

As of [29 April 2021](#), the forecast date of leafout is 8 May for mid-elevation bird plots at Hubbard Brook.

Phenology measurements by Amey Bailey, Northern Research Station, USDA Forest Service.

Leaf phenology model adapted from Nina Lany et al. 2016, *Oikos*.

Analyses by Matt Ayres et al., Dartmouth College.

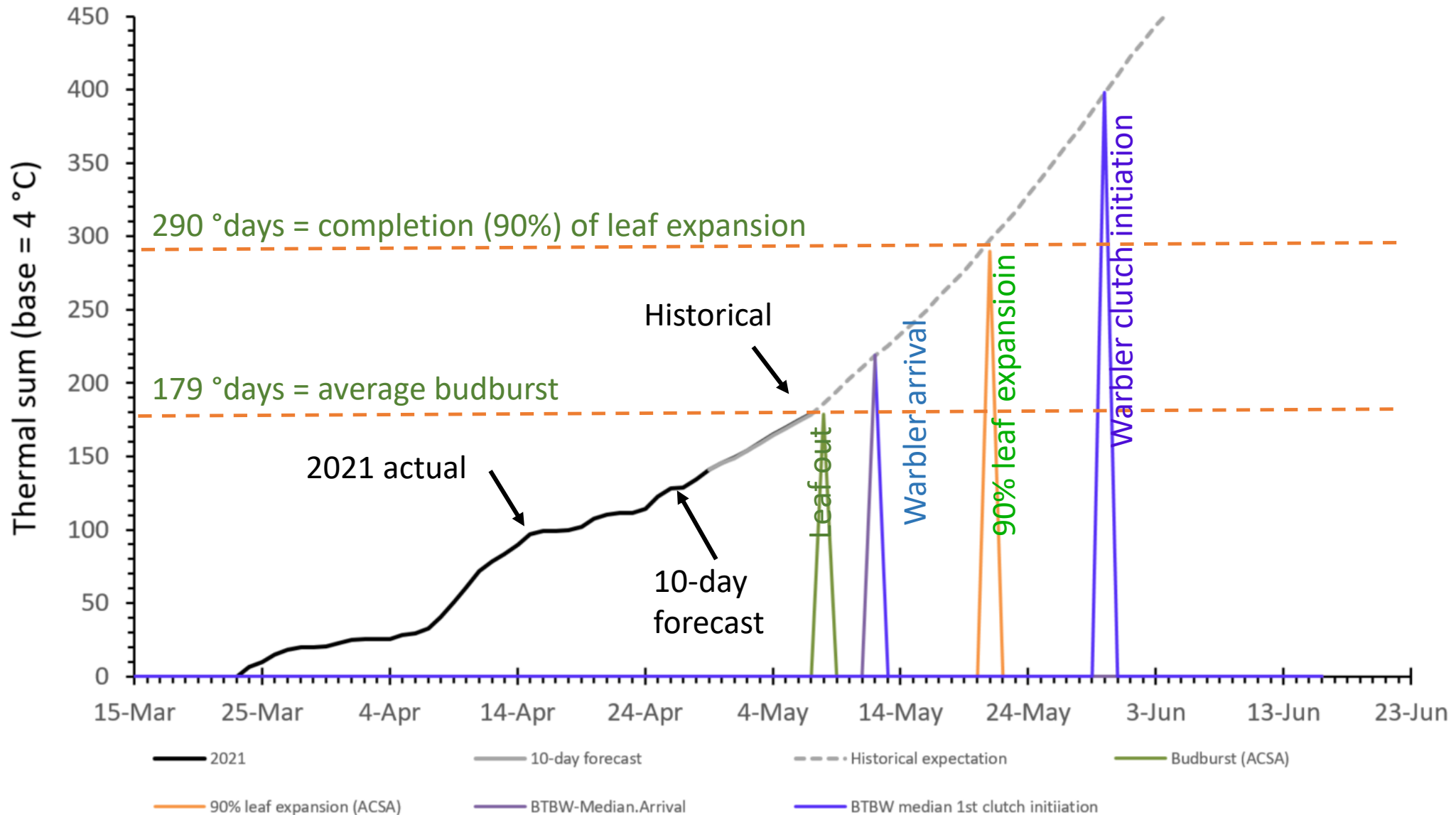
Estimated leaf-out phenology for mid-elevation Bird Plot in 2021 based on thermal sums.

As of 29 April 2021, predicted dates for budburst and 90% completion of leaf expansion are:

8 May and 21 May.

Predicted median dates of Arrival and 1<sup>st</sup> clutch initiation by Black-throated Blue Warblers are:

12 May and 30 May.



Real-time temperature records from USDA National Water & Climate Center (site 2069).

Phenological models adapted from Lany et al. 2016 using long term data of USDA Forest Service.

## References

USDA Forest Service, Northern Research Station. 2021. Hubbard Brook Experimental Forest: Routine Seasonal Phenology Measurements, 1989 - present ver 12. Environmental Data Initiative.

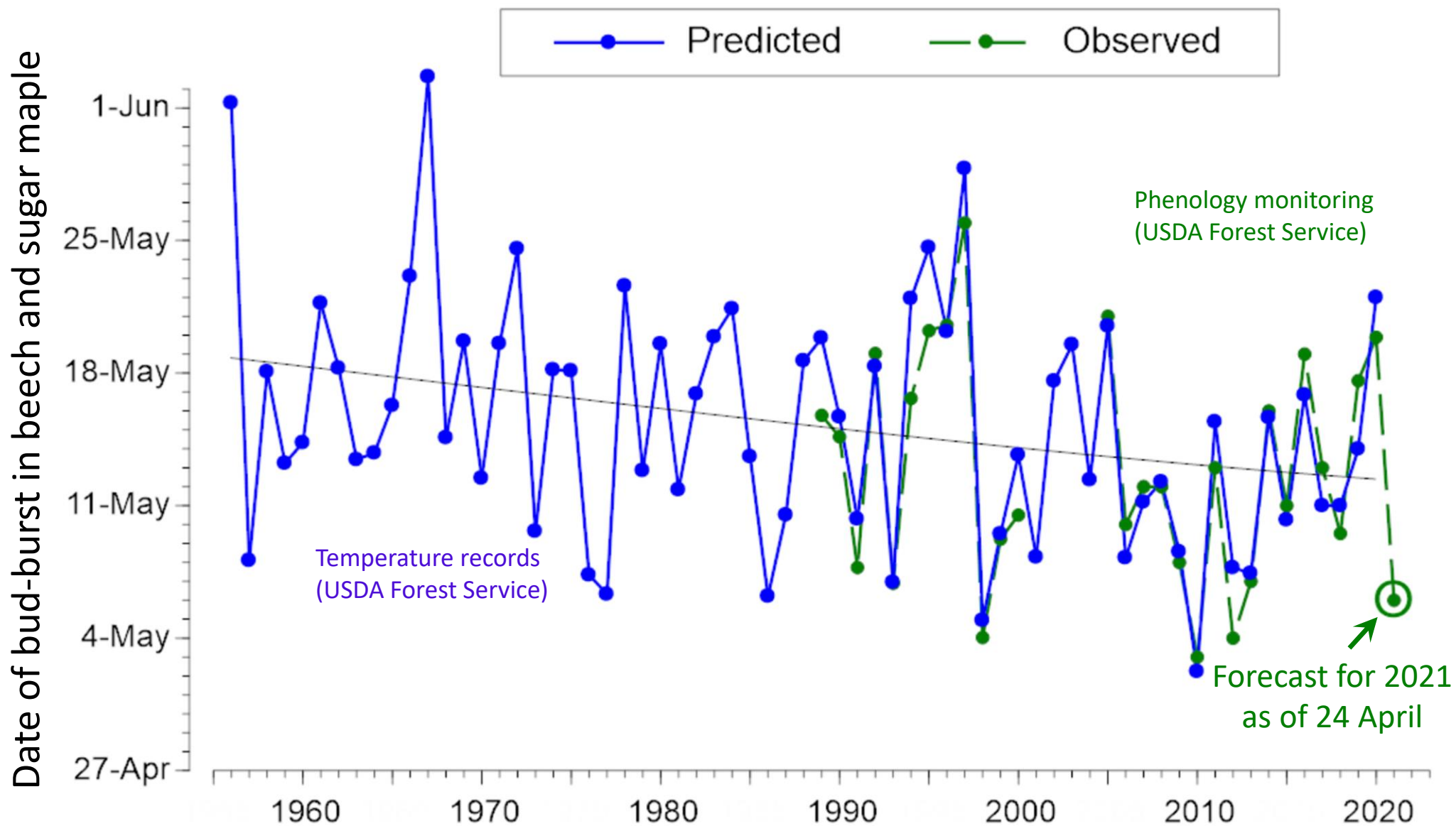
<https://doi.org/10.6073/pasta/f2c18a955c24eadaec1fa0d915a7b527>

USDA Forest Service, Northern Research Station. 2020. Hubbard Brook Experimental Forest: Daily Temperature Record, 1955 – present ver 9. Environmental Data Initiative.

<https://doi.org/10.6073/pasta/e7c793b98b895de2bb5e505f9ff5e0c>

Lany, Nina K., Matthew P. Ayres, Erik E. Stange, T. Scott Sillett, Nicholas L. Rodenhouse, & Richard T. Holmes. 2016. Breeding timed to maximize reproductive success for a migratory songbird: the importance of phenological asynchrony. *Oikos* 125: 656-666.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/oik.02412>



As of [24 April 2021](#), the forecast date of leafout is 6 May for mid-elevation bird plots at Hubbard Brook.

Phenology measurements by Amey Bailey, Northern Research Station, USDA Forest Service.

Leaf phenology model adapted from Nina Lany et al. 2016, *Oikos*.

Analyses by Matt Ayres et al., Dartmouth College.

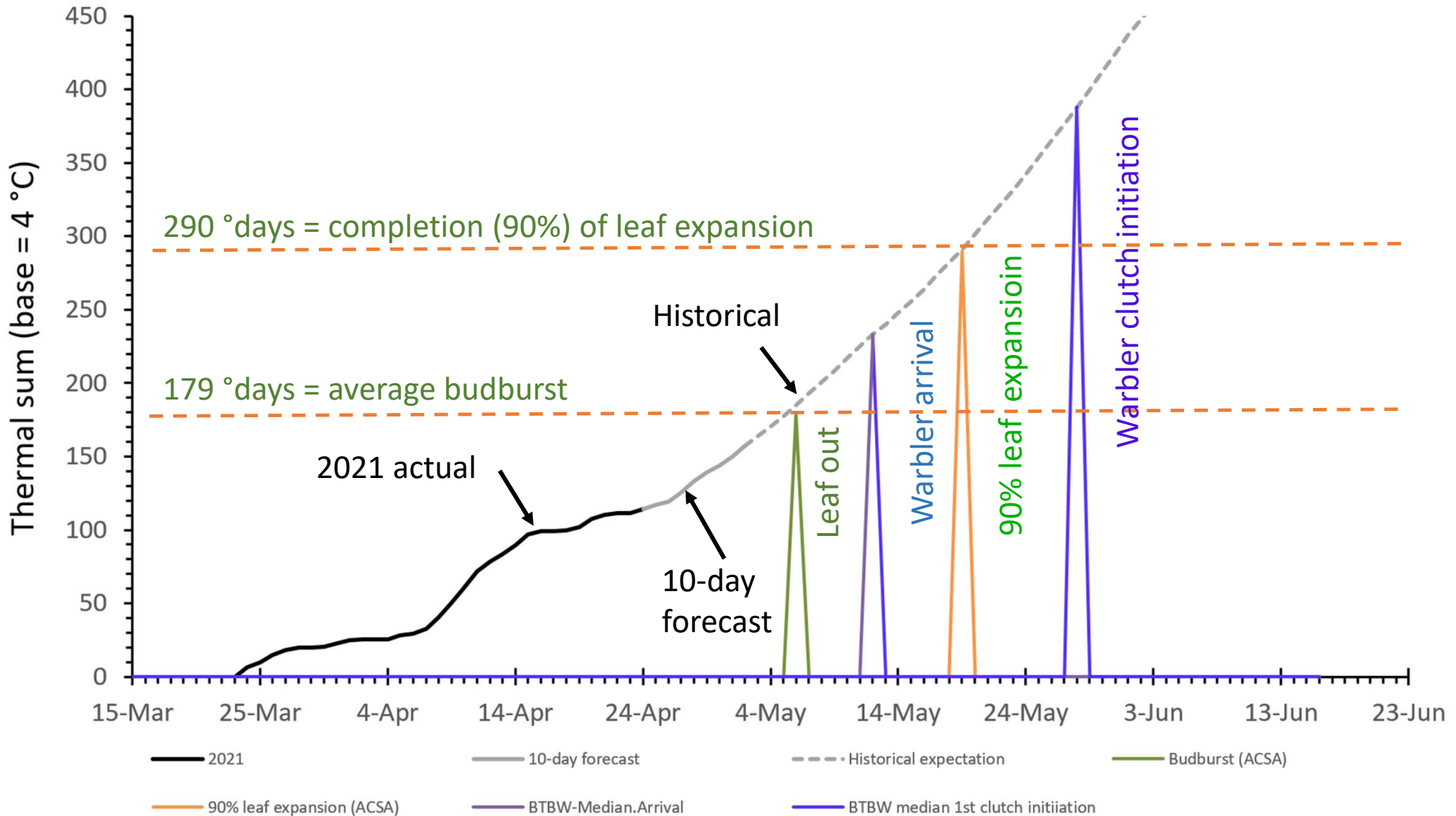
Estimated leaf-out phenology for mid-elevation Bird Plot in 2021 based on thermal sums.

As of 24 April 2021, predicted dates for budburst and 90% completion of leaf expansion are:

6 May and 19 May.

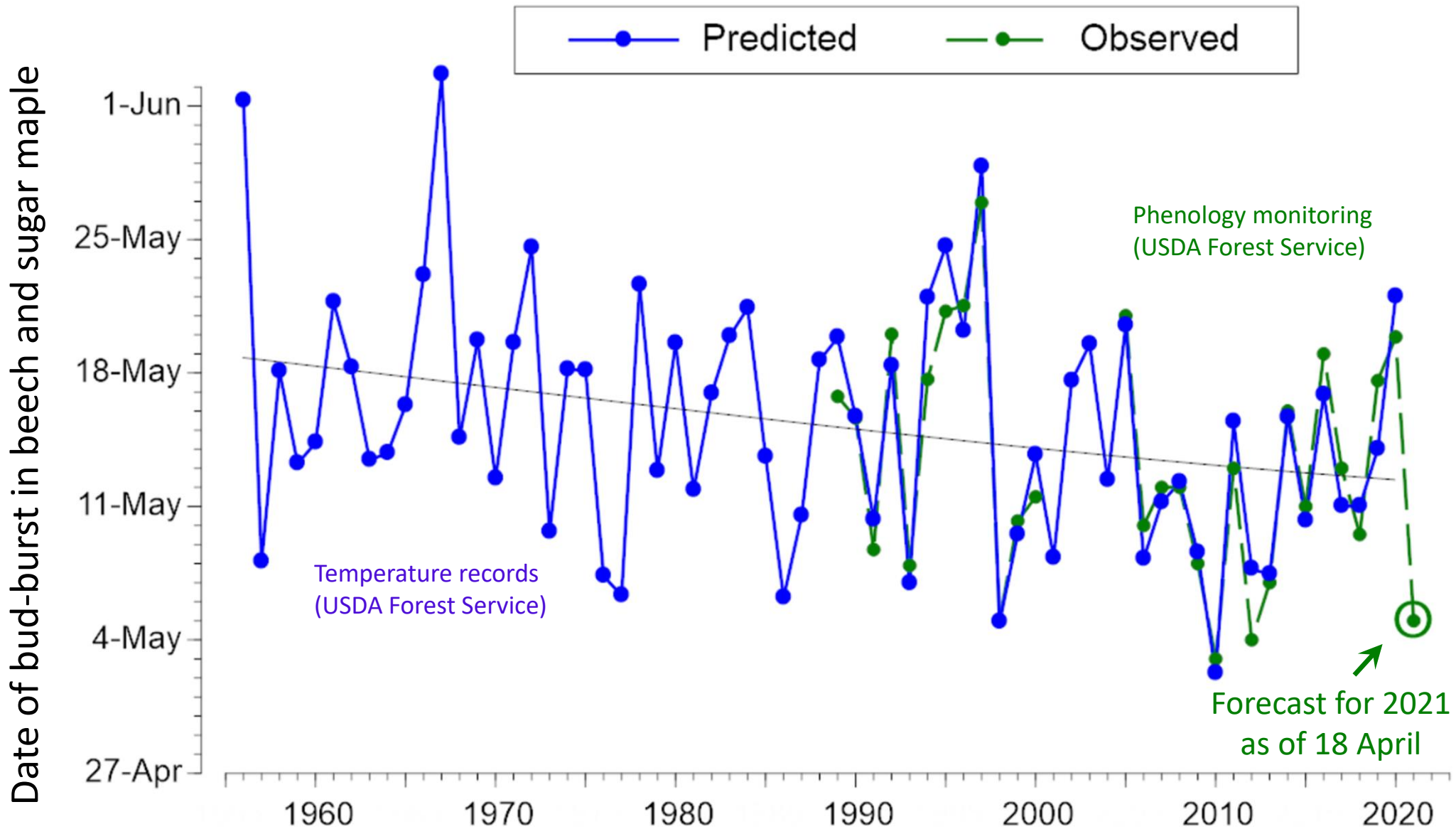
Predicted median dates of Arrival and 1<sup>st</sup> clutch initiation by Black-throated Blue Warblers are:

12 May and 28 May.



Real-time temperature records from USDA National Water & Climate Center (site 2069).

Phenological models adapted from Lany et al. 2016 using long term data of USDA Forest Service.



As of **18 April 2021**, the forecast date of leafout is 5 May for mid-elevation bird plots at Hubbard Brook.

Phenology measurements by Amey Bailey, Northern Research Station, USDA Forest Service.

Leaf phenology model adapted from Nina Lany et al. 2016, *Oikos*.

Analyses by Matt Ayres et al., Dartmouth College.



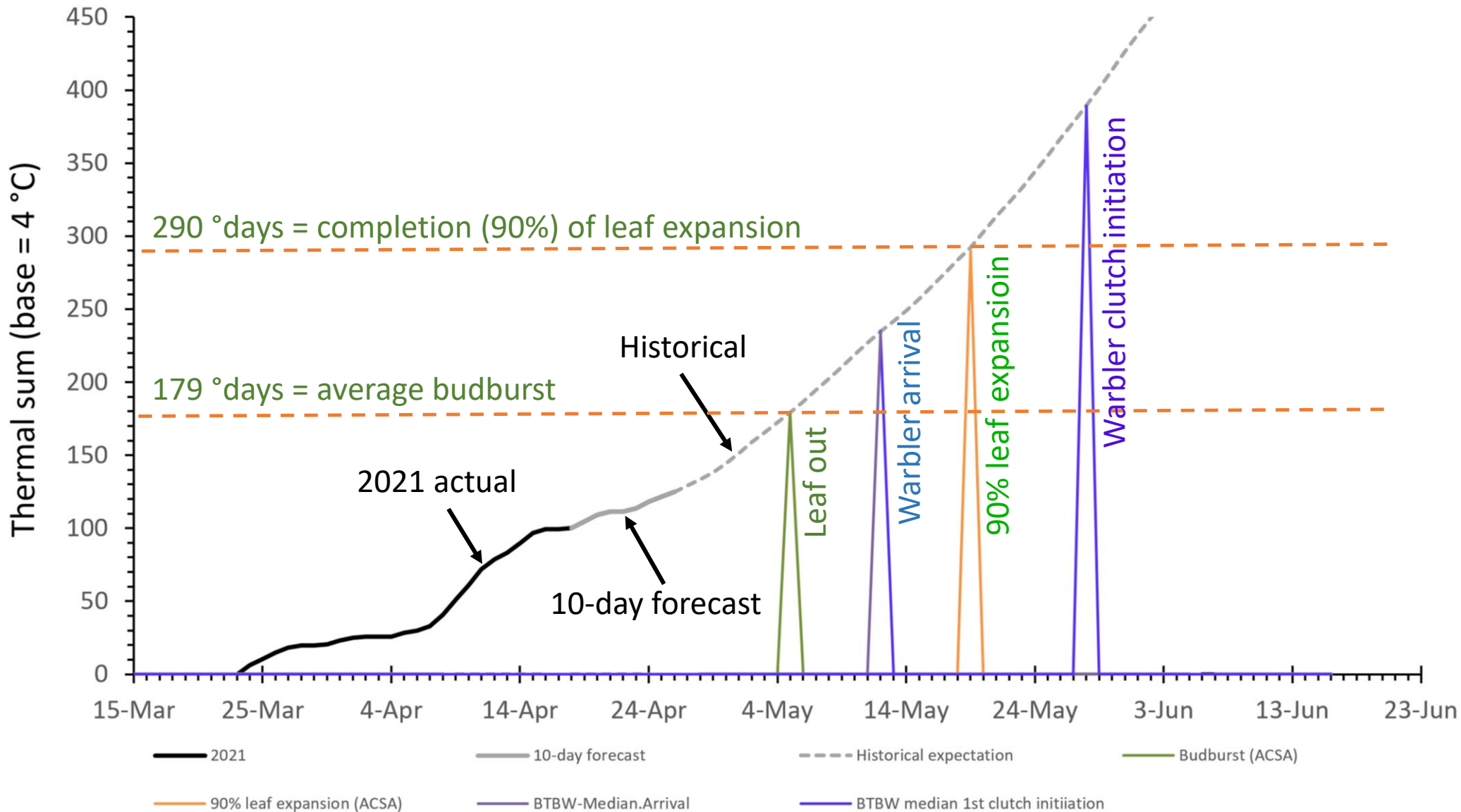
Estimated leaf-out phenology for mid-elevation Bird Plot in 2021 based on thermal sums.

As of 18 April 2021, predicted dates for budburst and 90% completion of leaf expansion are:

5 May and 19 May.

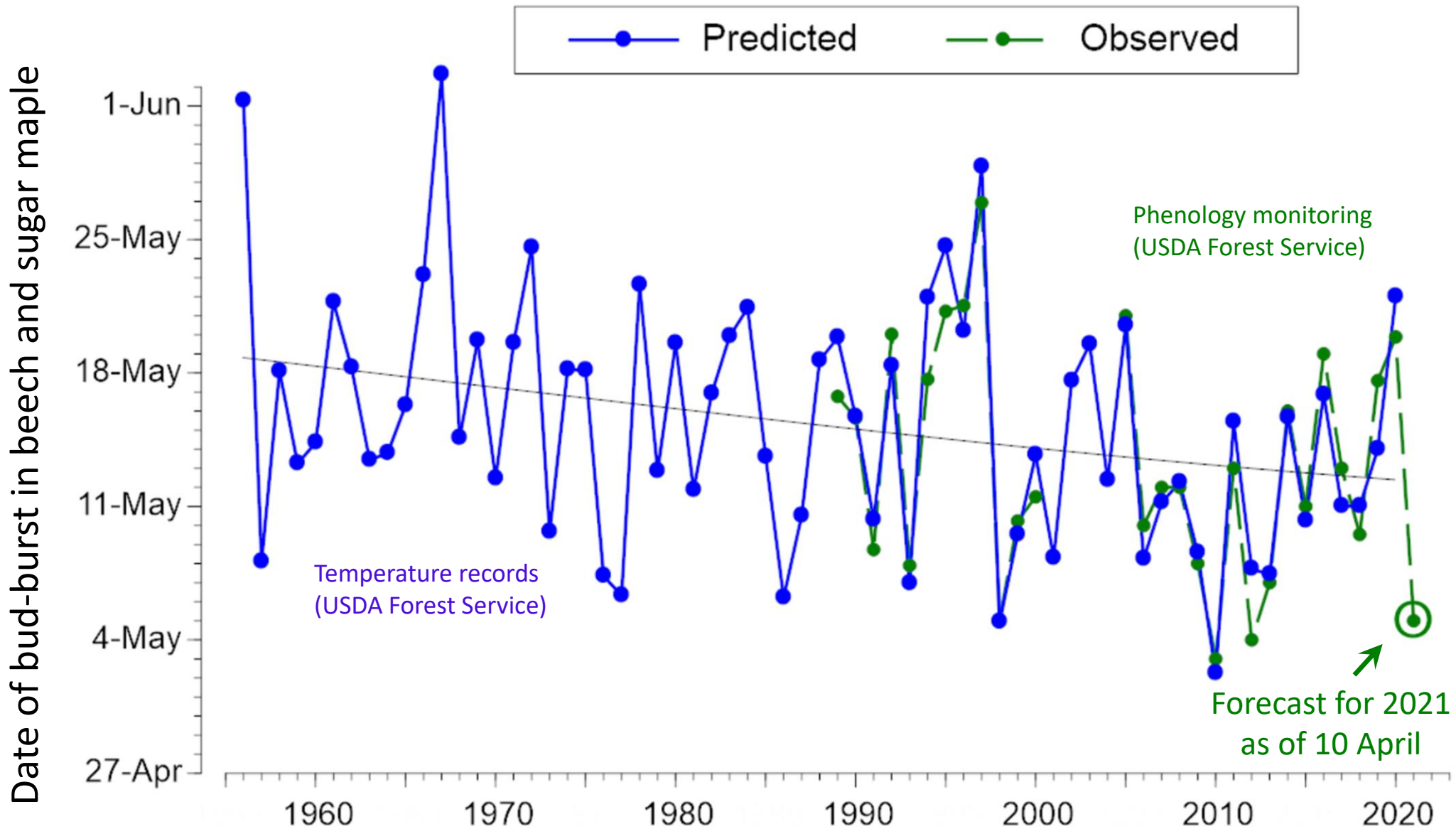
Predicted median dates of Arrival and 1<sup>st</sup> clutch initiation by Black-throated Blue Warblers are:

12 May and 28 May.



Real-time temperature records from USDA National Water & Climate Center (site 2069).

Phenological models adapted from Lany et al. 2016 using long term data of USDA Forest Service.



As of 9 April 2021, the forecast date of leafout is 5 May for mid-elevation bird plots at Hubbard Brook.

Phenology measurements by Amey Bailey, Northern Research Station, USDA Forest Service.

Leaf phenology model adapted from Nina Lany et al. 2016, *Oikos*.

Analyses by Matt Ayres et al., Dartmouth College.



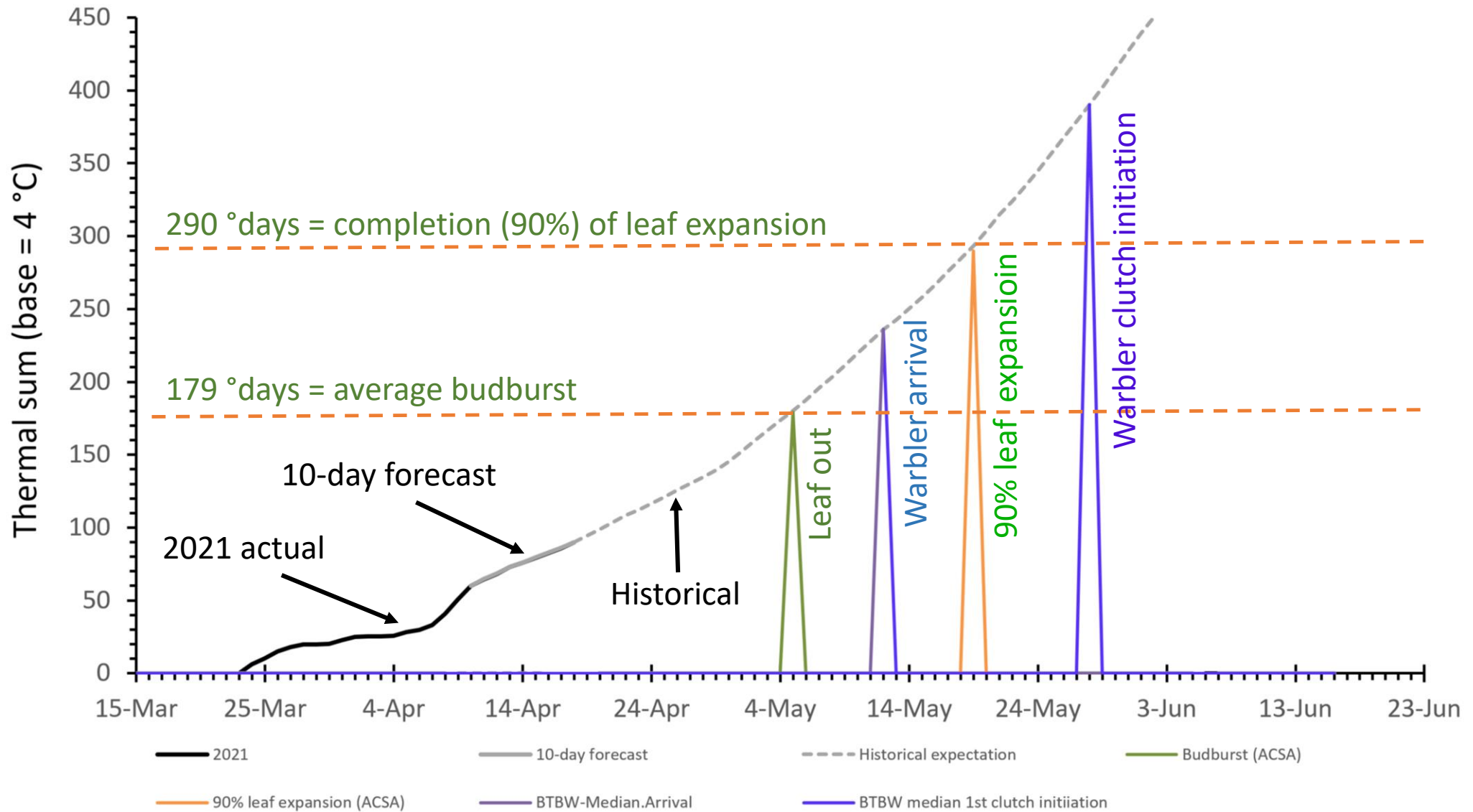
Estimated leaf-out phenology for mid-elevation Bird Plot in 2021 based on thermal sums.

As of 9 April 2021, predicted dates for budburst and 90% completion of leaf expansion are:

5 May and 19 May.

Predicted median dates of Arrival and 1<sup>st</sup> clutch initiation by Black-throated Blue Warblers are:

12 May and 28 May.



Real-time temperature records from USDA National Water & Climate Center (site 2069).

Phenological models adapted from Lany et al. 2016 using long term data of USDA Forest Service.