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# SCIENCE

First Hand



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Peatlands, as well as the oceans, are the largest carbon depot on the planet, curtailing the increase in the greenhouse effect

Melting permafrost in northern swamps causes thermokarst processes and the formation of lakes, which are sources of the methane threat

Spread of unwanted migrant plants across the planet poses another global threat to the biodiversity of natural communities

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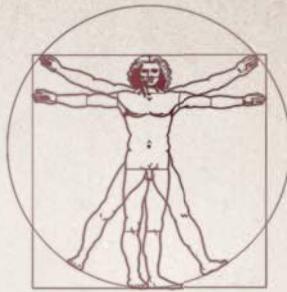
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*“The natural desire  
of good men is knowledge”*

Leonardo da Vinci

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*Dear friends!*

*For more than a century the biosphere of our planet has been suffering from a serious disease, which is only gaining momentum. Today this global disease poses, perhaps, the main threat to humanity. We are talking about the steady rise in global temperature, associated with the increasing greenhouse effect due to the accumulation of carbon dioxide, methane, and other gases in the atmosphere. Our planet experienced such episodes several times in its long life, but now the responsibility for the global warming lies with mankind, who is vigorously using the huge reserves of fossil fuels while destroying natural ecosystems that serve as a carbon depot.*

*Forests are the main sinks of carbon dioxide on land. This fact is recorded in the documents of the Kyoto Protocol and the Paris Agreement on climate change, which regulate greenhouse gas emissions by countries. Over the past two decades, however, 10 of the 257 forests on UNESCO World Heritage Sites have emitted more CO<sub>2</sub> than they have absorbed. This is the outcome of a natural decline in the productivity of mature forests and large-scale forest fires.*

*In this issue, we tell our readers about other terrestrial ecosystems that act as carbon dioxide sinks. Although not as popular as forests, these ones are able to remove carbon from the planetary cycle almost forever. These are peatbogs – occupying only 3% of the land, they contain a third of all soil carbon, twice as much as all the forests worldwide.*

*The largest swamp region in Russia is the West Siberian Plain. Here, on the southern border of peatlands, we also find the largest swamp system in the Northern Hemisphere, i.e., the Great Vasyugan Mire, valued for its truly virgin nature.*

*Stretching as wide as thousands of hectares, the Vasyugan mires provide today as a reserve of numerous species, including rare and endangered ones. In 2018, Russia created here the Vasyuganskiy Nature Reserve, or Zapovednik in Russian, a special area with the topmost protection status.*

*Specially protected areas of Russia are in the spotlight of another article in this issue. This one tells the reader about the Kurilskiy Nature Reserve and the Small Kurils Reserve (Malye Kurily), located thousands of kilometers to the east, on the southern islands of the Kuril Archipelago. A unique combination of natural conditions – geographical location, mild oceanic climate, and active volcanism – creates a rich natural environment harboring immense biodiversity. Here, magnolia grows next to monarch birches, and the heat-loving Japanese forest rat snake squirms on the same land as brown bears whose genotype contains genes of their polar relatives.*

*The protected islands host summer rookeries of rare marine mammals such Steller's sea lions; the coastal waters are home to the redlisted sea otter and to numerous cetaceans. The Southern Kurils are among the most biologically productive zones of the ocean, and it is very important to protect and preserve these marine ecosystems as they are also zones characterized by the most efficient carbon dioxide absorption. The Earth's biosphere is a most complex and well-regulated system, and its stability, and hence the future of mankind, depends on coherent work of all its links, both large and small.*

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