OBSERVATIONS OF JAMES E. STEWART WORK PRODUCT BASED ON RESEARCH CONTAINED IN THIS PAPER

1. Due to the many questions concerning the accuracy of the Stewart data, all parties would be better served if they used the 80 years of observed flood flows at The Dalles gage to determine the 100 year flood frequency curves then unproven estimates provided by USGS which are based on the 1923 Stewart Report.

2. Extreme differences between the 1918 Stewart conclusions and 1923 conclusions. At Concrete he added 70,000 cfs to 1897 flood, 75,000 cfs to 1909 flood, and 45,000 cfs to 1917 flood. At Sedro-Woolley he added 19,000 cfs to the 1897 flood, 51,000 cfs to the 1909 flood, and 38,000 cfs to the 1917 flood. In his 1923 report he never mentions his work product in 1918. Neither does USGS when they published his work in 1961, 38 years after it was turned in. This begs the question, was he wrong in 1918 or was he wrong in 1923?

3. Captain Harry Taylor of the Corps of Engineers observed the flood flows on the Skagit River both in 1896 and 1897. Just 24 days after the 1897 flood he publishes a report that the level of the Skagit River at Sedro Woolley was 1 foot 6 inches above the 1896 flood event. James E. Stewart who saw neither the 1896 nor the 1897 flood events has the difference between the two floods at Sedro-Woolley at only 1.2 inches. Who would have more creditability? A Captain in the U.S. Army who saw the flood events or an engineer who saw none of the flood events and could only "estimate" the flood flows.

4. Stewart used a field notebook ("FN") to record his observations while in Skagit County. His handwritten notes have been transcribed and are included in this paper. Sometime between March 17, 1923 and his submittal of his preliminary findings in September 1923 he put together handwritten notes regarding his rough computations ("HWN") of his observations presumably from his field notebook. The two are often in conflict with each other. For instance:

    a. The FN records the level of the Skagit in the 1921 flood at the Sauk as being 2.8 feet above the 1909 flood. The HWN show the 1921 flood as being only 10.8 inches higher then the 1909 flood.

    b. The FN records the level of the 1921 flood at the Larson Ranch as being 1.9 inches above the 1897 flood and 2.8 inches below the 1909 flood. The HWN records the level of the 1921 flood at the Larson Ranch as being 1.2 inches above the 1897 flood and 3.6 inches below the 1909 flood.

c. The FN records the level of the 1921 flood at The Dalles as being 2 feet lower then the 1909 flood. The HWN "estimates" that the 1921 flood was one foot 3.6 inches lower then the 1909 flood. Also noteworthy is that the FN documents a log jam in The Dalles for the 1897 flood event that "raised water 10 feet in 2 hours". Clearly this would have impacted flood flows both upstream and downstream for the 1897 flood event. There is never any mention in Mr. Stewart's final report nor USGS's 1961 report of this phenomenon.

d. At Hamilton the FN records a notation taken from a local newspaper article which stated that the 1909 flood was 4" higher then the 1897 flood. The HWN come very close to documenting this having the difference between the 1909 and 1897 flood as 3.6 inches with the 1909 flood being the higher of the two. The HWN further state that the **1921 flood** was 3.6 inches **higher then** the **1909 flood and** 7.2 inches **higher then** the **1897 flood**. Although probably accurate based on local newspaper accounts of the 1921 flood it would appear to contradict all his other estimates.

e. The next entry in the FN is at Cockreham Island and is significant because it shows that Stewart took whatever information a local settler gave him as the gospel and put it in his work product. Mr. Cockreham told Stewart that the 1897 flood was "the highest on his place", and that the 1909 and 1917 floods were about the same height. The HWN show the following computations: The 1897 flood was 6 inches above the 1909 and 1917 floods which were the same height and that the 1921 flood was 1 foot 2.6 inches below the 1909 flood. Cockreham Island is just downstream of Hamilton. How did the 1921 flood go from being 7.2 inches higher then the 1897 flood to being 8.2 inches lower then the 1897 flood in such a short distance?

f. Finally, at Sedro-Woolley the FN documents a conversation between Stewart and a local resident named Mr. Hart. Hart tells Stewart that the 1896 flood was about 2 inches below the 1897 flood. Amazing in the final printed 1961 study which was as much Bodhines work product as Stewarts the final computation is 1896 1.2 inches below 1897. The HWN's which was clearly Stewart's computations doesn't even compare the two at this location. *(See Capt. Taylors observations at #3 above.)*

5. The FN also had a very long list of "things to do" at the back of the notebook. Many if not all of the things listed Stewart wanted to do were clearly never accomplished and could have had a significant impact on his report. This is very significant because it shows that at best Stewart's report was incomplete. Some of the more interesting items include:

a. On pages 142 and 143 he list individuals that he wanted to meet with. One of these individuals was Charlie Moses, an upriver Indian living near Bacon Creek. Important to remember is that this was in 1923 that Stewart made this notation. He clearly never got around to speaking with Charlie Moses because if he had Charlie Moses would more likely then not told Stewart the same thing he told the Courier Times reporter on December 22, 1921, just 10 days after the 1921 flood event: "it was the biggest flood with the biggest volume of water ever carried in the Skagit" *(Source: (**12/22/21 CT**)*

b. Under "Things To Do" there is no indication in the record that he ever completed the following:

   i. *#2. Study Baker Lake storage.* It is unclear if Stewart meant water in Baker Lake before dams or if he had knowledge that a dam was going to be built. Dam construction did not begin until April 1, 1924 but was being talked about in local press since 1917. Very likely he knew dam on Baker was proposed.

   ii. *#8. Go to Seattle libraries and look-over old histories for floods.* No indication he ever visited libraries in Seattle.

   iii. *#12. Investigate saddle at Concrete to see if any indication that recent flood passed through there.* This is extremely important due to the fact that the current competing hydrology studies for the Skagit has one of them passing water through this saddle and the other does not just like Mr. Stewart did although had Stewart finished all the things he had left to do he might have changed his findings.

   iv. *#15. Define limits of floods of 1856, 1897, 1909, 1917, 1921.* There is no indication in the record that Mr. Stewart neither did this in 1923 nor is there any indication contained in the 1961 USGS version that they attempted to do this.

   v. *#18. Get all data concerning floods and damages from newspapers.* Clearly Mr. Stewart did not complete this task. Had he done so he would have found the Courier Times and Concrete Herald articles (**12/22/21 CT**, **12/31/21 C.H.**) both of which state the 1921 flood carried a greater volume of water than any previous flood since the county was settled, surpassing even the famous high water of 1897. Both articles also talk about a widening of the river between 1897 and 1921, something that would clearly have impacted Stewart's work product. Measurements were purportedly

taken at The Dalles which showed the 1921 flood to be 2 feet above the 1897 flood event.

vi. The last item on his very long list of things to do was to obtain "the Taylor Report". Had he ever done this he would have seen the significant difference between his own findings and what Captain Taylor observed between the 1897 flood and the 1896 flood at Sedro-Woolley. ***(See #3 above.)***

6. When you combine all the flaws and inconsistencies in the Stewart work product it is no wonder that in November 1924, one year after receiving the Stewart Report, both Skagit County and the U. S. Army Corps of Engineers rejected Stewart's work as "more or less inaccurate". *(See Robert E.L. Knapp, Skagit County Engineer, Testimony for 11/26/1924 Hearing, and Notice and Minutes of Public Hearing, 1924)*

7. Even USGS in its 2/14/05 report referred to the Stewart Report as "*Stewart's study of historical floods in the Skagit River basin had, by today's standards short-comings, simplifications, incomplete documentation, no known photographic documentation, and took decades to review and complete the evaluation of flood hydrology for the Skagit River near Concrete.*" *(Source:* ***Review & Comments,*** "Draft Evaluation of Flood Peaks Estimated by USGS" by Robert D. Jarrett, Ph.D., USGS, National Research Program, 2/14/05)

8. In sum, is this really the quality of work product that we as a society want to rely on to make multi-million dollar decisions regarding flood control projects? I think not, and once again urge the decision makers at FEMA to use the 80 years of gage records as a much more accurate reflection of predicting 100 year flood flows on the Skagit River.

Respectfully submitted:

Larry J. Kunzler

RESEARCH TO SUPPORT OBSERVATIONS RE: STEWART FIGURES

Stewart 1918 Report

YEAR	CONCRETE[1]	SEDRO-WOOLLEY
1897	205,000 cfs	171,000 cfs
1909	185,000 cfs	169,000 cfs
1917	175,000 cfs	157,000 cfs

Stewart Report Appendix, *(1918)*

USGS RECORDS 1896-1921 FLOODS
Stewart 1923 Report

Date	Concrete		Sedro-Woolley	
11/16/1896			185,000	45.86 (S-W Gage)
11/18/1897	275,000	51.1	190,000	45.96 (S-W Gage)
11/30/09	260,000	49.1	220,000	47.56 (S-W Gage)
12/30/17	220,000	45.7	195,000	N/A
12/12/21	240,000	47.6	210,000	140,000[2] (MV)

2003 Flood Event

	Con.		SW	MV	
10/21/03	166,000[3]	42.21	42.02	129,000	36.19

Source: **Historic Flood Flows**

[1] The Dalles

[2] Extreme difference between Sedro Woolley and Mt. Vernon was due to break in dikes upriver on Burlington side of river. Source: COE report 1/31/25.

[3] Sauk River crested 107,000 cfs 18.89, 100 yr flood per USGS 11/10/03 Skagit Flood Control Meeting

Unregulated Concrete Estimated Historical Flood Levels
vs.
Gauged Flood Levels After 1925[4]

	Existing Corps Hyd Study		No Historic Data w/o Stewart	
Event	Unregulated	Regulated	Unregulated	Regulated
500	423000	309000	327000	250000
250	362000	275000	288000	227000
200	344000	264000	276000	220000
100	293000	233000	241000	198000
75	274000	221000	228000	189000
50	248000	204000	210000	177000
20	197000	168000	173000	151000
10	163000	143000	147000	131000
5	131000	118000	122000	111000

2003 Observed Flood Levels[5]

Gauge	Date	Time	Level	CFS
Concrete	10/21/03	6:15	42.21	166,000
Mount Vernon	10/21/03	23:15	36.19	129,000

Captain Harry Taylor Report 12/11/1897 Describing 1897 Flood

Sauk River……..6 feet 8 inches above 1896 flood.
Lyman……..2 feet 9 inches above 1896 flood.
Sedro-Woolley.....1 foot 6 inches above 1896 flood

Stewart Handwritten Field Notebook Nov 1922 – Jan 1923

Rockport…….1897 flood 6 inches higher then 1909. Assumed 1909 & 1897 same height.(pg 101)

Sauk…….1921 flood 2.8 feet above 1909 (pg 100)

[4] **Source:** Corps of Engineers H&H Division, March 2003
[5] **Source:** USGS Gauge Data October 2003

John Larson Ranch….1896 flood 3.6 inches below 1921 flood (pg 20)
(Upstream Concrete) 1897 flood 1.9 inches below 1921 flood (pg 20)
1909 flood 2.8 inches above 1921 flood (pg 20)

Town of Concrete…..1909 flood 2 feet above 1921 flood (pg 23) At Everett Ranch above Concrete Magnus Miller says 1897 water came to middle of 2nd shake. About 3 feet above beam for rafters. This was shed on side of old barn. Water came to foot of steps to house. Did not get in house. May have came up on step a little. Leonard Everett says 1909 flood came just to bottom of shakes. Makes 1897 flood 2 feet above 1909. (pg 141)

Dalles…….1897 flood 3.6 feet above 1921 flood (pg 23)
1909 flood 2 feet above 1921 flood (pg 23)
Leonard Everett says 1897 flood about 9" lower than 1909. Says that **log jam in Dalles** raised water 10 feet in 2 hours. (pg 23)
He is wrong probably see bottom half of page 141.[6] See bottom of pg 18 for true comparison of 1909 & 1921[7] (pg 23 note written 3/24/23) (**NOTE**: This is significant because Stewart was in Pittsburg, PA at least by March 17th. See **Page 1 of notations taken from field notes regarding Skagit River Flood Level)**

Hamilton……1909 flood 4" higher then 1897 (quoting fm Hamilton Record-pg 98. The Hamilton Record was the forerunner to the Concrete Herald.)

Cockraham Is…… Mr. Cockraham (sic) farm was about 1,000 feet above the Lyman Ferry. (pg 135) 1897 flood was the highest at his place. 1909 and 1917 about the same. (pg 135) Mr. Cockraham (sic) says old Indian about 90 does not remember flood that drowned Indians but remembers flood several feet higher than 1909 and 1921. 1856 flood probably made HWM seen by Hart. (pg 135)

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[6] Bottom of page 141 says 1897 flood 2 feet above 1909 at Everett Ranch.

[7] Bottom of page 18 has 1909 flood 1.27 feet above 1921. Appears to have been written on Dec 20, 1922. However this measurement was taken at Washington Cement Plant above and adjacent to Baker River. Mark found is questionable because prior to the building of Baker Dam a earthen dam was placed upstream to generate electricity for the cement plant. It never withstood any flood event. Marks at Cement Plant could have been any number of flood events prior to 1909. *See 1951-06-21 Baker Water Power.pdf.*

Upriver……M. Costello (logger who came after 1909 flood) told Stewart 1909 flood at least 22 inches higher than any flood in 22 years. (pg 122)

Skiyou Ferry…….. Anderson says 1917 and 1921 highwater practically the same. He thinks 1909 about 6 inches higher than 1921 at his place and 1897 about 1 foot higher. (pg 131)

Sedro-Woolley……Hart saw 1896 about 2" below 1897. (pg 125)
Hart says 1896 nearly same height as 1917 and not over 2" below 1897. 1909 flood 16 inches above 1917. 1921 flood .075 feet below 1917 (pg 127)
Note: Sto descrip 9-197 12/11/16 GLP gives 1909 flood 56.1; Nov 1896 54.79; Nov 1906 54.7 (pg 128)

Beatty Slough…….Beatty says he came in 1878. 200 or 300 feet above County highway bridge. 1909 highest water he has ever seen. One spring freshet about 1882 the water was red and made the people sick. Possibly this was clay or something that would stain bark like the old extreme flood. (pg 137)

Hart Island……..Hart says he tried to dig out large stump of old cedar tree. He dug down 5 feet and didn't reach the roots of the tree. A Cedar grows on the surface of the ground therefore, the 5 feet of soil was accumulation of river silt after tree started growing. (pg 139)

Mt. Vernon…….1894 Mt. Vernon went underwater in May (pg 98)
Assessor says 1897 flood about 1 foot higher than 1896. (pg 122)
1906 flood 1 ft below dikes. (pg 122)
Oldtimers stated that 1897 only time waters reached downtown Mt. Vernon. (pg 123) ***NOTE:*** *See Stewart comment on pg 98*
Mt. Vernon gage 1896 23.0; 1897 23.2; 1906 23.9; 1909 25.1; 1917 23.6; 1921 25.0 (pg 125)
1896 flood did not top dikes while 1897 did. (pg 125)

Sometime after January 20, 1923 Stewart writes in his notebook beginning at page 140 the following:

> Possible sources of information as to flood marks:
>
> **Concrete**: See Otto Presentine near Grassmere. Kauhman on left side of River may have 1897 mark. Mr. Bratton at old Bratton Ferry marked old floods. Possibly was not there in 1897. See Magnus Miller again about 1897 flood. Mrs. Hamilton on Bensons Slough would know possibly where 1897 marks were. Ask Magnus Miller when cabin was built at Dalles. Examine cabin at Dalles for mud in walls. (pg 140)

Indians: Napoleon. A. Shaker at VanHorn medicine man on Suiattle. Joe Camel Broke a Toe at Concrete. Jimmy Sius on Suiattle. Dan Dillard can tell about where Indians are. Jasper Gates at Mt. Vernon knows about Indians. Eugene English also knows about Indians. (pg 140)

Hamilton: Old log house in lower edge at Hamilton below school house just across creek. Possibly 1897 mark in crevices. Henry Carey 1½ miles above Hamilton can give 1897 flood probably. Considered very intelligent man by others also said to have good memory. (pg 141)

Concrete: At Everett Ranch above Concrete Magnus Miller says 1897 water came to middle of 2nd shake. About 3 feet above beam for rafters. This was shed on side of old barn. Water came to foot of steps to house. Did not get in house. May have came up on step a little. Leonard Everett says 1909 flood came just to bottom of shakes. Makes 1897 flood 2 feet above 1909. (pg 141)

Sauk and Vicinity: S. B. Ellison and E.G. Ellison on Sauk River 1½ miles above mouth have all floods. Probably E.G. best and marks at his place. These marks indicate Sauk alone probably-possibly some backwater from Skagit. Hank Stafford at Sauk can possibly give 1897 flood. Algy Parker ½ mile downstream from Sauk left side can probably give 1897 flood. Old Mrs. Wainright or Harry Wainright may have 1897 HW. City of Seattle J.B. Dodge 1400 Alaska, Skagit River Development. J.M. Waters box 102 Rockport. Ed O'Brien Marblemount RFP 2 miles this side of Marblemount. Alec Stafford Hamilton. Stafford in town Rockport ranch on other side of river. Martin Rockport 5 miles up. Lyman Martin Indian Bacon Creek. Charlie Moses Indian Bacon Creek, good man.[8] William Nubey ½ way Rockport Marblemount. Ed Presentine Rockport. Harry Wainright Sauk. Jimmy Jones 2 miles below Rockport Indian. Johnny Towne Bennet Bros Store, 6 miles not Darrington. Skagit Boom at Van Horn Indian with Napoleon. (pgs 142 & 143)

Skagit County History: Ross was clerk at Astor Co. at Okanogan Post established fall of 1811. Pacific Fur Trading Co. headed by John Jacob Astor started in 1810. Northwest Fur Trading Co. had no posts south of 52º North and west of Rockies in 1810. Toriquin (sic) Astors ship arrived at mouth of Columbia March 22, 1811. Details of voyage in Irving's Astories and Franchores narrative. Ross Cox author of Adventures of Columbia River. Fort Vancouver on the Columbia established in 1824. Fraser River gold excitement in 1858. (pg 143)

[8] It was Charlie Moses who was quoted in the 1921 Courier Times article saying the water in 1921 flood at The Dalles was 2 feet above all the other floods. *See* **12/22/21 CT**. This is good indication Stewart never talked to Charlie Moses.

Things To Do:[9]

1. Get dredge data. Probably about .80 cents per cubic yard.
2. Study Baker Lake storage.[10]
3. Get exact date NP was built through Sedro. 1890 per Hart.
4. Get exact date NP trestle was replaced by fill. 1900 or 1901 per Hart.
5. Get grade of stream bed Sedro Woolley to mouth probably can obtain from Army Engineers report.
6. Enlarge 1909, 1914, 1917 and 1921 flood crests to 1861 size and find discharge acreage at Concrete.
7. See jomv (sic) about rights to riverbeds. Roberts says law was passed for Puyallup so that bed reverts to reclamation project.
8. Go to Seattle libraries and look-over old histories for floods.
9. Find when Canadian Pacific Ry was put through. Possibly get flood data from them on Fraser River.
10. Examine Bench (marks) downstream from Power Camp to see if any indication of flood that left them and if there has occurred a higher flood than 1856 in recent history.
11. See Charlie Presentine again and see if there is any virgin ground where we can dig to find leaves that he said had been covered up by extreme flood.
12. Investigate saddle at Concrete to see if any indication that recent flood passed through there.
13. Get soundings where USGS topo and Army maps do not cover bays.
14. Find head at old delta prior to present delta.
15. Define limits of floods of 1856, 1897, 1909, 1917, 1921.
16. Run level line from Sterling bend to coast.
17. Get loss suffered by flood districts.
18. Get all data concerning floods and damages from newspapers.
19. Cost of dikes to protect old channel.
20. Salvage value at old channel.
21. Put in slope stations possibly Sedro, just above Hamilton and from Concrete Ferry to bend above Dalles.
22. Get flows at tributaries at time of great flood, possibly at narrowed sections. Consult map.
23. Study possibility of River Control by dams.
29.[11] Cost of moving all people out above detention reservoir at The Dalles.
30. Study plan for detention reservoir and necessary additional dikes.

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[9] The page numbering stopped. Also no date indication as to when Stewart wrote these notes. Could have been things he wanted to do when study began OR things he wanted to do after January 1923. **In any event it shows that his "study" was incomplete as many of these things were not done for his final "preliminary" report in September 1923.**

[10] Unclear if Stewart meant water in Baker Lake before dams or if he had knowledge that dam was going to be built. Dam construction did not begin until April 1, 1924 but was being talked about in local press since 1917. Very likely he knew dam on Baker was proposed given second #10 note.

[11] No indication of why Stewart skipped numbering.

31. Get coast and geodetic soundings in Skagit and Padilla Bay and dates. Be sure and get oldest soundings.
32. Get HW levels above and below NP grade at Sedro. Get HW 1921 at Mt. Vernon gage.
33. Get 1921 HW above ws at BM #7 US Army.
34. Get distance from BM #6 to Fesszers Ranch.
35. Examine sand in tree at BM #6 to check 1921 HW at that place.

1.[12] Find out earliest settlement in BC, also earliest fur trading posts on rivers in BC.
2. Find oldest and largest solid cedar stump. Find depth of roots and count rings for age. Get rate of deposition per century.
3. Study possibility of diverting part of flood flows from new constructed channel to old channels and sloughs to fill them up.
4. Possibility of tidal gates to keep down stage of mouth of stream at high water.
5. Dam below Concrete to store total flow of Skagit River. Raise water to about elev. 450 feet probably depending on bedrock at Darrington. Dam at low water point of about 145 feet. This to be reduced to 100 feet by new channel net 350 feet. Dam probably 400 feet high.
6. Drift barrier at The Dalles to reduce flow and hold back drift until new channel below Hamilton reduces low water about 40 or 50 feet at The Dalles.
7. New channel below Hamilton to Padilla to carry 100,000 sec feet. 8 feet in 10,000. Dredge cut side trenches, start upper end and build levees. Place concrete facings to embankment to below cutting of stream.
8. Channel Sterling Bend to Padilla. Encircle Sedro so as to later cut channel from Hamilton to connect north of Sedro.
9. Ship channel sea to storage dam.
10. Dam on Skagit above Baker and below Sauk. Diversion dam on Baker to storage dam. . . .[13] Storage in Ruby dam. Study . . .[14]

The following notes were not numbered.

Get BM elevations Army Seattle.
Get Sacramento flood reports Army.
See Unden (sic).
Get rating table.
See Landes Skagit diversion to Stillaguamish.
Get BM's for Wickersham sheet.
See Roberts and Puyallup.
Write for Hudson Bay company records.
Get good stop watch.

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[12] No indication why Stewart re-started numbering or when he wrote this list.
[13] Unreadable text.
[14] Ibid.

Take along my flood report.
Get Army maps for Gilkey.[15]
Send for Taylors flood report.[16]

The next 14 final pages in the notebook are not the same handwriting as contained in the rest of the notebook. Names that appear at the top of the pages dated March 3rd through March 8th, 1923, are Wright, Theret and H.O. Stiles. The Washington State Archives, located in Bellingham Washington has confirmed that Mr. Wright was the Skagit County Assistant Engineer and Mr. Theret was also a County employee and an assistant to Mr. Wright. H.O. Stiles was a Concrete resident who sometimes assisted County survey crews. Measurements were taken on these days at Sedro-Woolley and The Dalles. What this shows us is that Mr. Stewart was not in Skagit County to observe the work of the County employees.

JAMES E. STEWART HANDWRITTEN NOTES

Contained in the USGS files were copies of James E. Stewart's handwritten notes indicating where he took flood measurements and the difference between the water surface and the flood elevation marks he reportedly observed. The document was undated so I have no idea when it was prepared however clearly it was prepared after March 17, 1923 and before September 1923. (***See*** **Page 1 of notations taken from field notes regarding Skagit River Flood Level, Page 2 of notations taken from field notes regarding Skagit River Flood Level)** Mr. Stewart had a propensity for writing very small and always used a pencil. In an attempt to transcribe his notes there is room for error. I enlarged his notes to a 11 x 17 piece of paper in order to obtain as much clarity as I could. Clearly when comparing the notes on these two pages with the notes in his field notebook there are huge discrepancies which to this day are unexplained.

James E. Stewart Handwritten Notes

PLACE	DATE	DIFFERENCE BTWN W/S AT DATE AND HIGHWATERS
Rockport	1/28/23	1897 = 18.1 1909 = 17.6 1917 = 17.5 1921 = 17.6
Sauk	1/28/23	1897 = 19.2 1909 = 18.1 1917 = 16.2 1921 = 19.0

[15] Frank Gilkey was the Skagit County engineer who retired in March 1923. Ironically the same month Stewart quit USGS. See 1923-3-10 Frank Gilkey.pdf)

[16] This is very likely Capt. Harry Taylor's 1897 flood report. Capt. Taylor says flood of 1897 at Sedro-Woolley was 1.6 feet above 1896 flood event. Stewart says the difference was only 1.2 inches above 1896 so he clearly never reviewed Taylor's report.

James E. Stewart Handwritten Notes		
PLACE	**DATE**	**DIFFERENCE BTWN W/S AT DATE AND HIGHWATERS**
Faber Ferry	1/28/23	1921 = 25.5
John Larson's Place	11/27/22	1894 = 15.5 1896 = 21.6 1897 = 21.8 1909 = 22.2 1921 = 21.9
1400 feet Above The Dalles	11/24/22	1856 = 38.2 1909 = 31.0 1921 = 39.6 ??
The Dalles at the Head of the Dalles	11/25/22	1820 = 53.2 1856 = 42.1 1897 = 36.5 1909 = 33.3 (Est) 1921 = 32.0
At Lower End of The Dalles	11/25/22	1820 = 43.1 1856 = 38.9 (Est) 1897 = 39.0 1909 = 28.6 1921 = 27.1
At Upper End of Slope Section	1/31/23	1820 = 45.0 (Est) 1856 = 36.6 (Est) 1921 = 21.2
At Lower End of Slope Section	1/29/23	1820 = 39.8 (Est) 1856 = 32.3 1921 = 24.8
Fessler's Ranch	11/28/22	1820 = 40.7 (Est) 1856 = 33.3 (Est) 1909 = 26.6 1921 = 25.9
Presentine Ferry	11/28/22	1897 = 24.0 1909 = 22.5 (Est) 1921 = 21.2
Hamilton	11/27/22	1897 = 15.8 1909 = 16.1 1917 = 15.5 1921 = 16.4
Cockerham Island	12/12/22	1894 = 14.4 1897 = 17.9 1909 & 1917 = 17.4 1921 = 16.2
Sedro-Woolley	12/12/22	1820 = 30.0 1856 = 26.4 1897 = 21.2 1906 = 21.1 1909 = 22.9 1917 = 20.5 1921 = 20.7

Since the readings were based on water surface elevations on a given day and there is more than a slight degree of probability that the surface elevations were different on November 24, 1922 then they were on January 31, 1923 wouldn't this impact Stewart's observations?

In 1924, Colonel Barden of the Corps of Engineers held a public hearing in Skagit County to discuss the future of flood control in Skagit County. At that public hearing, one year after the submission of the Stewart Report in October 1923 Colonel Barden stated the following:

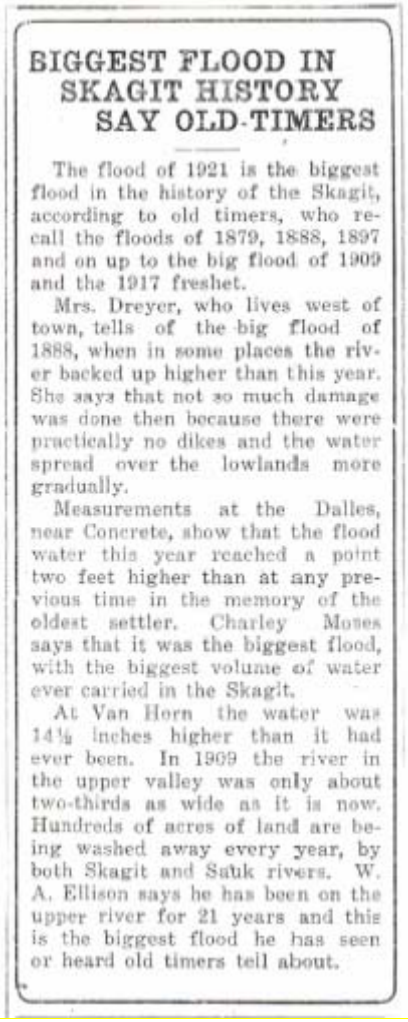
> I would like to emphasize the point that Mr. Knapp[17] brought out in his paper, that before any really scientific plan can be prepared for the protection of this valley from floods, it is necessary to have more authoritative information then we now have as to the amount of water carried by the river in time of floods. . . . The information that was collected by Mr. Stewart and given in his report to the committee was excellent so far as the data that he had to work upon permitted, but that data was necessarily more or less inaccurate. (Source: **Notice and Minutes of Public Hearing, 1924)**

USGS in its feeble attempt to conduct an "independent review" of the Stewart Report stated the following:

> Stewart's study of historical floods in the Skagit River basin had, by today's standards short-comings, simplifications, incomplete documentation, no known photographic documentation, and took decades to review and complete the evaluation of flood hydrology for the Skagit River near Concrete. (Source: Review & Comments, **"Draft Evaluation of Flood Peaks Estimated by USGS" by Robert D. Jarrett, Ph.D., USGS, National Research Program, 2/14/05)**

Very near the end of the Stewart Field notebook at approximately page 140, there is a long list of notes he made to himself on things he had left to do in order to finish his "study". Among the list was a notation at number 18 which stated "Get all data concerning floods and damages from newspapers." Another notation was to interview a man by the name of Charlie Moses, an upriver tribal member who according to Stewart's notes lived near Bacon Creek and was "a good man". It is clear from reviewing this list that Stewart never completed the things he viewed necessary to complete his work. If he had done these things, like the local newspaper did, he would have discovered the following:

[17] Mr. Knapp was the Skagit County Engineer who worked closely with Mr. Stewart and his comments can be viewed in their entirety at **Robert E.L. Knapp, Skagit County Engineer, Testimony for 11/26/1924 Hearing**.



BIGGEST FLOOD IN SKAGIT HISTORY SAY OLD-TIMERS

The flood of 1921 is the biggest flood in the history of the Skagit, according to old timers, who recall the floods of 1879, 1888, 1897 and on up to the big flood of 1909 and the 1917 freshet.

Mrs. Dreyer, who lives west of town, tells of the big flood of 1888, when in some places the river backed up higher than this year. She says that not so much damage was done then because there were practically no dikes and the water spread over the lowlands more gradually.

Measurements at the Dalles, near Concrete, show that the flood water this year reached a point two feet higher than at any previous time in the memory of the oldest settler. Charley Moses says that it was the biggest flood, with the biggest volume of water ever carried in the Skagit.

At Van Horn the water was 14½ inches higher than it had ever been. In 1909 the river in the upper valley was only about two-thirds as wide as it is now. Hundreds of acres of land are being washed away every year, by both Skagit and Suiuk rivers. W. A. Ellison says he has been on the upper river for 21 years and this is the biggest flood he has seen or heard old timers tell about.

Source: Courier Times 12/22/21 (**12/22/21 CT**)

Not only does the article document from several sources that the 1921 flood was higher than the other historic floods but they interviewed Charlie Moses, the man Mr. Stewart had on his list of things to do. There is no reason to believe that had Mr. Stewart interviewed Mr. Moses that Mr. Moses would have told Mr. Stewart anything different in 1923 then he told the newspaper just ten days after the flood occurred.

If that was the only local news article that came to that conclusion perhaps it would not carry the weight that it does. However, a week later the Concrete Herald ran the following story:

FLOOD WAS HIGHEST IN SKAGIT COUNTY HISTORY

Old timers in the Skagit valley, who have seen all the floods in the Skagit valley since the early 80's say that the recent flood carried a greater volume of water than any previous flood since the county was settled, surpassing even the famous high water of 1897. The fact that the river did not reach marks set in former years at some points in the upper valley is accounted for by the widening of the river since that time. In all places where the banks of the river have remained unchanged the **1921 mark is considerably above that of any previous flood known to settlers.** ***(Source: Concrete Herald 12/31/21 C.H.)***

Further, when one reviews the newspaper articles concerning the 1909 flood in Burlington and compares it to the 1921 flood it is clear that the 1921 flood was more damaging even in the lower valley then the 1909 flood was:

> Burlington had about one foot of water in some of the streets, and there were many buildings over the town that were not even surrounded by water. ***(Source: 12/3/09 B.J.)*** Thursday was a great day in Burlington and many talked of camping on the heights Tuesday night, but the change came about noon, the water went down rapidly and Burlington has perhaps received less damage then any other town on the Skagit. ***(Source: 12/3/09 The Journal)***
>
> Monday night, December 12, the dikes east and southeast of Burlington broke. Tuesday morning at six o'clock the flood water covered Fairhaven Avenue, and in part the residence districts of the city. At this time the entire lowlands lying east, west, south and in part northwest of Burlington were inundated. The depth of water is on relative, the lamentable fact being that the area of low lands covered with water was wide-spread. ***(Source: 12/16/21 B.J.)***

Had Mr. Stewart ever gotten around to completing his long list of "things to do" his report might have had a degree of creditability. At best, his report is incomplete and never should have been published 40 years after the fact by USGS and blindly accepted by the Corps of Engineers as "best available scientific information". There is nothing even remotely resembling science in Mr. Stewarts report.