

## Models of biological productivity

$$R_{fr} = \frac{M_{fr}}{GS} = c_0 \cdot SI^{C_1} \cdot A^{(C_2 + C_3 \cdot RS + C_4 \cdot RS^2)} \quad (1)$$

$$R_{fr} = \frac{M_{fr}}{GS} = c_0 \cdot A^{C_1} \cdot SI^{C_2} \cdot RS^{C_3} \cdot EXP(C_4 \cdot A + C_5 \cdot RS) \quad (2)$$

where  $M_{fr}$  – mass of phytomass fractions;  $GS$  – growing stock;  $A$  – average age of stand;  $SI$  – code of site index;  $RS$  – relative stocking.

### Codes for Site Index

Site index	Ic	Ib	Ia	I	II	III	IV	V	Va	Vb
Code	3	4	5	6	7	8	9	10	11	12

### Parameters of Models of Biological Productivity

Phytomass fractions	Parameters					
	C0	C1	C2	C3	C4	C5
<b>Larch stands (eq. 2)</b>						
Stem	3.3870E-1	7.6600E-2	3.6400E-2	-8.2500E-2	-6.0000E-4	5.0800E-2
of which bark	3.1100E-2	-2.8900E-2	6.1920E-1	3.6000E-3	-4.0000E-4	-1.4440E-1
Branches	5.1970E-1	-9.1320E-1	7.9810E-1	-2.4850E-1	5.1000E-3	-3.4370E-1
Foliage	8.1200E-2	-9.5760E-1	7.6980E-1	-5.7580E-1	4.3000E-3	5.3050E-1
Roots	4.5000E-2	-2.1490E-1	8.3420E-1	-6.6640E-1	9.0000E-4	4.9610E-1
<b>Pine stands (eq. 2)</b>						
Stem	2.1050E-1	2.1260E-1	1.2700E-2	-2.4000E-2	-2.6000E-3	-4.0900E-2
of which bark	2.2500E-2	-6.8650E-1	1.5137E+0	-1.1160E-1	3.5000E-3	3.5000E-3
Branches	3.3580E-1	-7.2670E-1	8.7260E-1	4.8630E-1	4.9000E-3	-1.0819E+0
Foliage	8.7200E-2	-9.1870E-1	1.0143E+0	-4.7890E-1	3.5000E-3	4.0920E-1
Roots	2.3030E-1	-1.4870E-1	2.6890E-1	8.1180E-1	4.0000E-5	-5.6260E-1
<b>Pine stands in European Part (eq. 1)</b>						
Stem	2.5080E-1	7.8500E-2	4.8200E-2	1.8210E-1	-1.4420E-1	
of which bark	3.4600E-2	6.2860E-1	-2.3220E-1	3.6000E-2	-6.5100E-2	
Branches	4.7700E-2	9.8030E-1	-2.8750E-1	-2.5830E-1	7.5200E-2	
Foliage	7.2500E-2	1.0731E+0	-6.9600E-1	-2.4400E-2	-4.7100E-2	
Roots	3.6400E-2	5.5370E-1	1.7680E-1	-4.0210E-1	2.3060E-1	
<b>Pine stands in Siberia, northern and middle taiga (eq. 1)</b>						
Stem	2.3290E-1	2.8250E-1	-6.1500E-2	6.3800E-2	7.6000E-3	
of which bark	2.6100E-2	7.4590E-1	-2.4510E-1	5.4800E-2	-2.3400E-2	
Branches	1.6200E-2	6.2620E-1	-4.1100E-2	1.1600E-2	-6.3800E-2	
Foliage	3.6900E-2	1.1844E+0	-5.7520E-1	1.8150E-1	-2.8210E-1	
Roots	1.0500E-2	9.7690E-1	-1.1180E-1	1.5890E-1	-1.6900E-2	

## Parameters of Models of Biological Productivity

Phytomass fractions	Parameters					
	C0	C1	C2	C3	C4	C5
<b>Pine stands in Siberia, southern taiga (eq. 1)</b>						
Stem	2.3050E-1	2.0190E-1	-5.0000E-3	1.2050E-1	-6.2000E-2	
of which bark	3.4600E-2	6.2860E-1	-2.3220E-1	3.6000E-2	-6.5100E-2	
Branches	3.4300E-2	5.8340E-1	1.9920E-1	-6.0040E-1	2.0640E-1	
Foliage	5.8000E-2	1.2977E+0	-4.0060E-1	-7.0740E-1	2.6520E-1	
Roots	8.3000E-3	1.3781E+0	6.9500E-2	-9.7100E-2	2.5500E-2	
<b>Pine stands in Siberia, forest-steppe (eq. 1)</b>						
Stem	2.6680E-1	1.2430E-1	1.3380E-1	-1.7660E-1	8.0300E-2	
of which bark	1.7300E-2	1.6555E+0	-4.4850E-1	-3.9520E-1	1.9370E-1	
Branches	6.3900E-2	8.8200E-1	-2.7620E-1	-2.8580E-1	4.9900E-2	
Foliage	1.7460E-1	1.3591E+0	-1.2059E+0	1.5650E-1	-7.9600E-2	
Roots	1.8830E-1	7.6530E-1	-2.9250E-1	-2.7520E-1	8.3800E-2	
<b>Spruce stands in European part (eq. 2)</b>						
Stem	2.1060E-1	1.3200E-2	1.7980E-1	-1.5940E-1	4.0000E-4	2.0920E-1
of which bark	4.4100E-2	-3.0910E-1	6.2570E-1	-1.9610E-1	1.7000E-3	3.5400E-2
Branches	1.5670E-1	-6.9750E-1	1.1094E+0	-7.6100E-2	2.8000E-3	-2.3520E-1
Foliage	1.1287E+0	-8.1630E-1	1.2148E+0	1.8073E+0	1.0000E-3	-1.9600E+0
Roots	4.1090E-1	-9.2300E-2	6.9290E-1	8.0430E-1	4.0000E-4	-2.0952E+0
<b>Spruce stands in Siberia (eq. 2)</b>						
Stem	2.0350E-1	-2.6100E-2	3.3080E-1	-1.0590E-1	-1.0000E-4	1.6320E-1
of which bark	8.5000E-3	5.5700E-2	8.6740E-1	-7.0600E-2	-1.3000E-3	-7.3300E-2
Branches	1.3110E-1	-7.9280E-1	1.3393E+0	1.2380E-1	3.9000E-3	-2.7980E-1
Foliage	1.5264E+0	-1.3441E+0	8.6010E-1	-2.5300E-2	8.6000E-3	-4.1650E-1
<b>Fir stands (eq. 2)</b>						
Stem	3.1910E-1	-2.2760E-1	2.8340E-1	-3.2830E-1	2.8000E-3	2.7850E-1
of which bark	2.4800E-1	-5.0230E-1	2.3770E-1	8.4800E-2	4.3000E-3	-3.5960E-1
Branches	6.5820E-1	-1.5111E+0	1.2925E+0	-5.5790E-1	1.4700E-2	2.5110E-1
Foliage	2.7200E-2	-5.7200E-1	1.0133E+0	-7.3720E-1	2.7000E-3	4.2820E-1
Roots	4.0500E-2	-1.0308E+0	1.3675E+0	-1.1218E+0	1.0300E-2	1.5001E+0
<b>Cedar stands (eq. 2)</b>						
Stem	2.3770E-1	2.0570E-1	8.3400E-2	1.8420E-1	-1.8000E-3	-3.5560E-1
of which bark	1.8720E-1	-2.9610E-1	4.7690E-1	6.7000E-1	8.0000E-4	-9.4150E-1
Branches	1.0770E-1	-3.1390E-1	8.1160E-1	-2.7600E-2	-9.0000E-4	-7.5770E-1
Foliage	4.2510E-1	-7.0820E-1	9.3210E-1	3.2710E-1	-1.0000E-3	-1.2715E+0
Roots	6.5170E-1	-3.3840E-1	4.0010E-1	5.5890E-1	8.0000E-4	-1.1526E+0
<b>Birch stands in European part (eq. 2)</b>						
Stem	5.7230E-1	7.5800E-2	-1.3800E-1	-9.6300E-2	-1.2000E-3	-8.2000E-3
of which bark	2.7450E-1	-7.3600E-2	1.8460E-1	7.4840E-1	-3.3000E-3	-9.1610E-1
Branches	1.7110E-1	-4.1830E-1	3.1160E-1	-4.0160E-1	6.8000E-3	2.2000E-3
Foliage	5.7300E-2	-9.8510E-1	9.4320E-1	-9.5870E-1	5.8000E-3	6.6700E-1
Roots	2.2690E-1	-4.8550E-1	1.0823E+0	4.2080E-1	1.4000E-3	-6.2770E-1

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Phytomass fractions	Parameters					
	C0	C1	C2	C3	C4	C5
<b>Birch stands in Siberia (eq. 2)</b>						
Stem	9.9820E-1	3.2300E-2	-3.8860E-1	-2.0100E-1	-4.0000E-4	6.1600E-2
of which bark	3.1370E-1	-1.4990E-1	1.0840E-1	5.0370E-1	-2.2000E-3	-6.4850E-1
Branches	3.7290E-1	-2.9830E-1	-1.7440E-1	-3.7170E-1	4.7000E-3	-5.3100E-2
Foliage	4.3360E-1	-1.3900E+0	1.7110E-1	-1.6585E+0	1.4200E-2	1.2080E+0
Roots	1.7930E-1	-4.7400E-1	1.0304E+0	-2.6300E-2	6.0000E-4	-2.9320E-1
<b>Aspen stands in European part (eq. 2)</b>						
Stem	5.4220E-1	3.4000E-3	-1.7510E-1	-1.5640E-1	-2.0000E-4	8.7100E-2
of which bark	1.7010E-1	-4.4190E-1	6.5040E-1	3.4770E-1	2.3000E-3	-6.1500E-1
Branches	6.7600E-2	-4.3460E-1	4.5810E-1	-6.9860E-1	5.5000E-3	4.8730E-1
Foliage	5.5800E-2	-9.0170E-1	3.3060E-1	-1.8630E+0	-3.7000E-3	1.3707E+0
Roots	1.0694E+0	-3.3720E-1	2.4350E-1	7.3940E-1	7.0000E-4	-1.1848E+0
<b>Aspen stands in Siberia (eq. 2)</b>						
Stem	4.0220E-1	5.7200E-2	-1.6990E-1	-3.3930E-1	-1.4000E-3	2.3640E-1
of which bark	1.7570E-1	-4.3760E-1	6.7770E-1	4.1500E-1	1.9000E-3	-6.8820E-1
Branches	4.0400E-2	-1.2060E-1	6.0860E-1	-3.0470E-1	5.0000E-4	-9.8600E-2
Foliage	1.1250E-1	-1.3143E+0	7.0620E-1	-1.5857E+0	6.9000E-3	1.0340E+0
Roots	1.6160E+0	-2.8570E-1	9.9400E-2	8.7540E-1	-5.0000E-4	-1.4635E+0
<b>Oak stands (eq. 1)</b>						
Stem	5.5920E-1	-7.5000E-2	1.4700E-2	4.9800E-2	-1.7900E-2	
of which bark	1.9800E-2	8.1940E-1	-1.3600E-2	-6.4000E-3	-1.0000E-2	
Branches	4.1200E-2	1.2960E+0	-3.6010E-1	2.9650E-1	-2.9570E-1	
Foliage	7.3200E-2	1.4000E+0	-9.0090E-1	-2.5430E-1	1.1650E-1	
Roots	3.1690E-1	8.3090E-1	-3.5480E-1	-1.8960E-1	9.6400E-2	
<b>Beech stands (eq. 2)</b>						
Stem	6.7570E-1	1.2200E-1	8.9300E-2	5.1750E-1	-1.6000E-3	-6.2440E-1
Branches	6.9500E-2	-5.9380E-1	2.5410E-1	-1.8871E+0	9.4000E-3	1.8350E+0
Foliage	7.0216E+1	-1.6062E+0	1.6218E+0	4.3308E+0	2.0600E-2	-5.9753E+0
<b>Alder stands (eq. 2)</b>						
Stem	6.8920E-1	8.8200E-2	-9.9600E-2	2.6990E-1	-2.0000E-3	-4.6360E-1
of which bark	3.9700E-1	-2.6880E-1	-3.3290E-1	-3.5700E-2	3.1000E-3	-5.1130E-1
Branches	6.7700E-1	-3.4790E-1	3.1290E-1	1.7839E+0	2.1000E-3	-2.0392E+0
Foliage	1.5340E-1	-1.0962E+0	1.1621E+0	8.7130E-1	1.1700E-2	-1.0731E+0
Roots	1.5029E+0	-3.9290E-1	5.6250E-1	1.4529E+0	3.2000E-3	-2.4085E+0
<b>Undergrowth and understory (eq. 2)</b>						
Pine	9.7700E-2	1.2007E+0	-6.4280E-1	3.9670E-1	-4.1000E-3	-1.2726E+0
Larch	5.0000E-4	2.2190E+0	-9.4090E-1	-7.9640E-1	-7.5000E-3	2.0500E-1
Dark coniferous	5.3000E-5	1.5008E+0	2.1088E+0	2.9230E-1	-5.0000E-3	-3.7400E-1
Deciduous	2.0000E-3	1.7174E+0	7.2810E-1	1.8920E-1	-1.0200E-2	-6.8040E-1
<b>Green forest floor (eq. 2)</b>						
Pine	1.5000E-1	8.4410E-1	3.4960E-1	6.3600E-2	-3.0000E-3	-9.2000E-1
Larch	1.1030E-1	1.6460E-1	2.1700E+0	9.6920E-1	9.0000E-4	-2.9794E+0
Dark coniferous	5.7000E-3	7.0500E-1	2.6234E+0	1.3107E+0	-1.3000E-3	-3.3367E+0
Deciduous	4.5290E-1	4.6640E-1	5.5790E-1	6.4000E-3	-2.3000E-3	-1.0993E+0