

# Modeling Water Flux (Transpiration) for an Unevenaged, Mature Boreal Mixedwood Stand Groundhog River Flux Site near Foleyet, Ontario

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Carbon sequestration can be measured directly or indirectly estimated by measuring and monitoring diurnal and seasonal water flux. Stand water flux (transpiration, sapflow) was monitored throughout the growing season for a mature 80-year-old boreal mixedwood forest located near Foleyet, Ontario.



Dominant species present include black spruce, balsam fir, white spruce, trembling aspen, white birch, and balsam poplar. To monitor sapflow rates for each species,



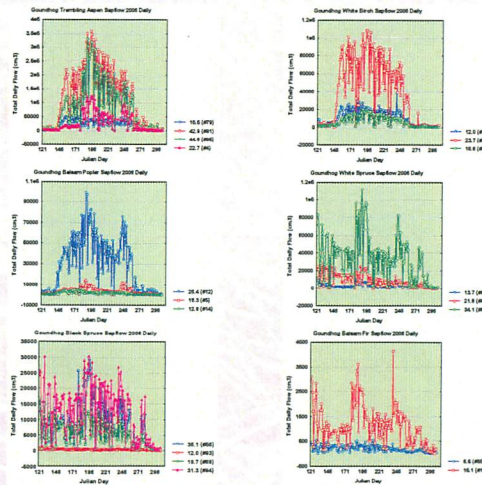
Dynamax TDP 30 mm probes were installed in the sapwood of spruce and fir trees for the range of diameters present. Dynamax TDP 50 mm probes were installed in the sapwood of hardwood trees present. Probes were reset periodically to avoid signal decay. Live sapwood widths were determined from stained increment cores. Sapwood widths were then combined with sapflow rates to calculate diurnal, daily, monthly, and seasonal water flux volumes.

These data were then combined with a population census for each species in order to estimate water flux on a per hectare basis.

## Water Flux (Sapflow) Research

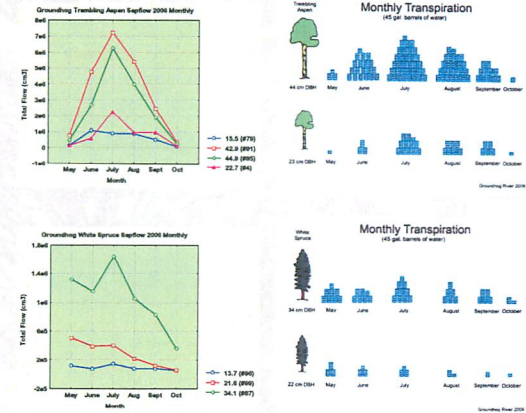
### Objectives:

- to determine temporal, spatial, and species differences in transpiration on a regional basis for boreal mixedwood forests
- to estimate forest canopy carbon fixation using transpiration data for boreal mixedwood forests
- to compare estimates of forest canopy carbon fixation using both regional and national sapflow and eddy covariance data



## Monthly Water Flux Trends

- Water flux volumes generally peak in July.
- Monthly flow volumes for conifers several times less than for hardwoods.
- Conifer flows sustained in shoulder seasons (spring and fall) before hardwood leaf-out and after leaf abscission.



## Results and Conclusions

- Daily water flux volumes highest for hardwoods.
- Daily water flux volumes lowest for conifers.
- Water flux volumes related to diameter (dbh).
- Flux volumes highest to lowest were: trembling aspen, white birch, balsam poplar, white spruce, black spruce, balsam fir.

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