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# Perspectives on Population and Geology in North Dakota

By Fred J. Anderson

North Dakota contains sweeping natural landscapes and a bounty of natural resources. The relationship of our state's geology and its impact on the populace of North Dakota, both from an economic and an environmental perspective is direct and relevant.

All of the activities we conduct in North Dakota can in some way, shape, or form, be observed to be influenced by, or derived as a product of, our state's geology. As citizens of North Dakota, we enjoy a high quality of life with respect to the air we breathe, the water we drink, the areas on which our homes are built, and the products we create as a result of the exploitation of our natural resources.

Our dynamic interplay with the geologic environment is vast and varied in North Dakota and ranges from the extraction and production of our state's vast resources of coal, petroleum products, natural gas, and aggregate resources, to our investigating and mitigating adverse geological conditions, such as flooding in our urban areas and protection of structures from mass movements such as landslides and soil creep.

Throughout history, many have been hampered by a lack of understanding of the relationships between population and the natural environment. Many peoples of the past (as well as peoples of today) have contaminated their waters, depleted their soils and exhausted their mineral resources. It is important, instructive, and relevant for us to consider the current relationship between our geologic environment and our current population.

*"The power of population is infinitely greater than the power in the Earth to produce subsistence for man"*  
Thomas Malthus, 1766-1834

According to the 2000 Census, the resident population of North Dakota was 642,200. The most recent number (year 2002), estimated by using a growth factor of -1.3%, obtained from the North Dakota State Data Center (NDSDC) is 634,110 residents (NDSDC, 2004). It has, nevertheless, been further projected that our resident population in North Dakota will increase gradually for the next two decades, after a slight decrease in population from 2000 to 2005 (NDSDC, 2002). The current population estimate of 634,110 is projected to increase to 645,325 by the start of the next decade in 2011 and to further increase to a population of 651,300 by the end of that decade in the year 2020 (Figure 1).

North Dakota's population is therefore expected to

increase by 17,190 people over the next twenty years, an amount approximately equal to the current population of Richland County, or roughly a three percent increase over the next two decades. From the perspective of sustainable growth, this projected increase can be viewed as being manageable and will likely present some environmental challenges for North Dakotans in the near future. A small population growth rate, relatively speaking, can arguably be easier to accommodate within a given area or locale with respect to urban expansion, and natural-resource exploitation, and environmental degradation.

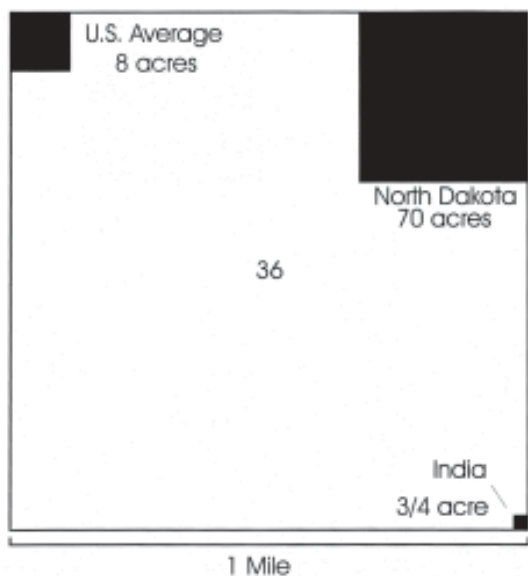
Throughout North Dakota we enjoy relatively uncrowded cities and urban areas with plentiful open spaces in which we can live, work, and play. Our rural communities and agricultural lands boast vast open vistas that highlight much of the subtle beauty of the plains.

To envision just how much land area we actually do have in North Dakota let's take a brief look at the relationship between our population and the land area of our state by way of a simple comparison between North Dakota's land area and our resident population. If we relate the current estimated population of 634,110 to the corresponding areal extent of North Dakota's state political boundary of 68,976 square miles, we find that there is a land area equal to an estimated 70 acres per individual.

When we consider this value from a national, and a global standpoint, the comparison provides for some additional perspective. The average land area per individual in the United States is eight acres per person. In densely populated India, the land area is a meager three-quarters of one acre per individual (Figure 2).



**Figure 1.** Trend of actual and estimated population values for North Dakota.



**Figure 2.** Comparison of representative land areas per individual as depicted within a standard section (640 acres) of land.

As North Dakotans, we can readily appreciate (by virtue of this brief discussion and our own direct experiences) that we have an abundance of wide-open natural landscapes to enjoy and appreciate (Figure 3).

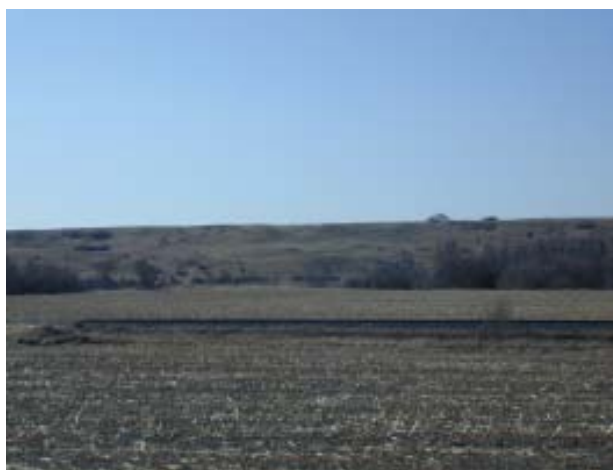
It is important to consider the relationship between our state's geology and its populace. Doing so can provide us with a perspective from which we can further understand, contemplate, and discuss, what our interplay with our state's geology may be in the future. One way to do this is to consider the relationships between our population and North Dakota's land area.

As we progress into this new century, we will face new challenges; challenges with respect to the ways that we understand, deal with and interact with North Dakota's environment and its geology. By understanding the simple relationship between how many people we have in our state and the land area available to us (our spatial relationship) we are provided with the *opportunity and foresight* to plan, analyze, and compare sustainable approaches to living in our geologic environment and growing, as a populace, in North Dakota.

We should all appreciate North Dakota's vast, open landscapes and abundant geologic resources, and further consider the many opportunities that we have as North Dakotans to realize responsible growth and natural resource-utilization in this century.

### Selected References

NDSDC, 2004, Census Data for the year 2000, North Dakota State Data Center, <http://www.ndsu.nodak.edu/sdc/data/census.htm>



**Figure 3.** View across the Sheyenne River Valley north of Valley City as one of many examples of our vast open landscapes (Photo by Anderson).

NDSDC, 2002, Population Projections in North Dakota: 2005-2020, The Population Bulletin, North Dakota State Data Center, Vol 18, No. 9, 3 p.