Newman Lake: An Ice Age Inlet to Glacial Lake Columbia

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During the last ice age of the Pleistocene Epoch (2.0 m.y.-12,000 years ago), Newman Lake was but a minor inlet or "arm" to a much greater lake system, glacial Lake Columbia. Our research study supports the theory that the Spokane Valley was occupied by several hundred feet of water from glacial Lake Columbia and that the Newman Lake area was an inlet or "arm" to this large lake.

The theory that the Spokane Valley was once under several hundred feet of chilly water from a glacially-dammed lake was proposed by United States Geological Survey geologist, Brian Atwater in the1980's. This lake, glacial Lake Columbia, occupied the lower reaches of the Spokane river system and extended from near Grand Coulee Dam to just past the town of Rathdrum. The lake was created by an ice dam from a section of the Okanogan Lobe (near today's Grand Coulee) of the Cordilleran ice sheet that crept south into central Washington from Canada. Indisputable evidence supports the existence and extent of the Okanogan Lobe.

Atwater suggested the idea of Lake Columbia from field research he did on rhythmically-bedded glacial lake sediments in the Sanpoil Arm area of today's Lake Roosevelt. The theory was based on a thick sequence glacial lake sediments termed rythmites in the Sanpoil Arm area. Rhythmites are repetitive fine sand and silt-clay layers believed to have been deposited on the bottom of glacial lakes and represent seasonal cycles that form during summer (sandy) and winter (clay-silt) deposition. The thin (1-2 centimeters) sandy layers represent summer-time sedimentation when nearby glaciers had higher runoff. The silt-clay layers represent winter-time layers when glacial runoff streams were lower thus having less transport capability. Atwater and other researchers found evidence for the actual elevation of glacial Lake Columbia from the discovery of lake strand lines; wave erosional "shelves" or coastlines cut into the hillsides. So, based on the thick sequence of glacial lakebed sediments and consistent strandline elevations, Atwater traced out the projected lake level to the east as far as the Rathdrum Prairie.

Research by geologists and graduate students at Eastern Washington University found evidence to support Atwaters theory. They studied glacial rhythmites in the Latah Creek/Hangman Valley area. What they also found surprised them. Corase sand and gravel layers were interbedded within the fine sand-clay rhythmite sequence. These coarse gravel layers proved to be deposits laid down by the catastrophic outburst floods from glacial Lake Missoula to the east.

The data from our study describes rhythmically-bedded deposits of glacial Lake Columbia in the Newman Lake area. To date, these are the easternmost reported deposits of Lake Columbia. In a small ravine area along the northwest section of Newman Lake, rhythmite deposits of fine sand and silt occur. Interbedded within the rhythmite layers are thicker layers of coarse sand and gravel. The gravel layers contain pebbles, cobbles, and boulders of quartzite and granite. Close examination of these coarse sediments along with

geologic maps indicates that the nearest source of the quartzite and granite was from bedrock areas to the east in northern Idaho and western Montana. We believe that the coarse sand/gravel beds are “outburst” deposits from Lake Missoula. The quartzite and granite cobbles and boulders were ice-rafted within icebergs that broke lose when the ice dam to glacial Lake Missoula disintegrated. The enormous Missoula floods would pour down the Rathdrum Prairie and encounter Lake Columbia forcing the huge floods to momentarily lose energy. As the flow slowed, thick deposits of sand and gravel were left in the Spokane Valley. As the flood waters rose, the Newman Lake arm would also fill to much higher levels. Our study indicates that interbedded lake bed sediments and flood deposits occur at elevations up to 689 meters (~2235 feet). These deposits represent the lake bed; flood levels reached much higher (to at least 2700 feet) levels. We were able to describe two sections of rhythmites (8 & 5 meters thick) that contained four interbedded outburst flood layers. We envision the Newman “arm” to have been a large inlet or bay that became a torrent of fast moving water as the Missoula floodwaters filled it. The coarse sandy interbeds of outburst sediments support this idea. Icebergs with engrained cobbles and boulders would melt and drop the large quartzite and granite pieces into the lake bed sediments only to be buried by continued sedimentation.

It is not a surprise to many of the long time residents here that Newman Lake was once much larger. Upon driving around the north end of the lake, it looks obvious that lake levels were once much higher. Our study not only supports this idea but it also suggests that Newman was but an “arm” to the vast Lake Columbia system that occupied the Spokane Valley during the last ice age.

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Quartzite boulder (dropstone) in rhythmite layers.

Trench in rhythmically bedded silt/clay and sand layers.

Contact between rhythmite layers above and a coarse sand (outburst) layer below.