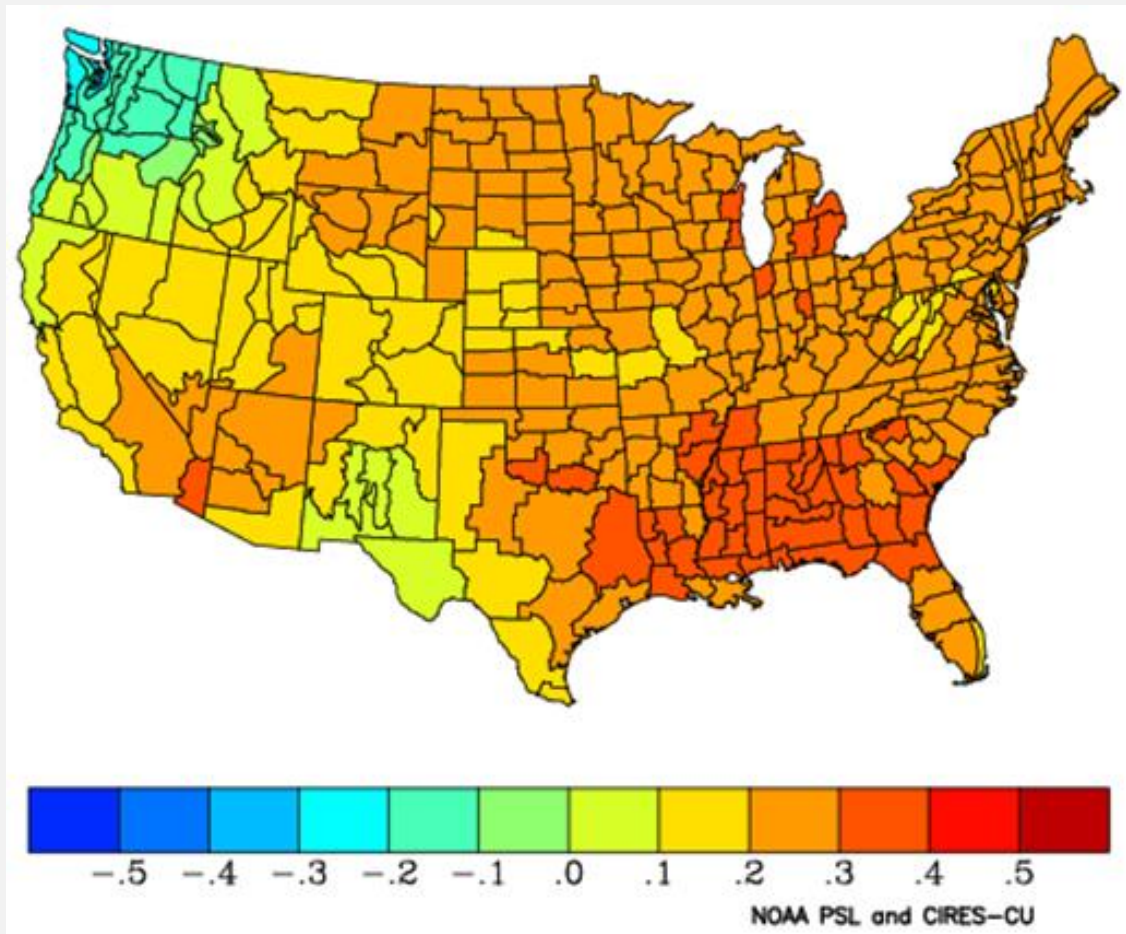


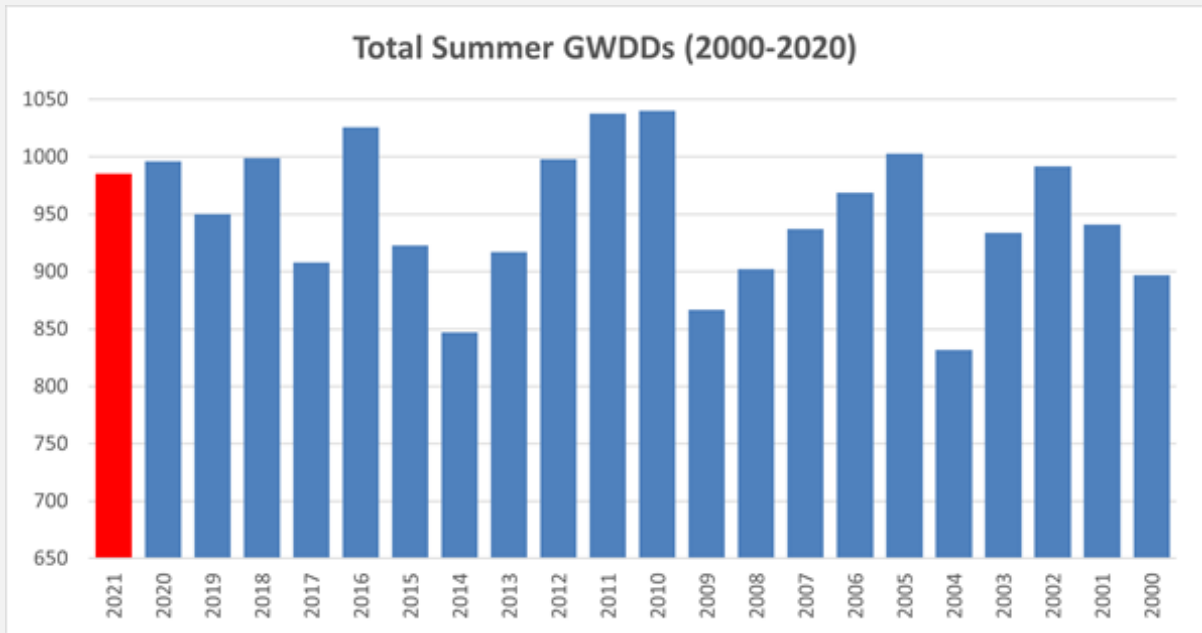
This weekend's commentary comes from Brian Lovern at [Bespoke Weather](#). Each month Brian Lovern will provide us with the latest medium-term outlook.

Our expectation is for another hotter summer this year, based on a La Niña-ish tilt in the atmospheric base state, and the fact that we are in a warmer climate regime, as summers have tended to run hot for several years now, regardless of the ENSO (El Niño / La Niña) state. All else being equal, however, La Niña does tend to enhance summer heat, as we see when looking at the correlation between La Niña and summer temperatures over the last 40 years.

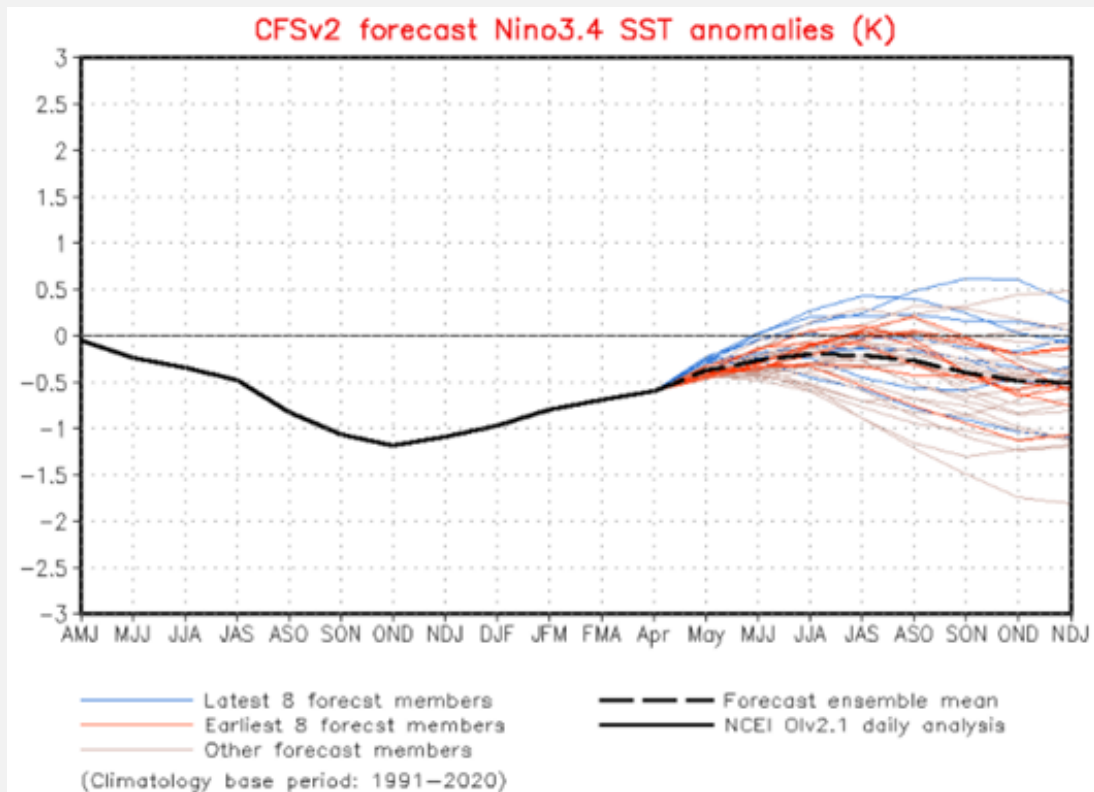
La Niña's Correlation With Summer (June-August) Temperatures



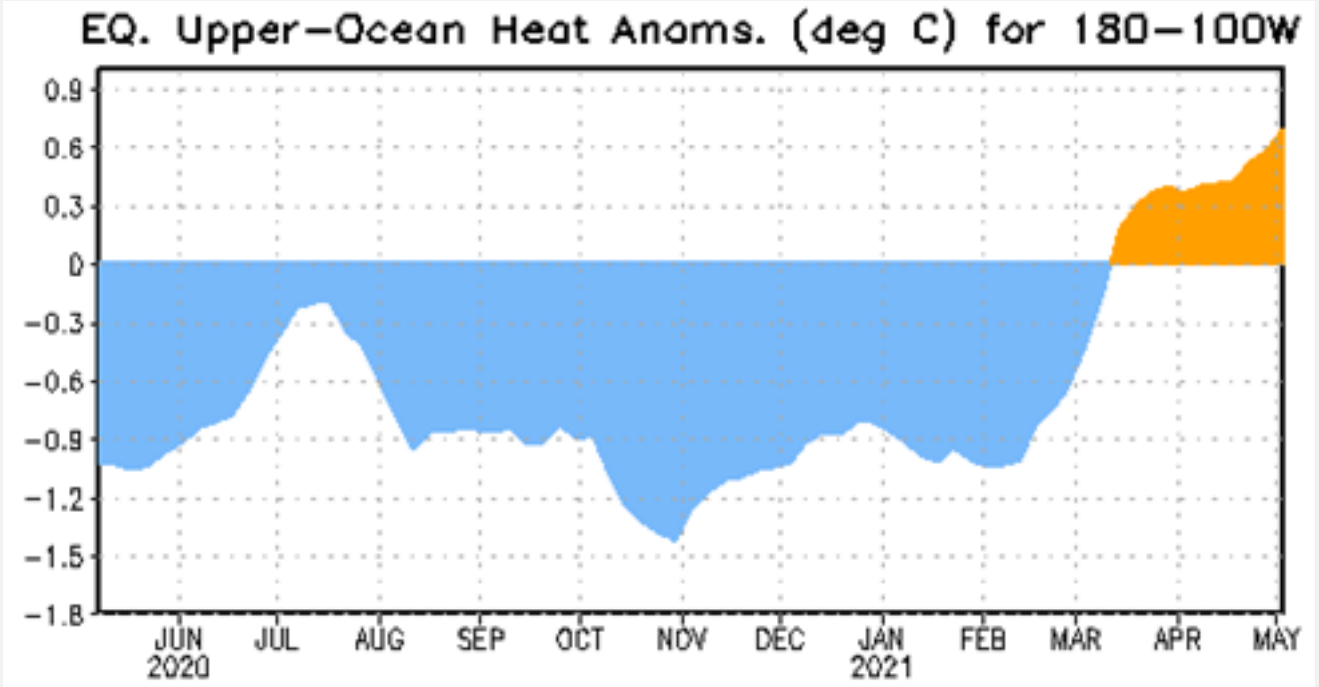
There are some important considerations, however, one being that, due to the flurry of hotter summers in recent years, a 10-year normal summer (which most folks use as a base case in the natural gas market) would already rank around 7th hottest on record, in terms of Gas-Weighted Degree Days (GWDDs), so the bar is already set quite high in that regard. That being said, our current estimate still lies a little hotter than the 10-year normal, but not quite as hot as last summer, and well short of the hottest summers on record from 2010, 2011, and 2016, with an initial estimate of 985 GWDDs from June to August.



We are seeing some potential risks to the hotter view, however, as the La Niña state has been a no-show in the current pattern, and there are some hints that could linger into Summer. The CFS, for example, projects ENSO region 3.4 anomalies to be close to neutral as we move forward.



Upper oceanic heat content in the equatorial Pacific has been trending higher as well, something not consistent with a predominant La Niña base state.



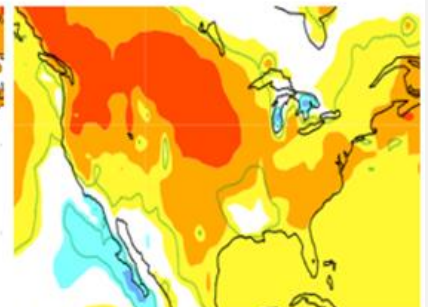
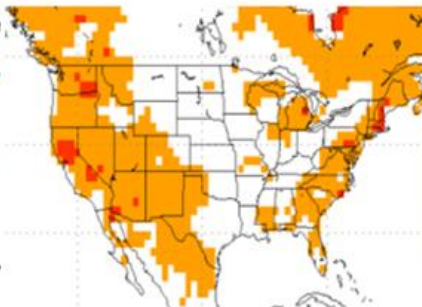
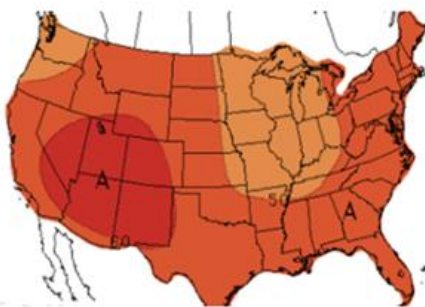
Now, the failure of the La Niña state does not mean it cannot still be hot (see 2018), but it typically does at least take some of the top-end risks off the table, so this will be watched closely in the coming weeks. For now, as things can still change, we stick with a hotter view, but acknowledge the risks outlined above.

3-Month Weather Outlooks (June-August)

CPC

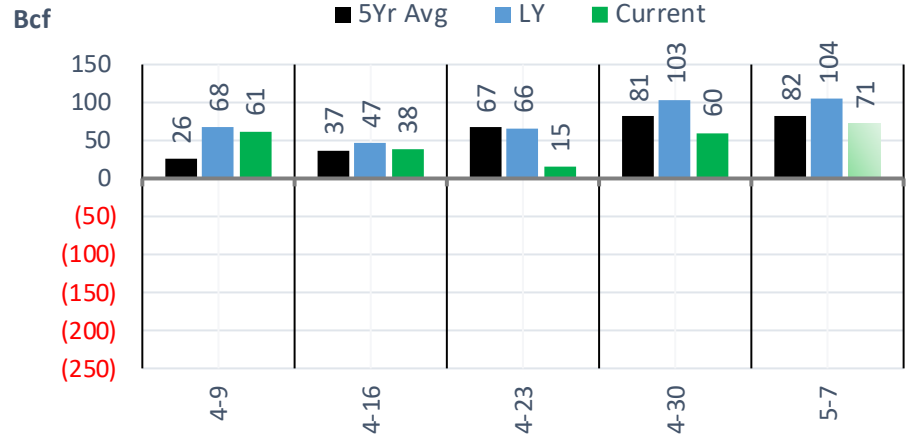
CFS

ECMWF

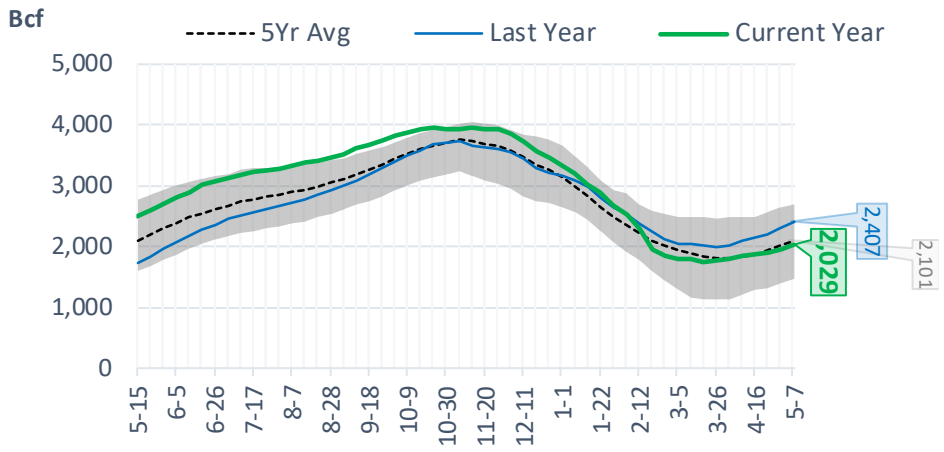


EIA Storage Report

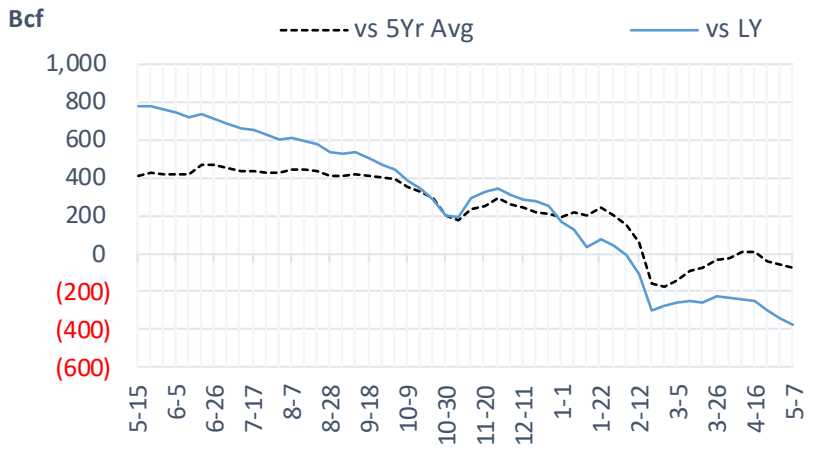
Total Lower 48 YoY Weekly Change



Total Lower 48 Storage Levels



Total Lower 48 LY Surplus/Deficit

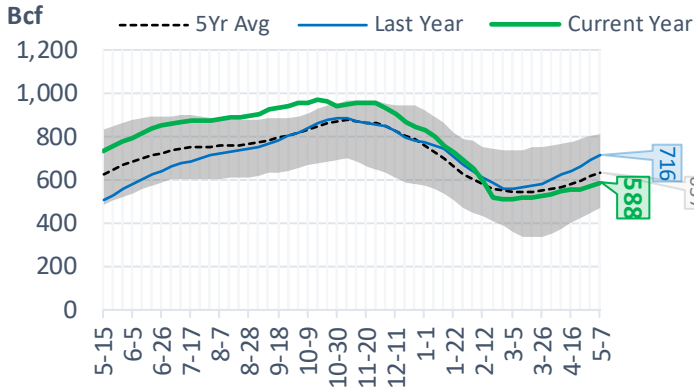


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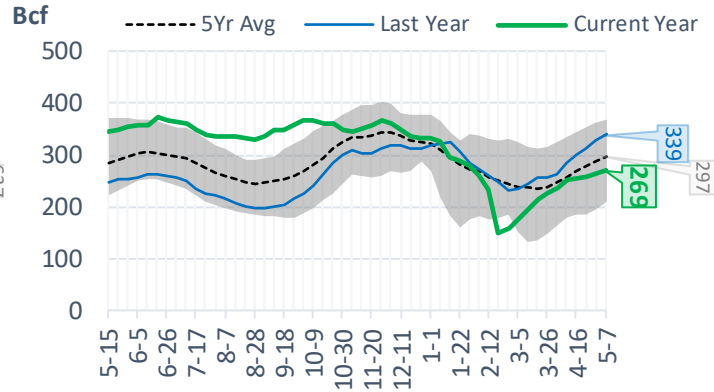
Natural Gas Storage Stats - Last 5 Weeks

Week Ending	Current 7-May	Week - 1 30-Apr	Week - 2 23-Apr	Week - 3 16-Apr	Week - 4 9-Apr	Week - 5 2-Apr
Total Lower 48 Storage Level	2029	1958	1898	1883	1845	1784
Weekly Change	+71	+60	+15	+38	+61	+20
vs LY	-378	-345	-302	-251	-242	-235
vs 5Yr Avg	-72	-61	-40	+12	+11	-24
S. Central Salt Storage Level	269	264	258	256	251	235
Weekly Change	+5	+6	+2	+5	+16	+9
vs LY	-70	-65	-54	-43	-32	-29
vs 5Yr Avg	-28	-25	-20	-12	-7	-13
S. Central NonSalt Storage Level	588	572	558	554	547	533
Weekly Change	+16	+14	+4	+7	+14	+10
vs LY	-128	-119	-103	-84	-76	-71
vs 5Yr Avg	-49	-47	-41	-28	-22	-25
Midwest Storage Level	458	442	427	421	414	398
Weekly Change	+16	+15	+6	+7	+16	-3
vs LY	-93	-85	-77	-71	-71	-77
vs 5Yr Avg	+10	+13	+15	+20	+16	-2
East Storage Level	347	332	319	325	311	305
Weekly Change	+15	+13	-6	+14	+6	-2
vs LY	-101	-89	-85	-75	-86	-77
vs 5Yr Avg	-22	-14	-7	+16	+8	+2
Mountain Storage Level	131	124	119	118	118	115
Weekly Change	+7	+5	+1	0	+3	+3
vs LY	+15	+14	+17	+22	+23	+23
vs 5Yr Avg	+9	+7	+6	+9	+11	+9
Pacific Storage Level	235	224	217	210	205	198
Weekly Change	+11	+7	+7	+5	+7	+4
vs LY	-3	-3	0	+1	+2	-4
vs 5Yr Avg	+8	+5	+7	+7	+7	+4

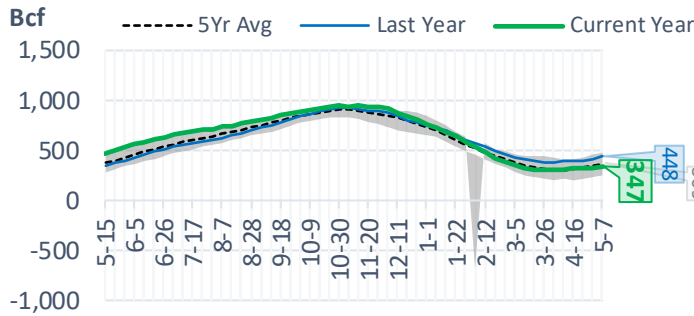
NonSalt Storage Levels



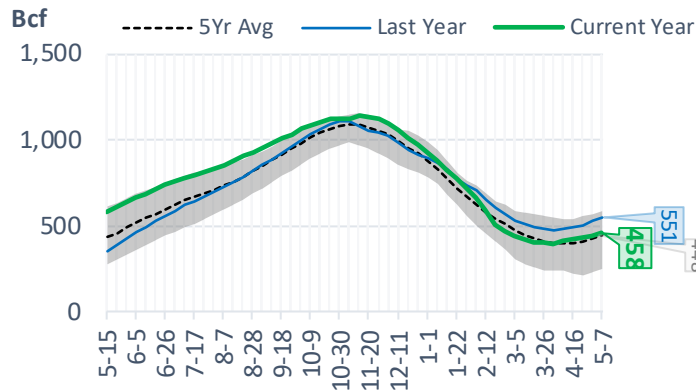
Salt Storage Levels



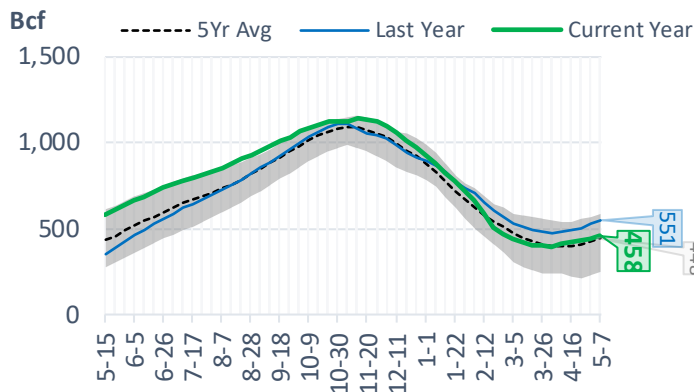
East Storage Levels



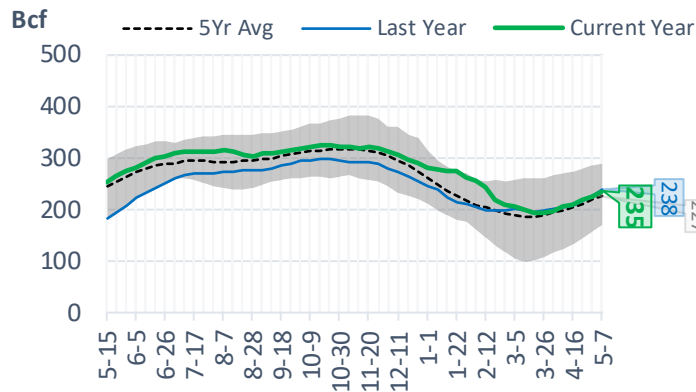
Midwest Storage Levels



Midwest Storage Levels



Pacific Storage Levels



EIA Storage Week Balances

	9-Apr	16-Apr	23-Apr	30-Apr	7-May	14-May	WoW	vs. 4W
Lower 48 Dry Production	92.7	92.1	91.3	92.0	92.2	92.3	▲ 0.1	▲ 0.4
Canadian Imports	4.2	4.3	5.3	4.6	4.6	4.8	▲ 0.3	▲ 0.1
L48 Power	23.2	24.6	25.9	26.6	26.7	25.9	▼ -0.8	▼ 0.0
L48 Residential & Commercial	18.6	18.6	24.0	16.5	13.7	18.0	▲ 4.3	▼ -0.2
L48 Industrial	22.0	21.4	20.1	20.4	21.6	20.9	▼ -0.7	▲ 0.0
L48 Lease and Plant Fuel	5.1	5.0	5.0	5.0	5.0	5.1	▲ 0.0	▲ 0.0
L48 Pipeline Distribution	2.1	2.1	2.5	2.1	2.1	2.2	▲ 0.2	▲ 0.1
L48 Regional Gas Consumption	70.9	71.7	77.4	70.7	69.1	72.1	▲ 3.1	▼ -0.1
Net LNG Exports	11.5	11.4	11.6	11.4	11.3	11.0	▼ -0.3	▼ -0.4
Total Mexican Exports	6.2	7.3	6.8	6.7	6.7	6.8	▲ 0.1	▼ 0.0
Implied Daily Storage Activity	8.3	6.0	0.9	7.8	9.7	7.1	-2.5	
EIA Reported Daily Storage Activity	8.7	5.4	2.1	8.6	10.1			
Daily Model Error	-0.4	0.6	-1.2	-0.8	-0.5			

Monthly Balances

	2Yr Ago May-19	LY May-20	Jan-21	Feb-21	Mar-21	Apr-21	MTD May-21	MoM	vs. LY
Lower 48 Dry Production	90.6	87.3	91.6	84.7	92.0	92.1	92.1	▲ 0.0	▲ 7.4
Canadian Imports	4.7	3.9	6.3	6.4	4.8	4.7	4.7	▲ 0.0	▼ -1.7
L48 Power	26.9	26.9	28.2	27.9	25.0	25.2	26.3	▲ 1.1	▼ -1.7
L48 Residential & Commercial	12.8	12.7	43.9	47.9	28.4	19.7	15.7	▼ -4.0	▼ -32.1
L48 Industrial	23.2	19.8	24.3	21.6	20.1	21.1	21.2	▲ 0.2	▼ -0.4
L48 Lease and Plant Fuel	5.0	4.8	5.0	4.7	5.0	5.0	5.0	▲ 0.0	▲ 0.4
L48 Pipeline Distribution	2.1	2.0	3.2	3.3	2.5	2.2	2.1	▼ -0.1	▼ -1.1
L48 Regional Gas Consumption	69.9	66.2	104.7	105.4	81.1	73.2	70.4	▼ -2.7	▼ -34.9
Net LNG Exports	5.6	6.7	10.5	8.4	11.1	11.5	11.0	▼ -0.4	▲ 2.6
Total Mexican Exports	5.0	4.8	6.2	5.7	6.5	6.7	6.7	▲ 0.0	▲ 1.0
Implied Daily Storage Activity	14.8	13.6	-23.5	-28.4	-1.9	5.4	8.5		
EIA Reported Daily Storage Activity									
Daily Model Error									

Source: Bloomberg, analytix.ai

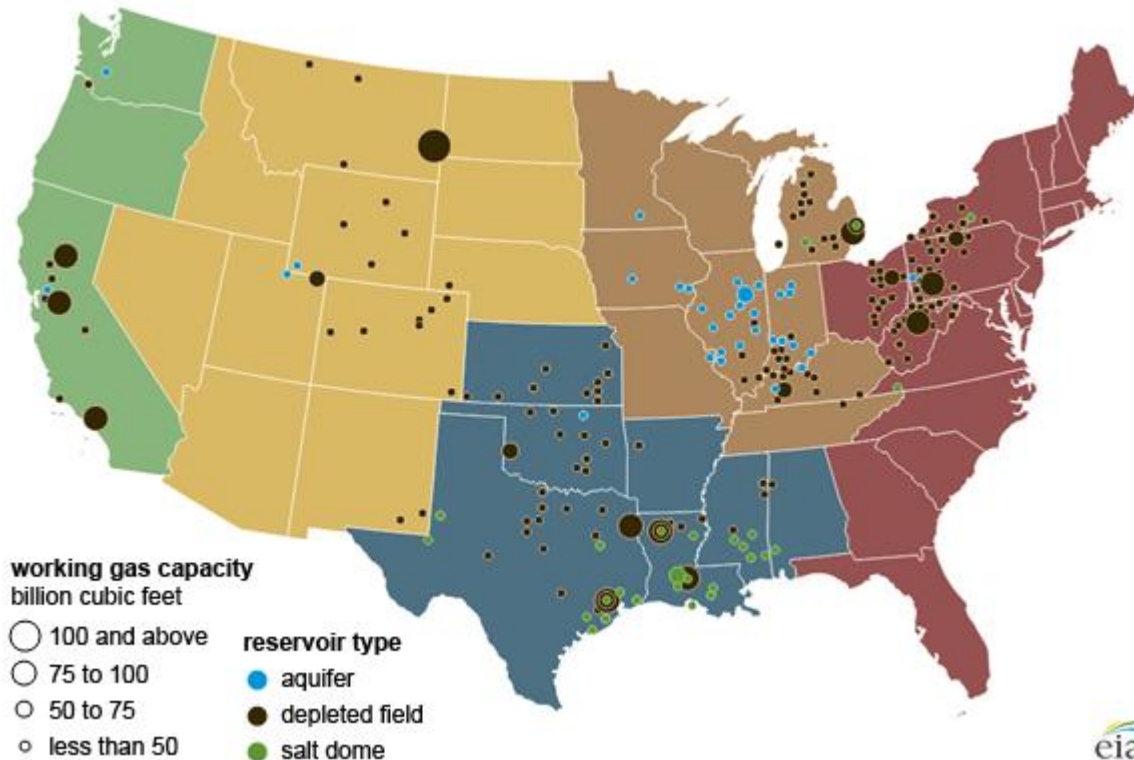
Regional S/D Models Storage Projection

Week Ending 14-May

	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	6.8	0.8	7.6	53
East	-0.1	0.7	0.6	4
Midwest	1.1	0.0	1.1	8
Mountain	3.9	-3.1	0.9	6
South Central	0.1	3.3	3.4	24
Pacific	1.8	-0.1	1.7	12

*Adjustment Factor is calculated based on historical regional deltas

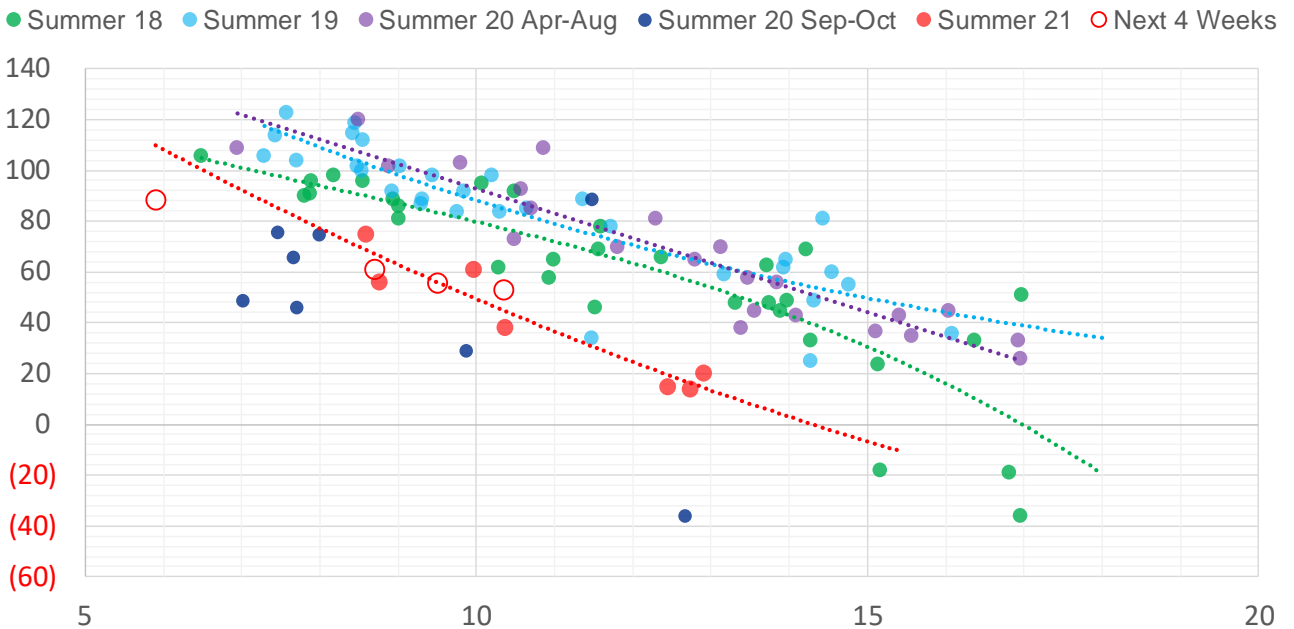
U.S. underground natural gas storage facilities by type (July 2015)



Weather Model Storage Projection

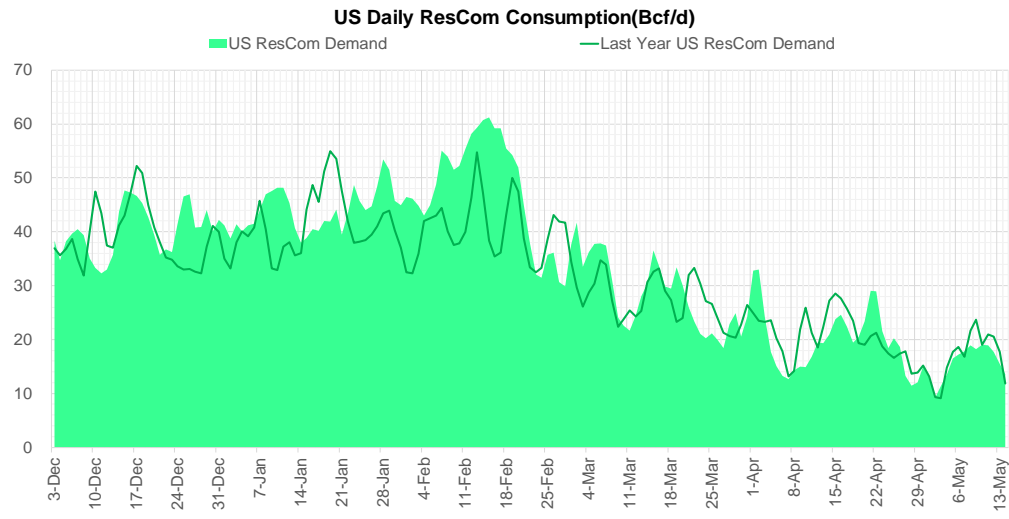
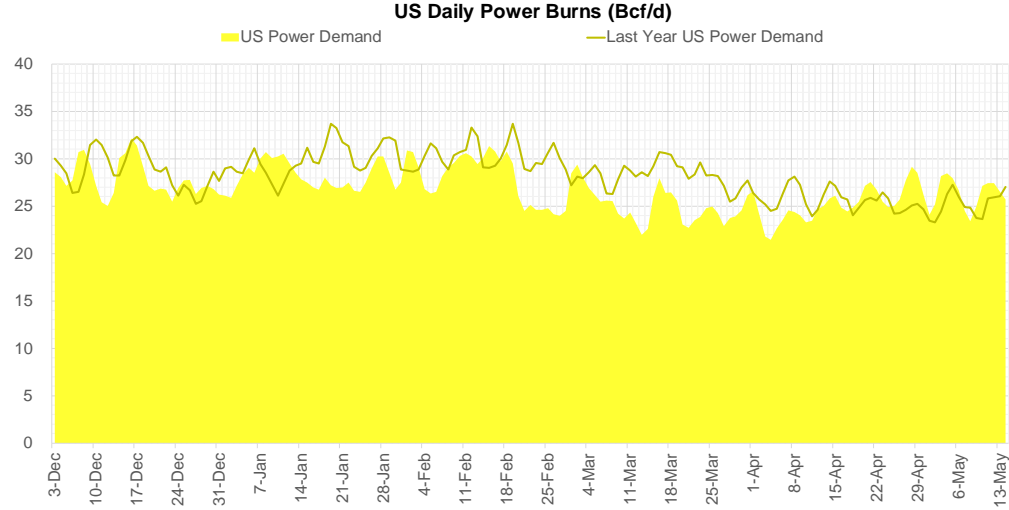
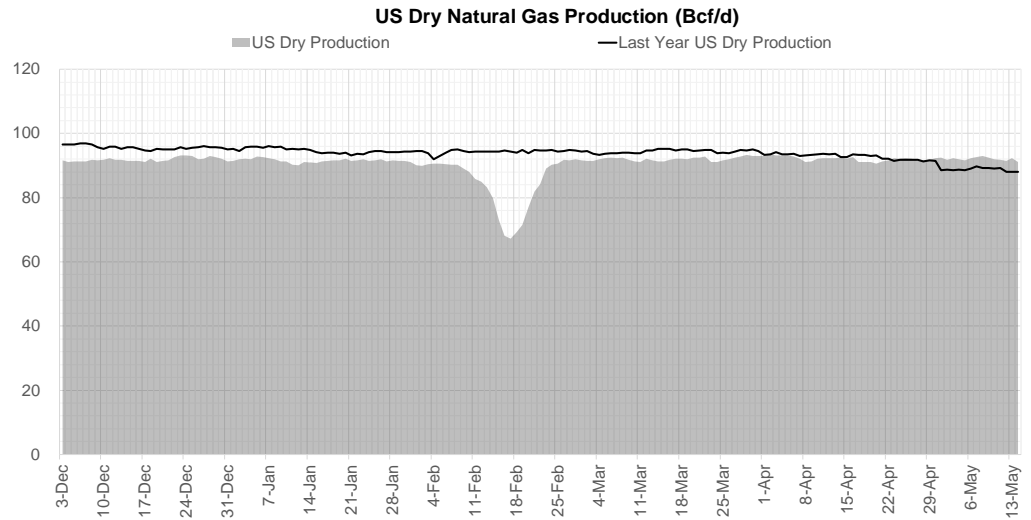
Next report and beyond		
Week Ending	Temp	Week Storage Projection
21-May	5.9	89
28-May	8.7	62
04-Jun	9.5	56

Weather Storage Model - Next 4 Week Forecast



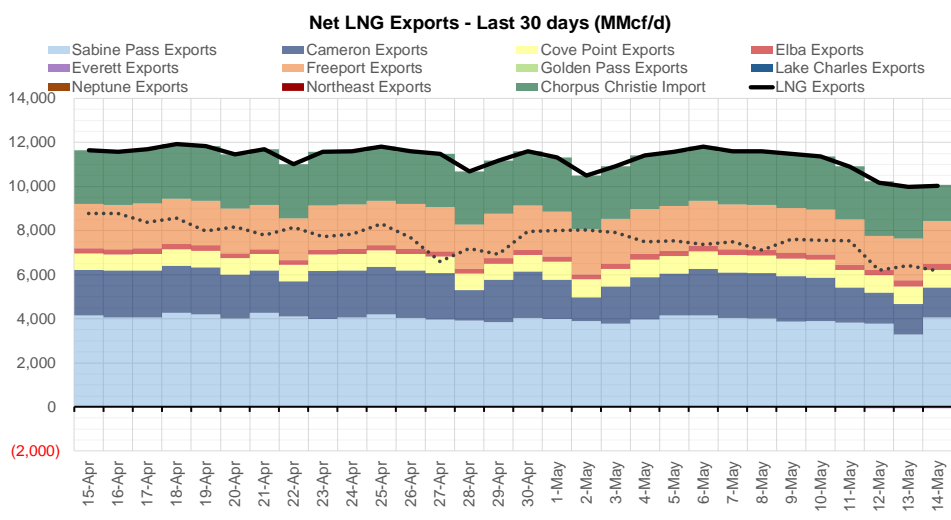
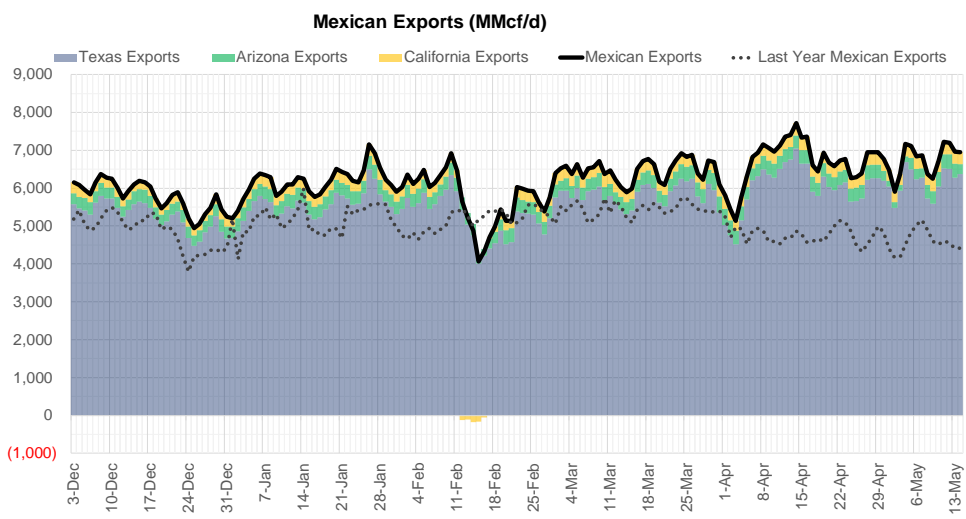
Note: this is not our official end of season forecast. This chart signifies where storage levels end with 10-year normal weather and current market tightness relative to last year

Supply – Demand Trends



Source: Bloomberg

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Source: Bloomberg

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Nat Gas Options Volume and Open Interest CME, ICE and Nasdaq Combined

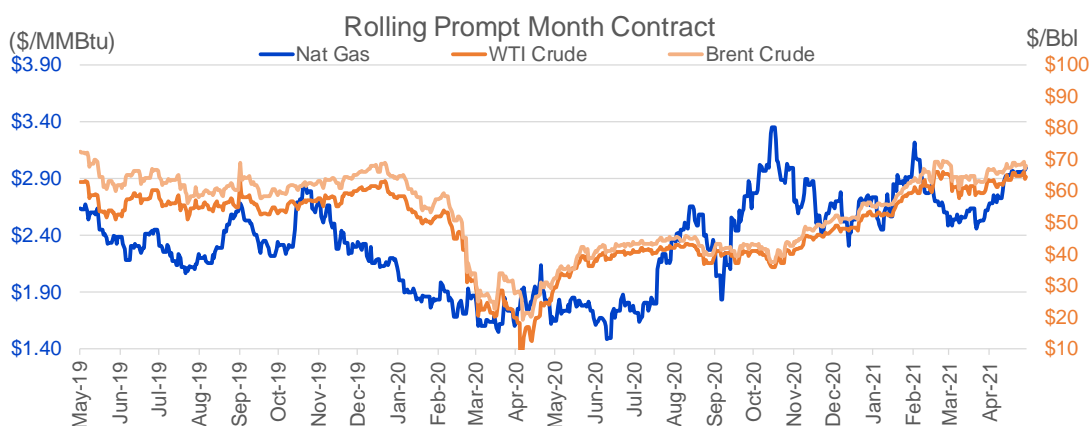
CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE VOL	CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE OI
7	2021	P	2.50	9696	10	2021	C	4.00	41299
6	2021	P	2.85	7028	8	2021	C	3.50	34191
6	2021	P	2.65	6936	9	2021	C	4.00	32636
6	2021	C	3.15	4992	6	2021	C	3.25	32007
8	2021	C	3.50	4112	8	2021	C	4.00	30304
7	2021	C	3.50	4104	6	2021	P	2.50	29821
6	2021	P	2.70	3982	10	2021	C	3.25	29426
8	2021	C	3.25	3550	6	2021	C	4.00	27949
6	2021	C	3.00	3110	7	2021	C	4.00	27311
6	2021	P	2.80	3109	8	2021	C	3.25	26589
6	2021	P	2.95	2589	7	2021	P	2.50	26353
7	2021	C	3.25	2378	10	2021	C	3.50	25359
9	2021	C	3.35	2000	9	2021	C	3.50	25302
9	2021	C	3.45	2000	10	2021	P	2.50	25208
6	2021	P	2.75	1804	10	2021	C	5.00	25132
6	2021	C	3.10	1622	6	2021	C	3.00	24972
6	2021	P	2.90	1452	6	2021	P	2.75	24632
6	2021	C	3.25	1345	7	2021	C	3.50	23537
7	2021	C	3.35	1253	6	2021	C	3.50	22902
6	2021	C	3.05	1225	7	2021	C	3.25	22651
2	2022	C	5.00	1100	6	2021	P	2.90	21947
2	2022	C	5.50	1100	6	2021	P	2.65	21299
2	2022	C	6.00	1100	10	2021	C	3.00	20184
7	2021	C	3.20	1047	6	2021	P	2.70	19791
7	2021	C	3.10	1034	9	2021	P	2.00	19647
6	2021	C	3.20	1024	8	2021	P	2.25	19585
7	2021	P	2.75	1019	4	2022	C	3.00	19579
8	2021	C	3.10	1002	12	2021	C	4.00	19395
8	2021	C	3.20	1000	8	2021	P	2.50	19335
8	2021	C	3.35	1000	6	2021	P	2.25	19089
10	2021	C	3.75	1000	10	2021	P	2.25	19048
1	2022	P	3.00	1000	10	2021	P	2.00	18378
7	2021	C	3.70	911	8	2021	P	2.00	17305
7	2021	P	2.80	878	11	2021	C	4.00	17192
2	2022	C	8.00	805	6	2021	P	2.00	17062
9	2021	P	3.00	795	9	2021	P	2.50	16720
6	2021	C	2.95	715	3	2022	C	4.00	16625
12	2021	C	5.00	700	7	2021	P	2.75	16414
7	2021	P	2.70	675	9	2021	C	3.25	16381
7	2021	P	3.00	624	7	2021	C	3.00	16333
7	2021	P	2.65	585	7	2021	P	2.65	16313
7	2021	P	2.95	550	8	2021	C	3.00	16290
7	2021	C	3.75	511	6	2021	C	3.05	16175
9	2021	P	2.75	510	8	2021	C	3.75	16148
2	2022	C	3.25	503	7	2021	P	2.00	16035
10	2021	P	2.50	501	6	2021	C	3.75	15823
9	2021	P	2.25	410	6	2021	C	2.75	15032
12	2021	C	4.50	400	6	2021	P	2.80	14887
6	2021	C	2.90	375	8	2021	P	2.75	14767
					3	2022	C	5	14200

Source: CME, Nasdaq, ICE

Nat Gas Futures Open Interest CME, ICE and Nasdaq Combined

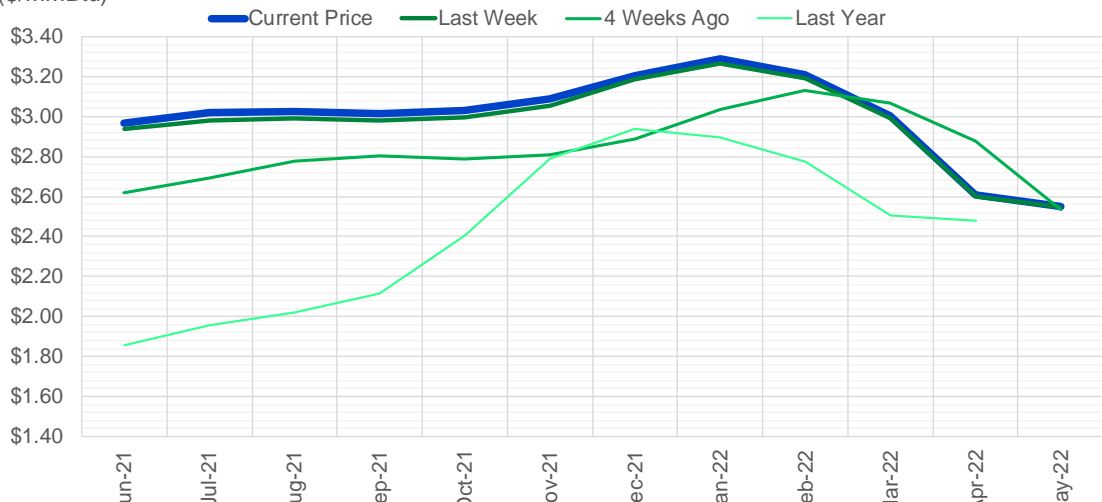
CME Henry Hub Futures (10,000 MMBtu)				ICE Henry Hub Futures Contract Equivalent (10,000 MM			
	Current	Prior	Daily Change	FOR JUNE 26	Current	Prior	Daily Change
JUN 21	132678	147406	-14728	JUN 21	87241	89990	-2748
JUL 21	253674	242646	11028	JUL 21	92284	91504	780
AUG 21	70654	70002	652	AUG 21	77339	77631	-292
SEP 21	109854	108810	1044	SEP 21	70257	70125	132
OCT 21	128835	129111	-276	OCT 21	88873	88388	486
NOV 21	68861	67172	1689	NOV 21	67607	67225	382
DEC 21	47324	46716	608	DEC 21	61527	61144	383
JAN 22	81637	80208	1429	JAN 22	69173	68859	314
FEB 22	28399	27646	753	FEB 22	53241	52957	284
MAR 22	56430	55606	824	MAR 22	59050	58453	596
APR 22	53501	53722	-221	APR 22	49642	49655	-13
MAY 22	32715	32396	319	MAY 22	45450	45257	193
JUN 22	18659	17895	764	JUN 22	42316	42011	306
JUL 22	10972	11085	-113	JUL 22	42629	42353	276
AUG 22	9541	9147	394	AUG 22	40865	40752	114
SEP 22	10438	9684	754	SEP 22	41766	41573	193
OCT 22	24020	23782	238	OCT 22	45841	46145	-304
NOV 22	10582	10488	94	NOV 22	37439	37383	56
DEC 22	10774	10415	359	DEC 22	41139	41143	-4
JAN 23	5641	5488	153	JAN 23	23670	23744	-74
FEB 23	2565	2561	4	FEB 23	22027	22112	-85
MAR 23	5185	5164	21	MAR 23	23879	23924	-45
APR 23	5574	5640	-66	APR 23	19382	19382	-1
MAY 23	4698	4549	149	MAY 23	19347	19361	-14
JUN 23	964	969	-5	JUN 23	17788	17849	-61
JUL 23	1019	1024	-5	JUL 23	17871	17848	23
AUG 23	803	808	-5	AUG 23	18015	17993	23
SEP 23	765	769	-4	SEP 23	17383	17360	23
OCT 23	1757	1757	0	OCT 23	18229	18322	-94
NOV 23	607	612	-5	NOV 23	17687	17694	-8

Source: CME, ICE



(\$/MMBtu)

Nat Gas Term Structure




	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22
Current Price	\$2.969	\$3.018	\$3.026	\$3.014	\$3.030	\$3.089	\$3.206	\$3.287	\$3.211	\$3.006	\$2.606	\$2.551
Last Week	\$2.938	\$2.982	\$2.992	\$2.978	\$2.995	\$3.056	\$3.184	\$3.264	\$3.193	\$2.991	\$2.602	\$2.546
vs. Last Week	\$0.031	\$0.036	\$0.034	\$0.036	\$0.035	\$0.033	\$0.022	\$0.023	\$0.018	\$0.015	\$0.004	\$0.005
4 Weeks Ago	\$2.618	\$2.693	\$2.775	\$2.803	\$2.790	\$2.809	\$2.890	\$3.038	\$3.130	\$3.066	\$2.879	\$2.534
vs. 4 Weeks Ago	\$0.351	\$0.325	\$0.251	\$0.211	\$0.240	\$0.280	\$0.316	\$0.249	\$0.081	-\$0.060	-\$0.273	\$0.017
Last Year	\$1.616	\$1.856	\$1.957	\$2.018	\$2.113	\$2.404	\$2.789	\$2.936	\$2.897	\$2.775	\$2.504	\$2.477
vs. Last Year	\$1.353	\$1.162	\$1.069	\$0.996	\$0.917	\$0.685	\$0.417	\$0.351	\$0.314	\$0.231	\$0.102	\$0.074

	Units	Current Price	vs. Last Week	vs. 4 Weeks Ago	vs. Last Year
NatGas Jul21/Oct21	\$/MMBtu	0.012	▼ -0.001	▼ -0.022	▲ 0.005
NatGas Oct21/Nov21	\$/MMBtu	0.059	▼ -0.002	▼ -0.022	▲ 0.011
NatGas Oct21/Jan22	\$/MMBtu	0.257	▼ -0.012	▼ -0.064	▼ -0.038
NatGas Apr22/Oct22	\$/MMBtu	0.025	▲ 0.001	▼ -0.007	▼ -0.021
WTI Crude	\$/Bbl	66.08	▲ 0.450	▲ 2.930	▲ 40.790
Brent Crude	\$/Bbl	69.32	▲ 0.360	▲ 2.740	▲ 40.130
Fuel Oil, NY Harbour 1%	\$/Bbl	97.18	▲ 0.000	▲ 0.000	▲ 0.000
Heating Oil	cents/Gallon	206.95	▲ 6.700	▲ 17.950	▲ 123.810
Propane, Mt. Bel	cents/Gallon	0.81	▼ -0.013	▼ -0.007	▲ 0.423
Ethane, Mt. Bel	cents/Gallon	0.26	▲ 0.001	▲ 0.026	▲ 0.043
Coal, PRB	\$/MTon	12.30	▲ 0.000	▲ 0.000	▲ 0.000
Coal, PRB	\$/MMBtu	0.70			

Source: CME, Bloomberg

Baker Hughes Rig Counts

Rotary Rig Count						
5/14/2021						
Baker Hughes 						
U.S. Breakout Information	This Week	+/-	Last Week	+/-	Year Ago	
Oil	352	8	344	94	258	
Gas	100	-3	103	21	79	
Miscellaneous	1	0	1	-1	2	
Directional	28	5	23	6	22	
Horizontal	410	2	408	103	307	
Vertical	15	-2	17	5	10	
Canada Breakout	This Week	+/-	Last Week	+/-	Year Ago	
Oil	25	3	22	18	7	
Gas	34	1	33	18	16	
Major Basin Variances	This Week	+/-	Last Week	+/-	Year Ago	
Ardmore Woodford	0	0	0	-2	2	
Barnett	1	0	1	-1	2	
Cana Woodford	13	1	12	9	4	
DJ-Niobrara	7	0	7	0	7	
Eagle Ford	33	0	33	9	24	
Granite Wash	3	0	3	1	2	
Haynesville	48	-1	49	16	32	
Marcellus	30	0	30	0	30	
Permian	231	2	229	56	175	
Utica	10	0	10	2	8	
Williston	16	1	15	0	16	