



Chehalis River Basin

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

February 25, 2014

City of Napavine

6:00 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 →

February 2014

"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:**
 - 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).
 - Sandi Triggs (Capital Budget Advisor to Governor).
 - Keith Phillips (Governor's Energy and Environment 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.

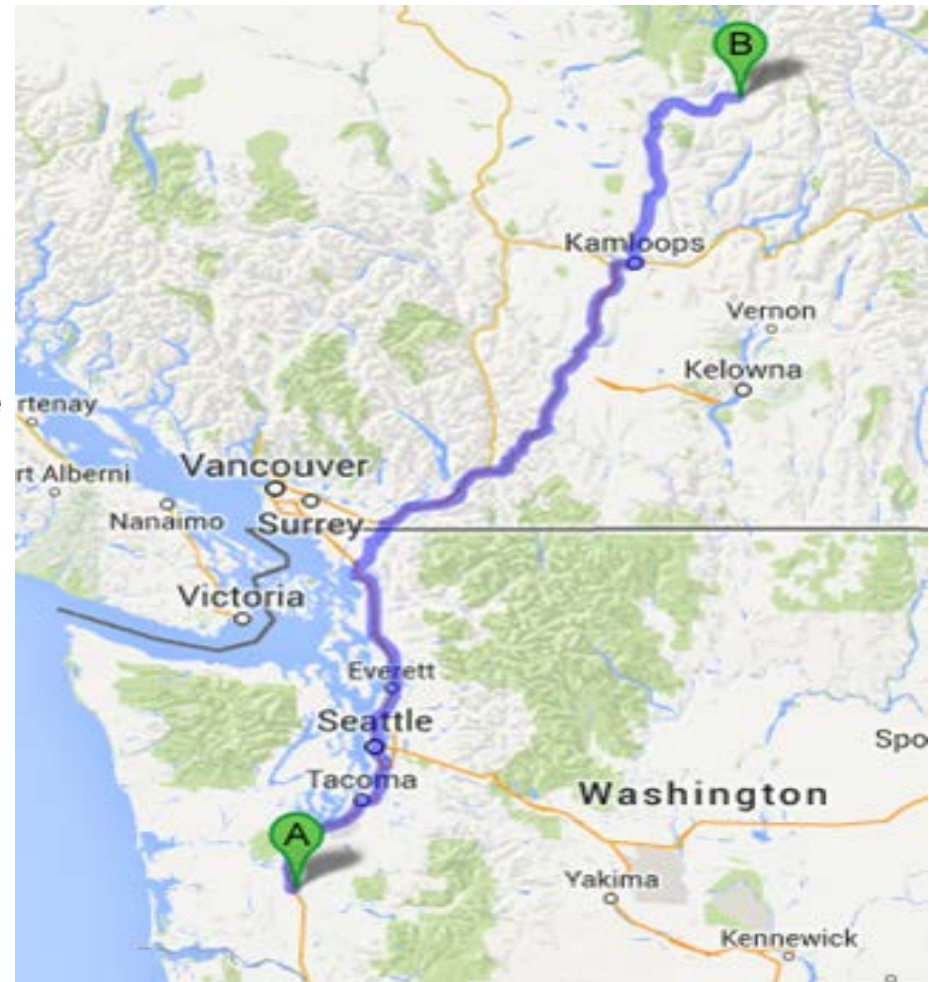


City of Centralia and I-5
STEVE RINGMAN /
SEATTLE TIMES

February 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.

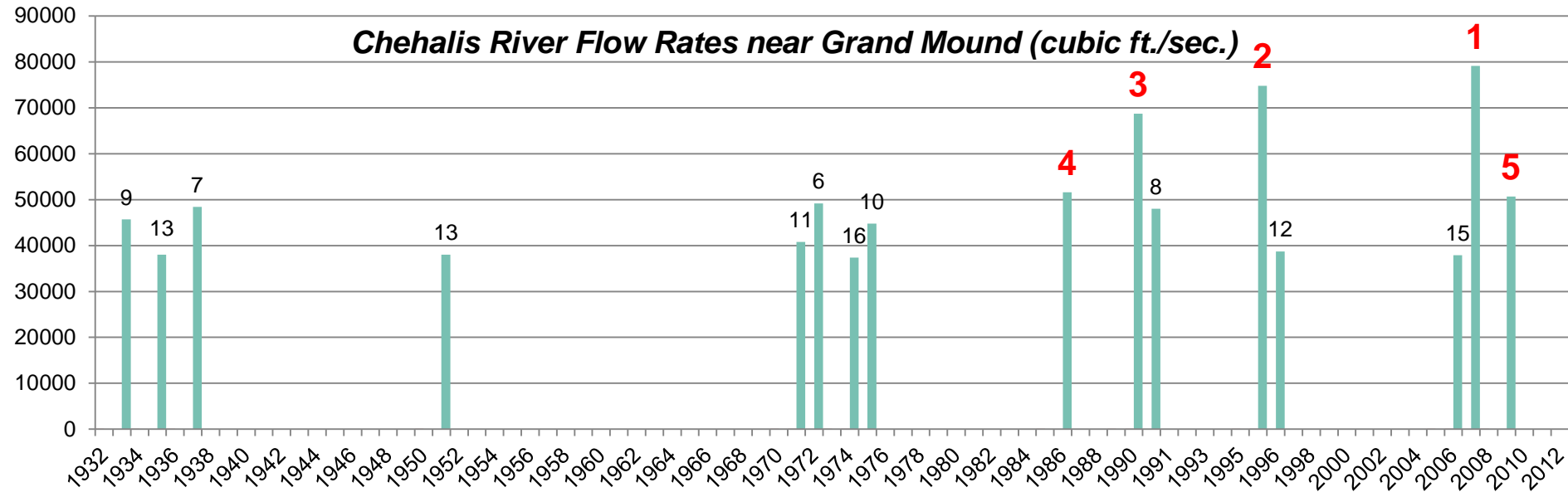


Background . . .

■ 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>WHAT SALMON NEED IN FRESHWATER HABITAT</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 & 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

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 been done 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.

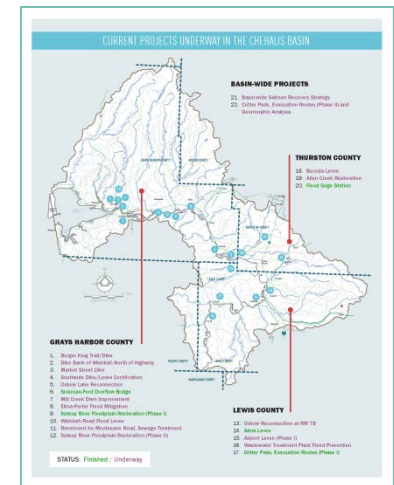
The 2013 Legislature funded a \$28 million program of capital investments that is building projects with immediate flood damage reduction and/or aquatic habitat benefits. The investment is also being used aggressively to fill data gaps, evaluate the feasibility of flood damage reduction actions, and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

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

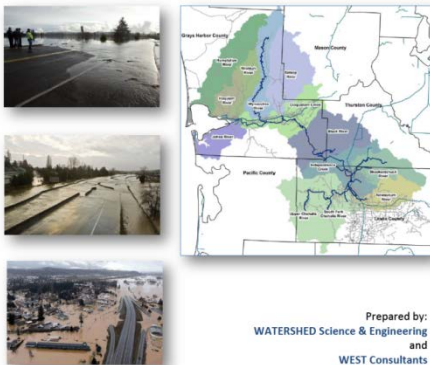
Better information. Better decisions. Better government.

February 2014

2. Hydraulic Understanding

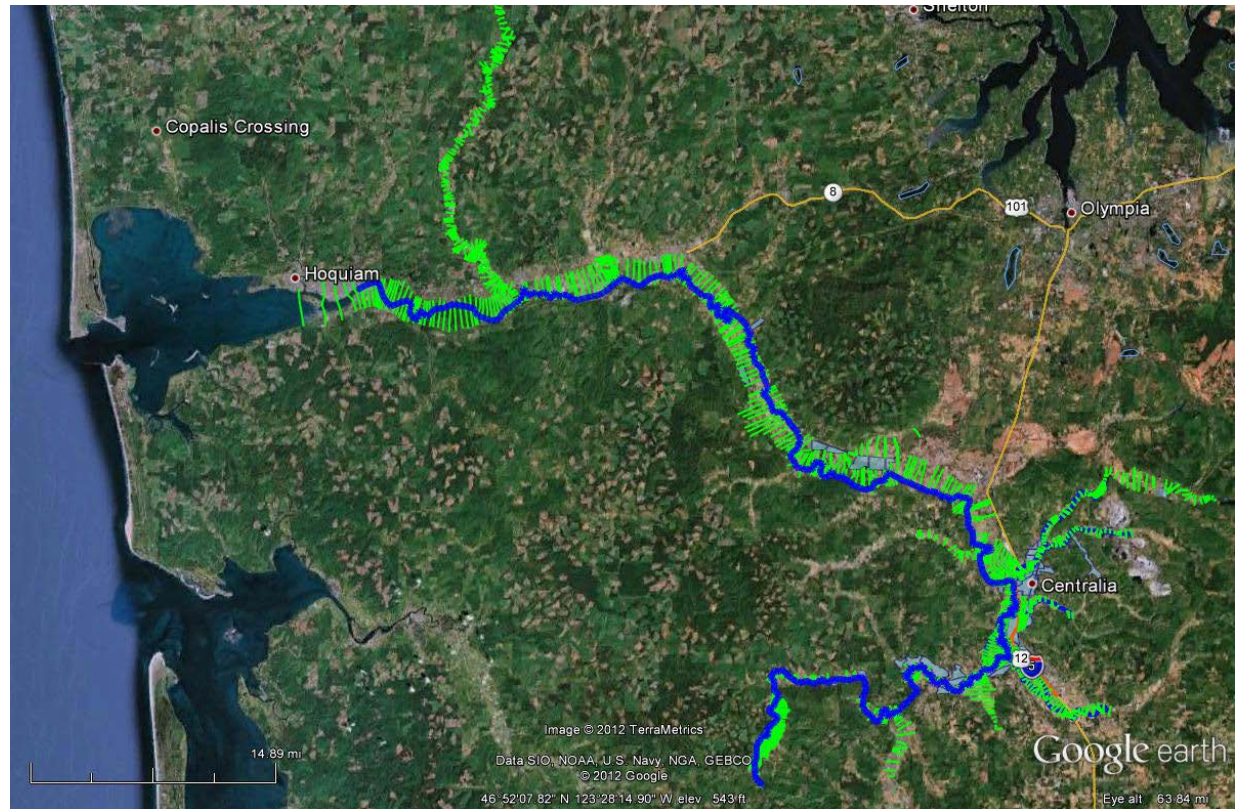
- **Science-based model** -- To inform decision-makers on hydraulic effects of potential flood relief options (at basin-wide and localized scales).
- **108 miles** -- Mouth of Chehalis River upstream to Pe Ell (108 miles).

Draft Report - Chehalis River
Hydraulic Model Development Project



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

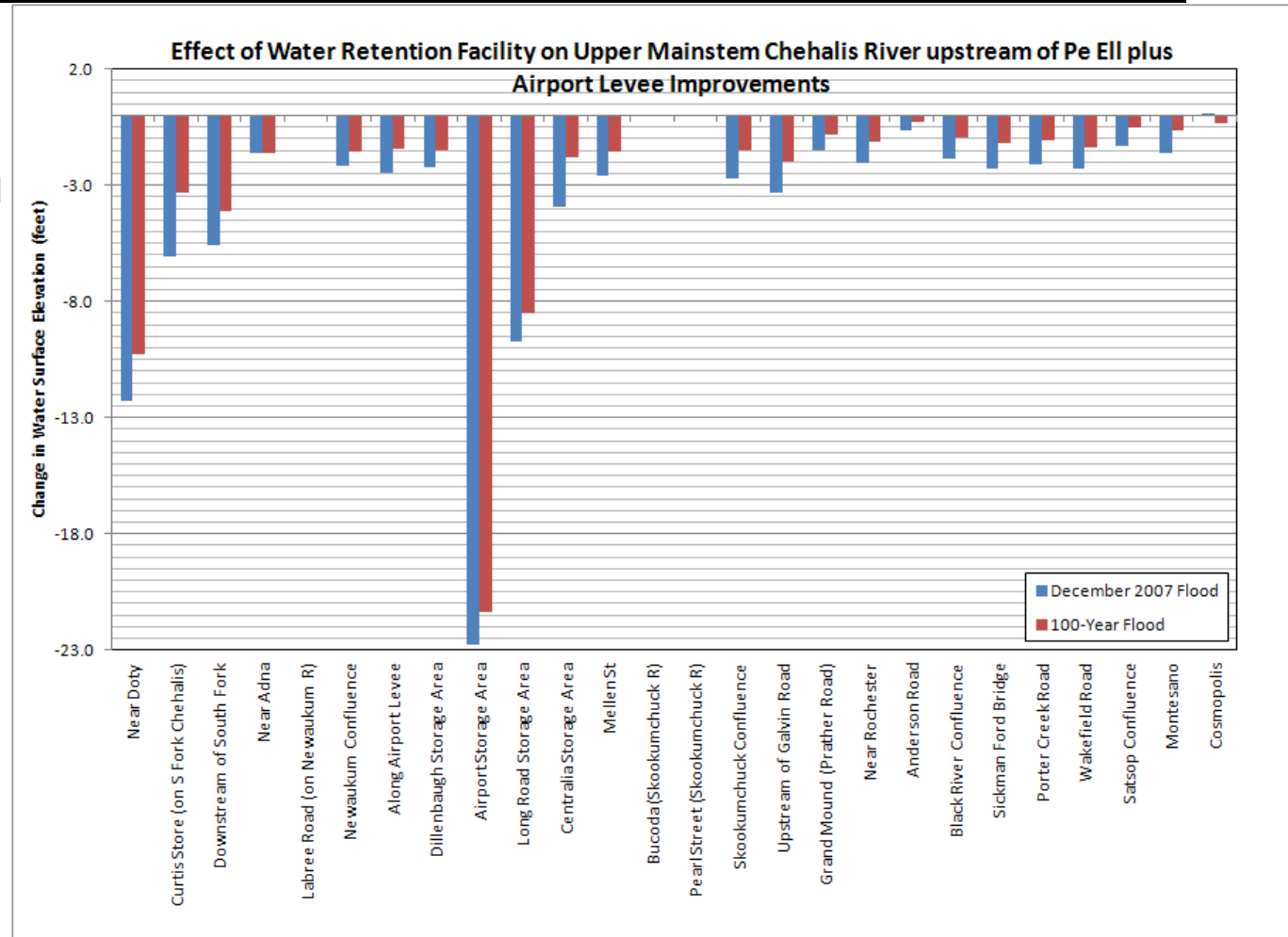
July 23, 2012



February 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

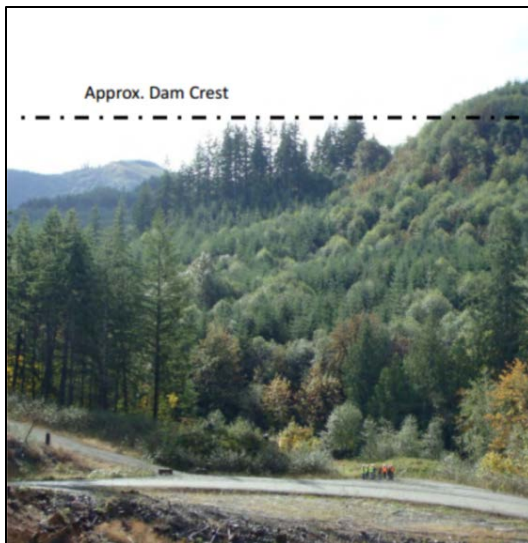
- **Technical team evaluating safety, feasibility of upper basin water retention structure** -- field visits, site and design considerations, world-wide research, etc.
 - Permanent reservoir with fish passage or Run-of-the-river without permanent reservoir.
 - Roller compact concrete or Earthen fill.
 - 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).**

www.ezview.wa.gov

■ Governor's Work Group -- November 13, 2014 (Policy Workshop #1)

Meeting Documents:

- Agenda and Meeting Location for upcoming Policy Workshop #1 -- Click [here](#).
- Presentation 1: Work Group Charge and Process for Developing Recommendations -- Click [here](#).
- Presentation 2: Design Storm Selection -- Click [here](#).
- Presentation 3: Chehalis River Aquatic Species -- Click [here](#).
- Presentation 4: Aquatic Species Enhancement Plan -- Click [here](#).
- Presentation 5: Alternatives for Reducing Flood Damage -- Click [here](#).
- **Presentation 6: Dam Design and Fish Passage Research Findings -- Click [here](#).**
- Presentation 7: Methods for Comparing Alternatives -- Click [here](#).



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 (2013):



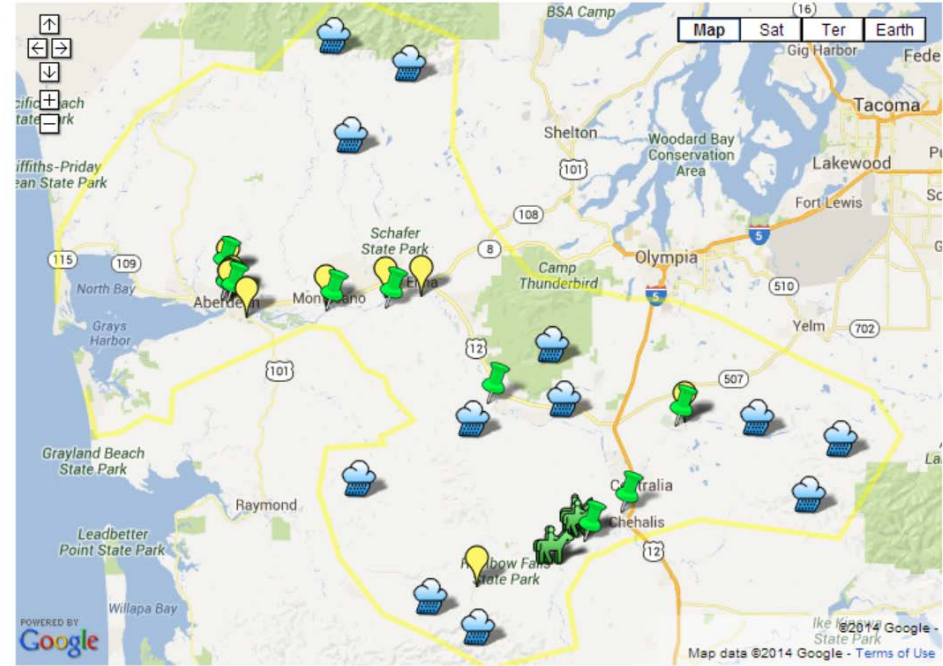
Local Projects Funded (2012):



Critter Pads Funded (2012):



Gages Funded (2011):



View [Projects Funded](#) in a larger map

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



Another Chehalis Basin Flood Protection Project
www.ezview.wa.gov

Wastewater Treatment Plant Flood Prevention Dike

Schedule → February 2014 to April 2014
 Budget → \$511,153
 Benefit → Protecting essential public infrastructure for all Basin residents

STELLAR J
 Parametrix



February 2014

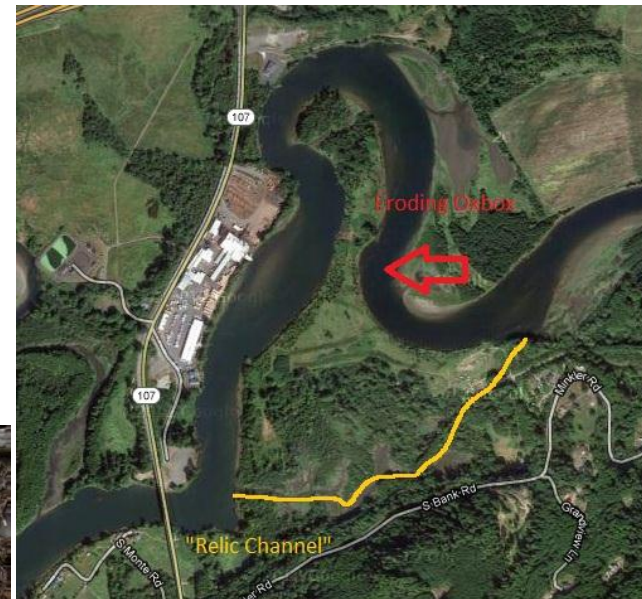
4. Smaller-Scale Local Projects

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

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](#).



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.

- **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).



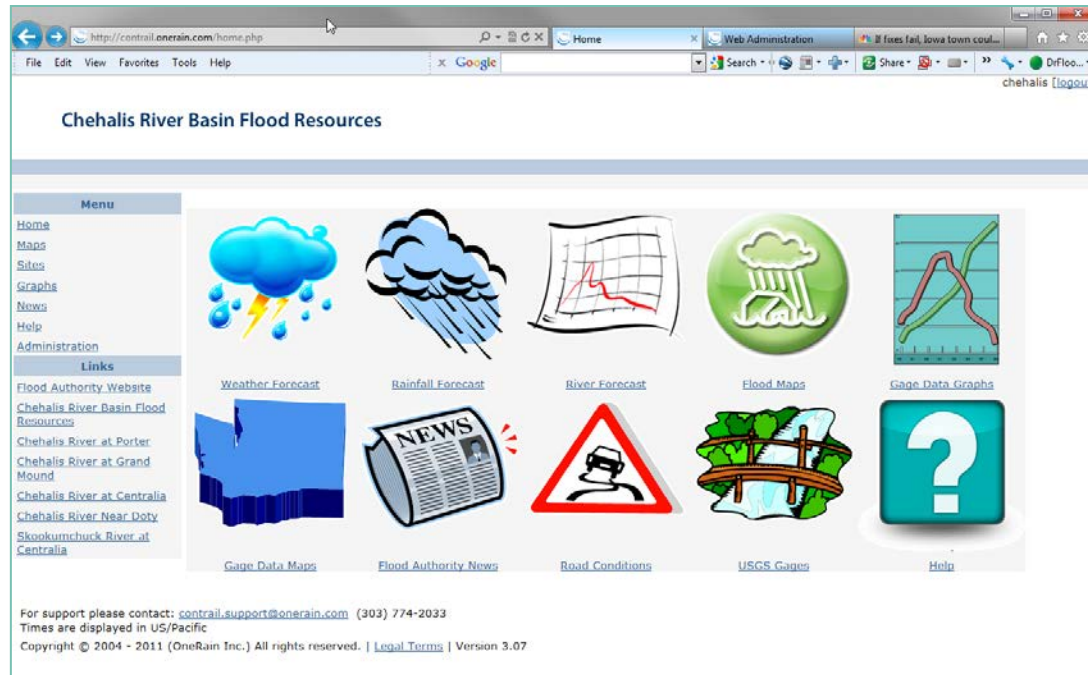
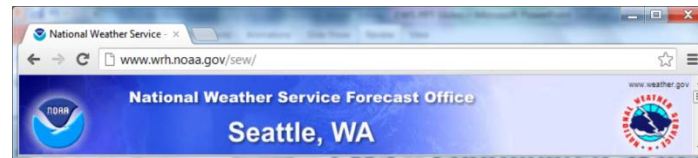
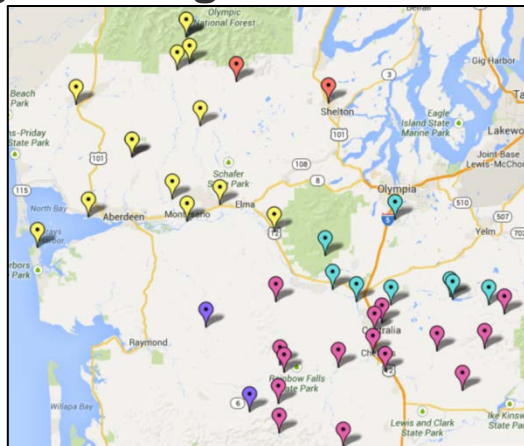
Seine collections (Chehalis River)



Downstream snorkel surveys (Chehalis River)

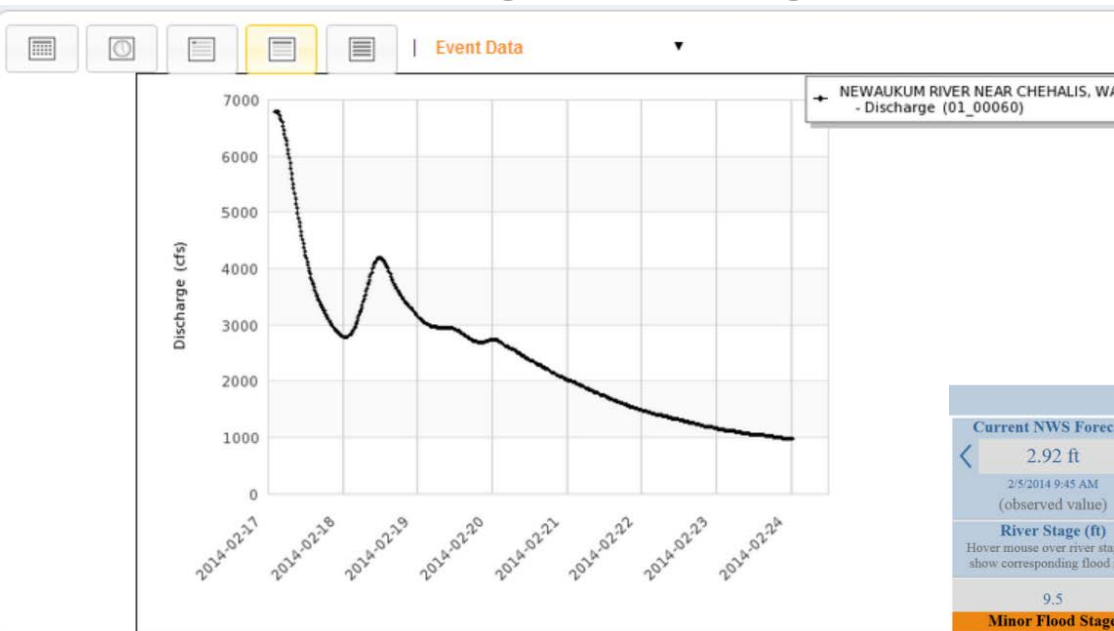
7. Early Flood Warning

- www.chehalisriverflood.com
- Front-facing website.
- Data collection, data synchronization.
- Improved forecasting, early-warning.



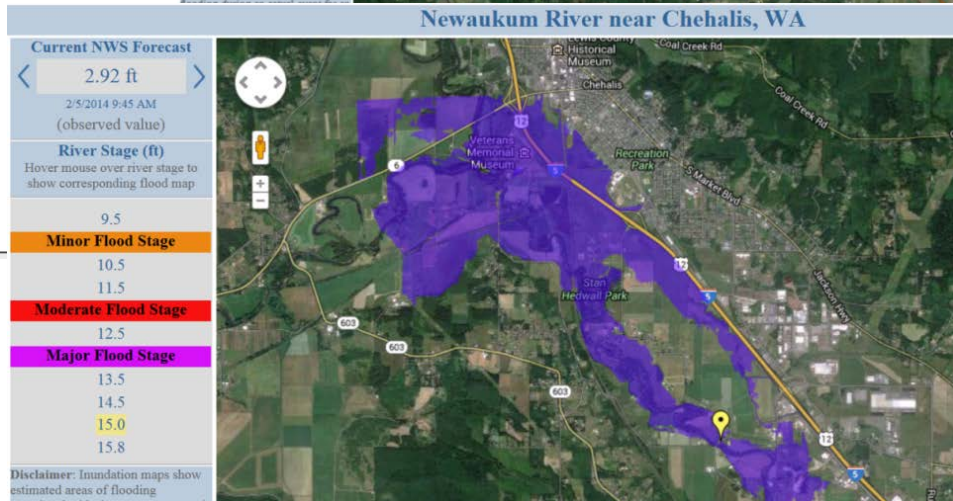
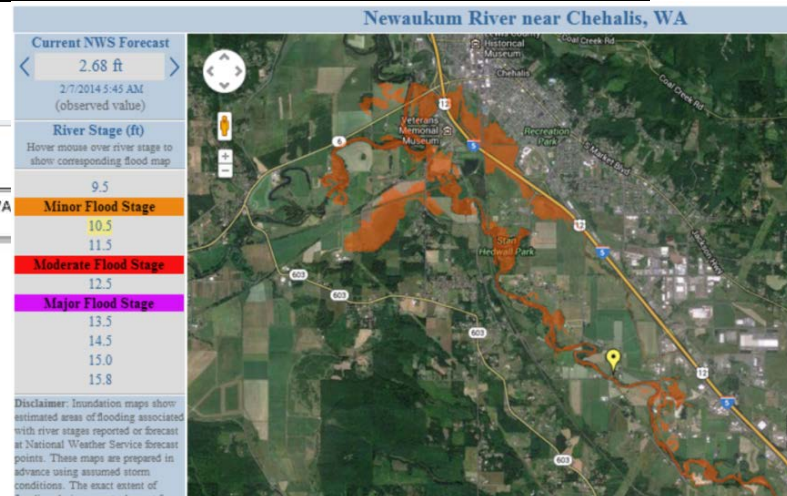
7. Early Flood Warning

Localized tracking, forecasting . . .



Daily discharge, cubic feet per second -- statistics for Feb 24 based on 71 years of record [more](#)

Min (1993)	25th percentile	Median	Most Recent Instantaneous Value Feb 24	Mean	75th percentile	Max (1986)
160	432	718	982	985	1030	5360



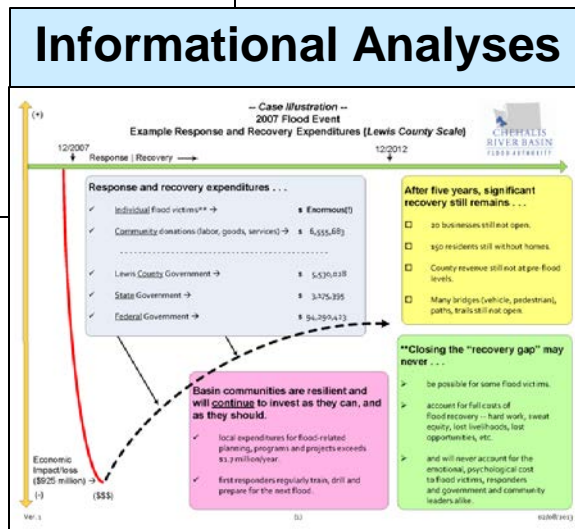
8. Outreach, Education and Communication

Website

Outreach Visits

Project Signs

Informational Analyses



Email Distribution List

Pat Anderson
Pat.Anderson@lewiscountywa.gov

Resources, Additional Information . . .

www.ezview.wa.gov

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

www.chehalisriverflood.com

Closing – 2007 Flood Damage . . .



Chehalis
River near
Doty
USGS

Closing – 2007 Flood Damage . . .

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



February 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



February 2014

Closing – 2007 Flood Damage . . .



February 2014

Closing – 2007 Flood Damage . . .



February 2014

Closing – 2007 Flood Damage . . .

I-5 Under Water
BRUCE ELY /
OREGONIAN



February 2014

Closing – 2007 Flood Damage . . .



Chehalis, WA
STEVE RINGMAN /
SEATTLE TIMES

February 2014

Closing – 2007 Flood Damage . . .



February 2014

Closing – 2007 Flood Damage . . .

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



February 2014

Closing – 2007 Flood Damage . . .

I-5 Under Water
BRUCE ELY / OREGONIAN



February 2014

Closing – 2007 Flood Damage . . .



Photos Source:
WSDOT

February 2014

Closing – 2007 Flood Damage . . .



February 2014

Closing – 2007 Flood Damage . . .



Closing – 2007 Flood Damage . . .



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

February 2014

For Further Information . . .

Vickie Raines, *Chair*

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Edna Fund, *Chair*

Community Outreach and Education Committee
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Jim Kramer, *Facilitator*

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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.**