WASHINGTON STATE DEPARTMENT OF HEALTH
OFFICE OF SHELLFISH AND WATER PROTECTION

ANNUAL GROWING AREA REVIEW

PREPARED BY: Lawrence Sullivan, Public Health Advisor

AREA: Annas Bay

YEAR ENDING: December 31, 2008

CLASSIFICATION: Approved, Conditionally Approved

ACTIVITIES IN THE GROWING AREA IN 2008:

Annas Bay was sampled 6 times during 2008 in accordance with the NSSP systematic random sampling criteria. Annas Bay was closed for a total of 14 days due to flooding of the Skokomish River. Station #300 in the marina area at Union is classified as Conditionally Approved. The Conditionally Approved area is closed seasonally from May 1st to December 1st.

ANALYTICAL RESULTS OF WATER SAMPLES:

Table #1 summarizes the results of the most recent 30 water samples collected from the area. Table #1 shows that all stations in the Approved and Conditionally Approved portions of the area meet the water quality standard. The Table #1 summary also indicates that station #195 is concerned due to elevated bacteria levels. Individual results for stations #195, #197, and #198 are shown in Tables 2, 3, and 4 respectively.

CHANGE IN ACTUAL POLLUTION SOURCES THAT IMPACT THE GROWING AREA:

The nature and location of pollution sources impacting the area are under investigation.

CLASSIFICATION STATUS:

☐ Well within the classification standards
☒ Meets standards but some concerns
☐ Meets standards but threatened with a downgrade in classification
☐ Fails to meet classification standards

REMARKS AND RECOMMENDATIONS:

The Skokomish River and the marine waters in Annas Bay near the river mouth are on the 303d list for fecal coliform.

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MANAGEMENT PLAN EVALUATION – BRIEFLY DESCRIBE THE FOLLOWING COMPONENTS:

1. Have all parties involved complied with the conditions in the management plan .....Yes
2. Has reporting been adequate to manage the conditional area .....Yes
3. Does the area consistently meet approved area criteria when it is open for harvest .....Yes
4. Has a field inspection of critical pollution sources been conducted.....Yes

TABLE 1

SUMMARY OF MARINE WATER DATA (SRS)

Growing Area: **ANNAS BAY**

Classification: **Approved,Prohibited,Conditionally Approved**

From **10/23/2002** To **10/20/2008**

FECAL COLIFORM ORGANISMS/100 ML

Station Number	Classification	Number of Samples	Range	Geometric Mean	Est. 90th Percentile	Meets Std.
195	Approved	32	1.7 - 49.0	7.2	27.0	Yes
196	Approved	32	1.7 - 79.0	2.9	9.0	Yes
199	Approved	32	1.7 - 350.0	3.2	14.0	Yes
200	Approved	32	1.7 - 33.0	2.7	7.0	Yes
201	Approved	32	1.7 - 6.8	1.8	2.0	Yes
202	Approved	32	1.7 - 17.0	2.7	6.0	Yes
203	Approved	32	1.7 - 49.0	2.7	8.0	Yes
204	Approved	32	1.7 - 17.0	2.1	3.0	Yes
205	Approved	32	1.7 - 7.8	1.9	3.0	Yes
206	Approved	32	1.7 - 49.0	4.3	13.0	Yes
299	Approved	30	1.7 - 33.0	2.6	7.0	Yes
197	Prohibited	31	1.7 - 95.0	8.0	38.0	Yes
198	Prohibited	32	1.7 - 350.0	6.9	28.0	Yes
300	Conditionally Approved	37	1.7 - 33.0	4.3	17.0	Yes

All tides information is presented

The standard for approved shellfish growing waters is fecal coliform geometric mean not greater than 14 organisms/100 ml and an estimate of the 90th percentile not greater than 43 organisms/100 ml. The above table shows bacteriological results in relation to program standards.

TABLE 2

SUMMARY OF SHELLFISH GROWING AREAS
WATER QUALITY STUDY RESULTS

Growing Area: **ANNAS BAY**

Sampling Station Number: **195**

Classification: **Approved**

Sample Date	Sample Time	Tide	Fcoli/100ml	Temperature	Salinity
10/23/2002	13:10	Ebb	13	11	8
11/06/2002	09:18	Ebb	49	10	15
01/14/2003	14:13	Ebb	1.7	6	0
05/21/2003	10:21	Ebb	4.5	11	25
05/22/2003	10:11	Flood	1.7	13	23
07/16/2003	09:24	Ebb	33	13	25
09/17/2003	09:54	Flood	49	11	18
11/12/2003	09:55	Ebb	7.8	7	30
02/23/2004	11:21	Ebb	4	7	4
03/16/2004	09:35	Flood	4.5	9	22
05/25/2004	09:14	Ebb	6.8	15	8
07/07/2004	09:49	Ebb	23	16	25
12/06/2004	10:18	Flood	14	6	4
02/07/2005	08:42	Ebb	27	5	4
04/13/2005	09:34	Ebb	13	6	4
05/31/2005	10:16	Flood	4.5	13	24
08/22/2005	09:32	Ebb	17	17	25
12/12/2005	11:05	Flood	6.8	5	12
04/03/2006	09:25	Ebb	6.8	8	16
05/03/2006	09:24	Ebb	1.7	12	22
08/21/2006	16:26	Flood	1.7	18	26
10/25/2006	09:55	Ebb	6.8	9	22
01/29/2007	10:19	Flood	2	4	0
06/05/2007	09:34	Ebb	13	13	22
09/17/2007	09:47	Flood	23	13	14
12/26/2007	09:37	Ebb	7.8	7	18
01/29/2008	09:18	Flood	6.8	7	22
04/15/2008	10:38	Flood	1.7	9	16
07/08/2008	09:44	Flood	13	18	15
08/06/2008	08:53	Flood	13	18	20
09/22/2008	12:14	Flood	2	15	22
10/20/2008	10:15	Flood	1.7	9	14

Number of Samples: 32 **Range:** 1.7 - 49

Geometric Mean: 7.2 **Estimated 90th Percentile:** 27

TABLE 3

SUMMARY OF MARINE WATER DATA (SRS)

Growing Area: **ANNAS BAY**

Sampling Station Number: **197**

Classification: **Prohibited**

Sample Date	Sample Time	Tide	Fcoli/100ml	Temperature	Salinity
10/23/2002	13:08	Ebb	95	11	8
11/06/2002	09:22	Ebb	79	10	15
01/14/2003	14:11	Ebb	1.7	6	0
05/21/2003	10:19	Ebb	4.5	11	20
05/22/2003	10:09	Flood	7.8	12	22
07/16/2003	09:27	Ebb	17	13	25
09/17/2003	09:56	Flood	23	11	14
11/12/2003	10:01	Ebb	4.5	7	10
02/23/2004	11:25	Ebb	1.7	7	4
03/16/2004	09:38	Flood	1.7	9	20
05/25/2004	09:17	Ebb	49	15	8
07/07/2004	09:53	Ebb	23	16	25
12/06/2004	10:21	Flood	33	6	4
02/07/2005	08:46	Ebb	13	5	6
04/13/2005	09:36	Ebb	7.8	6	2
05/31/2005	10:21	Flood	7.8	12	22
08/22/2005	09:35	Ebb	49	17	25
12/12/2005	11:09	Flood	2	5	10
04/03/2006	09:27	Ebb	7.8	8	18
05/03/2006	09:27	Ebb	2	12	22
08/21/2006	16:28	Flood	1.7	18	24
10/25/2006	09:58	Ebb	17	9	22
01/29/2007	10:21	Flood	2	4	0
06/05/2007	09:36	Ebb	13	13	21
09/17/2007	09:50	Flood	14	12	13
12/26/2007	09:29	Ebb	13	7	17
04/15/2008	10:41	Flood	2	9	16
07/08/2008	09:47	Flood	7.8	17	15
08/06/2008	08:57	Flood	1.7	18	20
09/22/2008	12:10	Flood	7.8	15	21
10/20/2008	10:17	Flood	4.5	9	15

Number of Samples: 31 **Range:** 1.7 - 95

Geometric Mean: 8.0 **Estimated 90th Percentile:** 38

TABLE 4

SUMMARY OF MARINE WATER DATA (SRS)

Growing Area: **ANNAS BAY**

Sampling Station Number: **198**

Classification: **Prohibited**

Sample Date	Sample Time	Tide	Fcoli/100ml	Temperature	Salinity
10/23/2002	13:06	Ebb	11	11	10
11/06/2002	09:25	Ebb	350	10	14
01/14/2003	14:09	Ebb	2	6	1
05/21/2003	10:17	Ebb	1.7	11	5
05/22/2003	10:07	Flood	7.8	12	22
07/16/2003	09:29	Ebb	13	13	22
09/17/2003	09:59	Flood	6.8	11	20
11/12/2003	10:07	Ebb	7.8	7	0
02/23/2004	11:28	Ebb	2	7	4
03/16/2004	09:40	Flood	2	9	20
05/25/2004	09:20	Ebb	4.5	13	4
07/07/2004	09:56	Ebb	4	16	24
12/06/2004	10:24	Flood	13	6	4
02/07/2005	08:48	Ebb	23	5	4
04/13/2005	09:40	Ebb	4.5	6	2
05/31/2005	10:24	Flood	49	12	20
08/22/2005	09:38	Ebb	11	17	25
12/12/2005	11:12	Flood	4.5	5	14
04/03/2006	09:30	Ebb	6.8	8	18
05/03/2006	09:30	Ebb	1.7	12	22
08/21/2006	16:30	Flood	1.7	18	24
10/25/2006	10:02	Ebb	7.8	8	22
01/29/2007	10:24	Flood	4.5	4	2
06/05/2007	09:39	Ebb	13	13	20
09/17/2007	09:53	Flood	17	12	12
12/26/2007	09:27	Ebb	4.5	6	11
01/29/2008	09:23	Flood	4	7	22
04/15/2008	10:44	Flood	2	9	18
07/08/2008	09:50	Flood	4	17	17
08/06/2008	09:01	Flood	17	18	20
09/22/2008	12:05	Flood	7.8	14	21
10/20/2008	10:20	Flood	17	9	10

Number of Samples: 32 **Range:** 1.7 - 350

Geometric Mean: 6.9 **Estimated 90th Percentile:** 28

Figure 1. Annas Bay Growing Area Map

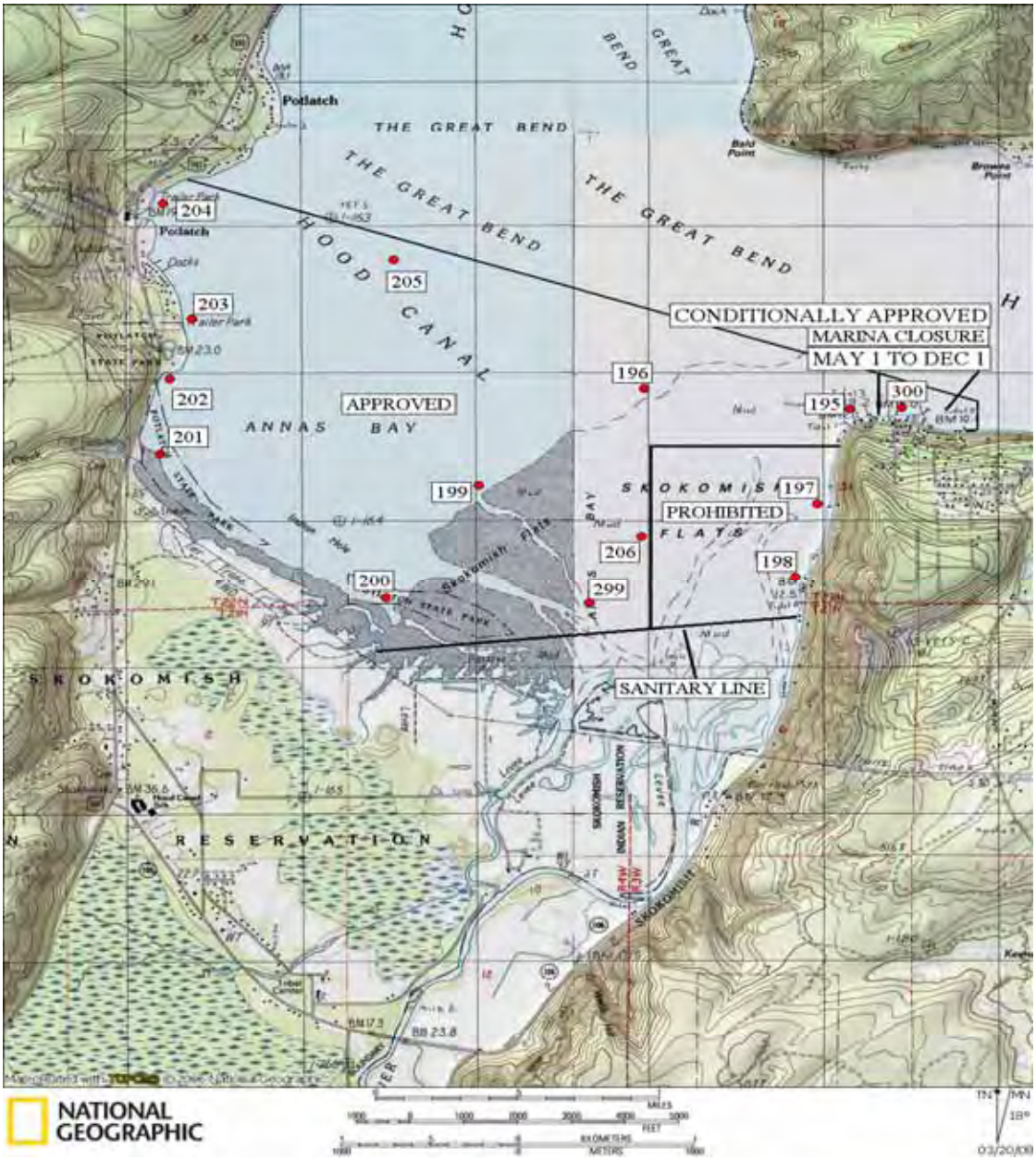
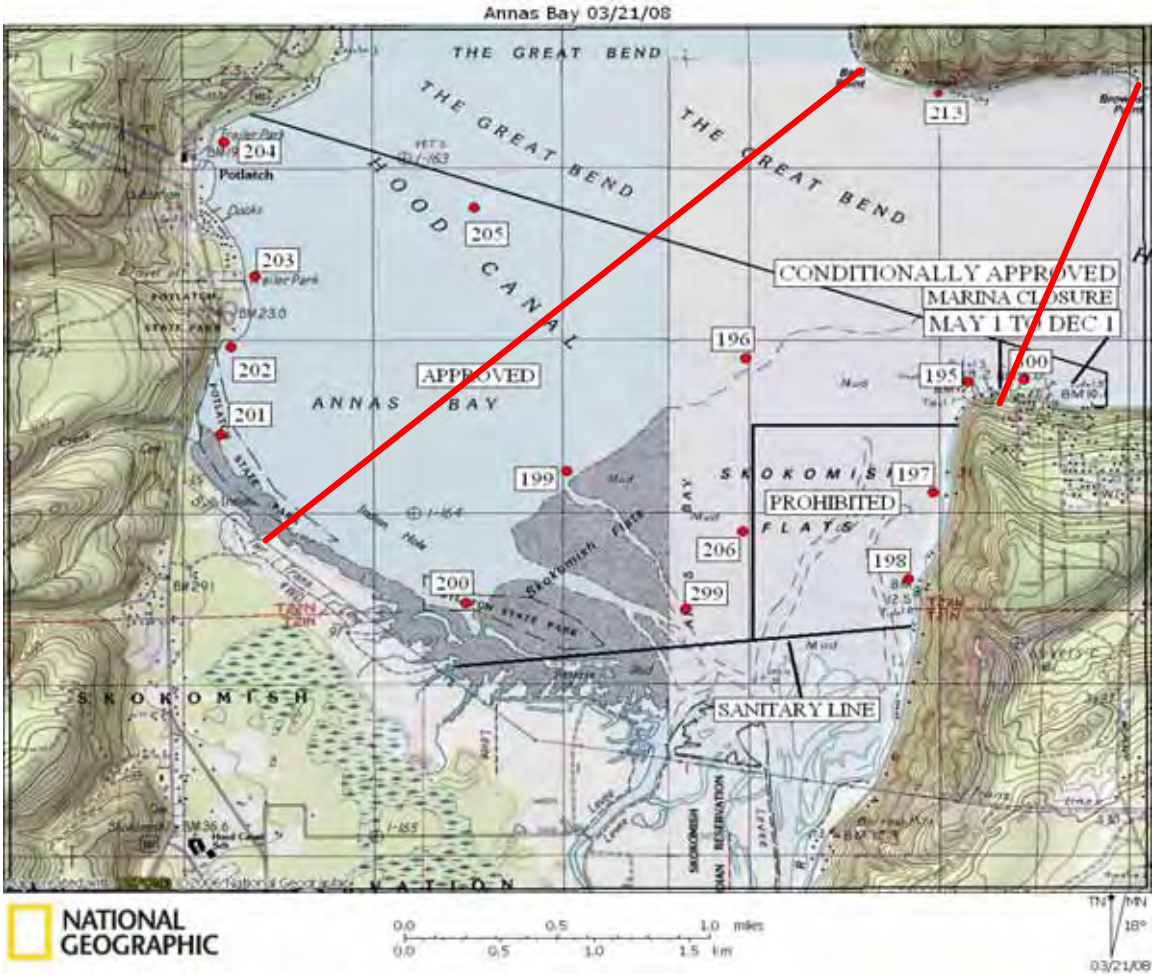
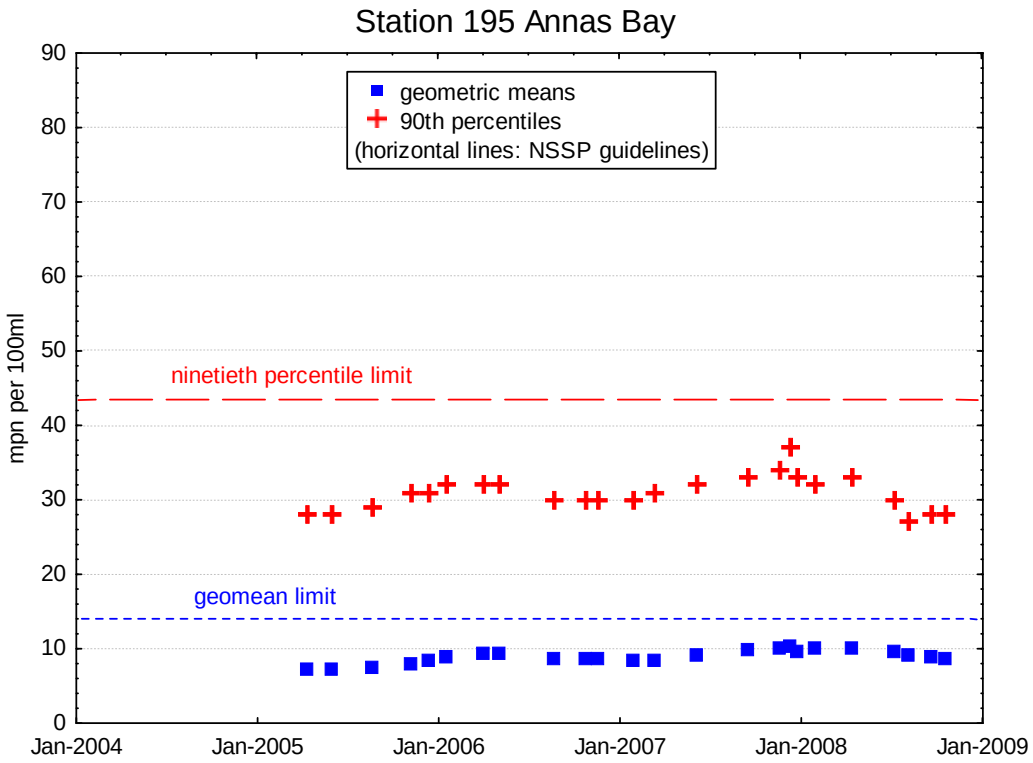
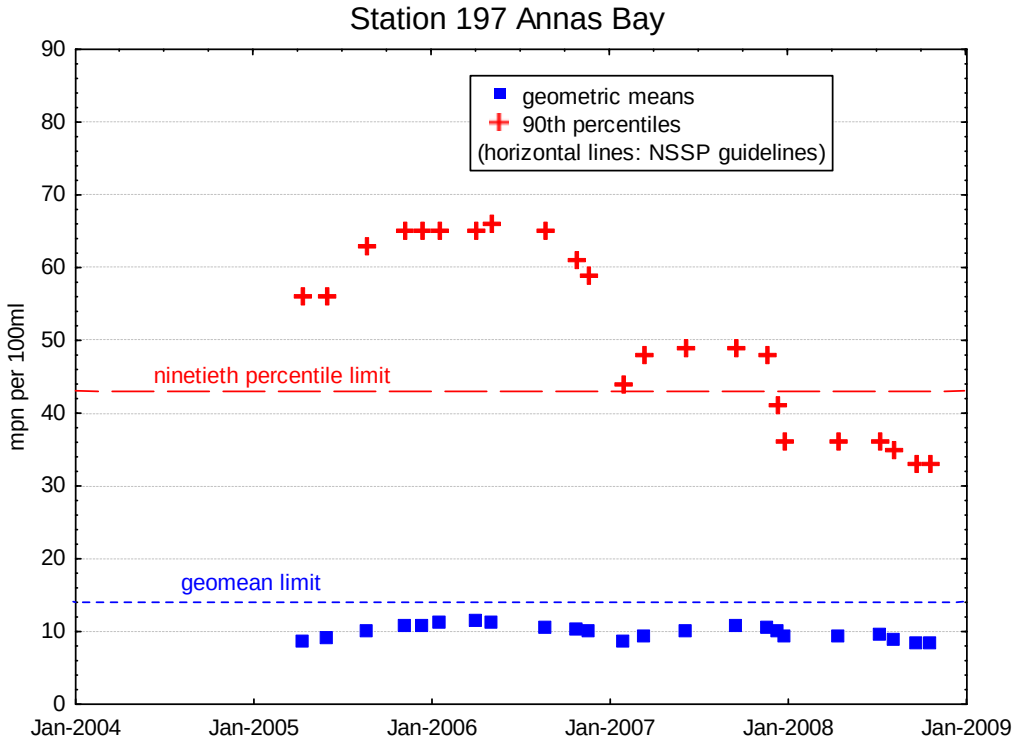
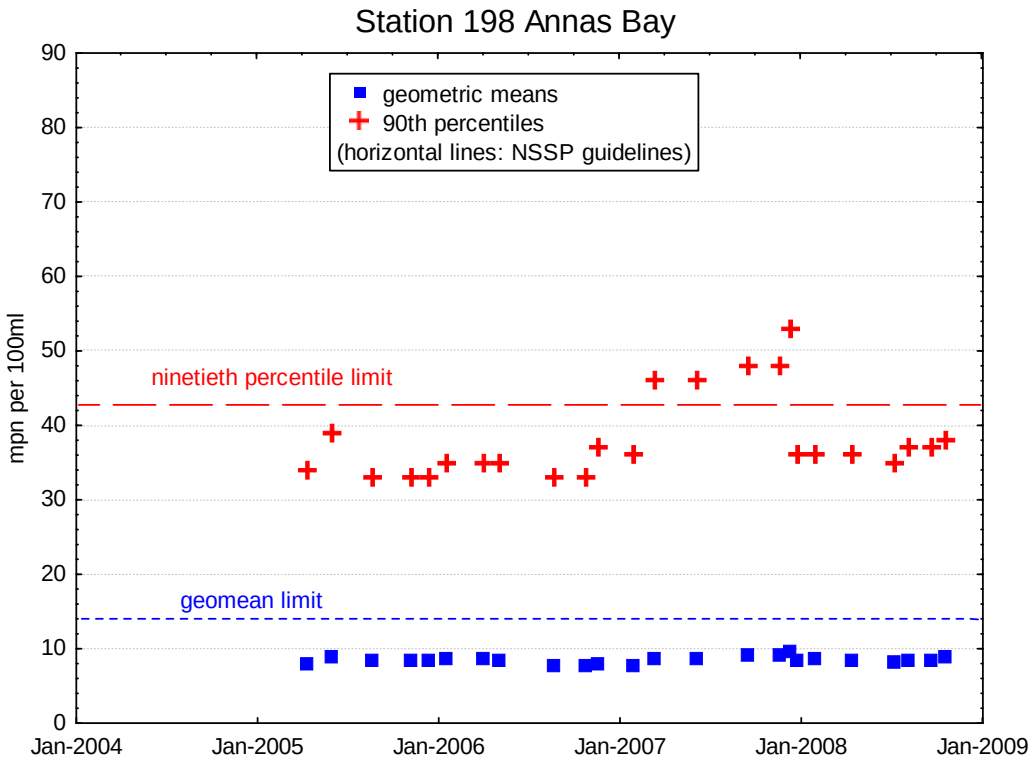


Figure 2. Skokomish River Flood Closure Map




Station 195 Annas Bay
geometric means
90th percentiles
(horizontal lines: NSSP guidelines)
ninetieth percentile limit
geomean limit
mpn per 100ml
0
10
20
30
40
50
60
70
80
90
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009


Station 197 Annas Bay
geometric means
90th percentiles
(horizontal lines: NSSP guidelines)
ninetieth percentile limit
geomean limit
mpn per 100ml
0
10
20
30
40
50
60
70
80
90
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009


Station 198 Annas Bay
geometric means
90th percentiles
(horizontal lines: NSSP guidelines)
ninetieth percentile limit
geomean limit
mpn per 100ml
90
80
70
60
50
40
30
20
10
0
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009