



Chehalis River Basin

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

December 2, 2014

North Beach Community Improvement Association

6:30 p.m.



Today's Presentation . . .

- Provide update

- Encourage discussion

- Key messages . . .

1. **Broad agreement** -- For first time in a century there is progress 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 to 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 = Action!

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



Action . . .



Photos Source: THE CHRONICLE →

Dec. 2014

“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

"Governor's Chehalis Basin Work Group"

- **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:**
 - Vickie Raines (Mayor Cosmopolis, Chair Flood Authority).
 - Karen Valenzuela (Thurston County Commissioner, Vice-Chair Flood Authority).
 - David Burnett (Chairman Chehalis Tribe).
 - 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).

**** Note:** Next steps delivered and accepted by Governor on 11/24/2014 (see slide 25).

Background . . .

- 2007 Storm -- \$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 . . .

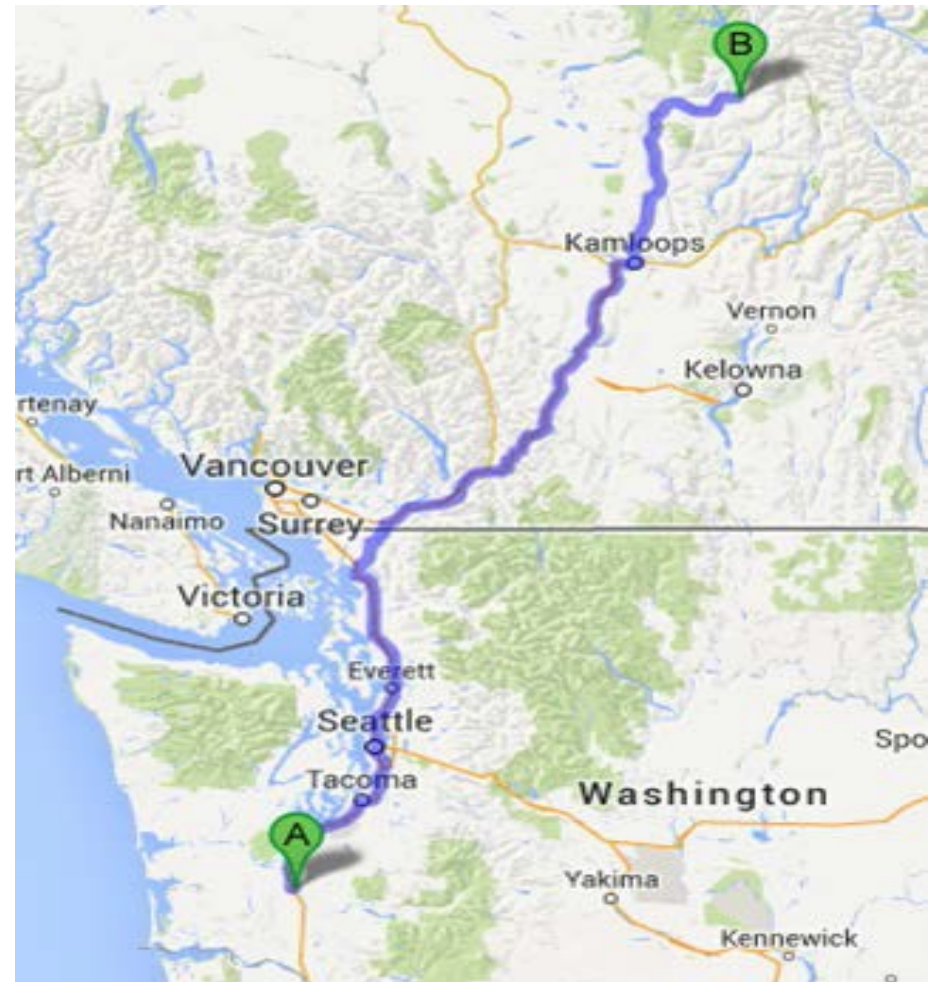
- 2007 Flood -- I-5 and Hwy 507 Interchange looking South.



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

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.

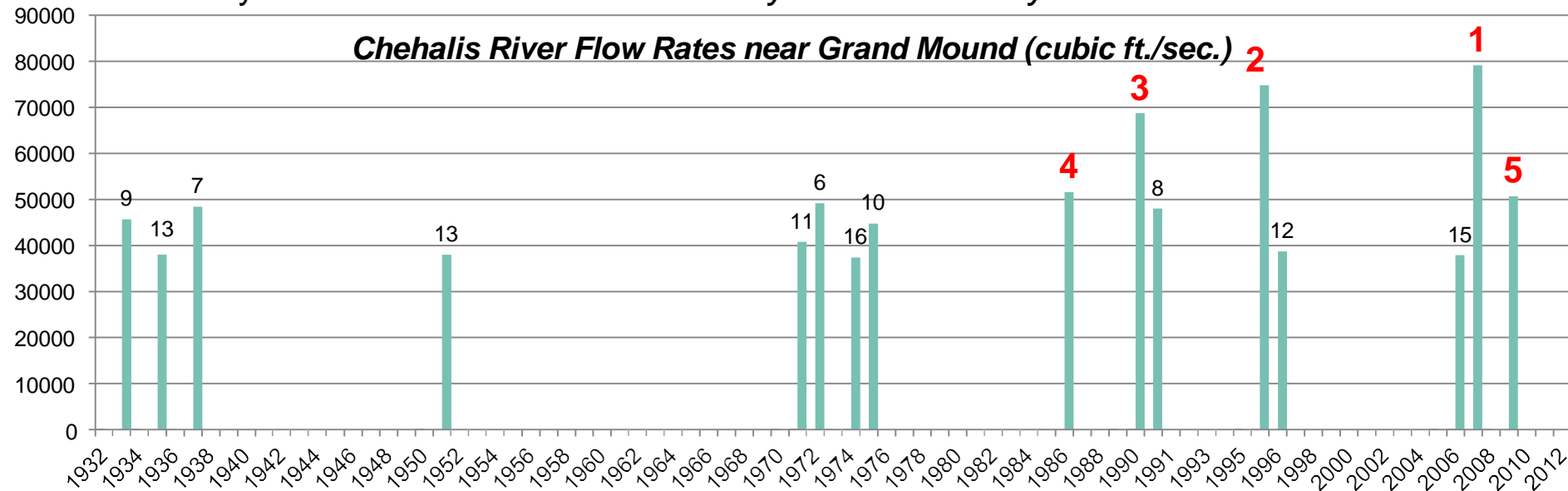


Background . . .

■ 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 . . .*
- ❑ 100 year flood estimate -- *Increased by 33% in last 30 years.*

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

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## CHEHALIS BASIN SALMON & TROUT

### OCEAN PHASE

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

**WHAT SALMON NEED IN FRESHWATER HABITAT**

Cool, clean water

Appropriate water depth, quantity and flow velocities

Upland and riparian (stream bank) vegetation to stabilize soil & provide shade

Clean gravel for spawning and egg-rearing

Large woody debris to provide resting and hiding places

Adequate food

Varied channel forms

### SPAWNING PHASE

~~~~~

www.chehalisbasinpartnership.org

Background . . .

Salmon-habitat potential

Species	Current (#fish)	Natural Conditions (#fish)	Habitat Impairment
Spring Chinook Salmon	3,349	15,287	78%
Fall Chinook Salmon	25,459	46,052	45%
Coho Salmon	24,144	78,986	69%
Winter-run Steelhead	4,557	8,102	44%

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, WRA has some 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 projects and leading to a comprehensive strategy to address flooding, while at the same time enhancing aquatic species across the Chehalis Basin.

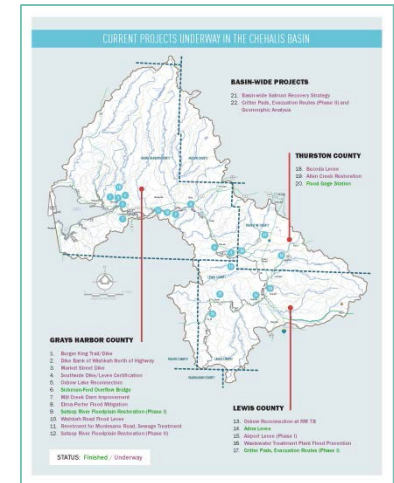
The 2013 legislature funded a \$28 million program of capital investments that is building projects with immediate flood damage reduction and/or aquatic habitat benefits. The investment is also being used aggressively to fill data gaps, evaluate the feasibility of flood damage reduction actions, and 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 manifest the Chehalis River Basin again in the not-so-distant future."

— Lewis County Chehalis Editorial

Photo courtesy of Mark Spitzer, The Observer



1. Basin-Wide Relationships



TOWN of BUCODA



WASHINGTON STATE
CONSERVATION
COMMISSION



WASHINGTON STATE DEPARTMENT OF
Natural Resources



Office of Financial Management

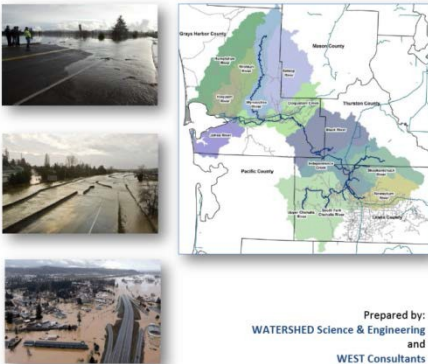
Better information. Better decisions. Better government.

Dec. 2014

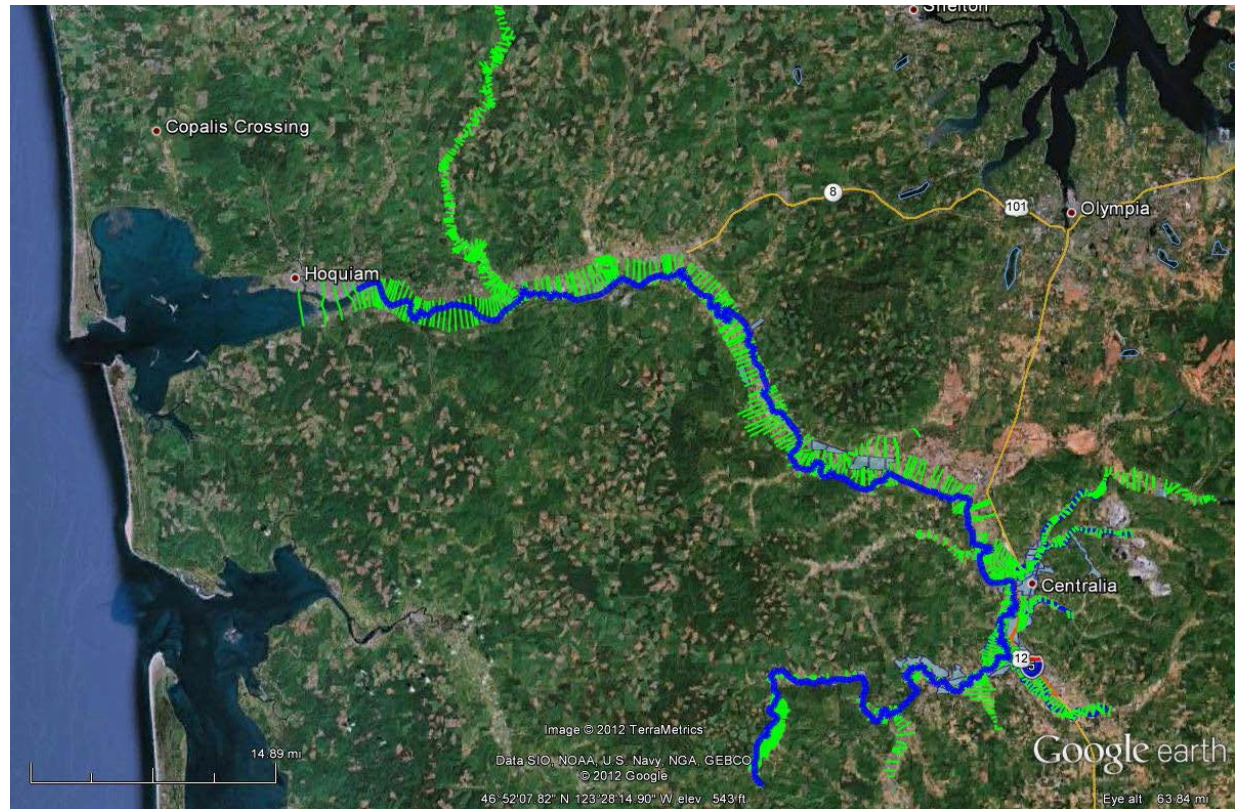
2. Hydraulic Understanding

- **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



July 23, 2012



Dec. 2014

2. Hydraulic Understanding

- **Example: Basin-wide effects analysis**
(Governor's Chehalis Basin Workgroup, 2014 Recommendations Report, 11/25/2014)

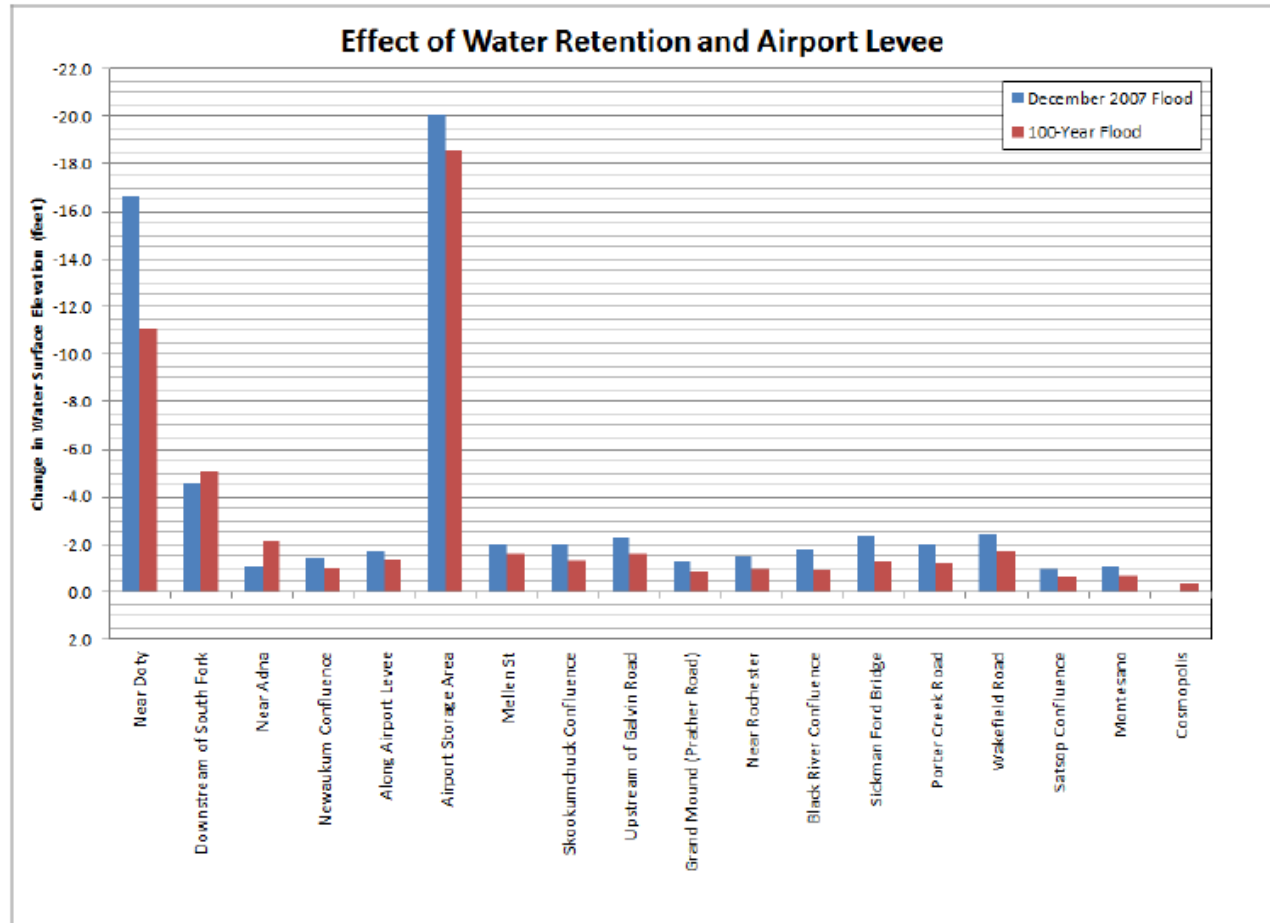


Figure 2: Predicted Changes in Water Surface Elevations from Water Retention and Airport Levee

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](#).

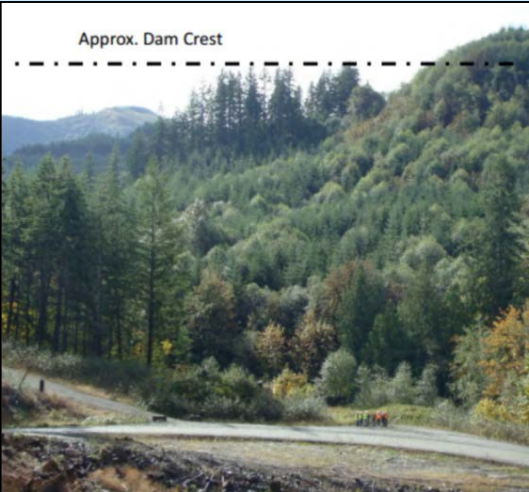
Wednesday, May 7, 2014

- 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



← Photos Source: ANCHOR QEA





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.

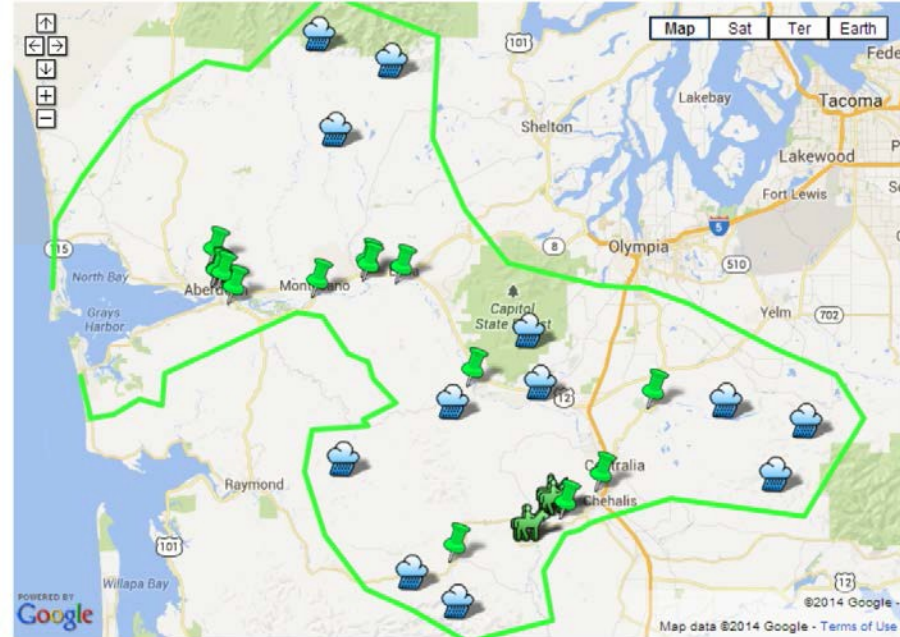
Local Projects Funded (2012, 2013-15):



Critter Pads Funded (2012):



Gages Funded (2011):



https://www.ezview.wa.gov/site/alias_1492/34489/local_projects.aspx



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
STELLAR J
 Parametrix

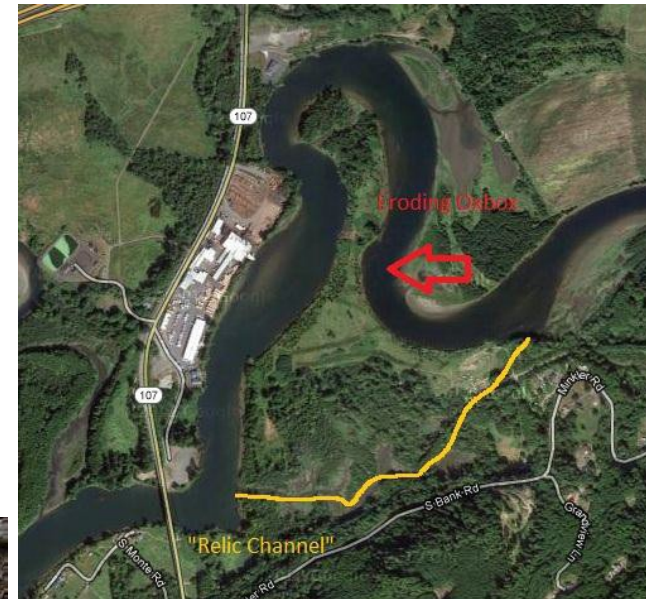



4. Smaller-Scale Local Projects





■ 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](#).



 **CHEHALIS RIVER BASIN FLOOD AUTHORITY**

 **City of Montesano**
Home of the Tree Farms
www.montesano.com

 **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

 **STELLAR J**
An employee owned company

 **Parametrix**



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.

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

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.

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)

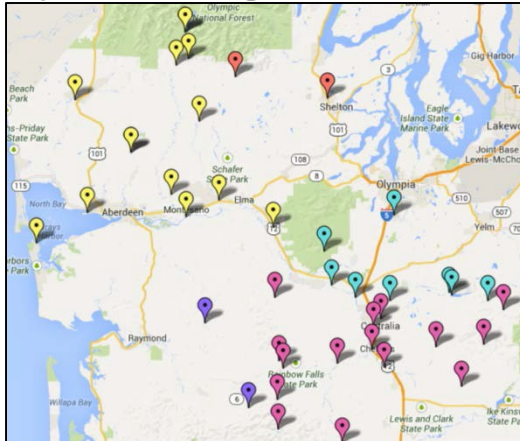
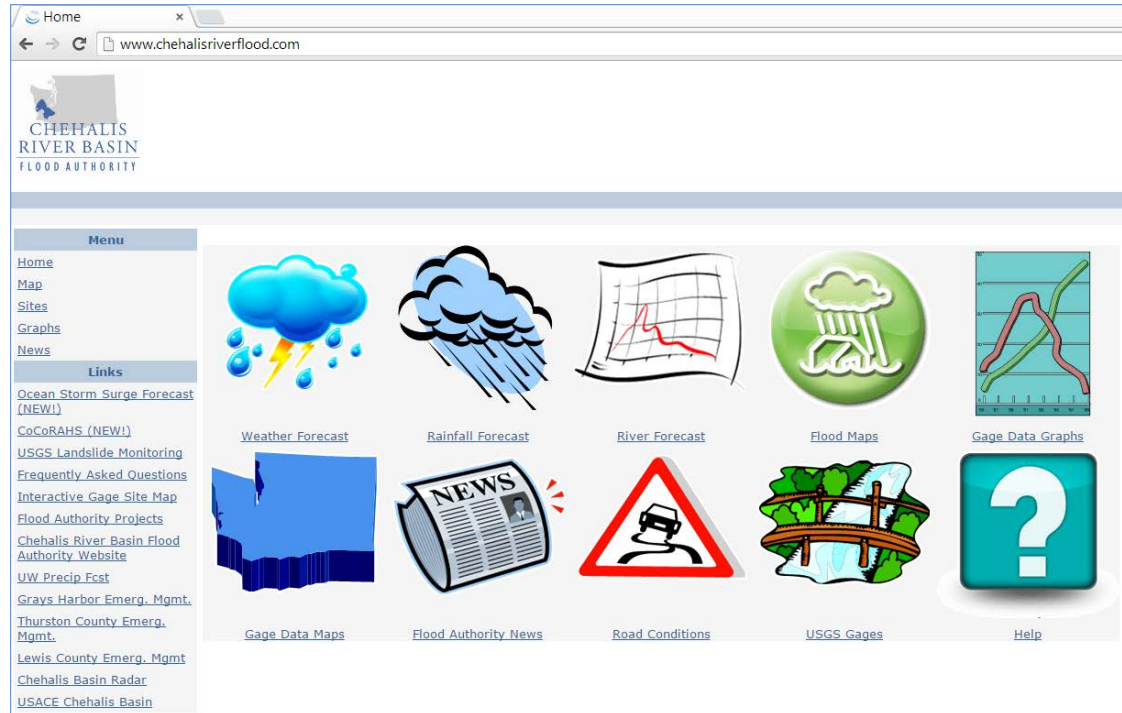
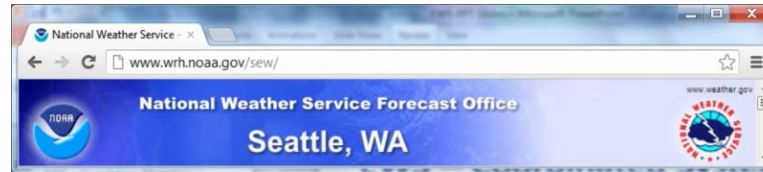
6. Enhance Salmon (Aquatic Species)

Other Fish and Aquatic Species



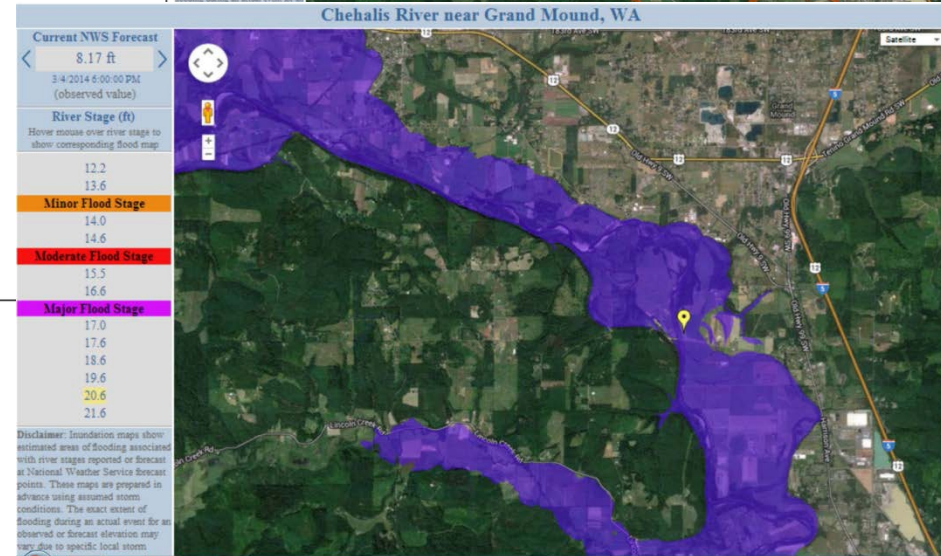
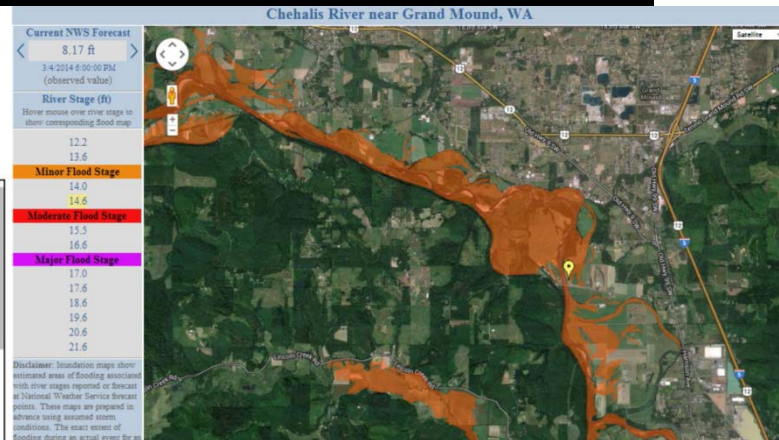
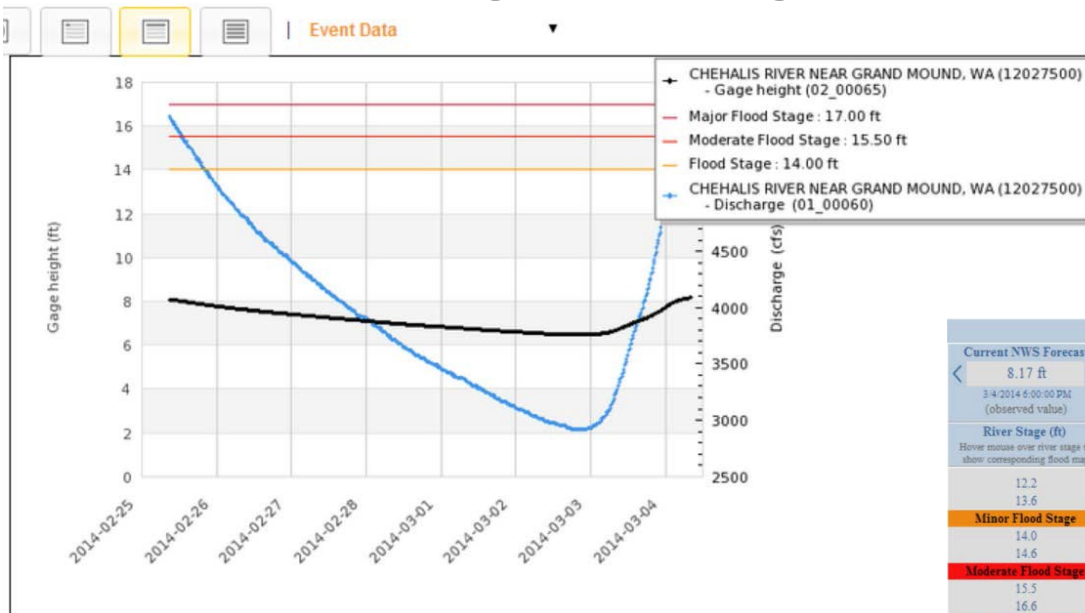
7. Early Flood Warning

- 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

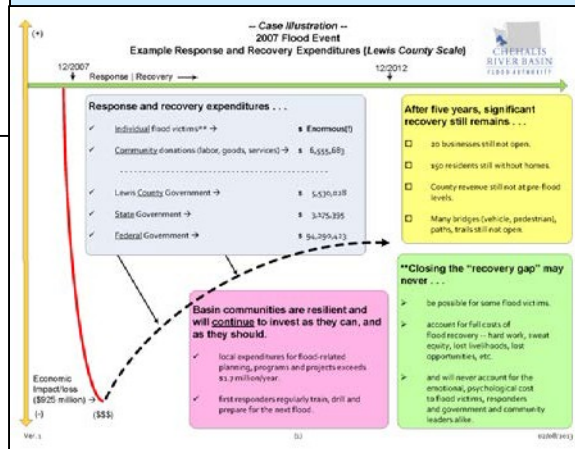
8. Outreach, Education and Communication

Website

Outreach Visits

Project Signs

Informational Analyses



Email Distribution List

Pat Anderson
Pat.Anderson@lewiscountywa.gov

Chehalis Basin Next Steps 2015-17



The Chronicle
SERVING THE GREATER LEWIS COUNTY, WASH. AREA SINCE 1889

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Chehalis Basin Work Group Celebrates 'Historic Step Forward' on Flooding

Water Retention Dam in the Upper Chehalis: Governor Approves Chehalis River Basin Work Group's Five-Point Plan to Address Persistent Damaging Floods

Posted: Tuesday, November 25, 2014 10:59 am

CHEHALIS BASIN STRATEGY

Governor's Chehalis Basin Work Group

2014 Recommendation Report

Final November 25, 2014

JAY INSLEE
Governor

STATE OF WASHINGTON
Office of the Governor

November 24, 2014

The next step is to **begin work on a programmatic Environmental Impact Statement (EIS)** where the analysis contained in this report can be further tested and a formal opportunity for input is provided to all parties. While the programmatic EIS is being carried out, we can **continue implementing smaller, more localized projects** on the ground to reduce flood damage and **improve habitat** in the Basin.

There is a tremendous amount of work ahead. I have asked the **Work Group to continue to provide leadership** for this plan, and I have **directed state agencies to provide technical support** for their efforts.

P.O. Box 40002 • Olympia, Washington 98504-0002 • (360) 902-4111 • www.governor.wa.gov

Chehalis River Basin

https://www.ezview.wa.gov/chehalisfloodauthority

Project: Chehalis River Basin Flood Authority
UP#1: 1492

Home Local Projects Meetings 2013-15 Capital Budget 2013-15 Damwork & Education Gages & Stations Documents Contact Library FAQ

ANNOUNCEMENTS!!
(Click for latest news)

GIVE US YOUR FEEDBACK
(Click icon to provide feedback)

THE CHEHALIS BASIN STRATEGY
(Click icon for 2014 strategy)

Current Flood Forecast
(Click icon for current river forecast)

CHEHALIS RIVER BASIN FLOOD AUTHORITY

CRBFA Governing Documents

- Cost = \$500–600 million.
- Benefit = \$720 million (over next 100 years).
- No Action = \$3.5 billion (over next 100 years).



Chehalis Basin Next Steps 2015-17

Recommended Package of Actions:

1. Concrete flood retention dam on upper Chehalis River.
2. Chehalis-Centralia Municipal Airport levee improvements.
3. Basin-wide aquatic species restoration, including 100+ miles of spawning, rearing habitat.
4. Smaller-scale flood-damage reduction projects, including raising homes, flood-proofing businesses and public structures.
5. Local action to protect natural floodplain functions, ensure future development doesn't create more harm.

Recommended Next Steps (2015-17):

- a. Initiate programmatic Environmental Impact Statement (EIS) to evaluate and further vet the timing and cost of the recommended package of flood-damage reduction and aquatic species restoration actions in preparation for permitting the individual components of the project.
- b. Further investment in laying the technical groundwork for successful implementation of water retention and aquatic species restoration efforts.
- c. Further investment in near-term, on-the-ground projects such as smaller-scale flood damage reduction, floodplain management, flood-proofing, and flood warning and preparedness.

Resources, Additional Information . . .

www.ezview.wa.gov/chehalisfloodauthority

ANNOUNCEMENTS!!
(Click for latest news)

GIVE US YOUR FEEDBACK
(Click icon to provide feedback)

THE CHEHALIS BASIN STRATEGY
Reducing Flood Damage and Enhancing Aquatic Species
(Click icon for 2014 strategy)

Current Flood Forecast
(Click icon for 2014 strategy)

Governing Documents

www.chehalisriverflood.com

Information
Flood inundation maps for the Newnesum River near Chehalis are now available.
chehalis - 01/29/2014 09:31:29
Click on the Flood Maps icon for new new flood inundation maps for the Centralia, Chehalis, Dohy, and Buckles areas. Maps for Grand Mount and Porter will be available soon.

Weather Forecast **Rainfall Forecast** **River Forecast** **Flood Maps** **Gage Data Graphs**

Gage Data Maps **Flood Authority News** **Road Conditions** **USGS Gages** **FIRB**

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

Chehalis Flooding

Upcoming Policy Workshop
The Chehalis Basin Strategy "Reducing Flood Damage and Enhancing Aquatic Species" Policy Workshop will be held on November 13, 2013 from 8:30am - 4:30pm at the Great Wolf Lodge in Centralia, WA. This workshop is open to the public. For more information, read the [agenda](#).

Project Description
The Chehalis Basin has repeatedly flooded over the past decades. There have been seven major floods in the past 30 years alone. The 2007 flood caused over \$900 million in private and public damages, as well as closed Interstate 5 and a major rail line for days. The 2010-11 Washington State Legislature passed Engrossed Substitute House Bill (ESHB) 2020, which required the Office of Financial Management (OFM) to produce a report for the Governor and Legislature that identifies recommended priority flood hazard mitigation projects in the Chehalis River Basin. The Center was asked by the Governor's Office to help OFM—in collaboration with the five state agencies, affected and interested federal agencies, 2 tribal governments, and 12 local governments—produce the report. The Center's tasks were to coordinate the report using technical information provided by other agencies and organizations, and to conduct a situation assessment of flood alternatives and relationships between the responsible parties and stakeholders. The report was completed in December 2012.

In August 2012, the Governor's Office asked the Center to facilitate a small work group convened by the Governor to inform the Governor's recommendations for the 2013-15 biennial budget. A framework document containing the group's consensus recommendations was presented to the Governor in November 2012. Then-Governor Gregoire endorsed the group's recommendations (as has current Governor Jay Inslee). In June 2013, the Legislature passed the 2013-15 biennial capital budget with \$28.2 million to fund the work group's recommendations. A summary of the budget for that work is located on right hand side of this page.

Governor Inslee requested the work group to continue to provide advice over the next two years to OFM on the implementation of these capital budget items. The Governor also requested work group provide

Documents and Resources
Read the [January 2014 Chehalis Basin Strategy](#) (2 MB PDF)
View the November 13 policy workshop [slide deck](#) (12 MB PDF)
Read the [Chehalis Basin Strategy Overview for 2013-2015](#) (437 KB PDF)
Read the [Chehalis River Basin Flood Damage Reduction 2013-2015 Capital Budget](#), approved by the Legislature in June 2013
Read the work group's [brief on the capital budget proposal](#) (279 KB PDF)
Read the [work group's framework](#) (70.7 KB PDF) or [summary of their recommendations](#) (42.5 KB PDF)
Read the [Alternatives Report](#) (11.5 MB PDF)
Read the [Executive Summary of the Alternatives Report](#) (2 MB PDF)
Read the [Comments on the Draft Report](#) as of 9-25-12 (1.6 MB PDF)
WSDOT Report: [I-5 Protection Flood Report](#) (7 MB PDF)

Closing – 2007 Flood Damage . . .



Chehalis
River near
Doty
USGS

Closing – 2007 Flood Damage . . .



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

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 . . .



Closing – 2007 Flood Damage . . .



Dec. 2014

Closing – 2007 Flood Damage . . .

I-5 Under Water
BRUCE ELY /
OREGONIAN



Closing – 2007 Flood Damage . . .

Chehalis, WA
STEVE RINGMAN /
SEATTLE TIMES



Closing – 2007 Flood Damage . . .



Dec. 2014

Closing – 2007 Flood Damage . . .

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



Dec. 2014

Closing – 2007 Flood Damage . . .



I-5 Under Water
BRUCE ELY / OREGONIAN

Closing – 2007 Flood Damage . . .



Photos Source:
WSDOT

Dec. 2014

Closing – 2007 Flood Damage . . .



Dec. 2014

Closing – 2007 Flood Damage . . .



Closing – 2007 Flood Damage . . .



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

For Further Information . . .

Vickie Raines, *Chair*

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

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Edna Fund, *Chair*

Community Outreach and Education Committee
(Chehalis River Basin Flood Authority)

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Edna.Fund@lewiscountywa.gov

Wes Cormier, *Grays Harbor County representative*

Chehalis River Basin Flood Authority

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wcormier@co.grays-harbor.wa.us

Jim Kramer, *Facilitator*

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

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Scott Boettcher, *Staff*

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scottb@sbgh-partners.com



Thank You . . .

Thank You!

Note:

**This Presentation Is Posted To
“Chehalis River Basin Flood Authority” Website
at www.ezview.wa.gov/chehalisfloodauthority.**