

BULLETIN

Corpus Christi Geological Society



and

Coastal Bend Geophysical Society



**January
2025
ISSN 0739 5620**

Table of Contents

Officers, Committees and Chairpersons for CCGS/CBGS.....	2-3
CCGS/CBGS Joint Calendar of Meetings & Events.....	4-5
Membership Renewal CCGS/CBGS.....	6
CCGS President’s Letter.....	7
Advertising in the Bulletin.....	8
CBGS President’s Letter.....	11
Luncheon Meeting Announcement, Jan. Speaker: Chuck Benson.....	13-15
Luncheon Meeting Announcement, Feb. Speaker: Jason Ashby.....	17-18
Slides: Using Bandwith Extensions and Phase Information as Tools in Seismic Interpretation	20-31
CCGS Papers available for purchase at the Bureau of Economic Geology.....	35
Geo Link Post.....	36
Type Logs of South Texas Fields.....	37
Order Oil Men DVD.....	38
Wooden Rigs Iron Men.....	39
Professional Directory.....	40



CORPUS CHRISTI GEOLOGICAL SOCIETY

P.O. BOX 1068* C.C.TX. 78403

2024-2025

www.ccgeo.org

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AAPG DELEGATE

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GEOLOGICAL SOCIETY COMMITTEES & CHAIRPERSONS

MEMBERS PLEASE NOTE COMMITTEES CONTINUE TO FUNCTION WITHOUT A NAMED CHAIR, ALL ARE WELCOME TO ANY COMMITTEE THAT SUITES YOUR INTEREST

Advertising/Bus. Cards Arrangements	Leighton Devine Wes Gisler & Will Graham	361-882-8400 830-239-4651 361-885-0110	ldevine@suemaur.com arrangements@ccgeo.org willg@headingtonenergy.com
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Fishing Tournament	Leighton Devine	361-882-8400	ldevine@suemaur.com
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P.O. BOX 2741 *C.C. TX. 78403
2024-2025

OFFICERS

President	Dr. Mohamed Ahmed	361-825-3278	mohamed.ahmed@tamucc.edu
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Golf Chairman	Mark Wiley	361-902-2844-office 361-445-6712-mobile	Mark_Wiley@eogresources.com
Scholarship Chairman	Matt Hammer	361-888-4792 361-563-6137	mhammer@royalcctx.com

**Visit the geological
web site at
www.ccgeo.org**

CCGS/CBGS JOINT MEETING SCHEDULE 2024-2025

September 2024							October 2024							November 2024							
S	M	T	W	Th	F	S	S	M	T	W	Th	F	S	S	M	T	W	Th	F	S	
1	2	3	4	5	6	7			1	2	3	4	5							1	2
8	9	10	11	12	13	14	6	7	8	9	10	11	12	3	4	5	6	7	8	9	
15	16	17	18	19	20	21	13	14	15	16	17	18	19	10	11	12	13	14	15	16	
22	23	24	25	26	27	28	20	21	22	23	24	25	26	17	18	19	20	21	22	23	
29	30						27	28	29	30	31			24	25	26	27	28	29	30	

2024-25 Membership Kickoff—Nueces Brewing Co. Downtown, 5-8 p.m.

Meeting at Joe’s Crab Shack Downtown. 11:00 Bar, 11:45 lunch, 12:00 speaker. Speaker: Julie Bloxson Associate Professor at Stephen F. Austin State University. “Understanding the Lithium Content Trends in the Smackover Formation”

Meeting at Joe’s Crab Shack Downtown. 11:00 Bar, 11:45 lunch, 12:00 Speaker: Mark Morford, Geophysicist (Technical Sales), Lumina “State-of-the Art Seismic Processing.”

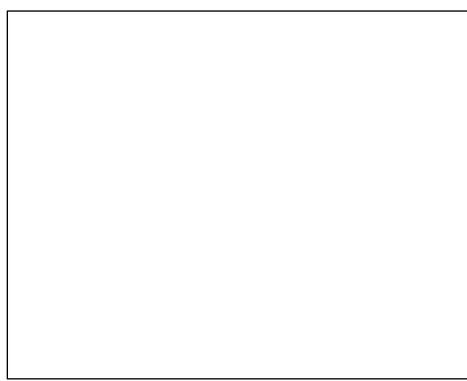
December 2024							January 2025							February 2025						
S	M	T	W	Th	F	S	S	M	T	W	Th	F	S	S	M	T	W	Th	F	S
1	2	3	4	5	6	7				1	2	3	4							1
8	9	10	11	12	13	14	5	6	7	8	9	10	11	2	3	4	5	6	7	8
15	16	17	18	19	20	21	12	13	14	15	16	17	18	9	10	11	12	13	14	15
22	23	24	25	26	27	28	19	20	21	22	23	24	25	16	17	18	19	20	21	22
29	30	31					26	27	28	29	30	31		23	24	25	26	27	28	

Meeting at Joe’s Crab Shack Downtown. 11:00 Bar, 11:45 lunch, 12:00 speaker: Chuck Benson, USAF Meteorologist (Retired). “Hurricanes of the Coastal Bend.”

Meeting at Joe’s Crab Shack Downtown. 11:00 Bar, 11:45 lunch, 12:00 speaker: Jason Ashby. “Hydrogen As a Future Alternative Source of Energy.”

CCGS/CBGS Joint Meeting Schedule 2024-2025

March 2025							April 2025							May 2025						
S	M	T	W	Th	F	S	S	M	T	W	Th	F	S	S	M	T	W	Th	F	S
						1			1	2	3	4	5					1	2	3
2	3	4	5	6	7	8	6	7	8	9	10	11	12	4	5	6	7	8	9	10
9	10	11	12	13	14	15	13	14	15	16	17	18	19	11	12	13	14	15	16	17
16	17	18	19	20	21	22	20	21	22	23	24	25	26	18	19	20	21	22	23	24
23	24	25	26	27	28	29	27	28	29	30				25	26	27	28	29	30	31
30	31																			



Meeting at Joe's Crab Shack
downtown. 11:00 Bar, 11:45
lunch, 12:00 speaker

Calendar Of Meetings and Events

- Corpus Christi Geological/Geophysical Society..... Third Wed.—11:30a.m.
- SIPES Corpus Christi Luncheons..... Last Tues.—11:30a.m.
- South Texas Geological Society Luncheons..... Second Wed—noon San Antonio
- San Antonio Geophysical Society Meetings..... Fourth Tuesday
- Austin Geological Society..... First Monday
- Houston Geological Society Luncheons..... Last Wednesday
- Central Texas Section of Society of Mining, Metallurgy & Exp..... 2nd Tues every other month in San Antonio

www.ccgeo.org



It is time to renew membership in the Corpus Christi Geological Society and/or the Coastal Bend Geophysical Society.

The easiest way to do that is to use our pay online website found at **<https://corpus-christi-geological-society.square.site/>**

Or use your smartphone with this QR Code





CCGS PRESIDENT'S LETTER

Greetings to All,

Welcome to a new year. Hopefully you had a little time to enjoy family and friends plus recharge your batteries to be ready for your next challenge. I had a busy November and early December, but I also had me time to get ready for the new year.

This year we have some interesting talks on the horizon, and we are planning a special event for the April meeting. Do you realize that our talks and events are planned by a few volunteers? Notice I said a FEW volunteers. The CCGS, your society, depends on volunteers. I'm sure you can see what I am leading up to in the next paragraph.

VOLUNTEERISM has been shown in credible studies to contribute to professional development, fosters a strong sense of social responsibility and enhances feelings of solidarity with your peers. My volunteerism began many years ago in college. I served on multiple campus activities, committees as well as positions in my fraternity. I am challenging each and every one of our members to step up and lend a hand in our society.

At the CCGS/CBGS November meeting the geophysical/seismic talk was well received, and many questions were discussed. We are fortunate the volunteers who put these talks together do such a great job to deliver quality presentations.

It is an honor for me to be your President. Please feel free to contact me with questions and/or concerns. Leave a message, and I will return your calls or emails. Remember the future is now, so please VOLUNTEER.

Dennis O. Moore
President CCGS 2023-2025
moore.dennis24@yahoo.com

SUPPORT YOUR SOCIETY

Advertise !!!

with the CCGS - CBGS

MONTHLY BULLETIN ADS

CCGS - CBGS Bulletin Ad Space Available: Annual Rates (4 issues + directory)	1/4 page 3.6" x 4.3" \$200
1/8 page 2.2" x 3.6" \$150	
1/2 page 7.2" x 4.3" \$300	
Full page 7.2" x 8.6" \$500	Inside Front or Back Cover \$650

FOR MORE DETAILS:

EMAIL LDEVINE@SUEMAUR.COM OR CALL (361) 510-8872

The 2024-2025 season is underway, and we would like to offer very inexpensive advertising opportunities to our members and industry partners. The CCGS has four bulletins distributed to all our members each year. Ads defray the cost of producing and distributing print and PDF Bulletins.

We have lots of space available for various-sized ads, and we run business card ads at the back of each bulletin. If you have started a new business or have recently moved offices this is a great opportunity to introduce yourself. Business cards are \$30 annually. Send me a scan of your card or contact me for more information on our ad program.



CBGS President's Letter

CBGS Board 2024-2025

- President- Dr. Mohammed Ahmed
- Vice President- Dr. Subbarao Yelisetti
- Secretary/Treasurer-Charles Benson

CBGS Business

- CBGS currently has 28 active members, 2 honorary members, and 40 student members.

Academic Programs and Research Activities at TAMU-CC and TAMUK

- Dr. Lindsay Prothro and CMSS PhD student M. Szemak at TAMU-CC recently attended the Thirty-First Annual West Antarctic Ice Sheet (WAIS) Workshop in Gainesville, FL, where Szemak won Best Student Poster for her research entitled, "*Using Diatom Analysis to Pinpoint Antarctic Ice Sheet Extent and Dynamics in the Pennell Basin During the Pleistocene-Holocene*"
- At TAMU-CC Dr. Richard Coffin PI and Dr. Ingo Pecher Co-PI are leading the NSF Collaborative Research: *Gas hydrate contribution to the Ross Sea carbon budget; shallow sediment to water column; present and future*. Coring and heatflow will be conducted on this expedition during February 11 to April 17, 2025. Hannah Organ's (a Ph. D. student) research focuses on methane cycling and shallow sediment dynamics of the Ross Sea. They plan to use lipids to identify potential methanogenic and methanotrophic microbes. They will also analyze traces of sulfate, nitrate, nitrite, and trace metals to reconstruct the electron gradient that drives methane cycling through the sediment. Additionally, they use radionuclides to trace bioturbation activity within the shallow sediment layers.
- TAMU-CC's geology curriculum is constantly being refreshed with new courses but this academic year we are looking to add additional tracks such as Marine and Climate Geosciences, Planetary Geosciences and Biogeosciences. For additional information contact Dr. Valeriu Murgulet (Valeriu.Murgulet@tamucc.edu) at TAMU-CC.
- Texas A&M University-Kingsville (TAMU-K) started its first cohort of MS Petrophysics program in Fall 2024. If you are interested in joining this program, please contact the graduate coordinator for MS in Petrophysics, Dr. Subbarao Yelisetti at Subbarao.Yelisetti@tamuk.edu.

Student News:

- Dr. Mohamed Ahmed at TAMU-CC and his research group presented 6 abstracts at the 2024 AGU meeting: ("*" Student at TAMU-CC)
 - **Ahmed, M.**, Bahamil, A., Sehli, T., Alsharif, A., Alsaied, A., Zebrmawi, Y., 2024, Detection and Mapping of Sinkholes and Fissures in Saudi Arabia from Space: **American Geophysical Union (AGU)**, Washington, DC, Dec. 2024.

- **Ahmed, M., Abdelrehim*, R., Elshalkany*, M., Abdrabou*, M., Omar*, A., 2024,** Response of the Nile River’s Downstream Reservoirs to the GERD Construction: **American Geophysical Union (AGU)**, Washington, DC, Dec. 2024.
- Omar*, A., **Ahmed, M., 2024,** Assessing the accuracy of groundwater level predictions in Texan aquifers using GRACE and machine learning models: **American Geophysical Union (AGU)**, Washington, DC, Dec. 2024.
- Elshalkany*, M., **Ahmed, M., 2024,** Spatiotemporal Analysis of Hurricane Impacts on the Texas Gulf Coast: **American Geophysical Union (AGU)**, Washington, DC, Dec. 2024.
- Abdelrehim*, R., **Ahmed, M., 2024,** A high-resolution 100-km electrical conductivity profile reveals the interplay between surface morphology and subsurface stratigraphy and hydrogeology along barrier island systems: **American Geophysical Union (AGU)**, Washington, DC, Dec. 2024.
- Abdrabou*, M., **Ahmed, M., 2024,** Mapping Bedrock Topography and Detecting Faults in Coastal Texas Using Microtremor and Gravity Measurements: **American Geophysical Union (AGU)**, Washington, DC, Dec. 2024.
- Graduate student Alan Innes at TAMU-CC recently received an award of \$6,000 from the SIPES Society of Independent Professional Earth Scientists (SIPES) Foundation in honor of SIPES member Bobby M. Greenwood. Alan earned his B.S. in Geology from TAMU-CC and is currently a graduate student in the Environmental Science M.S. Program at TAMU-CC. His major professor is Dr. Mohamed Ahmed.



Dr. Mohamed Ahmed’s PhD students at the 2024 AGU Meeting.

Meetings & Events

- The 2025 SAGEEP meeting (Denver, Colorado; April 13-17, 2025): <https://www.eegs.org/sageep-2025>
- The 2025 GSA meeting (San Antonio, Texas; Oct. 19-22, 2025): <https://community.geosociety.org/gsa2025/home>
- The 2025 IMAGE meeting (Houston, Texas; Aug. 25-28, 2025): <https://seg.org/events/upcoming-image-events/>

Mohamed Ahmed

President, CBGS

Mohamed.ahmed@tamucc.edu

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**CORPUS CHRISTI GEOLOGICAL SOCIETY
COASTAL BEND GEOPHYSICAL SOCIETY**



LUNCHEON MEETING ANNOUNCEMENT

January 15th, 2025

- Location:** Joe's Crab Shack, 444 North Shoreline Dr.,
Corpus Christi, TX 78401
- Student Sponsors:** Viper Exploration, Imagine Resources,
Mary DeMis. Thank you!
- Time:** 11:30 AM Social, Lunch follows at 11:45 AM,
Speaker at 12:00 PM
- Cost:** \$35.00 (additional \$10.00 surcharge without
reservation: NO SHOW may be billed.)
- Reservations:** Please RSVP by 11:00 AM on Monday, January
13th before the meeting!

Email: arrangements@ccgeo.org

Please note that luncheon RSVPs are a commitment to Joe's Crab Shack (Shoreline Drive) and must be paid even if you can't attend the luncheon.

SPONSORSHIP OPPORTUNITIES ARE AVAILABLE! IF YOU WOULD LIKE TO SPONSOR, PLEASE CONTACT US AT:

arrangements@ccgeo.org

ABSTRACT: HURRICANES OF THE COASTAL BEND

Chuck Benson, USAF Meteorologist (Retired)



Hurricanes are a serious threat to public safety and to industries in the Coastal Bend. On average, hurricanes make landfall on the Texas coast about once every other year. Major hurricanes (Category 3 or higher) directly affect this area about once every 50 years. The six necessary factors for hurricane formation will be presented. Next, the hurricane forecast production cycle will be explained. Then...through a lens of case studies, some commonalities become apparent for storms that pose the gravest threat to the Coastal Bend.

The September 1919 Hurricane brought the highest storm surge during historic times to downtown Corpus Christi. Hurricane Celia (August 1970) delivered a direct hit to Corpus Christi as a Category 4 storm, and produced almost unimaginable wind damage. Hurricane Harvey (August 2017) devastated an area from Rockport to Port Arthur, but largely spared Corpus Christi. Harvey also caused historic flooding in the Houston metropolitan area. Hurricane Hanna (July 2017) was only a Category 1 storm, but caused considerable damage from Baffin Bay to Port Aransas from a quite significant storm surge.

The worst-case scenario for the Coastal Bend would be a “long track” hurricane that is intensifying as it makes landfall just south of Corpus Christi Bay.

BIOGRAPHICAL SKETCH: CHUCK BENSON

Chuck Benson grew up in Houston, and has studied hurricanes since childhood. As a weather officer in the United State Air Force, he forecast the effects of hurricanes and typhoons in every ocean basin around the world.

After 26 years on active duty, Chuck became a public-school teacher. For 14 years, he taught earth science to eighth graders in Bellevue, Nebraska. Chuck and his wife moved to Corpus Christi during the summer of 2020...just in time for Hurricane Hanna! Since moving to the Coastal Bend, he has been an officer on the boards of both the CCGS and CBGS.

Chuck earned a bachelor of science (meteorology) from Texas A&M in 1977, a master of science (tropical meteorology) from St. Louis University in 1985, a master of arts (national security) from the Naval War College in 1991, a bachelor of science (education) from Peru State College (Nebraska) in 2005, and master of science (science education) from Montana State University in 2013.

JOIN!



The Desk & Derrick Club of Corpus Christi is a dynamic organization that promotes the education of the petroleum, energy and allied industries and advances the professional

Member Benefits:

- Learn from energy industry experts.
- Network with energy industry leaders and colleagues.
- Attend regional and national meetings.
- Receive critical updates and information about the energy industry.
- Enhance communication and leadership skills.
- Make friends for life!

For more information about the Desk & Derrick Club of Corpus Christi and to learn about member eligibility, go to www.addc.org or contact Jena Nelson at 361-844-6726 or email at jena@amshore.com

The Desk & Derrick Club of Corpus Christi is a proud affiliate of the Association of Desk And Derrick Clubs, www.addc.org



**CORPUS CHRISTI GEOLOGICAL SOCIETY
COASTAL BEND GEOPHYSICAL SOCIETY**



LUNCHEON MEETING ANNOUNCEMENT

February 19th, 2025

- Location:** Joe's Crab Shack, 444 North Shoreline Dr.,
Corpus Christi, TX 78401
- Student Sponsors:** Viper Exploration, Imagine Resources,
Mary DeMis. Thank you!
- Time:** 11:30 AM Social, Lunch follows at 11:45 AM,
Speaker at 12:00 PM
- Cost:** \$35.00 (additional \$10.00 surcharge without
reservation: NO SHOW may be billed.)
- Reservations:** Please RSVP by 11:00 AM on Monday, February
17th before the meeting!

Email: arrangements@ccgeo.org

Please note that luncheon RSVPs are a commitment to Joe's Crab Shack (Shoreline Drive) and must be paid even if you can't attend the luncheon.

SPONSORSHIP OPPORTUNITIES ARE AVAILABLE! IF YOU WOULD LIKE TO SPONSOR, PLEASE CONTACT US AT:

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Hydrogen as a Future Alternative Source of Energy

Abstract

Bridging Traditional Energy and Clean Fuel Solutions: A Practical Approach to Hydrogen Production

As the energy sector evolves to meet growing demands for cleaner fuel alternatives, hydrogen emerges as a compelling solution that bridges traditional energy expertise with future sustainability goals. This presentation explores the strategic advantages of hydrogen as a clean energy carrier and introduces an innovative methane pyrolysis approach that leverages existing natural gas infrastructure and industry knowledge.

Unlike conventional hydrogen production methods that generate significant CO₂ emissions, methane pyrolysis produces clean hydrogen while yielding solid carbon as a valuable by-product rather than greenhouse gases. This process represents a unique opportunity for the oil and gas industry to participate in the clean energy transition while utilizing their existing expertise, infrastructure, and resources.

The discussion will focus on how Modern Hydrogen's methane pyrolysis technology offers a pragmatic path forward, allowing traditional energy companies to expand their portfolio into clean energy production without abandoning their core competencies. We will examine the economic feasibility, scalability, and environmental benefits of this approach, with particular emphasis on how it can create new revenue streams while addressing growing market demand for low-carbon solutions.

This presentation will be of particular interest to industry professionals seeking to understand how their expertise in hydrocarbon production and management can be applied to emerging clean energy markets, while maintaining competitive advantages in an evolving energy landscape.


Biography

With over two decades of experience in the energy sector, Jason Ashby brings extensive operational and safety management expertise to the role as Field Operations Manager at Modern Hydrogen. During his distinguished 23-year tenure at Core Laboratories, Jason served in multiple leadership positions, culminating in concurrent roles as Field Services Manager, Laboratory Manager, and HSE Manager of the RRP Lab in Houston.

A graduate of Texas Tech University with a Bachelor of Science degree, Jason has demonstrated a commitment to innovation and safety throughout his career. He is listed as a co-inventor on two patents and was also recognized with the prestigious National Ocean Industries Association (NOIA) Safety Award for one of those patented devices, the Iron CoreHand, highlighting his contributions to workplace safety advancement.

In his current position at Modern Hydrogen, Jason has spent the last year and a half leading field operations of the Hydrogen pilot projects, bringing their wealth of experience in operational excellence and safety management to the renewable energy sector.

SPONSORS



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P.O. Box 252
Corpus Christi, Texas 78403
Office: (361) 884-0435
Fax: (361)-654-1436
www.nuecesland.com

Nueces Energy, Inc. is a complete land services company in the business of providing professional landmen and project management to various energy related jobs primarily in the oil and gas industry.

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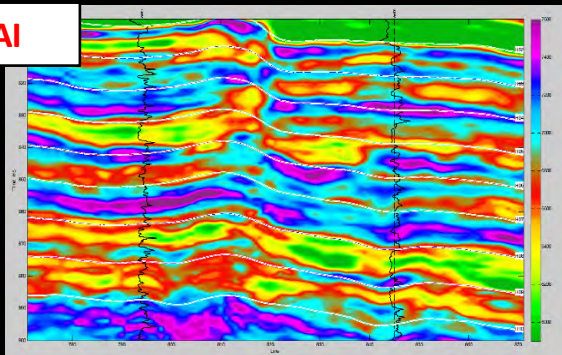


**Corpus Christi
Geological Society**

Using Bandwidth Extension and Phase Information as Tools in Seismic Interpretation

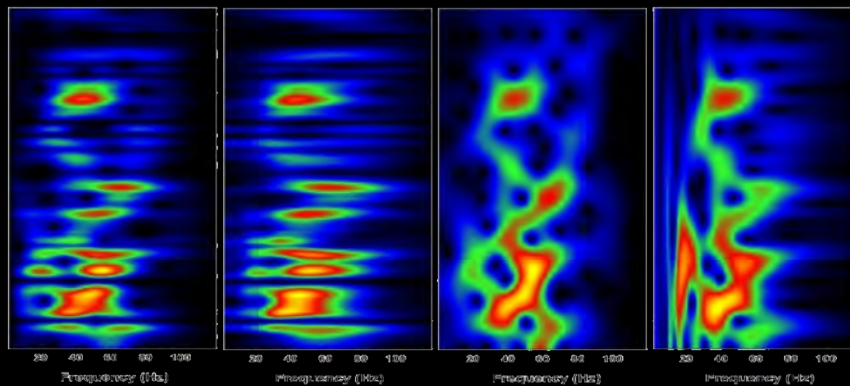
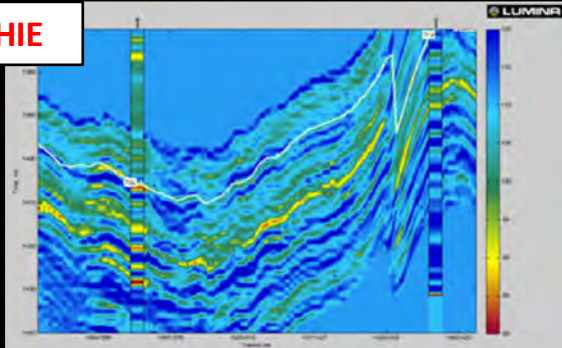
Mark.Morford@luminageo.com

AI



Inversion and Multi-Attribute Analysis

PHIE



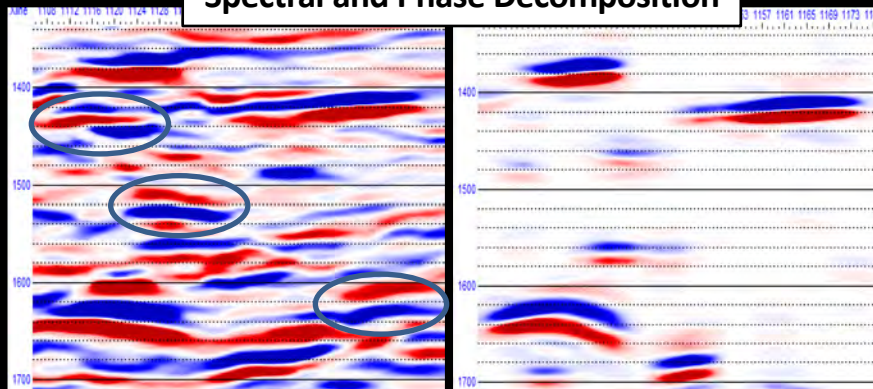
PSSD

CLSSA

STFT

CWT

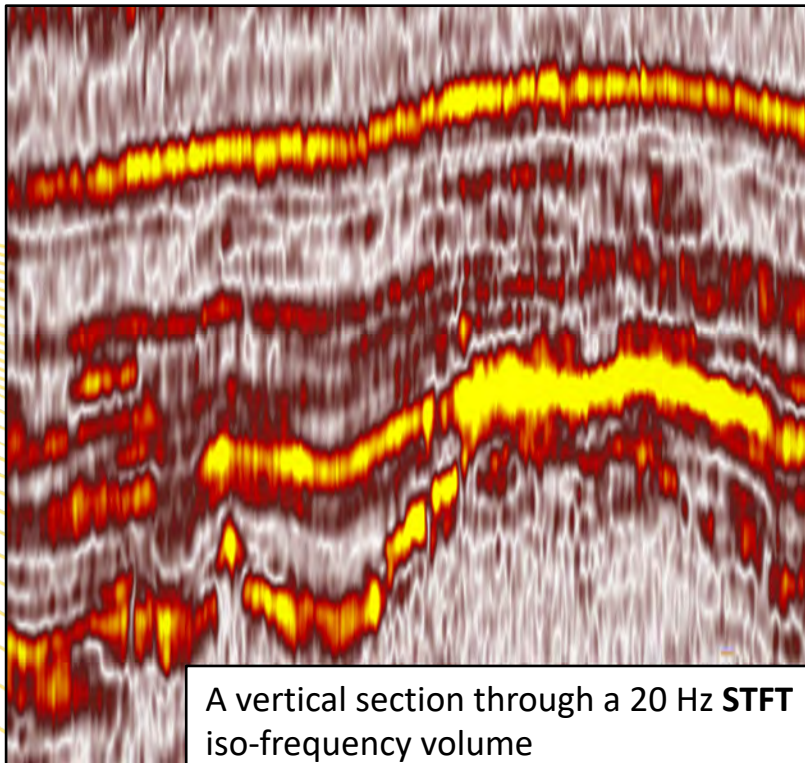
Spectral and Phase Decomposition





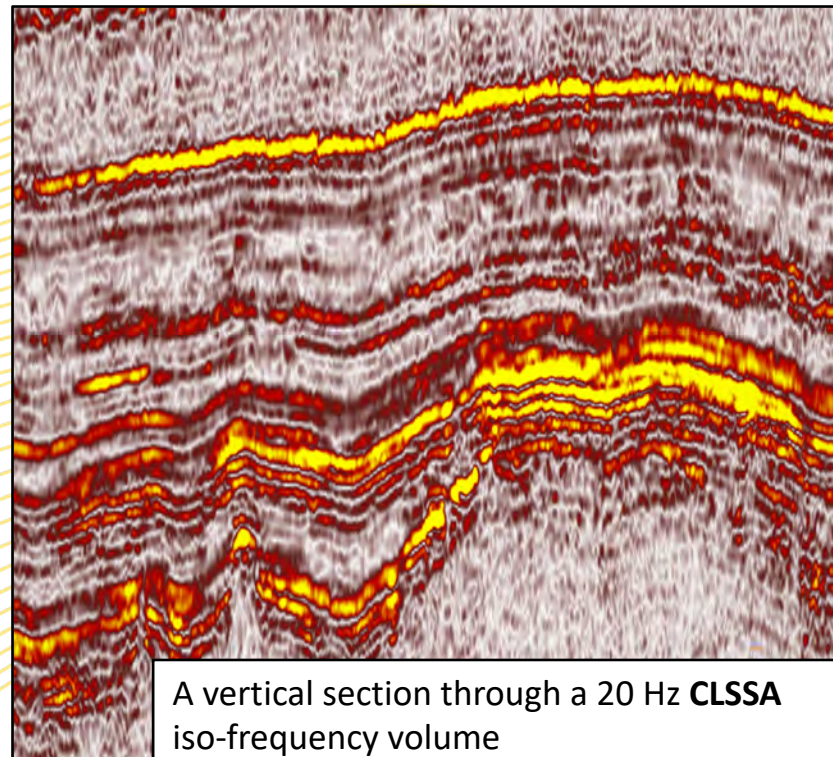
Standard STFT

20 Hz Iso- Frequency



A vertical section through a 20 Hz **STFT** iso-frequency volume

CLSSA



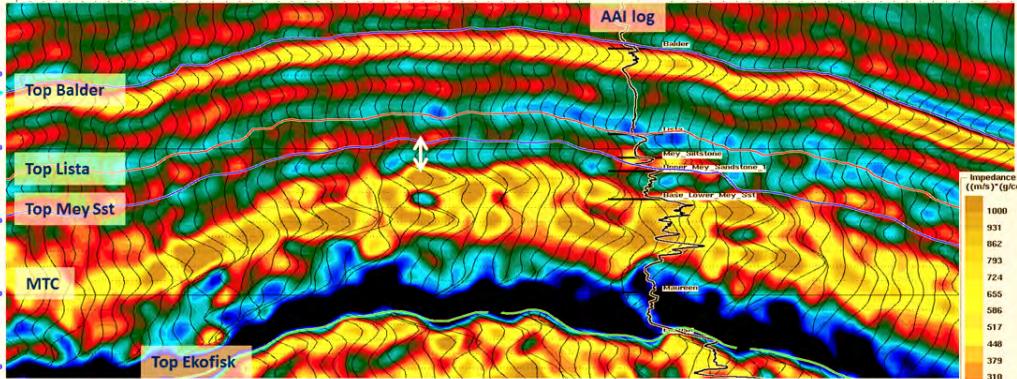
A vertical section through a 20 Hz **CLSSA** iso-frequency volume



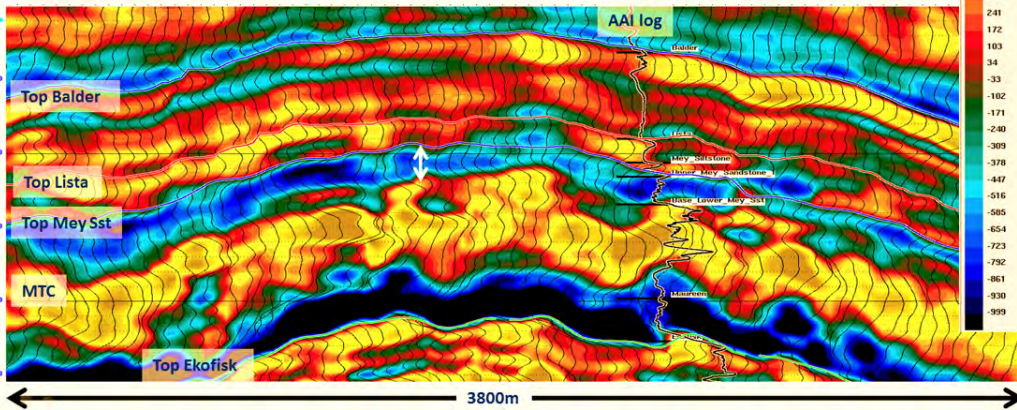
Sparse Spike vs Sparse Layer Seismic Inversion

Post-stack P-wave Impedance Inversions

Sparse-Spike



Sparse-Layer



- The challenge...

"The conventional seismic is insufficient to confidently interpret the Mey sandstone interval..."

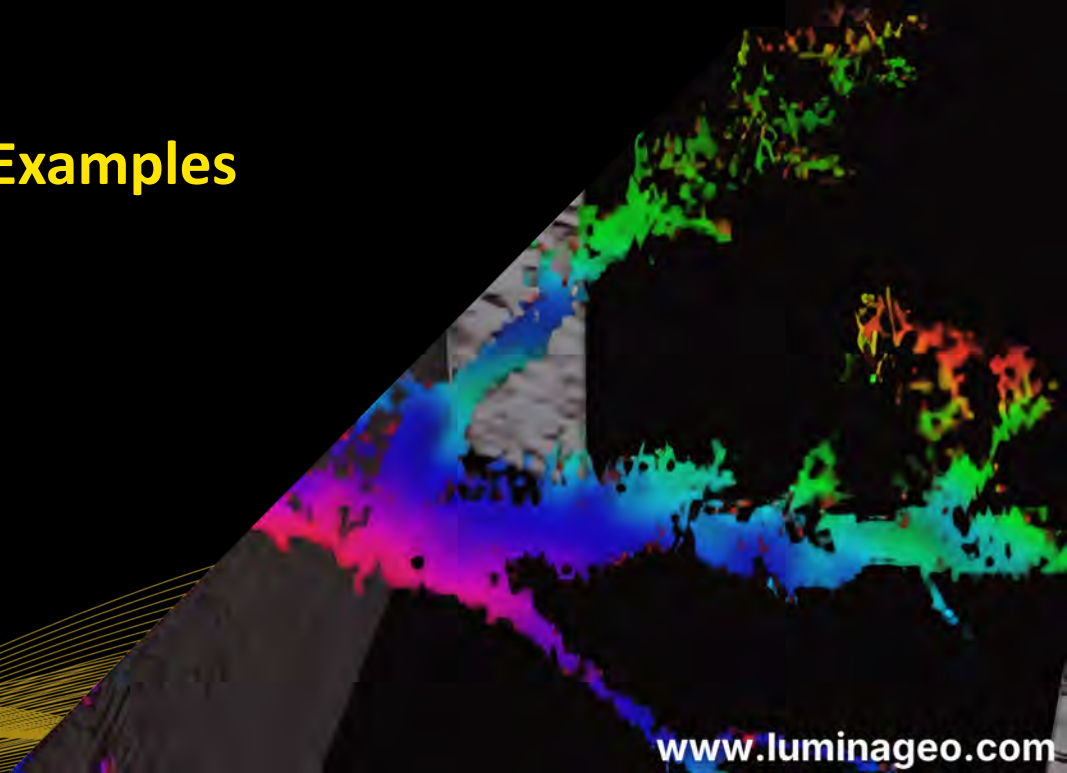
- The solution...

"...at least a doubling of bandwidth...improved vertical detail...improved stratigraphic understanding of the reservoir..."

"As a result, the Mey sandstone package itself can be more confidently interpreted across the structure"

Talisman-Sinopec, North Sea Case study, EAGE 2014

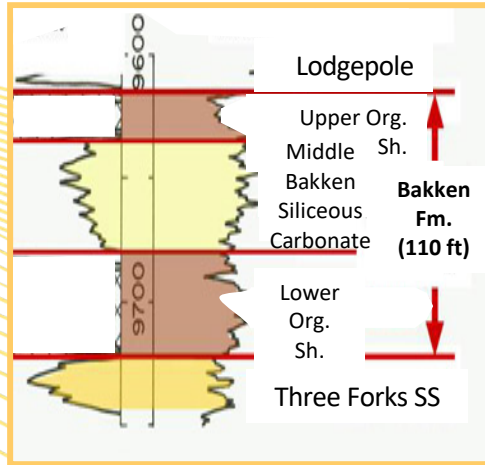
Examples



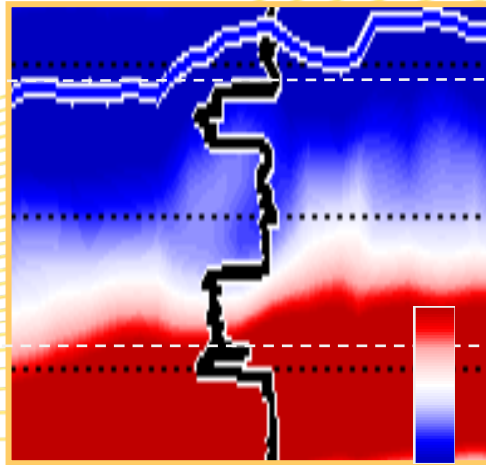


Bakken Shale: De-risking Horizontal Well Drilling

Bakken Stratigraphy

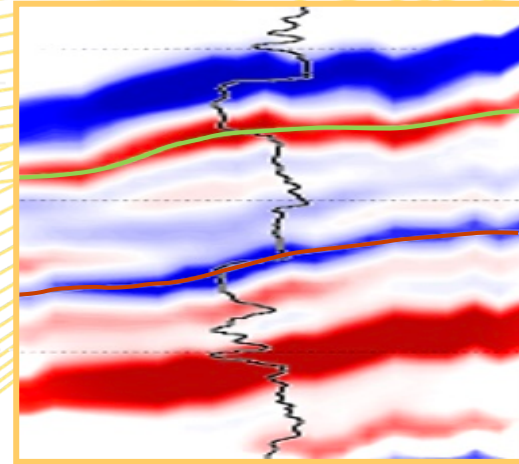


Conventional Seismic



Original seismic data insufficient detail for horizontal wells or fracking

High Resolution Reflectivity

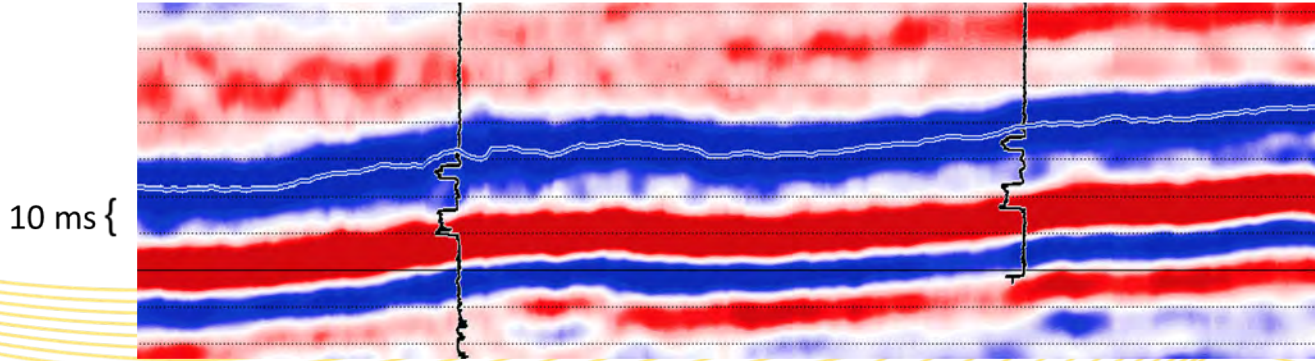


Sparse Layer Inversion results more detailed interpretation possible

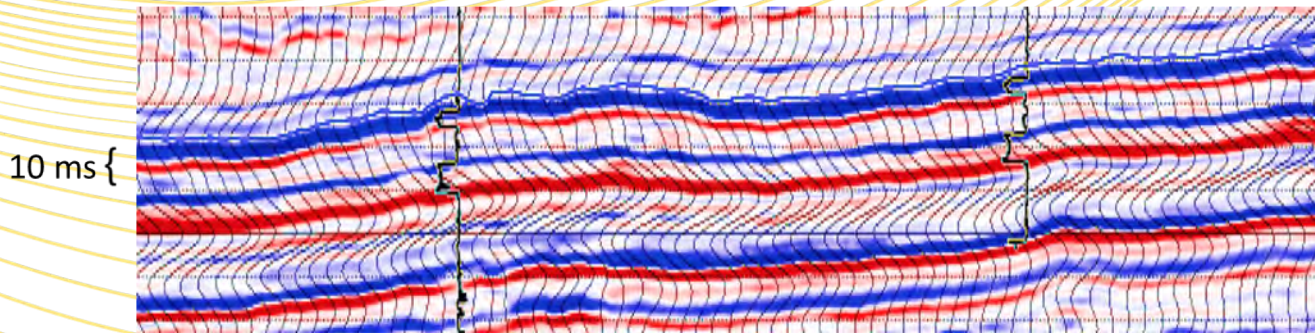


Bakken formation: de-risking horizontal well drilling

Original Seismic



Sparse Layer Inversion



Resolves thin reservoir layers, allowing accurate fracking of siliceous zones

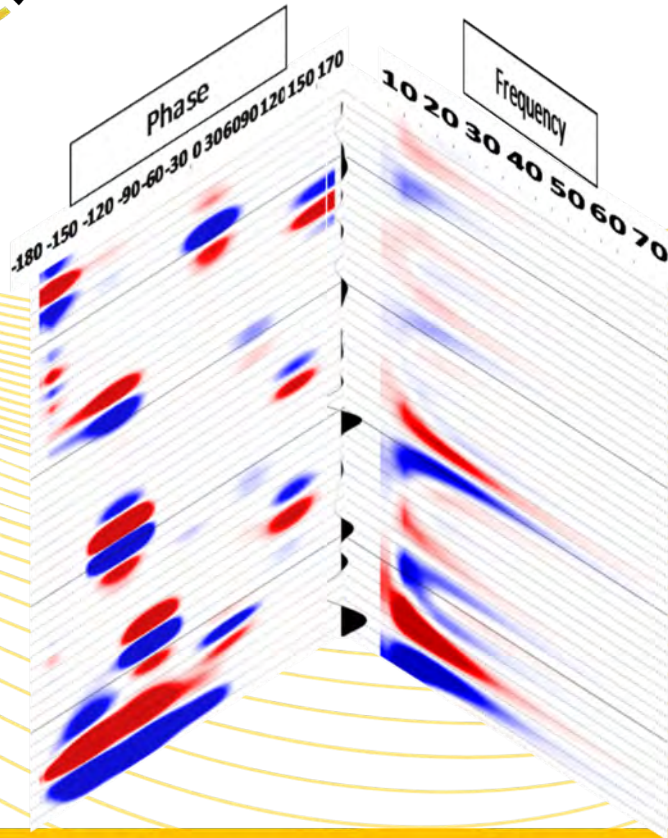


Basic Assumptions on Phase Decomposition

- The phase of the data is known
 - The algorithm assumes it is zero phase, but more importantly, the interpreter makes assumptions on the results based on this point (the algorithm will produce accurate results if the data is not zero phase, but the interpretation of these results is going to be more difficult, if not entirely wrong).
- The wavelet is laterally static
 - Lateral varying wavelets can misguide the interpretation of the result. In synthetic cases, the wavelet is laterally stable, providing static responses; real seismic data does not behave as such, therefore neither does the attribute.
- Requires delicate interpretation
 - Amplitude anomalies observed in these have to be carefully studied before making assumptions (take into account phase calibration, well data for calibration, interference patterns, lithology variations, fluid content, reservoir properties, thickness variability).



Phase Decomposition



- Every trace has an individual Phase/Amplitude component at each time sample.
- The Phase Decomposition separates these components into a phase gather, similarly to Spectral Decomposition and frequency.
- Each phase component can be associated to key layer geometries.



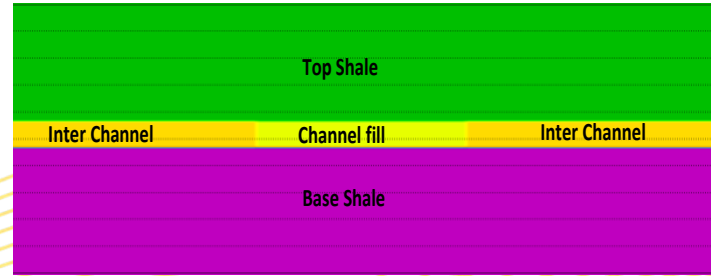
Phase Decomposition

Phase Decomposition

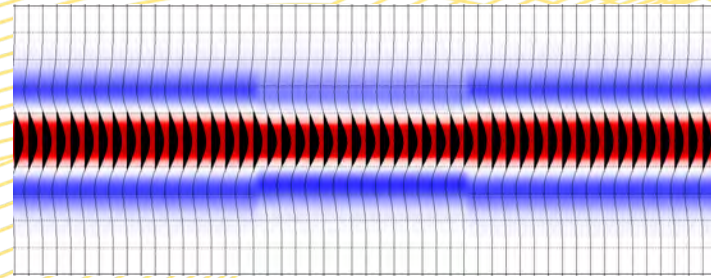
unlocks information hidden
in phase domain

*Reveals anomalies not
apparent on the original
seismic data*

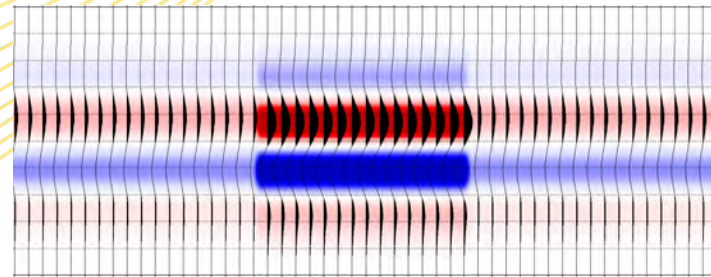
Channel fill mode!



Original seismic

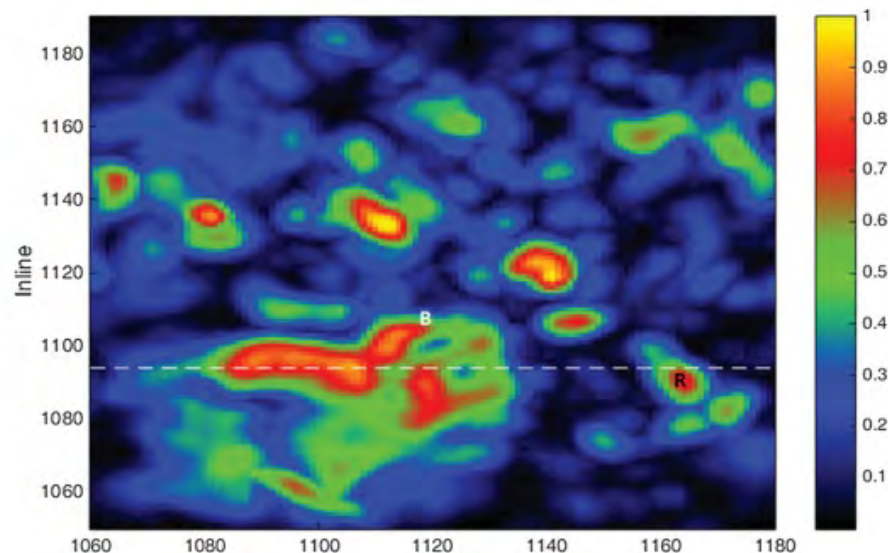
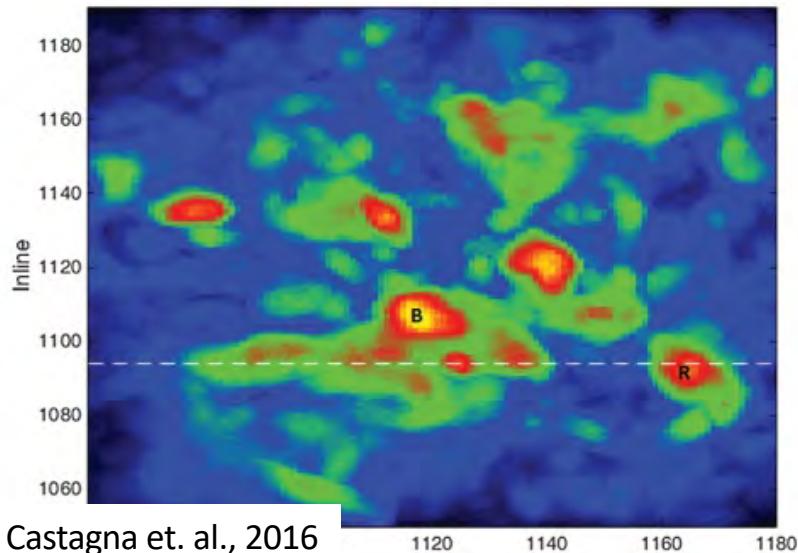
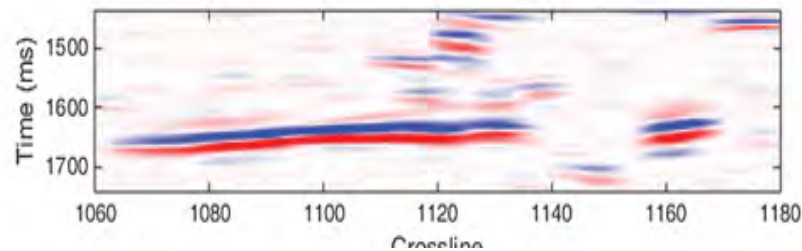
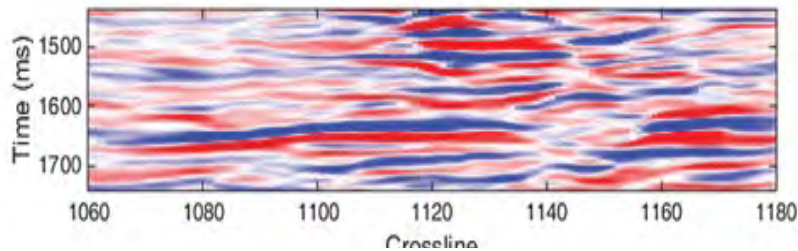


-90° Phase Component





Phase Decomposition – Stratigraphic imaging



Castagna et. al., 2016



Conclusion

- **SLI** reveals details not visible in conventional seismic data
- **Phase Decomposition** provides a new way to decompose the seismic traces for layer responses, isolating events corresponding to key phase components, therefore removing vertical interference and isolating the presence of the reservoir layers.
- When combined with AVO analysis, **Phase Decomposition** can be a more robust DHI compared to conventional AVO attributes, helping increase the certainty on positive AVO anomalies but also, decreasing the risk of false AVO anomalies.

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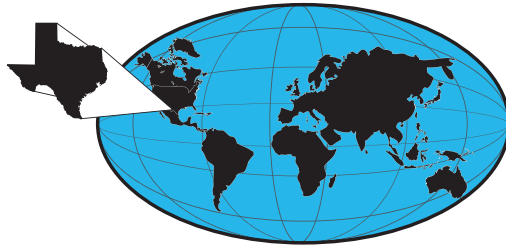
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Burgentine Lake
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Estes Cove
Fulton Beach
Goose Island
Half Moon Reef
Nine Mile Point
Rockport, West
St. Charles
Tally Island
Tract 831-G.O.M. (offshore)
Virginia

BEE COUNTY

Caesar
Mosca
Nomanna
Orangedale(2)
Ray-Wilcox
San Domingo

Tulsita Wilcox

Strauch_Wilcox

BROOKS COUNTY

Ann Mag
Boedecker
Cage Ranch
Encintas
ERF

Gyp Hill
Gyp Hill West

Loma Blanca

Mariposa

Mills Bennett

Pita

Tio Ayola

Tres Encinos

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Coloma Creek, North
Heyser

Lavaca Bay

Long Mott

Magnolia Beach

Mosquito Point

Olivia

Panther Reef

Powderhorn

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S.E. Zoller

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Hagist Ranch

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Petrox

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North Blanconia

Bombs

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Garcia

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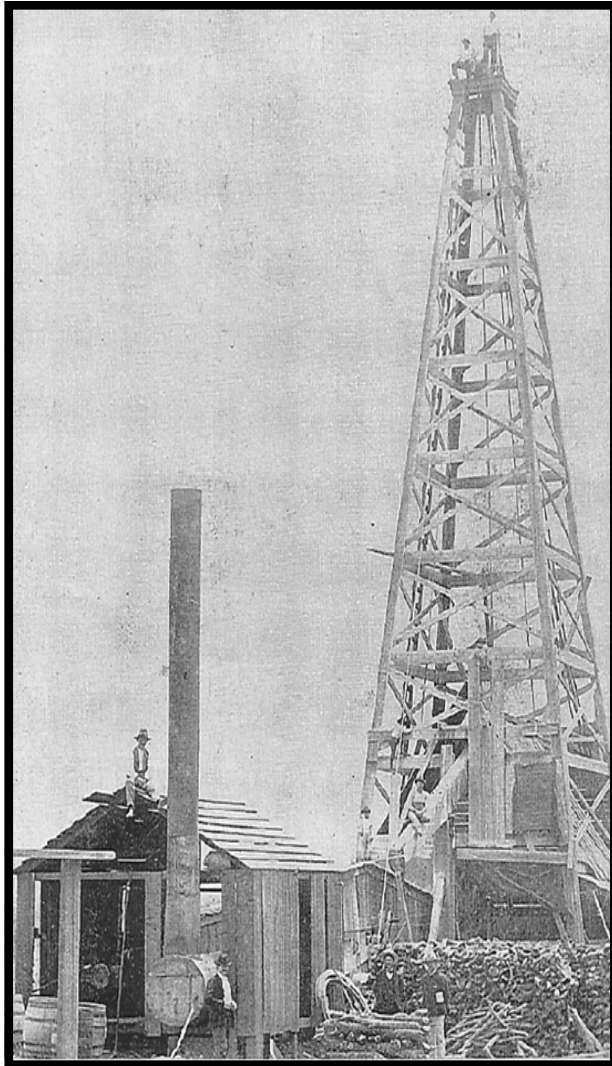
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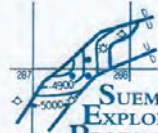
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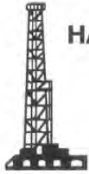
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