

Strategic Planning the Big Picture: Learning from the Positive Experiences for Companies Operating in Shale Plays*

Gary M. Hanson¹

Search and Discovery Article #80438 (2015)**

Posted February 23, 2015

*Adapted from oral presentation given at AAPG Education Directorate Woodford Shale Forum, Oklahoma City, Oklahoma, May 29, 2014.

**Datapages © 2015 Serial rights given by author. For all other rights contact author directly.

¹Red River Watershed Management Institute, Louisiana State University Shreveport, Shreveport, LA (hansongm@att.net)

Abstract

Currently, the oil and gas industry is providing critical skills and technology to discover and produce vital natural resources for society. However, the industry has now recognized regardless of the technology, wells will not get drilled without properly dealing with the social issues that are vital to the public. Corporate social responsibility (CSR) and sustainability are not just topics emanating from the HR office, but are values and real world tools that must be embraced by all individuals and leadership in the oil and gas culture. For if this is not done, the oil and gas industry as it exists today may not survive. The industry/public relationship is at a stage now where the public is demanding that in order for the industry to continue to operate it must recognize that a social license to perform is required. CSR has its roots in the early days of oil and gas boom towns. Those legacy actions by responsible operators has grown over the decades and now strategic planning utilizing well thought-out internal policies that address these public issues have resulted in successes by many corporations during the current cycle of shale gas and tight oil booms. The industry has been building on decades of interaction with local communities. Philanthropy alone is not sufficient today. Recognition of ongoing efforts, support of these efforts and the ability to bring assistance to education and other elements that empower the community, even after the boom has receded, are vital components of a successful CSR and sustainability program. One established program in the Haynesville shale area involved a watershed institute at a local university where adaptive management approaches are being utilized to enhance socio-economic resilience within the community. A case study of a major operator in the Haynesville shale play is reviewed so that other operators may profit from their efforts and positive experiences.

Woodford Shale Forum

Oklahoma City, Oklahoma

May 29, 2014

Strategic Planning the Big Picture: Learning from the Positive Experiences for Companies Operating in Shale Plays

A silhouette of a group of people standing on a dark horizon, with their arms raised in celebration against a bright, orange-hued sky. The people are of various heights and are positioned across the width of the frame.

Gary M. Hanson, Director
Red River Watershed Management Institute
Louisiana State University Shreveport



OTC 2014: Offshore Conference Panel Talks Unconventionals

By Richard Mason, Hart Energy

May 7, 2014

Different technologies are integral to deepwater and unconventional. But the more common issue for both will be social license.

Rising volumes of unconventional oil are offsetting declines in conventional oil and benefiting the domestic energy balance in the U.S. While deepwater oil will add to conventional totals with large volumes from a small number of wells, lead times remain daunting.

Meanwhile, lurking in the background is the issue of social licensing, or the level of acceptance and approval a local community provides industrial endeavors.

“Getting it right in terms of public acceptance is actually more important than technology itself,” said Greg Guidry, executive vice president of upstream Americas for Shell. “If our activity is not accepted, frankly the technology doesn’t matter.”

http://www.epmag.com/Technology-Operations/OTC-2014-Offshore-Conference-Panel-Talks-Unconventionals_133202?utm_source=sp&utm_medium=em&utm_campaign=8594084-May%202015,%202014&utm_term=EP%20Buzz%20May%202015%202014%20



OTC 2014: Offshore Conference Panel Talks Unconventionals

By Richard Mason, Hart Energy

May 7, 2014

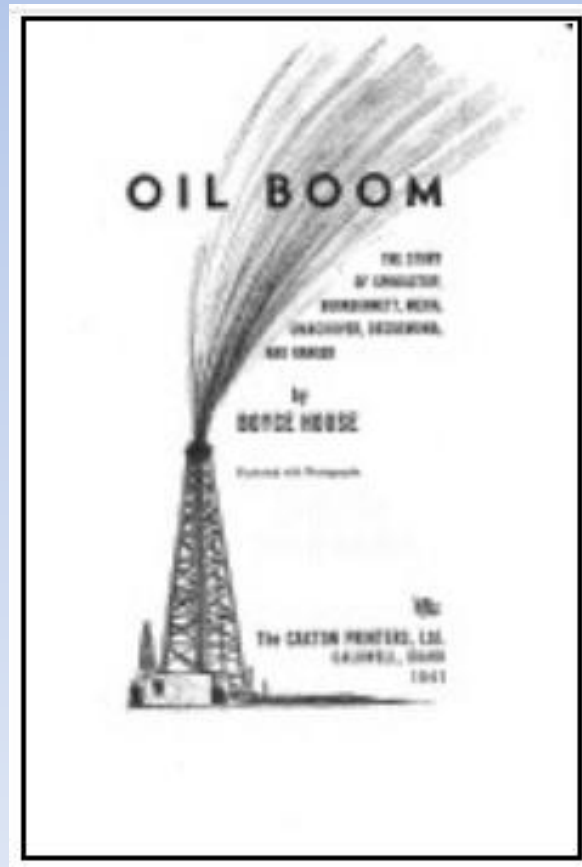
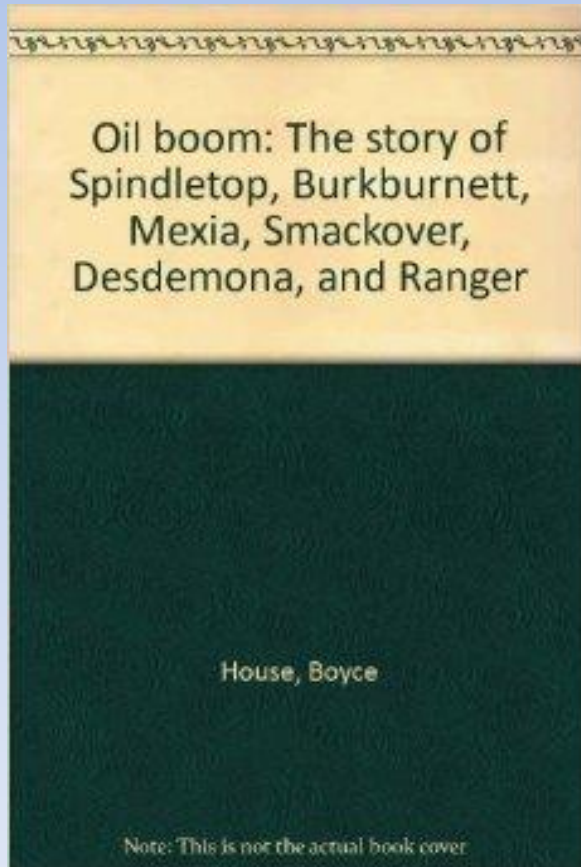
Different technologies are integral to deepwater and unconventional. But the more common issue for both will be social license.

“Getting it right in terms of public acceptance is actually more important than technology itself,” Greg Guidry, executive vice president of upstream Americas for Shell. **“If our activity is not accepted, frankly the technology doesn’t matter”**

http://www.epmag.com/Technology-Operations/OTC-2014-Offshore-Conference-Panel-Talks-Unconventionals_133202?utm_source=sp&utm_medium=em&utm_campaign=8594084-May%202015,%202014&utm_term=EP%20Buzz%20May%202015%202014%20

Early Oil & Gas Booms & Beginnings of Corporate Social Responsibility

Oil boom: the story of Spindletop, Burkburnett, Mexia, Smackover, Desdemona, and Ranger



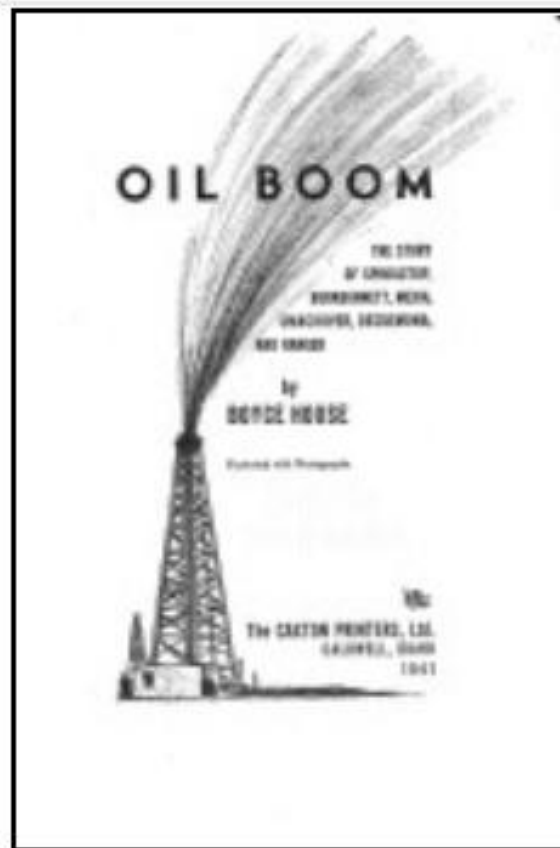
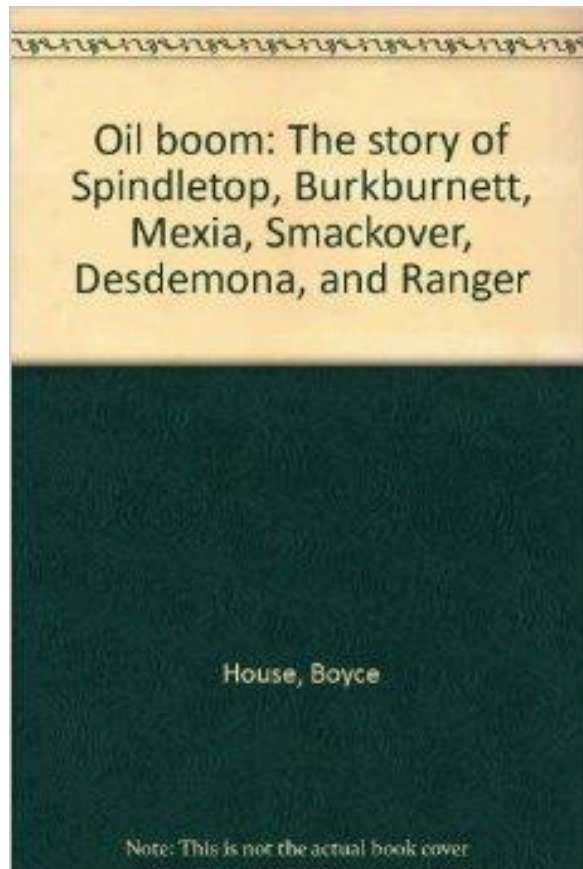
Early Oil & Gas Booms & Beginnings of Corporate Social Responsibility

Oil boom: the story of Spindletop, Burkburnett, Mexia, Smackover, Desdemona, and Ranger



Oil & Gas Booms

Oil boom: the story of Spindletop, Burkburnett, Mexia, Smackover, Desdemona, and Ranger

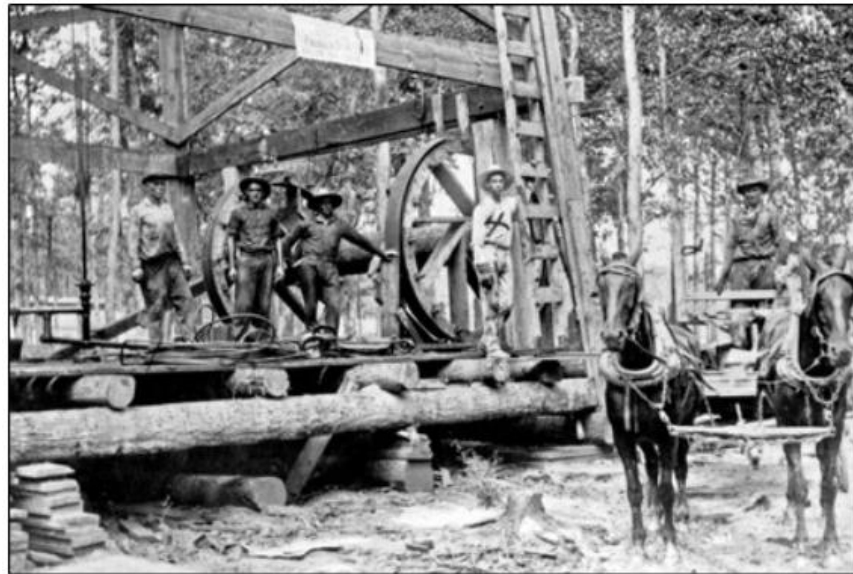


Oil & Gas Booms

Smackover



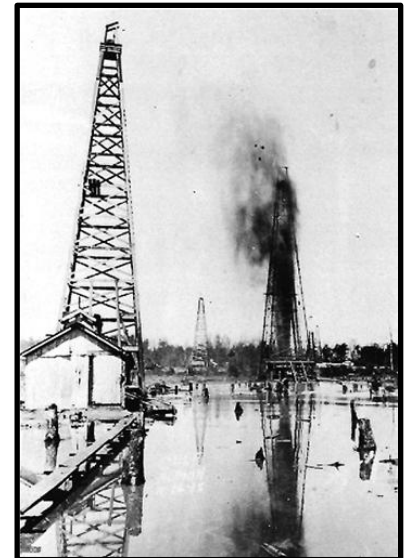
Old-time Driller – Cleaned-up
& ready to head into town



Arkansas Museum of Natural Resources Historic photo from the Museum of
Natural Resources



Smackover's existence is a result of one of the largest and most dramatic oil discoveries in the nation. Its sixty-eight-square-mile oil field led the nation's oil output in the mid 1920s. Prior to the discovery of oil, economy in the area initially relied upon cotton and a successful timber industry due to the vast forests of southern Arkansas.



Oil & Gas Booms

Smackover



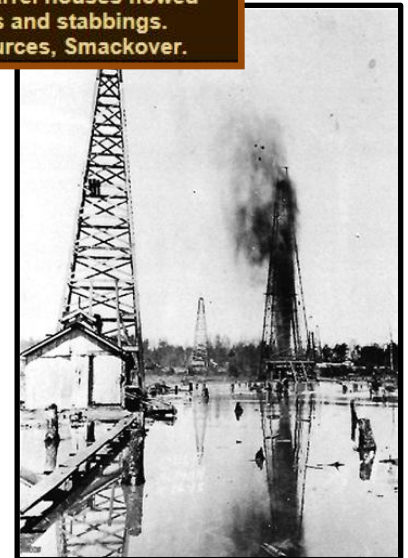
Old-time Driller – Cleaned-up
& ready to head into town



The interior of a "barrelhouse" in the Smackover oil field. Fashioned from oil barrels and rough-sawn lumber with sheet-metal roofs, barrel houses flowed freely with liquor and were frequently scenes of shootings and stabbings. Photo courtesy of the Arkansas Museum of Natural Resources, Smackover.

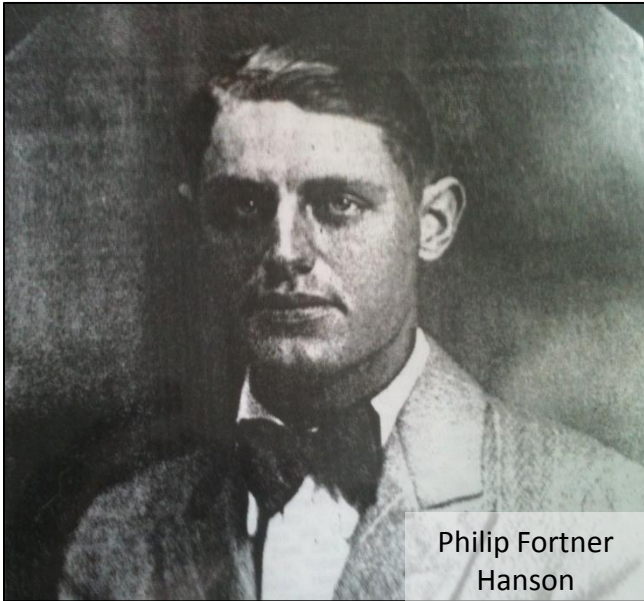


Smackover's existence is a result of one of the largest and most dramatic oil discoveries in the nation. Its sixty-eight-square-mile oil field led the nation's oil output in the mid 1920s. Prior to the discovery of oil, economy in the area initially relied upon cotton and a successful timber industry due to the vast forests of southern Arkansas.



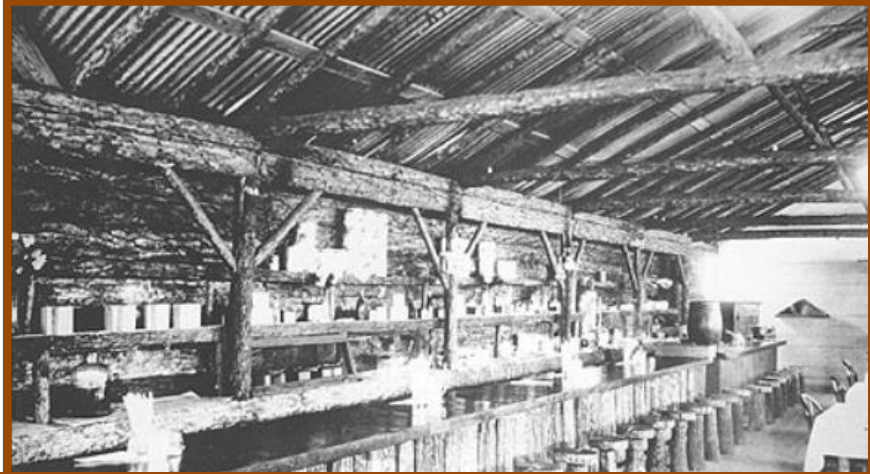
Oil & Gas Booms

Smackover



Philip Fortner
Hanson

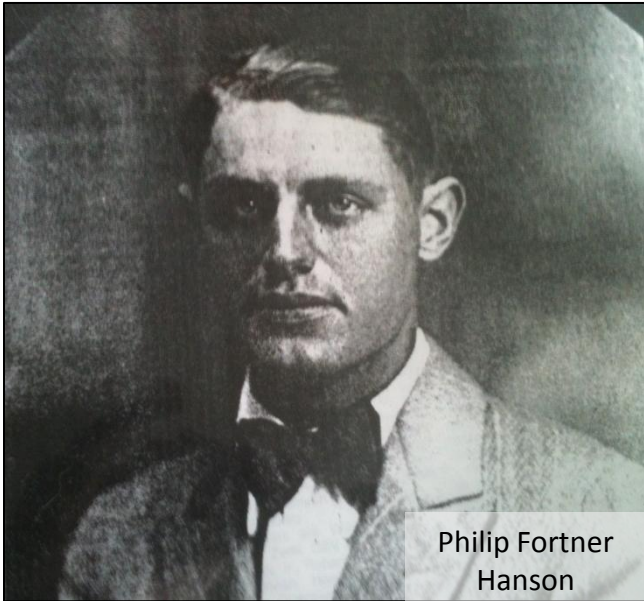
Old-time Driller – Cleaned-up
& ready to head into town



Smackover's existed
largest and most d
nation. Its sixty-eig
nation's oil output
discovery of oil, ec
relied upon cotton
industry due to the
Arkansas.

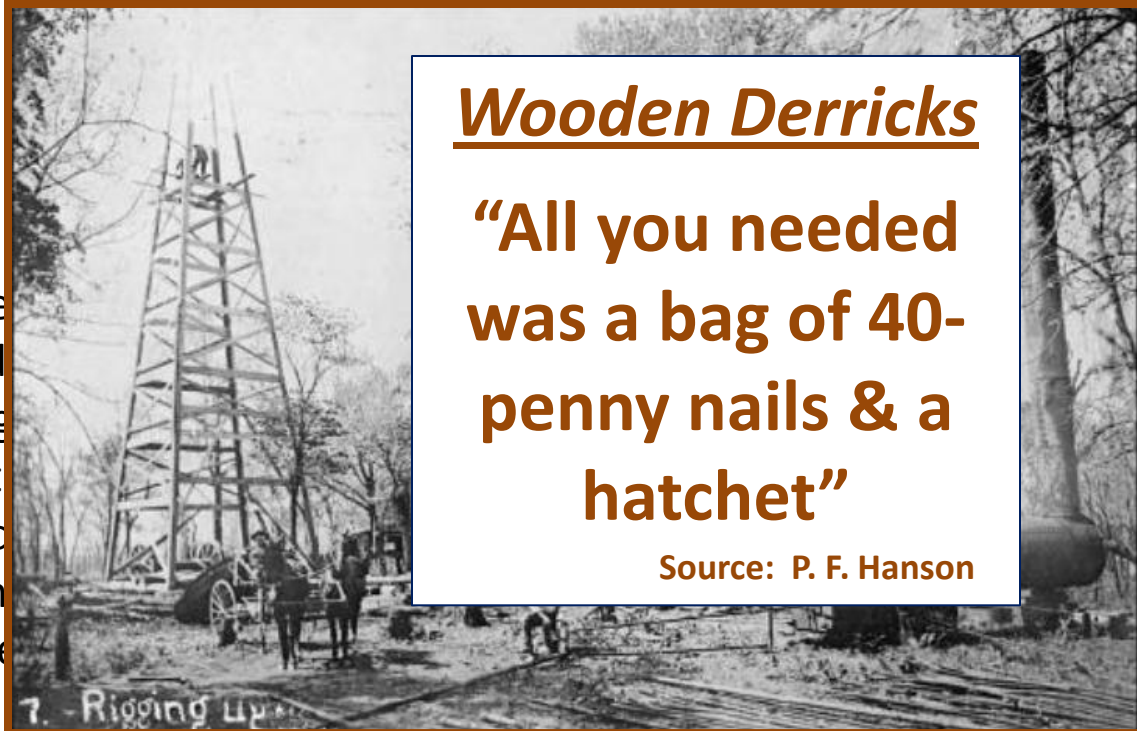
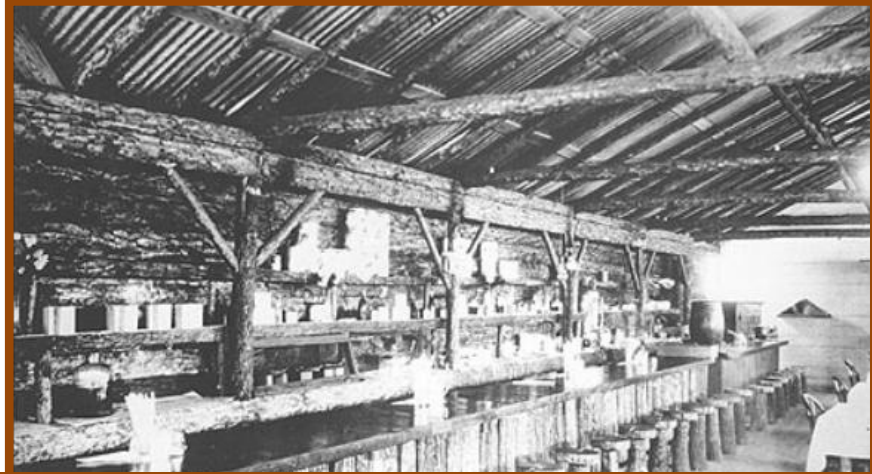
Oil & Gas Booms

Smackover



Philip Fortner
Hanson

Old-time Driller – Cleaned-up
& ready to head into town



Wooden Derricks

**“All you needed
was a bag of 40-
penny nails & a
hatchet”**

Source: P. F. Hanson



Smackover's existed
largest and most d
nation. Its sixty-eig
nation's oil output
discovery of oil, ec
relied upon cotton
industry due to the
Arkansas.

Oil & Gas Booms – Jobs!

Early on Vigilante Justice Prevailed



Although on many occasions in the Smackover Field local citizens took vigilante action against the criminal element under the cloak of the Ku Klux Klan's sheets, at other times they acted openly, as apparently is the case here. The photograph was labeled "Smackover's reception committee for hi-jackers." Max Taylor Collection, Arkansas Oil Heritage Center.

Oil & Gas Booms – Emergence of a Unique Culture

Oil Field Camps & Towns

Smackover, Ark – Oil Field “**Camps**” OK, TX, AR & LA

Trees City, LA – Oil Field “**Towns**”

- In 1908 a well-off farmer near Oil City and leased about 130,000 acres to **Oklahoma natives Joe C. Trees and Mike Benedum**. A few shallow wells had been drilled in the area, but had yielded no oil. Trees Oil Company drilled just six feet deeper than where the Texas Company had abandoned their tests, and struck oil.
- After noting that the **shack-like saloons in the rough towns of Oil City and Mooringsport** were causing the employees of Trees Oil Company to get too **caught up in revelry**, He established his own town in 1909. **He constructed a dance hall, pool hall, church, and school**. Prostitutes and men selling whiskey were not allowed in the community, and it wasn't long before **Trees City was known as the most orderly oil town in the nation. The city was possibly the first town to be built by an oil company.**

Oil & Gas Booms – Emergence of a Unique Culture

Oil Field Camps & Towns

Smackover, Ark – Oil Field “**Camps**” OK, TX, AR & LA

Trees City, LA – Oil Field “**Towns**”

- In 1908 a well-**Oklahoma nat** been drilled in six feet deeper struck oil. **The Emergence of Corporate Social Responsibility (CSR)?** res to wells had drilled just ir tests, and
- After noting that the **snack-like saloons in the rough towns of Oil City and Mooringsport** were causing the employees of Trees Oil Company to get too **caught up in revelry**, He established his own town in 1909. **He constructed a dance hall, pool hall, church, and school.** Prostitutes and men selling whiskey were not allowed in the community, and it wasn't long before **Trees City was known as the most orderly oil town in the nation. The city was possibly the first town to be built by an oil company.**

Early Oil & Gas Booms

Smackover Today – The Culture Continues

Oil Town Festival



Early Oil & Gas Booms

Smackover Today – The Culture Continues

Oil Town Festival



Early Oil & Gas Booms

Smackover Today – The Culture Continues

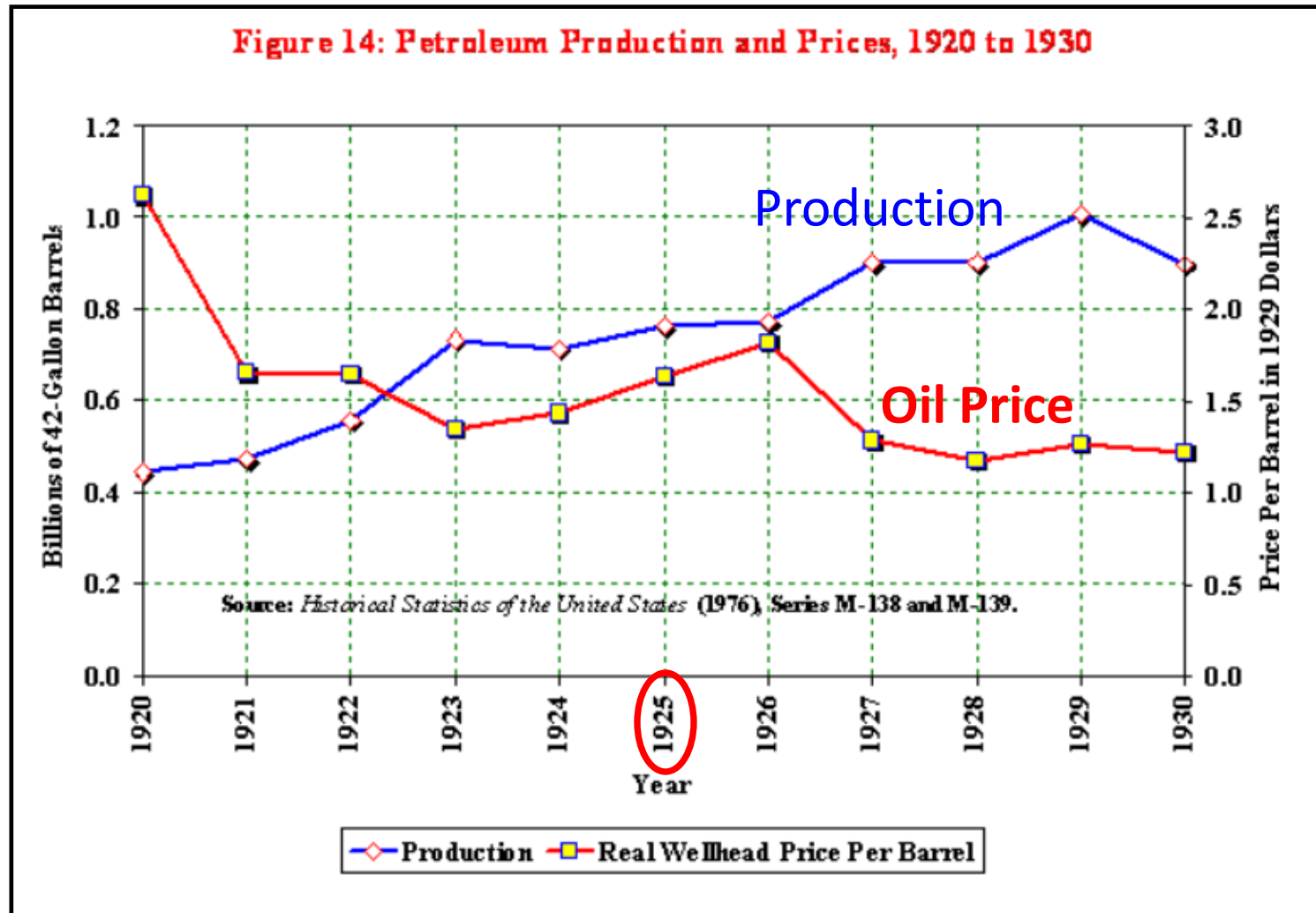
Oil Town Festival



Smackover Field Today - Environment



Oil & Gas Booms



In 1925 **Smackover Field** was the most productive oil field in the U.S.

<http://eh.net/encyclopedia/the-u-s-economy-in-the-1920s/>

Early Oil & Gas Booms

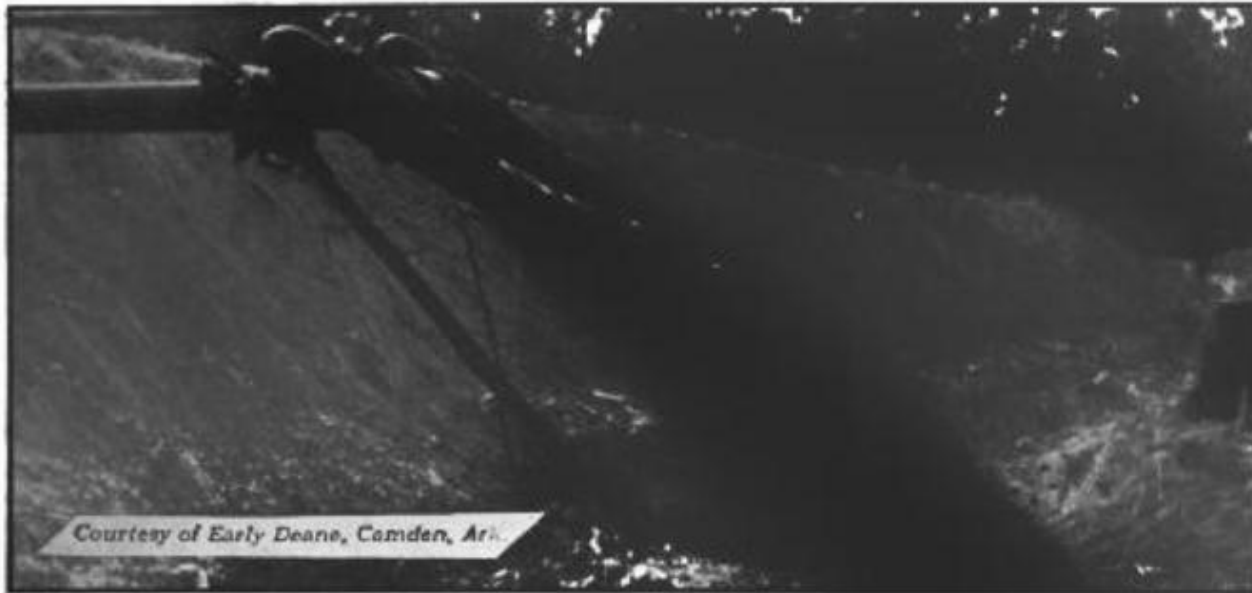
NATIONAL PETROLEUM NEWS

VOL. XIV

CLEVELAND, OHIO, NOVEMBER 22, 1922

NO. 47

El Dorado Revival, Plus Smackover Flood Threatens Crude Market



Courtesy of Early Deane, Camden, Ark.

Early Deane & M. M. Baker et al No. 1, Early, 20-15-15, making head into earthen storage

Early Oil & Gas Booms

NATIONAL PETROLEUM NEWS

VOL. XIV

CLEVELAND, OHIO, NOVEMBER 22, 1922

NO. 47

El Dorado Revival, Plus Smackover Flood Threatens Crude Market



Caused Mid-Continent Oil
Prices to Collapse

Courtesy of Early Deane, Camden, Ark.

Early Deane & M. M. Baker et al No. 1, Early, 20-15-15, making head into earthen storage

The New Shale Gas & Tight Oil Booms - Haynesville

THE WALL STREET JOURNAL. ≡ U.S.

POLITICS AND POLICY

U.S. Gas Fields Go From Bust to Boom

By Ben Casselman

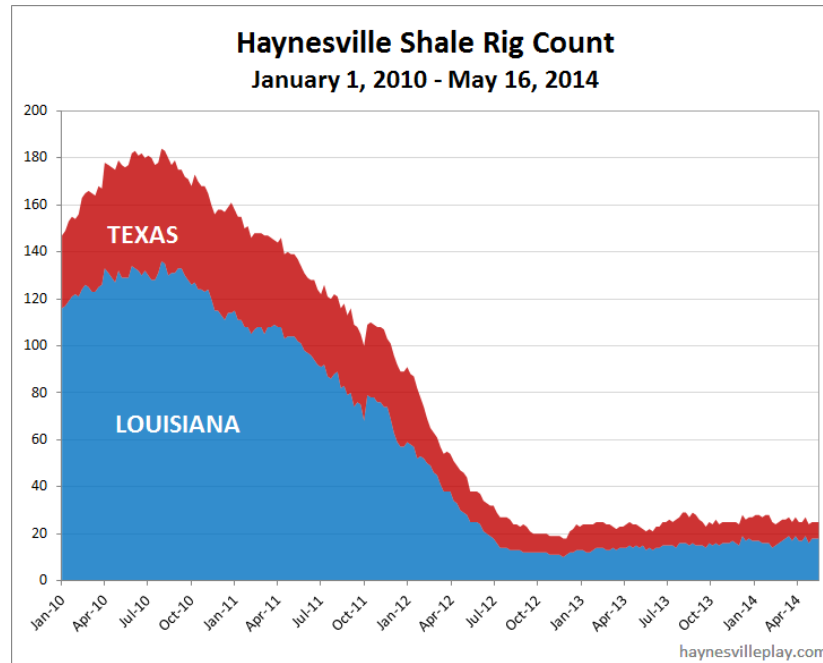
April 30, 2009

CADDO PARISH, La. — A massive natural-gas discovery here in northern Louisiana heralds a big shift in the nation's energy landscape. After an era of declining production, the U.S. is now swimming in natural gas.

Even conservative estimates suggest the Louisiana discovery — known as the Haynesville Shale, for the dense rock formation that contains the gas — could hold some 200 trillion cubic feet of natural gas. That's the equivalent of 33 billion barrels of oil, or 18 years' worth of current U.S. oil production. Some industry executives think the field could be several times that size.

"There's no dry hole here," says Joan Dunlap, vice president of Petrohawk Energy, standing beside a drilling rig near a former Shreveport amusement park.

Shale Gas & Tight Oil Booms – Déjà vu All Over Again



Dry Gas

**Too Much
Success**

[http://haynesvilleplay.com/HV-runningrigcountchart\(large\).png](http://haynesvilleplay.com/HV-runningrigcountchart(large).png)

NG - Natural Gas - Weekly Nearest OHLC Chart



<https://images.angelpub.com/2012/34/15816/large-gas-8-21.png>

Shale Gas & Tight Oil Development

Positive Experiences

- Jobs
- Economic Development
- Infrastructure
- Education Funding
- Infrastructure
- Water management
- Environment

Corporate Social Responsibility - Jobs

THURSDAY 29TH MAY 2014

 Home / BREAKING NEWS / Shale Revolution delivers 55,000 jobs to Houston

Shale Revolution delivers 55,000 jobs to Houston

Posted by: Aschere2015

Our abundance of affordable domestic energy, has also revitalized the American Sector

A new report co-authored by the Greater Houston Partnership finds that the benefits of the shale energy revolution are poised to continue in Houston, extending far beyond just the jobs on the wellpads.

The study, **"Houston's Next Boom: Exporting Innovation,"** analyzes the combined impact of the surge in energy-related exports and the expected oil and gas exploration efforts in Mexico, all made possible by advances in hydraulic fracturing and horizontal drilling. This "surge" in additional economic activity is expected to bring in an additional 55,185 jobs to the region. Here's the job breakdown from the report.

<http://aschereenergy.com/shale-revolution-delivers-55000-jobs-houston/>

FRACKING.

Helps Protect Colorado's Heritage.

LAST YEAR
COLORADO OIL & NATURAL
GAS CONTRIBUTED
\$81.5 MILLION
IN SEVERANCE
TAX REVENUE
TO THE DEPARTMENT
OF NATURAL
RESOURCES,
HELPING PROTECT
WILDLIFE, FORESTRY,
AND WATER
CONSERVATION.





Eagle Ford Shale Economic Impact in 2011

In 14 Texas counties directly involved in production

- \$20 billion in total economic output generated
- 38,000 full-time jobs supported
- \$2.6 billion in salaries and benefits paid
- \$310 million in state revenues generated
- \$211 million in local government revenues generated

Source: Center for Community and Business Research, UT-San Antonio Institute for Economic Development

Shale Booms: Industry Challenges and Solutions?

Housing

Midland Reporter-Telegram

South Texas boom offers opportunities in housing

By Jennifer Hiller

The housing business remains emphatically average across the major cities in Texas, as home builders continue to pull themselves up from the recession's lows. But in many small South Texas communities, where oil and gas drilling is booming, housing - of any sort, be it RVs or single-family homes - can't be added quickly enough. Then there's the commercial space - or, more accurately, the lack of space for lease or purchase.

Now more developers and builders are moving into the sparsely populated Eagle Ford Shale counties to build everything from housing to pipe yards to warehouses.

Shale Booms: Industry Challenges and Solutions

Housing



The banner features a stylized illustration of a blue oil rig on the left, a row of blue and green houses in the center, and a green hill on the right. The text 'Oilfield Housing Solutions' is in a large, dark serif font, with '2nd Annual Conference' in a smaller, red serif font below it. The 'PETROLEUM connection' logo is on the right, with 'PETROLEUM' in a large, dark serif font and 'connection' in a smaller, red sans-serif font. The date and location 'May 1-2, 2014 | Houston, TX' are in a red serif font at the bottom of the banner.

Oilfield Housing Solutions
2nd Annual Conference

PETROLEUM connection

May 1-2, 2014 | Houston, TX

home agenda venue sponsorship lodging participating companies advisory board about contact

REGISTRATION DETAILS	PARTICIPATING COMPANIES	PLATINUM SPONSOR
<p>General Registration \$995</p> <p>REGISTER NOW</p> <hr/> <p>Discount Rates for E&P and Pumping & Well Service Company Representatives, and Public Officials</p> <p>General Registration \$895</p>	<p>AIrgas On-Site Safety Services</p> <p>America's Counties for Energy Independence</p> <p>American Oil & Gas Reporter</p> <p>American Petroleum Institute</p> <p>Aramark</p> <p>Anies Building Systems</p> <p>Bickerstaff Heath Delgado Acosta LLP</p> <p>Bohunk Investments, LP dba Czech Haus</p> <p>Bradford County, PA</p> <p>C&J Energy Services</p>	<p>TEEMICO Water Solutions</p> <hr/> <p>SILVER SPONSORS</p> <p>HOWDY SERVICES, LLC</p> <p>OILFIELDLODGING.COM</p> <hr/> <p>BRONZE SPONSORS</p> <p>TALISMAN ENERGY</p>

Corporate Social Responsibility – Education Philanthropy



THE UNIVERSITY OF TEXAS
AT AUSTIN

Shell Oil Company Invests Nearly \$4 Million in the University

Shell Oil Company executives recently visited the University to present a check in the amount of \$3,963,250, representing the company's investment in UT for the year.

About \$3.5 million of the total is designated for sponsored research. Shell has active research partnerships with the University's Cockrell School of Engineering and Jackson School of Geosciences. Those partnerships include the Shell-UT Unconventional Research (SUTUR) initiative.

SUTUR is a five-year, \$7.5 million collaboration between Shell and UT's Department of Petroleum & Geosystems Engineering and Bureau of Economic Geology to address short- and long-term challenges facing the growing worldwide unconventional oil and gas industry.

"We not only celebrate Shell's investment of \$3.9 million in The University of Texas at Austin, we also celebrate our mutually respected



UT President Bill Powers, Shell Oil Company USA President Marvin Odum, Shell VP for Unconventional Technologies Ben van den Brule, and Bureau of Economic Geology Director Scott Tinker celebrate last fall at the signing of a five-year, \$7.5 million collaboration between Shell and UT. Shell also has provided nearly \$25 million in philanthropic funding over the years.

Corporate Social Responsibility – Education Philanthropy

ConocoPhillips Donates More Than \$1 Million to The University of Texas at Austin

May 16, 2014

AUSTIN, Texas — ConocoPhillips continued its commitment to funding higher education at The University of Texas at Austin yesterday with a contribution of \$1.185 million.

A portion of the donation, \$685,000, will support programs and activities at the Cockrell School of Engineering, the McCombs School of Business, the College of Natural Sciences and the Jackson School of Geosciences.

The remaining \$500,000 is half of a \$1 million pledge to support and name the ConocoPhillips Student Project Laboratory within the Cockrell School's new Engineering Education and Research Center. This investment will provide funding for five years to support multidisciplinary student engineering projects, which will enable collaboration and hands-on training to prepare students to launch their careers. ConocoPhillips will contribute the other \$500,000 toward the \$1 million pledge in 2015.

"ConocoPhillips continues to be an outstanding partner, and we are grateful for its support of our engineering students," said Sharon L. Wood, interim dean of the Cockrell School. "When completed, the ConocoPhillips Student Project Laboratory will offer our students an extraordinary opportunity to formulate and test their innovative ideas by working together."

Corporate Social Responsibility – Education Philanthropy

University of Oklahoma

Focus on Gas Shales: MPGE professor receives funding from RPSEA and Devon

Deepak Devegowda is assistant professor at the Mewbourne School of Petroleum and Geological Engineering. His research interests lie in the areas of high resolution reservoir description using inverse methods and ensemble-based techniques. The underlying motivation of this research, largely derived from similar algorithms in medical imaging and meteorology, is to utilize production data to construct reliable reservoir performance models that will enable operators to make accurate predictions of future reservoir performance, aid in reservoir management and to maximize recovery by giving the reservoir engineer information to either locate new wells or to design enhanced recovery processes by identifying the spatial distribution of bypassed hydrocarbon.

Although oil companies invest considerable time and effort in constructing reservoir models that attempt to provide a high-resolution image of the reservoir, these models often lack sufficient information related to the connectivities of the predominant flow paths and barriers in the subsurface. This is a consequence of the limited sampling of the reservoir, often just restricted to a few core samples and well logs from a modest number of wells. Although the deployment of seismic imaging technology is on the rise and can probe larger regions of the reservoir, the cost associated with



contaminant transport. He, along with Faruk Civan and Richard Sigal, recently received new research support from RPSEA in partnership with five other companies to develop novel schemes to model gas transport in shale gas reservoirs.

The three-year project aims to fill technology gaps in current implementations of numerical reservoir simulators in order to accurately model the complex flow that is believed to occur in these tight nano-porous media. He also is currently working on a Devon-funded project to integrate core, log and seismic data using geostatistical techniques in order to enable characterization of the heterogeneities in shale gas reservoirs. This project will potentially enable Devon to reliably integrate multiscale data, acquired from

Drilling-rich watershed district looking to reduce assessment paid by 500,000 Ohio landowners

By Bob Downing
Beacon Journal staff writer

Property owners from Akron to the Ohio River could see a reduction in the annual assessment paid to the Muskingum Watershed Conservancy District starting next year.

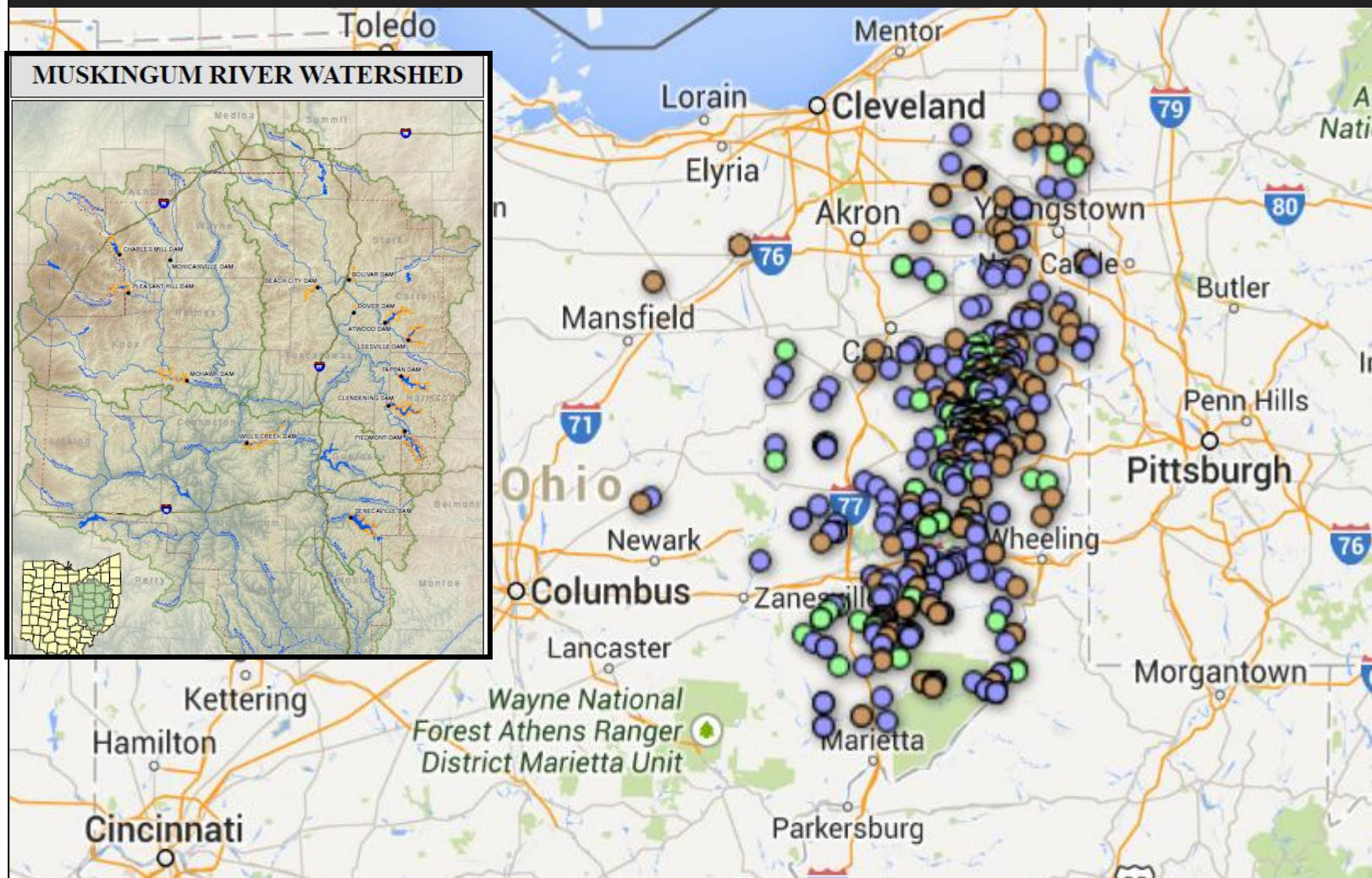
The reason: The district is flush with cash from Utica Shale leases and royalties paid on natural gas and liquids produced from wells on district-owned land.

Reducing the assessment — about \$12 a year for most landowners — will be recommended Friday when the district's five-member governing board meets at 9 a.m. in New Philadelphia.

"We believe it is not only prudent, but a responsibility of the conservancy district to return some of the benefits the oil and gas leases have generated for the MWCD to the property owners in the form of a reduction in their annual assessments," said John M. Hoopingarner, the district's executive director/secretary.

Last year, the board directed staff to review the annual assessment paid by the owners of nearly 500,000 parcels in the 18 counties that drain into the Tuscarawas and Muskingum rivers. Next year is the earliest the fee could be reduced.

The assessment was first levied in 2009 amid protests from some vocal landowners. It covers landowners in Summit, Stark, Wayne and 15 other counties. The district collects about \$11 million a year from the assessment to ensure the safety of 14 dams and reservoirs in eastern Ohio. The district's board must review and approve the assessment annually.



Well Type Legend: ● Permit or Not Drilled ● Drilling or Drilled ● Producing

Hydraulic Fracturing: Staying Afloat in Times of Tightening Water Supply

by Gene Lockard | Rigzone Staff | Wednesday, April 16, 2014

One of the criticisms levied against hydraulic fracturing, particularly during recent periods of drought, is the amount of water used in the process. However, energy companies are seeking to reduce water use during hydraulic fracturing, even as research shows more water is used in other activities.



Fracking trails other uses for water as the energy industry works to further reduce water use.

Red River Watershed Management Institute, LSU Shreveport, LA.

Gary Hanson

Aerial view of the LSU Shreveport Campus and Red River Education and Research Park in Louisiana, backed by the Red River with classic meanders and oxbow lakes.



Source: GeoExPro, June 2014

Red River Watershed Management Institute, LSU Shreveport, LA.

Gary Hanson

Aerial view of the LSU Shreveport Campus and Red River Education and Research Park in Louisiana, backed by the Red River with classic meanders and oxbow lakes.

Water Management &
Water Policy Changes to
Address Sustainability



TRUTHLAND MOVIE

TRUTHLAND

THE STORY

THE EXPERTS

THE FACTS

MEDIA / CONTACT

BLOG

W.T.A.S.

THE FACTS



WATCH TRUTHLAND

SCREENINGS

THE FACTS ON FRACTURING (AND OTHER STUFF TOO)

The history of fracturing technology's safe use in America extends all the way back to the Truman administration, with more than 1.2 million wells completed via the process since 1947. But only recently has the term "hydraulic fracturing" entered the public's vocabulary, a function of the enormous opportunities that the application of fracturing and horizontal drilling are making possible all around the country through the development of abundant resources from shale.



Truthlandmovie.com

twitter facebook YouTube tumblr.

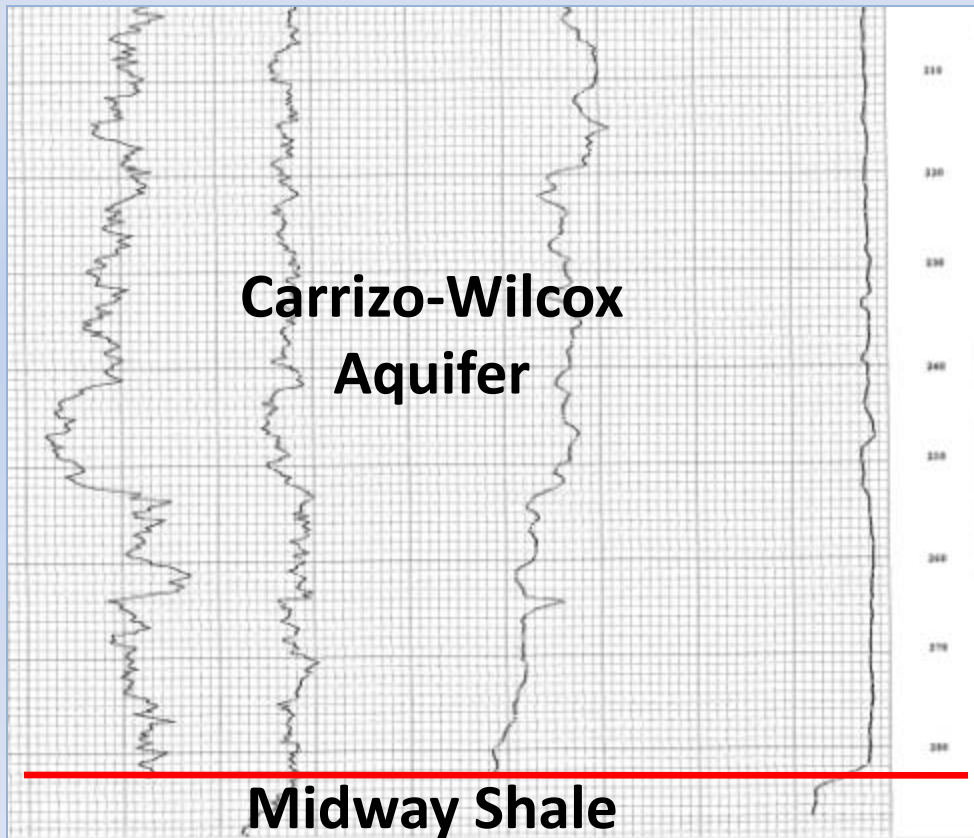
TRUTHLAND

Copyright Energy In Depth, a project of the Independent Petroleum Association of America © 2012 Movie Site. All rights reserved.

Caddo Parish/ LSUS Carrizo-Wilcox Monitoring Well Project

(Program initiated prior to Haynesville Shale Discovery)

Electric Log



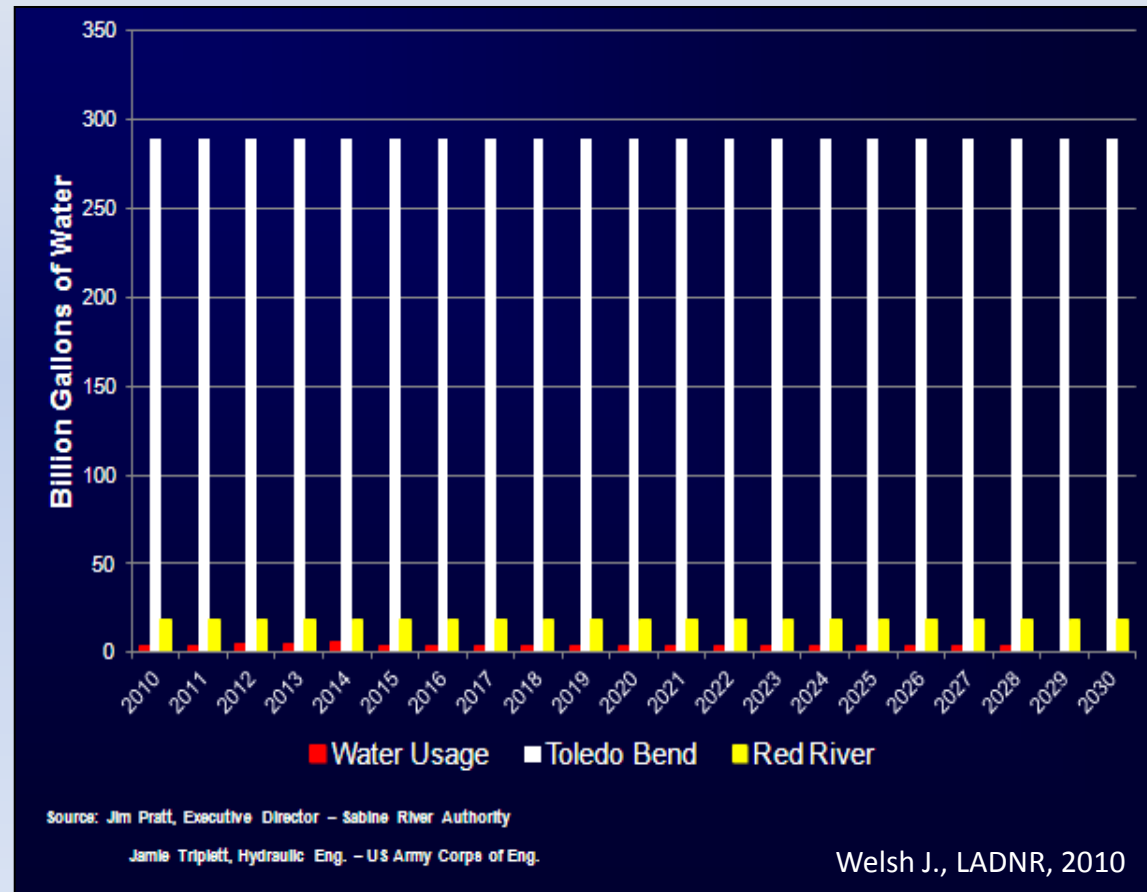
Hanna Park Site

Hydraulic Fracturing: Staying Afloat in Times of Tightening Water Supply

The total estimated water consumption for all shale wells completed in 2011 was .3 percent of total U.S. freshwater consumption, according to Jesse Jenkins, a Massachusetts Institute of Technology researcher for The Energy Collective, in a report. That was well under the water usage at golf courses, which accounts for .5 percent of all the freshwater consumption in the country, according to the Professional Golf Association. In Texas, where fracking has been the most prevalent, the amount of water used by the oil and gas industry is still less than 1 percent of the state's overall water use, according to the Texas State Water Board.

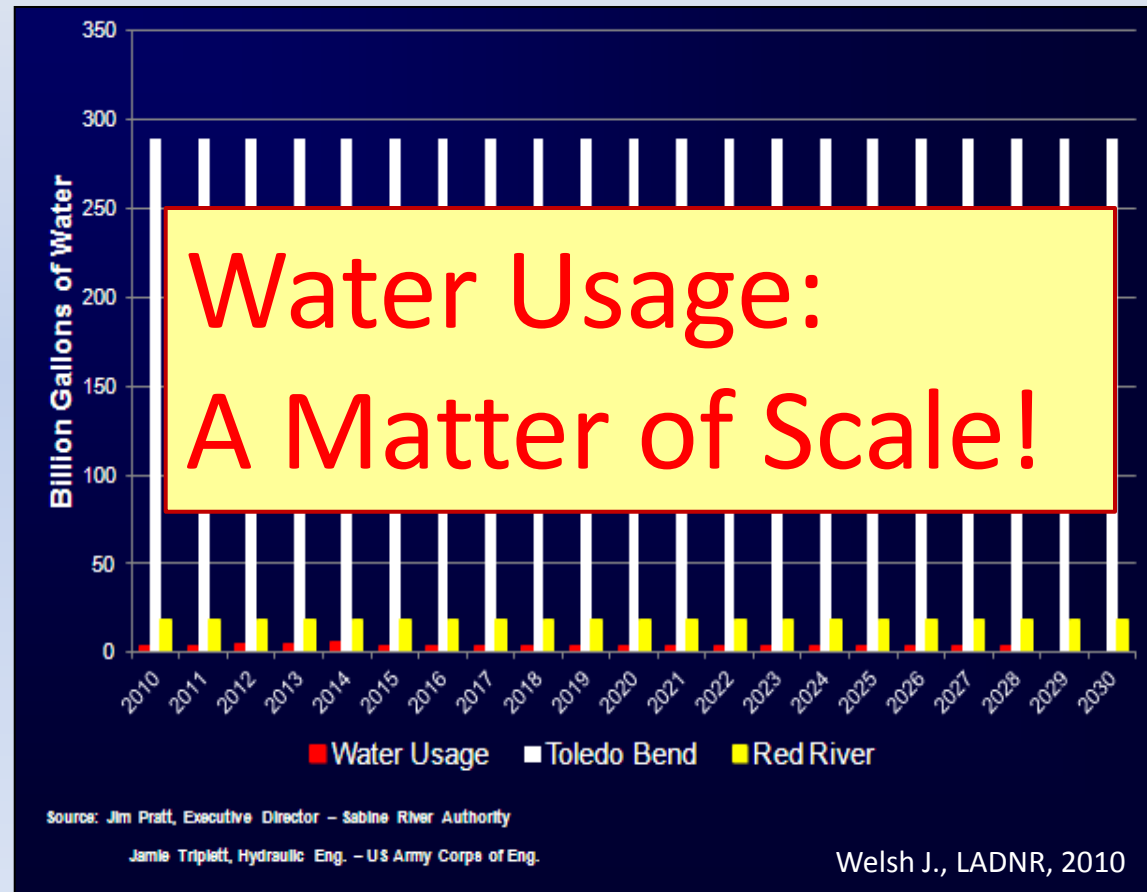
Fracking trails other uses for water as the energy industry works to further reduce water use.

Red River & Toledo Bend Reservoir yield capacity vs. projected surface water usage at 70% level – **Haynesville Frac Water Sources**



Water Footprint

Red River & Toledo Bend Reservoir yield capacity vs. projected surface water usage at 70% level – **Haynesville Frac Water Sources**



Water Footprint

Water Sourcing Solutions - Alternative surface water frac sources

EXCO has built a 9 mile pipeline in order to use treated wastewater from International Paper Co. at Mansfield, La.

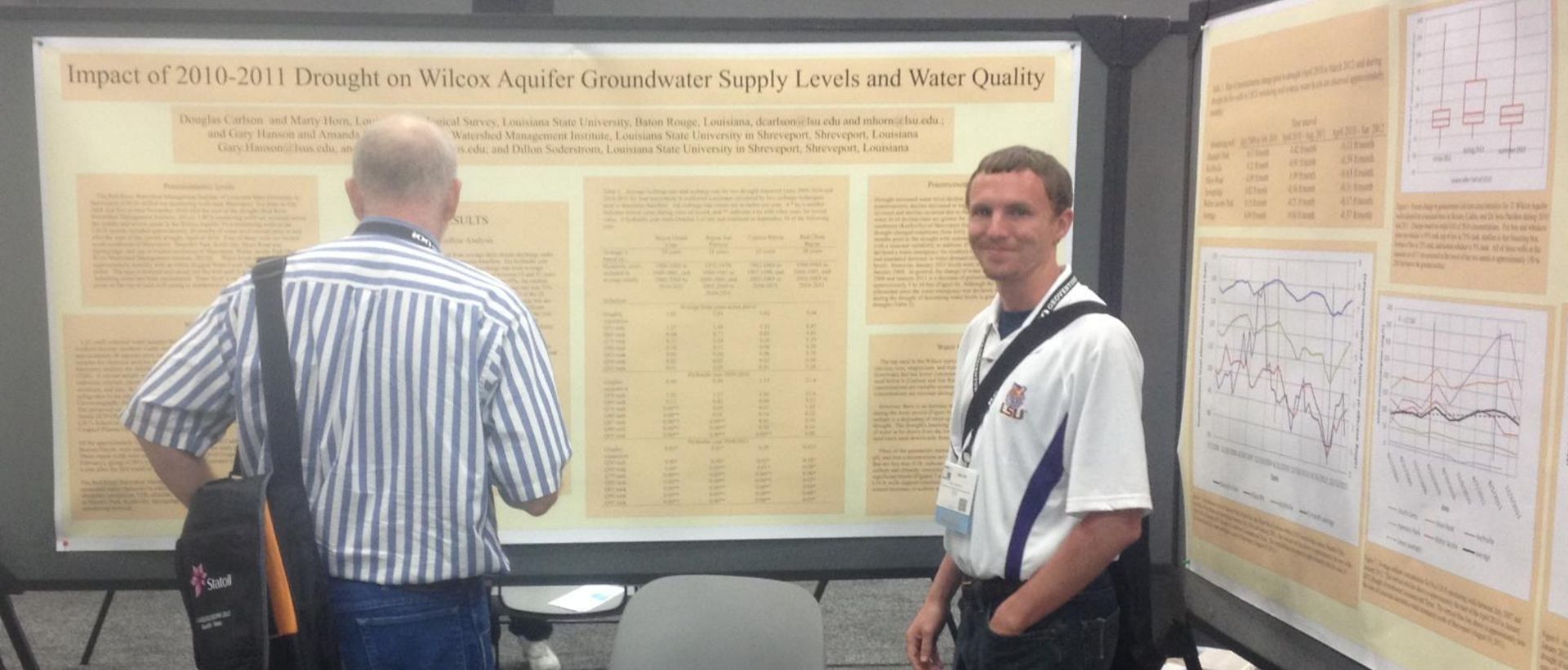


12 million gallons/day of non-potable frac water

Hydraulic Fracturing: Staying Afloat in Times of Tightening Water Supply

More fracking water is now being recycled than at any time in the past, and conservation efforts have been stepped up, according to Blackmon.

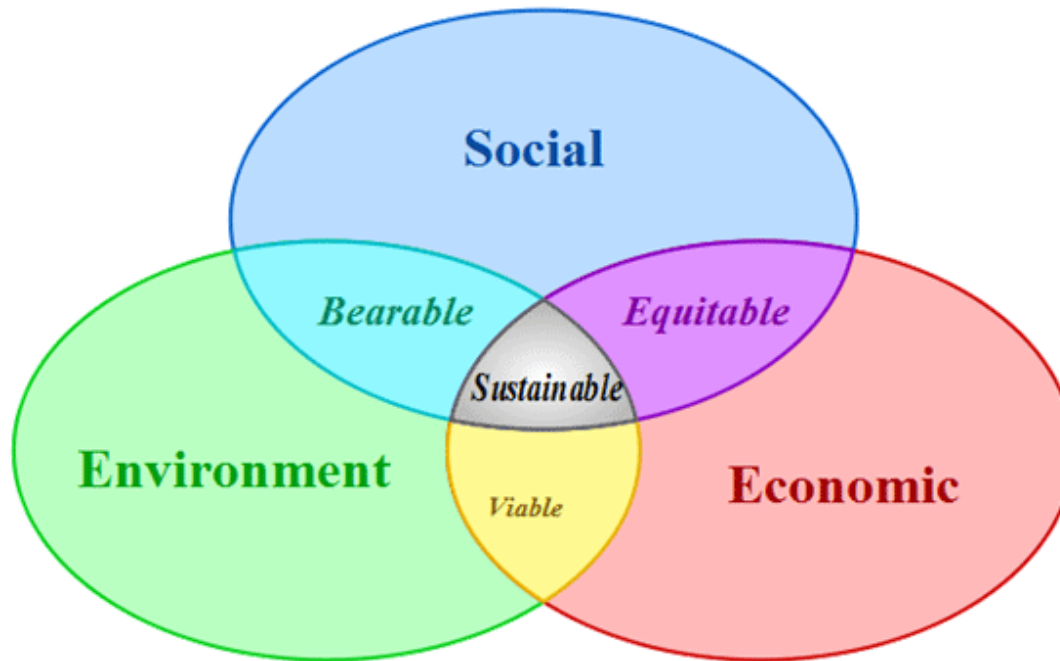
In Louisiana, for example, some drilling companies where the Haynesville Shale is located have begun purchasing effluent water that had been treated by the City of Shreveport, or are also using treated wastewater from a nearby paper mill. Some companies in the Eagle Ford, noting the success that the drilling companies next door in Louisiana have had, are now using effluent water, as well.



Study of only significant freshwater aquifer in northwest Louisiana. Severe drought of 2010-2011 was a cause of major stress on Wilcox Aquifer. Shale gas industry had voluntarily switched from groundwater to predominantly surface water prior to start of drought. LSU Shreveport student Dillon Soderstrom explaining study at Gulf Coast Association of Geological Society meeting in Austin, Texas

Corporate Social Responsibility (CSR) and Sustainability

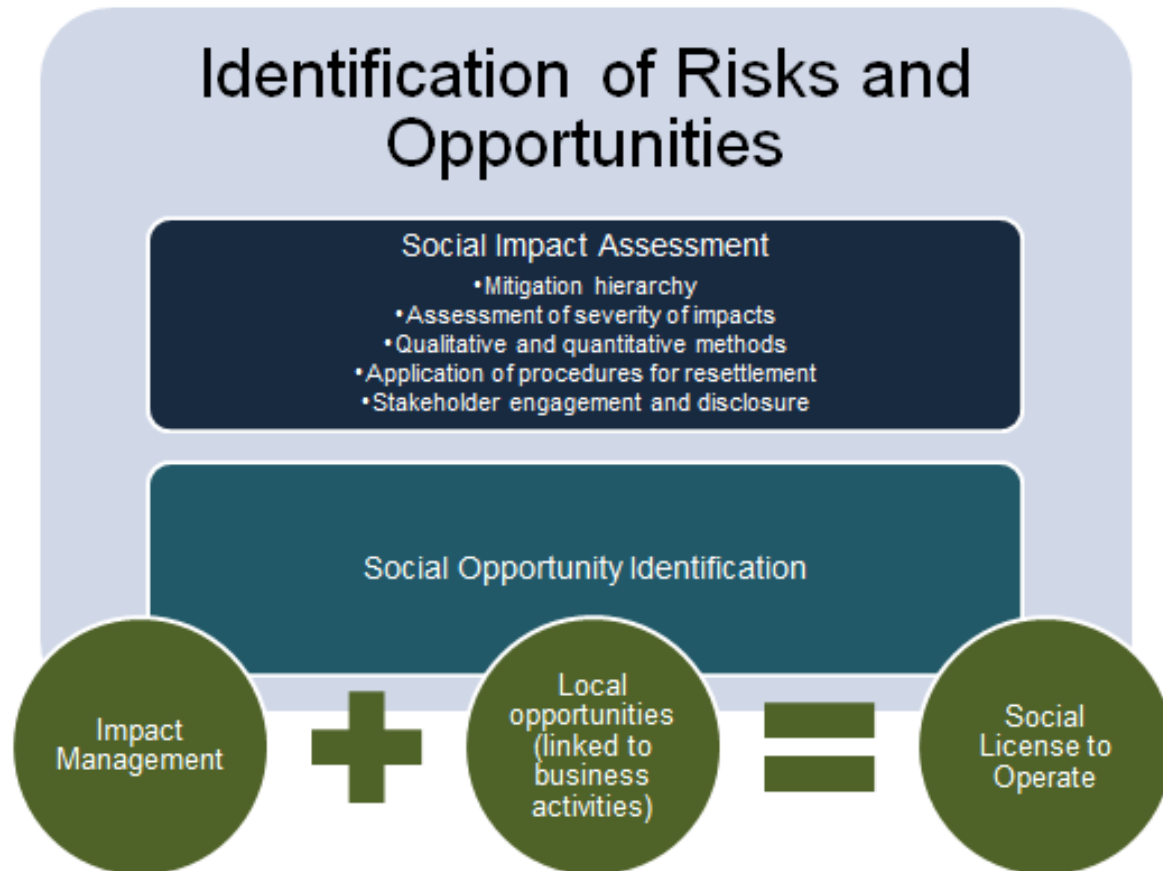
A company needs to **replace** a single-financial bottom line with a more balanced triple-bottom line encompassing economic, social and environmental objectives into its business practices.



A global study examining the **relationship between corporate social responsibility and company stock valuation** across **three regions of the world** over a **10 year period** revealed that **socially responsible firms** in the **United States, Europe and Asia** **outperformed** their **long-term financial performance expectations**. Source: Caroline Ganun

Example of a Formalized Social Performance Management System

Elements of Social Performance Management System Impact Assessment, Opportunity Identification and Management



Developing Community Educational Resilience



Red River Watershed Management Institute

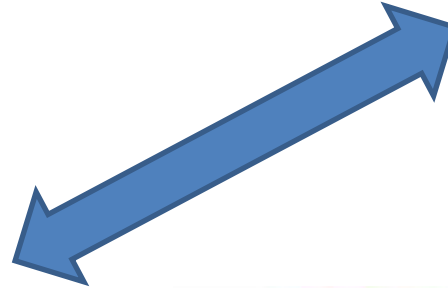
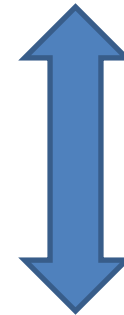
[About the Basin](#)

[About the Institute](#)

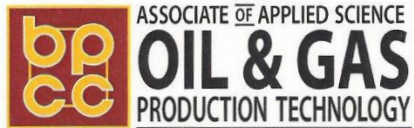
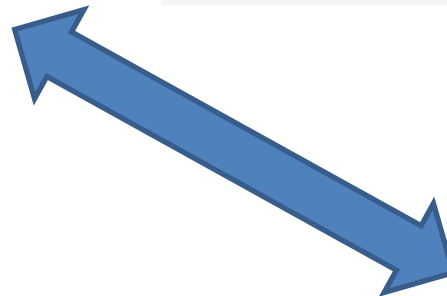
[Red River Education and Research Park](#)

[Research Projects](#)

[Academic Courses](#)



Shell Oil Company



In response to the job creation associated with the Haynesville Shale natural gas discovery, *Bossier Parish Community College*, in conjunction with energy exploration and production companies operating in northwest Louisiana, developed this program to meet the E & P companies' specific needs for qualified employees.



THE PROGRAM:

- Coursework is specific to the industry
- Learn in both lecture and lecture/lab environments
- Master the required theory and hands-on skills
- Earn degree (credential) in only 5 semesters
- Courses built upon the previously mastered material
- Work at technologist level positions upon graduation



Member of the Louisiana Community & Technical College System (LCTCS)

Resilience

Resilience - the capacity of a system to deal with change/disruptions and continue to develop

Corporate/Governmental Resilience - formalized, deliberate, resilience-directed government and private sector practices that are mobilized by the public safety officials charged with overseeing responses and recovery to disruptions.

Resilience

Inherent or Community Resilience – practices that natural resource-dependent residents deploy to cope with disruptions and that are retained in their collective memory.

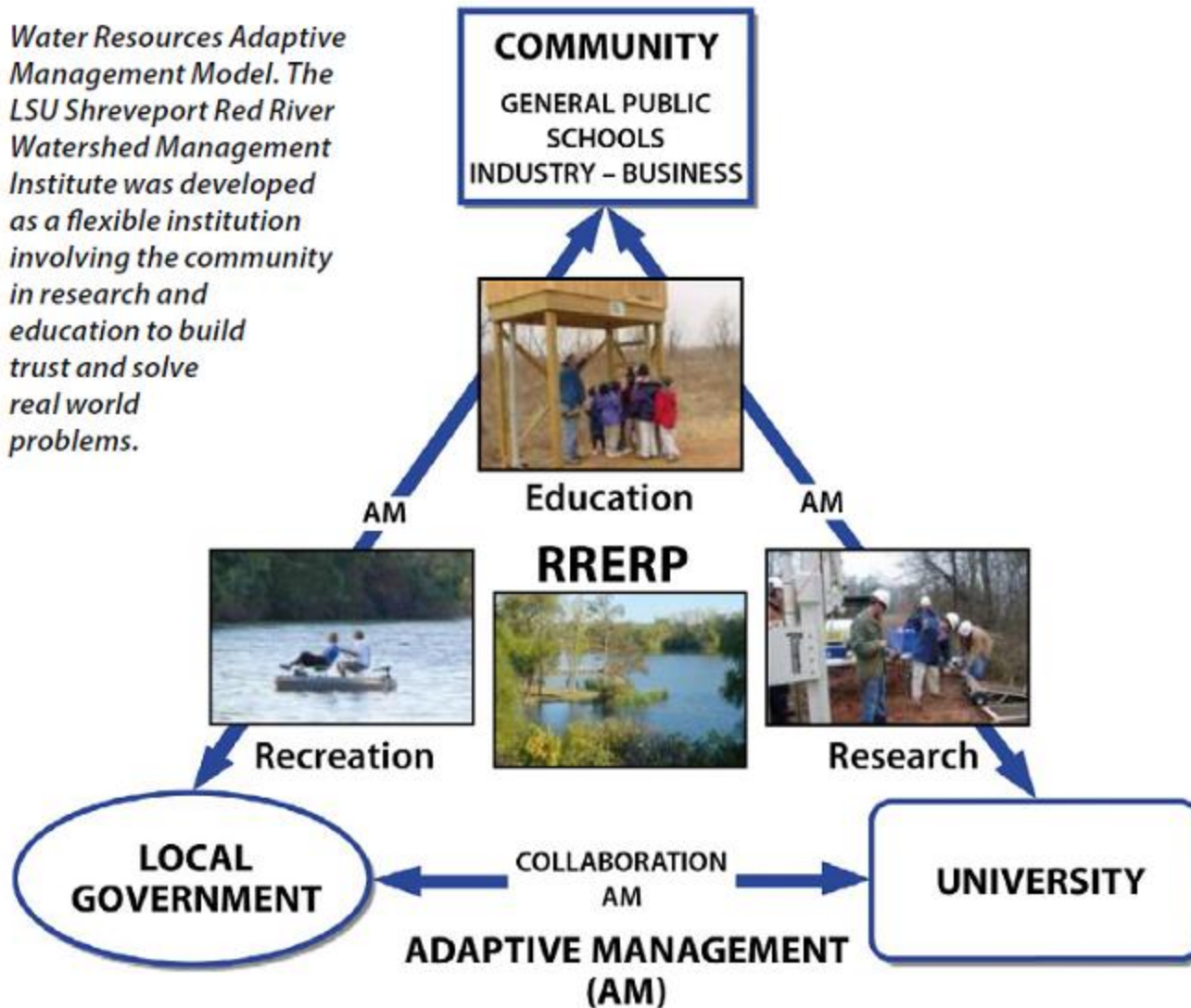
Resilient communities are those locales that maintain **four key elements** that enable:

- (1) the ability to anticipate disruptive events,
- (2) the capability to respond to them effectively,
- (3) the mechanisms to recover from them equitably and efficiently, and take steps to
- (4) reduce vulnerabilities to future events.

A Proven Adaptive Management Model...

Water Resources Adaptive Management Model. The LSU Shreveport Red River Watershed Management Institute was developed as a flexible institution involving the community in research and education to build trust and solve real world problems.

Gary Hanson



LSU Shreveport Red River Education & Research Model

2001

A Pathway to Resilience

Source: GeoExPro May 2014

Resilience

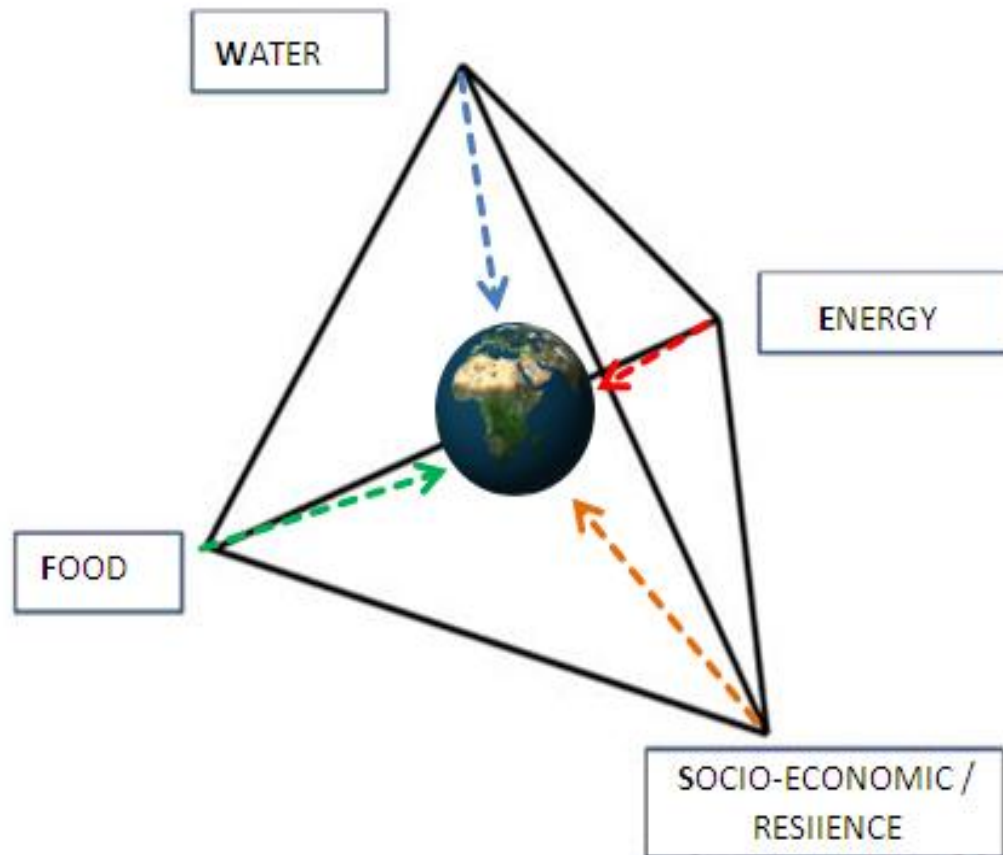
Inherent
Resilience
(Community)

The
Bridge
?

Government
and
Corporate
Resilience

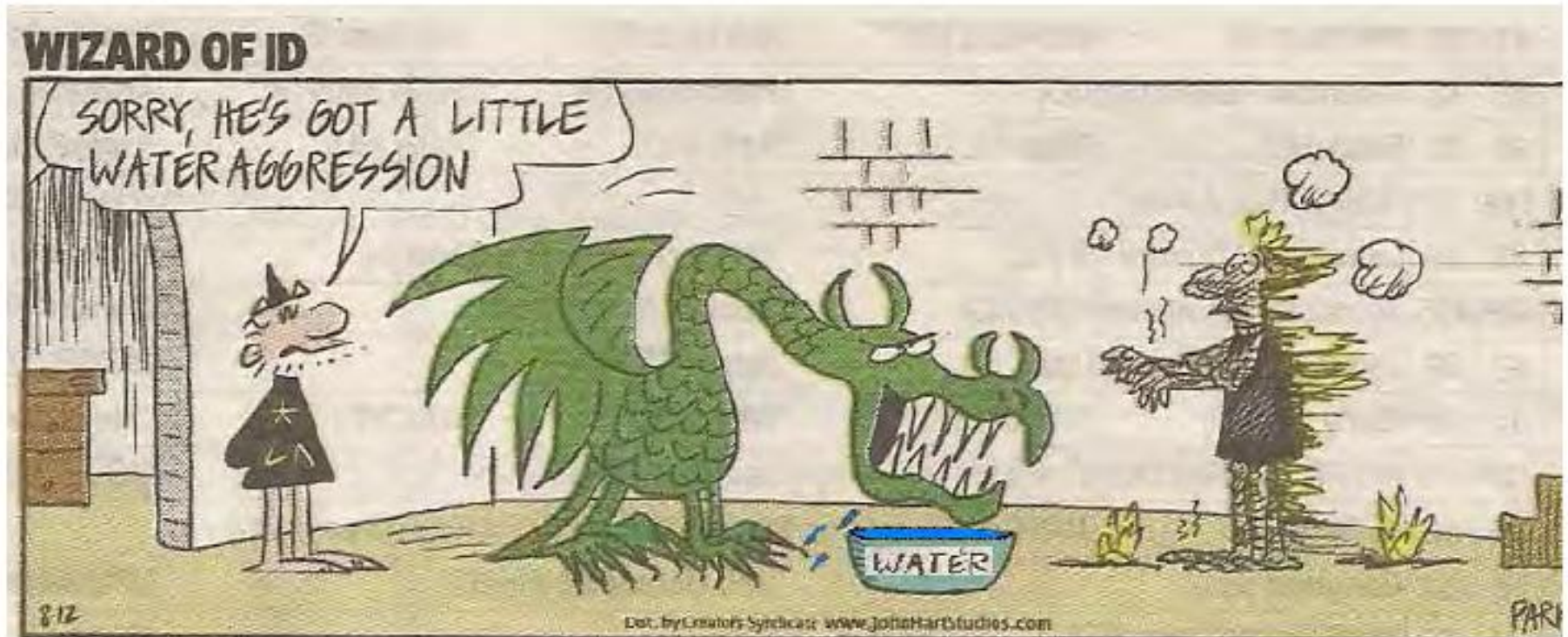


FOOD, ENERGY, WATER, SOCIO-ECONOMIC/RESILIENCE NEXUS TETRAHEDRON



G.M. Hanson, 2013

"TRUST ME. I AM FROM THE
GOVERNMENT AND I AM HERE TO
HELP YOU"



PLEASE DON'T _____ THE
MESSENGER!

First public meeting
since water wells
started going dry
because of drought.