INTERMEDIATE BASINS OF THE LAKE CHANY CATCHMENT, SOUTHERN WEST SIBERIA

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Chany is the largest, ca. 2000 km^2, lake in Western Siberia. It is also the largest endorheic lake which catchment, ca. 18000 km^2, is completely situated on the Russian territory (Figs. 1, 2). The lake is fed by two medium size rivers Kargat and Chulym sourced in the Vasyugan Swamp of the central West Siberia and providing 95% of the lake water budget (Savkin et al., 2006). The lake has very changeable water level depending on the climate. Additionally, the lake consists of several sub-basins of variable salinity: fresh, brackish and hypersaline. All this raised our interest to the Lake Chany Basin. Our preliminary study (Krivonogov et al., 2015) (Fig. 1) showed that the lake appeared as a swampy wetland ca. 8 cal ka BP and became a lake of modern extent only 4 cal ka BP. This result considerably changes the previous considerations about the Holocene history of the lake (e.g., Smirnova and Shnitnikov, 1982; Orlova, 1992; Tarasov et al., 1996).

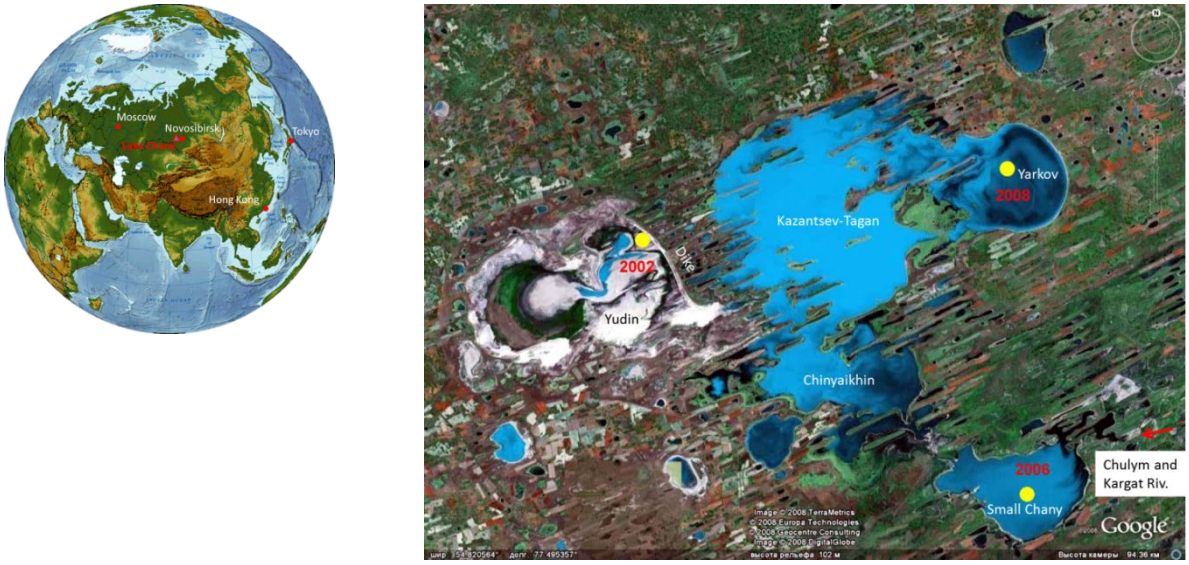

Figure 1. The Lake Chany Basin on the globe (left) and the GoogleEarth image of the lake (right). The image shows the Chany sub-basins, place of the Chulym and Kargat rivers inflow and position of our investigated boreholes (Krivonogov et al., 2015).

By the reporting study we try to explain so late watering of Lake Chany. This may result from local climatic and/or hydrological peculiarities. We hypothesized that the Kargat and Chulym rivers did not reach the lake during the early Holocene because they fed other intermediate basins well seen in the local topography and numbered to 18 (Fig. 2). Now these are wet meadows, reed wetlands or running lakes; some of them are quite extensive and compatible in size with the Lake Chany sub-basins. We suggested that the rivers sequentially reached these basins and filled them by water to form lakes. These lakes existed until the rivers have cut the local watersheds to flow farther towards the Chany.

Drilling of the intermediate basins do opened lake layers beneath peat and soil accumulations. The lake sediments are rich of mollusk shells which are good material for their dating (we did not use plant remains as roots of wetland plants deeply penetrate into the sediments which misrepresents their ages). The mollusk shell based chronology of the lake layers (Table 1) shows variations in evolution of the intermediate basins. Lake Sargul existed long before the lacustrine stage of Lake Chany. Maximum lake level in the Suma basin marked in the near-shore facies (5730 cal BP) also occurred before the deep Chany stage. However both Suma and Starogornostalevo lakes co-existed with the Chany Lake.

Additionally, we propose a model of sedimentation in the intermediate basins of the Lake Chany catchment.

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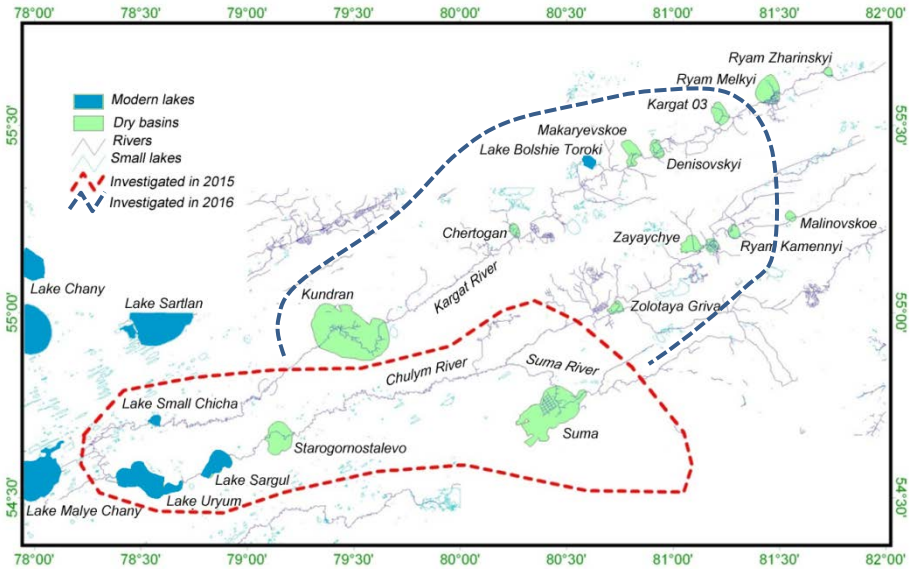

Figure 2. Modern hydrography and intermediate basins of the Lake Chany catchment.

Table 1

Radiocarbon chronology of the intermediate basins of the Lake Chany catchment (fieldwork 2015)

Locality	Depth, cm	Mollusk species	14C age	Calibrated age (median)
Lake Sargul	10-20	Pisidium sp.	3520 ± 100	**3800**
	50-60	Pisidium sp.	4260 ± 95	**4815**
	80-90	Pisidium sp.	4500 ± 95	**5145**
	120-130	Pisidium sp.	5190 ± 90	**5960**
	160-170	Bithynia sp.	5910 ± 95	**6540**
	180-190	Bithynia sp.	6640±100	**7525**
Starogornostalevo wetland	25	Limnaea sp.	1560 ± 85	**1460**
	53-55	Limnaea sp.	3540 ± 95	**3830**
Suma wetland, near-shore locality	16-25	Limnaea sp.	2760 ± 85	**2875**
	90-93	Limnaea sp.	4980±105	**5730**
Suma wetland, near-center locality	25-30	Anadonta sp.	2210 ± 85	**2210**
	25-30	Limnaea sp.	2510 ± 55	**2585**
	30-35	Anadonta sp.	2690 ± 60	**2810**

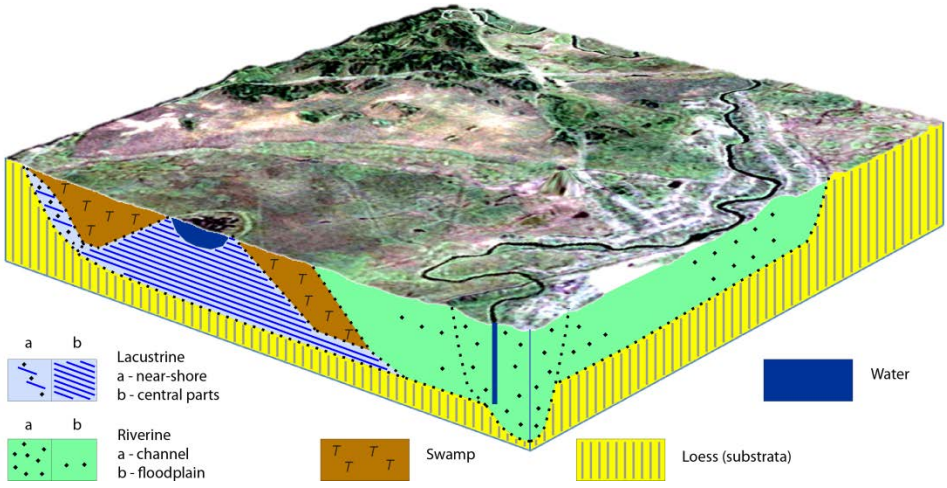

Figure 3. A model of sedimentation in the intermediate basins of the Lake Chany catchment. Legend shows the sediment origin. 3D view is draped by the GoogleEarth image of an investigated basin.

Keywords:
Hydrological and climatic changes, radiocarbon, West Siberia, Lake Chany, Holocene.