Lower James River Water Quality Monitoring -2013 Summary

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CHLA Principal Investigator Meeting

Monitoring Summary

- HRSD DataFlow monitoring (JMSMH, JMSPH, LAFMH and ELIPH) conducted weekly from **February-October.** Additional cruises conducted around storms in the LAFMH – 117 total cruises 2013

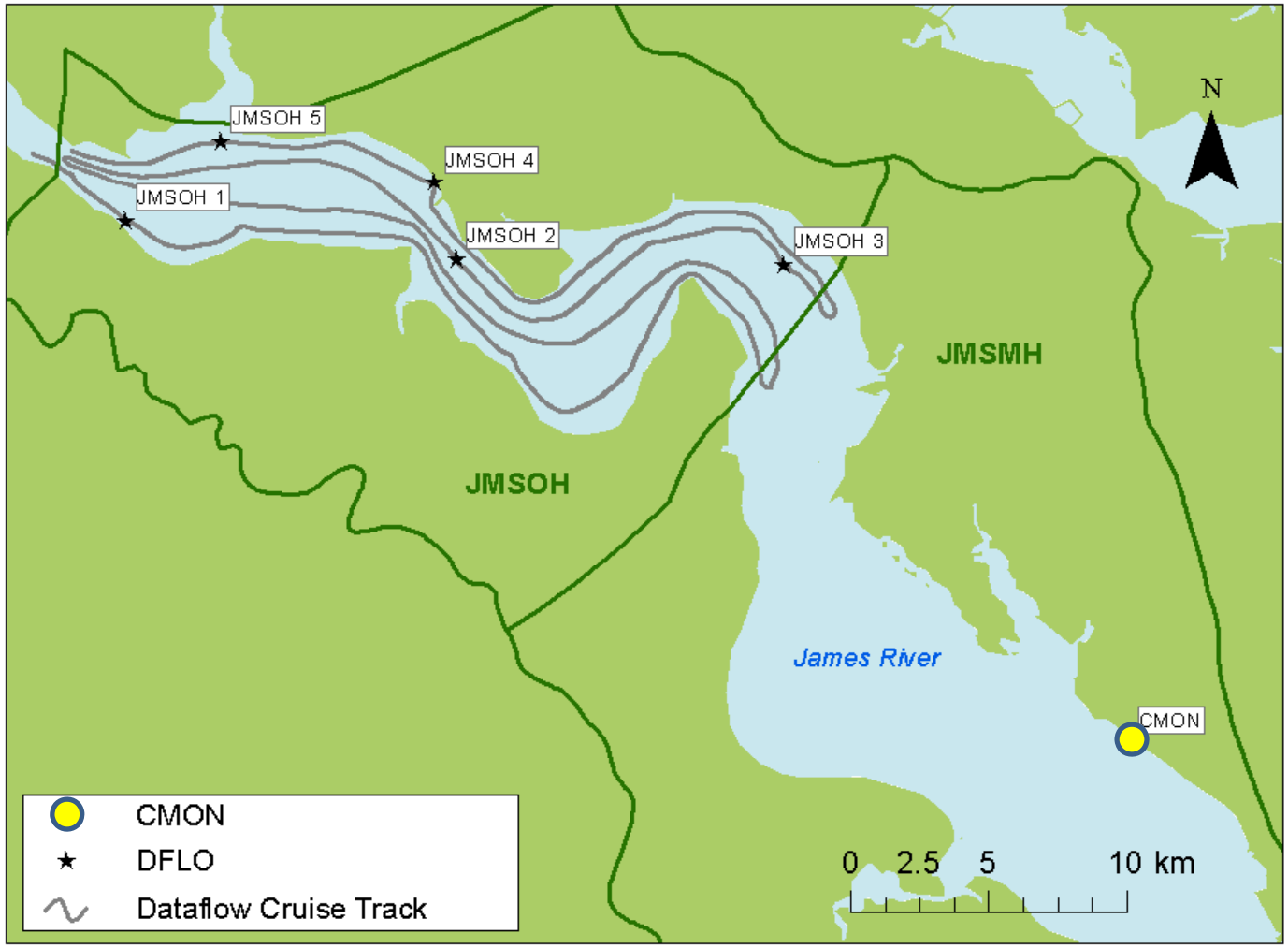
- VIMS DataFlow monitoring (JMSOH) conducted weekly (**Feb-Mar**), monthly (**Apr-Sep**)

- ConMon stations: JMS17.96 (**mid Feb-Nov 1**)*, LAF001.63 (**Mar12-Oct15**), LAF004.70 (**Mar12-Oct15)**

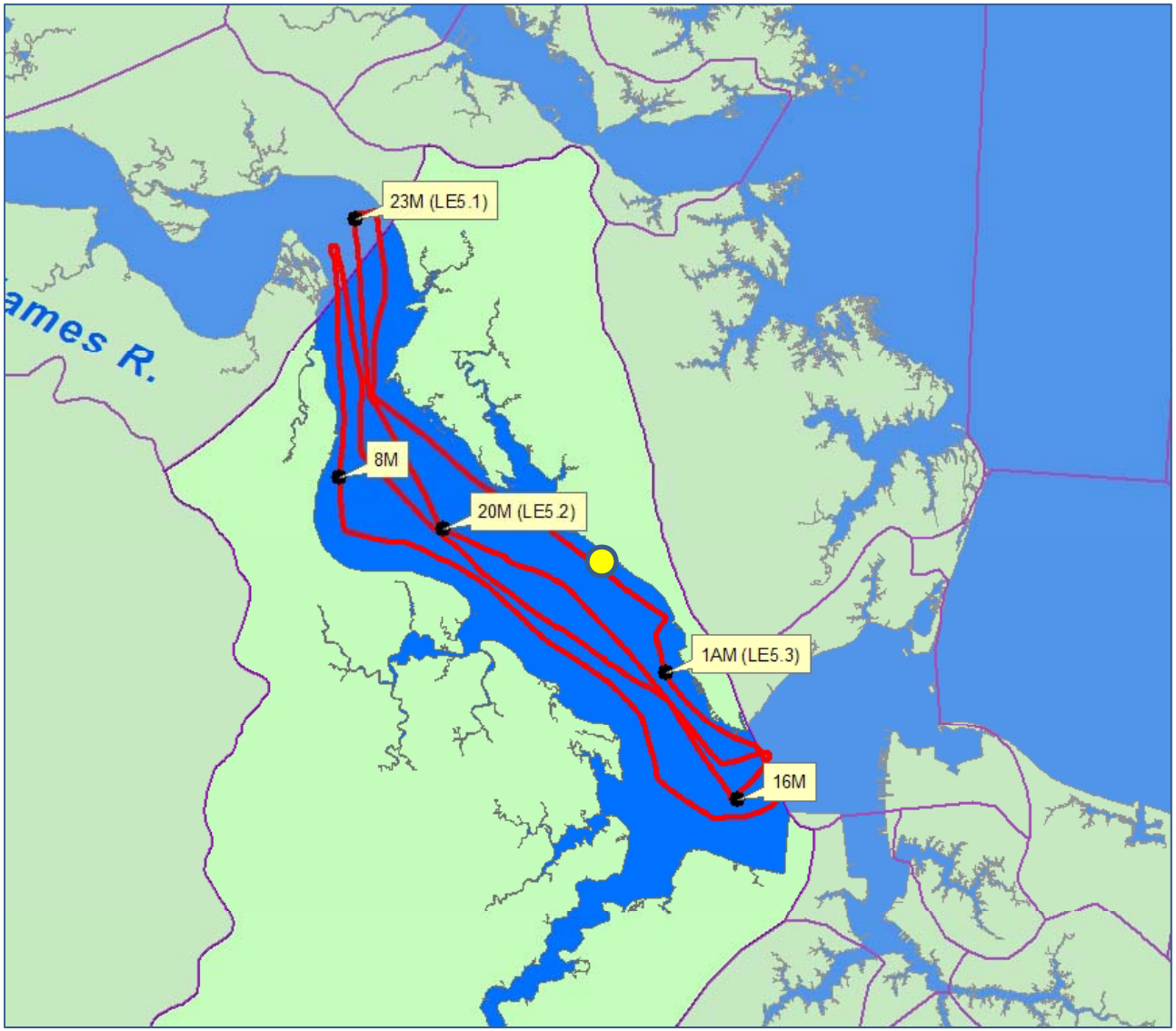
- Calibration samples (**5 per segment**) during each cruise, plus bloom samples as evident for further analyses. Calibration samples taken at each ConMon sonde switchout

- VIMS/HRSD Data is available at: http://www3.vims.edu/vecos/

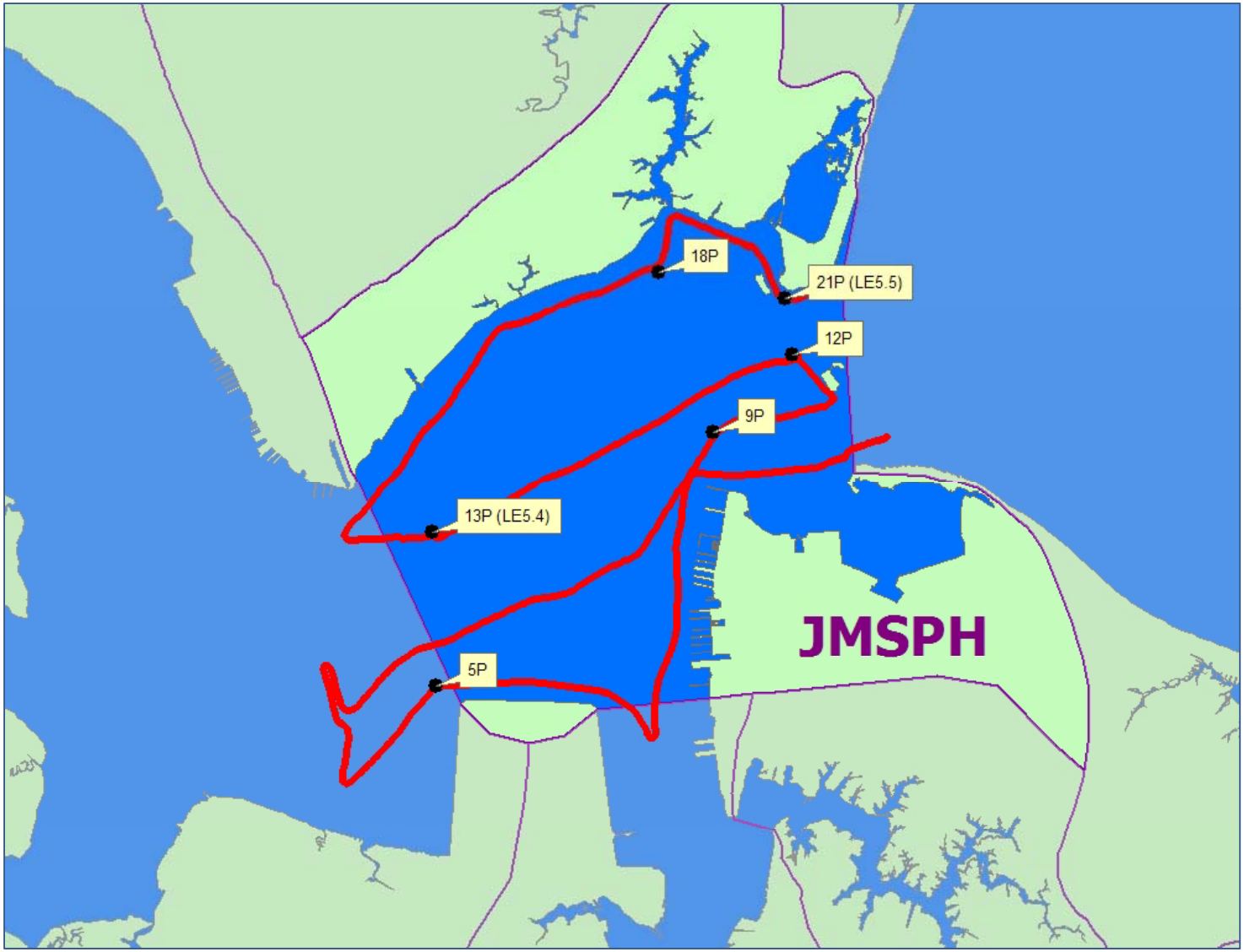
James Oligohaline (JMSOH)



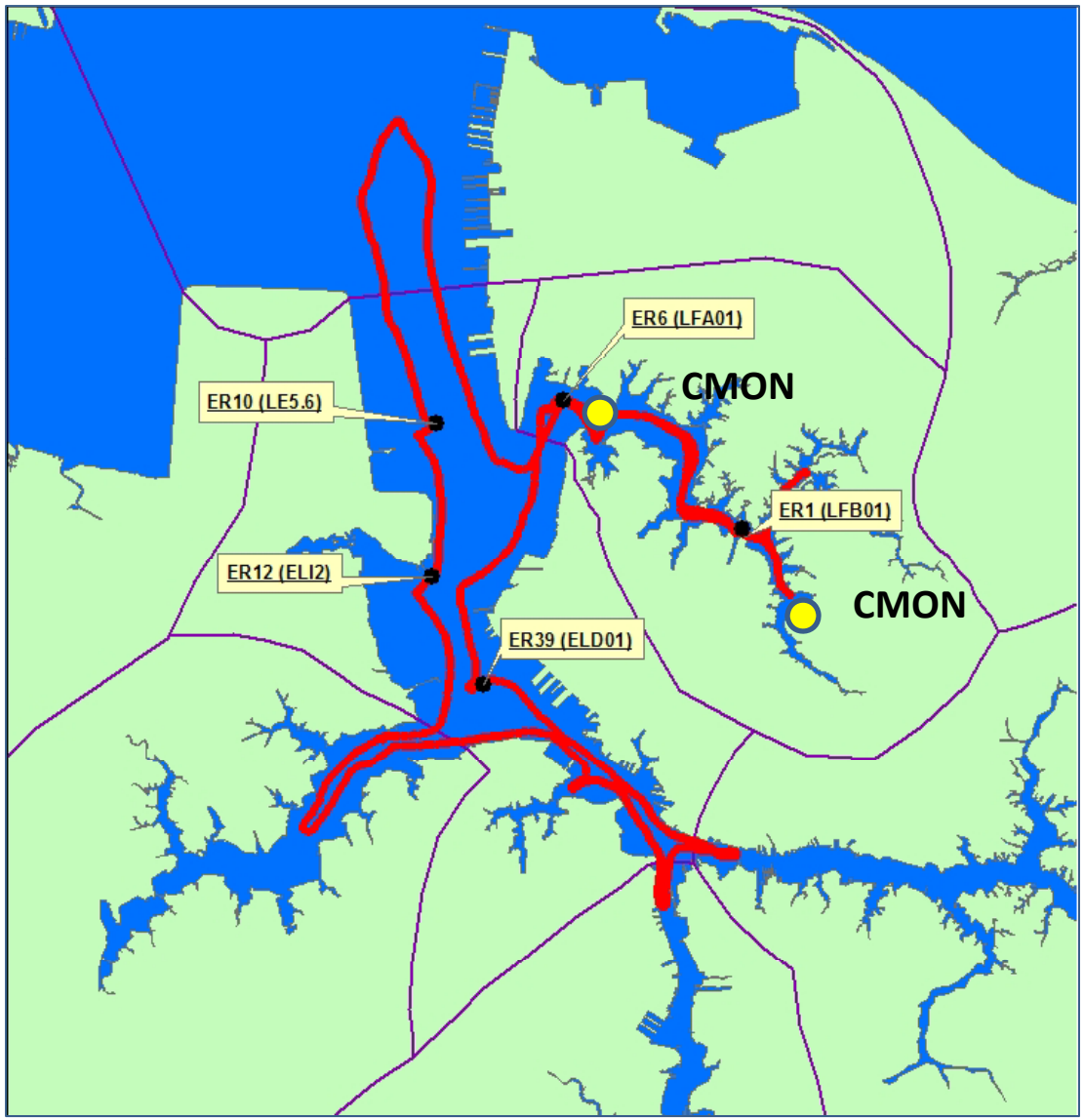
James Mesohaline (JMSMH)



James Polyhaline (JMSPH)



Elizabeth (LAFMH and ELIPH)



Lower James River Seasonal CHLa Criteria
(Spring: March 1-May 31; Summer: July 1 Sept 30)

Segment	Seasonal Mean Criterion (ug/l) Spring/Summer
James River Oligohaline (JMSOH)	15/22
James River Mesohaline (JMSMH)	12/10
James River Polyhaline (JMSPH)	12/10

Mean Monthly Percent Area Exceeding James River Seasonal CHL a Criteria 2012 -2013 (RED = >10% of area)

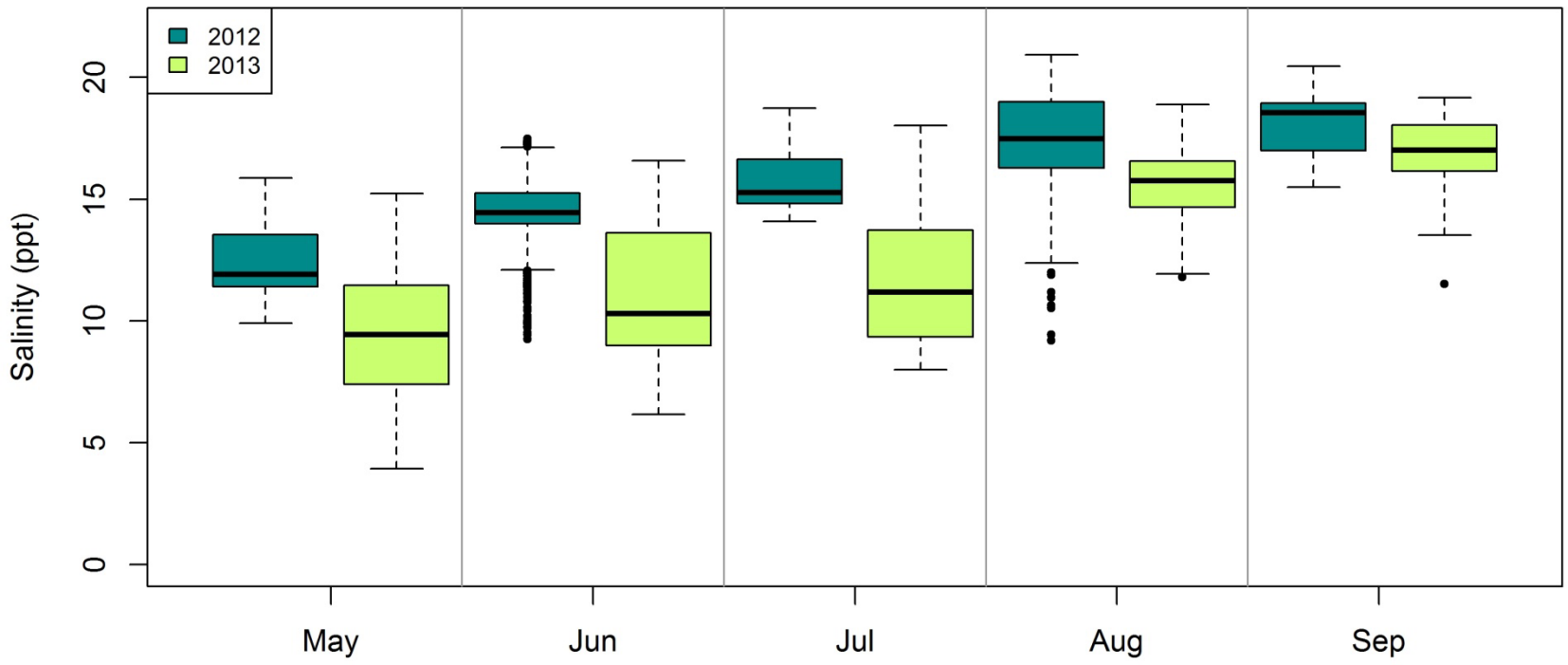
2012

Segment	Spring			Summer		
	Mar	Apr	May	Jul	Aug	Sep
ELIPH	1.4	0.0	0.0	60.4	17.4	4.0
LAFMH	18.3	2.9	18.9	52.6	47.8	25.2
JMSPH	0.1	0.0	1.3	35.8	12.6	3.2
JMSMH	12.7	0.0	0.1	5.2	6.9	0.2
JMSOH	ND	ND	3.7	0.7	2.5	0.6

2013

Segment	Spring			Summer		
	Mar	Apr	May	Jul	Aug	Sep
ELIPH	15.4	15.4	0.2	14.4	36.9	26.0
LAFMH	8.7	14.9	38.9	32.7	49.6	20.5
JMSPH	5.4	3.3	2.8	0.7	10.0	7.7
JMSMH	17.6	7.7	0.0	0.5	4.4	2.2
JMSOH	1.1	3.8	2.5	7.8	0.0	0.0

Mesohaline Continuous Monitoring Site Monthly Salinities

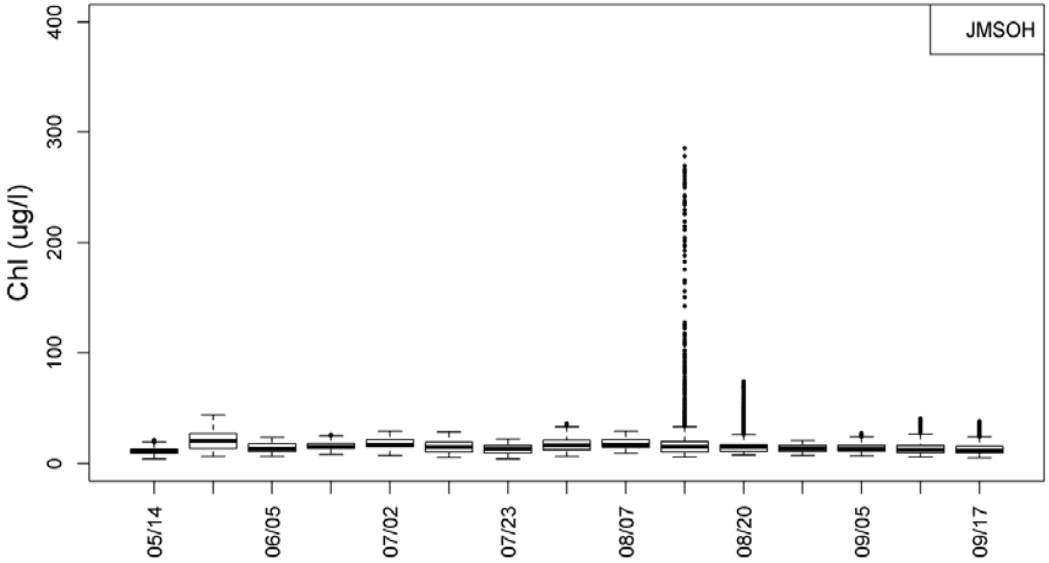


Median Integrated Chl *a* James River Oligohaline Segment

2012 -2013

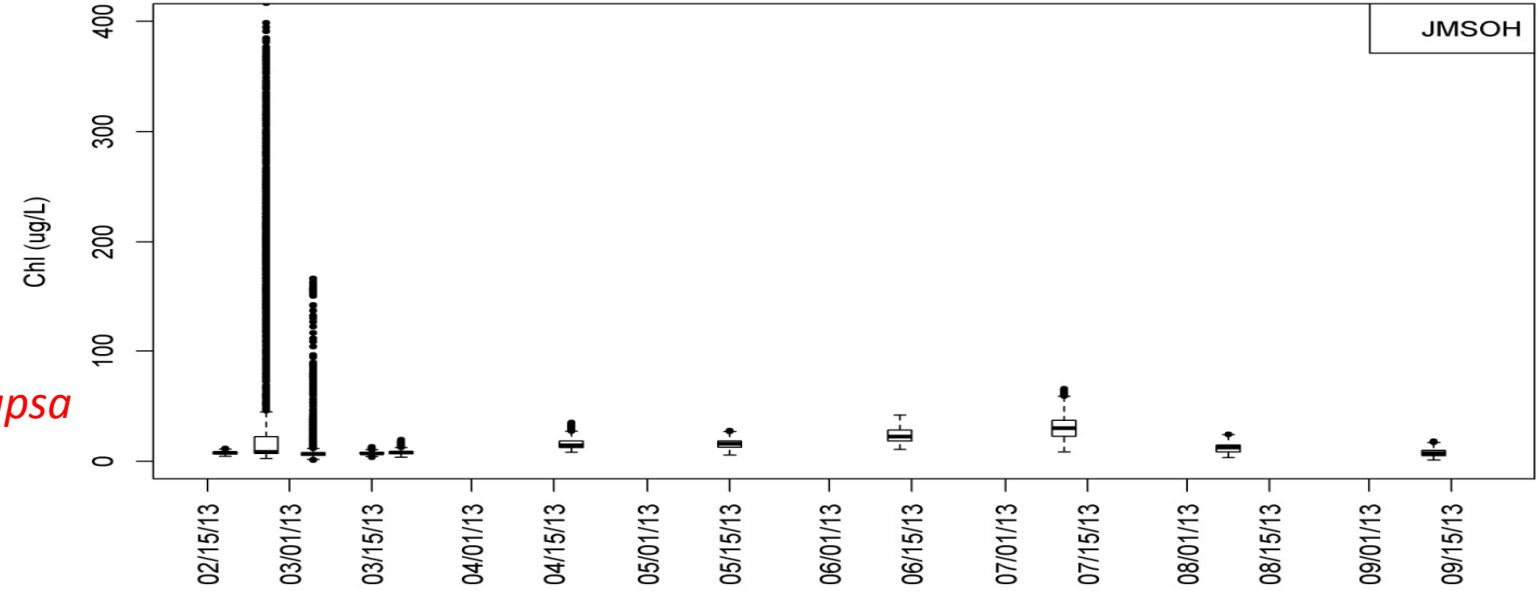
2012

NO SAMPLING



2013

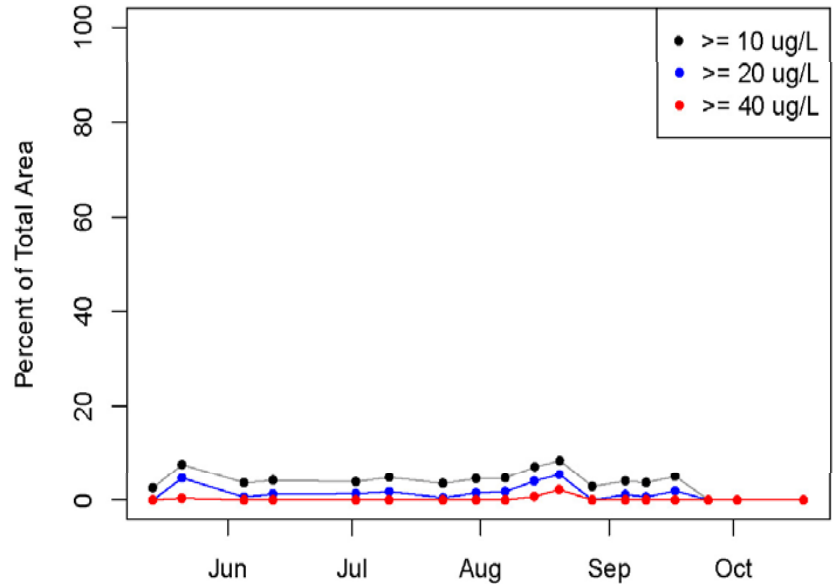
Heterocapsa



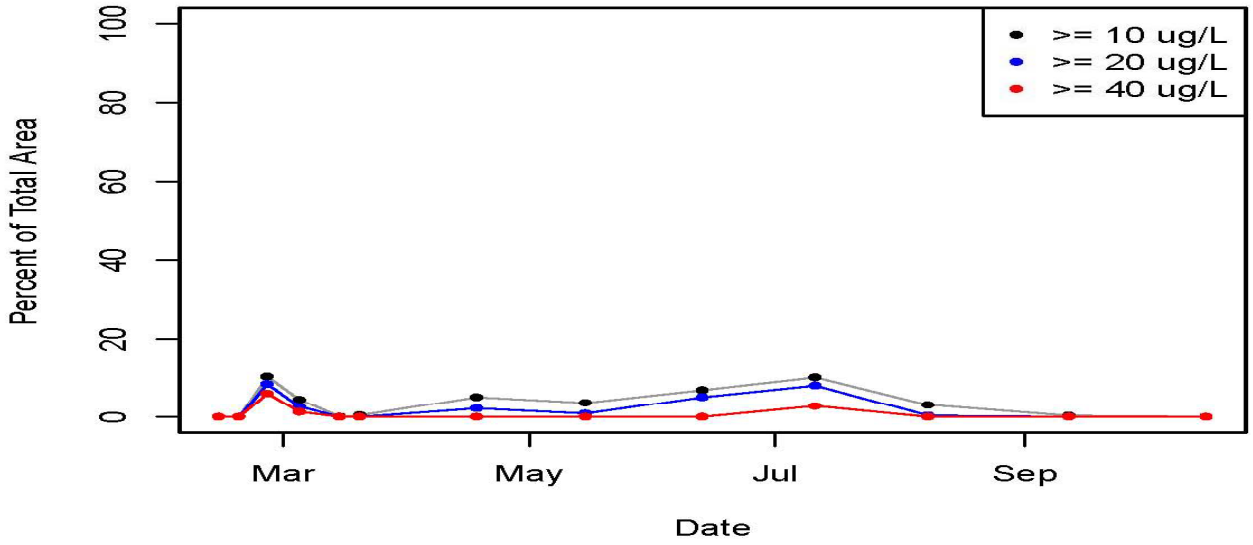
Integrated Percent Total Water Area James River Oligohaline Segment Greater Than or Equal To 10, 20, 40 ug/l Chl a

2012

NO SAMPLING

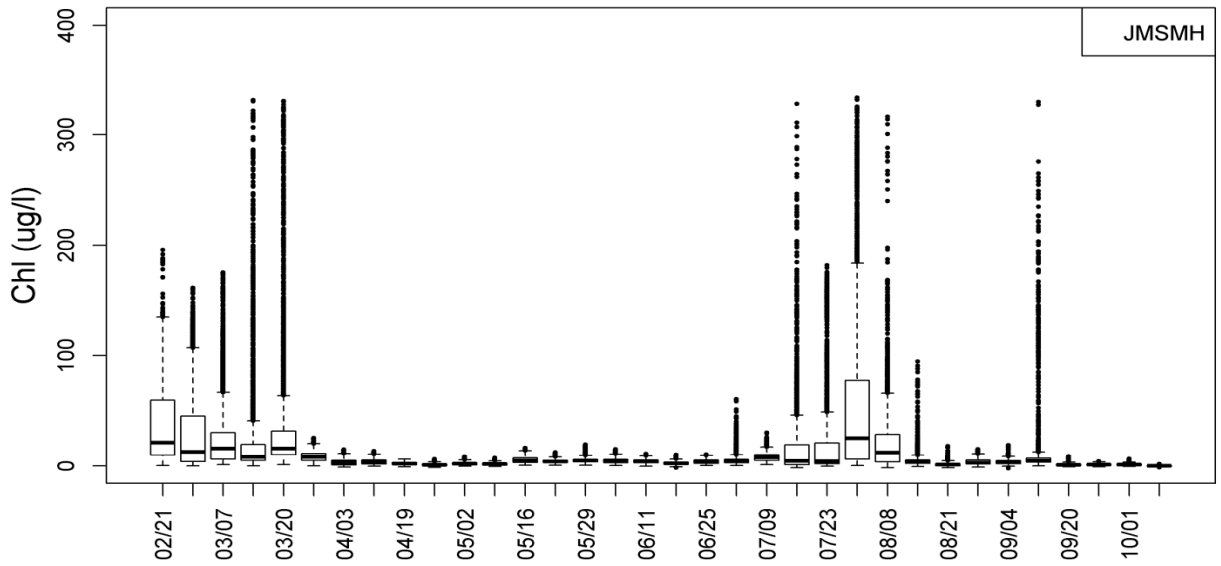


2013



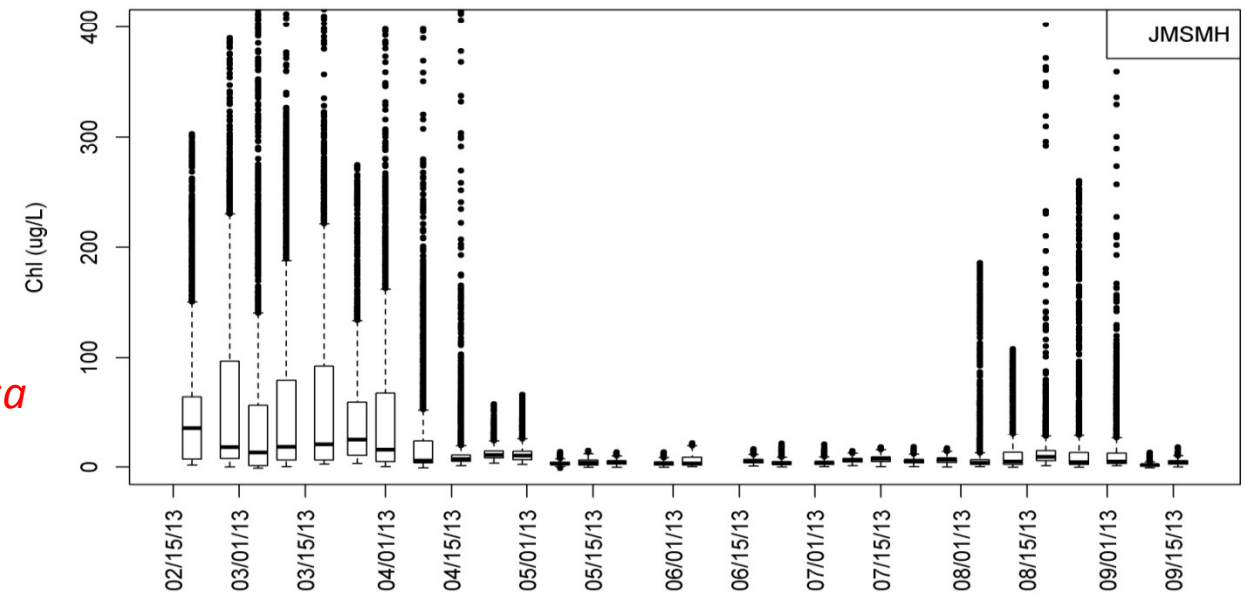
Median Integrated Chl *a* James River Mesohaline Segment
2012 -2013

2012



2013

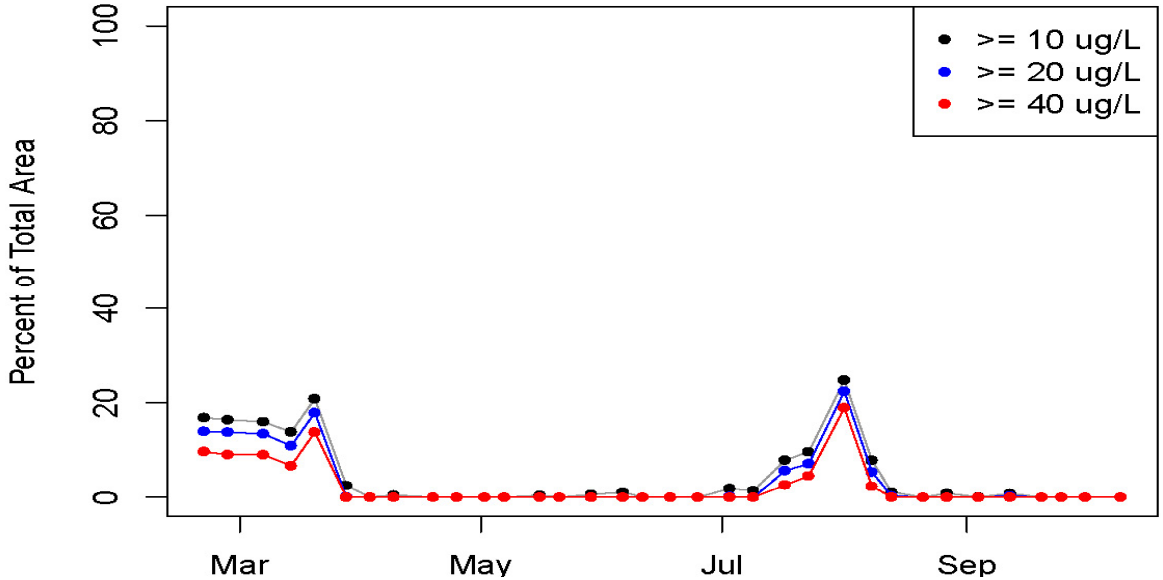
Heterocapsa



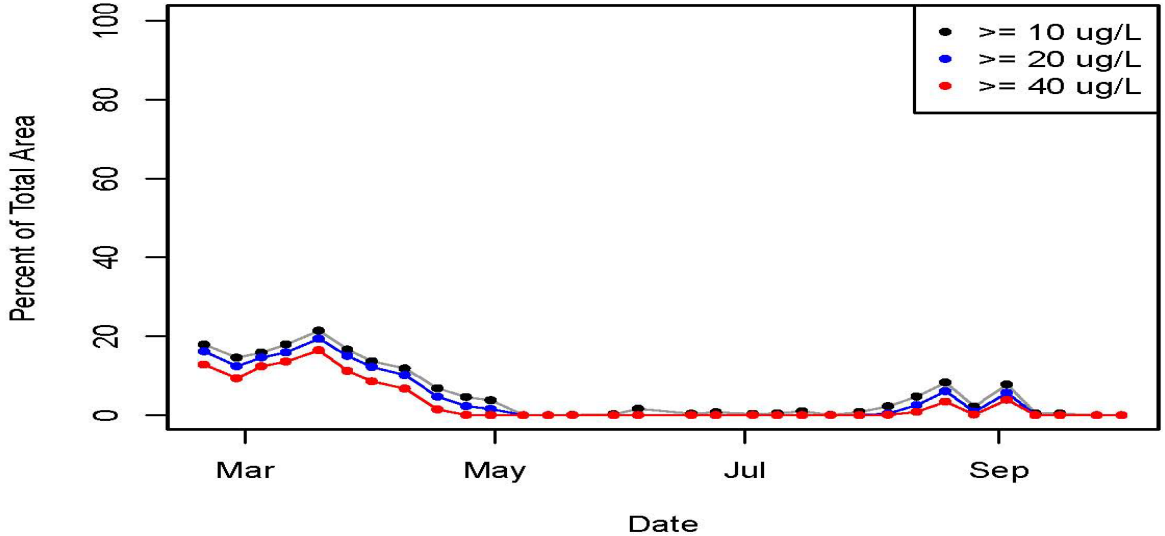
Cochlodinium

Integrated Percent Total Water Area James River Mesohaline Segment Greater Than or Equal To 10, 20, 40 ug/l CHL a

2012

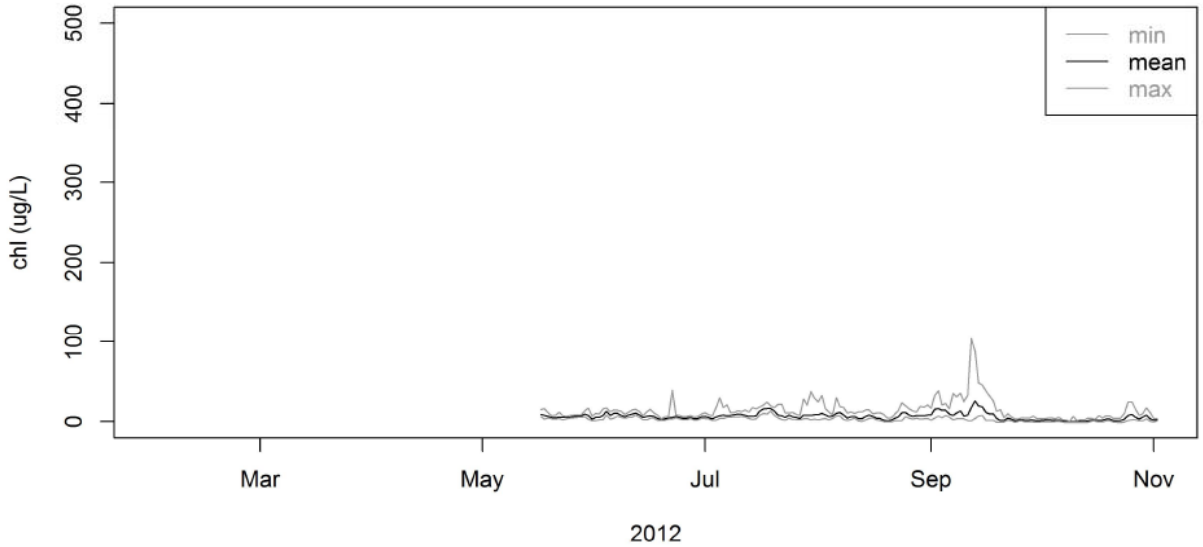


2013

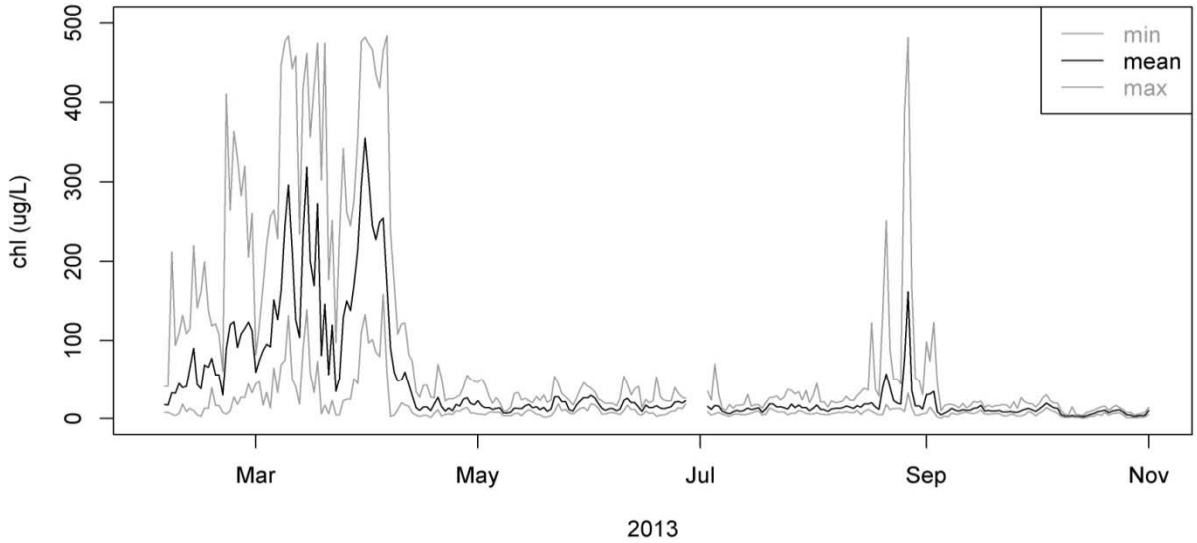


Daily Minimum, Maximum and Mean Chl *a* James River Mesohaline
ConMon Station
2012 -2013

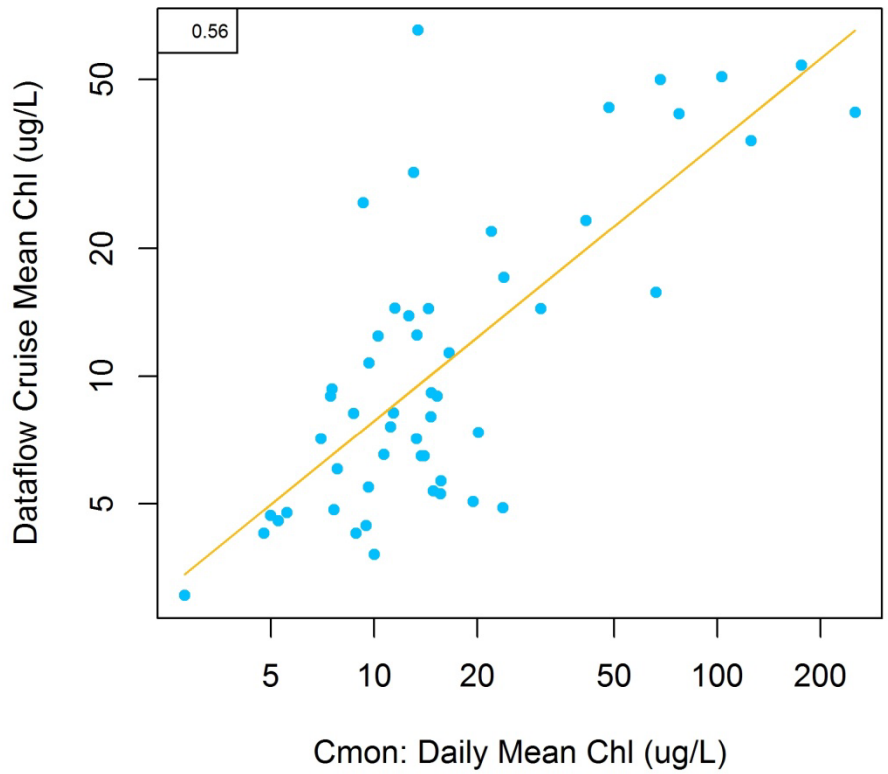
2012



2013

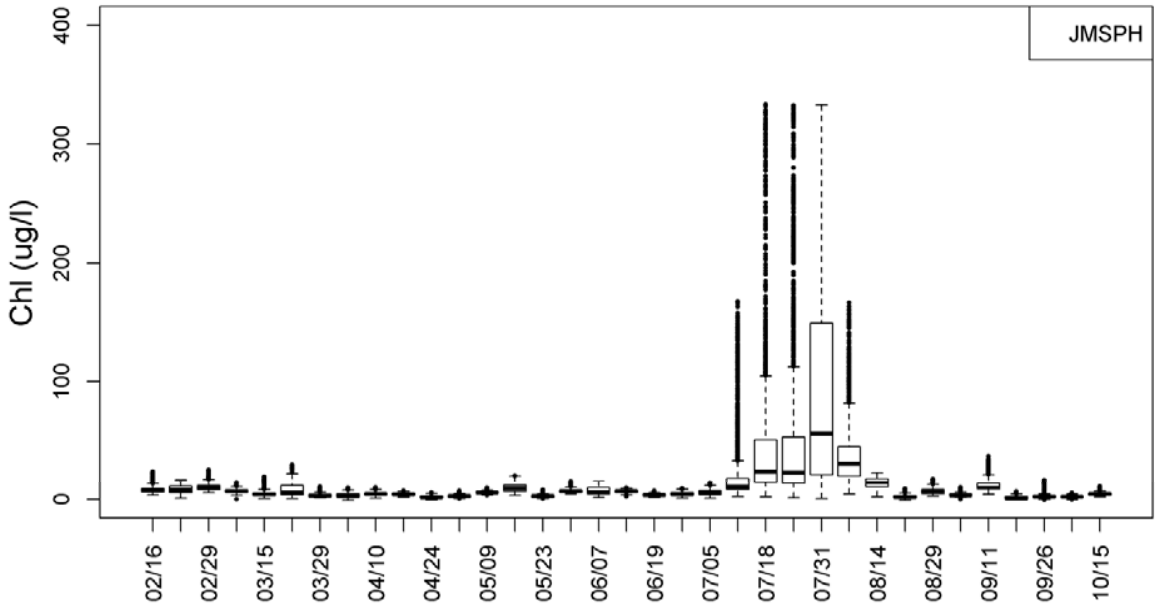


Feb-Oct 2013 James River Mesohaline Dataflow Cruise Means
CHLa vs Mean Daily Mesohaline ConMon CHLa

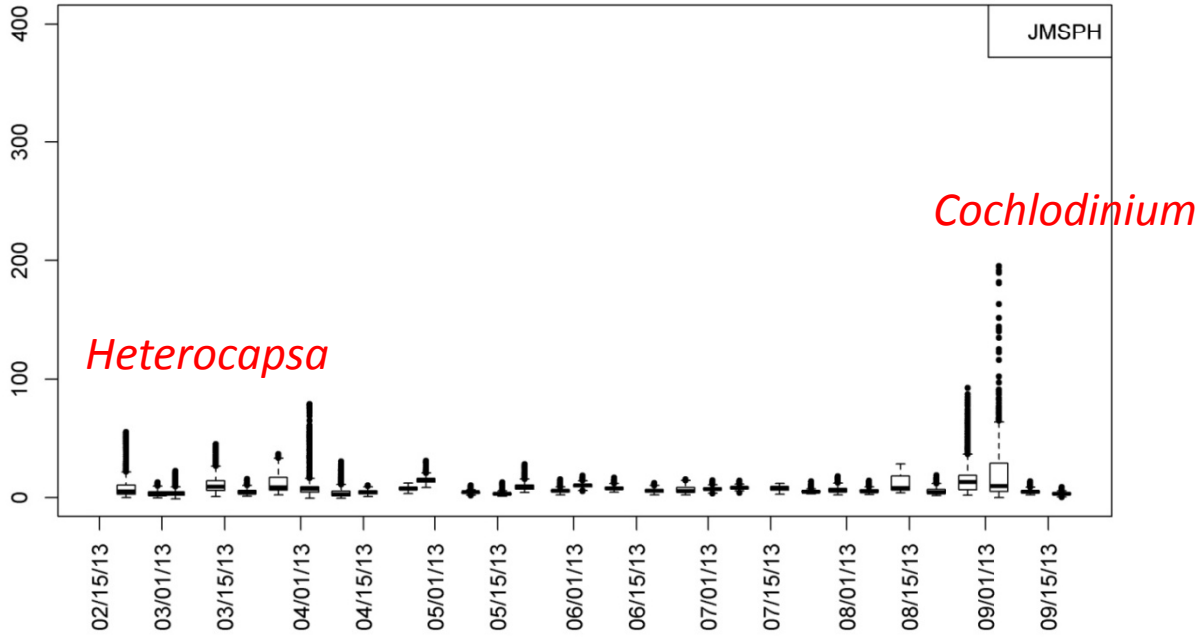


Median Integrated Chl *a* James River Polyhaline Segment 2012 -2013

2012

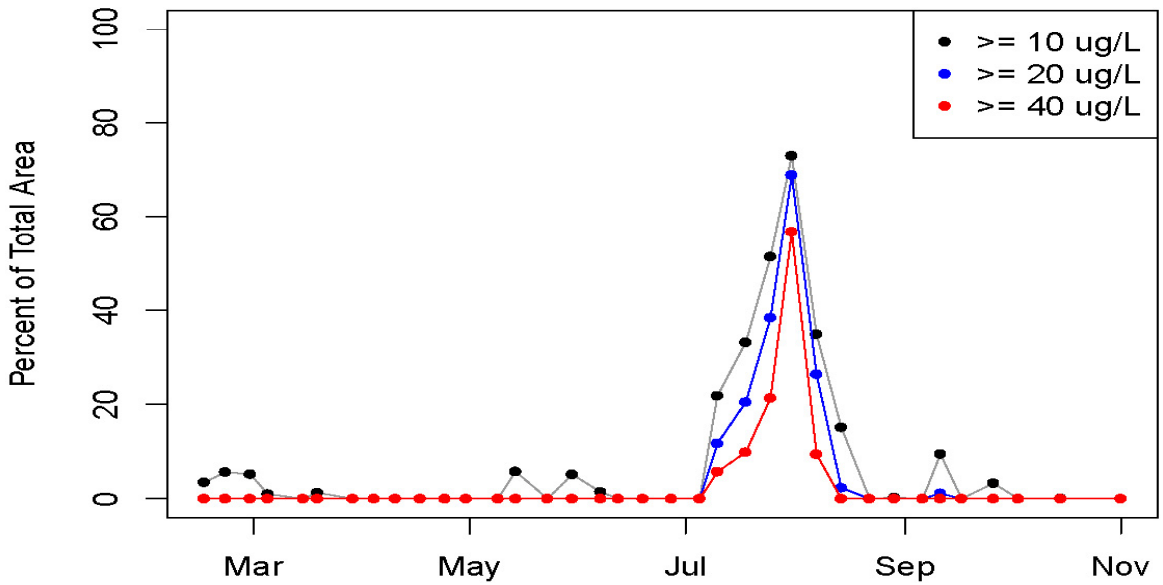


2013

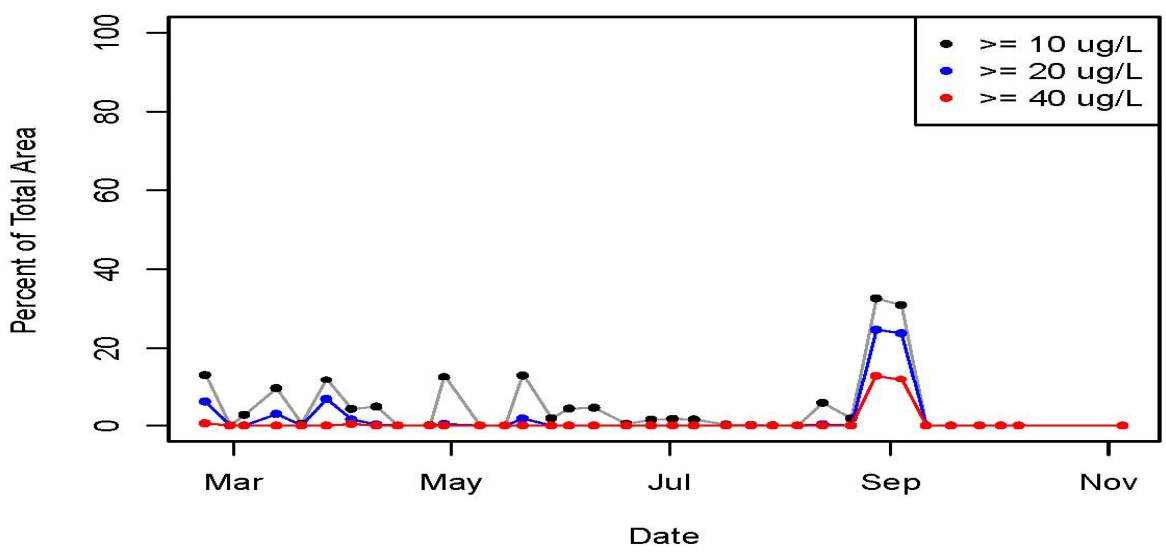


Integrated Percent Total Water Area James River Polyhaline Segment Greater Than or Equal To 10, 20, 40 ug/l CHL a

2012

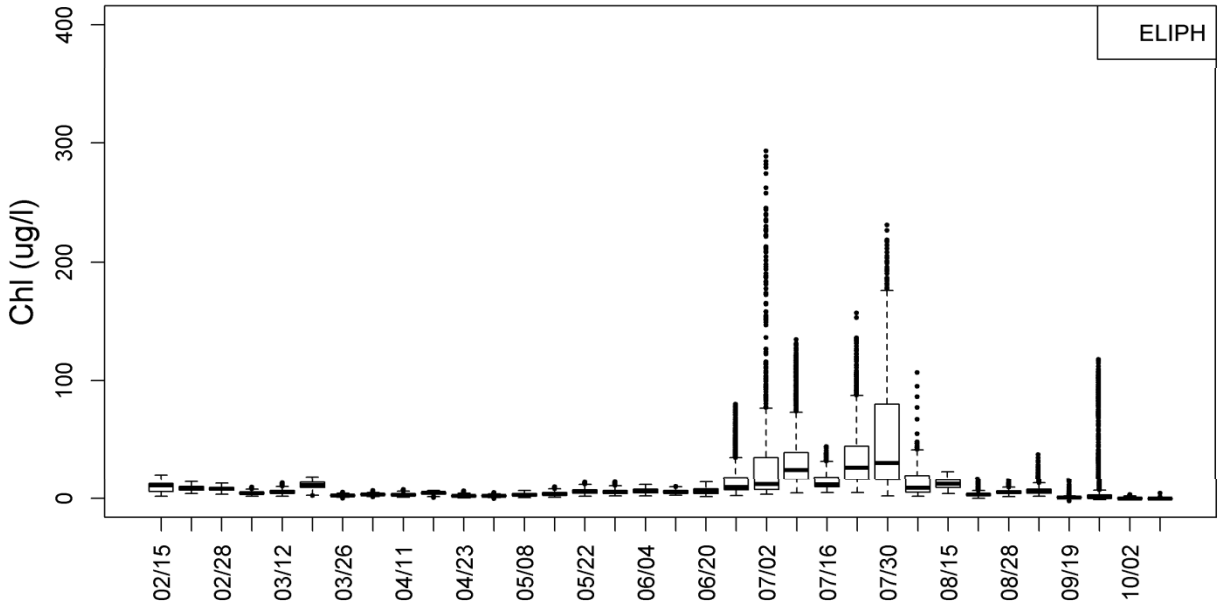


2013

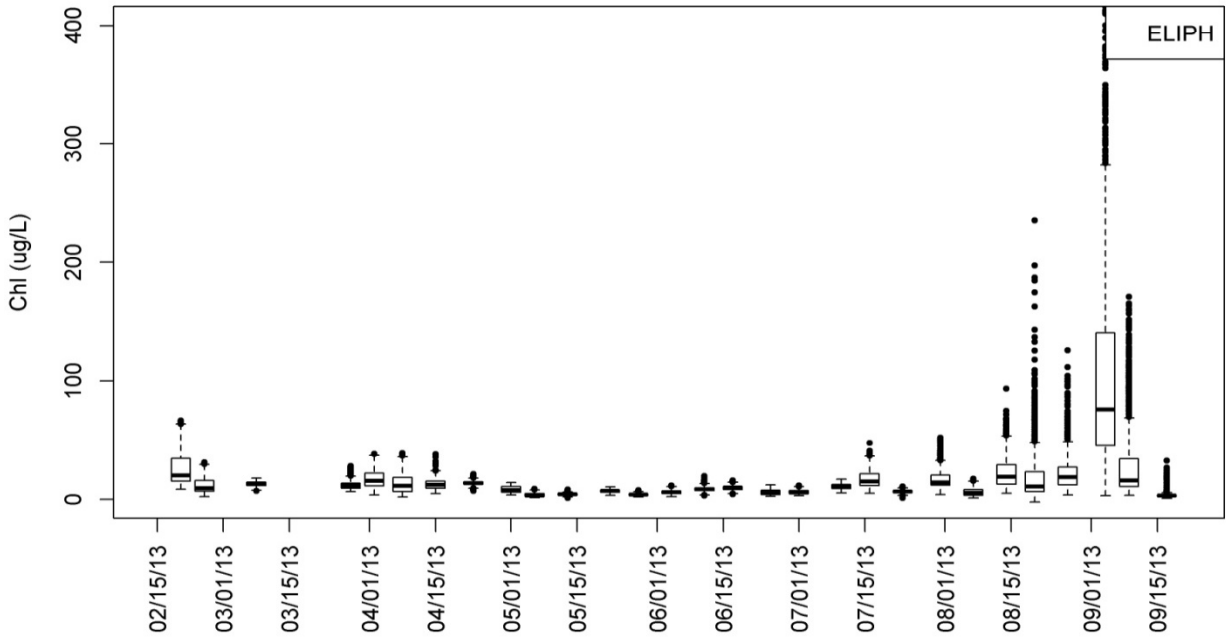


Median Integrated Chl *a* Elizabeth River Polyhaline Segment 2012 -2013

2012



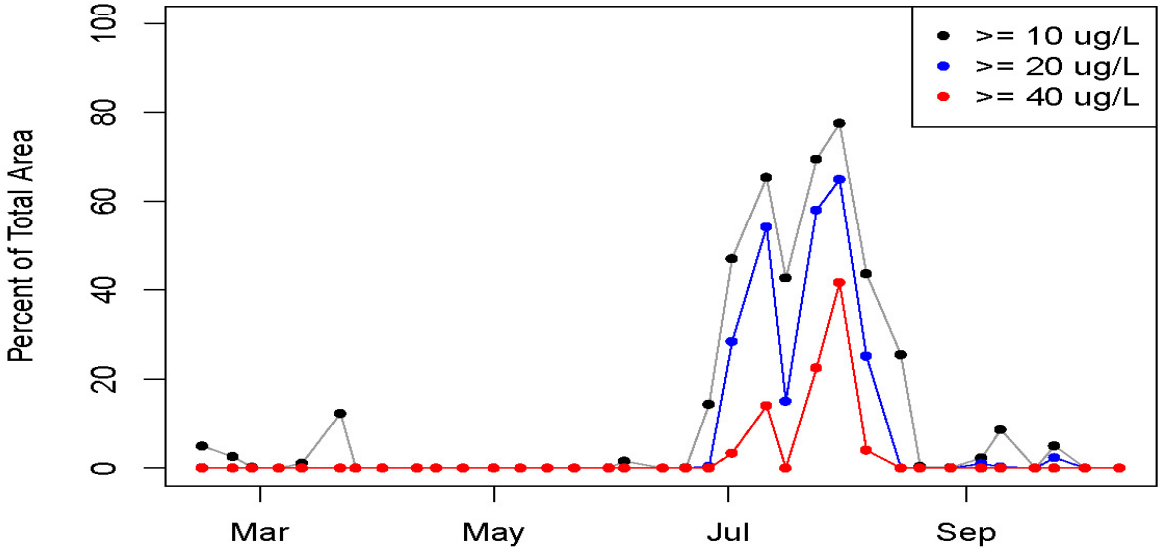
2013



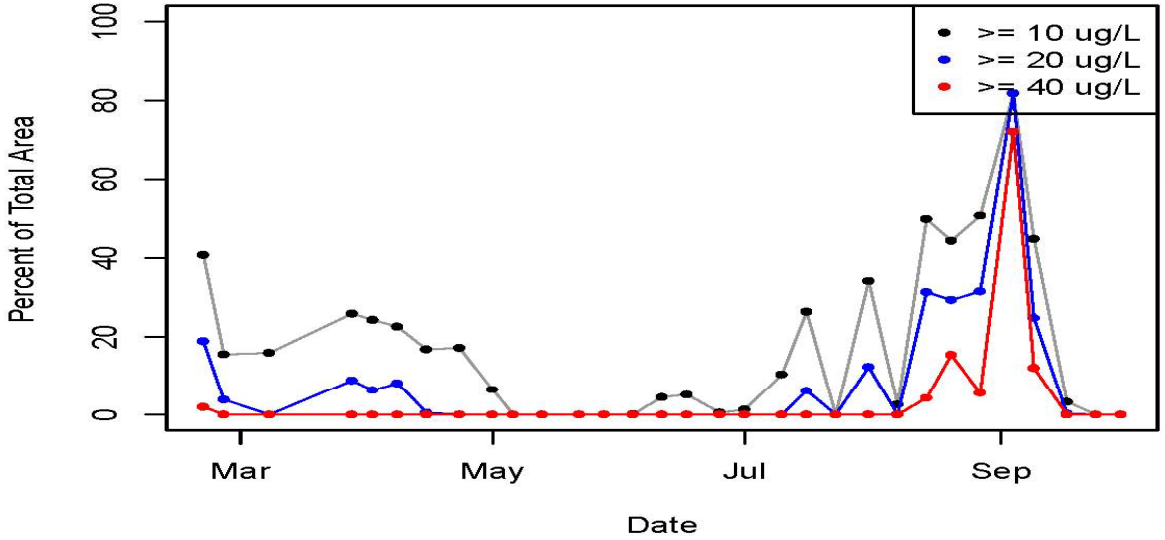
Cochlodinium

Integrated Percent Total Water Area Elizabeth River Polyhaline Segment Greater Than or Equal To 10, 20, 40 ug/l CHL a

2012

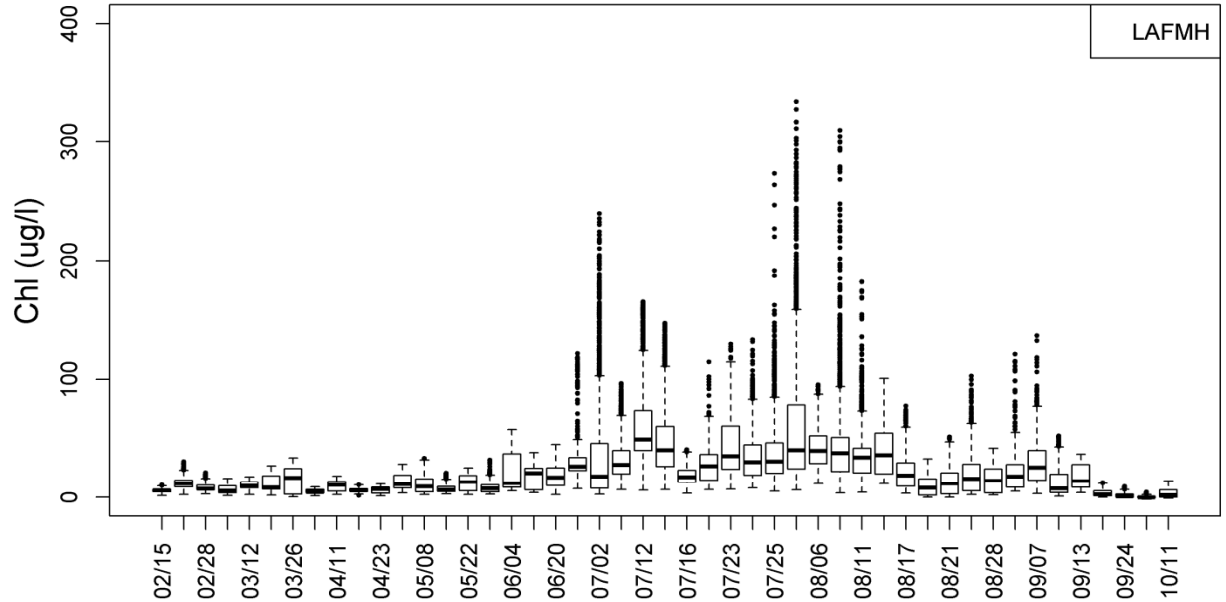


2013

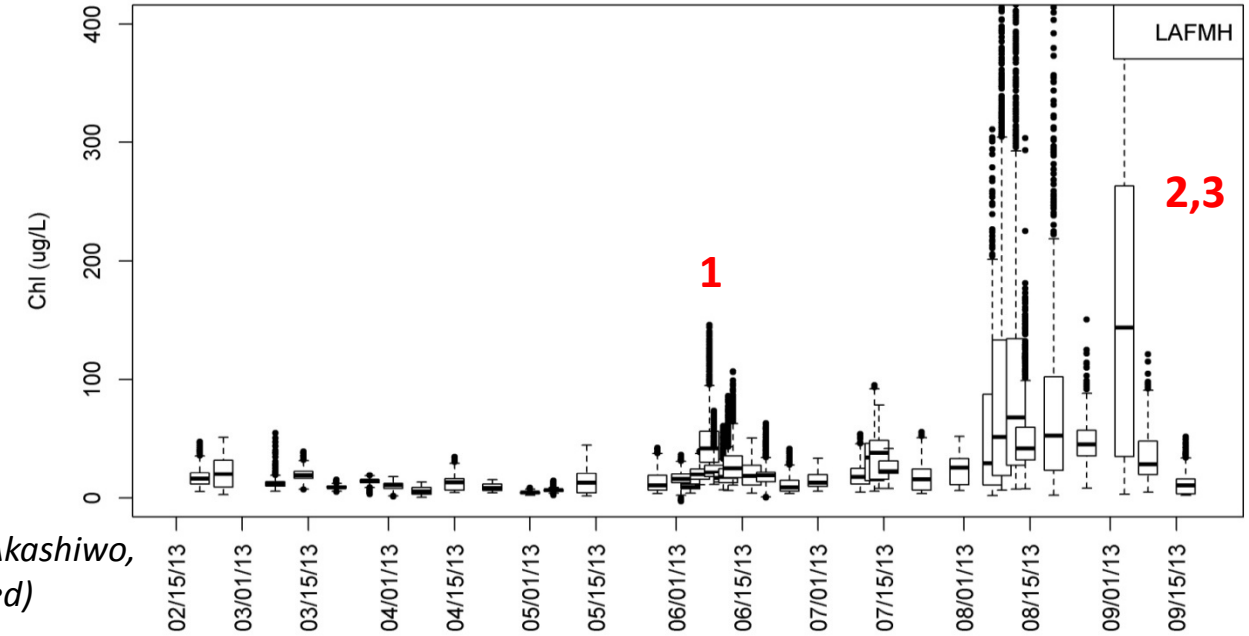


Median Integrated Chl *a* Lafayette River Mesohaline Segment 2012 -2013

2012



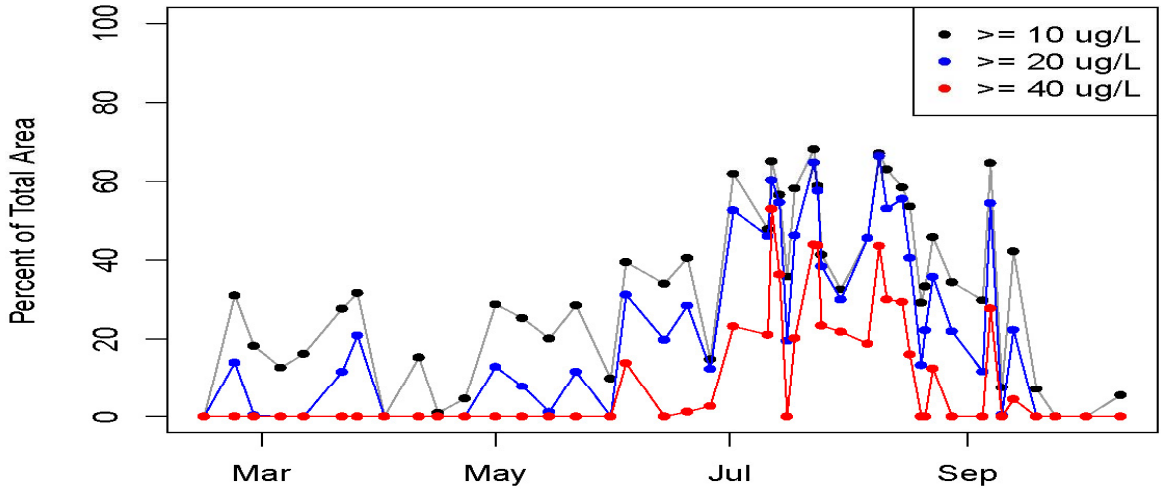
2013



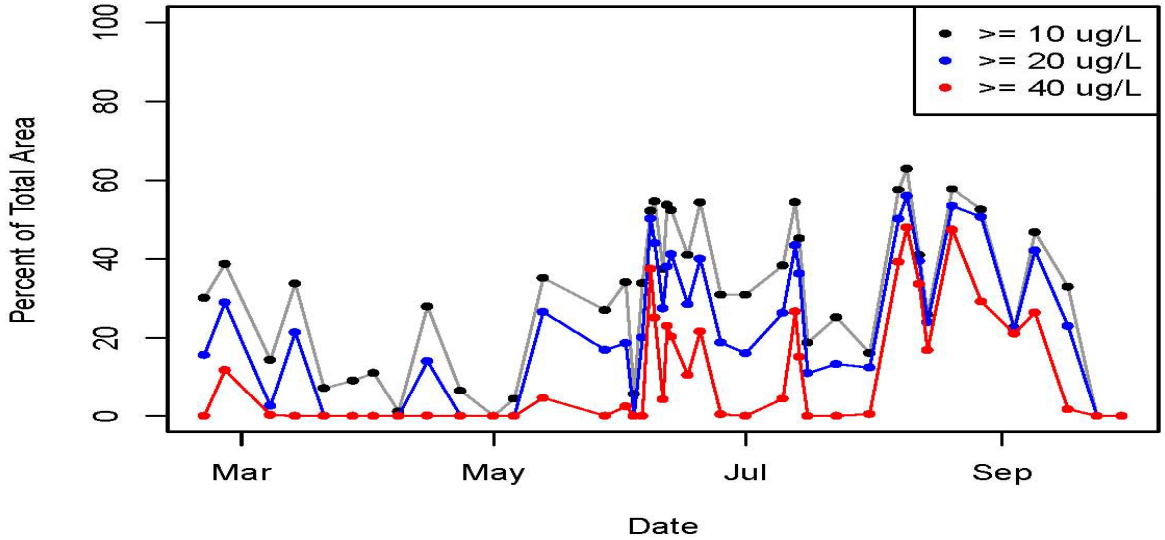
1= Gymnodinium
2= Gymnodinium, Akashiwo, Cochlodinium (mixed)
3= Cochlodinium

Integrated Percent Total Water Area Lafayette River Mesohaline Segment
Greater Than or Equal To 10, 20, 40 ug/l CHL a

2012



2013



Summary

- Exceedences of seasonal numeric standards only observed in James polyhaline in summer and mesohaline in spring
- Fixed station monitoring paralleled mean Dataflow mapping concentrations over time.
- Consistently lower salinities observed in James mesohaline in 2013
- Spring blooms centered in James mesohaline region and were of longer duration than 2012
- Summer blooms tended to occur later in the season and were of lower intensity than 2012
- Algal blooms generally followed previous spatial pattern
  - The Elizabeth River appears to be the initiation grounds for the larger system (*Cochlodinium*)
  - Hydrodynamic transport of blooms from LAFMH→ER→Lower James continues to be shown as an important feature