

Chapter 2:

P. 29: last paragraph: (with thanks to Steve Willson)

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Like the aquarium example, this example shows that if the reservoir rock has a significant migration pressure, the depth where the oil and water pressures are equal (the free water level) is significantly below the fluid contact. If the reservoir has the capillary properties of the Nankai Siltstone and the migration pressure is 300 psi (0.15 MPa) (Fig. 2.12), then the free water level is ~42 meters below the oil-water contact (OWC) (horizontal dashed lines, Fig. 2.15). In this case, the water pressure is 300 psi less than the oil pressure at the OWC (note separation between the green and the blue solid lines at the OWC in Figure 2.15b). In contrast, if the reservoir has the capillary properties of Facies 1 of the Bullwinkle sandstone with a migration pressure of only 6 psi (0.0029 MPa) (Fig. 2.13), then the free water level is only 0.8 meters below the OWC. If we compare the two examples (dashed versus solid blue line, Fig. 2.15), we see that the reservoir with a higher migration pressure results in a lower predicted water pressure (solid line) and a higher predicted capillary pressure at any depth.

Correction:

Like the aquarium example, this example shows that if the reservoir rock has a significant migration pressure, the depth where the oil and water pressures are equal (the free water level) is significantly below the fluid contact. If the reservoir has the capillary properties of the Nankai Siltstone and the mercury-air migration pressure is ~~300 psi~~ 2.1 MPa (Fig. 2.12~~3~~), then the equivalent oil-water migration pressure is 0.15 MPa (Eq. 2.22) (~~0.15 MPa~~), and the free water level is ~42 meters below the oil-water contact (OWC) (horizontal dashed lines, Fig. 2.15). In this case, the water pressure is ~~300 psi~~ 0.15 MPa (22 psi) less than the oil pressure at the OWC (note separation between the green

and the blue solid lines at the OWC in Figure 2.15b). In contrast, if the reservoir has the capillary properties of Facies 1 of the Bullwinkle sandstone with a mercury-air migration pressure of only 6 psi (~~0.0029 MPa~~) 0.041 MPa (Fig. 2.13), then the equivalent oil-water migration pressure is 0.15 MPa (Eq. 2.22), and the free water level is only 0.8 meters below the OWC. If we compare the two examples (dashed versus solid blue line, Fig. 2.15), we see that the reservoir with a higher migration pressure results in a lower predicted water pressure (solid line) and a higher predicted capillary pressure at any depth.