

Distribution and migrations of some pinnipeds, cetaceans, and the polar bear in the seas
of the eastern region of the Arctic

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With implementation of an aerial reconnaissance of the ice in the Arctic Basin in the 1960's, regular observations of marine mammals and polar bears were begun. The results of the observations of polar bears in 1962, 1967, and 1968 were analyzed by S. M. Uspenskii and V. I. Shil'nikov (1969). The present work utilizes observational data from aerial reconnaissances of the ice in 1971–1979. New materials are presented concerning the distribution of marine mammals and polar bears in the seas of the eastern region of the Arctic and about the migration routes of the Pacific population of the walrus.

METHODS

With implementation of the ice aerial reconnaissance, flights were conducted in an IL-14 aircraft at least once per 10 days over each area at an altitude, as a rule, of 100–300 m and a flying speed of 250–270 km/hr. The width of the surveyed strips was from 500 to 750 m. The flight path fluctuated somewhat with the survey of varying ice

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conditions. The location and number of animals were recorded and plotted on the ice maps. It should be recognized that the same group or individual could have been located two or three times in a month and plotted on one map; on the other hand, other animals could have occurred outside the zone of observation. The assessment from a rapidly flying aircraft of the number of animals in a group was, naturally, approximate. In this regard, the figures shown on the maps about the numbers of animals are only approximate indications of the actual numbers in a given region. For analysis of the data concerning the distribution of walruses, one must keep the following points in mind. First, on the monthly chart, the position of the border of the ice pertains, as a rule, to the second ten days of the month.¹ Second, the edge of the ice in the Chukchi Sea in the first half of the summer shifts to the west and north. Therefore, the walruses observed on the edge of the ice in the third ten days of the month appear on the composite monthly map to have been recorded far from the edge of the ice, amongst the close-packed ice. In actuality, especially in June, a large part of the walruses were distributed close to the edge of the ice, on it or in the water. Small groups of walruses were observed sometimes among the close-packed ice, beyond the edge, which some specialists from the Arctic and Antarctic Scientific Research Institute considered to be a prognostic indication of future (about 7 to 10 days) breaking up of the ice in this area.

ICE CONDITIONS

¹ In the monthly charts for 1978, the position of the edge of the ice pertains to the third ten days of the month.

The ice conditions reported below for the Chukchi and East Siberian Seas are reported by a succession of authors (Belinskii and Istomin, 1956; Karelin, 1952; Kupetskii, 1970).

The Chukchi and East Siberian Seas are covered with ice for the greater part of the year. In winter, vast shorefast ice is formed in the western part of the East Siberian Sea. In the eastern part of the East Siberian Sea and in the Chukchi Sea, shorefast ice is observed only in a narrow, nearshore zone. To the north of the New Siberian Islands in winter and spring, as well as to the north of Wrangell Island in spring, *polynias* or zones of young ice are recorded within the shorefast ice. The Alaskan *polynia* is observed in the eastern part of the Chukchi Sea in winter.

In these seas in winter, drift ice from the Arctic Basin predominates. In the spring and the first half of summer, most commonly, the most intense drift of ice is to the northwest. In August–September, drift of the ice again is recorded from the north and northwest.

Clearance of ice from the Chukchi Sea begins in the first half of June from Bering Strait. Complete clearance of the Chukchi Sea of ice is recorded extremely rarely, and complete elimination of ice from the East Siberian Sea generally does not occur. In summer, a considerable part of the East Siberian Sea is occupied by the Aion ice massif, which consists to a considerable measure of multi-year ice. The Wrangell ice massif forms in the southwestern part of the Chukchi in summer.

The presence of a nearly continuous ice cover in winter and a considerable area of close-packed ice (i.e., an ice massif) in the summer exerts a vast influence on the animal world of these seas.

RESULTS AND DISCUSSION

In Figures 1 to 9 are shown the locations and quantities of animals recorded, during ice reconnaissances in the seas of the eastern Arctic region. For analysis of these materials, we considered it expedient to consider them separately according to systematic groups of closely related species.

WALRUSES AND SEALS

The question of distribution of the Pacific population of the walrus in the west and the Laptev population in the east has remained controversial up to now, in spite of the fact that four decades have passed since K. K. Chapskii (1940) distinguished the Laptev subspecies of the walrus. The majority of investigators have agreed that the Pacific population in its dispersion to the west does not go out into the limits of the eastern part of the East Siberian Sea (Arsen'ev, 1935; Belopol'skii, 1939; Nikulin, 1940), and that the Laptev (Atlantic, according to Nikulin, 1940) does not go far eastward in the East Siberian Sea, practically being confined by the New Siberian Islands. L. O. Belopol'skii (1939) thinks that there is no connection between these two populations, and that they are

isolated ecologically. That opinion, unfortunately, has not been supported by factual material. In contrast, K. K. Chapskii (1940) cites cases of meeting walruses at 74.5° (for example, on the meridian of the western part of Chaun Bay), which were reported to him by H. Sverdrup, cruising in this region in the ship MAUD in April 1923. On the basis of this, he proposes the hypothesis that these walruses were headed for the DeLong Archipelago, i.e. to the New Siberian Islands.

Our data, however, do not support the opinion of K. K. Chapskii that Pacific walruses supposedly go as far as the New Siberian Islands. For example, in that same region to which he referred, walruses actually were found during the ice reconnaissance, but they were not recorded farther to the west (see Figs. 1–9). Their route, we assume, was blocked by the close-packed ice of the Aion ice massif. In other words, the ranges of the Laptev and Pacific populations of the walrus are separated geographically. Actually the Pacific walruses go only as far as the 160th meridian. The farthest that they visit is the western portion of the Kolyma coast.

P. A. Obukhov (1974) also noted that the walruses that are encountered in the given region pass to the east, together with the drifting ice.

The question arises, how could walruses have appeared so far west in the very beginning of the spring, as reported by H. Sverdrup? In fact, at that time the Bering stock still was only beginning to move northward toward Bering Strait. The answer to this question is given by the ice reconnaissance data, which give evidence that some quantity

of walrus remains to winter in the Chukchi and East Siberian seas. Thus, Yu. B. Konstantinov reports that, at the coast of Aion Island and in Chaun Bay, two groups of walrus were recorded in the winter of 1976–77: one by the southern coast of Aion Island (four individuals) and another in Great Rautan Bay (about 15 individuals). These two groups of walrus, which were observed in March and May, were able to live there, thanks to a lead in the shorefast ice. In April 1979, in a *polynia* within the shorefast ice north of Wrangell Island, more than 10 walrus were recorded. Stirling (1974) reported the finding of two walrus (adult males) in the eastern part of the Beaufort Sea on 10 April 1972.

Data received from the ice reconnaissances concerning observations of walrus show that the New Siberian herd of walrus, as before, remains in small numbers, apparently amounting to not more than a few hundred individuals. It is located year-round near the northern and northwestern New Siberian Islands, which is made possible by the existence of the Great Siberian *polynia*. Coastal haulouts are recorded only on the northern shore of Kotel'nii Island and on Val'katskii [*sic!*] Island. To find walrus of this population farther east than the New Siberian Islands is possible but exceptional. It is noticeable that the general drift of ice in that region is from east to west, and that the ice forms a compacted massif, extending far to the north from Chaun Bay.

The given data allow us to hypothesize that the Pacific walrus population has been expanding its range in recent decades; in any case, they continue to penetrate somewhat more to the west, as far as Aion Island and the Bear Islands. This could be due

to change in ice conditions. The connection between the distribution of walruses and ice conditions is apparent. In very difficult years (for example in 1956 and 1965), walruses apparently could not penetrate from the Chukchi Sea into the East Siberian. Probably, the expansion of the range of the walrus to the west is a result of growth in numbers of the Pacific population.

Analysis of the materials at our disposal concerning observation of walruses presents some information about the route of migration of the Pacific population into the Chukchi and East Siberian seas. An attempt to describe these routes was accomplished for two years (utilizing descriptions from questionnaires received from participants Yu. B. Konstantinov, V. N. Kupetskii, and V. P. Tarasenko of the Arctic and Antarctic Scientific Research Institute).

1976. In June, walruses remained on the eastern edge of the ice in the Chukchi Sea. In July, they advanced in small groups along the Chukchi coast to the west, up to Aion Island. In August, the basic herd of walruses finally separated into four groups: one at the edge of the ice between Two Pilots Spit and Cape Nettan, including Koliuchin Bay, another at the edge of the ice north-northeast of Herald Island, a third in Long Strait, and the fourth in the zone of scattered ice to the north of Aion Island.

In September, the large congregations of walruses broke up into smaller groups of up to 50 individuals. The distribution of the animals was comparatively uniform in all zones of scattered ice and along the border of the close-packed ice from Aion Island to

Vankarem village. As before, groups remained in the northeastern part of the Chukchi Sea and to the north of Wrangell Island. Migration of walrus to the east still was not recorded.

As in previous years, repeatedly, the appearance of walrus amongst the close-packed ice in June was indicative of the speedy breakup of the ice in a given location.

1978. On 27–29 April, a mass of walrus was noted in the central part of Anadyr Gulf in close-packed ice within 64 km of the edge of the ice. In the end of May in northernmost Bering Strait, within 200 km of the edge of the ice, more than 1000 walrus were noted. In June, walrus were found in the vicinity of Koliuchin Island. In July, they were distributed as far as Aion Island and penetrated into the *polynia* behind Wrangell Island. In August, the walrus reached as far as Ambarchika.

On the whole, the form of the migration of the Pacific walrus indicated by our observations appears as follows. In April–May, the walrus begin by degrees to move northward, with the recession of the edge of the ice from the Bering Sea into the Chukchi falling behind them. In the end of May to beginning of June, the basic mass of walrus converges into Bering Strait and into that part of the Chukchi Sea that borders on the Strait. A smaller part of the walrus remains in Anadyr Gulf, where, with favorable conditions, it remains all summer; in the end of summer and autumn, it comes out onto coastal haulouts. In June, the main part of the herd separates into groups of 20 to 150–200 individuals and thins out as it progresses along the shore to the west; in the end of June, it

passes Cape Serdtse-Kamen and reaches the vicinity of Koliuchin Bay, if the ice conditions are favorable for this. In July, the basic mass of walruses continues to advance westward. In favorable years, part of the walruses reach the vicinity of their summer pasture by the end of this month, in particular Wrangell Island, and it advances along the coast to Cape Billings. On the other hand, if a northwesterly wind prevails in July, the ice is swept away only from the southeastern part of the Chukchi Sea, and in such years, the walruses cannot reach the meridian of Koliuchin Bay, even by the end of July. At the end of August or beginning of September, they reach the vicinity of Aion Island and the entrance of Chaun Bay. In August and September, walruses are observed to advance to the north and northeast of Wrangell Island.

With the beginning of intensive ice formation, which in ordinary years falls in October, the herd begins the reverse migration. The walruses depart from the haulouts of Wrangell and Herald Islands and retreat from those parts of the Chukchi Sea where the ice edge lies.

The proposed scheme of migration of the Pacific walruses into the Chukchi and East Siberian Seas (Fig. 10) can be adjusted phenologically, in relation to actual ice conditions as they develop in the spring–summer period. In overall features, it is especially close to the scheme of migration of Pacific walruses as proposed by P. G. Nikulin (1940).

Contrary to the opinion of L. O. Belopol'skii (1939) that the "Wrangell group" of walrus moves to its summer-autumnal pasture far from shore, our data show that the walrus migrates sometimes on a narrow, sometimes on a wider front but, as a rule, not far from the shore. In any case, the greater part of the walrus gets to the area farthest north of Wrangell Island not by the shortest route but by crossing Long Strait and rounding Wrangell Island to the west (see Fig. 10.).

Annual fluctuations occur in the concentrations of animals and their spatial distribution, which is reflected in Figs. 1–9. Herds of walrus numbering in excess of 1000 individuals were found more often in June and July than in August and September (Table 1). In summer, with progressive thinning of the ice as a result of thawing, much greater dispersal of the walrus takes place. The summer–autumn pastures of walrus in the Chukchi and East Siberian Seas are in the nearshore zone from Koliuchin Bay to Chaun Bay, in Long Strait, and around Wrangell Island. But due to annual variation of the ice conditions, some portions of the pasture can become inaccessible to the animals. Thus, the distribution of walrus does not remain constant from year to year, which apparently plays a positive role, inasmuch as the food supply itself is not destroyed.

Other seals were observed for the most part on the shorefast ice between the New Siberian Islands and Chaun Bay (June 1972, 1975, 1976, May–June 1979). Although the species of seals, as a rule, were not differentiated by the observer-hydrologists, there is no doubt that the overwhelming majority of these were ringed seals, which absolutely prevail in the given region.

BELUGA AND LARGE WHALES

In the summer-autumn period, belugas were found singly (September 1973; June, August, and September 1974; June 1975; September 1977–1978; May–June, July, and September 1979) or in small groups (September 1973; August 1974; June and September 1976; June and September 1977; May, June, September, and October 1979). Large groups of belugas were encountered three times: in 1978, about 100 specimens were seen in the eastern part of the Laptev Sea (June), and about 150 individuals were within 210–220 km north-northeast of Wrangell Island (September); in October 1979, about 50 belugas were recorded within 90–100 km of Cape Billings.

Individual belugas were met far from the coast in the open sea, as well as in the ice. The farthest entrance into the high latitudes was at approximately 75°N. Encounters of belugas in the summer–autumn period far beyond dry land confirm the conclusion of S. E. Kleinenberg et al. (1964) that the animal is not strictly connected to the shore.

The large whales observed from the aircraft were not identified specifically, but those inhabiting the region under investigation are gray and bowhead whales. The majority of the observations apply, apparently, to the gray whale.

As can be seen in Figs. 1–9, whales were found not only in the Chukchi and Bering Seas but also in the East Siberian Sea. They were not found farther west than Cape Billings.

In 32 cases of observation of whales, only three of them were located farther than 100 km from shore (Table 2), and in those cases also, they had departed from the limits of the continental shelf. Such a picture was observed in the beginning of the 1930's (Tomilin, 1937)

Except in 1979, large groups of whales were not recorded, although they were not so very rare here in the 1930's (Zenkovich, 1936; Tomilin, 1937) On the other hand, groups of 10–30 animals were encountered comparatively often in the course of the ice reconnaissances.

POLAR BEAR

From Table 3, one can see that the number of polar bears observed per month varies each year. We think that this, in some measure, has been the result of seasonal changes in ice conditions. Some increases in numbers of bears observed in May–June, apparently, also is due to multiplication, for the females with young leave their dens at this time and go out onto the ice. In the spring months, some of the bears move out of the area of observation into the central part of the Arctic Basin. In autumn, with drifting of the ice, they even appear in the East Siberian and Chukchi Seas, where one can judge

indirectly from their numbers in September that there has been an increase (see Table 3). Considering the increase in number of animals encountered in 1971–1973 and the comparative stabilization of this showing in recent years (the data from June-September are compared), it is completely possible that these data reflect the dynamics of numbers in the 1970's.

An important role in the quantitative distribution of polar bears in the investigated region is played by Wrangell and Herald Islands, which are known as the largest breeding grounds of the species in the Arctic. These islands are located within the continental shelf zone, which is distinguished by extremely favorable conditions for marine animal life, as can be judged, in particular, from the high numbers of pinnipeds in this region. The abundance of food is conducive to concentration of polar bears in the given region.

In summer, when ice remains by the shore of Wrangell Island, polar bears are not infrequently in the coastal zone, as well as on the island. They often are found on the western and eastern coasts, where ringed seals are particularly abundant. According to the data of L. B. Lutsiuka (1978), the number of polar bears on the eastern coast of the island in 1975–1976 was correlated with ice conditions. In the end of the summer of 1975, ice was constantly present in the vicinity of Cape Waring; on the contrary, in 1976 ice was absent in that area at that time. Naturally, polar bears were seen more often on dry land and on the ice near the coast in September 1975 than in September 1976.

Polar bears can be found on the coasts of the islands and inland most of all in spring and autumn. This is connected with the facts that, first, in those seasons, the animals are in migration, part of which takes place on the coasts of the islands; second, , the pregnant females approach the coasts of the islands in autumn, and in spring they abandon their dens there with their cubs of the current year.

Polar bears as a whole lead a solitary life. An exception to that is the family group, which lasts for 1.5 to 2.5 years. At the same time, cases of congregations of polar bears are well known, sometimes involving several tens of individuals, in places where there is plenty to eat: i.e., by a beached carcass of a whale, on a walrus haulout after it has been abandoned by the walruses, in a place where marine mammals were butchered, on refuse dumps, etc. We note that the association of bears in groups is very temporary. As a rule, the groups exist only as long as there is a possibility to eat or hunt in a given place (Belikov and Kuprianov, 1977).

Congregations can continue to exist even after the cause has vanished, and they are forced to congregate. One such case was reported to us by A. N. Shadrin, who was conducting observations of ice conditions in the vicinity of Wrangell Island in 1977. In the beginning of September, he recorded 11 bears on Herald Island, among which were also some young animals. The ice at that time was 300 to 400 km from the island. Why the bears had not gone out onto the ice when it began to move away from the shore of the island is not understood. Possibly they remained on dry land because of the presence of food (for example, carcasses of dead walruses). Walruses are known sometimes to form

small onshore herds on this island (Nikulin 1940). Another possibility is that the bears were preparing to den up. In the fall of 1977 on Wrangell Island, they could not do this because of the absence of snow up to the beginning of October. In general, this can be inferred also at Herald Island, which is located only 60 km east of Wrangell Island.

The temporary, local congregation of bears mentioned above holds true only on dry land. In the ice of the eastern region of the Arctic in 1971–1979 groups larger than six bears were not observed at any time during the ice reconnaissances. Judging from the data shown in Table 4, in 65.5% of the cases (125 out of 191 occurrences) the bears were encountered singly, in 19.8% as two, in 11% as three, in 2.1% as four, and in 1.6% as five or six individuals. Among them, apparently, a considerable quantity consisted of family groups.

As noted above, the data show that regular observations concerning the occurrence of marine mammals and polar bears in the Arctic, even when not specifically conducted for that purpose, are capable of giving interesting material concerning the biology and distribution of these animals.

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