Sugaring in the Piedmont, North Carolina

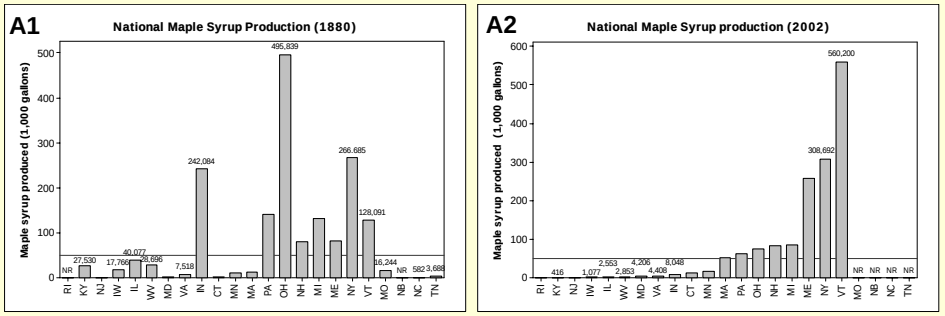
William P. Tyminski
Carolina Tree-Ring Science Laboratory, Department of Geography, UNC at Greensboro

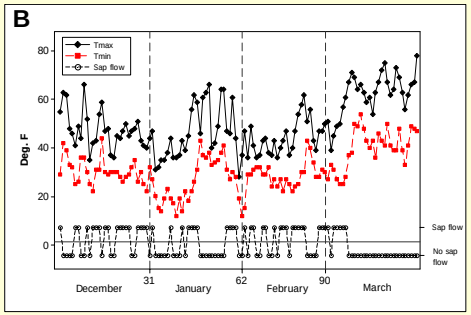
Introduction

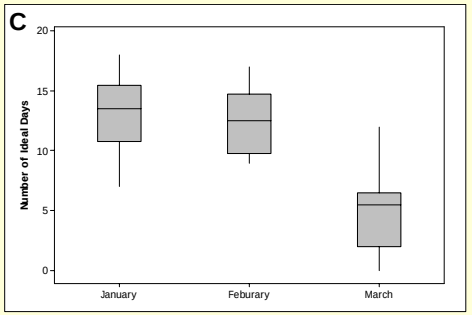
- Maple syrup production primarily occurs in the northeastern and midwestern U.S.
- From 1860–1910, maple syrup and sugar were produced in large quantities in North Carolina, Tennessee, Virginia, and West Virginia. In 2007 Virginia, West Virginia, and North Carolina maintained commercial production, albeit at much lower volumes compared to the 19th & early 20th centuries (Figs. A1 & A2).
- Despite the decline in production throughout the Southeast, collecting maple sap is still feasible where sugar maples (*Acer saccharum*) are found.
- The winters in the northwestern Piedmont region of North Carolina are marked with a window of meteorological conditions that would facilitate sap flow.
- This project was used to determine the feasibility of maple sugaring as a NSF GK–12 inquiry based project in High Point, NC.

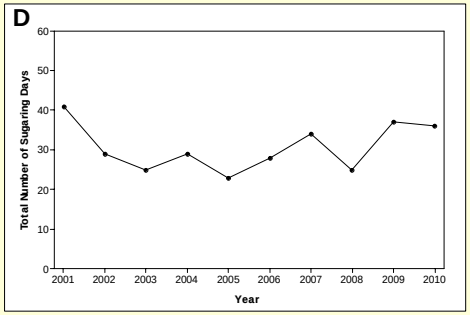
Methods and Data Collection

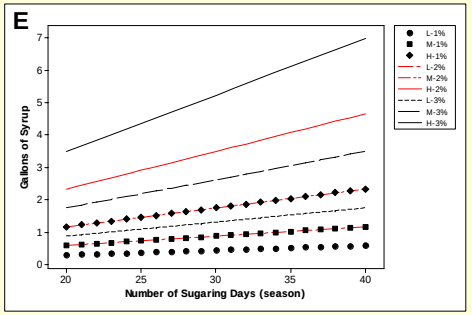
- Maximum and minimum daily temperatures from the Piedmont Triad Airport for 2001–2010 were analyzed to determine the suitability for maple syrup production.
- The months of January–March were used to count the number of days that the minimum temperature fell below 0.0°C (32.0°F) and had a maximum temperature of 4.4°C (40.0°F) or greater.
- We then calculated the 95% bootstrapped CI for the average number of possible sap flow days.
- The lower and upper CI were used to construct the total possible sap flow for the region.
- Using a 25 day range of sap flow, three sap flow rates of 0.125 (L), 0.25 (M), & 0.5 (H) gallons/day and average sap-sugar concentrations of 1, 2, & 3%, we calculated the potential quantity of syrup produced from 10 maple trees.

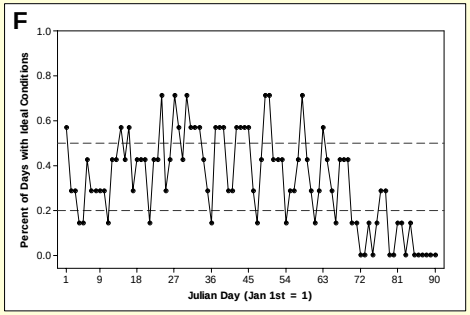












Sugaring Days	Mean (95% CI)
Average Total	30.7 (27.3,34.3)
January	13.1 (11.1,14.5)
February	12.5 (10.8,14.2)
March	5.1 (3.2,7.2)

Results

- The Greensboro-High Point region has, on average, 31 days with ideal meteorological conditions for sap flow (Fig. D & table).
- The length of the sugaring season is comparable to that of the commercial region.
- Conversely, the sugaring season begins 30–60 days before it begins in the commercial regions in the Northeast and the higher elevations in the southern tier.
- The majority of ideal days occur in January and February (Figs. B, C & F).
- We estimate that ten sugar maples in the Piedmont would produce 1.6 gallons of syrup (10th and 90th percentiles = 0.6 & 4.3 gallons, respectively) (Fig. E).

Conclusions

- Based on the last ten years of weather records, hobbyist maple syrup production is feasible, provided access to either sugar (*A. saccharum*) or red (*A. rubrum*) maples.
- Those interested in sugaring should be ready to start collecting in early January.