

An aerial photograph of a coastal watershed. A large, winding river or estuary flows through the center, surrounded by green fields and some developed areas. The water appears slightly turbid. The surrounding land is a mix of green agricultural fields and brownish, possibly eroded or undeveloped areas.

Perspectives on the Clean Samish Initiative

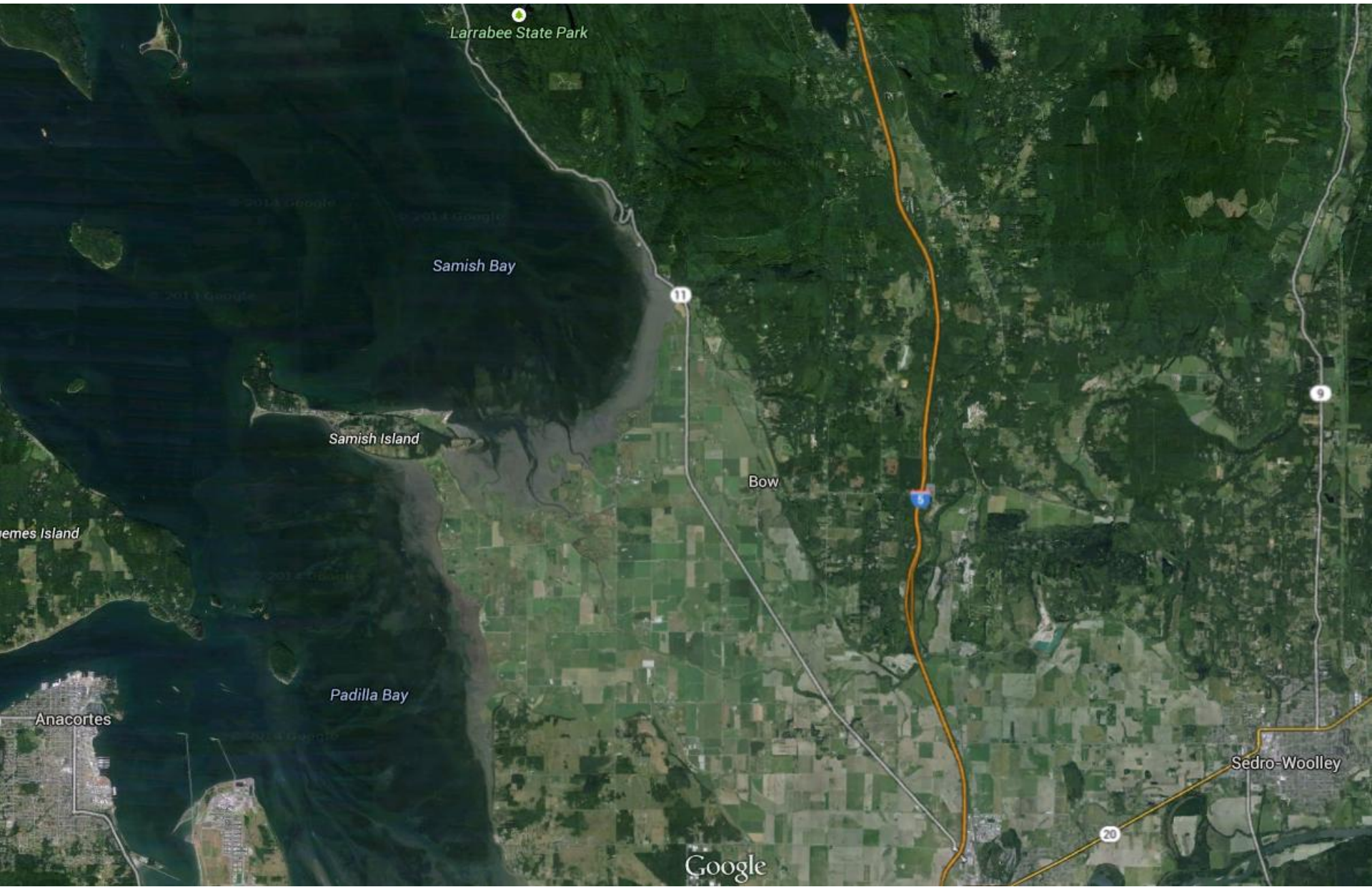
A Cooperative Effort to Recover a Watershed

Bill Dewey – Taylor Shellfish Farms

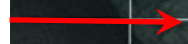
DOE Ag Water Quality Committee

10-24-14

The Samish Watershed



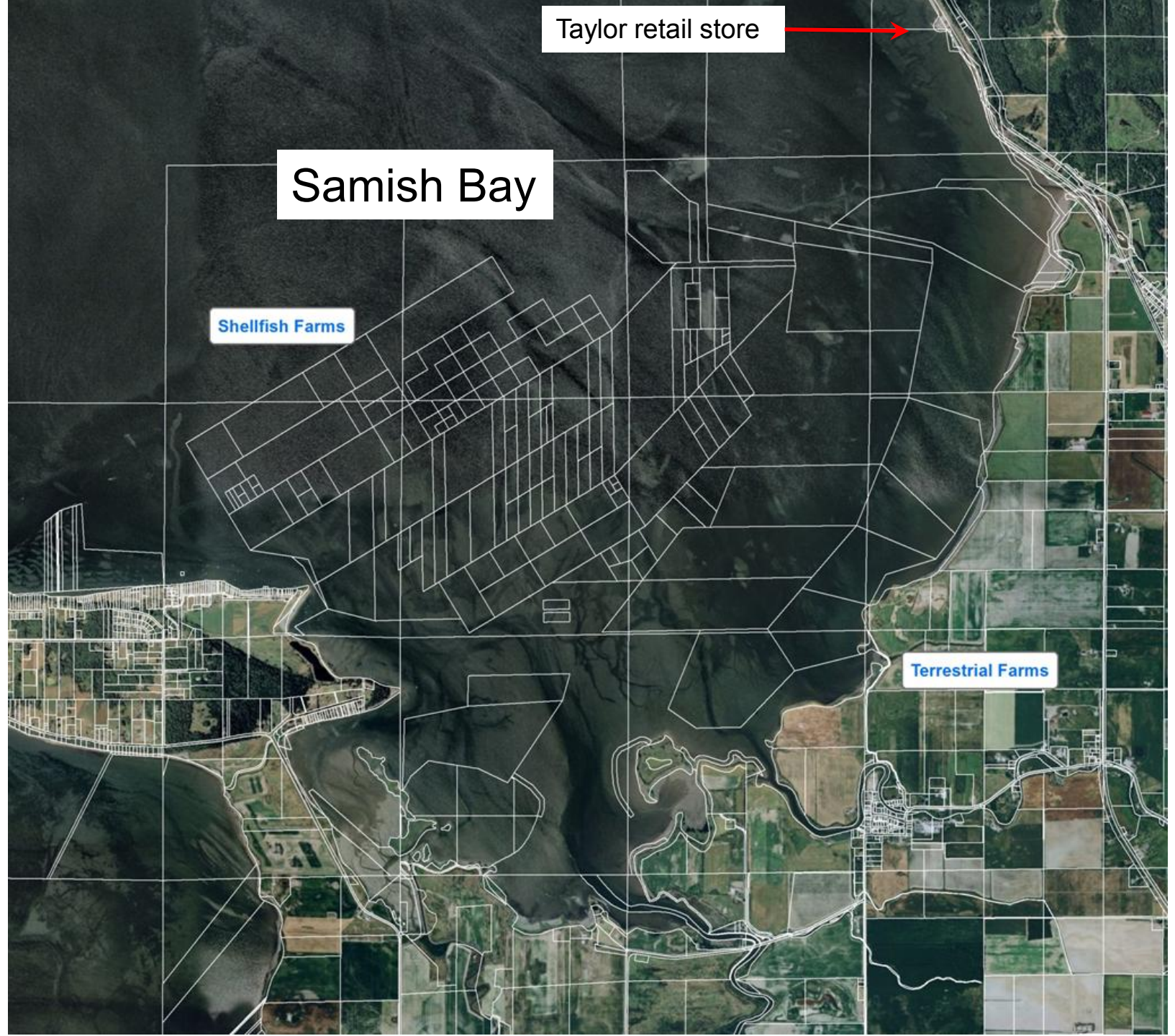
Taylor retail store



Samish Bay

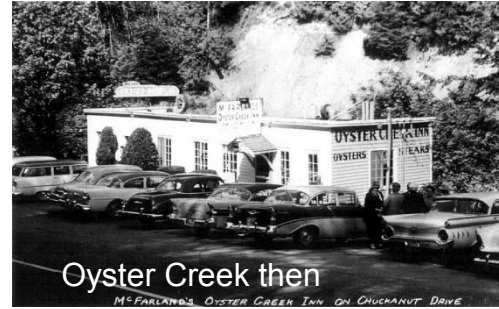
Shellfish Farms

Terrestrial Farms



Samish Bay Shellfish Value

- >\$1.2 million annual payroll
- 50+ full time equivalents directly employed by shellfish farms
- +\$3 million annual sales oysters and clams
- Retail stores, supplier to local restaurants, part of local heritage
- Tourism, festivals, (Samish Bay Shellfishtival, Oyster Run motor cycle rally)

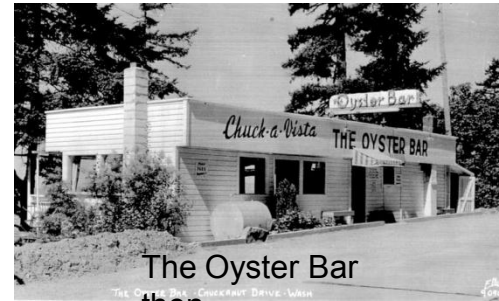


Oyster Creek then

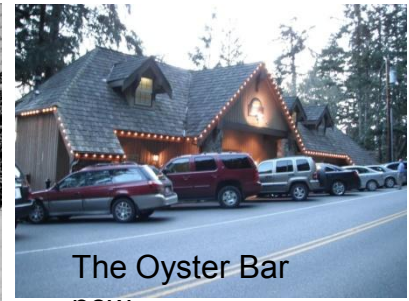
McFarland's Oyster Creek Inn on Chuckanut Drive



Oyster Creek now



The Oyster Bar then



The Oyster Bar now



Tour buses at Blau Oyster



Bivalve Bash



Mud run



Oyster Run motorcycle rally

My farm at low tide

(it is under 8-10 feet of water at high tide)



“tweed” pattern Manila clams



Clamdango!



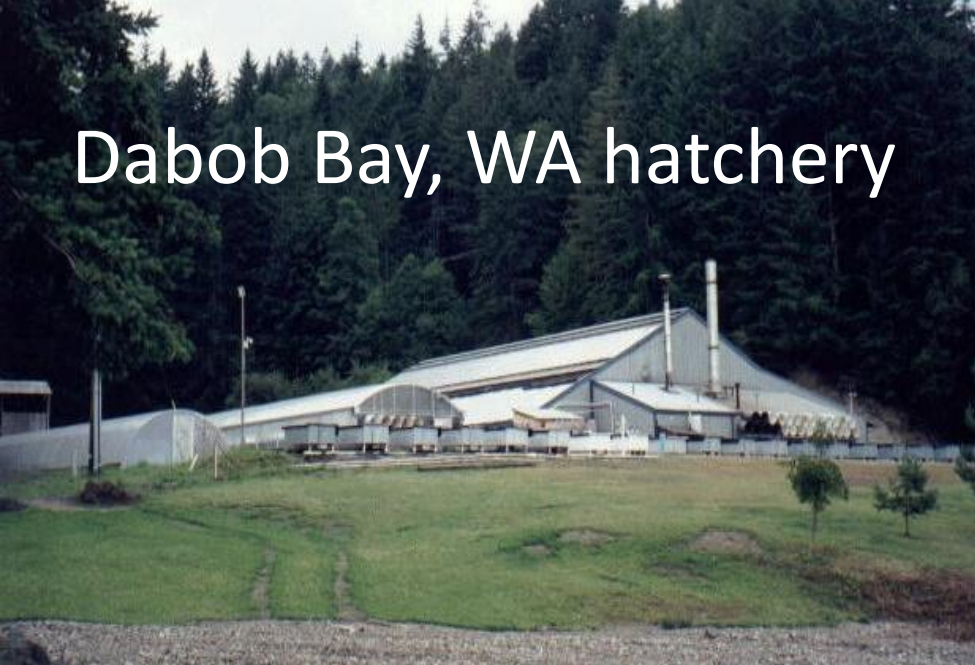
Harvester and gear on scow





Clam seed

Dabob Bay, WA hatchery



Larvae culture



Algae culture (food)



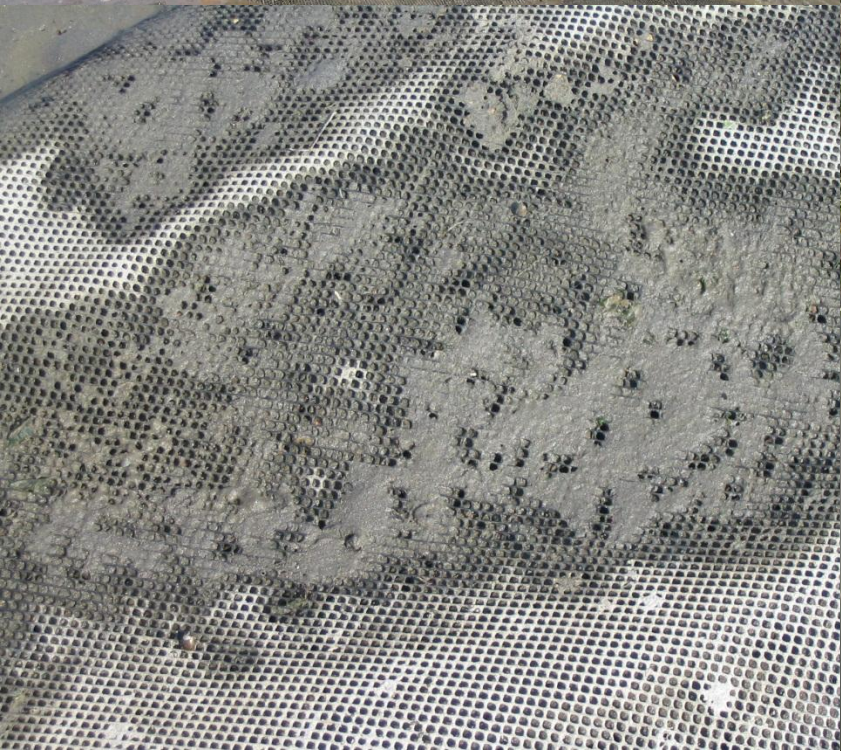
Oyster larvae

Planting clam seed





Sea lettuce growing on predator exclusion netting



Mechanical clam (tulip bulb/potato) harvester



Night tide harvest





Ellen T bringing in the harvest

Cultch bags



Oyster larvae





Oyster seeding



Clustered oyster bottom culture

Samish Bay oyster longlines



Shigoku oyster culture





Oyster harvesting

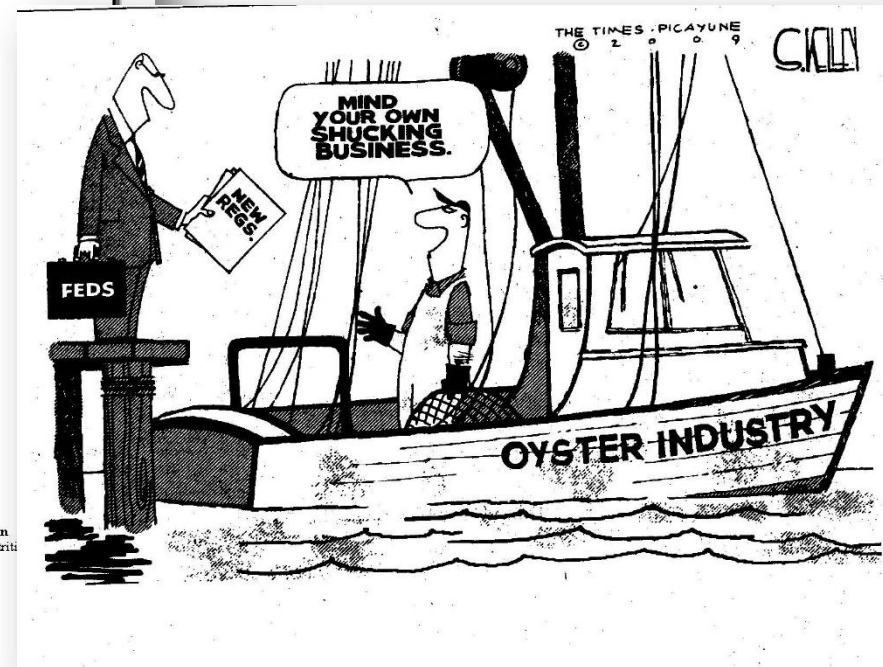
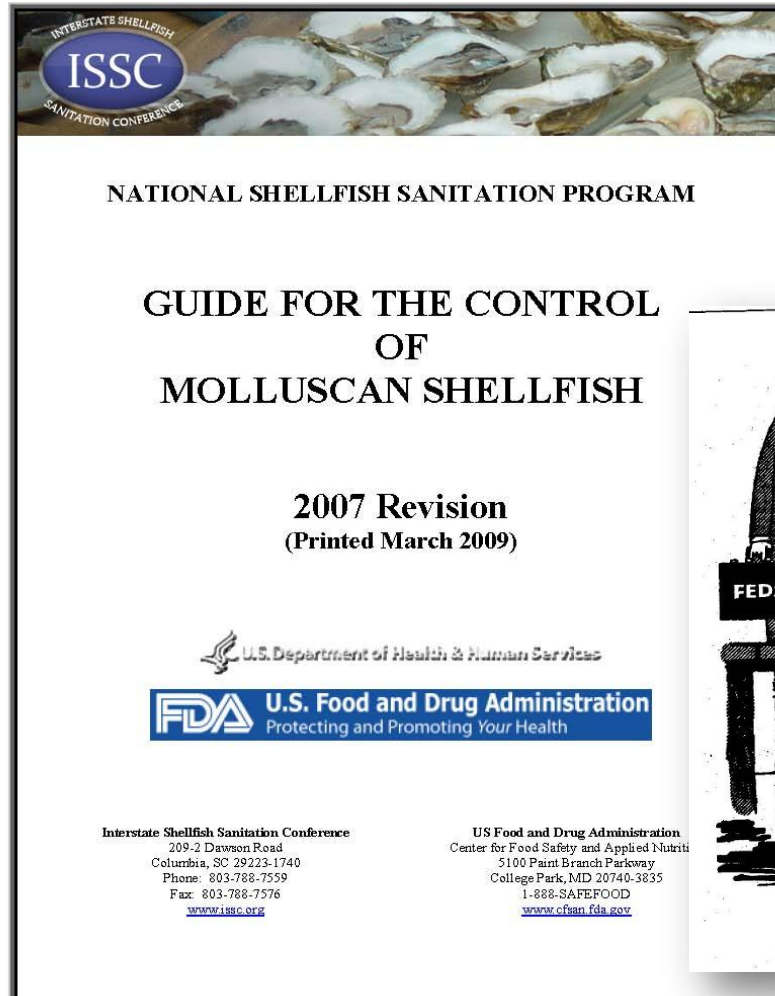


Hand digging Manila clams



Shellfish public health regulations

Marine fecal
coliform standard
= 14 MPN/100 ML



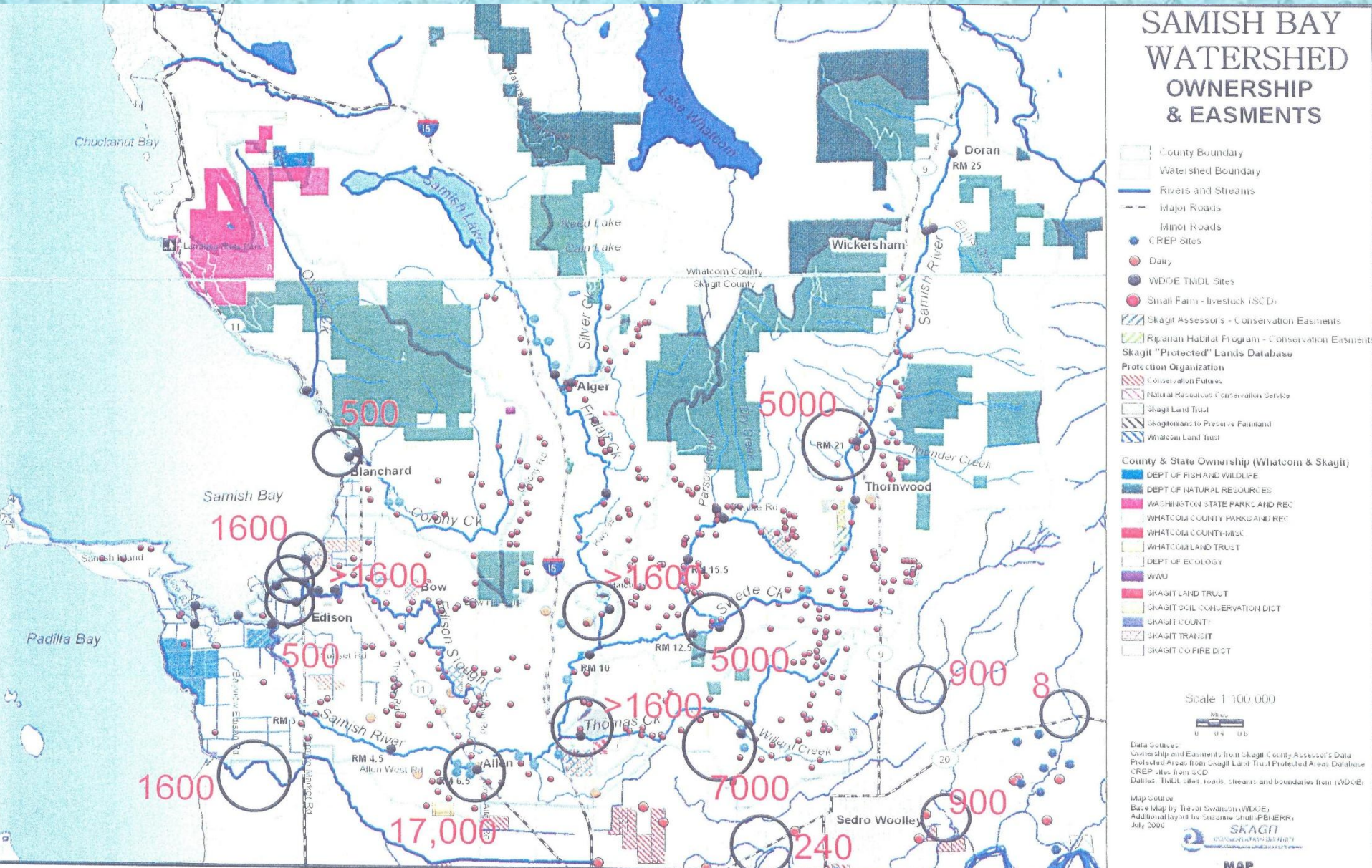
Shellfish growing water classifications

- Approved – no harvest restrictions
- Conditionally approved – rain = temporary closures
- Restricted – no harvest for market. Shellfish must be moved to clean bay for set period of time before harvesting for marketing (relay)
- Prohibited – no harvest for market. Only seed production allowed

Samish Bay classifications



The April 2008 "event"



The Clean Samish Initiative

- Multi-Agency effort to address fecal coliform pollution in Samish Basin
- Established by Washington State Department of Ecology in 2009
- 20+ Partner organizations
 - Local, state, federal government agencies
 - Tribes
 - Agriculture groups
 - Shellfish growers





#@%*!!





SAMISH BAY
POLLUTION
COMES FROM
EVERYWHERE
STUDIES SHOW

"EVERYBODY?! REALLY...?! THEN HOW COME THE FISH WERE NOT EVEN MENTIONED...??"



Mariner	20	Lynden	31
Mount Vernon	10	Burlington-Edison	19
Concrete	28	Sedro-Woolley	49
La Conner	21	Sehome	9

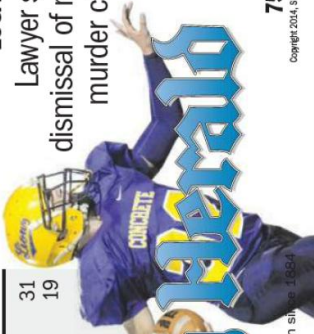
Skagit Valley Herald

SATURDAY
OCTOBER 11, 2014

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LOCAL | A3
Lawyer seeks
dismissal of man's
murder charge



Officials tour Samish watershed, note progress and next steps



Photos by Brandy Shreve / Skagit Valley Herald

Kevin Sutherland (left) and Jose Villa sort through freshly harvested shigoku oysters Wednesday at Taylor Shellfish Farm north of Blanchard. Harvesting was suspended at the farm in the spring because of high freshwater flows and fecal coliform levels from the Samish River and again in the late summer because of elevated shellfish toxins in Samish Bay.

By **KIMBERLY CAUVEL**
@Kimberly_SVH

EDISON — Skagit County's rich soils, expansive pastures and marine shorelines support a variety of agricultural industries, from dairies, beef and shellfish to berries, potatoes and corn.

In the Samish Watershed, shellfish harvest in the bay hinges on clean water in the river, which has been contaminated for years by upstream livestock manure and sewage from failing septic systems, particularly during heavy rain.

Although a soggy spring resulted in high levels of fecal coliform in Samish Bay this year, county officials and community members say that does not indicate failure on behalf of the Clean Samish Initiative.

On the contrary, Taylor Shellfish Farms spokesman Bill Dewey said he is pleased with the initiative's progress.

"It's been pretty exciting, frankly, that the Clean Samish Initiative is a success story," he said.

Representatives from county, state and federal agencies involved with the multiagency initiative toured the watershed Wednesday and learned about the



A herd of cows graze in a field along Chuckanut Drive in the Samish Bay watershed.

initiative's progress.

One of the stops was at Jim Neff's beef farm, where he installed one of the first riparian buffer projects in the watershed in 2005, Skagit Conservation District Director Carolyn Kelly said.

With 8,400 feet of fencing and 8,500 trees, Neff transformed 17 acres of stream-side land on his property.

Since the Clean Samish Initiative

The background

Skagit County has faced fecal coliform issues since the 1980s, and focused heavily on septic system maintenance and repairs in the 1990s, county water quality specialist Rick Haley said. But a spike in pollution in 2008 resulted in the state changing shellfish harvest rules for Samish Bay.

According to the state Department of Health, fecal coliform loading levels of more than 4 trillion bacterial colonies per day can make people sick with water contact or shellfish consumption.

Fecal coliform loadings in Samish Bay jumped to more than 170 times the state standard following a storm in 2008.

The record high marked a turning point for the watershed, and the Clean Samish Initiative was formed in 2009. The multiagency initiative includes 20 partners at the local, state, federal, tribal and nongovernmental levels.

Skagit County is the lead agency, but partners like the Skagit Conservation District, state Departments of Ecology and Health, U.S. Environmental Protection Agency, Samish Indian Nation and others provide support.

Fecal Coliform

- Intestinal bacteria from warm-blooded animals
- Serve as indicators of possible disease-causing organisms found in feces – bacteria, viruses, protozoa
- State WQ standards designed to protect contact recreation and downstream resources - Shellfish

Fecal coliform sources



Fecal coliform sources



Samish Bay Fecal Coliform Issues

- Ongoing problem for decades
- Septic system fixes in 1990s led to improved conditions
- Rain event in April, 2008 led to shellfish bed closure due to high FC
- Continued storm sampling revealed true scope of the problem
- Freshwaters don't meet state WQ standards; Shellfish bed closures

Pollution Identification and Correction Program (PIC)

- Common-sense approach to locate pollution sources
- Use water quality data to locate areas with consistent pollution increases
- Work with landowners in area to find and fix problems
- Designed to be cooperative
- Uses many agencies with different expertise

Local Agency Roles

- Skagit County
 - Project Lead
 - Pollution Identification and Correction Program (PIC)
 - WQ Monitoring, Property Inspection/Referral, Education/Outreach
- Skagit Conservation District
 - Farm Plan development
 - Education/Outreach
 - Liaison with Washington State Conservation Commission

State/Federal/Tribal Roles

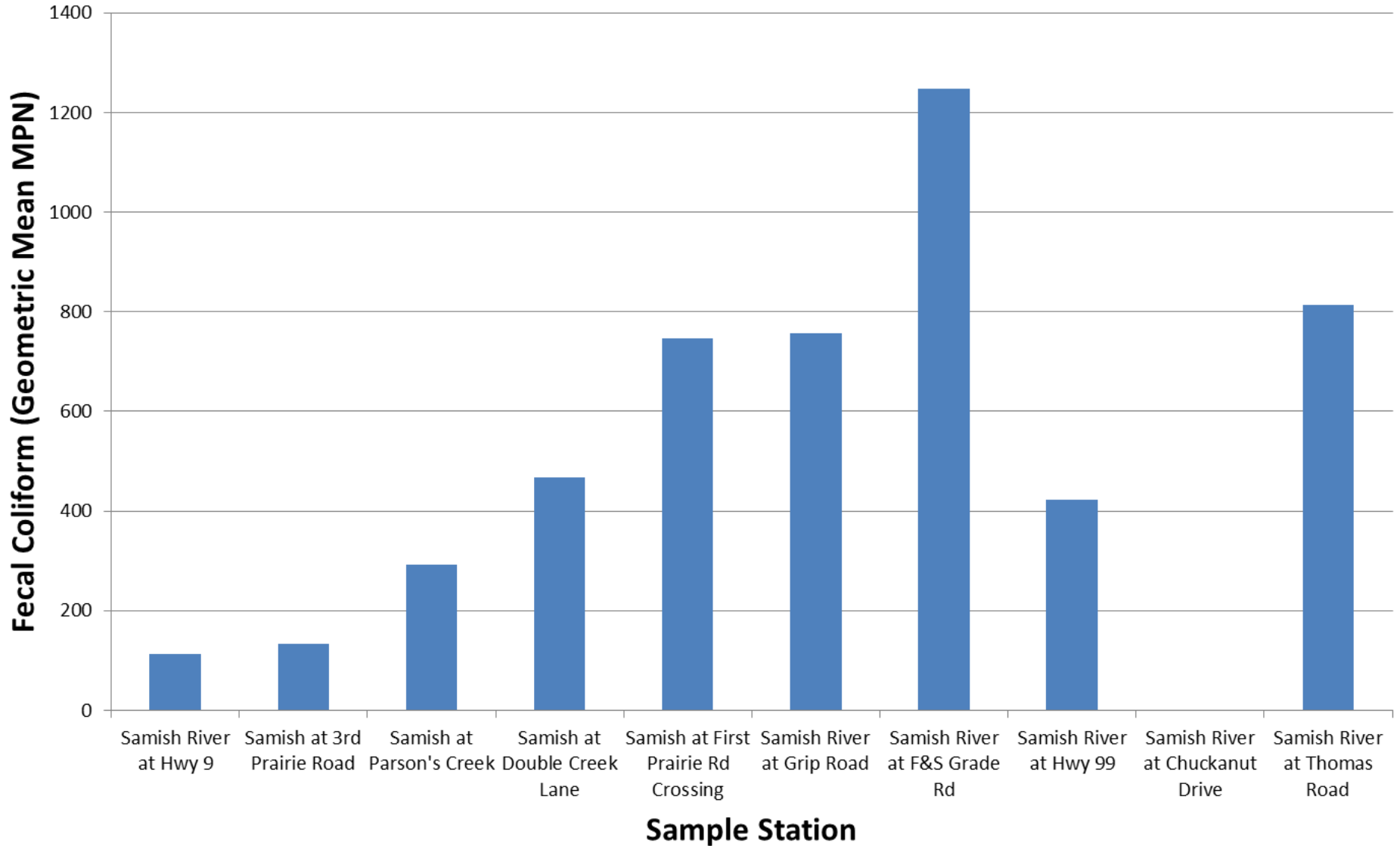
- Samish Indian Nation
 - Thomas Creek WQ and restoration
- Washington State Department of Ecology
 - Landowner Inspection/Referral
 - Enforcement
- Washington State Department of Health
 - Shellfish growing area regulation
- Puget Sound Partnership
 - State Agency Coordination/Shellfish Initiative
- USEPA
 - Funding, technical support
- Many other state, tribal, NGO entities involved



Samish River Fecal Coliform Concentrations 2010

Upstream to Downstream

Storm Events Only



Ecology Inspections

- 350 initial and follow-up inspections
- 67 warning letters
- 1 Notice of Violation
- 10 Administrative Orders
- 5 Notices of Penalty

Typical Case - Livestock

- Monitoring shows high FC in tributary
- Windshield survey shows livestock with sub-standard conditions
- County and/or Ecology inspector visits and asks landowner to fix the problems, if any
- Landowner works with Conservation District to design project and obtain cost-shares
- Everybody goes home happy!
- Or, landowner refuses and enforcement ensues

Pollution Correction- Livestock

- Technical assistance to 76 landowners
- 51 farm plans
 - Structural practices to contain sources
 - Management recommendations to protect properties
 - Nutrient management
 - Prescribed grazing
 - Pasture planting
 - Access control and use exclusion
 - Filter strips and buffers

Pollution Correction Projects

- 12 Gutter and outlet projects
- 5 Subsurface drain projects
- 8 Solar-powered pumps
- 10 Manure storage facilities
- 17 Fencing projects
- 22 Use exclusion projects
- 14 Heavy use area protections (HUAPs)
- 1 Waste transfer project

Restoration Activities



Pollution Correction - NRSP

Funded through Department of Ecology Centennial grant and the County's Clean Water Program (CWP). Since 2009, provided financial assistance to 20 projects in the Samish

- 22,905 linear feet of streamside
- 35 acres protected
- 15,472 native plantings installed in the riparian buffer
- 8,497 linear feet of livestock exclusion fencing
- 2 livestock crossings
- 2 manure storage facilities
- 1 roof runoff management project

Typical Case – Septic System

- Property owner is behind on inspections
- Skagit County Public Health sends letter asking owner to get inspection
- Owner gets inspection from private contractor, finds minor problem
- Septic system gets fixed before pollution occurs
- Or, owner ignores letters, septic system fails and causes pollution, Health starts enforcement

On-site Sewage (septic) Systems in the Samish Watershed

- 3,686 septic systems
- 1,979 (53%) up-to-date operations & maintenance inspections
 - Every 3 years for gravity
 - Annually for all other types of systems
- Failure rate
 - 1% high priority failures
 - 5% non-high priority (corrections needed)

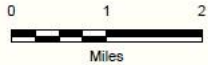


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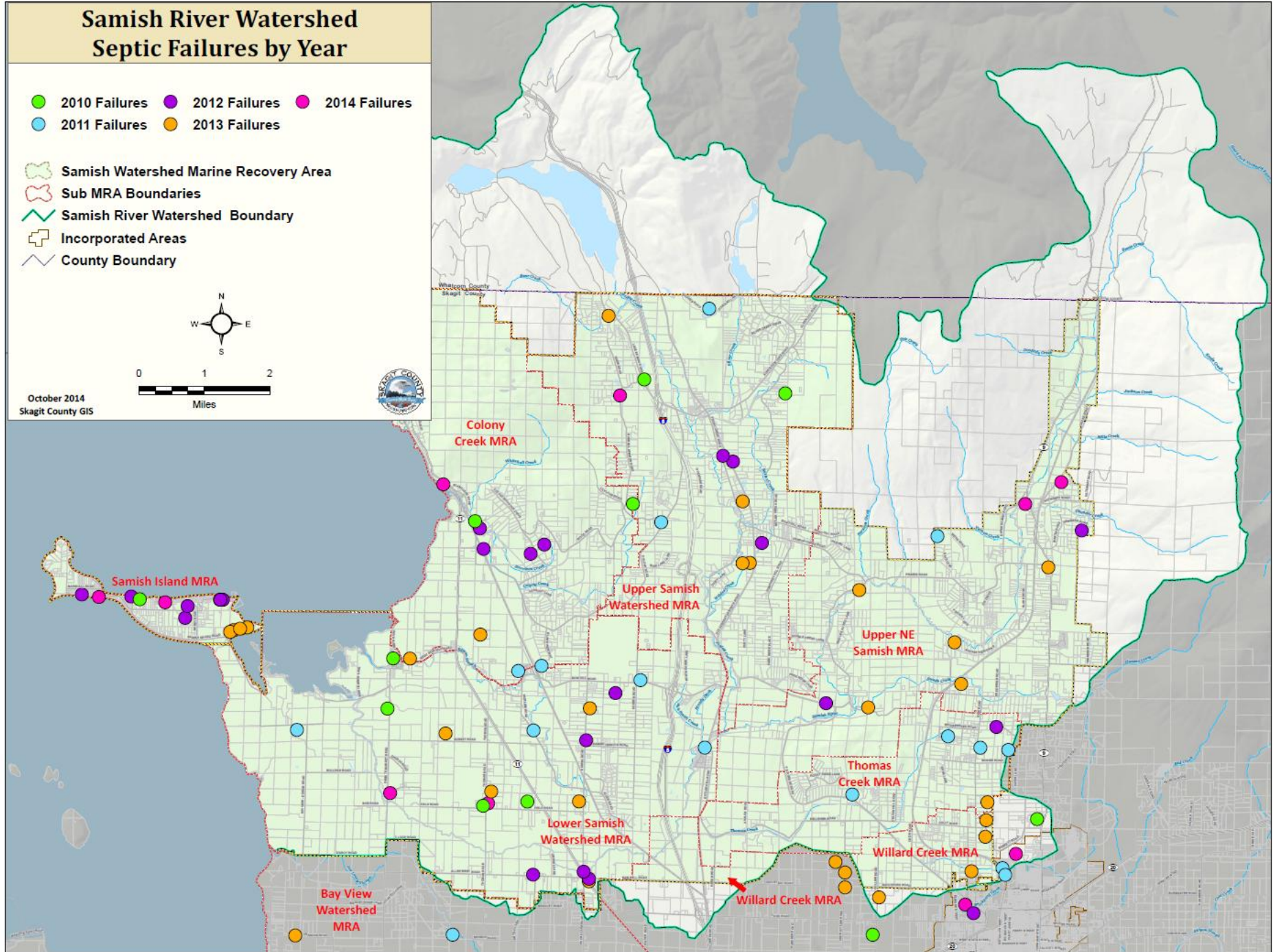
Samish River Watershed Septic Failures by Year

- 2010 Failures
- 2011 Failures
- 2012 Failures
- 2013 Failures
- 2014 Failures

- ▭ Samish Watershed Marine Recovery Area
- ▭ Sub MRA Boundaries
- ▭ Samish River Watershed Boundary
- ▭ Incorporated Areas
- ▭ County Boundary



October 2014
Skagit County GIS



SAMISH WATERSHED SEPTIC REPAIR STATUS

2010	2011	2012	2013	2014
13	22	26	32	17

New Tools

- Microbial Source Tracking/DNA Testing
- Sewage-sniffing dogs
- Detect human sewage only
- Several locations in Samish
- Septic system tests/fixes

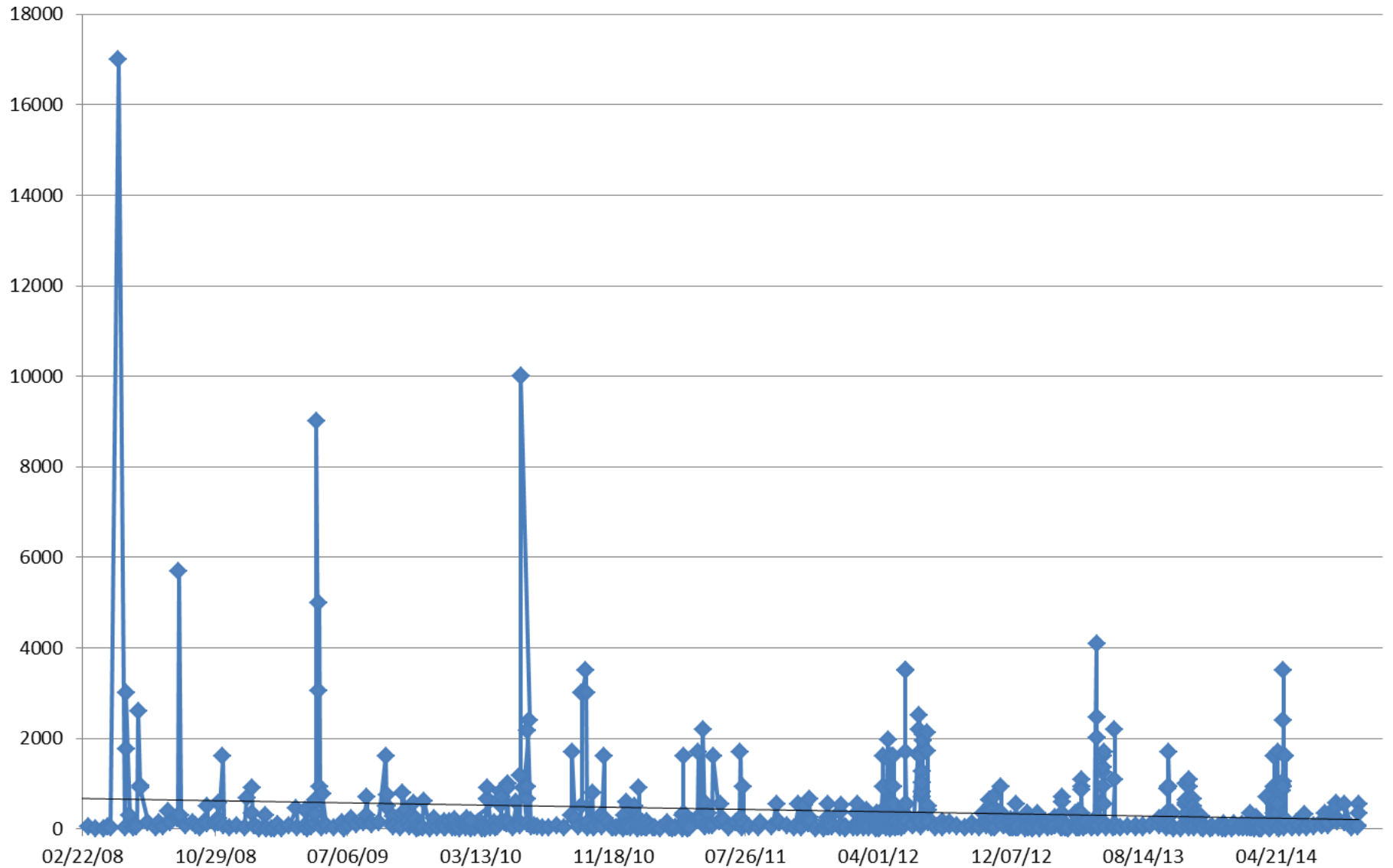


Current Status

- Over 100 agricultural BMP projects have been completed
- About 110 septic system repairs
- Peak fecal coliform loadings (number of bacteria delivered to Samish Bay) during storms down 5-10 x since 2009
- Freshwaters still don't meet WQ standards
- Shellfish bed closures still occurring

Samish River at Thomas Road Fecal Coliform Concentration 2008-2014

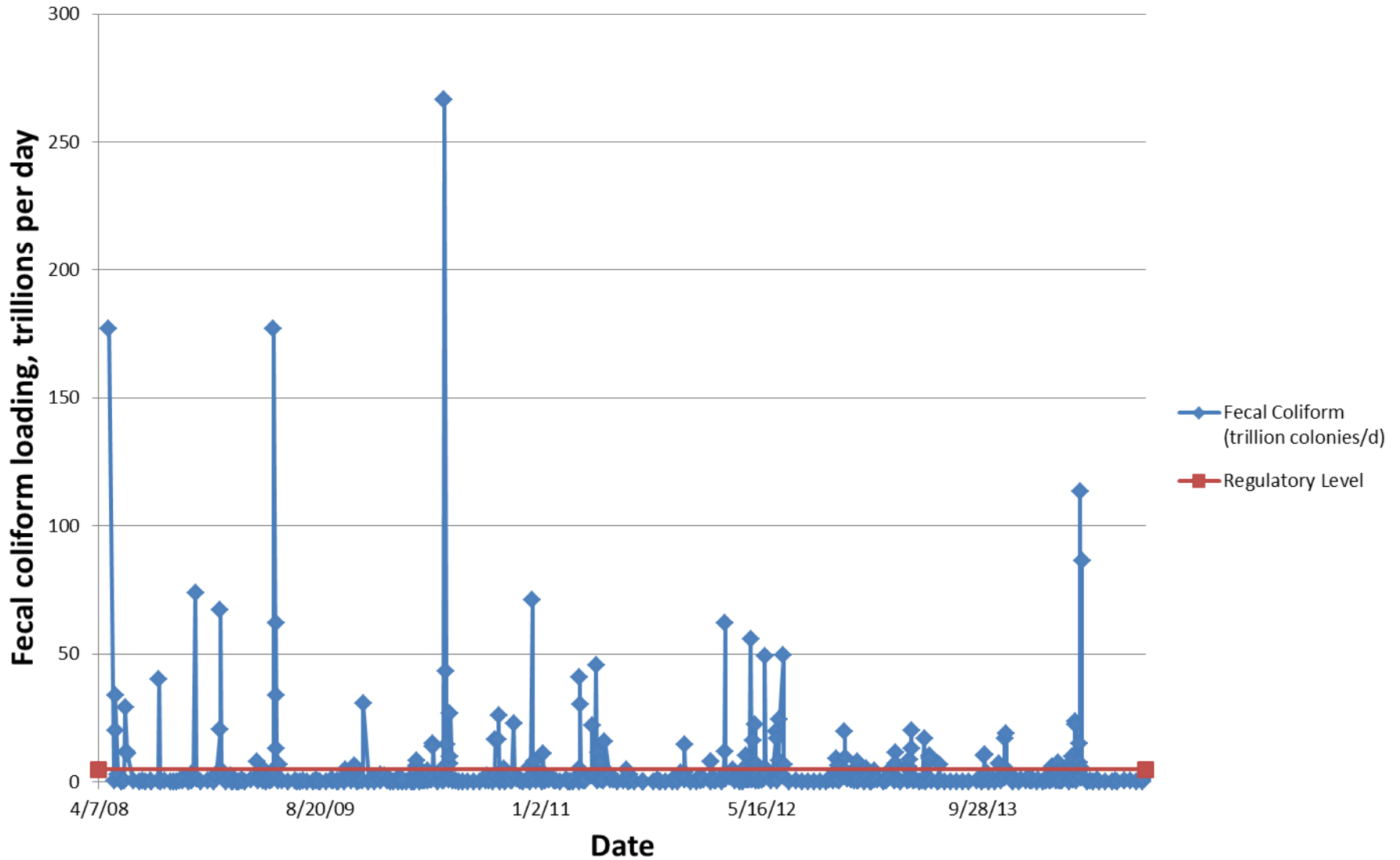
Updated through
9/30/14



Samish River Fecal Coliform Loading 2008-2014

Trillions of Colonies per Day

Updated through
9/30/14

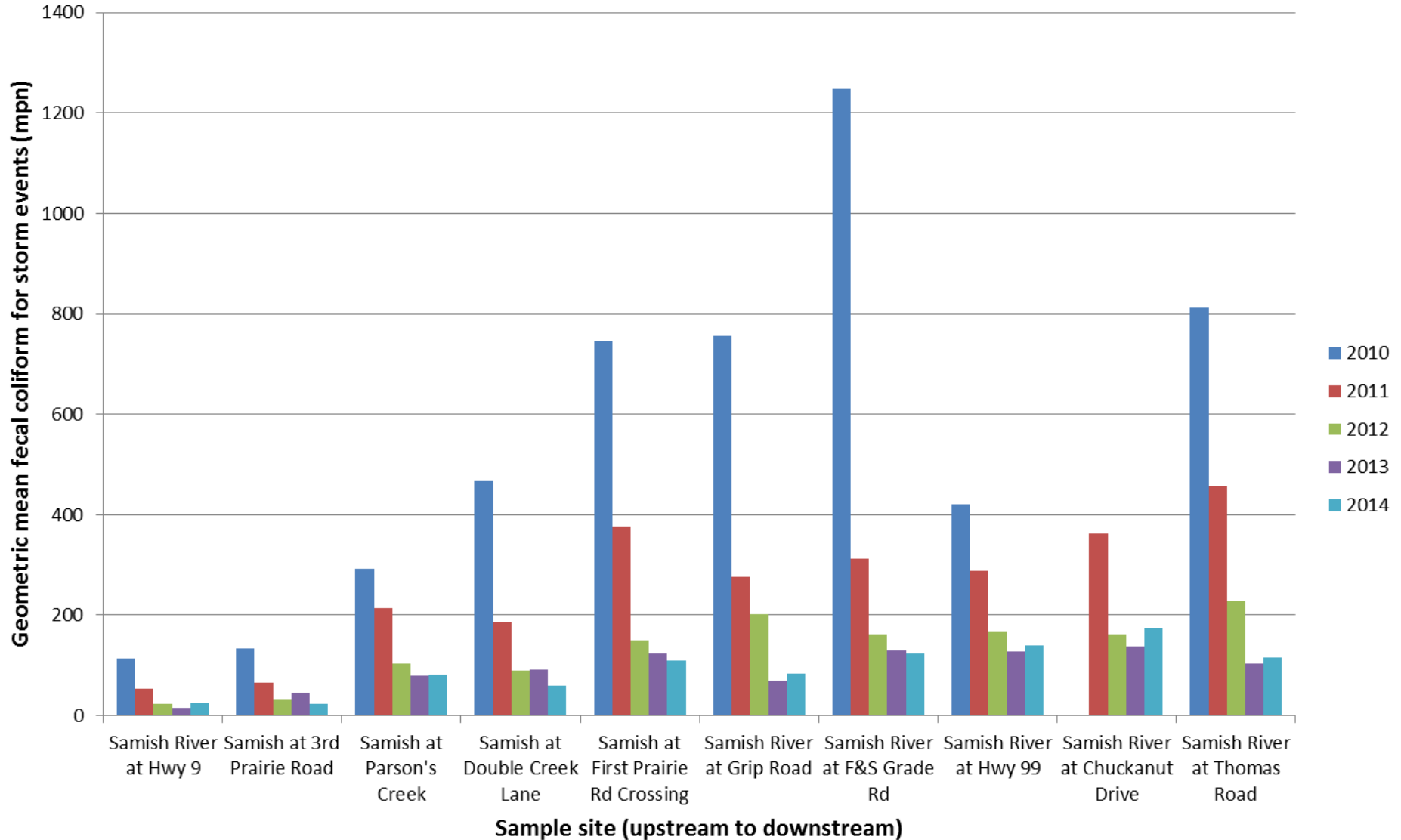


Samish River Fecal Coliform Concentrations

Storm Events Only

2010-2014 Water Years (Oct-Sep)

Updated
through
9/30/14



2011 Samish Bay Growing Area Pollution Closures

January						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
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16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

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27	28					

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27	28	29	30	31		

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29	30	31				

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19	20	21	22	23	24	25
26	27	28	29	30		

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24	25	26	27	28	29	30
31						

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30	31					

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2014 Samish Bay Growing Area Pollution Closures

January						
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February						
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March						
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April						
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27	28	29	30			

May						
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18	19	20	21	22	23	24
25	26	27	28	29	30	31

June						
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22	23	24	25	26	27	28
29	30					

July						
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		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
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27	28	29	30	31		





August						
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17	18	19	20	21	22	23
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31						

September						
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October						
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5	6	7	8	9	10	11
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19	20	21	22	23	24	25
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November						
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December						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

-  River Rise over cfs criteria
-  Unconfirmed Bacteriological Closure
-  Confirmed Bacteriological Closure
-  Flood closure

Challenges

- Consistent messaging
- Gaining trust
- Finding dispersed coliform sources
- Communicating science to general audience
- Coordinating 20+ organizations

Work Plan Going Forward

- CSI Partners remain engaged
- Funding through County Clean Water Program
- Additional grants sought as appropriate
- Continued WQ monitoring, property inspections, technical assistance, cost shares for restoration activities
- New program to use chemical tracers

Final Thought

- Everything that's been done to clean up the watershed has been accomplished by the citizens of Skagit County

Thank You!

