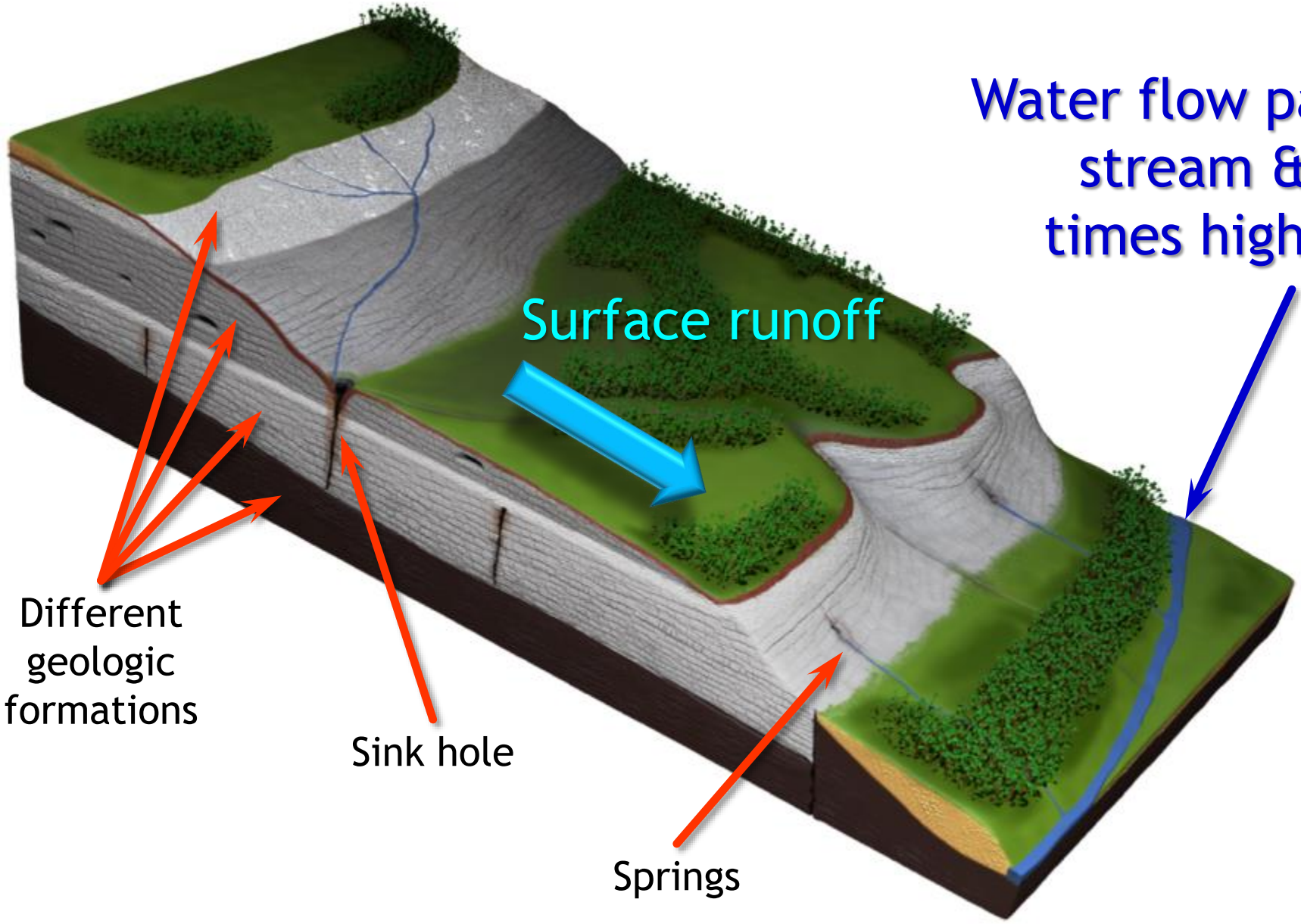
Big Creeek Research & Extension Team: Monitoring to date

C&H Hog Operation

- ✓ Farm established in early 2013
- ✓ Capacity for 6,500 hogs; operating at 2,500 pigs
- ✓ Complies with State & Federal nutrient management planning requirements

Complex karst systems



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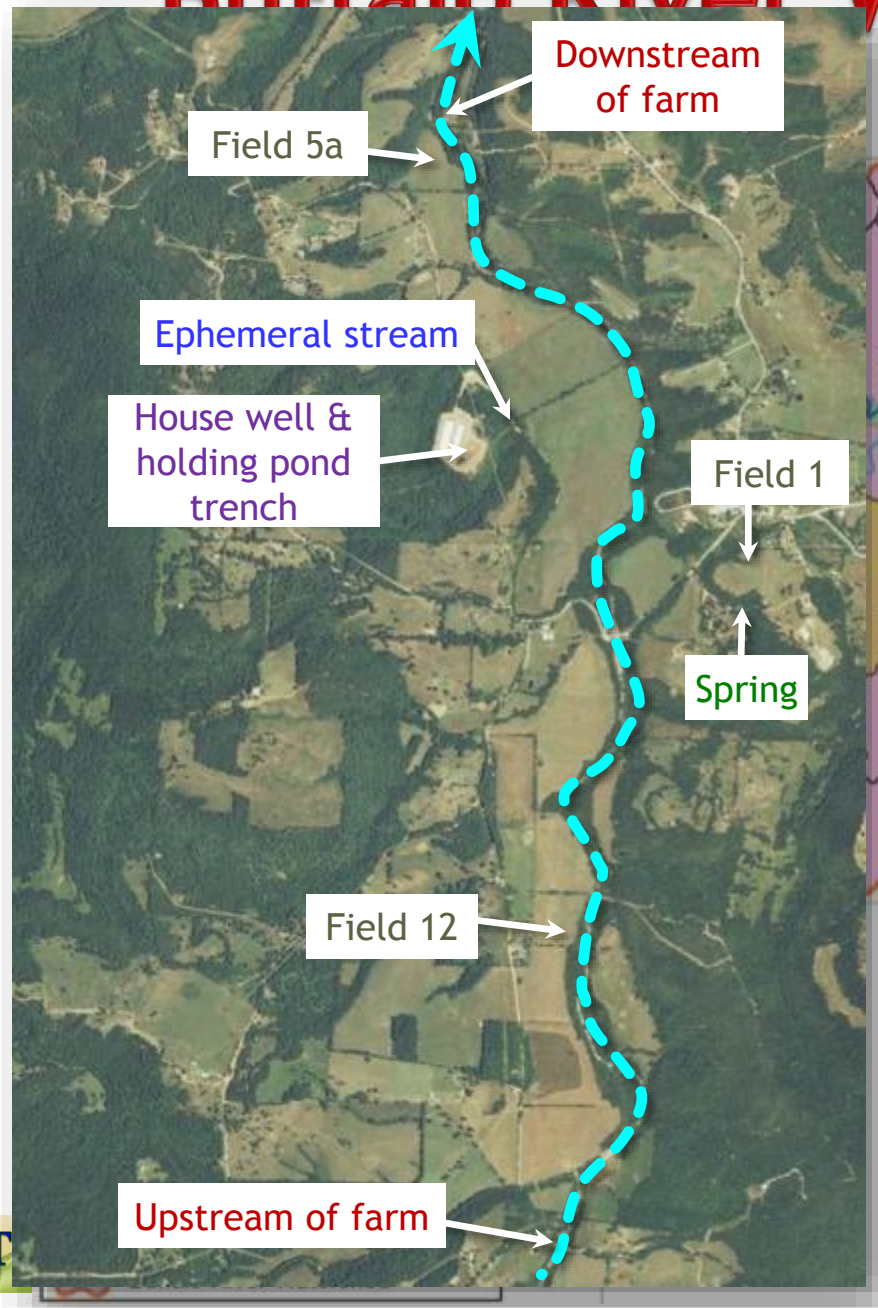
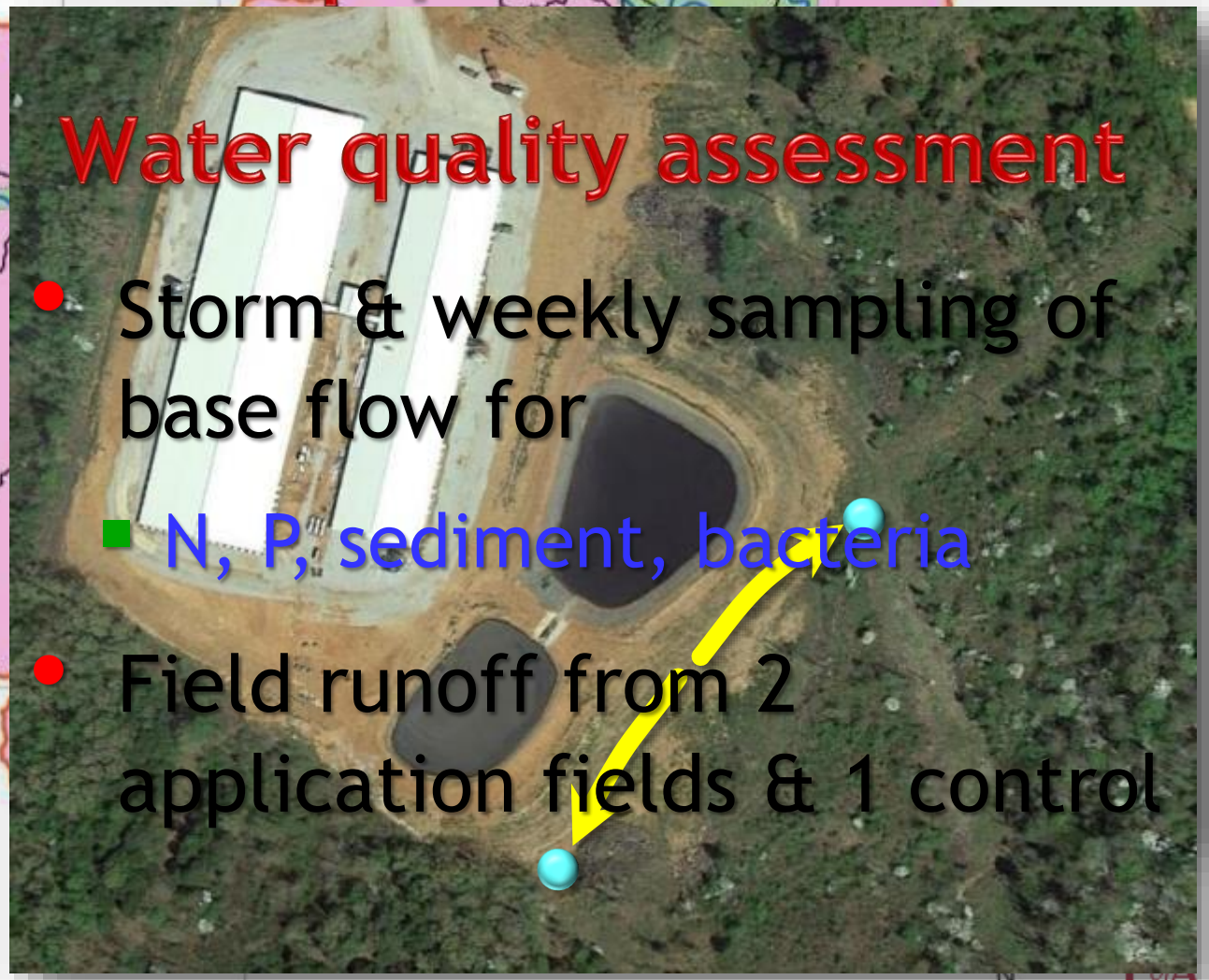
Water sample collection locations

Buffalo River Watershed

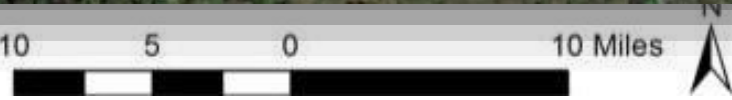


Holding pond trench



Water quality assessment

- Storm & weekly sampling of base flow for
  - N, P, sediment, bacteria
- Field runoff from 2 application fields & 1 control



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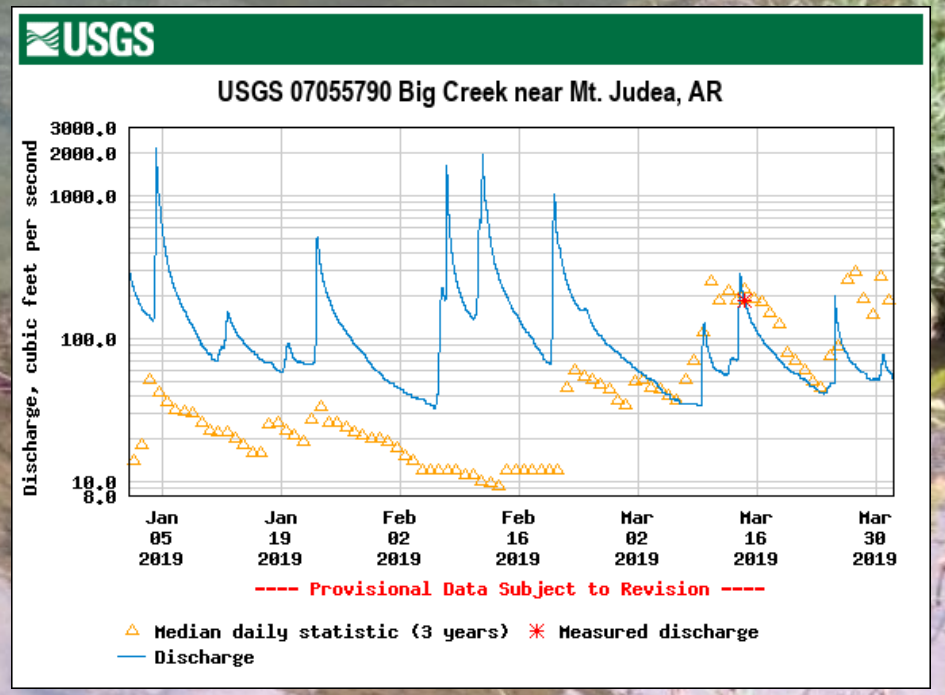
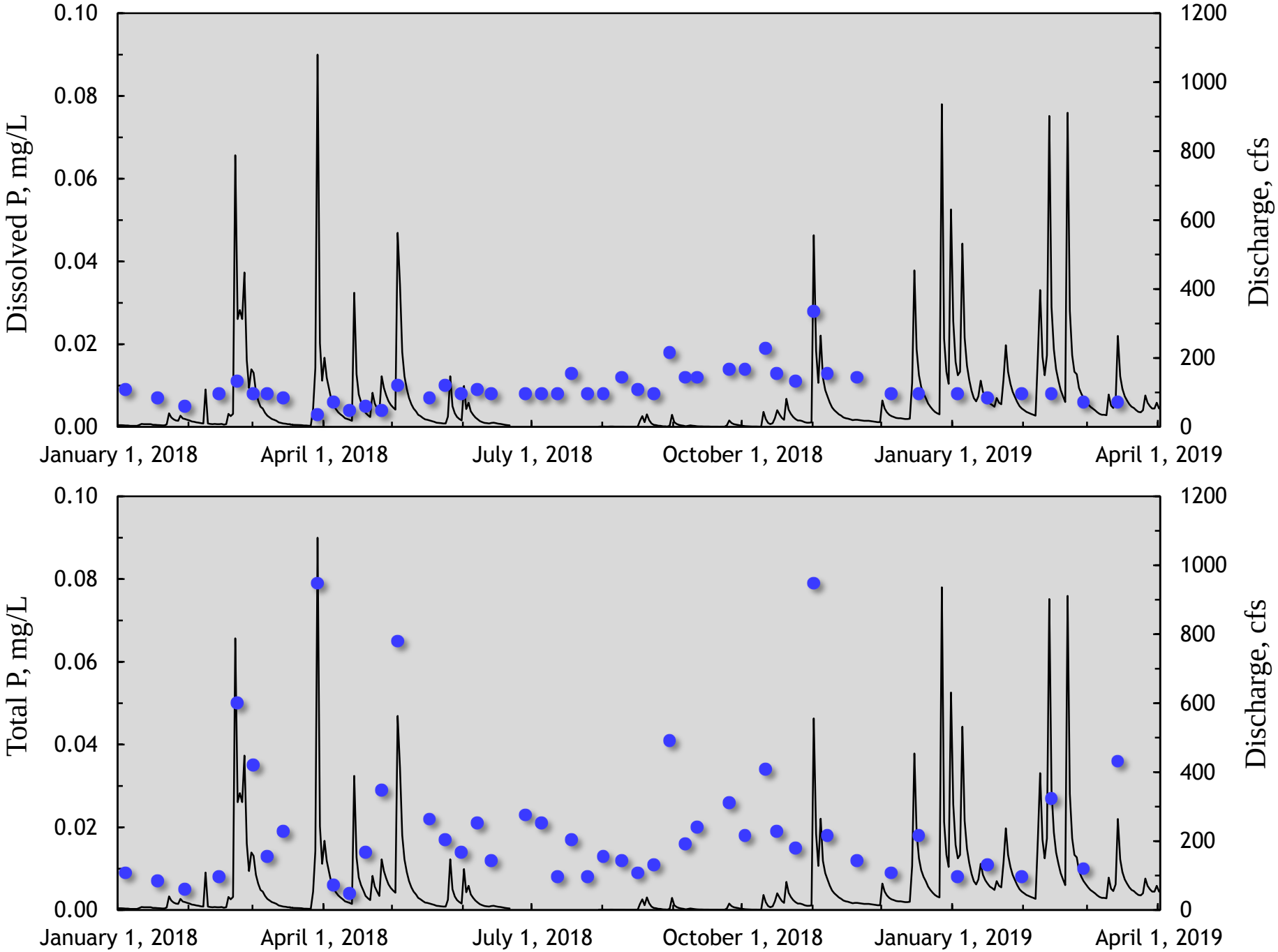
Storm flow
ISCO autosampler

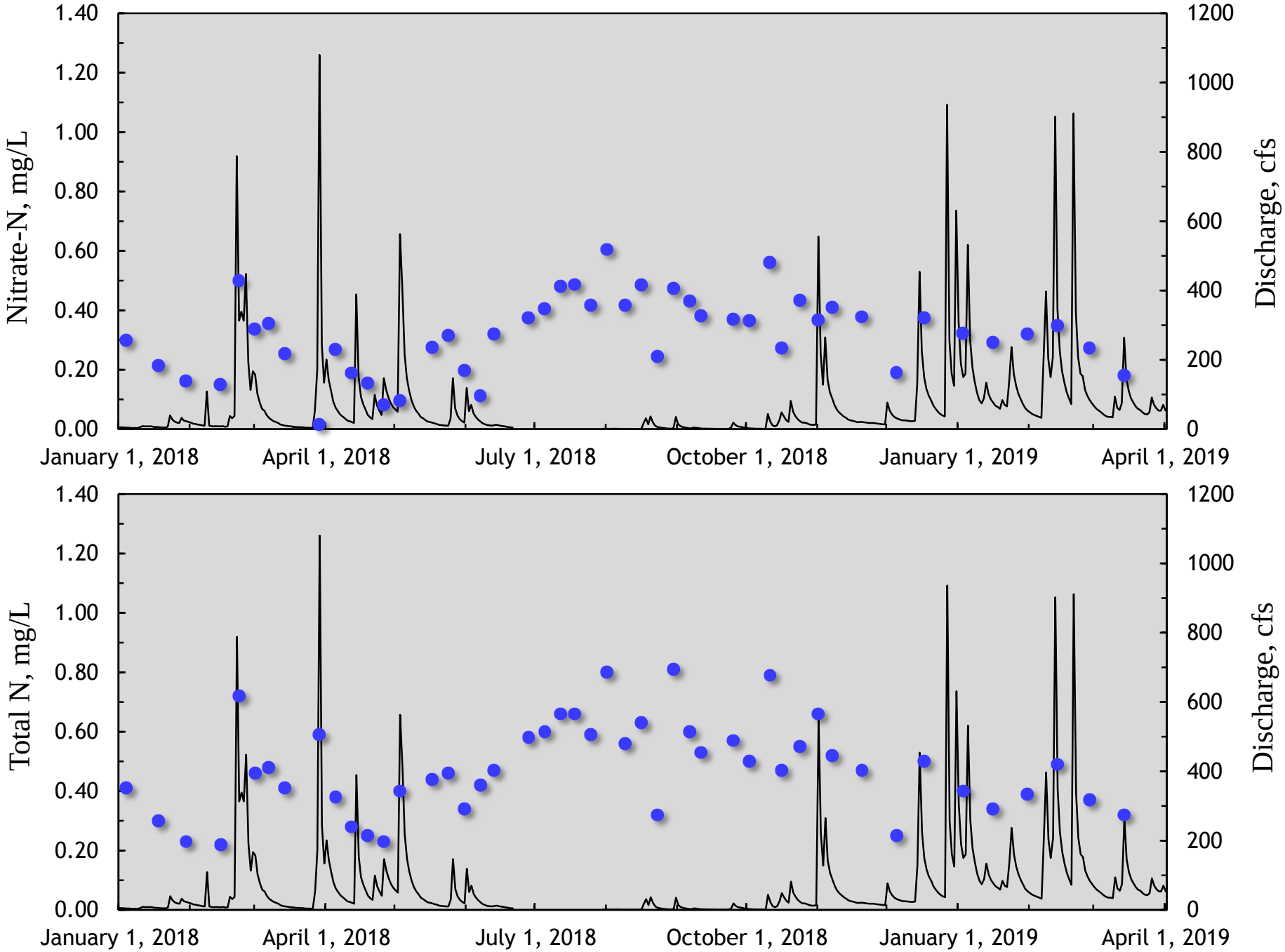
Base flow weekly
grab samples

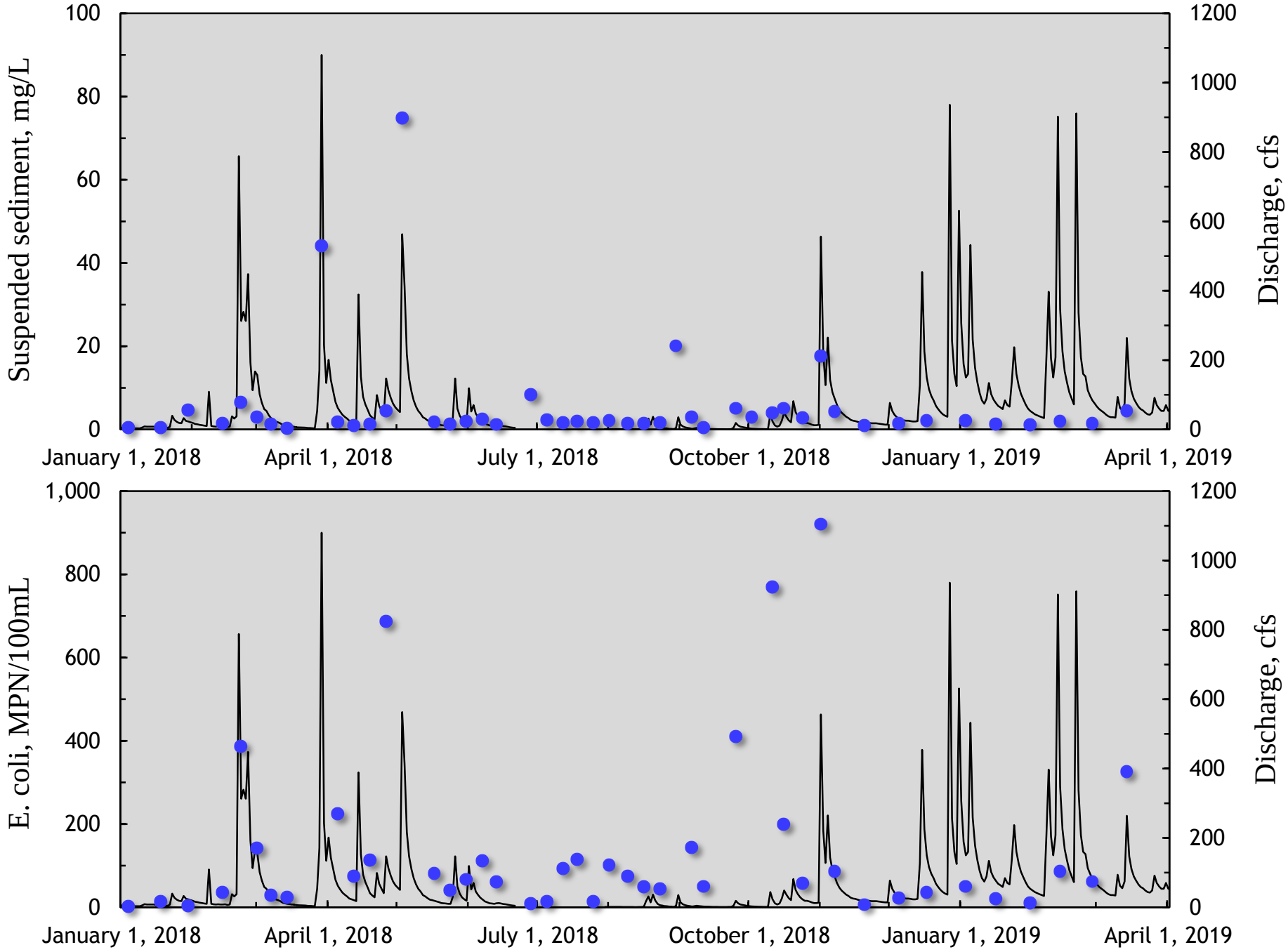
Downstream site



What is current WQ downstream?


Dissolved P, mg/L
0.10
0.08
0.06
0.04
0.02
0.00
1200
1000
800
600
400
200
0
Discharge, cfs
January 1, 2018
April 1, 2018
July 1, 2018
October 1, 2018
January 1, 2019
April 1, 2019
Total P, mg/L
0.10
0.08
0.06
0.04
0.02
0.00
1200
1000
800
600
400
200
0
Discharge, cfs
January 1, 2018
April 1, 2018
July 1, 2018
October 1, 2018
January 1, 2019
April 1, 2019

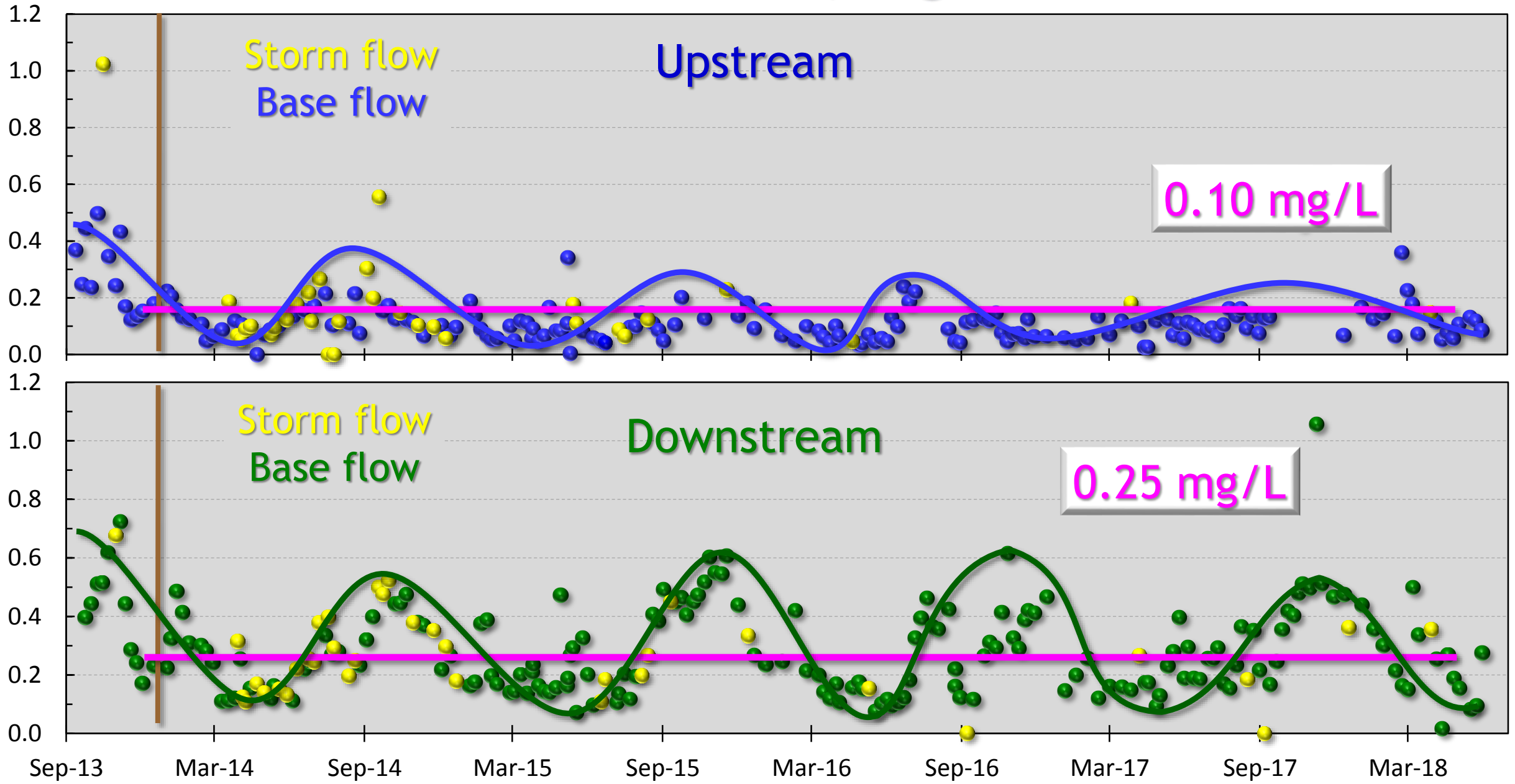

Nitrate-N, mg/L
Discharge, cfs
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
1200
1000
800
600
400
200
0
January 1, 2018
April 1, 2018
July 1, 2018
October 1, 2018
January 1, 2019
April 1, 2019
Total N, mg/L
Discharge, cfs
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
1200
1000
800
600
400
200
0
January 1, 2018
April 1, 2018
July 1, 2018
October 1, 2018
January 1, 2019
April 1, 2019


Suspended sediment, mg/L
100
80
60
40
20
0
1200
1000
800
600
400
200
0
Discharge, cfs
January 1, 2018
April 1, 2018
July 1, 2018
October 1, 2018
January 1, 2019
April 1, 2019
E. coli, MPN/100mL
1,000
800
600
400
200
0
1200
1000
800
600
400
200
0
Discharge, cfs
January 1, 2018
April 1, 2018
July 1, 2018
October 1, 2018
January 1, 2019
April 1, 2019

What have we found so far?

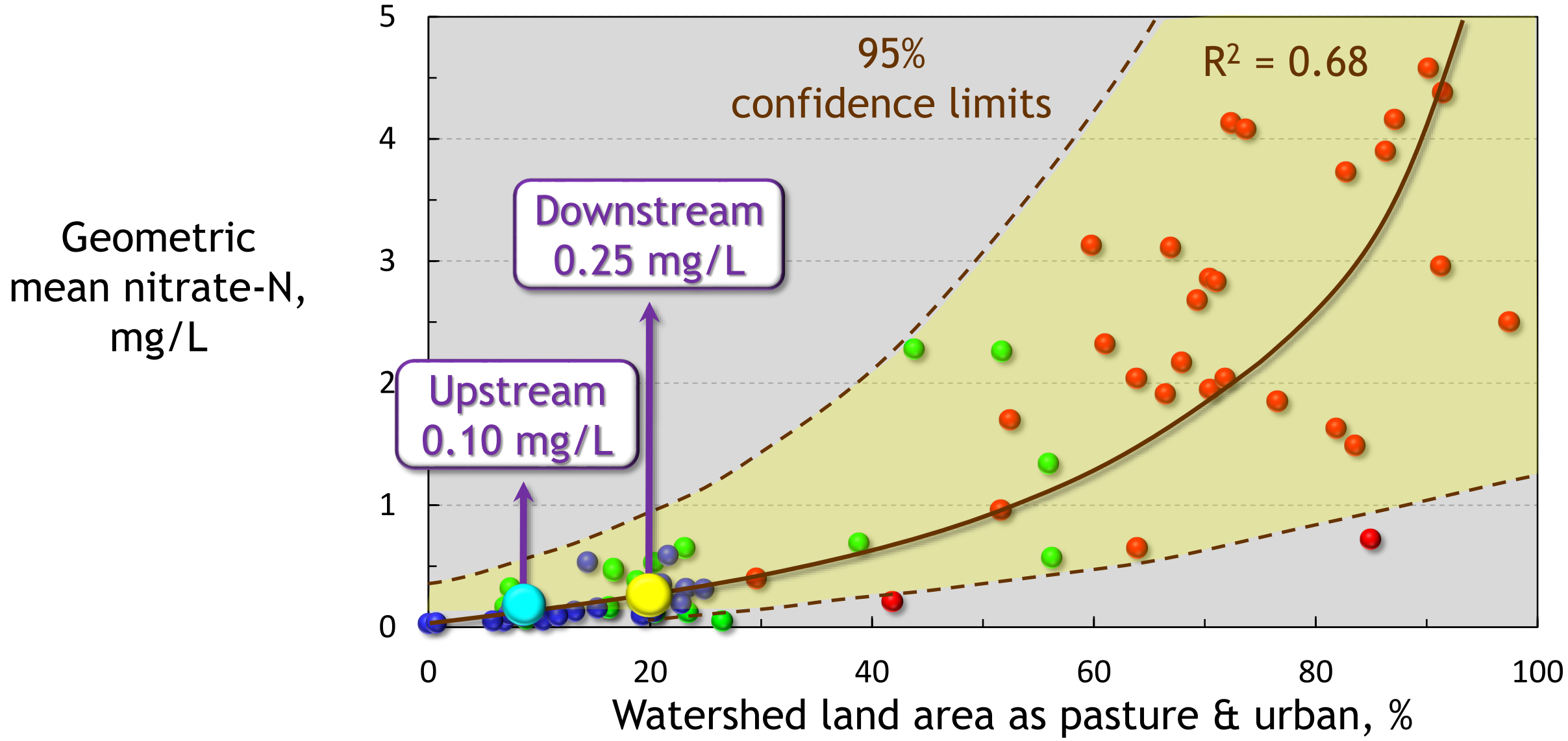
Initial slurry application

Nitrate-N, mg/L



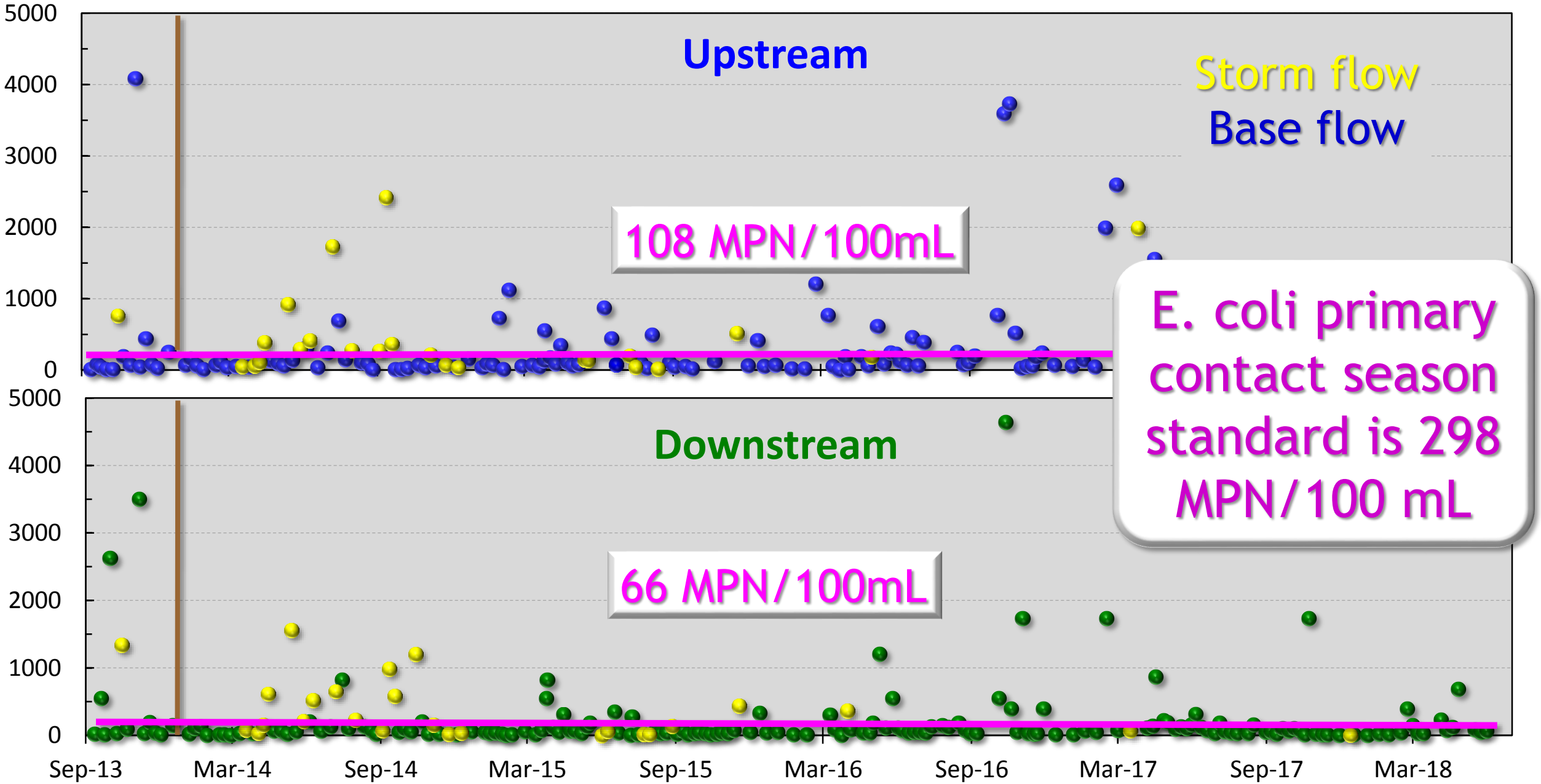
Putting this into a regional context

Beaver Reservoir Watershed Buffalo River Watershed Illinois River Watershed

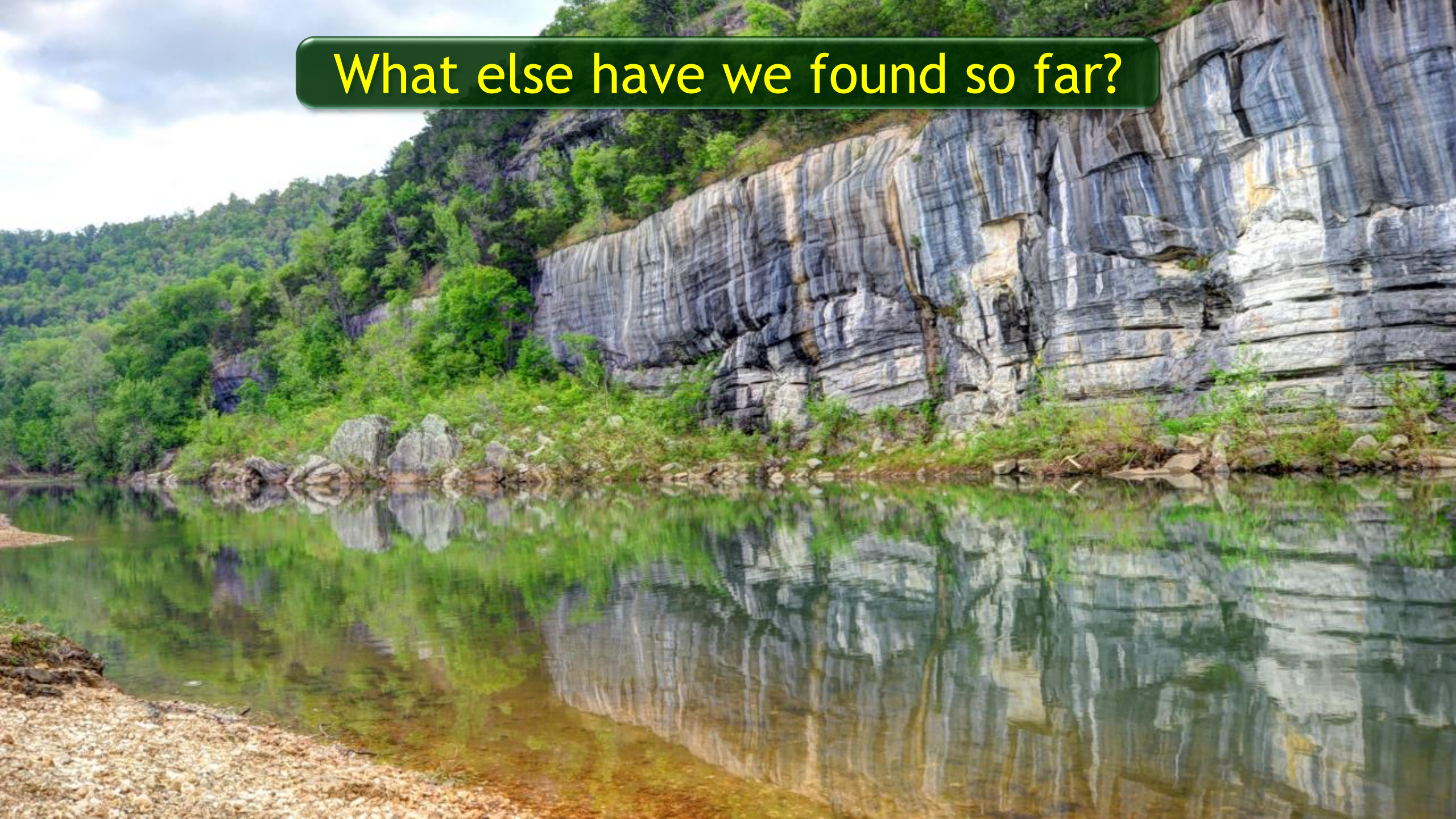


Initial slurry application

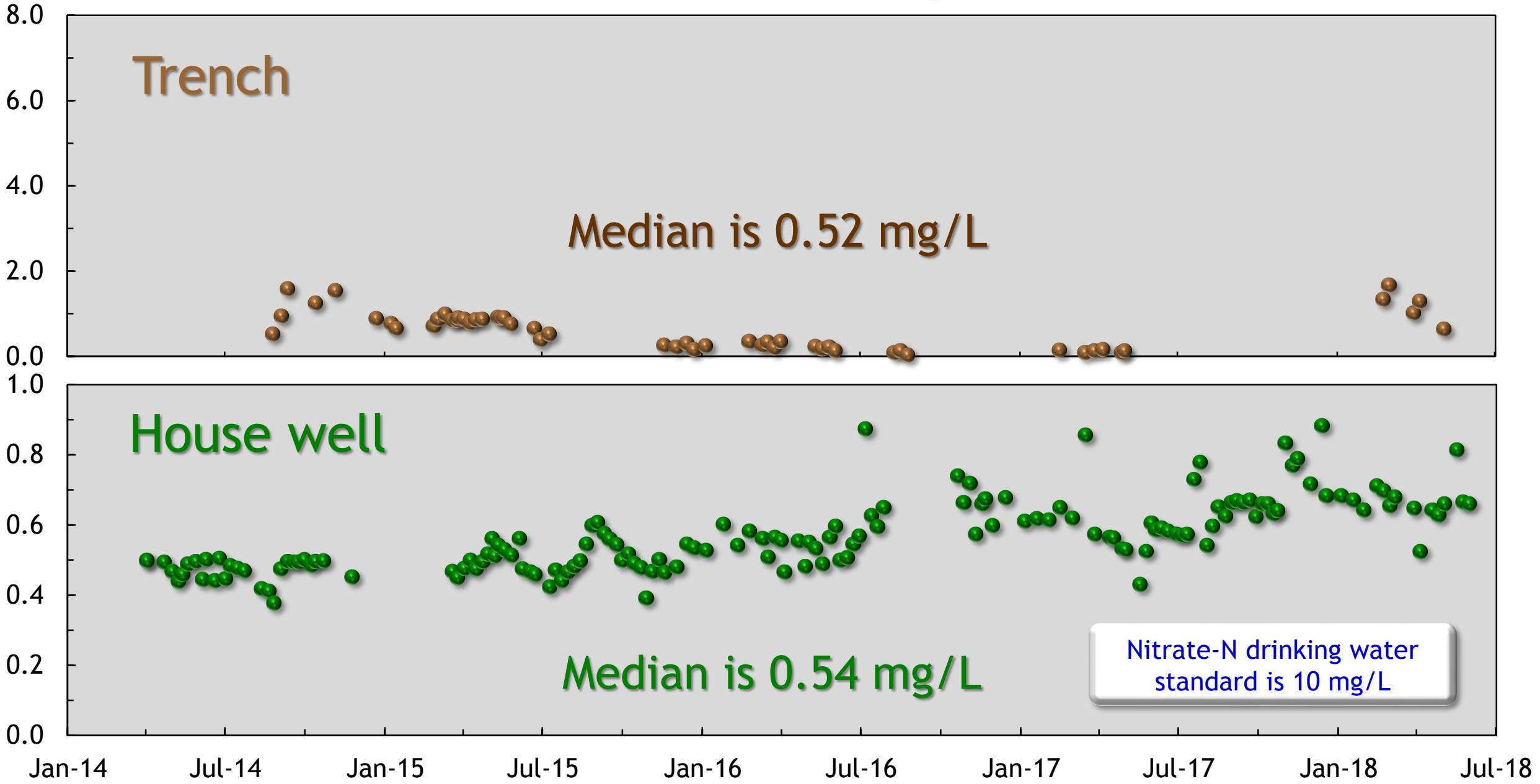
E. Coli MPN/100mL



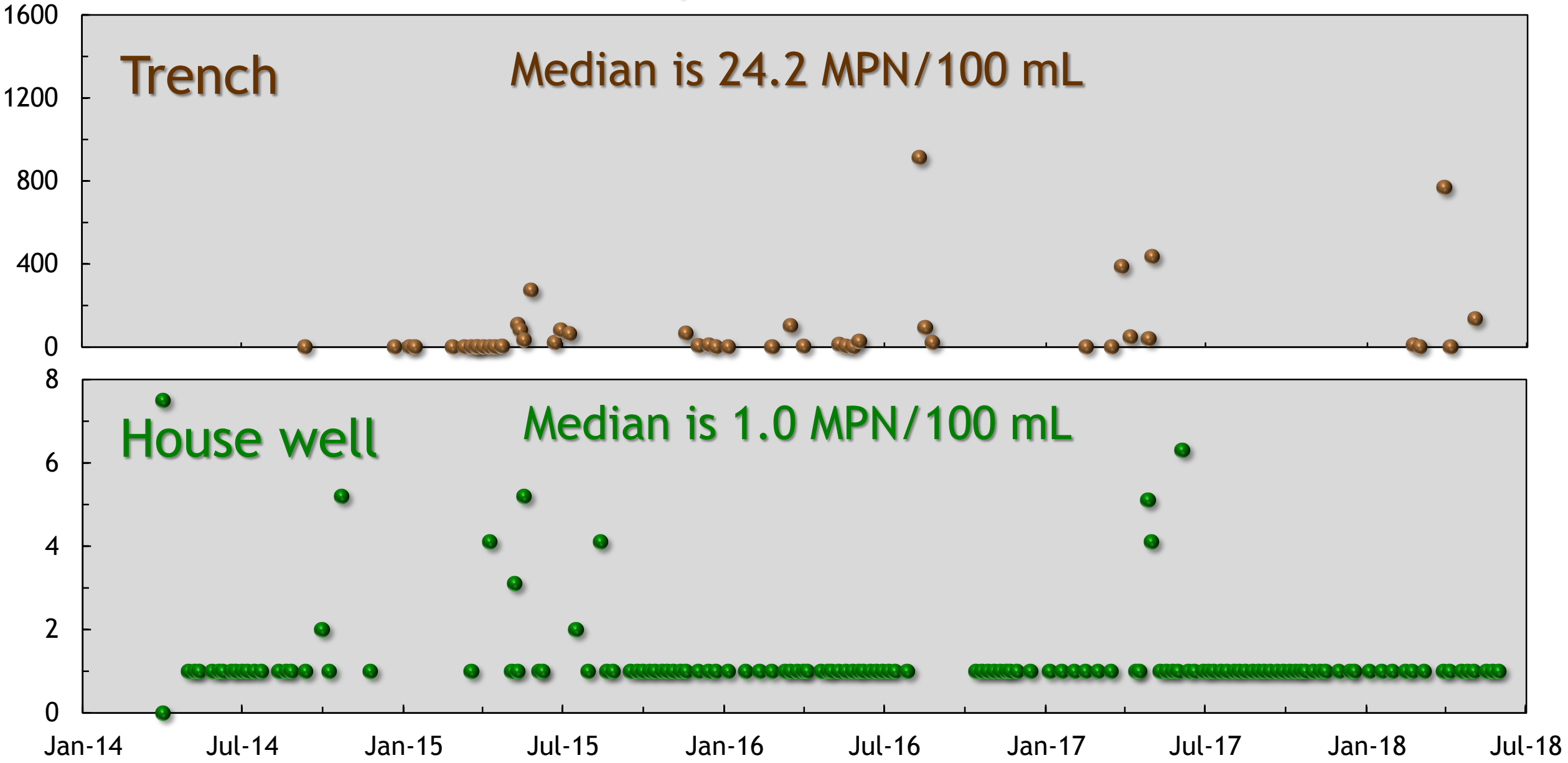
E. coli primary contact season standard is 298 MPN/100 mL


What else have we found so far?

Nitrate-N, mg/L



E. coli, MPN/100 mL

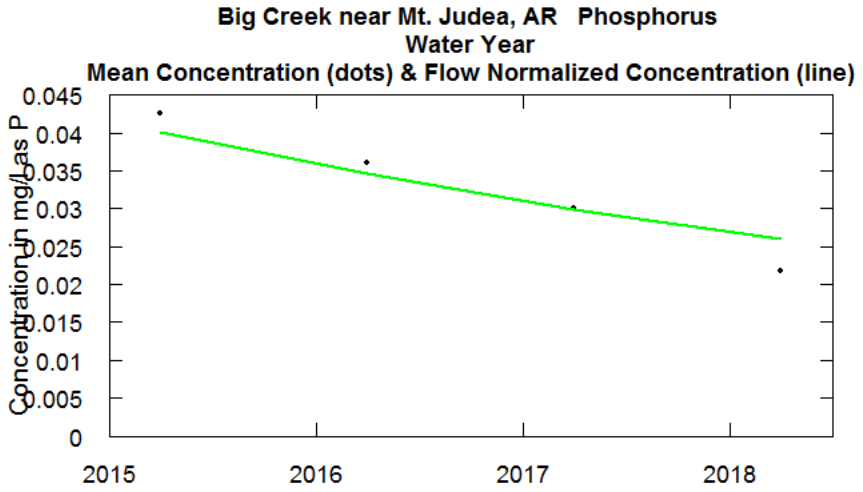


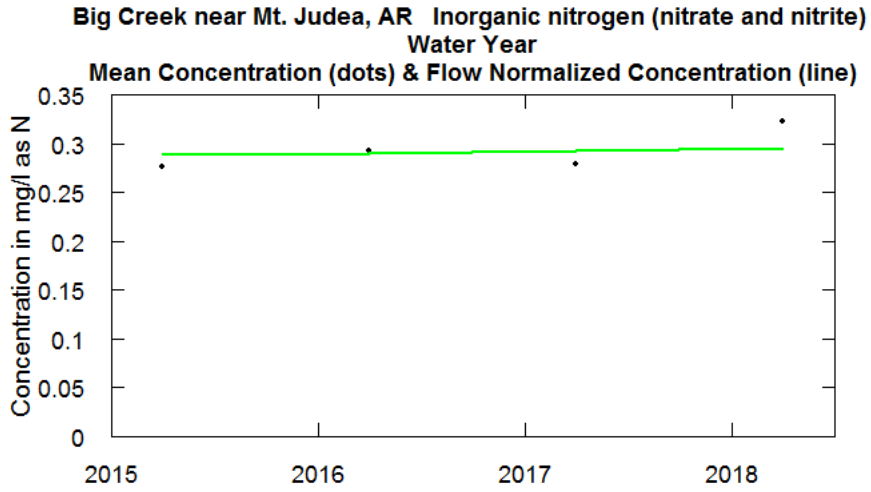
What have we learnt?

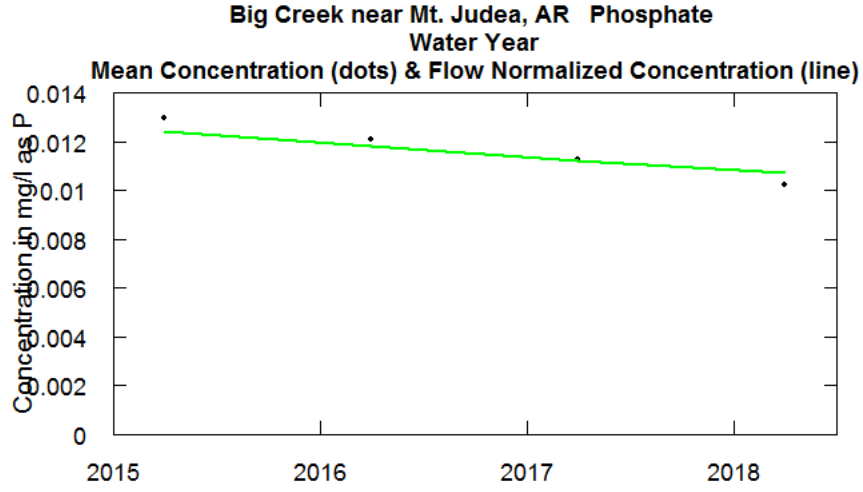
- ✓ Soil P accumulation in cattle feeding & loafing areas
- ✓ No consistent water quality trends to date
- ✓ Continue to provide transparent, unbiased, science for landowner & State to make decisions
- ✓ System variabilities create uncertainty
- ✓ To address variabilities, monitoring over least 5 years are recommended

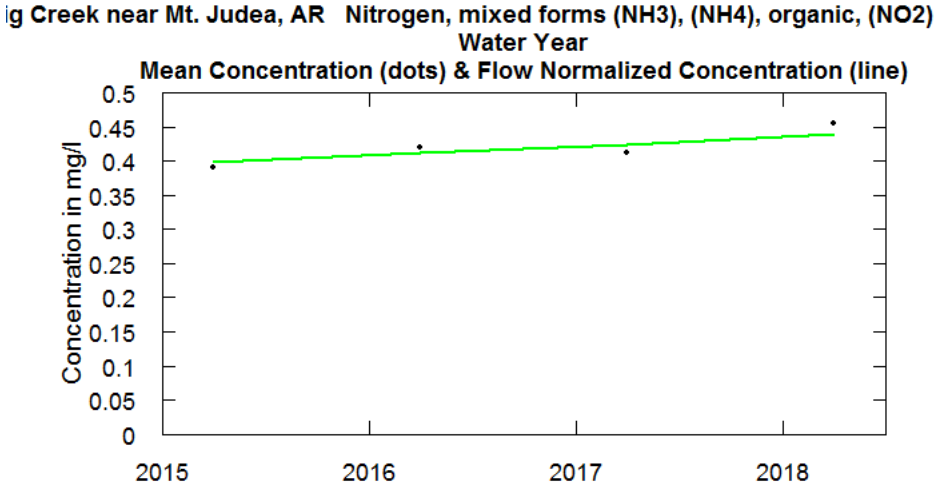
We are approaching five years of data so what are the current trends in water quality?

(Weighted Regression Time Discharge Season, WRTDS)









Thank you

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