



# Chehalis River Basin

*Reducing Flood Damage and  
Enhancing Aquatic Species Across The Basin*

**July 8, 2014**

**Centralia City Council**

**7 p.m.**



# Today's Presentation . . .

- Provide update

- Encourage discussion

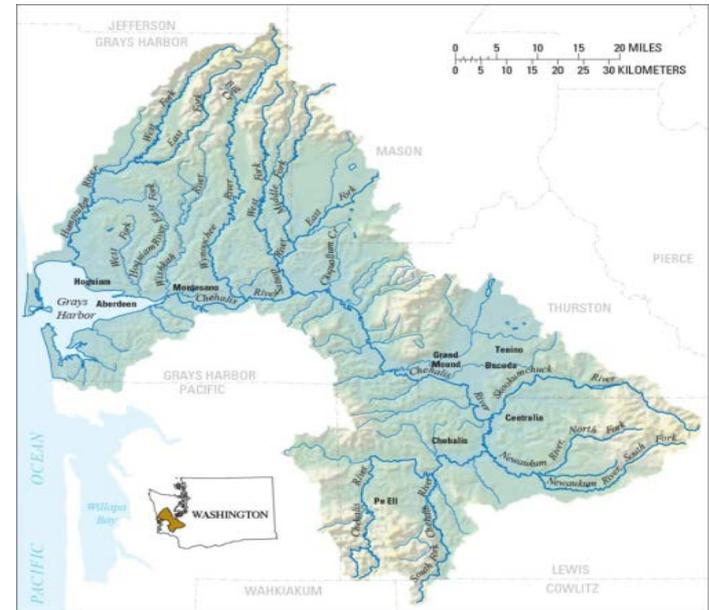
- Key messages . . .

1. **Broad agreement** -- For first time in a century there is broad agreement across the Basin on next steps to reduce flood damage and enhance salmon and aquatic species.

2. **Basin-wide strategy** -- An action-oriented, multi-phased Basin-wide strategy is needed to protect communities along the river and enhance aquatic species.

3. **Collaboration is key** -- WA State Legislature, Governor's Office, Governor's Chehalis Basin Work Group, Chehalis River Basin Flood Authority, and WA State Agencies all working together = A powerful force for action!

4. **Fundamental principle** -- Solving one's problems doesn't increase another's.



# Action . . .



↑  
Photos Source: THE CHRONICLE →

July 2014

# “Governor’s Chehalis Basin Work Group”

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- **Appointed by Gov. Gregoire (2012); Re-confirmed by Gov. Inslee (2013).**
- **Developed Next Steps Framework, \$28.2 capital budget request (2013-15).**
- **Looking Forward → Tasked by Gov. Inslee to oversee implementation of 2013-15 budget, recommend next steps by mid-November 2014 for: Water retention; I-5; Other Basin improvements; Aquatic species enhancement.**
- **Members are:**
  - ❑ David Burnett (Chairman Chehalis Tribe).
  - ❑ Karen Valenzuela (Thurston County Commissioner, Vice-Chair Flood Authority).
  - ❑ Vickie Raines (Mayor Cosmopolis, Chair Flood Authority).
  - ❑ J. Vander Stoep (Private Attorney, Pe Ell Alternate Flood Authority).
  - ❑ Jay Gordon (President Washington Dairy Federation and Chehalis Farmer).
  - ❑ Rob Duff (Governor’s Natural Resources and Environment Advisor).
  - ❑ Keith Phillips (Governor’s Climate and Energy Advisor).

# “Chehalis River Basin Flood Authority”

- **Formed in 2008**

- **Formal body focused on:** (1) flood hazard mitigation throughout the Basin; and (2) decision-making that is . . . .

- informed by science.
- protective of Basin residents/communities.
- environmentally appropriate.

- **Basin jurisdictions represented**

- ▶ Grays Harbor County

- City of Aberdeen
- City of Cosmopolis
- City of Montesano
- City of Oakville

- ▶ Lewis County

- City of Centralia
- City of Chehalis
- City of Napavine
- Town of Pe Ell

- ▶ Thurston County

- Town of Bucoda



# Background . . .

- 2007 Flood -- \$938M Basin-wide damage, \$300M lost economic activity (WA).



**Exit 77 (I-5) in Chehalis**  
STEVE RINGMAN / SEATTLE TIMES



**City of Centralia**  
STEVE RINGMAN / SEATTLE TIMES



← **Photos Source:** LEWIS COUNTY,  
DIVISION OF EMERGENCY  
MANAGEMENT



**State Route 6,  
West of Adna**  
MIKE  
SALSBURY /  
AP



# Background . . .

- 2007 Flood -- I-5 and Hwy 507 Interchange looking South.

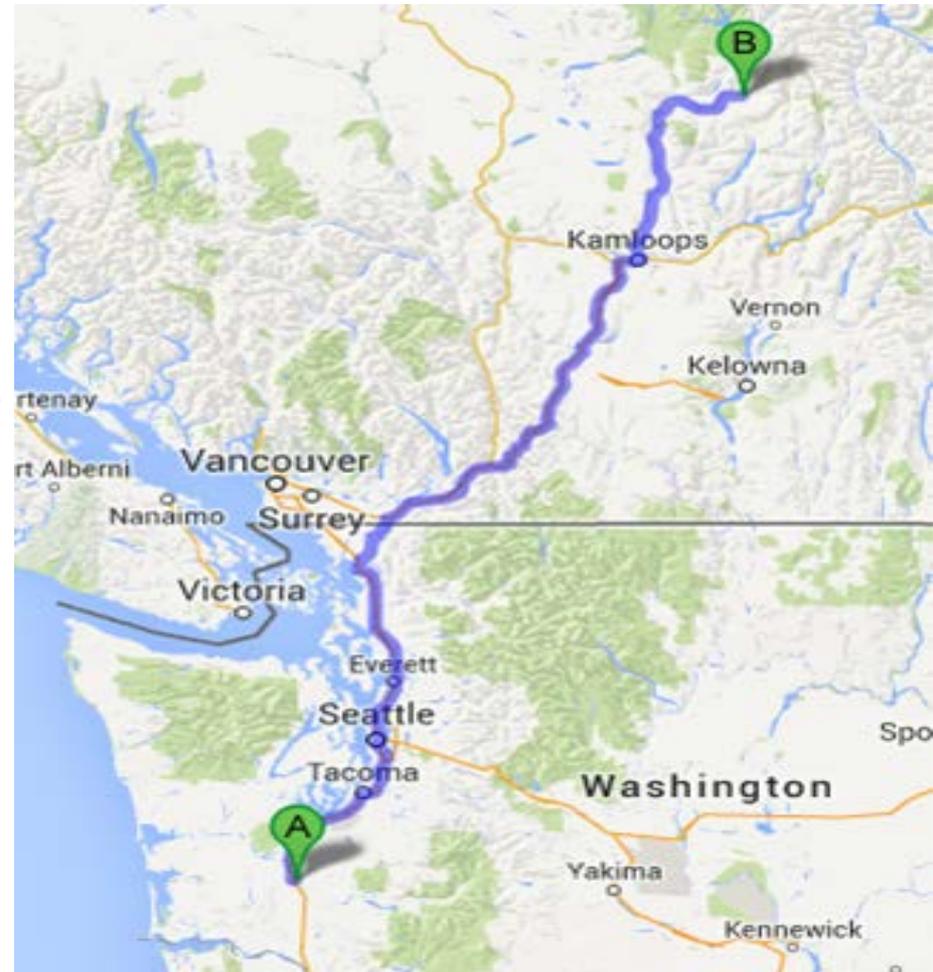


**City of Centralia and I-5**  
STEVE RINGMAN /  
SEATTLE TIMES

July 2014

# Background . . .

- 289,983 acre feet of measured water (12/03-08/2007).
- Equivalent to covering roadway between Chehalis and North of Kamloops with 1 foot of water 1-mile wide or covering . . .
  - 80% of Kitsap County.
  - 69% of Clark County.
  - 59% of Thurston County.

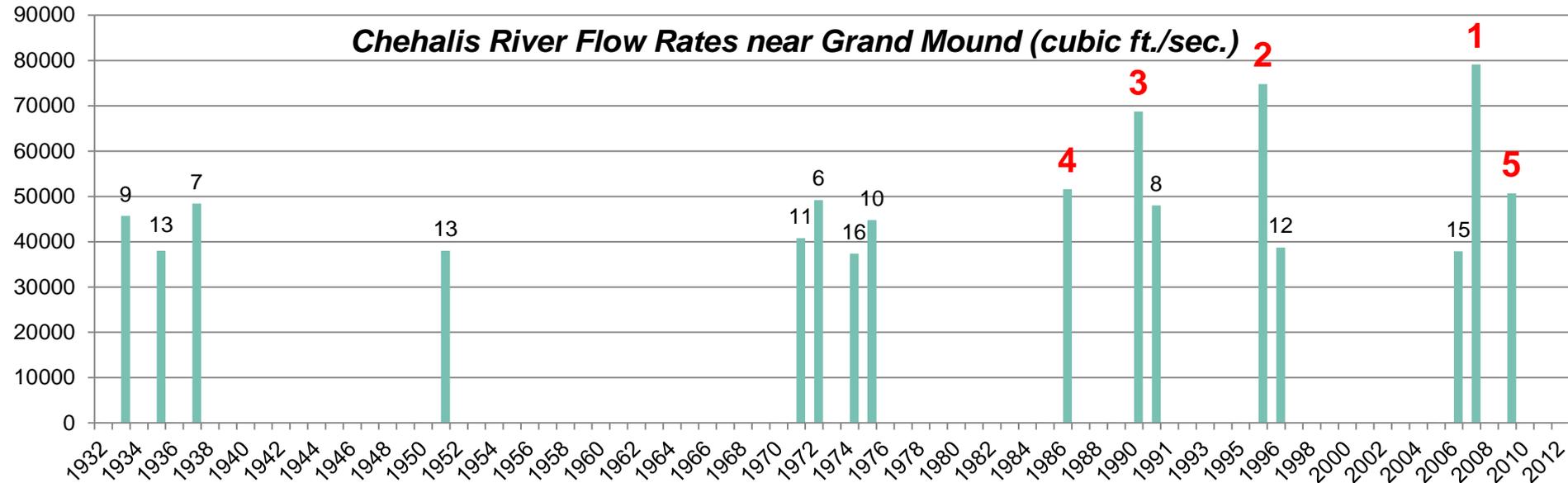


# Background . . .

## ■ Ranked high flow events (1932 - 2012) . . .

- ❑ I-5 closed 1990, 1996, 2007, 2009
- ❑ Five largest events since 1986 -- *Frequent floods are getting worse and damage is increasing . . .*

**Chehalis River Flow Rates near Grand Mound (cubic ft./sec.)**



# Background . . .

- Chehalis is the second largest river basin in the state, rich in natural resources . . .
- Salmon populations are 15-25% of historic levels.
- TMDL for the basin (<http://www.ecy.wa.gov/programs/wq/tmdl/ChehalisRvrTMDLSummary.html>).



Upper Chehalis (5/31/2010)  
 JAMES E. WILCOX / WILD GAME FISH  
 CONSERVATION INTERNATIONAL

CHEHALIS BASIN SALMON & TROUT

OCEAN PHASE		SPAWNING PHASE
Chinook Coho Chin Steelhead Bull trout Cutthroat	<p>The salmonid lifecycle involves adults maturing in the ocean, migrating back to their home streams and spawning, embryos incubating, fry emerging, juveniles growing, and smolts migrating to the estuary to acclimate to saltwater and moving out into the ocean</p> <p><b>WHAT SALMON NEED IN FRESHWATER HABITAT</b></p> <p>Cool, clean water</p> <p>Appropriate water depth, quantity and flow velocities</p> <p>Upland and riparian (stream bank) vegetation to stabilize soil &amp; provide shade</p> <p>Clean gravel for spawning and egg-rearing</p> <p>Large woody debris to provide resting and hiding places</p> <p>Adequate food</p> <p>Varied channel forms</p>	Chinook Coho Chin Steelhead Bull trout Cutthroat

[www.chehalisbasinpartnership.org](http://www.chehalisbasinpartnership.org)

# Solution = Basin-Wide Approach

## Action-oriented, Multi-phase Approach

1. Basin-Wide Relationships
2. Hydraulic Understanding
3. Large Capitol Projects
4. Smaller-Scale Local Projects
5. Land Use, Floodplain Management
6. Enhance Salmon and Aquatic Species
7. Early Flood Warning
8. Outreach, Education and Communication

**THE CHEHALIS BASIN STRATEGY**

Reducing Flood Damage and Enhancing Aquatic Species

For 80 years, little has come from efforts to reduce flood damage in the Chehalis Basin. Now, for the first time, there is a broadly-supported, Basin-wide process that is implementing long-sought local progress and leading to a comprehensive strategy to address flooding, while at the same time enhancing aquatic species across the Chehalis Basin.

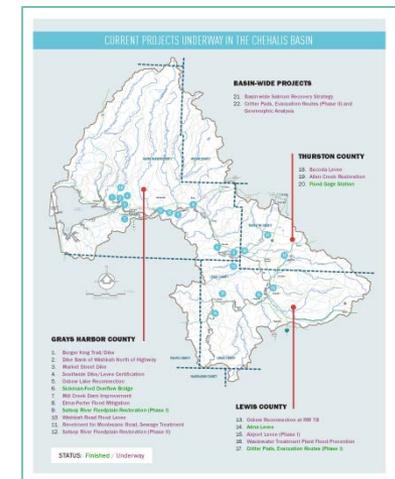
The 2013 Legislature funded a \$28 million program of capital investments that is building projects with immediate flood damage reduction and/or aquatic habitat benefits. The investment is also being used aggressively to fill data gaps, evaluate the feasibility of flood damage reduction actions, and create the first-ever plan for enhancing aquatic species in the Basin.



"Today, finally, we hold hope and see, for the first time, real efforts to mitigate the flooding that is sure to inundate the Chehalis River Basin again in the not-so-distant future."

— Lewis County Chehalis Editorial

Photo courtesy of Mark Quisenberry, The Observer



# 1. Basin-Wide Relationships



TOWN of BUCODA



WASHINGTON STATE CONSERVATION COMMISSION



Washington Department of FISH and WILDLIFE



WASHINGTON STATE DEPARTMENT OF Natural Resources



Office of Financial Management

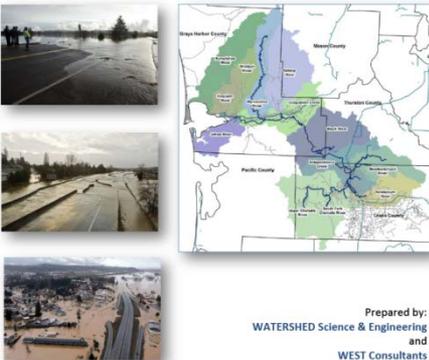
Better information. Better decisions. Better government.

July 2014

## 2. Hydraulic Understanding

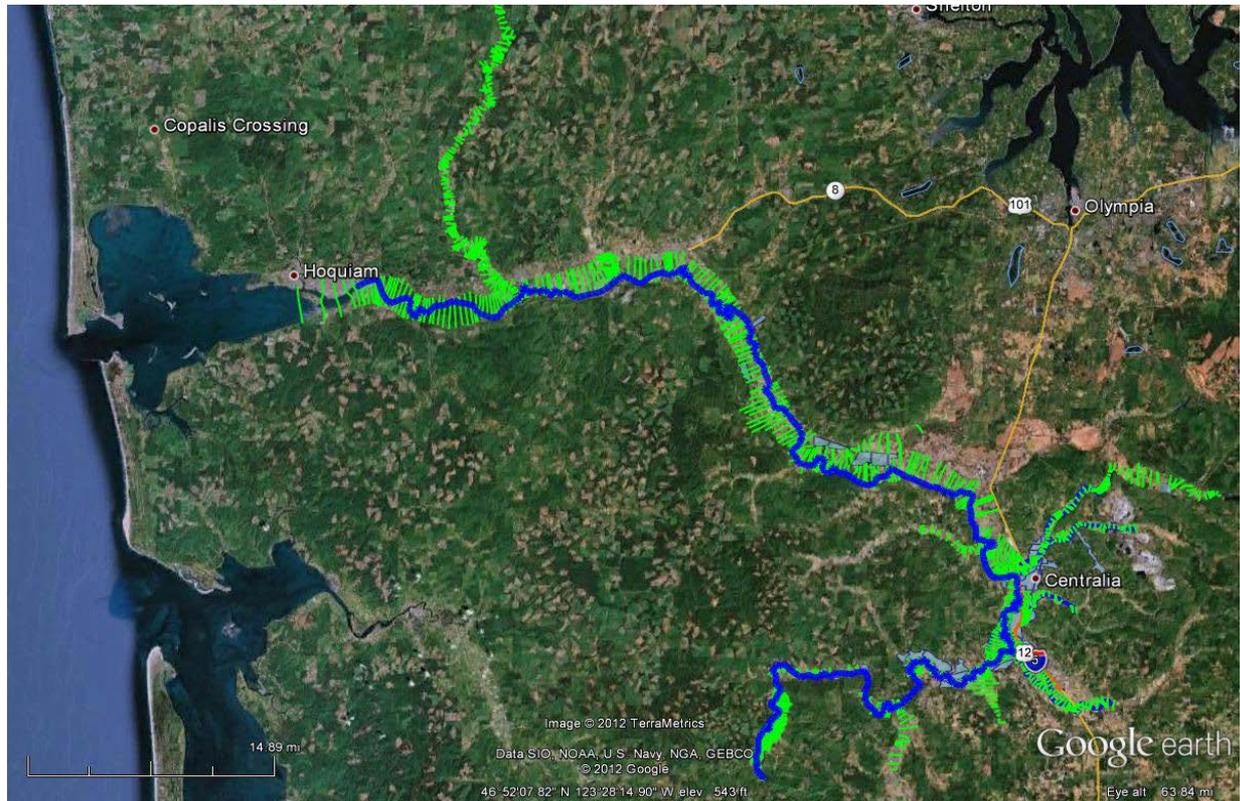
- **Science-based model** -- To inform decision-makers on hydraulic effects of potential flood relief options (at basin-wide and localized scales).
- **108 miles** -- Mouth of Chehalis River upstream to Pe Ell (108 miles).

Draft Report - Chehalis River  
Hydraulic Model Development Project



Prepared by:  
WATERSHED Science & Engineering  
and  
WEST Consultants  
Prepared for:  
Chehalis River Basin Flood Authority

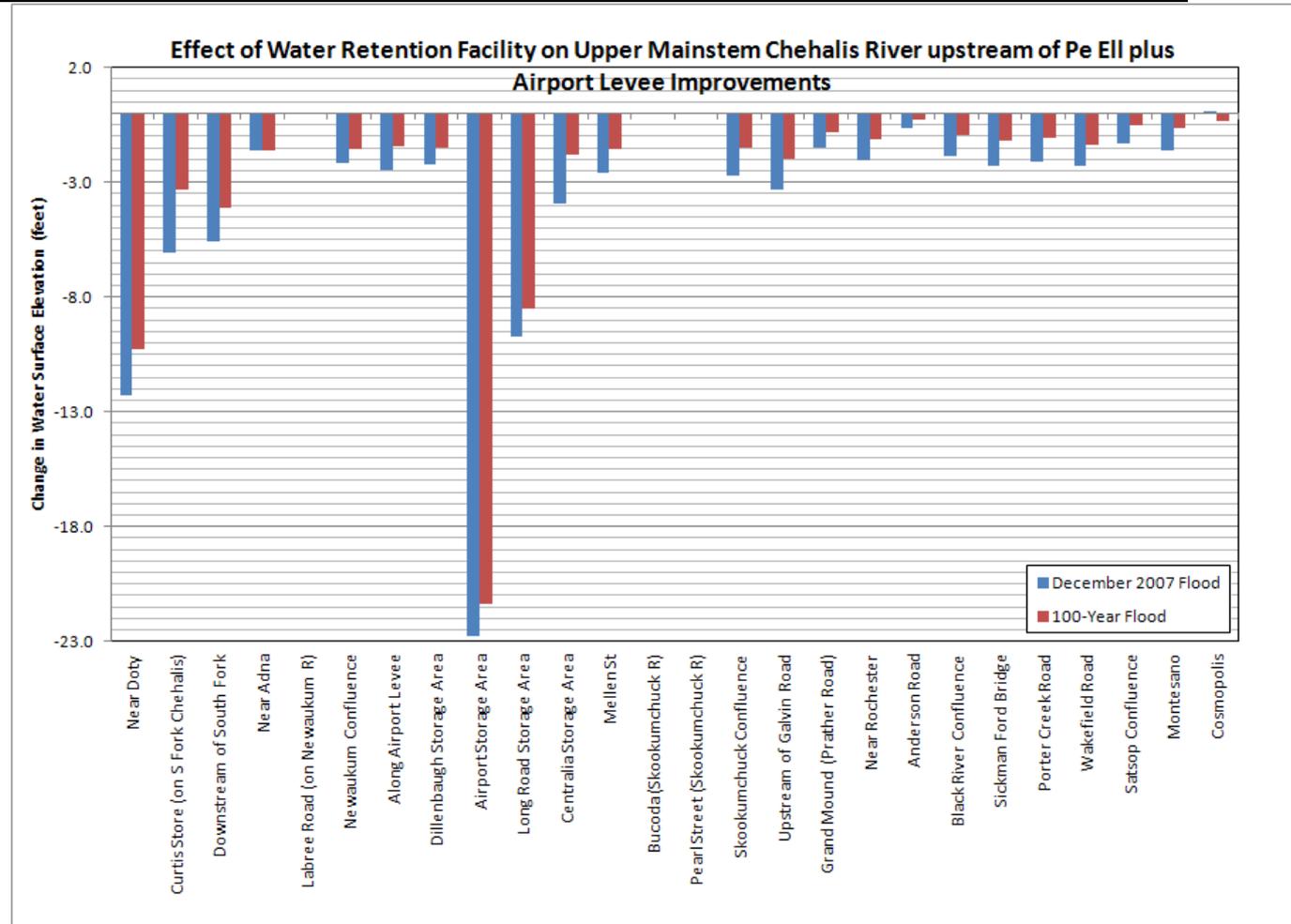
July 23, 2012



July 2014

## 2. Hydraulic Understanding

- **Example: Basin-wide effects analysis** (Watershed Science and Engineering; Chehalis Basin Flood Hazard Mitigation Alternatives Report analysis; 12/2012)



# 3. Large Capitol Projects

- **Technical team evaluating safety, feasibility of upper basin water retention structure** -- field visits, site and design considerations, world-wide research, etc.
  - Permanent reservoir with fish passage or Run-of-the-river without permanent reservoir.
  - Roller compact concrete or Earthen fill.
  - Flood-control only or Multi-purpose.
- **WSDOT evaluating alternatives to protect Interstate 5** – levees, walls, raise, etc.
- **Comprehensive set of recommendations to Governor, Legislature (11/2014).**

■ Governor's Work Group -- May 7-8, 2014 (Technical Workshop #2)

#### Meeting Documents:

- Agenda and Meeting Location --> Click [here](#).

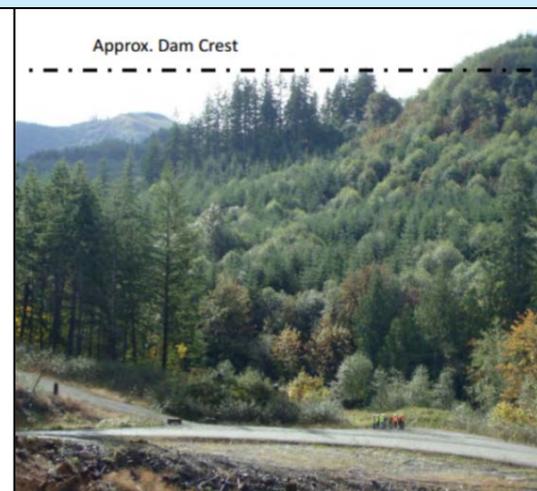
#### Wednesday, May 7, 2014

- 9:15 a.m. -- Methods for Comparing Alternatives. Click [here](#).
- 9:30 a.m. -- Flooding in the Chehalis.
  - Presentation. Click [here](#).
  - Results with Dam. Click [here](#).
- 10:00 a.m. -- Water Retention.
  - Dam and Fish Passage. Click [here](#).
  - Dam Operations. Click [here](#).
  - Chehalis Geomorphology. Click [here](#).
  - Reservoir Geotechnical Challenges. Click [here](#).
- 3:00 p.m. -- Interstate 5 Alternatives. Click [here](#).

#### Thursday, May 8, 2014

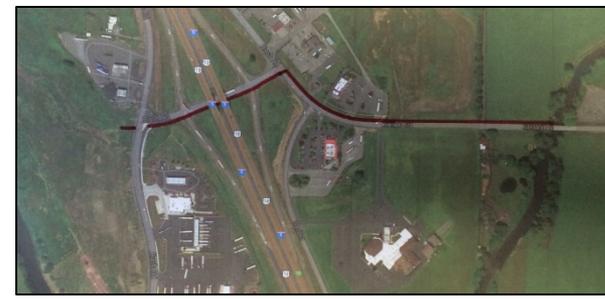
- 9:00 a.m. -- Suite of Local Projects. Click [here](#).
- 10:00 a.m. -- Aquatic Species Enhancement Plan.
  - Impacts. Click [here](#).
  - Tech Committee. Click [here](#).

[www.ezview.wa.gov/chehalisfloodauthority](http://www.ezview.wa.gov/chehalisfloodauthority)



← **Photos Source:**  
ANCHOR QEA

July 2014



# 4. Smaller-Scale Local Projects

## 2012 Supplem. Capital Budget:

- \$5.0M – Local projects.

## 2013-15 Capital Budget:

- \$15.2M -- Local projects, aquatic species enhancement.

## 2015-17 Capital Budget:

- \$??M – More local projects\*\*\*.

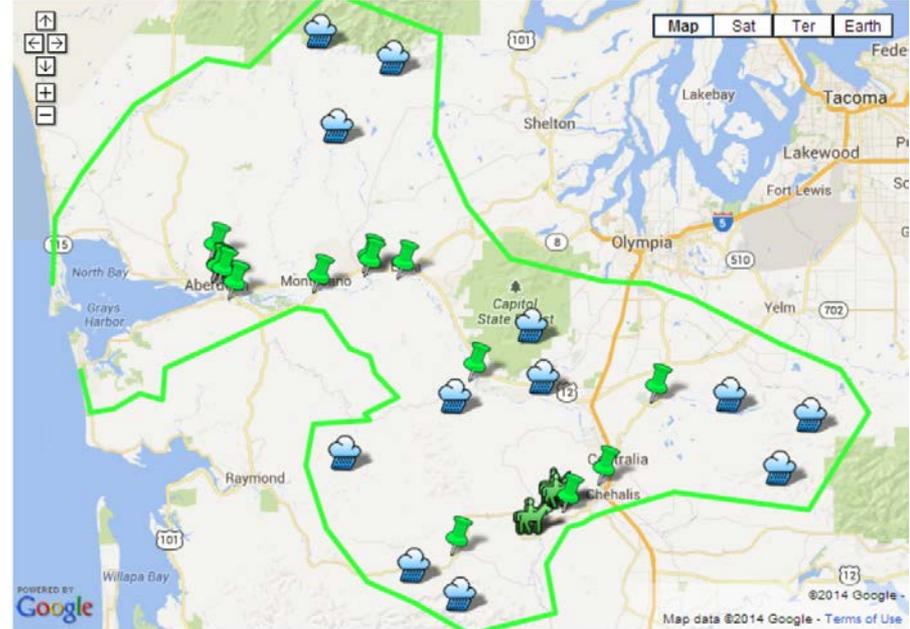
Local Projects Funded (2012, 2013-15):



Critter Pads Funded (2012):



Gages Funded (2011):



([https://www.ezview.wa.gov/site/alias\\_1492/34489/local\\_projects.aspx](https://www.ezview.wa.gov/site/alias_1492/34489/local_projects.aspx))



**CHEHALIS RIVER BASIN FLOOD AUTHORITY**

**City of Montesano**  
*Home of the Best View*

**Another Chehalis Basin Flood Protection Project**

**Wastewater Treatment Plant Flood Prevention Dike**

Schedule → February 2014 to April 2014

Budget → \$511,153

Benefit → Protecting essential public infrastructure for all Basin residents

[www.ezview.wa.gov](http://www.ezview.wa.gov)

**STELLAR J**  
 An engineering consulting company

**Parametrix**



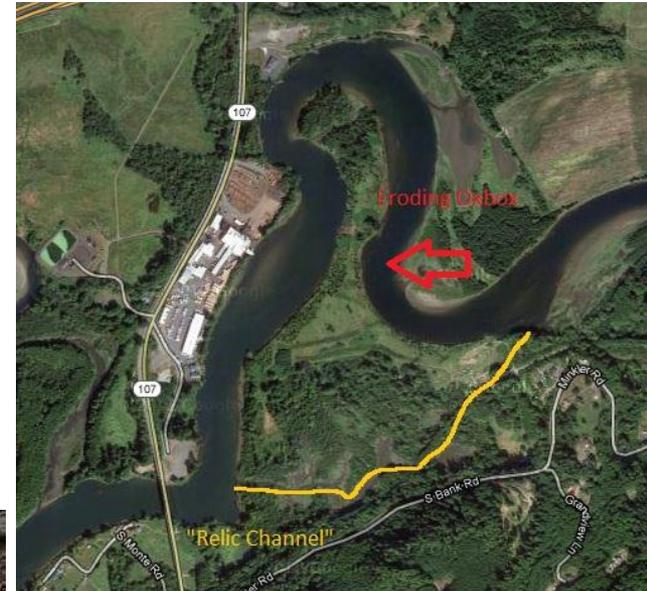
# 4. Smaller-Scale Local Projects

		2012 (\$)	2013 (\$)
<b>GRAYS HARBOR COUNTY</b>			
1 - Aberdeen	<a href="#">Burger King Trail/Dike</a>	24,600	140,000
2 - Aberdeen	<a href="#">Dike Bank of Wishkah North of Highway</a>	47,000	270,000
3 - Aberdeen	<a href="#">Market Street Dike</a>	0	670,000
4 - Aberdeen	<a href="#">Southside Dike/Levee Certification</a>	50,000	0
5 - Chehalis Tribe	<a href="#">Oxbow Lake Reconnection</a>	0	1,149,009
6 - Chehalis Tribe	<a href="#">Sickman-Ford Overflow Bridge</a>	2,075,000	0
7 - Cosmopolis	<a href="#">Mill Creek Dam Improvement</a>	0	737,750
8 - Grays Harbor County	<a href="#">Elma-Porter Flood Mitigation</a>	0	584,000
9 - Grays Harbor County	<a href="#">Satsop River Floodplain Restoration (Phase I)</a>	50,000	0
10 - Grays Harbor County	<a href="#">Wishkah Road Flood Levee</a>	125,000	690,000
11 - Montesano	<a href="#">Revetment for Montesano Rd., Sewage Treatment Plant, Mary's River Lumber</a>	102,426	6,000,000
12 - WDFW	<a href="#">Satsop River Floodplain Restoration (Phase II)</a>	450,000	0
<b>LEWIS COUNTY</b>			
13 - Chehalis Tribe	<a href="#">Oxbow Reconnection at RM 78</a>	0	602,383
14 - Lewis County	<a href="#">Adna Levee</a>	244,145	0
15 - Lewis County	<a href="#">Airport Levee (Phase I)</a>	1,239,829	0
16 - Pe Ell	<a href="#">Wastewater Treatment Plant Flood Prevention Dike</a>	0	521,000
17 - WSCC	<a href="#">Critter Pads, Evacuation Routes (Phase I)</a>	500,000	0
<b>THURSTON COUNTY</b>			
18 - Bucoda	<a href="#">Bucoda Levee</a>	42,000	305,000
19 - Chehalis Tribe	<a href="#">Allen Creek Restoration</a>	0	987,645
20 - Chehalis Tribe	<a href="#">Flood Gage Station</a>	50,000	0
<b>BASIN-WIDE</b>			
21 - TBD	<a href="#">Basin-wide Aquatic Species Plan</a>	0	1,350,000
22 - WSCC	<a href="#">Critter Pads, Evacuation Routes (Phase II) and Geomorphic Analysis</a>	0	850,000
		<b>\$ 5,000,000</b>	<b>\$ 14,856,787</b>

# 4. Smaller-Scale Local Projects

## ■ Revetment to Protect Montesano Road, Adjacent Facilities

- ❑ Mary's River Lumber = 120 family wage jobs.
- ❑ State Highway (SR 107) = At risk of damage.
- ❑ Montesano STP = Risk of overtopping.
- ❑ Solutions and Alternative = Balance time, cost, results.
- ❑ Project [website](#).



**Another Chehalis Basin Flood Protection Project**

**Wastewater Treatment Plant Flood Prevention Dike**

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[www.ezview.wa.gov](http://www.ezview.wa.gov)

# 4. Smaller-Scale Local Projects

## ■ Pe Ell -- WWTP Flood Prevention Dike

- ❑ Construct 900 foot dike between river and WWTP.
- ❑ Final elevation to be 2 feet higher than 2007 flood.
- ❑ Project [website](#).



**EZ view** Pe Ell – Wastewater Treat. Plant Flood Prevention Dike Project [Portal ID #1782]

Updates Overview Contacts Events Library

### Summary of the project

Last Updated: [January 9, 2014](#)

Click [HERE](#) To Return To Main Flood Authority Website

**2013-15 Funding** -- \$521,000 (09/06/2013).

**Description** -- The proposed project will design and construct approximately 900 linear feet of dike along the northwest side of the wastewater treatment plant (WWTP) to protect the WWTP from flood events. The top of the dike will have an elevation of approximately 365.00 feet, which is approximately 2 feet higher than the water level reached in the 2007 flood event.

**Flood Hazard Reduction Benefits** -- The WWTP Dike will reduce the risk of flooding at the Town of Pe Ell's WWTP by creating a barrier to flood waters that is 2 feet higher than the level that water reached in the 2007 flood event. The dike will be constructed in 2014 and will be ready to protect the WWTP in the winter of 2014-15.

**Project Status** -- **Underway, On-Track**

*Pictures*



# 5. Land Use, Floodplain Management

- **Analyze local floodplain management programs across the Basin and, where appropriate, make recommendations to:**
  - protect existing homes/businesses.
  - ensure new development does not increase flood hazard risk.
  - identify ways to reduce flood insurance rates.
  - address properties that are repetitively flood damaged.

LEWIS COUNTY NOTICE TO CONSULTANTS FOR:

**Request for Proposals (RFP)  
Floodplain Management Analysis**

Lewis County is seeking a qualified consulting firm or team to provide professional services to complete a floodplain management analysis report for jurisdictions in the Chehalis Basin.

**PROJECT DESCRIPTION**

Lewis County, Fiscal Agent for the Chehalis River Basin flood Authority, is seeking a qualified consulting firm or team to provide professional services to complete a floodplain management analysis report for jurisdictions in the Chehalis Basin; provide technical assistance to explore potential local and regional cooperative efforts that allow jurisdictions to improve local floodplain management, and work with the local governments in the Basin to develop a strategic approach for buyouts, elevating structures, and other techniques to address repetitive loss properties. The work in this proposal is part of the 2013-2015 Chehalis Basin Strategy, a State of Washington effort to reduce flood damage and enhance aquatic species in the Chehalis River Basin. For more information, view the Ruckelshaus Center's Chehalis Basin project site: <http://ruckelshauscenter.wsu.edu/ChehalisFlooding.html>

Interested consultants shall provide a letter of interest, approach/methodology, budget, personnel resume(s), experience related to this project, and client references.

- **Contract work to be completed by August 31, 2014.**

## 6. Enhance Salmon (Aquatic Species)

- Collect aquatic species, water quality, hydrologic data.
- Model analyses to understand impacts/benefits on fish, wildlife, water quality, sediment, streamflow and flooding.
- Develop DRAFT and FINAL aquatic species enhancement plan.
- Comprehensive set of recommendations to Governor, Legislature (11/2014).



**Seine collections (Chehalis River)**



**Downstream snorkel surveys (Chehalis River)**

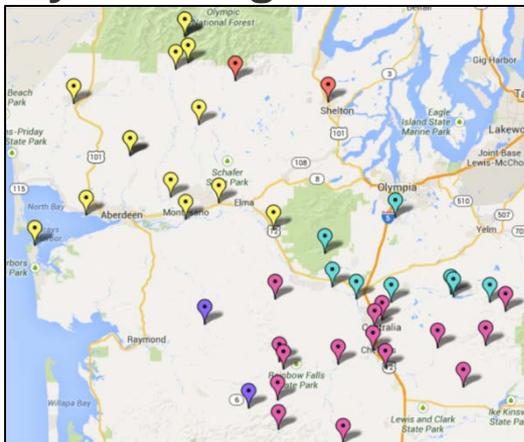
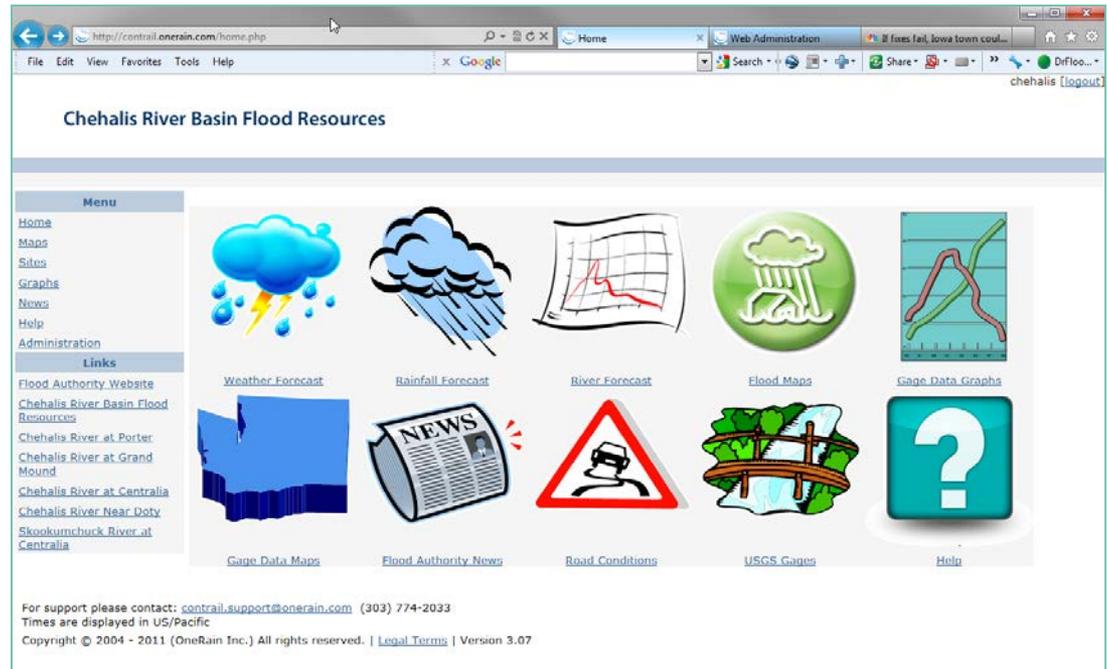
# 7. Early Flood Warning

- [www.chehalisriverflood.com](http://www.chehalisriverflood.com)

- Front-facing website.

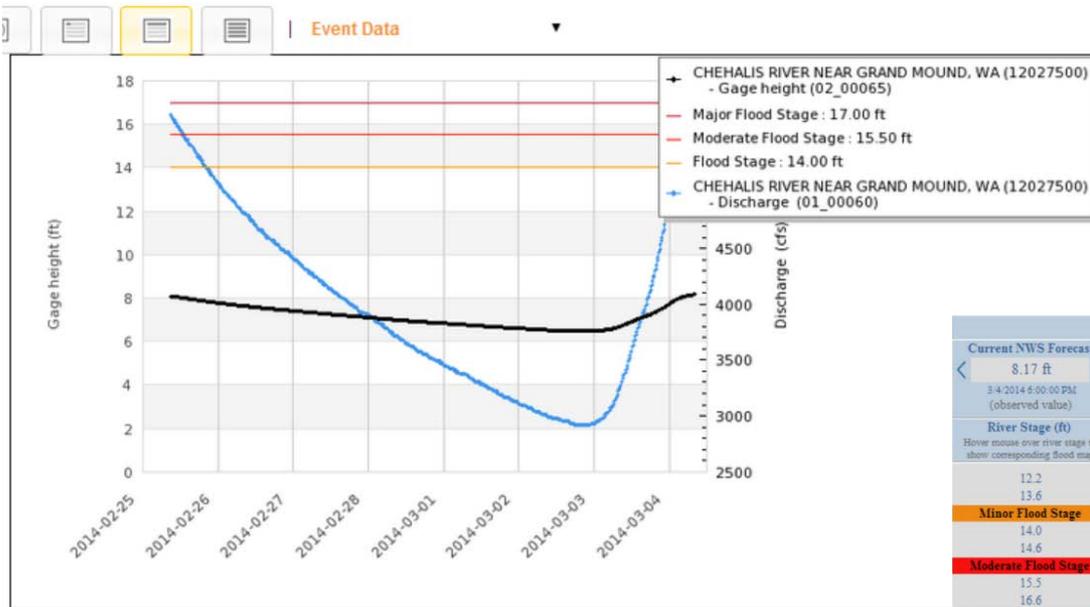
- Data collection, data synchronization.

- Improved forecasting, early-warning.



# 7. Early Flood Warning

## Localized tracking, forecasting . . .



Daily discharge, cubic feet per second -- statistics for Mar 4 based on 84 years of record [more](#)

Min (2005)	25th percentile	Median	Mean	Most Recent Instantaneous Value Mar 4	75th percentile	Max (1987)
903	2340	3260	4670	5830	6340	22700

# 8. Outreach, Education and Communication

## Website

The screenshot shows the website's header with 'EZview' and navigation links. The main content area includes a 'Click Here to Listen Now!' button, the organization's logo, and a 'GIVE US YOUR FEEDBACK' button. A sidebar on the left lists categories like 'Local Flood Hazard Reduction Projects', 'Recent Documents', 'Community Outreach & Education Visits', and 'Implementation of 2013-15 State Capital Budget'.

## Outreach Visits

**Chehalis River Basin**

*Reducing Flood Damage and  
Enhancing Aquatic Species Across The Basin*

March 5, 2014  
Grand Mound-Rochester Chamber of Commerce  
12 noon

## Project Signs

**Another Chehalis Basin Flood Protection Project**

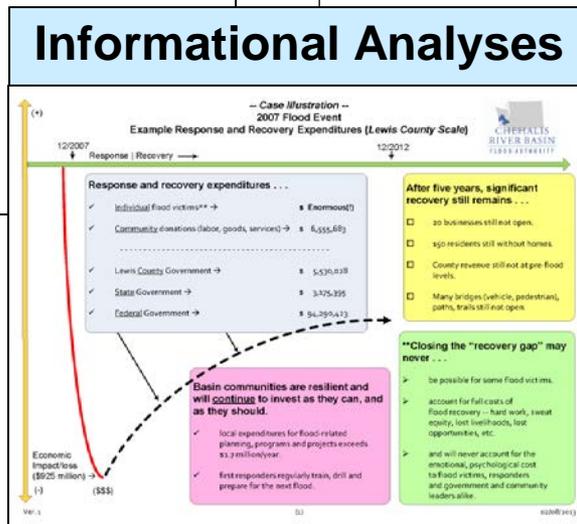
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Schedule → February 2014 to April 2014  
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[www.ezview.wa.gov](http://www.ezview.wa.gov)

Logos for CHEHALIS RIVER BASIN FLOOD AUTHORITY, City of Montesano, STELLAR, and Parametrix are also present.

## Informational Analyses



## Email Distribution List

**Pat Anderson**  
[Pat.Anderson@lewiscou  
ntywa.gov](mailto:Pat.Anderson@lewiscountywa.gov)

# Resources, Additional Information . . .

[www.ezview.wa.gov/chehalisfloodauthority](http://www.ezview.wa.gov/chehalisfloodauthority)

<http://ruckelshauscenter.wsu.edu/ChehalisFlooding.html>

[www.chehalisriverflood.com](http://www.chehalisriverflood.com)



Implementation of 2013-15 State Capital Budget

July 2014

# Closing – 2007 Flood Damage . . .



Chehalis  
River near  
Doty  
USGS

# Closing – 2007 Flood Damage . . .

**Clearing Mud in  
Curtis, WA**  
STEVE RINGMAN /  
SEATTLE TIMES



July 2014

# Closing – 2007 Flood Damage . . .



**Curtis, WA, Aftermath  
of 7 Feet of Water**  
STEVE RINGMAN /  
SEATTLE TIMES

# Closing – 2007 Flood Damage . . .



**Chandler Road Bridge  
near Doty, WA**  
STEVE RINGMAN /  
SEATTLE TIMES

# Closing – 2007 Flood Damage . . .



July 2014

# Closing – 2007 Flood Damage . . .



July 2014

# Closing – 2007 Flood Damage . . .

**I-5 Under Water**  
BRUCE ELY /  
OREGONIAN



July 2014

# Closing – 2007 Flood Damage . . .



**Chehalis, WA**  
STEVE RINGMAN /  
SEATTLE TIMES

July 2014

# Closing – 2007 Flood Damage . . .



July 2014

# Closing – 2007 Flood Damage . . .

**Jackson Street,  
Centralia, WA**  
STEVE RINGMAN /  
SEATTLE TIMES



July 2014

# Closing – 2007 Flood Damage . . .



**I-5 Under Water**  
BRUCE ELY / OREGONIAN

# Closing – 2007 Flood Damage . . .



Photos Source:  
WSDOT

July 2014

# Closing – 2007 Flood Damage . . .



July 2014

# Closing – 2007 Flood Damage . . .



July 2014

# Closing – 2007 Flood Damage . . .



**Wakefield Road,  
Elma, WA**  
GREG GILBERT /  
SEATTLE TIMES

July 2014

# For Further Information . . .

**Vickie Raines, *Chair***

Chehalis River Basin Flood Authority  
(*Member, Governor's Chehalis Basin Work Group*)

360/590-4100

[vraines@cosmopolis.us.com](mailto:vraines@cosmopolis.us.com)

**Edna Fund, *Chair***

Community Outreach and Education Committee  
(Flood Authority)

360/269-7515

[Edna.Fund@lewiscountywa.gov](mailto:Edna.Fund@lewiscountywa.gov)

**Karen Valenzuela, *Vice-Chair***

Chehalis River Basin Flood Authority  
(*Member, Governor's Chehalis Basin Work Group*)

360/786-5440

[ValenzK@co.thurston.wa.us](mailto:ValenzK@co.thurston.wa.us)

**Jim Kramer, *Facilitator***

Governor's Chehalis Basin Work Group, and  
Chehalis River Basin Flood Authority

206/841-2145

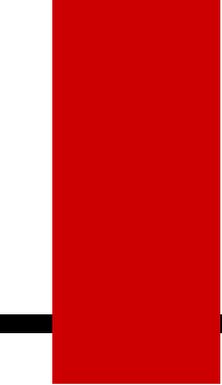
[jkramer.consulting@gmail.com](mailto:jkramer.consulting@gmail.com)

**Scott Boettcher, *Staff***

Chehalis River Basin Flood Authority

360/480-6600

[scottb@sbgh-partners.com](mailto:scottb@sbgh-partners.com)



Thank You . . .

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# Thank You!

**Note:**

**This Presentation Is Posted To  
“Chehalis River Basin Flood Authority” Website  
at [www.ezview.wa.gov/chehalisfloodauthority](http://www.ezview.wa.gov/chehalisfloodauthority).**