

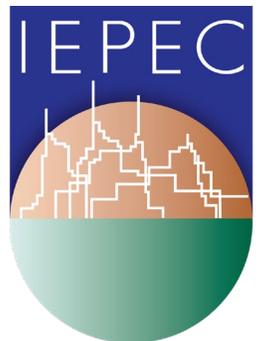
Bridging the Gap: How Updated Weather Datasets Improve Energy Efficiency Modeling

WILLIAM WALKER – EVERSOURCE (PRESENTER)

RILEY HASTINGS – EVERSOURCE

SHARON JONES – LEXICON ENERGY

GEORGE SORIN IOAN – DNV



Eversource at a Glance



3 STATES

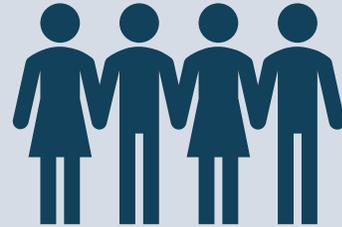
Largest energy company in New England

4.6M CUSTOMERS

Servicing electric and natural gas

10,000 EMPLOYEES

Across all three states



**STEWARD OF
ENERGY EFFICIENCY
FUNDS**

Eversource works collaboratively with other energy efficiency providers under the umbrella of these brand names

**#1 ENERGY
EFFICIENCY
PROVIDER IN THE
NATION**

~\$775m annual energy efficiency investment for 2024





Together, we make good happen for Massachusetts.

Your local electric and natural gas utilities and energy efficiency service provider are taking strides in energy efficiency: Berkshire Gas, Cape Light Compact, Eversource, Liberty, National Grid and Unitil.

As one, we form Mass Save[®], with the common goal of helping residents and businesses across Massachusetts save money and energy, leading our state to a clean and energy efficient future.

WE ARE MASS SAVE[®]:



We Are Mass Save[®]

When You Give A Model A Heat Pump

Savings:

1. Cooling

Efficiency Margin vs. AC

2. Heating

Efficiency Margin vs. [Heating]

Fuel Switch Benefits

MINUS – Electricity penalty*



When You Give A Model A Heat Pump

REALITY

SCENARIO A

HDDs: 5,802
CDDs: 746

Savings:

Cooling – ~392kWh
Heating – ~406 Therms – ~11.5 MWh

TMY3

SCENARIO B

HDDs: 7,275
CDDs: 492

Savings:

Cooling – ~258 kWh
Heating – ~509 Therms – ~14.5 MWh

COMMON ASSUMPTIONS

HDD = 7,000 BTU per
CDD = 2 kWh per using SEER 14 Central AC
Replacement Heat Pump is SEER 18 (26.31% efficiency edge over AC, 3,510 BTU per kWh)
1,000 sq ft Single Family Residence with gas furnace and reasonably good insulation

HD\$, CD\$ (Nationwide, Per Year)

1 HDD = 1.581Bcf CH₄ (EPA 2014)

1 CDD = ~305,000MWh (EPA 2021)

*Individual Mileage May Vary

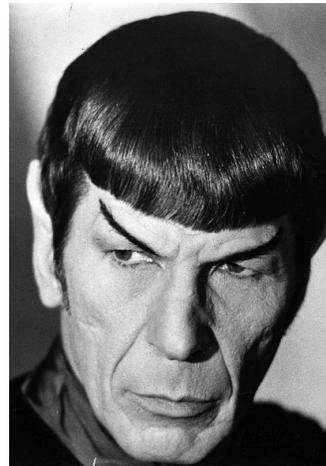
Fictional Creatures by Discipline

Storytelling



Wizards

Economics



Rational Actors

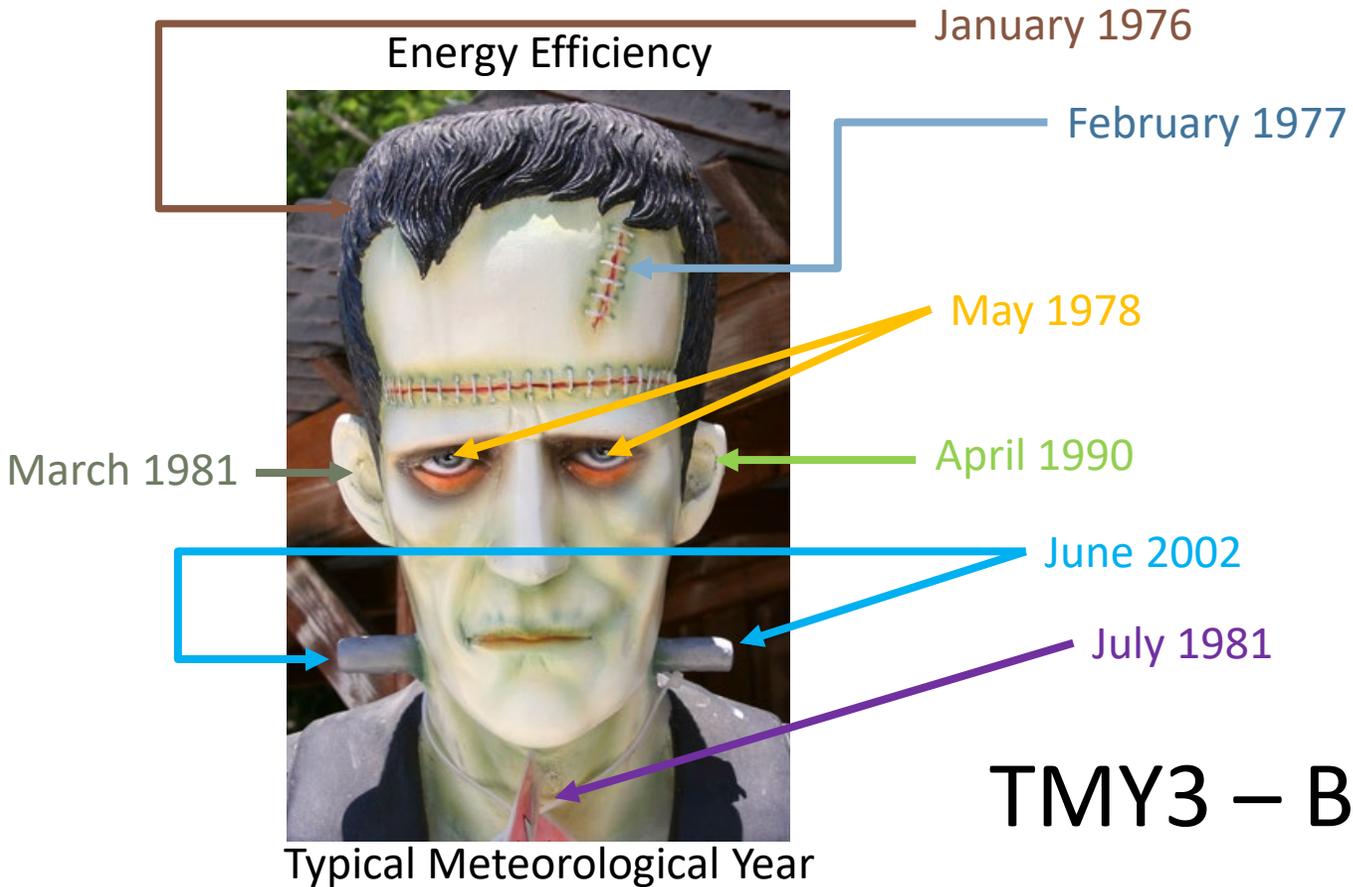
Physics



2. Spherical Space Cows

This is a spherical cow. It's floating in space in a vacuum. From the center of this cow, it is emitting strange electric field at the rate of $\mathbf{E}(r) = (\mu r + 1)\hat{r}$, where μ is the "Moo" constant and r is the radius from center of cow. If the

Fictional Creatures by Discipline



Not Pictured:

August 1989

September 1976

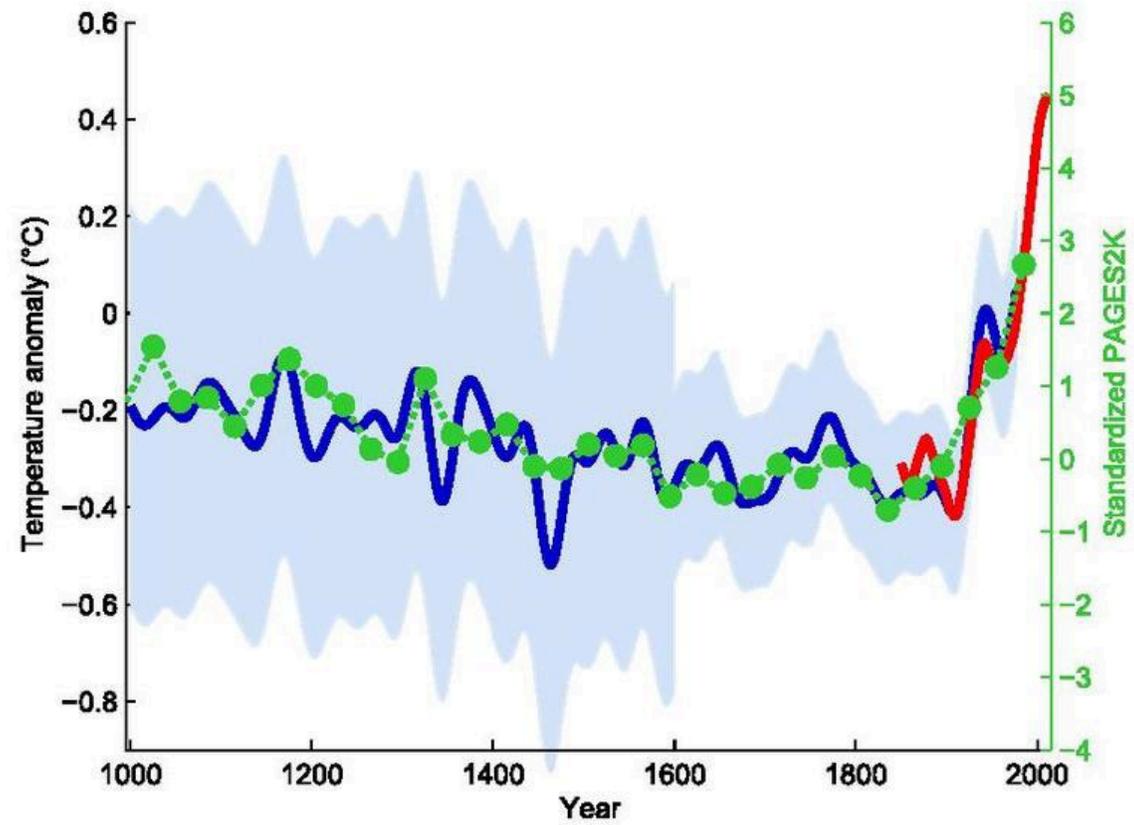
October 1986

November 1978

December 2003

TMY3 – Boston, Massachusetts

This.





FINAL REPORT

Massachusetts Typical Weather – Research and Dataset Development

MA22C04-B-TMY

Date: August 17, 2023

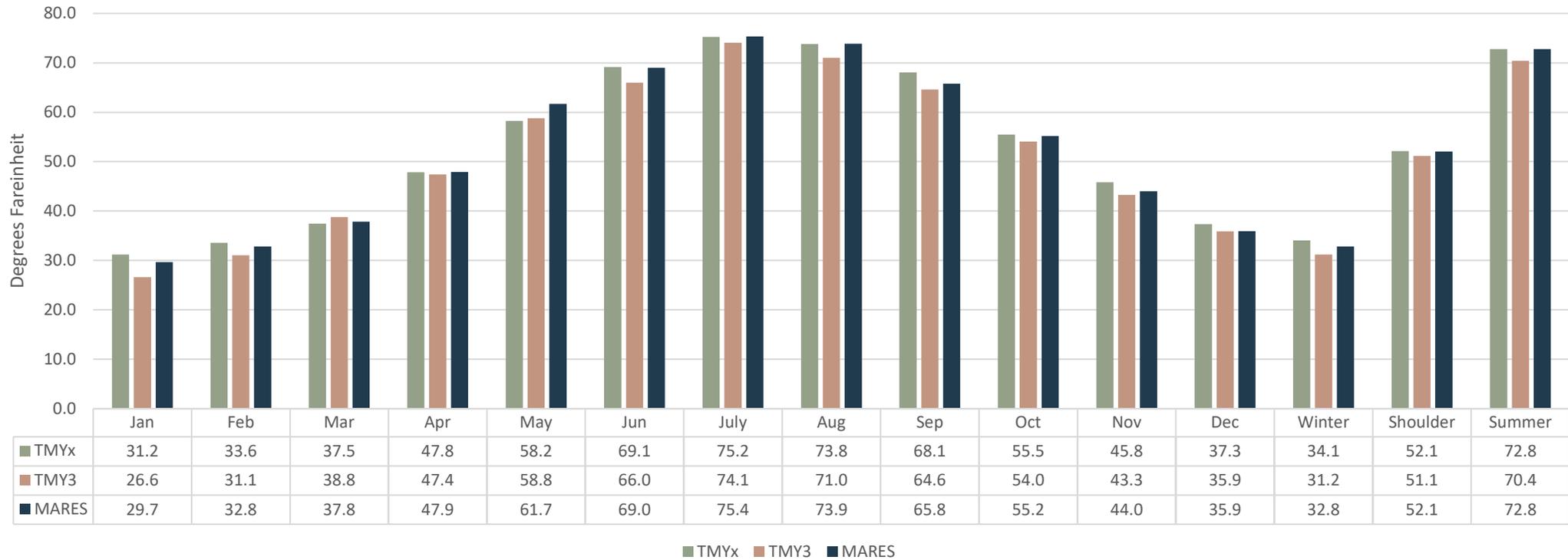


Mass Save[®] Program Weatherization Needs

	TMY3	MARES	TMYx
1. Hourly Data	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2. Spatial Resolution	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3. Reliable	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Credible	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5. Low-Cost	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

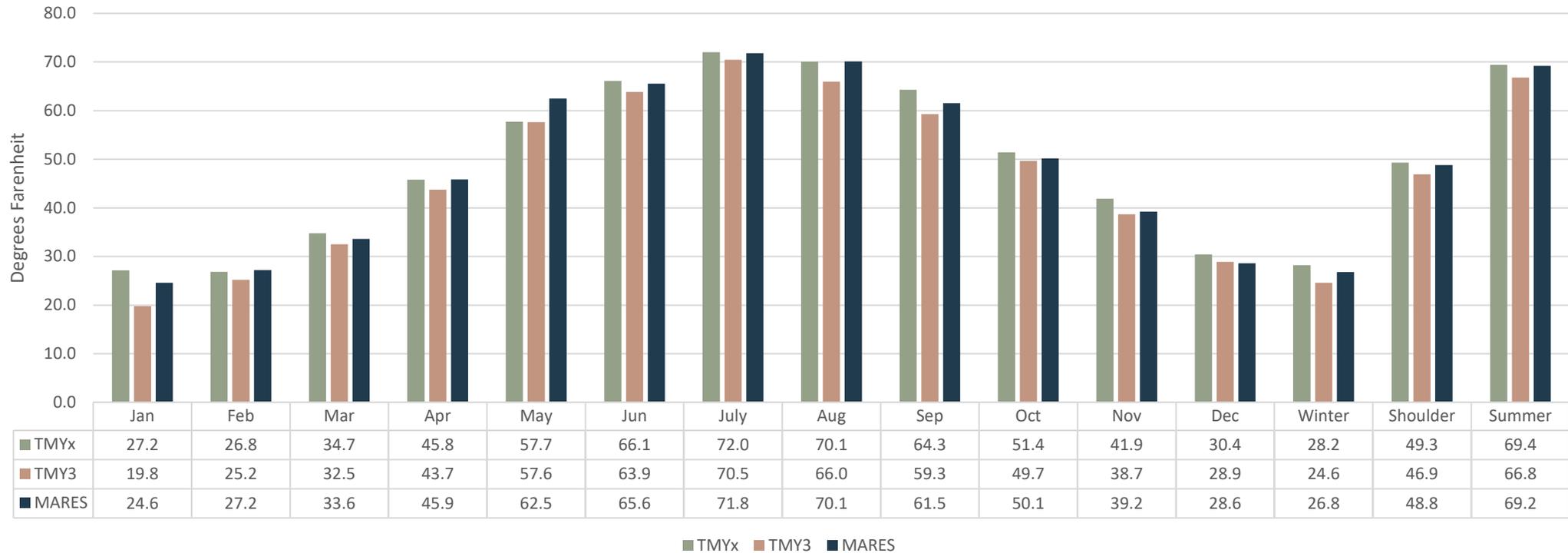
Side-by-Side-by-Side (KBOS)

Mean Temp by Month and Season (KBOS)



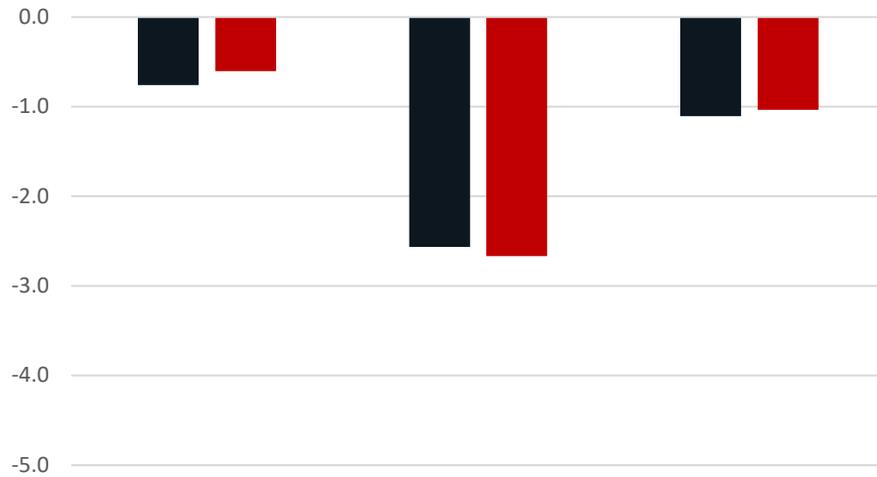
Side-by-Side-by-Side (KORH)

Mean Temp by Month and Season (KORH)



Vs. Actuals (Mean Temp)

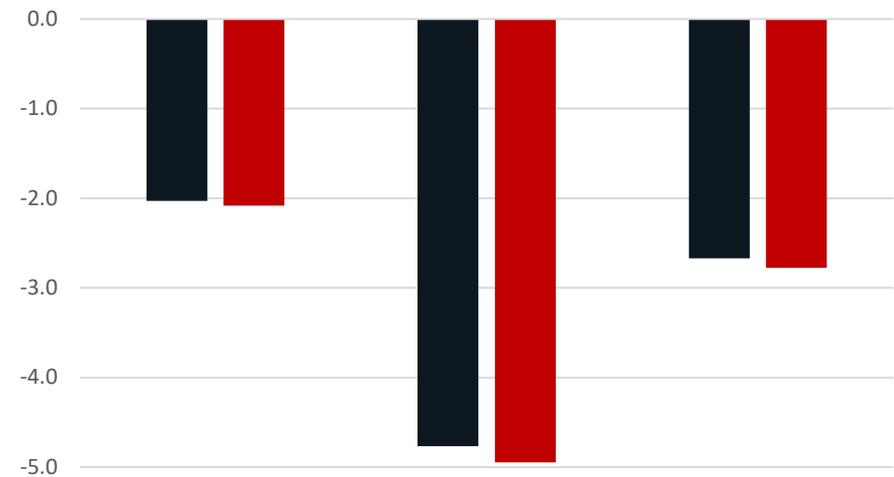
Difference of Means vs. 2022-2024 Actual (KBOS)



	TMYx	TMY3	MARES
■ Monthly	-0.8	-2.6	-1.1
■ Seasonal	-0.6	-2.7	-1.0

■ Monthly ■ Seasonal

Difference of Means vs. 2022-2024 Actual (KORH)



	TMYx	TMY3	MARES
■ Monthly	-2.0	-4.8	-2.7
■ Seasonal	-2.1	-4.9	-2.8

■ Monthly ■ Seasonal

Vs. Actuals (CDD)

	2022	2023	2024	3 Yr Mean
Boston	1,020	852	909	927 +/- 100
Worcester	751	697	791	746 +/- 50

1020 – 852 = 168 swing in one year

-123 vs. +/- 100



	TMY3	MARES	TMYx
Boston	-123	+82	+55
Worcester	-255	-38	-57

-255 vs. +/- 50 = (

Vs. Actuals (HDD)

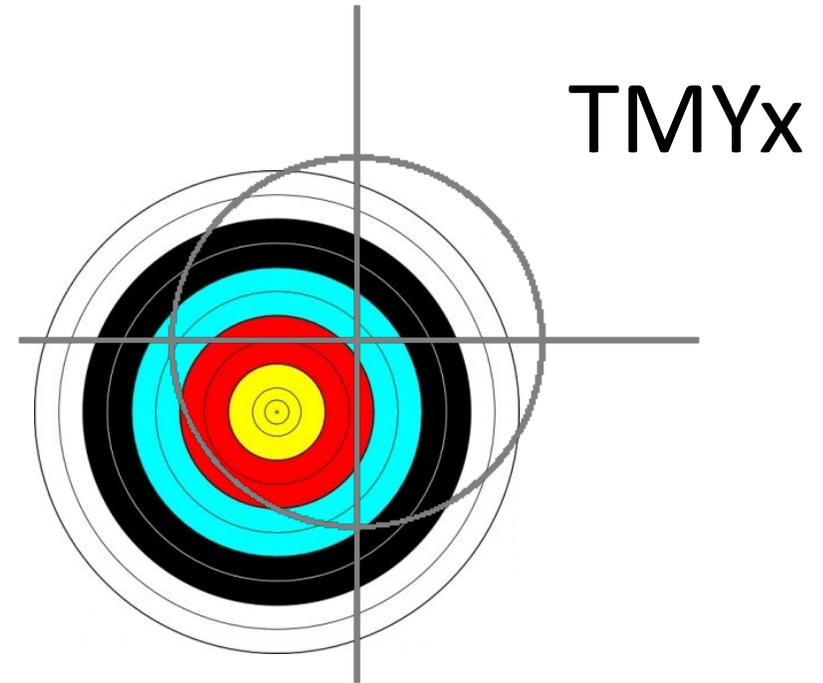
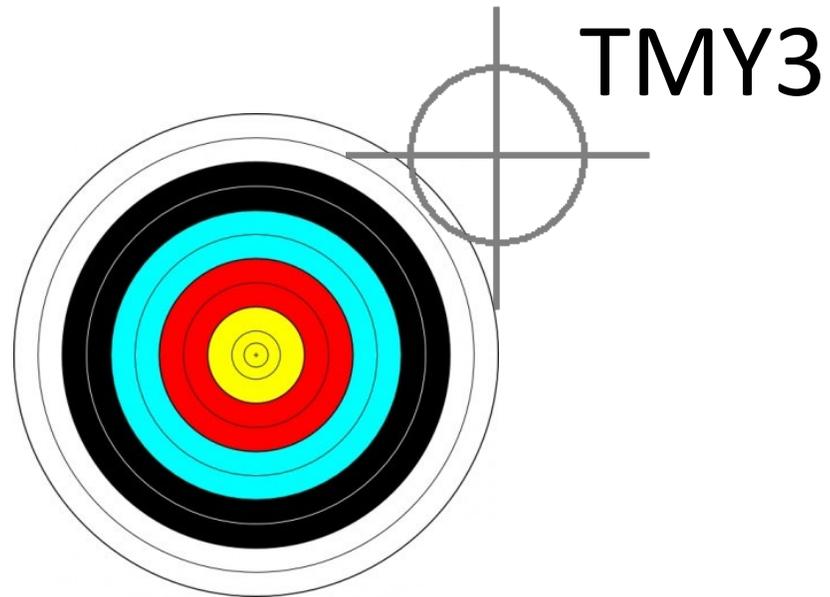
	2022	2023	2024	3 Yr Mean
Boston	5,227	4,895	5,130	5,084
Worcester	6,052	5,621	5,732	5,802

+/- 200

	TMY3	MARES	TMYx
Boston	+801	+474	+325
Worcester	+1,473	+922	+669

;-) = (

What's The Catch?



Acknowledgements

Artwork

Vexels.com

Chegg.com

UN IPCC

Williamc.walker@eversource.com

CONTACT US

**No Fictional Creatures Were Harmed During
The Production Of This Presentation**