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SOVIET OCEAN ACTIVITIES: A PRELIMINARY SURVEY

PREPARED AT THE REQUEST OF

Hon. WARREN G. MAGNUSON, *Chairman*

COMMITTEE ON COMMERCE

AND

HON. ERNEST F. HOLLINGS, *Chairman*

NATIONAL OCEAN POLICY STUDY

FOR THE USE OF THE

COMMITTEE ON COMMERCE

AND

THE NATIONAL OCEAN STUDY POLICY

PURSUANT TO

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LETTER OF TRANSMITTAL

DEAR COLLEAGUE: The following survey, prepared by the Congressional Research Service at the request of the National Ocean Policy Study, presents a comprehensive overview of the ocean related activities of the Soviet Union.

Within the last two decades, the Soviet Union has emerged as a major maritime nation, capable of utilizing the oceans and its resources to serve Soviet domestic and international economic and military interests. Such rapid advancements have challenged U.S. ocean interests and have been due in large measure to the high priority placed upon marine policy within the U.S.S.R. and the centralized administration of ocean affairs existing within the Soviet Union. In comparison, U.S. marine affairs policy has often been disjointed, redundant, and misdirected. This study highlights the high priority need for the U.S. to formulate and implement a comprehensive and effective national and international marine affairs policy.

We wish to emphasize that the findings and recommendations incorporated in this report have neither been approved, disapproved, nor considered by the Senate Committee on Commerce or the National Ocean Policy Study. Rather, this report, prepared at our request for the information and use of the National Ocean Policy Study, is the work product of the Congressional Research Service.

WARREN G. MAGNUSON,
Chairman,
Committee on Commerce.

ERNEST F. HOLLINGS,
Chairman,
National Ocean Policy Study.

LETTER OF SUBMITTAL

THE LIBRARY OF CONGRESS,
CONGRESSIONAL RESEARCH SERVICE,
Washington, D.C., March 3, 1975.

Hon. ERNEST F. HOLLINGS,
Chairman, National Ocean Policy Study, Committee on Commerce, U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: In response to your request, we are submitting a preliminary survey of Soviet ocean activities.

The report includes most of the important salient aspects of Soviet ocean activities such as: fisheries, transportation, oceanography, deep-sea mining, underwater activities, oil and gas developments on the outer continental shelf, and Soviet response to marine pollution problems. The report concludes with a chapter on the implications of Soviet ocean policy on U.S. policy.

The work was done by Herman T. Franssen, James E. Mielke, Joseph P. Riva, Jr., and Christopher H. Dodge, of the Science Policy Research Division under the direction of George A. Doumani and by Harvey Sherman of the Environmental Research Division, and John P. Hardt of the Senior Specialists Division. John P. Hardt and Herman T. Franssen coordinated and edited the contributions.

We hope that this survey will serve your committee's needs as well as those of other committees and Members of Congress interested in ocean affairs.

Sincerely,

LESTER S. JAYSON.

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I. FINDINGS

1. Soviet maritime policy became global under Nikita Khrushchev and under current leadership promises to stay in the world arena and challenge U.S. preeminence.

2. Unlike fragmented U.S. maritime policy, Soviet policy unifies the many facets of ocean activities. The central unifying forces are the Soviet navy and the Communist Party of the Soviet Union.

3. By expanding all facets of its maritime capability, the Soviet Union may attain the position of overriding dominance of the oceans occupied until recently by the United States and earlier by Great Britain.

4. Now is the time for an assessment by American policy makers of the implications of future Soviet maritime dominance. If dominance in one or more facets of maritime affairs is viewed as unacceptable to U.S. interests, then, appropriate corrective or counter actions may be in order at this time.

5. While Naval developments are not discussed in any detail, the Soviet Navy is expanding very rapidly, and its naval strategy has shifted from a basically defensive posture towards inclusion of an offensive capability, appropriate for making global political impact and challenging the United States presence in many areas not contiguous to the Soviet Union.

6. Within a period of two decades, the Soviet Union has emerged from a primarily coastal fishing nation to one of the most modern—if not the most modern—of fishing nations in the world and is likely to become the dominant fishing nation of the world in the near future. In contrast, with the exception of its distant-water tuna and shrimp fisheries, the development of U.S. fisheries has been largely stagnant.

7. The Soviet merchant marine moved from the 23rd to the 6th place on the list of the major merchant fleets of the world. In contrast, the United States moved from the first to the eighth place over the same 1946 to 1974 period. Congressional and Executive action in 1970 was instrumental in stopping further decline.

8. The Soviet Union emerged from an inferior position in oceanography in the period following World War II to one of overall capabilities comparable with the United States today.

9. The Soviet Union is active in developing placer deposits of minerals on its continental shelf but is not known to have the capability to mine manganese nodules from the deep-seabed. In contrast, the United States mines only sand, gravel and shells from its continental shelf but has the technological capability to mine manganese nodules from the deep-seabed.

10. The Soviet Union has one of the most extensive continental shelves of the world. Although the country produces only about a fifth of the U.S. offshore oil production, about 70 percent of the Soviet continental shelf offers good oil and gas prospects.

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11. The Soviet Union is behind the United States in offshore drilling and production technology but is attempting to overcome this problem by importing capital-embodied technology in the form of drilling rigs and equipment from Western countries.

12. The Soviet Union is concerned about oil pollution, but Soviet authorities believe the offshore drilling is now so environmentally safe that "literally not even one drop of pollution-causing liquid falls into the sea."

13. The Soviet position on the Law of the Sea is consistent with that of a major ocean power with diversified interests in the seven seas. In contrast, some experts believe that during the negotiations on the Third Law of the Sea Conference, the executive branch of the U.S. Government did not at all times follow a policy consistent with the national interest of the United States as a major maritime power.

14. The Soviet Union presently lags behind the U.S. in manned and unmanned undersea research capabilities and technology both qualitatively and quantitatively.

15. The Soviet Union supports the largest fisheries-oriented marine biology and aquaculture programs in the world. The counterpart U.S. program, on the other hand, is small by comparison, although qualitatively equivalent to the Soviet program.

II. SOVIET POLICY FOR THE SEVEN SEAS

TOWARD A GLOBAL POLICY OF THE SEAS

Traditionally, Soviet Russia has been an insular nation—introspective in its world view, coastal and river-oriented in its marine policy. This policy began to change under the leadership of Nikita Khrushchev and, under his successor, Leonid Brezhnev, has approached the global dimensions of current U.S. and earlier British policy in scope.

In the Tsarist period, economic, military, scientific and political interests in the seas were limited to Eurasia. Russia did not have a notable maritime or naval tradition. Access to warm water ports—what Peter the Great referred to as holes in the ice—continued to be the limits of Russian external policy of expansion. Russian "Manifest Destiny" was primarily directed to the extensive land mass from the Baltic and Black Seas in the West to the Pacific Ocean and the Sea of Japan in the East. Indeed, their limited maritime ventures to maintain their coastal Eurasian positions were far from successful. The Tsarist naval and military activities in the Crimean War were not only a military failure but provided an occasion for reassessing the institution of serfdom as a justification for defeat. Later the Russian navy intruded into the Russo-Japanese War via a well publicized trip from Europe to Asia and met an inglorious defeat by Japan in the Tsushima Straits. The modest commercial and fishing activities were either coastal or used foreign bottoms.

The policy of continental land orientation was reinforced by a recurrent political strain of isolation and withdrawal. Periodically, "westernizers" pulled Russia out of its land-locked shell, but these brief interludes were overshadowed by returns of the xenophobic influence of the "slavophiles"—Russian isolationists.

The Soviet Revolution under Lenin and Trotsky looked toward an international arena for spreading Communism. However, confronted by a predominantly hostile and nonrevolutionary Western world, their successor Stalin returned to the Russian isolationist tradition with a policy he called "socialism in one country."

Thus, the current global policy of the last several decades is a new phenomenon in the long history of Russia under Tsars and Communist leaders. Yet it does not appear to be a temporary policy. Soviet plans for a global maritime policy appear to be accelerating in scope and scale. At the Twenty-Fourth Party Congress in 1971, a program for developing the world's oceans was launched in the context of the current Ninth Five-Year Plan (1971–1975). The forthcoming Twenty-Fifth Party Congress may be expected to use the upcoming Tenth

Five-Year Plan (1976–1980) and the new Fifteen-Year Plan (1976–1990) as vehicles for expanding their efforts in developing the world's oceans.[1]

The current global role of Soviet maritime power may have an historical parallel with that of Victorian England in the wake of the Napoleonic Wars. The English global role represented a conscious projection of merchant and naval power in order to extend its imperial power over far-flung geographic regions. The parallel with the global role of the United States after World War II seems less apt as that appeared to be an American preeminence based on the filling of a power vacuum through many areas required by a national desire to ensure stability and foster development. The parallel with England's imperial period suggests a more persistent, conscious extension of Soviet maritime power directed toward attaining political and economic goals than would be the case if the American parallel were chosen.

The parallel with English maritime patterns suggest a Great Power rather than a revolutionary thrust to the Soviet global role. If, by seeking control or dominance of the various regions of the world, the Soviet Union acts like a Great Power, then they may be willing to compromise, negotiate, and settle for "spheres of influence." This Great Power flexibility and pragmatism might be easier to deal with than the inflexible, ideological thrust of a revolutionary, Communist, global power.

UNITARY NATURE OF SOVIET POLICY OF THE SEAS

The various facets of ocean policy have been integrated in Soviet development. Soviet leaders have considered the legal, political, military, scientific and economic aspects of the ocean as facets of a single coherent program. It does not appear to be by chance that growth in all of these interrelated areas proceeded concurrently. It is as if the high level political decision to be a global power was orchestrated with the subordinate policies for extending simultaneously the Soviet maritime, naval, scientific, and political arms of the Soviet Union beyond its continental borders.

The unification of ocean's policy comes naturally for a centrally controlled system such as that guided by the Soviet Communist Party. The close political ties among the various organizational elements of the Soviet system facilitate coordinated policy. The dominant institutional thread is the Soviet navy, which has strong influence over maritime industries. The administration of the Soviet merchant marine, fishing fleet and oceanographic vessels are very closely allied with the naval command in the Soviet Union and may be readily and directly militarized or mobilized under naval direction.[2] World War II-type militarization may still be an option for the leadership through this interlocked administration.

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[1] Academician P. Bunin, *Ekonomika osvoeniya resursov mirovoga okeana* (Economics of Developing the Resources of the World's Oceans), *Voprosy ekonomiki*, No. 11, 1974, pp. 55–67.

[2] J. T. Reitz, "Soviet Defense-Associated Activities Outside the Ministry of Defense," *Economic Performance and the Military Burden in the Soviet Union*, Joint Economic Committee, GPO, Sept. 1970, pp. 144–148.

The Soviet leadership's plan for development of world's ocean resources is both integrated with their central economic plans and interconnected with Soviet global policy as illustrated by the following:

The sea's economy today is determined by the fishing industry and maritime transport. The situation will change somewhat as we approach the year 2000. The fishing industry will continue to occupy the leading place in the maritime economy. According to our rough estimates, second place will be taken by the petroleum and gas industry, while maritime transport will move from second to third place. Other branches of the U.S.S.R.'s maritime economy will rise and be developed.[3]

MERCHANT MARINE

Although the Soviet merchant fleet began its expansion in 1956, the Seven-Year Plan (1959–1965) was a major take-off point for Soviet merchant marine expansion. From that date, the Soviet merchant marine grew faster in volume than the economy as a whole.[4] Prior to World War II, the Soviet Union was 23rd in world shipping (by tonnage); now it is 5th or 6th (depending on the measures used) and may rise higher; some speculate to first place by 1980.[5] The initial rationale for expansion was to provide Soviet bottoms to carry military and economic aid, Soviet commercial trade, and passengers throughout the world. The Soviet Union's global role apparently dictated the need for control of their aid and commerce in their own fleet. Another important consideration was the rising Soviet balance-of-payments deficits to hard currency nations, which were exacerbated by the cost of using foreign transport requiring hard currency payment.

Although large and growing, the Soviet merchant marine is not as diversified as they would like. Only recently have they entered the large-scale, ocean going, tanker business. Moreover, if the Suez Canal were reopened, their large fleet of small and medium tankers might now project the Soviet Union into the center of the world's tanker field.

While the rapid development of the Soviet merchant marine has been spurred by the broad need to carry military and economic aid to countries throughout Asia, Africa, and Latin America, the supply routes to Cuba and North Vietnam were responsible for a major share of the increase in the tonnage requirements for this purpose.

Marine transport has also been expanded in Eurasia. Opening of the "Northern Sea Route"—the formerly unnavigable Soviet Arctic routes—provides new opportunities for the Soviet merchant marine to expand its maritime activities in commerce between Western Europe and the Far East. Likewise, the "container bridge" stretching from the new Japanese-built Port Wrangel in the Far East to Leningrad in the West adds an overland alternative to very long sea routes around the Cape of Good Hope to Europe for Japanese and West European trade.

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[3] S. Mikhailov, review article in *Voprosy ekonomiki*, No. 7, 1972 of *Mirovoi okean i chelovechestvo* (The World's Oceans and Mankind). Moscow: "Ekonomika" Publishing House. 1969.

[4] Nicholas Shadrin, "The Soviet Merchant Marine, A Late Developing Economic Growth Sector", *Soviet Economic Prospects for the Seventies*, Joint Economic Committee, GPO, June 1973,, p.p. 719–765. J.L. Moulton (ed.) *Brassey's Annual: The Armed Forces Yearbook, 1973*, New York, Praeger, 1973, p. 136.

[5] Reitz, *op. cit.*, p. 145.

Shipbuilding in Soviet and East European ports has been greatly expanded to support this maritime development. The Soviet concern over Polish riots in Baltic ports in December 1970 was heightened by the fact that they were building ships for the Soviet fleet, along with several other East European nations. Although some Soviet ships are still purchased abroad, they have also become a supplier of ships to other nations.

FISHERIES

Fish as a source of protein in the diet is an important part of the Soviet leadership's announced goal of raising the per capita consumption of protein. Massive imports of U.S. feed grain in recent years illustrate the seriousness of their animal husbandry program. The expanding fishing operations with large-scale equipment, such as the floating fish factories, correlates with this program. Serious discussions with the Japanese on rights to fishing waters and conservation measures highlight the importance of this industry. Perhaps in recognition of the limits of the ocean's supply of fish to meet their protein needs, Soviet nutritional plans have highlighted the need to animal husbandry (cattle, swine, and poultry). Still the current Ninth Five-Year Plan calls for an increase in per capita output of meat and meat products by 23 percent and fish and fish products by 43 percent.[6] If successful, the improved availability of protein products projected for 1975 per capita would only place the Soviet citizen at a rough par with his East European counterpart and about one-third the American level.[7]

RESOURCES OF THE SEABED

Offshore development of energy and metal resources is to expand sharply in the next ten to twenty years. Offshore development of oil and gas is now underway near Sakhalin Island in the Pacific. Industrial cooperation in this area among the Soviet Union and Western companies is likely; foreign capital and technology will be paid for with oil and gas. Petroleum products have in the past been the major hard currency earner for the Soviet Union. With natural gas—from their continental shelf and elsewhere—the Soviet Union will attempt to reduce their chronic balance-of-payments deficit.

A wide range of metals are thought to be located in the coastal areas.[8] These may likewise enter foreign commerce if economically available.

The Soviet Union has become a leader in physical oceanography. This application of Soviet science may correlate with naval interests in possible submarine operations. The oceanographic efforts coordinated by the Soviet Academy of Sciences also benefit their merchant marine and fishery industries.

NAVAL EXPANSION

Admiral Gorshkov, in the special series of articles published in 1972 and 1973, in their authoritative naval journal *Morskoy sbornik* argued for a larger and more diversified Soviet fleet. According to his central

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[6] N. K. Baibakov, *Gosudarstvennyi pyatiletnyi plan razvitiia narodnogo khoziaistva SSSR na 1971–1975 gody.* (State Five-Year Plan for Development of the U.S.S.R. National Economy for the Period 1971–1975). Moscow, Gosplan, April 1972), p. 300.

[7] Peter Petersen, "U.S.-Soviet Commercial Relations in a New Era," Washington, U.S. Department of Commerce, August 1972, p. 2.

[8] Mikhailov, *op. cit.*, p. 108.

concepts, this fleet would have the capability not only for defensive roles around the periphery of the Soviet Union, but also for an offensive capability appropriate for making a global political impact and challenging the United States presence in many areas not contiguous to the Soviet Union. The surface naval combat and support ships required by this new Soviet naval strategy imply a significant additional naval demand on scarce resources in the Ninth Five-Year Plan (1971–1975) and the years ahead. At a time when poor economic performance and rising civilian demands for resources to modernize their economy and better serve consumption needs have been acknowledged by General Secretary Leonid Brezhnev and his colleagues in the leadership, a new, substantial set of military claims on resources would seem especially unwelcome and untimely. At the same time, the appearance of the Gorshkov series after the Twenty-Fourth Party Congress and the formulation of the Ninth Five-Year Plan (1971–1975) strongly suggests that the issue was not settled at that time and even though Mr. Brezhnev and possibly Defense Minister Grechko may oppose the adoption of the full dimensions of the new naval strategy of Admiral Gorshkov, it does have support among top leaders. Although the precise resource claims of the new naval demand are not explicitly or publicly discussed by Admiral Gorshkov in the *Morskoy sbornik* series or elsewhere to our knowledge, we may assume that the integrated Soviet ocean's policy includes a major expansion of their navy.[9]

INTERNATIONAL RELATIONS AND LAW

The heightened interest of the Soviet leadership in a global oceans program has influenced their foreign policy, their position in international organizations, and their view of the law of the sea. In recent bilateral and multilateral forums, the Soviet position on many ocean issues have become more evident.

Negotiations between Norway and the Soviet Union on the status of Spitzbergen and the surrounding continental shelf provide an interesting case study of Soviet ocean policy. The full panoply of Soviet ocean interests and policies will be influenced by the outcome of these bilateral talks. In particular, the Soviets want to protect their claims to the potentially rich mineral resources of the Barents Sea and to keep foreign powers away from their major naval and maritime fleets at Murmansk. Soviet conduct in the negotiations may foreshadow new dimensions in their strategy in pursuing their interests in the world's oceans.

Soviet representatives have also played an active role in the United Nations Conference on the Law of the Sea. In this forum they appear to be faced with a dilemma on whether to support or oppose the position of small coastal states which want to increase their territorial and economic control over contiguous ocean waters. On the one hand, the Soviets are inclined to support the claims of small countries in order to gain influence in the world political arena, however, Soviet economic interests dictate a more traditional, open-seas approach to international law.

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[9] M. Mac Gwire, *Soviet Naval Policy: Continuity and Change.* New York, Praeger, February–March 1974. J. Hardt, "National Economic Priorities and Naval Demand," in M. Mac Gwire (ed.) *Soviet Naval Policy: Objectives and Constraints,* New York: Praeger, 1975.

The position which the Soviet leadership takes in these forums will be influential in efforts to reach international agreements on the law of the sea. Moreover, Soviet interaction with other great maritime powers, including the United States, on issues of ocean policy is likely to have a profound impact on the future direction of East-West relations.

In negotiating on the law of the sea, the Soviet Union has distinct advantages over the U.S., owing to their global, unitary, coordinated ocean's policy. In specific areas such as merchant marine, fisheries, and oceanography, as well as their dominant, dynamic naval program—the Soviet Union each year comes closer to sectoral as well as a comprehensive overtaking and surpassing of United States efforts. Just as the United States replaced the United Kingdom as the dominant world maritime power, the day is fast approaching when the Soviet Union may take over this dominant position.

III. SOVIET FISHING INDUSTRY

Over a period of about 50 years, the Soviet Union has converted its labor-intensive fishing fleet (about 200,000 fishermen before the revolution) consisting of some 100,000 boats sailing its inland waters (only 90 had engines, with a combined hp of 1,800) to a modern capital-intensive fleet of over 5,000 high-seas fishing vessels. The number of fishermen has been estimated at approximately 200,000 to 250,000, which is about the same number as in 1913. However, the 1913 harvest was slightly over one million metric tons, whereas the 1974 catch surpassed 9.6 million metric tons. Total employed in the fishing industry is approximately 750,000.

Although a feeble effort to modernize the fleet began during the 1930's, the main thrust came after the Second World War, in particular, in the late 1950's and thereafter. In 1940, the modern sector of the fishing fleet consisted of 63 trawlers with main engines of 600–700 hp, three whalers of 900 hp, and 182 seiners with engines ranging from 40 to 130 hp. By 1972, the Soviets had developed a fleet of 3,247 fishing vessels and 494 factory ships of more than 100 GRT. Within these totals, factories and transports larger than 10,000 tons had increased to 100 and catchers larger than 2,000 tons to 574. While there are no accurate data available on the entire world fishing fleet, it has been estimated that the Soviet fleet is about 25 percent of the world's fishing fleet (vessels of more than 100 GRT) in terms of number of ships, and about 50 percent of the world's fishing fleet measured in gross register tons.

Capital outlays for fleet and onshore facilities have indeed been impressive during the postwar years. While the average yearly investment was 43.6 million rubles in 1946–1950, it was 269.2 million rubles in 1961–1965 and it had climbed to 410 million rubles in 1966–1968.

The growth of the fishing fleet was reflected in the Soviet catch figures, which, after a short period of postwar adjustment, grew from 1.5 million tons in 1947 to approximately 9.2 million metric tons in 1972 (see table 1).

The rapid increase is in part related to the decree of the Central Committee of the Communist Party and the U.S.S.R. Council of Ministers "On measures to increase the catch of fish and the output of fishery products", adopted in 1962. It was planned to raise the catch of fish, marine animals, and other marine products to 5.5 million tons by 1965. The target was overfilled in 1965 when the total catch from inland waters and open seas surpassed 5.7 million tons.

STAGES OF DEVELOPMENT

During the early stages of development the Soviet fishing industry continued to concentrate on inland freshwater fisheries and on marine

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fisheries of the Caspian and Black Seas (including the Sea of Azov). Until just after the Second World War, high seas fisheries were less than half of the Soviet catch, but by 1968 high seas fisheries accounted for 85.2 percent of the total harvest.

One of the main reasons behind the lower productivity of semi-enclosed and enclosed seas is the decrease of river run-off (caused by river-dam construction) and the subsequent increase in salinity of the Caspian Sea which affected the hatchery and nursery grounds of the Volga delta and had a ruinous effect on reproduction.

TABLE 1.—SOVIET CATCH DATA

Year	Catch in internal and open water bodies (thousands of tons)	Internal water bodies		Open water bodies	
		Thousands of tons	Percent	Thousands of tons	Percent
1913	1,051.0	869.0	82.7	182.0	17.3
1917	892.8	799.7	89.6	92.1	10.4
1928	840.2	618.7	73.6	221.5	26.4
1940	1,308.7	744.1	56.9	564.6	43.1
1946	1,103.7	555.7	50.3	548.0	49.7
1950	1,654.5	709.1	42.9	945.4	57.1
1955	2,673.9	810.7	30.3	1,863.2	69.7
1960	3,510.9	775.2	22.1	2,735.7	77.9
1965	5,725.3	944.1	16.5	4,781.1	83.5
1968	6,748.3	996.3	14.8	5,752.0	85.2
1972	7,757.0	NA	NA	NA	NA
1973	9,200.0	NA	NA	NA	NA

Source: N. P. Sysoev, Economics of the Soviet fishing industry, Moscow, 1970, p. 192. Figures for 1972 and 1973 from the National Marine Fisheries Service, NOAA.

The first stage of Soviet marine fisheries (up to the second half of the 1950's) was linked with the development of fisheries in the regions of the Northern Arctic and Pacific Oceans. Among these regions were the Barents Sea, the northern part of the Sea of Japan, the Sea of Okhotsk and the coastal regions of the western part of the Bering Sea. The development of the herring fishery in the Northeast Atlantic (from 1948) was also related to this stage.

The second stage (1956–1965) was marked by the development of new and more distant-water regions. Among them were the Northwest Atlantic, the Equatorial and South Atlantic, the North Sea, the eastern part of the Bering Sea and the Northeast regions of the Pacific. In order to increase the harvest, the Soviet fleet had to move further from its shores. In 1959 the fleet had to sail an average of 1,655 miles to catch a ton of fish in open water bodies, whereas in 1966 it had to cover 2,881 miles to catch the same amount. Soviet fishing vessels had to penetrate distant regions of the world oceans because there was a sharp decrease in the resources of the fish species on which fisheries were based in the adjacent regions of the Barents Sea, the Sea of Japan and the Sea of Okhotsk (cod, haddock, ocean perch, salmon).

The northern Atlantic and northern Pacific are the most important fishing areas for the Soviet fleet. Out of a total catch of 6,748.3 million metric tons in 1968, just over four million metric tons were harvested in northern temperate waters (see table 2.). In the past 20 years, Soviet fishery activities in the Atlantic were concentrated mainly in the northeastern part (Barents, North, Norwegian and Baltic seas and the region around Iceland and the Faroe Islands). However, since the early 1960's the U.S.S.R. has also begun fishing in the English Channel

and near the eastern coast of Greenland, Canada, and the United States (New England). It now harvests more than one-third of the total allowable catch off the New England coast.

FLEET STRUCTURE

The fishing industry of the Soviet Union includes not only fish production and fish processing but a number of specialized, associated activities such as shipbuilding and ship-repairing yards, net and gear factories and harbor facilities. The industry is directed by the Ministry of Fisheries of the U.S.S.R. which includes five main administrative units: Riga, Murmansk, Vladivostok, Sevastopol and Astrakhan. The operations administered by these centers presently account for some 90 percent of the country's total catch and processing of food fish.

The Soviet fishing fleet mainly comprises large vessels of varicus specialized types, for example, deep sea trawlers of the BMRT class, which are being replaced by new super-trawlers of increased productivity and carrying capacity, purse seine vessels and factory/mothership of the "Vostok" class which not only carry catch, but also process fish on board.

TABLE 2.—SOVIET HARVEST: REGIONAL DISTRIBUTION

Fishing region	1950		1955		1960		1965		1968	
	Thousand tons	Percent	Thousand tons	Percent	Thousand tons	Percent	Thousand tons	Percent	Thousand tons	Percent
Atlantic Ocean:										
Northeast	402.3	24.3	1,075.1	40.2	1,128.4	32.1	1,048.0	18.3	1,416.1	21.0
Northwest					285.1	8.1	886.5	15.5	801.4	11.9
West-central							17.4	.3	6.8	.1
East-central					44.0	1.3	82.4	1.4	318.6	4.7
Southeast							360.7	6.3	484.5	7.1
Southwest									189.8	2.8
Northern part of the Pacific Ocean	483.8	29.2	639.9	23.9	855.5	24.4	1,589.3	27.8	1,789.3	26.5
Indian Ocean							36.1	.6	10.3	.2
Caspian Sea	319.1	19.3	447.0	16.8	366.9	10.5	359.9	6.4	379.8	5.6
Sea of Azov and Black Sea	234.3	14.2	170.5	6.4	152.6	4.3	251.8	4.4	284.8	4.2
Other water bodies	214.9	13.0	341.4	12.7	678.4	19.3	1,093.2	19.1	1,066.9	15.9
Total for the U.S.S.R.	1,654.4	100.0	2,673.9	100.0	3,510.9	100.0	5,725.2	100.0	6,748.3	100.0

Source: N. P. Sysoev, op. cit., p. 193.

TABLE 3.—SOVIET HARVEST BY SPECIES

Species composition of fishing objects	1940		1950		1960		1965		1968	
	Thousands of tons	Percent	Thousands of tons	Percent	Thousands of tons	Percent	Thousands of tons	Percent	Thousands of tons	Percent
Freshwater fishes	424.35	32.4	439.13	26.5	369.73	10.6	429.83	7.5	390.16	5.8
of which carp	187.01	14.3	241.97	14.6	186.55	5.3	160.60	2.8	170.00	2.5
Sturgeon	14.12	1.1	16.88	1.0	12.29	.4	16.83	.3	18.11	.3
Salmon, white fish, smelt	145.32	11.1	139.97	8.5	119.74	3.4	153.19	2.7	111.67	1.7
Cod	197.00	15.1	277.84	16.8	662.58	18.9	1,380.81	24.1	2,297.18	34.0
Herring and anchovy	411.16	31.4	465.80	28.2	1,083.51	30.9	1,694.16	29.6	1,707.50	25.3
Ocean perch and gilthead	8.54	.7	21.86	1.3	183.89	5.2	553.75	9.6	237.13	3.5
Flounder	7.13	.5	39.79	2.4	241.76	6.9	158.74	2.8	270.52	4.0
Horsemackerel and mullet	3.85	.3	6.61	.4	25.12	.7	165.48	2.9	206.64	3.1
Tuna and mackerel			12.24	.7	6.02	.2	34.20	.6	171.03	2.5
Other fishing objects	97.28	7.4	234.36	14.2	799.76	22.8	1,138.31	19.9	1,338.91	19.8
Total	1,308.76	100.0	1,654.48	100.0	3,504.40	100.0	5,725.30	100.0	6,748.85	100.0

TABLE 4.—REGIONAL CATCH DATA 1913–68

Year	Catch in all basins	Caspian	Azov-Black Sea	Far Eastern	Northeast Atlantic	Northwest Atlantic
1913	3,407.0	3,295.0	25	67.0	20.0	----------
1940	1,913.4	1,267.8	24.7	552.6	68.3	----------
1950	2,461.6	522.8	17.7	1,599.9	321.2	----------
1955	4,073.8	455.6	15.0	1,359.3	2,243.9	----------
1960	7,728.5	550.0	14.7	1,930.1	5,233.7	----------
1965	9,476.7	36.0	25.0	3,310.6	5,668.2	436.9
1968	8,894.0	6.0	9.0	4,455.0	2,966.0	1,458.0

Source: N.P. Sysoev, op. cit., p. 94.

ECONOMIC ROLE OF THE FISHING INDUSTRY

The main reason underlying Soviet development of a major fishing capability is the need for protein foods. The Soviet Union has had recurrent problems in the fields of agriculture and animal husbandry. Fish products help take up the slack and provide for approximately one-third of the animal protein found in the Soviet diet and about one-fifth of all protein consumption. The output of the fishing industry accounts for more than 7 percent of the gross output of the entire food industry in the U.S.S.R. The production of the fishing industry also plays a significant role in the foreign trade of the Soviet Union. Exports in 1970 exceeded 300,000 tons and were valued at 81.3 million rubles (mainly crab and salmon); imports amounted to 73,000 tons in 1970, valued at 14.9 million rubles (mainly frozen fish products).

DEVELOPMENT PROSPECTS

The prospects for a continuance of the expansion in the U.S.S.R. catch must, because of the far ranging activities of the Soviet fleets (about 50 percent caught off the coasts of foreign countries), be viewed in the context of worldwide resources of fish species and the dwindling number of areas with presently lightly exploited stocks. Most recent estimates of the potential yield of the oceans range from 80 to 110 million metric tons, of which (according to FAO experts) no more than about 80 percent should be harvested at any one time in order to take into account the effect on environmental changes in the oceans on fishery stocks. Total worldwide marine harvest has reached approximately 63 million metric tons. Even if fish harvests increase at a rate that is one-half of the average annual increase of 6.5 percent of the past 20 years (1950–1970), the maximum potential yield will be achieved within a decade.

The Soviet Union, however, has shown no intention to limit its expansion. Its fishing fleet continues to grow (estimated at 5,383,000 GRT in 1973 and 5,600,000 GRT in 1974) and the current five-year plan for fisheries aims at a fisheries catch exceeding 10 million tons a year (9.6 million tons harvested in 1974). On the basis of its past performance, the Soviet fishing industry will probably achieve this target by the end of 1975 as projected. Beyond 1975 expansion is likely to continue, but possibly at a much slower pace. Once the per capita consumption of fish has been raised from 14.3 kg (in 1968) to a standard yearly consumption of 18.2 kg set by the Institute of Nutrition of the Academy of Science of the U.S.S.R., the annual growth is

likely to decline. The emphasis in the future will be on diversification and on development of new fisheries such as Antarctic krill, which is available in great abundance. The need for diversification to meet consumer demand has been outlined by Soviet planners. In view of expected new consumer demands:

> It will be necessary to put on the market a wide range of food products, able to satisfy the requirements of even the most fastidious consumer. There will be a change in the pattern of ocean fishing as regards the species caught, and new sources will be used on a bigger scale to satisfy the demand for fishery products.[1]

The fleet will undergo further modernization. The Soviets intend to process their entire marine catch aboard factory ships in the future. Special attention will be given to the comprehensive mechanization and automation of production on board factory ships. The fleet will be equipped with automated highly productive refrigeration lines, the most up-to-date plants for the processing of the catch into fish fillet, canned fish, etc. The marine catch will therefore reach the ports mainly as finished products which can immediately be shipped to the regions of consumption.

The operations of the Soviet fleets are more than those of any other nation likely to be affected by the tendency to extend national jurisdiction over adjacent seas. Its total harvest off the coasts of foreign nations is larger than the entire U.S. coastal and distant-water catch. Hence, the Soviet Union is anxious to safeguard its fishing interests at the ongoing conference on the law of the sea.

THE SOVIET POSITION AT THE LOS CONFERENCE

Under existing international law, fishing on the high seas is open to all nations. The Soviet Union has a 12 mile territorial sea, and respects the rights of nations with narrower territorial limits to extend national jurisdiction over fisheries out to 12 miles from the coast. Moreover, the Soviet Union is a member of eight international regulatory fisheries bodies, and the American experience in the ICNAF region (off New England) is that the Soviets generally abide by the regulations of the international organization.

Since the Soviets catch approximately half of their total harvest (or about 6 percent of the world catch of marine fish) off the coasts of foreign countries, it is understandable that the Soviet Union has emerged at the law of the sea conference as one of the most ardent defenders of the Grotian concept of freedom of the seas. During the seabed debates, the Soviet Union has opposed the trend to adopt unilateral decisions regarding the limits of the territorial sea, because any extension of national jurisdiction by coastal states would reduce that part of the oceans which contains most of the living resources (close to 90 percent of the commercially important fisheries remain within 200 nautical miles from the coast).

Many of the claims to enlarged coastal State control have been made on the grounds that the developing coastal States deserve a special share of ocean resources because they are poor. The Soviet Union claims that the backwardness of the developing nations was caused by the former colonial powers and that the capitalist countries are responsible for giving the developing countries special preferences or income supplements. The Soviets argue that it would be unfair to

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[1] Sysoev, N.P. Op. cit.

restrict the activities of the socialist countries in the world oceans to make up for the previous foul play and exploitation of the colonial and imperialist powers.

In spite of the fact that the Soviet Union catches more fish off West Africa (one of the regions with the lowest per capita protein intake) than *all* 19 coastal states together, it has consistently accused the western world of depriving the poor nations of protein from the oceans. The Soviets maintain that 70 percent of the edible fish food products are consumed by the nations of Western Europe and the United States, and that 50 percent of the total catches by the developing countries are used for the manufacture of fishmeal, which is exported chiefly to the developed capitalist countries. However, the Soviets neglect to add that the advanced industrial countries of Europe and the United States primarily import highly valued species such as shrimp, enabling the developing nations to earn dearly needed foreign exchange with which they can purchase (among others) larger volumes of low-cost proteins. Foreign imports by the western nations contribute to the national economies of the developing countries, whereas foreign fishing without compensation does not provide poor nations with any benefits, and more often than not contributes to the overexploitation of coastal stocks. Moreover, about 25 percent of Peru's fishmeal is exported to socialist countries.

The Soviet Union has voiced its opposition to the proposal that coastal states be permitted to establish economic zones of up to 200 nautical miles into the ocean, arguing that ". . . If claims to exclusive rights over extensive off-shore regions of the high seas were admitted, a huge quantity of food resources would be lost . . .", and ". . . with a large proportion of the world's population starving, it was wrong to waste any of the available resources of fish." [2] While it is doubtful that the Soviet Union is making a major contribution to feeding the world's poor, it appears quite clear that an exclusive resource zone of 200 nautical miles could seriously impair Soviet access to stocks in foreign waters, or at least add to the cost of fishing.

The Soviet Union has, however, recognized the need to make some concessions on the fisheries question. Hence, it proposed in 1970 that in the area of the high seas directly adjacent to its territorial sea or fishery zone, a developing coastal state may annually reserve to itself such part of the allowable catch of fish as can be taken by vessels navigating under that state's flag. With the growth of the fishing fleet of the developing state, the above mentioned part of the allowable catch of fish reserved by that state may increase accordingly.[3] This means that under the early Soviet proposal, distant-water vessels would be allowed to continue to operate under present international regulations in the high seas area off the coasts of developed countries such as the United States (as indicated before, most Soviet fishing takes place in the North Atlantic and North Pacific off its own coast and off the coasts of other developed countries). The only exception to this proposal for preferential rights for developing countries only are the anadromous species (such as salmon). The Soviet draft articles on fisheries assure all coastal states a share of the anadromous species equal to the total spawning in the coastal state's

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[2] United Nations, General Assembly, doc. A/AC 138/SR 56, New York, 1971, p. 151.
[3] United Nations, General Assembly, doc. A/Cof. 62/C II/L.1, New York, 1974, p. 7.

waters and up to the capability of the coastal state to exploit that share.[4]

According to the 1970 Soviet proposal on fisheries, the maximum possible catch and the allocation of the remaining shares of that total catch would be determined by regional fishery organizations or, where such organizations do not exist, by agreement between coastal and fishing states.[5] Most coastal states do not like to leave fishing regulations to the international fishery bodies, which have proved to be notoriously weak, and unable to enforce their decisions. In many fishing areas there are just not enough data available to determine the optimum yield, and projections made by scientists from coastal and other fishing states frequently vary significantly. Distant-water vessels often do not provide accurate catch data, which adds to the problem of determining maximum sustainable yields and quotas. Moreover, most international regulatory fishery bodies contain no provisions for enforcement of the regulations, leaving this in fact to the flag state.

At the Caracas session of the conference in the summer of 1974, the Soviet Union made changes in its earlier position concerning the area beyond the territorial limits, the economic zone. In draft articles introduced on August 5, 1974, by six communist countries, including the U.S.S.R., the Soviets agreed on the establishment of an economic zone under certain specific conditions, and only if an acceptable agreement could be reached on the other basic questions of the law of the sea.

The new draft articles specifically recognize the right of coastal states to establish an economic zone of no more than 200 nautical miles, within which the state shall have the right of preserve, explore and produce living resources and minerals. The basic difference between the Caracas position and the earlier 1970 draft fisheries is related to the rights of developing countries. Under the new draft articles, all coastal states would have the right to determine the size of their annual catch by their own fishermen within their economic zone. If coastal states do not take 100 percent of the allowable annual harvest (to be determined scientifically and in cooperation with regional and international organizations) of any stocks of fish or other living marine resources in the economic zone, fishermen of other states would be granted licences to fish for the unutilized part of the total sustainable yield (article 15). Under article 15 (2) and (3), permission for foreign fisherman to fish in the economic zone of a developed coastal state would be granted on an equitable basis and in accordance with other specific conditions (under articles 16, 19, and 20), and foreign fishermen may be allowed to fish in the economic zone of a developing state by the grant of special licence and in accordance with other provisions (article 16, 17, 18, 19, 20). One of the most important provisions concerns the priority list of foreign vessels to be permitted to fish in the economic zone of coastal states. On top of that list are states which have borne considerable material and other costs of research, discovery, identification and exploitation of living resource stocks, or which have been fishing in the region involved (article 16(a)), e.g. the U.S.S.R. in many parts of the world.

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[4] United Nations, General Assembly, doc. A/AC.138/SC II/L6, New York, 1972.
[5] Ibid.

While these and other provisions are a step closer to a more flexible position on the economic zone concept, the Soviet draft articles may not go far enough in satisfying the demands of the developing nations. The new position does indicate a new and pragmatic approach towards the law of the sea. The Soviet Union is well aware of the almost universal demands by developing nations to control all resources within and beyond territorial sea out to 200 nautical miles. In anticipation of agreement on extensive zones of national jurisdiction over resources, the Soviet Union has already concluded a number of bilateral agreements with coastal states concerning fishing in their coastal waters.

In summary, if the Soviet proposals were accepted (which does not appear likely at this time), the bulk of that nation's distant-water fisheries (in the North Atlantic and North Pacific) would initially be only marginally affected. Distant-water fisheries off the costs of developing countries would gradually decline with the development of the indigenous fishing capacity of the developing coastal states.

U.S. AND SOVIET FISHERIES: A COMPARISON

In contrast to the rapid expansion of Soviet fisheries during the late nineteen fifties and the sixties, U.S. fisheries remained stagnant. The total harvest was 2,777,000 metric tons in 1963 and 2,793,000 metric tons in 1973. In terms of exvessel value of fishery landings, both the U.S.S.R. and the United States gained considerably. The value of Soviet landings has been estimated at $600 million in 1963 and $1,700 million in 1971.[6] During the same period, the value of American fisheries grew from $377.2 million in 1963 to $643.2 in 1971.[7]

The Soviet Union registered a favorable trade balance in fisheries of 66.4 rubles (1 ruble=$1.33 at the official exchange rate). In contrast, the United States balance of trade in fisheries showed a deficit of $919,926,000 in 1970 and $1,279,495 in 1973.[8] The Soviet fleet employed approximately 200,000 fishermen, and its fleet of 5,383,000 GRT (5,600,000 GRT in 1974) contained about 5,000 stern factory trawlers of 100 GRT or more. In contrast, 140,538 people were either full-time or part-time engaged in commercial fishing in the United States. The total size of the U.S. fishing fleet in 1971 was 586,253 GRT with 1,019 vessels of 100 GRT or more.

Per capita fish consumption is about three times higher in the Soviet Union than in the United States (U.S.: 5.7 kg in 1973; Soviet Union: 14.3 kg in 1968), but the United States is not dependent on fisheries to meet animal protein requirements in the daily diet.

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[6] Estimates by Fred Olson, Fisheries economist at the N.M.F.S. of N.O.A.A.
[7] N.M.F.S. Statistics.
[8] National Marine Fisheries Service, *Fisheries of the United States, 1973*, Washington, D.C., March 1974, pp. 42 and 49.

IV. SOVIET MERCHANT MARINE

". . . Russia has little maritime commerce, at least in her own bottoms: her merchant flag is rarely seen . . ."—Capt. A. T. Mahan, USN.

Until the middle of the nineteen fifties this statement by the revered dean of the American school of geopolitics remained generally true. However, the existing merchant marine of the Soviet Union until that time did meet the needs of the Soviet Union, which until the Khrushchev era was neither a major trading nation nor a global power with worldwide military and commercial interests. While still not among the world's five biggest merchant marines, the Soviet fleet is sufficiently large to carry more than half of the Soviet foreign trade cargo, to deliver military and economic aid to satisfy basic domestic needs in sea transport, and to earn foreign exchange to pay for the drain on hard-currency caused by charter of foreign vessels.

SOVIET DEVELOPMENTS

After the First World War and the following period of internal struggle, the Soviet Union possesed a merchant marine of only 600,000 tons. In the 50 years from 1922 until 1972, the Soviet merchant marine increased its tonnage 22 times to over 15 million DWT, and its freight turnover 180 times.[1] In spite of the severe setback during the Second World War when Russia lost nearly half of its merchant marine (in tonnage) or about 380 vessels, and many of its repair yards were destroyed, the Soviets now sail the seven seas, making thousands of port calls around the world and establishing an ever growing number of shipping lines which link the Soviet Union with many countries in Asia, Africa, Europe and the Americas. By 1972, the Soviet Union ranked seventh in terms of DWT, sixth in GWT and second in terms of the number of ships.[2] The target for merchant marine expansion during the current Five-Year Plan (1971–75) is five million DWT, which would bring the total tonnage up to over seventeen million DWT by the end of this year. The target is not likely to be achieved, primarily because of failures in achieving planned ship deliveries in 1971 and 1972.

The Soviets began a program of accelerated fleet development in 1956 with a large shipbuilding program, and during the decade of the nineteen sixties about 90 percent of the merchant marine was renewed. Cargo turnover between 1959 and 1965 increased by 360 percent, from 57.4 billion ton miles in 1958 to 209.9 billion ton miles in 1965, and total tonnage of the merchant marine grew from 2,848,000 GRT in 1958 to 7,150,000 GRT in 1965.[3]

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[1] A. Voronkov and Y. Klementyev. *The Soviet Merchant Marine*, Novosti Press Agency Publishing House, Moscow, 1974, p. 121.

[2] See table 5 Prior to World War II the Soviets ranked 23rd and in 1960 11th in terms of number of ships.

[3] Nicholas G. Shadrin. "The Soviet Merchant Marine, A Late Developing Economic Growth Sector", in *Soviet Economic Prospects for the Seventies*, United States Congress. Joint Economic Committee. 93d Congress (Washington, D.C., Government Printing Office, June 27, 1973), p. 723.

TABLE 5.—SOVIET FLEET EXPANSION [4]

Year	Inventory as of December 1972		Net increase in tonnage		Deliveries during year (million of deadweight tons)
	Number	Million of deadweight tons	Millions of deadweight tons	Percent	
1959	590	3.3	0.3	10	0.4
1960	650	3.9	.6	18	.6
1961	680	4.2	.3	8	.4
1962	740	4.8	.6	14	.7
1963	820	5.7	.9	19	.9
1964	900	6.9	1.2	21	1.3
1965	990	8.0	1.1	16	1.2
1966	1,070	8.9	.9	11	1.0
1967	1,150	9.7	.8	9	.8
1968	1,230	10.4	.7	7	.8
1969	1,320	11.2	.8	8	.8
1970	1,400	11.9	.7	6	.8
1971	1,470	12.4	.5	4	.5
1972	1,500	12.7	.3	2	.5
1973	1,550	13.5	.8	6	1.0

[4] In the 13 years between 1946 and 1959 (the beginning of a new 5-year plan), the Soviets succeeded in restoring its ports and repair faciliites and continued to expand its shipbuilding program in the U.S.S.R. and the Comecon nations.

The number of long-haul ships grew from 250 in 1958 to over 800 by 1965, moving the Soviet Union from the 12th place in the world ranking by number of ships in 1958, to the sixth place in 1965.

During the next Five Year Plan (1966–70), another 4.5 million tons (340 ships) were added to the fleet, and total cargo turnover increased about 70 percent to 354 billion ton-miles in 1970. At the end of the eighth Five Year Plan (1970), merchant marine minister Guzhenko stated that the Soviet merchant marine during 1966–70 "asserted the complete fulfillment of the cargo transportation requirement in coastal navigation, the independence of Soviet foreign trade from the capitalistic charter market, and assistance to fighting people of Vietnam, Egypt, and other countries".[5] The Ninth Five-Year Plan (1971–75) called for a further increase in Soviet merchant marine tonnage in excess of five million tons, for construction of new ports and modernization of existing port facilities. The plan emphasized greater specialization of newly built ships and called for a considerable increase in labor productivity. Among the specialized ships needed are: International Standards Organization containers, timber carriers, bulk carriers, packetized and palletized cargo, carriers, refrigerated carriers and tankers.[6]

SOVIET MERCHANT MARINE NEEDS

Prior to the middle nineteen fifties the development of the merhcant marine was dictated mainly by internal economic needs. At the time the emphasis was on self-sufficiency, and there was little trade between the Soviet Union and non-communist countries. With the advent of the Khrushchev era this policy of isolationism gradually changed, and foreign policy approached global dimensions under Khrushchev's successor, Leonid Breshnev. Rapidly expanding trade with western capitalist and developing nations, coupled with growing economic and military assistance to socialist and other friendly nations, resulted in growing demand for shipping. The Soviet Union had assumed obligations towards Arab countries, Indonesia and India, and had pledged

[5] Ibid. p. 723.
[6] For a complete list of Soviet merchant marine expansion from 1959 to 1973, see table 5.

sustained military and economic assistance to Cuba and North Vietnam.[7] Coupled with the traditional Soviet design "to free the country of the capitalistic shipping market" and to have greater flexibility, the new outward looking policy of the Soviet Union required major investments in ship construction.

However, for some time to come, Soviet dependence on foreign shipping grew with the expansion of foreign trade (see table 6).

TABLE 6.—SOVIET DEPENDENCE ON FOREIGN SHIPPING

Year	Seaboard trade (millions of tons)	Percentage carried on Soviet ships
1950	8.3	72
1958	26.6	55
1959	34.8	47
1962	66.9	37
1965	91.8	50
1970	121.3	56

Source: Mark W. Janis and Donald C. F. Daniel, the U.S.S.R.: Ocean Use and Ocean Law, L.S.I. Occasional Paper No. 21 (University of Rhode Island, May 1974), p. 4.

When the discrepancy between planned growth of the merchant fleet and the tonnage actually required became apparent at the beginning of the 1960's, the Soviets were forced to charter foreign ships which was very expensive and a severe drain on their badly needed foreign exchange. The ongoing Seven Year Plan was reviewed after the 22nd Party Congress in October 1961, and it was decided to accelerate the already rapid growth of the merchant marine. Soviet shipyards were unable to meet the demand, and the Soviet Union decided to step-up purchases abroad, in particular from other Comecon nations. About 40 percent was being built in the Soviet Union, 50 percent in other socialist countries such as Poland and East Germany, and approximately 10 percent in Western Europe and Japan.[8] The result of the Soviet effort became noticeable by the middle of the nineteen sixties. In 1962 the Soviet Union reversed the downward trend of self-sufficiency in shipping, and toward the end of the decade the total annual increase in Soviet merchant marine cargo carrying capacity exceeded the growth of sea shipments of foreign trade cargo (see table 3).

The Soviet merchant marine is now sufficiently large and diversified to carry more than half of the Soviet foreign trade cargo, to deliver military and economic aid, to satisfy basic domestic needs in sea transport, and to earn enough foreign currency to pay for the Soviet charter of foreign ships and even supplement the terms and determine shipping rates in the world shipping community. While occasionally able to provide competition to shipping countries in world commerce, it will for the foreseeable future be limited to the goal of providing for Soviet shipping needs.

However, the Russians plan to build a record number of tankers during the next five years and have already begun scheduling construction of new vessels as fast as shipyard capacity permits. As the Soviet Union is a net exporter of oil, many of the new tankers are intended to seek a larger share of the world's oil shipping business.

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[7] The American government had initiated measures against carrying cargo to Cuba, and Western oil companies organized a boycott against non-Soviet tankers carrying oil to Cuba.

[8] Nicholas G. Shadrin, *op. cit.*, p. 719.

The Soviet Union wants to provide friendly producing and consuming nations, such as Algeria and India, with enough tankers "to eliminate their dependence on capitalist shipping monopolies." [9] It has been suggested that the Soviets plan to make their tankers available to these countries on attractive charter terms, depressing the world tanker market even further. A larger tanker fleet will also enhance Russia's worldwide military posture, enabling them to supply friendly nations and support foreign actions.

TYPES OF SHIPS CONSTRUCTED

In the nineteen sixties, the Soviet Union began to use a standard design for ships and ship machinery (11 different types) which allowed them to build ships in large series and to improve training of crews, ship operations, and ship repair facilities.

Dry cargo, particularly general cargo, ships represent the largest number of vessels in the Soviet merchant marine. They were built in large series during the last decade and carry mainly bulk cargoes and heavy long cargoes. Soviet dry cargo ships were built in the USSR, Japan, Denmark, Yugoslavia, Finland, Poland, and East Germany. Tankers, which comprise about 40 percent of the Soviet fleet (by tonnage), were mostly built abroad in Japan, Yugoslavia, Italy, Poland and Finland. Approximately 85 percent of the Russian tankers were built during the decade of the Sixties. The Soviet Union only recently entered the era of the supertankers by ordering two tankers over 100,000 DWT in the United Kingdom and Poland and by beginning the construction of a 150,000 DWT vessel in their own shipyards. The tanker fleet has been one of the main foreign exchange earners of the Soviet fleet. As indicated before, the construction of tankers is listed among the priorities of the current Five Year Plan for the expansion of the merchant marine.

The Soviet bulk carrier fleet totalled 450,000 DWT by the end of 1973, with only 16 vessels larger than 10,000 DWT. The largest bulk carrier in 1973 registered only 32,000 DWT, while some non-communist countries operate dry bulk carriers exceeding 150,000 DWT. The Soviets bought 44,000 and 72,000 DWT bulk carriers from a Scandinavian country in 1973 and began construction of a 50,000 DWT bulk carrier at home. The Soviet Union recognized the need for larger bulk carriers during the period of the large wheat purchases and deliveries of 1972/74. In 1973, the Russians carried only 18 percent of the imported wheat, while U.S. vessels hauled 20 percent, and third country ships 62 percent. In early 1974, the Soviet Union carried 22 percent, the U.S. 49 percent, and third countries 29 percent. The limited Soviet role in the grain trade resulted from the small size of their dry bulk carrier fleet. Most of the vessels in the U.S.S.R. 9 million DWT dry cargo fleet are general-purpose ships and timber carriers of 16,000 DWT or less which are capable of carrying grain, but not efficiently. More than 800,000 tons of U.S. grain were carried to the Soviet Union by Russian tankers. The U.S.-Soviet grain deal clearly indicated the need for larger, specialized cargo vessels. The current Five Year Plan has emphasized construction of larger specialized vessels.

The leading maritime powers have been very successful in the highly competitive charter market by introducing container ships.

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[9] *Ocean Oil Weekly Report*, Vol. 9, no. 17, January 20, 1975, p. 1.

Due to the absence of specially built container ships, the only commodities left for the Soviets to transport were small amounts of irregularly scheduled and low-rate cargo unsuitable for containerization. Small containers are being used by regular cargo ships which can carry between 218 and 358 containers (with speeds up to 17 knots) compared with free world container ships which have capacities as high as 3,000 containers and speeds of up to 33 knots. The current Five Year Plan (1971–75) has planned a number of container ships with capacities of 40, 200, 300 and 700 20-foot containers. Roll-on/roll-off ships and LASH ships designed to take on-board 40–50 lighters of 200 to 400 tons each are also under construction. As of March 1973, the Soviets had three container ships in operation and a number of universal ships capable of carrying up to 358 containers each. Six more were planned for delivery in 1973, and a number (each with 750 containers capacity) were ordered in Eastern Germany. In addition, six roll-on/roll-off ships with a capacity of 200 to 1,300 containers were ordered (2 in the U.S.S.R., 2 in Poland, 1 in Finland, 1 in France). The Soviet Union plans to enhance its capability in container ships during the 1976–1980 Five Year Plan when containerization will become the main stream of transportation for general cargo. New specialized container ships will have a carrying capacity of 1,200 to 1,400 containers and a speed of 23–25 knots (numbers are not specified). Also, 20 to 30 smaller ships with a 700 container capacity and 25 ships with a 300 container capacity are being planned.

STATUS OF SOVIET FLEET

In comparison with major mercantile fleets of the world, the Soviet merchant marine is not yet well balanced in terms of ship composition. It still has few bulk carriers and is just starting to receive container ships planning to construct lighter aboard ships. The Soviets have large numbers of small vessels, but large modern, specialized vessels are small in number. While the unusually high proportion of general cargo ships provides them with diversified capabilities, because most of the new tonnage consisted of small general-purpose dry cargo vessels and dry bulk carriers, only two of which were longer than those already in the Soviet inventory. The major advantage of the Soviet program is the fact that merchant marine fleet development is interrelated to the whole of the nation's maritime developments.

ADDITIONAL BOTTLENECKS

In addition to improving the composition of the fleet and adding to the size of specialized carriers, one of the main problems of the Soviet merchant marine will continue to be port facilities. Even a partial solution of the containerization problem will improve the situation in Soviet ports which lack sufficient handling and repair facilities. A comparison with foreign ports is striking. For example, in 1968 Soviet ships lost 268 ship days in foreign ports waiting to be loaded or unloaded, which constituted 1.6 percent of total world loss or only Soviet lost time in unproductive waiting. In Soviet ports, they lost 6,341 ship days or 27.5 percent, i.e. 24 times as much as in foreign ports. The main cause of the processing problem is the uneven distribution of investment capital. In the period from 1959–1968, for example, capital investment in fleets exceeded that in ports by more than 7.5 times. While the Soviets have obtained a rather modern and

to a large degree diversified fleet, their ports are incapable of serving it properly, and the ships are losing a considerable portion of their operating time in ports waiting to be processed. The situation is so bad that the United States had to insist on special handling privileges when the two countries signed a shipping agreement in 1972. The emphasis on containerization may be inspired in part by the poor processing capacity of Soviet ports. Development of a universal cargo containerization handling system would help solve some of the processing problems because it would eliminate traditional pier-side sorting, warehousing, and repacking of goods.

ORGANIZATION

Overall planning, coordination, and control is established within the Ministry of Merchant Marine, which in turn is supervised by the Council of Ministers. The Ministry of Merchant Marine also supervises mercantile navigation within the Soviet Union and publishes regulations, instructions, and statutes which are binding on all ministries, departments, and organizations dealing with shipping.

The immediate economic management of the merchant marine is mainly in the hands of the eighteen steamship companies in the various parts of the country. The operations of the steamship companies are supervised by the Administration of Fleet and Port Operations of the Southern, Northwestern, Northeastern and Far Eastern basins. The Administrations, in turn, are part of the Ministry of Merchant Marine. An elaborate computerized system has been set up to manage the flow of data to and from the Ministry of Merchant Marine.

PERSONNEL

It has taken many years or decades to educate an appropriate number of specialists to man the ships constructed. At present there are 4 higher and 12 specialized secondary educational establishments in the U.S.S.R. which train officers for an engineering diploma in 14 specialities and a technician diploma in 10 specialities. The 4 higher institutions have a combined total of 5,000 full-time cadets and more than 4,000 correspondence courses and part-time students. In addition, three institutes are training engineers for shore services and some have departments for training ship officers as well. Two marine science institutions also provide post-graduate training for ship officers. In the period from 1966–1970, 32,179 engineers and technicians were trained and 8,150 specialists improved their qualifications in the merchant marine educational system. They were trained both onshore or on one of the fifteen Soviet merchant marine training ships.[10]

GLOBAL OUTLOOK

In the post-Stalin era, the Soviet Union has paid special attention to the developing, non-aligned countries. Combining political support with military and economic assistance, Soviet foreign policy in the selected areas of the developing nations was in most cases quite pragmatic, demonstrating the existence of a mutually interacting relationship between Soviet aims and capabilities. Three distinguished types of Soviet activity have been distinguished:[11] (1) denial of

[10] Nicholas G. Shadrin, *op. cit.*, p. 750.
[11] Ibid., p. 764.

influence in neutral areas to adversaries; (2) intrusion into the opopponent's sphere of influence; (3) promotion to a revolutionary situation.

It is not difficult to see that maritime power is needed for all three activities. The Soviets' own economic interests (foreign trade) as well as defense interests were among the major factors generating the quite rapid development of maritime power. The ongoing drive to develop efficient sea transportation is capable not only of assuring the Soviets a pattern of commerce but also of implementing Soviet foreign policy mainly through economic and military assistance. However, the size and composition of the Soviet merchant fleet is not yet capable of dictating worldwide policies.

SHORT AND MEDIUM-RANGE FUTURE

The Soviets will continue to expand their merchant marine, diversify, and further specialize their fleet. Also, emphasis will be made on larger ships and improvements in the quality of the fleet. Despite these efforts, the Soviet fleet will for some time continue to lag behind the leading western merchant marine powers because of the small number of technically advanced ships it possesses.

INTERESTS IN THE LAW OF THE SEA: THE ISSUE OF NARROW TERRITORIAL SEAS AND FREE TRANSIT THROUGH STRAITS

In view of the expansion of both the Soviet merchant marine and Naval fleet (see tables 2 and 12), the Soviet position on territorial seas and transit through international straits is very close to the position of other major maritime powers. Restrictions on navigation could limit the mobility of the submarine and surface fleets, and an extensive territorial sea could impair the ability of the naval fleet to maneuver close to foreign shores to support friends or deter enemies. Restrictions on navigation might also subject the Soviet merchant marine to foreign regulations within claimed territorial waters of coastal states. National jurisdiction by coastal states over straits connecting two parts of the high seas could also severely impair merchant marine transit, especially tankers.

The Soviet Union has become one of the main defenders of the traditional freedoms of the seas, although it pays lip service to the need for "progressive development" of international ocean law. By progressive, the Soviet Union means acceptable changes rather than a radical departure from the existing law of the sea.

According to the draft articles presented by the Soviet Union at the preliminary conference on the law of the sea held in Geneva in 1973, the traditional Russian territorial sea of 12 miles would be the maximum allowable.[12]

Universal acceptance of a 200-mile economic zone (which appears likely at this point) could endanger passage through 100 international straits, including such vital ones as Gibraltar and Malacca. Under existing international law, international straits are governed by the principle of innocent passage. But innocent passage is not sufficient to protect Soviet interests because it does not provide for the passage of submerged submarines, nor for the overflight of aircraft, nor, at least

[12] United Nations, General Assembly, doc. A/AC/SC 11 L 7/Add. 1, Geneva, 1973.

according to some interpretations, for the passage of warships without notice.

The Soviet Union is afraid that a handful of the most important straits (Gibraltar, Malacca, Hormuz, Bab el-Mandab and a few others) would be controlled by a small group of states which could obstruct freedom of navigation through these straits. Hence, from the outset of the debates on the law of the sea, the Soviet Union has demanded free transit through international straits:

> In straits used for international navigation between one part of the high seas and another part of the high seas, all ships in transit shall enjoy the same freedom of navigation, for the purpose of transit through such straits, as they may have on the high seas . . . In the case of straits over which the airspace is used for flights by foreign aircraft between one part of the high seas and another part of the high seas, all aircraft shall enjoy the freedom of overflight over such straits as they have in the airspace over the high seas.[13]

However, the Soviet Union conveniently excludes straits connecting parts of waters surrounding the Soviet Union. Most straits in the northern passage are less than 24 miles wide and therefore are overlapped by Soviet territorial waters. Two other wider straits, the Laptev Strait and the Sannikov Strait, in the opinion of some Soviet jurists, belong to the Soviet Union by historical prescription. These have "never been used for international navigation, and in view of specific natural conditions and frequent ice jams, the legal status of these straits is sharply distinguished from all other straits being used for international navigation."[14]

The Soviet Union has also closed off considerable areas of ocean space which are defined as "historic waters," "historic bays," "closed sea," "historic seas," and what they call "seas of the bay type."[15] Applying these concepts, vast areas of ocean space are brought under the national jurisdiction of the Soviet Union.

In defending the traditional freedoms of the seas, the Soviet Union is taking a very conservative position, which in fact is more traditional than the position taken by the leader of the capitalist world, the United States. The Soviet Union has been somewhat embarrassed by its conservative stand and has felt obliged to defend its "revoluntionary" tradition even while supporting conservative international law:

> . . . the USSR, faithful to its revolutionary and democratic traditions, was opposed to all that was outmoded and reactionary in international relations. . . . On the other hand, the country had no intention of doing away with established concepts of international rules which it considers to be of use.[16]

These established concepts still of course include the traditional freedoms of the high seas, which the developing countries—the real revolutionaries in the debate—cannot appreciate.

U.S.-U.S.S.R.: A COMPARISON

In contrast to the expansion of the Soviet merchant marine in the period immediately following the Second World War, the U.S. merchant marine started out with a large fleet of 4,888 vessels with a total of 50,820 DWT in 1946 (see Table 7). The U.S. fleet declined rapidly until it reached its lowest point in 1957 when the U.S. merchant

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[13] United Nations, General Assembly, doc. A/AC/138/SC 11 L 7, New York, 1972.
[14] William E. Butler, *The Soviet Union and the Law of the Sea*, (Baltimore, The Johns Hopkins Press, 1971), p. 114.
[15] Ibid., chapter 3.
[16] United Nations, General Assembly, doc. A/AC 138 SC II SR 58, New York, 1973, p. 124.

marine fleet consisted of only 13,133 DWT (1,012 ships). Hence, the United States nose-dived from the first to the eighth place (or seventh if one includes the inactive fleet) today. This happened in spite of the fact that U.S. foreign trade has grown significantly since the end of the Second World War.

TABLE 7.—U.S.-U.S.S.R. COMPARISON OF FLEET STRENGTH

	U.S.	U.S.S.R
Size fleet in 1946 (in deadweight tons)	50, 820, 000	[1] 2, 500, 000
Size fleet in 1974 (June-active fleet)	14, 148, 000	[1] 16, 797, 000
Number of ships 1946	4, 888	<600
Number of ships 1974 (active fleet)	612	2, 306
Manpower aboard ships (active fleet, 1974)	28, 379	[2] 90, 000
Active Naval vessels, July 1974	511	2, 336
Oceanographic ships, 1974	120	200
Fishing vessels over 100 gwt	1, 019	5, 000
Men in training (merchant marine)	[3] 2, 499	[4] 5, 000
Percentage of ocean trade shipped on flag vessels (by volume)	[5] 6	[6] 56

[1] Including about 500,000 dwt lend-lease.
[2] Approximately.
[3] As of June 1, 1974.
[4] (1973) plus 4,000 part time.
[5] 1974.
[6] 1970.

In an attempt to prevent further deterioration of the U.S. merchant marine, Congress enacted the Merchant Marine Act of 1970. Under the original 10 year plan, 300 ships of up to 80,000 DWT each (or a smaller number of larger size) would be constructed with government subsidies in U.S. shipyards. The government subsidy is scheduled to drop from an initial 41 percent to 35 percent of costs by 1976. From 1970 through F.Y. 1974, 59 new ships with a total of 6.2 million DWT have been completed under the program. Total value of the new vessels was $3.0 billion, and the government subsidy amounted to $1.14 billion. Private enterprise made up for the difference. In addition, 19 older ships were converted from general cargo to container vessels with government financial aid. The value of the conversion was $100.0 million, of which $40.0 million was paid by the government. The total value of new and converted ships constructed under the 1970 Merchant Marine Act through F.Y. 1974 was $3.10 billion, of which the government paid $1.18 billion.

It has been projected that for F.Y. 1975 and 1976 an additional 1.6 million DWT will be constructed in U.S. shipyards with government subsidies under the Merchant Marine Act. For F.Y. 1975, 17 new ships and 4 conversions to container ships have been planned. The value of newly constructed ships and conversions will be $730.0 million and $5.0 million respectively. Government subsidies will amount to $270.0 million for new ships and $2.0 million for converted ships. For F.Y. 1976, 14 new ships and 2 conversions are planned. The value is estimated to be respectively $850.0 million and $3.0 million; government contributions are estimated at $240.0 million for new ships and $1.0 million for converted ships.[17]

In addition to ships being built or converted with government subsidies under the Merchant Marine Act of 1970, other ships are being constructed by private enterprise. As of October 1, 1974, 90 ships totalling 7.7 million DWT and representing a value of more

[17] Data received from the Department of Commerce, Maritime Administration.

than $4 billion were under construction in U.S. shipyards. These ships are scheduled to be completed between 1975 and 1979.[18]

There is little doubt that it was the Merchant Marine Act of 1970 which reversed the downward trend of the U.S. merchant marine. Prior to this program, U.S. ships were too old, too slow and too small to be competitive on the world shipping market. Because of the very nature of U.S. foreign trade (more than 90 percent of our trade in volume consists of oil, natural gas and raw materials), the emphasis on recent ship construction has been on bulk carriers, tankers and containerships. Of the 76 ships under construction on June 1, 1974, 67 were tankers, 6 bulk carriers and 3 others. Of the 25 vessels completed between July 1, 1973 and May 31, 1974, the composition was as follows: 8 bulk carriers, 6 containerships, 4 tankers, 3 lighter aboard ships, 2 roll-on/roll-off ships, 1 deep-sea mining ship and 1 tug barge. [19]

Between January and August 1974, U.S. flag vessels carried 23,522,000 tons out of a total volume of ocean trade of 359,546,000 tons, or about 6 percent. The value of our ocean trade over the same period was $69.5 billion, of which U.S. flag vessels carried about $12.6 billion, or less than 20 percent. [20] The reason for the considerable difference between the percentages of U.S. flag vessel contributions by value and by weight is related to the very nature of our trade. We export primarily high-value industrial goods, and import raw materials, in particular oil. Much of our imported oil is carried on foreign flag vessels, some of these are U.S. owned but sailing under a flag of convenience (primarily Panama and Liberia). If we were to add all U.S. owned vessels sailing under flag of convenience, our total U.S. owned fleet would be 34,650,000 DWT, and we would rank ahead of the United Kingdom as the third biggest merchant fleet in the world. [21] Most of the U.S. owned vessels sailing under flag of convenience are tankers; the others are primarily dry bulk carriers.

U.S.-SOVIET MERCHANT MARINE AGREEMENT OF 1972

In October 1972 the United States and the Soviet Union entered into an agreement dealing with questions of ocean shipping. The agreement was a spin-off of the grain deal between the two countries, and provided for greater participation of Soviet and U.S. merchant fleets in the shipping of goods between the two countries. In accordance with the agreement, which became effective on January 1, 1973, 40 U.S. ports were opened to Soviet ships, and 40 Soviet ports to U.S. ships.

The agreement specifically spells out the division of cargo allotted to national flag ships and the share of cargoes available to third country carriers. It names the 40 ports in each country that will be open for commercial, merchant marine training, hydrographic, oceanographic, meteorological or other civilian research ships, and specifies that ships may call upon 4 days notice rather than 14 days notice that had hitherto been the requirement.

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[18] Data received from the Department of Commerce, Maritime Administration.
[19] United States, Department of Commerce, Maritime Administration, *Merchant Marine Data Sheet*, no. 74-18, July 17, 1974.
[20] Data received from the Department of Commerce, Maritime Administration.
[21] Data received from the Department of Commerce, Maritime Administration.

While the United States was allotted about 30 percent of the bilateral ocean trade, Soviet vessels carried about 94 percent of all the bulk cargo between the two countries in 1973, and about the same ratio in general cargo. One of the reasons for the apparent disparity was the lack of available space on U.S. bottoms which were engaged in other trade or committed to long term charter contracts. In 1974, the United States carried 21 percent of 4.7 million tons of all bulk cargo; the Soviet Union carried 17.5 percent or 3.9 million tons, and third countries carried the remaining 61.5 percent.

The agreement expires on December 31, 1975, but if trade between the two nations continues to grow, the agreement is likely to be renewed.

TABLE 8.—LARGEST MERCHANT FLEETS IN THE WORLD

Country	Number	Size (GWT) [1]	Size (DWT) [1]
Liberia	2,292	55,750	103,386
Japan	2,097	34,871	58,250
United Kingdom	1,596	30,934	50,723
Norway	1,063	24,484	42,100
Greece	1,788	21,377	35,000
Soviet Union	2,306	13,167	16,797
Panama	1,241	10,589	16,838
United States [2]	612	9,745	14,148
Italy	639	8,795	13,661
France	410	8,669	14,486
West Germany	689	7,780	12,149
Sweden	321	5,981	9,758
Netherlands	433	4,721	6,977
Spain	434	4,164	6,815
Denmark	295	3,822	6,323

[1] DWT (deadweight tons) excludes the weight of the ship itself. It is the weight of the cargo, fuel, store and ballast that a ship can carry before submerging her load line.

[2] Includes U.S. private merchant fleet and vessels under general agency agreement, bareboat charter, and in the Departments of State, Defense and Interior. It does not include the U.S. reserve fleet (376 vessels, 2,759 GWT or 3,186 DWT), because most of the vessels in the reserve fleet are either obsolete or can no longer be operated economically.

Source: Department of Commerce, Maritime Administration.

TABLE 9.—SOVIET SHIPPING LINES

Soviet company and route	Nationality of foreign partners
Lines operated jointly by Soviet and foreign steamship companies:	
Azov:	
Soviet Black Sea-Turkey/Greece	
Soviet Black Sea-Italy [2]	
Soviet Black Sea-Near East	
Soviet Black Sea-Algeria	
Caspian: Iran (Caspian)-Baltic-North Sea (via Volga-Baltic Waterway) [1]	
Far East:	
Southeast Asia-Western Canada and the United States (Straits Pacific) [1]	
Soviet Far East/Japan-Western Canada and the United States [1 2]	
Soviet Far East/Japan-Southeast Asia/India [1]	
Soviet Far East/Hong Kong [1 2]	
Soviet Far East/Japan [1 2]	
Baltic:	
Soviet Baltic-East Coast United Kingdom (London) [2]	British.
Soviet Baltic/Western Europe-East Coast of South America (Balt-America) [3]	Polish and East German.
Estonian:	
Soviet Baltic-West Germany	West German.
Baltic/Western Europe-West Africa (UNIAFRICA) [3]	Polish and East German.
Latvian:	
Soviet Baltic-West Coast United Kingdom [2]	British.
Soviet Baltic-East Germany [2]	East German.
Soviet Baltic-France (Atlantic) [2]	French.
Soviet Baltic-Netherlands [2]	Dutch.
Soviet Baltic-Belgium [2]	Belgian.

See footnotes at end of table.

TABLE 9.—SOVIET SHIPPING LINES—Continued

Soviet company and route	Nationality of foreign partners
Lines operated jointly by Soviet and foreign steamship companies:—Continued	
Black Sea:	
Soviet Black Sea-Bulgaria [2]	Bulgarian.
Soviet Black Sea-Egypt [2]	Egyptian.
Soviet Black Sea-India/Ceylon	Indian.
Soviet Black Sea-Southern France	French.
Far East: Soviet Far East-Japan	Japanese.
Murmansk Arctic: Soviet Baltic/Western Europe-Eastern Canada/Great Lakes [1]	
Baltic:	
Soviet Baltic/Western Europe-U.S. East Coast (Balt-Atlantic) [1 2]	
Soviet Baltic/Western Europe-Australia [2 3]	
Soviet Baltic/Western Europe-New Zealand [3]	
Soviet Baltic/Western Europe-Caribbean, U.S. Gulf, and West Coast of South America (Balt-Pacific WICAS) [1]	
Soviet Baltic/Finland-Netherlands/Belgium (Balt-Scan) [1 2]	
Soviet Baltic-West Germany/Netherlands [2]	
Soviet Baltic-Belgium [2]	
Soviet Baltic-East Coast United Kingdom (Hull) [2]	
Soviet Baltic-Sweden-Italy-UAR (SCAN-MED) [1]	
Estonian:	
Soviet Baltic/Western Europe-Eastern Mediterranean (Balt-Levant) [1]	
Soviet Baltic-Sweden (East Coast)	
Soviet Baltic-Norway and Denmark	
Lithuanian: Soviet Baltic-West Germany [2]	
Latvian: Soviet Baltic-East Coast United Kingdom (London/Tilbury) [2]	
Danube:	
Soviet Danube-Near East (Lebanon, Syria, UAR, and Cyprus)	
Soviet Danube-Turkey	
Soviet Danube-North Africa	
Soviet Danube-Greece	
Black Sea:	
Soviet Black Sea-Persian Gulf (Iraq)	
Soviet Black Sea-North Vietnam	
Soviet Black Sea-Cuba	
Southeast Asia-Western Europe/Soviet Black Sea (Odessa Ocean) [1]	
Soviet Black Sea/Mediterranean Europe-Eastern Canada/Great Lakes [2 3]	
Soviet Black Sea-East Africa/Red Sea	

[1] An independent line operating largely or entirely in the cross (or transit) trades.
[2] Line offering full or partial container service.
[3] A conference line operating largely or entirely in the cross trades.

TABLE 10.—USSR: INTERNATIONAL CARGO LINES, JUNE 30, 1974

Company and route
Lines operated unilaterally by Soviet steamship companies:
Murmansk Arctic: Soviet Baltic/Western Europe—Eastern Canada/Great Lakes [1]
Baltic:
Soviet Baltic/Western Europe-U.S. East Coast (Balt-Atlantic) [1 2]
Soviet Baltic/Western Europe-Australia [2 3]
Soviet Baltic/Western Europe-New Zealand [3]
Soviet Baltic/Western Europe-Caribbean, U.S. Gulf, and West Coast of South America (Balt-Pacific WICAS) [1]
Soviet Baltic/Finland-Netherlands/Belgium (Balt-Scan) [1 2]
Soviet Baltic-West Germany/Netherlands [2]
Soviet Baltic-Belgium [2]
Soviet Baltic-East Coast United Kingdom (Hull) [2]
Soviet Baltic-Sweden-Italy-UAR (Scan-Med) [1]
Estonian:
Soviet Baltic/Western Europe-Eastern Mediterranean (Balt-Lewant) [1]
Soviet Baltic-Sweden (East Coast)
Soviet Baltic-Norway and Denmark
Lithuanian: Soviet Baltic-West Germany [2]
Latvian: Soviet Baltic-East Coast United Kingdom (London/Tilbury) [2]
Danube:
Soviet Danube-Near East (Lebanon, Syria, UAR, and Cyprus)
Soviet Danube-Turkey
Soviet Danube-North Africa
Soviet Danube-Greece
Black Sea:
Soviet Black Sea-Persian Gulf (Iraq)
Soviet Black Sea-North Vietnam
Soviet Black Sea-Cuba
Southeast Asia-Western Europe/Soviet Black Sea (Odessa Ocean) [1]
Soviet Black Sea/Mediterranean Europe-Eastern Canada/Great Lakes [2 3]
Soviet Black Sea-East Africa/Red Sea

[1 2 3] Department of Defense.

TABLE 11.—MERCHANT FLEETS OF THE WORLD, OCEANGOING STEAM AND MOTOR SHIPS OF 1,000 GROSS TONS AND OVER AS OF JUNE 30, 1974

[Excludes ships operating exclusively on the Great Lakes and inland waterways and special types such as channel ships, icebreakers, cable ships, etc., and merchant ships owned by any military force; tonnage in thousands]

Country of registry	Total			Type of vessel: Combination passenger and cargo			Type of vessel: Combination passenger and cargo/refrigerated		
	Number	Gross tons	Deadweight tons	Number	Gross tons	Deadweight tons	Number	Gross tons	Deadweight tons
Total, all countries	21,917	289,404	472,020	761	6,062	3,250	24	361	210
United States	965	12,504	17,334	92	859	577	4	45	37
Privately owned	589	9,560	13,888	4	61	29	4	45	37
Government owned	376	2,944	3,446	88	798	548	----	----	----
Reserve fleet	353	2,759	3,186	88	798	548	----	----	----
Other [2]	23	185	260	----	----	----	----	----	----
The British Commonwealth of Nations:									
United Kingdom	1,596	30,934	50,723	29	485	193	4	120	57
Australia	83	903	1,279	----	----	----	----	----	----
Bangladesh	11	52	78	----	----	----	----	----	----
British Colonies	92	1,467	2,413	5	19	17	----	----	----
Canada	73	316	395	15	41	17	----	----	----
Cyprus	570	3,359	4,885	9	72	58	----	----	----
Ghana	17	123	162	----	----	----	----	----	----
India	276	3,451	5,417	9	55	56	1	17	8
Jamaica	2	12	9	----	----	----	----	----	----
Kenya	6	15	23	----	----	----	----	----	----
Malaysia	23	289	416	2	3	4	----	----	----
Mauritius	6	33	50	1	2	2	----	----	----
New Zealand	37	118	156	----	----	----	1	3	2
Nigeria	16	103	150	----	----	----	----	----	----
Pakistan	58	499	664	7	69	58	----	----	----
Sierra Leone	2	3	5	----	----	----	----	----	----
Singapore	301	2,383	3,954	17	100	83	----	----	----
Sri Lanka (Ceylon)	5	33	46	----	----	----	----	----	----
Tanzania	3	24	34	----	----	----	----	----	----
Tonga	3	8	9	----	----	----	----	----	----
Trinidad-Tobago	3	6	5	1	3	2	----	----	----
Uganda	1	6	9	----	----	----	----	----	----
Western Somoa	1	2	2	----	----	----	----	----	----
Zambia	1	6	8	----	----	----	----	----	----
Albania [3]	10	50	69	----	----	----	----	----	----
Algeria	25	196	264	----	----	----	----	----	----
Argentina	164	1,284	1,751	9	52	39	1	13	9
Austria	19	75	113	----	----	----	----	----	----

See footnotes at end of table, p. 34.

TABLE 11.—MERCHANT FLEETS OF THE WORLD, OCEANGOING STEAM AND MOTOR SHIPS OF 1,000 GROSS TONS AND OVER AS OF JUNE 30, 1974

[Excludes ships operating exclusively on the Great Lakes and inland waterways and special types such as channel ships, icebreakers, cable ships, etc., and merchant ships owned by any military force
tonnage in thousands]

Country of registry	Total			Type of vessel					
				Combination passenger and cargo			Combination passenger and cargo refrigerated;		
	Number	Gross tons	Deadweight tons	Number	Gross tons	Deadweight tons	Number	Gross tons	Deadweight tons
Belgium	75	1,127	1,734	2	24	25			
Brazil	253	2,383	3,686	8	3	18			
Bulgaria	112	818	1,193	4	22	8			
Burma	10	58	73	2	5	3			
Chile	45	372	552	3	9	5			
China (Taiwan)	156	1,442	2,215	9	44	49			
China (Communist) [3]	302	1,821	2,490	22	85	47	2	17	10
Colombia	42	229	303						
Cuba [3]	59	360	475	2	15	10			
Czechoslovakia	12	123	181						
Denmark	295	3,822	6,323	6	16	13	1	3	1
Dominican Republic	4	8	11						
Ecuador	13	108	154						
Ethiopia	5	37	53						
Finland	195	1,353	1,991	7	32	9	1	2	
France	410	8,669	14,486	7	116	35			
Gabon	4	32	43						
Germany (West)	689	7,780	12,149	4	38	11			
Germany (East) [3]	142	1,031	1,432	4	43	26			
Greece	1,788	21,377	35,000	61	491	248	1	2	
Guatemala	3	6	8						
Guinea	2	14	19						
Honduras	10	49	48						
Hungary [3]	16	48	66						
Iceland	26	48	71						
Indonesia	148	518	635	30	126	95			
Iran	26	254	347						
Iraq	13	201	317						
Ireland	16	161	243						
Israel	59	581	802						
Italy	639	8,795	13,661	54	665	223	1	14	8

Ivory Coast	17	124	170							
Japan	2,097	34,871	58,250	32	122	73				
Korea (South)	129	1,027	1,677	1	10	11				
Korea (North)[3]	9	38	41	1	5	2				
Kuwait	34	665	1,122							
Lebanon	37	112	151	1	5	4				
Liberia	2,292	55,750	103,386	24	250	161	2	41	30	
Libya	6	152	274							
Malagasy	11	53	80							
Maldives	28	76	95							
Mexico	46	415	629							
Monaco	5	37	50	1	4	1				
Morocco	16	44	62							
Nauru	5	47	60	3	23	22				
Netherlands	433	4,721	6,977	10	197	78				
Nicaragua	8	18	26							
Norway	1,063	24,484	42,100	34	339	79	1	18	9	
Panama	1,241	10,589	16,838	33	332	192	1	5	4	
Peru	38	291	421							
Philippines	154	714	993	18	35	33				
Poland	261	1,997	2,812	2	16	7				
Portugal	113	1,162	1,712	15	152	92				
Rumania[3]	71	552	810	1	7	2				
Saudi Arabia	14	56	71	2	6	4				
Senegal	4	8	11							
Somalia	242	1,793	2,596	2	10	8				
South Africa	52	412	519				2	58	32	
Spain	434	4,164	6,815	36	206	136				
Sudan	8	45	58							
Swedan	321	5,981	9,578	5	74	17				
Switzerland	26	249	363							
Thailand	25	138	230							
Trucial States	1	4	8							
Tunisia	10	25	34							
Turkey	99	793	1,146	15	71	32				
United Arab Republic	47	216	281	7	43	40				
Uruguay	17	156	240	1	8	10				
U.S.S.R.[4]	2,306	13,167	16,797	83	532	231	1	3	1	
Venezuela	43	407	586							
Vietnam (South)	10	24	38							
Yugoslavia	201	1,699	2,487	11	61	60				
Zaire	5	49	61	2	24	24				
U.S.S.R. (lend-lease)	43	298	439							

See footnotes at end of table, p. 34.

TABLE 11.—MERCHANT FLEETS OF THE WORLD, OCEANGOING STEAM AND MOTOR SHIPS OF 1,000 GROSS TONS AND OVER AS OF JUNE 30, 1974—Continued

Country of Registry	Type of vessel											
	Freighters			Freighters refrigerated			Bulk carriers			Tankers (including whaling tankers)		
	Number	Gross tons	Dead-weight tons	Number	Gross tons	Dead-weight tons	Number	Gross tons	Dead-weight tons	Number	Gross tons	Dead-weight tons
Total, all countries	11,238	67,469	91,463	1,021	5,371	5,725	3,924	78,452	132,706	4,949	131,689	238,666
United States [1]	566	6,216	7,374	7	33	37	21	326	570	275	4,980	8,739
Privately owned	318	4,424	4,939				21	326	570	242	4,704	8,313
Government owned	248	1,837	2,435	7	33	37				33	276	426
Reserve Fleet	232	1,711	2,261	6	25	30				27	235	347
Other [2]	16	126	174	1	8	7				6	51	79
The British Commonwealth of Nations:												
United Kingdom	647	4,943	6,195	129	1,161	1,381	333	7,932	13,426	454	16,293	29,471
Australia	36	251	275				34	477	730	13	175	274
Bangledash	10	51	76							1	1	2
British Colonies	33	159	226	4	4	4	27	483	785	23	802	1,381
Canada	27	85	102				9	59	84	22	131	191
Cyprus	440	2,166	3,128	7	25	27	60	486	728	54	610	944
Ghana	17	123	162									
India	185	1,399	1,981	1	9	13	60	1,423	2,432	20	548	927
Jamaica				2	12	9						
Kenya	4	12	19				1	2	2	1	1	2
Malaysia	14	108	128				6	176	282	1	2	2
Mauritius	4	29	45							1	2	3
New Zealand	24	78	104	3	15	18	9	22	32			
Nigeria	16	103	150									
Pakistan	49	407	575				2	23	31			
Sierra Leona	2	3	5									
Singapore	208	1,119	1,574	13	57	64	26	660	1,114	37	647	1,119
Sri Lanka (Ceylon)	5	33	46									
Tanzania	3	24	34									
Tonga	2	6	8							1	2	1
Trinidad-Tobago	1	1	1							1	2	2
Uganda	1	6	9									
Western Somoa	1	2	2									
Zambia	1	6	9									
Albania [3]	7	41	57				3	9	12			
Algeria	16	59	82				3	25	36	6	112	146
Argentina	69	446	595	16	88	87	39	218	56	56	546	803
Austria	17	52	79				2	23	34			
Belgium	29	289	385	7	37	36	20	485	816	17	292	472
Brazil	151	839	1,121	8	39	51	32	465	1,003	52	901	1,493
Bulgaria	58	245	334	3	18	16	28	244	358	19	289	457
Burma	8	53	70									
Chile	29	194	272	1	2	2	7	133	5	5	86	140
China (Taiwan)	94	349	765	9	40	43	30	461	752	14	348	606

China (Communist) [3]	218	1,332	1,863	2	3	4	24	130	182	34	254	384
Columbia	40	208	271				1	2	2	1	19	30
Cuba [3]	40	262	361	8	29	25	2	2	2	7	52	77
Czechoslovakia	8	41	54				4	82	27			
Denmark	181	1,107	1,440	18	77	97	32	569	912	37	2,050	1,840
Dominican Republic	3	7	9	1	1	2						
Ecuador	5	32	41	2	13	13				6	63	100
Ethiopia	3	14	17							2	23	36
Finland	116	475	628	9	20	27	13	75	107	49	749	1,219
France	167	1,276	1,661	18	199	188	58	1,230	2,058	140	5,848	10,554
Gabon	3	22	28				1	10	15			
Germany (West)	489	3,073	4,005	42	257	317	77	2,201	3,761	77	2,211	4,055
Germany (East) [3]	105	576	765	8	36	32	16	207	319	9	169	290
Greece	901	3,779	8,576	45	221	236	448	7,162	12,193	332	7,722	13,744
Guatemala	3	6	8									
Guinea	1	3	4				1	11	15			
Honduras				10	69	48						
Hungary [3]	16	48	66									
Iceland	18	30	48	6	13	19	2	3	4			
Indonesia	96	318	435				7	16	23	15	58	82
Iran	21	198	262	1	3	4				4	53	81
Iraq	6	51	71							7	150	246
Ireland	5	11	10				9	148	230	2	2	3
Israel	39	227	272	8	66	76	12	288	454			
Italy	197	996	1,379	20	93	76	141	3,230	5,482	226	3,797	6,491
Ivory Coast	15	112	159	22	12	11						
Japan	949	5,646	7,750	99	330	412	521	12,683	20,740	496	16,090	29,275
Korea (South)	81	348	515	2	3	4	20	209	337	25	457	810
Korea (North) [3]	6	29	34	2	4	5						
Kuwait	28	241	332							6	424	790
Lebanon	31	97	132	2	4	6	3	6	9			
Liberia	505	3,470	5,165	40	184	205	819	17,674	31,786	902	34,131	66,039
Libya	1	1	3							5	151	271
Malagasy	8	32	48							3	21	32
Maldives	24	67	86	3	7	7	1	2	2			
Mexico	17	87	124	1	4	4	3	39	60	25	285	441
Monaco										4	33	49
Morocco	9	30	44	7	14	18						
Nauru	1	4	6				1	20	32			
Netherlands	283	1,863	2,416	27	92	95	30	453	711	83	4,116	3,677
Nicaragua	7	17	24							1	1	2
Norway	329	1,993	2,733	24	112	126	334	9,245	15,641	341	12,777	23,512
Panama	796	3,474	5,150	30	94	93	165	1,997	3,219	216	4,687	8,180
Peru	28	187	262				5	59	90	5	45	69
Philippines	98	470	643	5	15	15	6	64	107	27	130	195
Poland	176	1,091	1,467	15	54	58	64	794	1,221	4	42	59
Portugal	65	375	317	2	5	5	6	80	125	25	350	973
Rumania [3]	47	175	246	4	28	20	14	190	280	5	152	262
Saudi Arabia	8	24	33	3	9	7				1	17	27
Senegal	2	4	5							2	4	5
Somalia	201	1,266	1,783	1	3	4	27	388	596	11	126	201

See footnotes at end of table, p. 34.

TABLE II.—MERCHANT FLEETS OF THE WORLD, OCEANGOING STEAM AND MOTOR SHIPS OF 1,000 GROSS TONS AND OVER AS OF JUNE 30, 1974—Continued

Country of Registry	Type of vessel											
	Freighters			Freighters refrigerated			Bulk carriers			Tankers (including whaling tankers)		
	Number	Gross tons	Dead-weight tons	Number	Gross tons	Dead-weight tons	Number	Gross tons	Dead-weight tons	Number	Gross tons	Dead-weight tons
South Africa	38	231	304	6	43	61	3	41	61	3	39	66
Spain	205	695	1,024	29	55	75	53	922	1,570	111	2,286	4,010
Sudan	7	41	53	1	4	5						
Sweden	136	962	1,193	27	239	252	81	2,500	4,224	72	2,206	4,072
Switzerland	20	158	222	2	3	3	4	88	138			
Thailand	14	51	76				1	1	2	10	86	152
Trucial States	1	4	8									
Tunisia	7	12	15				1	3	4	2	10	15
Turkey	60	342	491				7	108	169	17	272	454
United Arab Republic	30	96	122							10	77	119
Uruguay	8	32	47	1	4	3				7	112	180
U.S.S.R.[4]	1,369	6,456	8,502	254	413	1,264	145	907	1,284	454	3,856	5,515
Venezuela	22	110	147				4	14	19	17	283	420
Vietnam (South)	8	20	32				1	2	3	1	2	3
Yugoslavia	138	897	1,228	4	14	15	31	496	802	17	231	182
Zaire	3	25	37									
U.S.S.R. (lend-lease)[1]	42	291	427							1	7	12

[1] Excludes 69 nonmerchant type ships which are currently in the National Defense Reserve Fleet.
[2] Comprised of vessels under general agency agreement, bareboat charter, and in the Departments of Defense, State and the Interior.
[3] Source material limited.
[4] Includes the following U.S. Government-owned ships transferred to U.S.S.R. under lend-lease agreements, 41 of which are still under registry; and 2 under North Korean registry.

Source: Department of Commerce, Maritime Administration.

TABLE 12.—U.S. MERCHANT MARINE FLEET SIZE

Year	Number	Deadweight tons (thousands)
1946	4,888	50,820
1947	3,911	40,814
1950	3,492	37,271
1955	3,304	35,539
1956	1,059	13,537
1957	1,012	13,429
1958	1,007	13,429
1960	1,008	14,088
1965	948	14,650
1969	931	15,453
1971	711	13,887
1972	651	13,638
1973	596	13,717
1974	583	14,446

Note: Data prior to 1956 includes Government as well as privately owned ships. After 1956, private ships only. Government ships were put into reserve (nonactive) fleet.

Source: Department of Commerce, Maritime Administration.

TABLE 13.—CARGO CARRIED BY U.S. FLAG VESSELS: TONNAGE AND VALUE

[Percentage of ocean-borne trade]

Year	Cargo-tonnage basis	Cargo-value basis
1960	11.1	26.4
1964	9.2	25.8
1969	4.5	19.2
1971	5.3	19.6
1972	5.5	19.7

Source: Department of Defense.

TABLE 14.—MERCHANT FLEETS OF THE WORLD: UNITED STATES AND U.S.S.R.

[Ocean steam and motor ships of 1,000 GWT as of June 30, 1974]

	U.S. privately owned [1]	U.S. Government owned [2]	U.S.S.R.
Number of ships	589	376	2,306
Gross weight tons	9,560	2,944	13,167
Deadweight tons	13,888	3,446	16,797
Combination passenger/cargo (gross weight tons)	61	798	532
Combination cargo/refrigerated (gross weight tons)	45	----------	3
Freighters (number)	318	248	1,369
Freighters (gross weight tons)	4,424	1,837	6,456
Freighters (deadweight tons)	4,939	2,435	8,502
Freighters (refrigerated; in gross weight tons)	----------	33	1,413
Freighters (refrigerated; number)	----------	7	254
Bulk carriers (number)	21	----------	145
Bulk carriers (gross weight tons)	326	----------	907
Tankers (including whaling tankers; number)	242	33	454
Tankers (gross weight tons)	4,074	276	3,856

[1] Excludes ships operating exclusively on the Great Lakes and Inland waterways and special ships such as channel ships, icebreakers, cable ships, etc., and merchant ships owned by any military force. U.S. fleet also excludes 69 non-merchant-type ships which are currently in the National Defense Reserve Fleet.

[2] Includes reserve fleet and vessels under general agency agreement, bareboat charter, and in the Departments of State, Defense, and Interior.

Source: Department of Commerce, Maritime Administration.

TABLE 15.—SHIPBUILDING—LEADING NATIONS, MERCHANT SHIP DELIVERIES—1972

[Oceangoing ships—Deadweight tons in thousands]

For whom built	Number of ships	Deadweight tons	Rank	Where built	Number of ships	Deadweight tons
Liberia	138	11,140	1	Japan	417	22,756
Japan	198	9,406	2	Sweden	38	3,695
United Kingdom	132	5,213	3	Spain	63	1,913
Norway	77	4,062	4	United Kingdom	61	1,849
Greece	72	2,577	5	Germany (West)	85	1,764
Sweden	28	1,264	6	Denmark	17	1,677
Italy	13	1,249	7	Italy	25	1,669
Spain	27	1,207	8	France	23	1,620
Panama	18	1,097	9	Norway	58	1,401
Denmark	29	1,087	10	Netherlands	41	1,254
France	22	1,067	11	Yugoslavia	17	1,088
Germany (West)	89	1,034	12	Poland	45	663
United States [1]	15	658	13	United States	13	602
U.S.S.R	76	570	14	U.S.S.R	42	364
Brazil	24	300	15	Germany (East)	31	314

[1] 1973 deliveries—34 ships at 883,600 gross tons.

Source: Department of Defense.

TABLE 16.—U.S. ACTIVE NAVY FORCES

	July 1968	July 1974
U.S. total fleet	976	511
U.S. ships:		
Warships	484	302
Attack carriers	15	14
ASW carriers	8	0
Attack submarines:		
Nuclear	33	61
Diesel	72	12
Fleet ballistic missile S/M's	41	41
Cruisers	15	7
Frigates	31	29
Destroyers:		
Missile	28	29
Other	181	32
Escort ships (DE)	50	63
Patrol ships (PG)	9	14
Amphibious warfare	157	65
Mine warfare	84	9
Auxiliary ships	251	135
U.S. Naval aircraft:		
Active aircraft (total)	(8,491)	(6,475)
Attack	1,539	1,334
Fighter	886	821
Antisubmarine	302	127
Patrol	493	403
Training	1,876	1,314
Helicopter	1,191	1,129
Other types	816	664

Source: Department of Defense.

TABLE 17.—NAVAL FORCES OF THE U.S.S.R.

[Numbers approximate in most cases]

	July 1970	July 1974
Soviet total fleet	2,323	2,336
Combatant ships and craft	1,623	1,586
Submarines [1]	350	320
Nuclear	80	120
Diesel [2]	270	200
Other major combatants	213	221
Helicopter carriers	2	2
Cruisers (missile)	11	17
Cruisers (other)	10	12
Destroyers (missile)	35	44
Destroyers (other)	50	37
Escorts	105	109
Minor combatants	695	685
Guided missile boats	150	135
Patrol and torpedo types (1974)	----	250
Patrol craft and sub chasers (1970)	295	----
Sub chasers (1974)	----	200
Motor torpedo boats (1970)	250	----
Coastal escorts (1974)	----	100
Amphibious warfare ships	[3] 50	100
Minesweepers	315	260
Auxiliaries (all types)	[3] 700	750

[1] Included are: Ballistic missile S/M's July 1970, 50; July 1974, 68. Cruise missile S/M's, July 1970, 65; July 1974, 65.
[2] Additional ships of this type believed to be in reserve.
[3] Or more.

SOVIET NAVAL AIRCRAFT AND PERSONNEL, JULY 1974

	Number
Aircraft:	
Strike/medium bombers	350
ASW	400
Reconnaissance	100
Tankers	100
Transport/training	250
Total	1,200
Personnel:	
Afloat	180,000
Naval aviation	45,000
Coastal defense	10,000
Naval infantry	10,000
Shore support	180,000
Training	50,000
Total	495,000

Source: Department of Defense.

Table 18: Soviet Navy—Ships and Craft

NAMES OF PRINCIPAL TYPES AND CLASSES—SUBMARINES

Ballistic missile, nuclear: *Delta, Yankee, Hotel.*
Ballistic missile, diesel: *Golf, Zulu-V.*
Cruise missile, nuclear: *Charlie, Echo-II, Echo-I.*
Cruise missile, diesel: *Juliett, Whiskey Conversions.*
Attack, nuclear: *Victor, November.*
Attack, diesel: *Bravo, Foxtrot, Zulu, Romeo, Whiskey.*

SURFACE SHIPS AND CRAFT

Aircraft carriers: *Kuril.*
Helicopter carriers: *Moskva, Leningrad* (individual ships).
Cruisers, missile: *Kara, Kresta II, Kresta I, Kynda.*
Cruisers, other: *Sverdlov.*
Destroyers, missile: *Krivak, Kashin, Krupny, Kanin, Kotlin-Sam, Kildin.*
Destroyers, other: *Kotlin, Skoryy.*
Escorts: *Grisha, Mirka, Petya, Riga, Kola.*
Guided missile patrol craft: *Nanuchka, Komar, Osa.*
Patrol craft and sub chasers: *Stenka, Pchela, Poti, SO–1.*
Motor torpedo boats: *Shershen, P4, P6.*
Amphibious warfare—LST types: *Alligator, MP6;* LCM types: *MP4, Polnocny.*
Fleet minesweepers: *Nayta, Yurka, T–58, T–43.*
(Later classes are listed first.)

V. SOVIET OCEANOGRAPHY

SOVIET OCEANOGRAPHY: DEVELOPMENTS

Since the mid-1950's Soviet oceanographic effort has exceeded ours both in numbers of ships and in skilled personnel. This is an ominous development, particularly in the area of submarine warfare where offensive capabilities are outstripping defense techniques. I believe that, on balance, we still hold a marginal lead, but if we lose it we will surely lose our place as the number one sea power and with it the ability to supply and defend ourself under all conditions.[1]—Vice Adm. W. W. Behrens, Jr., former oceanographer of the Navy.

The conduct of oceanographic research on a large scale is relatively young in both the Soviet Union and the United States. In the United States, oceanography underwent very rapid growth during the Second World War when the government and the scientific community suddenly realized that nature is often a limiting factor in the effectiveness of new devices designed for use in the oceans. Special units were set up for the conduct of ocean science within the Department of Defense, and a considerable number of university scientists were either assigned to defense research in D.O.D. laboratories or received government assistance to work on war-related research at their own universities. An important result of the war-time activity was that for the first time a considerable number of university scientists became to some degree familiar with problems of oceanography and a much larger number of young graduate students in physics, chemistry, geology, geophysics, meteorology and engineering gained field experience. The United States went into the war with only about 50 people who could properly be called oceanographers. By the end of the war, about 300 professionals and a considerably greater number of non-professionals had acquired experience in the subject.[2]

The Soviet Union began its major oceanographic expansion in the nineteen fifties, around the same time they pushed ahead with the development of a major distant-water fishing capability and a large merchant marine. All these developments were part of the overall post-Stalin plan for a global marine policy.

In 1957–58 two events occurred which signalled a quantum jump in Soviet oceanological research capabilities. The first was the mounting of the largest oceanological research program to be associated with the International Geophysical Year. The second was the launching of the *Michael Lomonosov*, the first of a sizable number of large, first rate, oceanographic research ships.[3]

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[1] Merle Mac Bain, "Is the Soviet Union Leaving Us Behind in Oceanography"?, *Sea Power*, June 1972, p. 28.

[2] National Academy of Sciences, National Research Council, *Oceanography* 1960 to 1970, A Report by the Committee on Oceanography, Washington, D.C., 1962, p. 14.

[3] Mark W. Janis and Donald C. F. Daniel, *The USSR: Ocean Use and Ocean Law*, L.S.I. Occasional Paper No. 21, (University of Rhode Island, Kingston, May, 1974), p. 6.

Evidence indicates that the United States was the world's leader in oceanography (measured in terms of inputs: ships and scientific personnel) until the early 1960's when the Russian program of expansion was well underway. A six-man delegation of American ocean scientists visiting the U.S.S.R. in 1964 reported that in 1961, the U.S.S.R. was operating oceanographic survey ships having a total gross tonnage of 50,000 tons compared with 60,000 tons in the United States.[4] The number of scientists (excluding technicians) was estimated at 700, expanding at a rate of 10 to 15 percent per year. Dietz writes that professor Dobrovolsky of Moscow State University estimated the number of Soviet oceanographers at between 1,000 and 1,500 in 1964.[5] The United States had more than 1,500 scientists at that time (2,000 in 1968 vs 1,600 for the U.S.S.R. in that year).[6]

In 1974, the number of scientists and supporting technicians in the United States totalled between 2,000 and 3,000, while the Soviet Union was estimated to have between 7,000 and 8,000 ocean scientists and technologists.[7] The actual number of scientists may not differ very much between the two countries. The great discrepancy is in the numbers of technicians. The Soviets have long thought to be handicapped by a shortage of scientific personnel, and they have apparently opted to supplement their professional ocean scientists with oceanographic technicians. Dietz writes that the Soviet oceanographer at the Candidate (Ph. D.) level can expect a group of five to ten junior scientists and technicians to assist him in his work.[8] In contrast, the American ocean scientist works with little support, and tends to be overwhelmed in a morass of data.

Comparing the strength of the oceanographic fleet of the two countries with world-wide oceanographic capabilities, U.S. superiority was known to be overwhelming in the 1950's and early 1960's. Exact figures are not available for this period.[9] By 1971, the United States had 39 research vessels of over 1,000 GWT; the U.S.S.R. had 70 such ships.[10] Counting all oceanographic vessels, including small coastal ships, the United States had 120 ships and the Soviets 200 in 1974.[11] Of the United States research ships in the over 1,000 tons category, six are over 20 years old, while most of the Soviet ships were constructed during the 1960's. The Defense Department data on the comparative size of the oceanographic research fleets coincide with figures quoted by Janis and Daniel. The latter's maintain that in 1970 the Soviet fleet was made up of approximately 200 vessels with a displacement of about 320,000 tons, compared with only 180,000 tons for the U.S. oceanographic research fleet.[12] It should be noted that the total number of available research vessels is only one way to measure oceanic research activities. Actual time spent at sea is of great importance. U.S. ships are known to spend more active time at sea than Soviet vessels.

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[4] U.S. Department of Commerce, Coast and Geodesic Survey, *Soviet Oceanography 1964: A Trip Report* by R. S. Dietz (Washington, D.C., April 1965), p. 3.
[5] Ibid., p. 3.
[6] United Nations, ECOSOC, *Marine Science and Technology: Survey and Proposals*, Report to the Secretary-General (New York, April 24, 1968), pp. 35, 36.
[7] See table 1.
[8] U.S. Department of Commerce, *op. cit.*, p. 2.
[9] Information received from Department of Defense, Office of the Oceanographer.
[10] Data received from Department of Defense
[11] See table 1.
[12] Mark W. Janis and Donald C. F. Daniel, *op. cit.*, p. 6.

Intelligence sources indicate that the Soviet Union is expected to continue to improve its oceanographic resources by continued new construction of ships, qualitative improvements of their research fleet, and continued input of trained oceanographic technicians to supplement the professional ocean scientists. In contrast, U.S. oceanographic research has been poorly funded in recent years. The Navy's basic oceanographic research program peaked in 1967 with a budget of $268 million (1967 dollars). In 1974, only $189 million was allocated for basic oceanographic research (1974 dollars) and $185 million was projected for FY 1975.[13] In view of the high rate of inflation in recent years, the actual decline is much higher. Some have argued that N.S.F. funding has made up for the declining Naval budget for oceanography, but even a casual look at the N.S.F. budget for oceanography shows that actual N.S.F. funding in real dollars declined somewhat in recent years.

Intelligence reports indicate that the Soviet Union continues to expand its oceanographic research fleet while the United States Navy received funding for only two small research ships between FY 1968 and 1975. (The Soviet Union had constructed 39 oceanographic ships between 1960–67, 69 between 1968–74, and 9 are still under construction.)

Working together or independently, the American government, industry and academic institutions have come forward with some real technological achievements in oceanographic instrumentation during the past decade and a half. The Soviet Union was known for years to be behind the United States in instrumentation technology, a vital part of oceanography that enable scientists to collect and interpret data. A group of U.S. ocean scientists visiting the U.S.S.R. in 1972 noticed considerable progress in the Soviet Union and noted in their report to the government, "The work of the Institute of Oceanology is well known to most of the oceanographic research scientists in the United States. However, those on the delegation who had visited the institution in previous years, were greatly impressed by the strides made in the instrumentation and data processing capabilities since their last respective visit. Soviet scientists have long been known for their excellence in theory. These new tools provide opportunities for great strides in Soviet oceanography and major contributions to the world in marine sciences." [14] Visits by American ocean scientists to Soviet laboratories and research ships confirm the quoted report as well as Soviet articles on advanced instrumentation used in oceanographic investigations.[15]

Unclassified information confirms personal observations by U.S. scientists that in some aspects of oceanographic research the Soviets are behind. For example, the Russians appear behind in the most sophisticated satellite navigation systems and instrumentation such as current meters. Hence, the Soviet Union is eager to cooperate in international intercalibration programs and has made successful attempts to obtain current meters from the West. New systems are on the drawing board in the United States, but R&D programs have

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[13] Data received from the Department of Defense, Office of the Oceanographer of the Navy.
[14] Trip Report of 1972 Oceanographic Exchange Visit to the USSR, 9/16/72–10/7/72, p. 50.
[15] *The Soviet Surge in Oceanography, 1961–1971*, Statement by the Commander of the Naval Oceanographic Office, Washington, D.C., 1972, p. 9.

slowed down considerably due to budget restrictions. The budget for basic science conducted by the Navy itself declined from $30 million in 1968 (1968 dollars) to $28 million for 1975 (current dollars). As a result of these budget cuts the Navy had to cut personnel in the basic research laboratory from 540 in 1968 to 260 today.[16]

Summarizing Soviet current capabilities in oceanic research, it is fair to say that they are well ahead in the number of research ships, they have capable personnel to man those ships and their onshore facilities, and after a period of copying and borrowing from the West, the basic "oceanographic instrument suit" on their ships is approaching parity with the United States.[17] If naval and civilian funding for oceanography does not improve, the Soviets are likely to achieve parity in instrumentation soon. The one area where the Soviets lag considerably behind the United States is in diving and submersible technology (see section on submersibles). The Soviets initially unsuccessfully attempted to acquire submersibles from foreign sources. In December 1971, the Canadian government cancelled a permit for the sale of the Canadian-built PISCES submersible to the Soviet Union. However, the Canadian government has now granted permits for the sale of 3 submersibles to the U.S.S.R.

The one area in which the Soviets clearly surpass the U.S. effort is in Arctic research. In Arctic support of their Northern Sea route, the Soviets maintained four Arctic Ocean drift stations with scientific parties of 15–25 personnel from 1968–72 (now only one left). This program is also supported by a number of polar research ships. In contrast the U.S. Navy occasionally supports one Arctic Ocean drift station and has fewer ships committed to polar research. The importance of Arctic research becomes obvious if one realizes that the Arctic is not only a highly strategic military area, but it is the one area in the world where we literally stand face-to-face with the Soviet Union.

NAVAL VS. NON-NAVAL ACTIVITIES

In contrast to the United States where about 50 percent of all oceanographic research is conducted by academic and private research institutions, all Soviet research is controlled and conducted by government institutions.

In oceanography, the Soviet Naval Hydrographic Service shares responsibilities with over fifty service-oriented institutions (academic and government labs). The major non-naval organizations involved in oceanography (and operating research vessels) include: Hydrometeorological Service, Institute of Oceanology, Marine Hydrophysics Institute, Acoustics Institute, All-Union Scientific Research Institute of Marine Geology and Geophysics, All-Union Scientific Research Institute of Marine Fishery and Oceanography. The most important of these is the Hydrometeorological Service, which is roughly the equivalent to NOAA. Founded in 1936, it has broad responsibilities for supervising collection of hydrologic and hydrometeorologic data. Its subordinate Arctic and Antarctic Scientific Research Institute is the major organization in polar research. The Service operates some thirty ocean-going research vessels and runs World Data Center B (NOAA runs World Data Center A).

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[16] Data received from the Department of Defense, Office of the Oceanographer of the Navy.
[17] *The Soviet Surge in Oceanography, 1961–1971*, op. cit., p. 13.

The Soviet Naval Hydrographic Service has broad responsibilities for oceanographic and hydrographic surveying and services. In the unclassified literature few details are available concerning their operations and activities. Their concern is with military oceanography, and their research findings are not published. The non-naval research institutions are only the top of the Soviet oceanographic iceberg. While they are federally controlled, they do participate in international activities and publish a vast quantity of scientific material that is readily available.

Unlike many U.S. oceanographers who emphasize "pure research", published in well-known national and international magazines, Soviet ocean scientists are said to be more pragmatic. Their first concern is immediate practical results. Hence, a great deal of the nonmilitary effort is concentrated on problems related to the utilization of ocean resources, both living and non-living. The work of oceanological agencies usually entails locating the resources, be they fish or mineral, and aiding in the development of techniques and equipment necessary to exploit them. Soviet oceanographers also serve the needs of the merchant marine, through the determination of wind and current conditions throughout the world. The Naval Hydrographic Service disclaims the conduct of any basic research, but instead has its basic research requirements done by the civilian institutions. In spite of the fact that the Naval Hydrographic Service downplays its role in Soviet oceanography, it is known to have a major role in oceanic research. The hydrographic office of the Naval Hydrographic Service claims to have produced a total of 2200 charts, which is almost triple the number of issues produced by the National Ocean Survey (OFNO AA) and nearly a third of the quantity issued by the U.S. Defense Mapping Agency. Distribution of Soviet nautical charts is extremely limited, and they are not offered by sale to the public. Every ship which sails for the Soviet Union may be considered as a data source. Some observers consider that the Soviet Union, through its naval survey program and the purchase of foreign chart editions, has compiled a very nearly complete holding of nautical charts of the world.

REASONS FOR SOVIET EMPHASIS ON OCEANOGRAPHY

The basic reasons for the Soviet oceanographic program are:

(1) Support of Soviet naval operations. Oceanography is essential for modern navies, since it supplies information necessary in surface and subsurface navigation, in the production of sonar charts and atlases, in the preparation of bathymetric and navigational charts, in making oceanographic environmental predictions, and in the development of underseas warfare techniques.

(2) Rapid and efficient conversion of basic research into economic development (fisheries, merchant marine, continental shelf).

(3) World respect for Soviet scientific achievements.

(4) Extensive oceanographic activity is required in the northern coastal waters of the U.S.S.R. in support of Northern Sea Route navigation. This route is a vital communications link between eastern and western portions of the Soviet Union, and with increased development of the Soviet Far East, its importance increases.

SOVIET POSITION ON FREEDOM OF SCIENTIFIC RESEARCH AT SEA

The freedom to conduct scientific research on the high seas is a corollary of the ancient doctrine of freedom of the high seas which has been under serious attack ever since the inclusion of article 5, paragraph 8 in the 1958 Continental Shelf Convention. This article reads:

> The consent of the coastal state shall be obtained in respect of any research concerning the continental shelf and undertaken there. Nevertheless, the coastal state shall not normally withhold its consent if the request is submitted by a qualified institution with a view to purely scientific research into the physical or biological characteristics of the continental shelf, subject to the proviso that the coastal state shall have the right, if it so desires, to participate or to be represented in the research, and that in any event the results will be published.

The Soviet Union, as an oceanographic research leader and defender of the concept of freedom of the high seas, defends the right to freely conduct research on the high seas, but has frequently limited access to its coastal waters to U.S. oceanographic vessels. In an article on restrictions on oceanic research, Judith Kildow of the Scripps Institution of Oceanography writes:

> Between 1967 and 1971 the Soviet Union on four occasions gave military security reasons for refusing American scientists' requests to do research in their waters or on their shelf. On the fifth and sixth occasion, the United States attempted to arrange an exchange program to perform physical and chemical work in Soviet waters but met with no response. These cases could perhaps also be attributed to military reasons, if further information were uncovered, since the Russians have consistently turned down American requests to perform research in their waters.[18]

However, the Soviets took a different view at the preparatory meetings on the law of the sea, where they have ardently defended oceanic research:

> In view of the importance of exploding marine scientific research, attempts to deny or limit the freedom of scientific research in the world ocean were completely unjustified. Any such limitation would be a step backward and highly detrimental to the interests of the world community.[19]

Within the context of the proposed economic resource zone in the oceans, developing nations in particular have insisted that all scientific research needs to be controlled by the coastal state in this zone, which may extend out to 200 nautical miles from the coast. The Soviet Union and the United States, the only two nations with major world-wide oceanographic capabilities, are very much opposed to this position because it would adversely affect more than two-thirds of all oceanic research. The United States has, however, expressed its willingness to compromise on the issue to the extent that it would be willing to provide coastal states with specific details on cruise proposals and with data collected within their economic zone, assist them in interpreting the results, and provide coastal states with some technical assistance. The Soviet Union has not made any such proposal and continues to insist on complete freedom of scientific research outside territorial waters of 12 nautical miles.

FUTURE OUTLOOK

The 1971–75 Five-Year Plan emphasized the development of scientific research at sea for the elaboration of problems of the broader and more rational utilization of the resources of the seas and the ocean,

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[18] Judith A. Tegger Kildow, "Nature of the Present Restrictions on Oceanic Research", in Warren S. Wooster, ed., *Freedom of Oceanic Research* (New Yok: Crane, Russak & Company, Inc., 1973) pp. 14 and 15.
[19] United Nations, General Assembly, doc. A/AC r138/ SC III/ SR 38, New York, 1973, p. 77.

and the elaboration of scientific principles of the protection and transformation of nature for the purpose of improving the natural environment surrounding man.[20] The Russians are expected to continue their fleet expansion and training programs, to improve their instrumentation, and to pursue research and development on submersibles. Support of Soviet Navy requirements will continue to maintain top priority in the Soviet ocean science program, and cooperative programs in oceanographic with the U.S. and many other countries will continue.

In view of the U.S.–U.S.S.R. cooperative programs it may be of interest to note that the Soviets have recently called for stepped-up basic research in the field of offshore petroleum geology and geochemistry. In the past these areas have received less attention than other areas of oceanography such as physical and biological oceanography. The United States is the undisputed leader in the world in offshore oil and gas exploration and production. One of our scientific programs in the area of ocean geology is the deep-sea drilling program of which several of our best oceanographic institutions are participating. The deep-sea drilling program possesses the most advanced drilling ship in the world, capable of drilling up to a depth of about 20,000 feet in about 80 percent of the oceans. The sophisticated technology embodied in the drilling ship *Glomar Challenger* is the work of many years of accumulated R&D by the Global Marine Company of Long Beach, California. As part of the U.S.–Soviet program of cooperation in oceanography, the U.S.S.R. has been invited to participate in the program at a cost of $1 million per year. The director of R&D of Global Marine has indicated that a scientist with an engineering background would be able to pick up enough information aboard the ship to copy many of the advanced instruments on the ship.

TABLE 19.—OCEANOGRAPHIC RESEARCH DATA

	Number
Oceanographic ships, 1974:	
U.S. total	120
Of which, reduced status	(10–15)
Owner:	
Government	55–60
University, research groups	25–30
Private industry	40–50
U.S.S.R. total (estimate)	200
Scientists and technicians (total):	
United States	2,000–3,000
U.S.S.R	7,000–8,000
University study program, 1974–75: Field of study (schools):	
Oceanography and marine science	126
Ocean engineering	34
Marine food/fisheries	22

	1st year	Advanced study	Degrees awarded		
			B.S./A	M.S./A	Ph. D.
U.S. graduates entering field:					
1966/67	349	825	39	96	40
1967/68	467	935	74	109	40
1968/69	467	980	113	123	43
1969/70	400	995	117	143	71
1970/71	411	1,049	228	152	52

[20] Mark W. Janis and Donald C. F. Daniel, *op. cit.*, p. 6.

U.S. FUNDING, FISCAL YEARS 1974 AND 1975

[Millions of dollars]

	Fiscal year 1974	Fiscal year 1975
By purpose:		
National security	109.2	97.0
Ocean exploration, mapping, charting, geodesy	94.8	106.8
Research	116.1	131.4
Fisheries development and seafood technology	85.6	94.4
Coastal zone development	103.8	109.2
General ocean engineering	31.9	40.6
Transportation	38.7	43.2
(All other federal programs)	89.5	115.3
Total	669.6	737.9
By Department or Agency:		
Department of Defense	257.4	254.9
(Navy)	(188.9)	(185.5)
(Army)	(31.8)	(31.9)
(Other)	(38.7)	(37.5)
Interior Department	44.5	62.6
National Science Foundation	62.5	63.5
Commerce Department	190.3	216.3
Transportation Department	50.9	61.0
Atomic Energy Commission	7.4	17.5
(All other Federal)	57.2	62.1
Total	670.6	737.9

Source: Department of Defense.

VI. SOVIET UNDERSEA RESEARCH ACTIVITIES

INTRODUCTION

The Soviet Union supports an undersea research and development effort in keeping with its status as a major maritime country. This effort is but a part of a larger national fisheries and oceanographic program the stated goal of which is to attain a leading world role in oceans-related exploration and exploitation.

The major components of Soviet undersea research and development are submersible, habitat, diving, marine biology and aquaculture programs. The broad objective of these programs since the mid-1960's has been to investigate the nutritional, chemical, energy, and mineral resources of the oceans and to evaluate man's role in the exploration and exploitation of these resources. During this period, the Soviet Union has developed some ten habitats and a handful of research submersibles of the manned and unmanned type. At the same time, the Soviet Union has been placing increasing emphasis on the conservation and cultivation of economically and nutritionally significant sea life. The present status of the Soviet undersea research and development effort is reviewed below.

SUBMERSIBLES

Since the early 1960's, the Soviet Union has developed 6 major manned submersibles of the dry-cockpit type.[1] [2] [3] Of this number, one is a tethered observation chamber (Sever-I) which can be used to depths down to 600 m.[4] A second (Gvidon) is an untethered observation chamber with limited mobility capable of achieving a depth of 250 m.[5] Two submersibles (Atlant-I and Atlant-II) are hydrodynamic vehicles which are towed behind a fisheries vessel to depths down to 100 m.[6] The remaining two (Tinro-2 and Sever-2) are self-propelled submersibles of the conventional type with depth capabilities of 300 m and 2000 m respectively.[7] [8] [9] During the same period, the Soviet Union has converted two old-model diesel attack submarines to scientific research vessels. One of these (Severyanka) is no longer operational.[10] A second, unnamed Navy submarine was converted to a diver lock-out platform in the early 1970's.[11] The Soviet manned submersible program is summarized in Table 20.

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[1] Boylan, L. Soviet-Bloc Submersible development. Foreign Science Bulletin (Library of Congress), Vol. 5, 1969, 1–55.

[2] Boylan, L. Recent Soviet developments in undersea technology. Marine Technology Society Journal, Vol. 6, No. 5, 1972, 41–43.

[3] Boylan, L. *Underwater Activities in the Soviet Union.* Informatics Inc. Report, November, 1974, 77 p. (in press).

[4] Danilov, I. Underwater research in the USSR. Sea Frontiers, Vol. 18, No. 5, 1972, 274–280.

[5] Danilov, I.V. and Pavlov, O.P. The manned underwater device "Gvidon." Sudostroyeniye (Shipbuilding, USSR), No. 11, 1972, 4 p.

[6] Boylan, L. Underwater Activities in the Soviet Union. op. cit. p. 32–36.

[7] Boylan, L. Recent Soviet developments in undersea technology. op. cit. p. 41–43.

[8] Fadeyev, Ye. Track in the depths of the sea. Pravda (USSR), Feb. 27, 1974, p. 6.

[9] Ocean Science News. Vol. 16, No. 45, Nov. 8, 1974, p. 3–4.

[10] Boylan, L. Soviet-Bloc submersible development. op. cit. p. 14–17.

[11] Chertkov, V. Aquanauts live on the ground. Pravda (USSR), March 19, 1972, p. 6.

TABLE 20.—SOVIET MANNED SUBMERSIBLES

Submersible	Sponsor	Year developed	Depth capability (m)	Crew	Status
Sever–I	PINRO,[1] Murmansk.	1957	600	1	Operational; several models constructed; tethered observation chamber.
Sever–II	do	1969	2,000	3	Operational; self-propelled submersible.
Tinro–II	TINRO,[2] Vladivostok.	1973	300	2	Undergoing tests; self-propelled submersible.
Atlant–I	AtlantNIRO,[3] Moscow.	1963	100	1	Inactivated; towed, hydrodynamic vehicle.
Atlant–II (Tetis)	do	1972	100	2	Operational; improved variant of Atlant–I.
Gvidon	VNIRO,[4] Moscow	1970	250	2	Operational; untethered observation chamber.
Severyanka	do	1958	200	[5] 10	Inactivated in 1967; converted W-class submarine.
	Soviet Navy	1972	(?)200+	[6] 8	Operational; converted W-class submarine.
Aquarius	IOAN,[5] Moscow	(?)1975	400	3	To be purchased from Canada; self-propelled submersible.

[1] PINRO-Polar Scientific Research Institute of Marine Fisheries and Oceanography.
[2] TINRO-Pacific Scientific Research Institute of Marine Fisheries and Oceanography.
[3] AtlantNIRO-Atlantic Scientific Research Institute of Marine Fisheries and Oceanography.
[4] VNIRO-All-Union Scientific Research Institute of Marine Fisheries and Oceanography.
[5] IOAN-Institute of Oceanology, Academy of Sciences, U.S.S.R.
[5] Scientists.
[6] Divers.

The Soviet Union has also developed a few, small unmanned submersibles since 1967. These include the Krab—series platforms capable of depths down to 2000 m, the Manta, used as a test platform for underwater control systems, and Skorpena, used for ocean layer studies. All of these relatively unsophisticated platforms are cable controlled. Some are equipped with television, photographic, and manipulator systems for sample gathering. The control system of the Manta is somewhat unique in that the operator sits on a gimballed seat in front of a television feedback monitor. The operator is thereby oriented in the same position as the submersible to provide for more accurate manipulation of the platform.[12] This same remote-control concept was used in the Soviet series of unmanned lunar probes which involved the use of small robot vehicles. The Soviet unmanned submersible effort is summarized in Table 21.

TABLE 21.—SOVIET UNMANNED SUBMERSIBLES

Submersible	Year developed	Depth capability (m)	Weight in water kilograms	Status
Krab-I	1967	2,000	200	Operational; used for geological seafloor sampling
Krab-I	1971	2,000	200+	Operational; improved variant of Krab-I
Skorpena	1971	1,000	500	Operational; used for marine biology and study of ocean layer structure
Manta	1972	250	?	Operational; used as a test platform for underwater control systems

In contrast to the Soviet Union, the United States, since the early 1960's, has developed more than 35 manned submersibles and several sophisticated unmanned platforms, some with equipment and depth

[12] Boylan L. *Underwater Activities of the Soviet Union.* op. cit. p. 46–52.

capabilities far surpassing those of the Soviet Union.[13] Likewise, France has also qualitatively surpassed the Soviet Union in submersible development. Only the Soviet Sever-2 is qualitatively comparable to some United States submersibles with like depth capabilities.

The reasons for the relatively poor Soviet performance in submersible research and development are not clear. Apparently, a low priority has been placed on civilian submersible development in the Soviet Union. Likewise, there is no evidence in the literature that the Soviet naval priority for submersible development is any higher. Indeed, with the exception of one converted diver-lockout submarine, there is no evidence in the literature of a single Soviet naval submersible. Finally, there is no evidence to indicate that the Soviet Union will undertake to upgrade its submersible research and development program substantially in the near future.

It is apparent that the Soviets have not conceived of many vital missions for manned submersibles outside of the realm of fisheries research. In this connection, it is worthy to note that most of the past and current inventory of Soviet undersea vehicles belongs almost exclusively to fisheries research organizations. This is in contrast to the United States program wherein only one vehicle has been used for fisheries related research. While the trend in the United States is for the expanded application of submersibles for deep-sea geological research and offshore mineral and energy exploitation, there appears to be no such similar trend in the Soviet Union.

UNDERWATER HABITATS

Since the mid-1960's, the Soviet Union has deployed some ten habitats.[14] [15] All Soviet habitats have been non-naval and the depth to which all of them have been deployed in the Black Sea has not exceeded 30 m. The three major habitat programs have been "Chernomor", in which two habitats and improved variants thereof were deployed between 1968 and 1972.[16] [17] [18] The "Sadko" program between 1966 and 1969 involved the construction of three spherical habitats.[19] The "Ikhtiandr" program involved the development of several small structures which were tested between 1966 and 1969.[20] Finally, the Soviet Union has continued to develop a series of small, inflatable habitats of the "Sprut" series.[21] The status of the Soviet underwater habitat program is summarized in Table 22.

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[13] Manned Undersea Activities of the Federal Agencies and Utilization of Manned Undersea Research Submersibles and Habitats. Department of Commerce. Manned Undersea Science and Technology Office (NOAA), 1972, p. 9–12.

[14] Danilov, Underwater research in the USSR. op. cit. p. 274–280.

[15] Aybulatov, N. A. Oceanological research from manned underwater research laboratories. Oceanology (USSR), Vol. 12, No. 1, 1972, 120–130.

[16] Borovikov, P. A., Brovko, A. N. Podrazhanskiy, A. M., Stefanov, G. A., Yastrebov, V. S. Chernomor-2 sealab. Sudostroyeniye (Shipbuilding, USSR), no. 7, 1971, 19–20.

[17] Borovikov, P. A., Brovko, V. P., Podrazhanskiy, A. M., Stefanov, G. A. and Yastrebov, V. S. The Chernomor-2 underwater oceanology laboratory. P. P. Shirshov Institute of Oceanology, USSR Academy of Sciences, 1973, No. 2737–71.

[18] Klisurov, L. The Chernomor-2 and the experiment off Cape Maslen Nos. Korabostroene, Korabo-plavane (Shipbuilding and Cruising, Bulgaria), No. 9, 1973, 26–30.

[19] Deryugin, K. K. and Dzhus, V. Ye. Some results of scientific research work of the underwater research laboratory. Oceanology (USSR), Vol. 10, No. 5, 1970, 906–910.

[20] Kiklevich, Yu. N. Ikhtiandr-an amphibious man. Leningrad, Hydrometeorological Publishers, 1971, 219 p.

[21] Danilov, I. Underwater research in the USSR. op. cit. p. 274–280.

TABLE 22.—SOVIET UNDERWATER HABITATS

Habitat	Year deployed	Dimensions (m)	Crew	Depth deployed (m)	Duration of experiment	Experimental mission	Present status
Sadko-I	1966	Diameter, 3	2	10	6 hr	Physiology and hydrography	Inactive.
Sadko-II	1967	Diameter, 3 (2 spheres)	2	25	7 days	do	Do.
Sadko-III	1969	do	3	25	4 days	Hydrology and bioacoustics	Do.
Ikhtiandr	1966–70	Variable: 2 by 1; 2 by 2; 6 by 2	1–5	11–12	2 to 14 days	Medicine, physiology, nutrition, marine biology.	Program now involved in the testing of diving suits for prolonged underwater stays.
Chernomor-1	1968	Length, 8; diameter, 3	5–6	13	30 days	Geology; hydrooptics; marine biology; medicine; physiology.	Inactive.
Do	1969	do	5	12	8 days	Oceanology	Do.
Do	1969	do	5	24	17 days	Medicine; physiology	Do.
Chernomor-H	1970	do	5	31	2 days	Ocean engineering	Do.
Chernomor-IIm	1971–72	do	5	15	52 days	Geology; hydrooptics; medicine; physiology; marine biology.	Inactive; donated to Bulgaria.
Sprut (several variants)	1967–72	Diameter, 2.4; height, 2	1–2	5–10	1 to 2 days	Hydrochemistry; used as a diver rest station.	Portable, inflatable habitat several variants of which are still in use.

At the present, the Soviet underwater habitat program is largely inactive. Apparently, the only future habitat program is to be Chernomor-3. The new habitat will be mobile and autonomous. It will probe progressively deeper until a continental-shelf depth of about 300 m is attained.[22] The status of this program is not known at the present time. It is believed that the Soviets will progress slowly toward attaining an operational diving and habitat depth of 300 m.

Bentos-300, another autonomous habitat has been reportedly under development since the late 1960's.[23] [24] This habitat would be able to maintain 10 divers at depths down to 300 m for up to 30 days. The status of this habitat is unknown. It was reported in 1972 that prototype development was under way, but there has been no confirmation of this report.

Unlike certain United States (Sealab series) and French (Pre-Continent series) habitats of the 1960's which were deployed to saturation diving depths of more than 100 m for durations of up to 30 days, Soviet habitat programs have not been deployed to depths exceeding 30 m. Similarly, while the greatest duration of a United States habitat program was 59 days (Tektite-I in 1969), the greatest duration of a Soviet habitat program was 52 days (Chernomor-2m in 1971). Both the United States and French habitat programs have and continue to be qualitatively superior to the Soviet program in terms of habitat construction, life-support technology, depth capability, and program duration and diversity.[25] Western habitat programs have been characterized by geographical flexibility of deployment whereas all Soviet habitat programs to date have been conducted in a relatively small region of the Black Sea. Soviet habitat programs have continued to lag their Western counterpart programs both programatically and technologically.

DIVING

The Soviet Union continues to take a more conservative approach to deep diving than the United States, Great Britain, France, and Italy.[26] While these Western countries have rapidly developed both military and non-military deep saturation (mixed-gas) diving capabilities exceeding 300 m, the Soviet Union is apparently pursuing a moderate depth capability of 300 m or less. Presently, only the Soviet navy is capable of deep saturation diving operations to depths exceeding 200 m. Soviet civilian diving concerns such as those associated with the previously discussed Soviet habitat program are confined to depths of 100 m or less.

A new Soviet experimental diving facility is being constructed on the Black Sea which will permit simulated diving operations down to the 300 m level. At the same time, the Soviet Union is refining shallow-saturation diving techniques down to depths of 100 m using mixtures of nitrogen, oxygen, and small amounts of helium. This economical concept of shallow diving is also receiving renewed attention in the

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[22] Stefanov, G. Underwater research in the Black Sea. Underwater Journal and Information Bulletin, Vol. 4, No. 6, 1972, 249–251.
[23] Danilov, I. Underwater research in the USSR. op. cit. p. 274–280.
[24] Boylan, L. Underwater Activities in the Soviet Union. op. cit. p. 55–60.
[25] Manned Undersea Activities of the Federal Agencies and Utilization of Manned Undersea Research Submersibles and Habitats, December 1972, op. cit., p. 4–9.
[26] Dodge, C. H. International diving programs and technology. NOAA/NAS/NAE Joint Workshop on Manned Undersea Activities. Oct. 17–20, 1972, 13 p.

United States, Sweden, and Japan. The Soviet Union is also developing diving suits and life-support equipment for prolonged (more than 1 day) underwater stays at depths of 100 m or less.[27]

There is little or no evidence that the Soviet Union is attempting to compete with Western deep saturation diving programs. There appears to be no priority for establishing a Soviet deep saturation diving capability in the future which will exceed the 300 m level.

MARINE BIOLOGY AND AQUACULTURE

In keeping with its large and continually growing national fisheries effort, marine biology and aquaculture (the cultivation of marine and freshwater organisms) receive a high priority in the Soviet Union. In terms of facilities and personnel, the Soviet effort in these fields is considered to be the largest and most comprehensive in the world.[28, 29] Fisheries-related marine biology and aquaculture research and development is conducted in scores of institutes under the U.S.S.R. Ministry of the Fishing Economy and the U.S.S.R. Academy of Sciences. The Soviet Union probably has the largest and most rapidy growing aquaculture program in the world. Hundreds of species of marine and freshwater fish, invertebrates, and aquatic plants are undergoing comprehensive study and active cultivation. Hundreds of millions of fish are produced each year from the many hatcheries situated throughout the U.S.S.R. The area devoted to fish cultivation in the U.S.S.R. has more than doubled since the 1950's. At the same time, comprehensive field studies of commercially valuable marine fish and other sea life are aimed at their improved conservation, management and harvest. It is likely that the Soviet emphasis on marine biology and aquaculture will continue to grow rapidly throughout the 1970's.

CONCLUSIONS

The Soviet submersible development program substantially lags behind those of the United States and other Western countries both quantitatively and qualitatively. Nearly all existing Soviet submersibles are associated with the large Soviet fisheries effort. There is presently no indication that the Soviet submersible program will compete with counterpart Western programs in the near future. This is apparently due to the fact that the priority for Soviet non-military submersible development is relatively low. Similarly, there is no evidence that the Soviet navy has now or will support in the future a submersible development program. Apparently, the Soviet Union lacks specific, large-scale undersea goals, such as the off-shore oil and mineral programs of certain Western countries, to justify the support of a large submersible development program.

Soviet habitat and diving programs are similarly modest by United States and Western standards. There is apparently no national undersea goal of sufficient magnitude to justify the support of a deep saturation diving program in the Soviet Union competitive with those

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[27] Brats, Yu. M., Gulyar, S. A., Zubchenko, A. G., Kiklevich, Yu. N., and Selin, V. A. Diving suit for man's prolonged stay underwater. Sudostroyeniye (Shipbuilding, USSR), No. 9, 1971, p. 26.

[28] Ovchynnyk, M. Soviet Fish Culture. IN: The Status and Potential of Aquaculture. (J. E. Bardach et al Eds.), Vol. II. American Institute of Biological Sciences, Washington, D.C., 1968, p. 190–225.

[29] Bardach, J. E., Ryther, J. H., and McLarney, W. O. Aquaculture: The farming and husbandry of freshwater and marine organisms. N. Y. Wiley Interscience, 1972, p. 503–507.

of Western countries. The development of future saturation diving capabilities which will support diving and habitat programs down to the 300-m level will adequately satisfy the Soviet goal to explore and exploit continental shelf areas, the majority of which are at depths of less than 300 m.

The Soviet Union will continue to support large and ambitious marine biology and mariculture programs which are larger than counterpart Western programs. This trend is consistent with a large present and future fisheries effort.

In conclusion, there is no evidence that the Soviet Union is now or will in the future compete technologically with the United States and other Western countries in undersea research and development programs. Where possible, the Soviet Union will attempt to obtain or purchase the Western undersea technology necessary for the attainment of her own limited undersea goals. At present, Soviet undersea goals appear to be constrained by the economy and the lack of large-scale undersea research and development missions such as comprehensive offshore oil and mineral exploitation. This is consistent with the fact that mineral and energy resources in the continental U.S.S.R. remain largely unexploited and will receive a higher national priority in the immediate future than Soviet continental shelf resources. Accordingly, the present modest Soviet undersea technology effort appears adequate to support future undersea exploration and exploration goals which will entail operations at depths of 300 m or less. This depth range is characteristic of most Soviet continental shelf areas.

VII. SOVIET STUDY—OFFSHORE MINERAL RECOVERY AND DEEP SEABED NODULE EXPLORATION

INTRODUCTION

The Soviet Union is placing increasing emphasis on the extraction of minerals from seawater and developing a marine mining industry. Reports in the Soviet press indicate that while the West is more technologically advanced in these areas, development is proceeding at a fast pace in the Soviet Union. In general Soviet publications tend to glamorize the future prospects of offshore mining and gloss over the difficulties. Many of these reports originate with the U.S.S.R.'s authoritative Academy of Sciences. One book, translated to *Mines in the Sea*, published by the Academy in 1969 foresees a sharp increase in underwater mining in the years immediately ahead. It predicts development of huge marine mining and concentration combines for use in remote ocean areas. These combines will resemble floating island-cities and they will be provided with automatic extraction equipment.

Over the past several years Russian magazines have reported development of several types of new equipment for underwater exploration and mineral recovery. In 1970, *Izvestia*, the government's official newspaper, declared that one need hardly have great insight to predict the appearance of a specialized Soviet fleet of ocean-going dredges of various types, ships equipped with ocean mining machinery and floating concentration facilities. The only question *Izvestia* raised is when this fleet would make its appearance. The first generation of these dredges is apparently now in operation. The Soviet Union launched a new modern research ship in November 1974 (first of a series) with which researchers hope to uncover new deposits of minerals in the seas of the Soviet Far East.

OFFSHORE MINING

The extraction of titanium-containing sands from the Baltic Sea in the vicinity of Liepaja was begun in 1968. The *Vyborgsky*, described as a super dredge, was used in the first experimental extraction of offshore ilmenite-rutile-zircon sands by the U.S.S.R. The titanium sands are found in strata from 30 cm. to one meter in thickness, at rather shallow depths of three to eight meters, and are several times cheaper to recover than similar materials mined on land.[1] The Baltic shelf is also rich in other rare metals. Additional deposits of ilmenite-rutile-zircon sands have also been found in the Black Sea.

[1] Mikhailov, S. *Voprosy ekonomiki*, n. 7, July 1972, pp. 101–106.

In 1969 the 1,100-ton ship *Tura* was turned over for ocean mining research by the U.S.S.R.'s Ministry of the Maritime Fleet with plans for equipping it for use in recovering and concentrating tin-bearing ore.[2] This ship has been successful in mineral exploration of continental shelf areas in the Far East, especially where ore minerals have been found on beaches near Nakhodka Bay on the Okhotsk, and on the northeastern and western coasts of Kamchatka. Underwater alluvial deposits of gold have been discovered in Tinkan Bay (the deposit is about two kilometers across) and of tin ore in the area of Khuntazeyev and Syaukhu Bays and other bays in the Sea of Japan.[3]

Deposits of tin ore, cassiterite, in the Sea of Japan extend along the coast in three bands: one along the beach and the other two on the shelf, the first at depths of five to seven meters, the second at depths of 15 to 17 meters. In addition, deposits of phosphorites have been found on the coastal shelf of the Sea of Japan. Sands containing a large percentage of rare metals and lying at a depth of 40 meters have been found in the Kurile Islands, on the bottom of Prostor Gulf near the island of Iturup.

Rich placer deposits of cassiterite lie on the bottom of Vankin Inlet (Yakutia) in the Arctic Ocean where the barge *Gornyak* is being used to extract this ore. This barge, which has ore-concentrating equipment and crew quarters on board, is the first floating mining operation in the Arctic Ocean. The neighboring Selyakhskaya Inlet, the Cape Svyatoi Nos area, the Dmitry Laptev Strait, and the southern part of B. Lyakhovsky Island are also rich in tin.

The Soviets have determined the following minimum content of metals and minerals for profitable recovery offshore: (a) tin in non-freezing areas of the sea, 100 grams per ton of sand, and in freezing areas, 200 to 300 grams; (b) iron in magnetite and titano-magnetite placer deposits, 10%; (c) conventional ilmenite-rutile-zircon placer deposits, 35 grams per cubic meter of sand. Using the above grade limits; the following metals and minerals could be profitably recovered from the U.S.S.R.'s continental shelves: ilmenite, rutile, zircon, titano-magnetite and magnetite, cassiterite, wolframite, gold, diamonds, phosphorite, and other useful minerals.

MANGANESE NODULE EXPLORATION

The Soviet Union has been actively engaged in manganese nodule research and prospecting since the 1950's. Large numbers of photos and samples of nodules have been obtained. Several technical papers have appeared in Soviet scientific journals over the years describing the mineralogy, chemistry, and internal structure of the nodules, their distribution, and hypotheses of origin.[4 5 6] Earlier expeditions were mainly concentrated in the Pacific and Indian Oceans while later investigations have extended into the Atlantic Ocean. At a meeting in the Baltic Sea port of Riga in 1971, Soviet-bloc geologists set up an International Coordinating Center of Marine Exploration in the

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[2] *Oceanography Newsletter*. v. 5, no. 17, April 27, 1970, p. 1-2.
[3] Mikhailov. *op. cit.*, p. 106.
[4] Isayeva, A. B. Chemical composition of the iron-manganese nodules of the Indian Ocean. *Litologiya i poleznyye iskopayemyye*, n. 3, 1967.
[5] Skornyakova, N. S. Manganese nodules in deposits from the northeast Pacific. *Dokl. Akad, nauk SSSR*, 130, n. 3, 1960.
[6] Skornyakova, N.S. and P.F. Andrushchenko. Iron-manganese nodules from the central part of the South Pacific. *Oceanology*, v. 8, n. 5, 1968, pp. 692-701.

Soviet Union. According to a published interview with G. A. Mirlin, head of the Soviet delegation at the Riga meeting and head of the Geology and Mineral Resources Department of the State Planning Committee, expeditions are being planned to the Atlantic and Indian Oceans to select prospective sites for mineral exploitation.[7]

Although the Soviets have dredged many nodule samples from the deep seabed for study purposes, there seems to be little progress toward commercial exploitation. There are indications that no technological development for commercial exploitation of nodules had even begun in the Soviet Union prior to 1970 or 1972. According to an *Izvestia* interview in 1970 with V. Kostin, Deputy Minister of Nonferrous Metallurgy, there is a need to expand ocean-bottom exploration and to give thought to construction of ships for experimental extraction of ore nodules.[8] In 1972, S. Mikhailov wrote in the magazine *Voprosy Ekonomiki* (Economic Problems), a publication of the U.S.S.R. Academy of Sciences' Economics Institute, "In this field we are lagging significantly behing the advanced capitalist countries of the West (the U.S.A. and Japan plan to begin in 1974–1975 the industrial extraction of iron and manganese concretions from the bottom of the Pacific Ocean at depths of 4,000 to 5,000 meters)." [9] He went on to state that it is necessary by the end of the five-year plan (1975) to provide a scientifically substantiated forecast of the volume of useful minerals on the U.S.S.R.'s continental shelf and to begin work on the technical base for exploiting these minerals so that "a large-scale mineral raw-material industry on the seabed and ocean floor can be started in the next five-year plan." From this it would appear that the Soviet's major thrust toward offshore mining will come during the period 1976–1980 and will be based on the continental shelf with some development expected toward deep seabed exploitation. To further this goal and deal with other problems of underwater mineral exploitation, the U.S.S.R. has established the All-Union Scientific-Research Institute for Marine Geology and Geophysics and a Problems Laboratory for Underwater Extraction of Minerals.

On the Soviet shelf, low grade manganese nodules have been discovered in the Baltic Sea, in the Gulf of Riga. In some areas of the shelf they are reported to exceed 3500 tons per square kilometer.[10]

RECOVERY OF MINERALS FROM SEAWATER

The Soviet Union is developing its marine chemical industry with special emphasis being placed on reducing the West's technological superiority in extracting bromine and magnesium from seawater. In the U.S.S.R. more than 70 percent of the requirements for bromine and more than 65 percent of the requirements for iodine are satisfied through domestic production from seawater. However, Soviet industry has mastered bromine extraction only in southern embayments such as the Sivash Sea (a shallow body of water located just east of the Crimea and west of the Sea of Azov), where there are 600 to 1000 grams of bromine per cubic meter of water.[11] Furthermore, according to a report in *Voprosy Ekonomiki*, "We are confronted with the task of artificially increasing the bromine content per cubic meter of

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[7] *New York Times*, 24 April 1971, Soviet bloc plans big seabed study.
[8] *Oceanography Newsletter*. *op. cit.*, p. 2.
[9] Mikhailov. *op. cit.*, p. 106.
[10] *Sovetskaia latviia*, November 24, 1968, p. 4.
[11] Mikhailov. *op. cit.*, p. 105.

seawater to 2,000 grams as a precondition for increasing the capacity of bromine plants and turning them into profitable enterprises."[12] By comparison, until 1969 the United States extracted bromine from ordinary seawater containing only 65 grams of bromine per cubic meter of water. However, this was first concentrated by solar evaporation before processing.

The Soviet Union has also begun and is expanding production of magnesium chloride from brine lakes in the Crimea which in the past were connected to the Black Sea. For comparison, the United States began recovery of magnesium from seawater in 1940 and Great Britain satisfies more than 80 percent of its requirements for magnesium through marine operations where its production costs are lower than the cost of imported magnesium.

One area of particular interest to the marine chemical industry of the U.S.S.R. is the Kara-Bogaz-Gol (an eastern arm of the Caspian Sea). The Kara-Bogaz-Gol is nearly as large as Lake Ontario, and is gradually drying up (maximum water depth is only about 10 meters). Most of the Soviet Union's primary production of sodium sulfate comes from this area, and work is progressing to expand this into a profitable export item. Besides sodium sulfate, Kara-Bogaz-Gol is rich in bromine and magnesium.[13]

According to *Voprosy Ekonomiki*, next in order of priority for both the Soviet and world marine chemical industry is extraction of rare and trace elements, especially gold, from the seas and oceans.[14] The Soviets look toward the complete utilization of seawater—the extraction from it of magnesium, bromine, boron, cesium, and other chemical components—by building integrated chemical enterprises, as the most important way of making the products of marine chemistry cheaper.

LAW OF THE SEA POSITION ON A DEEP SEABED REGIME

The Soviet Union has made known its position on a proposed international seabed regime both through its own spokesmen and those of its satellite countries. As one of the world's greatest beneficiaries from the traditional rules of international legal order of the oceans, the Soviet Union is reluctant to alter those rules. At first, the Soviet Union opposed the notion of a new international organization.[15]

It has been an important Soviet principle that all States should have the right to consent to changes in the law of the sea, and the Soviet delegation has been a proponent of reaching ocean decisions by consensus rather than by majority vote or by a supernational organization. Characteristic of the Soviet position was its long and vocal support of the Inter-governmental Oceanic Commission as the proper means for deciding questions of ocean use.

As pressure grew to establish some form of international authority, the Soviet Union responded by insisting that the powers of that

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[12] *Ibid.*, p. 105.
[13] *Offshore.* Special emphasis is placed by Soviets on improving extraction of minerals from seawater. Sept., 1973, p. 86.
[14] Mikhailov, *op. cit.*, p. 105.
[15] United Nations. A/C1/PV 1708, 1969. p. 76.

organization be strictly limited so as not to infringe traditional freedoms:

> There should be an article stating specifically that the provisions of the treaty did not affect the legal status of the superadjacent waters or air-space of the seabed.[16]

In proposing that the international regime's executive broad reach decisions only on the basis of concensus, the U.S.S.R. sought to ensure that the Soviet bloc would have effective veto power over organizational decisions. The U.S.S.R. has also proposed restricting the power of the authority so that it would only "coordinate the activities of States and not direct them." [17]

The Soviet Union endorses a licensing arrangement with a quota system for granting licenses only to States rather than directly to private entities.

In an attempt to obtain greater support from developing nations at the 1974 Law of the Sea Conference in Caracas, the Soviet Union endorsed exploitation by the Authority through service contracts and joint ventures as well as exploitation by States. Spokesmen for the German Democratic Republic also made a point of advocating that national liberation movements recognized by regional organizations can participate in the seabed Authority.

COMPARISION TO THE UNITED STATES

U.S. technology for deep seabed mining has been undergoing ocean testing since 1970. Commercial scale equipment was first tested in 1974. Despite numerous exploratory and sampling expeditions there are no solid indications that the Soviet Union has developed a commercial seabed mining capability. In fact, inspection of import and export tabulations of mineral commodities of the U.S.S.R. would suggest that offshore mining development in the Soviet Union has been stimulated by the desire to become self sufficient in metals that are now imported (primarily tin) or considerably more expensive to mine on land (titanium minerals).

On the other hand, the U.S.S.R. is essentially self sufficient or a major exporter of the major metals contained in manganese nodules (nickel, copper, cobalt, and manganese). Consequently, developing expensive technology to recover these metals from the deep seabed would not be as pressing a concern to the U.S.S.R. as it would be to the United States which imports these metals. Furthermore, according to the U.S. Bureau of Mines, *Minerals Yearbook*, satisfactory recovery of copper from ores continued to be a problem in the U.S.S.R. resulting in the loss of considerable amounts of metals.[18] Since recovery of metals from manganese nodules requires even more sophistication, one might suspect that the Soviets have not developed the technology to process nodules.

The United States also has a technological lead in the extraction of minerals from seawater. In the United States magnesium is extracted from ordinary seawater, whereas the U.S.S.R. has mastered its extraction only from water containing much higher concentrations.

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[16] United Nations. A/AC 138/SR 56, 1971, p. 154.
[17] United Nations. A/AC 138/SR 56, 1971, p. 155.
[18] U.S. Bureau of Mines. *Mineral Yearbook*. 1971. Volume III, Area Reports: International, U.S. Gov. Print. Office, Washington, D.C., 1973, p. 840.

The United States position at the Law of the Sea Conference is generally much closer to that of the Soviet Union than to the developing countries. The United States differs from the Soviet Union on the quota and licensing system. The United States would permit licensing private entities with no quota on the number of licenses. Since it controls a number of satellite countries, the Soviet Union would obviously gain by its proposal for a quota system licensing only States. Both the United States and the Soviet Union are agreed on the right of all States to explore and exploit the seabed on an equal footing and without discrimination, and oppose exploitation only under direct control by the Authority.

The basic contention in the Law of the Sea seabed debate is between the industrialized countries and the developing countries which favor a strong international authority with "direct and effective control" over all activities and, preferably, direct seabed exploitation only by that authority.

VIII. SOVIET OFFSHORE OIL AND GAS

by Joseph P. Riva, Jr.

THE GEOLOGY AND THE OIL AND GAS PROSPECTS OF THE SOVIET CONTINENTAL SHELF

The oil and gas fields which may be found on Russian continental shelves are expected, by the Soviet geologists, to be an important source of new oil and gas production. Oil and gas potential, however, differs in different parts of the shelves.

The continental shelf of the U.S.S.R. to a depth of 200 meters, covers an area of about six million square kilometers. The shelf includes different geologic elements of the crust ranging from ancient platforms to folded belts. The shelf is divided into three large regions: the continental shelves of remnant seas in southern Russia (such as the Caspian Sea) which are connected with the Mediterranean geosynclinal zone; the continental shelf of the Arctic seas and the Arctic basin, and the continental shelf of the Pacific Far East mobile zone.

Geological knowledge of these shelf areas is scanty except for the Caspian Sea shelves which are well known. In the Caspian Sea, good prospects for large hydrocarbon reserves are certain.[1]

Southern U.S.S.R.

In the southern region there are large, geologically active, crustal depressions which contain great thicknesses of sedimentary rocks (20 kilometers in the Caspian Sea area and 10 to 12 kilometers in the Black Sea). The presence of these thick sedimentary rock sections and the discovery of large accumulations of oil and gas both in the sea and in the adjoining lands indicate a high rating for the hydrocarbon potential of the continental shelf in the southern U.S.S.R. and especially in the Caspian Sea shelf. The Caspian Sea, with its large oil and gas potential, is at present undergoing extensive offshore drilling and exploitation. It is the world's largest interior body of water, with an area of 430,000 square kilometers. Approximately 60 percent of its area is 200 meters or less in depth. The most promising section of the Caspian Sea for hydrocarbons is the Apsheron-Balkhan zone, a sill that separates the Tersk-Caspian basin from the South Caspian depression. This zone is made up of a chain of folded geological structures associated with the rich Apsheron and West Turkmen hydrocarbon provinces, including such large fields as Neftyanyye, Kamni, Zhiloy Island, Zhdanov Bank, Cheleken, and others. The oil and gas in this province are in middle Pliocene (about five million years old) deposits.[2]

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[1] Eremenko, N. A., Malovitskiy, Ya. P., Gramberg, I. S., and Lebedev, L. I. Geologic Structure and Oil and Gas Prospects of the USSR Continental Shelf. *American Association of Petroleum Geologists Bulletin*, v. 57, n. 2, February 1973, p. 235.

[2] Ibid., p. 239.

In the Black Sea and the Sea of Azov exploration will test geological structures in Cretaceous and older Tertiary rocks (26 million to 136 million years old). Oil and gas prospects are considered good in this area.

Northwestern and Arctic U.S.S.R.

More than 70 percent of the Soviet shelf area fronts the Arctic Ocean. Much of it is poorly explored, yet sufficient data are available to show that the Arctic shelves are associated largely with stable and ancient platforms of Precambrian ingeneous and metamorphic rocks, which in general are unfavorable for hydrocarbon accumulation. There has, however, been later subsidence, folding, and sedimentation in smaller areas of the Arctic shelves which have enhanced oil and gas potential especially in the gently dipping platform sedimentary rocks that extend from the land onto the shelf. This potential is supported by the major finds in northern Siberia and Alaska.

The Arctic Barents Sea, opening on the Arctic Ocean, is about 1,405,000 square kilometers in area. About one half of this expanse is deeper than 200 meters. The sea is underlain by fold belts of several ages, each of which is the basement of a younger rock cover. In the Barents Sea seismic surveys have determined the presence of all the basic requirements for an oil and gas bearing complex.[3]

In the Pechora Sea, the southeastern part of the Barents Sea, extensions of anticlinal axes have been traced which on land form the northern part of the Timan-Pechora oil and gas province. The White (Beloye) Sea includes a portion of the Barents-Pechora Basin in which the Devonian rocks (395 million years old) are the principal oil and gas objectives and have great potential.

To the south, the U.S.S.R. sector of the Baltic Sea contains approximately 60 prospective oil and/or gas structures which have been identified both onshore and offshore. Source beds, volume of reservoir rocks, and density of local structures appear to increase seaward indicating that even larger subsea reserves are present.[4]

Further east, beneath the Kara Sea is an offshore continuation of the rich West Siberian basin. The largest oil and gas fields in the Soviet Union are in the West Siberian basin and include such giants as Urengoy and Samotlor. More than 170 fields have been discovered in the basin, of which about 60 percent are strictly oil fields. In the Kara Sea the thickness of the sedimentary section is believed to be two or three kilometers. A considerable increase in sandstone thickness is expected in the offshore zone of the Kara Sea along with large gas and gas-condensate accumulations thought to occur on vast uplifts and at shallow depths.[5]

The Laptev Sea shelf has a total area of about 650,000 square kilometers and at the edge of the continental slope its depth is 100 to 200 meters. The most favorable oil and gas prospects are in the rocks of the Khatanga depression and in the southern Laptev trough, which has a similar structure.

The East Siberian and the Chukchi Seas are generally shallow. The average depth of the East Siberian Sea is only 50 meters while the

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[3] Eremenko, N. A., Ovanesov, G. P., and Semenovich, V. V. Status of Oil and Gas Prospecting in USSR in 1971. *American Association of Petroleum Geologists Bulletin*, v. 56, n. 9, September 1972, p. 1716.
[4] Eremenko, N. A., Malovitskiy, Ua. P., Gramberg, I. S., and Lebedev, L. I. Op. cit., p. 240-241.
[5] Eremenko N. A., Ovanesov, G. P., and Semenovich, V. V. Op. cit., p. 1716.

Chukchi (Chukotsk) Sea, 80 meters. The shelves are characterized by large positive and negative structures. Oil and gas potential is considered good in the negative basins and depressions.

Pacific Far East Mobile Zone

In this region the Bering, Okhotsk, and Japan Seas are in the transition zone from continental platform to the Pacific Ocean basin. Geosynclinal deeps and their associated island arcs separate the continental platforms from the ocean crust. The Al'katvaam Khatir basin of the U.S.S.R. Bering Sea shelf has good hydrocarbon potential for gas and condensate pools already have been discovered onshore nearby. There are other depressions in which hydrocarbons may be present.

About half of the shelf area of the Sea of Okhotsk and the Japan Sea contain good prospects for hydrocarbons, especially on and adjacent to Sakhalin and in the western Kamchatka shelf. Commercial oil and gas reservoirs have already been discovered by directional drilling onshore, into the Odoptu-Tossin uplift in the northern Sakhalin shelf.

Conclusion

Approximately 75 percent of the extensive Soviet continental shelf has good oil and gas potential. The possibilities are associated with such adjacent land features as platform basins and troughts, foredeeps, and depressions. The rocks of Mesozoic age are of primary importance and the older Paleozoic rocks are secondary. More than 70 percent of the prospective shelf area is the Arctic seas, where deep depressions containing great thicknesses of sedimentary rock are present on the shelves and connected closely with proven oil and gas provinces on land, but these shelf areas still require further study. Climate and geography, as well as geology, favor continued development of the Caspian region. In the Far East, the Sakhalin shelf and Anadyr' depression should be of primary interest because of the discoveries already made there. The U.S. Geological Survey estimates U.S.S.R. potential offshore gas reserves at 100 to 1,000 trillion cubic feet and potential offshore oil reserves at 100 to 1,000 billion barrels.[6]

CURRENT STATUS OF SOVIET OFFSHORE OIL AND GAS EXPLORATION AND PRODUCTION

Caspian Sea

Caspian Sea production reached a peak in 1970 of 258,000 barrels per day and declined to 236,000 barrels per day in 1972. In 1973 average production rose to 240,000 barrels per day of oil and gas condensate from 2,287 wells. Caspian gas production in 1973 gained over 1972, averaging about 700 million cubic feet per day. The largest production increases were in the Baku Archipelago, where 17 new oil and gas wells were added during the first eight months of 1973.[7]

Offshore production in the Caspian moved north with discovery of a new field about ten miles from Derbent in Dagestan. By the end of 1971 there were 11 fields in the southern part of the offshore Caspian

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[6] Frezon, Sherwood E., *Summary of 1972 Oil and Gas Statistics for Onshore and Offshore Areas of 151 Countries*. Geological Survey Professional Paper 885, Washington, 1974. p. 141.

[7] King, Robert E. Petroleum Exploration and Production in Europe in 1973. *American Association of Petroleum Geologists Bulletin*, v. 58, n. 10, October 1974, p. 1991.

Sea. Wells in the Caspian Sea area are often highly productive. A well drilled and completed in October of 1974 by the jack-up rig Chazar was reported to flow at 875 barrels of oil per day from 14,495 feet. The well was drilled in the Livanov-East Bank field on the eastern coastal shelf. The Soviet Union is building two fixed platforms to test the western coastal shelf as well. A structural test to 6,562 feet is planned on the first platform, about six miles offshore, and a 13,124 foot test to determine productivity of deeper horizons will be drilled from the second platform.

A new Dutch-made pipelaying barge has been purchased for the Caspian Sea area. The vessel will be able to lay 112 miles per year of pipe as large as 31.5 inches in water up to 656 feet deep. By comparison, total oil and gas pipeline laid by the Soviets in the Caspian in over 50 years of offshore oil and gas activity is 186 miles at a maximum water depth of 82 feet. The new barge is 350 feet long and weighs 8,000 metric tons. It was built in Rotterdam and towed 3,700 miles, in two sections through rivers and canals, to Astrakhan at the northern end of the Caspian. In the summer of 1974, the U.S.S.R. announced that it had approved plans for building its largest crane ship to permit construction of fixed Caspian Sea platforms in over 300 feet of water. Tentative completion date is 1976. The self-propelled catamaran will be equipped to lift 600 metric ton loads more than 130 feet above the sea. The largest crane ship now operating in the Caspian has a 250 metric ton lifting capacity.

Black Sea

In the Krasnodar area, a gas discovery was made near the Sea of Azov, a northern arm of the Black Sea. Most of the gas-containing structure lies offshore beneath the Beisuglei Estuary. A well has been drilled from a fixed platform and tested at seven million cubic feet of gas per day. Two more wildcats are planned.

In the Black Sea west of Crimea the large Golizinsk structure was found by drilling operations started in 1971. The drilling produced gas of non-commercial value. In 1974, after a two year delay, two fixed platforms have to be erected to further test the Black Sea area. A new wildcat will be drilled from a platform in about 150 feet of water about 43 miles offshore to a target depth below 13,000 feet. In 1974 there was drilling also on Zmeinyi Island in the northwestern sector of the Black Sea about 25 miles from shore and near Romanian territorial waters. The wildcat was drilled directionally from the small island toward a subsea structure and was apparently unsuccessful.

Other areas of exploration and production

Exploration has begun in the Baltic Sea. The U.S.S.R. Ministry of Geology has requested assistance from the offshore technology section of the Ministry of Petroleum Industry to develop a design for platforms to be used in exploring the Baltic Sea.

To the north, the Yamal Peninsula has been an area of much drilling activity. Seven gas fields have been discovered on the peninsula and the largest, Kharasavei, extends about ten miles under the Kara Sea. This is a giant field with reserves estimated at 35.3 trillion cubic feet. Seismic data indicate potential oil and/or gas bearing structures which extend west and north from the Yamal Peninsula into the Kara Sea and east beneath the Ob Gulf. A recently drilled well near

the Ob Gulf flowed more than 35 million cubic feet of gas per day along with some gas condensate. Further west, geophysical exploration for oil and gas is in progress offshore from the Kola Peninsula.

In the Far East, the Soviets and Japanese are working on an agreement for the development of the continental shelves of Sakhalin Island in the Sea of Okhotsk. Under terms of the agreement, the U.S.S.R. will use about $155 million in loans from Japan to lease seismic and drilling equipment and purchase other machines and supplies. The U.S.S.R. will reimburse Japan, at about six percent interest, only if oil and gas is found. Japan in turn will be allowed to buy production at an 8.4 percent discount for the first ten years to compensate for its risk. The joint venture is expected to explore 50,000 square miles of the north coast of Sakhalin and about 18,000 square miles off the southern coast, both in about 600 feet of water. To date, 39 small oil and gas fields have been found onshore on the Island and some onshore wells have been directionally drilled to tap offshore hydrocarbon zones. The Soviet Union plans to construct a drilling platform off northeastern Sakhalin in water about 50 feet deep. As many as twelve wells may be drilled off the platform to depths of about 10,000 feet. The structure will be assembled onshore and towed to the drilling location. A reinforced concrete jacket will protect the structure at the water line where ice-pack pressure is greatest.

SOVIET OFFSHORE PRODUCTION TECHNOLOGY

The Soviet Union began operational tests last fall on the first modern mobile offshore drilling rig built in Russia. The rig, the Kaspy, is a jack-up unit constructed at Astrakhan's shipyard at the northern end of the Caspian Sea, from where it was towed to the port of Baku where it will be based. It is expected to be ready for work this year.[8]

The rig is capable of drilling to about 20,000 feet in waters up to 200 feet in depth. The new unit is the first of ten Kaspy-class jack-ups the U.S.S.R. hopes to complete by 1980. The second rig in the series is under construction, but the overall program as announced in 1970 is far behind schedule. Soviet sources have announced that the Kaspy is about 189 feet long, 156 feet wide, and has a displacement of 10,000 metric tons when fully loaded. The length of the four legs is 330 feet. The rig was fabricated in three sections and was designed to to operate in ice free areas in waves up to 40 feet high and in winds of up to 100 miles per hour.

Russia has two other Soviet-built jack-ups in service, both at work in the Caspian Sea. They are the Apsheron, activated in 1966, which can drill to 6,000 feet in 50 feet of water; and the Azerbaijan, activated in 1972, which can drill to 12,000 feet in water up to 66 feet deep. The only other U.S.S.R. mobile offshore rig is the more modern Dutch-built Chazar which also is based in the Caspian Sea. It can drill to 21,000 feet in about 200 feet of water.

The U.S.S.R. currently has no semisubmersible drilling rigs. However, Deputy Minister of the Petroleum Industry, V. I. Mishevich, speaking recently in Baku to delegates of an offshore oil conference,

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[8] New Russian Built Jack-up Due for Operational Tests. *The Oil and Gas Journal*, November 11, 1974, p. 112.

called for widening cooperation with foreign firms in order to use their experience in developing Russia's subsea oil and gas. He went on to say that Soviet construction of semisubmersible offshore drilling rigs, or their purchase from abroad, is essential to Russia's newly expanded and accelerated program for offshore exploration and development.

SOVIET POLICY REGARDING OFFSHORE OIL AND GAS DEVELOPMENT

It appears that the U.S.S.R. is mounting an all-out national effort toward developing domestic oil and gas production to attain even greater self-sufficiency domestically and also to assume a much stronger oil and gas export position in Europe. The Soviet Union has orders and inquiries for 4.5 million tons of line pipe, made to steel mills in Europe since last fall. Such tonnages indicate a new and massive petroleum effort. The Russians, however, have conceded that they will not achieve their original petroleum production goals for 1975, the last year of the current five year plan. Revised targets have been set at 9,788,000 barrels per day for crude oil and gas liquids and slightly more than ten trillion cubic feet per year for natural gas. Initial goals for 1975 were 10.1 million barrels per day for liquids and 11.3 trillion cubic feet per year for gas.

In a recent article in *Pravda*, Professor A. Geodekian, Deputy Director of the U.S.S.R. Academy of Sciences' Oceanographic Institute, called for increased basic research in the fields of offshore petroleum geology and geochemistry.[9] The article warns that these areas have been given too little attention, possibly because of the country's large proved onshore oil and gas reserves. While the Soviet Union can obtain large increases in onshore oil and gas for many years into the future, the greater drilling depths at which the new onshore discoveries are being made add considerably to the cost and complexity of exploring and developing dry land deposits. Under these conditions, the article continues, the continental shelves and slopes merit closest attention. The article concludes with the recommendation that the potential oil and gas content of all the shelves surrounding the U.S.S.R. and also the interior seas be mapped in advance and that organized and basic research be undertaken which would assist in this exploration.

Russia's vastly improved foreign exchange position has cleared a major obstacle to larger Soviet purchases of advanced offshore technology which only the West can provide. Increased oil export prices have enabled the U.S.S.R. to transform record trade deficits into large surpluses. The reasons for Russian interest in Western offshore technology include: a growing need for such equipment in the Caspian Sea and in the Sea of Azov, as well as in the Arctic's Barents and Kara Seas, and in the Sea of Okhotsk in the Far East; long delays in obtaining inferior equipment manufactured domestically; and disappointing results in exploring for large new onshore crude reserves during the past several years.

The Soviet Union is thus looking increasingly to its shelves for additional oil and gas production. According to B. V. Tkachenko, who directed the Institute for Arctic Geology for almost 25 years, potentially petroliferous structures on Russia's western Arctic shelves

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[9] Basic Ocean Research is Pushed Faster in Russia. *Offshore*, December 1974, p. 19.

in the Barents, Pechora, and Kara Seas will be clearly defined within the next few years, permitting more detailed exploration and then actual development within the next ten years.[10]

Russian newspapers, to prepare the population, have assured their readers that offshore drilling is now so environmentally safe that "literally not even one drop of pollution-causing liquid falls into the sea." [11]

The United States is far in advance of the Soviet Union in offshore technology and production. However, the Soviet Union, with total oil and gas reserves two to three times that of the U.S. and a much smaller rate of domestic consumption, has apparently determined to exploit the oil and gas reserves on its continental shelves to the full extent permitted by its technological resources. The United States, on the other hand, is currently assessing its policy toward offshore oil and gas production in light of the various impacts of such development on the coastal zone and the marine environment as well as on overall energy considerations.

SOVIET POSITION AT THE LAW OF THE SEA CONFERENCE

The Soviets view their position on the continental shelves as an improvement on the existing law of the sea. The areas of improvement that have emerged from the presentations of the Soviet delegation are the need to limit territorial seas to 12 miles (the traditional Russian territorial sea) and the need to strictly define the legal extent of the continental shelf. Maximum claims to the continental shelf, under the Soviet proposal, would be to 500 meters or 100 nautical miles, whichever was greater.[12]

The Soviet position is defined as: (1) The outer limit of the continental shelf may be established by the coastal State within the 500 meter isobath. (2) In areas where the 500 meter isobath is situated at a distance less than 100 nautical miles measured from the baselines from which the territorial sea is measured, the outer limit of the continental shelf may be established by the coastal State by a line every point of which is at a distance from the nearest point of said baselines not exceeding 100 nautical miles. (3) In areas where there is no continental shelf, the coastal State may have the same rights in respect to the sea bed as in respect of the continental shelf, within the limits provided for in paragraph (2).[13]

Soviet reference to depth as the determining factor in claims to the continental shelf is ideally suited to take maximum advantage of their physical situation. The continental shelves of the U.S.S.R., to a depth of 200 meters, cover an area of about six million square kilometers. To permit claims out to an additional 300 meters in depth, particularly in the shelf areas of the Arctic seas and the Sea of Okhotsk, would add to this an enormous additional area. The exploitation of these vast shelf areas would, in all probability, result in very substantial additions to Soviet oil and gas production.

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[10] *Ocean Oil Weekly Report*, v. 9, n. 10, December 2, 1974, p. 2.
[11] Gardner, Frank J., U.S. and U.S.S.R. Diverge on Energy Policy. *The Oil and Gas Journal*, December 9, 1974, p. 31.
[12] Janis, Mark W. and Daniel, Donald C. F. The USSR: Ocean Use and Ocean Law. *Occasional Paper No. 21, Law of the Sea Institute*, University of Rhode Island, May 1974, p. 10.
[13] Ibid.

IX. SOVIET MARINE POLLUTION PROGRAMS

Soviet interest in the marine environment parallels, both on a time and a spatial scale, the development of its marine policies. Early manifestations concentrated on those inland and offshore waters of most immediate concern, where levels of pollution, coinciding with reduced fish catches, have been increasingly publicized over the past few years—the Black, the Caspian, the Aral and the Barents Seas, and the Baltic in particular. But with its broader orientation toward a global marine policy, the Soviets appear more and more directed toward cooperative efforts with other nations. This may be seen in their participation in efforts of such organizations as the Intergovernmental Maritime Consultative Organization and the United Nations Environment Program, its membership in the seven-nation Baltic Sea Convention, and in their bi-lateral associations with several countries, including the United States. Kolbasov describes this cooperative effort as "a clear political directive" contained in the resolutions of the 24th Congress of the Communist Party.[1]

THE TERRITORIAL AND INLAND SEAS

Protection of territorial waters in the U.S.S.R. received increased attention throughout the 1960's, with growing awareness of the effect of pollution on offshore fisheries and an improved level of technology that presaged exploratory activities on its continental shelf, an outgrowth of even earlier concentration on pollution of the Caspian and other traditional fisheries. Formal expression of that concern was set out in Article 36 of the law "Principles of Water Legislation of the U.S.S.R. and the Union Republics," adopted by the Supreme Soviet in December 1970.

Pollution of the oceans from land-based sources has received increased emphasis. Measures to combat such pollution have concentrated on the principal river basins, where it is reported in the Black and Azov Seas basins "treatment plants with a total capacity of 5.8 million cubic meters a day and water supply circulation systems with a capacity of 21 million cubic meters a day" were built in the period 1966–1970.[2] In the Baltic basin, particularly in the Latvian SSR, the treatment of sewage water increased 1.6 times and the capacities of treatment plants increased 8 times over the 1966–70 period. Oil pollution of the Caspian Sea is reported to have been cut in half as a result of protection measures performed in the 1968–72 period, following adoption of a 1968 decree of the Council of Ministers, U.S.S.R.,

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[1] Oleg S. Kolbasov, Head, Department of Legal Problems of Environmental Protection, Institute of State and Law, Academy of Sciences of the U.S.S.R. *Legal Protection of the Environment in the U.S.S.R.* Paper presented at the U.S. Council on Environmental Quality, May 1973. (mimeo.)

[2] Y. P. Belichenko et. al. The protection of ocean waters against pollution. *Rybnove Khozyaystvo* No. 12 (Moscow) 1973. (U.S. Joint Publications Research Service, No. 61111, 31 Jan. 1974.)

"On Measures to Prevent the Pollution of the Caspian Sea." [3] In other areas, a report by TASS in mid-1974 indicated that in 1973 alone "1,700 water purification complexes were built. Large scale works are being built to insure basins of the Volga, Ural, Kama, Don, Irtysh and Moskva rivers." [4]

Against the charge that, although the U.S.S.R. has many broad, even toughly worded laws to control air and water pollution, but tends to enforce them in haphazard fashion, a mid-1974 report from Leningrad indicates that prosecution of polluters of basin waters is being vigorously pursued. B. Kochetov, Chief of the Procurator Division in Leningrad reported his office had "brought 30 officials to disciplinary account, and instituted 15 criminal cases." [5] Leningrad's sewage system is reported under modernization "so that by 1985, its outfall should compete in cleanliness with the waters of natural rivers and springs." [6]

Beyond the protection of river basins feeding into offshore waters, the U.S.S.R. is reported to have issued rules and regulations relating to construction and operation of installations on the continental shelf. Most of these appear to be related to geological surveys and prospecting work.[7]

Of perhaps more significance for marine environmental protection are the Soviet programs relating to shipping and port operations. Belichenko relates a variety of regulations to conform U.S.S.R. shipping and port procedures to its commitments under the oil pollution conventions of the Intergovernmental Maritime Consultative Agency.[8] According to this report, coastal installations for the treatment of ballast and other oil polluted waters are operating in six of the country's eight tanker ports (Batumi, Tuapse, Novorossiysk, Klaypeda, Ventspils, and Nakhodka), and construction of similar installations are being completed at Odessa in late 1973. He reports that 90 percent of the vessels of the Estonian maritime steamship company, and all of those of the Baltic company, are equipped with oil separators and "at the present time all of the ships being built were being equipped with treatment equipment or sufficient capacities for the collection of petroleum-polluted waters, sewage, debris, and other waste which is taken to coastal or floating treatment plants." [9] Beyond this, two sets of instructions have been developed and distributed throughout the fleet to implement the IMCO oil pollution conventions: *Instructions on the Reception and Testing of Ship Petroleum-Water Separators;* and, *Directions on Preventing the Pollution of the Seas by Petroleum.*

Another report describes measures to improve the marine environment at Kola Gulf, on the Barents Sea, where construction of a high-capacity installation was started at Murmansk in 1973.[10] The installation is designed to take polluted water from merchant ships and purify it of oil mixtures and other wastes. TASS also reported that "most of the large Soviet harbors have available coastal stations

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[3] Ibid.
[4] Environmental protection measures in U.S.S.R. related. TASS International Service (Moscow) 4 June 1974. (JPRS No. 62235, June 13, 1974.)
[5] B. Kochetov. For clean water and air. *Sotsialisticheskaya Zakonnost'*, No. 2 (Moscow) 1974. (JPRS No. 61951, May 9, 1974).
[6] Marine Pollution Bulletin, Vol. 5, No. 7 (London) July 1974.
[7] Balichenko, *op. cit.*
[8] Ibid.
[9] Ibid.
[10] The drive to keep the oceans pure. TASS (Moscow) 26 Nov. 1973 (JPRS No. 61009, Jan. 17, 1974).

which protect the water area from oil pollution," and that in 1973, such installations "collected over 100,000 tons of oil which, if discharged, could have caused great damage to the sea and coast." [11]

Administration of these programs, relating to protection of inland and offshore waters is exercised by the Ministry of Reclamation and Water Resources, according to a January 1973 report from *Pravda*.[12] A proposal to create a national environmental body to manage environmental programs was rejected by the Soviet government in April 1973, mainly because such an agency would mean duplication of staff. To improve environmental management, Deputy Premier Vladimir Kirlillin stated the Government had ordered the nation's 15 republic governments to "work out concrete proposals" for better environmental protection.[13]

THE WORLD OCEANS

Beyond its territorial waters and the river systems feeding into them, the Soviet Union's concern has found expression in the past few years in several international arrangements. The basis for such cooperation is reported to have been provided for in a decree of the 24th CPSU Congress:

> The position of the Soviet Union in the matter of the international political and legal aspects of the use of the world ocean is derived from its unchanging peaceful foreign policy course. The Program of Peace which was adopted by the 24th Congress of the CPSU envisages the participation of the USSR together with other countries which are interested in the solution of the problems of the exploration and exploitation of the world ocean.[14]

Under this decree, the Presidium of the USSR Supreme Soviet issued a ukase titled "On Increasing Responsibility for Pollution of the Ocean with Substances Which are Harmful to the Health of People and the Biological Resources of the Sea." [15] The ukase, issued to put teeth into the Soviet's commitments under the IMCO conventions on oil pollution and ocean dumping, provides heavy fines for violators of the conventions' terms, for inspections of ships' logs, and for the reporting and subsequent prosecution of violations beyond territorial jurisdiction of the U.S.S.R.[16]

Among several international cooperative actions by the Soviet Union to improve the marine environment, the September 1973 signing of an agreement on environmental protection of the Baltic Sea is significant. The agreement, believed to be the first of its kind, was signed by Ministers from the seven Baltic nations—Finland, Sweden, Denmark, East Germany, West Germany, Poland and the Soviet Union.[17] Discussions leading up to the convention included a November 1972 meeting of Baltic nations scientists at Gdynya and a resolution to create a scientific center to coordinate marine research; a first international symposium for protection of the Baltic,

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[11] Ibid.
[12] CPSU Central Committee and USSR Council of Ministers resolution: "On the Intensification of Nature Conservation and the Improvement of the Utilization of Natural Resources." *Pravda*, (Moscow) 10 January 1973. (USSR Economic Affairs, 16 Jan. 1973, K1).
[13] Christian Science Monitor, April 27, 1973.
[14] S. Molodtosov. Urgent problems of the law of the sea. *Mirovaya Ekonomika I Mezhdunarodnye Otnosheniya* (Moscow) June 24, 1974. (JPRS No. 63047, Sept. 24, 1974).
[15] V. F. Kostin, Deputy Chief of State Inspection for the Protection of Water Sources, USSR Ministry of Land Reclamation and Water Resources. *Sovetskaya Rossiya* (Moscow) 20 Sept. 1974. (JPRS No. 63307, Oct. 29, 1974.
[16] Ibid.
[17] Cleaning up the Baltic. *Marine Pollution Bulletin*, Vol. 5, No. 6 (London) June 1974.

at Rostock in 1972; formal discussions in May 1973 to formulate measures to protect the Baltic by the seven countries; and signing of the Convention in September 1973.[18] Under the *Convention on Protecting the Marine Environment in the Region of the Baltic Sea*, signatory powers established a secretariat and a commission to carry forward the Convention's purpose—to prevent the dumping of poisonous wastes into the Baltic and to preserve the living resources of the Sea. Joint research projects have been instituted under the Convention. At the Soviet-Swedish Symposium on the Baltic in 1974, plans were outlined for further joint research. Among these is the biological study of the sea bed organisms and algae which could serve as indicators of hydrological phenomena, and the determination of changes in chemical composition of the water and of the oxygen balance of Baltic waters. A follow-up Soviet-Swedish symposium is scheduled in Stockholm for September 1975.[19]

Beyond its international role as a participant in the IMCO oil pollution conventions and the Ocean Dumping Convention (all of which, according to Soviet sources, have been implemented by new laws and regulations by the U.S.S.R.) the Soviet Union has entered into a wide variety of bilateral marine pollution agreements in the past two or three years. Those cited by TASS include agreements with the United States, Canada, France, Finland, Iran, and other "socialist countries."[20]

The U.S.-Soviet agreement to pursue ocean studies in particular, and environmental protection in general, has its genesis in a May 1972 "summit" agreement. Following that, in late June 1973, a joint communique issued at the Western White House on the week-long meeting of President Nixon and Premier Brezhnev included a provision on ocean studies:

> Considering the unique capabilities and the major interest of both countries in the field of world ocean studies, and noting the extensive experience of U.S.-U.S.S.R. oceanographic cooperation, the two sides have agreed to broaden their cooperation and have signed an agreement to this effect. In so doing, they are convinced that the benefits from further development of cooperation in the field of oceanography will accrue not only bilaterally but also to all peoples of the world. A U.S.-U.S.S.R. joint committee on cooperation in world ocean studies will be established to coordinate the implementation of cooperative programs.[21]

The agreement announced in the communique was signed in late October 1973, and provided for a two-step program to establish a joint marine environmental monitoring network. The first step was to provide for simultaneous publication in the U.S. and the U.S.S.R. of a marine journal containing "articles reflecting the highest level of marine research being conducted in the U.S. and the U.S.S.R."[22] The second step provided for the establishment of a scientist exchange program, under which as many as 10 marine scientists from each

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[18] Tom Yemel'yanov. Polemic notes on the fate of the Baltic Sea. *Neva*, No. 3 (Leningrad) March 1974. (JPRS No. 61951, May 9, 1974).

[19] Problems of studying the Baltic. *Sovetskaya Latviya* (Riga) 24 Nov. 1974. (JPRS No. 63713, Dec. 19, 1974).

[20] TASS International Service, 4 June 1974, *op. cit.*

[21] New York Times, June 26, 1973, p. 18.

[22] U.S. and U.S.S.R. accord aims at establishment of joint marine environmental monitoring system. Environmental News, U.S. Environmental Protection Agency news release, Nov. 2, 1973.

country would exchange visits each year to lecture and become acquainted with marine research in the host country; research methodologies would be emphasized in the early stages of these exchanges.

Prior to the formalization of U.S.-U.S.S.R. cooperative research, several exchanges had taken place. In May 1973, a team of Soviet marine scientists visited the U.S. under a Joint Working Group on Effects of Pollutants on Marine Organisms. These meetings were carried out under the terms of the Agreement on Cooperation in the Field of Environmental Protection signed by President Nixon and Soviet Chairman Podgorny in May 1972. The main purpose of the Joint Working Group was the discussion of possible cooperative projects for controlling the pollution of ocean waters, formalized by the October 1973 agreement.[23]

Other elements of the U.S.–U.S.S.R. cooperative oceans studies program included a visit to the Soviet Union by a team of U.S. oil production specialists in September 1973, which included a tour of the Caspian Sea offshore oil development.[24] Among current joint studies is one related to oil industry pollution.[25]

In spite of the rather rapid movement of the Soviet Union into the international marine environment arena, government officials have continued to press for further multi-lateral effort. In early 1974, A. Yushchak, Director of the Soviet Institute of Oceanography noted concentrations of harmful substances of oil, mercury and detergents in the North Atlantic, and called for "the immediate organization of the international observation and investigation of marine pollution."

> Although two international conventions to prevent pollution of the sea have been adopted in the past two years, Mr. Yushchak stresses that there are still many outstanding problems. He proposes the establishment of a global system of exploration of the oceans, which would pay particular attention to the increasing discharge of oil and oil products.[26]

Yushchak's proposals for a "sort of global research system would include three levels, an international level of observations in the open seas outside the zone of international regional agreements (such as the Baltic area); regional ones in individual neighboring regions of the oceans on the basis of international agreements; and national ones in territorial waters and on the continental shelves.[27] Beyond this, additional measures to reduce and prevent marine pollution were proposed in late 1973. These included:

> The reception and treatment of ship ballast waters in all tanker ports;
> Supplying all ports with a sufficient amount of petroleum and debris collectors, floating cleaning stations, and other equipment for the cleaning of port basins;
> Equipping ships of the maritime, fishing, and river fleets with petroleum-water separators for the removal of petroleum products from ship drainage waters;
> The construction and reconstruction of water protection facilities . . . at industrial enterprises and facilities which dump untreated or insufficiently treated sewage waters into the seas and its basins.[28]

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[23] U.S. and Soviet Marine Scientists Meet in U.S. May 13–27. Environmental News, U.S. Environmenta Protection Agency news release, May 13, 1973.
[24] Moscow meeting aimed at pollution prevention. U.S. Department of the Interior news release (Geologoical Survey) Sept. 29, 1973.
[25] U.S.–U.S.S.R. Joint Committee signs pact on environmental cooperation. U.S. Environmental Protection Agency news release, Nov. 16, 1973.
[26] Marine Pollution Bulletin. Vol. 5, No. 5 (London) May 1974.
[27] A Yuschak. How do you feel, ocean? *Pravda* (Moscow) March 5, 1974. (JPRS No. 62022, May 17, 1974).1
[28] Belichenko et al. *p. cit.*

No attempt is made here to evaluate the success of the Soviet effort to improve the marine environment. A survey of the translated literature appears to indicate an effort not unlike that currently pursued in the United States. But a comparative review of the efforts of the two countries indicates that both are pursuing similar programs with respect to offshore dumping, implementation of the IMCO oil pollution and ocean dumping conventions, and the control of effluent discharges into river systems. There is no dearth of criticism of effort in the literature of either country, and official news releases from both attest to an earnest effort at cooperative solution of ocean problems.

X. IMPLICATIONS OF SOVIET OCEAN POLICY ON U.S. POLICY

NATURE OF THE SOVIET CHALLENGE—IS U.S. NUMERICAL INFERIORITY IMPORTANT?

Over a period of about two decades, the Soviet Union has emerged from a minor ocean power with primarily coastal interest to a major ocean power with global interests. From a small Navy consisting of 852 vessels in 1946 with primarily regional responsibilities, the Soviet Navy today counts 2,630 vessels, operating in the Atlantic, Pacific and Indian oceans. While the actual evaluation of comparative U.S.-Soviet naval capabilities is a very complex task which goes beyond the scope of this study, the United States is no longer the sole heir of Britain's naval power. In terms of numerical strength, the U.S. Navy declined from a total of 2,630 active naval vessels in 1956, to 511 by July 1974. Several additional naval vessels were retired in 1974, and the total number of active vessels is said to have declined to well below 500 vessels.[1]

Within a period of about two decades, the Soviet Union has emerged from a primarily coastal fishing nation to one of the most modern—if not the most modern—fishing nations in the world. In contrast to the United States which has slightly over 1,000 modern fishing vessels over 100 GRT, the Soviet Union operates about 5,000 ocean-going fishing vessels of 100 GRT or more. Several of these Soviet fishing vessels are known to be equipped with sophisticated electronic gear, capable of collecting data for military and research purposes.

The Soviet merchant marine moved from a relative insignificant position—number 23 on the list of the major merchant fleets of the world—to the seventh place, just ahead of the United States. The United States came out of the Second World War with the largest merchant fleet in the world, but its position deteriorated rapidly after the war. A new government subsidized plan (Merchant Marine Act of 1970) has prevented the U.S. merchant marine from declining even further. To support their growing ocean capabilities, the Soviet Union is undertaking a vast program in the marine sciences. Particularly in recent years when the U.S. budget for basic oceanic research has been lowered, the Soviet Union has rapidly expanded its own programs in oceanography.

The only areas in ocean affairs where the United States still holds a significant lead over the Soviet Union—both quantitatively and qualitatively—is in offshore petroleum drilling and production, submersibles, and in deep-sea mining of manganese nodules.

By the end of the decade the Soviet Union may be in a position to claim numerical superiority in many aspects of maritime power, e.g.

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[1] The number of vessels is not the only and not necessarily the best way to compare capabilities. Comparisons should include size and types of ships, and differences in strategic missions.

naval ships, merchant marine tonnage, etc. The implications of numerical inferiority itself may not be disturbing. However, as the Soviet policy is unified and integrated the overall impact may be greater than the numerical sum of the parts. Likewise, as many of the Soviet ocean programs involve denial of U.S. access to waterways and resources, and establishment of Soviet control, the measures of relative capability, the differential rate of Soviet augmentation of maritime power, may be translated into gains and losses of the Superpower adversaries.

TABLE 23.—COMPARATIVE STRENGTHS AND WEAKNESSES IN UNITED STATES AND SOVIET OCEAN ACTIVITIES

	United States	U.S.S.R.
Size merchant fleet in 1946 (in deadweight tons)	50, 820, 000	[1] < 2,500,000.
Size merchant fleet in 1974	[2] 14, 148, 000	[3] 16,797,000.
Number of merchant vessels in 1946	4, 888	[4] < 600.
Number of merchant vessels in 1974	[5] 612	2,306.
Manpower aboard merchantman, 1974	28, 379	About 90,000.
Men in merchant marine officers training programs	[6] 2, 499	[6] 5,000 full-time, 4,000 part-time.
Oceanographic research ships, 1974	120	200.
Scientists and technicians in oceanography, 1974	2, 000–3, 000	7,000–8,000.
Fishing vessels over 100 gross tons 1974	1, 019	About 5,000.
Number of fishermen, 1973	140, 538	About 200,000.
Total marine catch, 1972 (metric tons)	2, 650, 000	7,757,000.
Fishing vessels, 1974 (tonnage) in gross tons	586, 253	5,383,000.
Active naval vessels in 1946 (numbers)	2, 630	852.
Active naval vessels, July 1974	[7] 511	2,336.
Manned research submersibles	35	8.
Mareculture	([8])	Largest and most comprehensive program in the world.
Deepsea mining	([9])	No commercial seabed mining capability.
Offshore oil production, 1972 (in barrels)	472, 300, 000	86,140,000.
Offshore natural gas production 1972 (in billions of cubic feet).	3, 325	[10] 0.

[1] Includes about 500,000 deadweight tons provided by United States under lend-lease.
[2] Active fleet only; reserve fleet excluded (mostly old-fashioned or uneconomical).
[3] Includes about 500,000 deadweight tons provided by United States under lend-lease (still registered).
[4] Includes 43 vessels provided by the United States under lend-lease.
[5] Active fleet only.
[6] United States figure per June 1, 1974; U.S.S.R. figure for 1973.
[7] Projected to decline even further in fiscal year 1975.
[8] Limited program.
[9] Commercial seabed mining capability.
[10] United States has superior technology for offshore drilling and production.

Source: Various Government and nongovernment sources.

Thus, if the numerical advantage leads to control by the Soviet Union of the Mediterranean, the Indian Ocean, fishing waters in the Atlantic and Pacific, etc., then the maritime contest will have specific political and security dimensions. If it merely represents the prestige and honor of being the biggest or No. 1, the utility is of lesser magnitude. The likely mixture of the two suggests a careful appraisal in-depth of the implications is in order.

DEMANDS ON THE UNITED STATES OF ECONOMIC INTERDEPENDENCE AND GLOBAL SECURITY

Raw material deficiencies in the United States are likely to increase the dependence on foreign sources of supply. Control of the foreign sources, security in transport and leverage in pricing may all be influenced by American maritime power. Sole U.S. ownership and control of raw material sources, transport and handling facilities is neither possible nor necessary. However, some foreign controlled operation of sources and means of transport would likely be inimicable to U.S.

interests. Major Soviet control or influence over pricing, sources, strategic waterways, tankers and other ships might make the U.S. and other western industrial nations an economic hostage to Soviet policy. With much greater dependence on foreign sources and facilities, the Japanese have been able to retain considerable independence and economic security. But the effects of greater U.S. economic dependence on foreign facilities might have are suggested by the interactions of Japanese political and economic policies. However, as the U.S. position has been one of providing an umbrella for independence of action of such countries as Japan, the impacts might be greater on world alignment by a changing relative position of the U.S. vis-a-vis the Soviet Union or a shift in the maritime balance.

ORGANIZATIONAL REQUIREMENTS FOR U.S. OCEANS POLICY

The major deficiency in the U.S. response to a potential challenge of Soviet maritime power is the inability to make a coordinated and integrated assessment of impacts and needs. The benefits and costs of ocean programs should be assessed individually and in concert. The fragmentation of the U.S. organization of agencies dealing with maritime policy is one factor inhibiting this assessment. Perhaps the time is ripe to consider a NASA-type approach to U.S. oceans policy. An integrated maritime effort need not suffer from the Soviet problems of overcentralization and Party-military dominance. A NOAA with broader responsibilities and coordinating policy might be able to formulate a more integrated U.S. policy assessment that would facilitate a more knowledgeable assessment of appropriate future courses of action.

Congress has taken steps in this direction in the past. From 1960–65, several measures to establish national ocean policy studies and mechanisms to carry them out were introduced and considered by Congress. In 1966 Congress passed the Marine Resources and Engineering Development Act "to develop, encourage and maintain a coordinated comprehensive, and long-range national program in marine science for the benefit of mankind to assist in protection of health and property, enhancement of commerce, transportation, and national security, rehabilitation of our commercial fisheries, and increased utilization of these and other resources."

The major actions mandated in the legislation was the establishment of two new organizations, the National Council on Marine Resources and Engineering Development, and the Commission on Marine Science, Engineering and Resources (called the "Stratton Commission"). On January 9, 1969, the Stratton Commission released a report, entitled "Our Nation and the Sea; A Plan for National Action."[2]

The Stratton report strongly recommended the formation of an independent agency—the National Oceanic and Atmospheric Agency—for national ocean policy planning and program coordination. The Commission also recommended the creation of a National Advisory Committee for the Oceans (NACOA), a presidentially appointed, broadly representative committee to provide continuing advice for

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[2] Commission on Marine Science, Engineering and Resources, *Our Nation and the Sea; A Plan for National Action* (Washington, D.C., U.S. Government Printing Office, January 1969).

the broad national marine community in the development of a national marine program.

In October 1970, the government did create a National Oceanic and Atmospheric Administration (NOAA), which differed in two major ways from the agency proposed in the Stratton report; it was not an independent agency, but instead was established within the Department of Commerce, and it did not contain the Coast Guard as proposed in the report. NOAA today consists of the following former entities: Environmental Science Services Administration of the Commerce Department; the Bureau of Commercial Fisheries and elements of the marine sports fisheries program of the Department of the Interior; the Marine Minerals Technology Center of the Bureau of Mines in the Department of the Interior; the Office of Sea Grant of the National Science Foundation; elements of the U.S. Lake Survey of the Army Corps of Engineers; the National Oceanographic Data Center of the Navy; the National Oceanographic Instrumentation Center of the Navy; and the National Data Buoy project of the Department of Transportation.

In recent years the Nixon administration has suggested the consolidation of the programs of seven of the Cabinet departments into four major new departments. The Nixon administration proposed to make NOAA a part of a newly created Department of Natural Resources. NACOA, the other offspring of the Stratton report (NACOA was created in 1971 by act of Congress) at first favored the administration's plan, but in its most recent report (June 1974) the committee has raised several objections. NACOA has also continued to emphasize the deleterious effects of the excessive fragmentation of the Federal oceans program, and recommended in its 1974 report the consolidation of the following entities: NOAA; the U.S. Geological Survey of the Department of the Interior; the marine and coastal zone portion of the civil planning, policy and funding activities of the Army Corps of Engineers; the mineral leasing program for the OCS and submerged lands management duties of the Bureau of Land Management of the Department of the Interior; all marine related functions of the Department of the Interior's Bureau of Sports Fisheries and Wildlife; and the U.S. Coast Guard.[3]

While the creation of NOAA in 1970 did establish for the first time a Federal lead agency for ocean affairs, a large number of important ocean-related functions are still scattered over five other departments and a number of independent agencies. NOAA is the leader among the various ocean agencies, but it has limited authority over the others. The Interagency Committee on Marine Science and Engineering (ICMSE), which was set up in 1971, serves as the primary interagency coordinative mechanism on ocean-related programs.

National policy making in the area of ocean resources management is evolving rapidly. Since Senate Resolution 222, authorizing a Natioual Ocean Policy Study to be conducted by the Committee on Commerce, passed on February 19 of 1974, the National Ocean Policy Study has issued four reports on offshore oil and gas and other economic problems related to the development of ocean resources. On the basis of these studies legislation has been introduced. However, in

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[3] National Advisory Committee on Oceans and Atmosphere. Third Annual Report, A Report to: The President and Congress, Washington, D.C., June 28, 1974, pp. 16 and 17.

spite of these reports and legislative attempts by Congress, there has not been any major progress in the direction of establishing one coordinated ocean agency to carry out ocean policy.

AGENDA FOR LAW OF THE SEA DELIBERATIONS

The Soviet position on international law in general and the law of the sea in particular has apparently been more influenced by the policy ends of their integrated oceans' program. As a result, their negotiating position has from time to time been traditional and at other times pragmatic or flexible. International law appears to be more a means than an end or principle in this Soviet pattern of behavior.

In the relatively short period after the Second World War the Soviet Union turned from a minor sea power with limited capabilities to a major maritime power. These basic changes in maritime capabilities are reflected in the changes in the position on the law of the sea by the Soviet government. William E. Butler, a British expert on Soviet law distinguishes three or possibly four stages in the development of Soviet attitudes toward the law of the sea.[4] From 1917 until about 1948, the military weakness of the Soviet Navy and the nation's vulnerable sea frontiers were reflected in a continuation of Tsarist laws and practices concerning coastal jurisdiction, fishing, innocent passage, etc. In fact, neither Soviet doctrine nor its practices departed fundamentally from that of non-socialist states. Butler writes that these practices were generally compatible with Soviet foreign and maritime policy during that period. "Dependent upon foreign shipping to carry sea-borne trade, possessing modest naval forces suitable at best for coastal defense, and striving to attain diplomatic recognition, expanded foreign trade, and greater international acceptance, the Soviet government was neither disposed nor in a position to challenge effectively the public order of the oceans."[5]

With the general worsening of East-West relations, the Soviet position on the law of the sea changed. From 1946 until the early 1960's the Soviet Union vigorously enforced its 12 mile fishing zone, and in contrast with the pre-war period it became increasingly difficult for foreign fishing interests to extract concessions by treaty to fish up to or within 3-miles of the Soviet coast. With still no major naval force to speak of, Soviet jurists and diplomats—without exception and in contrast with the legal doctrine of the prewar period—sought to create a legal basis for broad claims over coastal waters and expanded jurisdiction on the high seas.[6]

During this period the Soviet Union became obsessed with encirclement and national security matters. Butler writes that Soviet jurists who prior to 1940 had interpreted Soviet legislation as creating contiguous zones were criticized for their harmful and mistaken views. Commencing in 1948, the U.S.S.R. insisted that it had always claimed a 12 mile territorial limit, supposedly fixed by Tsarist Russia in 1909, and some Soviet jurists even went so far as to question the existence of a "right" of innocent passage.[7] Historic waters and closed seas were

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[4] William E. Butler, *The Soviet Union and the Law of the Sea*, (Baltimore: The Johns Hopkins Press, 1971), p. 198.
[5] Ibid., p. 199.
[6] Ibid., p. 199.
[7] Ibid. p. 199.

introduced into Soviet doctrine, the doctrine of freedom of the high seas was redefined in a manner consistent with Soviet interests, and the concept of state piracy was militantly defended in legal media.[8]

The Soviet Union did participate in the 1958 conference on the law of the sea, but failed to get its ideas incorporated in the four conventions. The Soviets ratified three of the four conventions, and acted unilaterally in areas where no agreement was reached (breadth of territorial seas and innocent passage for warships).

The emergence of the Soviet Union as a major maritime power in the late nineteen sixties once again brought about major changes in their attitudes towards the law of the sea. As a major naval power, capable of defending its coastal area and protecting its interests outside the U.S.S.R., the Soviet Union has gradually turned into a staunch defender of the freedom of high seas concept. At the preparatory conferences on the law of the sea in New York and Geneva (1971–1973) and at the Caracas meeting of the Third Law of the Sea Conference (summer 1974), the Soviet Union opposed the claims of those developing countries demanding extensive zones of national jurisdiction for some of the same reasons the Soviet Union once favored extensive coastal state jurisdiction and insisted on "historic waters" and "closed seas". The Soviet Union now wants narrow territorial limits (no more than 12 n.m.), freedom of navigation through international straits, and freedom of scientific research outside territorial waters. On fisheries, the Soviets have indicated a willingness to compromise by allowing developing countries to harvest as much fish as they can within their economic zone but leaving the remainder of the maximum sustainable yield (to be determined by all interested parties) free for other countries with fishing interests in the area. Soviet draft articles on the continental shelf also show objections to claims of up to 200 n.m. made by some developing countries. The Soviet Union instead has proposed national jurisdiction over the continental shelf up to a water depth of 500 meters, or 100 nautical miles (whichever is larger). As the Soviet Union has vast shallow seas adjacent to its northern land borders, acceptance of this position would bring most potentially petroliferous areas under national jurisdiction.

In sharp contrast to the minor-power position taken by the People's Republic of China on the international regime which is expected to be established for the management of deep-sea resources, the Soviet Union insists that the Soviet bloc will have veto powers over all organizational decisions, and that the power of the executive organ of the international regime will be limited to coordination of the activities of states and not direct them.

Butler writes that Soviet practice reveals a pattern of pragmatic, rather traditional, often sensitive appraisals of the existing state of international law by Soviet authorities.[9] When the Soviet Union moved from minor to major maritime power status, its views on the law of the sea gradually changed from a rather revolutionary to a very traditional and conservative approach, which is more in tune with the western capitalist states than with the developing socialist and non-socialist nations.

United States policy has been largely focused on the preservation of traditional concepts of international law as ends in themselves. As

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[8] Ibid., p. 200.
[9] Ibid., p. 201.

a result, where traditional concepts such as freedom of the seas and international control of waterways coincide with U.S. interests, the position serves our overall maritime interests. However, some critics of the administration's position on the law of the sea have wondered whether this traditional position does not tend to downgrade the importance of access to the oceans' resources. These critics contend that at a time when the United States is becoming increasingly dependent on foreign sources of supply for many important raw materials, access to ocean minerals should not be used as a *quid pro quo* to maintain other traditional freedoms of the seas. However, others would argue that in recent years the administration has revised its earlier position on the law of the sea, and moved towards a more balanced position, attempting to preserve traditional freedom of navigation and passage through straits, while moving to protect resources-related interests.

In addition to the advantage of being able to apply *realpolitik* to issues concerning the law of the sea, the Soviet Union has the added advantage of a more unified domestic position on the major issues. In the United States it has proved difficult to reconcile the interests of coastal-water fisheries with distant-water shrimp and tuna fisheries, deep-sea mining interests with naval interests, nationalists with internationalists, ocean scientists with ocean resource industry interests, etc.

Differing Soviet and U.S. views regarding international law, with the companion unified and fragmented Soviet and U.S. policies, tend to color the approaches of the two nations to agenda items and at times places the U.S. at a disadvantage in negotiations.

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