THE MINNESOTA LONG-TERM TEMPERATURE RECORD*

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Abstract. A remarkable climatological record exists in the heart of the North American interior that deserves recognition and exploitation. The objective of this paper is to bring this unique record that commenced in October, 1819, at Ft. Snelling, Minn., to the attention of the climate change community.

1. Description of the Station

On 18 January, 1803, President Jefferson recommended to Congress that a small expedition be sent to the interior of the continent to confer with the Indian tribes with respect to the admission of the American traders into their domains (Hanson, 1918). The Louisiana purchase later in the same year altered matters, however, for now such an expedition was important in terms of establishing sovereignty; it was no longer simply a matter of trade. At least two exploration parties resulted. The one led by Lewis and Clark in 1803-05 is the most famous. Their immediate objective was to ascend the Missouri River. Less well known is the 1805-06 expedition led by Lt. Zebulon M. Pike with the goal of ascending the Mississippi River (Hanson, 1918). Both expeditions were apparently directed to survey the natural history of the interior and also to observe the climate. (A reviewer of this paper informs us that a third Jefferson inspired expedition, and one on which daily weather observations were made, was that of Freeman and Curtis (Flores, 1984) who explored the Red River of Texas in 1806). The first national weather service observations amounted to a 'diary of the weather' according to an order issued by the Surgeon General of the Army, Dr James Tilton, directed to the U.S. Army Medical Corps dated 2 May, 1814 (Landsberg, 1964). This duty fell to the local surgeon or chief medical officer of each post (Ludlum, 1968). The objective was to know more about the climatic conditions facing the troops in the interior of the continent and to investigate the influence of weather and climate upon diseases. Immediate compliance with the orders was delayed due to the War of 1812 (Hughes, 1970).

Ft. Snelling was one of a series of fortifications constructed in the continental interior, in what was then Missouri Territory, with the object of safeguarding the Indian agents, the trading houses, and the advancing settlements (Hanson, 1918). It was first established

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on 23 August, 1819, by an expedition from Ft. Detroit led by Col. Henry Leavenworth and named Cantonment New Hope (Ludlum, 1968). It was soon renamed Ft. St. Anthony and then in 1825, upon the recommendation of Gen. Winfield Scott, was renamed Ft. Snelling for the first Post commander (Hanson, 1918). The fort was built on a promontory overlooking the confluence of the Mississippi and St. Peter rivers (the latter to be renamed the Minnesota river) on a site originally surveyed and ceded by the Indians to the government through the efforts of Lt. Pike during his 1805–06 expedition. It is located at 44°54' N, 93°11' W, and stands at 245 m (805 ft) msl.

Today it is about 8 km (5 mi) distant from the central business districts of St. Paul and Minneapolis, Minnesota. The temperature record began in October, 1819. (An associated precipitation record dates from 1837). With relatively minor adjustments the temperature record continues to this day at a site (Farmington 3 NW) removed from the urban effect.

2. **History of the Record**

The instrumentation was rather crude to begin with as might be expected, according to Ludlum (1968), quoting an explorer who in 1823 wrote that ‘the instrument consisted of a glass tube, attached to a brass plate, on which the gradation was marked’. The instrument was manufactured by a Mr. Fisher of Philadelphia 'who sustains a high reputation as a manufacturer of the instrument'. It is possible that similar instruments are to be seen in the Smithsonian collection (Middleton, 1969).

The history of the record is shown in Table I. The record is not continuous at one site but like almost any other lengthy record has had to be reconstructed. It is our contention, however, that through fortuitous circumstances a nearly homogeneous record has been obtained with only minor adjustments in the original record and the substitution of three nearby station records. While Ft. Snelling was closed from July, 1858, until May, 1867, when it was reactivated for nearly 25 more years, the records from two enterprising citizens are available for substitution. One was taken by Dr. C. Anderson, who resided near Loring Park, a residential area in Minneapolis that is approximately 11.4 km NNW and 11 m higher in elevation. The other was by Rev. A.B. Patterson, D.D. He resided at 9th and Wacouta streets in what was then a residential area of St. Paul. That site is 12.7 km NE of Ft. Snelling and 5 m higher.

<table>
<thead>
<tr>
<th>Date</th>
<th>Observer</th>
<th>Location from Ft. Snelling</th>
<th>Height difference</th>
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</thead>
<tbody>
<tr>
<td>Oct., 1819–June, 1858</td>
<td>Ft. Snelling Post Surgeon</td>
<td>11.4 km NNW</td>
<td>+11 m</td>
</tr>
<tr>
<td>July, 1858–Dec., 1858</td>
<td>Dr C. Anderson</td>
<td>12.7 km NNE</td>
<td>+ 5 m</td>
</tr>
<tr>
<td>Jan., 1859–May, 1867</td>
<td>Rev. A. B. Patterson</td>
<td></td>
<td></td>
</tr>
<tr>
<td>June, 1867–Mar., 1888</td>
<td>Ft. Snelling Post Surgeon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April, 1888—to date</td>
<td>Mr. D. F. Akin, Mr. E. D. Akin and Mr. J. W. Akin</td>
<td>24.3 km S</td>
<td>+53 m</td>
</tr>
</tbody>
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