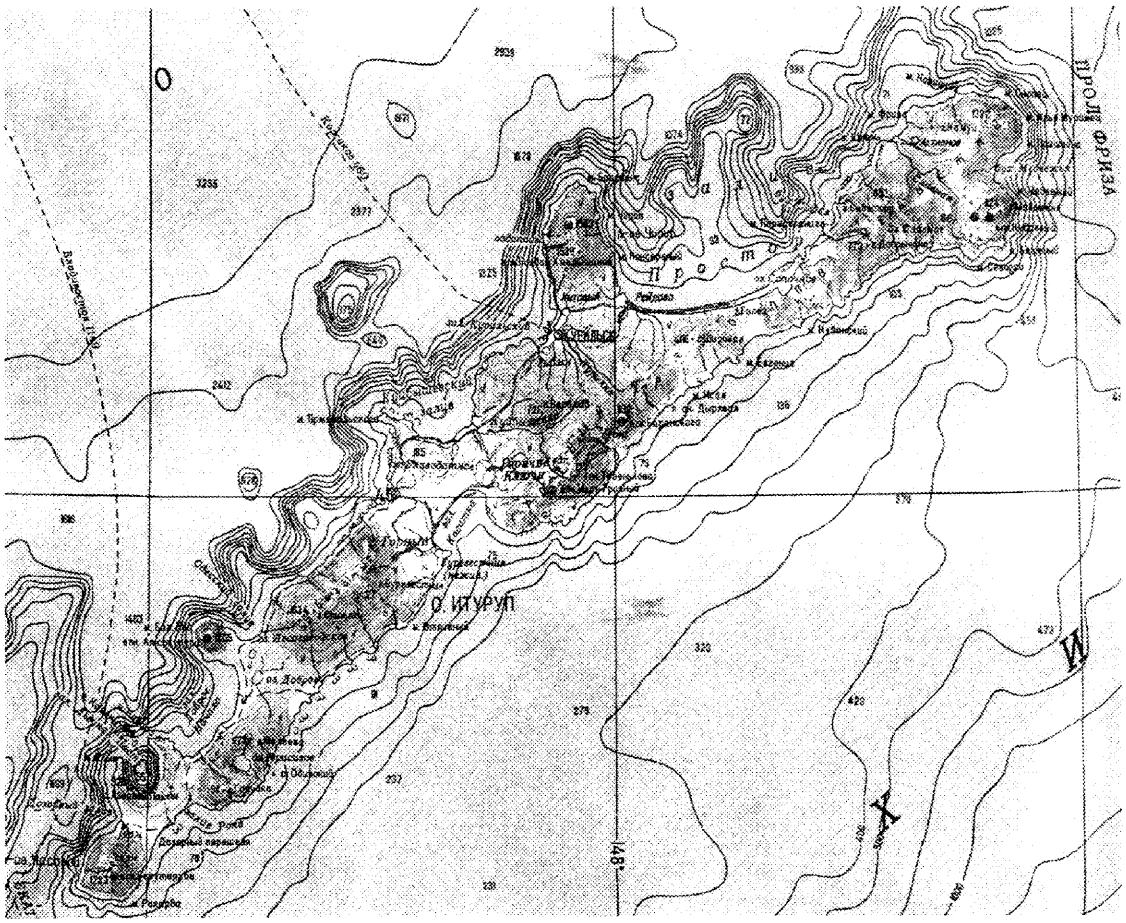
Iturup island

Physico- geographical description

Iturup island is the largest in the Archipelago of the Kurile Insular Arc. Its length is 203 km from south-west to north-east, width is from 6 to 36 km and total area is 6725 km^2. The Okhotsk sea coast of the island is indented with bays (Lvinaya Past, Dozorny, Dobroye Nachalo, Odessky, Kuibyshevsky) and peninsulas (Chelust, Klyk, Atsonopuri, Przhevalskogo and Chirip) to a much more degree than its Pacific one. On the opposite side of peninsulas of the Okhotsk sea coast there are massive and poorly dissected coastal cliffs jutting out into the ocean. All this formed the landscape of the island as made up of separate mountain ranges and group of volcanoes connected with more or less wide hilly or low-laying isthmuses. (Fig. 3.1 page 58 of the Russian language original).



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There are 9 active, 7 dormant and 4 possibly active volcanoes on the island [20]. The highest point of the island, (1634 m. above sea level) , is located on the top of dormant volcano Stokap (Bogatyr mountain range). 9 independent or separate volcanic groups are distinguished [21] such as: Medvezhy range, Kamui range, Ivan Grozny volcanic complex, Chirip peninsula, Przhevalsky cape, Bogatyr mountain range, caldera Urbich with Krasivoye lake, caldera Lvinaya Past and Berutarube volcano. Iturup is located in the southern part of the Kurilian Chain.

Climate of Iturup is of marine and monsoon type, as of the most of the other Kurile islands, due to the specific currents and features of air masses' circulation. Warm current Soya produces a great warming effect on the Okhotsk sea coast of the island. The table 3.1 shows major climatic indicators for the town of Kurilsk (based on multiannual observations). Winters are mild, but long, given the island's latitude: average negative monthly temperatures persist from December till March. Winters are characterized with frequent snowfalls and snow blizzards with snow cover reaching 80-110 cm. on the level areas.

Table 3.1 - Major climatic indicators recorded in the Kurilsk area, Iturup island [1]

Climatic indicators	
Average temperature of January, t ◦C	-5.8 ◦C
Average temperature of July, t ◦C	13.6 ◦C
Average temperature of August, t ◦C	16 ◦C
Absolute minimum recorded in the period of 1912- 1985), t ◦C	-27 ◦C February, 1967
Absolute maximum recorded in the period of 1891- 1985), t ◦C	31 ◦C August , 1938
Timing of air temperature transition through 0 ◦C in spring	April 4
Timing of air temperature transition through 0 ◦C in autumn	December 3
Duration of no-frost period (days)	242
Averaged date of the snow cover formation	December 16
Averaged date of removal of the snow cover	April 25
Annual precipitation (mm)	1040
Average # of days with fog	50
Average # of days with snow blizzards	68
Likelihood of rain storms (days)	4
Likelihood of hail (days)	0.9

Winters are warm; on some days in January and February air temperature can be as high as 7 ◦C due to south-western winds. The lowest air temperatures are observed in February, with absolute minimum being -27 ◦C. Monthly average for February is as low as -8.6 ◦C. In some years January could be the coldest month. Spring season starts in April and lasts for about three months. Summer season begins in late June and lasts into September.

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August is the warmest month with average temperature of 16 ◦C, reaching 17.6 ◦C in some years; over some years September could be the warmest. A recorded temperature maximum for summer season was 31 ◦C. As a whole, an annual air temperature profile is comparatively smooth [1,22] , showing no sharp jumps. Duration of vegetational season is about 127 days. In some years soil frosts are observed in early June; in autumn they are observed starting from the second half of September.

An average annual precipitation reach 1000-1500 mm in the area of the southern Kuriles [3,23]. Distribution of precipitation amount is approximately equal for both warm, and cold seasons. 30-35 % of the annual precipitation falls on cold season (November – March) with appr. 40 % falling on the warm one. In the autumn precipitation is appr. 1.5 times as great as that for the spring time. In Kurilsk the greatest precipitation falls on the autumn season – 338 mm with lowest value falling on the spring one (203mm). The highest monthly average for precipitation is up to 128-220 mm; with lowest average being as low as 56-58 mm. Most of precipitation come down in the form of rain (See the table 3.2 below). In the annual sum for precipitation solid precipitations make up 29 %, liquid – 55 % and mixed ones - 16 %.

Table 3.2 Average precipitation for Kurilsk area (mm) [23]

Per month	Solid precipitations	Liquid precipitations	Mixed precipitations
I	88		5
II	44		12
III	42	3	17
IV	27	19	23
V	2	64	10
VI		63	
VII		77	
VIII		98	
IX		101	
X	1	94	16
XI	41	49	38
XII	54		39
Per year	299	568	160

The figure 3.2 shows monthly average for precipitation around Kurilsk and Yuzhno-Kurilsk based on multiannual observations.

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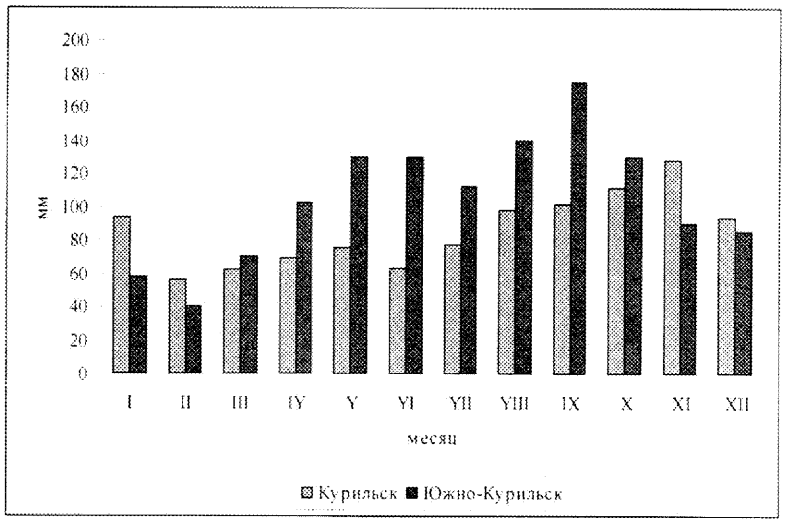

Mountain terrain, considerable precipitation accompanied with comparatively low moisture losses for vaporization and seepage contributes to development of a dense river network. Rivers of the Iturup are predominantly of the mountain type and short with dominating length of 10-15 km and width of 5-10 m (up to 30 m in the lower reaches). Water depth is 0.7-2 m. and current velocity is 0.5-1 m/sec (up to 3 m/sec in the upper reaches). In the mountains river beds are cataracted, with waterfalls of 30 m high. River bottoms are rocky and pebbled for the most part; gravel areas can be found only in the lower reaches.

There are about 200 rivers and creeks on the island, which flow into the sea either directly , or via the system of lakes and channels. Of all the island rivers explored, 37 are from 5 to 10 km long, 6 have a length from 11 to 20 km and 3 rivers are from 21 to 30 km long. The length of the longest rivers is as follows: Kuibyshevka river – 24 km. and Slavnaya river – 22 km. In the upper reaches of the Slavnaya river and the left tributary of the Kuibyshevka river – Mnogoozyorny creek – there are 2-5 km plain-like stretches where the current is slow and water depth is up to 2 m. Mnogoozyorny creek drains numerous lava – dam (choked) lakes of Ivan Grozny caldera. Water from some rivers (Severny and Yuzhny Chirips) can not be used for drinking due to a high acid content.

As a rule only some rivers get frozen in the estuarine part (rivers such as: Kurilka, Kuibyshevka, Slavnaya and Reidovaya), this taking place in the reaches with slow current. As to the hydraulicity, the regimen of the rivers is very poorly studied so far in the Sakhalin Region. Spring flood ends in early June. During the warm season there could be from 2 to 4 rain floods with average duration of 6-15 days.

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During high water (flood) periods water level rise by 0.4-0.8 m. (sometimes by 1.5 m.). In low water period rivers could be crossed on foot. Relatively long-term observations were conducted only on Kitovaya river by such agency as SakhUGKS, and the river can be used as a reference. In the annual water level profile one can distinguish spring floods, non-stable summer-autumn low water period with rain floods and stable winter levels. The start of spring floods more often than not falls on late April - early May. Floods take place as one push with insignificant fluctuations of water level both at the beginning and at the end. Typical flood related rise in the water levels with respect to a normal one is 0.4-0.6 m. in the upper reaches and 0.8-1.0 m in the lower reaches with highest rise being 1.2-1.4 m. Average flow rate for Kitovaya river amounted to 0.53 m^3/sec. for the 1971-1988 years' period. Minimum calculated flow rate amounted to 0.17 m^3/sec. for the winter and 0.26 m^3/sec. for the summer.

Lithological composition of the Kurile islands' rocks, formed by recent volcanism, gives rise to a deep circulation of underground waters and their intensive seepage into the beds of rivers and lakes. Due to this reason, the share of seepage flows amounts to 50 % of the annual volume for average annual rivers' hydraulicity, while for the most of the rivers of Sakhalin island this value fluctuates from 20% to 30 % [24].

There are more than 30 lakes in the Iturup island. The largest of them (Blagodatnoye, Kasatka, Dobroye and others) are of lagoon origin, while others (Slavnoye, Lopastnoye, Chistoye and Izumrudnoye) are of lava dam-up origin. The large lava – dam Slavnoye lake in caldera of Medvezhiy volcano, has a surface area of 2,69 km, water depth of 4m. and elevation of water table - 174 m. The above-mentioned Krasivoye lake has a caldera origin. Several of limonite lakes are located at the foot of the Chirip and Bogdan Khmelnitsky volcanoes. The largest of them – the Tikhoye lake – is connected with the Severny Chirip river via a channel ending in the Limonite cascade.

As a whole (the above-mentioned – Translator's note) hydrometeorological conditions can be considered comparatively favorable for reproduction of salmon at a freshwater period of life cycle. An abundant seepage of ground waters, comparatively warm winters with lots of snow falls in conjunction with insignificant daily fluctuations of air temperature prevent freeze up of the spawning grounds and death-out of fish eggs laid into the spawning grounds soil. Furthermore, a relatively uniform annual distribution of the surface run-off has been observed, due to rich vegetational cover and great forest areas. .

Forests of the Iturup island are of the open woodland type and made up of larch, dwarf Siberian pine, fir tree, stone birch and oak. Trees are mainly 5-8 m. high, with average distance between them being 4-10 m.

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Depressed flag shaped and elfin types of coniferous trees and stone birch (*Betula Ermani*) with undergrowth of bamboo as tall as 3.5 m. occupy big portion of the island area. Somewhere bamboo forms heavy going obstacle of its own. At altitudes higher than 700 m mountain slopes (except the cones of active volcanoes) are dominated by the dwarf Siberian pine, which occupy 42 % of the Iturup island wooded area [25]. The fir tree's range on the island is limited by Atsonopuri peninsula and Lesozavodskoye lake. On the island one can see castor oil trees, hydrangea, squawbush (sumah), and Kurile cherry. Japan poplar, willow and other tree species are common along river banks. Under the cover of bamboo such plants as euonymus, maplewood, and oak grow. Northern mountain slopes are often covered with thick growth of elfin alder wood. River banks are covered with thick tall grass made up of buckwheat, groundsel and butterbur.

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