Eurasian Chronicle of Nature as a basis for large-scale analysis of changing ecosystems.

(Poster)

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At present, the study of the consequences of global climate change on ecosystems has become particularly relevant. "Chronicles of Nature" is a unique monitoring program unmatched in geographical (former USSR) and temporal scale (from early 1900s and still ongoing in most locations), that accumulated mostly on paper until early 2000s with no coordinated attempt to compile it in a common format. It has become the basis for international cooperation since 2011 in the framework of ECN project led by the University of Helsinki. ECN: Eurasian Chronicle of Nature - Large Scale Analysis of Changing Ecosystems, it has more than 450 participants (researchers) representing 176 organizations from 12 countries including 114 PAs, 34 research institutes, 15 universities, and ministries and departments for environmental protection. The compilation of the data into a common database was conducted by the database coordinators. Large-scale and long-term dataset currently processed that can be used to examine community-level spatial variation in phenological dynamics and its climatic drivers. The database consist of 401,127 observation dates collected in 239 localities in Russia, Ukraine, Belarus, Latvia, Lithuania and Estonia, with the longest time series of 115 years - from 1899 to 2014. In addition to phenological data, we compile the long-term population data of mammals and birds and other types of surveys included "Chronicle of nature". From the very beginning, the project had the task of forming an international network of cooperation and provided for the creation of a database for the mass counting of mammals (including small ones), birds, invertebrates, the dynamics of abundance and diversity of vascular plants and fungi, hunting statistics, meteorological factors, forest cover and phenology . The area of research is biomes of the Eurasian taiga - from Scandinavia to the Urals and further to the coast of the Pacific Ocean. It is assumed, that the database will reflect the environmental changes that have occurred in the ecosystem of boreal forests over the last 50-100 years (including taking into account the monitoring of anthropogenic dynamics of the forest structure occurring against the backdrop of climate change). Data processing is based on developments of the Group of Mathematical Biology of the University of Helsinki. The main work of the Group focuses on the interaction between theoretical and empirical research in spatial and evolutionary biology. The group developed a wide range of mathematical, statistical and computational methods for analyzing the movement of species inhabiting diverse landscapes, with special emphasis on the survival of populations. The existing experience of joint research allows us to speak about the special importance of monitoring works within the "Chronicles of nature" of PAs, and the significance of this work grows in proportion to the duration of observations.