



March 15, 2017

**TO:** Flood Authority Members

**FROM:** Scott Boettcher, Staff

**SUBJECT:** Use of Flood Warning System Spare Parts Inventory

The purpose of this memo is to provide Flood Authority members with a proposal to begin replacing and upgrading radio transmitters for Flood Authority gages using available spare parts budget starting with the Haywire Ridge Rain Gage. We will review and discuss this proposal on tomorrow's 3-16-2017 Flood Authority conference call. Please feel free to call or email if you have questions (i.e., 360/480-6600, [scottb@sbgh-partners.com](mailto:scottb@sbgh-partners.com)).

#### **A. Background**

1. The Flood Authority funded purchase, installation, and calibration of the Haywire Ridge Rain Gage ([https://chehalis.onerain.com/site.php?site\\_id=16002&Bview\\_id=219](https://chehalis.onerain.com/site.php?site_id=16002&Bview_id=219)).
2. The Flood Authority annually authorizes regular maintenance of this gage as well other Flood Authority funded gages ([https://www.ezview.wa.gov/Portals/\\_1492/images/2017%20Flood%20Warning%20System%20Costs%2009132016.pdf](https://www.ezview.wa.gov/Portals/_1492/images/2017%20Flood%20Warning%20System%20Costs%2009132016.pdf)).
3. One of the budget items in the Flood Authority's annual maintenance authorization is a "spare parts" budget to be used situationally when technicians are doing routine maintenance checks and find some aspect of a gage instrumentation need repair or replacement.
4. On 12/09/2017, the Haywire Ridge Rain Gage stopped reporting. Gage maintenance crew went to the site and swapped out the radio transmitter using parts from existing inventory and got the site working again. See Attachment A.
5. The Haywire Ridge Gage radio transmitter is a Version 1.0 radio transmitter. Version 1.0 transmitters were no longer sold after May 2012, and will no longer be supported after May 2022. Across the nation, gage owners are being faced with the need to upgrade existing radio transmitters (Version 1.0) to a new Version 2.0 standard by 2022. (Note: Upgrade requirement applies for example to USGS, Ecology, USFS, NOAA tide stations, Flood Authority, etc.).
6. WEST recommends upgrading existing Flood Authority radio transmitters incrementally between now and 2022 and then also incrementally managing the spare parts budget (as opposed to waiting to 2021 to replace all 10 transmitters). New Version 2.0 radio transmitters cost about \$1,800 to purchase and install.

## **B. Recommended Next Steps**

Staff recommends moving forward to incrementally replace 10 existing Version 1.0 radio transmitters with 10 new Version 2.0 radio transmitters as follows:

- a. Staff determine if upgrades are “maintenance” or potentially funded by other sources (e.g., state capitol budget).
- b. Staff develop a “master replacement and annual maintenance cost schedule” showing which transmitters will be replaced when and what the resultant annual maintenance cost will be (out through 2022 and also considering the Flood Authority’s decision regarding replacing the NWS gages in Centralia).
- c. Flood Authority approves the “master replacement and annual maintenance cost schedule” at their April 20, 2017 meeting.

## ATTACHMENT A

### Haywire Ridge Rain Gage

([https://chehalis.onerain.com/site.php?site\\_id=16002&amp%3Bview\\_id=219](https://chehalis.onerain.com/site.php?site_id=16002&amp%3Bview_id=219))



## ATTACHMENT B

### Version 2.0 Radio Transmitters

**From:** [David Curtis](#)  
**To:** [Scott Boettcher](#)  
**Subject:** GOES radio transmitter upgrade  
**Date:** Thursday, March 9, 2017 3:08:23 PM  
**Attachments:** [NOAA GOES Certified Transmitters \(002\).docx](#)

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Scott,

Here's a description of the GOES radio upgrade program. Each radio upgrade is about \$1800-\$1900.

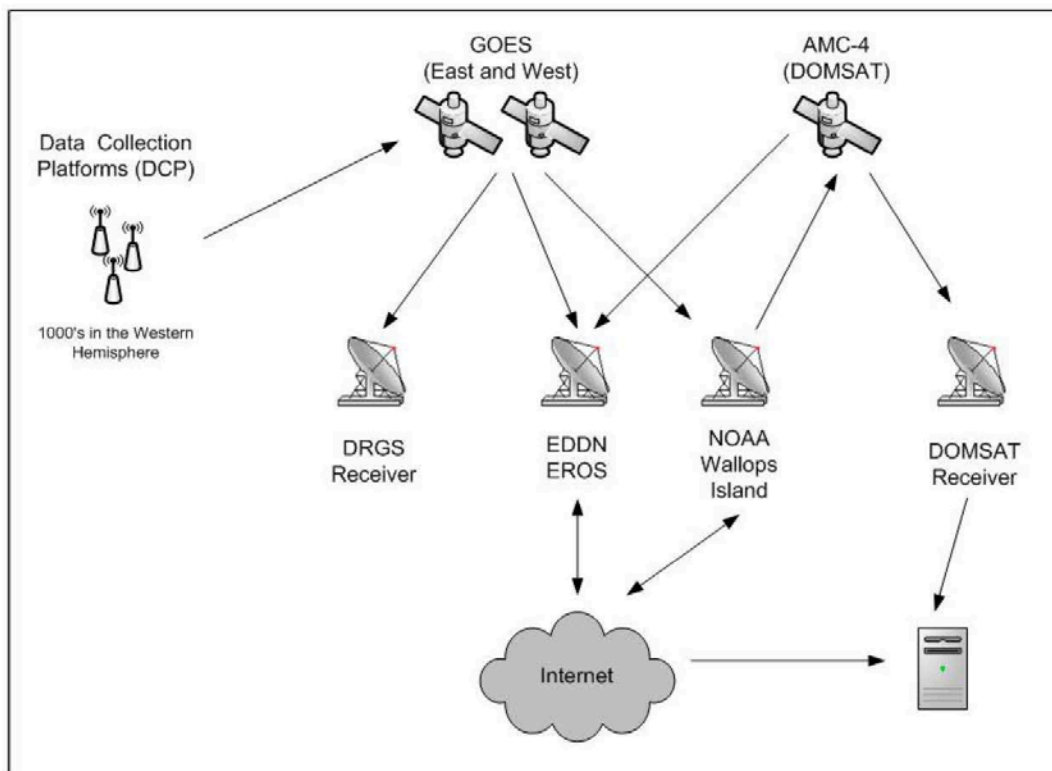
We can cycle 1-2 through inventory each year to meet the conversion deadline. That way, we can meet the goal with only a minor change to future year maintenance budgets through the next 5 years.

Dave

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### What is the GOES DCS?

The National Environmental Satellite, Data, and Information Service (NESDIS) of the U.S. Department of Commerce operates Geostationary Operational Environmental Satellites (GOES) that are part of a radio relay or data collection system (DCS). Data collection platforms (DCPs) measure environmental parameters (such as water level, air temperature, precipitation, etc.) and generally consist of a data logger, transmitter, power source, antenna, and various environmental sensors. DCPs (also known as gages or sites) measure sensors at a specified interval (typically every 15 minutes) and then transmit data at routine intervals (typically every hour) via the GOES DCS. The environmental data is sent up to the GOES East or West satellite where it is relayed back to a receiving station on Earth. Once it has been relayed back to Earth the environmental data is available (via various sources) for distribution and is typically hosted on a website.



<http://eddn.usgs.gov/goesdcs.html>

### Changes to the GOES DCS

In June of 2009, NOAA adopted the current set of certification standards for GOES DCP transmitters which included requirements for Version 2.0 transmitters. At a technical working group meeting in May of 2011, NOAA announced that three manufacturers had been certified to the new standard and that **no Version 1.0 transmitters would be sold after May 31, 2012. Existing Version 1.0 transmitters will be**



supported until May 31, 2022, but NOAA strongly encourages users to transition to Version 2.0 transmitters prior to this deadline. Switching over to Version 2.0 transmitters will double channel capacity of the GOES DCS and it will allow users to take advantage of more frequent transmissions.

#### **GOES DCS in the Chehalis River Basin**

A majority of near real-time gages in the Chehalis River Basin use the GOES DCS to get data from field locations to a website where it is available to emergency managers, state and local officials, and the general public. Sites operated by USGS, Washington Department of Ecology, WEST Consultants (WEST) and others all make use of the GOES DCS with GOES transmitters. The GOES DCS is used as the primary data transmission method in the Chehalis River Basin due to the large size, rugged terrain, and remote nature of the basin and because of the reliability and cost efficiency associated with the GOES system.

USGS plans to have all of their GOES transmitters upgraded before the cutoff date. After receiving stimulus money in 2009, USGS purchased numerous GOES transmitters (V1.0) for the region which means they have a significant number to upgrade.

WEST operates 10 gages in the Chehalis River Basin on behalf of the Chehalis River Basin Flood Authority. Each of the 10 gages has a GOES DCP with transmitter. The cost to upgrade each transmitter (WaterLog H-2221 models) is approximately \$1,800 (including parts, labor, shipping and tax) as of December 19<sup>th</sup>, 2016. There are 5 full years left before the upgrade to Version 2.0 transmitters is required. WEST can start making the upgrade incrementally by removing and sending back two transmitters per year to the manufacturer until all ten are upgraded, or the upgrade can be delayed until the summer of 2021 (lowest flood risk) at which point all of the transmitters would be removed and sent back for upgrade. When transmitters are removed from the field (if there are no spares), data will not be collected or transmitted.