Lower James River Water Quality Monitoring

2012 Summary
November 2, 2012
CHLA Science Advisory Panel

Needs – Criteria Development and System Status Assessment

- Objective 1. Characterize algal blooms in the lower James River and evaluating their causes.
  - Task A1. What are the temporal and spatial dynamics of algal blooms in the lower James River?
  - Task A2. What are the relationships between Chl a, diagnostic pigments and HABs and other phytoplankton bloom species cell densities?
  - Task A3. What are the environmental triggers of HAB and non-HAB bloom development and dynamics?

Monitoring Summary

- HRSD DataFlow monitoring (JMSMH, JMSPH, LAFMH and ELIPH) conducted weekly from February-October.
- VIMS DataFlow monitoring (JMSOH) conducted twice monthly (May-June), weekly (July-Sept), twice monthly (October).
- ConMon stations: JMS17.96 (May-Jul-Nov 1), LAF001.63 (Mar-Oct11), LAF004.70 (Mar-Oct11).
- Calibration samples (5 per segment) during each cruise, plus bloom samples as evident for further analyses. Calibration samples taken at each ConMon sonde switchout.
- Data is available at: http://www3.vims.edu/vecos/ (password protected; Username: JamesDataUser; Password: VecosDataAccess)
Elizabeth (LAFMH and ELIPH)

Time with integrated DataFlow highlighted

Period with substantial increases in average values
Period with substantial increases in average values
Time with integrated DataFlow highlighted

Relationship between daily rainfall and average DFLO CHLA
Summary

- Summer bloom followed previous pattern
  - Initiation associated with storm events (storm effects better assessed this year)
  - The Elizabeth River appears to be the initiation grounds for the larger system
  - Hydrodynamic transport of blooms from the Elizabeth to the James is an important feature
- Spring and Summer blooms in lower James occurred earlier than in 2011 and were more intense
- Duration and intensity of blooms decreased with distance up the James
- Exposure of benthic organisms to bloom effects may vary with tides and water depth.

Recommendations for 2013

- Water quality mapping and continuous station records should be continued for at least one more year.
- Monitoring should start in February 2013 to quantify the extent of the spring bloom that was missed in 2012.
- Depth profiles of chlorophyll should be done to determine bloom depths.