CHANGES OF THE INTERTIDAL MACROBENTHIC BELT-FORMING COMMUNITIES IN IZMENY BAY (KUNASHIR ISLAND, SOUTH KURILE ISLANDS): A SURVEY OF 1963 REPEATED IN 1991 AND 2011

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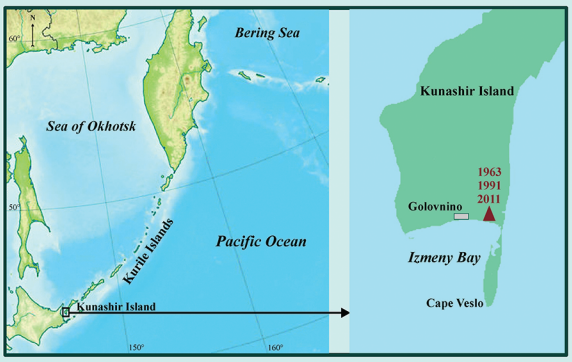


Izmeny Bay is located on the southern coast of Kunashir Island. Species composition of the intertidal macrobenthos is poorer as compared to that in the many other areas of Kunashir Island. In the area of Golovino Village, the intertidal zone was exposed to domestic effluents and effluents from sea food processing. In 1991 and 2011, survey of the intertidal zone was conducted at one of locations studied by Oleg G. Kussakin in 1963 (1.5 km eastward of Golovnino Village).

Macrobenthos is not found in the upper intertidal subzone. In 1963, most of the middle intertidal subzone was occupied by the belt-forming community dominated by a bivalve mollusk *Ruditapes philippinarum*, and a gastropod species *Batillaria cumingii* was the subdominant species. In 1991 and 2011, *B. cumingii* became the dominant species of the community. The lowest part of the middle intertidal subzone and the upper part of the lower intertidal subzones are occupied by the belt-forming community dominated by the eelgrass *Zostera japonica*. The *Zostera marina* belt is widespread in the lower part of the lower intertidal subzone.

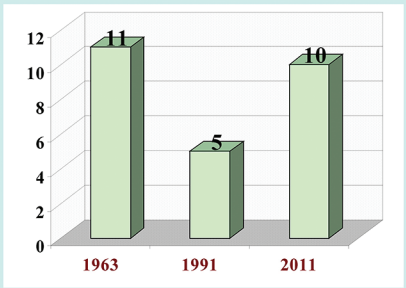
Over almost 50 years, the quantitative and qualitative changes of the intertidal biota took place in Izmeny Bay. Reduction of species richness and increase of biomass of macrobenthos have been recorded from 1963 to 1991 due to the fact that this area has been exposed to anthropogenic impact. It conforms to the observed earlier tendency on the other South Kurile Islands, when eutrophication of biotopes takes place and increase of the macrobenthic biomass is observed, and at the same time, species richness steadily declines under the effect organic pollutions. However, in 2011, the biomass of macrobenthos did not increase and even reduced in the *B. cumingii* community. The species richness reached the level of 1963 in the *B. cumingii* community and exceeded probably the 50 years level in the eelgrass communities. The 1994 earthquake did not appear to affect the distribution of the intertidal communities. At present, recovery of the intertidal macrobenthic belt-forming communities apparently occurs in Izmeny Bay.

m
1.8
Upper intertidal subzone
1.3
Middle intertidal subzone
0.85
Lower intertidal subzone
0

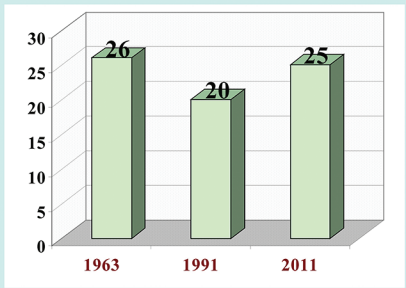
Belt-forming intertidal macrobenthic communities and their biomasses

	1963	1991	2011
	Ruditapes philippinarum	*Batillaria cumingii*	
Middle intertidal subzone	329.0 g wet wt m^{-2}	503.6 g wet wt m^{-2}	121.1g wet wt m^{-2}
		Zostera japonica	
Lower intertidal subzone	1280.5 g wet wt m^{-2}	1942.1 g wet wt m^{-2}	1957.4 g wet wt m^{-2}
		Zostera marina	
Lower intertidal subzone	2384.0 g wet wt m^{-2}	2422.8 g wet wt m^{-2}	2439.6 g wet wt m^{-2}

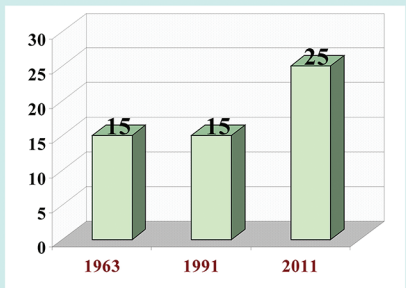
Species richness (number of species)



R. philippinarum / *B. cumingii*



Z. japonica



Z. marina