

AG-342, AG-842

The Marine Cryosphere and its Cenozoic History (10 ECTS)

Articles listed directly under the blocks complements the lectures and comprise the reading material for the exam. Some additional articles may be added under the blocks during the course start.

The “Additional reading list” is aimed to provide guidance for more in depth reading on the subjects brought up in the course. This list will be further developed during the course.

Blocks

The Marine Cryosphere: Cenozoic History I, II, III (Martin Jakobson)

Jakobsson, M., Andreassen, K., Bjarnadóttir, L. R., Dove, D., Dowdeswell, J. A., England, J. H., Funder, S., Hogan, K., Ingólfsson, Ó., Jennings, A., Krog Larsen, N., Kirchner, N., Landvik, J. Y., Mayer, L., Mikkelsen, N., Möller, P., Niessen, F., Nilsson, J., O'Regan, M., Polyak, L., Nørgaard-Pedersen, N., and Stein, R., 2014, Arctic Ocean glacial history: *Quaternary Science Reviews*, v. 92, p. 40-67.

Jakobsson, M., Nilsson, J., Anderson, L., Backman, J., Björk, G., Cronin, T. M., Kirchner, N., Koshurnikov, A., Mayer, L., Noormets, R., O'Regan, M., Stranne, C., Ananiev, R., Barrientos Macho, N., Cherniykh, D., Coxall, H., Eriksson, B., Floden, T., Gemery, L., Gustafsson, O., Jerram, K., Johansson, C., Khortov, A., Mohammad, R., and Semiletov, I., 2016, Evidence for an ice shelf covering the central Arctic Ocean during the penultimate glaciation: *Nature Communication*, v. 7, p. 1-10.

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Sea ice (Johan Nilsson)

Leppäranta, M., 1993: A review of analytical models for sea-ice growth. *Atmosphere-Ocean* 31 , 1, 123-138.

Høyland, K.V., 2009. Ice thickness, growth and salinity in Van Mijenfjorden, Svalbard, Norway. 2009 28, 339-352.

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Rudels, B., 2009: Arctic Ocean circulation. Encyclopedia of Ocean Science 2nd. Ed, " Eds J. Steele, S. Thorpe and K. Turekian. *Academic Press*, 211-225.

The Marine Cryosphere: Sediment proxies and sedimentation (Matt O'Regan)

Dowdeswell J.A. (2009) Ice-Rafted Debris (IRD). In: Gornitz V. (eds) Encyclopedia of Paleoclimatology and Ancient Environments. Encyclopedia of Earth Sciences Series. Springer, Dordrecht.

Licht K. (2009) Glaciomarine Sediments. In: Gornitz V. (eds) Encyclopedia of Paleoclimatology and Ancient Environments. Encyclopedia of Earth Sciences Series. Springer, Dordrecht.

*Krylov, A.A., Andreeva, I.A., Vogt, C., Backman, J., Krupskaya, V.V., Grikurov, G.E., Moran, K., Shoji, H., 2008. A shift in heavy and clay mineral provenance indicates a middle Miocene onset of a perennial sea ice cover in the Arctic Ocean. *Paleoceanography* 23, PA1S06.

Stein, R.; Fahl, K.; Müller, J. (2012) Proxy Reconstruction of Cenozoic Arctic Ocean Sea-Ice History – from IRD to IP25 –. *Polarforschung*, 82, 1, 37-71, hdl:10013/epic.40432.d001

Polyak, L., Jakobsson, M., 2011. Quaternary sedimentation in the Arctic Ocean: Recent advances and further challenges. *Oceanography* 24, 52-64.

Marine ice sheets and their components (Nina Kirchner)

Kirchner, N., van Dongen, E., Gowan, E.J., Pattyn, F., Noormets, R., Jakobsson, M., Ó Ingólfsson, Ó., GRANTSISM: an Excel™ ice sheet model for use in introductory Earth Science courses. Accepted for publication in *Journal of Geoscience Education* (publishing date February 2018)

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Pattyn, F., 2006: GRANTISM: An Excel™ model for Greenland and Antarctic ice-sheet response to climate changes, *Computers & Geosciences* 32, 316-352.

Colleoni, F., Kirchner, N., Niessen, F., Quiquet, A., Liakka, J. (2016). *An East Siberian ice shelf during the Late Pleistocene glaciations: Numerical reconstructions*. *Quaternary Science Reviews*:147, p.148-163. doi:10.1016/j.quascirev.2015.12.023

Vallot, D., R. Pettersson, A. Luckman, D. Benn, T. Zwinger, W.J.J. van Pelt, J. Kohler, M. Schäfer, B. Claremar and N.R.J. Hulton, 2017. Basal dynamics of Kronebreen, a fast-flowing tidewater glacier in Svalbard: Non-local spatio-temporal response to water input, *Journal of Glaciology*, 1-13, doi:doi:10.1017/jog.2017.69.

Marine ice sheets and their components (Riko Noormets, Anne Flink)

Dowdeswell, J.A., Canals, M., Jakobsson, M., Todd, B.J., Dowdeswell, E.K. and Hogan, K., 2016. Introduction: an Atlas of Submarine Glacial Landforms. In J.A. Dowdeswell, M. Canals, M. Jakobsson, B.J. Todd, E.K. Dowdeswell, K.A. Hogan (Eds.): *Atlas of Submarine Glacial Landforms*, Geological Society of London, *Memoirs* 46, 3-14.

Hogan, K.A., Dowdeswell, J.A. and Noormets, R., 2016. Assemblage of submarine landforms in the glacial troughs of the northern Barents Sea, east of Svalbard. In J.A. Dowdeswell, M. Canals, M. Jakobsson, B.J. Todd, E.K. Dowdeswell, K.A. Hogan (Eds.): *Atlas of Submarine Glacial Landforms*, Geological Society of London, *Memoirs* 46, 333-336.

Andreassen, K., Hubbard, A., Winsborrow, M., Patton, H., Vadakkepuliambatta, S., Plaza-Faverola, A., Gudlaugsson, E., Serov, P., Deryabin, A., Mattingdal, R., Mienert, J. and Bünz, S., 2017. Massive blow-out craters formed by hydrate-controlled methane expulsion from the Arctic seafloor. *Science* 356, 948–953.

Fransner, O., Noormets, R., Chauhan, T., O'Regan, M.A. & Jakobsson, M. Late Weichselian ice stream configuration, dynamics and retreat history in Albertini Trough, northern Svalbard margin. *Arktos*, (In press).
Fransner, O., Noormets, R., Flink, A.E. Hogan, K.A. & Dowdeswell, J.A. Sedimentary processes on the continental slope off Kvitøya and Albertini troughs north of Nordaustlandet, Svalbard – importance of structural-geological setting in trough-mouth fan development. *Marine Geology* (In press).

Flink, A.E. & Noormets, R., 2017. Glacial history of Vaigattbogen, northeastern Spitsbergen. *Marine geology* (In press).

Additional reading tips

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- Dowdeswell, J.A., et al., 2010. High-resolution geophysical observations from the Yermak Plateau and northern Svalbard margin: implications for ice-sheet grounding and deep-keeled icebergs. *Quaternary Science Reviews* 29, 3518-3531.
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- Dyke, A.S., Hooper, J., Savelle, J.M., 1996. A History of Sea Ice in the Canadian Arctic Archipelago Based on Postglacial Remains of the Bowhead Whale (*Balaena mysticetus*). *Arctic* 49, 235-255.
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