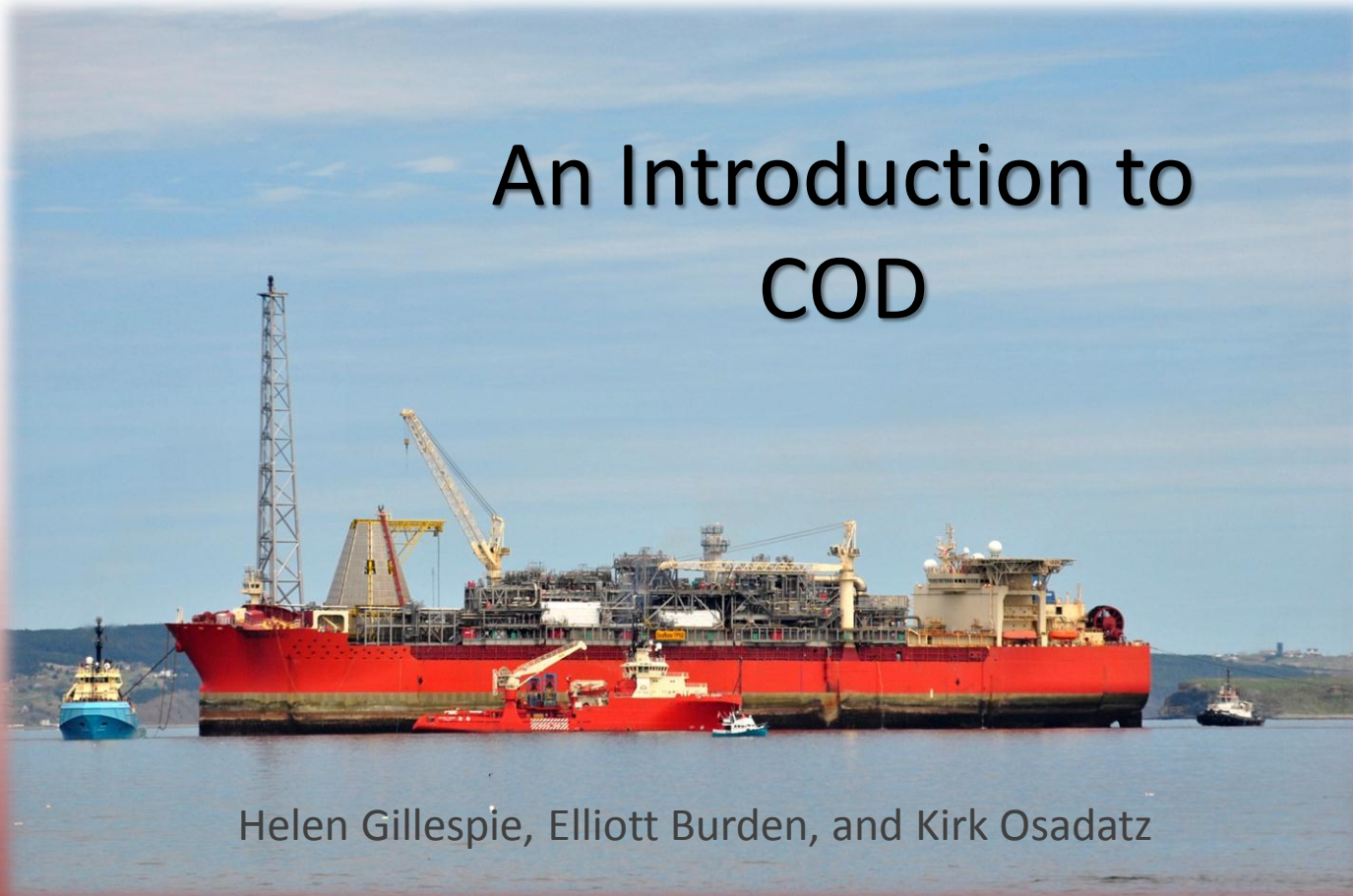


An Introduction to COD



Helen Gillespie, Elliott Burden, and Kirk Osadatz

Contents

- Brief explanation of what COD is
- Why did MUN develop it (application)
- What are the limitations
- Who can benefit
- Future work

What is COD?

COD is a Crude Oil Database

- COD was initially developed as a means to organize existing crude oil data
- Its information enables researchers at Memorial to use Fluorescence Microspectrometry as a tool to infer the oil quality of HFI

It contains a lot of information

List of providers
and their
contribution

Memorial University

- Sample Collection (129)
- Fluorescence Microspectrometry Analyses
 - Collected Fluorescence spectrograms
 - Determined quantitative information like λ_{\max} and Q_{values}
- Developed the Database

CNLOPB

- Oil samples
- Sample Information
- Well location
- API⁰ gravity at time of drilling (DST)

Husky Energy

- Oil samples
- Sample information
- Well location

GSC (Calgary)

➤ Geochemical data

- SARA data

- GRGC

 - Graph

 - Report

- SFGC

 - Graph

 - Report

Petroforma Inc.

- API⁰ gravity (new data, 2012) on the oil samples for Memorial

How do we access
COD?

The screenshot displays the Microsoft Office Access 2007 interface. The title bar indicates the current database is 'fluorescent database current : Database (Access 2007 - 2010) - Microsoft...'. The ribbon is set to 'Table Tools' with the 'Table' tab selected. The main window shows a table named 'Tbl_Sample Information' with the following data:

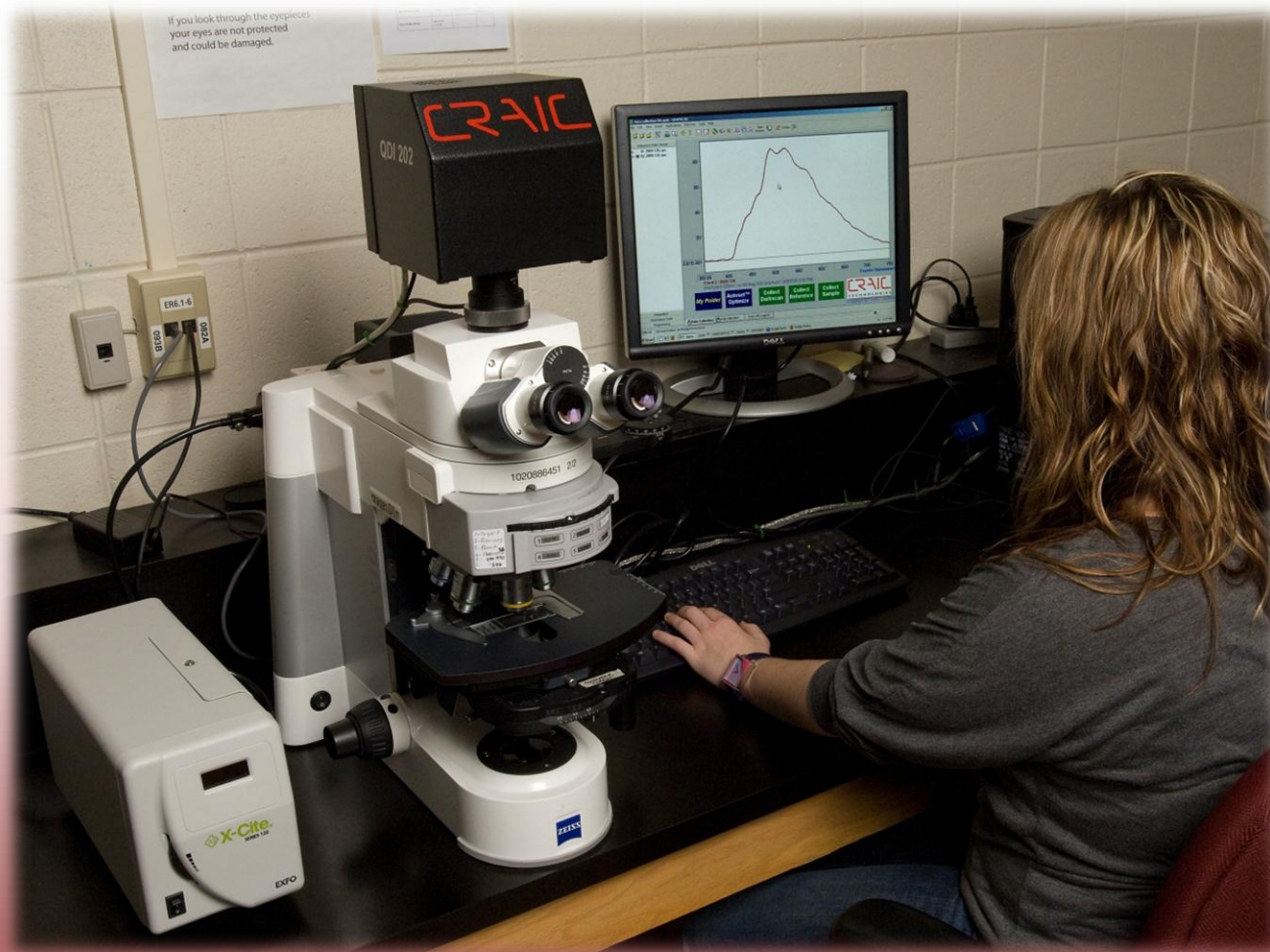
MUN ID	Well Name	Top of Interval	Bottom of Interval	Formation Name	Member
Mun0001	Hibernia B-08	2293	2305.8	Dawson Canyon	Petrel M
Mun0002	Adolphus 2K-41	2609.1	2647.2	Eider	Petrel M
Mun0003	Gudrid H-55	2663.4	2723.1	unknown	
Mun0004	Snorri J-90	2493.3	2502.4	Cartwright	Upper G
Mun0005	Hopedale E-33	1938	1997	Bjarni	
Mun0006	Hibernia P-15	4113	4129.2	Jeanne d'Arc	
Mun0007	Hibernia P-15	3852	3858	Hibernia	layer 3
Mun0008	Hibernia P-15	3805	3822	Hibernia	layer 2
Mun0009	Hibernia P-15	3742	3746	Hibernia	layer 1
Mun0010	Hibernia P-15	2422	2443	Ben Nevis	
Mun0011	Bjarni O-82	2362	2373	Bjarni	
Mun0012	Hibernia O-35	2467.1	2475.9	Avalon	
Mun0013	Hibernia O-35	2431	2440	Avalon	
Mun0014	Hibernia O-35	2219	2226.6	Avalon	
Mun0015	Hibernia O-35	2184.5	2195.5	Ben Nevis	
Mun0016	Hibernia O-35	2055	2066	Ben Nevis	
Mun0017	Hibernia O-35	2293	2306	Avalon	
Mun0018	Hibernia O-35	2538	2549	White Rose	
Mun0019	Ben Nevis I-45	2883.4	2894.1	East Shoals	
Mun0020	Ben Nevis I-45	4426.1	4437.9	Hibernia	
Mun0021	Ben Nevis I-45	2440.6	2445.4	Ben Nevis	

The status bar at the bottom indicates 'Record: 1 of 155' and 'No Filter' is applied. The primary key is identified as 'memorial university's sample number'.

Why do we need
COD?

**We need COD Information to help us
Infer Oil Quality**

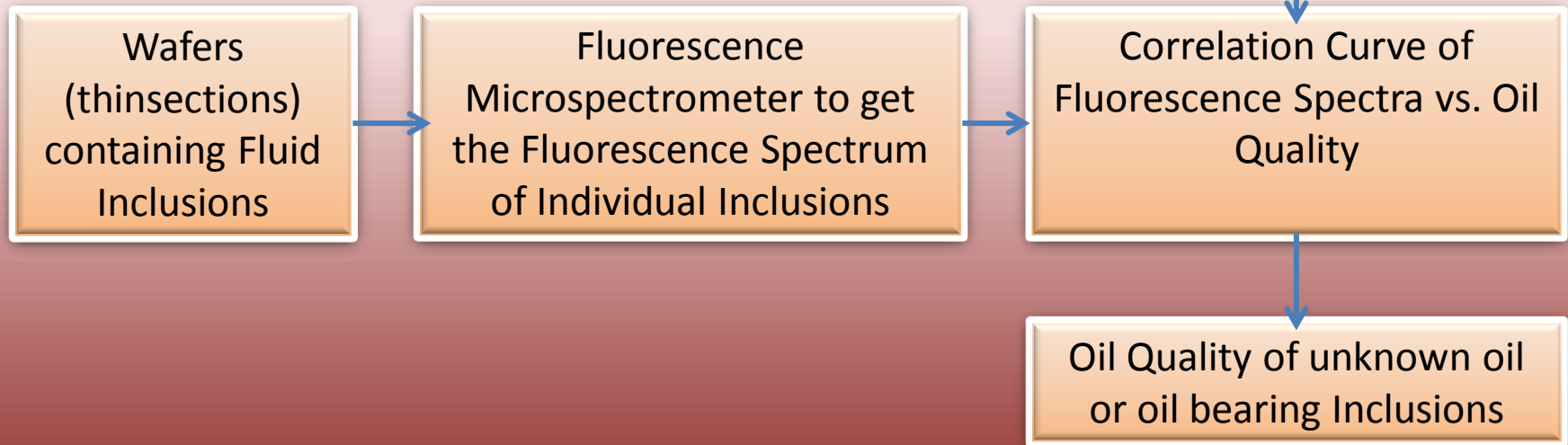
How do we
infer oil quality?

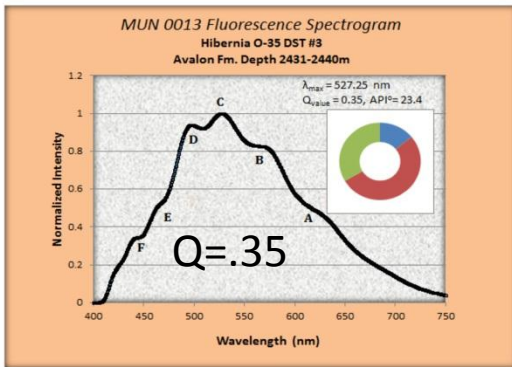
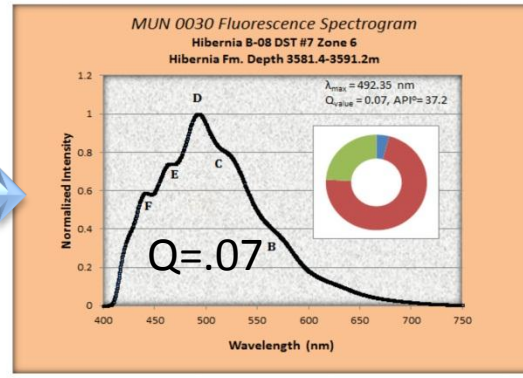
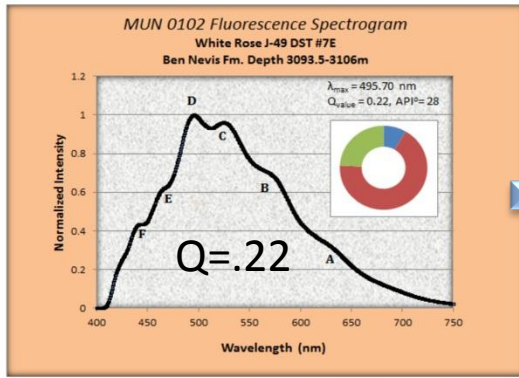


Fluorescence Microspectroscopy

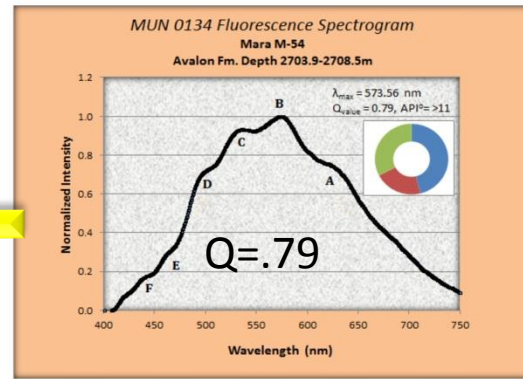
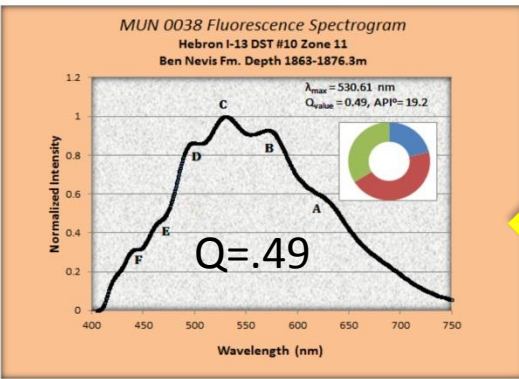
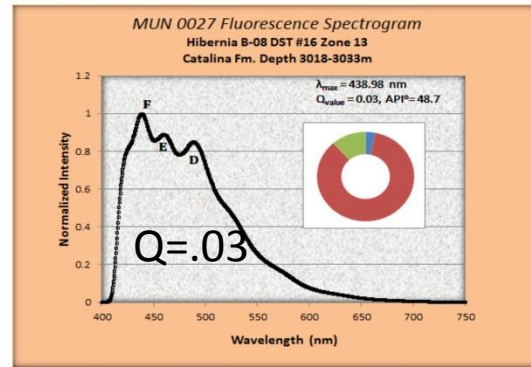
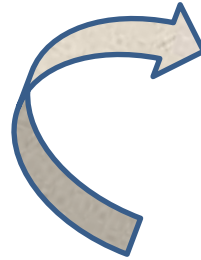
Method to characterize oil quality of an unknown oil or HFI.

After Tsui (1989)





Increasing Thermal Maturity



API=23.4°

S=49.8

API=48.7°

S=85.1

API=<11°

S=21.2

Gillespie/2012

An illustration of how fluorescence spectra is influenced with changes in oil quality

Data Limitations

- Age and condition of the samples
- We can only use the maturation diagram to infer oil quality
- We do not know if the changes we are seeing in the fluorescence are a function of petroleum system characteristics or if these changes are actually universally applicable

Users/
Future Work

Users



- ❖ Anyone with an interest in oil exploration or basin analyses studies: Industry, Government or Academia

Future Work

- ❖ We recommend that the study be expanded to consider other petroleum families such as those in Western Canada. This would enable us to understand if the changes we are seeing are a function of petroleum system characteristics or if they are universally applicable.
- ❖ Fresh samples

Summary

➤ **Functional Database**

➤ Well information, API^o gravity, Geochemistry, Fluorescence

➤ **Easily accessible** (down loadable to a home computer)

➤ **Can be used for basin analyses or other oil related studies**

➤ **Limited** by the quality and location of the oils collected to date

➤ **Users** anyone with an interest in oil exploration

➤ **Future work** test the fluorescence maturation diagram on other petroleum families within Canada



Acknowledgements

I would like to thank the Department of Natural Resources for their financial support and my employer, CREAIT Network, for their encouragement to pursue this project.

Questions

???



Thank-you