

Read Me:

Model Name: DM-15_Lake_Washington_Model

Objective: Use EFDC+ Explorer (EE) and EFDC+ to simulate hydrodynamics in Lake Washington. The model uses temperature modules with the Sigma-Zed vertical layering option to simulate thermal stratification in Lake Washington, Seattle, USA. The Sigma Zed model is unique to EFDC+ and is designed to reduce pressure gradient errors with an approach that is computationally efficient.

Model Grid: 1,183 horizontal grid cells and 55 vertical layers.

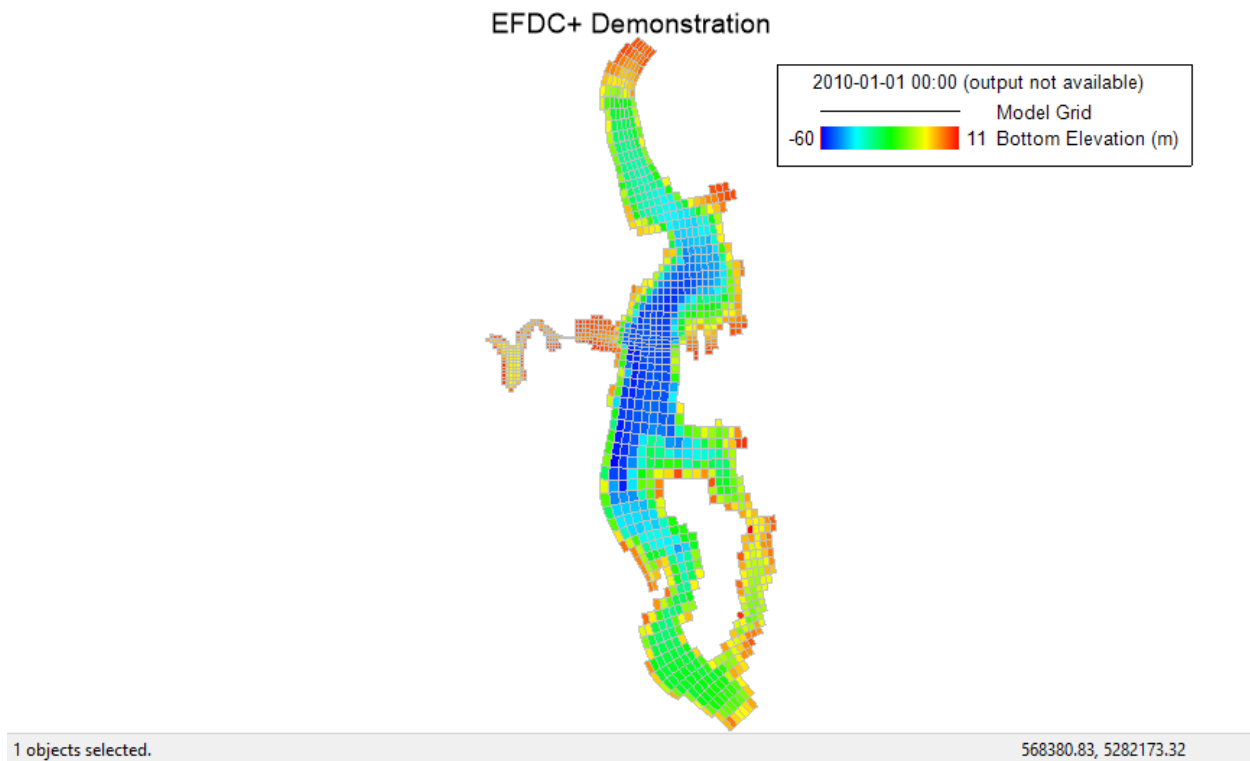


Figure 1 Model Domain of DM-15_Lake_Washington.

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: EFDC model that can be loaded in EE to pre- and post-process.

Grid: This folder contains grid for building the model

- LW Grid.cvl: CVL grid format, EE uses this grid type for building model
- LW Grid.kml: This file can be opened with Google Earth

Maps-Images: This folder contains the maps / images of the study area. The formats of the maps / images can be *.geo (geo-referenced file), *.jgw, *.jpg etc.

- Lake Washington.jgw
- Lake Washington.jpg

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

Modules Activated: Hydrodynamics with Sigma-Zed vertical layering, temperature.

Disclaimer: The model is provided to our users to demonstrate that EFDC_Explorer and EFDC+ can be used to accurately simulate thermal stratification in a water body. The model is running as expected however this shouldn't be considered as a final product as the model can be improved / refined to get improved results.

Files in Data Folder:**Bathymetry:**

- Bathymetry.dat

Boundaries: contains time series data for setting the models's boundaries

Calibration: contains measured data file of water levels and water temperature for comparing to the model result.

References:

Craig, Paul M. 2014. *Sigma-Zed: A Computationally Efficient Approach to Reduce The Horizontal Gradient Error in the EFDC's Vertical Sigma Grid*. Proceedings from the 11th International Conference on Hydrodynamics (ICHHD 2014), October 19 – 24, 2014, Singapore

Model Boundaries Settings:**Sammamish River**

- Inflow time series: KingCo51T
- Temperature:0804

KingCo34a

- Inflow time series: KingCo34a

- Temperature: constant (0oC)

KingCo35C

- Inflow time series: KingCo35c
- Temperature: constant (0oC)

Lock

- Inflow time series: Lock02
- Temperature: constant (0oC)

12120000

- Inflow time series: Lock01
- Temperature: constant (0oC)

KingCo37A

- Inflow time series: KingCo37a
- Temperature: constant (0oC)

Cedar River

- Inflow time series: 0804
- Temperature:0831

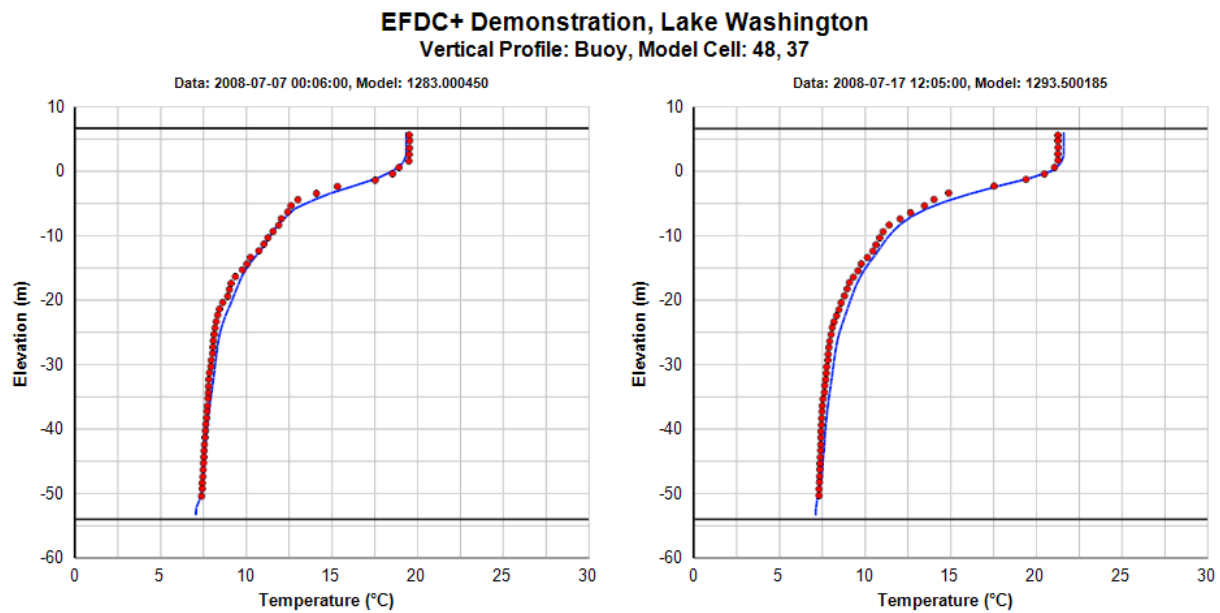


Figure 2 Modeled vs measured water temperature at Buoy station.