A five-week disruption to crude oil and fuel importation in the western Gulf Coast (Louisiana and Texas) was simulated. We examined three cases: fixed demand, variable supply, and both a constant and a variable demand.

We modeled the petroleum industry with the following representation of stocks and flows. This model structure allows for the analysis of understanding complex processes and relationships involved in the production, processing, storing, refining, and transportation of crude oil and fuel among the regions in the United States. The result of disruption simulations shows that the disruption reduces the fuel stock at the distributors until fuel imports, from the Gulf Coast have decreased and other sources can not make up the difference. A fuel shortage at the distributors appears if the disruption occurs for more than 5 weeks.

The Strategic Petroleum Reserve (SPR) also maintain sufficient stocks for Midwestern and other regions. The SPR provided crude oil for refineries in the Gulf Coast, who, in turn, provided fuel to the Midwest and other regions.

The policy of crude oil release from the Strategic Petroleum Reserve (SPR) is to release crude oil to the region that will cover the largest amount of shortfall. The SPR also maintain sufficient stocks for Midwestern distributors. The SPR provided crude oil for refineries in the Gulf Coast, who, in turn, provided fuel to the Midwest and other regions.