

ABSTRACT

A method and apparatus for hydrocarbon management, including generating a fluid saturation model for a subsurface region. Generating such a model may include: performing a brine flood petrophysical inversion to generate inversion results; iteratively repeating: classifying rock types (including at least one artificial rock type) based on the inversion results; generating a trial fluid saturation model based on the classified rock types; performing a trial petrophysical inversion with the trial fluid saturation model to generate trial results; and updating the inversion results with the trial results; and generating the fluid saturation model for the subsurface region based on the inversion results. The petrophysical inversion may include a facies-based inversion and/or may invert for water saturation. Generating such a model may include: performing a brine flood petrophysical inversion, performing a hydrocarbon flood petrophysical inversion; identifying misfits in the inversion results, and generating a trial fluid saturation model based on the misfits.

FIG. 1