



Chehalis River Basin

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

November 20, 2014

Thurston County SSWAB Meeting

5:50 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 →

Nov. 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).

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.

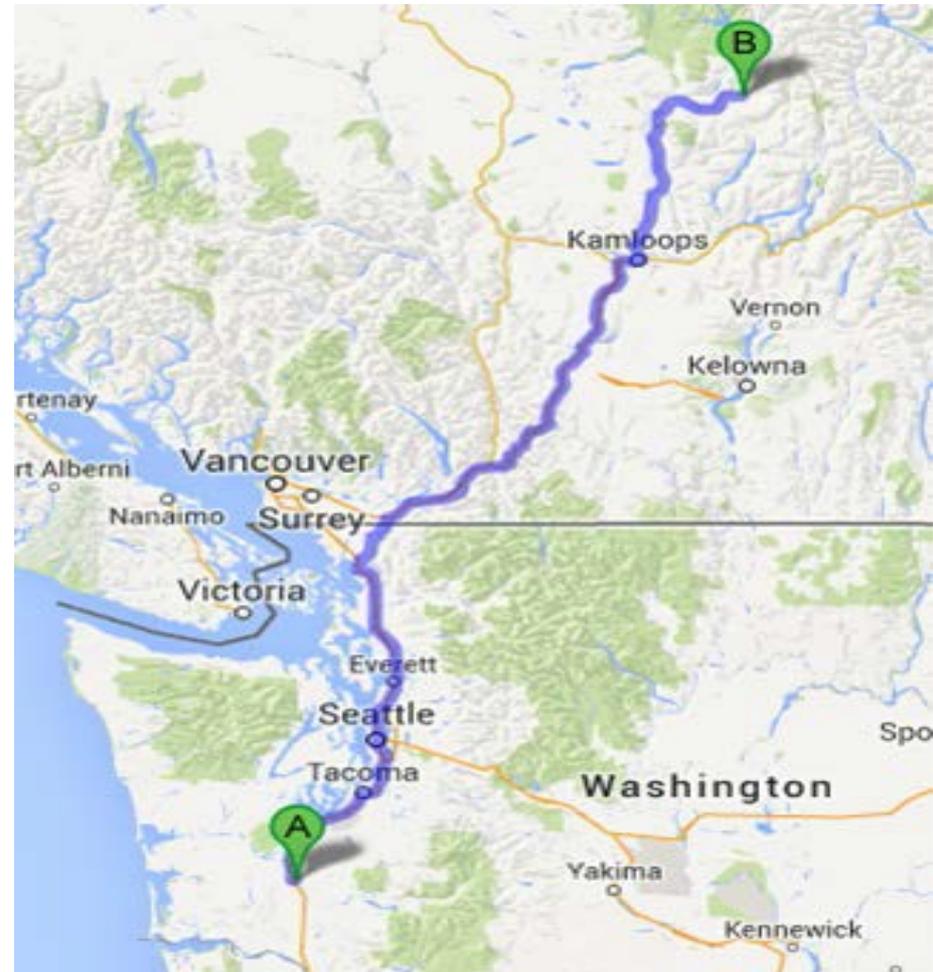


City of Centralia and I-5
STEVE RINGMAN /
SEATTLE TIMES

Nov. 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.

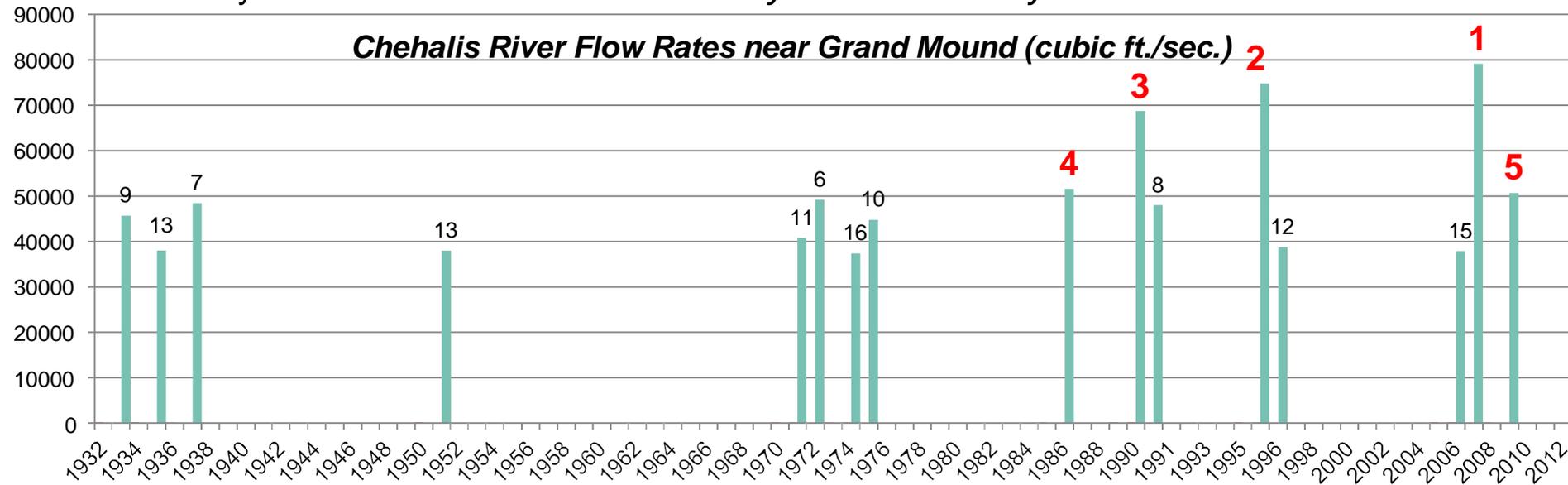


Background . . .

■ 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 . . .*
- 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

Chinook  
Coho  
Coho  
Steelhead  
Bull trout  
Cutthroat

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

Chinook  
Coho  
Coho  
Steelhead  
Bull trout  
Cutthroat

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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.

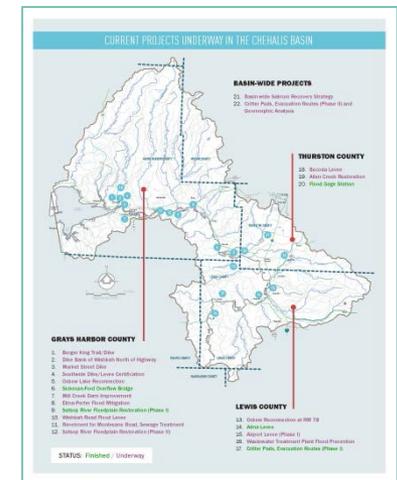
The 2013 legislature funded a \$28 million program of capital investments that is building projects with immediate flood damage reduction and/or aquatic habitat benefits. The investment is also being used aggressively to fill data gaps, evaluate the feasibility of flood damage reduction actions, and 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
Department of
FISH and
WILDLIFE



WASHINGTON STATE DEPARTMENT OF
Natural Resources



Office of Financial Management

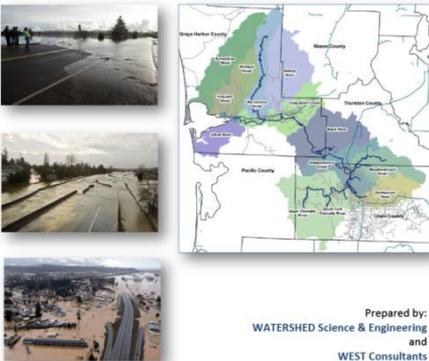
Better information. Better decisions. Better government.

Nov. 2014

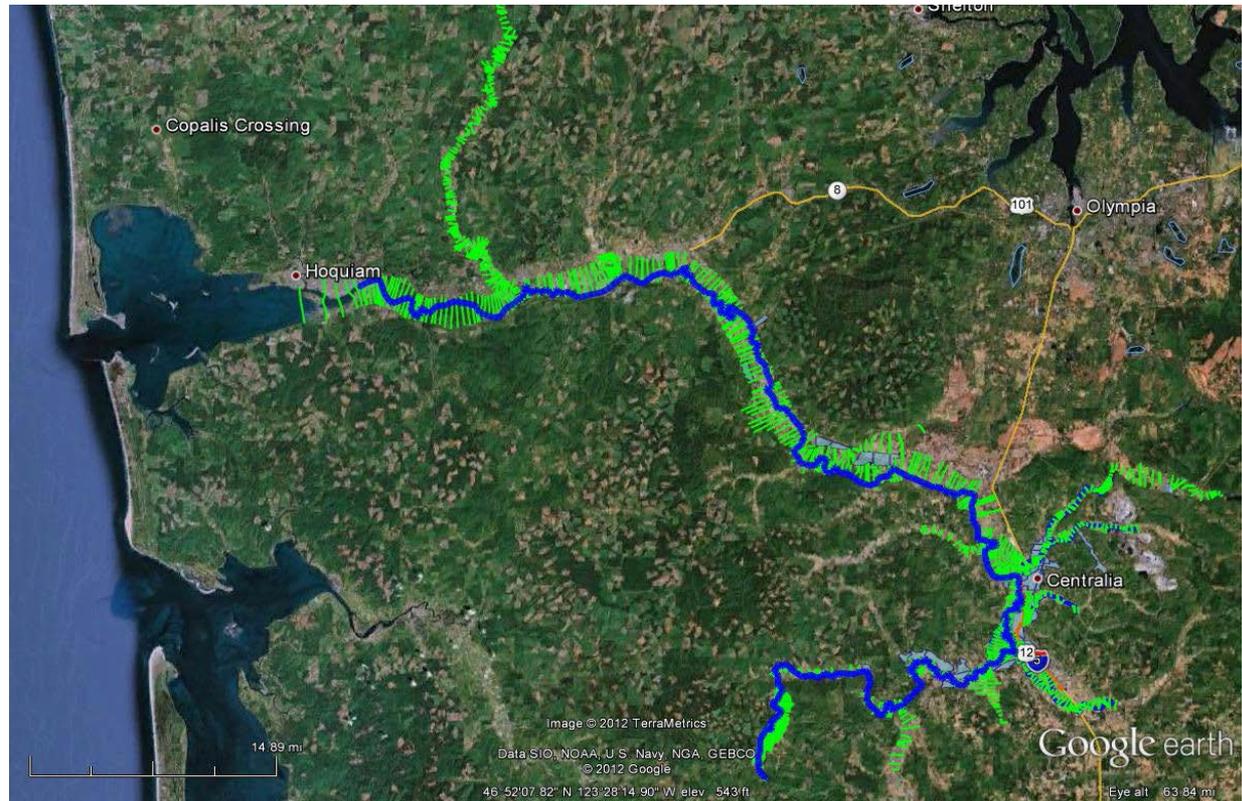
2. Hydraulic Understanding

- **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



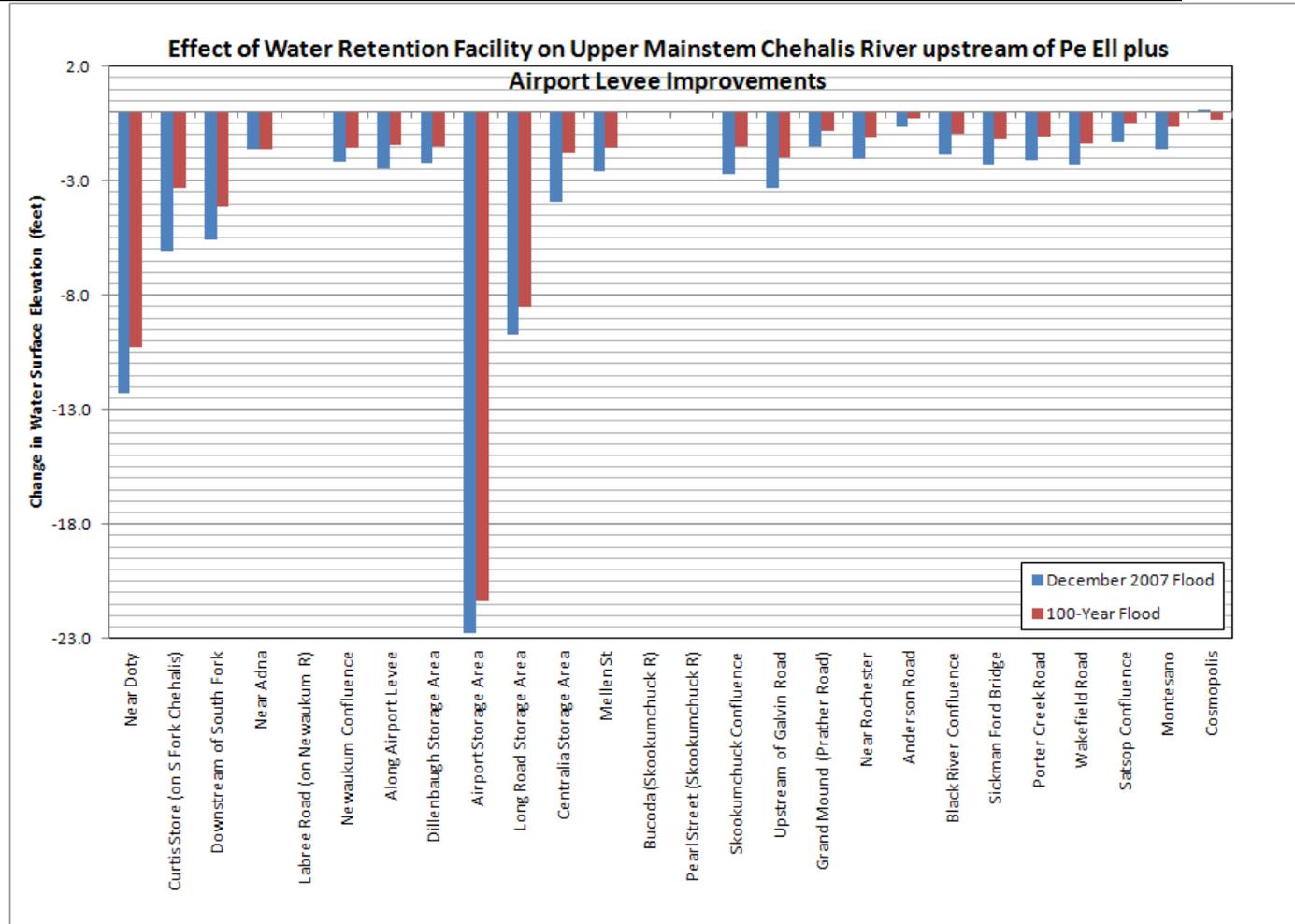
July 23, 2012



Nov. 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](#).

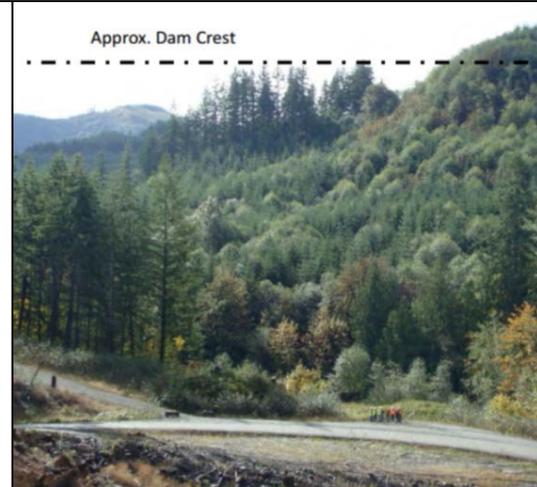
Wednesday, May 7, 2014

- 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



← Photos Source: ANCHOR QEA

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Market Street Dike



Southside Dike/Levee Certification

Dike Bank of Wishkah



Burger King Trail/Dike

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.

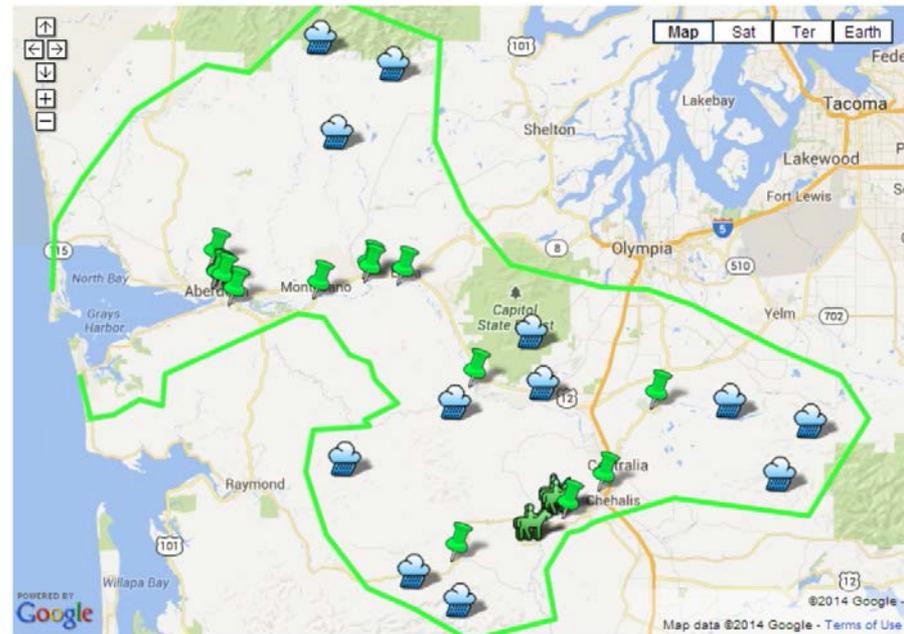
Local Projects Funded (2012, 2013-15):



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
 CHEHALIS RIVER BASIN FLOOD AUTHORITY
 City of Montesano
 STELLAR J
 Paramatrix

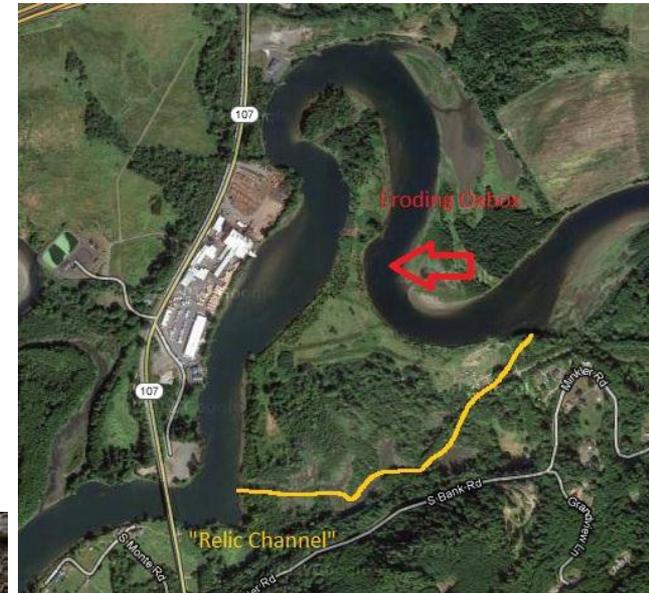


4. Smaller-Scale Local Projects



■ 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

Schedule → February 2014 to April 2014

Budget → \$511,153

Benefit → Protecting essential public infrastructure for all Basin residents

www.ezview.wa.gov

An employee owned company

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



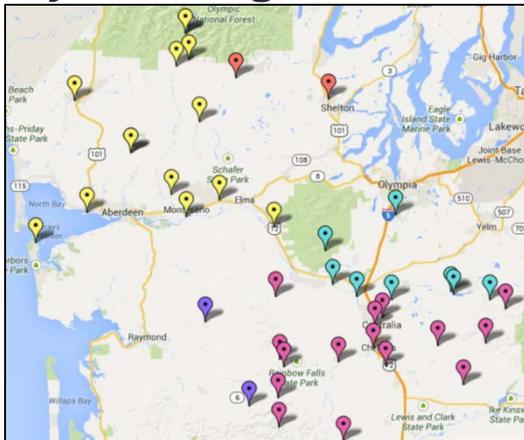
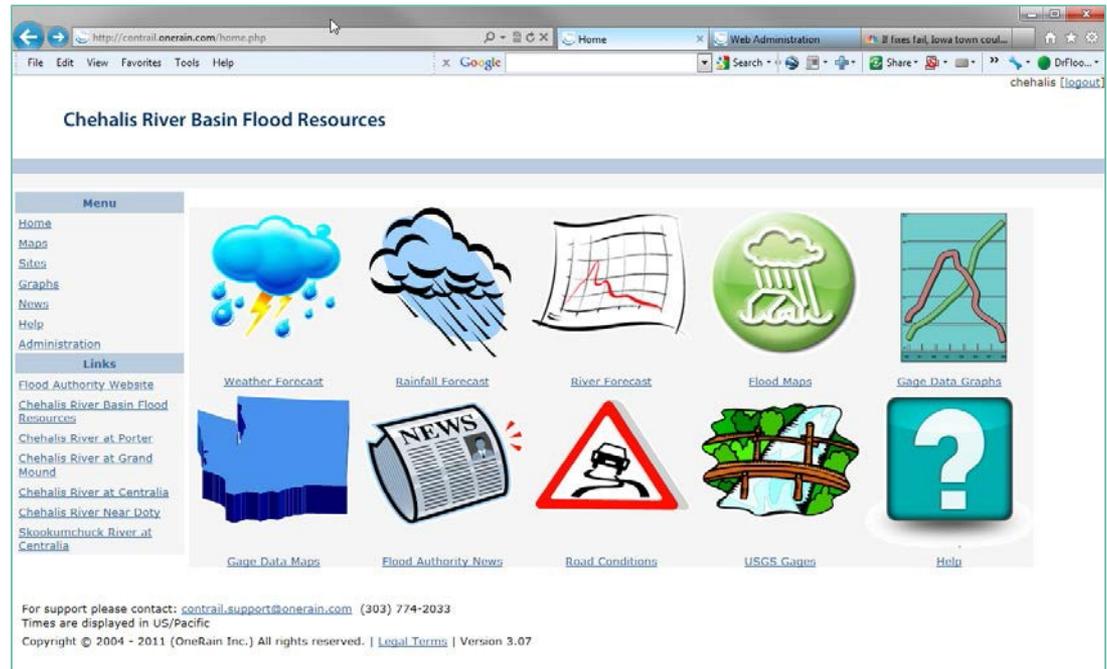
7. Early Flood Warning

- www.chehalisriverflood.com

- Front-facing website.

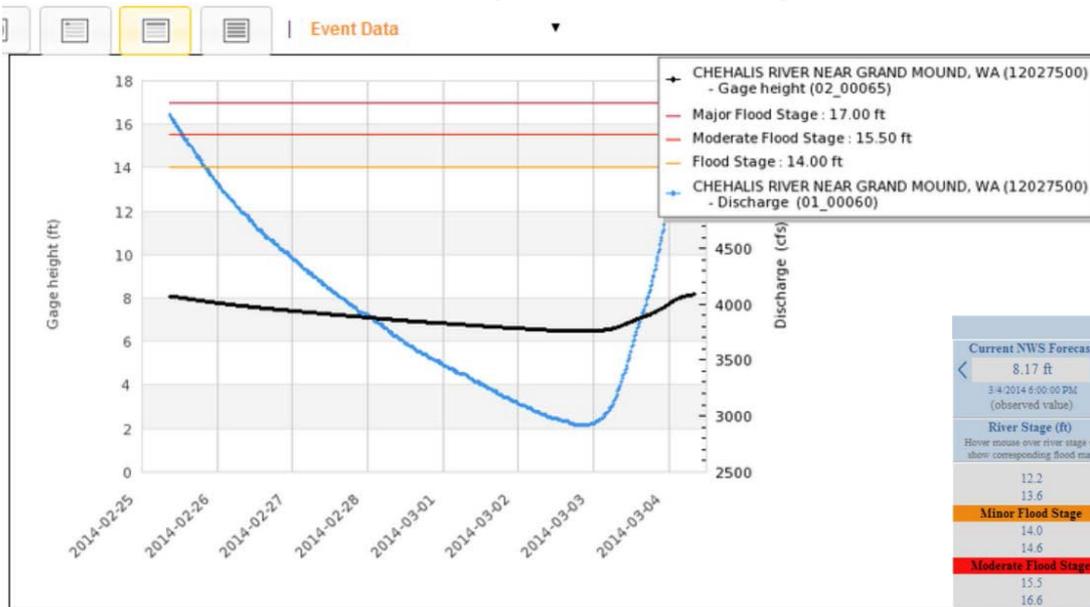
- Data collection, data synchronization.

- 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

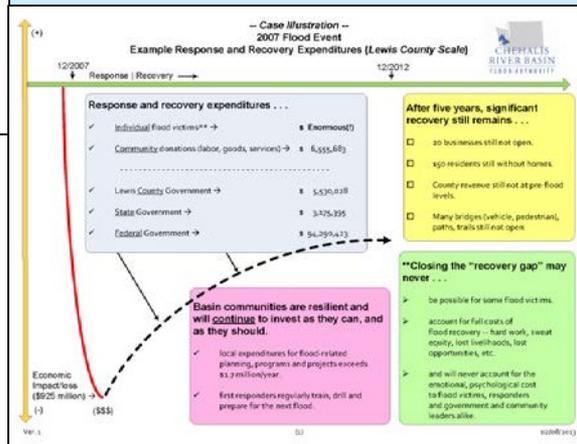
8. Outreach, Education and Communication

Website

Outreach Visits

Project Signs

Informational Analyses



Email Distribution List

Pat Anderson
Pat.Anderson@lewiscountywa.gov

Resources, Additional Information . . .

www.ezview.wa.gov/chehalisfloodauthority

www.chehalisriverflood.com

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

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 . . .



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Closing – 2007 Flood Damage . . .

I-5 Under Water
BRUCE ELY /
OREGONIAN



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Closing – 2007 Flood Damage . . .

Chehalis, WA
STEVE RINGMAN /
SEATTLE TIMES



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Closing – 2007 Flood Damage . . .



Nov. 2014

Closing – 2007 Flood Damage . . .

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



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Closing – 2007 Flood Damage . . .



I-5 Under Water
BRUCE ELY / OREGONIAN

Closing – 2007 Flood Damage . . .



Photos Source:
WSDOT

Nov. 2014

Closing – 2007 Flood Damage . . .



Nov. 2014

Closing – 2007 Flood Damage . . .



Closing – 2007 Flood Damage . . .



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

For Further Information . . .

Vickie Raines, *Chair*

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Edna Fund, *Chair*

Community Outreach and Education Committee
(Flood Authority)

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Edna.Fund@lewiscountywa.gov

Karen Valenzuela, *Vice-Chair*

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

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Jim Kramer, *Facilitator*

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

206/841-2145

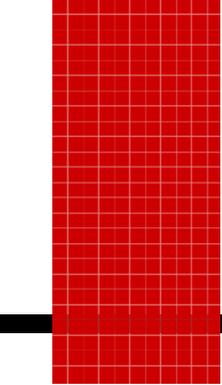
jkramer.consulting@gmail.com

Scott Boettcher, *Staff*

Chehalis River Basin Flood Authority

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Thank You . . .

Thank You!

Note:

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