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Correlation of Upper Jurassic Carbonate and Reef Facies Across the Burgundy and Ardennes Platforms, Eastern Paris Basin, France

Integrated lithologic, biostratigraphic, chemostratigraphic, and sequence stratigraphic correlation of Upper Jurassic (Oxfordian) carbonates from the eastern Paris Basin, France provides insights into the controls on carbonate and reef deposition and the development of the Burgundy and Ardennes Platforms. Lithologic correlation was achieved from well and outcrop data. Biostratigraphic and chemostratigraphic data was obtained from outcrop samples. Sequence stratigraphic interpretations were derived from integration of well, outcrop and seismic data.

The Upper Jurassic units of the eastern Paris Basin are primarily composed of carbonates, coral-rudist-microbial boundstones, and mixed carbonates/siliciclastics. Both the Burgundy and Ardennes Platforms record deposition within one transgressive-regressive cycle (T-R cycle). Within this T-R cycle, higher order cycles show great variability across the study area. Examination of these higher order cycles indicate that carbonate deposition responded strongly to local environmental and regional tectonic controls.

On both the Burgundy and Ardennes Platforms, reef deposition occurs in two episodes. On the Burgundy Platform, initial reef development is characterized by deep-water microsolenid biostromes, which are associated with transgressive deposits. These deep-water corals grade into coral-rudist-microbial barrier reefs and lagoonal patch reefs that are associated with highstand deposits. On the Ardennes Platform, the first cycle consists of coral patch reefs developing on an oyster-rich hardground within late transgressive to early highstand deposits. These reefs are overlain by crinoidal and oolitic grainstones to packstones. The second reef cycle is composed of coral-microbial barrier reefs and lagoonal patch reefs. Again these lithologies are overlain by grainstones.

Correlation of the Upper Jurassic units across the eastern Paris Basin provides insight into the development of the Burgundy and Ardennes Platforms. Reef facies are particularly significant in that they provide a detailed record of the subtle changes in the development of these two platforms.