University of Regina

DEPARTMENT OF GEOLOGY

ACADEMIC UNIT REVIEW SELF STUDY REPORT

REVIEW YEAR 2019

1. Background

The first Geology class was taught on this campus, in 1965 by a research geologist with the Saskatchewan Government, while a formal 3-year B.Sc. program was established within the Natural Sciences Division in May, 1967. Thereafter, the department gradually grew in size with successive appointments of Dr. Tony Gordan, Dr. John Lewry, Dr. Lawrence Vigrass and Dr. Donald Kent, among others. From these humble beginnings, the department has expanded and evolved, in response to student and societal needs, with programs in both the Solid Earth and Environmental Earth Sciences. These programs have, and continue to benefit from inter-departmental and inter-institutional collaborations, as well as strong linkages with external agencies, including the Association of Professional Engineers and Geoscientists of Saskatchewan (APEGS) and the Saskatchewan Geological Survey (SGS) of the Ministry of Energy and Resources.

The department consists of nine professors and three lab. instructors, and up to three sessional lecturers yearly, delivering six undergraduate degree programs: B.Sc. and B.Sc. Honours in Geology, B.Sc. and B.Sc. Honours in Environmental Geosciences, and B.Sc. and B.Sc. Honours with Co-op designation. The department has a well-rounded curriculum that promotes solid understanding of the fundamentals of the Earth Sciences across all sub-disciplines, coupled with significant 'hands-on' training, including field-oriented class exercises, regular use of the SGS subsurface core repository and two intensive field school courses. Over the years, the department has striven to keep its curriculum relevant, closely adhering to professional accreditation standards set by APEGS and Canadian Geoscience Standards Council (CGSC) through Geoscientists Canada. In doing so, the department has maintained close ties with the Geography Department, Faculty of Arts and the Faculty of Engineering and Applied Science in the delivery of our undergraduate programs, with numerous inter-departmental and cross-listed courses. At the graduate level the department offers research-based M.Sc. and Ph.D. degree programs. A conscious choice has been made to remain broad-based, while maintaining a significant research profile in five thematic areas: Stratigraphy, Sedimentology, Basin Architecture and Petroleum Systems; Geomorphology, Soils, Quaternary, Paleoecology and Paleoenvironmental Reconstructions; Fluid Systems, Fluids in relation to Mineral and Hydrocarbon Resources; Structural Geology and Tectonics, Precambrian Geology and Structural Controls of Ore Deposits; and Volcanology, Igneous Petrology and Petrogenesis. The department attracts significant research funding from government agencies, national-international university collaborations and strong industry connections. Research is supported by rock preparation facilities combined with eight research laboratories, housing computer workstations for Geological applications, as well as research microscopes and a modest range of analytical equipment. To facilitate other specialized analyses associated with their research (e.g., geochemical, stable and radiogenic isotopes etc.), faculty have proven highly adept at fostering linkages with collaborators/laboratories at other institutions.

In the past decade the department has continued its commitment to excellence in teaching and research with programming that truly reflects the three strategic priorities of the university: Student Success, Research Impact and Commitment to our Communities. The department has an established reputation of high-quality, impactful research, coupled with a significant record for teaching and training of HQP. Our alumni have gone on to successful careers in the academic, government and industry sectors. The Department of Geology 'family' of graduates continues to grow and contribute in a tangible way to the knowledgebase, sustainable development and economy of Saskatchewan, as well as other jurisdictions in Canada and globally.

Glossary/List of Abbreviations

AAPG – American Association of Petroleum Geologists
ACROFI – Asian current research on fluid inclusions
APEGS – Association of Professional Engineers and Geoscientists of Saskatchewan
ARC – Academic Review Committee for APEGS
CAG – Canadian Association of Geographers
CCE – Centre for Continuing Education (University of Regina)
CCPG – Canadian Council of Professional Geoscientists
CGSC – Canadian Geoscience Council
CGEN - The Canadian Geoscience Education Network
CFI – Canada Foundation for Innovation
CIM – The Canadian Institute of Mining, Metallurgy and Petroleum
CL – Classroom Building (University of Regina)
CSPG – Canadian Society of Petroleum Geologists
CW – College West Building (University of Regina)
D.M. Kent club – Geology undergraduate student society
EDS – Energy Dispersive X-ray Spectrometry system
EYES – Educating Youth in Engineering and Science (University of Regina)
FGSR – Faculty of Graduate Studies and Research (University of Regina)
GAC – Geological Association of Canada
GC – Geoscientists Canada
GSA – Geological Society of America
GSBF - Graduate Student Base Funding Scholarships (formerly 'GSS', University of Regina)
GSC – Geological Survey of Canada
GTA – Graduate Teaching Assistantship (University of Regina)
HQP – Highly Qualified Personnel
IAGOD – International Association on the Genesis of Ore Deposits
IGC – International Geological Congress
LB – Laboratory Building (University of Regina)
M4S – (Mining for Society)
MAC – Mineralogical Association of Canada
NRCan – Natural Resources Canada
NSERC – Natural Sciences and Engineering Research Council of Canada
PDAC – Prospectors and Developers Association of Canada
PTRC – Petroleum Technology Research Centre
RI – Research and Innovation Centre Building (University of Regina)
RCGS –Royal Canadian Geographical Society
SEM – Scanning electron microscope
SGA – Society for Geology Applied to Mineral Deposits
SGS/Sask Geol Surv – Saskatchewan Geological Survey
Sask Geol Soc – Saskatchewan Geological Society
STEM – Science, Technology, Engineering and Mathematics
TA – Teaching Assistant (University of Regina)
UR/U of R – University of Regina
WIUGC - The Western Inter-University Geoscience Conference

2. Staffing and Resources

2.1.1. Staffing - faculty, instructors, lab. instructors, technicians, and support staff

Name	Position	Notes
Bend, Stephen	Professor	(retiring 30th April 2019)
Bethune, Kathryn	Professor	Department Head
Chi, Guoxiang	Professor	Undergraduate Advisor - Geology
Cliveti, Monica	Laboratory Instructor III	
Coulson, Ian	Professor	Co-op Coordinator, Director Electron microbeam facility
Dale, Janis	Associate Professor	Undergraduate Advisor - Environmental Geoscience
From, Richard	Laboratory Instructor I	
Kostelny, Trent/Downing, Joanne	Technician	Trent (Dec. 2018-April 2019), Joanne (Feb. 2019-)
Qing, Hairuo	Professor	Graduate Coordinator
Raharimahefa, Tsilavo	Assistant Professor	
Roelofsen, Jeanette	Laboratory Instructor III	
Salad Hersi, Osman	Associate Professor	
Tran, Van	Administrative Assistant	
Vélez, Maria	Associate Professor	Chair of curriculum committee

Name	Position	Notes
Ashton, Kenneth	Project Geologist with the Saskatchewan Geological Survey	Adjunct Professor
Binda, Pier	Professor Emeritus	Adjunct Professor
Card, Colin	Project Geologist with the Saskatchewan Geological Survey	Adjunct Professor
Kent, Donald	Professor Emeritus	Adjunct Professor
Morelli, Ryan	Project Geologist with the Saskatchewan Geological Survey	Adjunct Professor
Normand, Charles	Project Geologist with the Saskatchewan Geological Survey	Adjunct Professor
Potter, Eric	Research Scientist, Geological Survey of Canada	Adjunct Professor
Rostron, Benjamin	Professor, Earth and Atmospheric Sciences Dept., University of Alberta	Adjunct Professor
Tokaryk, Tim	Curator of Vertebrate Palaeontology, Royal Sask. Museum	Adjunct Professor
Tschirhart, Victoria	Research Scientist, Geological Survey of Canada	Adjunct Professor
Vigrass, Laurence	Professor Emeritus	
Watters, Brian	Professor Emeritus	

Note: Our Adjunct Members contribute by offering the occasional senior classes, guest lectures in their areas of expertise and by co-supervising graduate and undergraduate student theses through field and laboratory support and guidance on their projects.

2.1.2. Special Awards and Recognitions

Members of our department have been awarded special awards for service and contributions to the Geoscience community. In 2017 Dr. Stephen Bend received the American Association of Petroleum Geologists (AAPG) Foundation's Professorial Award for excellence in the teaching of natural resources in the Earth Sciences. Dr. Guoxiang Chi (2012-14) and Dr. Hairuo Qing (2016) were awarded Canadian Society of Petroleum Geologists (CSPG) Volunteer Awards. Dr. Chi also won their Service Award (2015-2016), and was Outstanding Reviewer for Ore Geology Reviews (2018) and Journal of Geochemical Exploration (2017). Dr. Qinq is the 2017 recipient of the CSPG Award for his work as the Co-Editor in Chief of the Bulletin of Canadian Petroleum Geology. Dr. Janis Dale, has been made a Fellow of Geoscientists Canada (2016) and selected as a Fellow in the Royal Canadian Geographical Society; she served two terms on the Board of Governors, where she was awarded a dedicated service and wise counsel award. Dr. Kathy Bethune invited to serve on the NSERC evaluation group 1506 (Geoscience) for a 3-year term and is currently Vice President of the Geological Association of Canada (GAC). Drs. Bend (2011) and Dale (2015) also received University of Regina Alumni Association Awards For Excellence in Teaching. Resumes of Faculty are presented in Appendix 1 for more details.

2.2. Resources

2.2.1. Teaching Space

Room	Capacity	Function
CW209	20	Small classes (lecture/lab.: 4th year and graduate), seminars, defence & group/Dept. meetings.
CW237.1 / CL431	36	Introductory classes (primarily laboratories for Geol 102, 201, 240, 270 & 353).
CW237.3 / CL420	36	Primarily intermediate to senior classes (lecture/lab.: Geol 102, 201, 241, 307, 313, 314, 315, 340, 429, 453, 470, 472 & 476).
CL407	24	Primarily intermediate to senior classes (Labs.: Geol 210, 211, 313, 314, 315, 453, 470 & 476
RI016 / RI333	8	Electron microbeam facility: Teach Geol211, graduate students, Biochem340 microscopy course.
CW239	4	Geology Library / exam room.
CW230.4	20	Study area for undergraduate students, D.M. Kent club
CW 230 foyer		Dept. of Geology display area: 4 cabinets, Poster board displays

2.2.2. Research Space

Room	Function	Principal Investigators	Funding agency
RI016.2.1 / RI333	Electron microbeam facility (Jeol JSM 6360 SEM, Noran System 7 EDS, Gatan MonoCL3).	Ian Coulson, Guoxiang Chi	CFI new opportunities, CFI Leaders opportunity, Science Faculty
RI016.2	SEM prep. area	Ian Coulson	As above
CW020	Rock prep./crushing Lab.	Ian Coulson	Department
CW022	Rock saw lab.	Trent Kostelny, Joanne Downing	Department
LB413	Solid Earth Studies Lab.	Ian Coulson	NSERC, Science Faculty

LB317	Sedimentary Petrography Lab.	Hairuo Qing	NSERC
LB316	Quaternary Geology and Paleoecology Research	Janis Dale, Maria Velez	NSERC, Communities of Tomorrow
LB317	Geofluids Lab. (Renishaw 2000 Raman spectroscopy, Linkam heating-freezing stages, various microscopes, computer workstations and software of numerical modelling of fluid flow and fluid-rock reactions)	Guoxiang Chi	CFI Leaders opportunity, NSERC-CRD
LB420	Precambrian Tectonics and Ore Deposits Research Lab.	Kathryn Bethune	NSERC
LB415, CW207	Organic Petrology, Geochemistry and Modelling Lab. (Rock Eval, Petrel, PetroMod)	Stephen Bend	NSERC-CRD, Western Diversification, SaskPower, PTRC, Schlumberger
CW019.3	Rock storage / workshop	Trent Kostelny, Joanne Downing	Department

2.2.3. Specialized teaching equipment, instrumentation and collections

Equipment/Instrumentation	Location	Notes
15 Dell Optiplex 580 computers	CW237.3	Preloaded with MS Office & ArcGis software, used for Geomodelling & GIS courses: Geol490AH/AJ
80 Petrographic / polarising microscopes:	CW237.3 / CW209 / CL407	3 Leica DM EP 23 Leica DM750P 20 Leitz SM-POL 4 Leitz HM-POL 3 Nikon Optiphot-POL 16 Nikon Labophot-POL 7 Nikon Alphaphot 2-POL 4 Nikon Eclipse E200POL
15 Reflected / polarized light microscopes:	CL407	14 Nikon epi illuminators 2 Leica epi illuminators
27 Stereo-microscopes:	CW237.3 / CW237.1 / CL407	20 Olympus X 3 Olympus SZ-III 4 Nikon SMZ-1
Poster / Sample Displays	Various locations Dept. and campus	Map cabinets x 3 Rock and mineral collections Thin-section collections Poster display boards x 10 Sample cabinets x 18 Display cabinets x 13 Collection of maps, diagrams and posters 3D sandbox
Sample preparation	CW020 / CW022	Rock saws, Rock splitter, Rock tumbler, Vibrating lap, Petrographic hand polisher Muffle furnace, Precision ovens

Geological Core (190 boxes)	CW019.3	Used for teaching in Geol 240, 270, 314, 340, 414, 472
Miscellaneous Undergraduate equipment:	CW234.1 / CW019.3	Microscope cameras x 4 Field GPS units x 18 Field compasses x 34 Two way radios x 12 Altimeter Geiger counter Black light units (fluoroscopes) x 7 Data projectors x 5 Overhead projectors x 3 Educational videos/DVDs

2.2.4. Research equipment and instrumentation

Equipment/Instrumentation	Location	Funding agency	Notes
3 Nikon Epol600 polarizing microscopes	Faculty offices	NSERC	Includes Nikon digital camera, 2 with reflected light capabilities
Cold-cathodoluminescence stages and microscope, heating/freezing fluid inclusion stage and microscope, Raman spectroscopy, computer workstations and software for numerical modelling of fluid flow and fluid-rock reactions	LB317	NSERC CRD, CFI	
Rock Eval IV analyser, computer workstations and software, 40" 3D Monitor, Leica DM2500 and Leitz Orthoplan (x2) reflected/transmitted uv/white light microscopes. Leica M420 microscope, Foss SOXTECH 2045 solvent extractor, vacuum oven, liquid chromatography apparatus	CW207 / LB415	SaskPower, NSERC-CRD, Western Development, PTRC, Schlumberger	Workstations preloaded with Petrel, PetroMod, GeoScout, Rockworks and ARC-GIS
Computer workstations and software	LB420	NSERC, GSC	Workstations preloaded with ARC-GIS
Computer workstations and software; Polarizing and binocular microscopes, sedigraph, sediment and water measurement and sampling equipment	LB316	NSERC, CT	Workstations preloaded with ARC-GIS & GeoScout, Sedigraph
Computer workstation and software; Leitz polarizing and binocular microscopes	LB413	NSERC	Workstation preloaded with GeoScout
JEOL JSM-6360 scanning electron microscope	RI016.2.1	Department, Science Faculty	
Noran System 7 energy-dispersive spectrometer, liquid N free	RI016.2.1	CFI Leaders opportunity	

Gatan MonoCL3 cathodoluminescence imaging and spectrometry instrument	RI016.2.1	CFI new opportunity	
Carbon sputter coater	RI016.2	CFI	
Leonard hydraulic rock splitter (150 ton) Rock saws, Muffle furnace Precision ovens, Tungsten, steel, and agate milling equipment, a Bico rock pulveriser, a Bico chip crusher, Nelson Machinery rock crusher, and a Spex Industries ball mill, Franz Magnetic separator, Beckman XRF powder pellet press and various platinum crucibles for rock fusion. Various sieves, balances and scales, and a water still.	CW020 / CW022	Department	
Zodiak boat & motor	CW019.3	NSERC, GSC	

2.2.5. Research institutes, clusters, or specialized labs

The research in the Department of Geology can be grouped into three clusters: 1) 'hard rock' and mineral resources (Drs. Bethune, Chi, Coulson and Raharimahefa), 2) 'soft rock' and oil-and-gas resources (Drs. Bend, Qing and Salad Hersi), and 3) Environmental Geoscience (Drs. Dale and Velez). Most faculty members are involved in more than one cluster, and adjunct professors and visiting scholars contribute to our research programs. Specialized labs include the following:

Geofluids Lab: This lab houses facilities for fluid inclusion analysis and numerical modeling of geologic fluid flow and geochemical reactions. The main facilities include a Linkam heating-freezing stage equipped with UV and IR functions, a Linkam high-temperature heating stage, a USGS heating-freezing stage, a Renishaw 2000 Raman spectroscopy, and computer workstations and software (FLAC3D and TOUGHREACT) for numerical modeling. These facilities were purchased through CFI New Opportunity and CFI Leaders Opportunity as well as NSERC-CRD awards to Dr. Chi; the lab is managed by Dr. Chi.

Organic Petrology, Geochemistry and Modelling Lab: This lab houses a Rock Eval IV Analyser for geochemical analysis of organic matter, reflected and transmitted light microscopes for petrographic study of organic materials and associated sample preparation facilities, and computer workstations and software (Petrel and PetroMod) for petroleum system modeling. These facilities were purchased through a combination of NSERC-CRD, Western Diversification grants and donations from SaskPower, PTRC and Schlumberger to Dr. Bend; the lab is managed by Dr. Bend.

Precambrian Tectonics and Ore Deposits Research Lab: This lab has naturally lit tables with binocular microscopes for examining hand samples, petrographic microscope, computer workstations equipped with ARC-GIS and other specialized software programs (e.g., Stereonet 10, Rocscience-Dips, Geosoft, IsoPlot, Rockware-Igpet) for mapping and data analysis, and equipment for field work including compasses, GPS units, core-measuring tools, camping gear and a Zodiac boat and 15-HP motor. These facilities were purchased with NSERC grants to Dr. Bethune; the lab is managed by Dr. Bethune.

Quaternary Geology and Paleoecology Research Lab: This lab includes a wet lab suitable for analysing soil and sediment textural and physical properties, a variety of biologic microscopes with digital image capture system, stereo microscope with camera set-up for fossil identification and binocular microscope for hand samples, and computers and software for paleoecological and paleoenvironmental research. Field equipment includes a Russian corer to core and extract undisturbed sediments, and soil and sediment grab

samplers, meters measuring water turbidity, salinity, DO and temperature. These facilities were purchased with grants to Drs. Dale and Velez from NSERC, University of Regina Start-up funds, Communities of Tomorrow, U of R Vice-President's grants, the provincial government and industry. The lab is managed by Drs. Dale and Velez.

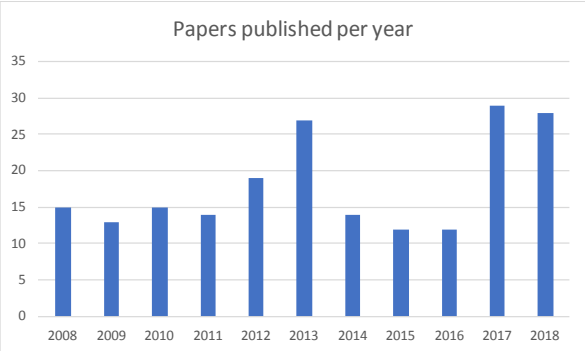
Sedimentary Petrography Lab: This lab is equipped with a petrographic microscope with digital image capture system, stereo microscope for sample observation and imaging, cathodoluminescence microscope with digital camera, and a dental drill system for micro sampling for geochemical analyses. These facilities were purchased with NSERC grants to Dr. Qing; the lab is managed by Dr. Qing.

Electron Microbeam Facility: This lab is equipped with a Jeol JSM-6360 scanning electron microscope (SEM) coupled to a Thermo/Noran System 7 ultra-dry EDS, for mineral phase analysis and compositional mapping, augmented with a Gatan MonoCL3 cathodoluminescence imaging and spectroscopy instrument. Sample preparation and coating facilities include those for carbon and gold. The system was purchased with University of Regina Start-up funds, a CFI New Opportunity grant (to Dr. Coulson) and a CFI Leaders Opportunity grant (to Dr. Chi); the lab is managed by Dr. Coulson. A new environmental SEM and EDS system are on order from Tescan, with an anticipated operational date of the Spring 2019.

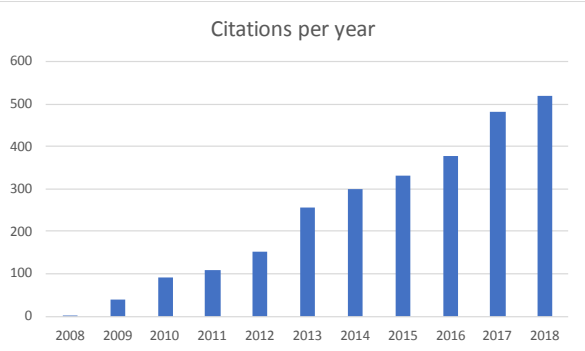
3. Scholarly Output

3.1.1. Summary

The 9 faculty members of the Department of Geology published 240 refereed journal articles, 90 other refereed conference proceedings and papers, 44 technical reports, 2 books, 5 book chapters, and 428 conference presentations over the last 10 years. These publications reflect significant contributions of our faculty members in areas of fundamental Earth Science, mineral and hydrocarbon resources, and environmental geoscience. Statistics of publications that are collected by 'Web of Science', including total publications per year and total citations per year, are shown in the two figures below.



Publications per year according to Web of Science



Citations per year according to Web of Science

In the area of 'hard rock' and mineral resources related studies, Drs. Chi and Bethune have made significant advancement in uranium ore genesis, having published more than 15 papers in ore geology journals including Economic Geology, Mineralium Deposita, and Ore Geology Reviews, one of which was nominated as one of the most influential papers published in Mineralium Deposita in 2017. Dr Chi's research has been recognized internationally and he has been invited as a keynote speaker for SGA (2017), ACROFI (2014, 2016, 2018), IGC (2012), GSA (2009). Dr. Bethune's research on the Rae craton tectonic evolution has produced a number of publications including 7 papers in Precambrian Research. Dr. Coulson organised a short course, including editing a short course volume on cathodoluminescence, supported and published by the Mineralogical Association of Canada. He has published papers on Mt. Etna and Mt. Garibaldi volcanoes in Bulletin of Volcanology and Lithos. Dr. Raharimahefa published several papers on the tectonics of Madagascar in Gondwana Research, Tectonophysics, and Precambrian Research.

In the area of 'soft rock' and oil-and-gas resources related studies, Dr. Bend published an AAPG eTextbook on Petroleum Geology, and his studies of the petroleum systems of the Williston Basin have resulted in the publication of papers in Organic Geochemistry and AAPG Memoirs. Dr. Qing's global comparison of dolomite from different basins (especially the Williston Basin in Canada and the Tarim Basin in China) has led to a better understanding of the nature and processes of dolomitization in different tectonic settings, with publication of a number of papers in Sedimentary Geology, Sedimentology, Marine and Petroleum Geology, and Journal of Sedimentary Research. Dr. Salad Hersi's studies of various strata in the Williston Basin and the St. Lawrence Platform have produced a number of publications in journals such as Sedimentary Geology and AAPG Memoir.

In the area of Environmental Geoscience studies, Dr. Velez's studies of Holocene sediments and fossils in Lakes in South America have contributed to the understanding of the effects of climate variability and anthropogenic impact on freshwater ecosystems, having produced a number of publications including those in Palaeogeography-Palaeoclimatology-Palaeoecology (Palaeo-III), The Holocene, Journal of Paleolimnology, and Journal of Quaternary Science. Dr. Qing's studies of O and C isotopic records of speleothems from SE China provide precisely-dated, high-resolution paleoclimatic records of the timing and character of the East Asian monsoon, which have been published in Earth and Planetary Science Letters and Palaeo-III. A project lead by Dr. Dale on developing subsurface geological criteria for small

modular reactors (SMR) in Saskatchewan has resulted in publications with the Canadian Nuclear Society and will have impact on environmental evaluation of the SMR siting. Dr. Dale's interests in the environment and investigations in green energy sources have resulted in publications in the International Journal of Greenhouse Gas Control and Geological Society of America Special Publication.

3.1.2. Statistical summary of published and accepted scholarly work over the last ten years

	Number	Notes
Refereed journal articles	240	
Refereed conference proceedings	90	Including refereed government publications
Technical reports	44	
Book chapters	5	
Books	2	
Professional creative activity (specify):	428	Mainly conference presentations
Other scholarly output (specify):	3	Geology calendars

3.1.3. Grants and Contracts

Principal Investigator(s)	Funding Agency	Total Amount (% Assigned To Unit)	Dates
Bend	PTRC	$158,000 (100%)	2011-2013
Bend	PTRC	$103,050 (100%)	2009-2012
Bend	PTRC	$208,330 (100%)	2009-2013
Bethune	Sask Geol Surv	$23,200 (100%)	2018-2019
Bethune	NRCan TGI-V	$24,250 (100%)	2018-2019
Bethune	NSERC-DG	$120,000 (100%)	2016-2020
Bethune	NRCan GEM	$99,790 (100%)	2015-2016
Bethune	NSERC-CRD + Industry	$101,255 (100%)	2015-2017
Bethune	NSERC-CRD + Industry	$160,490 (100%)	2013-2017
Bethune	Faculty of Science	$7,000 (100%)	2013-2014
Bethune, Chi	NRCan TGI-IV	$130,375 (100%)	2012-2015
Bethune	NRCan GEM	$160,000 (100%)	2009-2011
Bethune	Faculty of Science	$18,000 (100%)	2008-2011
Chi	NSERC-CRD + Industry	$258,750 (100%)	2019-2022
Chi	NSERC-DG	$180,000 (100%)	2018-2023
Chi, Bethune	NSERC-CRD + Industry	$417,000 (100%)	2016-2018
Chi, Bethune	Cameco	$15,000 (100%)	2015-2015
Chi	Sask Geol Surv	$30,000 (100%)	2014-2016
Chi	Sask Geol Surv	$25,000 (100%)	2014-2016
Chi	Geol Surv Can	$12,000 (100%)	2014-2014
Chi	NSERC-DG	$130,000 (100%)	2013-2018
Chi	Sask Geol Surv	$35,000 (100%)	2012-2014
Chi	Sask Geol Surv	$30,000 (100%)	2011-2013
Chi	Sask Geol Surv	$15,000 (100%)	2010-2011
Chi	Sask Geol Surv	$30,000 (100%)	2009-2011
Chi	NSERC-DG	$100,000 (100%)	2008-2013
Chi	China U of Geosciences	$9,000 (100%)	2008-2009
Chi	Sask Geol Surv	$30,000 (100%)	2007-2009
Chi	CFI & Sask Innov Fund	$193,002 (100%)	2007-2008

Coulson	UR VP Research	$5,000 (100%)	2017-2018
Coulson	UR VP Research	$5,000 (100%)	2015-2016
Coulson	NSERC-DG	$90,000 (100%)	2008-2012
Coulson, Velez	UR President & Sci Dean	$5,000 (100%)	2008-2008
Coulson, Velez	UR International	$7,000 (100%)	2008-2008
Dale	UR President Fund	$5,000 (100%)	2018-2019
Dale, Bend, Bethune	Fedoruk Centre Fund	$171,000 (100%)	2016-2019
Dale	Sask Geol Surv	$30,000 (100%)	2014-2016
Dale	Ecotech	$91,315 (100%)	2012-2013
Dale	Munic Infras Innov Fund	$18,100 (100%)	2011-2012
Qing	Sask Geol Surv	$30,000 (100%)	2017-2019
Qing	Repsol Sinopec Brazil	$350,000 (100%)	2015-2017
Qing	NSERC-DG	$110,000 (100%)	2015-2020
Qing	Sinopec	$137,000 (100%)	2015-2017
Qing	Repsol Sinopec Brazil	$130,000 (100%)	2014-2015
Qing	Sask Geol Surv	$30,000 (100%)	2013-2015
Qing	PTRC	$165,000 (100%)	2012-2013
Qing, Chi	PTRC	$139,000 (100%)	2011-2013
Qing, Chi	PTRC	$30,000 (100%)	2011-2011
Qing, Chi	Sask Geol Surv	$30,000 (100%)	2011-2013
Qing	NSERC-DG	$125,000 (100%)	2010-2015
Qing	Sask Geol Surv	$30,000 (100%)	2010-2012
Qing	PetroChina	$132,000 (100%)	2009-2011
Qing	Sask Geol Surv	$30,000 (100%)	2008-2010
Qing	Sask Geol Surv	$30,000 (100%)	2006-2008
Raharimahefa	Queen Elizabeth II Jubilee Scholarship Program	$49,250 (100%)	2018-2021
Raharimahefa	UR VP Research	$3,000 (100%)	2018-2018
Raharimahefa	UR Faculty of Science	$16,000 (100%)	2017-2018
Raharimahefa	UR Faculty of Science	$25,000 (100%)	2017-2018
Salad Hersi	UR President	$5,000 (100%)	2017-2018
Salad Hersi	Sask Geol Surv	$30,000 (100%)	2015-2016
Salad Hersi	Sultan-Qaboos Univ	$10,720 (100%)	2012-2012
Salad Hersi	UR Faculty of Science	$40,000 (100%)	2012-2012
Velez	Colombian Government for Science and Technology	$130,000 (15%)	2019-2021
Velez	NSERC-DG	$125,000 (100%)	2018-2023
Velez	Queen Elizabeth II Jubilee Fellowship Program	$156,000 (100%)	2017-2019
Velez	Inter American Inst Global Change Research	$49,000 (100%)	2012-2017
Velez	UR Partnership Grant	$5,000 (100%)	2015-2017
Velez	Sask Geol Surv	$30,000 (100%)	2014-2016
Velez	UR Faculty of Science	$5,000 (100%)	2015-2015
Velez	Bank Republic Colombia	$9,000 (100%)	2012-2015
Velez	UR Faculty of Science	$2,500 (100%)	2014-2014
Velez	UR Faculty of Science	$15,000 (100%)	2010-2012
Total	**Total number of grants = 68**	**$5,361,877 (100%)**	**2008-2019**

4. Community Service Initiatives

Members of our department are active participants of annual outreach events created by Faculty of Science (Orientation week, Science Rendezvous, Science Fair including the 2017 Canada Wide Science Fair at the U of R), the Science Pub series at Bushwakker (a local pubic house), the U of R Summer camps Arts (Science component), and EYES. One time participation in outreach activities include: M4S in Saskatoon (Mining for Society) organized by the CIM foundation, the 2nd International Festival of Science, Technology, Engineering and Mathematic STEM Fest of 2015 in Saskatoon, and the Education & Training Panel of International Minerals Innovation Institute. Our members have also volunteered at the Lecture Series for the Life Long Learning Center (Continuing Education, U of R) and presented at seminars in other departments at the U of R (i.e., Physics, Biology, Chemistry and Biochemistry).

We have offered Geol102 Environmental Geology (lectures and labs) in classrooms outside U of R, and outside Regina when faculty are available. These include classes in Weyburn, Estevan, La Ronge, and Moose Jaw.

Annually, members of our department volunteer at the Sask. Geological Survey (Open House) in the organization, judging posters, etc. and volunteer in the organization and teaching of the Public School Lecture of the Sask. Geological Society for public schools in Regina.

We have maintained active participation as committee members, presidents and volunteers in the following organizations: APEGS, ARC, CCPG, CGEN, CGSC, NSERC DG, Sask Geol Soc, CSPG, AAPG, RCGS and GAC, and as editors or associate editors of Acta Geologica Sinica, Bulletin of Canadian Petroleum Geology, Canadian Geographer, Canadian Journal of Earth Science, The Canadian Mineralogist, Geosciences, Mineralogical Magazine, Ore Geology Reviews and Sedimentology.

Members of our department have helped organize the international Williston Basin Petroleum Conference – Core Workshop. Have been conveners and/or chairs at conferences including SGA, Goldschmidt, IAGOD, GAC/MAC, and ACROFI, and invited participants in an international workshop on volcanic risk (Galeras volcano, Colombia; Servicio Geolóligo Colombiano). They have also volunteered as poster judges at CSPG, and GAC/MAC. Short courses have been offered on a volunteer basis at AAPG, GSA, GAC/MAC, and Chengdu University of Technology.

On a regular basis we provide lectures at schools around Regina, and identify rocks, fossils and minerals, and possible meteorites for the public at large. We have been invited for radio and television interviews (CBC, CTV) on everything from tsunamis, volcanoes, earthquakes, unusual rocks, to the stability of clays and water main failures. We also have an open source textbook that can be accessed by teachers at schools. We lend teaching materials such as rocks, minerals, fossils, and books to schools and have donated hundreds of kilograms of teaching materials (books and rock slabs) to schools in Saskatchewan (e.g., LaRonge and Regina), but also in Alberta, Ukraine, Italy, Romania, the Czech Republic, and Ecuador.

Lastly, members of the department participated in an advisory capacity for the development of the Earth Science 30 class at the high school level in Saskatchewan as well as commenting on various versions of the curriculum over the years.

5. Programs Offered

5.1. Programs

Undergraduate

Our Geology and Environmental Geoscience programs are both professional programs that meet the requirements for professional registration with APEGS. All practising Geoscientists in Canada must be professionally accredited.

Current undergraduate programs in Geology include: B.Sc., B.Sc. Honours in Geology, B.Sc. in Environmental Geoscience, B.Sc. Honours in Environmental Geoscience. Undergraduate admission standards are set by the Faculty of Science for Geology degrees. The B.Sc. in Environmental Geoscience and BSc Honours in Environmental Geoscience are relatively new programs (as of 2014), that evolved from the former B.Sc. Combined Major in Geology and Geography, to meet and expedite the requirements for professional registration in Geoscience. Many of our B.Sc. students are shared between the Departments of Geology (Faculty of Science) and Geography and Environmental Studies (Faculty of Arts). Classes such as Glacial Geology (429) and Soils (329) are offered both as Geology and Geography courses. In addition, the department offers a Co-op program of 3 or 4 semesters.

Any student admitted by the U of R can take our first year class (Geol102). However, the department requires that students taking the second year Geology class (Geol201) obtain a minimum of 60% in Geol102. In order to register into the first mineralogy class (Geol210), a minimum of 60% is required in pre-req Geol201. Geol210 can also be taken concurrently with Geol201 if a minimum grade of 75% has been obtained in Geol102. We offer two 7 to 9 day field courses – Geol396 and Geol496. To be eligible for the first field course, the student should have 18 credits in Geology. For the second field course, the pre-requisites are Geol 396, 353, 313, 315. For the Co-op program, students must maintain an average of at least 70% and be enrolled in (or have completed) at least 33 and no more than 65 credit hours (including current semester of study) towards their Science degree, including completion of Geol 102, 201, and 210 before the first work term.

Research-based courses are available for students with relatively high GPAs, mainly in the form of an undergraduate thesis (Honours thesis for students with a >75% GPA). The purpose of Geol400 is to train a student to undertake an independent research project supervised by faculty and adjunct members. The course has a total of 6 credit hours, and can be carried out in two consecutive semesters (as Geol 400AA and 400AB, 3 credits each), or in one semester (Geol400AC, 6 credits). We offer varied directed reading classes to foster student's interests in specific areas of Geoscience (Geol490AA-ZZ series).

In addition to the research courses and Co-op opportunities, our courses have a strong experiential component. Most courses have a lab component, in which the students learn practical and required skills for Geoscience. This includes the identification of geological samples, practice sampling and measuring techniques, and work with a wide range of materials from maps to specialized software, such as GIS and Geoscout, following the lectures. Both field camps include a number of exercises in on site selection, measuring and recording of data, interpretation and production of a map/cross section as part of a final report. A similar process is involved with one to three-day field trips for the Geol240, 314, Geol/Geog 329 and 429 classes. These and other courses (e.g., Geol 240, 340, 416) include a similar component involving the use of the facilities at the Subsurface Core Lab from the Saskatchewan Geological Survey.

The department offers student advising for the Geology and Environmental Geosciences programs. The Geology program rotates among faculty members. Students normally book an appointment to see the advisor, who explains the requirement of the degree and professional registration with APEGS, and suggests the best order of courses to take, to complete their degree in a timely fashion. The students have advising opportunities with the Faculty of Science and Luther and Campion Colleges too. Advisors work closely with the Faculty of Science and APEGS and regularly invite the APEGS registrar, Dr. Kate McLaughlin, to speak to introductory Geology classes (e.g., Geol. 102, 201), senior classes and those about to graduate regarding professional registration.

Graduate
We offer a M.Sc. (30 credit hours) and a Ph.D. in Geology and Environmental Geoscience (60 credit hours). The Ph.D. program changed from a Special Case program to a regular PhD program in 2010 (8 theses were produced between 1991-2010 and 4 between 2010-2016). Admission standards for the graduate programs are set by the Faculty of Graduate Studies & Research.
https://www.uregina.ca/gradstudies/future-students/programs/geology.html

For the M.Sc., the course work typically consists of two courses (Geol800 and another 800-level course), a seminar course and research. For the Ph.D. it consists of 6 credits hours, a seminar course, and research. Many of our graduate theses are funded or partly funded and co-supervised by researchers from the Saskatchewan Geological Survey and the Geological Survey of Canada, and funded or partly funded by industrial partners including the mineral resources and petroleum sectors.

Appendix 2 provides lists of our student Honours, M.Sc. and Ph.D. theses.

5.2. Enrolment trends

Geology majors

The total number of undergraduate students majoring in the Geology Dept. at present is 79. This number reflects both declared *Geology* (64) and *Environmental Geoscience* (15) stream students. In terms of full-time enrolment in courses offered by our departmental programs (see Tables 1 & 2, below), student numbers rose dramatically between 2004 and 2007, reaching a peak in the years 2013-15, and remain strong at levels of around two hundred students. This is in marked contract to 2003/4 where student enrolment (majors) was typically around 95 (<30 majors). This doubling (or trebling) of numbers has offered challenges as well as benefits, which will be discussed in the SWOT section of this guide. A noted increase in international students across campus has been one influence on our growth.

Year	Table 1. Full-time enrolment								Yearly total
	undergraduate				*graduate*				
	Winter	Fall	Summer	Sum	Winter	Fall	Summer	Sum	
2018	86	72	5	*163*	15	13	6	*34*	**197**
2017	96	92	11	*199*	12	14	4	*30*	**229**
2016	112	115	10	*237*	9	12	3	*24*	**261**
2015	132	127	7	*266*	14	11	2	*27*	**293**
2014	129	126	12	*267*	13	13	5	*31*	**298**
2013	121	126	12	*259*	13	13	5	*31*	**290**
2012	106	121	5	*232*	11	11	8	*30*	**262**
2011	101	120	5	*226*	9	12	7	*28*	**254**
2010	97	110	9	*216*	6	8	3	*17*	**233**
2009	109	108	2	*219*	3	2	2	*7*	**226**
2008	96	107	2	*205*	5	4	2	*11*	**216**
2007	81	89	4	*174*	4	6	1	*11*	**185**
2006	62	72	3	*137*	7	8	2	*17*	**154**
2005	45	53	2	*100*	11	11	4	*26*	**126**
2004	35	46	0	*81*	7	8	2	*17*	**98**
2003	38	36	1	*75*	6	10	4	*20*	**95**

Note:
Table data is based on 2018 enrolment data at the end of the fall semester. This number does not differentiate between declared majors of the students in the Geology Department.

The Dept. is actively engaged in student recruitment and retention activities. With few opportunities to take Geoscience in high schools at present most of our catchment occurs when undeclared majors opt to take Geol102 Environmental Geology as a Science elective with lab. We have two academic advisors, one for each of the Geology and Environmental Geoscience streams. The general 'health' of a Dept. might be assessed by the strength of undergraduate / graduate enrolments within a given program, but also by the connected nature of course offerings across campus. *Service Teaching* by the Dept. is as important to any academic unit as the provision of its own programs. A concern to us relates to the advent of automatic timetabling in 2014, which appears to have negatively impacted our enrolment, certainly with respect to Geol102 (see trends in Fig. 1) that is now offered at a less than ideal schedule. That students have greater choice of first-year and elective classes (including Science courses offered on-line), with an increasing number of so-called 'pre-professional' programs, has further cut into our Geol102 enrolment in recent years.

Our faculty are involved in the Regional Science fair, as judges, and other initiatives across campus, and within the high school region, helping to attract students with an interest in rocks and minerals to the University of Regina and our Department. A total of 315 students majoring in our two programmes have convocated over the past 15 years. Note the Environmental Geoscience stream was first offered in 2015; prior to that date, students had opted for a double major in Geology and Geography, or vice-versa.

Table 2. Enrolment in our classes, that include non majors

Year	First			Second			Third			Forth			Yearly total
	Winter	Fall	Summer	Winter	Fall	Summer	Winter	Fall	Summer	Winter	Fall	Summer	
2018	89	146	38	127	52	-	29	100	21	77	28	21	728
2017	133	186	36	162	48	-	48	85	27	78	47	22	872
2016	136	202	43	163	63	-	55	102	30	96	49	28	967
2015	149	215	68	206	110	-	53	138	34	98	49	34	1154
2014	187	225	64	207	99	-	95	137	27	79	90	16	1226
2013	142	267	57	194	104	-	58	96	31	47	54	25	1075
2012	165	232	57	174	117	-	70	71	27	66	56	26	1061
2011	186	242	49	165	96	-	63	101	24	114	50	28	1118
2010	173	242	56	145	98	-	64	118	24	76	55	27	1078
2009	156	262	31	158	115	-	68	56	20	71	58	13	1008
2008	203	258	36	138	126	-	66	55	20	47	56	21	1026
2007	165	244	51	134	118	-	61	48	17	50	63	21	972

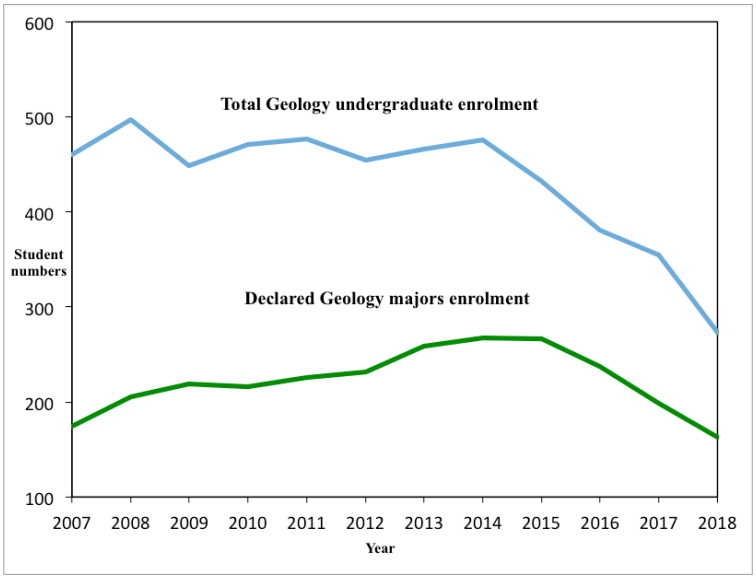


Figure 1. Plot of total enrolment in Geol102 over the period 2007-18, compared to majors enrolment in Geology and Environmental Geology program.

Graduate enrolments

The Department of Geology currently has 19 graduate students, including 4 Ph.D.'s. Our graduate student numbers also followed the rise in undergraduate majors some 10 years ago, highlighting both the strength and demand for our Geoscience programs and the employment opportunities for students of Geology and Environmental Geoscience, both of which at the under- and graduate level remains robust. Of note was the formalisation of our Department's Ph.D. program in 2010, which had been previously under the category of Ph.D. Special Case. A total of 48 M.Sc. and 8 doctoral students have graduated in Geology over the past 15 years.

5.3. Student Successes (see also Appendix 3)

'Student success' can be measured in a number of ways, ranging from a simple assessment of those that secure employment as a Geoscientist, those who employ our graduates, those who become 'industry survivors' and develop impressive careers, to those who successfully complete a graduate program, win scholarships, or experience success at national or international conferences. Our alumni have attained all of these successes.

Our graduates are highly employable. Recent baccalaureates have secured full-time positions with regional, national and international agencies or corporations, such as: DeBeers, Rio Tinto, Cameco, Shell Canada, Crescent Point Energy, Nexen, Husky Oil and Gas, SNC Lavalin, Clifton Associates, Tri Metals (USA), the Geological Survey of Canada/NRCAN or the Saskatchewan Geological Survey. On two previous informal surveys we asked our alumni to compare their educational experience and level of knowledge gained at the U of R Geology, with that of their working peers. Most said either better or superior to those from other, typically larger Universities. None of the respondents said 'worse'.

Another expression of 'student success' is by examining gainful employment and long-term career success. Within our Alumni we have numerous ***Vice Presidents*** (e.g., Eric Strachan P.Geo., B.Sc. Hons.'73, *Torc Oil and Gas;* Greg Neibergall, P.Geo., B.Sc. Hons.'03, *Yoho Resources*; Russell Walz, P.Geo., B.Sc. Hons.'05*; Astra Oil Corp*), ***Chief Geologists*** (e.g., Glen McCrimmon, P.Geo., B.Sc.'91, *Husky Oil and Gas;* Jason Berenyi, P.Geo., B.Sc., M.Sc.'16: *Assist Chief Geol., Govt. of Saskatchewan*), ***Exploration Directors*** (e.g., Chad Yuhasz, P.Geo., B.Sc. Hons.'02: *Barrick Gold Corp*), ***Senior Geologist/Managers*** (e.g., Darren Anderson, P.Geo., B.Sc.'95, *Graymont GoldCorp*; Pamela Ellemers, P.Geo., B.Sc.'96, *De Beers Canada*; Mike Blair, P.Geo., B.Sc.'98, M.Sc. 2004: *Crescent Point Energy*; Shawn Harvey, P.Geo., B.Sc.'98, M.Sc. 2004: *Cameco;* Mark Urban, P.Geo., B.Sc. Hons.'01, M.Sc.'10: *Vermillion Energy*; William Clark, P.Geo., B.Sc. Hon.'05: *TimberRock Energy*), and those who became successful ***academics and/or former researchers*** (e.g., Dr. Grant Garven, B.Sc.'87: Professor of Hydrogeology, Groundwater Hydrology and Economic Geology, Tuffs University; Dr. James MacEachern, B.Sc. Hons.'82, M.Sc.'87, *Professor*, *Simon Fraser University);* Dr. Vern Stasiuk, B.Sc.'84, M.Sc.,'88, Ph.D.'93 *GSC/Shell Canada*; Dr. Larry Hulbert, B.Sc.'73, M.Sc.'79, *GSC-NRCAN*), Dr. Hai Thanh Tran, Ph.D.'01: *Head of Department and Vice Rector, Hanoi University of Mining and Geology (Vietnam);* Dr. Colin Card, P.Geo., B.Sc. Hons.'98, M.Sc.'01, Ph.D.'16; *Saskatchewan Geological Survey*; Dr. Zenghua Li, Ph.D.'16, *Professor at East China University of Technology (China);* Dr. Haixia Chu, Ph.D.'16, *China University of Geosciences (Beijing).*

Many of our Alumni successfully completed M.Sc., MBA, and Ph.D. programs at other Universities, including the University of Alberta, University of Calgary, University of British Columbia, University of Toronto, University of Saskatchewan, Western University, Dalhousie University, Queen's University, University of Ottawa, Simon Fraser University, Lakehead University, University of Melbourne and the University of Oklahoma.

Within our undergraduate and graduate programs students develop and hone presentation skills, resulting in student awards at conference and society/scientific meetings, including the student organised *Western Inter-University Geoscience Conference*, SGS *Lazlo Fuzesy Award* (Graduate Poster Award), the SGS *President's Award* (Undergraduate Poster Award), the Canadian Society of Petroleum Geology *Best Student Poster Award*, the Canadian Society of Petroleum Geology *Bill Aryton Award* and the Canadian Society for Organic Petrology *Cameron Award*.

We have Alumni who have been the recipients of life-time awards or awards in recognition of their contributions in Geoscience: including Peter Ogryzlo, M.Sc.'95, recipient of the *Governor General Gold Medallion* ('95) and in 2015 the *H. H. "Spud" Huestis Award for Excellence in Prospecting and Mineral Exploration* (Association for Mineral Exploration BC). Dr. Grant Garven, B.Sc.'87 recipient of the *O.E. Meinzer Award* from the Geological Society of America. Dr. Larry Hulbert, B.Sc.'75, M.Sc.'78: CIM *Barlow Medal* (1993) and in 2003 received the *Earth Sciences Sector Merit Award* from Natural Resources Canada.

6. Departmental Budget

6.1. Human Resources Budget (Table 1): In the past decade the department has grown in size, mainly spurred by significant increases in enrolment, starting in 2005-2006. In 2010, the department hired a 2-year-term lab instructor (Ms. Monica Cliveti) to cover the duties of the retirement of one full-time Lab Instructor (Ms. Evanna Simpson); the position was later converted to tenure-track (TT). In July 2012, the department welcomed one tenure-track faculty (Dr. Osman Salad Hersi) and one 3-year term lecturer (Dr. Tsilavo Raharimahefa) while maintaining its complement of two full-time LIs (Ms. M. Cliveti, Dr. J. Roelofsen). In 2015, the 3-year term lecturer hired in 2012 (Dr. T. Raharimahefa) was converted to a TT Lecturer position. In addition, due to ever increasing student numbers, the Faculty of Science approved hiring of a new TT Lab Instructor (Geoffrey Reith). In 2016, Dr. Raharimahefa was promoted from Lecturer to Assistant Professor. Subsequently, Geoffrey Reith left the U of R and his position was renewed with the appointment of Dr. Richard From on July 1, 2018. **The department thus retains a complement of 9 professors, 3 lab instructors, one administrative assistant and one technician**. The increase in human resources is reflected by an increase in allocated expenditures over this decade, from **$927,293 in 2009-2010 to $1,667,754 in 2018-19**. Note that the Expenditure Budget (Column 2) does not include salaries of administrative staff. One administrative (Ms. Van Tran) and one technical staff (Mets Ritsema who was transferred to Biology and replaced by Trent Kostelny December 2018) have remained unchanged in the past ten years.

Table 1: Departmental Human Resources Budget

Expenditure Budget		Faculty/Staff	Lab Instructors	Administrative Staff
ORG 2571		Academic		(Non-Academic)
2018-19	$1,667,754	9	3	2
2017-18	$1,650,677	9	3	2
2016-17	$1,588,354	9	3	2
2015-16	$1,526,422	9	3	2
2014-15	$1,430,857	9	2	2
2013-14	$1,247,864	9	2	2
2012-13	$1,150,818	8	2	2
2011-12	$1,099,466	7	2	2
2010-11	$1,041,723	7	2	2
2009-10	$927,293	7	2	2

6.2. Operating Budget (Table 2): The operating budget has remained more or less constant at ~$20K over the ten year period albeit for a slight decrease in 2013 due to university-wide budget reductions. The majority of this $20K operating budget is devoted to updating and maintaining teaching laboratories and equipment, some of which are aging and require continuous love/care, with the remainder devoted to teaching materials and supplies, plus a small fraction to office supplies. At the same time, the budget allocated to labour costs, mainly encompassing the salaries of tutorial assistants (TAs) for our laboratory-based classes, increased substantially in 2013 in recognition of the significant upward trend in student enrolment since 2005-2006. This increase in the operating budget, from ~38.8K to 60.4K, with ~68% devoted to costs associated with TAs, markers and special accommodations invigilators supplied long needed assistance for our programs, students and faculty. There have been modest increases since and the current total budget (2017-18) now stands at ~$65K.

It is noteworthy that the department's budget is heavily dependent on revenues (Column labelled 'recoveries') related to the delivery of the two geology field school courses, Geol 396 and 496 required by APEGS for professional registration. Approximately 85% of the direct costs of delivering these classes are

paid for by 'extra fees' collected from individual students taking the classes each year, with the remainder (mainly TA costs) covered by the department. These fees, now amounting to $925/student for Geol396 and $1000/student for Geol496 are additional costs over and above the tuition fees set by the university (~$930/class), meaning that these two classes collectively cost students ~$3,800. As seen in Table 2, these extra fees play an important role in the fiscal management of the department. The setting of these fees has at times been challenging, resulting is slight deficits that need to be recovered by raising fees in subsequent years.

Table 2. Departmental Operating Budget

Fiscal Year	Academic Labour Budget ($)	Oper. Budget ($)	Total Oper. Budget ($)	Academic Labour Expenses ($)	Oper. Expenses ($)	Recov. Geol 396 & 496 field courses ($)	Yearly total Budget ($)	Year-end Status ($)
2018-2019	44,908	20,000	64,908					
2017-2018	44,861	20,000	64,861	59,544	52,909	45,273	**97,770**	**-2,319**
2016-2017	44,749	20,000	64,749	55,836	65,530	54,704	**110,279**	**-1,913**
2015-2016	45,827	20,000	65,827	56,763	70,952	61,524	**116,779**	**-364**
2014-2015	44,584	20,000	64,584	66,327	43,521	33,850	**88,105**	**-11,414**
2013-2014	40,403	20,000	60,403	42,332	58,485	36,000	**98,888**	**-4,414**
2012-2013	18,448	20,314	38,762	45,066	51,642	33,100	**70,090**	**-24,846**
2011-2012	18,148	20,314	38,462	33,892	47,197	31,248	**65,345**	**-11,379**
2010-2011	17,246	20,314	37,560	27,038	42,463	29,457	**59,709**	**-2,484**
2009-2010	17,128	20,314	37,442	19,418	37,679	16,500	**54,807**	**-3,155**
2008-2009	17,128	20,314	37,442	21,795	116,170	16,850	**133,298**	**-83,673**

FGSR contributes to the department budget indirectly through disbursements of Graduate Teaching Assistantships (GTAs), with GTAs of ~$2,500/semester/per TA. On average, the department receives between 4 and 6 of these per year, contributing to an extra ~$10K of revenue toward the delivery of our programs. FGSR also contributes to graduate student support; allocations for Graduate Student Base Funding Scholarships ('GSBF', formerly 'GSS') are determined by the Faculty of Science based on the graduate student numbers in Geology (versus total in Science). $35 to 45K/year has been received on average.

The department also hires sessional lecturers for several Centre for Continuing Education (CCE)-based classes, including Geol 102, which is delivered on Saturdays in the fall and winter semesters, and in a regular time slot in the spring/summer. The salary expenses for the sessional lecturers are covered by CCE, with materials and supplies, including photocopying, handled by the department.

7. SWOT Analysis (strengths, weaknesses, opportunities, threats)

7.1. Strengths

- We have an established reputation for training highly "rock-conscious" students i.e., students with superior skills in the fundamentals of Geology, e.g., identification of rock types, mineral assemblages and structures.
- Our programs emphasize hands-on 'experiential' learning, as demonstrated by numerous class-run field exercises, two intensive field schools, a co-operative education program and laboratory training across all sub-disciplines.
- We offer Professional degree programs that lead to accreditation (P.Geo. designation) with the Association of Professional Engineers and Geoscientists of Saskatchewan (APEGS) that is transferable to every other jurisdiction in Canada.
- Our academic program is broad-based, covering almost all sub-disciplines of Earth Science; this provides students with a strong knowledgebase across the Earth Sciences, as well as allowing for flexibility in career choices.
- The delivery of our academic programs involves multiple inter-faculty and -departmental connections; e.g., Engineering and Applied Science, Petroleum Engineering, Environmental Engineering, Geography, and Education.
- We fill a niche in the training of HQP that are in high demand in Saskatchewan's (and Canada's) resource-based economy, both in the mineral resource (e.g., potash, uranium, gold and base metals) and hydrocarbon (petroleum, natural gas) sectors. At the same time, we have a growing reputation for quality training of HQP in the environmental sector, with industry, government and environmental consultants.
- Owing to the above, we have grown and maintained a robust enrolment over the last 10 years, relative to the size of our department.
- Our faculty members are enthusiastic, dedicated, and highly accessible to students; several have won Teaching Awards, including the Alumni Award for Excellence in Teaching.
- We have dedicated in-house academic advisors, both for the Geology and Environmental Geoscience programs.
- Our second to fourth year classes have an excellent faculty: student ratio, allowing for more effective, hands on training.
- Courses such as our Geol400 thesis course are recognized for their rigorous training and valuable skills that help prepare them for a successful entry into the workforce (including exposure to the research process, independent fieldwork, laboratory analyses and interpretation of their findings, as well as training in effective written and oral communication skills).
- We have a unique location and presence on the campus, with teaching labs, offices and displays centralized in one area of the College West building.
- We have an active student society, the D.M. Kent Club of Geology, which organizes and supports social and community building activities, as well as academic and networking opportunities (e.g., invited alumni, academic and APEGS guest lectures). They last hosted the Western Inter-University Geoscience Conference in January of 2018. Many of these opportunities involve fund-raising, while sponsored trips to several national conferences for potential employment (PDAC, Mineral exploration Round-up conference, CSPG) and field trips to potash, petroleum and uranium operations benefit our diverse student body.

- We have ongoing student-faculty organized international field-trips; e.g., Colombia, Iceland 2015 that provides international experience, exposure to a wider range of geological features, alternate landscapes and environmental hazards and concerns.
- Because of this strong supportive environment, and centralized location, students develop a sense of belonging; we are a 'tight-knit' unit and students appreciate Geology as their 'home.'
- We are proud of our graduating students and owing to these traditions, Geology has a well-developed, active and effective alumni network (see Appendix 3a).
- Moreover, we have excellent linkages with industry and Provincial and Federal Government agencies, , including an MOU for collaboration in student training and research with the Saskatchewan Geological Survey (SGS). Our students are routinely hired by SGS as their summer field, core lab and office assistants - this linkage has allowed several of our classes to incorporate 'hands-on' learning at the SGS's Subsurface Core Laboratory.
- Complementing our undergraduate programs, we have a very strong graduate program that includes M.Sc. and Ph.D. programs. Related to this we have impressive and successful outcomes for our graduate students who contribute to our substantial alumni network.
- All of our faculty are engaged in active research programs across several sub-disciplines with related opportunities for HQP training.
- We attract substantial research funding for a department of our size; coupled with this, we have a record of excellence in scholarly research productivity; additionally over the years, we have fostered strong international research collaborations, most notably in Colombia and China.
- Our faculty are engaged in public service in a variety of capacities; e.g., professional societies, national and provincial boards, editorial boards, NSERC evaluation group 1506.
- Our faculty are routinely consulted for editorial work, reviewing and expert witness activities in the Geoscience community i.e., journal articles, grants, external thesis examinations at both M.Sc. and Ph.D. level.
- Our faculty are involved in various Earth Science education initiatives; e.g., Science Rendez-Vous, summer schools, school and public lectures, annual Sask. Geol. Surv. Open House Events, bi-annual Williston Basin Symposium and other invited presentations to name a few.
- We have received media attention, including interviews for local broadcasters and answering questions from the public; e.g., causes of tsunamis, volcanic eruptions, potential meteorite finds, thixotropic clays, interesting fossils and unusual rocks.

7.2. Weaknesses

- While there is great potential to engage our extensive alumni network, as well as capitalize on our excellent relations with industry, there has been lack of initiative by the Science Faculty/University to develop effective mechanisms to do so.
- The importance of sustainable resource development to the Province of Saskatchewan appears to be under-appreciated by the Faculty of Science and University; there is significant potential to develop a much stronger earth science department in southern Saskatchewan in support of the provincial economy.
- The delivery of an APEGS accredited program is essential, yet the small size of our unit makes this extremely challenging. To conform to APEGS for professional accreditation for our students, who follow the Canadian Geoscience Knowledge Standards, we are required to deliver ~21 classes annually. As each of us typically teaches three (some four) undergraduate classes per year, for a total of 9 x 3 = 18 courses, we are hard pressed to deliver this program without yearly help

from sessional lecturers. Sabbatical leaves and teaching reductions due to extra administrative responsibilities (e.g., Dept. Headship) need to be factored into this situation.

- Virtually all of our classes have a significant laboratory component. The additional load of experiential learning through labs, especially in upper level classes, is relatively unique within the Faculty; while it has obvious benefits it seriously impacts our research endeavours.
  One key area of weakness is in the lack of support for space and research infrastructure; this applies to research lab space (e.g., many professors share and two have no space at all) and the lack of adequate office space for students/visiting scholars/students and sessional lecturers.
- At the same time, we face issues in the area of human resources. On several occasions the department has faced uncertainty in hiring, and this has hindered research competitiveness over the long term, i.e., hiring short-term positions in preference to longer term stable (tenure track) positions at the appropriate level. This is a serious issue that needs careful consideration in future planning.
- In the past three years we have faced physical disruptions/issues, notably having to move our main teaching labs to the classroom building due to excessive noise and dust related to major renovation projects in College West above us (Residence complex: 2016-17 and 2017-18). A few months after moving back to the department we were forced to move all of our labs back to the classroom building due to renovations of the bookstore below us (a new Central Test Facility: 2018-19). Needless to say these moves were disruptive and involve the transportation of rock and mineral samples, fragile thin sections, maps, sand box and other equipment.
- The automatic timetabling system appears to be impacting our enrolment, especially for Geol102. It is crucial for us to have highly visible primetime lecture slots for this class, with as little conflict as possible with the other natural sciences classes (e.g., Chemistry, Biology and Physics). Unlike other Science departments, courses in Geology are not required for Science majors. In addition, most first-year students have had limited previous exposure to the Earth Sciences in high school. As a result Geol102, Environmental Geology is our entry level class and the primary means of attracting students into our program.

7.3. Opportunities

- We have striven to build a department that is broad based and meets demands across a large range of sub-disciplines and currently satisfies professional registration for our graduates. Because of this approach, we are confident that our programs, especially at the B.Sc. and M.Sc. levels, can compete with any in the country and have been complimented by Geologists in government and industry that our graduates are very well trained and prepared for the work force.
- In doing so, we have made efforts to capitalize upon our strengths in niche areas, specifically mineral and hydrocarbon resources, which are of fundamental importance to this province, and accounts for the largest sector of the provincial GDP at 21.5% (Stats Canada, 2017).
- At the same time, we consider it important to develop a more robust Environmental Geoscience program to address climate change and the future non-carbon-based economy, as well as take advantage of emerging areas. This could run the gamut of expertise in newly sought after commodities (e.g., lithium, rare earth elements) to research and/or training in the areas of the environmental sciences not currently covered e.g., hydrogeology and water resources and/or environmental geochemistry, or to applications to renewable energy (e.g., geothermal).
- The transition to ‘green energy’ thus offers exciting opportunities for Geology and we are well positioned, if adequately resourced in the future, to take advantage of these emerging trends.
- There is a tremendous opportunity to strengthen Indigenous education in our unit. There is a natural connection of First Nation peoples with the land (Mother Earth); as such, Geoscience

education is highly valued by the First Nations because it enables more informed decisions on land use, related resources (minerals/hydrocarbons) and resource use, such as water and soils, and any related environmental concerns. We are excited to explore opportunities to design effective programming, but we will require more support.

7.4. Threats

- Size matters: we are at critical mass in terms of being able to deliver effective programs that meet accreditation (e.g., APEGS) requirements. We have several retirements in the next 2-5 years. A succession plan needs to be established ensuring that we can continue to fulfill our research and community service mandates while continuing to deliver high-quality undergraduate and graduate degree programming that satisfies these requirements. To sustain and potentially broaden our environmental program, which we think is important (see below) we will require extra human resources.
- Historically, our unit has not been allocated resources commensurate with other departments in Science. Also, we have faced the challenge (for many years now) that there is not an obvious fit to the University's research clusters despite the fundamental importance of resources (e.g., potash, uranium, petroleum) to the Province of Saskatchewan.
- Government cutbacks have led to the university's budget being threatened in the last five years. The resultant austerity measures that have been in place (i.e., reduced or frozen budgets, lack of new hires of faculty and support staff) have had a trickledown effect, contributing to low morale.
- In this environment there is a risk of faculty attrition, due partly to excessive workloads, lack of support and a perceived lack of recognition for what we do. There is a perception that the university needs to provide more supports at the grassroots level.
- There are still significant barriers among the faculties, departments and research areas on campus, and in some cases these roadblocks have impeded progress. The physical isolation of Geology, while beneficial in some ways (e.g., contributing to an 'identity' on campus, see above), has contributed to a disconnect with the Faculty of Science and units in the Laboratory building. Improved communication and consultation on both sides would help.

7.5. Into the future…

- There is a perception, rightly or wrongly, that Geoscience enrolments fluctuate markedly with the commodity cycle. While our own enrolments suggest that this cycle has had an influence, the continued demand for our programs well after the 'Saskaboom' (2006 to 2014) suggests that it is not the only factor involved! Building upon our strengths, including our breadth of offerings across sub-disciplines will make our unit more sustainable, more relevant and better able to withstand such fluctuations (which are beyond our control) into the future.
- Our vision of the ideal Earth Sciences department is one that continues to train students for the high-demand area of resource exploration, and at the same time educates them to do so in the most sustainable, environmentally positive (and honourable) way possible, for the sake of our planet.
- In closing, we see a tremendously exciting opportunity, here in southern Saskatchewan, to develop a **leading-edge Earth Sciences department** that fulfills this two-fold mandate; those of educating our future generations in the **sustainable development of our abundant resources**, coupled with educating them in the **areas of environmental processes, awareness and mitigation**.

Appendix 1

Short Curricula Vitae of Academic Staff Members

Stephen L. Bend

Professor, Petroleum Geochemistry and Petrology, Petroleum Systems, EOR
Stephen.bend@uregina.ca, (306) 585-4021

Education and Professional Development

Ph.D.	Coal Characterisation	1989	The University of Newcastle Upon Tyne, England
M.Sc.	Petroleum Geochemistry	1986	The University of Newcastle Upon Tyne, England
B.A. (Hon.)	*Dbl Mjr*: Geology; Geography	1978	The University of Keele, England
	Dbl Minor: Geochemistry & History		

American Association of Petroleum Geologists Foundation: *Professorial Award* (2016)
University of Regina Alumni Award: *Excellence in Teaching* (2011)

- *Leadership Workshop & Retreat for Dept. Heads,* Universities of Saskatchewan and Regina, June, 1998
- *Teaching Development Workshop*, University of Regina, August, 1998
- *Hydrocarbon Exploration and the N. Sea*, BGS, Newcastle upon Tyne, March, 1986
- *EXLOG Subsurface Pressure Detection School*, Halifax, April 1984
- *Schlumberger Wireline School*, Calgary, September 1980
- *Canadian Stratigraphic Drill-cuttings and logging School*, Calgary, March 1980
- *Lynes DST School*, Calgary, June 1980

Employment History

2009 - present ***Professor***, Department of Geology, University of Regina

1994 – 2009 ***Associate Professor***, Department of Geology, University of Regina

CGI granted each year, at ceiling (2008, & 2015-recent)

Merit Increment 2008, 2012 & 2017

Promoted 2009

Teaching History

Geology 102: *Environmental Geology* (enrolment range 257 to 130): years 2008, 2009, 2016-2018

Geology 270: *Resources of the Earth* (enrolment range 106 to 56): years 2008-2018

Geology 472: *Petroleum Geology* (enrolment range 25 to 15): years 2008-2018

Geology 473: *Petroleum Geochemistry* (enrolment range 12 to 4): years 2010, 2012, 2014, 2015

Geology 492AC: Petroleum Geology of the Ukraine' (enrolment 2 to 5): years 2008 - 2011

TDC: *Graduate Citation Certificate Program* (enrolment 9): year 2012

Continuing Education 3510: *Natural Disasters* (enrolment 27): year 2009

Student and Post-Doctoral Supervision

Name	Position	Dates of supervision	Current Employment
Gang Gao	Visiting Scholar	2015 (Sept) - 2016 (Aug)	Professor
Olusey Olajide	Ph.D.	2011 (Sept) - 2018 (May)	Husky Canada
Titilade E. Aderojut	Ph.D.	2011 (Sept) - 2016 (May)	Consultant
Scott MacKnight	M.Sc.	2014 (Sept) - 2018 (May)	Crescent Point Energy
Bree Rees	M.Sc.	2011 (Sept) - 2014 (April)	Shell (on Mat leave)
Matt Cugnet	M.Sc.	2012-2013 (Withdrew)	Own Company
Sienna Johnson	B.Sc. Hons.	2015 (Winter)	DeBeers International
Nathan Wielgoz	B.Sc. Hons.	2013 (Sept) - 2014 (April)	Schlumberger
Ashlee Latimer	B.Sc. Hons.	2013 (Fall)	Nexen (CNOOC)
Braden Mueller	B.Sc. Hons.	2013 (Fall)	Field Geologist
Oyeleye Adeboye	B.Sc. Hons.	2008 (Winter)	PhD Candidate (OSU, USA)

University Service

University

2014, 2016 & 2017: Chair of Search Committee, Lab. Instructor, Dept. Geology

2014: Faculty of Engineering Search Committee

2010–present: Faculty of Science representative to the Faculty of Engineering

2009 & 2013: University Promotion Committee

2002–present: Faculty of Science Safety Committee

2006–2016: Department Library representative

2006–2010: Member of Executive of Council

'Community'

2009–present: Student Development Committee, *Assoc. Prof. Eng. & Geo. Sask*.

2009–2012, 2012-2018: House of Delegates Member, *American Association of Petroleum Geologists*

2014-present: Editorial Member: *Journal of Petroleum* ISSN 2405-5816

2014: Conference Co-Chair: Canadian Society of Petroleum Geologists Geoconvention, Calgary, May

2009–2012: Education Committee, *American Association of Petroleum Geologists*

2008: SaskCAT (Sask. Council for Admissions and Transfer); Articulation Committee Member

2008: Western and Northern Canadian Protocol: High School Math and Science [Prov.]

2008-2013: Summer Sports/Science Camps, School Presentations, University Orientation

2008-2018: Numerous talks/presentations to local societies, schools & *Expert Witness* (twice)

Professional / University - Short Courses Delivered

2012: Chengdu Technical University (Chengdu; China: enrollment 109)

2010, 2011: American Association of Petroleum Geologists: x3 (Houston, Denver, Ft Worth; USA)

2008: Geological Association of America: x 2 (Houston; USA)

Reviewed

NSERC CRD & Discovery Grants, Reviewed Papers for AAPG Bull., J Coal Geol., Org Geochem, J. of Sed.

Scholarly Research

Aderoju, T and Bend, S.L. (2018). Reconstructing the palaeoecosytem and palaeodepositional environment within the Upper Devonian-Lower Mississippian Bakken Formation: A biomarker approach. Organic Geochemistry 119 (2018) p. 91-100

Aderoju, T.E. and Bend, S.L., (2017) "*A Comparative Assessment of Biomarker Thermal Maturation Indices*"; in *Petroleum Systems Analysis – Case Studies, Chapter 9,* AAPG Special Memoir on Petroleum Systems (Hege M. Nordgård Bolås, Isabelle Moretti, and Mahdi AbuAli; Eds), AAPG Memoir 114, p. 219-237

Aderoju, T.E. and Bend, S.L., (2013) A rock-eval evaluation of the Bakken Formation in Southern Saskatchewan: in Summary of Investigations 2012, Volume 1, Saskatchewan Geological Survey, Sask. Ministry of the Economy. 2013-4.1, A-2, 14p

Olajide, O. and Bend, S.L. (2013) *1D and 2D Basin and petroleum systems models for Southern Saskatchewan:* in Summary of Investigations 2013, Volume 1, Saskatchewan Geological Survey, Sask. Ministry of the Economy, Misc. Rep. 2013

Olajide, O. and Bend, S.L. (2012) The application of McKenzie's lithospheric stretching technique to 1D Basin Modelling within the Williston Basin: in Summary of Investigations 2012, Volume 1, Saskatchewan Geological Survey, **Sask**. Ministry of the Economy, Misc. Rep. 2012-4.2, A-6, 12p

Bend, S.L., Aderoju, T., Rees, B., Olajide, O., Marsh, A. and Yurkowski, M. (2012): Saskatchewan Phanerozoic fluids and petroleum systems: petroleum geochemistry and modelling update and activity; in Summary of Investigations 2012, Volume 1, Saskatchewan Geological Survey, Sask. Ministry of Energy and Resources, Misc. Rep. 2012-4.2, Paper A-2, 4p.

Bend, S.L., Aderoju, T., Rees, B., Olajide, O., Marsh, A., Yurkowski, M., Rostron, B., and Whittaker, S. (2011): Saskatchewan Phanerozoic fluids and petroleum systems: petroleum geochemistry and modelling; in Summary of Investigations 2011, Volume 1, Saskatchewan Geological Survey, Sask. Ministry of Energy and Resources, Misc. Rep. 2011-4.1, Paper A-2, 12p.

Melnik, A., Rostron, B., Bend, SL., Marsh, A., Yurkowski, M. and Whitaker, S. (2010), Saskatchewan Phanerozoic Fluids and Petroleum Systems; in Summary of Investigations 2010, Vol. 2, Sask., Geol. Survey, Sask. Ministry of energy and resources, Misc. rep. 2010-6.1, Paper A-12, 12p

Bend, S., Marsh, A., Rostron, B. and Whittaker, S. (2009), 'Saskatchewan Phanerozoic Fluids & Petroleum Systems', in Summary of Investigations 2009, Vol. 1, Sask., Geol. Survey, Sask. Ministry of energy and resources, Misc. rep. 2009-4.1

Bend, S. (2008), 'Volumetric Calculation'; in Leetaru, H. (Ed.) 'Teaching in Petroleum Geology', AAPG Special Publication, American Association of Petroleum Geologists, Tulsa, OK, USA, 6p

Xu, Q., Chi, G. and Bend, S.L. (2008), Diagenesis of the Mannville group in the Lloydminster area, western Sakatchewan: a preliminary petrographic study; in Summary of Investigations 2008, Vol. 1, Sask., Geol. Survey, Sask. Ministry of energy and resources, Misc. rep. 2008-4.1, Paper A-7, 16p

Bend, S.L. (2017) "*Liquid Catalyst: An Initial Comparative Assessment of Six Samples from Peru",* Geochemical Assessment and Confidential Report for PointSource Processing Inc., Feb, 2017, *9p*

Bend, S.L. (2014) *"Yard Four Coal Assessment"* Expert Witness report for Dentons Canada and Coal Valley Resources in CVR v Riddley Terminal Inc. January 2014, *19p*

Bend, S.L. (2013) *"International Coal Shipment Tonnage Estimations"* Expert Witness report for Dentons Canada and Coal Valley Resources in CVR v Riddley Terminal Inc. September 2013, *33p*

Kathryn M. Bethune

Professor, Precambrian Geology & Tectonics, Head of Geology
kathryn.bethune@uregina.ca, (306) 585 4270

Education and Professional Development

1987–1993:	Ph.D., Queen's University, Kingston, Ontario (Convocated in May, 1994)
1982–1986:	B.Sc. Honours, McMaster University, Hamilton, Ontario; E.S. Moore Prize – highest standing, undergraduate geology program
1977–1982:	Glenforest Secondary School, Mississauga, Ontario

Employment History

2013–	Professor, Department of Geology, University of Regina; Head of Department commencing July 1, 2016
2004–2012:	Associate Professor, Department of Geology, University of Regina
1999–2003:	Assistant Professor, Department of Geology, University of Regina (Tenure in 2004)
1996–1998:	Post-doctoral Fellow & Research Associate, Dept. Geological Sciences & Geological Engineering, Queen's University, Kingston, Ontario
1993–1995:	Post-doctoral Fellow (NSERC), Geological Survey of Canada, Ottawa

Teaching History

Undergraduate Courses: Geol 353 – Structural Geology I: Introductory Structural Geology; **Geol 453** – Structural Geology II: Advanced Structural Geology; **Geol 315** – Metamorphic Petrology; **Geol 452** – Global Tectonics and Earth History; **Geol 496** – Senior Geological Field School (Flin Flon, MB); **Geol 400** – Undergraduate Thesis in Geology (Geol 400AA, AB and AC)
Graduate Courses: Geol 800 – Reading Class, selected topic in geology relevant to thesis research; **Geol 850** – Topics in Structural Geology; **Geol 880** – Structural Analysis/Analysis of Polyphase Deformation; **Geol 880AE** – Theory and applications of U-Pb geochronology; **Geol 876** – Precambrian Geology

Student and Post-Doctoral Supervision

Name/Degree:	Role:	Dates:	Current Employment:
Arin Kitchen, M.Sc.	Supervisor	9/18-present	
Dillon Johnstone, Ph.D.	Supervisor	1/18-present	
Jordan Deane, M.Sc.	Supervisor	9/16-present	
Michael Cloutier, M.Sc.	Supervisor	1/16-present	
Khalifa Eldursi, PDF	Co-Sup. (G.Chi)	4/16-present	
Zenghua Li, PDF	Co-Sup. (G.Chi)	4/16-present	
Dillon Johnstone, M.Sc.	Supervisor	9/15-12/17	Ph.D. student, UofR
Devon Stuebing, M.Sc.	Supervisor	9/14-present	Geologist, Silver Standard Res.
Kewen Wang, M.Sc.	Co-Sup. (G.Chi)	1/14-8/16	Geologist, NexGen Energy Ltd.
Chase Wood, M.Sc.	Supervisor	9/13-4/16	Geophysics (Drone) Surveyor
Zenghua Li, Ph.D.	Co-Sup. (G. Chi)	2/12-4/16	Post-doctoral fellow, UofR
C. Card, Ph.D.	Supervisor	1/10-4/16	Geologist, Sask. Geol. Survey
Brian McEwan, M.Sc.	Supervisor	1/10-12/12	Geologist, NexGen Energy Ltd
B. Knox, M.Sc.	Co-sup. (K. Ashton)	9/06-10/11	Geologist, Gov. N.W.T.
B.Sc. students: Since 2008, I have supervised and co-supervised **11 undergraduate student theses** and another **three B.Sc. theses** are in progress.			

Student Awards: In 2008, M.Sc. student R. Hunter (graduated in 2007) won the Canadian Tectonics Group "**Best M.Sc. Thesis Award**"; additionally, B.Sc. and M.Sc. students collectively have won **10 poster awards (plus one talk)**, including **two national-level poster awards** (M.Sc., D. Johnstone, 2017) and (B.Sc., R. Bachynski, 2016) at the annual SEG-PDAC Student Minerals Colloquium.

University Service

INTERNAL SERVICE:

University Level:

2015–2016: Member, Dean of Science Search Advisory Committee (2 searches)
2014–2016: Faculty of Science Representative, Executive of Council, University of Regina
2002–2016: Chair, M.Sc. thesis defenses (FGSR), range of disciplines, three since 2010

Faculty Level:

2016–present: Head, Department of Geology & Member, Deans Executive Committee
2007–2009: Member, Faculty of Science Faculty Review Committee (2 years)
2006–2008: Member, Faculty of Science Student Appeals Committee

Departmental Level:

2018: Member, Search Committee, Tenure-track Lab. Instructor in Geology
2017: Member, Search Committee, Tenure-track Lab. Instructor in Geology
2014–2015: Member, Search Committee, Tenure-track Lecturer Position in Geology
2013-2016: Member, Undergraduate Student Awards Committee
2010–2011: Member, Search Committee, Term Lecturer Position in Geology
2007–2016: Co-Chair, Department of Geology Curriculum Review Committee
2010–2012: Graduate Studies Coordinator for Geology
2013–2014: Chair, Dept. of Geology International Minerals Innovation Institute (IMII) Committee; Co-ordinated application for laboratory infrastructure
2010–2011: Coordinated 'Academic Program Review' response for Department of Geology

EXTERNAL SERVICE:

National & Provincial Public Service Activities:

2018–2019: Vice-President, Geological Association of Canada (GAC)
2001–present: Campus Representative, Geological Association of Canada (GAC)
2010–present: Member, Canadian Geoscience Education Network
2013–2015: Councilor, Canadian Tectonics Group (Division of GAC)
2010–2013: Councilor, Geological Association of Canada, 'Logan Student Chapter' program
2003–2009: Member, Association of Professional Engineers & Geoscientists of Saskatchewan Student Development Committee (two consecutive terms)
2009: K-12 Geology/Science session at UR Summer Science Camp
2006–2008: Edited and commented on Myra Guymer's Earth Science children's book

Editoral & Reviewing Activities:

2017–2020: Member of NSERC Evaluation Group 1506 (Geosciences), 3-year term
2007–2016: Associate Editor, Canadian Journal of Earth Sciences, three consecutive terms, has included yearly selection of CJES Best Paper Award
Dec. 2016: Recognized as an 'Exceptional Reviewer' by the Journal Lithosphere
1999–present: Perform reviews of journal papers in my field, typically 3-4 per year
2011–2013: Guest Editor, Special Volume 232, Precambrian Research

Expert Witness Activities:

2018: Invited Reviewer, Promotion to Full Professor (Canadian University)
2006, 2016: Invited Co-Chair, Saskatchewan Geological Survey Open House

2009–2016:	Reviewed four NSERC Discovery Grants and one NSERC CRD application
2015:	Selection Committee, Geological Association of Canada Ambrose Medal
2015:	Selection Committee, Geological Association of Canada Logan Medal
2014 and 2015:	Selection Committee, Canadian Tectonics Group 'Best Paper Award'
2014:	External Examiner, M.Sc. thesis, University of Saskatchewan
2013:	External examiner, M.Sc. thesis, McGill University
2012:	External Examiner, M.Sc. thesis, University of Saskatchewan
2011:	External Examiner, M.Sc. thesis, Laurentian University
2012:	Judge, Western Inter-University Geological Conference oral presentations
2010–2011:	Reviewed Ph.D. thesis for Canadian Tectonic Group's "Best Ph.D. Thesis Award"
2009 and 2013:	Poster Judge at Saskatchewan Geological Survey Open House

Scholarly Research

My research deals with the tectonic architecture and evolution of Precambrian mountain belts of the Canadian Shield. Within this context, I am also interested in metallogeny and structural-fluid controls of mineral deposits, particularly uranium and gold. In the past decade, my primary focus has been the tectonic evolution of Rae Craton. In this period, I have authored/co-authored **one editorial** and **19 papers**, **12 government reports** and **one geological map**. **Four conference papers** and **82 conference abstracts** were also produced, most co-authored with students. Selected papers are listed below (**Cor = corresponding author if not first author; Student names in bold with asterisk***):

Card, C.D.*, Bethune, K.M., Davis, W.J., Rayner, N., Creaser, R. 2018. Characterising the southern part of the Hearne Province in Saskatchewan: a forgotten part of the Canadian shield revisited. Precamb. Res., **307**: 51–65.

Li, Z.*, Chi, G., and Bethune, K.M. 2016. The effects of basement faults on thermal convection and implications for the formation of unconformity-style uranium deposits in the Athabasca Basin, Canada. Geofluids, 16(4):729-751.

Li, Z.*, Bethune, Chi, G., K.M., Bosman, S., and Card, C., 2015. Topographic features of the sub-Athabasca Group unconformity surface in southeastern Athabasca Basin and their relationships to uranium ore deposits. Can. J. Earth Sci., **52**: 903–920.

Card, C.D.*, Bethune, K.M., Davis, W.J., Rayner, N., Ashton, K.E. 2014. The case for a distinct Taltson orogeny: evidence from northwest Saskatchewan, Canada. Precamb. Res., **255**: 245-265. [Sask. Geol. Survey]

Bethune, K.M., Berman, R.G., Ashton, K.E., and Rayner, N. 2013. Structural, petrological and U–Pb SHRIMP geochronological study of the western Beaverlodge domain: implications for crustal architecture, multi-stage orogenesis and the extent of the Taltson orogen in the SW Rae craton, Can. Shield. Precamb. Res., **232**: 89–118.

Berman, R.G., Bethune, K.M. 2013. Paleoproterozoic tectonic assembly of the western Canadian shield: new findings and implications for the reconstruction of Nuna/Laurentia. Editorial, Special Volume, Precamb. Res., **232**: 1–3.

Ashton, K.E., Hartlaub, R.P., Bethune, K.M., Heaman, L.M., Rayner, N., and **Niebergall, G.*** 2013. New depositional age constraints for the Murmac Bay group of the southern Rae craton, Canada. Precamb. Res., **232**: 70–88.

Bethune, K.M., **Hunter, R.C.***, and Ashton, K.E. 2010. Age and provenance of the Paleoproterozoic Thluicho Lake Group based on detrital zircon U–Pb SHRIMP geochronology: new insights into the protracted tectonic evolution of the southwestern Rae Province, Canadian Shield. Precamb. Res., **182**: 83–100.

Hunter, R.C.*, Bethune^{Cor}, K.M., Ashton, K.E., and Yeo, G.M. 2010. Stratigraphy and sedimentology of the Paleoproterozoic Thluicho Lake Group, southwestern Rae Province, Canada: alluvial basin development in the hinterland of the Taltson orogen. J. Geology, **118**: 487–508.

Ashton, K.E., Hartlaub, R.P., Heaman, L.M., Morelli, R.M., Bethune, K.M., and **Hunter, R.C.*** 2009. Post-Taltson sedimentary and intrusive history of the southern Rae Province along the northern margin of the Athabasca Basin, Western Canadian Shield. Precamb. Res., **175**: 16–34.

Tran, H.T.*, Ansdell, K.M., Bethune, K.M., Ashton, K.E., and Hamilton, M.A. 2008. Provenance and tectonic setting of Paleoproterozoic metasedimentary rocks along the eastern margin of Hearne craton: constraints from SHRIMP geochronology of the Wollaston Group, Saskatchewan, Canada. Precamb. Res. **167**: 171–185.

Guoxiang Chi

Professor, Mineral Deposits Geology and Geochemistry; Geofluids
guoxiang.chi@uregina.ca, (306) 585 4583

Education and Professional Development

- P. Geo., 2007, Association of Professional Engineers and Geoscientists of Saskatchewan (APEGS)
- Certificate, 1999, Computer Science, Laval University
- Ph.D., 1992, Mineral Resources, University of Quebec at Chicoutimi
- M.Sc., 1986, Geotectonics and Metallogeny, Chinese Academy of Sciences, Institute of Geotectonics
- B.Sc., 1983, Geology, Fuzhou University, China

Employment History

- Professor, University of Regina / Department of Geology, 2010 – present
- Department Head, University of Regina / Department of Geology, 2013 – 2016
- Associate Professor, University of Regina / Department of Geology, 2005 – 2010

Teaching History

- Geol-307 (former Geol-471): Geochemistry, 2010 - now
- Geol-314: Sedimentology, 2003 - 2011
- Geol-371 (now Geol 476): Principles of Groundwater Flow, 2003 - now
- Geol-396: Geology Field School – I, 2002 - 2010
- Geol-496: Geology Field School – II, 2011 - 2015
- Geol-470: Geology of Mineral Deposits, 2003 - now
- Geol-870: Recent Advances in Geochemistry, 2002 - now
- Geol-874: Geology of Fluids, 2002 - now
- Geol-800-006: Fluid Inclusions, 2002 - now
- Geol-880-AA: Selected Topics in Geology – Metallogeny of Gold Deposits, 2002 - now
- Geol-880-AL: Selected Topics in Geology – Unconformity-type Uranium Deposits, 2002 - now

Student and Post-doctoral Supervision

Name	Position	Dates of supervision	Current employment
Xinyuan Li	Post-doc	Sep 2017 - present	
Khalifa Eldursi	Post-doc	Jan 2016 - present	
Zenghua Li	Post-doc	Mar 2016 - present	
Badrul Imam	Post-doc	May 2008 - Apr 2011	Professor (Dhaka U)
Morteza Rabiei	Ph.D.	Sep 2016 - present	
Zenghua Li	Ph.D.	Jan 2012 - Apr 2016	Post-doc (U of R)
Haixia Chu	Ph.D.	Sep 2011 - Apr 2016	Res. Assoc. (China U of Geosci)
Yumeng Wang	M.Sc.	Sep 2017 - present	
Jacklynn Kennicott	M.Sc.	May 2014 - Apr 2017	Geologist (Tri Metals, USA)

Morteza Rabiei	M.Sc.	Jan 2014 - Aug 2018	Ph.D. student (U of R)
Kewen Wang	M.Sc.	Sep 2013 - Aug 2016	Geologist (NexGen)
Rong Liang	M.Sc.	May 2012 - Apr 2015	Geologist (Golden Fortune)
Ryan Scott	M.Sc.	May 2011 - Apr 2015	Sessional lecturer (U of R)
Rachelle Boulanger	M.Sc.	May 2010 - Aug 2012	Geochemist (Rio Tinto)
Dan Kohlruss	M.Sc.	May 2009 - Apr 2012	Research Geologist (SGS)
Qin Xu	M.Sc.	May 2007 - Apr 2012	Project scientist (SNC Lavalin)
Yongxing Liu	M.Sc.	May 2007 - Apr 2010	Staff Geologist (Denison Mine)
Qiuxia Wang	M.Sc.	May 2005 - Apr 2010	Staff Geologist (Husky)
Andy Tong	M.Sc.	May 2005 - Apr 2009	Staff Geologist (Husky)
Carrie Walz	M.Sc.	May 2003 - Apr 2007	Staff Geologist (NRC)
Niko Wicharuk, B.Sc.	B.Sc.	May 2018 - present	
Kirsten Cunningham	B.Sc.	Sep 2017 - Apr 2018	Geologist (TectoNex)
Brodie Stroh	B.Sc.	May 2015 - Apr 2016	M.Sc. student (UBC)
Travis LeGault	B.Sc.	May 2013 - Apr 2014	Geo-technician (Clifton Assoc.)
Taylor Haid	B.Sc.	May 2013 - Apr 2014	Geologist (Golden Predator)
S. Van de Kerckhove	B.Sc.	May 2012 - Apr 2013	Research geologist (SGS)
Ryan Scott	B.Sc.	May 2010 - Apr 2011	Sessional lecturer (U of R)
Yi Wang	B.Sc.	May 2010 - Apr 2011	Geologist (Cameco)
Rachelle Boulanger	B.Sc.	May 2009 - Apr 2010	Geochemist (Rio Tinto)
Misty Urbatsch	B.Sc.	May 2007 - Apr 2008	Geologist (Cameco)

University Service

- Department Head, Geology, U of R, Jul 2013 – Jun 2016
- Website maintenance, Department of Geology, U of R, 2003 – present
- Student adviser, Department of Geology, U of R, 2005 – 2008, 2012 – 2013, 2018 – present
- Curriculum committee co-chair, Department of Geology, U of R, 2005 – 2013, 2018 – present
- Various admin duties, Department of Geology, U of R, since 2002: seminar coordinator, departmental poster design, search committees, Geoscout program coordinator, Ph.D. program proposal drafting
- Various admin duties, Faculty of Science, U of R, since 2002: CRC search committee, faculty & lab instructor review committees, student appeal committee, research handbook internal reviewer, representative to Faculty of Kinesiology & Health Sciences, APEGS, IMII, CFI outcome study.
- Associate Editor, Bull. Can. Petrol. Geol. 2011 – now; Acta Geologica Sinica, 2014 – present
- Guest editor: Ore Geology Reviews, Geoscience Frontiers
- Co-chair, IAGOD – Commission on Tectonics of Ore Deposits (CTOD), 2014 to 2018
- APEGS – Academic Review Committee, 2009 – 2013

Scholarly Research

Refereed journal papers (n = 89; a few selected papers are listed below)

*supervised student; [#]supervised post-doc; [©]corresponding author (if not first author)

Chi, G., #Li, Z., Chu, H., Bethune, K.M., Quirt, D.H., Ledru, P., Normand, C., Card, C., Bosman, S., Davis, W.J., Potter, E.G. 2018. A shallow-burial mineralization model for the unconformity-related uranium deposits in the Athabasca Basin. *Economic Geology*, v. 113, p. 1209-1217.

*Wang, K., ©Chi, G., Bethune, K.M., Li, Z., Blamey, N., Card, C., Potter, E.G., Liu, Y. 2018. Fluid P-T-X characteristics and evidence for boiling in the formation of the Phoenix uranium deposit (Athabasca Basin, Canada): implications for unconformity-related uranium mineralization mechanisms. *Ore Geology Reviews*, v. 101, p. 122-142.

#Li, Z., Chi, G., Bethune, K.M., #Eldursi, E., Thomas, D., Quirt, D., Ledru, P. 2018. Synchronous egress and ingress fluid flow related to compressional reactivation of basement faults: the Phoenix and Gryphon uranium deposits, southeastern Athabasca Basin, Saskatchewan, Canada. *Mineralium Deposita*, v. 53, p. 277-292.

Chi, G., Xue, C., Sun, X., Luo, P., #Song, H., Li, S., #Zeng, R. 2017. Formation of a giant Zn-Pb deposit from hot brines injecting into a shallow oil-gas reservoir in sandstones, Jinding, southwestern China. *Terra Nova*, v. 29, p. 312-320.

Chi, G., *Haid, T., Quirt, D., Fayek, M., Blamey, N., *Chu, H. 2017. Petrography, fluid inclusion analysis and geochronology of the End uranium deposit, Kiggavik, Nunavut, Canada. *Mineralium Deposita, v.* 52, p. 211-232.

*Rabiei, M., ©Chi, G., Normand, C., Davis, W.J., Fayek, M., Blamey, N. 2017. Hydrothermal REE (xenotime) mineralization at Maw Zone, Athabasca Basin, Canada, and its relationship with unconformity-related uranium deposits. *Economic Geology*, v. 112, p. 1483-1507.

*Li, Z., Chi, G., Bethune, K.M., Thomas, D., Zaluski, G. 2017. Structural controls on fluid flow during compressional reactivation of basement faults: insights from numerical modeling for the formation of unconformity-related uranium deposits in the Athabasca Basin, Canada. *Economic Geology*, v. 112, p. 451-466.

Chi, G., Xue, C. 2014. Hydrodynamic regime as major control on localization of uranium mineralization in sedimentary basins. *Science China Earth Sciences*, v. 57, p. 2928-2933.

Chi, G., Bosman, S., Card, C. 2013. Numerical modeling of fluid pressure regime in the Athabasca basin and implications for fluid flow models related to the unconformity-type uranium mineralization. *Journal of Geochemical Exploration*, v. 125, p. 8-19.

Chi, G., Xue, C. 2011. An overview of hydrodynamic studies of mineralization. *Geoscience Frontiers*, v. 2, p. 423-438.

Chi, G. and Xue, C. 2011. Abundance of CO_2-rich fluid inclusions in a sedimentary basin-hosted Cu deposit at Jinman, Yunnan, China: implications for mineralization environment and classification of the deposit. *Mineralium Deposita*, v. 46, p. 365-380.

Chi, G., Lavoie, D., Bertrand, R. and Lee, M.K. 2010. Downward hydrocarbon migration predicted from numerical modeling of fluid overpressure in the Paleozoic Anticosti Basin, eastern Canada. *Geofluids*, v. 10, p. 334-350.

Refereed conference papers & government publications (n=26; a few selected papers are listed below)

Chi, G., Chu, H., #Li, Z., Bethune, K. 2017. Some recent advances in deciphering the genesis of unconformity-related uranium deposits in the Athabasca Basin, northern Saskatchewan, Canada. Proceedings of the 14th Biennial SGA Meeting, 20-23 August 2017, Quebec City, Canada, p. 703-706.

Chi, G., *Chu, H., *Scott, R., *Li, Z. 2015. Basin-scale hydrodynamic and fluid P-T-X characterization of the Athabasca basin (Canada) and significance for unconformity-related U mineralization. Proceeding of the 13th Biennial SGA Meeting, 24-27 August 2015, Nancy, France, p. 1793-1796.

Ian M. Coulson

Professor, Igneous Petrology & Volcanology
ian.coulson@uregina.ca, (306) 585 4184

Education and Professional Development

- URLeading. Leadership development programme, University of Regina (2018-19 cohort)
- Geoscientist in Training, Association of Professional Engineers and Geoscientists of Saskatchewan (APEGS) (2014)
- City & Guilds Stage 1 Teaching Certificate in Further and Adult Education and Training, City of Bristol College, UK (1997)
- Ph.D. (Earth Sciences), School of Earth Sciences, University of Birmingham, UK (1996)
- B.Sc. (Honours) Degree in Geology, Department of Geology, University of Portsmouth, UK (1993); Jeremy Miller Prize – for best undergraduate Honours thesis project.

Employment History

- Professor, University of Regina / Department of Geology, 2011 – present
- Associate Professor, University of Regina / Department of Geology, 2004 – 2011

Teaching History

- Geology Co-op work terms 1-4 (GEOL051, GEOL052, GEOL053, GEOL054) 2012 - present
- Environmental Geology (GEOL102) 2001-2009
- Mineralogy I (GEOL210) 2001 - present
- Mineralogy II (GEOL211) 2002 - present
- Igneous Petrology I (GEOL313) 2004 - present
- Metamorphic Petrology (GEOL315) 2002, 2017 - present
- Undergraduate Thesis in Geology (GEOL400) 2002 - present
- Geology Field Camp II (GEOL496) 2001 -2009
- Directed Readings: Geology of Colombia – GEOL490AD (2009); Igneous Geochemistry - GEOL492 (2002 – 2012)]
- Volcanology (GEOL800AE) 2004 - present
- Advanced Mineralogy (GEOL811) 2005 - 2010
- Recent Advances in Petrology (GEOL843) 2002 - present
- Geochemistry (GEOL870) 2013

Student and Post-Doctoral Supervision

Name	Position	Dates of supervision	Current Employment
Yumeng Wang	M.Sc. candidate	9/2017 - present	Visiting Scholar (China)
Yuting Zhang	M.Sc. candidate	9/2016 - present	
Siyang Zhang	Ph.D. candidate	9/2016 - present	
Zenghua Li	Ph.D.	9/2013 - 4/2016	Post-doc., U of R

Haixia Chu	Ph.D.	9/2011 - 4/2016	Res. Assoc., China U of Geosci
Andrea Torres Saldarriaga	M.Sc.	9/2011 - 7/2014	Geologist, Servicio Geológico Colombiano
Shen Liu	Visiting Scholar (China)	7/2010 - 6/2011	Professor, Northwest University, Xi'an
Colin Card	Ph.D.	9/2010 - 7/2016	Geologist, Sask. Geol. Survey
Daniel Seed	B.Sc. (Honours)	9/2010 - 7/2011	Geologist, Sask.
Julie Fillmore	M.Sc.	9/2009 - 7/2014	Geologist, Ontario
Monica Cliveti	M.Sc.	9/2005 - 7/2009	Lab. Instructor, U of R

University Service

Associate Editor for: The Canadian Mineralogist 2008 - 2014; Mineralogical Magazine, 2018 - present
Journal Editorial Board for: Geosciences 2015 - present; Petrologia 2014 - present
Convenor, Mineralogical Assoc. Canada short course in Cathodoluminescence at UNB (GAC/MAC) 2015
Acting Head of Geology Dept. various times in the absence of my colleagues from 2002 - present
President's advisory committee on radiation 2003 - present (served as vice-Chair 2014/15)
Manager of Science's Scanning Electron Microscope/Cathodoluminescence facility 2003 - present
Various Departmental committees on Space, Curriculum, new hires, Awards, 2000 - present
Various Faculty / University committees on Curriculum, Scholarships, Career decisions: (Faculty and Lab. instructor review, campus promotion to full professor), Admissions and Studies, 2000 - present
Expert Examiner (Minerals) Cultural Property Export and Import Act, Canadian Heritage, 2005 - present
Academic Program Advisor for undergraduate students in Geology, 2008 - 2011 and 2013/14
CO-OP programme academic coordinator for Geology, 2011 - present

Scholarly Research

Refereed Journal articles (*n* = 42; select papers are listed below)

Kolaceke, A., Velez, M.I., Coulson, I.M., Barbi, M. and Tokaryk, T. (In press, 7 Nov. 2018) Lithostratigraphy of sections in the vicinity of the excavation site of a nearly complete Tyrannosaurus rex skeleton, southwestern Saskatchewan, Canada. In: *Summary of Investigations 2018*, Volume 1, Saskatchewan Geological Survey, Saskatchewan Ministry of the Economy, Miscellaneous Report 2018-4.1, Paper A-1, 12 p.

Liu, S., Feng, C., Santosh, M., Feng, G., Coulson, I.M., Xu, M., Guo, Z., Guo, X., Peng, H., and Feng, Q. (2018) Integrated elemental and Sr-Nd-Pb-Hf isotopic studies of Mesozoic mafic dykes from the eastern North China Craton: implications for the dramatic transformation of lithospheric mantle. *Journal of Geodynamics* **114**, 19-40.

Liu, S., Feng, C., Feng, G, Xu, M., Coulson, I.M., Guo, X., Guo, Z., Peng, H. and Feng, Q. (2017) Timing, mantle source and origin of mafic dykes within the gravity anomaly belt of the Taihang-Da Hinggan gravity lineament, central North China Craton. *Journal of Geodynamics* **109**, 41-58.

Qi, Y., Hu. R., Liu, S., Coulson, I.M., Qi, H., Tian, J., Feng, C., Wang, T., Zhu, J., Chen, H. (2016) Petrogenesis and geodynamic setting of Early Cretaceous mafic–ultramafic intrusions, South China: A case study from the Gan–Hang tectonic belt. *Lithos* **258-259**, 149-162.

Daku, R.M., Rabbi, F., Buttigieg, J., Coulson, I.M., Horne, D., Martens, G., Ashton, N.W., and Suh, D.-Y. (2016) PpASCL, the Physcomitrella patens anther-specific Chalcone Synthase-like enzyme implicated in Sporopollenin biosynthesis, is needed for integrity of the moss spore wall and spore viability. *PLoS ONE* **11**(1): e0146817.

Zhang, D., Peng, J., Coulson, I.M., Hou, L. and Li, S. (2014) Cassiterite U-Pb and muscovite ^{40}Ar-^{39}Ar age constraints on the timing of mineralization in the Xuebaoding Sn-W-Be deposit, western China. *Ore Geology Reviews* **62**, 315-322.

Lei, M., Qing, H. and Coulson, I.M. (2014) A preliminary investigation of the mineralogy of the Bakken shales in southern Saskatchewan. In: *Summary of Investigations 2014*, Volume 1, Saskatchewan Geological Survey, Saskatchewan Ministry of the Economy, Miscellaneous Report 2014-4.1, Paper A-5, 14 p.

Fillmore, J. and Coulson, I.M. (2013) Petrological and geochemical constraints on the origin of adakites in the Garibaldi Volcanic Complex, southwestern British Columbia, Canada. *Bulletin of Volcanology* **75**:730.

Li, S., Wang, S., Li, X., Li, Y., Liu, S. and Coulson, I.M. (2012) A new method for the measurement of meteorite bulk volume via ideal gas pycnometry. *Journal of Geophysical Research: Planets*, **117**:E10, 1-7.

Li, S., Wang, S., Bao, H., Miao, B., Liu, S., Coulson, I.M., Li, X. and Li, Y. (2011) The Antarctic achondrite, Grove Mountains 021663: an olivine-rich winonaite. *Meteoritics & Planetary Science* **46**:9, 1329-1344.

Coulson, I.M., Stuart, F.M. and MacLean, N.J. (2011) Assessing the link between mantle source and sub-volcanic plumbing in the petrology of basalts from the 2001 and 2002/2003 eruptions of Mount Etna, Sicily: Evidence from geochemical and helium isotope data. *Lithos* **123**:1-4, 254-261.

Shen, N-P., Peng, J-T., Hu, R-Z., Liu, S. and Coulson, I.M. (2011) Strontium and lead isotopic study of the carbonate-hosted Xujiashan antimony deposit from Hubei Province, South China: implications for its origin. *Resource Geology* **61**:1, 52-62.

Beech, M. and Coulson, I.M. (2010) The making of Martian meteorite Block Island. *Monthly Notices of the Royal Astronomical Society* **404**, 1457-1463.

Beech, M., Coulson, I.M., Nie, W. and McCausland, P. (2009) The thermal and physical characteristics of the Gao-Guenie (H5) meteorite. *Planetary and Space Science* **57**:7, 764-770.

Marks, M.A.W., Coulson, I.M., Schilling, J., Jacob, D.E., Schmitt, A.K. and Markl, G. (2008) The effect of titanite and other HFSE-rich mineral (Ti-bearing andradite, zircon, eudialyte) fractionation on the geochemical evolution of silicate melts. *Chemical Geology* **257**:1-2, 153-172.

Marks, M.A.W., Schilling, J., Coulson, I.M., Wenzel, T. and Markl, G. (2008) The alkaline-peralkaline Tamazeght Complex, High Atlas Mountains, Morocco: mineral chemistry and petrological constraints for derivation from a compositionally heterogeneous mantle source. *Journal of Petrology* **49**:6, 1097-1131.

Beech, M., Nie, W. and Coulson, I.M. (2008) The pre-atmospheric size of the Martian meteorite ALH 77005 progenitor. *Planetary and Space Science* **56**:3-4, 320-325.

Refereed Books and Book Chapters

Coulson, I.M., editor. (2014) *Cathodoluminescence and its application to geoscience*. Mineralogical Association of Canada Short Course 45, 182 p.

Bechberger, M. and Coulson, I.M. (2014) Chapter 4: Applications of cathodoluminescence imaging to sedimentary rocks. In: Coulson, I.M. (ed.) *Cathodoluminescence and its application to geoscience*. MAC Short Course 45, 47-74.

Refereed Conference proceedings and published abstracts (*n* = 24; a selection are listed below))

Kaliwoda, M., Hochleitner, R., Coulson, I.M., Schmahl, W. (2018) Raman-Spectroscopy as a modern tool to investigate minerals and rocks within the Mineralogical State Collection Munich, Germany. Session on Minerals and mineral museums. XXII International Mineralogical Association, Melbourne, Australia, *Abstracts*, p. 258.

Azadbakht, Z., Coulson, I.M., Lentz, D. and McFarlane, C. (2017) The relationship between trace-element characteristics and the cathodoluminescence colour exhibited in apatites from felsic intrusions of New Brunswick. AGS 2017, 43rd Colloquium: "Innovations in Geoscience, Geological engineering, and the Geoenvironment, in the Northern Appalachians", Fredericton, New Brunswick, *Program with Abstracts*, p. 6.

Coulson, I.M. and Luo, P. (2014) Towards successful CO_2 flooding for EOR in Bakken Formation reservoirs: assessing the critical interplay of lithological framework, mineralogy and geochemical fluid-rock interaction. GAC-MAC Annual Meeting, Fredericton, New Brunswick, *Abstract Volume* 37, p. 64-65.

Janis Elaine Dale

Professor, Glacial and Quaternary Geology
Janis.Dale@uregina.ca, (306) 585- 4840

Education and Professional Development

University of Guelph	B.Sc. with Distinction	Physical Geography	1979
McMaster University	M.Sc.	Coastal Geomorphology	1982
Queen's University	Ph.D.	Arctic marine processes, sedimentology, invert taxonomy	1992

2016. Awarded a Fellowship in Canadian Geoscience. Geoscientists Canada Fellowship, FGC. In recognition of service to the Provincial (APEGS) and National Canadian Geoscience Board (CGB)
2015. University of Regina, Alumni Association Award for Excellence in Teaching
2012-2010 GSA 490 Mima Mounds: The Case for Polygenesis and Bioturbation, Received the G.K. Gilbert award for excellence, for the best contribution to the field of geomorphology for last three years (2010-2012) Assoc. American Geographers Geomorphology Specialty Group.
2001-2007 Recognition of Service, Board of Governors. Royal Canadian Geographical Society
2007 Saskatchewan: Geographic Perspectives. Nominated for three Saskatchewan Book awards in Scholarly Writing, Publishing and Publishing in Education. Won Publishing in Education which recognizes both the editors' and publishers efforts.
2004 Royal Canadian Geographical Society's 75th Anniversary Medallion for Volunteer Service- Nov 5, 2004.
2001 Named to the Board of Governors. Royal Canadian Geographical Society

Employment History

2003-2018	*Associate Professor, Department of Geology, University of Regina*. Associate Professor in Dept. of Geography.
2003-2009	Head of Department of Geology, University of Regina.
06/2011 - 12/2011	Geological Consultant for the IPAC-CO2 RESEARCH INC. Kerr Investigation. Provided on-site and follow-up observatory services for scientists from US & UK studying allegations that anthropogenic CO_2 being released on a farm property near Goodwater SK.

Teaching History

GEOL 102	Environmental Geology
GEOL 329	Soils (Annual Field Trip to new sites every year to study the soils)
GEOL 396	Field School
GEOL 400	Geology Undergraduate Thesis
GEOL 429	Glacial Geology
GEOL 494AD	Advanced Soils
GEOL 495AB	Quaternary Geology
GEOL 495AE	Advanced Glacial Geology
GEOL 800	Current Problems in Earth Sciences
GEOL 840	Topics in Sedimentology
GEOL 880/890	Selected Topics in Geology, Directed Readings in Geology

Student and Post-Doctoral Supervision

Name	Position	Dates of supervision	Current Employment
Amber Sprague	M.Sc. candidate	2017-present	
Gordon Schnare	B.Sc. (Honours)	2017-2018	Student, 2 summers as Grasslands National Park Interpreter
Dallas Dixon	B.Sc. (Honours)	2017-2018	Rocanville Nutrien Potash Mine
Sabrine Ben Rhouma	MITAC student	2017	Graduate Student, Tunisia
Matthew Thompson	M.Sc. candidate	2016-present	
Justine Kwochka	B.Sc. (Honours)	2015-2016	

Elysia Schuurmans	M.Sc. candidate	2014-present	Maternity Leave
Wahid Kelimu	Ph.D. Research Project	2012-2013	
Jerry Swetlow	B.Sc. (Honours)	2012-2013	Armed Forces Reserves
Richard Boulding	M.Sc.	2010-2018	Carbon & Climate Change Researcher, Agricultural Producers Association
Andrew Kazowcka	B.Sc. (Honours)	2008-2009	Geologist, Cameco Corporation
Jennifer Nicolay	B.Sc. (Honours)	2008-2009	
Rodrigo Arroba	M.Sc.	2007- 2018	Environmental & Regulatory Geoscientist, Fort McKay First Nation, Fort McMurray
Deliang Han	M.Sc.	2006-2009	Project & Resource Geologist Respec Consulting Inc., formerly North Rim Exploration Ltd.

University Service

University:
2014-2018 President's Advisory Committee on Sustainability PACS, 2 terms
2014-2018 University of Regina, GeothURmal Demonstration Project Coordinator
2013-2017 President's, Liberal Arts Advisory Group
2013-2015 Faculty of Science Representative for Faculty of Social Work
2013-2014 University of Regina Executive of Council
Provincial:
2015-2018 Saskatchewan Geology Society – Geology Calendar Committee- Secretary
2014- Invited Participant, presenter in workshops Government of Saskatchewan, Ministry of Health, Mental Health and Addictions Action Plan for Saskatchewan.
2000-2010, Fall 2013 Academic Review Committee (ARC) Association of Professional Engineers and Geoscientists of Saskatchewan (APEGS) –Vice-Chair Term 2004-2007
2005-2009 Southern Saskatchewan Geological Resources Advisory Comm. Sask Energy & Mines
National:
2017- 2018 Saskatchewan Geoscience Representative, Canadian Geoscience Standards Committee.
2001-2018 Member Royal Canadian Geographical Society –Research and Grants Committee- James W. Bourque Studentship and Northern Geography Scholarship Committee
2001 –2007 Governor of the Board of Governors of the Royal Canadian Geographical Society, 1 of 27.
2001 -2018 Fellow of the Royal Canadian Geographical Society.
2003-2009 Member Council of Canadian Chairs of Earth Science Departments (CCESD) –Discussions pertaining to Earth Science Departments in Canada.
2010-2011 Editor Canadian Association of Geographers- Physical Geography - The Canadian Geographer

Scholarly Research

Sprague, A., Dale, J., Bend, S. and K. Bethune, 2018. Developing Subsurface Geological Criteria for Small modular reactors (SMR) in Saskatchewan. Paper 4368. Canadian Nuclear Society, Proceedings, Saskatoon 2018. ISBN#978-1-926773-27-8

Thompson, M., Dale, J., Bend, S. and K. Bethune, 2018. Small modular reactors (SMR) in Saskatchewan: Developing Surficial Geological Siting Criteria. Paper 4372 Canadian Nuclear Society, Proceedings, Saskatoon 2018. ISBN#978-1-926773-27-8

Hussein E.M.A., I. Al-Anabagi, S. Bend, K. Bethune, J. Dale, G. Ferguson, R. Gokaraju, G. Huang (University of Regina), D. McMartin (University of Saskatchewan), B. Mehran (University of Regina), D. Newman (University of Saskatchewan), J. Piwowar, S. Sharma, D. Wagner (University of Regina), 2018. A case study on introducing small modular reactors into a new nonnuclear jurisdiction. Canadian Nuclear Society ISBN#978-1-926773-27-8

Schuurmans, Elysia D., Dale, Janis, Osman Salad Hersi 2015. Preliminary Study of paleosols in the Lower Cretaceous McLaren and Waseca Members of the Mannville Group in Saskatchewan; in Summary of Investigations 2015, Volume 1, Saskatchewan Geological Survey, Saskatchewan Ministry of the Economy, Miscellaneous Report 2015-4, 1, Paper A-3, 12p.

Romanak, Katherine Duncker, Wolaver, Brad, Yang, Changbing, Sherk, William George, Dale, Janis, Donbeck, Laura, M. and Lee, Spangler. 2014. Process-based soil gas leakage assessment at the Kerr Farm: Comparison of results to leakage proxies at ZERT and Mt. Etna. International Journal of Greenhouse Gas Control. Volume 30, pp. 42-57

Irvine, L. Lee-Ann. and Janis E. Dale. 2012. "Pimple" mound micro-relief in southern Saskatchewan, Canada." Burnham, J.L., D.L. Johnson, and D.N. Johnson, editors. n.d Mima mounds: The case for polygenesis and bioturbation. [Collation of eight multi-authored papers]. Geological Society of America Special Publication, (Source: http://www.geog.illinois.edu/people/johnson/index.html) Special Publication Geological Society of America.

Li, Z., Wu, S., Dale, J., Ge, L., He, M., Wang, X., Jin, J., Liu, J., Li, W., Ma, R. 2008 Wind tunnel experiments of air flow patterns over sabkhas modeled after those from the Hotan River basin, Xinjiang, China (II): Vegetated Frontiers of Earth Science in China, volume 2, issue 3, pp. 340 – 345.

Li, Z., Wu, S., Dale, J., Ge, L., He, M., Wang, X., Jin, J., Liu, J., Li, W., Ma, R. 2008 Wind tunnel experiments of air flow patterns over sabkhas modeled after those from the Hotan River basin, Xinjiang, China (II): Non-Vegetated Frontiers of Earth Science in China, volume 2, issue 3, pp. 345 – 350.

Abstracts, Talks, Reports

Dale, Janis. 2017. Saskatchewan is not just flat! Top geological Sites of Saskatchewan. Science Pub Series 2017-2018, November 23, 2017.

Dale, Janis, Brunskill, Brian, Henni, Amr and Katherine Arbuthnott 2018.The University of Regina Geoth**UR**mal Project: A deep geothermal energy demonstration project in Saskatchewan. Resources for Future Generations (RFG) 2018, Vancouver, BC, Canada. June 16-21, 2018

Thompson, Matt, Dale, Janis, Bethune, Kathy and Stephen Bend. 2018. Small Modular Reactors (SMR) in Saskatchewan: Developing surficial geological siting criteria. Resources for Future Generations (RFG) 2018, Vancouver, BC, Canada. June 16-21, 2018

Dixon, Dallas, Michelle Hanson and Janis Dale. 2017 Surficial mapping of the Wapus Bay Area, Reindeer Lake Saskatchewan: Preliminary Study. Saskatchewan Geological Open House Saskatchewan Geological Survey, Saskatchewan Ministry of the Economy, Saskatoon, Saskatchewan. November 26-29, 2017

Thompson, Matt, Sprague, Amber, Dale, Janis, Bethune, Kathy and Stephen Bend. 2017. Developing siting criteria for a small modular reactor (SMR) in Saskatchewan. Geological Open House Saskatchewan Geological Survey, Saskatchewan Ministry of the Economy, Saskatoon, Saskatchewan. November 26-29, 2017

Schuurmans, E. D., J. E. Dale, O.Salad Hersi. 2015. Preliminary Study of the Paleosols of the Mannville Group, Lower Cretaceous, Saskatchewan, Canada. Geological Society of America Meeting Baltimore, US. Nov 1-5, 2015.

Boulding, Richard J., Janis E. Dale, and Tim Tokaryk . 2015 Stratigraphy of the Late Cretaceous in Saskatchewan: Addressing Formation Discrepancies. Williston Basin Petroleum Conference and Prospect Expo at Evraz Place in Regina, April 28th to April 30, 2015.

Dale, Janis, Swetlow, Jerry, Wahid Kelimu, Evan Morris, Guy Lafond, Sean Sunley, and Connor Tant. 2013. Abstract # 467 Improving the accuracy of soil conductivity measurements, Geological Association of Canada/Mineralogical Assoc Can Joint Annual Meeting. Winnipeg, May 21-25, 2013

Boulding, Richard, Janis E. Dale, and Tim Tokaryk 2013 Abstract #396 Biohorizons of the Upper Cretaceous Eastend Formation near Eastend, Saskatchewan. Geological Association of Canada/Mineralogical Association of Canada, Joint Annual Meeting. Winnipeg, May 21-25, 2013

Sherk, Jerry , Katherine Romanak, Stuart M. V. Gilfillan, Janis E. Dale, Brad D. Wolaver and Changbing Yang 2012. H20 (Combining Learnings from Natural Releases of CO2 for CO2 storage: Processes, Impacts and Scale) at the 2011 AGU Fall Meeting, *Title*: Alleged Leakage of CO2 from the Weyburn-Midale CO2 Monitoring and Storage Project: Preliminary Findings from Implementation of the IPAC-CO2 Incident Response Protocol Abstract

Dale, Janis E. and M-L Byrne. 2011. Seasonal Dune-Forming processes in Point Pelee National Park, Ontario Canada, Conference of Canadian Assoc of Geographers, May 31- June 4th, 2011, Calgary Alberta.

Arrobo R, Dale J and Piwowar J 2011. Mass Wasting and erosional processes on the Moose Jaw River, Wakamow Valley Area. 19th Williston Basin Petroleum Conference 2011. May 1-3, 2011. Evraz Place, Regina, Saskatchewan.

Sherk, George William, Katherine D. Romanak, Janis Dale, Stuart M.V. Gilfillan, R. Stuart Haszeldine, Eric S. Ringler, Brad D. Wolaver and Changbing Yang, 2011. *The Kerr Ivestigation: Final Report – Findings of the Investigation into the Impact of CO2 on the Kerr Property*.Regina, SK: IPAC-CO2 Research Inc. (2011).

Dale, Janis E. and M-L Byrne. 2010. The Use of GIS in Sand Dune Rehabilitation Studies in Point Pelee National Park, Ontario, Canada. GEOCANADA 2010, Working With the Earth. Canadian Federation of Earth Sciences and Geoscientists Canada. Joint Conference of Geological Association of Canada, MAC, CSEG, CSPG, Can Well Logging, May 10-14, 2010, Calgary Alberta.

Dale, J.E., Sauchyn, D and S.Wolfe. 2010. Saskatchewan Palliser Triangle, *in* Prairie Summit, Joint Conference of Canadian Association of Geographers, Can.Cartographic Association, Can. Geomorphology Research Group,

Hairuo Qing

Professor, Carbonate Geology and Geochemistry
Hairuo.Qing@uregina.ca, (306) 585 4677

Education and Professional Development

- Ph.D. 1991 McGill University ***(Dean's Honours List)*** Montreal, Canada.
- M.Sc. 1986 McGill University Montreal, Canada.
- B.Sc. 1982 Chengdu University of Technology Chengdu, China.

Employment History

- 2005- Professor, University of Regina.
- 2001-2005 Associate Professor, University of Regina.

Teaching History

- Geol 240 Earth system history: 2008, 2010, 2018,
- Geol 340 Stratigraphy: 2008, 2010, 2011, 2012, 2013, 2015,
- Geol 396 Field School 1: 2015, 2016, 2017, 2018
- Geol 416 Carbonate rocks: 2008, 2009, 2010, 2011, 2012, 2014, 2015, 2016, 2017
- I have also taught a number of graduate courses over the last ten years.

Student and Post-Doctoral Supervision

Name	Position	Dates of supervision	Current Employment
Siyang Zhang	Ph.D. candidate	2014 - present	
Lu Wang	M.Sc. candidate	2014 - present	
Celine Chow	M.Sc. candidate	2016 - present	
Hang Ying	M.Sc.	2014-2017	Self employed
Jason Berenyi	M.Sc.	2010-2014	Assistant Director, Sask. Ministry of Resources
Adam Staruiala	M.Sc.	2011-2014	Geologist, Baker Hughes, Calgary
Siyang Zhang	M.Sc.	2010-2013	PhD student, UofR
Junjie Liu	M.Sc.	2008-2011	Potash Mining Company, Saskatoon
Sze-Shan Yip	M.Sc.	2007-2013	Geologist, Oil company, Calgary
Xiaochun Cen	M.Sc.	2005-2009	Senior Geologist, Nova Scotia Dept. of Energy
Jason Cosford,	Ph.D.	2002-2009	Geoscientist, J.D. Mollard & Associates, Regina
Mark Urban	M.Sc.	2002-2009	Geologist, Talisman Inc. Calgary
Jennifer Cugnet	B.Sc. (Honours)	2008-2008	Geologist, Oil company, Calgary

University Service

UofR ADMINISTRATIVE SERVICE:

1) 2017-2018 Member, Academic Review Committee, Faculty of Science
2) 2012 Nov - 2013 June Member, Travel and Fieldwork Work Policy Committee
3) 2012 Oct - 2013 June Member, Internationalization Strategy Task Force
4) 2010-2013 Head of the Geology Department
5) 2010-2013 Member, Dean's Executive Council, Faculty of Science
6) 2010-2011 Member, UR-China Celebration Committee
7) 2007-2008 Member, Campus Promotion Committee

Activities as journal editor

1) Editor in Chief: Bulletin of Canadian Petroleum Geology, since 2015
2) Member of the Editorial Board: Petroleum, since 2016
3) Member of the Editorial Board: Journal of Palaeogeography, since 2017.
4) Guest Editor: Minerals, since 2017
5) Associate Editor: Sedimentology, since 2018

Chair at national and International conferences

1) 2018 Co-conveners and co-chair, at 20th International Sedimentological Congress, Aug 13-17, 2018, Quebec City, Canada.
2) 2018 Co-conveners and co-chair at the 9th International Symposium on Oil and Gas Reservoir Geology and Exploitation. OGGE 2018, Oct. 29-31, 2018, Chengdu, China.
3) 2017 Session co-chair, 3rd Int. Paleogeography Conf, Sept 23-25, 2017, Chengdu, China.
4) 2015 Session co-chair: SEPM-CSPG Mountjoy Conference.
5) 2015 Session co-chair: 2nd Int Palaeogeography Conf., Beijing, China, Oct 10 2015.
6) 2013 Session chair: 7th Int Chinese Geologist Conferences, Chengdu, China, June 2013.
7) 2009 Co-chair, 2009, Plenary session at: "The Fifth International Conference of Oil/Gas Reservoir Geology and Eng.", Chengdu Univ. of Technology, China, Oct. 22-23, 2009.

Other service to the professional organization:

1) 2014-2016 Committee Member: Academic Review Committee of the Association of Professional Engineers and Geoscientists of Saskatchewan (APEGS).
2) 2012-2014 Past-President, Association of Chinese Canadian Professors at UofR.
3) 2011-2015 Board of Directors, Chinese Canadian Petroleum Society.
4) 2011-2012 President, Association of Chinese Canadian Professors at University of Regina.
5) 2003-2018 Member, Int. Professionals for the Advancement of Chinese Earth Sciences
6) 2007-2009 Board member, Association of Chinese Canadian Professors, UofR

Scholarly Research

Peer-reviewed journal publications: *n*=40, with selected publications as follows:

1. Yang, C.Y. and Qing, H., 2016, Possible occurrences of transition zones and residual oil zones below oil-water contact in mature oil fields, SE Saskatchewan, Canada. ***Interpretation***, 4, T591–T612.
2. Dong, S.F., Chen, D.Z., Zhou, X.Q. , Qian, Y.X., Tian, M., Qing, H., 2017, Tectonically-driven dolomitization of Cambrian to Lower Ordovician carbonates of the Quruqtagh area, north-eastern flank of Tarim Basin, north-west China. ***Sedimentology***, 64, 1079-1106.
3. Guo, C., Chen, D.Z., Qing, H., Dong, S.F., Li, G.R., Wang, D., Qian, Y.X., and Liu, C.G., 2016, Multiple dolomitization and later hydrothermal alteration on Upper Cambrian – Lower Ordovician carbonates in the northern Tarim Basin, China. ***Marine and Petroleum Geology***, 72, 295-316.
4. Rott, C. and Qing H., 2013: Early dolomitization and recrystallization in shallow marine carbonates, Mississippian Alida Beds, Williston Basin (Canada): evidence from petrography and isotope geochemistry. ***Journal of Sedimentary Research***, 83, 928-941.
5. Fu, Q. and Qing, H., 2011, Medium and coarsely crystalline dolomites in the Middle Devonian Ratner Formation, southern Saskatchewan, Canada: origin and pore evolution. ***Carbonates Evaporites***, 26, 111–125
6. Shen, J.W. and Qing, H., 2010, Mississippian (Early Carboniferous) stromatolite mounds in a fore-reef slope setting, Laibin, Guangxi, South China. ***International Journal of Earth Sciences*** (*GR Geologische Rundschau)*, 99, 443–458.
7. Shen, J., Webb, G., and Qing, H., 2010, Microbial mounds prior to the Frasnian-Famennian mass extinctions, Hantang, Guilin, South China, ***Sedimentology***, 57, 1615-1639.
8. Cosford, J., Qing, H., Yin, L., Mattey, D., Chen, Y.G., Eglington, B., Zhang, M., and Cheng, H., 2010, The East Asian monsoon during marine isotope stage 2: a stalagmite δ18O record from Jintanwan Cave, Hunan, China. ***Quaternary Research***, 73, 541-549.
9. Cosford, J., Qing, H., Mattey, D., Eglington, B. and Zhang, M., 2009. Climatic and local effects on stalagmite d^{13}C values at Lianhua Cave, China, **Palaeogeography, Palaeoclimatology, Palaeoecology**, 280, 235-244.
10. Qing, H. and Nimegeers, A., 2008, Lithofacies and depositional history of Midale carbonate-evaporite cycles in a Mississippian ramp setting, Steelman-Bienfait area, southeastern Saskatchewan, Canada. ***Bulletin of Canadian Petroleum Geology***, 56, 209-234.
11. Fu, Q., Qing, H., Bergman, K. and Yang, C., 2008, Dedolomitization and calcite cementation in the Middle Devonian Winnipegosis Formation in Central Saskatchewan, Canada. ***Sedimentology***, 55, 1623-1642.
12. Cosford, J., Qing, H., Eglington, B., Mattey, D., Yuan, D., Zhang, M. and Cheng, H., 2008, East Asian monsoon variability since the Mid-Holocene recorded in a high-resolution, absolute-dated aragonite speleothem from eastern China. ***Earth & Planetary Science Letters***, 275, 296-307.

Other refereed publications: *n*=11, with the following contribution as an example.

1. Lei, M., Qing, H. and Coulson, I.M. (2014) A preliminary investigation of the mineralogy of the Bakken shales in southern Saskatchewan. In: *Summary of Investigations 2014*, Volume 1, Saskatchewan Geological Survey, Saskatchewan Ministry of the Economy, Miscellaneous Report 2014-4.1, Paper A-5, 14 p.

Abstracts published in conference proceedings: *n*=47

Osman Salad Hersi

Associate Professor, Sedimentology, stratigraphy and basin analysis.
osman.salad.hersi@uregina.ca, (306) 585 4663

Education and Professional Development

Year	Subject	Degree	Institution
1998	Carbonate Sedimentology, Stratigraphy & Diagenesis	Philosophy of Doctorate (PhD)	Carleton University, Ottawa, Ontario
1991	Stratigraphy/Sedimentology	Dottorato (PhD)	Florence University, Italy
1988	Remote Sensing & Natural Resources Evaluation	Diploma	Istituto Agronomico Per l'Oltremare, Florence, Italy
1984	Geology	Laurea	Somali National University, Somalia

Employment History

7/2012 - Present	University of Regina, Regina, Canada	Associate professor
9/2006 – 6/2012	Sultan Qaboos University, Muscat, Oman	Assistant professor

Teaching History

University of Regina, Regina, Saskatchewan, Canada (Sept. 2012 – present)
Geol 841, Geol 840, Geol 800, Geol 414, Geol 416, Geol 340, Geol 314, Geol 201

Sultan Qaboos University, Muscat (Al-Khoudh) Oman (Feb. 2008 – June 2012)
ERSC 6107, ERSC6101, ERSC5051, ERSC4311, ERSC3901, ERSC2102, ERSC2101, ERSC1003

Student Supervision

Name	Position	Dates of supervision	Current Employment
Zack Maurer	M.Sc. candidate	9/2017 – present	
Ahmed Khan	M.Sc. candidate	9/2016 - present	
Elyssia Schuurmans	M.Sc. candidate	9/2015 - present	
Ebbyan Koshin	B.Sc.	9/2017–4/2018	Millennium Ems, Calgary
Peter Hill	M.Sc.	9/2016–4/2018	SK Geol. Survey, Regina
Aman Ullah	M.Sc.	9/2014 – 12/2016	Enterprise, Regina
Jason Bot	M.Sc.	9/2014 – 12/2015	Mosaic Potash, Esterhazy
Congwei Ji	M.Sc.	1/2013 –4/2016	Chinese Consulate, Calgary
Sze-Shan Yip	M.Sc.	9/2008– 4/2013	Environmental in Calgary
16 U/G students	**B.Sc. (SQU)**	**2/2008– 12/2012**	Oman petrol. Industry & gov't
Dr. Wen-Biao Huang	Visiting Scholar	10/2015–10/2016	Professor in China
Dr. Hongqi Yuan	Visiting Scholar	11/2015–11/2016	Professor in China
Dr. Yinghua Yu	Visiting Scholar	6/2016–11/2016	Professor in China
Dr. Xiaoqi Ding	Visiting Scholar	6/2016–11/2016	Professor in China
Dr. Sajjad Ahmed	Visiting Scholar	12/ 2015–1/2016	Professor in Pakistan

SQU = Sultan Qaboos University (Oman), Visiting researchers are professors from China & Pakistan.

University Service

Committees: Geology Graduate Coordinator (9/2013–7/2017); PhD Accreditation Committee member (FGSR, 2015-present); Science Appeals Committee (9/2014 – present); Geology curriculum committee (9/2017–Present); Science Graduate Scholarship Committee (9/2013–7/2017); Science Review committee (proxy) (04/2018–Present); Laboratory Instructor search committee member (9/2017–04/2017).
Supervisory committee member: Akande, A (Engineering PhD, internal/external,); Deedwania, A. (Engineering PhD int/ext); Olajide, O. PhD-Geol.; Scott, R., MSc-Geol.; Xu, F., MSc–Geol.
Thesis defense chair: Wu, M. (9/19/2018), Al-Jabouri, H. (01/25/2018), Alarbah, A. (08/20/2017), Ghani, A. (07/23/2014), Durasisamy, R. (12/20/2013).
External Examiner: Samal, J.K.: PhD, Indian School of Mines, Dhanbad, India (2/2016), and Marcelina Labaj, PhD-Geology, University of Saskatchewan (06/30/2015).

Scholarly Research

Refereed journal publications and book chapters

1-Ding X., **Salad Hersi O.,** Huxin, Z., Zhang S., and Liu, X. (2018) Diagenesis of volcanic-rich tight sandstones and conglomerates: a case study from Cretaceous Yingcheng Formation, Changling Sag, Songliao Basin, China. Arabian Journal of Geosciences, **11**:287.

2-Hakimi, M.H., Al-Matary, A.M., and **Salad Hersi, O.** (2018) Late Jurassic bituminous shales from Marib oilfields in the Sabatayn Basin (NW Yemen): Geochemical and petrological analyses reveal oil-shale resource. Fuel, **232:** 530-542.

3-Hakimi, M. H., Al-Matary, A.M., and **Salad Hersi, O.** (2018) Burial and thermal history reconstruction of the Mukalla -Sayhut Basin in the Gulf of Aden, Yemen: implications for hydrocarbon generation from Paleocene potential source rock. Journal of African Earth Sciences, **144:** 59-75.

4-Jagt, J., **Salad Hersi, O**., Al-Zidi, H.S., and Smith, A.B. (2018) Mid-Cretaceous echinoids from the Dhalqut Formation of Dhofar, southern Oman – taxonomy and biostratigraphical implications. Cretaceous Research, **89**:75-91

5-Huang, W.B., Lu, S.F., **Salad Hersi, O.**, Wang, M., Deng, S., Lu, R. (2017) Reservoir spaces in tight sandstones: classification, fractal characters & heterogeneity. J. Natural Gas Science & Eng., **46:**80-92.

6-Huang, W.B., Lu, S.F. and, and **Salad Hersi, O.** (2017) Quality grading system for tight sandstone reservoirs in the Quantou 4 Member, southern Songliao Basin, NE China. Interpretation, **15:** 503-522

7-Jafarian, A., Javanbakht, M., Koeshidayatullah, A., Pimentel, N., **Salad Hersi, O.**, Yahyaei, A., and Beigi, M. (2017) Paleoenvironmental, diagenetic and eustatic controls on the Permo-Triassic carbonate-evaporite reservoir quality, Upper Dalan and Kangan Formations, Lavan Gas Field, Zagros Basin. Geological Journal, **53**:1442-1457.

8-Huang, W.B., **Salad Hersi, O.,** Lu, S.F., and Deng, S.W. (2017) Quantitative modelling of hydrocarbon expulsion and quality grading of tight oil lacustrine source rocks: Case study of Qingshankou 1 member, central depression, Southern Songliao Basin, China. Marine & Petroleum Geology, **84**: 34-48

9-Salad Hersi, O., Abbasi, I.A., and Al-Harthy, A., (2016) Sedimentology, rhythmicity and basin-fill architecture of a carbonate ramp depositional system with intermittent terrigenous influx: The Albian Kharfot Formation of the Jeza-Qamar Basin, Dhofar, Southern Oman. Sedim. Geology, **331**: 114-131.

10-Savard, M.M., Nasteve, M., Paradis, D., Lefebvre, R., Martel, R., Cloutier, V., Murat, V., Bourque, E., Ross, M., Lauziere, K., Parent, M., Hamel, A., Lemieux, J-M., Therrien, R., Bolduc, A., Rocher, M., **Salad Hersi, O.**, Kirkwood, D., Castonguay, S., and Gelinas, P. (2013). Regional hydrogeology of the fractured aquifer system. Geological Survey of Canada Bulletin, **587**: 8-102.

11-Abbasi, I.A., **Salad Hersi, O.,** Al-Harthy, A., and Al-Rashdi, I. (2013) Lithofacies attributes, depositional system and diagenetic properties of the Permian Gharif Formation from Haushi-Huqf area, Central Oman. Arabian Journal of Geosciences, **6**: 4931–4945.

12-Salad Hersi, O. (2011) Lithologic and diagenetic attributes of the Sharwayn (Maastrichtian) and Umm Er Radhuma (late Paleocene–Eocene) formations and their significance to the K-T unconformity, Jabal Samhan area, Dhofar, Sultanate of Oman. Arabian Journal of Geosciences, **4**: 147-160.

13-Rajendran, S., **Salad Hersi, O.,** Al-Harthy, Al-Wardi, M., El-Ghali, A. and Al-Abri, A. (2011) Capability of advanced spaceborne thermal emission and reflection radiometer (ASTER) on discrimination of carbonates and associated rocks and mineral identification of eastern mountain region (Saih Hatat window) of Sultanate of Oman. Carbonates & Evaporites, **26**: 351–364.

14-Salad Hersi, O., and Al-Harthy, A. (2010) Lithofacies attributes of a transgressive carbonate system: the Middle Eocene Seeb Formation, Al Khoud area, Muscat, Oman. Journal for Science, **15**: 41-54

15-Salad Hersi, O., Al-Harthy, A., Al-Sayig, A., Abbasi, I.A., and Al-Lazki, A. (2009) A shoaling-upward carbonate sequence in a tectonically active sedimentary basin: the Albian Kharfot Formation of the eastern margin of Jeza-Qamar basin, Jabal Samhan, Dhofar, Oman. Tethys Geol. Soc. Bull., **4**:37-44.

16-Salad Hersi, O., Abbasi, I.A., Al-Harthy, A., Cherchi, A., and Schroeder, R. (2014) Stratigraphic evolution and depositional system of Lower Cretaceous Qishn Formation, Dhofar, Oman. Geological Society of London Special Publication, **392**: 303-323.

17-Abbasi, I.A., **Salad Hersi, O.**, and Al-Harthy, A. (2014) Late Cretaceous conglomerates of the Qahlah Formation, North Oman. Geological Society of London, Special Publications, **392**: 325-342.

18-Salad Hersi, O., (2012) Biostratigraphic constraints on chronostratigraphic intraformational relationships within the Lower – Middle Ordovician Beekmantown Group, Laurentian margin: Eastern Ontario and southwestern Quebec, Canada, **in** J. R. Derby (eds.), The great American carbonate bank: The geology and economic resources of the Cambrian – Ordovician Sauk megasequence of Laurentia: American Association of Petroleum Geologists (AAPG) Memoir 98, **22**: 559-574.

19-Lavoie, Denis, Andre´ Desrochers, George Dix, Ian Knight, and **Salad Hersi, O.** (2012) The great American carbonate bank in eastern Canada: An overview, **in** J. R. Derby et al. (eds.) The great American carbonate bank: The geology and economic resources of the Cambrian – Ordovician Sauk megasequence of Laurentia: AAPG Memoir 98, p. 499-523.

Refereed extended conference papers ($undergraduate student, *graduate student)

20-*Hill, P. and **Salad Hersi, O.** (2017) Depositional Controls on Various Reservoirs within the Middle Jurassic Upper Shaunavon Member Reservoirs in Southwestern Saskatchewan. Williston Basin Petroleum Conference, Regina, Saskatchewan, Canada.

21-*Ullah, A., **Salad Hersi, O.**, & Ahmed, S. (2017) Lithofacies properties, biostratigraphy, cyclicity and depositional environment of the Margala Hill Limestone, Hazara Basin, Pakistan. CSPG Conv. Calgary

22-Cheema, A., and **Salad Hersi, O.** (2016). Lithofacies attributes and depositional setting of the Middle Jurassic Samana Suk Formation, Potewar Basin, North Pakistan. CSPG Convention, 2016, Calgary.

23-Salad Hersi,O., Abbasi, I.A., Ahmed, S., and $Al-Raisi, T. (2013) Age of siliciclastic-dominated Fars Group of the Batina Coast, North Oman, inferred from bioclastic-bearing carbonate unit. Extended abstract, Geologic Problem Solving with Microfossils III Conference. Univ. Houston, Abstracts: 72-73.

24-Salad Hersi, O., Abbasi, I.A., and Al-Harthy, A. (2009) Qishn Formation: A Barremian to Aptian third-order transgressive-regressive depositional sequence, eastern margin of the Jeza-Qamar Basin, Dhofar, Oman. International Lithosphere Program Task Force on Sedimentary Basins, Abu Dhabi. Abst., 68-71

25-Salad Hersi, O., Al-Harthy, A., Abbasi, I.A., Al-Sayig, A. and Al-Lazki, A. (2009) Hydrocarbon potential of the Jeza-Qamar Forntier Basin, Dhofar, Southern Oman. ***In:*** Detective Stories Behind Prospect Generation: Challenges and the Way Forward. European Association of Geologists and Engineers Workshop, Muscat. Extended Abstracts Book: 29-33.

Tsilavo Raharimahefa

Assistant Professor, Structural Geology; Tectonics; Remote Sensing and GIS
raharimt@uregina.ca, (306) 337 2124

Education and Professional Development

- **Ph.D. in Geophysics (Structural Geology)**. Department of Earth and Atmospheric Sciences Saint Louis University, Saint Louis, Missouri, USA. 2008
- **Post-Master's Graduate Certificate in Geographic Information Systems**. Saint Louis University, Saint Louis, Missouri, USA. 2007
- **Professional Development Certificates**. EduMine Certificate. Environmental Control and Reclamation. Canada. 2006
- **Gemologist Diploma** (Registered Gemologist «R.G.») International School of Gemology, San Antonio, Texas, USA. 2005
- **Master of Science in Geology**. Department of Earth and Atmospheric Sciences. Saint Louis University, Saint Louis, Missouri, USA. 2004
-Visiting Student and Research Assistant. Department of Geosciences. Williams College, Williamstown, Massachusetts, USA. 2001-02
-***"Aptitude à l`Etude Approfondie"*** in Petrology-Metallogeny. Département des Sciences de la Terre. Université d` Antananarivo, Madagascar. 2001
- **Maîtrise de Recherche en Géologie**. Département des Sciences de la Terre. Université d` Antananarivo, Madagascar. 1999-2000
- **Diplome Universitaire d`Etude Scientifique I et II**. Université d` Antananarivo, Madagascar. Faculté des Sciences Naturelles. 1998

Employment History

- **Assistant Professor. Tenure-track.** Department of Geology. University of Regina, Canada 2016-present
- **Lecturer. Tenure-track**. Department of Geology. University of Regina, Canada 2015-2016
- **Lecturer. Term position**. Department of Geology. University of Regina, Canada 2012-2015
- **Senior Geologist Consultant.** Americas Gold Exploration Inc, Nevada U.S., and Condor Mining Corporation S.A. Ecuador 2011-2012
- **Post-Doctoral Fellow and Researcher.** Department of Earth Sciences. Laurentian University, Sudbury, Ontario, Canada. 2009-2011
- **Visiting Assistant Professor.** Geosciences Department. Earlham College, Indiana, USA. 2008- 2009

Teaching History

Courses Taught at the **University of Regina:**
Advanced Geomodelling (Geol 880AD; Seminar in Earth Science (GEOL900); Geomodelling Applied to Mineral Exploration (GEOL 490 AJ); Applied Exploration Geophysics (GEOL 460); Structural Geology II (GEOL453); Structural Geology I (GEOL353); Metamorphic Petrology (GEOL315); Internal Processes of the Earth (GEOL 201); Earth System History (GEOL 240); Environmental Geology (GEOL102); Geology Field Camp II (GEOL 496); Geology Field Camp I (GEOL 396); Thesis in Geology (GEOL 400AA).

Courses Taught at **Earlham College, Indiana, USA:**
Environmental Geoscience (GEOS111) with laboratory; Seminar for senior (GEOS-480) (new topics on Structural Geology and Tectonics); Geographic Information Systems (GEOS 357) with laboratory.

Student and Post-Doctoral Supervision

Name	Position	Dates of Supervision	Current Employment
Hossein Narimani	M.Sc.	2018-present	
Zachary Maurer	M.Sc.	2017-present	
Ryen Queypo	B.Sc. Honours	2018-present	
Jared Squire	B.Sc. Honours	2017-2018	Barrick Gold, N. Americas
Tyson Wall	B.Sc.	2017-2018	Barrick Gold, N. Americas
Jamie D. Schmidt	B.Sc. Honours	2017-2018	
Anastasia C. Poissant	B.Sc. Honours	2016-2017	Silver Standard Resources Inc

University Service

- Committee Member, Academic Representative of the Faculty of Science for the University of Regina Faculty Association, Academic Representative representing the Faculty of Science at the University of Regina Faculty Association. (2017/6 - 2019/4)
- Committee Member, Curriculum, Department of Geology, University of Regina. Since 2016/7.
- Coordinator, Seminar in Earth Sciences at the University of Regina, Seminar. Since 2012/9.
- External committee and council member. Ecole Doctorale des Sciences de la Terre et de l`Evolution at the Universite d`Antananarivo Madagascar. Science 2014.
- Leading Geo-conservation and Geo-research in Madagascar National Parks, Madagascar. Since 2017.
- Promoting Geo-conservation through the public talks and field excursions, Madagascar. Since 2012
- Volunteer Judge, Canada-Wide Science Fair, Regina.

Scholarly Research

Refereed journal articles:

- Randrianaly, H.N., Di Cencio, A. Rajaonarivo, A., **Raharimahefa, T.,** 2016. A proposed geoheritage inventory system: Case study of Isalo National Park, Madagascar. Journal of Geoscience and Environment Protection **4**, 163-172.
- Randrianaly, H.N., **Raharimahefa, T.,** Rajaonarivo, A., Di Cencio, A. and Tolimasy, D.H., 2015. Instauration of Geopark Pilot: Preliminary Approach in Implementation Process of Geoconservation at Isalo National Park, Madagascar. Journal of Geoscience and Environment Protection **3**, 25-40.
- Raharimahefa T., Lafrance B., Tinkham, D., 2014. New Structural, Metamorphic, and U-Pb Geochronological on the Blezardian orogeny and Yavapai Orogeny in the Southern Province, Sudbury, Canada. Canadian Journal of Earth Sciences **51**(8), 750-774.
- Raharimahefa T., Kusky. T.M., Toraman, E., Rasoazanamparany, C., Rasaonina, I., 2013. Geometry and kinematics of the late Proterozoic Angavo shear zone, central Madagascar: implication for Gondwana assembly. Tectonophysics **592**, 113-129.
- Raharimahefa T., 2012. Geoconservation and geodiversity for sustainable development in Madagascar. Madagascar Conservation & Development **7**, 3: 126-134.

- Raharimahefa T., Kusky. T.M., 2010. Temporal evolution of the Angavo and related shear zones in Gondwana: Constraints from LA-MC-ICP-MS U-Pb zircon ages of granitoids and gneiss from central Madagascar. Precambrian Research **182**, 30-42.
-Kusky, T.M, Toraman,E., **Raharimahefa**, T., Rasoazanamparany, C., 2010. Active tectonics of the Alaotra-Ankay Graben System, Madagascar: Possible extension of Somalian–African diffusive plate boundary? Gondwana Research **18**, 274-294.
- Raharimahefa T., Kusky. T.M., 2010. Environmental monitoring of Bombetoka Bay and the Betsiboka estuary, Madagascar, using multi-temporal satellite data. Journal of Earth Sciences **21**, No. 2, 210–226.
- Raharimahefa, Tsilavo, and Kusky M. Timothy, 2009. Structural and Remote Sensing Analysis of the Betsimisaraka Suture in Northeastern Madagascar. Gondwana Research **15**, 14-27.

Refereed conference proceedings:

- Squire, J.*, Van De Kerckhove, S., **Raharimahefa, T**. 2018. Geological and Geophysical Study of a Gossanous Outcrop near White Lake,Northern Saskatchewan. PDAC, Canada.
- Rasoazanamparany, C., Widom, E., Kuentz, D., **Raharimahefa, T**., Rakotondrazafy, A.M.F, Rakotondravelo, K.M, 2017. Sources of Quaternary volcanism in the Itasy and Ankaratra volcanic fields, Madagascar. American Geological Union (AGU). USA.
- Raharimahefa, T., Rasoazanamparany, C., Schmitd, J.D.*, Wall, T.*, 2017. Structural evolution of the volcanism in the Itasy volcanic field, Madagascar. AGU. New Orleans, USA.
- Comtois-Poissant, A., **Raharimahefa, T.,** Normand, C., 2017. Petrogenesis and geochemistry of mafic granulites from the Upper-Deck of the Tantato Domain, northern Saskatchewan. PDAC - Canada.
- Rasoazanamparany, C., Widom, E., **Raharimahefa, T**., Kuentz, D., Rakotondravelo, K.*, Rakotondrazafy, A., 2016. Volcanism in the Itasy Volcanic Field, Madagascar. Cities on Volcanoes, Understanding volcanoes and society: the key for risk mitigation. Puerto Varas, Chile.
- Raharimahefa, T., 2015. Geochemical signatures of Neoproterozoic granites and granitoid-gneisses from Angavo belt, Central Madagascar. American Geological Union, Abstracts V23B-3117.
- Rambeloson, A. R., and **Raharimahefa, T.,** 2014. Madagascar and the EAO during assembly of East and West Gondwana. “Gondwana and Island arc: Past and Present”. Yokohama National University, Japan.
- Raharimahefa, T., 2013. Tectonic significance of granitoid plutons from the Andasibe paragneiss belt east-central Madagascar. American Geophysical Union, USA.
- Raharimahefa,T., Tinkham D. K., Lafrance, B., 2011. New U-Pb geochronological constraints on the structural evolution of the Southern Province, Sudbury, Canada. GSA. USA.
- Raharimahefa,T., Tinkham D. K., Lafrance, B., 2011. Polyphase deformation in the Southern Province, Sudbury, Canada. AGU, USA.
- Raharimahefa, T., Kusky, T.M., 2008. A Neoproterozoic Dextral Shear Zone, Central Madagascar Geological Society of America, USA.

Technical report:

- Raharimahefa, T., 2011. Zircon U-Pb geochronological constraints on the structural evolution of the Southern Province, Sudbury, Ontario. Centre for Excellence in Mining Innovation and Mineral Exploration (CEMI) Research Centre, Laurentian University (LU) 5p.
- Raharimahefa, T., 2010. Geological Field Trip Guide. Tectonic evolution of the Southern Province of the Sudbury region and the South Range of the Sudbury Impact Structure, Sudbury Canada. CEMI LU, 11p.
- Raharimahefa, T., 2010. Updated structural and metamorphic geology of the Southern Province, Sudbury. CEMI, LU. 24p.
- Raharimahefa, T., 2009. Structural Geology of the Southern Province and the South Range of the Sudbury Impact Structure Canada . CEMI, LU. 9p.

Maria I. Vélez

Associate Professor, Palaeontology; Quaternary Geology
maria.velez@uregina.ca, (306) 337 2608

Education and Professional Development

- Workshop on the Reconstruction of Paleofloods (PAGES) (Grenoble, France, 2016)
- Postdoc 2004-2005. Prairie Adaptation Research Collaborative (PARC, University of Regina)
- Ph.D. 2003. Quaternary Studies, University of Amsterdam (The Netherlands)
- Master's of Research in the Natural Environment (MRes). 1998. University of Edinburgh (U.K.)
- B.Sc. in Geology, 1992. Universidad EAFIT (Colombia)

Employment History

- Associate Professor. 2014-Present. University of Regina
- Assistant Professor. 2010-2013. University of Regina
- Lecturer 2006-2009. University of Regina

Teaching History

- Geol 241 Palaeontology; 2006-present
- Geol 201 Internal Processes of the Earth; 2006-2012; 2007-2012; 2016-2018.
- Geol 240 Earth´s Systems; 2014-2017
- Geol 800 Reading course in Paleontology; 2008; Review of the Current Problem; 2012, 2015
- Geol 396 Field School 1; 2007-2010
- Geol 414 Geology of Siliciclastic rocks; 2007-2010; 2014
- International Field School to Colombia; 3rd and 4rd year students; 2009
- Geol 400 AB; 2010-2011; 2013-2017
- Geol 490 AI; Environmental Micropaleontology; 2014
- Geol 490 AK; Quaternary Environments; 2015, 2016, 2018

Student Supervision

Name	Degree	Dates of supervision	Present position
Jenya Kistanov	B.Sc.	2017-present	
Rae MacClintock	B.Sc. Honours	2018-Present	
Katie MacKenzie	B.Sc.	2016-2017	Geologist Equity Explorat.
Kevin Hoover	B.Sc. Honours	2016-2017	Applying for MSc
Brant Olineck	B.Sc.	2015	Geologist, Silver Standard
Luisa Patiño	B.Sc., Nat. U. Colombia	2015- 2016	MSc student U. Nacional
Stephen Meickel.	Research Assistant	2015	Canada Post
Drew Lubiniecki.	Research Assistant	2015	PhD U of Adelaide, Aust.
Yunuén Telmotzin	B.Sc., U. Puebla, Mexico	2015	High school teacher, Mexico
Daniel Jaramillo	B.Sc., U. Caldas, Colombia	2014-2015	Geologists –Institute for Stratigraphy- Colombia
Dillon Johnstone	B.Sc.	2012-2014	PhD (UofR) Geologists Sk. Geol Survey

Yuliana Serna	B.Sc., U. Antioquia, Colombia	2011-2012	PhD (U. del Norte)
Adam Edwards	Research Assistant	Sept-Dec. 2012	Geologist, Inland Aggregates
Danielle Seed	B.Sc.	Sept. 2010-April 2011	Geologist (mining company)
Susan Biss	B.Sc.	Sept. 2010-April 2011	Geologist Cameco
Luc Chabanole	B.Sc.	Sept. 2010-April 2011	PhD, U. Saskatchewan
Nicole Barber	M.Sc.	Sep. 2018-	
Yunuén Telmotzin	M.Sc.	2015-2018	High school teacher, Mexico
Juan Fernano Díaz	M.Sc.	2015-2017	Geologist. Colombian Geol. Survey
Carina Seitz	Ph.D., U.del Sur, Argentina	2013-present	
Yuliana Serna	Ph.D., U. del Norte, Colombia	PhD 2013-present	
Andrea Torres	M.Sc.	2012-2014	Sessional, Geology EAFIT
Yuri Carolina Garcia	M.Sc., U. EAFIT, Colombia	2009-2011	Biologist Consultant

University Service

- Chair curriculum committee, Department of Geology, 2016-present
- Chair Search committee Department of Geology, Fall 2017-Winter 2018
- Member (Internal member) of the Unit Review for Computer Science (Fac of Science), 2017
- Member Faculty of Science for the revision of the Criteria Document, 2017
- Student advisor, Department of Geology, 2014-2017
- Science Repr. URFA Council of representatives, 2016-2017
- Member Faculty of Science Strategic Plan, 2016
- Department of Geology, seminar coordinator 2007-2012
- Member URFA committee for the Status of Women 2007-2012
- Member Women in Science and Engineering (URWISE) 2014-Present
- Judge at the Regina Science Fair, 2006- present (except 2013 and 2017)

Scholarly Research

Students underlined; Refereed journal papers, below is a list of a few selected papers (Total number 32)

-Velez, M.I., Conde, D., Lozoya, J.P. Rusak, J., Garcia-Rodriguez, F., Seitz, C., Harmon, T., Perillo, G., Escobar, J. and Vilardy, S. Paleoenvironmental Reconstructions Improve Ecosystem Services Risk Assessment: Case Studies From Two Coastal Lagoons In South America. Accepted, Water, Sept. 2018.
-Seitz, C., Perillo, G. and Velez, M. Geological study of Cenozoic sediments in the surrounding area of La Salada shallow lake. Accepted, *Andean Geology*, August 2018.
-Temoltzin-Loranca,Y., Velez, M., Moreno, J.E., Escobar, J. Late Holocene environmental history of Lake Boquete and its watershed: human or natural causes involved? *Bol. Soc. Geol. Mex*. 70:121-131.
-Diaz, J. and Velez, M.2018. Late Cretaceous radiolarians from a bentonite-rich interval at the base of the Niobrara Formation, southwestern Saskatchewan, Canada: biostratigraphic and paleoenvironmental implications. *Canadian Journal of Earth Sciences* **55**(3):321-329

-Velez, M.Jaramillo, C., Salazar, A., Benito, X., Fritz, S., Tapia, P., Lubiniecki, D., Kar, N. and Escobar, J.2018. Freshwater ecosystems in a newly formed ecospace: Early Pliocene lakes in the Central Andean Altiplano. *Palaeogeography, Palaeoclimatology, Palaeoecology* **490**: 218-226
-Diaz, J.F. and Velez, M.I. 2017. Foraminiferal biostratigraphy of the middle Turonian-early Coniacian interval in southern Saskatchewan, Canada. *Bulletin of Canadian Petroleum Geology*. **65**: 366-386
-Jaramillo D., Vallejo D. F., Vélez M., Restrepo S., Pardo, A., Trejos R. and Murcia, H. Middle Pleistocene paleolimnology of a dammed tropical river: The Zarzal Formation, Cauca Valley, Colombia. *Palaeogeography, Palaeoclimatology, Palaeoecology*. **487**: 194-203
-Bird, B., Rudloff, O., Escobar, J., Gilhooly III, W., Correa-Metrio, A., Velez, M. and Polissar, P. 2017. Paleoclimate support for a persistent dry island effect in the Colombian Andes during the last 4700 years. *The Holocene* 1-12.
-Correa-Metrio, A., Velez, M.I., Escobar, J., St-Jacques, J., Curtis, J. and Cosford, J. 2016. Mid-Elevation ecosystems of Panama: future uncertainties in light of past global climatic variability. 2016. *Journal of Quaternary Science*. Dec. 2016. ISSN 0267-8179.
-Serna, Y., Velez, M., and Escobar, J. 2015. Microscopic organic matter particles in late Holocene riparian sediments near the Cauca River, Colombia. *Journal of Paleolimnology*. **54**: 325-344
-Velez M, Escobar J, Brenner M, Rangel O, Betancur A, Jaramillo A, Curtis J and Moreno, J. 2014. Middle to late Holocene relative sea level rise along the Colombian Caribbean coast inferred from a sediment core taken in the Ciénaga Grande de Santa Marta. *The Holocene*. **24**: 898-907
-De Boer EJ, Tjallingii R, Vélez MI, Rijsdijk KF, Vlug A, Reichart G-J, Prendergast AL, De Louw PGB, Florens FBV, Baider C, Hooghiemstra H, 2014. Climate variability in the SW Indian Ocean from an 8000-yr long multi-proxy record in the Mauritian lowlands shows a middle to late Holocene shift from negative IOD-state to ENSO-state. *Quaternary Science Reviews* **86**: 175-189.
-De Boer E., Slaikovska M., Hooghiemstra H., Rijsdijk K., Vélez M.I., Prins M., Baider C., Vincent Florens C.F. 2013. Multi-proxy reconstruction of environmental dynamics and colonization impacts in the Mauritian uplands, *Palaeogeography, Palaeoclimatology, Palaeoecology*. 383-38: 42-51
-Velez M.I., Martínez J.I. and Suter F. 2013. A Mid-Late Holocene History of the Floodplain Lakes of the Cauca River, Colombia. *Journal of Paleolimnology*. **49**: 591-604
-Harvey T, Vélez M and Butterfield N. 2012. Exceptionally preserved crustaceans from western Canada reveal a cryptic Cambrian radiation. *Proceedings of the National Academy of Science*. 109: 1589-1594
-Gonzalez-Carranza Z., Hooghiemstra H. and Vélez M. 2012. A 14,000 yr pollen and diatom based record of environmental and climatic change from South Colombian Andes shows decadal climate variability. *The Holocene*. **22**: 1227-1241
-Velez M., Curtis J., Brenner M., Escobar J., Leyden B.W. and Popenoe de Hatch M. 2011. Environmental and cultural changes in highland Guatemala inferred from lake sediments from lake Amatitlán sediments. *Geoarchaeology*. **26**: 346-264.
-Suter F., Martinez J.I. and Velez M.2011. Holocene soft-sediment deformation of the Santa Fe-Sopetrán Basin, northern Colombian Andes: evidence for Prehispanic seismic activity? *Sedimentary Geology* **235**: 188-199
-Sauchyn D. and Vélez M. 2007. Holocene climate change. Saskatchewan: geographic perspectives. Ed. By Thraves, et al. *CPRC*. Pag. 57-61
-Vélez M.I., Berrío J.C., Hooghiemstra H. and Metcalfe, S. 2005. Palaeoenvironmental changes during the last ca. 8529 cal yr in the dry forest ecosystem of the Patía valley. *Palaeogeography, Palaeoclimatology, Palaeoecology* **216**: 279-302
-Vélez M.I., Hooghiemstra H., Metcalfe S., Martínez I. y Mommersteeg H. 2003. Pollen and diatom-based environmental history since the Last Glacial Maximum from the Andean core Fúquene-VII, Colombia. *Journal of Quaternary Science* **18**: 17-30

Appendix 2

Lists of B.Sc. Honours, M.Sc. and Ph.D. theses completed in the Dept. of Geology

Table of B.Sc. (Honours) theses completed in the Dept. of Geology

Year	Student	Title of Thesis	Supervisor(s)
1973	Cole, Marian Kathleen	Flow of Fluids in the Winnipeg Formation of Saskatchewan	L. Vigrass
1973	Shaw, Darrell E.	The Geology of the Orphan Lake Area	J. Lewry
1974	Posehn, Gary	The Geology of the Mawdsley Lake Area	J. Lewry
1974	Thomas, Mike	A Review of Orogenic Fronts and Structural Domain Relations, with Comparisons to The Hudsonian Orogen in The Saskatchewan Precambrian	J. Lewry
1975	Letson, John R. J.	A Comparison of Four Palynomorph Zones of the Upper Devonian Saskatchewan Group and Equivalent Rocks of Western Canada by Statistical Analysis of the Palynomorph Leiosphaeridia Eisenack, 1958	D. Kent
1975	Hulbert, Larry	Structure of the Fraser Lake Gabbro Complex, Northern Manitoba	G. Parslow
1976	Garven, Grant	Hydrodynamics and Hydrogeochemistry of the Deadwood Formation, Saskatchewan	L. Vigrass
1976	Potter, Dean	Structural-metamorphic Geology of the Numabin Bay Area, Reindeer Lake, Saskatchewan	J. Lewry
1978	Thomas, David	The Geology of the Compulsion River Area, Saskatchewan	J. Lewry
1978	Haidl, Fran	A Sedimentologic and Geochemical Analysis of the Frobisher Evaporite in the Benson Oilfield, Southeastern Saskatchewan	D. Kent
1980	Tritthardt, Allan	The Lithologies and Depositional Environment of the Upper Member of the Shaunavon Formation of the Whitemud Field	D. Kent
1981	Davison, D.A.	The Paleoecology and Diagenesis of a Middle Devonian Reef in the Outcrop Region of Lake Manitoba	D. Kent
1981	Robb, Brian	The Harmattan Reef: a Core Study of a Dolomitized Upper Devonian Leduc reef, Harmattan Area, Alberta, Canada	D. Kent
1982	Arne, Dennis	Petrography and Geochemistry of the Nowyak Lake Area	B. Watters J. Lewry
1982	Walker, Dan	Geochemistry of Volcanic Rocks, West Amisk Lake Area, Saskatchewan	B. Watters
1982	MacEachern, James A.	Lower Cretaceous Microtidal Estuarine Sediments of the Upper Mannville Group, Pikes Peak Heavy Oil Field, Saskatchewan	D. Kent
1985	Richardson, Sherry	Neilburg Mclaren Oil Pool of Western Saskatchewan Geology and Depositional Environments	L. Vigrass
1985	Schwann, Pamela Lee	Geochemistry and petrology of the Nicholson Bay ultramafic complex, northwestern Saskatchewan	G. Parslow
1987	Haid, Linda	Sedimentology of a Carbonate Buildup in the Hart River Formation, Yukon Territory	D. Kent
1987	Riley, Deirdre	The Geology of the Cockwill Lake Area, Saskatchewan	G. Parslow
1987	Rehman, Jill	Depositional History and Diagenesis of the Kisbey Sandstone and Related Carbonate Rocks (Mississippian) within the Rosebank - Alida Beds Pool Southeastern Saskatchewan	D. Kent
1988	Toop, David	Hydrogeologic Study of the Paleozoic Rocks of Southwestern Saskatchewan	L. Vigrass
1990	Sparks, Dwayne	Geology of the Raine - Walker Gold Showing, Amisk Lake, Saskatchewan	D. Kent
1991	Edwards, Mark D.	Petrology and Geochemistry of the Alteration Zone at the North Cook Lake Massive Sulphide Deposit, Snow Lake, Manitoba	J. Lewry B. Watters

1992	Wilkinson, Kent	Sedimentology, Depositional Environment and Diagenesis - Controls on Reservoir Quality in the Gull Lake South Voluntary Unit No. 1, Southwest Saskatchewan	D. Kent
1993	Strachan, Eric	Carbonate Facies, Depositional Setting and Diagenesis: a Geological Model of a Mississippian Frobisher Beds Reservoir, South Workman Pool, Southeast Saskatchewan	D. Kent
1994	Labelle, Danny G.P.	Allostratigraphic Analysis of the Middle Cambrian Deadwood Formation in Southern Saskatchewan	K. Bergman
1994	Ellemers, Pamela Cook	A Comparison of the eEker and Till Geochemistry of the Winter Lake Region, NWT to the Bedrock Geochemistry of the Point Lake Greenstone Belt	G. Parslow
1995	Webber, Jeffrey D.	High Resolution Stratigraphic Analysis of the Lower Cretaceous (Albian) Flotten Lake Sandstone, West-Central Saskatchewan	K. Bergman
1995	Fossenier, Kevin	Lithogeochemistry of Metavolcanic Rocks from the Courtenay Lake Formation, Courtenay Lake, Saskatchewan	B. Watters
1997	Sandy, David G.	Allostratigraphic Analysis of the Spinney Hill Member (basal Joli Four Formation); West Central Saskatchewan; Backstepping Incised Shoreface Deposits	K. Bergman
1997	Kletzel, Andrea	Geochemical Modeling of the Thermal Maturation for the Saskatchewan Portion of the Williston Basin	S. Bend
1997	Zimmer, Paula	Dolomitization in the Yeoman Member, Red River Formation, Minton Pool, South-central Saskatchewan: Timing, Distribution and Controls	D. Kent
1998	Ward, Kimberley	Sequence Stratigraphic Analysis of the Lower Cretaceous (Albian) St. Walburg Sandstone, in West-central Saskatchewan	K. Bergman
1998	Card, Colin D.	Structural Geology of the Mokoman (Knife) Lake-Reindeer River Transect, Nnorthern Saskatchewan, Canada	J. Lewry
1998	Harvey, Shawn	Geology of the Knife (Mokoman) Lake Copper Deposit: Petrology, Geochemistry and a New Ore Deposit Model	J. Lewry
1998	Ricci, Angela	Vadose Diagenesis of the Middle Devonian Upper Winnipegosis Carbonate and the Origin of the Whitkow Anhydrite, Southern Elk Point Basin, Southern Saskatchewan	K. Bergman J. Jin
1998	Blair, Michael James	Vadose Diagenesis of the Upper Winnipegosis Carbonate and the Origin of the Ratner Laminite and Whitkow Anhydrite, Middle Devonian Elk Point Basin, South-central Saskatchewan	K. Bergman J. Jin
1998	Pinnow, Rachelle	Mapping and Sedimentologic Analysis of the Devonian-Mississippian Bakken Formation in Southeast Alberta	K. Bergman
1998	Legault, Alain R.	The Kisbey Sandstone: An Example of Basin Margin Gamma-ray Marker Cconvergence in the Frobisher-Alida Beds, Williston Basin, Southeastern Saskatchewan	D. Kent
1998	Hasanie, Raza	Petrology and Geochemistry of Amphibolites of the Maclean Lake Belt, Sucker Lake Area, La Ronge Domain	B. Watters
1999	Marsh, Arden	Carbonate/Evaporite Cycles within the Shell Lake Marker Bed of the Middle Devonian Elk Point Basin at Rocanville, Saskatchewan	K. Bergman
2000	Coolican, Jeffrey	Geochemistry and Tectonic Setting of Meta-igneous Rocks within the Train Lake and Dodge Domains, Eastern Rae Province, Saskatchewan	K. Ashton B. Watters

2000	Smith, Mauri	Geochemical, Petrological and Structural Analysis of Basement Gneisses at the Wollaston-Mudjatik Domain Boundary, Northern Saskatchewan	K. Bethune B. Watters
2000	Cameron, Orrin	Proximal to Distal Outer Ramp Rocks of the Mississippian Midale Formation of the Williston Basin, Southeastern Saskatchewan, Canada	D. Kent
2000	Williamson, Cathy	Stratigraphy and Paleoenvironments of the Basal Manitou Falls Formation in the P2 North Area Athabasca Basin, Saskatchewan	H. Qing
2000	Nimegeers, Andrew	An Allostratigraphic Analysis of the Middle Ordovician Winnipeg Group in Southern Saskatchewan	K. Bergman
2001	Collier, Brent	Stratigraphy of the Paleoproterozoic Lower Manitou Falls B Member of the Deilmann pit,at Key Lake, Saskatchewan	K. Bethune
2001	Chorney, Erin	Geology of the Eagle Lake Area within the Beaverlodge Domain, Southwestern Rae Province, Saskatchewan	K. Bethune K. Ashton
2001	Heinemann, Kimberley	Petrographical and Geochemical Investigation of the Influence of Organic Matter in the Dolomitization of the Ordovician Red River Formation	H. Qing S. Bend
2001	Urban, Mark	Ordovician Red River Reservoir Development in the Midale Field, Southeastern Saskatchewan	H. Qing
2002	Boivin, Danielle	Structural Geology of the Fold Lake Area, Northwestern Saskatchewan	K. Bethune K. Ashton
2002	Yanko, Asha D.	Structural Geology of the Kluachesi Lake, Peace River District (94G/13), Northeastern British Columbia	K. Bethune K. Ashton
2002	Tong, Andy	Petrography of Chert Nodules in the Mississippian Midale and Frobisher Beds, Steelman Field, Southeastern Saskatchewan	H. Qing
2002	Rainville, Scott	Geochemical Investigation and Geological Mapping of Possible Ennadai-Rankin Metavolcanic Rocks in the Bonokoski Lake Area, Northern Saskatchewan	B. Watters I. Coulson
2003	Senkow, Matthew	Investigation of a Presumed Rhodochrosite Occurrence in Hurwitz Group Carbonate Rocks, Many Islands Lake Area, Northeast Saskatchewan	I. Coulson
2003	Bailey, Kimberley	Geology and Geochemistry of Part of the Myo Lake Section, Creighton, Saskatchewan	K. Bethune
2003	Thain, Scott F.	Occurrence, Distribution and Evaluation of Coalbed Methane and Enhanced Coalbed Methane Recovery Potentials of the Sparky Coal, Lower Cretaceous Mannville Formation, West-central Saskatchewan, Canada	S. Bend
2003	Niebergall, Gregory	The Basal Polymictic Conglomerate Separating ca. 3.05 Granitoid Basement and the Murmac Bay Group in Northwestern Saskatchewan	K. Bethune K. Ashton
2004	Hagen, Nadene	A Thermal Maturity Assessment of Two Boreholes in the Williston Basin Using Vitrinite Reflectance	S. Bend
2004	Sulz, Rachel	Geology, Structural History and Geochemistry of the Xenolith-rich Northwest margin of the Patterson Island Pluton, Peter Lake Domain	K. Bethune
2004	Legault, Kathie	The formation of the white-banded sand layer of Madge Lake and the Seward Sand Hills	J. Dale
2004	Geller, Kari	Wisconsinan Glacial Retreat Margins in Northern Saskatchewan: reconstruction using Radiocarbon Data	J. Dale
2005	Clark, William	Sedimentology and Stratigraphy of the Carlile Formation, Dodsland-Hoosier Area, Western Saskatchewan	G. Chi, P.K. Pedersen
2005	Brown, Aaron	Metamorphic Pressure-Temperature Conditions of Migmatization in the Rottenstone Domain, Northern Saskatchewan	K. Bethune
2005	Leugner, Chad	Petrographic and Geochemical Investigation of the Wathaman Batholith and 'Tonalite-Migmatite Complex' of the Rottenstone Domain in the Davin Lake - Wathaman Lake area, Northern Saskatchewan	K. Bethune

2005	Craven, Jason	A Petrographic Study of Metamorphosed Mafic Igneous Rocks Southwest of 'Spider Island', Northwest Reindeer Lake	K. Bethune
2006	Ebel, Chelsey	Development of a Highly Strained, Paleoweathered Zone at the Contact between the Archean Shaganappie Island Basement Inlier and Paleoproterozic Wollaston Supergroup, Kukelko Island, Northern Wollaston Lake Area, Saskatchewan	K. Ashton K. Bergman
2006	Walz, Russell	Sedimentology and Stratigraphy of the Viking Formation in the Edgerton/Wainwright Area, East-central Alberta	G. Chi
2006	Solomon, Amanda	A Preliminary Fluid Inclusion and Stable Isotope Study of the Buffalo Gold Deposit, Red Lake, Ontario	G. Chi
2007	Mack, Earline M	Sedimentology, Stratigraphy and Depositional Model of the Mississippian Midale Evaporite, Tableland Field, Southeastern Saskatchewan	H. Qing
2007	Giesen, Marsha	Controls on Petroleum Fluid Compartmentalization in the Upper Cretaceous Chinook Formation, Northwest Alberta	S. Bend
2007	Marcotte, Jeanette M.	Brittle Structure and Dylkes of the South-Central Beaverlodge Domain, Southern Rae Province: Late Magmatism, Upper Crustal Stresses and Implications for Uranium Exploration	K. Bethune K. Ashton
2008	Nicolay, Jennifer	Preliminary Results of Golden Band Resources "Hope Showing" Gold Exploration Project	J. Dale
2008	Urbatsch, Misty	Diagenetic Study of the Carbonates of the West Point Formation, Gaspe Peninsula, Quebec	G. Chi
2008	Adeboye, Oyeleye	Heat Affected Coals	S. Bend
2008	Cugnet, Jennifer	Effects of Prairie Evaporite Salt Collapse on the Bakken Formation, Southeast Saskatchewan	H. Qing
2008	Kazowcka, Andrew	Quaternary Investigations of the Keeler Peninsula-McRae Bay area Northeast Wollaston Lake, Saskatchewan	J. Dale
2008	Nicolay, Jennifer	Preliminary Results of Golden band Resources "Hope Showing" Gold Exploration Project	J. Dale
1999	Kevin Treptau	Sub-Phanerozoic Precambrian of southwest Saskatchewan: lithological, geochemical, and geophysical interpretations, 47 p.	K. Bethune K. Ashton
2009	McEwan, Brian	Origin of mafic dykes in the Lloyd Domain adjacent to the Virgin River shear zone.	K. Bethune
2009	Morley, Andrew	Metamorphism of the Virgin schist group in the Virgin River shear zone, southeast of the Athabasca Basin	K. Bethune
2009	Boulanger, Rachelle	Characterization and Evolution of Fluids Associated with the Cu-Zn Deposit of the Rambler Metals and Mining Plc Mining Mine, Northeast Newfoundland, Canada	G. Chi
2010	Scott, Ryan	Petrographic and Geochemical Studies of Ferroan Poikilotopic Calcite Cement in Sandstones from the Western Canada Sedimentary Basin	G. Chi
2010	Wang, Yi	Petrographic and Geochemical Studies of the Uranium Deposit at Cigar Lake, Northern Saskatchewan, Canada	G. Chi
2011	Chabanole, Luc	An Environmental Reconstruction of Mauritius Island Based Upon Diatom Analysis of the Mare aux Tatos Core	M. Velez
2011	Biss, Susan	An Analysis of the Ichnofossils of a Holocene Floodplain Deposit in the Cauca River, Colombia	M. Velez
2011	Seed, Danielle	The Effects of Volcanic Tephra on the Productivity within Lake Amatitlan, Guatemala	M. Velez I. Coulson
2011	Riemer, Waren	Tectonic Fabric Elements and Their Relationship to Metamorphism in the Archean Woodburn Lake and Paleoproterozoic Ketyet River Groups	K. Bethune
2011	Boulding, Richard	Geology Select Stratigraphic Sections of the Eastend Formation, Lower Cretaceous, near Eastend Saskatchewan	J. Dale
2012	Kerckhove, Samantha	Petrographic, Geocheimiscal and Structural Analysis of Outcrop ALSV-12 in the Amisk Lake Gold Deposit, Saskatchewan	G. Chi K. Bethune

2013	Rocha, Amanda	The Use of Forward Modelling to Interpret a Near Surface Electromagnetic Survey	J. Dale
2013	Latimer, Ashlee	An Evaluation of Source Rock Potential of the Devonian Birdbear Formation in Southern Saskatchewan	S. Bend
2013	Mueller, Braden	A Source Rock Appraisal of The Duperow Formation, Southern Saskatchewan	S. Bend
2014	Johnstone, Dillon	Geomorphology, Paleonpedology and Sedimentology of the Holocence Sediments of the Santa Fe-Sopetran Basin, Antioquia Colombia	M. Velez U. Hardenbicker
2014	LeGault Travis	Petrographic and Geochemical Study of Hydrothermal Albitite Alteration in the Beaverlodge Uranium District, Northwestern Saskatchewan, Canada	G. Chi K. Ashton
2014	Haid, Taylor	Petrographic and Fluid Inclusion studies of the End Uranium Deposit, Kiggavik, Nunavut, Canada	G. Chi
2014	Wielgoz, Nathan	Petroleum Source Rock Analysis of the Upper Devonian Torquay Formation of South Eastern Saskatchewan	S. Bend
2015	Ogilvie, William T.	Geological Characterization and Structural Analysis of Ni-Cu Sulphide Bearing Mafic Dykes of the Tantato Domain, Saskatchewan.	K. Bethune, C. Normand B. Knox
2015	Johnson, Sienna	Petrographic and Natural Facture Analysis of the Souris Valley Beds (Lodgepole Formation)	S. Bend
2015	Olineck, Brant	Examining the Qu'Appelle Valley subsurface sediments as potential archives for the paleoflood history within the valley and a preliminary, multiproxy reconstruction of precipitation events	M. Velez
2015	Berthiaume, Jonathan	Geology of the 10-vein outcrop, Seabee Mine, Saskatchewan: Structural Controls on Gold Mineralization	K. Bethune
2015	Cloutier, Michael A.	An Overview of Quartz (LPO/CPO) Fabric Analysis	K. Bethune
2015	Edwards, Adam	Micro and Macro Structural Analysis of a Fault Zone in the End East Zone, Kiggavik, Nunavut	K. Bethune
2016	Stroh, Brodie	Structural, Petrographic, and Fluid Inclusion Studies of Zone 3 and Zone 7 Gold Occurrences in the Tantato Domain of Northern Saskatchewan	G. Chi C. Normand
2016	Deane, Jordan	Reanlaysis of Santoy Zones 6 and 7 along the Sheared Western Limb of the Carruthers Lake Synform	K. Bethune
2016	Bachynski, Ryan	Field, Petrographic, and Structural Analysis of Sulphide Mineralization in Western Brabant Lake, Saskatchewan	K. Bethune R. Morelli
2017	MacKenzie, Katie	An Environmental Reconstruction of Pedro-palo Lake Based Upon Diatom Analysis	M. Velez
2017	Hoover, Kevin	The Colombian Holocene and the Identification of the Anthropocene through a Palelimnoligic Reconstruction of Lake Fuquene in the Eastern Cordillera of Colombia	M. Velez
2017	Comtois-Poissant, Anastasia	Petrogenesis and Geochemistry of Mafic Granulites from the Upper-Deck of the Tantato Domain, Northern Saskatchewan, Canada	T. Raharimahefa
2018	Koshin, Ebbyan	Subsurface Distribution and Reservoir Variability of the late Jurassic Roseray Formation, Southwestern Saskatchewan	O. Salad-Hersi
2018	Cunningham, Kirsten	Petrography and Geochemistry of late to Post-Collisional Felsic Suites in the Laird and White Lake areas of the Northern Glennie Domain, Saskatchewan	G. Chi R. Morelli
2018	Squire, Jared	Detailed Mapping, Petrography and Economic Significance of a Magnetite Amphibolite Outcrop near White Lake, Northern Saskatchewan	T. Raharimahefa
2018	Schmidt, Jamie	The Structural Controls of the Ampefy Monogenetic Volcanic Field , Central Madagascar	T. Raharimahefa
2018	Dixon, Dallas	Surficial Mapping of the Wapus Bay Area, Reindeer Lake, Saskatchewan: Preliminary Study in Summary of Investigations, Saskatchewan Geological Survey, Saskatchewan Ministry of the Economy	J. Dale M. Hanson

2018	Kistanov, Jenya	Paleoenvironmental and Paleolimnological Reconstruction of the Big Quill Lake, Saskatchewan Big Quill Lake, SK	M. Velez
2018	Kitchen, Arin	Structural Study of Deformation Bands and their Application to Paleo-stress Analysis in the Athabasca Sandstone at Fox Lake, Northern Saskatchewan	K. Bethune

Table of M.Sc. theses completed in the Dept. of Geology

Year	Student	Title of Thesis	Supervisor(s)
1977	Dwairi, Ibrahim	Aspects of the Uranium Geochemistry of Selected Lakes in Northern Saskatchewan: a Preliminary Study	G. Parslow
1978	Garven, Audrey	Geology of the Stackhouse – Numabin Bays – Area – Reindeer Lake, Saskatchewan	J. Lewry
1979	Hulbert, Larry	Geology of the Fraser Lake Gabbro Complex, Manitoba	G. Parslow
1979	Roberts, Keith	The Precambrian Geology of the Oliver-Spalding Lakes Region, Northern Saskatchewan	J. Lewry
1980	Rees, Christopher	Metamorphism in the Canadian Shield of Northern Saskatchewan	J. Lewry
1980	Potter, Dean	Zinc-lead Mineralization in the Wollaston Group stratigraphy, Sito–Fable Lakes area, Saskatchewan	G. Parslow J. Lewry
1980	Leibel, Robert	A Pore Geometry Study of the Mississippian Midale Carbonate of the Benson Field, Southeastern Saskatchewan	D. Kent L. Vigrass
1982	Crabtree, Harry	A Geological Model of the Innes Oilfield (Mississippian)	D. Kent
1982	Walters, Kenneth	Microfacies Relationships of the Mississippian Midale Carbonate of the GLEN EWEN Field Southeastern Saskatchewan	D. Kent
1983	Adamson, David	Uranium and Thorium Abundances in High-grade Rock from the Western Saskatchewan Shield	G. Parslow
1983	Eriyagama, Sarath	Geology and Reservoir Rock Types Mississippian – Ratcliffe Beds Hummingbird Oilfield Area Tp. 2-3, Rge. 18-19 W 2 M Saskatchewan	L. Vigrass D. Kent
1983	Thomas, David James	Distribution, Geological Controls and Genesis of Uraniferous Pegmatites in the Cree Lake Zone of Northern Saskatchewan	J. Lewry
1984	Akhurst, Maxine	Pore Geometry Model of The Mississippian Frobisher Beds (Innes Field) Southeastern Saskatchewan	D. Kent
1985	Abraham, Andrew	The Geology of the Otter Lake Area and Its Relation to the Southeastern Complex of the Western Churchill Province, Saskatchewan	J. Lewry
1986	Haidl, Frances	Geology and Fluid Distribution in the Lower Cretaceous Mannville Group, Celtic-Westhazel Area, Saskatchewan	L. Vigrass D. Kent
1986	Maceachern, James	Paleoenvironmental Interpretation of the Lower Cretaceous Waseca Formation, Upper Mannville Group, Lloydminster Area, Saskatchewan	D. Kent L. Vigrass
1988	Stasiuk, Lavern	Thermal Maturation and Organic Petrology of Mesozoic Strata of Southern Saskatchewan	J. Potter L. Vigrass
1990	McDougall, William	Characterization of Coals from the Ravenscrag Formation, Southern Saskatchewan, Canada	J. Potter L. Vigrass
1990	McTavish, Gregory	Salt Dissolution and Tectonics, South-central Saskatchewan	L. Vigrass
1990	Groeneveld, Neil	Geology of the Lower Mannville Strata, Winter-Senlac Area, Western Saskatchewan	L. Vigrass

1990	Beaton, Andrew	The Organic Petrology and Geochemistry of Lignite from the Paleocene Ravenscrag Formation, Southern Saskatchewan, Canada	L. Vigrass J. Potter
1990	Burton, John	Characterization and Comparison of Reservoir Lithologies, Mississippian Ratcliffe Beds; Oungre, Flat Lake and Lake Alma Oilfields, Southeastern Saskatchewan	D. Kent
1990	Kreis, Lyle	Stratigraphy of the Jurassic System in the Wapella-Moosomin Area, Southeastern Saskatchewan	D. Kent
1990	Perras, Gregg L.	Sedimentological and reservoir characteristics of the Frobisher-Alida Beds Lost Horse Hill Field, southeastern Sasktchewan	D. Kent
1990	Lincoln, D'Arcy	Sedimentation, Diagenesis and Petrophysical Characteristics of the Bone Creek Pool, Southwest Saskatchewan	D. Kent
1990	Koopman, Henry	Geology and Base Metal Occurrences of the Proterozoic Upper Grinnell and Lower Siyeh Formations, Southwestern Alberta	P. Binda D. Kent
1991	Karma, Ramez	Geology and Geochemistry of the Bakken Formation (Devonian-Missippian) in Saskatchewan	G. Parslow D. Kent
1991	Cisyk, David	Stratigraphy, Depositional Settings and Diagenesis of Carbonate Rocks of the Upper Devonian Birdbear Formation West-central Saskatchewan	D. Kent
1991	Peiris, Elias	Geology, Geochemistry and Petrography of the Uranium – Precious Metal Mineralization in the Nicholson Bay and Fish Hook Bay Area in Northern Saskatchewan	G. Parslow
1993	Maxeiner, Ralf	Geochemistry, Petrography and Metallogenesis in the Hanson Lake Area	B. Watters
1993	Cole, Kevin	The Regional Geology, Organic Petrology and Geochemistry of the Middle Jurassic Gravelbourg Formation in Southern Saskatchewan	L. Vigrass J. Potter
1994	Slimmon, William	Geology of the Gee-Sadler Lakes Area and Is Relation to the Tectonics of the Glennie Domain, Saskatchewan, Canada	J. Lewry
1995	Ogryzlo, Peter	Hearne Hill, British Columbia, Canada: Collapse Brecciation in a Continental Volcano-plutonic Arc	P. Binda G. Parslow
1995	Shi, Rupan,	Origin and Kinematic History of Highly Strained Gneisses in the Eastern Jan Lake Area	J. Lewry
1996	Yurkowski, Melinda	Factors Influencing Diagenesis, Facies Development and Reservoir Quality for Middle Devonian Upper Winnipegosis Member Southeastern Saskatchewan through Empirical Relationships between Porosity, Permeability and Pore Throat Size Distribution	D. Kent
1996	Minto, Jeffrey	A Study of Winnipegosis Reefs in the Devonian Outcrop Belt of Manitoba	D. Kent
1997	Labelle, Daniel	Allostratigraphic Analysis of the Upper Jurassic (Callovian-Oxfordian) Roseray Formation-Southwestern Saskatchewan	K. Bergman
1997	Tran, Hai	Structural Relations and Thermotectonic History of the Medicine Rapids Grassy Narrows Area, Northern Saskatchewan, Canada	J. Lewry

1997	Webber, Jeffrey	Development of a Regional High-resolution Stratigraphic Framework for the Late Albian Viking Formation in East-central Alberta and West-central Saskatchewan	K. Bergman
1998	Bernatsky, Riona	Hydrogeochemistry of Formation Waters in Southern Saskatchewan	L. Vigrass
1999	Hartlaub, Russell	Boundary Relationships Between the Northern Flin Flon Domain (Attitti Block), Kisseynew Domain And Scimitar Complex: Towards a Flin Flon-Glennie Complex	J. Lewry K. Ashton
1999	Cosford, Jason	Geomorphology and Glacial History of the Las Hayas Valley, Santa Cruz, Argentina	K. Bergman
2000	Gordon, John	Stratigraphy and Sedimentology of the Foremost Formation in Southeastern Alberta and Southwestern Saskatchewan	K. Bergman
2001	Card, Colin	Geology and Tectonic Setting of the Oldman-Bulyea Shear Zone, Northern Saskatchewan, Canada	K. Bethune K. Ashton
2002	Seibel, Christopher	An examination of the Source Rock Potential of the Deadwood and Winnipeg Formations of Southern Saskatchewan	S. Bend
2003	Ward, Kimberley	Lower Cretaceous Sparky Sandstone, Redwater Area, Central Alberta: Stratigraphy and Paleoenvironment	K. Bergman
2003	Harvey, Douglas	A Reservoir Characterization of Selected Ordovician, Devonian and Mississippian Dolostones from the Southeast Saskatchewan Portion of the Williston Basin	D. Kent H. Qing
2004	Harvey, Shawn E.	Structural Geology and Its Relationship to Paleotopography, Alteration, and Uranium Mineralization in the Deilmann Orebody, Key Lake Mine, Saskatchewan	K. Bethune K. Ashton
2004	Blair, Michael	Allostratigraphic Analysis of the Lower Middle Jurassic, Southern Saskatchewan	K. Bergman
2004	Smith, Mauri	Geochemical Analysis and Familial Association of Oils and Potential Source Rocks of the Ordovician Winnipeg Formation and Cambrian Deadwood Formation, Williston Basin	S. Bend
2005	Toews, Cameron	Sedimentology and Stratigraphic Architecture of the Bakken Formation (Devonian-Mississippian), West-Central Saskatchewan	K. Bergman
2006	MacLean, Natalie	Implications of the compositions erupted during the recent 2001-2003 activity at Mt. Etna, Sicily on the evolution of the volcano	I. Coulson
2006	Marsh, Arden	Sedimentology and Diagenesis of the Frobisher Succession in the Steelman Field in Southeast Saskatchewan	H. Qing
2006	Cameron, Angela	Petrography, Digenesis and Reservoir Analysis of The Middle Devonian Upper Winnipegosis Unit, South-Central Saskatchewan	D. Kent
2006	Nimegeers, Andrew	Stratigraphic Relationships and Depositional Model of the Mississippian Midale Beds in the Steelman-Bienfait Area, Southteastern Saskatchewan	H. Qing

2007	Cameron, Orrin	The stratigraphy, Organic Petrology, and Depositional Environments of The Middle Devonian Brightholme Member and Ratner Formation of South Central Saskatchewan	D. Kent
2007	Hunter, Rebecca	A Geological Investigation of the Thluicho Lake Group, Southwestern Rae Province, SK, Canada	K. Bethune K. Ashton
2007	Walz, Carrie	Sedimentologic, Stratigraphic, and Diagenetic Study of The Viking Formation, Bayhurst Pool and Surrounding Areas, Southwestern Saskatchewan	G. Chi P. Pedersen
2008	Nickel, Erik	Geological and Geochemical Characterization of Sealing Units in the Weyburn Oil Field, Southeast Saskatchewan	H. Qing
2009	Tong, Andy	Sedimentology, Sequence Stratigraphy, and Diagenesis of the Lower Cretaceous Viking Formation, Dodsland and Hoosier Area, West-Central Saskatchewan.	G. Chi P. Pedersen
2009	Cliveti, Monica	The Ennadai Greenstone Belt, Northern Saskatchewan	I. Coulson
2009	Cen, Xiaochun	Stratigraphy, Sedimentology and Reservoir Characterization of an Inner Platform Carbonate-Evaporite Sequence: the Late Devonian Duperow Formation of Southeastern Saskatchewan, Canada.	O. Salad-Hersi H. Qing
2010	Urban, Mark	Sedimentology, Diagenetic History and Reservoir Characterization of the Coronach Member, Herald Formation, Williston Basin, SE Saskatchewan.	H. Qing
2010	Wang, Autumn	Stratigraphic, Diagenetic and Geochemical Study of Cretaceous Strata in Central Saskatchewan.	G. Chi P. Pedersen
2010	Liu, Yongxing	Fluid Dynamics and Fluid-Structural Relationships in the Red Lake Mine Trend, Red Lake Greenstone Belt, Ontario.	G. Chi
2011	Liu, Junjie	Diagenesis of the Mississippian Midale Beds, Steelman Midale Pool, Southeastern Saskatchewan.	H. Qing
2011	Xu, Qin	Diagenetic Studies of the Mannville Group with Reference to Petroleum Charging & Biodegradation in the Lloydminster Area, Saskatchewan.	G. Chi
2010	Han, Deliang	Remote Predictive Mapping (RPM) of the Surficial Materials in the Phelps Lake Area, Northern Saskatchewan.	J. Dale
2012	Boulanger, Rachel	Geological, petrographic and geochemical characterization of the Roughrider West Zone unconformity-type uranium deposit, Athabasca Basin, Saskatchewan.	G. Chi
2012	Kohlruss, Daniel	Stratigraphic Architecture and facies analysis of the lower cretaceous Dina Member of the Mannville group in Northwest, Saskatchewan.	G. Chi
2012	McEwan, Brian	Structural Style and regional comparison of the Paleoproterozoic Ketyet River group in the region north-northwest of Baker Lake, Nunavut.	K. Bethune
2012	Knox, Bernadette	A geological investigation of the south-central Beaverlodge Domain, southern Rae Province: with emphasis on the nature and timing of deformation and associated metamorphism	K. Bethune K. Ashton
2013	Yip, Sze Shan	Diagenetic Evolution of the Middle Devonian Stone and Dunedin Formations of the Liard Basin, Northeast British Columbia	O. Salad Hersi H. Qing

2014	Saldarriaga, Andrea	Paleoecological and Paleohydrological Reconstruction of Holocence Deposits of the Cauca River Based on Diatoms and Sedimentological Analysis	I. Coulson M. Velez
2014	Yang, Chengyu	A Preliminary Investigation of Possible Occurrences of Transition Zones and Residual Oil Zones Below Oil-Water Contact in Matured Oil Fields, Southeast Saskatchewan	H. Qing
2014	Wrolson, Bree	Maceral Variations and Maceral Assemblages Within the Upper and Lower Members of the Bakken Formation, Williston Basin, Saskatchewan, Canada	S. Bend
2014	Zhang, Siyang	Petrography and Diagenesis of Cambrian Dolomite in Tabei Uplift, Northern Tarim Basin, China	H. Qing
2014	Fillmore, Julie	The Origin of Adakites in the Garibaldi Volcanic Complex, southwestern British Columbia, Canada	I. Coulson
2015	Xu, Fanghao	Characteristics of Tight Reservoirs in the Oligocene Huagang Formation, Xihu Sag, East China Sea Basin	H. Qing
2015	Liang, Rong	Characterization of Fluids Associated with Vein-type Uranium Mineralization in the Beaverlodge Uranium District, Northern Saskatchewan: Field, Petrographic, Fluid Inclusion and C-O Isotope Studies	G. Chi K. Ashton
2015	Staruiala, Adam	Sedimentology, Diagenesis (Including Dolomitization) of the Bakken Formation, Southeastern Saskatchewan Canada	H. Qing G. Chi
2015	Scott, Ryan	Petrographic, Fluid Inclusion, and Illite Geothermometry Analysis of the Rumpel Lake Drill Core, Athabasca Basin, Northern Saskatchewan, Canada	G. Chi
2016	Rabiei, Morteza	Petrography, Geochronology, Oxygen Isotope Geochemistry and Fluid Inclusion Analysis of the Maw Zone Ree Deposit: New Insights on the Relationships with Unconformity-Related Uranium Mineralization in the Athabasca Basin, Canada	G. Chi C. Normand
2016	Wood, Chase	Structural study of the auriferous Santoy shear zone, northeastern Glennie domain, Saskatchewan	K. Bethune
2016	Wang, Kewen	A Study of Petrography, Fluid Inclusions and Graphite Alteration of the Phoenix Uranium Deposit, Athabasca Basin, Northern Saskatchewan, Canada	G. Chi K. Bethune
2016	Ji, Congwei	Lithofacies, Cyclicity and Diagenetic Characteristics of the Mississippian Mission Canyon Formation, Southeast Saskatchewan	O. Salad Hersi
2016	Lei, Ming	An Examination of the Mineralogy and Lithology of the Bakken Shale with Implications upon the Bakken Petroleum System, Southeastern Saskatchewan	H. Qing
2016	Berenyi, Jason	Stratigraphic investigations into the genesis of anomalously thick coal deposits in East-central Saskatchewan	H. Qing
2016	Diaz, Juan Fernando	Litho- and Biostratigraphic analysis of the Upper Cretaceous Carlile and Niobrara formations in southern Saskatchewan, Canada	M. Velez

2017	Kennicott, Jacklyn	Petrographic, geochemical and geochronological study of albitization associated with vein type uranium mineralization in the Beaverlodge district, northern SaskatchewanA geological investigation of the south-central Beaverlodge Domain, southern Rae Province: with emphasis on the nature and timing of deformation and associated metamorphism	G. Chi K. Ashton
2017	Ullah, Aman	Lithofacies properties, biostratigraphy, cyclicity and depositional environment of the Margala Hill Limestone, Hazara Basin, Northern Pakistan	O. Salad-hersi
2018	Yin, Hang	A Comparative Study of Silicified Rock Reservoir in Shunnan 4 well of Tarim Basin with Hydrothermal Chert Reservoir of Parkland Gas Field in Western Canada Sedimentary Basin	H. Qing
2018	Hill, Peter	Sedimentology, Stratigraphy and Reservoir Characterization of the Middle Jurassic Upper Shaunavon Member in Southwestern Saskatchewan	O. Salad-Hersi
2018	Telmotzin-Loranca, Y	Palaeoenvironments and palaeoclimates during the late Holocene in lake Siscunsí (Colombia), a multiproxy perspective	M. Velez G. Simpson
2018	MacKnight, Scott	A geological and Geochemical Assessment of the Lower Mississippian Souris Valley Beds of the Lodgepole Formation in South-East Saskatchewan	S. Bend
2018	Johnstone, Dillon	Lithostratigraphic and Structural Controls of Uranium mineralization in the Kiggavik East Zone, Centre Zone, and Min Zone Deposits, Thelon Basin, Nunavut	K. Bethune

Table of Ph.D. theses completed in the Dept. of Geology.

Year	Student	Title of Thesis	Supervisor(s)
1991	Stasiuk, Lavern	Organic Petrology and Petroleum Formation in Paleozoic Rocks of Northern Williston Basin, Canada	L. Vigrass F. Goodarzi
1999	Frank, Michael	Organic Petrology and Depositional Environments of the Souris Lignite, Ravenscrag Formation (Palaeocene), Southern Saskatchewan, Canada	S. Bend
2000	Chen, Dongqing	Cretaceous Stratigraphy and Basement Influences, Peace River Arch Region, Western Canada Sedimentary Basin	K. Bergman
2001	Tran, Hai	Tectonic Evolution of the Paleoproterozoic Wollaston Group in the Cree Lake Zone, Northern Saskatchewan, Canada	K. Bethune K. Ashton B. Watters
2004	Zhang, Jichun	Stratigraphic Relationships of the Middle Devonian Elk Point Group, Saskatchewan Sub-Basin	K. Bergman H. Qing
2005	Fu, Qilong	Diagenesis of the Middle Devonian Winnipegosis and Ratner Deposits in Southern Saskatchewan, Canada	H. Qing K. Bergman
2007	Rott, Cornelius	Diagenesis of Mississipian Alida Beds, Southeastern Saskatchewan, Canada	H. Qing
2009	Cosford, Jason	A Contribution of Speleothem Isotope geochemistry to the Interpretation of Paleoclimates in Eastern China	H. Qing
2016	Chu, Haixia	Geochemical and Paleo-Geothermal Studies of the Basinal Fluids in the Athabasca Basin – Implications for unconformity- related Uranium Mineralization	G. Chi
2016	Li, Zenghua	Geometric and Hydrodynamic Modelling of Fluid-Structural Relationships in the Southeastern Athabasca Basin, Saskatchewan, Canada, with implications for Uranium Ore Genesis	G. Chi K. Bethune
2016	Aderoju, Titilade	Organic Geochemical Assessment of the Upper and Lower Members of the Bakken Formation, Southern Saskatchewan	S. Bend
2016	Card, Colin	A coming together: The juxtaposition of the Rae and Hearne cratons along the Virgin River shear zone (Snowbird tectonic zone), Saskatchewan, Canada, and the implications for proto-Laurentia	K. Bethune
2018	Olajide, Oluseyi	The Application of Modified McKenzies' Lithospheric Stretching Concept to 1D, 2D, and 3D Petroleum Systems Modelling Within the Saskatchewan Portion of the Williston Basin	S. Bend

Appendix 3 (a-d)

Examples of our student success in terms of career and future education plans, and various awards received

Appendix 3a: Partial list of our Alumni (predominately from 2007 to the present)

Undergraduate

Year of Graduation	Name		Present Employer/Educational Institution
	First	Last	
1995	Glenn	McCrimmon	Chief Geologist, Husky Energy
1998	Colin	Card	Precambrian Research Geologist, Saskatchewan Geological Survey (Energy & Resources)
1998	Shawn	Harvey	Senior Structural Geologist, Mineral Resource Management, Cameco Corp.
2001	Mark	Urban	Senior Geologist, Vermillion Energy
2002	Andy	Tong	Formerly Geologist, Suncor Energy; now owner Bicycle Repair Hub
2003	Kimberley	Bailey	MSc Laurentian (2006); now student at UBC School of Business
2007	Jason	Craven	Formerly Cameco Corp.; now Senior Geologist, SSR Mining
2007	Richard	From	MSc (2012) UofSaskatchewn, PhD (2017) UManitoba; Lab Instructor, U of Regina
2007	Marsha	Giesen	Geologist, Husky Energy
2007	Earline	Mack	Well Data Geologist, Saskatchewan Geological Survey
2007	Jeanette	Marcotte	Formerly Geologist. Troillus Gold Corp., now at Stornoway Diamond Corp.
2008	Oyeleye	Adeboye	MSc (2011) University of British Columbia ; PhD (2018), Oklahoma State University
2008	Jennifer	(Braun) Scott	Geologist, Nutrien
2008	Steve	Christie	Geologist/Partner, Tallman Geological Counsulting
2008	Jennifer	Cugnet	Owner of Valleyview Petroleum
2008	Jill	Dreger	Exploration Geologist, Encana Corporation
2008	Jennifer	Nicolay	Geologist, GoldenBand Resources Inc.
2008	Tanner	Soroka	Formerly North Rim; Now Senior Geologist, Nutrien
2008	Misty	Urbach	Exploration Geologist, Cameco Corp.; MBA (2018) Athabasca University
2008	Jenna	Vanstone	Cameco Corp. (2008-16); now Workforce Coordinator at UofS; Diploma (2019) SK Poly
2009	Rachelle	Boulanger	Geochemist, Rio Tinto in United State
2009	Matthew	Cugnet	Owner of Valleyview Petroleum
2009	Kirby	(Ebel) Philips	Geologist, SNC-Lavalin Inc.
2009	Peter	Hill	Geologist, Saskatchewan Geological Survey (Subsurface Core Facility)
2009	Andrew	Kaczowka	MSc (2017) Queens University; Mine Geologist, Cameco Corp.
2009	Brian	McEwan	Formerly SSR Mining; now Geologist, NexGen Energy Ltd.
2009	Andrew	Morley	Petroleum Research Geologist, Saskatchewan Geological Survey
2009	Jessica	Perras	Geologist, SNC-Lavalin Inc.
2009	Andrew	Weber	Fomerly Prairie Hunter; now VP Exploration, Adonai Resources II Corp.
2009	Kyle	Weir	Wellsite Geologist & President, Coyote Consulting Ltd.
2010	Jaime	Bewcyk	Project Geologist, Hudbay Mines Inc.
2010	Luc	Chabanole	MSc (2014) & PhD (end 2018), U of Saskatchewan
2010	Carole	Fletcher	Mine Submissions Administrator, Saskatchewan Geological Survey
2010	Lindsey	Richan	SNC-Lavallin
2010	Adam	Staruiala	Geologist/Geophysicist, Athabasca Oil Corp.
2010	Ryan	Szilagyi	MSc (2014) U of Alberta; Geologist, Montney Development NuVista Energy
2010	Karen	(Wassell) Calitis	Mine Geologist, Hudbay Mines Inc.
2010	Chase	Wood	Owner Pioneer Aerial Surveys Ltd., Calgary
2011	Susan	Biss	Formerly Cameco Corp.; now GIS and Land Administrator, UEX Corporation
2011	Adam	Coderre	MSc (2016) University of Calgary
2011	Tyler	Costigan	Geologist, Husky Energy
2011	Chad	Hebert	Environmental Inspector, TransCanada
2011	Hedy	Hughes	Geologist, Cenovus Energy Inc.
2011	Stephen	Kitchen	Mine Geologist, Westmoreland Coal
2011	Kelsey	McKee	Modelling Specialist Geoscientist, ORANO/Areva Resources Canada Ltd.
2011	Jalisa	Miller(McMullen)	Environmental Geoscientist, Nutrien
2011	Michael	Mueller	Equity Research Associate, Cormark Securities
2011	Michael	Petryshyn	Tallman Geological Consulting Ltd (also Petryshyn Geological Consulting)
2011	Baha	Rashid	Formerly wellsite consultant; MEng (2018) U of Regina
2011	Warren	Riemer	Project Geologist, RioTinto Exploration
2011	Ryan	Scott	Sessional lecturer, UofRegina
2011	Danielle	Seed	Geological consultant
2011	Yi	Wang	Geologist, Cameco Corp.
2011	Brody	Ward	Wellsite Geologist, Praire Stone Consulting
2011	Dane	Welter	Analyst II, Geomodeller, Cameco Corp.
2011	Bree	Wrolson	Formerly Shell; now student, Robertson College
2012	Jenna	Baker	Mineral Rights Officer, Saskatchewan Geological Survey
2012	Jason	Bot	Geologist, Mosaic Potash
2012	Richard	Boulding	Carbon and Climate Change Researcher, Agricultural Producers Association
2012	Michelle	Cronk	Former Cameco Corp. & NexGen Energy Ltd.; now Junior Techician MNP
2012	Tara	Fuchs	Senior Geologist, Storage and Production, TransGas Ltd.
2012	Alexa	Gross	Previously Areva & Big Rock; now Consulting Geologist, UEX
2012	Chris	Knott	Formerly Schlumberger Ltd.; now AHS System Builder, BHP
2012	Trent	Kulbida	Production Geologist, SSR Mining
2012	Drew	Lubiniecki	PhD student, U Adelaide, Australia
2012	Scott	MacKnight	Junior Geologist, Cresent Point Energy
2012	Ian	Mansfield	Wellsite Geologist, Reservior Dogs Geological
2012	Cody	Morrell	Geologist at K+S Potash, Canada
2012	Charla	Philippon	Hydrogeologist, Matrix Solutions
2012	Landen	Powell	Outreach Geologist, Northwest Territories Geological Survey
2012	Andrew	Thomas	Geological Consultant, Cabra Consulting Ltd.

Year of Graduation	Name		Present Employer/Educational Institution
	First	Last	
2013	David	Delorme	Cabra Consulting Ltd.
2013	Zach	Henry	Project Geologist, GeoPacific Consultants Ltd.
2013	Ashlee	(Latimer) Thomas	Geologist, Global Exploartion, New Ventures, CNOOC International
2013	Braden	Mueller	Wellsite Geologist, McLeay Geological Consultants
2013	Andrew	Smith	Geologist, ORANO/AREVA Resources Canada Ltd.
2013	Corbin	Stewart	Analyst, RBC Capital markets
2013	Samantha	Van de Kerckhove	MSc (2017) Dalhousie; Precambrian Research Geologist, SGS (Energy & Resources)
2013	Jeff	Wagner	Wellsite geologist, Pipestone Geological Inc.
2014	Taylor	Haid	MSc (2016) Western; Exploration Geologist, Metallic Minerals Corp. & Consultant
2014	Brady	Henderson	Geoscientist, Dillon Consulting Ltd.
2014	Tyson	Jamieson	Staft tech at DMC Mining Services
2014	Dillon	Johnstone	PhD student (UofR) & Precambrian Research Geologist, SGS (Energy & Resources)
2014	Travis	LeGault	Geo-technician, Clifton Associates
2014	Lee	MacKenzie	Canadian Air Force pilot
2014	Clarke	Plews	Mudlogging Analyst (ML-1) at Schlumberger Ltd. in Newfoundland
2014	Jessica	Poncsak	Surveyor, ACCIONA
2014	James	Rushton	Previously Matrix Solutions, Inc.; now a consultant
2014	Elysia	Schuurmans	MSc student, UofRegina
2014	Nathan	Wielgoz	Formerly Schlumberger Ltd.; now Cabra Consulting Ltd.
2015	Jonathan	Berthiaume	MSc (2018) U of Adelaide; Exploration Geologist, Fortescue Metal Group, Australia
2015	Matthew	Boey	SK Poly Diploma (2018); Hazardous Minerals Technologist, Pinchin Ltd.
2015	Erica	Bourlon	Waste Diversion Officer, City of Regina
2015	Andrew	Brittner	Student Environmental Technology, SK Polytechnic
2015	Jenna	Cannon	Gallery Interpreter, Royal Saskatchewan Museum
2015	Michael	Cloutier	Current MSc student, UofRegina
2015	Ryley	Garchinski	BEng student, UofRegina; Solar Site Technician, Exactus Energy Inc.
2015	Shayna	Glass	Director/Owner, Diva Dance
2015	Cory	Hill	NexGen Energy Ltd.
2015	Mark	Matthews	Environmental Technician, Westmoreland Coal Company
2015	Steve	Mieckel	CanadaPost, Regina
2015	William	Ogilvie	MSc student, Laurentian University
2015	Amanda	Palaniuk	Assessment Geologist; Saskatchewan Geological Survey (Energy & Resources)
2015	Henry	Reis	Rock Mechanics Associate, SRK Consulting
2015	Carson	Renaud	MSc (2016) UofAlberta; Junior Geologist, Cresent Point Energy
2015	Justin	Rodko	Exploration geologist, GIT-IsoEnergy Ltd.
2015	Jared	Suchan	Geography (2016) UofRegina; Student PhD(Eng), UofRegina; Voyageur Exploration, Inc.
2015	Matthew	Thompson	MSc student, U of Regina
2015	Katherine	Todd	Ekati Diamond mine (Dominion Diamond Mines)
2016	Ryan	Bachynski	TerraX Minerals; cofounder and managing partner Voyageur Exploration, Inc.
2016	Keane	Baseden	Formerly NexGen; now ORANO/Areva Resources Canada Ltd.
2016	Werner	Baylefeld	International Office, U of Regina
2016	Jordan	Deane	MSc student, UofRegina
2016	Taylor	Forsyth	Business Development Representative, Crestview Chrysler Dodge Jeep
2016	Randelyn	Freed	Logging Geologist, NexGen Energy Ltd.
2016	Bryn	Gelowitz	Geologist, Rio Tinto
2016	Sienna	Johnson	Geologist, De Beers
2016	Max	Kaczmer	Logging Geologist, NexGen Energy Ltd.
2016	John	Kelly	Junior Geologist, Orix Geoscience Inc.
2016	Britney	Laturnus	MEng (2018) U of Saskatchewan; Geologist, SRK Consulting
2016	Sean	Lobb	Exploration Geologist, SSR Mining
2016	Ivan	Marsden	Junior Field Geologist, Petroleum Technology Research Centre, Estevan
2016	Zach	Maurer	Geologist/hydrogeologist, Vertex & MSc student, UofRegina
2016	Kalcey	Moltz	Contract Geologist, Rio Tinto Exploration
2016	Jarred	Noll	Contract Geologist, NexGen Energy Ltd.
2016	Micheal	Raiwet	Junior Geologist, SSR Mining
2016	Amanda	Schoenroth	Mine submissions, Saskatchewan Geological Survey
2016	John	Sprague	Associated Scientist at Saskatchewan Research Council
2016	Brodie	Stroh	MSc student, UBC
2016	Jacob	Van Niekerk	Geologist, NexGen Energy Ltd.
2016	Brett	Williams	Dip. Business Admininstration (2016), UofRegina; Geoscientist, Rio Tinto Exploration
2016	Andrew	Yubeta	Field Manager, Pioneer Aerial Surveys, Ltd.
2017	Madeleine	Berry	Logging Geologist, NexGen Energy Ltd.
2017	Ashton	Chaykowski	Geologist, NexGen Energy Ltd.
2017	Chelsea	Cooke	Environmental Scientist, Associated Environmental Consultants
2017	Derrick	Johnson	Exploration Geologist, RioTinto
2017	Arin	Kitchen	MSc student, UofRegina
2017	Joel	Lesko	Student in computer sciences, UofRegina
2017	Kaitlynn	MacKenzie	Equity Exploration Consultants Ltd.
2017	Zach	McClinton	Crop Production Advisor, Crop Production Services, Nutrien
2017	Landin	Moldenhauer	Formerly Dias; now wellsite in United States
2017	Codie	Page-Korchinski	Junior Geologist/Field Manager, Pioneer Aerial Surveys, Ltd.
2017	Hilary	Roemer	BEd student, UofRegina

Year of Graduation	Name		Present Employer/Educational Institution
	First	Last	
2017	Brayden	Schwartz	Fremont Gold, USA
2018	Kirsten	Cunningham	Fremont Gold, USA
2018	Josh	Kluck	Junior Mine Geologist, SSR Mining
2018	Ebbyan	Koshin	Hydrogeologist at Millennium EMS Solutions, Calgary
2018	Jared	Mellom	Inspector, Absolute Locating
2018	Stephanie	Sawchuk	Formerly Parsons; now Environmental Technician, Baffinland Iron Mines, Baffin Island
2018	Jarred	Squire	Barrick Gold North America
2018	Alana	Wagner	Environmental Technician, Conuma Coal Resources
2018	Joel	Wright	Teacher in China
2019	Anastasia	Comtois-Poissant	Likely 2019 graduate; Project Geologist, SSR Mining
2019	Evan	Hauber	Geologist, Stantec
2019	Natasha	Zeiler	Geologist, K&S Potash

MSc Graduates

Year of Graduation	Name		Present Employer/Educational Institution
	First	Last	
1999	Jason	Cosford	Geoscientist, J.D. Mollard and Associates
2001	Colin	Card	Precambrian Research Geologist, Saskatchewan Geological Survey (Energy & Resources)
2004	Shawn	Harvey	Senior Structural Geologist, Mineral Resource Management, Cameco Corp.
2007	Rebecca	Hunter	PhD student (Laurentian U); formerly Cameco Corp. (10 years), now a consultant
2008	Erik	Nickel	Director of Operations, Petroleum Technology Research Centre
2009	Helen (Xiaoc	Cen	Petroleum Geologist, Nova Scotia Government, Halifax
2009	Monica	Cliveti	Laboratory Instructor III, UofRegina
2009	Andy	Tong	Formerly Geologist, Suncor Energy; now owner Bicycle Repair Hub
2010	Deliang	Han	Project Geologist, Respect Consulting Inc.
2010	Yongxing	Liu	Senior Project Geologist, Dennison Mines
2010	Mark	Urban	Senior Geologist, Vermillion Energy
2010	Autumn	Wang	Senior Staff Geologist, Husky Energy
2011	Junjie	Liu	Manager, Potash Mining Company, Saskatoon
2012	Rachelle	Boulanger	Geochemist, Rio Tinto in United State
2012	Bernadette	Knox	Formerly SGS; now Geologist, Northwest Territories Geological Survey
2012	Dan	Kohlruss	Research Geologist, Saskatchewan Geological Survey (SGS)
2012	Brian	McEwan	Formerly SSR Mining; now Geologist, NexGen Energy Ltd.
2012	Qin	Xu	Project Scientist, SNC Lavalin Inc.
2013	Sze-Shan	Yip	Environmental Geologist, Alberta Environmental Company
2014	Julie	Filmore	Homemaker
2014	Bree	Wrolson	Formerly Shell; now student, Robertson College
2014	Chengyu	Yang	Catering business owner
2014	Siyang	Zhang	PhD student, UofRegina
2015	Rong	Liang	Geologist. Golden Fortune Mining (Canada)
2015	Ryan	Scott	Sessional lecturer, UofRegina
2015	Adam	Staruiala	Geologist/Geophysicist, Athabasca Oil Corp.
2015	Fanghao	Xu	Professor at Chengdu University of Technology
2016	Jason	Berenyi	Assistant Chief Geologist, Saskatchewan Geological Survey (Energy & Resources)
2016	Congwei	Ji	Staff member at the Chinese Consulate in Calary
2016	Ming	Lei	Acting Multi Program Inspector, Canadian Food Inspection Agency
2016	Morteza	Rabiei	PhD student, UofRegina
2016	Kewen	Wang	Supervisor of Logging Geologists, NexGen Energy Ltd.
2016	Chase	Wood	Owner Pioneer Aerial Surveys Ltd., Calgary
2017	Juan	Diaz-Tamayo	PhD student, University of Calgary
2017	Jacklynn	Kennicott	Geologist, TriMetals Mining Inc.
2017	Scott	MacKnight	Junior Geologist, Cresent Point Energy
2017	Aman	Ullah	Deputy Manager, Enterprise, Regina
2018	Peter	Hill	Geologist, Saskatchewan Geological Survey (Subsurface Core Facility)
2018	Dillon	Johnstone	Current PhD student (UofR) & Saskatchewan Geological Survey (Energy & Resources)
2018	Yunuen	Telmotzin-Loranca	PhD student (Anthropology), U of Alberta
2018	Hang	Yin	Maternity leave
2019	Richard	Boulding	Carbon and Climate Change Researcher, Agricultural Producers Association
2019	Devon	Stuebing	Anticipate defense shortly; Project Geologist, SSR Mining

PhD

Year of Graduation	Name		Present Employer/Educational Institution
	First	Last	
2007	Cornelius	Rott	Oil company in Calgary
2009	Jason	Cosford	Geoscientist, J.D. Mollard and Associates
2016	Titilade	Aderoju	Sessional lecturer, UofRegina & Consultant
2016	Colin	Card	Precambrian Research Geologist, Saskatchewan Geological Survey (Energy & Resources)
2016	Haixia	Chu	Associate Researcher at China University of Geosciences, Beijing, China
2016	Zenghua	Li	Postdoc (UofRegina); now Professor at East China University of Technology, China

Appendix 3b: List of some of the Awards received by our students

Year of Graduation	Student's Name	Scholarship/Awards Achievement
2018	Macnight, Scott, MSc	CSPG Best Student Presentation (2018)
2016	Zenghua Li, PhD	SGS Second Best Graduate Student Poster Award (2015)
2016	Brodie Stroh, BSc	SGS President's Award (Best Undergraduate Student Poster Award) (2015)
2015	Rong Liang, MSc	SGS Lazlo Fuzesy Award (Best Graduate Student Poster Award) (2013)
2014	Taylor Haid, BSc	SGS President's Award (Best Undergraduate Student Poster Award) (2013)
2013	Samantha Van de Kerckhove, BSc	SGS President's Award (Best Undergraduate Student Poster Award) (2012)
2012	Rachelle Boulanger, MSc	SGS Lazlo Fuzesy Award (Best Graduate Student Poster Award) (2010)

Appendix 3c: List of our successful participants in SIFT and S-IMEW (2004 to the present)

S-IMEW

Year	Student Name	Present Employment/Educational Institution
2018	Dallas Dixon	Was on co-op with Nutrien for 8 months; completing his last semester of BSc
2017	Anastasia Comtois-Poissant	Project Geologist, SSR Mining; hopes to finish her last course in 2019
2016	Ryan Bachynski	Geologist, TerraX Minerals; co-founder and managing partner Voyageur Exploration, Inc.
2015	Ivan Marsden	Junior Field Geologist, Petroleum Technology Research Centre, Estevan
2014	Jonathan Berthiaume	MSc (2018) University of Adelaide; Exploration Geologist, Fortescue Metal Group, Australia
2013	Taylor Haid	MSc (2016) Western; Exploration Geologist, Metallic Minerals Corp. & Consultant
2012	Chase Wood	MSc (2016) University of Regina; Entrepreneur runs Pioneer Aerial Surveys, Ltd.
2011	Not awarded	
2010	Andrew Smith	Geologist, ORANO/AREVA Resources Canada Ltd.
2009	Jamie Bewcyk	Project Geologist, Hudbay Minerals, Inc.
2008	Jessica Perras	Project Geologist, SNC-Lavalin
2007	Not awarded (first year)	

SIFT

Year	Student	Present Employment/Educational Institution
2018	Josh Kluck	Junior Mine Geologist, SSR Mining
2017	Arin Kitchen	Won technical award; MSc student at University of Regina
2016	Brodie Strohl	MSc student at University of British Columbia
2015	Sienna Johnson	Won technical award; Geologist, DeBeers
2014	Nathan Wielgoz	Geologist, Cabra Consulting Ltd.
2013	Andrew Thomas	Geologist, Cabra Consulting Ltd.
2012	Warren Riemer	Project Geologist, RioTinto Exploration (turned down SIFT for another scholarship)
2011	Luc Chabanole	MSc (2014) & PhD (end 2018) University of Saskatchewan
2010	Ryan Szilagyi	MSc (2014) University of Alberta; Geologist, Montney Development, NuVista Energy
2009	Steven Christie	Geologist/Partner, Tallman Geological Counsulting
2008	Andrew Weber	VP Exploration, Adonai Resources II
2007	Misty Urbach	MBA (2018) Athabasca University; Exploration Geologist, Cameco Corp.
2006	Jeanette Marcotte	Geologist, formerly at Triollus Gold now at Stornoway Diamond Corp.
2005	Chelsey Ebel	
2004	William Clark	Won technical award; MBA (2011) U of Calgary; Exploration Manager, TimberRock Energy

Appendix 3d: List of Awards that our undergraduate students may be considered for each year.

Robert Milner award of the Saskatchewan Geological Society, for the top graduating student in Geology
Mineralogical Association of Canada Prize in Mineralogy, awarded to the student with the highest aggregate marks in Mineralogy (Geol210, Geol211)
GAC-PDAC Logan Prize, for a graduating, academically sound student, who has shown leadership and proficiency in field methods
D.M. Kent Consulting Geologist Ltd. Scholarship in Sedimentary Geology, for student with the highest aggregate in courses on Sedimentary Geology
L.V. Vigrass Prize in Geology, for student with the highest grade in Petroleum related Geology courses
D.M. Kent Consulting Geology Student Travel Award, funds are made available under this award to support student field trips
Gerry Handford Memorial Award
APEGS Gold Medal, an award for students in Geology who demonstrate both leadership and a high Gpa (min 75%)
Governor General Gold Medal
John Lewry Prize in Geology, an award for students who excel in Precambrian Geology and Structural Geology
W.A. Gordon Prize in Geology, for student with the highest Gpa at the end of their second year in Geology
APEGS Geoscience Prize (formerly book award), for student with highest Gpa in Geology, after 90 credit hours completed
PDAC, Student-Industry Mineral Exploration Workshop. Each year we recommend to the PDAC one or two of our best students to participate in this competitive award
CSPG - Student Industry Field Trip (SIFT), each year we recommend to the CSPG our best student to participate in this field trip