

Supporting Information Table S1. Records of non-indigenous species (NIS) introductions for marine environments in the Arctic from 1960-2015. Fifty-four introduction events, representing 34 unique aquatic NIS were included in the analysis. For introduced region, ID # 1 = Faroe Islands, 2 = Iceland Shelf, 3 = Greenland Sea East-Greenland, 4 = Norwegian Sea, 5 = Barents Sea, 6 = Kara Sea, 7 = Laptev Sea, 8 = East Siberian Sea, 9 = East Bering Sea, 10 = Aleutian Islands, 11 = West Bering Sea, 12 = Northern Bering Chukchi Sea, 13 = Central Arctic Ocean, 14 = Beaufort Sea, 15 = Canadian High Arctic North Greenland, 16 = Canadian East Arctic-West Greenland, 17 = Hudson Bay, and 18 = Labrador-Newfoundland. For source region, ID #18 = Arctic Sea, 21 = Northwest Atlantic, 27 = Northeast Atlantic, 31 = the West Central Atlantic, 34 = East Central Atlantic, 37 = Mediterranean and Black Sea, 41 = Southwest Atlantic, 47 = Southeast Atlantic, 48 = Antarctic Atlantic, 51 = Western Indian Ocean, 57 = Eastern Indian Ocean, 58 = Antarctic and Southern Indian Ocean, 61 = Northwest Pacific, 67 = Northeast Pacific, 71 = Western Central Pacific, 77 = Eastern Central Pacific, 81 Southwest Pacific, 87 = Southeast Pacific, and 88 = Antarctic Pacific. For pathway, M = multiple possible pathways and S = single possible pathway, where C = canal, A = aquaculture activities, L = live food trade, N = natural spread, V = vessels, and W = wild fisheries. Established NIS are embolden. Asterisks indicate introduction events that were originated from within the Arctic.

Phylum	Species	Common name	Habitat	Year of first report	Introduced region (Arctic LME)	Source region (FAO fishing area)	Population status	Pathway	A	C	L	N	V	W	References
Arthropoda	<i>Caprella mutica</i>	Japanese Skeleton Shrimp	Marine	2000	9	67	Established	M	1			1	1		Ashton et al. 2008; Cohen 2016; Fofonoff et al. 2003
	<i>Caprella mutica</i>	Japanese Skeleton Shrimp	Marine	2002	5	?	Established	M	1			1	1		Ashton et al. 2007; Cohen 2016; Fofonoff et al. 2003; Gederaas et al. 2012; Hopkins 2001, 2002
	<i>Caprella mutica</i>	Japanese Skeleton Shrimp	Marine	2002	4	?	Established	M	1			1	1		Ashton et al. 2007; Cohen 2016; Fofonoff et al. 2003; Gederaas et al. 2012; Hopkins 2001, 2002
	<i>Eurytemora americana</i>		Marine, brackish	2015	5	21	Established	S					1		Moon et al. 2006; Sukhikh et al. 2016
	<i>Cancer irroratus</i>	Atlantic Rock Crab	Marine	2006	2	21	Established	S					1		AquaNIS Editorial Board 2015; Cohen 2016; EMOEnet 2017; Gíslason et al. 2013a,b, 2014; Thorarinsdottir et al. 2014
	<i>Chionoecetes opilio</i>	Snow Crab	Marine	1996	5	18, 21, 61, 67	Established	M				1	1	1	Cohen 2016; Dvoretzky and Dvoretzky 2015; EMODnet 2018; Gederaas et al. 2012; Sundet 2014; Zimina 2015
	<i>Chionoecetes opilio</i>	Snow Crab	Marine	2012	6	27*	Established	S				1			Cohen 2016; EMODnet 2018; Zimina 2015
	<i>Crangon crangon</i>	European Brown Shrimp	Marine	2003	2	?	Established	S					1		EMODnet 2018; Gunnarsson et al. 2007; Thorarinsdottir et al. 2014

	<i>Eriocheir sinensis</i>	Chinese Mitten Crab	Marine, brackish, fresh	1998	5	27	Established	M	1	1	Berger and Naumov 2002; Cohen 2016; Shakirova et al. 2007
	<i>Homarus americanus</i>	American Lobster	Marine	1965	2	21	Failed	S	1		AquaNIS Editorial Board 2015; Cohen 2016
	<i>Homarus americanus</i>	American Lobster	Marine	2002	4	?	Failed	S	1		Fofonoff et al. 2003; Jørstad et al. 2007
	<i>Paralithodes camtschaticus</i>	Red King Crab	Marine	1961	5	61	Established	S		1	AquaNIS Editorial Board 2015; Cohen 2016; Dvoretzky and Dvoretzky 2015; EMODnet 2018; Falk et al. 2011; Orlov and Ivanov 1978; OSPAR 2000; Sokolov and Milyutin 2006
	<i>Clausocalanus furcatus</i>		Marine	2011	17	?	Unknown	S		1	Brown et al. 2016; EMODnet 2018
	<i>Clausocalanus furcatus</i>		Marine	2011	16	?	Unknown	S		1	Brown et al. 2016; EMODnet 2018
	<i>Eurytemora affinis</i>		Marine, brackish	2011	17	?	Unknown	S		1	Brown et al. 2016
	<i>Euterpina acutifrons</i>		Marine, brackish	2011	17	?	Unknown	S		1	Brown et al. 2016; EMODnet 2018
	<i>Euterpina acutifrons</i>		Marine, brackish	2011	16	?	Unknown	S		1	Brown et al. 2016; EMODnet 2018
	<i>Temora turbinata</i>		Marine	2011	17	?	Unknown	S		1	Brown et al. 2016; EMODnet 2018
	<i>Temora turbinata</i>		Marine	2011	16	?	Unknown	S		1	Brown et al. 2016; EMODnet 2018
Chlorophyta	<i>Codium fragile</i> subsp. <i>fragile</i>	Green Sea Fingers	Marine	1974	2	61	Established	S		1	AquaNIS Editorial Board 2015; Cohen 2016; EMODnet 2018; Thorarinsdottir et al. 2014
Chordata	<i>Oncorhynchus gorbuscha</i>	Pink Salmon	Marine, brackish, fresh	1960	4	27*	Established	S		1	AquaNIS Editorial Board 2015; Bjerknes and Vagg 1980; Cohen 2016; Emodnet 2018; Hopkin 2001, 2002; Niemelä et al. 2016
	<i>Oncorhynchus gorbuscha</i>	Pink Salmon	Marine, brackish, fresh	1960	2	61	Failed	S		1	AquaNIS Editorial Board 2015; EMODnet 2018; Niemelä et al. 2016; Petryashov et al. 2002; Zubchenko et al. 1998
	<i>Oncorhynchus kisutch</i>	Coho Salmon	Marine, brackish,	1976	5	61	Failed	S		1	Rozdestnenskaya and Krasnova 1978

	<i>Oncorhynchus mykiss</i>	Rainbow Trout	fresh Marine, brackish, fresh	1983	2	27*	Failed	S	1				AquaNIS Editorial Board 2015; Thorarinsdottir et al. 2014
	<i>Oncorhynchus mykiss</i>	Rainbow Trout	Marine, brackish, fresh	1990	1	27*	Established	S	1				AquaNIS Editorial Board 2015
	<i>Oncorhynchus nerka</i>	Sockeye Salmon	Marine, brackish, fresh	1964	5	61	Failed	S			1		Surkov 1966
	<i>Platichthys flesus</i>	European Flounder	Marine, brackish, fresh	1999	2	27*	Established	M			1	1	AquaNIS Editorial Board 2015; Cohen 2016; Emodnet 2018; Thorarinsdottir et al. 2014
	<i>Ciona intestinalis</i>	Sea Vase Tunicate	Marine	2007	2	21, 27	Established	S				1	AquaNIS Editorial Board 2015; Bouchemousse et al. 2016; Cohen 2016; EMODnet 2018; Thorarinsdottir et al. 2014
	<i>Molgula manhattensis?</i>	Sea Grapes	Marine	1997	4	21	Established	S				1	Brattegard and Holthe 1997; Fofonoff et al. 2003; G. Lambert personal communication 2018; Hopkins 2001; OSPAR 2000
Mollusca	<i>Magallana gigas</i>	Pacific Oyster	Marine, brackish	1979	4	27	Failed	S	1				Fofonoff et al. 2003; Hopkins 2001, 2002; Streftaris et al. 2005; Walday 2002
	<i>Ruditapes philippinarum</i>	Manila Clam	Marine	1987	4	27	Failed	M	1	1			AquaNIS Editorial Board 2015; Cohen 2016; Hopkins 2001; Mortensen et al. 2000; Walday 2002; Streftaris et al. 2005
	<i>Mytilus galloprovincialis</i>	Mediterranean Mussel	Marine	2011	17	27	Unknown	M			1	1	Brown et al. 2011; EMODnet 2018
	<i>Mytilus galloprovincialis</i>	Mediterranean Mussel	Marine	2010?	5	27	Established	M			1	1	Brooks and Farmen 2013; EMODnet 2018; Mathiesen et al. 2017
	<i>Mytilus galloprovincialis</i>	Mediterranean Mussel	Marine	2014	2	27	Unknown	M			1	1	EMODnet 2018; Mathiesen et al. 2017
	<i>Mytilus galloprovincialis</i>	Mediterranean Mussel	Marine	2014	16	27	Unknown	M			1	1	Mathiesen et al. 2017
Myzozoa	<i>Karenia mikimotoi</i>		Marine	1966	4	?	Unknown	M	1		1	1	AquaNIS Editorial Board 2015; Cohen 2016; Gomez et al. 2008; Guiry & Guiry 2018; Hopkins

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Ochrophyta	<i>Mediopyxis helysia</i>		Marine	2007	2	?	Established	S		1	Cohen 2016; EMODnet 2018; Thorarinsdottir et al. 2014
	<i>Neodenticula seminae</i>	Pacific diatom	Marine	1999	18	61, 67	Unknown	S		1	Cohen 2016; Miettinen et al. 2013; Poulin et al. 2010; Reid et al. 2007; Thorarinsdottir et al. 2014
	<i>Neodenticula seminae</i>	Pacific diatom	Marine	1999	16	61, 67	Unknown	S		1	Cohen 2016; Miettinen et al. 2013; Poulin et al. 2010; Reid et al. 2007; Thorarinsdottir et al. 2014
	<i>Neodenticula seminae</i>	Pacific diatom	Marine	2002	2	61, 67	Unknown	S		1	Cohen 2016; EMODnet 2018; Miettinen et al. 2013; Poulin et al. 2010; Thorarinsdottir et al. 2014
	<i>Neodenticula seminae</i>	Pacific diatom	Marine	2006	3	61, 67	Unknown	S		1	Cohen 2016; Miettinen et al. 2013; Poulin et al. 2010; Thorarinsdottir et al. 2014
	<i>Neodenticula seminae</i>	Pacific diatom	Marine	2006	5	61, 67	Unknown	S		1	Cohen 2016; Miettinen et al. 2013; Poulin et al. 2010; Thorarinsdottir et al. 2014
	<i>Neodenticula seminae</i>	Pacific diatom	Marine	2006	4	61, 67	Unknown	S		1	Cohen 2016; Miettinen et al. 2013; Poulin et al. 2010; Thorarinsdottir et al. 2014
	<i>Stephanopyxis turris</i>		Marine	1997	2	?	Established	S		1	Cohen 2016; EMODnet 2018; Thorarinsdottir et al. 2014
	<i>Fucus serratus</i>	Toothed Wrack	Marine	1997	1	27*	Established	S		1	Cohen 2016; Coyer et al. 2006
	<i>Sargassum muticum</i>	Japanese Wireweed	Marine	1984	4	27	Established	M	1	1	AquaNIS Editorial Board 2015; Brattegard and Holthe 2001; Gederas et al. 2012; Hopkins 2001; NOBANIS 2018
	<i>Heterosigma akashiwo</i>		Marine	1987	2	61	Failed	S		1	AquaNIS Editorial Board 2015; EMODnet 2018; Engesmo et al. 2016; Thorarinsdottir et al. 2014
	<i>Heterosigma akashiwo</i>		Marine	2001	5	?	Failed	S		1	Engesmo et al. 2016; EMODnet 2018; Ratkova and Wassmann 2005
Platyhelminthes	<i>Gyrodactylus salaris</i>	Salmon Fluke	Marine, brackish,	1975	4	27	Established	S	1		AquaNIS Editorial Board 2015; Artamonova et al. 2011

	<i>Gyrodactylus salaris</i>	Salmon Fluke	fresh Marine, brackish, fresh	1992	5	27	Established	S	1			Artamonova et al. 2011
Rhodophyta	<i>Bonnemaisonia hamifera</i>	Japanese Red seaweed	Marine	1964	2	21, 27	Established	M	1	1	1	AquaNIS Editorial Board 2015; Cohen 2016; EMONDnet 2017; Fofonoff et al. 2003; OBIS 2018; OSPAR 2000; Thorarinsdottir et al. 2014
	<i>Bonnemaisonia hamifera</i>	Japanese Red seaweed	Marine	1980	1	?	Unknown	M	1		1	AquaNIS Editorial Board 2015; Cohen 2016; EMODnet 2018
	<i>Dasysiphonia japonica</i>		Marine	1999	4	61	Established	M	1		1	AquaNIS Editorial Board 2015; Cohen 2016; Lein 1999; Husa et al. 2004; Sjøtun et al. 2008
	<i>Dumontia contorta</i>		Marine	1967	14	27	Established	M	1		1	Cohen 2016; Lee 1980; Mathieson et al. 2010

References

- AquaNIS Editorial Board. (2015). Information system on aquatic non-indigenous and cryptogenic species. Retrieved from: www.corpi.ku.lt/databases/aquanis
- Artamonova, V. S., Makhrov, A. A., Shulman, B. S., Khaimina, O. V., Yurtseva, A. O., Lajus, D. L., Shirkov, V. A., & Shurov, I. L. (2011). Response of the Atlantic Salmon (*Salmo salar* L.) population of the Keret River to the invasion of parasite *Gyrodactylus salaris* Malmberg. *Russian Journal of Biological Invasions*, 2, 73-80.
- Ashton, G. V., Willis, K. J., Cook, E. J., & Burrows, M. (2007). Distribution of the introduced amphipod, *Caprella mutica* Schurin, 1935 (Amphipoda: Caprellida: Caprellidae) on the west coast of Scotland and a review of its global distribution. *Hydrobiologia*, 590, 31-41.
- Ashton, G. V., Riedlecker, E. I., & Ruiz, G. M. (2008). First non-native crustacean established in coastal waters of Alaska. *Aquatic Biology*, 3, 133-137.
- Berger, V. J. A., & Naumov, A. D. (2002). Biological invasions in the White Sea. In E. Leppäkoski, S. Gollasch, & S. Olenin (Eds.), *Invasive Aquatic Speices of Europe* (pp. 235–239). Dordrecht, the Netherlands: Kluwer Academic Publishers.
- Bjerknes, V., & Vaag, A. B. (1980). Migration and capture of pink salmon, *Oncorhynchus gorbuscha* Walbaum in Finnmark, north Norway. *Journal of Fish Biology*, 16, 291-297.
- Bouchemousse, S., Bishop, J. D. D., & Viard, F. (2016). Contrasting global genetic patterns in two biologically similar, widespread and invasive *Ciona* species (Tunicata, Ascidiacea). *Scientific Reports*, 6, 4875.
- Brattegard, T., & Holthe, T. (2001). *Distribution of marine, benthic macroorganisms in Norway a tabulated catalogue* (Report No: DN 1997-1). Trondheim, Norway: Directorate for Nature Management.

- Brooks, S. J., & Farnen, E. (2013). The distribution of the mussel *Mytilus* species along the Norwegian coast. *Journal of Shellfish Research*, 32, 265-270.
- Brown, E. A., Chain, F. J. J., Zhan, A., MacIsaac, H. J., & Cristescu, M. E. A. (2016). Early detection of aquatic invaders using metabarcoding reveals a high number of non-indigenous species in Canadian ports. *Diversity and Distributions*, 22, 1045–1059.
- Cohen, A. N. (2016). *White paper on ship-mediated bio invasions in the Arctic: pathways and control strategies* (Report No. MEPC 69/INF.17). London, UK: International Maritime Organization.
- Coyer, J. A., Hoarau, G., Skage, M., Stam, W. T., & Olsen, J. L. (2006). Origin of *Fucus serratus* (Heterokontophyta: Fucaceae) populations in Iceland and the Faroes: a microsatellite-based assessment. *European Journal of Phycology*, 41, 235-246.
- Dvoretzky, A. G. & Dvoretzky, V. G. (2015). Commercial fish and shellfish in the Barents Sea: have introduced crab species affected the population trajectories of commercial fish? *Reviews in Fish Biology and Fisheries*, 25, 297-322.
- EMOEnet. (2018). Arctic Alien Species. Retrieved from: <http://www.emodnet-arctic.eu/alien-species>
- Engesmo, A., Eikrem, W., Seoane, S., Smith, K., Edvardsen, B., Hofgarrrd, A., & Tomas, C. R. (2016). New insights into the morphology and phylogeny of *Heterosigma akashiwo* (Raphidophyceae), with the description of *Heterosigma minor* sp. nov. *Phycologia*, 55, 279-294.
- Falk-Petersen, J., Renaud, P., & Anisimova, N. (2011). Establishment and ecosystem effects of the alien invasive red king crab (*Paralithodes camtschaticus*) in the Barents Sea – a review. *ICES Journal of Marine Science*, 68, 479-488.

- Fofonoff, P. W., Ruiz, G. M., Steves, B., Hines, A. H., & Carlton, J. T. (2003). National Exotic Marine and Estuarine Species Information System. Retrieved from: <http://invasions.si.edu/nemesis/chesapeake.html>
- Gederaas, L., Moen, T. L., Skjelseth, S., & Larsen, L. K. (Eds.). (2012). *Alien species in Norway— with the Norwegian black list*. Trondheim, Norway: the Norwegian Biodiversity Information Centre.
- Gíslason, Ó. S., Svavarsson, J., Halldórsson, H. P., & Pálsson, S. (2013a). Nuclear mitochondrial DNA (NUMT) in the Atlantic rock crab *Cancer irroratus* Say, 1817 (Decapoda, Cancridae). *Crustaceana*, 86, 537-552.
- Gíslason, Ó. S., Pálsson, S., McKeown, N. J., Halldórsson, H. P., Shaw, P. W., & Svavarsson, J. (2013b). Genetic variation in a newly established population of the Atlantic rock crab *Cancer irroratus* in Iceland. *Marine Ecology Progress Series*, 494, 219-230.
- Gíslason, Ó. S., Halldórsson, H. P., Pálsson, M. F., Pálsson, S., Davíðsóttir, B., & Svavarsson, J. (2014). Invasion of the Atlantic rock crab (*Cancer irroratus*) at high latitudes. *Biological Invasions*, 16, 1865-1877.
- Gómez, F. (2008). Phytoplankton invasions: comments on the validity of categorizing the non-indigenous dinoflagellates and diatoms in European seas. *Marine Pollution Bulletin*, 56, 620-628.
- Guiry, M. D., & Guiry, G. M. (2018). Algaebase. Retrieved from: <http://www.algaebase.org>
- Gunnarsson, B., Ásgeirsson, P., & Ingólfsson, A. (2007). The rapid colonization by *Crangon crangon* (Linnaeus, 1758) (Eucarida, caridea, crangonidae) of Icelandic coastal waters. *Crustaceana*, 80, 747-753.

- Hopkins C. C. E. (2001). *Actual and potential effects of introduced marine organisms in Norwegian waters, including Svalbard* (Report No. 2001-1). Trondheim, Norway: Directorate for Nature Management.
- Hopkins, C. C. E. (2002). Introduced marine organisms in Norwegian waters, including Svalbard. In Leppäkoski E., S. Gollasch., & S. Olenin S (Eds.), *Invasive Aquatic Species of Europe distribution, impacts, and management* (240-252). Dordrecht, the Netherlands: Springer.
- Husa, V., Sjøtun, K., & Lein, T. E. (2004). The newly introduced species *Heterosiphonia japonica yendo* (Dasyceae, Rhodophyta) geographical distribution and abundance at the Norwegian southwest coast. *Sarsia*, 89, 211-217.
- Jørgensen, L. L., & Nilssen E. M. (2011). The invasive history, impact and management of the Red King Crab *Paralithodes camtschaticus* off the Coast of Norway. In B. S. Galil, P. F. Clark, & J. T. Carlton (Eds.), *In the Wrong Place – Alien Marine Crustaceans: Distribution, Biology and Impacts* (pp. 521-536). Dordrecht, Netherlands: Springer.
- Jørstad, K. E., Prodohl, P. A., Agnalt, A. L., Hughes, M., Farestveit, E., & Ferguson, A. F. (2007). Comparison of genetic and morphological methods to detect the presence of American lobsters, *Homarus americanus* H. Milne Edwards, 1837 (Astacidea: Nephropidae) in Norwegian waters. *Hydrobiologia*, 590, 103-114.
- Lee, R. K. S. (1980). *A catalogue of the marine algae of the Canadian Arctic*. Ottawa, Canada: National Museum of Natural Sciences.
- Lein, E. (1999). A newly immigrated red alga ('*Dasysiphonia*', Dasyaceae, Rhodophyta) to the Norwegian coast. *Sarsia*, 84, 85-88.

- Mathieson, A. C., Moore, G. E., & Short, F. T. (2010). A floristic comparison of seaweeds from James Bay and three contiguous northeastern Canadian Arctic sites. *Rhodora*, 112, 396-434.
- Mathieson, S. S., Thyrring, J., Hemmer-Hansen, J., Berge, J., Sukhotin, A., Leopold, P., Bekaert, M., Sejr, M. K., & Nielsen, E. E. (2017). Genetic diversity and connectivity within *Mytilus* spp. in the subarctic and Arctic. *Evolutionary Applications*, 10, 39-55.
- Miettinen, A., Koç, N., & Husum, K. (2013). Appearance of the Pacific diatom *Neodenticula seminae* in the northern Nordic Seas – An indication of changes in Arctic sea ice and ocean circulation. *Marine Micropaleontology*, 99, 2–7.
- Moon, S. Y., Choi, J., Kim, J., Kim, S., & Maran, B. A. V. (2016). New extension range and complimentary description of *Eurytemora americana* (Calanoida: Temoridae) in northern Korea. *Marine Biodiversity Records*, 9, 76.
- Mortensen, S. H., Strand, Ø., & Høisæter, T. (2000). Releases and recaptures of Manila Clams (*Ruditapes philippinarum*) introduced to Norway. *Sarsia*, 85, 87-91.
- Niemelä, E., Johanson, N., Zubchenko, A. V., Dempson, J. B., Veselov, A., Ieshko, E. P., Barskaya, Y., Novokhatskaya, O. V., Shulman, B. S., Länsman, M., Hassinen, E., Kuusela, J., Haantie, J., Kylmäaho, M., Kivilahti, E., Arvola, K. M. & Kalske, T. H. (2016). *Pink salmon in the Barents region with special attention to the status in the transboundary rivers Tana and Neiden, rivers in North West Russia and in East Canada* Report No. 3-2016. Hamar, Finland: Office of the Finnmark County Govenor.
- NOBANIS. (2018). The European Network on Invasive Alien Species (NOBANIS). Retrieved from: <https://www.nobanis.org/>
- OBIS. (2018). *Codium fragile* (Suringar) Hariot 1889. Ocean Biogeographic Information System (OBIS). Retrieved from: <http://www.iobis.org/explore/#/taxon/424799>

- Orlov, Y. I., & Ivanov, B. G. (1978). On the introduction of the Kamchatka king crab *Paralithodes camtschatica* (Decapoda: Anomura: Lithodidae) into the Barents Sea. *Marine Biology*, 48, 373-375.
- OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic. (2000). *Quality status Report 2000 Region I – Arctic*. London, UK: OSPAR Commission.
- Petryashov, V. V., Chernova, N. V., Denisenko, S. G., & Sundet, J. H. (2002). Red king crab (*Paralithodes camtschaticus*) and pink salmon (*Oncorhynchus gorbuscha*) in the Barents sea. In E. Leppäkoski E., S. Gollasch, S. Olenin (Eds.), *Aquatic Invasive Species of Europe distributions, impacts, and management* (147-152). Dordrecht, the Netherlands: Springer.
- Poulin, M., Lundholm, N., Berard-Therriault, L., Starr, M., & Gagnon, R. (2010). Morphological and phylogenetic comparisons of *Neodenticula seminae* Bacillariophyta populations between the subarctic Pacific and the Gulf of St. Lawrence. *European Journal of Phycology*, 45, 127–142.
- Ratkova, T. N., & Wassmann, P. (2005). Sea ice algae in the White and Barents seas: composition and origin. *Polar Research*, 24, 95-110.
- Reid, P. C., Johns, D. G., Edwards, M., Starr, M., Poulin, M., & Snoeijs, P. (2007). A biological consequence of reducing Arctic ice cover: arrival of the Pacific diatom *Neodenticula seminae* in the North Atlantic for the first time in 800 000 years. *Global Change Biology*, 13, 1910–1921.
- Rozdestnenskaya, A. D., & Krasnova, E. K. (1978). Experimental cultivation of the coho salmon in the Polar Circle. *Rybnoe Khoziaistvo (Fisheries)*, 6, 22–24. (in Russian)

- Shakirova, F. M., Panov, V. E., & Clark, P. F. (2007). New records of the Chinese mitten crab, *Eriocheir sinensis* H. Milne Edwards, 1853, from the Volga River, Russia. *Aquatic Invasions*, 2, 169-173.
- Sjøtun, K., Husa, V., & Peña, V. (2008). Present distribution and possible vectors of introductions of the alga *Heterosiphonia japonica* (Ceramiales, Rhodophyta) in Europe. *Aquatic Invasions*, 3, 377-394.
- Sokolov, V. I., & Milyutin, D. M. (2006). Distribution, size-sex composition, and reserves of the red king crab (*Paralithodes camtschaticus*) in the upper sublittoral of the Kola Peninsula (the Barents Sea). *Zoologicheskii Zhurnal*, 85, 158-171. (In Russian)
- Streftaris, N., Zenetos, A., & Papathanassiou, E. (2005). Globalisation in marine ecosystems: the story of non-indigenous marine species across European seas. *Oceanography and Marine Biology: An Annual Review*, 43, 419-453.
- Sukhikh, N. M., Castric, V., Polyakova, N. V., Souissi, S., & Alekseev, V. R. (2016). Isolated populations of *Eurytemora Americana* Williams (Crustacea, Copepoda) in the White Sea rock pools – postglacial relicts or anthropogenic invasions? *Russian Journal of biological Invasions*, 7, 396-404.
- Sundet, J. H. (2014). The red king crab (*Paralithodes camtschaticus*) in the Barents Sea. In Fernandez, L., Kaiser, B. A., & Vestergaard, N. (Eds.), *Marine Invasive Species in the Arctic* (71-82). Copenhagen, Denmark: Nordic Council of Ministers.
- Surkov, S. S. (1966). General results and further perspectives of acclimation work in the Murmansk region. In Surkov S. S., & Dryagin P. A. (Eds.), *Fish of the Murmansk region, habitat conditions, life and fishery* (289-293). Murmansk, Russia: GosNIORH and PINRO Press. (in Russian)

- Thorarinsdottir, G. G., Gunnarsson, K., & Gíslason, Ó. S. (2014) Invasive species: case studies from Iceland. In TemaNord (Ed.), *Marine invasive species in the Arctic* (pp. 83–103). Copenhagen, Denmark: Nordic Council of Ministers.
- Walday, M. (2002). The Arctic Ocean - home of the walrus. In Künitzer, A. (ed.). *Europe's biodiversity - biogeographical regions and seas. Seas around Europe*. Copenhagen, Denmark: European Environment Agency.
- Zimina, O. L. (2015). Finding the snow crab *Chionoecetes opilio* (O. Fabricius, 1788) (Decapoda: Majidae) in the Kara Sea. *Russian Journal of Marine Biology*, 40, 490-492.
- Zubchenko, A. V., Popov, N. G., & Svenning, M. A. (1998). *Salmon rivers on the Kola Peninsula some results of acclimation of pink salmon (Oncorhynchus gorbusha (Walbaum))*. Copenhagen, Denmark: International Council for the Exploration of the Sea.