

CURRICULUM VITAE OF SALLY L. POTTER-MCINTYRE

I. PROFESSIONAL AFFILIATION AND CONTACT INFORMATION

A. Present university Department or Unit :

Geology

B. Office Address :

College of Science, Geology Department
Parkinson Lab Mailcode 4324
Room 215D
Southern Illinois University
Carbondale, IL 62901
E-Mail: pottermcintyre@siu.edu

II. EDUCATION

Ph.D. in Geology, University of Utah, 2013, Dr. Marjorie A. Chan, advisor,
Dissertation: Biogeochemical Signatures in Iron (Oxyhydr)oxide Diagenetic Precipitates:
Chemical, Mineralogical and Textural Markers

M.S. in Geology, University of Utah, 2009, Dr. Marjorie A. Chan, advisor
Thesis: Characterization of Navajo Sandstone Hydrous Ferric Oxide Concretions

B.S. in Geology, Mesa State College, summa cum laude, 2006

A.S., Colorado Mountain College, 2004

III. PROFESSIONAL EXPERIENCE

Assistant Professor in Sedimentology, Department of Geology, Southern Illinois University,
8/2013 to present

Lecturer, Colorado Mesa University, Department of Physical and Environmental Sciences,
2012/2013

Energy and Geoscience Institute at the University of Utah, summer 2011. Field Geologist.

Research Assistant (to B.J. McPherson), 2011-2013

Field Geologist, Energy and Geoscience Institute at the University of Utah, summer 2010: CO₂
sequestration project; Atlas III project; Brian McPherson, supervisor;

Teaching Assistant, University of Utah, Fall 2010, Spring 2011

Graduate Fellow, Fall 2009 – Spring, 2010

Research Assistant (to M. Chan), Fall 2006 – Spring 2008

IV. RESEARCH AND CREATIVE ACTIVITY

A. Interests and Specialties :

Sedimentology, sedimentary diagenesis, basin analysis

Geochemistry of terrestrial environments, geobiology

Mars sedimentology, sedimentary/geochemical records of life, astrobiology

B. Current Projects :

Magmatic Intrusions into Sulfur-rich Sediments: An Exposed Potential Subsurface Habitable Environment as an Analog for the Martian Crust

Basin reconstruction of the Central Colorado Trough

Distinguishing biotic from abiotic precipitation mechanisms: Ten Mile Graben cold spring system

Constraining conditions for habitability in diagenetic environments

The origin and persistence of diagenetic jarosite and alunite in Jurassic rocks on the Colorado Plateau

C. Grants Received :

Filiberto, Justin, Potter-McIntyre, Sally (Co-Principal), "Magmatic Intrusions into Sulfur-rich Sediments: An Exposed Potential Subsurface Habitable Environment as an Analog for the Martian Crust," Sponsored by NASA, Federal, \$349,054.00. (January 2018 - December 2020).

Potter-McIntyre, Sally, "NAI Early Career Collaboration Award," Sponsored by NASA Astrobiology Institute, Federal, \$4,324.00. (June 1, 2016 – May 31, 2017).

Potter-McIntyre, Sally (Co-Principal), Filiberto, Justin (Principal), "Magmatic Intrusions Into Sulfur-rich Sediments: Analogs for Martian Exploration and Potential Habitability," Sponsored by National Geographic Society Committee for Research and Exploration, Foundation, \$14,692.00. (May 1, 2016 - April 30, 2017).

Potter-McIntyre, Sally, "Middle to Late Jurassic Paleogeography, Western Colorado, USA," Sponsored by American Chemical Society Petroleum Research Fund, Foundation, \$110,000.00. (May 1, 2015 - April 30, 2017).

E. Honors and Awards :

2015 Editors' Citation for Excellence in Refereeing for JGR-Planets, AGU, 2015

Student awards:

Nahid Hasan, Porter-Jobling Research Grant, 2018

Jessica Whiteaker, Minority Student Scholarship Award, 2016

Jason William, LPI Early Career Development Award, 2016

Jason Williams, NASA Astrobiology Institute Scholarship to the International Astrobiology Summer School in Santander, Spain, (one of ten American graduate students and post docs), 2015

John Ejembi, Student Education Program Award, SEG/ ExxonMobil, 2016

John Ejembi, Applied Geoscience Conference Student Travel Grant, HGS, 2016

John Ejembi, Porter-Jobling Research Grant, 2016

F. Papers and Presentations at Professional Meetings :

(Student authors are italicized. Authors are listed in order of contribution.)

Potter-McIntyre, Sally, McCollom, Thomas, Geophysical Research Abstracts Vol. 20, EGU2018-17976, EGU General Assembly, "Unusual Preservation of Diagenetic Jarosite and Alunite in Jurassic Sandstones at Mollies Nipple, Kane Country, Utah, USA." (April, 2018)

Costello, Lacey, Filiberto, Justin, Potter-McIntyre, Sally, *Crandall, Jacob*, Schwenzer, Susanne, Hummer, Daniel, 49th Lunar and Planetary Science Conference (LPI Contrib. No. 2083) "Alteration and oxidation of an olivine lamprophyre dike from southern Utah, USA: An analog for Mars." (March, 2018)

Crandall, Jacob, Filiberto, Justin, Potter-McIntyre, Sally, Schwenzer, Susanne, 49th Lunar and Planetary Science Conference (LPI Contrib. No. 2083), "Magmatic intrusions into the sulfur-rich Carmel Formation on the Colorado Plateau, USA: Implications for the Mars 2020 mission." (March, 2018)

Potter-McIntyre, Sally, Thomas, Rebecca, Osterloo, Mikki, Hynek, Brian, 49th Lunar and Planetary Science Conference (LPI Contrib. No. 2083), "Windows into the habitable subsurface: terrestrial examples of exposed subsurface mineralization as analogs for Mars." (March, 2018)

Knuth, Jordan, Potter-McIntyre, Sally, 49th Lunar and Planetary Science Conference (LPI Contrib. No. 2083), "Preservation of biosignatures in the Ten Mile Graben cold springs, Utah." (March, 2018)

Ejembi, John, Ferre, Eric, Potter-McIntyre, Sally, AGU Fall Meeting, "Paleocurrents of the Middle–Upper Jurassic strata in the Paradox Basin, Colorado, inferred from anisotropy of magnetic susceptibility (AMS)." (December 2017)

Ejembi, John, Potter-McIntyre, Sally, GSA Annual Meeting, "Detrital zircon U-PB geochronology of Middle to Upper Jurassic strata in the Paradox Basin: Insights into tectonic uplift of the Wet Mountains AND southern Front Range, Colorado, U.S.A." (October, 2017)

O’Connell, Laura, Potter-McIntyre, Sally, *Williams, Jason*, *Knuth, Jordan*, GSA Annual Meeting, "Facies analysis and comparison of Jurassic, Quaternary, And Modern carbonate lake and spring deposits of Ten Mile Graben, East Central Utah." (October, 2017)

McCollom, Thomas, Potter-McIntyre, Sally, 4th International Conference on Early Mars, "Jarosite and Alunite Cements in Jurassic Sandstones of Utah and Nevada, a Potential Analog for Stratified Sulfate Deposits on Early Mars." (August 2017).

Potter-McIntyre, Sally, *Ejembi, John*, Goldschmidt, "Differentiating Climatic from Tectonic Influences on Shifting Depositional Environments Using Detrital Zircon Geochronology." (August 2017).

Potter-McIntyre, Sally, McCollom, Thomas, Astrobiology Science Conference, "Jarosite in Ancient Terrestrial Rocks: Implications for Understanding Mars Diagenesis and Habitability." (April 2017).

Filiberto, Justin, *Crandall, Jake*, Potter-McIntyre, Sally, Schwenzer, Susanne, Olsson-Francis, Karen, Bridges, John, Astrobiology Science Conference, "Magmatic intrusions into Sulfur-rich Sediments: An Exposed Potential Subsurface Habitable Environment as an Analog for the Martian Crust." (April 2017).

Crandall, Jake, Potter-McIntyre, Sally, Schwenzer, Susanne, Filiberto, Justin, 48th Lunar and Planetary Science Conference, "Intrusions into Sulfur-rich Sediments on the Colorado Plateau: An Analog for Mars Exploration." (March 2017).

Thomas, Rebecca, Potter-McIntyre, Sally, Hynek, Brian, 48th Lunar and Planetary Science Conference, "Fluid-Deposited Fracture-Margin Ridges in Margaritifer Terra, Mars." (March 2017).

Potter-McIntyre, Sally, GSA Annual Meeting, Jarosite in ancient terrestrial sedimentary rocks: Implications for understanding Mars diagenesis and habitability. (October, 2016)

Williams, Jason, Potter-McIntyre, Sally, O'Connell, Laura, GSA Annual Meeting, "Quaternary and Jurassic terrestrial spring deposits as analogs for ancient aqueous environments on Mars." (October, 2016)

Potter-McIntyre, Sally, *Williams, Jason*, Phillips-Lander, Charity, O'Connell, Laura, Biosignature Preservation and Detection in Mars Analog Environments (LPI contribution 1912) Progressive Diagenetic Alteration of Macro- and Micro-Scopic Biosignatures in Ancient Springs and Spring-Fed Lacustrine Environments (May, 2016).

Potter-McIntyre, Sally, *Williams, Jason*, Lander, Charity, Laura, O'Connell, 47th Lunar and Planetary Science Conference, "Diagenetic Alteration of Biosignatures Preserved in Spring Carbonates: Implications for Mars." (March 2016).

Williams, Jason, Potter-McIntyre, Sally, Phillips-Lander, Charity, O'Connell, Laura, GSA National Meeting, "A Jurassic Spring-Fed Lake System In The Brushy Basin Member Of The Morrison Formation, Ten Mile Graben, Utah, USA: Biosignature Preservation And Astrobiological Implications," GSA, Baltimore, MD. (October, 2015).

Johnson, Matthew, Potter-McIntyre, Sally, *Ejembi, John*, GSA National Meeting, "A Porosity and Permeability Comparison of the Mancos Shale and Wanakah Formation of Western Colorado," GSA. (2015).

Ejembi, John, *Johnson, Matthew*, Potter-McIntyre, Sally, GSA National Meeting, "Detrital Zircon Studies In Relation To Provenance Of The Jurassic Wanakah Formation And Adjacent Rock Units In Western Colorado." (October, 2015).

Potter-McIntyre, Sally, *Williams, Jason*, Phillips-Lander, Charity, O'Connell, Laura, GSA National Meeting, "Identification and Preservation over Geologic Time of Biosignatures in Cold Spring Carbonates." (October, 2015).

Craft, K.L., Potter-McIntyre, Sally, Lowell, R.P., 46th Lunar and Planetary Science Conference, "Aromatum Chaos: Heating Up, Melting Ice, and Letting It Flow - A Preliminary Analysis," LPI. (March, 2015).

Potter-McIntyre, Sally, Conger, Robert, Astrobiology Science Conference, "The Astrobiology Project: A Scientific and Artistic Synthesis of Humankind's Most Profound Questions," Astrobiology Science Conference, Chicago, IL. (June 2015).

Potter-McIntyre, Sally, Chan, Marjorie, McPherson, Brian, AGU Fall Meeting, "Diagenetic Iron Cycling in Ancient Alkaline Saline Lacustrine Sedimentary Rocks: A Case Study of the Jurassic Brushy Basin Member of the Morrison Formation, Colorado Plateau, USA," AGU. (2014).

Potter-McIntyre, Sally, GSA National Meeting, "Diagenetic Alteration And Concretion Formation In The Jurassic Brushy Basin Member Of The Morrison Formation, Colorado Plateau, Usa: An Analog Study For The Yellowknife Bay Formation At Gale Crater, Mars," GSA, Vancouver, Ontario. (2014).

Potter-McIntyre, Sally, Nordic Astrobiology Conference, "The Fluvio-Lacustrine Yellowknife Bay Formation, Gale Crater, Mars: A Truly Habitable Volcaniclastic Environment?," Bergen, Norway. (May 2014).

Potter-McIntyre, Sally, "Diagnostic Characteristics to Aid in the Search for Early life on Earth and Mars," Santiago, Chile. (December 2013).

Potter-McIntyre, Sally, Chan, Marjorie, McPherson, Brian, AGU, "The Lacustrine Upper Brushy Basin Member of the Morrison Formation, Four Corners Region, Usa: a Lithological and Mineralogical Terrestrial Analog for Gale Crater, Mars." (2013).

Potter-McIntyre, Sally, Marjorie, Chan, Brian, McPherson, GSA National Meeting, "Evaluating the role of organics, mineralogy and petrophysical properties on early diagenesis and concretion formation in volcaniclastic host rock composition," GSA. (2013).

Boraas, Marisa, Potter-McIntyre, Sally, DePriest, Keegan, Aslan, Andres, GSA National Meeting, "Initial Provenance Analysis of the Late Jurassic Lacustrine Wanakah Formation, Eastern Utah and Western Colorado," GSA. (2013).

Potter-McIntyre, Sally, *Boraas, Marisa, DePriest, Keegan, Aslan, Andres, GSA National Meeting, "Late Jurassic Rocks of the Colorado Plateau as Depositional and Diagenetic Analogs to Gale Crater, Mars," GSA. (2013).*

DePriest, Keegan, Potter-McIntyre, Sally, Boraas, Marisa, Spain, Thomas, GSA Regional Meeting, "Petrophysical properties of the Wanakah Formation; evaluating seal efficacy of terrestrial versus marine shales," GSA. (2013).

Potter-McIntyre, Sally, Chan, Marjorie, McPherson, Brian, AGU Fall Meeting, "Textural and Mineralogical Characteristics of Microbial Fossils in Modern and Ancient Iron (oxyhydr) oxides," AGU. (2012).

Potter-McIntyre, Sally, Chan, Marjorie, McPherson, Brian, LPSC, "Iron (oxyhydr)oxide biosignatures in the Brushy Basin Member of the Jurassic Morrison Formation, Colorado Plateau, USA; analog for Martian diagenetic iron," LPI. (2012).

G. Invited and Keynote Talks :

Potter-McIntyre, Sally, Cosmic Perspective of Earth: A Planet Permeated and Shaped by Life – Implications for Astrobiology, "Past and Present Potential Habitable Environments on Mars," ELSI EON, Tokyo, Japan. (September 2017).

Potter-McIntyre, Sally, "Habitable and Diagenetic Environments," University of Cincinnati. (September 22, 2017).

Potter-McIntyre, S., keynote (funded) address, "Past and Present Potential Habitable Environments on Mars", 4th International Geobiology Conference, Wuhan, Hubei, China. (June 2017)

Potter-McIntyre, Sally, Search for life: from Early Earth to Exoplanets, "Progressive Diagenetic Alteration of Macro- and Micro-Scopic Biosignatures in Ancient Springs and Spring-Fed Lacustrine Environments," Quy Nhon, Vietnam. (December 2016).

Potter-McIntyre, S., "Biosignatures and habitability in the rock record", Northern Illinois University. (January, 2017)

Potter-McIntyre, S., Chancellor's Scholar Weekend, "Mars Exploration," Southern Illinois University. (February, 2016)

Potter-McIntyre, S.L., Jurassic Fluvio-lacustrine Formations on the Colorado Plateau: Informing Astrobiological and Sedimentological Research at Gale, Crater, Mars, University of Wisconsin, Madison. (February, 2015)

Potter-McIntyre, S.L., The Jurassic Brushy Basin Member of the Morrison Formation, Colorado Plateau, western US: A lithological, diagenetic and astrobiological terrestrial analog for Gale Crater, Mars, Illinois State University. (October, 2013)

H. Hosted Meeting Technical Sessions :

Diagenesis on Mars and Clues from Terrestrial Systems, AGU, 2018

Deciphering Diagenesis: Understanding Fluid/Rock/Biota Interactions in the Rock Record, EGU, Vienna, Austria, April 8-13, 2018.

Past and Present Biosignature Recognition on Earth and Mars, GSA Annual Meeting, Denver, September, 2016.

I. Software Donations :

"Interactive Petrophysics Software," Sponsored by Lloyd's Register, Private. (December 16, 2016 - December 15, 2019).

"BasinMod Software," Sponsored by Platte River Associates, Private. \$120,000. (January 2016 - December 2018).

"Petrel Software," Sponsored by Schlumberger, Private, \$2,843,825.25. (January 1, 2015 - December 31, 2018).

"Petra Software," Sponsored by IHS Markit, Private. \$97,060. (August 2017 - August 2018).

"OpendTect," Sponsored by dGB, Private. (January 1, 2016 - December 31, 2017).

V. PUBLICATIONS AND CREATIVE WORKS

A. Articles in Professional Journals :

Chan, Marjorie A., Hinman, Nancy W., **Potter-McIntyre, Sally L.**, Schubert, Keith E., Gillams, Richard J., Awramik, Stanley M., Boston, Penelope, Bower, Dina M., Des Marais, David J., Farmer, Jack, King, Penelope L., Kirshvink, Joe, Hazen, Robert M., Léveillé, Richard J. Papineau, Dominic, Sánchez-Román, Mónica, Spear, John R., Southam, Gordon, Stern, Jennifer C., Rempfert, Kaitlin R., Jia, Tony Z. and Cleaves II, H. James (2018) Biosignatures in Planetary Context, *Frontiers in Microbiology*, in review.

Potter-McIntyre, S.L., McCollom, T.M. (2018) Jarosite and alunite in ancient terrestrial sedimentary rocks: Reinterpreting martian depositional and diagenetic environmental conditions, *Life*

Potter-McIntyre, S.L., *Breeden, J.R.*, Malone, D. (2018) A Maastrichtian birth of the Mississippi River, *Cretaceous Research*, v. 91, p. 71-79.

Thomas, R.J., **Potter-McIntyre, S.L.**, Hynek, B.M. (2017) Large-scale fluid-deposited mineralization in Margaritifer Terra, Mars, *Geophysical Research Letters*, v. 122, p. 483-500.

Hays, L.E., Graham, H.V., Horgan, B. **Potter-McIntyre, S.L.**, Williams, A.J., Des Marais, D., Parenteau, M.N., Hausrath, E., McCollom, T.M., Lynch, K.L. (2017) Report from the Biosignature Preservation and Detection in Mars Analog Environments Workshop, *Astrobiology*, doi: 10.1089/ast.2016.1627.

Potter-McIntyre, S.L., *Williams, J.*, Phillips-Lander, C., *O'Connell, L.* (2016) Identification and Preservation Over Geologic Time of Biosignatures in Cold Spring Carbonates, *Astrobiology*, doi: 10.1089/ast.2016.1495.

Potter-McIntyre, S.L., Boraas, M., DePriest, K., Aslan, A. (2016) Middle Jurassic Landscape Evolution of Southwest Laurentia using Detrital Zircon Geochronology, *Lithosphere*. doi: 10.1130/L467.1.

Potter-McIntyre, S.L., Chan, M.A., and McPherson, B.J. (2014) Evaluating the Role of Organics, Mineralogy and Petrophysical Properties on Early Diagenesis and Concretion Formation in Volcaniclastic Host Rock Composition, *Journal of Sedimentary Research*, doi: <http://dx.doi.org/10.2110/jsr.2014.58>.

Potter-McIntyre, S.L., Chan, M.A. and McPherson, B.J. (2014) Textural and Mineralogical Characteristics of Microbial Fossils Associated with Modern and Ancient Iron (Oxyhydr)oxides, *Astrobiology*, v.14, no.1.

Diniega, S., Balcerski, J., Carande, B., Diaz-Silva, R.A., Fraeman, A.A., Guzewich, S.D., Hudson, J., Nahm, A.L., **Potter-McIntyre, S.L.**, Route, M., Sayanagi, K., Urban, K., Vasisht, S., Benneke, B., Gil, S., Livi, R., Williams, B., Budney, C.J., Lowes, L.L., January (2013) Mission to the Trojan Asteroids: lessons learned during a JPL Planetary Science Summer School mission design exercise. *Planetary and Space Science*, DOI:10.1016/j.pss.2012.11.011.

Potter-McIntyre, Sally L., Allen, J.L., Lee, S-Y., Chan M.A., McPherson, B.J. (2013) Iron Precipitation in a Natural CO₂ Reservoir: Jurassic Navajo Sandstone in the northern San Rafael Swell, UT, USA. *Geofluids*, doi: 10.1111/gfl.12014.

Allen, J.L., Lee, S-Y., **Potter, S.L.** (2013) Three Dimensional Geologic Model of the Eolian Jurassic Navajo Sandstone in Central Utah for the Evaluation of CO₂ Sequestration, *UGA Publication 42*.

Chan, M.A., Parry, W. T., Bowen, B.B., and **Potter, S.L.** (2011) Follow the water: Connecting a CO₂ reservoir and bleached sandstone to iron-rich concretions in the Navajo Sandstone of south-central Utah, USA – COMMENT. *Geology*.

Potter, Sally L., Chan, M., Petersen, E., Dyar, M.D., Sklute, E. (2011) Characterization of Navajo Sandstone Concretions: Mars comparison and criteria for distinguishing diagenetic origins. *Earth and Planetary Science Letters* 301, 444-456.

Potter, Sally L., Chan, M.A. (2011) Joint controlled fluid flow patterns and iron mass transfer in Jurassic Navajo Sandstone, Southern Utah, USA. *Geofluids* 11, 184-198.

Barge, L.M., Hammond, D.E., Chan, M.A., **Potter, S.L.**, Petruska, J., Nealson, K.H. (2011) Precipitation patterns formed by self-organizing processes in porous media. *Geofluids* 11, 124-133.

C. Chapters in Professional Books :

Crandall, J. R., Filiberto, J., and **Potter-McIntyre, S.L.**, (in review) Potential impact-related mineral resources on Mars, in: Gaci, S., Hachay, O., and Nicolis, O. (eds.), *Methods in petroleum and mineral exploration, and geological engineering*, AGU Books, in review.

Chan, M.A., **Potter, S.L.**, Bowen, B.B., Petersen, E.U., Parry, W. T., Bowman, J.R., Barge, L., and Seiler, W. (2011) Characteristics of terrestrial ferric oxide concretions and implications for Mars, in: Grotzinger, J. and Milliken, R. (eds.), *Sedimentary geology of Mars: SEPM Special Publication 102*.

VI. TEACHING EXPERIENCE

A. Teaching Interests and Specialties :

Sedimentology and Stratigraphy (GEOL325), Petroleum Geology (GEOL420), Advanced Sedimentology (GEOL491/524), Field Camp (GEOL454), Fracking Seminar (GEOL524), Imperial Barrel Award (AAPG Petroleum Competition; GEOL 591)

B. Master's and Ph.D. Committees on which you have served:

Current Masters

Keegan DePriest

Nahid Hasan

Ph.D.

Jason Williams

Committee member:

Chamila Ranaweera, M.S.,

Caitlyn Korren, M.S.,

Jacob Crandall, M.S.

Ruben Macuster, M.S.

Lacey Costello, M.S.

Christopher McCoy, M.S.

Jessica Whitaker, M.S.

Jacob Crandall, Ph.D.

John Ejembi, Ph.D.

D. Names of Students who have completed Master's Theses and Doctoral Dissertations under your Direction:

Completed Masters:

Jeremy Breeden

Joshua Groth

Simao Guterres Pereira

Jeremy Breeden

Jason Williams

Jordan Knuth

E. Former Undergraduate researchers:

Colton Schuler

Dallas Cook

Elayna Northrup

Jessica Whiteaker

Victoria Hammond
Caleb Macer

VII. UNIVERSITY EXPERIENCE

1. Department Committees :

Curriculum committee: 2017-present
Graduate Admissions Committee, Geology, August, 2013 to 2017
Department colloquium chair, August 2015 to May 2016
Regional Illinois Junior Academy of Science Fair, judge, March, 2015.
Open House Geology Department Representative, November 7, 2015
Commencement, Graduate Marshall, December 2015
Department Colloquium Speaker Organizer, Fall 2015

VIII. PROFESSIONAL SERVICE

A. Membership in Professional Associations :

Geological Society of America, 2005-present
American Association of Petroleum Geologists, 2006-present
American Geophysical Union, 2013-present
Illinois Oil and Gas Association 2013-present

B. Nominations for Professional Committees and Awards :

Early Career Faculty Award, Southern Illinois University, 2017
Mars Exploration Program Analysis Group (MEPAG), 2016

IX. COMMUNITY SERVICE

American Association of Petroleum Geologists (AAPG) Student Chapter Faculty Advisor,
August, 2014 – present
AAPG Imperial Barrel Award Faculty Advisor, spring semester 2015, 2016, 2017, 2018