October 1, 2021 | WebEx

Winter Generator Readiness Seminar

Winter 2021/2022

Agenda

1. Opening Remarks – John Norden *(no slides)*
2. Capacity Outlook & Gas-Electric Coordination – Mike Knowland
3. Winter Weather Outlook – Mike Fontaine
4. OP-21 Surveys, Forecasting & Reporting – Jaren Lutenegger
5. Dual-Fuel Auditing – Jim Nichols
6. Winter Preparedness Review – Stephen George
7. Emergency Procedure Review – Steve Gould

Capacity Outlook
Gas-Electric Coordination

Mike Knowland

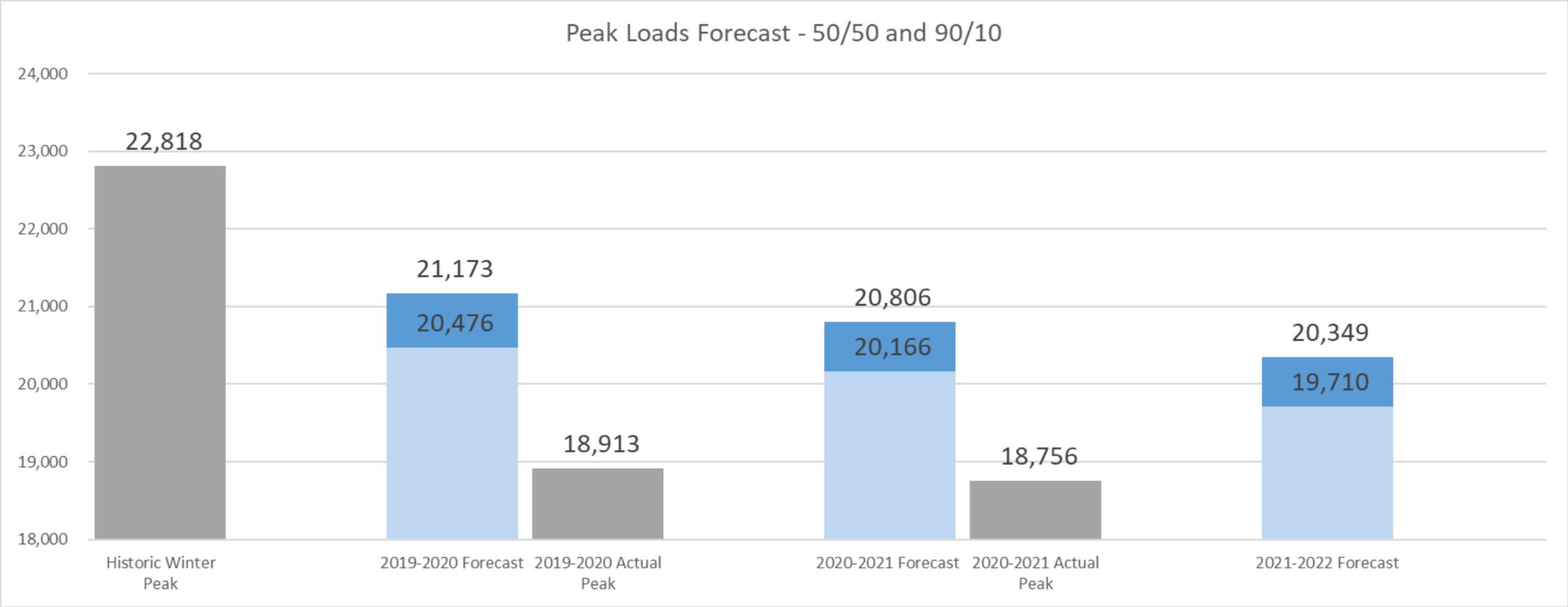
Manager, Operations Forecast and Scheduling

Capacity Outlook

Winter 2021-2022

Capacity Outlook – Peak Net Load Forecast

- Prior years load, actual vs. 50/50 and 90/10 forecast



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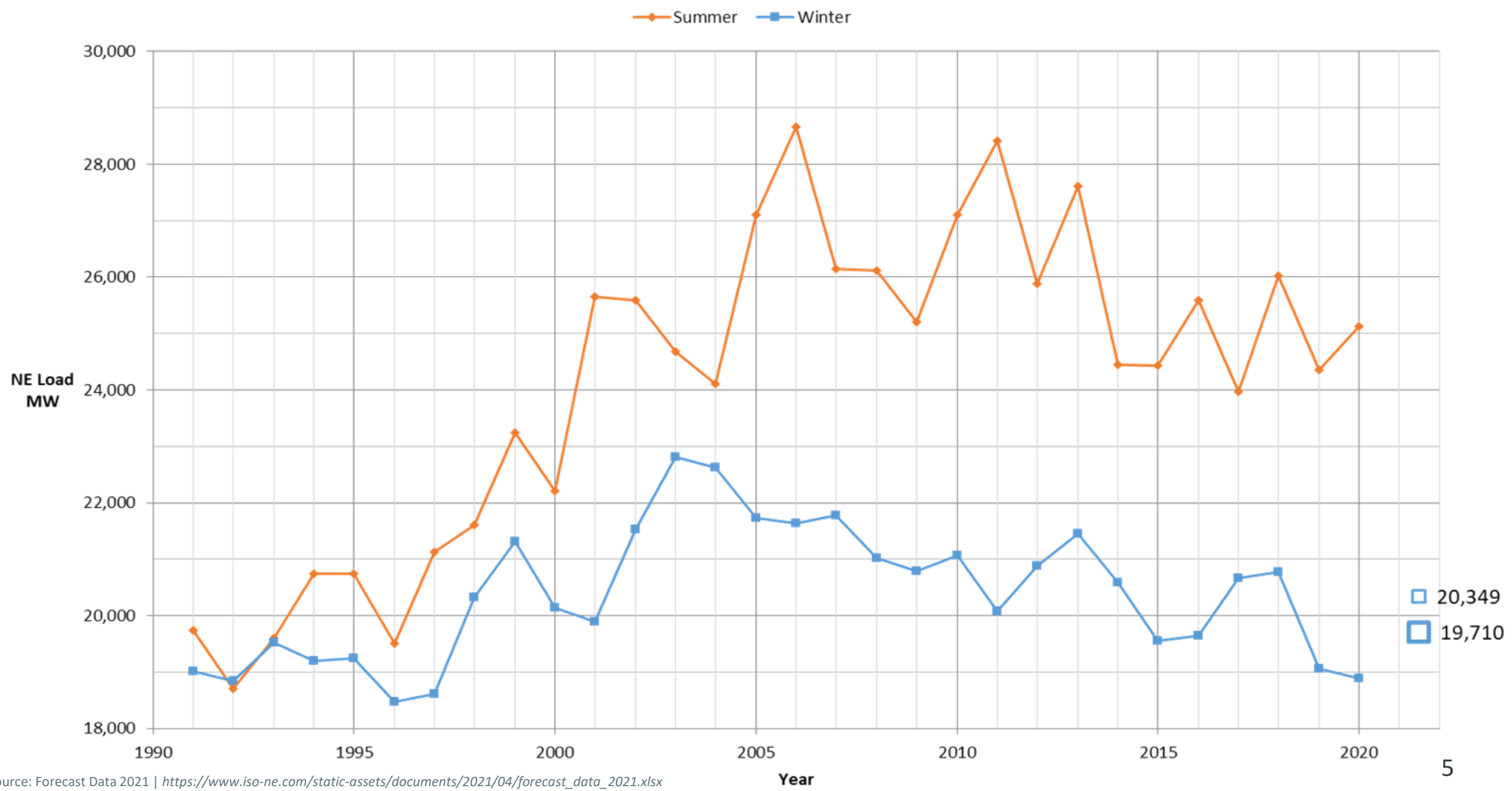
Seasonal Peak Loads



Source: Forecast Data 2021 | *https://www.iso-ne.com/static-assets/documents/2021/04/forecast_data_2021.xlsx*

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Preliminary Winter Capacity Outlook

- Operable capacity **surplus** on both the 50/50 forecast and the 90/10 forecast, using capacity supply obligation (CSO)
  - 50/50: surplus **2,495** MW
  - 90/10: surplus **1,149** MW
  - 100/0: deficient 333 MW
  - Eco Max offers are consistently above CSO
    - Can range from 1,500 to 4,000 MW
    - Approximately **2,000** MW difference between surplus on SCC vs. CSO

Operational Capacity Analysis

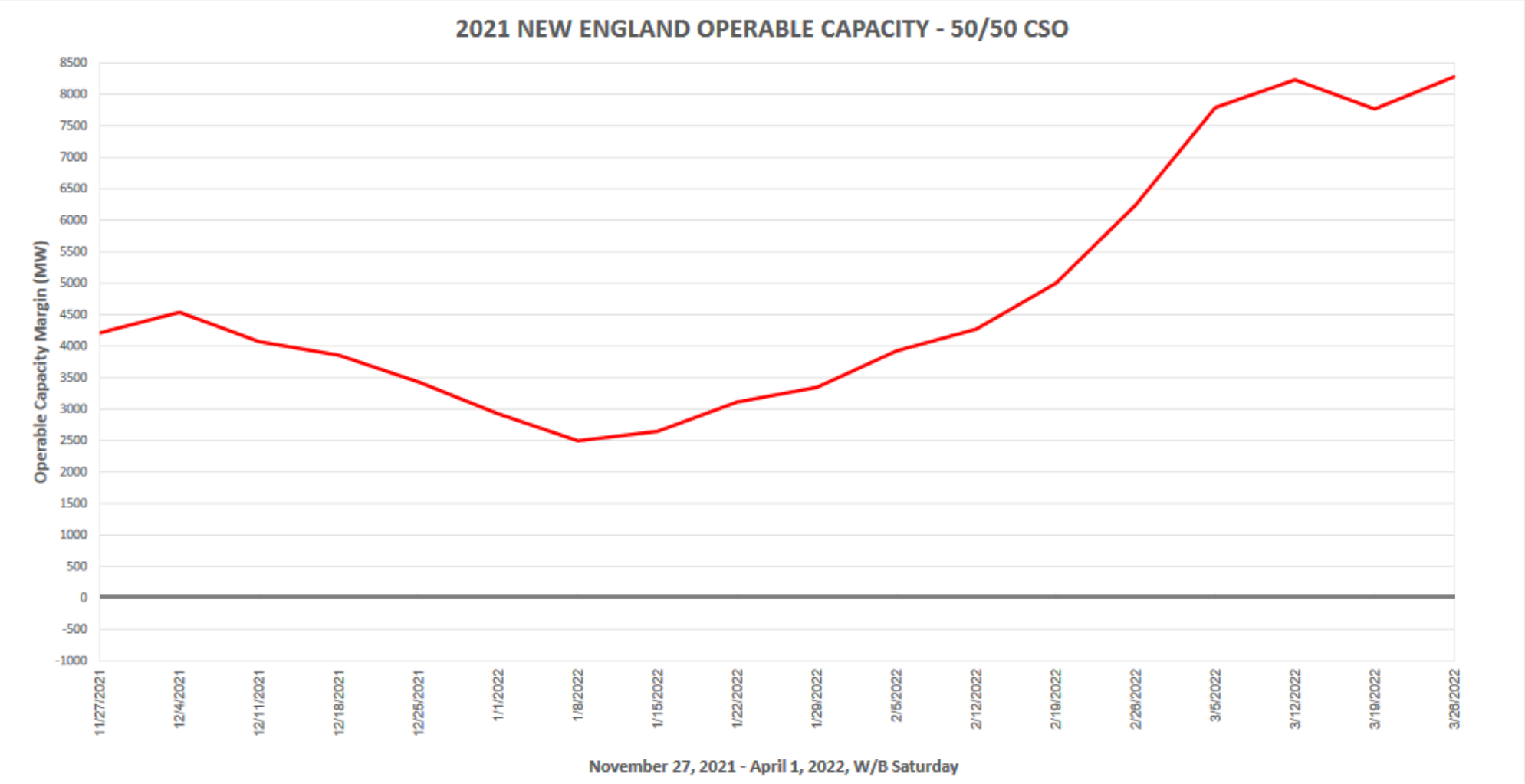
(+) Total Supply (CSO)

- Generators and demand-response resources
- External capacity transactions

(–) Demand and Supply Reductions

- Planned and unplanned outages
- Gas related outages (also unplanned)
- Peak load forecast and reserve requirements

Preliminary Winter 2021/22 Operable Capacity Analysis
50/50 Forecast (Reference)



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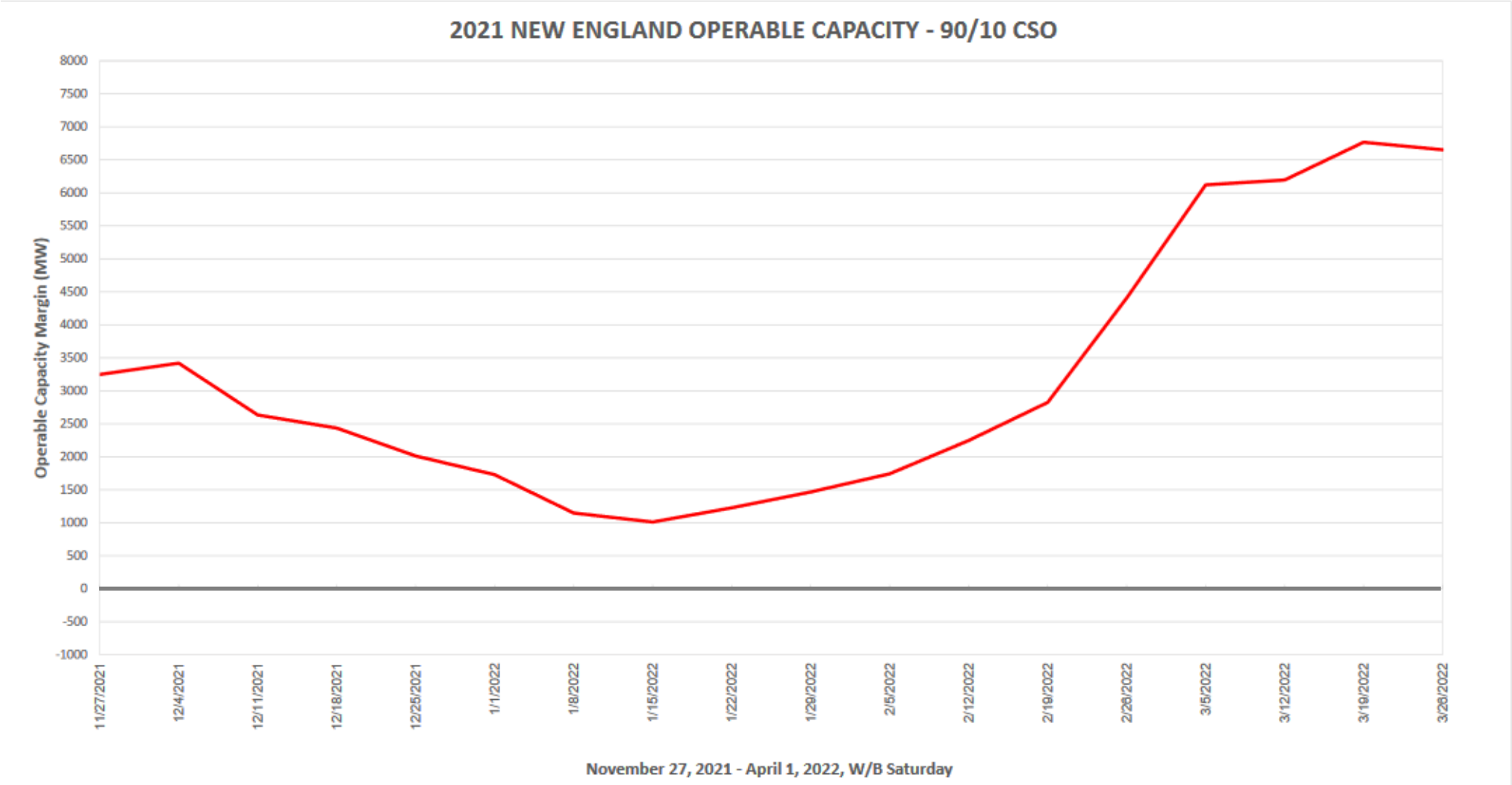
Preliminary Winter 2021/22 Operable Capacity Analysis
90/10 Forecast



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Where to find this information

- Most recently available data is in the COO report every month
  - Posted to the ISO New England website
    - Committees and Groups > Participants Committee

    - Look for COO Report from each month

☐	2020-10 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.	09/29/2020	PDF	5.2MB

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Keep Your Guard Up

Labor Day 2018

- Operable capacity analysis is a forecasted scenario before bad things happen
- Last OP-4, we started the day with over 1,900 MW surplus

H. Total Available Capacity (A+B-C-D+E-F-G)	25,035
I. Peak Load Forecast For Hour Ending 20	20,590
J. Total Operating Reserve Requirement	2,303
K. Capacity Required = I+J	22,893
L. Surplus = (+) Deficiency = (-) (H - K)	2,142
M. Replacement Reserve Requirement	160
N. Excess Commitment Surplus = (+) Deficiency = (-) (L - M)	1,982

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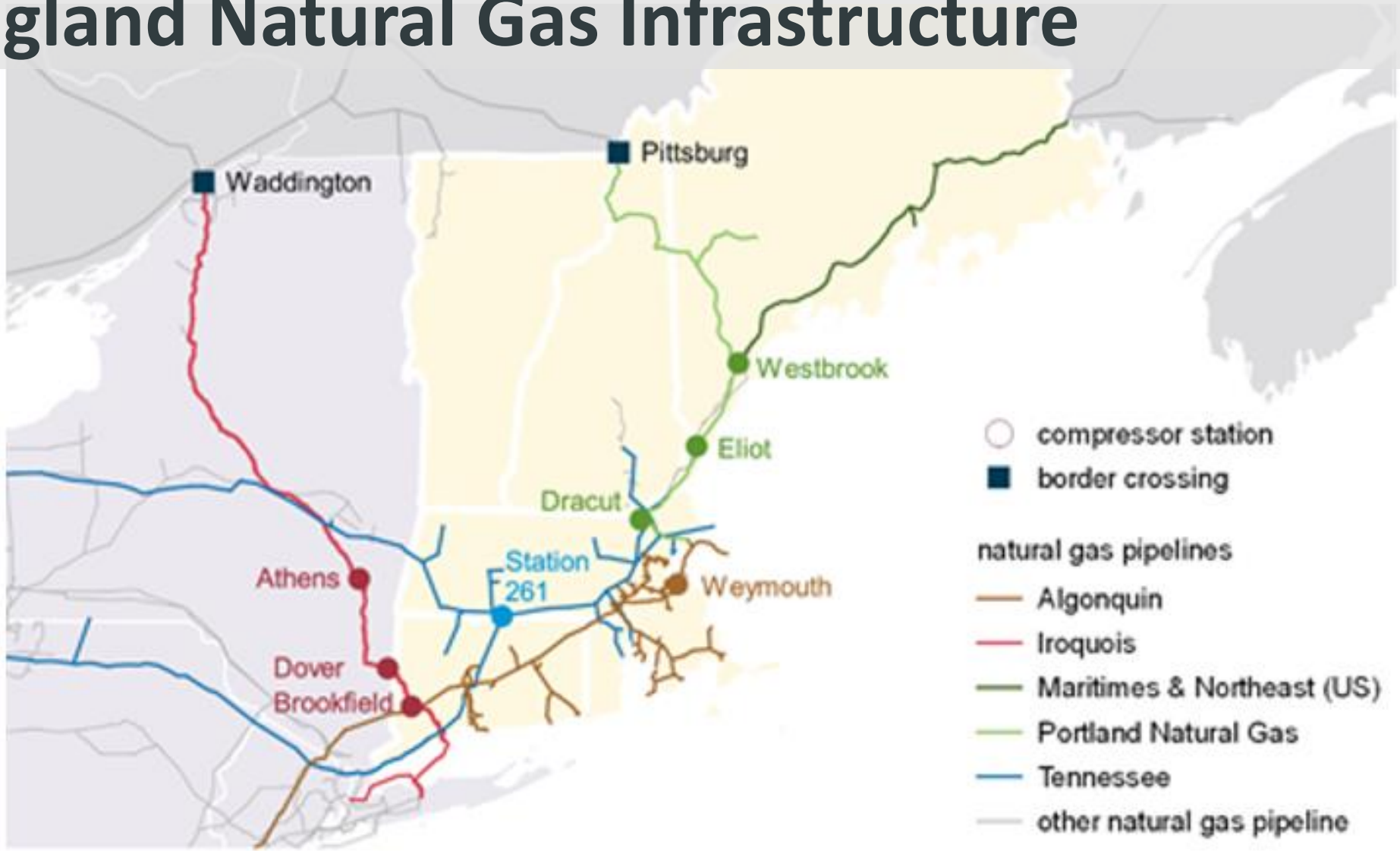
Statement on Posturing Thermal Resources

- ISO-NE does not intend to posture any thermal resources this winter for reliability
- This remains consistent with the information we have stated publicly prior to the winter of 2018/19 and adhered to
- It would have to be an extraordinary event for ISO-NE to deviate from this guidance.

Natural Gas / Pipeline Outlook

New England Natural Gas Infrastructure



eia Source: U.S. Energy Information Administration

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New England Gas Sources

- Pipeline western supply is at capacity every day
  - Southeast Compressor Station (Algonquin)
  - Station 254 (Tennessee)
- Additional Pipeline Supply
  - Waddington (Iroquois) supply through NY
  - Pittsburg (PNGTS) from Canadian pipelines
- Liquefied Natural Gas
  - Canaport, via the M&N pipeline (Brunswick Meter)
  - Distrigas (Algonquin and Tennessee pipelines)
  - Northeast Gateway Deepwater Port (Excelerate Buoy)

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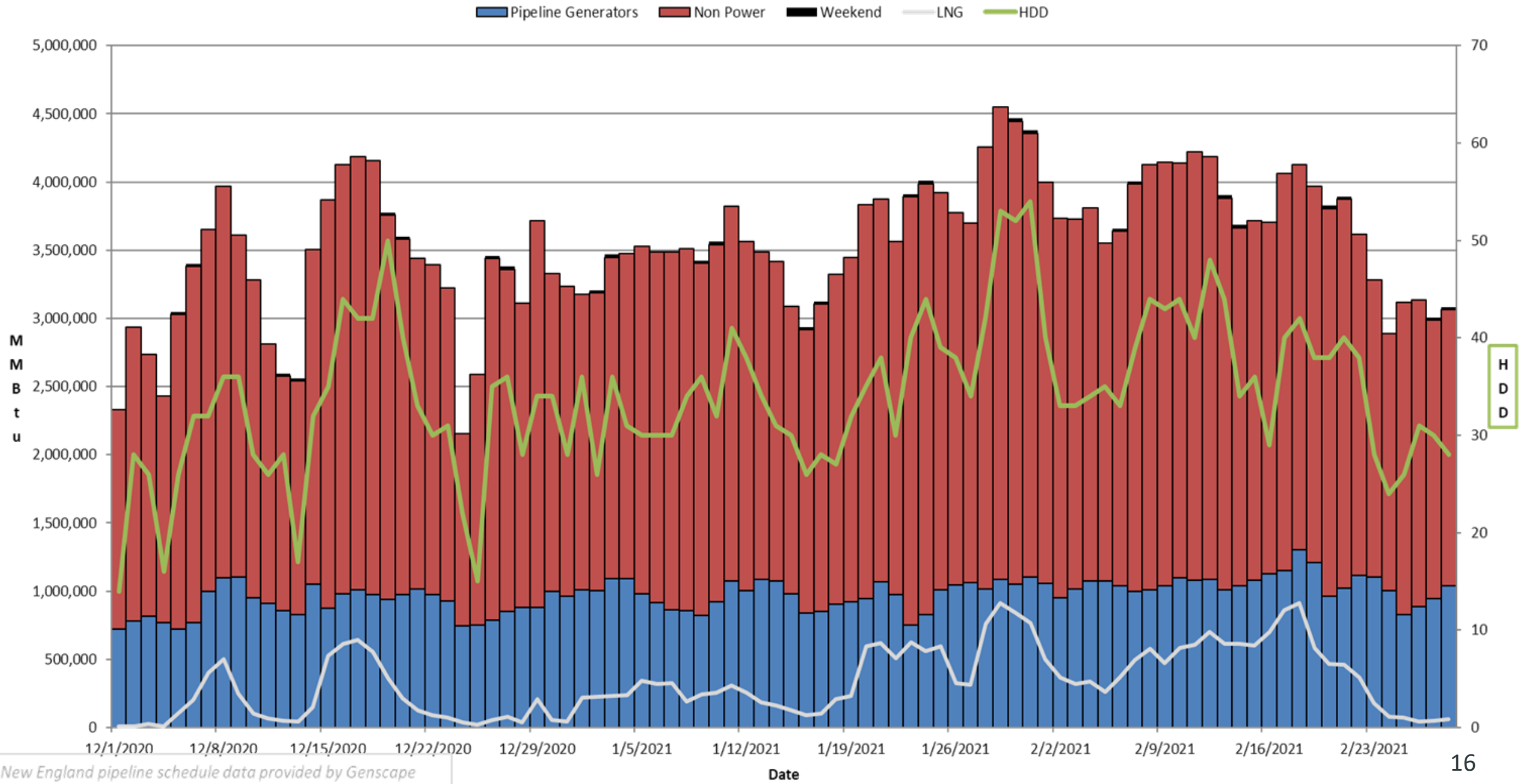
Natural Gas Schedules to Generators vs. Non-Power Use - Winter 2020 - 2021



New England pipeline schedule data provided by Genscape

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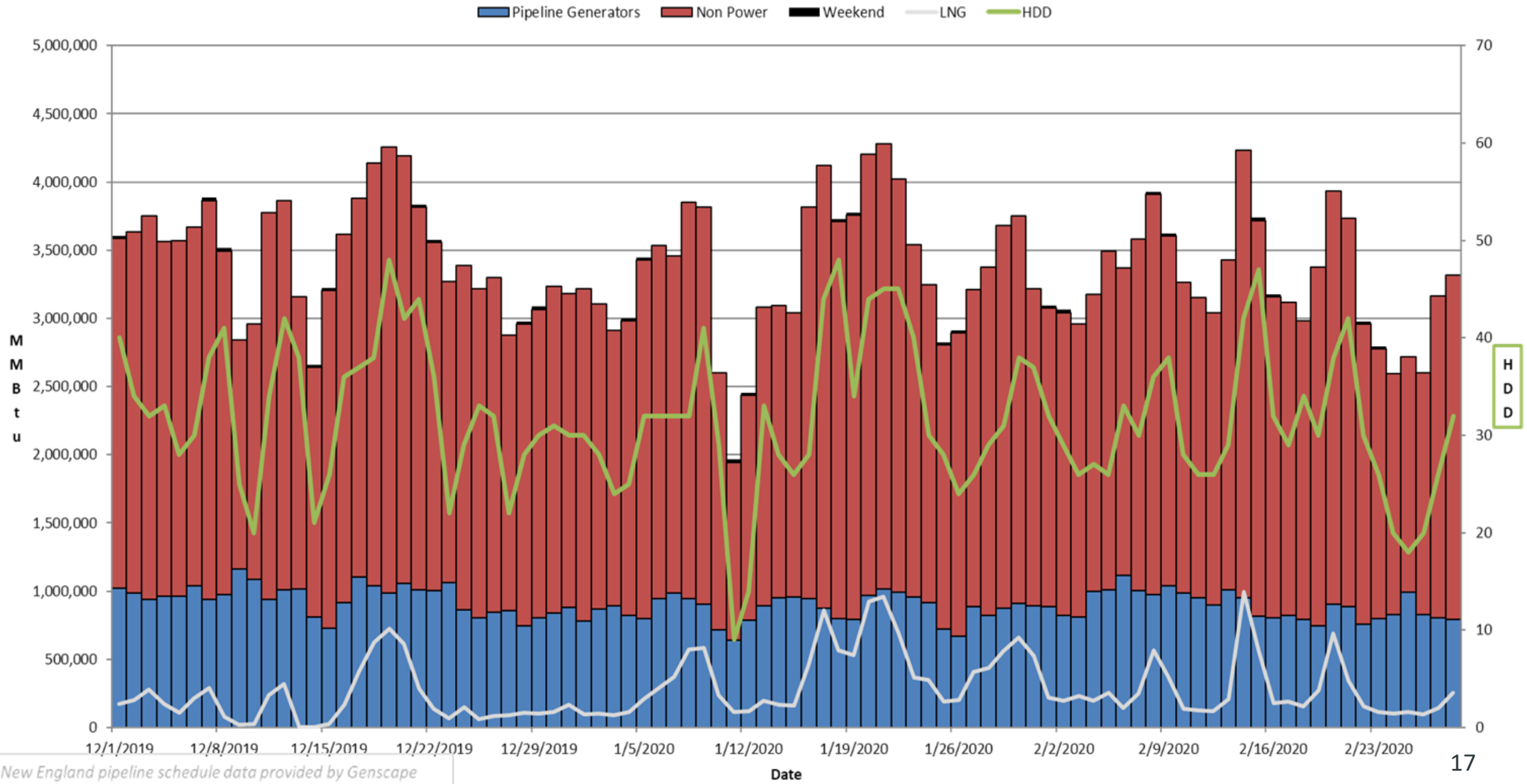

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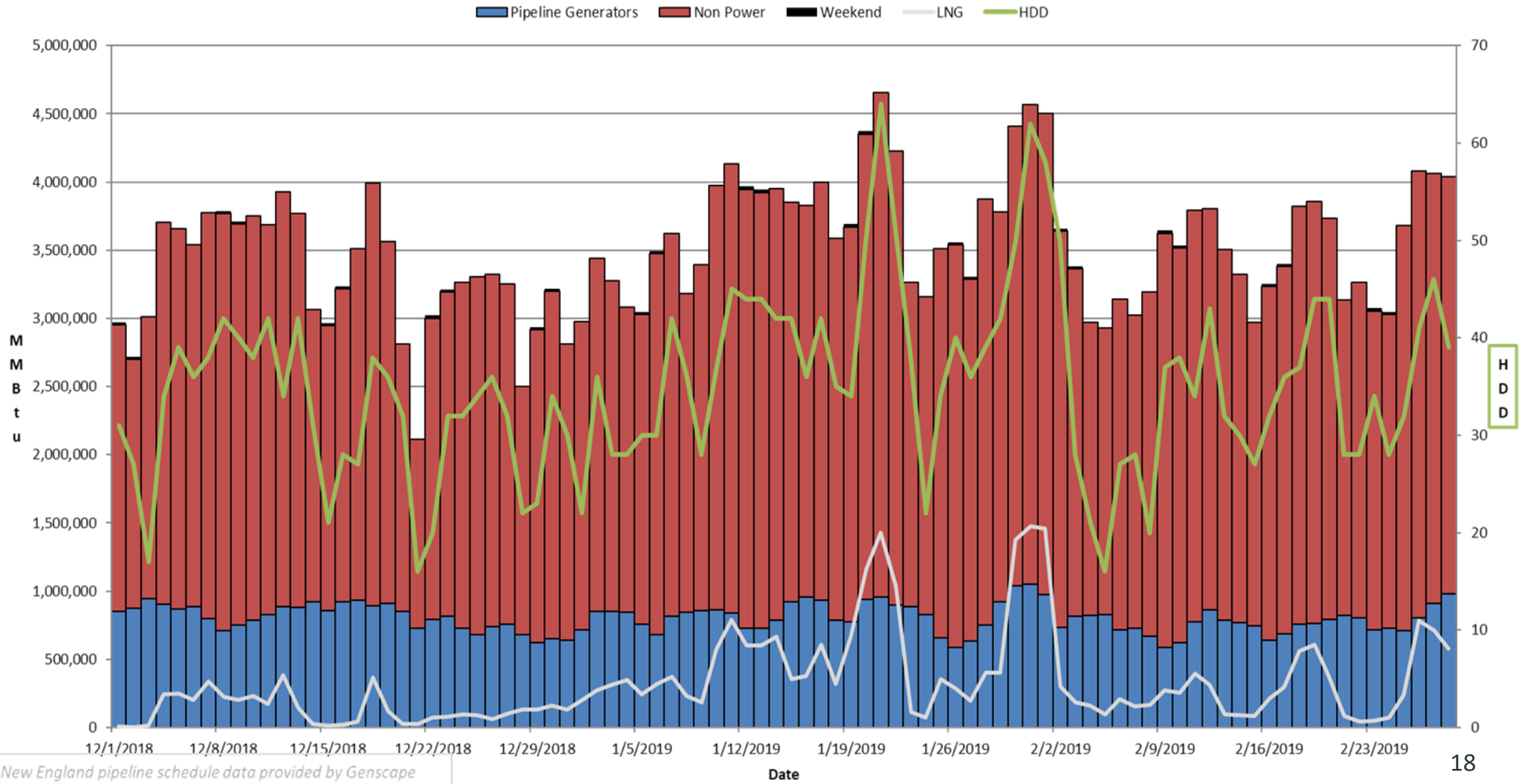

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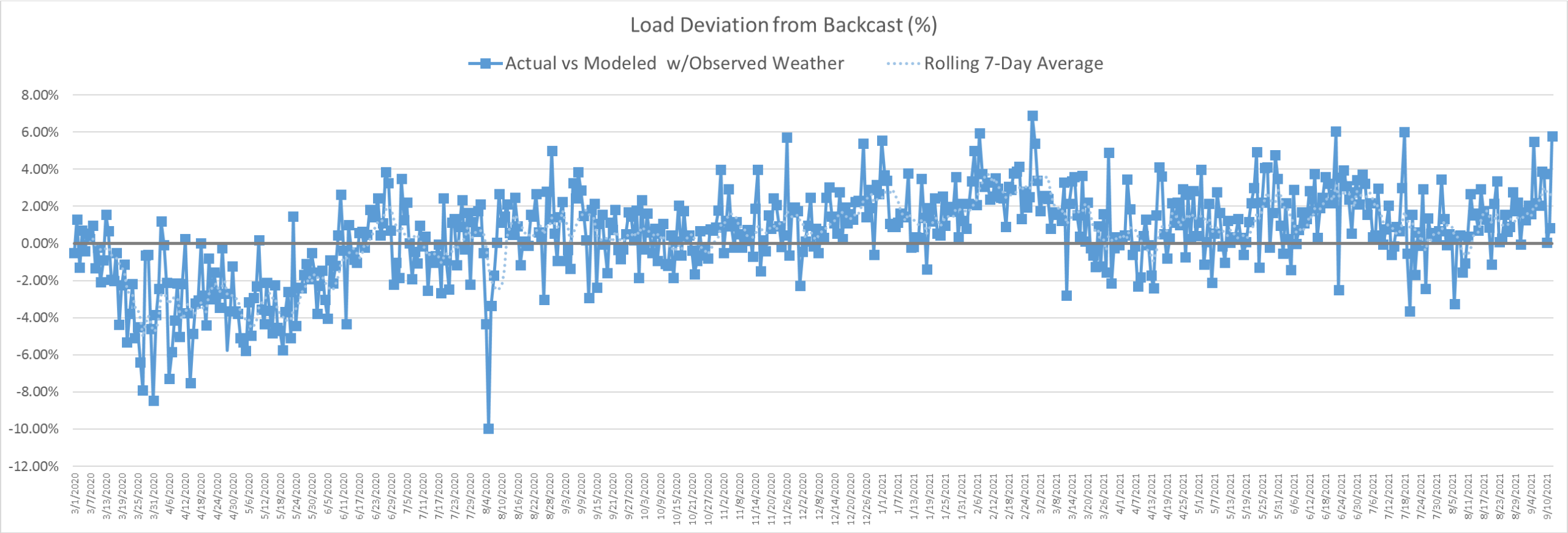
COVID-19 Impact on Demand

Follows the trend of pandemic response

Electric Demand



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Societal Impacts

- Some unknown societal factors will continue to exist throughout this winter
  - Restrictions come and go with the trend of the case counts
  - Working from home will impact demand
  - Distribution and success rate of the vaccine will influence actions taken by state and federal government, employers, and businesses
- Be prepared for winter gas demand to follow the same trend for heating residential vice commercial and industrial
  - There is limited historical data to determine the expected outcome

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Gas – Electric Scheduling

Review of Timelines and Offer Flexibility

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

Fuel Price Volatility and Offer Flexibility

- Offer Flexibility allows for Generators to proactively adjust offers intraday as fuel prices fluctuate on spot market
- Most parameters can be offered on an hourly granularity and re-offered or redeclared throughout the course of the day
  - Generator limits can be redeclared
  - Price/MW pairs and costs can be re-offered up to 30 minutes prior
- For a more detailed overview of the Energy Market Offer Flexibility (EMOF) project, visit
  - http://www.iso-ne.com/static-assets/documents/support/training/courses/energy_mkt_ancil_serv_top/energy_market_offer_flexibility_06_2014.pdf

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Opportunity Cost

- Intended to enhance the ability of economic commitment and dispatch to make the most cost-effective use of limited fuel supplies during stressed operating conditions
- Mechanism used to incorporate the future value of limited inventoried fuel into reference pricing
- More information
  - https://www.iso-ne.com/participate/support/participant-readiness-outlook/emoc-project

Gas – Electric Coordination

Control Room's role during normal, abnormal, or emergency conditions

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)
    - 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. you don't 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 DE to communicate any changes in generator capability to the ISO-NE Control Room

Pipeline Communication Information Policy

FERC Pipeline Communication/Info Policy

- ISO-NE changed the **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.

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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 designated entities 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

Electronic Bulletin Board Links

- Algonquin
  - https://infopost.enbridge.com/infopost/AGHome.asp?Pipe=AG
- Maritimes and Northeast
  - https://infopost.enbridge.com/InfoPost/MNUSHome.asp?Pipe=MNUS
- Tennessee
  - https://pipeportal.kindermorgan.com/portalui/DefaultKM.aspx?TSP=TGPD
- Iroquois
  - https://iolz.iroquois.com/infopost/Pages/Default.php
- Portland Natural Gas Transmission System
  - http://www.columbiapipeinfo.com/cpginfopost/

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Questions

Click here to go back to the Agenda

October 1, 2021

Winter Weather Outlook

Winter 2021-2022

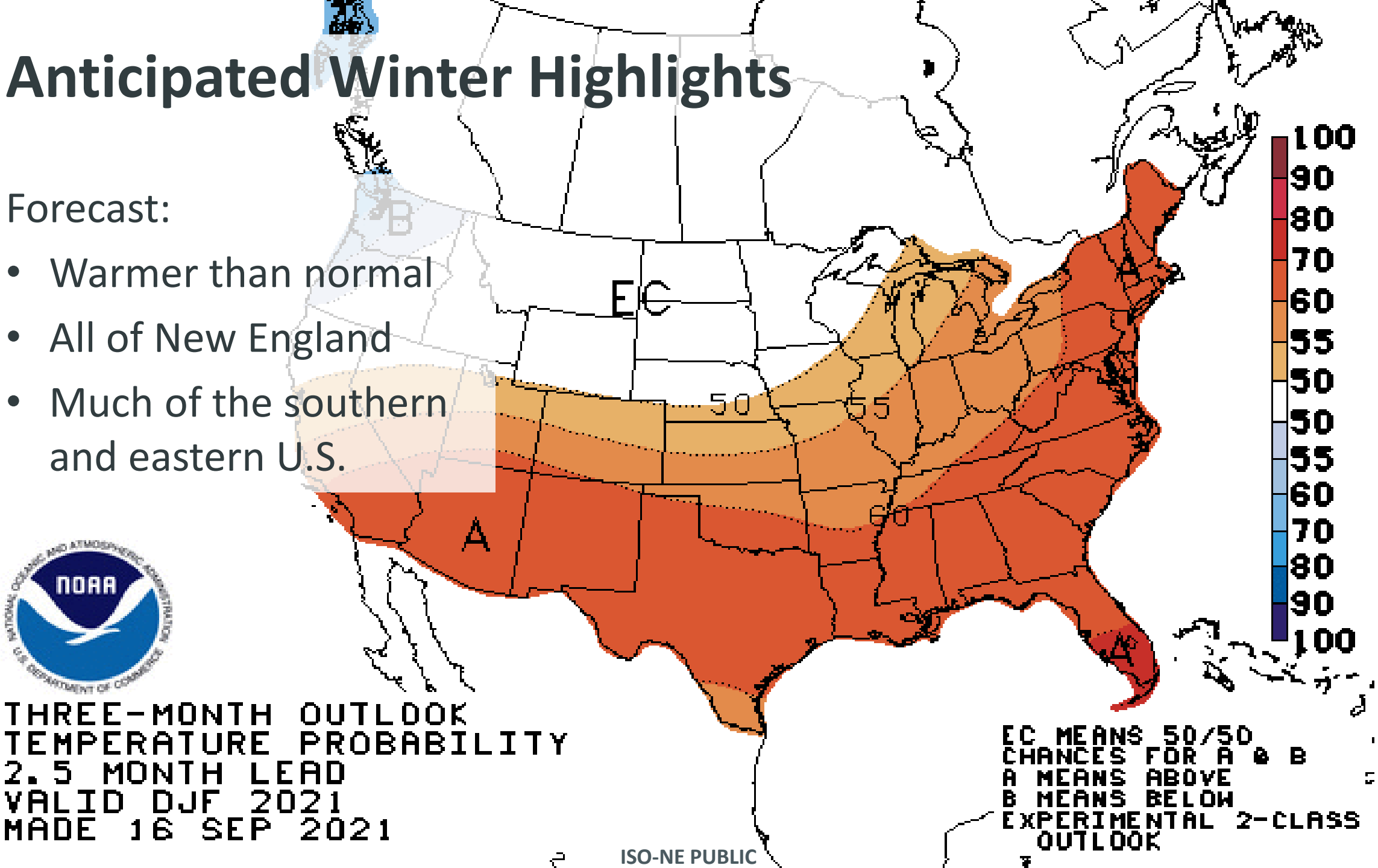
Mike Fontaine

Lead Forecast Analyst, Forecasting & Scheduling

Anticipated Winter Highlights

Forecast:

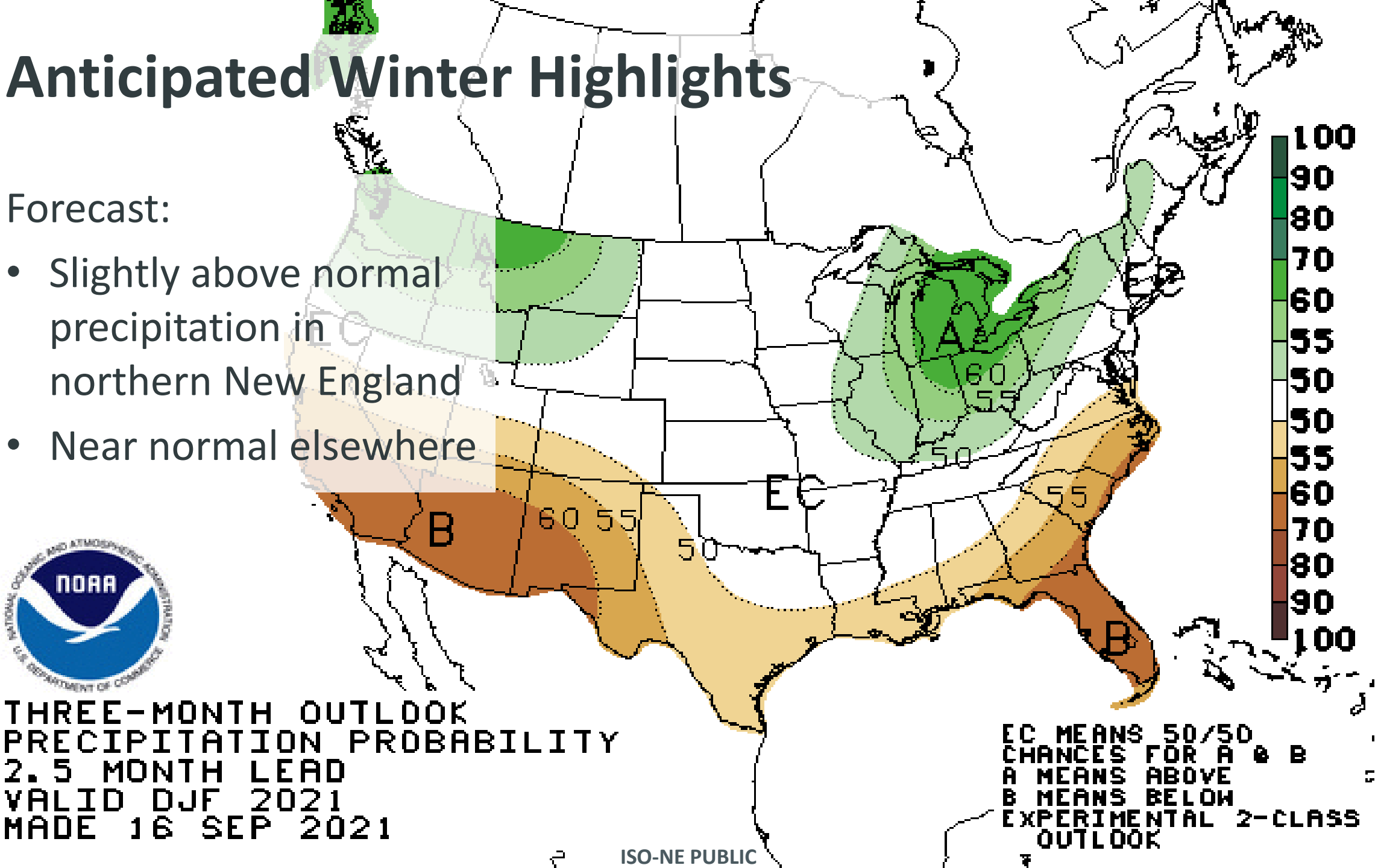
- Warmer than normal
- All of New England
- Much of the southern and eastern U.S.



Anticipated Winter Highlights

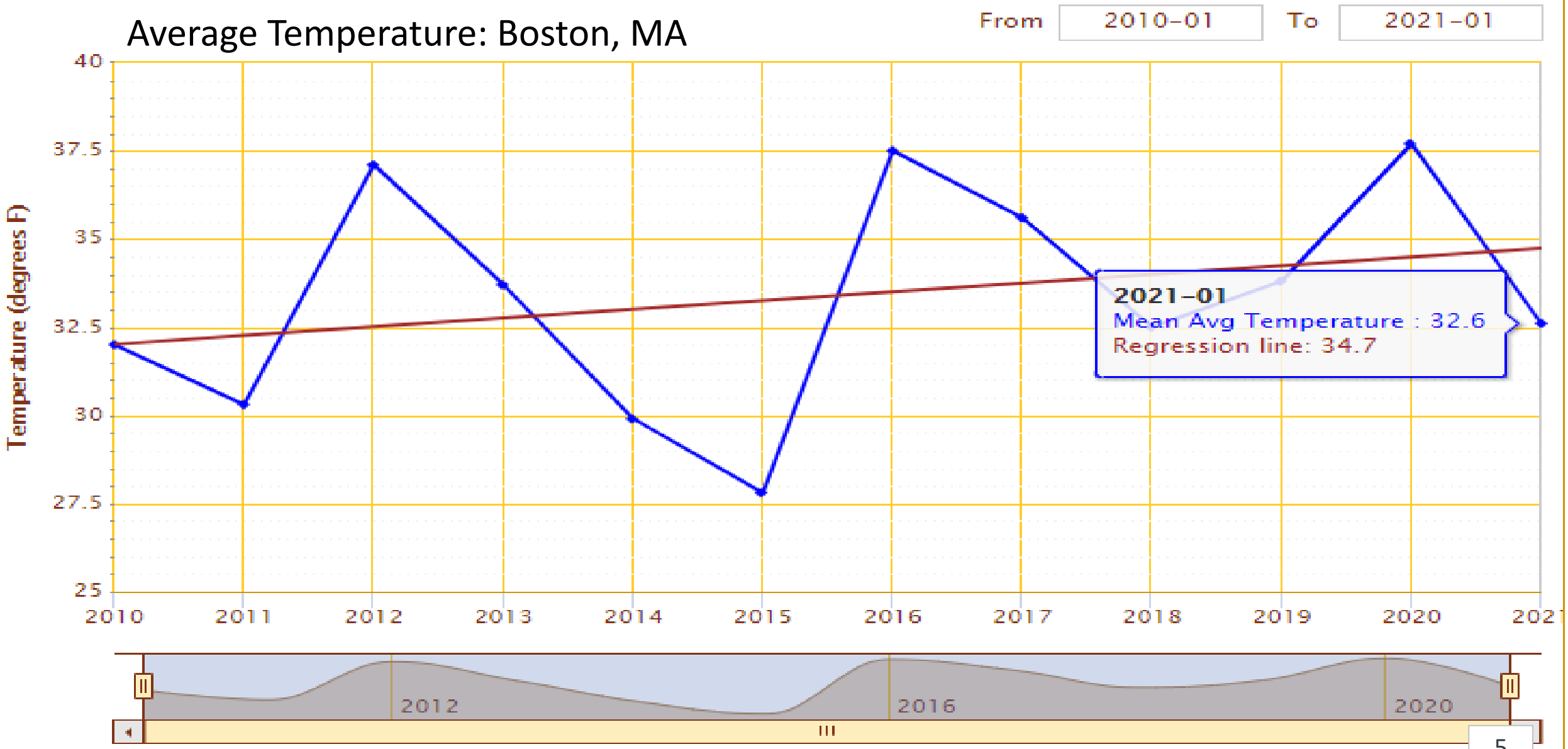
Forecast:

- Slightly above normal precipitation in northern New England
- Near normal elsewhere



Last Decade: Winter Temperature Trend

Average Temperature: Boston, MA



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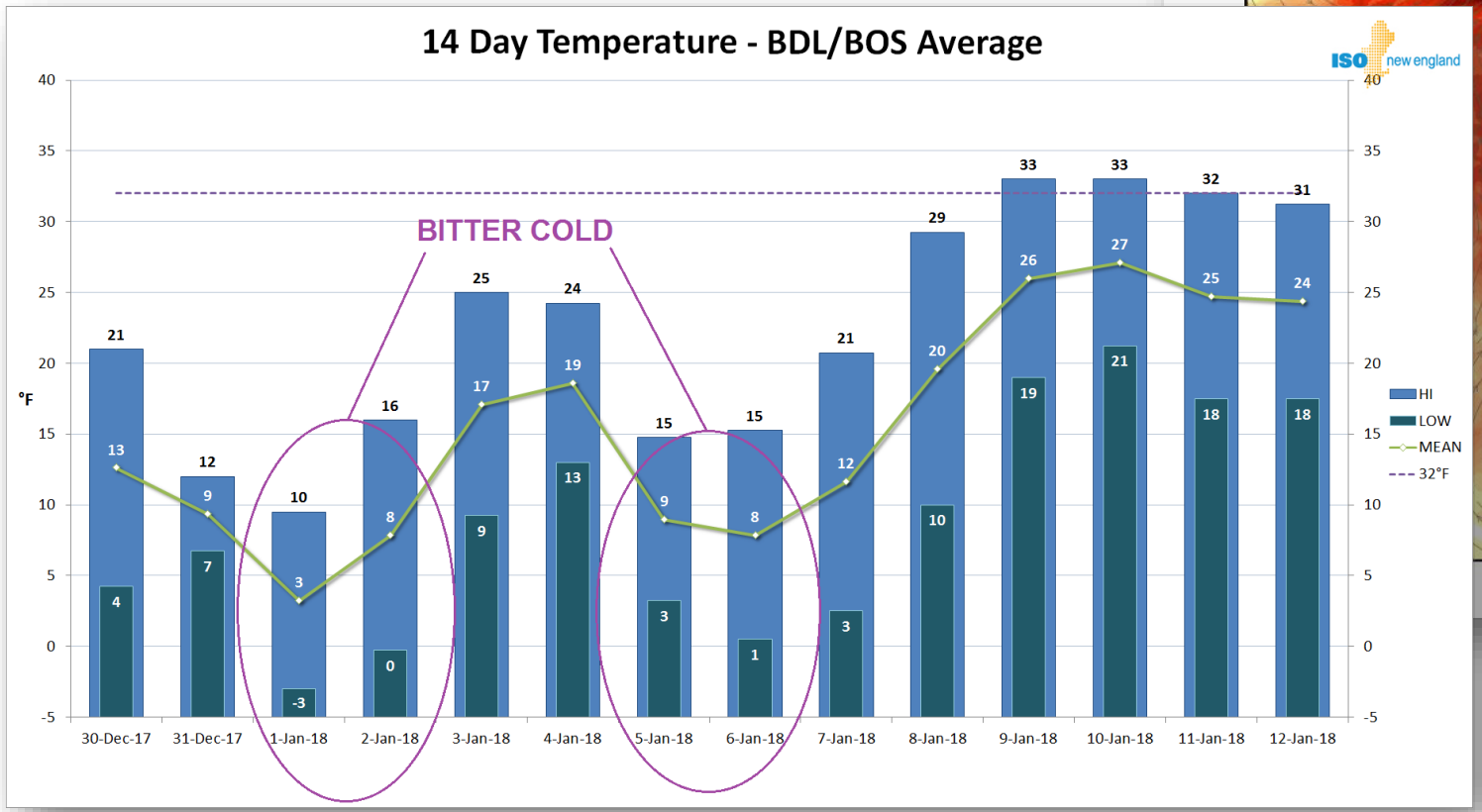
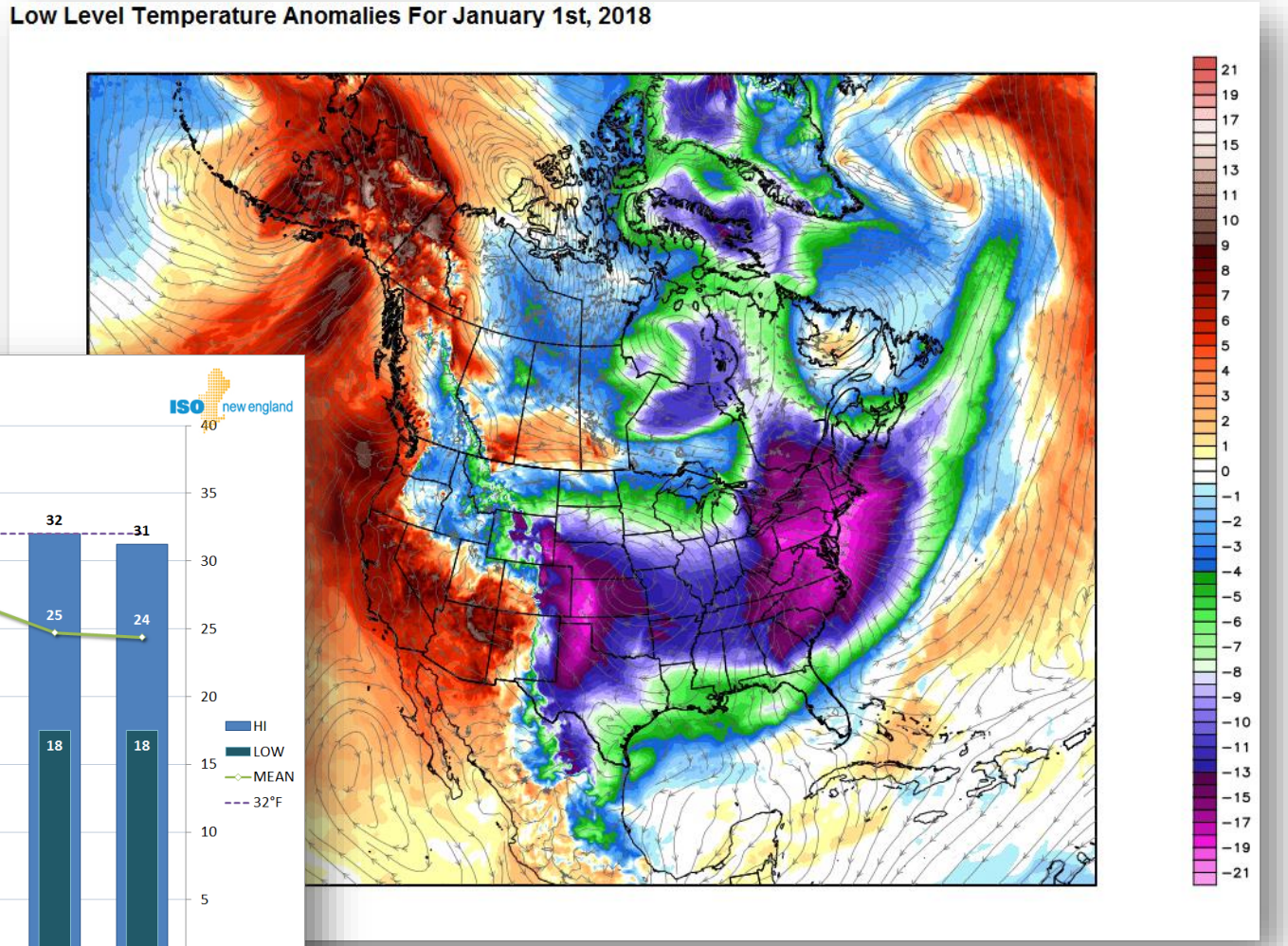
Major Outbreak During a ‘Normal’ Winter





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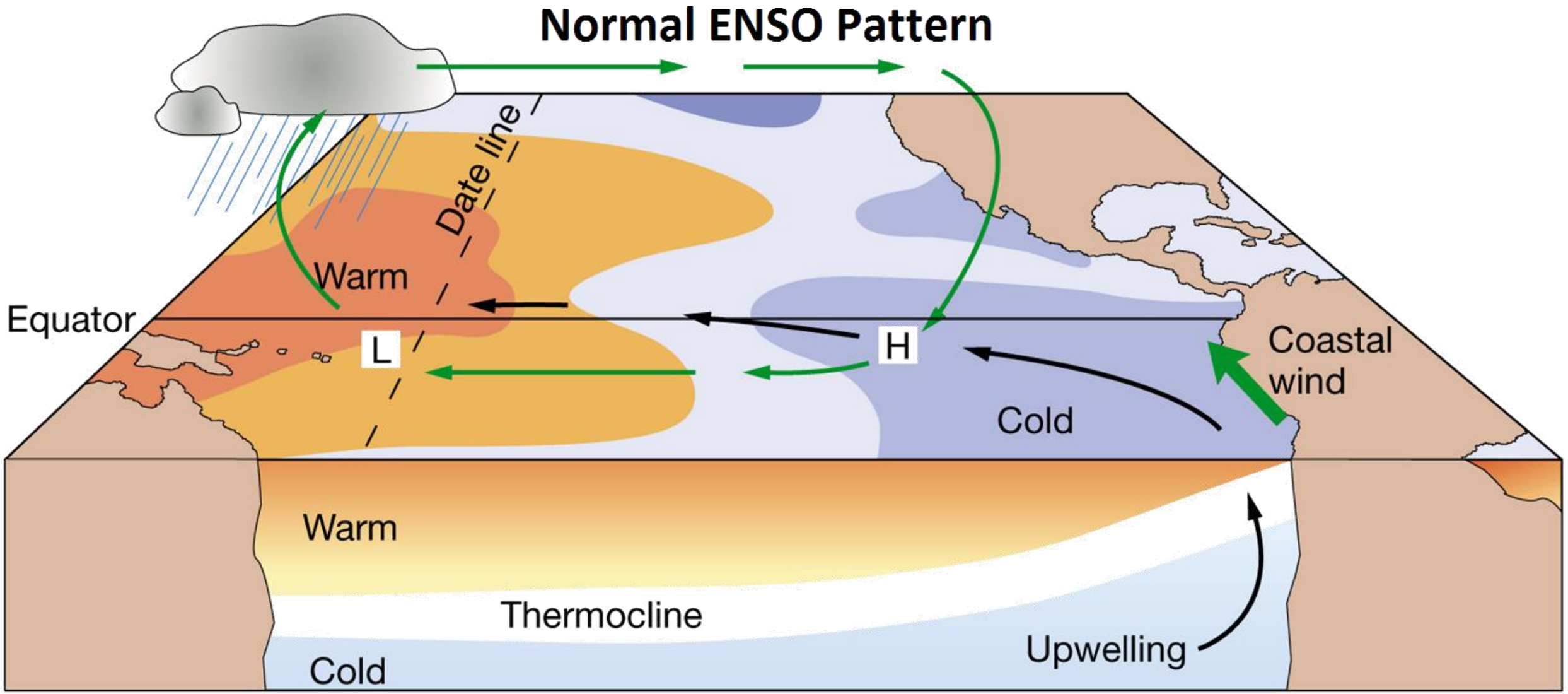
Primary Weather Indices

Which Impact New England Winters

El Niño – Southern Oscillation (ENSO)



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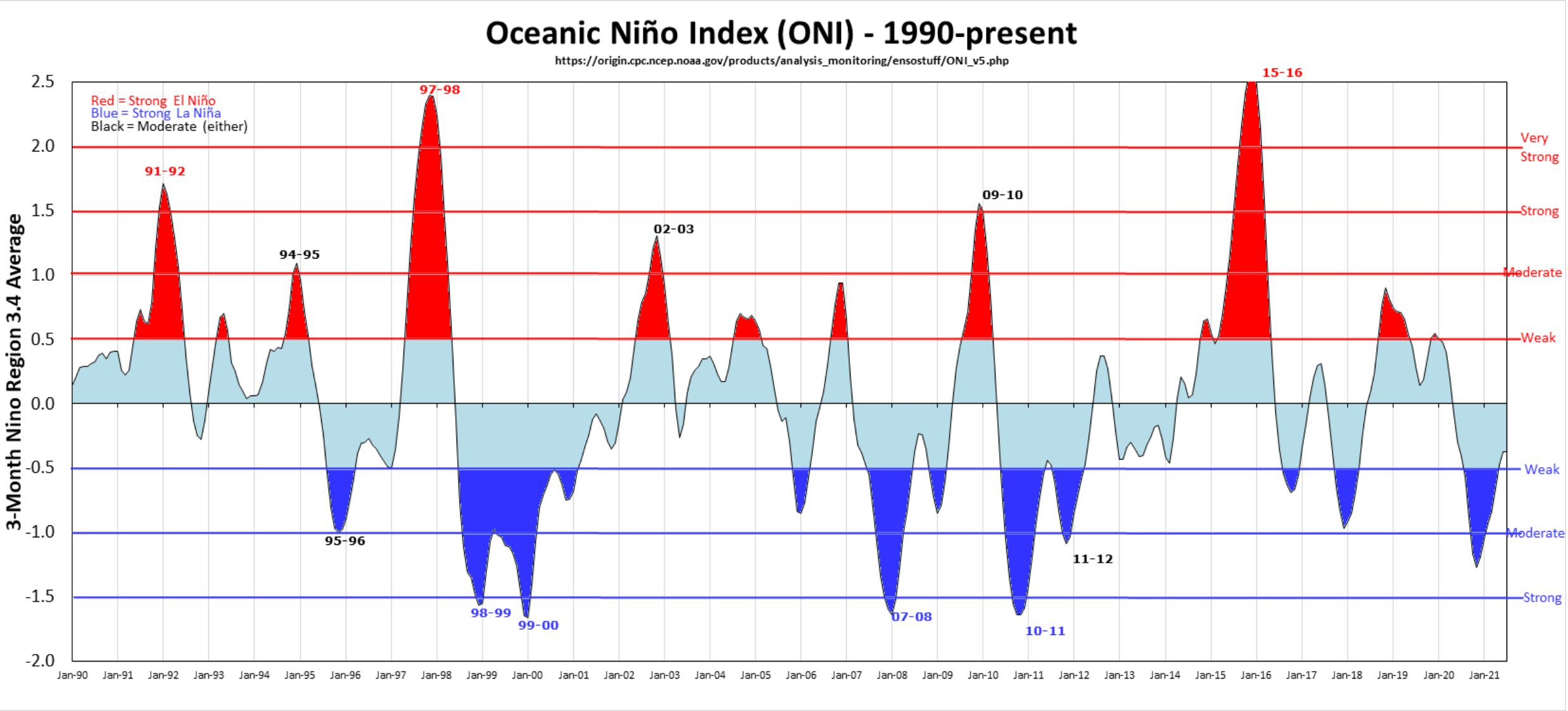
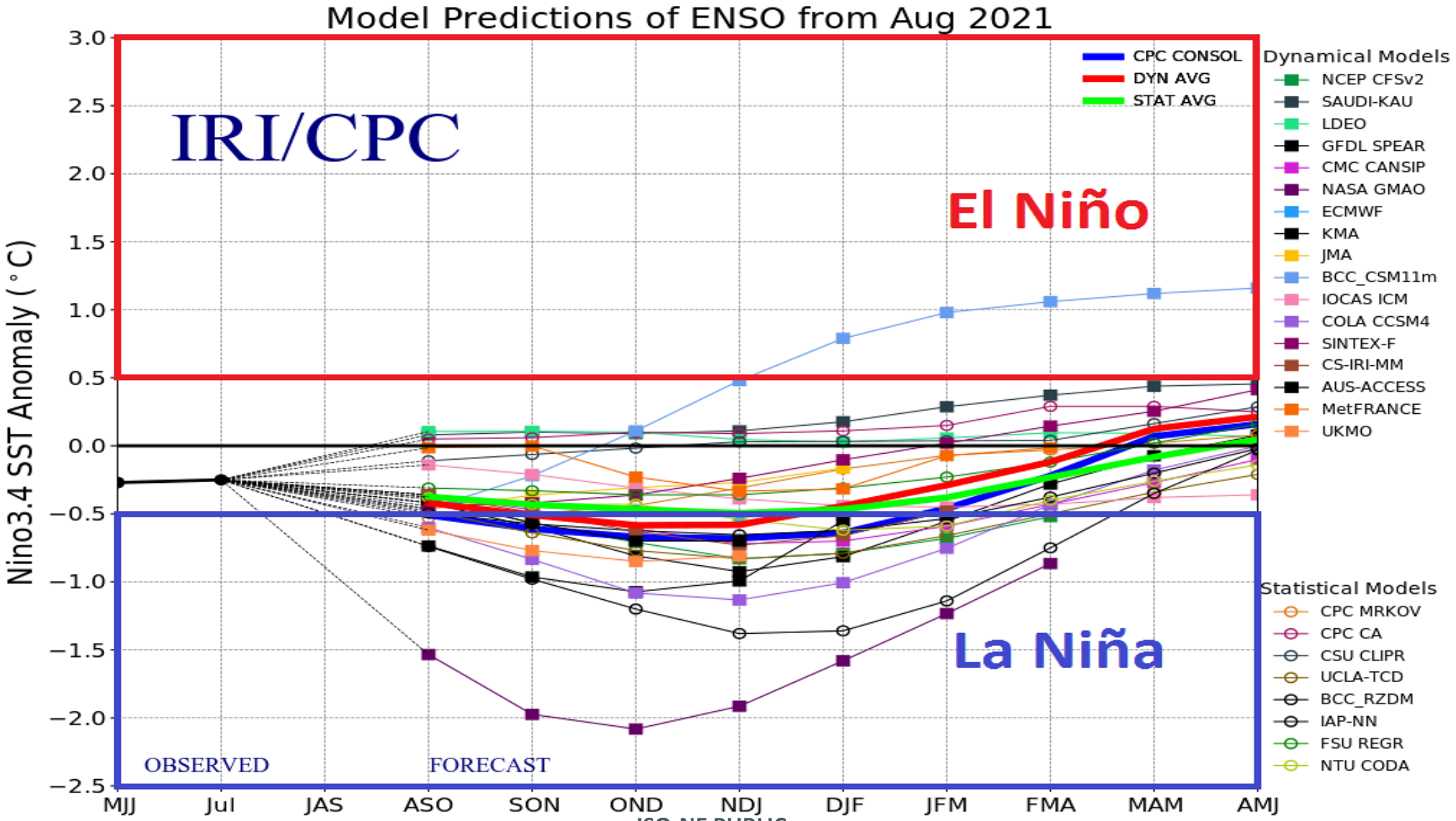
30-Year El Niño Southern Oscillation History



La Niña is Predicted



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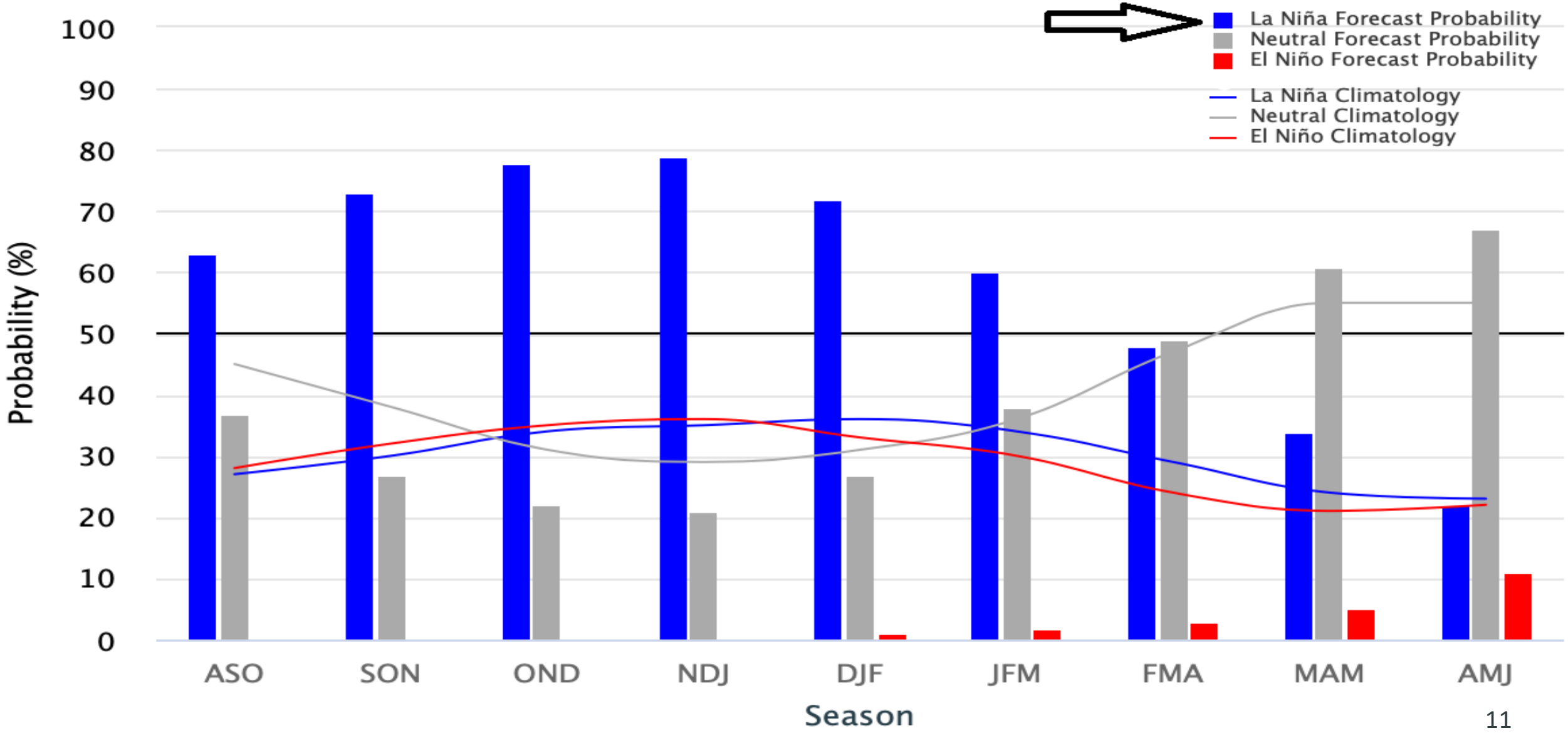
Early-September 2021 CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: -0.5 °C to 0.5 °C



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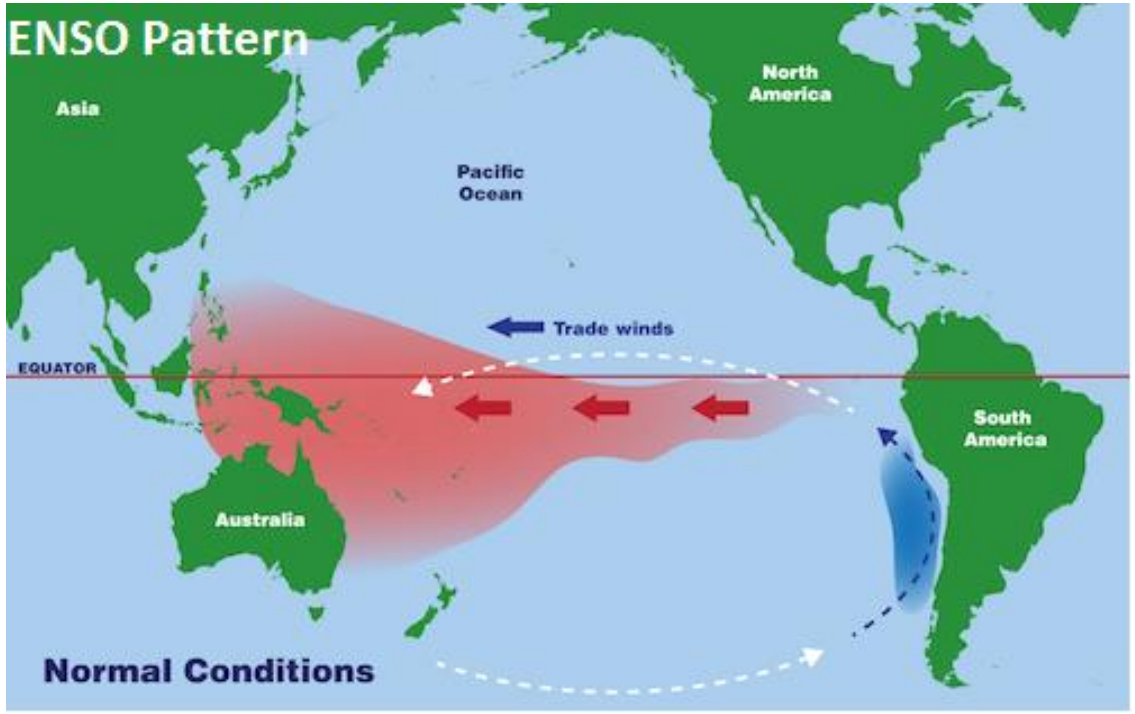
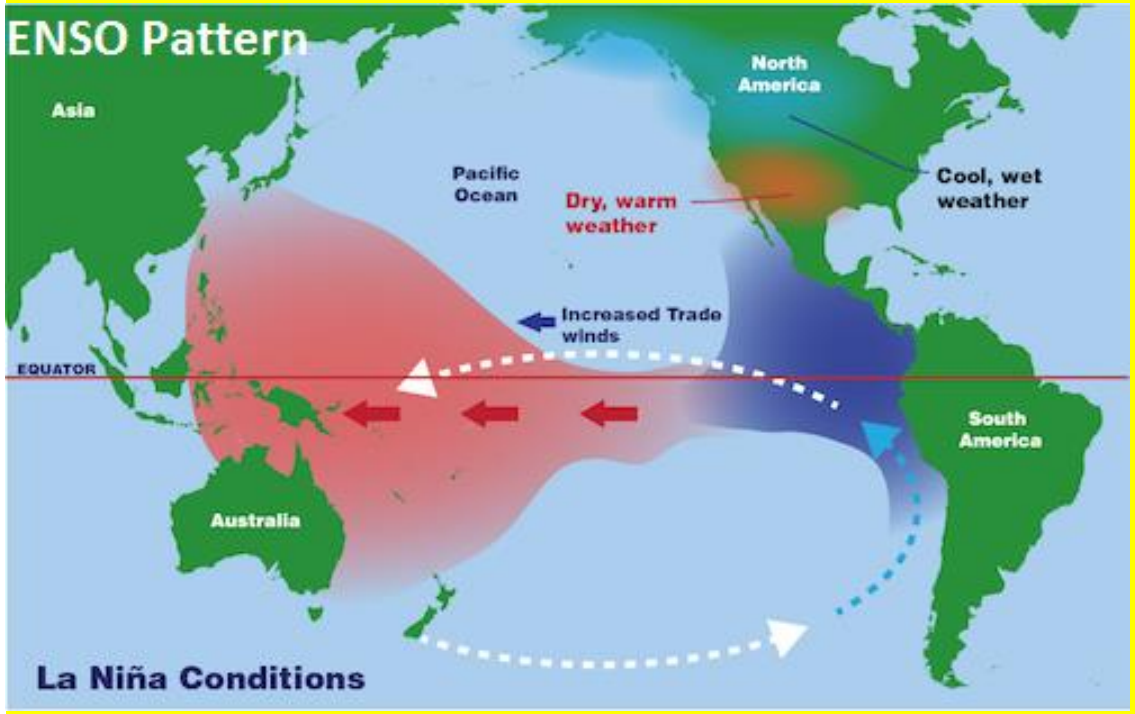
Cooler Than Normal Waters in Eastern Pacific

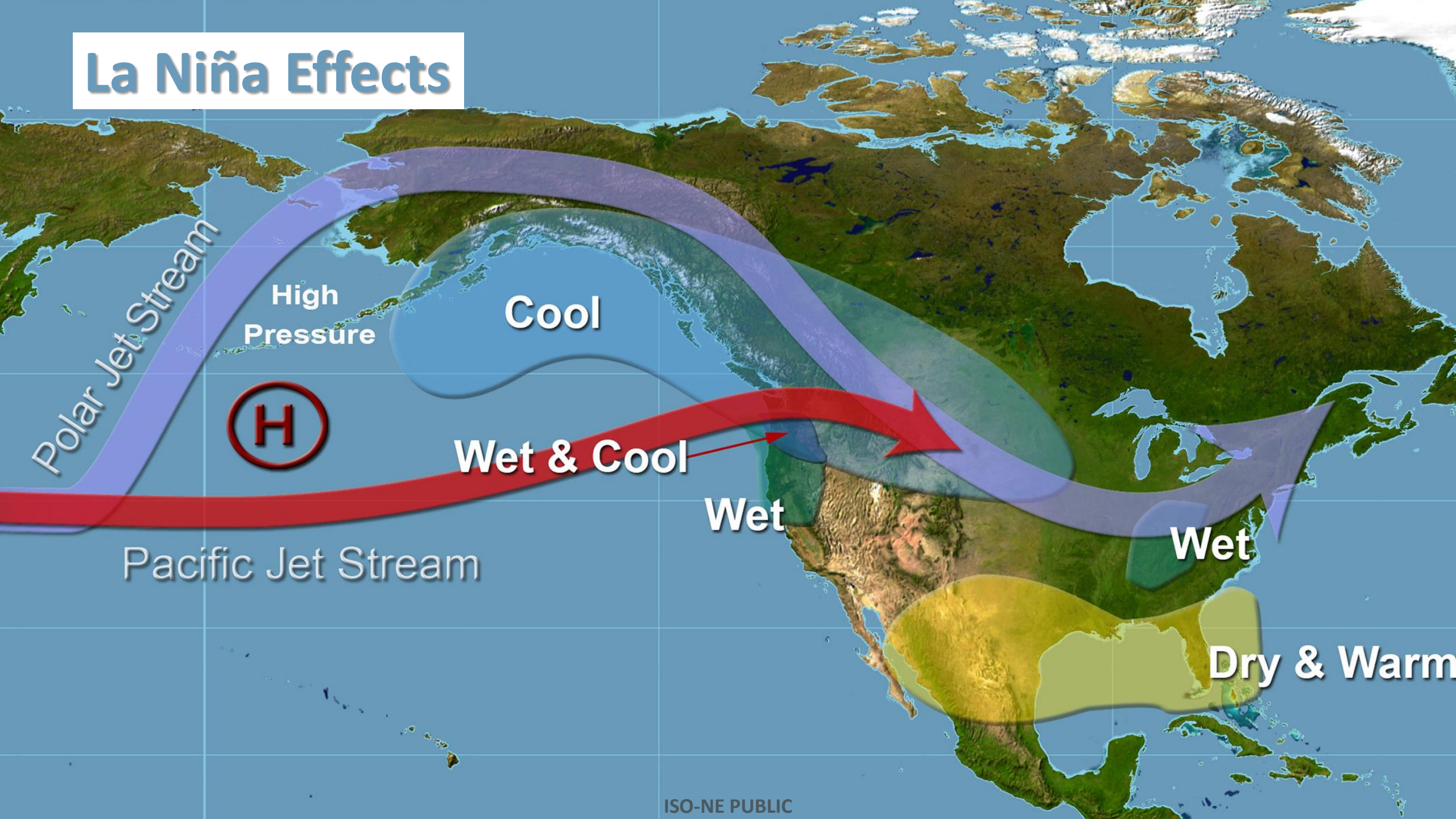
Normal Conditions



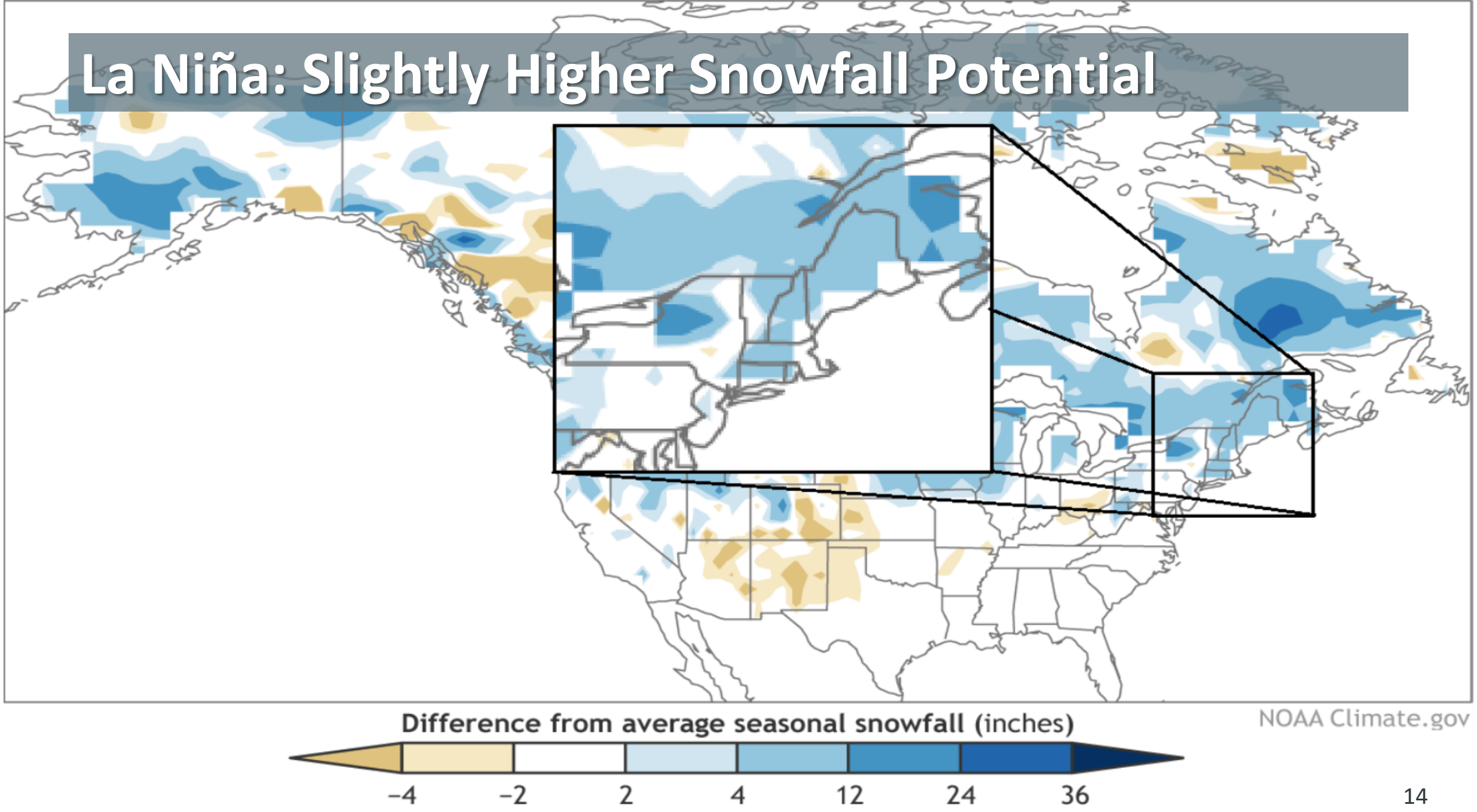
La Niña Conditions



La Niña Effects



La Niña: Slightly Higher Snowfall Potential



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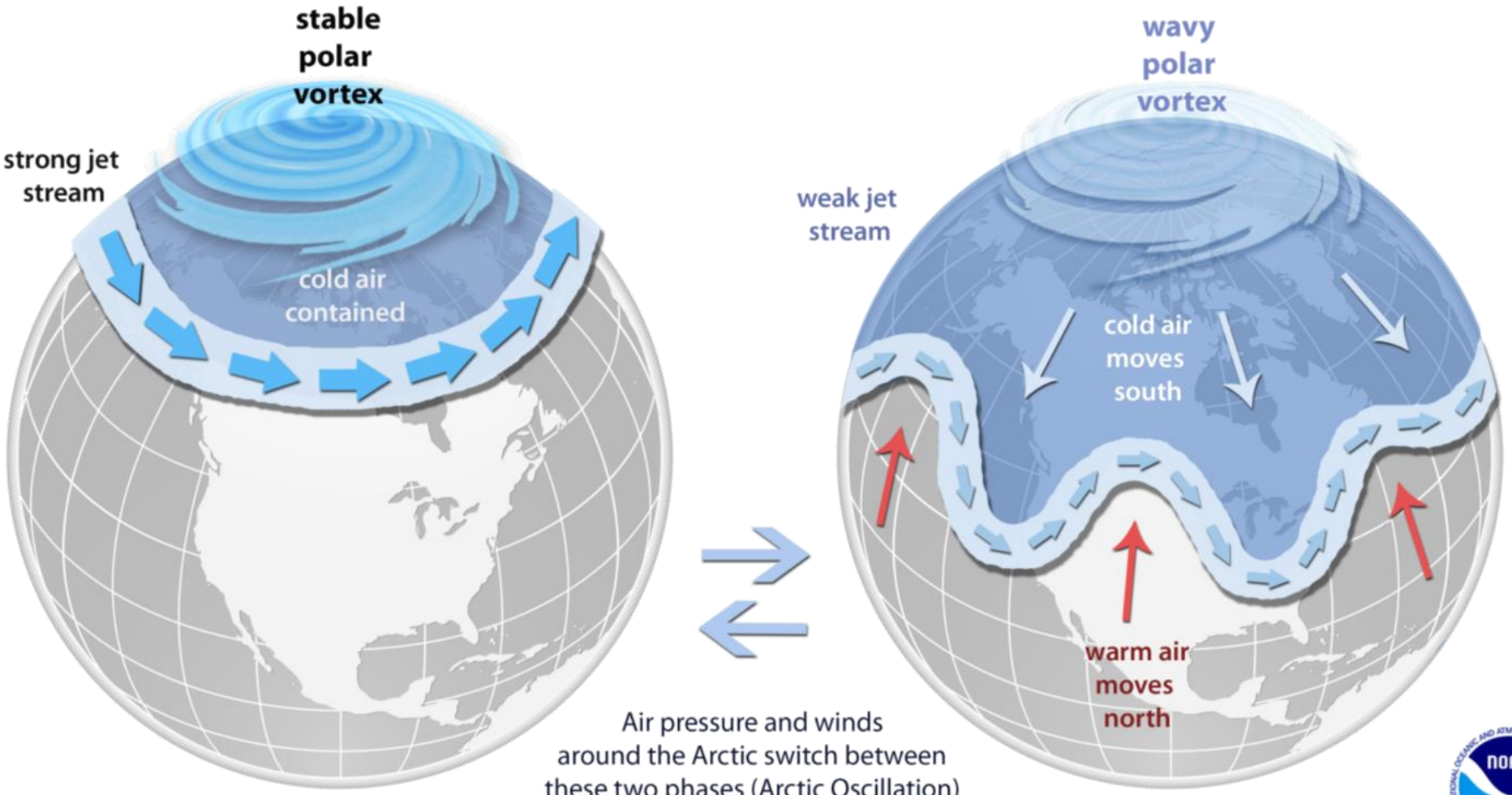
Polar Vortex

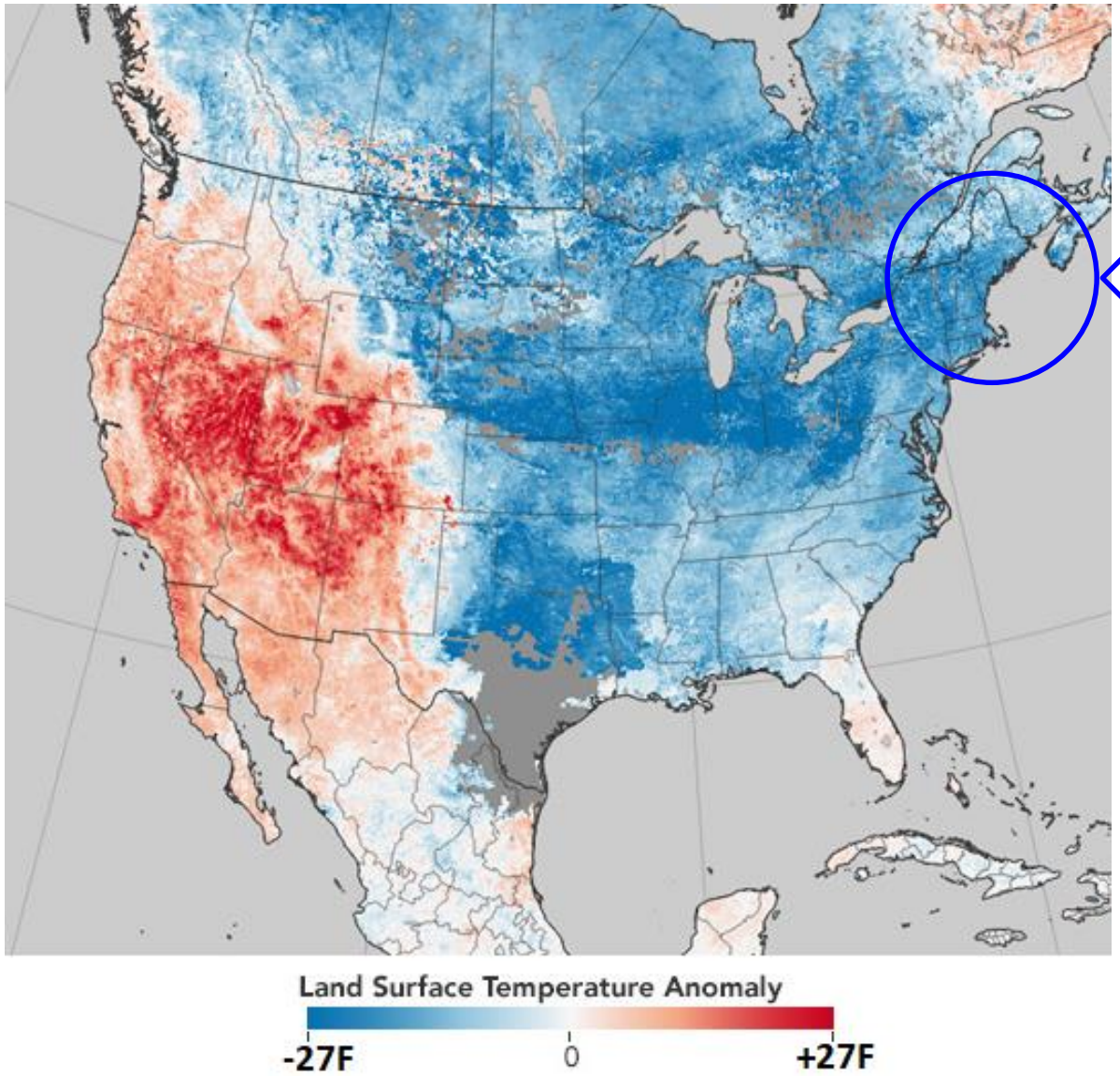
The Science Behind the Polar Vortex

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*.



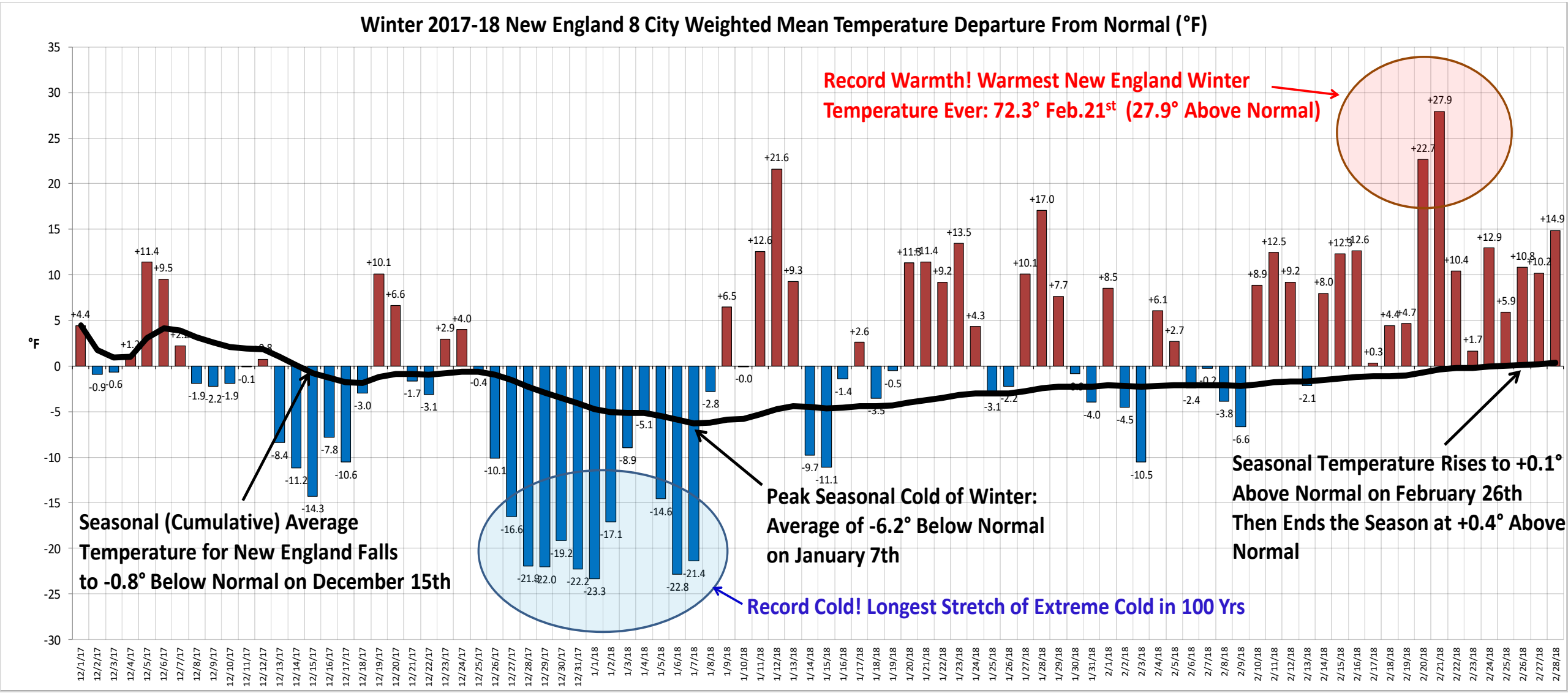
Air pressure and winds around the Arctic switch between these two phases (Arctic Oscillation) and contribute to winter weather patterns.

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!

Weak Polar Vortex Can Still Cause Temp. Swings



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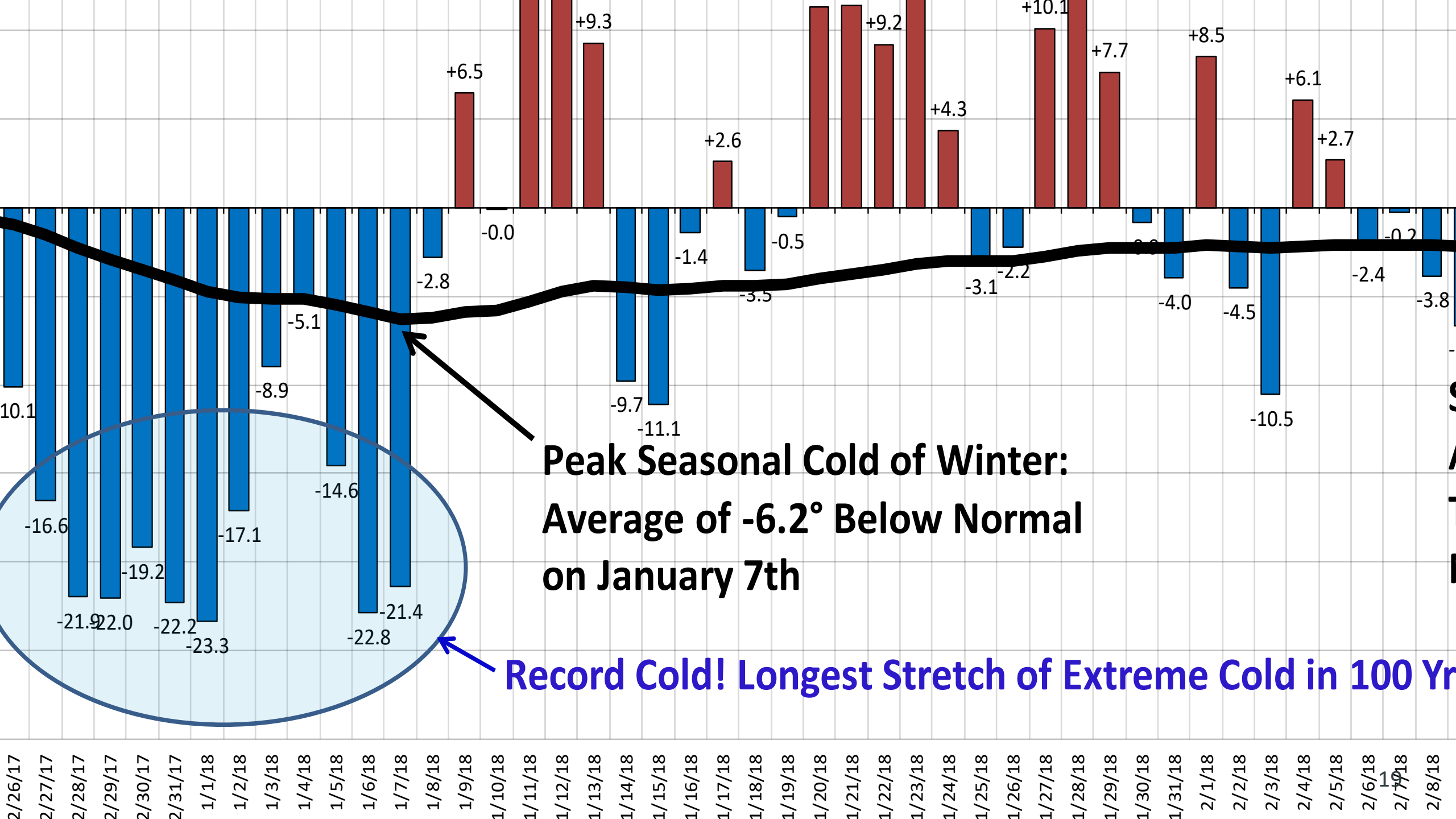
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-23.3
-17.1
-14.6
-22.8
-21.4
Peak Seasonal Cold of Winter:
Average of -6.2° Below Normal
on January 7th
Record Cold! Longest Stretch of Extreme Cold in 100 Yr
2/26/17
2/27/17
2/28/17
2/29/17
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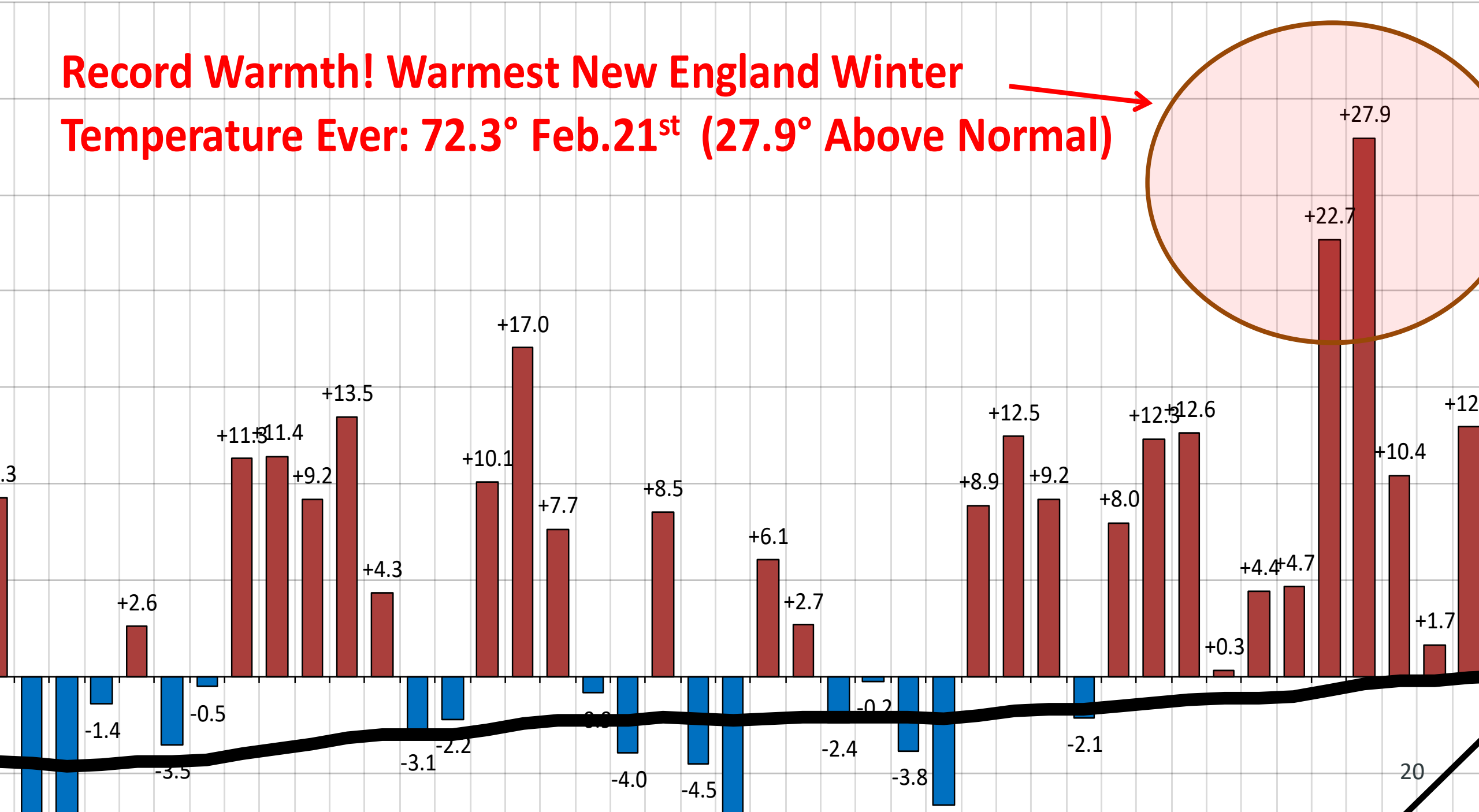
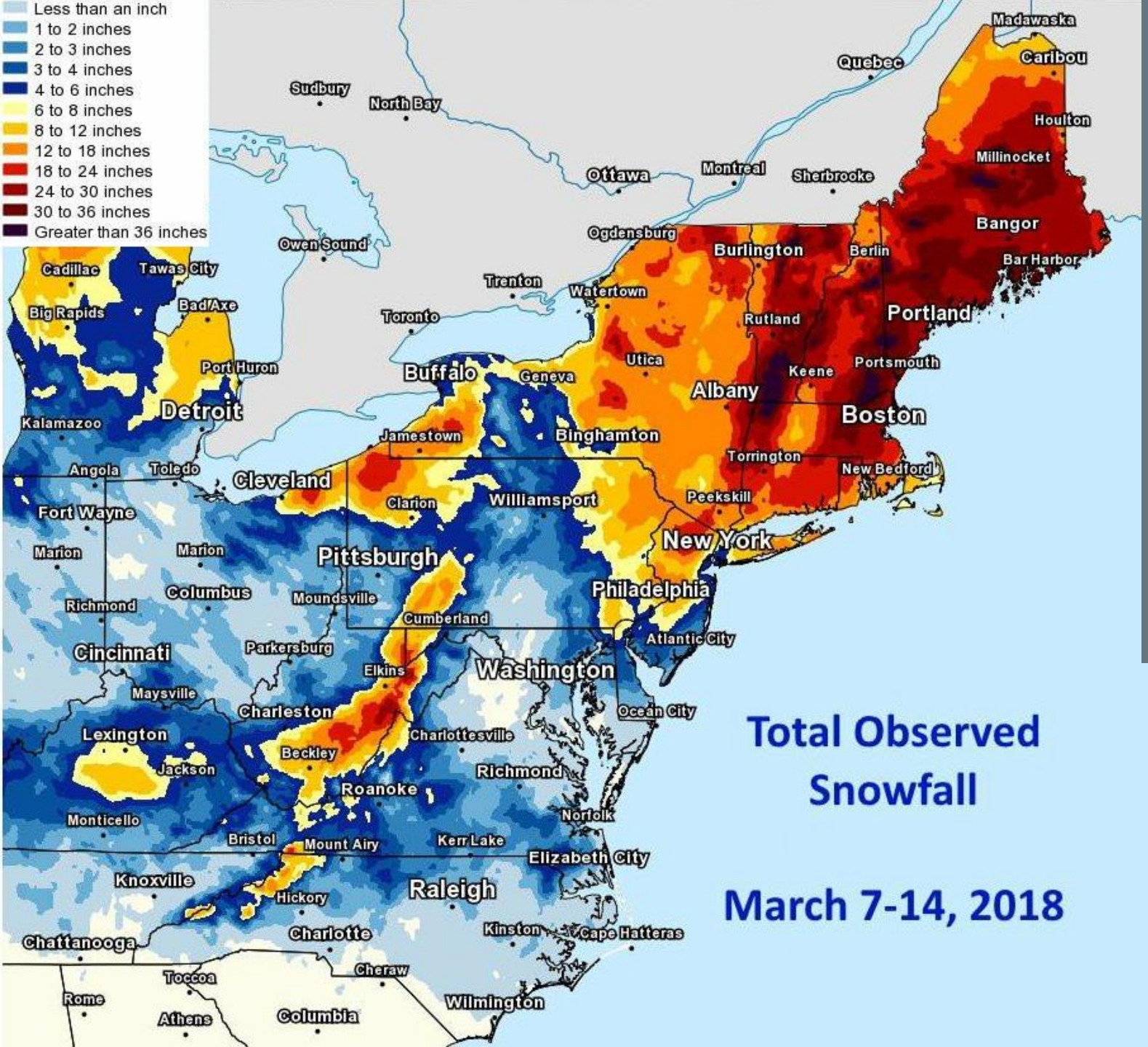
2/8/18

Record Warmth! Warmest New England Winter Temperature Ever: 72.3° Feb.21st (27.9° Above Normal)





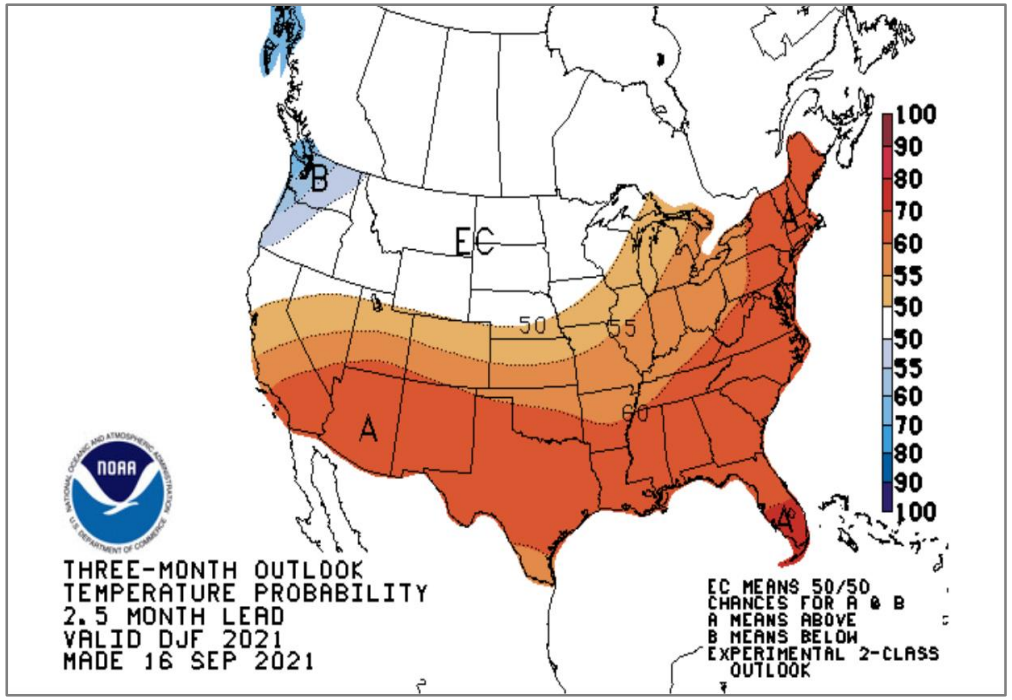
If polar vortex is weak, harsh weather is still possible – even late in the season!

- Blizzards
- Nor'easters

2021-22 Winter Weather Outlook

- Temperatures forecasted to average above normal this winter
  - Based on NOAA Seasonal Outlook
- La Niña conditions are expected through the winter
  - Slightly above-normal snowfall possible in parts of New England
- Polar vortex will need to be monitored closely
  - Changes in its strength could result in significant cold outbreaks and major storms for the New England region

Will you be winter ready?



Questions

Click here to go back to the Agenda

Review of OP-21

Operational Surveys, Energy Forecasting & Reporting, and Actions During an Energy Emergency

Jaren Lutenegger

Supervisor, Operations Analysis & Integration

Topics Covered

- Objectives of OP-21
- OP-21 Survey Processes
  - Generator Fuel and Emissions Survey
  - Generator Winter Readiness Survey
- Energy Emergency Forecasting and Reporting

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Objectives of OP-21

Objectives of OP-21

1) **Facilitate strong lines of communication** among ISO-NE, interstate natural gas pipelines, LNG import facilities, LDCs, DEs, and lead market participants regarding all matters relating to resource fuel availability and environmental limitations

2) **Facilitate identification** of critical infrastructure of the interstate natural gas pipeline system in order to ensure critical components are not included in automatic or manual load shed schemes

3) **Alert regional stakeholders** of actual or anticipated near-term energy deficiency conditions **such that stakeholders** with resources in short supply of fuel, or with potential environmental limitations, **can take action to replenish fuel supplies and/or take action to mitigate environmental limitations**

Objectives of OP-21, cont.

4) **Alert regional stakeholders** of potential energy deficiencies such that they **may take action to shorten or reschedule maintenance or repair to transmission facilities or resources** throughout the region

5) **Raise the awareness** of New England consumers, lead market participants, officials of the New England states, regional and national regulators, and regional and national reliability organizations of potential energy deficiencies that may be faced by the region

6) **Allow for timely implementation of load and capacity relief** available within actions of OP-4 or through implementation of load shedding through OP-7, in order to address future capacity deficiencies expected as a result of an Energy Emergency

OP-21 Generator Survey Processes

OP-21 Survey Summary

Survey Process	Audience	Periodicity	Purpose
Generator Fuel and Emissions Survey	Oil, Coal, and Natural Gas Generators	Winter: Weekly Non-Winter: Bi-Weekly	Monitor fuel inventory levels, fuel replenishment plans, and actual or anticipated environmental limitations on generators within New England
Generator Winter Readiness Survey	All Generators	Annually	Facilitate situational awareness of generator readiness during winter months
Natural Gas Critical Infrastructure Survey	Interstate Natural Gas Pipeline Companies and Canaport and Everett LNG Facilities	Annually	Ensure that the critical infrastructure of the interstate natural gas system are not served by transmission or distribution circuits subject to automatic or manual load shedding schemes

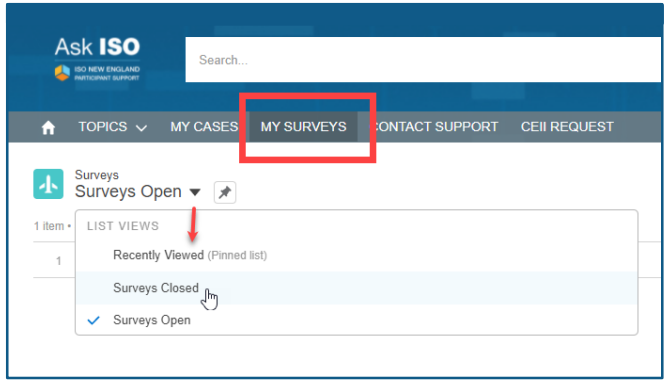
ISO-NE shall treat all submitted responses as Confidential in accordance with the ISO New England Information Policy

OP-21 Generator Surveys in AskISO

- Beginning on September 14th, ISO-NE began using AskISO instead of Excel spreadsheets for OP-21 generator surveys
  - Training materials, user guides, and other project materials are available here: https://www.iso-ne.com/participate/support/participant-readiness-outlook/generator-survey-system-project-gss

- When new surveys are requested, all registered submitters will receive an email request with the survey type, due date, and link to the survey in AskISO

- Current and past surveys in AskISO can be seen in the "My Surveys" section of AskISO



Generator Fuel and Emissions Survey

- Collect information to:
  - Perform a regional energy assessment
  - Identify potential reliability issues
- All oil, coal, and natural gas generators are surveyed to gather:
  - Available and maximum volumes of fuel
  - Fuel supplier and procurement information
  - Environmental and emissions limitations
- Survey frequency:
  - Weekly*, in the months of December - March (i.e. winter)
  - Bi-Weekly*, in the months of April - November (i.e. non-winter)

  *Note - Frequency of surveys may be increased as needed, up to and including daily, based on indications of potential energy deficiencies in the region
- Surveys are conducted via the AskISO platform

Generator Fuel and Emissions Survey

Ask ISO

Search... SEARCH JOHN DOE

TOPICS MY CASES MY SURVEYS CONTACT SUPPORT CEII REQUEST

ISO New England Operating Procedure 21 - Fuel and Emission Survey

Survey Number: SVY-0408

Lead Market Participant: Lead MP A (50305)

Submitter: John Doe

Station

Station Name: ISO New England Station

Oil Inventory

Maximum Usable Storage Capacity (gal) *: 123

Current Usable Inventory (gal) *: 32

Oil Inventory Validation Message:

Reason for Change in Max Capacity from previous (if applicable):

Oil Orders

Do you have currently oil ordered? *

○ Yes ◉ No

How long does it take for fuel to arrive after placing an order? (Days) *

If fuel replenishment is on a set schedule, how much time occurs between replenishments? (Days) *

What is the maximum volume of oil that can be delivered in a single shipment? (Gallons) *

At what typical oil level is a replenishment ordered? (Gallons) *

Generator Winter Readiness Survey

- Collect information to facilitate ISO-NE situational awareness
- All generators surveyed to gather:
  - Winter preparation activities
  - Ambient temperature limitations on real-time or future capabilities
  - Specific protocols followed in extreme cold weather events
  - Specific training completed prior to cold weather events
- Survey to be distributed to lead market participants prior to November 1st via AskISO platform
- Lead market participants shall submit responses to the survey in AskISO no later than December 1st

Reminder for Real-Time Operations

Call the ISO-NE control room (through your DE) if you have:

- Anticipated or actual reductions in generator availability or capability
  - Including, but not limited to:
    - Ability to procure fuel for the operating day
    - Permitting, environment, or emissions limitations
    - Adverse weather conditions
- Knowledge of changes to real-time fuel deliverability

Energy Emergency Forecasting and Reporting

21-Day Energy Assessment

- Energy emergency forecasting and reporting is an hourly 21-day energy assessment, which is compared with the energy emergency forecast alert thresholds in order to identify and communicate potential reliability issues to regional stakeholders
- Same periodicity as Generator Fuel and Emissions Survey data collection
- Based on OP-21 survey responses, planned generation & transmission outages, load & weather forecasts, and other data collection, models, or assumptions (LNG levels, pipeline status, etc.) prepared by ISO-NE staff

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Energy Forecast Results

Each hour of **each day** within the 21-day look-ahead period will be identified as:

- **Normal** – resources are forecasted **≥ 200 MW** above energy and reserve requirements
- **FMLCC2** – resources are forecasted **< 200 MW** above energy and reserve requirements
- **FEEA1** – resources forecasted **<** requirements, forecasting use of **OP4 Actions 1-5**
  - **Aligns with NERC EEA Level 1**
- **FEEA2** - resources forecasted **<** requirements, forecasting use of **OP4 Actions 6-1**
  - **Aligns with NERC EEA Level 2**
- **FEEA3** - resources forecasted **<** requirements, forecasting use of **OP-7**
  - **Aligns with NERC EEA Level 3**

Energy Alert and Emergency Criteria

ISO-NE shall declare an **Energy Alert**:

- **FEEA2 or FEEA3** is forecasted to occur in at least 1 hour on 1 or more consecutive days in **days 6 through 21** of the 21-day energy assessment, or
- **Any other reason(s)** for which the ISO-NE Chief Operating Officer (COO), or designee, determines that the actions described in Section III.B of this OP may mitigate the impact of an actual or forecasted energy deficiency

ISO-NE shall declare an **Energy Emergency**:

- **FEEA2 or FEEA3** is forecasted to occur in at least 1 hour on 1 or more consecutive days in **days 1 through 5** of the 21-day energy assessment, or
- **Shedding of firm load** under OP-7 is occurring or is anticipated to occur **due to an actual energy deficiency** resulting from a sustained shortage of fuel availability or deliverability to, or sustained environmental limitations on some or several of New England resources, or
- **Any other reason(s)** for which the ISO-NE Chief Operating Officer (COO), or designee, determines that the actions described in Section III.B of this OP may mitigate the impact of an actual or forecasted energy deficiency.

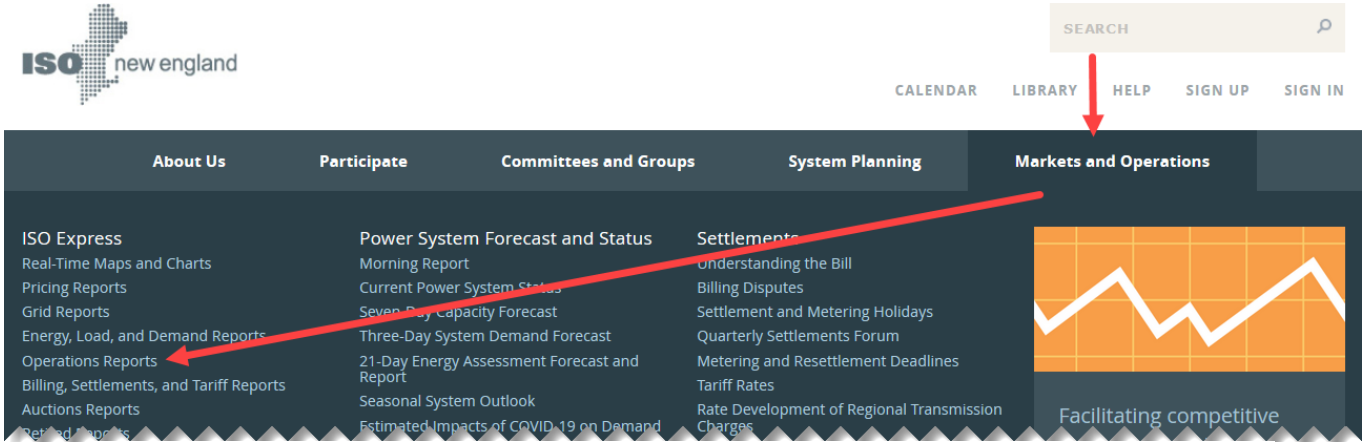
Energy Alert and Emergency Declaration & Cancellation

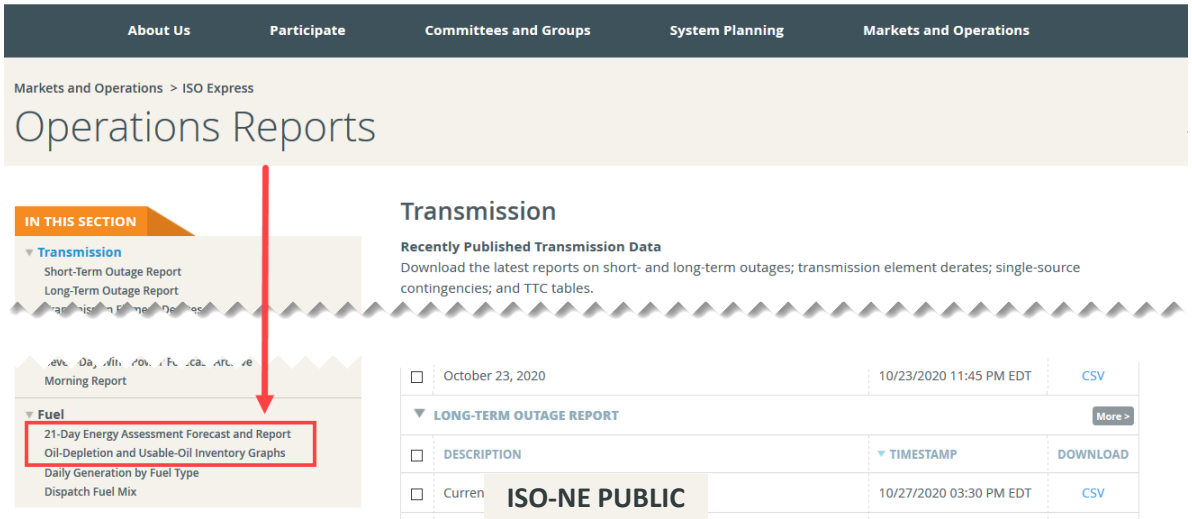
- Energy Alert or Energy Emergency will **normally be declared** based on results of the 21 Day Energy Assessment
- When conditions have sufficiently improved and the criteria for declaration of an Energy Alert or an Energy Emergency are no longer being met, ISO-NE shall cancel the Energy Alert or Energy Emergency, as applicable
- To the extent possible, Energy Alerts and Energy Emergencies will be **declared and cancelled** on daily boundaries

OP-21 Reporting Requirements

- Each lead market participant, through its DE, shall notify ISO-NE when fuel supply emergencies occur that could impact BES adequacy or reliability
- If ISO-NE determines that resource availability will affect the adequacy or reliability of the BES or a sub-area of the BES, ISO-NE shall notify the U.S. DOE in using Form DOE-417
- **ISO-NE shall report to the U.S. DOE using Form DOE-417 when an Energy Emergency has been declared**
- On a case-by-case basis, ISO-NE shall consider reporting to the U.S. DOE using Form DOE-417 whenever supplies of fuel types, other than fuel oil or coal, are diminished below normal levels

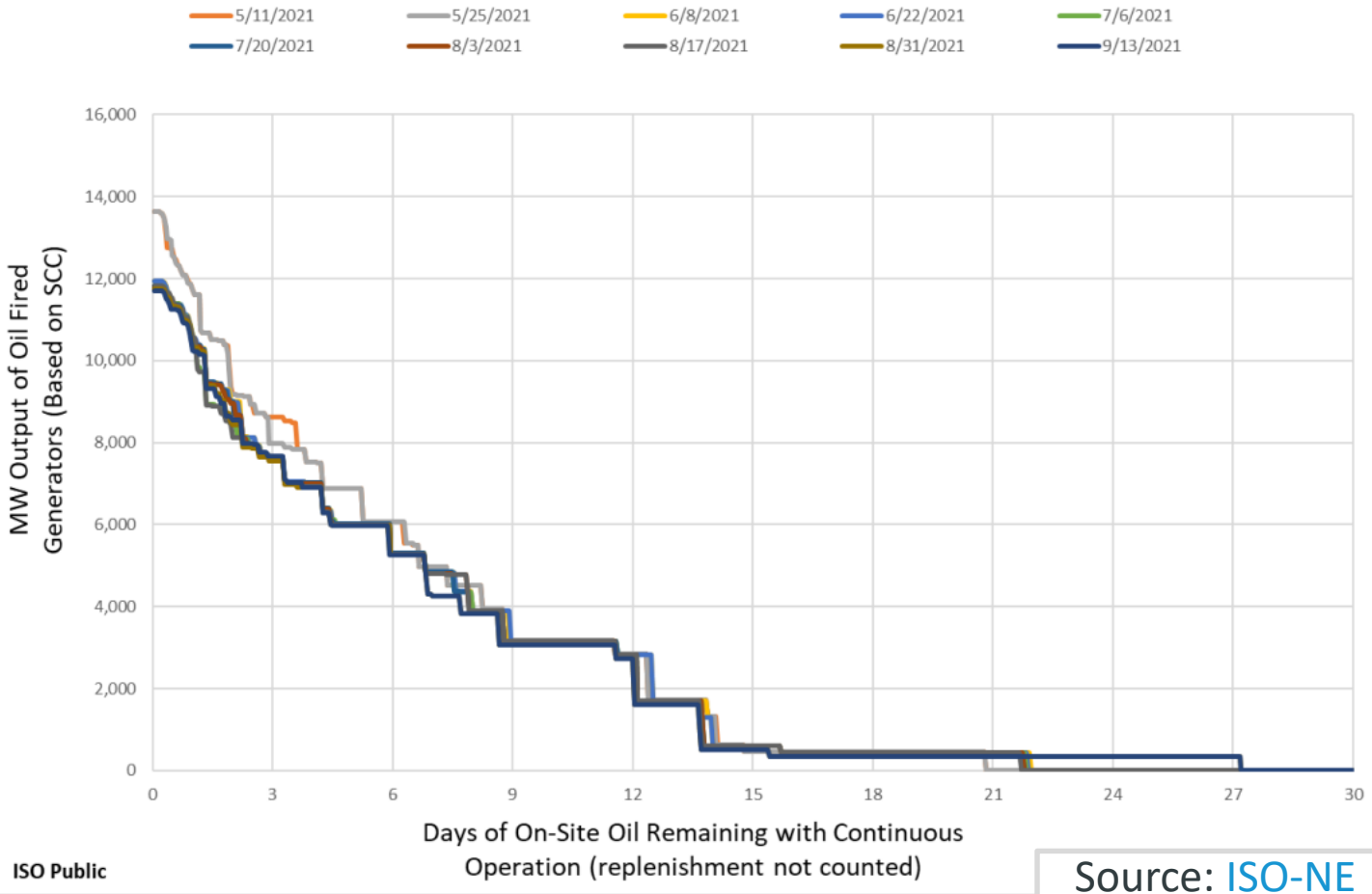
Public Data Available





Oil and Electricity Depletion - 10 Most Recent

Based on OP-21 Generator Surveys Received from Market Participants



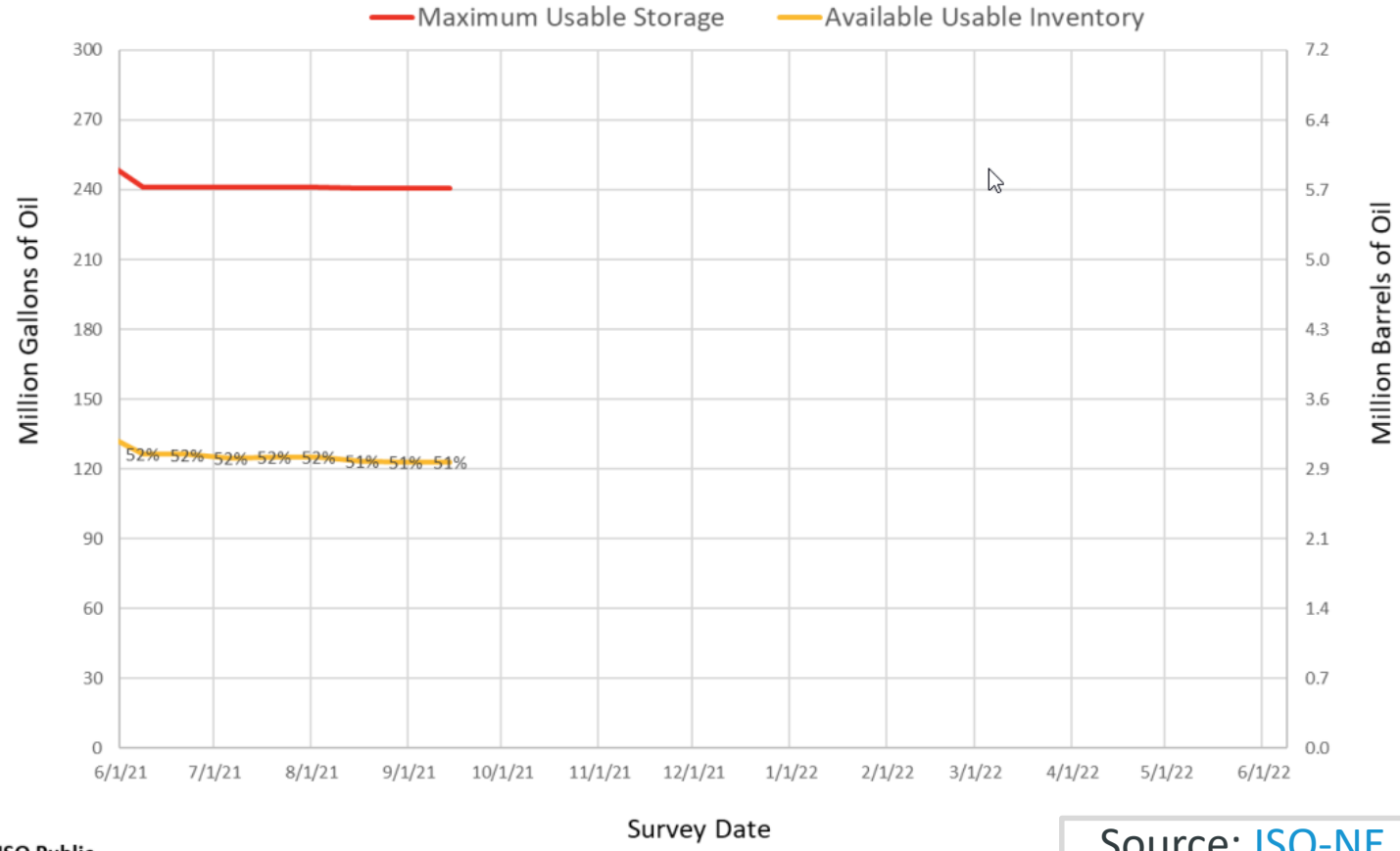
ISO Public

Source: ISO-NE

Total Usable New England Fuel Oil Inventory - June 2021 - June 2022

Based on OP-21 Generator Surveys Received from Market Participants

Percentages indicate % of Maximum Usable Storage



Source: ISO-NE

21-Day Energy Assessment Forecast

- https://www.iso-ne.com/isoexpress/web/reports/operations/-/tree/21-Day-Energy-Assessment-Forecast-and-Report-Results

21-Day Energy Assessment Forecast and Report
September 14 – October 4, 2021

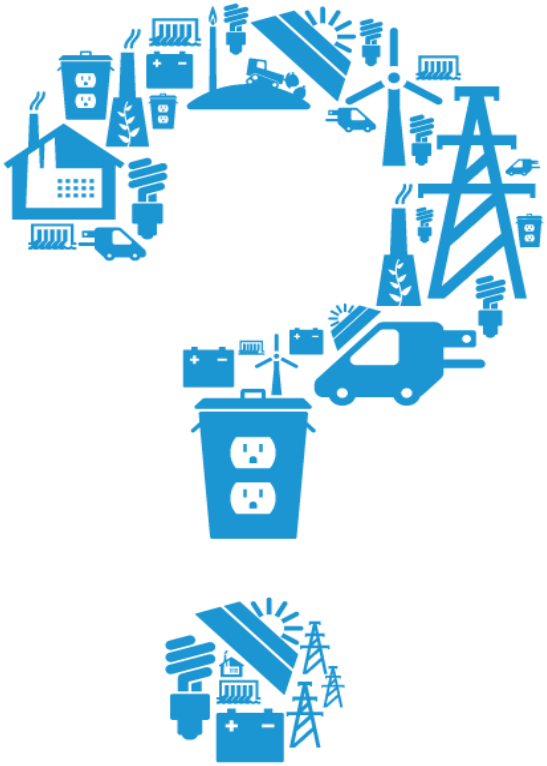
ISO new england

System Conditions Normal

Alert Threshold	Start	Through
None		

Emergency Threshold	Start	Through
None		

Questions



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Dual Fuel Auditing

Winter Generator Readiness Seminar

Jim Nichols

Principal Analyst, Asset Registration & Auditing

Topics

- Notifications/Audit Requirements
- Scheduling an Audit
- Communications During the Audit
- Compensation/Offers

Dual Fuel Audits

- ISO is requiring generators to perform dual fuel audits as part of winter readiness
  - Generators with gas as a primary fuel that can also run on oil

- **Provides opportunity for generators to test ability to swap to oil, run at max output on oil, and get compensated**

- ISO-Initiated Parameter Auditing (Market Rule 1, Section III.1.5.2)
  - Allows for the ISO to initiate audits of dual fuel capability and indicates that they are announced and scheduled in advance

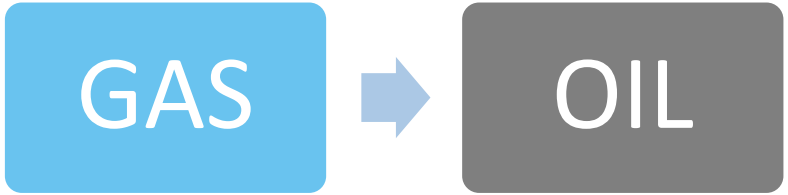
Dual Fuel Generators

- Currently there are 36 generators registered with gas as the primary fuel that indicate an ability to swap to oil
- The Capacity Supply Obligation for these generators for December 2021 is about 6,000 MW* (*As of September 15th)

Notification/Audit Requirements

- Notifications were sent out in September to generators requesting that a dual fuel audit be performed prior to December 1st

- Notifications included:
  - Instructions for scheduling an audit
  - Real-time communication needs
  - Information regarding supply offers
  - **Demonstration requirements**
    - Switch from gas to oil and run 1 hour at max output on oil



Scheduling the Audit

CROW
Outage Scheduler

- Request via CROW application
  - By 9 am on the business day prior to the test
- CROW applications
  - Must clearly indicate Dual Fuel Audit
    - State that it is a Dual Fuel Audit in External Comments
    - Outages Cause Code = “615-Dual Fuel Audit Request”
    - Outage Priority = “Owner Testing”
  - Must include a test plan (Fill out Excel form that was provided with the notification and attach to CROW application.)
  - Are subject to approval

Communications

- Designated entity must notify the ISO-NE control room in real-time of the following actions/times:
  - Test start
  - Fuel swap start time
  - Stable on oil at ecomin (end of fuel swap)
  - Completed 1 hour at max output on oil
  - Test completion
- Notify the control room of any changes to the audit plan or issues that arise during the audit
- Real-time conditions may prompt ISO-NE to change the plan and dispatch

Compensation and Offers

- Resources will be compensated through real-time NCPC pursuant to Market Rule 1, Appendix F

- Supply Offers
  - Offers made in the Day-Ahead Energy Market should reflect the primary fuel
  - Real-Time Energy Market hourly offers in eMarket should reflect the fuel and fuel blend percentages appropriately
  - Please make every effort to provide accurate offers
  - Notify the Internal Market Monitor if there are real time deviations from the final supply offers

- Failure to provide timely notification, a clear indication of the purpose of the test, and other required information including accurate supply offers may jeopardize proper compensation

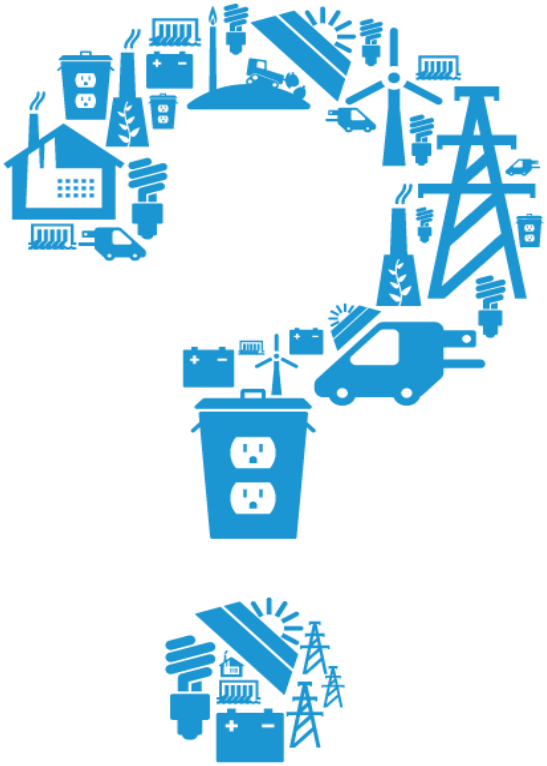
Demonstration Not Scheduled as DF Audit

- A swap from gas to oil that meets the demonstration requirements, but was not scheduled as a dual fuel audit may be submitted for consideration to satisfy the audit
  - The generator would not be eligible for back-dated NCPC consideration

Results

- ISO will communicate whether the demonstration was satisfactory
- If audit was not successful: ✗
  - Generator will need to audit again
  - Provide a plan with actions and timelines to resolve issues

Questions



Contact Information

Generation and Load Administration

- Claimed Capability Auditing group mailbox
  - Email: opacca@iso-ne.com
- Jim Nichols
  - Phone: 413-540-4678
  - Email: opacca@iso-ne.com

Customer Support

- Ask ISO
- Phone: 413-540-4220
- Email: custserv@iso-ne.com

ISO Website

References

Rules and Procedures

- Transmission, Markets & Services Tariff
  - Section III of Market Rule 1
    - » Section III.1.5.2 (ISO-Initiated Parameter Auditing)

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Winter Preparedness Review

Stephen George

Manager, Operational Performance, Training, and Integration

Recent Cold Weather Events and Reports

Recent Cold Weather Events and Reports

- On 9/23/21 FERC and NERC staff released preliminary findings and recommendations related to the February 2021 cold weather grid operations in ERCOT, MISO, and SPP
  - Final findings and recommendations will be included in the full report, which is expected to be issued by this winter
- Preliminary key findings are related to generation freezing issues, natural gas fuel supply issues, natural gas and electric reliability interdependency, ERCOT firm load shed affected natural gas facilities, and coordination of manual and automatic load shedding
- Preliminary recommendations are related to enhancement of NERC Reliability Standards, funding of generator winterization, natural gas infrastructure winterization, and development of natural gas - electric reliability forums
  - 28 preliminary recommendations with specific timeframes for implementation

Recent Cold Weather Events and Reports

- A FERC/NERC report, The South Central U.S. Cold Weather Bulk Electric System Event of January 17, 2018, and associated recommendations was published in 2019
  - Report findings echo previous FERC/NERC reports which found generators did not properly prepare their facilities for cold temps, leading to loss of firm load or other energy emergency measures
- Preparation for cold temperatures is a priority for the region and lessons learned from recent are clearly relevant to our winter seasons and preparation efforts
- New England's approach to winter weather preparations, which meets or exceeds recommendations from these recent reports, is discussed in detail on the following slides

NERC Reliability Standards, Reliability Guidelines, & Training Resources Related to Cold Weather

NERC Cold Weather Reliability Standards

- On August 24th, FERC approved NERC's proposed Cold Weather Standards
- The Cold Weather Standards were developed, in part, based on a recommendation from the joint FERC/NERC report, The South Central United States Cold Weather Bulk Electric System Event of January 17, 2018, which was published in 2019
  - Report findings echoed previous FERC/NERC reports which found generators did not properly prepare their facilities for cold temps, leading to loss of firm load or other energy emergency measures
- February 2021 cold weather events in the Midwest and South Central states contributed to the accelerated pace of cold weather standard development and approval
- The effective date of these Cold Weather Standards is April 1, 2023

NERC Cold Weather Reliability Standards, cont.

- Cold Weather Standards will require generators to implement plans to prepare for cold weather and will also require the exchange of certain generator cold weather operating parameters that will help enhance situational awareness
- Impacted Reliability Standards are EOP-011-1, IRO-010-4, and TOP-003-5
  - EOP-011-1 includes two new requirements related to generator cold weather preparation, including freeze protection and training
  - IRO-010-4 and TOP-003-5 are revised to include provisions of generator cold weather data to RCs, BAs, and TOs
    - Examples include fuel supply and inventory concerns, fuel switching capabilities, historical minimum operating temperatures

NERC Reliability Guideline

- NERC Generating Unit Winter Weather Readiness Reliability Guideline
  - In general, the objective of NERC reliability guidelines is to distribute key practices and information on specific issues critical to promote and maintain a highly reliable and secure bulk power system
  - The Generating Unit Winter Weather Readiness Reliability Guideline consists of industry best practices related to enhancing resource reliability while minimizing the likelihood that the impacts of severe cold weather will negatively impact overall system reliability
  - Review of these best practices is highly encouraged

Effective Winter Weather Readiness Programs

- The NERC Generating Unit Winter Weather Readiness Reliability Guideline describes that an effective winter weather readiness program consists of the following components:
  - Safety
  - Management roles & expectations
  - Processes and procedures
  - Evaluation of potential problem areas with critical components
  - Testing
  - Training
  - Communications

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Recent Guideline Updates

- The NERC Generating Unit Winter Weather Readiness Reliability Guideline was recently updated and Version 3 was published in December 2020
- Recent updates include:
  - Guidance for scheduling of any needed cold weather related inspections, repairs, winterization, etc. prior to the NOAA First Frost Date
  - Identification of potential critical component problem areas
  - Best practices & recommendations for communication of low temperature cut-outs to the Balancing Authority (BA)
- This Reliability Guideline and the Natural Gas and Electrical Operational Coordination Considerations Reliability Guideline were discussed at the recent NERC Preparation for Severe Cold Weather Webinar

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NERC Cold Weather Training Materials

- In addition to the Generating Unit Winter Weather Readiness Reliability Guideline, NERC has developed many additional resources applicable to cold weather preparation and operations
- The NERC website also has a page which provides a single location listing all applicable resources related to cold weather preparation

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

NERC Information Resources on Cold Weather Preparation and BPS Impacts

(as of 2/11/2021)

NERC has been collecting and sharing information on cold weather preparation and BPS impacts for years via Webinars, Special Reports, Lessons Learned, Failure Modes & Mechanisms, and other resources.

Version 3 of the Generating Unit Winter Weather Readiness Reliability Guideline was approved by the RSTC at the end of 2020. The changes between versions 2 and 3 were discussed in the 2020 Winter Weather Webinar.

Here are links to some cold weather resources:

Reports on major BPS-impacting Cold Weather events

- Outages and Curtailments during the Southwest Cold Weather Event of February 1-5, 2011
- Winter Weather Readiness for Texas Generators, (2011)
- January 2014 Polar Vortex Review
- The South Central United States Cold Weather Bulk Electric System Event of January 17, 2018 (There are a number of 'sound practices' from the industry, starting on page 100.)
- Other Cold Weather Reports and Training Materials can be found on this site.

Cold weather related Lessons Learned:

- LL20110902 Adequate Maintenance and Inspection of Generator Freeze Protection
- LL20110903 Generating Unit Temperature Design Parameters and Extreme Winter Conditions
- LL20111001 Plant Instrument & Sensing Equipment Freezing Due to Heat Trace & Insulation Failures
- LL20120101 Plant Onsite Material and Personnel Needed for a Winter Weather Event
- LL20120102 Plant Operator Training to Prepare for a Winter Weather Event
- LL20120103 Transmission Facilities and Winter Weather Operations
- LL20120901 Wind Farm Winter Storm Issues
- LL20120902 Transformer Oil Level Issues During Cold Weather
- LL20120903 Winter Storm Inlet Air Duct Icing
- LL20120904 Capacity Awareness During an Energy Emergency Event
- LL20120905 Gas and Electricity Interdependency
- LL20180702 Preparing Circuit Breakers for Operation in Cold Weather (also 2018 Webinar w/FMM)
- LL20200601 Unanticipated Wind Generation Cutoffs during a Cold Weather Event
- LL20201101 Cold Weather Operation of SF6 Circuit Breakers

Winter Weather Webinars from 2012 – 2020 can be found on this site.

Annual Winter Reliability Assessments 2003/2004 thru 2019/2020 can be found on this site.

RELIABILITY | RESILIENCE | SECURITY

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New England’s Winter Weather Preparations

Enhancements to Situational Awareness

- OP-21 enhancements
  - Initiated the annual Winter Generator Readiness Survey process in 2019 to help ISO gain better understanding of winter weather preparations at all generating facilities and incorporated the process into OP-21 in 2020
  - Initiated the annual Natural Gas Critical Infrastructure Survey process in 2014 and incorporated the process into OP-21 in 2020
  - Implemented periodic Energy Emergency Forecasting and Reporting, beginning in 2018
  - Increased the frequency of and incorporated additional detailed questions into the OP-21 Generator Survey process in 2018
  - Enhanced Oil-Depletion and Usable-Oil Inventory Graphs available on the ISO website

[1]*ISO New England Operating Procedure No. 21 – Operational Surveys, Energy Forecasting & Reporting and Actions During An Energy Emergency*

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Enhancement of Market Rules

- An Inventoried Energy Program has been developed and will be implemented for the winters of 2023-2024 and 2024-2025
  - Aimed at helping to address near-term energy security issues while ISO and stakeholders work to develop and implement a more robust, long-term, market-based solution
  - Is expected to improve incentives for resources to maintain inventoried energy during periods of system stress

[1]ISO New England Operating Procedure No. 21 – Operational Surveys, Energy Forecasting & Reporting and Actions During An Energy Emergency

Periodic Auditing & Testing

- Generator audits
- Generator dual fuel auditing
- Blackstart resource testing
- Load shed testing
  - Monthly
- Voltage reduction testing
  - A voltage reduction test is scheduled for October 21

Communication & Coordination

- Annual Winter Generator Readiness Seminars since 2013
- Regular conference calls with NPCC Reliability Coordinators
- Regular communications with interstate natural gas pipelines
- Pre-winter conference calls with the Northeast Gas Association
- Daily calls to dual-fuel generators
- Increased monitoring and coordination of gas pipeline maintenance

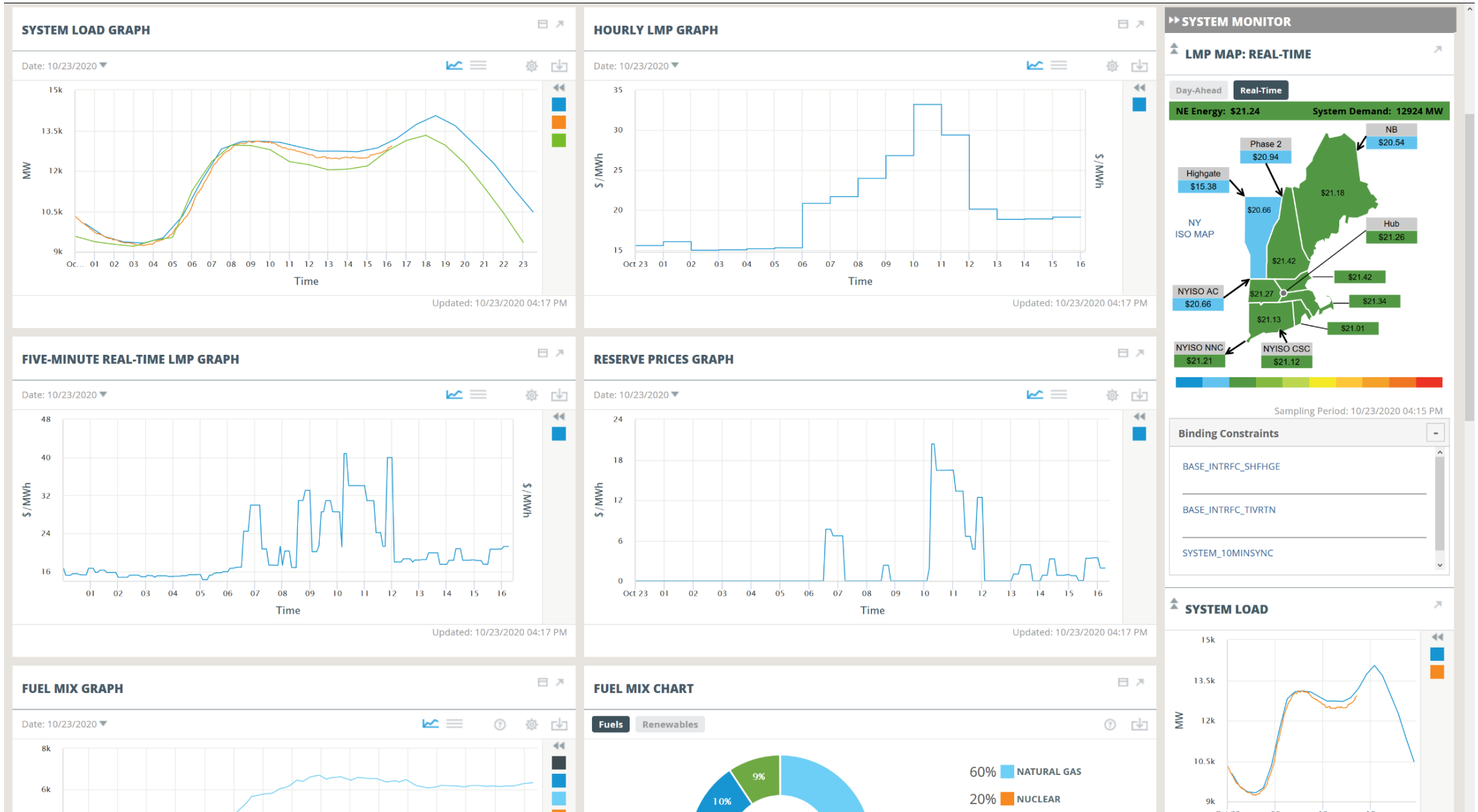
Winter Communications

- Updates to gov't and news media
- Media affairs
- Press releases

ISO-NE Website

- Power system conditions
- Notices
- ISO Express

ISO Express


SYSTEM LOAD GRAPH
Date: 10/23/2020
MW
Time
Updated: 10/23/2020 04:17 PM
HOURLY LMP GRAPH
Date: 10/23/2020
$ / MWh
Time
Updated: 10/23/2020 04:17 PM
FIVE-MINUTE REAL-TIME LMP GRAPH
Date: 10/23/2020
$ / MWh
Time
Updated: 10/23/2020 04:17 PM
RESERVE PRICES GRAPH
Date: 10/23/2020
$ / MWh
Time
Updated: 10/23/2020 04:17 PM
FUEL MIX GRAPH
Date: 10/23/2020
FUEL MIX CHART
Fuels
Renewables
60% NATURAL GAS
20% NUCLEAR
9%
10%
SYSTEM MONITOR
LMP MAP: REAL-TIME
Day-Ahead
Real-Time
NE Energy: $21.24
System Demand: 12924 MW
NB $20.54
Phase 2 $20.94
Highgate $15.38
$21.18
$20.66
NY ISO MAP
Hub $21.26
$21.42
$21.42
NYISO AC $20.66
$21.27
$21.34
$21.13
$21.01
NYISO NNC $21.21
NYISO CSC $21.12
Sampling Period: 10/23/2020 04:15 PM
Binding Constraints
BASE_INTRFC_SHFHGE
BASE_INTRFC_TIVRTN
SYSTEM_10MINSYNC
SYSTEM LOAD
MW

ISO to Go App

ISO to Go 4+
ISO New England Inc.
★★★★★ 5.0 • 7 Ratings
Free

- Pricing data
- Past, present, and future electricity demand
- System conditions
- Extensive fuel mix data

Screenshots iPhone iPad

ISO and LCC Seasonal Preparations M/LCC-16

- Documents preparations to maintain reliability during seasonal periods of peak demand and high power transfers
- Verifies the Local Control Centers (LCCs) conduct an assessment of the reliability of the system before winter
- Coordinated effort between ISO and the LCCs
- Directs the following steps, where applicable:
  - Winterization of substations and equipment
  - Maintenance of voltage reduction equipment
  - Assessment of generator outages
  - Review of scheduled transmission outages

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Recommended Generator Preparations

- The following recommendations are consistent with NERC's Generating Unit Winter Weather Readiness Reliability Guideline and industry best practices

Plant-Specific Winter Preparation Procedure

- Include processes, staffing plans, and timelines directing key activities that must take place prior to severe weather
- Include a plan to winterize critical components that ensure continued availability of the resource
- Include plans for performance of periodic maintenance and inspection of freeze protection measures
- Include a list of critical components that require increased surveillance during severe weather

Maintenance & Fuel Supply

- Complete any outstanding improvements identified during operations during prior year severe weather events
- Ensure adequate supplies of fuel
  - Verify fuel switching capabilities, where applicable
  - Review environmental permits and ensure necessary contacts are in place

Training & Communication

- Provide plant-specific training to staff
  - Highlight the necessary preparations as well as expectations for severe weather events
- Notify ISO immediately when constraints arise or are anticipated
  - Understand temperatures and wind speeds that potentially limit the capability of your resource and keep ISO-NE informed

Questions

Click here to go back to the Agenda

Emergency Procedure Review

M/LCC-2, OP-4, OP-21, OP-7

Steve Gould

MANAGER, CONTROL ROOM OPERATIONS

Overview of ISO-NE Emergency Procedures

- M/LCC-2: Abnormal Conditions Alert
- OP-4: Action During a Capacity Deficiency
  - OP-4 Appendix A: Estimates of Additional Generation and Load Relief
- OP-21: Operational Surveys, Energy Forecasting & Reporting, and Actions During an Energy Emergency
- OP-7: Action in An Emergency

M/LCC-2

Abnormal Conditions Alert

M/LCC-2 Purpose

- **To alert applicable power system operations, maintenance, construction and test personnel** as well as each applicable market participant (MP) **when an abnormal condition** affecting the reliability of the power system **exists or is anticipated**.
- The intent is to **declare M/LCC-2 when the system conditions are** anticipated to be **close to or beyond the limits of reliability**.
- The M/LCC-2 declaration and associated actions is intended to **reduce or eliminate the risk** of losing equipment due to testing or other high risk activities whenever the system is stressed.

M/LCC-2 Abnormal Conditions

- **An abnormal condition exists when the reliability of the New England RCA/BAA is degraded**
- Examples include:
  - Forecasted or actual deficiency of operating reserves requiring implementation of OP-4 or OP-7
  - Low transmission voltages and/or low reactive reserves
  - A credible threat to power system reliability such as sabotage or an approaching storm
  - Cold Weather Event is declared
  - Any other condition that may occur as determined by the ISO-NE Operations Shift Supervisor or the LCC System Operator

M/LCC-2 Declarations

- May be declared by ISO-NE for:
  - All of New England,
  - or for a specific local control center (LCC)
- An LCC may independently declare M/LCC-2 for its own local area
  - Declaration by an individual LCC would be limited to abnormal conditions within one LCC that would not become degraded by the consequences of maintenance, construction and/or test activity in another LCC area.

M/LCC-2 ISO-NE Actions

- Notify each DE and DDE via Emergency Notification System
- Verbally notify each LCC and NPCC RC/BA
- Notify each interstate natural gas pipeline
- Review and, as appropriate, curtail, cancel, postpone maintenance, testing, and construction activities

M/LCC-2 DE, DDE, and TO Actions

- Take actions to curtail testing, construction, and maintenance activities
- Ensure AVRs are in service (unless grandfathered)
- Ensure PSS devices are in service, if required

M/LCC-2 Criteria to Stop and/or Postpone Activities

- A maintenance, construction or test activity shall be stopped and/or postponed, if the following could occur:
  - Reduction in reliability or output of a generator, DARD or DRR
  - Increased reliability exposure (decreased reliability) to the loss of a critical transmission facility
  - Reduced staffing that restricts operability of a generator, DARD, DRR or transmission facility
  - Interruption of voice or data communications used for dispatching purposes
  - Operation of any ISO, LCC, or MP SCADA computer becomes degraded or fails
- If a maintenance, construction or test activity cannot be stopped and/or postponed; precautions shall be taken to prevent the activity from posing further risk to the power system.

Historical M/LCC-2 Events:

Link to Historical M/LCC-2 Events

Time In	Time Out	Region	Reason
03-JAN-2018 16:00	09-JAN-2018 12:00	New England	Severe Weather
07-MAR-2018 09:00	09-MAR-2018 21:00	New England	Severe Weather
12-MAR-2018 14:00	15-MAR-2018 12:00	New England	Severe Weather
15-MAR-2018 12:00	16-MAR-2018 16:00	NSTAR	Severe Weather
20-MAR-2018 16:00	22-MAR-2018 12:00	New England	Severe Weather
12-JUL-2018 19:55	13-JUL-2018 01:00	New England	Computer Failure
03-SEP-2018 15:15	03-SEP-2018 21:00	New England	Capacity Deficiency
10-APR-2020 10:30	11-APR-2020 14:00	MAINE	Severe Weather
04-AUG-2020 15:40	10-AUG-2020 21:00	New England	Severe Weather
29-OCT-2020 15:00	30-OCT-2020 16:00	New England	Severe Weather
28-JUN-2021 14:30	28-JUN-2021 22:00	New England	Capacity Deficiency
08-JUL-2021 17:00	09-JUL-2021 22:00	New England	Severe Weather
20-AUG-2021 15:00	23-AUG-2021 11:45	New England	Severe Weather
25-AUG-2021 12:45	25-AUG-2021 22:00	New England	Capacity Deficiency

OP-4

Actions During a Capacity Deficiency

OP-4 Purpose

- Establishes criteria and guidelines for actions during capacity deficiencies, as directed by ISO-NE and as implemented by ISO-NE and the LCCs

OP-4 Conditions

- A capacity deficiency exists when one or more of the following events occurs or is expected to occur:
  - Available resources are insufficient to meet the anticipated load plus operating reserve requirements
    - May result from one or more contingencies
  - Transmission facilities into a sub-area of the region are loaded beyond transfer capabilities
  - A sub-area of New England is experiencing abnormal voltage and/or reactive conditions
  - Manual load shedding is imminent (IAW OP-7) but may be avoided, or magnitude reduced, by implementation of OP-4
  - An external area is experiencing a capacity deficiency and has requested assistance from ISO, thereby reducing operating reserve below the required levels
  - Any other serious threat to the integrity of the BES for which ISO-NE determines that OP-4 actions would mitigate the impact

OP-4 Declarations

- May be declared by ISO-NE for:
  - All of New England, *or*
  - For a specific local control center (LCC)
- An LCC may independently declare OP-4 for its own local area

Actions Prior to OP-4

- Time permitting, ISO-NE system operators take action in advance of OP-4
- Actions may include, but are not limited to:
  - Ordering on longer lead time resources
  - Reducing real-time only export transactions
  - Scheduling available dispatchable import transactions
  - Implementing M/LCC-2
  - Convening conference calls with LCC and NPCC areas control room management

OP-4 Actions

1. Implement a Power Caution
30-Minute Reserve Depletion
Resources with CSO prepare

2. Declare Energy Emergency Alert (EEA) 1

3. Request Voluntary Load Curtailment of MP facilities

4. Implement a Power Watch

5. Emergency cap/energy from MPs or neighboring RC/BAs
10-Minute Reserves

6. Implement Voltage Reduction (5% > 10 Min)
Declare EEA2

7. Resources w/o CSO voluntarily provide MWs

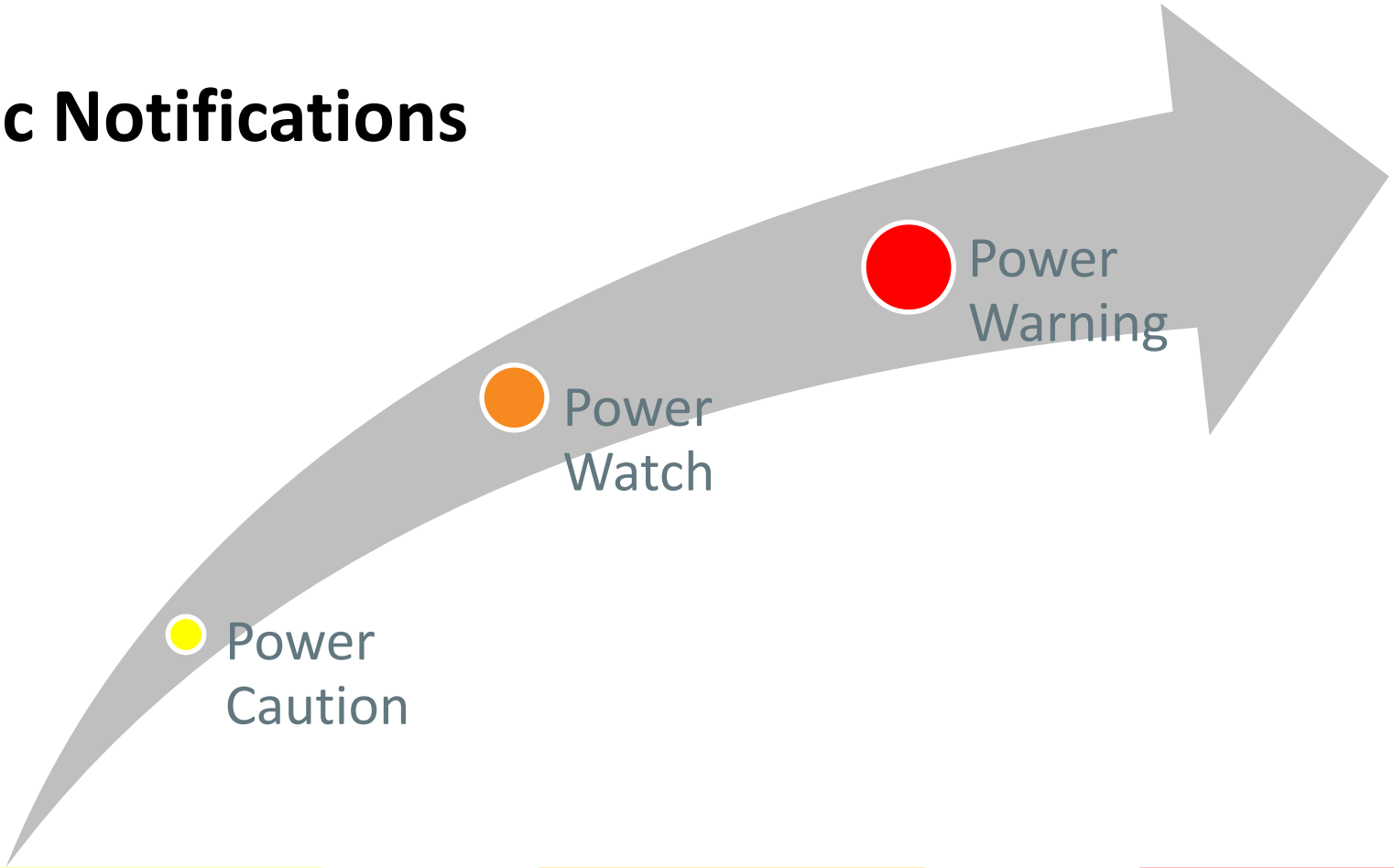
8. Implement Voltage Reduction (5% ≤ 10 Min)
Declare EEA2 *(if not done yet)*

9. Request Customer Generation & Voluntary Load Curtailment
(Large Industrial/Commercial)

10. **Implement a Power Warning**
Initiate Radio/TV Appeals
Declare EEA2 *(if not done yet)*

11. Request State Governor Appeals
Declare EEA2 *(if not done yet)*

OP-4 Public Notifications



Electric reserves can no longer be maintained using normal measures

Further steps to manage capacity could impact the public

Immediate reduction of power usage is necessary

OP-4 Estimates of Relief (Appendix A)

1	600
2	0
3	40
4	0
5	0 – 1,000
6	125
7	0 – 1,500
8	250
9	205
10	200
11	100

Total MWs of relief: 1,920 – 4,020 MW

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Historical OP-4 Events

- Most recent OP-4 implementation was Monday, September 3, 2018
- Caused by significant generation outages and reductions totaling ~1,650MW, and higher than forecasted temperatures and dew points, with largest departures in the afternoon, resulted in significant load forecast deviations
- System conditions required implementation of Master/Local Control Center Procedure No. 2 (M/LCC2) and OP-4
  - M/LCC2: 15:15 – 21:00
  - OP-4, Actions 1, 2: 15:30 – 20:00
  - OP-4, Actions 3-5: 16:00 – 19:00
- Link to Historical OP4 Implementation Summaries

Capacity Scarcity Conditions

- June 1, 2018: Pay-For-Performance Capacity Market rules went into effect
- Under this structure, a Capacity Scarcity Condition (CSC) is triggered by the approval of a single dispatch case that is violating one or more of the following reserve constraints for one 5-minute interval:
    - System Ten-Minute Non-Spinning Reserve (TMNSR)
        - RCPF of $1,500/MWh
    - System Thirty-Minute Operating Reserve (TMOR)
        - RCPF of $1,000/MWh
    - Local Reserve Zone TMOR
        - RCPF of $250/MWh
- CSC on September 3, 2018:
    - TMOR RCPF violated for the following 5 minute intervals: 15:40 – 18:15
    - TMNSR RCPF violated for the following 5 minute intervals: 17:00 – 17:10 and 17:35 – 18:00

OP-21

Actions During Normal, Energy Alert, and Energy Emergency Conditions

Normal Actions

Action	Normal
ISO Data Collection Frequency **(non-winter)**	**Bi-weekly**
ISO Data Collection Frequency **(winter)**	**Weekly**
ISO Forecasting & Reporting **(non-winter)**	**Bi-Weekly**
ISO Forecasting & Reporting **(winter)**	**Weekly**
ISO Alert LCCs & RC/BAs	N
ISO Alert State Regulators & Officials	N
Report to DOE using DOE-417	N
Request DF gen switch to fuel not in short supply (voluntary)	N
Implement OP-4, excluding Governor Appeals	N
Implement OP-4, including Governor Appeals	N
Implement OP-7	N
Lead MPs (Fuel & Emissions)	N/A
Lead MPs & LCCs (Transmission Facilities)	N/A

Energy Alert Actions

Action	Normal	Energy Alert
ISO Data Collection Frequency **(non-winter)**	Bi-weekly	**Daily**
ISO Data Collection Frequency **(winter)**	Weekly	**Daily**
ISO Forecasting & Reporting **(non-winter)**	Bi-Weekly	**Daily**
ISO Forecasting & Reporting **(winter)**	Weekly	**Daily**
ISO Alert LCCs & RC/BAs	N	**Y**
ISO Alert State Regulators & Officials	N	**Y**
Report to DOE using DOE-417	N	N
Request DF gen switch to fuel not in short supply (voluntary)	N	N
Implement OP-4, excluding Governor Appeals	N	N
Implement OP-4, including Governor Appeals	N	N
Implement OP-7	N	N
Lead MPs (Fuel & Emissions)	N/A	**Evaluate**
Lead MPs & LCCs (Transmission Facilities)	N/A	**Evaluate**

Energy Emergency Actions

Action	Normal	Energy Alert	Energy Emergency
ISO Data Collection Frequency **(non-winter)**	Bi-weekly	Daily	**Daily**
ISO Data Collection Frequency **(winter)**	Weekly	Daily	**Daily**
ISO Forecasting & Reporting **(non-winter)**	Bi-Weekly	Daily	**Daily**
ISO Forecasting & Reporting **(winter)**	Weekly	Daily	**Daily**
ISO Alert LCCs & RC/BAs	N	Y	**Y**
ISO Alert State Regulators & Officials	N	Y	**Y**
Report to DOE using DOE-417	N	N	**Y**
Request DF gen switch to fuel not in short supply (voluntary)	N	N	**Y**
Implement OP-4, excluding Governor Appeals	N	N	**Y (as needed)**
Implement OP-4, including Governor Appeals	N	N	**Y (as needed)**
Implement OP-7	N	N	**Y (as needed)**
Lead MPs (Fuel & Emissions)	N/A	Evaluate	**Evaluate**
Lead MPs & LCCs (Transmission Facilities)	N/A	Evaluate	**Evaluate**

OP-7

Action in an Emergency

OP-7 Purpose & Objectives

- Establishes criteria to be followed in the event of an operating emergency involving unusually low frequency, equipment overload, capacity or energy deficiency, unacceptable voltage levels, or any other emergency that ISO-NE deems appropriate
- Objectives for establishment of these emergency actions are:
  - To protect reliable operation of the Eastern Interconnection
  - To restore balance between customers' load and available generation in the shortest practicable time
  - To minimize risk of damage to equipment
  - To minimize interruption of customer service

OP-7 ISO-NE Responsibility

ISO-NE has the responsibility and authority to issue operating instructions to shed load or open of circuits when the emergency situation involves:

- An overall capacity or energy deficiency in New England or in a sub-area of New England
- Interconnections with adjacent RCA/BAA systems
- Conditions on facilities external to New England caused by operations or conditions within the New England RCA/BAA
- Transmission and/or generating facilities within the New England RCA/BAA
- Any other emergency conditions where ISO-NE deems it appropriate

OP-7 Load Shed

- 50% of the New England load can be shed manually in 10 minutes or less
  - This includes the 30% that is shed automatically by underfrequency relays
- Load shed instructions are communicated as an operating instruction from ISO-NE to the LCCs verbally as a % of area load to be shed
- A monthly simulated manual load shed test is performed with all LCCs in order to verify readiness

CONCLUSION/ SUMMARY

Questions

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