



Session 2: Pore space access and use

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Resolving the Legal and Regulatory Challenges to Geologic Sequestration of CO₂—A CCSReg Project Workshop

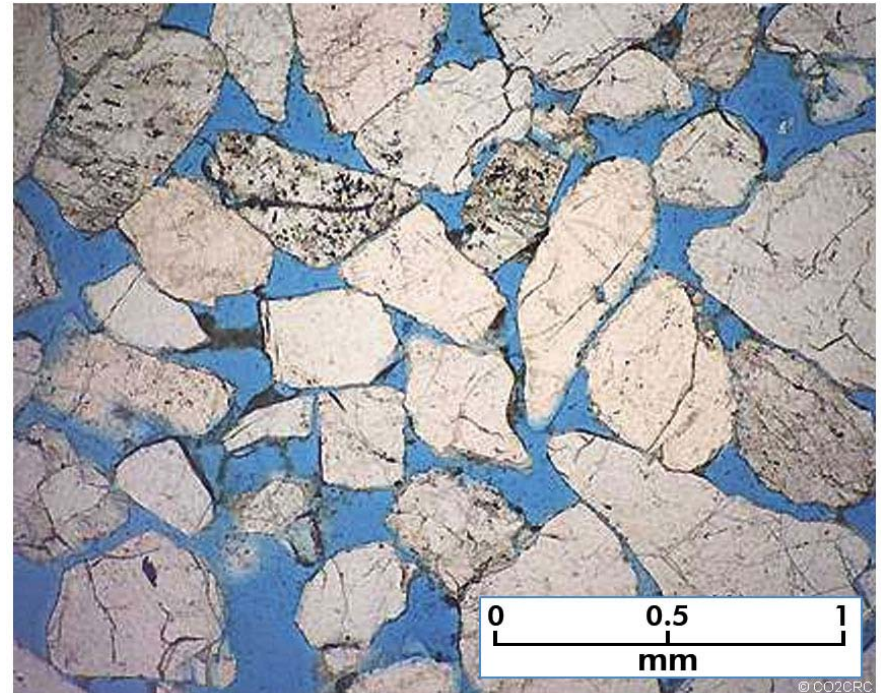
Hall of the States, Washington, DC

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Pore space—What is it?

- In porous rock, pore space exists in the rock matrix which can be occupied by CO₂ when injected into the subsurface.
- A "very good" sequestration reservoir might have porosity approaching 30%; a marginal reservoir could be in the single digits.



Pore space is blue and grains of quartz are white in this photograph of a microscopic cross-section of rock (courtesy of CO2CRC)

Framing the issue

Private property rights cannot be used or taken without just compensation

- Trespass: Common law theory redressing property owners for physical invasions of their property by others or activities
- Taking: Taking of private property for public use requires just compensation to the owner for the value of the property taken—*5th Amendment to the Constitution*

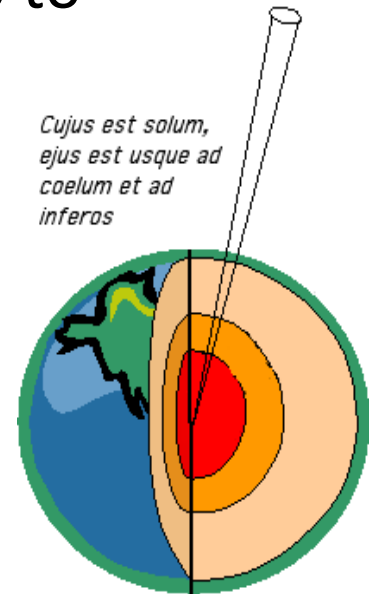
Ownership of pore space and the *Ad Coelum* Doctrine

Ownership of pore space depends on the jurisdiction: in most nations, pore space, along with the resources that are found in the pore space and in the rock matrix, are the property of the nation; in the US, ownership rights are more ambiguous or incoherent.

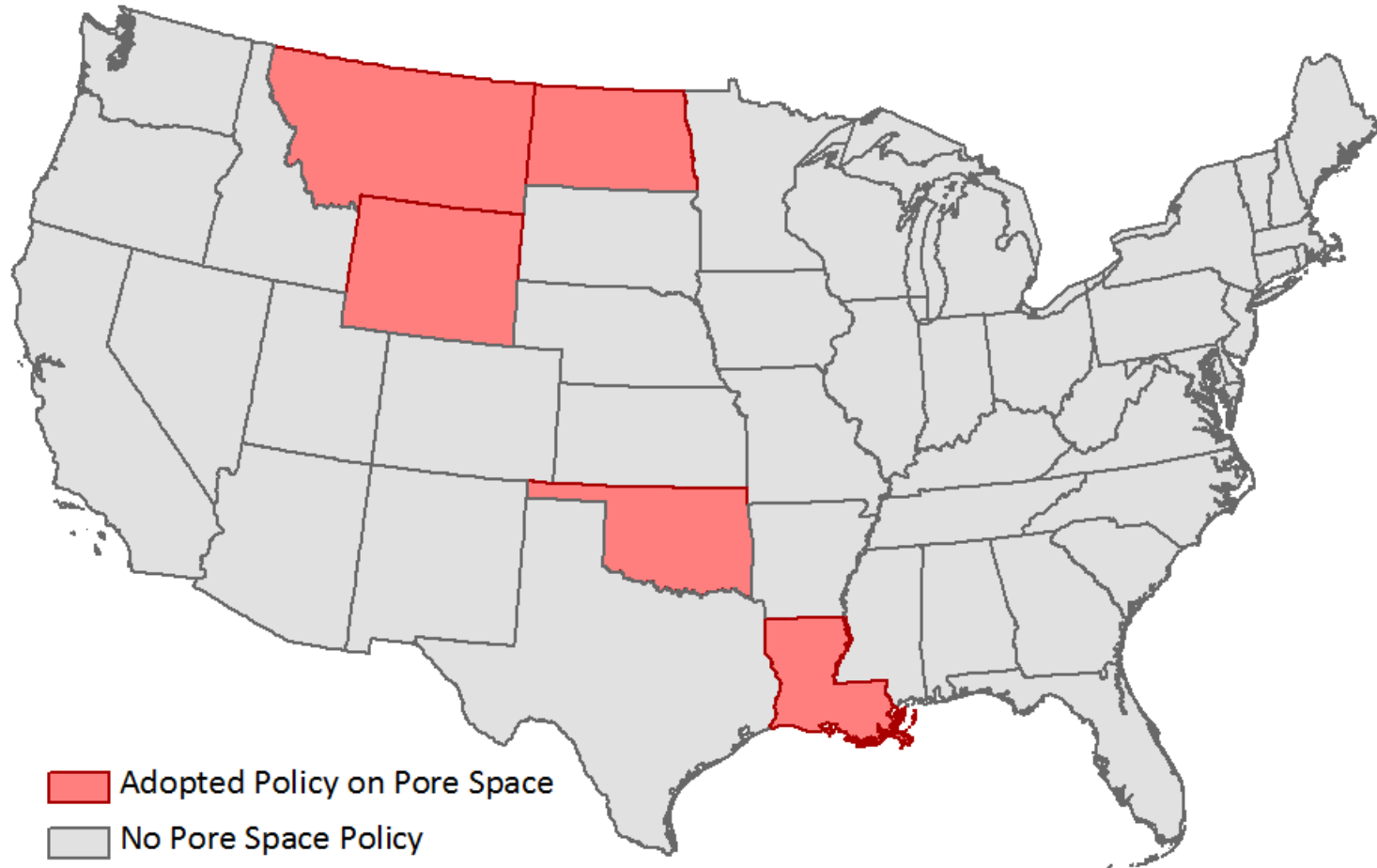
***Ad Coelum* Doctrine:** landowner's title extends up to the heavens and down to the center of the earth

*[The] maxim—**cujus est solum ejus est usque ad coelum et ad inferos**—“has no place in the modern world.” . . . Lord Coke, who pronounced the maxim, did not consider the possibility of airplanes. But neither did he imagine oil wells.*

- Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1, 11 (Tex. 2008) (citing United States v. Causby, 328 U.S. 256, 260-61 (1946)).



Five states have explicitly or implicitly addressed ownership of pore space and access



Three of these states have established that pore space is tied to the surface estate

Montana: SB 498 (2009)

Pore space is tied to the surface estate, unless deeds or severance documents establish otherwise

North Dakota: SB 2139 (2009)

Pore space is tied to the surface estate and *may not be severed*

Wyoming: HB 89 (2009)

Pore space belongs to surface owner and *may be severed*

Clearing up the question of ownership doesn't necessarily make it easier to develop GS

If each individual land owner is willing to allow use of their pore space, and the operator signs contracts with the owner, the problem is solved. However, this it could make geologic sequestration projects:

- (1) much more difficult to site in many places
- (2) more expensive everywhere

Analogous imply that use of pore space alone is not compensable

- Underground injection of fluid wastes
- Injection of fluids for enhanced hydrocarbon recovery (e.g., EOR)
- Hydraulic fracturing
- Groundwater storage and recharge

Compensation for the use of pore space is typically **not required** when a properly **licensed activity** achieves an important **public benefit** and **no actual or substantial damages** to private property result from use

Could the use of pore space for GS give rise to legal claims?

YES – Physical invasion of the subsurface of neighboring lands by injected fluids is a **technical trespass** and could be a **per se taking**

BUT – When physical invasion accomplishes an important societal need—including private and commercial needs—the use of pore space **might not be compensable** if the subsurface owner **does not suffer actual and substantial damages**

ESPECIALLY – If the injection operator is **lawfully engaged in activities** that are **licensed/permitted by a regulatory agency or commission**

The CCSReg proposal: Managing access and use of pore space for GS

- Ambiguity associated with pore space ownership, access, and use might be resolved in several ways, many of which could make GS logistically or economically infeasible
- **Ownership:** We do **not** attempt to resolve this issue—ownership of private property rights can adequately be dealt with at the state-level
- **Access and use:** A federally coordinated solution is superior to a purely state-by-state solution, or resolution in the courts

The CCSReg proposal: Required federal legislative action

Federal legislation should:

- 1) declare that GS for the purpose of addressing climate change is in the public interest
- 2) declare that the use of pore space for GS is not compensable unless the injection and migration of CO₂ actually and substantially impairs a preexisting interest in the subsurface

The CCSReg proposal: Details of framework managing access and use of pore space

- Modify but work within the EPA's Underground Injection Control (UIC) Program
 - Establish a Federal opt-in program to manage access to pore space
 - Issuance of a **UIC injection permit** and **pore space permit** expressly grants a GS project developer the legal right to inject and sequester CO₂ within the boundaries specified by the permit
 - Pore space permit has the effect of a perpetual easement
- The permitting process would allow mineral rights owners and other pore space users opportunity to notify the permitting agency of conflicting uses of the pore space

The CCSReg proposal: Details of framework managing access and use of pore space (cont.)

- Conflicts between GS and non-GS uses of pore space would be resolved in one of three ways:
 - a contractual resolution of the preexisting interest;
 - a modification of the project that avoids the impairment; or
 - a finding by the UIC permitting agency that the GS project is of such public importance as to justify condemnation of the preexisting interest, with appropriate compensation if necessary
- Migration of sequestered CO₂ outside the pore space permit area would present a basis for claims of trespass

We have extended the proposal to federal lands

- The BLM and EPA should jointly license GS projects on federal lands and split estates under the UIC and Title V of the FLPMA, respectively, under the permitting procedures laid out above
- Use of pore space on federal and private lands permitted jointly
- As with private lands, a permit to use pore space on federal lands would have the effect of a perpetual easement

Title III of the model legislation implements the pore space recommendations

Recommendation	Relevant Sections
"Establish a Federal opt-in program..."	Sec. 323(b)
"...pore space permit..."	Sec. 322(c)
"...legal right to inject and sequester CO ₂ ..."	Sec. 323(b)
"...opportunity to notify the permitting agency of conflicting uses..."	Sec. 323(c)
"Conflict between GS and non-GS uses ..."	Sec. 323(d), (e), and (f)
"...limit claims of trespass..."	Sec. 323(g)(1)
"...basis for claims of trespass."	Sec. 323(g)(1)(A) and (B)

Questions for discussion

- Is this approach constitutional?
- Will this approach fly with private landowners?
- Do recent state actions make it impractical, or even unlawful, to implement such a framework?
- Could this approach have the unintended consequence of making GS development difficult in certain instances?