

systematically varies with soil development in this region. Chronosequence studies (35 pedons) in Alabama (U.S.A.) (climatic, aggradation terraces from Holocene to late Pliocene age) have illustrated the presence of vermiculite and smectite and the relative absence of hydroxy-interlayered vermiculite within the solum of Holocene terraces, but the presence of hydroxy-interlayered vermiculite with systematic depth trends on significantly older (>50,000 ybp) terraces. Pedogenic indicators including depth of solum, clay content, dithionite extractable iron, and CEC/clay ratios indicate highly weathered soils and mineralogical suites develop on the scale of 10^4 to 10^5 years in this environment.

Keywords: Ultisols, Kandic horizons, Chronosequences

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(6161 - 1615) Modelling of water balance dynamics of a Technosol on an abandoned mine site in northern Québec (Canada)

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Acid mine drainage (AMD) is responsible of soil and groundwater pollution in most mining countries such as Canada, and represents a major environmental concern for the mining industry. It originates from oxidation of sulfide minerals in the mine wastes with sharp decrease of pH and increase of heavy metals concentration in drainage water. Until 2008, the Manitou mine site was considered as one of the most polluted abandoned mine sites in northern Québec (Canada) with acid-generating mine wastes covering an area of approximately 190 ha. Recently, a part of this site (identified as Tailings Storage Facility TSF 2) was reclaimed with a cover made of Goldex non-acid generating mine wastes of 1.2 to 1.8 m thick combined with an elevated water table. Half of the cover was revegetated with herbaceous plants. The main objective of the reclamation approach is to maintain a high level of water saturation in the reactive Manitou tailings and the cover made with non-reactive Goldex tailings material. This water saturation allows to limit oxidation of sulfide minerals and inhibit the production of AMD. The Manitou acid-generating tailings and the Goldex non-generating cover material above with or without vegetation can be referred as a Technosol since its properties and pedogenesis are dominated by its technical origin. Pedological properties and hydrogeological dynamics of the engineered soil cover and its colonization by plants (e.g. grasses, legumes and willows) are critical to maintain tailings at high degree of water saturation and allow successful reclamation of the abandoned Manitou mine site in the long term. The objective of our research is to model the water balance dynamics in the experimental plots of the TSF 2 and to compare it with monitoring and field observation of water balance parameters. From 2015 to 2017, volumetric water content, matric suction, soil temperature and groundwater level were monitored on 8 instrumented stations of the Manitou site. Complementary laboratory analyses were performed to determine hydrogeological properties of the cover material used to reclaim the site. Additionally, a monitoring of natural vegetation species that successfully established on the site was conducted. A one-dimensional water balance modeling was performed with Vadose/W (GEO-SLOPE International, Ltd., 2016). The aim was to evaluate the ability of this numerical model to adequately simulate the water balance while including the effect of the vegetation.

Keywords: Technosol, soil cover, water balance, mine reclamation, revegetation, abandoned mine site

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(7325 - 3063) Pedogenesis in a semi-arid wetland

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The Convention on Wetlands of International Importance - RAMSAR is an intergovernmental treaty that establishes frameworks for national actions and for cooperation among countries with the aim of promoting the conservation and the wise use of wetlands in the world. These wetlands include environments with natural or artificial, permanent or periodic water. These wetlands are also found in arid and semi-arid environments, such as temporary ponds, which are generally small and shallow, intermittently flooded, and pass through a period of annual drying with no surface water. They are of great importance to the environment because they are responsible for a high biodiversity and productivity. There are many studies about these lands in the fields of biogeochemistry, ecology and botany. However, no significant studies were found regarding the pedogenesis of these soils. Thus, the purpose of this work is to identify the pedogenetic processes and to classify chemically, physically and morphologically the soils. The study was carried out in four soil profiles (P1, P2, P3, P4) distributed in a dry lagoon in Parnamirim City, Pernambuco, Brazil, taking into account the position of the points in the landscape and the absence of anthropic interference. The profiles were morphologically described and the horizons evaluated for physical, chemical and mineralogical properties. The profiles P1 and P2 were classified as Vertisols, with a gray color typical of gleation processes, as well as vertization: presence of slits, slickensides and argilloturbation. P3 was classified as Gleysol with gley horizon; and P4 classified as Planosol with presence of B textural. Soils also have kaolinite, smectite and strong feldspar minerals.

Keywords: temporary ponds, wetlands, semiarid, pedogenesis.

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(8226 - 689) Pedogenic forms of iron and manganese and its implication on soil genesis over a lithosequence in Nigeria.

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Citrate-bicarbonate-dithionite extractable iron and manganese oxides (Fe_d and Mn_d), Oxalate extractable iron and manganese oxides (Fe_{ox} and Mn_{ox}) and Sodium pyrophosphate extractable iron and manganese oxides (Fe_p and Mn_p) were studied on soils from two agro ecological zones in Nigeria. The active iron and manganese oxide ratios (Fe_{ox}/d and Mn_{ox}/d) and Clay/dithionite iron ratio ($clay/Fe_d$) were evaluated in the soils derived from schist and older granite to establish influence of parent material on soil development and identify major pedogenic processes in the study area. Significant differences were observed in means of most of the properties studied between the parent materials with exception of means of Fe_d and Mn_{ox}/d that were not significant. There were higher values of Fe_d , Fe_{ox} , Fe_p , Mn_d , Mn_{ox} and Mn_p (2.276, 0.511, 0.350, 0.085, 0.017 and 0.016%) respectively in soils formed on schist. Significant differences were observed in the means of Fe_d between horizons with subsurface