







Editorial

Remembering Natalya Nikolaevna Vygodskaya

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As the Guest Editor I want to dedicate this Special Issue in memory of my university professor Natalya Nikolaevna Vygodskaya (Figure 1).



Citation: Schulze, E.-D.; Tchebakova, N.; Groisman, P.; Oltchev, A.; Panferov, O.; Kurbatova, J. Remembering Natalya Nikolaevna Vygodskaya. *Forests* **2022**, *13*, 980. <https://doi.org/10.3390/f13070980>

Received: 2 June 2022
Accepted: 14 June 2022
Published: 22 June 2022

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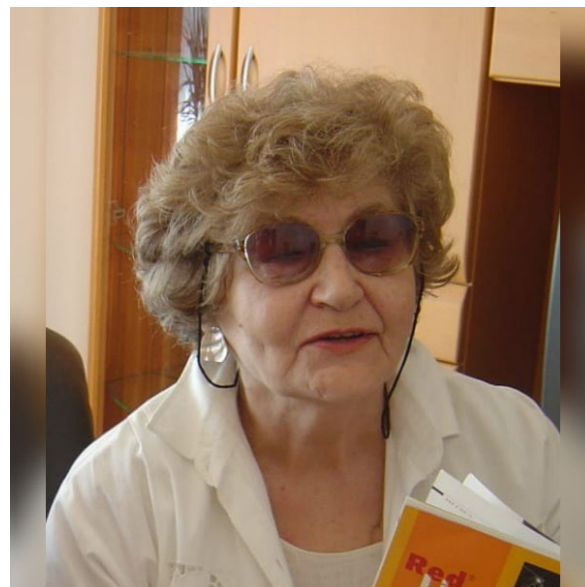


Figure 1. Natalya Nikolaevna Vygodskaya.

Natalya Nikolaevna Vygodskaya, Emerita Professor at the Russian Academy of Science, was a prominent and leading scientist in Russian Biometeorology. She started studying meteorology and climatology at Pushkin Leningrad State University in 1956, and then continued her education with the geography faculty at Lomonosov Moscow State University from which she graduated in 1961. She obtained her PhD in plant physiology in 1968 at Kuusinen Karelian University in Petrozavodsk, under the supervision of Prof. A.A. Molchanov. Her PhD dissertation title was “Optical Properties of Forest-Steppe Oak Stands

of Various Productivity". Natalya started teaching very early, just after defending her PhD. Her students were only 5 years younger than she. During her career, she had more than two dozen students who became PhDs and reached respected positions in the international scientific community. In 1981, she successfully defended her DSc degree at Lomonosov Moscow State University (i.e., the *doctor habil.* degree). Her doctorate dissertation title was "The Solar Radiation Transformation in Mountain Biogeocenoses and Its Role Evaluation as an Ecological-Cenotic Factor".

Natalya N. Vygodskaya was an enthusiastic and inspiring scientist with a remarkably broad range of interests focusing on solar radiation transformation by forest canopies and later on turbulent processes above forest canopies measured by the eddy-covariance method. She was full of ideas, and always eager to fully understand the highly complex interactions between the vegetation and the atmosphere. She carried out her scientific research at the Forest Science Laboratory of the Russian Academy of Sciences, headed by the prominent Russian academician V. N. Sukachev, the founder of the biogeocenology theory. N.N. Vygodskaya was head of this laboratory from 1989 to 2001.

Her international collaborations started in the late 1980s. She was one of the initiators of the bilateral Russian-German project titled "Scientific Bases for Comprehensive Monitoring of Ecosystems Including Monitoring in Biosphere Reserves and Protected Areas". The project was initiated within the framework of the agreement between the governments of the USSR and the Federal Republic of Germany to cooperate in the field of environmental protection (25 October 1988) and was aimed at long-term monitoring observations in a biosphere reserve for climate change, gas composition of the atmosphere, chemical composition of atmospheric precipitation, and reactions of natural ecosystems to changes in the environment. The National Central Forest Biosphere Reserve (NCFBR) near the old Russian town of Tver was selected for field experiments, many conducted with the active involvement of Natalya Nikolaevna. Her research activities included the development of geographic information systems, in-situ studies of functional interactions in ecosystems using modern technologies, remote sensing, and environmental process modeling.

In 1996–1997 Natalya Nikolaevna was awarded the German Alexander Humboldt fellowship that supports academic cooperation between excellent scientists and scholars from abroad and from Germany. She was the principal investigator in the research project within the International Geosphere-Biosphere Programme (IGBP) Global Change in Terrestrial Ecosystems titled "Effects of Climate on Plant Responses and Adaptations in the Eurasian Taiga" with the collaborative partner the Institute of Bioclimatology, Georg-August University (Göttingen, Germany).

In the early 2000s, a political decision was made to organize a long-term large-scale bilateral collaboration in Earth Science Studies between the Russian Academy of Sciences and NASA (The National Aeronautics and Space Administration). It was named the Northern Eurasia Earth Science Partnership Initiative (NEESPI; <http://neespi.org> (accessed on 15 June 2022)). An international team of more than 100 members was organized to prepare the NEESPI Science Plan. The Plan preparation began officially with the Suzdal, Russia International Workshop in April 2003. The Plan was peer-reviewed, reworked, and, finally, received the reviewers' approval in autumn 2004 (NEESPI Science Plan). Following approval, dedicated NEESPI calls for research funding were initiated in the USA and Russia. Subsequently, numerous scientific groups joined the Initiative, and very soon NEESPI became an international group of research projects that included more than 600 scientists from 30 countries. The NEESPI Science Plan had a timeframe of 10 to 12 years, was comprehensive and inclusive. Its science questions were clear, convincing, and gave to the NEESPI scientists a small but sometimes decisive advantage in the highly competitive world of scientific research ideas. As a result, 172 research projects joined the Initiative during the following 10 years. Natalya N. Vygodskaya was among the major authors of the NEESPI Science Plan and led the preparation of its key chapter "Ecosystems and Climate Interactions". In addition to her encyclopedic knowledge, Natalya Nikolaevna introduced

a number of her European and Russian colleagues and former students to the Initiative, which further expanded the horizon of the NEESPI research.

Despite her many international collaborations, her heart was with the National Central Forest Biosphere Reserve (NCFBR) in central European Russia. By the mid-90s, under her auspices, the first research station that was equipped with modern instruments allowing for high precision continuous measurements of energy and mass fluxes between forest and atmosphere by the eddy-covariance method was established in Russia. She linked novel flux measurements to excellent forest inventories data to draw conclusions about the carbon balance of East-European southern taiga forests. The NCFBR station was included in the EuroFlux Network. Still, her research interests went much beyond her biosphere station near Tver. Establishing flux measurements across Russia was one of her pioneer tasks. For decades she organized international expeditions to various parts of Siberia, with a main focus on the Yenisei basin. As a result, an eddy measuring network was established in central Siberia, near the village of Zotino located on the powerful Yenisei River. The eddy towers monitored ecosystem fluxes in various ecosystems of the landscape: forests (light- and dark-needled), forest glades with lichen ground cover, peat and grass bogs. Flux stations were maintained even in winter with temperatures of $-56\text{ }^{\circ}\text{C}$. In the summers, Natasha and her group lived in tents for months, cooking on fires, but maintaining instrumentation all the time, while avoiding the forest fires. These stations led eventually to the construction of the Russia's first tall eddy tower, Zotto (300 m), in the middle of Siberia.

Her multiyear scientific studies resulted in approximately 100 publications in numerous international journals. Among her most prominent publications were monographs "The Solar Radiation Regime and Structure of Mountain Forests" (1981) and "Theory and Experiments in Remote Sensing Studies of Vegetation" (1987), and numerous chapters in books devoted to optical traits of tree stands defined by their age and structure.

Everybody who had the chance to meet Natalya N. Vygodskaya was excited by her personality and benefitted from her encouragement to conduct his or her own research with high motivation, energy, and courage. She had a remarkably broad knowledge of plant ecology, ecosystems research, nature conservation, global change ecology, and interactions between these field of science. She had a perfect understanding of ecosystem processes and functions, especially in boreal and mountain forests. She was always full of ideas and loved to discuss scientific ideas for hours.

Very sadly, we have lost an ingenious and original advisor. We will miss the stimulating discussions that led to so many new insights in science and which helped many scholars cope with life during the ups and downs of their careers. Natalya was a caring and helpful person, who always thought of her students and young scientists. She was also a personal friend, who cared passionately about people, not only about those who were near but about many others she did not even know. She loved to bring people together.

Natalya Nikolaevna Vygodskaya died on 22 August 2020, after a long illness. With her death, the ecological community has lost valued member and a leading biometeorologist. She will be sorely missed.

Ernst-Detlef Schulze, Nadezhda Tchebakova and Pavel Groisman, and additionally Julia Kurbatova, Irina Milukova, Alexander Oltchev, Oleg Panferov, Elena Parfenova, Olena Sadovnich, Tatyana Sazonova, Andrey Sogachev, Andrey Varlagin, Natalya Zukert, Marina Lebedeva, Choimaa Dulamrusen, and many more of her students and collaborators.

Author Contributions: Conceptualization, E.-D.S., N.T. and P.G.; methodology, N/A; software, N/A.; validation, N/A.; formal analysis, N/A; investigation, N/A; resources, N/A; data curation, N/A; writing—original draft preparation, E.-D.S., N.T., P.G.; writing—review and editing, N.T., P.G., A.O., O.P., J.K.; visualization, N/A; supervision, N.T; project administration, N/A; funding acquisition, N/A. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.