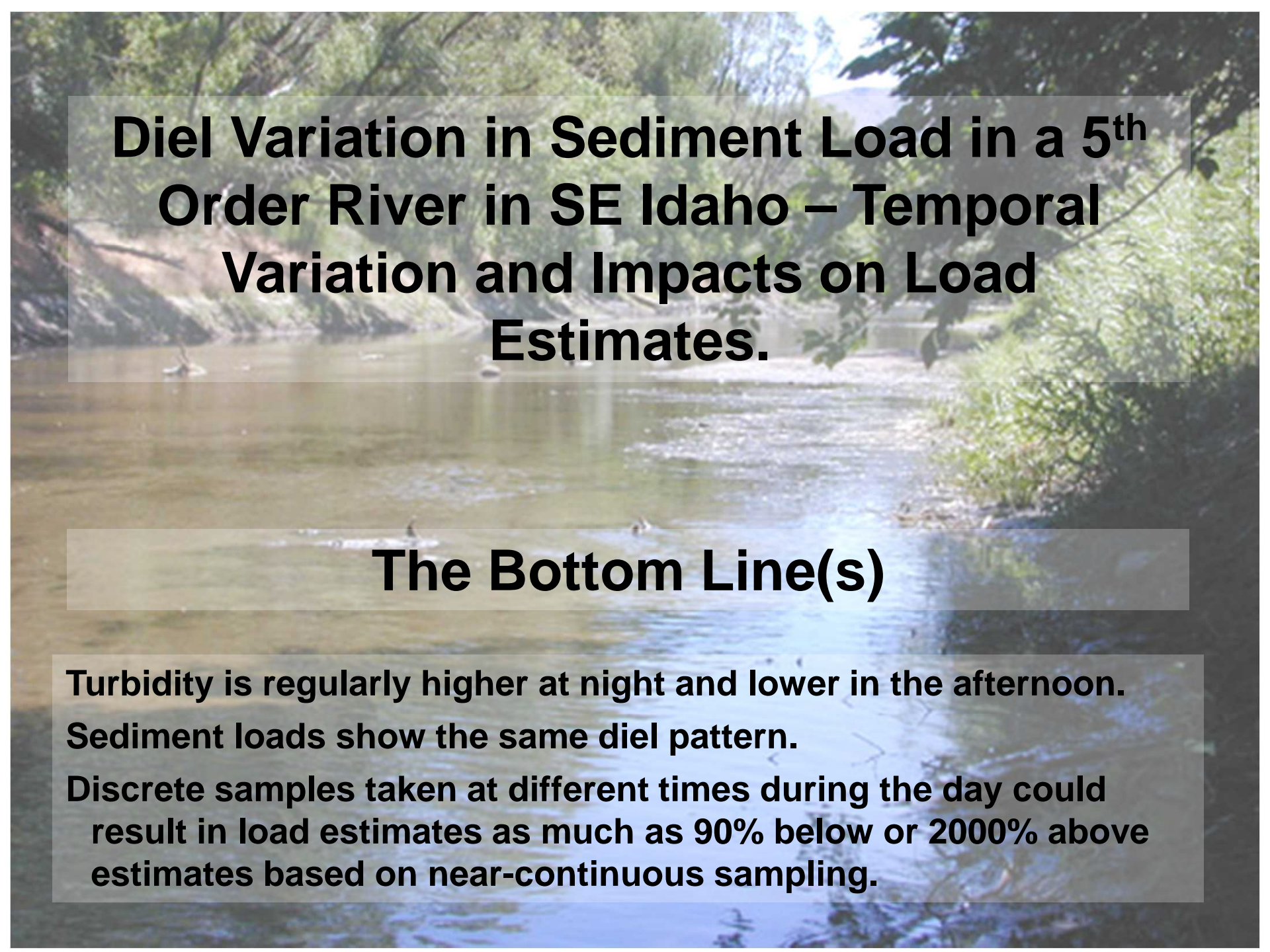


**Diel Variation in Sediment Load in a 5<sup>th</sup>  
Order River in SE Idaho – Temporal  
Variation and Impacts on Load  
Estimates.**

**Richard Inouye**

**May 2012, Portland, Oregon**



# **Diel Variation in Sediment Load in a 5<sup>th</sup> Order River in SE Idaho – Temporal Variation and Impacts on Load Estimates.**

## **The Bottom Line(s)**

**Turbidity is regularly higher at night and lower in the afternoon. Sediment loads show the same diel pattern.**

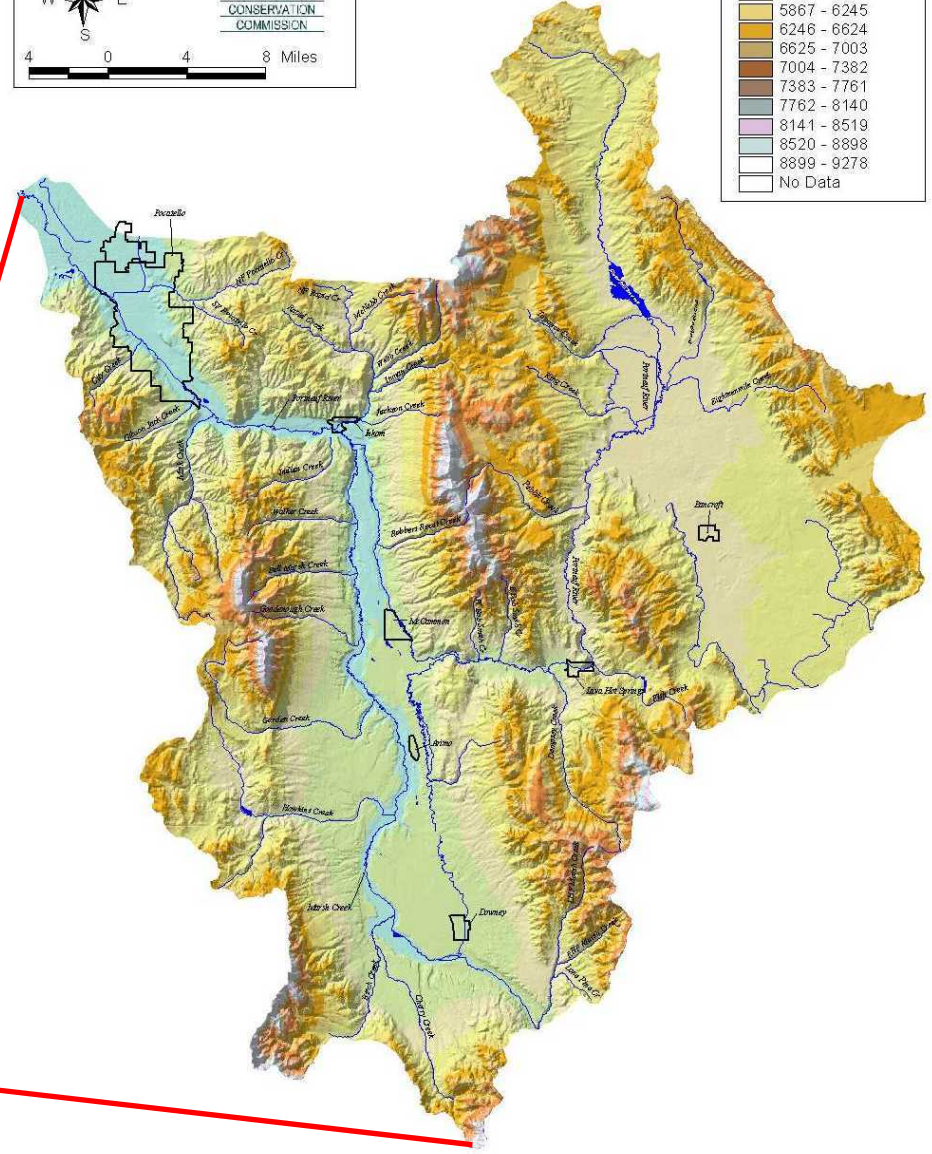
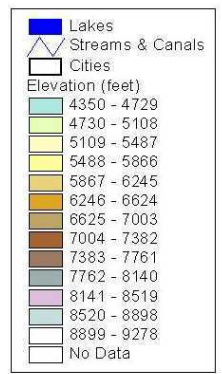
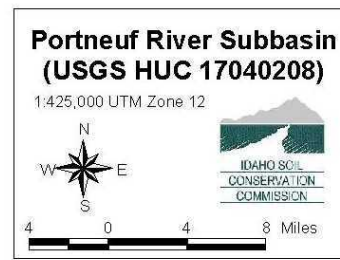
**Discrete samples taken at different times during the day could result in load estimates as much as 90% below or 2000% above estimates based on near-continuous sampling.**

# Portneuf River

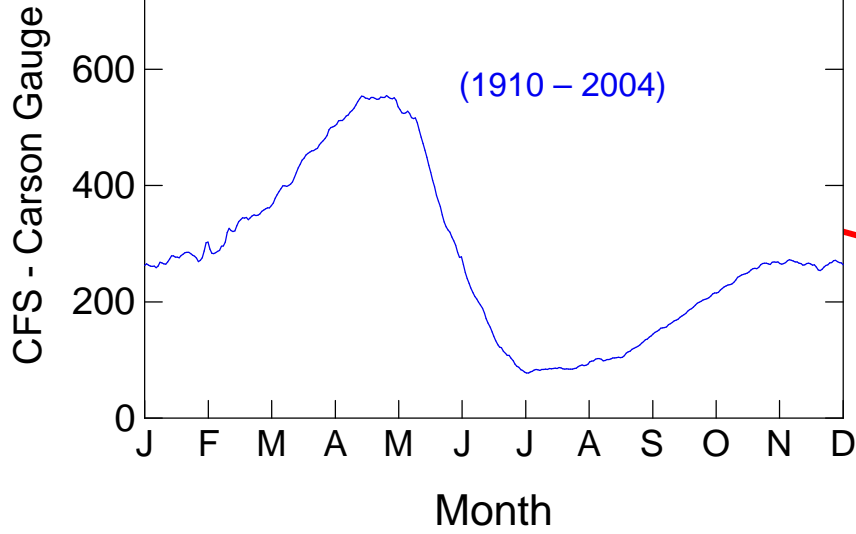
**Drainage: 3,574 km<sup>2</sup>**

**Length: 156 km**

**Watershed: 1,326 – 2,830 m**



# Average Daily Discharge

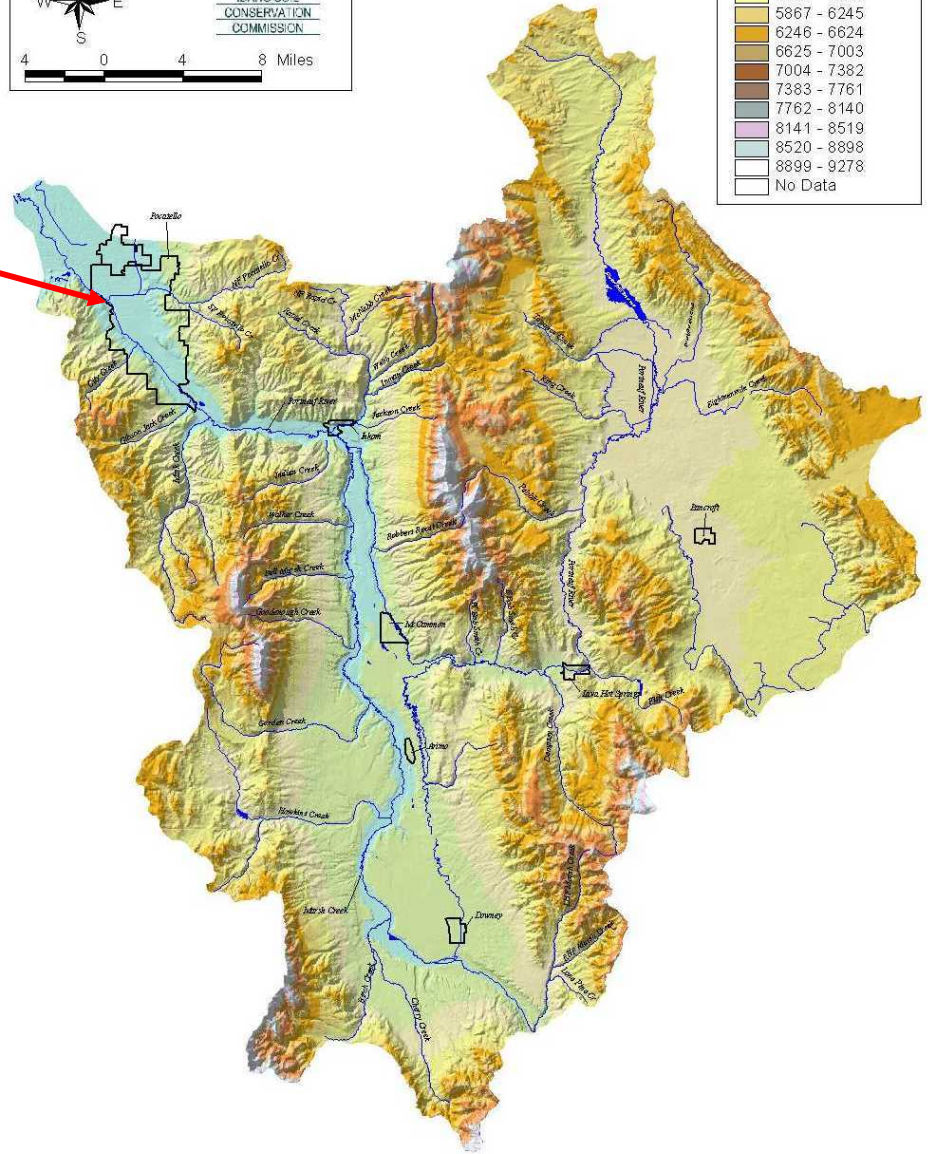


**Portneuf River Subbasin**  
(USGS HUC 17040208)

1:425,000 UTM Zone 12

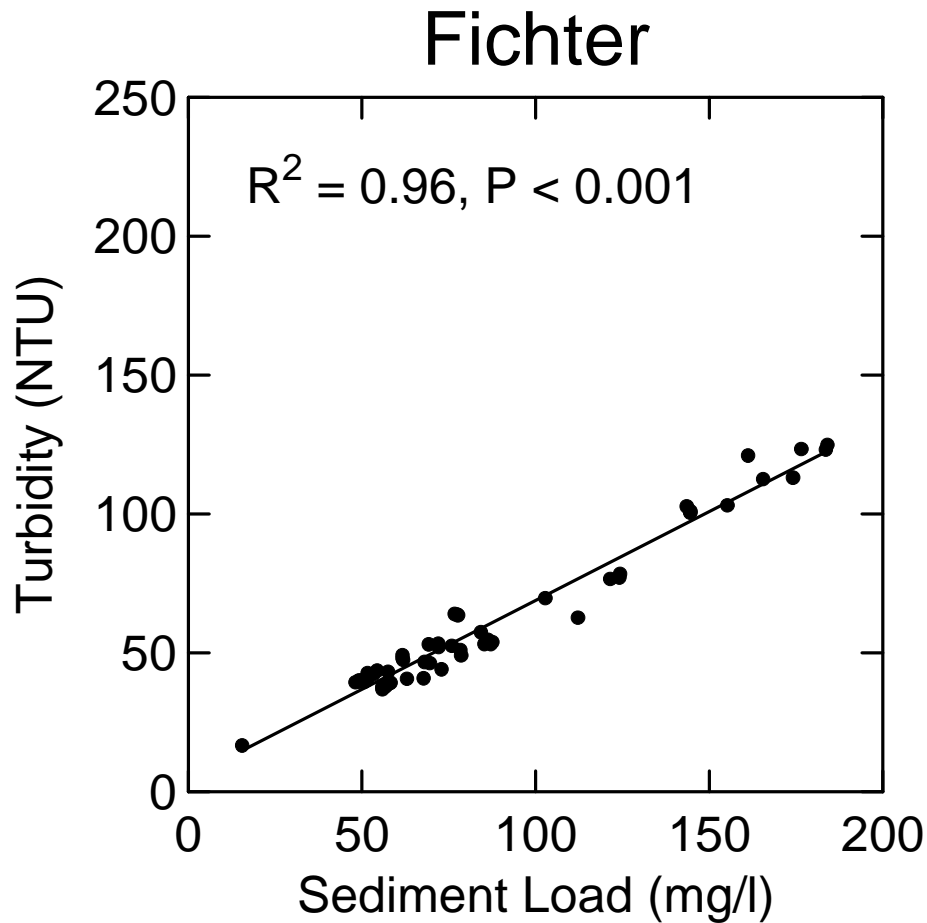
IDAHO SOIL CONSERVATION COMMISSION

Symbol	Description
	Lakes
	Streams & Canals
	Cities
Elevation (feet)	
	4350 - 4729
	4730 - 5108
	5109 - 5487
	5488 - 5866
	5867 - 6245
	6246 - 6624
	6625 - 7003
	7004 - 7382
	7383 - 7761
	7762 - 8140
	8141 - 8519
	8520 - 8898
	8899 - 9278
	No Data





# Turbidity and Suspended Sediment Load



**24-hr sample periods:**

**April 31 – May 1, 2002**

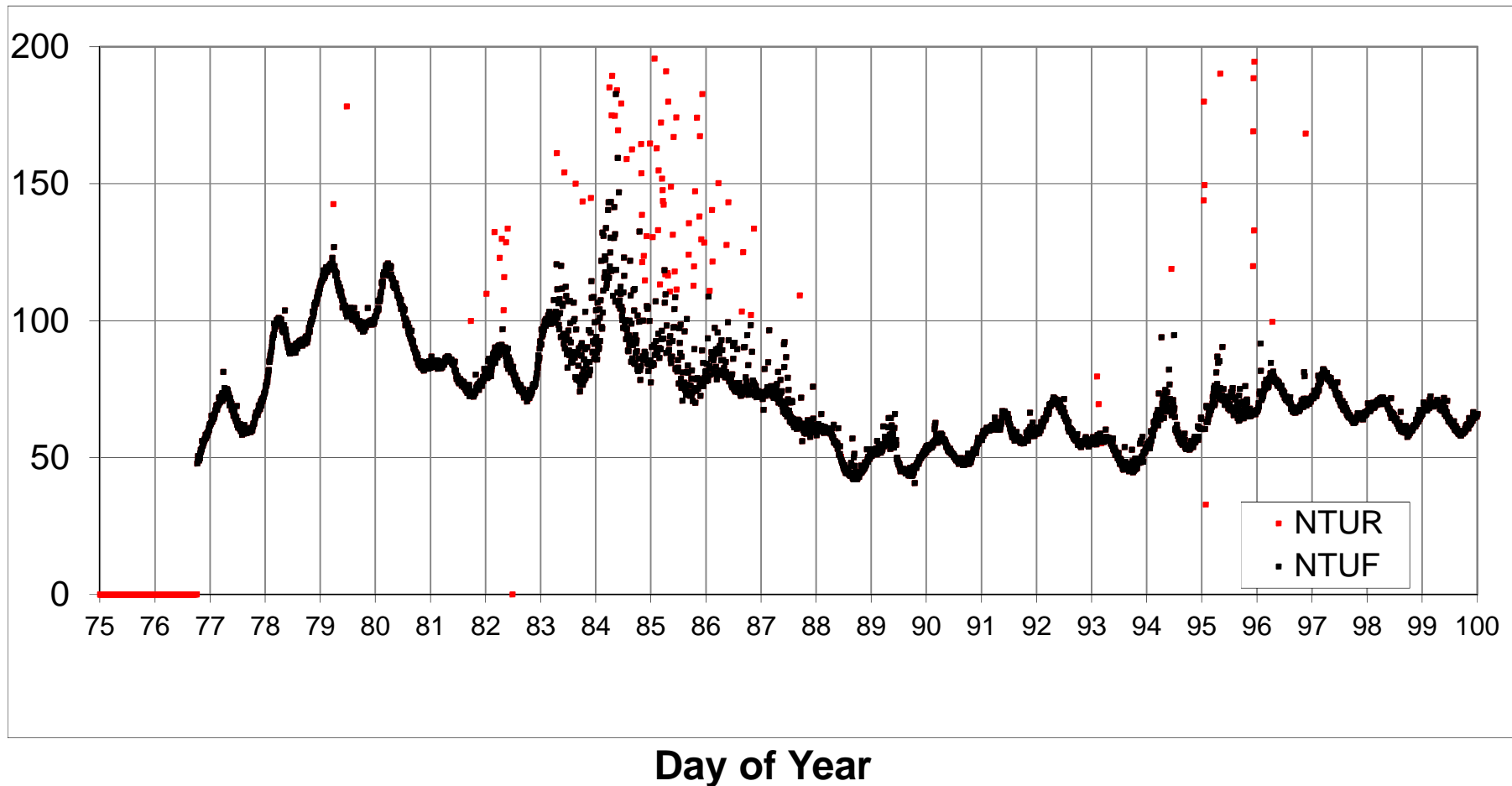
$R^2=0.90, p<0.001, N=9$

**August 8-9, 2009**

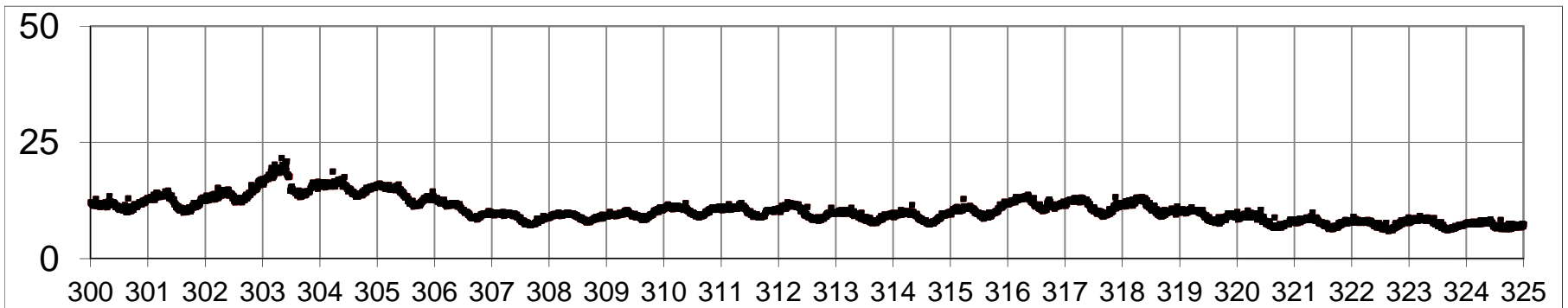
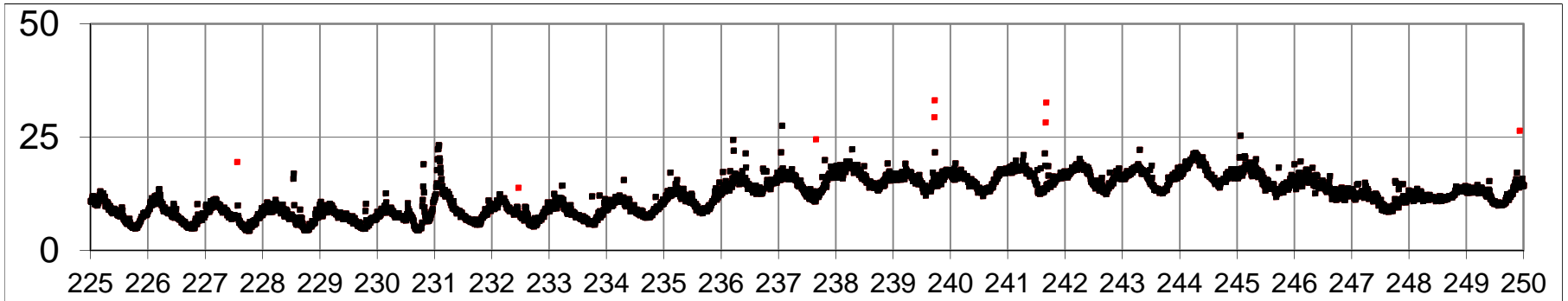
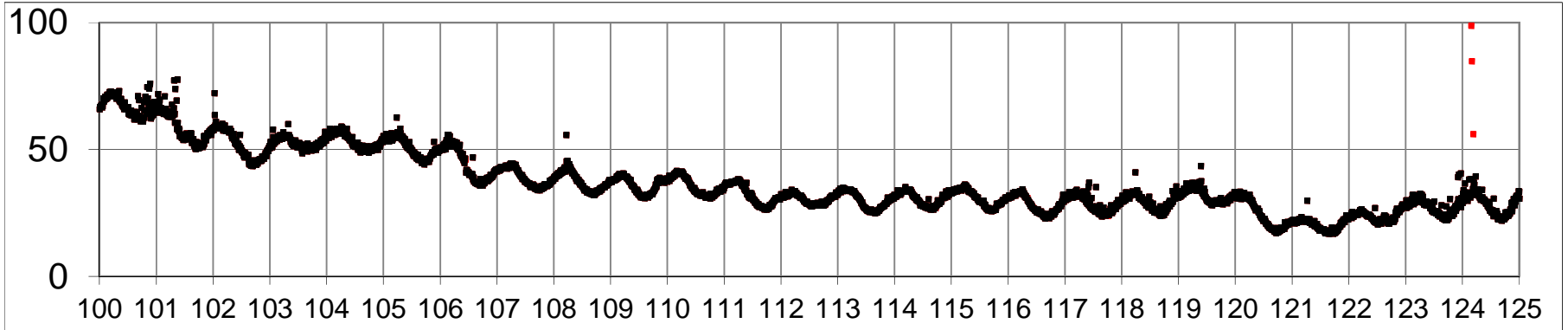
$R^2=0.97, p<0.001, N=14$



# Fichter 2004: NTU vs Time, Days 75-125



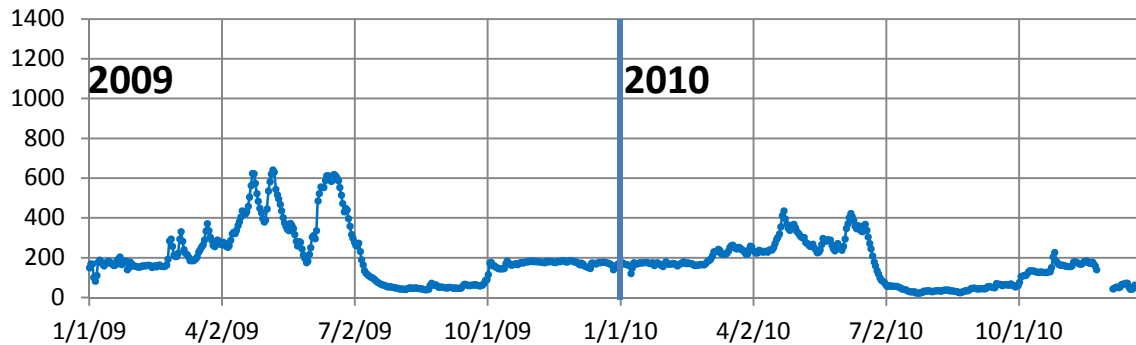
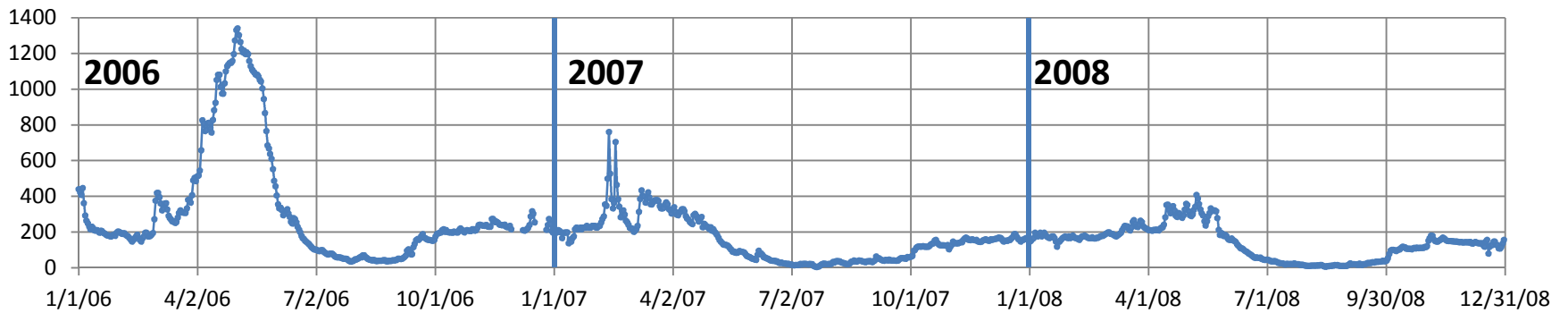
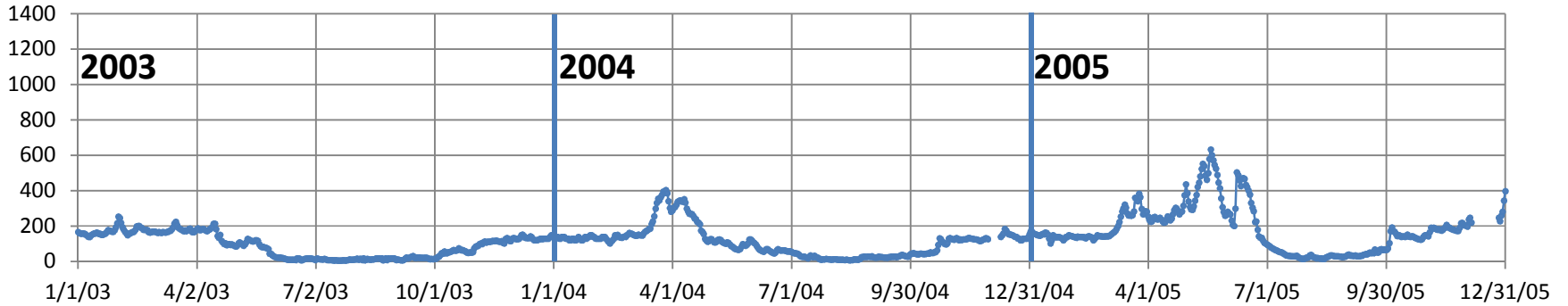
# Fichter 2004: NTU vs Time



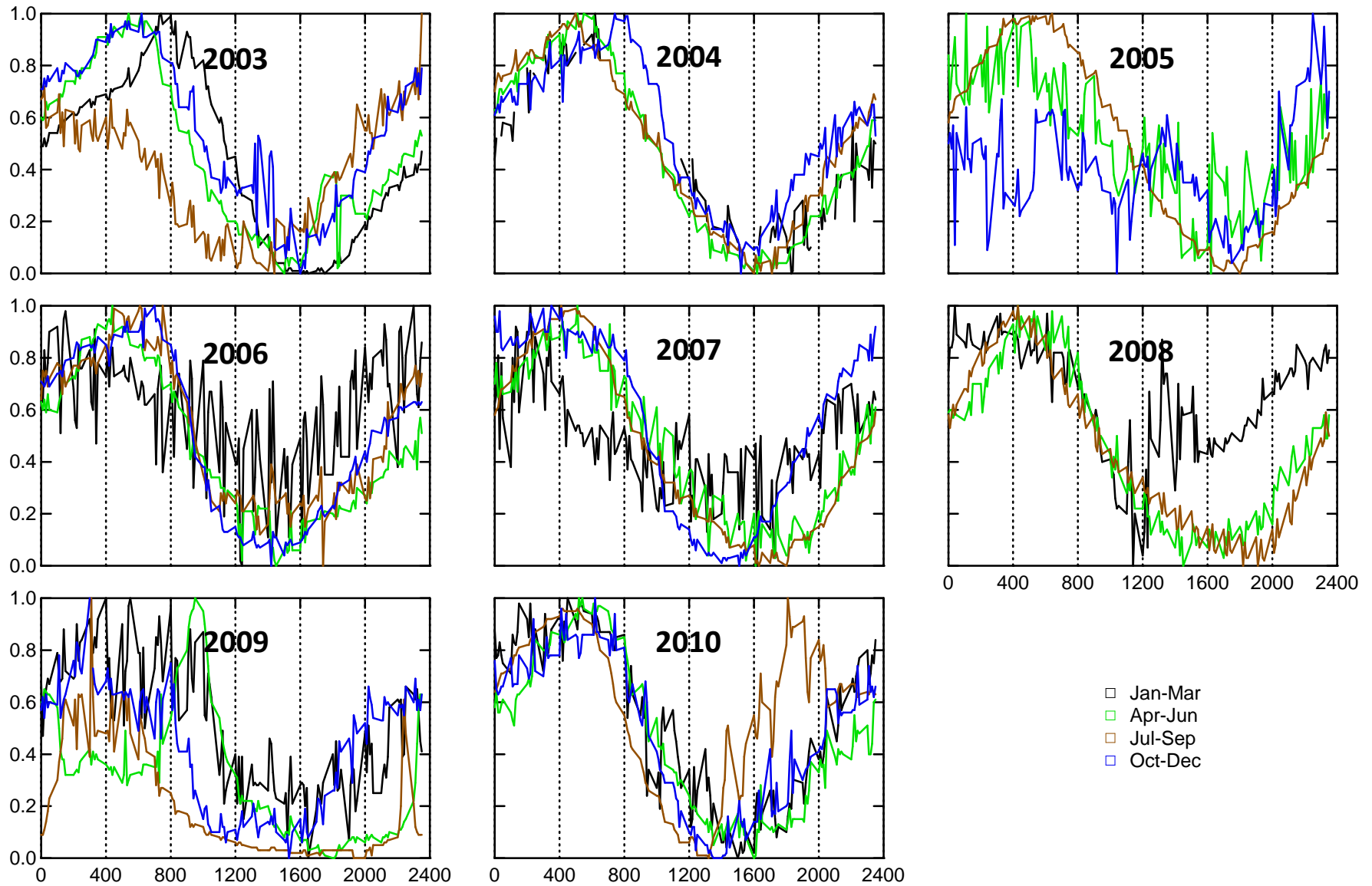
Day of Year



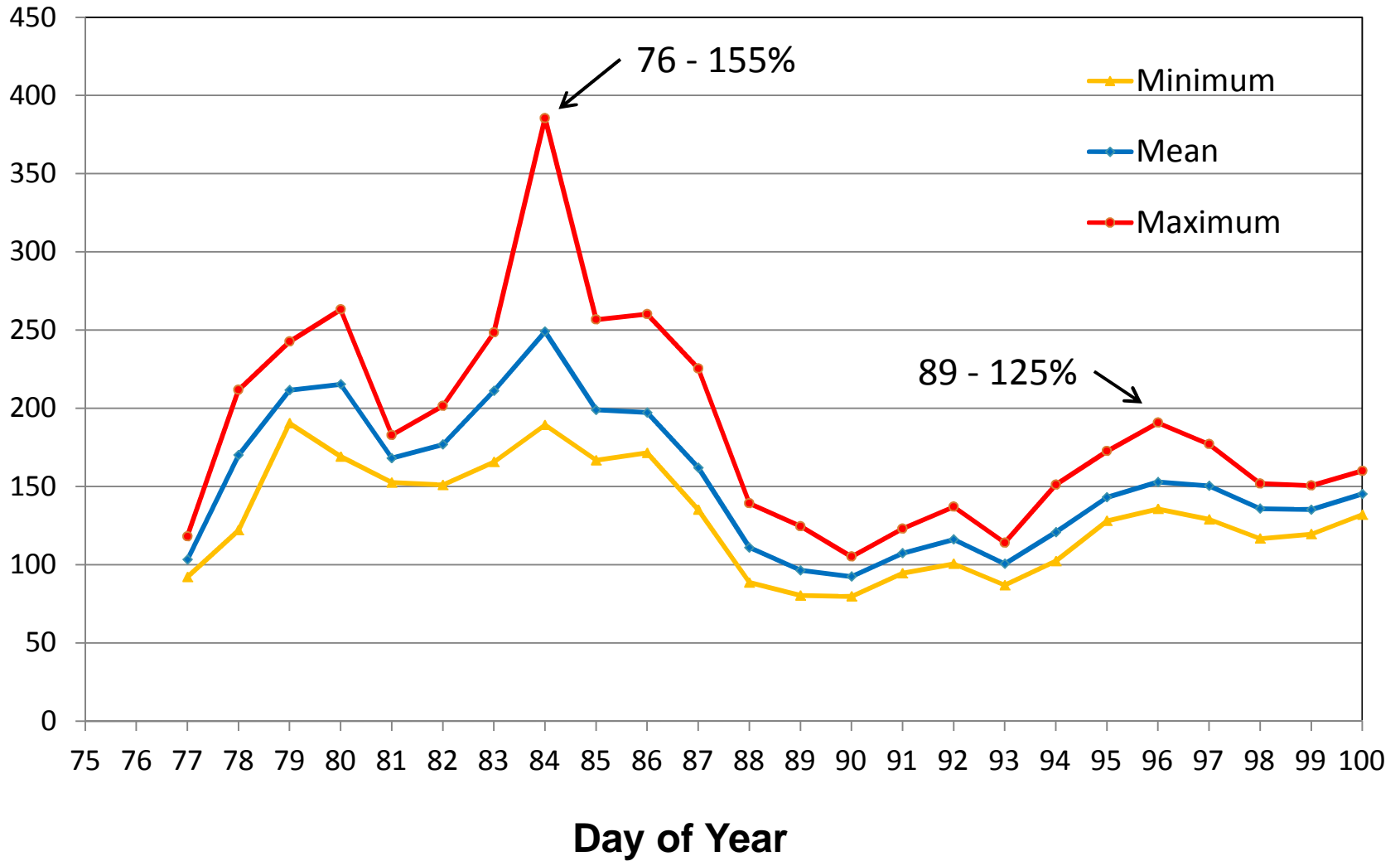
# Fichter: Discharge (Average Daily CFS)



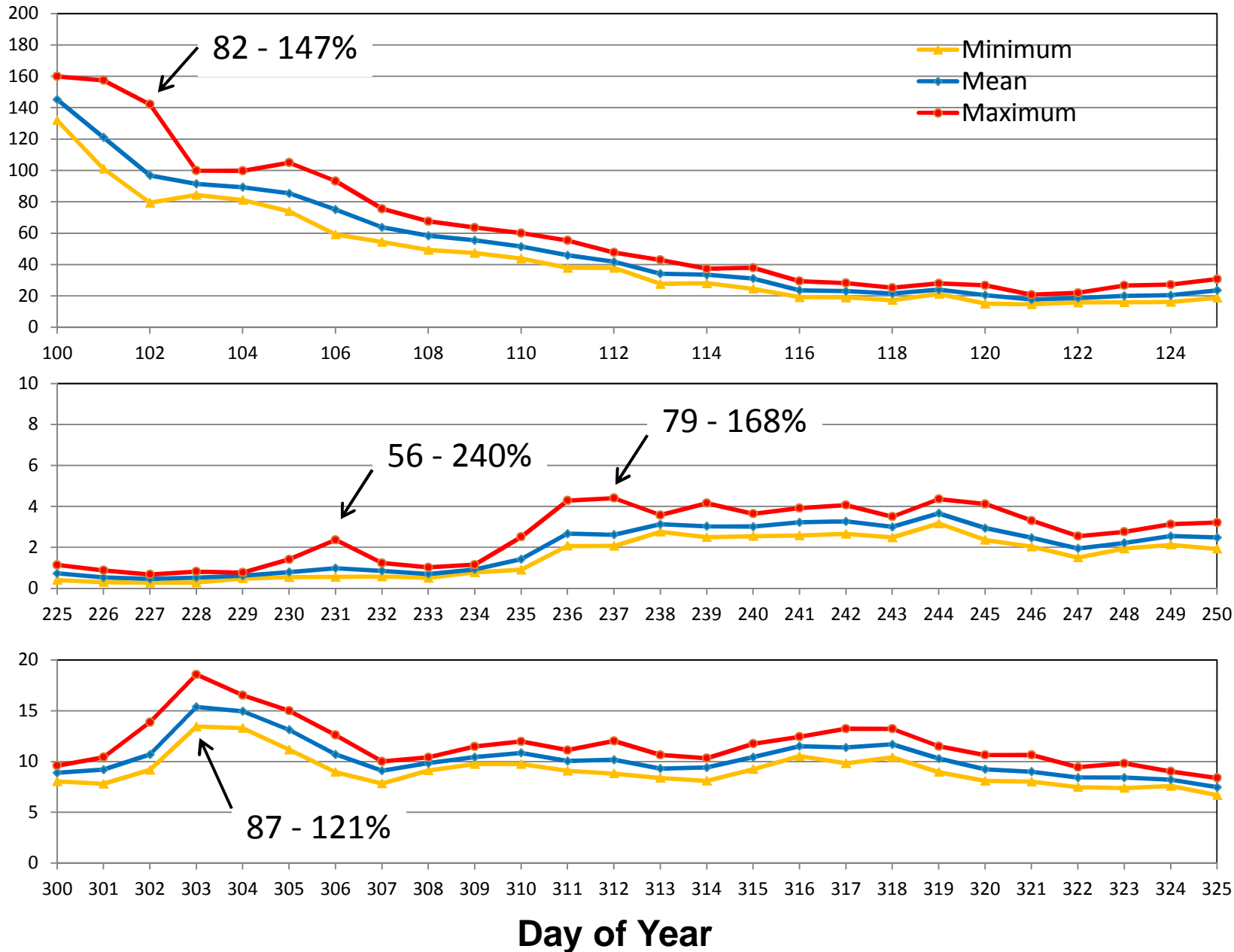
# Fichter: Annual, Seasonal, & Diel Turbidity



# Fichter 2004: TSS Load Estimates (g/l)



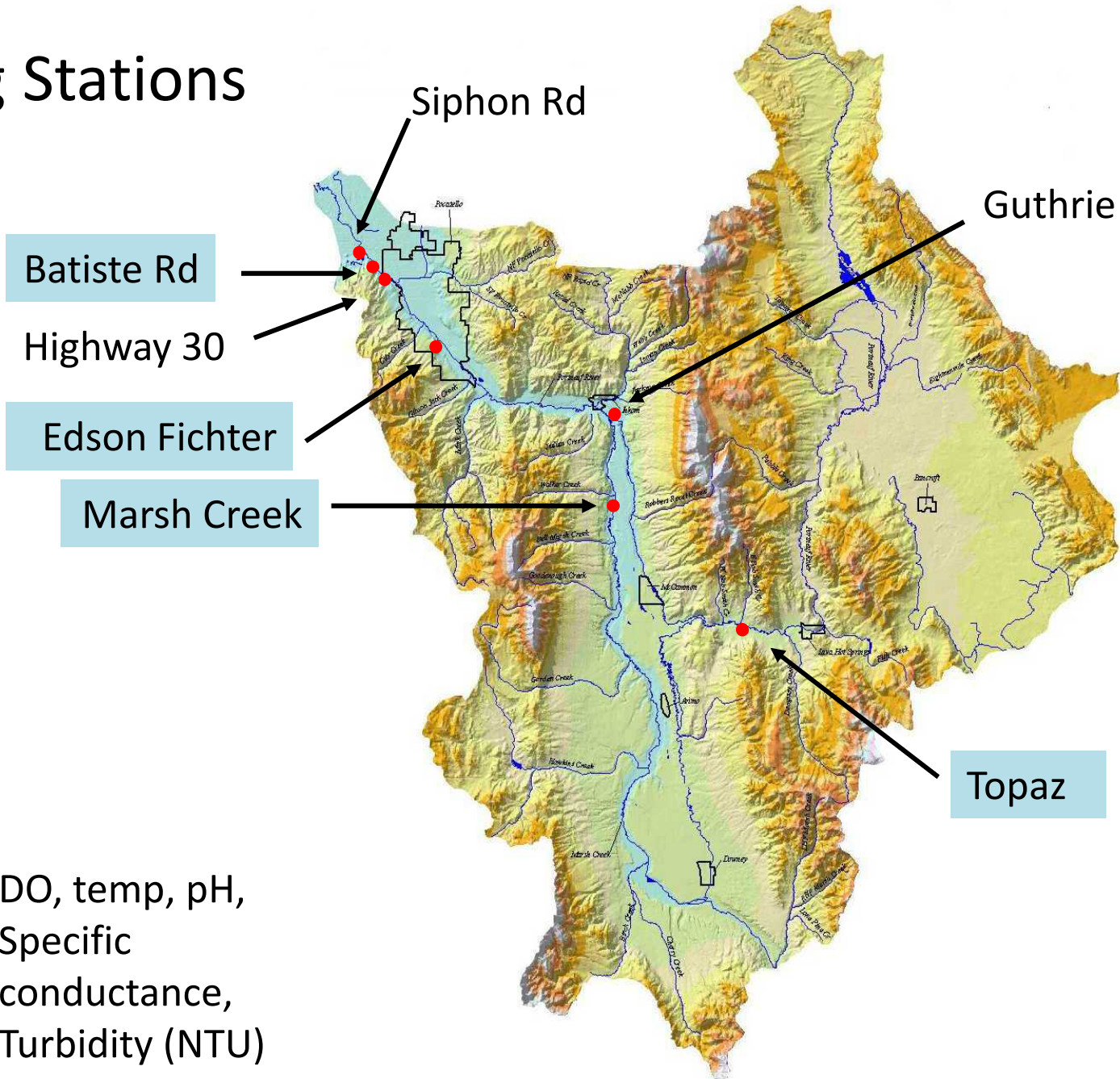
# Fichter 2004: TSS Load Estimates (g/l)



# Fichter: Single Sample Deviations

	Extreme		Average		Days with Deviation	
Year	Minimun	Maximum	Minimun	Maximum	<75%	>150%
2003	24%	563%	73%	151%	47%	27%
2004	44%	247%	81%	130%	21%	13%
2005	35%	344%	79%	136%	30%	18%
2006	33%	228%	88%	118%	8%	6%
2007	33%	286%	77%	138%	39%	22%
2008	27%	202%	76%	133%	41%	18%
2009	16%	2232%	78%	157%	29%	20%
2010	9%	656%	78%	140%	26%	16%

# Monitoring Stations



**YSI 6920**  
**Multi-parameter**  
**Monitoring**  
**Equipment**



DO, temp, pH,  
Specific  
conductance,  
Turbidity (NTU)



## **The Bottom Line(s)**

**Turbidity is regularly higher at night and lower in the afternoon.  
Sediment loads show the same diel pattern.**

**Discrete samples taken at different times during the day could  
result in load estimates as much as 90% below or 2000% above  
estimates based on near-continuous sampling.**

# Acknowledgements



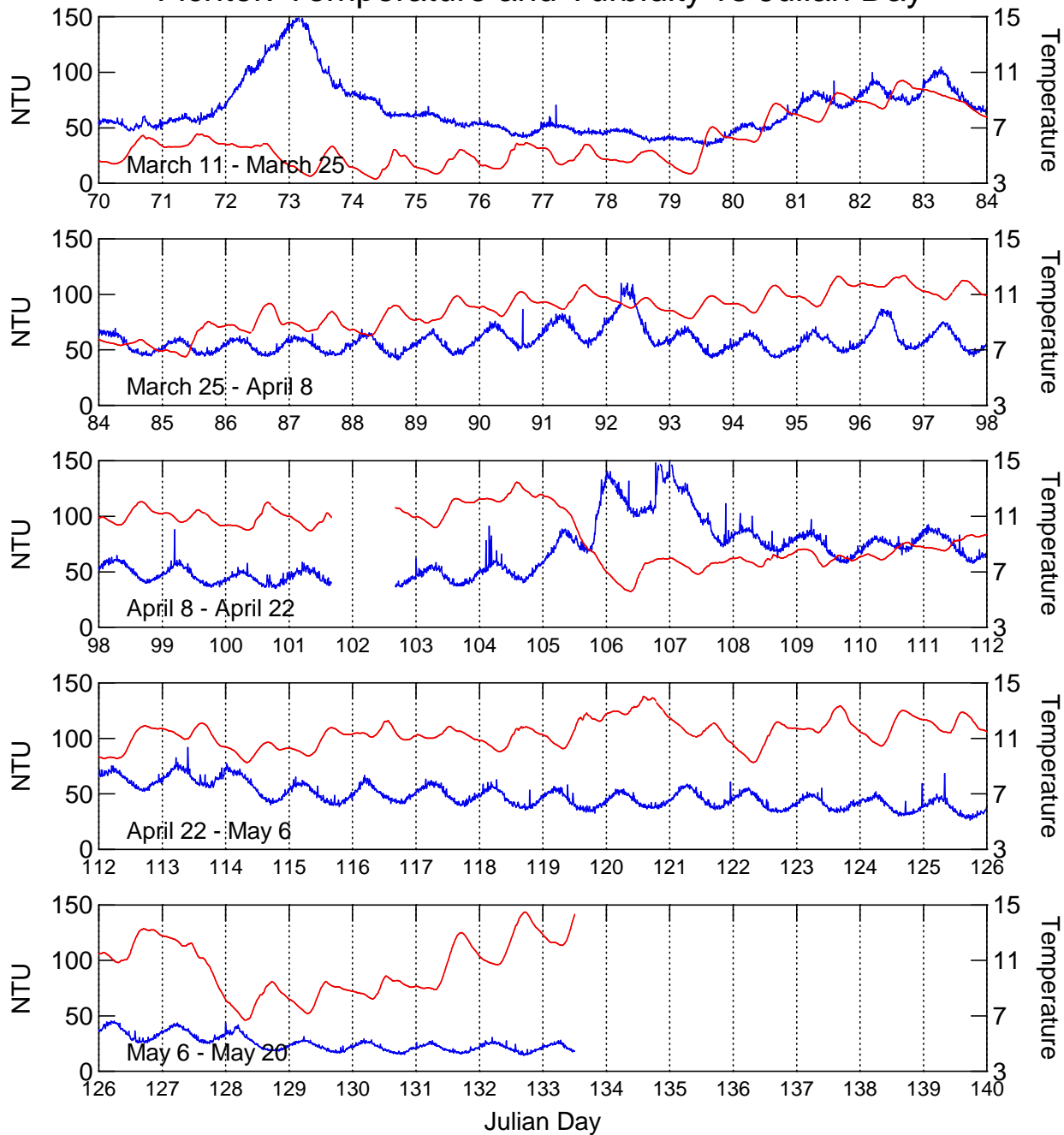
Idaho DEQ – Greg Mladenka, Mike Rowe, Lynn Van Every

Pocatello –Water Pollution Control Facility

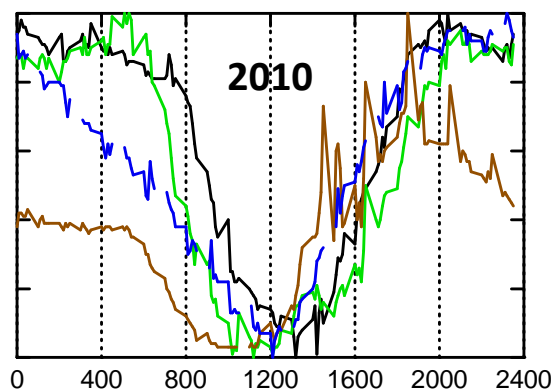
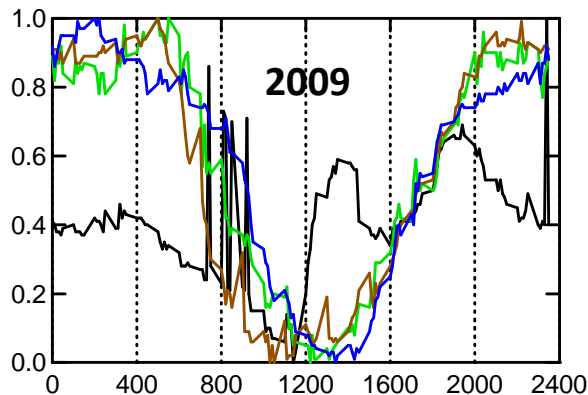
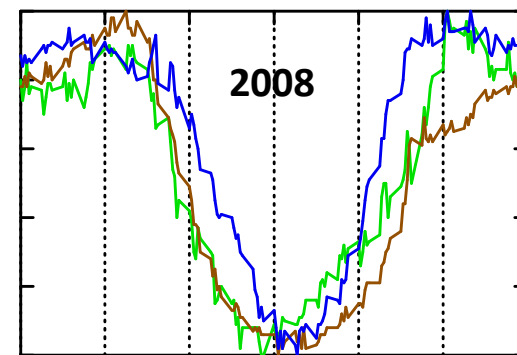
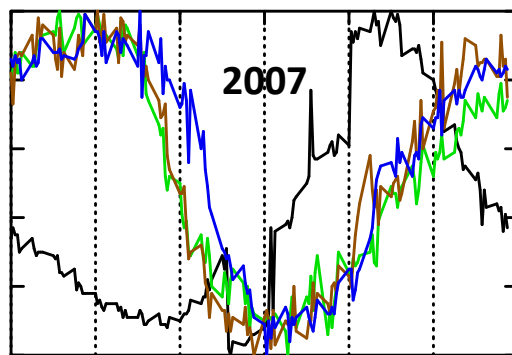
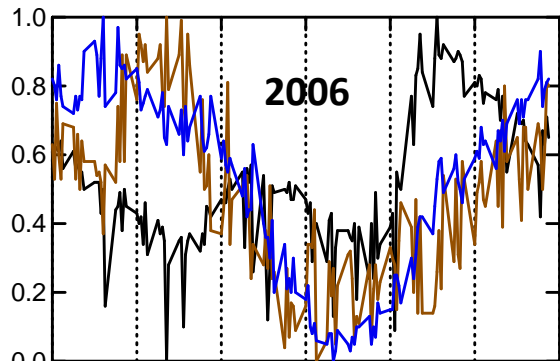
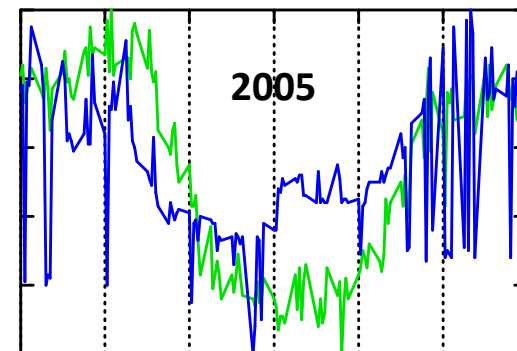
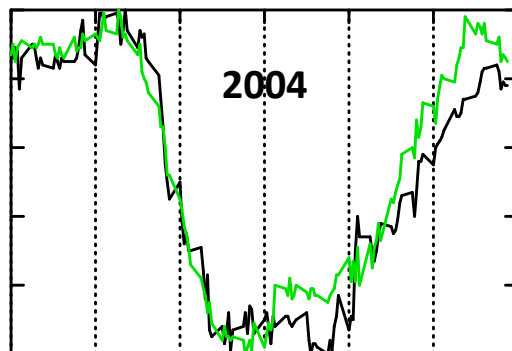
Idaho State Univ -Center for Ecological Research and Education



# Fichter: Temperature and Turbidity vs Julian Day



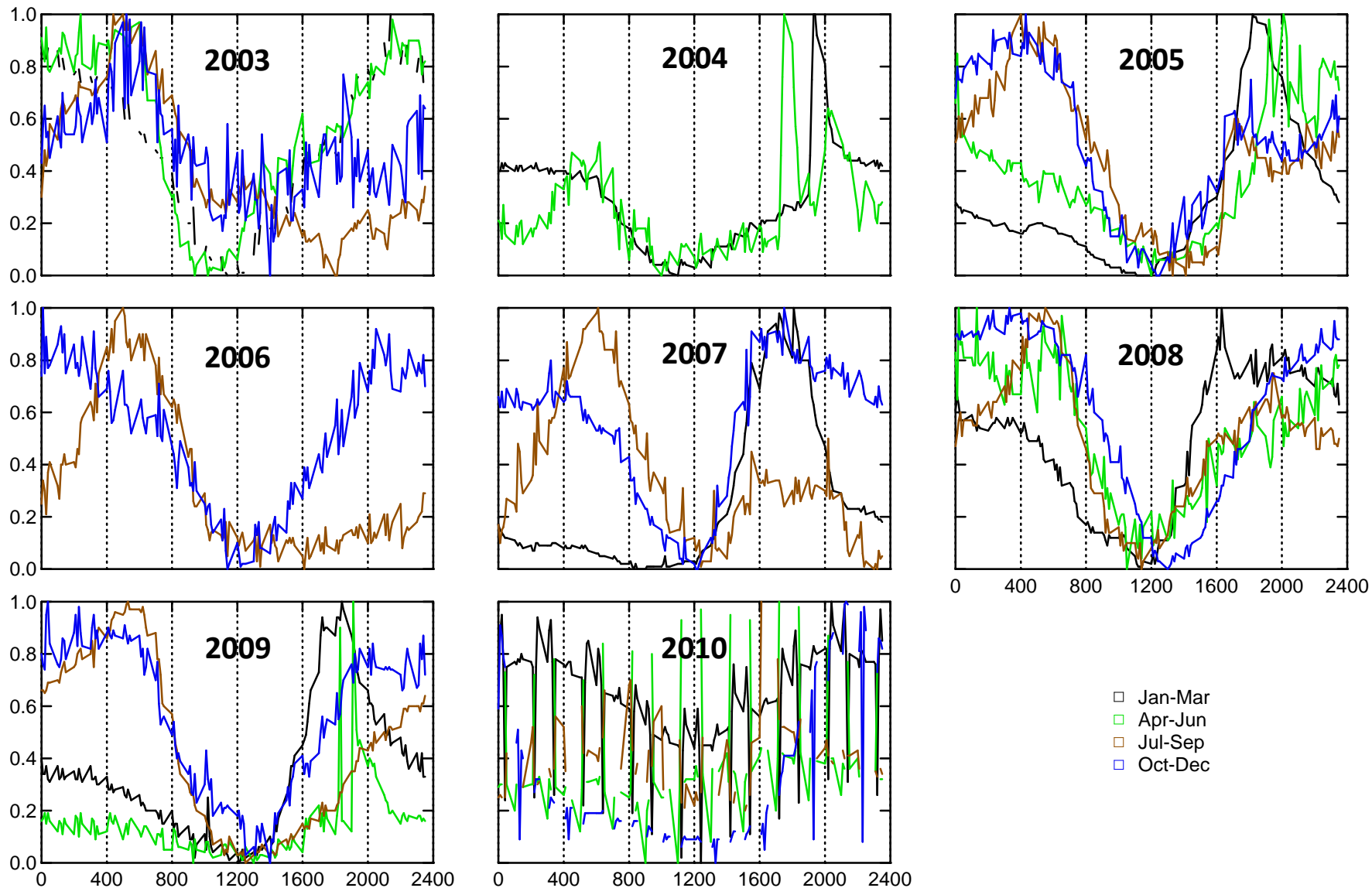
# Marsh Creek: Annual, Seasonal, & Diel Sediment Load



0 400 800 1200 1600 2000 2400

- Jan-Mar
- Apr-Jun
- Jul-Sep
- Oct-Dec

# Topaz: Sediment Load, Diel & Seasonal



# Batiste: Annual, Seasonal, & Diel Sediment Load

