



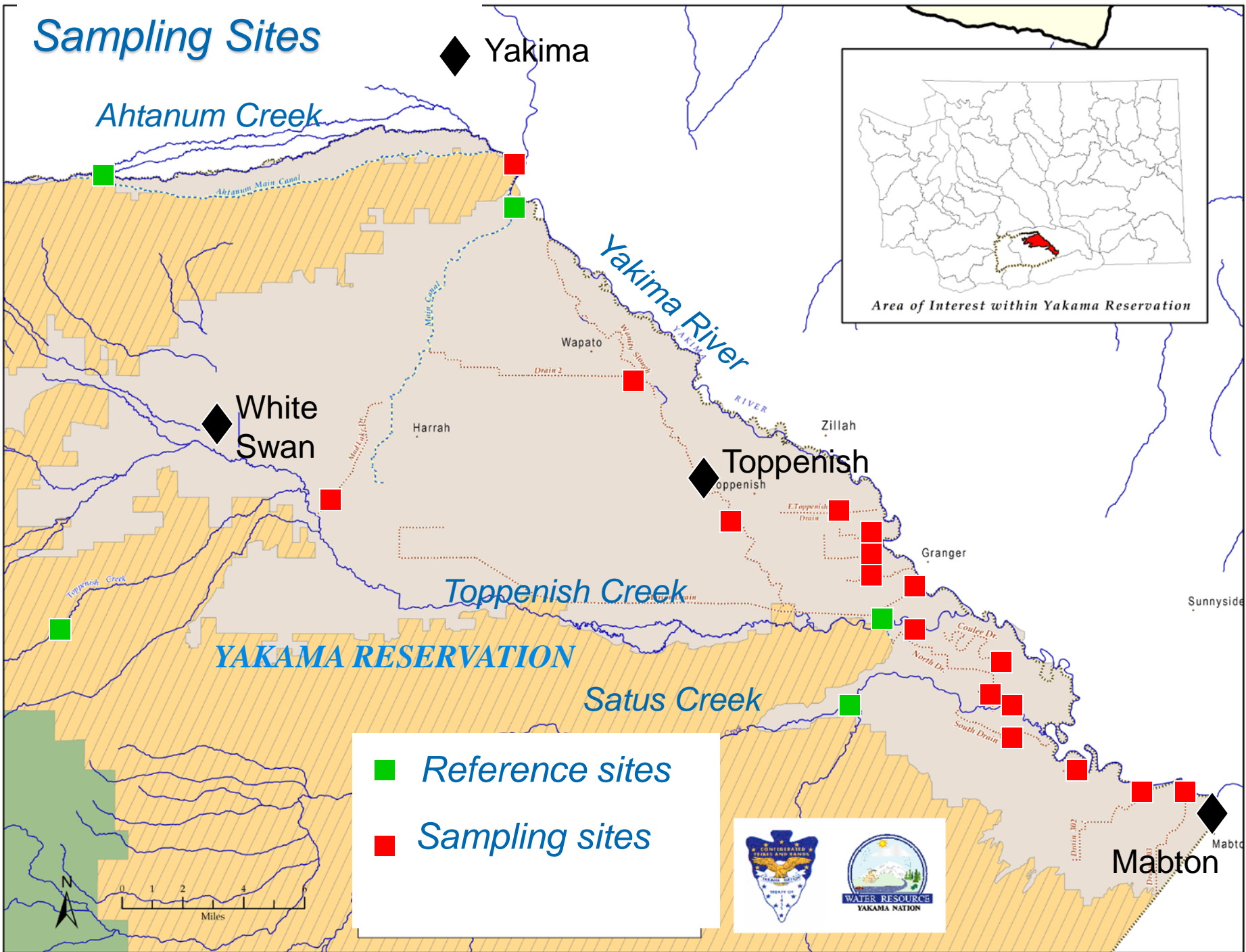
Suspended Sediment Loading in Yakama Reservation Tributaries of the Yakima River





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Partners/Contributors: Dept of Ecology; BIA-Wapato Irrigation Project, Bureau of Reclamation

Sampling Sites



-  Reference sites
-  Sampling sites



13 Tributaries

-Toppenish Creek

-Satus Creek

-Ahtanum Creek

-Marion Drain

-Sub Drain 35

-South Satus Drain

-East Toppenish Drain

-Drain 303

-Drain 302

-Coulee Drain

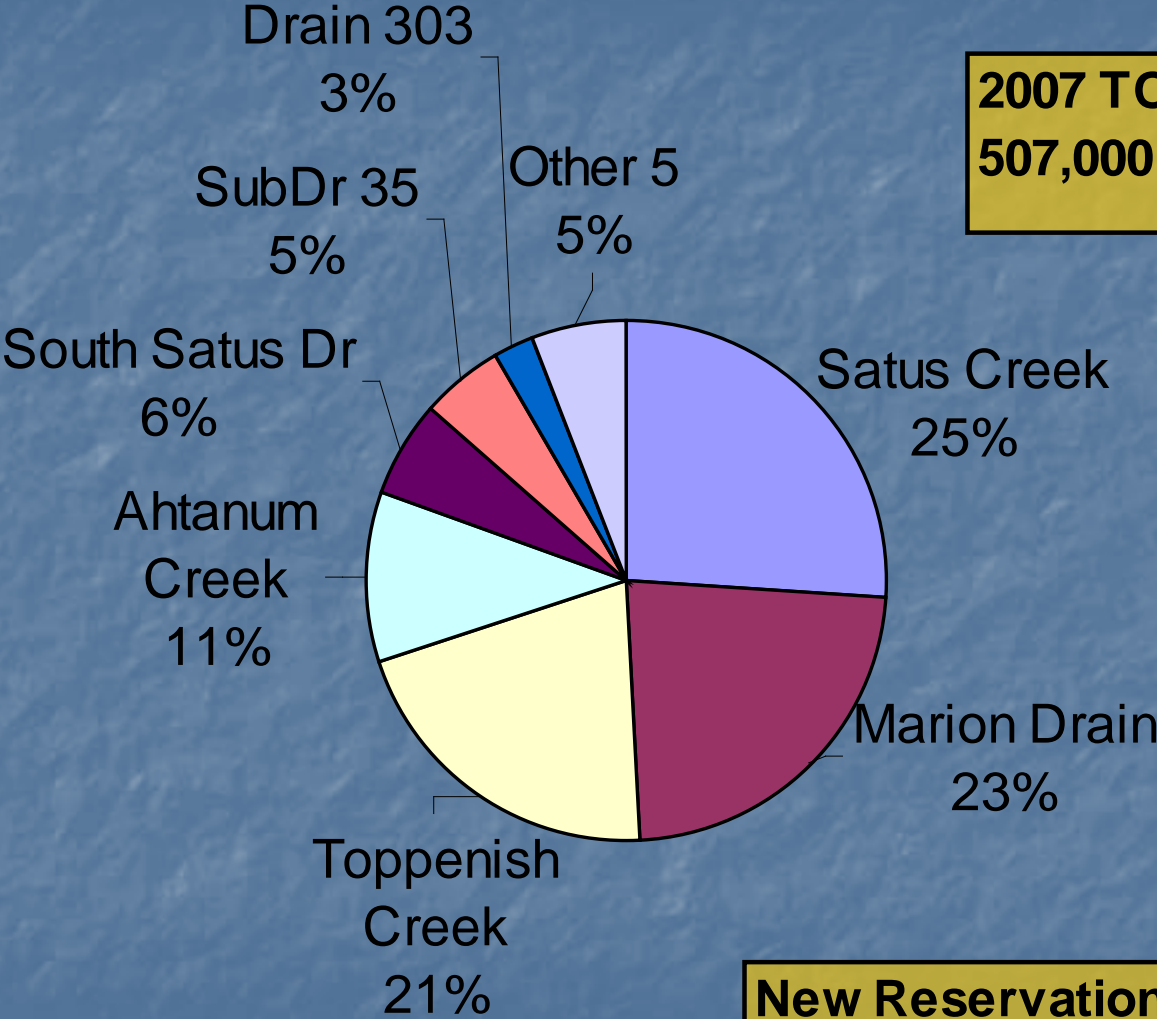
-Mose Bar (Spillway) Drain

-Parton Drain

-Sub Drain 93



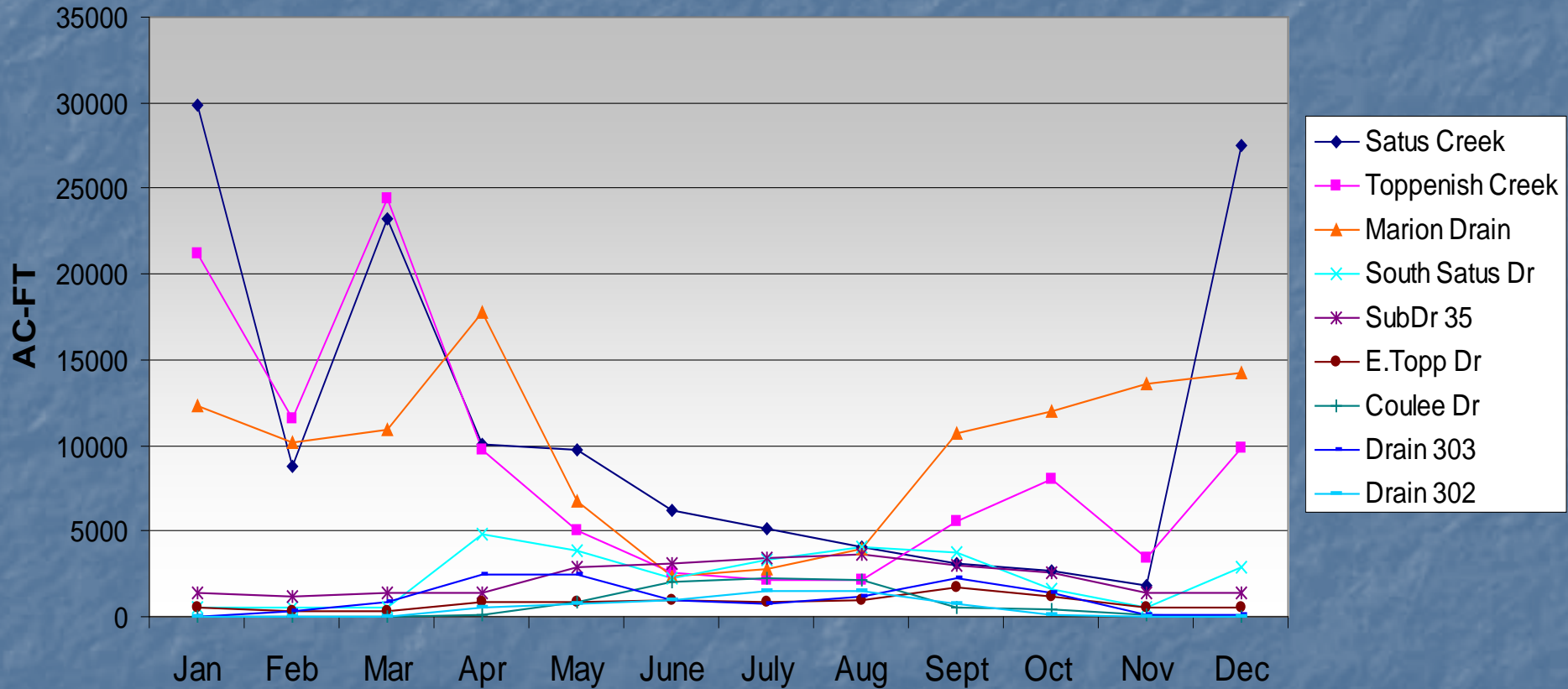
Annual Streamflow - Reservation Tribs



**2007 TOTAL:
507,000 ac-ft**

**New Reservation (WIP Main)
Canal: 552,000 ac-ft**

Streamflow Volume 2007



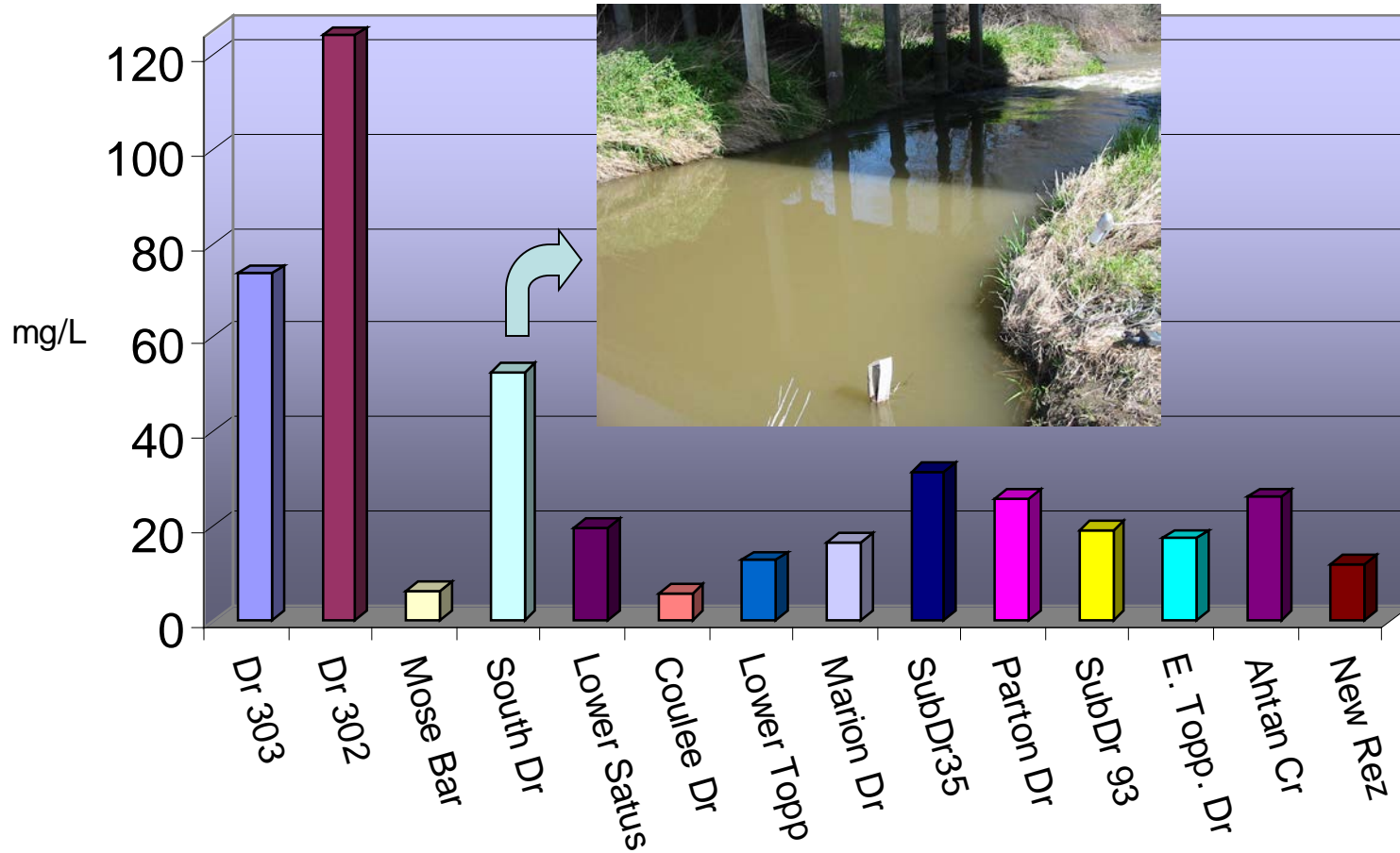
Sediment happens...





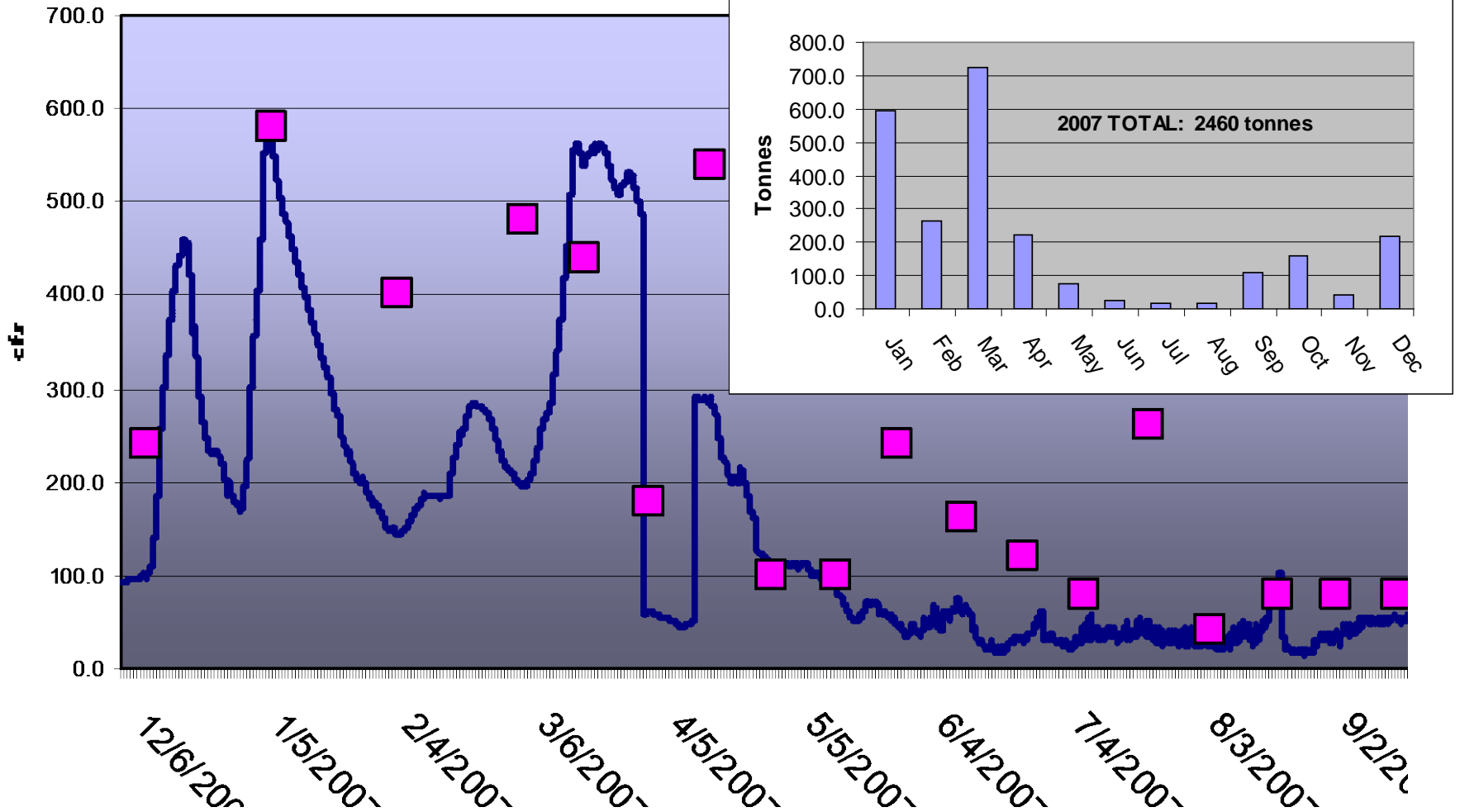
Total Suspended Solids Concentration

2007 mean



Toppenish Creek

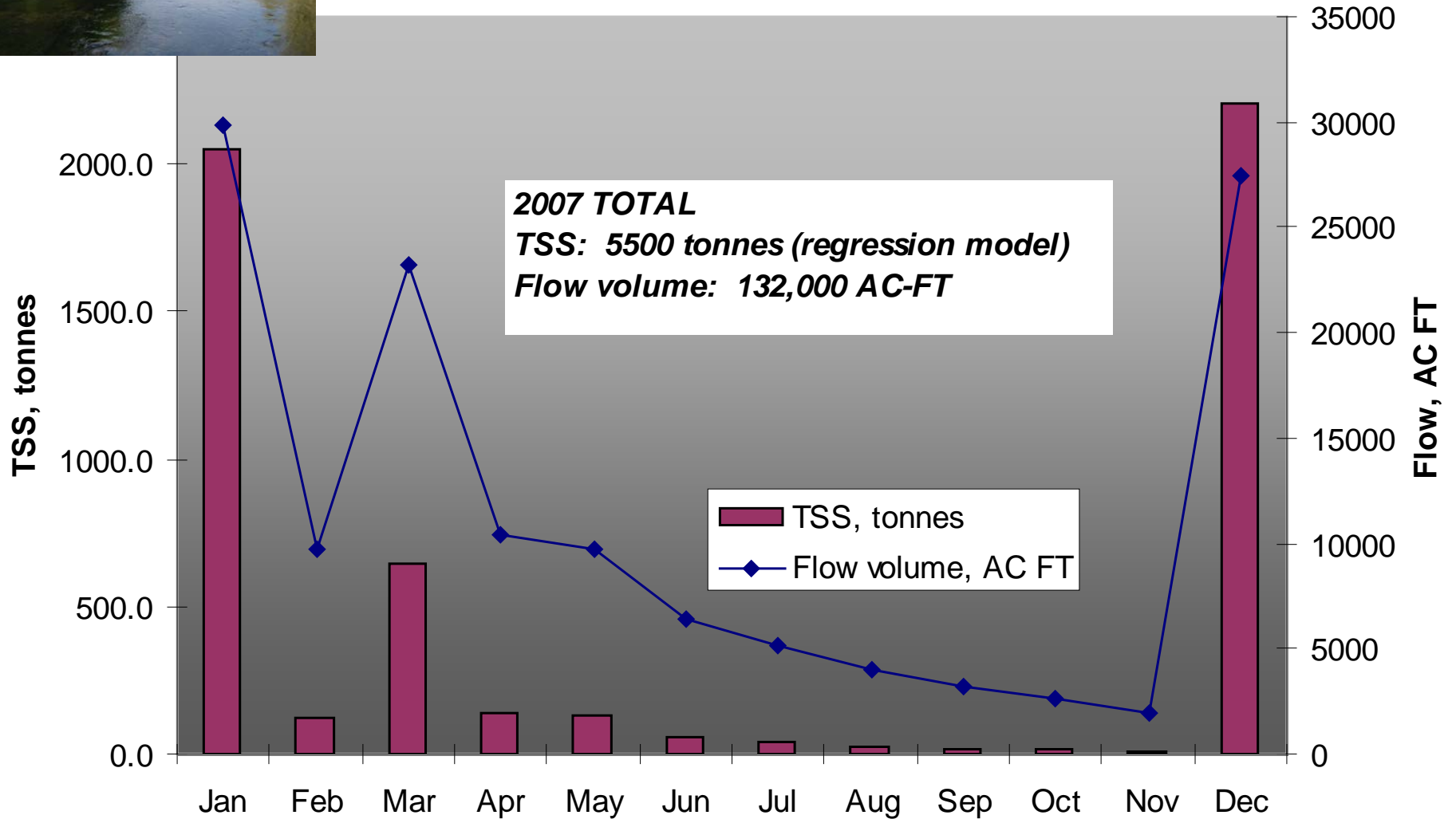
Discharge & TSS Concentration



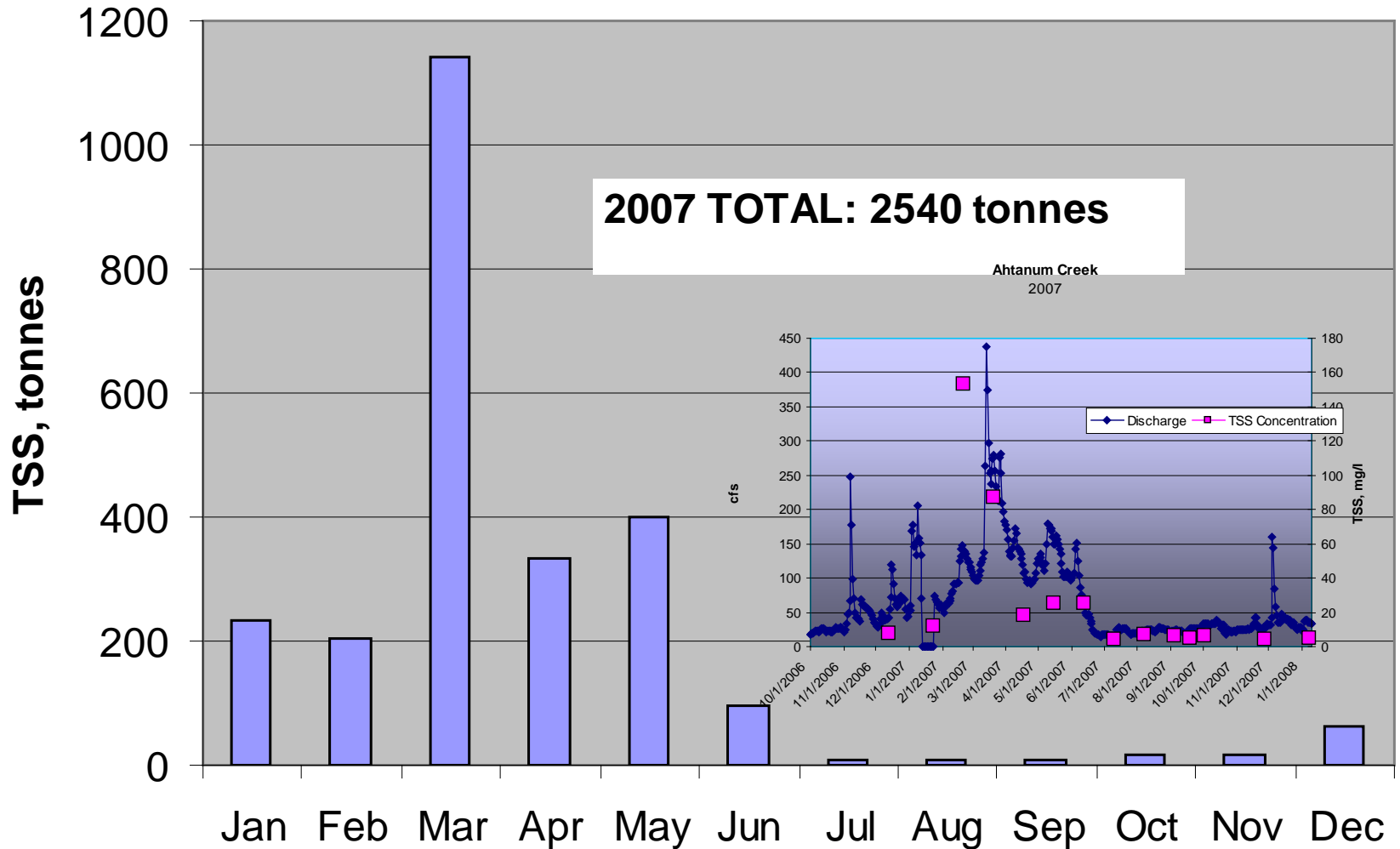


Satus Creek

TSS Loads & Flow Volume

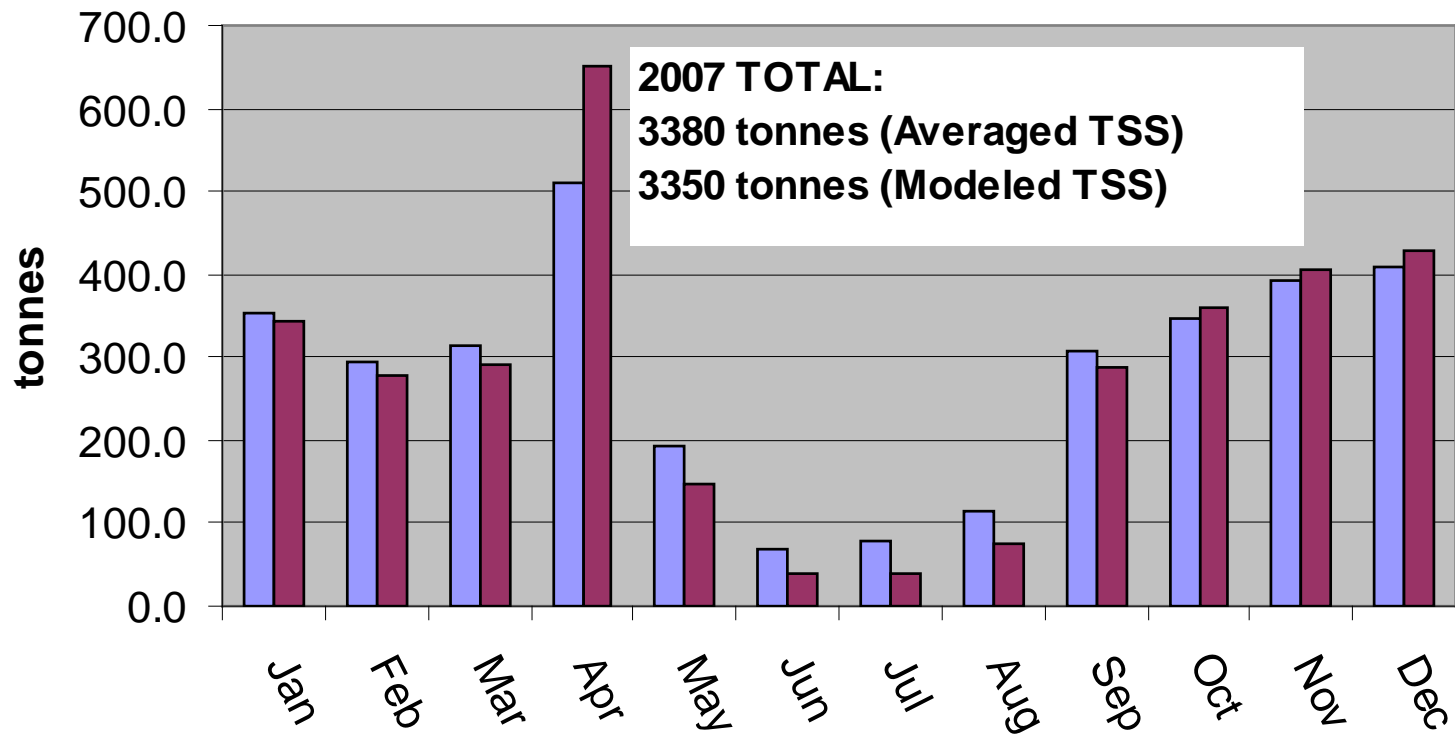


Ahtanum Creek TSS Loading



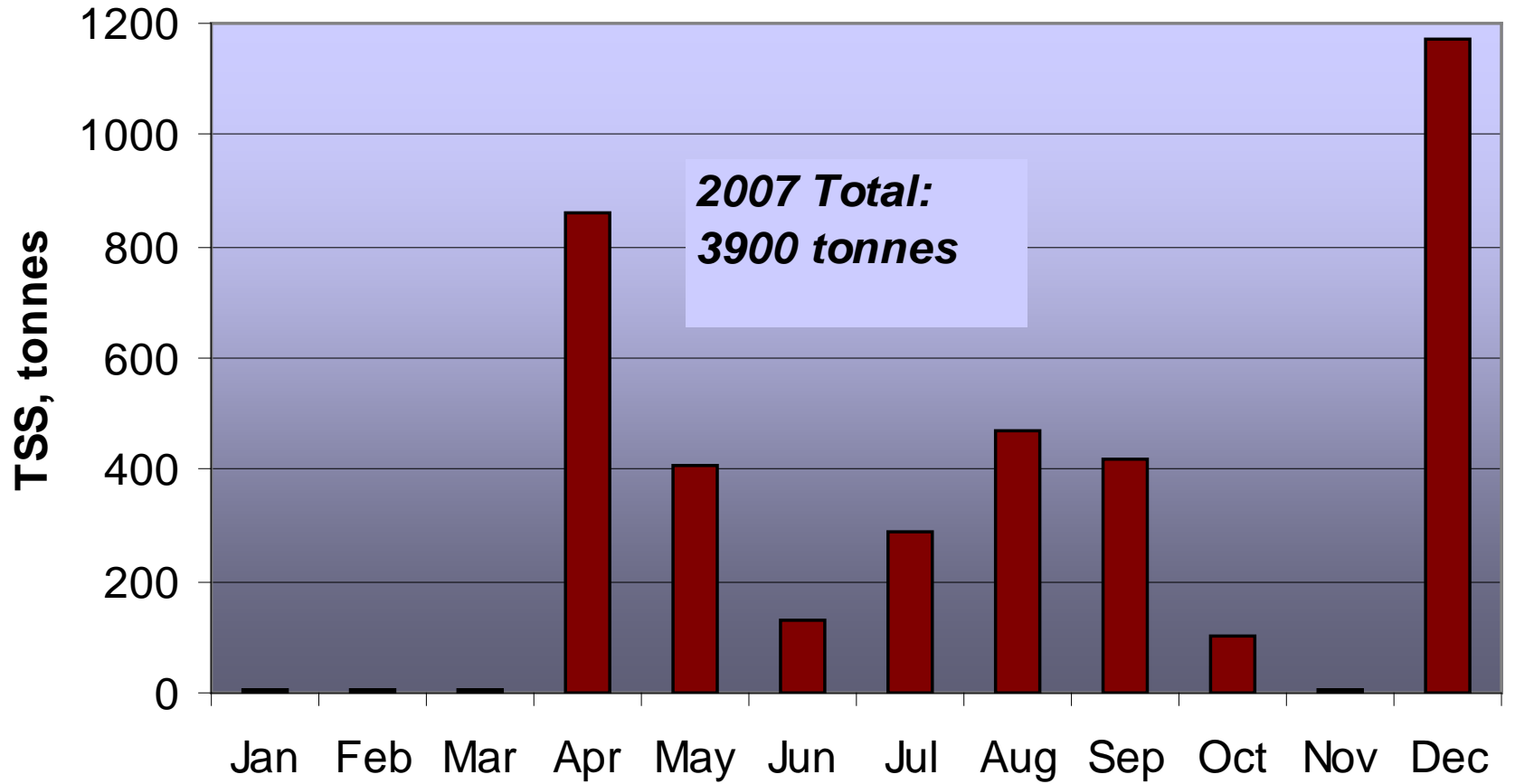
Marion Drain TSS Loading

Averaged TSS
Modeled TSS

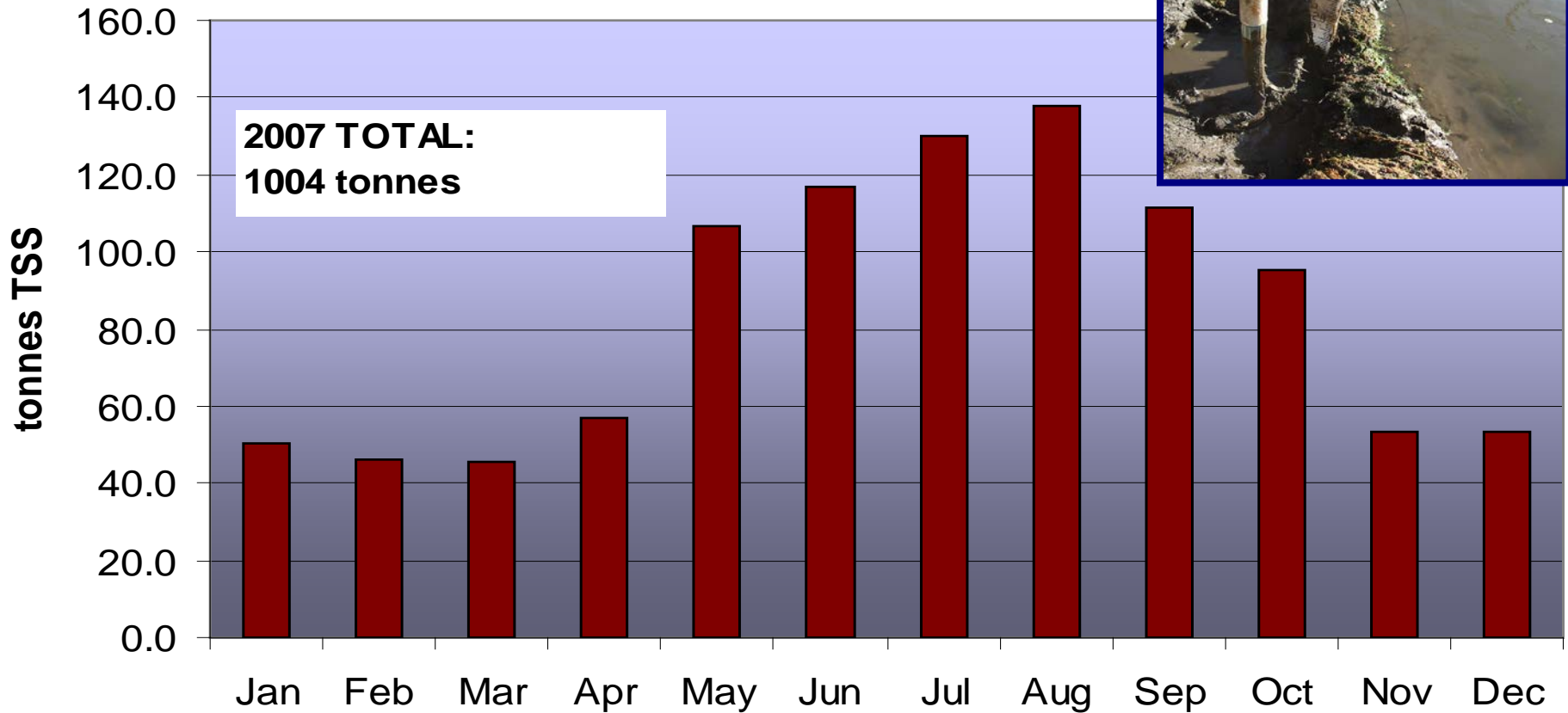


South Satus Drain

TSS Loading

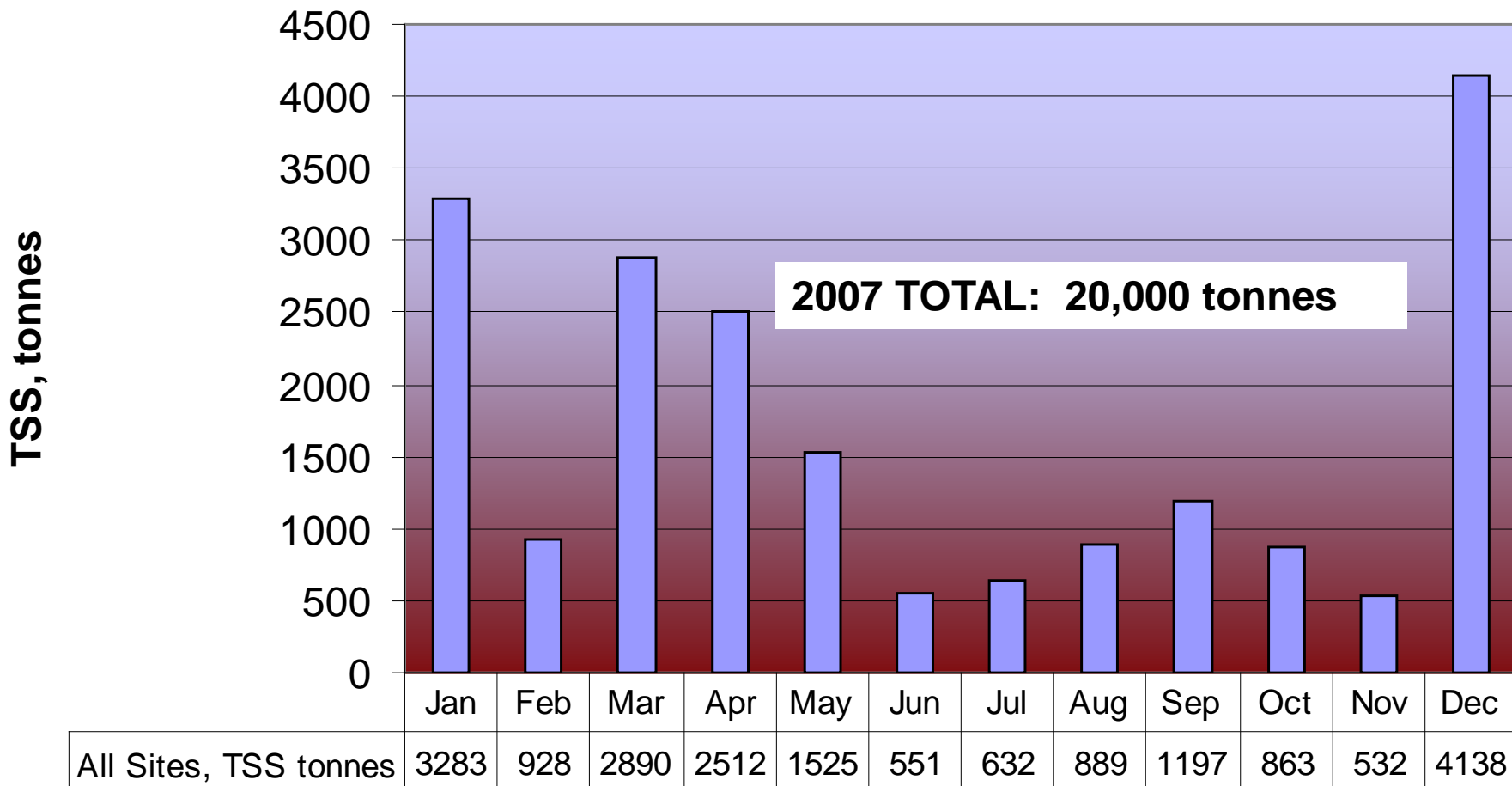


Sub Drain 35 *TSS Loading*



TSS Loading

All Sites-Composite



New Reservation Canal

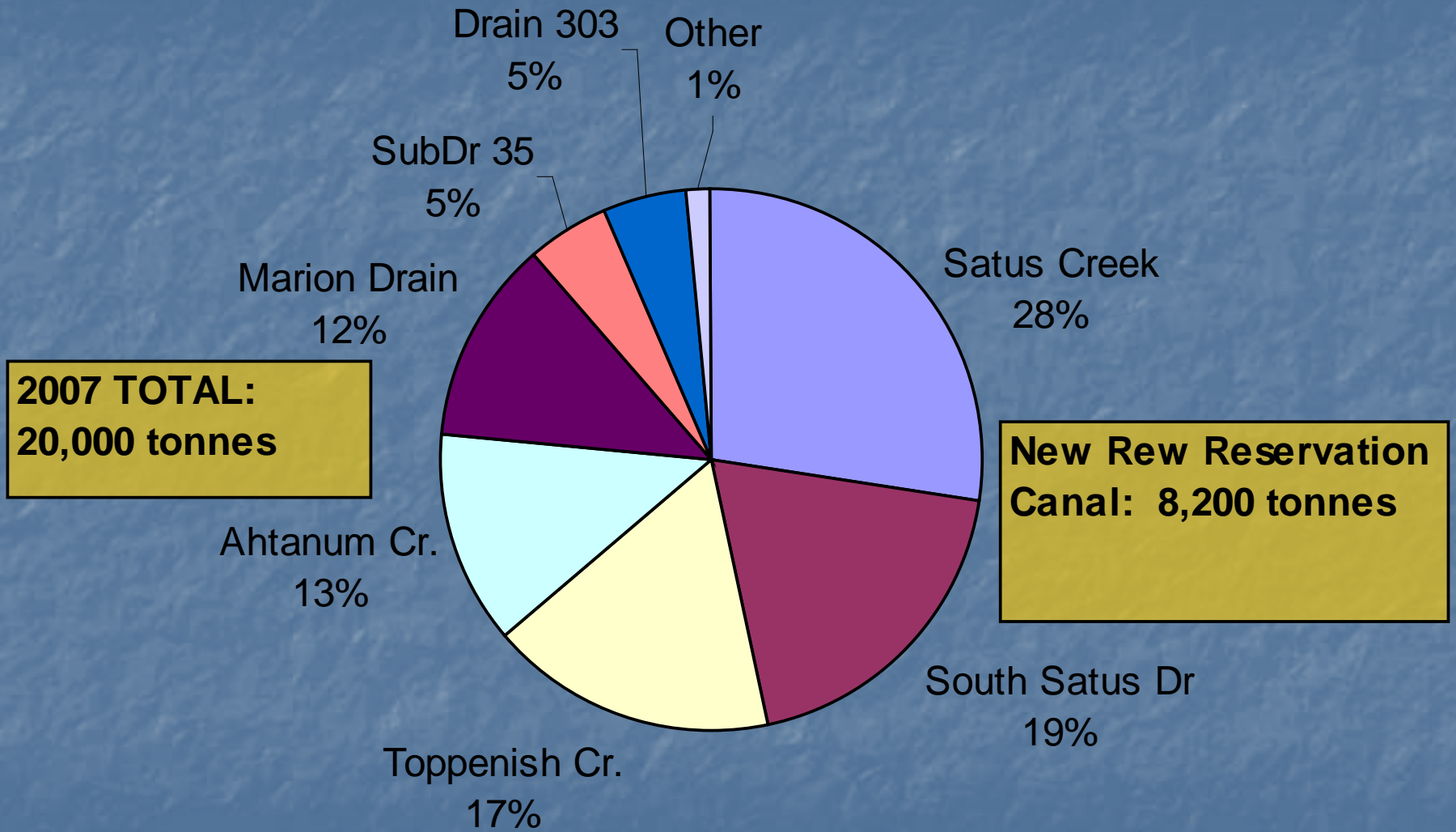
Irrigation Season 2007

- 8,200 tonnes SS came in via New Res Canal
- 9,200 tonnes went out (13 drains & streams)

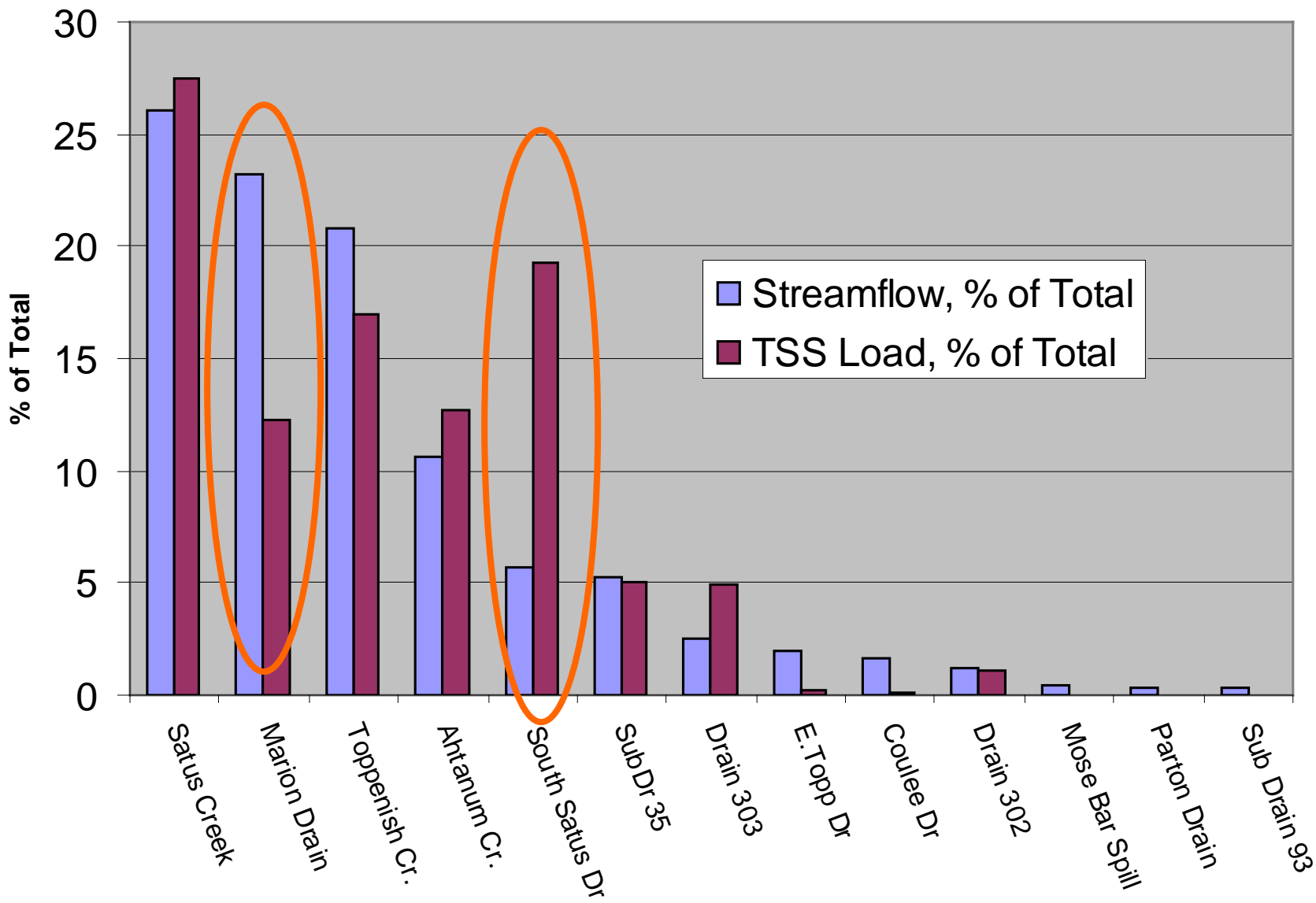
Is this a significant difference?



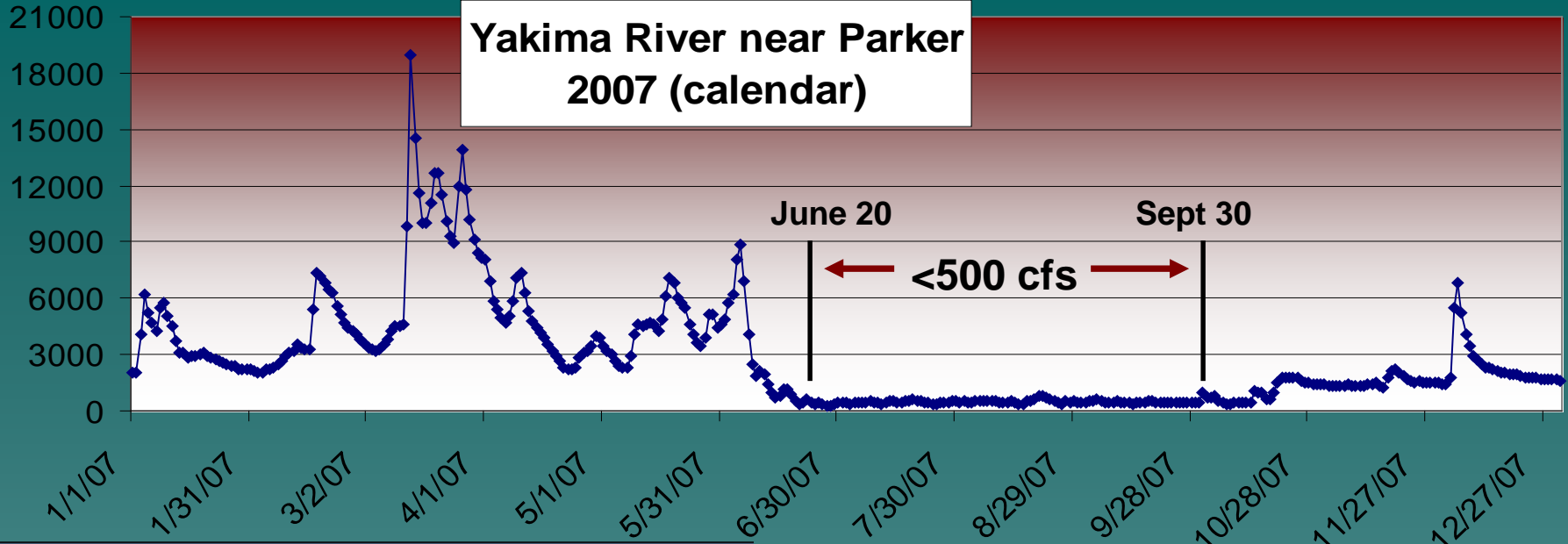
2007 TSS Loading



Streamflow-TSS Loading Proportion

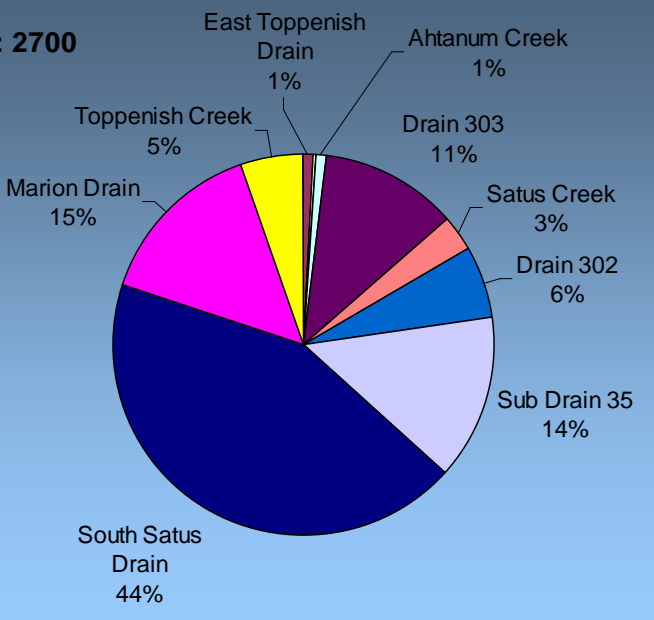


Yakima River near Parker 2007 (calendar)



July-Sept TSS Loading

2007 TOTAL: 2700 tonnes



Hydrologic/Ecologic Importance

July-Sept '07

- ◆ 480 cfs - Yakima River at Parker
- ◆ 452 cfs – Reservation tributaries
 - 13% of the annual ('07) TSS load
 - 16% of annual ('07) streamflow

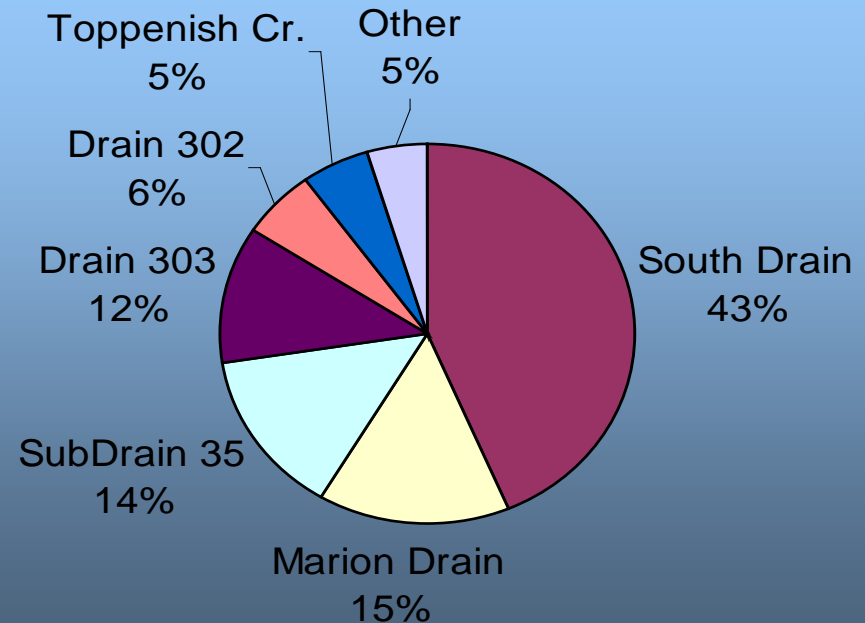
Annual TSS Loading...

- ◆ The "Big Seven"
 - Satus, Toppenish, Ahtanum Creeks
 - Marion, South Satus Drains, Sub Drain 35, Drain 303
- ◆ 7 of the 13 waterways contributed 99% of the *annual* TSS load and 95% of the flow.
- ◆ 54% of 2007 TSS load occurred during irrigation off-season

For July-September '07...

- ◆ The "Muddy" Six in summer are:
 - South Satus, Marion, Sub Drain 35, 303, 302 and Toppenish Creek.
- ◆ 6 of 13 waterways contributed 95% of the TSS loading and only 68% of the flow.

July-September TSS Loading



Data Stores

<http://www.ecy.wa.gov/eim>

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