

---

[EE] Evening Poster | M (Multidisciplinary and Interdisciplinary) | M-IS Intersection

## [M-IS02]Conservation of geoparks, natural geosites and cultural heritage: weathering process and damage assessment

convener:Chiaki T. Oguchi(Institute for Environmental Science and Technology, Graduate School of Science and Engineering, Saitama University), Tetsuya Waragai(Graduate School of Science and Engineering, Nihon University), Miguel Gomez-Heras(Universidad Autonoma de Madrid, 共同), Magdalini Theodoridou(School of Engineering, Cardiff University, Wales, UK)

Mon. May 21, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

Geoparks, natural geosites and cultural geo-heritage are recognized as an important natural and cultural properties. Due to long years of suffering from weathering of rocks and earthen materials, they are often facing deterioration problems and somehow treatments or conservations might be necessary. Investigation from wide range of research fields such as geomorphology, engineering geology, geoarchaeology, conservation of cultural properties, petrophysics, geochemistry, geotechnical engineering, etc, however, our knowledge of many aspects of these materials is still limited. Here in this session, we accept discussions on original researches and case studies of documentation, measurement and monitoring techniques, experiments, predictive models, damage assessments, etc. We welcome papers from any kinds of research fields.

---

## [MIS02-P04]Direction dependence of hollows formed on sandstone pillars at Angkor Wat temple, Cambodia.

\*Tetsuya Waragai<sup>1</sup>, Yusuke Hiki<sup>2</sup> (1.Graduate School of Science and Engineering, Nihon University, 2.Suijo High School)

Keywords:Angkor Wat temple, World Heritage Site, sandstone, weathering environment, Protection and Management

Angkor Wat temple is in a tropical monsoonal climate having seasons of dry and wet, and rocks such as sandstone and laterite forming the temple are mainly deteriorated by wet-dry weathering and salt weathering. In this study, we focus on weathering environments and a hollow formed on the inside sandstone pillar in the first gallery of the temple which is located most outside from the central sanctuary. It is supposed that depth of the hollow is different from due to direction of the pillar and gallery. Therefore, environmental condition which provides the depth of hollow is analysed based on the measurement of the depth of hollow and air temperature-humidity environment in the gallery. As a result, the depth of hollow on pillar facing to the outside which is placed in a highly wet-dry repeat situation is deeper than the inside of pillar about three times. In addition, the depth depends on the direction of the gallery. Namely, the depth is deep at the eastern gallery with a rapid humidity change, is shallow at the northern gallery with high humidity and low air temperature through the year. It is supposed that the hollow formation has been accelerated since the clearing of vegetation at the temple that progresses as a conservation project. Because the clearing of vegetation is possible to decrease thermal buffer function and increase moisture changes for the pillar.