

GRIDLESS SIMULATION OF A FLUVIO-DELTAIC ENVIRONMENT

BACKGROUND OF THE INVENTION

[0001] In the oil and gas industry, reservoir modeling involves the construction of a computer model of a petroleum reservoir for the purpose of improving estimation of reserves and making decisions regarding the development of the field. For example, geological models may be created to provide a static description of a reservoir prior to production. In many existing geological modeling systems, the subsurface volume is divided into a grid consisting of cells or blocks and geological properties are defined or predicted for the cells or blocks.

SUMMARY OF THE INVENTION

[0001a] According to a first aspect of the present invention, there is provided a computer-implemented method for performing gridless simulation of a fluvio-deltaic environment, the method comprising: generating a set of channel centerlines corresponding to a set of channels that are indicative of flow units of a reservoir; and generating channel widths for each of the channel centerlines.

[0001b] According to a second aspect of the present invention, there is provided a system comprising: at least one processor; at least one memory coupled to the at least one processor and storing instructions that when executed by the at least one processor performs operations comprising: generating a set of channel centerlines corresponding to a set of channels that are indicative of flow units in a fluvio-deltaic environment; and generating channel widths for each of the channel centerlines.

[0001c] According to a third aspect of the present invention, there is provided a non-transitory computer readable medium comprising computer executable instructions for performing gridless simulation of a fluvio-deltaic environment, the computer executable instructions when executed causes one or more machines to perform operations comprising: generating a set of channel centerlines corresponding to a set of channels that are indicative of flow units of a reservoir; and generating channel widths for each of the channel centerlines.

BRIEF DESCRIPTION OF THE DRAWINGS

[0002] Illustrative embodiments of the present invention are described in detail below with reference to the attached drawing figures, which are incorporated by reference herein and wherein:

5 [0003] Figure 1 is a diagram illustrating an example of sequential simulation for a simple two-category indicator variable in accordance with the disclosed embodiments;

[0004] Figure 2 is a diagram illustrating kriging weights in accordance with the disclosed embodiments;

10 [0005] Figure 3 is a diagram illustrating an example of a simulation of fluvio-deltaic channels using a conventional multi-point statistics algorithm;

[0006] Figure 4 is a flowchart illustrating an example of a computer implemented method for performing gridless simulation of a fluvio-deltaic environment in accordance with the disclosed embodiments;

15 [0007] Figure 5 is a diagram that illustrates conditioning data for performing a simulation in accordance with the disclosed embodiments;

[0008] Figure 6 is a diagram depicting selected seed points corresponding to a set of channels in accordance with the disclosed embodiments;

[0009] Figure 7 is a diagram that illustrates three snapshots of the evolution of a simulation of centerlines in accordance with the disclosed embodiments;