

Spring-Hunting Strategy and the Diversity of Springs in Minnesota

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The Minnesota Spring Inventory (MSI) was established by the DNR in 2014 and funded by the LCCMR. Protecting trout and rare plant habitat were major motivations. Judging from neighboring Wisconsin's spring inventory (1956-1962) we expected about 15,000 springs for the proportionately larger area of Minnesota and are now up to 4,500 springs. The Minnesota protocol, modified from DRI (2002) and SSI (2011) protocols, records springs down to 1 gpm.

LIDAR proved the most valuable tool for spring-hunting. A LIDAR tilepack is made in ArcGIS and exported to an iPad tablet. At each spring, GPS location is captured along with a variety of attribute data, with photo, and remotely uploaded. Water parameters are measured where spring flow is sufficient to use probes. While ecosystem data is collected, point of discharge, rather than sphere of discharge, classification, is employed. Citizen science, involving submission of spring locations from cellphones, is promoted, but this data must be verified by DNR personnel.

Minnesota was divided into the following 6 spring-hunting provinces, focusing more on public than private lands. Apart from the first one, the state was largely uncharted territory when MSI began mapping:

The southeastern karst, where about 2,600 springs had already been mapped since the original Surber survey (1918-1920).

The Minnesota River passes from prairie to deciduous forest, allowing us to study springs in relation to climatic and ecological gradients.

The St. Croix River forms much of the eastern border of Minnesota, paralleled by Glacial Lake Lind, whose prominent escarpment contains a sand-clay seepage contact. Whereas springs emanate from Paleozoic sandstones along the southern, downstream, half of the river.

The abandoned sand & gravel beachlines of Glacial Lake Agassiz, roughly paralleling the western border of Minnesota, are associated with calcareous fens.

On the rugged North Shore of Lake Superior the largest springs were not found along trout streams as had been expected, but on the abandoned sand & gravel beachlines of Glacial Lake Duluth, above present lake level.

While Minnesota has more than 10,000 lakes, far fewer are spring-fed. In the Lake District, lakes such as Shingobee, are ringed with littoral springs.