

Marcos Zentilli van Kilsdonk

Marcos Zentilli, PhD, PGeo (NS)

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PERSONAL

Born: Santiago, Chile, 31-May-1940
Father: Aquiles Zentilli Melano
Mother: Denise van Kilsdonk Laureys
Spouse: Armgard Raczynski von Oppen
Daughters: Francisca, Veronica, Patricia
Citizenship: Chile, and Canada (1975)



EDUCATION/Training

Degree	Year	Discipline/Field	Institution/Country
Geólogo	1963	Mining Geology	Universidad de Chile, Santiago
Grad. Studies	1964-65	Geology - Mineral Deposits	<i>Ludwig – Maximilians - Uni- versität München, Germany</i>
PhD	1974	Geology - Metallogensis, Tectonics - Geochronology	Queen’s University, Kingston, Ontario, Canada
Post-Doctoral	1978-79	Isotope geochemistry	USGS Denver Fed. Center, USA
Post-Doctoral	1986-97	Trace element geochemistry	Univ. of Montpellier, France

LANGUAGES: English (Spoken Read Written), Spanish (SRW), French (SR), German (SR)

SUMMARY

After working on regional geological mapping for the Geological Survey of Chile (now SERNAGEOMIN) and as exploration geologist for industry in Canada, Zentilli joined Dalhousie University in 1973, where he taught Geology of Mineral Deposits and carried out research on metallogeny, isotope geology and geochronology. He developed the first Canadian low-temperature thermochronology laboratory using the apatite fission-track technique and applied it to the Central Andes and Atlantic and Arctic Canada. He was Chair of Earth Sciences 1984-1986. He directed more than 20 PhD and 20 MSc, and over 55 BSc (Honours) theses. In 1985, peers baptized a Zentilli Volcano in the High Andes, in recognition of his earlier work in the area. He retired in 2005 and continues to be active as Professor Emeritus at Dalhousie University, and until 2022 as international consultant with MZGeoscience Inc. In 2010 he was appointed Honorary Consul of Chile in Halifax by presidential decree. He is currently a volunteer Lecturer at Seniors College Association of Nova Scotia (SCANS).

EMPLOYMENT HISTORY

- **Resident Geologist**, Copiapó, Atacama Province, (I.I.G.) Geological Survey of Chile 1964 – 1968
- **Exploration Geologist**, Clarenville, Newfoundland, Geophysical Engineering Ltd. (Teck) 1972
- **Assistant Professor (1973), Associate Professor (1980), Chairman (1984-1986), Full Professor (1986)** Department of Earth Sciences, Dalhousie University
- **Emeritus Professor**, Dalhousie University, July 2005 – present
- **Scientific Director**, Fission Track Research Laboratory, Dalhousie University 1987 -2005
- **Visiting Professor**, University of Montpellier, France, 1986-1987
- **Visiting Scientist**, Solid Source Mass Spectrometry Laboratory (c/o Dr. Bruce Doe); U.S. Geological Survey, Denver General Center, and Colorado School of Mines, Golden, Co, USA, 1978-1979
- **President and CEO**, MZ Geoscience Inc. 2010 - Dec 2022
- **Honorary Consul of Chile for the Atlantic Provinces of Canada (NS, NB, PE, NL), in Halifax**, 2010-present
- **Voluntary Instructor (2009 -)** and Board Member (2009-2021), Seniors College Association of Nova Scotia (SCANS)

RECOGNITION OR AWARDS

- Recipient of “**Medalla al Mérito Profesor Juan Brügger**” 2023, Colegio de Geólogos de Chile: “In recognition of your outstanding and extensive academic career, your scientific publications and the awards obtained, both in Canada and in Chile. It seems to us that you and your career deserve to be highlighted as an example, since you have given prestige to our profession throughout your career.”
- The **Marcos Zentilli Graduate Award**, Dalhousie University: “This award recognizes Marcos’ legacy by providing support to attract and retain graduate students of the highest caliber to conduct their studies in the Department of Earth Sciences”. <https://blogs.dal.ca/earthsciences/2018/03/08/the-marcos-zentilli-graduate-award/>
- Recipient of the **Queen Elizabeth II’s Platinum Jubilee Medal** by Lt.-Governor Arthur J. LeBlanc: “For significant contribution to Canada, Nova Scotia, or their community”. November 24th 2022



- Declared **Honorary Member of Sociedad Geológica de Chile - 2021** (www.sociedadgeologica.cl)



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- **Excellence in Geoscience Award – 2019** Geoscientists Nova Scotia (APGNS)



- **Gesner Medal - 2015** - Distinguished Scientist Award - from Atlantic Geoscience Society (AGS).



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- **Appointed Technical Expert** (Minerals) to Volunteer Panel, Natural Resources Strategy for Nova Scotia, 2009-2010
- **Vice-President, Society of Economic Geologists**, Colorado, USA, 2007
- **Julian Boldy Award 1997** - Mineral Deposits Division - for Best Technical Paper Presented at the GAC/MAC, Ottawa, Canada
- **Student Affairs Committee**, Society of Economic Geologists (SEG), 1999 - 2002

- **Treasurer, Geoscientists Nova Scotia, APGNS, 2005 -2010**
- **Chair, Northeastern Section, Geological Society of America Meeting in Halifax, N.S., March 2003**
- **City of Halifax - Ambassador Award 2003** as organizer of Geological Society of America Annual Meeting in Halifax, Canada.
- **Associate Director**, Lester Pearson Institute for International Development, Dalhousie U, 1984 - 1986
- **Leader IGCP/UNESCO Project 342: *Age and Isotopes of South American Ores* (1992- 1997)**
- **Lecturer**, XVI International Course in Metallogeny, UNESCO, Univ. Central de Ecuador. June 1997.
- **Associate Editor, *Andean Geology* (ISSN: 0718-7106) ~1995 -**
- **Member of the Editorial Board**, *International Geology Review* ~1995 – 2012 (ISSN 0020-6814)
- **Guest Editor**, *Exploration and Mining Geology* 1999; Issue on Latin American Ore Deposits
- **Guest Editor**, *Atlantic Geology*, Issues dedicated to Environmental Geology: 1997, 2006
- **NSERC Grants Selection Committee (Committee #8 Solid Earth Sciences) 1984-1986**
- **NSERC: Awarded Operating or Discovery Research grants without interruption from 1974 to 2011**
- **Short Course on Thermochronology**, sponsored by the Isotope Science Division, Geological Association of Canada, **GAC/MAC/CSPG Halifax 2005, May 14-18, 2005.4**
- **Second Vice-President**, The Dalhousie Faculty Association 2001 – 2002
- **1999 Earth Sciences Professor of the Year**, Department of Earth Sciences, Dalhousie University.
- **Volcán Zentilli** named in Chile-Argentina border (*Tectonophysics*, 1985, volume 112, 423-444; also Book 1995 *Volcanes de Chile*, Instituto Geográfico Militar, Chile, ISBN: 956-202-054-1)
- M. Zentilli credited with discovery of **Volcán Copiapó gold epithermal porphyry deposit** with “9,773,000 ounces of gold” e.g. Pressacco, R. et al. (2009) *MICON Report*, 147 p.
- **NSERC Postgraduate Scholarship**, 1969-1972
- **McLaughlin Fellowship, Queen’s University**, 1968-1969
- **Queen’s University Graduate Honour Roll** 1969, 1970
- **The German Academic Exchange Service (DAAD) Scholarship**, 1964-1965
- **Beca del Rector**, Universidad de Chile, 1958

SOCIETIES (partial)

- **Colegio de Geólogos de Chile (#35)**
- **Sociedad Geologica de Chile (Honorary Member)**
- **Society of Economic Geologists (Fellow)**
- **Geological Association of Canada**
- **Atlantic Geoscience Society**
- **Association of Professional Geoscientists, Geoscientists Nova Scotia (#39) (Life Member)**
- **Centro de Estudios de Minerales Estratégicos y Críticos de Chile – CEMEC**
- **Red Investigación Chile Canada - REDICEC**

SELECTED PUBLICATIONS (Former Students in Italics)

<https://scholar.google.com/citations?user=ATDW504AAAAJ>

PAPERS and Extended Abstracts

1. **ZENTILLI, M., HANLEY, J., *GRAVES, M.C., CLAVERO J.* (2024) **Capitana mine, Tignamar District, a unique tin – bismuth concentration in the Chilean Central Andes, 250 km west of the Bolivian Tin Belt: link to the Proterozoic-Paleozoic basement Belén inlier and the Arequipa-Antofalla Terrane, a probable remnant of Laurentia.** *Journal of South American Earth Sciences*. 134 (2024) 104747, ISSN 0895-9811, <https://doi.org/10.1016/j.jsames.2023.104747>.
<https://www.sciencedirect.com/science/article/pii/S089598112300559X>**
2. **ZENTILLI, M. (2022) *Review of Historia, Exploración y Geología de los Yacimientos Metalíferos de Chile 900-2021.*** Francisco Camus I. and Juan Carlos Castelli S. 2021. ISBN 978-956-316-489-3. 1338 p. *Economic Geology* v. 117, No. 7 pp. 1675-1676.
3. **Zarasvandi, A., Fereydouni, Z., Alizadeh, B., Absar, N., Dutt-Shukla, A., Qaim-Raza, M., Ashok, M. and ZENTILLI, M. (2021) **Phosphogenesis in the Zagros Fold-Thrust Belt, Iran: Relation between Tethys Paleo-environment****

- and Phosphate Ore Deposition**, *Ore Geology Reviews*; 139 (2021) 104563
<https://doi.org/10.1016/j.oregeorev.2021.104563>
4. ZENTILLI, M., GRAVES, M.C., MATHUR, R., HANLEY, J., HEAMAN, L.M., BORIC, R. (2021) **Locating the “Missing Half” of the Giant Chuquicamata Porphyry Copper Deposit, Chile**, Chapter 5 in Special Publication, Society of Economic Geologists, no. 24, pp. 69–85.
<https://www.dropbox.com/s/8t6egm7mmx58lbt/Zentilli%20et%20al%202021%20SEG%20SP%2024%20%235%20w%20appendix.pdf?dl=0>
 5. SLATER, E., HANLEY, J., MULJA, T., ZENTILLI, M., TROTTIER, C. (2020) **Epithermal Mineralization in the Busang Southeast Zone, Indonesia: New Insight into the Au Prospect at the Center of the Bre-X Fraud**, *Minerals* Volume 10, Issue 8, 10.3390/min10080698 ; <https://doi.org/10.3390/min10080698>
 6. ZENTILLI, M., OMELON, C.R., HANLEY, J., LEFORT, D. (2019) **Paleo-hydrothermal predecessor to perennial spring activity in thick permafrost in the Canadian high Arctic, and its relation to deep salt structures: Expedition Fiord, Axel Heiberg Island, Nunavut**. Special issue "Geothermal Systems: Interdisciplinary Approaches for an Effective Exploration", *Geofluids*, vol. 2019, Article ID 9502904, 33 pages., <https://www.hindawi.com/journals/geofluids/2019/9502904/>
 7. ZENTILLI, M., MAKSAEV, V., BORIC, R., & WILSON, J. (2018). **Spatial coincidence and similar geochemistry of Late Triassic and Eocene–Oligocene magmatism in the Andes of northern Chile: evidence from the MMH porphyry type Cu–Mo deposit, Chuquicamata District**. *International Journal of Earth Sciences*, 107(3), 1097–1126. <https://repositorio.uchile.cl/bitstream/handle/2250/149972/Spatial-coincidence.pdf?sequence=1>
 8. ZENTILLI, M., SALAS-OLIVARES, R., GRAVES, M.C. (2018) **A unique Sn-bearing Bi-Ag-Sb, polymetallic, epithermal district in the Chilean Andes: Capitana Mine, Tignamar, Arica – relation to the Proterozoic–Paleozoic Belén Metamorphic Complex**. Abstract XV Chilean Geological Congress, Concepcion, Chile, November 21, 2018, 5 p.
 9. KETTANAH, Y., ZENTILLI, M., HANLEY, J., TWEEDALE, F. (2016) **Geological setting and fluid inclusion characteristics of a lead-copper-barium occurrence hosted in a Neoproterozoic mafic sill at Kiatak, Northumberland Island, Northwestern Greenland**. *Ore Geology Reviews* 79: 268–287
 10. PINGET, M-C., DOLD, B.S., ZENTILLI, M.; FONTBOTÉ, L (2015) **Reported supergene sphalerite rims at the Chuquicamata porphyry deposit (Northern Chile) revisited: Evidence for a hypogene origin**. *Economic Geology*, v. 110, pp. 253–262.
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.1009.210&rep=rep1&type=pdf>
 11. MAKSAEV, V., MUNIZAGA, F., ZENTILLI, M. & CHARRIER, R. (2009) **Fission track thermochronology of Neogene plutons in the Principal Andean Cordillera of central Chile (33-35°S): Implications for tectonic evolution and porphyry Cu-Mo mineralization**. *Andean Geology* 36 (2): 153-171.
<https://www.redalyc.org/pdf/1739/173914378001.pdf>
 12. ZENTILLI, M., COLLINS, P.G., BORIC P., R., WILSON, S.F.J. (2009) **Diagenetic pyrite in the El Soldado stratabound copper deposit: a link with the petroleum system of the Cretaceous basin of central Chile**. Extended Abstract. 12th Chilean Geol. Congress, Santiago, Chile. 22-26 Nov. 2009 S11_054, 5p.
 13. ZENTILLI, M., GRIST, A.M. & WILLIAMSON, M- (2008) **The Stolz Thrust and its connection with the Eocene *Metasequoia* Fossil Forest of Axel Heiberg Island, Canadian Arctic Archipelago: Apatite Fission Track Evidence**. In Garver, J.I., and Montarrio, M.J. (eds.), *Proceedings from the 11th International Conference on thermochronometry, Anchorage, Alaska, Sept. 2008*. 280-282. https://www.researchgate.net/profile/John-Garver/publication/295705039_FT2008_11th_International_Conference_on_Thermochronometry_Extended_Abstracts_and_program_Anchorage_Alaska/links/56cce37c08aeb52500c09f2b/FT2008-11th-International-Conference-on-Thermochronometry-Extended-Abstracts-and-program-Anchorage-Alaska.pdf#page=300
 14. ZENTILLI, M., KETTANAH, Y., NEGULIC, E., WIELENS, H., GRIST, A.M. & BROWN, E.T. (2008) **Thermal effects of salt on the petroleum system”: evidence from fission track thermochronology, fluid inclusions and thermal modelling**. Extended Abstract, Central Atlantic Conjugate Margins Conference (Aug. 13-15 2008) , Halifax, NS, Canada, pp. 75-82
 15. JONES, S.F. H. WIELENS, H., WILLIAMSON, M-C. & ZENTILLI, M. (2007) **Impact of magmatism on petroleum systems in the Sverdrup Basin, Canadian Arctic Islands, Nunavut: A numerical modelling study**. *Journal of Petroleum Geology*, Vol. 30(3), July 2007, pp 237-256. <https://doi.org/10.1111/j.1747-5457.2007.00237.x>
 16. ZARASVANDI, A., LIAGHAT, S., ZENTILLI, M. & REYNOLDS, P.H. (2007) **⁴⁰Ar/³⁹Ar Geochronology of Alteration and Petrogenesis of Porphyry Copper – Related granitoids in the Darreh-Zerreshk and Ali-Abad**

- area, Central Iran. *Exploration and Mining Geology*, Vol. 16, Nos. 1–2, p. 11–24.
17. FOX, D., PARSONS, M. & ZENTILLI, M. (2006) **Foreword: Environmental Geoscience Research in the Atlantic Region**, Special Issue, *Atlantic Geology* 127-128.
 18. O'BEIRNE-RYAN, A.M. & ZENTILLI, M. (2006) **Weathering of Devonian monzogranites as recorded in the geochemistry of saprolites from the South Mountain Batholith, Nova Scotia, Canada.** *Atlantic Geology*, 42, 151–157
 19. CLOUGH, M., ZENTILLI, M., BRODERS, H.G. & NETTE, T. (2006) **Elemental composition of incisors in Nova Scotia moose: evaluation of a population with abnormal incisor breakage.** *Alces*, 09-Volume 42, p.55-64.
 20. GRIST, A.M. & ZENTILLI, M. (2006) **Preliminary apatite fission track thermal history modelling of the Nares Strait region of eastern Ellesmere Island and northwestern Greenland**, *Apatit Spaltspuren-Daten: Modellierung der thermischen Entwicklung an den Rändern der Nares Strait auf dem östlichen Ellesmere Island und in NW-Grönland.* *Polarforschung*, 74, 1-3 (2004), 113-127
 21. GRIST, A.M. & ZENTILLI, M. (2005) **Insights into the thermal history of the Nares Strait, Kane Basin and Smith Sound region in Canada and Greenland from apatite fission track and (U-Th)/He dating**. *Canadian Journal of Earth Sciences*, 42, 1547–1569
 22. MAKSAEV, V., MUNIZAGA, F., MCWILLIAMS, M., FANNING, M., MATHUR, R., RUIZ, J. AND ZENTILLI, M. (2005) **New Chronology for El Teniente, Chilean Andes, from U-Pb, $^{40}\text{Ar}/^{39}\text{Ar}$, Re-Os, and Fission-Track Dating: Implications for the Evolution of a Supergiant Porphyry Cu-Mo Deposit.** Chapter 2 in Sillitoe, R.H.; Perello, J.; and Vidal, C.E.(editors) *Andean Metallogeny: New Discoveries, Concepts, and Updates*, *SEG Special Publication* 11, ISBN 1-887483-89-6, 358 p.
 23. ZARASVANDI, A., LIAGHAT, S. & ZENTILLI, M. (2005) **Porphyry Copper Deposits and Urumieh- Dokhtar Magmatic Arc, Iran.** In Porter, T.M. (Ed.), *PGC Publishing*, Adelaide, pp 163-184.
 24. WILSON, N.S.F & ZENTILLI, M. (2006) **Pyrobitumen Associated with Copper Mineralization from the Uchumi and Talcuna districts, Central Chile.** *International J. of Coal Geology*, 65, 158– 169
 25. ZENTILLI, M, HARRISON, J.C. & CREALOCK, J. (2006) **Neutral buoyancy icebergs in Kane Basin between Arctic Canada and Greenland a threat to northern navigation: Identifying the source and possible links with Arctic warming.** (In) Robert A. Scott and Dennis K. Thurston (Editors) *Proceedings of the Fourth International Conference on Arctic Margins*, Dartmouth, Nova Scotia, Canada, September 30-October 3, 2003. US Department of the Interior, Minerals Management Service, Anchorage, Alaska, OCS Study, MMS 2006-003, pp 244-248.
 26. ZARASVANDI, A., LIAGHAT, S. & ZENTILLI, M. (2005) **Geology of the Darreh-Zerreshk and Ali-Abad Porphyry Copper Deposits, Central Iran.** *International Geology Review*, 47, 620–646
 27. RYAN, R.J., BEIRNE-RYAN, A.M., & ZENTILLI, M. (2005) **A rounded cobble that has not traveled far: Incorporation of corestones from saprolites in the South Mountain area of southern Nova Scotia, Canada.** *Sedimentology*, 52, 1109–1121.
 28. ENCINAS A.,MAKSAEV, V., PINTO L, LE ROUX J.P., MUNIZAGA, F. & ZENTILLI, M. (2005) **Pliocene lahar deposits in the Coastal Cordillera of central Chile: Implications for uplift, avalanche deposits, and porphyry copper systems in the Main Andean Cordillera,** *Journal of South American Earth Sciences* 20, 369-381.
 29. KRONFELD, J., GODFREY-SMITH, D.I., JOHANNESSEN, D. & ZENTILLI, M. (2004) **Uranium series isotopes in the Avon Valley, Nova Scotia.** *Journal of Environmental Radioactivity*, 73, 335-352
 30. Maksaev, V., Munizaga, F., McWilliams, M., Mathur, R., Ruiz, J., Fanning, M.C., ZENTILLI, M. (2003). **New timeframe for El Teniente Cu–Mo giant porphyry deposit: U–Pb, ^{40}Ar – ^{39}Ar , Re–Os and fission track dating.** Short Papers—IV South American Symposium on Isotope Geology, IV SSAGI, Salvador, Bahia, Brazil, CD-ROM, 736–739 p.
 31. Maksaev, V., Munizaga, F., McWilliams, M., Fanning, M., Mathur, R., Ruiz, J., ZENTILLI, M. (2004). **New chronology for El teniente, chilean andes, from U/Pb, $^{40}\text{Ar}/^{39}\text{Ar}$, Re–Os and fission track dating: implications for the evolution of a supergiant porphyry Cu–Mo deposit.** In: Sillitoe, R.H., Perello', J., Vidal, C.E., (Eds.) *Andean Metallogeny: New Discoveries, Concepts and Updates*. Society of Economic Geologists, SEG Special Publication 11, 15–54.
 32. ARNOTT, A. M. AND ZENTILLI, M. (2003) **The Chuquicamata Intrusive Complex: Its relation to the Fortuna Intrusive Complex, and the role of the Banco Porphyry in the potassic alteration zone.** Extended Abstract, 10th Congreso Geológico Chileno, Concepcion, 1-10.
 33. MAKSAEV, V. & ZENTILLI, M. (1999; © 2000) **Fission track thermochronology of the Domeyko Cordillera, Northern Chile: Implications for Andean tectonics and porphyry copper metallogenesis.** *Exploration and*

- Mining Geology, 8, 65-89.
34. BORIC, R., HOLMGREN, C. & WILSON, N.S.F. & ZENTILLI, M., (2002) - **The Geology of the El Soldado Manto Type Cu (Ag) Deposit, Central Chile**; in Porter, T.M. (Ed.), *Hydrothermal Iron Oxide Copper- Gold & Related Deposits: A Global Perspective*, Volume 2; PGC Publishing, Adelaide, pp 185-205.
 35. MAKSAEV, V. & ZENTILLI, M. (2002) - **Chilean Strata-bound Cu-(Ag) Deposits: An Overview**; in Porter, T.M. (Ed.), *Hydrothermal Iron Oxide Copper-Gold & Related Deposits: A Global Perspective*, Volume 2; PGC Publishing, Adelaide, pp 185-205.
 36. GLASMACHER, U.A., LOPEZ-MARTINEZ, A., TREMBLAY, A., ZENTILLI, M. & WAGNER, G.A. (2002) **Cretaceous to Tertiary Tectono-thermal evolution of the Laurentian margin in Quebec, Canada - Preliminary results**. Proceedings, Fission Track Analysis, Theory and Applications Symposium, Cádiz, Spain, June 4-7, 2002. Geotemas, (ISSN 1576-5172) Soc. Geológica de España, 4, pp. 83-87.
 37. OSSANDÓN, G., FRÉRAUT, R. GUSTAFSON, L., LINDSAY, D. & ZENTILLI, M. (2001) **Geology of the Chuquicamata mine: A progress report** . Economic Geology, 96, 240-270.
 38. GRIST, A.M., & ZENTILLI, M. (2003). **Post-Paleocene Cooling in the Southern Canadian Atlantic Region: Evidence from Apatite Fission Track Models**. Can. Journal of Earth Sciences, 40, No. 9, 1279-1297.
 39. WILSON, N.S.F., ZENTILLI, M. & SPIRO, B. (2003) **A sulfur, carbon, oxygen, and strontium isotope study of the volcanic-hosted El Soldado manto-type copper deposit, Chile: the essential role of bacteria and petroleum**. Scientific Communication, Economic Geology, 98, pp. 163-174.
 40. WILSON, N.S.F., ZENTILLI, M., REYNOLDS, P.H. & BORIC, R. (2003) **$^{40}\text{Ar}/^{39}\text{Ar}$ geochronology of K-feldspar from the El Soldado manto-type copper deposit, Chile**. Chemical Geology, Isotope Geoscience., 197, 161-176
 41. O'BEIRNE-RYAN, A.M., & ZENTILLI, M. (2003) **Paleoweathered surfaces on granitoids of southern Nova Scotia: paleoenvironmental implications of saprolites**. Can. Journal of Earth Sciences, 40, 805- 817.
 42. GLASMACHER, U.A., ZENTILLI, M. AND RYAN R. (2003): **Nitrogen distribution in Lower Palaeozoic slates/phyllites of the Meguma Supergroup, Nova Scotia, Canada: Implications for Au and Zn-Pb mineralization**. Chemical Geology, 194, 297– 329.
 43. ARNE, D.C., GRIST, A.M., ZENTILLI, M., COLLINS, M., EMBRY, A. & GENTZIS, T. (2002). **Denudation of the Sverdrup Basin during the Tertiary Eureka Orogeny: Implications for hydrocarbon exploration**, Basin Research, Vol. 14, 183-205.
 44. ZENTILLI, M. AND GRIST, A.M. (2002) **Fission Track Thermogeochronology Study (pp.94-107)**. In Jackson, R. et al. (2002) **Cruise 2001 Louis S. St Laurent PASSAGES Pathways to the Arctic Seismic Survey and Geoscientific Experiment, Resolute (Nunavut) to Thule (Greenland)**. Geological Survey of Canada Open File Report # 4828, 157p.
 45. ZENTILLI, M. AND HARRISON, J.C. (2002) **Sediment covered iceberg near Cape Hayes, northeast Ellesmere Island: August 17, 2001**. In Jackson, R. et al. (2002) **Cruise 2001 Louis S. St Laurent PASSAGES Pathways to the Arctic Seismic Survey and Geoscientific Experiment, Resolute (Nunavut) to Thule (Greenland)**. Geological Survey of Canada Open File Report # 4828, 157p.
 46. MATHUR, R., RUIZ, J., MUNIZAGA, F. & ZENTILLI, M. (2001) **Reply (on Re-Os dating of porphyry copper deposits, Discussion)** Geology: Vol. 29, No. 5, pp. 468-469.
 47. WILSON NSF & ZENTILLI M (1999) **The Role of organic matter in the genesis of the El Soldado volcanic-hosted manto-type Cu deposit, Chile**. Economic Geology, 94, 1115-1136.
 48. GRIST, A. M., AND ZENTILLI, M. (2000) **Apatite fission track constraints on a widespread Early Cretaceous heating episode in the Canadian Atlantic margin: added effect of a climatically perturbed gradient?** FT2000, 9th International Conference on Fission Track Dating and Thermochronology, Lorne, Australia, Feb. 6-11, Geological Society of Australia Abstract Series #58, 135-137.
 49. GLASMACHER, U., ZENTILLI, M. & GRIST, A.M. (1998) **Apatite fission track thermochronology of Paleozoic sandstones and the Hill-intrusion, Northern Linksrheinisches Schiefergebirge, Germany**. In P. Van den haute and F. de Corte (Eds.), **Advances in Fission-Track Geochronology**, Kluwer Academic Publishers, Dordrecht, The Netherlands, ISBN 0-7923-4904-0, 151-172.
 50. CARRILLO-CHAVEZ, A., H.HUYCK, & M.ZENTILLI (1999) **Age constraints on host rocks of Los Uvares gold deposit: magmatic pulses in southernmost Baja California, Mexico**. Geofisica Internacional, 38, 27-33.
 51. ARNE,D.C., ZENTILLI, M., A.M.GRIST, & M.COLLINS (1998) **Constraints on the timing of thrusting during the Eureka Orogeny, Canadian Arctic Archipelago: an integrated approach to thermal history analysis**. Can. Journal of Earth Sciences, 35, 30-38.

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53. ZENTILLI, M., F.MUNIZAGA, M.C.GRAVES, R.BORIC, N.WILSON, P.MUKHOPADHYAY, L.SNOWDON (1997) Hydrocarbon Involvement in the Genesis of Ore Deposits: an Example in Cretaceous Stratabound (Manto-Type) Copper Deposits of Chile. International Geology Review. 39, 1-21.
54. ZENTILLI, M. AND FOX, D. (1997) Geology and mineralogy of the Meguma Group and their importance to environmental problems in Nova Scotia (Foreword), Atlantic Geology, 33, 81-85.
55. CAMERON, B., & ZENTILLI, M. (1997) Interaction between the mineralized transition of the Goldenville-Halifax Formations and granitoids of the Liscomb Complex, NS: Evidence from mineral and whole rock chemistry. Atlantic Geology, 33, 143-156.
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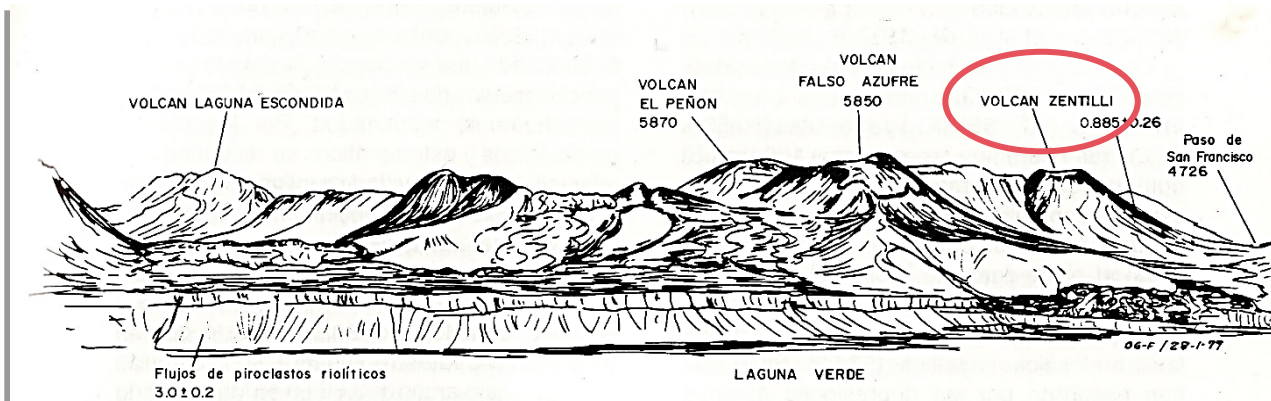
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