***Public Perceptions of Carbon Capture and Storage: Survey Evidence from Indiana***

David C. Warren, Indiana University, 202-384-4403, dcwarren@indiana.edu

Sanya Carley, Indiana University, 812-856-0920, scarley@indiana.edu  
John D. Graham, Indiana University, 812-855-1432, grahamjd@indiana.edu  
Rachel M. Krause, University of Texas–El Paso, 915-747-5000, rmkrause@utep.edu  
John Rupp, Indiana Geological Survey, 812-855-1323, rupp@indiana.edu

## Overview

Governments and industry around the world are pursuing solutions aimed at mitigating climate change or attenuating its negative consequences. Of the many alternatives offered as a solution in the energy realm, carbon capture and storage (CCS) has emerged as a novel bridge technology that pairs fossil-based electricity generation with a mechanism for capturing carbon dioxide (CO2) and permanently isolating it underground (Congressional Budget Office 2007, U.S. Department of Energy 2010). CCS, therefore, offers society the ability to continue producing electricity via carbon-intensive sources with reduced climate impact while newer, lower carbon content energy technologies are being developed. Despite the promise of CCS, many factors limit its potential for immediate implementation, including economic feasibility, geologic and legal constraints, risk uncertainties, and public acceptance (Bachu 2007, Parfomak 2008, U.S. Department of Energy 2010).

## Utilizing a telephone survey of 1,000 Indiana residents, this investigation focuses on the public acceptance constraint by exploring whether an individual’s initial perceptions of CCS are related to their family and/or community having a history of interaction with the land and local natural resources. In particular, it is hypothesized that a history of interaction with the land causes a person, at least initially, to be more optimistic (or less skeptical) about the overall promise of CCS. This hypothesis is tested in a multi-variate framework that incorporates other variables known to influence public perception of new technologies, including risk perception, trust, cultural orientation, gender, and environmental beliefs (Wildavsky and Dake 1990, Midden and Huijts 2009, Wallquist et al. 2011). In addition to exploring this new hypothesis, the study collects data on initial impressions of CCS that will serve as a baseline for comparison as households in Indiana are exposed to more information about CCS over time, both through the national media and through local CCS projects in the state that are now at the very early stages of development. Evidence gained from analysis of the survey results will shed light on social constraints for CCS implementation. Knowledge of such constraints—when combined with economic, legal, geologic, and technological constraints—will permit improved multi-criteria evaluations of optimal CCS location decisions in the future.

## Methods This study utilizes results from two telephone survey instruments administered in July and August of 2011 to a stratified random sample of 1,000 Indiana residents at two points in time—before reading an unbiased two-page fact sheet on CCS and after reading the fact sheet. To observe how differences in proximity to a possible CCS facility and how varying degrees of interaction with the land potentially influence attitudes about (and acceptance of) CCS, the five strata employed in the survey administration were defined based on land interactivity characteristics. These strata include: high-intensity agriculture areas, low-intensity agriculture areas, counties that are home to a significant amount of coal mining and other mineral extraction activities, urban areas, and a large college town (Bloomington, Indiana). Multi-variate regression analysis will be employed to test hypotheses involving the correlation of individuals’ stated acceptance of CCS with factors including their history of interaction with the land, proximity to locations considered favorable for CCS facilities, and various attitudes about risk, trust, and the environment.

## Results The data collected from the survey will provide several types of results. These include: top-line results on overall acceptance of CCS technology broken down by demography and geography; regression estimates of factors that determine individuals’ attitudes regarding CCS; and results from key hypothesis tests regarding the correlation between CCS attitudes, interactivity with the land, and environmental attitudes.

## Conclusion Conclusions drawn from the survey data analysis will have the potential to inform government and industry decisionmakers on the social constraints of CCS acceptance which are a critical element of the potential to deploy this technology. The conclusions developed will also be of use in multi-criteria evaluations that incorporate economic, legal, geologic, technological, and social constraints in analyses to identify optimal locations for the siting of CCS facilities. Moreover, the survey results provide a useful baseline of initial impressions of CCS that can be updated over time to determine whether, how, and why attitudes change.

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