

# Michael DeAngelo

## Professional Summary

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## Professional Preparation

### Academic Background

M.S. Geophysics, The University of Texas at El Paso, 1988

B.S. Geophysics, The University of Texas at El Paso, 1983

### Professional Appointments

Present Position: Research Scientist Associate, The University of Texas at Austin, Bureau of Economic Geology (August 1997 - Present). Experience in offshore/onshore exploration projects in which commercial quantities of hydrocarbons are targeted. Experience in reservoir characterization projects with emphasis on redevelopment strategies for mature reservoirs. Involved in vector-wavefield research.

Inventory Specialist, Petroleum Information, Houston, Texas (June 1992 - December 1996). Managed geological/geophysical data bases for numerous clients.

Assistant Party Manager, Western Geophysical, Brazil, South America (October 1988 - March 1991). Managed vibroseis and dynamite crews in Brazil. Supervised 117 employees. Billed USD\$5.5 million per year. Managed crew expenses of USD\$700k per year. Developed fluency in Portuguese and working knowledge of Spanish.

Geo-Technician, Exxon Company International, Houston, Texas (June 1988 - October 1988). Participated in exploration projects concentrating on identifying prospects within Cenozoic basins of Colombia, South America. Operated IBM mainframe computer; generated synthetic seismograms for well-to-seismic correlation.

### Professional Registrations and Certificates

Texas Board of Professional Geoscientists #3779 Geophysics

### Theses

Geophysical Anomalies in Southwestern New Mexico and Adjacent Areas, El Paso, Texas, The University of Texas at El Paso, M.S. thesis, 70 p., 1988

### Continuing Education Courses Taken

ParkSEIS - Multichannel Analysis of Surface Waves (MASW): ParkSEIS, Austin, Tex., April 30-May 1, 2019

Rock Solid Images: Seismic Attribute Workshop, Austin, Texas, November 2006

ProMax 2D/3D Training Course: Landmark, Austin, Texas, July 2005

Carbonate sequence stratigraphy and reservoir characterization: concepts and applications: Bureau of Economic Geology short course, The University of Texas at Austin, Drs. Scott Tinker and Charlie Kerans, instructors, Austin, Texas, May 2002

Understanding seismic anisotropy in exploration and exploitation: SEG Distinguished Instructor short course by Leon Thomsen, BP Amoco Upstream Technology, Houston, Texas, 2002

Seismic Sequence Stratigraphy: Bureau of Economic Geology, Austin, Texas,

STRATA: Hampson and Russell, Earth Imaging Solutions, Houston, Texas,

SYNTOOL: Landmark Graphics Corporation, Houston, Texas,

## Areas of Expertise

### Areas of Expertise

2-D/3-D seismic interpretation and seismic inversion analysis

Development of seismic vector-wavefield technologies

Geological/geophysical database management

Seismic data acquisition and 3D acquisition design

## Awards

### Awards and Honorary Societies

Bureau of Economic Geology Author Achievement Award, 2016

Bureau of Economic Geology Author Achievement Award, 2009, 2011, 2014

## Service

### External Committees Participation

Member, Technical Program Committee, Society of Exploration Geophysicists, 87th Annual International Meeting, Houston, Tex., 2017

Member, Editorial Board, Interpretation, Society of Exploration Geologists, January, 2013

Key Contact, Technical Program Committee, 77th Annual International Meeting, Society of Exploration Geophysicists, 2007

Key Contact, Technical Program Committee, 71st Annual International Meeting, Society of Exploration Geophysicists, 2001

## Presentations

### Presentations

Early Miocene High Island Delta System, Offshore Texas and Louisiana: presented at AAPG annual meeting, San Antonio, Tex., May 19-22, 2019.

Evaluation of the seismic structural and stratigraphic framework of the Upper Texas Shelf and its potential for CCS: presented to IEAGHG members, presented at International Workshop on Offshore Geologic CO<sub>2</sub> Storage: Digital Poster, Austin, Texas, April 21, 2016.

Integrated 4C2D OBC seismic data registration of near-seafloor sediments, Green Canyon, Gulf of Mexico: presented at the Exploration Geophysics Laboratory Spring Sponsors' Meeting, Austin, Texas, April 17, 2008.

## Activities of a Professional Nature

### Professional Societies

Society of Exploration Geophysicists

Texas Board of Professional Geoscientists #3779 (Geophysics)

## Funding

### Research Support

Principal Investigator: Sabine Pass CO2 Site Assessment - Phase I, Cheniere Energy (June 5-August 1, 2019; \$29,907.00).

## Publications

### Peer Reviewed Journal Articles

DeAngelo, M. V., Fifariz, R., Meckel, T., and Treviño, R. H., 2019, A seismic-based CO<sub>2</sub>-sequestration regional assessment of the Miocene section, northern Gulf of Mexico, Texas and Louisiana: *International Journal of Greenhouse Gas Control*, v. 81, p. 29-37, <http://doi.org/10.1016/j.ijggc.2018.12.009>.

Olariu, M. I., DeAngelo, M., Dunlap, D., and Treviño, R. H., 2019, High frequency (4th order) sequence stratigraphy of Early Miocene deltaic shorelines, offshore Texas and Louisiana: *Marine and Petroleum Geology*, v. 110, p. 575-586, <http://doi.org/10.1016/j.marpetgeo.2019.07.040>.

DeAngelo, M., and Hardage, B. A., 2016, Comparing P-P, P-SV, and SV-P mode waves in the Midland Basin, West Texas: *Interpretation*, v. 4, no. 2, p. T183-T190, <http://doi.org/10.1190/INT-2015-0170.1>.

DeAngelo, M., and Hardage, B. A., 2014, Application of 3C/3D converted mode reflections, King County, Texas: *Interpretation*, v. 2, no. 2, p. SE39-SE45, <http://doi.org/10.1190/INT-2013-0181.1>

Wei, S., DeAngelo, M., and Hardage, B. A., 2014, Advantages of joint interpretation of P-P and P-SV seismic data in geothermal exploration: *Interpretation*, v. 2, no. 2, p. SE117-SE123, <http://doi.org/10.1190/INT-2013-0084.1>

Wei, S., DeAngelo, M., and Hardage, B. A., 2014, Interpretation of multicomponent seismic data across Wister geothermal field, Imperial Valley, California: *Interpretation*, v. 2, no. 2, p. SE125-SE135, <http://doi.org/10.1190/INT-2013-0083.1>

Yuan, S., DeAngelo, M., and Hardage, B. A., 2014, Interpretation of fractures and joint inversion using multicomponent seismic data -- Marcellus Shale example: *Interpretation*, v. 2, no. 2, p. SE55-SE62, <http://doi.org/10.1190/INT-2013-0146.1>

DeAngelo, M. V., and Hardage, B. A., 2013, A 3C/3D analysis of the Appalachian Basin Hamilton Group, Northeastern Pennsylvania: *Journal of Seismic Exploration*, v. 22, p. 271-293.

Sava, D., Hardage, B. A., DeAngelo, M., and Murray, P., 2011, Evaluating marine gas-hydrate systems, part II: rock-physics joint inversion of electrical resistivity and seismic velocities: *Journal of Seismic Exploration*, v. 20, p. 105-118.

DeAngelo, M. V., Sava, D. C., Hardage, B. A., and Murray, P. E., 2010, Integrated 2D 4-C OBC analysis for estimating hydrate concentrations, Green Canyon, Gulf of Mexico: *Journal of Seismic Exploration*, v. 19, p. 263-278.

DeAngelo, M. V., Murray, P. E., Hardage, B. A., and Remington, R. L., 2008, Integrated 2D 4-C OBC velocity analysis of near-seafloor sediments, Green Canyon, Gulf of Mexico: *Geophysics*, v. 73, no. 6, p. B109-B115.

Hernández-Mendoza, J. J., DeAngelo, Michael, Wawrzyniec, T. F., and Hentz, T. F., 2008, Major structural elements of the Miocene section, Burgos Basin, northeastern Mexico: *AAPG Bulletin*, v. 92, no. 11, p. 1479-1499. [DeAngelo is the true senior author. As a condition for publication of this PEMEX-funded study, PEMEX required one of its personnel to be listed as first author.]

Hernández-Mendoza, J. J., Hentz, T. F., DeAngelo, Michael, Wawrzyniec, T. F., Sakurai, Shinichi, Talukdar, S. C., and Holtz, M. H., 2008, Miocene chronostratigraphy, paleogeography, and play framework of the Burgos Basin, southern Gulf of Mexico: *AAPG Bulletin*, v. 92, no. 11, p. 1501-1535. [Hentz is the true senior author. As a condition for publication of this PEMEX-funded study, PEMEX required one of its personnel to be listed as first author.]

## Peer Reviewed Book Chapters

Hardage, B. A., Murray, P., Remington, R. L., DeAngelo, M., Sava, D., Roberts, H. H., Shedd, W. W., and Hunt, J., Jr., 2009, Chapter 4. Multicomponent seismic technology assessment of fluid-gas expulsion geology and gas-hydrate systems: Gulf of Mexico, in Collett, T., Johnson, A., Knapp, C., and Boswell, R., eds., *Natural gas hydrates--energy resource potential and associated geologic hazards*: AAPG, Memoir 89, 247-265.

## Non Peer Reviewed Authored Books

Hardage, B. A., DeAngelo, M. V., Murray, P. E., and Sava, D., 2011, *Multicomponent seismic technology*: Tulsa, Society of Exploration Geophysicists, Geophysical References Series No. 18, 318 p.

## Non Peer Reviewed Journal Articles

Hardage, B. A., DeAngelo, M., Sava, D., Wagner, D. E., Murray, P. E., Sullivan, C., Simmons, J. L., Jr., Ebrom, D., Roche, S., and Zhou, R., 2014, Introduction to special section: multicomponent seismic interpretation: *Interpretation*, v. 2, no. 2, p. SEi-SEii, <http://doi.org/10.1190/INT2014-0324-SPSEINTRO.1>.

DeAngelo, Michael, 2009, Hunting for gas hydrates in the Gulf of Mexico, in Laubach, S. E., and Tinker, S. W., eds., 2009, *Earth's art: celebrating the Centennial of the Bureau of Economic Geology, 1909-2009*: The University of Texas at Austin, Bureau of Economic Geology, p. 96-97.

Hardage, B. A., Sava, Diana, Murray, Paul, and DeAngelo, Michael, 2009, Resource potential of deep-water hydrates across the Gulf of Mexico: part 2, evaluating hydrate systems with 4C OBC seismic data, in Carr, T., D'agostino, T., Ambrose, W., Pashin, J., and Rosen, N. C., eds. *Unconventional energy resources: making the unconventional conventional: 29th Annual GCSSEPM Foundation Bob F. Perkins Research Conference*, December 6-8, Houston, p. 117-149.

Hardage, B. A., DeAngelo, Michael, and Remington, R. L., 2008, Going super-deep with P-P, P-SV data: *AAPG Explorer, Geophysical Corner*, v. 29, no. 2, p. 32.

Hardage, B. A., Sava, Diana, Remington, R. L., and DeAngelo, Michael, 2008, Rocks-physics theory a help: *AAPG Explorer, Geophysical Corner*, v. 29, no. 1, p. 34.

Hardage, B. A., DeAngelo, Michael, and Sava, Diana, 2007, Why do P-wave wipeout zones occur?: *AAPG Explorer, Geophysical Corner*, v. 28, no. 3, p. 48.

Hardage, B. A., Sava, Diana, DeAngelo, Michael, and Remington, R. L., 2007, Which seismic wave mode is best?: *AAPG Explorer, Geophysical Corner*, v. 28, no. 4, p. 32.

Hardage, B. A., and DeAngelo, M. V., 2006, S-wave analysis of fracture systems: *AAPG Explorer*, v. 27, no. 10, p. 42.

Hardage, B. A., and DeAngelo, Michael, 2006, S-waves and fractured reservoirs: *AAPG Explorer*, v. 27, no. 11, p. 36.

Hardage, B. A., DeAngelo, Michael, Sava, Diana, and Remington, Randy, 2006, Technology can avoid the fizzles: *AAPG Explorer, Geophysical Corner*, March, p. 28-29.

Hardage, B. A., Remington, Randy, DeAngelo, Michael, and Fouad, Khaled, 2006, Imaging deep gas in crowded areas: *AAPG Explorer, Geophysical Corner*, April, p. 38.

DeAngelo, M. V., Remington, Randy, Murray, P. E., Hardage, B. A., Graebner, Robert, and Fouad, Khaled, 2004, Multicomponent seismic technology for imaging deep gas prospects: *The Leading Edge*, December, p. 1270-1281.

De Angelo, M. V., Backus, Milo, Hardage, B. A., Murray, Paul, and Knapp, Steve, 2003, Depth registration of P-wave and C-wave seismic data for shallow marine sediment characterization, Gulf of Mexico: *The Leading Edge*, v. 22, no. 2, p. 96-105.

Hardage, B. A., DeAngelo, Michael, and Murray, Paul, 2003, Defining P-wave and S-wave stratal surfaces with nine-component VSPs: The Leading Edge, v. 22, no. 8, p. 720-729.

Holtz, M. H., Lake, L. W., Zeng, Hongliu, Knox, Paul, and DeAngelo, Mike, 2003, 3-D geocellular modeling of Gulf Coast Miocene water-drive gas reservoirs--example from Starfak field, Louisiana, in Proceedings, Third Annual E-EXITEP, Veracruz, Mexico: CIPM, 12 p.

Wood, L. J., Hentz, Tucker, Zeng, Hongliu, DeAngelo, Michael, and Dutton, Shirley, 2003, Applying sequence stratigraphy and seismic stratal slice technology in the Gulf of Mexico: GasTIPS, v. 9, no. 1, p. 10-21.

De Angelo, Michael, and Wood, L. J., 2001, 3-D seismic detection of undrilled prospective areas in a mature province, South Marsh Island, Gulf of Mexico: The Leading Edge, v. 20, no. 11, p. 1282-1292.

## Contract Reports

Hardage, B. A., DeAngelo, M. V., Fomel, Sergey, Fouad, Khaled, Murray, P. E., Remington, Randy, and Sava, Diana, 2007, Imaging super-deep gas plays across the Gulf of Mexico shelf with multicomponent seismic technology: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for the U.S. Department of Energy, under DOE Contract DE-FC26-04NT42239, 84 p.

Hardage, B. A., Backus, M. M., DeAngelo, Michael, Fomel, S. B., Fouad, Khaled, Graebner, R. J., Murray, Paul, Remington, R. L., and Sava, Diana, 2006, Elastic wavefield stratigraphy: an emerging seismic technology: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for U.S. Department of Energy, under DOE contract DE-PS26-02NT15375, 86 p.

Hardage, B. A., Backus, M. M., DeAngelo, M. V., Graebner, R. J., Laubach, S. E., and Murray, Paul, 2004, Combining a new 3-D seismic S-wave propagation analysis for remote fracture detection with a robust subsurface microfracture-based verification technique: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for U.S. Department of Energy, under contract no. DE-AC26-00NT40690, 72 p.

Hardage, B. A., Backus, Milo, DeAngelo, Michael, Fomel, Sergey, Fouad, Khaled, Graebner, Robert, Murray, Paul, and Remington, Randy, 2004, Imaging deep gas prospects using multicomponent seismic technology: The University of Texas at Austin, Bureau of Economic Geology, final project report prepared for Research Partnership to Secure Energy for America, under contract no. GRI-04/0186, 31 p.

Hentz, T. F., Ambrose, W. A., DeAngelo, Michael, Holtz, M. H., Sakurai, Shinichi, Talukdar, S., Wawrzyniec, T. F., Dunlap, D. B., Dutton, S. P., Guevara, E. H., Nance, H. S., Yeh, J. S., Bouroullec, Renaud, Brown, L. F., Jr., Martinez Sierra, Ricardo, Hernández-Mendoza, J. J., Ramos Gallardo, Hilario, Alvarado Cespedes, Alberto, Marino Castanon, Alberto, Machado Simental, Ruben, Ayala Anguiano, Ramiro, and Segura Trevino, Alberto, 2004, Definition of the geological framework and exploration plays of the Miocene of the Burgos Basin, northern Mexico: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for Pemex in two volumes, Spanish and English, variously paginated + 5 vols. Plates.

Potter, E. C., Hentz, T. F., Kim, E. M., Olson, J. E., Yeh, J. S., and DeAngelo, M. V., 2004, Jackson Endowed Fund lease holdings: portfolio refinement and opportunities for incremental production: The University of Texas at Austin, Bureau of Economic Geology, final report submitted to the Geology Foundation, The University of Texas at Austin, 48 p. + 2 vols. of plates.

Kerans, Charles, Loucks, Robert, Janson, Xavier, Sakurai, Shinichi, DeAngelo, Michael, Holtz, Mark, Guevara, Edgar, and Dunlap, Dallas, 2003, Integrated reservoir characterization of the Poza Rica field within a sequence stratigraphic framework: phase 1--data, sequence framework, and petrophysics: The University of Texas at Austin, Bureau of Economic Geology, final report

prepared for PEMEX Exploracion y Produccion, variously paginated, 3 CD-ROM's.

Hardage, B. A., Backus, M. M., De Angelo, Michael, Fomel, Sergey, Graebner, R. J., Murray, Paul, and Wood, L. J., 2002, Characterizing marine gas-hydrate reservoirs and determining mechanical properties of marine gas-hydrate strata with 4-component ocean-bottom-cable seismic data: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for U.S. Department of Energy, under contract no. DE-FC26-00NT41024, 43 p. + apps.

Hardage, B. A., Backus, M. M., De Angelo, Michael, Graebner, R. J., Murray, Paul, and Wood, L. J., 2002, Characterizing marine gas-hydrate reservoirs and determining mechanical properties of marine gas-hydrate strata with 4-component ocean-bottom-cable seismic data: The University of Texas at Austin, Bureau of Economic Geology, annual report prepared for U.S. Department of Energy, under contract no. DE-FC26-00NT41024, 37 p. + figs.

Hentz, T. F., Wood, L. J., DeAngelo, M. V., Zeng, Hongliu, Holtz, M. H., Dutton, S. P., Chan, Ke-Sheng, Rassi, Claudia, Garcia, Javier, Kim, E. M., Dunlap, D. B., Barba, R. E., and Knox, P. R., 2002, Targeting reserve growth opportunities in the northern Gulf of Mexico Basin: transferring secondary gas recovery technology to the offshore environment: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for the U.S. Department of Energy, National Energy Technology Laboratory, under contract no. DE-FC26-98FT40136DOE, 237 p. + CD-ROM.

Hardage, B. A., De Angelo, Michael, and Remington, R. L., 2001, Seismic detection and analysis of underground laboratory facilities: The University of Texas at Austin, Bureau of Economic Geology and Institute for Advanced Technology, final report for Year One prepared for U.S. Department of the Army, U.S. Army Research Laboratory, under contract no. DAAA21-93-C-0101, 11 p. + figs.

Wood, L. J., De Angelo, Michael, Hentz, T. F., Zeng, Hongliu, and Holtz, M. H., 2001, Targeting reserve growth opportunities in the northern Gulf of Mexico Basin: transferring secondary gas recovery technology to the offshore environment: The University of Texas at Austin, Bureau of Economic Geology, technical progress report: year 3 prepared for the U.S. Department of Energy, National Energy Technology Laboratory, under contract no. DE-FC26-98FT40136DOE, 64 p., 2 encl.

De Angelo, Michael, Hentz, T. F., Wood, L. J., Zeng, Hongliu, and Barba, R. E., Jr., 2000, Targeting reserve growth opportunities in the northern Gulf of Mexico Basin: transferring secondary gas recovery technology to the offshore environment: The University of Texas at Austin, Bureau of Economic Geology, technical progress report: year 2 prepared for U.S. Department of Energy, National Energy Technology Laboratory, under contract no. DE-FC26-98FT40136, 59 p.

Hamilton, D. S., Ambrose, W. A., Barba, R. E., Jr., De Angelo, Michael, Tyler, Noel, Yeh, J. S., Dunlap, D. B., and Laubach, S. E., 1999, Hydrocarbon production opportunities defined by integrated reservoir characterization, Guarico 13/10 Area, eastern Venezuela: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for Teikoku Oil de Sanvi Guere, C.A., 95 p. + app. + attachments.

Hardage, B. A., Simmons, J. L., Jr., and De Angelo, Michael, 1999, Development of active seismic vector-wavefield imaging technology for geothermal applications: The University of Texas at Austin, Bureau of Economic Geology, final project report prepared for the U.S. Department of Energy, Idaho Operations Office, under Grant No. DE-FG07-97ID133573, 31 p. + figs.

Hentz, T. F., Zeng, Hongliu, Wood, L. J., Kilic, Cem, Yeh, J. S., Skolnakorn, J., and De Angelo, Michael, 1999, Targeting reserve growth opportunities in the northern Gulf of Mexico Basin: transferring secondary gas recovery technology to the offshore environment: The University of Texas at Austin, Bureau of Economic Geology, technical progress report: year 1 prepared for

U.S. Department of Energy, Federal Energy Technology Center, under contract no. DE-FC-26-98FT40136, 40 p.

Knox, P. R., De Angelo, Michael, Hamilton, D. S., Ambrose, W. A., Tyler, Roger, and Tyler, Noel, 1999, Hydrocarbon production opportunities defined by sequence stratigraphic analysis and depositional systems characterization, East Guarico Unit, eastern Venezuela: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for Teikoku Oil de Venezuela, C.A., 115 p. + 98 pls.

Hamilton, D. S., Fouad, Khaled, Barba, R. E., Jr., De Angelo, Michael, and Dunlap, D. B., 1998, Hydrocarbon production opportunities defined by sequence stratigraphic analysis and depositional systems characterization, Sanvi-Guere Unit, eastern Venezuela: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for Teikoku Oil de Sanvi-Guere, C.A., 12 volumes, 110 p.

Hamilton, D. S., Fouad, Khaled, Barba, R. E., Jr., De Angelo, Michael, and Dunlap, D. B., 1998, Hydrocarbon production opportunities defined by sequence stratigraphic analysis and depositional systems characterization, Sanvi-Guere Unit, eastern Venezuela: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for Teikoku Oil de Sanvi-Guere, C.A., 72 p.

### Published Reports

De Angelo, Michael, and Hardage, B. A., 2001, Using 3-D seismic coherency and stratal surfaces to optimize redevelopment of waterflooded reservoirs, Cut Bank field, Montana: The University of Texas at Austin, Bureau of Economic Geology Geological Circular 01-1, 24 p.

### Workshop Workbooks

Hardage, B. A., Backus, M. M., DeAngelo, Michael, Fomel, S. B., Fouad, Khaled, Graebner, R. J., Murray, Paul, and Remington, R. L., 2004, Imaging deep gas prospects using multicomponent seismic technology: The University of Texas at Austin, Bureau of Economic Geology, 52 p.

### Published Abstracts

Treviño, R. H., Meckel, T., Olariu, M. I., Dunlap, D. B., DeAngelo, M., Lu, J., Sabbagh, R., and Klovov, A., 2018, Offshore CO<sub>2</sub> storage resource assessment of the northwest Gulf of Mexico Inner Continental Shelf, upper Texas - western Louisiana coast (ext. abs.): AAPG Datapages Search and Discovery, no. 80630, 27 p.

Gupta, M., DeAngelo, M., and Hardage, B. A., 2015, P-P and S-S wave interpretation of a carbonate formation: a case study from the Arbuckle interval in Wellington field, Kansas. (ext. abs.): Society of Exploration Geophysicists International Exposition and 85th Annual Meeting, 18-23 October, New Orleans, LA., p. 2082-2087, <http://doi.org/10.1190/segam2015-5834398.1>.

Hardage, B. A., Murray, P. E., Remington, R. L., DeAngelo, M., Sava, D., Roberts, H. H., Shedd, W. W., and Hunt, J., Jr., 2009, Multicomponent seismic technology assessment of fluid-gas expulsion geology and gas-hydrate systems: Gulf of Mexico (ext. abs.), in Collett, T., Johnson, A., Knapp, C., and Boswell, R., eds., Natural gas hydrates--energy resource potential and associated geologic hazards: AAPG Memoir 89, p. 13-15.

Hardage, B. A., Sava, Diana, and DeAngelo, Michael, 2009, Resource potential of deep-water hydrates across the Gulf of Mexico: part 2, evaluating hydrate systems with 4C OBC seismic data (abs.), in Unconventional energy resources: making the unconventional conventional: 29th Annual GCSSEPM Foundation Bob F. Perkins Research Conference, December 6-8, Houston, p. 7.

Murray, P. E., and DeAngelo, M. V., 2008, Simultaneous P- and S-wave interval velocity model building of near-seafloor geology using OBC data (ext. abs.), in SEG Las Vegas 2008 Annual Meeting, p. 1038-1042.

Sava, D. C., Hardage, B. A., Murray, P., and DeAngelo, M., 2008, Quantitative integration of electrical resistivity logs and seismic velocities for reducing the uncertainty in evaluating deep-water gas-hydrate systems (abs.), in SEG D&P Forum on Uncertainty and Upscaling Issues in Reservoir Characterization, July 27-31, Austin.

Sava, D. C., Hardage, B. A., Murray, P., and DeAngelo, M., 2008, Rock-physics joint inversion of resistivity log and seismic velocity for hydrate-characterization (exp. abs.), in Society of Exploration Geophysicists Expanded Abstracts, November 9-14, Las Vegas.

Sava, D. C., Hardage, B. A., Murray, P., DeAngelo, M., 2008, Rock-physics joint inversion of resistivity log and seismic velocity for hydrate-characterization (ext. abs.): Society of Exploration Geophysicists Expanded Abstracts, November 9-14, Las Vegas.

Hentz, T. F., DeAngelo, Michael, Wawrzyniec, T. F., Brown, L. F., Jr., Sakurai, Shinichi, Ambrose, W. A., Cuevas, Antonio, and Hernández-Mendoza, J. J., 2005, Miocene depositional and chronostratigraphic framework: relation to potential gas exploration in the Burgos Basin, northeastern Mexico (abs.), in *Plays y yacimientos de aceite y gas en rocas siliciclasticas*, Reynosa, Mexico: Pemex, CD-ROM, 1 p.

Hentz, T. F., Ambrose, W. A., DeAngelo, M. V., Wawrzyniec, T. F., Holtz, M. H., Sakurai, Shinichi, Talukdar, S. C., Cuevas, Antonio, and Hernández-Mendoza, J. J., 2004, Miocene play definition and chronostratigraphic framework of the Burgos Basin, northeastern Mexico (abs.), in AAPG International Conference & Exhibition, Cancun, Mexico, official program book: American Association of Petroleum Geologists, p. A30. Also on CD-ROM.

Hentz, T. F., DeAngelo, Michael, Wawrzyniec, T. F., Brown, L. F., Jr., Sakurai, Shinichi, Ambrose, W. A., Cuevas, Antonio, and Hernández-Mendoza, J. J., 2004, Miocene depositional and chronostratigraphic framework: relation to potential gas exploration in the Burgos Basin, northeastern Mexico (abs.): American Association of Petroleum Geologists Annual Convention Abstracts Volume, v. 13, p. A62.

Murray, Paul, Backus, Milo, DeAngelo, Michael, Fomel, Sergey, Graebner, Robert, Hardage, Bob, and Wood, Lesli, 2004, Evaluating marine gas hydrates with 4-C OBC seismic data (abs.): American Association of Petroleum Geologists Annual Convention Abstracts Volume, v. 13, p. A102.

Wawrzyniec, T. F., Hentz, Tucker, DeAngelo, Michael, Cuevas, Antonio, Hernández-Mendoza, J. J., and Sánchez-Barreda, L. A., 2004, Termination of the offshore northern Gulf of Mexico structural style, Burgos Basin, Mexico (abs.): American Association of Petroleum Geologists Annual Convention Abstracts Volume, v. 13, p. A146.

Fomel, S. B., Backus, M. M., DeAngelo, Michael, Murray, Paul, and Hardage, B. A., 2003, Multicomponent seismic data registration for subsurface characterization in the shallow Gulf of Mexico (ext. abs.), in Offshore Technology Conference, OTC Paper No. 15117, 4 p.

Murray, Paul, DeAngelo, Michael, Backus, M. M., Hardage, B. A., Graebner, R. J., and Fomel, S. B., 2003, Interpreting multicomponent seismic data in the Gulf of Mexico for shallow sedimentary properties (ext. abs.), in Offshore Technology Conference, OTC Paper No. 15118, 5 p.

Holtz, M. H., Zeng, Hongliu, Knox, P. R., and De Angelo, Michael, 2002, Assigning petrophysical properties in gas reservoir 3-D geocellular modeling, by integrating geophysics, geology, and reservoir engineering (abs.), in SPWLA European Symposium Transactions, September 4-6, London: Society of Professional Well Log Analysts, Paper F2C, unpaginated.

Wood, L. J., De Angelo, Michael, Zeng, Hongliu, Hentz, T. F., Holtz, M. H., Kim, E. M., and Bergquist, Bill, 2002, Exploring nontraditional hydrocarbon traps for gas resource additions in the shallow Gulf of Mexico shelf, U.S.A. (abs.): Gulf Coast Association of Geological Societies Transactions, v. 52, p. 1018.