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Guest column: Research and regulation of carbon capture risk is robust

BY CHRIS MCLINDON

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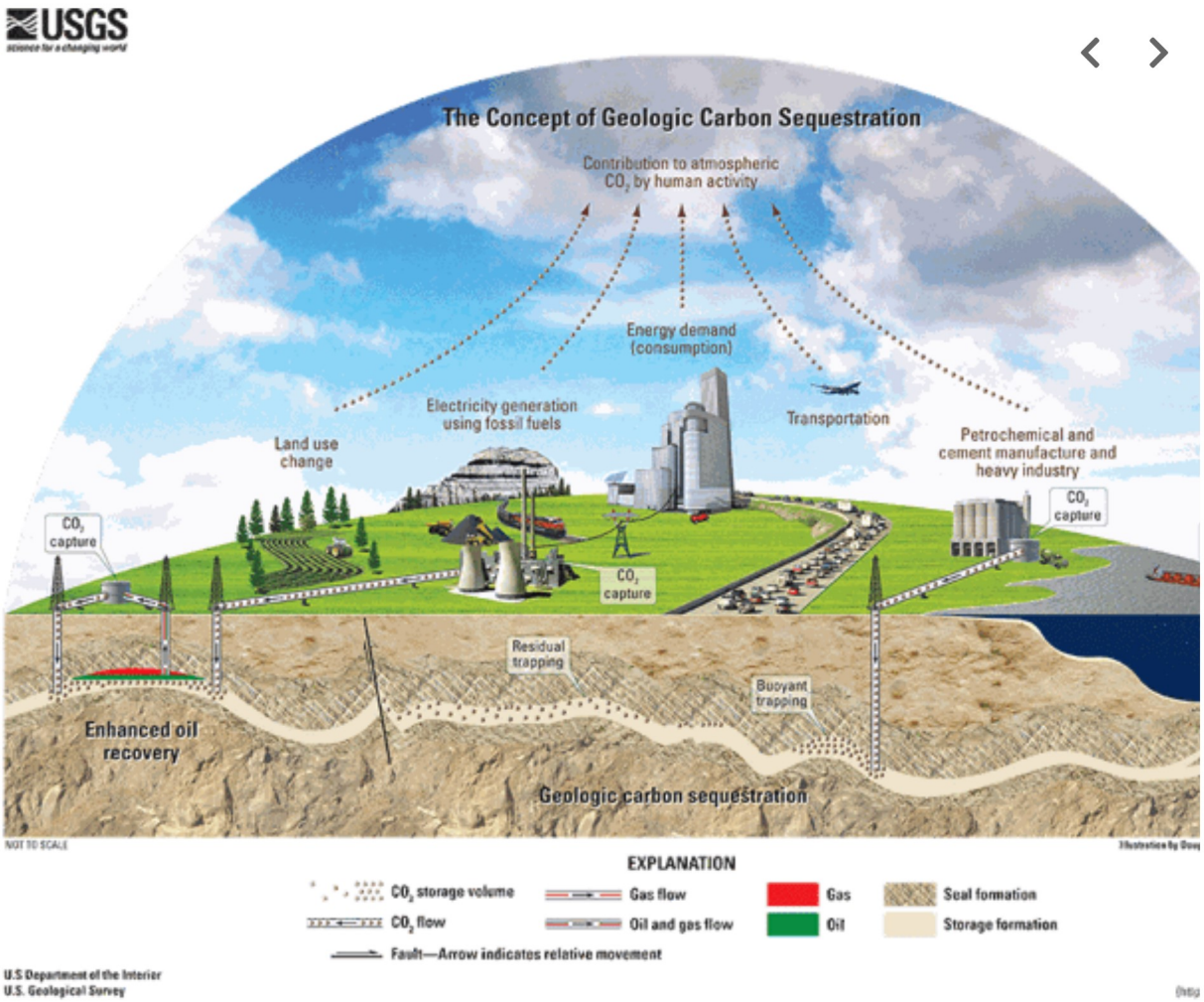

An example of various methods that can be used to capture and store -- or reuse -- carbon gas. Where it will inject gas into a 10,0(containing saline water, which should permanently hold the gas in liquid form.

U.S. Geological Survey

The Mississippi River has made south Louisiana a global center of industry and commerce. Taken collectively, the system of ports on the

river is one of the largest in the world. Industrial facilities along the river provide fuels to power everything from lawnmowers to aircraft carriers. They produce fertilizers that allow the world's population to be fed, and chemical feedstocks that allow for the production of everything from building materials to medicine.

This concentration of productivity also means that Louisiana, unlike most other states, gets a majority of its carbon dioxide emissions from the industrial rather than the transportation sector. It is the very concentration of these sources of CO2 emissions that makes south Louisiana an ideal place for large scale carbon capture and storage operations.

The idea of injecting the emissions and byproducts of industrial production underground is nothing new for Louisiana. It was decided decades ago that it was significantly safer and more effective to inject industrial wastewater into underground saline aquifers rather than handle them at the surface.

The wastewater from a typical fertilizer plant may include chemicals such as arsenic, lead and mercury. The Louisiana Department of Natural Resources currently regulates 3,459 injection wells including those that inject CO2 for enhanced oil recovery. DNR has a robust regulatory process that effectively evaluates the potential risks of the injection operations.

There are some differences between industrial wastewater injection and the injection of CO2, and this is why academic research on CCS operations is so important. The LSU Center for Energy Studies and the

Bureau of Economic Geology at UT Austin are at the forefront of CCS research for Louisiana. They have produced several significant studies and reports that provide overviews of the entire enterprise and detailed evaluations of all of the important geological parameters of CO2 injection and storage.

These evaluations include the storage capacity of saline aquifers, the integrity of the overlying confining zones and the potential for transmissivity by faults. They provide a database of critical parameters for CCS operators and regulators so that appropriate safety margins can be built into the design of CCS projects. Studies by CES and BEG provide a comprehensive picture of the subsurface geology essential to CO2 storage.

It is interesting that capacity for storage of CO2 underground in south Louisiana is also closely tied to the Mississippi River. The ancestral Mississippi has been draining the North American continent for more than fifty million years. Deposits in the river deltas and on the continental shelf have accumulated throughout this time span, and sedimentary layers extend down miles below the surface. They provide both permeable layers of sand and the impermeable layers of shale (lithified clay) necessary for underground storage.

BEG studies have shown that the saline aquifers formed by these sand layers have excellent capacity to store CO2, and the broadly extensive shale layers make excellent seals that keep it in the aquifers.

Opponents to CCS operations in Louisiana often speak about associated geological risks. Assertions have been made of the potential

for the risk of leakage up abandoned oil and gas wells, vertical transmissivity by faults, and the potential for induced seismicity (earthquakes). Aside from the observation that all of these theoretical risks apply equally to wastewater injection wells — and there should have been some evidence of their occurrence over the last 50 years — these assertions are generally made with the implication that the risks are not being evaluated and quantified. This undermines the integrity of researchers at CES and BEG and regulators at EPA and DNR.

Existing and ongoing research is providing a solid foundation of understanding for all aspects of CCS operations. The regulatory process for CCS is as robust as any other enterprise in this country. Scientists and engineers at EPA and DNR work diligently to ensure that all potential risks are properly evaluated and addressed, and the safety of all Louisiana residents and their drinking water will be protected. To suggest otherwise is irresponsible at best.

The Mississippi River has brought together the rich geological history and the modern economic prowess of south Louisiana in such a way that a concentration of CO2 emissions is underlain by a massive array of saline aquifers that are capable of storing those emissions. This coincidence offers the state the potential to become a global leader reducing carbon emissions.

It is an opportunity that we should not squander.

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