UNRBA Modeling and Regulatory Support

Board of Directors Meeting

January 2017

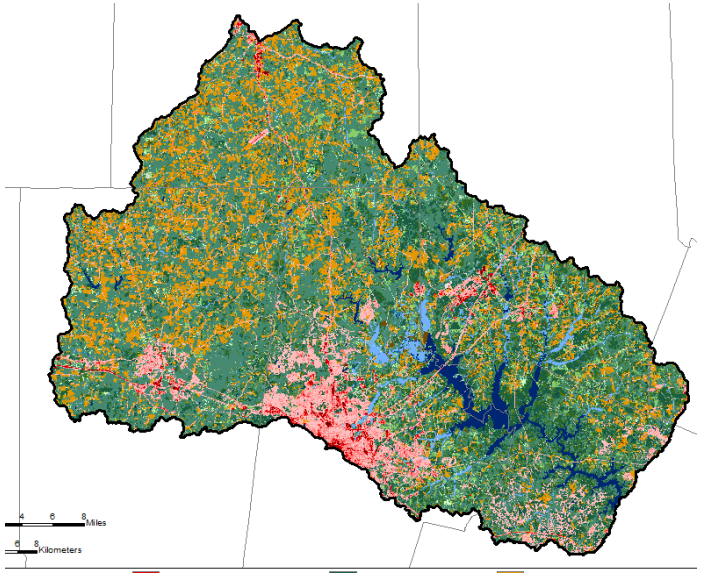
January 18, 2017

Year 1 Goals for the Project

- ✓ > Project Kickoff Meeting on September 28th to engage stakeholders
- ✓ > Select modeling packages to support the reexamination
  - Watershed
  - Lake
- > Describe how multiple models will be used together
- > Develop a Modeling Quality Assurance Project Plan (QAPP)
- > Develop a two-year work plan (October 2017 through September 2019)

Selection of the Watershed Model Package

- WARMF (Watershed Analysis and Risk Management Framework)
- Same package used by the State
- City of Durham is currently revising for its subwatersheds
- UNRBA will update for entire watershed
- Supported by UNRBA Monitoring Program



Selection of Two Lake Nutrient Response Model Packages

- EFDC (Environmental Fluid Dynamics Code)
  - Same package used by the State to develop the Falls Lake Nutrient Management Strategy
  - UNRBA will update and revise based on UNRBA Monitoring Program
- WARMF-LAKE (part of WARMF package)
  - Simpler model with faster model run times
  - Directly linked to the watershed model
  - Independent lake model to corroborate results
  - Supported by the UNRBA Monitoring Program

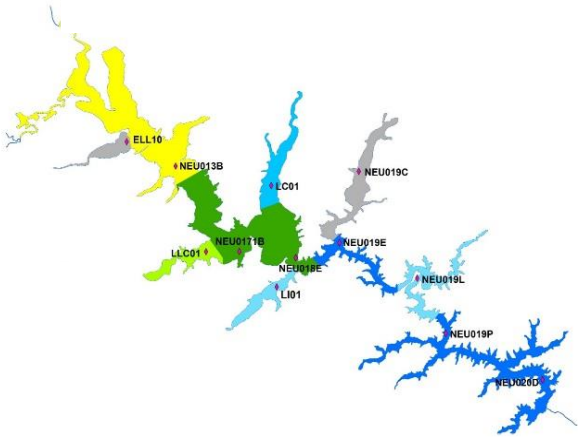


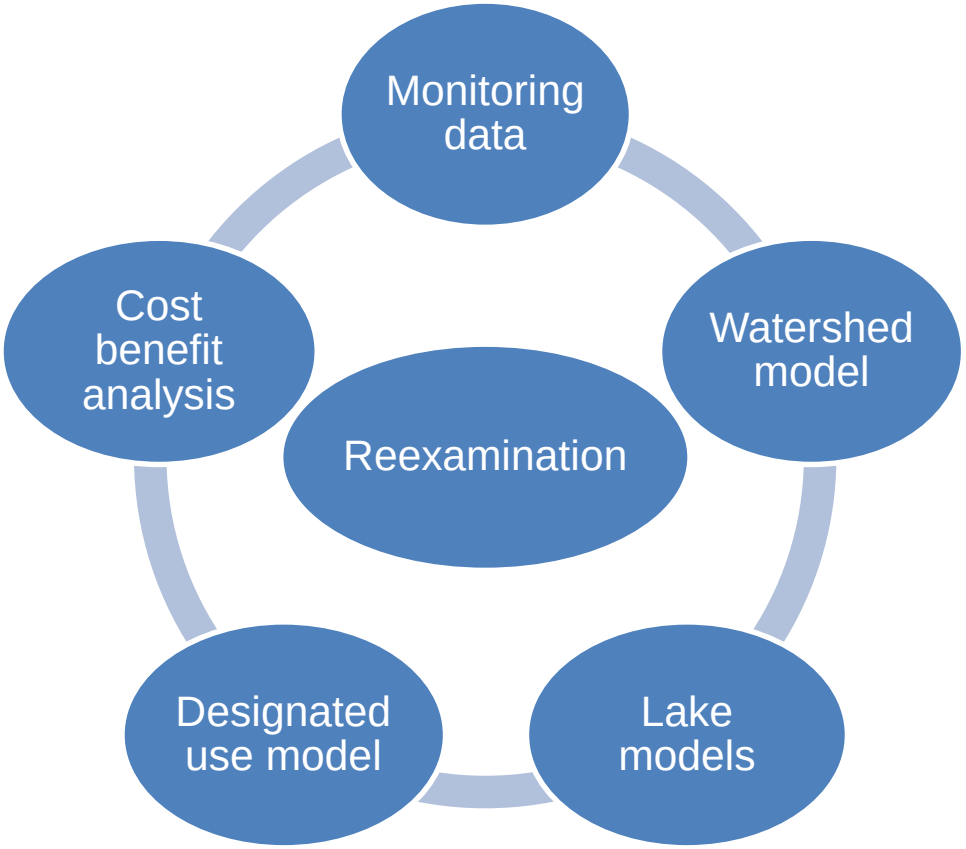
Figure from DEQ 2016 Falls Lake Status Report

Development of the Designated Use Model

- Statistical Model
  - Data-driven mathematical relationships
  - Supported by the UNRBA Monitoring Program
  - Links water quality to designated uses
    - Aquatic life
    - Drinking water
    - Recreation
  - Compare management strategies

Optional Ecosystem Model

- CASM Ecosystem Model
  - Simulates food web responses
  - Use output from EFDC
    - Hydrodynamics
    - Water quality
  - Predicts biomass of aquatic species
  - Investigating additional data requirements and costs

Next Steps

- Develop the conceptual modeling plan to explain how the models will work together
- Begin drafting the modeling quality assurance project plan (QAPP)