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Model name: TC-10_Chapra_33-2_Test_Case

Objective: Use EFDC+ Explorer (EE) and EFDC+ to replicate the test case for algal/nutrient interactions with light limitation through the three IWQSUN options outlined by Stephen C. Chapra in Example 33.2 of his book "Surface Water-Quality Modeling" (2008).

Model grid: 3 horizontal grid cells and one vertical layer.

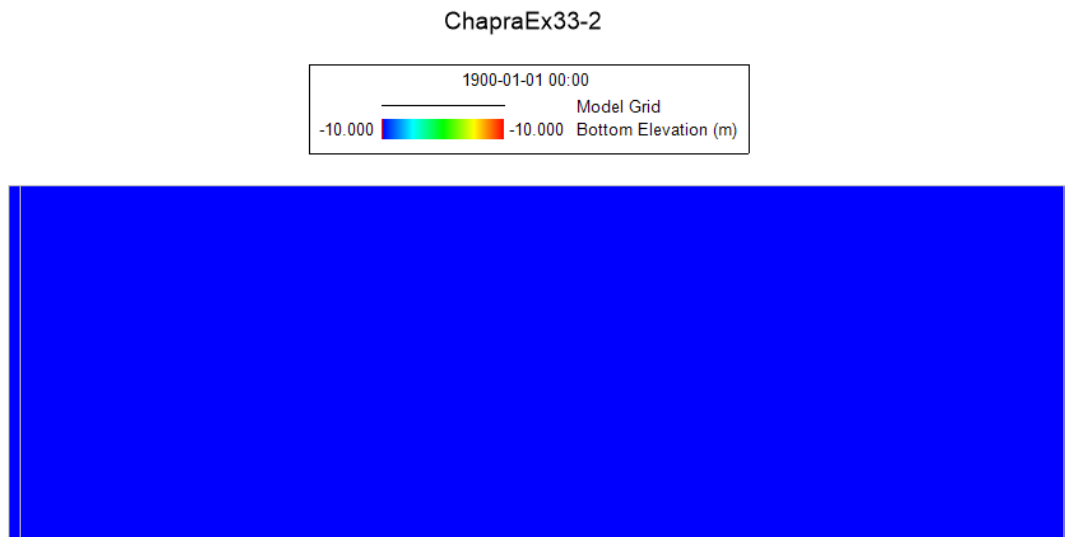


Figure 1. Model Domain of TC-10 Chapra 33-2.

Folder structure:

Data: This folder contains data that can be used with the model. These data can be measured data or output from model or derived from analytical equations.

Model: Three EFDC models corresponding to three IWQSUN options that can be loaded in EE to pre- and post-process.

Test_record file: This file is just a record file that informs which EFDC+ executable was used to run the model.

Modules Activated: Hydrodynamics, Temperature, Dye/ Age, Water Quality.

Description: The Chapra test case Example 33.2 in his text book cited below looks at algal/nutrient interactions with light limitation through the three different solar radiation (SR) options (IWQSUN =0, 2, 3 which are constant SR, hourly SR from the ASER.INP file, and computed daily average SR from the ASER.INP, respectively). An EFDC+ model has been configured to replicate Chapra's case and comparison of chlorophyll *a* values for the analytical case and model with different SR settings are shown in Figures 2 to 4.

Disclaimer: The model is provided to our users to demonstrate that EFDC_Explorer and EFDC+ can be used to better understand how to build this kind of model. The model is running as expected; however, shouldn't be considered final as the model can be modified / refined to obtain improved results.

Citation for the paper:

Chapra, Stephen C. (2008). "Surface Water-Quality Modeling." *Waveland Press Inc* (December 31, 2008)

Files in Data Folder:

TS_Chlorophyll a (Depth Avg.).dat

Model Results:

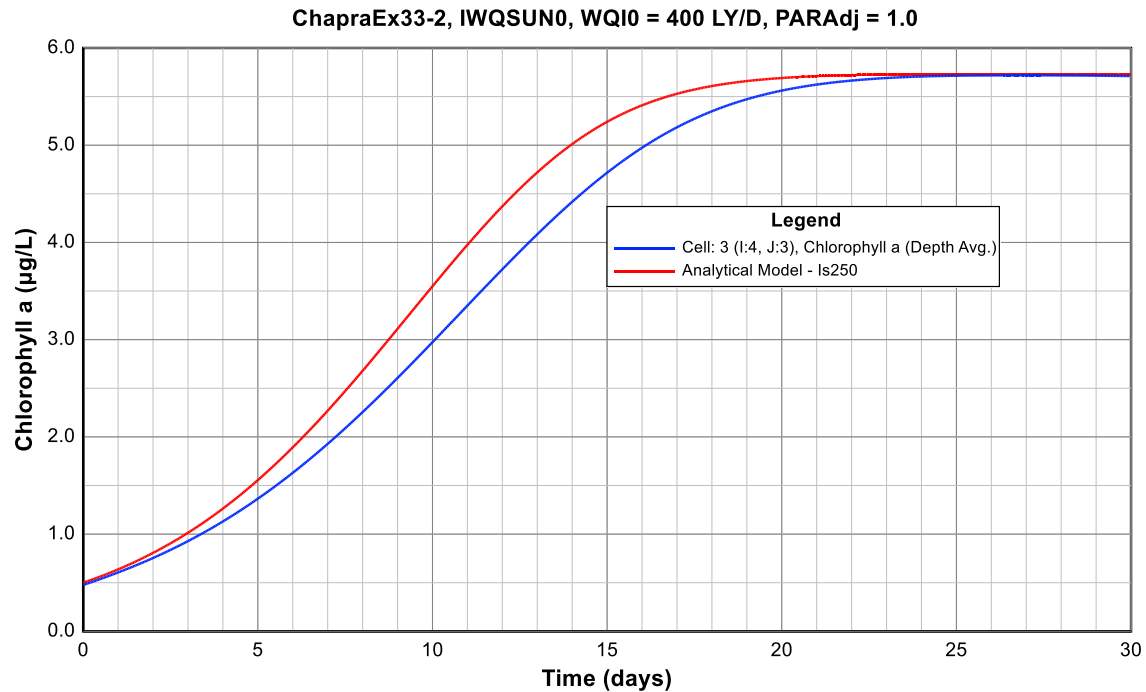


Figure 2. EFDC model and analytical model-IS250 Chlorophyll a comparison.

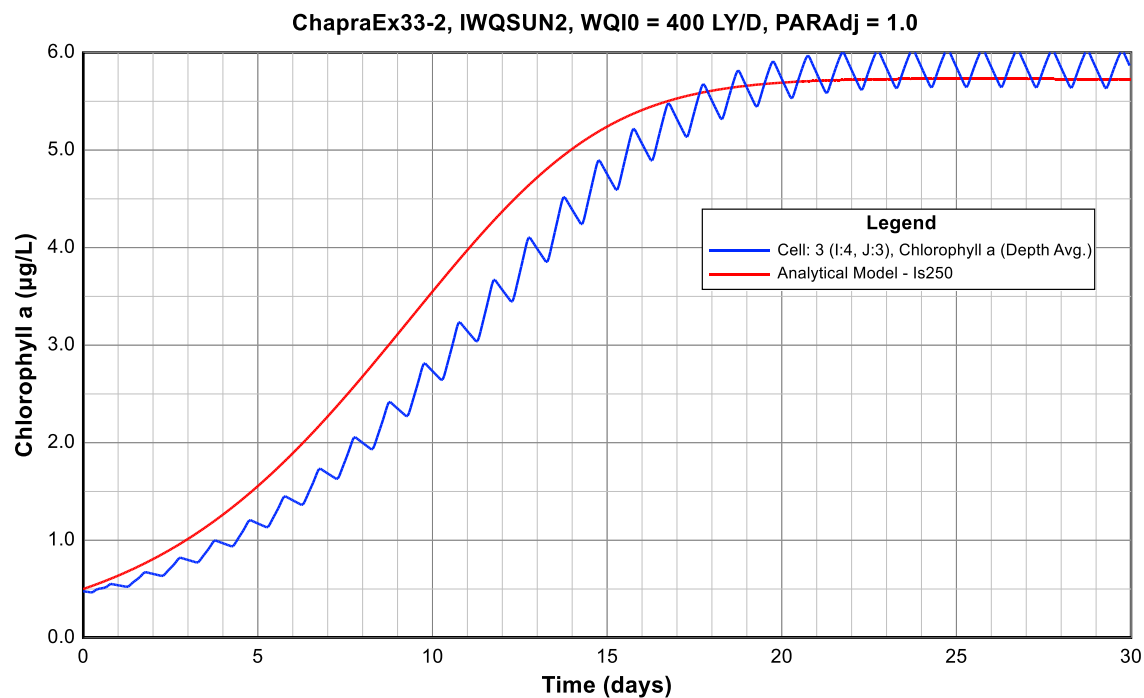


Figure 3. EFDC model and analytical model-IS250 Chlorophyll a comparison.

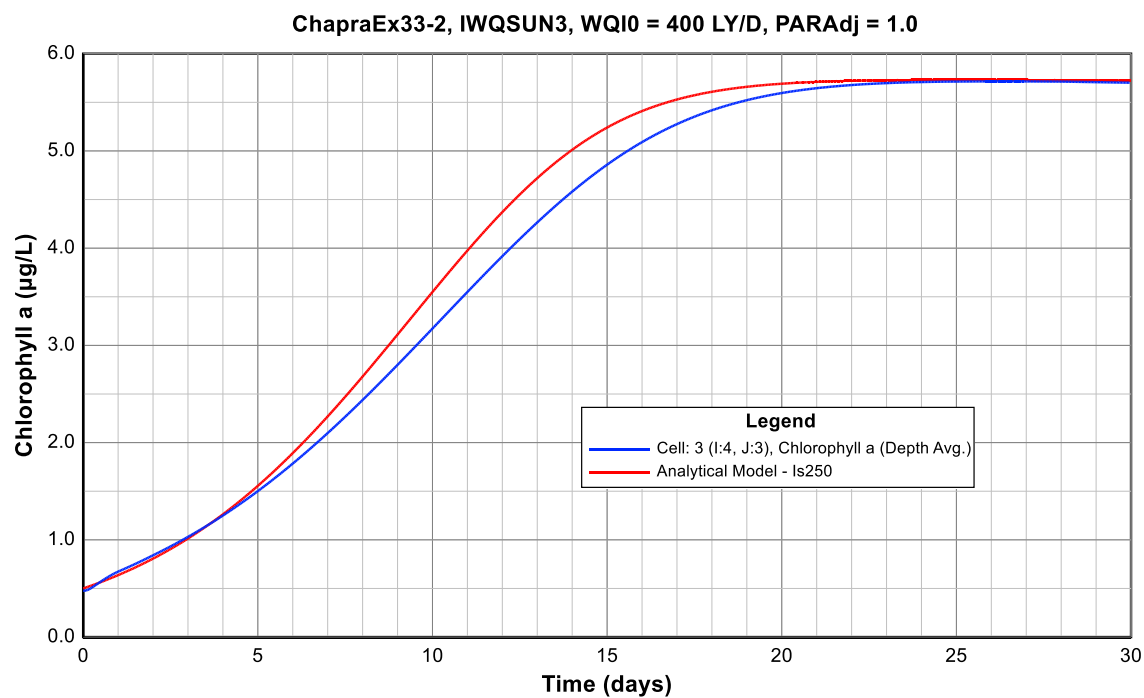


Figure 4. EFDC model and analytical model-IS250 Chlorophyll a comparison.