

Table S1. Altitudinal position and shift of OFB in 1960 and 2020.

Peak	1960				2020				Shift 1960–2020		
	S	N	Gen	S/N	S	N	Gen	S/N	S	N	Gen
Tigereksky	1230	1416	1307	0.87	1384	1520	1452	0.91	154	104	145
Gorkiy Belok	1501	1574	1537	0.95	1639	1636	1637	1.00	138	62	100
Baschelakskiy	1799	1760	1778	1.02	1879	1823	1853	1.03	80	63	76
Cherginsky	1739	1709	1749	1.02	1781	1774	1801	1.00	41	65	52
Ioldo	1628	1668	1658	0.98	1732	1770	1756	0.98	104	103	98
Elovyi	1667	1597	1626	1.04	1727	1671	1688	1.03	59	74	62
Sinyuha	1369	1322	1355	1.04	1475	1490	1505	0.99	106	169	150
Koksyisky	1458	1624	1552	0.90	1661	1733	1711	0.96	203	109	159
Sarkyik	1871	1834	1834	1.02	1929	1902	1898	1.01	59	68	64
Serginsky Belok	1317	1422	1370	0.93	1429	1545	1501	0.92	113	122	131
Turgusin	1330	1651	1523	0.81	1451	1744	1627	0.83	122	93	104
Krasnaya	1771	1755	1763	1.01	1928	1838	1883	1.05	158	83	120
Holodny Belok	1883	1987	1956	0.95	1990	2086	2042	0.95	108	99	86
Kara-Tyurek	1856	2088	2045	0.89	1970	2177	2152	0.90	114	89	107
Aktru	2111	2227	2160	0.95	2194	2301	2236	0.95	83	74	76
Tetykol	2096	2065	2083	1.02	2155	2129	2144	1.01	59	65	61
Bay-Tayga	1950	2032	2011	0.96	2002	2159	2103	0.93	52	127	91
Tesninskiy Belok	1344	1702	1503	0.79	1552	1868	1691	0.83	208	166	188
Listvyaga	1484	1796	1653	0.83	1631	1894	1759	0.86	147	98	106
Taymenie	1738	1984	1823	0.88	1807	2041	1881	0.89	69	57	58
Katunsky	2089	1958	2026	1.07	2205	2092	2145	1.05	116	134	118
Altay_Tengzyak	1949	1902	1917	1.02	2021	1999	2004	1.01	71	97	88
Altay_Tirektinskiy	1883	1903	1902	0.99	1984	2009	1998	0.99	100	105	95
Altay_Tongosh	1990	2007	1999	0.99	2051	2091	2070	0.98	61	84	71
Sayani_Borus	1448	1330	1389	1.09	1520	1478	1510	1.03	72	148	120
Sayani_Ergaki	1515	1380	1474	1.10	1587	1492	1555	1.06	72	112	82
Sayani_Khansyn	1566	1570	1554	1.00	1648	1637	1640	1.01	81	66	86
Sayani_Kohosh	1978	1921	1955	1.03	2058	1988	2030	1.04	79	67	75
Sayani_Kurtushubinsky	1735	1653	1715	1.05	1837	1768	1814	1.04	102	115	99
Sayani_Sarlinskii	1771	1745	1758	1.01	1929	1903	1893	1.01	157	158	135
Mean value	1702	1753	1732		1805	1852	1833		103	99	100
St. Dev	253	236	237		234.6	226	222		42	31.6	32.2

Table S2. Altitudinal shifts for period of 1960–2020 for sites with and without soil constrains and average shift in ASR.

Peak	Sites without Soil Constrains			Sites with Soil Constrains			Average Altitudinal Shift		
	Altitudinal Shift 1960–2020			Altitudinal Shift 1960–2020			Values		
	S	N	Gen	S	N	Gen	S	N	Gen
Tigereksky	154	104	145	25	2	13	90	53	79
Gorkiy Belok	138	62	100	20	43	31	79	52	66
Baschelakskiy	80	63	76	36	31	33	58	47	55
Cherginsky	41	65	52	7	20	13	24	42	33
Ioldo	104	103	98	46	–48	–1	75	27	48
Elovyi	59	74	62	28	–3	13	43	36	37
Sinyuha	106	169	150	27	3	15	66	86	82
Koksyisky	203	109	159	–24	27	2	89	68	80
Sarkyik	59	68	64	0	16	8	29	42	36
Serginsky Belok	113	122	131	–18	22	2	47	72	66
Turgusin	122	93	104	13	8	11	67	51	57
Krasnaya	158	83	120	–1	2	0	78	42	60
Holodny Belok	108	99	86	57	21	39	82	60	62

Kara-Tyurek	114	89	107		67		114	78	107
Aktru	83	74	76	16	-5	6	50	35	41
Tetykol	59	65	61	10	-2	4	35	32	33
Bay-Tayga	52	127	91	33	35	34	43	81	63
Tesninskiy Belok	208	166	188	-6	-28	-17	101	69	85
Listvyaga	147	98	106		115		147	106	106
Taymenie	69	57	58	9	4	6	39	30	32
Katunsky	116	134	118	72	66	69	94	100	93
Altay_Tengzyak	71	97	88	65	53	59	68	75	73
Altay_Tirektinskiy	100	105	95	2	17	9	51	61	52
Altay_Tongosh	61	84	71	33	14	23	47	49	47
Sayani_Borus	72	148	120	40	18	29	56	83	74
Sayani_Ergaki	72	112	82	22	32	27	47	72	54
Sayani_Khansyn	81	66	86	1	21	11	41	43	49
Sayani_Kohosh	79	67	75	41	47	44	60	57	59
Sayani_Kurtushubinsky	102	115	99	28	12	20	65	63	59
Sayani_Sarlinskii	157	158	135	77	104	90	117	131	113
Mean value	103	99	100	23	24	21	67	61	63
St. Dev	42.2	31.6	32.2	24.4	32.6	22.4	27.5	23.5	21.7

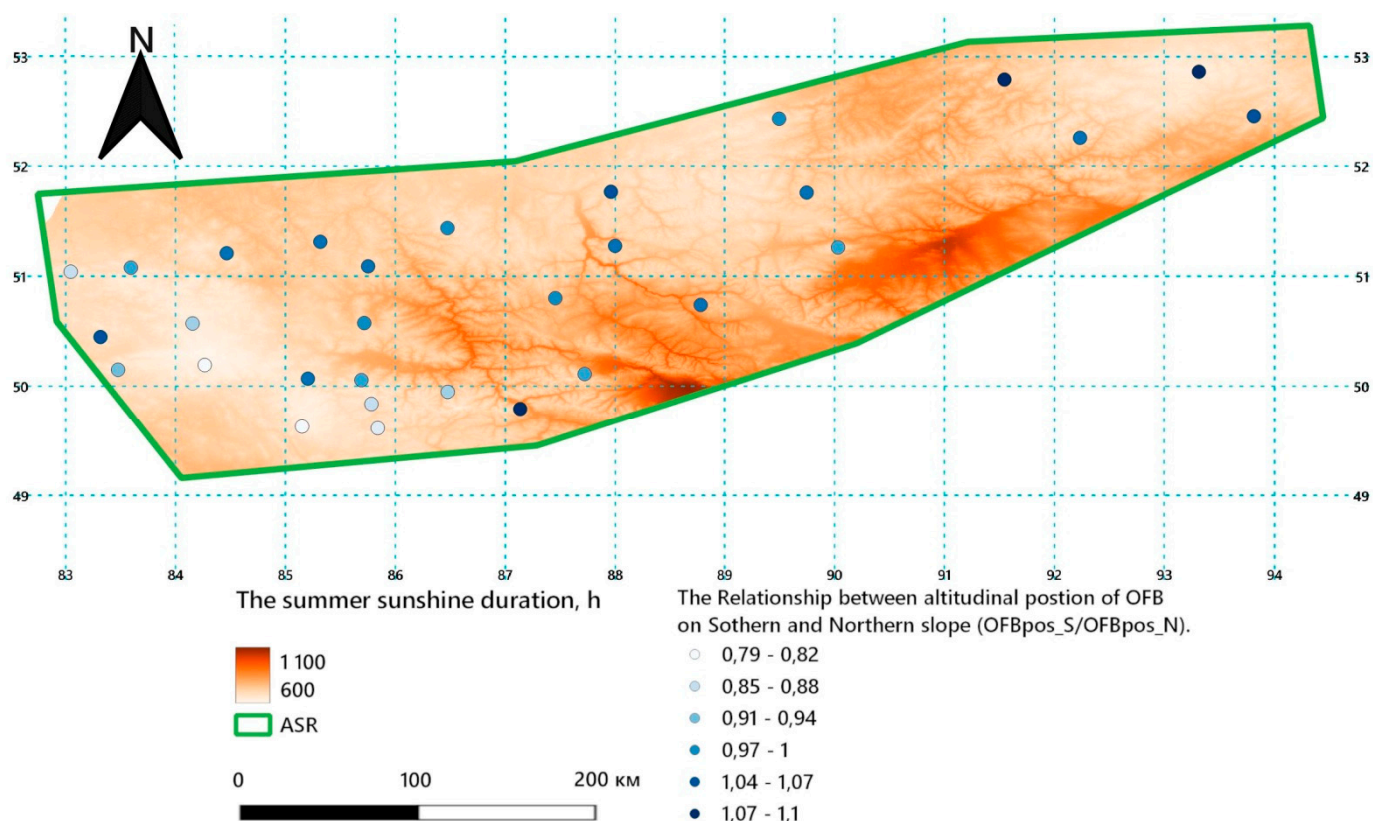


Figure S1. The values of OFBpos_S/OFBpos_N for 30 summits, the summer sunshine duration and the geographic positions.