sunlight and provides a means for introduction of new UV 'D-index' on daily UV forecasts in addition to commonly used erythemal UV index.

Geochemistry and hydrology of a small catchment: fogs as an important part of the wet deposition

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The present paper deals with an importance of wind driven low clouds and fogs on the geochemistry and water balance of small forested watersheds situated in the mountainous headwater regions of the Czech Republic. The importance of the fog and cloud water droplet deposition in seacoast and mountaintop areas has been recognized for a long time. This portion of the wet deposition is rather ephemeral and terrible difficult to measure, but clouds and fogs was proved as an important delivery mechanism for atmospheric particles, gases, and liquid water from the near surface atmosphere onto the forest canopy. This contribution is concerned especially with advected fogs, that are wind-borne such orographic and other clouds that envelop mountain-tops. This type of fog wets vegetation (in harmony with radiation fogs) and unlike radiation fogs, because of the associated winds, can bring large amount of water and dissolved ions to the earth´s surface. The main goals of the present paper are to: (i) introduce the small experimental watersheds established in the headwater regions of the Czech Republic in order to evaluate their water balance and geochemistry; (ii) evaluate the time and space variation of the fog characteristics (especially the duration and frequency of occurrence; liquid water content and horizontal visibility); (iii) assess the water and mass balance of the selected experimental catchments taking into account the input of water and matter delivered to the basin via low clouds and fogs; and (iv) describe new techniques for fog water collection, i.e. ground-level cloud water sampler designs will be introduced. Mountainous ecosystems of the headwater region in the Czech Republic are frequently immersed in wind-driven clouds and this condition is believed to lead to significant deposition of water beyond that measured by incident rain gauges. In order to study the input of water and matter from wind driven low clouds and fogs on the water balance and chemistry of mountainous forested catchments, three experimental watersheds were established: (1) the Liz basin (Sumava Mts. – southern Bohemia; 0,99 km^2, 828 – 1073 m a.s.l., brown podzolic soil, moldanubic crystallinicum, paragneiss, prevailing type of tree: spruce aged up to 120 years); (2) the Uhlirska basin (the Jizerske hory Mts. – northern Bohemia; 1,87 km^2, 774 – 870 m a.s.l., brown podzolic soil, podzol, peat, Variscan igneous rocks of granite massif of the Krkonose-Jizerske hory crystalline complex, biotitic gneiss,prevailing type of tree: spruce aged up to 80 years); (3) the Modry potok basin (the Giant Mts. – north-eastern Bohemia; 2,62 km^2, 1010 – 1554 m a.s.l., ferrous humic podsole, brown podzolic soil, rocks of metamorphic aureole of Variscan granite pluton, mica schist,prevailing type of tree: spruce and dwarf pine 62 % and meadow 38 % of the area). These experimental catchments are situated in the main massifs of the Bohemian border mountains. They differ especially in the level of anthropogenic impacts on vegetation cover. While the Liz catchment represents a relatively healthy productive forest in a clear landscape, the Uhlirska basin is situated in a formerly heavily polluted region of the so-called "Black Triangle". The Modry potok basin in the Giant Mts. represents the original spruce forest in the lower part of the basin and the artic-alpine tundra with dwarf pine covers the upper part above the timberline. Based on the model predictions and on the water balance of the forest canopy the annual occult (deposited from low clouds and fogs) precipitation totals were estimated by the 10 % of the annual falling (rain and snow) precipitation total in the Sumava Mts., by 10 – 15 % in the Jizerske hory Mts., and even more than 20 – 25 % in the Giant Mts. An analysis of a statistical study of fog characteristics since 1960 till the time being was worked out. A fog water chemistry study carried out over the 16-years period proved high acidity of fog water and high values of

enrichment factors (that means the ratios between concentrations of chemical compounds in falling and occult precipitation). The compounds NH_4^+, SO_4^{2-} and NO_3^- are the dominant species both in fog water and in precipitation. In order to collect cloud water samples, the active and passive sample-taking devices were constructed. Besides the collectors, as described in literature, both passive and active fog water collectors of the new design were developed and installed at the selected localities.

Characterization of natural dimension stones used in Hungarian historic constructions; a case study of the Ruin Garden in Székesfehérvár

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The example of the Ruin Garden of Székesfehérvár in Hungary was selected as a case study for this current research. That assemblage of monuments in Székesfehérvár is of a great historic importance since it served as the coronation and burial church for most of the Hungarian kings in the Middle Ages. Moreover, its several reconstructions and expansions throughout history and the presence of several lithotypes found among the remained building and decorative stones makes the research related to the materials crucial not only for the conservation of that specific monument but also for a series of other historic structures in the Hungarian territory.

A total of 65 samples were collected both from left over pieces and the existing walls and went under investigation. In order to help the study, a series of maps was created based on in-situ investigations. Several wall selections were selected and three different kinds of maps were designed for each one. The first series of maps depicts the different construction periods of the selected section of the walls. The second series of maps shows the distribution of the different lithotypes over the wall which helps both to better evaluate the use of different stone types over the different construction periods and to correlate the different stone types to the various identified weathering forms. The last series of maps represent the visible weathering forms on the building materials. As it is well represented by the selected wall sections, several types of limestones such as oolitic, travertine, bioclastic and red biomicritic ones are the most widely used lithotypes in the different construction periods of the monument. Rhyolite and granite were also widely used in some construction periods.

Several weathering forms were observed on the various lithotypes with the oolitic limestone presenting the most severe ones such as individual fissures visible by naked eye, detachment of grains, multiple scaling, black and white crusts and detachment of black crust. The red limestone appears to be the most durable one among the different types of limestones. Only minor alterations were observed on these blocks such as decolourization of the surface and a few cracks.

The new maps have proven to be very useful also for the further identification of the site such as the documentation of the in-situ measured results (e.g. moisture content, rebound values measured by Schmidt hammer, drilling resistance) and their ensuing interpretation in relation with the existing climatic conditions.

As a further step for understanding the behaviour of the three most relevant materials, additional samples were taken from local quarries with similar physical and mineralogical characteristics: a medium-grained and a coarse-grained oolitc limestone from Sóskút and a red compact limestone from Tardos, Hungary. Both historic and freshly quarried stones were submitted to a series of physical and mechanical tests in order to identify the materials properties and behaviour such as their pores volume and structure, ultrasonic velocity, uniaxial compressive strength, dynamic modulus of elasticity and resistance to frost damage.