Natural Resources Canada | Ressources naturelles Canada




Using advanced bibliometric analysis to cost efficiently tell a science impact story: One organization's current experience.

BRIC Conference 2021
April 27 – 29, 2021

Francis Loughheed
Senior Policy Advisor, Performance Measurement and Data Analytics

Canada

Purpose

- The purpose of this presentation is to review some experimental work being undertaken by Natural Resources Canada and the Canadian Forest Service around the use of citations and social media mentions to gain insight into the impact of our science.

CFS Background

- Sector of Natural Resources Canada
- Founded in 1899 – one of Canada's oldest Federal institutions.
- Regional offices/labs across Canada
- Specific science focus on sustainable forest management, wildfire mitigation, pest management and climate effects on forests/forestry.
- Data rich enterprise

Telling Our Science Story

- Have a mandated obligation to report our performance results to Parliament -> Canadians through our annual Departmental Plan and Departmental Results Report, as well as the annual State of Canada's Forests Report.
- Program funding requires a solid performance measurement framework: efficiency and effectiveness.
- As a science based organization we want to inform our stakeholders about the impact of our science.
- How do we know if we are doing the right science?

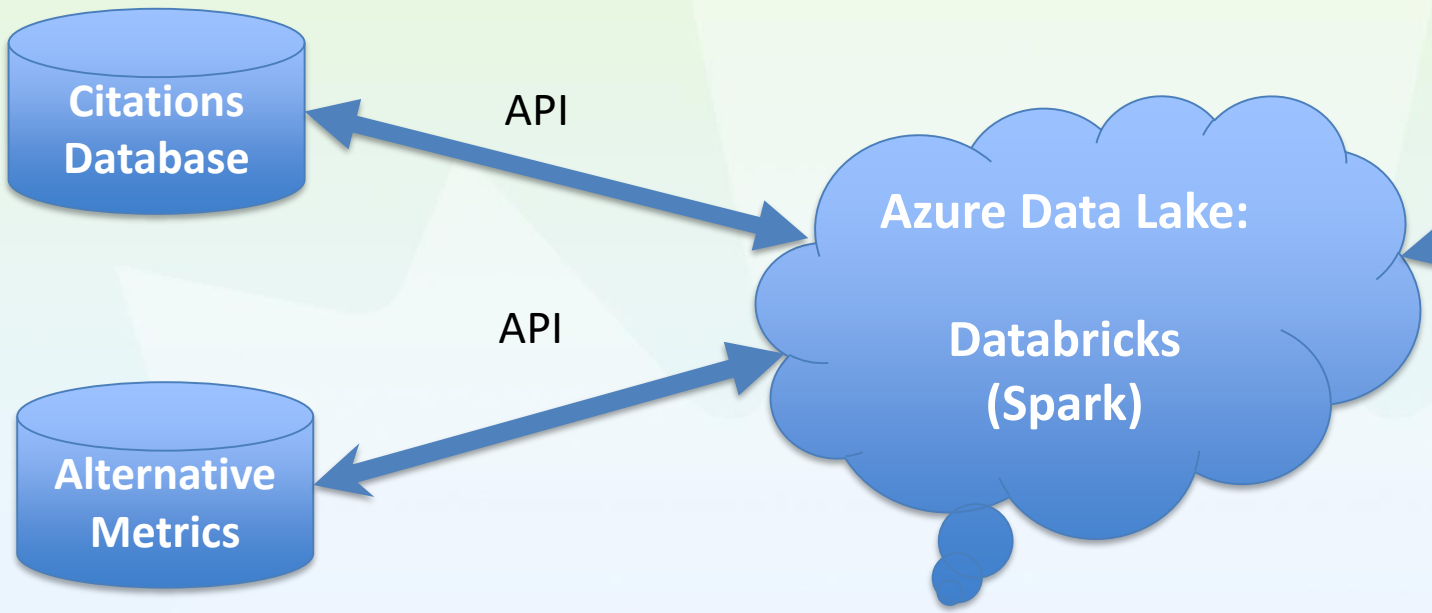
Program Logic

Project Background

- 2018 began work exploring the use of citations and alternative metrics to provide a basis for telling the CFS science story.
  - Manual approach to begin with: downloading data into spreadsheets and bringing into Tableau for data visualizations
  - 2019-2020 invited to be a pilot for the NRCan cloud based DataHub – using API connections to a data lake with near real time updates on data/metrics
  - 2020- 21 transformed the pilot into a corporate DataHub application.
  - The data is now live and available on the DataHub portal and we are developing advanced use cases for program/sector and corporate reporting.

Data Lake Architecture

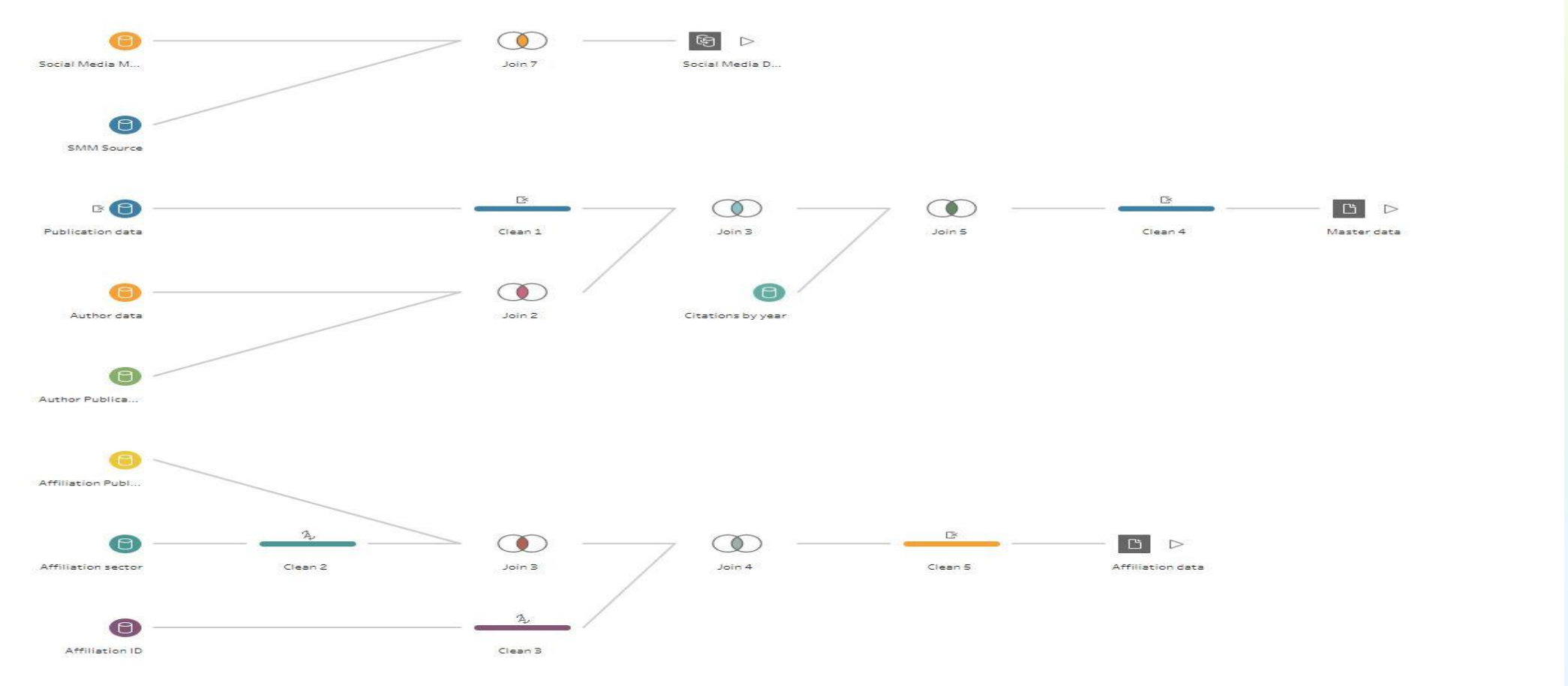
- Building on our 2018 pilot - Goal is near real-time updates on citations and social mentions of NRCan Science. Core Schema of 8 data tables, 3 M lines of data.
- Comprehensive data analytics/data mining capacity.



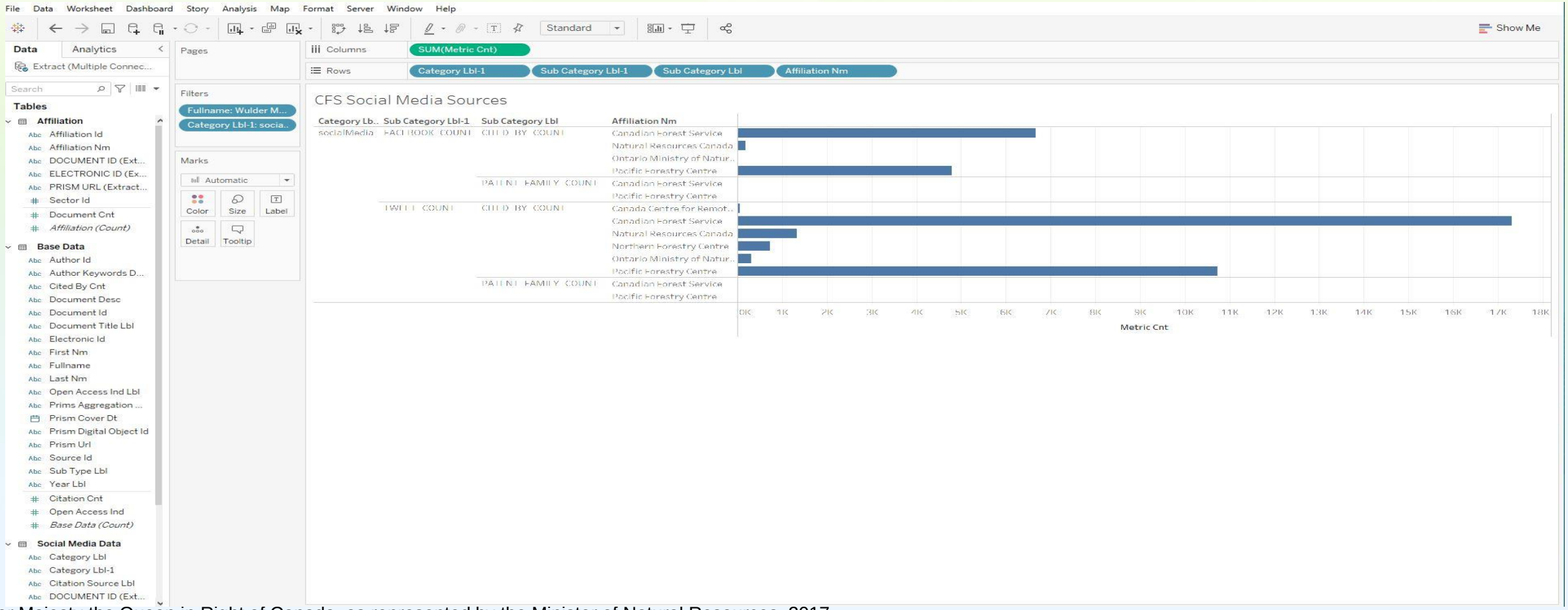
Ability to link to the Cloud with:

- Tableau/data prep
- KNIME
- Orange data mining
- Alteryx
- Power BI

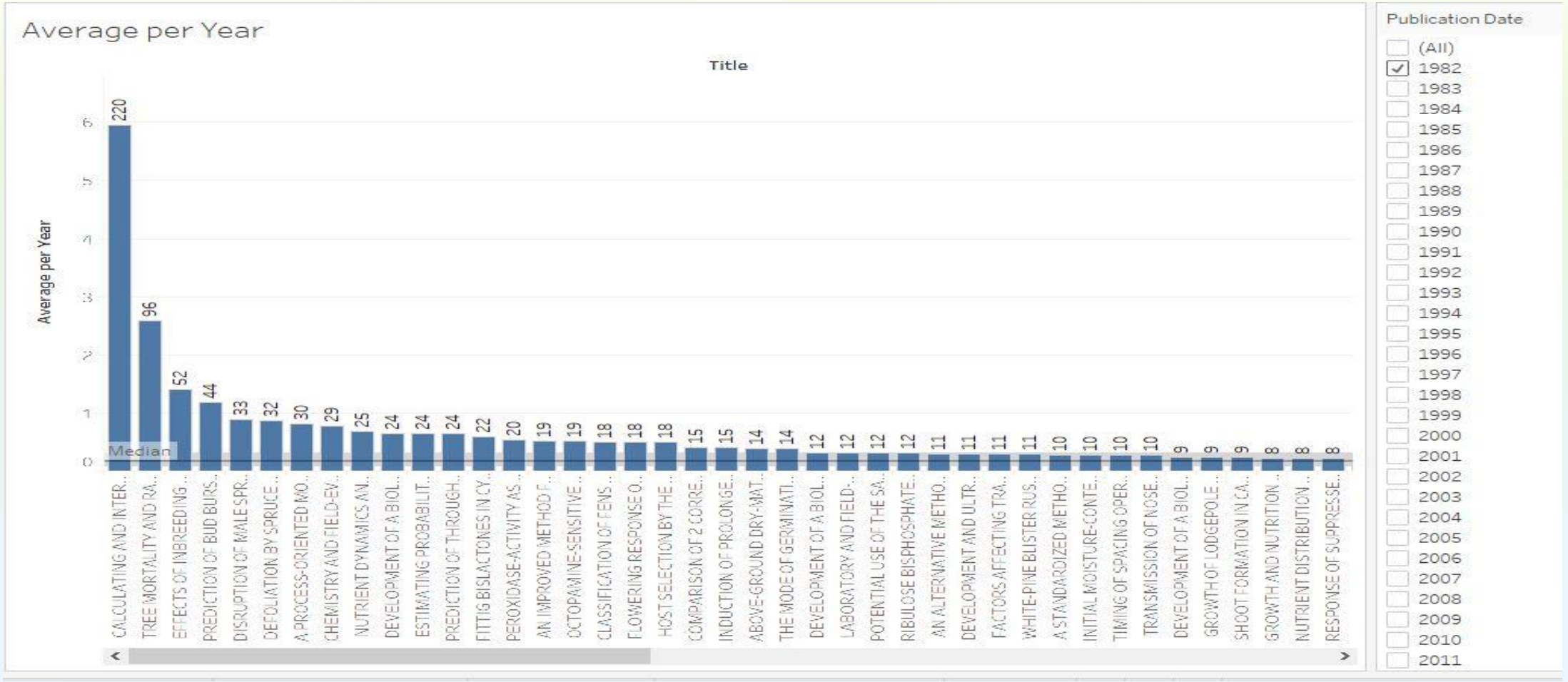
Screen shot of data clean up



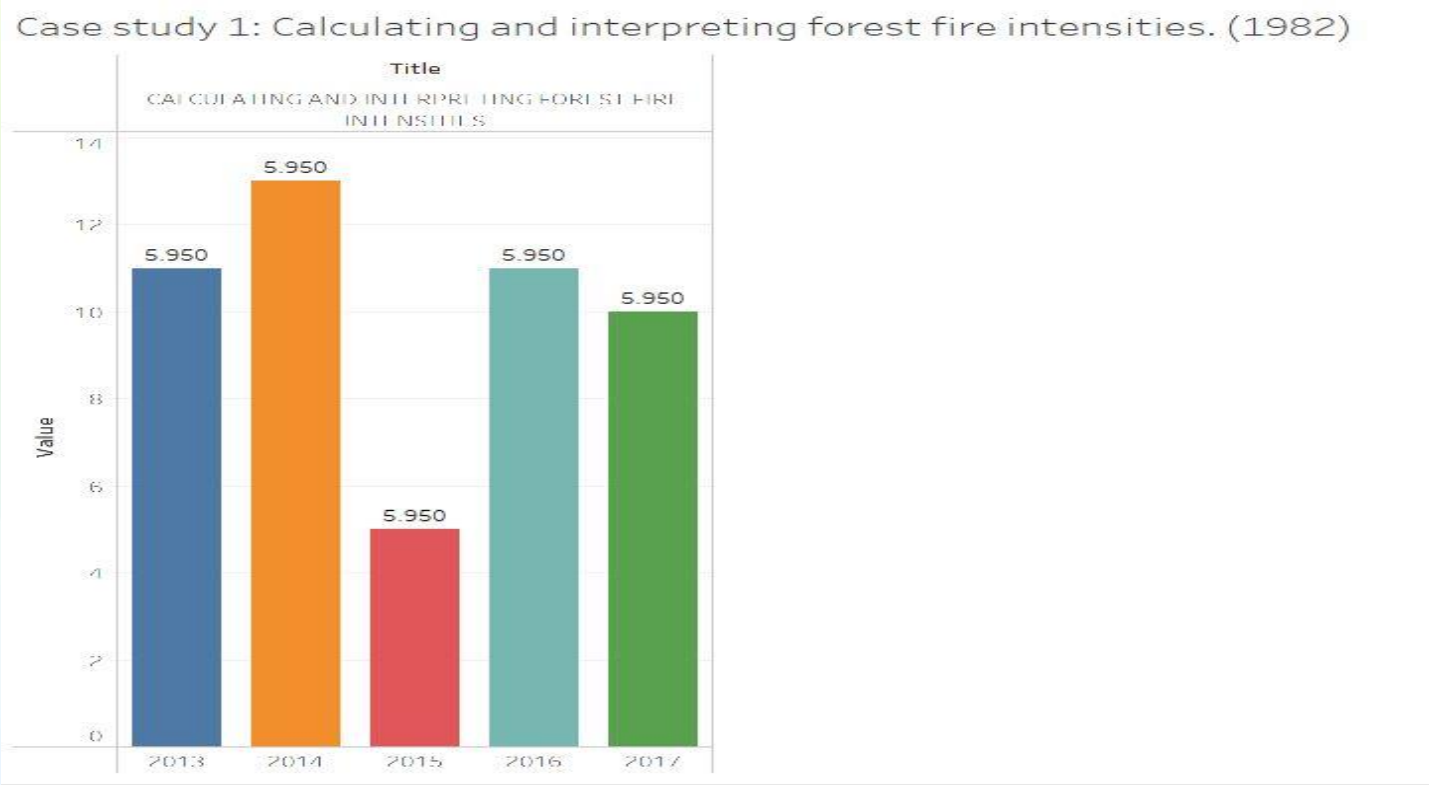
Data Visualization



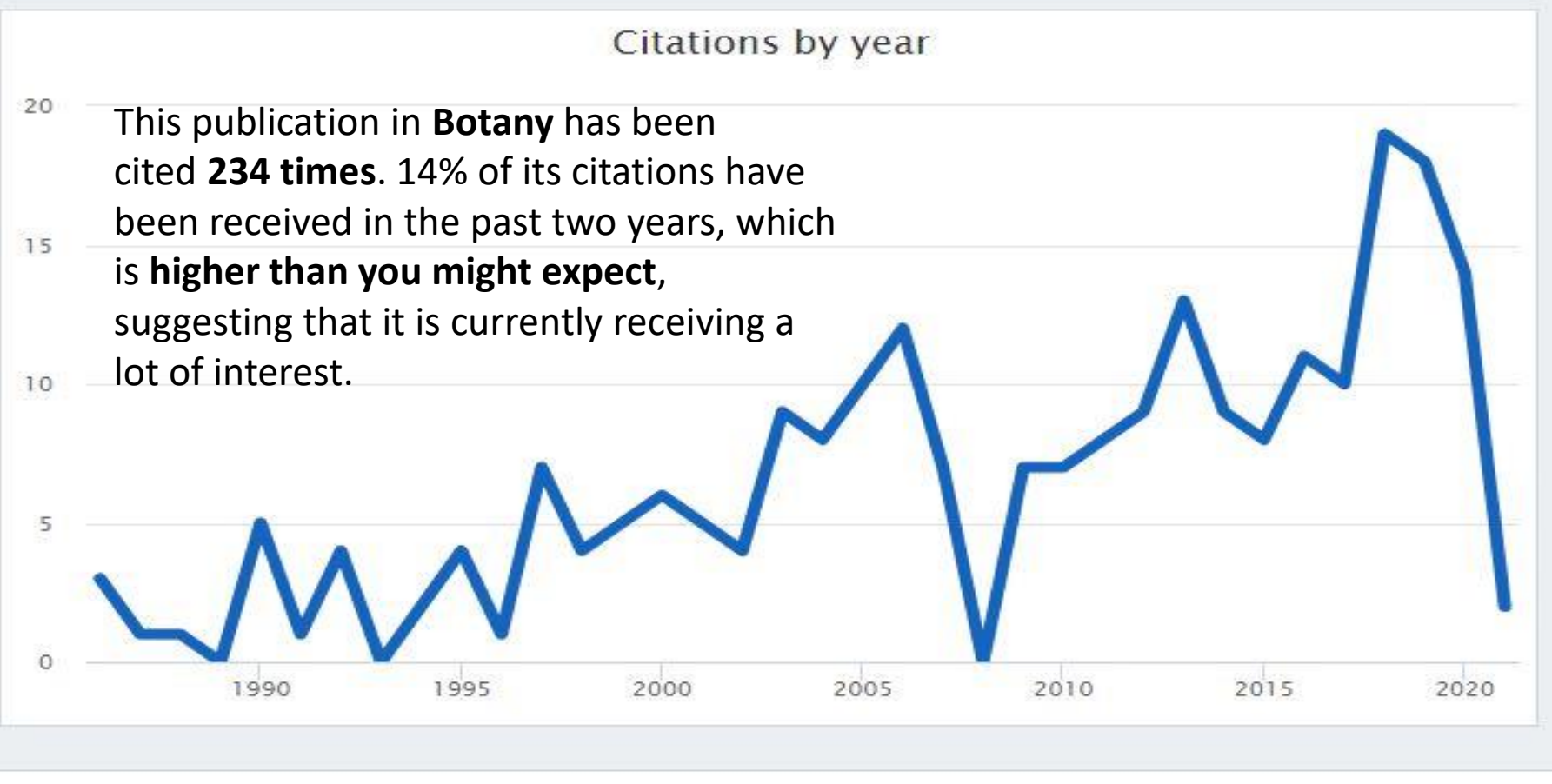
CFS Case Study



CFS Case Study (2)



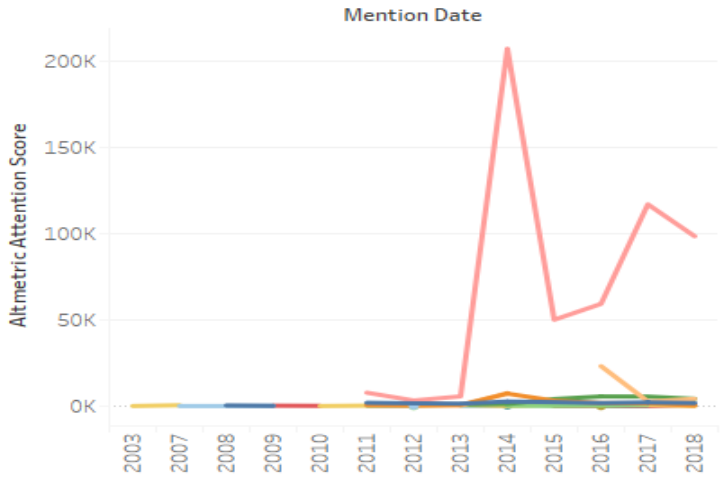
CFS Case Study (3)



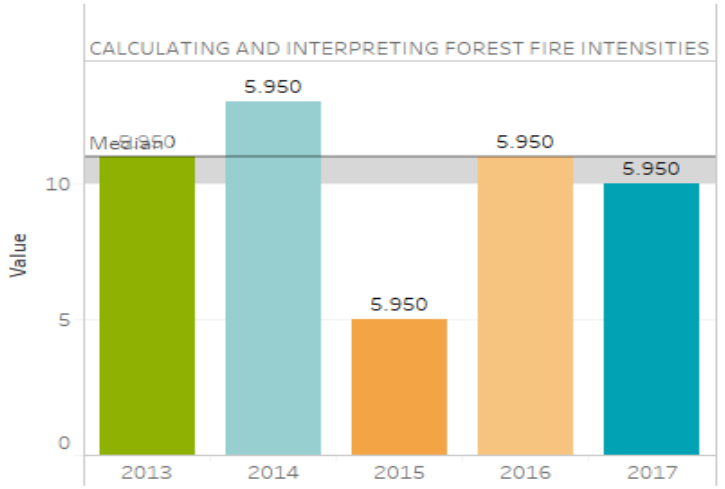
This publication in **Botany** has been cited **234 times**. 14% of its citations have been received in the past two years, which is **higher than you might expect**, suggesting that it is currently receiving a lot of interest.

Natural Resources Canada | Ressources naturelles Canada

Altmetric Mentions (2)



Case Study 1



Case Study 1 Years
- 2013
- 2014
- 2015
- 2016
- 2017

Mention Type
- [x] Blog post
- [x] F1000 post
- [x] Facebook post
- [x] Google+ post
- [x] News story
- [x] Patent
- [x] Peer review
- [x] Policy document
- [x] Reddit post
- [x] Tweet
- [x] Video
- [x] Wikipedia page

Altmetric Mentions By Country

Mention Type
- [ ] Blog post
- [ ] F1000 post
- [ ] Facebook post
- [ ] Google+ post
- [x] News story
- [ ] Patent
- [ ] Peer review
- [ ] Policy document
- [ ] Reddit post
- [ ] Tweet
- [ ] Video
- [ ] Wikipedia page

Number of Records
1 — 59

Canada

Potential Use and Next Steps

- Understanding the impact of NRCan/CFS science
- Enhancing the value of our data (>$181 M)
- Leveraging trends in social media
- Planning more effective knowledge transfer
- Influencing the science -> policy interface
- Linking to new opportunities
- Data mining text/abstracts for predictive analytics

Questions and Contacts

- Francis Loughheed
- francis.loughheed@canada.ca
- LinkedIn: https://www.linkedin.com/in/loughheed/
  - Connect for more information on data-driven impact stories and case studies.