Future Winegrape Phenology in the Okanagan Valley

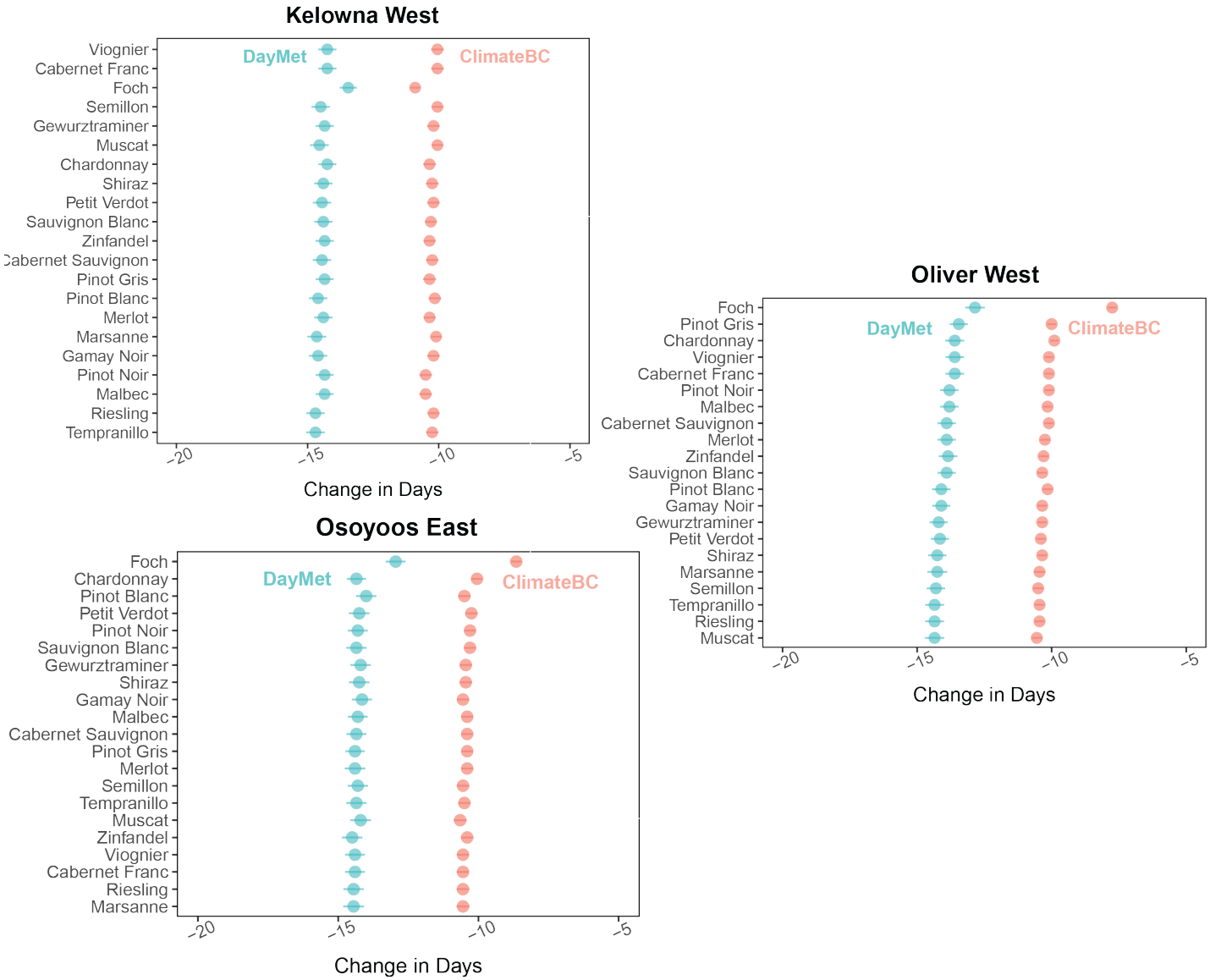
A series of factsheets on predicted phenology with continued warming across locations and varieties

Flowering

When plants reach 50% capfall (Eichorn-Lorenz stage 23).

Projections across the Okanagan Valley

Using a thermal sum (growing degree day) model of flowering (calculated using thermal sums from budbreak to flowering), built from long-term data across the Okanagan Valley, we projected future flowering dates given continued warming across varieties.



Figures above: Projected shifts in flowering across three locations in the Okanagan Valley, using two different sources for projected climate (Climate BC and Daymet), show trends of advance by an average of 12 days across locations. Varieties are ordered from the smallest to largest shift (averaged across climate sources), with Foch showing smaller shifts than other varieties in Oliver and Osoyoos.

How we developed these projections

Using historical phenology data across 18 years (2001-2018), we built growing degree day models (GDD, base temperature of 10°C) that separated out variation due to vineyard, variety then used these models to project (forecast) future winegrape phenology.

For these phenological forecasts, we needed future daily climate data that was on a relatively fine spatial scale. Because future projections are themselves uncertain we used two methods:

1) **DayMet**: For this we used fine-scale long-term, continuous, gridded estimates of daily temperature data (provided here https://daymet.ornl.gov/). Projections for warming by mid-century (2031-2050) are roughly +2°C, thus we added +2°C to to daily climate data from 2001-2020 for our DayMet projections.

2) **ClimateBC**: Climate BC provides fine spatial scale future climate projects from global circulation models at the monthly scale (for more see: https://climatebc.ca/). We used DayMet daily data to downscale monthly mid-century projections.

In general these two methods agreed. They were especially similar for the middle and southern Okanagan, but diverged somewhat for Kelowna. This suggests projected warming for Kelowna--and thus shifts in phenology in the future--is more uncertain compared to other parts of the Okanagan winegrowing region.

Project Information

We analysed historical phenology data for vineyards spanning different companies and locations to compile historical trends and inform growers' decision making. Data for this project was generously donated by Arterra Wines Canada, Quails' Gate Winery and Sebastian Farms.

For further information please visit stateofwine.org

Acknowledgments

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