

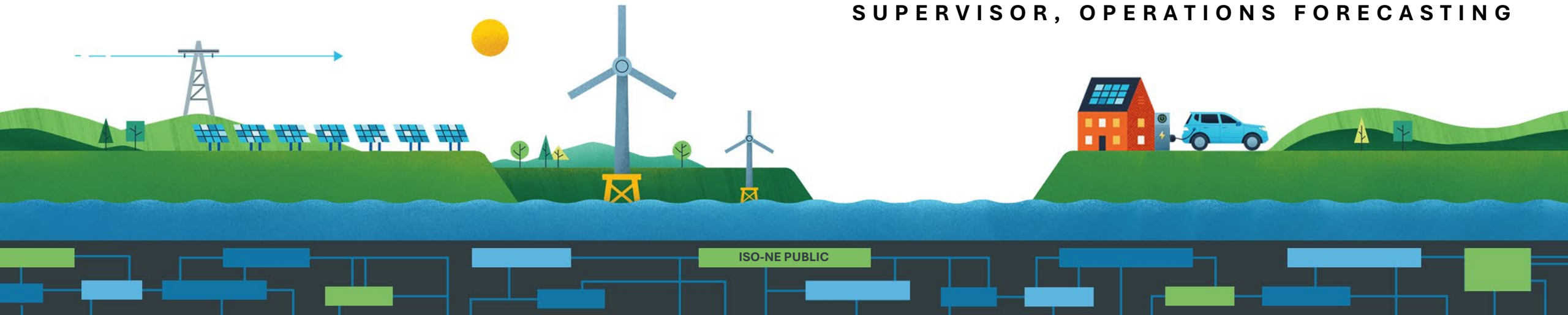


Winter Outlook 2024-2025

Electric Gas Operations Committee

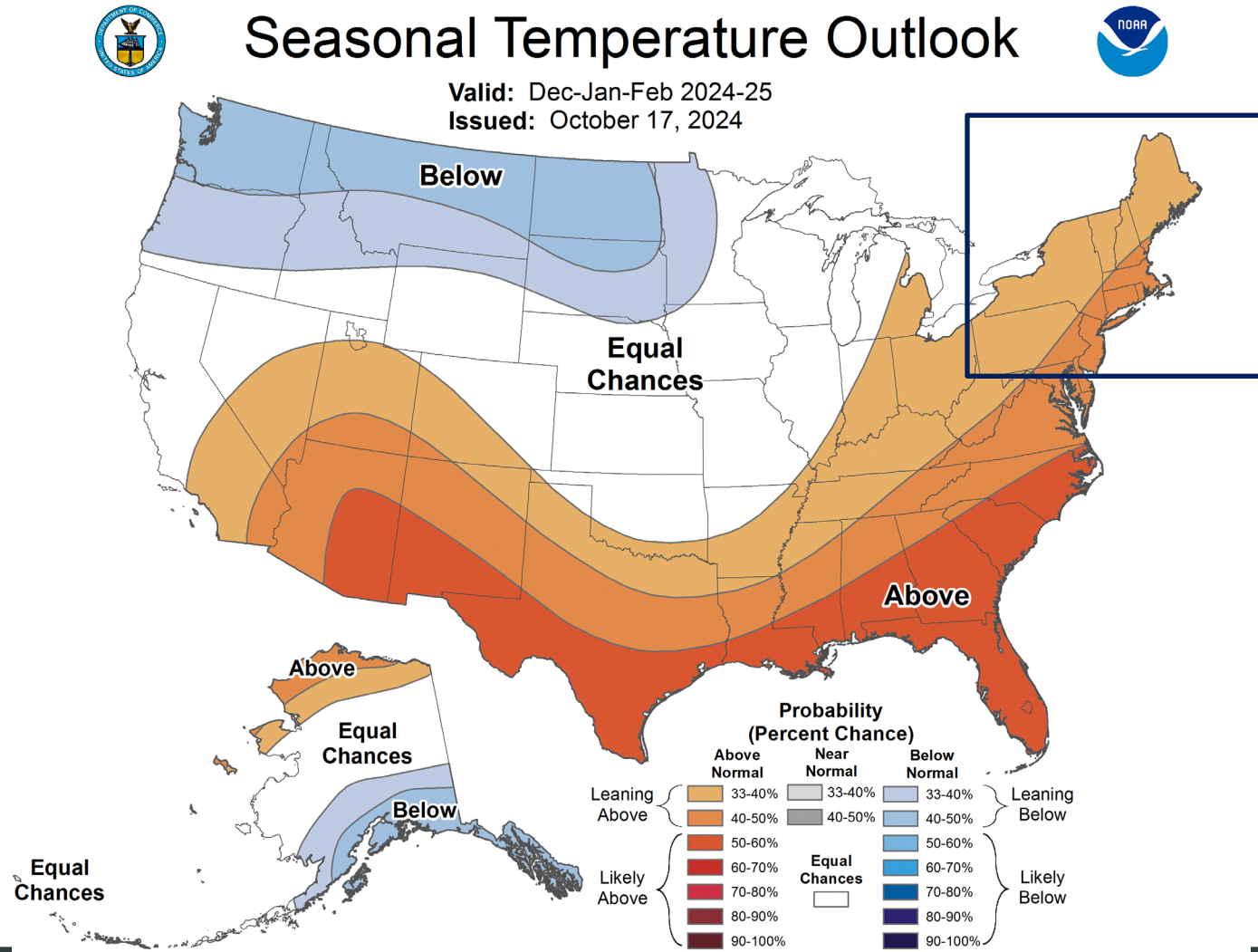
Mike Fontaine

SUPERVISOR, OPERATIONS FORECASTING



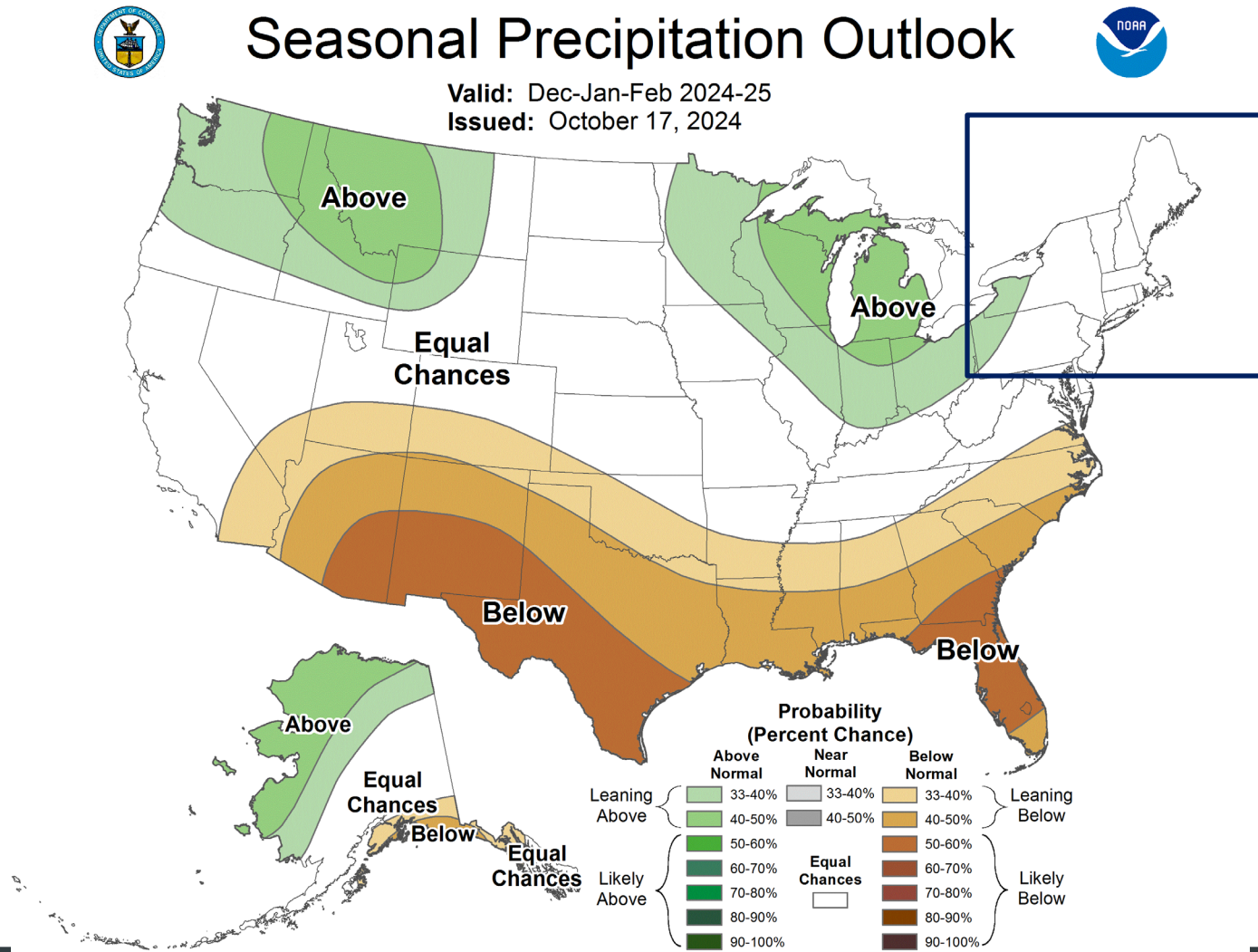
Winter Temperature Outlook

Warmer than normal temperatures forecast for New England.



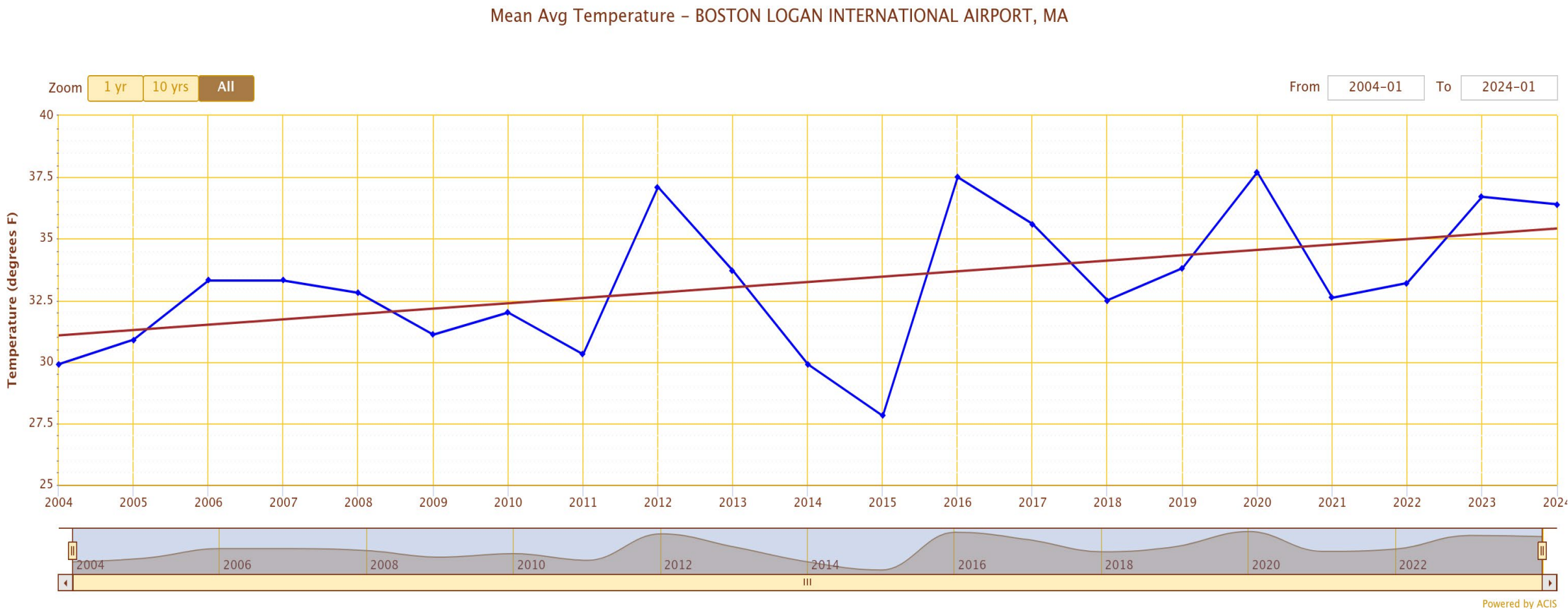
Winter Precipitation Outlook

Near normal precipitation forecast for New England.



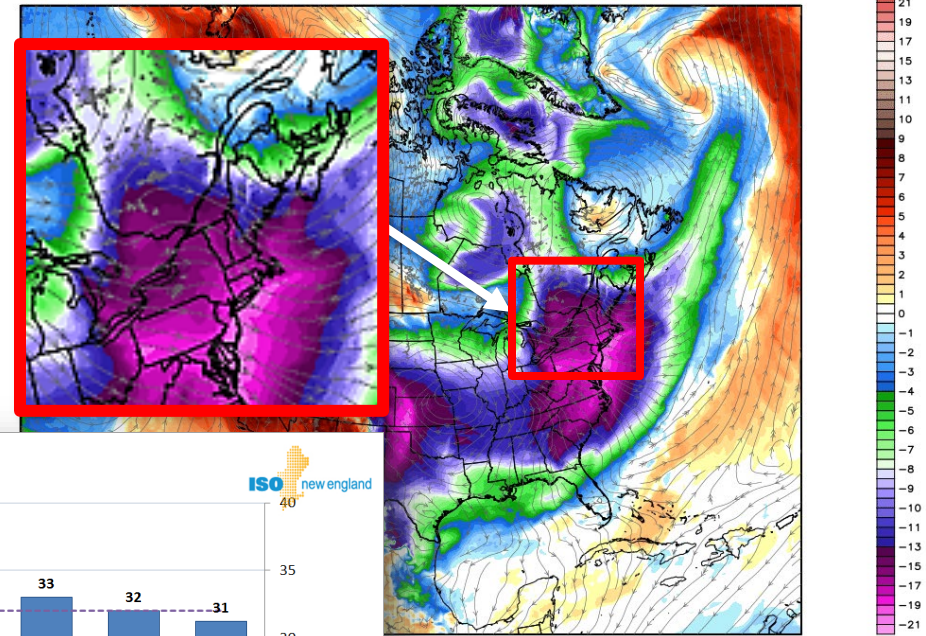
Boston Winter Temperatures

Average winter temperatures have been trending milder over the past couple of decades, however exceptional cold can occur at any time.

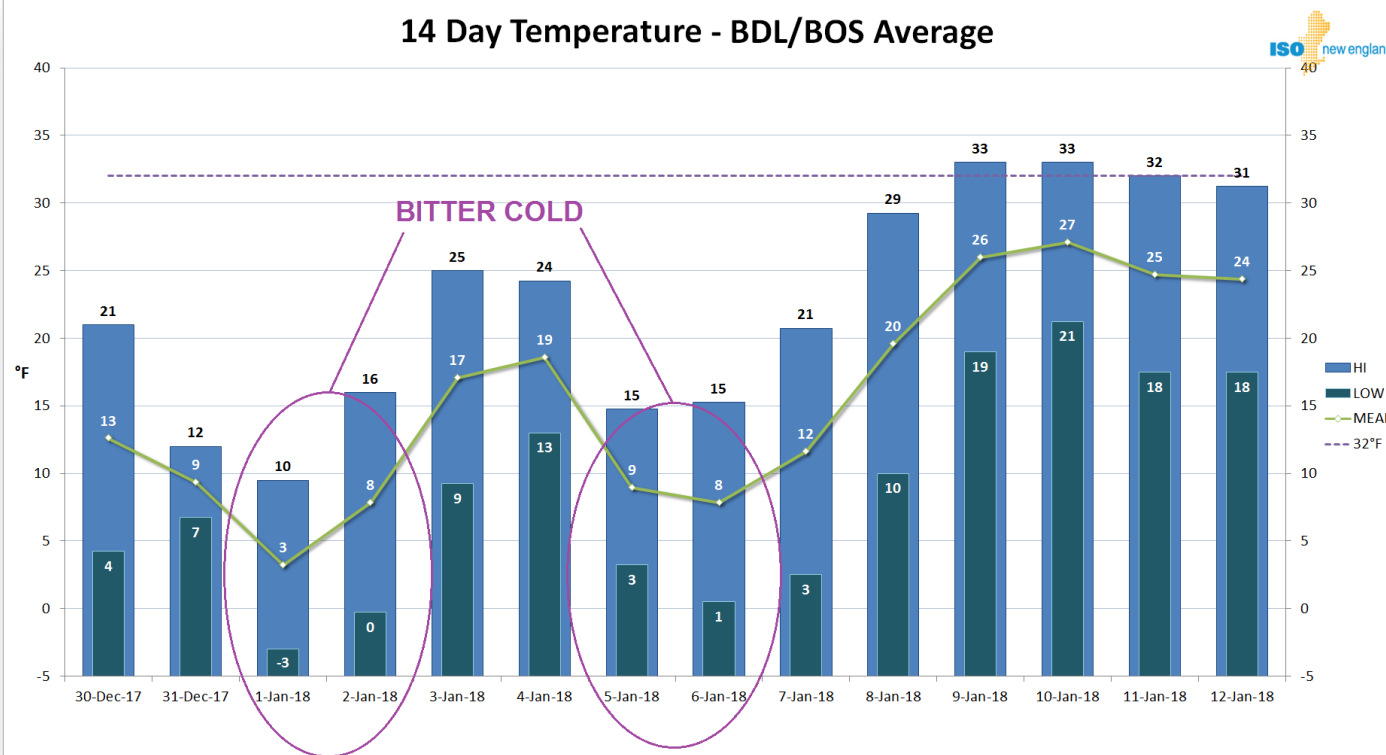


From late December 2017 through early January 2018 a major arctic outbreak occurred, even though the average for the winter was above normal

Low Level Temperature Anomalies For January 1st, 2018



14 Day Temperature - BDL/BOS Average





PRIMARY CLIMATE/WEATHER PATTERNS

WHICH IMPACT NEW ENGLAND WINTERS

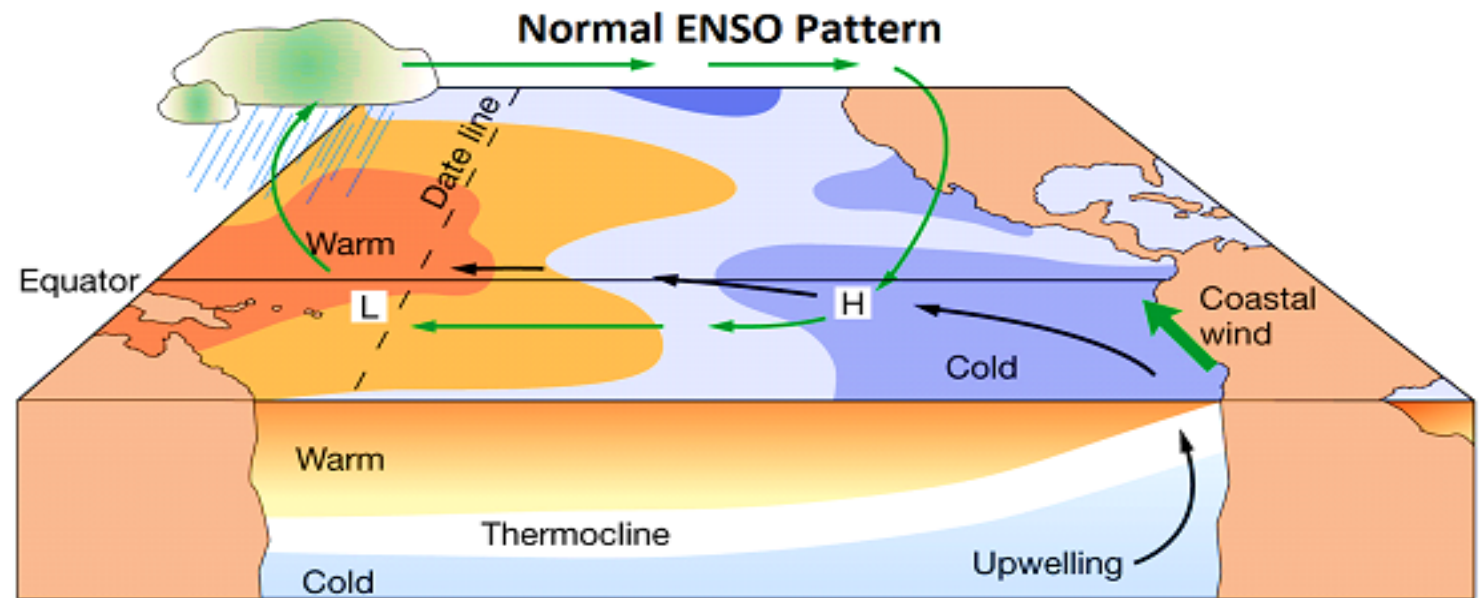


Drivers For A Winter Forecast

El Niño-Southern Oscillation (ENSO)

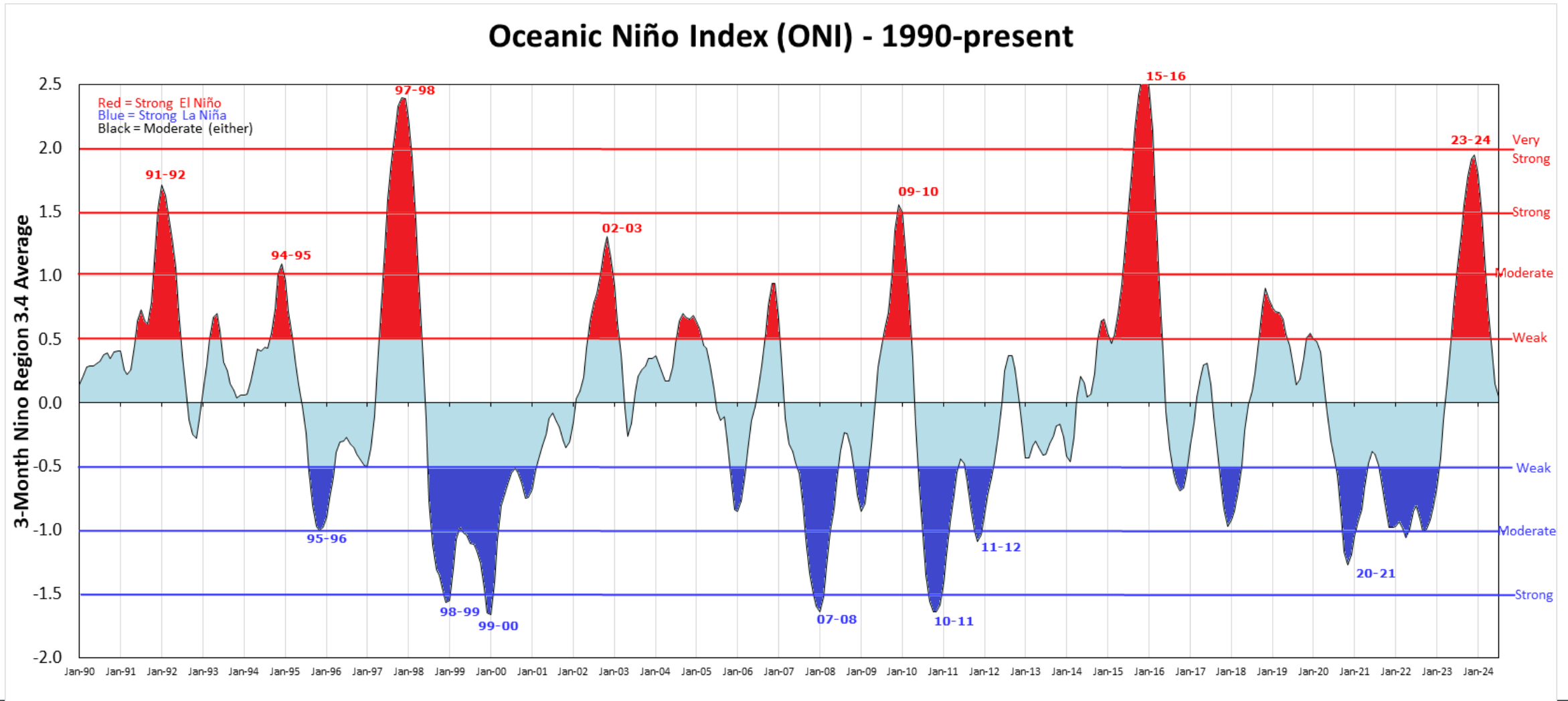
The ENSO is a multi-part circulation pattern across the tropical Pacific Ocean.

In most years, high pressure dominates in the equatorial eastern Pacific Ocean, and general low pressure is observed in the western Pacific region, which results in the easterly trade winds causing warm ocean waters near the equator to accumulate in the west.



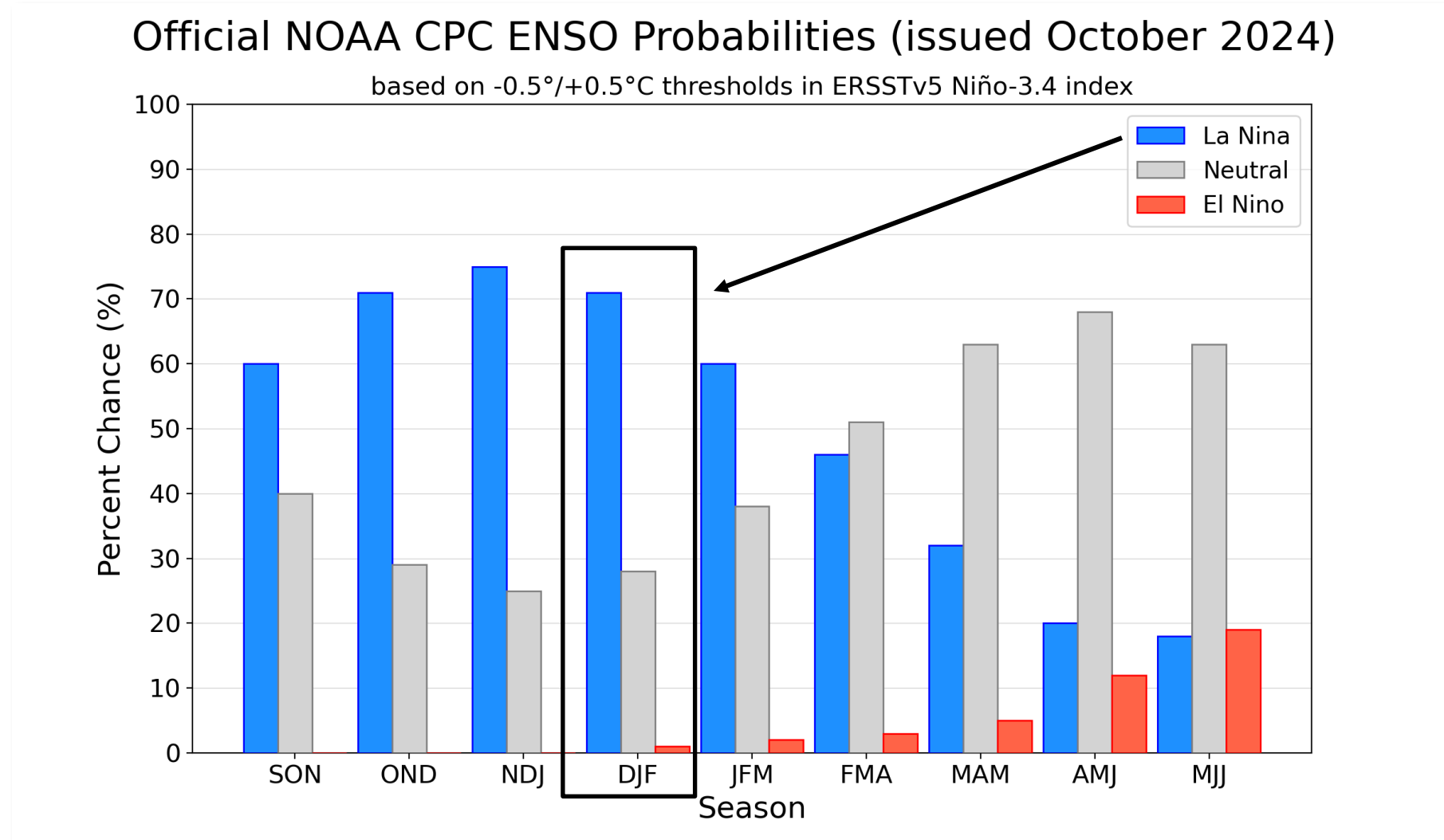
30 Year ENSO History

El Niño events (Red) often cause flooding in parts of the North America, while La Niña events (Blue) have caused historical flooding across portions of the West Pacific, particularly Australia



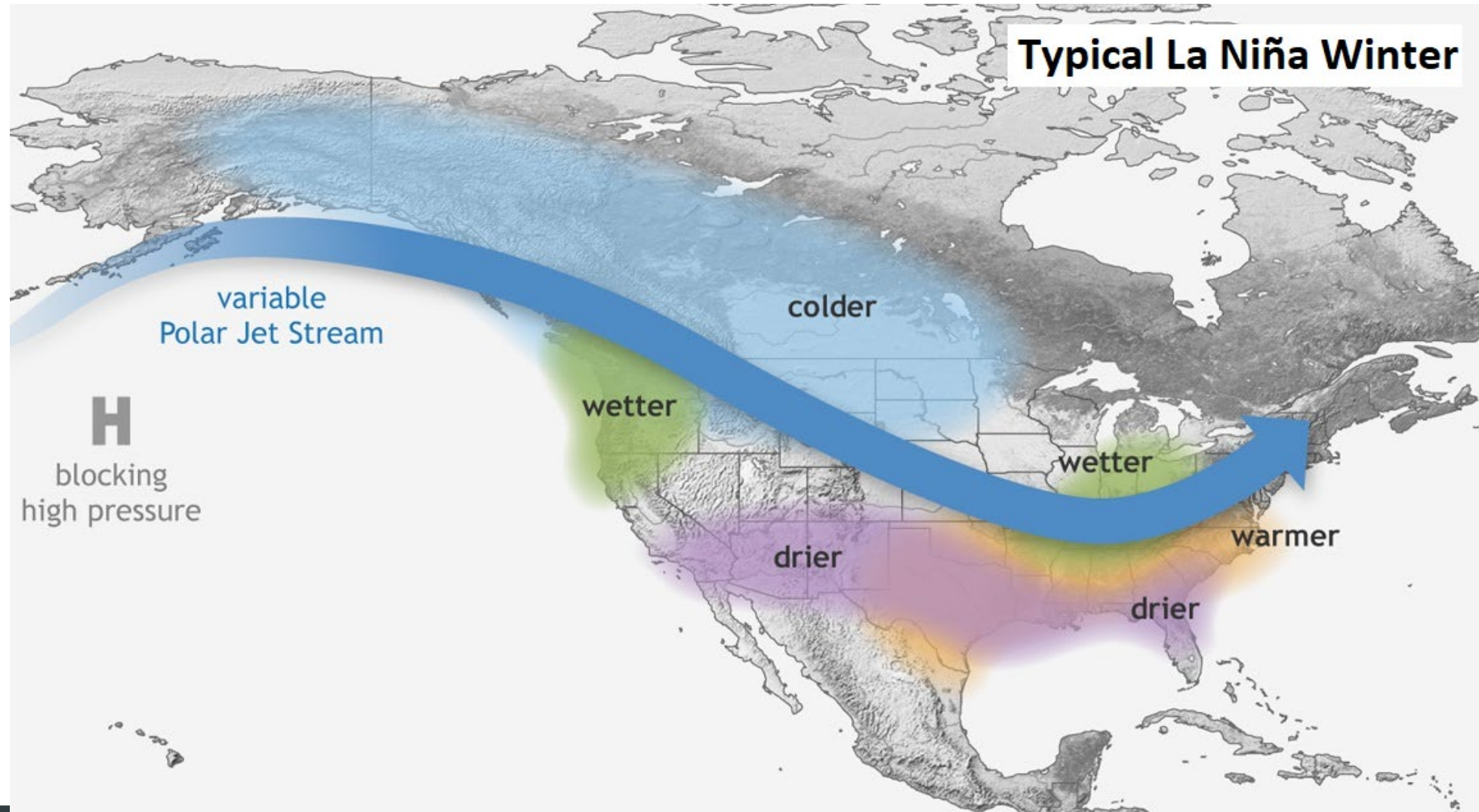
Main Driver For New England Winter Forecast

ENSO Forecast – La Niña is Predicted



La Niña Conditions

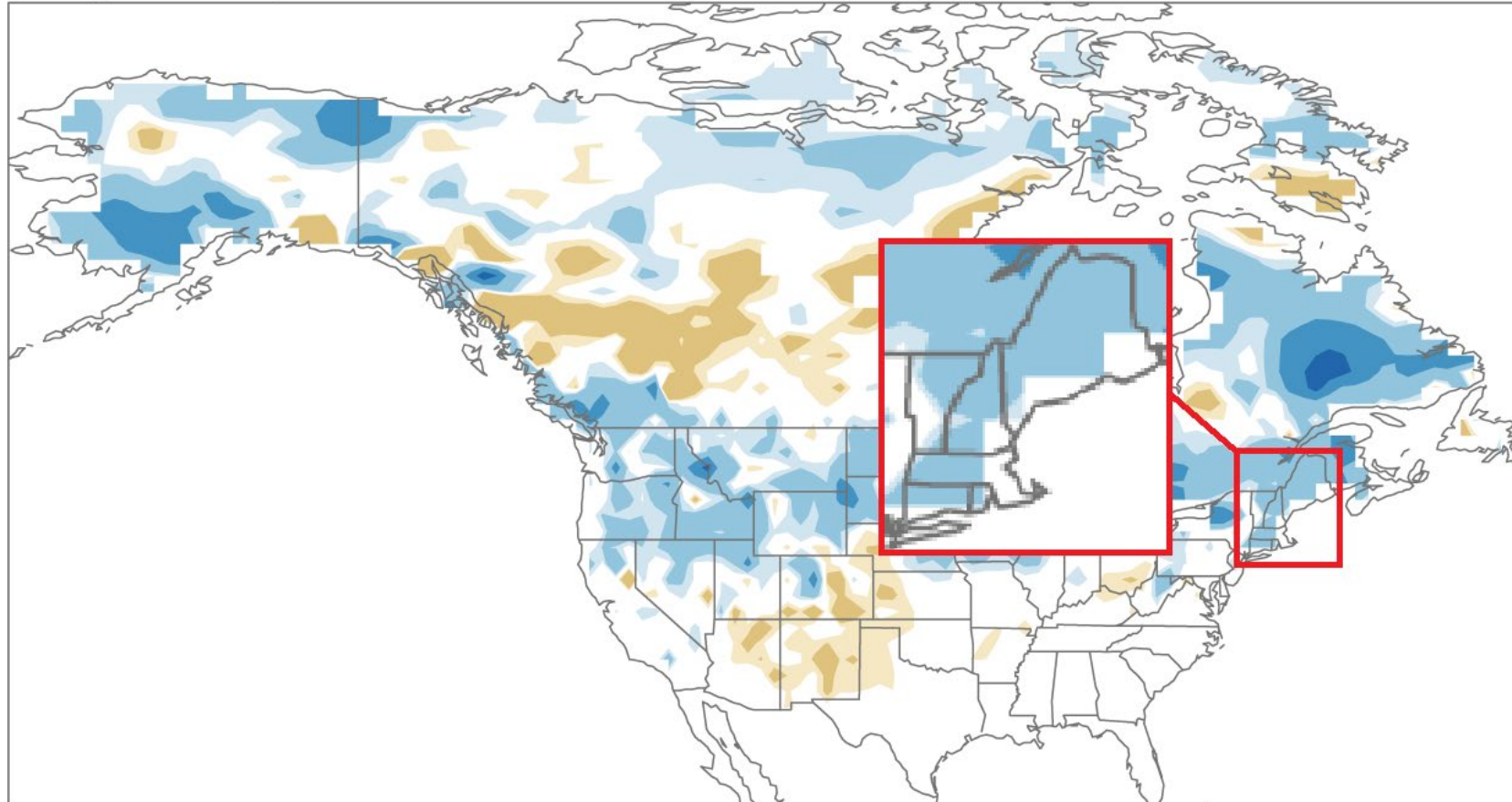
Create An Active Jet Stream And Pattern Anomalies In The Eastern U.S.



La Niña Effects

Snowfall averages a bit above normal in New England during weak La Niña years, and an active Jet Stream increases the potential for more Nor'easter type storms.

Average snowfall patterns for weak La Niña years



October-April
1950-51 to 2008-09

Difference from average seasonal snowfall (inches)



NOAA Climate.gov
Data: Rutgers GSL



THE POLAR VORTEX

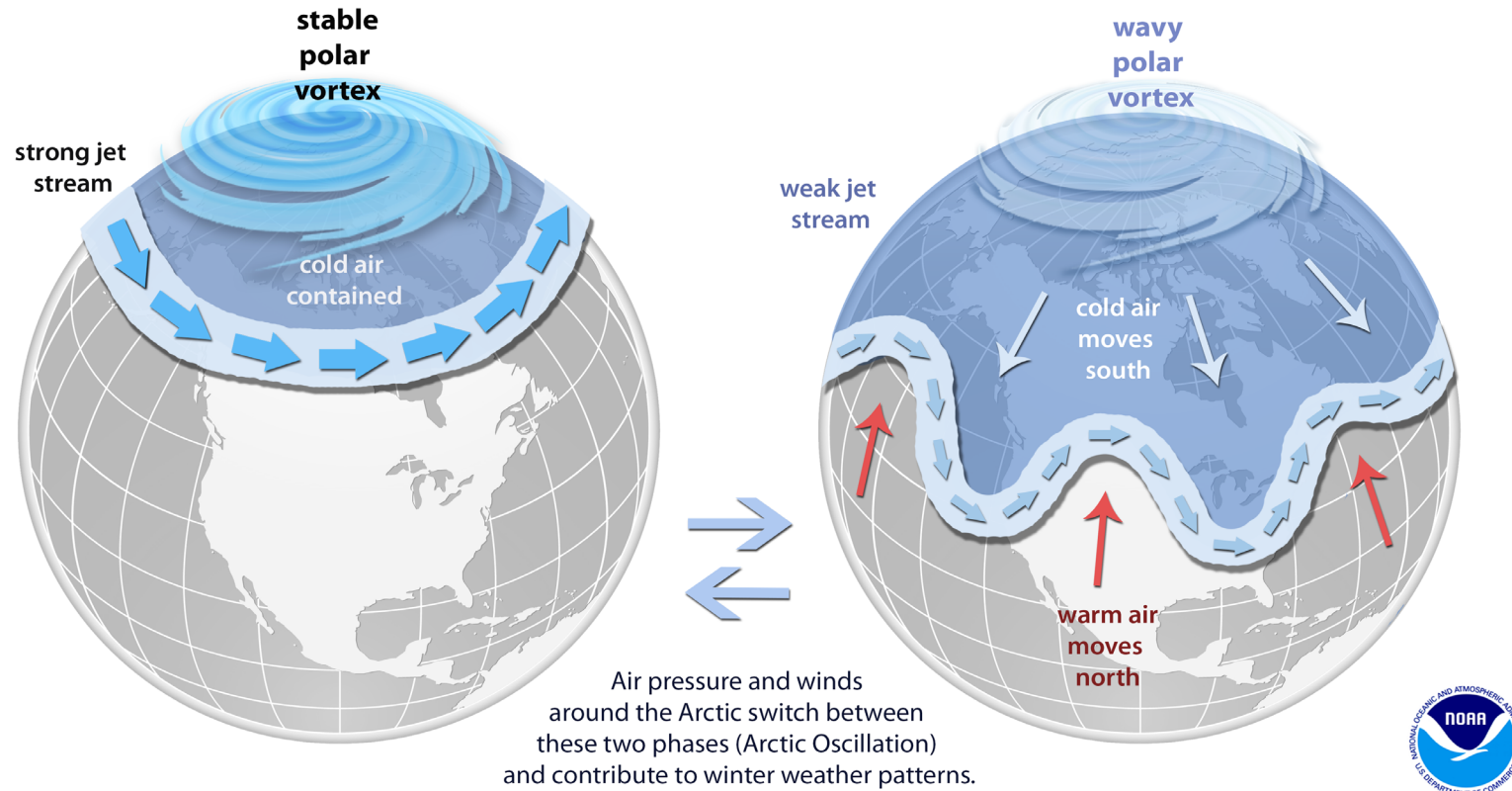
A Major Weather Player in New England Winters

Polar Vortex: Very Important, but Low Predictability Skill

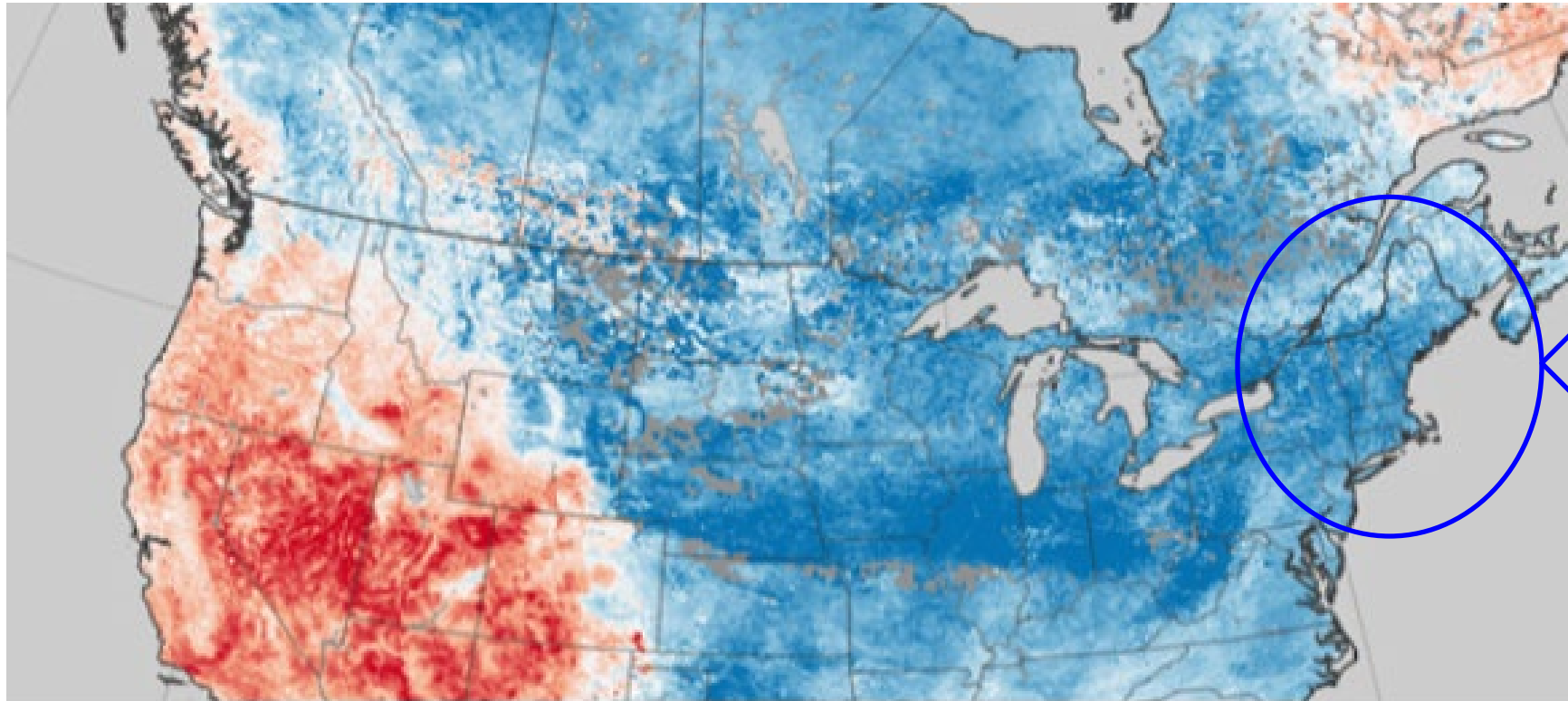
The Science Behind the Polar Vortex

The polar vortex is a large area of low pressure and cold air surrounding the Earth's North and South poles. The term vortex refers to the counterclockwise flow of air that helps keep the colder air close to the poles (left globe). Often during winter in the Northern Hemisphere, the polar vortex will become less stable and expand, sending cold Arctic air southward over the United States with the jet stream (right globe).

The polar vortex is nothing new — in fact, it's thought that the term first appeared in an 1853 issue of E. Littell's *Living Age*.



Potential Weak Polar Vortex Impacts: Periods Of Below Normal Temperatures



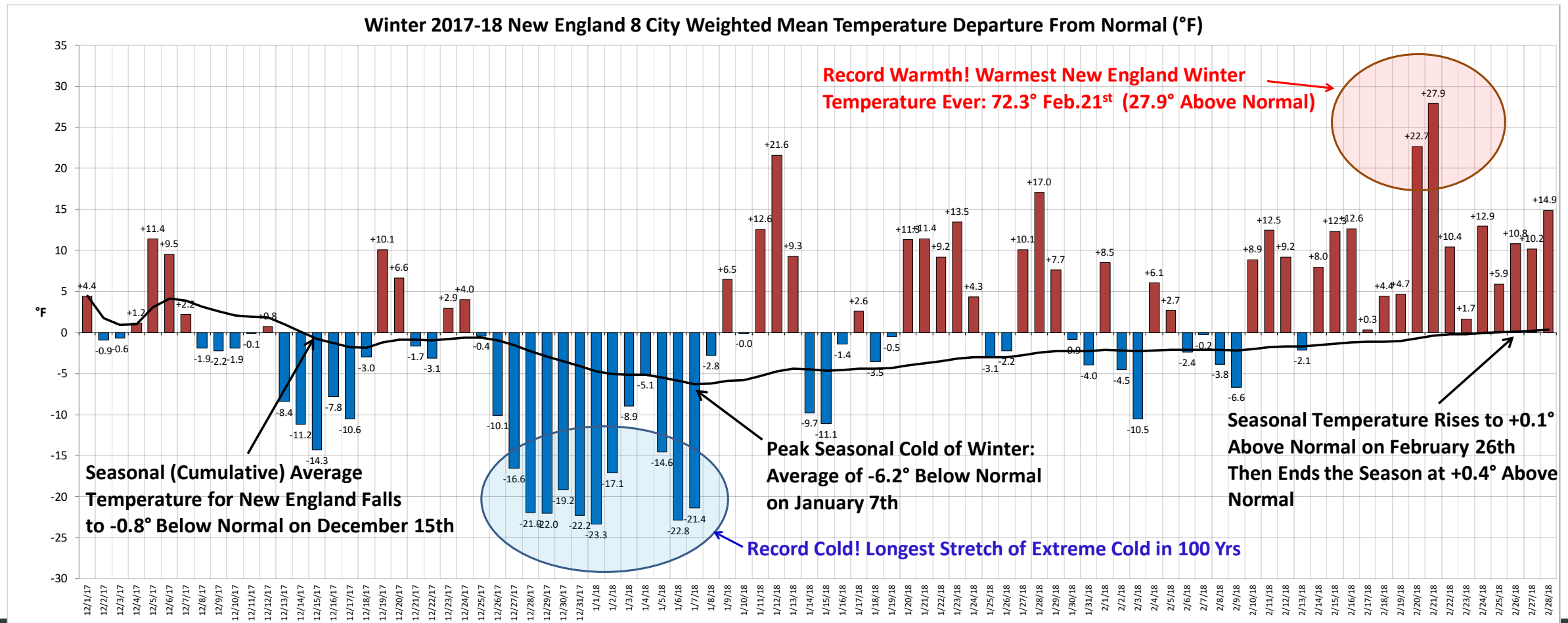
Arctic Outbreak

Dec. 24, 2017 - Jan. 8, 2018:
14 Consecutive Days of Below
Normal Temperatures Across
New England!

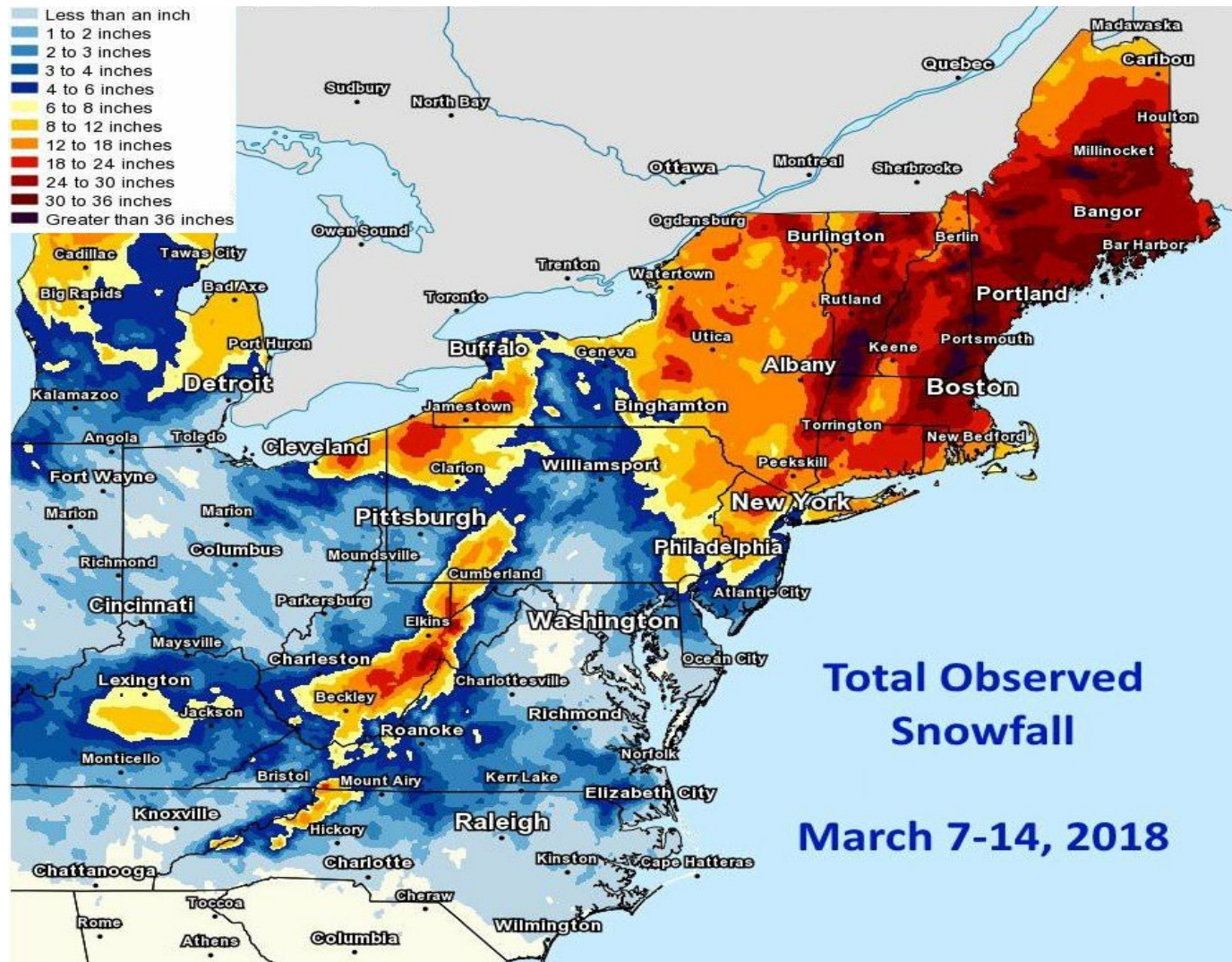


Even With Above Normal Temperatures Forecast This Winter, A Weak Polar Vortex Can Cause Drastic Temperatures Swings

The 2017-18 Winter Mean Temperature was above normal; yet the season saw both record warmth *and* severe record cold



A Weak Polar Vortex Can Also Result in Blizzards & Nor'easters Across New England, Even Late In The Season

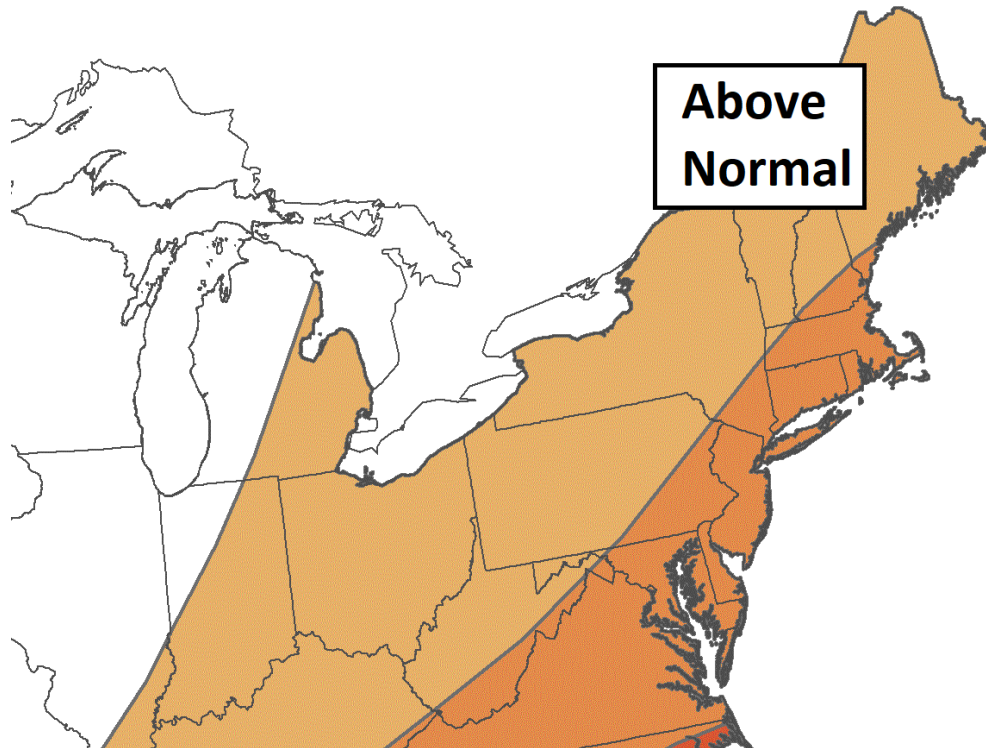


The 2024-25 Winter Is Forecast To Be Warmer Than Normal, But Arctic Outbreaks, Cold Snaps And Severe Winter Storms Are All Possible



Will You Be **WINTER READY?**

Issued: October 17, 2024



Questions



NOVEMBER 15, 2024

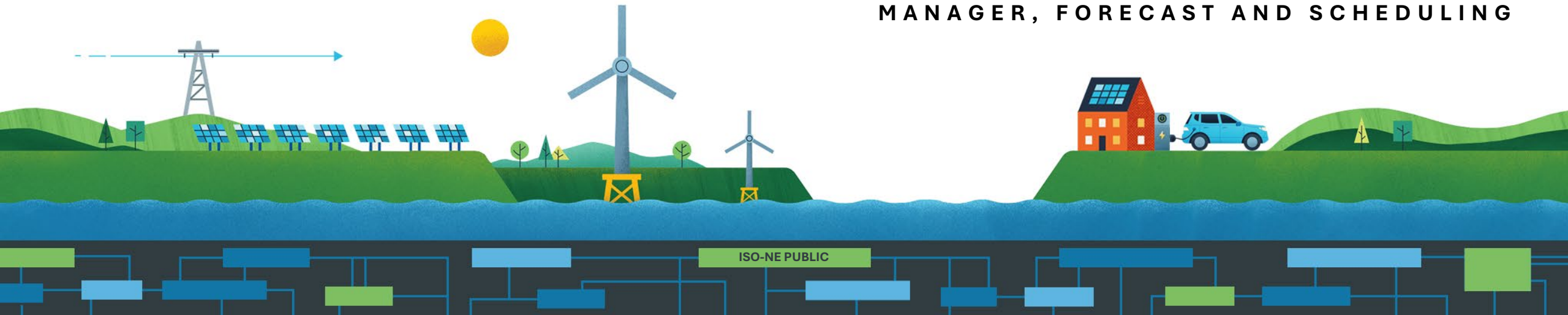
Capacity Outlook and Electric-Gas Coordination

Electric Gas Operations Committee

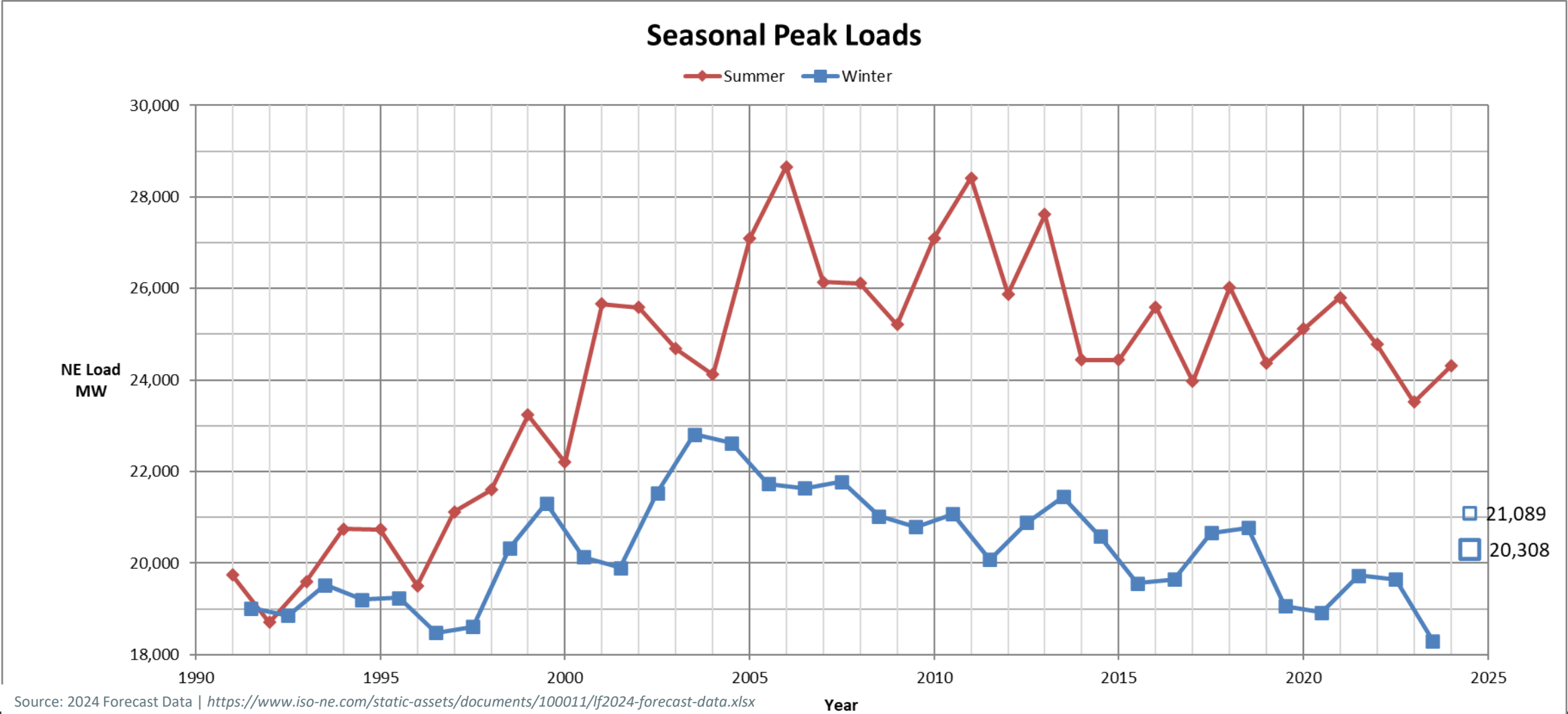


Mike Knowland

MANAGER, FORECAST AND SCHEDULING



Peak Load Trends



Preliminary Winter Capacity Outlook

- Operable capacity **surplus** on the 50/50 and 90/10 forecasts
 - 50/50: Surplus **2,254** MW
 - 90/10: Surplus **716** MW
- Generator Economic Maximum offers are consistently above CSO; as a result, ISO anticipates adequate capacity for both the 50/50 and 90/10 loads
 - Can range from 1,500 to 4,000 MW
 - Approximately **3,000** MW difference between surplus on SCC vs. CSO



Operable Capacity Analysis



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Budget and Finance Subcommittee

Reliability Committee and Working Groups

Reliability Committee

Load Forecast Committee

Industry Collaborations

Consumer Liaison Group

Electric/Gas Operations Committee



Markets Committee and Groups

2024-10 COO Report

Summary of System and Market Operations for current reporting period, including supporting data. Presentation by Vamsi Chadalavada, Executive Vice President and Chief Operating Officer, ISO New England.

10/08/2024

PDF

5.79MB

Preliminary Winter 2024/25 Operable Capacity Analysis

50/50 Load Forecast (Reference)	Dec - 2024 ² CSO (MW)	Dec - 2024 ² SCC (MW)
Operable Capacity MW ¹	27,919	30,030
Active Demand Capacity Resource (+) ⁵	427	343
External Node Available Net Capacity, CSO imports minus firm capacity exports (+)	1,161	1,161
Non Commercial Capacity (+)	293	293
Non Gas-fired Planned Outage MW (-)	234	258
Gas Generator Outages MW (-)	17	168
Allowance for Unplanned Outages (-) ⁴	3,200	3,200
Generation at Risk Due to Gas Supply (-) ³	3,716	3,973
Net Capacity (NET OPCAP SUPPLY MW)	22,633	24,228
Peak Load Forecast MW(adjusted for Other Demand Resources) ²	19,849	19,849
Operating Reserve Requirement MW	2,125	2,125
Operable Capacity Required (NET LOAD OBLIGATION MW)	21,974	21,974
Operable Capacity Margin	659	2,254

¹Operable Capacity is based on data as of Sept 30, 2024 and does not include Capacity associated with Settlement Only Generators, Passive and Active Demand Response, and external capacity. The Capacity Supply Obligation (CSO) and Seasonal Claim Capability (SCC) values are based on data as of Sept 30, 2024.

² Load forecast that is based on the 2024 CELT report and represents the week with the lowest Operable Capacity Margin, week beginning Dec 28, 2024.

³ Total of (Gas at Risk MW) - (Gas Gen Outages MW).

⁴ Allowance for Unplanned Outage MW is based on the month corresponding to the day with the lowest Operable Capacity Margin for the week.

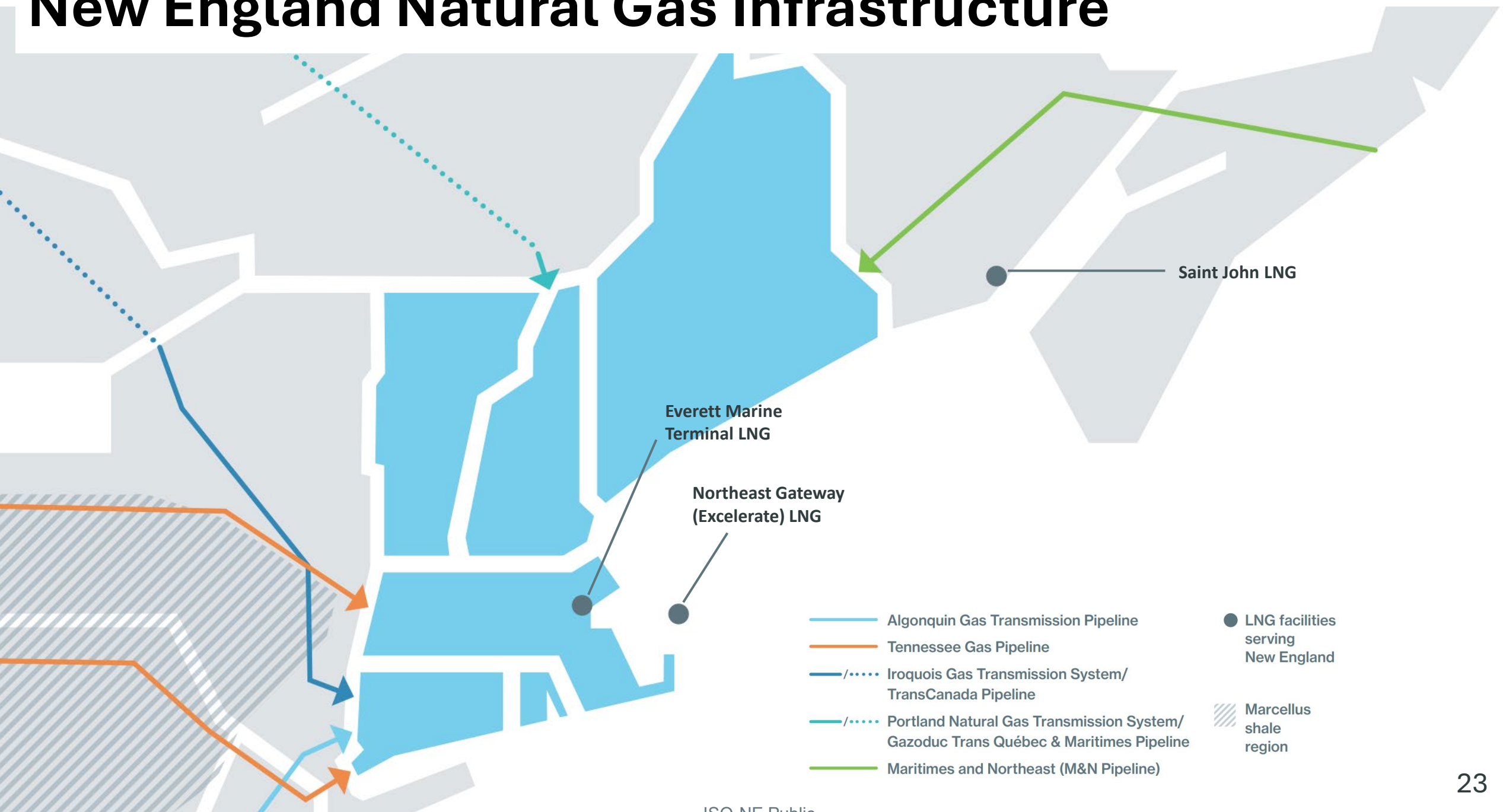
⁵ Active Demand Capacity Resources (ADCRs) can participate in the Forward Capacity Market (FCM), have the ability to obtain a CSO and also participate in the Day-Ahead and Real-Time Energy Markets.

ISO-NE PUBLIC

100

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New England Natural Gas Infrastructure



Normal Operating Conditions

- Collect Pipeline Bulletin Board Data
 - After the Reserve Adequacy Analysis (RAA) process is completed, run two nominations reports for the overlapping gas day and electric day (0000 - 1000 and 1000 - 2400)
 - The Designated Entity (DE) for every generator that has **inadequate gas** scheduled to their meter **will be contacted** and requested to confirm if gas will be scheduled
 - Information provided in the reports, the information from the generator, and information gathered through communication with gas control will be used to determine if supplemental commitments are required to ensure reliability



Pipeline Bulletin Board Data

Plant	MWh Burned So Far	MWh Before Midnight	MWh After Midnight	MWh Scheduled	MWh Surplus	Gas Scheduled
1	2201	169	1932	4493	191	34600
2	777	0	663	0	(1440)	0
3	1910	0	901	2849	38	20700
4	2131	0	0	2736	605	20028
5	5903	403	0	7706	1400	53800
6	2369	0	798	3097	(70)	22500
7	1253	0	350	93	(1510)	1000
8	2402	185	1850	5129	692	45500
9	0	0	0	28	28	300
10	3	0	525	0	(528)	0
11	0	0	0	0	0	0
12	1	0	0	0	(1)	0
13	4	0	0	0	(4)	0
14	5077	389	2864	9591	1261	65621
15	3394	215	0	3347	(262)	25048
16	3554	550	6017	221	(9900)	1500
17	10639	797	4157	17418	1825	126540
18	7249	545	3892	11096	(590)	80813
19	972	45	1066	9	(2074)	100
20	0	0	0	0	0	0
21	0	0	0	0	0	0
22	6294	0	2476	1643	(7127)	17471
23	2758	0	1209	3944	(23)	30000
24	2400	250	1250	579	(3321)	5000
25	4998	0	2317	6917	(398)	52595
26	3208	250	1189	0	(4647)	0
27	2434	0	0	2747	313	23512
28	4222	0	0	5634	1412	42963
29	2121	0	0	2343	222	20000
30	0	0	0	0	0	0
31	1141	86	860	2344	257	27000
32	0	0	0	0	0	0
33	1071	0	3490	5037	476	38325

Follow Up

- If sufficient gas has not been nominated and scheduled to the generator meter (i.e. generator does not appear to have enough gas)
 - Assessments will be done to determine the impact on system operations
 - ISO Control Room will **call to inquire** as to whether the generator intends to secure the requisite gas supply to match its dispatch
- It is always the responsibility of the Designated Entities (DE) to communicate any changes in generator capability to the ISO-NE Control Room



Timeline – Daily Routine

ISO New England Activity	Time	Gas Procurement Schedule
Final Load Forecast Published	≤ 09:30	
DAM bidding window closes	10:30	
DAM results published Re-offer period opens	≤ 13:30	
Re-offer period closes RAA Process begins	14:00	Timely Cycle Nomination Deadline
RAA Process completed	≤ 17:00	
Intraday Re-offer window opens	18:30	
	19:00	Evening Cycle Nomination Deadline



PIPELINE COMMUNICATION INFORMATION POLICY



FERC Pipeline Communication/Info Policy

- ISO changed its Information Policy effective January 11, 2014 as approved by FERC
- Provides explicit authority to interstate natural gas pipelines and ISOs to share non-public, operational information with each other for the purpose of promoting reliable service or operational planning
- Permits transmission operators to share the information that they deem necessary to promote the reliability and integrity of their systems with each other
- Parties are subject to a No-Conduit Rule that prohibits subsequent disclosure of that information to an affiliate or third party



Sharing Fuel Burn Expectations

- Pipeline specific & resource specific
- Daily report provided to each pipeline operator
 - Hourly gas burn at each meter (converted to MMBtu)
 - Information is only shared with the associated pipeline
 - Electric day, not gas day

PIPELINE NAME			Date: 7/21/2014				Note: Hourly Values Are in Dekatherms																				
Meter Name	Meter #	LDC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
Plant A	700	N							562	1,748	2,372	2,541	2,541	3,458	3,458	3,458	3,458	3,458	3,458	3,458	3,458	3,458	3,458	3,458	1,178		48,978
Plant B	701	N	1,007	1,007	1,007	1,007	1,007	1,007	1,007	1,250	1,242	1,233	1,233	1,225	1,225	1,217	1,217	1,217	1,217	1,225	1,225	1,233	1,242	1,242	1,250	1,007	27,749
Plant C	702	N	5,122	5,122	5,122	5,122	5,122	5,122	5,122	3,698	5,122	4,352	5,122	5,122	5,122	5,122	5,122	5,122	5,122	5,122	5,122	5,122	5,122	5,122	5,122	5,122	120,730
Plant D	703	N	2,367	2,367	2,367	2,579	3,257	3,852	4,789	3,681	4,078	3,729	4,789	4,789	4,789	5,090	5,090	5,090	5,090	5,090	5,090	4,803	4,803	4,803	4,803	4,789	101,980
Plant E	704	N					71	212	354	495	637	707	707	707	707	707	1,061	1,061	1,061	1,061	859	859	707				11,973
Plant F	705	N	2,180	2,180	2,180	2,180	2,180	2,180	2,180	3,487	3,444	3,400	3,371	3,327	3,327	3,313	3,298	3,284	3,298	3,327	3,342	3,385	3,429	3,444	3,458	2,180	71,371
Plant G	706	N	1,489	1,489	1,489	1,489	1,489	1,498	1,489	1,064	1,064	1,064	1,454	1,445	1,436	1,427	1,427	1,427	1,427	1,427	1,436	1,445	1,454	1,462	1,471	1,480	33,839
Plant H	707	N							171	342	513	1,256	1,922	1,922	1,922	2,033	2,025	2,042	2,042	2,059	2,067	2,084	2,102	1,948	2,110	1,922	30,481
Plant I	708	N	3,689	3,689	3,689	3,689	3,689	3,689	3,689	3,683	3,689	3,683	3,689	4,205	4,205	4,205	4,205	4,205	4,205	4,205	4,205	4,205	4,205	2,096	2,096	2,096	88,905
Plant J	709	N									206	412	412	412	412	497	497	497	532	532	497	446	412	412			6,175
Total			15,854	15,854	15,854	16,066	16,814	17,560	19,363	19,447	22,365	22,376	25,241	26,612	26,603	27,069	27,400	27,402	27,451	27,506	27,301	27,040	26,933	23,986	21,489	18,596	542,183



Sharing Generator Planned Outages

- Provide plant/meter specific outage information to individual pipelines associated with those units; this information is shared on a 6-month forward looking basis in the interest of outage coordination between all parties concerned
- ISO is actively coordinating pipeline and generator outages on a real-time and forward looking basis



Maintain Awareness and Communicate

- Generator operators and DEs should always know their specific gas (and other fuel supply) situation at all times, including alternatives as necessary
- Pipelines are being transparent and posting updates to the electronic bulletin boards
 - Be sure to follow the updated postings
- Communicate with the ISO whenever fuel supply situation changes so that the ISO has the information necessary to operate the system reliably



Questions

