

**Alberta
Soil Science
Workshop**

55th Annual Alberta Soil Science Workshop

ALBERTA SOILS TOUR 2017

Addressing Knowledge Gaps
in Soils Education

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History of the Alberta Soils Tour

- **1960s** – in 1962 the first Alberta Soil Science Workshop (ASSW) and the first Alberta Soils Tour were launched by the Alberta Advisory Fertilizer Committee (AAFC).
- **1960s-1980s** - with few gaps, the Alberta Soils Tours took place every two years organized by the Alberta Soils Advisory Committee (ASAC).
- **1990-2013** – since abolishment of the ASAC in 1989, the Alberta Soils Tours were led by groups of enthusiasts while ASSW played a role of a sponsor.
- **2017** – Alberta Soils Tour was adopted by the ASSW as its integral part

SOILS TOUR-1980

Solonchic Soils-Deep Plowing

Forestburg-Gadsby Area

MAY 10 1980

Sponsored by:

Alberta Soils Advisory Committee

Canadian Society of Soil Science

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Held in conjunction with the AIC convention

August, 1980

ALBERTA SOILS TOUR

JULY 1985

North-eastern Region

Solonchic, Salinity Plots,

S.C.A.P. Project,

K Trials,

Agriculture / Oilfield Interface

Sponsored By:

Alberta Soils Advisory Committee

Geography of Alberta Soils Tours

- 2000 – Brooks, AB
- 2002 – Edmonton to Wainwright and Lloydminster
- 2004 – Edmonton to Fort McMurray
- 2006 – Lethbridge to Milk River
- 2008 – Lacombe to Rocky Mountain House
- 2010 – Edmonton to Peace River
- **2013** – Lethbridge to Writing on Stone PP
- **2017** – Edmonton to Fort McMurray and Fort Hills

2016 Alberta Soils Tour cancellation

- Planning continued until wildfire burst at Fort McMurray on May 4, 2016, less than two months before the tour
- Short notice cancellation
- Tour was not cancelled but rather postponed for 11 months
- Effects of forest fire was proposed as a new topic for the Tour



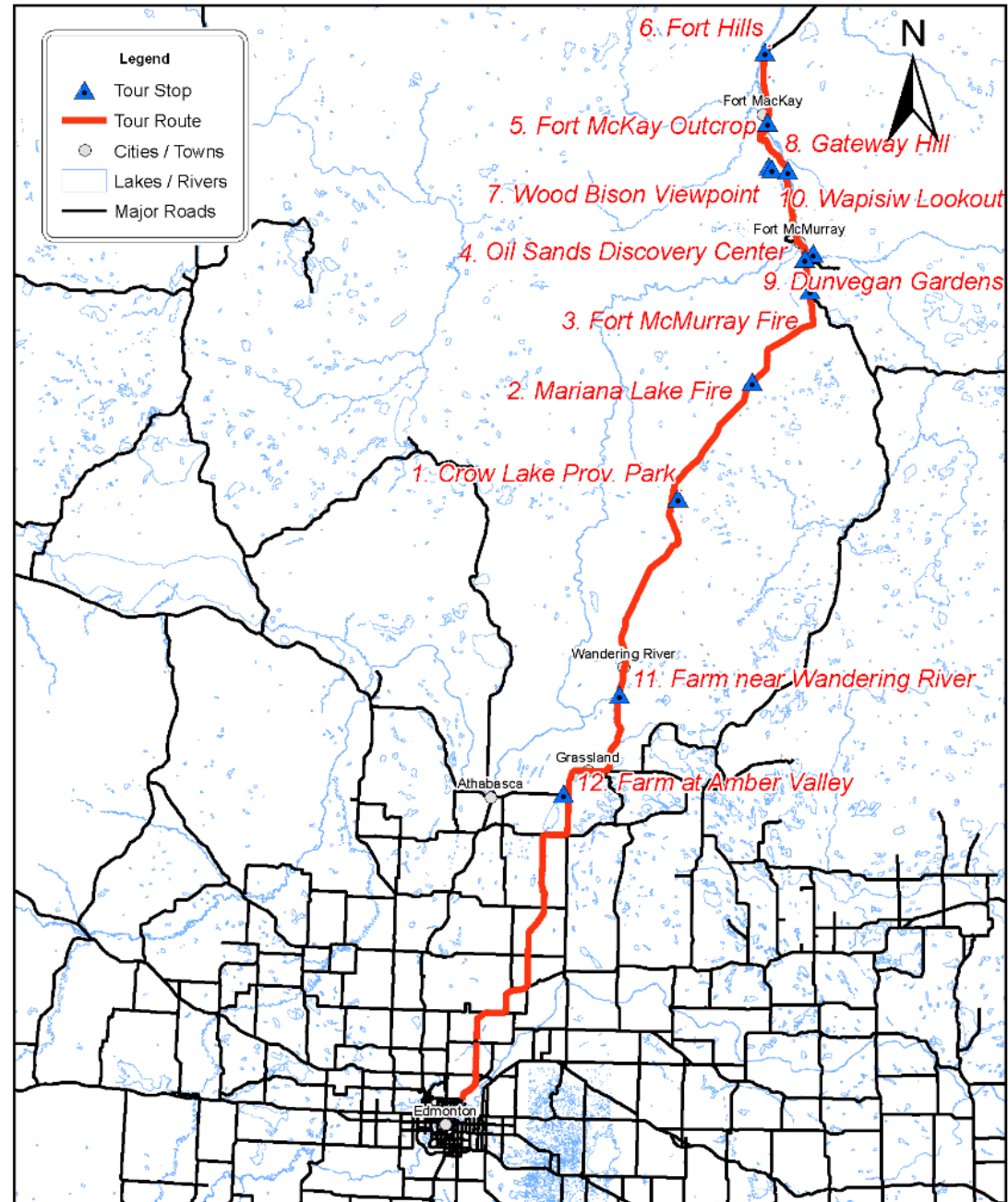
Photo source <https://www.nationalobserver.com/2016/05/04/news>



Photo source <http://www.canadianbusiness.com/economy>

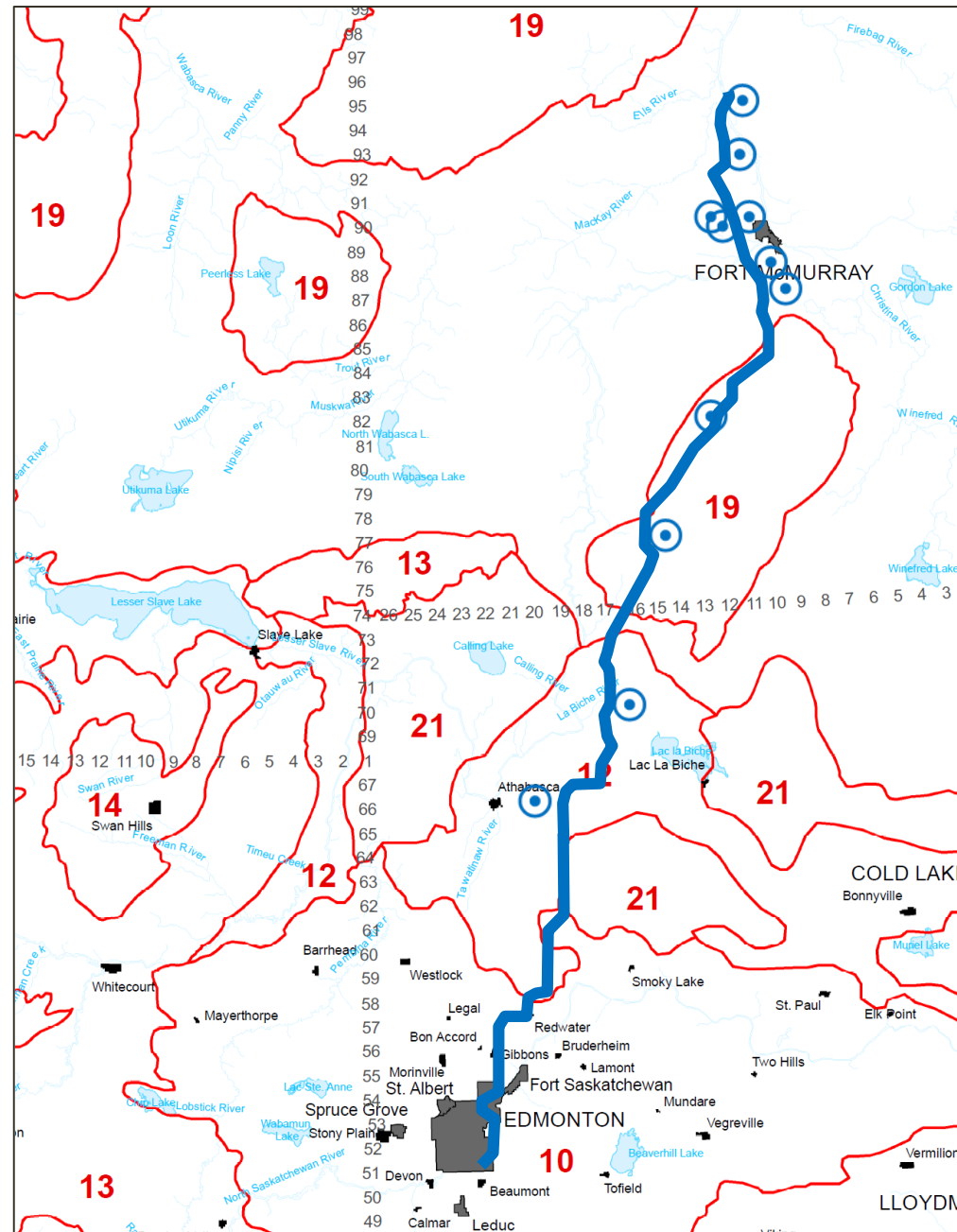
2017 Tour Route

- 12 stops along the Highway 63
- Southernmost stop (#12) was 150 km north of Edmonton near Athabasca
- Northernmost stop (#6) was 507 km from Edmonton at Fort Hills



Focus on Boreal

- **SCA 12** – Dark Gray-Gray Soil Zone of Northeast-Central Alberta; dominant soils are Dark Gray Chernozems and Dark Gray Luvisols
- **SCA 19** – Boreal Highland Areas of Northern Alberta; dominant soils are Luvisols, Brunisols and Organic Soils
- **SCA 20** – Central Mixedwood Area of Central and Northern Alberta; dominant soils are Luvisols, Brunisols and Organic Soils



En route interpretation of landscape



Stop 1. Crow Lake Provincial Park

- Luvisol-Gleysol-Mesisol catena on glacial till
- Brunisols on glaciofluvial deposits
- Vegetation recovery from 2002 House River Fire



Photo credit: Ed Karpuk



Photo credit: Konstantin Dlusskiy

Stop #1. Mineral Soil Presentation



Photo credit: Ravinder Pannu



Photo credit: Ravinder Pannu

Mildred Soil Series
Eluviated Dystric Brunisol
on glaciofluvial sand



Photo credit: Petr Kuznetsov

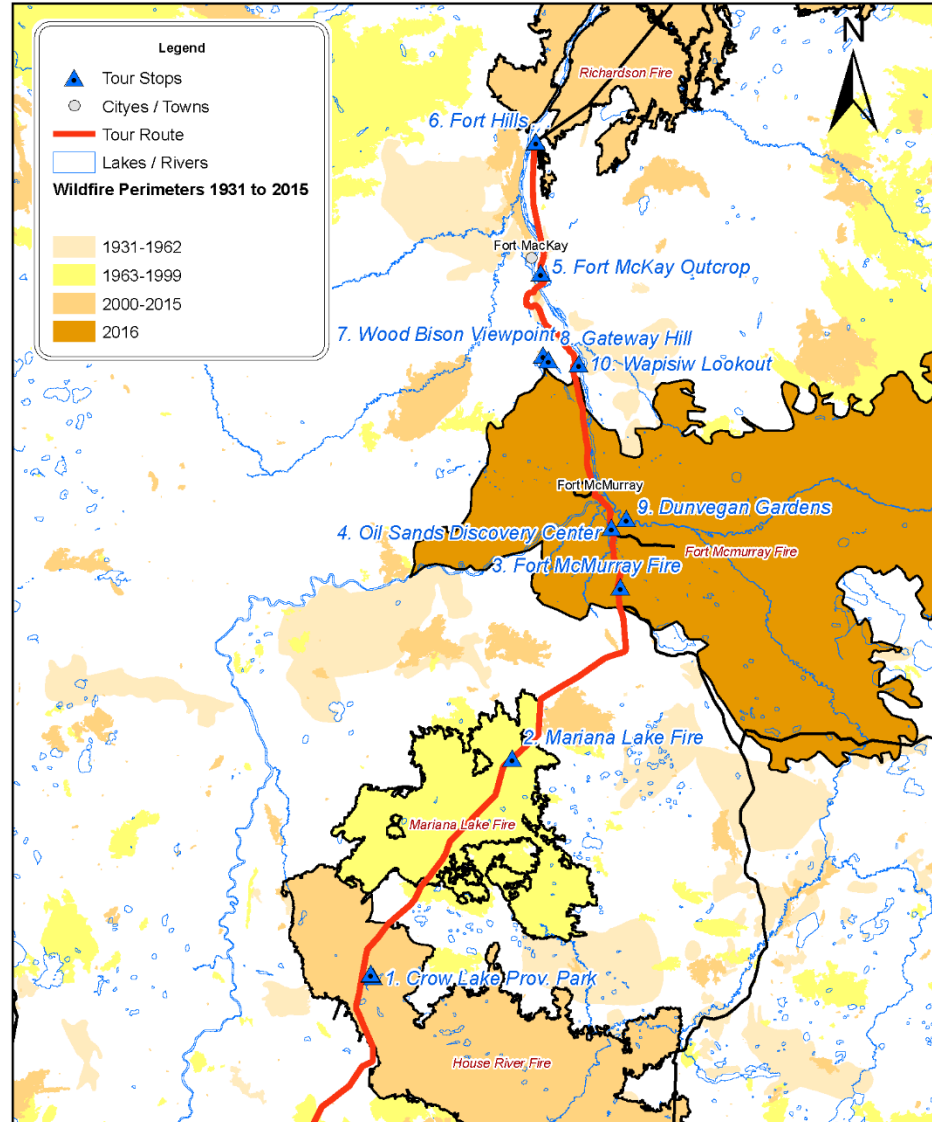
Kinosis Soil Series
Orthic Gray Luvisol
on loamy glacial till

Stop #2 Mariana Lake Fire (1995)

- Brad Pinno (Canadian Forest Service) presented vegetation recovery from 1995 Mariana Lake Fire



Photo credit: Ravinder Pannu



Stop #3. Fort McMurray Fire (1916)

- Brad Pinno (Canadian Forest Service) presented the first year vegetation recovery from 2016 Fort McMurray Fire



Fort McMurray residents evacuating along Highway 63 as the fire encroaches on the area. May 2016. Photo source:

https://en.wikipedia.org/wiki/2016_Fort_McMurray_Wildfire



Photo credit: Ravinder Pannu

Stop #3: 2017 Alberta Soils Tour participants in the Fort McMurray Fire area

Stop #4. Oil Sands Discovery Centre

- Pay Dirt – Alberta’s Oil Sands: Centuries in the Making: a 45-minute film described the history and development of the oil sands in Alberta
- Hot Water Extraction Demonstration: The Center interpreters showed how bitumen is separated from the oil sands in this 10-minute live presentation
- Self-guided tour on the Exhibition Gallery



Stop #5 Fort McKay outcrop

- McMurray formation of Lower Cretaceous age at surface due to the Clearwater-Athabasca valley paleoflood about 9,900 years ago
- Exposed bituminous sandstone – the oil sands
- Dystric Brunisols on shallow bedrock (Marguerite-xl or Mildred-xl soil series)



Photo credit: Petr Kuznetsov

Stop #5. Brunisols over shallow bedrock



Photo credit: Konstantin Dlusskiy

Eluviated Dystric Brunisol
over shallow bituminous sands
Marguerite-xl or Mildred-xl soil series



Photo credit: Petr Kuznetsov

Larry Turchenek presents
Eluviated Dystric Brunisol
over shallow bituminous sands
Marguerite-xl or Mildred-xl soil series

Stop #6. Fort Hills

- Dystric Brunisols on glaciofluvial deposits
- Two sites showing different phases of glaciofluvial and eolian sedimentation
- Vegetation recovery from 2011 Richardson Fire



Photo credit: Petr Kuznetsov

Stop #6: Dystric Brunisols



Konstantin Dlusskiy presents Eluviated Dystric Brunisol profile in Fort Hills area

Stop #7. Land of Giants - Syncrude



Photo credit: Petr Kuznetsov

Tour participants at the Syncrude mining equipment exhibit

Stop #7. Wood Bison Viewpoint

- Land Reclamation at Syncrude's Mildred Lake operations
- Beaver Creek Wood Bison Ranch – the northernmost agricultural enterprise in Athabasca River basin



Stop #8. Gateway Hill - Anthroposols

- Reclaimed waste rock pile from Syncrude's Mildred operations
- Reclamation certificate received in 2008.
- Spoilic Anthroposols on reclaimed overburden materials
- Man-made forest 20 (or so) years after revegetation



Stop #8. Gateway Monument



Photo credit: Chi Chen

Stop #9. Dunvegan Gardens



Photo credit:
Konstantin Dlusskiy

Stop #9. Dunvegan Gardens



Photo credit: Petr Kuznetsov

Brad Friesen, owner of Dunvegan Gardens (AB) Ltd gives an overview of the farm operations at the prepared soil pit

Stop #9. Cumulic Regosol Presentation



Photo credit: Ed Karpuk

Stop #10. Suncor's Wapisiw Lookout



Suncor Energy's Pond 1 in 2002. Pond 1 operated from 1967 to 1997. Dikes were built to create a wider and deeper basin until eventually pond was lifted about 100 metres above the Athabasca River



Suncor Energy's Pond 1 in 2010. Suncor is the first Alberta oil sands company to convert a tailings pond to a stable surface solid enough to be re-vegetated

Source of imagery and text with Suncor permission:

<http://www.suncor.com/sustainability/environment/land/wapisiw-lookout-reclamation>

Stop #10. Suncor's Wapisiw Lookout



Photo credit: Petr Kuznetsov

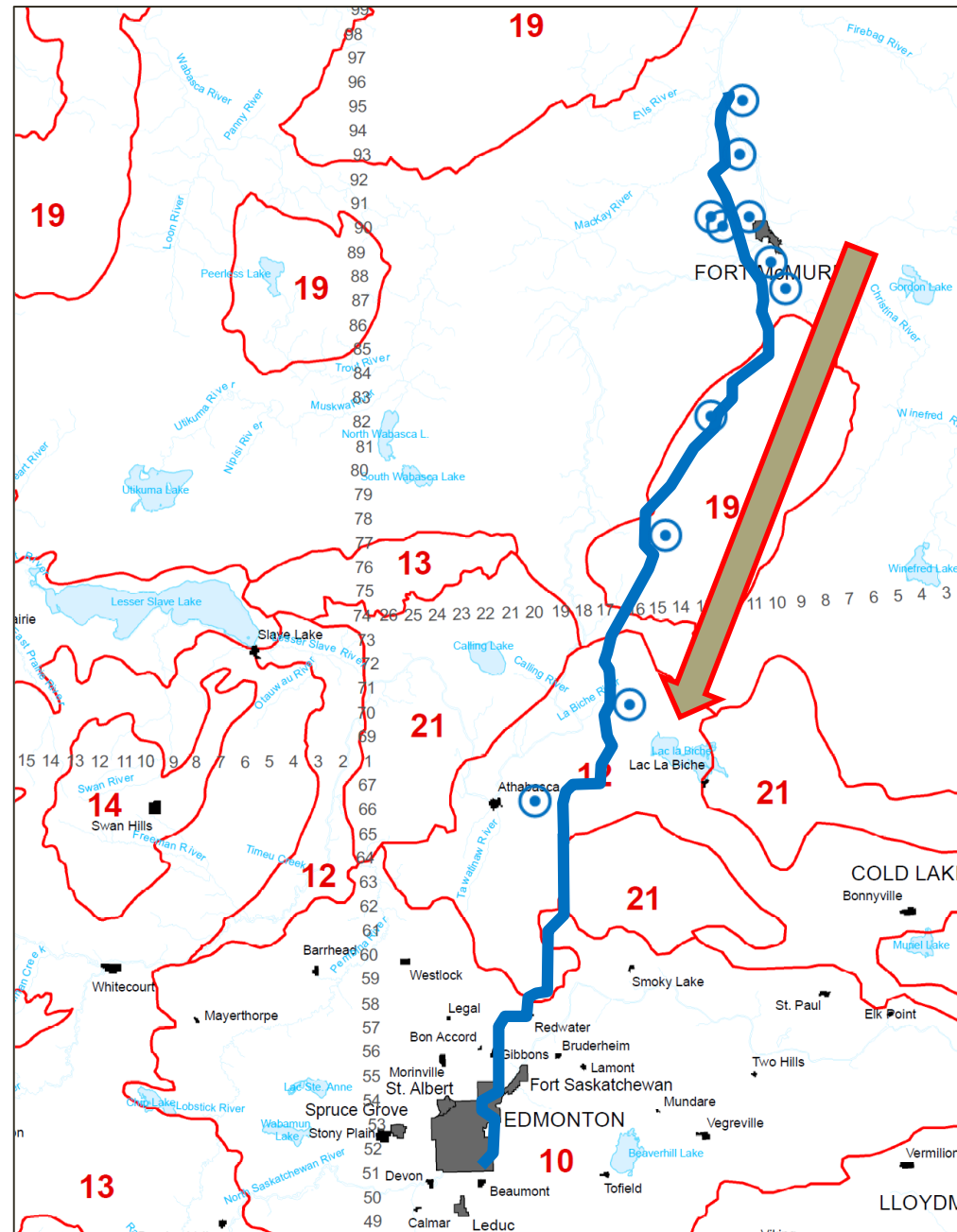
Stop #10. Interpretive trail



Photo credit: Petr Kuznetsov

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Stop #11. Luvisol Discussion



Photo credit:
Petr Kuznetsov

Photo credit: Petr Kuznetsov

Len Leskiw and Larry Turchenek answer questions on Dark Gray Luvisol on clayey glaciolacustrine deposits (Malcola Soil Series)

Stop #11. Gleysol Presentation



Photo credit: Petr Kuznetsov

Konstantin Dlusskiy demonstrated hand texturing techniques on clayey Humic Luvic Gleysol (Sawdy Soil series)

Stop #12. Farm near Athabasca, AB



Image source: Google Earth

Stop #12. Luvisol Discussion



Photo credit:
Petr Kuznetsov

Photo credit: Petr Kuznetsov

Len Leskiw and Larry Turchenek answer questions on Dark Gray Luvisol on till
(La Corey Soil Series)

Stop #12. Farming a Wetland



Photo credit: Petr Kuznetsov

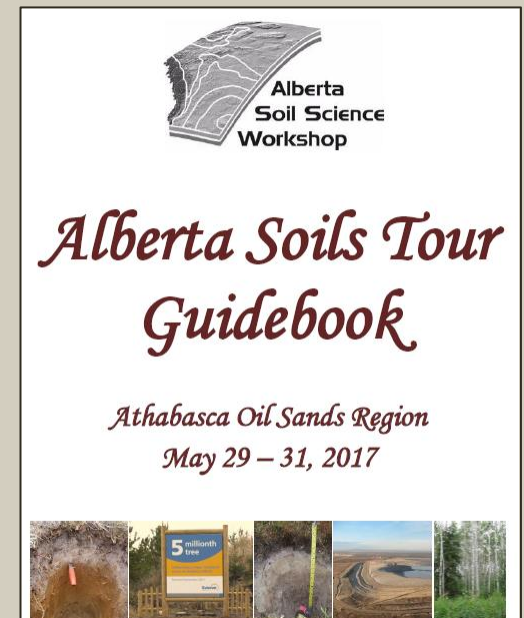
Konstantin Dlusskiy demonstrated Peaty Humic Gleysol (Columbine Soil Series)



Photo credit: Petr Kuznetsov

Conclusion: The 2017 Alberta Soils Tour

- The tour brought together over 60 soil specialists
- Very positive response from all participants and volunteers
- Tradition of Alberta Soils Tour was re-established
- New team of enthusiasts was build
- The Guidebook is available as a reference material online



Conclusion: Addressing Gaps in Soil Education

- Alberta Soils Tour provides an opportunity for soil specialists to observe and discuss Alberta soils outside their project areas
- Addressing various regional issues through the prism of pedology is a unique feature of the event
- Next task is establishing connections to University courses



Acknowledgements

- **Len Leskiw** (Soil Savvy) and **Larry Turchenek** as key speakers of the 2017 Alberta Soils Tour
- **Scott Boorman** and **Katelyn van den Tillaart** (Paragon Soil and Environmental Consulting), and **Derek MacKenzie** (University of Alberta) for writing Guidebook chapters,
- **Ray Gauthier** and **Allan Jenkins** for accommodating the Tour at their farms (Tour Stops 11 and 12),
- **Brad Friesen** (Owner of Dunvegan Gardens (AB) Ltd.) for accommodating the Tour at his facility (Tour Stop #9),
Amanda MacPherson and **Len Savoy** (Suncor Energy Inc.) for guiding the tour at the Wapisiw Lookout (Tour Stop #10),
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