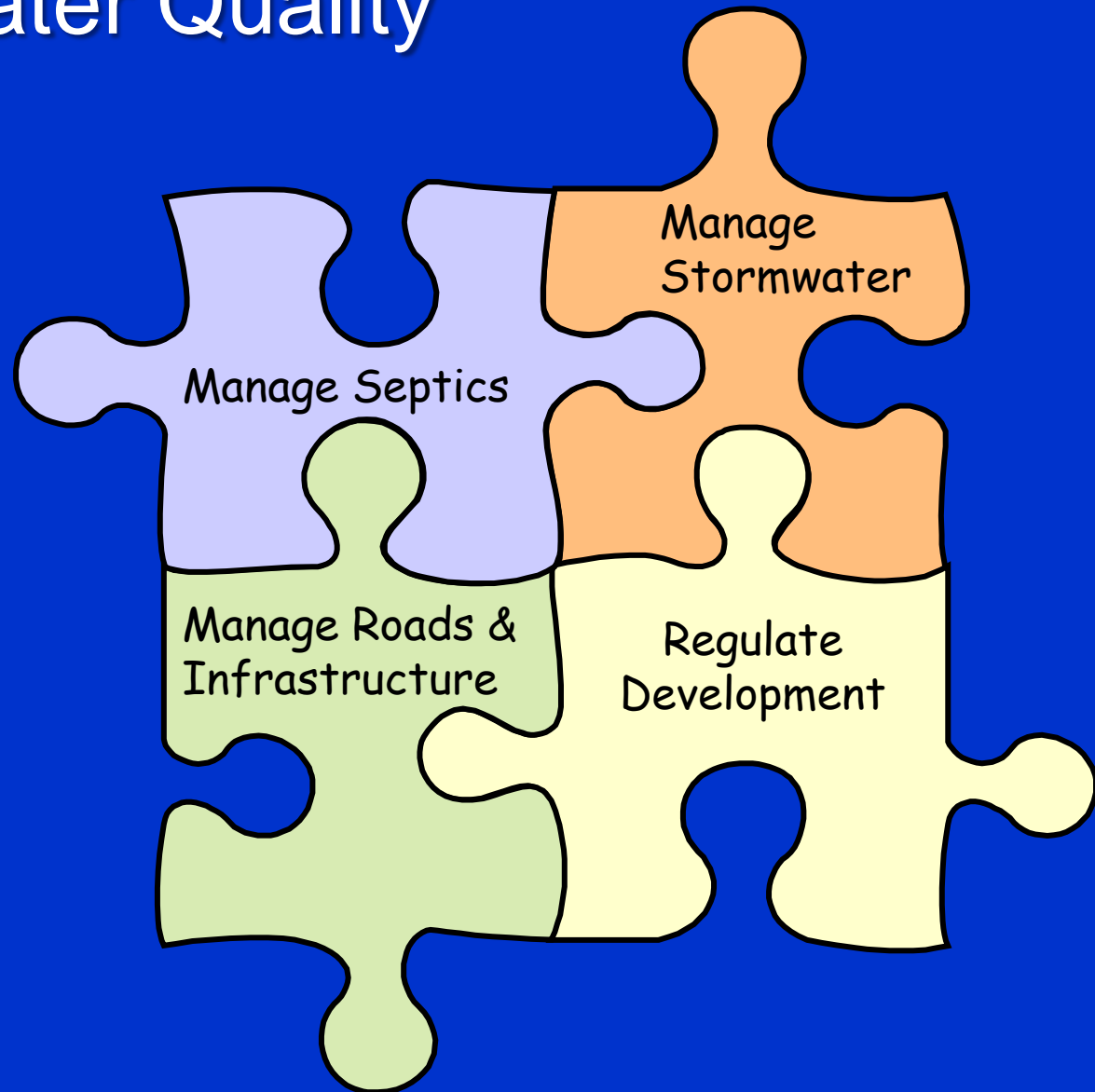


Thurston County
Surface Water Quality &
Sensitive Areas

Purpose of this Presentation:

To provide an overview of the County's surface water quality conditions as it relates to septic systems

Many County Programs Protect Water Quality



So that Thurston County residents can....

- Swim



- Dig



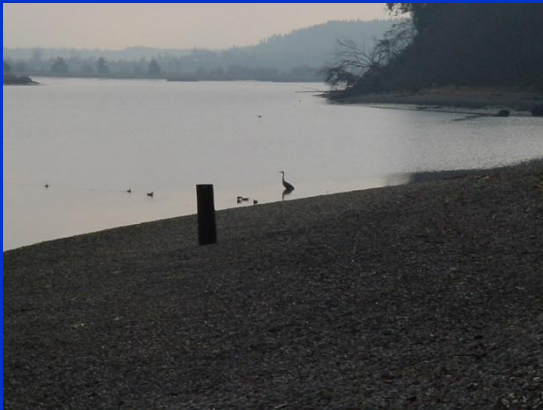
- Fish



- Drink Water

Thurston County Surface Water

- Puget Sound



- Lakes

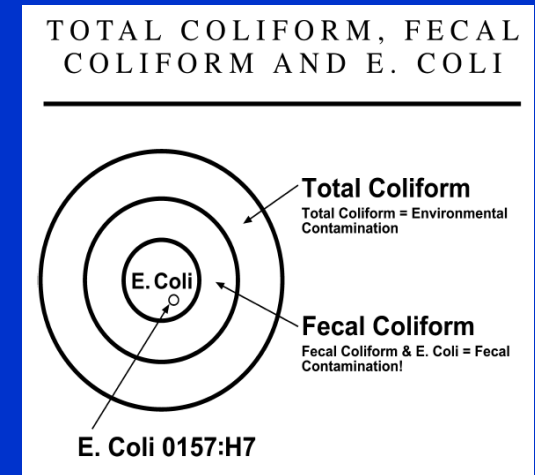


- Rivers



Bacteria & Nutrients are Indicators of Septic Pollution

- Fecal Coliform –
 - Indicates that disease-causing organisms, includes viruses, could be present
- Nitrates –
 - Human health impacts, eutrophication, & indicates that other contaminants could be present, like pharmaceuticals



Puget Sound



Dense
Development
2 hours
“travel time”
away



Shellfish Growing Areas

Monitored by Washington State
Department of Health

- 108 marine WQ stations monitored 6-12 times per year
- Shoreline evaluations every 12 years
- Annual waste water treatment plant & marina evaluations

WDOH 2013 Early Warning System

ELD INLET GROWING AREA

- 3 Stations CONCERNED due to water quality

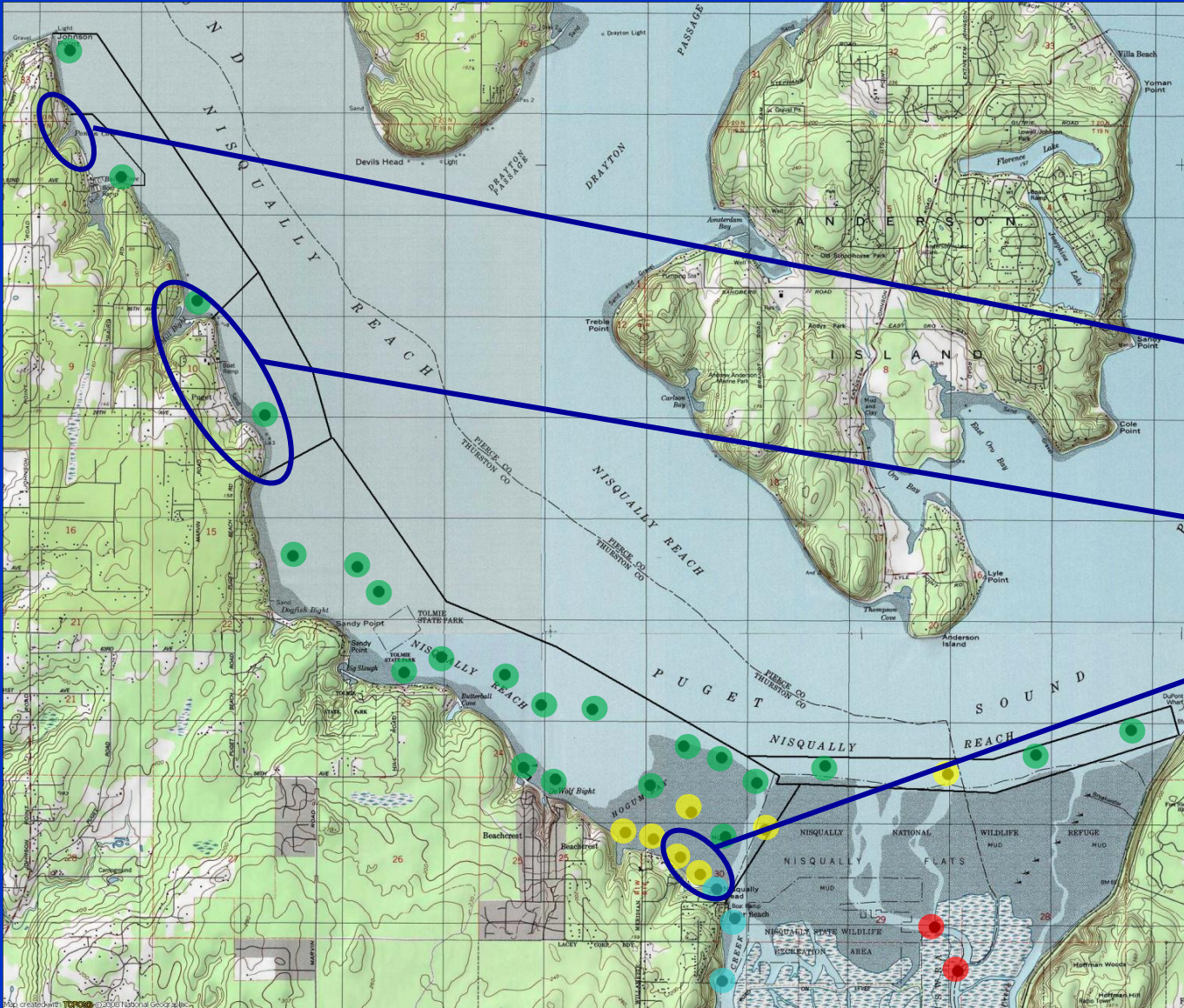
HENDERSON INLET GROWING AREA

- 4 Stations THREATENED due to water quality
- 4 Stations CONCERNED due to water quality

NISQUALLY REACH GROWING AREA

- 4 Stations THREATENED due to water quality
- 4 Stations CONCERNED due to water quality

Shoreline Survey Findings



Over 20% of the on-site sewage systems along the shoreline were defined as potential sources of pollution.

High bacteria levels in a stream draining to the shoreline.

High bacteria levels in 23 shoreline discharges.

High bacteria levels.



Drainage systems carry water, and pollution, to creeks and the Sound

State Law Requires Response to Shellfish Down Grades

RCW 90.72.045 requires County to:

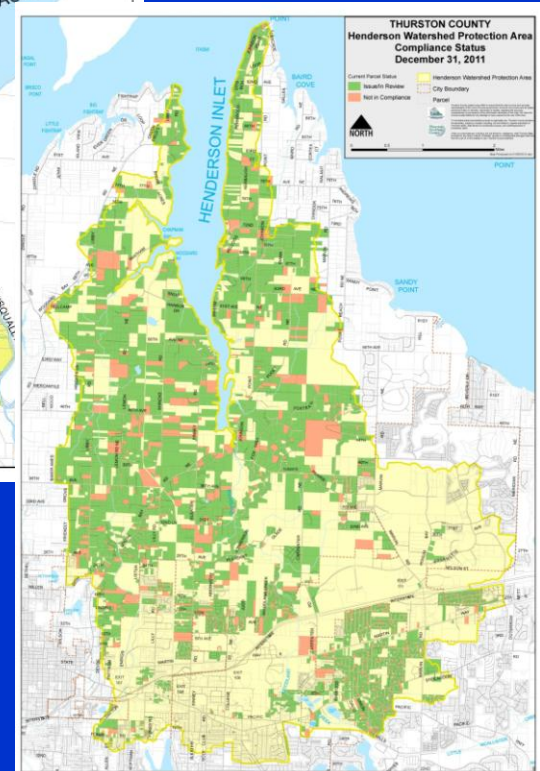
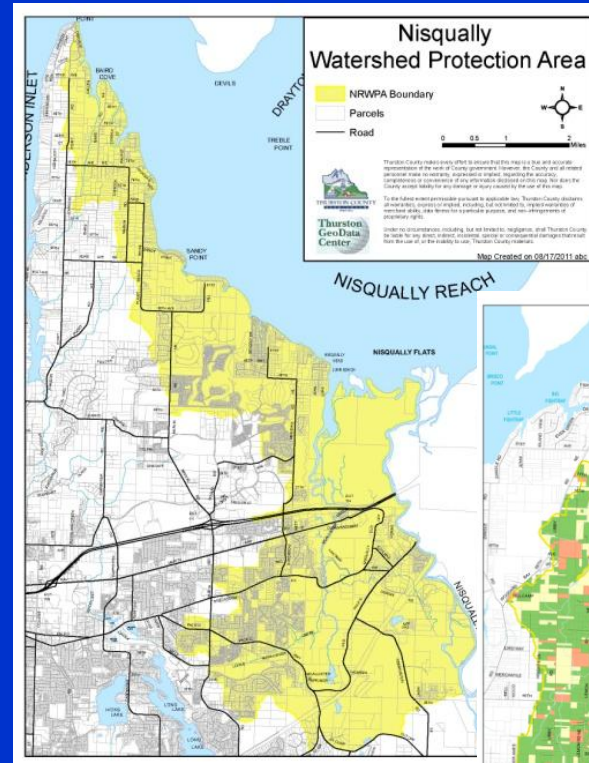
- Create “Shellfish Protection District”
- Establish a program to improve water quality



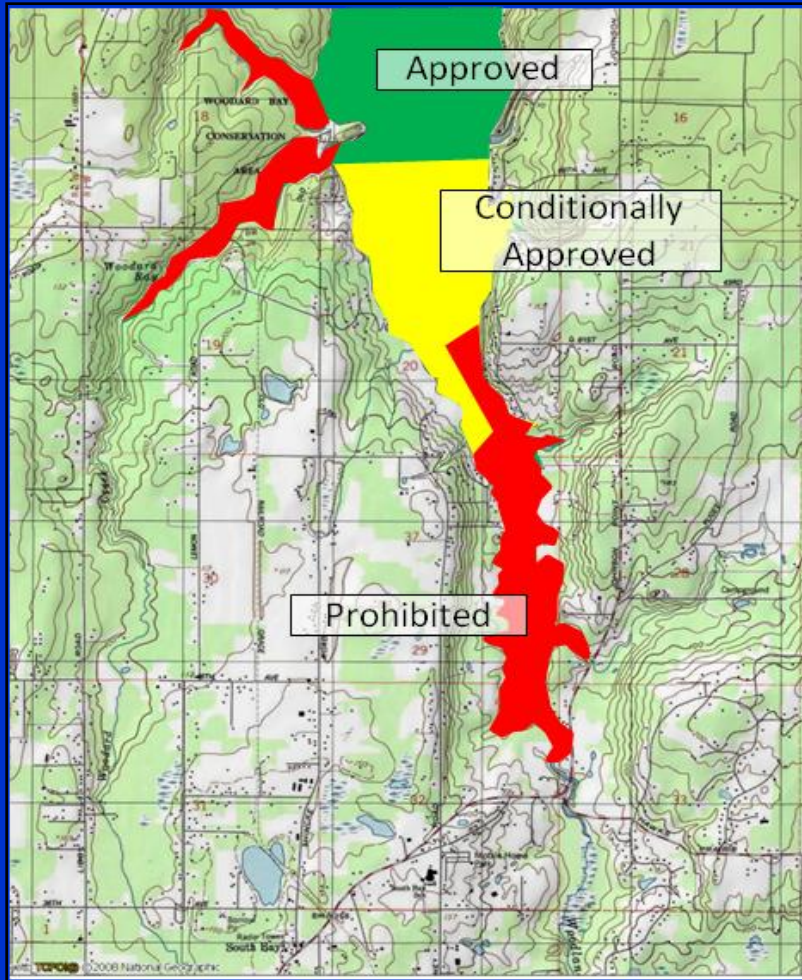
Henderson and Nisqually MRAs

MRA Boundaries based on:

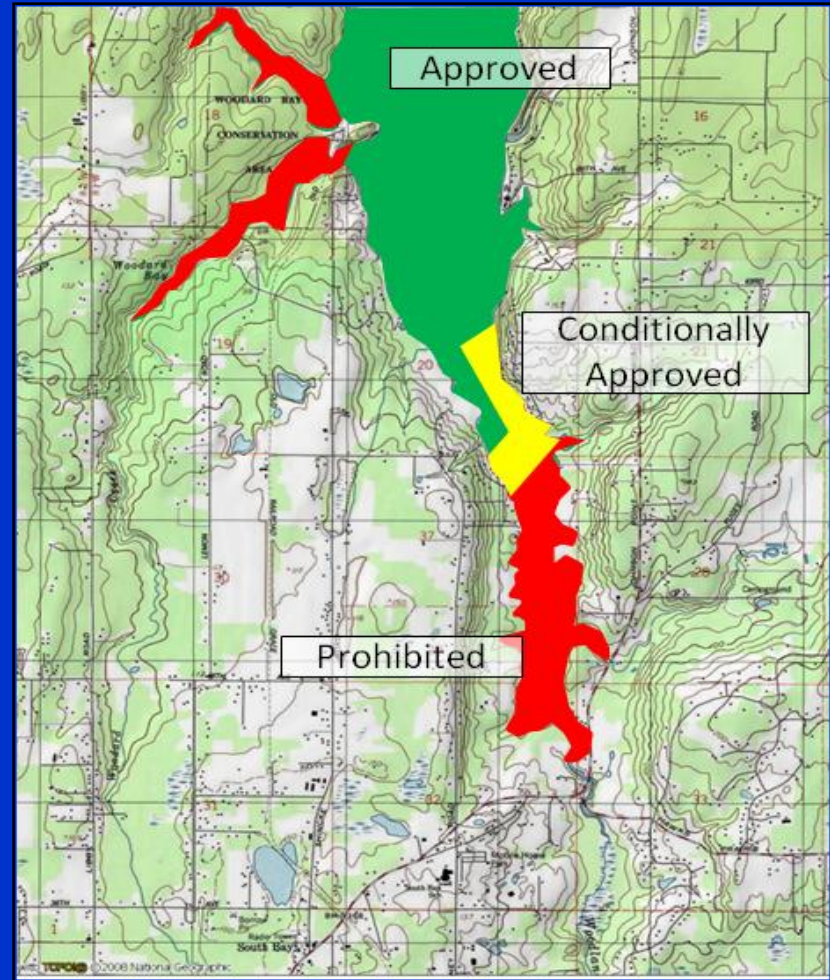
- Watershed boundaries
- Time of travel for pollution



2005

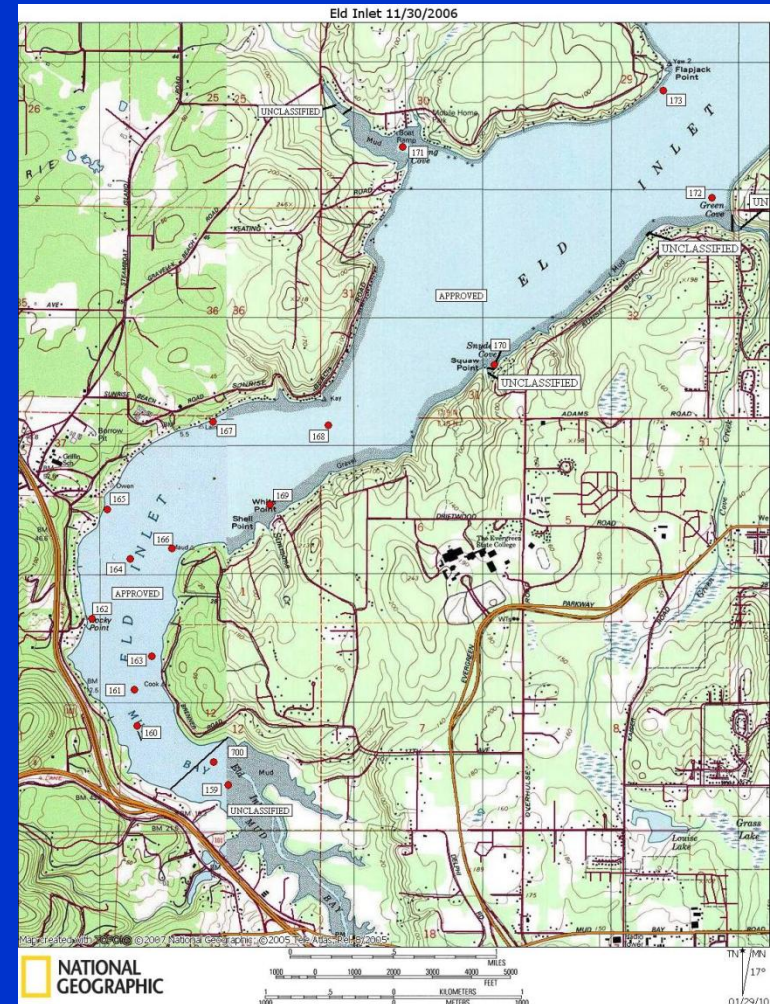


2012



Eld Inlet- Current

- 23 dwellings/shoreline mile
- 3 stations concerned
- 9 out of 25 marine sampling sites have a worsening trend in fecal coliform levels

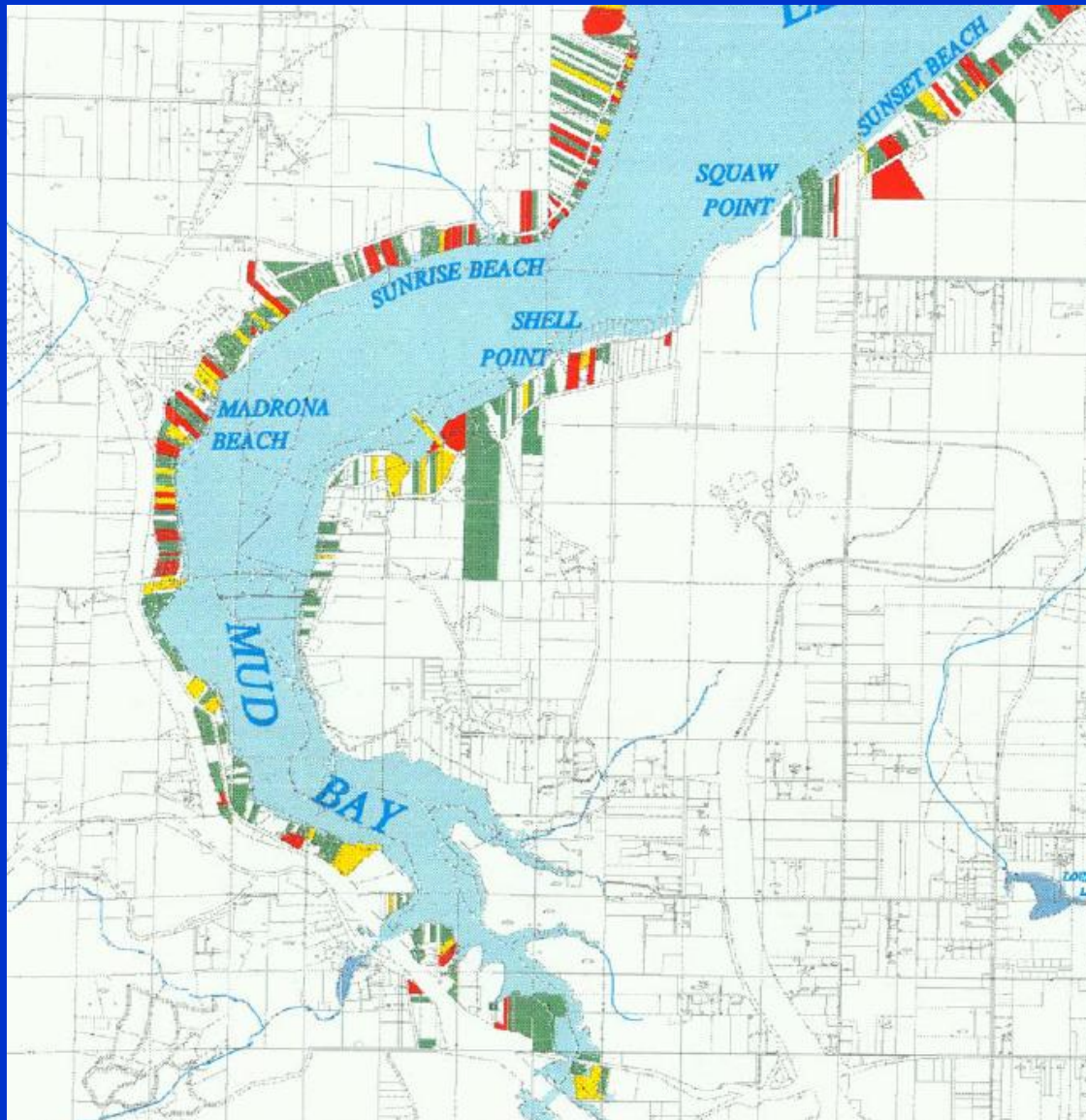


Eld Inlet – Historical Work

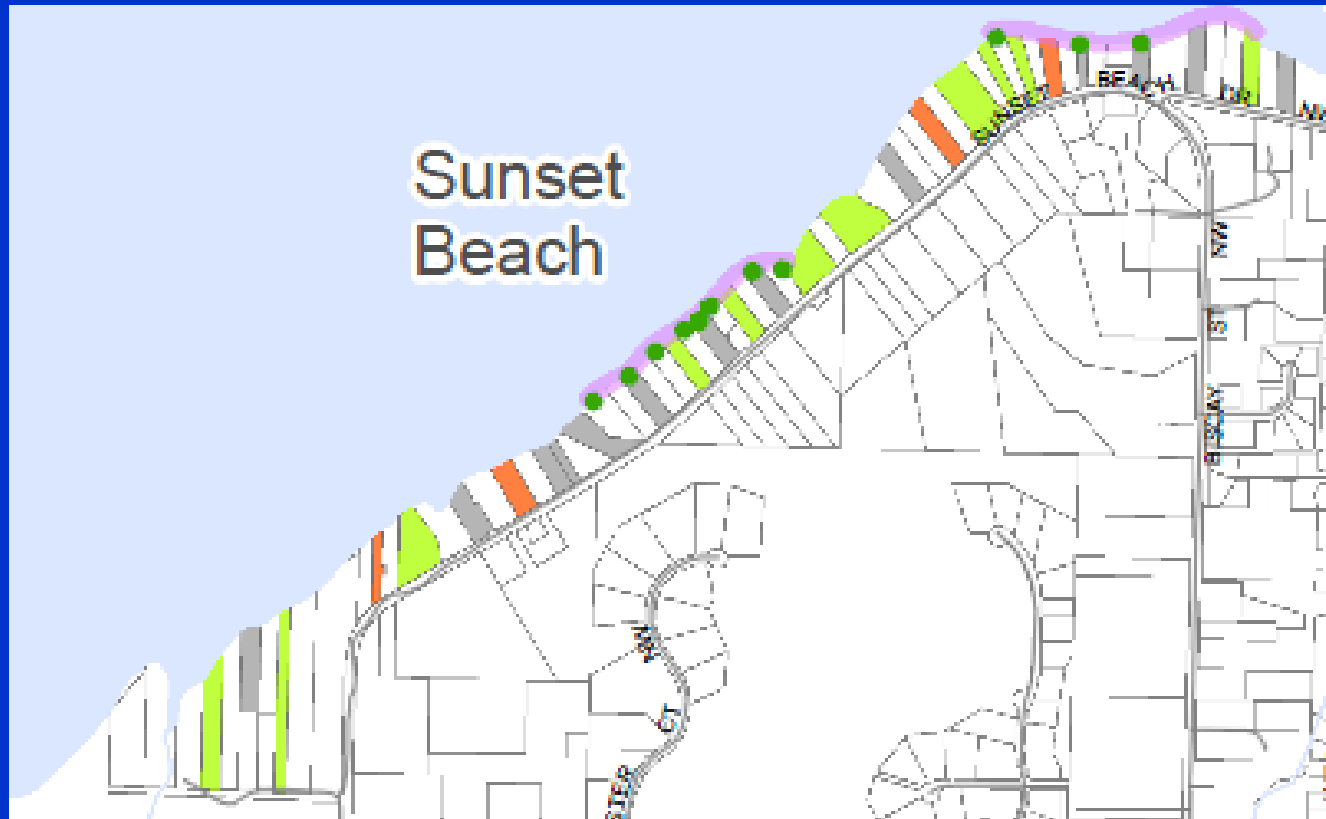
- Downgraded in the 1980's
- Intensive grant funded effort in 1980's-90's
- Upgraded in 1998
- Concerned again in 2000's
- Currently conducting another intensive grant funded investigation



1990 – 96 Septic Dye Testing



2012 – 2014 Dye Testing



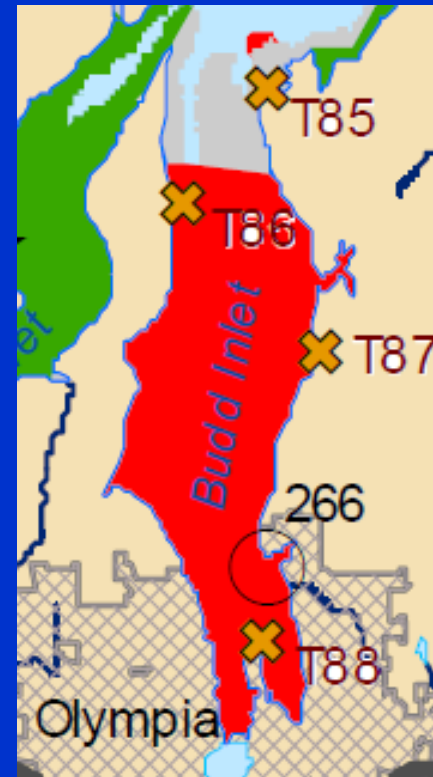
Totten Inlet- Current

- 20 dwellings/shoreline mile
- All stations currently meeting shellfish wq standards
- Burns & Pierre Creeks have improved
- Grant funded investigations in the 90's



Budd Inlet

- 24 dwellings/shoreline mile
- No shellfish growing area
- Important recreational area
- Water Clean Up Plan under development



Thurston County Lakes

10 Lakes
Sampled in 2013

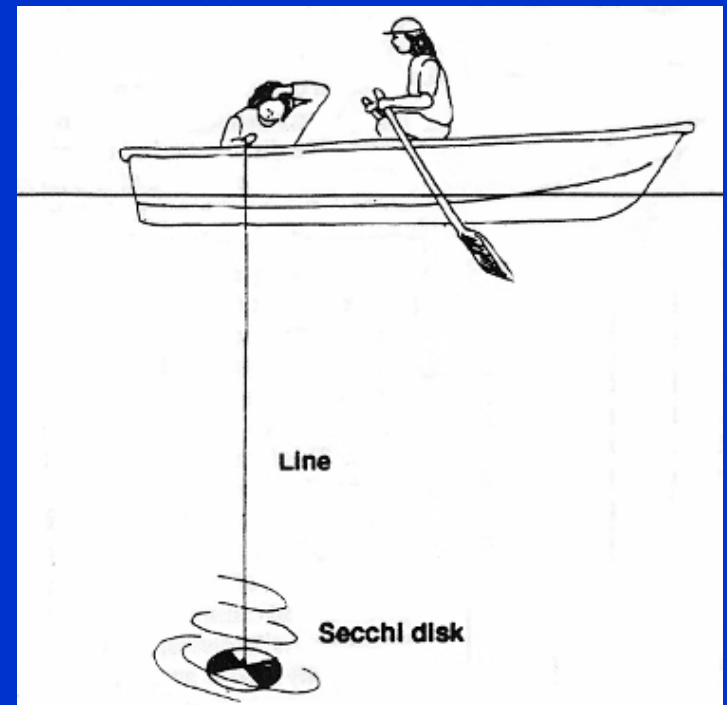


- Public Access
- High Recreation
- Drinking water supply lakes

- Black
- Capitol
- Deep
- Hicks
- Lawrence
- Long
- Pattison
- St Clair
- Summit
- Ward

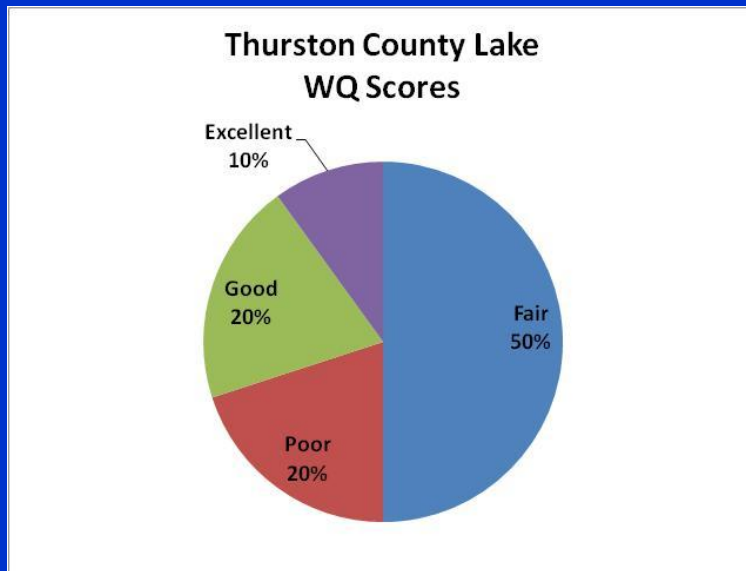
Ambient Lake Monitoring Objectives:

- Collect baseline data
- Identify problems
- Track trends over time
- Algae identification



Lake Sampling Results

8 out of 10 Lakes Eutrophic for Chlorophyll



Drinking Water Lakes



Lake St. Clair & Summit Lake

Summit Lake

- Drinking water source
- 1992-1997 Sanitary Survey
 - 17% Failures (57/330)
 - 11% Suspect (36/330)
- 2014 Conditions???
 - a systematic evaluation of the septic systems surrounding the lake has not been done in over fifteen years



What Causes an Algae Bloom?

- Sunlight
- Temperature
- Excess
Nutrients



Thurston County Blue-Green Toxin Advisories

2013 Advisories

- Long Lake
- Lawrence Lake
- Pattison Lake
- Lake St Clair

WARNING

TOXIC ALGAE PRESENT
Lake unsafe for people and pets

Until further notice:

- **Do not swim or water ski.**
No nade o practique el esquí acuático.
- **Do not drink lake water.**
No tome el agua del lago.
- **Keep pets and livestock away.**
Mantenga alejados las mascotas y el ganado.
- **Clean fish well and discard guts.**
Limpie bien el pescado y deseche las tripas.
- **Avoid areas of scum when boating.**
Evite las áreas con espuma o verdín cuando ande en lancha.

Call your doctor or veterinarian if you or your animals have sudden or unexplained sickness or signs of poisoning.

Report new algae blooms to Department of Ecology: 360-407-6000	Call your local health department:
--	------------------------------------

For more information: www.doh.wa.gov/ehp/algae/
www.ecy.wa.gov/programs/wq/plants/algae/index.html





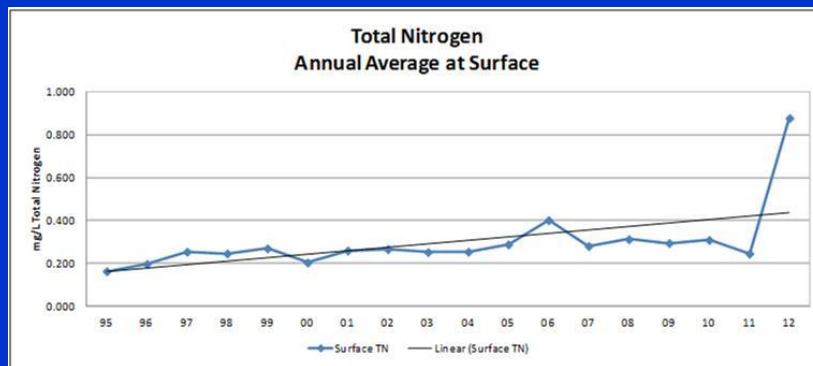
May 2008

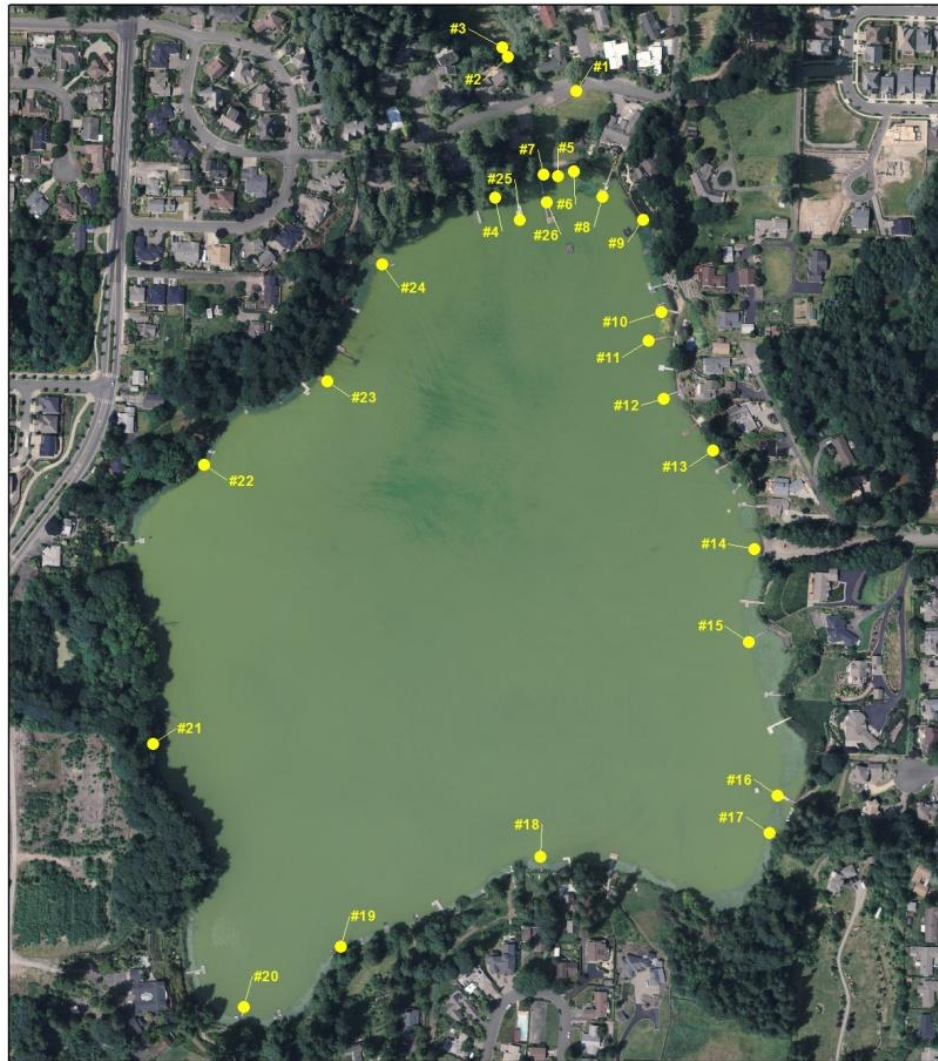
Lake Special Events- Ward Lake



2012 Lake Closure

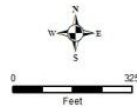
- 8/29 - Bacteria Samples Results Show High Level Fecal Contamination Range 520 - 1580
- County Beach Closure Policy - Sample $>1,000$
- Health Officer Closed Lake - 8/31 to 9/18





THURSTON COUNTY
 August/September 2012
 FC Sample Locations
 Ward Lake Special Investigation

● Sample Locations



Aerial Photography Taken July 2012

Thurston County makes every effort to ensure that this map is a true and accurate representation of the work of County government. However, the County and all related personnel make no warranty, expressed or implied, regarding the accuracy, completeness or convenience of any information displayed on this map. Nor does the County accept liability for any damage or injury caused by the use of this map.

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Map Created by kwh on 09/01/12

Thurston County Rivers



State Water Quality Violations

FC & nutrient related listings:

- 90 countywide
- 49 in UGA



Ecology TMDL Studies Identify Septic Pollution Sources

***TMDL Technical Report – External Review Draft –
October 2008***

**Deschutes River, Capitol Lake, and Budd Inlet
Temperature, Fecal Coliform Bacteria,
Dissolved Oxygen, pH, and Fine Sediment
Total Maximum Daily Load**

Water Quality Study Findings



DRAFT - October 2008

Publication No. 09-03-0xx



**Henderson Inlet Watershed
Fecal Coliform Bacteria, Dissolved
Oxygen, Temperature, and pH
Total Maximum Daily Load**

**Water Quality Improvement Report
Implementation Strategy, Vol. II**



October 2006
Publication No. 06-10-058

 Printed on Recycled Paper

Specific TMDL Recommendations

- On-site sewage systems in the Woodland Creek basin should have mandatory septic system operation and maintenance inspections on a regular basis
- The Woodland Creek Estates neighborhood should be strongly considered for sewerage.

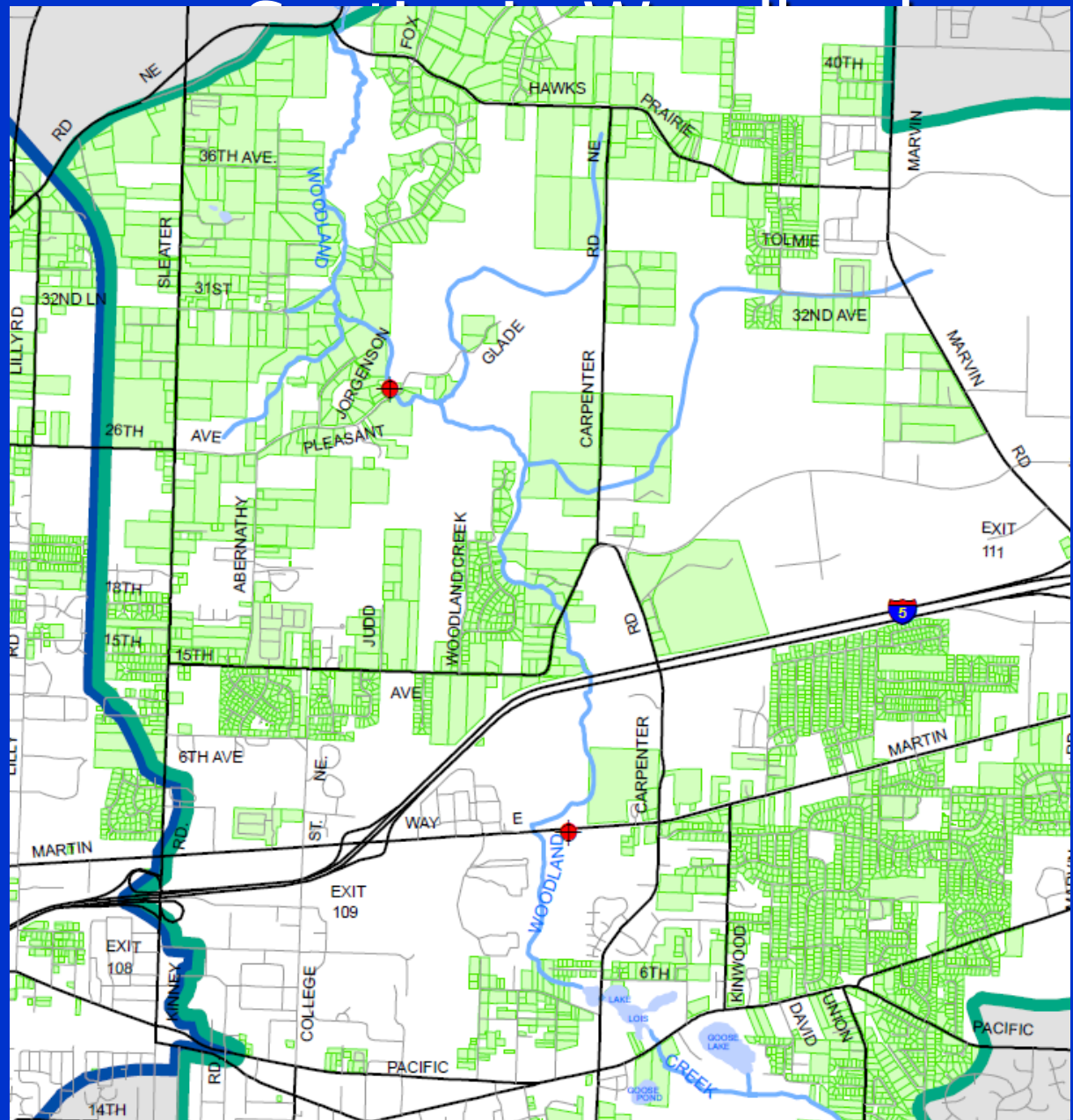


Woodland Creek

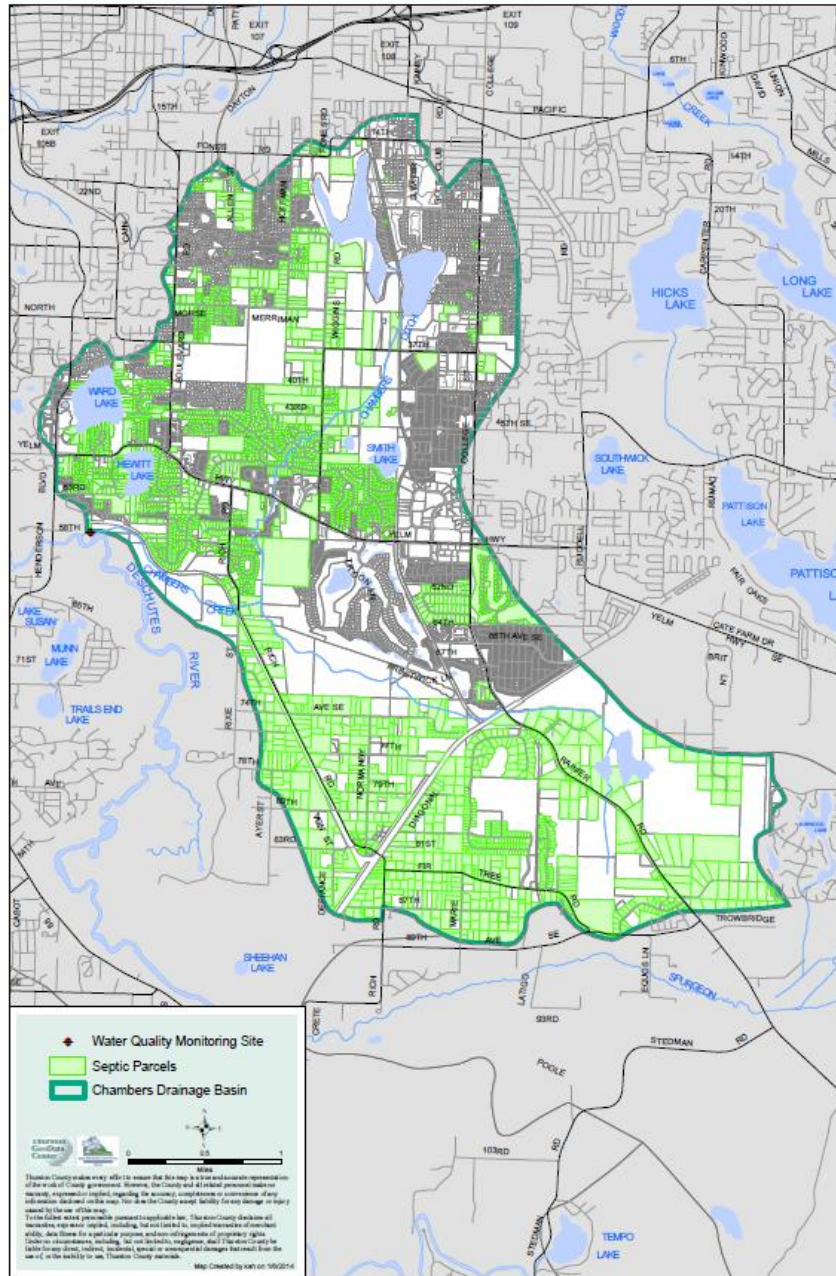
- Multiple studies note fecal coliform & nitrate problems
- TMDL called for 93% reduction FC loading



Septic Systems in Woodland Creek



Chambers Basin

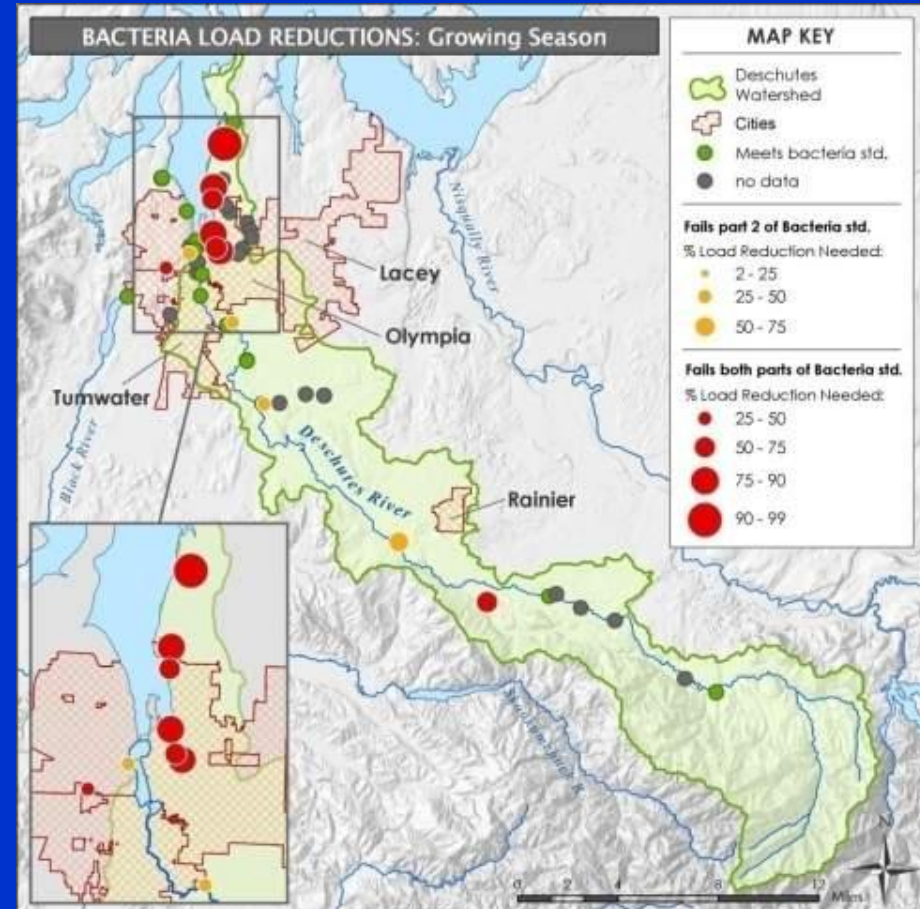
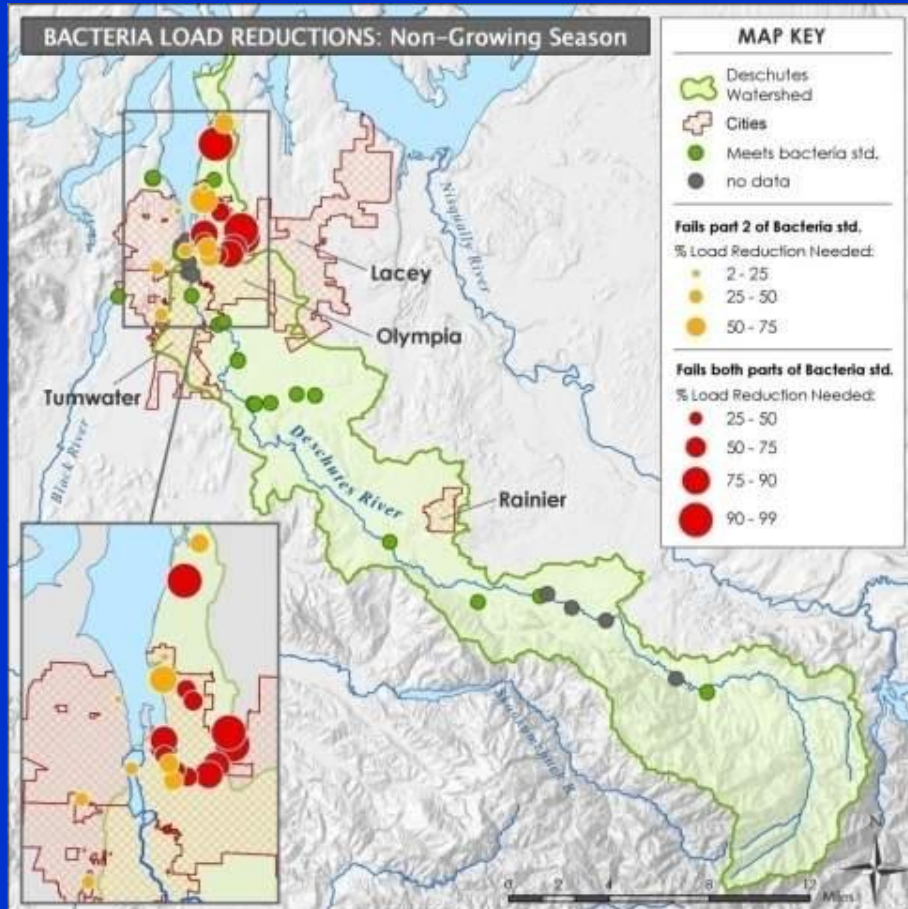


- Deschutes TMDL found high surface nutrient concentrations associated with onsite systems

Deschutes River Fecal Coliform Bacteria Reduction Targets

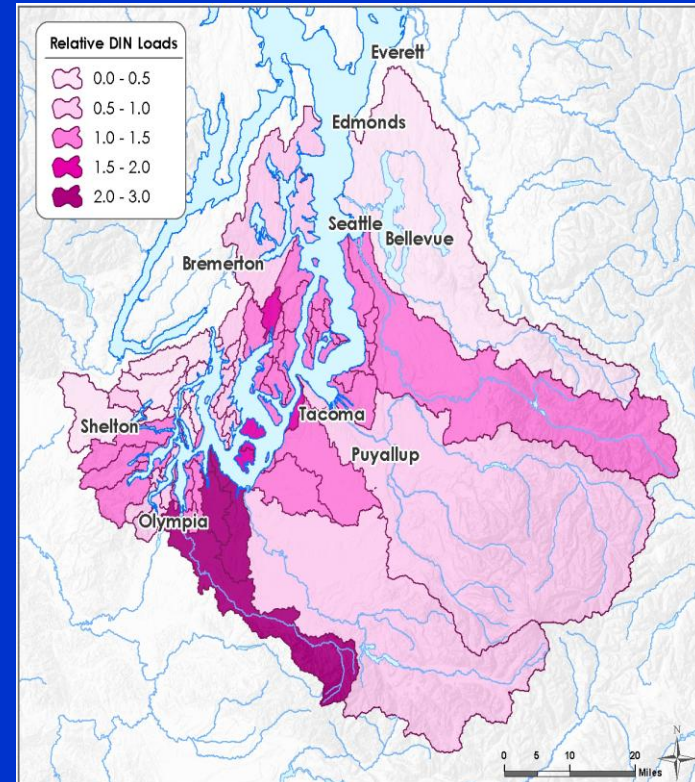
Winter

Summer



South Sound DO Study

- Thurston County watersheds add nitrogen to South Puget Sound



Thurston County Ambient Streams Monitoring

- 39 Streams and Rivers monitored in 2013
- Ambient Monitoring Objectives
 - Collect baseline data
 - Identify problems
 - Track trends over time



Water Quality Index

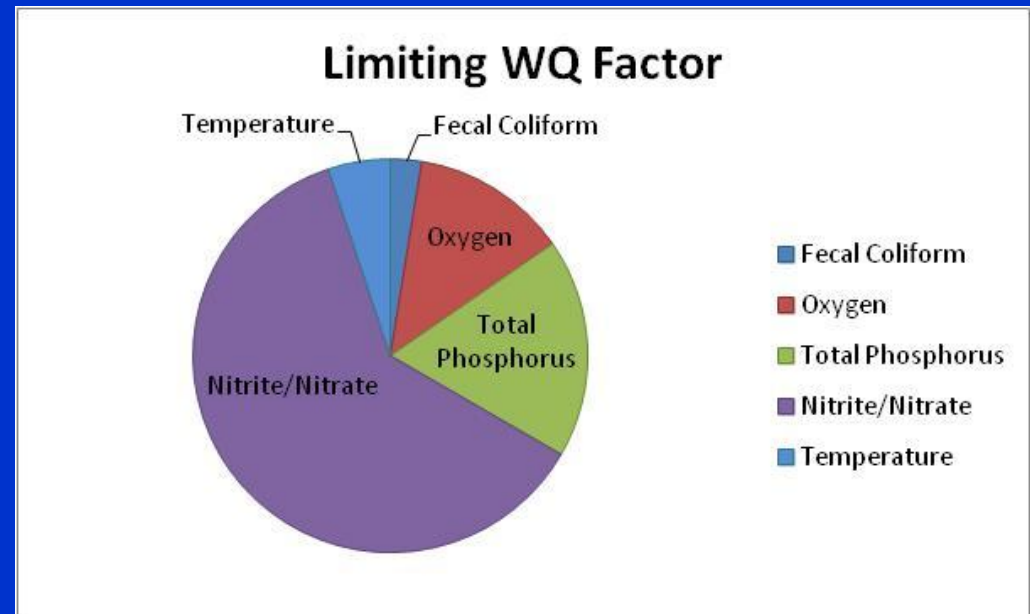
- WQI Developed by Dept. of Ecology
 - Summarizes stream health
 - Translates complicated WQ data into a 0 to 100 score



Thurston County streams averaged 73 in 2012-
Fair

Water Quality Index Scores

- Thurston County stream health impacted by nutrients
- Nitrate pollution consistent over time



2012 Water Quality Index Scores				
Site Descripton	WQI Overall	Fecal Coliform	Total Phosphorus	Nitrite/Nitrate
	Score			
Thompson Ck	93	94	88	1
Kennedy Ck	89	80	86	72
Spurgeon Ck	88	82	77	88
Prairie Ck	88	77	73	68
Skookum Ck	88	85	79	81
Deschutes at Vail Lp Rd	87	84	81	66
Chambers Ck	87	83	80	1
Blooms Ditch	87	80	64	88
Perry Ck	86	88	66	72
Deschutes at Waldrick	85	92	81	28
Yelm Ck at Mouth	85	78	80	1
Deschutes at Tumwater	84	91	73	38
Reichel Ck	84	84	54	80
Scatter at Gibson Rd	82	89	80	66
McLane Ck	81	71	69	82
Percival Ck at Mouth	78	79	73	90
Schneider Ck near Mouth	78	65	64	96
Black R at Moon Rd	78	91	76	46
Schneider Ck at West Bay Dr	76	75	75	1
Black R at Littlerock	76	94	75	95
Salmon Ck	76	90	57	99
Beaver Ck	75	82	65	63
Schneider at Steamboat Interchange	74	80	83	100
Chehalis R	73	71	67	66
Black Lake Ditch	67	83	74	98
Green Cove Ck	66	79	60	1
Tanglewilde Outfall	63	93	49	1
Ellis Ck	60	79	61	25
Yelm Ck at 103rd	60	88	47	99
Scatter Ck at James	60	86	44	1
Eaton Ck	59	57	64	34
Woodland Ck at Pleasant Glade Rd	55	65	56	1
Woodland at Draham Rd	54	73	56	1
Moxlie Ck at Plum St	52	69	52	42
Woodard Ck at Libby Rd	52	68	58	22
Indian Ck at Mouth	49	63	51	1
Mission Ck	43	62	32	1
McAllister Ck at I-5	31	75	25	1
Moxlie Ck Mouth	10	33	42	42

2008 Potential Sensitive Areas

- Henderson Watershed Protection Area
- Nisqually Watershed Protection Area
- Eld Inlet
- Totten Inlet
- Budd Inlet
- Summit Lake
- Southern Thurston County (Scatter Creek)
- McAllister Geologically Sensitive Area
- Shana Park Well Head Protection District/East Olympia