ORGANIZATION OF HETEROGENEOUS REMOTE SENSING DATA MANAGEMENT FOR NEAR REAL-TIME VOLCANIC ACTIVITY MONITORING AND ANALYSIS WITH THE VOLSATVIEW INFORMATION SYSTEM

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Kamchatka Peninsula and the North Kurile Islands region is one of the most volcanically active on the planet. Every year up to eight volcanoes erupt and produce tons of volcanic ash, gas and aerosol which can pose a serious threat to aviation. Reducing and possible prevention of this threat requires a near real-time monitoring of volcanic activity in the region using all the data sources possible, including Earth remote sensing data from satellites, ground observations and meteorological information. To meet these requirements in 2011 the VolSatView information system for volcanic activity monitoring in Kamchatka and North Kurile Islands was developed and launched by Institute of Volcanology and Seismology FEB RAS, Space Research Institute RAS (IKI), Computing Center FEB RAS and Far Eastern Center of SRC «Planeta» (Gordeev et. al., 2016), (http://volcanoes.smislab.ru).

The VolSatView system provides access to very large (exceeding 1.5 PB) satellite data and derived products archives including low and moderate resolution data (MODIS, AVHRR, VIIRS, MSU-MR sensors), geostationary satellites data (most notably – from HIMAWARI-8 satellite), high and detailed resolution data (Landsat, Sentinel-2, Kanopus-V, Resurs-P, Meteor-M satellites) and also hyperspectral (EO-1) and radar data (Sentinel-1). The data is assimilated from many sources, including the USGS and ESA archives (via the IKI-Monitoring (Loupian et al., 2015) shared computing center), SRC «Planeta», Roscosmos Geoportal etc. Also the system provides access to ground observations data, various cloud-based interactive data analysis and processing tools (Kashnitskiy et. al., 2017). VolSatView is a distributed system and has three main nodes in Petropavlovsk-Kamchatsky, Khabarovsk and Moscow, each of them providing full-featured access to the whole system. .

The presentation describes the system architecture, it's main blocks and focuses on the data management part. The data management part of the system includes two main blocks: data archives and data access, and provides data collection from local satellite receiving station and outer data sources, data processing and archiving, online access to remote nodes archives, archive nodes synchronisation and data provision to the end user. Data archives are based on the UNISAT technology (Proshin et al,. 2016). It provides uniform storage of heterogeneous satellite data and enables online generation of so-called «virtual» products, i.e. online data processing on user request. Data access block is based on the GEOSMIS technology (Tolpin et al., 2011) and provides uniform data access, online analysis and processing with the web interface.

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