
Front Range Urban Forestry Council

Meeting Minutes

January 18, 2018

City of Westminster, City Park Recreation Center

Upcoming Events & Announcements:

- Tim Buchanan's retirement party: Wednesday, January 24th at the Fort Collins Senior Center, Prairie Sage Room. RSVP to mroche@fcgov.com or rzentz@fcgov.com.
- City Forestry/Parks Departments: request EAB traps and lure by February 5th. Contact Jeanne Ring at CDA to place a request: Jeanne.Ring@state.co.us.
- The 6th Annual Tree Diversity Workshop, March 15th, 2018: The March FRUFC meeting will be combined with the Tree Diversity workshop! See below for details.
- Northern Colorado Pest Meetings will resume in May.
- May 17th: FRUFC meeting in Lone Tree.
- September 17th – 18th: ISA-RMC Annual Conference in Grand Junction.
- Email Kendra Nash if you are interested in participating in the Select Tree Program this year: knash@fcgov.com.
- Please consider completing Deidre Jaeger's survey for Tree Sway in the Urban Environment: <https://goo.gl/forms/dHV09qjYGHHRAFi92>. This will help direct research for urban tree environments and urban forestry applications.

Thanks to John Kasza and the City of Westminster for hosting!

EPIC Committee (Ralph Zentz):

- The NoCo Pest Meetings will begin in May.
- EPIC is gathering information for topics for the 2019 Plant Health Care Workshop. Contact Ralph Zentz with suggestions: rzentz@fcgov.com.

CDA Emerald Ash Borer Trap Order (Jeanne Ring):

- Any cities' forestry or parks programs that would like to request traps and lure for the 2018 trapping season can submit a request to Jeanne Ring at CDA **no later than February 5th**.
- CDA will coordinate ordering supplies from USDA APHIS, but traps need to be installed and maintained by city staff.
- Traps will be distributed in late February. Submission of orders does not guarantee approval.
- Email Jeanne at Jeanne.Ring@state.co.us to request traps.

Select Tree Program (Tim Buchanan):

- Kendra Nash, of the City of Fort Collins Forestry program, will be the new Co-Chair of the Select Tree Committee and Select Tree Evaluation Program.
- This year the selected tree is American sycamore, *Platanus occidentalis*. This is not a hybrid, and is meant to be anthracnose resistant.
 - Features attractive bark, and is considered a pioneer species in its native range.
- The Select Tree Committee is looking for three communities that want to plant trees for evaluation.
 - Email Kendra, knash@fcgov.com, if you are interested.
 - While this email address should still work please note that Kendra's new email address is kboot@fcgov.com.
 - Cities purchase three 2" caliper B&B trees, and will be reimbursed by CTC.

Tree Risk Assessment (Bill Cassel):

- No updates.

Next FRUFC meeting (Keith Wood):

- The next FRUFC meeting will be at the Denver Botanic Gardens on March 15th. The meeting will be combined with the 6th Annual Tree Diversity Conference.
 - The cost of the conference will be discounted to \$60 for CTC members. This includes lunch.
 - Regular registration is \$75, and student registration is \$40.
 - The conference continues to host nationally renowned speakers. This year's speakers:
 - Keith Wood will discuss the latest on his long-term periodic assessment of tree species growth rates based on surveying in Westminster.
 - David Temple, long time nurseryman from Cortez, CO, will talk about underutilized tree species and cultivars. David has been the past president of ALCC and owned his own arborist company in Durango for many years.
 - Andrew Bunting, Assistant Director of the Chicago Botanic Gardens and Director of Plant Collections, will discuss small flowering trees and the Chicagoland Grows Program, which is a joint effort between the Chicago Botanic Gardens, the Morton Arboretum, and the Illinois green industry to test and introduce new woody plant cultivars.
 - Chris Stone, the Director of the Boone County Arboretum in Kentucky, will discuss the role of arboreta and botanic gardens in educating green industry professionals, the effects of woody plants on encroaching heat islands in metro areas, and his experience with how extreme weather events have impacted various tree species.
 - Keith will distribute more information as it becomes available.
 - The conference will run from 8:30 to 3:30, with check-in beginning at 8:00.
- The May 17th meeting will be hosted by the City of Lone Tree.

CTC/Program Updates (David Flaig, Keith Wood):

- The next CTC board meeting is on January 26th.
- CTC has received 20 grant applications. These will be reviewed at the meeting.
- **Just a reminder that FRUFC is the only active chapter of the CTC. Please consider joining the CTC as a member if you are not already. Individual memberships are only \$15/year!**

ISA:

- The Think Trees! conference is currently underway in Albuquerque, NM.
- The ISA-RMC Annual Conference will take place Sept 17th and 18th in Grand Junction.
- The 10th edition of the ISA Plant Appraisal guide is in print and will be available in late summer or early fall.
 - CTLA voted 8 to 0 to publish.
 - There are changes to the cost formula (Trunk Formula Method) that will affect future appraisals, and those communities that use the TRM to determine relative value of their community forest.
 - There will be a tree appraisal qualification.

Community updates:

- Westminster (John Kasza):
 - The city is currently hiring for 2 arborist tech positions.
 - The City of Westminster has a goal to become next urban center in the Front Range. As part of this effort, the city is constructing a 1-acre plaza park.
 - **John Kasza is looking for anyone with experience working with structural soils to share their experience.** Trees will be in a paved brick area. The city wants to ensure trees planted in the plaza will survive longer term.
 - Contact John Kasza at jkasza@cityofwestminster.us.

EAB:

- Still has not been detected outside of Boulder Colorado.

CU Boulder Tree Phenology Study, Deidre Jaeger

Deidre.Jaeger@colorado.edu

- Deidre is working with USGS and the North Central Climate Science Center on a study looking at deciduous tree seasonality.
- She is looking for feedback from this group to direct future research and applications for urban forestry management goals.
- Plant-environment interactions are her primary research interest:
 - Urban microclimates/heat island effect.
 - Tree physiology and phenology.
 - Human-ecosystem relations, specifically human wellbeing response to tree canopy shade.

- Her current research focuses on the use of accelerometers to measure wind sway to get information about tree crown mass and density change over time.
 - The accelerometers measure the frequency of trunk sway to evaluate changes in seasonal tree mass.
 - Frequency: the duration of time it takes to complete 1 cycle of a repeating event in seconds. In this case, sway in two directions, and a return to center.
- The study area encompasses urban areas of Boulder, and ash is the species that Deidre is currently studying.
- The trees that have been measured include 5 green ash and 1 white ash, which is located at weather station on east campus. This allows the collection of a lot of weather and climate data at that site.
- How many times tree goes through a cycle over a one-month period was measured. There was a negative trend in period over time: cycles became shorter as foliage senesces and drops.
 - Color change and senescence, as well as less moisture in the tree late in the season, were related to the change in period.
 - Change in mass is most likely responsible for temporal sway changes.
- She plans to keep investigating other trees and signals.
 - The accelerometer was placed higher in one tree on campus to see if sway is greater further up in the tree.
 - Haven't correlated sway to wind as wind was not of primary research interest, and was only used to identify times to pick up signal.
- Deidre has a proposal in to do more data collection with a Raspberry Pi, which will allow for more sophisticated data collection.
- 2018 Research Topics:
 - Denver ranks high for urban heat island effect.
 - Look at heat island effect in other cities along the FR and trees' contribution to air cooling effect.
 - How does this change in different species, or in the same species over a larger area.
 - Human well-being study using surveys.
 - Using accelerometers to:
 - evaluate drought stress in trees,
 - infer times of structural damage,
 - validate remote sensing data.
- Summary – changes in dormancy, growth and snow interception can be detected with accelerometers; this novel method to measure tree sway is low cost and noninvasive, yet is still developing.
- Deidre would like to know how measuring tree sway could be useful for achieving some of your current or future management goals.

- Please consider completing Deidre Jaeger's survey for Tree Sway in the Urban Environment: <https://goo.gl/forms/dHV09qjYGHHRafi92>. This will help direct research for urban tree environments and urban forestry applications.

Mark Raleigh, PhD, PE

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- Quantifying snow in forest canopies from tree sway to evaluate snow interception.
 - In the tree's canopy, snow is more likely to evaporate and not make it to the ground. This has implications for water availability.
 - Shade effect: snow under the canopy persists into the summer.
 - Wind protection from the tree canopy reduces evaporation by sheltering snowpack.
 - Findings could help maximize water supply for communities.
- Motivation: need for quantifying forest effects on snow, water.
 - 40% of North American snow zone is forested.
 - Forests can have dramatic impact on snow accumulation, retention.
 - Lack of measurements for quantifying snow interception in forest canopies.
 - Different ways to measure snow loading in canopy – most invasive or labor intensive:
 - Under-explored approach – tracking snow via tree sway.
- Study area: Niwot Ridge LTER Area:
 - Fairly dense, mixed conifer forest.
 - Average tree height 11.5 m.
 - Accelerometers placed on tree trunks take 12 measurements/second.
 - There are currently 2 trees being measured.
 - Time-lapse cameras are used to qualitatively determine whether there is snow and how much, which helps to explain why they might be seeing differences in sway period when looking at the data from the accelerometer.
- Tree sway winter 2014 – 2015:
 - Period increase with mass increase.
 - Drier snow = lighter snow and longer periods.
 - Chaos in sway signal – as the tree freezes, sway periods are shorter.
- May be used to determine limb breakage, beetle outbreaks, rain interception, biomass monitoring.

Denver Digs Trees:

- Applications for the organization's free and low-cost trees for Denver residents is due February 15th: <http://theparkpeople.org/What-We-Do/Denver-Digs-Trees>.
- DDT provides free trees and planting for those experiencing financial hardship.
- DDT hosts a tree sale for non-Denver residents:
 - Two distribution sites: City Park and Sloan's Lake. Trees are distributed on a first come, first served basis.
- April 21st to 22nd: annual tree sale.

Ash Wood Biomass Study (Micaela Truslove):

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- The study attempted to provide an accurate way to measure green ash woody biomass to help forestry managers quantify, and budget for, wood disposal costs as a result of EAB management activities.
 - Very little is known about ash wood disposal costs as a result of EAB. Anecdotal evidence is that costs can be overwhelming.
 - Current literature about EAB financial impacts roll costs of disposal into tree removal, or do not mention it at all.
 - Current EAB calculators do not offer any way to quantify disposal costs.
- Research goals:
 - Evaluate existing ash biomass equations from scientific literature to determine their predictive ability for Northern Front Range green ash:
 - Two main literature equations for urban green ash: a volume equation developed by McHale et al. for Fort Collins in 2009 using ground-scanning LiDAR, which was not validated using destructively sampled trees.
 - One for Twin Cities urban ash trees.
 - Evaluated each equation that was previously assessed in these studies for a total of 18 equations.
 - Equations predict either mass or volume on a green wood or oven dry wood basis.
 - Determine a local specific gravity value for the Northern Front Range:
 - Specific gravity varies as a result of different climactic and management regimes.
 - Specific gravity used to transform mass measurements to volume, such as in USFS FIA Program.
 - Has implications for bioenergy as wood characteristics affect usage.
 - Develop a novel green ash woody biomass predictive equation for the Northern Front Range.
- Found that McHale and equation from the Twin Cities study, which was a refit of a widely used “general hardwood” predictive equation, adequately predicted green woody ash biomass.
 - We expect much of the ash wood disposed of as a result of EAB removals will be green.
- Two “general hardwood” equations adequately predicted woody biomass on an oven dry basis.
 - Because biomass equations from literature were primarily developed using only healthy trees with full canopies from natural forests, it may be that urban ash do not conform to “average” structure as defined by existing equations.
- Specific gravity for Northern Colorado green ash was higher than widely used published values. This is supported by the literature as open-grown trees experience significant

edge effects, such as higher wind loads. In addition, open-grown canopies are larger. Both require greater mechanical support, resulting in a trunk that has a higher density.

- Novel equations developed as part of this study were good predictors of urban green ash biomass, but usage may be limited to Northern Front Range or areas with similar climate and management regimes to trees collected as part of the study, and over a similar DBH range.
- The final equation will be incorporated into CO-Tree View's Emerald Ash Borer Calculator.

CoWood Urban Wood Utilization Program, Kurt Mackes

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- Colorado Wood Utilization and Marketing Program (CoWood)
 - Forest products industry support in CO – partnership between CSU Department of Forestry and Rangeland Stewardship and CSFS:
 - Partnership resulted in the formation of CoWood.
 - <https://csfs.colostate.edu/cowood>
 - Assist forest products producers, consumers and forest users.
 - CO's leading resource on forest products.
- Three primary tasks:
 - Applied research:
 - Forest harvest and hazardous fuel reduction economics/utilization.
 - Wood product processing and wood product marketing research.
 - Energy applications and policy analysis.
 - Tech and business assistance:
 - Forest products harvesting and manufacturing.
 - Business, financial and market planning.
 - Education and outreach:
 - Colorado's forest products economy.
 - Colorado Forest Products (CFP) Program.
 - Continuing education for industry professionals.
 - Seminars, workshops and conferences.
 - Community Wood-to-Energy iBook PDF:
 - <http://woodenergy.umn.edu/CommunityBiomassHandbook.pdf>
 - CFP program:
 - Promotes local wood.
 - Colorado Proud partner – online searchable database.
 - Plot business locations on map.
- Recent projects:
 - Bioenergy Alliance Network of the Rockies (BANR).
 - Colorado Wood Energy Team.
 - DIA shadow array project.
 - Forest business loan fund:
 - Mandated by legislation: HB1199.
 - Urban companies dealing with wood products would be eligible.

- Black walnut recovery project (TCD) – Tara Costanzo graduate thesis project.
 - Black walnut sells for \$6-\$9/bf retail, which makes it a desirable species for local sawyers.
- Ash recovery project (EAB):
 - Ash not as valuable as black walnut, and not as in demand.
 - Will take some work to handle the volumes of ash that we anticipate we'll see as a result of EAB.
- Factors influencing the value and sale of urban wood products in CO:
 - Forest products industry
 - Urban forest conditions
 - Sources of wood supply
 - How wood will come off the land – different from natural forests.
 - Economics of utilizing wood from urban sources:
 - Will take a variety of species to keep a small mill operator in business.
 - Some species more valuable than others.
 - Size of tree important (larger trees are more valuable).
- Current state of forest industry in CO:
 - Several in FR currently:
 - No large, integrated forest products companies in CO:
 - Wood supply and economic environment won't support large companies – urban especially.
 - Small companies, from a few employees to about 20 employees, are the norm.
 - Because these companies are around, we already have some infrastructure in place.
 - Need to do development work to make this work.
- Forest conditions – current problems:
 - Mountain pine beetle, fire killed trees, urban resources, overstocked stands.
 - Sources of CO wood supply:
 - Conventional timber sales
 - Ecological restoration
 - Hazardous fuels reduction
 - Forest health improvement
 - Fire killed tree salvage
 - Urban tree removals
- Urban tree removals:
 - Supply generally dependent on incident.
 - Variable source that includes small to large trees.
 - Higher value trees are more likely to be salvaged.
 - Lack of funding to support urban tree removals.
- Economics – preliminary requirements:
 - Wood supply
 - Harvesting infrastructure

- Processing infrastructure
 - Wood markets:
 - Fairly severe limitation in Colorado.
- Missing components:
 - Supply – not consistent enough to keep mill operators in business.
 - Harvesting infrastructure – inadequate to handle existing forest management challenges.
 - Processing infrastructure – region continues to lose capacity.
 - Wood markets – exist, but most from out of state.
 - Economics – we are not competitive with larger processing firms.
- Cost components:
 - Felling
 - Limbing & bucking
 - Skidding
 - Transport
- Thoughts:
 - Wood supply will be substantial with EAB:
 - Anticipate that it will be over an extended period of time (10-20 years+).
 - Supply with other urban removals – steady for indefinite period.
 - Wood harvesting and processing infrastructure:
 - Businesses have to be properly scaled to be successful/sustainably match wood supply with markets.
 - Develop wood markets that maximize value.
- Products from urban wood:
 - Lumber and timbers
 - Outdoor structures
 - Millwork
 - Landscape timbers
 - Railroad ties
 - Firewood
 - Wood pellets
 - Landscape mulch
 - Compost
 - Many other products
- Challenges:
 - High harvesting and transportation costs.
 - Handling and wood quality issues.
 - Relatively high capital costs.
 - Lack of sufficient, stable wood supply and unwillingness of industry to invest given past history of wood supply.
 - Lack of entrepreneurs with experience to champion projects.
- Current efforts to expand the type and number of products produced from urban wood in CO:

- Identify harvesting systems and removal strategies that reduce urban removal costs.
- Assist with the establishment of collection yards to concentrate log supply.
- Conduct marketing studies to help identify and demonstrate value-added products that can be produced from urban wood.
- Questions:
 - Lack of kilns seem to be an issue – will CoWood help?
 - Have worked with a number of companies to demonstrate solar kilns.
 - The university had a kiln, but surplused it many years ago. No interest in getting another at this time.
 - CoWood could work with companies on this issue.