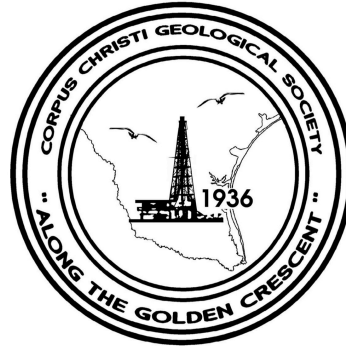


**BULLETIN**  
**Corpus Christi**  
**Geological Society**



and

**Coastal Bend**  
**Geophysical Society**



**November**  
**2018**  
**ISSN 0739 5620**

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

2018-2019

[www.ccgeo.org](http://www.ccgeo.org)

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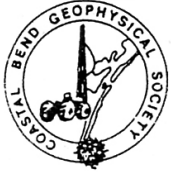
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**2017-2018**

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---

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## CCGS/CBGS JOINT MEETING SCHEDULE 2018-2019

September 2018							October 2018							November 2018						
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	6					1	2	3	
2	3	4	5	6	7	8	7	8	9	10	11	12	13	4	5	6	7	8	9	10
9	10	11	12	13	14	15	14	15	16	17	18	19	20	11	12	13	14	15	16	17
16	17	18	19	20	21	22	21	22	23	24	25	26	27	18	19	20	21	22	23	24
23	24	25	26	27	28	29	28	29	30	31				25	26	27	28	29	30	
30																				

Wednesday Sept. 19<sup>th</sup> at 5:30 BBQ Kickoff at Hoegemeyers Barbeque Barn. Meet/greet our special guest, Dr. Satinder Chopra\*  
 \*One of the most widely published geoscientists of our day.

11:30am-1:00pm  
 Speaker Dr. Jeremy Meyer, Senior Vice President GeoMechanics. "The application of Geomechanics to Unconventional Development"

December 2018							January 2019							February 2019						
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
2	3	4	5	6	7	8	6	7	8	9	10	11	12	3	4	5	6	7	8	9
9	10	11	12	13	14	15	13	14	15	16	17	18	19	10	11	12	13	14	15	16
16	17	18	19	20	21	22	20	21	22	23	24	25	26	17	18	19	20	21	22	23
23	24	25	26	27	28	29	27	28	29	30	31			24	25	26	27	28		
30	31																			

No meeting

11:30am – 1:00pm  
 Speaker: Hongliu Zeng research scientist Bureau of Eco. Geology, Jackson School of Geosciences, The Univ. of Tx. Austin. "Seismic Sedimentology Talk"

To be announced

## CCGS/CBGS Joint Meeting Schedule 2018-2019

March 2019							April 2019							May 2019						
S	M	T	W	Th	F	S	S	M	T	W	Th	F	S	S	M	T	W	Th	F	S
					1	2		1	2	3	4	5	6				1	2	3	4
3	4	5	6	7	8	9	7	8	9	10	11	12	13	5	6	7	8	9	10	11
10	11	12	13	14	15	16	14	15	16	17	18	19	20	12	13	14	15	16	17	18
17	18	19	20	21	22	23	21	22	23	24	25	26	27	19	20	21	22	23	24	25
24	25	26	27	28	29	30	28	29	30					26	27	28	29	30	31	
31																				

To be announced

To be announced

No meeting

## Calendar of Meetings and Events

### Calendar of Area Monthly Meetings

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.....	2 <sup>nd</sup> Tues every other month in San Antonio



## CCGS PRESIDENT'S LETTER

People of the Earth, hear my words. GCAGS 2018 has passed and as I look ahead, I see, next will be the AAPG in San Antonio (May, 2019) and am pleased that we (CCGS) will not have that burden. Houston will host the 2019 GCAGS. I have found through my career here along the fabulous Texas Coastal Bend that GCAGS always has something useful for your work effort or your career. Maybe a little idea outside your geological thinking box or a new business opportunity offered by someone you may know. I try to attend at least one convention a year, but amongst SEG, AAPG, GCAGS and SIPES there is a vast pallet to choose from. I chose the one near rocks.

Lately, I find that I have an interest in rocks. Does this happen to you? Sometimes all these echoes we look at (seismic) seem to lie to our little interpretive minds. Slipping pieces of paper and playing with 3D data is fun, but real fun started when I was a kid in New Orleans, sitting in the only pile of rocks in the Crescent City. You see, any hard surface in south Louisiana is usually oyster or clam shells, the rest is mud. Imagine my surprise when I found dinosaur bones in the chert gravels. Oh, a neighbor kid, David Hill, told me they weren't dino bones, but horn corals. Wow, cool old stuff in rocks. And my Dad took me to a wonderful place called Texas where John Wayne and the Alamo was, and I got to find thousands of fossils. I am surprised there were any left after I came home. I did not know what geologists did. So I went to college and took EZ stuff – math, close to engineering, but I wouldn't have to get my hands greasy.

At LSU, I was sitting in 2<sup>nd</sup> semester differential equations class. I realized this was not for me. But what could I do? Luckily, I had a geology class next, and the subject was stratigraphy. The prof drew a line and one on top of it, and said, "This is what Nicholas Stehno called the "Law of Superposition." I was on the edge of my seat. "It says that the layer on top is younger than the layer below." Even before there was a "no duh!" I said "no duh!" I looked around and suddenly I knew, that if Mr Stehno could just come out and say that stuff, and now it's in a book, and a prof is telling me its "A LAW," then I could be King of Geology.


And so it came to pass that I was endowed with special stratigraphic powers hammered into my little brain by giants of stratigraphy at LSU and UT. And this causes me occasionally to have LOTWR "loss of touch with rocks" syndrome, and I must be off on a field trip, even looking at metamessed up rocks or ingenious rocks, my favorite besides sandstone. So, Colorado and Hawaii is where I go to find myself among geologically powerful places, and I get re-centered on rocks. This is why I go to conventions annually. For a small fee, people smarter than me will point out cool rock stuff in New Mexico or California, and I am comfortable, can nap in the bus, can drink beer, and take lots of pictures. I smile, when they talk about superposition stuff, and nod my head knowingly. Because of Mr. Stehno, many of us are also Kings of Geology.

Frank G Cornish

Benevolent Overlord, King of Geology, Master of Arts, and a little kid with fossils and LOTWR



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



**LUNCHEON MEETING  
ANNOUNCEMENT**

**November 14, 2018**

- Location:** Water Street Events (Previously the Seafood Company Restaurant) 300 Block N. Water Street, CC, TX 78401
- Student Sponsor:** Imagine Resources, Nye Exploration, Viper Exploration, Ltd.
- Bar Sponsor:** Sponsorship Opportunities Available!!!!!!
- Time:** 11:30 am Bar, Lunch follows at 11:45 am, Speaker at 12:00 pm
- Cost:** \$25.00 (additional \$10.00 surcharge without reservation; **NO SHOW** may be billed and non-RSVP attendees cannot be Guaranteed a lunch); FREE for students with reservation (discounted by our generous sponsors)!
- Reservations:** Please RSVP by 4PM on the FRIDAY before the meeting!  
E-Mail: [arrangements@ccgeo.org](mailto:arrangements@ccgeo.org)

Please note that luncheons RSVPs are a commitment to the Water Street Events and must be paid even if you can't attend the luncheon.

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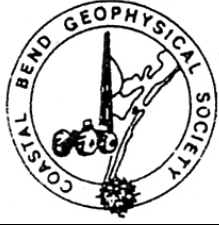
# **THE APPLICATION OF GEOMECHANICS TO UNCONVENTIONAL DEVELOPMENT**

- 1. Basic of Geomechanics**
- 2. Application of Geomechanics in Unconventional plays**
- 3. Building 3D models using Seismic Data**
- 4. Presentation of case studies**

## **Biography**

Jerry has nearly 20 years' experience in petroleum geomechanics. After completing a mathematics and computer science degree he undertook an honors degree in geophysics and then a PhD in geomechanics entitled "the determination and application of in situ stresses in petroleum exploration and production." During his PhD research he completed several consulting/research projects which led to further employment with Adelaide University working on additional consulting projects.

Jerry is now responsible for operational management of Ikon Geomechanics ensuring service work is completed as efficiently as possible and that quality is maintained at the highest levels. Ikon Geomechanics is responsible for project delivery and providing technical sales support to the regions, to both generate and grow revenues. Jerry continues to both undertake and review technical work as well as his operational responsibilities to ensure that revenue and cost targets are met. He has experience in projects as diverse as wellbore, stability, image-log interpretation, fracture stimulation, fault reactivation and CO<sub>2</sub> sequestration and has worked on projects across the globe.



## **CBGS President's Letter**

### **CBGS Board 2018-2019**

Dr. Subbarao Yeliseti- President  
Lonnie Blake- Vice President  
Matt Hammer- Secretary/ Treasurer  
Dr. Robert Schneider- Continuing Education  
Lonnie Blake- Golf Chair  
Ed Egger- Scholarship Chair

### **CBGS Scholarships**

The board awarded three scholarships of \$2,000 each to undergraduate geophysics majors from Texas A&M University-College Station, University of Houston and Texas A&M University-Kingsville in 2017-2018.

The following criteria is followed in awarding the scholarships.

1. Must be a citizen of the USA
2. Must have declared Major Geophysics at the main campus of the receiving university
3. Must have GPA 3.0
4. Must be in good standing with the school
5. Must make effort to attend a Coastal Bend Geophysical Society Meeting in Corpus Christi Texas after being awarded a scholarship to be recognized by the society.

### **News**

- At the time of writing this report, the U.S. crude futures have averaged over \$67.01 a barrel in 2018, as opposed to an average of \$50.85 a barrel in 2017 and \$43.47 a barrel in 2016, as reported by Scott DiSavino on reuters.com. This is going to increase to \$75 for the remainder of 2018 and about \$74 for 2019.
- Analysts at Simmons & Co predict that the average oil and natural gas rig count would rise from 876 in 2017 to 1,031 in 2018, 1,092 in 2019 and 1,227 in 2020.
- According to U.S. Energy Information Administration (EIA) forecasts, the U.S. crude oil production is expected to rise by 840,000 bpd to 11.5 million bpd in 2019. EIA forecasts that U.S. crude oil production will average 10.7 million b/d in 2018, up from 9.4 million b/d in 2017.

### **CBGS Business**

CBGS currently has 60 active members, 4 honorary members, and 60 student members.

### **CBGS workshops/talks**

- As part of the annual Kickoff Bar-B-Q, CBGS hosted Dr. Satinder Chopra on Sep 19, 2018 at the EOG conference center. His talk was entitled “Seismic reservoir characterization of Utica-Point Pleasant shale with efforts at quantitative interpretation – a case study”.
- CBGS offered a Geophysics workshop on April 20<sup>th</sup> in EOG conference center with the following talks.

Talks:

1. IHS – What’s new/coming in the Kingdom Software Suite
2. Tad Smith – SEG Distinguished Lecturer: Seismic Petrophysics
3. CGG/Hampson Russell: Reservoir Property Prediction with Seismic

CBGS is looking forward to offer many such workshops in the future. Topic/speaker suggestions are welcome. Email your suggestions to [Lonnie.Blake@eogresources.com](mailto:Lonnie.Blake@eogresources.com) or [Subbarao.Yelisetti@tamuk.edu](mailto:Subbarao.Yelisetti@tamuk.edu)

### **Golf Tournament**

CBGS organized its annual **Golf Tournament** to fund its scholarship program in the first week of October, 2018 at Northshore Country Club. Raised ~\$4,000 for the scholarship fund.

If you are interested in our next Golf Tournament, please contact Lonnie Blake at 361-887-2665 or [Lonnie.Blake@eogresources.com](mailto:Lonnie.Blake@eogresources.com)

### **New Degree Tracks at TAMUK**

- Texas A&M University-Kingsville (TAMUK) started its first cohort of MS Petrophysics program in Fall 2018. If you are interested in joining this program in Spring 2019, please contact the graduate coordinator for MS in Petrophysics, Dr. Subbarao Yelisetti at [Subbarao.Yelisetti@tamuk.edu](mailto:Subbarao.Yelisetti@tamuk.edu).
- **BS degree in Geophysics, Minor in Geophysics and Certification in Geophysics** offered at Texas A&M University-Kingsville from Fall 2017.

Interested students can contact Dr. Subbarao Yelisetti ([Subbarao.Yelisetti@tamuk.edu](mailto:Subbarao.Yelisetti@tamuk.edu)) for additional information.

### **Seismology class**

**PHYS 5385 Seismology** will be offered in Spring 2019 at Texas A&M University-Kingsville. This is available for the professional community as well as our students. You can sign up as a “transient” student in order to take classes without actually enrolling in the school. If anyone in the professional community wishes to sign up for this, please contact the instructor, Dr. Subbarao Yelisetti [Subbarao.Yelisetti@tamuk.edu](mailto:Subbarao.Yelisetti@tamuk.edu).

### **SEG Distinguished Lecture**

CBGS and TAMUK SEG student chapter organized 2018 SEG Distinguished Lecture in January, 2018. We wish to organize many more lectures in the future.

### **Education/Events**

#### **-SEG**

SEG annual meeting will be held in Anaheim, CA from Oct 14<sup>th</sup>-19<sup>th</sup>, 2018. Abstract due date is April 1<sup>st</sup>, 5 pm CDT. See <https://seg.org/Annual-Meeting-2018> for additional details.

See <https://seg.org/Education/Lectures/Distinguished-Lectures> for information about upcoming SEG distinguished lecture in Houston and other locations.

See <https://seg.org/Education/Lectures/Honorary-Lectures> for SEG honorary lecture locations in Texas.

### **-AGU**

2018 Fall AGU annual meeting will be held in Washington, DC from December 10<sup>th</sup>-14<sup>th</sup>, 2018.  
<https://fallmeeting.agu.org/2018/>

### **-GSA**

The Geological Society of America's 130<sup>th</sup> annual meeting will be held in Indianapolis, Indiana from 4-7<sup>th</sup> November 2018.

<https://community.geosociety.org/gsa2018/home>

### **Monthly Saying**

"We usually find gas in new places with old ideas. Sometimes, also, we find gas in an old place with a new idea, but we seldom find much gas in an old place with an old idea. Several times in the past we have thought that we were running out of gas, whereas actually we were only running out of ideas." - Adapted from Parke A. Dickey by American Potential Gas Committee.

### **Monthly Summary**

<b>Texas Oil and Gas Info</b>	<b>Current Month</b>	<b>Last Month</b>	<b>Difference</b>	
<b>Texas Production</b>	<b>MMBO/BCF</b>	<b>MMBO/BCF</b>	<b>MMBO/BCF</b>	
Oil	107.7	111.8	-4.1	June
Condensate	12.2	12.6	-0.4	June
Gas	661.4	690.8	-29.4	June
	<b>Current Month</b>	<b>Yr to date - 2018</b>	<b>Yr to date - 2017</b>	
<b>Texas Drilling Permits</b>	974	10414	9531	September
Oil wells	271	2693	2414	September
Gas wells	55	657	543	September
Oil and Gas wells	576	6340	5973	September
Other	10	104	134	September
<b>Total Completions</b>	744	8041	5408	September
Oil Completions	553	6243	4235	September
Gas Completions	129	1336	777	September
New Field Discoveries	1	17	23	September
Other	2	29	14	September

Subbarao Yelisetti  
 President, CBGS

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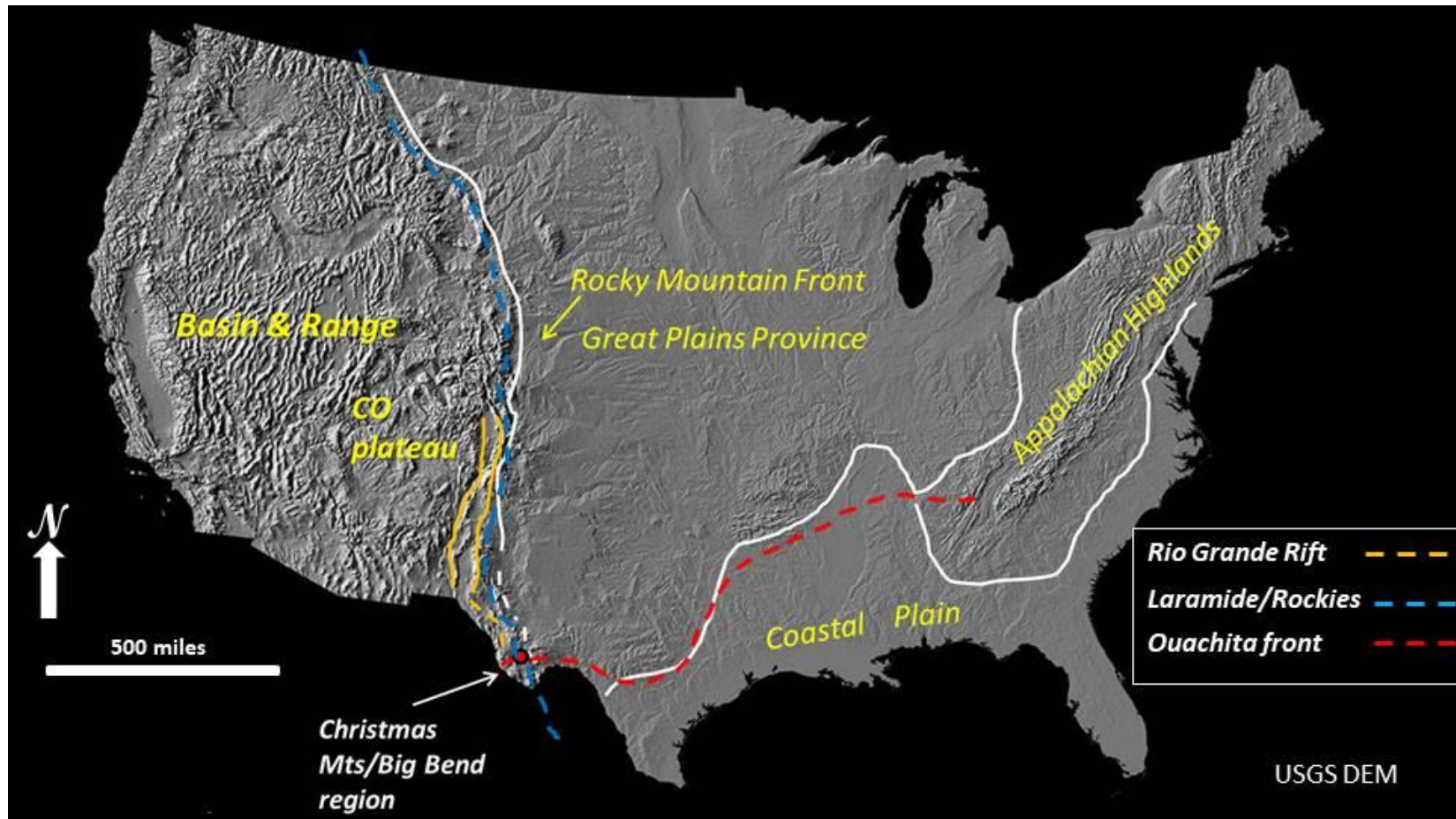
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## ***Assessing the structural history of the Christmas Mts., west TX, in relation to the greater Trans-Pecos region***

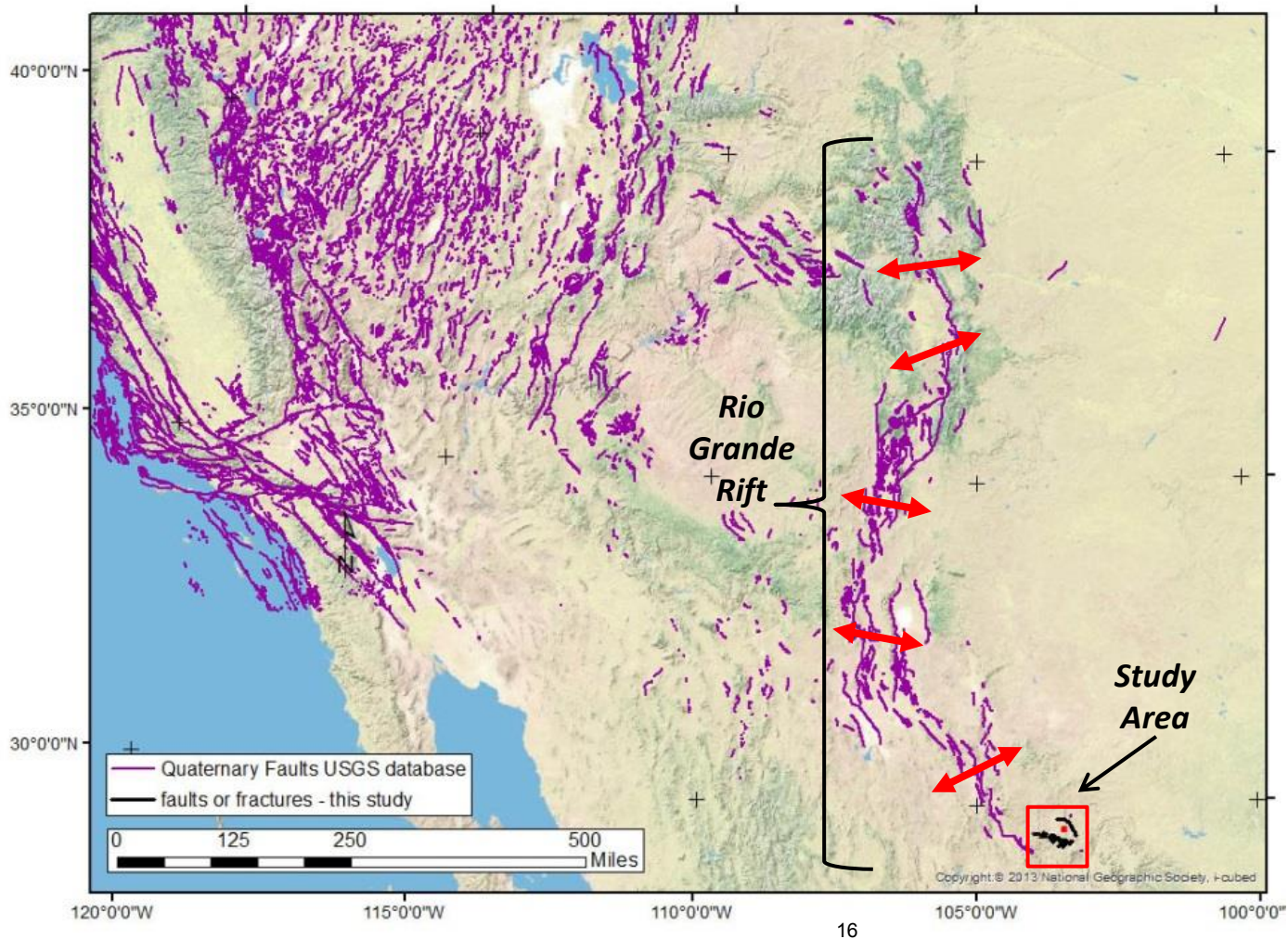
As we ponder on the geology of the rugged Trans-Pecos region of west Texas we can quickly envision the influence of a few key geologic events. We are all too familiar with the San Andreas Fault, or the volcanoes of the Cascades, as evidence of a “tectonically active” west coast. What does the active west coast have to do with the geology of Texas, west of the Pecos River? The geology of west Texas presents us with exposures of major tectonic events that specifically meet here, to our favor, whether they were started out in the west (Rocky Mountains), or far along the east coast (Appalachians-Ouachita Mts.) millions of years ago, specifically in the areas surrounding and within Big Bend National Park (BBNP) (Figure 1). The remnants of the late Pennsylvanian Ouachita Orogeny are remarkably exposed in the Marathon region and at Persimmon Gap in BBNP. This was an intense period of N-NW-directed compression that ultimately led to the development of the Ouachita Mountains, a long fold-thrust belt suturing South America with North America. By the late Cretaceous, ~80 million years ago, the landscape changed dramatically as the Laramide Orogeny, resulting from the collision of North America with the Farallon plate and its subsequent subduction developed the Rocky Mountains. The Rocky Mountains now trend north-south and clearly delineate the boundary of the rugged west and the subdued east of the continental U.S.; they are generally segmented into three sections, the southernmost is located in west Texas and northern Mexico. The compression conditions changed in the Cretaceous to more east-directed, and although we can contest whether we state that the resulting structures developed over “weak” structures from the previous event or developed entirely new ones, it is clear that stress conditions were different, paving way to new landforms. The period from ~48 to 17 Ma was a very active period for the Trans-Pecos region, as the development of numerous intrusions and volcanic flare-ups once again transformed the landscape. It is during this intense volcanic-magmatic period that the Christmas Mountains were formed, ~42 Ma, after a laccolith emplacement and subsequent collapse into a volcanic caldera. Concurrently with this magmatic period is extension of the crust which led to the “horst” and “graben” structures bordered by steep faults that initiated ~36 Ma. The long chains of high mountains, bordered by valleys, of the Basin and Range extension episode that initiated approximately in the early Miocene provided ample space for sediment accumulation. The Rio Grande Rift probably initiated at about the same time and those structures may be challenging to distinguish from those associated coevally with Basin and Range extension. For most of its topographic extent the Rift trends north-south and is composed of a series of asymmetrical basins connected by complex transfer zones giving it an oblique geometry (Figure 2).

Detailing some of the geologic events may be conjectural in this region, as it is in many geologic problems, because of weathering and erosion denuding the landscape over time, which is then transformed by more recent events. Some of the evidence from basement-involved structures, for instance, might be hidden deep in the crust and may be predicted based on gravity and/or magnetic surveys. Imaging even deeper still, into the mantle, may be aided by tomographic studies. The important question to have in mind is how can we decipher the evidence for various geologic events at the outcrop scale, in the field, to help us gain a better perspective on the large-scale tectonics that have shaped the region? That is not a simple question demanding a simple answer, but it has provided motivation to conduct field studies in the Christmas Mountains of west Texas (Figure 3).

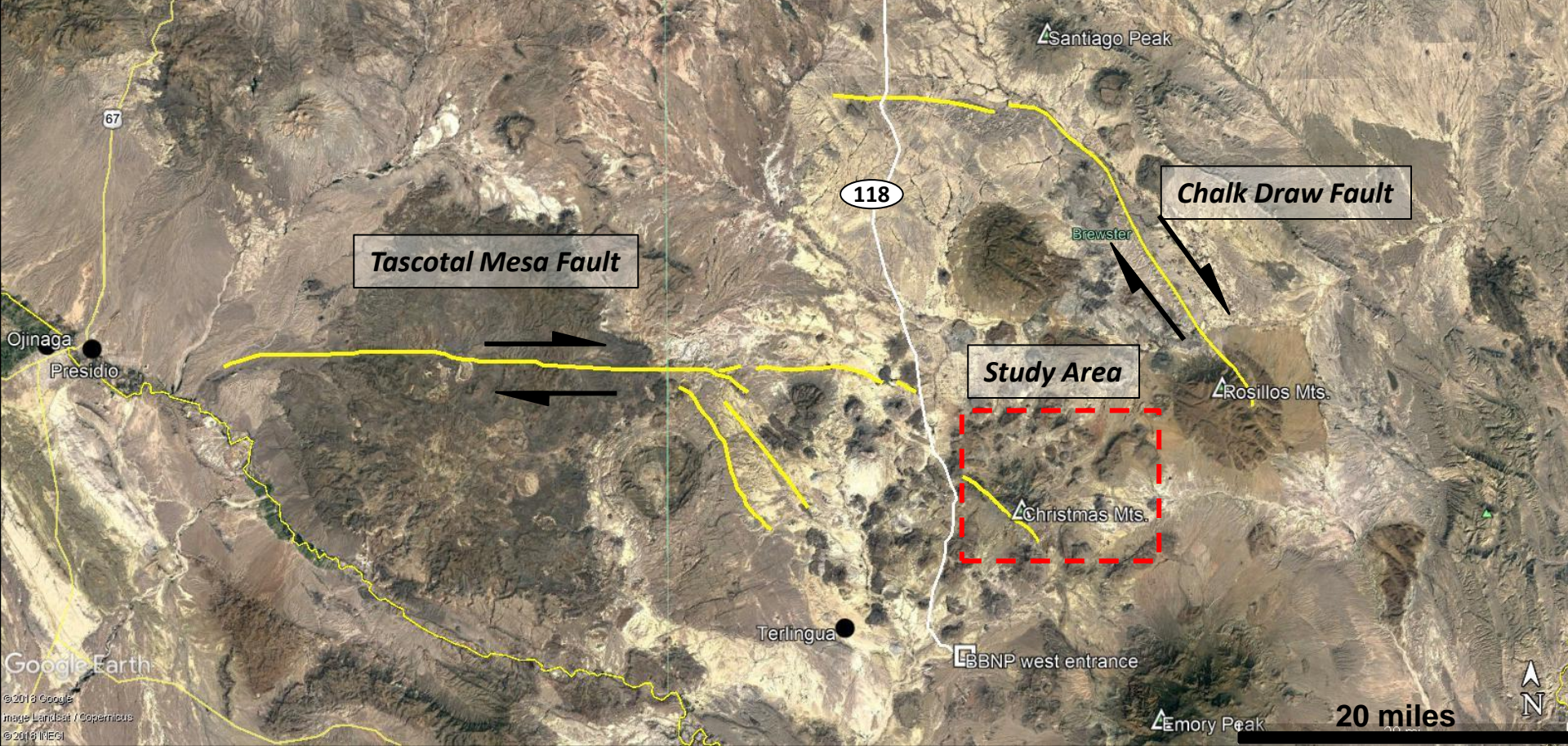




**Figure 1.** Digital Elevation Model (DEM) obtained from the USGS showing significant topographic-structural boundaries defining the regional physiography. At least three major tectonic “boundaries” can be pointed out as shown with the dashed colored lines. Red circle in the Big Bend Region shows the study<sup>15</sup> area location.



**Figure 2.** The Rio Grande rift trends parallel to the Rocky Mts. showing here the clear break between the “active west” and the great plains to the east. Red box shows the location of the study area in the Christmas Mts. Red arrows represent extension direction from various sources including kinematics of basin-bounding faults, GPS, fracture and dike orientations.



**Figure 3.** The Chalk Draw and Tascotal Mesa faults (thick yellow lines) are two dominant right-lateral faults in the southernmost Rio Grande Rift. Their role may be more significant acting as a transfer zone that facilitates a connection to the central Rio Grande Rift to the north. Their structural history has been suggested by many to be inherited from Precambrian rifting, then continental collision in the Pennsylvanian and Cretaceous times.

In the Christmas Mountains (Figure 3), approximately 15 miles north along highway 118 from the west entrance to BBNP, we see the opportunity to explore ideas concerning the continuation of the Rio Grande Rift, hoping we can provide a little more to the understanding of continental rifting and the influence of inherited structure. Inherited structures are ideal candidates for areas of weakness that are “reactivated” with each change in tectonic regime. The Trans-Pecos region is ~1000 miles from the active margin of the west coast; could the extension along the Rio Grande Rift be the result of those far-field stresses, or perhaps deep-seated mantle dynamics in the region? The region is presently dominated by block-type faulting along steep kilometer-scale normal faults associated with extension. It is a tricky complex task in deciding whether sets of faults and fractures are associated with intrusion mechanisms, Rio Grande rifting or Basin and Range extension when all can be found in the same outcrop location. We see the need to focus efforts on providing detailed geologic/structural maps that would show the interactions of the local field relationships, which we could then add to the wider-scope tectonic picture.

We have focused on collecting kinematic data along fault zones and fracture zones in the Christmas Mountains, geologic mapping, remote sensing and field testing of lineament characterization to calculate stress fields. We have found dominant populations of outcrop-scale fracture and faults systems oriented N10-20°W in the northern mapping area in Tertiary volcanic rocks, and N45 -50°W and N0 - 20°E populations in the south cutting through both Cretaceous limestone and Tertiary volcanics (Figure 4). Although these orientations are within range to what has been suggested as a signature of Basin and Range extensional structures, we predict that they may tell us more about the competency of the rocks during Rio Grande rifting and accommodation and transfer zone mechanisms. Based on cross-cutting relationships and fault and fracture zone kinematics, our data indicate that there is a dominant right-lateral shear component. So far our limited data concur with the hypothesis that the right-lateral shear is evidence for the continuation of the southern Rio Grande rift via transfer structures into west Texas and possibly down into northern Mexico (e.g. via the Tascotal Mesa Fault). We are performing slope and geometric analyses of the elliptical dome and predict that it is influenced by a NW-trending basement structure, probably inherited from a much older tectonic event, as far back as Precambrian time.

The irregular dome we see today making up the high topography of the Christmas Mountains is part of a complex geologic history involving volcanism, intrusions, and faulting. In more recent times, this area has been subjected to faulting associated with Basin and Range deformation, but we also argue that there is evidence for faulting and complex fracturing related to the Rio Grande Rift System. Significant questions exist regarding the nature of rifting in continental settings; in general, it may not be a simple mechanical stretch or a magma-assisted ripping of the crust. Although the topography and exposed geology and structure can aid in detailing a rifting history, we perhaps need to work closely with models of mantle dynamics, geochemistry and petrology of the igneous rocks in the area, and detailed structural data. There is much more exciting work to be done to add to the understanding of relationships between structure and igneous activity in the tectonic history of West Texas/Trans-Pecos region.

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*vsanchez2@uh.edu*

*This research was initiated at the Department of Physics & Geosciences at Texas A&M University-Kingsville.*



**Figure 4.** Normal-oblique fault in Cretaceous limestone showing 2 directions of slip towards the west-south-west (note dashed yellow lines). Kinematic data were collected from slicken-fibers, tension gashes, among other slip indicators exposed in the area.

## Biography

Dr. Veronica Sanchez is a graduate of the University of Houston where she conducted research on the structure and tectonics of the Himalaya Orogen and Tibetan Plateau, focusing on the evolution of intracontinental strike-slip fault systems in west Tibet and rifts in south-central Tibet. During her undergraduate education at the University of Houston she interned with Conoco-Phillips and after graduating she worked for Core Labs as core analyst/petrophysics. After receiving her Masters in 2007 she worked briefly for BP before starting her PhD research. In 2011 she completed her PhD and continued for another year at UH as visiting research professor working on research and teaching summer field camp at the Yellowstone-Bighorn Research Association (YBRA) in Montana and Wyoming.

She joined College of the Mainland in 2012 as assistant professor of geology. For three years, she co-directed a multidisciplinary symposium with a humanities colleague to host students from the Gulf Coast community colleges to present original research in arts, sciences and engineering. This led to an advocacy for mentoring undergraduate researchers. In 2014 she led an introductory geology field-based course to Ontario and New Brunswick, Canada, where students mapped remnants of the Grenville Orogeny, and the Sudbury impact crater and mining province. From 2015-2018 she was assistant professor of structural geology at Texas A&M University-Kingsville, where she also taught field methods, geomorphology, field camp, and GIS. She actively pursued research in west Texas, Tibet, and Mexico with a group of undergraduates who successfully presented results at the Geological Society of America (GSA) and the American Geophysical Union (AGU) meetings.

Her research interests include the deformation of the crust during orogenesis especially regarding the mechanics of faults, suture zone development, and continental rifting. Her approach to field research is multi-faceted, leading her to conduct field work in strikingly beautiful locations (e.g., Tibet, northern Mexico, west Texas) alongside in-depth remote sensing/GIS studies, and geochronology analyses. Dr. Sanchez has presented research at multiple AGU and GSA meetings, and more recently at the Plate Tectonics workshop in Switzerland (2016), and Christmas Mountains Symposium in west Texas (2016; 2018).

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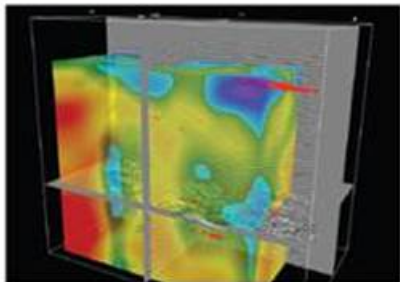
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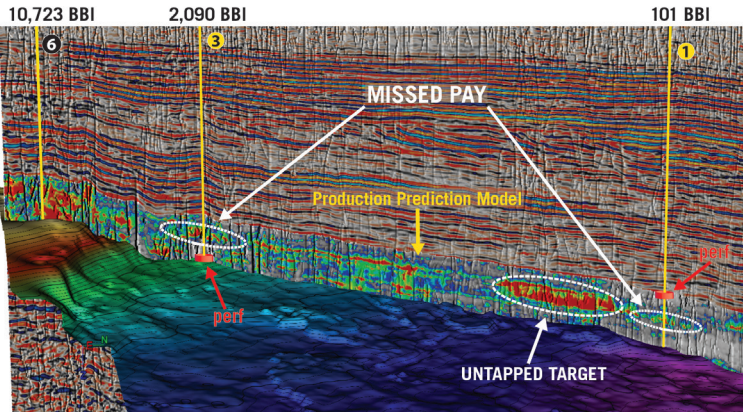


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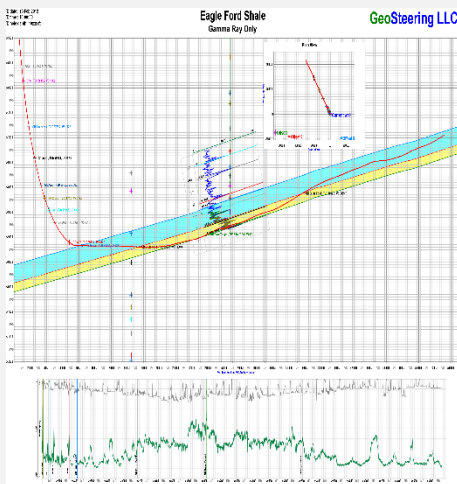
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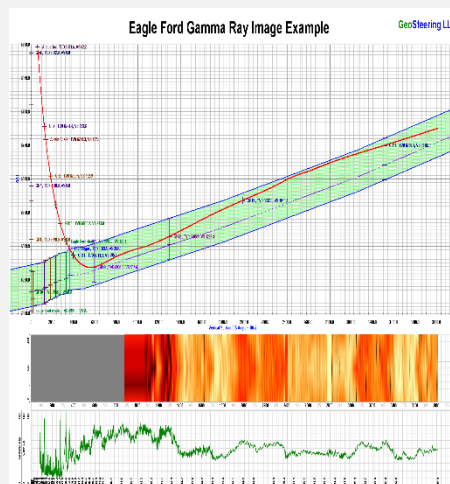
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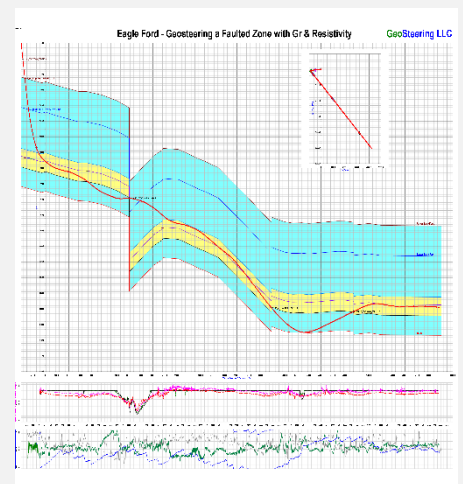
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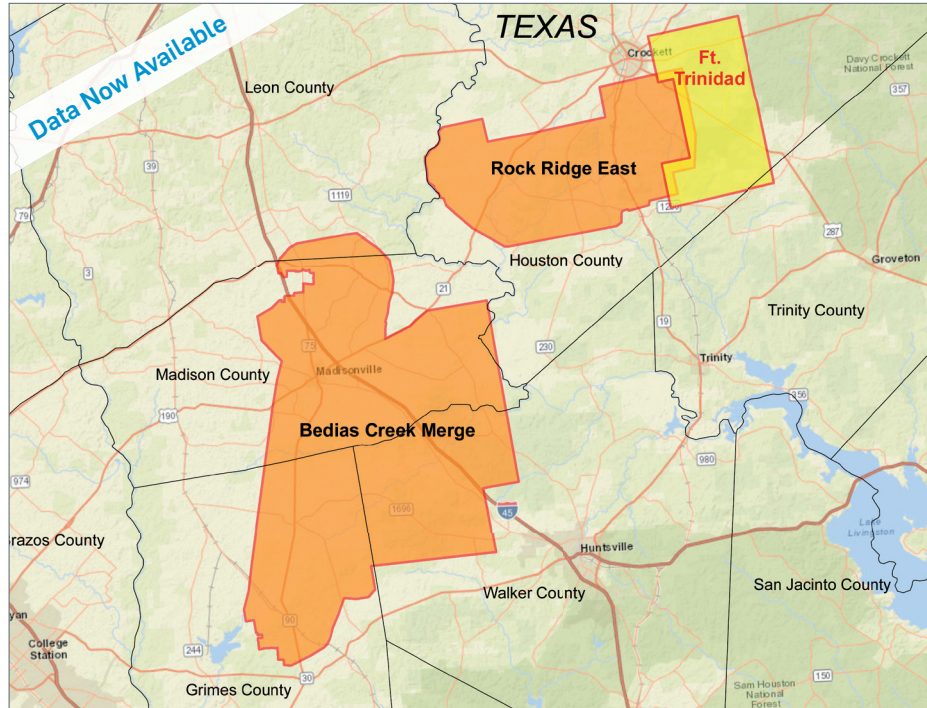
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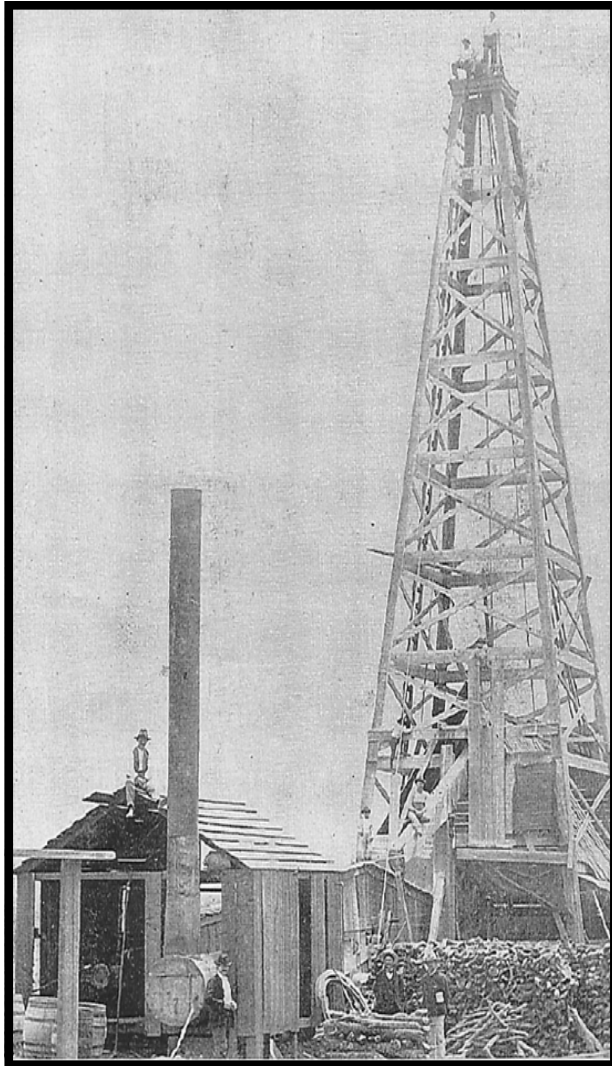
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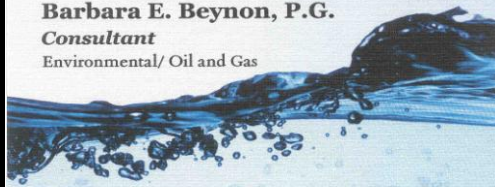
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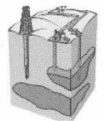
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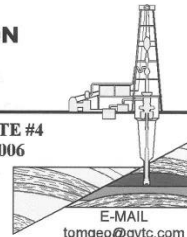
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