

SOCIAL IMPACTS OF MARCELLUS SHALE EXPLORATION: A RESEARCH SUMMARY

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Panel Discussion: Municipal Impacts of Oil & Gas Development

Central Section, American Planning Association, Pennsylvania Chapter

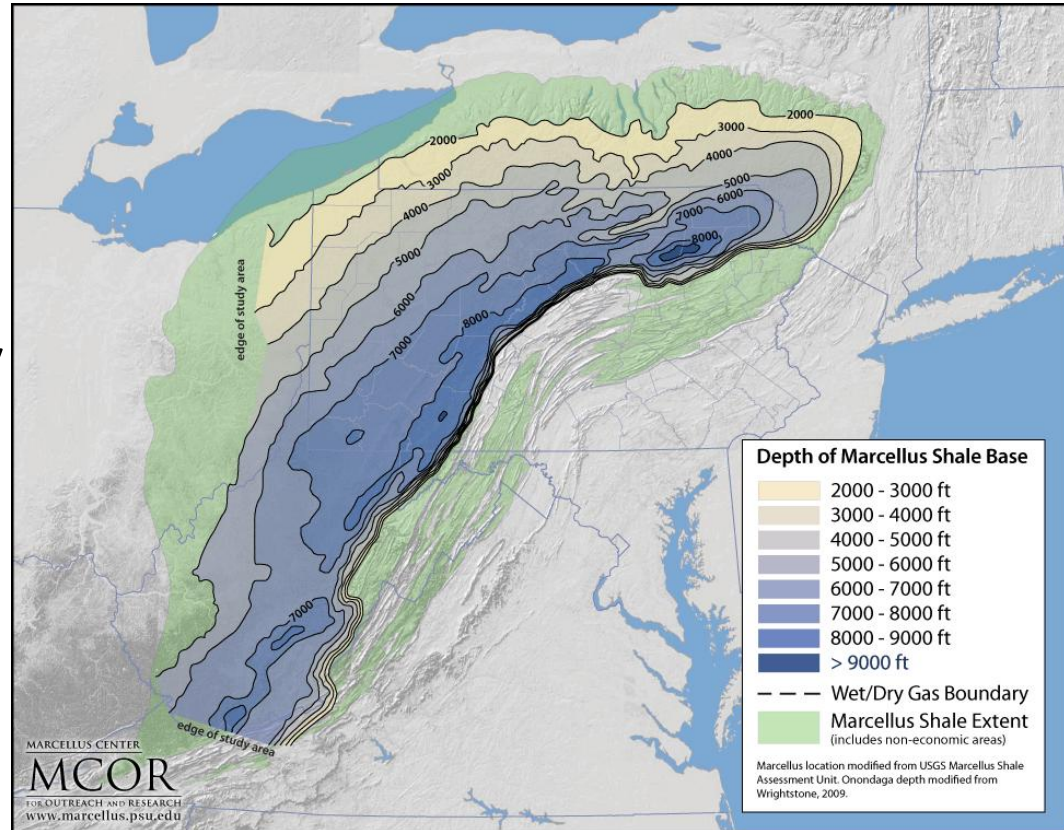
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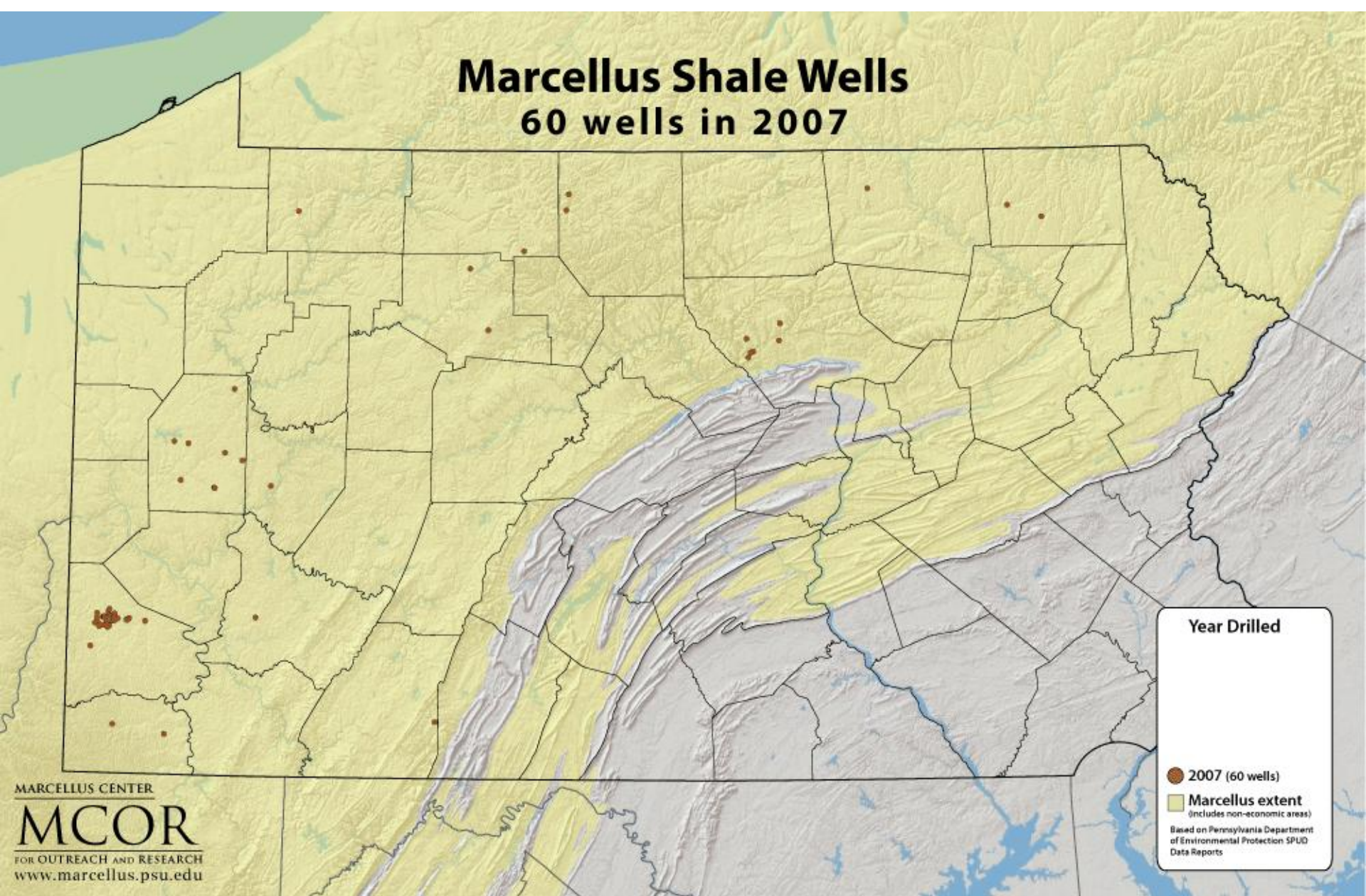
Outline

- Background
- Summary of research:
 - Perceptions of early social impacts
 - Risk perceptions
 - Institutional trust
- Current research project



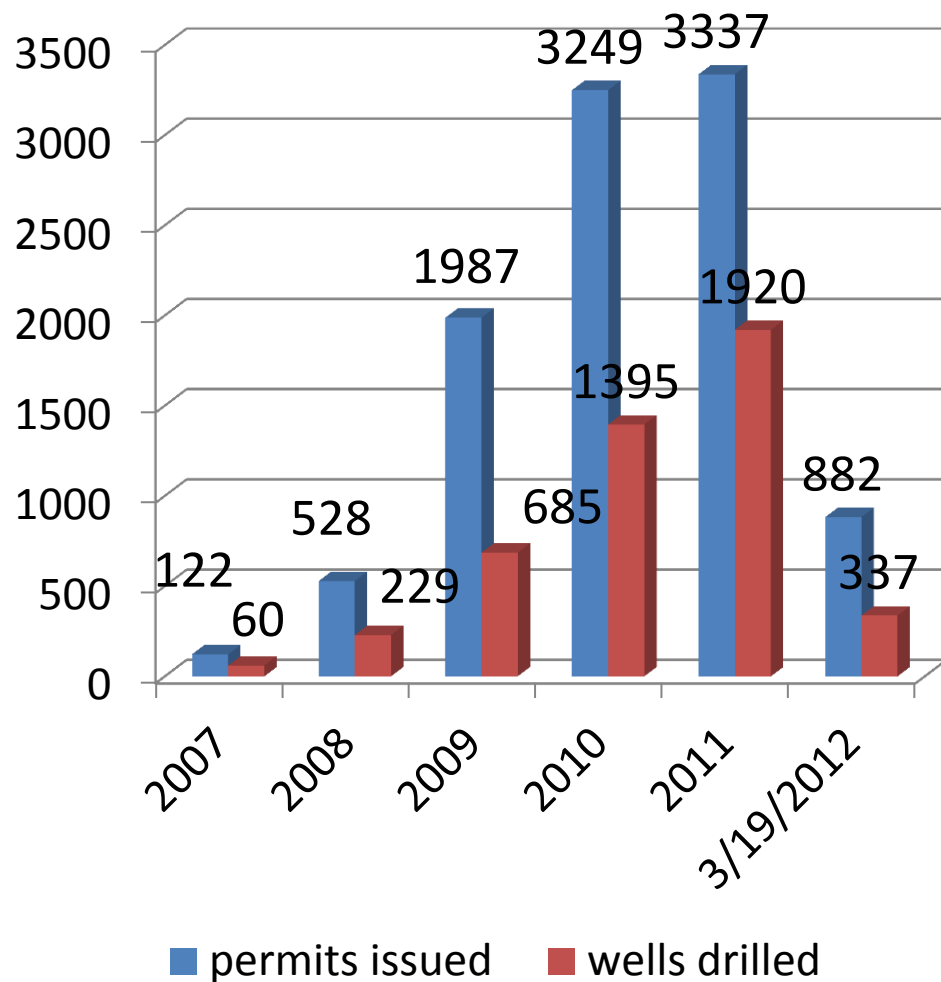
Marcellus Shale Wells

60 wells in 2007



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Pennsylvania Activity 1/2007-3/2012



Monthly Averages		
	Permits issued	Wells drilled
2007	10	5
2008	44	19
2009	166	57
2010	271	116
2011	278	160
3/19/12	352	135

Source: Penn State MCOR and PA DEP (<http://www.dep.state.pa.us>) through 3/19/2012

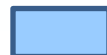
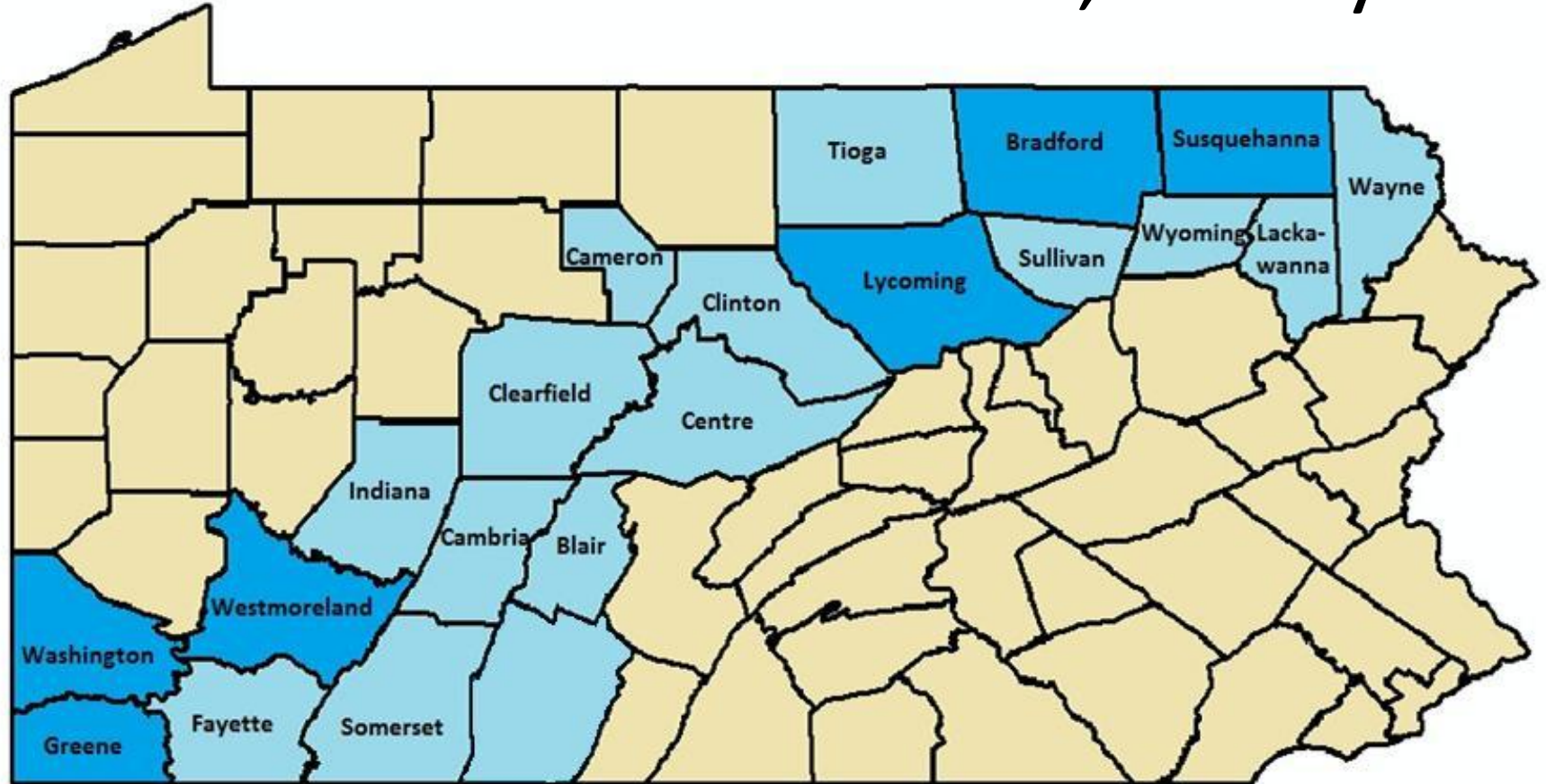
Research and Outreach Projects

Title (<i>Funder</i>)	Investigators	Years
Community Impacts: Case studies (PSU CAS, ARC)	<i>Brasier, Filteau, Goetz, Jacquet, Kelsey, McLaughlin, Stedman, Rhubart</i>	2009-2010
Community Satisfaction & Change: Household Survey (PSU CAS, Cornell, ARC)	<i>Willits, Brasier, Filteau, Jacquet, McLaughlin, Stedman</i>	2009-2010
Community Task Forces (PSU CAS)	<i>Brasier, Filteau, Goetz, Jacquet, Kelsey, McLaughlin, Stedman, Rhubart</i>	2009-2010
Marcellus Family Project (PSU MCOR)	<i>McLaughlin, Martin, K. Davis, Brasier, Gunsallus</i>	2011-2012
Community Dialogue Project (PSU CAS)	<i>Brasier, Kelsey, Whitmer</i>	2011-2012
<i>Marcellus Shale Impacts Project (CRP)</i>	<i>Brasier, L. Davis, Filteau, Glenna, Kelsey, McLaughlin, Rhubart, Schafft</i>	2012-2013

‘Boomtowns’ and ‘Boom and Bust’

- Rapid industrialization of small, isolated rural communities
- Focused on energy development in intermountain West in 1970s and 1980s
- ‘Social disruption’ lens: rapid population growth and change stress infrastructure and social relations, create jobs and economic growth
- Distribution of costs/benefits uneven across place, stage of development, social position
- Boom-Bust-Recovery model

PA Counties in Case Studies, Surveys



Household Survey



Household Survey and Case Study

**New York Counties: Broome, Chemung, Delaware, Schuyler, Steuben, Sullivan, Tioga, and Tompkins.*

Case Study Summary

County	Region	Rural/ urban*	Wells drilled 2008-2010	Interviews	Year Interviews conducted
Bradford	NC	Rural	513	15	2009
Washington	SW	Rural**	309	15	2009
Lycoming	NC	Rural**	144	18	2009
Greene	SW	Rural	189	12	2010
Susquehanna	NC	Rural	184	13	2010
Westmoreland	SW	Urban	111	16	2010

**Center for Rural PA definition where rural = < 284 persons per square mile*

***lies within a metropolitan statistical area*

Household Survey

- Sample of 6000 households in 21 PA counties and 8 NY counties
- Mail survey conducted Oct. 2009 – March 2010
- 1917 out of 5479 valid surveys returned (35%)

Community Satisfaction and Change

A Study of Communities in the Marcellus Shale Region

In the years ahead, your community will face many important decisions. This survey seeks information on your feelings about where you live and your opinions about some of the changes that may occur in the future. Your answers, combined with those of others, can help focus attention on the issues of concern to people like yourself.

A. For each of the following questions, please think about your community and your life situation as it is TODAY. For each item choose the ONE answer that best expresses your views.

A1. For EACH of the following, rate your present community as it is today. Use a scale of 1 to 5, where:
1 = Very Poor, 2 = Poor, 3 = Neither Poor nor Good, 4 = Good, and 5 = Very Good

	Very Poor	Poor	Neither Poor nor Good	Good	Very Good
a. Availability of good jobs	1	2	3	4	5
b. Public schools	1	2	3	4	5
c. Medical services/Health care	1	2	3	4	5
d. Availability of affordable housing	1	2	3	4	5
e. Roads and streets	1	2	3	4	5
f. Freedom from crime/violence	1	2	3	4	5
g. Natural environment	1	2	3	4	5
h. Neighborliness/friendliness	1	2	3	4	5
i. Drinking water	1	2	3	4	5
j. Recreation opportunities	1	2	3	4	5
k. Cultural events and activities	1	2	3	4	5
l. Job training opportunities	1	2	3	4	5
m. Overall quality of life	1	2	3	4	5

A2. How would you rate the cost of living in your community?

- 1 Relatively low
- 2 About average
- 3 Relatively high

A3. Would you say that your community is better off, worse off, or about the same as it was five years ago?

- 1 Better off
- 2 Worse off
- 3 About the same

A4. Would you say that your community will be better off, worse off, or about the same in five years compared to how it is now?

- 1 Better off
- 2 Worse off
- 3 About the same

Willits, F.K., K. Brasier, M. Filteau, J. Jacquet, D.K. McLaughlin, R. Stedman. 2010. *Community Satisfaction and Change: A Study of Communities in the Marcellus Shale Region*. University Park, PA, Penn State.

Counties in the Survey Sample

County, State (wells permitted/drilled 2009)				
Bedford, PA	0/0	Lackawanna, PA	28/1	Broome, NY
Blair, PA	2/0	Lycoming, PA	107/24	Chemung, NY
Bradford, PA	430/113	Somerset, PA	18/3	Delaware, NY
Cambria, PA	6/2	Sullivan, PA	1/0	Schuyler, NY
Cameron, PA	5/1	Susquehanna, PA	155/60	Steuben, NY
Centre, PA	42/7	Tioga, PA	300/114	Sullivan, NY
Clearfield, PA	72/27	Washington, PA	209/138	Tioga, NY
Clinton, PA	41/12	Wayne, PA	1/0	Tompkins, NY
Fayette, PA	88/55	Westmoreland, PA	89/46	
Greene, PA	182/91	Wyoming, PA	11/1	
Indiana, PA	19/8			

(Source: PA DEP)

Early visible, tangible effects
Concerns about future effects
Effects on place

RESEARCH SUMMARY



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Economic Impacts

- Economic effects
 - Employment in industry, related businesses
 - Personal income, leasing/royalty income
- Issues
 - Competition for workers, materials
 - Localized inflation reported
- Economic future in rural places
 - Workforce education
 - Stem 'brain drain'
- Agriculture: save it or kill it?

"[Company] has put their... headquarters here. So that provides opportunities for skilled labor... and white collar jobs... It will change some of our youth."

"so far there have been a lot of new millionaires in this area"

"Are millionaires going to milk dairy cows?"

Source: Community Impacts Case Study Interviews

Infrastructure

- Transportation and roads
- Public safety
 - Traffic
 - Crime
- Housing
- Displacement of disabled, low-income families
- Stress on human service agencies, court system, schools



“You can’t swing a dead cat in our county right now without hitting a water truck.”

“for our homeless programs we would put people up at the local hotels and we wanted to put someone up two weeks ago and the next available room is [four months later]. So there is no short term housing.”

Source: Community Impacts Case Study Interviews

Environmental Quality

- Issues mentioned:
 - Public and private water sources
 - Water quality
 - Forest fragmentation
 - Wildlife, habitat
 - Air quality
- Recreation & tourism impacts
- Comparison to coal legacy



“... but the fact that there’s millions of gallons of water being injected under ground at high pressure’s gonna create some turbidity in some private wells...”

Source: Community Impacts Case Study Interviews

Effects on Place

- Population growth and change in rural areas
- Threat to rural identity, quality of life
- Increased diversity, changing social networks
- Social conflict
- Attachment to place and its natural and social amenities

“population increase of about 1800 people in one month.” by comparison, “Our biggest influx of people....is hunting season.”

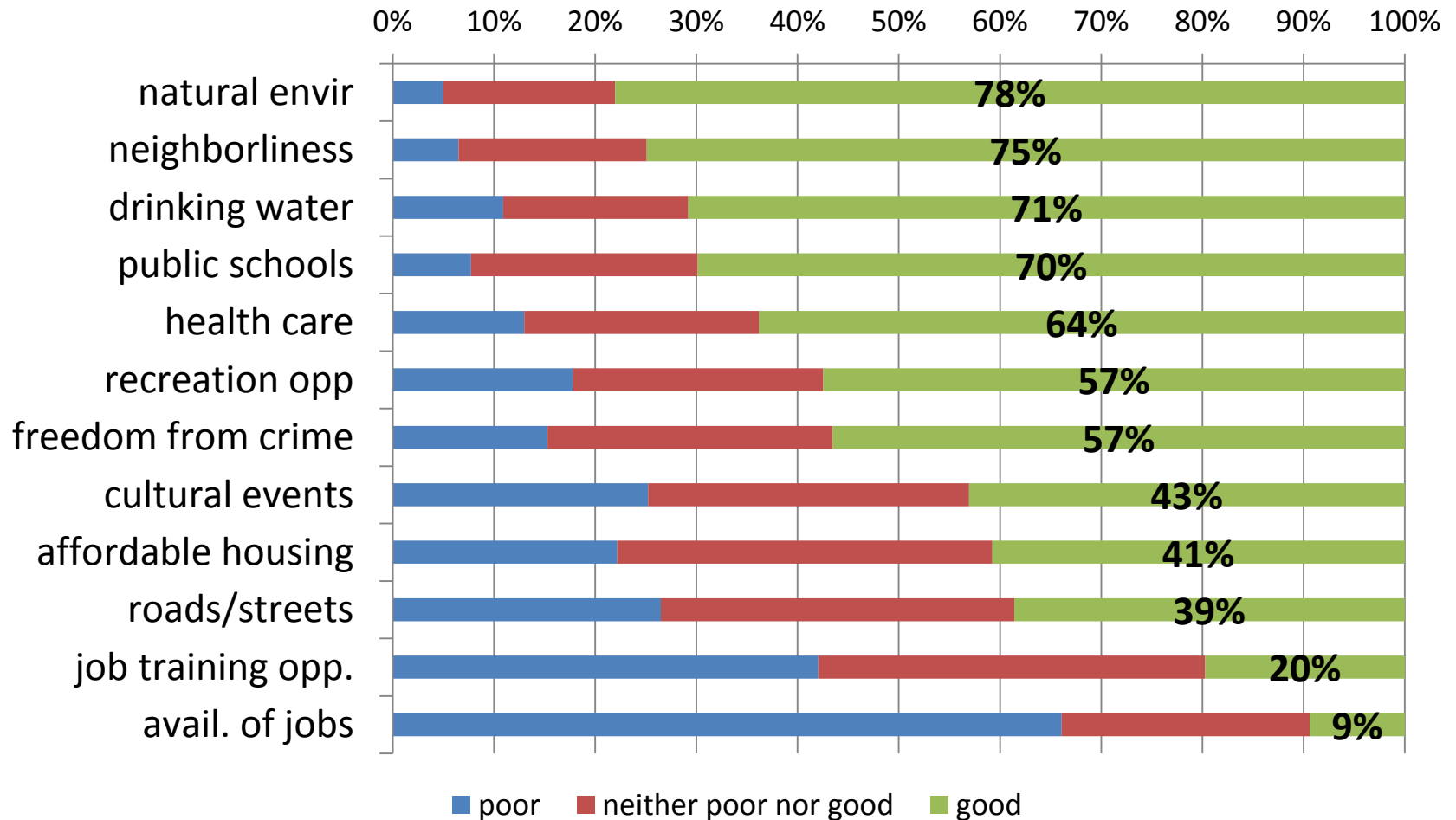
“... a lot of the workers ... have no ownership and ...they don’t feel the need to take care of this area.... they don’t care if they trash the place or spend all their money on booze....”

“... they’re [seasonal residents] not as concerned... as the people who live here full time.... If they’re up here three weeks a year ... they don’t have to worry....”

“I’ve turned down many opportunities to go other places and work for bigger pay... it’s such a beautiful ... and a pleasant place to live that I hate to see those values be degraded.”

Source: Community Impacts Case Study Interviews

Quality of Community Features



Rating of Quality

Source: Community Satisfaction and Change: A Study of Communities in the Marcellus Shale Region.

Expectations of Changes

Marcellus development will make...	Get better	Stay same	Get worse	Don't know
Good jobs	42%	34%	2%	23%
Job training	30%	43%	4%	23%
Roads/streets	10%	42%	31%	17%
Affordable housing	9%	51%	20%	20%
Recreation	5%	58%	16%	22%
Neighborliness	4%	65%	10%	21%
Natural environment	4%	30%	48%	18%
Drinking water	3%	33%	41%	23%
Crime/violence	3%	52%	23%	21%
Overall quality of life	14%	48%	19%	20%
Overall cost of living	9%	42%	28%	21%

Source: Community Satisfaction and Change: A Study of Communities in the Marcellus Shale Region.

Context Matters

- Perceptions of social effects vary by:
 - Social, cultural, economic history (esp. extractive)
 - Speed, scale, and type of development
 - Geographic location and proximity to infrastructure
 - Human and social capacity to respond to change
- Examples:
 - Most rural, with least infrastructure, w/o history of fossil fuel extraction => most visible change, most difficulty absorbing change
 - ‘Hubs’ with business infrastructure may be able to ‘keep the dollars local’
 - Areas with seasonal residents and in-migration may have conflicting perspectives

Overall attitudes: “This could be a good thing - if it’s done right”

Perceptions of risk

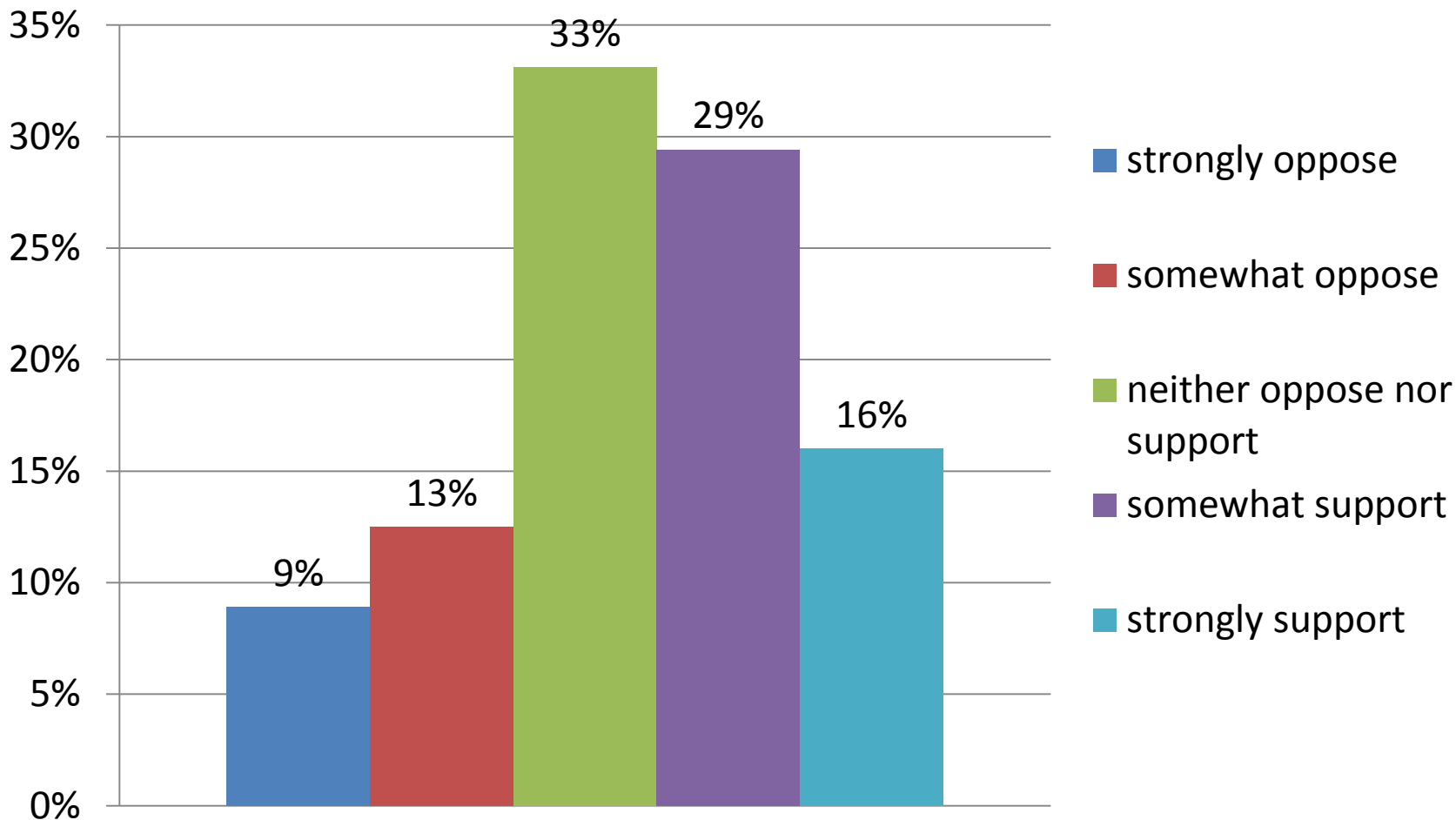
Trust in managing institutions

RESEARCH SUMMARY



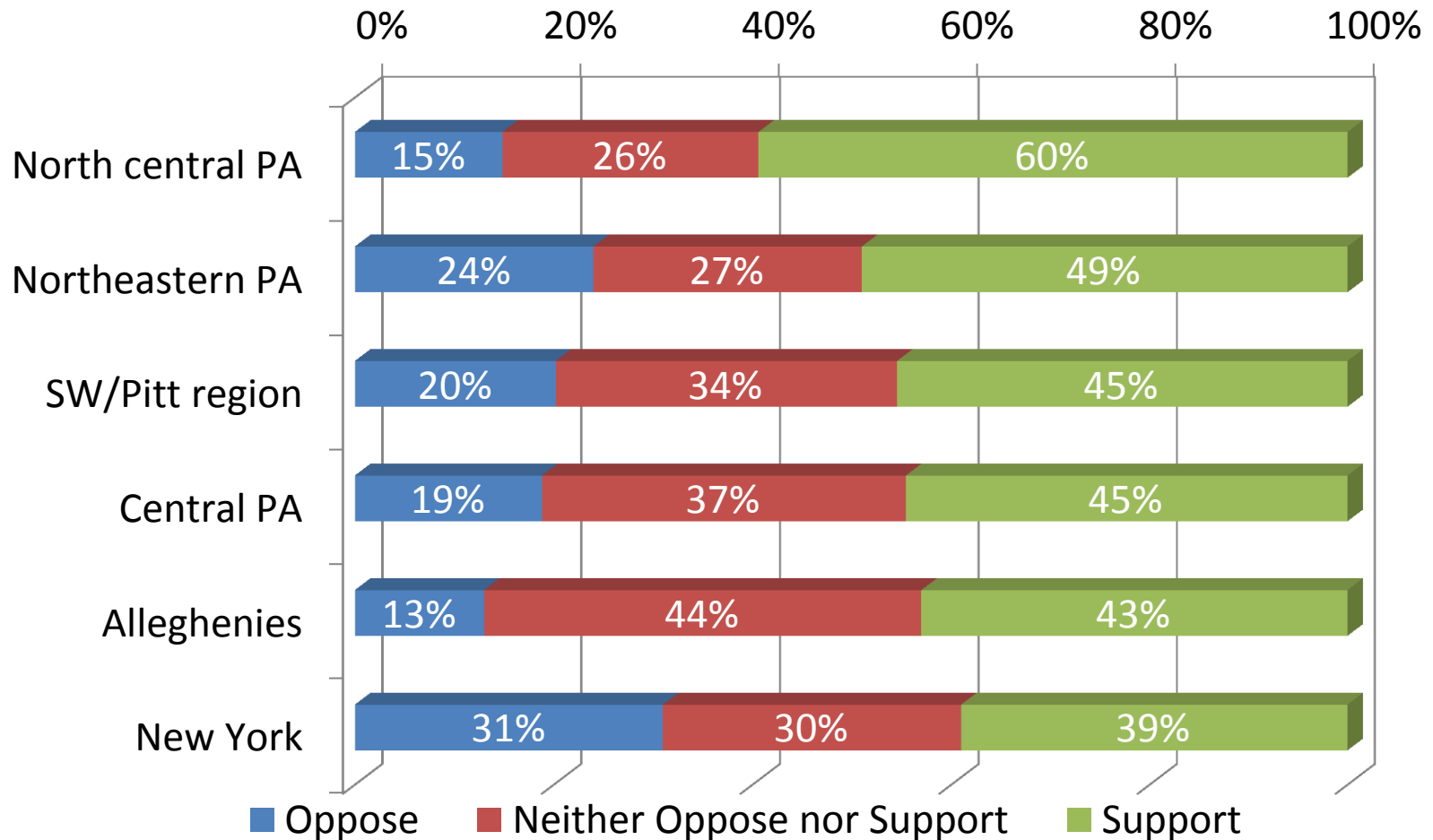
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“How do you feel about natural gas extraction from the Marcellus Shale?”



Source: *Community Satisfaction and Change: A Study of Communities in the Marcellus Shale Region.*

Overall Attitude by Region

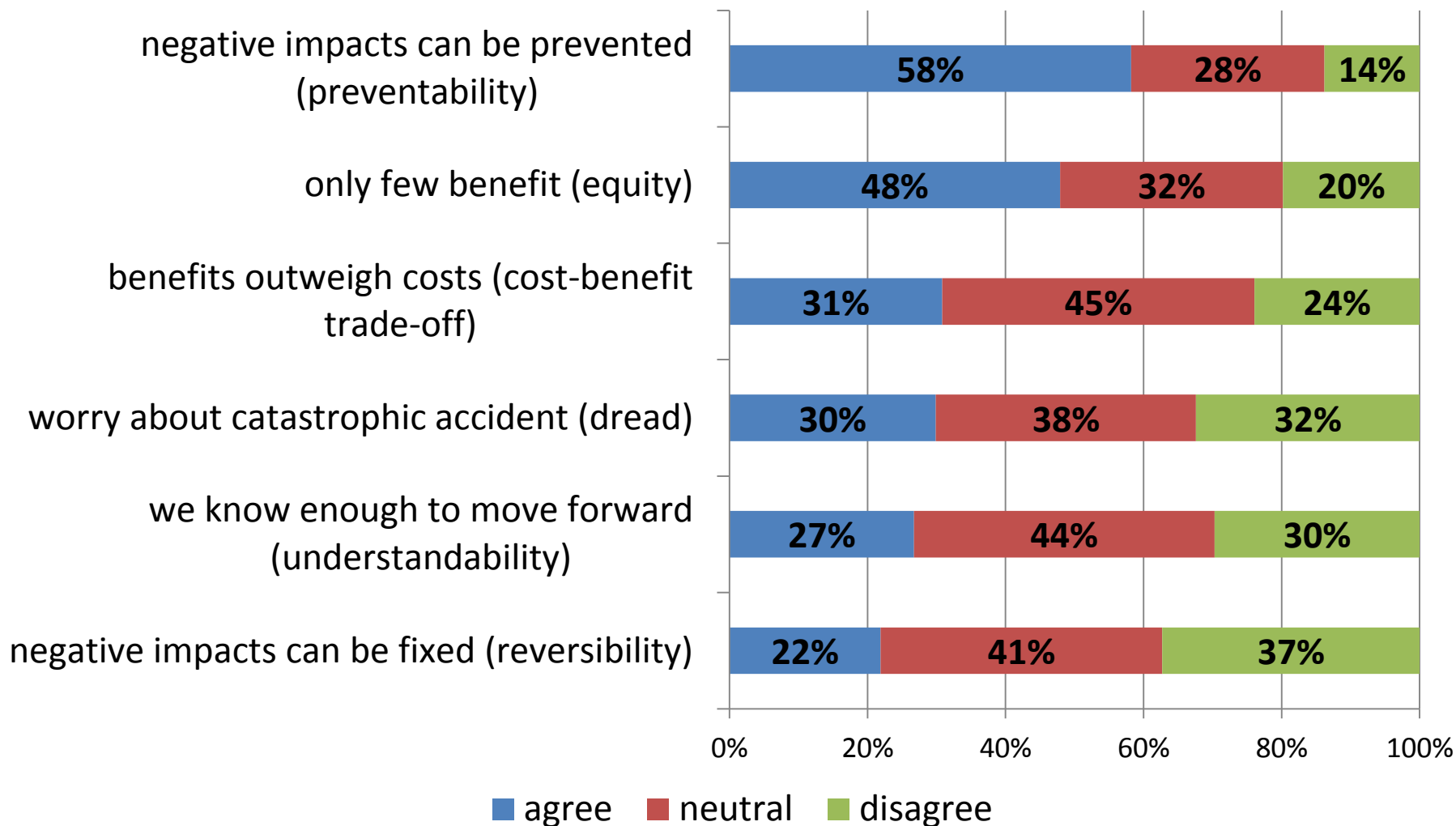


Source: Community Satisfaction and Change: A Study of Communities in the Marcellus Shale Region.

Thinking about Risk Perceptions

- Potential for harm and degree of that harm
- Not just probability of an adverse event; perceptions based on:
 - Cognitive elements
 - Emotional elements
 - Evaluations of risk communicators
 - Culture, customs, worldviews
- Theories of technological risk
 - Modern technological risk as “new species of trouble”, difficult to definitively identify and trace impacts = greater reliance on technical experts
 - ‘Mundane Risks’ less likely to create catastrophe but change nature of relationships among communities and their environment

Perceptions of Risk Related to Marcellus

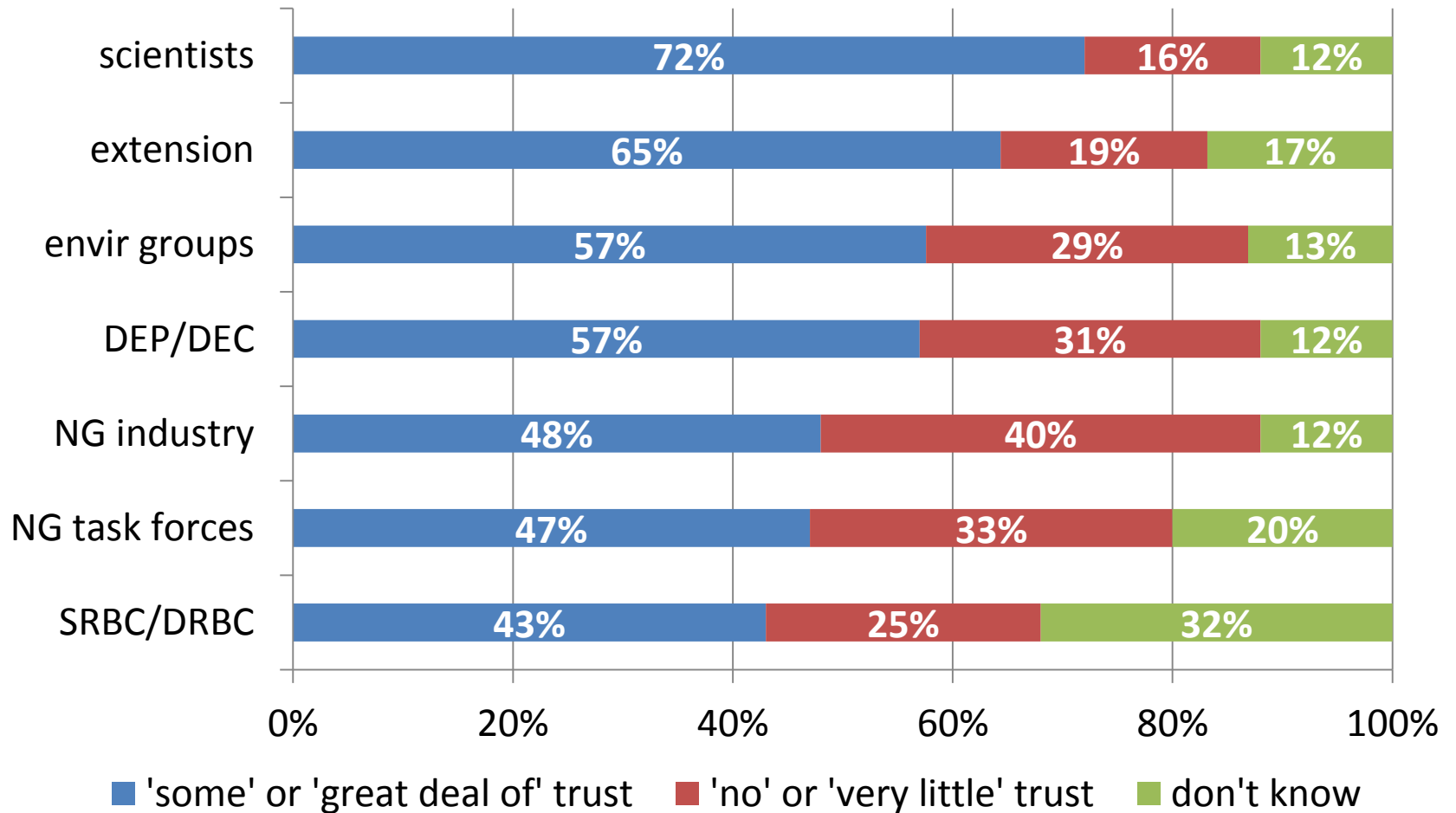


Source: Community Satisfaction and Change: A Study of Communities in the Marcellus Shale Region.

Statistical Analysis of Risk Perceptions

- Those with perceptions of greater risk....
 - Have less trust in natural gas industry and science institutions, more trust in environmental groups
 - Hold a worldview in which humans are part of ecological system
 - Expect environment and jobs to get worse
 - Report less knowledge of economic and social issues and more knowledge of environmental issues
 - Are male
 - Do not own mineral rights
 - Live in New York
 - Have friends or family with drilling

Institutional Trust



Source: Community Satisfaction and Change: A Study of Communities in the Marcellus Shale Region.

Trust in Natural Gas Industry

- Fiduciary responsibility:
 - Communication, perception of fairness
 - Direct behaviors (landmen)
 - Asymmetry of information
 - Lack of transparency
 - Perceptions of motives
- Competence: Can industry manage risks of new technology?
- Predictability: lease offers not fulfilled

“The majority of the people talked to the same representative and they were told the same thing. When we got our contract, the contracts are all identically worded....”

“I sometimes wonder..., can they steal the minerals out from under my ground?”

“Well one thing they won’t tell you is ... what their formula is or their recipe that they use in ... fracking.”

“When the almighty dollar’s there, people can blow a lot of smoke....”

Source: Community Impacts Case Study Interviews

Trust in State Regulatory Agencies

- Fiduciary responsibility:
 - Integrity
 - Commitment to protect people
- Competence:
 - Do they have capacity in time of tight budgets?
 - Do they have needed expertise?
 - Are they too reactionary?
- Predictability questioned: removal of conservation districts in permitting process

“I think that they are trying to look out for the ground water table and I think they are trying to look out for people’s best interest...”

“I would say anytime you hear DEP, you hear of fines and penalties. You don’t hear that they have been out and that they corrected a problem, but you hear that they go out and fine people after the fact.”

“I think they are a couple of decades behind in what they have to do. So I think they have a lot of catching up to do... So they definitely need to look into those kinds of regulations...”

Source: Community Impacts Case Study Interviews

Trust in State Government

- Concerns about integrity
 - Indecision about severance tax or how money might be allocated
 - ‘Fire-sale’ leasing of state land
 - ‘Ulterior motives’

“I think I trust the gas industry more than I do the state. It’s a fine line, but I think the state has ulterior motives. I think they see a gold mine and they are trying to find a way to grab money off of it to help with the budget....The fear I think of most people is any kind of severance tax that is going to the general budget would wind up in Philadelphia.”

Source: Community Impacts Case Study Interviews

Summary: Attitudes toward Marcellus Shale Development

- Hydraulic fracturing is the ‘face’ or point of conflict - but not the only issue
 - What is at risk – environment, community, place
 - Risk perceived holistically, across multiple dimensions
 - Effects of trust in critical institutions (industry, regulators, government – and scientists)
- Polarization
 - Polarized groups have fundamentally different orientations toward natural environment and sources of trusted information
 - Don’t forget the middle! Large group of people mixed or unsure about development

MARCELLUS SHALE IMPACTS STUDY: Chronicling Social and Economic Change in North Central and Southwestern Pennsylvania

2012-2013 Research Project

Penn State Project Team: Kathy Brasier, Lisa Davis, Matt Filteau, Leland Glenna, Tim Kelsey, Mark Leach, Diane McLaughlin, & Kai Schafft



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Marcellus Shale Impacts Study



- Project Goals
 - Identify and document indicators of change
 - Understand and interpret trends related to Marcellus activity
 - Describe the experiences of critical populations and institutions
 - Evaluate organizational management strategies
- Funded by the Center for Rural Pennsylvania
- Dates: February, 2012 – August, 2013

Marcellus Shale Impacts Study



- Case study counties: Bradford, Lycoming, Washington, and Greene
- Collect publicly available data and examine trends in relation to:
 - Other Pennsylvania counties in and out of Marcellus shale region
 - Historical trends for that county
- Collect primary data in case study counties

Marcellus Shale Impacts Study



- Topics
 - Economic and business development
 - Changes in other economic sectors (agriculture, tourism, forestry)
 - Jobs and workforce development
 - Occupational and industrial change
 - Population change
 - Housing, real estate
- Changes to....
 - Public services (health and human services, criminal justice, education, public safety, emergency services)
 - Local infrastructure
 - Local governments
- Explore how to study:
 - Low-income families
 - Youth
 - New residents

Marcellus Shale Impacts Study



- Current Activities
 - Establishing advisory committee
 - Conducting preliminary interviews
 - Examining newly-released Census data
 - Collecting other data
 - Economic activity, jobs, economic impact
 - Health service use
 - Criminal activity
 - School district characteristics

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