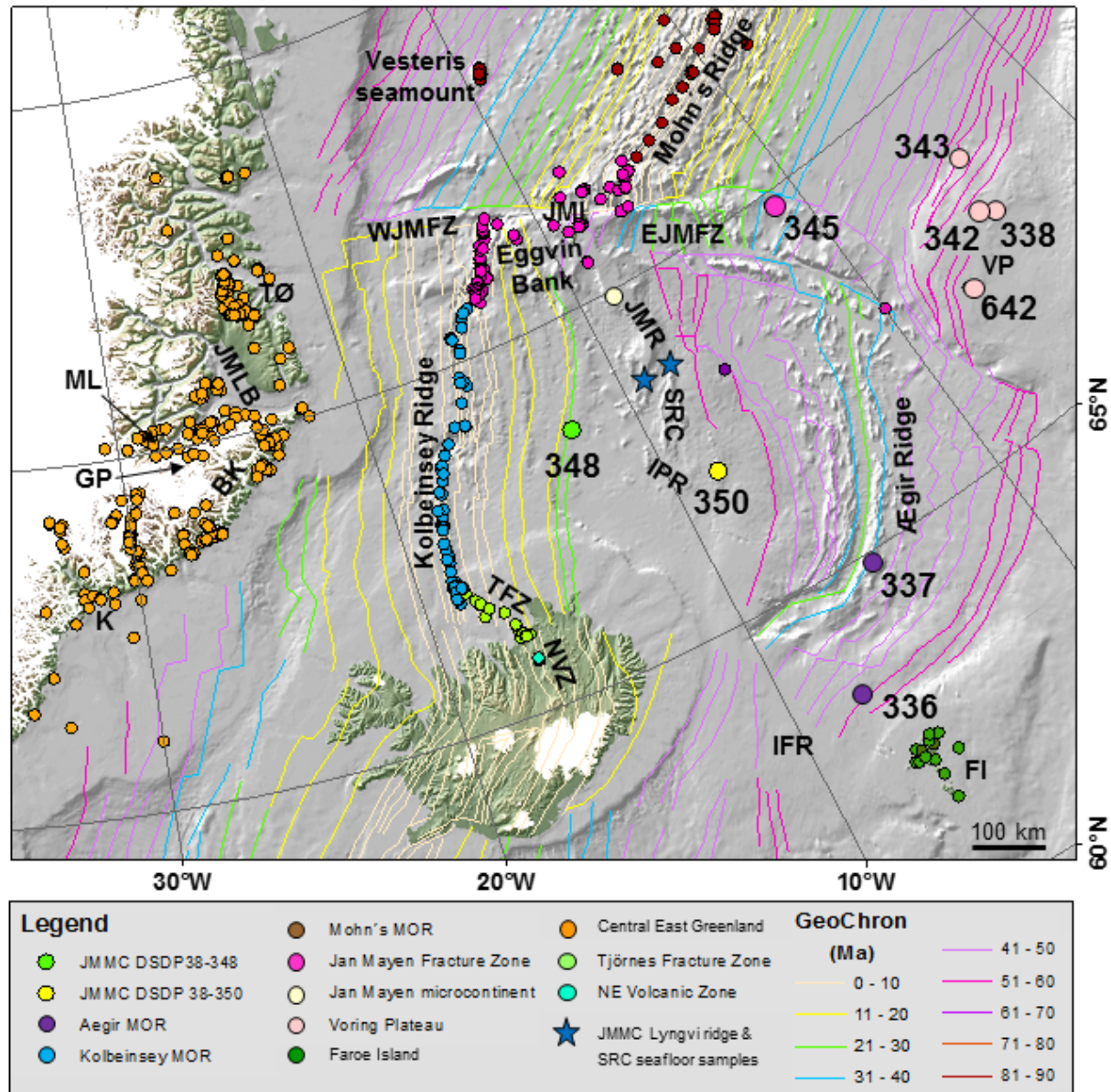


## **Supplement 5**

*Geochemical database location map*



(a) Borehole and seafloor sample location map.

The sites are labelled by sub-region or igneous provinces in comparison with geochronologic time zones and age dating model by Gaina et al. [2014]. Geochemistry data reference: PETDB [Lamont Doherty Earth Observatory, Columbia University, New York, <http://www.earthchem.org/petdb>], and GEOROC [Max Planck Institute for Chemistry, Mainz, <http://georo~mpch-mainz.gwdg.de/georoc/>]. Abbreviations: borehole numbers of DSDP Leg 38 sites 336 – 350, and ODP Leg 104 site 642; BK – Blosseville Kyst; EJMfZ – East Jan Mayen Fracture Zone; FI – Faroe Islands; GP – Geiko plateau; IFR – Iceland-Faroe Ridge; IPR – Iceland Plateau Rift; JMI – Jan Mayen Island complex; JMLB – Jameson Land Basin; JMR – Jan Mayen Ridge; K – Kangerlussuaq (central East Greenland); ML – Milne Land; NVZ – Northern Volcanic Zone; SRC – Southern Ridge Complex; TFZ – Tjörnes Fracture Zone; TØ – Trail Ø; VP – Vøring Plateau and Margin; and WJMfZ – West Jan Mayen Fracture Zone.

**(b)** Geochemical ICP-OES analysis data for DSDP Leg 38 sites 348 and 350.

Sample abbreviations: ISOR-HÍ – Iceland GeoSurvey and University of Iceland and UoAH – University of Aarhus.

Sample name	SiO <sub>2</sub> (wt%)	Al <sub>2</sub> O <sub>3</sub> (wt%)	FeO <sup>T</sup> (wt%)	MnO (wt%)	MgO (wt%)	CaO (wt%)	Na <sub>2</sub> O (wt%)	K <sub>2</sub> O (wt%)	TiO <sub>2</sub> (wt%)	P <sub>2</sub> O <sub>5</sub> (wt%)	Volatiler (wt%)	SUM-N	SUM-RUN
ISOR-HÍ A: 348/88-91	48.72	15.10	13.09	0.30	6.39	12.17	2.48	0.06	1.54	0.13		100	93.79
ISOR-HÍ B: 348/91-92	49.25	14.72	12.97	0.26	6.77	12.10	2.30	0.02	1.48	0.13		100	98.30
ISOR-HÍ C: 348/120-120,5	50.48	13.74	12.39	0.23	7.82	11.58	2.19	0.07	1.39	0.11		100	100.22
ISOR-HÍ E: 350/98-99	49.99	14.06	12.91	0.21	5.95	10.97	2.87	0.30	2.44	0.29		100	98.54
ISOR-HÍ F: 350/128-129	50.23	14.49	12.01	0.21	5.74	11.54	2.87	0.30	2.34	0.27		100	97.66
ISOR-HÍ G: 350/135-136	49.93	13.94	12.84	0.22	6.18	11.11	2.84	0.27	2.38	0.28		100	100.89
ISOR-HÍ D: 350/142-143	45.80	17.47	16.04	0.09	6.52	6.72	3.37	0.49	3.10	0.39		100	94.44
UoAH: 348-32-4-142-150	50.38	13.50	13.30	0.23	7.39	11.55	2.13	0.06	1.32	0.12	1.06	100	100.47
UoAH: 348-33-2-10-17	50.45	13.61	13.49	0.25	6.97	11.64	2.11	0.03	1.34	0.12	1.08	100	100.21
UoAH: 348-34-1-127-135	50.49	13.58	13.44	0.24	7.09	11.55	2.13	0.05	1.31	0.11	1.10	100	99.83
UoAH: 348-34-2-117-125	49.30	13.69	13.57	0.23	8.07	11.48	2.15	0.08	1.30	0.11	1.65	100	100.41
UoAH: 348-34-2-48-58	49.41	14.43	13.43	0.21	7.02	11.67	2.25	0.07	1.39	0.12	1.38	100	100.50
UoAH: 348-CORE-123-128	50.19	13.74	13.38	0.23	7.28	11.57	2.13	0.05	1.31	0.12	1.06	100	100.72
UoAH: 350-14-2-140-148	44.66	17.83	16.57	0.10	6.33	7.67	3.13	0.45	2.90	0.36	5.16	100	98.77
UoAH: 350-14-2-44-50	56.31	14.73	16.24	0.03	6.17	0.90	1.74	1.41	2.09	0.38	9.69	100	98.65
UoAH: 350-16-1-142-148	49.96	13.85	13.80	0.21	5.71	10.82	2.74	0.30	2.34	0.28	1.12	100	100.25
UoAH: 350-16-2-117-126	49.84	13.84	13.62	0.21	6.00	10.90	2.75	0.26	2.31	0.27	1.14	100	100.04
UoAH: 350-16-3-139-144	49.82	13.75	13.57	0.22	6.18	10.86	2.73	0.28	2.31	0.27	0.95	100	100.32
UoAH: 350-16-3-20-29	49.75	13.98	13.50	0.21	6.13	10.89	2.76	0.25	2.27	0.27	1.15	100	99.98

**Note:**

Chemical composition analyzed at the University of Iceland are reported on dry basis and therefore recalculated to 100% expressing total iron as FeO. To facilitate direct comparisons with this dataset, the Aarhus data have also been recalculated to 100%.

## Geochemistry data references:

### Borehole core samples

#### **DSDP Leg 38 borehole sites 336, 337, 338, 342, 343, 345, 348 & 350**

Kempton, P.D., Fitton, J.G., Saunders, A.D., Nowell, G.M., Taylor, R.N., Hardarson, B.S., & Pearson G. (2000). The Iceland plume in space and time: a Sr–Nd–Pb–Hf study of the North Atlantic rifted margin, *Earth and Planetary Science Letters*, **177**(3–4), 255-271. [https://doi.org/10.1016/S0012-821X\(00\)00047-9](https://doi.org/10.1016/S0012-821X(00)00047-9)

Kharin, G.N., Udintsev, G.B., Bogatikov, O.A., Dmitriev, J.I., Raschka, H., Kreuzer, H., Mohr, M., Harre, W., & Eckhardt, F.J., (1976). *K/AR ages of the basalts of the Norwegian-Greenland Sea DSDP Leg 38*. <https://doi.org/10.2973/dsdp.proc.38.116.1976>

Raschka, H., Eckhardt, F.J., & Manum, S.B. (1976). *Site 348*. In: Talwani, M., & Udintsev, G. (eds). *Initial Reports of the Deep-Sea Drilling Project*. U.S. Government Printing Office, Washington, pp. 595-654.

Ridley, W.I., Perfit, M.R., & Adams, M.L. (1976). *Petrology of basalts from deep sea drilling project, Leg 38, Initial reports DSDP, Volume 38, Pages 731-739*. <http://doi.org/10.2973/dsdp.proc.38.113.1976>

#### **ODP Leg 104 borehole site 642**

Parson, L., Viereck, L., Love, D., Gibson, I., Morton, A., & Hertogen, J. (1989). *The petrology of the lower series volcanics, ODP Site 642*. In: Eldholm, O., Thiede, J., Taylor, E., et al., *Proc. ODP, Sci. Results, 104*, College Station, TX (Ocean Drilling Program), 419–428. <https://doi.org/10.2973/odp.proc.sr.104.134.1989>

Viereck, L.G., Hertogen, J., Parson, L.M., Morton, A.C., Love, D., & Gibson, I.L. (1989). *Chemical stratigraphy and petrology of the Vøring Plateau: tholeiitic lavas and interlayered volcanoclastic sediments at ODP Hole 642E*. In: Eldholm, O., Thiede, J., Taylor, E., et al., *Proc. ODP, Sci. Results, 104*, College Station, TX (Ocean Drilling Program), 367–396. <https://doi.org/10.2973/odp.proc.sr.104.135.1989>

Viereck, L., Taylor, P.N., Parson, L., Morton, A.C., Hertogen, J., & Gibson, I.L. (1988). Origin of the Palaeogene Vøring Plateau volcanic sequence. *Geological Society, London, Special Publications*, **39**, 69-83. <https://doi.org/10.1144/GSL.SP.1988.039.01.08>

## Onshore samples

### *East Greenland – Blossville Kyst (BK)*

- Danish Lithosphere Centre database (2014). In: Hopper, J.R., Funck, T., Stoker, M.S., Árting, U., Peron-Pinvidic, G., Doornenbal, H., & Gaina, C. (eds) (2014). *Tectonostratigraphic Atlas of the North-East Atlantic Region*. Geological Survey of Denmark and Greenland, GEUS, Copenhagen, 338 pp.
- Brown, P.E., Evans, I.B., & Becker, S.M. (1996). The Prince of Wales Formation - Post-flood basalt alkali volcanism in the Tertiary of East Greenland. *Contributions to Mineralogy and Petrology*, **123**, 424-434. <https://doi.org/10.1007/s004100050166>
- Hansen, H., Pedersen, A.K., Duncan, R.A., Bird, D.K., Brooks, C.K., Fawcett, J.J., Gittins, J., Gorton, M., & O'Day, P. (2002). Volcanic stratigraphy of the southern Prinsen af Wales Bjerger region, East Greenland. In: Jolley, D.W., & Bell, B.R. (ed). *The North Atlantic Igneous Province: Stratigraphy, Tectonic, Volcanic and Magmatic Processes*. *Geological Society of London Special Publication*, **197**, 183-218. <https://doi.org/10.1144/gsl.sp.2002.197.01.08>
- Holm, P.M. (1988). Nd, Sr and Pb isotope geochemistry of the Lower Lavas, E Greenland Tertiary Igneous Province. In: Morton, A.C., & Parson, L.M. *Early Tertiary Volcanism and the Opening of the NE Atlantic*. *Geological Society of London Special Publication*, **39**.
- Larsen, L.M., Watt, W.S., & Watt, M. (1989). Geology and petrology of the Lower Tertiary plateau basalts of the Scoresby Sund region, East Greenland. *Bulletin Grønlands Geologiske Undersøgelse*, **157**, 164.
- Momme, P., Tegner, C., Brooks, K.C., & Keays, R.R. (2002). The behaviour of platinum-group elements in basalts from the East Greenland rifted margin. *Contributions to Mineralogy and Petrology*, **143**(2), 133-153.
- Peate, D.W., Baker, J.A., Blichert-Toft, J., Hilton, D.R., Storey, M., Kent, A.J.R., Brooks, C.K., Hansen, H., Pedersen, A.K., & Duncan R.A. (2003). The Prinsen af Wales Bjerger Formation Lavas, East Greenland: The Transition from Tholeiitic to Alkalic Magmatism during Palaeogene Continental Break-up. *Journal of Petrology*, **44**(2), 279-304. <https://doi.org/10.1093/petrology/44.2.279>
- Tegner, C., Brooks, C.K., Duncan, R.A., Heister, L.E., & Bernstein, S. (2008).  $^{40}\text{Ar}$ - $^{39}\text{Ar}$  ages of intrusions in East Greenland: Rift-to-drift transition over the Iceland hotspot. *Lithos*, **101**, 480-500.
- Tegner, C., Leshner, C.E., Larsen, L.M., & Watt, W.S. (1998). Evidence from the rare earth-element record of mantle melting for cooling of the Tertiary Iceland plume. *Nature*, **395**(6702), 591-594.

## Seafloor samples

### *Jan Mayen Island igneous complex (JMI)*

- Carmichael, I.S.E. (1967). The iron-titanium oxides of salic volcanic rocks and their associated ferromagnesian silicates. *Contributions to Mineralogy and Petrology*, **14**, 36-64.
- Carstens, H. (1961). Cristobalite-trachyte of Jan Mayen. *Norsk Polarinst. skrifter*, **121**, Oslo.
- Debaille, V., Trønnes, R.G., Brandon, A.D., Waight, T.E., Graham, D.W., & Lee, C.-T.A. (2009). Primitive off-rift basalts from Iceland and Jan Mayen: Os-isotopic evidence for a mantle source containing enriched subcontinental lithosphere. *Geochimica et Cosmochimica Acta*, **73**(11), 3423-3449. <https://doi.org/10.1016/j.gca.2009.03.002>
- Gevorkyan, V.Kh., Lomakin, I.E., & Kasabov, R.V. (1981). Petrology of volcanic rocks of Jan Mayen (Northern Atlantic Ocean). *GEOL. ZH.*, 41 (4), p. 80-92.
- Hawkins, T.R.W., & Roberts, B. (1970). The petrology of the volcanic and intrusive rocks of Nord-Jan, Jan Mayen. *Norsk Polarinst. Arbok*, 19-41.
- Imslund, P. (1986). The volcanic eruption on Jan Mayen, January 1985: Interaction between a volcanic island and a fracture zone. *Journal of Volcanology and Geothermal Research*, **28**, 1-2, 1986, 45-53. [https://doi.org/10.1016/0377-0273\(86\)90004-1](https://doi.org/10.1016/0377-0273(86)90004-1).
- Imslund, P. (1984). Petrology, mineralogy and evolution of the Jan Mayen magma system. *Vísindafélag Íslendinga*, **43**, 1-328.
- Lussiaa-Berdou-Polve, M., & Vidal, P. (1973). Initial strontium composition of volcanic rocks from Jan Mayen and Spitzbergen. *Earth Planet Science Letters*, **18**(2), 333-338.
- Maaloe, S. Sørensen, J.B., & Hertogen, J. (1986). The trachybasaltic suite of Jan Mayen. *Journal of Petrology*, **27**, 439-466.
- Roberts, B., & Hawkins, T.R.W. (1963). The geology of the area around Nordkapp, Jan Mayen. *Norsk Polarinst. Arbok*, 25-48.
- Weigand, P.W., Brunfelt, A.O., Heier, K.S., Sundvoll, B., & Steinnes, E. (1972). Geochemistry of Alkali Olivine Basalts from an Eruption on Jan Mayen. *Nature Physical Science*, **235**, 31-33. <https://doi.org/10.1038/physci235031a0>
- Weigand, P.W. (1970). Bulk-rock and mineral chemistry of recent Jan Mayen basalts. *Norsk Polarinst. Arbok*, 42-52.

**Jan Mayen fracture zone (JMFZ)**

- Dittmer, F., Fine, S., Rasmussen, M., Bailey, J.C., & Campsie, J. (1975). Dredged basalts from the mid-oceanic ridge north of Iceland. *Nature*, **254**, 298-301. <https://doi.org/10.1038/254298a0>
- Gevorkyan, V.Kh., Lomakin, I.E., & Kasabov, R.V. (1981). Petrology of volcanic rocks of Jan Mayen (Northern Atlantic Ocean). *GEOL. ZH.*, **41**(4), 80-92.
- Haase, K.M., Devey, C.W., Mertz, D.F., Stoffers, P., & Garbe-Schönberg, D. (1996). Geochemistry of lavas from Mohns Ridge, Norwegian-Greenland Sea: implications for melting conditions and magma sources near Jan Mayen. *Contributions to Mineralogy and Petrology*, **123**(3), 223-237. <https://doi.org/10.1007/s004100050152>
- Hanan, B.B., Blichert-Toft, J., Kingsley, R., & Schilling, J.G. (2000). Depleted Iceland mantle plume geochemical signature: Artifact of multicomponent mixing? *Geochemistry Geophysics Geosystems*, **1**(4). <https://doi.org/10.1029/1999GC000009>
- Hawkins, T.R.W., & Roberts, B. (1970). The petrology of the volcanic and intrusive rocks of Nord-Jan, Jan Mayen. *Norsk Polarinst. Arbok*, 19-41.
- Imslund, P. (1984). Petrology, mineralogy and evolution of the Jan Mayen magma system. *Visindafélag Íslendinga*, **43**, 1-328.
- Kruber, C., Thorseth, I.H., & Pedersen, R.B. (2008). Seafloor alteration of basaltic glass: Textures, geochemistry, and endolithic microorganisms. *Geochem. Geophys. Geosyst.*, **9**, Q12002. <https://doi.org/10.1029/2008GC002119>
- Lussiaa-Berdou-Polve, M., & Vidal, P. (1973). Initial strontium composition of volcanic rocks from Jan Mayen and Spitzbergen. *Earth Planet Science Letters*, **18**(2), 333-338.
- Maaloe, S. Sørensen, J.B., & Hertogen, J. (1986). The trachybasaltic suite of Jan Mayen. *Journal of Petrology*, **27**, 439-466.
- Magna, T., Wiechert, U.H., Stuart, F.M., Halliday, A.N., & Harrison, D. (2011). Combined Li-He isotopes in Iceland and Jan Mayen basalts and constraints on the nature of the North Atlantic mantle. *Geochim. Cosmochim. Acta*, **75**, 922-936. <https://doi.org/10.1016/j.gca.2010.11.007>
- Melson, W.G., & O'Hearn, T. (2003). Smithsonian volcanic glass file.
- Mertz, D.F., & Haase, K.M. (1997). The radiogenic isotope composition of the high-latitude North Atlantic mantle. *Geology*, **25**(5), 411-414. [https://doi.org/10.1130/0091-7613\(1997\)025<0411:TRICOT>2.3.CO;2](https://doi.org/10.1130/0091-7613(1997)025<0411:TRICOT>2.3.CO;2)
- Michael, P.J. (1995). Regionally distinctive sources of depleted MORB: Evidence from trace elements and H<sub>2</sub>O. *Earth and Planetary Science Letters*, **131**(3-4), 301-320. [https://doi.org/10.1016/0012-821X\(95\)00023-6](https://doi.org/10.1016/0012-821X(95)00023-6)
- Neumann, E.-R., & Schilling, J.-G. (1984). Petrology of basalts from the Mohns-Knipovich Ridge; the Norwegian-Greenland Sea. *Contributions to Mineralogy and Petrology*, **85**(3), 209-223. <https://doi.org/10.1007/BF00378101>
- O'Nions, R.K., & Pankhurst, R.J. (1974). Petrogenetic Significance of Isotope and Trace Element Variations in Volcanic Rocks from the Mid-Atlantic. *Journal of Petrology*, **15**(3), 603-634, <https://doi.org/10.1093/petrology/15.3.603>

- Pedersen, S., Larsen, O., Hald, N., Campsie, J., & Bailey, J.C. (1976). Strontium isotope and lithophile element values from the submarine Jan Mayen province. *Bulletine of the geological society of Denmark*, **25**, 25-30.
- Poreda, R., Schilling, J.G., & Craig, H. (1986). Helium and hydrogen isotopes in ocean-ridge basalts north and south of Iceland. *Earth and Planetary Science Letters*, **78**(1), 1-17. [https://doi.org/10.1016/0012-821X\(86\)90168-8](https://doi.org/10.1016/0012-821X(86)90168-8)
- Roberts, B., & Hawkins, T.R.W. (1963). The geology of the area around Nordkapp, Jan Mayen. *Norsk Polarinst. Årbok*, 25-48.
- Schilling, J.G., Zajac, M., Evans, R., Johnston, T., White, W., Devine, J.D., & Kingsley, R. (1983). Petrologic and geochemical variations along the Mid-Atlantic Ridge from 29 degrees N to 73 degrees. *North American Journal of Science*, **283**, 510-586. <https://doi.org/10.2475/ajs.283.6.510>
- Sigurdsson, H. (1981). First-order major element variation in basalt glasses from the Mid-Atlantic Ridge: 29°N to 73°N. *Journal of Geophysical Research*, **86**(B10), 9483– 9502. <https://doi.org/10.1029/JB086iB10p09483>
- Stecher, O. (1998). Fluorine geochemistry in volcanic rock series: examples from Iceland and Jan Mayen. *Geochim. cosmochim. Acta*, **62**, 3117-3130. [https://doi.org/10.1016/S0016-7037\(98\)00210-5](https://doi.org/10.1016/S0016-7037(98)00210-5)
- Sun, S.S., Tatsumoto, M., & Schilling, J.G. (1975). Mantle plume mixing along the Reykjanes ridge axis - Lead isotope evidence. *Science*, **190**(4210), 143-147. <https://doi.org/10.1126/science.190.4210.143>
- Troennes, R.G., Planke, S., Sundvoll, B., & Imsland, P. (1999). Recent volcanic rocks from Jan Mayen: Low-degree melt fractions of enriched Northeast Atlantic mantle. *J. Geophys. Res.*, **B104**, 7153-7168. <https://doi.org/10.1029/1999JB900007>
- Waggoner, D.G. (1989). *An isotopic and trace element study of mantle heterogeneity beneath the Norwegian-Greenland Sea*. Doctoral dissertation, University of Rhode Island, USA.
- Weigand, P.W., Brunfelt, A.O., Heier, K.S., Sundvoll, B., & Steinnes, E. (1972). Geochemistry of Alkali Olivine Basalts from an eruption on Jan Mayen. *Nature Physical Science*, **235**, 31-33. <https://doi.org/10.1038/physci235031a0>
- Weigand, P.W. (1970). Bulk-rock and mineral chemistry of recent Jan Mayen basalts. *Norsk Polarinst Årbok*, 42-52.

### ***Jan Mayen microcontinent (JMMC-SRC) seafloor samples***

- Polteau, S., Mazzini, A., Hansen, G., Planke, S., Jerram, D.A., Millett, J., Abdelmalak, M.M., Blischke, A., & Myklebust, R (2018). The pre-breakup stratigraphy and petroleum system of the Southern Jan Mayen Ridge revealed by seafloor sampling. *Tectonophysics*, **760**(6), 152-164. <https://doi.org/10.1016/j.tecto.2018.04.016>



**Kolbeinsey ridge (KR)**

- Devey, C.W., Garbe-Schönberg, C.-D., Stoffers, P., Chauvel, C., & Mertz, D.F. (1994). Geochemical effects of dynamic melting beneath ridges: Reconciling major and trace element variations in Kolbeinsey (and global) mid-ocean ridge basalt. *J. Geophys. Res.*, **99**(B5), 9077–9095. <https://doi.org/10.1029/93JB03364>
- Dittmer, F., Fine, S., Rasmussen, M., Bailey, J.C., & Campsie, J. (1975). Dredged basalts from the mid-oceanic ridge north of Iceland. *Nature*, **254**, 298–301. <https://doi.org/10.1038/254298a0>
- Hanan, B.B., Blichert-Toft, J., Kingsley, R., & Schilling, J.G. (2000). Depleted Iceland mantle plume geochemical signature: Artifact of multicomponent mixing? *Geochemistry Geophysics Geosystems*, **1**(4). <https://doi.org/10.1029/1999GC000009>
- Jochum, K.P., Hofmann, A.W., & Seufert, H.M. (1993). Tin in mantle-derived rocks: Constraints on Earth evolution. *Geochimica et Cosmochimica Acta*, **57**(15), 3585–3595. [https://doi.org/10.1016/0016-7037\(93\)90141-I](https://doi.org/10.1016/0016-7037(93)90141-I)
- Mertz, D.F., Devey, C.W., Todt, W., Stoffers, P., & Hofmann, A.W. (1991). Sr-Nd-Pb isotope evidence against plume-asthenosphere mixing north of Iceland. *Earth and Planetary Science Letters*, **107**(2), 243–255. [https://doi.org/10.1016/0012-821X\(91\)90074-R](https://doi.org/10.1016/0012-821X(91)90074-R)
- O'Nions, R.K., & Pankhurst, R. J. (1974). Petrogenetic Significance of Isotope and Trace Element Variations in Volcanic Rocks From the Mid-Atlantic. *Journal of Petrology*, **15**(3), 603–634. <https://doi.org/10.1093/petrology/15.3.603>
- Schilling, J.G., Zajac, M., Evans, R., Johnston, T., White, W., Devine, J.D., & Kingsley, R. (1983). Petrologic and geochemical variations along the Mid-Atlantic Ridge from 29 degrees N to 73 degrees. *North American Journal of Science*, **283**, 510–586. <https://doi.org/10.2475/ajs.283.6.510>
- Schilling, J.G., Kingsley, R., Fontignie, D., Poreda, R., & Xue, S. (1999). Dispersion of the Jan Mayen and Iceland mantle plumes in the Arctic: A He-Pb-Nd-Sr isotope tracer study of basalts from the Kolbeinsey, Mohns, and Knipovich Ridges. *Journal of Geophysical Research*, **104**(B5), 10543–10569. <https://doi.org/10.1029/1999jb900057>
- Sigurdsson, H., & Brown, G.M. (1970). An unusual enstatite-forsterite basalt from Kolbeinsey Island, north of Iceland. *J. Petrol.*, **11**, 205–220. <https://doi.org/10.1093/petrology/11.2.205>
- Sun, S.-S., Nesbitt, R.W., & Sharaskin, A.Ya. (1979). Geochemical characteristics of mid-ocean ridge basalts. *Earth and Planetary Science Letters*, **44**(1), 119–138. [https://doi.org/10.1016/0012-821X\(79\)90013-X](https://doi.org/10.1016/0012-821X(79)90013-X)
- Waggoner, D.G. (1989). *An isotopic and trace element study of mantle heterogeneity beneath the Norwegian-Greenland Sea*. Doctoral dissertation, University of Rhode Island, USA.

**Mohns ridge (MR)**

- Blichert-Toft, J., Agraniér, A., Andres, M., Kingsley, R., Schilling, J.-G., & Albarède, F. (2005). Geochemical segmentation of the Mid-Atlantic Ridge north of Iceland and ridge-hot spot interaction in the North Atlantic. *Geochem. Geophys. Geosyst.*, **6**, Q01E19. <https://doi.org/10.1029/2004GC000788>
- Haase, K.M., Devey, C.W., Mertz, D.F., Stoffers, P., & Garbe-Schönberg, D. (1996). Geochemistry of lavas from Mohns Ridge, Norwegian-Greenland Sea: implications for melting conditions and magma sources near Jan Mayen. *Contributions to Mineralogy and Petrology*, **123**(3), 223-237. <https://doi.org/10.1007/s004100050152>
- Hanan, B.B., Blichert-Toft, J., Kingsley, R., & Schilling, J.G. (2000). Depleted Iceland mantle plume geochemical signature: Artifact of multicomponent mixing? *Geochemistry Geophysics Geosystems*, **1**(4). <https://doi.org/10.1029/1999GC000009>
- Kingsley, R.H., Schilling, J.-G., Dixon, J.E., Swart, P., Poreda, R., & Simons, K. (2002). D/H ratios in basalt glasses from the Salas y Gomez mantle plume interacting with the East Pacific Rise: Water from old D-rich recycled crust or primordial water from the lower mantle? *Geochem. Geophys. Geosyst.*, **3**(4), 1-26. <https://doi.org/10.1029/2001GC000199>
- Kruber, C., Thorseth, I.H., & Pedersen, R.B. (2008). Seafloor alteration of basaltic glass: Textures, geochemistry, and endolithic microorganisms. *Geochem. Geophys. Geosyst.*, **9**, Q12002. <https://doi.org/10.1029/2008GC002119>
- Melson, W.G., & O'Hearn, T. (2003). *Smithsonian volcanic glass file*.
- Mertz, D.F., & Haase, K.M. (1997). The radiogenic isotope composition of the high-latitude North Atlantic mantle. *Geology*, **25**(5), 411-414. [https://doi.org/10.1130/0091-7613\(1997\)025<0411:TRICOT>2.3.CO;2](https://doi.org/10.1130/0091-7613(1997)025<0411:TRICOT>2.3.CO;2)
- Michael, P.J. (1995). Regionally distinctive sources of depleted MORB: Evidence from trace elements and H<sub>2</sub>O. *Earth and Planetary Science Letters*, **131**(3-4), 301-320. [https://doi.org/10.1016/0012-821X\(95\)00023-6](https://doi.org/10.1016/0012-821X(95)00023-6)
- Neumann, E.-R., & Schilling, J.-G. (1984). Petrology of basalts from the Mohns-Knipovich Ridge; the Norwegian-Greenland Sea. *Contributions to Mineralogy and Petrology*, **85**(3), 209-223. <https://doi.org/10.1007/BF00378101>
- Poreda, R., Schilling, J.G., & Craig, H. (1986). Helium and hydrogen isotopes in ocean-ridge basalts north and south of Iceland. *Earth and Planetary Science Letters*, **78**(1), 1-17. [https://doi.org/10.1016/0012-821X\(86\)90168-8](https://doi.org/10.1016/0012-821X(86)90168-8)
- Schilling, J.G., Kingsley, R., Fontignie, D., Poreda, R., & Xue, S. (1999). Dispersion of the Jan Mayen and Iceland mantle plumes in the Arctic: A He-Pb-Nd-Sr isotope tracer study of basalts from the Kolbeinsey, Mohns, and Knipovich Ridges. *Journal of Geophysical Research*, **104**(B5), 10543-10569. <https://doi.org/10.1029/1999jb900057>
- Waggoner, D.G. (1989). *An isotopic and trace element study of mantle heterogeneity beneath the Norwegian-Greenland Sea*. Doctoral dissertation, University of Rhode Island, USA.

### **Northern Jan Mayen Ridge (NJMR)**

- Debaille, V., Trønnes, R.G., Brandon, A.D., Waight, T.E., Graham, D.W. & Lee, C.-T.A. (2009). Primitive off-rift basalts from Iceland and Jan Mayen: Os-isotopic evidence for a mantle source containing enriched subcontinental lithosphere. *Geochimica et Cosmochimica Acta*, **73**(11), 3423-3449. <https://doi.org/10.1016/j.gca.2009.03.002>
- Haase, K.M., Devey, C.W., Mertz, D.F., Stoffers, P., & Garbe-Schönberg, D. (1996). Geochemistry of lavas from Mohns Ridge, Norwegian-Greenland Sea: implications for melting conditions and magma sources near Jan Mayen. *Contributions to Mineralogy and Petrology*, **123**(3), 223-237. <https://doi.org/10.1007/s004100050152>

### **Northern volcanic zone – Krafla (NVZ)**

- Grönvold, K., & Mäkipää (1978). *Chemical composition of Krafla lavas 1975-1977*. Nordic volcanological institute, University of Iceland, report 78, 16.

### **Tjörnes fracture zone (TFZ)**

- Devey, C.W., Garbe-Schönberg, C.-D., Stoffers, P., Chauvel, C., & Mertz, D.F. (1994). Geochemical effects of dynamic melting beneath ridges: Reconciling major and trace element variations in Kolbeinsey (and global) mid-ocean ridge basalt. *J. Geophys. Res.*, **99**(B5), 9077– 9095. <https://doi.org/10.1029/93JB03364>
- Hemond, C., Condomines, M., Fourcade, S., Alegre, C.-J., Oskarsson, N., & Javoy M. (1988). Thorium, Strontium and oxygen isotopic geochemistry in recent tholeiites from Iceland: Crustal influence on mantle-derived magmas. *Earth Planet. Sci. Lett.*, **87**, 273-285. [https://doi.org/10.1016/0012-821X\(88\)90015-5](https://doi.org/10.1016/0012-821X(88)90015-5)
- Kokfelt, T.F., Hoernle, K., Hauff, F., Fiebig, J., Werner, R., & Garbe-Schönberg, D. (2006). Combined Trace Element and Pb-Nd–Sr-O Isotope Evidence for Recycled Oceanic Crust (Upper and Lower) in the Iceland Mantle Plume. *Journal of Petrology*, **47**(9), 1705-1749. <https://doi.org/10.1093/petrology/egl025>
- Schilling, J.G., Zajac, M., Evans, R., Johnston, T., White, W., Devine, J.D., & Kingsley, R. (1983). Petrologic and geochemical variations along the Mid-Atlantic Ridge from 29 degrees N to 73 degrees. *North American Journal of Science*, **283**, 510-586. <https://doi.org/10.2475/ajs.283.6.510>
- Sigvaldason, G.E. (1974). Basalt from the centre of the assumed Icelandic mantle plume. *J. Petrol.*, **15**, 497-524. <https://doi.org/10.1093/petrology/15.3.497>

### **Vesteris seamount (VSM)**

- Haase, K.M., & Devey, C.W. (1994). The Petrology and Geochemistry of Vesteris Seamount, Greenland Basin—an Intraplate Alkaline Volcano of Non-Plume Origin. *Journal of Petrology*, **35**(2), 295-328. <https://doi.org/10.1093/petrology/35.2.295>