Monitor reservoir fracturing
An operator working in the Fayetteville shale wanted to better understand the fracturing of the reservoir to optimize production. The operator had already begun a stimulation campaign in the field but found that fracture monitoring would be useful to optimize fracturing operations.

Perform StimMAP diagnostics
The operator selected the StimMAP hydraulic fracture stimulation diagnostics service. In an era of demand for technical resources, the Schlumberger integrated solution offered industry-leading expertise. StimMAP diagnostics map hydraulic fracture systems in 3D as they are created. These measurements can be used to ensure optimal hydraulic fracture placement and improve reservoir development. Information collected is processed on site to refine the fracturing design for the next stage. The service can also be used to evaluate the influence of treatment communication with offset wells.

Challenge
Understand fracture propagation in the Fayetteville shale reservoir to enhance future fracturing stage and well spacing design for optimized reservoir performance where previous stimulation had not been particularly effective.

Solution
Used StimMAP* hydraulic fracture stimulation diagnostics service, which maps hydraulic fracture systems in 3D as they are created.

Results
Acquired a lease spacing change from the state; exceeded the expectations of the operator, who now uses the StimMAP service for almost 20% of all wells in the field.

Map view of microseismic events from a three-stage stimulation treatment.
Case study: State grants lease spacing change based on fracture diagnostics

Refine fracture design

In the case of one particular target well, information was collected as Stage 1 was performed. Stages 2 and 3 were performed on subsequent days, and the stimulation treatment program was refined between each stage. However, stimulation was not particularly effective. Diagnostics determined that the well was in a high-stress-contrast area of the shale, and overlapping was observed between Stages 1 and 2. The fracture system developed mainly downward, resulting in a narrow fracture fairway coverage.

The state reviewed the StimMAP data and granted a lease spacing change. Schlumberger made a number of recommendations for future operations, including increasing the number of stages; incorporating the use of diversion techniques such as ball sealers and fibers; and constructing a reservoir model to determine the effective fracture length and drainage area.

The StimMAP service exceeded the expectations of the operator, who now uses it for almost 20% of all wells in the field.