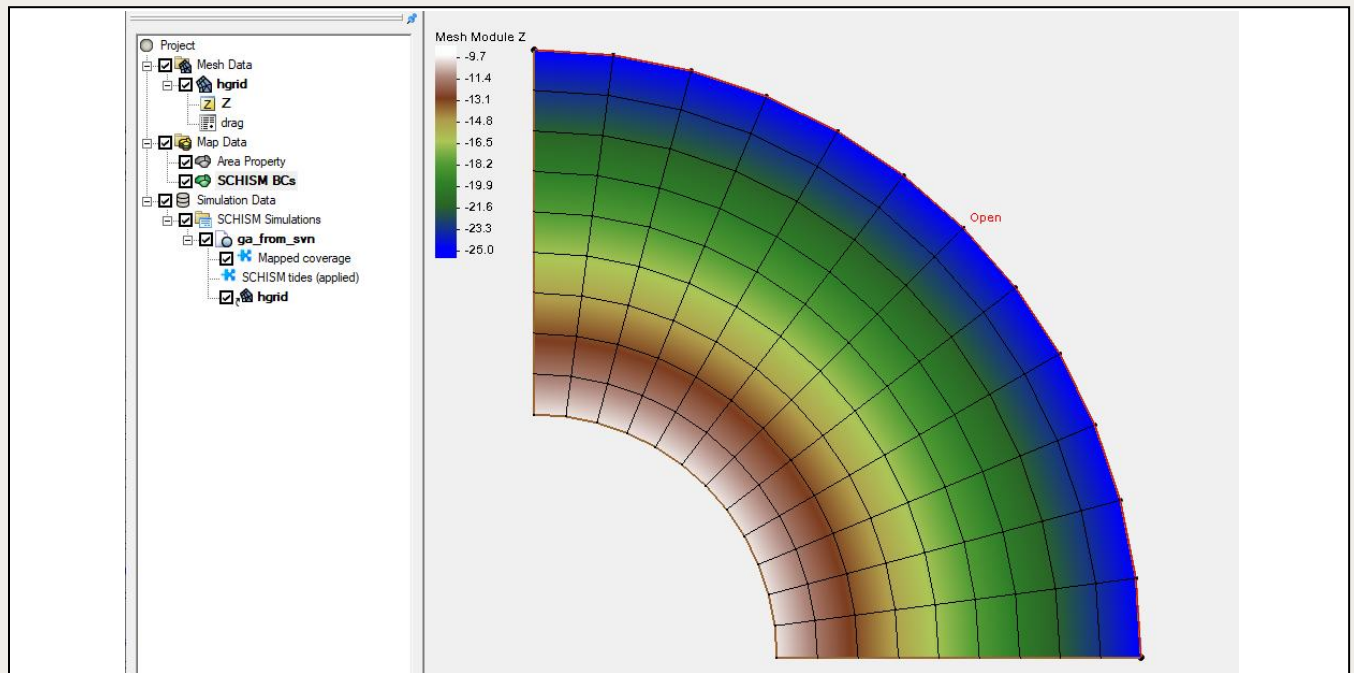


*SMS 14.0 Tutorial****SCHISM – Quarter Annulus Model Native***

Using SCHISM model native files

**Objectives**

This tutorial demonstrates how to use SCHISM model native files to set up a simulation inside of SMS.

Prerequisite Tutorials

- Overview

Required Components

- SMS Core

Time

- 5 minutes

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1 Introduction

This tutorial demonstrates setting up a SCHISM simulation using model native files.

SCHISM (Semi-implicit Cross-scale Hydrosceince Integrated System Model) is an open-source community-supported modeling system based on unstructured grids. Refer to <https://ccrm.vims.edu/schismweb/> for more information.

SMS includes pre-processing tools for working with SCHISM. Most SCHISM runs require a supercomputer, so post-processing functionality is still in the works.

2 Getting Started

Start by opening the model native SCHISM project file ("param.nml"). It must be in the same directory as all the other SCHISM native files used by the simulation. The files for this case were downloaded from the SCHISM SVN repository at:

https://columbia.vims.edu/schism/schism_verification_tests/Test_QuarterAnnulus/

To open this simulation in SMS:

1. Launch the SMS application.
2. Select **File | Open...** to bring up the *Open* dialog.
3. Browse to the *data files* folder and select "param.nml".
4. Click **Open** to import the project and exit the *Open* dialog.

The project should appear similar to Figure 1.

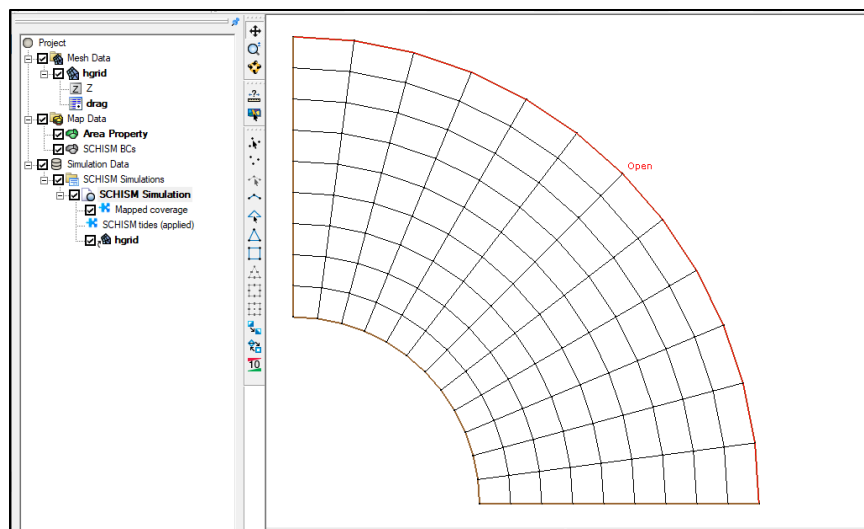


Figure 1 Initial data

3 Input Data

The SCHISM simulation can include many separate parts. This simulation includes:

- A mesh:  "hgrid". This includes elevation data.
- A drag dataset on the mesh.
- A set of boundary conditions:  "SCHISM BCs". For a SCHISM simulation, SMS only saves the "open" boundaries as arcs. For this simulation there is an open boundary around the outer edge of the mesh. It is set to force both water surface elevation and flow rates from tidal constituents.
- A simulation:  "SCHISM Simulation"
- A set of mapped tidal constituents:  "SCHISM tides (applied)".

4 Reviewing the Simulation

SMS assigns the simulation a default name of "SCHISM Simulation". This is not very descriptive, so we will change the name and review the simulation data. To do this:

1. Right-click on  "SCHISM Simulation", select **Rename....**
2. Enter "qa_from_svn" as the new name.
3. Right-click on  "qa_from_svn" and select **Model Control...** to open the *SCHISM Model Control* dialog.

SCHISM supports a very large number of options and parameters. The SMS interface is designed to allow access to the most common options and basic configurations. The *SCHISM Model Control* dialog includes four groups of parameters including:

- **CORE:** These are the general model parameters required for all SCHISM simulations.
- **OPT:** This tab displays the most common optional parameters for SCHISM. At the bottom of the list, the *Advanced* toggle can be enabled to expose a much longer list of optional parameters.
- **SCHOUT:** This tab enables the standard output options for SCHISM. The *Global output options* button shows a comprehensive list of the output datasets.
- **OTHER:** This tab includes a variety of other required parameters.

Refer to <https://ccrm.vims.edu/schismweb/> for detailed documentation of the SCHISM parameters

4. Click the **OK** button to close the *SCHISM Model Control* dialog.
5. Right-click on the  "SCHISM tides (applied)" component in the simulation and select **Tidal constituents...** to open the *Applied Tidal Constituents* dialog.

This dialog contains a table of the open boundary nodes and the applied forcing value for water surface and velocity.

6. Click the **OK** button to close the *Applied Tidal Constituents* dialog.

Refer to the SCHISM documentation to get more information on the specific parameters.

5 Verifying the New Project

The quarter annulus simulation is now converted to an SMS project. This project can be used to edit/save the SCHISM simulation and run the simulation.

5.1 Saving the Simulation

To save this new SMS project and the associated SCHISM simulation:

1. Select *File* | **Save New Project...** to bring up the *Save* dialog.
2. Enter the name “schism_qa” and click the **Save** button.
3. Right-click on “ qa_from_svn” and select **Save Simulation**

SMS has created a *schism_qa_models* folder next to the “schism_qa” project. In this folder it has created a *SCHISM/qa_from_svn* folder that contains the SCHISM simulation files listed below:

- bctides.in
- drag.gr3
- hgrid.gr3
- param.nml
- vgrid.in

These can be compared with the files of the same name in the folder from the SCHISM repository.

5.2 Running the Simulation

To run the simulation:

1. Right-click on “ qa_from_svn” and select **Run Simulation**

SMS will launch the specified SCHISM executable using the input files created in the previous section. This will result in a set of outputs for the simulation. In the future, SMS will be able to load the outputs for post processing.

6 Conclusion

This concludes the “SCHISM Quarter Annulus Native” tutorial.

Refer to other SCHISM tutorials or documentation to learn about model options and output.