SATELLITE IMAGERY USED TO CREATE A VIRTUAL MODEL OF
RUSSIA'S FAMOUS VALLEY OF GEYSERS IN THE KRONOTSKY RESERVE

In 2007, Andrey Leonov began his goal of sharing one of Russia's most renowned tourist destinations to millions around the world. The Valley of Geysers is one of the largest geyser fields in the world and is considered to be one of the Seven Wonders of Russia. Located in Eastern Russia, on the Kronotsky Reserve, it is also part of the United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site, "Volcanoes of Kamchatka."

The plan was first conceived after the Valley had experienced a huge landslide that destroyed approximately half of all the geysers in 2007. Realizing the popular demand of sharing this wonderful site, which normally receives an average attendance of only 3,000 people a year, Leonov began the "Virtual Valley of Geysers" project in 2009 in hopes of bringing the Valley to more people through the internet.

"Such high demand on information about the Valley led me to the idea of creating a free, publically available virtual 3D-model of this unique place; to allow everybody to visit the Valley virtually, explore the landscape and geysers location, and view photos and videos," said Leonov of the project. In addition to the help he received from the Kronotsky Reserve and sponsors of the project, he adds that, "The GeoEye Foundation granted us with the full crop [of the Valley and surroundings], which is approximately 280 square kilometers. It was a great help in creating the precise 3D-model of the entire region."

"Our project is fueled by non-commercial interests. It is developed by the collaborative efforts of enthusiasts who love Kamchatka Peninsula and the Valley of Geysers. We would like to thank all the people and organizations supporting this project. I'd also like to express a special thank you to the Russian Foundation for Basic Research, R&D Center ScanEx and the GeoEye Foundation for their images and grants to our project." – Andrey Leonov

The 3D-model of the landscape, which is connected with a web database containing text, photos and videos, is accessible in two versions: one for internet access and another for stereoscopic "virtual reality" systems. High resolution GeoEye images not only helped in establishing the 3D-model, but have also provided a precise

A view of the Valley of Geysers. This main thermal wall in the central part of the Valley is called Vitrazh ("Stained Glass Wall").
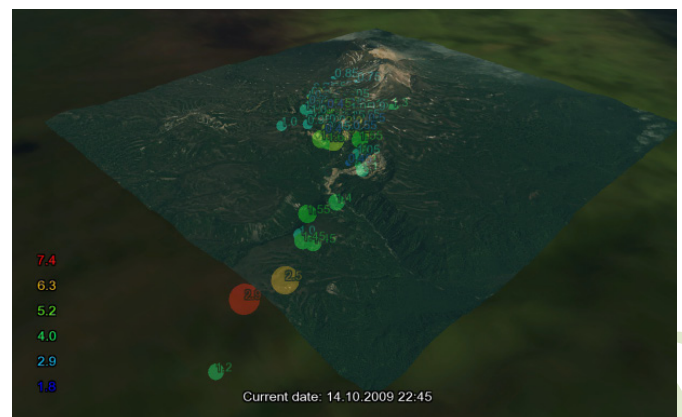
3D-visualization of the seismicity under the Valley. Seismic data courtesy by Yulia Kugaenko et al., KBGS RAS.

geographically referenced basis for creating a "Catalogue of the Main Objects of the Valley of Geysers." This collection provides the most comprehensive overview of the Valley's thermal features, including 56 geysers. This work has greatly helped to catalogue all the geysers and other objects in the Valley.

The model serves other useful purposes other than virtual tourism. It can be helpful for scientific visualization, such as research in local seismic activity and aid in geological education. Such research can also help in answering an age old question: "How does the geyser actually work?" As a reserved Natural Heritage Site, no human intervention is allowed in preventing natural disasters like landslides, nor can they lighten the consequences of such events. Due to such irretrievable changes that occur as a result of natural processes the only way to preserve the site for future generations is as a constantly evolving digital 3D-model. In the future, the Valley of Geysers project hopes to obtain new GeoEye images of the Valley to continuously improve their "Virtual Heritage" model and explore the dynamic changes of the landscape.

Visit the Virtual Valley of Geysers at www.valleyofgeysers.com.