
FROM THE STATE GEOLOGIST

Productivity of the North Dakota Geological Survey

by John P. Bluemle



As budget dollars become tighter, state government needs to question what it is getting for its money. The question of how any state agency's productivity is "measured" is not an easy one. To measure the productivity of the North Dakota Geological Survey, for example, the most important criteria has to be how much and how valuable are the results of the agency's work?

And another pertinent question might be "what is the "cost/benefit" ratio?" We have shown, repeatedly, that the value delivered by the NDGS is several hundred times the cost of its budget – *the return on investment in studying geology results in benefits to the state that far exceed the costs*. I wish I could get more people to understand that basic fact!

But another, almost entirely different set of criteria is the measured amount of our output: such things as 1) the number of publications we issue; 2) the number of talks our geologists give, both to technical audiences and to the lay public; 3) how quickly and effectively our geologists respond to requests for information; 4) the number of displays we provide for the Heritage Center and other museums in North Dakota – the list is a long one. Let me address one small facet of this issue – publications productivity – and then perhaps expand my comments to a broader context.

During the 2003 Legislative Session, some legislators told me they had been told that the number of publications issued by the North Dakota Geological Survey has been declining. A review of the performance of the NDGS over its 108-year history shows the relative productivity of the agency through time, under the tenure of each State Geologist (Table 1). Table 1 lists the duration of tenure for each of the Survey's 12 state geologists, from 1895 until 2003. The total number of publications by Survey staff during the administration of each of these 12 state geologists is also recorded and the number of publications per year calculated. A quick look at Table 1 shows how our publication productivity has changed through time.

It should also be kept in mind that the size of the NDGS has varied considerably over the years. During the years that Drs. Laird, Noble, and Gerhard administered the agency, the Survey reached its maximum size (mainly because of the fact

that the NDGS was responsible for regulating oil and gas, which at the time was a vibrant and growing industry). It would be reasonable to expect that the total number of agency publications issued when the agency was at its largest would have been relatively high (and it was). In contrast, during the administrations of Babcock through Foley, the agency was very small, ranging from one to three people during most of that time; it would be unreasonable to expect such a small number of geologists to produce any significant numbers of publications.

One difficulty inherent in accurately (or meaningfully) compiling a listing such as the one on Table 1 can be illustrated by considering what happened during the administration of Earle J. Babcock, first state geologist of North Dakota. During that seven-year period, the North Dakota Geological Survey published only one official report, the *First Biennial Report of the State Geological Survey of North Dakota*. However, that report included several articles on North Dakota geology, all written by Babcock. In addition to the articles he wrote for the *First Biennial Report*, Dr. Babcock also published a total of nine other items relating to North Dakota geology, both before and after the seven-year period he was State Geologist.

[Note: It is a measure of the value of Babcock's early efforts that his work on clay (and the articles he wrote about North Dakota's clay resource) resulted in a clay industry being established in the state. That industry remains important in North Dakota today].

A comparison can be made between Babcock's (the first) and my own (Bluemle's – the current) administrations. Since I became State Geologist 13 years ago, a total of 189 items have been published by the North Dakota Geological Survey. However, during that same 13-year period, NDGS geologists have published several hundred additional articles dealing with North Dakota geology, both within Survey publications such as the *NDGS Newsletter*, and in other "outside" (national and international) journals. These are not accounted for in Table 1. Publications in "outside" journals provide information on the geology, paleontology, fossil fuels, and natural resources of North Dakota to scientists worldwide, as well as to the energy industries headquartered in places like Houston, Denver, Calgary, New Orleans, Oslo, Abu Dhabi, and elsewhere.

Of course, the number of publications issued by the Geological Survey (or any similar state agency) is only one measure of output productivity – and it is rapidly becoming a

Table 1
Number of Publications Issued Annually by the North Dakota Geological Survey
During the Tenure of Each State Geologist, 1895 - 2003

State Geologist	Total Publications	Years of Tenure	Publications/year	Web Site Hits/mo.
E. J. Babcock 1895 - 1902	1	7	0.14	-0-
Frank A. Wilder 1902 - 1903	1	1	1.00	-0-
A. G. Leonard 1903 - 1932	10	29	0.35	-0-
Howard E. Simpson 1933 - 1938	4	5	0.80	-0-
Frank C. Foley 1938 - 1941	1	3	0.33	-0-
Wilson M. Laird 1941 - 1969	124	28	4.43	-0-
E. A. Noble 1969 - 1978	94	9	10.44	-0-
Lee C. Gerhard 1978 - 1982	43	4	10.75	-0-
Donald L. Halvorson 1982 - 1985	28	3	9.33	-0-
Sidney B. Anderson 1985 - 1988; 1989 - 1990	35	4	8.75	-0-
Frank R. Karner 1988 - 1989 (about six months)	3	0.5	6.00	-0-
John P. Bluemle 1990 - 2003	189	13	14.53	-0-
1990 - 2000				-0-
2000 - 2002				100 - 5,000
2003				>50,000

relatively less important one. We receive requests for information and assistance from people visiting the Survey (577 last year), via U.S. Postal Service (313 last year), via telephone calls (1,129), via e-mail (1,845), and (increasingly) via requests routed through our web site (see Table 1). We respond to all of these requests appropriately – and normally our response does not involve writing a new publication, though we often refer to information contained in existing Survey publications as we consider our response. Our geologists also give numerous talks to a great variety of groups.

For example, within a short period in April, I gave a talk on the geology of North Dakota to a group of fourth graders and, later that month, I spoke to a gathering of more than 300 geologists on the potential for exploring for gas in glaciated areas in eastern North Dakota. Two quite different talks delivered to two very different audiences for two entirely different reasons. Which was more important? I don't think the answer is necessarily obvious.

Considering only the number of publications released,

Table I may also be misleading because it fails to account for a variety of other facts. Since the late 1990s, we have been developing an internet web site, which has grown tremendously in the past few years and is currently seeing a huge increase in usage by the public. Much of the data and information that might once have been provided as “hard-copy” publications is now being made available on the Survey’s web site (the same information is also available in other formats for those who do not have access to the internet – but this is a dwindling number of people).

In addition to making far more data and other information available to, literally, hundreds to thousands of times more people, development of the internet results in a tremendous savings to the state agency. While we expect to continue, indefinitely, providing hard-copy publications describing the results of our studies, we are now able to make the same information (actually much more information) available to an unlimited number of people at a small fraction of the cost of formal publication. We have also recently begun providing our publications on CDs. This allows us to include much more background information than in a hard-copy report format, and again, at a fraction of the cost.

As recently as the autumn of 2001, the NDGS web site averaged between 800 and 1,400 “hits” per month. Among the thirteen Midwestern member states in our regional ESIC (Earth Science Information Center), our web traffic was among the two or three lowest. So far this year (2003), we are averaging more than 50,000 hits per month¹. Now we are among the two or three most-visited web sites in the 13-state ESIC district. This explosion in web-site traffic reflects the fact that:

- 1) More people are depending on the internet for information than ever before;
- 2) The Survey has added, and continues to add, more material to its web site, making it increasingly attractive to users; and
- 3) One and a half years ago we were able to add a full-time computer specialist who, as part of his duties, has done a tremendous job revamping our site and registering our web page so that our site routinely shows up first on computer searches whenever North Dakota geology is involved.

Incidentally, as a result of action during the just-completed Legislative Session, the Survey has been stripped of this position; the loss will have devastating consequences to our ability to properly maintain and build our web site – and provide vital information to the public.

So, in summary, the short answer to the question raised during the recent Legislative session: No, our publication productivity has definitely not been declining! We are producing more (and better, I might add) publications than we ever have.... and we do so with fewer geologists than the survey had in the 1950s, 60s, 70s, and 80s. But, in addition, our ability to communicate our science to the public has vastly improved, thanks to modern technology. Please take a look at our web site and see for yourself what is available: <http://www.state.nd.us/ndgs/>.

¹ I wrote this article in early May, 2003. Figures I received since then indicate that the number of web site hits during April was 77,935.