BULLETIN

Corpus Christi Geological Society

and

Coastal Bend Geophysical Society

April
2022
ISSN 0739 5620

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Table of Contents

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2021-2022
www.ccgeo.org

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

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P.O. BOX 2741*C.C. TX. 78403
2021-2022

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Scholarship Chairman	Matt Hammer	361-888-4792 361-563-6137	mhammer@royalcctx.com

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Visit the geological web site at www.ccgeo.org

CCGS/CBGS JOINT MEETING SCHEDULE 2021-2022

September 2021

S	M	T	W	Th	F	S
			1	2	3	4
5	6	7	8	9	10	11
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November 2021

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2021-22 Membership Kickoff—Nueces Brewing Co. Downtown Thursday, Sept., 9, 2021 5:30p.m.-til

Oct. 20th meeting at Crawdaddy's Downtown. Presenter: Barry J Rava- Exploration consultant to international companies. "Subtle Prospects in the 21st Century: Are They Relevant?"

Nov. 17th meeting at Crawdaddy's Downtown. Presenter: R. Scott Pollard "Magnus Opus --A Long Look Back"

December 2021

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Jan. 19meeting at Crawdaddy's Downtown. Presenter: Robert Schneider "Seismic Stratigraphy Via Attribute Analysis, Brooks County, TX."

Feb. 16 meeting at Crawdaddy's Downtown
Presenter: Dr. Rajesh Vayavur, Research Associate-Geophysics, Harquail School of Earth Sciences, Laurentian Univ., Sudbury, Ontario, Canada "Mineral Exp. In Canada

CCGS/CBGS Joint Meeting Schedule 2021-2022

March 2022						
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May 2022						
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29	30	31				

April 20th meeting at Crawdaddy's Downtown. Presenter: Dr. Snons Cheong Principal Researcher, Korea Institute of Geoscience & Mineral Resources. "Inversion of Porosity Distribution for CO2 Storage Formation in Otway Project."

May 18th meeting at Crawdaddy's Downtown Presenter: Dallas Dunlap-Research Scientist Assoc. Univ. of Texas, Bureau of Eco Geology. "An Experimental Model of the Influence from Obstructed Subaqueous Channels on Turbidity Current Deposition/Erosion & the Potential for Channel Avulsion."

Calendar of Meetings and Events 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, Metalllurgy & Exp..... 2nd Tues every other month in San Antonio

From the President's Desk

Rick Paige

A Winter Survived

Springtime greetings! A time of returning warm weather, greening lawns, blossoming flowers, and Spring Break at the beach. It's always a welcome end to winter's cold snaps.

Speaking of winter, it appears we survived this winter without a repeat of the catastrophic freeze, and subsequent power losses, we endured in February of last year. However, that was more because we didn't suffer an extended polar vortex, rather than any changes made by policy-makers overseeing the Texas electrical grid. Long-time member Bill Maxwell has been studying the operation of the Texas grid since before the "Great-Texas-Freeze-out". He points out that not enough of the post-freeze recommendations have been implemented. This realization probably occurred to Governor Abbott, when he changed his position on winter power disruptions from guaranteeing none, to admitting we could, potentially, experience selective grid shutdown. Bill, along with Steve Emerson, has written a paper on the subject. Appropriately, next January, on the cusp of typically our coldest weather, they will speak to us about Texas grid realities and the fuel sources that power them.

Upcoming Events

This month's technical luncheon meeting is hosted by the CBGS, and features Dr. Cheong, of the Korea Institute of Geosciences and Mineral Resources, and currently a Visiting Scholar at TAMU-K in the

Physics and Geosciences department, speaking on porosity distribution determined from seismic inversion and its application to $C0_2$ storage. May's luncheon meeting, our last for this season, presents Dallas Dunlap of the BEG speaking to us on the dynamics of submarine debris flows and their impact on deep-water turbidite processes.

Speaking of our luncheon meetings, I want to give a shout-out to our new venue this season, Crawdaddy's Downtown. Upon learning that our pre-pandemic venue, the Water Street Oyster Bar's upstairs meeting room, was no longer available, Crawdaddy's stepped up to provide us with a great space, good food, wonderful service, very good prices, a state-of-the-art PA system, and…..FREE BEER! I hope you have found it a rewarding place to meet each month. It certainly is different from venues past!

On the social side, the golf tournament has been set for Friday, April 22 at North Shore CC. Fermin Muniz has worked very hard to reinstate this event following the pandemic lockdowns. Sign-ups were lagging until we realized that the email hyperlinks to the application form were not working! You should have received a new Golf invitation via email. Please take a moment to respond to the application (also available in this Bulletin), so that the golf tournament can become a reality. And don't forget an event like this also needs sponsors. Thank you Fermin, for all your worthwhile effort.

The fishing tournament has been set for Thursday, July 28th to Friday, July 29th in Port Aransas. Leighton Devine is again organizing the event, so it is certain to be a fun and exciting time. Please look for the application, (also in this Bulletin and your email inbox), and also consider sponsoring. Thank you Leighton.

One social event in the works, unfortunately, had to be cancelled. The Pub Crawl, an enthusiastically received event for several years, until the pandemic cancelled it the last 2 years, has again been forced to cancel, this time due to insurance. Event insurance for this outing is prohibitively expensive, far more

so than any other activity we put on. I suppose it's partly due to Corpus Christi as the personal injury lawsuit capital of the country! Organizers B.J Thompson and Dawn Bissell had this event ready to go, until the insurance snag. Thank you both for your efforts.

By the way, this is the second popular social event the CCGS has been forced to terminate due to excessive event insurance. The other was the Family Fossil Field Trip. If anyone can suggest how we can legally protect ourselves without high insurance premiums, please let your board know.

AAPG/SPE Merger?

For those of us in the petroleum side of geoscience, there has recently been a loud debate in our industry over consolidating professional societies. As you are probably aware, the American Association of Petroleum Geologists (AAPG) and the Society of Petroleum Engineers (SPE) have put forth a proposal to merge societies. The proposal passed both organizations' executive committees. A vote by the general membership was scheduled for March 11th, but was postponed.

I can now report that the most recent meeting of the AAPG executive board (March 11), reacting to strong member reaction, voted to suspend merger discussion. Regardless your position on the appropriateness of a merger, suspension at this time is probably for the best. As both organizations were preparing for a membership vote on the matter, there remained a basketful of important unresolved issues that leadership said would be decided AFTER the merger. Issues such as membership criteria, certification, dues, continuance of core programs, executive governance structure, regional and sectional governance, and even maintaining journal publications had not been decided. Asking for a mandate on merging, while so many important elements remain unresolved is, in my opinion, foolhardy. I recall another vote on a far-reaching program that included many unknowns at the time of passage, Obamacare! We don't need to emulate that!

This merger would have had far- reaching implications for petroleum geoscientists around the world. There are many factors at play, including financial health, changing energy priorities, globalization, falling membership, to name just a few. Here is a link to AAPG describing their latest decision: www.aapg-spe-merger.org. There, you can also find information on what prompted the merger proposal in the first place. Lastly, should a merger proposal be revived, in order to have a say, your membership in AAPG, or SPE, must be current to place a vote.

Personally, for whatever it's worth, I was against the merger. SPE membership dwarfs AAPG. Despite the fact that it takes both disciplines to find, drill and complete oil and gas properties, the skill sets are completely different. Currently, those differing skill sets are preferentially addressed by each independent organization. A merged society, I believe, would offer diminished attention and support to the minority members, which in this case, would be petroleum geoscientists.

If the two organizations want to reduce costs by co-hosting their annual conventions, I'd be in favor of that. Forming a joint program that bridges both organizations, which is populated by members of both, shares literature, training, and field studies, etc. is another possibility.

Farewell

As this is the last Bulletin issue for the 2021-22 season, let me take this opportunity to say I have been honored to be president of this worthwhile organization for the last 2 years. Enduring the pandemic (still!), and with the general, slow decline in membership as a backdrop, it's been a challenge, but I think we've survived as well as could be expected. Our luncheon meetings have returned to in-person, and are well-attended, while our social events are slowly coming back, with early indications of full participation.

I also want to express my gratitude to the rest of the board, and our hard-working volunteers, that keep this organization running every year. I leave the office with full confidence that it will continue to be stewarded by generous and caring people who, like me, appreciate what this society provides for our members and the community at large.

Rick

TAMU-K Geosciences Research Symposium

Greetings from Texas A&M-Kingsville

Our inaugural Geosciences Research Symposium is scheduled for Friday, April 29, from 2:30 PM to 5 PM, at Peacock Auditorium on campus. The time frame might be adjusted once we figure out how many submissions we have.

We would be delighted to have 2 to 3 members of the CCGS in the Judging Committee. If interested please contact Veronica Sanchez.

Thank you.

Veronica Sanchez, PhD
Assistant professor of structural geology
Department of Physics & Geosciences
Texas A&M University-Kingsville, MSC 175
Kingsville, TX 78363-8202

Office: Manning Hall 136
361-593-4925

Connect with us

SPONSORS

CBGS President's Letter

CBGS Board 2021-2022

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

CBGS Scholarships

The Coastal Bend Geophysical Society (CBGS) has donated $10,000 to the Department of Physics and Geosciences, Texas A&M University-Kingsville in support of the multidisciplinary Petrophysics Graduate Program that has been requested. These funds will be used as scholarships in attracting quality graduate students.

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. We will be awarding the scholarships again this year.

Scholarship Requirements

Criteria for awarding the Scholarship from Coastal Bend Geophysical Society of Corpus Christi, Texas:

1. Scholarships are open to undergraduate or graduate students.
2. Must have declared major in Geophysics, or Geology with a concentration in Geophysics or Petrophysics.
3. Preference is given to students attending Coastal Bend schools (TAMU-K, TAMU-CC and Del Mar College), then to Coastal Bend natives attending other universities.
4. Must have a GPA of at least 3.0 and 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

- According to the U.S. Energy Information Administration (EIA) forecasts, total oil output in the major U.S. shale oil basins will rise 117,000 bpd to 8.708 million bpd in April, which is the highest since March 2020.
- The oil output in the biggest U.S. shale oil basin, Permian is also projected to rise 70,000 bpd to a record 5.2 mbpd in April, as per EIA projections. They also indicate a rise of 23,000 bpd to 1.1 mbpd in April in the Eagle Ford in South Texas.

- According to EIA, total natural gas output in the big shale basins will increase 0.6 bcfd to a record 92.3 bcfd in April, as reported by Stephanie Kelly and Scott DiSavino on reuters.com.
- According to Baker Hughes Co, the oil and gas rig count is 663 in the week of March 11, 2022, which is the highest since April 2020. This also reflects a 65% increase compared to this time last year.
- As of March 15, the U.S. crude futures were trading at ~$130 a barrel, as reported by Scott DiSavino on reuters.com.
- According to U.S. government projections, the U.S. oil production is expected to rise from 11.2 million bpd in 2021 to 12 million bpd in 2022 and 13 million bpd in 2023. This is expected to rise to 11.9 million bpd in 2022.

CBGS Business

CBGS currently has 43 active members, 4 honorary members, and 40 student members. Raised $1,450 towards student scholarships through membership revenue this past year.

CBGS workshops/talks

CBGS will be hosting two luncheon meetings in February and April, 2022 featuring international speakers, Dr. Rajesh Vayavur, Canada and Dr. Snons Cheong, South Korea, respectively.

CBGS is looking forward to offer workshops/talks in the future. Topic/speaker suggestions are welcome. Email your suggestions to Subbarao.Yelisetti@tamuk.edu

New Degree Tracks at TAMUK and Graduate Scholarships

- 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 2022, please contact the graduate coordinator for MS in Petrophysics, Dr. Subbarao Yelisetti at Subbarao.Yelisetti@tamuk.edu.
- The Department of Physics and Geosciences at TAMUK is offering competitive scholarships for MS Petrophysics students. For additional details about the program and scholarships, please visit the website:

  https://www.tamuk.edu/artsci/departments/phge/phys/academics/gp.html
- **BS degree in Geophysics, Minor in Geophysics and Certification in Geophysics** offered at Texas A&M University-Kingsville since Fall 2017. Interested students can contact Dr. Subbarao Yelisetti (Subbarao.Yelisetti@tamuk.edu) for additional information.

Education/Events

-SEG

SEG 2022 annual meeting will be held in Dallas, TX from September 10th -16th. See https://seg.org/AM/ 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

2022 Fall AGU annual meeting will be held in Chicago, IL from December 12-16th, 2022.
https://www.agu.org/Fall-Meeting

Monthly Saying

"My formula for success is rise early, work late and strike oil." - J. Paul Getty

Monthly Summary

Texas Oil and Gas Info	Current Month	Last Month	Difference	
Texas Production	**MMBO/BCF**	**MMBO/BCF**	**MMBO/BCF**	
Oil	136.5	144.2	-7.7	November
Condensate	20.3	20.9	-0.6	November
Gas	842.9	895.7	-52.8	November
	Current Month	**Yr to date - 2022**	**Yr to date - 2021**	
Texas Drilling Permits	836	1654	8730	February
Oil wells	181	377	2026	February
Gas wells	81	160	754	February
Oil and Gas wells	518	1015	5557	February
Other	9	20	82	February
Total Completions	1106	2420	13729	February
Oil Completions	857	1874	10485	February
Gas Completions	249	546	3244	February
New Field Discoveries	0	0	21	February
Other	348	937	5812	February

Subbarao Yelisetti
President, CBGS

CORPUS CHRISTI GEOLOGICAL SOCIETY
COASTAL BEND GEOPHYSICAL SOCIETY

LUNCHEON MEETING ANNOUNCEMENT

April 20, 2022

Location:	**Crawdaddy's Downtown, 317 Mesquite St. CC, TX 78401**
Student Sponsor:	**Viper Exploration, Nye Exploration, Imagine Resources. Thank you!**
Time:	**11:30 AM Bar, Lunch follows at 11:45 AM, Speaker at 12:00 PM**
Cost:	**$30.00 (additional $10.00 surcharge without reservation: NO SHOW may be billed.)**
Reservations:	**Please RSVP by 11:00 AM on Monday, May 16th before the meeting!**
	Email: arrangements@ccgeo.org

Please note that luncheon RSVPs are a commitment to Crawdaddy's Downtown 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

Inversion of Porosity Distribution for CO_2 Storage Formation in Otway Project

Dr. Snons Cheong, Principal Researcher, Korea Institute of Geoscience and Mineral Resources

ABSTRACT

Successful Carbon Capture and Storage (CCS) might be assured with long-term stabilization of the injected CO_2 in the geological storage formation. Monitoring CO_2 can be accomplished by numerical simulation with accurate geo-mechanical and petrophysical parameters such as porosity and permeability. Based on the seismic inversion, we estimated porosity information of the Paaratte Formation in the Otway site, one of the CO_2 storage sites in Australia. With 3D seismic subsurface volume and well logs, we inverted P-wave impedance of storage formation. Gathering the impedance and seismic attributes, the porosity distribution is derived across a whole domain by neural network scheme. The estimated porosity values matched well with porosity logs with an overall correlation of ~90%. The inversion scheme can improve the certainty of numerical simulation with embedding more confident input parameters.

BIOGRAPHY

Dr. Snons Cheong is a Principal Researcher at the Korea Institute of Geosciences and Mineral Resources (KIGAM), and is currently a Visiting Scholar in the Department of Physics and Geosciences at Texas A&M University-Kingsville. He is a Geophysicist with expertise in seismic data acquisition, processing, inversion, time-lapse seismic monitoring for Carbon Capture and Storage (CCS), development of the integrated geophysical survey in Korea and passive seismic monitoring with traffic noise.

Dr. Cheong obtained his BS and MS degrees in Energy Resources Engineering, and PhD in Geophysics from Seoul National University in 2001, 2003, and 2006, respectively. Since then he has been working in various roles from Researcher, Senior Researcher to his current position of Principle Researcher for KIGAM-a premier government research institute in South Korea. So far, he has 7 publications in international journals, 9 publications in Korean journals, over 20 international conference presentations, and participated in over 30 research cruises particularly on R/V Tamhae II.

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CORPUS CHRISTI GEOLOGICAL SOCIETY
COASTAL BEND GEOPHYSICAL SOCIETY

LUNCHEON MEETING ANNOUNCEMENT

May 18th, 2022

Location:	**Crawdaddy's Downtown, 317 Mesquite St. CC, TX 78401**
Student Sponsor:	**Viper Exploration, Nye Exploration, Imagine Resources. Thank you!**
Time:	**11:30 AM Bar, Lunch follows at 11:45 AM, Speaker at 12:00 PM**
Cost:	**$30.00 (additional $10.00 surcharge without reservation: NO SHOW may be billed.)**
Reservations:	**Please RSVP by 11:00 AM on Monday, May 16th before the meeting!**
	Email: arrangements@ccgeo.org

Please note that luncheon RSVPs are a commitment to Crawdaddy's Downtown and must be paid even if you can't attend the luncheon.

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CCGS Luncheon Presentation – May 18, 2022

Crawdaddy's Downtown

An Experimental Model of the Influence from Obstructed Subaqueous Channels on Turbidity Current Deposition/Erosion and the Potential for Channel Avulsion.

Dallas B Dunlap
Research Scientist Associate Bureau of Economic Geology.
Jackson School of Geosciences
Dallas.dunlap@beg.utexas.edu
512-656-6382

Biography:

Dallas B. Dunlap is a Research Scientist Associate at the University of Texas, Bureau of Economic Geology. He received his B.S. degree from the University of Texas at Austin in 1996. That year, he joined the BEG's International projects group focused on reservoir characterization studies in Austria, Mexico, and Venezuela. Dunlap further received a M.S. from UT in 2013 and is currently working towards a PhD (2022) focused on the impacts to channel migration and evolution from the emplacement of submarine landslides and sediment mass-movements. Dunlap continues to work in geologically complex deep-water settings which include the Northern Atlantic, Gulf of Mexico, and offshore Brazil and most recently in the growing field of reservoir characterization for carbon management and sequestration on the Texas and Louisiana Coast.

Abstract:

Recent availability of high-quality and laterally expansive 3D marine seismic-reflection data revealed unusual high-angle meander bend character in deep-water channels adjacent to structural highs and local areas of remobilized sediments. Subaqueous leveed-channels have been shown to influence the path of debris flows and the spatial distribution of resulting deposits. What has been less studied is how turbidity currents interact with channel-emplaced debris flow deposits and how these interactions influence sediment deposition/erosion and the potential for channel avulsion. To investigate these interactions, we have conducted a series of 3D laboratory experiments using similar shape but different size (height, width) and relative attack angle (90 and 60 degrees) obstructions that were placed within a 2 m long by 0.65 m wide by 0.06 m deep straight channel submerged within an 8 m x 4 m x 2 m tank. Both saline gravity flows and sediment-laden turbidity currents were released into the channel. High resolution topographic scans were used to identify the spatial and temporal evolution of deposition/erosion and 3D current velocity fields were measured on a 0.04 m x 0.04 m grid using a profiling acoustic doppler velocimeter.

For all obstruction sizes and turbidity current attack angles, two relatively large horizontal eddies with depth-limited vertical heights formed upslope of the obstruction within the channel thalweg and along the sloping channel walls. Near the obstructions, currents were accelerated by these eddies, resulting in localized erosion or reduced sedimentation and increased deposit reworking within the channel thalweg. These eddies were also associated with the redirection of the lowermost portions of the currents to the channel margins, while the portions of the currents above the eddies travelled over the obstruction. For a 90-degree attack angle (perpendicular to the channel), a portion of the currents were re-routed out of the channel for a large (approximately channel filled) obstruction, whereas the entire current flowed over a small obstruction (approximately 84% channel filled). For a 60-degree attack angle, a portion of the currents were re-routed out of the channel for

both large and small obstructions. Additionally, for the large obstruction more current was re-routed out of the channel for the 60-degree orientation than for the 90-degree orientation. It's estimated that approximately 10-30% of the current's volume was re-routed out of the channel axis, highlighting the often-overlooked impact of emplaced debris flow and slump deposits on post-emplacement turbidity current re-routing and potential avulsion of submarine channels and the implications for reservoir quality and facies distributions.

The Corpus Christi Geological Society

Proudly Presents

2022 Annual Spring Golf Tournament

April 22, 2022

12:30 p.m. Shotgun Start!!!

NorthShore Country Club
801 E. Broadway Blvd.
Portland, TX 78374

Proceeds benefit the Corpus Christi Geological Society ScholarshipTrust Fund

---

Tournament Coordinator:
Fermin Munoz
361-960-1126 (talk or text)
Fmunoz04@hotmail.com

Information and Registration Packet
CLICK HERE to get a registration form or **download** the brochure & attachment.

CORPUS CHRISTI GEOLOGICAL SOCIETY

4th Annual Spring Golf Tournament

NorthShore Country Club
April 22, 2022
12:30 p.m. Shotgun Start
Four-Person Scramble
100 Player Limit * Sign up Early
Contact: **Fermin Munoz, fmunoz04@hotmail.com, 361-960-1126**

Name _____

Email _____

Company Name _____

Address _____

City, State, Zip _____

Phone _____

_____ Yes, Please Place on a Team

_____ I want to be on a Team with: (list below)

Player 2: _____

Player 3: _____

Player 4: _____

_____ $110 per Golfer

_____ $440 per Team (4 players)

_____ Sponsorship Total

_____ **TOTAL AMOUNT DUE**

PAYMENT INFORMATION

_____ Check Enclosed

Make Checks payable to:
Corpus Christi Geological Society

Mail check to:
CCGS Golf Tournament
Fermin Munoz Jr.
619 E. Broadway
Portland, TX 78374

Sponsorships

#____ Beverage Sponsor	$500 ea.	_____
#____ Hole Sponsor	$200 ea.	_____
#____ Longest Drive	$100 ea.	_____
# ____ Closest to Pin	$100 ea.	_____
Door Prize Sponsor	$	_____
General Sponsor	$	_____
Total Sponsorship	**$**	_____

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Entry Fee Includes:

- Green Fees
- Range Balls
- Carts
- Beverages on the Golf Course (limited)
- Door Prizes
- Dinner

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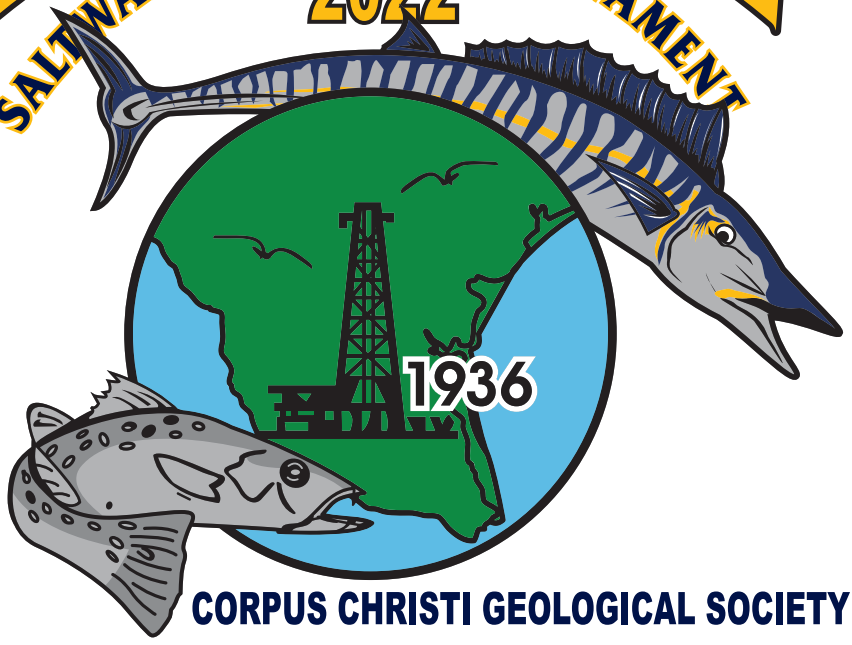
Jason Downing

Insurance Representative/Former O&G Professional
361-742-9252
Jason.downing@mutualofomaha.com

12th ANNUAL

SALTWATER FISHING TOURNAMENT

2022



CORPUS CHRISTI GEOLOGICAL SOCIETY

Thursday, July 28th

Treasure Island

@ 5:00 PM

Registration : 5:00 - 7:00 PM

Captains Meeting : 7:15 PM

Dinner, Drinks, Door Prizes !!

Friday, July 29th

Roberts Point Pavillion

Bay Weigh-in : 2:00 - 5:00 PM

Offshore Weigh-in : 4:00 - 7:00 PM

Trophy Presentation !!

Come and Join Us !!

PORT ARANSAS, TX

ldevine@suemaur.com @cc_geo @ ccgeologicalsociety

12th ANNUAL CORPUS CHRISTI GEOLOGICAL SOCIETY SALTWATER FISHING TOURNAMENT

The CCGS Saltwater Fishing Tournament will be held Friday, July 29th, 2022 for you and your guests at **Roberts Point Pavilion** located in Port Aransas, Texas. We invite you to join us in support of the **CCGS Scholarship Trust Fund.**

Fishing Hours will be from:
Offshore Division 12:01 AM to 7:00 PM Friday, July 29, 2022
Bay Division 6:00 AM to 5:00 PM Friday, July 29, 2022

Dock/Ramp departure time:
Offshore Division Boats may leave after Captain's Meeting Thursday, July 28, 2022
Bay Division 5:00 AM Friday, July 29, 2022

Weigh-In Time & Location will be:
Offshore Division 4:00 PM to 7:00 PM Friday, July 29, 2022 at **Roberts Point Pavilion**
Bay Division 2:00 PM to 5:00 PM Friday, July 29, 2022 at **Roberts Point Pavilion**

REGISTRATION: Early Registration will be by mail/e-mail with on-site registration available at **Treasure Island** from 5:00 PM to 7:00 PM Thursday, July 28, 2022. Don't forget your money for the fish pots!!!

DOCK PARTY & CAPTAIN'S MEETING: **Dinner, Drinks, and Entertainment will be provided Thursday Evening from 5:00 to 9:00 PM at Treasure Island (315 N. Alister St.). At least one team member must check-in and attend the Captain's meeting. Meeting will begin at 7:15PM. All anglers are encouraged to participate. *Note: Door prizes will be given away immediately following the Captain's Meeting. You must be present to win.**

COST:
Early tournament registration fee per Team/boat on or before July 15, 2022:
Offshore Division: $400.00
Bay Division: $300.00
Tournament registration fee per Team/Boat after July 15, 2022:
Offshore Division: $500.00
Bay Division: $400.00

TEAM AWARDS: The awards presentation for the Bay Division will start at/about 5:30 PM. Awards for the Offshore Division will start at/about 7:30 PM. **Cash Prizes will be awarded this year for Heaviest Stringer (Bay Division) and Offshore Grand Champion (Offshore Division). Amount TBD.** The following categories will be presented to 1st & 2nd place teams:

Bay Division:	**Offshore Division:**
Heaviest Stringer (1 Red Drum, 1 Speckled Trout, 1 Flounder)	Offshore Grand Champion
Heaviest Speckled Trout	Catch and Release Champion
Heaviest Red Drum (Redfish)	Heaviest Wahoo
Heaviest Flounder	Heaviest Dolphin (Dorado/Mahi)
Heaviest Black Drum	Heaviest Blackfin Tuna
	Heaviest Yellowfin Tuna

FISH POTS: Offshore and Bay Division fish pots are available and payments can be submitted via your registration forms, or at the on-site registration. **15% OF ALL FISH POTS WILL GO TO THE CCGS Scholarship Trust Fund.**

CONTACT: **Leighton Devine** 361-510-8872 (ldevine@suemaur.com)

CCGS Saltwater Fishing Tournament Rules

This year's tournament will be open to any and all Oilfield affiliated members and their guests. This is a **TEAM TOURNAMENT** with both bay and offshore fishing divisions.

OFFSHORE AND BAY DIVISIONS:

- All fish must be caught on Friday, July 29, 2022 during specified tournament fishing hours.
- No contestant will be eligible for awards unless registered in advance. Angler substitutions must be made by 7:00 PM July 28, 2022.
- Changing of fishing divisions must be done by 7:00 PM July 28, 2022.
- **Live, Dead and Artificial baits are legal.** All fish must be caught by rod and reel only. The use of trotlines, seines, dynamite, spear fishing, or any other illegal means of fishing are strictly prohibited. All Federal, and State recreational fishing and Boating Laws apply.
- **Weigh-In Station:** All fish weighed must be legal according to Federal and State game laws. Any team/boat attempting to weigh a fish that is not legal **will be disqualified**. Fish that are frozen, gutted, or otherwise mutilated will not be eligible and the team attempting to weigh such a fish will be disqualified. All fish are subject to further inspection if deemed necessary by the Weighmaster. Please be aware of your fishing division's weigh-in time as no fish will be weighed in before or after each division's allotted weigh-in time**. No sorting or substituting fish** while in the weigh-in line.
- All contestants are personally/solely responsible for any fines/actions resulting from any violations of Federal or State game laws, boating laws, or any other law relevant to boating and/or fishing. You are strongly encouraged to practice safe boating and use common sense.
- **ONE TEAM MEMBER MUST CHECK-IN AND ATTEND THE CAPTAIN'S MEETING THE DAY BEFORE THE TOURNAMENT. THE OFFSHORE DIVISION'S OBJECT OF THE DAY WILL BE AVAILABLE AT THIS TIME.**
- Only one boat per team is allowed, any team found fishing from multiple boats will be disqualified.
- Transfer of fish from one boat to another is not allowed.
- Teams are subject to disqualification from the tournament, and may be administered a polygraph test, in the event of any violation of tournament rules or suspected of foul play, including the weighing-in of fish which appear to have been caught prior to the day of the tournament. Contestants will be responsible for the cost of polygraph testing if they fail.
- The Tournament Chairman or Weighmaster will act as judge, and will handle all disputes or interpretations of the rules. **THE DECISIONS OF THE JUDGES ARE FINAL!**
- **In case of bad weather and tournament cancelation, registration fees and 15% of fish pots will be donated to the CCGS Continuing Education Programs. Tournament will not be rescheduled. The CCGS Fishing Tournament Board will make any/all decisions regarding tournament cancelation during the Captain's Meeting Thursday, July 28, 2022.**

OFFSHORE DIVISION:

- Boats entered in the Offshore Division may leave the dock/boat ramp after the Captain's Meeting, with lines in the water no earlier than 12:01 AM. **YOU MUST BE IN THE WEIGH-IN LINE** (visible to the tournament Weighmaster) no later than 7:00 PM. **NO EXCEPTIONS!**

  Offshore division dock/ramp departure time: After Captain's Meeting
  Offshore division fishing hours: 12:01 AM to 7:00 PM
  Offshore division Weigh-In time: 4:00 PM to 7:00 PM

- **BOAT CHARTERS ARE ALLOWED. IGFA RULES APPLY, WITH ONE RULE MODIFICATION REGARDING ANGLING REGULATIONS. DECKHANDS ARE ALLOWED TO REMOVE ROD, STRIKE AND HOOK FISH THEN PASS THE ROD TO THE ANGLER.**

OFFSHORE DIVISION: *(cont.)*

- **All Billfish will be released.** To qualify for catch and release points, a digital image from a camera clearly showing both the dorsal fin of the fish, and the object of the day must be present, and visible. The digital image and Catch & Release Sheet must be submitted to the weigh station at the time of weigh-in. All Billfish must remain in the water. Photos showing the fish in the boat WILL NOT be eligible for points, and will disqualify the team/boat. In order to receive points for a blue marlin, the picture must clearly show it is a blue marlin; otherwise the fish will be scored as a white marlin. **LAPTOP WITH A USB CONNECTION WILL BE AVAILABLE; IT IS THE BOAT/TEAM'S RESPONSIBILITY TO PROVIDE ANY NESSECARY CABLES OR CORDS TO UPLOAD DIGITAL IMAGES.**

- **Offshore Catch & Release points are as follows:**

Blue Marlin	…… 500 Points
White Marlin	…… 300 Points
Sailfish	…… 200 Points

- **All boats registered in the tournament will act as committee boats.** All catch and release fish must be reported on VHF channel 68, stating the Boat name, species of billfish released, and time of the release. When the catch and release report is received by another boat in the tournament, the receipt of time will be recorded. If you are unable to reach another boat in the tournament to record release, you may proceed to the weigh-in and report the catch and release. It is important to report as soon as possible as the time the report is received by another tournament boat or the Weigh master is the time recorded. A release sheet will be provided to all boats. It is the sole responsibility of the team/boat to turn in their release sheet to the weigh master during weigh-in.

- All other eligible offshore fish may be weighed in and scored (1) point per pound. Eligible offshore fish species include: **Wahoo**, **Dolphin** (Dorado/Mahi), **Yellowfin Tuna, & Blackfin Tuna.** Only these fish species will be weighed in. **EACH BOAT/TEAM MAY ONLY WEIGH-IN ONE FISH PER ELIGIBLE SPECIES.** Remember Weigh-In time for the Offshore Division is from 4:00 PM to 7:00 PM.

- In the event of a tie, the first team to accumulate points by earliest time will be declared the winner.

BAY DIVISION:

- Boats entered in the Bay Division may not leave the dock/boat ramp earlier than 5:00 AM with lines in the water no earlier than 6:00 AM. **YOU MUST BE IN THE WEIGH-IN LINE** (visible to the tournament Weigh Master) no later than 5:00 PM. **NO EXCEPTIONS!**

  Bay division dock/ramp departure time: 5:00 AM
  Bay division fishing hours: 6:00 AM to 5:00 PM
  Bay division Weigh-In time: 2:00 PM to 5:00 PM

- Bay Division Teams may launch and fish anywhere on the bays, as long as the weigh-in deadlines are made at **Roberts Point Pavilion**. **Surf fishing is allowed in the bay division.**

- Each Team member is allowed to have only one line in the water at any time during tournament fishing hours.

- All fish must be caught by rod and reel in adherence to Texas State Law.

- **FISHING GUIDES ARE ALLOWED**. However, all fish weighed in must be caught by registered anglers.

- Eligible Bay Division fish species include: **Speckled Trout**, **Red Drum** (Redfish), **Flounder**, & **Black Drum**. Only these fish species will be weighed in. No oversized, tagged Redfish will be weighed in. **The Weigh-in of any undersized fish will disqualify the team.** Remember Weigh-In time for the Bay Division is from 2:00 PM to 5:00 PM.

- **EACH TEAM/BOAT MAY ONLY WEIGH-IN ONE FISH PER ELIGIBLE SPECIES.**

- **In the event of a tie by fish weight, length and girth will determine the winner.**

12th ANNUAL CORPUS CHRISTI GEOLOGICAL SOCIETY SALTWATER FISHING TOURNAMENT

TEAM REGISTRATION FORM

Tournament registration fee on or before July 15, 2022: Offshore Division: $400.00, Bay Division: $300.00. Tournament registration fee after July 15, 2022: Offshore Division: $500.00, Bay Division: $400.00. **Registration fee includes Team entry into the tournament, Dinner, awards, tournament t-shirt, & a chance to win door prizes.** Additional dinner tickets: $20.00 per person. **Official Tournament Fishing Shirts: $50.00 (pre-order only).** By participating in the fishing tournament you are helping to support the CCGS Scholarship Trust Fund. We look forward to seeing you there.

TEAM REGISTRATION:

Boat/Team Name:_____ **Division: Offshore** _____ **Bay** _____ ***(Check one)***

TX No.: _____ **Make:**_____ **Length:** _____

Angler #1: _____ **Company:** _____
(Team Captain)

Address: _____

Phone: _____ **Email:** _____

Angler #2: _____ **Angler #3:** _____

Angler #4: _____ **Angler #5:** _____
(Applies for Offshore Division only)

**Please note Bay Division teams may have up to 4 anglers, and Offshore Division teams may have up to 5 anglers.*

By entering the "CORPUS CHRISTI GEOLOGICAL SOCIETY SALTWATER FISHING TOURNAMENT" We hereby waive all liability claims against tournament sponsors, hosts, officials and all persons associated with said tournament. We acknowledge that we have received a copy of, understand and agree to abide by all tournament rules, and understand my team will be disqualified for violation of any rules. We agree to abide by tournament official's rulings. We understand our entry fee is non-refundable.

*Team Captain:*_____ _____
Sign *Date*

FISH POTS : *(optional)*
To participate in the fish pots please indicate which categories the team wants to enter. Teams will be able to enter into the fish pots until the end of the Captain's Meeting 7:00 PM July 28, 2022. ***15% of the fish pots will be donated to the CCGS Scholarship Trust Fund.***

Bay Division

Heaviest Team Fish				
Red Drum	Speckled Trout	Flounder	Black Drum	Spot Pot
$100.00	$100.00	$100.00	$100.00	$100.00

Offshore Division

Total Catch and Release points			Heaviest Team Fish			
Blue	White	Sail	Wahoo	Dolphin	Blackfin Tuna	Yellowfin Tuna
$300.00	$300.00	$300.00	$100.00	$100.00	$100.00	$100.00

Payment Information: **Registration fee:** _____
Email with Credit Card Authorization Form to ldevine@suemaur.com or,
Please enclose registration form with a check payable to: *(Registration fee does not apply for Platinum or Gold sponsors)*

Corpus Christi Geological Society
C/O Suemaur Expl. & Prod.
555 N. Carancahua St. #1230
Corpus Christi, Texas 78401

Fish Pot total: _____
Additional Dinner Tickets: _____
Tournament Fishing Shirt: _____
Sizes: XXL_____ **XL** _____**L** ____**M** _____
Total Amount: _____

12th ANNUAL CORPUS CHRISTI GEOLOGICAL SOCIETY SALTWATER FISHING TOURNAMENT

SPONSORSHIP FORM

The Corpus Christi Geological Society (CCGS) is pleased to announce the 12th annual saltwater fishing tournament. The fishing tournament is being held Friday July 29, 2022 in Port Aransas, at Roberts Point Pavilion, and will consist of two fishing divisions (offshore/bay). The goal of the CCGS is to conduct a quality industry event that more importantly provides the CCGS with funds to support the CCGS Scholarship Trust Fund. Sponsorships are needed to maintain this program, and provide support for our future industry leaders.

Registration can be made until July 28th during the Captain's Meeting, with the tournament on July 29, 2022. We look forward to seeing you there.

Name of Business/Organization: _____

Contact Person: _____ Phone: _____

Address: _____

Sponsorships:

☐ **$2000.00 & up Platinum Sponsor**
Sponsorship recognition of Business/Organization at Tournament, and on tournament t-shirts
Plus **two** team entry fees, **8 Official Tournament Fishing Shirts for teams**, and $300 Fish pot credit.

☐ **$1000.00 Gold Sponsor**
Sponsorship recognition of Business/Organization at Tournament, and on tournament t-shirts
Plus **one** team entry fee, and **4 Official Tournament Fishing Shirts for team.**

☐ **$500.00 Silver Sponsor**
Sponsorship recognition of Business/Organization at Tournament, and on tournament t-shirts

☐ **$250.00 Bronze Sponsor**
Sponsorship recognition of Business/Organization at Tournament

**** ALL SPONSORS ARE WELCOMED TO DISPLAY THEIR OWN COMPANY BANNERS THURSDAY, AND FRIDAY DURING THE EVENT.***

Please mail this form along with a check payable to:

Corpus Christi Geological Society
C/O Suemaur Expl. & Prod.
555 N. Carancahua St. #1230
Corpus Christi, TX 78401

For more information regarding sponsorship please contact:
Patrick McCullough 361-876-7881
Leighton Devine 361-510-8872

Corpus Christi Geological Society

Credit Card Authorization Form

Please Return Authorization Form to Leighton Devine via fax (361) 884-9623 or e-mail to ldevine@suemaur.com

Event Sponsorships: **Platnum: $2000** **Gold: $1000** **Silver: $500** **Bronze: $250**

Total Invoice Amount: _____

Company Name: _____

Name on Credit Card: _____

Billing Address of Credit Card: _____

_____

Contact Phone Number: _____

Fax Number or Email Address: _____

Credit Card Number: _____

Type of Card: **VISA** **MASTERCARD** **AMEX** **DISCOVER**

Expiration Date: _____/_____

Security Code: _____

Authorized Signature: _____ Date: _____

Printed Name: _____

DON'T FORGET TO SEND IN THE TEAM REGISTRATION FORM

(SINCE 1983)

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Subtle Prospects in the 21st Century: Are They Relevant

Barry J Rava, President, Icarus Oil and Gas, Inc., Houston, Texas

Search for the Subtle Trap

Michel T Halbouty : "[Subtle traps are] are found mainly when explorationists were concentrating their efforts towards locating [obvious] structural accumulations."
AAPG Memoir 32 (1982) The Deliberate Search for the Subtle Trap

New Subtle Trap Definition: Only You Can See It!

Subtle Prospects in the 21st Century: Are They Relevant?

Barry J Rava, President, Icarus Oil and Gas, Inc., Texas PG 2515 and 2516, SIPES 3198

Abstract:

This paper is developed from several lectures delivered over the last year at several SIPES and CCGS/CBGS meetings. It seemed that there was a marked increase in the number of participants in projects both originated and/or participated in by Icarus Oil and Gas, Inc. Internal records since 1996 were investigated and proved this to be the case; prospects appeared to be getting increasingly difficult to market. Anecdotal conversations by this author with other prospectors in the Oil and Gas Industry seemed to point to an increased number of participants as an industry-wide phenomenon, and thus not unique to Icarus' prospects (i.e. Icarus' prospects were not becoming increasingly risky, or were they?). An analysis of the potential reasons for the increased number of participants was commenced.

Coming as a discovery to none, the drilling and development of oil and gas prospects does not occur in a vacuum. There are many factors that contribute to when and which particular prospect finally gets drilled. This paper examines, solely from the Author's perspective and experiences, the state of the Oil and Gas Industry, the demand for hydrocarbons, macroeconomics, the exploration cycle and prospect flow for a small shop, and the development, economics, and sale and of a subtle trap in the 21st century.

Introduction:

First, a definition of Subtle trap: Michel T Halbouty: "[Subtle traps] are found mainly when explorationists were concentrating their efforts towards locating [obvious] structural accumulations." AAPG Memoir 32 (1982); The Deliberate Search for the Subtle Trap.

A new proposed definition is: A Subtle Trap is a supposed accumulation of oil and gas that only the project originator can recognize and understand! "Only you can see it!"

Accepting that definition it becomes the responsibility of the prospector to convince other scientists and investors of the viability of the supposed accumulation. This paper examines what goes into the making and marketing, and some tools that may help qualify such a prospect.

State of the Oil and Gas Industry; its Environment of Existence:

This is the environment into which drilling projects are marketed. According to the largest **Distributors Of News (DON)** – the major UHF and VHF networks, and 3 or 4 major nationally and internationally distributed newspapers – civilization urgently and immediately needs to turn away from its voracious consumption of environmentally harmful hydrocarbons and turn to the friendly technologies of the 17th Century solution of producing energy from windmills or the 21st century solution of energy from solar collectors. Examination of the actual environmental impact of those technologies is not the subject of this paper. The message here is a quick comparison of the economics of these two technologies and their perception by the general public as being ESG (Environmental, Societal, and Governance) compliant. The past lectures illustrated this point in 20 diagrams – here it is summarized in bullet points (**Table 1-Wind, Table 2-Solar**).

Table 1 - Wind

- **There is no such thing as a dry hole in the wind or solar industries.** That is why renewable industries can attract new capital while offering investors steady but lower returns.
- **If oil managements do decide to enter the renewables** business in a big way, as opposed to mere greenwashing, **they may have to accept a lower rate of profitability.** If they don't, they will have a hard time obtaining business.

By Leonard Hyman and William Tilles for Oilprice.com Jan 05, 2021

- [Wind] projects are bankable as soon as they have contracts signed.
- They do not compete against state controlled entities with few capital or environmental constraints.
- They can contract for a steady flow of revenues and pay regular dividends.
- Environmental accidents do not have multi-billion dollar consequences. Okay, weather can affect performance, but on balance performance averages out.
- In brief, renewable energy projects can be characterized as relatively small, or modular, with short duration of construction (planning takes longer), predictable revenues with limited foreign exposure

- **BP Gambles Big on Fast Transition from Oil to Renewables** Ron Bousso, Reuters, Thu, 09/23/2021 - 04:25 AM

https://www.hartenergy.com/exclusives/bp-gambles-big-fast-transition-oil-renewables-196342?utm_source=Internal&utm_medium=Popular&utm_campaign=reccoengine&utm_content=/exclusives/bp-gambles-big-fast-transition-oil-renewables-196342

BP acknowledged that its fast-growing clean-energy business—including its solar, EV-charging and wind ventures—continues to lose money. **The company does not expect profits from those businesses until at least 2025.**

BP CEO Bernard Looney, who took office in February 2020, is gambling that BP can make the clean-energy transition much faster than its peers. Last year, he became **the first major oil CEO to announce that he would purposely cut future production. He aims to slash BP's output by 40%, or about 1 million bbl/d, an amount equal to the UK's entire daily output in 2019.** At the same time, BP would boost its capacity to generate electricity from renewable sources….

Table 2 - Solar

- **Most of 2022's solar PV projects risk delay or cancelation due to soaring material & shipping costs** October 26, 2021 – RYSTAD ENERGY – David Dixon

- **The surging cost of manufacturing materials and shipping** could threaten a staggering 56% PV developments planned for 2022. Inflation and supply chain bottlenecks could lead to the **postponement or even cancelation** of some of these projects, impacting demand and consumer pricing for solar-generated power.

- Driven by core component price inflation, **manufacturing costs for PV modules** have surged from below $0.20 per watt peak (Wp) in 2020 to between $0.26 and $0.28 per Wp in the second half of 2021 – a **near 50% increase in a year.**

- A significant driver of this surge is a more than **300% hike in the cost of polysilicon**, a core component in PV manufacturing. In addition, **other raw materials – silver, copper, aluminum and glass – have also climbed steadily** since January 2020, increasing the pressure on module prices.

- "**The current bottlenecks are not expected to be relieved within the next 12 months**, meaning developers will have to decide whether to reduce their margins, delay projects or increase prices to get projects to financial close," says David Dixon, senior renewables analyst at Rystad Energy.

- **To Reach net-zero emissions by 2050 Rystad Energy pointed out :**

> "the significant utility solar PV installed capacity required to meet the target would occupy around **13,412 square miles of land … roughly 50 times the size of Austin, Texas**.

"Land scarcity is often cited as a key barrier to ramping up solar and wind energy capacity in the U.S., thus undermining the country's revitalized decarbonization ambitions for the next 30 years," Rystad said. "Solar farms, in particular, require a lot of real estate and, unlike wind farms, could take land away from agriculture or other uses."

- The Wall Street Journal reported that some environmentalists have begun to oppose large-scale solar farm sites, since they could possibly destroy the nesting habitat of certain endangered tortoises. You just can't please some people.

https://www.rystadenergy.com/newsevents/news/press-releases/most-of-2022s-solar-PV-projects-risk-delay-or-cancelation-due-to-soaring-material-and-shipping-costs/

https://www.hartenergy.com/exclusives/oil-and-gas-investor-closing-new-years-eve-2050-195406?mkt_tok=NDMzLU9ESy04ODkAAAF-ldUbm1OvNwGKdQHACgYF9kBg_ilVHVmBBmEmm-vjMHY1t5istWhCw_qShzEj8cegSRHA_C6LCK_FrgroSS9E9Eit_NGsdV_9aBJhDpw9_g

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- Attend regional and national meetings.
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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

It is noted, based on data in Tables 1 and 2 that Wind and Solar have their own unique set of problems that society will discover after it's too late. For a few examples, the blades of a modern windmill are not recyclable, those blades are made of hydrocarbon products, and the components of solar panels do not last forever and will also, at some point, become a land-fill nuisance.

There is more to ESG than just the promotion of Solar and Wind power. ESG thought encompasses everything in our lives. Belief in ESG by the political leadership and the DON also affect the oil and gas market. Political leadership tends to set the mood of society and the DON reinforces these points and in many cases seems to lead the politicians into their stances on various topics. The current political leadership and DON view oil and gas in an unfavorable light.

Table 3, Government 'Actions,' lists some hurdles laid before the Industry and **Table 4, Petroleum-Based Products**, highlights some of the many good things in life that petroleum makes possible. The Government Actions table is culled from news stories over the last year from many different sources. All the various current government actions have caused a major slowdown in the drilling and discovery of new oil and gas fields. Demand for petroleum products is ever increasing as they tend to make life much healthier and easier for people that have access to those products (Table 4).

The Industry is in a constant 'Battle of Perception' with various 'end-of-planet' predictions. A listing of such predictions was undertaken but it was discovered that such a list already exists. Railroad Commissioner Wayne Christian assembled and made a press-release of such a list in August 2021 – it is repeated here in **Table 5, Environmental Predictions**. Another great source of environmental information is the CO2 Coalition and can be found at co2coalition.org.

The result of these various actions and societal feelings is an upsurge in petroleum prices as these actions and feelings act in concert to make supply scarcer. An amusing look at the price of various liquids is presented in **Chart 1, Liquid Prices**. The chart is merely amusing as a direct price comparison on a per-gallon basis; it is not an attempt at, or even suggested that or possible to effect an 'apples to oranges' comparison. The purpose is to note that society's values are reflected in these prices and it is suggested, or opined, some of these values may be 'miss-placed'!

More somber thoughts on pricing are provided by the Russian Deputy Prime Minister, Alexander Novak and Saudi Energy Minister Prince Abdulaziz bin Salman. These leaders of OPEC+ mock our political leaders and the Wests' political leaders' "Net Zero Roadmap" as being a map to 'la-la land!' In June of 2021 they predicted oil prices of $200 per barrel. Seems they may come close to being correct. A very precedent, dead-on prediction, was made by Bank of America (BOA). Way back in November of 2021 BOA predicted that Brent crude would hit $120 a barrel by the end of June 2022! In October of 2021, according to Hart Energy, Putin was blaming high energy prices in Europe on 'hysteria on the green transition.' Russell Hardy, CEO of The Vitol Group, the world's largest crude trader, in November of 2021, noted that supply and demand is "going to be reasonably tight" for the next 12 months and a price spike to $100 a barrel is "certainly a possibility".

CHARGER EXPLORATION

Michael L. Jones

President/Geologist

Onshore Gulf Coast Prospect Generation and Consulting

1001 McKinney Street, Suite 801 Houston, TX 77002
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Email: mjones@chargerexploration.com
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Table 3 – Government 'Actions'

- Proposed Methane Fee - $1,500/ton of methane
- This is to ameliorate the many natural disasters caused by burning hydrocarbons
- No new federal leases
    - – this can be followed like a pin-pong ball, on again, off again
    - On but then voided by lawsuit based on environmental concerns
- Elimination of drilling permits on federals as directed by executive order
- Permitted and litigated Pipelines cancelled
- Pipelines no-permitted
- Urging oil producers to pump more fossil fuels while imploring countries to tackle 'climate change'
- Constant threat to remove 'subsidies' for oil and gas
- Drilling setbacks
- Wetlands every where
- Antiquities
- Windfall Profits Tax
- Discouraging banks and other money-controllers from oil and gas investments
- Divestment of oil and gas holdings by large institutions
- Reinforcement of these ideas through various political appointments of individuals adverse to the oil and gas industry
- AND THEN THERE IS CALIFORNIA

California to open 5 natural gas plants to avoid blackouts Shelby Bracho – 8-20-2021 . KMPH Local (Fox 26).

California officials say five temporary gas-fueled generators will be set up around existing power plants throughout the state to avoid blackouts and boost the state's grid.

This is a move in the opposite direction from California's big push toward "green" renewable energy. **"We cannot keep the lights on without additional natural gas and the state's been forced to go out and find it in an emergency situation," said Assembly member Jim Patterson.**

"California has been gambling that we can have a grid that can supply the fifth largest economy in the planet with enough electricity primarily from wind and solar," said Assembly member Patterson, "Now, the problem with that is that wind and solar is not baseload, it is intermittent load, it is a supply that goes away when we need it the most."**Natural gas, you can turn it on when you need it, you can use it at any time of the day or night, it is readily available, it is relatively affordable and it burns relatively cleanly,.."**

According to Forbes (11/3/2201) Governor Gavin Newsom fixed this problem by signing Senate Bill 423 into law. This legislations declares Natural Gas a firm zero-carbon resource

- The German Social Democrats like this idea too and are discussing with the Greens to have the EU label gas power plants 'green'

Table 4 – Petroleum-Based Products

A partial list of products made from Petroleum (144 of 6000 items)

One 42-gallon BO creates 19.4 gallons of gasoline.
The rest (over half) is used to make things like:

Solvents	Diesel fuel	Motor Oil	Bearing Grease	Guitar Strings	Aspirin
Ink	Floor Wax	Ballpoint Pens	Football Cleats	Antifreeze	Awnings
Upholstery	Sweaters	Boats	Insecticides	Clothes	Ice Chests
Bicycle Tires	Sports Car Bodies	Nail Polish	Fishing lures	Combs	Paint Brushes
Dresses	Tires	Golf Bags	Perfumes	Vaporizers	Sun Glasses
Cassettes	Dishwasher parts	Tool Boxes	Shoe Polish	Heart Valves	Parachutes
Motorcycle Helmet	Caulking	Petroleum Jelly	Transparent Tape	Enamel	Dishes
CD Player	Faucet Washers	Antiseptics	Clothesline	Anesthetics	Artificial limbs
Curtains	Food Preservatives	Basketballs	Soap	Dentures	Folding Doors
Vitamin Capsules	Antihistamines	Purses	Shoes	Cold cream	Soft Contact lenses
Dashboards	Cortisone	Deodorant	Shoelace Aglets	Fan Belts	Shaving Cream
Putty	Dyes	Panty Hose	Refrigerant	Refrigerators	Toothpaste
Percolators	Life Jackets	Rubbing Alcohol	Linings	Luggage	Safety Glasses
Skis	TV Cabinets	Shag Rugs	Electrician's Tape	Football Helmets	Eyeglasses
Tool Racks	Car Battery Cases	Epoxy	Paint	Toothbrushes	Footballs
Mops	Slacks	Insect Repellent	Oil Filters	CD's & DVD's	Detergents
Umbrellas	Yarn	Fertilizers	Hair Coloring	Balloons	Tents
Roofing	Toilet Seats	Fishing Rods	Lipstick	Crayons	Telephones
Denture Adhesive	Linoleum	Ice Cube Trays	Synthetic Rubber	Pillows	Cameras
Speakers	Plastic Wood	Electric Blankets	Glycerin	Artificial Turf	Bandages
Tennis Rackets	Rubber Cement	Fishing Boots	Dice	Model Cars	Hair Curlers
Nylon Rope	Candles	Trash Bags	House Paint	Movie film	Drinking Cups
Water Pipes	Hand Lotion	Roller Skates	Surf Boards	Car Enamel	Ammonia
Shampoo	Wheels	Paint Rollers	Shower Curtains	Golf Balls	Gasoline

On Ranken Energy website (www.ranken-energy.com) Source EIA – https://www.eia.gov/tools/faqs/faq.php?id=41&t=6

Table 5 – Environmental Predictions

News Release from Railroad Commissioner Wayne Christian; Tuesday, August 10, 2021

A new report by the United Nations released yesterday implies that it is too late to stop global warming from intensifying over the next 30 years no matter what policy changes or technological advancements are made.

This isn't the first time environmental thought-leaders have falsely proclaimed armageddon is around the corner:

1970: "The world has been chilling sharply for about twenty years. If present trends continue, the world will be about four degrees colder for the global mean temperature in 1990, but eleven degrees colder in the year 2000. This is about twice what it would take to put us into an ice age." - Kenneth Watt (prominent ecologist)

1976: "This cooling has already killed hundreds of thousands of people. If it continues and no strong action is taken, it will cause world famine, world chaos and world war, and this could all come about before the year 2000." - Lowell Ponte (Author, The Cooling)

1982: "By the turn of the century, an environmental catastrophe will witness devastation as complete, as irreversible, as any nuclear holocaust." - Mostafa Tolba (Former Executive Director of the United Nations Environment Program)

1989: "Entire nations could be wiped off the face of the Earth by rising sea levels and shifting climate patterns that would bring back 1930s Dust Bowl conditions to Canadian and U.S. wheat-lands. If the global warming trend is not reversed by the year 2000." - Noel Brown (Former Director of the United Nations Environment Program)

2006: "Humans may have only 10 years left to save the planet from turning into a total frying pan." - Al Gore (Former Vice President)

Climate change is not the same thing as a climate crisis. Climate models are constantly being updated or modified, and wildly irresponsible climate predictions — like the starvation of 4 billion people during the 1980s — have not happened.

As stated by Alex Epstein: "The international disaster database, which tracks climate-related deaths — including deaths from flood, droughts, extreme heat, extreme cold, storms, and wildfires — shows a 98% decrease in the rate of climate-related deaths since significant CO2 emissions began 80 years ago. Fossil fuel use doesn't take a safe climate and make it dangerous, it takes a dangerous climate and makes it safe."

The truth is the United States is getting cleaner, not dirtier. Over the last fifty years, the six major pollutants regulated by the EPA have fallen by 77 percent while the U.S. economy grew 285 percent and its population by 60 percent.

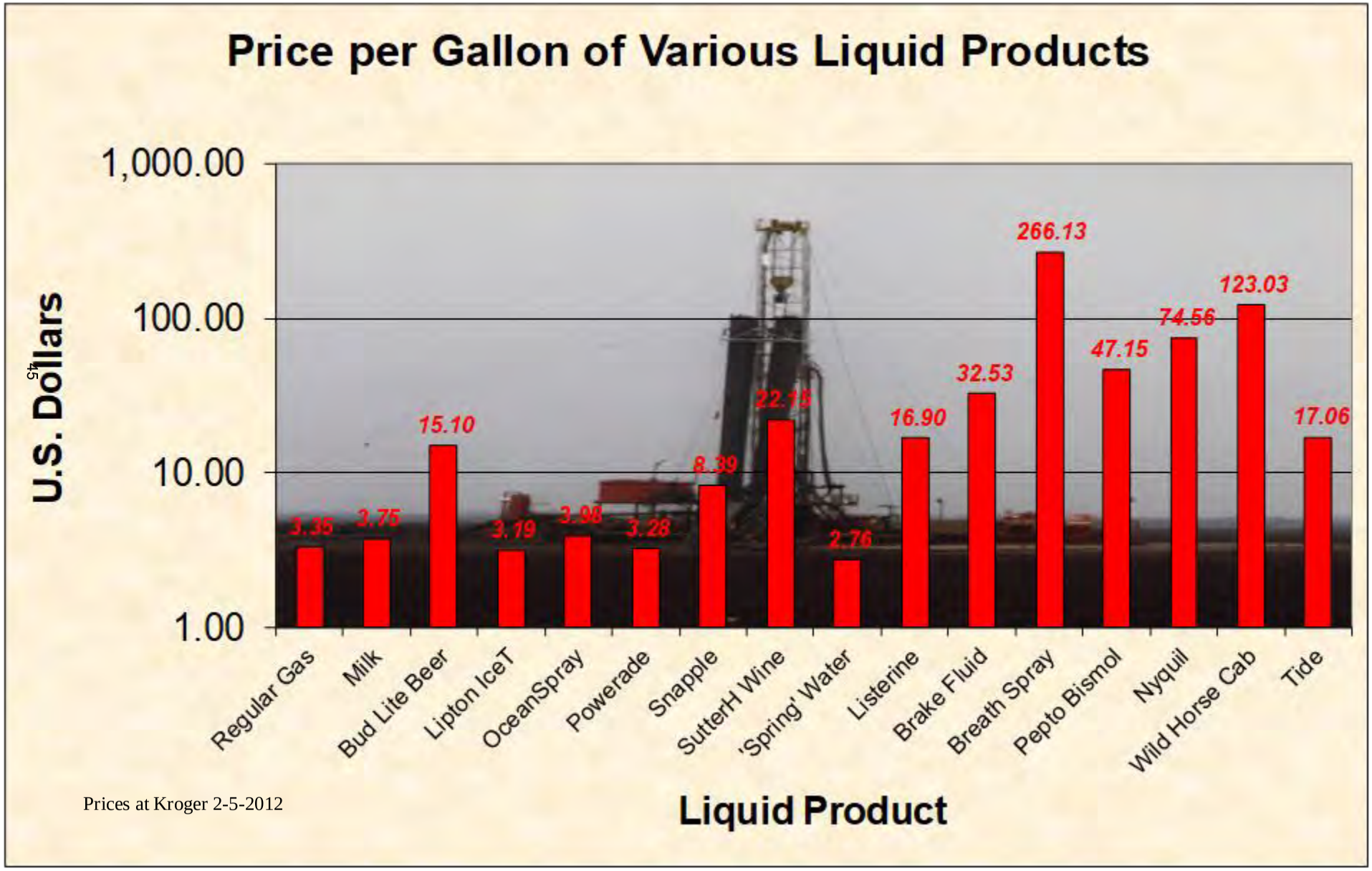
While natural gas production increased more than 50% between 1990 and 2017, methane emissions from natural gas decreased by more than 14%.

According to the U.S. Energy Information Administration, between 2005 and 2019, total U.S. electricity generation increased by almost 2% while related CO2 emissions fell by 33%.

Meanwhile, China — already the largest carbon emitter on Earth — commissioned more coal-fired electric generation capacity last year than the rest of the world retired. More than 50 percent of the raw materials required to make solar panels and wind turbines are now mined in China by power generated from fossil fuels. This means utilizing wind and solar isn't reducing our emissions, it is just shipping them overseas.

I touched on this hypocrisy in my recent op-ed in the Midland Reporter Telegram. Please take a moment to give it a read and SHARE with your friends.

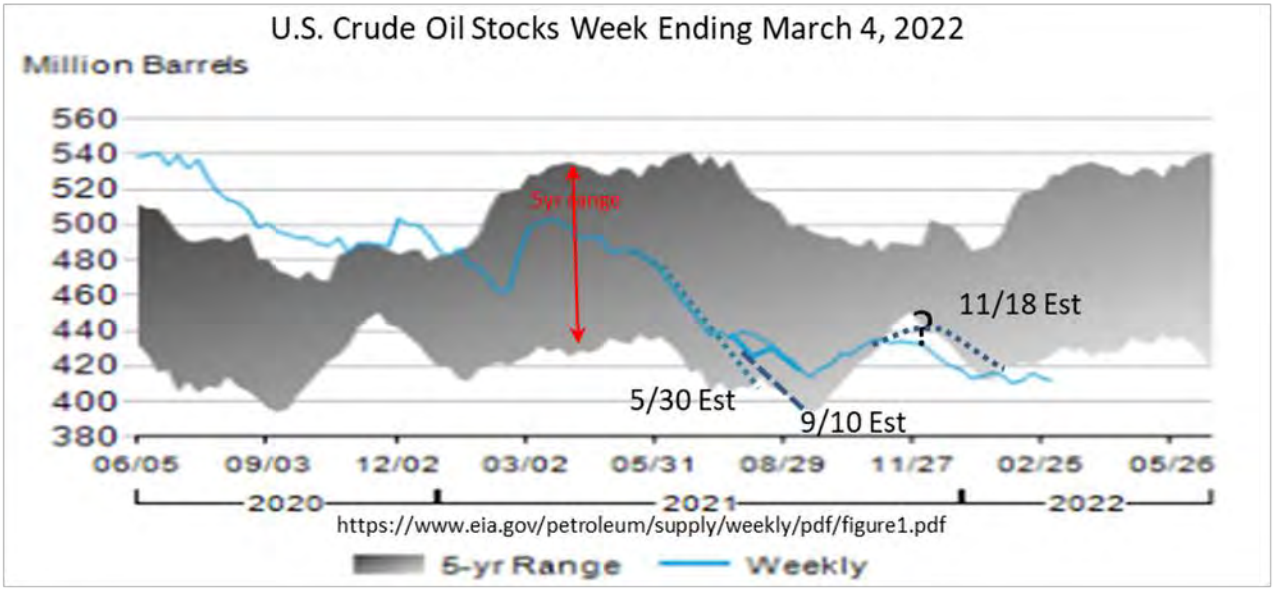
Chart 1 – The Price of Various Liquids



Prices at Kroger 2-5-2012

In fact, everyone is capable of making some kind of informed price prediction if the DON, markets, and production and storage trends are followed closely. **Chart 2 is a record of U.S. crude oil stocks**. This chart is published by the Energy Information Agency (EIA) and can be found on their website. The latest chart (prepublication of this article) is reproduced here. The chart shows the historic 5-year high and low storage range in gray shading (red arrow added) and shows the current year storage in blue. Dashed lines are predictions made, at various times, by this author. The point is not whether or not the author can make accurate predictions but that by casual observation one can see that current storage is not running concordant to historical storage. Indeed at the 2022 end of the chart it is observed that the current storage is becoming increasingly low compared to historical trends.

Chart 2 – US Oil Stocks



US Inventories are at a deficit of 70.839 MBbls to last year and a deficit of 28.73 MBbls to the five-year average.

The crude stocks are down because demand is up and production is decreasing or at least not meeting storage plans (demand). This is the U.S. chart, but the world-wide the chart is similar. Currently the imbalance world-wide is exacerbated by the war in Ukraine. The crude storage, gas storage and product storage information together with supply figures as reported to various governmental agencies in the U.S. and around the world, and leading economic indicators lead to price predictions. This author is not a trader and would fail miserable as one (for instance the author believed the price would increase when actual bombs began dropping during the Gulf War in the 1990's but instead, the price decreased). As government agencies are known for their accuracy in various matters, the Federal Reserve Bank of Dallas, using available EIA and other data, charts the price of WTI and Brent and always adds their prediction to the chart. Their most recent chart is reproduced below in **Chart 3, Crude Price**.

Chart 3A is from November of 2021. The red oval and three arrowed trend lines and the question marks are added by this author. The dashed blue and green lines are the FED's future price prediction (which obviously shows no influence from the political class that wishes prices remain low). Three trend arrows all suggest an upward trend but the FED predicts a radical turn-around. The folly is repeated in Chart 3B

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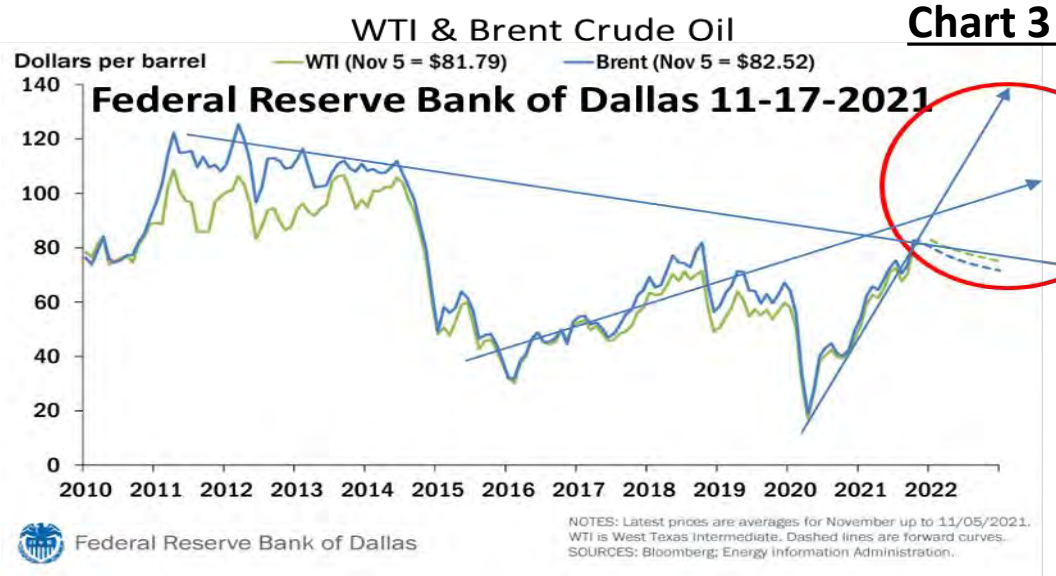
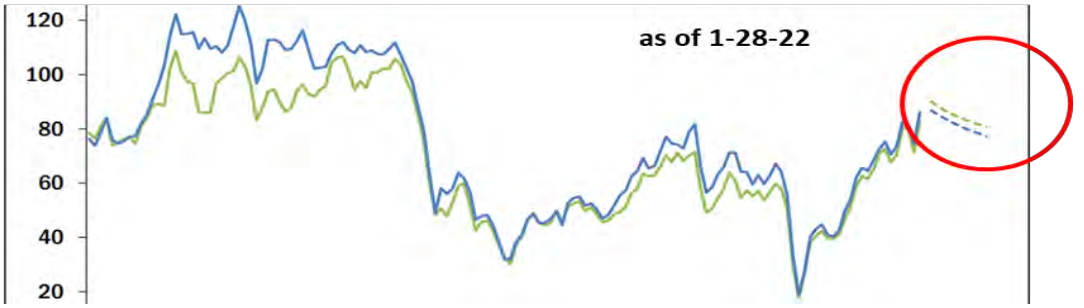
Chart 3 – Crude Price

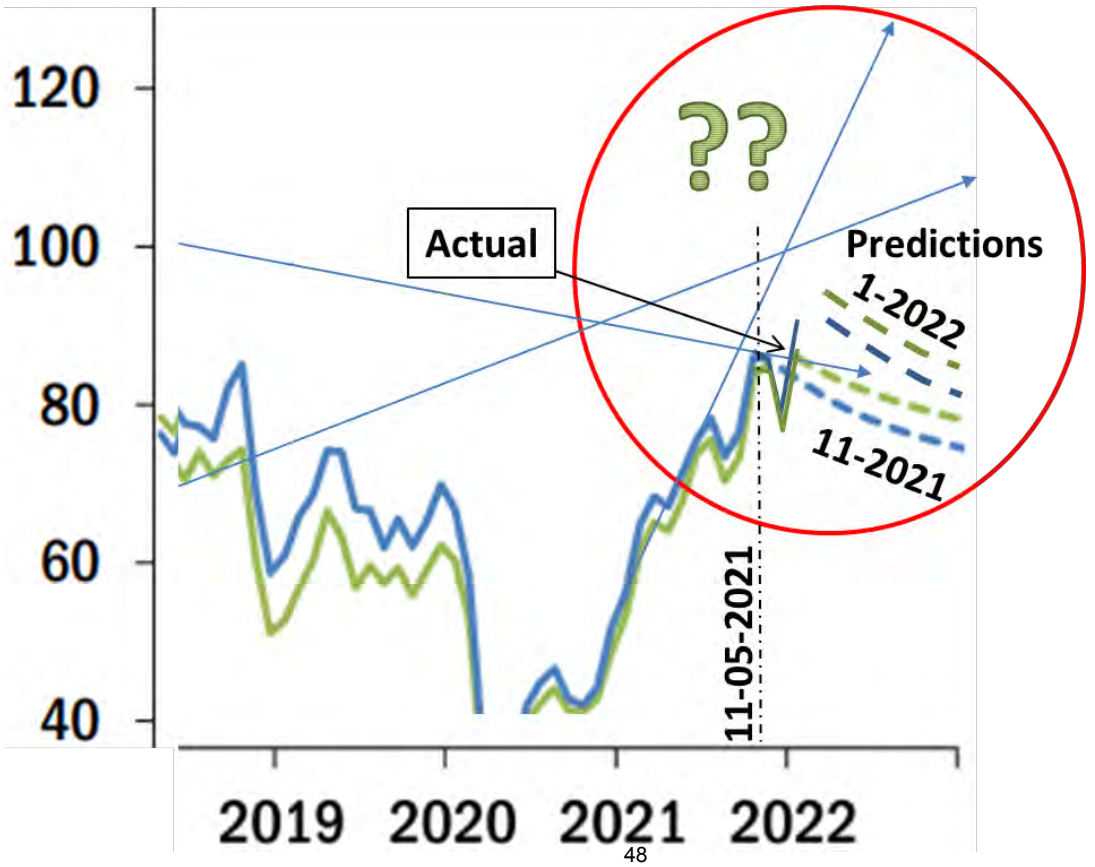


3-A

Same Chart, same scales as above, same prediction
Federal Reserve Bank of Dallas 3-13-2022



3-B



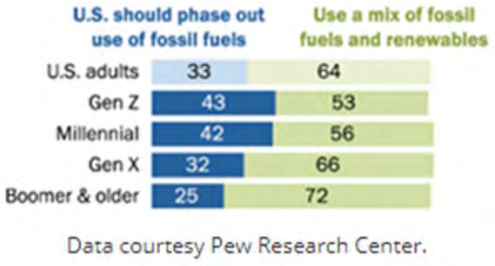
3-C

released in March of 2022 based on data up to January 28, 2022. Chart 3C enlarges the last (current) part of their chart and shows in clarity the sharp turn-around predicted so contrary to all other indicators.

The general public (13,000 of them), when polled by Pew Research Center in April 2021, opposed phasing out of fossil fuels. As reported in World Oil (Chart 4 below)**,** nearly two-thirds of Americans (64%) say the U.S. should use a mix of energy sources going forward – including oil, coal and natural gas, along with renewables. Only about a third (33%) of Americans support phasing out fossil fuels entirely. On the other hand, nearly all respondents (92 percent) said protecting the environment for future generations is important to them personally in policies to tackle climate change. Almost as many respondents believe that increasing jobs and economic growth and keeping consumer costs low are also important - 91 percent of adults placed high value on these factors.

Chart 4 – Results of Pew Research in 2021

64% = Need O,G, Coal
33% = No Fossil, now!
3% = extra ignorant



The Federal Reserve of Dallas conducts various surveys throughout the year. One of the polling questions from a survey collected in June of 2021 inquired about plans to make investments in wind and/or solar. Of the respondents to this poll 149 oil and gas firms answered this question. Only 7% said they already invested in wind/solar and 9% said they planned to invest by 2025. The good news went unanalyzed. The results indicate that 124 respondents are committed to oil and gas. Too bad the survey is anonymous – this would make a great contact list for selling prospects!

According to Moody's analyst Sajjad Alam, as reported in Bloomberg and World Oil, explorers need to raise drilling budgets by 54% to more than half a trillion dollars to forestall a significant supply deficit in the next few years. Drilling outlays are only forecast to increase by 8% globally that's too little to replace what those companies will pump from the ground in 2022 (i.e. Chart 2), setting the stage for even tighter supply scenarios. Along with this, even before the war in Ukraine, a variety of DON's report OPEC and shale-oil producers 'have showed remarkable restraint' in not increasing production. This author calls BS on that reasoning – OPEC is apparently unable to as they do not have the ability, right now, to produce more and the U.S. shale drillers will not use their own money on new wells as most of these horizontal wells are simply not economic enough to drill unless investors of one type or another are promoted into the project – and due to the government and DON pressures put upon investors and banks to 'go green' and have good ESG scores those pools of money are currently not available.

This is the state of the industry into which explorers are marketing their projects in 2022. On an optimistic tick, there are about 7 billion people in the world and about half of them have energy and the other half want energy. The EIA projects the world's population to increase by 2 billion people by 2050, pushing up global energy use by nearly 50%. **EXPLORERS NEED TO FIND MORE OIL AND GAS.**

Developing Ideas:

It is not the purpose of this article to tell the reader how to find and develop an idea, but rather to help structure that idea into its proper context. Ideas for prospects come from many different sources and in many different ways and at many different times – it is the artistic portion of finding places to drill for oil and gas. However, these ideas do not occur in a vacuum, they occur in the 'Environment of Existence' discussed above. Since the idea occurs in a societal context, it is likely not unique – it may be rare, but it will not be unique.

John Masters, in 1966, said "Recognize this: If you have a new idea, there is something about the evolution of information which has made the time ripe for that idea. Sure as the sun will rise, someone else is going to have that same idea. Always go fast. Someone will be catching up." Contrary to this, one can also be too far in front with an outlier idea and nobody else will follow! Linus Pauling (Nobel Prize winning chemist) supposedly said "The best way to come up with a good idea is to come up with a lot of ideas." Sometimes it is good to have a foil to review ideas to help choose the best.

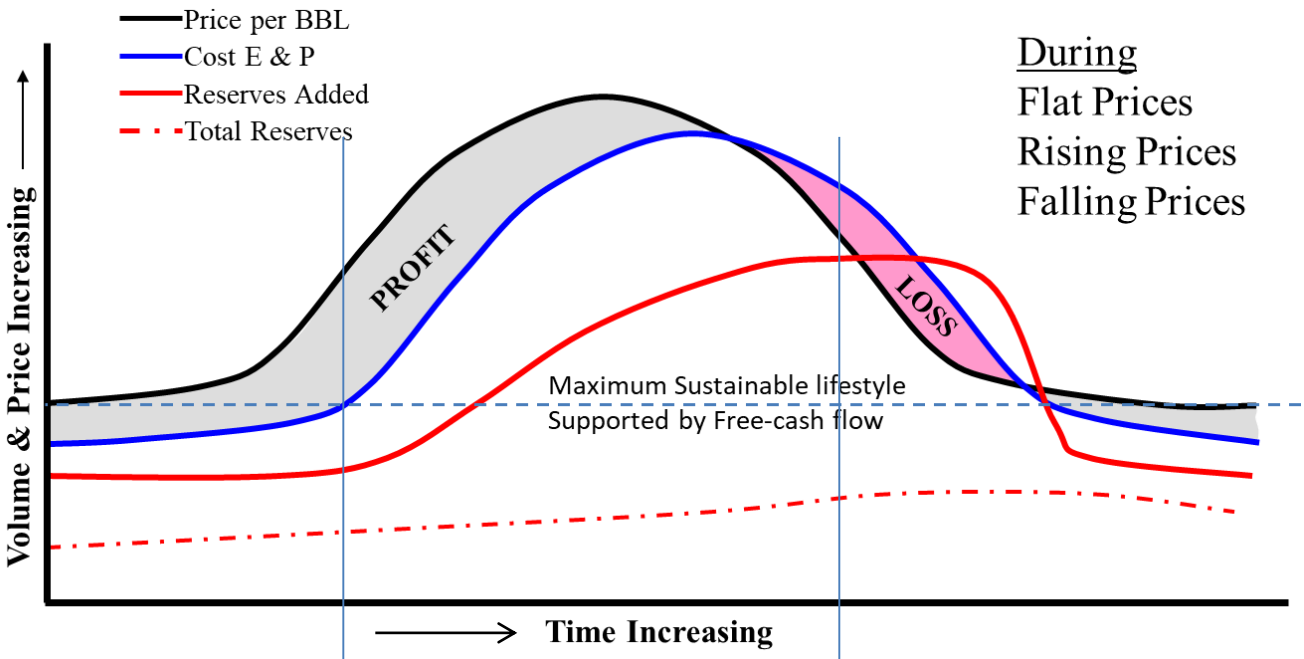
One does not want to propose a wildcat well when the price per barrel is minus $37.00, yet that is exactly what happened to the author! By the way, that prospect remains unsold to this day. Ideas for prospects should be tempered to match the prevailing economic and political concerns.

These concerns are cyclical as they are mostly related to the economy and rhythmic swings in commodity prices – going up when scarce and down when plentiful. For purposes of this article this phenomenon shall be called the 'Exploration Cycle.' Broadly speaking, the Exploration Cycle is like any other cycle and has ups, downs and flat spots. These ups and downs are defined as Rising Prices, Falling Prices and Flat Prices.

Depending on what part of the cycle the Industry is experiencing prospects, projects and research can be fine-tuned to match what is most likely to attract investors. This cycle is self-explanatory and is illustrated and annotated in **Chart 5, 'The Exploration Cycle**.' It can be summarized as follows: drill big and risky when prices are rising, don't drill much when prices are falling and do regional and background work during flat prices. A bonus is that there is also a straight dashed line on the chart – this line should be the explorers' set line as to life-style where income and expenses are balanced between upturns and downturns in commodity prices.

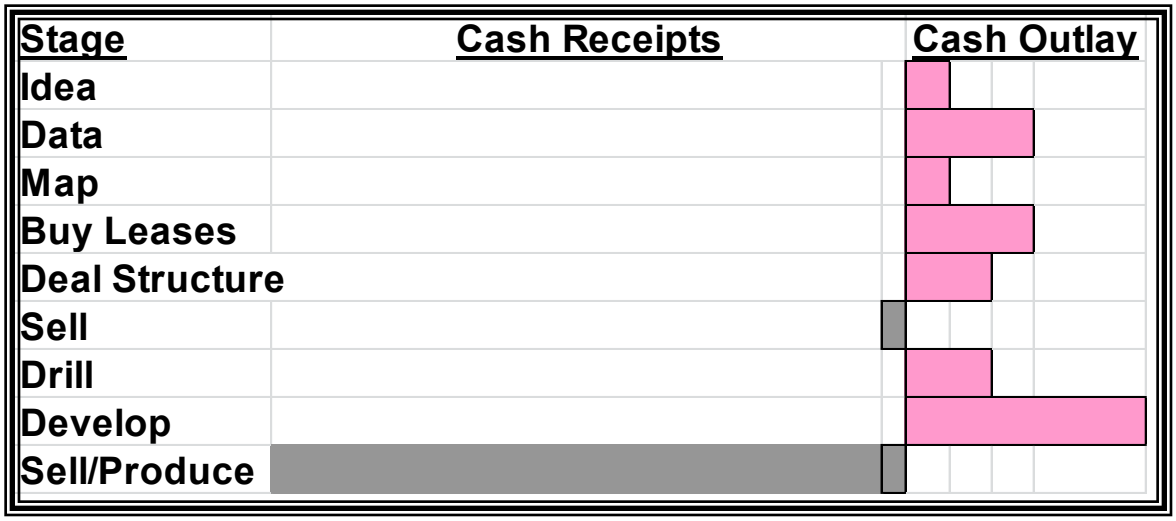
Another great but difficult way to capture and capitalize on ideas is to 'stack' them or rather stack their resulting prospects. By this technique a number of ideas and prospects should be in different stages of development at any given time. This is illustrated in **Chart 6 'Stacking Projects.'** By recognizing that any project has several stages, an explorer can strive to have multiple projects at different stages. Probably many different stages can be defined, but here the stages are presented as: idea, data collection, and map, buy leases, deal structure, selling, drilling, development, and sell production or the well. For a prospect, these many stages may also overlap and be ongoing. Most times if mapping is put off until all data has arrived and been analyzed, the Masters observation occurs – someone else has already captured the acreage! Chart 6 highlights a particular set of 6 prospects.

The Exploration Cycle



FLAT PRICES	RISING PRICES	FALLING PRICES
Prospect Types:		
Close-in, low risk Well documented Technologically sound Purchase distressed Normal sales effort	Riskier prospects High reward Sell older fields Banks willing to lend Easy sales	Prior commitments Jeopardy leases Extremely low risk Purchase distressed Herculean sales effort
Activities:		
technology breakthrough regional geology long term contracts	hire geoscientists poor safety and cost control drill big & risky	fire geoscientists good safety & cost control Reorganize & break contracts

Stacking Projects

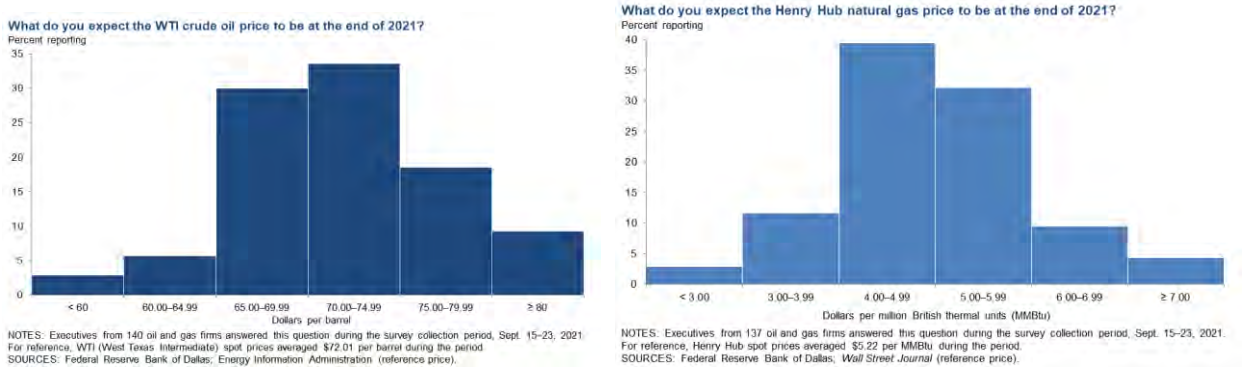


Prospect 1	Prospect 2	Prospect 3	Prospect 4	Prospect 5	Prospect 6
Idea					
Data	Idea				
Map	Data	Idea			
Buy Leases	Map	Data	Idea		
Deal Structure	Buy Leases	Map	Data	Idea	
Sell	Deal Structure	Buy Leases	Map	Data	Idea
Drill	Sell	Deal Structure	Buy Leases	Map	Data
Develop	Drill	Sell	Deal Structure	Buy Leases	Map
Sell	Develop	Drill	Sell	Deal Structure	Buy Leases
	Sell	Develop	Drill	Sell	Deal Structure
		Sell	Develop	Drill	Sell
			Sell	Develop	Drill
				Sell	Develop
					Sell

Knowing somewhat what competitors are thinking is also important. This is not corporate espionage, but rather general reconnaissance. This means keeping up with all sources of news information, both technical and financial, about the exploration industry. The various technical journals will keep you abreast of where critical thinking is heading and the financial and news outlets will do the rest. A good source for general information is the Dallas Federal Reserve Bank. As mentioned earlier they regularly poll the industry. An interesting poll question is the imagined commodity price for WTI and Henry Hub natural gas at year end.

Chart 7, WTI and Henry Hub Predicted 2021 Year-End price, is such an example. This is important in analyzing the economics of a prospect – if a majority of respondents believe WTI is going to be less than $60 at year end and a given prospect is only economic at $80, it's probably not going to sell. Chart 7 shows that the majority currently believes WTI at year-end 2021 will be between $65 and $75 per barrel, which becomes the sweet-spot for prospects. Of course, at this time WTI is trading between $95 and $110 making nearly all prospects appear economically viable.

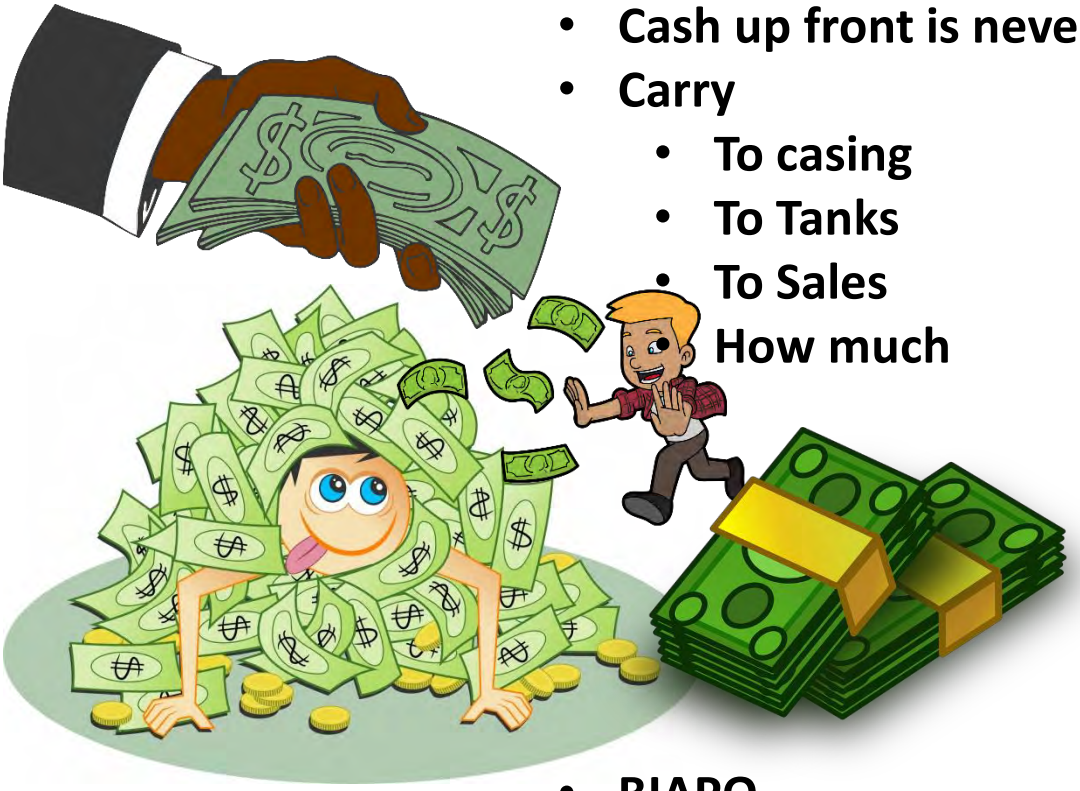
Chart 7 – WTI and Henry Hub Predicted 2021 Year-End Price



Knowing your market is very important. Selling a good economic prospect into an up market should be easy. Today, money is becoming easier to find, but until just recently was extremely difficult to find for the reasons discussed in the Industry Environment section. Today there is a dearth of risk-takers and this will be addressed in the Packaging the Prospect section.

The last point in the development of an idea or prospect is setting the price expectations for the prospect. Many considerations are given to determining 'cash up-front.' A listing of some of these considerations is found in **Table 6, Sales Price.** In setting the price, the best lesson is to be flexible and to remember that part of something is better than all of nothing - do not be afraid to negotiate – the prospect should stand on expected revenues from commodity prices and the production rate, not prospect fees. Prospect fees should at least cover land expenses so in the case of a dry hole you can afford to create the next prospect.

Table 6 – Sales Price



- Cash up front is never enough
- Carry
  - To casing
  - To Tanks
  - To Sales
  - How much
- BIAPO
- Considerations
  - Your Time
  - Other professionals
  - Office overhead
  - Cost of land
  - Cost of data (all data)
- Recovery of all costs not very likely
- Current Industry Conditions
- Current Investor Mind-set

Know the current environment!
..part of something is better than all of nothing..
Don't be afraid to negotiate!

Risk Reduction:

When selling any prospect into any market the prospect needs to be vetted for risk and the best de-risking advice is to employ the most apropos technology. For many investors this means you must have 3-D seismic data accompanied by all the bells and whistles. This is neither necessary nor appropriate for all prospects. For instance angle gathers for an amplitude at 2,500' from a regional processing job and a large acquisition 3D will probably prove to be unreliable – the author speaks from experience! On the other hand a special high-effort 3D focused on shallow targets and designed appropriately may be helpful. This paper does not address the technical merits of various techniques. There is a partial list of different technologies available for employment found in **Table 7, Technology**.

The lesson is to employ appropriate technology, not necessarily the best available regardless of price. Technology should be applied with a certain hierarchy in mind. Drilling a hilltop in a totally wild area may still be appropriate. But if that hilltop has already been drilled there might be a need for 2D seismic or some other appropriate de-risking technology. If 2D has been applied in the subject area then 3D seismic better be used. The converse is true too: If 3D seismic is available across the prospect area, it had better be examined and presented to potential investors – or at the very least they should be made aware of its existence and educated as to why it is not necessarily needed!

Table 7 - Technology

TECHNOLOGY HIERARCHY

TOPOGRAPHIC MAP
REGIONAL GEOLOGY
GRAVITY, MAGNETICS
GEOCHEMICAL
SATELLITE IMAGERY
SCOUT DATA
WELL LOG DATA
2 D SEISMIC
3 D SEISMIC
COMPUTER WORKSTATIONS
GEOPHYSICAL MODELLING
MULTICOMPONENT SEISMIC
Self Organizing Maps (SOM)

Trust in Methodology

Underutilized
Tools for Mapping

Production matching
Water Contacts
Fault Analysis
Seismic: 2D vs 3D

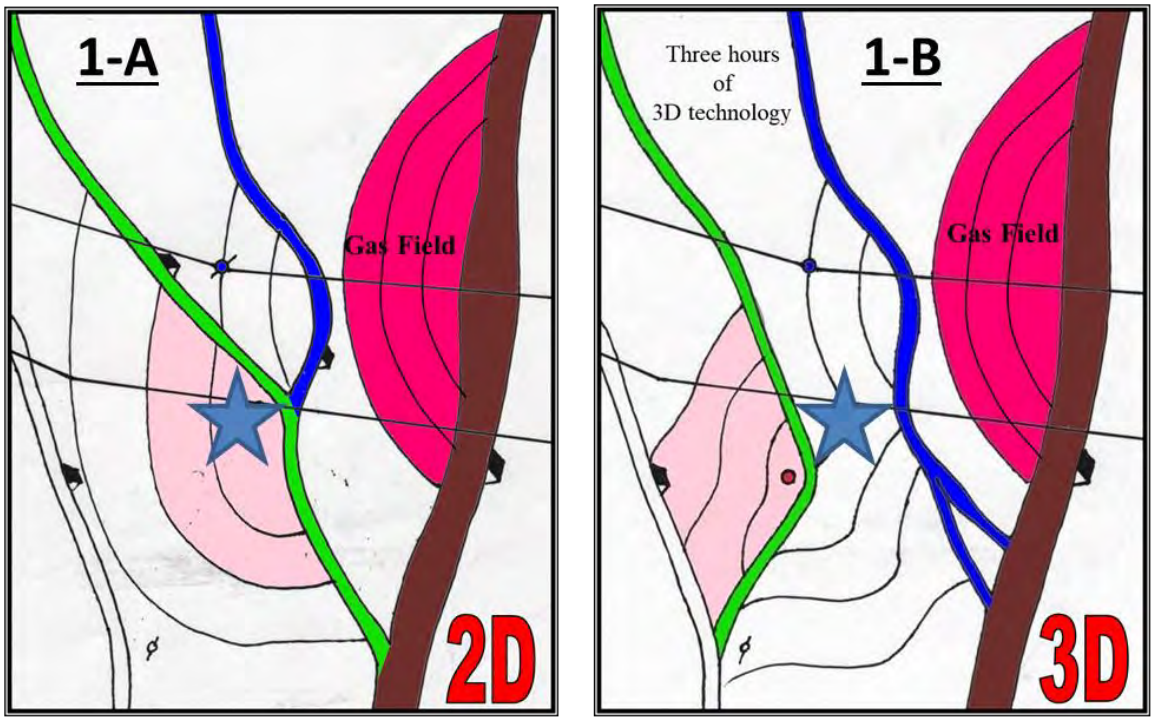
- The wilder your area of interest the more likely 'old' and basic tools will still have a valid application.
- The more mature the area, more sophisticated and advanced tools need to be employed properly!

Often finesse in interpretation is overlooked. It is very important to always check all water contacts and match the production to your rock properties and reservoir size. This is especially true if the exploration program covers more than one basin. Four-acre targets in south Louisiana may work just fine, but don't expect the same results from a south Texas reservoir of the same size. Another oft overlooked methodology dealing with fault seal integrity is the Smear-Gouge Ratio (SGR) – this compares the ratios of sand and shale up thrown and down thrown to a fault and considers the throw of the intervening fault.

Examples of Subtle prospects and their risk and technology use follow in Subtle Trap Examples 1-5.

Risk Reduction Example 1 and Subtle Trap Example 1:

This 2D prospect looked so good that the available 3D was not investigated pre-drilling. The prospect sold in less than 2-weeks.



This example features a 100' fault (green) that was not imaged by the original 2D used to identify the prospect. This is likely caused by the narrow nature of the fault block (about 1,800 feet) and due to out of plane reflectors (think Fresnel zone). The seismic data is not available for display. The blue star is the first well drilled in the prospect. After drilling it was discovered that the new well was a twin to the old wet well on strike (1-B). The generators and one participant decided to view the 3D. The green fault west of the blue star was not identified on the original 2D and actually had a strange, nearly 90 degree bend. A second well was drilled at the small red dot, up thrown to green.

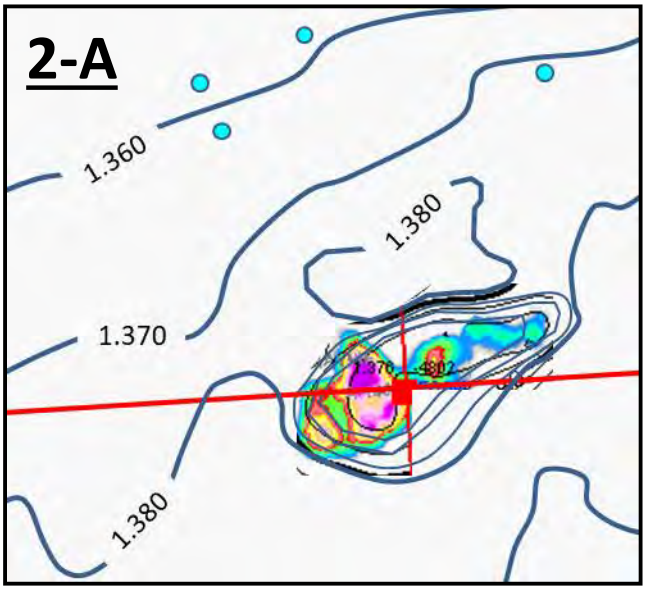
Result: well with multiple pay sands that produced **over 5 BCFG.**

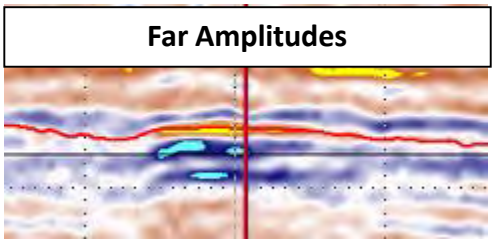
This prospect was drilled in 1998 and had 7 Participants.

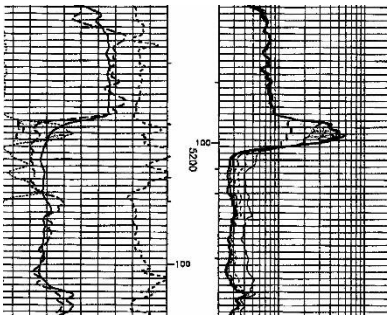
Subtle Trap Example 2: "Would You Find Gas?"
Shallow meandering fluvial system and low-relief structures

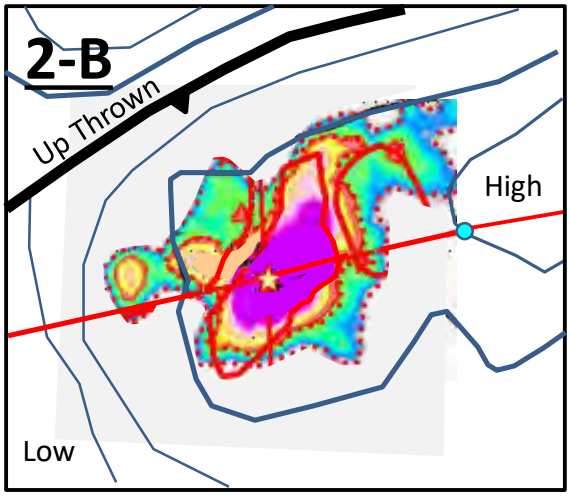
Key: ● Well with wet sand

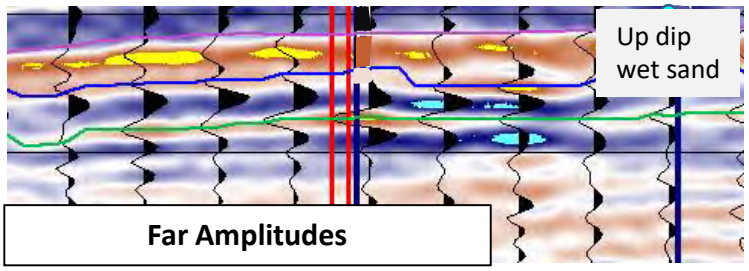
- This area was heavily drilled using subsurface and 2D seismic. Not one well in 60 years of development accidentally hit a shallow reservoir.
- Risk reduction methodology 3D seismic











Both prospects were drilled in 2000 and had 6 Participants

Both prospects did find gas.
1-A produced 1.1 BCFG and 1-B produced .75 BCFG

Subtle Trap Example 3: "Would You Find Gas and/or Oil?"
Small, sub-seismic fault and low-relief structure

Key: ● Well with wet sand

Critical marketing points:

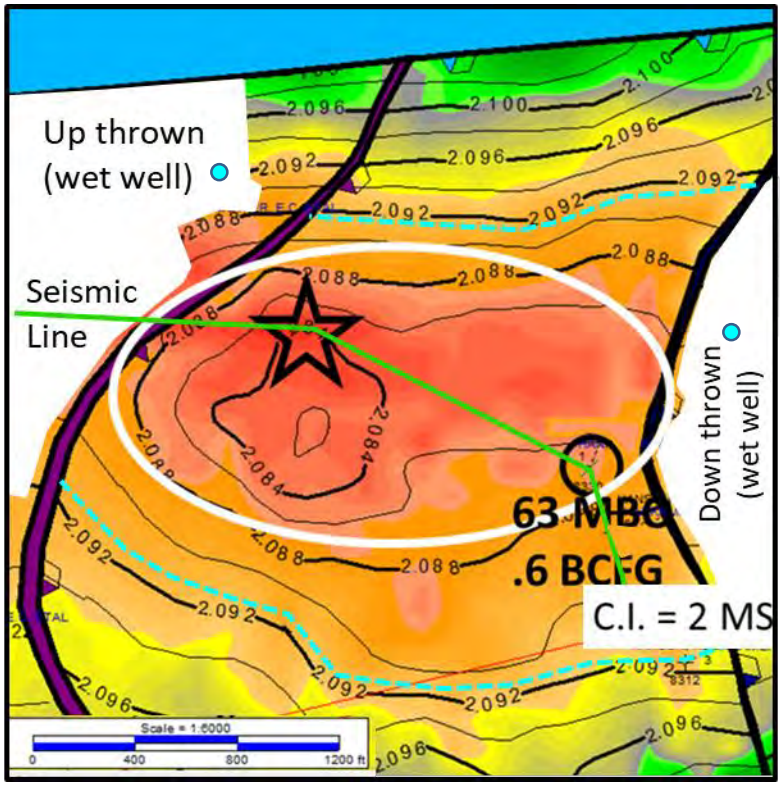
1- Up dip (only marginally) from producer that went off line due to mechanical failure
2- Great synthetic tie (green on seismic line 3-B)
3- Multiple sand targets
4- Proof of fault seal – up thrown wet well and,
5- Different water contacts in various sands in wells on the down thrown side of fault to the east

Criticisms by Turn-down reviewers

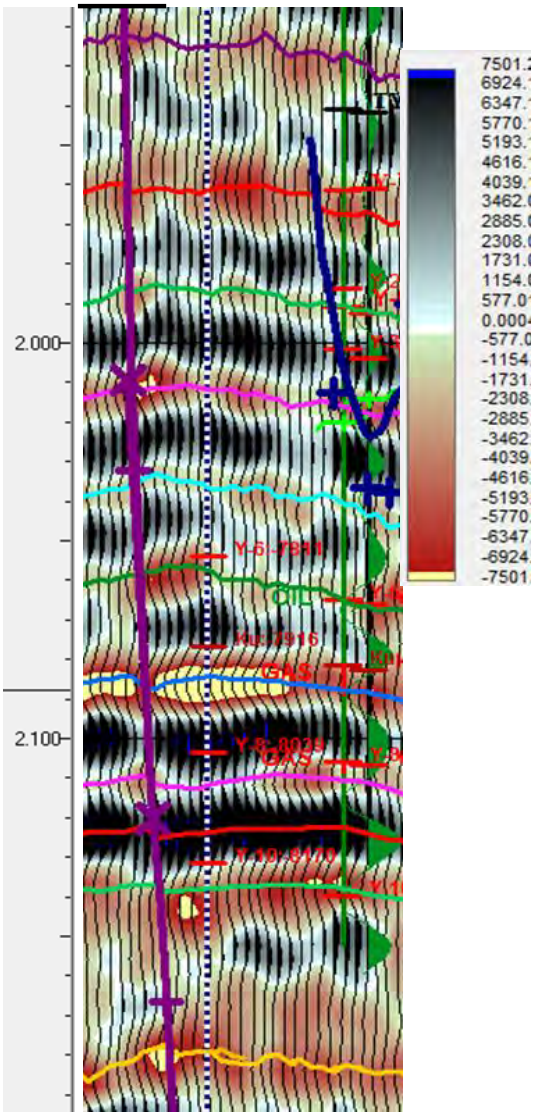
1- Faults too small, can't seal
2- Phase of data not correct
3- Probably will be too small
4- Its depleted

Throw ~4ms ~20'; Gain in structural elevation ~4ms~20'

3-A



3-B



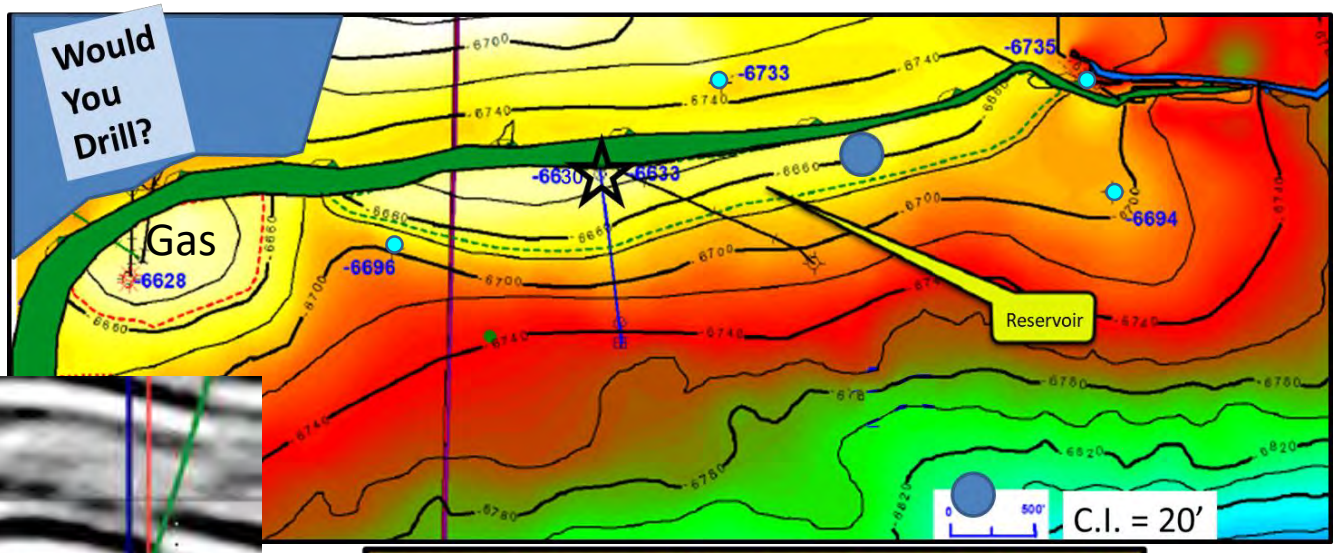
This prospect was drilled in 2019 was turned down ~50 times and had 26 Participants
Found 5 Pay sands
EUR 1 MMBO & 2 BCFG
Currently producing ~ 130 BOPD

Subtle Trap Example 4: "Would You Find Gas and Oil?"
Long, narrow reservoir

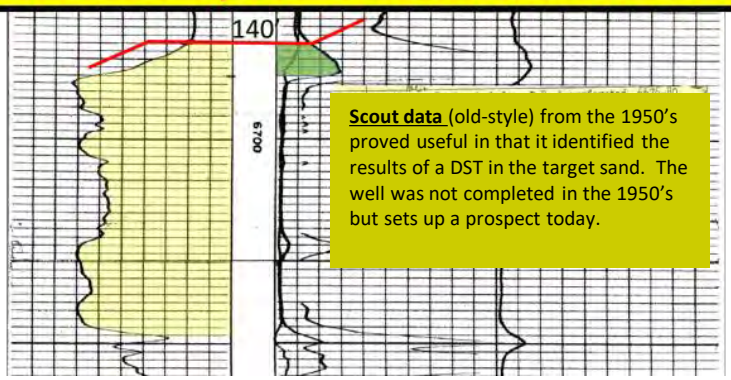
4-A

Key: ○ Well with wet sand, large blue circle is for scaling the reservoir against the map scale

PROVED UNDEVELOPED SAND DEPTH MAP: south Louisiana
Subtle Trap = 30' of dip at 6600', reservoir width ~250'; est.426 MBO



TOP 26' OF 6,600' SD PAY FAULTED OUT



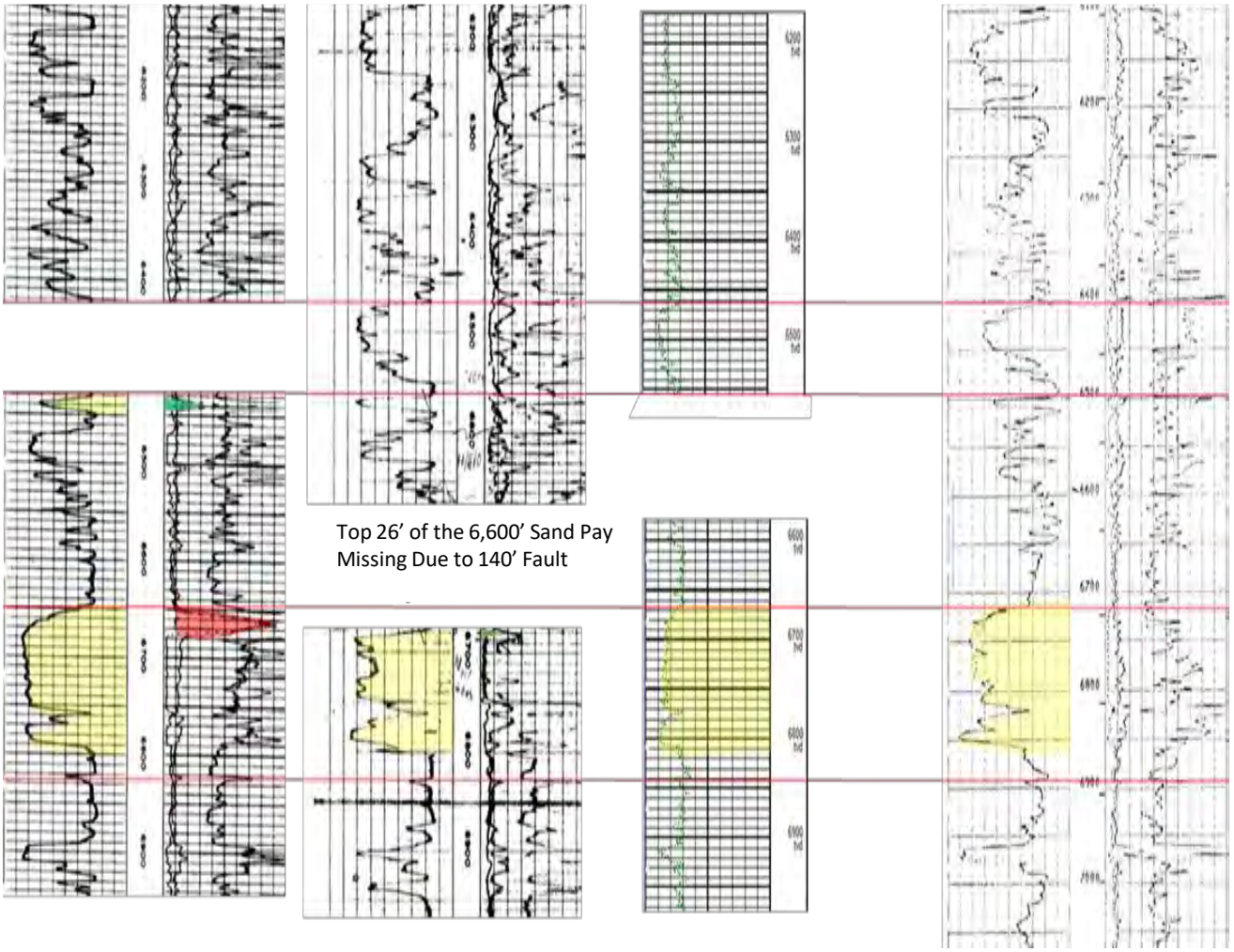
Risk Reducing Tools:

- 3D seismic
- **Scout data** (old-style) from the 1950's proved useful in that it identified the results of a DST in the target sand. The well was not completed in the 1950's but sets up a prospect today.
- Newer offset wells prove that the top 26 feet of the pay sand are faulted out in the old well.

Subtle Trap Example 4: "Would You Find Gas and Oil?" **4-B**
Long, narrow reservoir

Stratigraphic cross section to help prove 26 ' of missing sand

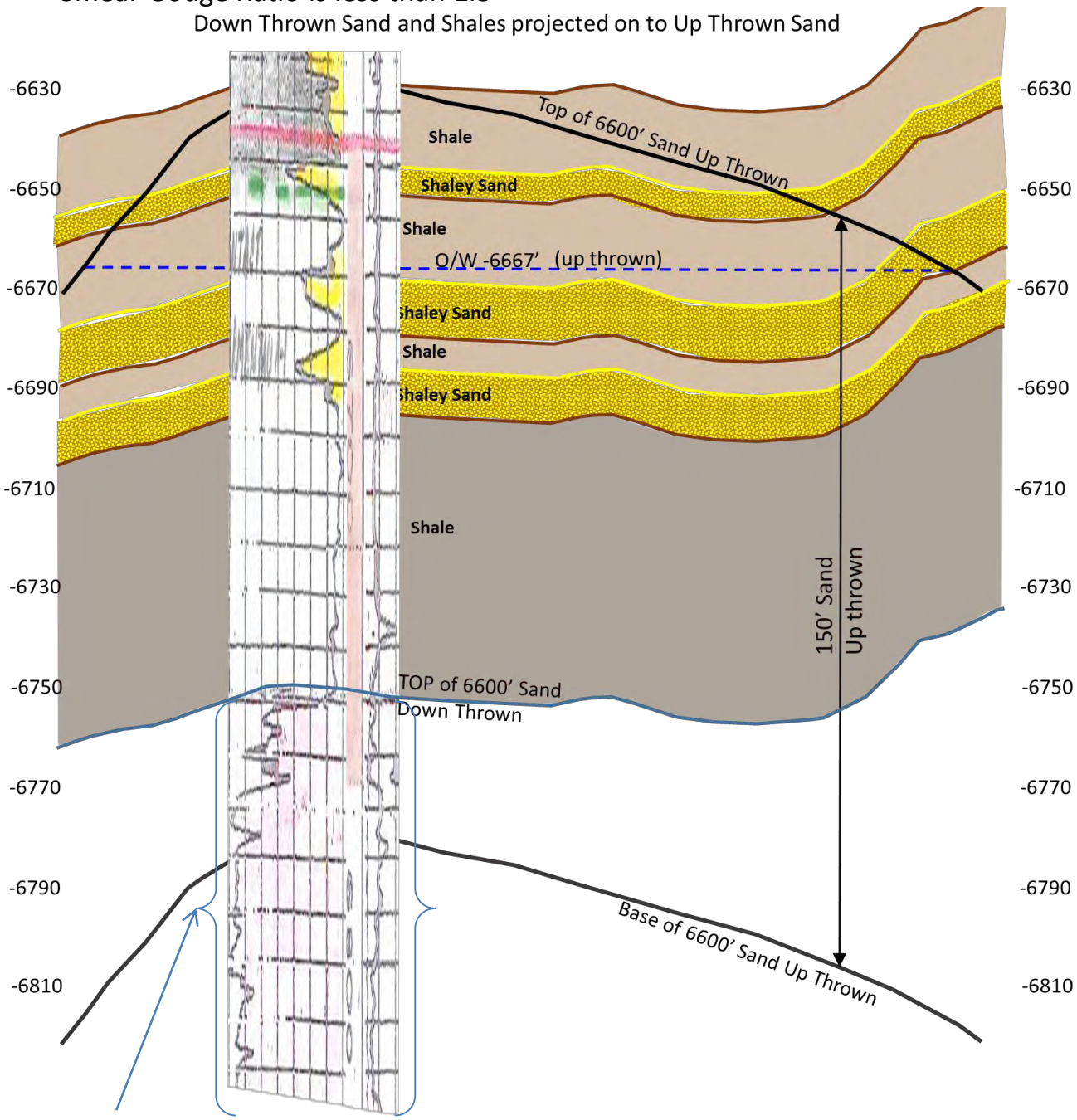
Key: Well with wet sand



Subtle Trap Example 4: "Would You Find Gas and Oil?"
Long, narrow reservoir

4-C

- Proof of Seal: Cross Section in the fault plane transposing up thrown and down thrown lithology in the same picture
- Down thrown lithology is in color
- Up thrown O/W contact at -6667' against shaley and sealed fault
- Smear Gouge Ratio is less than 1.5



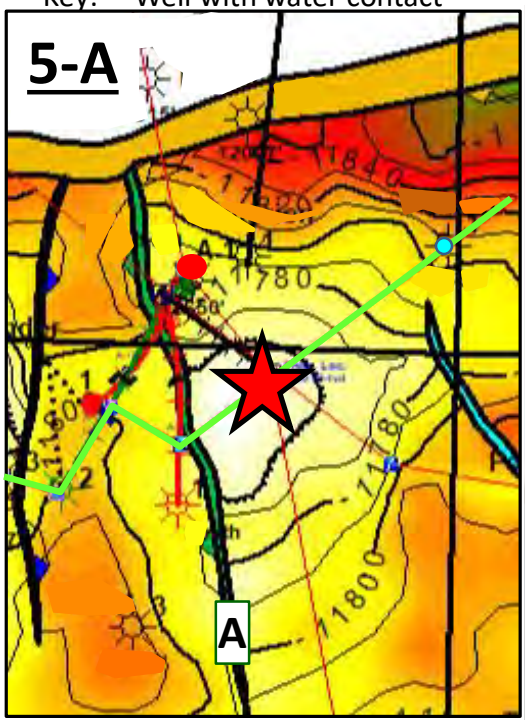
This is the target sand in the up thrown fault block, this log is from the down thrown side of the fault

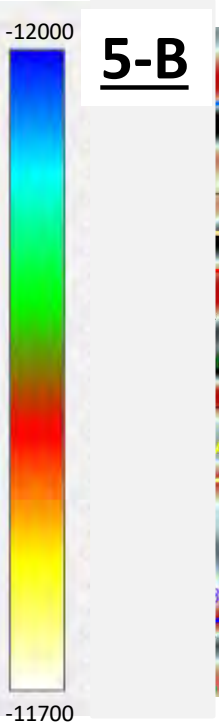
Subtle Trap Example 5: "Would You Find Gas and/or Oil?" 5A -5D

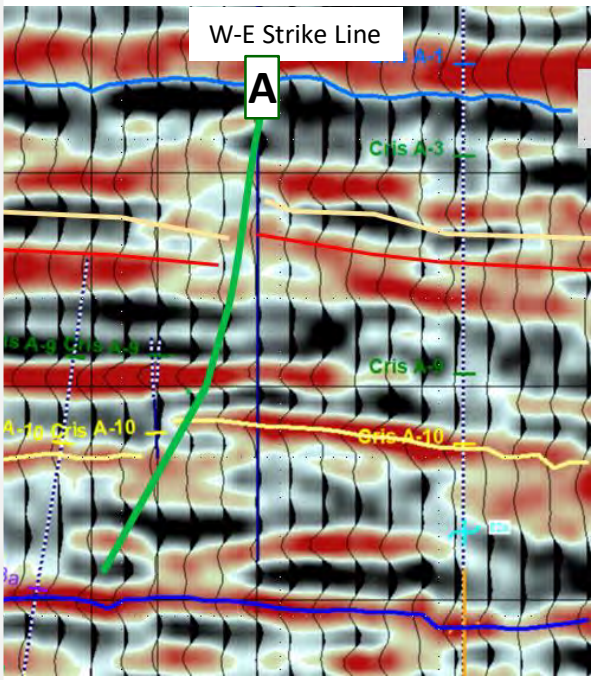
Small, sub-seismic faults that die with depth, and low-relief structure

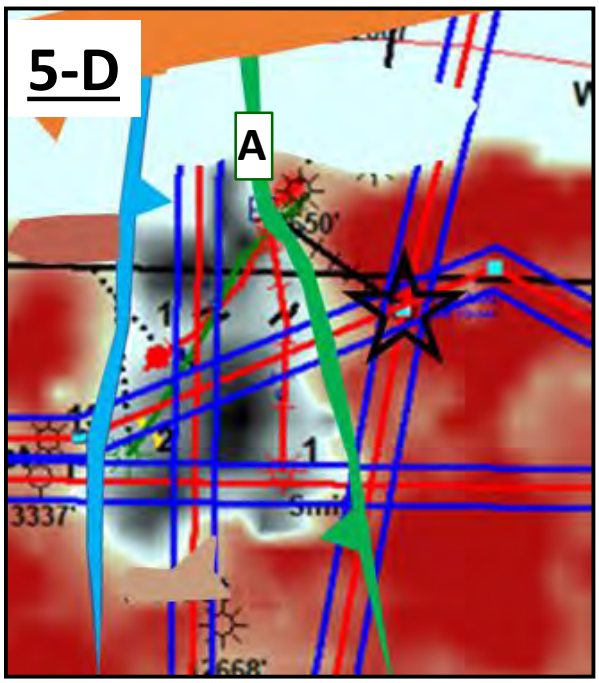
- 5-A: Structure map on one of several prospective horizons
- Fault A (green) is the trapping fault and needs review
- 5-B West to East 3D seismic shows difficult to find, small-throw seismic fault 'A' that also dies with depth; Fault Also can be seen in a few wells, but has only 20 to 50 feet of missing section.
- 5-C Flattened seismic line; time 0.0 is the flattened horizon and
- 5-D is a time slice from the flattened seismic line about 80 ms above the flattened horizon and illustrates the existence of the graben between the green 'A' fault and the blue fault – the graben is occupied by a peak (black) everywhere else the flattened slice is a trough (red)

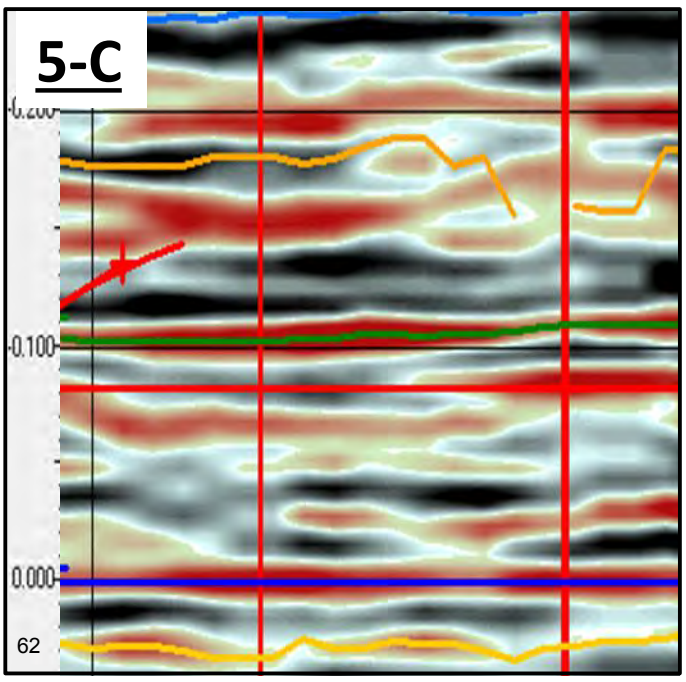
Key: Well with water contact











Subtle Trap Example 5: "Would You Find Gas and/or Oil?" 5E – 5F

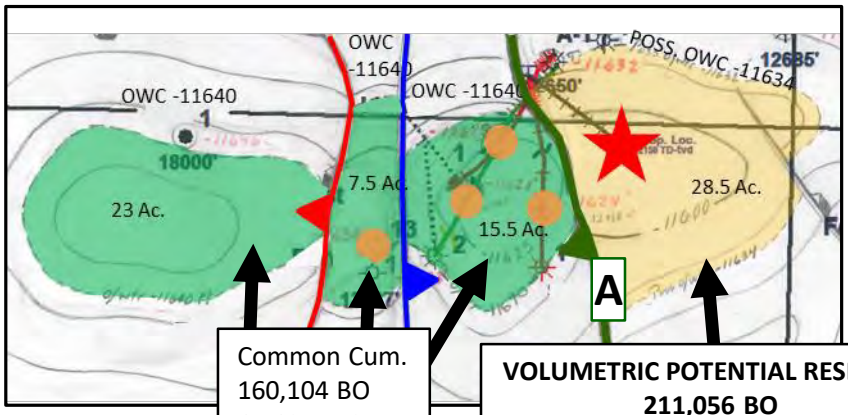
Small, sub-seismic faults that die with depth, and low-relief structure

Risk: Fault 'A' is not real and/or does not seal

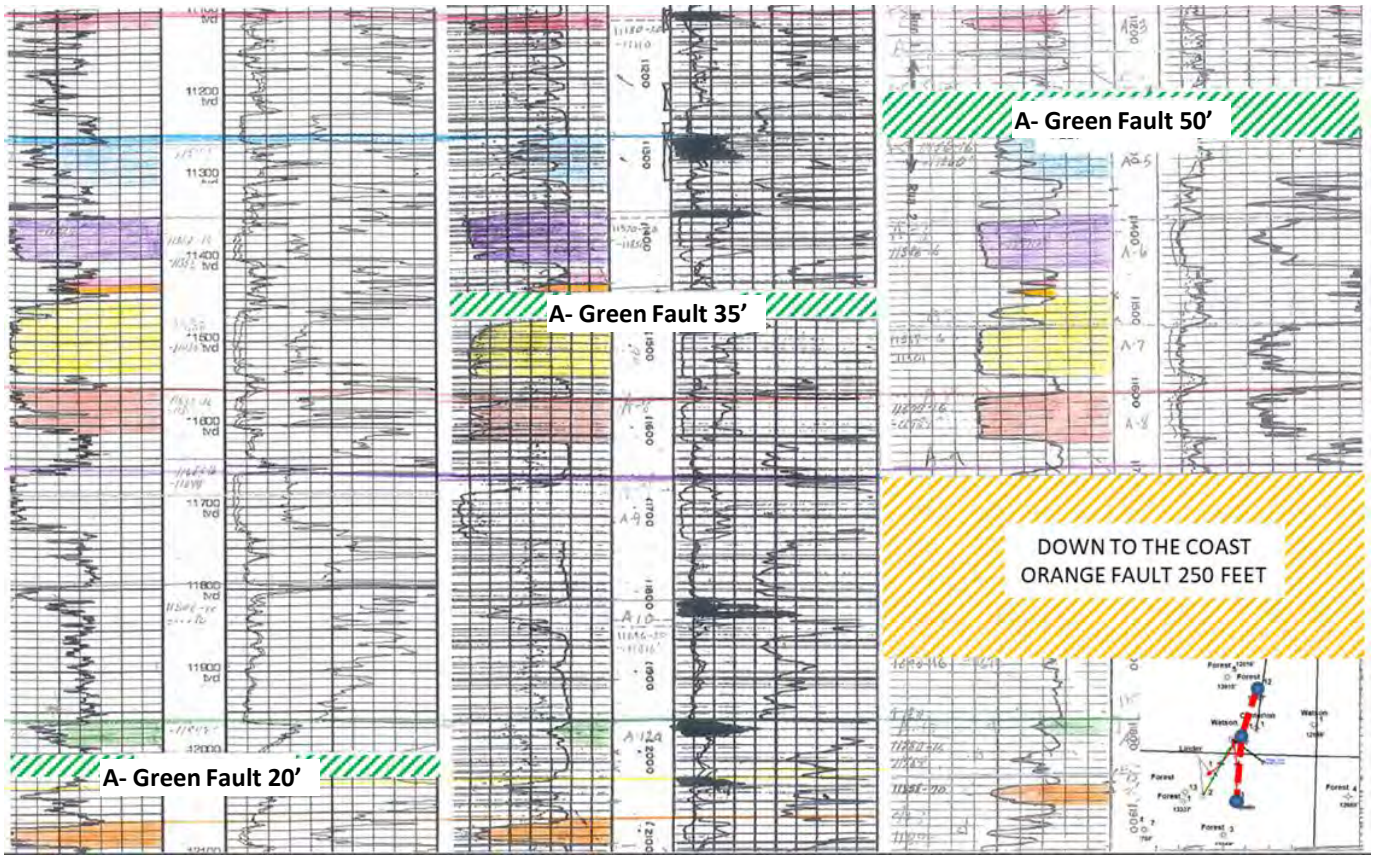
Risk reducers:

- Volumetric analysis of the fault blocks
- Water contacts
- Stratigraphic cross section

5-E



5-F GREEN FAULT (A) STRATIGRAPHIC CROSS SECTION



Subtle Trap Example 5: "Would You Find Gas and/or Oil?" **5-G**

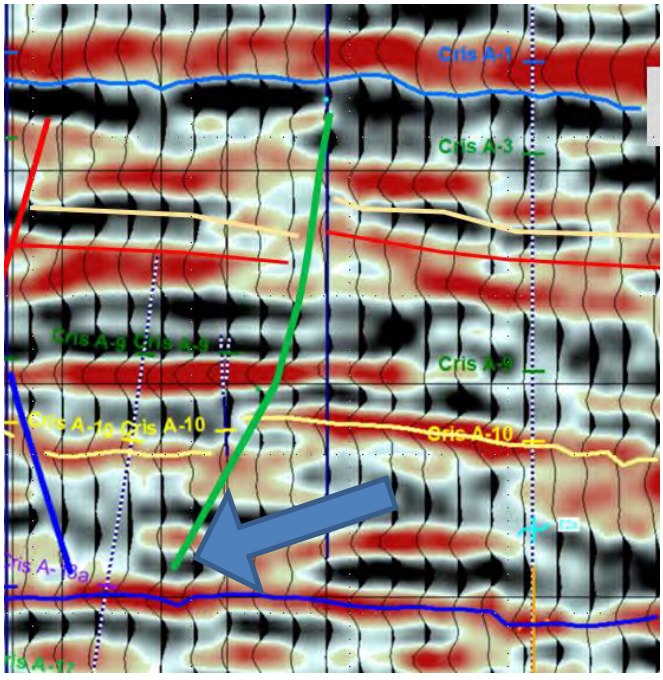
Small, sub-seismic faults that die with depth, and low-relief structure

5-G Example of Fault Ending - Santa Elena Canyon, Big Bend

Big Bend Field Trip

Contact SCA's Training Department at training@scacompanies.com to schedule an In-House field course

From Lecture by: Eric D. Carlson 4/8/2021



End of fault plane in prospect 3D

Reviewing 5 examples of subtle traps and some basic technologies to reduce risk illustrates the importance of using a myriad of methodologies to ameliorate risk. Some of the examples have been drilled and some have not. There is a point at which risk can no longer be reduced no matter how much time, money and effort is exerted. At some point the prospect must be drilled or abandoned!

A final note in risking is to **be consistent** across prospects. The best way to do that is to employ a set of rules that are used regardless of the prospect. The risking rules and/or template this author uses are summarized in **Table 8, Prospect Risking**.

Table 8 – Prospect Risking

Field:								
Location / Prospect / Well Name								
	Parameter Considerations:	(Source*Seal*Reservoir*TypeGeometry)+HCI =					POS:	0.54
Source Rock:								
	Parameter considerations:	Generation, Maturity, Migration, Timing, Preservation						
	Description: Gen/Matur/Ident	Max=.4	0.40					
	Migration	Max=.2	0.10					
	Timing	Max=.2	0.05					
	Confidence	Max=.2	0.15					0.7
Seal:								
	Parameter Considerations:	Shale & Sand thickness, fault throw, fault mineralization						
	Vertical	Max=.4	0.40					
	Latteral	Max=.4	0.25					
	Confidence	Max=.2	0.20					0.85
Reservoir Quality:		ϕ = .25	K= 300md					
	Parameter Considerations:	Porosity, permeability, continuity, grain size/sorting						
	Characteristics Favorability	Max=.4	0.40					
	Continuity lateral & Vertical	Max=.4	0.40					
	Confidence	Max=.2	0.20					1.00
Type and Geometry:								
	Parameter Considerations:	sufficient data available, trend-similarity						
	Type (Strat/Struct/Comb/Other)	Max=.4	0.30					
	Geophysical (2D/3D)	Max=.2	0.20					
	Geological	Max=.2	0.10					
	Confidence	Max=.2	0.15					0.75
+ Hydrocarbon Indicators:								
	Parameter Considerations:	Seismic & log indicators, field extension, surface						
	Seismic Indicators	Max=.05	0.04					
	Log Indicators	Max=.05	0.00					
	Field Extension	Max=.05	0.03					
	Surface	Max=.05	0.02					0.09
Estimated Probability of Finding Economically Recoverable Hydrocarbons								
	Parameter Considerations:	(Source*Seal*Reservoir*TypeGeometry)+HCI =						0.5363
Estimated by:	Barry J. Rava			Date				

Traditional:
Source
Seal
Reservoir Quality
Type and Geometry
Hydrocarbon Indicators

Plus:
Political?
Environmental?
Pipeline?
Location?
Economics?

Macro Economics:

The purpose of macroeconomics in this study is as a comparison to mega trends as an extension of the industry environment previously discussed and in relation to other similar and dissimilar drilling projects occurring during the marketing phase of a prospect.

As previously discussed, current government policies discourage banks and PE firms from investing in oil and gas projects. President Biden is reportedly **privately strong-arming big banks to refuse to lend to or invest in coal, oil and gas companies.** But more than a dozen state treasurers (15 to be exact, and including some you might not expect, such Idaho and South Carolina) will fight back. The current count is up to 26 states suing the federal government for one energy policy reason or another. Traditional money sources are evaporating. One of the prospect sellers' jobs then is to find a new source of potential investors. It should be noted that Millennials are accumulating wealth and may soon be the wealthiest consort in the population. How many millennials do you know?

In the Oil and Gas Investor in November 2021, Gregory Morris reported that Marc Sharpe, chairman and founder of the Family Office Association said "No one I know believes oil and gas is going away in the next 10 years, so there will be a need to continue funding high quality projects for some time to come." Many family offices seem to be most interested in real estate. However that is not always the case. Smart groups like to see value, which can be found in long-lived reserves and the current oil and gas environment.

A summary of Hart Energy's Faiza Rizvi interview with Rice's Baker Institute fellow Mark Finley on an energy study conducted by Columbia University Center on Global Energy Policy and University of California, Davis Institute of transportation Studies in July o f2021 found that Climate policies are unlikely to disrupt oil demand and growth. A summary of the study as reported by Hart Energy is:

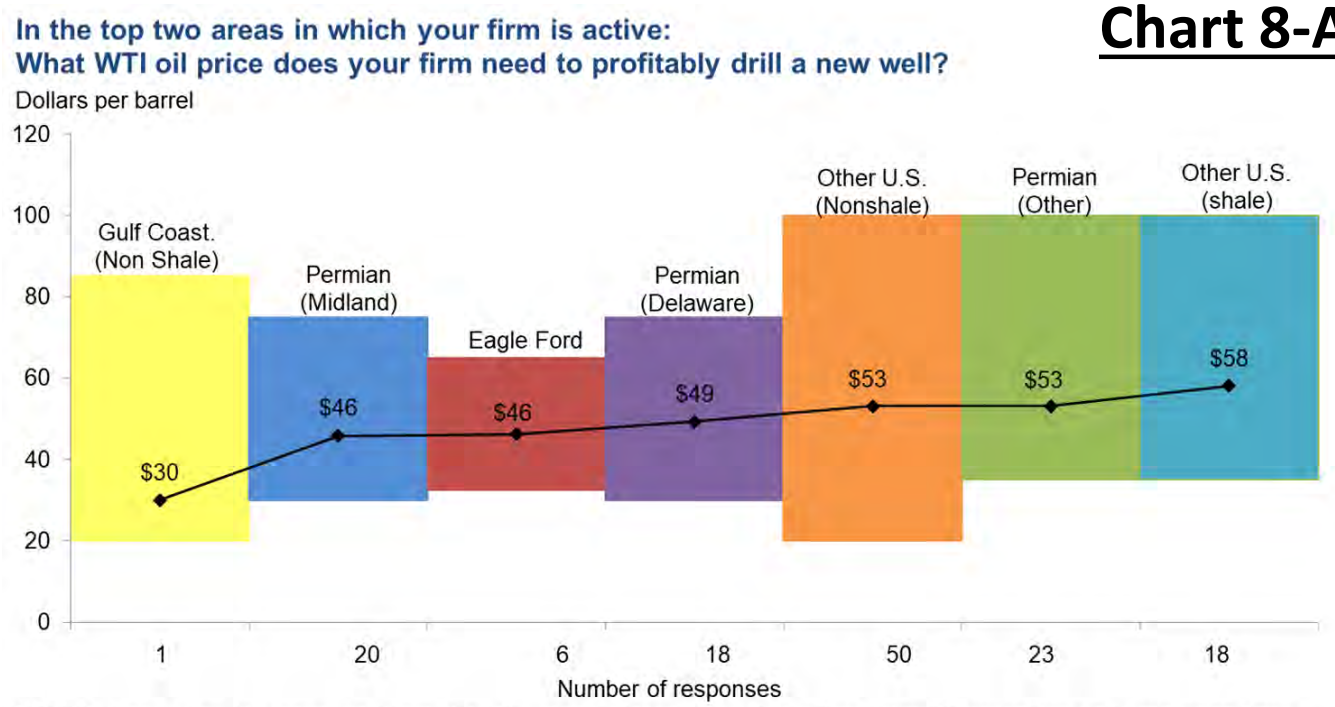
- Global oil demand projected to grow through 2030
- Substitution from mass transit to personal vehicles
- People left large cities for suburbs and smaller cities (less mass transit available)
- Increase in petrochemicals used for PPE and take-out packaging
- Increase in e-commerce deliveries

But from a macroeconomic standpoint even more important than the study is how a prospect stacks up against its cash competitors within the oil patch. Again, hats off to the Federal Reserve of Dallas and their surveys. These surveys and the raw data can be down loaded from their website.

In the case of **Charts 8A and 8B – WTI Price Necessary for Drilling and Operating Expenses For Your Company to be Active**, the Gulf Coast basin, where Icarus is active, did not even rate a category – the Gulf Coast was lumped into 'Other U.S. (Nonshale),' which of course includes midcontinent and offshore (all depths) – hardly a fair comparison to the Gulf Coast. This author added Gulf coast to the charts and found that the Gulf Coast compares extremely favorably to all other basins.

Finally, **Chart 9,-Horizontal vs Vertical**, is a head to head look at two current 2021 projects one from the headlines and one from Icarus' program. The vertical well (Icarus, Gulf Coast) is between 3 and 10x more profitable than the horizontal well depending on actual EUR and production rate of the horizontal well which are unknowns other than the 'averages' found in the Enverus data base.

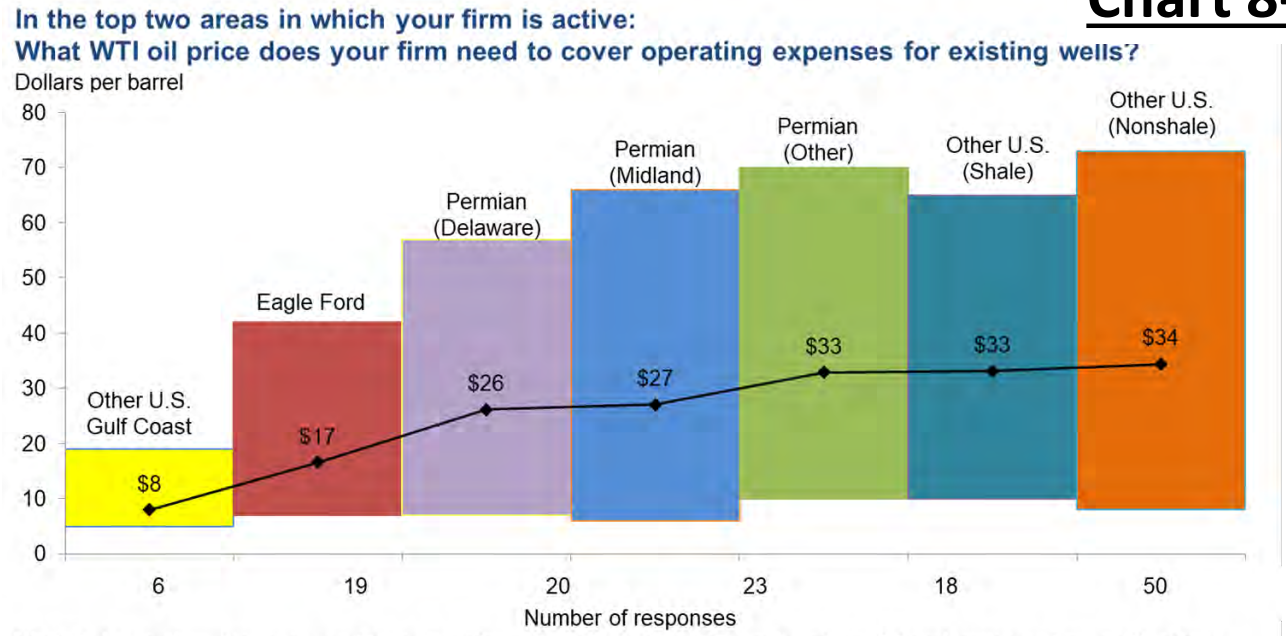
Chart 8-A



NOTES: Lines show the mean, and bars show the range of responses. Executives from 92 exploration and production firms answered this question during the survey collection period, March 10–18, 2021.
SOURCE: Federal Reserve Bank of Dallas. (modified by B.J. Rava)

GEOPHYSICAL TECHNOLOGY NEWS: Longer laterals give US shale drillers cash flow boost
US shale operators are realizing increased well productivity and cost and time savings from drilling longer laterals, and despite some technical and surface constraints, the practice could become commonplace in the industry. Increasing lateral length from 1,524 meters to 3,048 reduced the **breakeven WTI price of a well from $38 to $34.50 per barrel in the core Delaware Basin Wolfcamp-A formation**, according to Enverus' Daryl Ko. Full Story: S&P Global (5/21)

Chart 8-B



NOTES: Lines show the mean, and bars show the range of responses. Executives from 94 exploration and production firms answered this question during the survey collection period, March 10–18, 2021.
SOURCE: Federal Reserve Bank of Dallas. (modified by B.J. Rava)

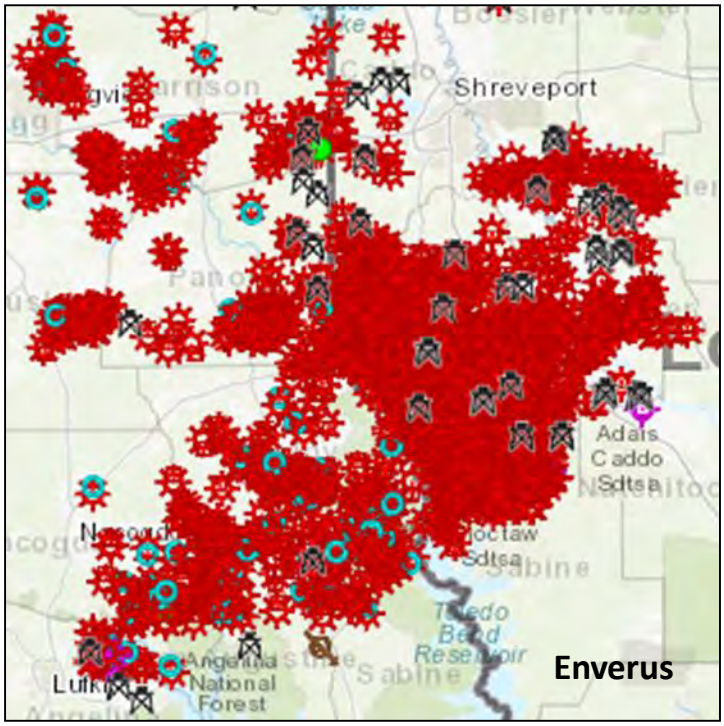
Chart 9 – Horizontal vs Vertical

Vine Energy Drills Longest Horizontal Well in State of Louisiana

The well was recently drilled by Vine Energy in Sabine Parish to the Mid-Bossier formation with an estimated lateral of 15,240 ft and total measured depth of 27,520 ft. Hart Energy Staff Wed, 10/27/2021 - 04:25 AM

Vine Energy Inc. said Oct. 26 it had completed the drilling phase of the longest onshore horizontal well in the State of Louisiana.

The CHKMIN 20-29-32HC-01 ALT was recently drilled in Sabine Parish to the **Mid-Bossier formation** with an estimated lateral of 15,240 ft and total measured depth of 27,520 ft. The well was drilled in 35 days and the drilling phase cost approximately **$400 per lateral ft,** a Vine record for both drilling time and cost, according to a company release.



https://www.hartenergy.com/exclusives/vine-energy-drills-longest-horizontal-well-state-louisiana-197003?mkt_tok=NDMzLU9ESy04ODkAAAGAYCrImaHTLNQNkESSzlLsEIaEgFbn_JISnLkllaikn1Jo8AY46GU2jSMumEssfOr3_rDqPUA2J8FxIpoQ2HNEfnnocYbzRMcTnjezQw3DOA

Drilling cost Estimate: $6,096,000 ($400/lateral ft)
'Typical' Estimated Bossier Formation EUR by Enverus (DrillingInfo) Statistics ~ 5 BCFG
Value at $5/MCF=$25MM*.75=$18,750,000; **ROI~3**
(EUR Range .5BCFG-20BCFG; if 20 BCF = $100MM*.75=$75MM; ROI~11)

Gulf Coast (Icarus) Current PTD 9500 (vert) AFE $1,078,000 = **$113/ft**
EUR 8.4 BCFG 117 MBO
Value at $5/mcf +$69/bo $50MM*.75=$37.6MM; **ROI~37**
Spend 1/6th earned 3x (or is it 10x?)

No oil and gas economic review would be complete without a mention of decline. Steve Hedrickson, President, Ralph E. Davis Associates wrote in Hart Energy in June of 2020 about shale declines. In the article it is noted that Unconventional production dominates – fully 2/3 of U.S. oil production; first year declines are high in unconventional plays and that the total U.S. oil production decline is significant – at a rate of 34% per annum. This would result in a 4.2 MMB/D reduction after one year in the absence of new drilling [or completions of DUC wells]. **Chart 10, Oil Decline**, is copied from Hedrickson's paper and shows that the 'Remainder' (think Gulf Coast) has a first year decline of 15% which also happens to be the statutory decline rate allowed by the IRS. Other plays ranged from 19% to 48% save the Alaska North Slope coming in at a very impressive 9% - let's buy some warm clothes and move! Hedrickson has a matching gas decline chart not presented here, but the results are very similar.

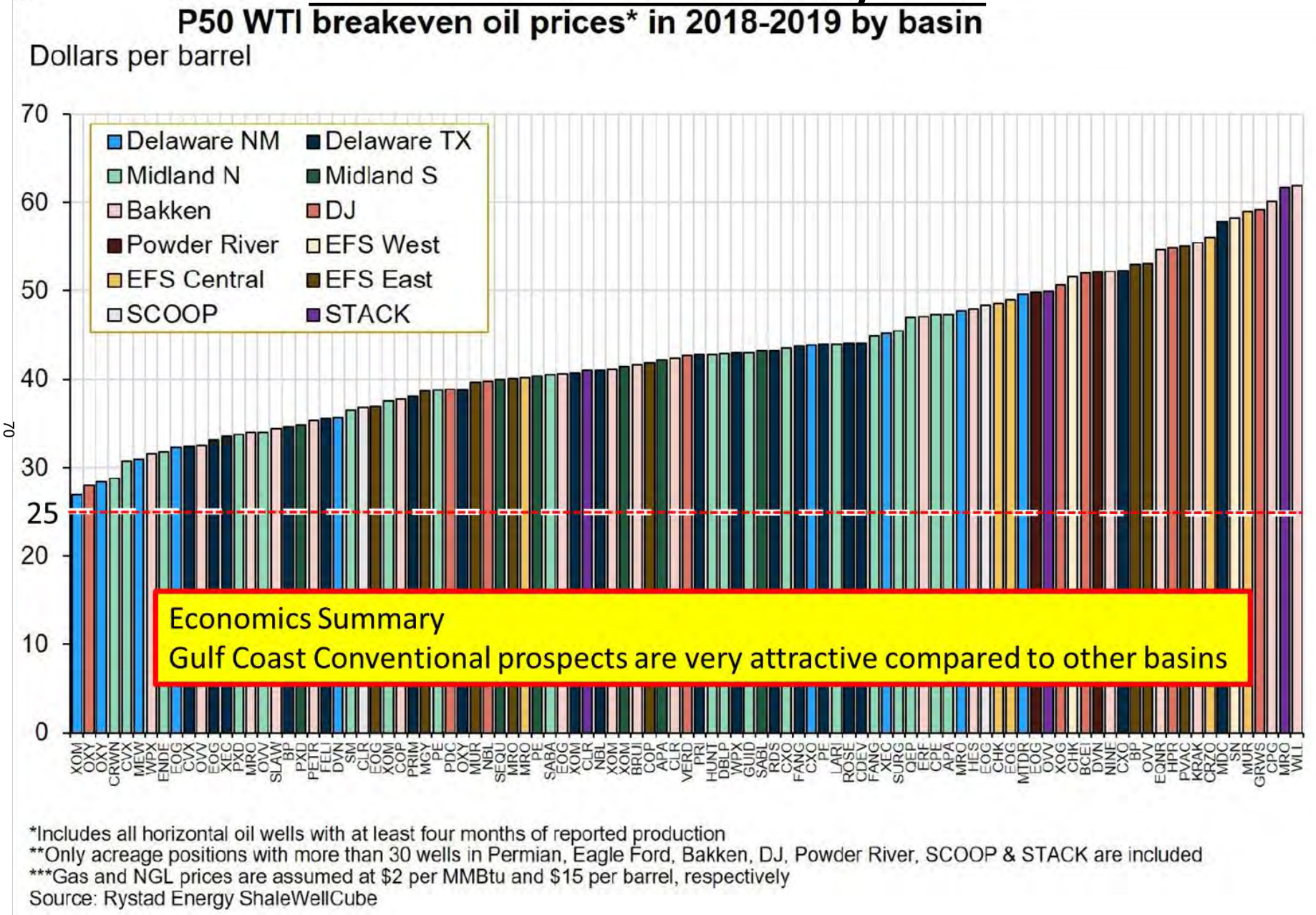
Chart 10- Oil Decline

Shale Plays	Estimated YE2019 Gas Production Rate		First-Year Decline
	Bcf/d	% of total	Annual %
Delaware	10.1	9%	25%
Eagle Ford	6.8	6%	37%
Haynesville	12.3	11%	40%
Marcellus/Utica	33.8	31%	34%
Midland	5.6	5%	21%
Niobrara	3.2	3%	36%
SCOOP	2.4	2%	35%
STACK	2.8	3%	31%
Remainder	33.1	30%	17%
Total	**110.1**		**28%**

The industry is preoccupied with shale mergers. This detracts from sending money into conventional drilling programs and prospects. It seems to have been observed by finance-oriented people that it is perceived to be cheaper to buy reserves than to drill for them. If a success rate of 60% can be achieved in a conventional drilling program this can be disproved (refer to Chart 9 notes).

Rystad Energy published a chart showing breakeven oil prices in 2018-2019 by basin in dollars per barrel. The Gulf Coast came out the best, at $25. The chart is reproduced below as **Chart 10, Breakeven Price by Basin.**

Chart 10 – Breakeven Price by Basin



*Includes all horizontal oil wells with at least four months of reported production
**Only acreage positions with more than 30 wells in Permian, Eagle Ford, Bakken, DJ, Powder River, SCOOP & STACK are included
***Gas and NGL prices are assumed at $2 per MMBtu and $15 per barrel, respectively
Source: Rystad Energy ShaleWellCube

Packaging the Prospect:

One word summary for packaging and marketing a prospect: PERSISTENCE

Outside of that one word and the insights on society, government and the industry previously discussed, the following bullet list sums up, in general, what needs to be considered and well-thought out for each prospect:

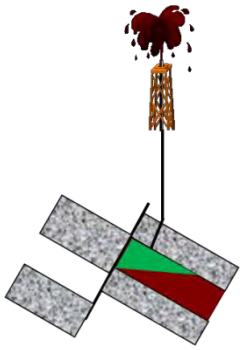
- Market conditions
- Trade development – why is this prospect special
- Market research / finding investors
- Elevator pitch
- Personal Introduction
- Know the Audience – finance / geology / geophysics / engineer / neophyte
- Keep presentation time as short as possible
- Overview and then greater detail
- Modify presentation and displays – based on feedback (caution: do not get dragged into the weeds and make presentation too long)

If these items can be well-understood the prospect is ready to market. At this point the displays needed should be considered. The single task that can be performed to help a prospect sell is to clean up the workstation. Not a task for Windex or the cleaning service. This is a task for the interpreter. All faults should tie and spurious faults and horizons should be eliminated or named as 'x…' and turned off. The list considers items necessary for any prospect package:

- Manage Displays
    - Workstation Clean up
    - Consistent scales with scale bar
    - Unclutter
    - Know your audience –additional displays for technical folks
- Displays needed
    - Locator map regional and local?
    - Executive Summary with disclaimer
    - Simple Paragraph on geology, geophysics, engineering
    - Simple paragraph on trend/offset production (if any)
    - Type Log (1", 2", 5")?
    - Offset Logs – proper annotation
    - Structure Map(s) with Scale Bar
    - Cross section – strike/dip – with scale bar
    - Seismic line – strike/dip – with scale bar
    - Production curve(s)
    - Reserve calculations (in table form)
    - Appendix for explaining extraordinary details
    - Biography of originators (Paragraph style)
    - Drilling Records
    - Paper Brochure
    - Montage
    - Electronic forms

Finally there is now an answer the original question: As time goes on are more participants getting involved in a given prospect? In the case of both Icarus' original prospects and those in which Icarus participates the answer is yes. This paper explored and discovered some of the reasons behind the numerous participants; mainly money has become scarcer, companies moved into shale or were absorbed by other companies and society has become risk-adverse. **Chart 11, Prospect Participation** excerpts from Icarus' files a representative sample of prospects spanning from 1996 to 2021. The chart lists a prospect number, the year, the number of participants, the TD, whether it was pressured and the expected results in MCFG and MBO – red numbers in these two columns indicate a dry hole.

Conclusions:



A. Subtle Traps in the Gulf Coast are Economically competitive with shale, other basins, and deep water

B. Maximize Risk Reduction in Prospect development; Appropriate technology

C. Be Aware of market conditions pricing, storage, supply/demand, politics

D. Be honest in presentations

AND

- Exploration Cycle guides type of prospects to sell
- Government policies can set stage for exploration
- Wield technology wisely 20/80 vs 80/20
- If 3D is available it better be utilized for interpretation
- You only think you're a scientist: we are SALESMEN
- Safe Operations and Environmentally friendly policies are good community relations (faster permits, more profit)
- Workflow should allow for 5-8 prospects at a time

Maps and interpretations are the work product or simplified versions of work by the following independent geoscientists: Matt Franey (Corpus Christi, TX), Barry Rava (Houston, TX), Norman Pullman (Houston, TX) and David Broadbridge (Covington, LA). Several seismic excerpts approved by data holders Mr. Beard and Mr. Miller

25 Years of Changing Market Conditions

Prospect	Year	Participants	TD	Press	MCFG	MBO
1	1996	4	7,000	N	1,000	1,000
2	1998	7	8,425	N	7,000	400
3	1999	6	11,500	Y	2,000	100
4	2000	6	6,000	N	1,000	0
5	2000	6	6,000	N	600	0
6	2000	6	6,000	N	600	0
7	2001	6	15,000	Y	50,000	5,000
8	2001	3	11,550	Y	7,000	42
9	2002	5	3,000	N	2,000	0
10	2006	12	1,000	N	3,000	200
11	2007	13	7,050	N	6,000	1,000
12	2008	12	10,000	Y	10,000	2,000
13	2015	10	13,500	Y	6,000	600
14	2017	23	9,250	N	2,000	100
15	2018	10	9,500	N	1,000	320
16	2019	10	3,530	N	0	50
17	2019	10	13,500	Y	2,000	15
18	2019	10	9,450	N	14,000	1,000
19	2019	26	8,450	N	2,000	1,000
20	2020	24	8,330	N	1,500	450
21	2021	16	6,700	N	1,500	100

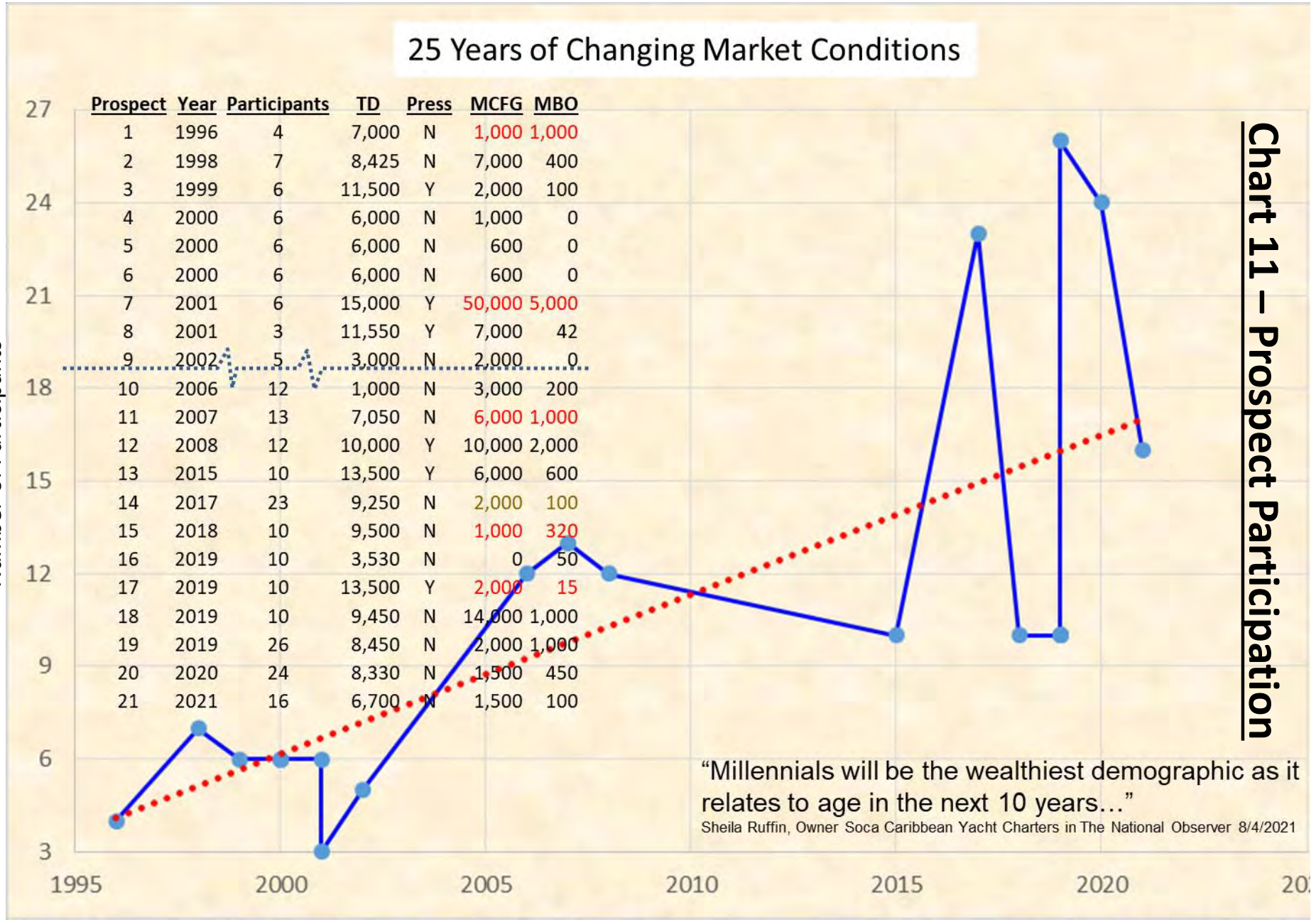


Chart 11 – Prospect Participation

"Millennials will be the wealthiest demographic as it relates to age in the next 10 years…"

Sheila Ruffin, Owner Soca Caribbean Yacht Charters in The National Observer 8/4/2021

Citations

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Bloomberg 11/1/2021 Devika Krishna Kumar

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Type Logs of South Texas Fields, Vol. I, Frio Trend. Compiled by Don Kling. Includes 134 fields. 158 p., 1972. Ring binder.
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Field Trip Guidebooks

South Texas Uranium. J. L. Cowdrey, Editor. 62 p., 1968.
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Portrero Garcia and Huasteca Canyon, Northeastern Mexico. Barbara Beynon and J. L. Russell, Editors. 46 p., 1979.
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Modern Depositional Environments of Sands in South Texas. C. E. Stelting and J. L. Russell, Editors. 64 p., 1981.
CCGS 108G $15.00

Geology of Peregrina & Novillo Canyons, Ciudad Victoria, Mexico, J. L. Russell, Ed., 23 p. plus geologic map and cross section, 1981.
CCGS 109G $10.00

Geology of the Llano Uplift, Central Texas, and Geological Features in the Uvalde Area. Corpus Christi Geological Society Annual Spring Field Conference, May 7-9, 1982. Variously paginated. 115 p., 53 p.
CCGS 110G $15.00

Structure and Mesozoic Stratigraphy of Northeast Mexico, prepared by numerous authors, variously paginated. 76 p., 38 p., 1984.
CCGS 111G $15.00

Geology of the Big Bend National Park, Texas, by C. A. Berkebile. 26 p., 1984.
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Aransas Pass/McCampbell Deep
Bartell Pass
Blackjack
Burgentine Lake
Copano Bay, South
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

CALHOUN COUNTY
Appling
Coloma Creek, North
Heyser
Lavaca Bay
Long Mott
Magnolia Beach
Mosquito Point
Olivia
Panther Reef
Powderhorn
Seadrift, N.W.
Steamboat Pass
Webb Point
S.E. Zoller

CAMERON COUNTY
Holly Beach
Luttes
San Martin (2)
Three Islands, East
Vista Del Mar

COLORADO COUNTY
E. Ramsey
Graceland N. Fault Blk
Graceland S. Fault Blk

DEWITT COUNTY
Anna Barre
Cook
Nordheim
Smith Creek
Warmsley
Yorktown, South

DUVAL COUNTY
DCR-49
Four Seasons
Good Friday
Hagist Ranch
Herbst
Loma Novia
Petrox
Seven Sisters
Seventy Six, South
Starr Bright, West

GOLIAD COUNTY
Berclair
North Blanconia
Bombs
Boyce
Cabeza Creek, South
Goliad, West
St Armo
Terrell Point

HIDALGO COUNTY
Alamo/Donna
Donna
Edinburg, West
Flores-Jeffress
Foy
Hidalgo
LA Blanca
McAllen& Pharr
McAllen Ranch
Mercedes
Monte Christo, North
Penitas
San Fordyce
San Carlos
San Salvador
S. Santallana
Shary
Tabasco
Weslaco, North
Weslaco, South

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Francitas
Ganado & Ganado Deep
LaWard, North
Little Kentucky
Maurbro
StewartSwan Lake
Swan Lake, East
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Coy City
Person
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Julian
Julian, North
Laguna Madre
Rita
Stillman

KLEBERG COUNTY
Alazan
Alazan, North
Big Caesar
Borregos
Chevron (offshore)
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Seeligson
Sprint (offshore)

LA SALLE COUNTY
Pearsall
HAWKVILLE:EAGLEFORD

LAVACA COUNTY
Halletsville
Hope
Southwest Speaks
Southwest Speaks Deep

LIVE OAK COUNTY
Atkinson
Braslau
Chapa
Clayton
Dunn
Harris
Houdman
Kittie West-Salt Creek
Lucille
Sierra Vista
Tom Lyne
White Creek
White Creek, East

MATAGORDA COUNTY
Collegeport

MCMULLEN COUNTY
Arnold-Weldon
Brazil
Devil's Waterhole
Hostetter
Hostetter, North

NUECES COUNTY
Agua Dulce (3)
Arnold-David
Arnold-David, North
Baldwin Deep
Calallen
Chapman Ranch
Corpus Christi, N.W.
Corpus Christi West C.C.
Encinal Channel
Flour Bluff/Flour Bluff, East
GOM St 9045(offshore)
Indian Point
Mustang Island
Mustang Island, West
Mustang Island St. 889S(offshore)
Nueces Bay/Nueces Bay West
Perro Rojo
Pita Island
Ramada
Redfish Bay
Riverside
Riverside, South
Saxet
Shield
Stedman Island
Turkey Creek

REFUGIO COUNTY
Bonnieview/Packery Flats
Greta
La Rosa
Lake Pasture
Refugio, New
Tom O'Connor

SAN PATRICIO COUNTY
Angelita East
Commonwealth
Encino
Enos Cooper
Geronimo
Harvey
Hiberia
Hodges
Mathis, East
McCampbell Deep/Aransas Pass
Midway
Midway, North
Odem
Plymouth
Portilla (2)
Taft
Taft, East
White Point, East

STARR COUNTY
El Tanque
Garcia
Hinde
La Reforma, S.W.
Lyda
Ricaby
Rincon
Rincon, North
Ross
San Roman
Sun
Yturria

VICTORIA COUNTY
Helen Gohike, S.W.
Keeran, North
Marcado Creek
McFaddin
Meyersville
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Bruni, S.E.
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Davis
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Las Tiendas
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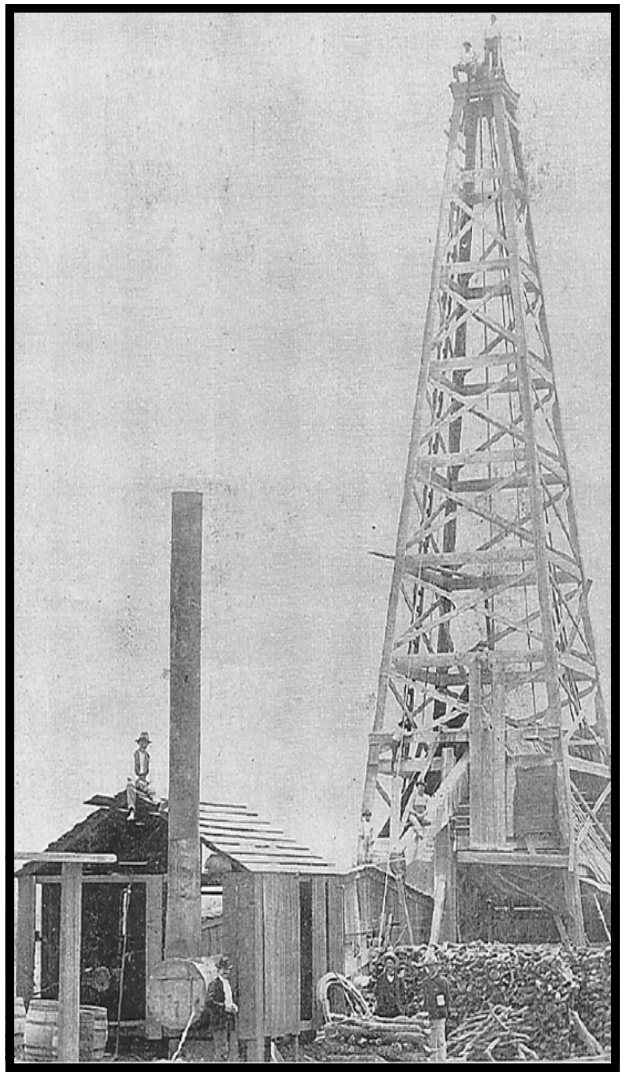

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