

# SOCIAL & NATURAL SCIENCE NEXUS



Pump jack extracting oil near Farmington, NM

Energy is crucial to the economy in New Mexico, but energy development is often constrained by environmental impacts and water resources. In order to determine the best options for an energy-sustainable future in New Mexico, the Social & Natural Science Nexus team works on innovative ways of using a system dynamics (SD) modeling framework to increase understanding of the behavior of complex systems over time—like the interaction of water, the environment, energy, and people. In Year 4, the team has advanced work on socio-economic budgets incorporating energy models, developed data-gathering mechanisms for human perceptions, and continued advancement on the statewide water budget.

Despite saving energy and time by conventionally

disposing of produced water, oil and gas drilling companies still face energy hurdles when fresh-water sources are limited and companies must transport water to and from drilling sites. Therefore, early results with water modeling indicate that both treatment and reuse of produced water in oil and gas operations (hydraulic fracturing in particular) may become more prevalent.

Also in Year 4, the team analyzed attitudes and preference surveys to further understand how New Mexicans feel about energy. 51% of respondents believe natural gas is a long-term energy solution, and 71% agree that climate change is happening, and caused by humans. These results and more will be incorporated into the final, overarching SD model.