

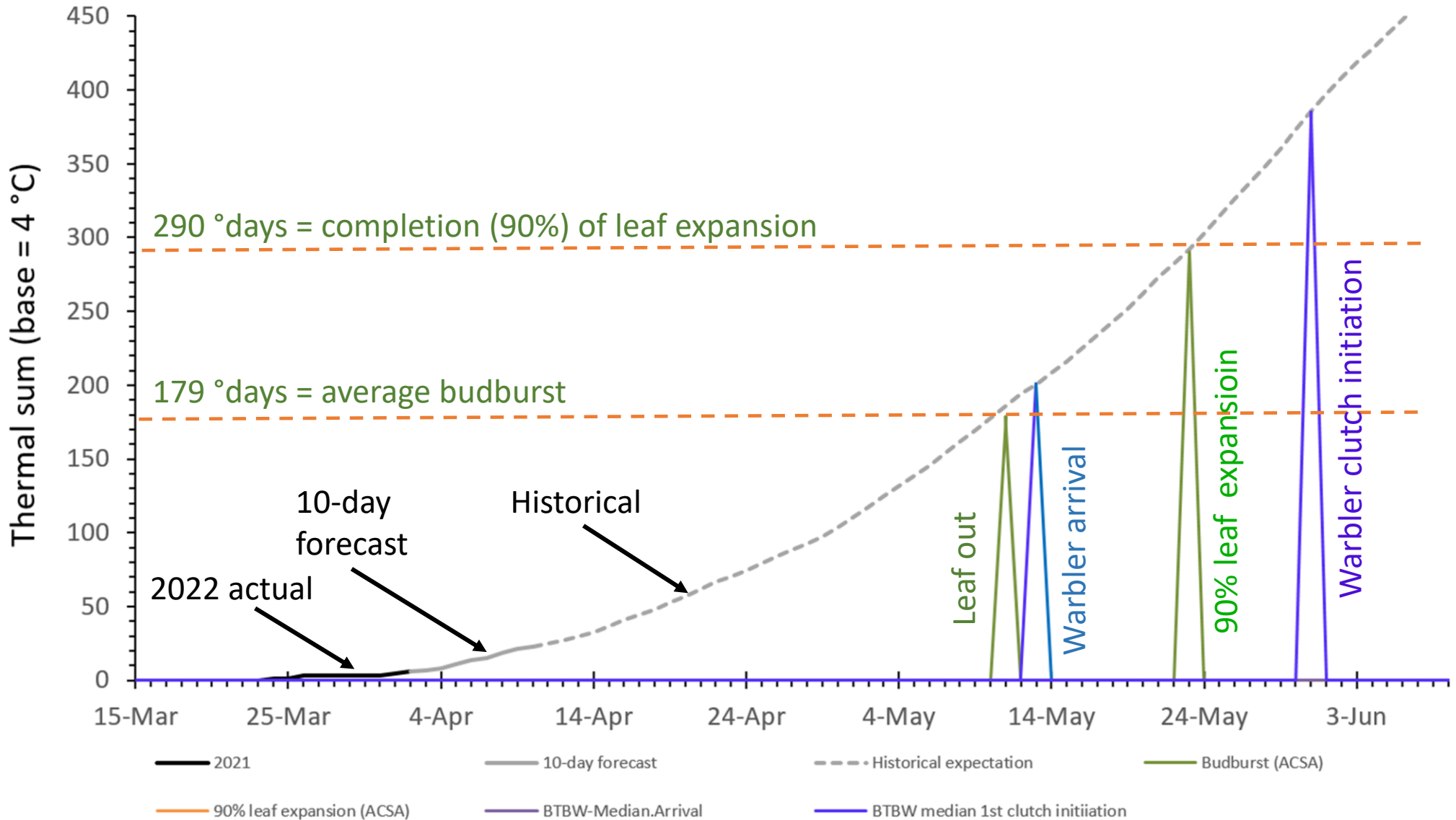
Estimated leaf-out phenology for mid-elevation Bird Plot in 2022 based on thermal sums.

As of 3 April 2022, predicted dates for budburst and 90% completion of leaf expansion are:

11 May and 23 May.

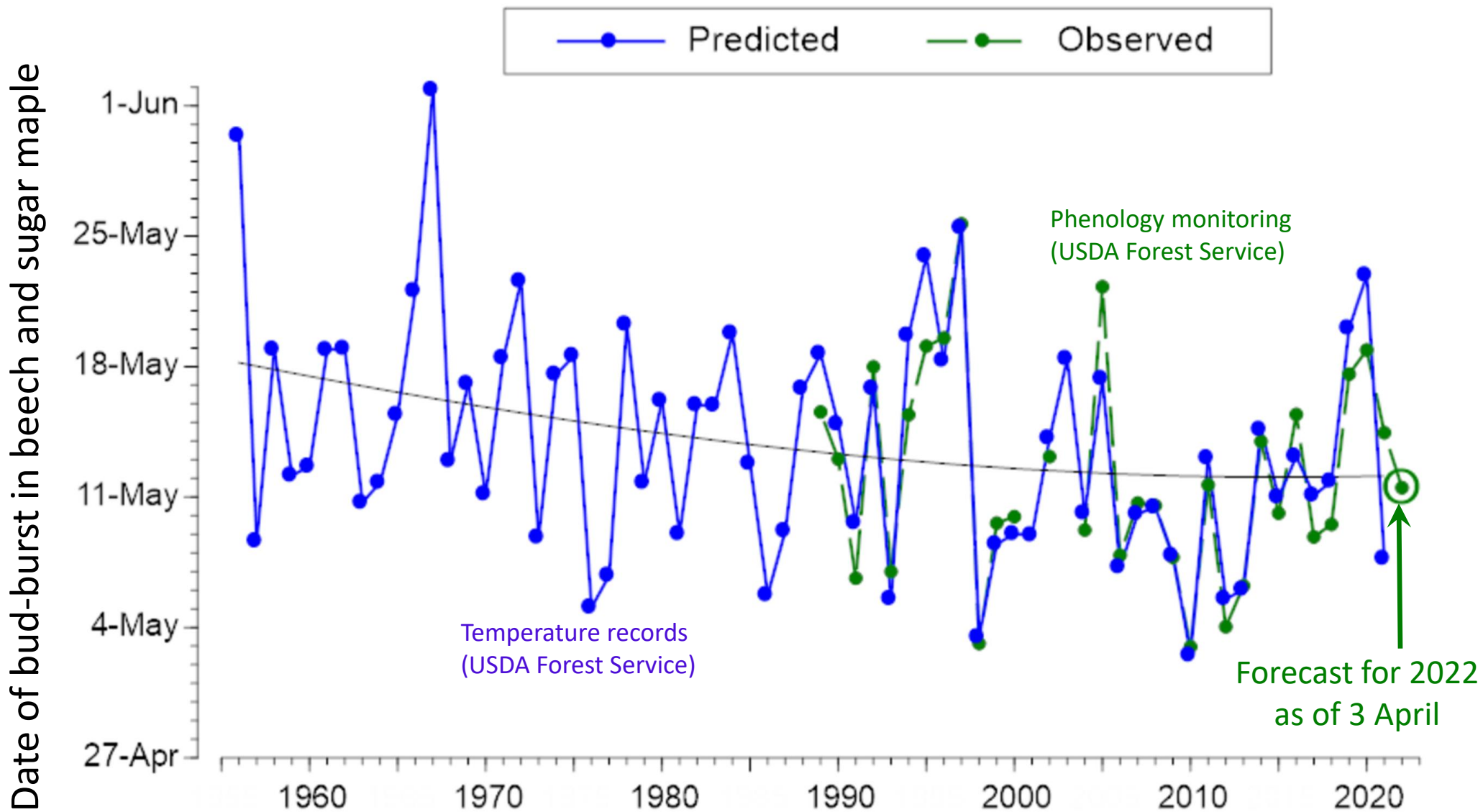
Predicted median dates of Arrival and 1st clutch initiation by Black-throated Blue Warblers are:

13 May and 31 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 [3 April 2022](#), the forecast date of leafout is 11 May for mid-elevation bird plots at Hubbard Brook.

Phenology measurements by 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.

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. 2021. Hubbard Brook Experimental Forest: Daily Temperature Record, 1955 - present ver 10. Environmental Data Initiative.

<https://doi.org/10.6073/pasta/3afab60d54d5f2fcb1112e71f4be2106>

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>

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

<https://wcc.sc.egov.usda.gov/nwcc/site?sitenum=2069&state=nh>