

GCS Solutions, Inc.

*geopressure consulting
services & solutions*

RhoVe™ Method

(U.S. patent pending - copyright © 2017)

A New Empirical Pore Pressure Transform

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RhoVe™ Method Platform

(U.S. patent pending - copyright © 2016)



JIP – seeking \$55,000 investment* for:

- Commercial implementation of RhoVe & RhoVe T (temperature-based) methods
- Plug-in or web-based application to include:
 - Real-Time WITSML connectivity,
 - notebook (iPad) capability,
 - 1D temperature modeling capability,
- Explore automation capabilities

*** Investors will receive extended licenses & Beta version(s), along with an opportunity to influence functional capability and access**

RhoVe™ T Method

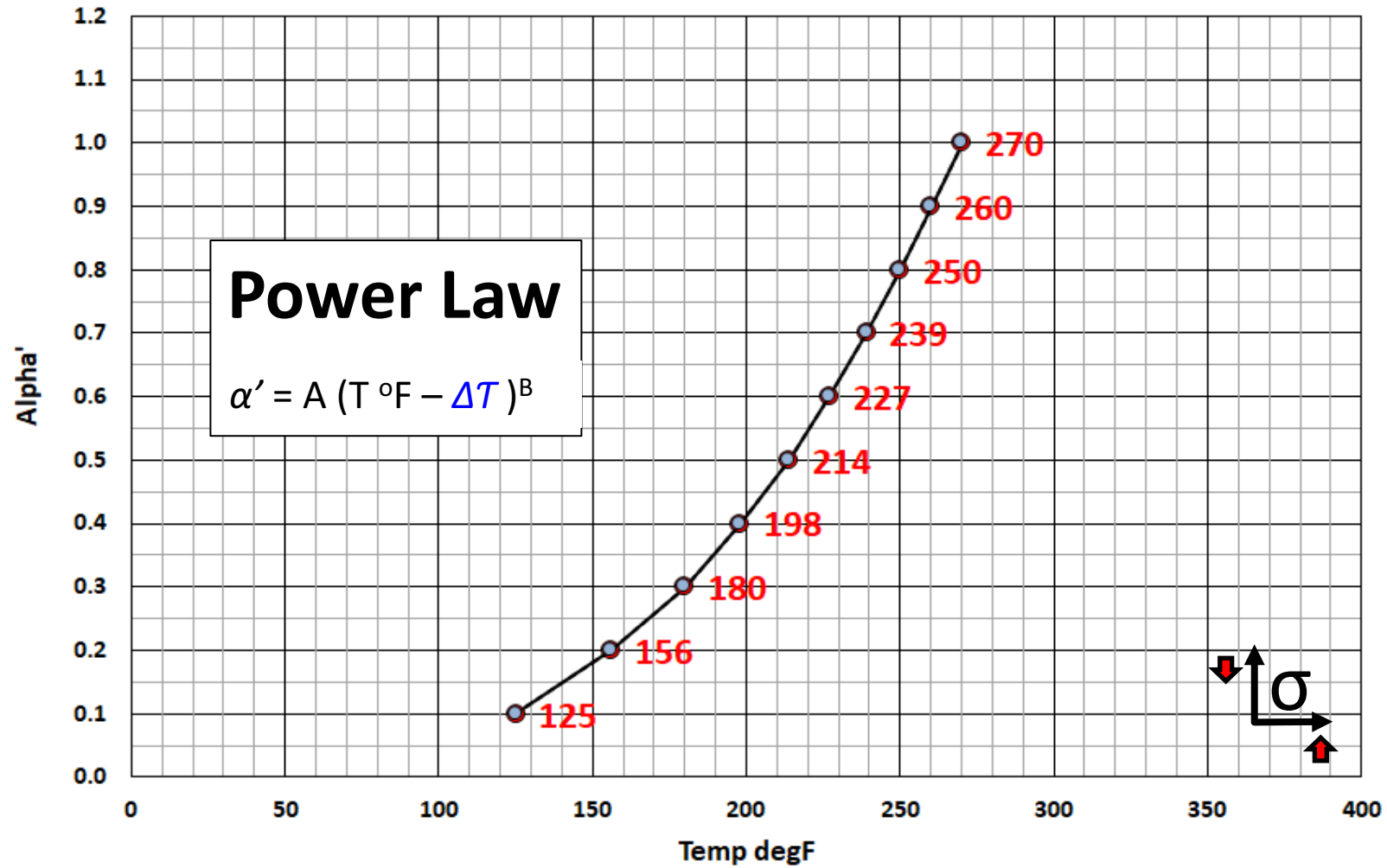
❖ Study Area includes 20 GoM wells:

- ❖ South Marsh Island (1 well - shelf)
- ❖ Eugene Island (Rask 1997 – 1 well Shelf)*
- ❖ Port Isabel (1 well)
- ❖ Mississippi Canyon (4 wells)
- ❖ Viosca Knoll (1 well)
- ❖ Walker Ridge (5 subsalt)
- ❖ Keathley Canyon (7 subsalt)

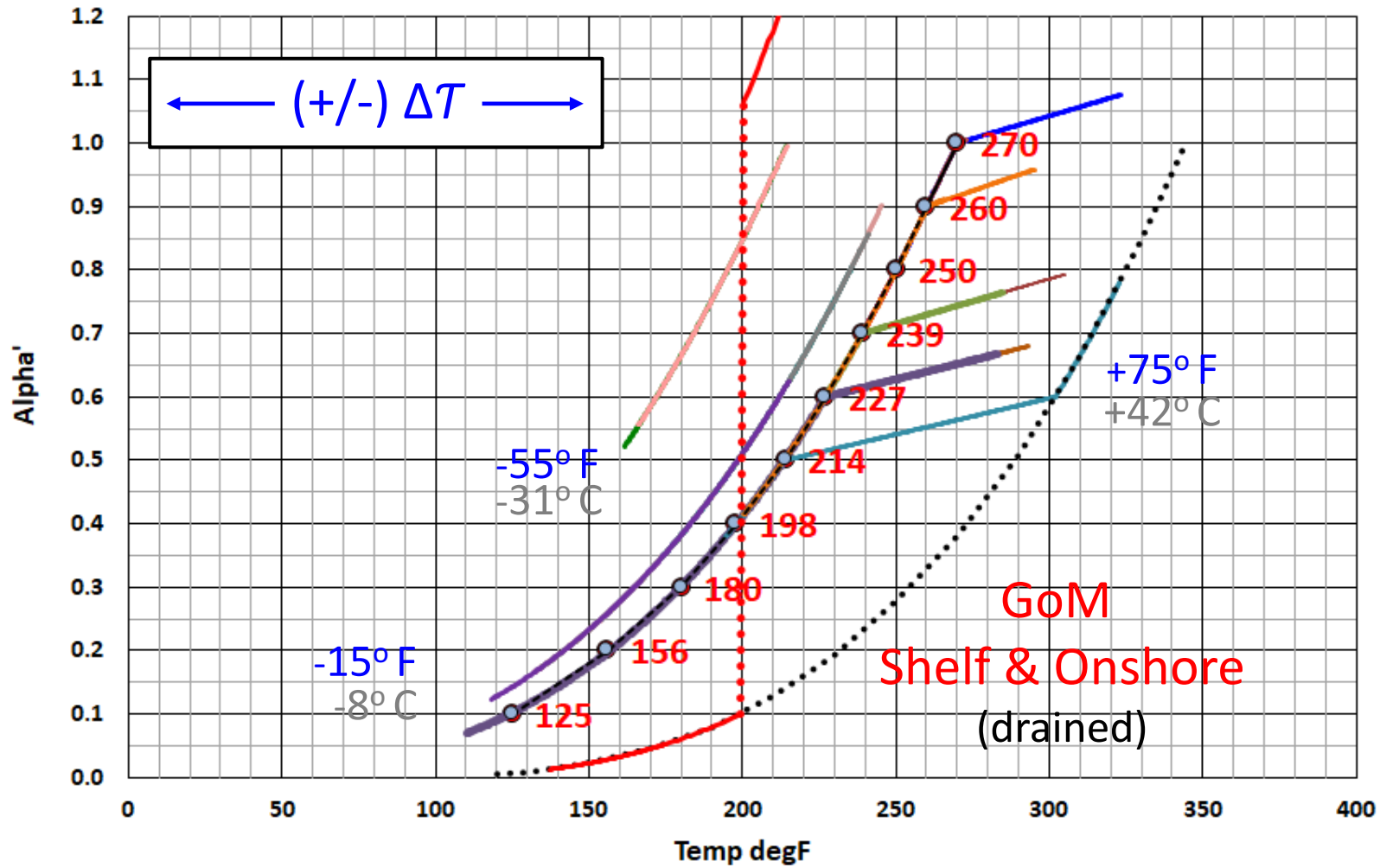
❖ Margin of error <7% (+/-0.5 PPG.EMW) for 16 of 20 Deepwater GoM wells (out-of-the-box)*

- ❖ Master Power Law relationship (temperature – alpha')
- ❖ RhoVe™ T method is applied as an instantaneous series
- ❖ PP calculated for any well in the GoM by changing one parameter: (+/-) ΔT
- ❖ Single transform converts dtco/rhob for Plio-Pleistocene, Miocene, Oligocene & Paleogene (Wilcox)
- ❖ Predrill, Real-Time (goal to greatly reduce or eliminate NPT) & Post Drill Analysis
- ❖ Fully Automated applications for large data volumes

ALPHA' vs TEMP

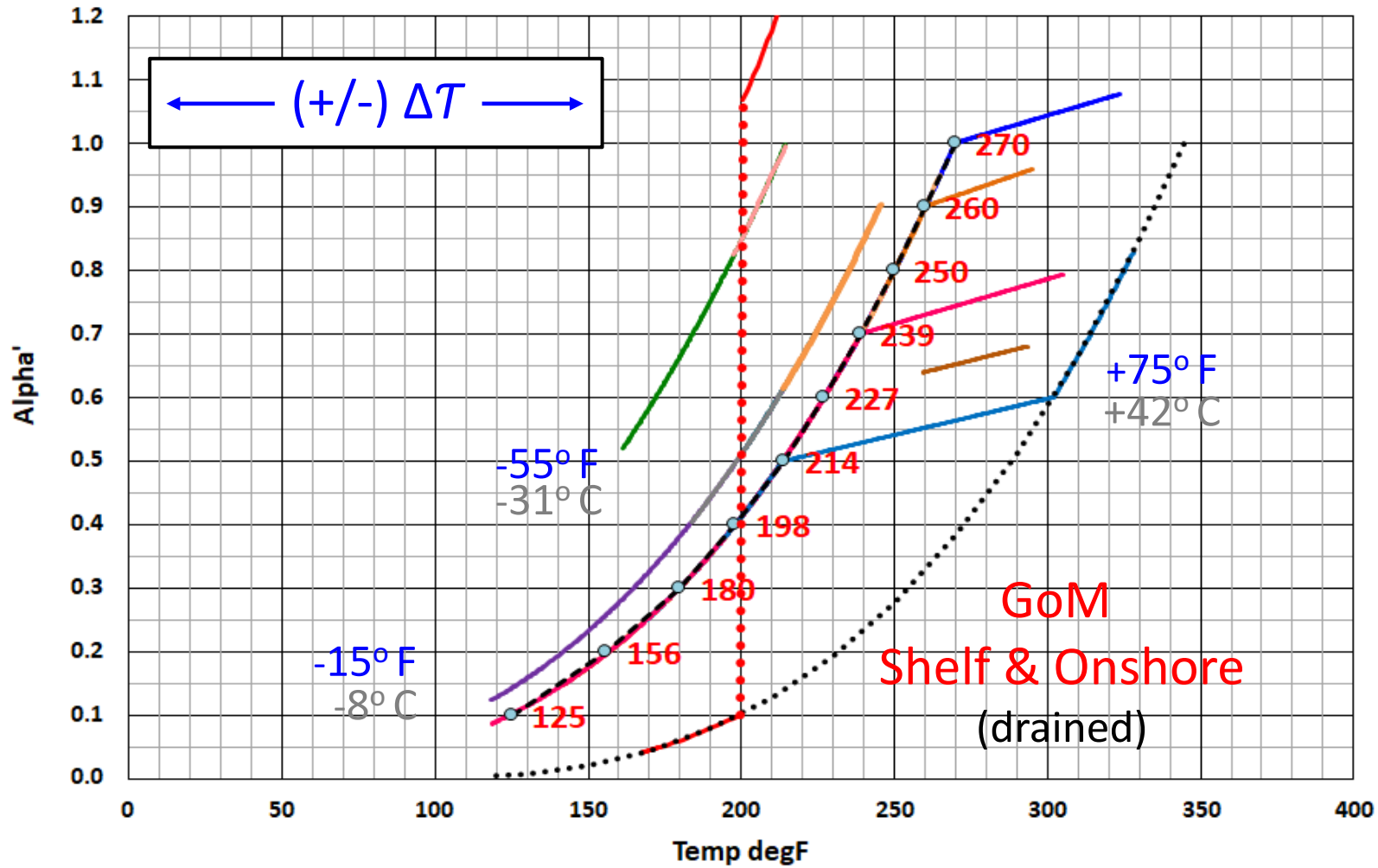


ALPHA' vs TEMP



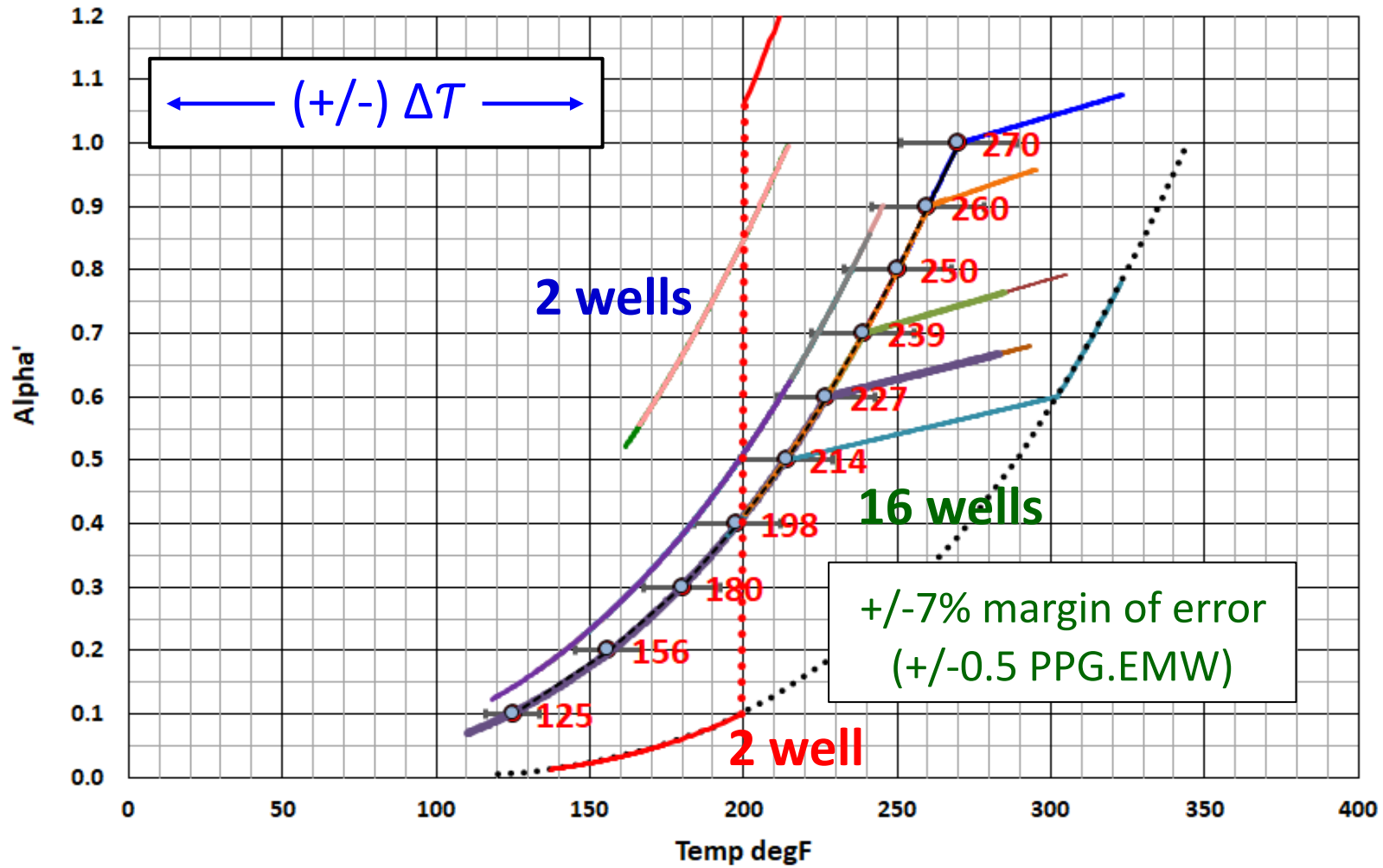
dT

ALPHA' vs TEMP



Rhob

ALPHA' vs TEMP



dT



**District Boundaries
Gulf of Mexico OCS Region**

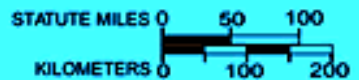
Rask 1997

Keathley Canyon

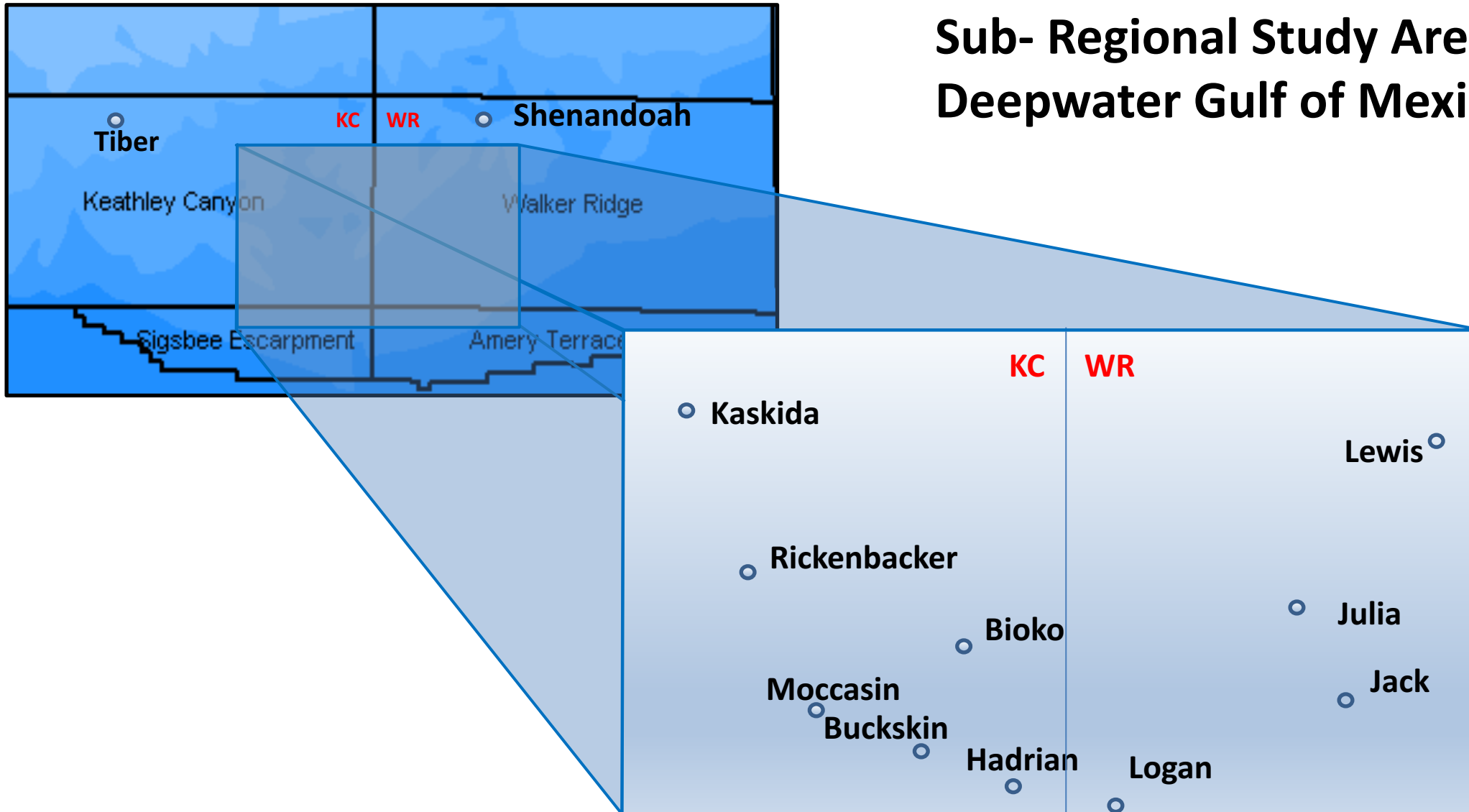
Tiber

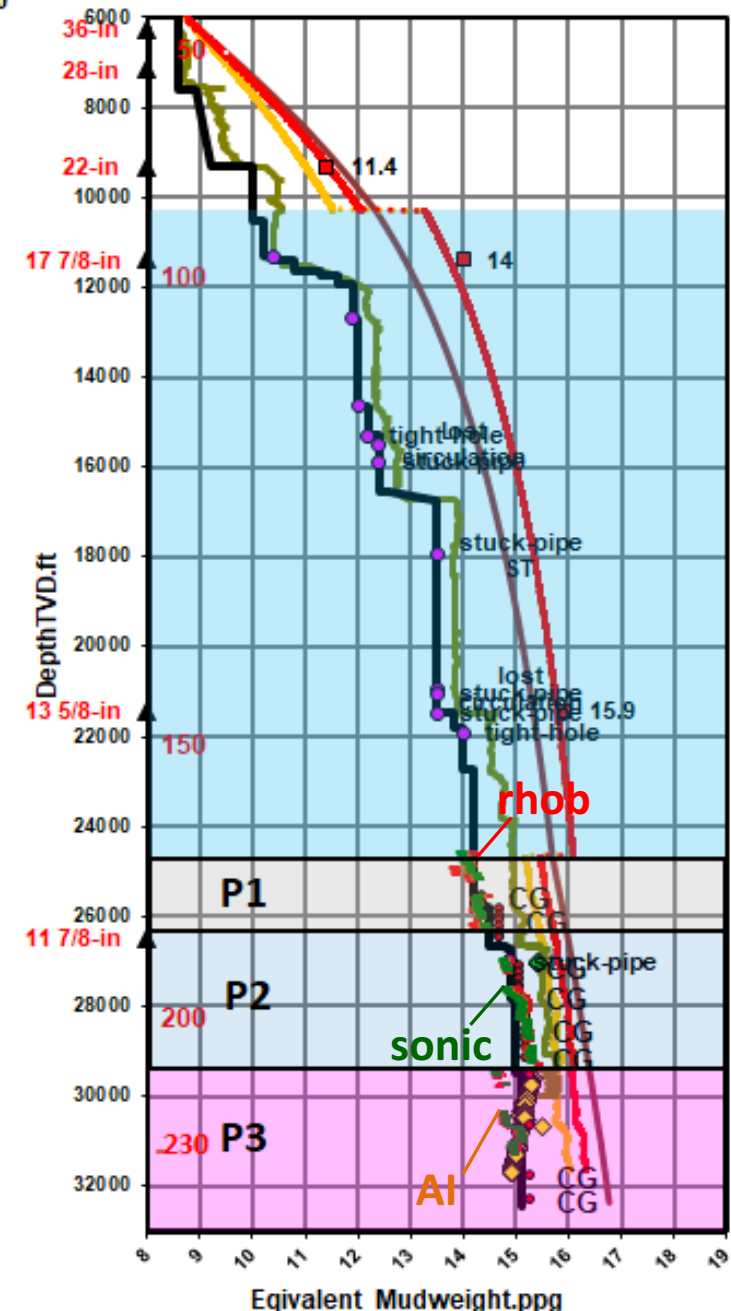
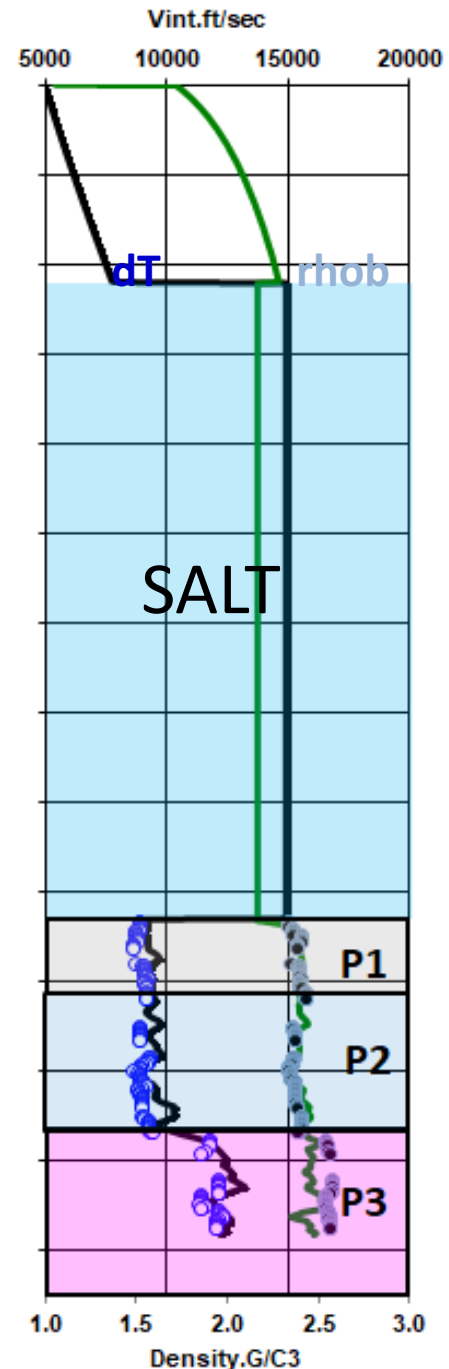
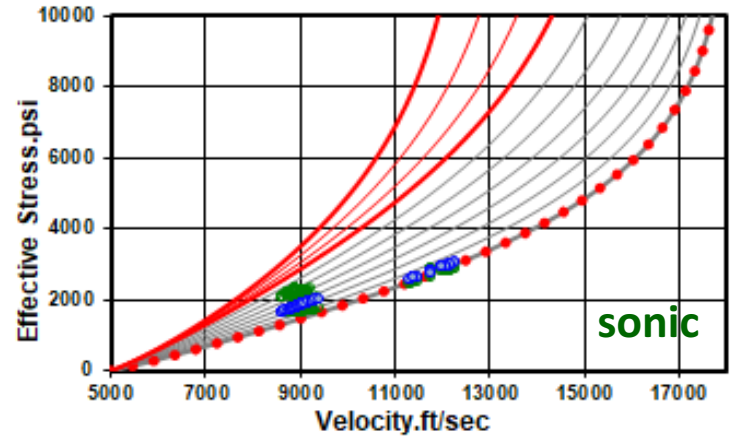
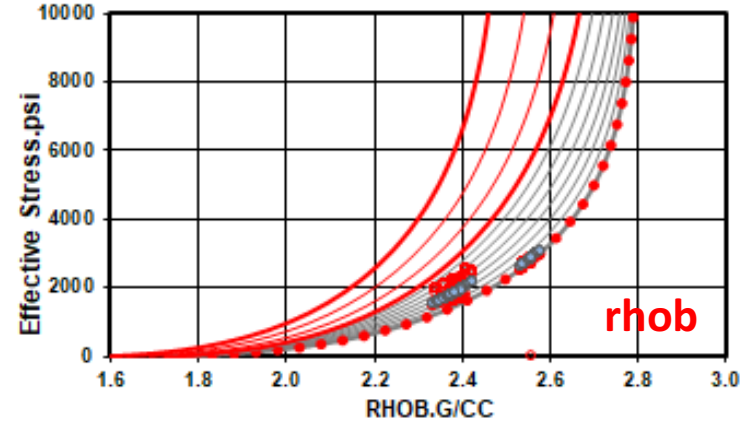
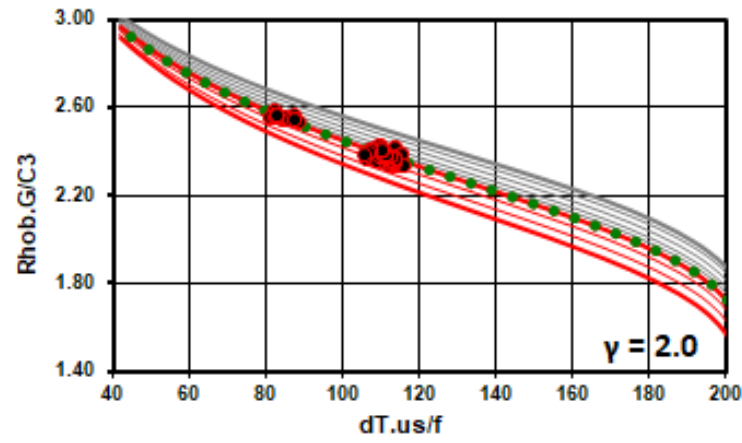
Shenandoah

Walker Ridge



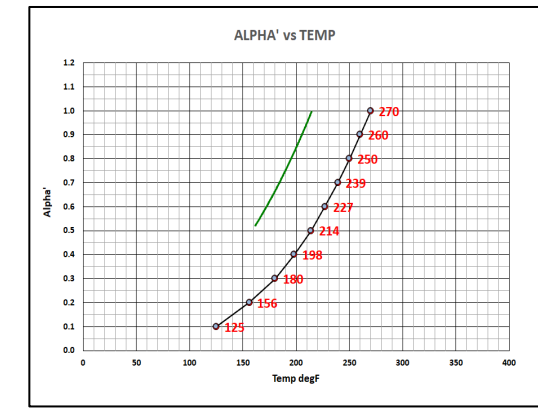
Sub-Regional Study Area Deepwater Gulf of Mexico



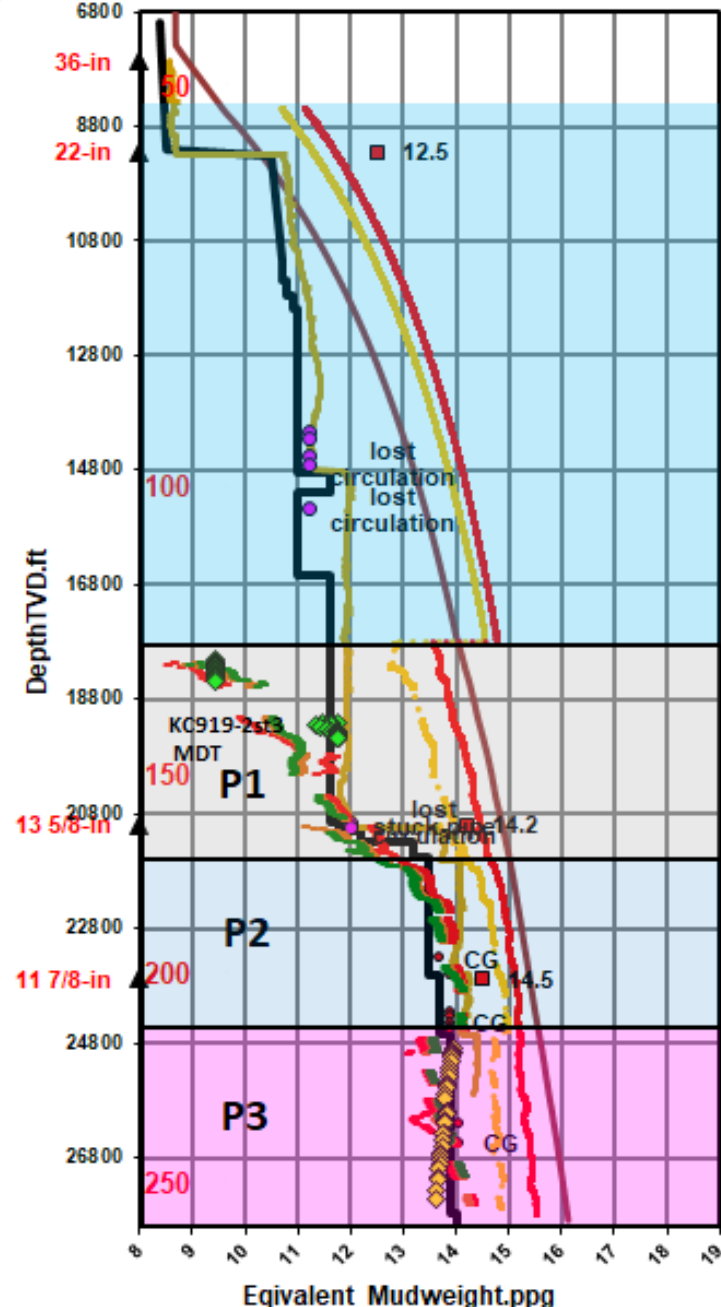
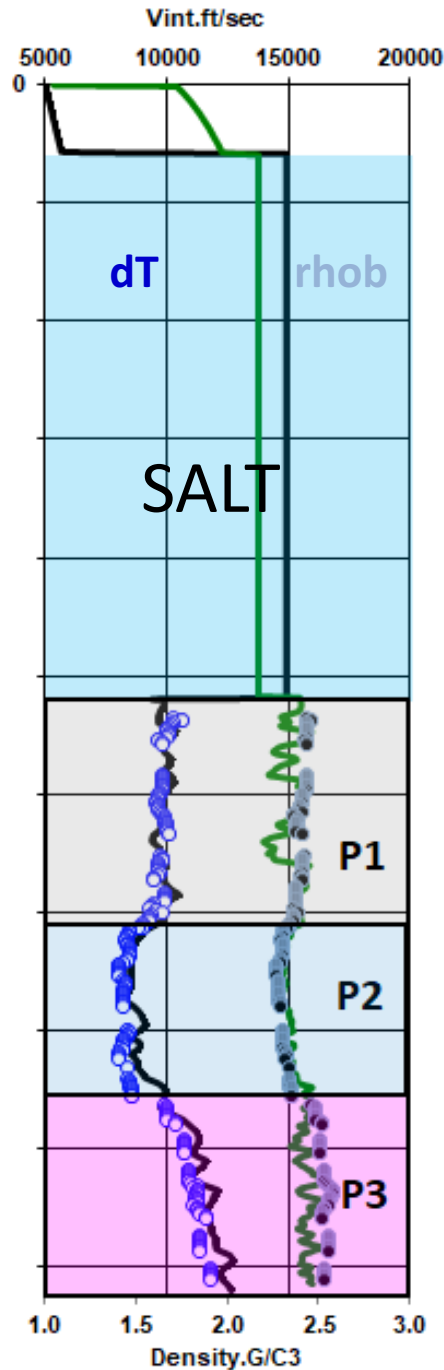
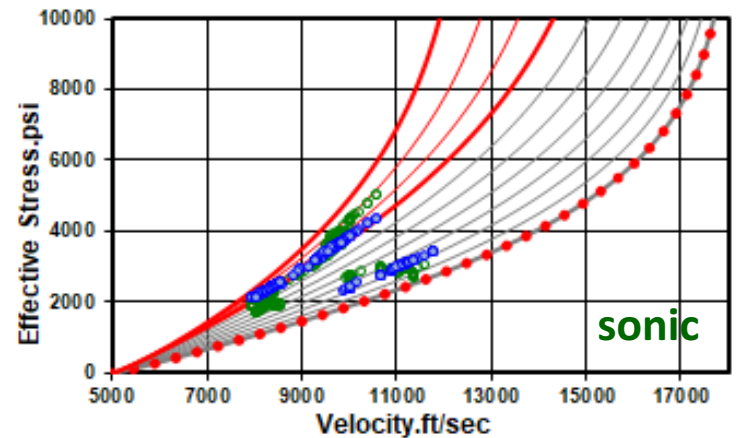
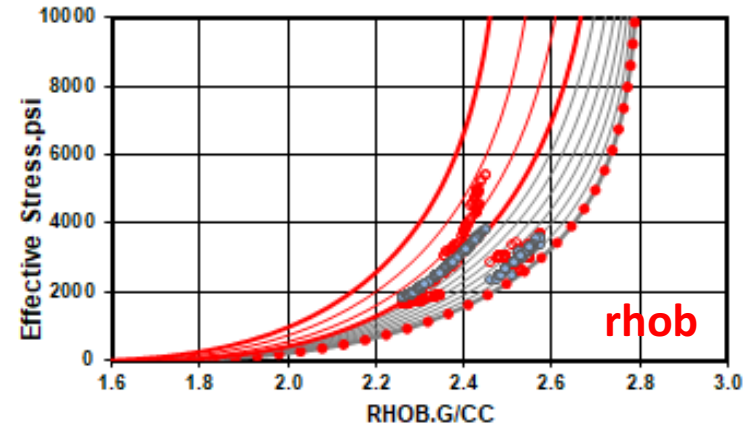
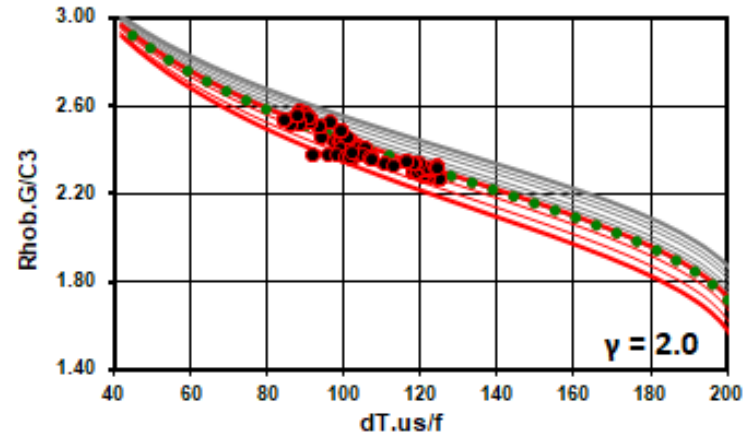


vint	alpha'	TdegF
#N/A	0.0	0
#N/A	0.1	70
#N/A	0.2	101
#N/A	0.3	125
#N/A	0.4	143
#N/A	0.5	159
9043	0.6	172
#N/A	0.7	184
8992	0.8	195
#N/A	0.9	205
#N/A	1.0	215

-55 degrees

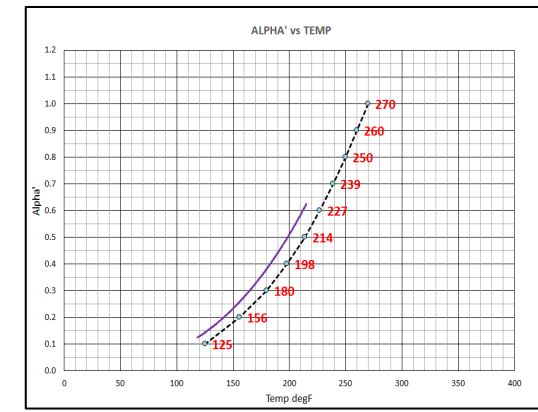


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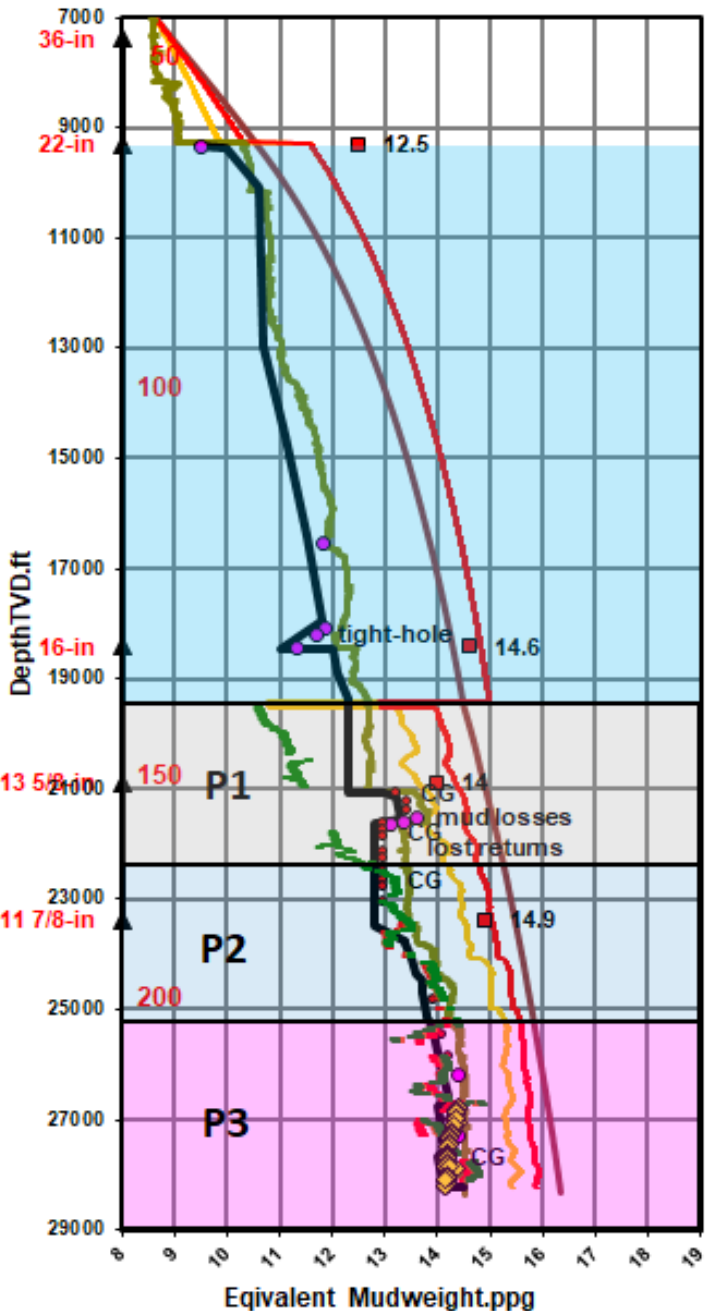
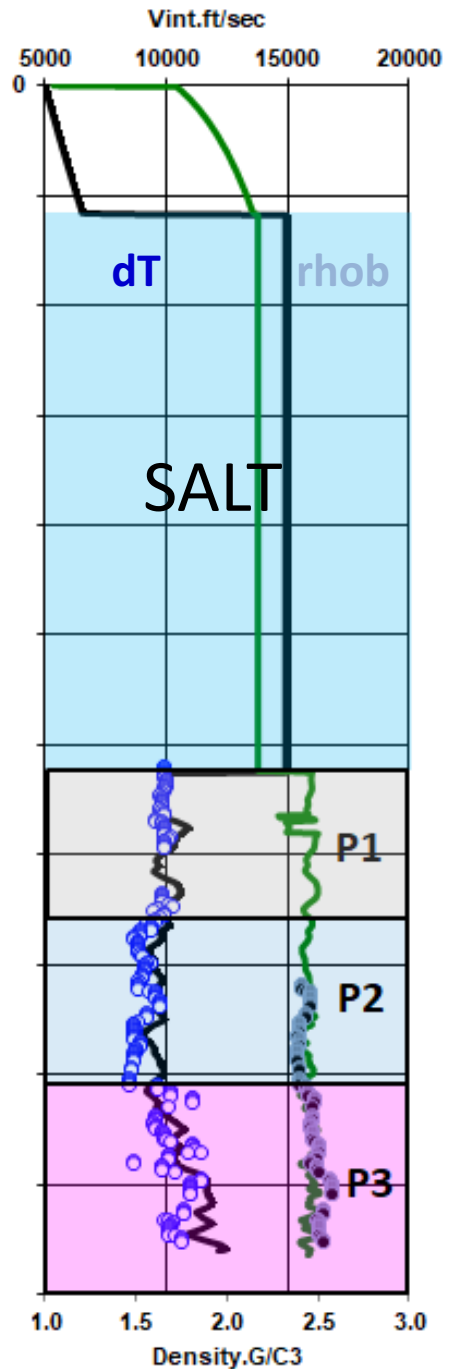
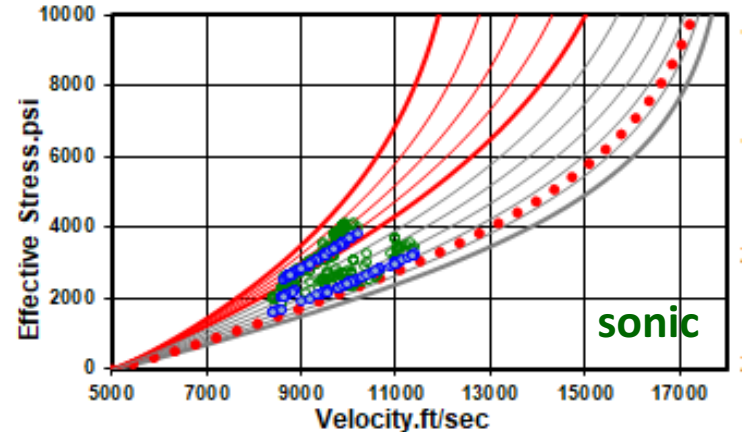
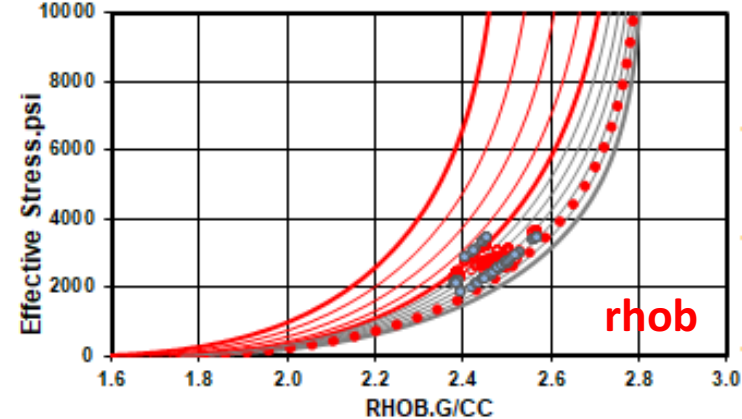
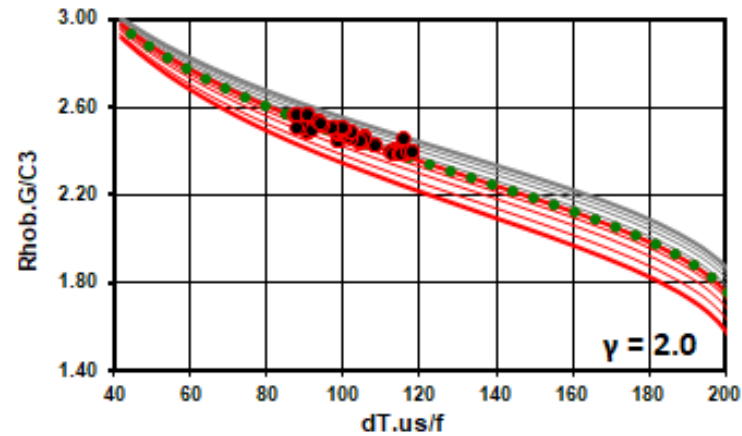


vint	alpha'	TdegF
#N/A	0.0	30
#N/A	0.1	110
9837	0.2	141
#N/A	0.3	165
8142	0.4	183
#N/A	0.5	199
8485	0.6	212
#N/A	0.7	224
11007	0.8	235
#N/A	0.9	245
#N/A	1.0	255

-15 degrees

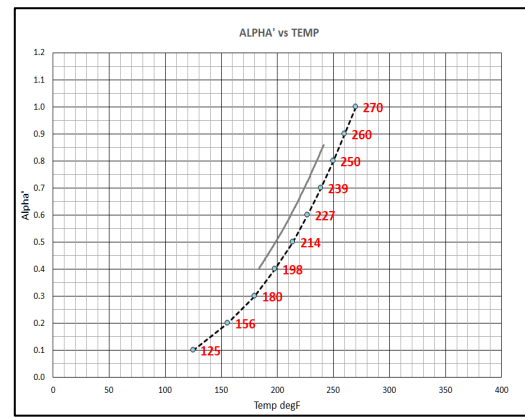


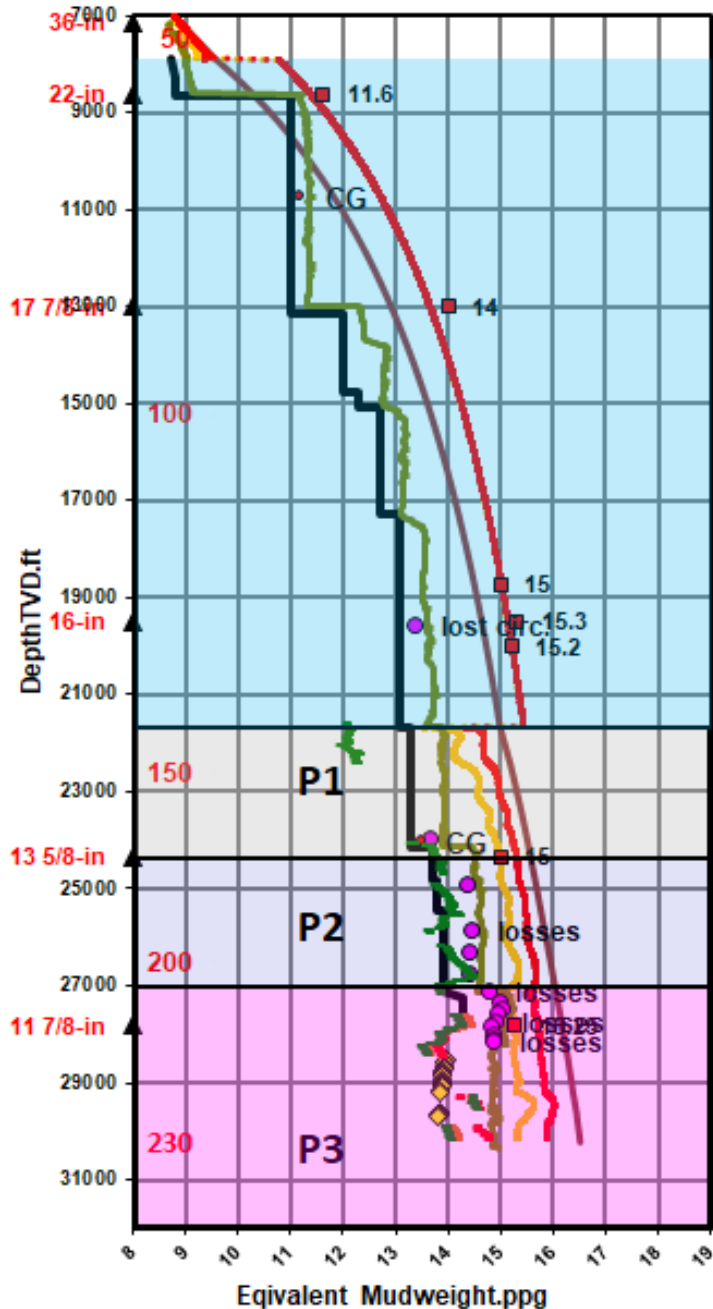
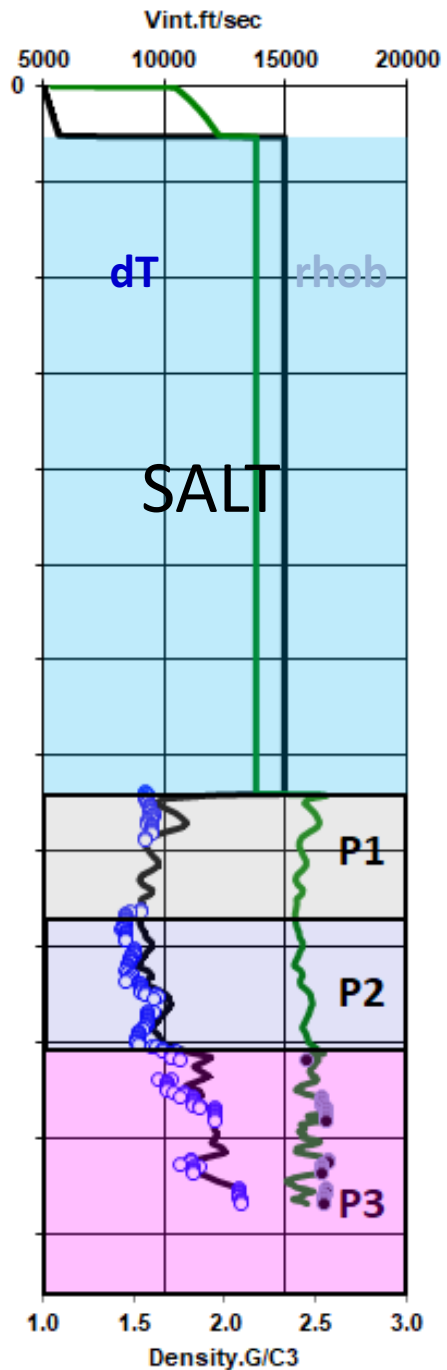
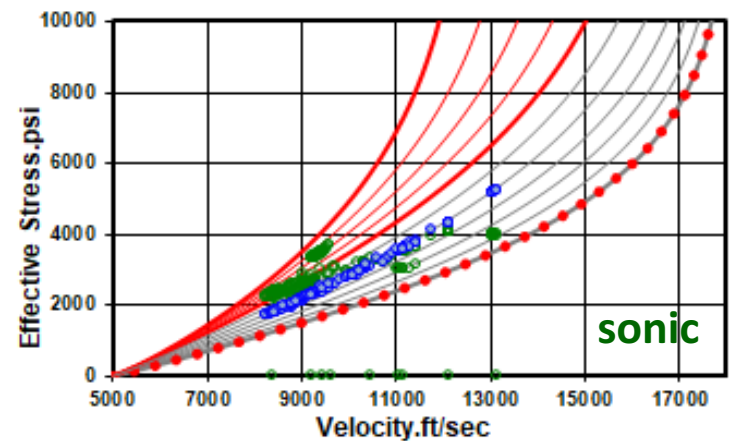
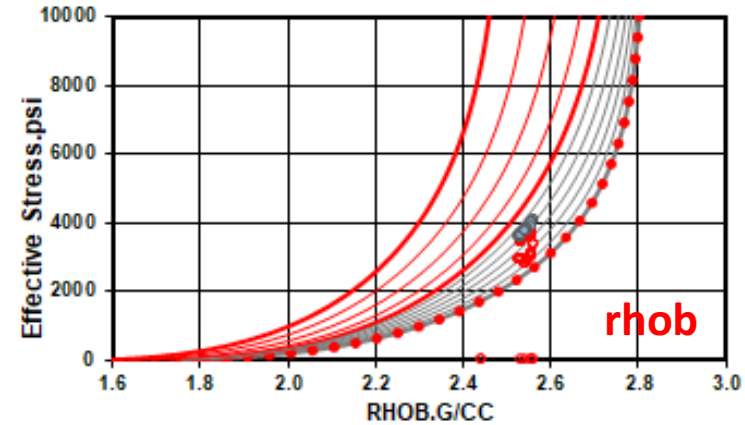
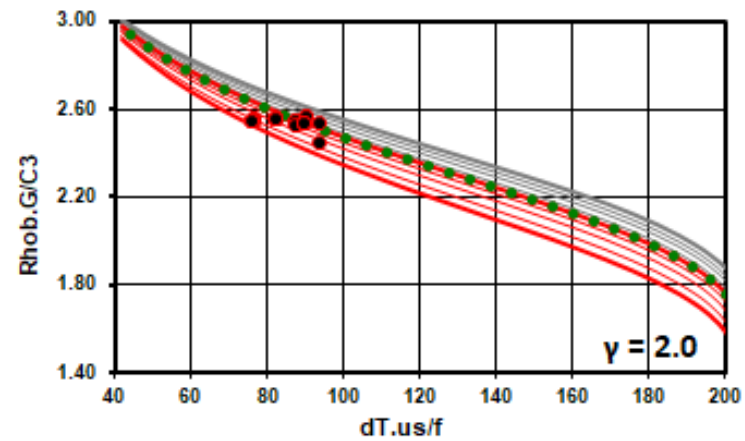
AREA: DW GOM KC872-1 BUCKSKIN



vint	alpha'	TdegF
#N/A	0.0	30
#N/A	0.1	110
9738	0.2	141
9800	0.3	165
8830	0.4	183
8716	0.5	199
#N/A	0.6	212
8645	0.7	224
10723	0.8	235
#N/A	0.9	245
#N/A	1.0	255

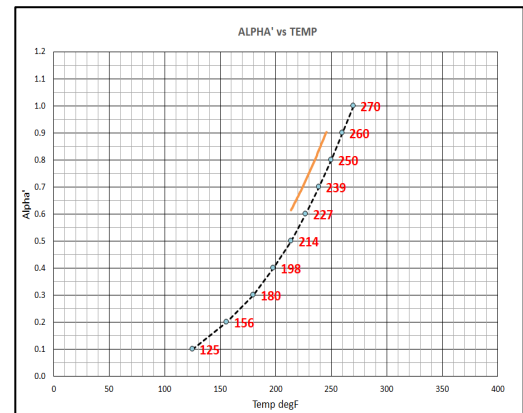
-15 degrees



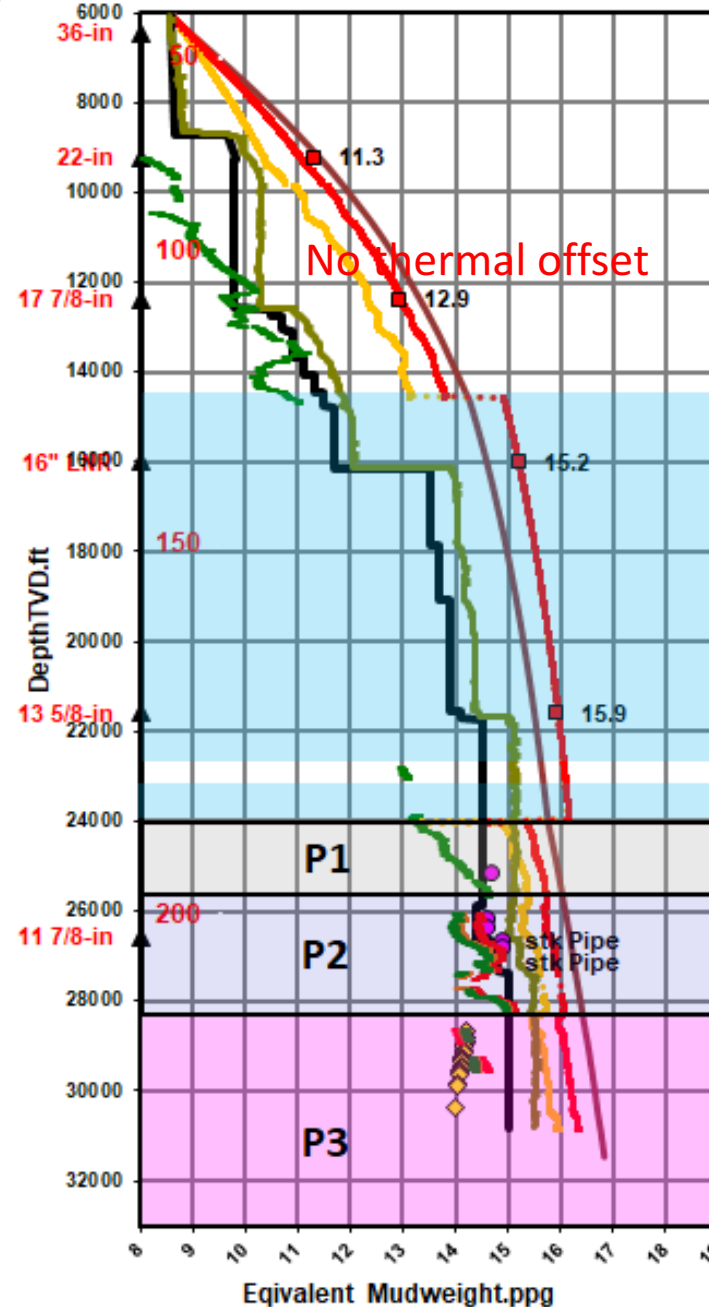
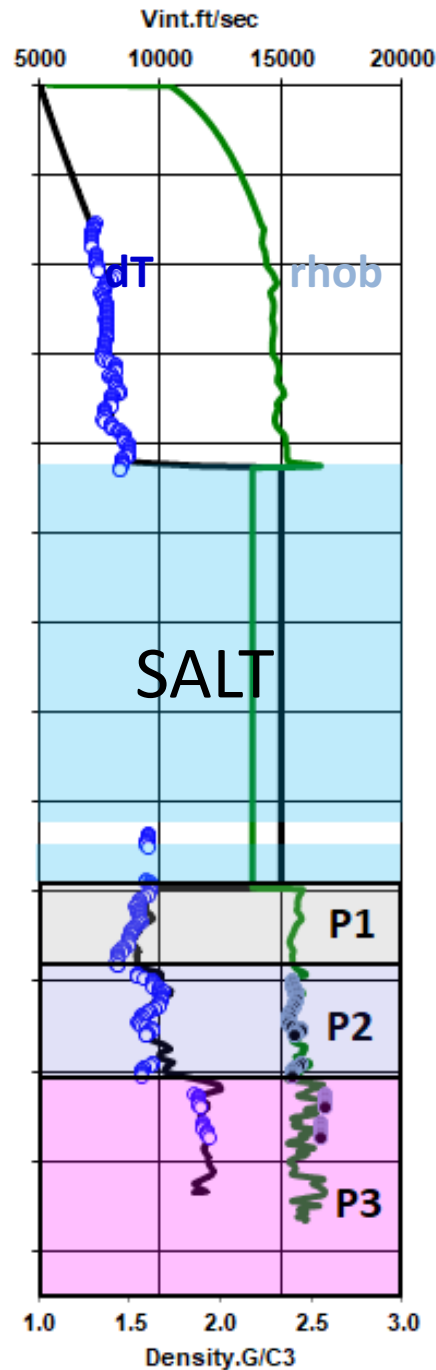
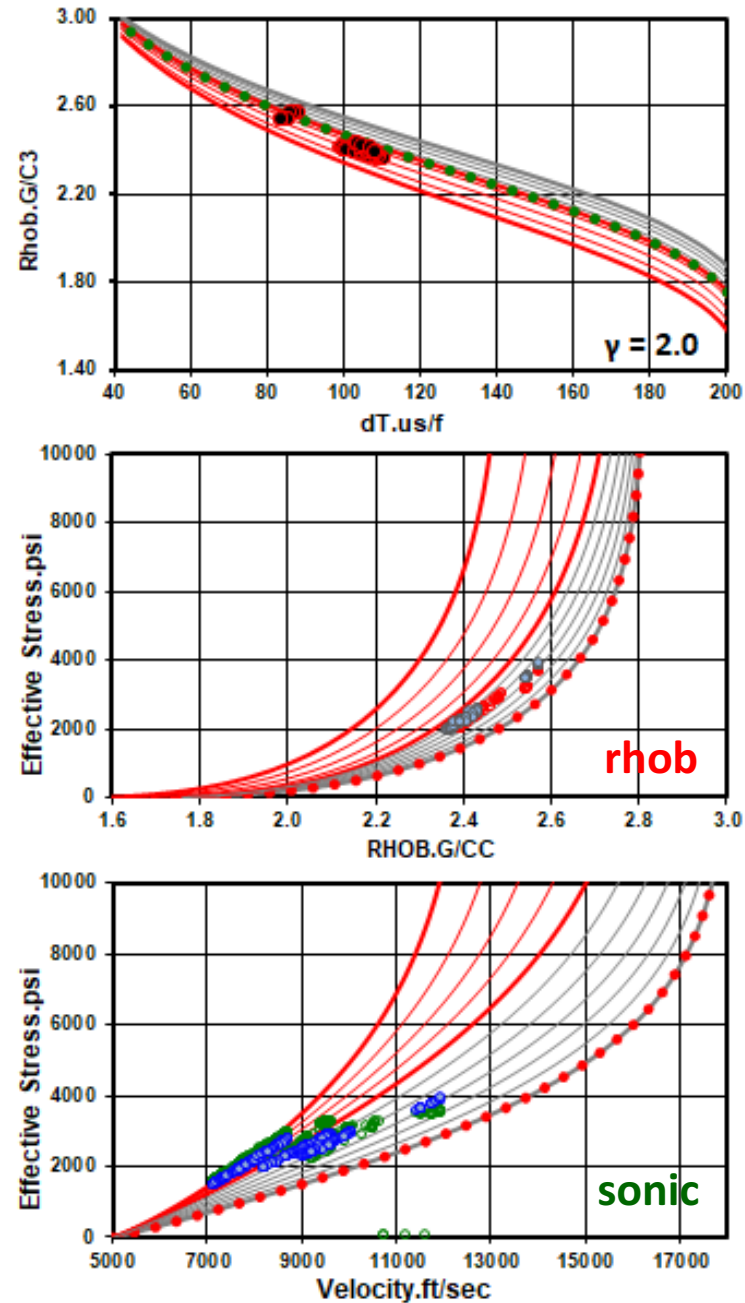


vint	alpha'	TdegF
#N/A	0.0	30
#N/A	0.1	110
9390	0.2	141
#N/A	0.3	165
8582	0.4	183
9278	0.5	199
#N/A	0.6	212
12135	0.7	224
11080	0.8	235
#N/A	0.9	245
#N/A	1.0	270

-15 degrees

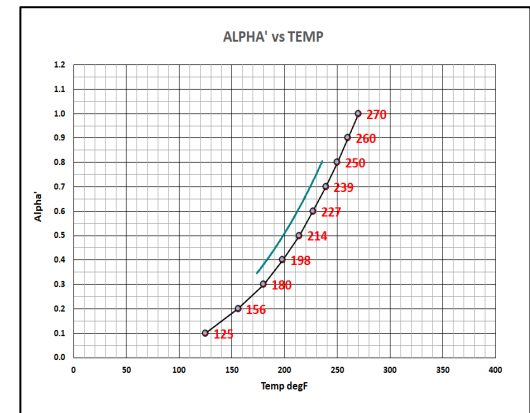


AREA: DW GOM KC470-1 RICKENBACKER

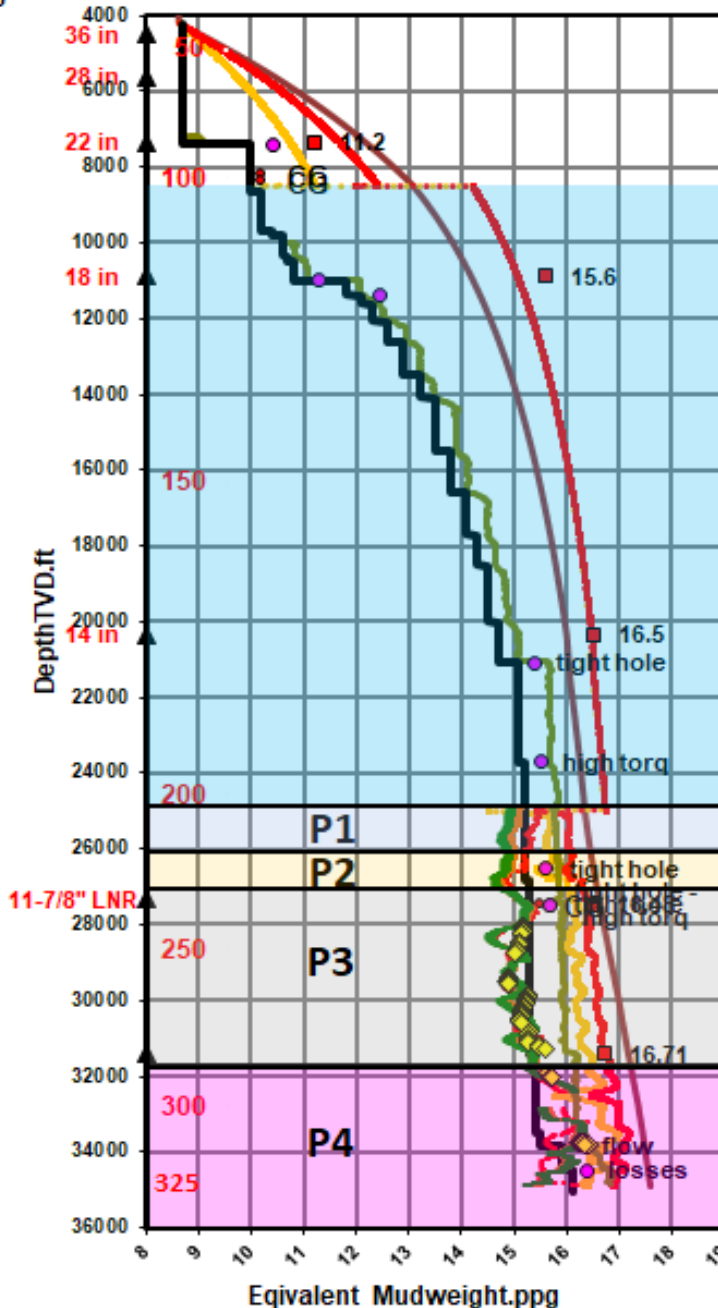
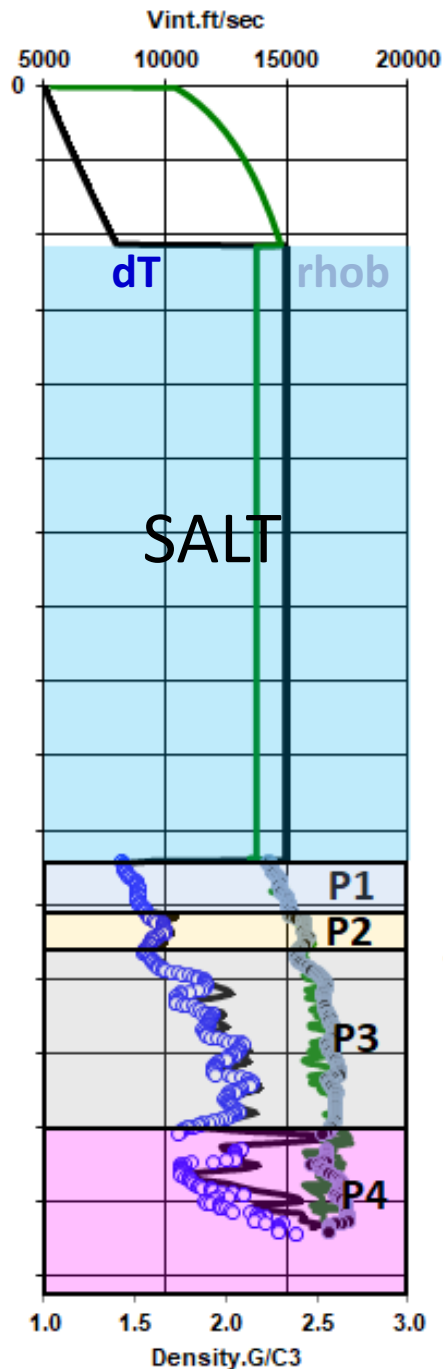
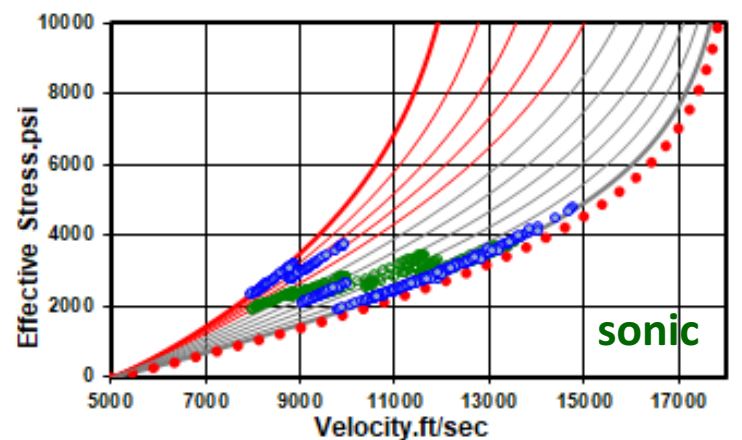
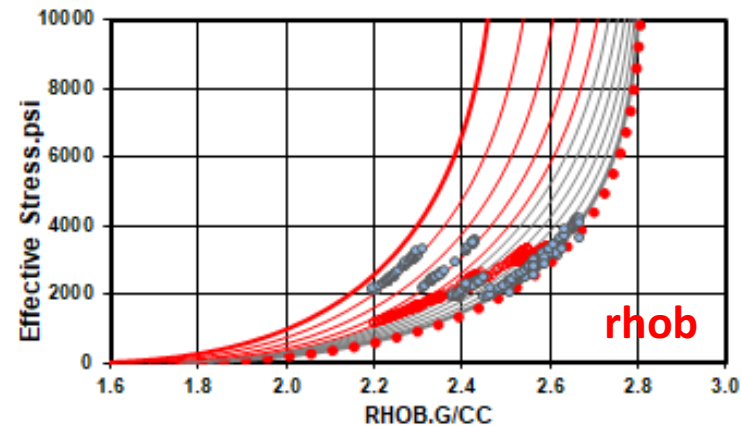
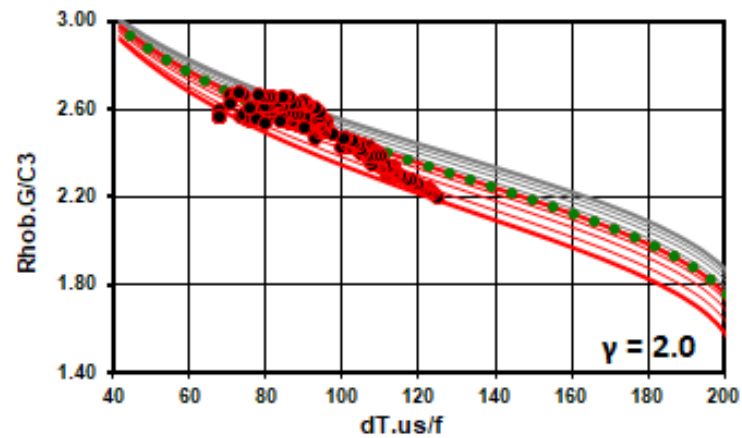


vint	alpha'	TdegF
#N/A	0.0	30
7655	0.1	110
#N/A	0.2	141
#N/A	0.3	165
9161	0.4	183
#N/A	0.5	199
9708	0.6	212
#N/A	0.7	224
11956	0.8	235
#N/A	0.9	245
#N/A	1.0	270

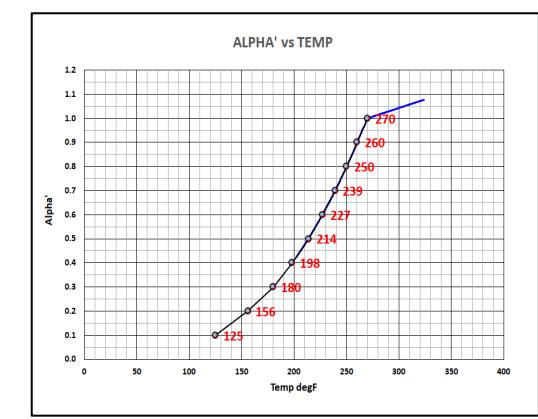
-15 degrees



AREA: DW GOM KC102-1 TIBER



vint	alpha'	TdegF
#N/A	0.0	45
#N/A	0.1	125
#N/A	0.2	156
#N/A	0.3	180
#N/A	0.4	198
8919	0.5	214
9896	0.6	227
9474	0.7	239
10938	0.8	250
11816	0.9	260
12867	1.0	270



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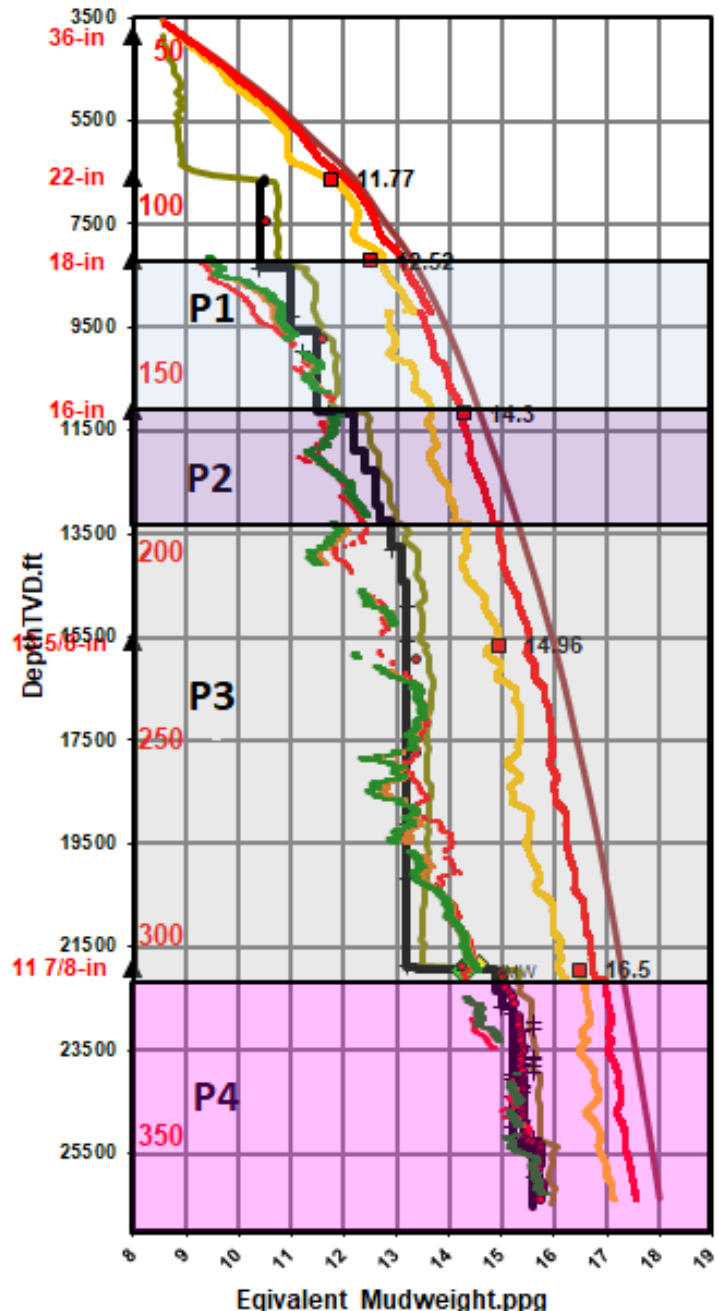
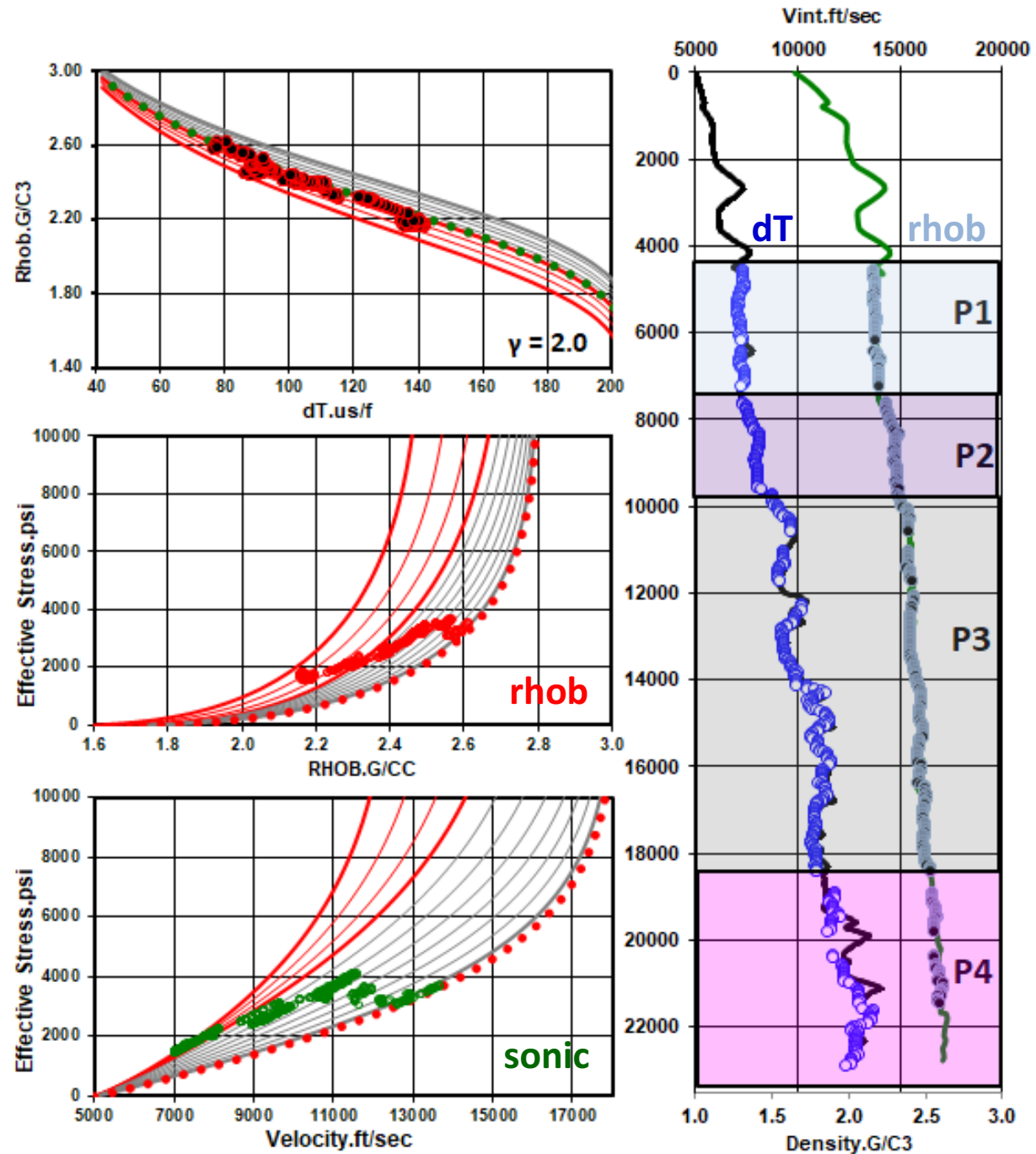
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Non-subsalt

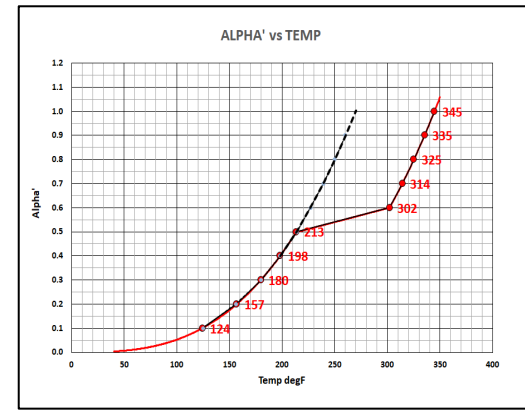


District Boundaries Gulf of Mexico OCS Region

AREA: W. DWGOM Jack Hays-1 PI526



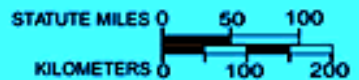
vint	alpha'	TdegF
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7156	0.1	125
7317	0.2	156
7979	0.3	180
9092	0.4	198
9303	0.5	214
10706	0.6	302
#N/A	0.7	314
11586	0.8	325
#N/A	0.9	335
12976	1.0	345



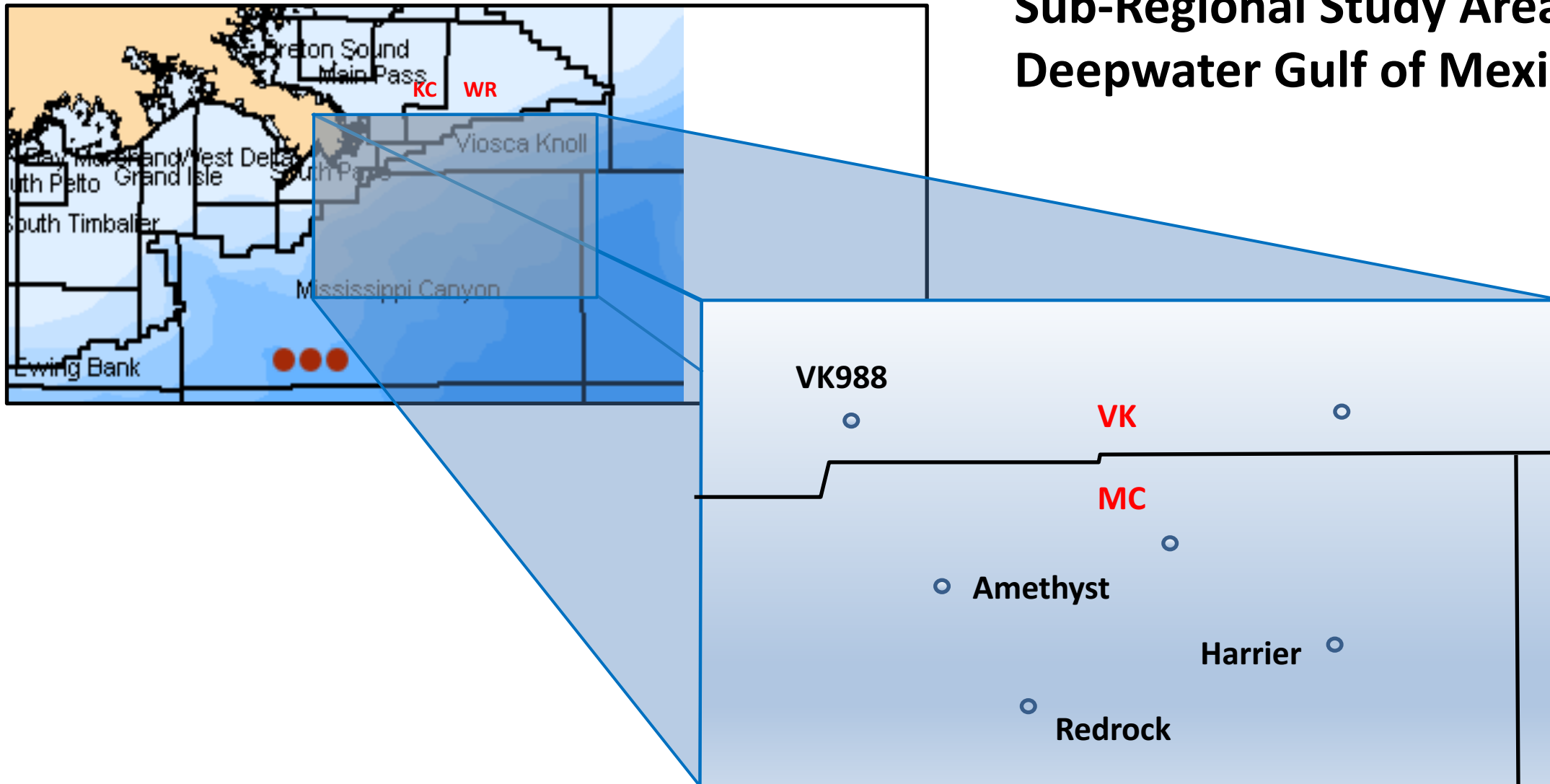


Mississippi Canyon
Viosca Knoll

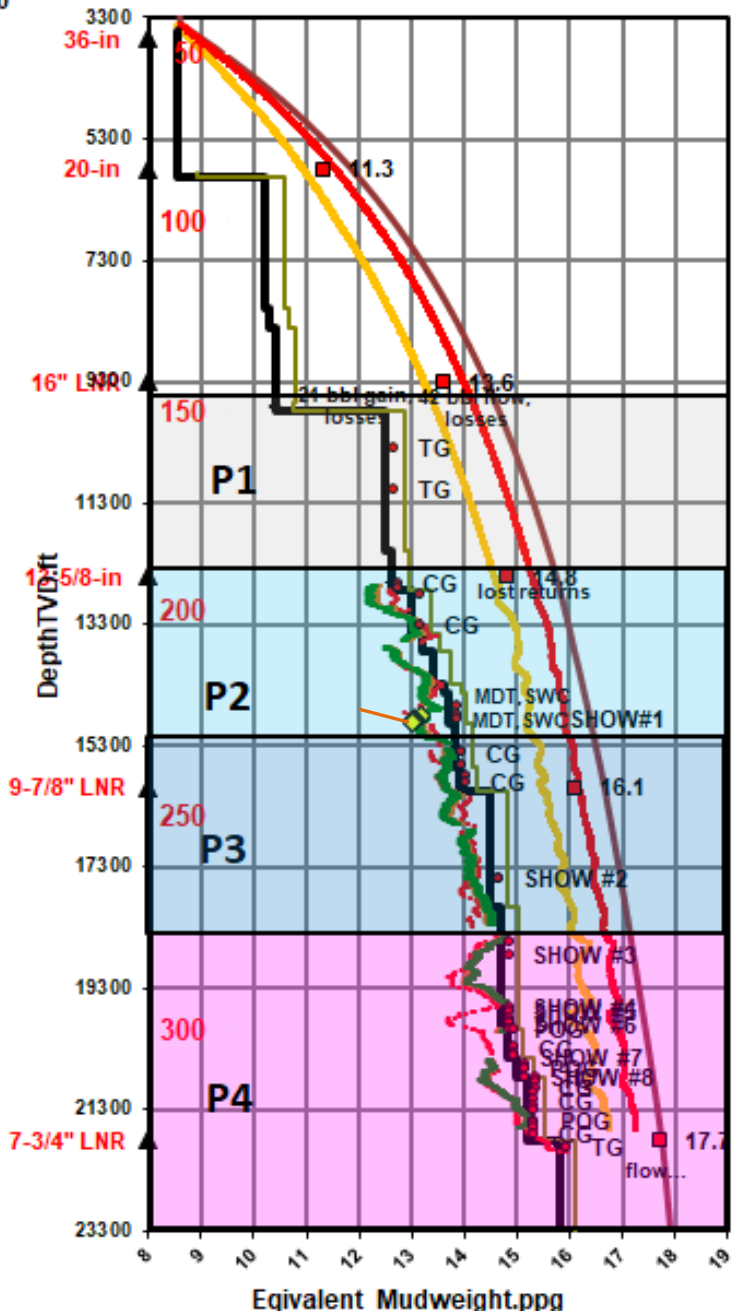
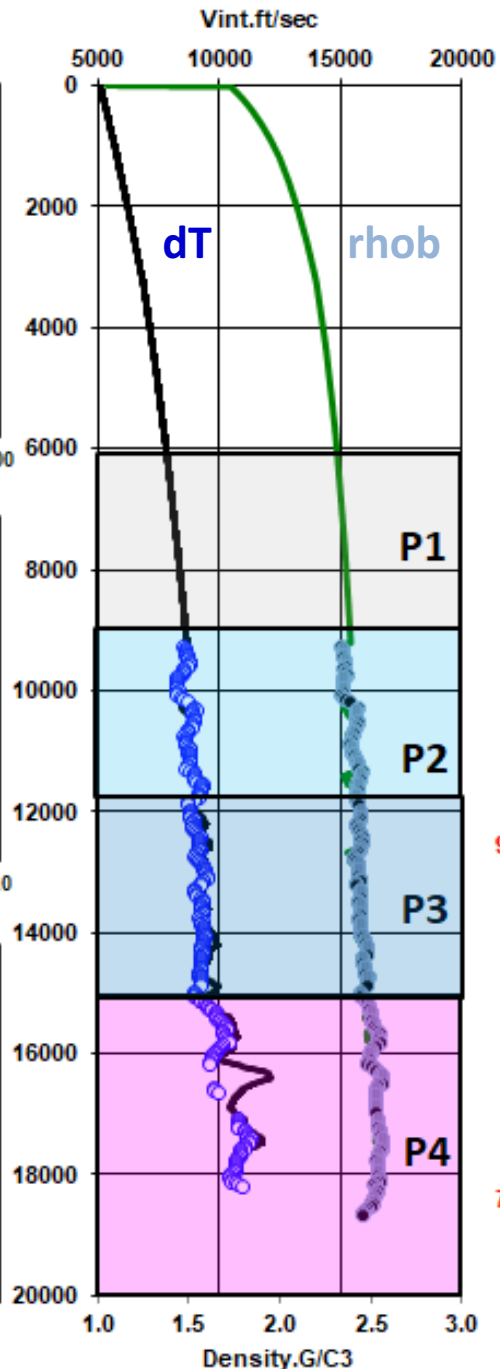
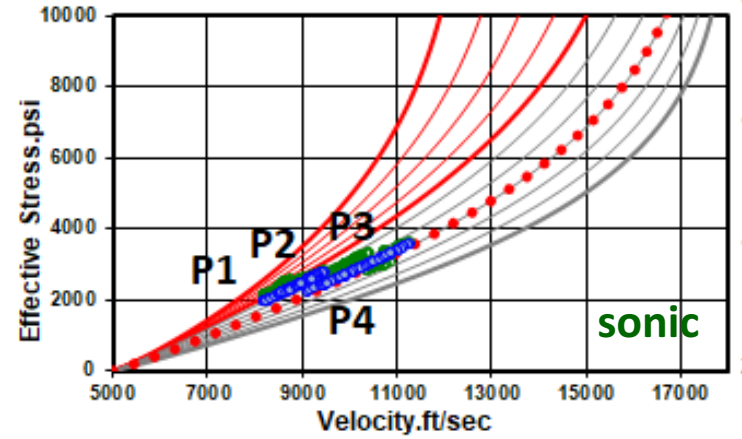
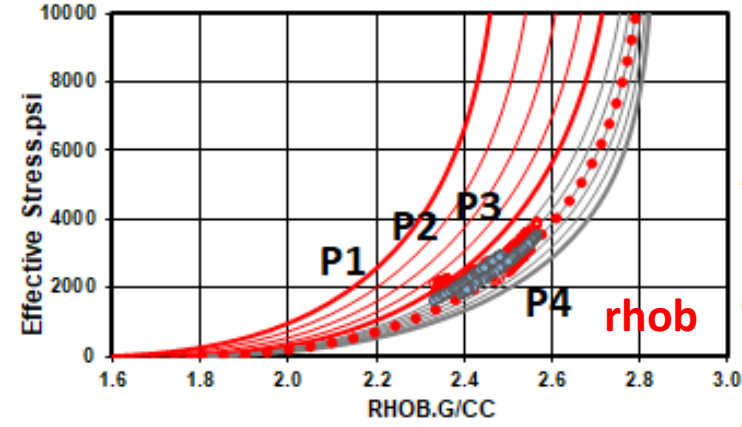
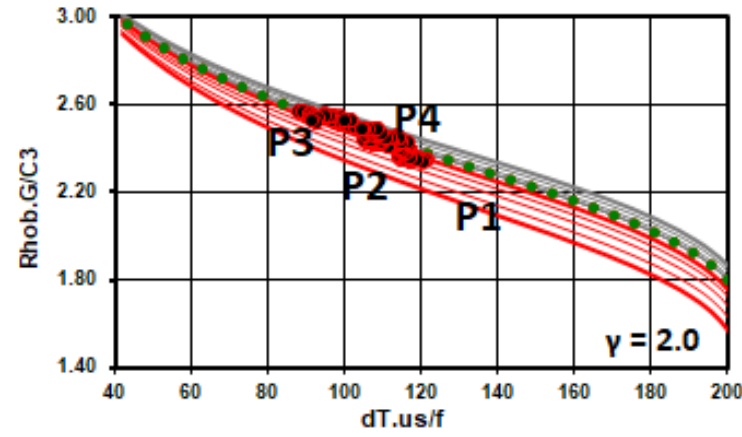
District Boundaries
Gulf of Mexico OCS Region



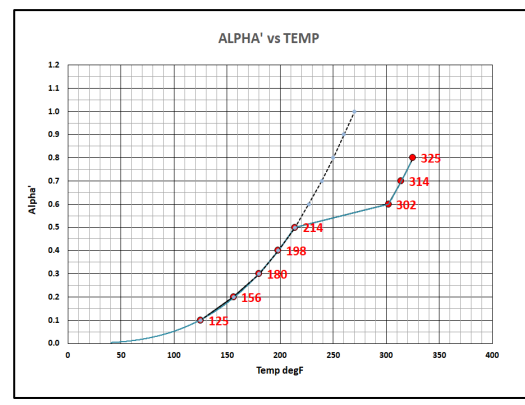
Sub-Regional Study Area Deepwater Gulf of Mexico



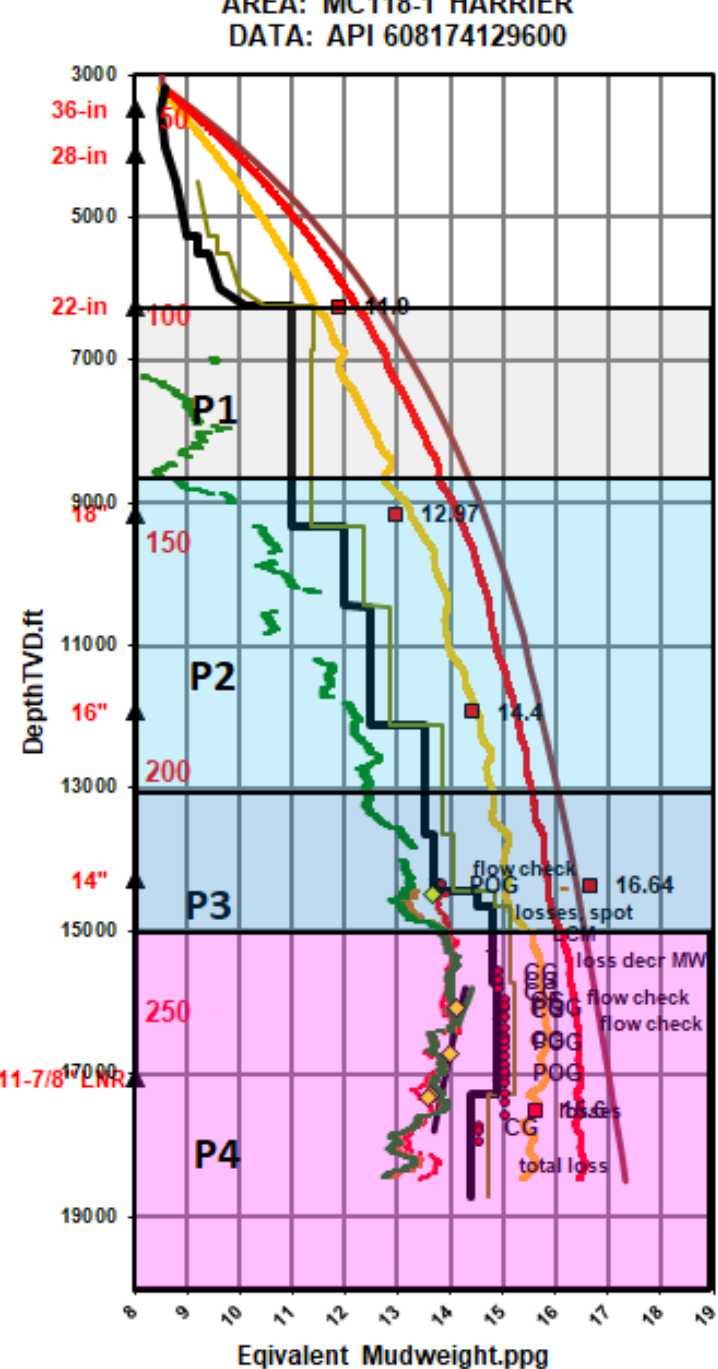
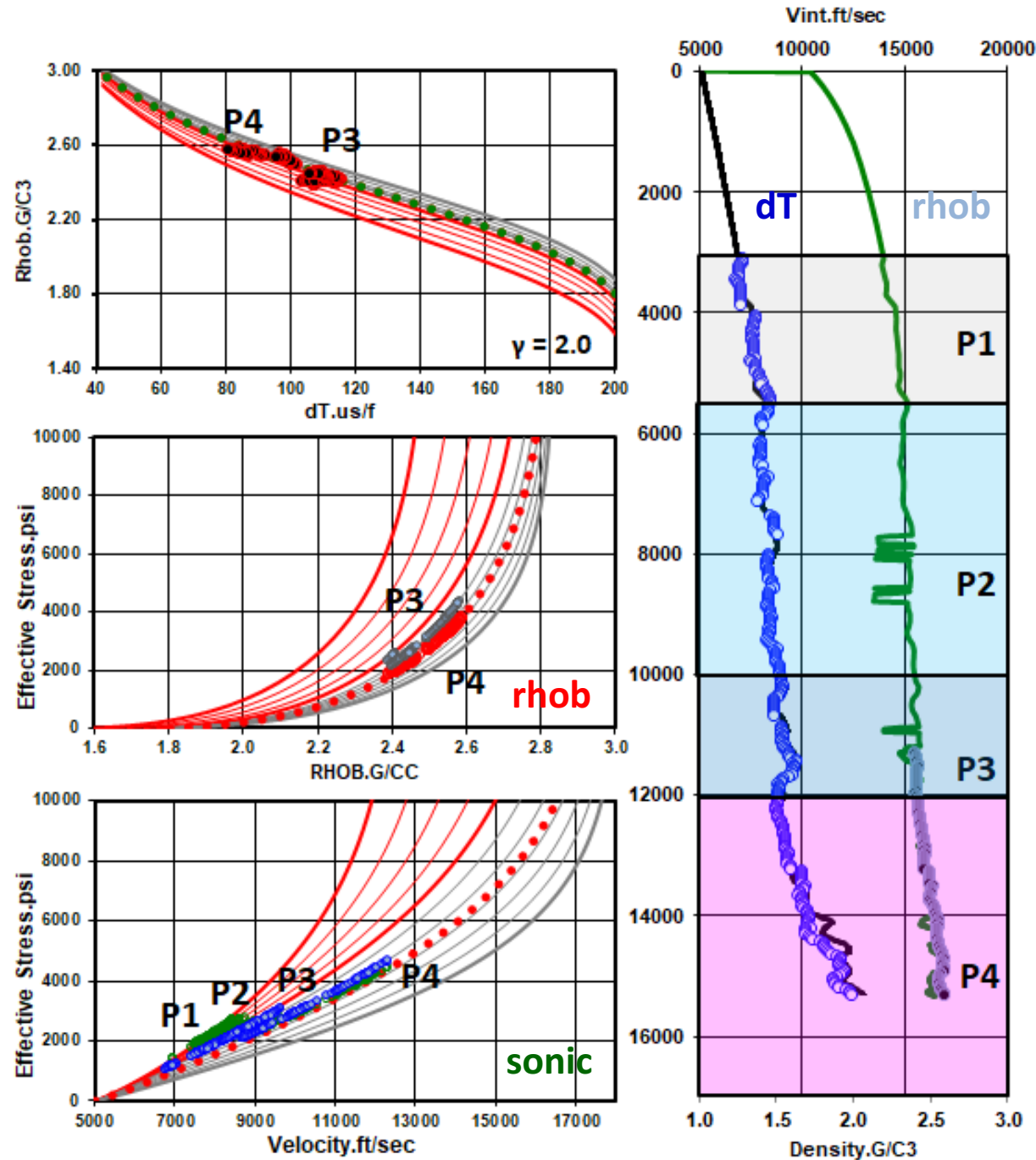
AREA: MC204 REDROCK MCZ
DATA: API 608174107600



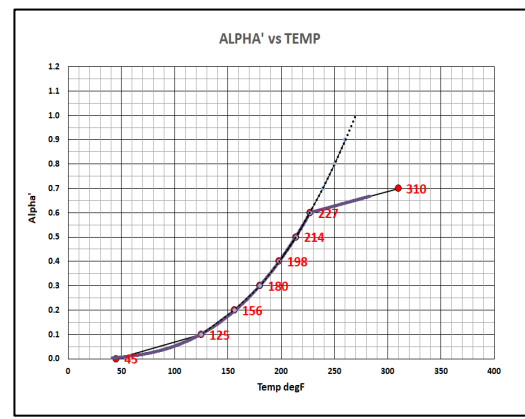
vint	alpha'	TdegF
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#N/A	0.1	125
#N/A	0.2	156
#N/A	0.3	180
8767	0.4	198
8891	0.5	214
8965	0.6	302
8938	0.7	314
9466	0.8	325
9253	0.9	335
9222	1.0	345



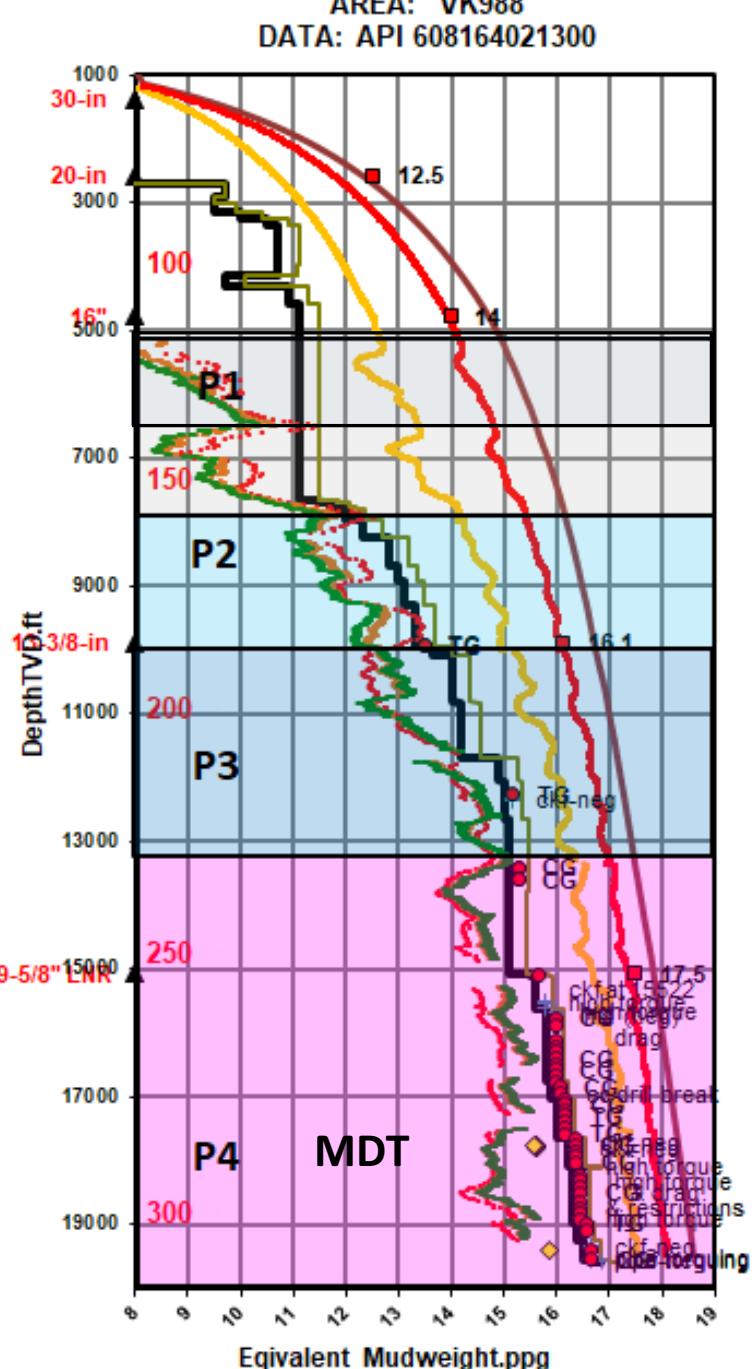
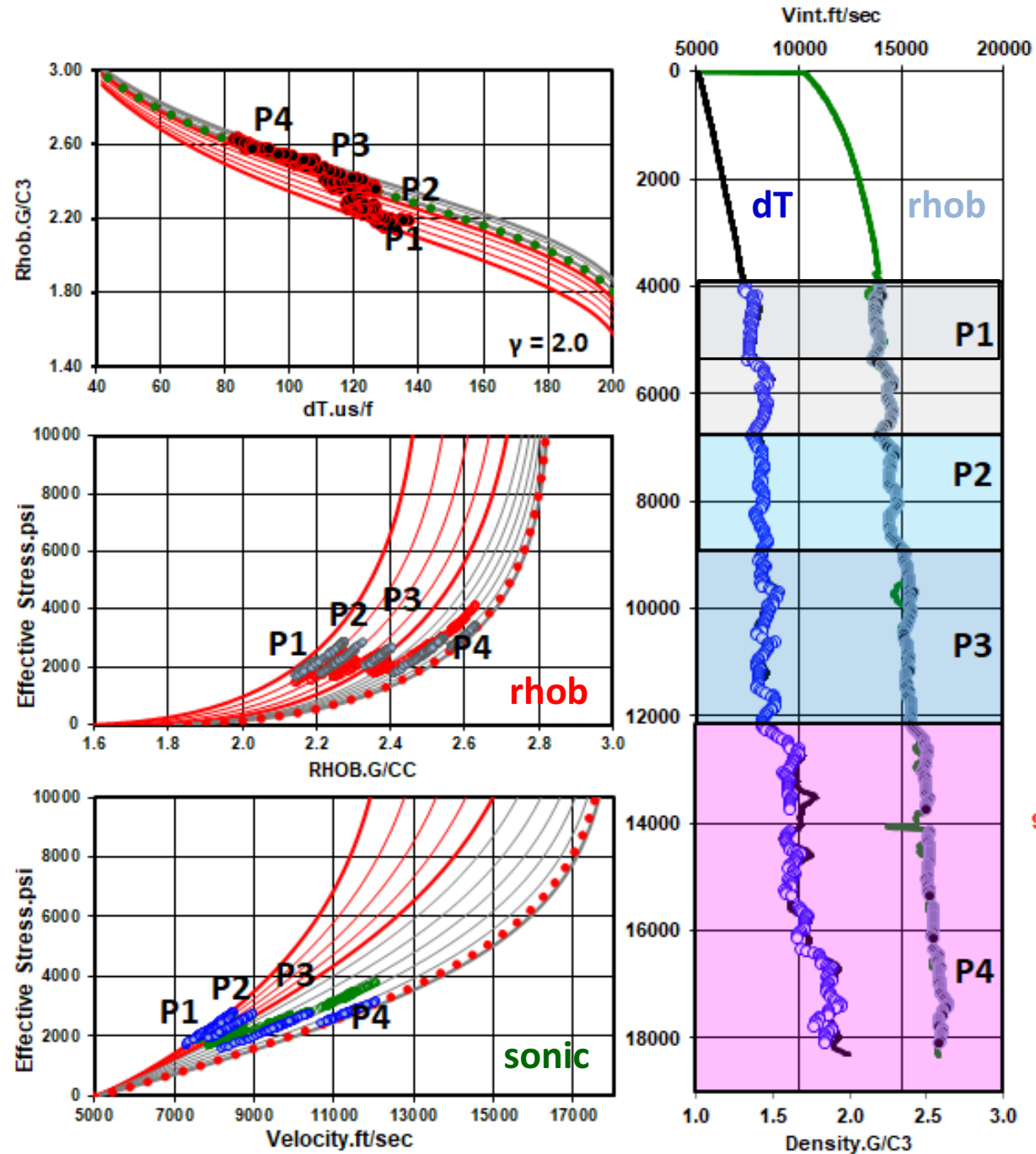
AREA: MC118-1 HARRIER
DATA: API 608174129600



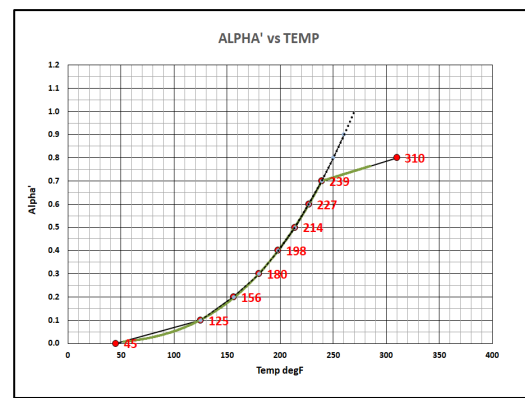
rhob	alpha'	f15f
#N/A	0.0	110
▲	0.1	125
▲	0.2	150
▲	0.3	175
▲	0.4	200
▲	0.5	215
▲	2.41	230
▲	0.7	310
▲	0.8	320
▲	0.9	340
▲	1.0	350
▲	1.05	375



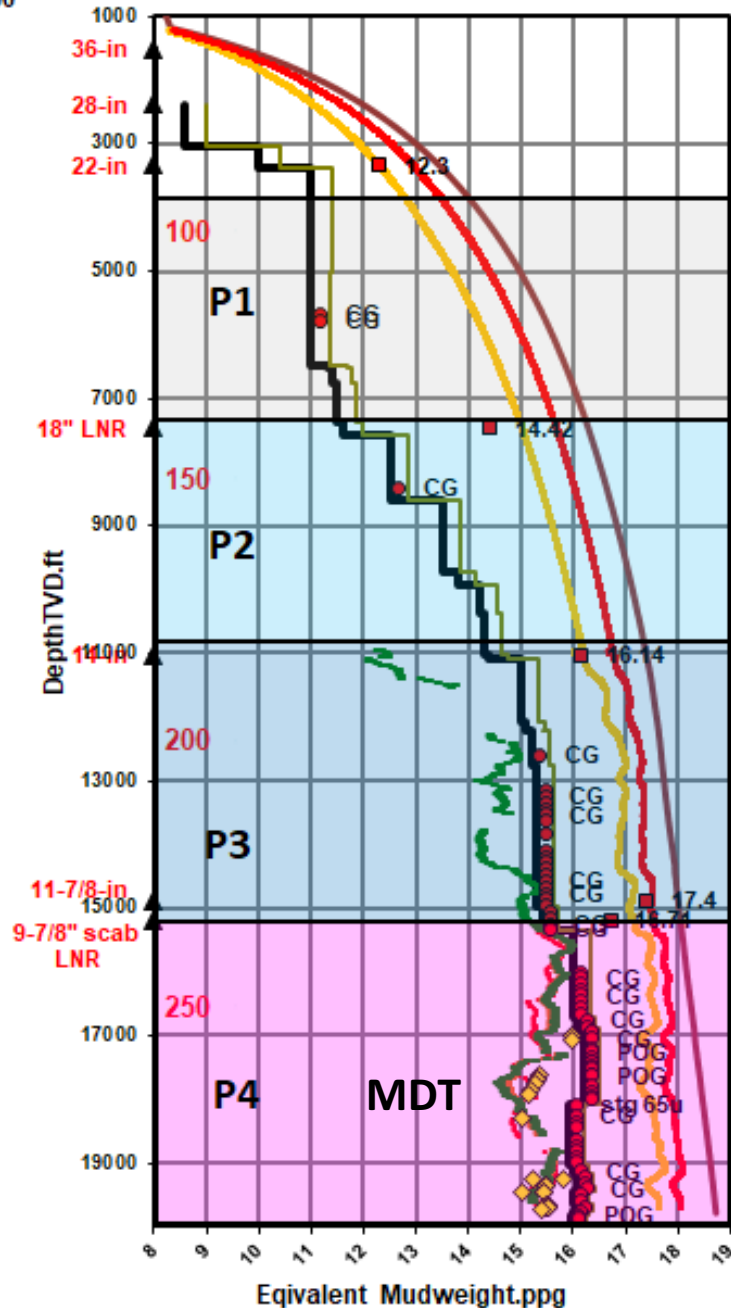
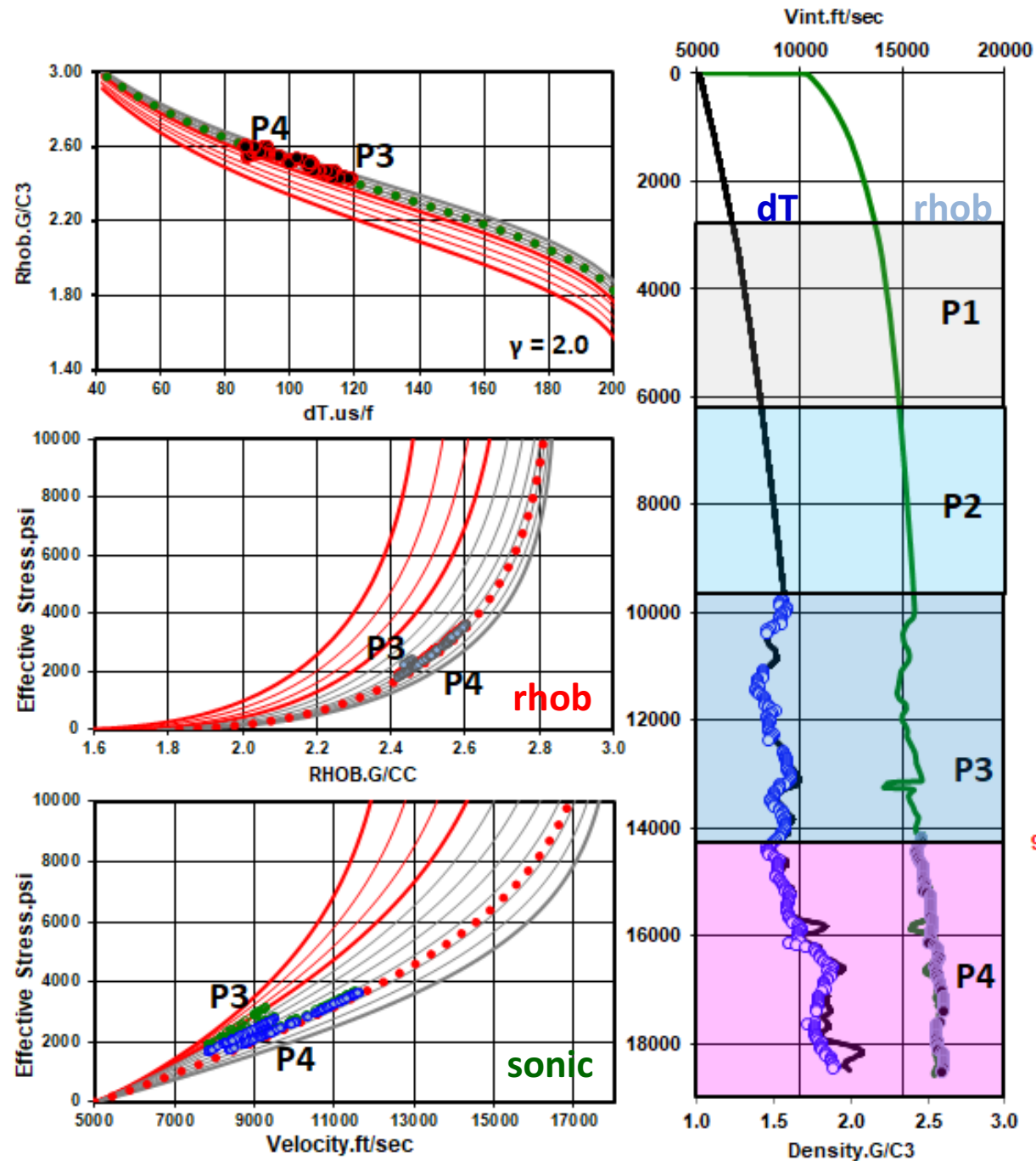
AREA: VK988
DATA: API 608164021300



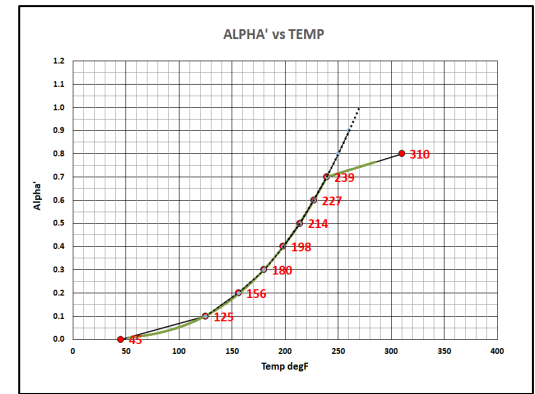
vint	alpha'	TdegF
#N/A	0.0	45
7727	0.1	125
8067	0.2	156
7963	0.3	180
8376	0.4	198
8390	0.5	214
8795	0.6	227
9992	0.7	239
#N/A	0.8	310
#N/A	0.9	320
#N/A	1.0	330



AREA: MC26 Amethyst-1
 DATA: API 608174126900



vint	alpha'	TdegF
#N/A	0.0	45
#N/A	0.1	125
#N/A	0.2	156
#N/A	0.3	180
#N/A	0.4	198
8740	0.5	214
8772	0.6	227
8425	0.7	239
#N/A	0.8	310
#N/A	0.9	320
#N/A	1.0	330





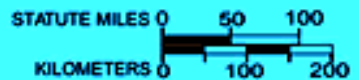
SMI23-5

Risk 1997

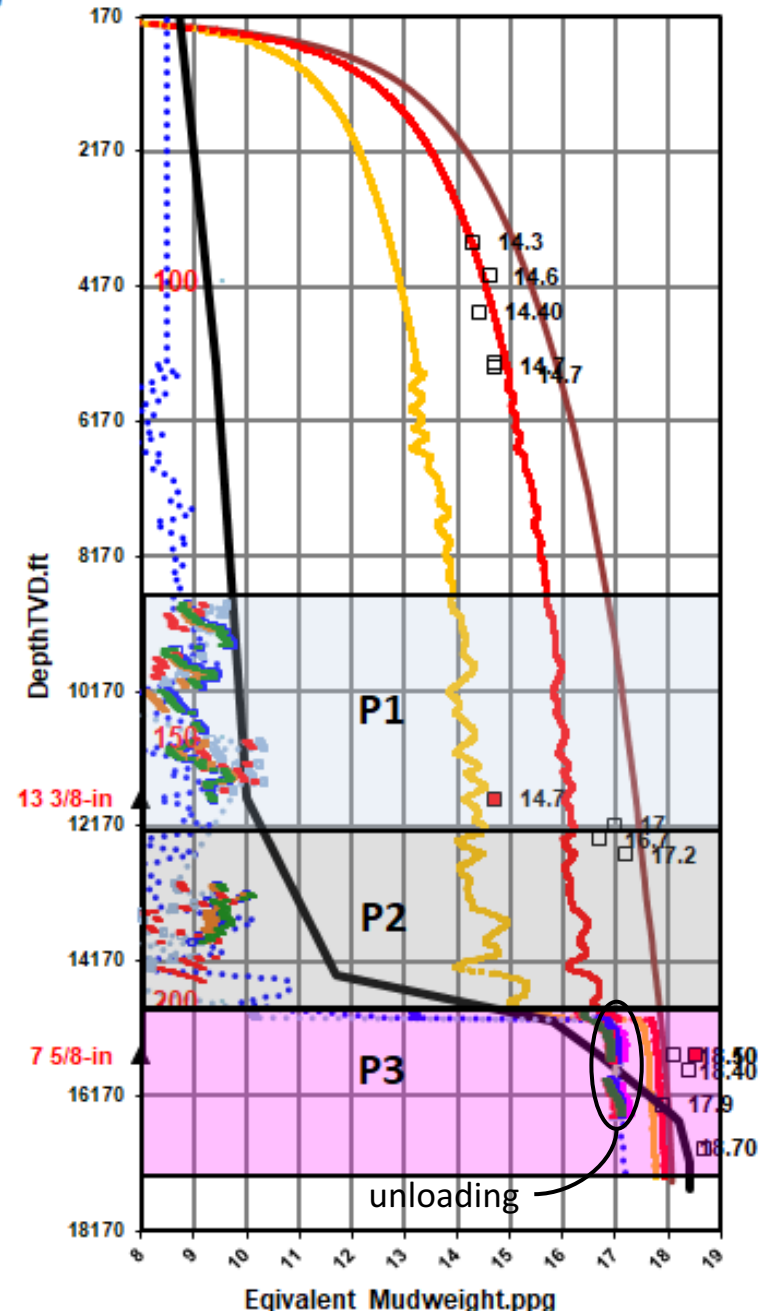
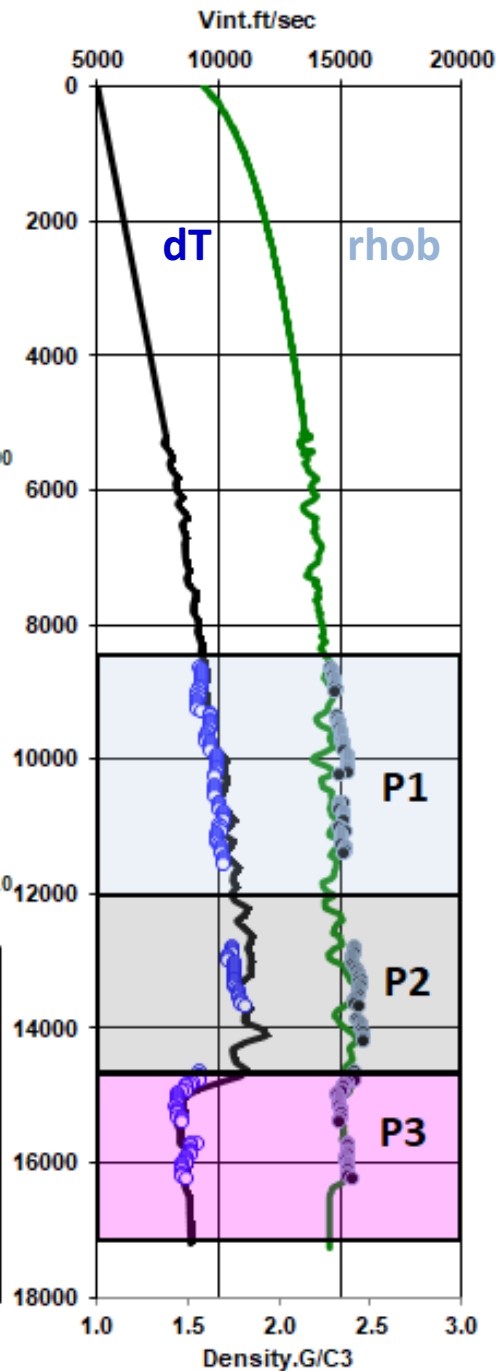
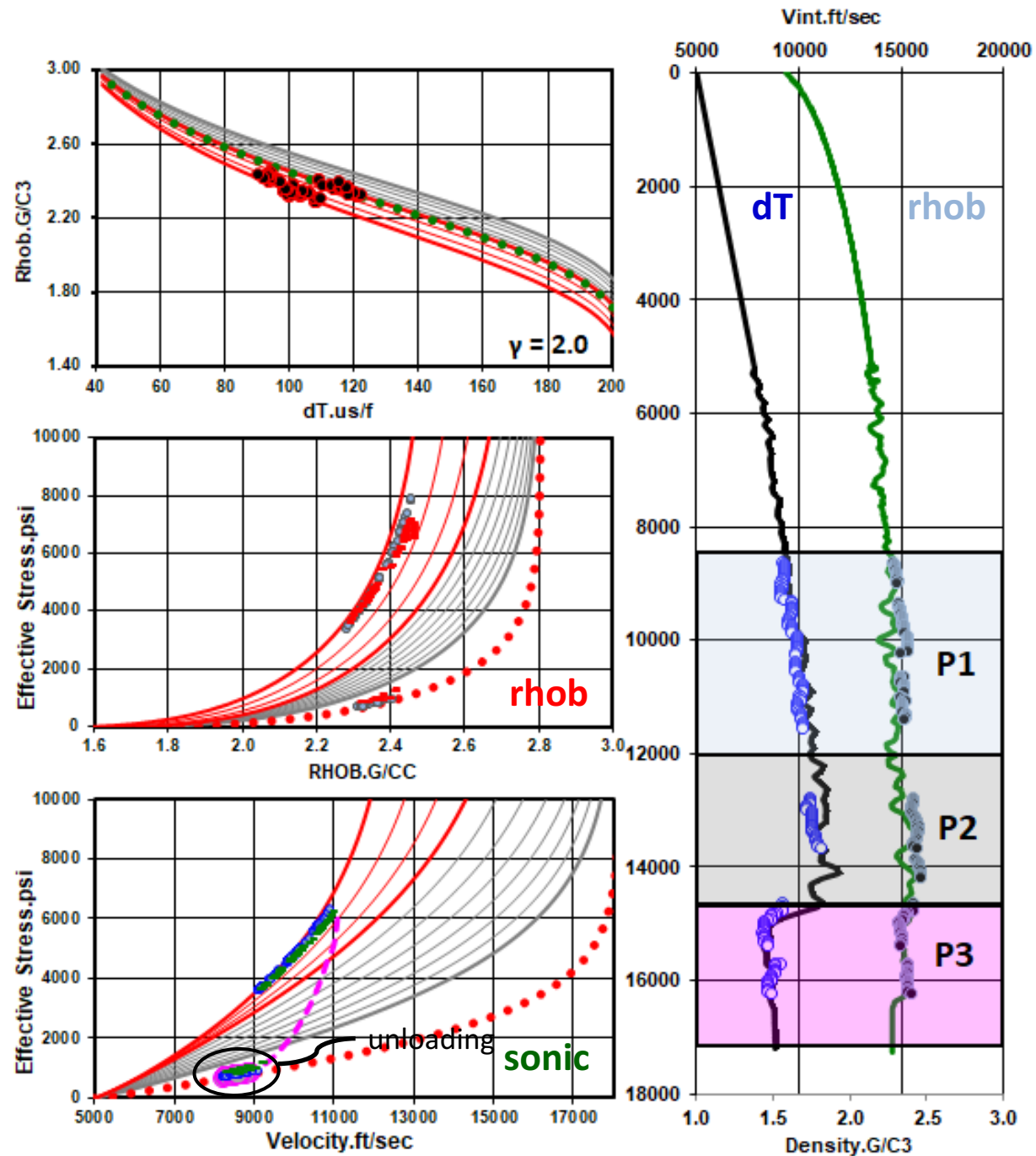
Tiber

Shenandoah

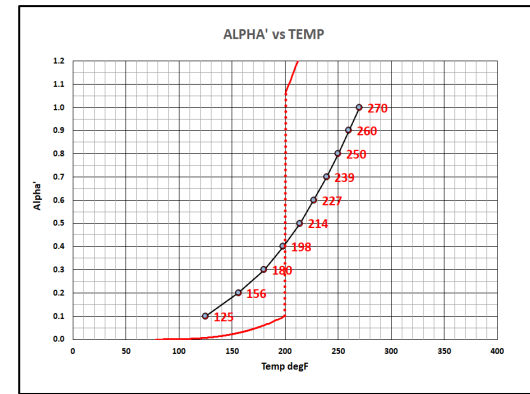
District Boundaries Gulf of Mexico OCS Region



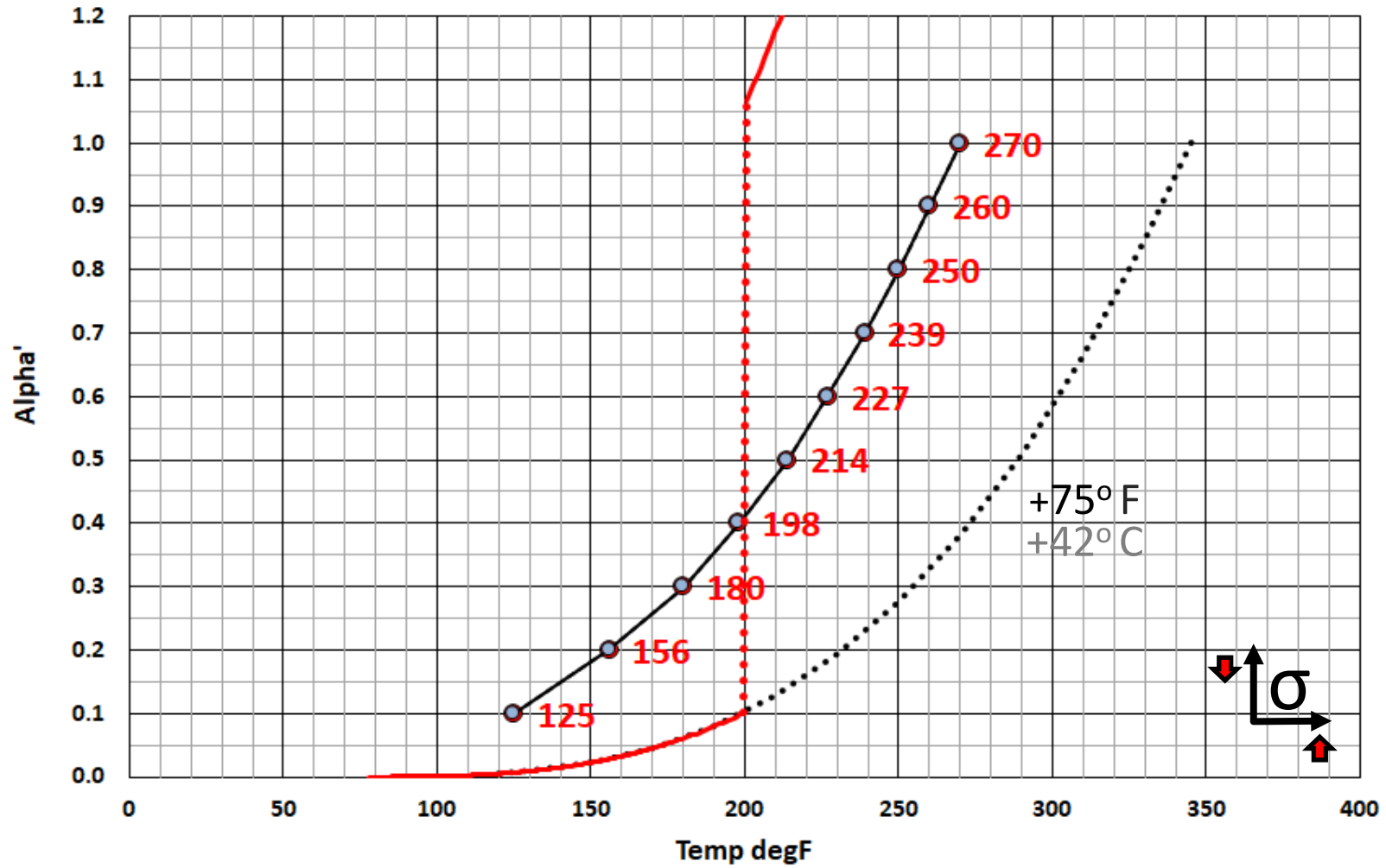
AREA: Gulf of Mexico SMI23-5



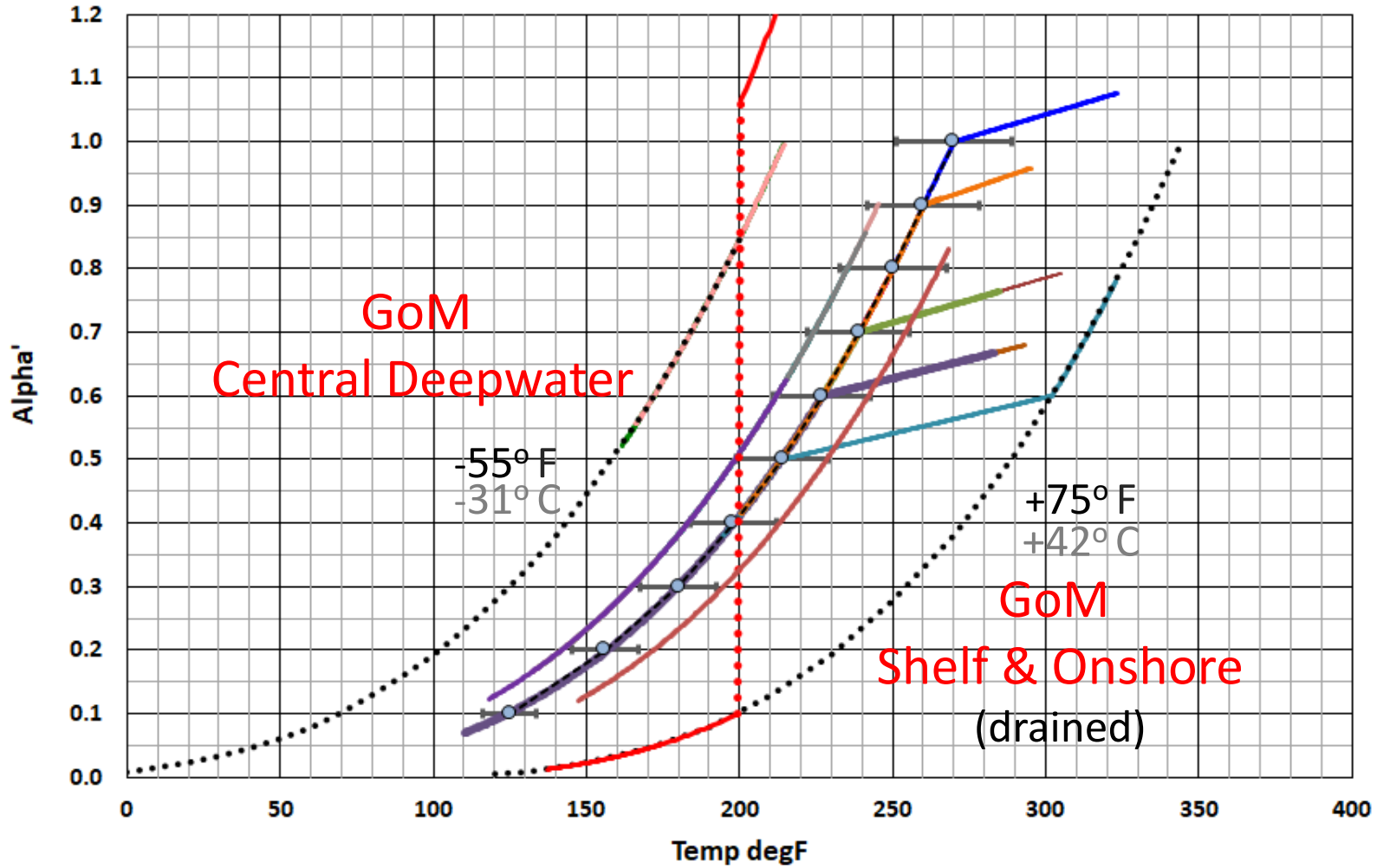
vint	alpha'	TdegF
#N/A	0.0	120
#N/A	0.1	200
#N/A	0.2	101
#N/A	0.3	125
#N/A	0.4	143
#N/A	0.5	159
#N/A	0.6	172
#N/A	0.7	184
#N/A	0.8	195
#N/A	0.9	205
#N/A	1.0	215



ALPHA' vs TEMP



ALPHA' vs TEMP



dT

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RhoVe™ Method

(U.S. patent pending - copyright © 2016)



JIP – seeking \$55,000 investment for:

- Commercial implementation of RhoVe & RhoVe T temperature-based method as a plug-in or web-based application to include:
 - Real-Time WITSML connectivity,
 - notebook (iPad) capability,
 - 1D temperature modeling,
- Explore automation capabilities,

