

BENCHMARKS FOR CLIMATE CHANGE

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This evening I would like to explore with you some of the present geographic patterns that might be used as benchmarks for the identification of climatic change in the Upper Great Lakes region. There are some fairly momentous changes already underway. Some of these changes obviously will be accelerated or retarded by climatic change. But I think we need to be cautious about giving too much credit to climatic change or to El Niño, or to whatever else happens to be our favorite whipping boy or seems to be popular this week.

I begin with the assumption that climatic change is not going to have much direct impact on city folk. Some of them might be moderately inconvenienced, but most will simply reset their thermostats and go on about their business. Even in urban areas, I assume that many will not be greatly affected by change, and in the interest of time I will ignore it, despite its importance in a few areas. I want to focus on rural areas, which were settled predominantly by two groups. The largest native-born groups were Yankees and Yorkers, who were leapfrogging westward to the frontier. Some became farmers, to be sure, but many sought their fortunes in commerce, and they played a major role in the development of towns and cities. The other major group of early settlers came directly from Europe. Actually, the Upper Lakes States was the only large area, in the United States, where foreign-born people comprised as much as a quarter of the total population.

The construction of railroads in the 1850s, 60s and 70s enabled immigrants to travel directly from their homes to the port of embarkation in

Europe, and from the port of entry in the United States directly to the frontier. For the most part the foreign-born became farmers, and often there was tension between the foreign-born on the land – the farmers, and the Yankees and the Yorkers who had businesses in small towns and cities. Neither group, however, seemed to understand that milking cows was women’s work, well beneath the dignity of a man, and after a highly successful initial fling with growing wheat, they settled down to become dairy farmers.

There are well-known maps for the types of farming in the United States which identify the Upper Lakes States as a dairy farming area. But some of these maps can be grievously exaggerated – you have got to be suspicious of any map showing a distribution that changes sharply and abruptly at a state line or along an international boundary. A more realistic map is based on sales of dairy products. Two quite different but equally revealing maps can be compiled from the identical data statistics. One map shows sales per square mile, [and] emphasizes the absolute importance of Wisconsin and Minnesota as dairy states, with Michigan a very poor third. The other map, which shows sales of dairy products

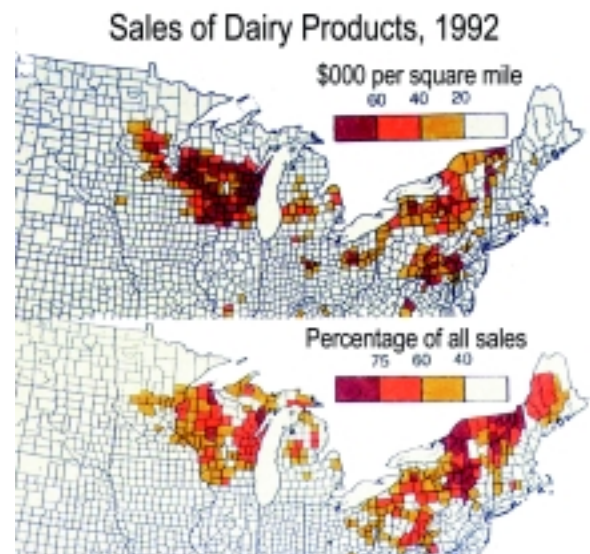


Figure 1: Sales of dairy farm products in 1992. Adapted from slide presented by Fraser Hart, May, 1998.

as a percentage of all farm sales, shows that farmers in the northeast rely far more heavily on sales of dairy products, whereas dairy farmers in the Upper Lakes States are appreciably more diversified.

Ralph Steiner is a representative Wisconsin dairy farmer. He was milking 15 cows when he started farming in 1950, and he has gradually built up his herd to 45 milking cows. Ralph has 120 acres of cultivable land. His principal crop is alfalfa, which gives him protein-rich hay that is excellent feed for his cows. He has 40 acres of corn, and he chops the entire plant for silage before the grain is ripe. Now corn is a subtropical plant, and summers in the northern part of the Upper Lakes States are too cool for the grain to ripen before the first frost. Traditional dairy farm states have barns with huge lofts for storing alfalfa hay and cylindrical silos for storing the corn crop. Better varieties and increased yields have enabled dairy farmers to fill their silos from only half as much acreage as they once needed, and some of them are willing to gamble that the rest of the corn field will ripen into grain. But they are taking a chance, that an early snow won't beat them to the punch.

Most dairy farmers have learned that it is cheaper and easier for them to buy the grain corn they need, instead of trying to grow it them-



Figure 2: Dairy farm in Minnesota which contrasts sharply with the dairy farm production in California; photo by Don Breneman, Minnesota Extension Service.

selves. I think that dairy farmers in the Upper Lakes States are in for some rough sledding. They have been cocooned — they would say victimized, but I think they have been sheltered — they have been cocooned by a truly bizarre price support system. For example, a milk marketing “order” is actually an area within which all dairy farmers receive the same support price for their milk. The milk price support system is a relic of the era of the horse and buggy and the slow milk train that stopped at every crossroads.

Dairy farmers have a long tradition of cooperation that dates back to the days when cheese-making left the farm house kitchen and moved into the crossroads creamery, and no other group of farmers is so well organized to insure that Congress treats them the way they want to be treated. The support price of milk increases with distance to Eau Claire, Wisconsin. And that is indeed a disadvantage for dairy farmers in the Upper Lakes States. But they have been too complacent in their political power, too conservative about adopting new technologies.

For example, the average number of cows per dairy farm in Wisconsin increased from 15 in 1949 to 50 in 1992, while California was exploding from 16 to 400. Dairy farmers around the peripheries, especially in California, have capitalized on technological innovations to develop large new dairy operations, but the Upper Lakes States have only a handful. In 1992, the United States had 564 dairy operations that were milking 1,000 cows or more. These operations accounted for less than 1/2 of 1% of all our dairy farms, but they produced nearly 10% of our milk. On these large operations, the cows spend their lives in small enclosures called drylots where they are fed alfalfa hay trucked in from distant places. Three times a day they are marched to milking parlors where they are milked and given concentrated feed shipped in from all over the world. A parlor can handle 50 cows at a time — an entire average Wisconsin dairy herd in one single place — and it operates

24 hours a day. The lights have never been turned off since the day it was opened.

Urban sprawl is displacing dairy farmers in California, and they're starting to look for new areas. Joe Pires, for example, was milking 2,000 cows in Tulare, California, but he set up his kids on a large new operation near Elkton, South Dakota, just west of the Minnesota line. Joe was milking 1,400 cows, the equivalent of 28 average Minnesota dairy farms. "Why would your kids want to move from California to South Dakota?" I asked him. He thought a minute, and then he said, "They're crazy." Crazy or not — I think it is large new operations like these that are going to sound the death bell for many traditional small dairy farms in the Upper Lakes States.

Fruit production is a specialized agricultural activity along the eastern side of Lake Michigan. It capitalizes on the ameliorating effect of the lake. But I think that the days of fruit farming in Michigan also are numbered. The fruit has to be picked by hand, and finding an adequate and reliable supply of harvest labor has always been a headache for fruit producers.

Some producers have taken a page from Tom Sawyer. Let the suckers pay you for the privilege of doing the work themselves by charging them to pick their own. Some producers will even sell you a tree. They tend it for you, let you know when the fruit is ripe and ready to pick, even lend you a table so you can have a picnic under your own fruit tree. Marketing is becoming a major headache. Gordon Nye has 160 acres of peach and apple orchards, and he is too small. The major grocery chains want large standard lots over the longest possible season. They would rather do business with a few large producers in California than with many small growers like Gordon. He has had to build his own roadside market. "One hour by interstate highway from the Chicago loop," he said proudly, and this is where he sells his products. The fruit farmers of southwestern Michigan already rely heavily — perhaps too heavily — on direct sales to consumers. I wonder how much longer they will be able to compete with large producers in areas with longer growing seasons. I have a hunch that many of them will be out of business long before the climate can change enough to affect them.



Figure 3: Fruit market near Traverse City, Michigan; photo by Michigan Farm Bureau.

The southwestern corner of the Upper Great Lakes region is quite a different story. Southwestern Minnesota is part of a vast field of corn and soybeans that stretches 800 miles eastward from Sioux City to Cincinnati and bulges about 200 miles north and south. In parts of Illinois and Iowa, an incredible three quarters of the land area — the total land area — is devoted to just these two crops — corn and soybeans. Farmers like Doug Magnus are concentrating on doing what their

computers tell them to do. They are growing corn and soybeans that they can sell straight off the farm as cash grains. In 1983, Doug was farming 700 acres of corn and beans. He told me that was about all he could handle. This year he is farming 1,500 acres and eagerly looking for more because a 1,500 acre cash-grain farm is undersized by today's standards. Can cash-grain farming spread northward into what is now dairy country if the climate ameliorates? I doubt it for two reasons: First, the dairy areas do not have the vast level areas necessary for the efficient operation of huge modern farm machines; and secondly, extensive areas, especially in Michigan, have sandy, outwash soils of great thirstiness and low inherent fertility.

What are the agricultural prospects for the boreal forest areas in the northern parts of the Upper Great Lakes States? In Canada, where farmland is in precious short supply, they call it the pioneer fringe. They are still clearing the forests and trying to bring it into production. Unfortunately, about the only crop you can really count on in such areas is hay, and you're not going to be able to make much money growing hay. Some farmers have been able to eke out a living at the southern edge of the boreal forest, but for many of them, I suspect the principal source of farm income is the mailbox down at the end of the lane. Most attempts to



Figure 4: Isle Royale National Park, Lake Superior, Michigan. US Fisheries and Wildlife Service; photo by: Mark E. Hodgkins.

farm the boreal forest have eventually wound up in heartbreak and abandonment. Between 1934 and 1987 more than two of every three farms in the boreal forest areas of Minnesota and Wisconsin were abandoned. Even more striking is the astonishing decline in the number of farms throughout nearly all of Michigan, which is rapidly losing whatever agricultural importance it might once have had. Climatic change cannot be blamed for this loss. The cards in the environmental deck are stacked heavily against the boreal forest. Evergreen coniferous trees drop acid needles, rainwater percolating down through this litter is acidified, and leaches soluble plant nutrients from the soil. The glaciers left a terribly tangled drainage system. The problems posed by climate seem to be almost an incidental addendum to this dreary litany of environmental constraints. Climatic change is not going to change the soil, nor the topography, nor the deranged drainage system.

The primeval boreal forest was pretty spectacular before the lumber barons butchered it, to judge from the little bits and pieces that escaped. The forest that replaced it is a pretty sorry collection of weed trees. And several human lifetimes of careful management will be needed to restore the boreal forest to its primeval splendor. Forest industry companies are trying to expedite the process by developing industrial forests to produce the prodigious amounts of biomass they require. They are planting rows of coniferous seedlings on land where they had poisoned broadleaf saplings that might compete. But in the north, trees will grow only one-third as fast as in the south. Perhaps climatic change might level the playing field a bit. But one might wonder whether it is wise to encourage the growth of the pulp and paper industry which is one of our most egregious environmental polluters, spewing great clouds of toxic gases into the atmosphere and throwing great quantities of acid waste into rivers and streams.

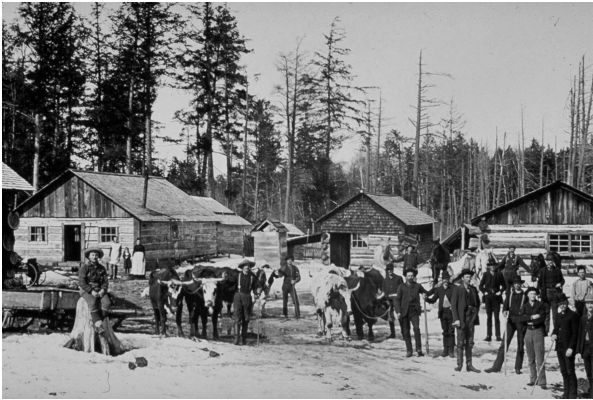


Figure 5: Lumber camp, c.1900. Superior, Wisconsin; photo from Douglass County Historical Society.

The first lumbering operations in the boreal forest used natural waterways to reach the wooded areas, to drive the logs to the sawmills. They employed hordes of lumberjacks, who were housed in logging camps with bunk houses, cook shacks, blacksmith shops, barns for horses and oxen, and a host of smaller web buildings. But lumbering has changed. Clayton Rollins is a modern lumberman in northern Minnesota. His daddy hired 50 lumberjacks. Clayton can cut more lumber than his daddy did and only employs two workers. Clayton operates the feller-buncher. One worker drives the tractor that skids logs to the harvester; the other operates the harvester. The feller-buncher has a huge claw that grabs a tree at ground level and has a pair of powerful hydraulic shears that can cut through a 12-inch tree as easily as scissors can cut through paper. The claw grabs the tree, the shears snip it off, the machine twirls it like a baton, places it on the ground, to be skidded to the harvester, which slices it into four-foot lengths that are ready to be trucked to the mill.

After the accessible areas near the streams had been logged off, the lumbermen built railroads to get them into the more remote *interfluvial* areas. The lumbering railroads had the side effect of making the boreal forest easily acces-



Figure 6: Loading logs on the truck for transport to the milling plant; Superior National Forest, Minnesota; photo from USDA Forest Service.

sible to city folk — sufferers from hay fever, members of rod and gun clubs.

The first resorts in the boreal forest were primitive affairs where people could get back to nature. Since World War II better highways and better automobiles have spawned vast development of second homes and summer cottages. Some lakeshore areas are as extensively built up as the city streets that their residents were trying to escape. Artificial created huge new lakeshore developments. Lake Arrowhead did not even exist until the developer built a dam in 1980. He subdivided the land around it into some 2,000 more-or-less lakeshore lots and created a veritable new city. Michigan has fewer lakes and other bodies of inland water than the morainic belts of Minnesota and Wisconsin. But Michigan has even more second homes and summer cottages. The pattern in Michigan is linear rather than clustered because water related recreation in Michigan is oriented toward rivers rather than towards lakes, and many Michigan rivers have almost continuous strings of cottages.

Seasonality has been the curse of resort areas in the boreal forest. People in resort areas have had to earn their entire 12 month income in a few hectic weeks between Memorial Day and

Labor Day. But resort areas have begun to develop more year-round activity. Older folk enjoy the relative peace and quiet of the shoulder season of the fall when the noisy kids have gone back to school and the leaves are changing color. And skiing and snowmobiling attract enthusiasts in winter.

The natural history of a summer cottage is well known. It starts off as a hunting shack up in the woods, where dad and the boys can put on their red-checked flannel shirts, play poker, smoke cigars, drink whiskey, pretend that they are the reincarnation of Daniel Boone. Eventually, mom starts to get suspicious. She decides to tag along. Talk about culture shock! Finally she calms down, and says, “Well, where’s the biffy?” “Gee whiz, mom, we’ve been using that tree out there.” Next thing you know, you’ve got running water and electricity and a telephone. And as mom and dad start to get older, they begin to think this might not be such a bad place to retire. So they winterize the place and move into it as their new primary retirement home. It becomes their primary residence because their new second home is a trailer park beneath the palm trees in southern Florida where they winter.

Cohort survival ratios demonstrate the importance of retirement migration to the boreal forest. An age cohort is a group of people of the same age. They are ten years older when the census is taken ten years later. In some counties the number of people in the cohort age 60-64 in 1980 was greater than the number of people in the same cohort, age 50-54 in 1970. What explains this increase? It is extremely difficult to be born at any age over 50. So we may safely assume that people age 60-64 in 1980 have retired and moved to these counties. In a sense, it is the retirement belt of the Upper Lakes States.

The in-migration of retired people has helped to stabilize the economies of resort areas in the



Figure 7: Boats at TLR Marina, Monroe, Michigan. Michigan Sea Grant Extension; photo by: Carole y. Swinehart.

boreal forest. Retired people have created jobs in construction, in maintenance and repair. They have created new jobs for plumbers and utility workers and even garbage collectors, because rural areas in the boreal forest do not have the city services that retired people expect and demand and for which they are able to pay. Local young people, who once had to go to the cities in search of jobs when they finished school or a stint in the service can now find jobs close to home. These jobs helped to stabilize an economy in the boreal forest that is based on a complex of tourism, recreation, resorts, and retirement migration.

I have no idea how climatic change might affect this new economy. In areas farther south, I have argued that the fruit areas in southwestern Michigan, and the dairy areas in Wisconsin, may already be under greater stress than many people seem to realize. And Michigan has almost ceased to be a farming state. I am rather more sanguine about the future of cash grain farming areas in southwestern Minnesota. But I have argued that environmental constraints will limit the expansion of cash grain farming northward. In short, I believe that momentous changes already are underway in the rural areas of the Upper Lakes States. But I defer to those of you who are assembled here to try to figure out how these areas are going to be impacted by climatic change.