

IN MEMORIAM

Stepan G. Shiyatov

1933–2021



Stepan Grigorievich Shiyatov died October 23, 2021, in Yekaterinburg, Russia. Professor Shiyatov was a leading pioneer of dendroecological and dendroclimatic studies in northern Eurasia and internationally. He had a well-deserved reputation for rigor in the central process of dendrochronology–crossdating. He early tackled other basic problems such as detrending of ring-width series and the real-world frequency distributions of ring widths. He knew his material, from the field context to the properties of the measured series. This, and his generous mentoring of colleagues at his own laboratory and across Russia and the former USSR, as well as internationally, led to the work for which he is best known in dendrochronology: the long-term temperature reconstructions from Siberian tree-ring networks and the Yamal multi-millennial chronology.

He was born December 24, 1933, in Vladimirovka village, Zilair District, eastern

European Russia. After high school he entered the Forestry Department of the Ural Forestry Institute (Sverdlovsk, now Yekaterinburg). As a student, he took part in several expeditions to the Subpolar and northern Urals. This stimulated his interest in vegetation growing at the upper limit of its latitudinal and elevational distribution. His graduation thesis, and first scientific work, was about the ecology and diversity of open woodlands and crooked forests, as well as the altitudinal patterns and spatial distribution of the upper forest limits within the Kytlym Mountains (Northern Urals). After this, he worked for one year in the forestry industry until, in 1958, he joined the Ural Forest Experimental Station (Sverdlovsk) as a Research Assistant where he studied reforestation of concentrated felling areas and assessment of their fire hazard. In the fall of 1959 he enrolled in the postgraduate program at the Institute of Biology of the Ural Branch of

the USSR Academy of Sciences, where, under the guidance of Professor P.L. Gorchakovskiy, he began studying the upper tree-lines in the Polar Urals. In 1964 he defended his Ph.D. thesis on the topic “*Dynamics of the Upper Tree Line on the Eastern Slope of the Polar Urals (Sob River Basin)*”. He had been admitted as a Researcher in the Laboratory of Plant Ecology and Geobotany of the Ural Branch of the USSR Academy of Sciences in 1962, which became the Institute of Plant and Animal Ecology of the Ural Branch, most recently of the Russian Academy of Sciences. From 1971 to 1985 he served as Senior Research Scientist in this laboratory. In 1981 he defended his doctoral dissertation on the topic “*Climatogenic Changes in Forest Vegetation in the Upper and Polar Limits of Its Growth*”. He served as head of the Laboratory of Forestry and Dendrochronology from 1985 to 1988 and headed the established Laboratory of Dendrochronology from 1988 to 2009.

During his long and distinguished career as Professor of Dendrochronology and Director of the Laboratory of Dendrochronology at the Institute of and Plant and Animal Ecology and after his retirement, Stepan Shiyatov conducted a unique and invaluable program of research of national and international significance. His research foci were forest ecology, dendroecology and dendroclimatology in extreme environments, specifically at the upper, polar, lower and southern limits of woody vegetation growth. On the ecological front, he studied the role of the climatic and edaphic factors that determine the composition, morphological and age structure of stands at the upper tree-line. Further, he identified and described the main physiognomic and ecological types of the upper forest boundary. Notably, he reconstructed the dynamics of stands in the Polar Urals over the last 1350 years. Furthermore, a unique archive was created of carefully positioned repeated landscape photographic images of tree-line in the Polar and Southern Urals over the last century. A system of dendroclimatic monitoring was organized in the boreal forests of the Urals and the north of Western Siberia. These achieve-

ments laid the basis for studying the reaction of forest-tundra ecosystems to modern climate warming. Stepan G. Shiyatov was a true ecological explorer. His lifelong, patient and meticulous study of vegetation at plant distributional limits in the northern Urals and Yamal Peninsula revealed unexpected and important findings on forest dynamics at upper limits. Over more than a half-century he showed these dynamics to be more complex, and much more interesting, than a simple shift of a boundary.

On the dendrochronological front, he worked on super-long tree-ring chronologies from the Polar Urals, the Yamal Peninsula, Mangazeya, the Taimyr Peninsula and the Indigirka region. Summer temperature reconstructions of 300 to 1350 years length were developed for high-elevation regions in the Urals and Subarctic Eurasia. A seven millennia-long temperature reconstruction is presently in preparation. Each of these represented many years of work, in the field and in the laboratory. Each also represents a major contribution to knowledge of climate variability at high latitude, in regions of great significance for the functioning of the Earth System, its climate, biogeochemistry and biodiversity.

It was a privilege to know and work with this true scientist. Stepan G. Shiyatov's persistent, meticulous and cooperative approach to science, his enthusiastic love of the outdoors and his friendly good humor will be sadly missed.

—Contributed by Leonid Agafonov¹, Rashit Hantemirov¹, Malcolm K. Hughes², Valeri Mazepa¹, Irina Panyushkina², Vladimir Shishov³, Eugene A. Vaganov³

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[Note—Sections of this article are drawn from a translation to English of the notice of Stepan G. Shiyatov's death posted at the website of <https://ipae.uran.ru/node/1027>. Some co-authors of that notice are among authors of this *In Memoriam*]