



LSU | Center for Energy Studies

Summer 2014 **Newsletter**

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Dismukes Named Executive Director



David E. Dismukes has been named executive director for the Center for Energy Studies. He replaces Allan Pulsipher, who will continue at the Center as associate executive director.

During his nearly 20 years at the Center, Dismukes has led a number of the Center's research efforts on topics associated with many aspects of the energy industry, including offshore and onshore oil and gas exploration and production (E&P) activities; the restructuring of natural gas and electric power markets; market structure issues in various energy industries;

economic and policy issues related to renewable energy generation and market design; and the economic impacts of energy industry infrastructure development along the Gulf Coast. He has given more than 200 energy-related presentations to civic, professional, and trade groups. His opinions on energy industry trends and issues have been quoted in the *Wall Street Journal*, *Washington Post*, *New York Times*, *Los Angeles Times*, and *USA Today*, as well as regional and local newspapers and trade newsletters.

Dismukes also has a joint appointment as a professor in the Department of Environmental Sciences and serves as the director of the Coastal Marine Institute, both of which are in the LSU School of the Coast and Environment. He received his M.S. and Ph.D. in economics from the Florida State University.

Kaiser Continues *Oil & Gas Journal* Contributions

Haynesville Update Series

In a series of articles for the *Oil & Gas Journal*, Mark Kaiser, professor and director of the Research & Development Division, and Yunke Yu, CES research associate, review trends and prospects for the Haynesville shale. Addressing the "rapid retrenchment" and the decline in the number of new wells drilled over the past two years in the formation, Kaiser and Yu update drilling activity, reserves positions, development cost and profitability in the play, and provide a production forecast for the region.



The first installment of the series ("North Louisiana gas shale's drilling decline precipitous," 111[12]:62-67) summarizes drilling, production, and reserves statistics for the play, showing that, on the average, production profiles have improved. More accurate identification of the most prospective areas, improved technology, and more effective completion designs are credited with the success.

In part two of the series ("North Louisiana drilling costs vary slightly 2007-12," 112[1]:54-61), well construction costs for the period 2007-12 are examined. The article features cost statistics, distributions, and correlations at both a regional and operator level. Among the findings: More than half of Haynesville wells cost \$8-\$11 million to drill and complete, with the average costing \$9.95 million.

Part three of the series ("Low gas price constrains profitability, 112[2]:52-59) looks at the economics and profitability of Haynesville wells, using public data from the Strategic Online Natural Resources Information System (SONRIS), as well as Louisiana tax records. Analyses show that the average Haynesville well is expected to generate \$1.1 million before taxes during its operational lifetime, but after taxes, the average well does not generate positive value.

continued

In the final installment “Haynesville update, short- and long-term production outcomes for the play,” 112[3]:62-65), production in the play is predicted to continue to fall if commodity prices stay in the \$4/Mcf range. Obstacles to long-term, sustainable development of the Haynesville shale include high drilling and completion costs and current low commodity prices. The play’s high production rates, good recovery volumes, high-density infrastructure and the abundance of transport mechanisms and end-use facilities have facilitated the state’s building bonanza.

Deepwater Gulf Decommissioning Series

The four-part *Oil & Gas Journal* series “Deepwater Gulf Decommissioning” (112[2-5]) examines end-of-life production in the deepwater Gulf of Mexico and forecasts the expected removal times for structures located in water depths greater than 400 ft. Kaiser and visiting scholar Mingming Liu of China University of Petroleum in Beijing review the life-cycle stages of offshore production and summarize historical installation and removal trends, economic-limit statistics, and the revenue and lease status of structures. The series concludes with short, medium and long-term removal forecasts for the deepwater inventory of fixed and floating structures. By 2023, a total of 26 fixed platforms and at least one floating structure will be decommissioned, and from 2024-2035, another 10 fixed platforms and floaters are expected to be decommissioned. The timing of floater removals is subject to greater uncertainty because of the high residual value of the assets. Gas structures are also more vulnerable to removal than oil structures because of lower prices and low-density infrastructure that may not allow economic transport for gas-lift operations.

Visit **www.enrg.lsu.edu/publications**
to view or download CES publications.

Dismukes, Barnes Prepare Oil Spill Analysis for Louisiana Legislature

David Dismukes and Stephen Barnes, director of the Division of Economic Development for the LSU E.J. Ourso College of Business, prepared a report titled “Analysis of Louisiana Oil Spills, the Louisiana Oil Spill Contingency Fund, and Future Oil Spill Response,” for the Interagency Council for the House Committee on Appropriations, the House Committee on Natural Resources, the Senate Committee on Finance, and the Senate Committee on Natural Resources. The report was prepared in response to Act 394 of the Louisiana Legislature. The act was designed to amend and re-enact statutes defining the funding mechanism for the Louisiana Oil Spill Contingency Fund and the Louisiana Oil Spill Coordinator’s Office (LOSCO). It increased the percent of crude oil moving through the state that was subject to the fee while lowering the amount of the fee on each barrel. The act also directed the Oil Spill Interagency Council to conduct a study of the Louisiana Oil Spill Contingency Fund, including the effects of recent and potential changes to the funding mechanism for the state’s oil spill-related activities.

Dismukes and Barnes provide a review of the Fund including its uses, revenues, expenditures, and projected needs for oil spills in the future. For context, the report starts with a broad picture of Louisiana’s historic crude oil supply, which has fluctuated to meet the needs of Louisiana’s refineries and, to a lesser extent, as Louisiana’s role as a transportation hub has changed over time. Historic oil spill trends are reviewed using data on spill notifications from the National Response Center. These data show an increasing trend in the number of reported spills as well as total reported volume spilled. Additionally, the report provides a survey of the Fund and the historical oil spill related expenditures of the Louisiana Oil Spill Coordinator’s Office and other state agencies as they relate to the Fund. The full report is available online at http://www.enrg.lsu.edu/files/images/publications/online/2014/DavidLOSCO_FUND_REPORT_v23-1-3.pdf

LSU, BOEM Renew Five-Year CMI Agreement

In March, LSU and the Bureau of Ocean Energy Management (BOEM) signed a memorandum of agreement to continue the Coastal Marine Institute (CMI) program through December 2018. The agreement, the fifth five-year contract between BOEM and the state since the initiation of the CMI program in 1992, sets out the general terms for continuing the program at LSU, namely to collect and disseminate environmental information needed for Outer Continental Shelf (OCS) energy and mineral decisions; address local and regional OCS related environmental and resource issues of mutual interest; strengthen the BOEM-LSU-state partnerships in addressing OCS energy and mineral information needs.

Under the direction of David Dismukes, CMI coordinates university research in response to federal and state information needs regarding OCS development of the oil and gas industry, including environmental responses to changing energy extraction and transport technologies, analyses and synthesis of existing data/information from previous studies, and modeling of environmental, social, and economic processes.

Visit the LSU CMI page at www.cmi.lsu.edu



School of the
Coast & Environment
Coastal Marine Institute

Spring 2013 Presentations

By David Dismukes:

"Some Unconventional Thoughts on Regional Unconventional Gas and Power Generation Requirements," Gulf Coast Power Association Meetings, February 6.

"Industry Investments and the Economic Development of Unconventional Development," 2014 Tuscaloosa Marine Shale Conference & Expo, March 31.

"Regional Natural Gas Demand Growth: Industrial and Power Generation Trends," Kinetica Partners Shippers Meeting, April 30.

Visit www.enrg.lsu.edu/presentations
to view or download CES presentations.

"Energy Outlook 2035" Examines Global Energy Industry, Impact on Louisiana

On Tuesday, March 18, 2014, the Center for Energy Studies and the Grow Louisiana Coalition hosted "Energy Outlook 2035: The Global Energy Industry and Its Impact on Louisiana." The featured speaker was industry analyst Mark Finley, general manager, Global Energy Markets & U.S. Economics, BP. Panelists were James Richardson, director, LSU Public Administration Institute; Gifford Briggs, vice president Louisiana Oil & Gas Association; Chris John, president, Louisiana Mid-Continent Oil and Gas Association; and David Dismukes.

In his address, Finley explained that U.S. gas production would increase by 45 percent between 2012 and 2035, with shale gas production increasing an average of 4.3 percent during that time. The current boom means the U.S. will become a net exporter of liquefied natural gas in 2016.

His energy outlook included a prediction that oil would continue to serve as the primary transportation fuel through 2035; however, full hybrid vehicles will likely account for 24 percent of auto sales, and "mild" hybrids (internal combustion engines equipped with an electric machine), will account for 38 percent.

Finley's prediction regarding renewable energy sources, including biofuels, is an increase from 2 percent to 7 percent, surpassing that of nuclear power by 2025 and attaining the same level as hydro by 2035.

Coal will remain king for non-Organisation for Economic Cooperation and Development Countries through 2035, but for North America, the EU, and China, natural gas will serve as the primary power source.

Tuscaloosa Marine Shale Summit Addresses Economic, Environmental Impacts

The LSU Center for Energy Studies and the U.S. Oil and Gas Association co-hosted the Tuscaloosa Marine Shale Summit, March 31 and April 1, 2014, at the Natchez Convention Center in Natchez, Miss. The Summit examined economic impacts of the Tuscaloosa Marine Shale (TMS) Trend on the region, its environmental effects, and the safety concerns regarding oil transportation and storage along the Mississippi River. The goal of the Summit was to inform elected area leaders, the business community, and concerned citizens of the benefits and challenges of this billion-dollar investment. Job creation, business investments, environmental concerns, transportation, infrastructure, and storage were among the topics addressed.

In his presentation “Industry Investments and the Economic Development of Unconventional Development,” David Dismukes provided an overview of unconventional oil and gas development, explaining that natural gas production and reserves are at levels not seen since the 1970s, and both U.S. natural gas production and reserves are now at an all-time recorded peak and that unconventional resources are expected to continue to increase over the next two decades or more. The presentation is available at http://www.enrg.lsu.edu/files/images/presentations/2014/DISMUKES_TMS_PRESENTATION_final.pdf



“Manufacturing Renaissance” Focus of May Event

On Friday, May 9, CES and the American Shale & Manufacturing Partnership (ASMP) hosted the “Manufacturing Renaissance Discussion Series Regional Event,” at the Hilton Capitol Center. The event featured a senior-level discussion focusing on the potential of domestic shale resources and the resurgence of American manufacturing. The Baton Rouge event featured Governor Bobby Jindal as keynote speaker. Representatives from manufacturing companies and organizations, government agencies, environmental groups, and academia discussed federal and state policies; infrastructure; environment; research and innovation; and workforce education and jobs creation.

ASMP had previously hosted three other events in Pennsylvania, Ohio and Texas. Each event has served as an information-gathering tool to formulate a manufacturing renaissance policies framework scheduled for launch in 2015 in Washington, D.C.

National Geothermal Data System Launched

On April 30, the U.S. Department of Energy (DOE) formally launched the National Geothermal Data System (NGDS), which provides free online access to the nation's digital geothermal resources. All 50 U.S. state geological surveys contributed to the project. In June 2013, the Louisiana Geological Survey completed its contribution, which included well temperature data from more than 9,000 wells and eight relevant georeferenced geothermal related geologic maps.

The database is designed to facilitate the potential development of geothermal and geopressed-geothermal research in the U.S. by helping to mitigate much of the upfront risks associated with this resource development. More than 30 major types of data resulting in the availability of more than 7 million interoperable data points, including 650,000 well logs, 530,000 borehole temperatures, and 1.7 million oil and gas, water, and geothermal well headers are available through the database.

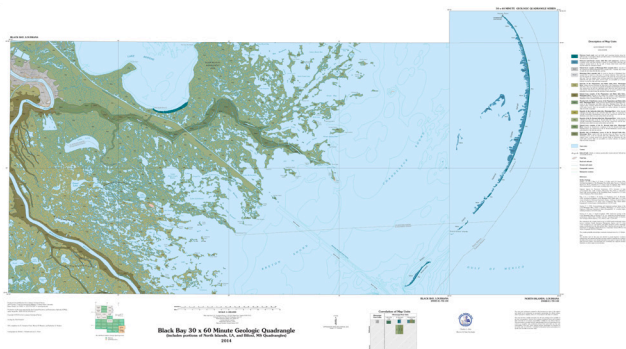
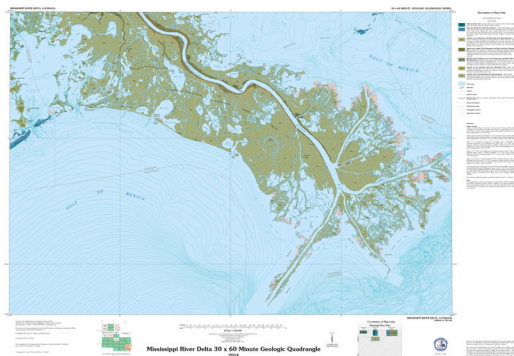
The state geological surveys' contributions to the NGDS project was funded by a \$21.9 million agreement from the DOE's Geothermal Technologies Office and led by the Arizona Geological Survey on behalf of the Association of American State Geologists (AASG).

Find out more about the National Geothermal Data System at <http://geothermaldata.org/> and the U.S. Geoscience Information Network at <http://usgin.org/>.



Geologic Mapping

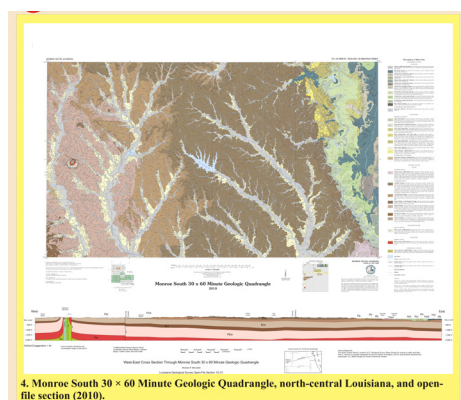
The Louisiana Geological Survey's production of lithographs of 30 × 60 minute geologic quadrangles previously compiled with STATEMAP support continued with two quadrangles in the eastern Mississippi River delta plain (Black Bay and Mississippi River Delta). The fiscal year 2013-2014 project has completed the 1:100,000 scale coverage of the state with GIS compilation for all 30x60 minute quadrangles by undertaking the final remaining two, Bastrop and Tallulah, in the northeastern corner of the state.



McCulloh Presents STATEMAP Summary to Geological Society of America

Richard P. McCulloh, Louisiana Geological Survey research associate, presented a poster summarizing the course of STATEMAP projects in Louisiana for a session on geologic mapping programs at the Geological Society of America (GSA) South-Central Section meeting, March 17-18, in Fayetteville, Arkansas. LGS's Paul V. Heinrich, John Snead, Marty Horn, R. Hampton Peele, Robert L. Paulsell, and Chacko J. John coauthored the poster.

Begun in the early 1990s, the STATEMAP projects are part of the National Cooperative Geologic Mapping Program. STATEMAP projects are conducted in annual cooperative agreements with the USGS. Through STATEMAP, the LGS will map the surface geology of the entire state at a scale of 1:100,000, which allows for abundant detail while covering relatively large areas. McCulloh provided a PowerPoint presentation about the poster for the GSA website.



RSO Participates in “Radiation Safety in Medicine” School

In February, LSU and the Mary Bird Perkins Cancer Center hosted a three-day professional development school titled “Radiation Safety in Medicine” at the Lod Cook Conference Center. The school offered continuing education to practicing radiation protection professionals, clinicians, and graduate students.

CES’s Wei-Hsung Wang, director of the LSU Radiation Safety Office (RSO), served as a co-academic dean and presented a course in “Management of an ALARA Radiological Control Program” at the school. Wang emphasized the importance of the program for radiation professionals. “Continuing education has been a key factor in achieving excellent radiation safety practice in medicine, research, and teaching,” he said.

More than 90 radiation professionals, mostly from the United States, who are engaged in advanced technology of radiation therapy, diagnostic radiology, and nuclear medicine, attended the event. The school was sponsored by the Health Physics Society, the American Association of Physicists in Medicine, the National Council on Radiation Protection and Measurements, and other organizations.

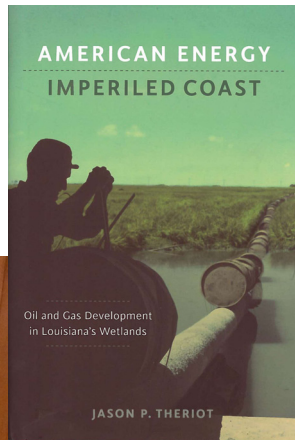


L to R: Radiation School deans Wei-Hsung Wang, Lorraine Day, and Wayne Newhauser.

Theriot Gives Seminar on *American Energy, Imperiled Coast*

On June 9, CES hosted a seminar and book signing by Jason Theriot, author of *American Energy, Imperiled Coast*. In the book, Theriot, an energy and environmental historian and consultant, describes the tension between oil and gas development and the land-loss crisis in Louisiana and includes an analysis of the successful, yet ecologically destructive, industrial growth in the region and the mounting environmental problems that threaten south Louisiana’s communities, culture, and “working” coast.

A former Energy Policy Fellow at Harvard University’s Kennedy School of Government, Theriot earned a doctorate in history from the University of Houston and a degree in journalism from Louisiana State University.



Author Jason Theriot signs a copy of his book *American Energy, Imperiled Coast*, published by the LSU Press, after a seminar June 9.

Jackson Awarded Outstanding Student Thesis Award

On May 9, Environmental Sciences graduate student Emily Jackson was awarded the LSU School of the Coast & Environment Outstanding Student Thesis Award for 2013-2014. Her thesis “Hydraulic Fracturing: A Look at the Haynesville Shale and the Environmental Effects of Fracking,” estimates an inventory of water use, air emissions, and chemicals used in the hydraulic fracturing and drilling process. It then compares the estimates to overall regional and state-wide uses of water, as well as various air emissions and chemical discharges, and provides estimates of “learning-by-doing” effects of operator environmental performance in the Haynesville shale. David Dismukes served as her lead professor on the research project.

“Emily’s thesis topic is one very important to Louisiana from an energy, environmental, and economic perspective,” Dismukes said. “Hers is the first comprehensive, independent environmental assessment of the Haynesville shale that examines water use, air emissions, and chemicals used in the drilling and hydraulic fracturing process.”

Jackson created an extensive database of well-specific observations and matched this data (available from the Louisiana Department of Natural Resources) with information from industry non-profit reporting sources such as “Frac Focus” to estimated overall water use and discharges. The research results include:

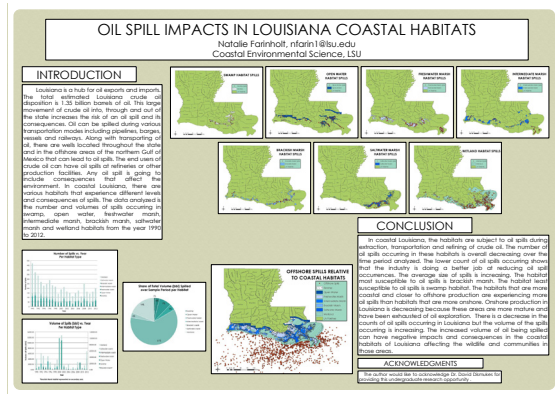
- A comprehensive inventory of air emissions, water use and chemical uses (in concentrations and volumetric terms). While some prior studies



Emily Jackson, left, with David Dismukes, graduated May 16 from the School of the Coast & Environment

have estimated Haynesville air emissions, those studies were based upon a number of assumptions, and not the types of well-specific characteristics utilized in Jackson's thesis.

- The relative size of the discharges and water uses to both overall statewide statistics and regional/local statistics. The thesis generally finds that, while discharges and water uses were moderate at the state-wide level, there were some significant local impacts that needed to be monitored, particularly regarding local water use.
- Preliminary findings that show that there are environmental "learning-by-doing" impacts associated with hydraulic fracturing: namely, that firms get better in their environmental performance as the number of wells drilled/fractured increases. Findings show that water use trends for major operators in the Haynesville improved their performance considerably relative to small players developing fewer wells.



Dismukes Directs Undergraduate Research

During the spring semester, David Dismukes directed the research of LSU undergraduate Natalie Farinholt, who presented her project, "Oil Spill Impacts in Louisiana Coastal Habitats," at the School of the Coast & Environment undergraduate research fair. Farinholt examined the number and volumes of spills occurring in swamp, open water, freshwater marsh, intermediate marsh, brackish marsh, saltwater marsh and wetland habitats from the year 1990 to 2012. Her research revealed that the number of oil spills occurring in coastal habitats was decreasing during the time period analyzed; the industry was more effective at reducing oil spill occurrences; the average size of spills was increasing; the habitat most susceptible to oil spills was brackish marsh, and the least susceptible was swamp.

Abedin Completes Thesis

Under the guidance of Ralph Pike and F. Carl Knopf, director and associate director of the Minerals Processing Research Division, respectively, and John A. Pojman, LSU professor of chemistry, M.S. student Rubaiyet Abedin completed her thesis, "Effect of Process Mixing on the Size Distribution and Mean Diameter of the Trithiol-Triacrylate Micro-Particles," in the spring semester. Her experimental research compared the performance of two chemical reactors for the formation of micro-particles. One was a new vibrating membrane chemical reactor developed by Knopf and a standard impeller chemical reactor that had been used in numerous previous studies. The new reactor demonstrated a 25 percent improvement in performance over the standard reactor.

CES Celebrates with Iledare

Wumi Iledare, professor of petroleum economics and policy research and the director of the Energy Information and Data Division, retired January 3, 2014, after 21 years of service to the Center for Energy Studies. The Center honored Wumi with a retirement party February 21. Guests included Wumi's wife, Joyce, close friends and current and former colleagues. Upon retirement, Wumi assumed directorship of the Emerald Energy Institute for Petroleum, Energy Economics, Policy and Strategic Studies at the University of Port Harcourt in Rivers State, Nigeria.

Wumi Iledare celebrated his retirement from LSU in February with current and former colleagues. Pictured clockwise from top are Ric Pincomb, Rita Jackson, Iledare, Barbara Kavanagh and Rama Ramachandran.



Save the date
ENERGY SUMMIT 2014
The Future of Louisiana Energy

Wednesday, October 22, 2014

presented by the **LSU CENTER FOR ENERGY STUDIES**
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The **Center for Energy Studies** conducts, encourages, and facilitates research and analysis to address energy-related problems or issues affecting Louisiana's economy, environment, and citizenry. Whether conducted by its staff or by others it supports, the Center's goal is to provide a balanced, objective, and timely treatment of issues with potentially important consequences for Louisiana.

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