Welcome and Introductions

Lisa Prcin
Watershed Coordinator
Texas AgriLife Research at
Blackland Research & Extension Center

Past Business

Lisa Prcin
Watershed Coordinator
Texas AgriLife Research at
Blackland Research & Extension Center

Steering Committee Meeting December 2009

- Addition of 2 new Steering Committee members
  - David Cole
    - Kempner Water Supply Corporation
  - Lee Kelley
    - Central Texas Water Supply Corporation
- Basics of Nonpoint Source Pollution
- Introduction to Modeling
  - Load Duration Curves
  - SELECT (Spatially Explicit Load Enrichment Calculation Tool)

Technical Advisory Group Meeting February 2010

- February 3rd at Texas AgriLife Blackland Research and Extension Service in Temple
- 25 people in attendance from 13 agencies/organizations
  - Local
    - City of Killeen
    - Brazos River Authority
    - Clearwater Underground Water Conservation District
    - Little River-San Gabriel Soil and Water Conservation District
  - State
    - Texas Commission on Environmental Quality
    - Texas Department of Agriculture
    - Texas Parks and Wildlife Department
    - Texas State Soil and Water Conservation Board
    - Texas Water Resources Institute
  - Federal
    - U.S. Army Corps of Engineers
    - U.S. Environmental Protection Agency
    - U.S. Department of Agriculture – Natural Resources Conservation Service
  - Community Organizations
    - Lake Stillhouse Hollow Cleanwater Steering Committee

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Technical Advisory Group Meeting February 2010

- Agenda
  - Why was the Lampasas River Watershed Selected for a WPP?
  - Status of the Lampasas River Watershed Partnership
  - Historical and Current Monitoring Efforts within the Lampasas River Watershed
  - Existing Data and Gaps
  - Modeling Approach and Input Needed from TAG Members
  - Incorporating Agency Programs and Funding Mechanisms into the WPP

TCEQ Surface Water Quality Monitoring Meeting – February 2010

- Product of February TAG meeting
- February 24th
- Conference call participants
  - Brazos River Authority
  - Texas AgriLife Blackland Research and Extension Center
  - Texas Commission on Environmental Quality
  - Texas State Soil and Water Conservation Board
- Data that originally placed the Lampasas River on the 303(d) list no longer meets the new criteria
- TCEQ is considering removing the river from the 2010 Integrated Report (a combination of the 303(d) list and the Texas Water Quality Inventory)

Draft 2010 Integrated Report

- Public comment period ended Monday 3/8
- Due to short notice, the Partnership was not able to submit comments
- A letter/email was sent to Steering Committee members asking them to submit their own comments to TCEQ
- TCEQ must consider and respond to all comments and then new list must be approved by the TCEQ and U.S. EPA

Draft 2010 Integrated Report

- TSSWCB submitted the following comment regarding the Lampasas River:

  "The Assessment Guidance states on page 2-13 "In order to ensure that minimum sample size requirements can be met for determining use support, the period of record will be extended back in time, up to ten years, until the minimum sample number is identified. At least half of the samples (five samples) must come from the most recent seven-year sample period." Further, the Assessment Guidance indicates that when only fecal coliform data is availabe, fecal coliform will be used to determine use support. But must this data still satisfy the temporal requirements? TSSWCB understands the only data available to assess bacteria criteria for segment 1217 is fecal coliform data, all collected beyond the 7 year period of record. It would seem that delisting of this waterbody would be appropriate. The consistent assessment of waterbodies with data conditions like 1217 would help deal with TCEQ's previous practice of carrying forward the assessment information from only the last period that had a complete data set."

Draft 2010 Integrated Report

- Carried Forward
  - Lampasas River, 5c, bacteria
    - 1217_04
  - North Fork Rocky Creek, 5c, Depressed Dissolved Oxygen
    - 1217D (entire stream segment)
- New Listings
  - Sulphur Creek, 5c, Depressed Dissolved Oxygen
    - 1217B_02

Draft 2010 Integrated Report

- Removal from the list does NOT eliminate the need for a WPP
- If delisting occurs, it will not be because river has improved or is no longer impaired
- Delisting will be because assessment criteria has changed
- WPP allows us to sustain and protect our water quality in our transitioning watershed
- WPP allows us to identify other concerns… not just bacteria

Questions?? »

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Water Quality Data Analysis in the Lampasas River Watershed

Steve Potter
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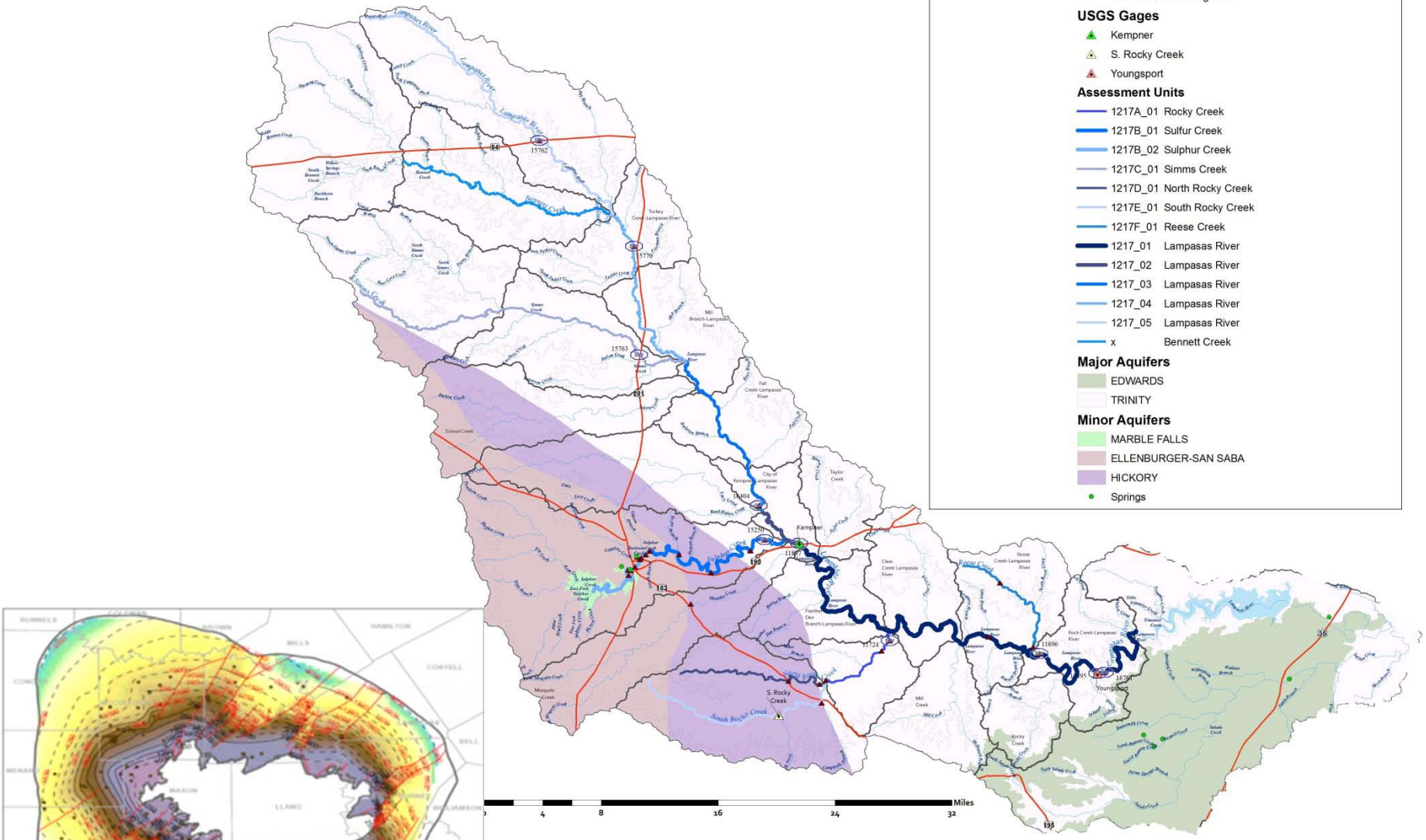
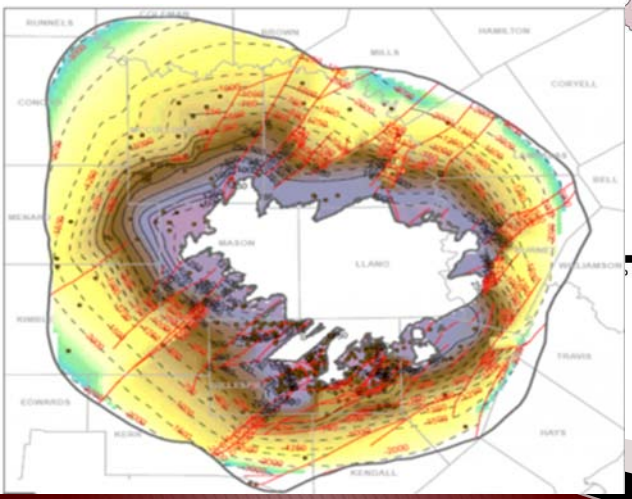
With all thy getting, get understanding.

Sulphur Creek at the city park in Lampasas, TX

Topics

- Major Hydrologic Features of the Lampasas Watershed
- Monitoring Data Quantity & Quality
- Data Trends & Patterns
- Wrap up: Understanding => Wise Solutions





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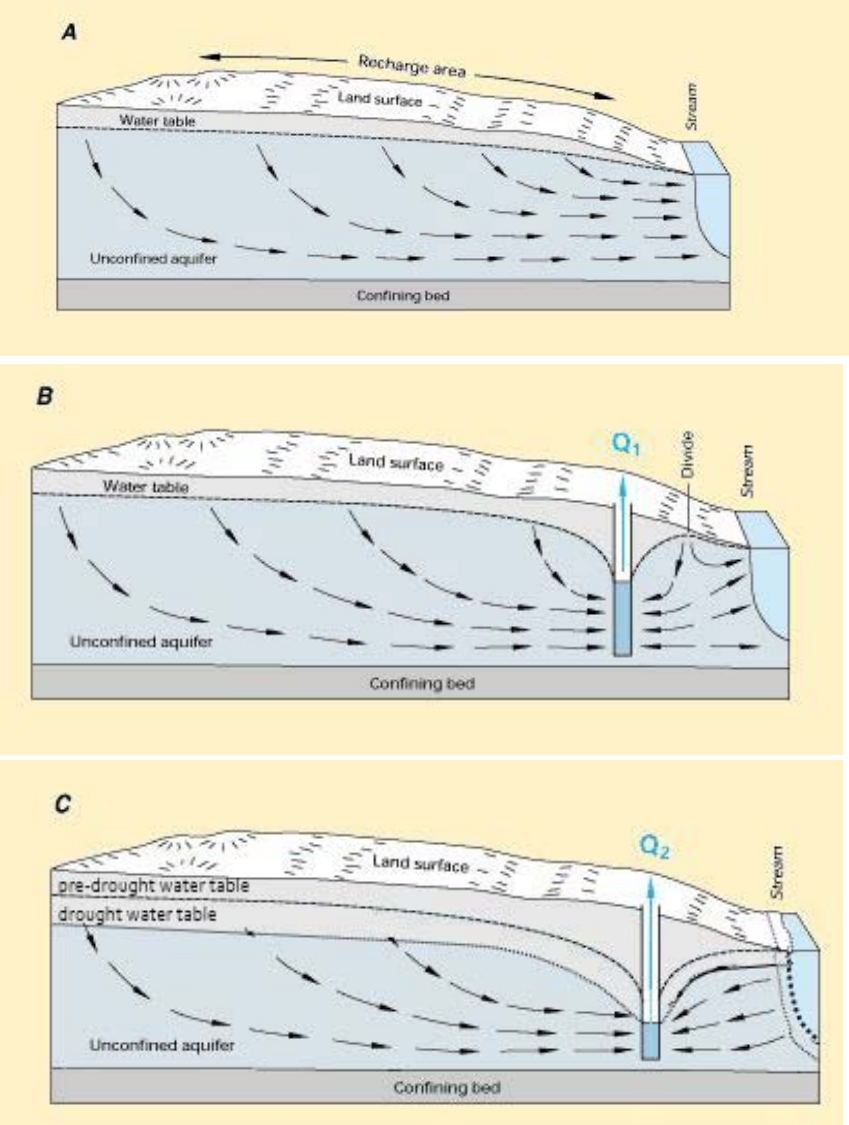
Ground-Surface Water Interactions in Lower Watershed

Stream name	Lampasas R iver	Lampasas R iver	Sulphur Creek	Sulphur Creek
Reach length (river mi)	79.8	15.7	3.67	3.67
Total no. of measurement sites	22	6	9	9
No. of measurement sites on main channel	12	4	6	6
Major aquifer outcrop intersected by reach	Edwards, Trinity	Edwards	Trinity	Trinity
Total gain or loss (-) in reach (CFS)	–5.5	15.88	15.2	11.7
Gain or loss per mile of reach	–.069	1.011	4.142	3.188
Reference	USGS (1964)	USGS (1969)	TBWE (1960)	TBWE (1960)



Stream Gain/Loss Studies in the Lampasas

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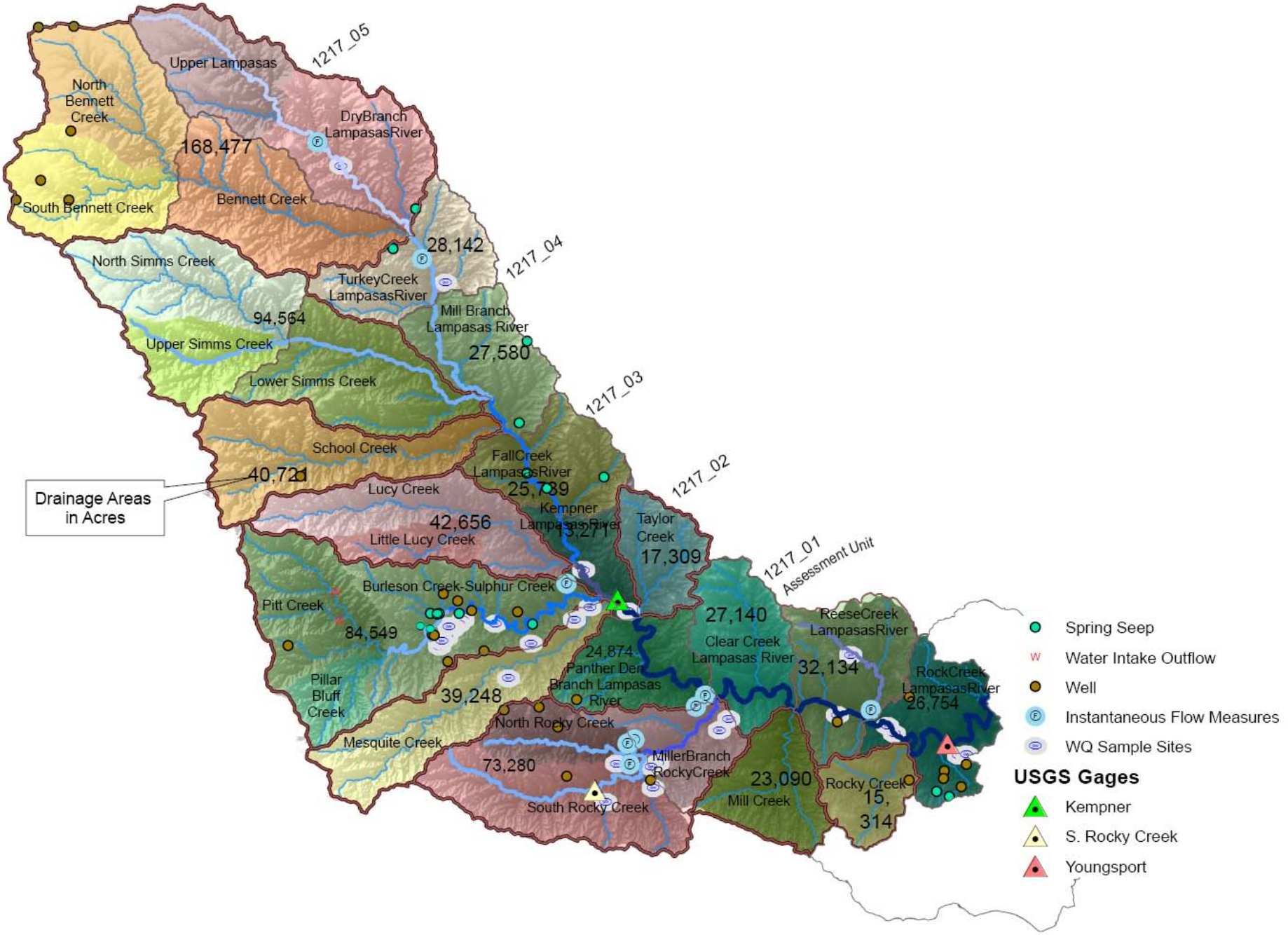
1217_05
Upper Lampasas
North Bennett Creek
168,477
DryBranch LampasasRiver
Bennett Creek
South Bennett Creek
28,142
1217_04
North Simms Creek
TurkeyCreek LampasasRiver
94,564
Mill Branch Lampasas River
27,580
Upper Simms Creek
Lower Simms Creek
1217_03
School Creek
40,721
FallCreek LampasasRiver
25,739
Drainage Areas in Acres
Lucy Creek
1217_02
Kempner LampasasRiver
13,271
42,656
Little Lucy Creek
Taylor Creek
17,309
1217_01 Assessment Unit
Burleson Creek-Sulphur Creek
Pitt Creek
84,549
27,140
ReeseCreek LampasasRiver
Clear Creek Lampasas River
24,874
Panther Den Branch Lampasas River
32,134
RockCreek LampasasRiver
26,754
Pillar Bluff Creek
39,248
North Rocky Creek
Mesquite Creek
MillerBranch RockyCreek
73,280
23,090
Rocky Creek
15,314
Mill Creek
South Rocky Creek
Spring Seep
Water Intake Outflow
Well
Instantaneous Flow Measures
WQ Sample Sites
USGS Gages
Kempner
S. Rocky Creek
Youngsport

Monitoring Data Quantity & Quality

USGS Gage Site at South Rocky Creek

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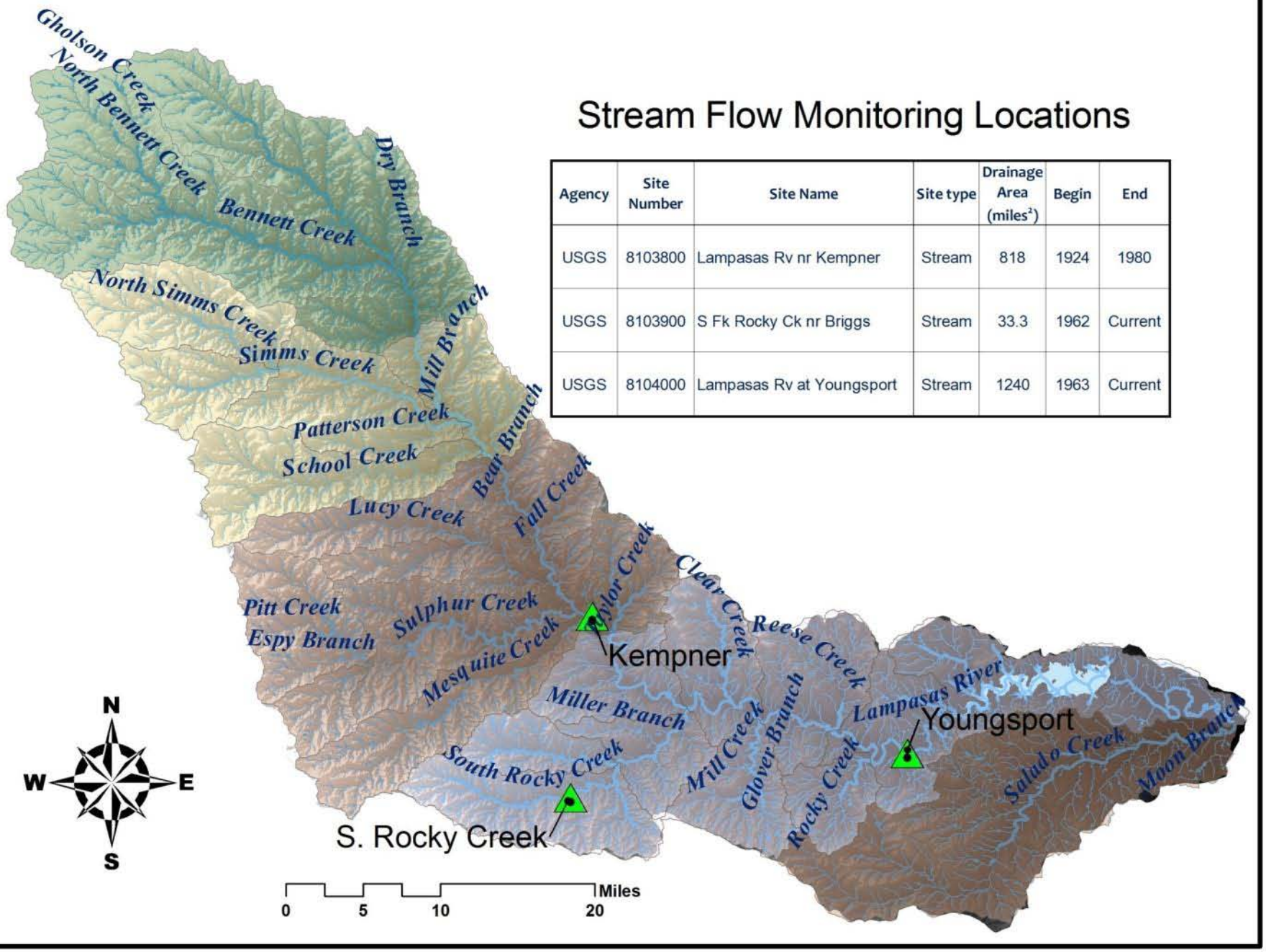
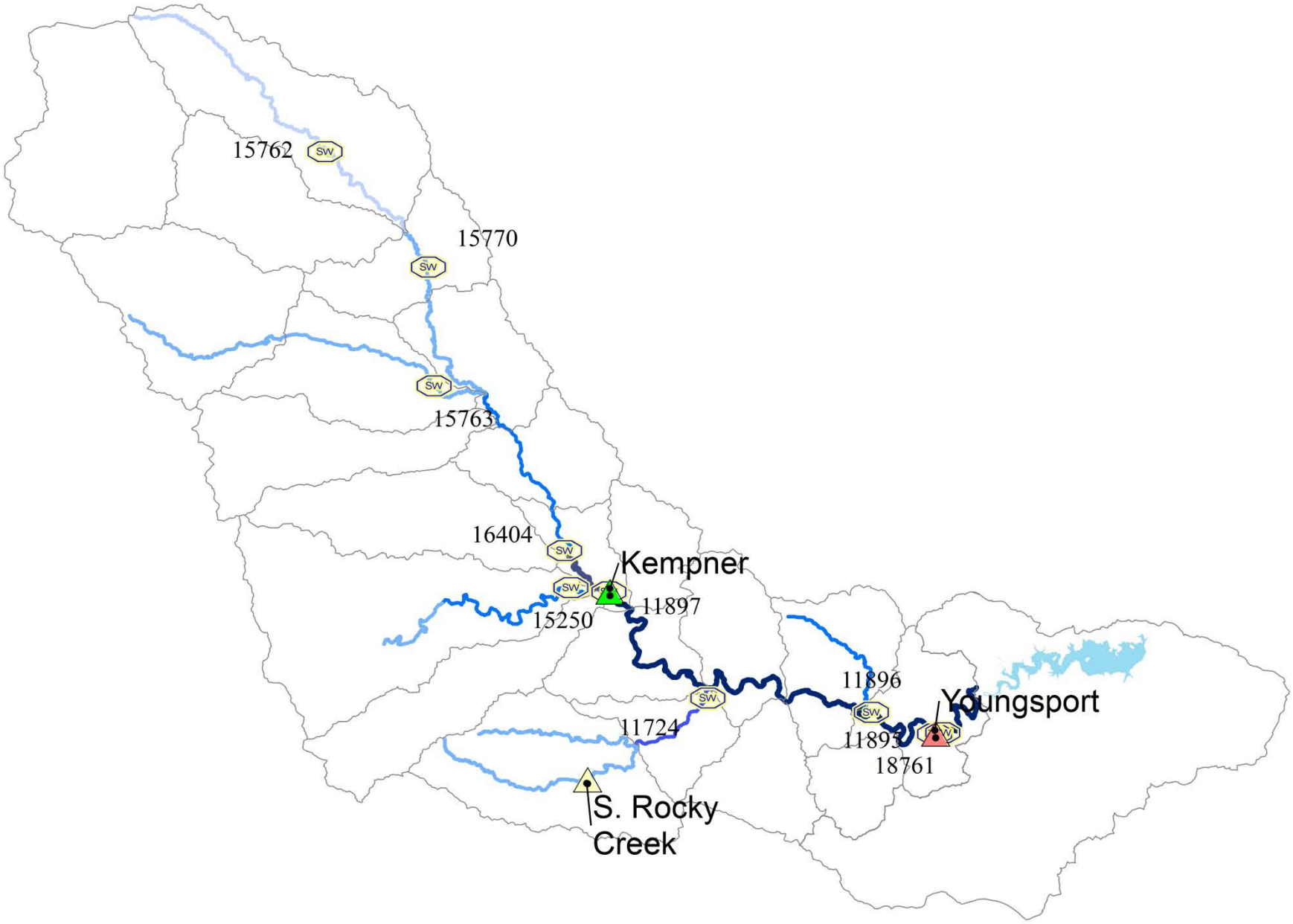
Monitoring Data Quantity & Quality

- Historic monitoring sites and USGS gage locations
- Are there sufficient monitoring data across time and space to evaluate water quality in the Lampasas River?
- What, if any, are the watershed-specific conditions or factors which may affect or limit our ability to evaluate the water quality?
- Strengths and weaknesses of available monitoring data
  - Key time, space, and parameter limitations

Stream Flow Monitoring Locations



Agency	Site Number	Site Name	Site type	Drainage Area (miles^2)	Begin	End
USGS	8103800	Lampasas Rv nr Kempner	Stream	818	1924	1980
USGS	8103900	S Fk Rocky Ck nr Briggs	Stream	33.3	1962	Current
USGS	8104000	Lampasas Rv at Youngsport	Stream	1240	1963	Current


15762
15770
15763
16404
Kempner
11897
15250
11896
Youngsport
11724
11893
18761
S. Rocky
Creek

Total Sample Counts by Assessment Unit

AU	Num. Stations	E Coli	FECAL COLIFORM	FLOW STREAM, INSTANT-ANEOUS	NITRITE PLUS NITRATE	ORTHO-PHOSPHATE	CHLORIDE	SULFATE	TDS	TSS	*Grand Total*
1217_01	3	74	187	39	114	56	240	241	67	243	*1261*
1217_02	1	37	36	82	74	60	84	83	31	89	*576*
1217_03	1		15		15		14	14		16	*74*
1217_04	1	2	12	4	13		12	12		13	*68*
1217_05	1		14	3	15		14	13		15	*74*
1217A_01	4	17	17	65	77	18	81	79	52	85	*491*
1217B_01	4	83	41	28	92	97	98	97	39		*575*
1217B_02	6	78			73	80	82	78	25		*416*
1217B_02'	1	7			7	7	7	7			*35*
1217C_01	1		13	1	14	14	13	12			*67*
1217D_01	1			15	11	11	11	11	12		*71*
1217E_01	3		38	86	72	47	79	80	67	31	*500*
1217F_01	2	6		2	9	9	9	9			*44*
Grand Total		*304*	*373*	*325*	*586*	*399*	*744*	*736*	*293*	*492*	*4252*

Temporal Trends

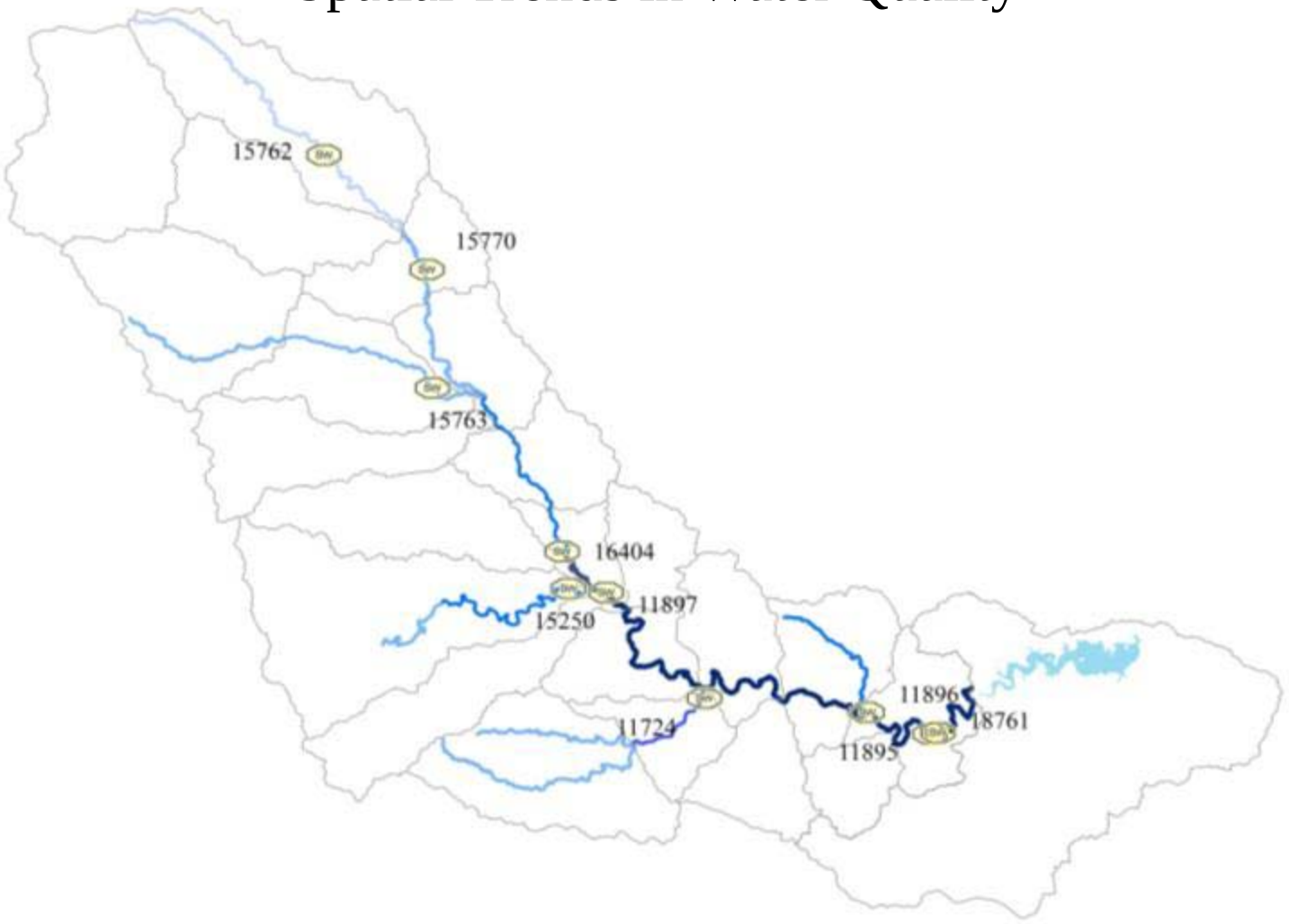
- Changes Over Time

Has the water quality changed over time (years)? If so, how?

Spatial Trends

- Spatial
  - How does the water quality change along the river from headwaters downstream to the outlet at the lake?
  - How do inputs from tributaries affect river water quality?
  - Can interactions between time and space and space be revealed in the data?

Key Monitoring Locations for Identifying Spatial Trends in Water Quality



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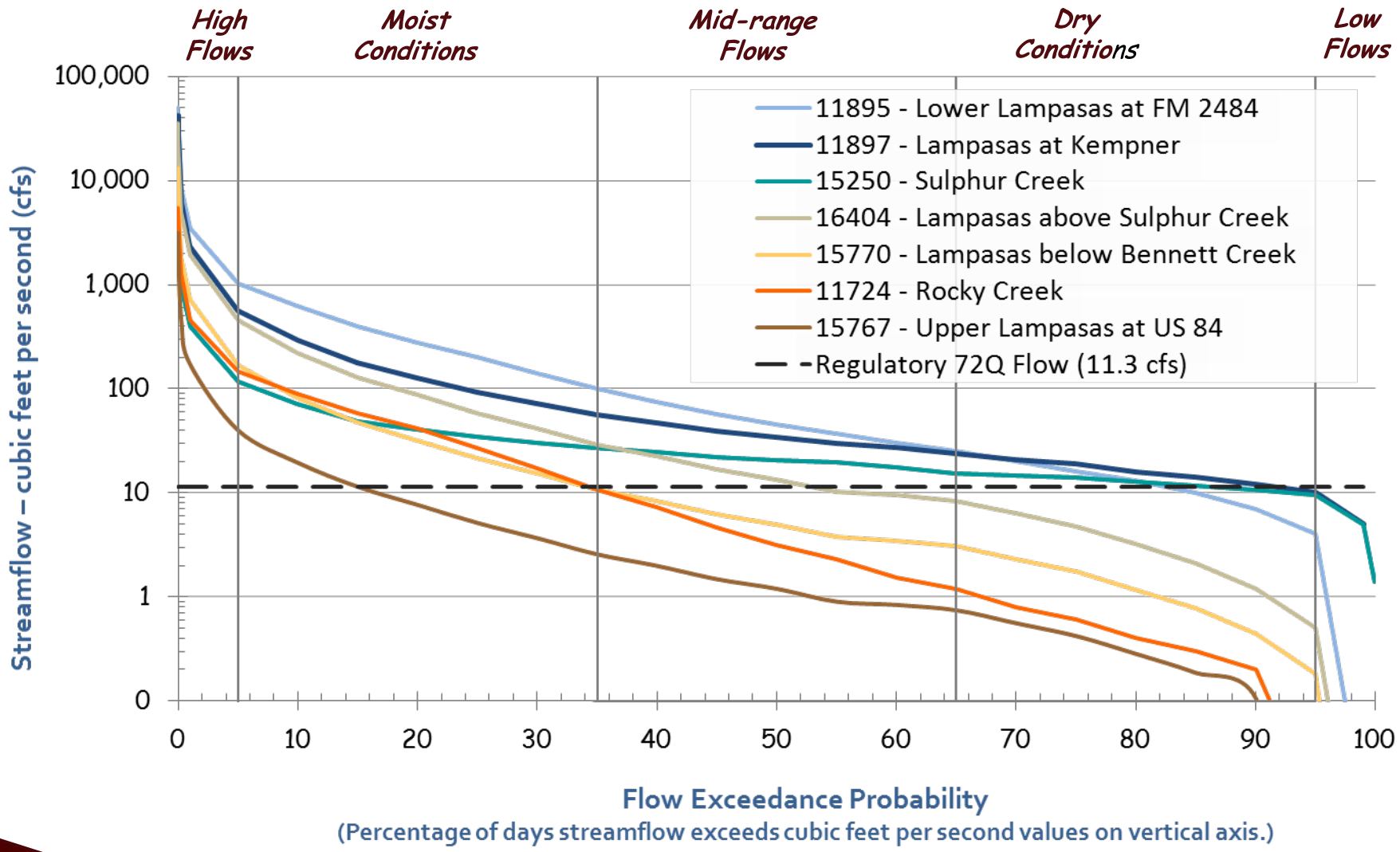
Flow Duration Curves for Lampasas River



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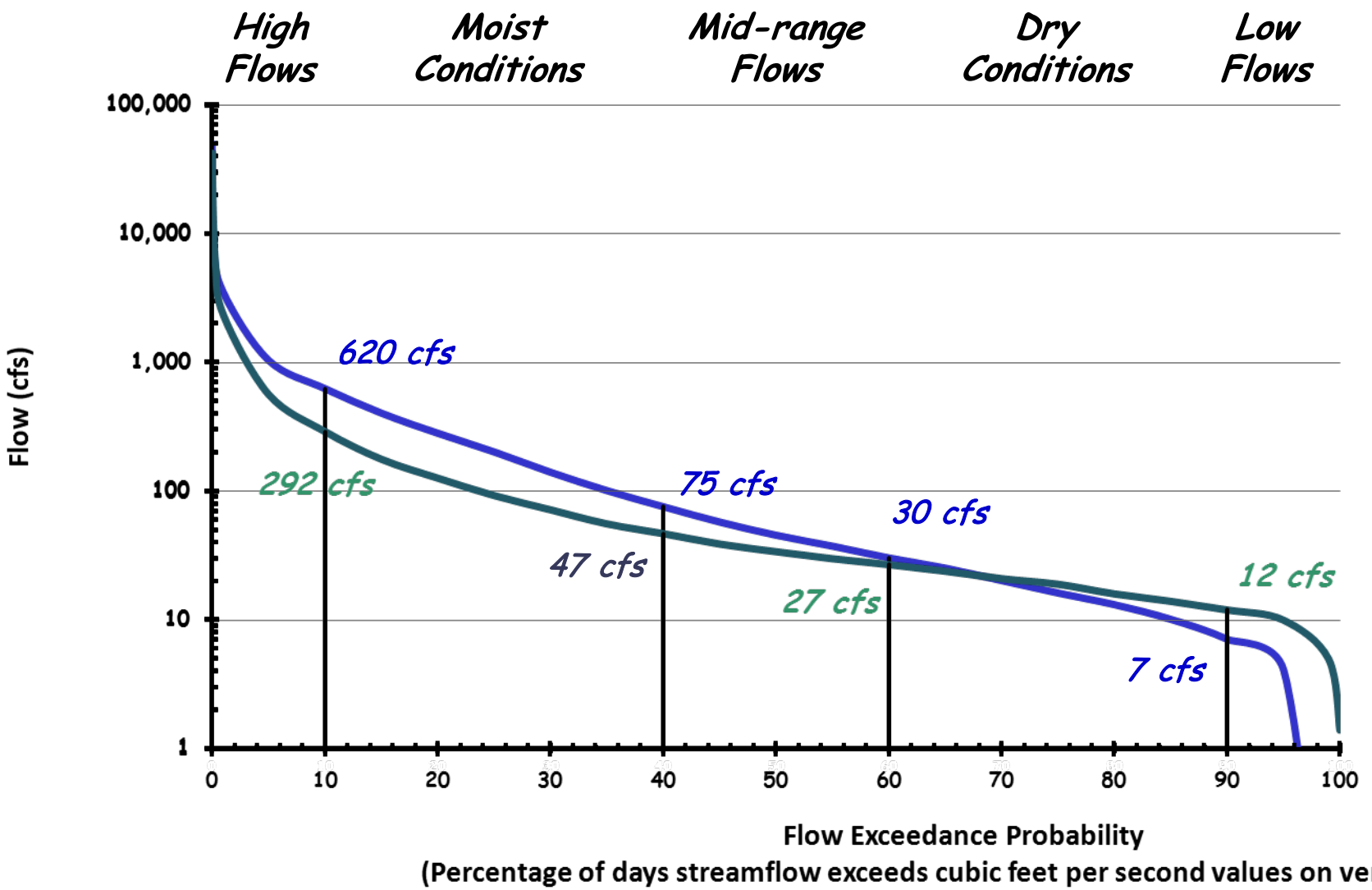

USGS Kempner Gage — Operation: 1962 - 2010 — Drains 818 square miles

USGS Youngsport Gage — Operation: 1924 - 1980 — Drains 1240 square miles

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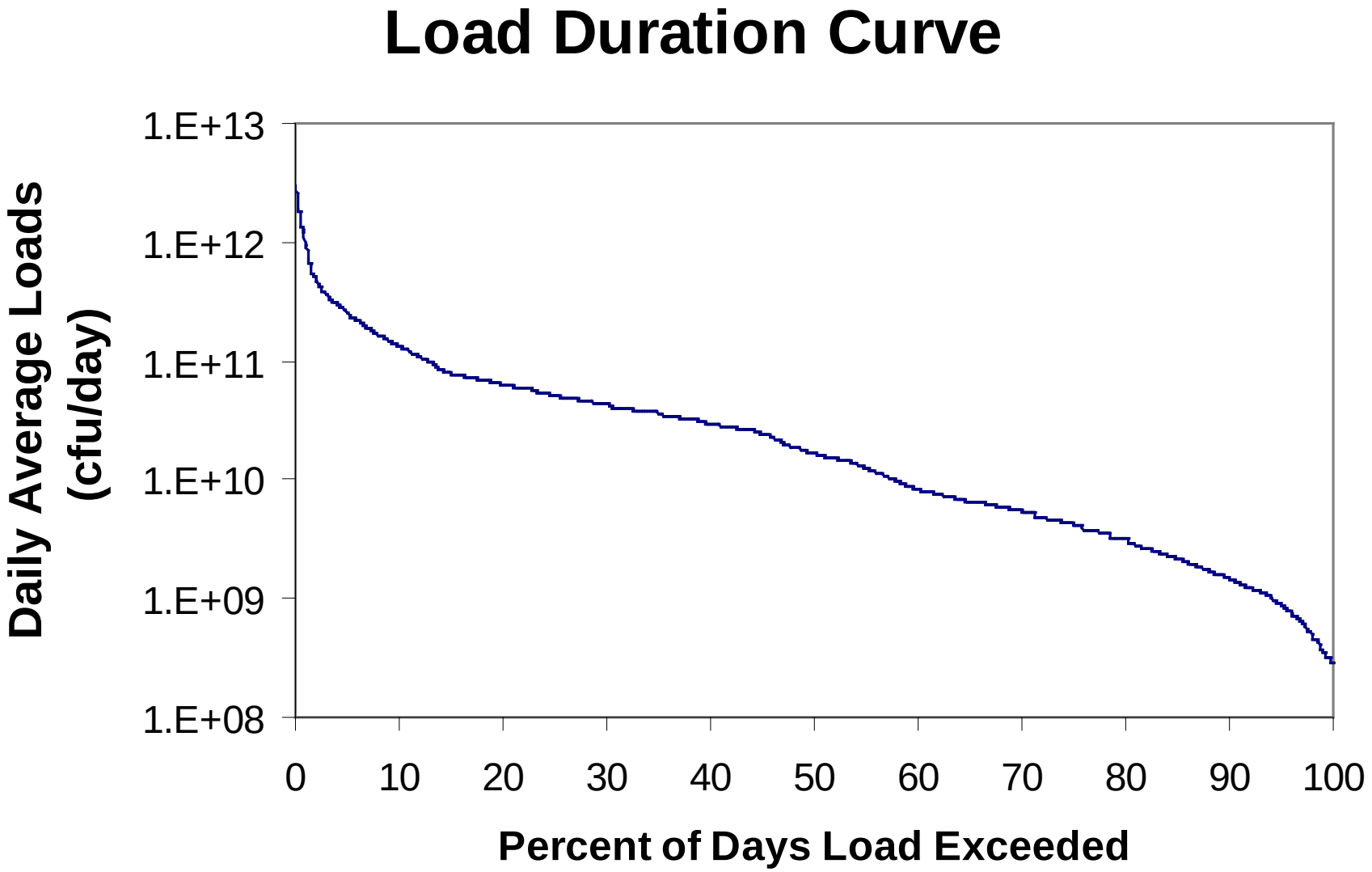
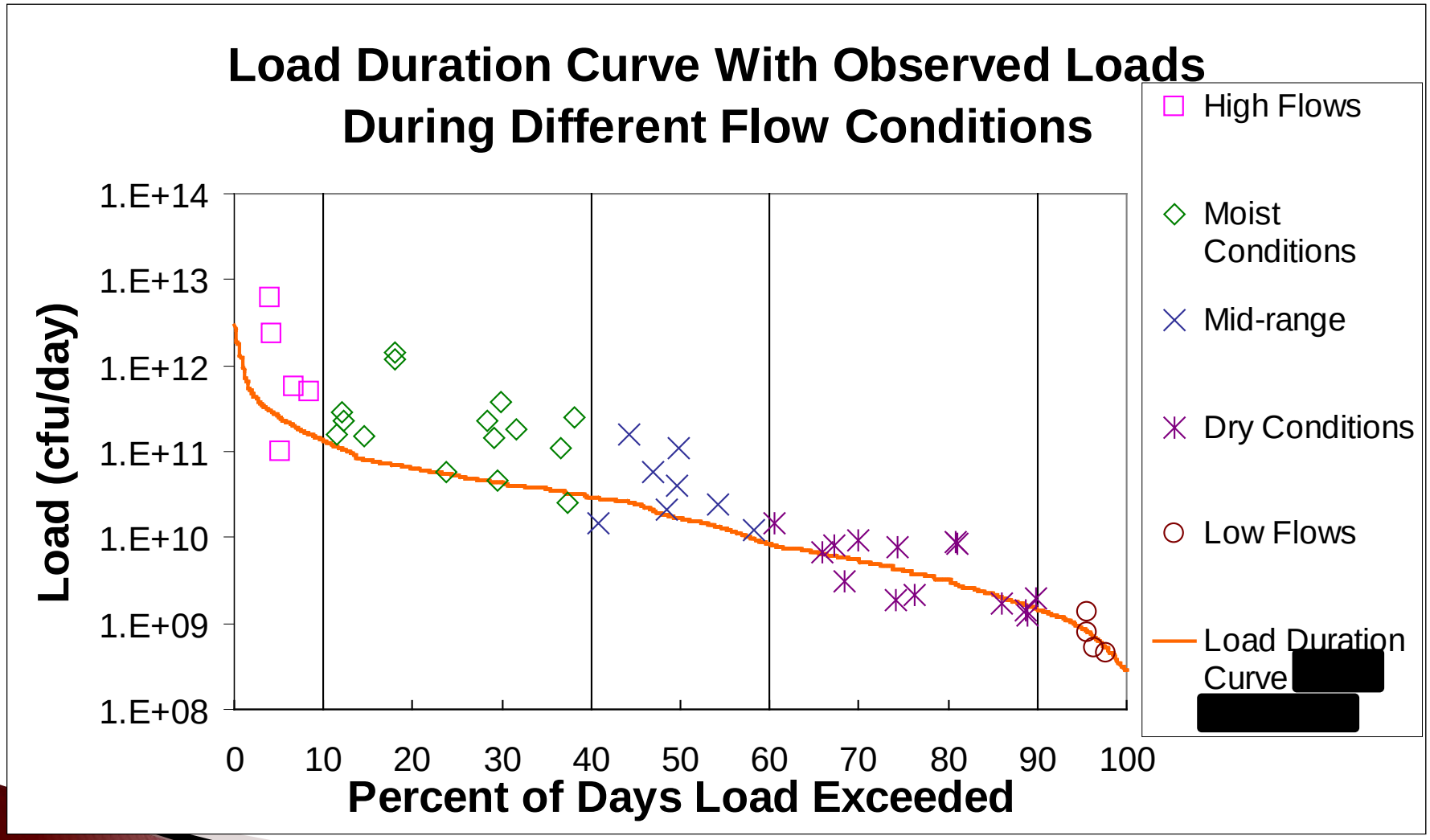
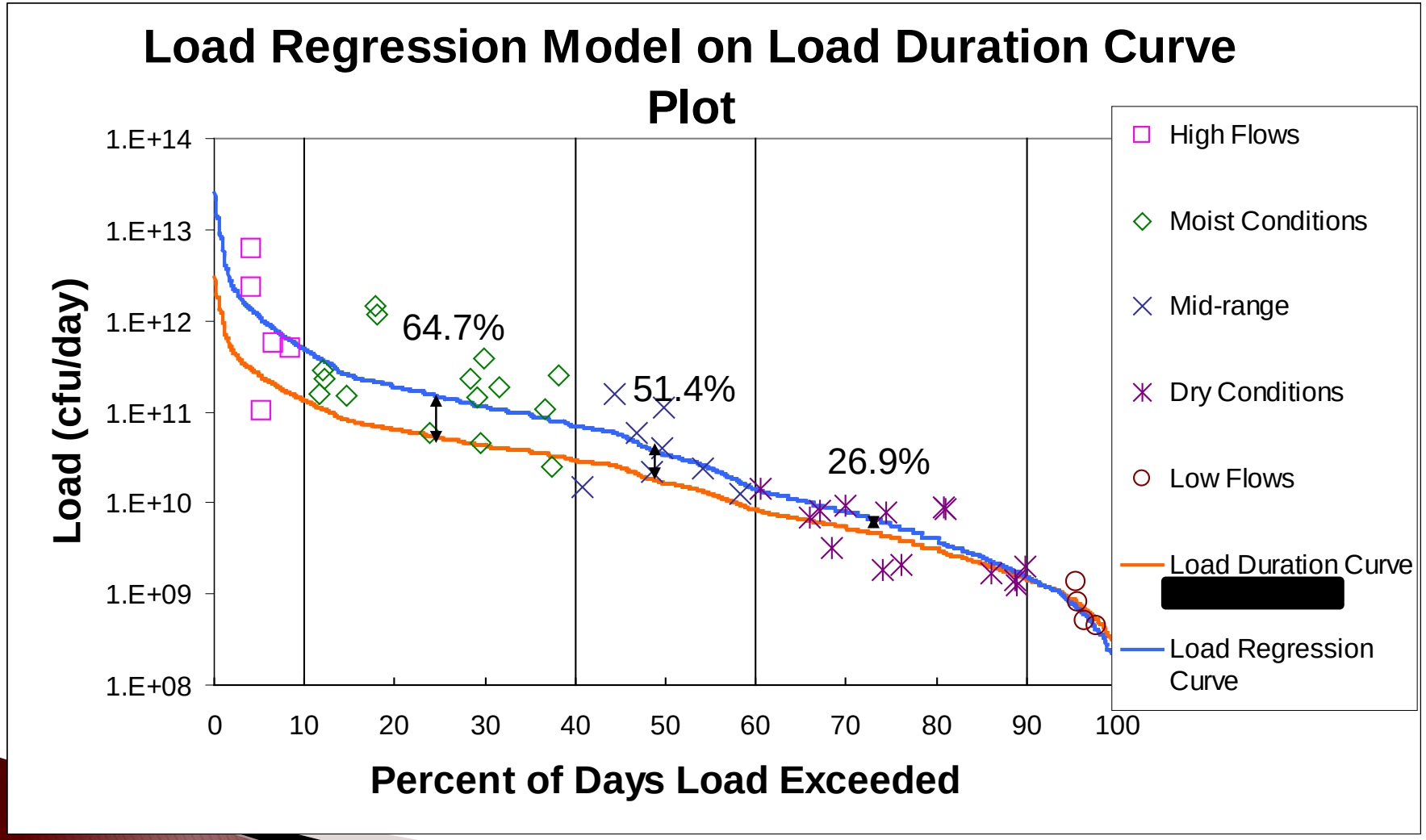
Example Load Duration Curve



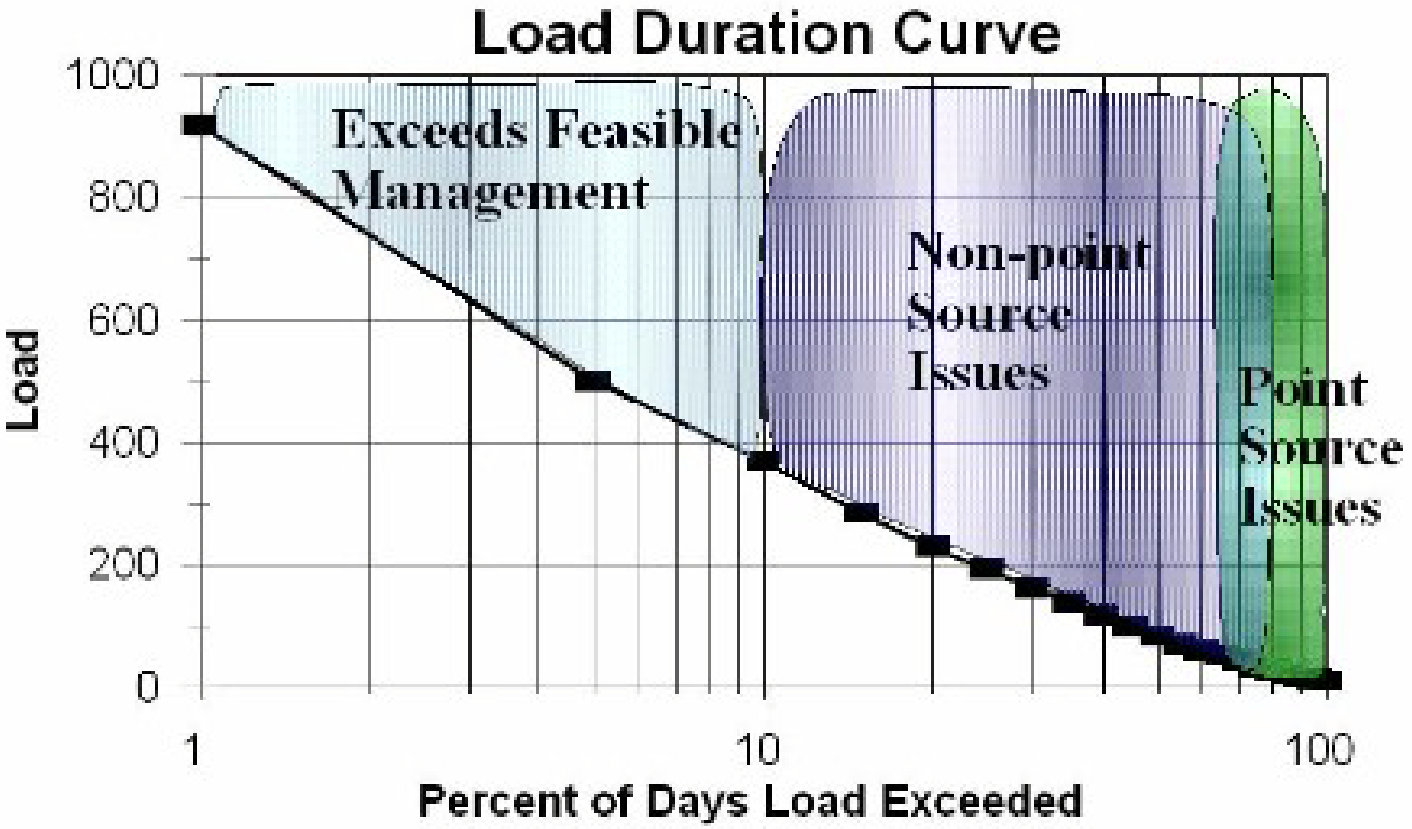
Example Load Duration Curve



Example Load Regression Model



LDC Usefulness (source ID based on LDC)



Load Duration Curve Analysis

Fecal Coliform

LAMPASAS RIVER AT US 84

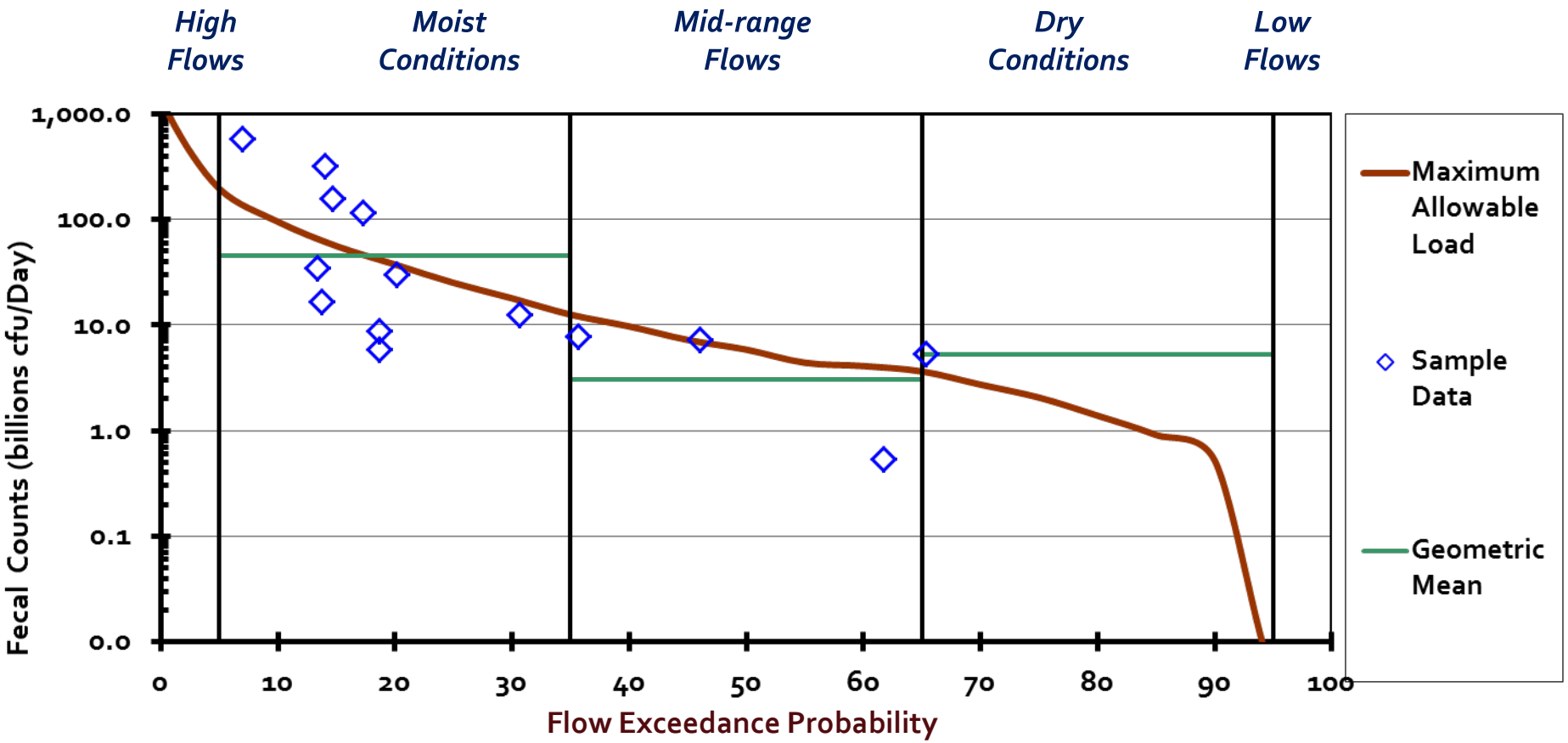
Site: 1217_05_15762

1998 – 1999

Fecal Coliform

Criteria: 200 cfu per 100 ml

Sample Count: 14



(Percentage of days streamflow exceeds cubic feet per second values on Flow Duration chart vertical axis.)

Flood ← → Drought

LAMPASAS RIVER AT CR 105

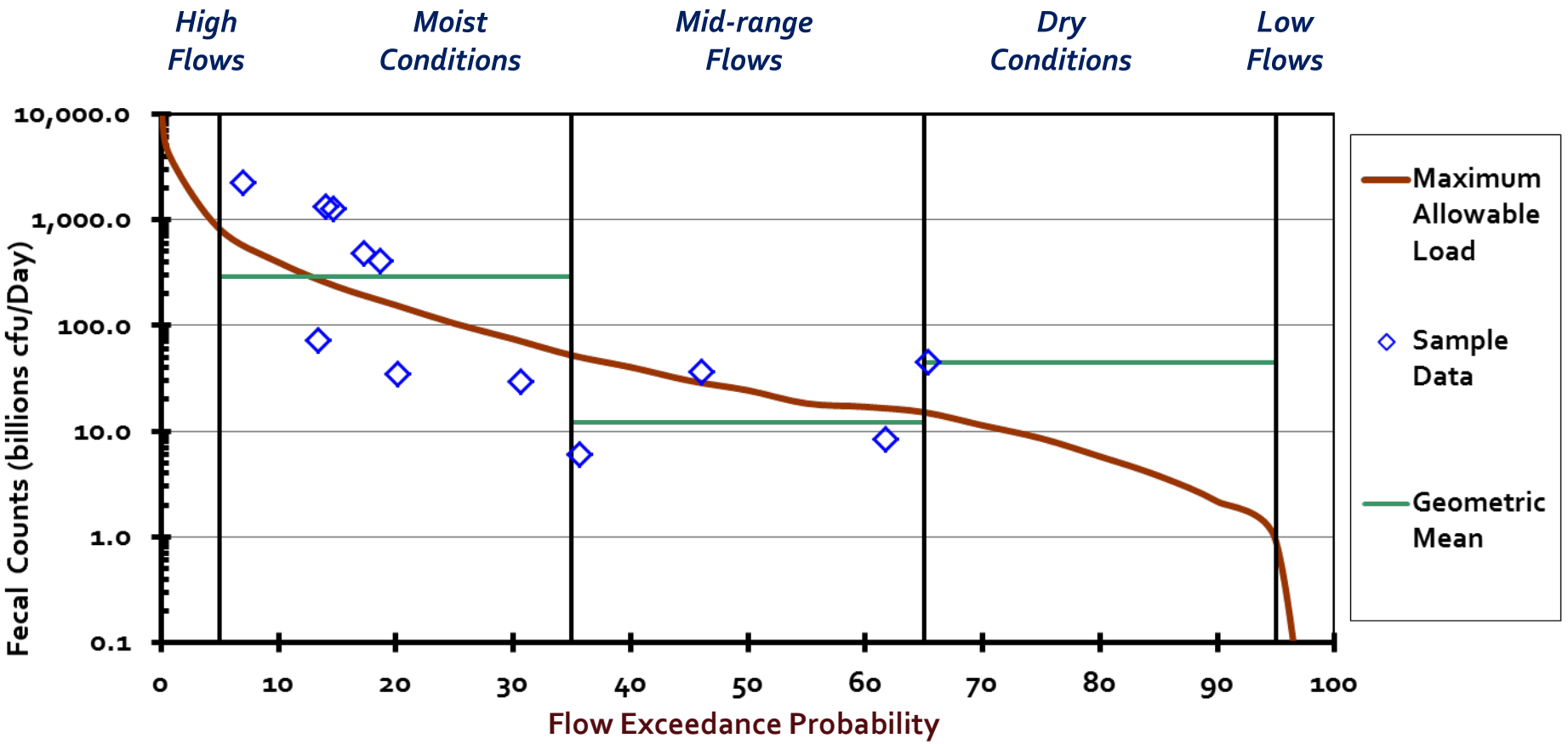
Site: 1217_05_15770

1998 – 1999

Fecal Coliform

Criteria: 200 cfu per 100 ml

Sample Count: 12



(Percentage of days streamflow exceeds cubic feet per second values on Flow Duration chart vertical axis.)

Flood ← → Drought

LAMPASAS RIVER AT FM 2313

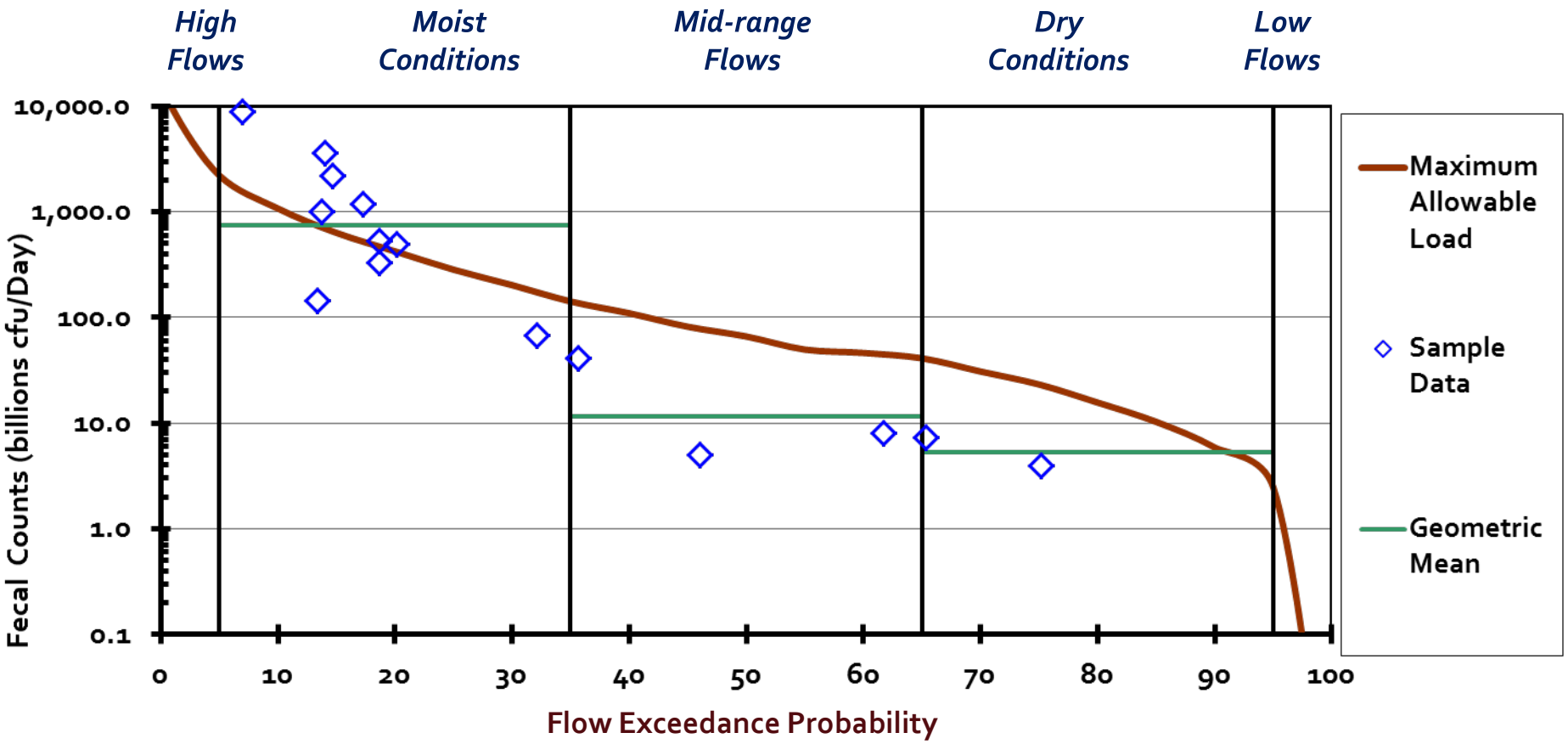
Site: 1217_05_16404

1998 – 1999

Fecal Coliform

Criteria: 200 cfu per 100 ml

Sample Count: 15



(Percentage of days streamflow exceeds cubic feet per second values on Flow Duration chart vertical axis.)

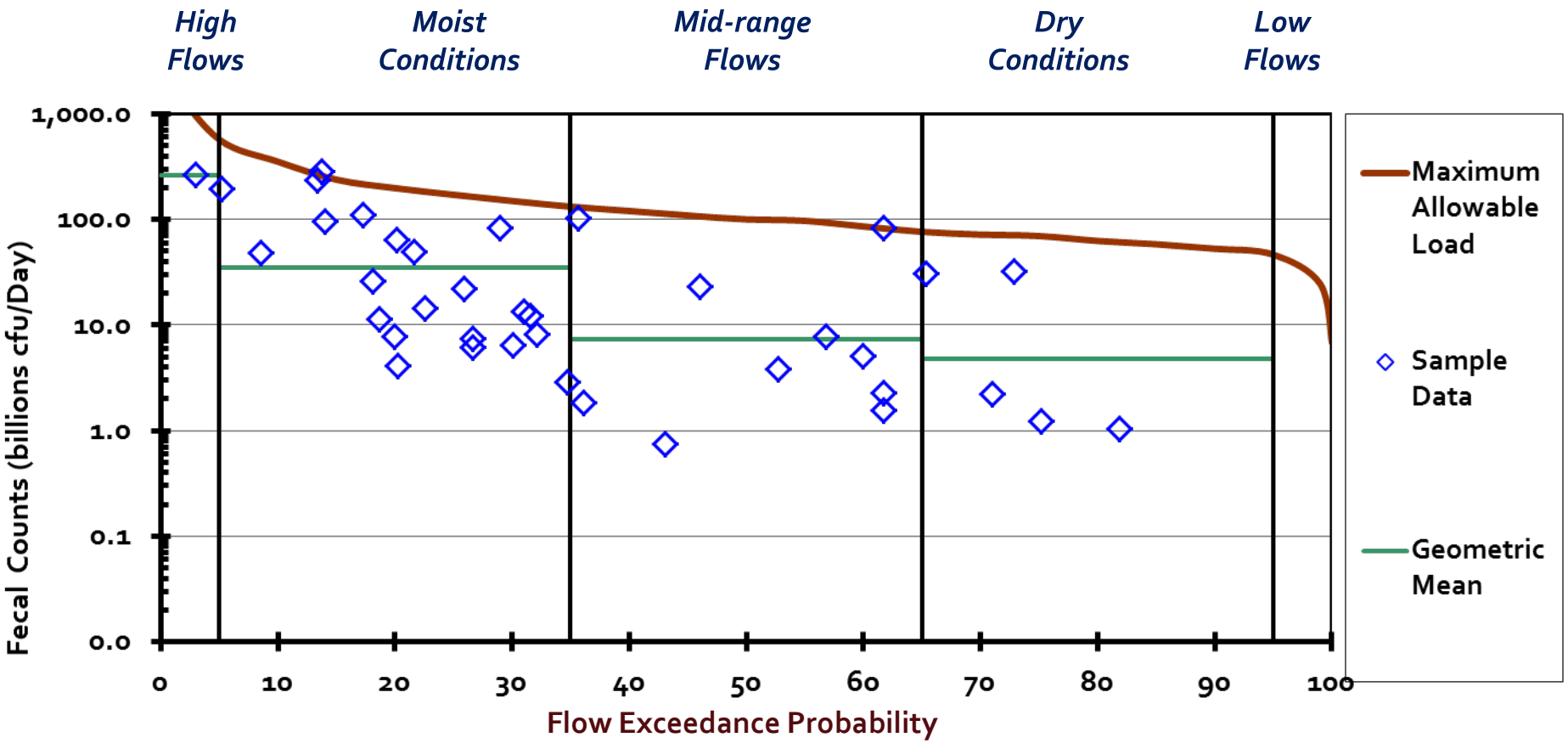
Flood → Drought

SULPHUR CREEK AT LAMPASAS CR 8

Site: 1217B_01_15250

1996 – 2004

Fecal Coliform
Criteria: 200 cfu per 100 ml
Sample Count: 39

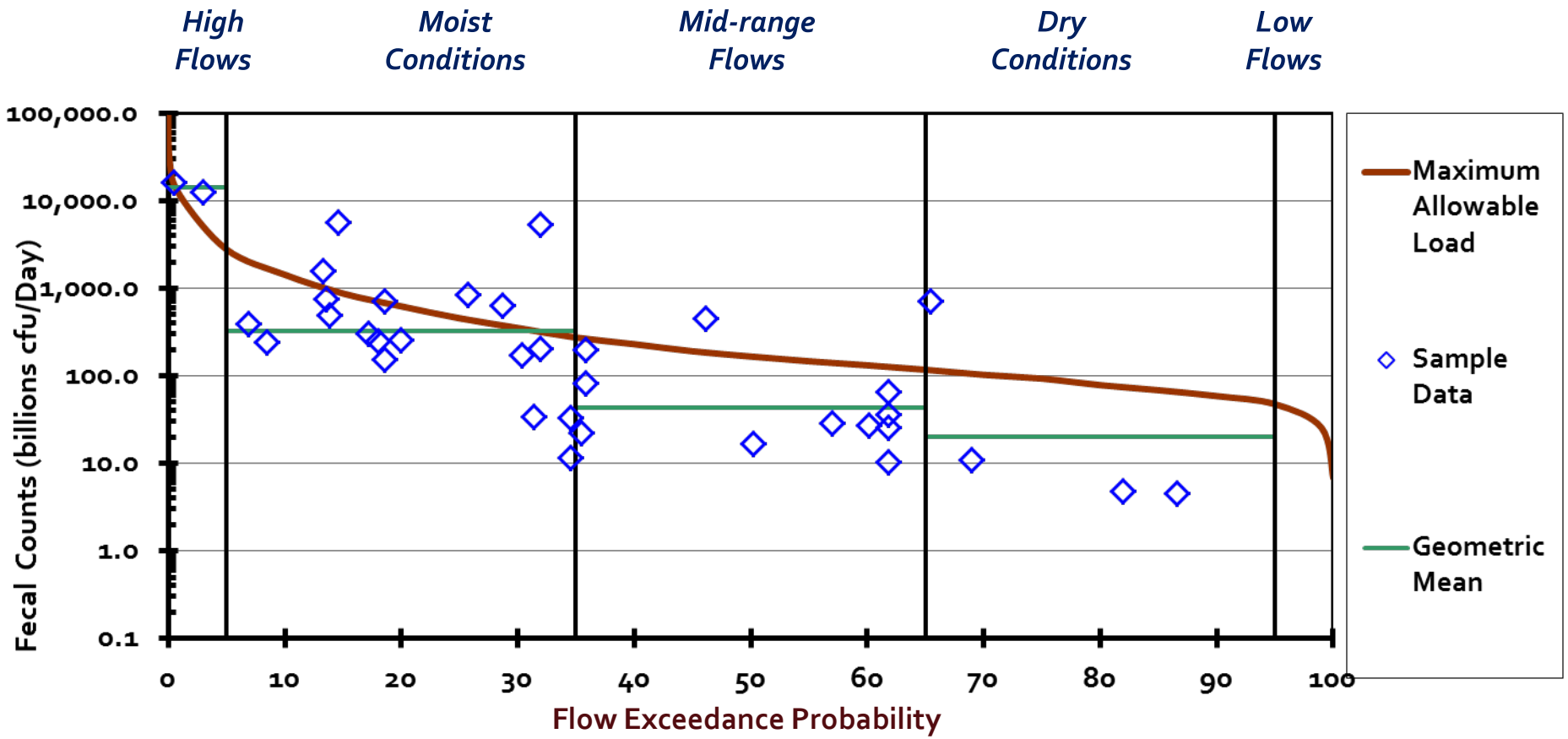


(Percentage of days streamflow exceeds cubic feet per second values on Flow Duration chart vertical axis.)

Flood ← → Drought

Lampasas River near Kempner, TX
Site: 1217_02_11897
1998 – 2004

Fecal Coliform
Criteria: 200 cfu per 100 ml
Sample Count: 36

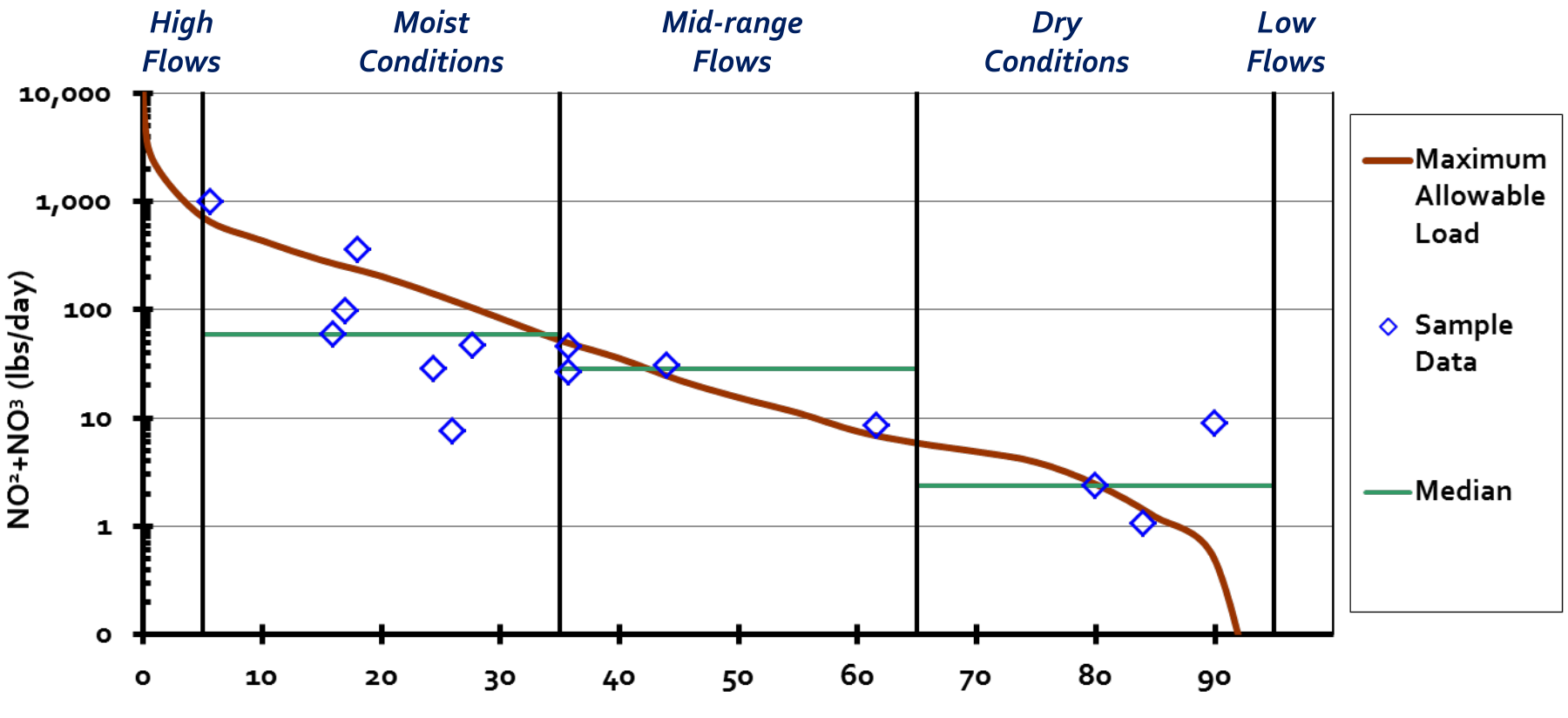


(Percentage of days streamflow exceeds cubic feet per second values on Flow Duration chart vertical axis.)

Flood ← → Drought

Rocky Creek
Site: 1217A_01_11724
1998 - 1999

Fecal Coliform
Criteria: 200 cfu per 100 ml
Sample Count: 15



Flow Exceedance Probability
(Percentage of days streamflow exceeds cubic feet per second values on Flow Duration chart vertical axis.)

Flood ← → Drought

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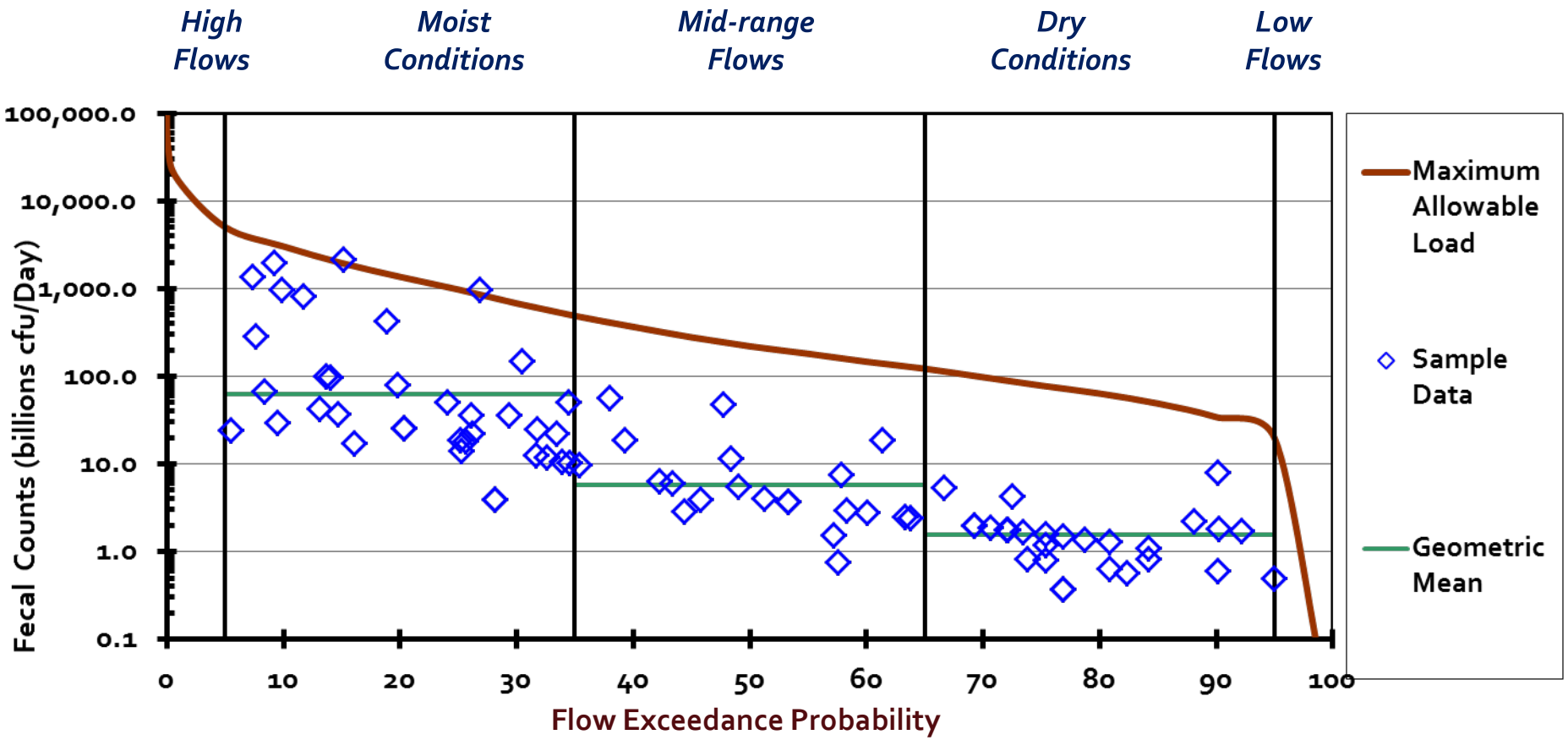
LAMPASAS RIVER AT FM 2484
Site: 1217_02_11895
1973 – 2004

Fecal Coliform
Criteria: 200 cfu per 100 ml
Sample Count: 84



(Percentage of days streamflow exceeds cubic feet per second values on Flow Duration chart vertical axis.)

Flood ← → Drought

E. Coli

LAMPASAS RIVER AT CR 105

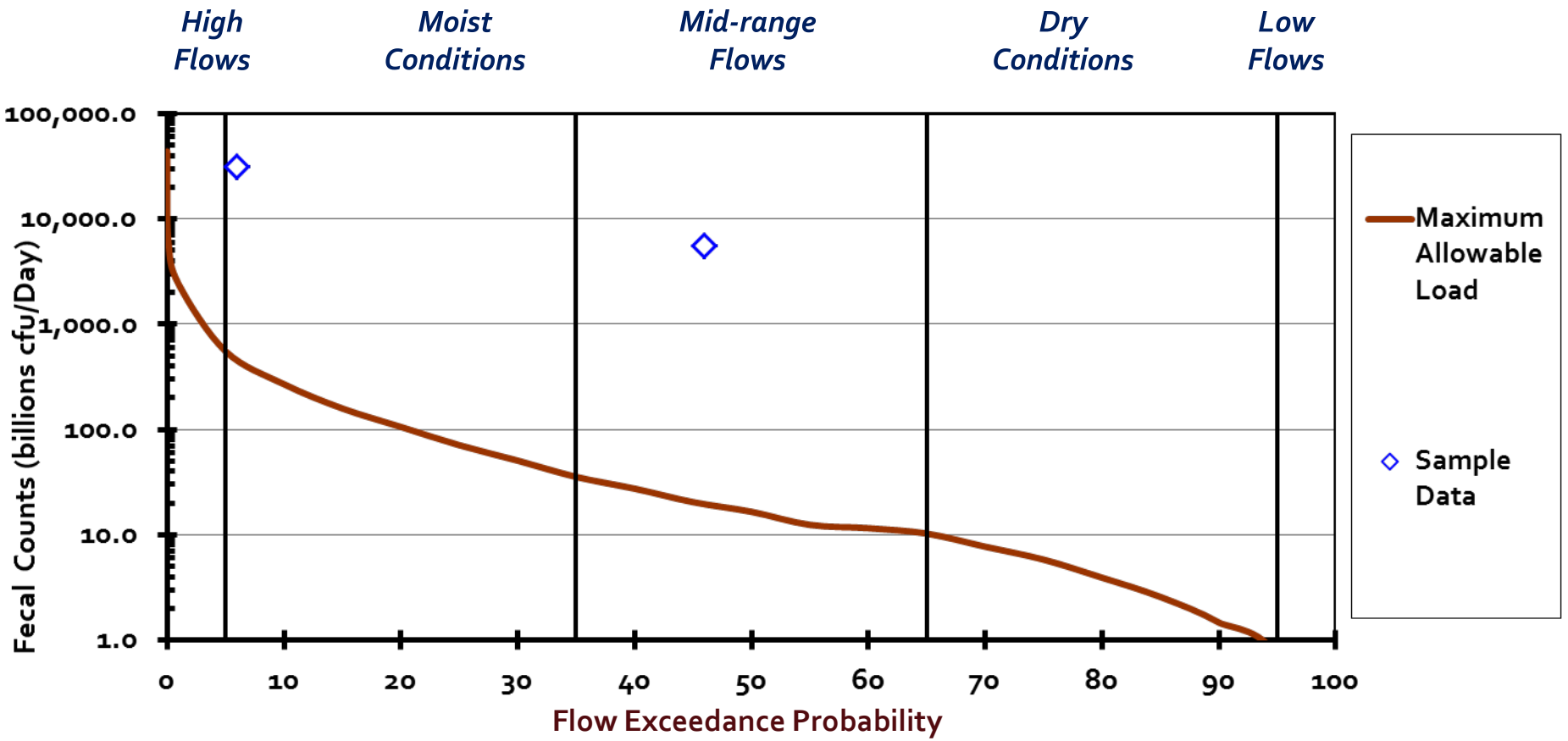
Site: 1217_05_15770

2009

E. Coli

Criteria: 126 cfu per 100 ml

Sample Count: 2



(Percentage of days streamflow exceeds cubic feet per second values on Flow Duration chart vertical axis.)

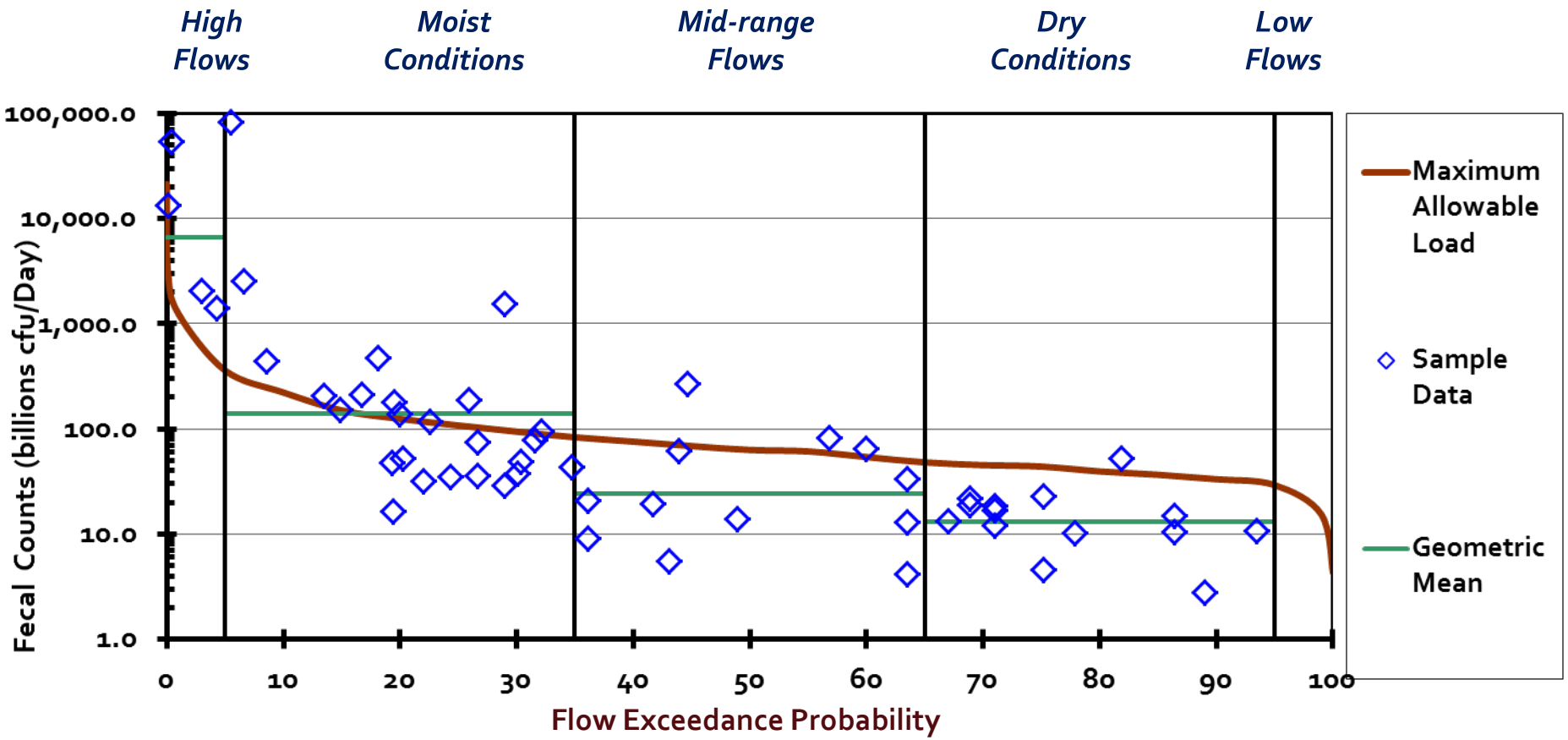
Flood ← → Drought

SULPHUR CREEK AT LAMPASAS CR 8

Site: 1217B_01_15250

2001 – 2009

E. Coli
Criteria: 126 mpn per 100 ml
Sample Count: 55

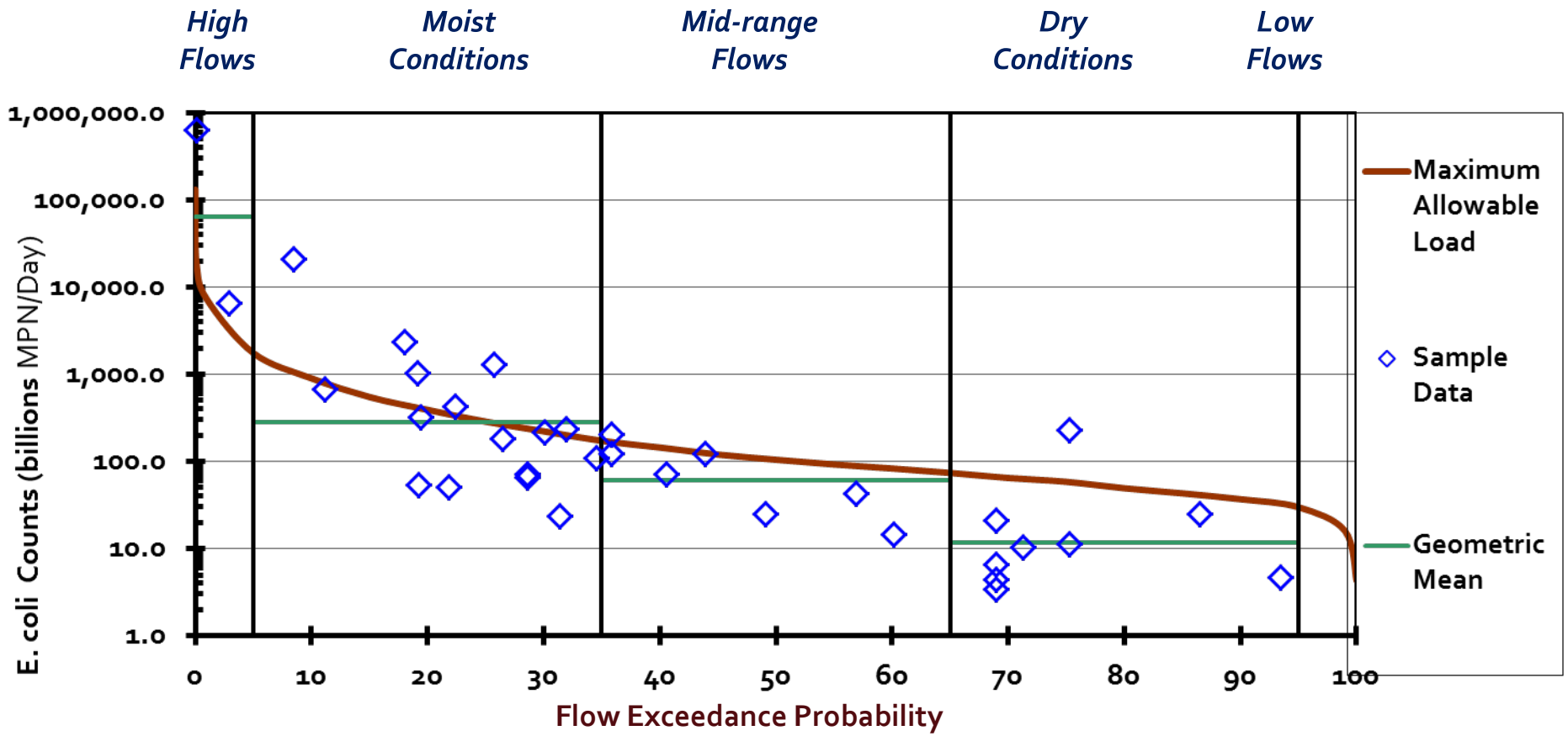


(Percentage of days streamflow exceeds cubic feet per second values on Flow Duration chart vertical axis.)

Flood ← → Drought

Lampasas River near Kempner, TX
Site: 1217_02_11897
2001 – 2009

E. Coli
Criteria: 126 mpn per 100 ml
Sample Count: 37

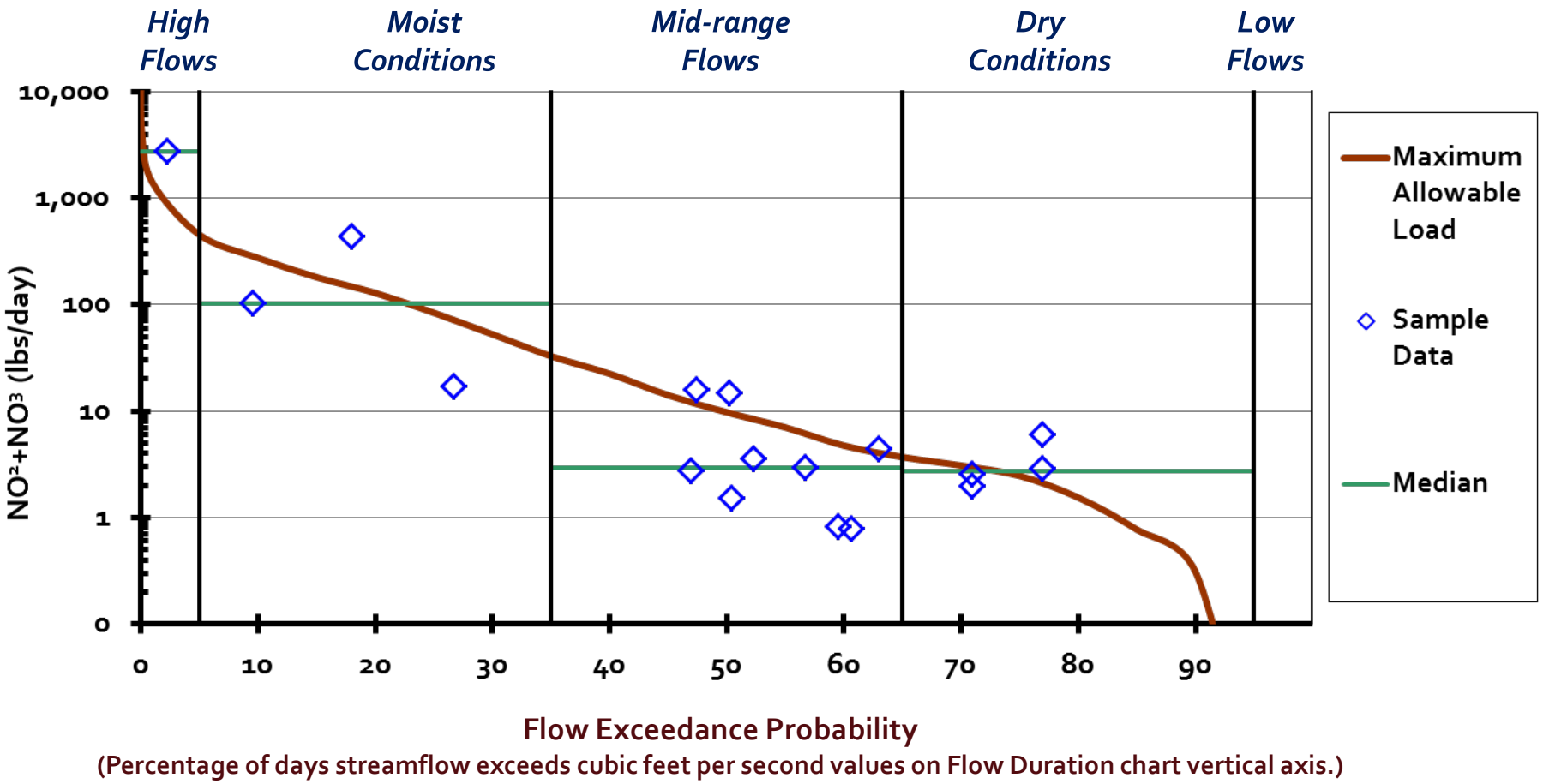


(Percentage of days streamflow exceeds cubic feet per second values on Flow Duration chart vertical axis.)

Flood ← → Drought

Rocky Creek
Site: 1217A_01_11724
2006 - 2009

E. Coli
Criteria: 126 mpn per 100 ml
Sample Count: 17



Flow Exceedance Probability
(Percentage of days streamflow exceeds cubic feet per second values on Flow Duration chart vertical axis.)

Flood ← → Drought

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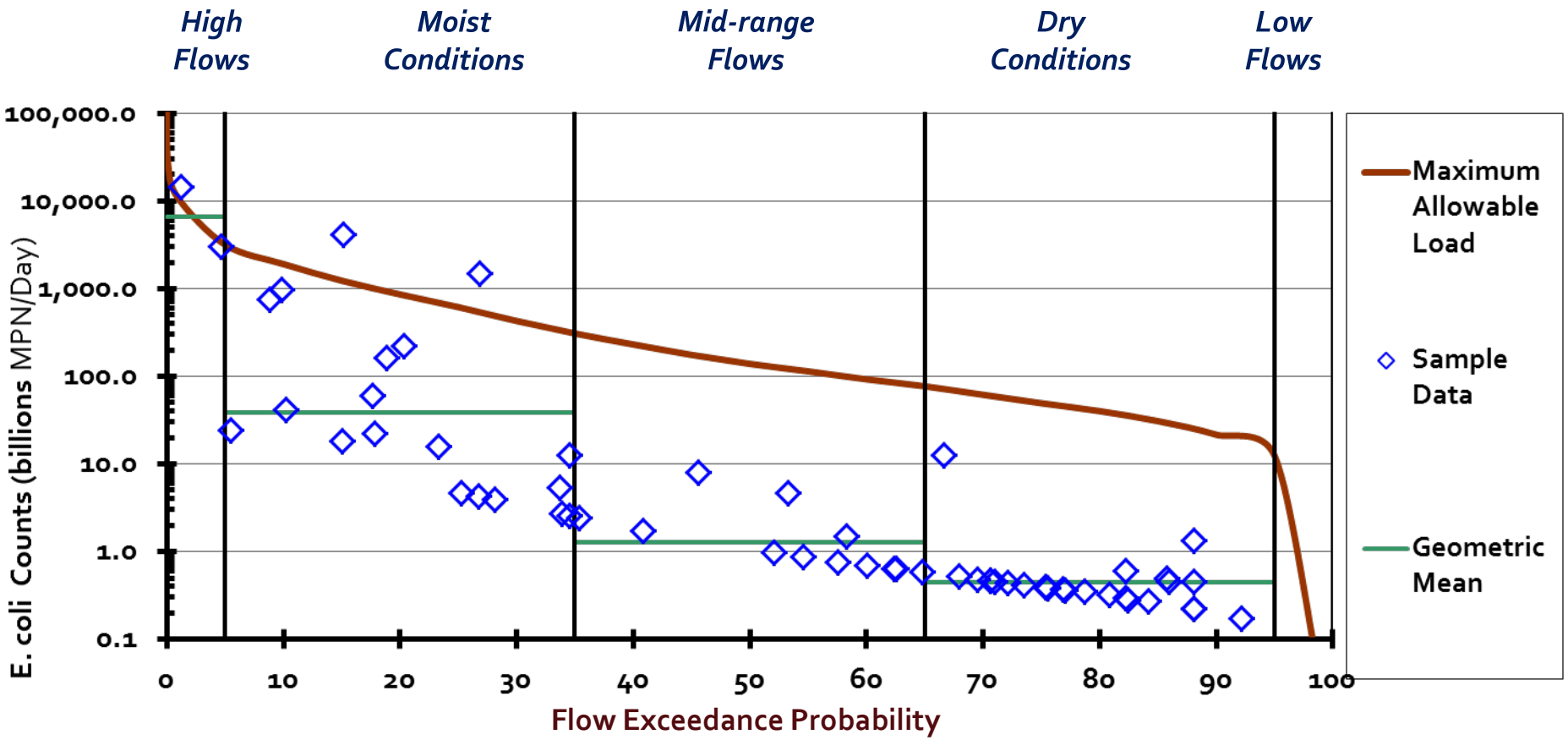
LAMPASAS RIVER AT FM 2484
Site: 1217_02_11895
2004 – 2008

E. Coli
Criteria: 126 mpn per 100 ml
Sample Count: 59



(Percentage of days streamflow exceeds cubic feet per second values on Flow Duration chart vertical axis.)

Flood ← → Drought

"The beginning of wisdom is: Get wisdom."

Proverbs 4:17

Lampasas Watershed in Burnet County

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Next Steps

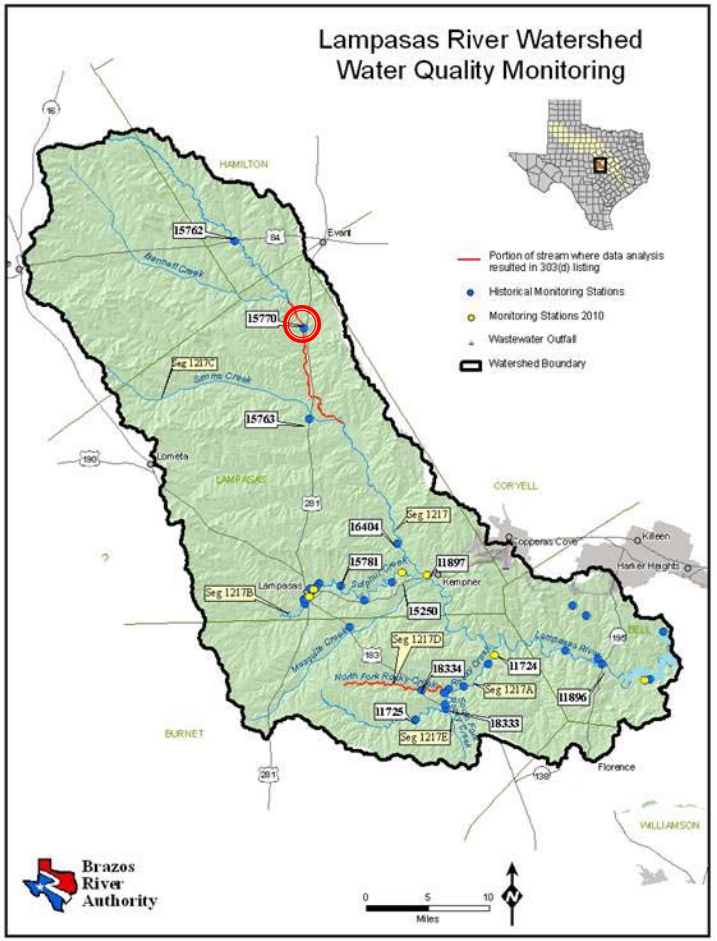
Lisa Prcin
Watershed Coordinator
Texas AgriLife Research at
Blackland Research & Extension Center

Clean Rivers Program Steering Committee Meeting

- 10 a.m. on March 31st at the Brazos River Authority Office, Waco
- Current status of waterbodies and ongoing efforts in the Brazos River Basin
- Discuss 2011 monitoring plans
- Requests may be made for additional monitoring
- Requests will be taken to the Coordinated Monitoring meeting

Clean Rivers Program Steering Committee Meeting

- TCEQ Special Bacteria Study at Station 15770 (red circle on map)
- Areas that the Partnership wants more monitoring?
- Volunteers to attend the CRP Steering Committee Meeting?



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Work Group Meetings

- Work Group meetings in April and May
- April WG meetings
  - Land Use / Land Cover Maps
  - Introduction into the SELECT model
  - Identify potential sources and model inputs

Work Group Meetings

- Initial meeting times:
  - Agricultural Issues –
    - 3rd Monday, 6–9 p.m.
    - April 19th
  - Waste Water Infrastructure –
    - 2nd Wednesday, 2–5 p.m.
    - April 14th
  - Habitat and Wildlife –
    - 2nd Monday, 6–9 p.m.
    - April 12th
  - Urban / Suburban Issues –
    - 2nd Wednesday, 6–9 p.m.
    - April 14th
  - Outreach and Education –
    - 3rd Tuesday, 2–5 p.m.
    - April 20th

Thank You!

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