# Ecography

**Supplementary material**

# Appendix 1

# Phenological delay despite warming in wood frog *Rana sylvatica* reproductive timing: a 20-year study
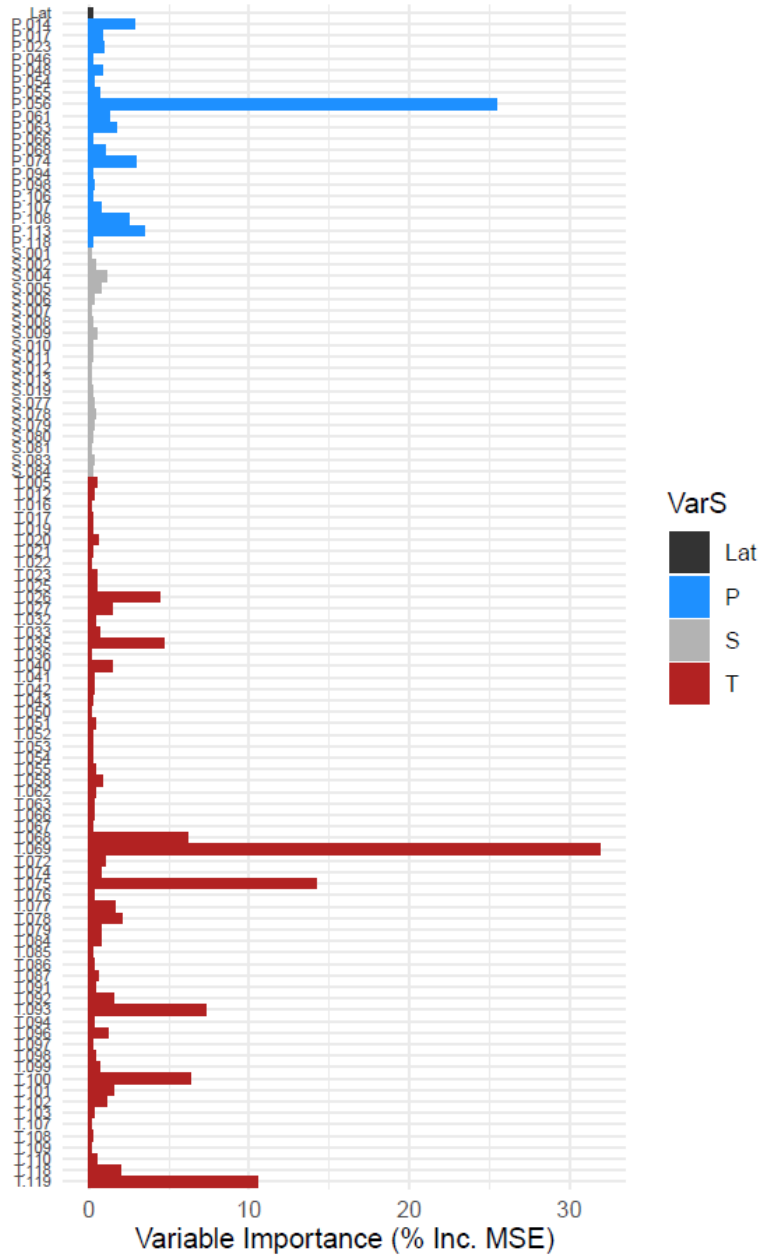


Figure A1. Random forest regression variable importance reported as the percent increase in predictive accuracy (% Inc MSE). The variable important metric estimates the proportional

increase in predictive accuracy as the decrease in mean squared error from including a variable compared to a random permutation of that variable and is calculated from cross-validation on the out-of-bag samples for each tree in the forest.

Variable codes are in the format of variable letter code followed by day-of-year (example: T.093 = daily mean temperature at day-of-year 93; P.017 = daily mean precipitation at day-of-year 17). Variables in the models include average daily temperature (T), daily precipitation (P), daily snow water equivalent (S), latitude (Lat), aspect, elevation, leaf-on global site factor (GSF), leaf-off GSF, weighted GSF, GSF variance, and an a site identifier (Pond). A randomly generated variable (Noise1) was included to assess rank importance. Only variables with importance greater than random noise are shown.
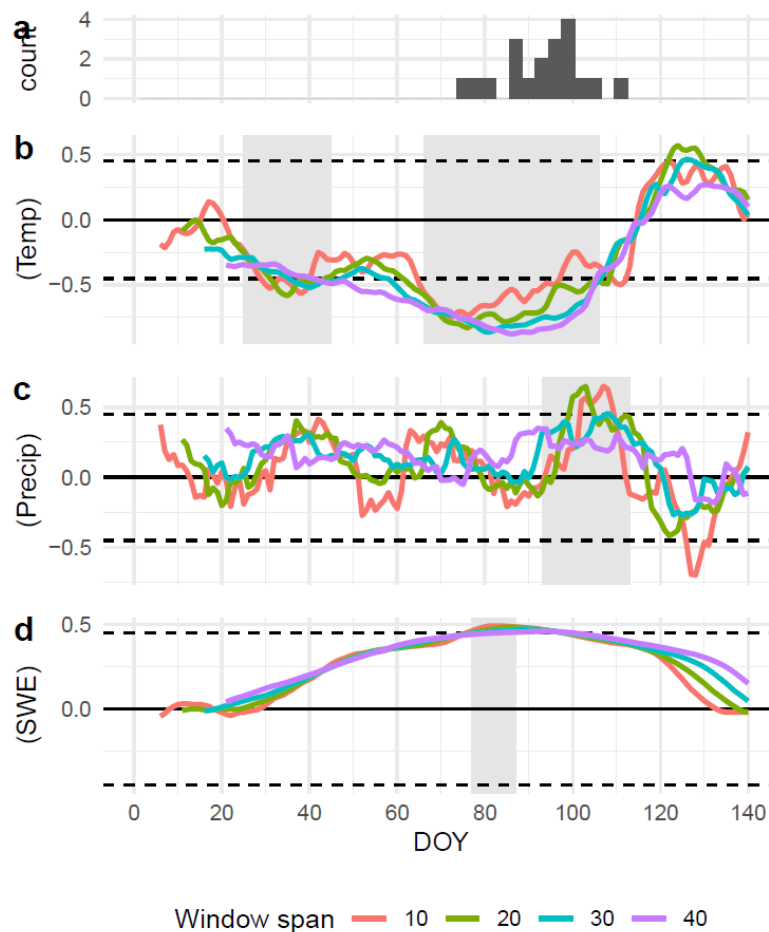


Figure A2. The correlation between 10-, 20-, 30-, and 40-day rolling averages of daily mean temperature (b), precipitation (c), and snow water equivalent (d) between 2000 and 2018 with oviposition timing (annual averages 2000-2019, 3-day bin width)(a). Dotted lines indicate 95% confidence interval (+/- 0.45) for Pearson's correlation for n = 20 pairs and 18 degrees of freedom. Light grey bands indicate non-overlapping windows of greatest correlation.

Table A1. Correlation between oviposition timing and seasonal windows for daily average temperature, precipitation, snow water equivalent (SWE).

| Climate variable | Window | Pearson's correlation |
|---|---|---|
| Temperature | 66, 106 | -0.88 |
| Temperature | 66, 96 | -0.86 |
| Temperature | 66, 86 | -0.83 |
| Temperature | 67, 77 | -0.76 |
| Precipitation | 102, 112 | 0.65 |
| Precipitation | 93, 113 | 0.65 |
| Temperature | 39, 79 | -0.60 |
| Temperature | 25, 45 | -0.58 |
| Temperature | 33, 43 | -0.57 |
| Precipitation | 94, 114 | 0.53 |
| Temperature | 25, 55 | -0.52 |
| SWE | 77, 87 | 0.49 |
| SWE | 76, 96 | 0.48 |
| SWE | 75, 105 | 0.47 |
| SWE | 74, 114 | 0.46 |
| Precipitation | 93, 123 | 0.46 |