

User Manual for the Interface of TRACE3D

This user manual provides information about how to run the streamline simulator TRACE3D in the windows environment. For details about the input data file structure and other information, please refer to the TRACE3D User Guide in the 'Help' menu after installing the software.

1. Installation:

Double click on Setup.exe.

It will guide you through all the steps to set up the software in your computer. It is recommended that you install the program with a simple path name, for example, C:/TRACE3D.

2. After installation is complete:

1. From Start → Programs, click on TRACE3D.
2. Once the program starts, the main screen appears as below (**Figure 1**)

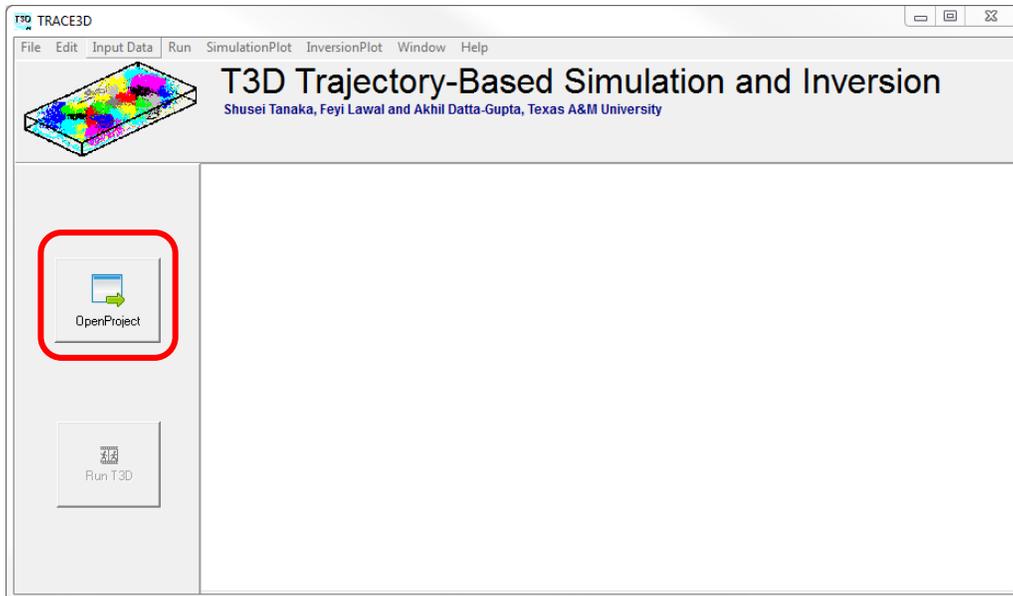


Figure 1: Starting Screen

3. To create a new project, Click File → New Project or click on the 'OpenProject' button as shown in Figure 1. Supply the Project name on the appearing dialog box. An automatic extension of TRACE3D will be associated with the project name. Choose a proper location for the project anywhere in the computer using the Browse button. If required (recommended), create a new folder for the new project. Before executing the program, all relevant data files **MUST** be in this folder.

See **Figs. 2, 3 & 4** for sequence to create a new project.

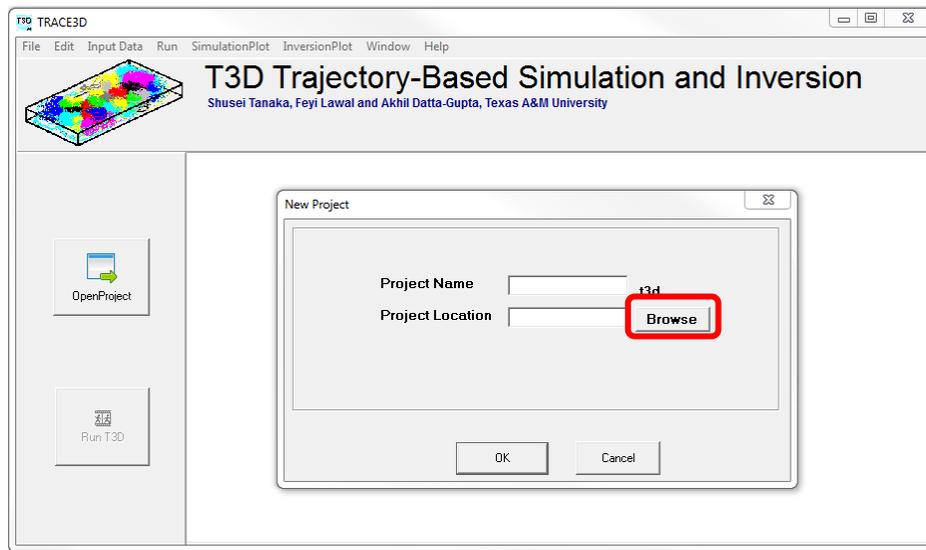


Figure 2: Supply a Project Name

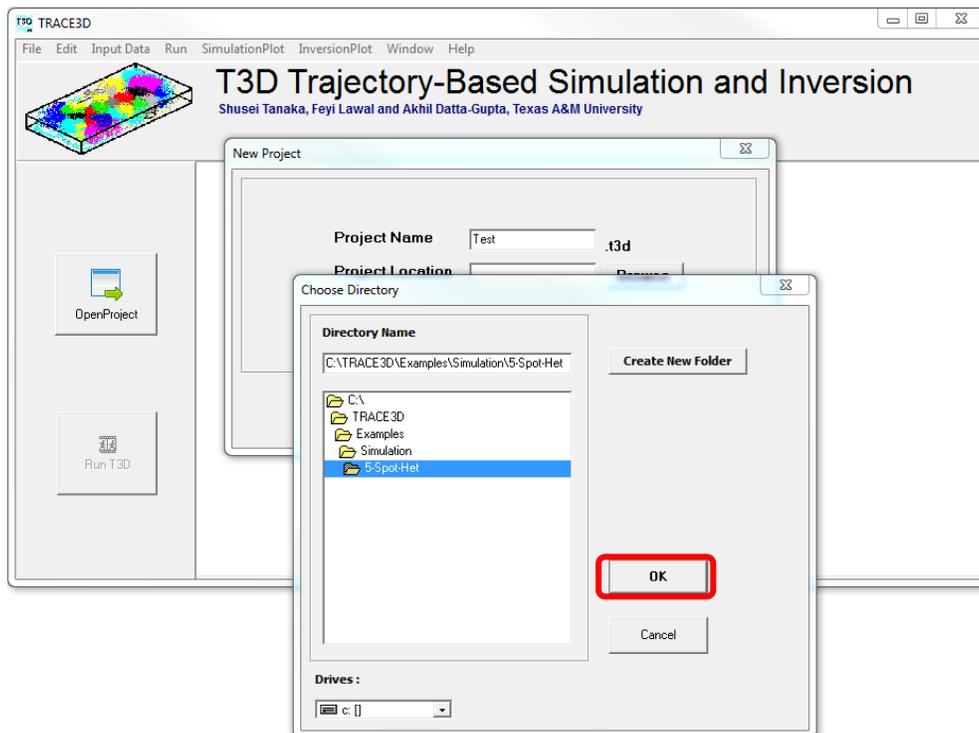


Figure 3: Supply a Location for File Information. Select 'Simulation' or 'Inversion' depending upon whether you are performing forward simulation or inversion.

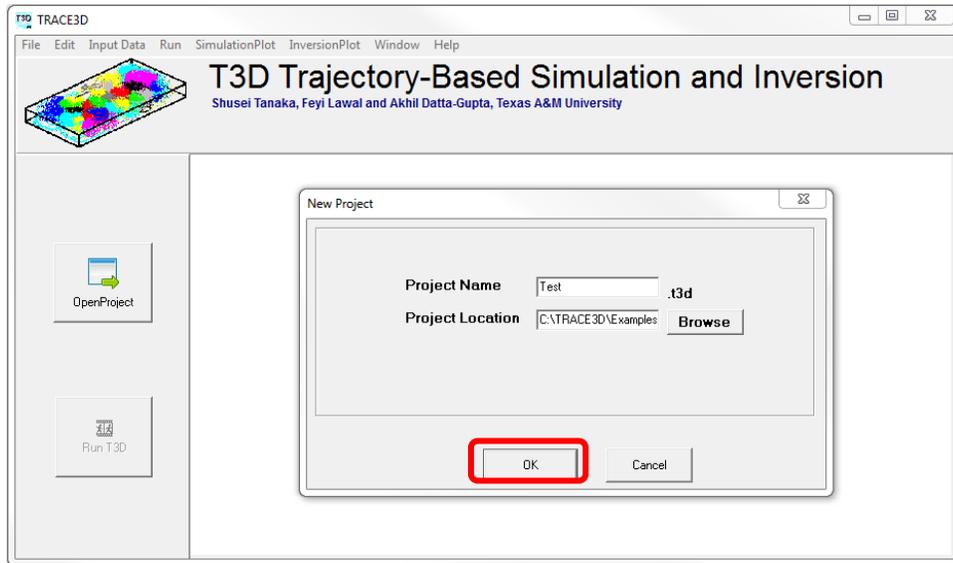


Figure 4: A New Project is Created

4. Once location for the new project is specified, Click **OK** (**Figure 4**). A panel with project information will appear (**Figure 5**). Click **OK** to close it.

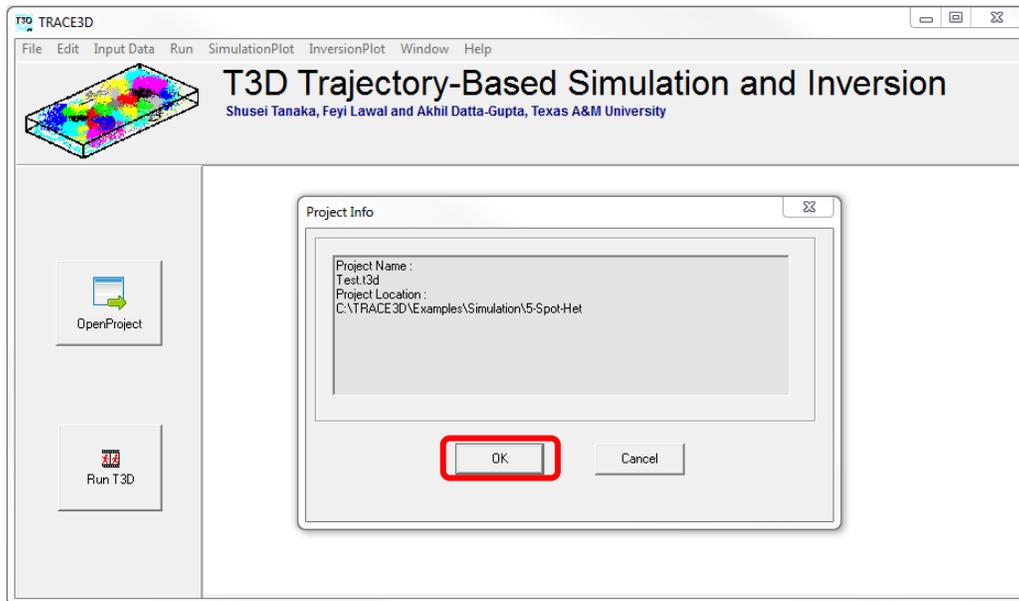


Figure 5: Project Location Information Panel

5. Once all data files are available, modify them as necessary from the Input Data Option. (**Figure 6**)

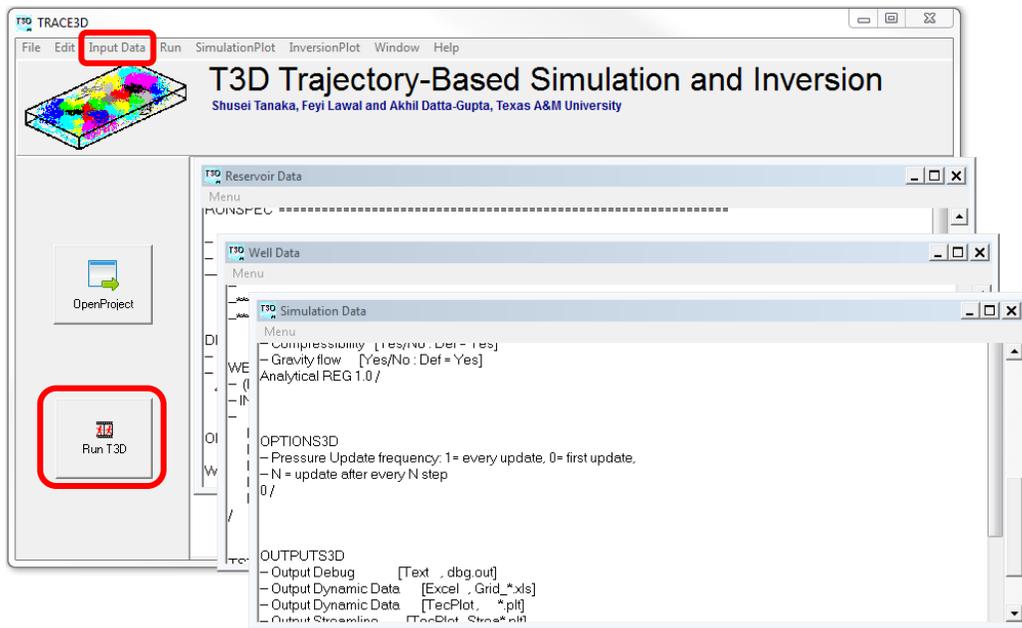


Figure 6: Input Data Panel

6. Once modifications are complete (modified files need to be saved), the project is ready to be executed. For execution, Click **RUN** button (or the Speed Button with two running men). A DOS window will appear indicating progress of the simulation. (Figure 7). After successful completion of the execution, the DOS window will close with a message 'Successful Execution'.

Note:

- Any error and/or omission in the any of the input files will result in an execution failure, causing the shutdown of the DOS window.
- Whenever the program is prematurely terminated, a *.log file is created. It explains the reason for the early termination. It is always a good idea to check the log file regardless of whether the program was executed properly or not. In the event of a successful execution, the log file will verify that.

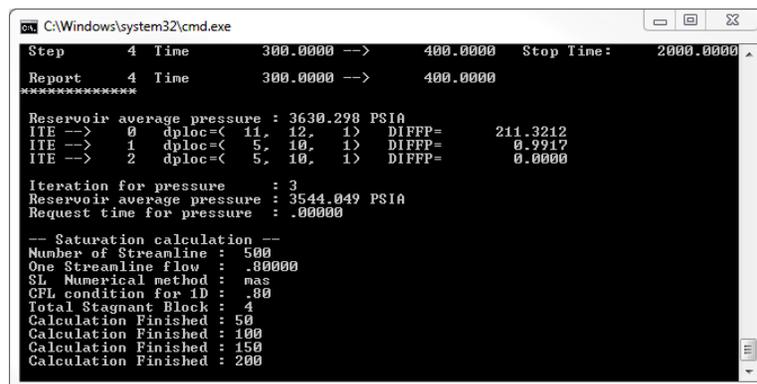


Figure 7: Simulation in Progress

7. Now the user is ready to view the results. Followings are the major points to consider while viewing the results:

- a. By clicking plots we can select the **Plots** shown in **Figure 8**.
- b. Some of the plots (Streamlines, Water Saturation and Time of Flight) can also be visualized by Tecplot Ver 8.0 or above if it is installed in the computer. These output files properly formatted for Tecplot are written into the project location folder.
- c. All the plots can be 'copied' and 'pasted' in Word or other documents for reporting purposes.

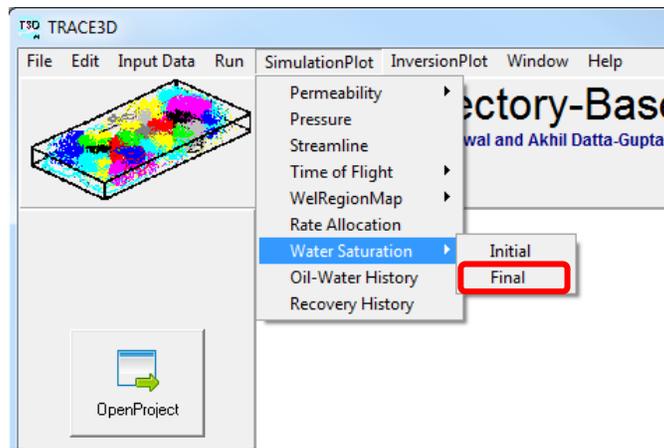


Figure 8: Accessing and visualizing simulation results

8. More detailed information about the use of the simulator for forward modeling and inversion in the manual. This can be accessed through the link: Help → User Manual → Trace3D as shown in Figure 9.

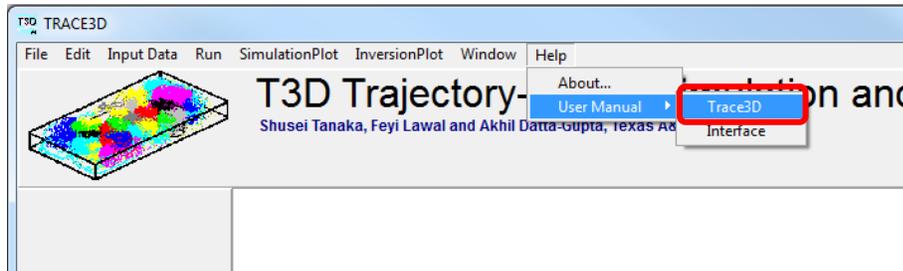
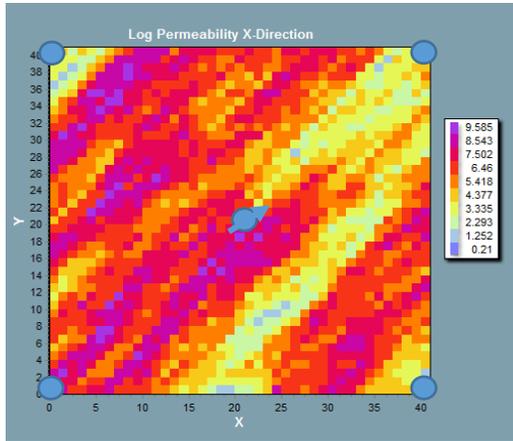
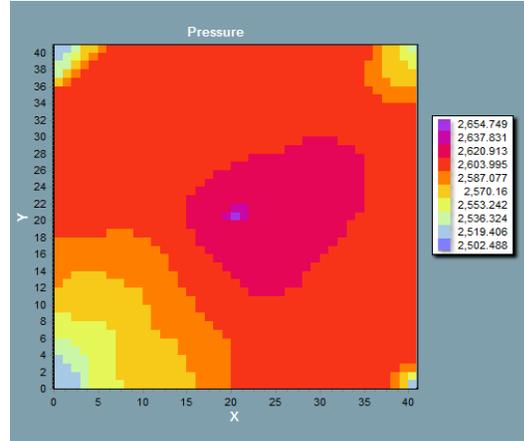


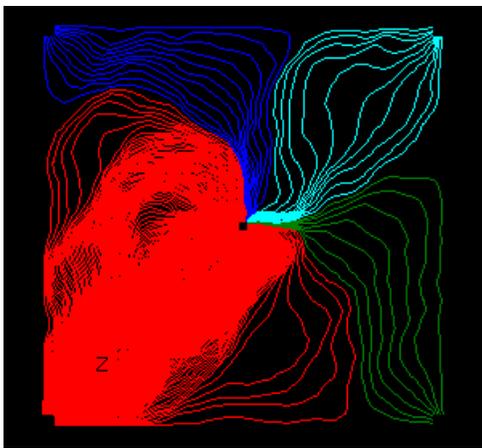
Figure 9: Accessing Trace3D simulator and interface manuals



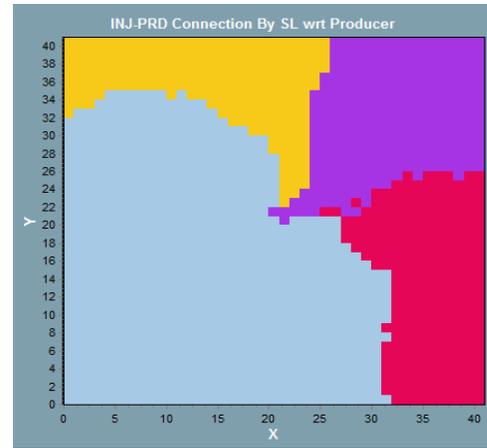
(a)



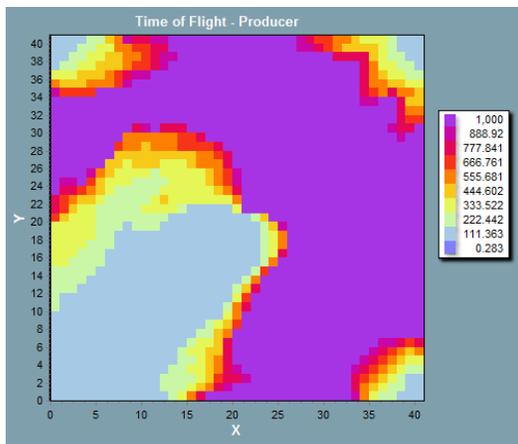
(b)



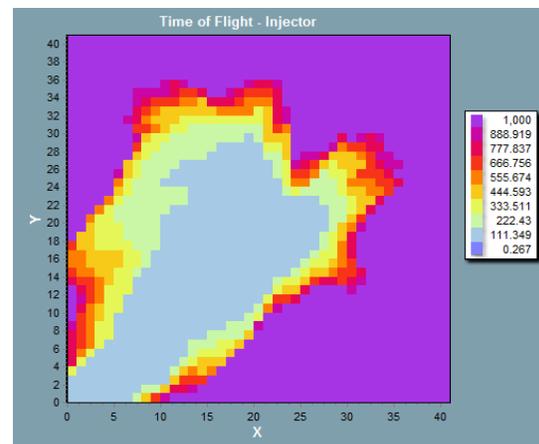
(c)



(d)

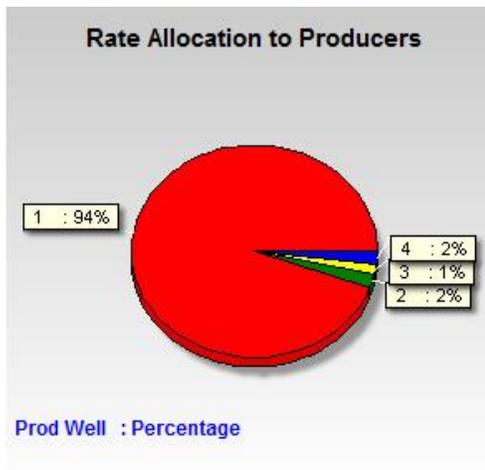


(e)

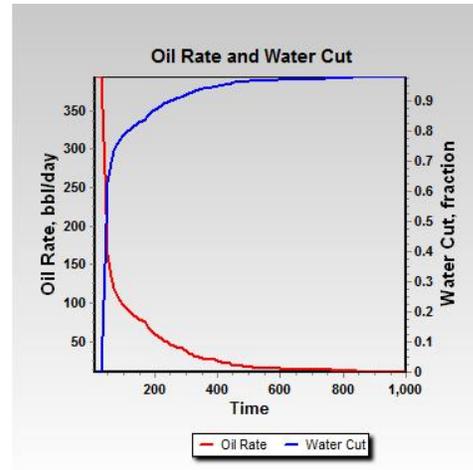


(f)

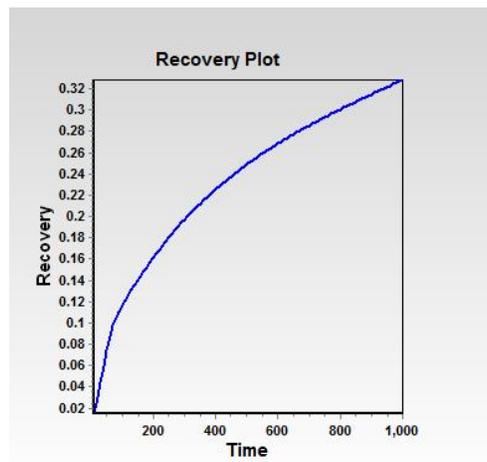
Figure 10: Forward Simulation Results – (a) Log permeability field, (b) Field pressure distribution, (c) Streamline distribution; coloring based on producer connections, (d) Reservoir partitioning by producers (e) Time of Flight from producer at 1000 Days, (f) Time of Flight from Injector at 1000 Days



(a)

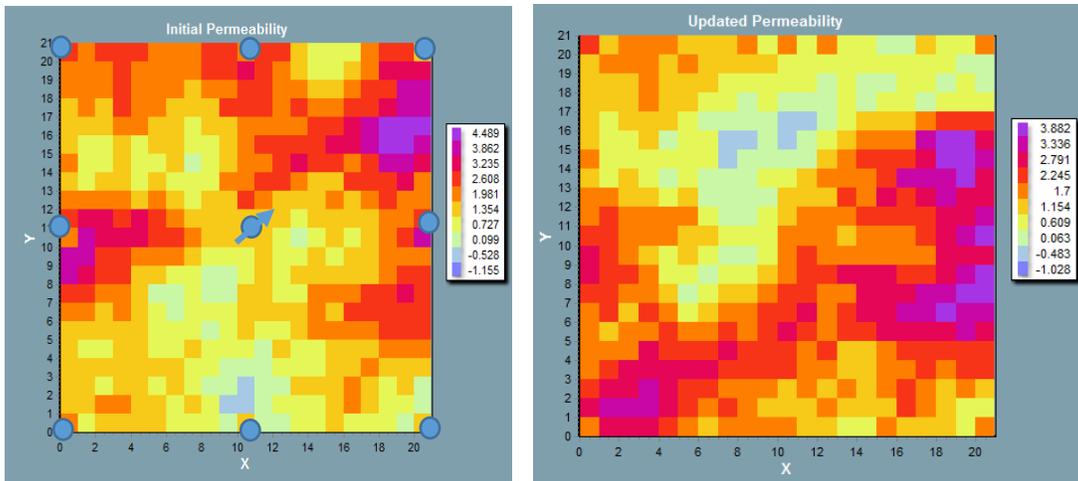


(b)



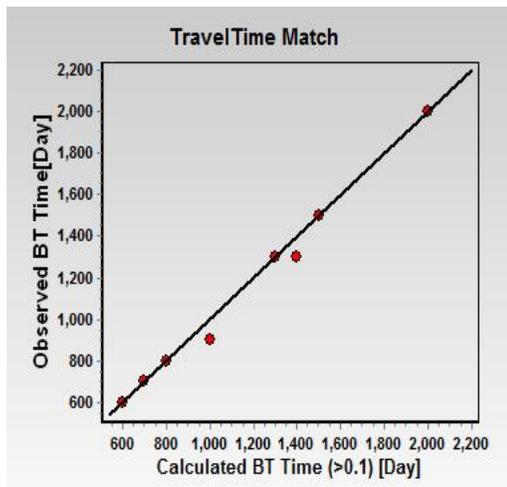
(c)

Figure 11: Reservoir performance plots for forward simulation showing (a) Injector rate allocation to all producers and (b) Well-wise oil production rate and water cut (c) Field-wide oil recovery plot.

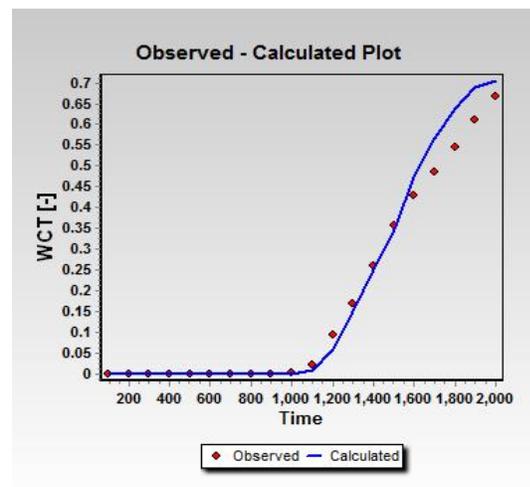


(a)

(b)



(c)



(d)

Figure 12: Inversion results visualization (a) Prior log-Permeability distribution, (b) Updated log-Permeability distribution (c) Breakthrough time match at producers (d) Amplitude match of water cut at a sample producer