



August 13, 2007

Memorandum for the Board of Skagit County Commissioners: Comments on USGS Scientific Investigations Report 2007-5159, "Re-evaluation of the 1921 Peak Discharge at Skagit River near Concrete, Washington"

Dear Commissioners,

This report reevaluates the roughness coefficient used to indirectly estimate the magnitude of the historic flood estimates of 1897, 1909, 1917 and 1921 in the Dalles vicinity near Concrete. We appreciate this work and believe it adds important information valuable in characterizing the nature of these historic, unrecorded flood events; however, this study alone is not nearly sufficient to form the basis for estimating the magnitude of these events. That's because it is based on the premise that the original estimate for the 1921 flood event was nearly correct. It was not. Consider:

- 1) The USGS report does not address the foundational issue of the initial overestimation of the original 1921 high water mark. Mr. Stewart transferred his observed high water marks from a hotel in Concrete 2.5 miles river miles upstream, not one mile he assumed; therefore, the effect of this is that Mr. Stewart would have significantly underestimated the drop in the river, thereby increasing his estimate of the discharge at the Dalles location. In addition to this foundational uncertainty, the USGS report also does not address the issue of the transfer of the staff gage readings to the new gage location, 200 feet downstream. This fall is likely 1.5 feet and would account for nearly a 10% reduction, by itself.
- 2) The reliability of Stewart's high water marks for the 1921 flood at the Dalles is unknown, but we know it could not have possibly been "within one or two tenths of a foot" as indicated in Water Supply Paper 1527. We know this because of this report and previous work the USGS did after the 2003 flood event, which showed high water marks surveyed many months after the event (as Stewart did) varied by many feet.
- 3) This report does not address the issue of Stewart's observation that none of the 4 historic floods spilled into the north overbank channel at the Dalles. Simple geometry shows that this would have occurred beginning at a flow of 180,000 cubic feet per second (cfs).
- 4) This report does not address the issue of the much lower coincident flow estimates of the same historic floods at Sedro-Woolley – 45% lower for the 1897 data point, and 13% lower, on average, for the other three. The recent NHC report stated that "it is not possible for the hydraulic model to reproduce the attenuation implied by the historic flood data. . . ." and further, went on to say that ". . . the consensus amongst the USGS reviewers of the 1950s was that the published Sedro-Woolley peak flows [already substantially below the Concrete published flows (comment inserted by Chal Martin)] were high and if that is the case then peak flow estimates at Concrete must also be high."
- 5) The report does not address the issue of the objective information we have gained from our research at the "Smith" house in Hamilton. This research indicates the largest discharge that the floods of 1909, 1917 and 1921 could be, is about 188,000 cfs.

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- 6) The USGS published (which were the same as Stewart's observed) high water marks at Sedro-Woolley for the 1897, 1917, and 1921 floods are lower than the observed 1995 flood stage. The 1909 high water mark is about a foot higher than the 1995 flood. While not conclusive, this information is an indicator that the four historic floods were just about the same magnitude as the 1990, 1995, and 2003 events. This is consistent with Stewart's observation that no overflow occurred at the north bank of the Concrete gage, is consistent with the Smith House high water marks, and is consistent with Fred Slipper's statement comparing the 1921 and 1990 high water marks at Hamilton (that is, the Slipper house only had a small amount of water covering the floorboards in 1921, and about 1.5 feet of water in 1990. After the 1990 flood, the house was elevated and is now the Hamilton museum which also serves as its council chambers.)
- 7) Extrapolation from eighty-two years of actual gage data at Concrete indicates the highest unregulated flow in that period was 200,000 cfs. It would be valuable to have a 200 – 300 year period of record, but in the absence of that, an 82-year record is long enough to get some sense of the nature of Skagit flooding.

We appreciate that the USGS has taken another look at these historic flood estimates. But they are still way too high. We are concerned that people will think that this USGS report authoritatively sets the new peak discharge estimates for the historic floods. But it does not. While it provides additional information, it cannot be used as a basis to set the discharge estimates for these historic floods. To do that, all of the issues raised above, need to be included in a complete technical evaluation.

This issue is of vital importance to the long term economic vitality and future quality of life for our area citizens. That quality of life is linked to the value of our property tax base. Growth in the property tax base is essential to provide important services including schools. Most people do not realize that the base flood elevations will go up, no matter which analysis is used. So there will be a handicap – it is already going to happen. At issue is whether our community will be handicapped for decades by overly conservative base flood estimates which follow from an incorrect analysis, or whether we will have a chance to, over years and perhaps decades, at least certify our levies and take other appropriate actions to protect ourselves from the externally-generated, administrative handicap that is being thrust upon us. We recognize the difficulty of, on the one hand, acknowledging the serious flood risk presented by the Skagit River, and on the other hand, protesting that the risk is overestimated. But it is a critical distinction that must be made. We hope we can count on your support.

Sincerely,



Chal A. Martin, P.E.
Public Works Director / City Engineer