CE-QUAL-ICM Short Course

Description

- The class will meet for 2 ½ days, January 9-11, 2019, in Annapolis MD.
- Students are expected to bring a Windows laptop computer.
- Course materials will be available for download prior to class meeting:
  - ICM manual
  - Lecture notes
  - 30-box model set-up
  - 4,000-cell Chesapeake Bay model set-up

CE-QUAL-ICM Short Course

The class will cover:

- Fundamental ICM concepts including model set-up and linkage to hydrodynamic model
- Structure of model code
- Review of model kinetics
- Format of input and output files
- Pre- and post-processing of input and output files
- Execution and interpretation of model runs

CE-QUAL-ICM Short Course

Daily Schedule

- Morning session I 08:00-10:00
- Break 10:00-10:15
- Morning session II 10:15-12:00
- Lunch 12:00-12:45 (To be ordered in at student expense, Day 1 and 2 only)
- Afternoon session I 12:45-14:45 (Afternoon sessions Day 1 and 2 only)
- Break 14:45-15:00
- Afternoon session II 15:00-16:30

CE-QUAL-ICM Short Course

Day 1, Morning Session I

- Conservation of mass equation
  - Discretization
  - Solution schemes
  - Model code
- Map file
  - Concept and code

CE-QUAL-ICM Short Course

Day 1, Morning Session II

- Boundary conditions
  - Conceptualization
  - Review input file
  - Run preprocessor, create file
- Hydrodynamic file
  - Model code
  - Conservation of volume
  - Grid formats (Z-grid, sigma grid, unstructured grid)

CE-QUAL-ICM Short Course

Day 1, Afternoon Session I

- Kinetics review
  - State variables
  - Nutrient, carbon, and oxygen cycles
  - Input files and formats

CE-QUAL-ICM Short Course

Day 1, Afternoon Session II

- Sediment diagenesis model (guest lecturer)
  - Model conceptualization
  - Linkage to ICM model of water column
  - File formats

CE-QUAL-ICM Short Course

Day 2, Morning Session I

- Load files
  - S1, S2, S3 files
  - Atmospheric and other loads
  - File formats
  - Linkage to Watershed Model
  - Example processor

CE-QUAL-ICM Short Course

Day 2, Morning Session II

- Other model features
  - Filter feeders (concept, file format and preparation)
  - Submerged aquatic vegetation
  - Wetlands module
  - Sediment transport

CE-QUAL-ICM Short Course

Day 2, Afternoon Session I

- Other model features (cont'd)

Afternoon Session II

- Execution of 50,000-cell Bay model on the cloud (guest lecturer)

CE-QUAL-ICM Short Course

Day 3, Morning Session I

- Introduction to 4,000-cell Bay model
- Output files
  - ASCII outputs
  - The PLT file
  - The APL file

CE-QUAL-ICM Short Course

Day 3, Morning Session II

- Execute 4,000-cell model
  - Post-process outputs
  - Visualize outputs
  - Execute scenarios