12TH ANNUAL NORTH SANTIAM BASIN SUMMIT

Meeting Report



October 24, 2022







INTRODUCTION

The 12th Annual North Santiam Summit was a hybrid event held in-person at Marion County Public Works at 5155 Silverton Road NE in Salem and online through Zoom in October 2022. The Summit's purpose was to provide a forum to share North Santiam Basin project updates and resources. This included presentations from the U.S. Army Corps of Engineers, U.S. Geological Survey, City of Salem, USDA Natural Resources Conservation Service, Oregon Silver Jackets, Oregon Department of Geology and Mineral Industries, Oregon Department of Forestry, Bureau of Land Management, North Santiam Watershed Council, and Marion County.

12th Annual North Santiam Basin Summit Agenda

Date: October 24, 2022, from 10:00 a.m. to 3:00 p.m. Format: Hybrid: In-person and Zoom

10:00	Meeting Protocols & Agenda	Tammy Menkerud
10:02	Welcome	Robert Chandler
10:05	Who's in the Room? - Instant Polling	Martin Bartlett
10:10	US Army Corps of Engineers Update and Q&A	Erik Petersen
10:55	USGS Water Quality & Source Water Protection Monitoring Project	Kurt Carpenter
11:10	City of Salem Prediction Lab Dashboard	Brandin Hilbrandt
11:25	USDA-NRCS Snow Survey	Scott Oviatt
11:55	Lunch	
1:00	Wildfire Recovery Updates	
	Silver Jackets – Flooding and Recovery in the Basin	Paul Sclafani
	DOGAMI - Beachie-Lionshead Post-fire Debris Flow Risk Project	Bill Burns
	ODF - State & Private Forest Recovery	Astrea Strawn
	BLM - Invasive Plant Management & Habitat Restoration	Charity Glade/ Jonas Parker
	North Santiam Watershed Council Updates	Scott Mischke
	Marion County - North Santiam Sewer Project Update	Brian Nicholas
1:30	Wildfire Recovery Panel Q&A	Facilitated by (Consor)
1:45	Council of Water Leaders Update	Suzanne de Szoeke
1:50	Other Updates	Brandin Hilbrandt
1:55	Closing & Thank You	Robert Chandler/
		Jennifer Mongolo
2:00	In-Person Networking	
3:00	Adjourn	

PARTICIPATION

Representatives from various organizations and agencies attended the Summit. There were 56 in-person registrants and 88 Zoom registrants for a total of 144 people registered. Summit attendance included 36 participants in-person and 68 participants online, for a total of 104 attendees. See a complete list of attendees in Appendix A.

Polling: Who's in the Room

Attendees answered two poll questions at the start of the meeting to learn a little about who was attending the Summit. A total of 79 attendees participated in the polling exercise.





SUMMIT OVERVIEW

The North Santiam Summit has been a forum to share information and establish relationships between groups who work and live in the watershed. It has been a much-anticipated event for more than a decade. The first half of the Summit centered on current and forecasted conditions for the North Santiam Basin. The second half of the Summit focused on wildfire recovery updates.

Public Works Assistant Director Robert Chandler kicked off the Summit. Consor (formerly Barney & Worth) facilitators Tammy Menkerud and Katie Wilson facilitated the in-person meeting. Consor facilitators Martin Bartlett and Trisha Maxfield facilitated the Zoom meeting.

Presentations

Erik Petersen from the U.S. Army Corps of Engineers (USACE) was the first presenter. Erik provided updates on USACE activities in the North Santiam. Following the USACE presentation, representatives from the U.S. Geological Survey, City of Salem, and the U.S. Department of Agriculture Natural Resources Conservation Service presented. These included:

- Kurt Carpenter, US Geological Survey: Water Quality & Source Water Protection Monitoring Project
- Brandin Hillbrandt, City of Salem: Prediction Lab Dashboard
- Scott Oviatt, USDA Natural Resources Conservation Service: Snow Survey

The presentations can be found in Appendix C.

The North Santiam Summit recording can be viewed at: https://vimeo.com/user118487293/

Wildfire Recovery Updates

Following the presentations, six organizations provided short updates on wildfire recovery. This included:

- Paul Scafani, Oregon Silver Jackets: Flooding and Recovery in the Basin
- Bill Burns, Oregon Department of Geology and Mineral Industries (DOGAMI): Beachie-Lionshead
 Post-fire Debris Flow Risk Project
- Astea Strawn, Oregon Department of Forestry (ODF): State & Private Forest Recovery
- **Charity Glade and Jonas Parker, Bureau of Land Management (BLM):** *Invasive Plant Management & Habitat Restoration*
- Scott Mischke, North Santiam Watershed Council: Watershed Council Updates
- Brian Nicholas, Marion County: North Santiam Sewer Project Update

After the updates, a panel made up of the presenters answered questions from Summit attendees. Questions were taken from participants on Zoom and in-person. Consor team members facilitated the discussion. At the end of the session participants had the opportunity to provide additional updates. A list of questions asked are included in Appendix B.

Polling: Wrap

Attendees answered two poll questions at the end of the meeting to gauge the biggest concerns participants had for the future of the Basin and to identify when participants prefer to hold the Summit next year. A total of 79 attendees participated in the polling exercise.





Closing

City of Salem Public Works Assistant Director Robert Chandler and Senior Natural Resources Planner Jennifer Mongolo thanked everyone and closed the meeting. In-person participants were invited to network and Zoom participants adjourned.

EVENT FEEDBACK

Seventeen attendees from the Summit provided feedback through an online survey after the event. Overall feedback about the 12th Annual North Santiam Summit was positive.

Overall, how would you rate the North Santiam Summit? Average Score: 9 (scale: 0 poor - 10 excellent) **How relevant was the information presented?** Average Score: 8 (scale: 0 not relevant - 10 very relevant)

Highlights of comments on what people liked best:

- "Bringing everyone together to get an update on management and focus areas."
- "The longer presentations were great, full of useful information. I enjoyed the opportunity to talk with people during lunch and at the end."
- "Current and future project updates. Opportunity to network."
- "The many different organizational perspectives in one event."
- "Well organized and not too long"
- "USDA-NRCS Snow Survey and water report for making forecast for the water year."
- "Great content and speakers"
- "... it was great information to hear from a variety of organizations working in the N. Santiam."

Highlights of what could be better:

- "Bigger venue and do everything in person"
- "The five-minute presentations left me wanting a bit more information."
- "Tribal and non-profit updates"
- "Maybe schedule for 1/2 hour longer so the pace can slow"

Highlights of topics suggestions to be covered in the future:

- "How can beavers help us care for watershed?"
- "Updates on recreation planning"
- "Perhaps something on soil health post fire"
- "More on what funding was made available from all partners to address resource concerns in this watershed."

Preferences for how the Summit is held next year (Zoom or in-person if COVID-19 protocols allow it):

In person	29.00%
Zoom virtual meeting	0.00%
Hybrid	71.00%

Other comments or suggestions:

- "Great program! Thanks for all your efforts!"
- "Great job"
- "Very good meeting and worth attending"
- "Thank you! Excellent summit."

Appendix A: Participant List

Event Planners & Contributors

First	Last	Organization
Martin	Bartlett	Barney & Worth (Consor)
Krista	Carter	Marion County
Brandin	Hillbrandt	City of Salem
Mike	Hintz	Marion County
Trisha	Maxfield	Barney & Worth (Consor)
Tammy	Menkerud	Barney & Worth (Consor)
Scott	Mischke	North Santiam Watershed Council
Jennifer	Mongolo	City of Salem
Jason	Pulley	City of Salem
Rob	Romanek	City of Salem
Kathleen	Silva	Marion County
Katie	Wilson	Barney & Worth (Consor)

In-person Attendees

First	Last	Organization
Ryan	Anderson	Bonneville Environmental Foundation
Katie	Arstingstall	Confederated Tribes of Warm Springs
Tana	Atchley-Culbertson	Nesika Wilamut
Les	Bachelor	USDA-NRCS
Steven	Bruncheau	Nesika Wilamut
Kurt	Carpenter	US Geological Survey
Robert	Chandler	City of Salem/Public Works
Matthew	Chase	USACE
Bonnie	Criss	US Environmental Protection Agency
Suzanne	de Szoeke	GSI Water Solutions, Inc.
Betsy	Emery	Senator Merkley
Alex	Farrand	Oregon Department of Fish and Wildlife
Reed	Fischer	ODFW
Charity	Glade	BLM
Brandin	Hilbrandt	City of Salem
Mike	Hintz	Marion County Emergency Management
Amy	Kaiser	NRCS
Don	Kloft	Oregon Department of Agriculture
Scott	Mischke	northsantiamwc@gmail.com
Jennifer	Mongolo	City of Salem
Randy	Nattis	USGS Oregon WSC
Brian	Nicholas	Marion County
Scott	Oviatt	USDA-NRCS
Jonas	Parker	U.S. Bureau of Land Management

First	Last	Organization
Chelsey	Peters	Oregon Department of Forestry
Erik	Petersen	USACE
Jessica	Stanton	Marion County Board of Commissioners
Brent	Stevenson	Santiam Water Control District
Astrea	Strawn	Oregon Department of Forestry
Mathew	Titus	Clearwater Analytica
Greg	Wacker	Oregon Water Resources Department
Greg	Walsh	City of Salem
Matt	Warbritton	USDA NRCS
Kelli	Weese	Marion County
Austin	Wegner	Santiam Water Control District
Michael	Wilson	Oregon Department of Forestry

Zoom Attendees

First	Last	Organization
Ryan	Anderson	Bonneville Environmental Foundation
Chad	Ball	Marion County
Anthony	Barber	US EPA Region 10
Dwayne	Barnes	City of Salem Public Works
Mark	Becktel	City of Salem Public Works Department - Operations
Holly	Bellringer	U.S. Army Corps of Engineers - Portland District
Кауlа	Bordelon	OSU Extension Fire Program - Willamette Valley Regional Specialist
Suzette	Boudreax	North Santiam Watershed Council
Grace	Brahler	Cascadia Wildland
Theresa	Brehm	Natural Resources Conservation Service
Lynn	Burditt	USDA
Sarah	Burnet	USACE
Bill	Burns	DOGAMI
Kevin	Cameron	Marion County
Kurt	Carpenter	US Geological Survey, Oregon Water Science Center
Elise	Chiba	Oregon Department of Forestry
Jana	Compton	compton.jana@epa.gov
James	Day	Mt. Angel Publishing/The Canyon Weekly
Mariana	Dobre	University of Idaho
David	Donahue	Eugene Water & Electric Board
Micelis	Doyle	USGS Oregon WSC
Alexandra	Etheridge	USGS
Jennifer	Fairbrother	Native Fish Society
Patricia	Farrell	City of Salem
Kenneth	Frederick	Streamline Landowner
Augustus	Gleason	Opal Creek Ancient Forest Center
Kelly	Gleason	Portland State University
Lacey	Goeres-Priest	City of Salem
Sarah	Hamilton	Marion Soil and Water Conservation District
Salina	Hart	USACE Water Management
Ken	Homolka	Public
Olivia	Jasper	Oregon Department of Agriculture
AI	Johnson	US Forest Service
Peter	Kauss	BLM
Rynn	Lamb	FEMA Region 10
Jiajia	Lin	DEQ
Lance	Ludwick	City of Stayton
Cody	Marrs	City of Salem
Emerson	Marsh	Linn County Emergency Management
Lizzie	Marsters	WRI
Emily	Martin	Oregon Department of Forestry

First	Last	Organization
Lindsay	McClary	Confederated Tribes of Grand Ronde
Will	McGill	willmcgill.surveying@gmail.com
Jeff	McPherson	BLM
Cameron	Mitchell	US Forest Service
Holly	Mondo	GSI Water Solutions
Anne	Mullan	NOAA
Darrin	Neff	US Forest Service
Susan	Ortiz	Marion Soil and Water Conservation District
Debra	Paul	Linn SWCD
Liz	Perkin	liz@nativefishsociety.org
Don	Pettit	Oregon DEQ - Emergency Response Program
Gary	Pullman	NESCA, FOT, (NSWC)
Todd	Reinwald	Forest Service
Shannon	Richardson	South Santiam Watershed Council
Pete	Robichaud	USDA Forest Service, Rocky Mountain Research Station
Tanisha	Rosas	USDA Forest Service
Alex	Rozin	Forest Service
Paul	Sclafani	USACE
Esther	Shin	ORWD
Trevor	Smith	City of Salem
Joe	Stack	ODFW
Jessica	Stanton	Marion County Board of Commissioners
Janna	Stevens	Oregon Department of Fish and Wildlife
Adam	Sussman	GSI Water Solutions
Michael	Ward	USDA NRCS
Tyson	Wepprich	ODF
Chantal	Wikstrom	Oregon Health Authority, Drinking Water Services

Appendix B: Questions

US Army Corps of Engineers

- The EIS draft and the scoping that's going on, are there any kind of places to manipulate the bell curve in any way?
- How do we, as stakeholders, stay engaged in [the USACE EIS] process?
- Is there any update on the continued authorization of power production at Detroit and Big Cliff given the cost-share that BPA is looking at for fish passage and temperature improvements?
- How long do you expect the EIS comment period to last?
- WRDA 2022 includes a directive to undertake a hydro power disposition study. What process is the Corps thinking they will undertake for this and how does it integrate with the alternatives considered in the EIS?
- Because there's so much going on system-wide, can you give three or four points that you want everyone to remember about what's different or staying the same in Detroit?

US Geological Survey

- I know right after the fires there was an effort to monitor for metals that were being released into the soil. Can you share if that's still continuing and what that has shown?
- For algae blooms that are in Detroit reservoir, are we going to have some sort of alert system for resident?

Marion County

- You mentioned the project still needs \$65 million, where do you think that might come from?
- You mentioned water being an additional component, can you speak to what plan you have for those cities that are limited in their supply?

Appendix C: Presentations

12TH ANNUAL **NORTH SANTIAM BASIN SUMMIT**

October 24, 2022 | 10:00-3:00 p.m.





NORTH SANTIAM WATERSHED COUNCIL



MEETING PROTOCOLS & AGENDA

Tammy Menkerud



IN-PERSON MEETING PROTOCOLS

Meeting is facilitated

Tammy Menkerud and Katie Wilson (in-person) Trish Maxfield and Martin Bartlett (Zoom)

Hold your questions

QA after US Army Corps of Engineers Update and Wildfire Recovery Updates Raise hands for questions

- Networking after presentations for in-person participants
- Food and beverages at the back of the room





ZOOM MEETING PROTOCOLS



Robert Chandler, PhD, PE Assistant Public Works Director City of Salem

WELCOME





AGENDA



12:00 1:00

2:00 3:00

Welcome

- Who's in the room *Instant Polling*
- US Army Corps of Engineers Update & Q&A
- USGS Water Quality & Source Water Protection Monitoring Project
- City of Salem Prediction Lab Dashboard
- USDA-NRCS Snow Survey Report
- Lunch
- Wildfire Recovery Updates
- Wildfire Recovery Panel Q&A
- Council of Water Leaders Update
- Closing & Thank You In-Person Networking Adjourn





WHO'S IN THE ROOM?

Instant Polling







What best describes the organization you're representing today?

City County Federal Non-profit Public member State Tribal Other

Start the presentation to see live content. For screen share software, share the entire screen. Get help at pollev.com/app



How many years have you attended the North Santiam Basin Summit

First year

10

2 - 5

0

Start the presentation to see live content. For screen share software, share the entire screen. Get help at pollev.com/app



US ARMY CORPS OF ENGINEERS UPDATE

Erik Petersen Operations Project Manager US Army Corps of Engineers



USACE BRIEF 2022 NORTH SANTIAM SUMMIT

Elevation (feet)

Erik S. Petersen **Operations Project Manager** Willamette Valley & Rogue Basin Projects

24 Oct 2022







14-Oct-2022 07:59:45





WY2021-2022 Hydrology and Water Management

Injunction operational measures

EIS / BA / BiOp

Dam Safety and Operational Issues

Questions







WATER MANAGEMENT BLUF

Interesting water year

Changes in operations affected authorized purposes

HABS & WQ – NSTR







DETROIT OPERATIONS

Detroit Forebay Elevations





North Santiam

- Detroit spring/summer spill for downstream fish passage and water temperature management
- Detroit fall lower RO* use for downstream water temperature management
- Detroit winter upper RO use for downstream fish passage

*Regulating Outlet = Low level "non turbine" outlet

Authorized Purposes Impacted*

- Flood Risk Management
- Hydropower
- Irrigation/water supply
- Fish and Wildlife
- Recreation
- Water Quality
 - * Green: Improves Red: Negatively impacts Black: No impact

www.nrcs.usda.gov









Creation Time: Saturday, Oct 1, 2022

Northwest River Forecast Center



MONTHLY PRECIPITATION WY2022

Start refill, drier conditions

	Oct		Nov		Dec		Jan		Feb		Mar	
Santiam River	OBS (in)	% NORM										
Basin	6.92	112	10.73	86	13.91	107	9.61	82	3.84	46	5.96	67

Above normal

Very dry

	AprMayOBS%(in)NORM(in)NORM		Jun		Jul		Aug		Sep			
Santiam River	OBS (in)	% NORM	OBS (in)	% NORM	OBS (in)	% NORM	OBS (in)	% NORM	OBS (in)	% NORM	OBS (in)	% NORM
Basin	9.91	147	11.61	222	6.79	191	0.48	48	0.09	8	0.63	25







EIS, BIOP & INJUNCTION BLUF

National Environmental Policy Act – daylights tradeoff's

Environmental Impact Statement – generational opportunity

Incorporates ESA concerns – integrates Biological Opinion

Accelerated timeframe

Technical scope – limited range

Preserves core mission





2008 BIOP & INJUNCTION REVIEW

2008 - NMFS issues jeopardy Biological Opinion (BiOp) – Reasonable and Prudent Alternative (RPA) included 96 measures

- 82 of 96 measures were implemented or are ongoing
- Unable to implement key downstream fish passage and water temperature control measures

March 2018 - Complaint filed alleging violations of the ESA related to alleged failure to implement RPA fully

- April 2018 Corps reinitiated ESA consultation with resource agencies • August 2020 - Court rules in favor of Plaintiffs on all claims
 - Plaintiff's subsequently requested injunction
 - September 2021 Judge issues injunction ordering the Corps to carry out specified measures to improve conditions for ESA-listed salmonids in Willamette until reinitiated consultation is completed





INJUNCTION MEASURES OVERVIEW

Complete reinitiated ESA consultation and issue a new BiOp by December 31, 2024

Operational measures to improve fish passage and water quality

- Corps experts, and 2 "ad hoc" federal experts
- Not all the injunction measures go through the Expert Panel.
- The Expert Panel has submitted all implementation plans to the Court.
- Outplant adult spring Chinook salmon above Green Peter Dam **Structural Measures**
 - Dexter Fish Facility
 - Structural improvements for Big Cliff Dam total dissolved gas
 - Cougar Dam regulating outlet improvements

Research, Monitoring, & Evaluation

Follow established maintenance outage schedules and emergency protocols Provide biannual status reports detailing progress and compliance with the injunction measures

Some to be recommended to the Court by Court-ordered "Expert Panel" consisting of 2 Plaintiffs, 2 NMFS biologists, 2

"Contrary to the Corps" arguments, limited agency resources and impacts to power production, recreation, and local economies do not overcome the presumption that the balance of harms and public interest factors tip in Plaintiffs' favor." United States District Court Judge Marco A. Hernandez





INJUNCTION OPERATIONS BY SUBBASIN

North Santiam (Detroit & Big Cliff)

- Detroit spring/summer spill for downstream fish passage and water temperature management
- Detroit fall lower regulating outlet (RO) use for downstream water temperature management
- Detroit winter upper RO use for downstream fish passage Fall Creek)
- Big Cliff spread spill to reduce TDG

South Santiam (Green Peter & Foster)

- Green Peter spring spill for downstream fish passage
- Green Peter fall deep drawdown for downstream fish passage through ROs (beginning fall, 2023)
- Foster spring delayed refill and spill for downstream fish passage
- Foster fall spill for downstream fish passage



McKenzie (Cougar)

- Fall drawdown for downstream fish passage through ROs
 - Spring delayed refill for downstream fish passage through ROs

Middle Fork Willamette (Lookout Point, Dexter, &

- Lookout Point spring/summer spill for downstream fish passage and water temperature management
- Lookout Point fall deep drawdown for downstream fish passage through ROs (beginning fall, 2023)
- Dexter spring and fall spill for downstream fish passage
- Fall Creek extended winter deep drawdown for downstream fish passage
- Fall Creek spring delayed refill for downstream fish passage













INJUNCTION OPERATIONS IMPLEMENTATION SCHEDULE

		January	February	March	April	May	June	July	August	September	October	Noven	nber	Dec
North	IM#10a				Detr	oit Downstream	n Fish Passage (DSFP) & Downs	tream Temper	ature Managem	ent (DSTM)			
Contiam	IM#10	Detroit Winter R	O Prioritization (PR) for DSFP									Detro	oit Winter
Sanuam	IM#10	Big Cliff Spread Spill (TDG Abatement)												
	IM#11						Outplantin	g above Green P	eter Dam					
Couth	IM#12a			GPF	R Spill PR for DSFF	0								
Santiam	IM#12b										Gree	en Peter D)eep Dra	awdown fo
	IM#13a										Fost	er Spill for	r DSFP	
	IM#13b		F	oster Delayed	Refill + Spillway fo	or DSFP	Foster Fisl	h Weir Spill for DSTN	N					
Mal/anzia	IM#14											0	ougar De	ep Drawdo
wickenzie	IM#15			Cougar Delay	ed Refill for DSFP									
	IM#8	Hills Creek	Winter RO PR for	DSFP										
Middle	IM#17			LOF	Spill PR for DSFF)								
Fork	IM#16										Look	out Point /	Deep Dr	rawdown
Willamette	IM#19	FC DD												FC Deep
	IM#20		Fall Cree	k Delayed Rei	fill for DSFP									







DETROIT OPERATIONS





North Santiam

- Detroit spring/summer spill for downstream fish passage and water temperature management
- Detroit fall lower RO* use for downstream water temperature management
- Detroit winter upper RO use for downstream fish passage

*Regulating Outlet = Low level non turbine outlet

Authorized Purposes Impacted*

- Flood Risk Management -
- Hydropower
- Irrigation/water supply
- Fish and Wildlife
- Recreation
- Water Quality
- * Green: Improves Red: Negatively impacts Black: No impact



RESEARCH, MONITORING AND EVALUATION

Expert Panel developed an overall monitoring framework

Panel modified the framework for each subbasin based on the interim injunction measures being implemented and fish species/life history stages present

Primary Objectives: Migration and passage timing, fish size and condition, passage rate and survival, and spawning success. Includes water quality objectives.

Injunction RME within range of previous RME program expenditures

RM&E plan will be in effect for the duration of the injunction, anticipated to extend through 2024






DETROIT TEMPERATURE MANAGEMENT X U.S.ARMY

Big Cliff Project Temperatures - 365 days



Water Temperature (degF)





WATER TEMPERATURE MANAGEMENT – LESSONS LEARNED

Lesson Learned	2021	2022	Notes
Reservoir volume is a key driver in water temperature management. The fuller the reservoir, the greater the options to manage downstream water temperatures.	Maximum Detroit Reservoir elevations = 1548 ft.	Maximum Detroit Reservoir elevations = 1568 ft.	Weather conditions have a signi- influence on water temperate goals. The late spring/summer events and heavy snowpack in a helped to refill the reservoir
Most reservoir heating occurs in July and early August, so by discharging this warm water through surface releases, cooler conditions can be realized in the fall and early winter.	In 2021, the reservoir was drafted below spillway crest in early July.	The Detroit spillway was utilized until late September in 2022.	The late spring/summer rain ev and heavy snowpack in 202 provided healthy inflows for mu the summer. This allowed the C to keep the reservoir full and a spillway crest longer.
Drawing Detroit Reservoir down and using the upper regulating outlets (UROs) and lower ROs early may deplete the reservoir of cold water and induce lake turnover too soon.	Detroit Reservoir was drawn down to El. 1465 ft on 15-October due to Court injunction. Resultant fall water temperatures were at times 8°F above downstream targets.	Detroit Reservoir will not be drawn down to El. 1465 ft. until early November. Current water temperatures are well within targeted ranges.	Delaying reservoir drawdown in will slow the depletion of cold w from the reservoir. Retaining of water for release later in autu helps keep river temperatures w targeted ranges, delaying Chin incubation.







TOTAL DISSOLVED GAS – LESSONS LEARNED



(cfs)

Flow



Frequency of Total Dissolved Gas as Measured Downstream of					
Big Cliff Dam and at the USGS Niagara Gauge					
TDG Saturation	Big Cliff Tailrace	USGS Niagara			
		Gauge			
< 110%	32%	48%			
110% - 115%	31%	28%			
115% - 120%	26%	19%			
120% - greater	11%	5%			

Take-aways:

- Despite implementation of TDG abatement tactics, high TDG can continue to exist, particularly during high flow (storm) events such as the unprecedented atmospheric rivers experienced in the late spring/early summer of WY22.
- USACE initiated a project to construct a TDG abatement structure below Big Cliff to improve conditions.
- USACE is initiating a FIRO (forecast*informed reservoir operations*) study in 2023. This may better inform future water management tactics and reduce the likelihood of TDG exceedances.











March 2019 - Notice of Intent filed March

Dec 2019 - Public Scoping Report

Biological Assessment in progress / BiOp integral to EIS

Nov 2022 – Public Release Draft EIS (3,000 pages)

- Virtual meeting December (TBD) how to navigate the EIS
- Sub-basin outreach (TBD) overview, SME's on-site to answer question
- Public comment period need focused technical feedback
- Focus: how to store water, move water, and avoid jeopardy

TBD - BiOp, revisions, Final Environmental Impact Statement (FEIS)

Dec 2024 – Record of Decision





DAM SAFETY BLUF

Risk inherent to dams

- Science is evolutionary
- Looking back great progress
- Looking forward work ahead







Risk inherent to dams

- Dam Safety Action Classification System
- Seismic & hydrologic concerns various locations in system
- Recent 4.4 magnitude event near Lacomb
- **Interim Risk Reduction Measures**
- **Issue Evaluation Studies**
- **Dam Safety Modification Studies**





DAM SAFETY RISK & EARTHQUAKES

HAZARDS

- What are the hazards?
- How often and how severe?
- What are conditions at the dam?

PERFORMANCE

- How will the dam respond?
- How likely to perform satisfactory?

RISK

What can go wrong?

Extreme earthquake (very LOW probability)



Life loss/property damage downstream (very HIGH)

CONSEQUENCES

- Who is downstream?
- What may flood?
- How much warning time?











SPILLWAY GATE REPAIRS











DETROIT SPILLWAY GATES

Completed rehabilitation project (2019-2022)

- Design based on current design guidance
- Seismic loads considered in accordance with current EM standards
- Structural rehabilitation to correct bending (trunnion friction) rather than axial buckling (seismic)

New information

- 2020 Site-Specific Seismic Hazard Analysis
- (Spring 2023) Issue Evaluation Study
- Updated USACE seismic criteria and inclusion of Dynamic Amplification Factor based on dam height



US Army Corps of Engineers ® Portland District



DETROIT/BIG CLIFF – RISK ASSESSMENT/IRRM STATUS

Inspection and Risk Assessment Status

Project	DSAC*	Last Periodic Inspection	Next Periodic Inspection	Last Risk Assessment	Next Risk Assessment
Detroit	3	Periodic Inspection No. 12 (2021)	Periodic Inspection No. 13 (2026)	Periodic Assessment No. 01 (2017)	Issue Evaluation Study No. 01 (Start TBD – in the IES Queue)
Big Cliff	4	Periodic Inspection No. 12 (2021)	Periodic Inspection No. 13 (2026)	Periodic Assessment No. 01 (2021)	Issue Evaluation Study No. 01 (Start TBD – in the IES Queue)

* DSAC – Dam Safety Action Classification

Interim Risk Reduction Measure (IRRM) Status

Dam	Spillway "Gate Tracking" *	Seismic "Pool Restriction"	Maximum Pool "Pool Restriction" **
Detroit	Gates track when pool above El. 1,568.5-ft	Max summer conservation pool El. 1,558.5-ft (5-ft below conservation pool)	TBD. Likely Maximum Pool restricted to maximum 1,570-ft (minimum 4-ft below current Maximum Pool)

* IRRM to be lifted upon final completion of gate rehabilitation project.

** Future IRRM currently being evaluated.



Spillway "Gate Tracking" IRRM







Non-exceedance increase in days below boat ramp

Domo	Elevation (ft)	Non-exceedance percentile				
Ramp		50%	60%	70%	80%	90%
State Park 1	1556	19	22	24	25	27
Kane's Marina	1546	6	9	10	11	14
Hoover	1543	4	9	10	10	12
South Shore	1542	3	9	9	10	11
Cove Creek	1541	3	9	9	10	11
Mongold East	1540	2	7	9	9	11
Mongold	1534	0	3	6	9	10
State Park 2	1530	0	0	3	8	10
Mongold Low	1450	0	0	0	0	0

(%) 100%

31

20

17

16

15

14

16

13

0

IRRM RECREATION IMPACTS

Detroit does not fill to IRRM elevation of 1558.5 ft in 21% of years \rightarrow no impact

Maximum conservation storage reduced up to 20,000 acre-ft in remainder of years \rightarrow potential impacts to other project purposes

Boat-ramp availability decreases 0 - 30 days (dependent on ramp elevation)

No impact on Mongold Low ramp



US Army Corps of Engineers ® Portland District





Study, and resourcing constraints.



Portland District







WY2021-2022 – remarkable variability; avoided a tough conservation season

EIS / BA / BiOp – "generational work" in progress, get ready for public review

Water Quality & HABS – not a significant issue this year

Questions?



- Injunction operational measures in-place now or soon, learning, adjusting, complying
- Dam Safety evolving science, responsible performance, informed risk management



US ARMY CORPS OF ENGINEERS Q&A

Erik Petersen Operations Project Manager US Army Corps of Engineers



USGS WATER QUALITY & SOURCE PROTECTION MONITORING PROJECT

Kurt Carpenter Research Hydrologist US Geological Survey









USGS Streamflow and Water Quality Post-Fire Monitoring and Studies for Source Water Protection in the North Santiam River Basin



Kurt Carpenter, Sean Payne, Will Long, and Marc Stewart

USGS Oregon Water Science Center <u>kdcar@usgs.gov</u> <u>spayne@usgs.gov</u> <u>wlong@usgs.gov</u> <u>mastewar@usgs.gov</u>

Presentation for the North Santiam Summit October 24, 2022

U.S. Department of the Interior U.S. Geological Survey This int



This information is preliminary and is subject to revision. It is being provided to meet the need for timely best science. The information is provided on the condition that neither the U.S. Geological Survey nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the information



N. Santiam River bl Stout Creek Photograph by David Weathers/USGS



Gratitude for our Partners

- **City of Salem (Brandin Hilbrandt and Lacey Goeres)** U.S. Corps of Engineers (Holly Bellringer, Norman
- • **Buccola, Salina Hart, Paul Sclafani, and others)**
- **Oregon State University (James Watson,** Theo Dreher, Nick Tufillaro, Kevin Bladon)
- **Barry Rosen/retired USGS**, emeritus
- US EPA (Jana Compton, James Markwiese, **Rochelle Labiosa, Jingwreng Lu, and others)**

And all the USGS Hydrologic **Technicians and** Ann McGowan – WQ Monitor Operations Frandon Overstreet – Remote Sensing other staff that make it happen William Roberts – Field Operations, Medford

David Piatt – Field/Lab Ops



- **Carrie Boudreau Data Management Bryan Coorlim – Field Operations, Medford** Heather Bragg – Autosampler deployments **Amy Brooks – Data Management Micelis Doyle – Team Lead Field Team** Adam Gibson – WQ Monitor Operations Nora Herrera – Lab Support Team Frank Johnson – Gage Installations Sean Payne – Lab Support Team Dan Polette – Lab Support Team **Michael Sarantou – Programmer/Equipment Ops Noah Schmadel – Streamflow Modeling** Adam Stonewall – Streamflow Modeling Randy Spitzer – Field Operations, Medford **David Weathers – WQ Monitor Operations James White – OWSC Fire Coordinator**





US Army Corps of Engineers®











<u>Continuous Flow and WQ Monitoring Network</u>

- - temp, pH, DO, conductance, chlorophyll / matter & turbidity
- Long-term data for tracking trends
- Spatial data for locating \bullet sources of turbidity
- Early warning system



Backbone of the Source Water Protection Program

Eleven real-time, high frequency/continuous stations - stage/streamflow (cameras at some stations) phycocyanin, fluorescing dissolved organic



Breitenbush River Photograph by Sylas Daughtrey



USGS Streamflow Gages and Continuous WQ Monitors



Index	Site Number	Station Name	Туре
1	14178000	NO SANTIAM R BLW BOULDER CRK, NR DETROIT, OR	Streamflow gage
2	14178500	DEVILS CREEK NEAR BREITENBUSH HOT SPRINGS, OR	Streamflow gage
3	14178800	WIND CREEK NR DETROIT, OR	Streamflow gage
4	14179000	BREITENBUSH R ABV FRENCH CR NR DETROIT, OR.	Streamflow gage
5	14181350	SARDINE CREEK NEAR NIAGRA, OR	Streamflow gage
6	14181900	LITTLE N SANTIAM RIVER ABV EVANS CR, AT ELKHORN, OR	Streamflow / Continuous water-quality monitor
7	14182500	LITTLE NORTH SANTIAM RIVER NEAR MEHAMA, OR	Streamflow / Continuous water-quality monitor
8	14183000	NORTH SANTIAM RIVER AT MEHAMA, OR	Streamflow / Continuous water-quality monitor
9	14183020	NORTH SANTIAM RIVER BLW STOUT CREEK, NR MEHAMA, OR	Continuous water-quality only
10	14181500	NORTH SANTIAM RIVER AT NIAGARA, OR	Streamflow / Continuous water-quality monitor
11	444306122144600	DETROIT LAKE AT LOG BOOM BEHIND DETROIT DAM, OR	Continuous water-quality only





<u>USGS Post-Fire WQ Study</u> Little N. Santiam at Mehama & 3 other Oregon streams

EUS6S California Wildfire Map

* * * * *

Four Sub-basins proposed for study

WMA-funded WQ monitors (Rock and Fish Creeks)

Existing USGS WQ monitors

- Other agency WQ monitors
- Drinking Water intakes

USGS

Coot Bay





<u>USGS Post-Fire WQ Study</u> Little N. Santiam similar to other burned watersheds





--Preliminary Information-Subject to Revision. Not for Citation or Distribution--



Sourcing **Turbidity** in the North **Santiam River**

2022 Water Year:

10 periods when turbidity > 10 FNU **(OHA threshold for** slow sand filtration water treatment systems)











--Preliminary Information-Subject to Revision. Not for Citation or Distribution--



Sourcing Turbidity in the Little North Santiam River

- Some influence from LNS ab Evans
 Creek site
- But at times even higher turbidity downstream, especially recently





--Preliminary Information-Subject to Revision. Not for Citation or Distribution--



Detroit Lake & Blue River Lake USGS/City of Salem/US ACE Lake Study Continuous lake WQ profilers and downstream WQ monitors







(0-30 m depth)



Real time data available at https://waterdata.usgs.gov/nwis/ And on the Data Grapher https://or.water.usgs.gov/grapher/



Detroit Lake Depth Profiler – Early Warning





Higher chlorophyll / phycocyanin values at depth in mid-July Two weeks later, surface bloom detected at 1 meter depth



Investigations to Understand Detroit Lake HABs

- \bullet forecasting and monitoring
- \bullet dynamics and composition analyses
- \bullet **2018 Drinking Water Crisis**







Lake Profiler Study with US ACE on Detroit and Blue River Lakes

Collaboration with OSU (James Watson) and USGS Remote Sensing Team to make "SMASH" Operational for HAB

Collaboration with Theo Dreher on phytoplankton community

Initial multivariate analyses suggest a change in 2017, with greater biovolumes of *Dolichospermum* at the log boom the cyanobacterium responsible for toxins that caused the



Dolichospermum filament Photograph by Barry Rosen, USGS (emeritus)



EPA Innovation Study at Detroit Lake

Collaboration with EPA Region 10 (Rochelle Labiosa and Jingwrang Lu) on early warning detection of cyanotoxins using gene monitoring Sampling conducted alongside passive samplers (Solid phase algal toxin trackers, or SPATTs)







Hyperspectral Characterization of Periphyton in Rivers used for Municipal Drinking Water Supply (Includes the North Santiam River)





Buffalo River, Arkansas





Remote Sensing 2022, v. 14, p. 953

USGS Study

USGS ScienceBase: https://doi.org/10.5066/P9SY4PSK



Data Collection North Santiam August 2021

- N. Santiam River at Fishermen's Bend
- Algae reflectance spectra obtained from drone, field, and microscope
- Nano hyperspectral sensor / DJI M600 drone



Conducting periphyton algae surveys, N. Santiam River at Fishermen's Bend



n's Bend ained from ope JI M600 drone





Green algae downstream of Bennett Dam, N. Santiam River





Study Goals

- periphyton at multiple scales
- "signatures"
- cyanobacteria





 Collect and evaluate hyperspectral data and develop a semiautomated workflow process to characterize

Expand reference database of algal taxon reflectance

Utilize hyperspectral data to monitor periphyton cover, biomass, and possibly major types of algae and

Thank You

Contact: Kurt Carpenter (kdcar@usgs.gov)





PREDICTION LAB DASHBOARD

Brandin Hilbrandt Watershed Program Coordinator City of Salem



Prediction Models, Dashboards and Data Gathering

Brandin Hilbrandt, Watershed Program Coordinator City of Salem – Public Works – Water Quality Division

> 56 Detroit Reservoir, August 2022



<u>City of Salem: Watershed Monitoring (April/May → Octo</u>

Monitoring Prep: Internal Data Management System (OSI Pi) dashboard houses external agency data such as: Weather Dam Operations Streamgage Discharge and Water Quality Prediction Model Dashboards

Field Observations and Photo Documentation

In-situ: YSI Water-Quality Parameters

Water temperature, Dissolved oxygen, pH, Specific conductance, Turbidity

Total chlorophyll-a (fluorescence), Phycocyanin (cyanobacterial pigment fluorescence, BGA PC), Fluorescing dissolved organic matter (fDOM)

Water Samples

Cyanotoxin Samples – Willow Lake

Cyanotoxin Samples at Regulatory Sites - ODEQ

Algal ID and Enumeration Samples – BSA Environmental in Ohio Nutrients – Eurofins (California)

Additional Samples (Current):

qPCR samples to ODEQ for an EPA Region 10 Innovative Research Pr Samples to Dr. Theo Dreher, Microbiologist and Algae Geneticist at Oregon State University

Samples to Dr. Barry Rosen, Research Biologist for USGS VOC and Cyanotoxin Project – Oregon State University, Dr. Kim Halse

Import and Share Data (updates to models and dashboard

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Project	
sey rds)	



USGS Streamgage Stations and Watershed Monitoring Sites



Streamgage Stations

Water Quality Monitoring Sites in proximity to USGS stations 58



Vertical Profiler - USGS Site



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OSI Pi Data Management System allows internal management, supervisors and staff access to visualization and navigation of internal data analysis, external data sources including prediction dashboards

The Prediction Lab: A.I. Prediction Model

Latest CyAN map from the EPA.

Where we are in the season

This plot shows the historical expectation for HAB risk over the year. Use this chart to see where we are in the season (identified by the vertical red line).



Harmful algal bloom risk over the year.

How hot has it been?

We know that in general certain weather conditions promote the likelihood of HABs. Check this chart to see how hot it is, relative to past years. This is simply adding up each day's temperature, for each year. If the red line is above the orange line, this year is hotter than average.



Air temperature at the lake compared to previous years.

Dashboard: https://detroitlake.clrwater.io/

How rainy has it been?

is below the orange line, then this year is dryer than average.



June 17, 2019

by James Watson 🛗 June 16, 2019 🍈 ~1 min read

Bloom Forecast June 17 - June 24

Our models suggest that over the next week algae blooms are likely, and that toxins are a possibility too.



Probability of occurrence (%) of different algal concentrations (left) and whether a toxin will be present in the water (right) in the next week (note that the toxin predictions are still highly experimental).

Blog: <u>https://thepredictionlabllc.github.io/detroit-lake-predictions/</u>


Additional Partnered Projects

- Harmful Algal Bloom Prediction Model with The Prediction Lab, LLC
- Deployed of Vertical Profiler at Log Boom Site, on Detroit Reservoir (2019-2020; 2022)
- UAS staff captured footage of watershed monitoring and deployment of vertical profiler (2019)
- Enhanced Water Quality Monitoring Project with USGS and US Army Corps of Engineers (2018 to current)
- Harmful Algal Bloom Monitoring Using Hyperspectral and Remote Sensing Imagery- Gybe (2018 to current)
- Cooperation with EPA Region 10 and Oregon DEQ Project focusing on Innovative Technology Research Project: qPCR (2019 to current)
- Cooperation and Support with Quantifying the Magnitude and Longevity of Effects of Wildfires in the North Santiam Watershed Project by Oregon State University (initiated: 2020 season)



GybeMaps Pro Dashboard



Staff is unable to monitor around the clock, so City of Salem uses this technology and dashboard for monitoring changes at key points within the watershed; focused on specific arms of the reservoir or POI. Sensors monitor for algal blooms, turbidity, and potentially new contaminants. (<u>www.gybe.eco</u>)

bard	Explorer			bhilbrandt BH
	COPY LINK			
bility (93%)	Log Boom	Water visibility Excellent (100%)	Heater Creek	Water visi Excellent
	Chlorophyll-a	Cyanobacteria Index	Chlorophyll-a	Cyanobacteria Index
1	2.6 mg/m² 1.3 mg/m² 3.5 mg/m²	+0.08	6.5 mg/m³ 1.4 mg/m³ 7.2 mg/m³	+0.2
	Turbidity	Suspended Matter	Turbidity	Suspended Matter
n ²	2.3 FNU 1.9 FNU 3.3 FNU	5.2 g/m³ 4.5 g/m ³ 6.9 g/m ³	0 1.2 FNU 1.4 FNU 2.9 FNU	3.6 g/m ³ 6.2 g/n







The Prediction Lab model and blog, along with Gybe's dashboard increases information and data density to make best decisions for City of Salem's drinking water treatment and distribution



A.I. Models and Field Monitoring

- Both are needed; provides more confident analysis and reporting with ground-truthing confirmation
- Small delay in satellite imagery processing (5-7days) vs some sample results can be received within 24hrs
- Had low predictions of HABs but field sampling resulted in more fine-tuned results of increased HABs activity; vice versa
- Presence of HABs does not indicate concentration of cyanotoxin production
- TPL model allows more indepth analysis of seasonal and climatic comparisons which can better prepare staff for upcoming season



Thank you

Thank you to internal divisions, and all North Santiam stakeholders, agencies, organizations, business and individual landowners in continuing to build a stronger network and a more resilient watershed. Thank you to supporting partners including U.S. Forest Service, U.S. Army Corps, U.S.G.S and Oregon State Parks.



Brandin Hilbrandt

Watershed Program Coordinator City of Salem – Public Works 1410 20th Street SE, Building 2 Salem, Oregon 97302

BHilbrandt@cityofsalem.net

THE R. LEWIS CO., LANSING MICH.



USDA-NRCS SNOW SURVEY

Scott Oviatt Snow Survey Supervisory Hydrologist USDA, Natural Resources Conservation Service



North Santiam Basin Summit - Snowpack and Water Supply Status – October 24, 2022

Little Meadows SNOTEL Elevation 4020' Linn and Marion County Border Willamette Basin







March 1, 2022

Umatilla-Walla Walla-Willo roady 95% lood-Sandy-Lower Deschute Grande Ronde-Burnt-Powder-117% 84% John Day 79% Willamette 95% Upper Deschutes-Crooked 78% Malheur 65% Lake County-Goose Lake Rogue-Umpqua 71% Owyhee 74% Harney 73% Klamath 62% MI Shasta CALIFORNIA

January 1st through May 1st **Snow Water Equivalent** % 1991-2020 Median



Water Year 2022 Willamette



peak (<u>March 28)</u>.

Selected Stations: 716 Salem +Richiegh Crisk River WALDO HILLS 23 Silver Falls State Park Monmouth Independence Mail Croex Aumsville Sublimity SALEM HILLS Stayto Ankeny National Lyons Wildhfe Thomas Crook ferson Benton 226 4294 ft Albany WILLAMETTE VALLEY Corvallis baron Hwy-Stations by Network Lebanon SNOTEL SNOLITE South Santiam Snow Course/Aerial Marker Watershed Boundaries ---- State Watersheds RCS Natural Resources Conservation Service Poster 10 km 5 mi Greated 10-20-2022, 05:49 AM PDT

Sweet Home





Link to data: CSV / JSON	





2022 SNOTEL Water Year Precipitation % of 1991-2020 median





North Santiam SNOTEL Water Year 2022 Precipitation (% of 1991-2020 Median)











SNOTEL Precipitation (POR) Records – July 8, 2022 – October 19, 2022





SNOTEL Precipitation (POR) Records – July 8, 2022 – October 19, 2022





SNOTEL Precipitation (in) – October 1, 2022 – October 23, 2022













USGS 14182500 LITTLE NORTH SANTIAM RIVER NEAR MEHAMA, OR



Median daily statistic (90 years) — Period of provisional data
 — Discharge

Period of approved data

second р С feet cubic Discharge



≊USGS

USGS 14183000 NORTH SANTIAM RIVER AT MEHAMA, OR



feet cubic Discharge,







Wetness percentiles are relative to the period 1948-2012 The surface layer is defined as the top 2 centimeters of soil Cell Resolution 0.125 degrees Projection of this document is Lambert Azimuthal Equal Area

Wetness Percentile 90 95 5 10 2

98







Oregon Percent Area in U.S. Drought Monitor Categories



U.S. Drought Monitor

Oregon

2019



U.S. Drought Monitor Oregon

2021



October 22, 2019

(Released Thursday, Oct. 24, 2019) Valid 8 a.m. EDT

	Drought Conditions (Percent						
	None	D0-D4	D1-D4	D2-D4	D3-0		
Current	100.00	0.00	0.00	0.00	0.0		
Last Week 10-17-2019	88.54	11.46	0.00	0.00	0.0		
3 Month s Ago 07-25-2019	66.08	33.92	10.83	0.00	0.0		
Start of Calendar Year 01-03-2019	0.00	100.00	91.78	78.16	23.3		
Start of Water Year 10-03-2019	88.54	11.46	0.00	0.00	0.0		
One Year Ago 10-25-2018	0.00	100.00	97.63	86.25	33.6		
ntensity: None D2 Se					re D		

D0 Abnormally Dry D3 Extreme Drought D1 Moderate Drought D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

<u>Author:</u> Richard Heim NCEI/NOAA



droughtmonitor.unl.edu

October 19, 2021

(Released Thursday, Oct. 21, 2021) Valid 8 a.m. EDT

	Drought Conditions (Percen							
	None	D0-D4	D1-D4	D2-D4	D3-			
Current	0.00	100.00	98.64	96.55	72.			
Last Week 10-12-2021	0.00	100.00	98.64	96.47	72.			
3 Month s Ago 07-20-2021	0.00	100.00	100.00	90.01	56.			
Start of Calendar Year 12-29-2020	8.57	91.43	<mark>83.5</mark> 3	68.71	27.			
Start of Water Year 09-28-2021	0.00	100.00	100.00	96.47	72.			
One Year Ago 10-20-2020	6.89	93.11	86.44	70.73	39.			

Intensity: None D2 Severe Drought D0 Abnormally Dry D3 Extreme Drought D1 Moderate Drought D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author: Brad Pugh CPC/NOAA



droughtmonitor.unl.edu

Area)					
04	D4				
0	0.00				
0	0.00				
0	0.00				
9	0.00				
0	0.00				
55	0.00				

Drought



nt Area)

	04
10	25.34
10	26.59
30	17.12
74	0.00
10	26.59
05	0.00

U.S. Drought Monitor Oregon

2020



October 20, 2020

(Released Thursday, Oct. 22, 2020) Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	6.89	93.11	86.44	70.73	39.05	0.00
Last Week 10-15-2020	6.51	93.49	86.44	69.99	37.31	0.00
3 Month s Ago 07-23-2020	9.21	90.79	75.87	50.31	12.49	0.00
Start of Calendar Year 01-02-2020	2.40	97.60	24.46	0.00	0.00	0.00
Start of Water Year 10-01-2020	6.50	93.50	84.77	65.53	33.59	0.00
One Year Ago 10-24-2019	100.00	0.00	0.00	0.00	0.00	0.00



D2 Severe Drought D3 Extreme Drought D1 Moderate Drought D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:

Curtis Riganti National Drought Mitigation Center



droughtmonitor.unl.edu

October 18, 2022

(Released Thursday, Oct. 20, 2022) Valid 8 a.m. EDT

	Drought Conditions (Percent Area)							
	None D0-D4 D1-D4 D2-D4 D3-D4 D4							
Current	0.44	99.56	80.77	52.92	30.73	1.40		
Last Week 10-11-2022	0.44	99.56	70.91	52.51	30.73	1.40		
3 Month s Ago 07-19-2022	24.60	75.40	66.42	52.76	31.72	1.77		
Start of Calend ar Year 01-04-2022	4. 16	95.84	89.75	75.37	50.84	17.27		
Start of Water Year 0.42 99.58 68.05 52.42 30.73								
One Year Ago 10-19-2021	0.00	100.00	98.64	96.55	72.10	25.34		

Intensity:

None D0 Abnormally Dry D1 Moderate Drought D4 Exceptional Drought

D2 Severe Drought D3 Extreme Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author: Adam Hartman NOAA/NWS/NCEP/CPC



droughtmonitor.unl.edu

U.S. Drought Monitor Oregon 2022



U.S. Drought Monitor Oregon





October 18, 2022 (Released Thursday, Oct. 20, 2022) Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	<mark>0.4</mark> 4	99.56	80.77	52.92	30.73	1.40
Last Week 10-11-2022	0.44	99.56	70.91	52.51	30.73	1.40
3 Month s Ago 07-19-2022	24.60	75.40	66.42	52.76	31.72	1.77
Start of Calend ar Year 01-04-2022	4.16	95.84	<mark>8</mark> 9.75	75.37	50.84	17.27
Start of Water Year 09-27-2022	0.42	99.58	<mark>68.05</mark>	52.42	30.73	1.40
One Year Ago 10-19-2021	0.00	100.00	98.64	96.55	72.10	25.34

Intensity:

None



D2 Severe Drought

D3 Extreme Drought

D1 Moderate Drought

D0 Abnormally Dry

D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:

Adam Hartman NOAA/NWS/NCEP/CPC

droughtmonitor.unl.edu

- 81% of Oregon in Drought
- 53% of Oregon in Severe (D2) to Exceptional Drought (D4)
- 31% of Oregon in Extreme
 (D3) or Exceptional Drought
 (D4)
- North Santiam Basin in Moderate Drought D1 in Upper Watershed and Abnormally Dry (D0) Categories

ght re (D2) (D4) me



Drought Declaration Status Map



Wildfire Conditions














		7-day Eleva
20.00 15.00 10.00 7.00		
-5.00 4.00 -3.00 2.50		
2.00 -1.75 -1.50 -1.25 -1.00		
0.75 0.50 0.25 0.10 0.01	168-Hour Day 1-7 QPF Valid 12Z Mon Oct 24 2022 Thru 12Z Mon Oct 31 2022 Issued: 0948Z Mon Oct 24 2022 Forecaster: WPC	



Forecast Precipitation 1.50" – 5.00" tion Dependent





Northwest River Forecast Center 10 Day QPF, Ending 12Z, 11/02/22



Creation Time: Sun Oct 23 21:14:02 UTC 2022

North Santiam Basin Summit - Snowpack and Water Supply Status – October 24, 2022



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Thank you! Scott Oviatt – NRCS Oregon Snow Survey Supervisory Hydrologist scott.oviatt@usda.gov 541-429-2359



LUNCH BREAK

11:55 - 1:00 p.m.



SILVER JACKETS FLOODING & RECOVERY IN THE BASIN

Paul Sclafani Coordinator Oregon Silver Jackets



Oregon Silver Jackets



There's IHMT, and within that; The focus of the State IHMT is to understand risk from natural hazards and implement strategies to lessen consequences.

Flood Sub-Committee: Silver Jackets

Establish and strengthen intergovernmental partnerships at the state level as a catalyst in developing comprehensive and sustainable solutions to flood hazard challenges in Oregon.

Deanna Wright, Team Lead deanna.wright@dlcd.oregon.gov 971-718-7473

ncv Hazara

Within Oregon Emergency Management

Paul Sclafani, Coordinator

Paul.Sclafani@usace.army.mil 503-457-7946



Oregon Silver Jackets Group Participation



NERS



DLCD Lead





Participating agencies contribute experience and information to team efforts.



↑ State Federal







Oregon Silver Jackets Group Priorities

Risk Identification & Technical Assistance

Floodplain Management & Mitigation Planning

Risk Communication, Outreach, Education and Training

Coordination and Partnerships

Oregon Silver Jackets: What's Going On

State of Oregon

 Flood Season Preparation (Need to be Scheduled)
Silver Jackets HUB (In Development)



DOGAMI

- Channel Migration Mapping
- Post-Fire Debris Flow Project
- Risk assessment: overlap with : what lies within

USGS

- Assessing Spawning Habitat from Big Cliff down to Stayton
- Collecting Sediment Data at 9 locations
- Aerial Data Collection to Assess Wildfires

DLCD

- New Oregon NFIP Floodplain Coordinator:
- Deanna Wright (971-718-7473); <u>deanna.wright@dlcd.oregon.gov;</u>
- Oregon Climate Change Adaptation Framework

Corps:

Debris Flow Modeling
(Work Represents a pilot project)



DLCD

National Weather Service

- Stay Alert to weather conditions and forecasts:
- iNWS email and text message alerts
- https://inws.ncep.noaa.gov/



DOGAMI BEACHIE-LIONSHEAD POST-FIRE DEBRIS FLOW RISK PROJECT

Bill Burns, MS, CEG Engineering Geologist, Landslide Specialist Oregon Department of Geology and Mineral Industries



Post-Fire Debris Flow Risk Reduction Project: Beachie-Lionshead Update

Bill Burns, MS, CEG

Engineering Geologist, Landslide Specialist **Project Manager and Principal Investigator**



Department of Geology and Mineral Industries



Project Area Maps: Beachie/Lionshead





Project Tasks

- Landslide inventory Complete
- Model future hazard areas Nearly Complete
- Risk analysis Starting
- Risk reduction Starting
- ng ting









Red Areas = CDF Fans

Green Points = Historic CDF Initiation Sites

Green Lines = Historic CDF Transport Paths

250 CDFs last ~30 years!

Several Post-fire CDFs

DRA

Burns, 2022



Next Steps and Risk Reduction

• Small group meetings

- Cities, counties, communities
- Look at the hazard data
- Talk about risk and brainstorm risk reduction activities

 Use new information from the project to work on risk reduction • Awareness, planning, warnings





ODF STATE & PRIVATE FOREST RECOVERY

Astrea Strawn Reforestation Program Project Coordinator Oregon Department of Forestry



Oregon Dept of Forestry Reforestation Updates: State and Private Forests

Astrea Strawn

Reforestation Program Project Coordinator Oregon Department of Forestry Salem, Oregon <u>Astrea.Strawn@ODF.Oregon.gov</u>

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State Forests

Reforestation/Restoration achievements

- Conifer replanting
- Aerial seeding
- Riparian replanting
- Replaced fire-damaged culverts

Future Activities

- Continue to monitor planted seedlings
- **Restoration of Mackey Creek**
 - City of Detroit's water in-take
 - Maintain agency and non-profit collaborations



Private Forests

Current and future

- Provide technical assistance for federal programs
- Uphold regulatory role
- Manage SAP program under HB 5006 Offer Seedling donations
- Engage in Non-profit and agency collaborations

 Continue support of partner recovery projects



to encourage economically efficient forest practices that species and the maintenance of forestland ... " ORS 527.630

Astrea Strawn **Reforestation Project Program** Coordinator **Oregon Department of Forestry** Salem, Oregon Astrea.Strawn@Oregon.gov 971 374 3471

"...it is declared to be the public policy of the State of Oregon ensure the continuous growing and harvesting of forest tree

BLM INVASIVE PLANT MANAGEMENT & HABITAT RESTORATION

Charity Glade | District Botanist Jonas Parker | District Hydrologist Bureau of Land Management



Year 1 (ES) - 2021









- Signs, \$27,000
- Storm prep, \$165,000
- Storm patrol, \$776,000
- Hazard tree assessment and removal, \$48,000+++++
- Mitigate safety issues at rec sites, \$277,000
- Secure hazmat at rec sites, \$6,000
- Repair instream structures, \$107,000
- Early detection/treatment noxious weeds, \$142,000



<u>2022</u>

- Storm Patrol, \$582,649
- Repair/replace minor infrastructure, \$97,704
- Early detection/treatment noxious weeds, \$141,789
- Kinnikinnick planting for Hoary Elfin, \$23,080
- Shrub planting for NSO prey, \$35,000

BAR

<u>2023</u>

- Storm Patrol, \$389,733
- Early detection/treatment noxious weeds, \$141,789



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BAR







FWS max acres per active ingredient 2019 B.O.

Method	Acres
Herbicide methods	
aminopyralid	390
glyphosate	150
imazapyr	150
triclopyr	345
other herbicides	330

2022 Annual Treatment Plan (with variance)

Aminopyralid	439.3	Fire 12.3
Glyphosate	1,248.0	Fire 675.5
Imazapyr	129.3	Fire 2.5
Triclopyr	783.8	Fire 110.3
Other	214.3	Fire 178.4

The acres treated described in this EA provide analytical assumptions for the issues analyzed in this EA and are not thresholds or targets for treatment (2018 IIPM EA p. 23)

Chocolate chip cookie analogy



Gross acres = area of the whole cookie

Net acres = area of the chips





NORTH SANTIAM WATERSHED COUNCIL UPDATE

Scott Mischke Executive Director North Santiam Watershed Council



NORTH SANTIAM SEWER PROJECT UPDATE

Brian Nicholas Public Works Director Marion County



WILDFIRE RECOVERY PANEL Q&A

Silver Jackets | Oregon Department of Forestry | Bureau of Land Management Department of Geology and Mineral Industries | North Santiam Watershed Council Marion County



COUNCIL OF WATER LEADERS UPDATE

Suzanne de Szoeke GSI Water Solutions











Suzanne de Szoeke, GSI Water Solutions, Inc.

sdeszoeke@gsiws.com








Council of Water Leaders - Objectives Improve water management in the North Santiam Basin by:

Informing decision-makers

- "Go to" forum for regular updates on water issues
- Developing and enhancing connection between science and policy
- Translating information between groups
- Safe space to share facts; non-advocacy

Increasing coordination

- Building and strengthening relationships
- Aligning activities and outreach



The Council of Water Leaders:

For Water-Related Groups Working in the North Santiam



Quarterly meetings and February symposium

- Some topics discussed to date:
 - USACE: Biological Opinion update, reservoir operations
 - Willamette Basin Minimum Perennial Streamflows
 - City of Salem Geren Island Water Treatment Facility Water Supply
 - Forest Management and Wildfire Recovery: USFS, ODF, OCAFC
- Next Meeting: November 9th, 9 AM-10:30 AM (virtual and in-person)
- Capacity to support planning efforts in the basin
 - Example
 - Updating Drought Contingency Plan
 - Helped identify parts of DCP to update
 - Upcoming: Assist with forming Task Force and seeking stakeholder input

OTHER UPDATES?

Brandin Hillbrandt Watershed Program Coordinator City of Salem



WRAP UP POLLING







When you think about the future, which of the following issues are most important for the North Santiam? (Select your top three)

Changes in land use Drought Economic viability Emergency response Endangered species and their habitat Flooding Water quality Wildfire Other

Start the presentation to see live content. For screen share software, share the entire screen. Get help at pollev.com/app



What time of year should the North Santiam Basin Summit be held in the future?

Winter

Spring

Summer

Fall

No preference

Start the presentation to see live content. For screen share software, share the entire screen. Get help at pollev.com/app



CLOSING

Robert Chandler, PhD, PE | City of Salem | rchandler@cityofsalem.net Jennifer Mongolo | City of Salem | jmongolo@cityofsalem.net



THANK YOU.







NORTH SANTIAM WATERSHED COUNCIL

