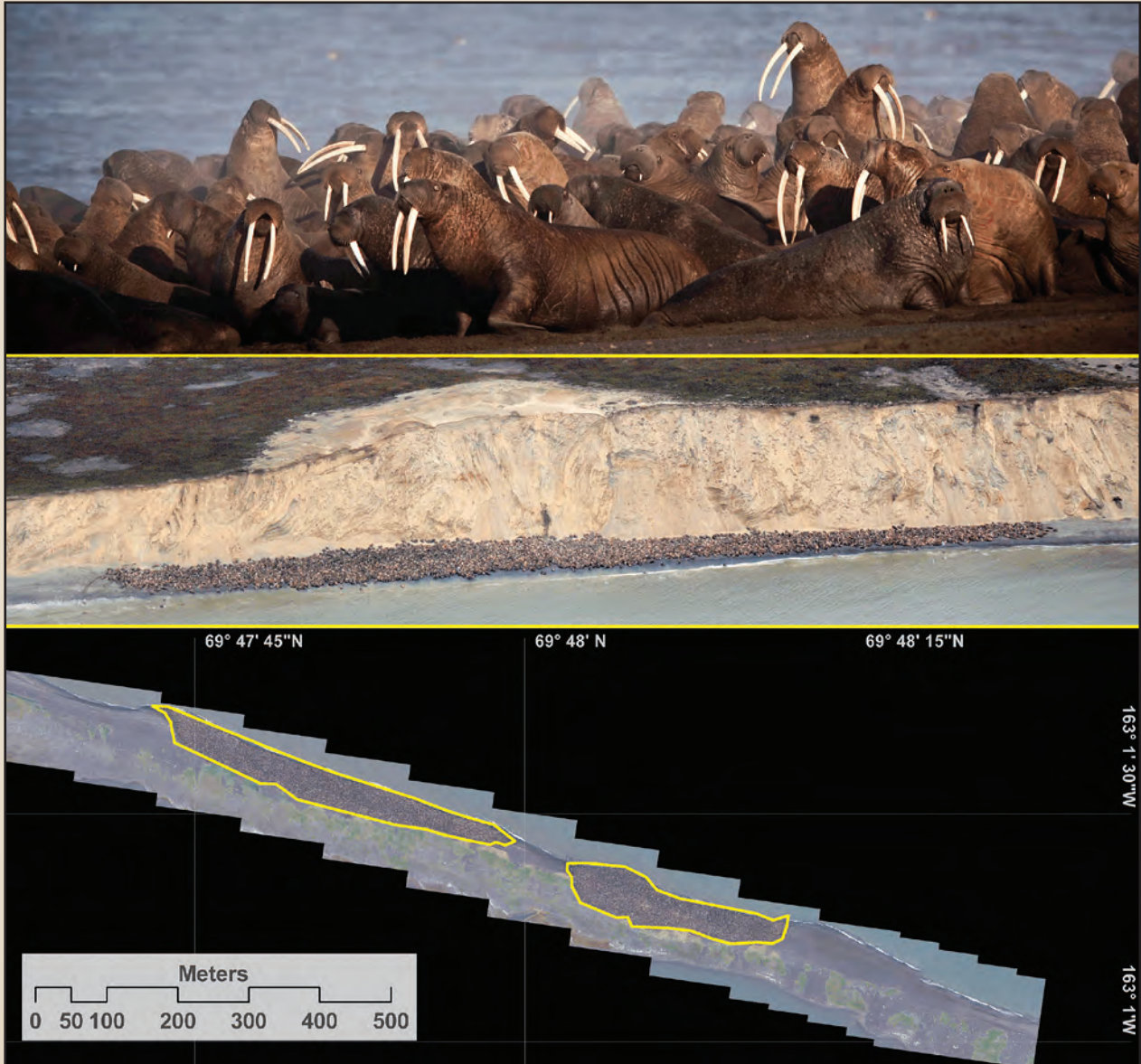


Prepared in cooperation with the U.S. Fish and Wildlife Service, Chukot-TINRO, and Institute of Biological Problems of the North Far East Branch of Russian Academy of Sciences

Pacific Walrus Coastal Haulout Database, 1852–2016—Background Report



Open-File Report 2016–1108

Cover: Images of walrus haulouts. A ground level view of an autumn haulout with adult females and young (Point Lay, Alaska, September, 25, 2013) is shown in the top panel. An aerial composite image of a large haulout with more than 1,000 male walruses is shown in the middle panel (Cape Greig, Alaska, May 3, 2016). A composite image of a very large haulout with tens of thousands of adult female walruses and their young is shown in the bottom panel in which the outlines of the haulout is highlighted in yellow (Point Lay, Alaska, August 26, 2011). Photo credits (top panel: Ryan Kingsbery, USGS; middle panel: Sarah Schoen, USGS; bottom panel: USGS).

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Conversion Factors

Inch/Pound to International System of Units

Multiply	By	To obtain
	Length	
foot (ft)	3.281	meter (m)
mile (mi)	1.609	kilometer (km)
mile, nautical (nm)	1.852	kilometer (km)
yard (yd)	1.094	meter (m)

Pacific Walrus Coastal Haulout Database, 1852–2016—Background Report

By Anthony S. Fischbach¹, Anatoly A. Kochnev², Joel L. Garlich-Miller³, and Chadwick V. Jay¹

Abstract

Walrus are large benthic predators that rest out of water between foraging bouts. Coastal “haulouts” (places where walrus rest) are formed by adult males in summer and sometimes by females and young when sea ice is absent, and are often used repeatedly across seasons and years. Understanding the geography and historical use of haulouts provides a context for conservation efforts. We summarize information on Pacific walrus haulouts from available reports (n = 151), interviews with coastal residents and aviators, and personal observations of the authors. We provide this in the form of a georeferenced database that can be queried and displayed with standard geographic information system and database management software. The database contains 150 records of Pacific walrus haulouts, with a summary of basic characteristics on maximum haulout aggregation size, age-sex composition, season of use, and decade of most recent use. Citations to reports are provided in the appendix and as a bibliographic database. Haulouts were distributed across the coasts of the Pacific walrus range; however, the largest (maximum >10,000 walrus) of the haulouts reported in the recent 4 decades (n=19) were concentrated on the Russian shores in regions near the Bering Strait and northward into the western Chukchi Sea (n=17). Haulouts of adult female and young walrus primarily occurred in the Bering Strait region and areas northward, with others occurring in the central Bering Sea, Gulf of Anadyr, and Saint Lawrence Island regions. The Gulf of Anadyr was the only region to contain female and young walrus haulouts, which formed after the northward spring migration and prior to autumn ice formation.

Introduction

The Pacific walrus (*Odobenus rosmarus divergens*) is one of two subspecies and represents about 90 percent of the worldwide number of walrus (Fay, 1985). The Pacific walrus ranges across the broad and shallow continental shelves of the Bering and Chukchi Seas that extend between the United States and the Russian Federation. Walrus are benthic predators that spend most of their time at sea where they forage primarily on organisms that live in and on marine sediments. Between foraging bouts, walrus rest out of the water. Coastal

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haulouts are locations where walrus aggregate on shore and rest. Haulouts may be used by adult males throughout the year, but are most commonly used during summer and autumn; but may also be used by females and young, especially during periods lacking sea ice. Pacific walrus are highly gregarious with a very clumped distribution and, when resting on land, they often gather in large numbers. Many coastal haulouts are used repeatedly across seasons and years, such that understanding their previous distribution and use can provide insight on current distribution and use.

Management agencies recognize a need to protect Pacific walrus when they are aggregated in large numbers at coastal haulouts and adjacent waters, because of the potential for trampling deaths and exposure to marine pollution (Garlich-Miller and others, 2011). When coastal haulouts are used by large numbers of walrus and the haulout is disturbed, walrus may be trampled if the herd moves in a panic toward the water. For example, when sea ice retreats from large regions of the Chukchi Sea, as in 1990 and 1991, or from the entire Chukchi Sea, as in more recent years beginning in 2007, large numbers of adult females and young walrus formed coastal haulouts, and trampling injuries resulted in the disproportionate death of young walrus by the hundreds and thousands (Ovsyanikov and others, 1994; Kochnev, 2001, 2002, 2008, 2012; Ovsyanikov and others, 2008; Fischbach and others, 2009; Semenova and others, 2010). Such large losses of young walrus could affect overall population growth (Kochnev, 2004b; Udevitz and others, 2013). Additionally, large aggregations of walrus in the water near coastal haulouts may be more vulnerable to localized marine pollution events than walrus using offshore sea ice (Kochnev, 2004b; Garlich-Miller and others, 2011). Localized marine pollution events are hazards inherent to marine shipping and offshore hydrocarbon resource development. Marine shipping is expected to increase substantially in the coming decades because the open water season that enables shipping through the Bering Strait is expected to expand in the coming decades (Smith and Stephenson, 2013; Reeves and others, 2014). Proposed offshore hydrocarbon resource development within the Pacific walrus range also poses a risk of localized marine pollution (Reeves and others, 2014; Kochnev, 2015).

The geography and characteristics of coastal Pacific walrus haulouts have been previously summarized on Asian shores (Arsenyev, 1927; Gol'tsev, 1968; Semenov and others, 1988; Figure 2B in Garlich-Miller and Jay, 2000; Kochnev, 2001, 2004a; Testin, 2004), on North American shores (Frost and others, 1983a, 1983b), and in general across the Pacific walrus range (Fay, 1982; Robards and others, 2007). Since these published summaries, substantial changes in the seasonal availability of sea ice have resulted in substantial shifts in coastal haulout use and the formation of new haulouts. Thus, there is a need to update the previous documentation of Pacific walrus coastal haulouts. None of the previous efforts to document Pacific walrus coastal haulouts provided a comprehensive database that could be queried based on geography and based on summary characteristics of the haulouts, and none provided bibliographic records that could be directly traced back to the original reports from across the Pacific walrus range. This report provides background information on the compilation of a georeferenced database of Pacific walrus haulouts across their range and provides a bibliography of available reports cited in the database.

Methods

Data Sources

We documented Pacific walrus coastal haulout locations reported in published papers, reports, personal communications, and personal observations from 1852 to 2016 across the range of the Pacific walrus, and provide a georeferenced database of these haulout locations. The monitoring of the occurrence and locations of Pacific walrus coastal haulouts has not been the subject of range-wide systematic study, and the reports of Pacific walrus coastal haulouts have generally not been published in the peer-reviewed scientific literature. As such, much of the information on haulouts is found only in management agency reports and in accounts from marine explorers, and little information is available in scholarly bibliographic databases. We discovered most of the reports and accounts cited in the database by following citations in previous efforts to summarize Pacific walrus coastal haulouts (Arsenyev, 1927; Gol'tsev, 1968; Fay, 1982; Frost and others, 1983a, 1983b; Semenov and others, 1988; Kochnev, 2001, 2004a; Testin, 2004) and reviewing references listed in the Walrus International Technical and Scientific Committee's compilation of a bibliography of walrus reports (Stewart, 1993). We expanded this search effort based on the authors' knowledge of management agencies and local history. We obtained copies of most reports through the interlibrary loan services of the Alaska Resource Library and Information Services (<http://www.arlis.org>) or through the website "Haulout Keepers" (<http://www.pacificwalrus.ru>, available through the Internet archive hosted on the website <http://web.archive.org/>). However, many reports were available only through the archives of the Chukotka Branch of the Pacific Research Institute of Fisheries and Oceanography (ChukotTINRO, Чукотский филиал Тихоокеанского научно исследовательского рыбохозяйственного центра) and from files from the U.S. Fish and Wildlife Service's Marine Mammals Management office. Residents of remote communities living near some haulouts, as well as coastal aviators, have made substantial observations of Pacific walrus coastal haulouts, and many have generously offered their observations. We included these observations as personal communications in the database. The authors have made personal observations of haulouts incidental to on-going walrus management and research efforts, and we included these in the database.

Haulout Locations

We assigned a geographic location to each haulout based on available data sources indicated above and adjusted the location based on publically available georeferenced imagery (Digital Globe, Longmont, Colorado, viewed through the virtual digital globe geographical information system Google Earth™). For each haulout location, we provided a brief geographic description indicating the country (Russian Federation or United States), waters (Bering, Chukchi, or East Siberian Seas; or North Pacific or Arctic Oceans), geographic region (table 1), and prominent local landmarks. When hauled out on land, walrus are generally restricted to a strip of coastline from which they may readily return to the water. As such, haulouts are essentially linear coastal geographic features. Due to the scale at which exact locations are known, the scale that haulout locations may shift among bouts of use, and the scale at which we expect this database to be used, we indicated each haulout as a single geographic point.

Table 1. Number and composition of Pacific walrus coastal haulouts reported in the Pacific Walrus Coastal Haulout Database, 1852–2016, by region.

Region	Description	Aggregation Composition			
		Predominantly male	Mix of age and sex classes	Predominantly females and dependent young	Not reported
Alaska Peninsula	Coast extending from the mouth of Naknek River to Cape Sarichef in the southeastern Bering Sea	7			4
Beaufort Sea	Coast extending east of Point Barrow		2		
Bering Strait and Chirikov Basin	The region north of Saint Lawrence Island bounded by Cape Chaplino, the Bering Strait, and Sledge Island in the northern Bering Sea	3	3		14
Bristol Bay	Coast between Cape Newenham and the Naknek River in the southeastern Bering Sea	9			
Central Bering Sea	Islands of the central Bering Sea, including the Pribilof Islands, Saint Matthew and Hall Island	4	2		
East Siberian Sea	Coast west of Long Strait in the eastern East Siberian Sea				5
Eastern Chukchi Sea	Eastern coast of the Chukchi Sea north of Kotzebue Sound	1	8	4	2
Gulf of Anadyr	Coast between Cape Chukotskiy and Cape Navarin in the northwestern Bering Sea	2	6		1
Kamchatka and Commander Islands	Western coast of the Kamchatka Peninsula south of Cape Anana in the southwestern Bering Sea and north Pacific Ocean, and the Commander Islands	8		1	8
Koryak Coast	Coast of the Koryak mountains between Cape Anana and Cape Navarin in the western Bering Sea	8			3
Kotzebue Sound	Coast between Cape Krusenstern and Cape Espenberg in the southeastern Chukchi Sea				2
Kuskokwim Bay Etolin Strait	Coast at the mouth of the Kuskokwim River between Cape Newenham and northern Etolin Strait				3
Norton Sound	Coast between the mouth of the Yukon River and the town of Nome in the northeastern Bering Sea	3			2
Saint Lawrence Island	Saint Lawrence and Penuk Islands in the northern Bering Sea	1	5		1
Western Chukchi Coast	Russian coast west of the Bering Strait and east of Long Strait in the western Chukchi Sea		7	3	7
Wrangel Island	Coast of Wrangel Island and adjacent islands in the western Chukchi and eastern East Siberian Seas			3	8

However, for some larger haulouts and for some haulouts that have repeatedly formed along an extended stretch of coastline, we also indicated a linear geographic feature in addition to a point. For haulouts that formed at various features within an enclosed bay, on a distinct promontory, or on a small island of less than 5 km diameter, we indicated the haulout location with a single point.

Haulout Aggregation Size

Reported haulout aggregation sizes ranged from less than 10 to more than 100,000 walrus. The degree, consistency, and method of effort to characterize haulout aggregation size varied greatly among reported haulout locations and years. Reports from haulouts that had consistent monitoring efforts spanning seasons and years indicated that aggregation size can vary greatly within and between seasons. As such, we indicated aggregation sizes among the haulouts, but only as a general index, by indicating the order of magnitude of the maximum number of walrus reported. For the index, we used a log 10 scale ranging from 0 to 5, representing from less than 10 to greater than or equal to 100,000 walrus. We coded haulouts without a reported aggregation size as -1.

Haulout Temporal Context

Coastal haulout use is generally seasonal, occurring during ice-free or sparse ice conditions. The onset and duration of ice-free conditions vary greatly among regions occupied by Pacific walrus. The dates of ice-free seasons have varied across the period of reported haulout use and are expected to shift substantially with continued sea ice loss through this century (Wang and Overland, 2015). The precision of the reported dates of haulout use varied greatly among haulouts and among reports. With these general constraints on our knowledge of seasonal use, we provided a general index of seasonal use during four 3-month periods (January–March, April–June, July–September, October–December). The temporal extent of haulout use varied across years and decades. Some haulouts were used throughout the decades of available reports while others were used consistently before falling into disuse, and others were used only recently. To provide a general temporal context of haulout use with respect to contemporary management issues, we indicated the decade of the most recent reported use.

Aggregation Composition

When composition was reported for individual haulouts, we indicated whether the composition was either predominantly male, predominantly adult female and dependent young, or a mix of age and sex classes. Determination of haulout composition requires expert knowledge on the aging and sexing of free-ranging walrus and requires a clear view of walrus throughout the haulout (Fay, 1982; Monson and others, 2013). Within the notes field of each haulout record, we note citations to reports indicating the haulout composition, as well as any caveats about the certainty of the haulout composition determination.

Results

Database Components

The database consists of a set of interrelated digital files (table 2). The georeferenced component of the database is provided in two digitally accessible forms—one intended for display and query in a geographic information system (GIS), and another for display and query in a virtual globe. The form of the database intended for display and query in a GIS is provided in two file formats: a tabular comma separated value (CSV) file and a shape file. The CSV file is encoded using the UTF-8 character encoding and can include all fields of the database, including the Cyrillic script field containing Russian language names of the haulouts. The shape file contains a geographic representation of spatial lines representing haulouts that are depicted as linear features. Linear features contained in the shapefile may be linked back to the full record of the haulout contained within the CSV file based on a key field.

Table 2. Components of the Pacific Walrus Coastal Haulout Database, 1852–2016.

File	Contents	Software required	Use if you are interested in:
Comma Separated Value tabulation (CSV)	All fields of the database in tabular format, including both the Latin script and the Cyrillic script fields of the database.	The file is optimally viewed with data management software, but may be viewed using spreadsheet management software or a text editor.	Querying of the database based on tabulated haulout characteristics, or manipulation of the database within a geographic information system.
Shape file	Linear features depicting extended coastal haulouts. These features are linked to records in the comma separated value tabulation based on a key field.	This file may be manipulated by geographic information system software.	Manipulation of the database within a geographic information system.
Keyhole Markup Language	A georeferenced copy of the database, including both linear and point features and all Latin script fields of the database.	The file may be viewed with a virtual globe such as Google Earth™ (http://www.google.com/earth/), Marble (http://marble.kde.org/), or World Wind (http://worldwind.arc.nasa.gov/java/).	Geographic query of the database and review of individual haulout records.
Machine readable bibliography	References to reports cited in the database, and listed in appendix B of this report.	This file may be read and manipulated by bibliography management software.	Management of the bibliographic entries cited in the database.
Metadata record	A full description of the database files.	This file may be read by metadata management software or standard text editors.	Technical description of the files and the fields contained therein.

The form of the database intended for display and query in a virtual globe is provided as a single keyhole markup language (KML) file that contains all points and linear features. The KML file can be viewed in a virtual globe such as Google Earth™ (<http://www.google.com/earth/>), Marble (<http://marble.kde.org/>), or World Wind (<http://worldwind.arc.nasa.gov/java/>).

In addition to the haulout database files, we provided a machine-readable bibliographic file that is a full copy of the references cited in the database (n=151). Bibliographic data management software is required to display and manipulate the citations in the machine readable bibliographic file. However, a full listing of these references is provided in a standard bibliographic listing format in appendix A of this report. A full description of these files is provided as a metadata file. The metadata file is written in an Extensible Markup Language (XML) format file encoded in UTF-8 following the biological metadata format of the United States Federal Geographic Data Committee (FGDC; <http://www.fgdc.gov/>).

Summary of Haulouts Reported in the Database

We documented 150 coastal haulouts reported across the range of Pacific walruses (fig. 1). These haulouts occurred primarily in the Bering (n=93) or Chukchi Seas (n=46); 5 occurred on the eastern shores of the East Siberian Sea, 4 on the western shores of the North Pacific Ocean, and 2 along the southern shores of the southern Beaufort Sea. Haulouts in the database occurred on shores of both the Russian Federation (n=86) and the United States (n=64) and were distributed across 16 distinct regions (table 1, fig. 1).

Of the 150 haulouts, 77 percent had their most recent reported use within the past 4 decades (2010s n=58; 2000s n=24; 1990s n=18; 1980s n=15). At least one report of an aggregation size was reported for 136 haulouts. Maximum reported aggregation size for most haulouts was of hundreds (n=32) to thousands (n=49) of walruses; however, maximum reported aggregation size for many (n=21) haulouts was in excess of 10,000 walruses; one of which was reported to have had more than 100,000 walruses (Cape Serdtse-Kamen' in the western Chukchi Sea region).

Although the database contains records of haulouts from 16 regions across the range of the Pacific walrus, haulout aggregation sizes were in excess of 10,000 walruses in 7 regions, all of which had a report within the past 4 decades (fig. 2): the Bering Strait and Chirikov Basin (n=4), Bristol Bay (n=2), the eastern Chukchi Sea (n=1), the Gulf of Anadyr (n=2), Saint Lawrence Island (n=1), the western Chukchi Sea (n=7), and the Wrangel Island area (n=2). Of haulouts reported within the past 4 decades (1980s– 2010s) with a maximum reported aggregation size greater than 10,000 walruses (n=19, fig. 2), all occurred within the same seven regions. Three regions had no haulouts with a maximum aggregation size in excess of 1,000 walruses. The Beaufort Sea had no reports of haulouts with a maximum aggregation size in excess of 10 walruses; East Siberian Sea coast had no haulouts with a maximum haulout aggregation size exceeding 100 walruses; and the Kuskokwim Bay-Etolin Strait region has no haulouts with a maximum haulout aggregation size exceeding 1,000 walruses.

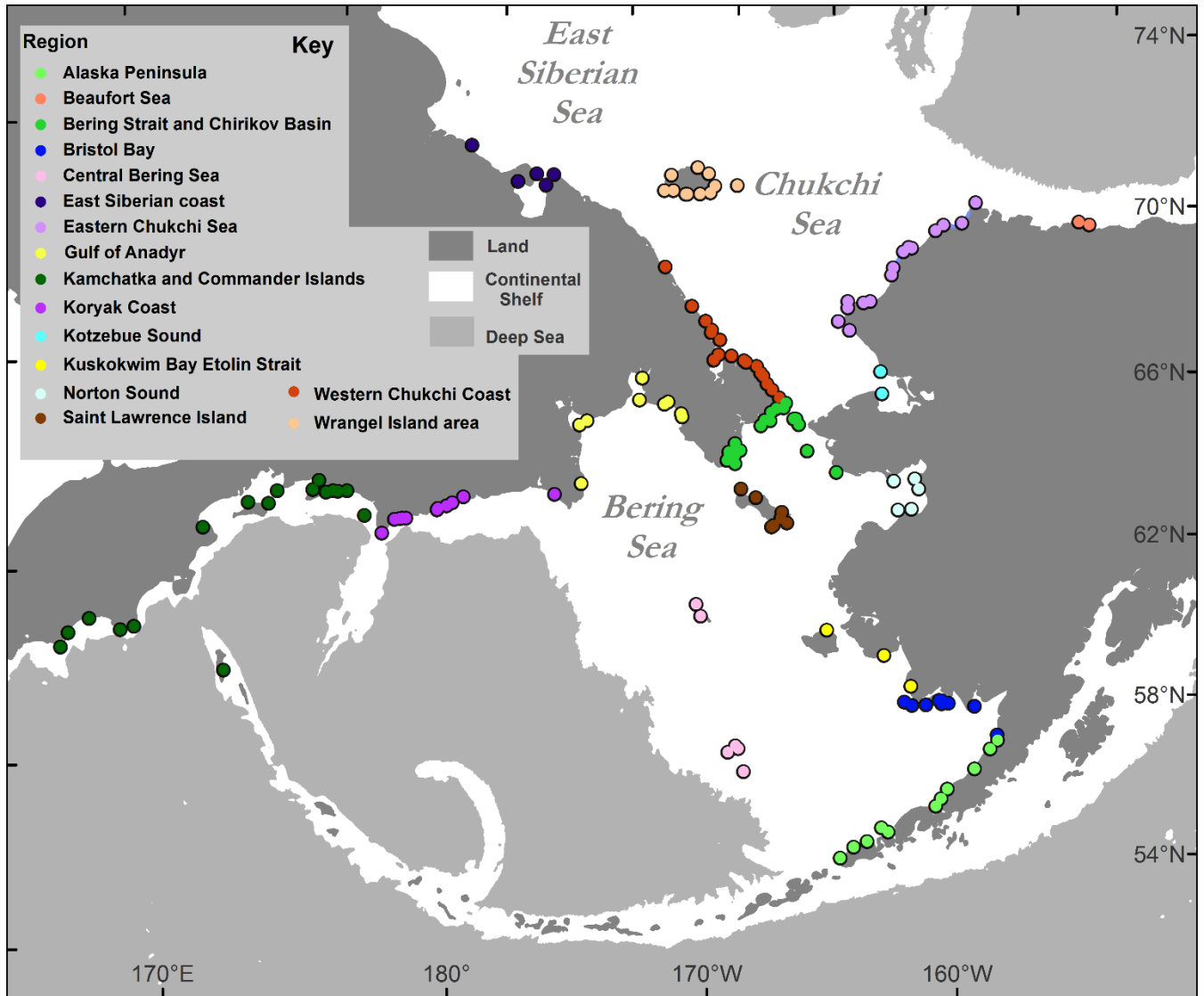


Figure 1. Map showing Pacific walrus coastal haulout locations reported in the Pacific Walrus Coastal Haulout Database, 1852–2016.

Of the 90 haulouts with reported herd compositions, most (n=46) had predominantly male walruses, many (n=33) had a mix of age and sex classes, while only a minority (n=11) had predominantly females and dependent young. Haulouts reported to have mixed age and sex classes or predominantly females and dependent young were primarily in the region of the Bering Strait and Chirikov Basin and north thereof (table 1), with the exception of the Central Bering Sea, Gulf of Anadyr, and Saint Lawrence Island. Only the Gulf of Anadyr had females and dependent young reported south of the Bering Straits during summer (July–September).

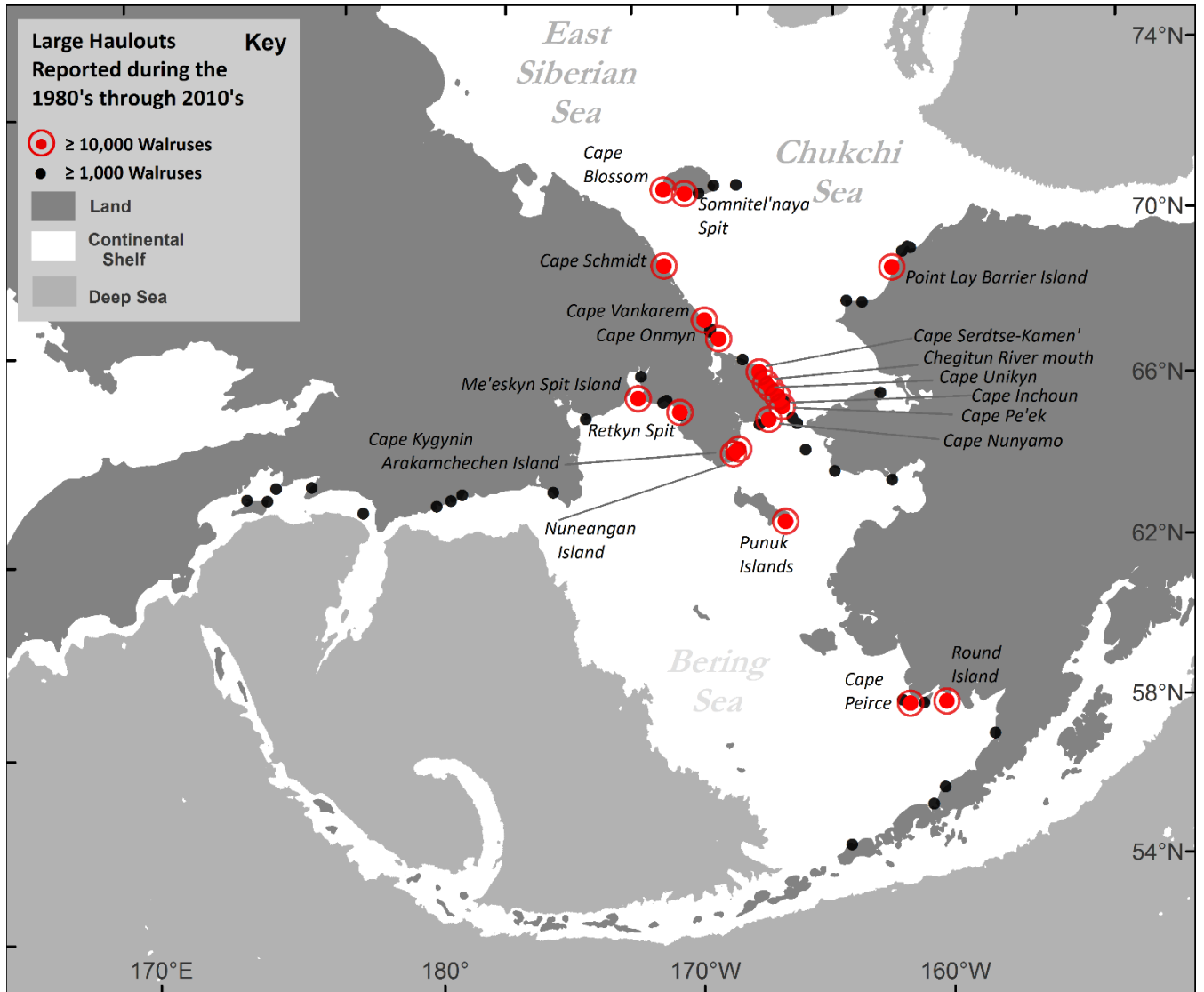


Figure 2. Map showing Pacific walrus coastal haulout locations reported in the past four decades (1980s–2010s), with a maximum aggregation size of greater than or equal to 1,000 walrus.

Discussion

The haulout records provided in the database provided a concise summary of reported haulout geography and characteristics, which may be suitable for the planning of walrus conservation. However, interpretation of trends among the reported haulouts must be tempered by the highly variable level of efforts made to observe walruses among areas and across years. Pacific walrus coastal haulouts are distributed across vast and generally remote regions. Efforts to systematically monitor coastal haulouts were made for only a small number of haulouts, and even fewer haulouts have received consistent monitoring efforts over decades. Systematic efforts have surveyed extended coastlines within the range of the Pacific walrus, such as the autumn aerial surveys of much of the Russian coasts conducted every 5 years between 1975 and 1990, and autumn aerial surveys of much of the United States coasts conducted in 1980, 1985, and 1990, as well as the surveys of the United States Chukchi Sea coast conducted annually during summer and autumn of 2007 through 2015 (see citations for eastern Chukchi Sea haulouts listed in the database). However, these systematic surveys have only documented any given haulout for a single point in time and have been unable to survey much of the coastline due to weather and logistics challenges.

Many haulouts were reported only from incidental accounts from mariners, aviators, or coastal fishery patrols that noted the haulout during transit of an extended coastline. Where dedicated observers have monitored individual haulouts, neighboring haulout sites and intervening coasts were typically not systematically monitored. Similar to the efforts of the dedicated surveys, observation efforts of local observers are constrained by many factors that limit access to the coast where walruses may haulout. Our collection of local observations for the database was from interviews conducted during the course of ongoing walrus management and research activities, and not from a comprehensive survey of communities across the Pacific walrus range.

The database enables a comprehensive geographic view of the reported Pacific walrus haulout distribution that may be readily accessed for conservation planning. For example, the database may be queried to provide a map of reported haulouts that meet specific criteria, such as the distribution of large haulouts observed within the past four decades represented in figure 2. Taken together, the information sources referenced in the database provide insight into where, when, and how Pacific walruses have come ashore to rest, and enable ready access to a summary of reports for each individual haulout. Because these information sources were not designed to collect systematic information on haulout characteristics across the range of the Pacific walrus, evaluation of trends should be done cautiously.

Records in the haulout database are consistent with the previously reported understanding that, after the time of northward migration, haulouts in the regions south of the Bering Strait contain almost exclusively independent male walruses (Fay, 1982). Fay (1982) noted that, after the late winter breeding season (January–March), Pacific walruses generally segregate by sex and age classes, and that during spring through the autumn onset of ice formation females and dependent young, as well as some independent males, move north through the Bering Strait into the Chukchi Sea. Reports in the haulout database indicating that hundreds to thousands of adult female walruses and dependent young use haulouts in the Gulf of Anadyr during the ice-free season are the exception to this general pattern.

The distribution of Pacific walrus haulout use has fluctuated over decades and shifted substantially in response to the expansion of the open water season in the Chukchi Sea. An understanding of these fluctuating and shifting distributions requires monitoring efforts. Because comprehensive monitoring of haulouts across the range of the Pacific walrus would be a challenge, contributions of haulout observations from local observers will continue to be an important information source. Individuals wishing to report coastal haulouts of Pacific walruses are requested to send their observations to the following e-mail address:
fw7_walrus_group@fws.gov.

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References Cited

- Arsen'ev, V.K., 1927, Тихоокеанский морж [Pacific walrus]: Хабаровск-Владивосток [Khabarovsk-Vladivostok], Книжное дело [Knizhnoe Delo], 35 p.
- Fay, F.H., 1982, Ecology and biology of the Pacific walrus, *Odobenus rosmarus divergens Illiger*: North American Fauna, v. 74, p. 1–279.
- Fay, F.H., 1985, *Odobenus rosmarus*: Mammalian Species, no. 238, p. 7.
- Fischbach, A.S., Monson, D.H., and Jay, C.V., 2009, Enumeration of Pacific walrus carcasses on beaches of the Chukchi Sea in Alaska following a mortality event, September 2009: U.S. Geological Survey Open-File Report 2009-1291, 10 p.
- Frost, K.J., Lowry, L.F., and Burns, J.J., 1983a, Distribution of marine mammals in the coastal zone of the Bering Sea during summer and autumn, OCSEAP Final reports of Principal Investigators: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, p. 365–561.
- Frost, K.J., Lowry, L.F., and Burns, J.J., 1983b, Distribution of marine mammals in the coastal zone of the eastern Chukchi Sea during summer and autumn, OCSEAP Final reports of Principal Investigators: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, p. 563–650.
- Garlich-Miller, J.L., and Jay, C.V., compilers, 2000, Proceedings of a workshop concerning walrus survey methods: U.S. Fish and Wildlife Service Technical Report MMM 00-2, 92 p.
- Garlich-Miller, J., MacCracken, J.G., Snyder, J., Meehan, R., Myers, M., Wilder, J.M., Lance, E., and Matz, A., 2011, Status review of the Pacific walrus (*Odobenus rosmarus divergens*): U.S. Department of the Interior, U.S. Fish and Wildlife Service, 155 p.
- Gol'tsev, V.N., 1968, Динамика береговых лежбищ моржа в связи с его распределением и численностью [Dynamics of coastal haulouts of walruses in connection with their distribution and abundance]: Известия ТИНРО [Izvestia Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khozyaistva i Okeanografii (TINRO News)], v. 62, no. Pinnipeds of the North Pacific, p. 205–215.

- Kochnev, A.A., 2001, Тихоокеанский морж в районе островов Врангеля и Геральда и его охрана [Pacific walrus in the area of Wrangel and Herald islands and their protection], in Pavlov, D.S. Bychkov, V.A., ed., Морж: Образ вида [The Walrus: Mode of the Species]: Moscow, Наука [Nauka], p. 180–205.
- Kochnev, A.A., 2002, Факторы, определяющие смертность Тихоокеанских моржей на береговых лежбищах Острова Врангеля [The factors of the Pacific walrus mortality at the coastal haulouts at the Wrangel Island], in Aristov, A.A., and others, eds., результаты исследований, проведенных в 1995–1998 гг. [Marine Mammals (Results of the research conducted in 1995–1998)]: Moscow, p. 191–215.
- Kochnev, A.A., 2004a, Половозрастная структура группировок тихоокеанского моржа (*Odobenus rosmarus divergens*) на береговых лежбищах и ее влияние на результаты аэрофотосъемки [Sex-age composition of Pacific walrus (*Odobenus rosmarus divergens*) on coastal haulouts and its influence to results of aerial photo survey], Морские млекопитающие Голарктики: Материалы Третьей международной конференции, 11–17 октября 2004 [Marine Mammals of the Holarctic: collection of scientific papers October 11–17 2004]: Koktebel, Crimea, Marine Mammal Council, p. 280–284.
- Kochnev, A.A., 2004b, Потепление восточной Арктики и современное состояние популяции тихоокеанского моржа (*Odobenus rosmarus divergens*) [Warming of eastern Arctic and present status of the Pacific walrus (*Odobenus rosmarus divergens*) population], Морские млекопитающие Голарктики: Материалы Третьей международной конференции (Коктебель, Крым, 11–17 октября 2004) [Marine Mammals of the Holarctic: Proceedings of the Third International conference (Koktebel, Crimea, October 11–17 2004)], Marine Mammal Council, p. 284–288.
- Kochnev, A.A., 2008, В институтах и лабораториях: Чукотский филиал ТИНРО-Центра (ЧукотТИНРО) лаборатория морских млекопитающих [Pacific Research Fisheries Center, Chukotka Branch (ChukotTINRO)] marine mammal laboratory, 17–20 p.
- Kochnev, A.A., 2012, Мониторинг береговых лежбищ тихоокеанского моржа на Чукотке, 2011 [Monitoring of Pacific Walrus coastal haulouts in Chukotka, 2011]: Wildlife Conservation Society, 78 p.
- Kochnev, A.A., 2015, Потенциальное воздействие сейсмозаземки и добычи углеводородного сырья в Чукотском море на популяцию тихоокеанского моржа (Potential impact of seismic and oil/gas activity in the Chukchi Sea to the Pacific walrus population, in Материалы Международной научно-практической конференции (Анадырь, Россия, 15–16 апреля 2015) [Problems and prospects of development of the Arctic zone of the North-East of Russia: Proceedings of the International conference (Anadyr, Russia, April 15–16 2015)], Перо [Pero], p. 65–67.
- Kochnev, A.A., Kryukova, N.V., Pereverzev, A.A., and Ivanov, D.I., 2008, Береговые лежбища тихоокеанских моржей (*Odobenus rosmarus divergens*) в Анадырском заливе Берингова моря в 2007 г. [Terrestrial haulouts of the Pacific walrus (*Odobenus rosmarus divergens*) in Anadyr Gulf (Bering Sea), 2007]: Морские млекопитающие Голарктики. Сб. научных трудов по материалам Пятой международной конференции. [Marine Mammals of the Holarctic: Proceedings of the Fourth International Conference], p. 267–272.
- Monson, D.H., Udevitz, M.S., and Jay, C.V., 2013, Estimating age ratios and size of Pacific walrus herds on coastal haulouts using video imaging: PLoS One v. 8, no. 7, p. e69806.

- Ovsyanikov, N.G., Bove, L.L., and Kochnev, A., 1994, Причины массовой гибели моржей на береговых лежбищах [Causes of mass mortality of walruses on coastal haulouts]: Зоологический журнал [Zoologische Journal], v. 73, no. 5, p. 80–87.
- Ovsyanikov, N.G., Menyushina, I.Y., and Bezrukov, A.V., 2008, Необычная гибель моржей у острова Врангеля в 2007 г. [Unusual deaths of walruses in the Wrangel Island in 2007], in Boltunov, A.N., Морские млекопитающие Голарктики: Материалы Пятой международной конференции (Одесса, Украина, 14–18 октября 2008) [Marine Mammals of the Holarctic: Proceedings of the Fifth International conference (Odessa, Ukraine, October 14-18 2008)], Астропринт [Astroprint], p. 413–416.
- Reeves, R.R., Ewins, P.J., Agbayani, S., Heide-Jørgensen, M.P., Kovacs, K.M., Lydersen, C., Suydam, R., Elliott, W., Polet, G., van Dijk, Y., and Blijleven, R., 2014, Distribution of endemic cetaceans in relation to hydrocarbon development and commercial shipping in a warming Arctic: Marine Policy, v. 44, p. 375–389.
- Robards, M., Kochnev, A.A., and Deming, S., 2007, Sharing knowledge about Pacific walrus: Audobon Alaska, Map of Pacific walrus haulouts.
- Semenov, A.R., Burkanov, V.N., and Mashagin, S.A., 1988, Лежбища моржей на Камчатке [The haulouts of walruses in Kamchatka], in Попов, Л.А., ed., Научно-исследовательские работы по морским млекопитающим северной части Тихого океана в 1986-1987 гг. [Investigations on marine mammals in the Northern Pacific in 1986-1987]: Moscow, ВНИРО [VNIRO], p. 103–108.
- Semenova, V.S., Boltunov, A.N., and Nikiforov, V.V., 2010, Береговое лежбище тихоокеанских моржей (*Odobenus rosmarus divergens*) на м. Кожевникова, 2007–2009 гг. [Coastal haulout of pacific walruses (*Odobenus rosmarus divergens*) on Cape Kozhevnikov in 2007-2009], Морские млекопитающие Голарктики. Сб. научных трудов по материалам Шестой международной конференции (Калининград, 11–15 октября 2010 г.) [Marine Mammals of the Holarctic: VI International Conference (Kaliningrad, 11–15 October 2010)]: Калининград, Капрос [Capros], p. 521–526.
- Smith, L.C., and Stephenson, S.R., 2013, New Trans-Arctic shipping routes navigable by midcentury: Proceedings of the National Academy of Sciences of the United States of America, v. 110, no. 13, p. E1191-1195.
- Stewart, B.E., 1993, The Walrus International Technical and Scientific Committee's bibliography on Walrus, *Odobenus rosmarus* (L.), to January, 1993: Fisheries and Oceans Canada, 195 p.
- Testin, A.I., 2004, Численность и проблемы сохранения тихоокеанского моржа (*Odobenus rosmarus divergens*) на береговых лежбищах северо-востока Камчатки [Walrus (*Odobenus rosmarus divergens*) on coastal haulouts of northeast Kamchatka—Abundance and conservation problems], Морские млекопитающие Голарктики: Материалы Третьей международной конференции (Коктебель, Крым, 11—17 октября 2004) [Marine Mammals of the Holarctic: Proceedings of the Third International conference (Koktebel, Crimea, October 11–17 2004)], КМК, v. 3, p. 535–538.
- Udevitz, M.S., Taylor, R.L., Garlich-Miller, J.L., Quakenbush, L.T., and Snyder, J.A., 2013, Potential population-level effects of increased haulout-related mortality of Pacific walrus calves: Polar biology, v. 36, no. 2, p. 291–298.
- Wang, M., and Overland, J.E., 2015, Projected future duration of the sea-ice-free season in the Alaskan Arctic: Progress in Oceanography, v. 136, p. 50–59.

Glossary

ChukotTINRO The Chukotka Branch of the Pacific Research Institute of Fisheries and Oceanography (Чукотский филиал Тихоокеанского научно исследовательского рыбохозяйственного центра) is the Federal agency with management authority for the scientific support of fisheries, including the management of the Pacific walrus, in the autonomous region of Chukotka.

GIS Geographical Information System.

Haulout A location where walruses haul themselves out of the water to rest.

VNIRO All-Russian Research Institute of Fisheries and Oceanography (Всероссийский научно-исследовательский институт рыбного хозяйства и океанографии) is the federal agency for the scientific support of management of fisheries in the Russian Federation.

TINRO The Pacific Research Fishery Center (Тихоокеанский научно-исследовательский рыбохозяйственный центр) is the federal agency with authority for the scientific support of management of marine fisheries, including the management of the Pacific walrus, in the Russian Federation.

USFWS United States Fish and Wildlife Service is the federal agency with authority for the management of Pacific walrus in the United States.

UTF-8 Universal Character Set Transformation Format 8-bit is a character encoding system capable of encoding characters in both English and Russian that is in common use worldwide.

Appendix A. Reports Cited in the Pacific Walrus Coastal Haulout Database, 1852–2016

- Arsen'ev, V.K., 1927, Тихоокеанский морж [Pacific walrus]: Хабаровск-Владивосток [Khabarovsk-Vladivostok], Книжное дело [Knizhnoe Delo], 35 p.
- Arutjunov, S.A., Krupnik, I.I., and Chlenov, M.A., 1982, Kitovaja alleja. Drevnosti ostrovov proliva Senjavina [Whale Alley. Antiquities of Senyavin Strait islands], Наука [Nauka], 174 p.
- Belikov, S.E., Gorbunov, J.A., and Shil'nikov, V.I., 1984, Распространение и миграции некоторых ластоногих, китообразных и белого медведя в морях восточного района Арктики [Distribution and migrations of some pinnipeds, cetaceans and polar bears in the seas of the east Arctic area], Морские млекопитающие [Marine Mammals]: Moscow, Nauka, p. 233-252.
- Belopol'skii, L.O., 1931, Краткий предварительный отчет о работе по изучению морских млекопитающих Анадырского района. Рукопись. Архив ТИНРО [A brief preliminary report on the study of marine mammals in the Anadyr District. Manuscript], Рукопись. Архив ТИНРО [Manuscript of the TINRO Archive], p. 25.
- Belopol'skii, L.O., 1939, О миграциях и экологии размножения тихоокеанского моржа (*Odobenus rosmarus divergens* Illiger) [On the migrations and ecology of reproduction of the Pacific walrus (*Odobenus rosmarus divergens* Illiger)]: Зоологический журнал [Zoologicheskyy Zhurnal], v. 18, no. 5, p. 762-776.
- Bernard, J.F., 1923, Local Walrus Protection in Northeast Siberia: *Journal of Mammalogy*, v. 4, no. 4, p. 224-227.
- Bernard, J.F., 1925, Walrus Protection in Alaska: *Journal of Mammalogy*, v. 6, no. 2, p. 100-102.
- Bockstoce, J.R., and Botkin, D.B., 1982, The Harvest of Pacific Walruses by the Pelagic Whaling Industry, 1848 to 1914: *Arctic and Alpine Research*, v. 14, no. 3, p. 183-188.
- Burkanov, V.N., 1988, Современное состояние ресурсов морских млекопитающих на Камчатке [Current status of marine mammal resources in Kamchatka], in Pinigin, V.E., ed., Рациональное использование биоресурсов Камчатского шельфа [Rational utilization of the bioresources of the Kamchatkan shelf]: Petropavlovsk-Kamchatskii, Far Eastern Book Publishers, p. 138-176.
- Burkanov, V.N., Vladimirov, V.A., and Shevlyagin, K.V., 1988, Краткие результаты наблюдений за распределению морских млекопитающих у побережья Юг и Восток Чукотки берегов в начале июня - конце июля, 1987 [Brief results of observations on distribution of marine mammals near South and East Chukotka coasts in early June - late July, 1987], Науч.-исслед. работы по мор. млекопитающим сев. части Тихого океана в 1986-1987 гг. [Investigations on marine mammals in the Northern Pacific in 1986-1987]: Moscow, p. 148-152.
- Chakilev, M.V., Dondua, A.G., and Kochnev, A.A., 2012, Лежбище моржей (*Odobenus rosmarus divergens*) на мысе Сердце-Камень (Чукотское море) в 2011 году [The Pacific walrus (*Odobenus rosmarus divergens*) terrestrial haulout on the Cape Serdtse-Kamen' (Chukchi Sea), 2011], *Marine Mammals of the Holarctic: VII International Conference: Suzdal*, Marine Mammal Council, v. 2, p. 343-348.
- Chapskii, K.K., 1940, Распространение моржа в морях Лаптевых и Восточносибирском [Distribution of the walrus in the Laptev and East Siberian seas]: Проблемы Арктики [Problems of the Arctic], v. 6, p. 80-94.
- Chugunkov, D.I., 1970, Моржи На Камчатке [Walruses on the Kamchatka Peninsula]: Вопросы Географии Камчатки [Questions concerning the geography of Kamchatka], v. 6, p. 175-177.

- Chugunkov, D.I., 1991, Распределение и динамика численности моржей на острове Верхотурова летом 1990 г. [Distribution and number dynamics of walruses on the Verhoturova Island during summer 1990], Науч.-исслед. работы по мор. млекопитающим сев. части Тихого океана в 1989-1990 гг. [Investigations on marine mammals in the Northern Pacific in 1989-1990]: Moscow, VNIRO, p. 25-36.
- Chugunkov, D.I., and Kalinichenko, Y.N., 1996, Изменение численности моржей на некоторых лежбищах северо-востока Камчатки. Известия ТИНРО. [Changing of walrus numbers on some haulouts of north-east Kamchatka]: Известия ТИНРО [Izvestia Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khozyaistva i Okeanografii (TINRO News)], v. 121, p. 122-126.
- Clark, J.T., Christman, C.L., Brower, A.A., and Ferguson, M.C., 2013, Distribution and Relative Abundance of Marine Mammals in the Northeastern Chukchi and Western Beaufort Seas, 2012. Annual Report, OCS Study BOEM 2013-00117: National Marine Mammal Laboratory, Alaska Fisheries Science Center, NMFS, NOAA.
- Clarke, J.T., Brower, A.A., Christman, C.L., and Ferguson, M.C., 2014, Distribution and Relative Abundance of Marine Mammals in the Northeastern Chukchi and Western Beaufort Seas, 2013. Annual Report, OCS Study BOEM 2014-018.
- Clarke, J.T., Christman, C.L., Brower, A.A., and Ferguson, M.C., 2012, Distribution and Relative Abundance of Marine Mammals in the Alaskan Chukchi and Beaufort Seas, 2011. Annual Report, OCS Study BOEM 2012-009.: National Marine Mammal Laboratory, Alaska Fisheries Science Center, NMFS, NOAA.
- Clarke, J.T., Ferguson, M.C., Christman, C.L., Grassia, S.L., Brower, A.A., and Morse, L.J., 2011, Chukchi Offshore Monitoring in Drilling Area (COMIDA) Distribution and Relative Abundance of Marine Mammals: Aerial Surveys. Final Report, OCS Study BOEMRE 2011-06: National Marine Mammal Laboratory, Alaska Fisheries Science Center, NMFS, NOAA.
- Collins, G., 1940, Habits of the Pacific walrus (*Odobenus divergens*): Journal of Mammalogy, v. 21, p. 138-144.
- Elliott, H.W., 1886, An Arctic province: Alaska and the seal islands: London, Charles Scribner's Sons.
- Estes, J.A., and Gol'tsev, V., 1984, Abundance and distribution of the Pacific walrus, *Odobenus rosmarus divergens*: Results of the first Soviet-American joint aerial survey, autumn 1975, in Fay, F.H., and Fedoseev, G.A., eds., Soviet-American Cooperative Research on Marine Mammals v. 1 - Pinnipeds. NOAA Technical Report NMFS 12, p. 67-76.
- Fay, F.H., 1957, History and present status of the Pacific walrus population, Transactions of the North American Wildlife Conference, v. 22, p. 431-443.
- Fay, F.H., 1982, Ecology and biology of the Pacific walrus, *Odobenus rosmarus divergens* Illiger: North American Fauna, v. 74, p. 1-279.
- Fay, F.H., 1985, *Odobenus rosmarus*: Mammalian Species, no. 238, p. 1-7.
- Fay, F.H., Burns, J.J., Stoker, S.W., and Grundy, J.S., 1994, The struck-and-lost factor in Alaskan walrus harvests, 1952-1972: Arctic, v. 47, no. 4, p. 368-373.
- Fay, F.H., and Kelly, B.P., 1980, Mass natural mortality of walruses (*Odobenus rosmarus*) at St. Lawrence Island, Bering Sea, autumn 1978: Arctic, v. 33, no. 2, p. 226-245.
- Fay, F.H., Kelly, B.P., Gehrich, P.H., Sease, J.L., and Hoover, A.A., 1986, Modern populations, migrations, demography, trophics, and historical status of the Pacific Walrus, OCSEAP Final Reports of Principal Investigators: U.S. Dept. Commerce, NOAA, p. 231-276.
- Fay, F.H., and Lowry, L.F., 1981, Seasonal use and feeding habits of walruses in the proposed Bristol Bay clam fishery area: North Pacific Fishery Management Council 18.

- Fedoseev, G.A., 1962, О состоянии запасов и распределении тихоокеанского моржа [On the status of the stocks and the distribution of the Pacific walrus]: Зоологический журнал [Zoologicheskyy Zhurnal], v. 7, p. 1083-1089.
- Fedoseev, G.A., 1966, Аэровизуальные наблюдения за морскими млекопитающими в Беринговом и Чукотском морях [Aerial survey of marine mammals in the Bering and Chukchi seas]: Известия ТИНРО [Izvestia Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khozyaistva i Okeanografii (TINRO News)], v. 58, p. 173-177.
- Fedoseev, G.A., 1981, Аэровизуальный учет моржей и гренландских китов в Восточной Арктике и Беринговом море [Aerovisual survey of walruses and bowhead whales in the eastern Arctic and Bering Sea], in Попов, Л.А., ed., Научно-исследовательские работы по морским млекопитающим северной части Тихого океана в 1980/81 гг. [Investigations on marine mammals in the Northern Pacific in 1980/81]: Moscow, ВНИРО [VNIRO], p. 25-37.
- Fedoseev, G.A., and Razlivalov, E.V., 1986, Распределение и численность моржей в Восточной Арктике и Беринговом море осенью 1985 г. [The distribution and abundance of walruses in the Eastern Arctic and the Bering Sea in autumn 1985], Научно-исследовательские работы по морским млекопитающим северной части Тихого океана в 1984/85 гг. [Investigations on marine mammals in the Northern Pacific in 1984/85]: Moscow, ВНИРО [VNIRO], p. 93-98.
- Fischbach, A.S., Monson, D.H., and Jay, C.V., 2009, Enumeration of Pacific Walrus carcasses on beaches of the Chukchi Sea in Alaska following a mortality event, September 2009: U.S. Geological Survey 2009-1291, 10 p.
- Frost, K.J., Lowry, L.F., and Burns, J.J., 1983, Distribution of marine mammals in the coastal zone of the Bering Sea during summer and autumn, OCSEAP Final reports of Principal Investigators: U.S. Dept. Commerce, NOAA, p. 365-561.
- Frost, K.J., Lowry, L.F., and Burns, J.J., 1983, Distribution of marine mammals in the coastal zone of the eastern Chukchi Sea during summer and autumn, OCSEAP Final reports of Principal Investigators: U.S. Dept. Commerce, NOAA, p. 563-650.
- Garin, P.V., 1935, Отчет по промысловому рейсу зверобойного судна «Палтус» - Берингово - Чукотское моря 1935 г. [Report on the sealing trip of the vessel sealer "Paltus" - Bering - Chukchi seas in 1935], Рукопись. Архив ТИНРО [Manuscript, TINRO Archive], no. 1475, p. 28.
- Garlich-Miller, J., and Jay, C.V., 2000, Proceedings of a workshop concerning walrus survey methods, Anchorage, Alaska, March 27-28, 2000: U.S. Fish and Wildlife Service MMM 00-2, 96 p.
- Geller, M.K., 1957, Об охране морских промысловых зверей Чукотки [On the protection of harvested marine mammals of Chukotka]: Охрана природы и заповедное дело в СССР [Nature conservation and preservation in the USSR], v. 1957, no. 2, p. 108-117.
- Gilbert, J.R., Fedoseev, G.A., Seagars, D., Razlivalov, E., and Lachugin, A., 1992, Aerial census of Pacific walrus, 1990: Marine Mammal Management, US Fish & Wildlife Service, Region 7 92-1, 33 p.
- Gol'tsev, V.N., 1968, Динамика береговых лежбищ моржа в связи с его распределением и численностью [Dynamics of coastal haulouts of walruses in connection with their distribution and abundance]: Известия ТИНРО [Izvestia Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khozyaistva i Okeanografii (TINRO News)], v. 62, no. Pinnipeds of the North Pacific, p. 205-215.
- Gol'tsev, V.N., 1972, Распределение и учет численности тихоокеанского моржа осенью 1970 года [Distribution and assessment of numbers of the Pacific walrus, autumn 1970], in Тезисы докладов 5-го Всесоюзного совещания по изучению морских млекопитающих (Махачкала, 19-21 сентября 1972 г.) [Abstracts of 5th All-Soviet Union Meeting on the study of marine mammals (Makhachkala, September 19-21 1972)], Махачкала [Makhachkala], Academia Nauk SSR, p. 25-28.

- Gondatti, N.L., 1897, Гондатти Н.Л. Оседлое население реки Анадыра [Settled people of Anadyr river]: Записки Приамурского отделения Императорского русского географического общества [Notes of Priamursky Division of the Imperial Russian Geography Society], v. 3, no. 1, p. 111-165.
- Grachev, A.I., 1988, Летнее распределение моржа в Анадырском заливе [Summer distribution of walrus in the Gulf of Anadyr], Научно-исследовательские работы по морским млекопитающим северной части Тихого океана в 1986-1987 гг. [Investigations on marine mammals in the Northern Pacific in 1986-1987]: Moscow, ВНИРО [VINRO], p. 118-123.
- Grachev, A.I., 2000, Результаты обследований лежбищ сивуча и моржа в Охотском, Беринговом и Чукотском морях в 1997 году [Results of surveys of sea lions and walrus rookeries in the Sea of Okhotsk, Bering and Chukchi Seas in 1997], in Belkovich, V.M., Boltunov, A.N., and Smelova, I.V., Marine Mammals of the Holarctic: Arkhangelsk, True North, p. 99-104.
- Grachev, A.I., and Mimrin, N.I., 1991, Численность и возрастно-половой состав моржей на лежбищах Чукотского полуострова [The size and age-sex composition of walrus haulouts on the Chukotka Peninsula], Научно-исследовательские работы по морским млекопитающим северной части Тихого океана в 1989-1990 гг. [Investigations on marine mammals in the Northern Pacific in 1989-1990]: Moscow, ВНИРО [VINRO], p. 48-51.
- Gromoff, L.V., 1961, Остров Врангеля [Wrangell Island]: Magadan, Книга Издательство [Publishing house].
- Hanna, G.D., 1920, Mammals of the St. Matthew Islands, Bering Sea: Journal of Mammalogy, v. 1, no. 3, p. 118-122.
- Hessing, P., and Sheffield, G., 1990, 1990 Round Island Field Season Report Walrus Islands State Game Sanctuary: Alaska Department of Fish and Game, Division of Wildlife Conservation.
- Huntington, H.P., Nelson, M., and Quakenbush, L.T., 2012, Traditional knowledge regarding walrus near Point Lay and Wainwright Alaska. Report to the Native Villages of Point Lay and Wainwright, and the Bureau of Ocean Energy Management for contract #M09PC00027: Eagle River, Alaska, Huntington Consulting, no. #M09PC00027, p. 9.
- Huntington, H.P., and Quakenbush, L.T., 2013, Traditional knowledge regarding walrus near Point Hope Alaska. Report to the Native Village of Point Hope and the Bureau of Ocean Energy Management for contract #M09PC00027: Eagle River, Alaska, Huntington Consulting, p. 9.
- Ireland, D.S., Funk, D.S., Rodrigues, R., and Koski, W.R., 2009, Joint Monitoring Program in the Chukchi and Beaufort seas, open water seasons, 2006-2007: Shell Offshore Inc., ConocoPhillips Alaska, Inc., National Marine Fisheries Service and U.S. Fish & Wildlife Service P971-2, 485 + appendices p.
- Irons, D.B., 1983, Hauling out and foraging behavior of walrus at St. Matthew Island, Alaska [draft]: U.S. Fish and Wildlife Service, Denver Wildlife Research Center, Marine Mammal Section, 30 p.
- Jay, C.V., and Hills, S., 2005, Movements of walrus radio-tagged in Bristol Bay, Alaska: Arctic, v. 58, no. 2, p. 192-202.
- Kalinichenko, E.N., 1990, Численность и распределение моржа у северо-востока Камчатки [Number and distribution of walrus in the north-east of Kamchatka], Морские млекопитающие: Тезисы докладов 10-го Всесоюзного совещания по изучению, охране и рациональному использованию морских млекопитающих (Светлогорск, 2-5 октября 1990 г.) [Marine Mammals: Abstracts of 10th All-Soviet Union Meeting on the study, protection and management of marine mammals (Svetlogorsk, October 2-5 1990).], p. 130-131.

- Kalinichenko, E.N., 1991, Наблюдения за численностью и распределением моржей в прибрежной части Наваринского района [Observations of the numbers and distribution of walruses in the coastal part of Navarin district], Научно-исследовательские работы по морским млекопитающим северной части Тихого океана в 1989-1990 гг. [Investigations on marine mammals in the Northern Pacific in 1989-1990]: Moscow, p. 44-47.
- Kalinichenko, Y.N., and Chugunkov, D.I., 1996, Влияние антропогенного фактора на состояние моржей залежек [The influence of human disturbance on the state of the walrus haulouts]: Известия ТИНРО [Izvestia Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khozyaistva i Okeanografii (TINRO News)], v. 121, p. 117-121.
- Kareayev, A.I., 1926, Чукотско-Анадырский край [Chukchi-Anadyr region], Экономическая жизнь Дальнего Востока [The economic life of the Far East]: Khabarovsk, p. 136-154.
- Kavry, V.I., Boltunov, A.N., and Nikiforov, V.V., 2008, Новые береговых лежбища моржей (*Odobenus rosmarus*) - ответ на изменения климата [New coastal haulouts of walruses (*Odobenus rosmarus*) – response to the climate changes], in Boltunov, A.N., Морские млекопитающие Голарктики: Материалы Пятой международной конференции (Одесса, Украина, 14-18 октября 2008) [Marine Mammals of the Holarctic : collection of scientific papers after the third international conference, Koktebel, Crimea, Ukraine, October 11-17, 2004]: Odessa, Ukraine, Астропринт [Astroprint], p. 248-251.
- Kavry, V.I., Kochnev, A.A., Nikiforov, V.V., and Boltunov, A.N., 2006, Мыс Ванкарем – природно-этнический комплекс на арктическом побережье Чукотки [Cape Vankarem – nature-ethnic complex at the Arctic coast of Chukotka (northeastern Russia)], Морские млекопитающие Голарктики: Материалы Четвертой международной конференции (Санкт-Петербург, 10-14 сентября 2006) [Marine Mammals of the Holarctic: collection of scientific papers after the fourth International Conference, Saint-Petersburg, September 10-14, 2006]: St. Petersburg, Изд-во Санкт-Петербургского университета [St. Petersburg State University Publishing], p. 227-230.
- Kawerak, 2013, Seal and walrus harvest and habitat areas for nine Bering Strait region communities, Traditional Ecological Knowledge Report (unpublished): Nome, Alaska.
- Khromchenko, V.S., 1822, V. S. Khromchenko's coastal explorations in southwestern Alaska, 1822: Chicago, Field Museum of Natural History, v. 64.
- Kibal'chich, A.A., 1978, Наблюдения на Аракамчеченском лежбище моржей [Observations on the Aramakchehen walrus haulout], in Agarkov, G.B.a.o., ed., Тезисы докладов VII Всесоюзного совещания (Симферополь, 20-23 сентября 1978 г.) [Abstracts of 7th All-Soviet Union Meeting (Simferopol', September 20-23 1978)]: Moscow, ЦНИИТЭИРХ [Central Research Institute of Information and Technical Economic Research Fisheries (TsNIITEIRKh)], p. 148-149.
- Kibal'chich, A.A., 1979, Материалы по исследованию ластоногих в период рейса ЗРС "Зубарево" в моря Берингово и Чукотское (июль-август 1978 года)[Materials on study of pinnipeds obtained during cruise of the sealer vessel "Zubarevo" in the Bering and Chukchi Seas (July-August 1978)], Научно-исследовательские работы по морским млекопитающим северной части Тихого океана в 1978/79 гг. [Investigations on marine mammals in the Northern Pacific in 1978/79]: Moscow, p. 7-16.
- Kibal'chich, A.A., 1988, Материалы по биологии тихоокеанского моржа (рейс ЗРС "Захарово", март-июль 1985 г.) [Materials on the biology of the Pacific walrus (cruise of the sealer vessel "Zakharovo", March-July 1985)], in Chernysheva, N.S., ed., Научно-исследовательские работы по морским млекопитающим северной части Тихого океана в 1986-1987 гг. [Investigations on marine mammals in the Northern Pacific in 1986-1987]: Moscow, ВНИРО [VINRO], p. 126-141.

- Kitayev, Y.V., 1988, Наблюдения за численностью и распределением моржей в Карагинском заливе в 1987 г. [Observations of the numbers and distribution of walruses in the Gulf of Karaginsky in 1987], Научно-исследовательские работы по морским млекопитающим северной части Тихого океана в 1986-1987 гг. [Investigations on marine mammals in the Northern Pacific in 1986-1987]: Moscow, ВНИРО [VNIRO], p. 123-126.
- Kleinenberg, S.E., 1957, Об охране моржей [On protection of the walrus]: Природа [Priroda], v. 1957, no. 7, p. 101-103.
- Kleinenberg, S.E., Bel'kovich, V.M., and Yablokov, A.V., 1964, Материалы к изучению распространения и состояния популяций моржей Советской Арктики [Materials to studying of distribution and status of walrus populations of the Soviet Arctic], Определение возраста промысловых ластоногих и рациональное использование морских млекопитающих [Age determination of harvested pinnipeds and rational use of marine mammals]: Moscow, Наука [Nauka], p. 43-58.
- Kochnev, A.A., 1991, Береговые лежбища моржей на острове Врангеля в 1990 г. [Walrus coastal haulouts on Wrangel Island in 1990], Научно-исследовательские работы по морским млекопитающим северной части Тихого океана в 1989-1990 гг. [Investigations on marine mammals in the Northern Pacific in 1989-1990]: Moscow, ВНИРО [VNIRO], p. 37-44.
- Kochnev, A.A., 1999, Тихоокеанский морж в прибрежных водах о. Врангеля (1991-1994): Численность и распределение в зависимости от гидрологических условий и хищничества белых медведей [Pacific walrus in coastal waters of Wrangel Island (1991-1994): Abundance and distribution in relation to hydrological conditions and polar bear predation]: Численность и распределение в зависимости от гидрологических условий и хищничества белых медведей [Izvestiya of the Pacific Fisheries Research Centre (TINRO-Centre) (News of the Pacific Fisheries Research Center (TINRO Center))], v. 126, p. 447-464.
- Kochnev, A.A., 2001, Моржи острова Врангеля и влияние на них белых медведей [Walruses Wrangel Island and the influence of polar bears], in В.А., В., ed., Материалы к 16 совещанию рабочей группы по проекту 02.05-61 «Морские млекопитающие» Российско-Американского соглашения о сотрудничестве в области охраны окружающей среды [Materials to the 16th Working Group meeting under Project 02.05-61 «Marine mammals» within the framework of the U.S.-Russia Agreement on Cooperation in the Field of Environmental Protection]: ВНИРО [VNIRO], p. 86-87.
- Kochnev, A.A., 2001, Тихоокеанский морж в районе островов Врангеля и Геральда и его охрана [Pacific walruses in the area of Wrangel and Herald islands and their protection], in Pavlov, D.S.a.B., V.A., ed., Морж: Образ вида [The Walrus: Mode of the Species]: Moscow, Наука [Nauka], p. 180-205.
- Kochnev, A.A., 2002, Факторы, определяющие смертность Тихоокеанских моржей на береговых лежбищах Острова Врангеля [The factors of the Pacific walrus mortality at the coastal haulouts at the Wrangel Island], in Aristov, A.A., and others, eds., результаты исследований, проведенных в 1995-1998 гг. [Marine Mammals (Results of the research conducted in 1995-1998): Moscow, p. 191-215.
- Kochnev, A.A., 2004а, Половозрастная структура группировок тихоокеанского моржа (*Odobenus rosmarus divergens*) на береговых лежбищах и ее влияние на результаты аэрофотосъемки [Sex-age composition of Pacific walruses (*Odobenus rosmarus divergens*) on coastal haulouts and its influence to results of aerial photo survey], Морские млекопитающие Голарктики: Материалы Третьей международной конференции, 11-17 октября 2004 [Marine Mammals of the Holarctic: collection of scientific papers October 11-17 2004]: Koktebel, Crimea, Marine Mammal Council, p. 280-284.

- Kochnev, A.A., 2004b, Потепление восточной Арктики и современное состояние популяции тихоокеанского моржа (*Odobenus rosmarus divergens*) [Warming of eastern Arctic and present status of the Pacific walrus (*Odobenus rosmarus divergens*) population], Морские млекопитающие Голарктики: Материалы Третьей международной конференции (Коктебель, Крым, 11-17 октября 2004) [Marine Mammals of the Holarctic: Proceedings of the Third International conference (Koktebel, Crimea, October 11-17 2004)], Marine Mammal Council, p. 284-288.
- Kochnev, A.A., 2006, Лежбище моржей (*Odobenus rosmarus divergens*) на острове Колючин, Чукотское море [Coastal haulout of Pacific walruses (*Odobenus rosmarus divergens*) on Kolyuchin Island, the Chukchi Sea], Морские млекопитающие Голарктики: Материалы Четвертой международной конференции (Санкт-Петербург, 10-14 сентября 2006) [Marine Mammals of the Holarctic: Proceedings of the Fourth International conference (Saint-Petersburg, September 10-14 2006)], Изд-во Санкт-Петербургского университета [St. Petersburg State University Publishing], p. 266-271.
- Kochnev, A.A., 2007, О топонимике береговых лежбищ моржей Чукотского полуострова (на примере косы Рэткын) [On toponymics of walrus coastal haulouts of Chukotka Peninsula (for example, Retkyn Spit)], Тропой Богораза: Культуры и языки народов Чукотки [Path Bogoras: Cultures and languages of Chukotka]: Moscow, p. 257-261.
- Kochnev, A.A., 2008, В институтах и лабораториях: Чукотский филиал ТИНРО-Центра (ЧукотТИНРО) лаборатория морских млекопитающих [Pacific Research Fisheries Center. Chukotka Branch (ChukotTINRO)] marine mammal laboratory, 17-20 p.
- Kochnev, A.A., 2010a, Лежбище моржей (*Odobenus rosmarus divergens*) на мысе Сердце-Камень, Чукотское море [The haulout of Pacific walruses (*Odobenus rosmarus divergens*) on Cape Serdtse-Kamen', the Chukchi Sea], Морские млекопитающие Голарктики: Материалы Шестой международной конференции (Калининград, 11-15 октября 2010) [Marine Mammals of the Holarctic: Proceedings of the VI International Conference (Kaliningrad, October 11-15 2010)], Капрос [Karpus], p. 281-285.
- Kochnev, A.A., 2010b, Численность, распределение и половозрастная структура тихоокеанских моржей (*Odobenus rosmarus divergens* Illiger, 1815) в прибрежных водах острова Врангеля (1995-1998) [Stock abundance, distribution and sex/age structure of the Pacific walrus (*Odobenus rosmarus divergens* Illiger, 1815), in the Wrangel Island coastal waters in 1995-1998]: Исследования водных биологических ресурсов Камчатки и северо-западной части Тихого океана [Research of marine biological resources of Kamchatka and the north-western Pacific Ocean], v. 19, p. 74-89.
- Kochnev, A.A., Fischbach, A.S., Jay, C.V., and Speckman, S.G., 2008, Спутниковое прослеживание тихоокеанских моржей (*Odobenus rosmarus divergens*) в Чукотском море осенью 2007 г. [Satellite radio-tracking of Pacific walruses (*Odobenus rosmarus divergens*) in the Chukchi Sea, autumn 2007], Морские млекопитающие Голарктики: Материалы Пятой международной конференции [Marine Mammals of the Holarctic: Proceedings of the Fifth International conference]: Одесса [Odessa], Астропринт [Astroprint], p. 263-267.
- Kochnev, A.A., and Kozlov, M.S., 2012, Лежбище моржей (*Odobenus rosmarus divergens*) на острове Колючин (Чукотское море) в 2011 г. [The Pacific walrus (*Odobenus rosmarus divergens*) terrestrial haulout on Kolyuchin Island (Chukchi Sea), 2011], Морские млекопитающие Голарктики: Материалы VII международной конференции (Суздаль, 24-28 сентября 2012) [Marine Mammals of the Holarctic: Proceedings of the VII International conference (Suzdal, September 24-28 2012)], v. 1, p. 329-332.

- Kochnev, A.A., Kryukova, N.V., Pereverzev, A.A., and Ivanov, D.I., 2008, Береговые лежбища тихоокеанских моржей (*Odobenus rosmarus divergens*) в Анадырском заливе Берингова моря в 2007 г. [Coastal rookeries of Pacific walrus (*Odobenus rosmarus divergens*) in the Anadyr Bay of the Bering Sea in 2007], in Морские млекопитающие Голарктики: Материалы Пятой международной конференции (Одесса, Украина, 14-18 октября 2008) [Marine Mammals of the Holarctic: Proceedings of the Fifth International conference (Odessa, Ukraine, October 14-18 2008)], Астропринт [Astroprint], p. 267-272.
- Korsakovskiy, P., Vasilev, I.Y., and VanStone, J.W., 1988, Russian exploration in Southwest Alaska: the travel journals of Petr Korsakovskiy (1818) and Ivan Ya. Vasilev (1829), University of Alaska Press.
- Kosygin, G.M., 1975, Состояние охраны и некоторые вопросы изучения тихоокеанского моржа. [Status of protection and some questions for study of the Pacific walrus], in Agarkov, G.B., Arsen'ev, V.A., Zemskii, V.A., Sokolov, V.E., Sokolov, A.S., Tver'ianovich, V.A., Tomilin, A.G., and Yablokov, A.V., Морские млекопитающие: Тезисы докладов VI Всесоюзного совещания (Киев, 1-3 октября 1975 г.) [Marine Mammals: Abstracts of 6th All-Soviet Union Meeting (Kiev, October 1-3 1975)], Наукова думка [Naukova Dumka], v. 1, p. 154-155.
- Kosygin, G.M., and Sobolevskii, E.I., 1971, Появление моржей южнее их современного ареала. [Occurrence of walruses south of their recent range], in Arsen'ev, V.A., and Tikhomirov, E.A., eds., Труды ВНИРО: Морские млекопитающие (котики и тюлени) [VNIRO Transactions: Marine mammals (fur seals and hair seals)]: Moscow, ВНИРО [VNIRO], p. 301-304.
- Kruse, S., 1995, Terrestrial haulout behavior of Pacific walrus on Arakamchechen Island, Chukotka, Russia, 12-22 August 1994: Anchorage, U.S. Fish & Wildlife Service, Marine Mammals Management, p. 29.
- Kruse, S., and Jack, C.R., 1998, Field report, Bristol Bay walrus haulout monitoring program, Cape Seniavin, summer 1998: Anchorage, U.S. Fish & Wildlife Service, Marine Mammals Management, p. 22.
- Krylov, V.I., 1966, Возрастной и половой состав, плотность залегания тихоокеанского моржа на льдах и береговых лежбищах. [Age and sex composition and density of Pacific Walrus haulouts on ice and land]: Известия ТИНРО [Izvestia Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khozyaistva i Okeanografii (TINRO News)], v. 58, p. 97-103.
- Krylov, V.I., 1968, О современном состоянии запасов тихоокеанского моржа и перспективах их рационального использования [Current status of the Pacific walrus stocks and prospects of their rational use]: Известия ТИНРО [Izvestia Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khozyaistva i Okeanografii (TINRO News)], v. 62, p. 189-204.
- Krylov, V.I., 2001, Численность тихоокеанского моржа [The number of Pacific walrus], in Pavlov, D.S., and Bychkov, V.A., eds., Морж: Образ вида [Walrus: the mode of the species]: Moscow, Наука [Nauka], p. 143-162.
- Krylov, V.I., Fedoseyev, G.A., and A.P., S., 1964, Ластоногие Дальнего Востока [Pinnipeds of the Far East]: Moscow, Пищевая промышленность [Food Industry], 60 p.
- Kryukova, N.V., Ivanov, D.I., and Pereverzev, A.A., 2010, Наблюдения за моржами (*Odobenus rosmarus divergens*) в районе лежбища на косе Рэткын. [Observations on walruses (*Odobenus rosmarus divergens*) in the area of their haulout on the Retkyn Spit], Морские млекопитающие Голарктики: Материалы Шестой международной конференции (Калининград, 11-15 октября 2010) [Marine Mammals of the Holarctic: Proceedings of the VI International Conference (Kaliningrad, October 11-15 2010)], Капрос [Capros], p. 291-276.

- Kryukova, N.V., and Kochnev, A.A., 2012, Лежбище моржей (*Odobenus rosmarus divergens*) на мысе Ванкарем в 2011 г. [The Pacific walrus (*Odobenus rosmarus divergens*) terrestrial haulout on the Cape Vankarem in 2011], в Морские млекопитающие Голарктики. Сб. научных трудов по материалам VII международной конференции (Суздаль, 24-28 сентября 2012 г.) [Marine Mammals of the Holarctic: Proceedings of the VII International conference (Suzdal, September 24-28 2012)], v. 2, p. 344-349.
- Lowe, S.J., 2015, Pacific Walrus presence on Unimak Island, in U.S. Department of the Interior Fish and Wildlife Service, I.N.W.R.: Cold Bay, Alaska.
- Lowe, S.J., and Walsh, P., 2011, Use of remote cameras to monitor walrus haulout numbers and timing on Togiak National Wildlife Refuge, in U.S. Department of the Interior Fish and Wildlife Service, T.N.W.R.: Dillingham, Alaska, p. 11.
- MacDonald, R., Winfree, M., 2006, Marine Mammals Haulout Use in Bristol Bay and Southern Kuskokwim Bay Alaska 2006: A Status Report of the 2006 Marine Mammal Monitoring Effort at Togiak National Wildlife Refuge: US Fish and Wildlife Service, Togiak National Wildlife Refuge, 50 p.
- Mineev, A.I., 1935, Промысел моржа на острове Врангеля [Walrus hunting on Wrangel Island], Советская Арктика [Society Arctic], no. 2, p. 49-52.
- Mineev, A.I., 1946, Остров Врангеля [Wrangel Island]: Leningrad, Изд-во Главсевморпути [Northern Sea Route Publishing], 432 p.
- Mumrin, N.I., 1991, Сивучи у Чукотского полуострова [Steller sea lions in the Chukotka Peninsula], Научно-исследовательские работы по морским млекопитающим северной части Тихого океана в 1989-1990 гг [Investigations on marine mammals in the Northern Pacific in 1989-1990]: Moscow, ВНИРО [VNIRO], p. 234-245.
- Mumrin, N.I., and Grachev, A.I., 1986, Численность и половой состав моржей на лежбищах Анадырского залива и острова Аракамчечен в 1984 году [Abundance and sex composition of walruses on the haulouts in Gulf of Anadyr and Arakamchechen Island in 1984], in Agarkov, G.B., and others, eds., Морские млекопитающие: Тезисы докладов IX Всесоюзного совещания по изучению, охране и рациональному использованию морских млекопитающих (Архангельск, 9-11 сентября 1986 г) [Marine Mammals: Abstracts of 9th All-Soviet Union Meeting (Arkhangelsk, September 9-11 1986)]: Arkhangelsk, Ротапринт ОБЛСТАТ [Rotaprint OBLSTAT], p. 286-287.
- Mumrin, N.I., Smirnov, G.P., Gajewski, A., Grachev, and Klimenko, A.Y., 1988, Миграции тихоокеанского моржа и динамика его численности на лежбищах [Migrations of Pacific walrus and the dynamics of its abundance on the haulouts], Научно-исследовательские работы по морским млекопитающим северной части Тихого океана в 1986-1987 гг [Investigations on marine mammals in the Northern Pacific in 1986-1987]: Moscow, ВНИРО [VNIRO], p. 109-115.
- Mumrin, N.I., Smirnov, G.P., Gajewski, A., and Kovalenko, V.E., 1990, Сезонное распределение и численность моржей в Анадырском заливе Берингова моря [Seasonal distribution and abundance of walruses in the Gulf of Anadyr in the Bering Sea]: Зоологический журнал [Zoologicheskyy Zhurnal], v. 69, no. 3, p. 105-113.
- Naumenko, A.T., Lobkov, Y., and Nikanorov, A.P., 1986, Кроноцкий заповедник [Kronotskiy Reserve]: Moscow, 190 p.
- Nikanorov, A.P., 2000, Морские млекопитающие Кроноцкого биосферного заповедника [Marine mammals of Kronotskiy Biosphere Reserve], Морские млекопитающие Голарктики: Материалы Международной конференции (Архангельск, 21-23 сентября 2000) [Marine Mammals of the Holarctic: Proceedings of the International Conference (Arkhangelsk, September 21-23 2000)]: Arkhangelsk, Правда Севера [True North], p. 295-298.

- Nikulin, P.G., 1941, Чукотский морж [The Chukchi walrus]: Известия ТИНРО [Izvestia Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khozyaistva i Okeanografii (TINRO News)], v. 20, p. 21-59.
- Nikulin, P.G., 1947, Биологическая характеристика береговых лежбищ моржа на Чукотском полуострове [Biological characteristics of coastal walrus haulouts on the Chukotka Peninsula]: Известия ТИНРО [Izvestia Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khozyaistva i Okeanografii (TINRO News)], v. 25, p. 226-228.
- Obukhov, P.A., 1974, Морские млекопитающие (Cetacea и Pinnipedia) устья Колымы [Marine mammals (Cetacea and Pinnipedia) at the mouth of the Kolyma River]: Териология [Theriology], v. 2, p. 317-321.
- Ovsyanikova, E.N., 2012, Встречи моржей (*Odobenus rosmarus divergens*) на северо-востоке Камчатки и юге Чукотки по результатам наблюдений с борта круизных судов в 2007-2011 гг. [Sightings of walruses (*Odobenus rosmarus divergens*) in NorthEastern Kamchatka and Southern Chukotka: results of observations from the cruise vessels in 2007-2011], Морские млекопитающие Голарктики: Материалы VII международной конференции (Суздаль, 24-28 сентября 2012) [Marine Mammals of the Holarctic: Proceedings of the VII International Conference (Suzdal, September 24-28 2012)], Marine Mammal Council, v. 2, p. 150-154.
- Ovsyanikov, N.G., Bove, L.L., and Kochnev, A., 1994, Причины массовой гибели моржей на береговых лежбищах [Causes of mass mortality of walruses on coastal haulouts]: Зоологический журнал [Zoologische Journal], v. 73, no. 5, p. 80-87.
- Ovsyanikov, N.G., and Menyushina, I.Y., 2012, Распределение береговых лежбищ моржей (*Odobenus rosmarus*) на о. Врангеля как реакция на хищничество белых медведей (*Ursus maritimus*) [Distribution of walrus (*Odobenus rosmarus*) haulouts on Wrangel and Herald Islands as a reaction to polar bear (*Ursus maritimus*) predation], Морские млекопитающие Голарктики: Материалы VII международной конференции (Суздаль, 24-28 сентября 2012) [Marine Mammals of the Holarctic: Proceedings of the VII International Conference (Suzdal, September 24-28 2012)], Marine Mammal Council, v. 2, p. 139-143.
- Ovsyanikov, N.G., Menyushina, I.Y., and Bezrukov, A.V., 2008, Необычная гибель моржей у острова Врангеля в 2007 г. [Unusual deaths of walruses in the Wrangel Island in 2007], in Boltunov, A.N., Морские млекопитающие Голарктики: Материалы Пятой международной конференции (Одесса, Украина, 14-18 октября 2008) [Marine Mammals of the Holarctic: Proceedings of the Fifth International conference (Odessa, Ukraine, October 14-18 2008)], Астропринт [Astroprint], p. 413-416.
- Pankratov, A.P., 1982, Особенности поведения тихоокеанского моржа на береговых лежбищах [Characteristics of the behavior of the Pacific walrus on shore haulouts], in Изучение, охрана и рациональное использование морских млекопитающих: Тезисы докладов VIII Всесоюзного совещания (Астрахань, 5-8 сентября 1982 г.) [Study, protection and management of marine mammals: Abstracts of 8th All-Soviet Union Meeting (Astrakhan', September 5-8 1982)], [Rotaprint OBLSTAT], p. 274-276.
- Pereverzev, A.A., 2006, Структура группировок тихоокеанского моржа (*Odobenus rosmarus divergens*) на береговых лежбищах Анадырского залива в 2003-2005 гг. [Group composition of Pacific walrus (*Odobenus rosmarus divergens*) in hauled out in Andyr Bay in 2003-2005], in Belkovich, V.M., Морские млекопитающие Голарктики: Материалы Четвертой международной конференции (Санкт-Петербург, 10-14 сентября 2006) [Marine Mammals of the Holarctic: Proceedings of the Fourth International conference (Saint-Petersburg, September 10-14 2006)], Санкт-Петербургского университета [St. Petersburg State University Publishing,], p. 402-405.

- Pereverzev, A.A., and Kochnev, A.A., 2012, Лежбище моржей (*Odobenus rosmarus divergens*) на острове Колючин (Чукотское море) в 2010 г. [The Pacific walrus (*Odobenus rosmarus divergens*) terrestrial haulout on Kolyuchin Island (Chukchi Sea), 2010. Marine Mammals of the Holarctic. VII International Conference], Морские млекопитающие Голарктики: Материалы VII международной конференции (Суздаль, 24-28 сентября 2012) [Marine Mammals of the Holarctic: Proceedings of the VII International Conference (Suzdal, September 24-28 2012)], v. 2, p. 171-176.
- Pereverzev, A.A., and Kochnev, A.A., 2012, Морские млекопитающие в районе мыса Шмидта (Чукотка) в сентябре-октябре 2011 г. [Marine mammals in the Cape Schmidt (Chukotka) in September-October 2011.], Морские млекопитающие Голарктики: Материалы VII международной конференции (Суздаль, 24-28 сентября 2012) [Marine Mammals of the Holarctic: Proceedings of the VII International Conference (Suzdal, September 24-28 2012)], v. 2, p. 176-181.
- Peskov, V., 1995, «Морская лошадь» [Horse of the sea], Комсомольская правда [Komsomolskaya Pravda] v. № 178 (21188), no. 13.
- Pikharev, G.A., 1943, Белуха и ластоногие в прибрежной зоне Анадырского района [Beluga whales and pinnipeds in the coastal zone of the Anadyr district] Рукопись. Архив ТИНРО [Manuscript, TINRO Archive]: Vladivostok, p. 29.
- Pinigin, V.E., and Prianishnikov, V.G., 1975, О появлении большой группы моржей на Камчатке [The appearance of a large group of walruses on Kamchatka], in Морские млекопитающие: Тезисы докладов VI Всесоюзного совещания (Киев, 1-3 октября 1975 г.) [Marine Mammals: Abstracts of 6th All-Soviet Union Meeting (Kiev, October 1-3 1975)], Kiev, Наукова думка [Naukova Dumka], p. 56-57.
- Popov, L.A., 1959, [Distribution of walruses in the western sector of the Soviet Arctic during the summer-autumn period]: Информационный сборник ВНИРО [Informatsionniy Sbornik of Vsesoyuznogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khozyaistva i Okeanografii (VNIRO News)], v. 1959, no. 7, p. 40-49.
- Razumovskiy, V.I., 1931, Ластоногие Чукотки [Pinnipeds of Chukotka], Социалистическая реконструкция рыбного хозяйства Дальнего Востока [The socialist reconstruction of the Far East fisheries], no. 11-12, p. 100-107.
- Semenov, A.R., Burkanov, V.N., and Mashagin, S.A., 1988, Лежбища моржей на Камчатке [The haulouts of walruses in Kamchatka], in Попов, Л.А., ed., Научно-исследовательские работы по морским млекопитающим северной части Тихого океана в 1986-1987 гг. [Investigations on marine mammals in the Northern Pacific in 1986-1987]: Moscow, ВНИРО [VNIRO], p. 103-108.
- Semenova, V.S., Boltunov, A.N., and Nikiforov, V.V., 2010, Береговое лежбище тихоокеанских моржей (*Odobenus rosmarus divergens*) на м. Кожевникова, 2007-2009 гг. [Coastal haulout of pacific walruses (*Odobenus rosmarus divergens*) on Cape Kozhevnikov in 2007-2009], Морские млекопитающие Голарктики. Сб. научных трудов по материалам Шестой международной конференции (Калининград, 11-15 октября 2010 г.) [Marine Mammals of the Holarctic: VI International Conference (Kaliningrad, 11-15 October 2010)]: Kaliningrad, Капрос [Capros], p. 521-526.
- Serebrennikov, E.Y., 1982, Современное распределение настоящих тюленей и моржа в Карагинском заливе [Contemporary distribution of the seals and walruses in the Karaginsky Bay], Изучение, охрана и рациональное использование морских млекопитающих: Тезисы докладов VIII Всесоюзного совещания (Астрахань, 5-8 сентября 1982 г.) [Study, protection and management of marine mammals: Abstracts of 8th All-Soviet Union Meeting (Astrakhan', September 5-8 1982)]: Astrakhan, Rotaprint OBLSTAT, p. 321-322.
- Smirnov, G.P., 1985, Моржи Анадырского лимана [Walruses of the Anadyr Estuary], Советская Чукотка [Sovetskaya Chukotka], v. 157, p. 12609.

- Smirnov, G.P., 1988, Лежбище моржей на косе Русская Кошка [Walrus haulout on the Russkaya Koshka Spit], Научно-исследовательские работы по морским млекопитающим северной части Тихого океана в 1986-1987 гг. [Investigations on marine mammals in the Northern Pacific in 1986-1987]: Moscow, ВНИРО [VNIRO], p. 115-118.
- Smirnov, G.P., 1999, Летнее распространение и численность моржа зал. Креста в 1996 г. [Summer distribution and abundance of walrus in 1996]: Известия ТИНРО [Izvestia Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khozyaistva i Okeanografii (TINRO News)], v. 126, p. 507-511.
- Smirnov, G.P., Kochnev, A.A., Litovka, M.I., Kompantseva, E.I., and P.V., G., 2002, Мониторинг береговых лежбищ моржа Анадырского залива [Monitoring of coastal rookeries of walrus in the Anadyr Gulf], Морские млекопитающие Голарктики: Тезисы докладов Второй международной конференции (Байкал, 10-15 сентября 2002) [Marine Mammals of the Holarctic: Abstracts of the Second International Conference (Baikal, September 10-15 2002)]: Moscow, КМК, p. 228-229.
- Snively, M., 2003, Bristol Bay Walrus Haulout Monitoring Program: Cape Seniavin, AK Summer 2003: Bristol Bay Native Association, 80 p.
- Somov, A.G., Yermakov, O.E., and Duniushkin, S.P., 1982, О динамике численности моржей на лежбище о. Аракамчечен [On the dynamic numbers of walrus on the haulout at Arakamchechen Island], Изучение, охрана и рациональное использование морских млекопитающих: Тезисы докладов VIII Всесоюзного совещания (Астрахань, 5-8 сентября 1982 г.) [Study, protection and management of marine mammals: Abstracts of 8th All-Soviet Union Meeting (Astrakhan', September 5-8 1982)]: Astrakhan, [Rotaprint OBLSTAT], p. 346-347.
- Stewart, B.E., 1993, The Walrus International Technical and Scientific Committee's bibliography on walrus *Odobenus rosmarus* (L.), to January, 1993: Fisheries and Oceans Canada 1923, 191 p.
- Suvurov, E.K., 1914, О промысле моржа и кита на Чукотской земле [Hunting of whales and walrus on the Chukotski country]: Материалы к познанию русского рыболовства [Materials to the knowledge of Russian fishing] v. 3(5), p. 189-191.
- Tanner, Z.L., 1893, Report upon the Investigations of the U. S. Fish Commission Steamer Albatross from July 1, 1889, to June 30, 1891., Report to the Commissioner for 1889-1891: Washington, D.C., United States Comission of Fish and Fisheries, p. 207-342.
- Testin, A.I., 2004, Численность и проблемы сохранения тихоокеанского моржа (*Odobenus rosmarus divergens*) на береговых лежбищах северо-востока Камчатки [Walrus (*Odobenus rosmarus divirgens*) on coastal haulouts of northeast Kamchatka: abundance and conservation problems], Морские млекопитающие Голарктики: Материалы Третьей международной конференции (Коктебель, Крым, 11-17 октября 2004) [Marine Mammals of the Holarctic: Proceedings of the Third International conference (Koktebel, Crimea, October 11-17 2004)], КМК, v. 3, p. 535-538.
- Tikhomirov, E.A., 1964, Промысел моржа и пути охраны его популяции [The harvest of the walrus and the ways to conservation of its population], Охрана природы на Дальнем Востоке [Nature conservation in the far east]: Vladisvostok, Изд-во СО АН СССР [Publishing of Siberian branch of USSR Academy of Sciences], p. 137-141.
- Tomilin, A.G., and Kibal'chich, A.A., 1975, Моржи района острова Врангеля [The walrus in the vicinity of Wrangel Island]: Зоологический журнал [Zoologicheskyy Zhurnal], v. 54, no. 2, p. 266-272.
- Udevitz, M.S., Jay, C.V., and Cody, M.B., 2005, Observer variability in pinniped counts: ground-based enumeration of walrus at haul-out sites: Marine Mammal Science, v. 21, no. 1, p. 108-120.
- Ushakov, G.A., 1972, Остров метелей [Island snowstorms]: Leningrad, Гидрометеиздат [Gidrometeoizdat], 180 p.

- VanStone, J.W., 1988, Russian Exploration in Southwest Alaska: The Travel Journals of Petr Korsakovskiy (1818) and Ivan Ya. Vasilev (1829): Fairbanks, Alaska, University of Alaska Press, 120 p.
- Velizhanin, A.G., 1965, Лежбища моржей на острове Врангеля [Walrus haulouts of Wrangel Island]: Записки Приморского филиала Географического общества СССР [Notes of the Primorskiy branch of Geographic Society of the USSR] v. 24, no. 1, p. 150-151.
- Vertyanin, V.V., 1978, Моржи на Командорских островах [Walruses on the Commander Islands], Морские млекопитающие: Тезисы докладов VII Всесоюзного совещания (Симферополь, 20-23 сентября 1978 г.) [Marine Mammals: Abstracts of 7th All-Soviet Union Meeting (Simferopol', September 20-23 1978)], ЦНИИТЭИРХ [TsNIITEIRKh], p. 59-61.
- von Ditmar, K., 1901, Дитмар К. Поездки и пребывание на Камчатке в 1851-1855 гг. К. фон-Дитмара. Ч.1. Исторические отчеты по путевым дневникам [Travel and stay on the Kamchatka Peninsula in the years 1851-1855: Historical reports on the travel diaries]: St. Petersburg, v. 756.
- Weiss, E.a.R.M., 2014, Walrus Islands State Game Sanctuary Annual Management Report 2013: Alaska Dept. of Fish and Game, Division of Wildlife Conservation, 100 p.
- Winfrey, M., 2009, Marine Mammal Haulout Use in Bristol Bay and Southern Kuskokwim Bay, Alaska, 2009: U.S. Fish and Wildlife Service. Togiak National Wildlife Refuge, 20 p.
- Yablokov, A.V., and Bel'kovich, V.M., 1962, Наблюдение моржей на лежбищах в Анадырском заливе и Чукотском море [Observations of walruses on the haulouts in the Gulf of Anadyr and Chukchi Sea]: Краеведческие записки [Local Historical Notes] v. 4, p. 156-174.
- Zdor, E., Zdor, L., and Ainana, L., 2009, Traditional Knowledge of the Native People of Chukotka About Walrus: Kawerak Inc., 58 p.
- Zenkovich, B.A., 1938, Развитие промысла морских млекопитающих на Чукотке [Development of marine mammal harvest on the Chukotka]: Природа [Priroda (The Nature)], v. 1938, no. 11-12, p. 59-63.
- Zheleznov-Chukotskiy, N.K., Sekretareva, N.A., Astakhova, T.I., Zhukova, A.I., Tikhomirov, Y., and Lozovskaya, S.A., 2003, Природные условия и ресурсы Чукотского полуострова [Natural conditions and resources of the Chukchi Peninsula]: Moscow, ГЕОС [GEOS].

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