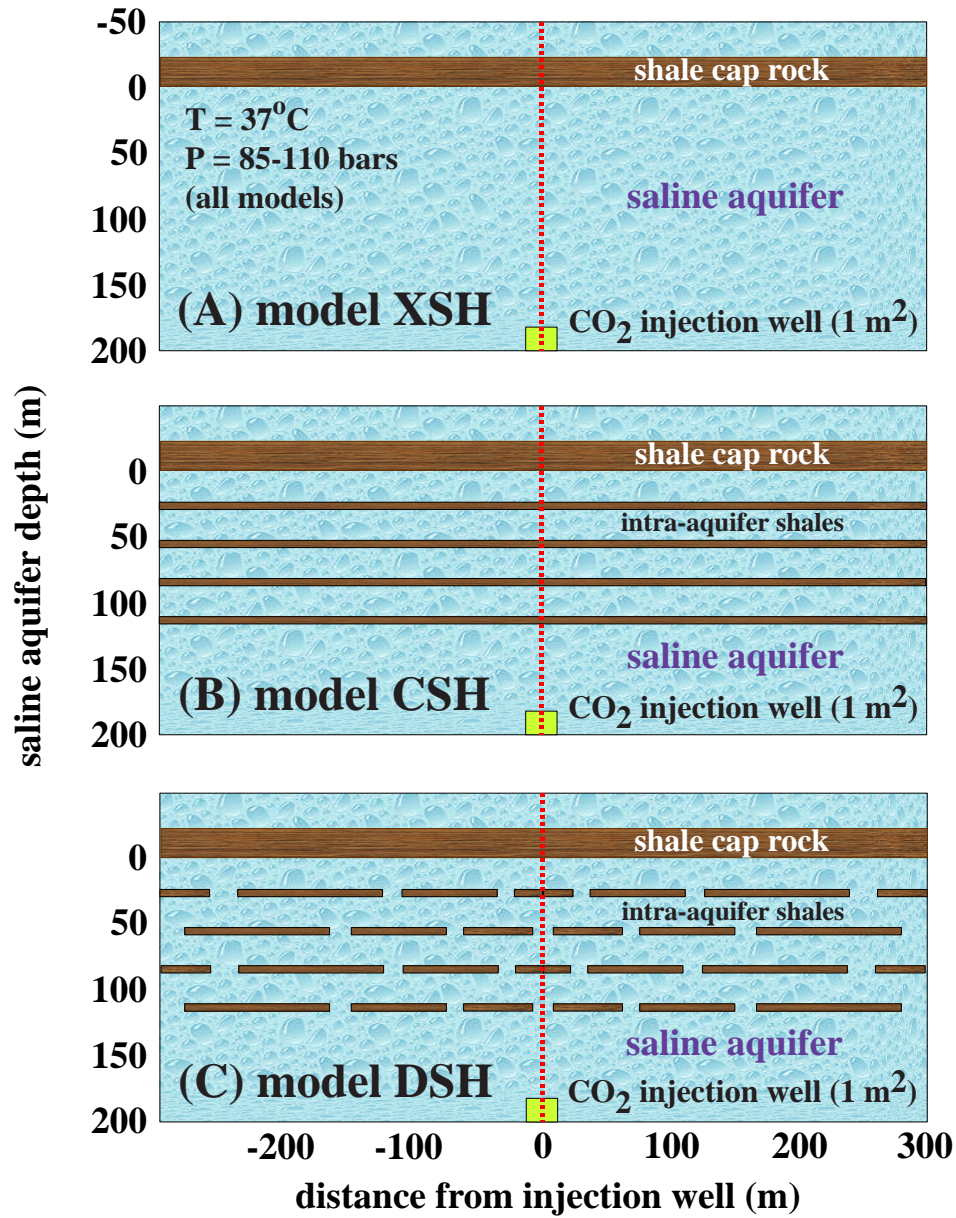
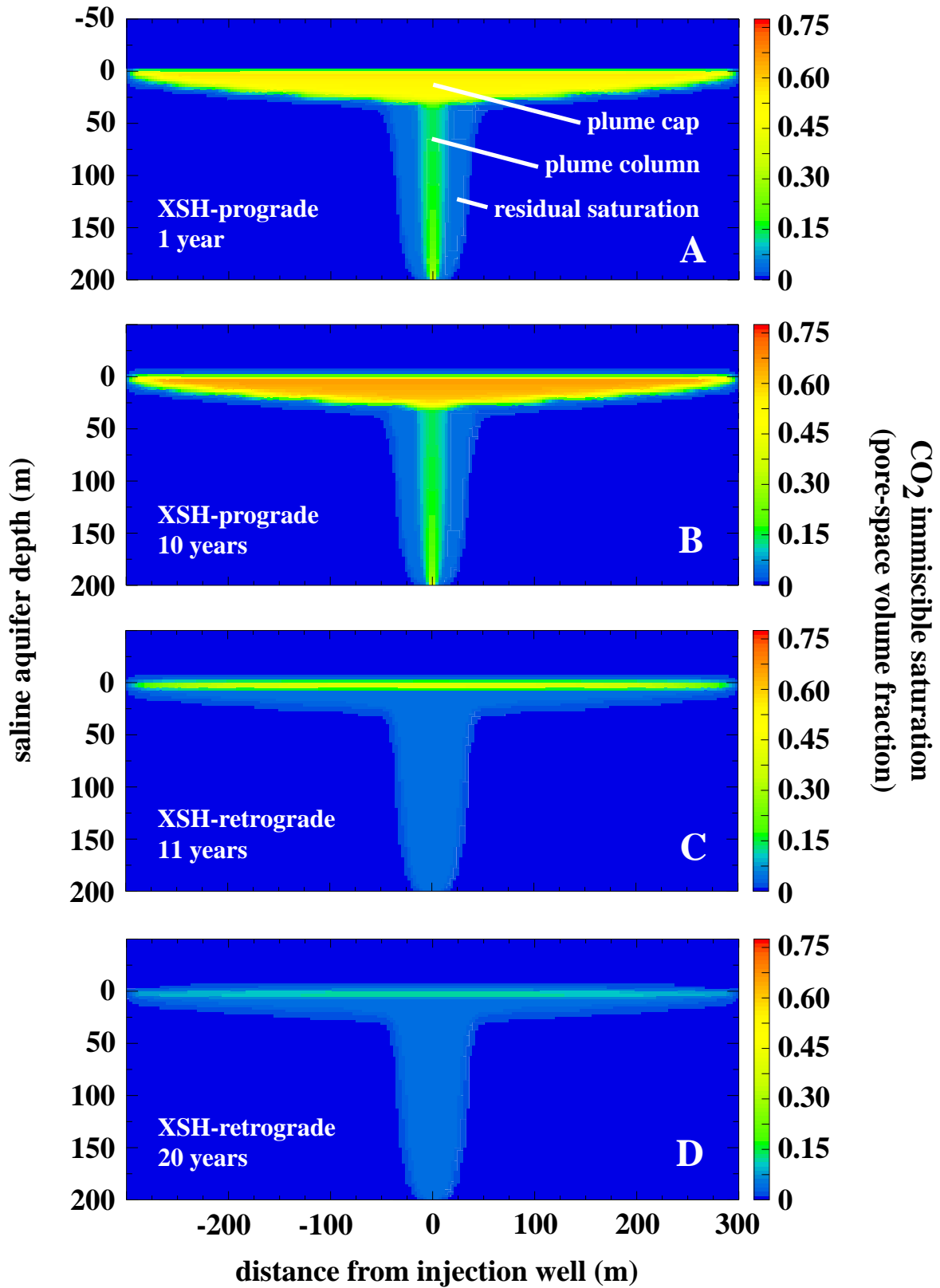


**Figure 1:** Schematic illustration of CO<sub>2</sub> injection into a confined saline aquifer at Statoil's North-Sea Sleipner facility. Question marks signify the current ring of uncertainty that surrounds the ultimate fate of injected CO<sub>2</sub> waste streams.



**Figure 2:** Schematic depiction of the near-field spatial domain adopted for reactive transport simulations of CO<sub>2</sub> injection at Sleipner in models XSH, CSH, and DSH. The dotted red line marks the left-hand side of the actual simulation regions, which are then reflected across this symmetry plane to obtain the composite 250x1x600 m (x-y-z) domains.

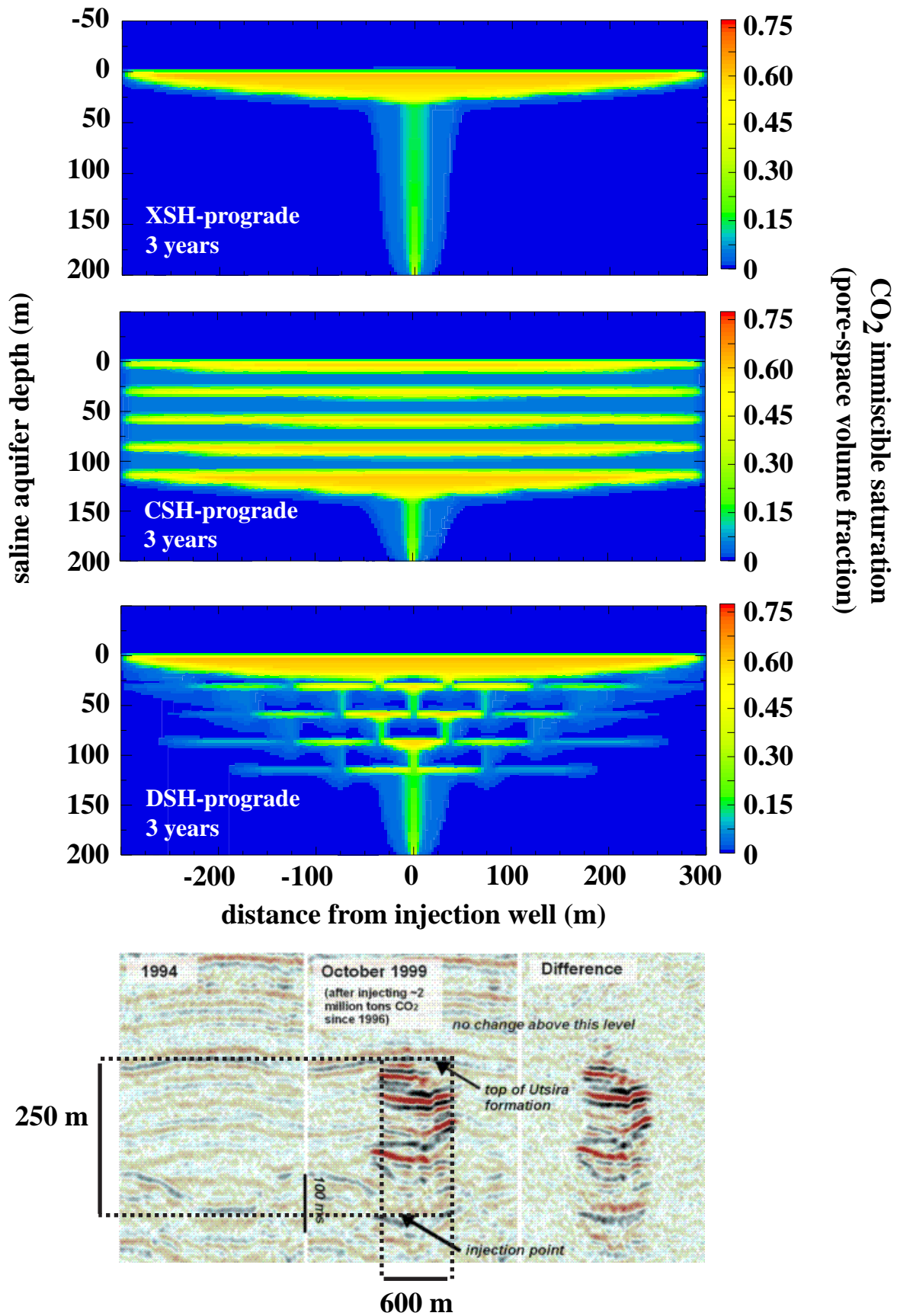




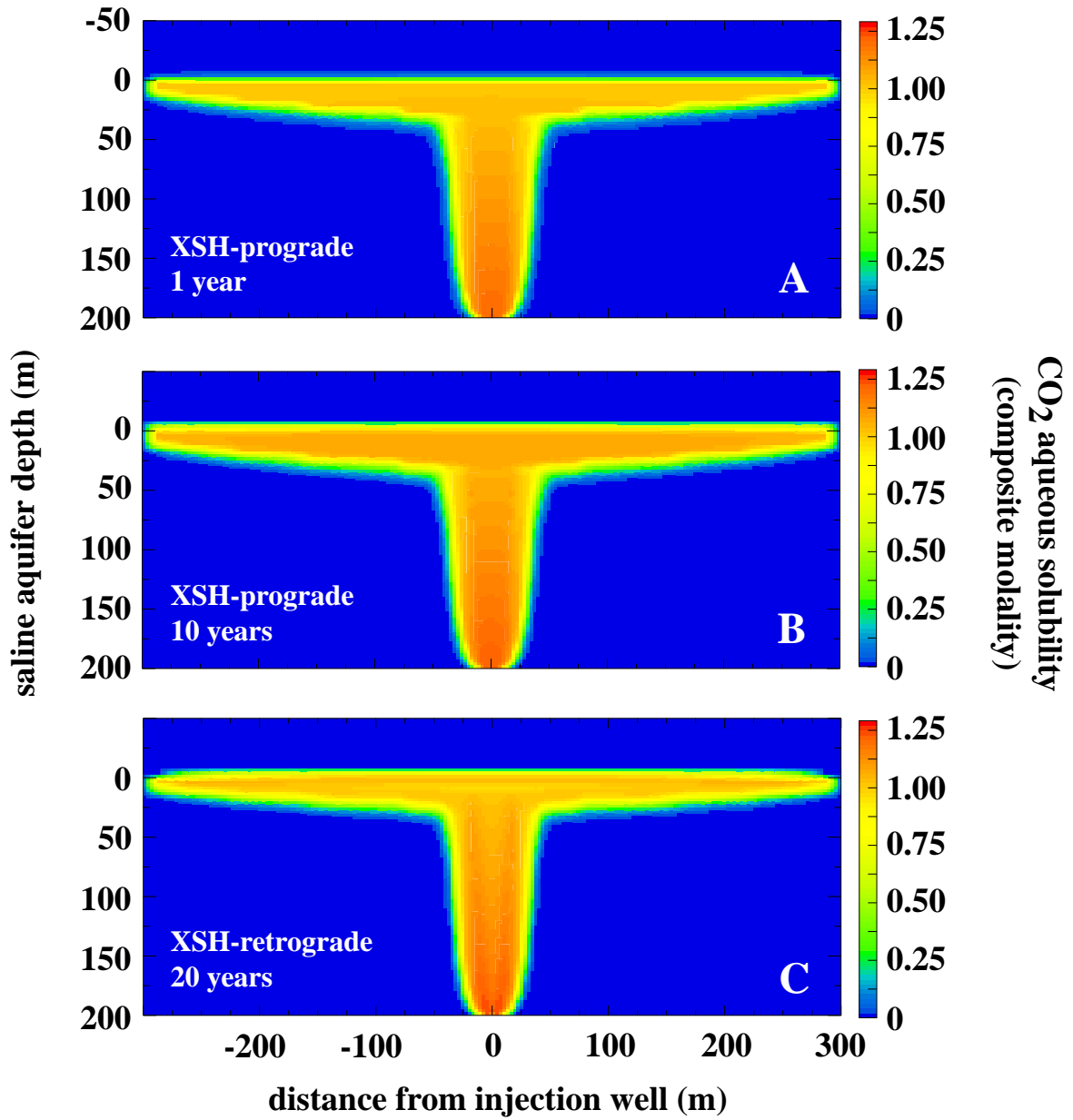
**Figure 3:** Evolution of CO<sub>2</sub> immiscible saturation in model XSH during prograde (1 and 10 years) and retrograde (11 and 20 years) sequestration.







**Figure 6:** CO<sub>2</sub> immiscible saturation in models XSH, DSH, and CSH after 3 years of injection juxtaposed above a seismic profile of CO<sub>2</sub> accumulations at Sleipner after the same time span (central panel of the bottom figure). Breakout scale bars that delineate the simulation domains have been added to the original seismic image, which appears on the cover of the IEA-GHG R&D Programme Annual Report 1999 and is available on their web site (<http://www.ieagreen.org.uk>).



**Figure 7:** Evolution of CO<sub>2</sub> aqueous solubility (composite molality of all carbon-bearing aqueous solutes) in model XSH during prograde (1 and 10 years) and retrograde (20 years) sequestration.





































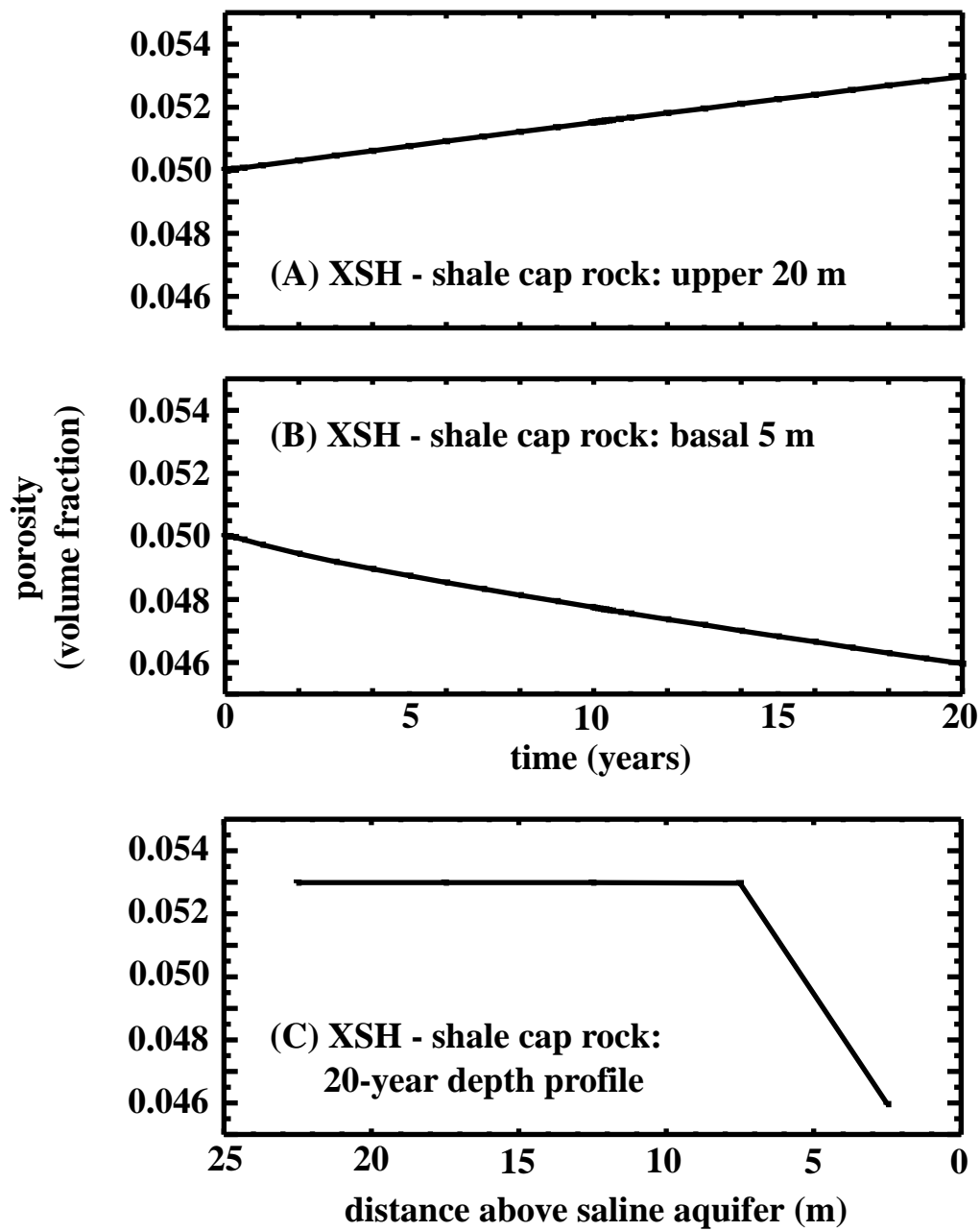




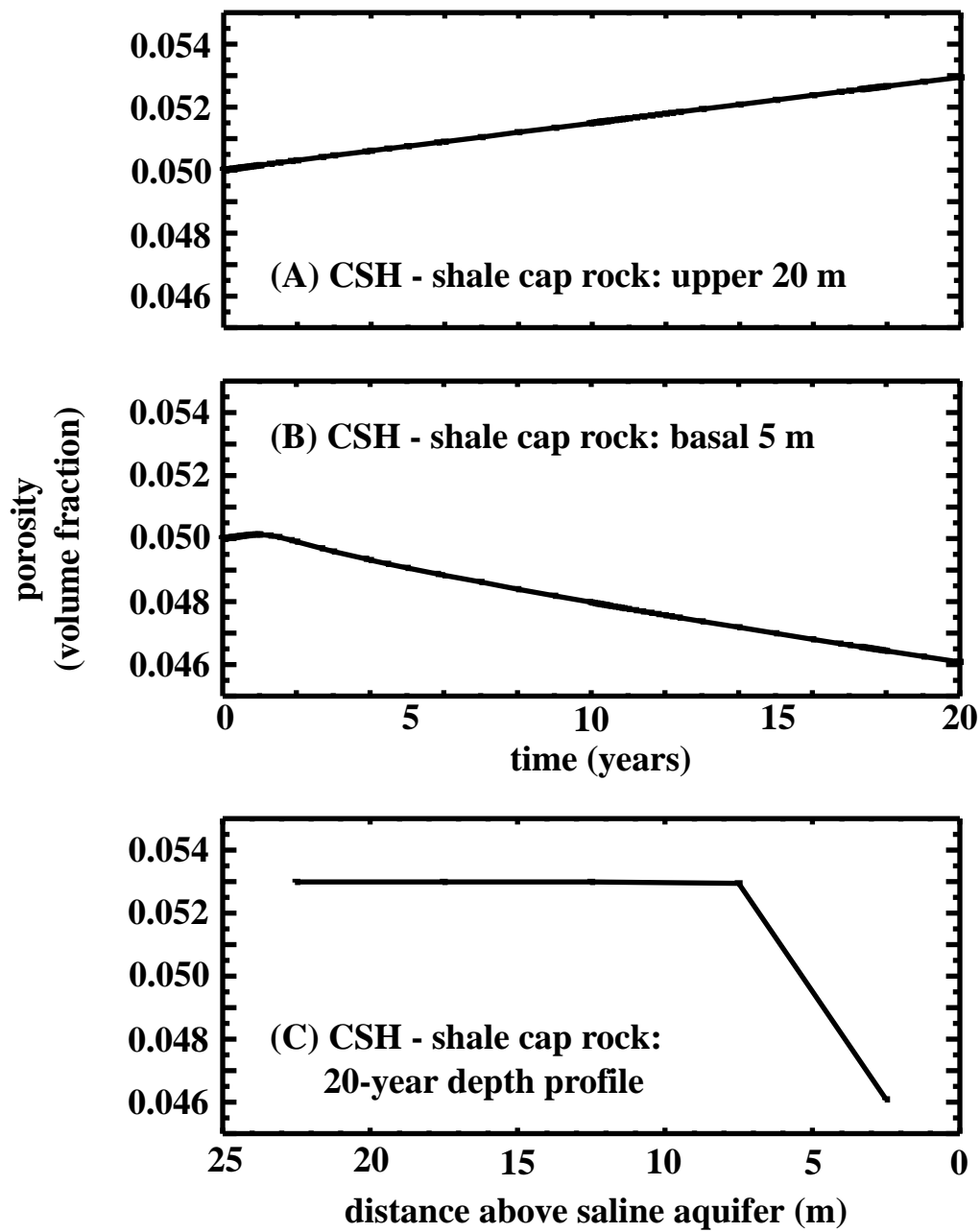




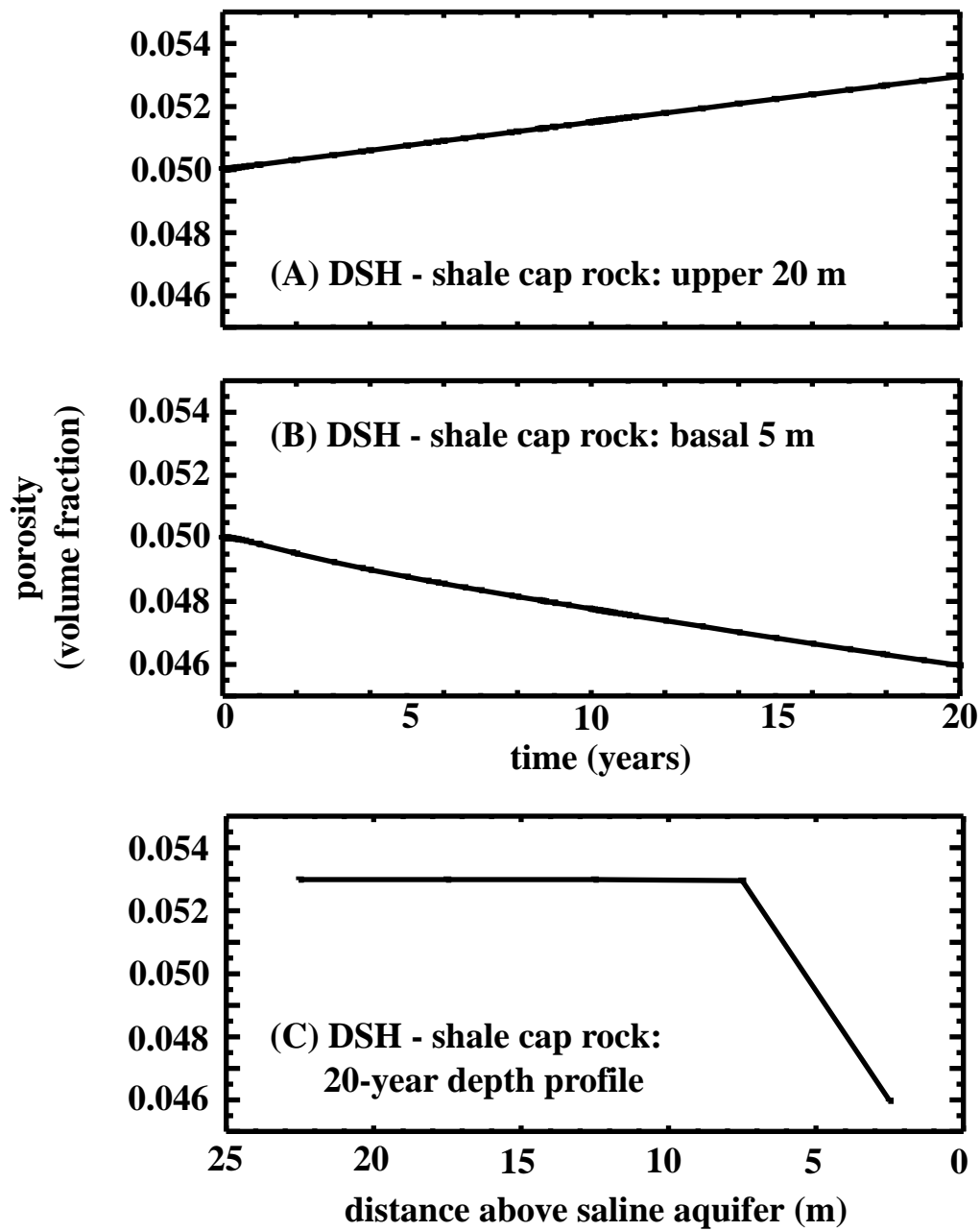




**Figure 28:** Porosity evolution and 20-year depth profile within the shale cap rock of model XSH. (A) porosity evolution within the upper 20 m [four layers of 5-m-thick grid cells], (B) porosity evolution within the basal 5 m [single 5-m-thick layer of grid cells that immediately overlies the saline aquifer], and (C) 20-year depth profile [data are plotted at grid-cell centers].



**Figure 29:** Porosity evolution and 20-year depth profile within the shale cap rock of model CSH. (A) porosity evolution within the upper 20 m [four layers of 5-m-thick grid cells], (B) porosity evolution within the basal 5 m [single 5-m-thick layer of grid cells that immediately overlies the saline aquifer], and (C) 20-year depth profile [data are plotted at grid-cell centers].



**Figure 30:** Porosity evolution and 20-year depth profile within the shale cap rock of model DSH. (A) porosity evolution within the upper 20 m [four layers of 5-m-thick grid cells], (B) porosity evolution within the basal 5 m [single 5-m-thick layer of grid cells that immediately overlies the saline aquifer], and (C) 20-year depth profile [data are plotted at grid-cell centers].