Integrating monitoring, modeling and trends analyses to inform management decisions

Description:

This project integrates monitoring, modeling and trends information on nitrogen, phosphorus and sediment throughout the Chesapeake Bay watershed to analyze patterns in water quality, its sources and its drivers that can inform management decisions moving into the future. The work incorporates data and trends analyses from a variety of sources, including but not limited to the Chesapeake Bay non-tidal monitoring network, the Chesapeake Bay Watershed Model, published literature, etc. The results of this work will be used in future analyses incorporating upcoming science products and tools from various Chesapeake Bay Program partner research programs. This project focuses on compiling and analyzing currently available monitoring and modeling data and analyses for specific locations, watersheds, or geographic regions throughout the watershed. The information to be compiled includes water quality monitoring as well as watershed characteristics such as BMP implementation, land-use, source sector contributions, etc.

Scope of the work:

There are two possible scopes for this work. The first scope employs a smaller geographic focus to integrate and analyze in-depth regional and local data. The second scope employs a larger geographic focus, compiling and analyzing more basic information.

1) Limited geographic scope
   This project would identify a focused geographic area (e.g. jurisdiction, major river basin, major tributary, etc.) and compile and analyze detailed information on water quality and watershed characteristics for that area. Work could include:
    1. A literature review compiling local or regional information on water quality and watershed characteristics including BMP implementation research or projects, nutrient and sediment fate and transport (e.g. contribution of runoff vs. groundwater), regional USGS water quality monitoring reports, etc.
    2. A compilation of local or regional information available supplemental to Chesapeake Bay Program data including local water quality monitoring, local BMP implementation efforts, soil phosphorus characteristics, etc.
    3. An analysis of available data from Chesapeake Bay Program partners, analyzed by different geographical boundaries (e.g. non-tidal network monitoring station drainage basin, sub-watershed, county) on water quality and watershed characteristics including, but not limited to:
        - Water quality trends in nitrogen, phosphorus, sediment and their various forms
        - Point sources load trends
        - Source sector load contributions
        - Change in land use over time
        - Change in BMP implementation over time
        - Agricultural production over time
    4. A synthesis of the above analyses specifically to group smaller geographic areas (e.g. non-tidal network monitoring station drainage basin, sub-watershed) based on similar watershed characteristics.

2) Watershed-wide scope

This project would work with the entire Chesapeake Bay non-tidal monitoring network and compile and analyze basic information on water quality and watershed characteristics for each station as well as broader geographic areas. Work could include:

1. An analysis of available data from Chesapeake Bay Program partners, analyzed by different geographical boundaries (e.g. non-tidal network monitoring station drainage basin, sub-watershed, tributary basin, county) on water quality and watershed characteristics including, but not limited to:
    - Water quality trends in nitrogen, phosphorus, sediment and their various forms
    - Point sources load trends
    - Source sector load contributions
    - Change in land use over time
    - Change in BMP implementation over time
    - Agricultural production over time
2. A synthesis of the above analyses specifically to group geographic areas (e.g. non-tidal network monitoring station drainage basin, sub-watershed) based on similar watershed characteristics.