Observing the diurnal variability of Aerosol Optical Depth (AOD) from a geostationary satellite: Implications for air quality and climate monitoring

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NOAA has been providing AOD product from the GOES series of Imagers to users for a decade now. GOES AODs are derived from the single visible channel using a look-up-table approach; cloud screening is done using IR channels. GOES AODs, available at 30-minute temporal resolution and 4-km spatial resolution, have a root mean square error of 0.12; retrieval errors, however, are large when solar angles and/or view angles are large. Other sources of errors include cloud contamination, calibration errors, and errors in surface reflectance characterization. Analysis of GOES AODs over the United States indicates that spatial and temporal variability during pollution events is well captured; sub-urban/rural regions show good grid-to-grid correlation and the urban regions dominated by local pollution sources show less correlation with sub-urban regions. Analysis also shows that diurnal sampling improves the accuracy of monthly/seasonal mean AODs that has relevance to monitoring the impact of climate change. In addition to these results, we will show analysis of some case studies of pollution events that highlight the strengths of diurnal sampling with respect to policy implications as well as the capabilities of the future satellite instruments (e.g. GEO-CAPE) that will have better product accuracy and precision.

Gold-ore resources of Uzbekistan: Systematization and regularities of deposits' location

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The principles of the classification of gold-ore deposits

While classifying a geology-industrial approach with emphasis on main mineras of ores (quartz, sericite, adularia, alunite, pyrite, arsenopyrite), high-, lowsulphidized types is used. It was found [1] that on all hydrothermal gold ore deposits of the world, independently from host environment, a standard row of mineral, correspondingly, geochemical types is shown: scheelite-molybdenite (Au-W), pyrite-arsenopyrite (Au-As), telluride-polymetallic (Au-Te), sulphosalt-silver (Au-Ag), antimonite-sulphoantimonite (Au-Sb), realgar-cinnabar (Au-Hg). A porphiritic (Au-Cu, Mo) type is marked separately. An industrial resource of the deposit is determined by1-4 types.

Regularities of location and mineral-geochemical style

Uzbekistan is one of the leading countries in the world on reserves of gold. All deposits are located within the Kyzylkum-Kurama metallogenic belt and they form ore districts in the places of intersection of the Beltau-Kurama volcanino-plutonic belt (BKVB) with deep faults. Each ore district is characterized by its mineral-geochemical style that is explained by different depth of the formation, hypo-, meso-, epithermal conditions. From the West to the East of the BKVB the role of later types from Au-W to Au-Sb-Hg types increases. Elements' concentration coefficients in ores relatively to their clarks form following rows and mineral forms [2]: Muruntau – Bi-As-Te-Au-Se-Pd-W-Ag-Sb-Mo; tellurides of Bi, maldonite, arsenopyrite, scheelite, pyrite, Co-Ni minerals. Charmitan – As-Te-Bi-Au-Sb-Ag-Se-Pb-W-Mo; Bi tellurides, maldonite, aurostibite, Pb-Ag-Se sulphoantimonites, arsenopyrite, pyrite. Kochbulak – Te-Au-Bi-Sb-Ag-Se-As-Cu-Pb-Sn; tellurides of Au, Ag, Bi, Sb, Pb, Cu, Hg; pyrite, goldfieldite, tetrahedrite. Kalmakyr – Te-Re-Bi-Mo-Au-Se-Cu-Ag-As-Sb; tellurides of Bi, Au, Ag; Re-molybdenite, chalcopyrite, pyrite.

According to the statistics [3] 5-6 medium size deposits (15-20 tonnes) and 25-28 small deposits (<15 tonnes) usually form around one big deposit (>100 tonnes).

The resources of gold in Uzbekistan are highly evaluated.

[1] Rundkvist (1997) Geol.ore dep. **1**, 11–24. [2] Koneev *et al.* (2010) Geol.ore dep. **52**, **8**, 755–766. [3] Nekrasov (1999) Ores & metals, **3**, 48–62.