

Borealis

the newsletter of the



PO Box 141613, Anchorage, Alaska

February-March 2020

Join us at our Next Meetings!

Monday, February 3, 7:00 PM

Main Topic: "Working Towards an
Alaska Vegetation Atlas"

Speaker: Timm Nawrocki

Mini-Botany – *Beringian Endemics*
Papaver alboroseum

Speaker: Mary Stella

Plant Family: Roseaceae: wild rose

Speaker: Joan Tovsen

Monday, March 2, 7:00 PM

Main Topic: "*The Botanical John
Muir*"

Speaker: Beth Baker

Mini-Botany – *Ranunculus turneri*

Speaker: Aaron Wells

Plant Family: Roseaceae:

Chamaerhodos erecta – Little Rose

Speaker: Joan Tovsen

All of our meetings, unless otherwise
announced, are held at the Campbell
Creek Science Center, 5600 Science
Center Drive, just off Lake Otis Parkway,
south of Tudor.

**For the latest information about
ANPS events and field trips, go to
www.aknps.org/**

What's Happening at ANPS?

The Alaska Native Plant Society has completed another busy and successful year of botanical education, including field trips, monthly meetings and even newsletters! We thank all of the many volunteers who have made this possible. You are great!

Looking forward, here are some action items we need from you. If everyone pitches in, we'll have an even better 2020!

- **SEEDS** – every year we package and sell native Alaskan wildflower seeds. Without Verna's lead on this we're seriously lacking the great variety of offerings that we've previously had. If you collected native plant seeds this past year and have some you would be willing to share, please let [Marilyn Barker](#) know. We'll get them packaged and ready to sell.
- **PLANTS** – well, not now, but in the spring. The Butterfly/Pollinator garden that we're building at Campbell Creek Science Center is desperately in need of additional native plants. When you begin to clean up your garden in the spring, if there are extra natives that you'd like to give another chance, contact [Mary Stella](#). Just put them aside and we'll even send someone out to pick them up.
- **FIELD TRIPS** – this is the time of year we need to start filling our spring/summer/fall field trip calendar. Please share some of your favorite sites. You don't have to be a botanical expert to lead a trip. Just set one up and the participants will gladly share in identification. Field Trip forms are available on our website: www.aknps.org. Contact [Dennis Ronsee](#).
- **VOLUNTEERS** – April Spring Garden Show at the Midtown Mall (formerly Sears Mall). Get your dose of spring and find out what other organizations are doing while volunteering for a block of time for ANPS. Contact: [Beth Baker](#)
- **MONEY**: If you haven't paid your 2020 membership dues you won't receive another newsletter and worse yet, you won't receive the FIELD TRIP calendar when it is available in June. Use form on page 8 or on website.



FROM WHAT WE GATHER



Facebook Groups

Facebook Groups provides a place to communicate about shared interests with certain people. If you're a Facebook member, you can create or join a group for just about anything. Here are a few that might be interesting to ANPS members:

- **Bugs and Plants of Alaska**

A place to ask questions, post pictures, and identify species of all bugs and plants found in Alaska.

- **Alaska Garden Seed Exchange**

Everyone of any gardening-experience level is welcome to join and share in the fun. Post seeds you are offering

- **Mushrooms and other Fungi of Alaska**

Here is a place for Alaskans to further our knowledge of all things fungal. This is not necessarily a place to get identification of edibles or ones that may alter your mind, but fungi in general. Post photos of fungi you know and don't know or other fungal related information. If someone lives in Alaska, he or she is pretty much given permission to join us. Where someone lives, is not always apparent on a Facebook page, especially if the page is not public. If you have friends who would like to join but are not let in, it's not clear from their public info that they live in Alaska or are specifically interested in Alaskan fungi. Have them message one of the admins. The rationale is there are lots of mushroom sites on Facebook. We would like to keep this one limited to people with a specific interest in Alaskan fungi.

- **Alaska Native Plant Society**

Adding ANPS to your Facebook feed will ensure that you are up-to-date on the latest activities and aware of any late-breaking changes to schedules. And be sure to "Like" us so that others will know how great we are!

Are you a Genus Genius?

Pun quiz by Tom Choate.

All answers, as punnishly pronounced, provide the genus of a local flower

1. What flower is a musical instrument?
2. Which flower ends its flock?
3. What flower has boring colors?
4. What do you do if your dog team gets lost?
5. What did the soldiers in Iraq see?

Answers on Page 6. Don't peek!





ANCHORAGE HOSTS! July 18-22, 2020

In July, Anchorage will be host to a national botanical conference that will include members of the American Bryological and Lichenological Society, American Fern Society, American Society of Plant Taxonomists, Botanical Society of America, International Association for Plant Taxonomy, and Society for Herbarium Curators.

Organizers estimate that there may be 3,000-5,000 botanists roaming around Southcentral Alaska! The theme of this year's conference is "Plants at the Extremes" and the conference will include both symposia and colloquia formats.

Our own Alaska Native Plant Society will be interfacing with the event, offering special field trips throughout the sessions, but you'll have to be a conference participant to attend. Conference registration begins in February. <https://cms.botany.org/home/meetings.html>



AMAZON SMILE: Another way to help ANPS

AmazonSmile is a website operated by Amazon with the same products, prices, and shopping features as Amazon.com. The difference is that when you shop on AmazonSmile, the AmazonSmile Foundation will donate 0.5% of the purchase price of eligible products to the charitable organization of your choice. To find an AmazonSmile Charity to donate 0.5% of your purchase to, go to: Go to Smile.Amazon.com. Go to Your Account from the navigation at the top of your page.

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ALASKA NATIVE PLANT SOCIETY

State and Anchorage Chapter Officers

President	Dennis Ronsse
Vice President	Zoe Meade
Secretary	Ginger Hudson
Treasurer	Mary Stella

Anchorage Chapter Program Coordinators

Membership	Mary Stella
Plant Family	Timm Nawrocki
Mini-Botany	Timm Nawrocki
Field Trips	Dennis Ronsse

Newsletter ("Borealis")

Editor Ginny Moore

Borealis is published bi-monthly, fall through spring. Articles may be sent to Ginny Moore, , Anchorage, AK 99516. Phone or FAX: , E-mail: elfinwood@gmail.com



IT WORKS!
IN 2018-2019 ANPS EARNED ALMOST \$400
FROM MEMBERS SHOPPING AT FREDDY'S!
WON'T YOU JOIN US?
IT DOESN'T AFFECT YOUR OWN REWARDS POINTS.

Fred Meyer is donating \$2.5 million per year to non-profits in Alaska, Idaho, Oregon and Washington, based on where their customers tell them to give. Here's how the program works:

- Sign up for the Community Rewards program by linking your Fred Meyer Rewards Card to (non-profit) at www.fredmeyer.com/communityrewards. You can search for us by our name or by our non-profit number **GC263**.
- Then, every time you shop and use your Rewards Card, you are helping (non-profit) earn a donation!
- **You still earn your Rewards Points, Fuel Points, and Rebates, just as you do today.**
- If you do not have a Rewards Card, they are available at the Customer Service desk of any Fred Meyer store.
- For more information, please visit

Scientists Surprised: Trees Are Sources of the Greenhouse Gas N₂O

Source: University of Helsinki

A recently published study, completed by researchers from the University of Helsinki together with Dr Katerina Machacova, a visiting scholar, demonstrates that boreal forests of the Northern Hemisphere are sources of the greenhouse gas nitrous oxide (N₂O). The study provides new information on the significance of trees as sinks and sources of greenhouse gases, proving that forests have relevance not only in the absorption of carbon, but also as a source of other greenhouse gases.

The research group observed that the greenhouse gas nitrous oxide is released into the atmosphere not only by the forest soil, but also by pine, birch and spruce, the trees of the northern boreal zone. The group has previously demonstrated (Machacova et al., 2016; *Scientific Reports*) that the stems and canopies of pine trees in the northern boreal zone are sources of N₂O. This recent study indicated that also birches and spruces release the gas into the atmosphere.

“Trees may have an impact more significant than previously thought on the nitrous oxide balance of forests, as well as on the global N₂O balance,” says Associate Professor Mari Pihlatie from the Faculty of Agriculture and Forestry, University of Helsinki.

The most important discovery in the study was that the N₂O emissions of tree stems clearly vary by season, corresponding with the physiological activity of the trees. During the growing season, trees release nitrous oxide from their stems, while during dormancy in the winter, they can become consumers of the gas. Even though the consumption of N₂O over the winter reduces annual emissions, trees remain annual N₂O sources. Seasonal variation in N₂O emissions corresponded with the carbon dioxide emissions of tree stems. Both types of emissions peaked in the summer.

Challenges in measuring tree emissions

“Trees acting as a source of nitrous oxide emissions is a new finding in the forest environment. Generally, trees have not been assumed to have a role in the N₂O balance of forests, which is why no relevant measurements of trees have been made. To a certain degree, trees have been omitted from measurements due to challenges in constructing suitable measurement chambers that would fit around stems or that could be utilised in measuring canopies, an even more difficult task,” says Elisa Vainio, a postdoctoral researcher at the Faculty of Agriculture and Forestry, University of Helsinki.



Chambers attached to trees to measure N₂O emissions

According to prevailing scientific knowledge, the primary emission source for greenhouse gases is fertilised and nitrogen-rich farmland. Already in 1998 it was originally suggested that trees may transport to the atmosphere nitrogen oxide produced by microbes in the soil. Subsequently, the phenomenon was verified in laboratory experiments (Pihlatie et al., 2005). However, the number of studies completed on the topic after that can be counted on one hand.

A range of environmental factors affect forests' greenhouse gas emissions

In the recently published study, comprehensive measurements of environmental factors in the atmosphere, soil and trees were combined with nitrous oxide emissions for the first time. The SMEAR II / ICOS research station at the Hyytiälä Forestry Field Station is a unique measurement location known for its comprehensive and continuous measurement of forest functions. By combining N₂O emissions measured from trees and the soil with the measurements made on the ecosystem level at the station, it was observed that the N₂O dynamics of trees correspond with their physiological activity.

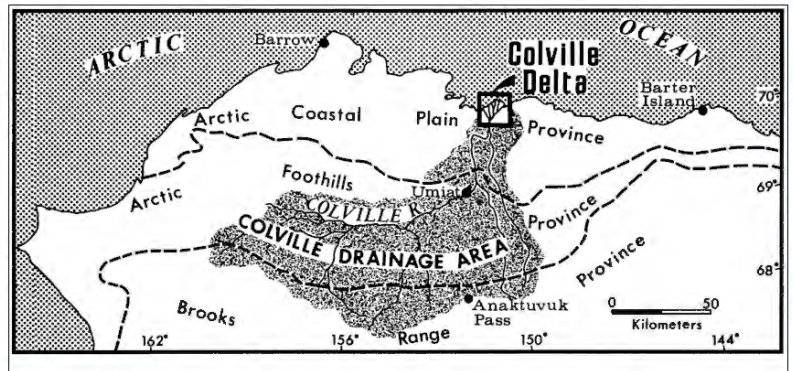
Furthermore, the researchers demonstrated that even in boreal forests with low nitrogen levels where the amount of nitrogen restricts tree growth, part of the nitrogen in the ecosystem is released into the atmosphere as nitrous oxide. In

the earlier studies carried out by the group, it was found that the N₂O emissions of the forest being measured only constituted a fraction of the nitrogen consumption and internal nitrogen cycle of the forest (Korhonen et al., 2013). In other words, the forest is efficient in recycling by breaking up organic matter found in the soil and releasing nitrogen in a form useable by plants, which trees then use for growing. Eventually, the nitrogen is returned to the soil in the form of needle and leaf litter. A small portion of the recycled nitrogen ends up in the atmosphere as nitrous oxide, either directly from the soil or transported from the soil by trees. The researchers suggest that most of the N₂O released by tree stems is produced by microbes in the soil and transported via the transpiration stream of trees from roots to stems, from where it is released into the atmosphere.

More on Alaska's Climate - North Slope Study

At our January meeting Zoe Meade described the research she was part of this past year on the north slope of Alaska along the Colville River. She was working near the Colville Delta, for the environmental services company, ABR, Inc, based in Alaska.

ABR developed a 30-year habitat monitoring study as part of a long-term monitoring plan with an adaptive management strategy implemented by ConocoPhillips Alaska, Inc. as a condition of their CD-5 construction permit. The CD5 habitat monitoring study is designed to monitor for changes in wildlife habitat through time at two spatial scales, including 1) the vegetation community scale using data from permanent vegetation plots, and 2) at the landscape scale using data from larger habitat plots in combination with a habitat map. The monitoring program was initiated in 2013 to document baseline conditions and included assessing a broad array of biotic and abiotic features that affect wildlife habitat, including vegetation, soils, geomorphology, permafrost, and climate. Zoe was part of a follow-up.



COVILLE RIVER DELTA

The Arctic Coastal Plain is a saturated ecoregion dominated by the presence of water loving sedges and grasses. The landscape is covered in a jigsaw-like pattern of polygons, braided channels, and thermokarst lakes. Water is perched on top of the restrictive layer of permafrost, unable to drain. The region's flat geography only adds to the poor drainage. The movement of water and sediment in the Colville River Delta makes this wetland environment ever changing.



PERMAFROST SOILS

Permafrost soils are soils that have been frozen for at least two years

The majority of permafrost soils in Arctic have been frozen for thousands of years.

the **active layer** - a thin layer of soil on resting on top of the permafrost table that unthaws every summer. This is where biological activity takes place.

The permafrost table forms an impenetrable boundary. Water remains perched on top.

Vegetation serves as an efficient insulating medium for permafrost, shielding the permafrost from solar energy.

HICKEL HIGHWAY

The removal or disturbance of vegetation (natural or anthropogenic) can cause thawing of the underlying permafrost.

- The Hickel Highway is the archetype of the effects of vegetation removal on permafrost soils.
- In just over 100 days, during the winter of 1968-1969, the State of Alaska carved a 400-mile road from Livengood to Sagwon – the North Slope airstrip/supply station for Prudhoe Bay.
- Bulldozers scraped away the protective mat of vegetation during construction and in the spring the exposed permafrost melted - the road became a long, muddy ditch.
- The road was an economic failure and ecological disaster. It became impassable and was abandoned just a month after operation. The scar on the landscape is still visible to this day.

WHAT WE FOUND AND WHERE YOU CAN FIND IT

A total of 386 species were recorded from the three collective field seasons. Non-vascular species were the largest group covering just over 40% of the total identified lifeforms. Specimens collected during the 2013 and 2016 field efforts are available for viewing at the UAA herbarium. The 2019 collection will be submitted soon and will be available online later this winter. Access specimens online: [Consortium of Pacific Northwest Herbaria website](#).

RESULTS OVERVIEW

Since this summer's data is still being analyzed there are no firm conclusions but, findings are looking similar to those found in the 2016 study. The 2016 report is a public document, available here:

http://northslopescience.org/wp-content/uploads/2016_CD5_Habitat_Monitoring_and_Assessment.pdf

CHANGES FOUND IN 2016

Since 2013 there have been two significant broad scale changes observed.

- 1) decreased standing water cover – Due to increasing temperatures in the Arctic, permafrost is becoming unstable causing lakes to drain and polygons to dissolve. The exposed, nutrient rich, mineral soils (previously underwater) are rapidly repopulating with vegetation.
- 2) Increased mineral cover – coming from natural deltaic movement and re-composition of sediments (seasonal breakup and flooding events).

Both were observed in test areas and reference sites – therefore not attributable to the CD5 road.

These changes were consistent with natural changes elsewhere on the Delta.

**Overall the road has not had a significant impact on the surrounding environment.

SENECIO CONGESTUS

(Asteraceae) aka Marsh Fleabane or Mastodon Flower.

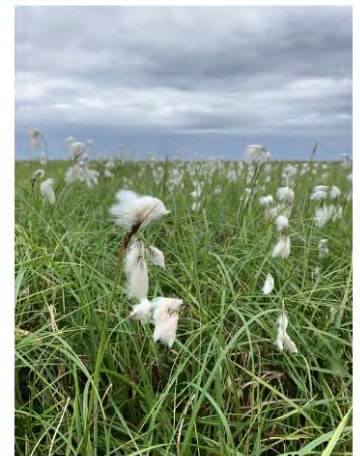
- Found across the circumpolar north and much of the state of Alaska (not along south coast).
- It favors wet low areas along lake margins or stream banks, or marshes and swampy areas.
- fairly common but highly variable.
- At lower latitudes it can grow up to a meter in height with few hairs.
- In the Arctic this species is low-growing and densely tomentose.
- Bright yellow 'congested' flowers that bloom in a tight umbel.
- The dense hairs act like a greenhouse trapping heat and giving the plant a protection from the wind, possibly extending the short growing season by a day or two.



MELANDRIUM APETALUM

Melandrium apetalum ssp. *arcticum* (Caryophyllaceae) aka Japanese Lanterns or Nodding Campion.

- The flowers are solitary and lilac in color, nodding or drooping when young and erect in fruit.
- Calyx is inflated when young, petals equal or just slightly longer than calyx. Calyx has a viscid (sticky) fringe and is urn shaped with purplish veins.
- Found in dry, grassy slopes in the mountains, meadows and rock outcrops in tundra, and in lowlands in the Arctic.



Eriophorum angustifolium

- Content and Photos from Zoe Meade

ANSWERS TO Genus Genius

1. Viola
2. Sherperdia
3. Draba
4. Ledum
5. Anemone

FROM OUR BOOKSHELVES



The Triumph of The Fungi – A Rotten History

by Nicholas P. Money

Oxford University Press 2006

Available as a free pdf download: <https://epdf.pub/the-triumph-of-the-fungi-a-rotten-history.html>

From the Preface: This book is concerned with the most devastating fungal diseases in history. These are the plagues of trees and crop plants, caused by invisible spores that have reshaped entire landscapes and decimated human populations. Everyone is aware of the Irish potato famine, but while many other fungal diseases are less familiar, they have had similarly disastrous consequences. The Triumph of the Fungi focuses on the fascinating biology of the well-known and lesser-known diseases. It also tells the stories of the scientists involved in their study and of the people directly affected by the loss of forest trees including the chestnut, and cash crops such as coffee and cacao. Although a book about fungal epidemics isn't tailor-made for an intoxicating and uplifting read, the chronicle of the mycologists and plant pathologists engaged in combatting these diseases is one of human optimism (often encouraged by desperate eccentricity). In a surprisingly brief time, human knowledge of the fungi that infect plants has evolved from Biblical superstition to the recognition of the true nature of plant disease and, more recently, to a sense of awe for the sophistication of these organisms. The crucial issue of human culpability in these fungal epidemics is addressed in the book's closing chapter. A note about the title of the book seems appropriate. In the second year of World War II, the engineer, novelist, and plant pathologist Ernest C. Large published a marvelous book, *The Advance of the Fungi* (New York: Henry Holt and Company, 1940). Large introduced scientists to the study of plant diseases with a refreshing mixture of technical rigor peppered with humorous asides. The *Advance of the Fungi* served as the introduction to fungal biology for many of the plant pathologists that staffed university departments and government-funded laboratories throughout the second half of the twentieth century. A second book, *Mushrooms and Toadstools* (London: Collins, 1953), published in 1953 by John Ramsbottom, served as a similarly good-humored and inspiring source for mycologists. Ramsbottom's book served as a model (albeit unconsciously) *Mr. Bloomfield's Orchard* (New York: Oxford University Press, 2002). The focus of both works, separated by a half-century of discoveries, was on topics such as fungal growth and mushroom function. In similar fashion, *The Triumph of the Fungi* updates Large's classic by offering a personal view of the continuing advance of the fungi in the last 65 years and by revisiting the history of the scientific study of plant disease. Large should approve of the new title. Since 1940, fungi have continued their advance, attacking every crop plant that we cultivate, and exploiting new hosts wherever spores are introduced. Through their continued advance, the fungi have proven unstoppable. Fungi are the most important cause of plant disease and cause billions of dollars of crop losses every year. Despite fantastically effective fungicides, the continual development of resistant varieties of crops, and the implementation of techniques of genetic modification,



Thus Spoke The Plant

By Monica Gagliano

North Atlantic Books November 2018

"In flowing prose and pointed language, *Thus Spoke the Plant* makes the case that we're not alone in our thoughts or even in the capacity to think and communicate; in a time of escalating atomization and endemic alienation, this might be just the medicine some people need."

Specifically, the book is about plants and their ability to communicate, not just metaphorically (as in, "the color of those flowers really spoke to me") but literally (as in, "that flower *really* spoke to me"). In this sense, *Thus Spoke the Plant* continues in the vein of earlier controversial books such as *The Secret Life of Plants*, which asserted that plants possess an interior dimension of emotion and thought. In Gagliano's book—which takes pains to remind us that it is grounded in scientific inquiry—the concept is taken further to indicate that plants not only have an interior life, but are capable of exteriorizing it as well. Part memoir, part research monograph, part self-help exposition, and part sociopolitical analysis, this book can be read on many different yet connected levels. For this reader it was most impactful as a critique of the limits of pure reason as the primary (or even only) method of understanding and constructing the world around us, given the obvious repercussions of technocratic rationality (even for all of its ostensible virtues and promises) on display through the mounting crises facing humankind right now."

Review by Randall Amster in New York Journal of Books: <https://www.nyjournalofbooks.com/book-review/thus-spoke-plant>

ANNUAL MEMBERSHIP APPLICATION/RENEWAL

The Alaska Native Plant Society was organized in 1982 by an enthusiastic group of amateur and professional botanists. It is a non-profit educational organization with the goal of uniting all persons interested in the flora of Alaska. Membership is open to any interested individual or organization. If you wish to join us, please indicate the category of membership you desire, fill in the form below, and mail it with the appropriate remittance to:

Alaska Native Plant Society
P. O. Box 141613
Anchorage, AK 99514

STATUS NEW RENEWAL

CATEGORY	E-Mail Newsletter	Snail-Mail Newsletter	Both Mail Deliveries
<input type="checkbox"/> Full-time Student	\$12	\$22	\$22
<input type="checkbox"/> Senior Citizen	\$12	\$22	\$22
<input type="checkbox"/> Individual	\$15	\$25	\$25
<input type="checkbox"/> Family	\$20	\$30	\$30

Name: _____

Address: _____

City _____ State: _____ Zip: _____

Telephone: (Home) _____ (Cell) _____ E-Mail: _____

PLEASE RENEW OR JOIN TODAY!

**ANPS Membership is on a calendar-year basis, so
Check your mailing label to see if it says 2020 or later!**