

Appendix to Skagit River Flood Report.

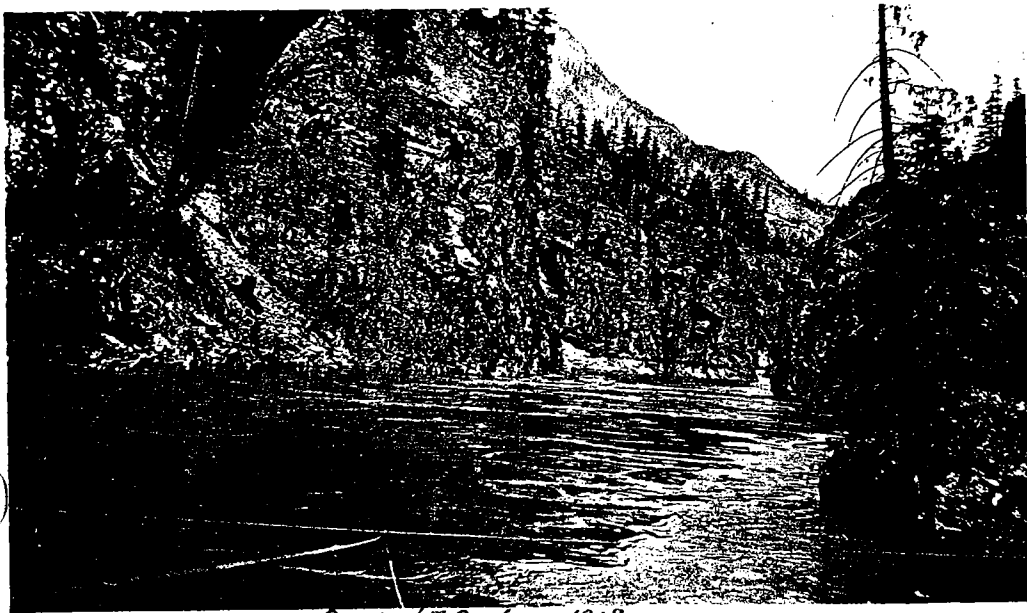
More data may at some time be desired in regard to the great flood of 1820 (approximate). Therefore, the following notes have been added to the original report.

From the study in the main text and on the curve sheets, it is fairly certain that this flood did not occur previous to 1810 nor subsequent to 1830. Very probably it occurred between 1815 and 1825. The year 1820 is the mean of these figures and has been used in the study. Large floods may occur any time during the winter. The limiting time of disastrous floods is, however, from about November 15 to January 15 for this region. Previous to November 15, the conditions of a large quantity of unpacked snow and a heavy warm rain seldom occur. After January 15 the snow is usually fairly well packed and will absorb a large amount of rain and yet not go off rapidly itself. The great flood, therefore, probably occurred between November 15 and January 15 within the limiting years of 1815 and 1825.

The Hudson Bay Fur Trading Company had posts on the Pacific Coast and in the Columbia and Frazier basins prior to the probable time of this flood. From some of their records now in the home office at London it is thought that the exact date of the flood may be obtained. Records kept by the Catholic Fathers in southern California show that many of the years from 1811 to 1828 were abnormal either as to drouth or floods. (See "Southern California floods of January, 1916," Water-Supply Paper 426) It must be remembered in

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this connection, however, that usually a time of drouth in southern California will be a time of floods in Washington and vice versa. Floods seldom occur in both places during the same winter.



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Flood marks on canyon walls above Reflector Bar gaging station.

It will probably be possible to determine the height of this great flood at Reflector Bar very closely. The picture shown above was taken from the cable about 100 feet downstream from the Reflector Bar automatic gage. This picture shows the marks of the 1909 and 1917 floods on the canyon wall about 700 or 800 feet upstream. Points to be noted are designated by numerals and arrows. No. 4 is the 1909 flood mark showing as a narrow horizontal line along face of cliff above crest of 1917 flood, <sup>designated by No 5</sup> Nos. 1, 2 and 3 are points on a rock slide a short distance downstream from the canyon wall on which the flood marks are. No. 1 is the point on

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this slide reached by the flood of 1820. No. 2 is the point reached by the 1909 flood, and No. <sup>3</sup>~~2~~ is the point reached by the 1917 flood.

In the spring of 1918 a hand level was used to obtain the difference in elevation of the 1909 and 1917 floods. The marks on the rock slide were used as a check on the marks on the canyon walls. It is very probable that the elevation of the crest of the flood of 1820 at this rock slide can be determined. River sand will doubtless be found up to crest of flood. Possibly pieces of cedar logs will be found driven in the crevices between rocks. To obtain this flood crest, it will be necessary to descend this slide from the trail leading to Ruby Creek. The difference in elevation of the 1909, 1917 and 1820 floods should all be determined at this time; also their height above water surface at the time of visit. In order to transfer the height of the 1820 flood to the gage, it will be necessary to find the slope of the water surface between the rock slide and the gage, during the flood. This can be determined very closely by comparison with the slope of water surface at time of visit and for the floods of 1909 and 1917.

At Sedro Wooley it may be of interest to examine some of the trees which have the flood marks on. The marks on the trees are made by the river mud adhering <sup>in</sup> on the crevices of the bark. The upper limit of this mud for the 1917 flood can be seen from a distance of about 100 feet, that of 1909 for about 30 feet, while for the Flood of 1820 it will probably be necessary to climb the tree and examine the deep crevices of the bark in order to determine

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of 1820 and no doubt the flood crest could be traced throughout the valley by the river mud in the crevices of the bark of old cedar and fir trees. This should be done as soon as possible, for the old trees are dying and being cut down rapidly.

As soon as a station is installed on Suiattle River, the height of the 1917 flood in relation to the gage should be determined. Possibly from mud in fir and cedar trees or from drift and beach lines, the crest of the 1897 flood can also be determined. The estimates given in the report can then be checked up. It is probable that the estimates as given for Suiattle River are too large rather than too small, since the run-off per square mile is greater than Sauk River at Darrington except for 1909. With a larger drainage area, the tendency would be for a smaller run-off per square mile, other things being equal.

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