Scott Boettcher

From: Scott Boettcher
Sent: Thursday, January 23, 2020 3:53 AM
To: Scott Boettcher
Subject: FW: FWS update for your FA meeting
Attachments: Chehalis Database- Updated_January_2020_Totals.xlsx; GageRelocationList.xlsx

Scott,
I see that you have a board meeting coming up and I thought I'd provide an update of some of our significant O&M activities. Plus, there's an issue on the horizon that we need to be aware of.

O&M Activities

- January 2020. OneRain, Inc. released the latest version of Contrail Web, the web platform for the Chehalis River Basin Flood Warning System. The upgrade was rolled out on January 8 with just a few minor hiccups. Most of the changes are "behind the scenes" to improve system performance and security. There are also user enhancements and some changes to the look and layout of the website. All of the basic functions remain but most have received some enhancements.
- January 2020. Webcam service was upgraded to Contrail Camera, a OneRain service integrated into the Contrail Web software platform. The move increases reliability of image access and archival, increased cyber security, more features (scan through recent images and provides the ability to make animations showing time lapse changes to the rivers.
- December 30, 2019. Additional battery power was installed at Satsop and Wynoochee webcams to improve performance during extended cloudy conditions. This configuration seems to be working well. New larger solar panels were ordered and will be installed when there is a break in the weather..
- November 13-15, 2019. Field trips to all gages completed. Next trip is scheduled for mid-February 2020 (weather dependent at some locations).
- Ongoing-weekly review of gage data on Contrail.

Issue on the Horizon
It turns out that logging companies like to grow trees, fast. Jeff and his crew have been monitoring site conditions and new trees are starting to negatively impact gage operations.

Good rain gage locations in the Chehalis Basin were challenging to find back in our recon/planning stage. Jeff and Steve drove around for days and days frustrated about not finding good, long-term sites. Since the gages are located on timber land, it is only a matter of time before the trees grow up and severely affect rain gage performance. And of course Weyerhaueser and Green Diamond want to take advantage of every inch of land they can farm – there's not much open space to work with. Jeff spoke with Storm Beech (Weyerhaueser Western Timberlands Research) about this problem and what they've done in the past. Beech said they get 10-12 years max out of each of their sites before they have to move to alternate locations. They try to relocate gages in roughly the same vicinity, elevation and within a recently harvested area to maximize site life.

- We currently operate 10 rain gages in the basin (2 of those are co-located with stage sensors – Chehalis Thrash and WF Satsop).

- We've been strategically trimming trees the best we can over the years, but at this point the trees can no longer be managed without upsetting the timber companies. We would have to cut down a swath of trees within maybe a few hundred feet of each gage to meet rain gage exposure recommendations.
- See attached Excel file for the site conditions assessment. In summary,
    - A total of 7 of 10 gages are/will be affected by tree growth.
    - 2 of the gages (Brooklyn & Haywire) should be relocated as soon as Summer 2020
    - 4 gages should be moved in the next 2-4 years. Chehalis below Thrash will need some consideration. This may be an important stage monitoring location for warning and for inflow to the potential dam reservoir in the future. Maybe the rain gage component gets moved but the stream gage stays in place.
    - 1 gage should be moved in the next 10 years (Beeville – Green Diamond owns the property, but apparently has allowed the Fire Authority to have the Barn). They recently planted trees all around.
    - We installed Newaukum when it was freshly cut back in 2012. Another 4-5 years will put that site at total of 11-12 years which fits Storm's assessment.

Thoughts

- We think we could work with both Weyerhaeuser and Green Diamond to find alternate locations. Maybe they would be able to provide a shapefile showing when plots of trees have been/plan to be cut and we could determine the best location to move gages?
- Maybe we take this as an opportunity to move gages if they could provide better data elsewhere?
    - For example, the Rock and Chehalis Thrash precip gages are close to Huckleberry Ridge gage.
- Ideally we would want to find locations that don't have to move, this may take more time, but would be worth it in the long run
- Or, we come to terms with the fact that we need to move each gage every 10 years.

Let me know if you have any questions.

Also, I sent and email a few days ago about who has the latest version on the hydraulic model for the Chehalis. ESA? WSE?

Dave

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Chehalis Flood Authority Gages - Operated by WEST
1/21/2020

Site Name	ID	Elevation	Latitude	Longitude	Property	Year Installed	Years from 2019 until significant tree growth obstruction of precip gage is expected	Notes	Alternate Location
BEEVILLE RAIN GAGE - (MATLOCK 3NE)	D15015CE	579	47.2815667	-123.4408222	Mason County FD	2011	8-10	Landowner recently planted trees in vicinity of gage next to Fire Authority property. They are currently 1-2 ft tall.	Mount to Fire Authority barn?
BROOKLYN RAIN GAGE	D150635E	1041	46.728083	-123.54525	Weyerhaeuser	2012	0-1		Discuss with WEYCO
CEDAR CREEK RAIN GAGE NR LITTLEROCK- WA	D1503322	710	46.885292	-123.141147	DNR	2012	NA	No trees nearby to grow and impact sensor significantly	
CHEHALIS BLW THRASH CRK	D15080AC	689	46.478544	-123.297167	Weyerhaeuser	2012	3-4	Important stream gage site. Move just precip?	Discuss with WEYCO. Discontinue? Close to Huckleberry.
CHEHALIS RIVER AT CENTRALIA, WA (GOES)	D1501B1C	158	46.711721	-122.978476	CityofCentralia	2017	NA	No precip gage	
HAYWIRE RIDGE RAIN GAGE	D15006B8	1792	47.3213083	-123.5955889	Green Diamond	2011	1-2		Talk to Green Diamond. Radio repeater location?
NEWAUKUM-WEYCO RAIN GAGE	D1507028	1594	46.670258	-122.612658	Weyerhaeuser	2012	4-5		Discuss with WEYCO
RIVERSIDE RAIN GAGE (RFA-STA8)	D15045B2	203	46.7791306	-123.3076917	RFA	2011	NA	Private landowner could plant trees in future however	
ROCK-WEYCO RAIN GAGE	D15093DA	1416	46.527972	-123.399056	Weyerhaeuser	2012	2-3		Discuss with WEYCO. Discontinue? Close to Huckleberry.
SKOOKUMCHUCK RAIN GAGE	D15056C4	1784	46.752756	-122.545994	Weyerhaeuser	2012	2-3		Discuss with WEYCO
SKOOKUMCHUCK RIVER AT CENTRALIA, WA (GOES)	D150086A	196	46.730663	-122.953704	WA State ROW	2017	NA	No precip gage	
WEST FORK SATSOP RIVER AT COUGAR SMITH ROAD NEAR SATSOP 13NNW	D1502054	225	47.1797222	-123.5594444	Private	2011	NA	No significant trees nearby to grow and impact sensor	

*Weyerhaeuser states they get 10-12 years max out of one precip location. They try to relocate gages in roughly the same vicinity, elevation, etc. Preferably in a recently harvested area.