
From: Chal Martin
Sent: Thursday, February 25, 2010 11:00 AM
To: 'Stephen F Blanchard'
Cc: Albert Liou; Cynthia Barton; Dan Berentson; Long, Kevin; LornaEllestad; Carey, Mark; Malcolm Leytham; Robert R Mason; Ike, Ryan; Jerad D Bales; Michael Nolan; Mark C Mastin; Robert A Kimbrough
Subject: RE: Request for USGS Participation in a Technical Conference: Skagit River WA Hydrology

Mr. Blanchard, I have included our responses here. We are still hopeful that the new information we have compiled, in response to the most recent USGS review, will tip the scale back toward a decision to provide a representative at the conference. I realize we have been difficult "customers" in the past and we are trying to tone down our often-times emotional responses. One thing I expect has been exasperating to the USGS, is that we keep coming back with tidbits of information that we have developed, any one of which individually is not sufficient to tip the scale. But we think we now have all of the information compiled that is going to be compiled. We are at an end point with our technical analysis and ready for a technical discussion with all interested parties.

Our community has made a very large investment in developing information to reduce the uncertainty surrounding the magnitude of the historic Skagit river floods. We believe the resolution of this issue is fundamental and critically important to the future quality of life of our constituents. We are asking you to please bear with us, one more time. Thank you. Chal

Chal A. Martin, P.E.
Public Works Director / City Engineer
City of Burlington
833 South Spruce Street
Burlington, WA 98233
(360) 755-9715 Office (360) 755-0783 FAX
cmartin@ci.burlington.wa.us

From: Stephen F Blanchard [mailto:sfblanch@usgs.gov]
Sent: Wednesday, February 24, 2010 9:42 AM
To: Chal Martin
Cc: Albert Liou; Cynthia Barton; Dan Berentson; Long, Kevin; LornaEllestad; Carey, Mark; Malcolm Leytham; Robert R Mason; Ike, Ryan; Jerad D Bales; Michael Nolan; Mark C Mastin; Robert A Kimbrough; Blanchard, Stephen F
Subject: RE: Request for USGS Participation in a Technical Conference: Skagit River WA Hydrology

Mr. Martin,

Since 2003, the U.S. Geological Survey (USGS) has been very actively involved with the Skagit Valley community in re-evaluating our historic flood data for the Skagit River. We recognize the critical importance of this issue to the community for flood protection and economic development. I can assure you we have taken your concerns and questions seriously.

The list below describes some of the work which the USGS has performed on your community's behalf since 2003:

1. We freely opened our archives related to Mr. Stewart's flood studies to the community for their review and scrutiny. ***[Martin, Chal]*** The ability to view Stewart's original work has provided insight into his competent and conscientious approach, and has been a treasure trove of information. We appreciate USGS' willingness to make Stewart's original work available.

2. Our USGS Washington State and National flood experts carefully went over Mr. Stewart's field notes and analyses, as well as field notes and analyses of a number of hydrologists that succeeded him in studying flooding on the Skagit River. ***[Martin, Chal]*** Acknowledged, and thank you.

3. We spoke to the community about our recent investigations of this historic data at public meetings. ***[Martin, Chal]*** Acknowledged.

4. We visited the measuring sites and did some preliminary paleoflood investigations and brought in experts in Cascade Mountain runoff, debris flows, and geomorphology to evaluate any potential impacts to the historic flooding. ***[Martin, Chal]*** I am not sure if there was any write-up or synopsis of conclusions? We are interested in this and would like to see if so. Regarding debris flows, Stewart's notes, page 23, state "*Leonard Everett says 1897 flood about 9" lower than 1909. He says that log jam in Dalles raised water 10 ft in 2 hrs*." I would note that the USGS official discharge estimate for 1897 at Sedro-Woolley is 190,000 cfs, while the current official estimate at Concrete is 265,000. Stewart's information downstream of the Dalles indicates the 1897 high water marks were similar to 1909. The 1897 flood could well have been a debris-blockage flood. More generally, the coincident flow issue between Concrete and Mount Vernon is an indicator that either the Sedro-

Woolley estimates are too low, or the Concrete estimates are too high. The hydraulic model developed by the Corps would indicate the discharges at Sedro Woolley, on average, for big Skagit flood events, should be higher, not lower than Concrete. To my knowledge, no one has ever said the Sedro-Woolley historic estimates are too low. This issue is not a basis for our analysis, but it is, and continues to be, an indicator that something is amiss. This issue was not discussed in the USGS published reports.

5. In order to re-evaluate the 1921 peak discharge estimate, we collected and analyzed additional flood data in 2003 and 2006 and published the results in two formal USGS reports (references below). Based on these studies, the USGS decreased the 1921 peak discharge by 5 percent. ***[Martin, Chal]*** These reports added much valuable information to the study.

6. We reviewed the analyses of the community's consultants including PIE and Northwest Hydraulics Consultants. This includes the report associated with the modeling done fairly recently upstream of the gage. We feel that it would be irresponsible for us to revise our flood estimates using this work given uncertainties associated the reach chosen for the modeling. ***[Martin, Chal]*** The extension of the hydraulic model upstream from the gage at the Dalles, to the Concrete location, has been criticized by the Corps. I am not an expert here but as I understand it, the criticism is that the model cannot accurately determine the water surface levels through the Dalles gorge. Again, I am not an expert, but I must say that this criticism completely misses the point. We certainly know with precision the water surface level at the Dalles gage site. And we certainly know with precision, the water surface elevation at the Baker gage, which is very near the Crofoot's Addition. And although the model can't be calibrated exactly through the few hundred feet upstream of the Dalles gorge, it can be calibrated quite accurately (certainly, within a half of a foot and probably closer than that) at the Crofoot's Addition to Concrete, and at the Baker River gage. And that is the purpose of the hydraulic model, to compare the water surface elevations in the Crofoot's Addition, to Stewart's high water mark survey (page 23 and 30 of Stewart's notes) to the water surface elevations shown by the hydraulic model. Given the discharge information the model is providing, we think the responsible way forward now is to focus on the specifics of the two approaches – the slope-area study provided by the USGS, and two variations of the hydraulic model study provided by Skagit County's and the City-Dike District consortium's consultants. That is the focus of the technical conference we are proposing. We would really like to engage in this discussion with a number of interested parties, as well as the USGS. After our consultants met with Mark Mastin to review the information our analysis was providing, we have focused on answering the questions Mark raised. It is my understanding that Mark was surprised that the hydraulic modeling approach was returning such different numbers than the slope-area approach. We are preparing a technical memo on these issues and the memo will be completed next week, to be provided as a read-ahead document for discussion at the technical conference.

7. We requested that Bob Jarrett, a USGS National Research Program hydrologist review and provide feedback on the modeling work of your community's consultants. ***[Martin, Chal]*** We appreciated Dr. Jarrett's review. Dr. Jarrett wrote his February, 2005 review, *"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. . . . I believe much of the uncertainty in the historical flood estimates that can be evaluated now resides in factors that likely may remain unknown (unless someone can find newspaper records, diaries, or other historical documents) and need to be evaluated."* Since this time, we have focused much more on the content of Stewart's notes. It fascinates me to think about one person, with the help of a small crew, conducting this study. He was familiar with the basin, having also conducted an earlier study in 1917. Still, he really cranked out the work. To me, the notes clearly convey an extremely competent and conscientious researcher who was thinking hard about how to make all the information fit together. In my view, Stewart's work was incredible, really, for the resources and information he had at the time. Since Dr. Jarret's review, we have conducted studies in Hamilton and at Concrete. We have checked historical records and added significant new information. We believe we do have significantly more information now than Dr. Jarrett had access to when he conducted his review. I agree and would concede that in February, 2005, we had not developed the technical information adequately to change the estimates, as Dr. Jarrett concluded.

8. We answered numerous questions from the consultants, the Corps of Engineers, and FEMA related to our data, collection methods, and analyses. These questions included ones related to high water marks, the measuring datum, and roughness coefficients. ***[Martin, Chal]*** We appreciate that and appreciated Mark Mastin meeting with our consultants to discuss the differences the two approaches were returning. However, the most important question about the 1.8-ft difference between the gage datum Stewart used in his survey and the gage datum all USGS published historical flood elevations used, remains unanswered. We would sincerely appreciate your participation in the conference to clarify this datum discrepancy. We believe we now have sufficient evidence, based on Stewart's work, to demonstrate that all published data for the historical floods are based on an incorrect gage datum. We need USGS participation to try to resolve this discrepancy, because if our analysis is true, the USGS estimated 228,000 cfs for the 1921 flood would be incorrect. Additionally, the head loss associated with the transfer of the data from the upper Dalles gage to the current location, although it cannot be determined exactly, is an important factor and should be included in a discussion to address this uncertainty. This factor could further reduce the stage estimate of the historic events by another 1 – 1.5 feet. And there are other issues we have analyzed. This is new information.

9. We held a one-day meeting in Reston several years ago with the PIE consultants, a Skagit County Commissioner, Bob Kimbrough, Mark Mastin, and me. ***[Martin, Chal]*** I concede we did not have sufficient information at that time to cause the historic estimates to be changed.

10. We have done a formal response to a congressional inquiry, several county responses to their inquiries, public meetings, many private meetings with the consultants. ***[Martin, Chal]*** Acknowledged and thank you.

11. John Costa, our USGS National Flood Coordinator (now retired), and Mike Nolan, our USGS Western Region Surface

Water Specialist, have all reviewed the historic data. ***[Martin, Chal]*** Thank you. I am not sure I have seen these reviews. However, assuming these reviews were performed several years ago, the reason for our request to attend a technical conference now is because we have new information since those reviews were performed.

The USGS considers the peak-discharge estimate of 228,000 ft^3/s for the 1921 flood on the Skagit River near Concrete as documented in the USGS Scientific Investigations Report 2007-5159 as the best estimate of the 1921 peak discharge. It utilizes modern indirect hydraulic analysis at a relatively uniform site selected to minimize complications in the flow hydraulics. Also, it utilizes high-water-marks and channel geometry data surveyed soon after the peak, and it does not require the data to be tied to an elevation datum.

The USGS is always willing to consider historic flood information, but as far as we know we have considered and evaluated all currently available information and nothing better exists than the work done by Mr. Stewart after the flooding and recently re-evaluated by the USGS. We would be willing to listen to suggestions from a group such the National Academy of Sciences or participate in collecting additional historic information using paleoflood techniques if such work would help clarify issues for the community. In summary, given the extensive work we have already done and the lack of any new compelling field information, I do not see how another meeting would be productive at this time. As a result, we respectfully decline to attend the proposed workshop. ***[Martin, Chal]*** We don't have new field information, but we do have responses and analysis of the questions Mark raised in his meeting with our consultants a few months back. We think that these responses, which focus specifically on the slope-area reach and relevant to the USGS 2007 study, are consistent with Stewart's work, new to the issue, and important to the discussion. We very much hope for your reconsideration. - Chal

Sincerely,
Stephen Blanchard

Mastin, M.C., 2007, Re-evaluation of the 1921 peak discharge at Skagit River near Concrete, Washington: U.S. Geological Survey Scientific Investigations Report 2007–5159, 12 p.

Mastin, M.C., and Kresch, D.L., 2005, Verification of 1921 peak discharge at Skagit River near Concrete, Washington, using 2003 peak-discharge data: U.S. Geological Survey Scientific Investigations Report 2005-5029, 18 p.

****

Steve Blanchard
Chief, Office of Surface Water (http//water.usgs.gov/osw)
Delaware River Master (http//water.usgs.gov/osw/odrm/)

U.S. Geological Survey 703-648-5629
National Center, MS415 571-216-1423 (cell)
12201 Sunrise Valley Drive 703-648-6693 (FAX)
Reston, VA 20192 sfblanch@usgs.gov

From: "Chal Martin" <chalm@ci.burlington.wa.us>
To: "Stephen F Blanchard" <sfblanch@usgs.gov>
Cc: "Cynthia Barton" <cbarton@usgs.gov>, "Robert R Mason" <rrmason@usgs.gov>, "LornaEllestad" <lornae@co.skagit.wa.us>, "Dan Berentson" <danb@co.skagit.wa.us>, "Albert Liou" <albertl@pie-pllc.com>, "Malcolm Leytham" <MLeytham@nhc-sea.com>, "Ike, Ryan" <ryan.ike@dhs.gov>, "Carey, Mark" <mark.carey1@dhs.gov>, "Long, Kevin" <Kevin.Long@dhs.gov>
Date: 02/23/2010 11:26 AM
Subject: RE: Request for USGS Participation in a Technical Conference: Skagit River WA Hydrology

---

Mr. Blanchard,
We are hoping to set up this conference March 17-18 in Washington D.C. A large amount of information has been developed regarding the Skagit hydrology, and the conference will need to be focused in order to adequately cover the key elements. To achieve that focus, we think the central discussion must be the 1921 peak flow estimate. In that regard, we expect we will be reviewing two approaches that have been developed to reevaluate the historic flood peaks: First, applying the slope-area methodology to a reach downstream of the current gage site (USGS reevaluation study, 2007); second, extending the hydraulic model upstream from the current gage site and comparing water surface elevations produced by the hydraulic model at various discharges, to historical information.

We are hoping that Mark Mastin of the Tacoma office can attend. In addition, would it be possible for you to assign a staff person to participate who would be comfortable with the technical information, hydraulic modeling, etc. and willing to engage in a robust technical discussion? FEMA will have qualified folks at the conference also, and we are asking for Corps participation, but I suspect the USGS perspective will be of paramount interest to all of the other participants.

I think it will be necessary for most participants to spend 8-12 hours in advance of the conference, reviewing the technical information.

We recognize this is a big time commitment, but we think this is a worthwhile investment of peoples' time to try to resolve this important issue. We request your support.

Thanks very much. This issue is of the utmost importance to our community. Chal

Chal A. Martin, P.E.
Public Works Director / City Engineer
City of Burlington
833 South Spruce Street
Burlington, WA 98233
(360) 755-9715 Office (360) 755-0783 FAX
cmartin@ci.burlington.wa.us

From: Jerad D Bales [mailto:jdbales@usgs.gov]
Sent: Monday, February 22, 2010 11:46 AM
To: Chal Martin
Cc: Stephen F Blanchard; Cynthia Barton; Robert R Mason
Subject: Fw: Request for USGS Participation in a Technical Conference: Skagit River WA Hydrology

Mr. Martin:

Thank you for your request for USGS involvement in the Skagit River flood hydrology meeting. We are aware of the ongoing discussions and disagreements on Skagit River flood hydrology issues.

By copy of this email, I am forwarding your request to Mr. Steve Blanchard, Chief of the USGS Office of Surface Water. Steve's office deals with issues of flood hydrology and flood frequency, and can provide a response for USGS.

Best of luck with your meeting . . . it seems to be an appropriate response for this issue.

Jerad

==========
Jerad Bales, Ph.D.
USGS Chief Scientist for Hydrology
436 National Center
12201 Sunrise Valley Drive
Reston, VA 20192
email: jdbales@usgs.gov
voice: 703-648-5044
==========

----- Forwarded by Jerad D Bales/WRD/USGS/DOI on 02/22/2010 02:39 PM -----

From: "Chal Martin" <chalm@ci.burlington.wa.us>
To: <jdbales@usgs.gov>
Cc: "LornaEllestad" <lornae@co.skagit.wa.us>, "Dan Berentson" <danb@co.skagit.wa.us>, <rakimbro@usgs.gov>, "Ike, Ryan" <ryan.ike@dhs.gov>, "Carey, Mark" <mark.carey1@dhs.gov>, "Long, Kevin" <Kevin.Long@dhs.gov>
Date: 02/19/2010 11:06 AM
Subject: Request for USGS Participation in a Technical Conference: Skagit River WA Hydrology

---

Mr. Bales,
Working with FEMA, we are trying to set up a 2-day technical meeting/conference in Washington D.C. March 17-18 to bring together experts to look at the Skagit River hydrologic analysis, focusing primarily on the historic flood events. The attached document outlines the concept.

This issue has been identified since 2003, and there has been much additional study since that time.

By way of background: the Seattle District, Corps of Engineers, under contract with FEMA Region X, performed the flood insurance study for FEMA, starting in 2002. It was thought at that time that since the District was already working on the Skagit River General Investigation study, money could be saved. But the GI Local Sponsor, Skagit County, had concerns about the hydrologic analysis, primarily related to its perception that four historic flood estimates included in the flood frequency analysis were significantly overstated. This issue has never been resolved and positions have basically hardened on all sides. The Corps and FEMA, although having independent authority to modify the historic flood estimates, have decided it is best in this case to use only USGS-published estimates. The USGS reevaluated the historic flood estimates in 2004 and 2007, and lowered the estimates a little. It is the USGS position that the Corps and FEMA are free to use its estimates, not use them, or modify them any way they see fit.

Additional study by Skagit County and a consortium of cities and dike districts since the USGS reevaluation indicate the revised USGS estimates are still high. This is the issue we want to resolve with a technical conference/meeting that focuses on the Skagit River historic flood estimates. It is our hope that in a forum which enables the technical experts from all parties to present, discuss and defend their technical positions, a consensus could emerge.

We think two full days are necessary to get through all of the elements of the various analyses. And there will also be the need to prepare for the conference. This is a big time commitment, but we very much need USGS help and participation in this conference. Can you or an appropriate member of your staff attend?

In addition to participation in this conference from a USGS technical expert from the headquarters level, we are also hoping that the regional office in Tacoma can send a technical representative who is closest to the issue. Additionally, we are hoping that FEMA Region X can send a technical representative, and that the Corps of Engineeers can send a technical representative.

I have copied Bob Kimbrough from the Tacoma USGS office here, as well as Ryan Ike and Mark Carey from FEMA Region X. Dan Berentson, also copied here, is Skagit County's Surface Water Division Manager, and Lorna Ellestad is Skagit County's GI project manager. Our FEMA headquarters contact is Kevin Long.

Thank you for considering this request. This issue is of the utmost importance to us. I will try to give you a call later today. Chal

http://www.skagitriverhistory.com/USGS%20Docs/2005-5029%20Scientific%20Investigations%20Report.pdf

http://www.skagitriverhistory.com/USGS%20Docs/2007%20USGS%20Stewart%20Revision.pdf

http://www.skagitriverhistory.com/Burlington%20Docs/2008-10-20%20Final%20Hydrology%20Report.pdf

http://www.skagitriverhistory.com/Skagit%20County%20Docs/nhc%20Reevaluation%20of%20Skagit%20River%20Historic%20Floods_FINAL.pdf

Chal A. Martin, P.E.
Public Works Director / City Engineer
City of Burlington
833 South Spruce Street
Burlington, WA 98233
(360) 755-9715 Office (360) 755-0783 FAX
cmartin@ci.burlington.wa.us

[attachment "100204 Expectations regarding a technical conference to resolve Skagit River hydrology.doc" deleted by Stephen F Blanchard/WRD/USGS/DOI]