Spatial distribution of runoff and its climate factors in extremal years: Case study for the largest Siberian Rivers.

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Mapping the spatial variability of extreme cases of annual values of river runoff and its climatic factors was done in the common system of measurement units for the basins of largest Siberian rivers Ob. Yenisei and Lena. This is achieved by transforming all considered variables in the ordinate of the normal probability distribution P for the corresponding function X, i.e. P (X) = 1 - F (X> x). For identification of extreme and mean years were calculated the values of P (X) for each point-element, in a basic time interval: 1961-1990. Then in every year we find the average value of P (X) for all pointelements located within a specific region. The cases when 7% = P (X) = 93% are attributed to extreme events (years), but when $45\% \le P(X) \le 55\%$ - to the average ones. Calculation of empirical values P (X) is performed by the Alekseev's formula: Pi(Xi)=(m(Xi)-0.25)/(Ni+0.5)*100. It is revealed that the extreme values of runoff and its climatic factors do not coincide in time. Average weighted by the area probability of runoff in the basins of the Ob. Yenisei and Lena was respectively: 11.0% (high flow of water - 1971) and 92.0% (low flow of water - 1982) 14.6% (1988) and 82.8% (1976) 15.9% (1978) and 88.7% (1986). Statistical probability or frequency of distribution for the average annual air temperature for these years was estimated as: 1971 - 43.7%, 1976 - 66.1%, 1978 -51.0%, 1982 - 40.0%, 1986 - 40.8%, 1988 - 23.6%. Similarly, for annual precipitation: 1971 - 47.8%, 1976 - 65.9%, 1978 - 49.3%, 1982 - 45.3%, 1986 - 60.2%, 1988 - 54.4%. The annual inflow of water (in km3) in the Arctic Ocean in the extreme years is: river Ob (gp Salekhard) - 503.5/304.4, river Yenisey (gp Igarka) - 631.4/519.0, river Lena (gp Kusur) - 605.0/402.6. The coefficients of variation of annual runoff in the extreme years in the same basins are: 3.20/3.10, 2.51/2.64, 2.37/2.40. In both cases, the numerator data related for high flow of water, in the denominator - for low flow of water.