Scott Boettcher

From: Andrew Kinney <KinneyA@co.thurston.wa.us>
Sent: Thursday, August 11, 2016 9:15 PM
To: Scott Boettcher
Cc: Cynthia Wilson
Subject: Local Project application
Attachments: USGS Gage application.docx; Chehalis proposal for USGS Gages.pdf

Scott – here is the application for the USGS Gages Any questions can be directed to me or Ken Frasl with the USGS. Thanks. Andrew

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2017-19 Local Projects Recruitment Form

Chehalis Basin Flood Relief

A. What are local flood relief projects? -- In general, local projects are those projects that provide predominantly localized and quantifiable benefit, are capable of being completed within the funding cycle, are supported by the jurisdiction within which the project is proposed, and are vetted and advanced through a public entity like a City, County, Conservation District, Agency, etc. Furthermore, local projects are envisioned as helping with flooding, not adverse to fish or habitat and (where possible) providers of multiple, quantifiable benefits.

B. What kinds of local flood relief projects are likely to be logical funding candidates for 2017-19?

- Projects that complete an effort previously funded/started.
- Projects that advance improved emergency response.
- Projects that advance improved public infrastructure protection.
- Projects that advance improvements in local or community flood hazard reduction, including local flood proofing projects (e.g., elevations, buy-outs, foundation venting/opening, etc.).
- Projects that advance Conservation District initiated flood hazard reduction (e.g., farm pads, evacuation routes, bank erosion/bank stabilization, etc.)
- Projects that demonstrate innovation (e.g., thinking beyond traditional bank stabilization techniques in favor of natural system designs), partnerships, cost-sharing/leveraging resources, multiple benefits, and proactive vetting with agencies and tribes.
- Projects typically not in excess of $3M for the stage/phase being funded.

C. Are there projects that would not be good candidates?

- Projects that seek to utilize State Capitol Budget dollars for uses not typically allowed (e.g., maintenance and repair work, cost-sharing under select circumstances, etc.).
- Projects likely to increase potential for flood damage upstream or downstream.
- Projects with unmitigable adverse environmental impacts or significant uncertainty regarding potential environmental impacts.
- Projects not sponsored by a public entity.

Instructions:

a. Please submit local flood relief project requests (via this form) to Scott Boettcher (scottb@sbgh-partners.com) no later than 5:00 p.m., Friday, August 12, 2016.

b. Please submit one request form for each project proposed, even those past projects previously or partially funded.

c. Note: Parts III and IV below [marked by "(**)"] will be scored as part of the Flood Authority Projects Committee's review and evaluation. Part I and II will not be scored.

Part I General	
1. **Date:**	August 8, 2016
2. **Project Name:**	Upgrade the stream gaging monitoring network of the Chehalis River basin. NOTE: This is a joint proposal involving the United States Geological Survey (USGS) and Thurston County.
3. **Project Location --** Please identify the location of the project as precisely as possible, including providing decimal degree latitude/longitude coordinates.	The project would impact 18 USGS Gaging Stations in the Chehalis River basin. See attachment for complete list of stations.
4. **Project Contact** -- Please identify who will be responsible for overseeing and managing the project (i.e., name, email, telephone number, etc.).	Thurston County Emergency Management; Andrew Kinney; Emergency Management Coordinator; kinneya@co.thurston.wa.us ; 360.867.2827; 9521 Tilley Rd S, Olympia WA 98512 US Geological Survey; Ken Frasl; Western Washington Field Office Chief; kefrasl@usgs.gov ; 253.552.1670; 934 Broadway Suite 300, Tacoma, WA 98402
5. **Lead Organization --** Please identify the lead organization, agency, entity, etc. responsible for this project. Please identify key partners responsible for assisting in the delivery or implementation of the project.	Thurston County Emergency Management; Andrew Kinney USGS; Ken Frasl

Part II Description, Timing and Cost	
6. **Project Description --** Please describe the project, what is intended to be accomplished, the benefits to be accrued, and to whom.	The project is comprised of three (3) Tasks – see attached proposal for full details. Task 1: Elevation of 18 stream gages in the Chehalis River basin that currently use either an arbitrary datum or the National Geodetic Vertical Datum of 1929 (NGVD 29) will be surveyed and tied to the North American Vertical Datum of 1988 (NAVD 88). This project will put all Chehalis Basin gages on the same datum and will benefit all agencies modeling river and flood flows including, but not limited to Grays Harbor, Lewis, Mason and Thurston counties, National Weather Service, WA Dept. Ecology, WA Fish and Wildlife, etc. Task 2: Fund the operation of Station no. 12019310

	(Chehalis River above Mahaffey Creek near Pe Ell) for the FY17 water year. This project provides data on river flow for modeling and flood forecasting for all downstream users. Same agencies listed in Task 1. Task 3: Take over operation of Stations no. 12026600 and 12025500. These stations are currently operated by the National Weather Service. The data does not meet the USGS quality-assurance and quality-control protocols and will be discontinued as of October 1, 2016. Again same benefits and users as for Task 1.
7. **Project Timeline --** Please describe the overall timeline for completion of the project as well any interim stages or phases.	Task 1 will take approximately 90 days from contract start but can be completed in FY18 water year. Tasks 2 and 3 need to be contracted by October 1, 2016 to meet the modeling and forecasting of the 2016/2017 flood season.
8. **Project Cost and Funding --** What is the cost of this project? What are the on-going maintenance and operation requirements and costs? Is it clear who will be responsible for covering on-going maintenance and operation costs?	Task 1 has a one-time cost of $43,000.00 and will be completed by the USGS. Task 2 has a yearly cost of $19,590.00. This will provide a year to determine the most appropriate way to fund and maintain this station. Task 3 has a one-time cost of $19,300.00 for equipment upgrade and an annual cost of $15,920.00 to operate the stations. Again, this will provide a year to determine the most appropriate way to fund and maintain this station.
9. **Other Funding --** Please explain the extent to which other funding sources or funding partners are available.	No additional funding has been identified for the one-time costs for all three tasks. Discussions over the following water year may identify additional funding for yearly maintenance and operation of the three stations.

Part III (**) Completion and Do ability by June 30, 2019	
10. **Project Completion --** Does the funding requested complete (or substantially complete) a project that has already been started? If so, please explain.	There are many on-going projects including habitat assessment, hydrologic modeling, and flood forecasting that rely on this data. An interruption in this data could impact the competition of these projects.
11. **Project Doable --** Can this project or the stage/phase for which funding is sought be completed by June 30, 2019? Please describe any circumstances with potential to impact the project's doability or timeline (e.g., permitting or regulatory unknowns, lack of availability of other cost-share	All tasks associated with this project can be completed within 180 days of the award of a contract.

funding resources, etc.). Please describe any advance coordination or vetting with agencies, tribes, other entities, etc. and the outcomes of that effort.	
12. **Project Impacts --** Please identify how any project impacts will be mitigated, funded and if that mitigation will be accomplished by June 30, 2019?	Presently as the tasks are identified there should be no impacts that would affect the competition of the tasks.

Part IV (**) **Benefits Stated and Quantified**	
13. **Emergency Response Benefits --** Please describe (and quantify) how this project enhances emergency response in a flood emergency (e.g., does it keep critical access roads and transportation facilities open and functional, does it enable easy movement of cattle, equipment and farm chemicals out of harm's way, etc.).	The data from the USGS gages in this proposal are critical to flood forecasting on the Newaukum, Skookumchuck, and Chehalis rivers. The flood forecasts are what allow emergency management agencies to save lives, reduce property damage and protect the environment.
14. **Essential Infrastructure Protection Benefits --** Please describe (and quantify) how this project protects essential infrastructure and the risks or consequences of not acting this funding cycle.	As above, the greater the accuracy in forecasting flood levels the more appropriate actions that can be taken to protect or mitigate flood impacts to essential infrastructure.
15. **Public Health, Safety and Welfare Benefits --** Please describe (and quantify) how this project protects public health, safety and welfare.	See response for Part IV question 13.
16. **Residential, Commercial and/or Agricultural Protection Benefits --** Please describe (and quantify) how this project protects residential, commercial and/or agricultural interests and communities and the benefits of acting (or consequences of not acting) this funding cycle. Consider factors like number of structures at risk, number of people at risk, historic frequency of flood damage, magnitude of benefit to be gained for the cost, etc.).	See response for Part IV question 13.

17. **Other Project Impacts --** Please explain how this project impacts or is potentially impacted by another project.	**PLEASE NOTE**: This project is at the core of flood and floodplain management for the Chehalis River basin. It impacts the ability, timing and accuracy of both every day hydrologic data and flood forecasting and flood level documentation. The data is utilized to activate emergency operations in all local jurisdictions and to alert and warn citizens of potentially flooding conditions and hazards. In short it is a vital tool to save lives, reduce property damage and protect the environment. It also provides the core data for construction projects by providing flow data for habitat enhancement projects, culvert replacement project and structure elevation projects..
18. **Anything Else --** Please feel free to offer any additional information (e.g., photos, maps, video, drawings, etc.) that would help to better understand the scope, timing and benefits of this project.	**The total cost of this project is $97,720.00. However $19,300.00 is for equipment replacement need by October of 2016. This should be funded under the current 2015-2017 budget.**

Appendix A

Process/Schedule (current as of 7-22-2017)	
July 21, 2016 (FA In-Person Mtg.)	• Post and distribute **local projects recruitment** request on 7/22/2016 following Flood Authority review/discussion at their 7/21/2016 meeting. • Allow three weeks for project proposals/submittals (i.e., due no later than 5:00 p.m., Friday, August 12, 2016).
August 18, 2016 (FA Conf. Call Mtg.)	• Receive proposals/submittals. • **Update Flood Authority** at their 8/18/2016 meeting on number received, type of projects received, distribution, etc.
September 15, 2016 (FA In-Person Mtg.)	• **Update Flood Authority** at their 9/15/2016 meeting on status of Projects Committee's effort to review, rank, discuss with Tribes, discuss with agencies, preliminarily sort and rank, etc.

October 20, 2016 (FA In-Person Mtg.)	• Review/discuss **DRAFT ranked and prioritized list** with Flood Authority at their 10/20/2016 meeting.
November 17, 2016 (FA Conf. Call Mtg.)	• Seek Flood Authority approval of **FINAL ranked and prioritized list** at their 11/17/2016 Flood Authority meeting.

Proposal to upgrade the streamgaging monitoring network of the Chehalis River basin

Prepared by the USGS for the Chehalis River Basin Flood Authority
June 6, 2016

The Chehalis River Basin Flood Authority requested a proposal from the USGS for changing the datums of the streamgaging network in the Chehalis River basin to a common datum, and it also requested a cost estimate for continuing a gage that is scheduled to be discontinued on September 30, 2016. Tasks 1 and 2 below describe the requested proposal components.

The USGS has included a third task in this proposal that was not requested by the Chehalis River Basin Flood Authority. This task involves taking over operation of two stage-only gages currently operated by the National Weather Service (NWS) for reasons explained below.

The NWS requests that the Chehalis River Basin Flood Authority coordinate any gage or datum changes with the NWS because making changes has implications for the flood warning system, river modeling, official flood stages, historical crest records, and the hydrograph and flood inundation mapping information displayed on the webpages generated by the Advanced Hydrologic Prediction Service (AHPS). The USGS requires a 90-day notification period prior to gage datum changes at streamgages to alert stakeholders, including the NWS, of the changes (http://water.usgs.gov/admin/memo/SW/sw13.02.html).

Task 1: Change datum for network of 18 gages to North American Vertical Datum of 1988

Elevations of 18 streamgages (table 1) in the Chehalis River basin that currently use either an arbitrary datum or the National Geodetic Vertical Datum of 1929 will be surveyed and tied to the North American Vertical Datum of 1988 (NAVD 88). Station no. 12026600 (Skookumchuck River at Centralia) and 12025500 (Chehalis River at Centralia) that are currently operated by the National Weather Service (NWS) will be included in the survey.

NAVD 88 datums will be determined by running levels from an NAVD 88 benchmark with a vertical accuracy of 5 cm or better. If no benchmark exists within about 1/2 mile of the gage, a real-time RTK GPS system will be used to determine the gage elevation.

Changing the datum of a gage is a complex process that involves multiple steps. For example, for each surveyed gage, approximately eight points will be surveyed, each tied back to a benchmark. These eight points include gage reference marks, multiple new staff plates for some of the gages, wire-weight gages, etc. Once the gages have been surveyed, USGS gage documentation and databases will be updated to reflect the new datum. In addition, historical measurements that are used for the most recent stage-discharge rating curve will be reentered into the database to create a new rating curve that is consistent with the new datum. The latter will need to be done for 14 of the 18 gages.

Once a Joint Funding Agreement has been signed for the proposed work, the USGS can complete the task in two month or less. The datum changes would be activated after the required public notification period described above.

The cost for task 1 is $43,000.

Task 2: Take over operation of one gage that is scheduled to be discontinued September 30, 2016

Station no. 12019310 (Chehalis River above Mahaffey Creek near Pe Ell) has been funded by the Confederated Tribes of the Chehalis Reservation but is scheduled to be discontinued September 30, 2016. The Flood Authority has expressed interest in funding this gage after September 30, 2016.

The cost to operate and maintain this gage in FY17 (Oct. 1, 2016 – Sept. 30, 2017) is $19,590.

Task 3: Take over operation of two gages currently operated by the National Weather Service

The National Weather Service (NWS) operates two stage-only gages in the basin: station no. 12026600 (Skookumchuck River at Centralia) and 12025500 (Chehalis River at Centralia). Even though these stations have a USGS station number and the data are currently shown on a USGS website, the USGS is not involved in the data collection and processing.

For data to be displayed on a USGS website, USGS quality-assurance and quality-control protocols for data collection and processing have to be followed. Because USGS is not involved in the collection of these data and NWS does not follow the same protocols as USGS, *the USGS will no longer be able to show these data on its website, starting October 1, 2016*.

Because these gages are important for flood forecasting in the Chehalis River basin, the NWS and USGS would like to suggest that the Chehalis River Basin Flood Authority may want to consider funding the USGS to operate these gages. Station 12026600 (Skookumchuck River at Centralia) could be upgraded to a station that collects discharge data. Because of the suspicion that backwater develops at the station at high flows, however, this would require a non-standard gage that is more expensive. The gage would measure steam index velocity using an Acoustic Doppler Velocity Meter (ADVM) that is converted to discharge using an index-velocity-discharge rating curve. Costs for this option can be provided if discharge data is desired.

The cost for taking over operation of the two gages:

a) Assume operation of station 12025500 (Chehalis River at Centralia). Upgrade to modern equipment with a radar sensor for measuring stage and with a Data Collection Platform (DCP) to transmit data via satellite.

   One-time equipment cost is $11,800
   Operation and maintenance cost for stage only in FY17 is $7,960

b) Assume operation of station 12026600 (Skookumchuck River at Centralia). Upgrade to modern equipment, including a DCP to transmit data via satellite.

   One-time equipment cost for stage only is $7,500
   Operation and maintenance cost for stage only in FY17 is $7,960

Table 1. List of 18 streamgages in the Chehalis River basin for which the datum would be changed to the North American Vertical Datum of 1988

USGS Station No.	Station Name
12019310	Chehalis River above Mahaffy Creek near Pe Ell
12020000	Chehalis River near Doty
12020525	Elk Creek below Deer Creek near Doty
12020800	South Fork Chehalis River near Wildwood
12021800	Chehalis River near Adna
12024000	South Fork Newaukum River near Onalaska
12024400	North Fork Newaukum River above Bear Creek near Forest
12025000	Newaukum River near Chehalis
12025100	Chehalis River at Wastewater Treatment Plant at Chehalis
12025500	Chehalis River at Centralia
12025700	Skookumchuck River near Vail
12026150	Skookumchuck River below Bloody Run Creek near Centralia
12026400	Skookumchuck River near Bucoda
12026600	Skookumchuck River at Centralia
12027500	Chehalis River near Grand Mound
12028060	Chehalis River near Rochester
12031000	Chehalis River at Porter
12035000	Satsop River near Satsop