

What's happening in the

BASIN & RESERVOIR LAB



Professor Grant Wach & Dr. Ricardo Silva

September / October 2015

Summer Internships Conclude

The Lab is happy to welcome back three M.Sc. Candidates home from their summer industry internships in Calgary, Alberta. This summer, **Natasha Morrison** completed an internship with Talisman Energy (Repsol), working with a development geology team. Her project focused on reservoir characterization of a fluvial heavy oil pool, looking for petrophysical and lithological changes which could cause baffles, barriers, as well as changes to fluid flow. As a very integrated project, Natasha was able to collaborate with other disciplines including geophysics, development and reservoir engineering.

This summer, **Taylor Campbell** also worked for Talisman Energy (Repsol) with a developmental geology team. Taylor's project focused on analyzing the reservoir of the Dunvegan Formation, giving her the opportunity to look at 27 cores, make and analyze thin sections as well as perform XRD analysis. Over the course of the summer, Taylor gained considerable experience mapping within Petrel and learnt the importance of considering all aspects of geology to come to a final conclusion. She also had the opportunity to collaborate with geophysicists, engineers, landmen, on her team, fully understanding what goes into making a well and a company perform successfully.

Finally, **Carla Dickson** had a geoscience internship with Shell, working in the Unconventionals America line of business for the Deep Basin asset. She was responsible for completing a regional geology study and geohazard assessment on the Belly River Group. The Belly River Group is a clastic wedge deposited during the middle Upper Cretaceous, and comprises the Basal Belly River, Foremost, Oldman, and Dinosaur Park formations. The Group was deposited in shallow marine to fluvial and alluvial depositional settings as a result of the withdrawal of the Western Interior Seaway.

Welcome Dr. Sadki!



Dr. Sadki at Joggins, Oct 4, 2015

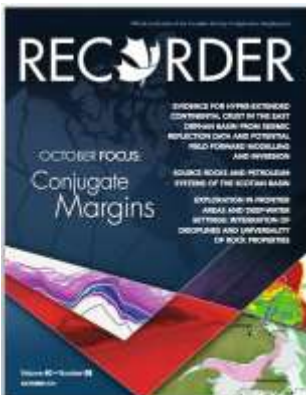
Prof. Dr. Driss Sadki arrived in Halifax on September 15th, and will be staying with us through to October 5th. Dr. Sadki is a professor from the Dept. of Geology at Moulay Ismail University in Morocco, often affectionately referred to as "Mr. Jurassic". On Tuesday, September 29th, Dr. Sadki presented on "The Sequence of events recorded in the Morocco Jurassic system".

Co-op Summer Research Assistants to Continue Through Fall Term

The Lab is happy to welcome Earth Science students **Maya Soukup** (right) and **Philip Sedore** (left) to stay on with the team this fall as ongoing research assistants. Both will continue to work along side Prof. Wach and Dr. Silva, in support of the **Source Rock and Geochemistry of the Central Atlantic Margins Project** as they continue their studies this fall term.



RESEARCH NEWS



- Congratulations to M.Sc. Candidate Carla Dickson on being published in the Canadian Journal of Earth Sciences. Full citation: Culshaw, N., Dickson, C. (2015) Cape St. Marys shear zone and the Halifax Group – Rockville Notch Group disconformity, southwestern Nova Scotia: structural development and tectonic significance. *Canadian Journal of Earth Sciences*, 52, 921-937. doi:0.1139/cjes-2015-0007
- Dr. Ricardo L. Silva, M.Sc. Candidate Carlos Wong and Prof. Grant Wach were published in the October edition of the CSEG's Recorder, "Source Rocks and Petroleum Systems of the Scotian Basin", pp. 22-27.
- M.Sc. Candidate **Charles Carlisle** will attend and present a project poster at the **Atlantic Ireland 2015** Conference and exhibition this October. His poster will highlight the progress made in the Offshore Ireland region in relation to the Source Rock Project.
- **Dr. Ricardo Silva** recently returned from Fuerteventura in the **Canary Islands**, off the coast of Morocco, where he conducted field observation and analysis of the **Lower Jurassic outcrops** around Ajus.



Cambridge Cove
(Photo M. Soukup)

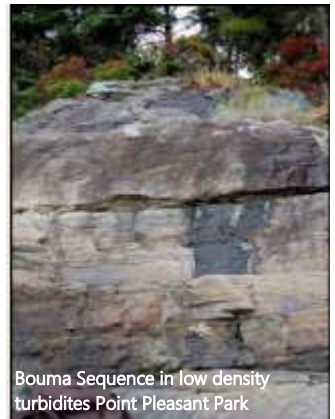


Sponsored by Shell, Dalhousie University stratigraphy and petroleum geoscience students attend several field seminars each fall. The Shell Field Seminars are led by Prof. Grant Wach of the Basin and Reservoir Lab, and include field visits to **Point Pleasant Park, Cambridge Cove, Rainy Cove, the Cheverie Coast, and the Joggins Cliffs**. Special thanks to everyone who helped make this years seminars possible, including Natasha Morrison, Anne Hargreaves, Taylor Campbell, Carlos Wong, Kenneth Martyns-Yellow, Darragh O'Connor, Trevor Kelly, Maya Soukup, and Darlene Van der Rijt.

After speaking at a Friday night **CSPG student event** on campus, **CSPG President Tony Cadrin** joined the group at Joggins on Sunday, October 4, 2015.

Point Pleasant Park— On September 17th, students visited Point Pleasant Park, located in the South End of Halifax. Students observed and described low density turbidite deposits within the Meguma Terrane. Students also were able to observe Ordovician paleogeography, stratigraphy, passive margins, Gondwanaland, Pangea, and Wilson cycles were highlighted.

Cambridge Cove— On September 19th, students traveled to Cambridge Cove to examine the stratigraphy and sedimentology of the Wolfville Formation (Fundy Group) and deduce the ancient depositional environments, paleocurrent trends and bedform geometries. The Fundy Group lie unconformably over rocks of Carboniferous age where they could touch the spectacular breakup unconformity. Students measured sections and interpreted photo pans to record the lateral facies changes and structural fault controls on potential fluid flow.



Bouma Sequence in low density turbidites Point Pleasant Park



Cambridge Cove (Photo: M.Soukup)



Intertidal sand flats, Minas sub-basin, Rainy Cove

Rainy Cove— On September 20th, students visited Rainy Cove in order to observe modern (recent) tidal sand flats and Triassic braid channel and sheet deposits as reservoir analogues within a petroleum system. Non-marine sequence stratigraphy was also observed, reservoir geometry and architecture, and the Evolution of the Fundy Basin. Students took permeability measurements and outcrop gamma ray logs, as well as investigated the depositional environments and structure of the Carboniferous section to demonstrate fracturing and key parameters of unconventional hydrocarbon production.. The finale of the trip was the first friendly International soccer match on a tidal flat. The game was called with a 2-2 draw due to rising tides.

Cheverie Coast—The Cheverie Coast is part of the Windsor Group. Students observed ancient Sabkha deposits with stromatolites and algal mat deposits. Spectacular examples of karsting and collapse structures were present. The students could smell the dead oil preserved in the evaporates and discussed the section as both a potential source and seal in a petroleum system.

Joggins—On October 4th, students traveled to the UNESCO World Heritage site, the Joggins Fossil Cliffs, to examine the paleoecology, climate, sedimentology, and stratigraphy of the Pennsylvanian (upper Carboniferous Period). The setting is the High Accommodation Cumberland basin, a salt withdrawal basin.



CSPG President Tony Cadrin, Joggins



Joggins Fossil Cliffs
(Photo: M.Soukup)