since 1984, Edmonton, Calgary, Red Deer and other cities nearly doubled the amount of land within their boundaries, collectively growing from 3,000 to 5,000 square kilometres.

The amount of farmland has remained largely unchanged, at around 17,000 square kilometres. But that land is increasingly fragmented, pushed into marginal areas that were once grassland and forest.

“For agricultural land, it’s more of where it’s being lost, as opposed to how much is being lost,” Stan said. “You get a lot of loss in agricultural land in the very, very good farm land areas, especially around Edmonton and Calgary.”

Roadmap for 2022

Stan used the historical trends in land use to chart what the corridor might look like in the next five years if those trends continue, if the economy booms or goes bust, or if government clamps down on urban sprawl.

Edmonton’s borders are projected to run into neighbouring municipalities in all but the lowest growth scenarios. That fits with the city’s ongoing push to annex lands on its southern border.

What will the Edmonton-Calgary corridor look like by 2022?

A study out of the University of Alberta used 30 years of satellite data to predict land use changes in the Edmonton-Calgary corridor. It planned for five scenarios, including rapid urban expansion, contracting urban growth, and what would happen if the government instituted U.K.-style greenbelts or land suitability policies like B.C.’s Agricultural Land Reserve. SOURCE: The Edmonton-Calgary corridor: Simulating future land cover change under potential government intervention.

Stan also considers the impacts of two hypothetical checks on growth adopted in other jurisdictions.

One is greenbelts, first proposed to curb urban growth in the U.K. beginning in the 1930s. The other is a land suitability system like B.C.’s Agricultural Land Reserve, instituted by the province’s first NDP government in 1974 and designed to protect farmland.

Protecting prime farmland in a reserve would check urban growth slightly, while protecting about the same amount of farmland but in larger parcels.

If the province brought in greenbelts, urban land expansion would be rolled back even further, while farmland would grow.

Swallow said it’s unlikely the provincial NDP government would take a risk on land reserves or greenbelts, which could anger rural voters.

But local governments are becoming more mindful about conserving land on their boundaries. Last year, the Capital Region Board for the first time began incorporating agriculture land protection into new regional growth plans.

“Some of the worst sprawl in Canada has occurred in the Capital Region over the last 30 years, but perhaps we can be an example of what can be done in a positive way, too,” he said.