

COST TU1202 – Impacts of climate change on engineered slopes for infrastructure

Working Group 1 – Numerical modelling capabilities

Gaetano Elia, Federica Cotecchia

During this first meeting, the chair has briefly outlined the aim and objectives of the working group (WG1), identifying a general framework for the numerical activities and possible overlaps with the work of the other WGs. This has been followed by a short introduction of the 11 working group participants in terms of numerical techniques adopted to model slope-atmosphere interaction and its effects on infrastructures. In general, the research work of all participants can be related to the analysis of the stability of natural and artificial slopes and their interaction with infrastructures.

The discussion between the participants has been focused on the following aspects:

1. A wide range of numerical approaches, with different level of complexity, can be employed to study the same boundary value problem. Each numerical technique has specific limitations and benefits and requires different input data. At the same time, the numerical approach adopted depends on the available input data.
2. The main input data for the analysis of slope failures triggered or reactivated by climate factors should come from the hydrological modelling of infiltration, evapo-transpiration and run-off effects (interaction with WG3).
3. In some cases, the most advanced simulations may try to couple the hydrological and mechanical models of the slope.
4. The importance and necessity to derive site specific climate data.
5. The importance of slope monitoring data (interaction with WG2).

The outcomes of this first discussion are:

1. Potential additional members (specifically climatologists and biologists) have been identified and will be contacted/invited by the different participants.
2. A possible long term output would be the definition of one or two benchmark slopes to be studied with different numerical approaches in order to identify the limits and benefits of each technique. This could lead to the publication of a report/guidance note on the performance of the available stability models.
3. Related to the previous point, a first STSM could be devoted to the identification of suitable case histories/datasets available between the partners of the Action.