South Fork Palouse River Fecal Coliform Bacteria Water Quality Improvement Plan

Total Maximum Daily Load or TMDL

DEPARTMENT OF ECOLOGY
State of Washington

August 27, 2009

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Tonight's Presentation:

- Overview on Water Quality Improvement Plans (Total Maximum Daily Loads)
- South Fork Palouse River Bacteria TMDL
  - Overview
  - The Study
  - The Strategy
- How to comment on the plan

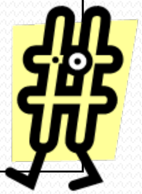
What is a TMDL?

- It’s a CLEAN-UP PLAN

- It’s a PROCESS

- It’s a DOCUMENT

- It’s an AMOUNT OF A POLLUTANT



What is a TMDL?

TMDL = Total **M**aximum **D**aily **L**oad

"the amount of a pollutant that a waterbody can receive and still meet water quality standards"

Allocations

Waste Load Allocations (WLA) - are allocations for **point sources** of pollution

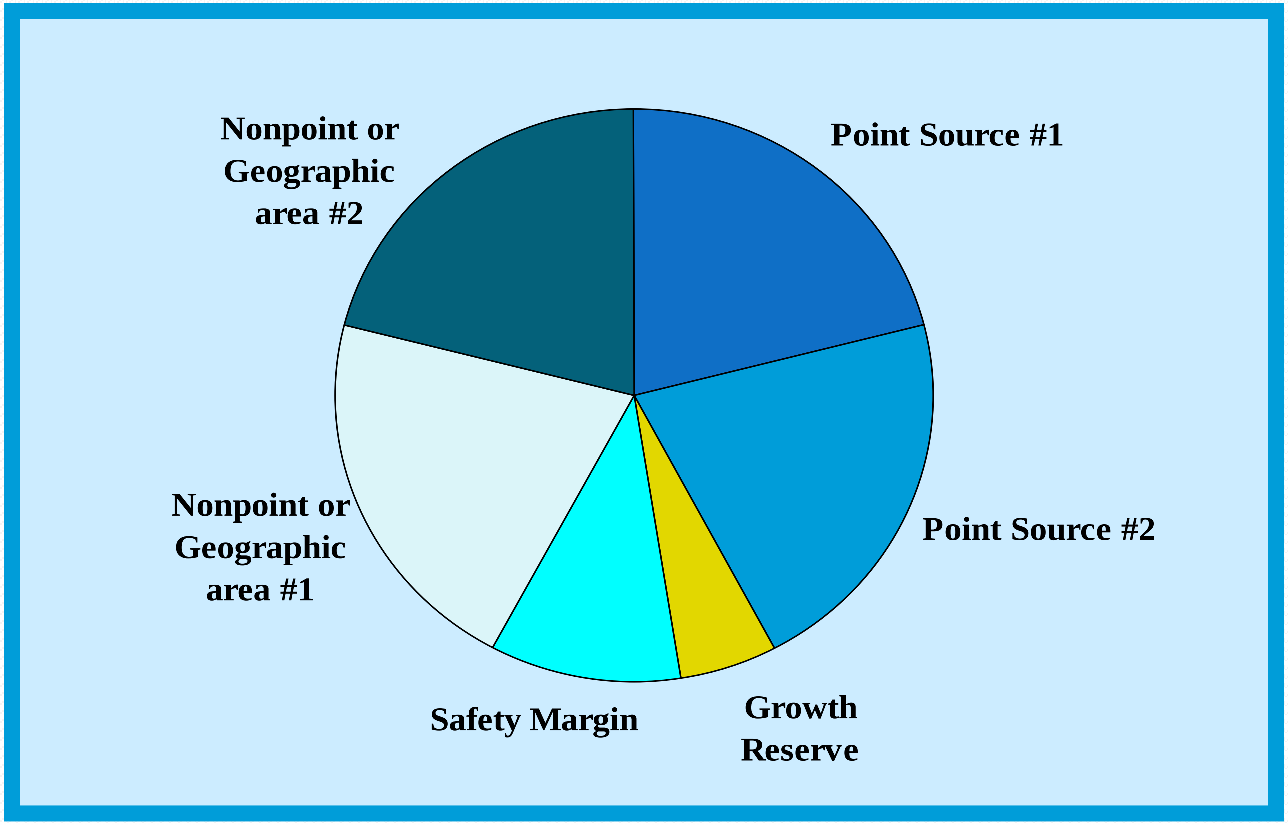
- End of pipe discharge
- Usually from a facility such as a wastewater treatment plant, a factory, or stormwater sewer outfall

Allocations - continued-

- **Load Allocations** (LA) - allocations from **nonpoint sources** of pollution
  - From diverse sources
  - Exact source not easily determined
  - Examples include:

- **Runoff from streets**
- **Fertilizer from lawns and crops**
- **Runoff from pastures**
- **Faulty septic tanks**

The TMDL pie contains the maximum amount of pollutant divided into allocations for each source



Parts of the Process

- **Problem Assessment**
- **Technical Analysis and Allocation**
- **Implementation Strategy**
- **Implementation Plan**
- **Monitor effectiveness**

Why do TMDLs?

1) To protect water

2) It’s the law

3) Lawsuit compliance

The Law

- The Clean Water Act (CWA) requires states to set water quality standards for surface waters to protect public and environmental health.

- These standards protect water for beneficial uses such as:
  - Drinking Water
  - Recreation
  - Fishing
  - Aquatic Habitat
  - Irrigation
  - Livestock

The Clean Water Act

- Streams and lakes not providing these beneficial uses are placed on a list of impaired waterbodies
  - The 303(d) list

- Waterbodies on the 303(d) list must have a TMDL developed for them to correct the impairment

Lawsuit Compliance

- **1990's:** several citizen lawsuits around the US claimed that EPA and states were not implementing section 303(d) of the Clean Water Act in a timely manner.
- **1998:** In January 1998, Ecology, EPA, and two environmental advocate groups agreed to a clean up schedule directing how Washington state will improve the health of nearly 700 water segments by the year 2013.
- This agreement was outlined in a Memorandum of Agreement (MOA).

How the process works?

- South Fork Palouse River and some of its tributaries failed to meet the state water quality standards
- Placed on a list of impaired water bodies (the 303(d) list) in 1996, 1998, 2004, & 2008
- The water body was prioritized and then scheduled for a TMDL

The South Fork Palouse River Watershed Bacteria TMDL

- Began TMDL in 2006
  - Public meeting to announce effort in May 2006
  - Study May 2006 – May 2007
  - Advisory group formed June 2008
- Addresses fecal coliform bacteria
- Includes tributaries
- Also listed for temperature, dissolved oxygen, and pH

Fecal Coliform Bacteria:

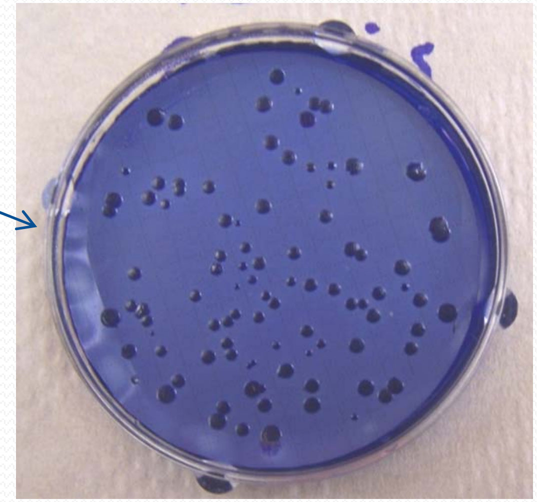
- Family of bacteria found in the intestines of warm-blooded animals including humans
- Indicator that sewage or animal wastes are entering streams
- Includes E. coli
- As levels increase risk of getting from sick from playing and swimming in the water increases

Water Quality Standards:

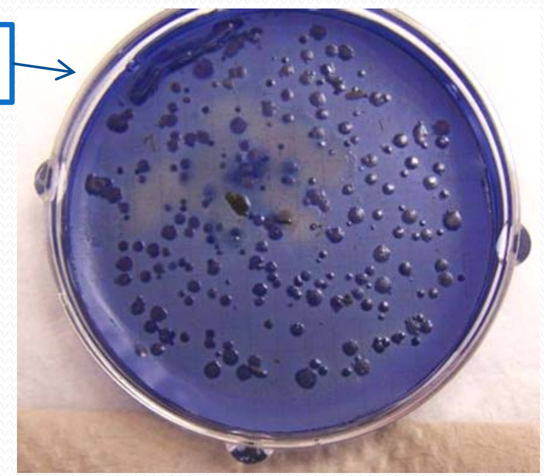
- Geometric mean must not exceed 100 colony forming units (cfu) per 100 mL of water
- Not more than 10% of the samples exceed 200 cfu per 100 mL
- At this level risk is 7 out of 1000 people recreating in the water could experience infection or illness.

100 mL

95 colonies



215 colonies



Parts of the Process

- **Problem Assessment**
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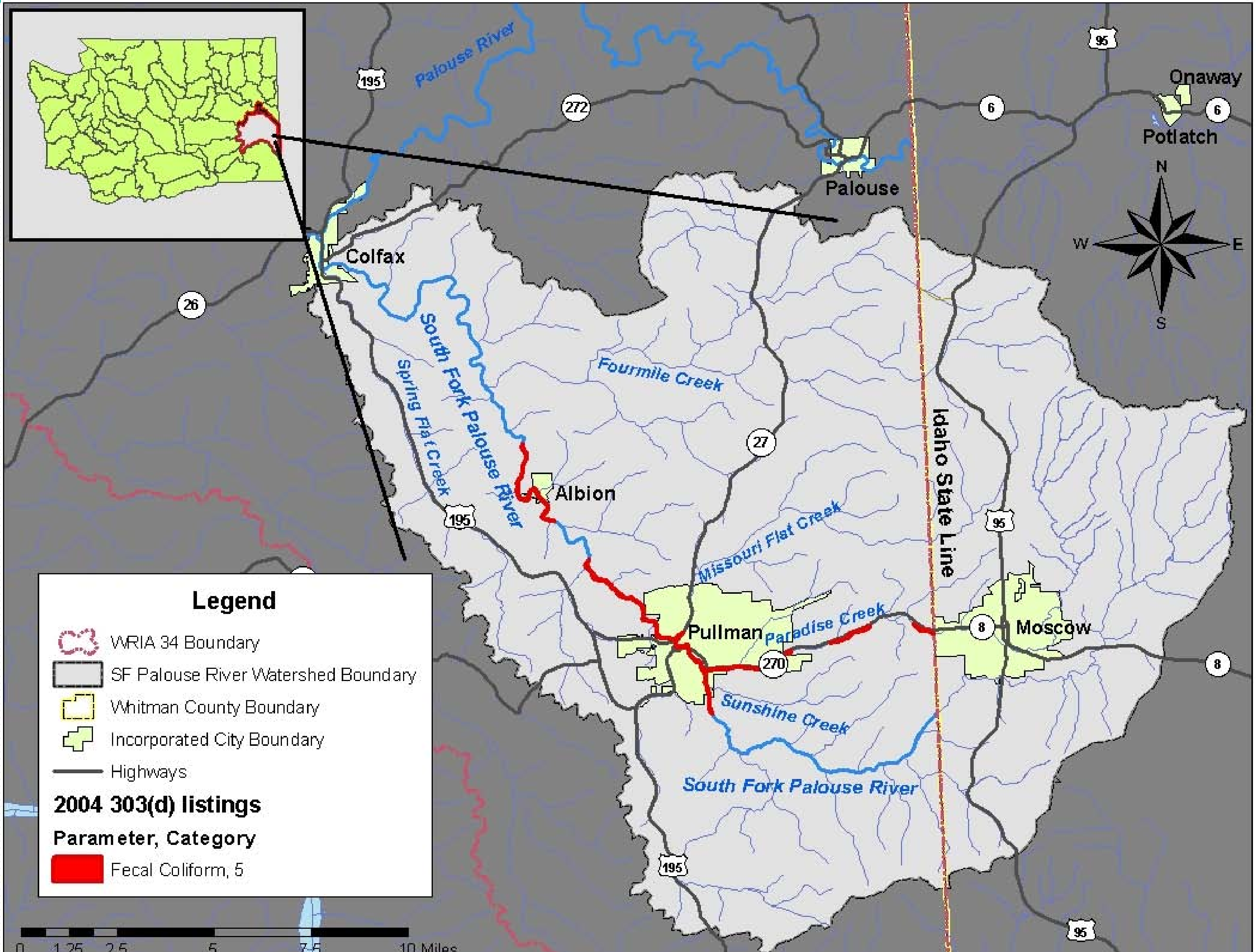
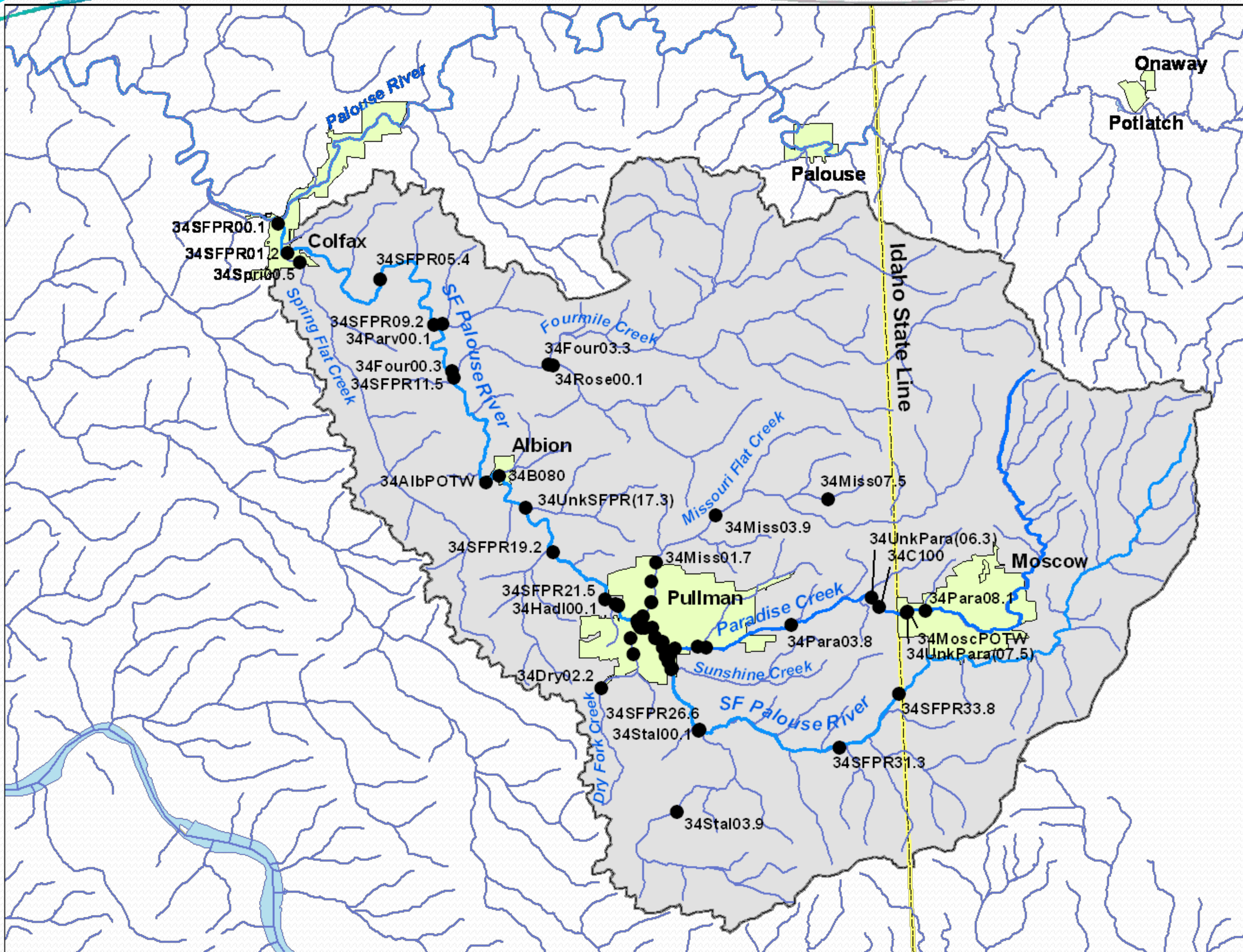
S.F. Palouse River Fecal Coliform Bacteria 303(d) Listings



S.F. Palouse River Fecal Coliform Bacteria Study Sites



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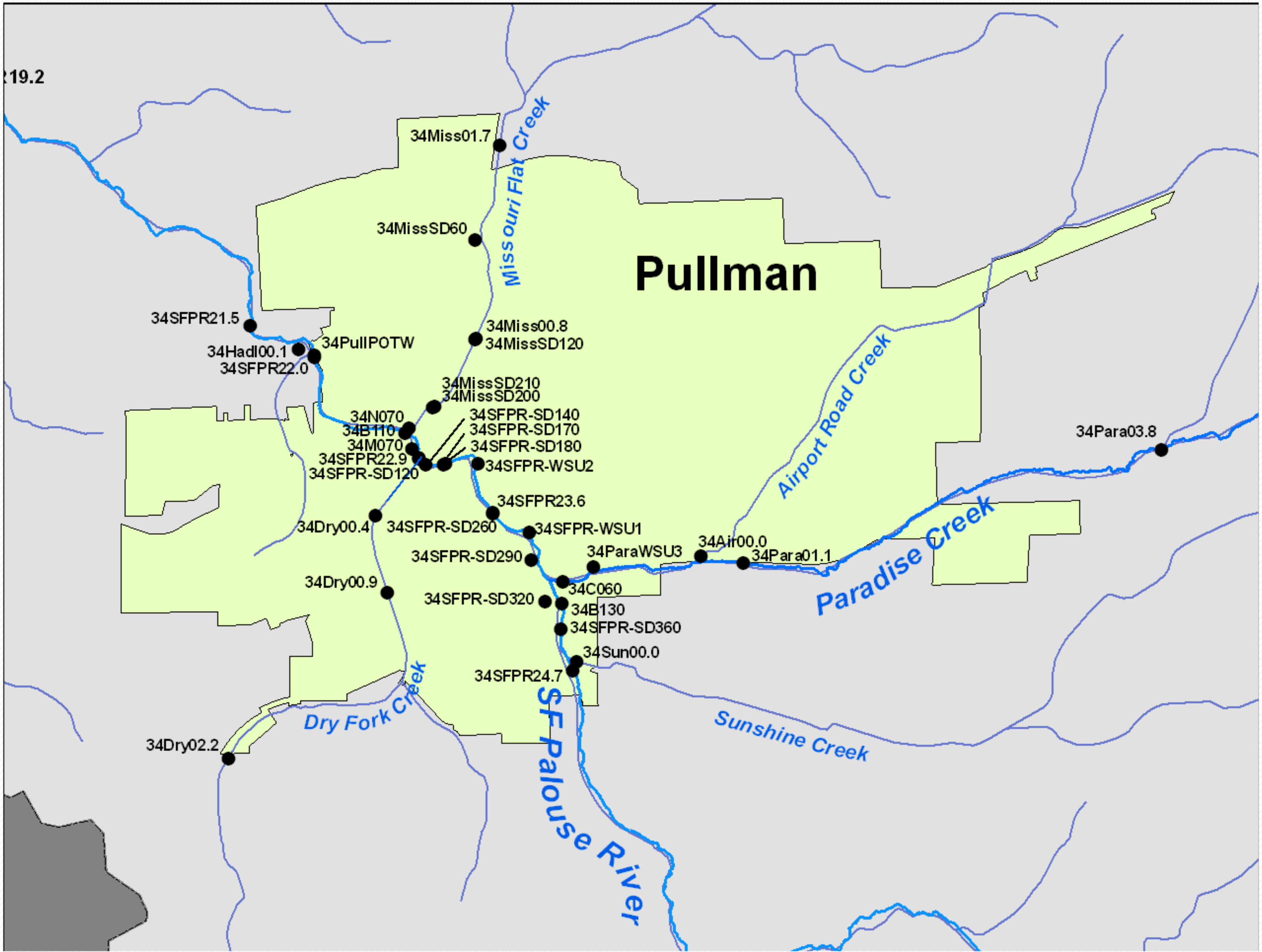


Fecal Coliform Bacteria TMDL Study

Goals:

- Identify fecal coliform bacteria concentrations and loads from tributaries, point sources under various seasonal conditions, including stormwater events.

- Identify relative loading contributions of fecal coliform so clean-up activities can focus on the largest sources.

- Establish fecal coliform load allocations (for nonpoint sources) and wasteload allocations (for point sources) to meet water quality standards.

Concentration versus Load

- Concentration is the term used to describe just how much of a substance is contained in a water sample. Concentration essentially means-just how strong is it? Concentration is usually what determines the impact that a substance in water will have on an organism, like fish, plants, animals, or humans.

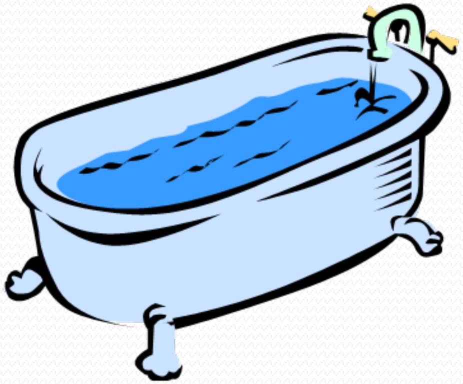
- Load is the total amount of the substance in the river, in this case, for a whole day.

1 teaspoon ≈ 65 million bacteria cells

(13 million bacteria cells in 1 gram human feces) (5 milliliters in 1 teaspoon)

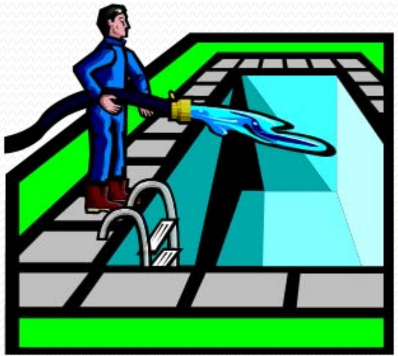
Cup

≅ 26 million cfu / 100 mL



Bath tub

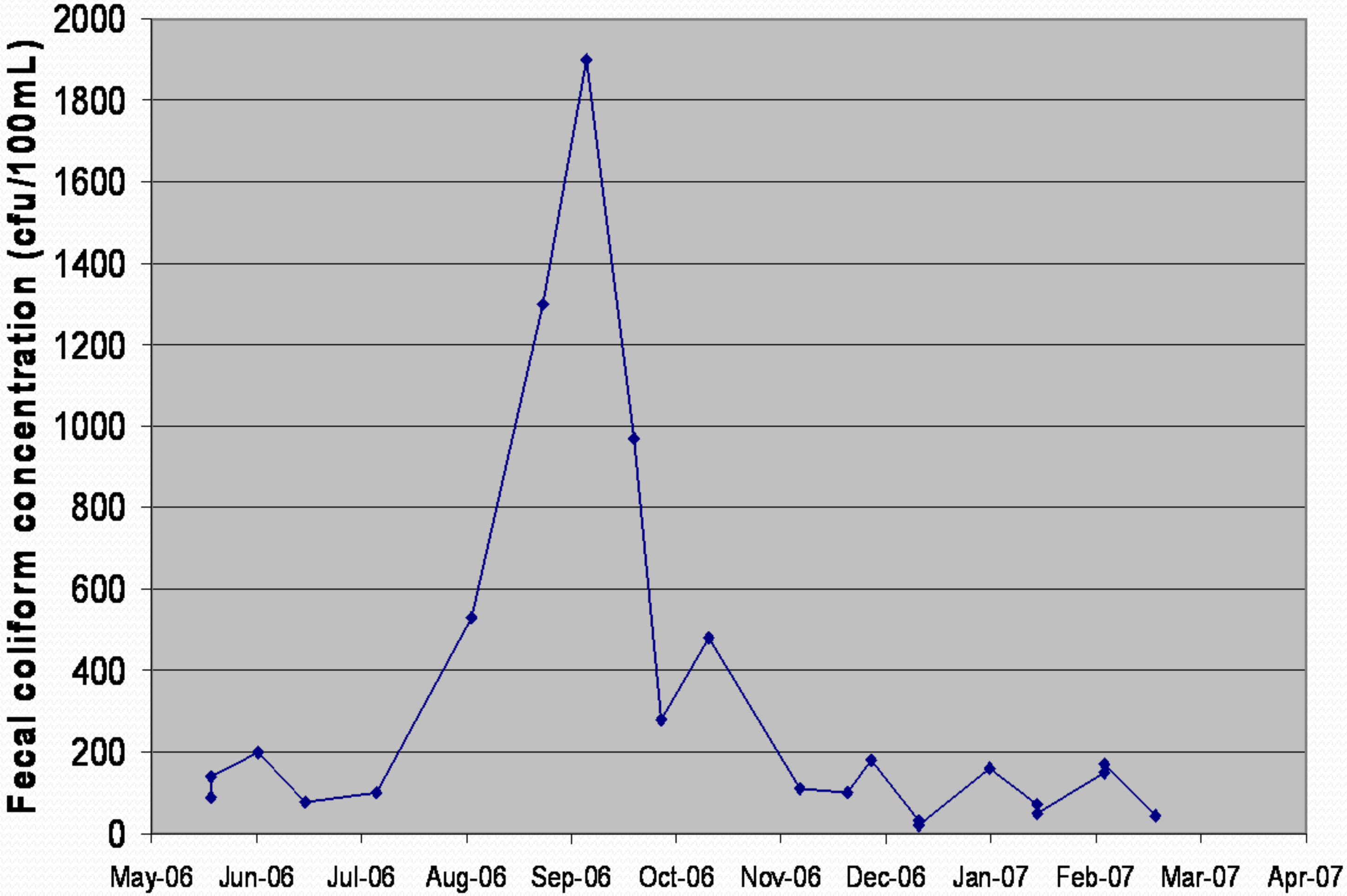
≅ 40,000 cfu / 100 mL

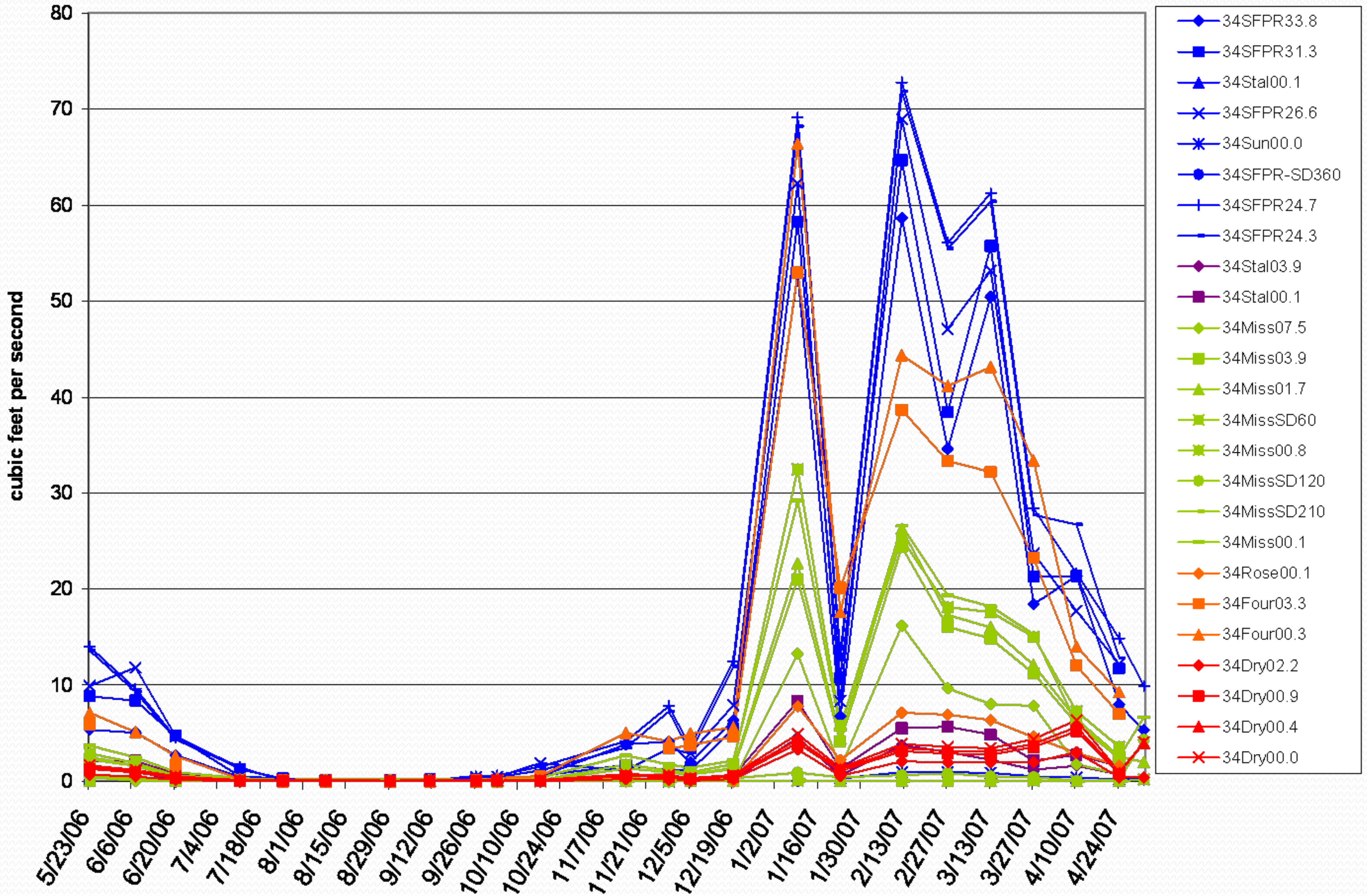


Swimming pool

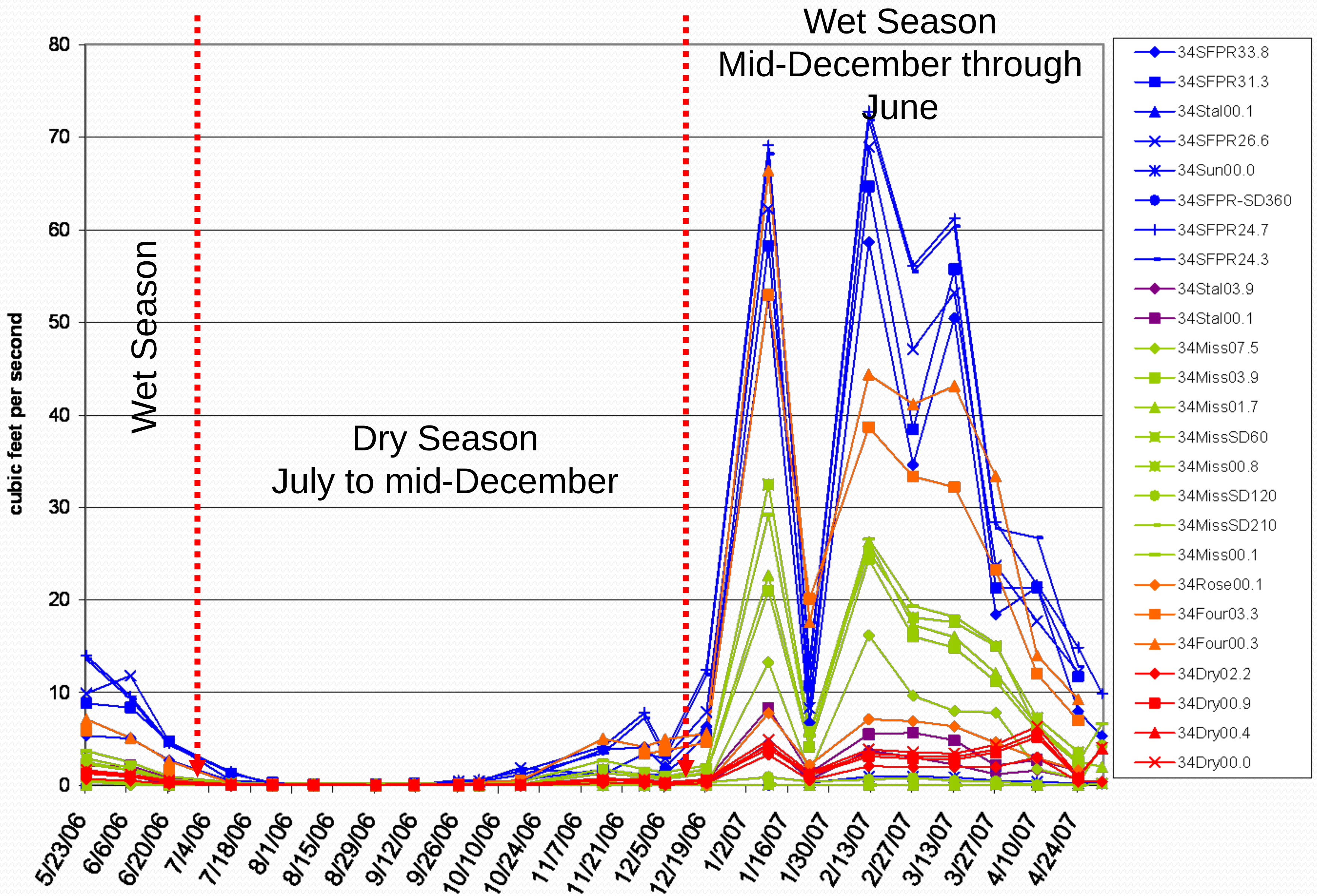
≅ 200 cfu / 100 mL

Fecal coliform concentrations at the WA/ID stateline on the SF Palouse River



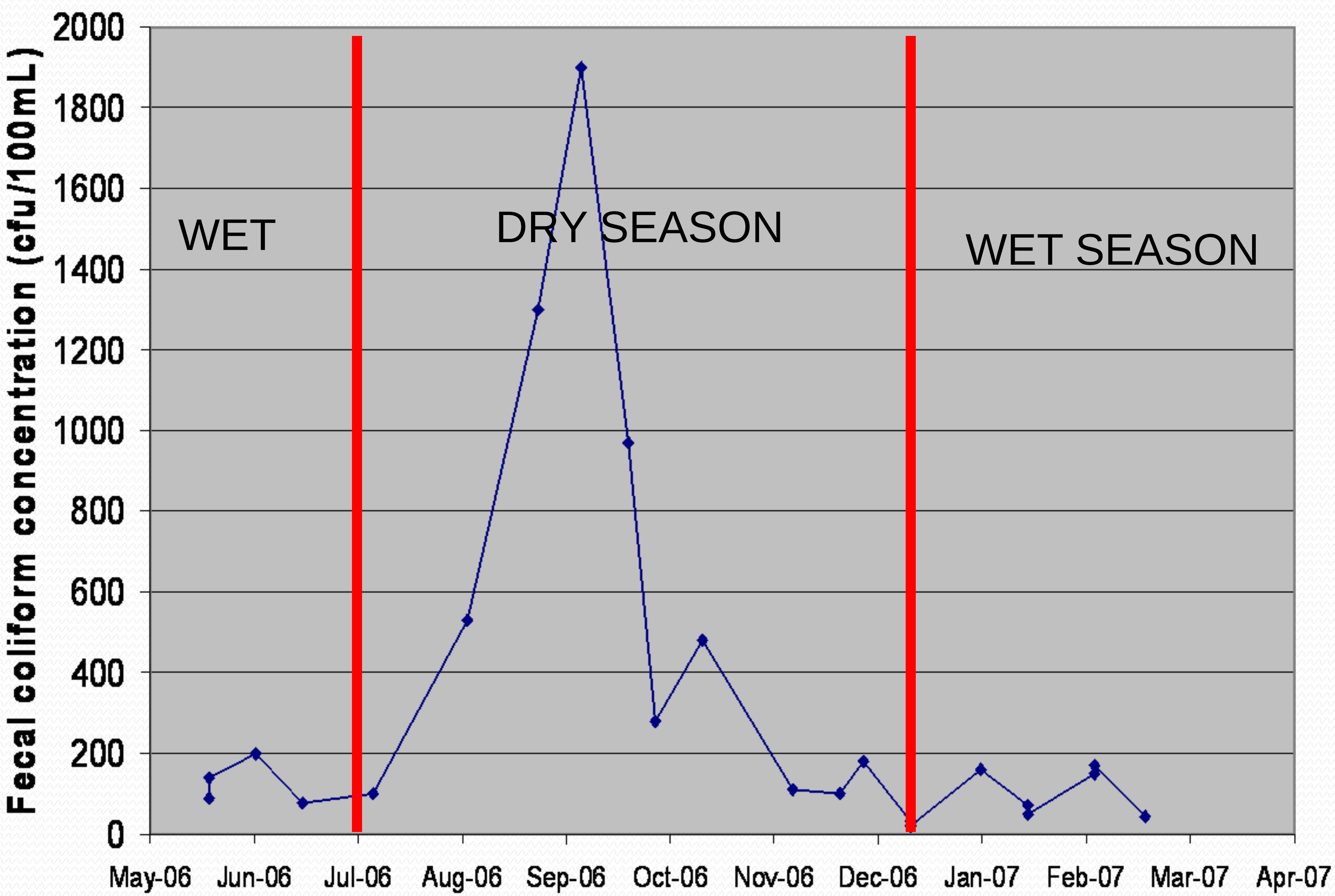


cubic feet per second
0
10
20
30
40
50
60
70
80
5/23/06
6/6/06
6/20/06
7/4/06
7/18/06
8/1/06
8/15/06
8/29/06
9/12/06
9/26/06
10/10/06
10/24/06
11/7/06
11/21/06
12/5/06
12/19/06
1/2/07
1/16/07
1/30/07
2/13/07
2/27/07
3/13/07
3/27/07
4/10/07
4/24/07
34SFPR33.8
34SFPR31.3
34Stal00.1
34SFPR26.6
34Sun00.0
34SFPR-SD360
34SFPR24.7
34SFPR24.3
34Stal03.9
34Stal00.1
34Miss07.5
34Miss03.9
34Miss01.7
34MissSD60
34Miss00.8
34MissSD120
34MissSD210
34Miss00.1
34Rose00.1
34Four03.3
34Four00.3
34Dry02.2
34Dry00.9
34Dry00.4
34Dry00.0



Wet Season
Mid-December through June
Wet Season
Dry Season
July to mid-December
cubic feet per second
0
10
20
30
40
50
60
70
80
5/23/06
6/6/06
6/20/06
7/4/06
7/18/06
8/1/06
8/15/06
8/29/06
9/12/06
9/26/06
10/10/06
10/24/06
11/7/06
11/21/06
12/5/06
12/19/06
1/2/07
1/16/07
1/30/07
2/13/07
2/27/07
3/13/07
3/27/07
4/10/07
4/24/07
34SFPR33.8
34SFPR31.3
34Stal00.1
34SFPR26.6
34Sun00.0
34SFPR-SD360
34SFPR24.7
34SFPR24.3
34Stal03.9
34Stal00.1
34Miss07.5
34Miss03.9
34Miss01.7
34MissSD60
34Miss00.8
34MissSD120
34MissSD210
34Miss00.1
34Rose00.1
34Four03.3
34Four00.3
34Dry02.2
34Dry00.9
34Dry00.4
34Dry00.0

Fecal coliform concentrations at the WA/ID stateline on the SF Palouse River



Rain can result in runoff

Seasonal pollution (potential runoff sources and non-runoff sources)

Runoff sources (wet season):

- Urban runoff/Stormwater (domestic pet, bird and other animal waste; illegal dumping; failing septic)
- Rural runoff (failing septic; farm animal waste; wildlife)
- Forest runoff (wildlife; recreation)

Non-runoff sources (year round):

- Point sources (wastewater not disinfected properly)
- Direct deposition by wildlife and other animals
- Illegal dumping or pipes and ditches to surface water
- Failing septic systems (overland or through ground or straight pipe)

Potential Bacteria Sources (runoff sources)

Urban runoff (pet waste)

Wildlife

Stormwater runoff

Excess nitrogen from animal waste can reach streams with runoff.
USDA Soil and Conservation Service

Farm runoff

Cattle-trodden and grazed streambanks offer little protection from runoff and associated pollutants.
USDA Soil and Conservation Service

Farm animal waste runoff

Failing septic runoff

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Non-runoff sources (year round):

- Point sources (wastewater not disinfected properly)
- Direct deposition by wildlife and other animals
- Illegal dumping or pipes and ditches to surface water
- Failing septic systems (overland or through ground or straight pipe)

Potential Bacteria Sources (non-runoff sources)

Point sources

Direct deposit

Illegal pipes

Failing septic system

Over watering

Fecal Coliform Bacteria TMDL Study

Goals:

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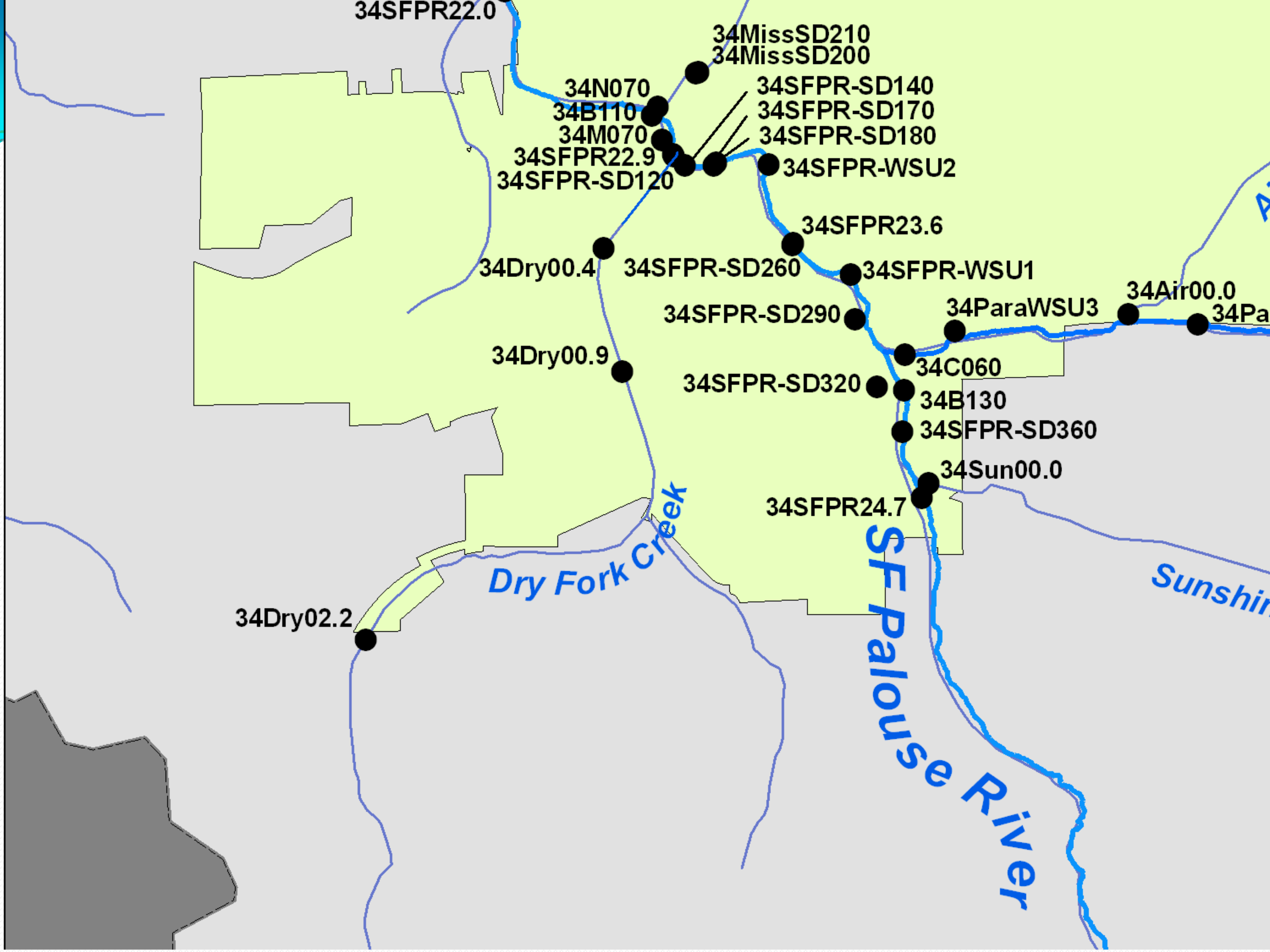
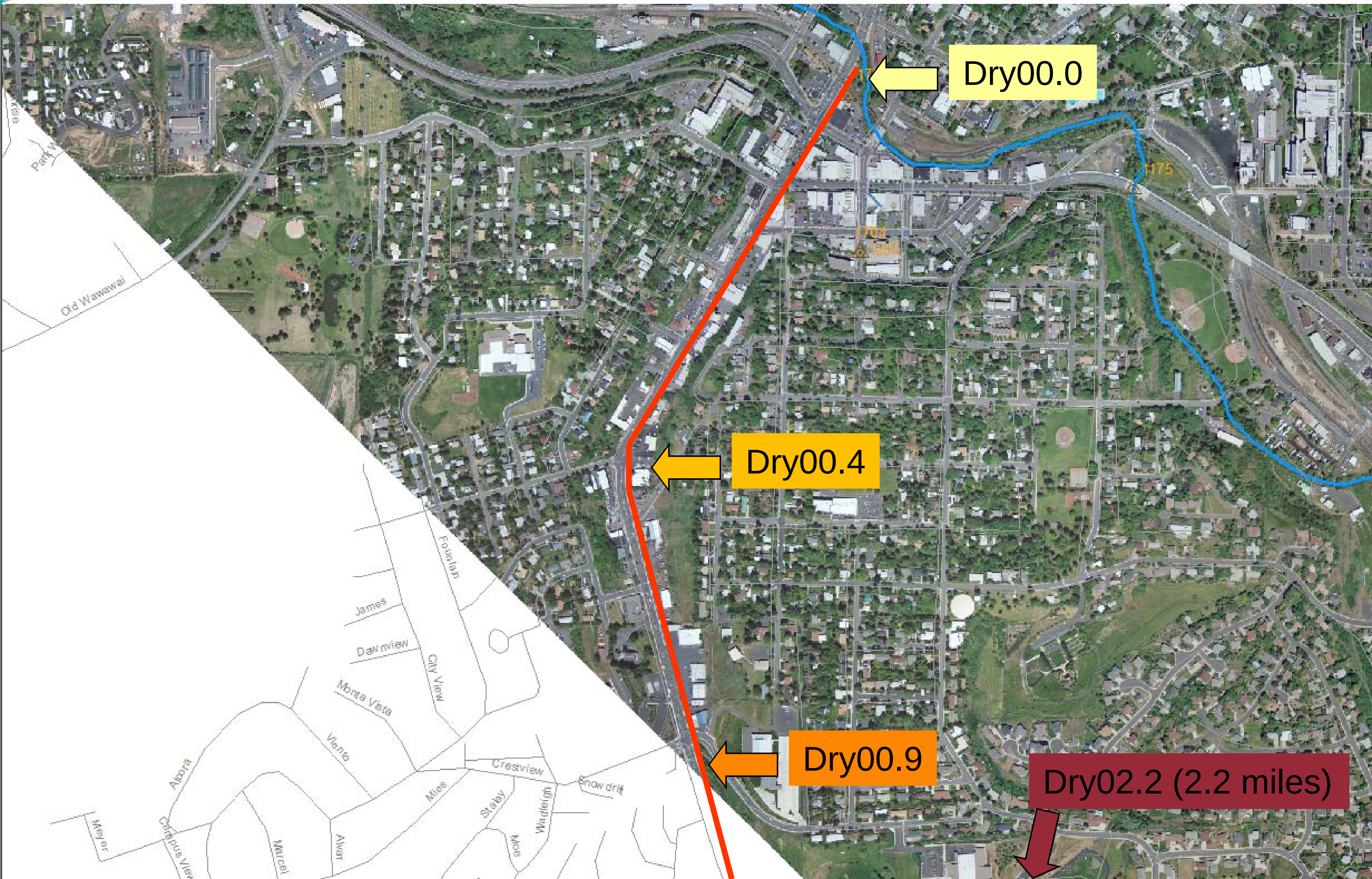
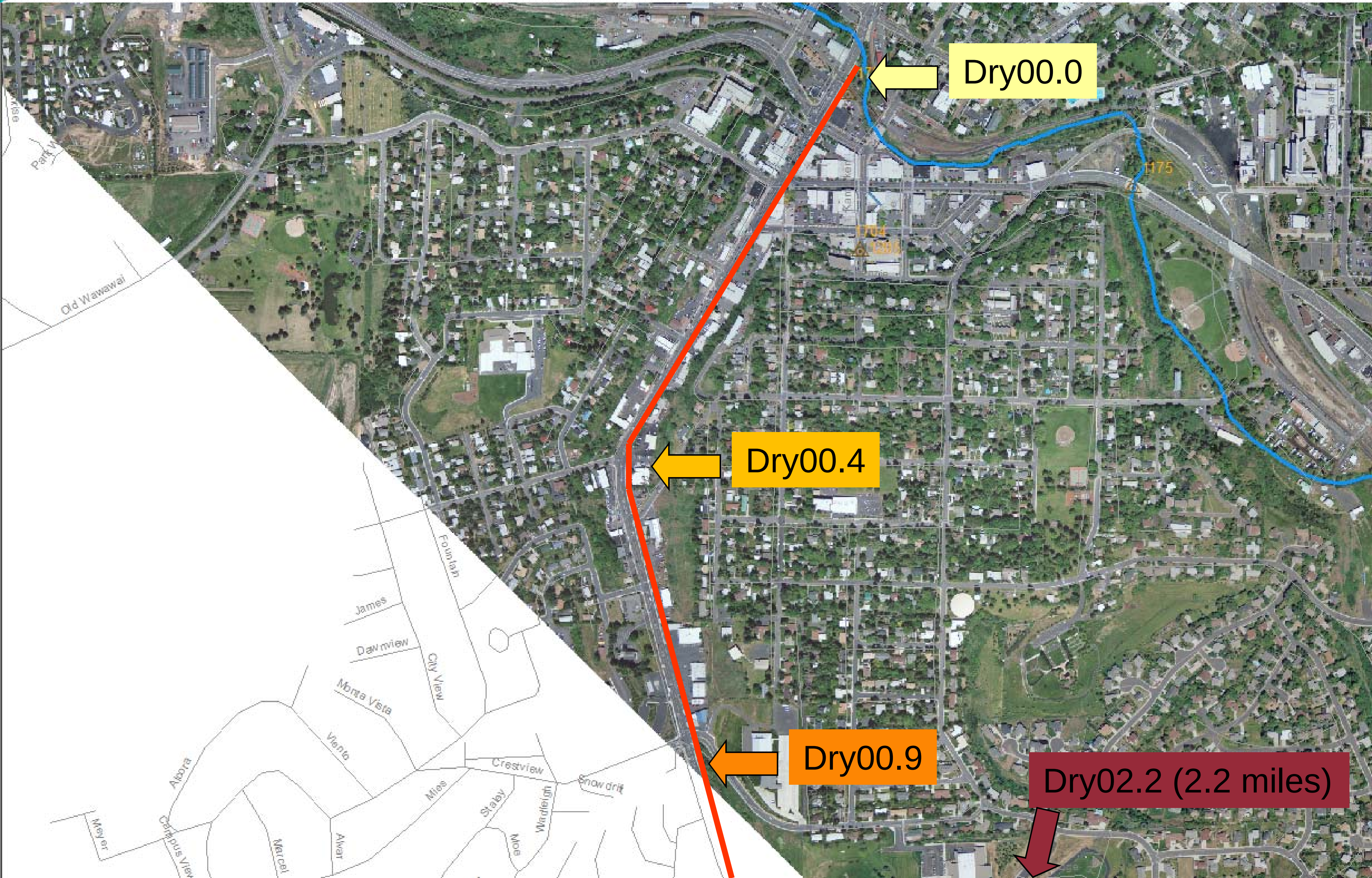

34SFPR22.0
34MissSD210
34MissSD200
34N070
34B110
34M070
34SFPR22.9
34SFPR-SD120
34SFPR-SD140
34SFPR-SD170
34SFPR-SD180
34SFPR-WSU2
34SFPR23.6
34Dry00.4
34SFPR-SD260
34SFPR-WSU1
34Air00.0
34ParaWSU3
34SFPR-SD290
34C060
34Dry00.9
34SFPR-SD320
34B130
34SFPR-SD360
34Sun00.0
34SFPR24.7
Dry Fork Creek
SF Palouse River
34Dry02.2

Map of Pullman – Dry Fork Creek (dry season loads)

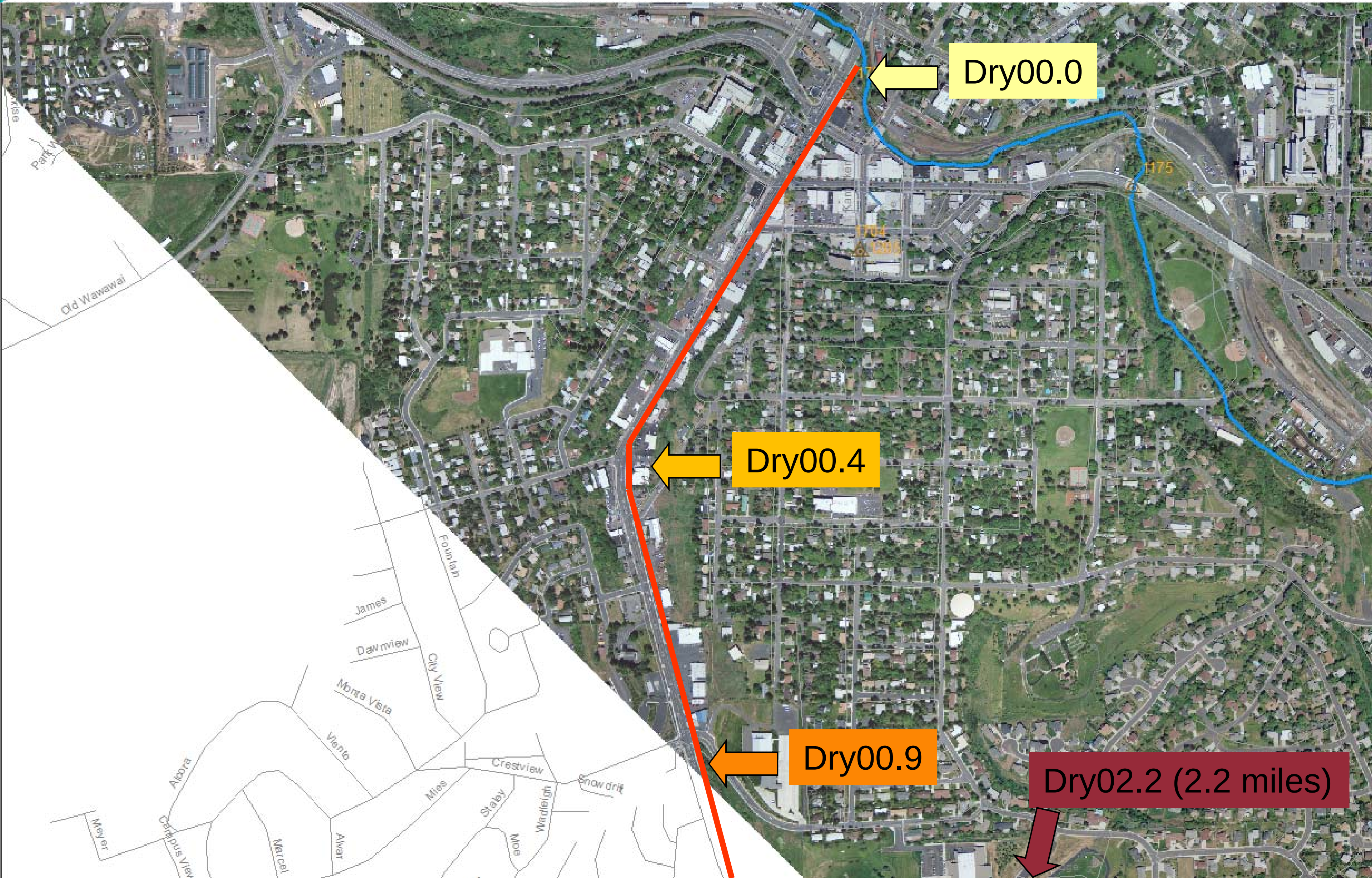


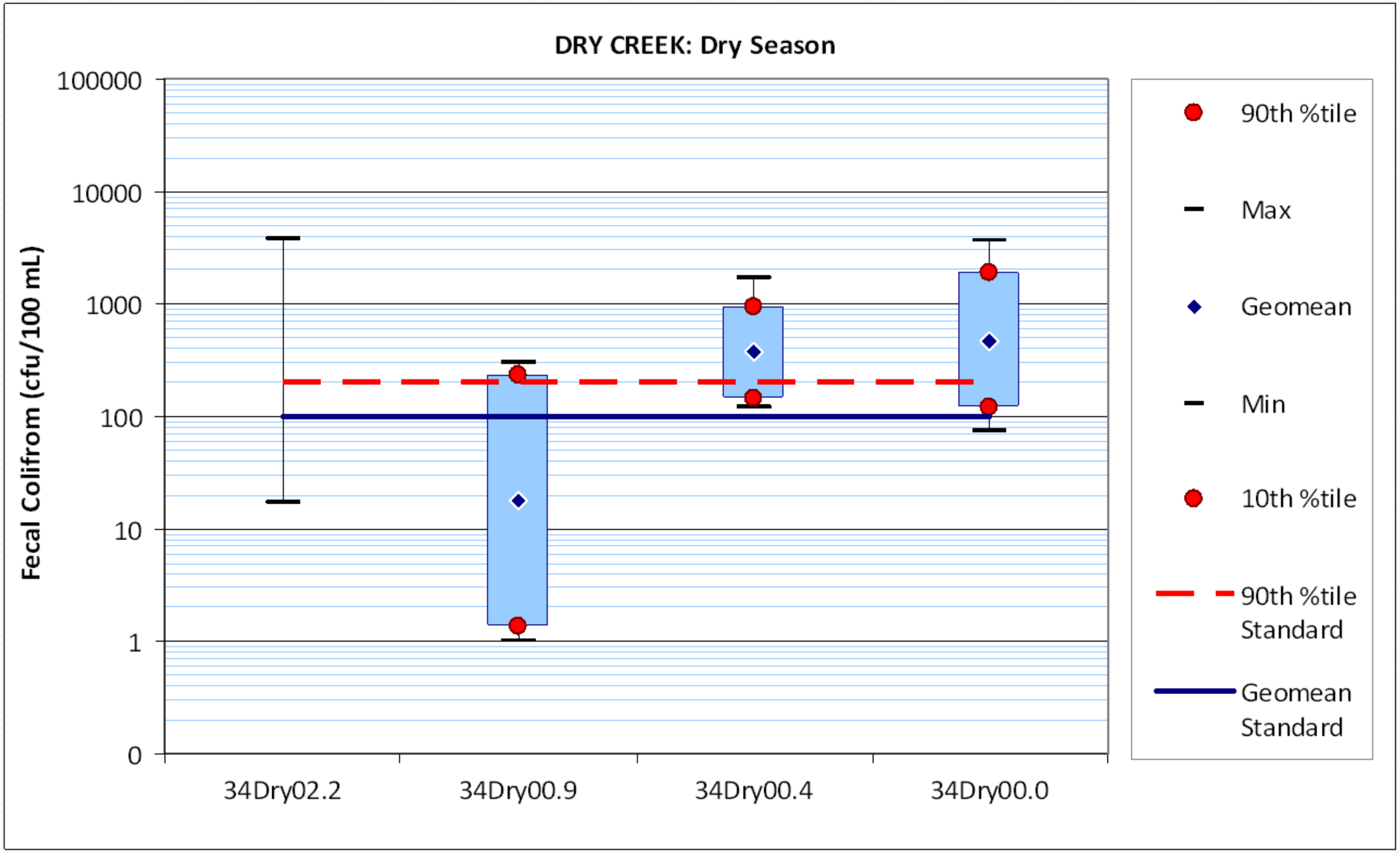
Map of Pullman – Dry Fork Creek (dry season loads)



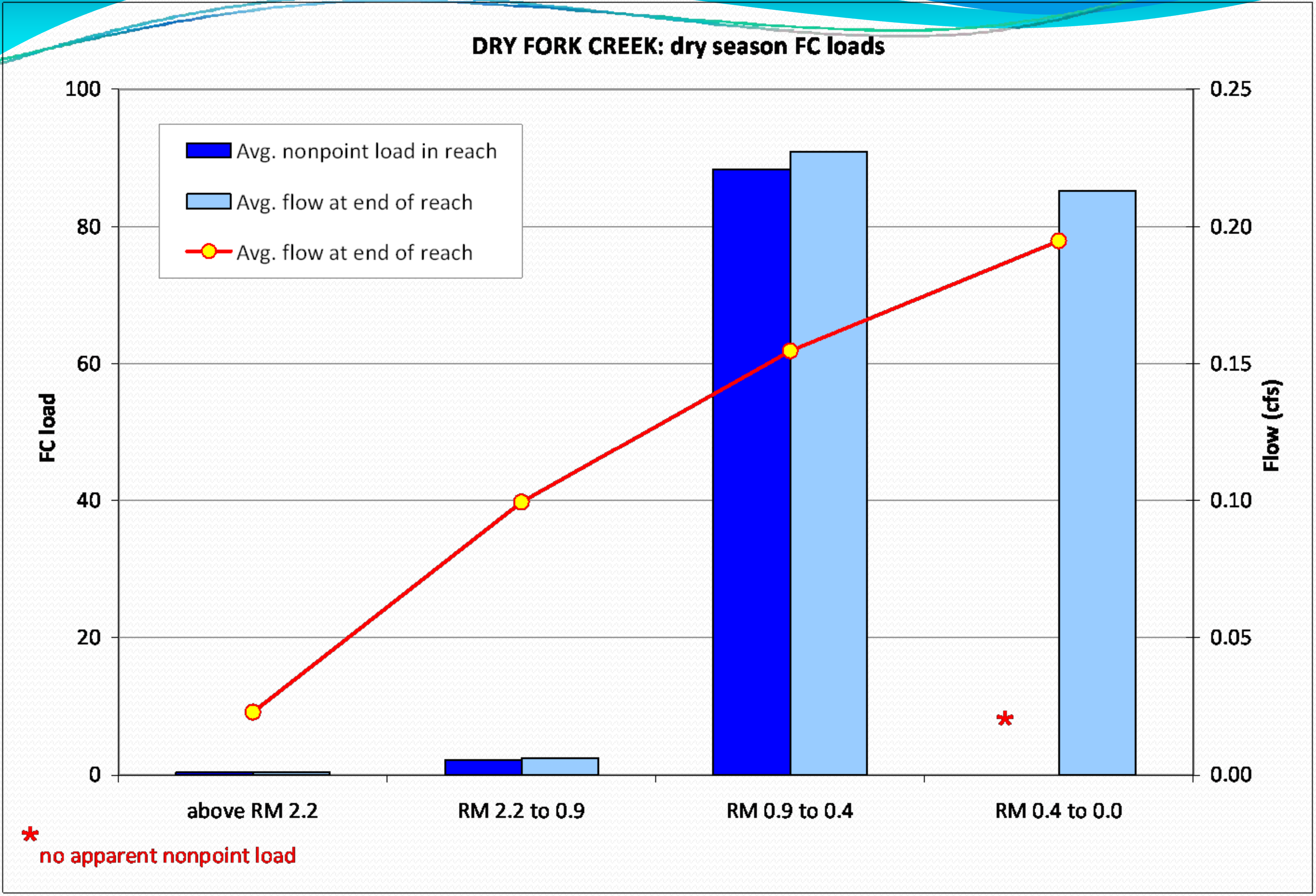

TEXACO
SELF

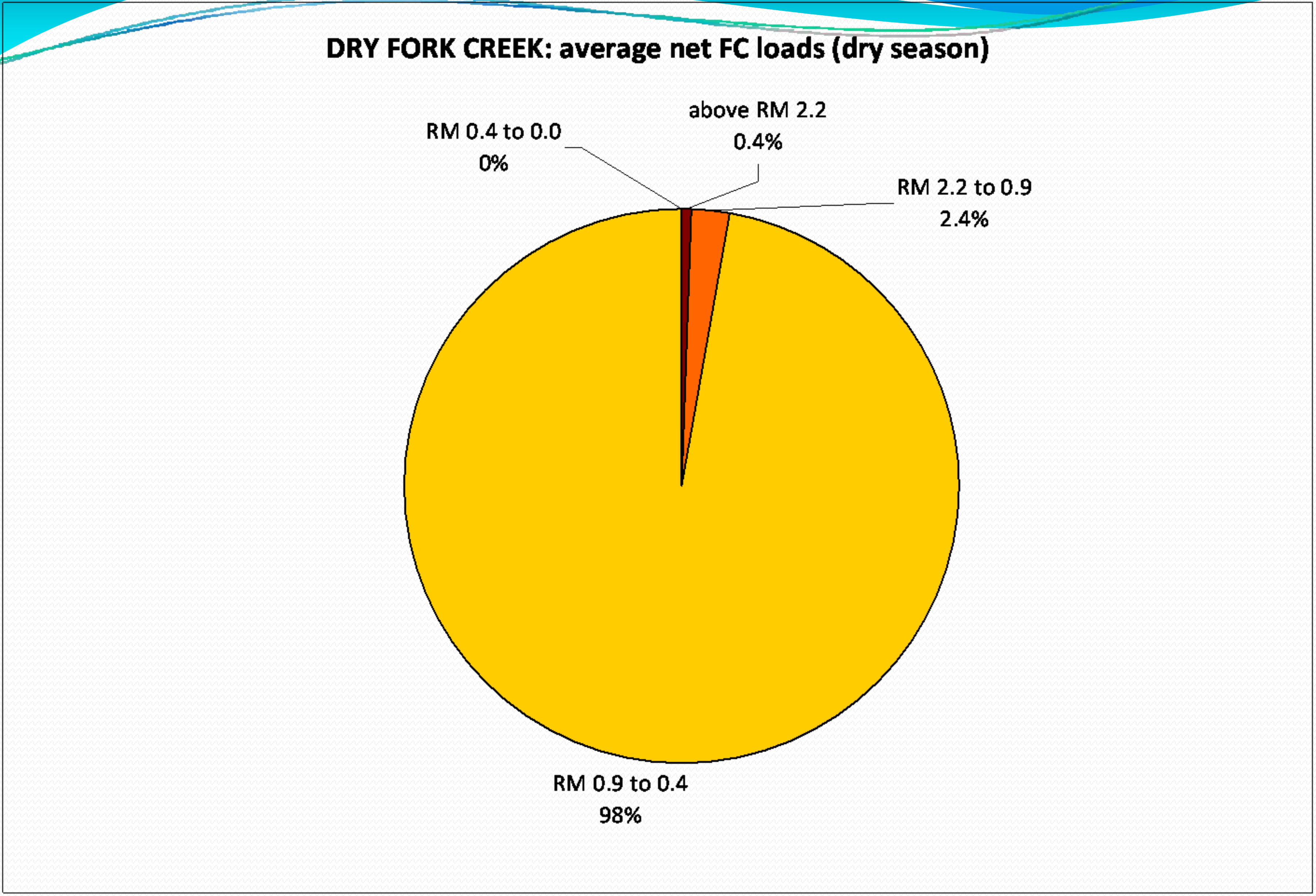
Map of Pullman – Dry Fork Creek (dry season loads)



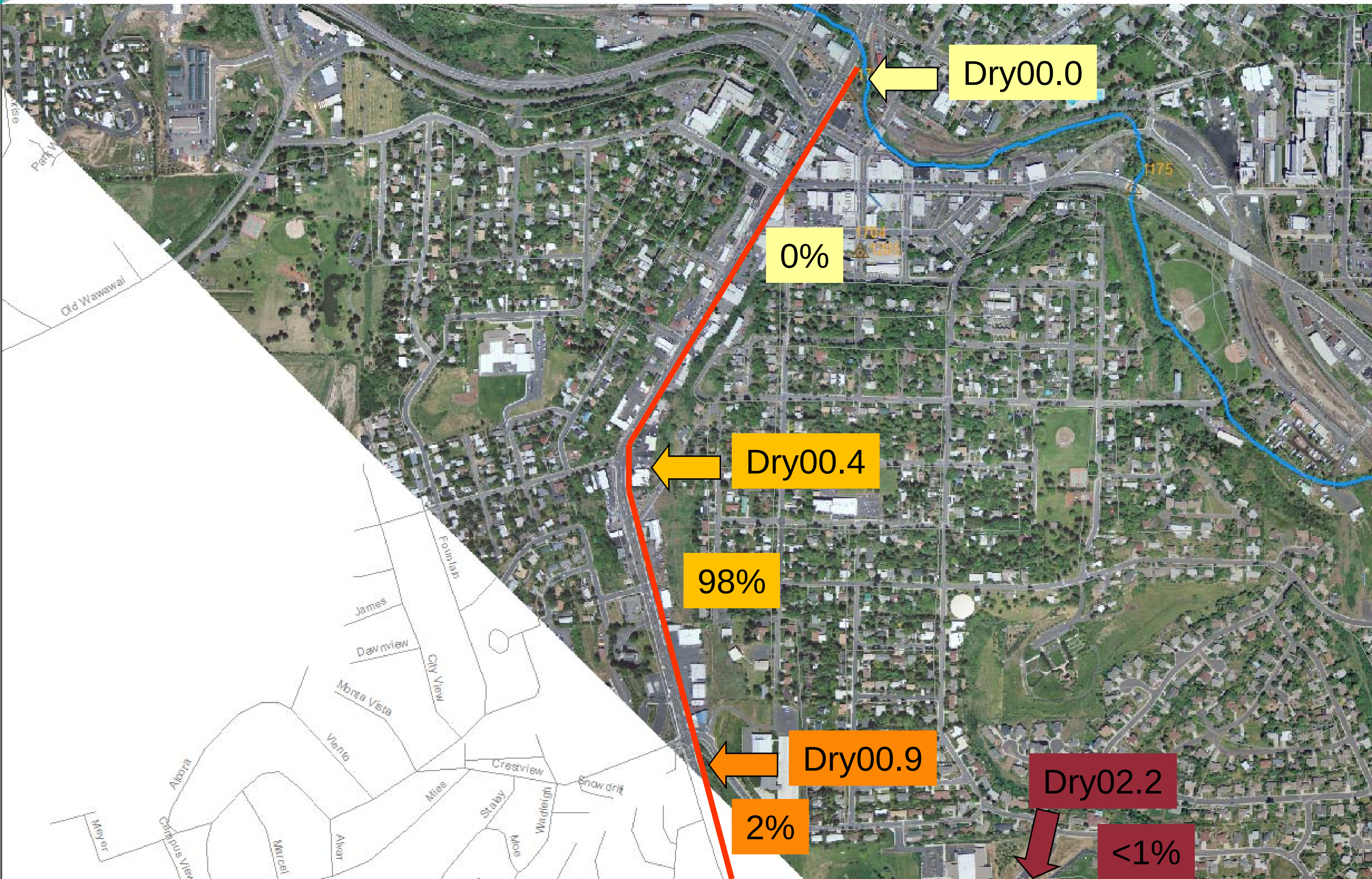


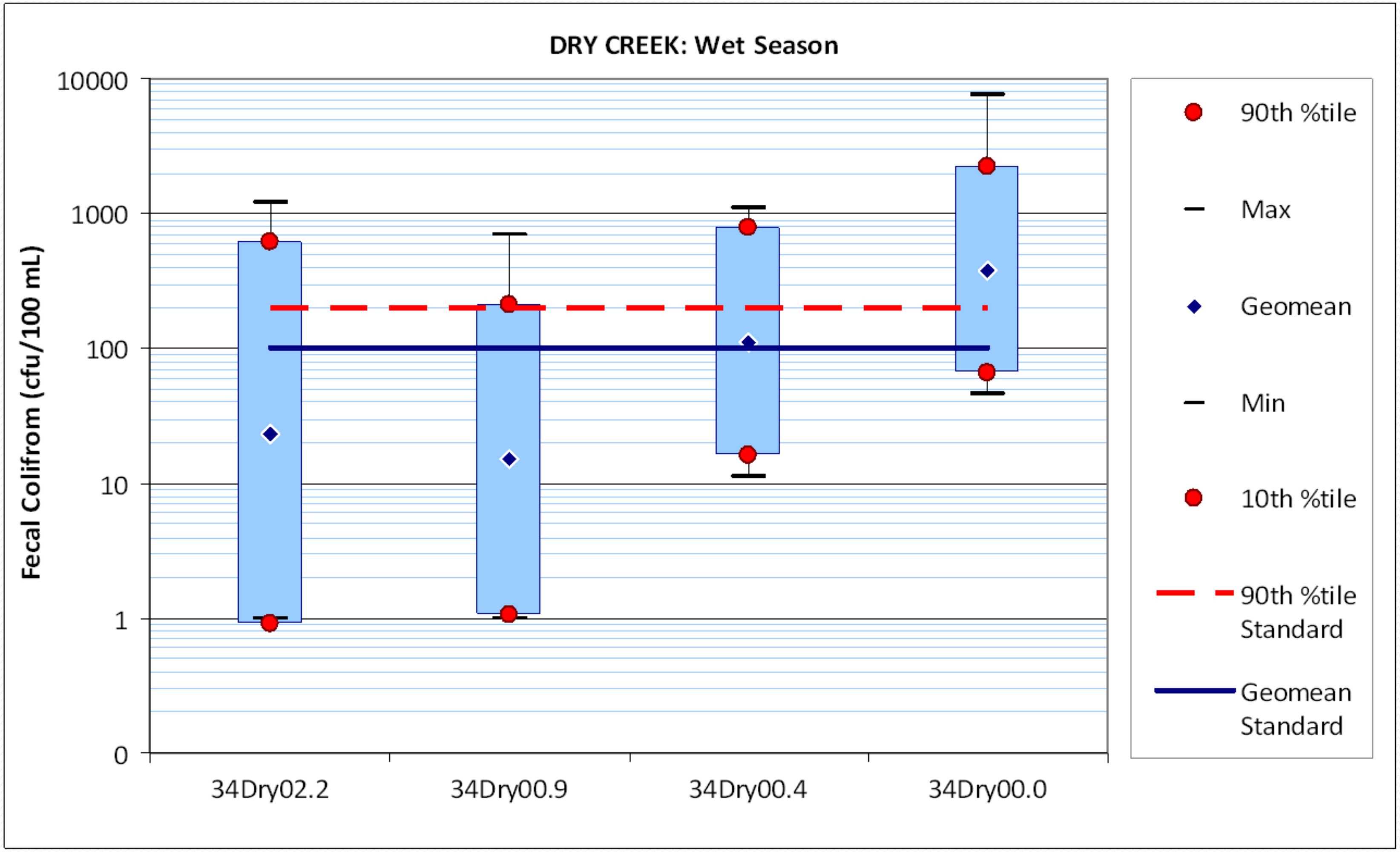
DRY CREEK: Dry Season
100000
10000
1000
100
10
1
0
Fecal Colifrom (cfu/100 mL)
34Dry02.2
34Dry00.9
34Dry00.4
34Dry00.0
90th %tile
Max
Geomean
Min
10th %tile
90th %tile Standard
Geomean Standard

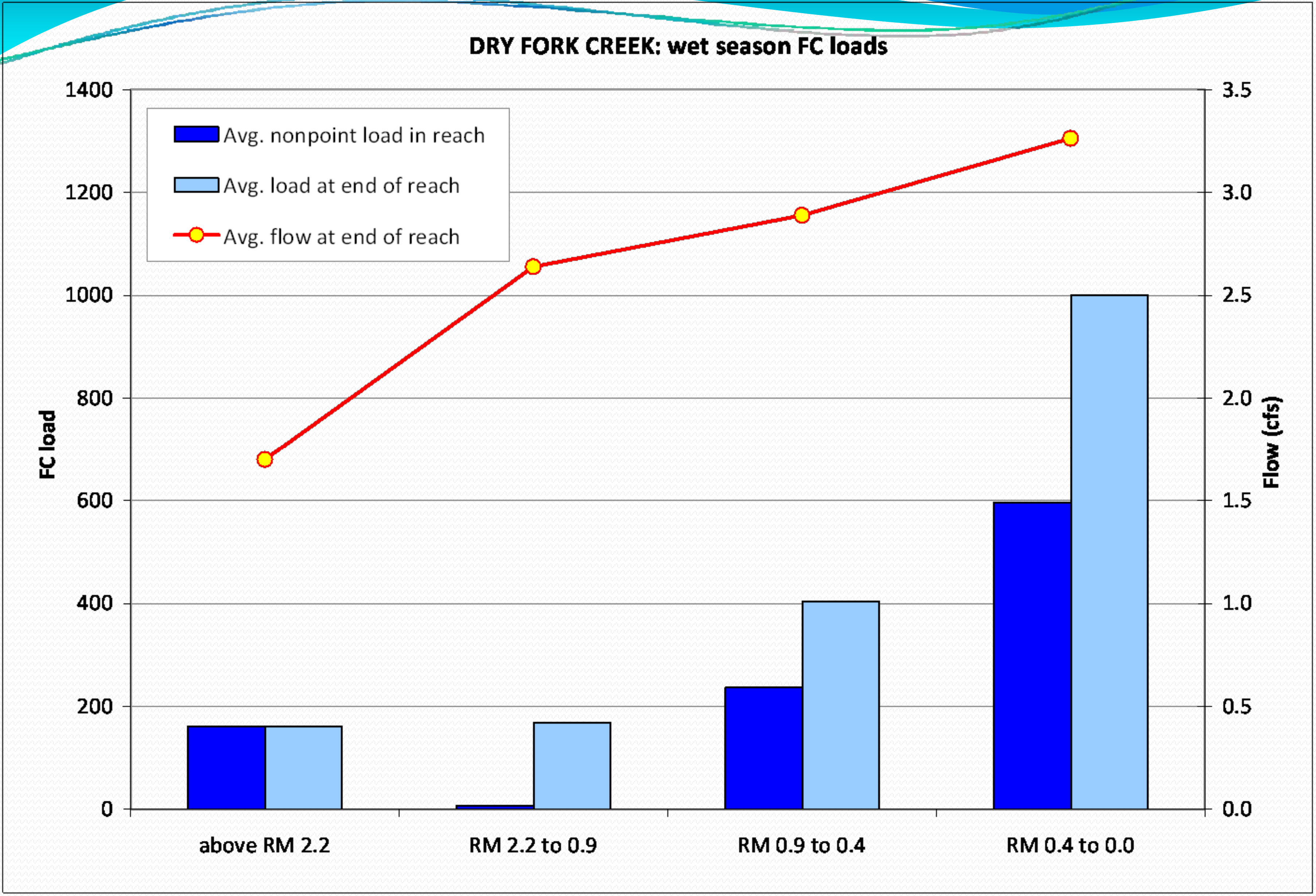

DRY FORK CREEK: dry season FC loads
Avg. nonpoint load in reach
Avg. flow at end of reach
Avg. flow at end of reach
FC load
Flow (cfs)
100
80
60
40
20
0
0.25
0.20
0.15
0.10
0.05
0.00
above RM 2.2
RM 2.2 to 0.9
RM 0.9 to 0.4
RM 0.4 to 0.0
*
* no apparent nonpoint load


DRY FORK CREEK: average net FC loads (dry season)
RM 0.4 to 0.0
0%
above RM 2.2
0.4%
RM 2.2 to 0.9
2.4%
RM 0.9 to 0.4
98%

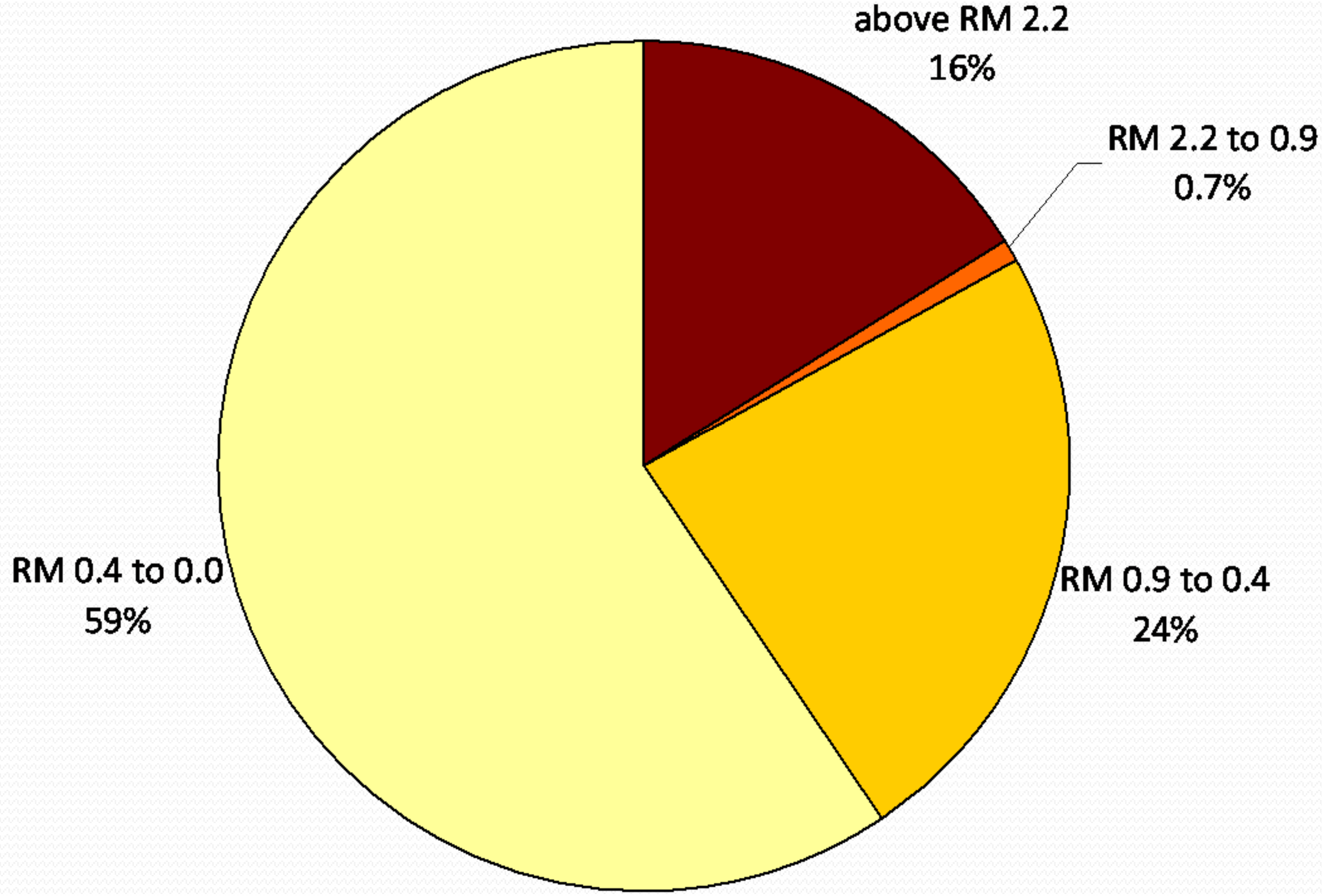
Map of Pullman – Dry Fork Creek (dry season loads)



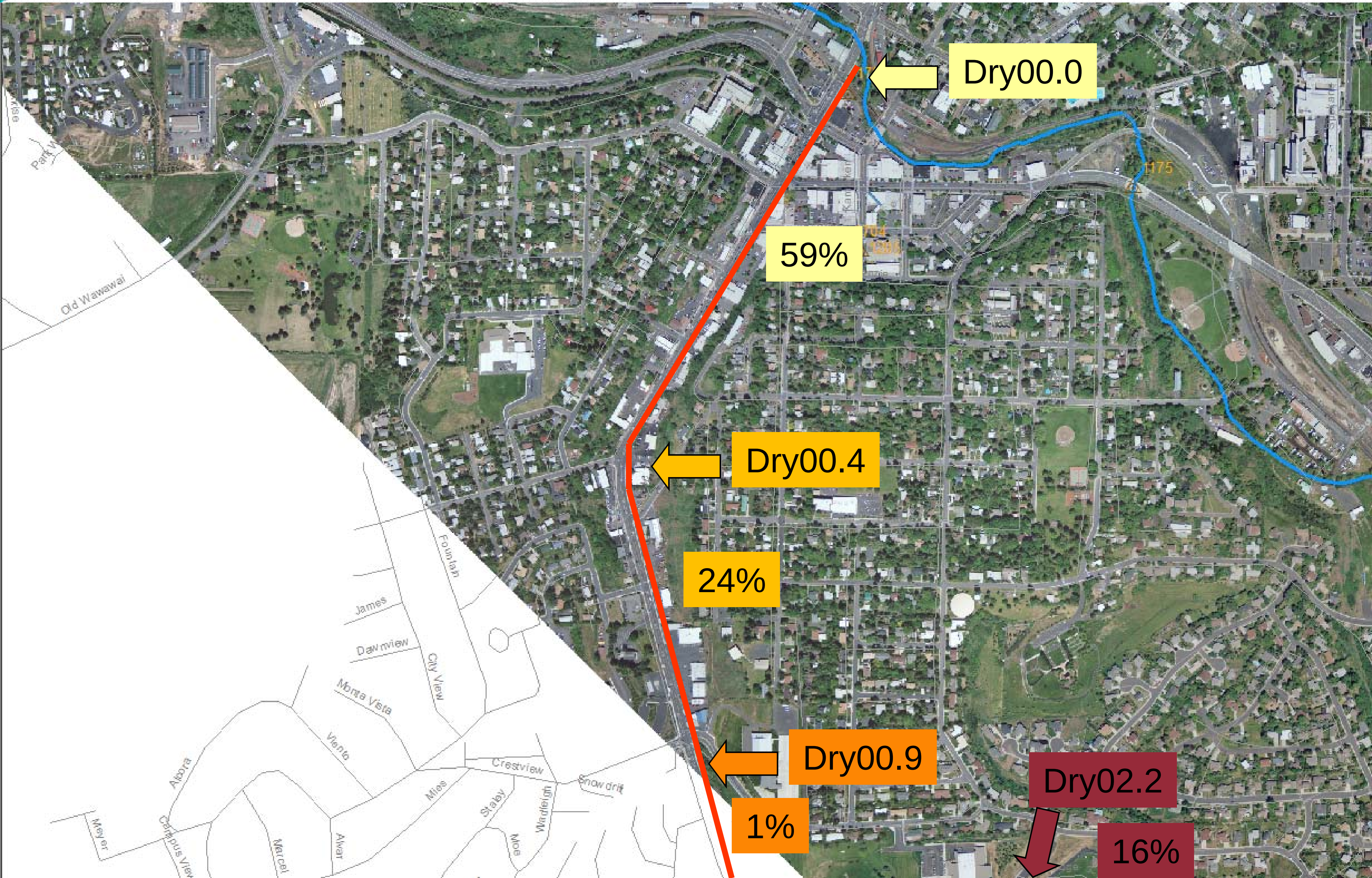

DRY CREEK: Wet Season
Fecal Colifrom (cfu/100 mL)
10000
1000
100
10
1
0
34Dry02.2
34Dry00.9
34Dry00.4
34Dry00.0
90th %tile
Max
Geomean
Min
10th %tile
90th %tile Standard
Geomean Standard


DRY FORK CREEK: wet season FC loads
Avg. nonpoint load in reach
Avg. load at end of reach
Avg. flow at end of reach
FC load
Flow (cfs)
1400
1200
1000
800
600
400
200
0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
above RM 2.2
RM 2.2 to 0.9
RM 0.9 to 0.4
RM 0.4 to 0.0

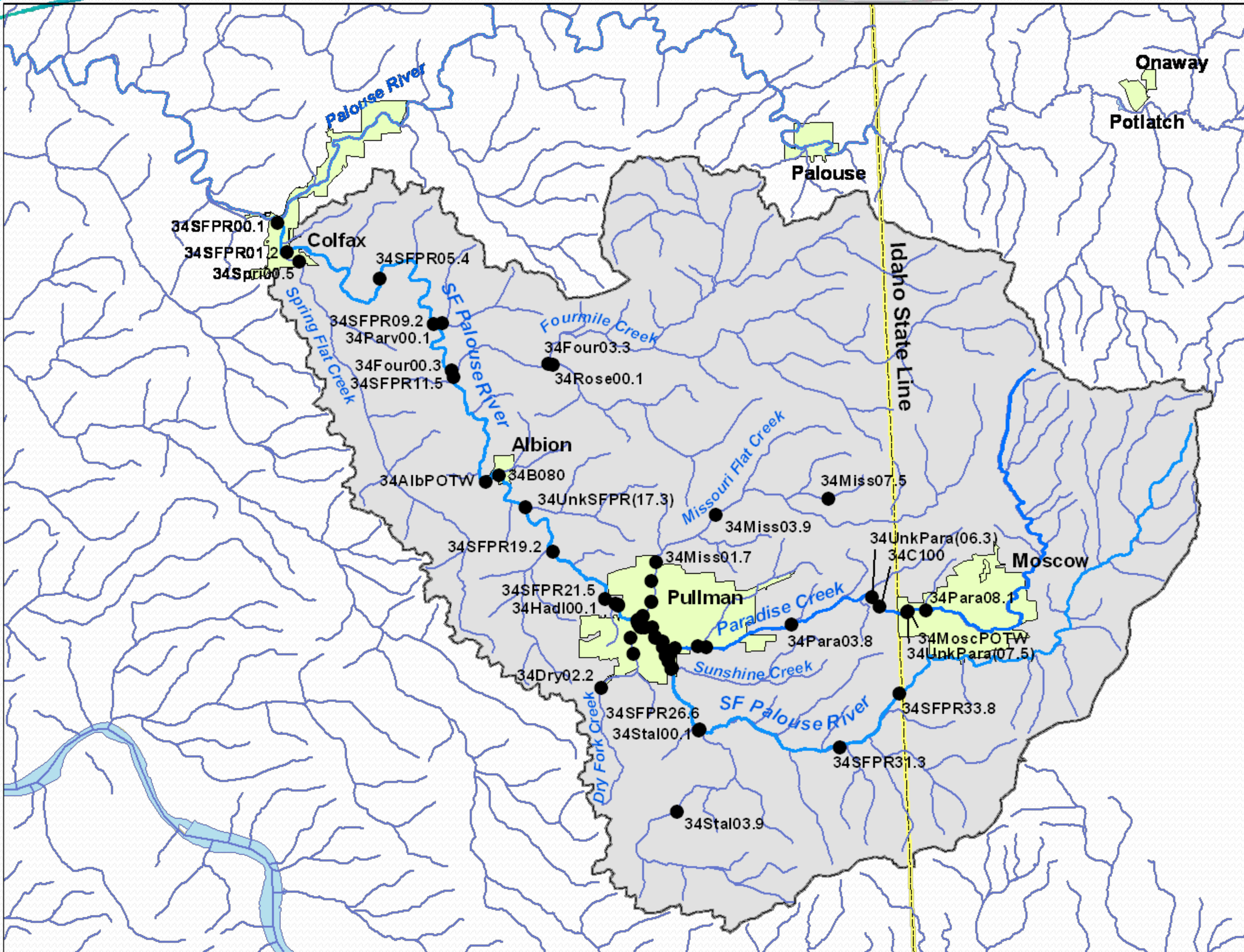
DRY FORK CREEK: average net FC load (wet season)

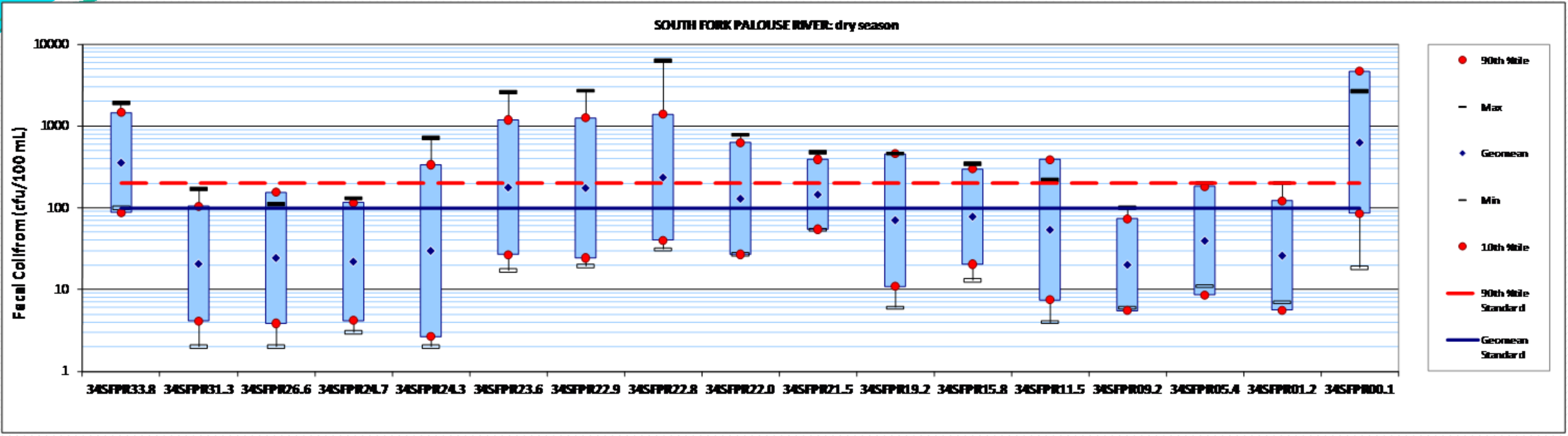


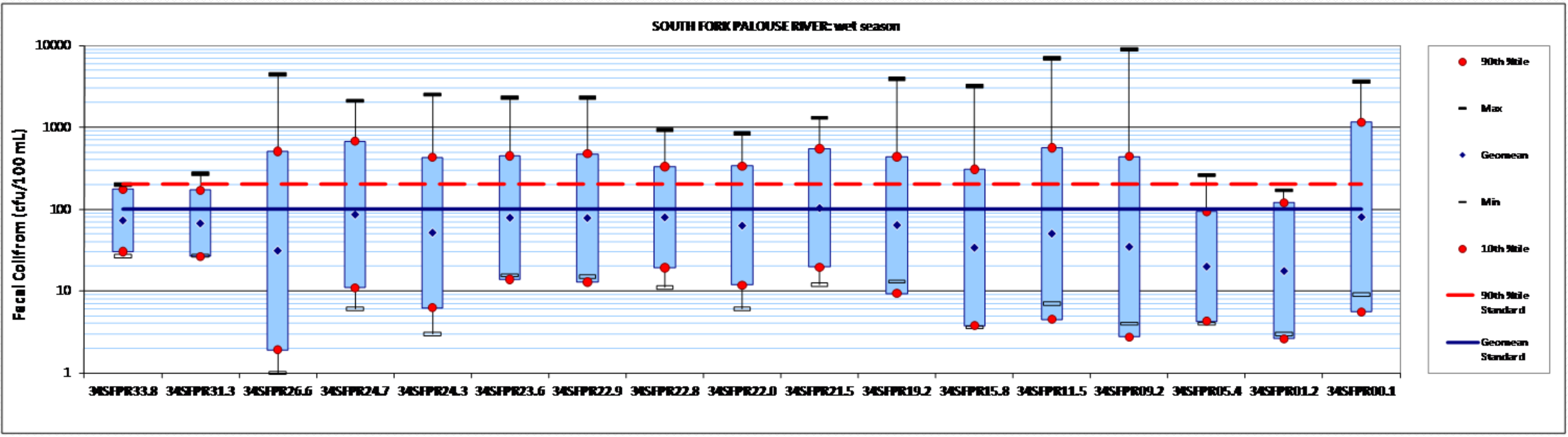
Map of Pullman – Dry Fork Creek (wet season loads)



S.F. Palouse River Fecal Coliform Bacteria Study Sites




SOUTH FORK PALOUSE RIVER: dry season
Facal Colifrom (cfu/100 mL)
10000
1000
100
10
1
34SFPR33.8
34SFPR31.3
34SFPR26.6
34SFPR24.7
34SFPR24.3
34SFPR23.6
34SFPR22.9
34SFPR22.8
34SFPR22.0
34SFPR21.5
34SFPR19.2
34SFPR15.8
34SFPR11.5
34SFPR09.2
34SFPR05.4
34SFPR01.2
34SFPR00.1
90th %tile
Max
Geomean
Min
10th %tile
90th %tile Standard
Geomean Standard


SOUTH FORK PALOUSE RIVER: wet season
Facal Colifrom (cfu/100 mL)
10000
1000
100
10
1
34SFPR33.8
34SFPR31.3
34SFPR26.6
34SFPR24.7
34SFPR24.3
34SFPR23.6
34SFPR22.9
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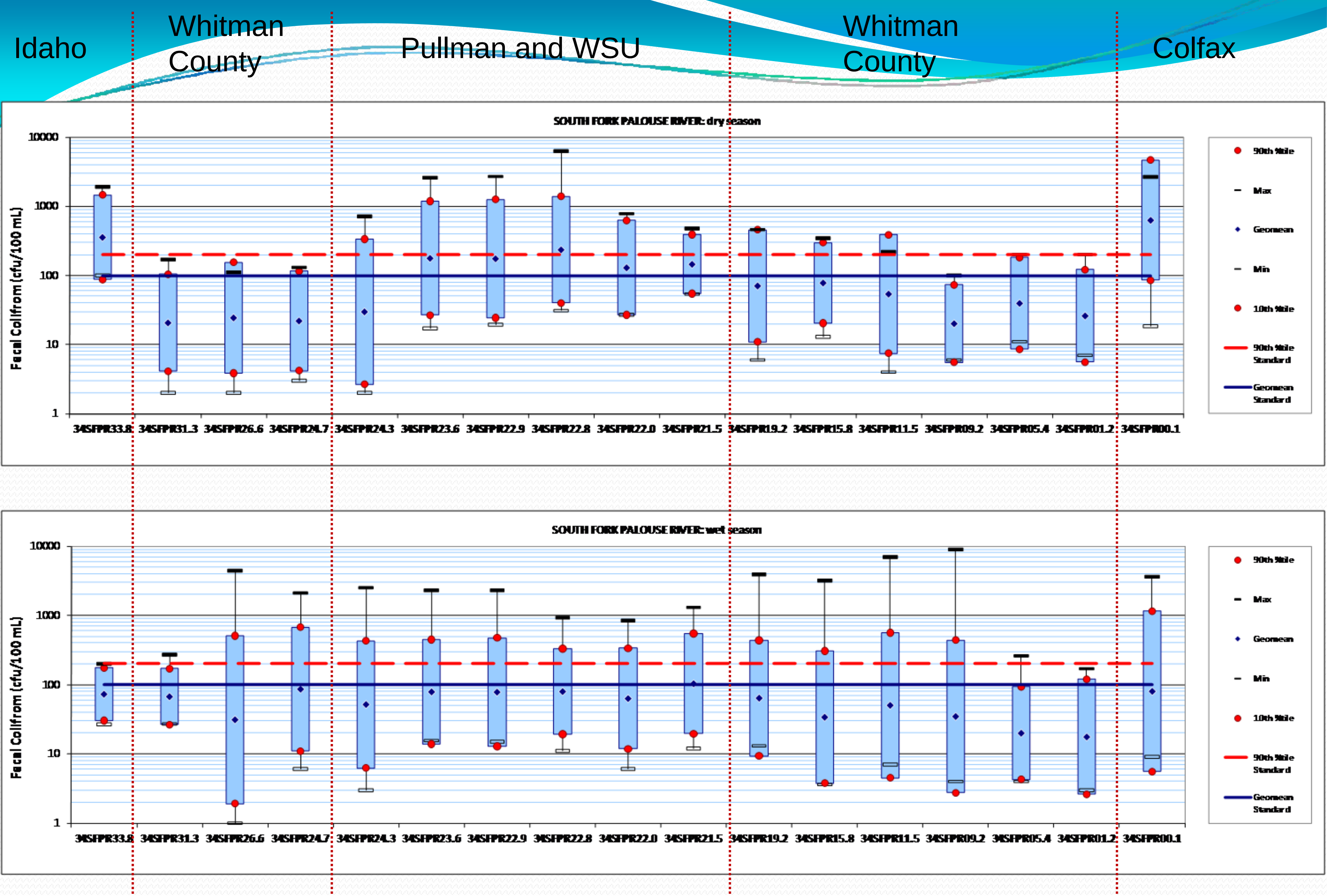
34SFPR21.5
34SFPR19.2
34SFPR15.8
34SFPR11.5
34SFPR09.2
34SFPR05.4
34SFPR01.2
34SFPR00.1
90th %tile
Max
Geomean
Min
10th %tile
90th %tile Standard
Geomean Standard



Idaho
Whitman County
Pullman and WSU
Whitman County
Colfax
SOUTH FORK PALOUSE RIVER: dry season
SOUTH FORK PALOUSE RIVER: wet season
Fecal Colifrom (cfu/100 mL)
10000
1000
100
10
1
34SFPR33.8
34SFPR31.3
34SFPR26.6
34SFPR24.7
34SFPR24.3
34SFPR23.6
34SFPR22.9
34SFPR22.8
34SFPR22.0
34SFPR21.5
34SFPR19.2
34SFPR15.8
34SFPR11.5
34SFPR09.2
34SFPR05.4
34SFPR01.2
34SFPR00.1
90th %tile
Max
Geomean
Min
10th %tile
90th %tile Standard
Geomean Standard

Fecal Coliform Bacteria TMDL Study

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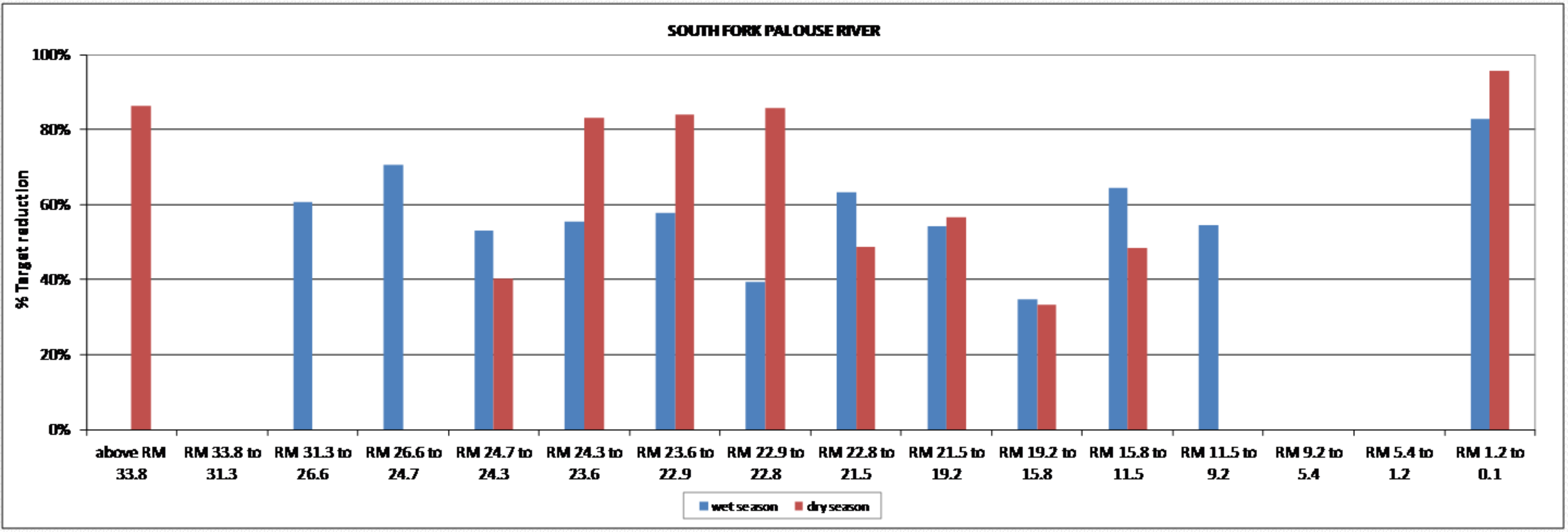
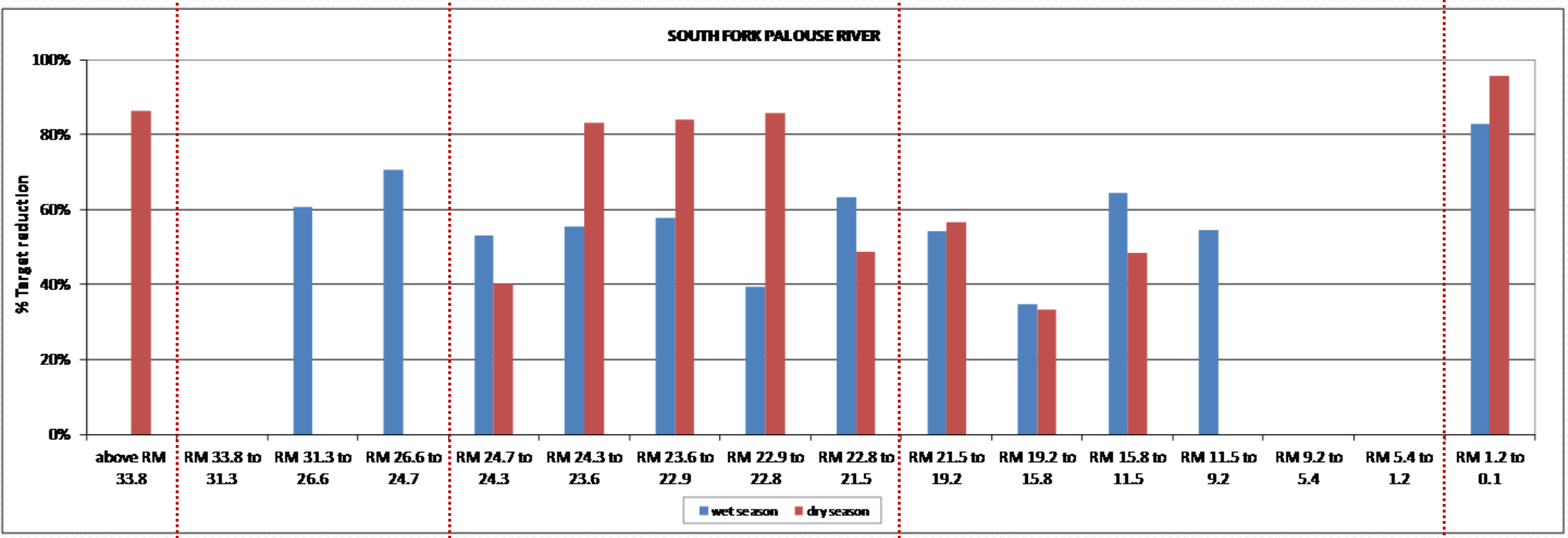
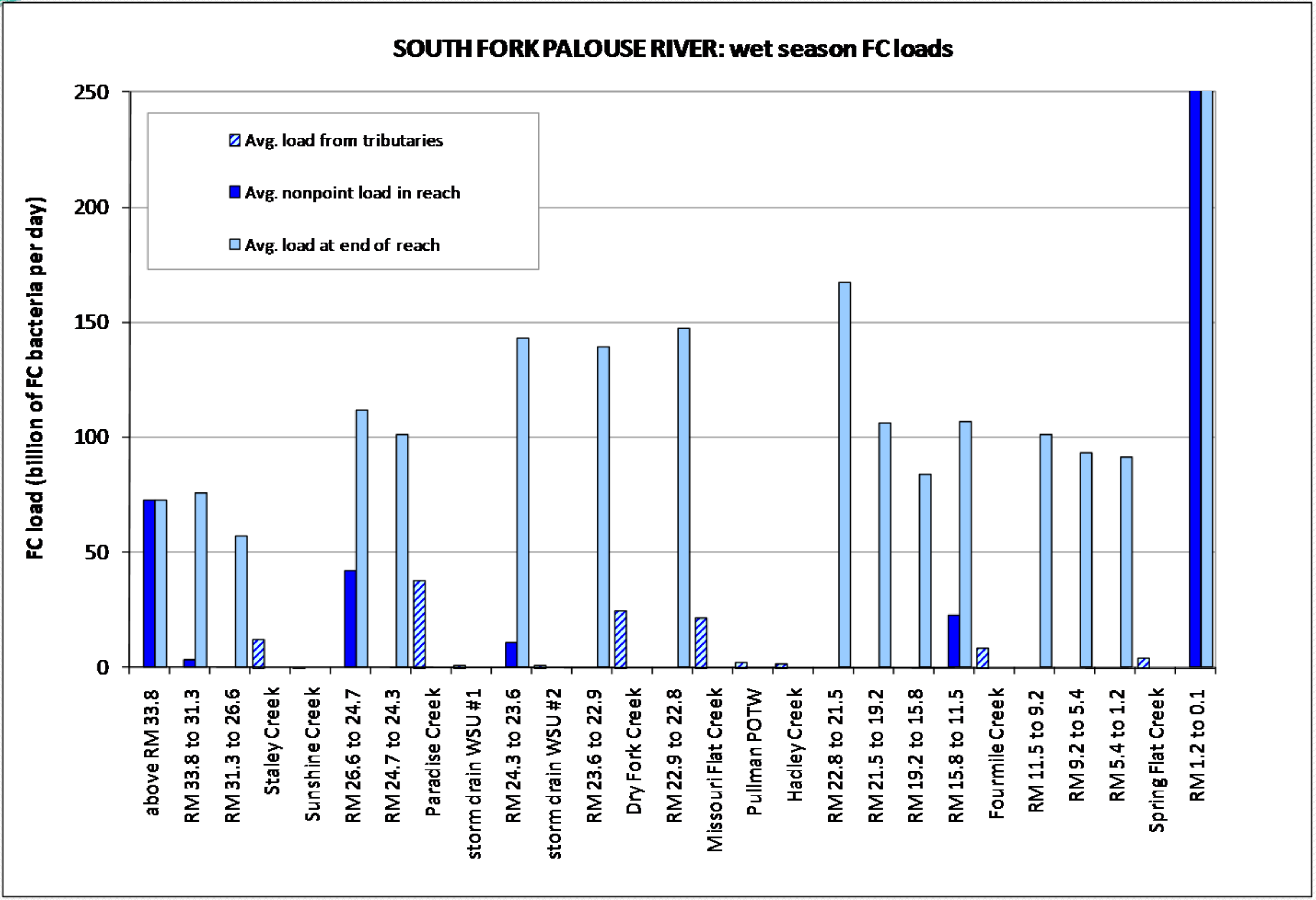
Target reductions for the SF Palouse River

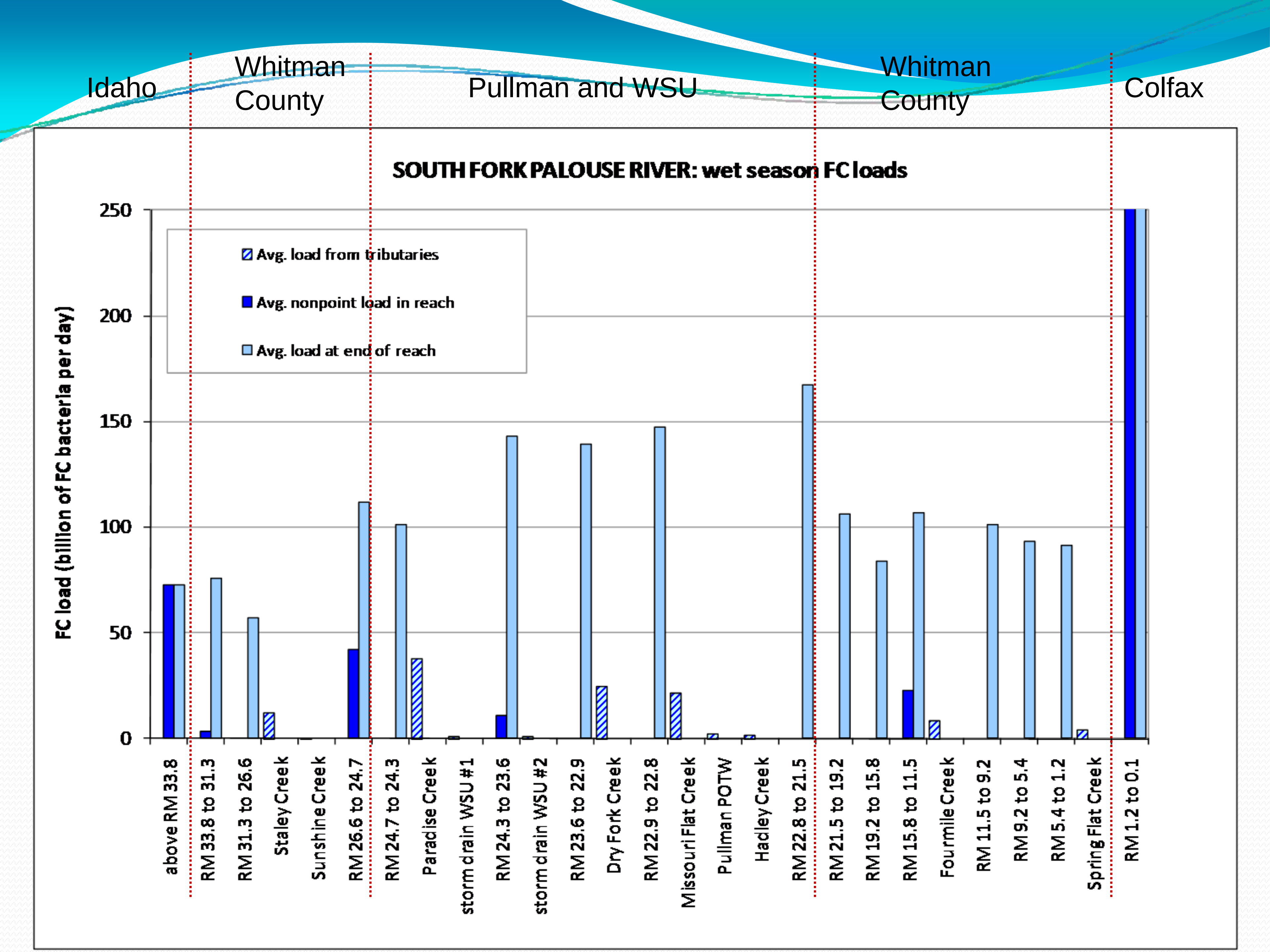


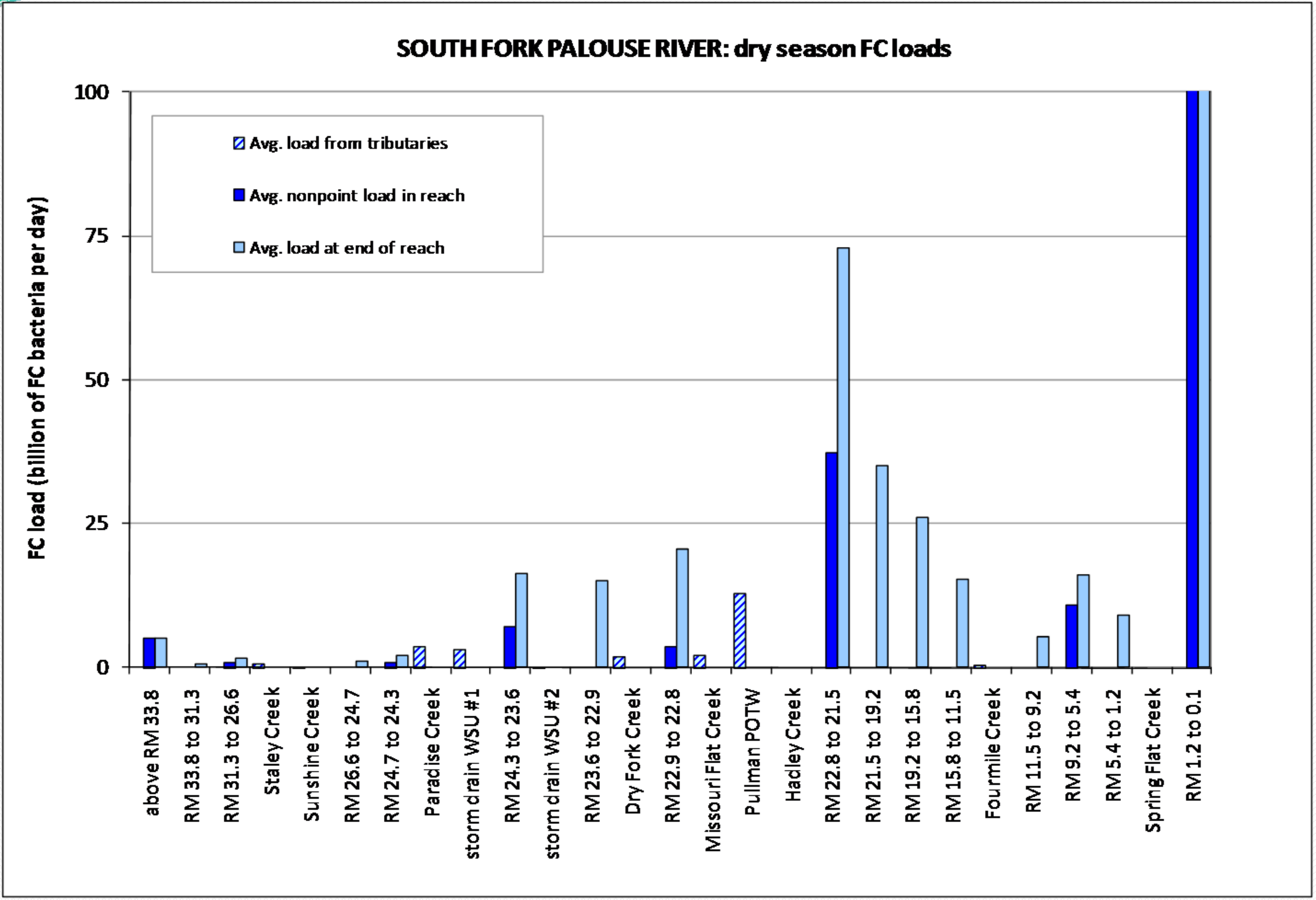
Idaho | Whitman County | Pullman and WSU | Whitman County | Colfax



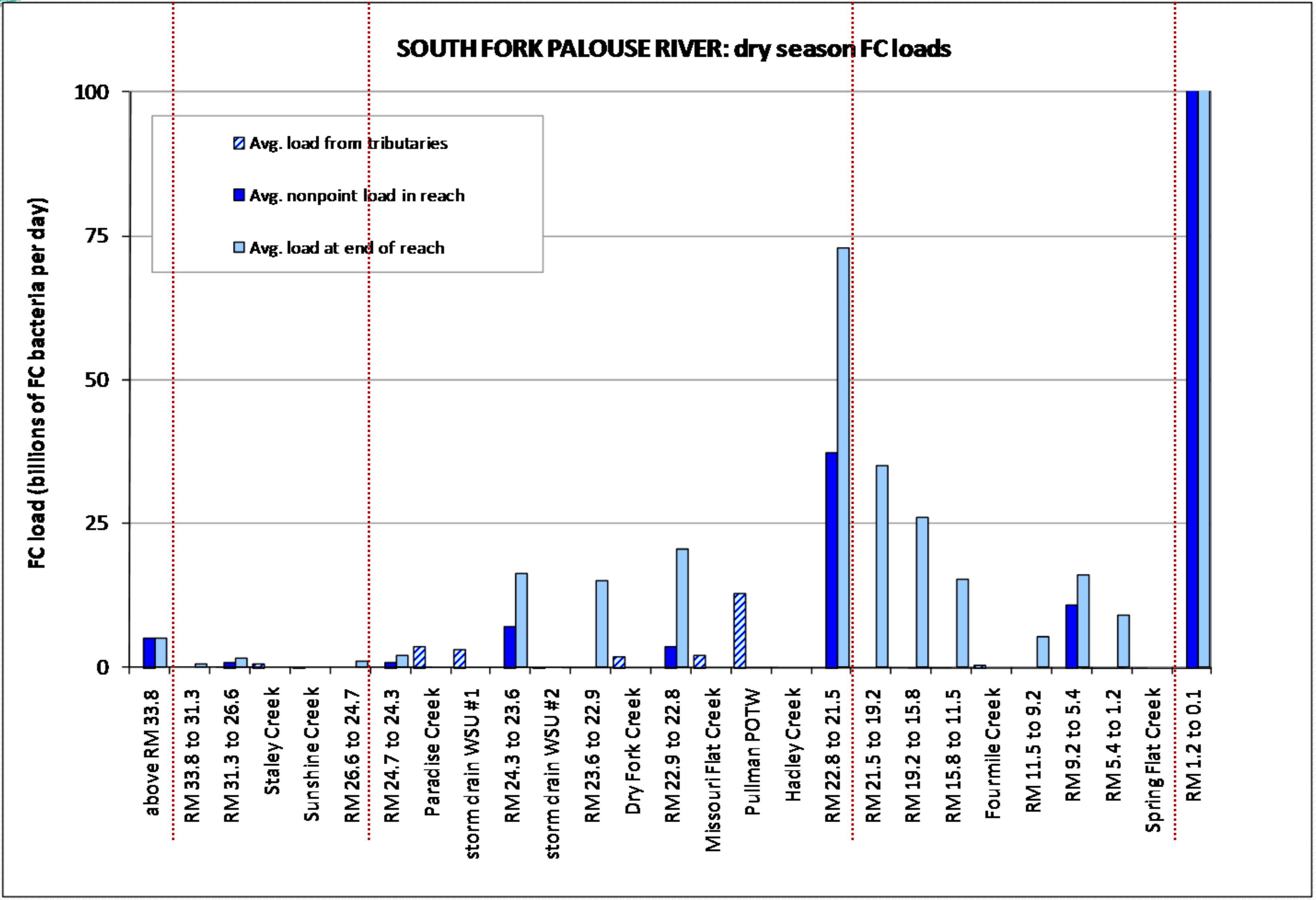


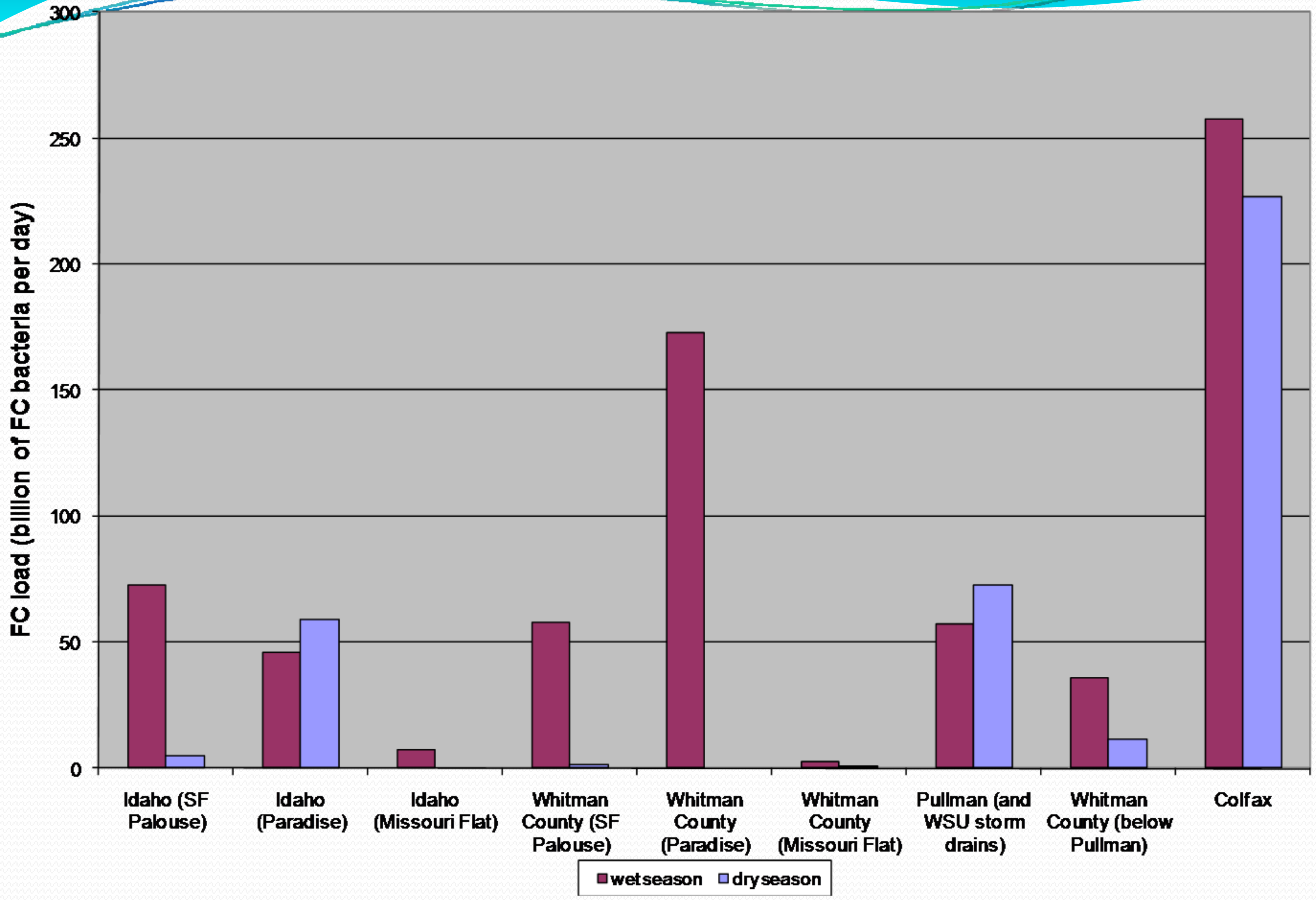
SOUTH FORK PALOUSE RIVER: wet season FC loads
Avg. load from tributaries
Avg. nonpoint load in reach
Avg. load at end of reach
FC load (billion of FC bacteria per day)
250
200
150
100
50
0
above RM 33.8
RM 33.8 to 31.3
RM 31.3 to 26.6
Staley Creek
Sunshine Creek
RM 26.6 to 24.7
RM 24.7 to 24.3
Paradise Creek
storm drain WSU #1
RM 24.3 to 23.6
storm drain WSU #2
RM 23.6 to 22.9
Dry Fork Creek
RM 22.9 to 22.8
Missouri Flat Creek
Pullman POTW
Hadley Creek
RM 22.8 to 21.5
RM 21.5 to 19.2
RM 19.2 to 15.8
RM 15.8 to 11.5
Fourmile Creek
RM 11.5 to 9.2
RM 9.2 to 5.4
RM 5.4 to 1.2
Spring Flat Creek
RM 1.2 to 0.1


Idaho
Whitman County
Pullman and WSU
Whitman County
Colfax
SOUTH FORK PALOUSE RIVER: wet season FC loads
FC load (billion of FC bacteria per day)
250
200
150
100
50
0
Avg. load from tributaries
Avg. nonpoint load in reach
Avg. load at end of reach
above RM 33.8
RM 33.8 to 31.3
RM 31.3 to 26.6
Staley Creek
Sunshine Creek
RM 26.6 to 24.7
RM 24.7 to 24.3
Paradise Creek
storm drain WSU #1
RM 24.3 to 23.6
storm drain WSU #2
RM 23.6 to 22.9
Dry Fork Creek
RM 22.9 to 22.8
Missouri Flat Creek
Pullman POTW
Hadley Creek
RM 22.8 to 21.5
RM 21.5 to 19.2
RM 19.2 to 15.8
RM 15.8 to 11.5
Fourmile Creek
RM 11.5 to 9.2
RM 9.2 to 5.4
RM 5.4 to 1.2
Spring Flat Creek
RM 1.2 to 0.1


SOUTH FORK PALOUSE RIVER: dry season FC loads
FC load (billion of FC bacteria per day)
100
75
50
25
0
Avg. load from tributaries
Avg. nonpoint load in reach
Avg. load at end of reach
above RM 33.8
RM 33.8 to 31.3
RM 31.3 to 26.6
Staley Creek
Sunshine Creek
RM 26.6 to 24.7
RM 24.7 to 24.3
Paradise Creek
storm drain WSU #1
RM 24.3 to 23.6
storm drain WSU #2
RM 23.6 to 22.9
Dry Fork Creek
RM 22.9 to 22.8
Missouri Flat Creek
Pullman POTW
Hadley Creek
RM 22.8 to 21.5
RM 21.5 to 19.2
RM 19.2 to 15.8
RM 15.8 to 11.5
Fourmile Creek
RM 11.5 to 9.2
RM 9.2 to 5.4
RM 5.4 to 1.2
Spring Flat Creek
RM 1.2 to 0.1

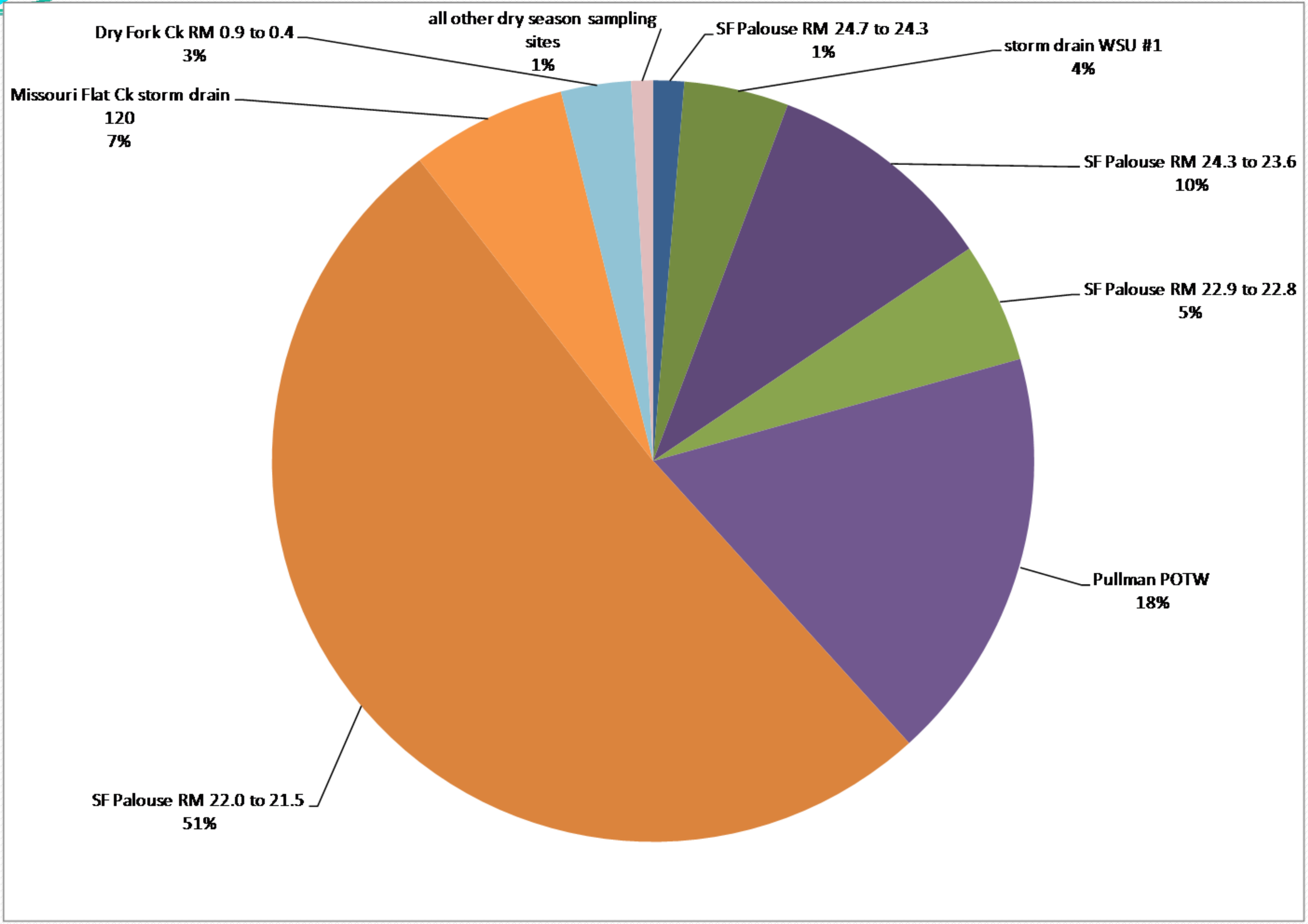
Idaho | Whitman County | Pullman and WSU | Whitman County | Colfax



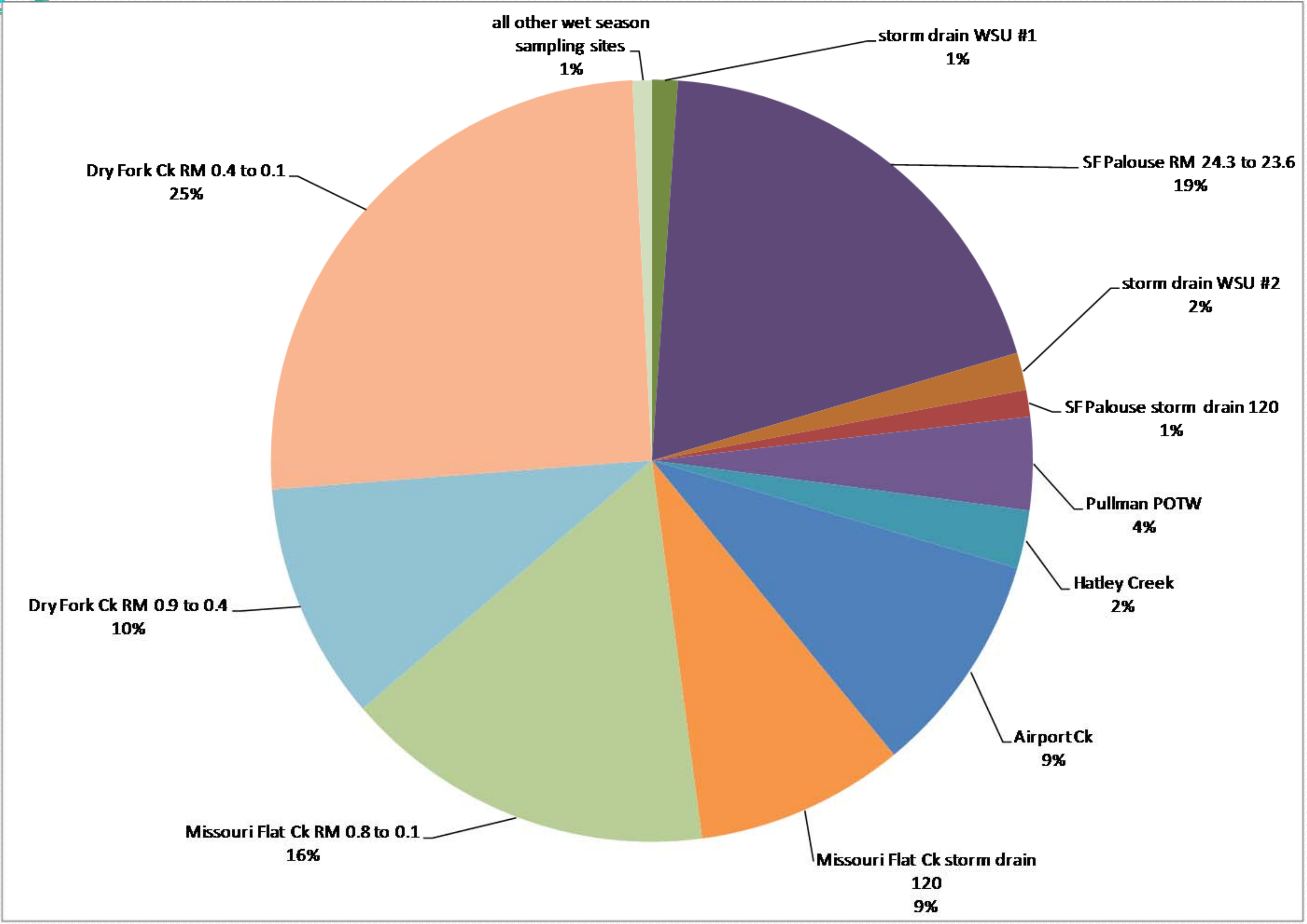


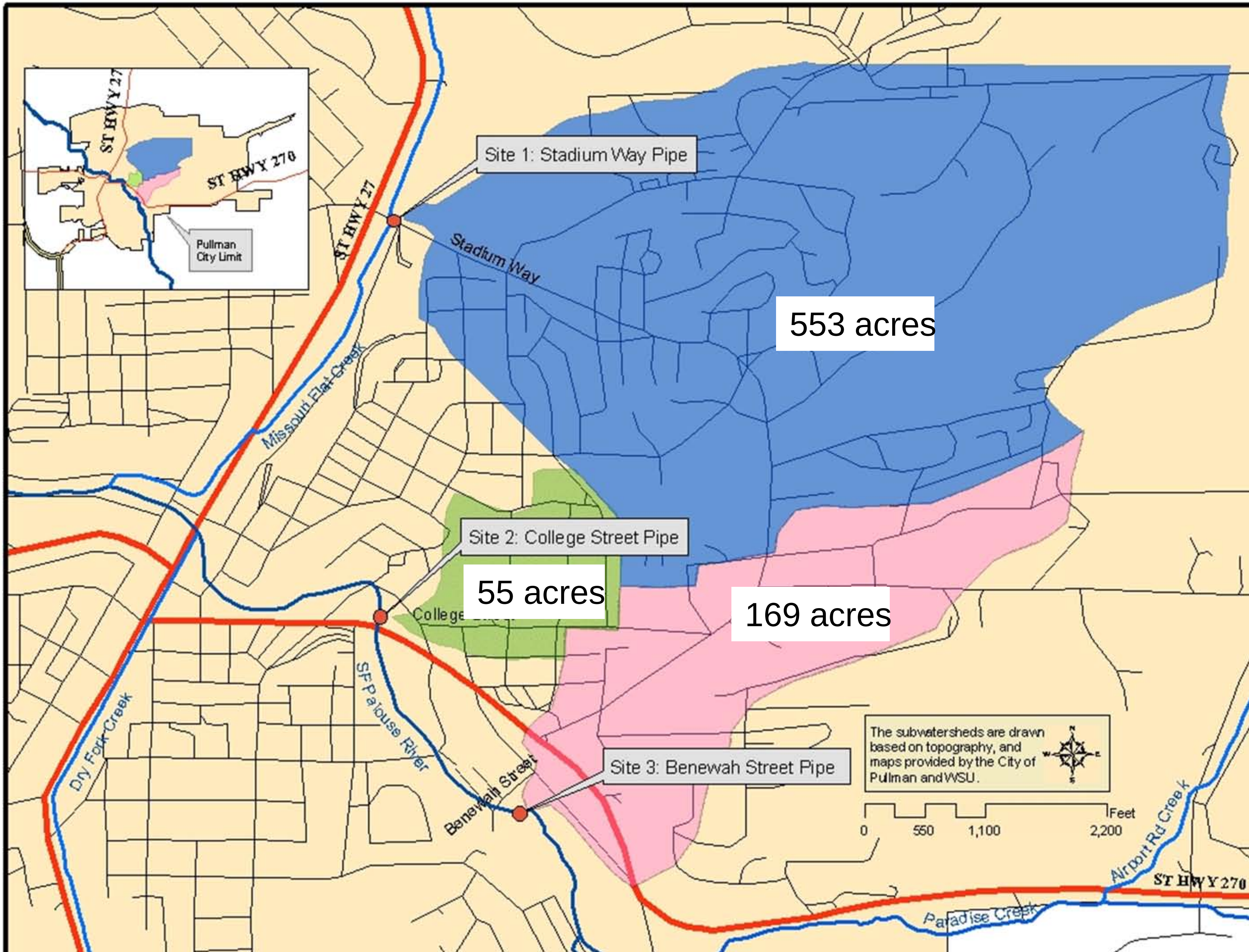
300
250
200
150
100
50
0
FC load (billion of FC bacteria per day)
Idaho (SF Palouse)
Idaho (Paradise)
Idaho (Missouri Flat)
Whitman County (SF Palouse)
Whitman County (Paradise)
Whitman County (Missouri Flat)
Pullman (and WSU storm drains)
Whitman County (below Pullman)
Colfax
wet season
dry season

Loads generated in Pullman city limits during the dry season

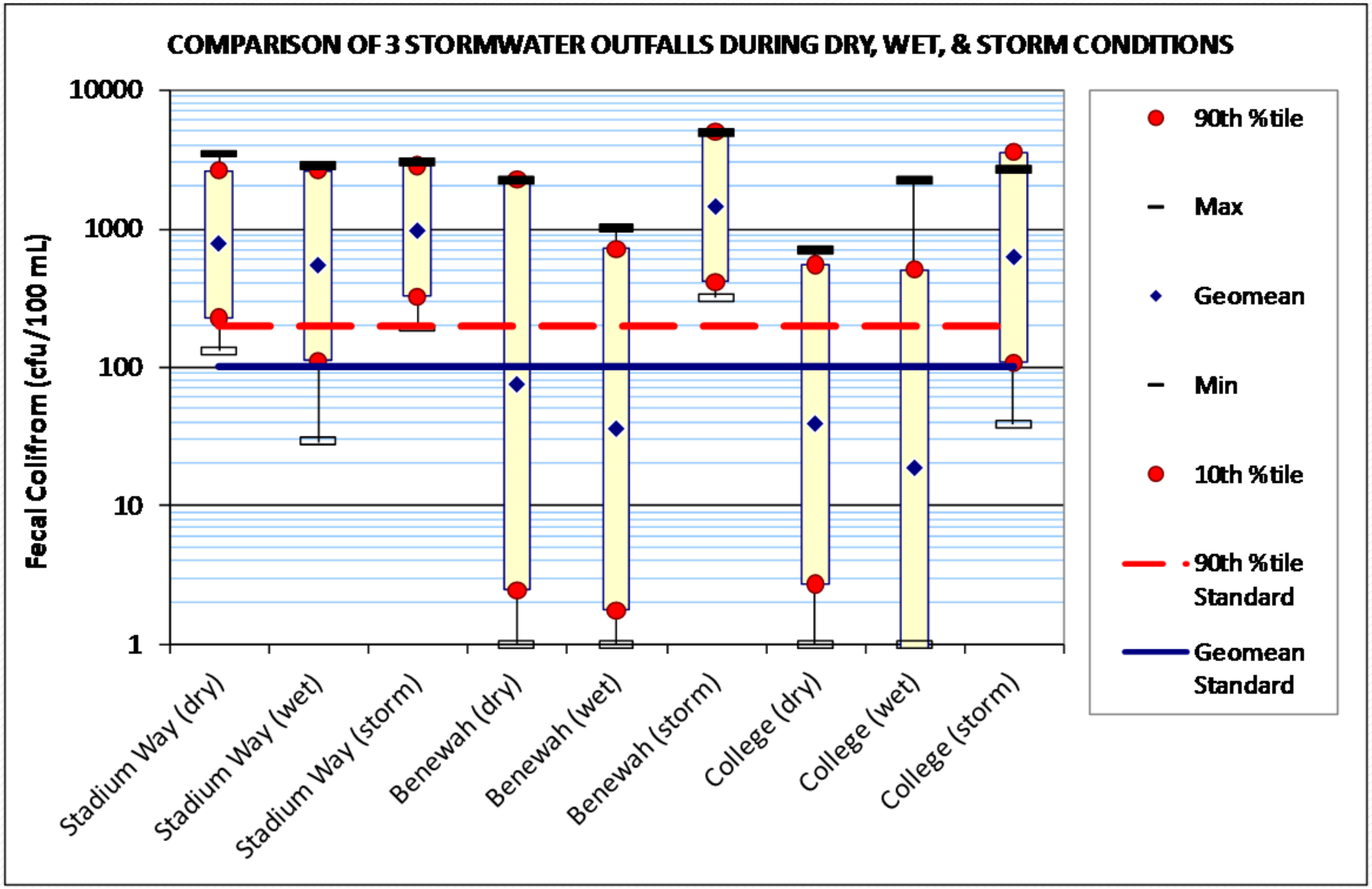


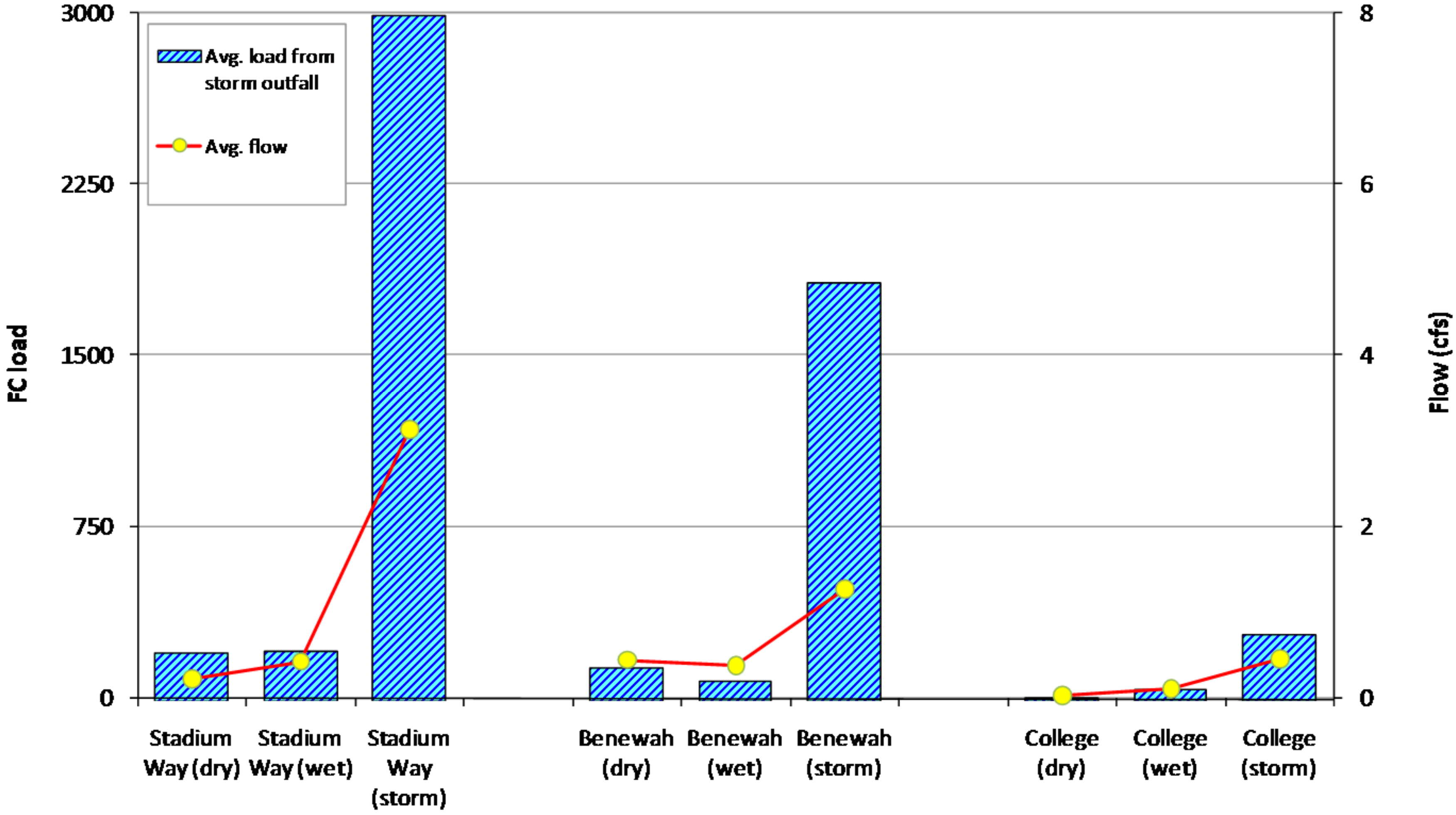
Loads generated in Pullman city limits during the wet season



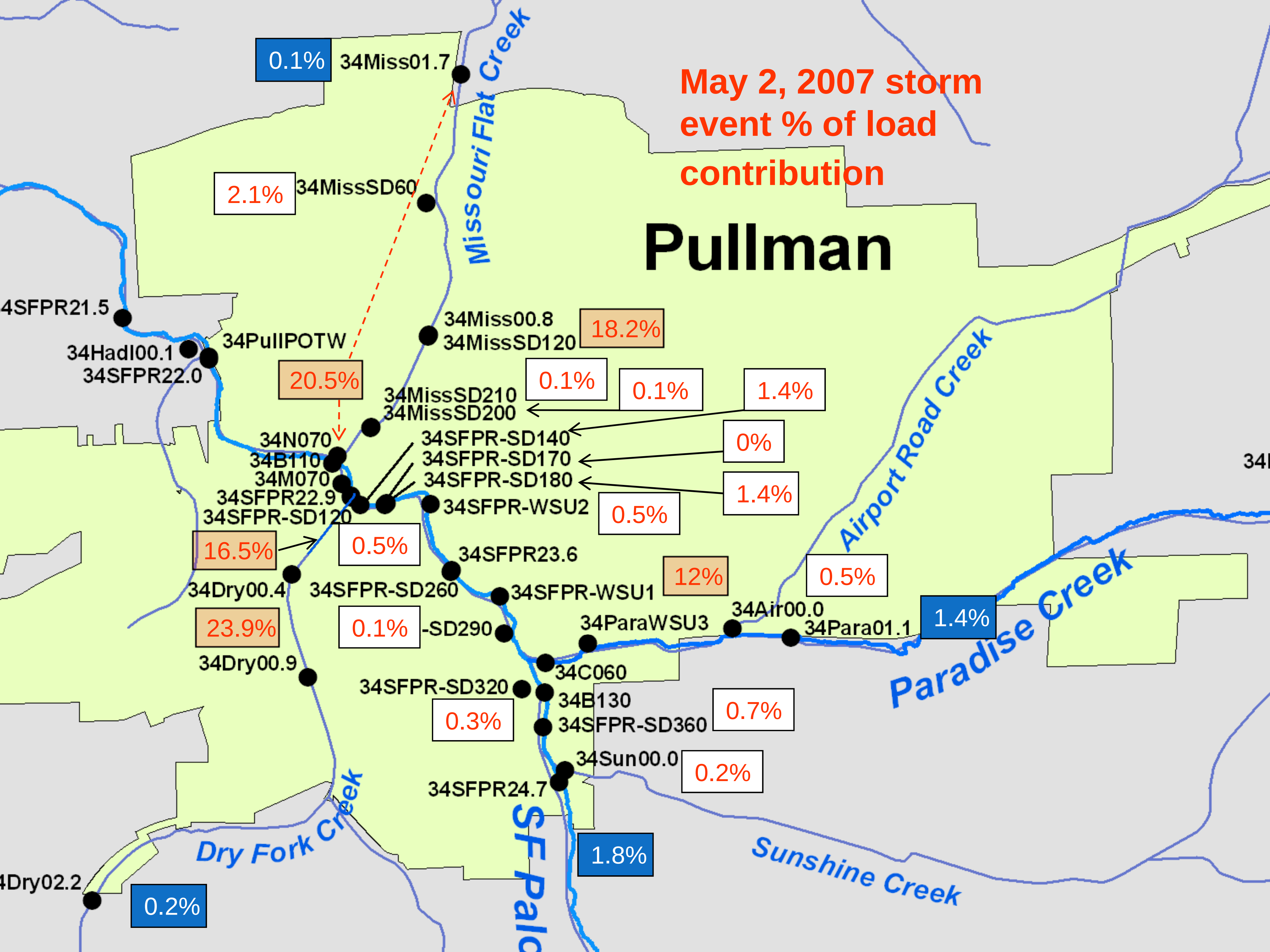


Site 1: Stadium Way Pipe
553 acres
Site 2: College Street Pipe
55 acres
169 acres
Site 3: Benewah Street Pipe
Pullman City Limit
ST HWY 27
ST HWY 270
Stadium Way
Missouri Flat Creek
Dry Fork Creek
SF Palouse River
Benewah Street
College
Airport Rd Creek
Paradise Creek
The subwatersheds are drawn based on topography, and maps provided by the City of Pullman and WSU.
Feet
0
550
1,100
2,200


COMPARISON OF 3 STORMWATER OUTFALLS DURING DRY, WET, & STORM CONDITIONS
Fecal Colifrom (cfu/100 mL)
10000
1000
100
10
1
Stadium Way (dry)
Stadium Way (wet)
Stadium Way (storm)
Benewah (dry)
Benewah (wet)
Benewah (storm)
College (dry)
College (wet)
College (storm)
90th %tile
Max
Geomean
Min
10th %tile
90th %tile Standard
Geomean Standard



3000
2250
1500
750
0
FC load
8
6
4
2
0
Flow (cfs)
Avg. load from storm outfall
Avg. flow
Stadium Way (dry)
Stadium Way (wet)
Stadium Way (storm)
Benewah (dry)
Benewah (wet)
Benewah (storm)
College (dry)
College (wet)
College (storm)


May 2, 2007 storm event % of load contribution
Pullman
Missouri Flat Creek
Airport Road Creek
Paradise Creek
Dry Fork Creek
SF Palo
Sunshine Creek
0.1%
34Miss01.7
2.1%
34MissSD60
4SFPR21.5
34Miss00.8
34MissSD120
18.2%
34PullPOTW
34Hadl00.1
34SFPR22.0
20.5%
0.1%
0.1%
1.4%
34MissSD210
34MissSD200
34N070
34B110
34M070
34SFPR22.9
34SFPR-SD120
34SFPR-SD140
34SFPR-SD170
34SFPR-SD180
0%
1.4%
34SFPR-WSU2
0.5%
16.5%
0.5%
34SFPR23.6
34Dry00.4
34SFPR-SD260
34SFPR-WSU1
12%
0.5%
34Air00.0
34Para01.1
1.4%
23.9%
0.1%
-SD290
34ParaWSU3
34Dry00.9
34C060
34SFPR-SD320
34B130
0.3%
34SFPR-SD360
0.7%
34Sun00.0
0.2%
34SFPR24.7
1.8%
4Dry02.2
0.2%
34I

Conclusions from the May 2, 2007 storm event sampling

- During the May 2, 2007 event less than 5% of the FC bacteria load originated from outside of the Pullman city limits.

- Within the city, almost 90% came from 3 different sources:

1. More than 40% came from Missouri Flat Creek, with almost 20% from the stormwater outfall at Stadium Way (34MissSD120).
2. Almost 12% came from the stormwater outfall to the SF Palouse River at Benewah St. (34SFPRWSU1).
3. Almost 40% came from Dry Fork Creek between the mouth and RM 2.2.

Technical Study Conclusions

South Fork Palouse River watershed

In summary:

•During the dry season, the FC load appeared to be generated more locally, either from unexplained nonpoint sources in specific reaches, or from specific point sources or tributaries.

• During the wet season, the FC load appeared to be generated from upstream sources and transported downstream, though smaller locally-generated loads contributed as well.

Technical Study Conclusions

Upper SF Palouse River

•On average, the majority of the loading to the upper SF Palouse River was from Idaho during both the wet season (56%) and dry season (67%).

•While the wet season bacteria counts at the Idaho border were within standards, the average FC bacteria load appears to use up most of the downstream load capacity in the upper SF Palouse.

•There was a linear relationship between TSS and FC bacteria concentrations, indicating soil-erosion control could reduce bacteria.

•Staley Creek violated water quality standards year-round.

Technical Study Conclusions

Middle SF Palouse River

•Overall, the middle SF Palouse River had too many high FC counts during both the dry and wet season at every site to meet the numeric standards.

•High FC counts were seen in the tributaries and storm drains.

•The middle SF Palouse sites generally met the geometric mean standard in the wet season, but not in the dry season.

•The majority of the dry season loads were from apparent nonpoint contributions within three SF Palouse reaches through the city of Pullman.

Technical Study Conclusions

Dry Fork Creek

•FC counts were highest within the culvert sections under Grand Avenue within the city of Pullman.

•The creek was mostly dry at the city limits during the dry season.

•During the wet season, the FC counts were variably high, indicating inconsistent runoff contamination.

Technical Study Conclusions

Paradise Creek

•Overall, most sites had too many high FC counts year-round to meet the numeric standards.

•The mass balance showed that the average dry-season FC load in Paradise Creek originated from the Idaho segment of the creek.

•The mass balance showed that the average wet-season FC load in Paradise Creek originated between RM 3.8 and RM 1.1.

•The average TSS load from Idaho accounted for 73% of the TSS load in Paradise Creek in the wet season and 87% of the TSS load in the dry season.

Technical Study Conclusions

Missouri Flat Creek

•Significant reductions are required within the Pullman city limits (from RM 1.7 downstream) during both dry and wet seasons.

•The average load discharged from storm drain 120 (at Jack in the Box) was about the same for both wet and dry seasons, indicating a constant or persistent source of baseflow and contamination.

Technical Study Conclusions

Lower SF Palouse River

•In comparison to the upriver portions of the SF Palouse, most of the lower portion of the river had fewer water quality standards violations and generally decreased FC bacteria counts.

•If upstream FC loads are reduced, the lower SF Palouse River might be nearer to compliance during the dry season.

•The FC counts within the city of Colfax were very high during both the dry and wet seasons. Significant reductions are required within the Colfax city limits.

Technical Study Conclusions

Storm water in Pullman

•The May 2, 2007 storm event sampling at the three stations monitored the previous year had similar results to the previous year.

•Storm events and storm runoff greatly increased FC bacteria pollution and degraded the water quality in the SF Palouse and its tributaries beyond the levels of dry or wet season pollution.

Thanks to Advisory Group

- City of Pullman
- City of Moscow
- City of Colfax
- Washington State University
- University of Idaho
- Palouse Conservation District
- Whitman County Health
- Agricultural representatives
- Individual citizens
- Landowners/residents

Reviewed the technical study and allocation development.

Implementation Strategy

- What needs to be done
- Who will participate in implementation
- A schedule for achieving water quality standards
- How to monitoring if progress is being made
- Adaptive management (what if its not working)
- Reasonable assurance
- Potential funding sources
- Summary of public involvement

Strategy to reduce fecal coliform bacteria pollution

- Locate and remove large source within Colfax
- Address failing septic systems
- Idaho continues to reduce bacteria across the border
- Land use changes are reviewed to assure they are not likely to result in bacteria entering the stream
- Livestock best management practices
- Pet waste education and ordinances
- Reducing sediment in runoff which may carry bacteria
- Reducing bacteria in stormwater
- Assuring treatment plants meet permit limits
- Discourage wildlife congregation along streams

Implementation

When nonpoint source pollution and stormwater are impairing streams it means everyone can take part in implementation:

- Properly managing and disposing animal wastes
- Inspecting and maintaining septic systems
- Protecting and restoring riparian areas
- Education others about the impacts everyday activities can have on water quality

Public Comment Period:

- August 24 – September 25, 2009
- Written comments must be sent by September 25th to:

    Elaine Snouwaert
    Washington Dept of Ecology
    4601 N Monroe Street
    Spokane, WA 99205

    Or by email to Elaine.Snouwaert@ecy.wa.gov

- Comments will be responded to in an Appendix in the final report and the document may be revised based on the comments received.

Next Steps:

- Submit final report to EPA for approval
- Develop a Water Quality Implementation Plan
  - Due 1 year after approval of the TMDL
  - Based on the Implementation Strategy
- Implement activities to reduce bacteria