Drilling muds III:

The O/W (oil-in-water) vs W/O (water-in-oil) distinction is a function of composition toward the ends of the compositional range but additionally is a function of acid-base chemistry for intermediate cases. (Patel 1999)

Oil-based muds
Favored in drilling

Water-based muds
Favored in completion

Emulsion muds (O/W)
Addition of acid
Addition of base

Emulsion muds (W/O)
Invert emulsion muds (oil-based)

Emulsion muds

Synthetics
Favored in drilling

Fresh-water-based
Salt-water-based

Illogical zone: the whole point of using synthetics is to not use natural petroleum.

This document is derived from Shah et al. (2010), the Schlumberger Oilfield Glossary, and Patel (1999). Many thanks to Dr. Subhash Shah for his help with this diagram.